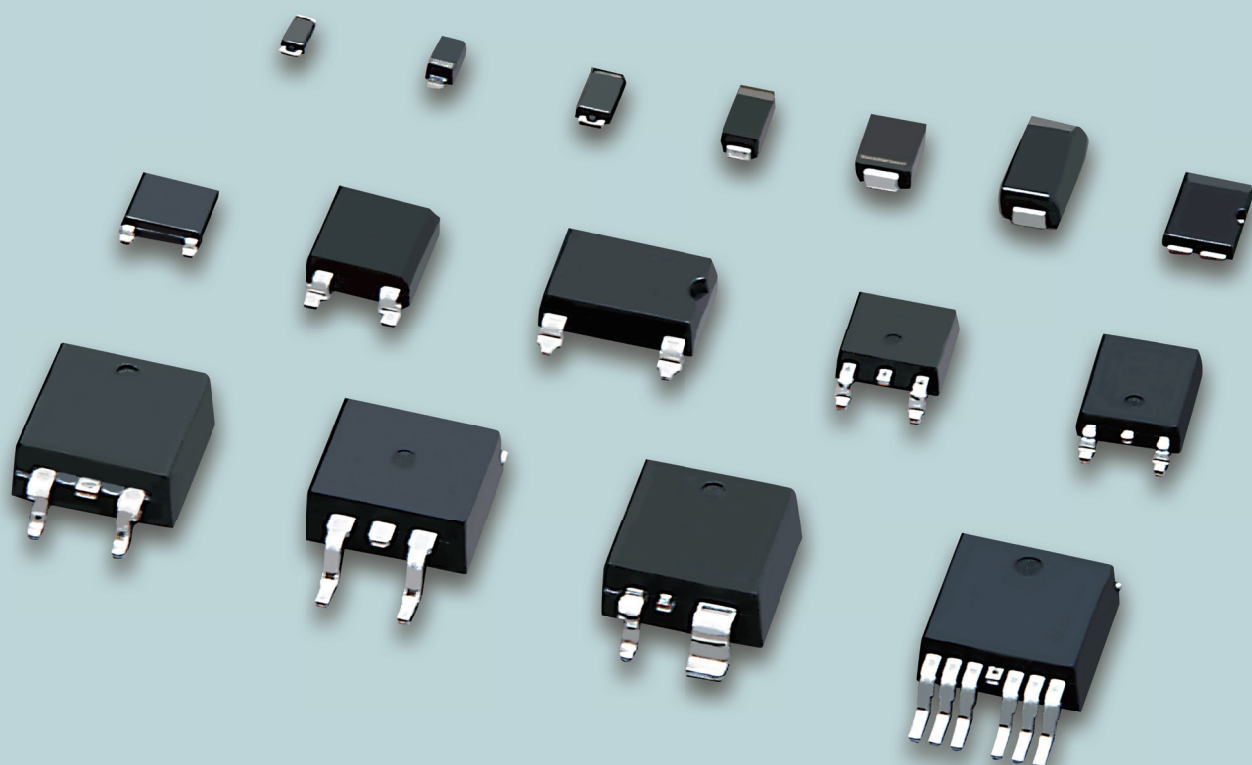
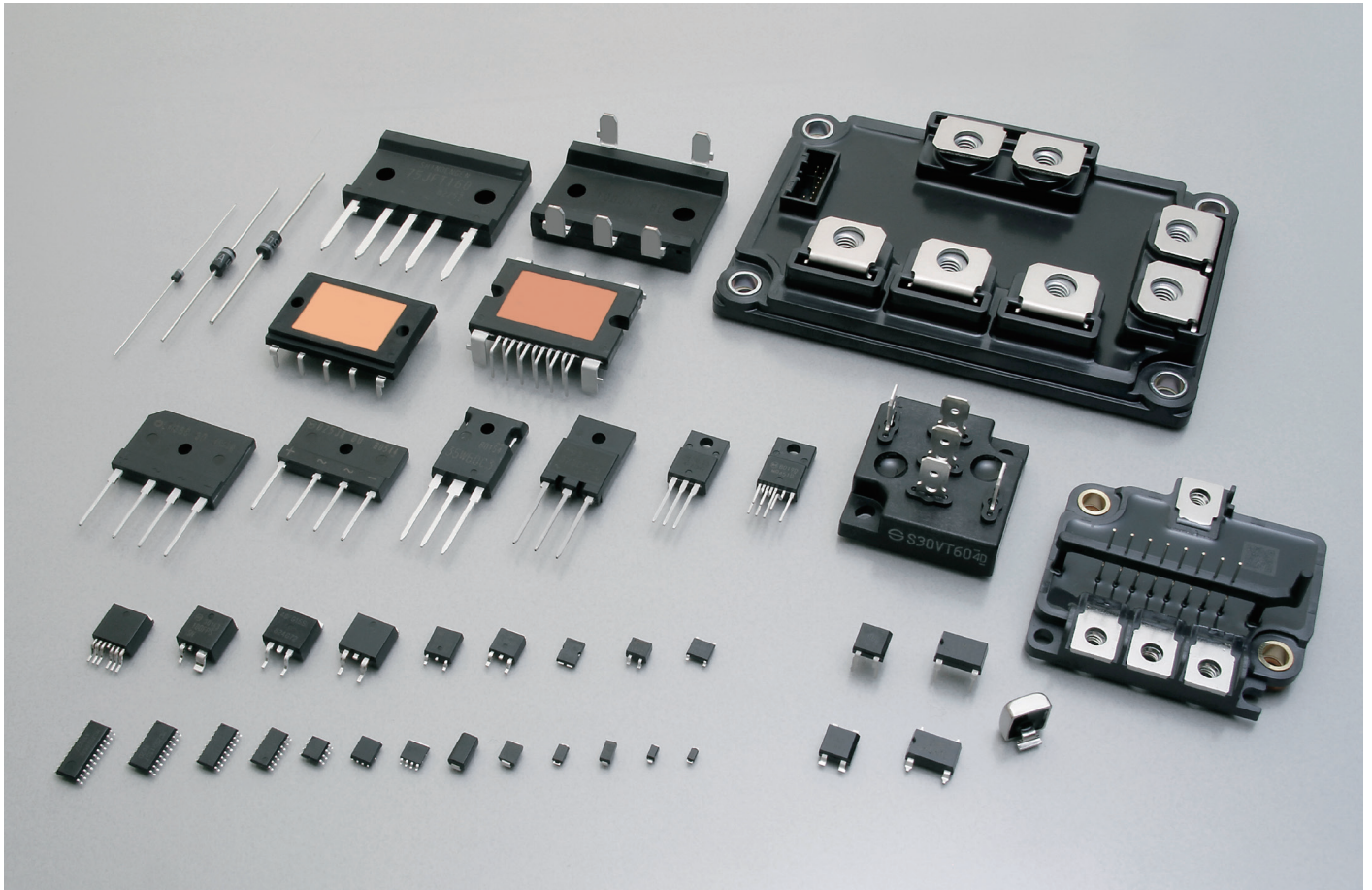


Semiconductor Product Catalog





Notes

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| P5F60HP2 | 54 | P25LF12SN | 50 | P60B6SN | 50 | P175FP4SN | 52 | S15WB60 | 16 | SF8K60USM | 34 | ST02-18G1 | 46 | ST06-27CE | 46 |
| P5FH90VX3 | 54 | P25LF12SNK | 50 | P64LF6QL | 50 | P175FP4SNK | 52 | S20K60T | 34 | SF10K60M | 34 | ST02-20G1 | 46 | ST06-30CE | 46 |
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GENERAL RECTIFYING DIODES




General Rectifying Diodes are defined as high-voltage and PN junction type devices.

These devices utilize our original glass passivation which is physically stable with a superior structure for resistance against heat and humidity. Variations are available for breakdown voltage up to 800V and output current from 1 to 30A.

Single

| Surface Mount | | | | | | | |
|---|--|------|-------------|----------|-----------------|-------|------------------------|
| Package | JEDEC Code JEITA Code House Name | Fig. | IF (AV) [A] | VRRM [V] | | | Remarks |
| | | | | 400 | 600 | 800 | |
|  3.9 × 1.8 × 1.4(mm) | DO-219AA similar M1F | B2 | 1 | | M1F60 M1FE60 | M1F80 | ① — <— ② |
| | | | 2 | M1FE40 | | | |
|  5.0 × 2.5 × 2.0(mm) | DO-214AC 1F | B3-1 | 1 | | D1F60 D1FE60 | | |
| | | | 1.1 | | LN1F60 | | |
| | | | 1.2 | | D1F60A | | |
|  4.7 × 2.4 × 0.98(mm) | SC-110B CE | B5-1 | 3 | | D3CE60V | | |
| | | | 3.5 | | D3CE60VE | | |
|  5.1 × 3.75 × 2.0(mm) | DO-214AA similar M2F | B6 | 1.2 | | M2F60 | | |
| | | | 3 | M3FE40 | M3F60 M3FE60 | | |
|  7.6 × 4.0 × 2.8(mm) | DO-214AA similar 2F | B9-1 | 1.4 | | D2F60 | | |
| | | | 3 | | D3F60 D3FE60 | | |
| | | | 4 | | D4F60 | | |
| | | | 5 | | D5FE60 | | |
|  9.5 × 6.6 × 2.65(mm) | SC-63 E-pack | G1-5 | 5 | DE5VE40 | | | ①④ — <— ② — ③ N.C. |
|  6.5 × 4.5 × 1.1(mm) | TO-277A similar FY | G4 | 10 | | D10FY60VE | | ① — <— ②③ |
|  9.6 × 6.6 × 2.3(mm) | TO-252AA similar FR | G5 | 10 | | D10FR60V | | ① — <— ②④ — ③ N.C. |
| | | | 15 | | D15FR60V | | |
|  13.2 × 10.2 × 4.7(mm) | SC-83 similar STO-220 | H1-2 | 25 | | DF25V60 | | ①②④ — <— ③ |
|  13.2 × 10.2 × 4.6(mm) | SC-83 similar FD | H2-1 | 25 | | D25FD60V | | ① — <— ②④ — ③ N.C. |

■ : New product

| Axial | | | | | | | |
|---|--|------|-------------|----------|---------|-------|-----------|
| Package | JEDEC Code JEITA Code House Name | Fig. | IF (AV) [A] | VRRM [V] | | | Remarks |
| | | | | 400 | 600 | 800 | |
|  3.0 × φ 2.6(mm) | AX057 | A1 | 1 | | D1N60 | D1N80 | ① — <— ② |
|  7.0 × φ 4.4(mm) | AX10 | A5-1 | 1.7 | | S2V60 | S2V80 | |
|  7.0 × φ 4.4(mm) | AX14 | A7 | 3 | | S3V100D | | |
| | | | 3.5 | | S3V60 | S3V80 | |

Single

| Surface Mount | | | | | | | | | | | | | |
|--|------|-----------|--------------------------|-----------------------|----------|----------|------------|----------------------------|----------------------|--------------------------|-----------------|----------------------|------------|
| JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive |
| | | | IF (AV) [A] | Conditions Ta [°C] | IFSM [A] | VRRM [V] | Tj [°C] | Vf (max) [V] | Conditions IF [A] | Ir (max) VR=VRRM [μA] | VESD (typ) [kV] | | |
| DO-219AA similar M1F | B2 | M1F60 | 1 | 25 | 25 | 600 | 150 | 1.10 | 1 | 10 | — | — | ○ |
| | | M1FE60 | 1 | 129 *1 | 30 | 600 | 150 | 1.10 | 1 | 10 | 25 | ○ | ○ |
| | | M1F80 | 1 | 25 | 25 | 800 | 150 | 1.10 | 1 | 10 | — | — | ○ |
| | | M1FE40 | 2 | 103 *2 | 25 | 400 | 150 | 1.10 | 1 | 10 | — | ○ | ○ |
| DO-214AC 1F | B3-1 | D1F60 | 1 | 25 | 25 | 600 | 150 | 1.10 | 1 | 10 | — | — | ○ |
| | | D1FE60 | 1 | 126 *1 | 30 | 600 | 150 | 1.10 | 1 | 10 | 25 | ○ | ○ |
| | | LN1F60 *3 | 1.1 | 25 | 25 | 600 | 150 | 1.05 | 0.8 | 10 | — | — | — |
| SC-110B CE | B5-1 | D1F60A | 1.2 | 25 | 45 | 600 | 150 | 0.97 | 1.2 | 10 | — | — | ○ |
| | | D3CE60V | 3 | 101 *1 | 50 | 600 | 150 | 1.10 | 3 | 10 | — | — | ○ |
| DO-214AA similar M2F | B6 | D3CE60VE | 3.5 | 93 *1 | 60 | 600 | -55 to 150 | 1.10 | 3.5 | 10 | 25 | ○ | ■ |
| | | M2F60 | 1.2 | 51 | 50 | 600 | 150 | 0.97 | 1.2 | 10 | — | — | ○ |
| | | M3FE40 | 3 | 76 *1 | 75 | 400 | 150 | 1.10 | 3 | 10 | 30 | — | ○ |
| | | M3F60 | 3 | 100 *1 | 90 | 600 | 150 | 1.05 | 3 | 10 | — | — | ○ |
| DO-214AA similar M3FE60 | B6 | M3FE60 | 3 | 76 *1 | 90 | 600 | 150 | 1.05 | 3 | 10 | 25 | ○ | ○ |
| | | D2F60 | 1.4 | 25 | 60 | 600 | 150 | 1.05 | 1.4 | 10 | — | — | ○ |
| | | D3F60 | 3 | 80 *1 | 150 | 600 | 150 | 1.05 | 3 | 10 | — | — | ○ |
| | | D3FE60 | 3 | 105 *1 | 150 | 600 | 150 | 1.05 | 3 | 10 | 25 | ○ | ○ |
| DO-214AA similar 2F | B9-1 | D4F60 | 4 | 68 *1 | 200 | 600 | 150 | 0.95 | 4 | 10 | — | — | ○ |
| | | D5FE60 | 5 | 82 *1 | 300 | 600 | 150 | 0.95 | 5 | 10 | 25 | ○ | ○ |
| | | D5F60 | 5 | 82 *1 | 300 | 600 | 150 | 0.95 | 5 | 10 | 25 | ○ | ○ |
| SC-63 E-pack | G1-5 | DE5VE40 | 5 | 130 *2 | 80 | 400 | 150 | 1.00 | 5 | 10 | 30 | — | ■ |
| TO-277A similar FY | G4 | D10FY60VE | 10 | 120 *1 | 220 | 600 | -55 to 150 | 1.10 | 10 | 10 | 25 | ○ | ○ |
| TO-252AA similar FR | G5 | D10FR60V | 10 | 130 *2 | 200 | 600 | -55 to 150 | 1.05 | 10 | 10 | — | — | ■ |
| | | D15FR60V | 15 | 125 *2 | 300 | 600 | -55 to 150 | 1.05 | 15 | 10 | — | — | ■ |
| SC-83 similar STO-220 | H1-2 | DF25V60 | 25 | 136 *2 | 400 | 600 | 150 | 1.10 | 25 | 10 | — | — | — |
| SC-83 similar FD | H2-1 | D25FD60V | 25 | 113 *2 | 450 | 600 | 150 | 1.10 | 25 | 10 | — | ○ | ○ |


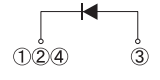
■ : New product *1 : Tl *2 : Tc *3 : trr(max)=3.5μs ■ : Please contact us.

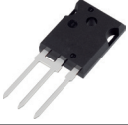
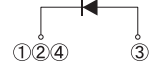
| Axial | | | | | | | | | | | | | |
|--|------|----------|--------------------------|-----------------------|----------|----------|---------|----------------------------|----------------------|--------------------------|-----------------|----------------------|------------|
| JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive |
| | | | IF (AV) [A] | Conditions Ta [°C] | IFSM [A] | VRRM [V] | Tj [°C] | Vf (max) [V] | Conditions IF [A] | Ir (max) VR=VRRM [μA] | VESD (typ) [kV] | | |
| AX057 | A1 | D1N60 | 1 | 25 | 30 | 600 | 150 | 1.05 | 1 | 10 | — | — | — |
| | | D1N80 | 1 | 25 | 30 | 800 | 150 | 1.05 | 1 | 10 | — | — | — |
| AX10 | A5-1 | S2V60 | 1.7 | 40 | 60 | 600 | 150 | 1.05 | 1.7 | 10 | — | — | — |
| | | S2V80 | 1.7 | 40 | 60 | 800 | 150 | 1.05 | 1.7 | 10 | — | — | — |
| AX14 | A7 | S3V100D | 3 | 130 *1 | 150 | 800 | 150 | 1.05 | 3 | 10 *2 | — | — | — |
| | | S3V60 | 3.5 | 40 | 120 | 600 | 150 | 1.05 | 2.6 | 10 | — | — | — |
| | | S3V80 | 3.5 | 40 | 120 | 800 | 150 | 1.05 | 2.6 | 10 | — | — | — |

*1 : Tl *2 : VR=1000V

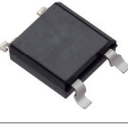
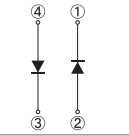

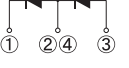
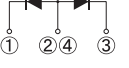
GENERAL RECTIFYING DIODES

Single


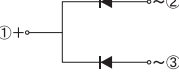
| Two Terminal Type | | | | | | | |
|---|--|------|------------------------|----------------------|---------|-----|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | Remarks |
| | | | | 400 | 600 | 800 | |
|  41.0 × 16.0 × 5.0(mm) | TO-247AD — MTO-3PT | K2 | 30 | | S30V60T | |  |

| Three Terminal Type | | | | | | | |
|---|--|------|------------------------|----------------------|---------|-----|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | Remarks |
| | | | | 400 | 600 | 800 | |
|  41.0 × 16.0 × 5.0(mm) | TO-247AD — MTO-3PV | K6 | 30 | | S30V80V | |  |

Array

| Surface Mount | | | | | | | |
|---|--|------|------------------------|----------------------|-----------|-----|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | Remarks |
| | | | | 400 | 600 | 800 | |
|  10.0 × 6.8 × 2.6(mm) | — — 1NA | C6-2 | 3 | | S1NAD80 | |  |
|  13.2 × 10.2 × 4.7(mm) | — SC-83 similar STO-220 | H1-5 | 5 | | DF5VD60 | |  |
| | | | 15 | | DF15VD60 | | |
| | | H1-7 | 16 | | DF16VC60R | |  |

Diode Module

| Diode Module | | | | | | | |
|--|--|------|------------------------|----------------------|---------|-----|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | Remarks |
| | | | | 400 | 600 | 800 | |
|  22.3 × 22.3 × 25.0(mm) | — — D30VC | E2 | 30 | | D30VC60 | |  |

Single

| Two Terminal Type | | | | | | | | | | | | | |
|--|------|----------|--------------------------|--------------------------------|----------------------|----------------------|---------------------|----------------------------|-------------------------------|--|-----------------------------|-------------------|------------|
| Package | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive |
| JEDEC Code JEITA Code House Name | Fig. | | I _{F(AV)} [A] | Conditions T _C [°C] | I _{FSM} [A] | V _{RRM} [V] | T _J [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [μA] | V _{ESD} (typ) [kV] | | |
| TO-247AD — MTO-3PT | K2 | S30V60T | 30 | 119 | 360 | 600 | 150 | 1.1 | 30 | 10 | — | — | — |

| Three Terminal Type | | | | | | | | | | | | | |
|--|------|----------|--------------------------|--------------------------------|----------------------|----------------------|---------------------|----------------------------|-------------------------------|--|-----------------------------|-------------------|------------|
| Package | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive |
| JEDEC Code JEITA Code House Name | Fig. | | I _{F(AV)} [A] | Conditions T _C [°C] | I _{FSM} [A] | V _{RRM} [V] | T _J [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [μA] | V _{ESD} (typ) [kV] | | |
| TO-247AD — MTO-3PV | K6 | S30V80V | 30 | 131 | 450 | 800 | 150 | 1.1 | 30 | 10 | — | — | ○ |

Array

| Surface Mount | | | | | | | | | | | | | |
|--|------|-----------|--------------------------|--------------------------------|----------------------|----------------------|---------------------|----------------------------|-------------------------------|--|-----------------------------|-------------------|------------|
| Package | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive |
| JEDEC Code JEITA Code House Name | Fig. | | I _{F(AV)} [A] | Conditions T _C [°C] | I _{FSM} [A] | V _{RRM} [V] | T _J [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [μA] | V _{ESD} (typ) [kV] | | |
| — — 1NA | C6-2 | S1NAD80 | 3 | 102 * | 110 | 800 | 150 | 1.05 | 0.75 | 10 | — | — | — |
| — SC-83 similar STO-220 | H1-5 | DF5VD60 | 5 | 140 | 140 | 600 | 150 | 1.05 | 2.50 | 10 | — | — | — |
| | | DF15VD60 | 15 | 127 | 190 | 600 | 150 | 1.05 | 7.50 | 10 | — | — | — |
| | H1-7 | DF16VC60R | 16 | 124 | 190 | 600 | 150 | 1.05 | 8.00 | 10 | — | — | — |

* : Tl

Diode Module


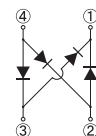






| Diode Module | | | | | | | | | | | | | |
|--|------|----------|--------------------------|--------------------------------|----------------------|----------------------|---------------------|----------------------------|-------------------------------|--|-----------------------------|-------------------|------------|
| Package | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive |
| JEDEC Code JEITA Code House Name | Fig. | | I _{F(AV)} [A] | Conditions T _C [°C] | I _{FSM} [A] | V _{RRM} [V] | T _J [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [μA] | V _{ESD} (typ) [kV] | | |
| — — D30VC | E2 | D30VC60 | 30 | 124 | 300 | 600 | 150 | 1.05 | 15 | 10 | — | — | — |

BRIDGE DIODES


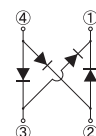





Bridge Diodes are suitable for the rectification of commercial voltage.

Variations are available for various packaging as well as high voltage (Max 1600V), high IFSM, low VF, and low noise.

Small Bridge Diodes

| Surface Mount | | | | | | | |
|---|--|------|------------|-------------------------|-----------|------|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | IF(AV) [A] | VRRM [V] | | | Remarks |
| | | | | 600 | 800 | 1000 | |
|  7.0 × 4.7 × 2.6(mm) | TO-269AA 1Z | C2-1 | 0.8 | S1ZB60 | S1ZB80 | |  |
|  6.2 × 5.15 × 1.45(mm) | SOPA-4 | C1 | 1 | | D1UBA80 | | |
|  10.0 × 6.8 × 2.6(mm) | 1N | C4 | 1 | S1NB60 | S1NB80 | | |
|  10.0 × 6.8 × 2.6(mm) | 1NA | C6-1 | 1 | | S1NBB80 | | |
|  10.0 × 6.8 × 2.6(mm) | 1NA | C6-1 | 1.5 | S1NBC60 | S1NBC80 | | |
|  10.6 × 10.2 × 3.1(mm) | 1W | C8 | 1 | S1WB(A)60 S1WB(A)60B | S1WB(A)80 | | |
|  10.6 × 10.2 × 3.1(mm) | 1W | C8 | 2 | | S2WB(A)80 | | |

THD (Through Hole Device)

| THD (Through Hole Device) | | | | | | | |
|--|--|------|------------|-------------------------|-----------|------|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | IF(AV) [A] | VRRM [V] | | | Remarks |
| | | | | 600 | 800 | 1000 | |
|  3.8 × 4.7 × 2.5(mm) | 1Z | C3 | 0.8 | S1ZB60 | S1ZB80 | |  |
|  6.5 × 6.8 × 2.5(mm) | 1N | C5 | 1 | S1NB60 | S1NB80 | | |
|  6.5 × 6.8 × 2.5(mm) | 1NA | C7 | 1 | | S1NBB80 | | |
|  6.5 × 6.8 × 2.5(mm) | 1NA | C7 | 1.5 | S1NBC60 | S1NBC80 | | |
|  6.2 × 10.2 × 3.0(mm) | 1W | C9 | 1 | S1WB(A)60 S1WB(A)60B | S1WB(A)80 | | |
|  6.2 × 10.2 × 3.0(mm) | 1W | C9 | 2 | | S2WB(A)80 | | |

Small Bridge Diodes

| Surface Mount | | | | | | | | | | | | | |
|--|------|------------|------------|--------------------------|--------------------|----------|----------|------------|----------------------------|-------------------|-----------------------|----|------------|
| Package | | Type No. | Spec. Code | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | UL | Automotive |
| JEDEC Code JEITA Code House Name | Fig. | | | IF (AV) [A] | Conditions Ta [°C] | IFSM [A] | VRRM [V] | Tj [°C] | VF (max) [V] | Conditions IF [A] | IR (max) VR=VRRM [μA] | | |
| TO-269AA | C2-1 | S1ZB60 | -7072 | 0.8 | 25 | 30 | 600 | 150 | 1.05 | 0.4 | 10 | - | - |
| 1Z | | S1ZB80 | -7072 | 0.8 | 25 | 30 | 800 | 150 | 1.05 | 0.4 | 10 | - | - |
| SOPA-4 | C1 | D1UBA80 | -7062 | 1 | 25 | 30 | 800 | 150 | 0.95 | 0.4 | 10 | - | - |
| 1N | C4 | S1NB60 | -7062 | 1 | 25 | 30 | 600 | 150 | 1.05 | 0.5 | 10 | - | - |
| 1NB80 | | S1NB80 | -7062 | 1 | 25 | 30 | 800 | 150 | 1.05 | 0.5 | 10 | - | - |
| 1NBB80 | C6-1 | S1NBB80 | -7062 | 1 | 26 | 50 | 800 | 150 | 1.05 | 0.5 | 10 | - | - |
| 1NBC60 | | S1NBC60 | -7062 | 1.5 | 105 * | 60 | 600 | 150 | 1.05 | 0.75 | 10 | - | - |
| 1NBC80 | | S1NBC80 | -7062 | 1.5 | 105 * | 60 | 800 | 150 | 1.05 | 0.75 | 10 | - | - |
| 1WB(A)60 | C8 | S1WB(A)60 | -7062 | 1 | 25 | 30 | 600 | 150 | 1.00 | 0.5 | 10 | - | - |
| 1WB(A)60B | | S1WB(A)60B | -7062 | 1 | 25 | 50 | 600 | 150 | 1.00 | 0.5 | 10 | - | - |
| 1WB(A)80 | | S1WB(A)80 | -7062 | 1 | 25 | 30 | 800 | 150 | 1.00 | 0.5 | 10 | - | - |
| S2WB(A)80 | | S2WB(A)80 | -7062 | 2 | 112 * | 50 | 800 | -40 to 150 | 1.05 | 1 | 10 | - | - |

* : TI









THD (Through Hole Device)

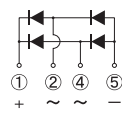
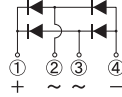
| THD (Through Hole Device) | | | | | | | | | | | | | |
|--|------|------------|------------|--------------------------|--------------------|----------|----------|------------|----------------------------|-------------------|-----------------------|----|------------|
| Package | | Type No. | Spec. Code | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | UL | Automotive |
| JEDEC Code JEITA Code House Name | Fig. | | | IF (AV) [A] | Conditions Ta [°C] | IFSM [A] | VRRM [V] | Tj [°C] | VF (max) [V] | Conditions IF [A] | IR (max) VR=VRRM [μA] | | |
| 1Z | C3 | S1ZB60 | -7101 | 0.8 | 25 | 30 | 600 | 150 | 1.05 | 0.4 | 10 | - | - |
| 1ZB80 | | S1ZB80 | -7101 | 0.8 | 25 | 30 | 800 | 150 | 1.05 | 0.4 | 10 | - | - |
| 1N | C5 | S1NB60 | -7101 | 1 | 25 | 30 | 600 | 150 | 1.05 | 0.5 | 10 | - | - |
| 1NB80 | | S1NB80 | -7101 | 1 | 25 | 30 | 800 | 150 | 1.05 | 0.5 | 10 | - | - |
| 1NBB80 | C7 | S1NBB80 | -7101 | 1 | 26 | 50 | 800 | 150 | 1.05 | 0.5 | 10 | - | - |
| 1NBC60 | | S1NBC60 | -7101 | 1.5 | 105 * | 60 | 600 | 150 | 1.05 | 0.75 | 10 | - | - |
| 1NBC80 | | S1NBC80 | -7101 | 1.5 | 105 * | 60 | 800 | 150 | 1.05 | 0.75 | 10 | - | - |
| 1WB(A)60 | C9 | S1WB(A)60 | -7101 | 1 | 25 | 30 | 600 | 150 | 1.00 | 0.5 | 10 | - | - |
| 1WB(A)60B | | S1WB(A)60B | -7101 | 1 | 25 | 50 | 600 | 150 | 1.00 | 0.5 | 10 | - | - |
| 1WB(A)80 | | S1WB(A)80 | -7101 | 1 | 25 | 30 | 800 | 150 | 1.00 | 0.5 | 10 | - | - |
| S2WB(A)80 | | S2WB(A)80 | -7101 | 2 | 112 * | 50 | 800 | -40 to 150 | 1.05 | 1 | 10 | - | - |

* : TI

BRIDGE DIODES


SIP (Single In-line Package) Bridge Diodes

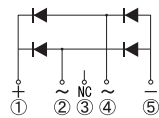
| THD (Through Hole Device) | | | | | | | Remarks |
|--|--|------|------------------------|------------------------------|------------------|----------|---------|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | |
| | | | | 600 | 800 | 1000 | |
|  24.0 × 13.8 × 3.1(mm) | — — D3K | D1 | 2 | | UD2KB80 | | |
| | | | 3 | | UD3KB80 | | |
| | | | 4 | | UD4KB80 | | |
| | | | 6 | | UD6KBA80 | | |
|  24.5 × 20.0 × 3.5(mm) | — — 2S | D2 | 1.5 | D2SBA60 D2SB60 | | | |
| | | | 2 | D2SB60A | | | |
|  25.2 × 25.0 × 4.2(mm) | — — JB | D5 | 6 | D6JBB60V | D6JBB80V | | |
| | | | 8 | D8JBB60V | D8JBB80V | | |
| | | | 10 | D10JBB60V | D10JBB80V | | |
|  32.5 × 25.0 × 4.6(mm) | — — 3S | D3 | 4 | D3SBA60 D3SB60 D4SB60L | D3SB80 D4SB80 | | |
| | | | 10 | D10XB60 D10XB60H | D10XB80 | | |
|  29.4 × 29.0 × 4.6(mm) | — — JA | D6 | 15 | D15JAB60V | D15JAB80V | | |
| | | | 25 | D25JAB60V | D25JAB80V | | |
|  37.5 × 30.0 × 4.6(mm) | — — 5S | D4 | 6 | D5SBA60 D5SB60 D6SB60L | D5SB80 D6SB80 | | |
| | | | 15 | D15XB60 D15XB60H | D15XB80 | D15XB100 | |
| | | | 20 | D20XB60 | D20XB80 | | |
| | | | 25 | D25XB60 | D25XB80 | D25XB100 | |
|  47.0 × 45.7 × 7.5(mm) | — — TSB(4pin) | D7 | 50 | | D50XB80 | | |
| | | | 50 | | D50JCB80V | | |
|  47.0 × 45.7 × 7.5(mm) | — — JC(4pin) | | | | | | |



■ : New product

DIP (Dual In-line Package) Bridge Diode

| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | Remarks |
|--|--|-------|------------------------|----------------------|-----------|------|---------|
| | | | | 600 | 800 | 1000 | |
|  47.0 × 45.7 × 7.5(mm) | — — JH | D10-1 | 70 | | D70JHB80V | | |



SIP (Single In-line Package) Bridge Diodes

| THD (Through Hole Device) | | | | | | | | | | | | |
|--|------|-----------|--------------------------|-----------------------------------|----------------------|----------------------|---------------------|----------------------------|----------------------------------|---|----|------------|
| JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | UL | Automotive |
| | | | I _{F(AV)} [A] | Conditions T _C [°C] | I _{FSM} [A] | V _{RRM} [V] | T _J [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [μA] | | |
| — — D3K | D1 | UD2KB80 | 2 | 143 | 62 | 800 | 150 | 1.05 | 1 | 10 | UL | — |
| | | UD3KB80 | 3 | 140 | 90 | 800 | 150 | 1.05 | 1.5 | 10 | UL | — |
| | | UD4KB80 | 4 | 138 | 135 | 800 | 150 | 1.00 | 2 | 10 | UL | — |
| | | UD6KBA80 | 6 | 131 | 135 | 800 | 150 | 1.05 | 3 | 10 | UL | — |
| | | UD8KBA80 | 8 | 126 | 165 | 800 | 150 | 1.05 | 4 | 10 | UL | — |
| — — 2S | D2 | D2SBA60 | 1.5 | 25 *1 | 60 | 600 | 150 | 1.05 | 0.75 | 10 | — | — |
| | | D2SB60 | 1.5 | 25 *1 | 80 | 600 | 150 | 1.05 | 0.75 | 10 | — | — |
| | | D2SB60A | 2 | 115 *2 | 120 | 600 | 150 | 0.95 | 1 | 10 | — | — |
| — — JB | D5 | D6JBB60V | 6 | 131 | 100 | 600 | 150 | 1.05 | 3 | 10 | UL | — |
| | | D6JBB80V | 6 | 131 | 100 | 800 | 150 | 1.05 | 3 | 10 | UL | — |
| | | D8JBB60V | 8 | 130 | 130 | 600 | 150 | 1.05 | 4 | 10 | UL | — |
| | | D8JBB80V | 8 | 130 | 130 | 800 | 150 | 1.05 | 4 | 10 | UL | — |
| | | D10JBB60V | 10 | 129 | 150 | 600 | 150 | 1.05 | 5 | 10 | UL | — |
| — — 3S | D3 | D3SBA60 | 4 | 108 | 80 | 600 | 150 | 1.05 | 2 | 10 | UL | — |
| | | D3SB60 | 4 | 108 | 120 | 600 | 150 | 1.05 | 2 | 10 | UL | — |
| — — 5S | D4 | D4SB60L | 4 | 111 | 150 | 600 | 150 | 0.95 | 2 | 10 | UL | — |
| | | D3SB80 | 4 | 108 | 120 | 800 | 150 | 1.05 | 2 | 10 | UL | — |
| | | D4SB80 | 4 | 108 | 150 | 800 | 150 | 0.95 | 2 | 10 | UL | — |
| | | D10XB60 | 10 | 100 | 120 | 600 | 150 | 1.10 | 5 | 10 | UL | — |
| | | D10XB60H | 10 | 112 | 170 | 600 | 150 | 1.05 | 5 | 10 | UL | — |
| — — 5S | D4 | D10XB80 | 10 | 100 | 120 | 800 | 150 | 1.10 | 5 | 10 | UL | — |
| | | D15JAB60V | 15 | 110 | 200 | 600 | 150 | 1.05 | 7.5 | 10 | UL | — |
| | | D15JAB80V | 15 | 110 | 200 | 800 | 150 | 1.05 | 7.5 | 10 | UL | — |
| | | D25JAB60V | 25 | 107 | 350 | 600 | 150 | 1.05 | 12.5 | 10 | UL | — |
| | | D25JAB80V | 25 | 107 | 350 | 800 | 150 | 1.05 | 12.5 | 10 | UL | — |
| | | D5SBA60 | 6 | 111 | 120 | 600 | 150 | 1.05 | 3 | 10 | UL | — |
| | | D5SB60 | 6 | 110 | 170 | 600 | 150 | 1.05 | 3 | 10 | UL | — |
| | | D6SB60L | 6 | 112 | 170 | 600 | 150 | 1.05 | 3 | 10 | UL | — |
| | | D5SB80 | 6 | 110 | 170 | 800 | 150 | 1.05 | 3 | 10 | UL | — |
| | | D6SB80 | 6 | 110 | 170 | 800 | 150 | 1.05 | 3 | 10 | UL | — |
| — — 5S | D4 | D15XB60 | 15 | 100 | 200 | 600 | 150 | 1.10 | 7.5 | 10 | UL | — |
| | | D15XB60H | 15 | 107 | 240 | 600 | 150 | 1.05 | 7.5 | 10 | UL | — |
| | | D15XB80 | 15 | 100 | 200 | 800 | 150 | 1.10 | 7.5 | 10 | UL | — |
| | | D15XB100 | 15 | 110 | 200 | 1000 | 150 | 1.10 | 7.5 | 10 | UL | — |
| | | D20XB60 | 20 | 87 | 240 | 600 | 150 | 1.10 | 10 | 10 | UL | — |
| | | D20XB80 | 20 | 87 | 240 | 800 | 150 | 1.10 | 10 | 10 | UL | — |
| | | D25XB60 | 25 | 98 | 350 | 600 | 150 | 1.05 | 12.5 | 10 | UL | ■ |
| | | D25XB80 | 25 | 98 | 350 | 800 | 150 | 1.05 | 12.5 | 10 | UL | ■ |
| | | D25XB100 | 25 | 106 | 350 | 1000 | 150 | 1.05 | 12.5 | 10 | UL | — |
| | | ■ D35XB80 | 35 | 93 | 550 | 800 | -55 to 150 | 1.05 | 17.5 | 10 | UL | — |
| — — TSB(4pin) | D7 | D50XB80 | 50 | 95 | 600 | 800 | 150 | 1.05 | 25 | 10 | UL | — |
| | | D50JCB80V | 50 | 94 | 600 | 800 | 150 | 1.05 | 25 | 10 | UL | ■ |


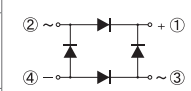






■ : New product *1 : T_a *2 : T_J ■ : Please contact us. UL : UL recognized (UL File No. E142422)

DIP (Dual In-line Package) Bridge Diode


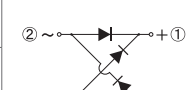



| JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | UL | Automotive |
|--|-------|-----------|--------------------------|-----------------------------------|----------------------|----------------------|---------------------|----------------------------|----------------------------------|---|----|------------|
| | | | I _{F(AV)} [A] | Conditions T _C [°C] | I _{FSM} [A] | V _{RRM} [V] | T _J [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [μA] | | |
| — — JH | D10-1 | D70JHB80V | 70 | 99 | 500 | 800 | -55 to 150 | 1.1 | 35 | 10 | — | — |

BRIDGE DIODES


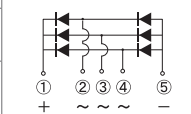




SQIP (Square In-line Package) Bridge Diodes

| Package | JEDEC Code JEITA Code House Name | Fig. | IF (AV) [A] | VRRM [V] | | | Remarks |
|--|--|------|-------------|----------|---------|------|---|
| | | | | 600 | 800 | 1000 | |
|  13.0 × 13.0 × 27.5(mm) | — S2VB | E3 | 2 | S2VB60 | | |  |
|  17.0 × 17.0 × 32.5(mm) | — S4VB | E4 | 4 | S4VB60 | | | |
|  25.0 × 25.0 × 32.5(mm) | — S5VB | E5 | 6 | S5VB60 | | | |
|  22.0 × 22.0 × 32.5(mm) | — S10VB | E6 | 10 | S10VB60 | | | |
|  26.5 × 26.5 × 25.0(mm) | — S15VB | E7 | 15 | S15VB60 | | | |
|  32.0 × 32.0 × 25.0(mm) | — S25VB | E8 | 25 | S25VB60 | S25VB80 | | |
|  36.0 × 36.0 × 24.0(mm) | — S50VB | E9 | 50 | S50VB60 | S50VB80 | | |

Input/Output In-line Terminal Type


| Package | JEDEC Code JEITA Code House Name | Fig. | IF (AV) [A] | VRRM [V] | | | Remarks |
|--|--|------|-------------|----------|---------|------|---|
| | | | | 600 | 800 | 1000 | |
|  17.0 × 17.0 × 31.0(mm) | — S3WB | E10 | 2.3 | S3WB60 | | |  |
|  22.5 × 22.5 × 32.5(mm) | — S10WB | E11 | 10 | S10WB60 | | | |
|  26.5 × 26.5 × 32.5(mm) | — S15WB | E12 | 15 | S15WB60 | | | |
|  32.5 × 32.5 × 32.5(mm) | — S20WB | E13 | 20 | S20WB60 | S20WB80 | | |

3 Phase Bridge Diodes

| Package | JEDEC Code JEITA Code House Name | Fig. | IF (AV) [A] | VRRM [V] | | | Remarks |
|---|--|-------|-------------|------------|-------------|---|---|
| | | | | 800 | 1200 | 1600 | |
|  47.0 × 45.7 × 7.5(mm) | — TSB(5pin) | D8 | 30 | D30XT80 | | |  |
| | | | 45 | D45XT80 | | D45XT160 | |
|  47.0 × 45.7 × 7.5(mm) | — JC(5pin) | 30 | | D30JCT120V | | | |
| | | 45 | | D45JCT120V | D45JCT160V | | |
|  47.0 × 45.7 × 7.5(mm) | — JF | D9 | 75 | D75JFT80V | | | |
|  47.0 × 45.7 × 7.5(mm) | — JH | D10-2 | 100 | D100JHT80V | D100JHT120V |  D100JHT160V | |


 : New product


SQIP (Square In-line Package) Bridge Diodes

| Package | | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | UL | Automotive | |
|--|------|----------|--------------------------|-----------------------|----------|----------|----------------------------|--------------|----------------------|----|---|--------------------------|
| JEDEC Code JEITA Code House Name | Fig. | | IF (AV) [A] | Conditions Tc [°C] | IFSM [A] | VRRM [V] | Tj [°C] | Vf (max) [V] | Conditions IF [A] | | | Ir (max) Vr=VRRM [μA] |
| — S2VB | E3 | S2VB60 | 2 *1 | 40 | 40 | 600 | 150 | 1.05 | 1 | 10 | — | — |
| — S4VB | E4 | S4VB60 | 4 | 40 | 80 | 600 | 150 | 1.05 | 2 | 10 | — | — |
| — S5VB | E5 | S5VB60 | 6 | 40 | 200 | 600 | 150 | 1.05 | 3 | 10 | — | — |
| — S10VB | E6 | S10VB60 | 10 | 40 | 200 | 600 | 150 | 1.05 | 5 | 10 | — | — |
| — S15VB | E7 | S15VB60 | 15 | 83 *2 | 200 | 600 | 150 | 1.05 | 7.5 | 10 | — | — |
| — S25VB | E8 | S25VB60 | 25 | 85 *2 | 400 | 600 | 150 | 1.05 | 12.5 | 10 | — | — |
| — | | S25VB80 | 25 | 85 *2 | 400 | 800 | 150 | 1.05 | 12.5 | 10 | — | — |
| — S50VB | E9 | S50VB60 | 50 | 95 *2 | 500 | 600 | 150 | 1.05 | 25 | 10 | — | — |
| — | | S50VB80 | 50 | 95 *2 | 500 | 800 | 150 | 1.05 | 25 | 10 |  | — |











*1 : Without heatsink *2 : Tc  : UL recognized (UL File No. E142422)

Input/Output In-line Terminal Type

| Package | | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | UL | Automotive | |
|--|------|----------|--------------------------|-----------------------|----------|----------|----------------------------|--------------|----------------------|----|---|--------------------------|
| JEDEC Code JEITA Code House Name | Fig. | | IF (AV) [A] | Conditions Tc [°C] | IFSM [A] | VRRM [V] | Tj [°C] | Vf (max) [V] | Conditions IF [A] | | | Ir (max) Vr=VRRM [μA] |
| — S3WB | E10 | S3WB60 | 2.3 | 40 * | 120 | 600 | 150 | 1.05 | 2 | 10 | — | — |
| — S10WB | E11 | S10WB60 | 10 | 74 | 170 | 600 | 150 | 1.05 | 5 | 10 | — | — |
| — S15WB | E12 | S15WB60 | 15 | 77 | 200 | 600 | 150 | 1.05 | 7.5 | 10 | — | — |
| — S20WB | E13 | S20WB60 | 20 | 76 | 500 | 600 | 150 | 1.05 | 10 | 10 | — | — |
| — | | S20WB80 | 20 | 76 | 500 | 800 | 150 | 1.05 | 10 | 10 |  | — |

* : Ta  : UL recognized (UL File No. E142422)

