

Semiconductor Product Catalog





Notes

- ⚠ If you wish to use any such product, please be sure to refer to the specifications issued by Shindengen.
- ⚠ All products described or contained herein are designed with a quality level intended for use in standard applications requiring an ordinary level of reliability. If these products are to be used in equipment or devices for special or specific applications requiring an extremely high grade of quality or reliability in which failures or malfunctions of products may directly affect human life or health, a local Shindengen office must be contacted in advance to confirm that the intended use of the product is appropriate. Shindengen products are grouped into the following three applications according to the quality grade.
 - Standard applications
Computers, office automation and other office equipment, communication terminals, test and measurement equipment, audio/visual equipment, amusement equipment, consumer electronics, machine tools, personal electronic equipment, industrial equipment, etc.
 - Special applications
Transportation equipment (vehicles, ships, etc.), trunk-line communication equipment, traffic signal control systems, anti-disaster/crime systems, safety equipment, medical equipment, etc.
 - Specific applications
Nuclear reactor control systems, aircraft, aerospace equipment, submarine repeaters, life support equipment and systems, etc.
- ⚠ Although Shindengen continuously endeavors to enhance the quality and reliability of its products, customers are advised to consider and take safety measures in their design, such as redundancy, fire containment and anti-failure, so that personal injury, fires, or societal damages can be prevented.
- ⚠ Please note that all information described or contained herein is subject to change without notice due to product upgrades and other reasons. When buying Shindengen products, please contact the Company's offices or distributors to obtain the latest information.
- ⚠ Shindengen shall not bear any responsibility with regards to damages or infringement of any third-party patent rights and other intellectual property rights incurred due to the use of information on this website.
- ⚠ The information and materials on this website neither warrant the use of Shindengen's or any third party's patent rights and other intellectual property rights, nor grant license to such rights.
- ⚠ In the event that any product described or contained herein falls under the category of strategic products controlled under the Foreign Exchange and Foreign Trade Control Law of Japan, exporting of such products shall require an export license from the Japanese government in accordance with the above law.
- ⚠ No reprinting or reproduction of the materials on this website, either in whole or in part, is permitted without proper authorization from Shindengen.

| | |
|--------|--|
| P3-6 | INDEX |
| P7-10 | GENERAL RECTIFYING DIODES |
| P11-20 | BRIDGE DIODES |
| P21-30 | SCHOTTKY BARRIER DIODES |
| P31-36 | FAST RECOVERY DIODES |
| P37-38 | THYRISTORS |
| P39-40 | SIDACs |
| P41-42 | TRIACs |
| P43-44 | SURGE ABSORBERS |
| P45-48 | TVS (Transient Surge Suppressor) |
| P49-54 | POWER MOSFETs |
| P55-56 | POWER MODULES |
| P57-60 | POWER ICs |
| P61-82 | PACKAGE LIST • OUTLINE DIMENSIONS |
| P83-84 | PACKING SPECIFICATION |
| P85 | NOTES • How to Order • Outline of Packing Form • About AEC-Q101 & Automotive Grade |