3 Phase Bridge Diodes


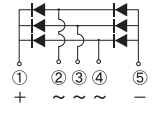

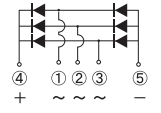



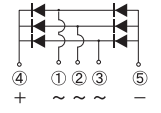


| THD (Through Hole Device) | | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | UL | Automotive | |
|--|------------|---|--------------------------|-----------------------|----------|----------|----------------------------|--------------|----------------------|---|---|--------------------------|
| JEDEC Code JEITA Code House Name | Fig. | | IF (AV) [A] | Conditions Tc [°C] | IFSM [A] | VRRM [V] | Tj [°C] | Vf (max) [V] | Conditions IF [A] | | | Ir (max) Vr=VRRM [μA] |
| — TSB(5pin) | D8 | D30XT80 | 30 | 117 | 300 | 800 | 150 | 1.05 | 10 | 10 |  | — |
| | | D45XT80 | 45 | 101 | 400 | 800 | 150 | 1.05 | 15 | 10 |  | — |
| | | D45XT160 | 45 | 97 | 330 | 1600 | 150 | 1.05 | 15 | 100 |  | — |
| — JC(5pin) | | D30JCT120V | 30 | 116 | 300 | 1200 | 150 | 1.05 | 10 | 10 |  | — |
| | | D45JCT120V | 45 | 99 | 450 | 1200 | 150 | 1.05 | 15 | 10 |  | — |
| | D45JCT160V | 45 | 97 | 450 | 1600 | 150 | 1.05 | 15 | 10 |  | — | |
| — JF | D9 | D75JFT80V | 75 | 109 | 400 | 800 | 150 | 1.05 | 25 | 10 | — | — |
| — JH | D10-2 | D100JHT80V | 100 | 99 | 500 | 800 | -55 to 150 | 1.10 | 35 | 10 |  | — |
| | | D100JHT120V | 100 | 92 | 450 | 1200 | -55 to 150 | 1.17 | 35 | 10 |  | — |
| | |  D100JHT160V | 100 | 92 | 540 | 1600 | -55 to 150 | 1.15 | 35 | 10 |  | — |

 : New product  : UL recognized (UL File No. E142422)

BRIDGE DIODES


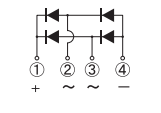

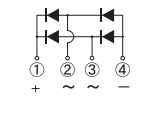
| Series | Feature |
|--------|---------------------------|
| S | Evenly balanced Vf and Ir |
| N | Low Vf, High Voltage |
| K | Low Vf |

3 Phase Bridge Diodes


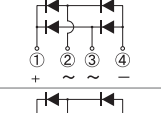

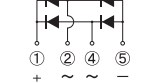
| Package | JEDEC Code JEITA Code House Name | Fig. | IF (AV) [A] | VRRM [V] | | | Remarks |
|---|--|-------|-------------|----------|--|---|---|
| | | | | 600 | 800 | 1600 | |
|  36.0 × 36.0 × 24.0(mm) | - | SVT | E15 | 10 | S10VT60 | S10VT80 |  |
| | | | | 15 | S15VT60 | S15VT80 | |
| | | | | 20 | S20VT60 | S20VT80 | |
| | | | | 30 | S30VT60 | S30VT80 | |
|  36.0 × 36.0 × 23.0(mm) | - | SVTA | E14 | 10 | S10VTA60 | S10VTA80 |  |
| | | | | 15 | S15VTA60 | S15VTA80 | |
| | | | | 20 | S20VTA60 | S20VTA80 | |
| | | | | 30 | S30VTA60 | S30VTA80 | |
|  89.0 × 50.0 × 16.6(mm) | - | MG038 | F7 | 150 |  MG038B150080A |  MG038D150160A |  |
| | | | | 200 |  MG038A200080A |  MG038C200160A | |

 : New product  : Under development








High Speed Bridge Diodes (SBD)

| THD (Through Hole Device) | | | | | | | |
|--|--|------|-------------|----------|---------|----------|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | IF (AV) [A] | VRRM [V] | | | Remarks |
| | | | | 40 | 60 | 200 | |
|  32.5 × 25.0 × 4.6(mm) | - | D3 | 4 | D4SBS4 | D4SBS6 | D4SBN20 |  |
| | | | 10 | D10SBS4 | | | |
| | | | 15 | | D15XBS6 | | |
|  37.5 × 30.0 × 4.6(mm) | - | D4 | 6 | | | D6SBN20 |  |
| | | | 15 | | | D15XBN20 | |
| | | | 20 | | D20XBS6 | | |
| | | | 30 | | | D30XBN20 | |

High Speed Bridge Diodes (FRD)

| THD (Through Hole Device) | | | | | | | |
|--|--|------|-------------|----------|-----|------------|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | IF (AV) [A] | VRRM [V] | | | Remarks |
| | | | | 200 | 400 | 1000 | |
|  32.5 × 25.0 × 4.6(mm) | - | D3 | 4 | D4SBL20U | | |  |
|  47.0 × 45.7 × 7.5(mm) | - | D7 | 30 | | | D30JCB100K |  |

3 Phase Bridge Diodes


| Package | | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | | UL | Automotive | |
|--|-------|---|---|--------------------|----------|----------|----------------------------|--------------|-------------------|-----------------------|---|---|---|
| JEDEC Code JEITA Code House Name | Fig. | | IF (AV) [A] | Conditions Tc [°C] | IFSM [A] | VRRM [V] | Tj [°C] | Vf (max) [V] | Conditions IF [A] | Ir (max) Vr=VRRM [μA] | | | |
| - | SVT | E15 | S10VT60 | 10 | 137 | 170 | 600 | 150 | 1.05 | 3.5 | 10 | - | - |
| | | S10VT80 | 10 | 137 | 150 | 800 | 150 | 1.05 | 3.5 | 10 | - | - | |
| | | S15VT60 | 15 | 132 | 200 | 600 | 150 | 1.05 | 5 | 10 | - | - | |
| | | S15VT80 | 15 | 132 | 200 | 800 | 150 | 1.05 | 5 | 10 | - | - | |
| | | S20VT60 | 20 | 128 | 300 | 600 | 150 | 1.05 | 7 | 10 | - | - | |
| | | S20VT80 | 20 | 128 | 300 | 800 | 150 | 1.05 | 7 | 10 | - | - | |
| | | S30VT60 | 30 | 121 | 400 | 600 | 150 | 1.05 | 10 | 10 | - | - | |
| | | S30VT80 | 30 | 121 | 400 | 800 | 150 | 1.05 | 10 | 10 |  | - | |
| - | SVTA | E14 | S10VTA60 | 10 | 137 | 170 | 600 | 150 | 1.05 | 3.5 | 10 | - | - |
| | | S10VTA80 | 10 | 137 | 150 | 800 | 150 | 1.05 | 3.5 | 10 | - | - | |
| | | S15VTA60 | 15 | 132 | 200 | 600 | 150 | 1.05 | 5 | 10 | - | - | |
| | | S15VTA80 | 15 | 132 | 200 | 800 | 150 | 1.05 | 5 | 10 | - | - | |
| | | S20VTA60 | 20 | 128 | 300 | 600 | 150 | 1.05 | 7 | 10 | - | - | |
| | | S20VTA80 | 20 | 128 | 300 | 800 | 150 | 1.05 | 7 | 10 | - | - | |
| | | S30VTA60 | 30 | 121 | 400 | 600 | 150 | 1.05 | 10 | 10 | - | - | |
| | | S30VTA80 | 30 | 121 | 400 | 800 | 150 | 1.05 | 10 | 10 | - | - | |
| - | MG038 | F7 |  MG038B150080A | 150 | 125 | 2350 | 800 | 150 | 1.05 | 67 | 10 |  | - |
| | |  MG038D150160A | 150 | 125 | 2350 | 1600 | 150 | 1.05 | 50 | 10 | to be certified | - | |
| | |  MG038A200080A | 200 | 125 | 2750 | 800 | 150 | 1.05 | 67 | 10 |  | - | |
| | |  MG038C200160A | 200 | 125 | 2750 | 1600 | 150 | 1.05 | 50 | 10 | to be certified | - | |


 : New product  : Under development  : UL recognized (UL File No. E142422)

High Speed Bridge Diodes (SBD)

| THD (Through Hole Device) | | | | | | | | | | | | | | |
|--|------|----------|--------------------------|--------------------|----------|----------|----------------------------|--------------|-------------------|-----------------------|-----|------------|----------|----------|
| Package | | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | | UL | Automotive | Remarks | |
| JEDEC Code JEITA Code House Name | Fig. | | IF (AV) [A] | Conditions Tc [°C] | IFSM [A] | VRRM [V] | Tj [°C] | Vf (max) [V] | Conditions IF [A] | Ir (max) Vr=VRRM [μA] | | | | |
| - | 3S | D3 | D4SBS4 | 4 | 116 | 60 | 40 | 150 | 0.55 | 2 | 2mA | - | - | S series |
| | | D4SBS6 | 4 | 114 | 60 | 60 | 150 | 0.62 | 2 | 2mA | - | - | S series | |
| | | D4SBN20 | 4 | 103 | 60 | 200 | 150 | 0.90 | 2 | 1.5 | - | - | N series | |
| | | D10SBS4 | 10 | 67 | 100 | 40 | 150 | 0.55 | 5 | 3.5mA | - | - | S series | |
| | | D15XBS6 | 15 | 59 | 150 | 60 | 150 | 0.63 | 7.5 | 6.0mA | - | - | S series | |
| - | 5S | D4 | D6SBN20 | 6 | 110 | 120 | 200 | 150 | 0.90 | 3 | 2 | - | - | N series |
| | | D15XBN20 | 15 | 106 | 200 | 200 | 150 | 0.90 | 7.5 | 5 | - | - | N series | |
| | | D20XBS6 | 20 | 100 | 200 | 60 | 150 | 0.63 | 10 | 8.0mA | - | - | S series | |
| | | D30XBN20 | 30 | 91 | 350 | 200 | 150 | 0.90 | 15 | 10 | - | - | N series | |

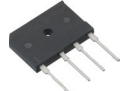
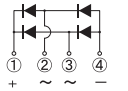
High Speed Bridge Diodes (FRD)

| THD (Through Hole Device) | | | | | | | | | | | | | | |
|--|----------|----------|--------------------------|--------------------|----------|----------|----------------------------|--------------|-------------------|-----------------------|----|---|---------|----------|
| Package | | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | | UL | Automotive | Remarks | |
| JEDEC Code JEITA Code House Name | Fig. | | IF (AV) [A] | Conditions Tc [°C] | IFSM [A] | VRRM [V] | Tj [°C] | Vf (max) [V] | Conditions IF [A] | Ir (max) Vr=VRRM [μA] | | | | |
| - | 3S | D3 | D4SBL20U | 4 | 108 | 80 | 200 | 150 | 0.98 | 2 | 10 | - | - | |
| - | JC(4pin) | D7 | D30JCB100K | 30 | 90 | 450 | 1000 | 150 | 1.90 | 15 | 10 |  | ○ | K series |


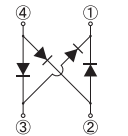
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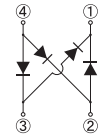

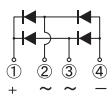
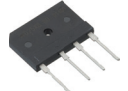
BRIDGE DIODES

Low Vf Bridge Diodes

| THD (Through Hole Device) | | | | | | | |
|--|--|------|------------------------|----------------------|-----|------|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | Remarks |
| | | | | 600 | 800 | 1000 | |
|  37.5 × 30.0 × 4.6(mm) | — — 5S | D4 | 15 | LL15XB60 | | |  |
| | | | 25 | LL25XB60 | | | |

Low Noise Bridge Diodes

| Surface Mount | | | | | | | |
|--|--|------|------------------------|----------------------|-----|------|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | Remarks |
| | | | | 600 | 800 | 1000 | |
|  10.6 × 10.2 × 3.1(mm) | — — 1W | C8 | 1.1 | LN1WBA60 | | |  |

| THD (Through Hole Device) | | | | | | | |
|--|--|------|------------------------|-----------------------|-----|------|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | Remarks |
| | | | | 600 | 800 | 1000 | |
|  6.2 × 10.2 × 3.0(mm) | — — 1W | C9 | 1.1 | LN1WBA60 | | |  |
|  32.5 × 25.0 × 4.6(mm) | — — 3S | D3 | 4 | LN4SB60 | | |  |
|  37.5 × 30.0 × 4.6(mm) | — — 5S | D4 | 6 | LN6SB60 | | | |
| | | | 15 | LN15XB60 LN15XB60H | | | |
| | | | 25 | LN25XB60 | | | |

Low Vf Bridge Diodes

| THD (Through Hole Device) | | | | | | | | | | | | | |
|--|------|----------|--------------------------|-----------------------------------|----------------------|----------------------|---------------------|----------------------------|----------------------------------|---|----------------------------|----|------------|
| Package | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | UL | Automotive |
| JEDEC Code JEITA Code House Name | Fig. | | I _{F(AV)} [A] | Conditions T _C [°C] | I _{FSM} [A] | V _{RRM} [V] | T _J [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [μA] | t _{rr} (max) [μs] | | |
| — | D4 | LL15XB60 | 15 | 124 | 200 | 600 | 150 | 0.90 | 7.5 | 10 | 3 | UL | — |
| 5S | | LL25XB60 | 25 | 113 | 300 | 600 | 150 | 0.92 | 12.5 | 10 | 3 | UL | ■ |

■ : Please contact us. UL : UL recognized (UL File No. E142422)





Low Noise Bridge Diodes


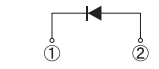
| Surface Mount-THD (Through Hole Device) | | | | | | | | | | | | | | |
|---|--------------------|-----------|--------------------------|-----------------------------------|----------------------|----------------------|---------------------|----------------------------|----------------------------------|---|----------------------------|----|------------|----------------------|
| Package | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | UL | Automotive | Remarks |
| JEDEC Code JEITA Code House Name | Fig. | | I _{F(AV)} [A] | Conditions T _C [°C] | I _{FSM} [A] | V _{RRM} [V] | T _J [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [μA] | t _{rr} (max) [μs] | | | |
| — | C8(SMD) C9(DIP) | LN1WBA60 | 1.1 | 25 * | 50 | 600 | 150 | 1.00 | 0.55 | 10 | 5 | — | — | SMD-7072 DIP-7101 |
| 1W | | LN4SB60 | 4 | 111 | 150 | 600 | 150 | 0.95 | 2 | 10 | 5 | UL | — | |
| — | D4 | LN6SB60 | 6 | 111 | 170 | 600 | 150 | 1.05 | 3 | 10 | 5 | UL | — | |
| — | | LN15XB60 | 15 | 100 | 200 | 600 | 150 | 1.10 | 7.5 | 10 | 5 | — | — | |
| — | | LN15XB60H | 15 | 106 | 290 | 600 | 150 | 1.05 | 7.5 | 10 | 5 | — | — | |
| 5S | | LN25XB60 | 25 | 85 | 350 | 600 | 150 | 1.05 | 12.5 | 10 | 5 | — | — | |


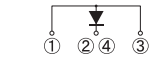
* : T_a UL : UL recognized (UL File No. E142422)

SCHOTTKY BARRIER DIODES

Single

| Axial | | | | | | |
|---|--|------|------------------------|----------------------|-------|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | Remarks |
| | | | | 40 | 60 | |
|  3.0 × φ 2.6(mm) | — — AX057 | A1 | 1 | D1NS4 | D1NS6 |  |
|  5.0 × φ 4.0(mm) | — — AX078 | A4-1 | 2 | D2S4M | D2S6M | |
|  7.0 × φ 4.4(mm) | — — AX14 | A7 | 3 | D3S4M | D3S6M | |

| Two Terminal Type | | | | | | | | |
|---|--|------|------------------------|----------------------|--------|--------|-----|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | | Remarks |
| | | | | 40 | 60 | 90 | 150 | |
|  28.5 × 10.0 × 4.5(mm) | — SC-91 FTO-220G | J4 | 5 | SG5S4M | SG5S6M | SG5S9M | |  |

| Three Terminal Type | | | | | | | | |
|---|--|------|------------------------|----------------------|----|----|---------|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | | Remarks |
| | | | | 40 | 60 | 90 | 150 | |
|  41.0 × 16.0 × 5.0(mm) | TO-247AD — MTO-3PV | K7-2 | 40 | | | | S40T15V |  |
| | | | 90 | | | | S90T15V | |

Single

| Axial | | | | | | | | | | | | | | |
|--|------|----------|--------------------------|-------------------------------|--------------------------------------|-------------------------|------------------------|--------------------------------|-------------------------------------|---|---------------------------------|----------------------|------------|----------|
| Package | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive | Series |
| JEDEC Code JEITA Code House Name | Fig. | | V _{RRM} [V] | I _F (AV) [A] | Conditions T _a [°C] | I _{FSM} [A] | T _j [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [mA] | C _t (typ) [pF] | | | |
| — — AX057 | A1 | D1NS4 | 40 | 1 | 59 | 30 | 150 | 0.55 | 1 | 0.8 | 50 | — | — | S series |
| — — AX078 | A4-1 | D2S4M | 60 | 2 | 46 | 30 | 150 | 0.58 | 1 | 1 | 53 | — | — | S series |
| — — AX078 | A4-1 | D2S6M | 60 | 2 | 119 *1 | 60 | 150 | 0.55 | 2 | 2 | 95 | — | — | S series |
| — — AX14 | A7 | D3S4M | 40 | 3 | 63 | 80 | 150 | 0.55 | 3 | 3.5 | 150 | — | — | S series |
| — — AX14 | A7 | D3S6M | 60 | 3 | 133 *1 | 80 | 150 | 0.58 | 3 | 2.5 | 130 | — | — | S series |




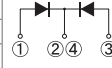

*1 : Tl

| Two Terminal Type | | | | | | | | | | | | | | |
|--|------|----------|--------------------------|-------------------------------|--------------------------------------|-------------------------|------------------------|--------------------------------|-------------------------------------|---|---------------------------------|----------------------|------------|----------|
| Package | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive | Series |
| JEDEC Code JEITA Code House Name | Fig. | | V _{RRM} [V] | I _F (AV) [A] | Conditions T _c [°C] | I _{FSM} [A] | T _j [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [mA] | C _t (typ) [pF] | | | |
| — SC-91 FTO-220G | J4 | SG5S4M | 40 | 5 | 131 | 150 | 150 | 0.52 | 5 | 0.5 | 157 | — | — | S series |
| | | SG5S6M | 60 | 5 | 130 | 120 | 150 | 0.56 | 5 | 0.5 | 165 | — | — | S series |
| | | SG5S9M | 90 | 5 | 124 | 90 | 150 | 0.75 | 5 | 0.5 | 140 | — | — | S series |

| Three Terminal Type | | | | | | | | | | | | | | |
|--|------|----------|--------------------------|-------------------------------|--------------------------------------|-------------------------|------------------------|--------------------------------|-------------------------------------|---|---------------------------------|----------------------|------------|----------|
| Package | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive | Series |
| JEDEC Code JEITA Code House Name | Fig. | | V _{RRM} [V] | I _F (AV) [A] | Conditions T _c [°C] | I _{FSM} [A] | T _j [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [mA] | C _t (typ) [pF] | | | |
| TO-247AD — MTO-3PV | K7-2 | S40T15V | 150 | 40 | 131 | 700 | 150 | 0.92 | 40 | 0.12 | 595 | — | ○ | N series |
| | | S90T15V | 150 | 90 | 122 | 1400 | 150 | 0.95 | 90 | 0.35 | 1690 | — | ○ | N series |

SCHOTTKY BARRIER DIODES

Center Tap, Common Cathode

| Surface Mount | | | | | | | | | | | Remarks | |
|--|--|------|-------------------|-----------|---------------------|----------|----------|------------|-----------|------------|---------|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | IF (AV) [A] | VRRM[V] | | | | | | Remarks | | |
| | | | | 30 | 40 | 60 | 90 | 100 | 120 | | | 150 |
|  9.5 × 6.6 × 2.65(mm) | — SC-63 E-pack | G1-1 | 5 | DE55C3ML | DE55C4M | DE55C6M | | | | | | |
| | | | 10 | DE10SC3L | DE10SC4 | | | | | | | |
|  9.5 × 6.6 × 2.65(mm) | TO-252AB similar SC-63 FE | G3-1 | 6 | | D6FEC4ST | | | D6FEC10ST | D6FEC12ST | D6FEC15ST | | |
| | | | | | | | | | | | | |
|  13.2 × 10.2 × 4.7(mm) | — SC-83 similar STO-220 | H1-1 | 10 | | DF10SC4M | DF10SC6 | DF10SC9 | | | DF10NC15 | |  |
| | | | 15 | | DF15SC4M | | | DF15JC10 | | DF15NC15 | | |
| | | | 20 | | DF20SC4M | | DF20SC9M | DF20JC10 | | DF20NC15 | | |
| | | | 25 | | | DF25SC6M | | | | | | |
| | | | 30 | DF30SC3ML | DF30JC4 DF30SC4M | DF30JC6 | | DF30JC10 | | DF30NC15 | | |
|  13.2 × 10.2 × 4.6(mm) | — SC-83 similar FD | H2-2 | 10 | | | | | D10FDC10ST | | | | |
| | | | 20 | | | | | D20FDC10ST | | D20FDC15ST | | |
| | | | 30 | | D30FDC4S | | | D30FDC10ST | | D30FDC15ST | | |
| | | | 40 | | | | | D40FDC10ST | | D40FDC15ST | | |

Center Tap, Common Cathode


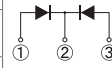

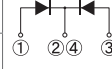

| Surface Mount | | | | | | | | | | | | | | | | | | |
|--|---------|------|--------------------------|--------------------------|-------------------|--------------------------|-------------|----------------------------|--------------------|-------------------------|--------------------------------|----------------------|------------|--------|---------------------|---|---|-----------|
| JEDEC Code JEITA Code House Name | Package | Fig. | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive | Series | | | | |
| | | | | VRRM [V] | IF (AV) [A] | Conditions Tc [°C] | IFSM [A] | Tj [°C] | Vf (max) [V] | Conditions IF [A] | Ir (max) VR=VRRM [mA] | | | | Ct (typ) [pF] | | | |
| — SC-63 E-pack | G1-1 | | DE55C3ML | 30 | 5 | 110 | 90 | 150 | 0.45 | 2.5 | 3.5 | 190 | — | ■ | S series | | | |
| | | | DE55C4M | 40 | 5 | 101 | 80 | 150 | 0.55 | 2.5 | 3.5 | 150 | — | ■ | S series | | | |
| | | | DE55C6M | 60 | 5 | 92 | 80 | 150 | 0.58 | 2.5 | 2.5 | 130 | — | ■ | S series | | | |
| | | | DE10SC3L | 30 | 10 | 124 | 100 | 150 | 0.45 | 4 | 5 | 290 | — | ■ | S series | | | |
| | | | DE10SC4 | 40 | 10 | 132 | 100 | 150 | 0.55 | 5 | 3.5 | 210 | — | ■ | S series | | | |
| TO-252AB similar SC-63 FE | G3-1 | | D6FEC4ST | 40 | 6 | 158 | 90 | 175 | 0.74 | 3 | 8μA | 93 | ○ | ○ | SL series | | | |
| | | | D6FEC10ST | 100 | 6 | 154 | 100 | 175 | 0.86 | 3 | 8μA | 60 | ○ | ○ | SL series | | | |
| | | | D6FEC12ST | 120 | 6 | 154 | 100 | 175 | 0.87 | 3 | 8μA | 60 | ○ | ○ | SL series | | | |
| | | | D6FEC15ST | 150 | 6 | 154 | 100 | 175 | 0.88 | 3 | 8μA | 52 | ○ | ○ | SL series | | | |
| | | | DF10SC4M | 40 | 10 | 125 | 100 | 150 | 0.55 | 5 | 3.5 | 180 | — | — | S series | | | |
| | | | DF10SC6 | 60 | 10 | 132 | 150 | 150 | 0.58 | 5 | 4.5 | 260 | — | — | S series | | | |
| — SC-83 similar STO-220 | H1-1 | | DF10SC9 | 90 | 10 | 131 | 150 | 150 | 0.75 | 5 | 3 | 185 | — | — | S series | | | |
| | | | DF10NC15 | 150 | 10 | 123 | 100 | 150 | 0.88 | 5 | 0.2 | 110 | — | — | N series | | | |
| | | | DF15SC4M | 40 | 15 | 129 | 150 | 150 | 0.55 | 7.5 | 5 | 340 | — | — | S series | | | |
| | | | DF15JC10 | 100 | 15 | 126 | 150 | 150 | 0.86 | 7.5 | 0.6 | 200 | — | — | J series | | | |
| | | | DF15NC15 | 150 | 15 | 126 | 150 | 150 | 0.88 | 7.5 | 0.3 | 155 | — | — | N series | | | |
| | | | DF20SC4M | 40 | 20 | 122 | 230 | 150 | 0.55 | 10 | 7.5 | 390 | — | — | S series | | | |
| | | | DF20SC9M | 90 | 20 | 111 | 200 | 150 | 0.75 | 10 | 10 | 370 | — | — | S series | | | |
| | | | DF20JC10 | 100 | 20 | 121 | 200 | 150 | 0.86 | 10 | 0.7 | 260 | — | — | J series | | | |
| | | | DF20NC15 | 150 | 20 | 121 | 200 | 150 | 0.88 | 10 | 0.4 | 200 | — | — | N series | | | |
| | | | DF25SC6M | 60 | 25 | 115 | 300 | 150 | 0.58 | 12.5 | 10 | 490 | — | — | S series | | | |
| | | | DF30SC3ML | 30 | 30 | 119 | 350 | 150 | 0.48 | 15 | 10 | 820 | — | — | S series | | | |
| | | | DF30JC4 | 40 | 30 | 115 | 250 | 150 | 0.61 | 15 | 0.7 | 560 | — | — | J series | | | |
| | | | DF30SC4M | 40 | 30 | 112 | 360 | 150 | 0.55 | 15 | 10 | 590 | — | — | S series | | | |
| | | | DF30JC6 | 60 | 30 | 108 | 250 | 150 | 0.69 | 15 | 0.7 | 490 | — | — | J series | | | |
| | | | DF30JC10 | 100 | 30 | 116 | 300 | 150 | 0.86 | 15 | 1 | 390 | — | — | J series | | | |
| | | | DF30NC15 | 150 | 30 | 115 | 300 | 150 | 0.88 | 15 | 0.5 | 300 | — | — | N series | | | |
| | | | DF40SC3L | 30 | 40 | 112 | 400 | 150 | 0.45 | 15 | 17 | 1200 | — | — | S series | | | |
| | | | DF40SC4 | 40 | 40 | 106 | 350 | 150 | 0.55 | 20 | 14 | 860 | — | — | S series | | | |
| | | | — SC-83 similar FD | H2-2 | | D10FDC10ST | 100 | 10 | 158 | 150 | 175 | 0.86 | 5 | 15μA | 104 | ○ | ○ | SL series |
| | | | | | | D20FDC10ST | 100 | 20 | 119 | 250 | 150 | 0.86 | 10 | 30μA | 185 | ○ | ○ | N series |
| D20FDC15ST | 150 | 20 | | | | 118 | 250 | 150 | 0.88 | 10 | 30μA | 159 | — | ○ | N series | | | |
| D30FDC4S | 40 | 30 | | | | 114 | 300 | 150 | 0.55 | 15 | 1.5 | 415 | ○ | ○ | S series | | | |
| D30FDC10ST | 100 | 30 | | | | 108 | 300 | 150 | 0.86 | 15 | 40μA | 242 | — | ○ | N series | | | |
| D30FDC15ST | 150 | 30 | | | | 107 | 300 | 150 | 0.88 | 15 | 40μA | 209 | — | ○ | N series | | | |
| D40FDC10ST | 100 | 40 | | | | 105 | 400 | 150 | 0.86 | 20 | 60μA | 360 | — | ○ | N series | | | |
| D40FDC15ST | 150 | 40 | | | | 103 | 400 | 150 | 0.88 | 20 | 60μA | 315 | — | ○ | N series | | | |

■ : Please contact us.

SCHOTTKY BARRIER DIODES

SCHOTTKY BARRIER DIODES

Center Tap, Common Cathode


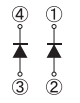
| Three Terminal Type | | | | | | | | | | | | | |
|--|--|------|-------------------|-----------|---------------------|----------|----------------------|----------|-----------|-----------|-----------|---|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | IF (AV) [A] | VRRM[V] | | | | | | | | Remarks | |
| | | | | 15 | 30 | 40 | 60 | 90 | 100 | 120 | 150 | | 600 |
|  28.5 × 10.0 × 4.5(mm) | SC-91 FTO-220G | J9 | 8 | | SG8SC4M | | | | | | | |  |
| | | | 10 | SG10SC3LM | SG10SC4M | SG10SC6M | SG10SC9M | | | | SG10TC15M | | |
| | | | 15 | | SG15SC4M | SG15SC6M | | | | | | | |
| | | | 20 | | SG20SC3LM | SG20SC4M | SG20JC6M SG20SC6M | SG20SC9M | SG20TC10M | SG20TC12M | SG20TC15M | | |
| | | | 30 | | SG30SC3LM | SG30SC4M | SG30JC6M SG30SC6M | | SG30TC10M | SG30TC12M | SG30TC15M | | |
|  41.0 × 16.0 × 5.0(mm) | TO-247AD MTO-3PT | K5-2 | 20 | | | | | S20SC9MT | | | |  | |
| | | | 30 | | | S30SC4MT | S30SC6MT | | | S30TC15T | | | |
| | | | 40 | S40HC1R5T | | | | | | | | | |
| | | | 60 | S60HC1R5T | S60HC3T S60SC3LT | S60SC4MT | S60SC6MT | | | | | | |
|  41.0 × 16.0 × 5.0(mm) | TO-247AD MTO-3PV | K7-1 | 60 | | | | | | | S60JC10V | | | |

Center Tap, Common Cathode


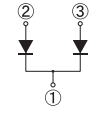

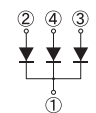
| Three Terminal Type | | | | | | | | | | | | | | |
|--|------|---------------------|--------------------------|-------------------|--------------------------|-------------|------------|----------------------------|-------------------------|--------------------------------|---------------------|----------------------|------------|-----------|
| JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive | Series |
| | | | VRRM [V] | IF (AV) [A] | Conditions Tc [°C] | IFSM [A] | Tj [°C] | Vf (max) [V] | Conditions IF [A] | Ir (max) Vr=VRRM [mA] | Ct (typ) [pF] | | | |
| SC-91 FTO-220G | J9 | SG8SC4M | 40 | 8 | 155 | 80 | 175 | 0.56 | 4.0 | 0.3 | 100 | - | - | S series |
| | | SG10SC3LM | 30 | 10 | 136 | 150 | 150 | 0.45 | 4.0 | 5 | 310 | - | - | S series |
| | | SG10SC4M | 40 | 10 | 150 | 150 | 175 | 0.52 | 5.0 | 0.5 | 157 | - | - | S series |
| | | SG10SC6M | 60 | 10 | 145 | 140 | 175 | 0.56 | 5.0 | 0.5 | 165 | - | - | S series |
| | | SG10SC9M | 90 | 10 | 139 | 150 | 175 | 0.75 | 5.0 | 0.5 | 140 | - | - | S series |
| | | SG10TC15M | 150 | 10 | 153 | 120 | 175 | 0.88 | 5.0 | 15μA | 92 | - | - | SL series |
| | | SG15SC4M | 40 | 15 | 117 | 150 | 150 | 0.52 | 7.5 | 0.8 | 230 | - | - | S series |
| | | SG15SC6M | 60 | 15 | 113 | 180 | 150 | 0.61 | 7.5 | 0.6 | 185 | - | - | S series |
| | | SG20SC3LM | 30 | 20 | 124 | 250 | 150 | 0.45 | 8.0 | 9 | 570 | - | - | S series |
| | | SG20SC4M | 40 | 20 | 115 | 200 | 150 | 0.52 | 10.0 | 1.1 | 315 | - | - | S series |
| | | SG20JC6M | 60 | 20 | 106 | 200 | 150 | 0.69 | 10.0 | 0.1 | 250 | - | - | J series |
| | | SG20SC6M | 60 | 20 | 107 | 200 | 150 | 0.61 | 10.0 | 0.8 | 250 | - | - | S series |
| | | SG20SC9M | 90 | 20 | 112 | 200 | 150 | 0.75 | 10.0 | 1 | 245 | - | - | S series |
| | | SG20TC10M | 100 | 20 | 140 | 200 | 175 | 0.86 | 10.0 | 30μA | 185 | - | - | SL series |
| | | SG20TC12M | 120 | 20 | 137 | 200 | 175 | 0.87 | 10.0 | 30μA | 175 | - | - | SL series |
| | | SG20TC15M | 150 | 20 | 136 | 200 | 175 | 0.88 | 10.0 | 30μA | 159 | - | - | SL series |
| | | SG30SC3LM | 30 | 30 | 117 | 350 | 150 | 0.45 | 12.5 | 15 | 960 | - | - | M series |
| | | SG30SC4M | 40 | 30 | 101 | 300 | 150 | 0.55 | 15.0 | 1.5 | 415 | - | - | S series |
| | | SG30JC6M | 60 | 30 | 90 | 250 | 150 | 0.69 | 15.0 | 0.15 | 325 | - | - | J series |
| | | SG30SC6M | 60 | 30 | 100 | 300 | 150 | 0.61 | 15.0 | 1.2 | 385 | - | - | S series |
| | | SG30TC10M | 100 | 30 | 126 | 300 | 175 | 0.86 | 15.0 | 40μA | 242 | - | - | SL series |
| | | SG30TC12M | 120 | 30 | 122 | 300 | 175 | 0.87 | 15.0 | 40μA | 228 | - | - | SL series |
| | | SG30TC15M | 150 | 30 | 122 | 300 | 175 | 0.88 | 15.0 | 40μA | 209 | - | - | SL series |
| | | SG40TC10M | 100 | 40 | 116 | 350 | 175 | 0.86 | 20.0 | 60μA | 362 | - | - | SL series |
| | | SG40TC12M | 120 | 40 | 112 | 350 | 175 | 0.87 | 20.0 | 60μA | 336 | - | - | SL series |
| | | TO-247AD MTO-3PT | K5-2 | S20SC9MT | 90 | 20 | 136 | 200 | 150 | 0.75 | 10.0 | 1 | 245 | - |
| S30SC4MT | 40 | | | 30 | 132 | 300 | 150 | 0.55 | 15.0 | 1.5 | 410 | - | - | S series |
| S30SC6MT | 60 | | | 30 | 129 | 300 | 150 | 0.61 | 15.0 | 1.2 | 385 | - | - | S series |
| S30TC15T | 150 | | | 30 | 128 | 300 | 150 | 0.88 | 15.0 | 40μA | 209 | - | - | N series |
| S40HC1R5T | 15 | | | 40 | 111 | 450 | 125 | 0.41 | 20.0 | 10 | 960 | - | - | H series |
| S60HC1R5T | 15 | | | 60 | 110 | 600 | 125 | 0.41 | 30.0 | 15 | 1400 | - | - | H series |
| S60HC3T | 30 | | | 60 | 112 | 650 | 125 | 0.40 | 30.0 | 20 | 1100 | - | - | H series |
| S60SC3LT | 30 | | | 60 | 138 | 650 | 150 | 0.48 | 30.0 | 25 | 1600 | - | - | S series |
| TO-247AD MTO-3PV | K7-1 | S60SC4MT | 40 | 60 | 127 | 500 | 150 | 0.55 | 30.0 | 3 | 790 | - | - | S series |
| | | S60SC6MT | 60 | 60 | 121 | 470 | 150 | 0.67 | 30.0 | 2 | 640 | - | - | S series |
| TO-247AD MTO-3PV | K7-1 | S60JC10V | 100 | 60 | 118 | 500 | 150 | 0.95 | 30.0 | 0.2 | 695 | - | ○ | J series |

SCHOTTKY BARRIER DIODES

Array

| Surface Mount | | | | | | |
|--|--|------|------------------------|----------------------|----|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | Remarks |
| | | | | 40 | 60 | |
|  7.0 × 4.7 × 2.6(mm) | TO-269AA — 1Z | C2-2 | 1.2 | S1ZAS4 | |  |

Diode Module

| Diode Module | | | | | | |
|---|--|------|------------------------|----------------------|----------|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | Remarks |
| | | | | 40 | 60 | |
|  43.0 × 27.0 × 21.0(mm) | — — Module | F1 | 120 | D120SC4M | D120SC6M |  |
| | | | 240 | D240SC4M | D240SC6M | |
|  43.0 × 27.0 × 21.0(mm) | | F3-1 | 180 | D180SC4M | D180SC6M |  |
| | | | 360 | D360SC4M | D360SC6M | |

Array

| Surface Mount | | | | | | | | | | | | | | |
|--|------|----------|--------------------------|---------------------------|--------------------------------------|-------------------------|------------------------|--------------------------------|-------------------------------------|---|---------------------------------|----------------------|------------|----------|
| Package | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive | Series |
| JEDEC Code JEITA Code House Name | Fig. | | V _{RRM} [V] | I _{F(AV)} [A] | Conditions T _a [°C] | I _{FSM} [A] | T _j [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [mA] | C _t (typ) [pF] | | | |
| TO-269AA — 1Z | C2-2 | S1ZAS4 | 40 | 1.2 | 47 | 40 | 150 | 0.55 | 1 | 1 | 65 | — | — | S series |

Diode Module

| Diode Module | | | | | | | | | | | | | | |
|--|------|----------|--------------------------|---------------------------|--------------------------------------|-------------------------|------------------------|--------------------------------|-------------------------------------|---|---------------------------------|----------------------|------------|----------|
| Package | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive | Series |
| JEDEC Code JEITA Code House Name | Fig. | | V _{RRM} [V] | I _{F(AV)} [A] | Conditions T _c [°C] | I _{FSM} [A] | T _j [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [mA] | C _t (typ) [pF] | | | |
| — — Module | F1 | D120SC4M | 40 | 120 | 90 | 800 | 125 | 0.58 | 60 | 40 | 2.1 | — | — | S series |
| | | D120SC6M | 60 | 120 | 85 | 800 | 125 | 0.67 | 60 | 40 | 2.2 | — | — | S series |
| | | D240SC4M | 40 | 240 | 77 | 1600 | 125 | 0.6 | 120 | 80 | 4.2 | — | — | S series |
| | F3-1 | D240SC6M | 60 | 240 | 71 | 1600 | 125 | 0.67 | 120 | 80 | 4.4 | — | — | S series |
| | | D180SC4M | 40 | 180 | 83 | 800 | 125 | 0.58 | 60 | 40 | 2.1 | — | — | S series |
| | | D180SC6M | 60 | 180 | 78 | 800 | 125 | 0.67 | 60 | 40 | 2.2 | — | — | S series |
| | | D360SC4M | 40 | 360 | 64 | 1600 | 125 | 0.6 | 120 | 80 | 4.2 | — | — | S series |
| | | D360SC6M | 60 | 360 | 58 | 1600 | 125 | 0.67 | 120 | 80 | 4.4 | — | — | S series |



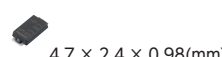


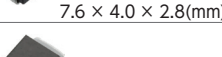
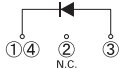






FAST RECOVERY DIODES

Fast Recovery Diodes are high speed type PN junction rectifying devices.



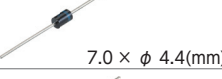

These diodes for the switching of power supply are suitable for use in household appliances, OA apparatuses, and FA apparatuses.

| Series | Feature |
|--------|--------------------------------|
| K | Low Vf |
| ML | Low Vf, Low trr, Soft Recovery |
| US | Ultra Fast, Soft Recovery |
| A | Ultra Fast, Low Vf |

Single

| Surface Mount | | | | | | | | | | | | | | |
|---|--|------|---------------|-----------|---------|---------------------|--------|---------|------------------------------|---------|--|---|---|--|
| Package | JEDEC Code JEITA Code House Name | Fig. | IF(AV) [A] | VRRM[V] | | | | | | Remarks | | | | |
| | | | | 200 | 400 | 600 | 700 | 1000 | 1200 | | | | | |
|  3.9 × 1.8 × 1.4(mm) | DO-219AA similar M1F | B2 | 1 | | | M1FK60 | | | | | | | | |
| | | | 1.1 | M1FL20U | | | | | | | | | | |
| | | | 1.5 | | M1FL40U | | | | | | | | | |
|  5.0 × 2.5 × 2.0(mm) | DO-214AC 1F | B3-1 | 0.8 | | | D1FK60 | D1FK70 | | | | | | | |
| | | | 1 | | | | | D1FK100 | N D1FK120P D1FK120 | | | | | |
| | | | 1.1 | D1FL20U | | | | | | | | | | |
|  4.7 × 2.4 × 0.98(mm) | SC-110B CE | B5-1 | 3 | D3CE20LUS | | D3CE60K | | | | | |  | | |
| | | | 1.5 | M2FL20U | | | | | | | | | | |
| | | | 3 | M3FL20U | | | | | | | | | | |
|  5.1 × 3.75 × 2.0(mm) | DO-214AA similar M2F | B6 | 1.3 | | D2FL40 | | | | | | | | | |
| | | | 1.5 | D2FL20U | | D2FK60 | | | | | | | | |
| | | | 2.1 | | | D3FK60 | | | | | | | | |
|  9.5 × 6.6 × 2.65(mm) | SC-63 E-pack | G1-5 | 3 | DE3L20UA | | | | | | | | | | |
| | | | 5 | | | DE5L60U DE5L60A | | | | | | |  | |
| | | | 5 | | | | | | | | | | | |
|  6.5 × 4.5 × 1.1(mm) | TO-277A similar FY | G4 | 5 | | | D5FY60K | | | | | | |  | |
| | | | 8 | | | DF8L60US | | | | | | | | |
| | | | 10 | | | DF10L60 | | | | | | | | |
|  13.2 × 10.2 × 4.7(mm) | SC-83 similar STO-220 | H1-2 | 20 | | | DF20L60 DF20L60U | | | | | | |  | |
| | | | 10 | | | D10FR60LA | | | | | | | | |
| | | | 15 | | | D15FR60LA | | | | | | | | |
|  9.6 × 6.6 × 2.3(mm) | TO-252AA similar FR | G5 | 8 | | | D8FD60LUS | | | | | | | | |
| | | | 20 | | | D20FD60LU | | | | | | | | |
| | | | 30 | | | D30FD60K | | | | | | | | |
|  13.2 × 10.2 × 4.6(mm) | SC-83 similar FD | H2-1 | 8 | | | D8FD60LUS | | | | | | | | |
| | | | 20 | | | D20FD60LU | | | | | | | | |
| | | | 30 | | | D30FD60K | | | | | | | | |

N : New product

| Axial | | | | | | | | | | | | |
|---|--|------|---------------|---------|---------|------------------|-----|------|---------|---------|--|--|
| Package | JEDEC Code JEITA Code House Name | Fig. | IF(AV) [A] | VRRM[V] | | | | | | Remarks | | |
| | | | | 200 | 400 | 600 | 700 | 1000 | | | | |
|  3.0 × φ 2.6(mm) | AX057 | A1 | 0.8 | | | D1NF60 D1NK60 | | | | | | |
| | | | 1 | D1NL20U | D1NL40U | | | | D1NK100 | | | |
|  5.0 × φ 4.0(mm) | AX078 | A4-1 | 1.5 | D2L20U | | | | | | | | |
| | | | 2 | | D2L40U | | | | | | | |
|  7.0 × φ 4.4(mm) | AX10 | A5-1 | 1.5 | S2L20U | | S2L60 | | | | | | |
| | | | 2 | | S2L40U | | | | S2K100 | | | |
|  7.0 × φ 4.4(mm) | AX14 | A7 | 2.2 | | | S3L60 | | | | | | |
| | | | 3 | S3L20U | S3L40U | S3K60 | | | | | | |

Single

| Surface Mount | | | | | | | | | | | | | | | | |
|--|---------|------|-------------------|--------------------------|-------------------|--------------------------|-------------|------------|----------------------------|-------------------------|--------------------------------|----------------------|---|----------------------|------------|--------|
| JEDEC Code JEITA Code House Name | Package | Fig. | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | | Based on AEC-Q101 | Automotive | Series |
| | | | | VRRM [V] | IF (AV) [A] | Conditions Tc [°C] | IFSM [A] | Tj [°C] | Vf (max) [V] | Conditions IF [A] | Ir (max) VR=VRRM [μA] | trr (max) [ns] | | | | |
| DO-219AA similar M1F | B2 | | M1FK60 | 600 | 1 | 116 *1 | 15 | 150 | 1.5 | 1 | 10 | 75 | | ○ | K series | |
| | | | M1FL20U | 200 | 1.1 | 25 *2 | 30 | 150 | 0.98 | 1.1 | 10 | 35 | ○ | ○ | - | |
| | | | M1FL40U | 400 | 1.5 | 139 | 30 | 175 | 1.2 | 1 | 10 | 25 | ■ | ○ | - | |
| DO-214AC 1F | B3-1 | | D1FK60 | 600 | 0.8 | 29 *2 | 20 | 150 | 1.3 | 0.8 | 10 | 75 | ○ | ○ | K series | |
| | | | D1FK70 | 700 | 0.8 | 32 *2 | 25 | 150 | 1.3 | 0.8 | 10 | 400 | ○ | ○ | - | |
| | | | D1FK100 | 1000 | 1 | 97 *1 | 20 | 150 | 2.1 | 1 | 10 | 75 | ○ | ○ | K series | |
| | | | N D1FK120P | 1200 | 1 | 79 *1 | 18 | -55 to 150 | 3.0 | 1 | 10 | 85 | ○ | ■ | K series | |
| | | | D1FK120 | 1200 | 1 | 75 *1 | 20 | 150 | 3.0 | 1 | 10 | 120 | - | ■ | K series | |
| | | | D1FL20U | 200 | 1.1 | 25 *2 | 20 | 150 | 0.98 | 1.1 | 10 | 35 | ○ | ○ | - | |
| SC-110B CE | B5-1 | | D3CE20LUS | 200 | 3 | 105 *1 | 60 | -55 to 150 | 0.98 | 3 | 10 | 25 | ○ | ○ | - | |
| | | | D3CE60K | 600 | 3 | 78 *1 | 50 | 150 | 1.45 | 3 | 10 | 80 | ○ | ○ | K series | |
| | | | M2FL20U | 200 | 1.5 | 31 *2 | 50 | 150 | 0.92 | 1.5 | 10 | 35 | - | ○ | - | |
| DO-214AA similar M2F | B6 | | M3FL20U | 200 | 3 | 75 *1 | 75 | 150 | 0.95 | 3 | 10 | 35 | ○ | ○ | - | |
| | | | D2FL40 | 400 | 1.3 | 25 *2 | 40 | 150 | 1.3 | 1.3 | 10 | 50 | - | - | - | |
| DO-214AA similar M2F | B9-1 | | D2FL20U | 200 | 1.5 | 25 *2 | 50 | 150 | 0.98 | 1.5 | 10 | 35 | ○ | ○ | - | |
| | | | D2FK60 | 600 | 1.5 | 101 *1 | 40 | 150 | 1.3 | 1.5 | 10 | 75 | - | ○ | K series | |
| | | | D3FK60 | 600 | 2.1 | 93 *1 | 120 | 150 | 1.2 | 2.1 | 10 | 75 | - | ○ | K series | |
| SC-63 E-pack | G1-5 | | DE3L20UA | 200 | 3 | 137 | 60 | 150 | 0.98 | 3 | 10 | 35 | - | ■ | - | |
| | | | DE5L60U | 600 | 5 | 91 | 60 | 150 | 3.0 | 5 | 25 | 25 | - | - | - | |
| | | | DE5L60A | 600 | 5 | 119 | 60 | 150 | 2.0 | 5 | 10 | 50 | - | ■ | - | |
| TO-277A similar FY | G4 | | D5FY60K | 600 | 5 | 130 *1 | 200 | -55 to 150 | 1.25 | 5 | 10 | 95 | - | ■ | K series | |
| SC-83 similar STO-220 | H1-2 | | DF8L60US | 600 | 8 | 66 | 60 | 150 | 3.6 | 8 | 50 | 25 | - | - | US series | |
| | | | DF10L60 | 600 | 10 | 105 | 100 | 150 | 1.9 | 10 | 10 | 50 | - | - | - | |
| | | | DF20L60 | 600 | 20 | 84 | 170 | 150 | 1.9 | 20 | 25 | 70 | - | - | - | |
| | | | DF20L60U | 600 | 20 | 93 | 160 | 150 | 3.0 | 20 | 25 | 35 | - | - | - | |
| TO-252AA similar FR | G5 | | D10FR60LA | 600 | 10 | 110 | 140 | -55 to 150 | 2.1 | 10 | 10 | 28 | ○ | ○ | A series | |
| | | | D15FR60LA | 600 | 15 | 95 | 220 | -55 to 150 | 2.1 | 15 | 10 | 30 | ○ | ○ | A series | |
| SC-83 similar FD | H2-1 | | D8FD60LUS | 600 | 8 | 120 | 60 | 175 | 3.6 | 8 | 50 | 25 | - | ○ | US series | |
| | | | D20FD60LU | 600 | 20 | 93 | 160 | 150 | 3.0 | 20 | 25 | 35 | ○ | ○ | - | |
| | | | D30FD60K | 600 | 30 | 102 | 300 | 150 | 1.7 | 30 | 10 | 95 | - | ■ | K series | |


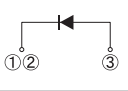

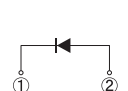


N : New product *1 : Tl *2 : Ta ■ : Please contact us.


| Axial | | | | | | | | | | | | | | | | |
|--|---------|------|----------|--------------------------|-------------------|--------------------------|-------------|------------|----------------------------|-------------------------|--------------------------------|----------------------|---|----------------------|------------|--------|
| JEDEC Code JEITA Code House Name | Package | Fig. | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | | Based on AEC-Q101 | Automotive | Series |
| | | | | VRRM [V] | IF (AV) [A] | Conditions Ta [°C] | IFSM [A] | Tj [°C] | Vf (max) [V] | Conditions IF [A] | Ir (max) VR=VRRM [μA] | trr (max) [ns] | | | | |
| AX057 | | A1 | D1NF60 | 600 | 0.8 | 25 | 50 | 150 | 1.3 | 0.8 | 10 | 400 | - | - | - | |
| | | | D1NK60 | 600 | 0.8 | 26 | 35 | 150 | 1.3 | 0.8 | 10 | 75 | - | - | K series | |
| | | | D1NL20U | 200 | 1 | 25 | 25 | 150 | 0.98 | 1 | 10 | 35 | - | - | - | |
| | | | D1NL40U | 400 | 1 | 137 *1 | 50 | 150 | 1.25 | 1 | 10 | 25 | - | - | - | |
| AX078 | | A4-1 | D2L20U | 200 | 1.5 | 125 *1 | 40 | 150 | 0.98 | 1.5 | 10 | 35 | - | - | - | |
| | | | D2L40U | 400 | 2 | 108 *1 | 80 | 150 | 1.25 | 2 | 10 | 35 | - | - | - | |
| AX10 | | A5-1 | S2L20U | 200 | 1.5 | 25 | 50 | 150 | 0.98 | 1.5 | 10 | 35 | - | - | - | |
| | | | S2L60 | 600 | 1.5 | 125 *1 | 50 | 150 | 1.5 | 1.5 | 10 | 50 | - | - | - | |
| | | | S2L40U | 400 | 2 | 120 *1 | 100 | 150 | 1.25 | 2 | 10 | 35 | - | - | - | |
| AX14 | | A7 | S2K100 | 1000 | 2 | 91 *1 | 65 | 150 | 2.1 | 2 | 10 | 75 | - | - | K series | |
| | | | S3L60 | 600 | 2.2 | 132 *1 | 60 | 150 | 1.5 | 2.2 | 10 | 50 | - | - | - | |
| | | | S3L20U | 200 | 3 | 128 *1 | 60 | 150 | 0.98 | 2.1 | 10 | 35 | - | - | - | |
| | | | S3L40U | 400 | 3 | 126 *1 | 150 | 150 | 1.25 | 3 | 10 | 35 | - | - | - | |
| AX14 | | A7 | S3K60 | 600 | 3 | 123 *1 | 120 | 150 | 1.3 | 3 | 10 | 100 | - | - | K series | |

*1 : Tl


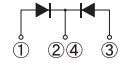


FAST RECOVERY DIODES

Single

| Two Terminal Type | | | | | | | |
|---|--|------------|---------------------------|----------------------|------------|---|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | Remarks |
| | | | | 200 | 400 | 600 | |
|  28.5 × 10.0 × 4.5(mm) | SC-91A FTO-220 | J1 | 3 | | | SF3L60U |  |
| | | | 5 | | | SF5L60U | |
| | | | 10 | | | SF10L60U | |
| | | | 20 | | | SF20L60U | |
| | | | 3 | | | SF3K60M | |
|  28.5 × 10.0 × 4.5(mm) | SC-91 FTO-220AG | J3 | 5 | | SF5L40UM |  | |
| | | | 8 | | SF8K60M | | |
| | | | 10 | | SF10K60M | | |
| | | | 10 | | SF10L60MVM | | |
| | | | 10 | | SF10L60MSM | | |
| | | | 20 | | SF20K60M | | |
| | | | 20 | | SF20L60MVM | | |
| 20 | | SF20L60MSM | | | | | |
|  28.5 × 10.0 × 4.5(mm) | SC-91 FTO-220G | J4 | 5 | SG5L20USM | | | |
| | | | 10 | SG10L20USM | | | |
|  41.0 × 16.0 × 5.0(mm) | TO-247AD MTO-3PT | K2 | 20 | | | S20K60T | |
| | | | 30 | | | S30K60T | |

| Three Terminal Type | | | | | | | |
|---|--|------|---------------------------|----------------------|----------|------|---------|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | Remarks |
| | | | | 600 | 1000 | 1200 | |
|  41.0 × 16.0 × 5.0(mm) | TO-247AD MTO-3PV | K6 | 20 | | S20K100V | | |
| | | | 30 | S30K60V | S30K100V | | |

Center Tap, Common Cathode

| Surface Mount | | | | | | | | |
|---|--|------|---------------------------|----------------------|----------|-----|-----|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | | Remarks |
| | | | | 200 | 300 | 400 | 600 | |
|  9.5 × 6.6 × 2.65(mm) | SC-63 E-pack | G1-1 | 5 | DE5LC20U | | | |  |
|  13.2 × 10.2 × 4.7(mm) | SC-83 similar STO-220 | H1-1 | 10 | DF10LC20U | DF10LC30 | | | |
| | | | 20 | DF20LC20US | DF20LC30 | | | |
|  13.2 × 10.2 × 4.6(mm) | SC-83 similar FD | H2-2 | 20 | D20FDC20L | | | | |
| | | | | D20FDC20LUS | | | | |

Single

| Two Terminal Type | | | | | | | | | | | | | | |
|--|------|------------|--------------------------|---------------------------|--------------------------------------|-------------------------|------------------------|--------------------------------|-------------------------------------|---|----------------------------------|----------------------|------------|-----------|
| JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive | Series |
| | | | V _{RRM} [V] | I _{F(AV)} [A] | Conditions T _C [°C] | I _{FSM} [A] | T _J [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [μA] | t _{rr} (max) [ns] | | | |
| SC-91A FTO-220 | J1 | SF3L60U | 600 | 3 | 115 | 40 | 150 | 3.00 | 3 | 25 | 20 | - | - | - |
| | | SF5L60U | 600 | 5 | 96 | 60 | 150 | 3.00 | 5 | 25 | 25 | - | - | - |
| | | SF10L60U | 600 | 10 | 85 | 120 | 150 | 3.00 | 10 | 25 | 25 | - | ■ | - |
| | | SF20L60U | 600 | 20 | 68 | 180 | 150 | 3.00 | 20 | 25 | 35 | - | ■ | - |
| SC-91 FTO-220AG | J3 | SF3K60M | 600 | 3 | 132 | 90 | 150 | 1.45 | 3 | 10 | 80 | - | - | K series |
| | | SF5L40UM | 400 | 5 | 121 | 100 | 150 | 1.25 | 5 | 10 | 30 | - | ■ | - |
| | | SF5K60M | 600 | 5 | 119 | 120 | 150 | 1.50 | 5 | 10 | 85 | - | ■ | K series |
| | | SF8K60USM | 600 | 8 | 70 | 60 | 150 | 3.60 | 8 | 50 | 25 | - | - | US series |
| | | SF8K60M | 600 | 8 | 108 | 150 | 150 | 1.50 | 8 | 10 | 90 | - | ■ | K series |
| | | SF10K60M | 600 | 10 | 106 | 180 | 150 | 1.50 | 10 | 10 | 95 | - | - | K series |
| | | SF10L60MVM | 600 | 10 | 119 | 200 | 150 | 1.10 | 10 | 10 | 115 | - | - | ML series |
| | | SF10L60MSM | 600 | 10 | 110 | 160 | 150 | 1.37 | 10 | 10 | 60 | - | - | ML series |
| | | SF20K60M | 600 | 20 | 96 | 240 | 150 | 1.50 | 20 | 10 | 95 | - | - | K series |
| | | SF20L60MVM | 600 | 20 | 106 | 250 | 150 | 1.10 | 20 | 10 | 130 | - | - | ML series |
| SF20L60MSM | 600 | 20 | 96 | 220 | 150 | 1.37 | 20 | 10 | 70 | - | - | ML series | | |
| SC-91 FTO-220G | J4 | SG5L20USM | 200 | 5 | 125 | 90 | 150 | 0.96 | 5 | 10 | 25 | - | - | - |
| | | SG10L20USM | 200 | 10 | 101 | 200 | 150 | 0.96 | 10 | 10 | 25 | - | - | - |
| TO-247AD MTO-3PT | K2 | S20K60T | 600 | 20 | 121 | 300 | 150 | 1.50 | 20 | 10 | 95 | - | - | K series |
| | | S30K60T | 600 | 30 | 123 | 450 | 150 | 1.50 | 30 | 10 | 100 | - | - | K series |

■ : Please contact us.

| Three Terminal Type | | | | | | | | | | | | | | |
|--|------|----------|--------------------------|---------------------------|--------------------------------------|-------------------------|------------------------|--------------------------------|-------------------------------------|---|----------------------------------|----------------------|------------|----------|
| JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive | Series |
| | | | V _{RRM} [V] | I _{F(AV)} [A] | Conditions T _C [°C] | I _{FSM} [A] | T _J [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [μA] | t _{rr} (max) [ns] | | | |
| TO-247AD MTO-3PV | K6 | S20K100V | 1000 | 20 | 127 | 550 | 150 | 2.10 | 20 | 10 | 120 | - | ○ | K series |
| | | S30K60V | 600 | 30 | 108 | 450 | 150 | 1.50 | 30 | 10 | 100 | - | ○ | K series |
| | | S30K100V | 1000 | 30 | 116 | 600 | 150 | 2.10 | 30 | 10 | 120 | - | ○ | K series |

Center Tap, Common Cathode


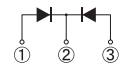


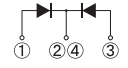

| Surface Mount | | | | | | | | | | | | | | |
|--|------|------------|--------------------------|---------------------------|--------------------------------------|-------------------------|------------------------|--------------------------------|-------------------------------------|---|----------------------------------|----------------------|------------|--------|
| JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive | Series |
| | | | V _{RRM} [V] | I _{F(AV)} [A] | Conditions T _C [°C] | I _{FSM} [A] | T _J [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [μA] | t _{rr} (max) [ns] | | | |
| SC-63 E-pack | G1-1 | DE5LC20U | 200 | 5 | 81 | 50 | 150 | 0.98 | 2.5 | 10 | 35 | - | ■ | - |
| SC-83 similar STO-220 | H1-1 | DF10LC20U | 200 | 10 | 127 | 80 | 150 | 0.98 | 5 | 10 | 35 | - | - | - |
| | | DF10LC30 | 300 | 10 | 124 | 80 | 150 | 1.30 | 5 | 25 | 30 | - | - | - |
| | | DF20LC20US | 200 | 20 | 125 | 180 | 150 | 0.96 | 10 | 10 | 25 | - | - | - |
| SC-83 similar FD | H2-2 | DF20LC30 | 300 | 20 | 124 | 180 | 150 | 1.30 | 10 | 25 | 30 | - | - | - |
| | | D20FDC20L | 200 | 20 | 113 | 100 | 175 | 1.20 | 10 | 10 | 30 | ○ | ○ | - |
| D20FDC20LUS | 200 | 20 | 125 | 180 | 150 | 0.96 | 10 | 10 | 25 | - | ○ | - | | |

■ : Please contact us.

FAST RECOVERY DIODES

Center Tap, Common Cathode

Three Terminal Type

| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | | Remarks |
|--|--|------|---------------------------|----------------------|------------|------------|------------|---|
| | | | | 200 | 300 | 400 | 600 | |
|  28.5 × 10.0 × 4.5(mm) | SC-91 FTO-220AG | J8-1 | 5 | | | SF5LC40UM | |  |
| | | | 10 | | | SF10LC40UM | SF10KC60M | |
| | | | 20 | | SF20LC30M | | SF20KC60M | |
|  28.5 × 10.0 × 4.5(mm) | SC-91 FTO-220G | J9 | 5 | SG5LC20USM | | | | |
| | | | 10 | SG10LC20USM | | | | |
| | | | 20 | SG20LC20USM | | | | |
|  41.0 × 16.0 × 5.0(mm) | TO-247AD MTO-3PT | K5-2 | 20 | S20LC20UST | S20LC30T | S20LC40UT | S20LC60UST |  |
| | | | | S20LC40UV | S20LC60USV | | | |
|  41.0 × 16.0 × 5.0(mm) | TO-247AD MTO-3PV | K7-1 | 20 | | | S20LC40UV | S20LC60USV | |
| | | | | | | | | |

Center Tap, Common Cathode

Three Terminal Type



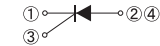



| JEDEC Code JEITA Code House Name | Package | Fig. | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive | Series | |
|--|---------|------|-------------|--------------------------|---------------------------|--------------------------------------|-------------------------|----------------------------|--------------------------------|-------------------------------------|---|----------------------|------------|--------|----------------------------------|
| | | | | V _{RRM} [V] | I _{F(AV)} [A] | Conditions T _C [°C] | I _{FSM} [A] | T _J [°C] | V _F (max) [V] | Conditions I _F [A] | I _R (max) V _R =V _{RRM} [μA] | | | | t _{rr} (max) [ns] |
| SC-91 FTO-220AG | J8-1 | | SF5LC40UM | 400 | 5 | 132 | 80 | 150 | 1.25 | 2.5 | 10 | 30 | - | - | - |
| | | | SF10LC40UM | 400 | 10 | 120 | 100 | 150 | 1.25 | 5 | 10 | 30 | - | - | - |
| | | | SF10KC60M | 600 | 10 | 109 | 120 | 150 | 1.50 | 5 | 10 | 85 | - | ■ | K series |
| | | | SF20LC30M | 300 | 20 | 107 | 250 | 150 | 1.30 | 10 | 25 | 30 | - | - | - |
| SC-91 FTO-220G | J9 | | SF20KC60M | 600 | 20 | 97 | 180 | 150 | 1.50 | 10 | 10 | 95 | - | ■ | K series |
| | | | SG5LC20USM | 200 | 5 | 133 | 70 | 150 | 0.96 | 2.5 | 10 | 25 | - | - | - |
| | | | SG10LC20USM | 200 | 10 | 122 | 90 | 150 | 0.96 | 5 | 10 | 25 | - | - | - |
| TO-247AD MTO-3PT | K5-2 | | SG20LC20USM | 200 | 20 | 95 | 150 | 150 | 0.96 | 10 | 10 | 25 | - | - | - |
| | | | S20LC20UST | 200 | 20 | 126 | 120 | 150 | 0.96 | 10 | 10 | 25 | - | - | - |
| | | | S20LC30T | 300 | 20 | 124 | 220 | 150 | 1.30 | 10 | 25 | 30 | - | - | - |
| | | | S20LC40UT | 400 | 20 | 123 | 130 | 150 | 1.25 | 10 | 10 | 30 | - | - | - |
| TO-247AD MTO-3PV | K7-1 | | S20LC60UST | 600 | 20 | 63 | 60 | 150 | 3.60 | 10 | 50 | 25 | - | - | - |
| | | | S20LC40UV | 400 | 20 | 123 | 200 | 150 | 1.25 | 10 | 10 | 30 | - | ○ | - |
| | | | S20LC60USV | 600 | 20 | 65 | 60 | 150 | 3.60 | 10 | 50 | 25 | - | ○ | - |


■ : Please contact us.

THYRISTORS



The Thyristor, in its normal state, will block an applied voltage in either direction, but when an appropriate current pulse is applied to the gate, current will flow through the anode to the cathode thus turning on power to the load circuit. The Thyristor has a planar passivation, and is available in both the general reverse-blocking type and the type without reverse voltage. The Thyristor without reverse voltage is suitable for a circuit limiting inrush current.

Thyristors

| Package |  10.0 × 6.6 × 2.3(mm) |  28.5 × 10.0 × 4.5(mm) | | |
|--|--|---|-------------------------------------|--|
| JEDEC Code JEITA Code House Name | TO-252AA — FB | — SC-91 FTO-220AG | | |
| Fig. | G2-2 | J8-5 | | |
| Internal Circuit |  |  | | |
| IT (AV) [A] | 3 | 5 | 5 | 8 |
| V _{DRM} [V] | 400 | KC3FB40H | KC5FB40H | |
| | 600 | | KC5FB60H KC5FB60HR KC5FB60HRT |  KC5SF60HRT |
| | 800 | | |  KC8SF80 |

 : New product

Thyristors

| Package JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | | | | Electrical Characteristics | | | | | Based on AEC-Q101 | Automotive |
|---|------|--|--------------------------|-------------------------|-------------------------------|--------------------------------------|-------------------------|------------------------|---------------------------------|--------------------------------------|---------------------------------|----------------------------------|---------------------------------|----------------------|------------|
| | | | V _{DRM} [V] | V _{RRM} [V] | I _T (AV) [A] | Conditions T _c [°C] | I _{TSM} [A] | T _j [°C] | V _{TM} (max) [V] | Conditions I _{TM} [A] | V _{GT} (max) [V] | I _{GT} (max) [μA] | I _H (max) [mA] | | |
| TO-252AA — FB | G2-2 | KC3FB40H | 400 | 400 | 3 | 111 | 40 | -40 to 125 | 1.4 | 4 | 0.8 | 100 | 5 | — | — |
| | | KC5FB40H | 400 | 400 | 5 | 101 | 65 | -40 to 125 | 1.6 | 10 | 0.8 | 200 | typ.1 | — | — |
| | | KC5FB60H | 600 | 600 | 5 | 98 | 90 | -40 to 125 | 1.8 | 15 | 0.8 | 100 | 5 | — | — |
| | | KC5FB60HR | 600 | — | 5 | 98 | 90 | -40 to 125 | 1.8 | 15 | 0.8 | 100 | 5 | — | — |
| — SC-91 FTO-220AG | J8-5 |  KC5SF60HRT | 600 | — | 5 | 127 | 82 | -40 to 150 | 1.8 | 15 | 0.8 | 100 | 5 | — | — |
| | |  KC8SF80 | 800 | 800 | 8 | 130 | 120 | -40 to 150 | 1.5 | 20 | 1.0 | 15mA | 100 | — | — |

 : New product




SIDACs

SIDAC series are semiconductor devices energized by the addition of a specific voltage. They are commonly used for switching devices or pulse generating devices.

Bi-directional (K1V series)

- Features
 1. Symmetrical characteristics.
 2. Operating directly from the AC mains, and can be used in all kinds of pulse generating circuits.
 3. The glass passivation ensures high reliability.




- Applications
 1. Pulse generation : gas igniters,HID(high intensity discharge)lamp drive circuit,etc.
 2. AC switching : drive circuit for switching power supplies,voltage detecting circuits,etc.
 3. Over voltage protection : AC line surge protection,capacitor rupture prevention,etc.

| Package |  |  |  |
|----------------------|---|---|---|
| JEDEC Code | DO-214AC | - | - |
| JEITA Code | - | - | - |
| House Name | 1F | AX06 | AX10 |
| Fig. | B4-3 | A2-1 | A5-3 |
| Internal Circuit | ①—N—② | | |
| V _{DRM} [V] | 5 | K1VZL09 | |
| | 15 | K1VZL20 | |
| | 90 | | K1V(A)10 K1V(A)11 K1V(A)12 |
| | 115 | | K1V(A)16 K1V14 |
| | 180 | | K1V22 K1V24 K1V26 |
| | 270 | | K1V22(W) K1V24(W) K1V26(W) K1V36(W) K1V38(W) |

Uni-directional (G1V series)

- Features
 1. Uni-directional characteristics.
 2. Smaller package than bi-directional SIDAC.
 3. Switching operation from DC power for pulse generation.
 4. The glass passivation ensures high reliability.

- Applications
 1. Pulse generation : gas igniters,negative ion generators, HID(high intensity discharge) lamp drive circuit,etc.
 2. Over voltage protection : DC line surge protection.

| Package |  |  |  |
|-------------------------|---|---|---|
| JEDEC Code | DO-214AC | - | - |
| JEITA Code | - | - | - |
| House Name | 1F | AX06 | AX078 |
| Fig. | B3-3 | A2-3 | A4-3 |
| Internal Circuit | ①—N—② | | |
| V _{DRM(A)} [V] | 70 | G1VL8C | G1V(A)8C |
| | 90 | G1VL10C | G1V(A)10C |
| | 100 | | G1V(A)12C |
| | 110 | | G1V(A)13C |
| | 115 | | G1V(A)15C |
| | 120 | G1VL15C | G1V(A)14C |
| | 170 | G1VL20C | G1V(A)20C |
| | 190 | G1VL22C G1VL24C | |
| | 210 | | G1V(B)20C G1V(B)22C G1V(B)24C |

Bi-directional (K1V series)

| Surface Mount | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | | Automotive | | |
|---------------|------------|----------|--------------------------|---------------------|------------|------------------|----------------|----------------------------|--------------------|------------|-----------------|----------------|--------------------|----------------|------------|
| JEDEC Code | Fig. | | V _{DRM} | I _T | Conditions | T _{stg} | T _J | V _{BO} | I _{DRM} | Conditions | I _{BO} | I _H | | V _T | Conditions |
| JEITA Code | House Name | [V] | [A] | T _L [°C] | [°C] | [°C] | [V] | [μA] | V _D [V] | [mA] | [mA] | [V] | I _T [A] | | |
| DO-214AC | B4-3 | K1VZL09 | 5 | 0.5 | 110 | -40 to 125 | 125 | 8 to 12 | 5 | 5 | 20 | 20 | 1.2 | 0.5 | - |
| 1F | | K1VZL20 | 15 | 0.5 | 110 | -40 to 125 | 125 | 18 to 22 | 5 | 15 | 20 | 20 | 1.2 | 0.5 | - |

| Axial | | Type No. | Absolute Maximum Ratings | | | | | | | Electrical Characteristics | | | | | Automotive | |
|------------|------------|----------|--------------------------|---------------------|------------|------------------|------------------|------------|--------|----------------------------|-----------------|----------------|--------------------|------------|------------|----------------|
| JEDEC Code | Fig. | | V _{DRM} | I _T | Conditions | I _{TSM} | I _{TRM} | Conditions | dit/dt | T _J | V _{BO} | I _H | V _T | Conditions | | R _S |
| JEITA Code | House Name | [V] | [A] | T _L [°C] | [A] | [A] | f [Hz] | [A/μs] | [°C] | [V] | [mA] | [V] | I _T [A] | [kΩ] | | |
| - | AX06 | K1V(A)10 | 90 | 1 | 109 | 16 | 60 | 60 | 50 | 125 | 95 to 113 | 50 | 1.6 | 1 | 0.1 | - |
| | | K1V(A)11 | 90 | 1 | 109 | 16 | 60 | 60 | 50 | 125 | 104 to 118 | 50 | 1.6 | 1 | 0.1 | - |
| | | K1V(A)12 | 90 | 1 | 109 | 16 | 60 | 60 | 50 | 125 | 110 to 125 | 50 | 1.6 | 1 | 0.1 | - |
| | | K1V(A)16 | 115 | 1 | 98 | 16 | 60 | 60 | 50 | 125 | 145 to 170 | 50 | 1.6 | 1 | 0.1 | - |
| - | A5-3 | K1V10 | 90 | 1 | 112 | 20 | 80 | 60 | 80 | 125 | 95 to 113 | 50 | 1.5 | 1 | 0.1 | - |
| | | K1V11 | 90 | 1 | 112 | 20 | 80 | 60 | 80 | 125 | 104 to 118 | 50 | 1.5 | 1 | 0.1 | - |
| | | K1V12 | 90 | 1 | 112 | 20 | 80 | 60 | 80 | 125 | 110 to 125 | 50 | 1.5 | 1 | 0.1 | - |
| | | K1V14 | 115 | 1 | 109 | 20 | 80 | 60 | 80 | 125 | 125 to 150 | 30 | 1.5 | 1 | 0.1 | - |
| | | K1V22 | 180 | 1 | 108 | 20 | 50 | 60 | 80 | 125 | 200 to 230 | 20 | 1.5 | 1 | 0.1 | - |
| | | K1V24 | 180 | 1 | 108 | 20 | 50 | 60 | 80 | 125 | 220 to 250 | 20 | 1.5 | 1 | 0.1 | - |
| | AX10 | K1V26 | 180 | 1 | 108 | 20 | 50 | 60 | 80 | 125 | 240 to 270 | 20 | 1.5 | 1 | 0.1 | - |
| | | K1V22(W) | 180 | 1 | 91 | 16 | 50 | 60 | 80 | 125 | 200 to 230 | 50 | 3 | 1 | 0.1 | - |
| | | K1V24(W) | 180 | 1 | 91 | 16 | 50 | 60 | 80 | 125 | 220 to 250 | 50 | 3 | 1 | 0.1 | - |
| | | K1V26(W) | 180 | 1 | 91 | 16 | 50 | 60 | 80 | 125 | 240 to 265 | 50 | 3 | 1 | 0.1 | - |
| | | K1V36(W) | 270 | 1 | 92 | 13 | 40 | 60 | 50 | 125 | 340 to 380 | 50 | 3 | 1 | 0.1 | - |
| | | K1V38(W) | 270 | 1 | 92 | 13 | 40 | 60 | 80 | 125 | 360 to 400 | 50 | 3 | 1 | 0.1 | - |

Uni-directional (G1V series)

| Surface Mount | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | | Automotive | |
|---------------|------------|----------|--------------------------|---------------------|------------|------------------|------------|----------------------------|----------------|-----------------|----------------|--------------------|------------|------------|
| JEDEC Code | Fig. | | V _{DRM(A)} | I _T | Conditions | I _{TRM} | Conditions | dit/dt | T _J | V _{BO} | I _H | V _T | | Conditions |
| JEITA Code | House Name | [V] | [A] | T _L [°C] | [A] | f [Hz] | [A/μs] | [°C] | [V] | [mA] | [V] | I _T [A] | | |
| DO-214AC | 1F | G1VL8C | 70 | 1 | 98 | 80 | 60 | 150 | 125 | 75 to 90 | 100 | 1.5 | 1 | - |
| | | G1VL10C | 90 | 1 | 98 | 150 | 60 | 150 | 125 | 95 to 110 | 100 | 1.5 | 1 | - |
| | | G1VL15C | 120 | 1 | 98 | 120 | 60 | 150 | 125 | 142 to 157 | 60 | 1.5 | 1 | - |
| | | G1VL20C | 170 | 1 | 98 | 120 | 60 | 150 | 125 | 190 to 210 | 60 | 1.5 | 1 | - |
| | | G1VL22C | 190 | 1 | 98 | 280 | 5 | 150 | 125 | 210 to 230 | 60 | 1.5 | 1 | - |
| | | G1VL24C | 190 | 1 | 98 | 280 | 5 | 150 | 150 | 230 to 250 | 60 | 1.5 | 1 | - |

| Axial | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | | Automotive | |
|------------|------------|-----------|--------------------------|---------------------|------------|------------------|------------|----------------------------|----------------|-----------------|----------------|--------------------|------------|------------|
| JEDEC Code | Fig. | | V _{DRM(A)} | I _T | Conditions | I _{TRM} | Conditions | dit/dt | T _J | V _{BO} | I _H | V _T | | Conditions |
| JEITA Code | House Name | [V] | [A] | T _L [°C] | [A] | f [Hz] | [A/μs] | [°C] | [V] | [mA] | [V] | I _T [A] | | |
| - | AX06 | G1V(A)8C | 70 | 1 | 98 | 80 | 60 | 80 | 125 | 75 to 90 | 100 | 1.5 | 1 | - |
| | | G1V(A)10C | 90 | 1 | 98 | 80 | 60 | 80 | 125 | 95 to 110 | 60 | 1.5 | 1 | - |
| | | G1V(A)12C | 100 | 1 | 98 | 80 | 60 | 80 | 125 | 110 to 130 | 60 | 1.5 | 1 | - |
| | | G1V(A)13C | 110 | 1 | 98 | 80 | 60 | 80 | 125 | 120 to 138 | 60 | 1.5 | 1 | - |
| | | G1V(A)14C | 120 | 1 | 98 | 80 | 60 | 80 | 125 | 130 to 150 | 60 | 1.5 | 1 | - |
| | | G1V(A)15C | 115 | 1 | 98 | 80 | 60 | 80 | 125 | 142 to 157 | 60 | 1.5 | 1 | - |
| - | AX078 | G1V(A)20C | 170 | 1 | 98 | 80 | 60 | 80 | 125 | 190 to 210 | 60 | 1.5 | 1 | - |
| | | G1V(B)20C | 170 | 1 | 102 | 120 | 60 | 220 | 150 | 190 to 210 | 60 | 1.5 | 1 | - |
| | | G1V(B)22C | 190 | 1 | 98 | 160 | 60 | 220 | 125 | 210 to 230 | 60 | 1.5 | 1 | - |
| | | G1V(B)24C | 210 | 1 | 102 | 120 | 60 | 220 | 150 | 230 to 250 | 60 | 1.5 | 1 | - |



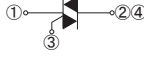
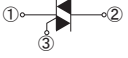








TRIACs

TRIACs are bidirectional Thyristors.

Our TRIACs are easy to use for motor and heater controls due to balanced gate sensitivity and $(di/dt)_c$.


Our lineup ranges from $V_{DRM}=600$ to 800V, $I_{T(RMS)}=3$ to 20A.

TRIACs (Triode for Alternating Current)








| Package |  10.0 × 6.6 × 2.3(mm) |  28.5 × 10.0 × 4.5(mm) |
|--|--|--|
| JEDEC Code JEITA Code House Name | TO-252AA — FB | SC-91 FTO-220AG |
| Fig. | G2-3 | J8-4 |
| Internal Circuit |  |  |
| $V_{DRM}[V]$ | 600 | |
| $I_{T(RMS)} [A]$ | 3 |  KD3FB60 |
| | 5 |  KD3SF60E  KD3SF60 |
| | 8 |  KD5SF60 |
| | 12 |  KD8SF60 |
| | 16 |  KD12SF60 |
| | 20 |  KD16SF60  KD20SF60 |

 : New product

TRIACs (Triode for Alternating Current)

| Surface Mount | | Type No. | Absolute Maximum Ratings | | | Electrical Characteristics | | | | | | Based on AEC-Q101 | Automotive |
|--|------|---|--------------------------|------------------|---------------|----------------------------|----------------------------|--|---|---|-------------------------------------|-------------------|------------|
| JEDEC Code JEITA Code House Name | Fig. | | I_T (RMS) [A] | V_{DRM} [V] | T_J [°C] | V_{TM} (max) [V] | Conditions I_{TM} [A] | V_{GT} (max) (I, II, III)* [V] | I_{GT} (max) (I, II, III)* [mA] | $(dv/dt)_c$ ($T_J=150^\circ C, V_D=2/3V_{DRM}$) [V/ μs] | Conditions $(di/dt)_c$ [A/ms] | | |
| TO-252AA — FB | G2-3 |  KD3FB60 | 3 | 600 | -40 to 150 | 1.7 | 4.5 | 1.5 | 15 | 1 | -1.5 | — | — |

 : New product * : Operation mode IV is not guaranteed.

| Two Terminal Type | | Type No. | Absolute Maximum Ratings | | | Electrical Characteristics | | | | | | Based on AEC-Q101 | Automotive |
|--|------|--|--------------------------|------------------|---------------|----------------------------|----------------------------|--|---|---|-------------------------------------|-------------------|------------|
| JEDEC Code JEITA Code House Name | Fig. | | I_T (RMS) [A] | V_{DRM} [V] | T_J [°C] | V_{TM} (max) [V] | Conditions I_{TM} [A] | V_{GT} (max) (I, II, III)* [V] | I_{GT} (max) (I, II, III)* [mA] | $(dv/dt)_c$ ($T_J=150^\circ C, V_D=2/3V_{DRM}$) [V/ μs] | Conditions $(di/dt)_c$ [A/ms] | | |
| SC-91 FTO-220AG | J8-4 |  KD3SF60E | 3 | 600 | -40 to 150 | 1.5 | 4.5 | 1.5 | 10 | — | — | — | — |
| | |  KD3SF60 | 3 | 600 | -40 to 150 | 1.5 | 4.5 | 1.5 | 20 | 1 | -1.5 | — | — |
| | |  KD5SF60 | 5 | 600 | -40 to 150 | 1.8 | 7 | 1.5 | 20 | 1 | -2.5 | — | — |
| | |  KD8SF60 | 8 | 600 | -40 to 150 | 1.6 | 12 | 1.5 | 30 | 1 | -4.0 | — | — |
| | |  KD12SF60 | 12 | 600 | -40 to 150 | 1.6 | 20 | 1.5 | 30 | 1 | -6.0 | — | — |
| | |  KD16SF60 | 16 | 600 | -40 to 150 | 1.5 | 25 | 1.5 | 30 | 1 | -8.0 | — | — |
|  KD20SF60 | 20 | 600 | -40 to 150 | 1.4 | 30 | 1.5 | 30 | 1 | -10.0 | — | — | | |

 : New product * : Operation mode IV is not guaranteed.

| Operation Mode | Terminal Characteristics | | |
|----------------|--------------------------|-------|-----|
| | ① T1 | ②④ T2 | ③ G |
| I | — | + | + |
| II | — | + | — |
| III | + | — | — |
| IV | + | — | + |




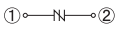
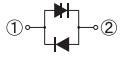
SURGE ABSORBERS

Surge Absorbers are semiconductor devices of the Thyristor type that turns on when triggered by their rated voltage. They are commonly used for lightning surge protection in communications equipment.

Thyristor Surge Suppressors

- Features**
1. Bi-directional or uni-directional characteristics.
 2. High speed response.
 3. Large surge current capacity.
 4. Repetitive use against surges is possible.


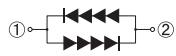
- Applications**
1. Lightning surge adsorption for communications circuits.
 2. Lightning surge adsorption for transmitters and switchboards.
 3. Surge protection for ISDN terminals.

| Series | KL Series | KU Series | KP Series | |
|---|--|---|--|----------|
| Package |  5.0 × 2.5 × 2.0(mm) |  5.1 × 3.75 × 2.0(mm) |  7.6 × 4.0 × 2.8(mm) | |
| JEDEC Code JEITA Code House Name | DO-214AC - 1F | DO-214AA similar - M2F | - - 2F | |
| Fig. | B4-3 | B7 B8 | B9-4 | |
| Internal Circuit |  |  | | |
| Off-state Voltage V _D [V] | 5 | KL3Z07 | | |
| | 15 | KL3Z18 | | |
| | 58 | KL3L07 | | |
| | 63 | | KU10L08 | |
| | 70 | | KU4F8 | |
| | 90 | | KU10NU11 | |
| | 92 | | KP20NU11 KP40NU11 | |
| | 100 | | KU4F12 | |
| | 115 | | KU10NU13 | |
| | 120 | KL3N14 | KU10N14 KU15N14 | |
| | 175 | KL3R20 | | |
| | 180 | | | KP40RU22 |
| | 190 | | KU10R23NS | |
| | 220 | | KU10R27NS | |
| 250 | | KU10R29NS | | |
| 275 | | KU5S31NS KU10S31NS KU10S35NS | | |

Varistor

- Features**
1. Bi-directional surge absorption is possible.
 2. Low junction capacitance.

- Applications**
1. Telephone set surge absorption.
 2. Digital communications circuit surge absorption.
 3. ISDN terminal surge absorption.

| | |
|--|--|
| Package |  5.0 × 2.5 × 2.0(mm) |
| JEDEC Code JEITA Code House Name | DO-214AC - 1F |
| Fig. | B4-1 |
| Internal Circuit |  |
| V _{F2} [V] | 2.75 ± 0.25 |
| | VR-61F1 |

Thyristor Surge Suppressors

| JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | Electrical Characteristics | | | UL | Automotive | | |
|--|------|-----------|--------------------------|--------------------|-------------------------|----------------------------|---------------------------------|---------------------------------|--------|------------|---------------------------------|---|
| | | | I _{TSM} [A] | Conditions [μs] | V _{DRM} [V] | T _J [°C] | V _{BO} (min) [V] | I _H (min) [mA] | | | C _t (max) [pF] | |
| DO-214AC - 1F | B4-3 | KL3Z07 | 30 | 10/1000 | 5 | 125 | 5.5 *1 | 50 | - | - | | |
| | | KL3Z18 | 30 | 10/1000 | 15 | 125 | 15.5 *1 | 50 | - | - | | |
| | | KL3L07 | 30 | 10/1000 | 58 | 125 | 65 | 100 | 90 | - | - | |
| | | KL3N14 | 30 | 10/1000 | 120 | 125 | 130 | 100 | 50 | - | - | |
| DO-214AA similar - M2F | B7 | KU10L08 | 100 | 10/1000 | 63 | 125 | 70 | 100 | 180 | UL | - | |
| | | KU4F8 | 40 | 10/1000 | 70 | 125 | 75 | 100 | 100 | - | - | |
| | B8 | KU10NU11 | 100 | 10/1000 | 60 | 125 | 100 | 150 | - | - | - | |
| | | B7 | KU4F12 | 40 | 10/1000 | 100 | 125 | 110 | 100 | 100 | - | - |
| | | | KU10NU13 | 100 | 10/1000 | 60 | 125 | 120 | 100 | - | - | - |
| | B7 | KU10N14 | 100 | 10/1000 | 120 | 125 | 125 | 100 | 140 | UL | - | |
| | | KU15N14 | 150 | 10/1000 | 120 | 125 | 125 | 100 | 110 | UL | - | |
| | | KU10R23NS | 100 | 10/1000 | 190 | 125 | 290 *2 | 100 | 90 | - | - | |
| | | KU10R27NS | 100 | 10/1000 | 220 | 125 | 320 *2 | 100 | 70 | UL | - | |
| | | KU10R29NS | 100 | 10/1000 | 250 | 125 | 400 *2 | 100 | 70 | UL | - | |
| | | KU5S31NS | 50 | 10/1000 | 275 | 125 | 420 *2 | 150 | 70 | - | - | |
| | - | B9-4 | KU10S31NS | 100 | 10/1000 | 275 | 125 | 420 *2 | 100 | 90 | UL | - |
| KU10S35NS | | | 100 | 10/1000 | 275 | 125 | 450 *2 | 100 | 90 | - | - | |
| KP20NU11 | | | 325 | 10/700 | 60 | 125 | 100 | 150 | 295 *3 | - | - | |
| KP40NU11 | | | 500 | 10/700 | 60 | 125 | 100 | 150 | 485 *3 | - | - | |
| - | - | KP40RU22 | 500 | 10/700 | 60 | 125 | 195 | 100 | 285 *3 | - | - | |

*1 : V_{BR} *2 : V_{CL(max)} *3 : typ.  : UL497B recognized (UL File No.E183905)

Varistor

| JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | Electrical Characteristics | | Automotive |
|--|------|----------|-----------------------------|-------------------------|------------------------|----------------------------|--------------------------------------|------------|
| | | | I _{F(RMS)} [mA] | I _{FSM} [A] | T _J [°C] | V _{F1} [V] | Conditions I _F [mA] | |
| DO-214AC - 1F | B4-1 | VR-61F1 | 370 | 7.5 | 150 | 2.3 ± 0.25 | 1 | - |

TVS (Transient Surge Suppressor)

TVSs are low voltage PN junction type devices.

These devices utilize technologically stable glass passivation (an in-house design) with a structural advantage that brings high resistance against heat and humidity.

They are available with a voltage range between 12 to 320V and peak pulse power from 200 to 8000W.

TVS (Transient Voltage Suppressor)

- Features
- 1.High speed response.
 - 2.Absorption energy tolerance capacity.
 - 3.Narrow clamping voltage width.

- Applications
- 1.IC protection for telephones.
 - 2.IC protection against abnormal voltage.
 - 3.Protection for load dump noise.

| Peak pulse power | 200W | | 600W | 2000W | 6000 ~ 8000W (Load Dump Surge Protecting) | | |
|--|-----------------------------------|----------------|----------------|----------------|---|--------------------------|----------------|
| Package | | | | | | | |
| JEDEC Code JEITA Code House Name | DO-219AB similar SC-109 G1F | DO-214AC 1F | DO-214AC 1F | DO-214AC 2F | MCP | SC-83 similar STO-220 | TO-263AB FZ |
| Fig. | B1-2 | B3-2 | B4-2 | B5-2 | B9-5 | B10 | E1 |
| Internal Circuit | | | | | | | |
| V _{BR} (typ) [V] | 12.5 | ST02-12G1 | ST04-12F1 | | | | |
| | 14 | ST02-14G1 | ST04-14F1 | | | ST80-14MF | |
| | 16 | ST02-16G1 | ST04-16F1 | | | | |
| | 18 | ST02-18G1 | ST04-18F1 | DL04-18F1 | ST06-18CE | | |
| | 20 | ST02-20G1 | ST04-20F1 | | | | |
| | 24 | ST02-24G1 | ST04-24F1 | | | | |
| | 27 | ST02-27G1 | ST04-27F1 | | ST06-27CE | ST20-27F2 | ST70-27MF |
| | 30 | ST02-30G1 | ST04-30F1 | | ST06-30CE | ST20-30F2 | ST70-30MF |
| | 33 | ST02-33G1 | ST04-33F1 | DL04-33F1 | ST06-33CE | ST20-33F2 | |
| | 36 | ST02-36G1 | ST04-36F1 | DL04-36F1 | ST06-36CE | ST20-36F2 | |
| | 39 | ST02-39G1 | ST04-39F1 | | ST06-39CE | | |
| | 40 | | | | | ST60-40MF | |
| | 43 | ST02-43G1 | ST03-43F1 | | | | |
| | 47 | ST02-47G1 | ST03-47F1 | | | ST20-47F2 | |
| | 48 | | | | | ST60-48MF | |
| | 58 | ST02-58G1 | ST03-58F1 | | | | |
| | 68 | | ST03-68F1 | | | | |
| | 75 | | ST02-75F1 | | | | |
| | 82 | | ST02-82F1 | | | | |
| | 100 | | ST02-100F1 | | | | |
| 120 | | ST02-120F1 | | | | | |
| 145 | | ST02-140F1 | | | | | |
| 170 | | ST02-170F1 | | | | | |
| 200 | | ST02-200F1 | | | | | |
| 240 | | ST03-240F1 | | | | | |
| 280 | | ST02-280F1 | | | | | |
| 320 | | ST02-320F1 | | | | | |

■ : New product

TVS (Transient Voltage Suppressor)

| JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive | | | |
|--|------|----------------|--------------------------|------------------------|-------------------------------|---------------------------------|---------------------------------|--------------------------------------|---------------------------------|----------------------|------------|-------------------------------------|---|---|
| | | | Prsm [W] | T _J [°C] | V _R (DC) [V] | V _{BR} (min) [V] | V _{BR} (max) [V] | Conditions I _R [mA] | I _R (max) [μA] | | | Conditions V _R [V] | | |
| DO-219AB similar SC-109 G1F | B1-2 | ST02-12G1 | 200 | -55 to 175 | 9 | 11.5 | 13.5 | 5 | 5 | 9 | ○ | ○ | | |
| | | ST02-14G1 | 200 | -55 to 175 | 12.8 | 13.5 | 15 | 5 | 5 | 12.8 | ○ | ○ | | |
| | | ST02-16G1 | 200 | -55 to 175 | 13.6 | 14.4 | 17.6 | 5 | 5 | 13.6 | ○ | ○ | | |
| | | ST02-18G1 | 200 | -55 to 175 | 13 | 16.8 | 19.1 | 5 | 5 | 13 | ○ | ○ | | |
| | | ST02-20G1 | 200 | -55 to 175 | 16 | 18.8 | 22 | 5 | 5 | 16 | ○ | ○ | | |
| | | ST02-24G1 | 200 | -55 to 175 | 20 | 22 | 25.6 | 5 | 5 | 20 | ○ | ○ | | |
| | | ST02-27G1 | 200 | -55 to 175 | 23 | 25.1 | 28.9 | 2 | 5 | 23 | ○ | ○ | | |
| | | ST02-30G1 | 200 | -55 to 175 | 24 | 28 | 32 | 2 | 5 | 24 | ○ | ○ | | |
| | | ST02-33G1 | 200 | -55 to 175 | 25 | 31 | 35 | 2 | 5 | 25 | ○ | ○ | | |
| | | ST02-36G1 | 200 | -55 to 175 | 27 | 34 | 38 | 2 | 5 | 27 | ○ | ○ | | |
| | | ST02-39G1 | 200 | -55 to 175 | 30 | 37 | 41 | 2 | 5 | 30 | ○ | ○ | | |
| | | ST02-43G1 | 200 | -55 to 175 | 33 | 40 | 45 | 2 | 5 | 33 | ○ | ○ | | |
| | | ST02-47G1 | 195 | -55 to 175 | 37 | 42 | 52 | 2 | 5 | 37 | ■ | ○ | | |
| DO-214AC 1F | B3-2 | ST04-12F1 | 400 | -55 to 175 | 9 | 11.5 | 13.5 | 1 | 5 | 9 | ○ | ○ | | |
| | | ST04-14F1 | 400 | -55 to 175 | 12.8 | 13.5 | 15 | 1 | 5 | 12.8 | ○ | ○ | | |
| | | ST04-16F1 | 400 | -55 to 175 | 13.6 | 14.4 | 17.6 | 1 | 5 | 13.6 | ○ | ○ | | |
| | | ST04-18F1 | 400 | -55 to 175 | 15.3 | 16.8 | 19.1 | 1 | 5 | 15.3 | ○ | ○ | | |
| | | ST04-20F1 | 400 | -55 to 175 | 16 | 18.8 | 21.2 | 1 | 5 | 16 | ○ | ○ | | |
| | | ST04-24F1 | 400 | -55 to 175 | 20 | 22.8 | 25.6 | 1 | 5 | 20 | ○ | ○ | | |
| | | ST04-27F1 | 400 | -55 to 175 | 23 | 24.3 | 29.7 | 1 | 5 | 23 | ○ | ○ | | |
| | | ST04-30F1 | 400 | -55 to 175 | 24 | 28 | 32 | 1 | 5 | 24 | ○ | ○ | | |
| | | ST04-33F1 | 400 | -55 to 175 | 25 | 31 | 35 | 1 | 5 | 25 | ○ | ○ | | |
| | | ST04-36F1 | 400 | -55 to 175 | 27 | 34 | 38 | 1 | 5 | 27 | ○ | ○ | | |
| | | ST04-39F1 | 400 | -55 to 175 | 30 | 37 | 41 | 1 | 5 | 30 | ○ | ○ | | |
| | | ST03-43F1 | 300 | -55 to 150 | 33 | 40 | 45 | 1 | 5 | 33 | ○ | ○ | | |
| | | ST03-47F1 | 300 | -55 to 150 | 37 | 42 | 52 | 1 | 5 | 37 | ○ | ○ | | |
| | | ST03-58F1 | 300 | -55 to 150 | 45 | 52 | 64 | 1 | 5 | 45 | ○ | ○ | | |
| | | ST03-68F1 | 300 | -55 to 150 | 58 | 64.4 | 71.2 | 1 | 5 | 58 | ○ | ○ | | |
| | | ST02-75F1 | 200 | -55 to 150 | 61 | 70 | 79 | 1 | 5 | 61 | ○ | ○ | | |
| | | ST02-82F1 | 200 | -55 to 150 | 67 | 74 | 90 | 1 | 5 | 67 | ○ | ○ | | |
| | | ST02-100F1 | 200 | -55 to 150 | 80 | 90 | 110 | 1 | 5 | 80 | ○ | ○ | | |
| | | ST02-120F1 | 200 | -55 to 150 | 100 | 110 | 130 | 1 | 5 | 33 | ■ | ○ | | |
| | | ST02-140F1 | 200 | -55 to 150 | 120 | 130 | 160 | 1 | 5 | 120 | ■ | ○ | | |
| | | ST02-170F1 | 200 | -55 to 150 | 145 | 155 | 185 | 1 | 5 | 145 | ■ | ○ | | |
| | | ST02-200F1 | 200 | -55 to 150 | 170 | 185 | 215 | 1 | 5 | 170 | ■ | ○ | | |
| | | ST03-240F1 | 310 | -55 to 175 | 200 | 220 | 250 | 1 | 5 | 200 | ■ | ○ | | |
| | | ST02-280F1 | 200 | -55 to 175 | 230 | 250 | 300 | 1 | 5 | 230 | ○ | ○ | | |
| | | ST02-320F1 | 150 | -55 to 175 | 260 | 300 | 350 | 1 | 5 | 260 | ○ | ○ | | |
| | | DO-214AC 1F | B4-2 | DL04-18F1 | 400 | -55 to 150 | 13 | 16.8 | 19.1 | 5 | 5 | 13 | ○ | ○ |
| | | | | DL04-33F1 | 400 | -55 to 175 | 25 | 31 | 35 | 1 | 5 | 25 | ○ | ○ |
| DL04-36F1 | 400 | | | -55 to 175 | 27 | 34 | 38 | 1 | 5 | 27 | ○ | ○ | | |
| SC-110B CE | B5-2 | ST06-18CE | 600 | -55 to 175 | 13 | 16.8 | 19.1 | 1 | 5 | 13 | ○ | ○ | | |
| | | ST06-27CE | 600 | -55 to 175 | 23 | 25 | 29 | 1 | 5 | 23 | ○ | ○ | | |
| | | ST06-30CE | 600 | -55 to 175 | 24 | 28 | 32 | 1 | 5 | 24 | ○ | ○ | | |
| | | ST06-33CE | 600 | -55 to 175 | 25 | 31 | 35 | 1 | 5 | 25 | ○ | ○ | | |
| | | ST06-36CE | 600 | -55 to 175 | 27 | 34 | 38 | 1 | 5 | 27 | ○ | ○ | | |
| - | B9-5 | ST20-47F2 | 1700 | -55 to 175 | 37 | 42 | 52 | 1 | 5 | 37 | ○ | ○ | | |
| | | ST20-27F2 | 2000 | -55 to 175 | 23 | 24.3 | 29.7 | 1 | 5 | 23 | ○ | ○ | | |
| | | ST20-30F2 | 2000 | -55 to 175 | 24 | 28 | 32 | 1 | 5 | 24 | ○ | ○ | | |
| | | ST20-33F2 | 2000 | -55 to 175 | 25 | 31 | 35 | 1 | 5 | 25 | ○ | ○ | | |
| - | B10 | ST20-36F2 | 2000 | -55 to 175 | 27 | 34 | 38 | 1 | 5 | 27 | ○ | ○ | | |
| | | ST80-14MF | 8000 | -40 to 150 | 12 | 13 | 15 | 1 | 10 | 12 | ○ | ○ | | |
| | | ST70-27MF | 7000 | -40 to 150 | 23 | 24.3 | 29.7 | 1 | 5 | 23 | ○ | ○ | | |
| | | ST70-30MF | 7000 | -40 to 150 | 26 | 27.5 | 33 | 1 | 5 | 26 | ○ | ○ | | |
| - | E1 | ST60-40MF | 6000 | -40 to 150 | 32 | 36.5 | 44 | 1 | 5 | 32 | ○ | ○ | | |
| | | ST60-48MF | 6000 | -40 to 150 | 40 | 43.2 | 54 | 1 | 5 | 40 | ○ | ○ | | |
| SC-83 similar STO-220 TO-263AB FZ | H1-6 | ST70-27F | 7000 | -40 to 150 | 23 | 24.3 | 29.7 | 1 | 5 | 23 | ○ | ○ | | |
| | | ST70-27FZ | 7000 | -55 to 175 | 23 | 25 | 29 | 1 | 5 | 23 | ○ | ○ | | |






■ : New product ■ : Please contact us.

TVS (Transient Surge Suppressor)

Power Clampers

- Features
- 1.High speed response.
 - 2.Absorption energy tolerance capacity.
 - 3.Narrow clampingvoltage width.
 - 4.Reverse blocking type.

- Application 1.Snubber circuit in the primary side of switch-mode power supplies.

| Package |  7.6 × 4.0 × 2.8(mm) |  5.0 × φ 4.0(mm) |  7.0 × φ 4.4(mm) | |
|------------------------------|--|--|--|--------------|
| JEDEC Code | — | — | — | |
| JEITA Code | — | — | — | |
| House Name | 2F | AX078 | AX10 | |
| Fig. | B9-3 | A4-2 | A5-2 | |
| Internal Circuit |  |  | | |
| V _{BR} (typ) [V] | 82 | | ST02D-82 | ST03D-82 |
| | 145 | ST02D-140F2 | ST02D-140 | ST03D-140 |
| | 170 | ST02D-170F2 | ST02D-170 | ST03D-170 |
| | 200 | | ST02D-200 | ST03D-200 |
| | 240 | | | ST03DH-240 |
| | 280 | | | ★ ST02DH-280 |
| 320 | | | ★ ST02DH-320 | |

★ : Under development

Power Clampers

| Surface Mount | | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | | | | Automotive |
|---------------|------|-------------|--------------------------|------------------------|---------------------------------|-----|---------------------------------|---------------------------------|--------------------------------------|---------------------------------|---------------------------------|-------------------------------------|------------|
| Package | | | PrSM [W] | T _J [°C] | V _{RM} (max) [V] | | ZD | | | Di | | | |
| JEDEC Code | Fig. | | | | ZD | Di | V _{BR} (min) [V] | V _{BR} (max) [V] | Conditions I _R [mA] | I _R (max) [μA] | I _R (max) [μA] | Conditions V _R [V] | |
| — | B9-3 | ST02D-140F2 | 200 | -40 to 150 | 120 | 600 | 130 | 160 | 1 | 5 | 5 | 600 | — |
| 2F | | ST02D-170F2 | 200 | -40 to 150 | 145 | 600 | 155 | 185 | 1 | 5 | 5 | 600 | — |

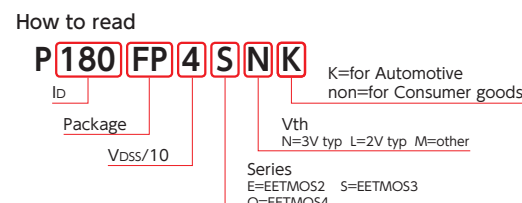
| Axial | | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | | | | Automotive |
|--------------|------|--------------|--------------------------|------------------------|---------------------------------|------|---------------------------------|---------------------------------|--------------------------------------|---------------------------------|---------------------------------|-------------------------------------|------------|
| Package | | | PrSM [W] | T _J [°C] | V _{RM} (max) [V] | | ZD | | | Di | | | |
| JEDEC Code | Fig. | | | | ZD | Di | V _{BR} (min) [V] | V _{BR} (max) [V] | Conditions I _R [mA] | I _R (max) [μA] | I _R (max) [μA] | Conditions V _R [V] | |
| — AX078 | A4-2 | ST02D-82 | 200 | -40 to 150 | 67 | 600 | 74 | 90 | 1 | 5 | 5 | 600 | — |
| | | ST02D-140 | 200 | -40 to 150 | 120 | 600 | 130 | 160 | 1 | 5 | 5 | 600 | — |
| | | ST02D-170 | 200 | -40 to 150 | 145 | 600 | 155 | 185 | 1 | 5 | 5 | 600 | — |
| | | ST02D-200 | 200 | -40 to 150 | 170 | 600 | 185 | 215 | 1 | 5 | 5 | 600 | — |
| — AX10 | A5-2 | ST03D-82 | 300 | -40 to 150 | 67 | 600 | 74 | 90 | 1 | 5 | 5 | 600 | — |
| | | ST03D-140 | 300 | -40 to 150 | 120 | 600 | 130 | 160 | 1 | 5 | 5 | 600 | — |
| | | ST03D-170 | 300 | -40 to 150 | 145 | 600 | 155 | 185 | 1 | 5 | 5 | 600 | — |
| | | ST03D-200 | 300 | -40 to 150 | 170 | 600 | 185 | 215 | 1 | 5 | 5 | 600 | — |
| | | ST03DH-240 | 300 | -40 to 150 | 200 | 1000 | 220 | 250 | 1 | 5 | 10 | 1000 | — |
| | | ★ ST02DH-280 | 300 | -40 to 150 | 230 | 1000 | 250 | 300 | 1 | 5 | 10 | 1000 | — |
| ★ ST02DH-320 | 300 | -40 to 150 | 260 | 1000 | 300 | 350 | 1 | 5 | 10 | 1000 | — | | |

★ : Under development

POWER MOSFETS

The EETMOS series offer world-class performance applying a trench-gate structure with an optimized layout hence lowered Qg.

| Series | Feature |
|------------|----------------------------|
| EETMOS2 | Evenly balanced Ron and Qg |
| EETMOS3/3Z | Low Ron, Low Qg |
| EETMOS4 | Ultra Low Ron, Low Qg |



EETMOS Series (Nch Single)

| Package | JEDEC Code JEITA Code House Name | Fig. | Id [A] | V _{ds} [V] | | | | | Remarks | | | | | |
|------------------------|--|-------------------------------|----------------------|--|--|--|----------------------|----------|--|--|--|--|----------------------|--|
| | | | | 40 | 60 | 75 | 100 | 120 | | | | | | |
| 6.0 × 4.9 × 1.0(mm) | — — LA | G6 | 15 | | | | | | N P15LA12SL | | | | | |
| | | | 18 | | | | | | N P18LA12SL | | | | | |
| | | | 19 | | | | | | N P19LA10SL | | | | | |
| | | | 23 | | | | | | N P23LA10SL | | | | | |
| | | | 25 | | | | | | N P25LA12SL | | | | | |
| | | | 30 | | | | | | N P30LA10SL | | | | | |
| 56 | N P56LA4SN | | | | | | | | | | | | | |
| 6.05 × 5.30 × 1.05(mm) | MO-235B similar — LF | G7 | 25 | | | | | | N P25LF12SLK N P25LF12SL N P25LF12SNK N P25LF12SN | | | | | |
| | | | 32 | | | | | | N P32LF10SLK N P32LF10SL N P32LF10SNK N P32LF10SN | | | | | |
| | | | 38 | | N P38LF6QLK N P38LF6QNK | | | | | | | | | |
| | | | 40 | | | | | | N P40LF12SLK N P40LF12SL N P40LF12SNK N P40LF12SN | | | | | |
| | | | 46 | | | N P46LF7R5SLK N P46LF7R5SL N P46LF7R5SNK N P46LF7R5SN | | | | | | | | |
| | | | 50 | | | | | | N P50LF10SLK N P50LF10SL N P50LF10SNK N P50LF10SN | | | | | |
| | | | 64 | | N P64LF6QLK N P64LF6QL N P64LF6QNK N P64LF6QN | | | | | | | | | |
| | | | 70 | N P70LF4QLK N P70LF4QNK | | | | | | | | | | |
| | | | 72 | | N P72LF7R5SLK N P72LF7R5SL N P72LF7R5SNK N P72LF7R5SN | | | | | | | | | |
| | | | 98 | | N P98LF6QLK N P98LF6QL N P98LF6QNK N P98LF6QN | | | | | | | | | |
| | | | 105 | N P105LF4QLK N P105LF4QL N P105LF4QNK N P105LF4QN | | | | | | | | | | |
| | | | 140 | N P140LF4QLK N P140LF4QL N P140LF4QNK N P140LF4QN | | | | | | | | | | |
| | | | 10.0 × 6.6 × 2.3(mm) | TO-252AA — FB | G2-1 | 8 | | | | | | | P8B10SB | |
| | | | | | | 16 | | P16B6SB | | | | | | |
| | | | | | | 20 | | | | | | | P20B12SN P20B12SL | |
| | | | | | | 24 | P24B4SB | | | | | | | |
| 25 | | P25B6EB | | | | | | | | | | | | |
| 26 | | | | | | P26B10SL P26B10SN | | | | | | | | |
| 30 | | | | | | P30B10EL | | | | | | | | |
| 32 | | | | | | | | P32B12SN | | | | | | |
| 40 | | P40B6SL | | | | | P40B10SL P40B10SN | | | | | | | |
| 54 | P54B4SN | | | | | | | | | | | | | |
| 60 | P60B4EL P60B4SN | P60B6EL P60B6EN P60B6SN | | | | | | | | | | | | |

N : New product

EETMOS Series (Nch Single)

| JEDEC Code JEITA Code House Name | Fig. | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | | Based on AEC-Q101 | Automotive | Series | |
|--|------|--------------|--------------------------|--------------------|---------------------|--------------------|----------------------|--|--|-----------------------------|---------------------------|---------------------------|----------------------|------------|--------|-----------------------------------|
| | | | V _{ds} [V] | I _d [A] | I _{DP} [A] | P _T [W] | T _{ch} [°C] | R _{DS(ON)} (typ) [mΩ] V _G S=10V | R _{DS(ON)} (max) [mΩ] V _G S=10V | C _{iss} (typ) [pF] | Q _g (typ) [nC] | V _{th} (typ) [V] | | | | R _{th(j-c)} (max) [°C/W] |
| — — LA | G6 | N P56LA4SN | 40 | 56 | 168 | 99 | -55 to 150 | 4.5 | 5.7 | 1680 | 38 | 3.0 | 1.26 | — | — | EETMOS3 |
| | | N P19LA10SL | 100 | 19 | 57 | 83 | -55 to 150 | 28 | 35 | 1730 | 38 | 2.0 | 1.5 | — | — | EETMOS3 |
| | | N P23LA10SL | 100 | 23 | 69 | 99 | -55 to 150 | 23 | 29 | 2080 | 46 | 2.0 | 1.26 | — | — | EETMOS3 |
| | | N P30LA10SL | 100 | 30 | 90 | 142 | -55 to 150 | 16.8 | 21.0 | 2890 | 61 | 2.0 | 0.88 | — | — | EETMOS3 |
| | | N P15LA12SL | 120 | 15 | 45 | 83 | -55 to 150 | 40 | 50 | 1735 | 38.5 | 2.0 | 1.5 | — | — | EETMOS3 |
| | | N P18LA12SL | 120 | 18 | 54 | 99 | -55 to 150 | 35 | 44 | 2090 | 47 | 2.0 | 1.26 | — | — | EETMOS3 |
| | | N P25LA12SL | 120 | 25 | 75 | 142 | -55 to 150 | 24 | 30 | 2900 | 61 | 2.0 | 0.88 | — | — | EETMOS3 |
| | | N P70LF4QLK | 40 | 70 | 210 | 123 | -55 to 175 | 3.6 | 4.5 | 2360 | 49 | 2.0 | 1.21 | ○ | ○ | EETMOS4 |
| | | N P70LF4QNK | 40 | 70 | 210 | 123 | -55 to 175 | 3.9 | 4.9 | 1890 | 38 | 3.0 | 1.21 | ○ | ○ | EETMOS4 |
| | | N P105LF4QLK | 40 | 105 | 315 | 168 | -55 to 175 | 2.1 | 2.7 | 4090 | 76 | 2.0 | 0.89 | ○ | ○ | EETMOS4 |
| | | N P105LF4QL | 40 | 105 | 315 | 168 | -55 to 175 | 2.1 | 2.7 | 4090 | 76 | 2.0 | 0.89 | — | — | EETMOS4 |
| | | N P105LF4QNK | 40 | 105 | 315 | 168 | -55 to 175 | 2.2 | 2.8 | 3400 | 62 | 3.0 | 0.89 | ○ | ○ | EETMOS4 |
| | | N P105LF4QN | 40 | 105 | 315 | 168 | -55 to 175 | 2.2 | 2.8 | 3400 | 62 | 3.0 | 0.89 | — | — | EETMOS4 |
| | | N P140LF4QLK | 40 | 140 | 560 | 217 | -55 to 175 | 1.17 | 1.42 | 6630 | 122 | 2.0 | 0.69 | ○ | ○ | EETMOS4 |
| | | N P140LF4QL | 40 | 140 | 560 | 217 | -55 to 175 | 1.17 | 1.42 | 6630 | 122 | 2.0 | 0.69 | — | — | EETMOS4 |
| | | N P140LF4QNK | 40 | 140 | 560 | 217 | -55 to 175 | 1.22 | 1.48 | 5530 | 96 | 3.0 | 0.69 | ○ | ○ | EETMOS4 |
| | | N P140LF4QN | 40 | 140 | 560 | 217 | -55 to 175 | 1.22 | 1.48 | 5530 | 96 | 3.0 | 0.69 | — | — | EETMOS4 |
| | | N P38LF6QLK | 60 | 38 | 114 | 123 | -55 to 175 | 7.9 | 9.9 | 2340 | 49 | 2.0 | 1.21 | ○ | ○ | EETMOS4 |
| | | N P38LF6QNK | 60 | 38 | 114 | 123 | -55 to 175 | 8.3 | 10.4 | 1875 | 35 | 3.0 | 1.21 | ○ | ○ | EETMOS4 |
| | | N P64LF6QLK | 60 | 64 | 192 | 168 | -55 to 175 | 4.5 | 5.7 | 4260 | 77 | 2.0 | 0.89 | ○ | ○ | EETMOS4 |
| | | N P64LF6QL | 60 | 64 | 192 | 168 | -55 to 175 | 4.5 | 5.7 | 4260 | 77 | 2.0 | 0.89 | — | — | EETMOS4 |
| | | N P64LF6QNK | 60 | 64 | 192 | 168 | -55 to 175 | 4.5 | 5.7 | 3540 | 61 | 3.0 | 0.89 | ○ | ○ | EETMOS4 |
| | | N P64LF6QN | 60 | 64 | 192 | 168 | -55 to 175 | 4.5 | 5.7 | 3540 | 61 | 3.0 | 0.89 | — | — | EETMOS4 |
| | | N P98LF6QLK | 60 | 98 | 392 | 217 | -55 to 175 | 2.5 | 3.2 | 6770 | 126 | 2.0 | 0.69 | ○ | ○ | EETMOS4 |
| | | N P98LF6QL | 60 | 98 | 392 | 217 | -55 to 175 | 2.5 | 3.2 | 6770 | 126 | 2.0 | 0.69 | — | — | EETMOS4 |
| | | N P98LF6QNK | 60 | 98 | 392 | 217 | -55 to 175 | 2.6 | 3.3 | 5650 | 96 | 3.0 | 0.69 | ○ | ○ | EETMOS4 |
| N P98LF6QN | 60 | 98 | 392 | 217 | -55 to 175 | 2.6 | 3.3 | 5650 | 96 | 3.0 | 0.69 | — | — | EETMOS4 | | |
| N P46LF7R5SLK | 75 | 46 | 138 | 168 | 175 | 8.2 | 10.3 | 2890 | 61 | 2.0 | 0.89 | ○ | ○ | EETMOS3 | | |
| N P46LF7R5SNK | 75 | 46 | 138 | 168 | 175 | 8 | 10 | 2380 | 48 | 3.0 | 0.89 | ○ | ○ | EETMOS3 | | |
| N P46LF7R5SN | 75 | 46 | 138 | 168 | -55 to 175 | 8 | 10 | 2380 | 48 | 3.0 | 0.89 | — | — | EETMOS3 | | |
| N P72LF7R5SLK | 75 | 72 | 288 | 217 | 175 | 4.6 | 5.8 | 4870 | 100 | 2.0 | 0.69 | ○ | ○ | EETMOS3 | | |
| N P72LF7R5SL | 75 | 72 | 288 | 217 | -55 to 175 | 4.6 | 5.8 | 4870 | 100 | 2.0 | 0.69 | — | — | EETMOS3 | | |
| N P72LF7R5SNK | 75 | 72 | 288 | 217 | 175 | 4.5 | 5.7 | 4080 | 78 | 3.0 | 0.69 | ○ | ○ | EETMOS3 | | |
| N P72LF7R5SN | 75 | 72 | 288 | 217 | -55 to 175 | 4.5 | 5.7 | 4080 | 78 | 3.0 | 0.69 | — | — | EETMOS3 | | |
| N P32LF10SLK | 100 | 32 | 96 | 168 | 175 | 15.7 | 19.7 | 2890 | 61 | 2.0 | 0.89 | ○ | ○ | EETMOS3 | | |
| N P32LF10SL | 100 | 32 | 96 | 168 | -55 to 175 | 15.7 | 19.7 | 2890 | 61 | 2.0 | 0.89 | — | — | EETMOS3 | | |
| N P32LF10SNK | 100 | 32 | 96 | 168 | 175 | 14.4 | 18.0 | 2430 | 48 | 3.0 | 0.89 | ○ | ○ | EETMOS3 | | |
| N P32LF10SN | 100 | 32 | 96 | 168 | -55 to 175 | 14.4 | 18.0 | 2430 | 48 | 3.0 | 0.89 | — | — | EETMOS3 | | |
| N P50LF10SLK | 100 | 50 | 200 | 217 | 175 | 9.0 | 11.3 | 4900 | 102 | 2.0 | 0.69 | ○ | ○ | EETMOS3 | | |
| N P50LF10SL | 100 | 50 | 200 | 217 | -55 to 175 | 9.0 | 11.3 | 4900 | 102 | 2.0 | 0.69 | — | — | EETMOS3 | | |
| N P50LF10SNK | 100 | 50 | 200 | 217 | 175 | 8.3 | 10.4 | 4130 | 80 | 3.0 | 0.69 | ○ | ○ | EETMOS3 | | |
| N P50LF10SN | 100 | 50 | 200 | 217 | -55 to 175 | 8.3 | 10.4 | 4130 | 80 | 3.0 | 0.69 | — | — | EETMOS3 | | |
| N P25LF12SLK | 120 | 25 | 75 | 168 | 175 | 23 | 29 | 2930 | 61 | 2.0 | 0.89 | ○ | ○ | EETMOS3 | | |
| N P25LF12SL | 120 | 25 | 75 | 168 | -55 to 175 | 23 | 29 | 2930 | 61 | 2.0 | 0.89 | — | — | EETMOS3 | | |
| N P25LF12SNK | 120 | 25 | 75 | 168 | 175 | 21 | 27 | 2430 | 48 | 3.0 | 0.89 | ○ | ○ | EETMOS3 | | |
| N P25LF12SN | 120 | 25 | 75 | 168 | -55 to 175 | 21 | 27 | 2430 | 48 | 3.0 | 0.89 | — | — | EETMOS3 | | |
| N P40LF12SLK | 120 | 40 | 160 | 217 | 175 | 13.0 | 16.3 | 5000 | 102 | 2.0 | 0.69 | ○ | ○ | EETMOS3 | | |
| N P40LF12SL | 120 | 40 | 160 | 217 | -55 to 175 | 13.0 | 16.3 | 5000 | 102 | 2.0 | 0.69 | — | — | EETMOS3 | | |
| N P40LF12SNK | 120 | 40 | 160 | 217 | 175 | 12.3 | 15.4 | 4075 | 80 | 3.0 | 0.69 | ○ | ○ | EETMOS3 | | |
| N P40LF12SN | 120 | 40 | 160 | 217 | -55 to 175 | 12.3 | 15.4 | 4075 | 80 | 3.0 | 0.69 | — | — | EETMOS3 | | |
| P24B4SB | 40 | 24 | 72 | 20 | -55 to 150 | 14.8 | 18.5 | 645 | 16.5 | 2.0 | 6.28 | — | — | EETMOS3 | | |
| P54B4SN | 40 | 54 | 162 | 44 | -55 to 150 | 5.0 | 6.3 | 1650 | 36 | 3.0 | 2.84 | — | — | EETMOS3 | | |
| P60B4EL | 40 | 60 | 240 | 62.5 | -55 to 150 | 3.3 | 4.2 | 2900 | 57 | 2.0 | 2 | — | — | EETMOS2 | | |
| P60B4SN | 40 | 60 | 180 | 62.5 | -55 to 150 | 3.2 | 4.0 | 2830 | 59 | 3.0 | 2 | — | — | EETMOS3 | | |
| P16B6SB | 60 | 16 | 48 | 20 | -55 to 150 | 29 | 37 | 655 | 17 | 2.0 | 6.28 | — | — | EETMOS3 | | |
| P25B6EB | 60 | 25 | 70 | 35 | -55 to 150 | 23 | 29 | 785 | 14.5 | 2.0 | 3.55 | — | — | EETMOS2 | | |
| P40B6SL | 60 | 40 | 120 | 44 | -55 to 150 | 9.5 | 12.0 | 2050 | 43 | 2.0 | 2.84 | — | — | EETMOS3 | | |
| P60B6EL | 60 | 60 | 240 | 62.5 | -55 to 150 | 6.1 | 7.7 | 2920 | 55 | 2.0 | 2 | — | — | EETMOS2 | | |
| P60B6EN | 60 | 60 | 240 | 62.5 | -55 to 150 | 6.4 | 8.0 | 2550 | 44 | 3.0 | 2 | — | — | EETMOS2 | | |
| P60B6SN | 60 | 60 | 180 | 62.5 | -55 to 150 | 5.3 | 6.7 | 2780 | 55 | 3.0 | 2 | — | — | EETMOS3 | | |
| P8B10SB | 100 | 8 | 24 | 20 | -55 to 150 | 75 | 94 | 665 | 16.5 | 2.0 | 6.28 | — | — | EETMOS3 | | |
| P26B10SL | 100 | 26 | 78 | 44 | -55 to 150 | 24 | 3 | | | | | | | | | |

POWER MOSFETS

EETMOS Series (Nch Single)

| Surface Mount | | | | | | | | | | | | Remarks | | | |
|---------------|--|------|--------|-------------------------|-----------|-----|--------------------------|-------------------------|-------------------------|-----------------------------|--|---------------------------|------------|-----------|--|
| Package | JEDEC Code JEITA Code House Name | Fig. | Id [A] | Vdss [V] | | | | | | | | | | | |
| | | | 40 | 50 | 55 | 60 | 75 | 100 | 120 | 150 | | | | | |
| | TO-252AB similar SC-63 FE | G3-2 | 8 | | | | | P8FE10SBK | | | | | | | |
| | | | 12 | | | | | | P12FE7R5SBK | | | | | | |
| | | | 14 | | | | | | | | | | | | |
| | | | 20 | | | | P14FE6SBK | | | | | | P20FE12SLK | | |
| | | | 22 | | | | | | | | | | | | |
| | | | 26 | | | | | | | | | | P26FE10SLK | | |
| | | | 30 | P30FE4SLK | | | | | P30FE6SLK | P30FE7R5SLK | | | | P32FG15SL | |
| | TO-263AB - FG | H4 | 32 | | | | | | | | | | | | |
| | | | 80 | | | | | P80FG6EAL | P80FG7R5EN | | | | | | |
| | | | 85 | | | | | P85FG6EAL | | | | | | | |
| | | | 90 | | | | | | | P90FG5R5SL | | | | | |
| | | | 94 | | | | | | | P94FG5R5SL | | | | | |
| | TO-263AB-1 - FH | H3 | 80 | | P80FH5ENK | | | | | | | | | | |
| | | | 100 | P100FH4ENK | | | | | | | | | | | |
| | - SC-83 similar FP | H5 | 70 | | | | | | | P70FP12SNK P70FP12SN | | | | | |
| | | | 88 | | | | | | P88FP10SNK P88FP10SN | | | | | | |
| | | | 100 | | | | | | | | | P100FP12SNK P100FP12SN | | | |
| | | | 126 | | | | | | | P126FP10SNK P126FP10SN | | | | | |
| | | | 153 | | | | | P153FP6SNK P153FP6SN | | | | | | | |
| | | | 168 | | | | | | | P168FP7R5SNK P168FP7R5SN | | | | | |
| | | | 175 | P175FP4SNK P175FP4SN | | | | | | | | | | | |
| | | | 180 | P180FP4SNK P180FP4SN | | | | | P180FP6SNK P180FP6SN | | | | | | |
| | | | | TO-263SC - FZ-7p | H7 | 211 | P211FZ4QMK | | | | | | | | |
| | | | | | | 240 | P240FZ4QLA P240FZ4QNK | | | | | | | | |

N : New product

THD (Through Hole Device)

| THD (Through Hole Device) | | | | | | | | | | | Remarks | | |
|---------------------------|--|------|--------|----------|----|----|---------|-----|-----|----------|-------------|----------|-------------------------|
| Package | JEDEC Code JEITA Code House Name | Fig. | Id [A] | Vdss [V] | | | | | | | | | |
| | | | 40 | 50 | 60 | 70 | 75 | 100 | 120 | | | | |
| | - SC-91 FTO-220AG | J8-2 | 22 | | | | | | | P22F10SN | | | |
| | | | 32 | | | | | | | | | P32F12SN | |
| | | | 34 | | | | | | | | | | P34F6EL |
| | | | 40 | | | | | | | | | | P40F10SN |
| | | | 42 | | | | | | | | | | P42F6EN |
| | | | 50 | | | | | | | | | | P50F10SN |
| | | | 55 | | | | | | | | | | P55F6EN |
| | | | 66 | | | | | | | | | | P66F7R5SNK P66F7R5SN |
| | | | 70 | | | | | | | | | | P70F7R5EN P70F7R5SN |
| | | | 82 | | | | P70F5EN | | | | | | P82F7R5SN |
| | TO-220AB SC-46 FA | J5 | 100 | | | | | | | | P100FA7R5EN | | |
| | | | 86 | | | | | | | | P86F6SN | | |

N : New product

EETMOS Series (Nch Single)

| Surface Mount | | | | | | | | | | | | | | | | |
|--|------|------------------------|--------------------------|------------|------------|-----------|-------------|----------------------------|-----------------------------------|--------------|------------|------------|----------------------|------------|--------|--------------------|
| Package | | | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | | Based on AEC-Q101 | Automotive | Series | |
| JEDEC Code JEITA Code House Name | Fig. | Type No. | Vdss [V] | Id [A] | IDP [A] | PT [W] | Tch [°C] | Rds(on) [mΩ] Vgs=10V | Rds(on) [mΩ] max Vgs=10V | Ciss [pF] | Qg [nC] | Vth [V] | | | | Rth(j-c) [°C/W] |
| TO-252AB similar SC-63 FE | G3-2 | P22FE4SBK | 40 | 22 | 66 | 24 | -55 to 175 | 15.2 | 19.0 | 645 | 16.5 | 2.0 | 6.2 | ○ | ○ | EETMOS3 |
| | | P30FE4SLK | 40 | 30 | 90 | 44 | -55 to 175 | 6.3 | 8.0 | 2020 | 44 | 2.0 | 3.4 | ○ | ○ | EETMOS3 |
| | | P14FE6SBK | 60 | 14 | 42 | 24 | -55 to 175 | 31 | 39 | 655 | 16.3 | 2.0 | 6.2 | ○ | ○ | EETMOS3 |
| | | P30FE6SLK | 60 | 30 | 90 | 44 | -55 to 175 | 10.9 | 13.8 | 2050 | 43 | 2.0 | 3.4 | ○ | ○ | EETMOS3 |
| | | P12FE7R5SBK | 75 | 12 | 36 | 24 | -55 to 175 | 40 | 50 | 660 | 16.6 | 2.0 | 6.2 | ○ | ○ | EETMOS3 |
| | | P30FE7R5SLK | 75 | 30 | 90 | 44 | -55 to 175 | 14.1 | 17.8 | 2020 | 45 | 2.0 | 3.4 | ○ | ○ | EETMOS3 |
| | | P8FE10SBK | 100 | 8 | 24 | 24 | -55 to 175 | 79 | 99 | 665 | 16.5 | 2.0 | 6.2 | ○ | ○ | EETMOS3 |
| | | P26FE10SLK | 100 | 26 | 78 | 44 | -55 to 175 | 24 | 30 | 1975 | 43 | 2.0 | 3.4 | ○ | ○ | EETMOS3 |
| | | P20FE12SLK | 120 | 20 | 60 | 44 | -55 to 175 | 35 | 44 | 2110 | 46 | 2.0 | 3.4 | ○ | ○ | EETMOS3 |
| | | TO-263AB - FG | H4 | P90FG5R5SL | 55 | 90 | 360 | 128 | 150 | 3.0 | 3.8 | 5130 | 106 | 2.0 | 0.97 | - |
| P94FG5R5SL | 55 | | | 94 | 376 | 156 | 150 | 2.5 | 3.2 | 7170 | 140 | 2.0 | 0.8 | - | - | EETMOS3 |
| P80FG6EAL | 60 | | | 80 | 320 | 128 | 150 | 3.6 | 4.9 | 4700 | 90 | 2.0 | 0.97 | - | - | EETMOS2 |
| P85FG6EAL | 60 | | | 85 | 340 | 156 | 150 | 3.2 | 4.3 | 5700 | 105 | 2.0 | 0.8 | - | - | EETMOS2 |
| P80FG7R5EN | 75 | | | 80 | 320 | 128 | 150 | 5.1 | 6.4 | 4100 | 67 | 3.0 | 0.97 | - | - | EETMOS2 |
| P32FG15SL | 150 | | | 32 | 96 | 100 | 150 | 32 | 40 | 3530 | 72 | 2.0 | 1.25 | - | - | EETMOS3 |
| TO-263AB-1 - FH | H3 | | | P100FH4ENK | 40 | 100 | 400 | 175 | 150 | 1.6 | 2.0 | 5500 | 100 | 3.0 | 0.71 | - |
| | | P80FH5ENK | 50 | 80 | 320 | 128 | 150 | 3.0 | 3.8 | 4000 | 70 | 3.0 | 0.97 | - | ○ | EETMOS2 |
| - SC-83 similar FP | H5 | P175FP4SNK | 40 | 175 | 700 | 178 | 175 | 1.3 | 1.6 | 5900 | 116 | 3.0 | 0.84 | ○ | ○ | EETMOS3 |
| | | P175FP4SN | 40 | 175 | 700 | 178 | 175 | 1.3 | 1.6 | 5900 | 116 | 3.0 | 0.84 | - | - | EETMOS3 |
| | | P180FP4SNK | 40 | 180 | 720 | 238 | 175 | 0.95 | 1.15 | 9220 | 160 | 3.0 | 0.63 | ■ | ○ | EETMOS3 |
| | | P180FP4SN | 40 | 180 | 720 | 238 | 175 | 0.95 | 1.15 | 9220 | 160 | 3.0 | 0.63 | - | - | EETMOS3 |
| | | P153FP6SNK | 60 | 153 | 612 | 178 | 175 | 2.4 | 3.0 | 5850 | 105 | 3.0 | 0.84 | ■ | ○ | EETMOS3 |
| | | P153FP6SN | 60 | 153 | 612 | 178 | 175 | 2.4 | 3.0 | 5850 | 105 | 3.0 | 0.84 | - | - | EETMOS3 |
| | | P180FP6SNK | 60 | 180 | 720 | 238 | 175 | 1.6 | 2.0 | 9380 | 158 | 3.0 | 0.63 | ■ | ○ | EETMOS3 |
| | | P180FP6SN | 60 | 180 | 720 | 238 | 175 | 1.6 | 2.0 | 9380 | 158 | 3.0 | 0.63 | - | - | EETMOS3 |
| | | P168FP7R5SNK | 75 | 168 | 672 | 238 | -55 to 175 | 2.2 | 2.8 | 9600 | 155 | 3.0 | 0.63 | ■ | ○ | EETMOS3 |
| | | P168FP7R5SN | 75 | 168 | 672 | 238 | 175 | 2.2 | 2.8 | 9600 | 155 | 3.0 | 0.63 | - | - | EETMOS3 |
| | | P88FP10SNK | 100 | 88 | 352 | 178 | -55 to 175 | 6.1 | 7.6 | 6100 | 108 | 3.0 | 0.84 | ■ | ○ | EETMOS3 |
| | | P88FP10SN | 100 | 88 | 352 | 178 | 175 | 6.1 | 7.6 | 6100 | 108 | 3.0 | 0.84 | - | - | EETMOS3 |
| | | P126FP10SNK | 100 | 126 | 504 | 238 | 175 | 3.8 | 4.8 | 9500 | 160 | 3.0 | 0.63 | ■ | ○ | EETMOS3 |
| | | P126FP10SN | 100 | 126 | 504 | 238 | 175 | 3.8 | 4.8 | 9500 | 160 | 3.0 | 0.63 | - | - | EETMOS3 |
| | | P70FP12SNK | 120 | 70 | 280 | 178 | -55 to 175 | 8.9 | 11.1 | 6100 | 109 | 3.0 | 0.84 | ■ | ○ | EETMOS3 |
| | | P70FP12SN | 120 | 70 | 280 | 178 | 175 | 8.9 | 11.1 | 6100 | 109 | 3.0 | 0.84 | - | - | EETMOS3 |
| | | P100FP12SNK | 120 | 100 | 400 | 238 | 175 | 5.6 | 7.0 | 9600 | 164 | 3.0 | 0.63 | ■ | ○ | EETMOS3 |
| | | P100FP12SN | 120 | 100 | 400 | 238 | 175 | 5.6 | 7.0 | 9600 | 164 | 3.0 | 0.63 | - | - | EETMOS3 |
| | | TO-263SC - FZ-7p | H7 | P211FZ4QMK | 40 | 211 | 752 | 178 | 175 | 1.10 | 1.38 | 8550 | 145 | 4.0 | 0.84 | - |
| P240FZ4QLA | 40 | | | 240 | 720 | 178 | -55 to 175 | 1.03 | 1.29 | 9675 | 171 | 2.0 | 0.84 | - | - | EETMOS4 |
| P240FZ4QNK | 40 | | | 240 | 720 | 178 | -55 to 175 | 1.07 | 1.34 | 7915 | 133 | 3.0 | 0.84 | ○ | ○ | EETMOS4 |
| | | | | | | | | | | | | | | | | |

N : New product ■ : Please contact us.

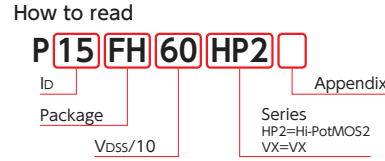
THD (Through Hole Device)

| THD (Through Hole Device) | | | | | | | | | | | | | | | | |
|--|------|-------------|--------------------------|-----------|------------|-----------|-------------|----------------------------|-----------------------------------|--------------|------------|------------|----------------------|------------|--------|--------------------|
| Package | | | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | | Based on AEC-Q101 | Automotive | Series | |
| JEDEC Code JEITA Code House Name | Fig. | Type No. | Vdss [V] | Id [A] | IDP [A] | PT [W] | Tch [°C] | Rds(on) [mΩ] Vgs=10V | Rds(on) [mΩ] max Vgs=10V | Ciss [pF] | Qg [nC] | Vth [V] | | | | Rth(j-c) [°C/W] |
| - SC-91 FTO-220AG | J8-2 | P70F5EN | 50 | 70 | 280 | 53 | 150 | 2.7 | 3.2 | 5500 | 100 | 3.0 | 2.35 | - | - | EETMOS2 |
| | | P34F6EL | 60 | 34 | 136 | 35 | -55 to 150 | 9.0 | 11.0 | 1960 | 41 | 2.0 | 3.55 | - | - | EETMOS2 |
| | | P42F6EN | 60 | 42 | 168 | 40 | 150 | 6.7 | 8.4 | 2540 | 47 | 3.0 | 3.12 | - | - | EETMOS2 |
| | | P55F6EN | 60 | 55 | 220 | 44 | 150 | 4.4 | 5.5 | 4100 | 73 | 3.0 | 2.84 | - | - | EETMOS2 |
| | | P86F6SN | 60 | 86 | 344 | 58 | 150 | 2.4 | 3.0 | 9380 | 181 | 3.0 | 2.15 | - | - | EETMOS3 |
| | | P66F7R5SNK | 75 | 66 | 264 | 51 | -55 to 150 | 4.0 | 5.0 | 6070 | 115 | 3.0 | 2.45 | - | ○ | EETMOS3 |
| | | P66F7R5SN | 75 | 66 | 264 | 51 | 150 | 4.0 | 5.0 | 6070 | 115 | 3.0 | 2.45 | - | - | EETMOS3 |
| | | P70F7R5EN | 75 | 70 | 280 | 53 | 150 | 3.8 | 4.8 | 5720 | 105 | 3.0 | 2.35 | - | - | EETMOS2 |
| | | P82F7R5SN | 75 | 82 | 328 | 58 | -55 to 150 | 3.0 | 3.8 | 9600 | 168 | 3.0 | 2.15 | - | - | EETMOS3 |
| | | P22F10SN | 100 | 22 | 66 | 35 | 150 | 22 | 28 | 1700 | 34 | 3.0 | 3.55 | - | - | EETMOS3 |
| | | P40F10SN | 100 | 40 | 160 | 44 | 150 | 8.5 | 10.7 | 4500 | 92 | 3.0 | 2.84 | - | - | EETMOS3 |
| | | P50F10SN | 100 | 50 | 200 | 51 | 150 | 6.9 | 8.7 | 5880 | 114 | 3.0 | 2.45 | - | - | EETMOS3 |
| | | P32F12SN | 120 | 32 | 128 | 44 | 150 | 12.4 | 15.5 | 4540 | 92 | 3.0 | 2.84 | - | - | EETMOS3 |
| P40F12SN | 120 | 40 | 160 | 51 | 150 | 9.5 | 11.9 | 6000 | 117 | 3.0 | 2.45 | - | - | EETMOS3 | | |
| TO-220AB SC-46 FA | J5 | P100FA7R5EN | 75 | 100 | 400 | 140 | 150 | 4.2 | 5.0 | 5720 | 104 | | | | | |

POWER MOSFETS

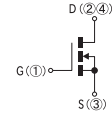
The Hi-PotMOS series are MOSFETs with a high breakdown strength, and they are 100% screened using di/dt & avalanche testing.

| Series | Feature |
|------------------|---|
| HP2 (Hi-PotMOS2) | High breakdown resistance, Avalanche rated, di/dt inspection(all parts) |
| VX | Automotive qualified, Avalanche rated, di/dt inspection(all parts), High Breakdown resistance |



HP2 • VX Series (Nch Single)

| Surface Mount | | | | | | | | | | |
|----------------------------|----------------------------------|----------|--------|----------------------|------------|----------|-------------|------------|-------------|-------------|
| Package | JEDEC Code JEITA Code House Name | Fig. | Id [A] | Vdss [V] | | | | | Remarks | |
| | | | | 250/280/300 | 400 | 500/525 | 600 | 900 | | |
| 10.0 × 6.6 × 2.3(mm) | TO-252AA FB | G2-1 | 0.5 | | | | P0R5B60HP2 | | | |
| | | | 1 | | | P1B52HP2 | | | | |
| | | | 1.5 | | P1R5B40HP2 | | | | | |
| | | | 2 | | | | P2B60HP2F | | | |
| | | | 2.5 | | | | P2R5B52HP2F | | | |
| | | | 3 | P3B28HP2 | | | | | | |
| | | | 4 | | P4B40HP2 | | | P4B60HP2F | | |
| | | | 5 | | | | P5B52HP2 | | | |
| | | | 6 | P6B28HP2 | P6B40HP2 | | P6B52HP2 | | | |
| | | | 8 | P8B28HP2 P8B30HP2 | | | | | | |
| 9 | N P9B30HP2F | P9B40HP2 | | | | | | | | |
| 10 | P10B28HP2 | | | | | | | | | |
| 9.5 × 6.6 × 2.65(mm) | TO-252AB similar SC-63 FE | G3-2 | 1 | | | | | P1FE90VX3 | | |
| | | | 2 | | | | P2FE60VX5K | | | |
| | | | 6 | P6FE25VX5K | | | | | | |
| | | | | | | | | | | |
| 15.25 × 10.2 × 4.6(mm) | TO-263AB-1 FH | H3 | 3 | | | | | | ★ P3FH90VX3 | |
| | | | 5 | | | | | | | ★ P5FH90VX3 |
| | | | 7 | | | | | P7FH60HP2 | | |
| | | | 15 | | | | | P15FH60HP2 | | |
| | | | 20 | | | | | P20FH50HP2 | | |
| | | | 36 | P36FH28HP2 | | | | | | |



N : New product ★ : Under development

THD (Through Hole Device)

| THD (Through Hole Device) | | | | | | | | | | |
|---------------------------|----------------------------------|------|--------|------------|-------------|-----------|------------|-----------|------------|------------|
| Package | JEDEC Code JEITA Code House Name | Fig. | Id [A] | Vdss [V] | | | | | Remarks | |
| | | | | 280 | 400 | 500 | 600 | 900 | | |
| 28.5 × 10.0 × 4.5(mm) | SC-91 FTO-220AG | J8-2 | 3 | | | | P3F60HP2 | | | |
| | | | 4 | | | | P4F60HP2 | | ★ P4F90VX3 | |
| | | | 5 | | | P5F50HP2 | | P5F60HP2 | | |
| | | | 6 | | | P5F50HP2F | | P5F60HP2 | | |
| | | | 7 | | | | | P7F60HP2 | | ★ P7F90VX3 |
| | | | 8 | P8F28HP2 | | | P8F50HP2 | | | |
| | | | 10 | | | | P10F50HP2 | P10F60HP2 | | |
| | | | 12 | | | | | P12F60HP2 | | |
| | | | 13 | P13F28HP2 | | | P13F50HP2 | | | |
| | | | 15 | | | | P15F50HP2 | P15F60HP2 | P15F60HP2F | |
| | | | 17 | P17F28HP2 | | | | | | |
| | | | 20 | | | | P20F50HP2 | | | |
| | | | 21 | P21F28HP2 | | | | | | |
| | | | 26 | P26F28HP2 | | | | | | |
| | | | 36 | P36F28HP2 | | | | | | |
| 28.5 × 10.0 × 4.5(mm) | SC-91 FTO-220A | J7-2 | 23 | | P23F40HP2FM | | | | | |
| | | | | | | | | | | |
| 41.0 × 16.0 × 5.0(mm) | TO-247AD MTO-3P | K4-2 | 85 | P85W28HP2F | | | | | | |
| | | | | | | | | | | |
| 41.0 × 16.0 × 5.0(mm) | TO-247AD MTO-3PV | K7-4 | 30 | | | | P30W60HP2V | | | |
| | | | | | | | | | | |

★ : Under development

HP2 • VX Series (Nch Single)

| Surface Mount | | | | | | | | | | | | | | | | | |
|----------------------------------|---------|---------------------------|----------|--------------------------|--------|------------|----------|----------------------------|---------------------------|-----------------|---------------|---------------|---------------------------|-------------------|------------|--------|-----------------------|
| JEDEC Code JEITA Code House Name | Package | Fig. | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | | | Body Diode trr (typ) [ns] | Based on AEC-Q101 | Automotive | Series | |
| | | | | Vdss [V] | Id [A] | Pr [W] | Tch [°C] | Rds(ON) (typ) [Ω] Vgs=10V | Rds(ON) (max) [Ω] Vgs=10V | Ciss (typ) [pF] | Qg (typ) [nC] | Vth (typ) [V] | | | | | Rth(j-c) (max) [°C/W] |
| TO-252AA FB | G2-1 | P3B28HP2 | 280 | 3 | 35 | 150 | 1.7 | 2.0 | 120 | 3.6 | 3.75 | 3.55 | - | - | - | HP2 | |
| | | P6B28HP2 | 280 | 6 | 35 | 150 | 0.66 | 0.85 | 240 | 5.7 | 3.75 | 3.55 | - | - | - | HP2 | |
| | | P8B28HP2 | 280 | 8 | 54 | 150 | 0.38 | 0.50 | 400 | 9.8 | 3.75 | 2.31 | - | - | - | HP2 | |
| | | P8B30HP2 | 300 | 8 | 54 | 150 | 0.42 | 0.50 | 400 | 9.8 | 3.75 | 2.31 | - | - | - | HP2 | |
| | | N P9B30HP2F | 300 | 9 | 54 | -55 to 150 | 0.44 | 0.55 | 402 | 14.0 | 4.5 *1 | 2.31 | 72 | - | - | - | HP2 |
| | | P10B28HP2 | 280 | 10 | 70 | 150 | 0.30 | 0.40 | 500 | 11.4 | 3.75 | 1.78 | - | - | - | - | HP2 |
| | | P1R5B40HP2 | 400 | 1.5 | 35 | 150 | 4.2 | 5.0 | 120 | 3.9 | 3.75 | 3.55 | - | - | - | - | HP2 |
| | | P4B40HP2 | 400 | 4 | 35 | 150 | 1.54 | 1.90 | 245 | 6.5 | 3.75 | 3.55 | - | - | - | - | HP2 |
| | | P6B40HP2 | 400 | 6 | 54 | 150 | 0.84 | 1.05 | 400 | 10 | 3.75 | 2.31 | - | - | - | - | HP2 |
| | | P9B40HP2 | 400 | 9 | 40 | 150 | 0.65 | 0.80 | 575 | 14.5 | 3.75 | 3.12 | - | - | - | - | HP2 |
| | | P1B52HP2 | 525 | 1 | 35 | 150 | 6.0 | 7.2 | 125 | 4.3 | 3.75 | 3.55 | - | - | - | - | HP2 |
| | | P2R5B52HP2F | 525 | 2.5 | 35 | 150 | 2.5 | 3.2 | 240 | 6.7 | 3.25 | 3.55 | 52 | - | - | - | HP2 |
| | | P5B52HP2 | 525 | 5 | 54 | 150 | 1.4 | 1.7 | 400 | 10.5 | 3.75 | 2.31 | - | - | - | - | HP2 |
| | | P6B52HP2 | 525 | 6 | 70 | 150 | 1.10 | 1.35 | 520 | 15 | 3.75 | 1.78 | - | - | - | - | HP2 |
| | | P0R5B60HP2 | 600 | 0.5 | 35 | 150 | 8.3 | 10.0 | 120 | 4.3 | 3.75 | 3.55 | - | - | - | - | HP2 |
| | | P2B60HP2F | 600 | 2 | 35 | 150 | 3.4 | 4.2 | 240 | 6.8 | 3.25 | 3.55 | 52 | - | - | - | HP2 |
| | | P4B60HP2F | 600 | 4 | 70 | 150 | 1.6 | 1.9 | 520 | 13 | 3.25 | 1.78 | 75 | - | - | - | HP2 |
| | | TO-252AB similar SC-63 FE | G3-2 | P1FE90VX3 | 900 | 1 | 36 | -55 to 150 | 9.5 | 14.0 | 193 | 10.8 | 3.5 | 3.4 | - | ○ | ○ |
| P6FE25VX5K | 250 | | | 6 | 27 | 150 | 0.58 | 0.70 | 250 | 10 | 3.75 | 4.62 | - | - | ○ | VX | |
| P2FE60VX5K | 600 | | | 2 | 27 | 150 | 3.4 | 4.2 | 247 | 12 | 3.75 | 4.62 | - | - | ○ | VX | |
| TO-263AB-1 FH | H3 | P36FH28HP2 | 280 | 36 | 175 | 150 | 0.08 | 0.12 | 1730 | 35 | 3.75 | 0.71 | - | - | - | HP2 | |
| | | P20FH50HP2 | 500 | 20 | 175 | 150 | 0.29 | 0.36 | 1735 | 40 | 3.75 | 0.71 | - | - | - | HP2 | |
| | | ★ P3FH90VX3 | 900 | 3 | 128 | -55 to 150 | 2.8 | 3.4 | 600 | 22 | 4.0 *1 | 0.97 | - | ■ | ○ | VX | |
| | | ★ P5FH90VX3 | 900 | 5 | 175 | -55 to 150 | 1.2 | 1.5 | 1380 | 41 | 4.0 *1 | 0.71 | - | ■ | ○ | VX | |
| | | P7FH60HP2 | 600 | 7 | 128 | 150 | 0.88 | 1.05 | 810 | 19 | 3.75 | 0.97 | - | - | - | - | HP2 |
| | | P15FH60HP2 | 600 | 15 | 175 | 150 | 0.41 | 0.49 | 1750 | 37 | 3.75 | 0.71 | - | - | - | - | HP2 |
| | | | | | | | | | | | | | | | | | |

N : New product ★ : Under development *1 : max. ■ : Please contact us.

THD (Through Hole Device)

| THD (Through Hole Device) | | | | | | | | | | | | | | | | | | | |
|----------------------------------|---------|--------------------------------|----------|--------------------------|------------|------------|----------|----------------------------|---------------------------|-----------------|---------------|---------------|---------------------------|-------------------|------------|--------|-----------------------|-----|-----|
| JEDEC Code JEITA Code House Name | Package | Fig. | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | | | Body Diode trr (typ) [ns] | Based on AEC-Q101 | Automotive | Series | | | |
| | | | | Vdss [V] | Id [A] | Pr [W] | Tch [°C] | Rds(ON) (typ) [Ω] Vgs=10V | Rds(ON) (max) [Ω] Vgs=10V | Ciss (typ) [pF] | Qg (typ) [nC] | Vth (typ) [V] | | | | | Rth(j-c) (max) [°C/W] | | |
| SC-91 FTO-220AG | J8-2 | P8F28HP2 | 280 | 8 | 52.5 | -55 to 150 | 0.38 | 0.5 | 400 | 9.8 | 3.75 | 2.38 | - | - | - | HP2 | | | |
| | | P13F28HP2 | 280 | 13 | 65 | 150 | 0.23 | 0.3 | 630 | 15 | 3.75 | 1.92 | - | - | - | HP2 | | | |
| | | P17F28HP2 | 280 | 17 | 79 | 150 | 0.17 | 0.23 | 830 | 19.5 | 3.75 | 1.58 | - | - | - | HP2 | | | |
| | | P21F28HP2 | 280 | 21 | 85 | 150 | 0.13 | 0.18 | 1000 | 20.5 | 3.75 | 1.47 | - | - | - | HP2 | | | |
| | | P26F28HP2 | 280 | 26 | 90 | 150 | 0.11 | 0.15 | 1200 | 24.5 | 3.75 | 1.39 | - | - | - | HP2 | | | |
| | | P36F28HP2 | 280 | 36 | 95 | 150 | 0.08 | 0.12 | 1730 | 35 | 3.75 | 1.32 | - | - | - | HP2 | | | |
| | | P5F50HP2 | 500 | 5 | 52.5 | 150 | 1.3 | 1.6 | 400 | 10.5 | 3.75 | 2.38 | - | - | - | HP2 | | | |
| | | P5F50HP2F | 500 | 5 | 52.5 | 150 | 1.38 | 1.65 | 405 | 10.5 | 3.25 | 2.38 | 70 | - | - | - | HP2 | | |
| | | P6F50HP2 | 500 | 6 | 62.5 | 150 | 1.00 | 1.25 | 500 | 12.5 | 3.75 | 2.00 | - | - | - | - | HP2 | | |
| | | P8F50HP2 | 500 | 8 | 65 | 150 | 0.8 | 1.0 | 610 | 15 | 3.75 | 1.92 | - | - | - | - | HP2 | | |
| | | P10F50HP2 | 500 | 10 | 79 | -55 to 150 | 0.60 | 0.75 | 820 | 20 | 3.75 | 1.58 | - | - | - | - | HP2 | | |
| | | P13F50HP2 | 500 | 13 | 85 | 150 | 0.48 | 0.60 | 1050 | 25 | 3.75 | 1.47 | - | - | - | - | HP2 | | |
| | | P15F50HP2 | 500 | 15 | 90 | 150 | 0.4 | 0.5 | 1340 | 27 | 3.75 | 1.39 | - | - | - | - | HP2 | | |
| | | P20F50HP2 | 500 | 20 | 95 | 150 | 0.29 | 0.36 | 1735 | 40 | 3.75 | 1.32 | - | - | - | - | HP2 | | |
| | | P3F60HP2 | 600 | 3 | 52.5 | 150 | 1.92 | 2.30 | 400 | 10 | 3.75 | 2.38 | - | - | - | - | HP2 | | |
| | | P4F60HP2 | 600 | 4 | 62.5 | 150 | 1.5 | 1.8 | 505 | 12.5 | 3.75 | 2.00 | - | - | - | - | HP2 | | |
| | | P5F60HP2 | 600 | 5 | 65 | 150 | 1.17 | 1.40 | 615 | 15 | 3.75 | 1.92 | - | - | - | - | HP2 | | |
| | | P7F60HP2 | 600 | 7 | 79 | 150 | 0.88 | 1.05 | 810 | 19 | 3.75 | 1.58 | - | - | - | - | HP2 | | |
| | | P10F60HP2 | 600 | 10 | 85 | 150 | 0.67 | 0.80 | 1040 | 23 | 3.75 | 1.47 | - | - | - | - | HP2 | | |
| | | P12F60HP2 | 600 | 12 | 90 | 150 | 0.56 | 0.67 | 1230 | 26.5 | 3.75 | 1.39 | - | - | - | - | HP2 | | |
| | | P15F60HP2 | 600 | 15 | 95 | -55 to 150 | 0.41 | 0.49 | 1750 | 37 | 3.75 | 1.32 | - | - | - | - | HP2 | | |
| | | P15F60HP2F | 600 | 15 | 95 | -55 to 150 | 0.44 | 0.53 | 1720 | 34 | 3.25 | 1.32 | 88 | - | - | - | HP2 | | |
| | | ★ P4F90VX3 | 900 | 4 | 79 | 150 | 2.8 | 3.6 | 595 | 21 | 4.0 *1 | 1.58 | - | - | - | - | VX | | |
| | | ★ P7F90VX3 | 900 | 7 | 95 | 150 | 1.2 | 1.7 | 1375 | 42 | 4.0 *1 | 1.32 | - | - | - | - | VX | | |
| | | SC-91 FTO-220A TO-247AD MTO-3P | J7-2 | P23F40HP2FM | 400 | 23 | 104 | 150 | 0.17 | 0.24 | 1620 | 40 | 3.25 | 1.2 | 68 | - | - | HP2 | |
| | | | | K4-2 | P85W28HP2F | 280 | 85 | 310 | -55 to 150 | 0.035 | 0.045 | 4440 | 90 | 3.45 | 0.4 | 76 | - | - | HP2 |
| | | | | | K7-4 | P30W60HP2V | 600 | 30 | 310 | -55 to 150 | 0.185 | 0.23 | 3935 | 70 | 3.75 | 0.4 | - | - | - |

★ : Under development *1 : max.

POWER MODULES

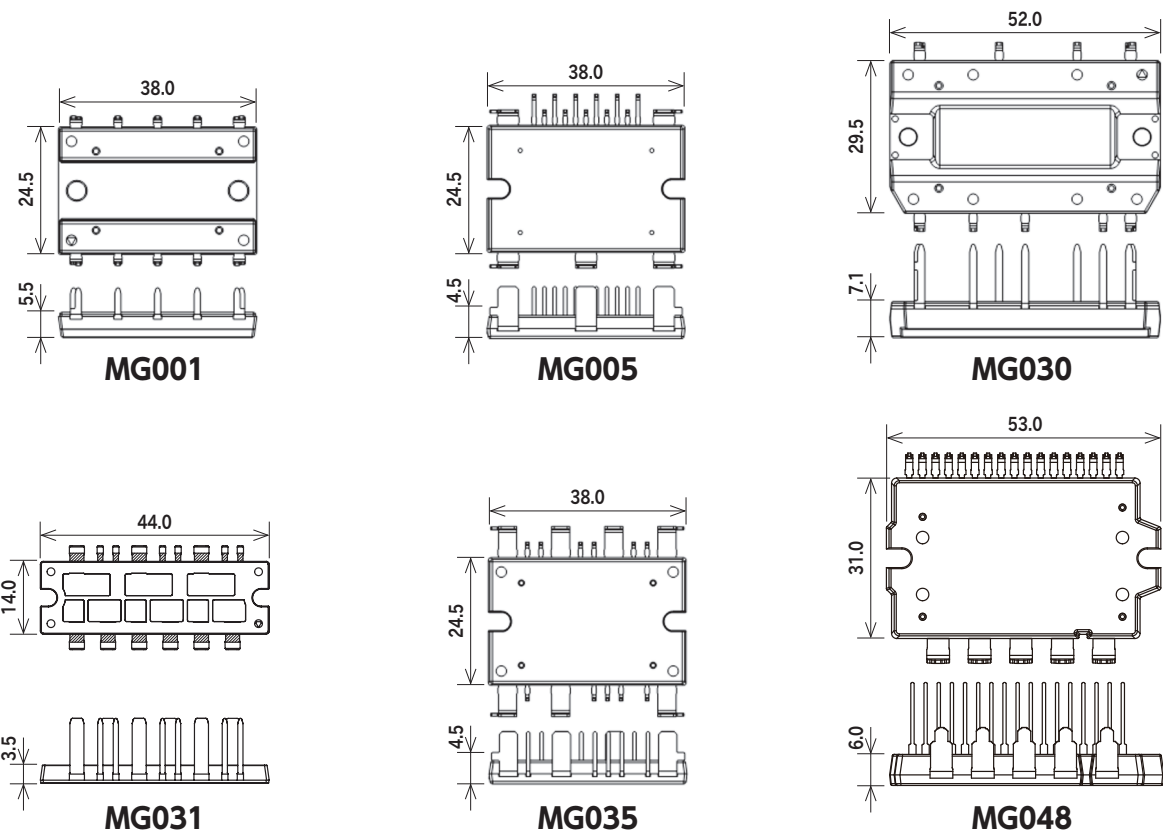
Power Modules include combinations of various power semiconductors.

They are easy to design, reduce the number of components needed in the device, are suitable for device downsizing, and mitigate heat-dissipation concerns.

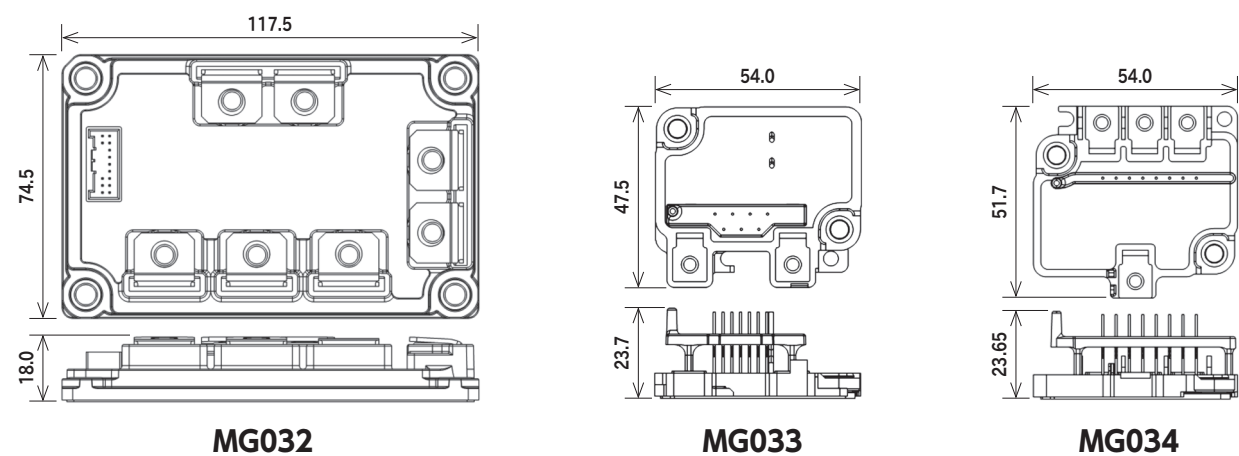
At Shindengen, a multitude of packages allow us to meet customer needs of MOSFET, diodes, and other products.

Semi customizable support and customizable package design support are available.

Transfer Type Package Sample



Potting Type Package Sample



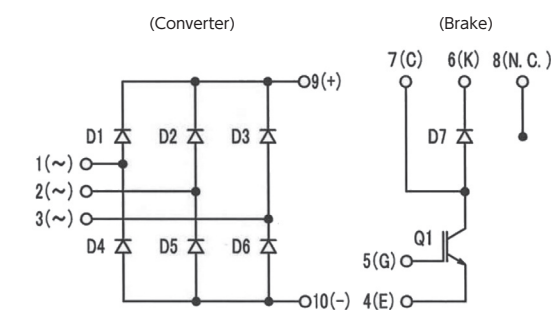
CB Module Series

Converter + Brake Modules

| Type No. | Package | | Converter Diode | | | | Brake IGBT | | | | Brake FRD | | | | UL | Automotive | | | | |
|----------|------------|------------|--------------------------|------|--------------------------|---------|--------------------------|----------|--------------------------|------|--------------------------|-----------------|--------------------------|------|-----|------------|---------|---------------|----------|---------------|
| | | | Absolute Maximum Ratings | | Electric Characteristics | | Absolute Maximum Ratings | | Electric Characteristics | | Absolute Maximum Ratings | | Electric Characteristics | | | | | | | |
| | JEDEC Code | JEITA Code | House Name | Fig. | VRRM | IF (AV) | Conditions Tc | Vf (max) | Conditions IF | VCEs | Ic | VCE (sat) (typ) | Conditions Ic | VRRM | | | IF (AV) | Conditions Tc | Vf (max) | Conditions IF |
| MG020200 | - | - | F4 | 600 | 20.0 | 137 | 1.05 | 7.0 | 600 | 28.0 | 2.10 | 15.0 | 600 | 3.0 | 137 | 1.65 | 3.0 | 50 | UL | - |
| MG020201 | MG001 | - | F4 | 600 | 30.0 | 136 | 1.05 | 10.0 | 600 | 30.0 | 2.00 | 30.0 | 600 | 3.0 | 137 | 1.65 | 3.0 | 50 | UL | - |

UL : UL recognize(UL File No.E142422)

Equivalent Circuit Schematic



MG001

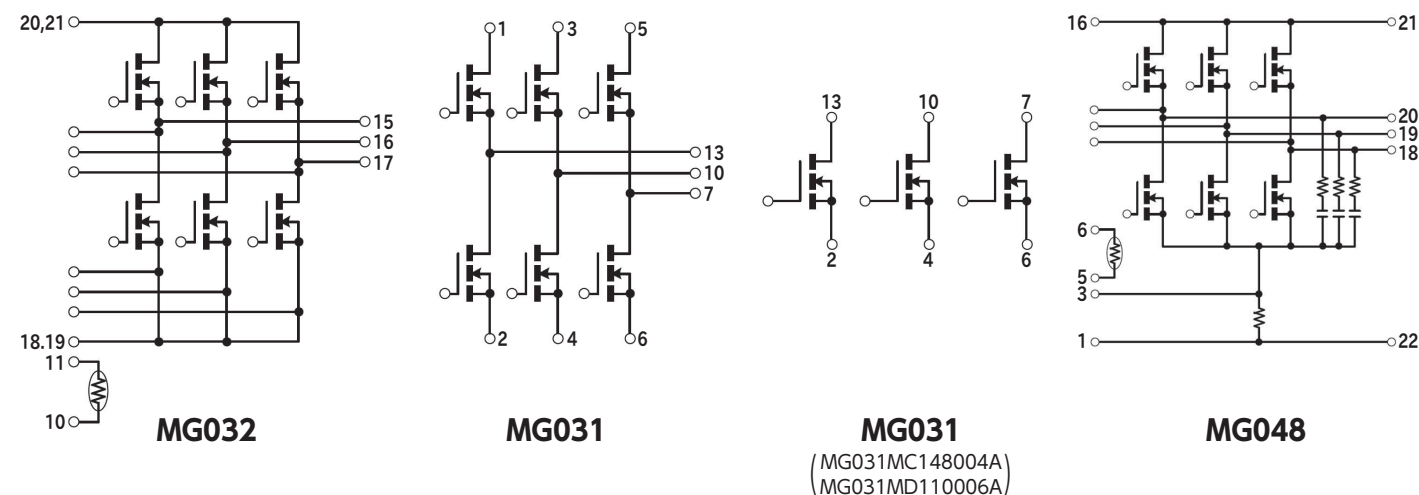
INV Module Series

Inverter Modules

| Type No. | Package | | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | | | UL | Automotive |
|----------------|---------|----|--------------------------|-----|-----|-----|-----|----------------------------|---------------|------------|----------|-----------|----------------|----|------------|
| | | | Vbss | Id | IdP | Pt | Tch | Rds(ON) (typ) | Rds(ON) (max) | Ciss (typ) | Qg (typ) | Vth (typ) | Rth(j-c) (max) | | |
| MG032A4207R5A | - | - | 75 | 420 | 840 | 500 | 150 | - | 0.98 | 80120 | 505 | 3.0 | 0.25 | - | ○ |
| MG032B420010A | MG032 | F6 | 100 | 420 | 840 | 500 | 150 | 0.99 | 1.37 | 91800 | 500 | 3.0 | 0.25 | - | ○ |
| MG031B090004A | - | - | 40 | 90 | 360 | 125 | 175 | 2.34 | 3.20 | 4180 | 76 | 2.0 | 1.2 | - | ○ |
| MG031E120004A | - | - | 40 | 120 | 480 | 125 | 175 | 2.44 | 3.10 | 3540 | 68 | 3.0 | 1.2 | - | ■ |
| MG031G148004A | - | - | 40 | 148 | 592 | 154 | 175 | 1.75 | 2.20 | 5330 | 96 | 3.0 | 0.97 | - | ○ |
| MG031L080006A | MG031 | F5 | 60 | 80 | 320 | 125 | 175 | 4.47 | 5.60 | 3570 | 65 | 3.0 | 1.2 | - | ■ |
| MG031N110006A | MG031 | F5 | 60 | 110 | 440 | 154 | 175 | 3.0 | 3.8 | 5630 | 94 | 3.0 | 0.97 | - | ■ |
| MG031MC148004A | - | - | 40 | 148 | 592 | 154 | 175 | 1.75 | 2.20 | 5330 | 96 | 3.0 | 0.97 | - | ■ |
| MG031MD110006A | - | - | 60 | 110 | 440 | 154 | 175 | 3.1 | 3.9 | 5630 | 94 | 3.0 | 0.97 | - | ■ |
| MG048A150004A | MG048 | F8 | 40 | 150 | 600 | 147 | 150 | 2.1 | 2.7 | 5900 | 111 | 3.0 | 0.85 | - | ■ |
| MG048B100006A | MG048 | F8 | 60 | 100 | 400 | 147 | 150 | 2.82 | 3.92 | 8186 | 136 | 3.0 | 0.85 | - | ■ |

■ : New product ★ : Under development ■ : Please contact us.

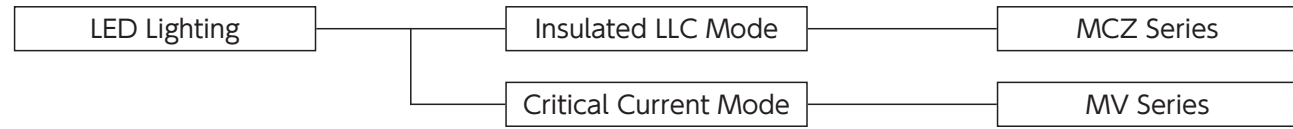
Equivalent Circuit Schematic



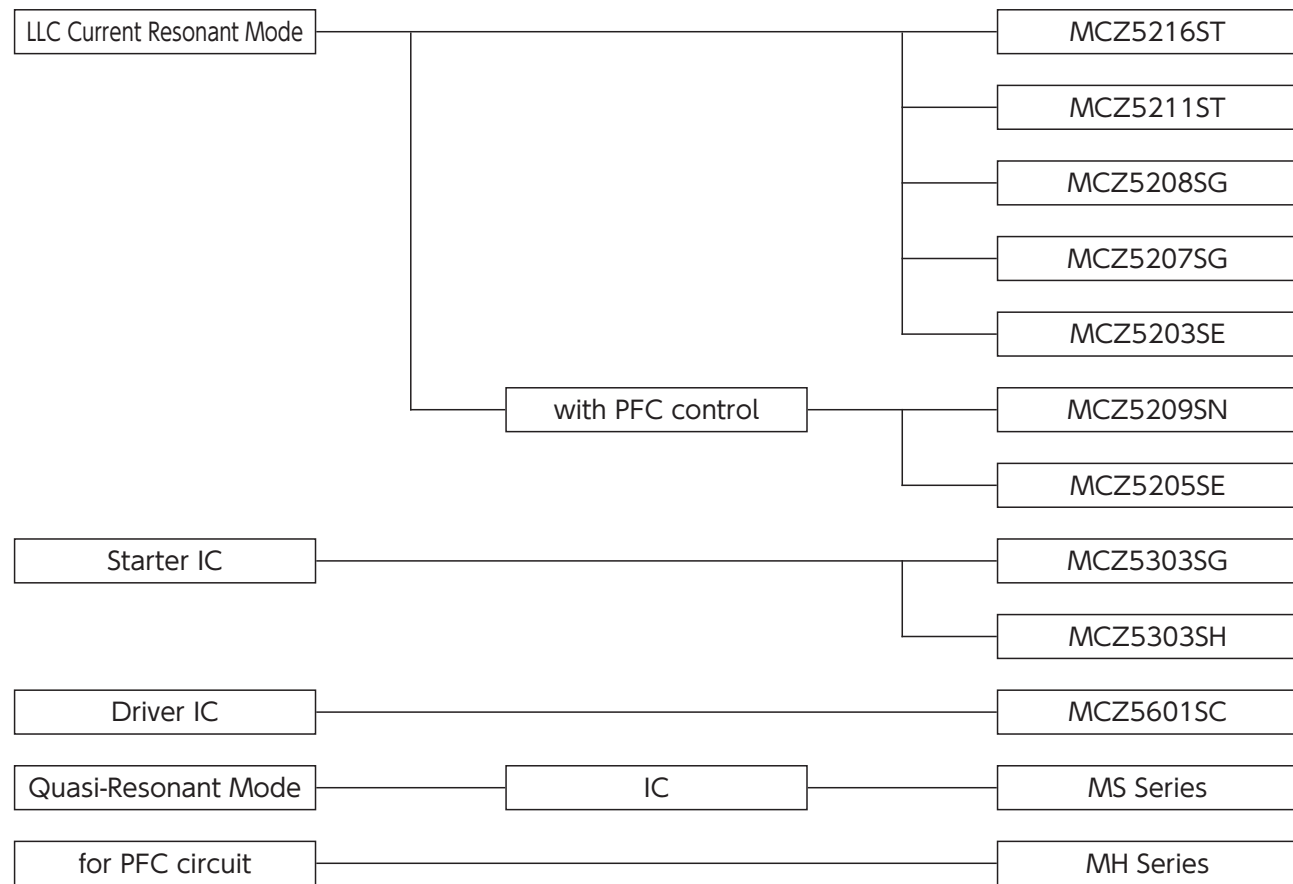
POWER ICs

Line up

IC for LED Lighting



IC for Power Supply





IC for LED Lighting

Critical Current Mode Power Supply ICs for LED Lighting : MV Series

- Outline** The MV series has a specialized function for LED lighting with PWM & Linear dimming that operates Critical Current Mode without auxiliary winding. On and off width modulation function allows for smooth deep dimming of 1% or less.

MV Series

| Critical Current Mode Power Supply ICs for LED Lighting | | | | | | | | | | |
|--|------|----------|------------|----------|--------|----------------------|--------------------------------|----------------|-------------|------------|
| Package | | Type No. | HV Startup | Vcc [V] | Output | ON/OFF | Built-in Regulator Voltage [V] | Linear Dimming | PWM Dimming | Automotive |
| JEDEC Code JEITA Code House Name | Fig. | | | | | | | | | |
|  - - SOP8J | L2 | MV1001SC | Yes | 9 to 16 | 1ch | - | - | Yes | Yes | - |
| | | MV1002SC | No | | | | | | | - |
| | | MV1011SC | Yes | | | | | | | - |
| | | MV1012SC | No | | | | | | | - |
|  - - SOP16 | L5 | MV2002SG | No | 10 to 16 | 2ch | Cont. by REF Voltage | 3.3 | Yes | Yes | - |
| | | MV2052SG | No | | | | | | | 5 |

POWER ICs

IC for Power Supply

LLC Current Resonant Mode Controller ICs for Bridge Converter : MCZ Series

- Outline** The MCZ series is an advanced symmetric LLC current resonant mode controller for bridge converters. Symmetric LLC resonant converter applications are greatly expanding due to their extremely high efficiency and low noise characteristics.

Starter ICs with Built-in Burst Function : MCZ5303

- Outline** A dedicated IC that provides a low power consumption start-up for circuits without an IC. Low power consumption standby is possible due to the ON/OFF Control IC with burst function. It is especially effective when used in conjunction with the LLC current resonance power supply.

High/Low Side Driving IC

- Outline** A driving IC for MOSFET and IGBT power devices. With built-in high-withstand voltage components, it can be used for a variety of uses such as inverter and power supply, etc.






Low Power Standby Quasi-Resonant Power Supply ICs : MS Series

- Outline** The MS series consumes much less power in standby mode than conventional MR series. The ICs incorporate various functions to make it more user-friendly and easier to design a power supply with fewer external components.

PFC ICs : MH Series



- Outline** The MH series is a PFC circuit control IC which enables multistage interleave. An efficient, high power operation is possible by utilizing a slave IC composed of multistage interleave and a master IC that can be used alone.

MCZ Series


| LLC Current Resonant Mode Controller ICs for Bridge Converter | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|------------|------|-----------|--|------------|-----------------|---------------|-------------|------------|-------------------------|------------------|----------------------------|-------------------------|-------------------------|------------|------------|-----|-----|-------|-------------|-----|-----|-----|-----|-------|-------------|-----|-------|-------------|-----|-------|-------------|---|
| Package | | Fig. | Type No. | Type | HV Startup | High-side Drive | Vcc (max) [V] | Vin Sensing | Burst Mode | Maximum Frequency [kHz] | X-cap. discharge | Capacitive Mode Protection | Over Voltage Protection | Over Current Protection | Automotive | | | | | | | | | | | | | | | | | | |
| JEDEC Code | JEITA Code | | | | | | | | | | | | | | | House Name | | | | | | | | | | | | | | | | | |
|  | - | L6 | MCZ5216ST | LLC Current Resonant Mode | Yes | Yes | 35 | Yes | Yes | 500 | Yes | Yes | Latch | Timer Latch | - | | | | | | | | | | | | | | | | | | |
| | SOP18 | | MCZ5211ST | LLC Current Resonant Mode | Yes | | | | Yes | 500 | No | | | | - | | | | | | | | | | | | | | | | | | |
|  | - | L8 | MCZ5209SN | LLC Current Resonant Mode with PFC Control | Yes | | | | Yes | 35 | Yes | | | | Yes | 300 | No | Yes | Latch | Timer Latch | - | | | | | | | | | | | | |
| | SOP24 | | MCZ5207SG | LLC Current Resonant Mode | No | | | | | | | | | | Yes | 300 | No | | | | - | | | | | | | | | | | | |
|  | - | L5 | MCZ5208SG | LLC Current Resonant Mode | No | | | | | | | | | | Yes | 35 | Yes | | | | Yes | 500 | No | Yes | Latch | Timer Latch | - | | | | | | |
| | SOP16 | | MCZ5205SE | LLC Current Resonant Mode with PFC Control | No | | | | | | | | | | | | | | | | No | 300 | No | | | | - | | | | | | |
|  | - | L7 | MCZ5205SE | LLC Current Resonant Mode with PFC Control | No | | | | | | | | | | | | | | | | Yes | 35 | Yes | | | | No | 300 | No | Yes | Latch | Timer Latch | - |
| | SOP22 | | MCZ5203SE | LLC Current Resonant Mode | No | | | | | | | | | | | | | | | | | | | | | | No | 300 | No | | | | - |
|  | - | L7 | MCZ5203SE | LLC Current Resonant Mode | No | Yes | 35 | Yes | | | | No | 300 | No | | | | | | | | | | | | | Yes | Latch | Timer Latch | | | | - |
| | SOP22 | | MCZ5203SE | LLC Current Resonant Mode | No | | | | | | | No | 300 | No | | | | | | | | | | | | | | | | | | | - |


 : New product

Starter ICs with Built-in Burst Function

| Package | | Fig. | Type No. | Vin Applied Voltage [V] | Vcc Output Voltage [V] | HV Startup | Vin Sensing | Burst Mode | Automotive |
|---|------------|------|-----------|-------------------------|------------------------|------------|-------------|------------|------------|
| JEDEC Code | JEITA Code | | | | | | | | |
|  | - | L5 | MCZ5303SG | 95 to 450 | 18.5(typ) | Yes | Yes | Yes | - |
| | SOP16 | | MCZ5303SH | | | | No | No | - |
|  | - | L3 | MCZ5303SH | 95 to 450 | 18.5(typ) | Yes | No | No | - |
| | SOP8/7J | | MCZ5303SH | | | | No | No | - |



High/Low Side Driver ICs

| Package | | Fig. | Type No. | Output | High-side Floating Supply Voltage [V] | Vcc (max) [V] | Input/Output Channel | Vcc_UVLO [V] | VBS_UVLO [V] | Typ. Output Current | | Automotive |
|--|------------|------|-----------|--------------------|---------------------------------------|---------------|----------------------|--------------|--------------|---------------------|-------------|------------|
| JEDEC Code | JEITA Code | | | | | | | | | House Name | Source [mA] | |
|  | - | L2 | MCZ5601SC | High-side/Low-side | 600 | 22 | 2/2 | 8.2 to 9.0 | 7.2 to 8.0 | 400 | 400 | - |
| | SOP8J | | MCZ5601SC | High-side/Low-side | 600 | 22 | 2/2 | 8.2 to 9.0 | 7.2 to 8.0 | 400 | 400 | - |

 : New product

MS Series


Low Power Standby Quasi-Resonant Power Supply ICs

| Package | | Fig. | Type No. | Vin [V] | Vcc [V] | Over Voltage Protection | Over Current Protection | Stand-by Operation | Bottom Skip | Automotive |
|---|------------|------|------------|-----------|----------|-------------------------|-------------------------|------------------------------|-------------|------------|
| JEDEC Code | JEITA Code | | | | | | | | | |
|  | - | L3 | ★ MS1007SH | 95 to 450 | 11 to 21 | Auto restart | Auto restart | Auto Burst Mode | 1 skip | - |
| | SOP8/7J | | MS1004SH | | | | | Auto Burst Mode/S-Stby Mode | 2 skip | - |
| | | | MS1003SH | | | | | Auto Burst Mode/S-Stby Mode | 1 skip | - |
|  | - | L4 | MS1006SK | 95 to 450 | 11 to 24 | Vcc Latch | Timer Latch 2sec. (typ) | Auto Burst Mode/UT-Stby Mode | 2 skip | - |
| | SOP14 | | MS1005SK | | | | | Auto Burst Mode/UT-Stby Mode | 1 skip | - |

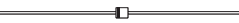






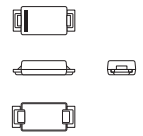
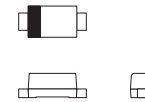
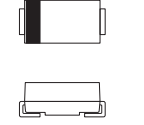
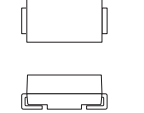
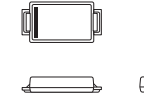
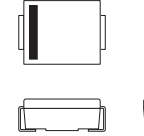
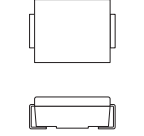
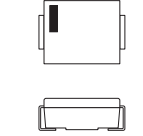
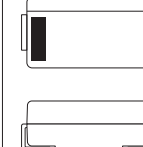
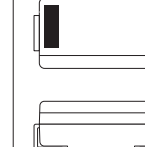
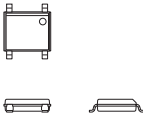
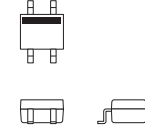
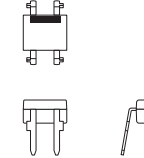
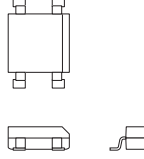
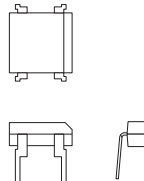
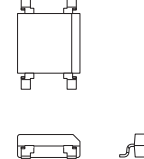
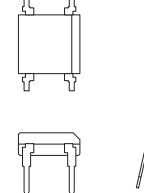
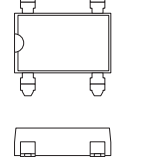
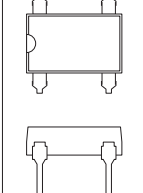
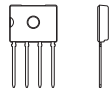
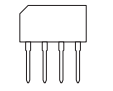
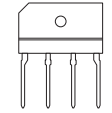
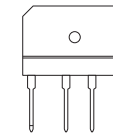
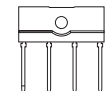
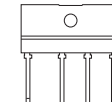
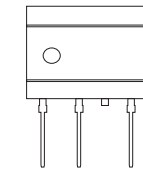
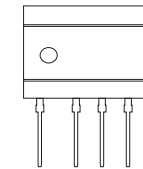
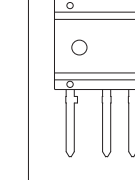
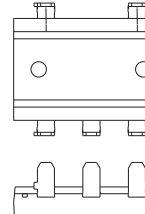

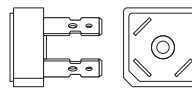

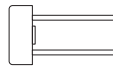
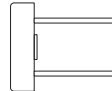
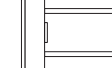
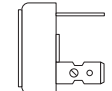
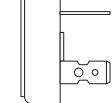
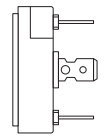

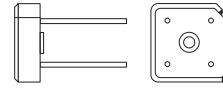
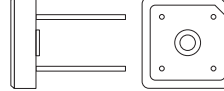
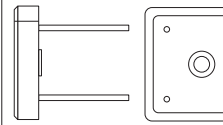
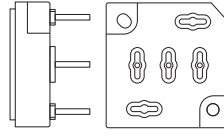
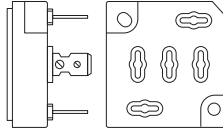
★ : Under development

MH Series

PFC ICs

| Package | | Fig. | Type No. | Type | Operation Mode | Vin Sensing | Vcc [V] | Zero Current Detection | Diodes Short Protection | FB Open Short Protection | Over Voltage Protection | Automotive |
|---|------------|------|----------|-----------------------------|----------------|-------------|----------|------------------------|-------------------------|--------------------------|-------------------------|------------|
| JEDEC Code | JEITA Code | | | | | | | | | | | |
|  | - | L2 | MH2501SC | Critical Current Mode | Master | Unnecessary | 13 to 23 | Auxiliary Winding | Yes | Yes | Yes | - |
| | SOP8J | | MH2511SC | Synchronizes with Master IC | Slave | | 11 to 23 | - | No | No | No | - |

PACKAGE LIST

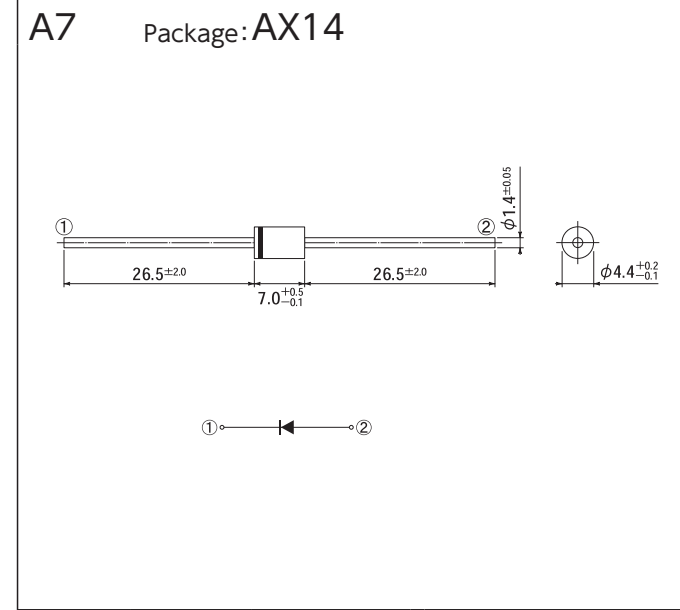
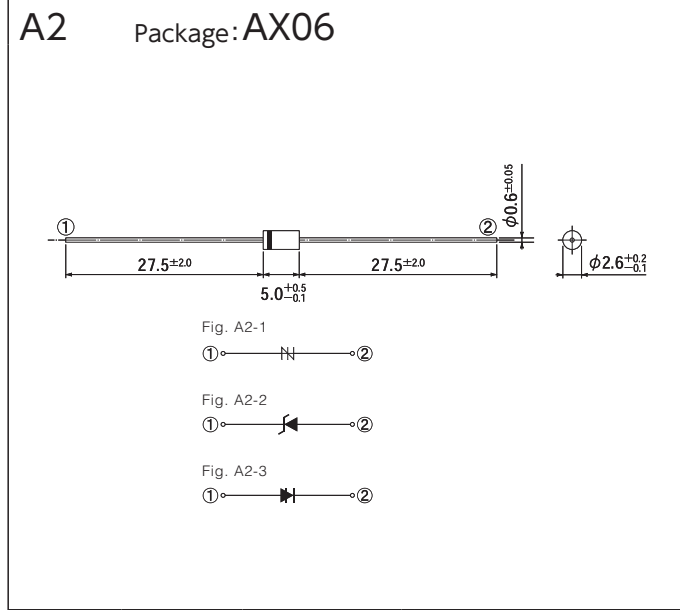
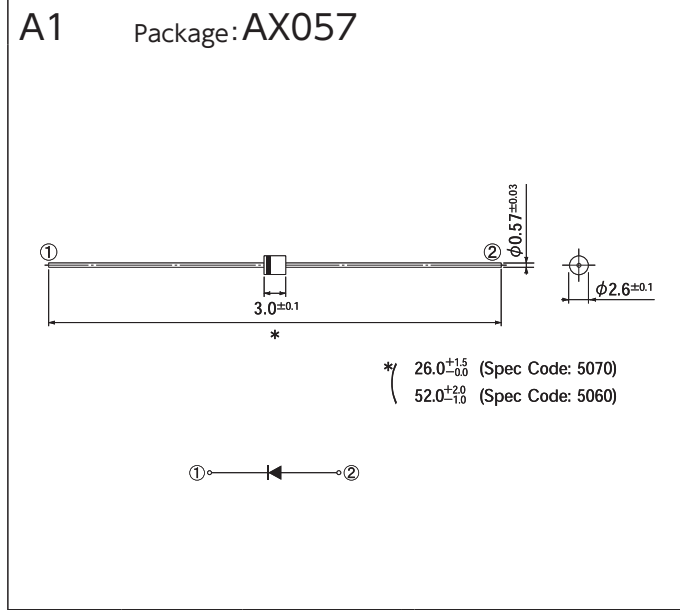
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
|---|---|--|--|---|---|---|---|---|---|--|---|
| A | A1 Package:AX057  | A2 Package:AX06  | A3 Package:AX06  | A4 Package:AX078  | A5 Package:AX10  | | A6 Package:AX10  | A7 Package:AX14  | | | |
| | | | | | | | | | | | |
| B | B1 Package:DO-219AB similar <small>5LF</small>  | B2 Package:DO-219AA <small>M1F</small>  | B3 Package:DO-214AC <small>1F</small>  | B4 Package:DO-214AC <small>1F</small>  | B5 Package:SC-110B <small>CE</small>  | | B6 Package:DO-214AA similar <small>M2F</small>  | B7 Package:DO-214AA similar <small>M2F</small>  | B8 Package:DO-214AA similar <small>M2F</small>  | B9 Package:2F  | B10 Package:2F  |
| | | | | | | | | | | | |
| C | C1 Package:SOPA-4  | C2 Package:TO-269AA <small>1Z(SMD)</small>  | C3 Package:1Z (DIP)  | C4 Package:1N(SMD)  | C5 Package:1N(DIP)  | | C6 Package:1NA(SMD)  | C7 Package:1NA(DIP)  | C8 Package:1W(SMD)  | C9 Package:1W(DIP)  | |
| | | | | | | | | | | | |
| D | D1 Package:D3K  | D2 Package:2S  | D3 Package:3S  | D4 Package:5S  | D5 Package:JB  | | D6 Package:JA  | D7 Package:TSB (4pin) ,JC (4pin)  | D8 Package:TSB (5pin) ,JC (5pin)  | D9 Package:JF  | D10 Package:JH  |
| | | | | | | | | | | | |
| E | E1 Package:MCP  | E2 Package:D30VC  | E3 Package:S2VB  | E4 Package:S4VB  | E5 Package:S5VB  | | E6 Package:S10VB  | E7 Package:S15VB  | E8 Package:S25VB  | E9 Package:S50VB  | E10 Package:S3WB  |
| | | | | | | | | | | | |
| | 11 | 12 | 13 | 14 | 15 | | | | | | |
| E | E11 Package:S10WB  | E12 Package:S15WB  | E13 Package:S20WB  | E14 Package:SVTA  | E15 Package:SVT  | | | | | | |
| | | | | | | | | | | | |

PACKAGE LIST

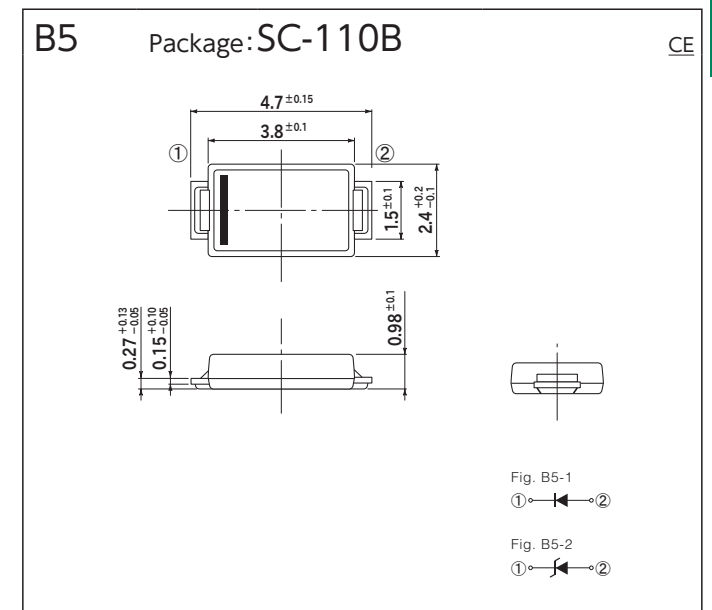
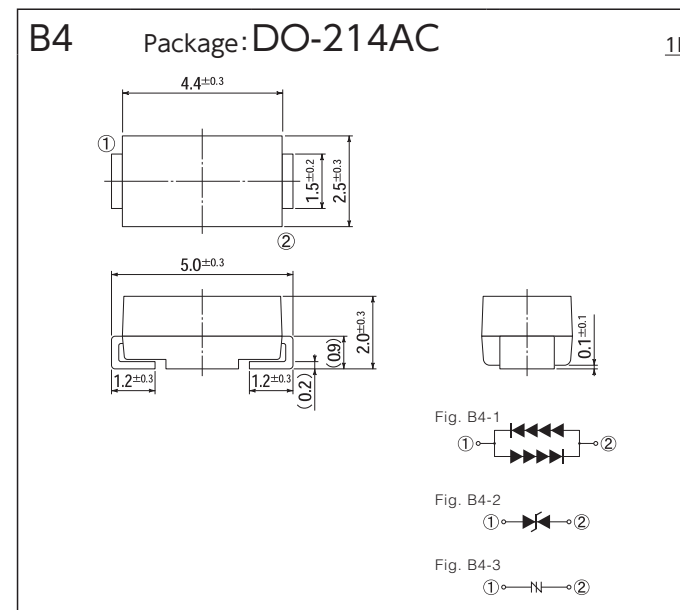
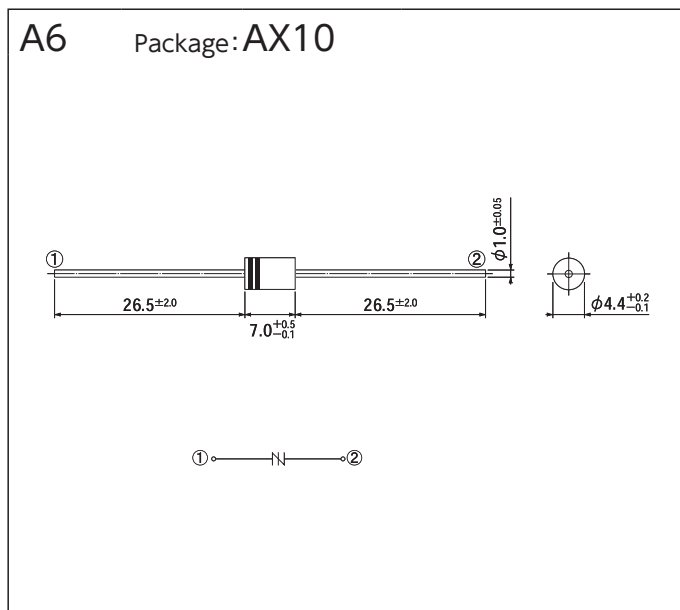
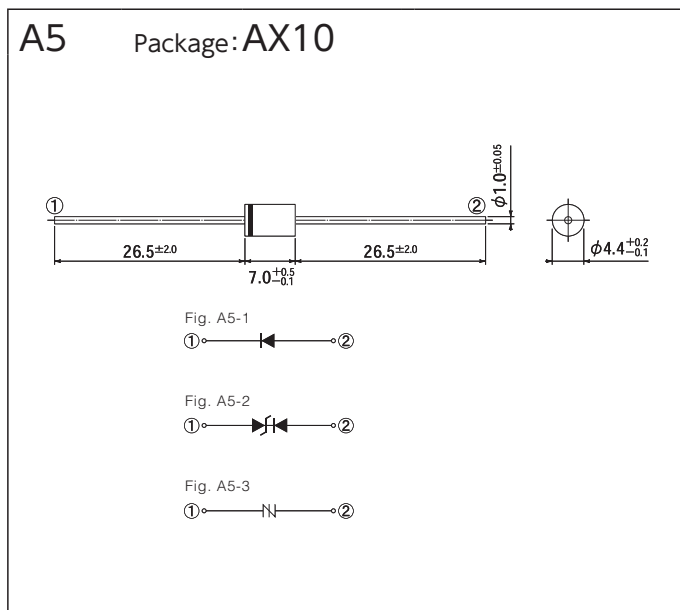
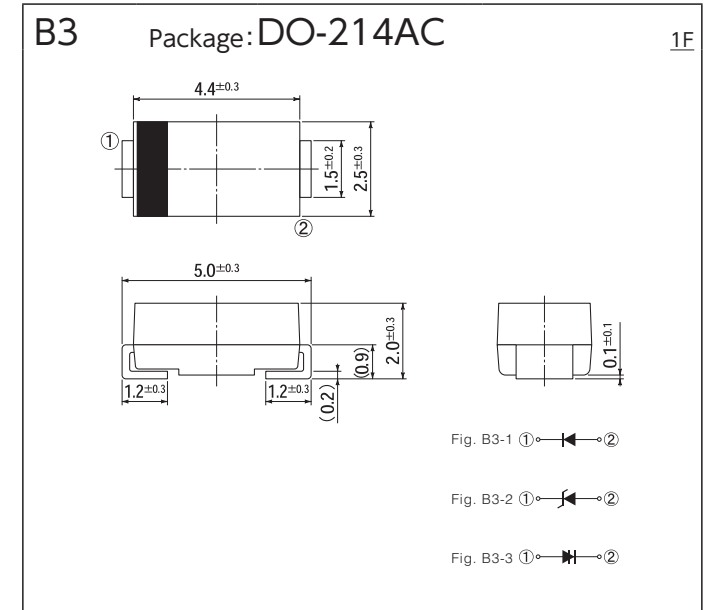
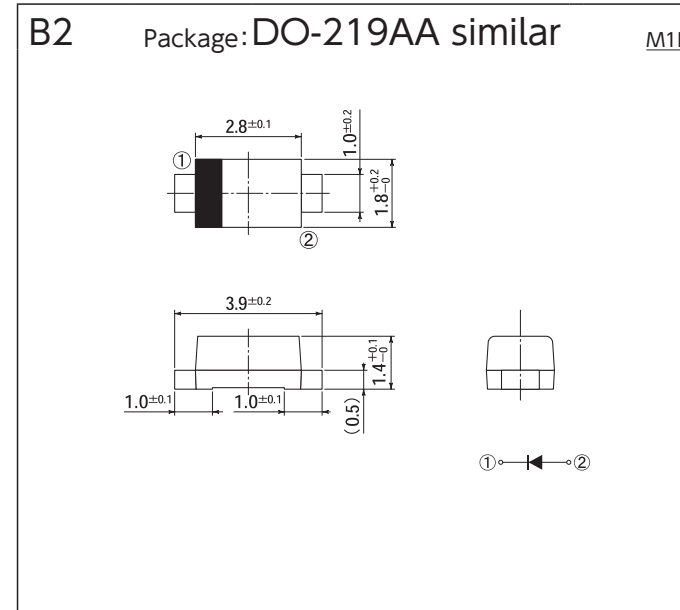
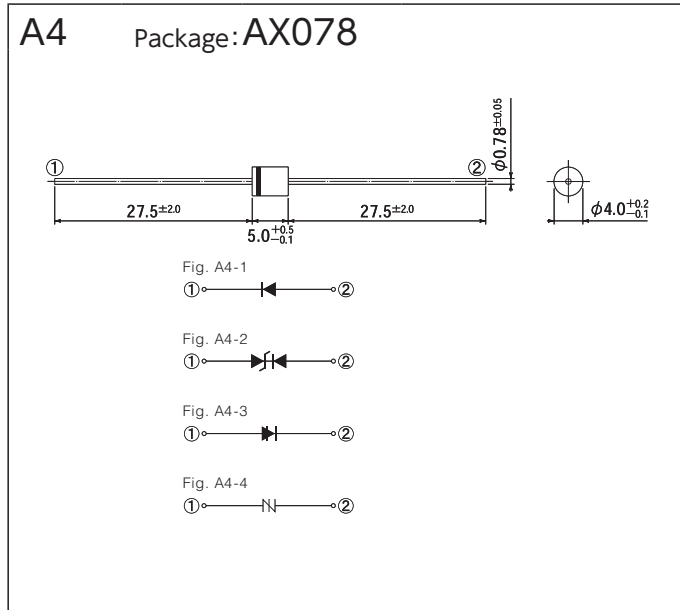
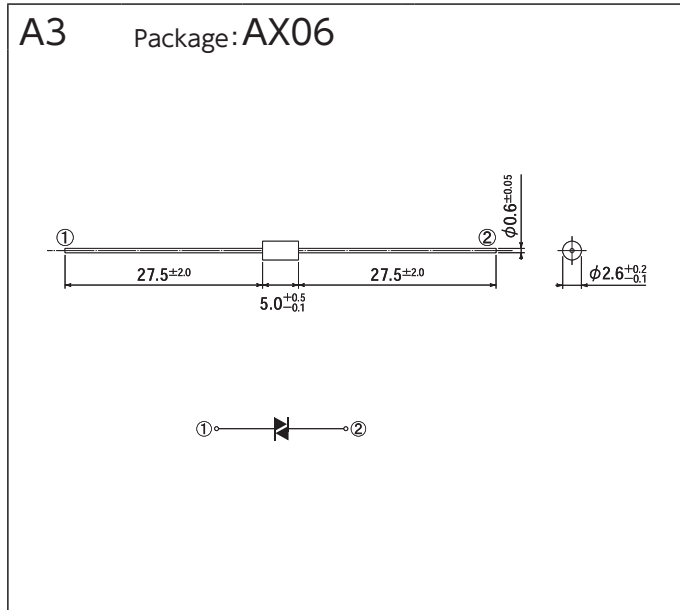
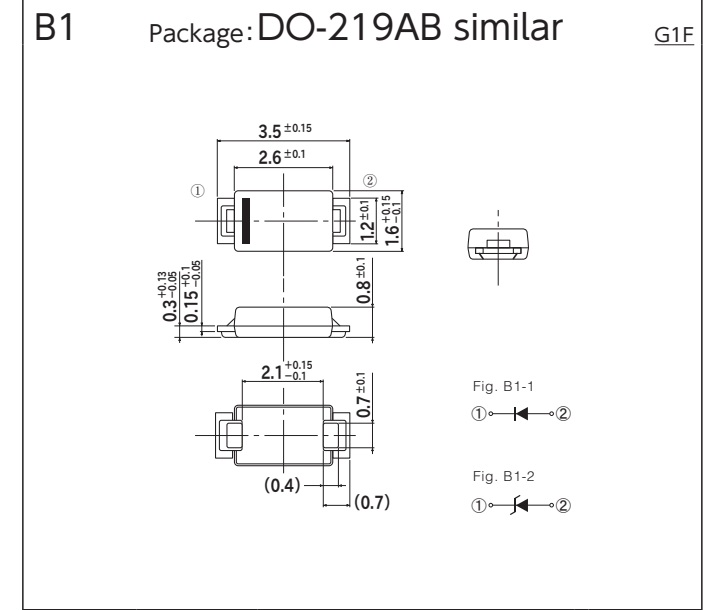
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|---|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|-------------------------------------|-------------------------------------|--------------------------------------|-------------------------------------|----|
| F | F1 Package:Module | F2 Package:Module | F3 Package:Module | F4 Package:MG001 | F5 Package:MG031 | F6 Package:MG032 | F7 Package:MG038 | F8 Package:MG048 | | |
| G | G1 Package:SC-63 E-pack | G2 Package:TO-252AA EB | G3 Package:TO-252AB similar EE | G4 Package:DO-277A similar EY | G5 Package:TO-252AA similar EB | G6 Package:LA | G7 Package:MO-235B similar LE | | | |
| H | H1 Package:SC-83 similar STO-220 | H2 Package:SC-83 similar ED | H3 Package:TO-263AB-1 EH | H4 Package:TO-263AB EG | H5 Package:SC-83 similar EF | H6 Package:TO-263AB EZ | H7 Package:TO-263-SC FZ-7b | | | |
| J | J1 Package:SC-91A FTO-220(2pin) | J2 Package:SC-91 FTO-220A(2pin) | J3 Package:SC-91 FTO-220AG(2pin) | J4 Package:SC-91 FTO-220G(2pin) | J5 Package:TO-220AB EA | J6 Package:SC-91A FTO-220(3pin) | J7 Package:SC-91 FTO-220A(3pin) | J8 Package:SC-91 FTO-220AG(3pin) | J9 Package:SC-91 FTO-220G(3pin) | |
| K | K1 Package:SC-93 ITO-3P(3pin) | K2 Package:TO-247AD MTO-3PT(3pin) | K3 Package:SC-93 ITO-3P(3pin) | K4 Package:TO-247AD MTO-3PT(3pin) | K5 Package:TO-247AD MTO-3PT(3pin) | K6 Package:TO-247AD MTO-3PV | K7 Package:TO-247AD MTO-3PV | | | |
| L | L1 Package:SOP8 | L2 Package:SOP8J | L3 Package:SOP8/7J | L4 Package:SOP14 | L5 Package:SOP16 | L6 Package:SOP18 | L7 Package:SOP22 | L8 Package:SOP24 | | |

OUTLINE DIMENSIONS

[Unit:mm]



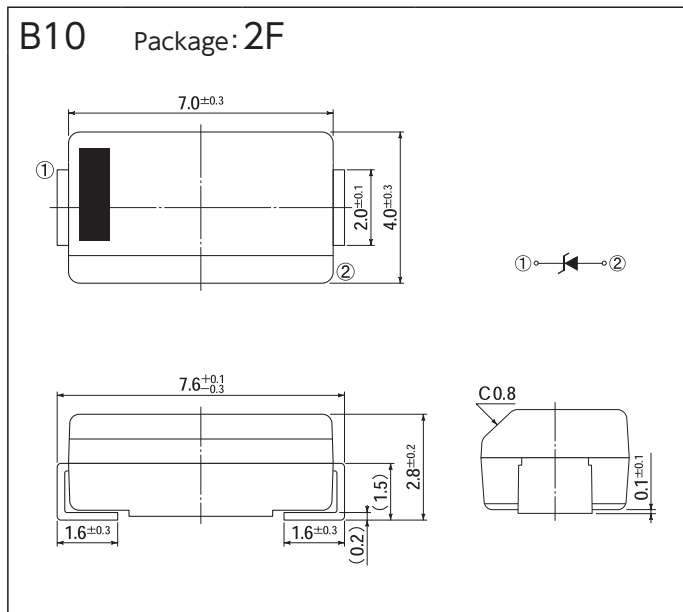
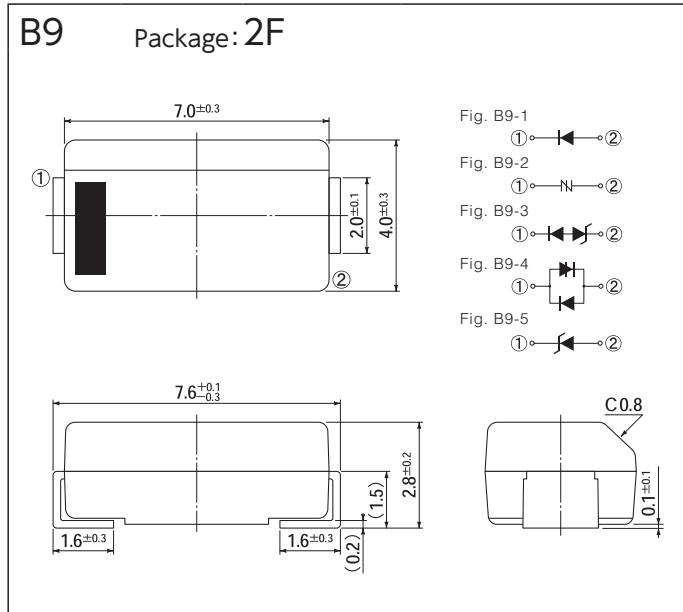
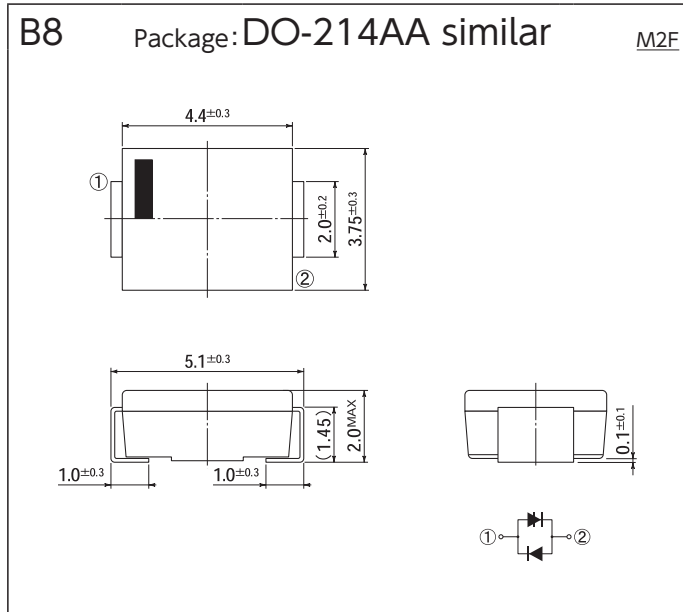
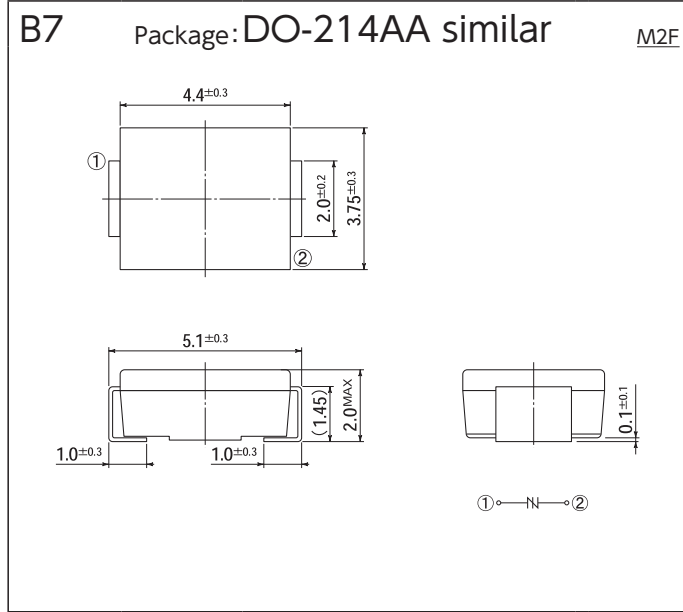
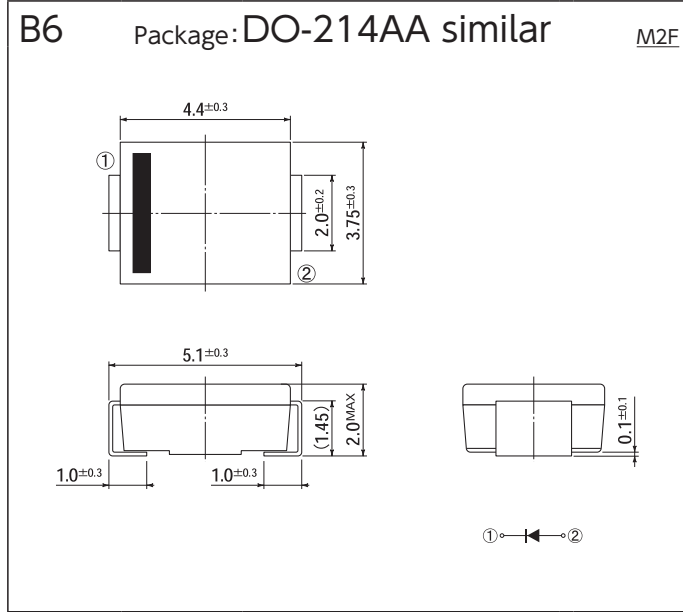
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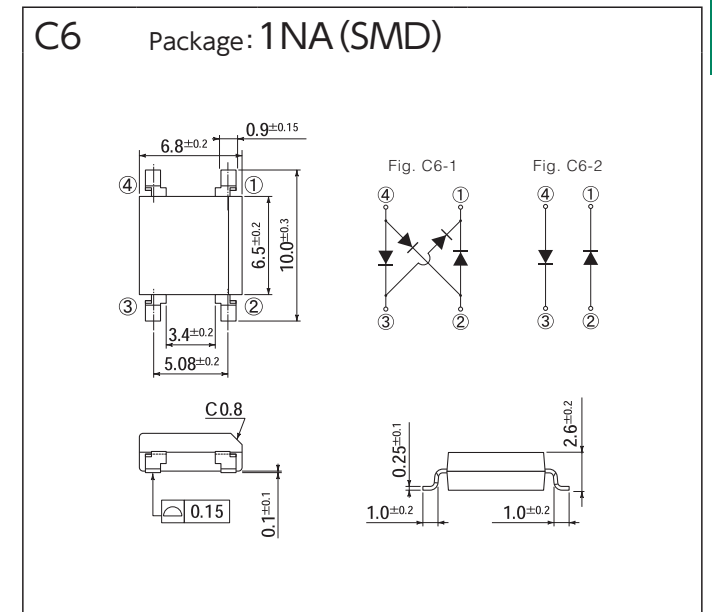
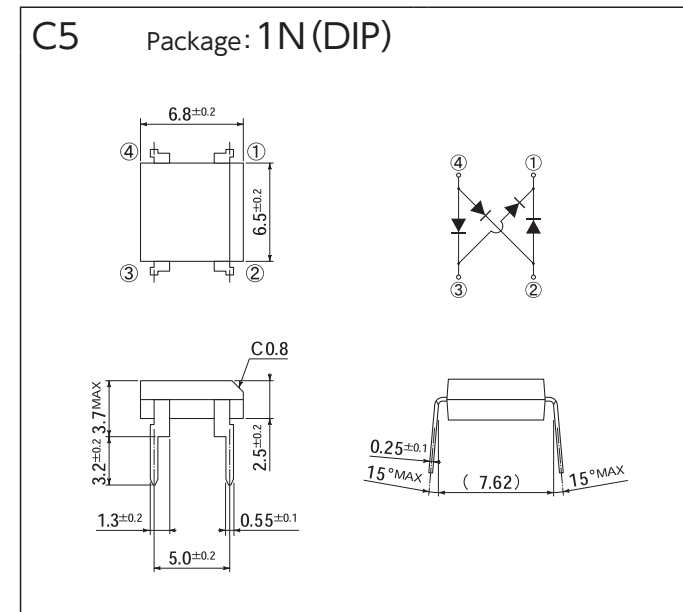
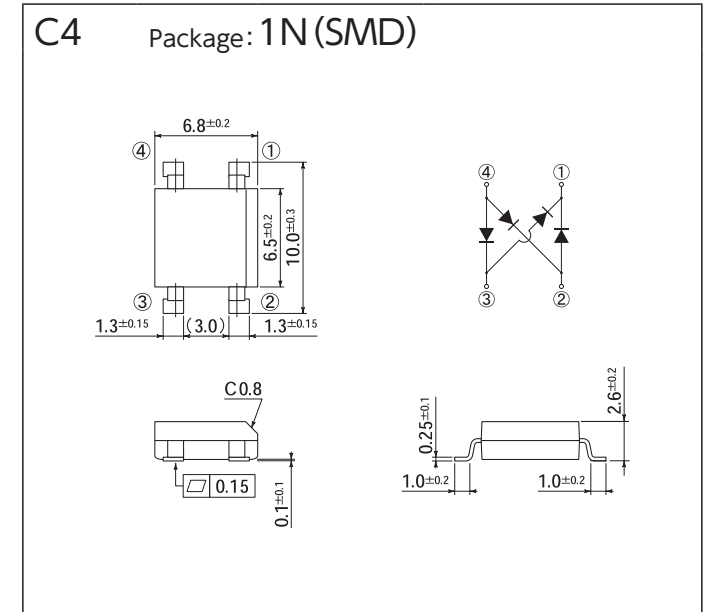
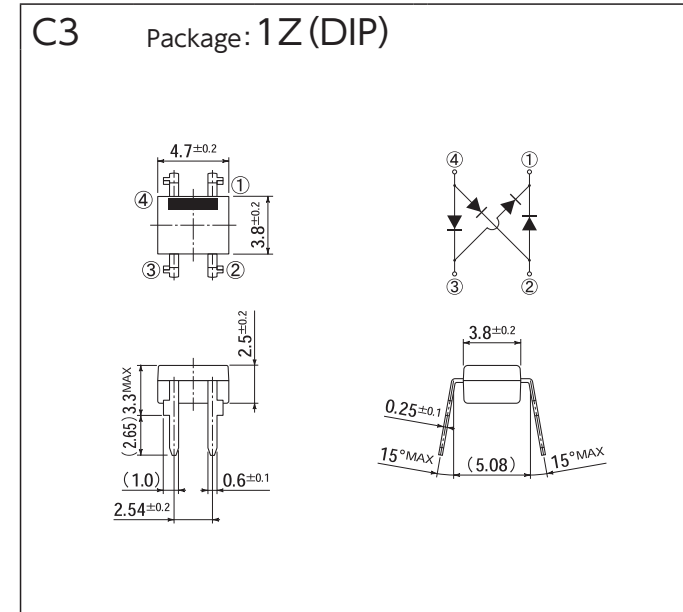
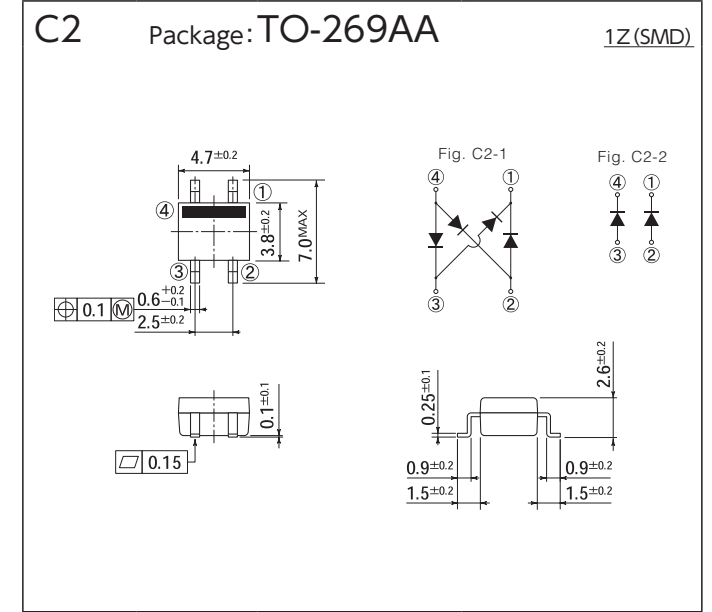
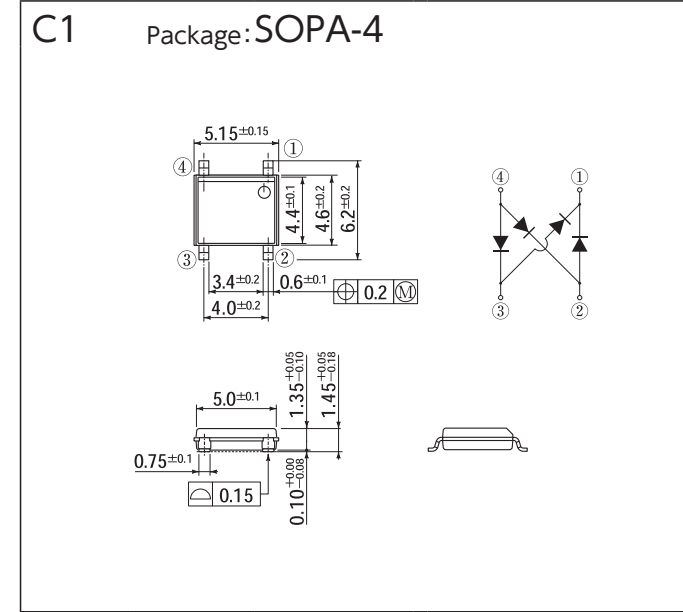
OUTLINE DIMENSIONS

OUTLINE DIMENSIONS

[Unit:mm]

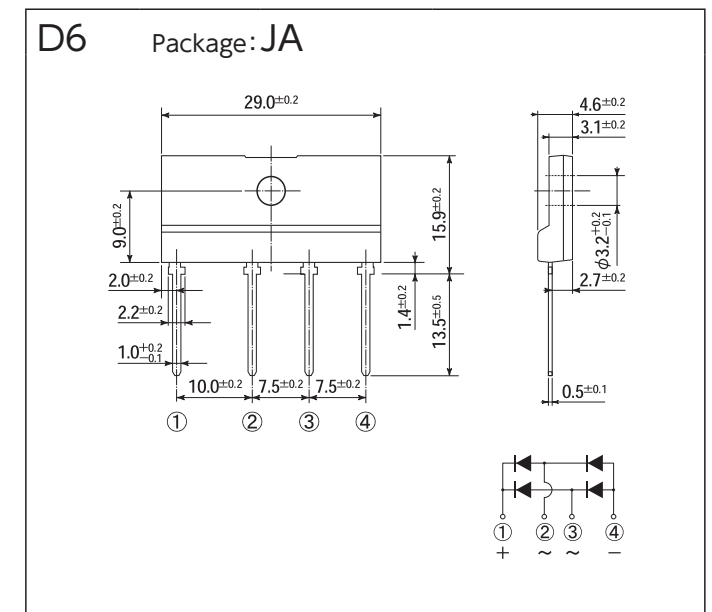
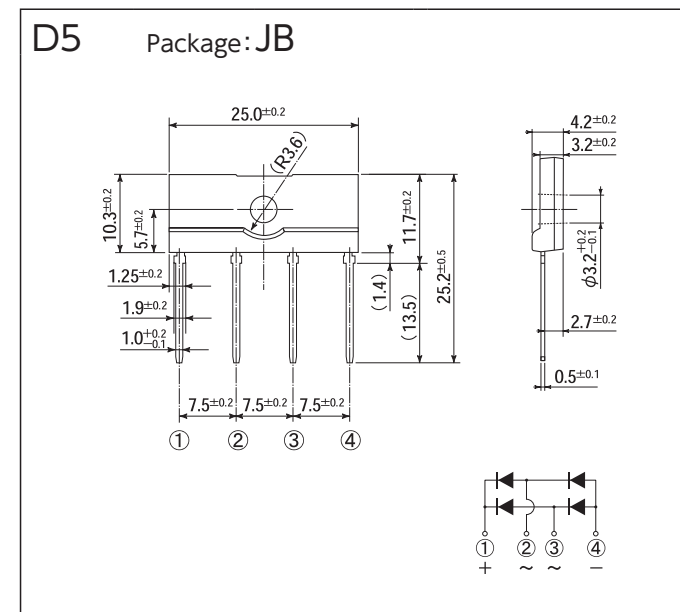
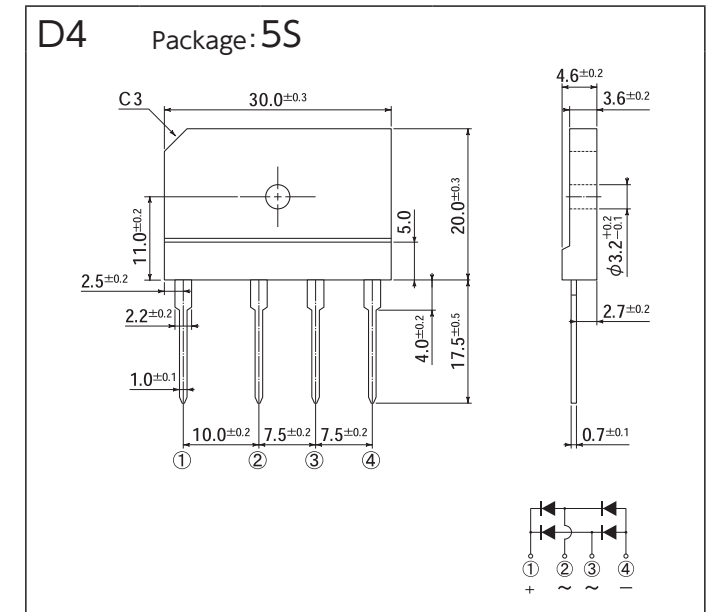
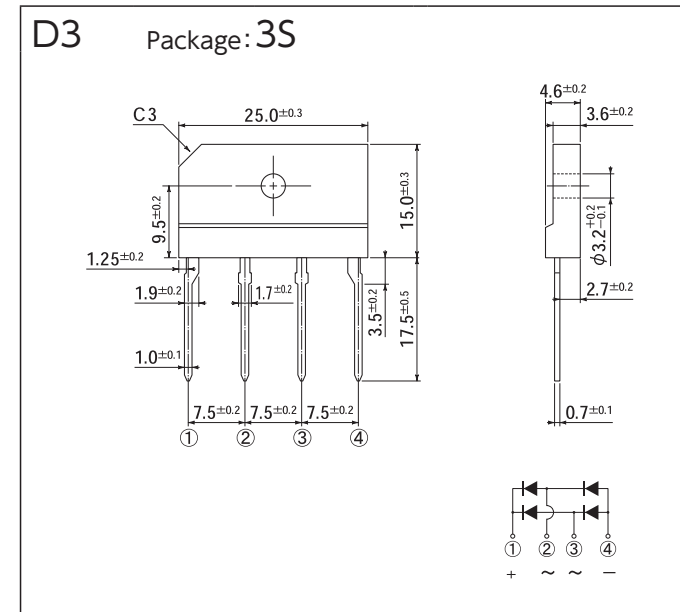
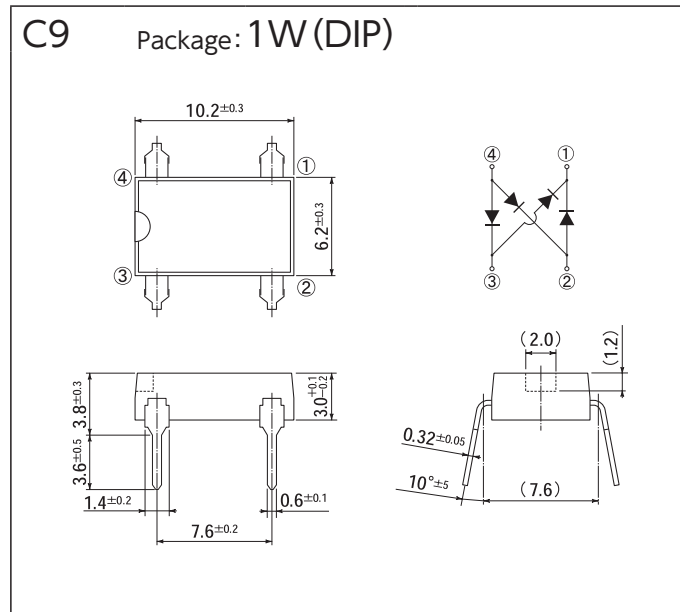
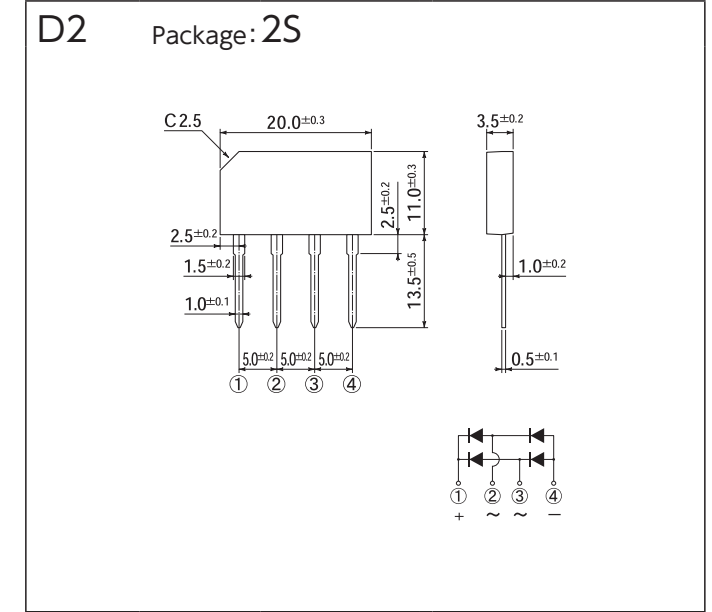
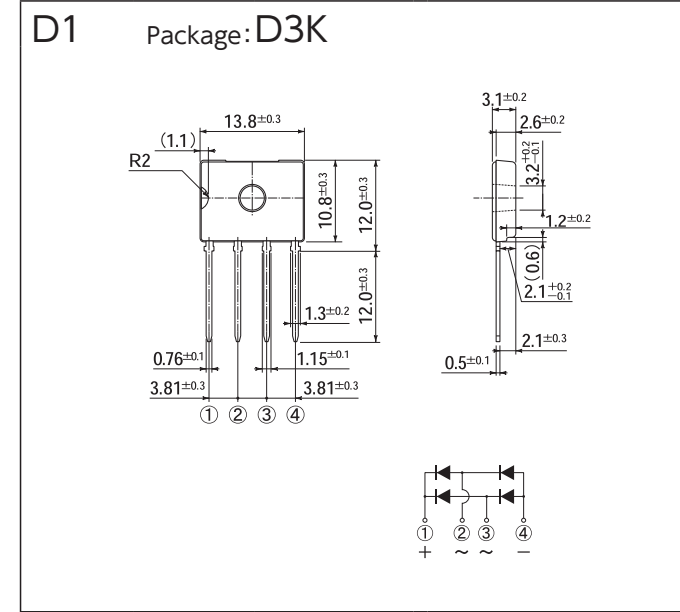
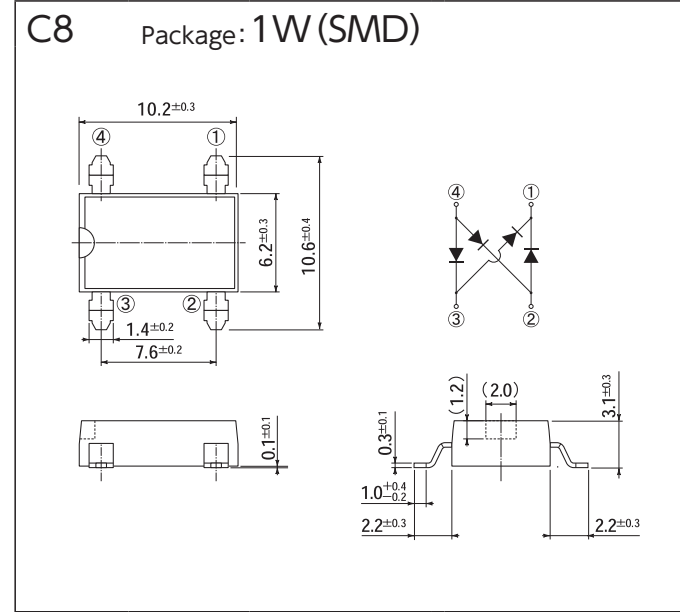
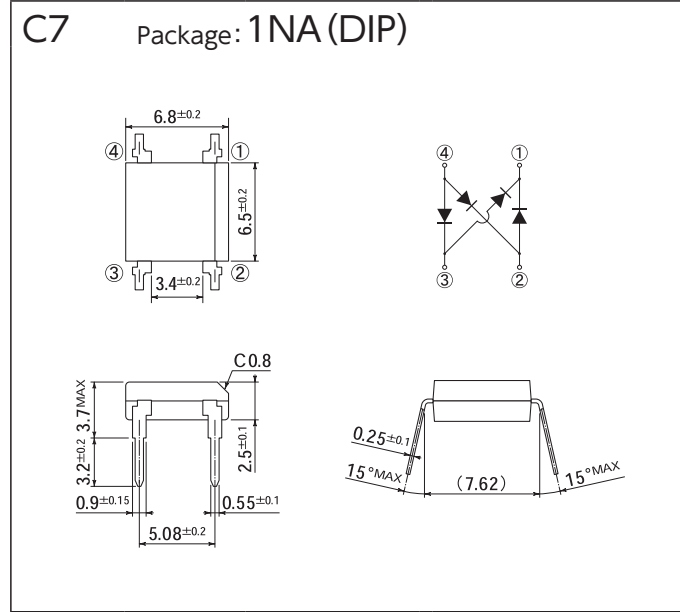


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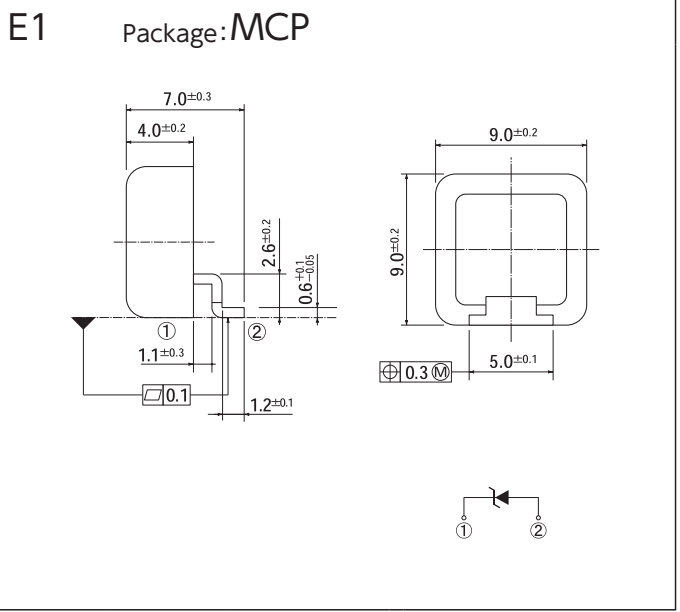
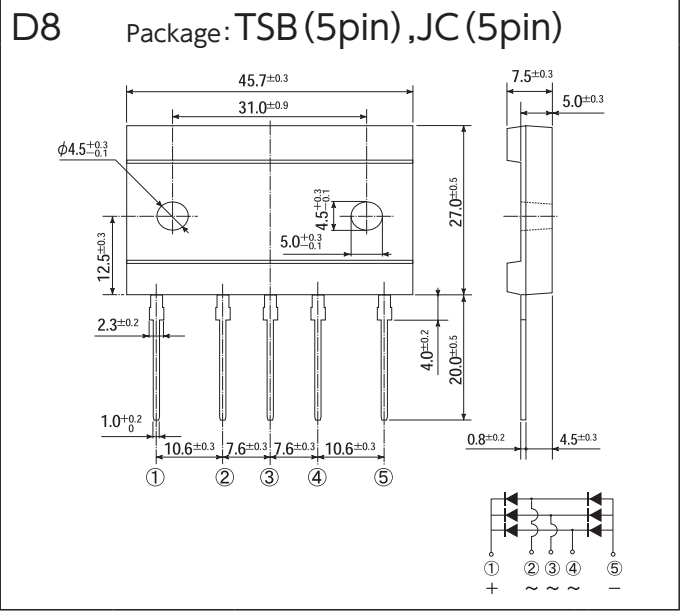
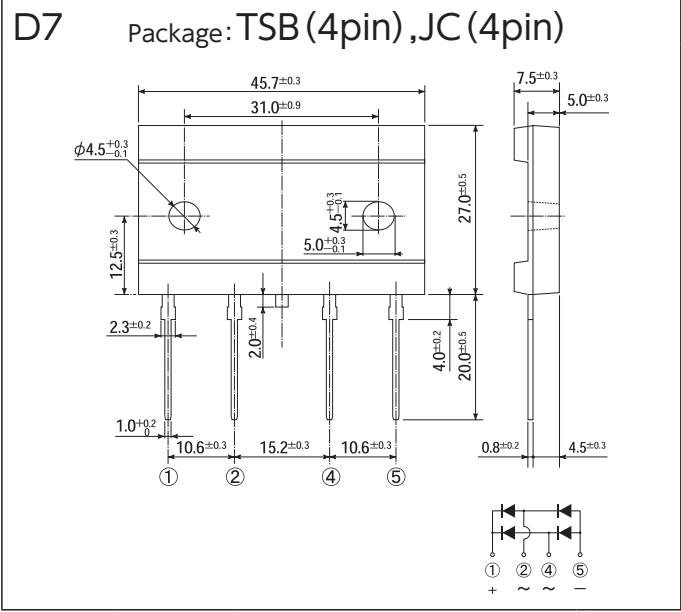
OUTLINE DIMENSIONS

[Unit:mm]

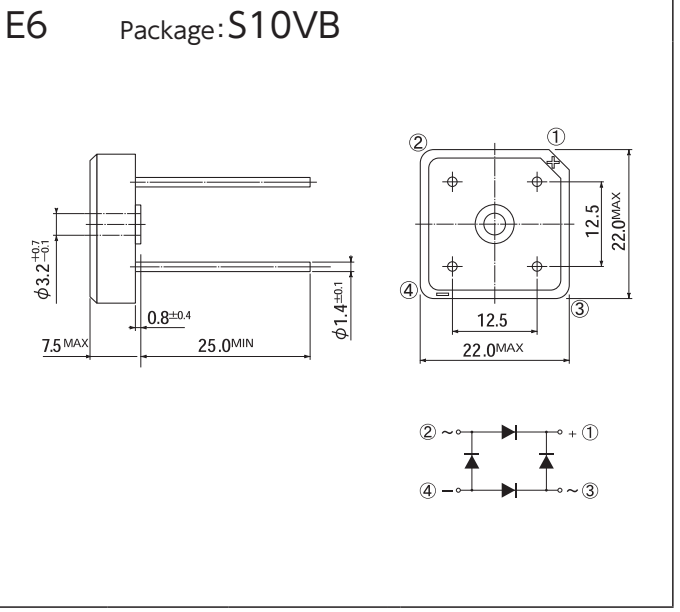
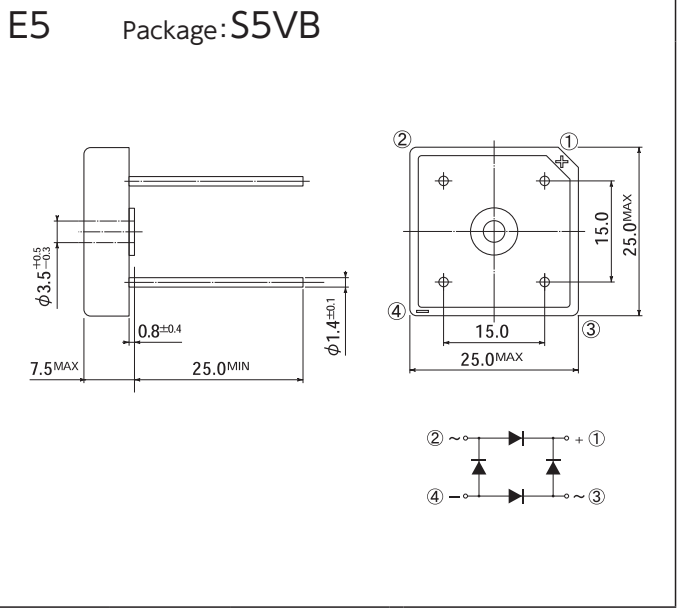
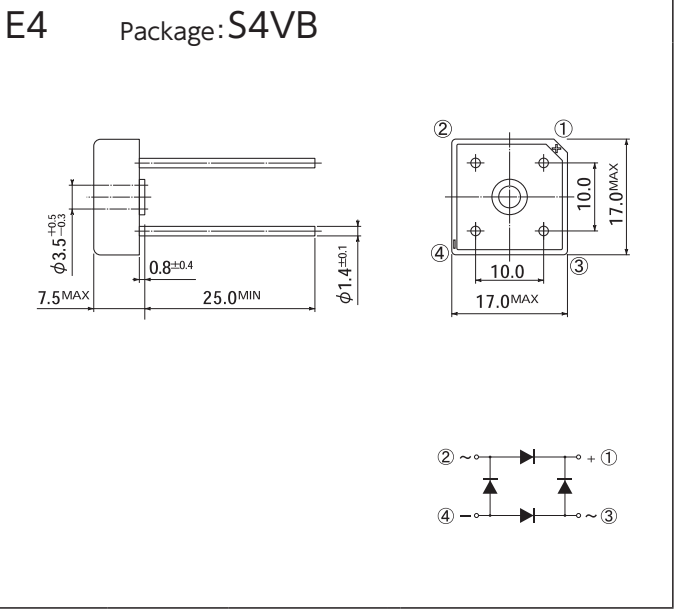
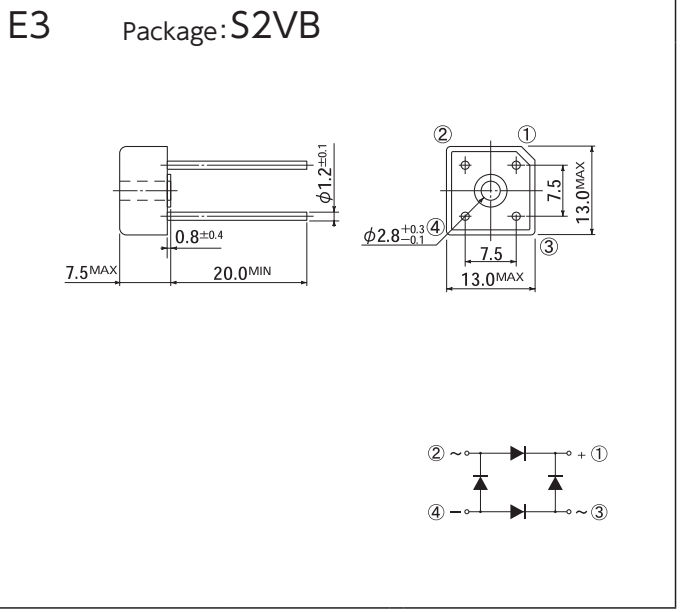
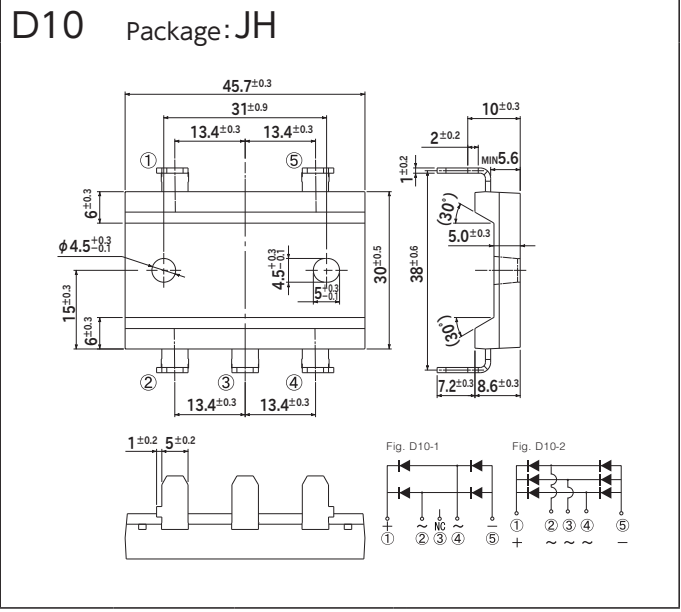
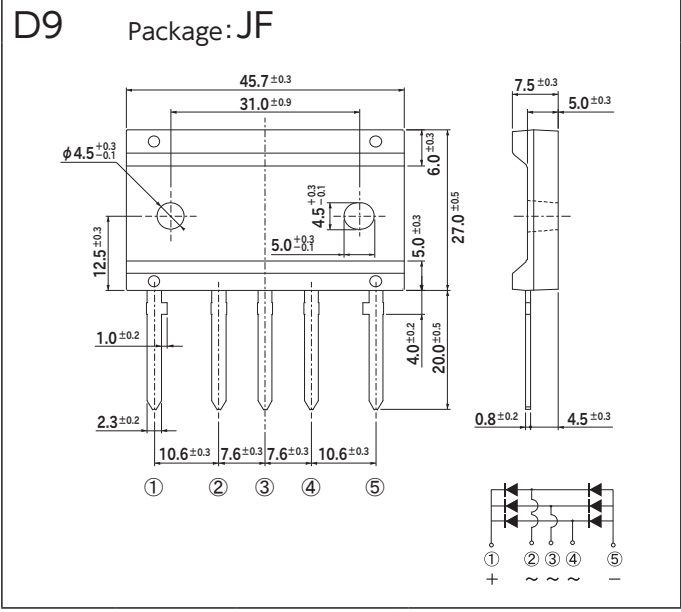
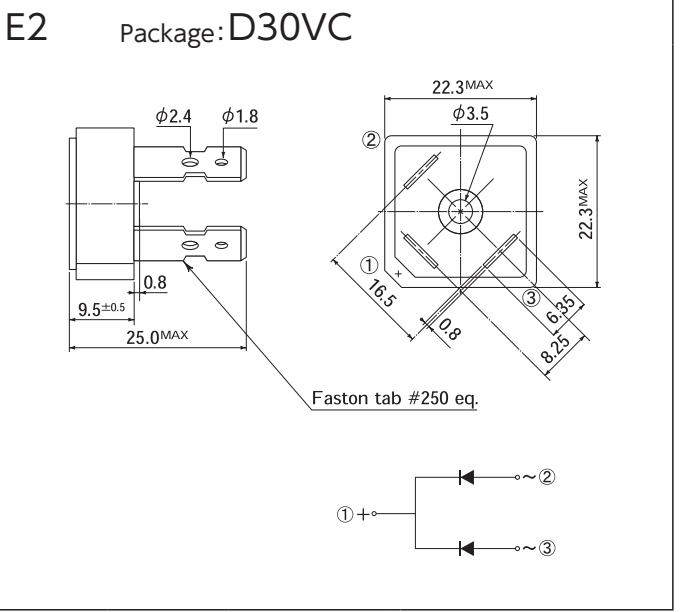


OUTLINE DIMENSIONS

[Unit:mm]



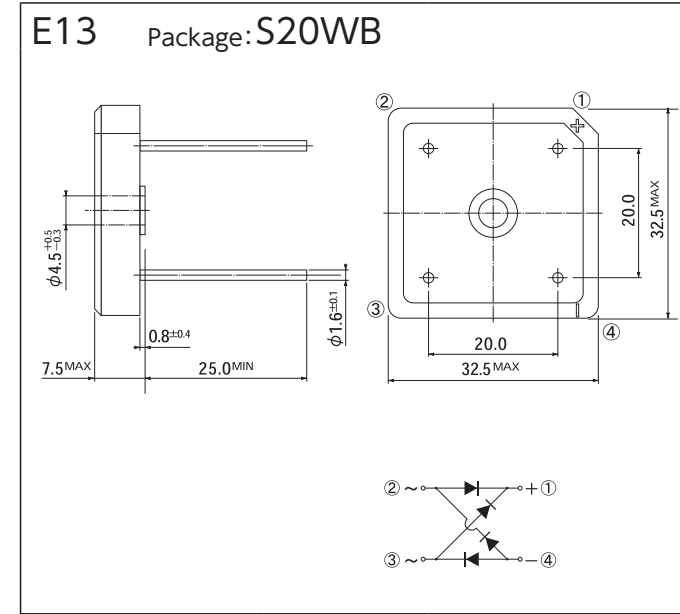
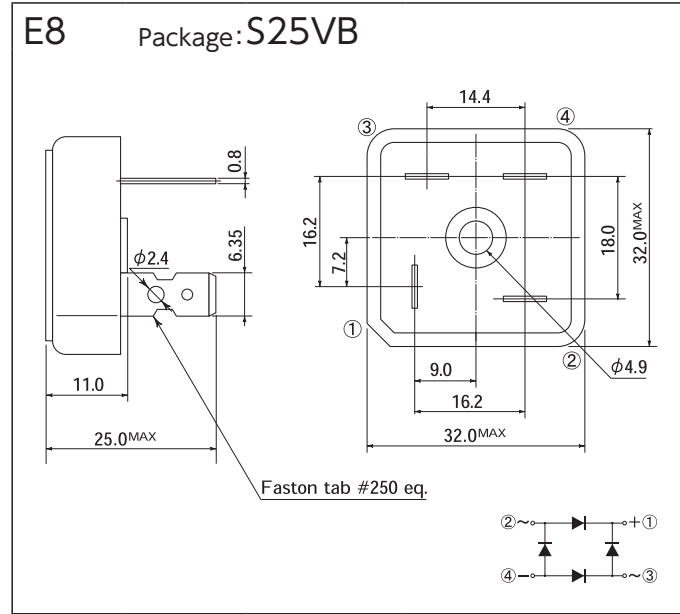
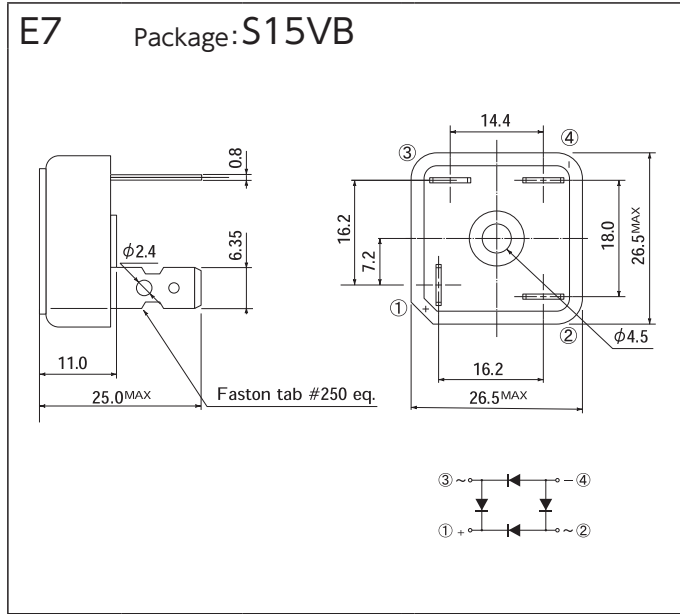
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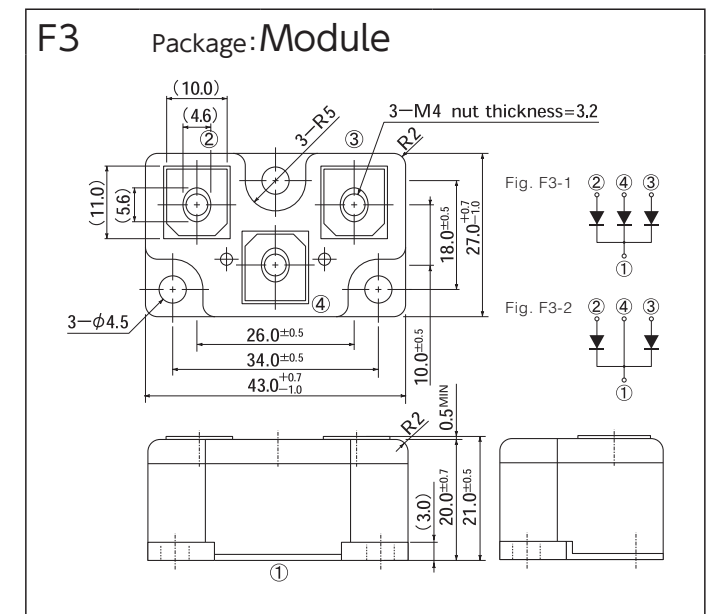
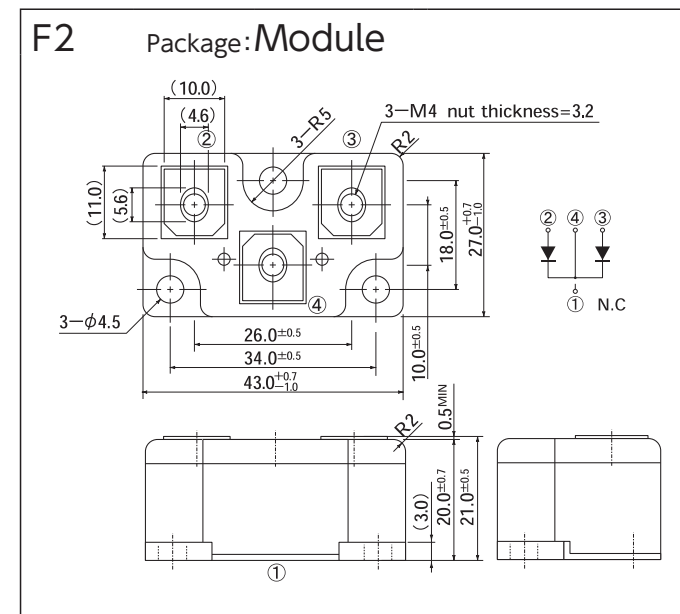
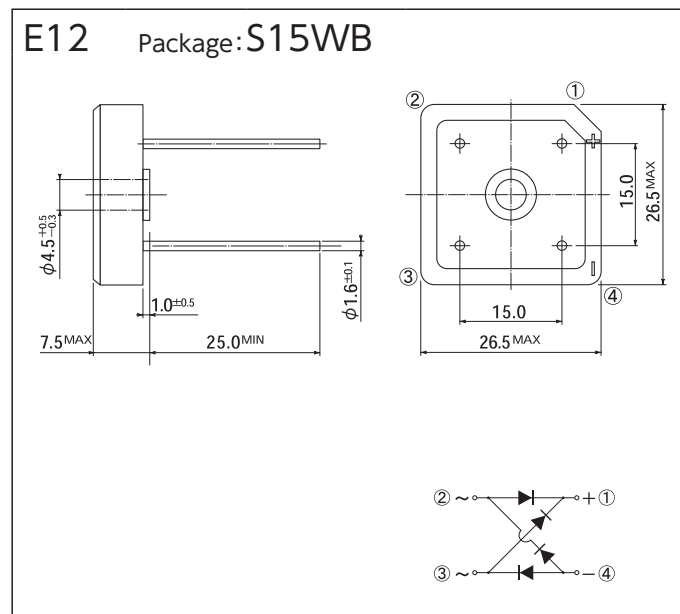
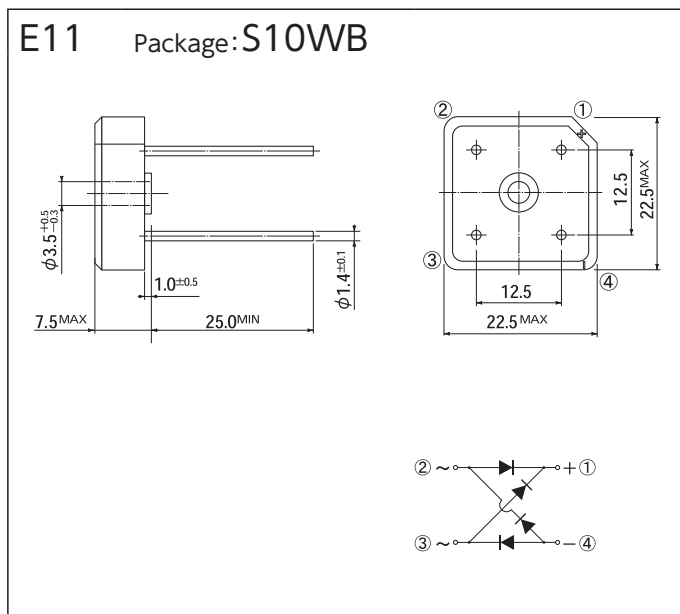
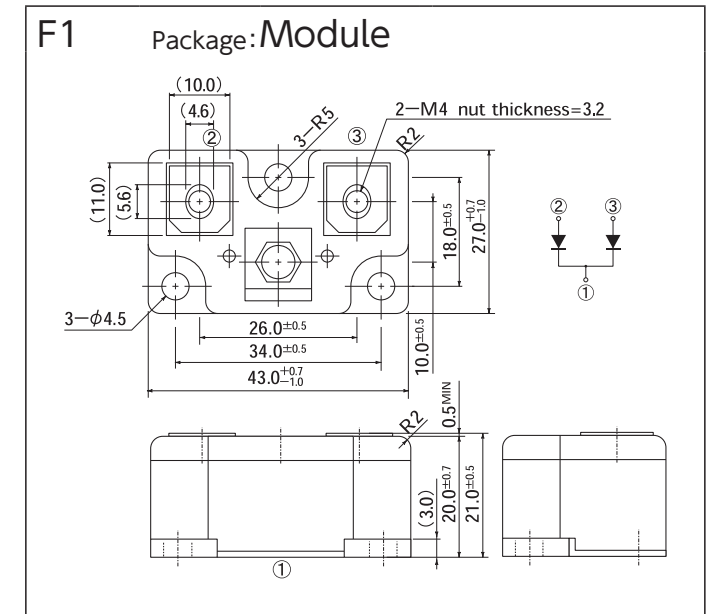
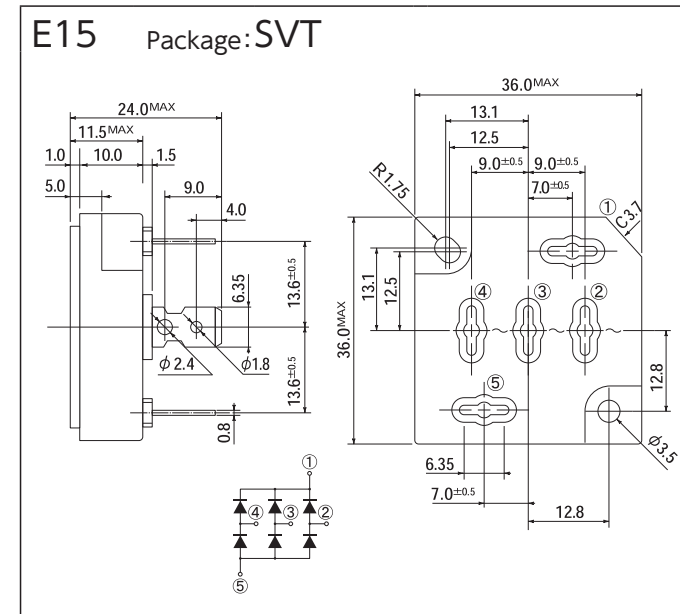
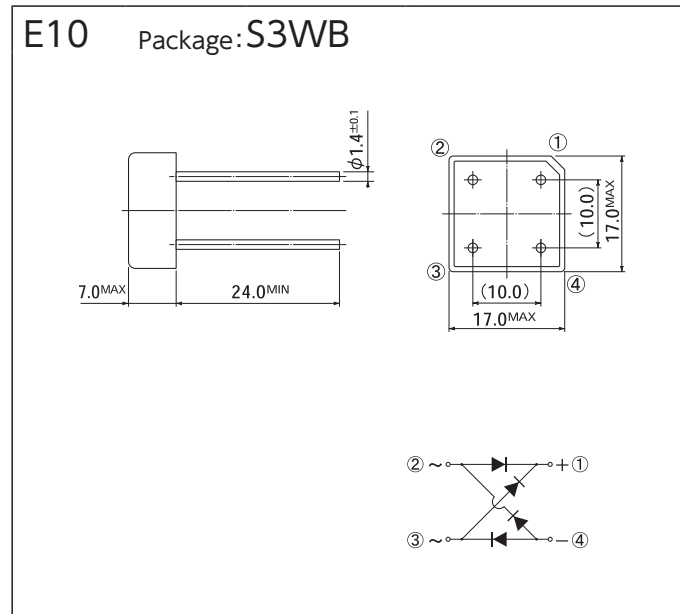
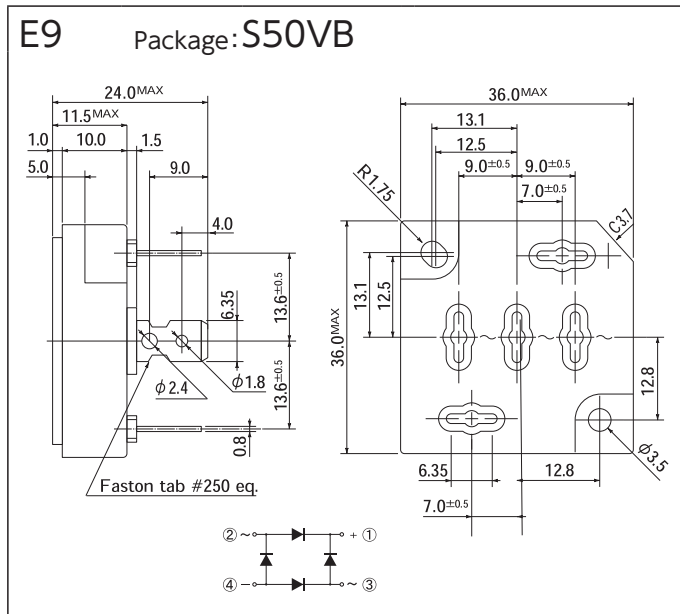
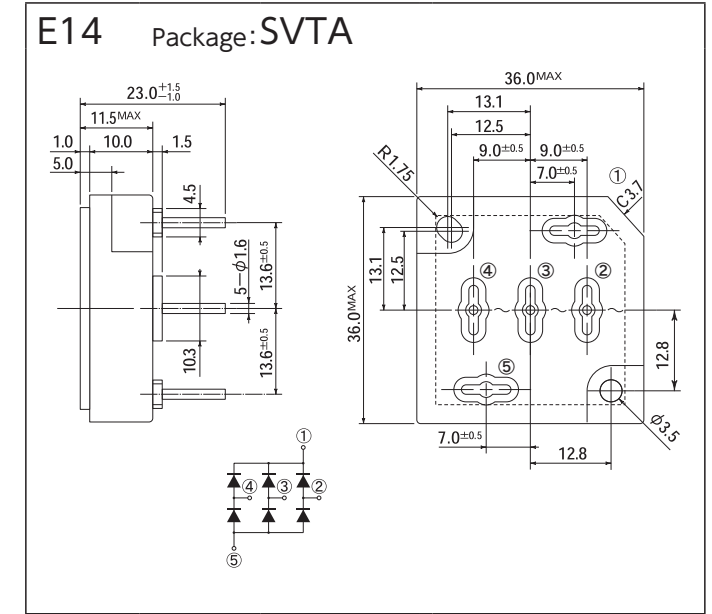
OUTLINE DIMENSIONS

OUTLINE DIMENSIONS

[Unit:mm]

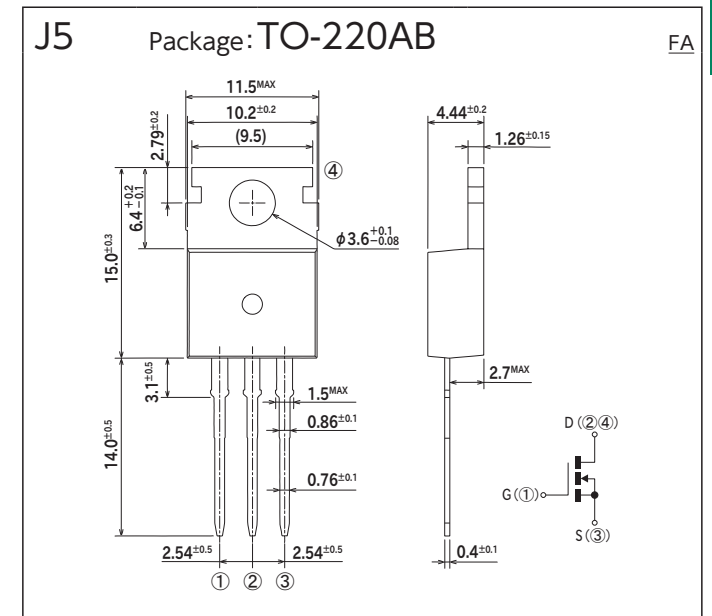
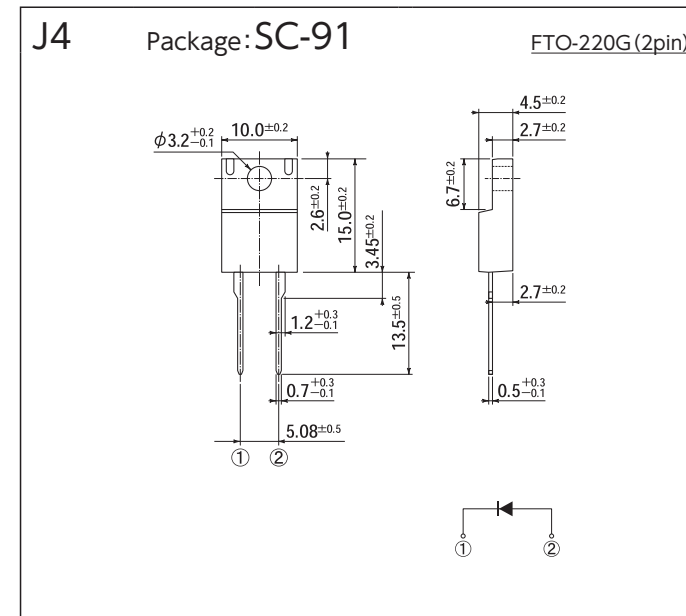
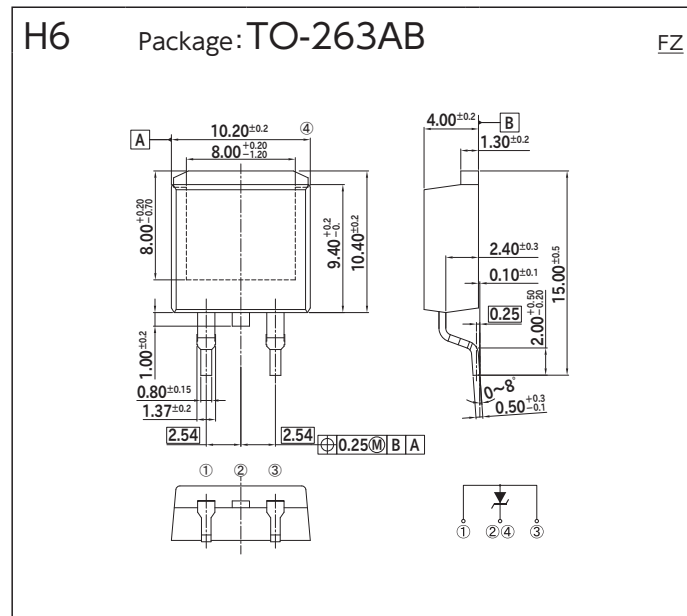
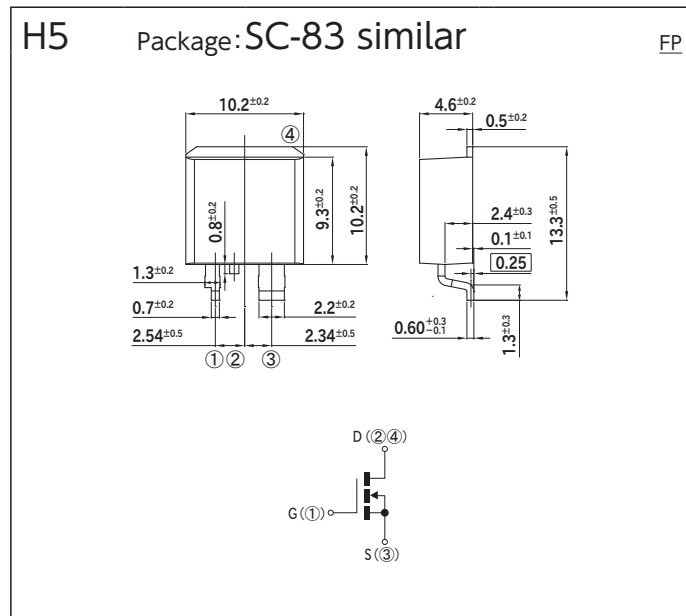
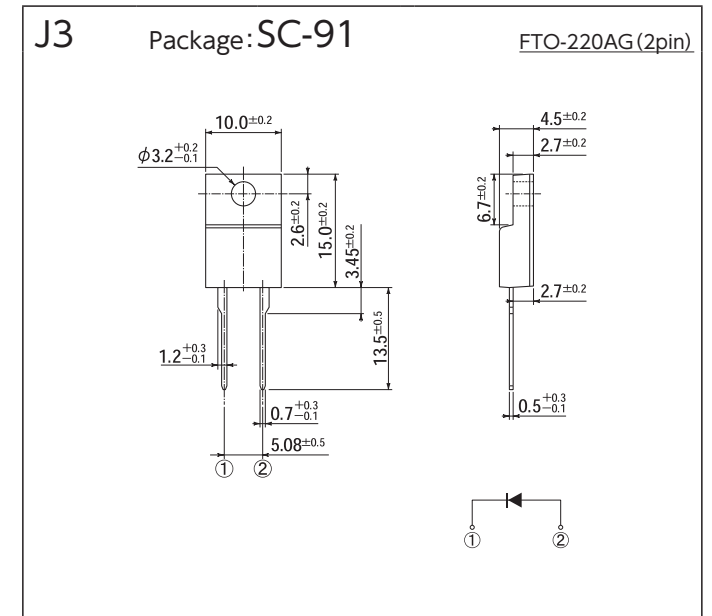
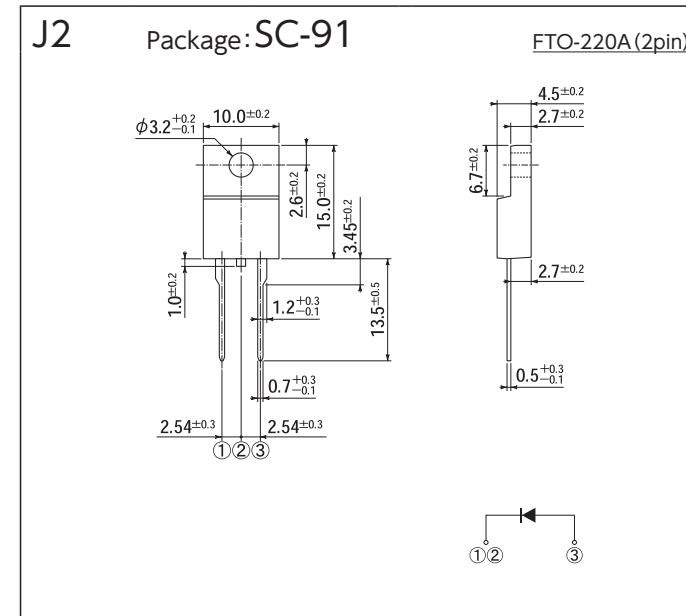
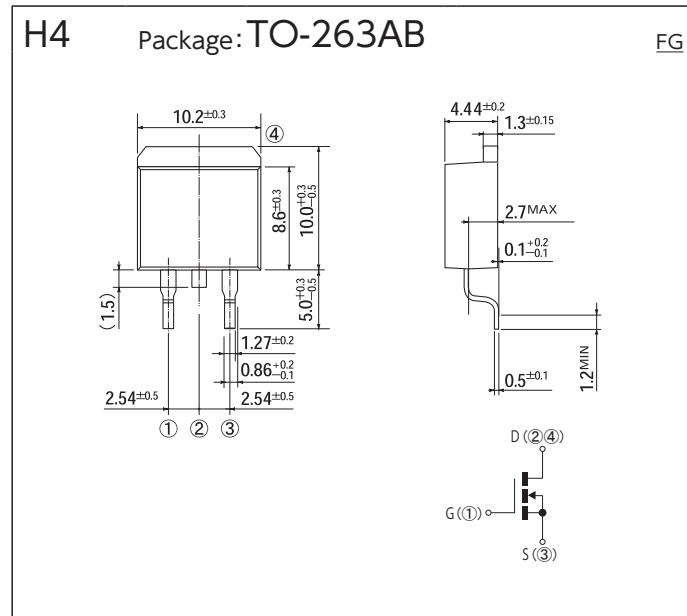
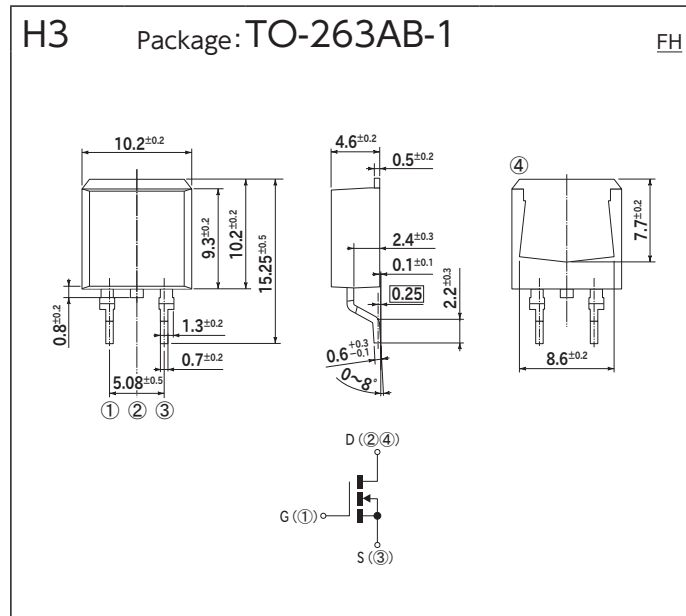
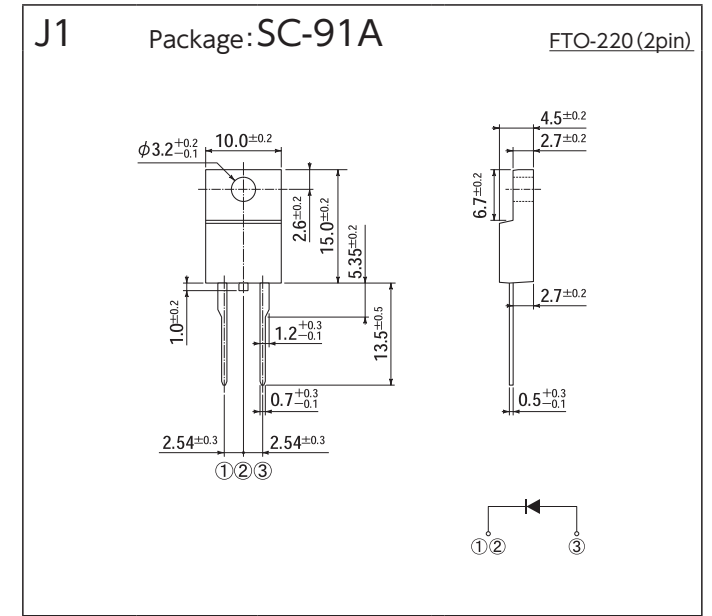
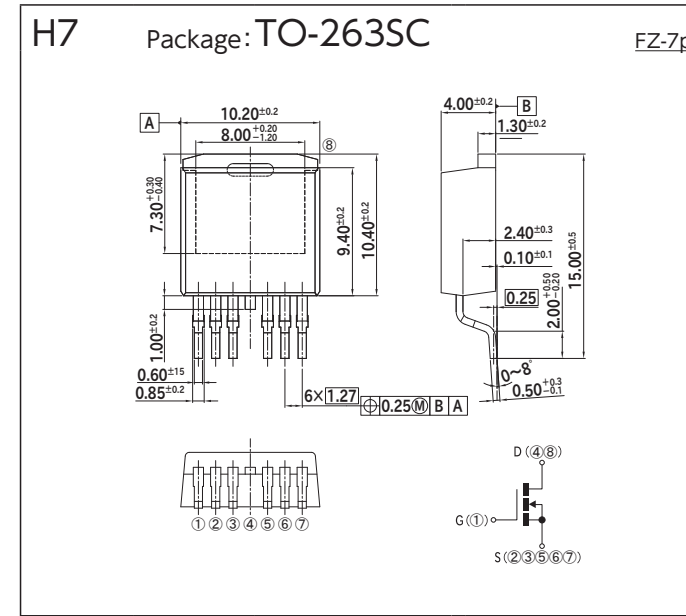
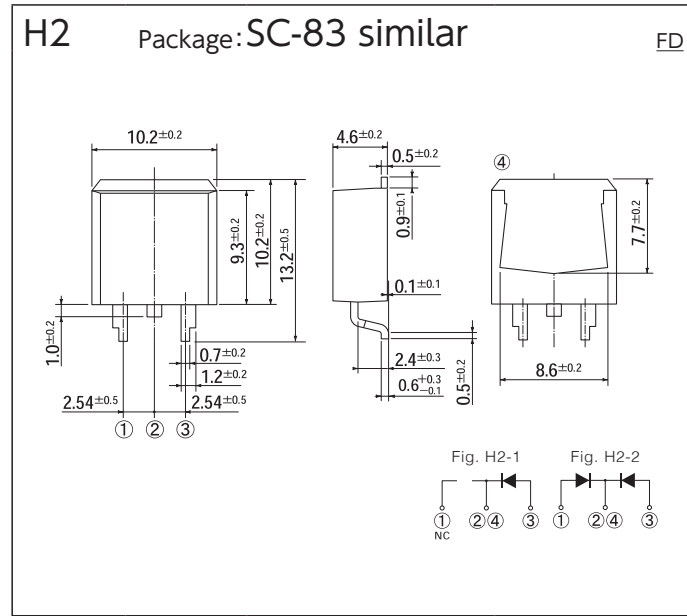
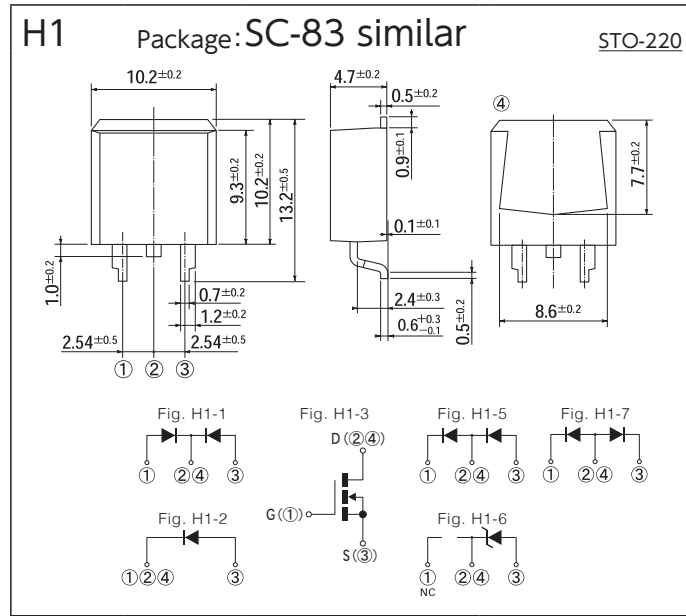


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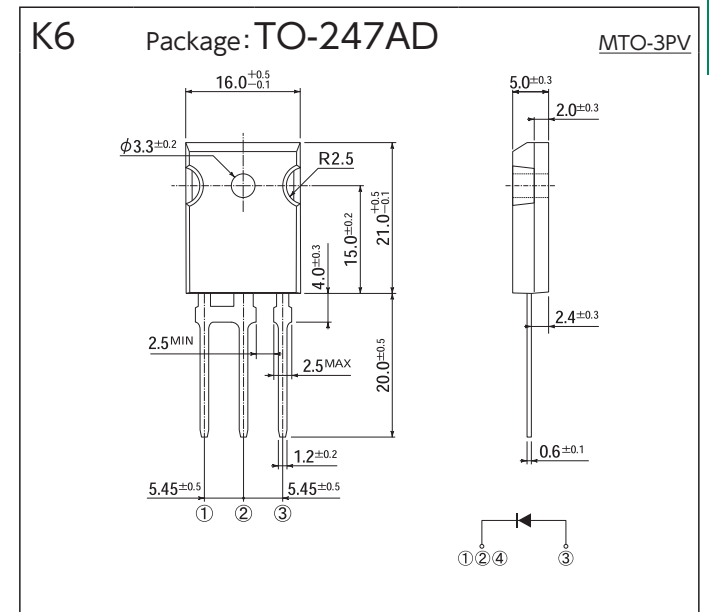
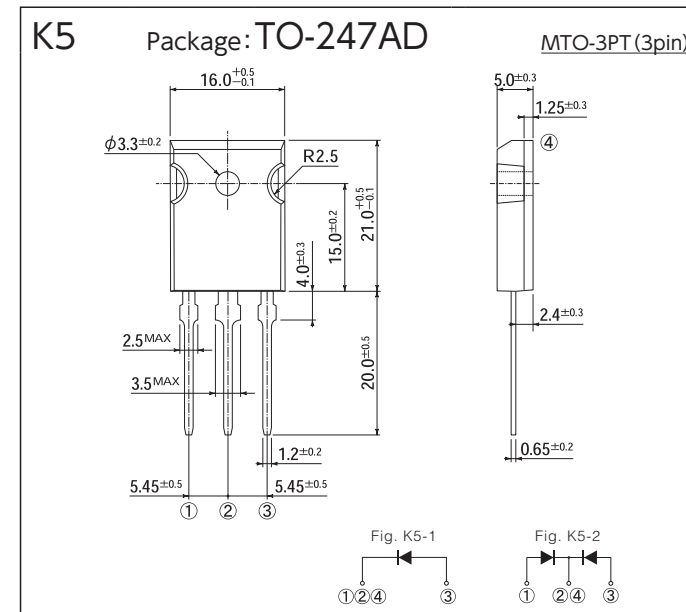
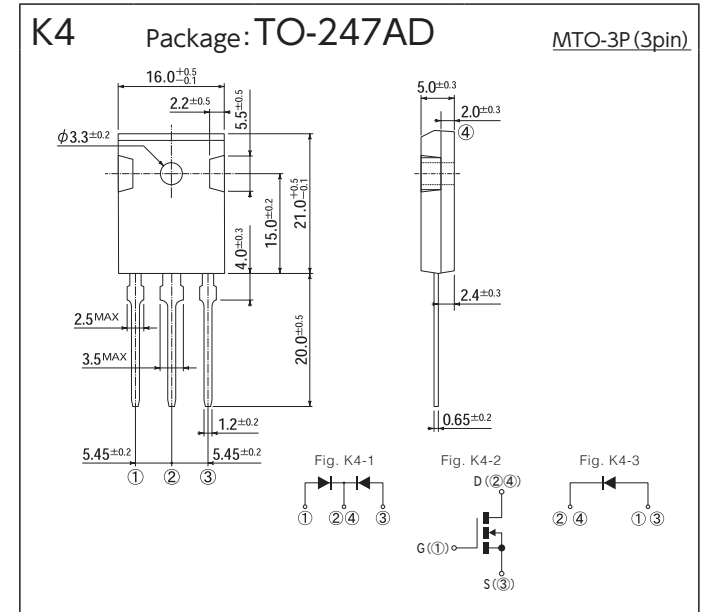
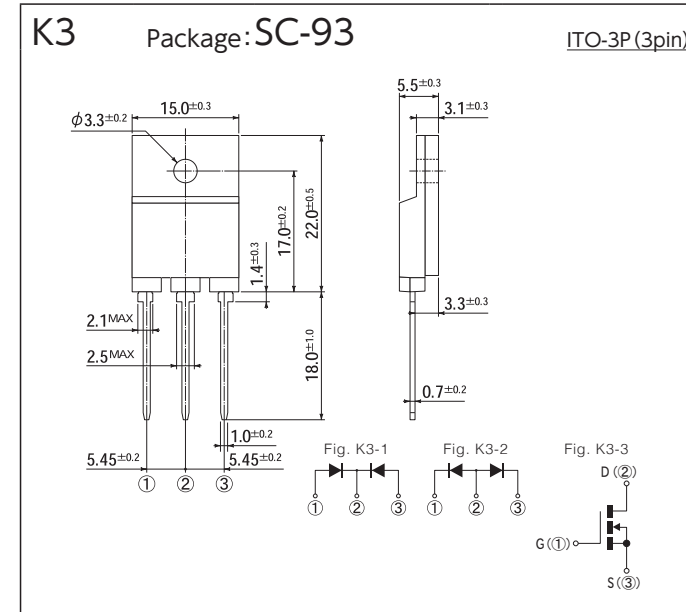
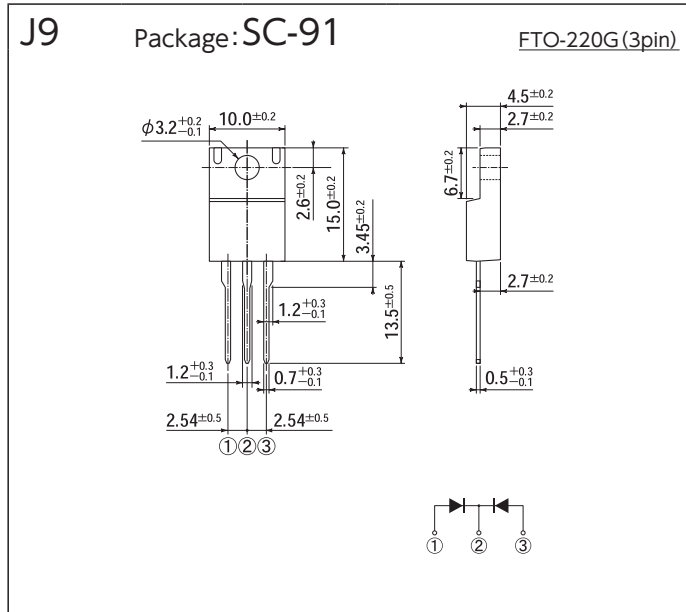
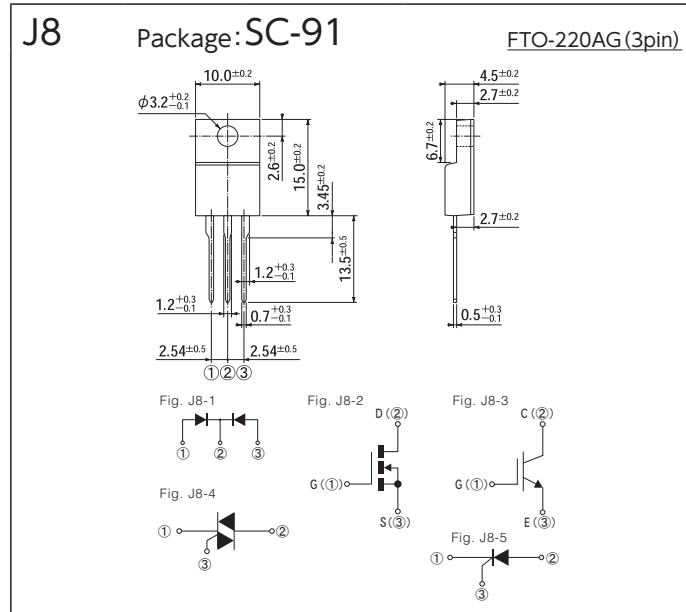
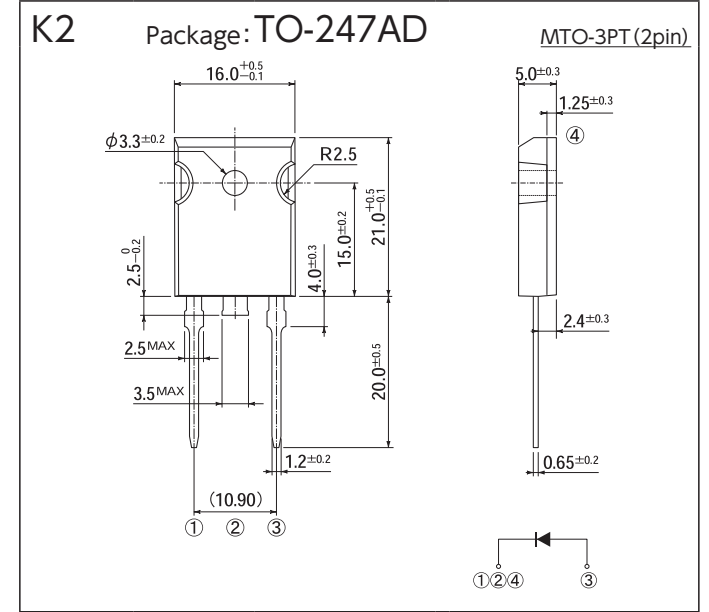
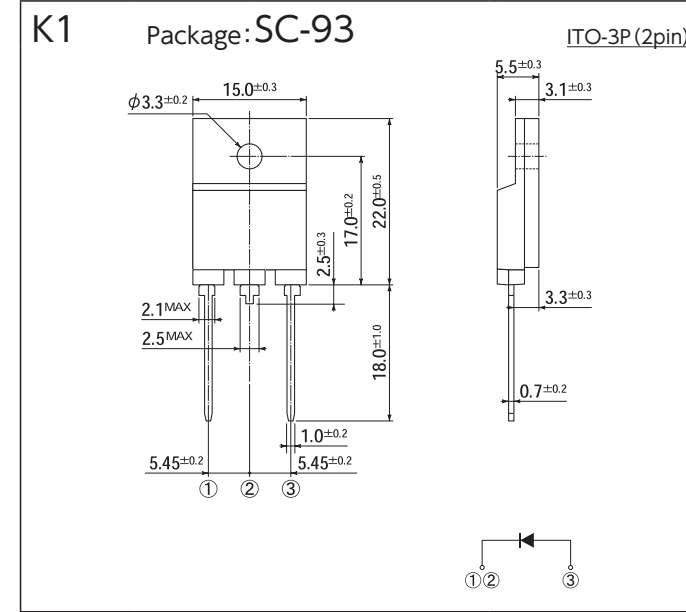
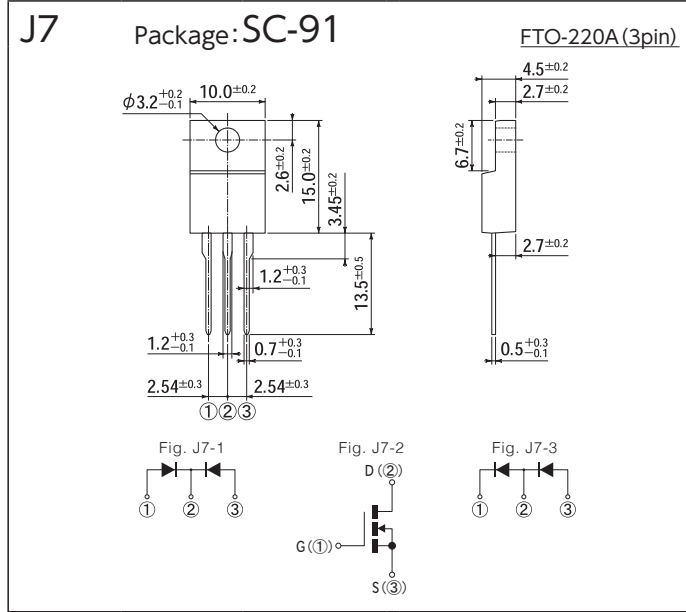
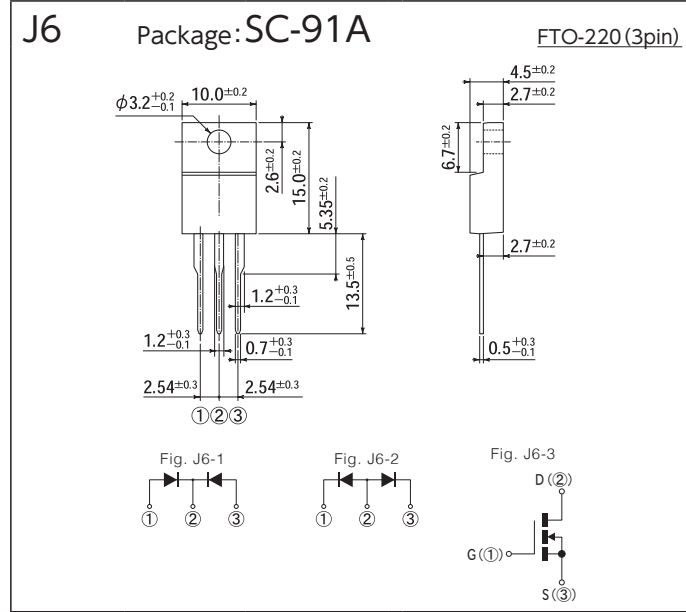
OUTLINE DIMENSIONS

[Unit:mm]



OUTLINE DIMENSIONS

[Unit:mm]



OUTLINE DIMENSIONS

PACKING SPECIFICATION

Please make your order: 'more than Inner Box Quantities' and 'a multiple of each Packing Unit'

Order Quantity & Packing Dimensions List

Please make your order: 'more than Inner Box Quantities' and 'a multiple of each Packing Unit'

| Package | | | Fig. | Spec Code | Terminal Plating | Weight (aprx.) | MSL | Remarks | Quantity | Inner Box | | Standard Packing | | Packing Box (mm) | | |
|--------------------|------------|------------|------|-----------|------------------|----------------|-----|----------|----------|--------------------------------|---------------------|------------------|-------------|------------------|-----|-----|
| JEDEC Package Code | JEITA Code | House Name | | | | | | | | Method | Quantity (Pcs./Box) | Pcs./Box | Weight (kg) | L | W | H |
| - | - | AX057 | A1 | -5060 | Sn | 190mg | - | | 4,000 | Tape, Ammo-Pack 52mm | 4,000 | 32,000 | 7.5 | 330 | 280 | 270 |
| - | - | AX06 | A2 | -7000 | Sn-Bi | 210mg | - | Standard | 3,000 | Tape, Ammo-Pack 26mm | 3,000 | 36,000 | 6.2 | 340 | 275 | 230 |
| - | - | AX078 | A4 | -7060 | Sn-Bi | 390mg | - | Standard | 4,000 | Tape, Ammo-Pack 52mm | 4,000 | 64,000 | 14.0 | 325 | 325 | 420 |
| - | - | AX10 | A5 | -7061 | Sn-Bi | 640mg | - | Standard | 4,000 | Tape&Reel, Diameter 300 φ 52mm | 4,000 | 20,000 | 6.3 | 325 | 325 | 420 |
| - | - | AX14 | A7 | -5060 | Sn | 1.1g | - | Standard | 3,000 | Tape, Ammo-Pack 26mm | 3,000 | 72,000 | 15.7 | 325 | 325 | 420 |
| DO-219AB similar | SC-109 | G1F | B1 | -5063R | Sn | 12mg | 1 | | 4,000 | Tape&Reel, Diameter 180 φ | 24,000 | 48,000 | 1.6 | 180 | 205 | 210 |
| DO-219AA similar | - | M1F | B2 | -6063 | Sn | 25mg | 1 | | 2,500 | Tape&Reel, Diameter 180 φ | 15,000 | 75,000 | 4.5 | 405 | 210 | 220 |
| DO-214AC | - | 1F | B3 | -5103 | Sn | 60mg | 1 | Standard | 2,000 | Tape&Reel, Diameter 180 φ | 8,000 | 40,000 | 4.1 | 340 | 195 | 205 |
| - | SC-110B | CE | B5 | -5063R | Sn | 30mg | - | | 7,500 | Tape&Reel, Diameter 330 φ | 45,000 | 90,000 | 10.8 | 395 | 245 | 395 |
| DO-214AA similar | - | M2F | B6 | -5073 | Sn | 75mg | 1 | Standard | 3,000 | Tape&Reel, Diameter 180 φ | 12,000 | 24,000 | 1.6 | 180 | 205 | 210 |
| - | - | 2F | B9 | -5103 | Sn | 180mg | 1 | Standard | 1,000 | Tape&Reel, Diameter 180 φ | 4,000 | 20,000 | 3.4 | 340 | 195 | 205 |
| - | - | SOPA-4 | C1 | -5073 | Sn | 90mg | 1 | | 4,000 | Tape&Reel, Diameter 330 φ | 4,000 | 48,000 | 8.6 | 395 | 245 | 395 |
| TO-269AA | - | 1Z | C2 | -5103 | Sn | 130mg | 1 | Standard | 60 | Magazine | 60 | 18,000 | 5.2 | 545 | 145 | 110 |
| - | - | 1N | C4 | -7102 | Sn-Bi | 290mg | 1 | | 1,000 | Tape&Reel, Diameter 180 φ | 3,000 | 36,000 | 9.2 | 395 | 245 | 395 |
| - | - | 1NA | C6 | -7062 | Sn-Bi | 290mg | 1 | Standard | 1,000 | Tape&Reel, Diameter 180 φ | 3,000 | 36,000 | 9.2 | 395 | 245 | 395 |
| - | - | 1W | C8 | -7102 | Sn-Bi | 500mg | 1 | | 1,000 | Tape&Reel, Diameter 250 φ | 1,000 | 10,000 | 5.5 | 275 | 285 | 295 |
| - | - | D3K | D1 | -7102 | Sn-Bi | 1.5g | - | | 70 | Magazine | 70 | 5,600 | 4.1 | 545 | 145 | 100 |
| - | - | 2S | D2 | -7062 | Sn-Bi | 2.1g | - | | 70 | Magazine | 70 | 5,600 | 4.1 | 545 | 145 | 100 |
| - | - | 3S | D3 | -7072 | Sn-Bi | 3.9-4.5g | - | | 70 | Magazine | 70 | 5,600 | 4.1 | 545 | 145 | 100 |
| - | - | 5S | D4 | -7101 | Sn-Bi | 6.3-7.5g | - | | 70 | Magazine | 70 | 5,600 | 4.1 | 545 | 145 | 100 |
| - | - | JB | D5 | -7101 | Sn-Bi | 2.7g | - | | 70 | Magazine | 70 | 5,600 | 4.1 | 545 | 145 | 100 |
| - | - | JA | D6 | -7101 | Sn-Bi | 4.5g | - | | 70 | Magazine | 70 | 5,600 | 4.1 | 545 | 145 | 100 |
| - | - | TSB | D7 | -7101 | Sn-Bi | 20g | - | | 1,000 | Tape&Reel, Diameter 250 φ | 1,000 | 10,000 | 5.5 | 275 | 285 | 295 |
| - | - | JC | D8 | -7101 | Sn-Bi | 20g | - | | 50 | Magazine | 50 | 4,000 | 4.4 | 545 | 145 | 110 |
| - | - | JF | D9 | -7062 | Sn-Bi | 25g | - | | 1,000 | Tape&Reel, Diameter 330 φ | 3,000 | 6,000 | 5.5 | 395 | 245 | 395 |
| - | - | JH | D10 | -7072 | Sn-Bi | 31g | - | | 2,000 | Tape&Reel, Diameter 380 φ | 2,000 | 10,000 | 7.8 | 395 | 245 | 395 |
| - | - | MCP | E1 | -4062 | Ni | 1.9g | 1 | | 50 | Magazine | 50 | 4,000 | 4.4 | 545 | 145 | 110 |
| - | - | | | -4072 | Ni | 1.9g | 1 | Standard | 300 | Tape&Reel, Diameter 255 φ | 300 | 1,500 | 5.0 | 280 | 275 | 190 |
| - | - | | | | Ni | 1.9g | 1 | Standard | 600 | Tape&Reel, Diameter 330 φ | 600 | 1,800 | 5.5 | 335 | 345 | 110 |

Exterior packaging is an example. Depending on the quantity ordered, the number of incoming, outline and weight may change.

| Package | | | | | | | | | | Inner Box | | | Standard Packing | | | Packing Box (mm) | | |
|--------------------|---------------|------------|--------|----------------|------------------|----------------|--------|---------|-------------------|-----------|---------------------------|----------|------------------|------|-----|------------------|-----|--|
| JEDEC Package Code | JEITA Code | House Name | Fig. | Spec Code | Terminal Plating | Weight (aprx.) | MSL | Remarks | Quantity | Method | Quantity (Pcs./Box) | Pcs./Box | Weight (kg) | L | W | H | | |
| - | - | D30VC | THD | E2 | -4000 | Ag | 12g | - | 100 | Tray | 100 | 500 | 7.0 | 375 | 285 | 160 | | |
| - | - | S2VB | THD | E3 | -5000 | Sn-Ag-Cu | 3.0g | - | 100 | Tray | 100 | 1,000 | 3.6 | 265 | 255 | 170 | | |
| - | - | S4VB | THD | E4 | -5000 | Sn-Ag-Cu | 5.2g | - | 100 | Tray | 100 | 1,000 | 5.9 | 315 | 285 | 220 | | |
| - | - | S5VB | THD | E5 | -5000 | Sn-Ag-Cu | 9.1g | - | 100 | Tray | 100 | 1,000 | 10.4 | 415 | 285 | 300 | | |
| - | - | S10VB | THD | E6 | -5000 | Sn-Ag-Cu | 8.0g | - | 100 | Tray | 100 | 1,000 | 9.3 | 375 | 285 | 270 | | |
| - | - | S15VB | THD | E7 | -4000 | Ag | 16g | - | 100 | Tray | 100 | 500 | 9.0 | 415 | 285 | 180 | | |
| - | - | S25VB | THD | E8 | -4000 | Ag | 21g | - | 60 | Bulk | 60 | 300 | 7.0 | 335 | 205 | 165 | | |
| - | - | S50VB | THD | E9 | -4000 | Ag | 28g | - | 50 | Tray | 50 | 200 | 6.2 | 335 | 205 | 165 | | |
| - | - | S3WB | THD | E10 | -5000 | Sn-Ag-Cu | 5.1g | - | 100 | Tray | 100 | 1,000 | 6.1 | 315 | 285 | 220 | | |
| - | - | S10WB | THD | E11 | -5000 | Sn-Ag-Cu | 9.0g | - | 100 | Tray | 100 | 1,000 | 9.3 | 375 | 285 | 270 | | |
| - | - | S15WB | THD | E12 | -5000 | Sn-Ag-Cu | 16g | - | 100 | Tray | 100 | 1,000 | 15.1 | 415 | 285 | 300 | | |
| - | - | S20WB | THD | E13 | -5000 | Sn-Ag-Cu | 20g | - | 100 | Tray | 100 | 700 | 15.0 | 415 | 285 | 300 | | |
| - | - | SVTA | THD | E14 | -5000 | Sn-Ag-Cu | 30g | - | 50 | Tray | 50 | 250 | 8.7 | 460 | 295 | 240 | | |
| - | - | SVT | THD | E15 | -4000 | Ag | 31g | - | 45 | Bulk | 200 | 200 | 13.6 | 335 | 205 | 165 | | |
| - | - | MODULE | - | F1 F2 F3 | -4000 | Ni | 42-66g | - | 25 | Tray | 100 | 200 | 13.4 | 480 | 330 | 210 | | |
| - | - | MG001 | THD | F4 | -7101 | Sn-Bi | 10g | - | 15 | Magazine | 15 | 450 | 7.1 | 623 | 232 | 144 | | |
| - | - | MG031 | THD | F5 | -7101 | Sn-Bi | 7.7g | - | 12 | Magazine | 12 | 600 | 8.5 | 573 | 281 | 127 | | |
| - | - | MG032 | - | F6 | -4500 | Ni | 340g | - | 24 | Tray | 24 | 24 | 8.0 | 610 | 315 | 140 | | |
| - | - | MG038 | - | F7 | -4500 | Ni | 180g | - | 40 | Tray | 40 | 40 | 90 | 425 | 360 | 155 | | |
| - | - | MG048 | THD | F8 | -7101 | Sn-Bi | 7.7g | - | 9 | Magazine | 9 | - | - | - | - | - | | |
| - | - | SC-63 | E-pack | Only DE5VE40 | -5101 | Sn | 310mg | 1 | Standard | 80 | Magazine | 80 | 10,000 | 6.9 | 560 | 130 | 109 | |
| - | - | SC-63 | E-pack | Other | -5061 | Sn | 310mg | 1 | Standard | 1,500 | Tape&Reel, Diameter 250 φ | 1,500 | 6,000 | 2.9 | 260 | 260 | 99 | |
| - | - | SC-63 | E-pack | Other | -5071 | Sn | 310mg | 1 | Standard | 3,000 | Tape&Reel, Diameter 330 φ | 3,000 | 12,000 | 5.5 | 335 | 335 | 99 | |
| - | - | SC-63 | E-pack | Other | -7101 | Sn | 310mg | 1 | Standard | 80 | Magazine | 80 | 10,000 | 6.9 | 560 | 130 | 109 | |
| - | - | SC-63 | E-pack | Other | -7061 | Sn | 310mg | 1 | Standard | 1,500 | Tape&Reel, Diameter 250 φ | 1,500 | 6,000 | 2.9 | 260 | 260 | 99 | |
| - | - | SC-63 | E-pack | Other | -7071 | Sn | 310mg | 1 | Standard | 3,000 | Tape&Reel, Diameter 330 φ | 3,000 | 12,000 | 5.5 | 335 | 335 | 99 | |
| TO-252AA | - | FB | SMD | G2 | -5071 | Sn | 320mg | 1 | Standard | 3,000 | Tape&Reel, Diameter 330 φ | 6,000 | 36,000 | 18.2 | 380 | 365 | 390 | |
| TO-252AB similar | SC-63 | FE | SMD | G3 | -5061 | Sn | 320mg | 1 | Only Di | 1,500 | Tape&Reel, Diameter 254 φ | 1,500 | 6,000 | 2.9 | 260 | 260 | 99 | |
| TO-277A similar | - | FY | SMD | G4 | -5063R | Sn | 110mg | 1 | Standard (Di,MOS) | 3,000 | Tape&Reel, Diameter 330 φ | 3,000 | 12,000 | 5.5 | 335 | 335 | 99 | |
| TO-252AA similar | - | FR | SMD | G5 | -5071 | Sn | 350mg | 1 | | 1,500 | Tape&Reel, Diameter 180 φ | 6,000 | 30,000 | 5.0 | 405 | 210 | 220 | |
| - | - | LA | SMD | G6 | -5070 | Sn | 100mg | 1 | | 3,000 | Tape&Reel, Diameter 330 φ | 3,000 | 12,000 | 6.3 | 348 | 348 | 122 | |
| MO-235B similar | - | LF | SMD | G7 | -5071 | Sn | 100mg | 1 | | 3,000 | Tape&Reel, Diameter 330 φ | 3,000 | 12,000 | 3.0 | 350 | 350 | 135 | |
| - | SC-83 similar | STO-220 | SMD | H1 | -7102 | Sn-Bi | 1.4g | 1 | Standard | 50 | Magazine | 50 | 4,500 | 9.5 | 555 | 145 | 110 | |
| - | SC-83 similar | FD | SMD | H2 | -5072 | Sn | 1.5g | 1 | | 1,000 | Tape&Reel, Diameter 330 φ | 1,000 | 3,000 | 6.0 | 336 | 336 | 119 | |
| TO-263AB-1 | - | FH | SMD | H3 | -7071 | Sn-Bi | 1.5g | 1 | | 1,000 | Tape&Reel, Diameter 330 φ | 1,000 | 3,000 | 6.4 | 336 | 336 | 119 | |
| TO-263AB | - | FG | SMD | H4 | -5071 | Sn | 1.5g | 1 | | 1,000 | Tape&Reel, Diameter 330 φ | 1,000 | 5,000 | 11.0 | 375 | 360 | 250 | |
| - | SC-83 similar | FP | SMD | H5 | -5071 | Sn | 1.6g | 1 | | 1,000 | Tape&Reel, Diameter 330 φ | 1,000 | 3,000 | 6.4 | 336 | 336 | 119 | |
| TO-263AB | - | FZ | SMD | H6 | -5071 | Sn | 1.5g | - | | 1,000 | Tape&Reel, Diameter 330 φ | 1,000 | 3,000 | 7.0 | 375 | 360 | 165 | |
| TO-263SC | - | FZ-7p | SMD | H7 | -5071 | Sn | 1.5g | - | | 1,000 | Tape&Reel, Diameter 330 φ | 1,000 | 3,000 | 7.0 | 375 | 360 | 165 | |
| - | SC-91A | FTO-220 | THD | J1 J6 | -7600 | Sn-Bi | 1.9g | - | | 100 | Bulk | 2,000 | 4,000 | 8.3 | 365 | 220 | 335 | |
| - | SC-91 | FTO-220A | THD | J2 J7 | -7600 | Sn-Bi | 1.9g | - | | 100 | Bulk | 2,000 | 4,000 | 8.3 | 365 | 220 | 335 | |
| - | SC-91 | FTO-220AG | THD | J3 J8 | -5600 | Sn | 1.6g | - | | 100 | Bulk | 2,000 | 4,000 | 8.3 | 365 | 220 | 335 | |
| - | SC-91 | FTO-220G | THD | J4 J9 | -5600 | Sn | 1.6g | - | | 100 | Bulk | 2,000 | 4,000 | 8.3 | 365 | 220 | 335 | |
| TO-220AB | SC-46 | FA | THD | J5 | -5100 | Sn | 2.0g | - | | 50 | Magazine | 1,000 | 6,000 | 17.4 | 303 | 598 | | |

NOTES

How to Order

1. Indication of Spec. Code when ordering

Please specify the Spec. Code when ordering semiconductors.
For the Spec. Code, Please refer to as follows and "PACKING SPECIFICATION".

Example Ordering THD type of S1ZB60
S1ZB60-7101

2. Spec Code

The code specifies each packing form, lead forming and terminal plate material.

Please refer to "PACKING SPECIFICATION".

Example 5 0 0 0

- Terminal forming
 - 0 : Straight terminal
 - 1 to 9 : Each number shows type of form
- Packing form
 - 0 : Standard
 - In case of surface mounting devices
 - 5, 6 : Small reel
 - 7 : Large reel
 - In case of axial device
 - 6 : Lead length 52mm (T52)
 - 7 : Lead length 26mm (T26)
- Minimum packing unit
 - 0 : Bulk, tray or taping
 - 1 : Magazine
 - 5 : Tray
 - 6 : Packed (FTO-220 Package)
- Terminal plate material
 - 3 : Ni/Pd/Au, Sn-Ag
 - 4 : Ni, Ag
 - 5 : Sn-Ag-Cu, Sn, Ag, Sn-Cu
 - 6 : Sn
 - 7 : Sn-Bi

Outline of Packing Form

1. Minimum packing unit

- Bulk : The form in which parts are inserted into plastic bags or cardboard boxes.
- Tray : The form in which parts are inserted in to containers made of resin.



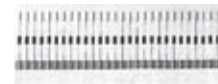
- Magazine : The form in which parts are inserted into resin cartridges designated for automatic inserters.



- Taping
 - Reel (Surface mounting devices)

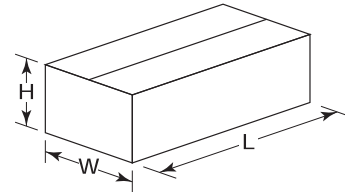


- Box (Axial devices)



2. Packing Box Dimensions

See the following pages for the dimensions of each cardboard box.



About AEC-Q101 & Automotive Grade

1. AEC-Q101

These products are AEC-Q101 compliant.

2. Automotive Grade

These products are produced on a designated production line qualified for internal automotive standards.

SALES OFFICES

U.S.A.

Shindengen America, Inc. www.shindengen.com/

2333 Waukegan Road Suite250, Bannockburn, IL.60015. U.S.A
Phone:+1-847-444-1363 FAX:+1-847-444-0654

Europe

Shindengen UK Ltd. www.shindengen.co.eu/

Head Office

Unit 1, 1 Tapper Walk, King's Cross, London, N1C 4AQ U.K.
Phone:+44-20-3829-6980 FAX:+44-20-3725-6855

German Branch

Prinzenallee 1, 40549 Düsseldorf, Germany
Phone:+49-211-5206-590 FAX:+49-211-4986-499

Asia

Shindengen Singapore PTE Ltd.

750d, Chai Chee Road, #05-01,
Viva Business Park, Singapore 469004
Phone:+65-6445-0082 FAX:+65-6445-6089

Shindengen (H.K.) Co., Ltd.

Head Office

Suite 2006B, 20/F., Exchange Tower, 33 Wang Chiu Road,
Kowloon Bay, HK
Phone:+852-2317-1884 FAX:+852-2314-8561

Taiwan Representative Office

20Fl, No.85, Sec.1, Jhongsiao E. Road, Taipei, 10049,
Taiwan, R.O.C.
Phone:+886-2-2321-3990 FAX:+886-2-2358-3991

Shindengen (SHANGHAI) Electric Co., Ltd.

Room1506, Sheng Gaolnt'l Building, 137 Xian Xia Road,
Chang Ning, Shanghai, China
Phone:+86-21-6270-8000 FAX:+86-21-6270-0419

Shindengen Electric Mfg. Co., Ltd.

Seoul Office

B701-4. 230, Simin-daero, Dongan-gu, Anyang-si,
Gyeonggi-do, 14067 Korea
Phone:+82-31-385-1431 FAX:+82-31-385-1430

Japan

Shindengen Electric MFG. Co., Ltd. www.shindengen.co.jp/

Head Office

New-Ohtemachi Bldg., 2-2-1, Ohtemachi, Chiyoda-ku,
Tokyo 100-0004, Japan
Phone:+81-3-3279-4431 FAX:+81-3-3279-6478

Osaka Branch Office

Minami Senba Heart Bldg., 2-3-2, Minami-Senba,
Chuo-ku, Osaka City, Osaka 542-0081, Japan
Phone:+81-6-6264-7770 FAX:+81-6-6260-1222

Nagoya Branch Office

Nagoya Daiichi Bldg., 1-19-24, Nishiki, Naka-ku,
Nagoya City, Aichi 460-0003, Japan
Phone:+81-52-221-1361 FAX:+81-52-201-4780

Hamamatsu branch

Hamamatsu Daiichi Seimei Nittsu Bldg., 110-5, Itaya-cho,
Naka-ku, Hamamatsu City, Shizuoka 430-0928, Japan
Phone:+81-53-450-3800 FAX:+81-53-450-3801

Utsunomiya Sales Office

Flora Bldg., 1-9-15 Higashi Syukugou Utsunomiya City,
Tochigi 321-0953, Japan
Phone:+81-28-637-3615 FAX:+81-28-637-3115

- All specifications are subject to change without notice.
- Please consult us for the latest specifications before you order.
- Please use this products after reading manual well.

• Printed January 2020

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