INDEX

| Type No. | Page | Type No. | Page | Type No. | Page | Type No. | Page | Type No. | Page | Type No. | Page | Type No. | Page | Type No. | Page |
|----------|------|-----------|------|-------------|------|-------------|------|------------|------|------------|------|-----------|------|----------------|------|
| D1F60 | 8 | D3CE4S | 22 | D8JBB80V | 14 | D25JAB60V | 14 | DE5LC20U | 34 | DG1S6 | 22 | KD8SF60 | 42 | M3F60 | 8 |
| D1F60A | 8 | D3CE6S | 22 | D10FDC10ST | 26 | D25JAB80V | 14 | | | DG1S6A | 22 | KD12SF60 | 42 | M3FE40 | 8 |
| D1FE60 | 8 | D3CE15ST | 22 | D10FR60LA | 32 | | | DE5S4M | 22 | DL04-18F1 | 46 | KD16SF60 | 42 | M3FE60 | 8 |
| D1FH3 | 22 | D3CE20LUS | 32 | D10FR60V | 8 | | | DE5S6M | 22 | DL04-33F1 | 46 | KD20SF60 | 42 | M3FL20U | 32 |
| D1FJ4 | 22 | D3CE60K | 32 | D10FY4R5ST | 22 | D25XB60 | 14 | DE5SC3ML | 26 | DL04-36F1 | 46 | KL3L07 | 44 | MCZ5203SE | 60 |
| D1FJ8 | 22 | D3CE60V | 8 | D10FY4R5SY | 22 | D25XB80 | 14 | DE5SC4M | 26 | G1V(A)8C | 40 | KL3N14 | 44 | MCZ5205SE | 60 |
| D1FJ8A | 22 | D3CE60VE | 8 | D10FY6ST | 22 | D25XB100 | 14 | DE5SC6M | 26 | G1V(A)10C | 40 | KL3R20 | 44 | MCZ5207SG | 60 |
| D1FJ10 | 22 | D3F60 | 8 | D10FY6SY | 22 | D30FD60K | 32 | DE5VE40 | 8 | G1V(A)12C | 40 | KL3Z07 | 44 | MCZ5208SG | 60 |
| D1FK60 | 32 | D3FE60 | 8 | D10FY10ST | 22 | D30FDC4S | 26 | DE10S3L | 22 | G1V(A)13C | 40 | KL3Z18 | 44 | MCZ5209SN | 60 |
| D1FK70 | 32 | D3FJ10 | 22 | D10FY10SY | 22 | D30FDC10ST | 26 | DE10SC3L | 26 | G1V(A)14C | 40 | KP20NU11 | 44 | MCZ5211ST | 60 |
| D1FK100 | 32 | D3FK60 | 32 | D10FY15ST | 22 | D30FDC15ST | 26 | DE10SC4 | 26 | G1V(A)15C | 40 | KP40NU11 | 44 | MCZ5216ST | 60 |
| D1FK120 | 32 | D3FS4A | 22 | D10FY60VE | 8 | D30JCB100K | 18 | DF5VD60 | 10 | G1V(A)20C | 40 | KP40RU22 | 44 | MCZ5303SG | 60 |
| D1FK120P | 32 | D3FS6 | 22 | D10JBB60V | 14 | D30JCT120V | 16 | DF8L60US | 32 | G1V(B)20C | 40 | KU4F8 | 44 | MCZ5303SH | 60 |
| D1FL20U | 32 | D3S4M | 24 | D10JBB80V | 14 | | | DF10L60 | 32 | G1V(B)22C | 40 | KU4F12 | 44 | MCZ5601SC | 60 |
| D1FL40U | 32 | D3S6M | 24 | D10SBS4 | 18 | | | DF10LC20U | 34 | G1V(B)24C | 40 | KU5S31NS | 44 | MG020200 | 56 |
| D1FM3 | 22 | D3SB60 | 14 | D10XB60 | 14 | D30VC60 | 10 | DF10LC30 | 34 | G1VL8C | 40 | KU10L08 | 44 | MG020201 | 56 |
| D1FS4 | 22 | D3SB80 | 14 | D10XB60H | 14 | D30XBN20 | 18 | DF10NC15 | 26 | G1VL10C | 40 | KU10N14 | 44 | MG031B090004A | 56 |
| D1FS4A | 22 | D3SBA60 | 14 | D10XB80 | 14 | D30XT80 | 16 | DF10SC4M | 26 | G1VL15C | 40 | KU10NU11 | 44 | MG031E120004A | 56 |
| D1FS6 | 22 | D4F60 | 8 | D15FR4ST | 22 | D35XB80 | 14 | DF10SC6 | 26 | G1VL20C | 40 | KU10NU13 | 44 | MG031G148004A | 56 |
| D1FS6A | 22 | D4S60L | 14 | D15FR60LA | 32 | D40FDC10ST | 26 | DF10SC9 | 26 | G1VL22C | 40 | KU10R23NS | 44 | MG031L080006A | 56 |
| D1FT4 | 22 | D4SB80 | 14 | D15FR60V | 8 | D40FDC15ST | 26 | DF15JC10 | 26 | G1VL24C | 40 | KU10R27NS | 44 | MG031MC148004A | 56 |
| D1FT4A | 22 | D4SBL20U | 18 | D15FY4R5ST | 22 | D45JCT120V | 16 | DF15NC15 | 26 | K1V10 | 40 | KU10R29NS | 44 | MG031MD110006A | 56 |
| D1FT6 | 22 | | | D15FY4R5SY | 22 | D45JCT160V | 16 | DF15SC4M | 26 | K1V11 | 40 | KU10S31NS | 44 | MG031N110006A | 56 |
| D1FT6A | 22 | D4SBN20 | 18 | D15FY6ST | 22 | D45XT80 | 16 | DF15VD60 | 10 | K1V12 | 40 | KU10S35NS | 44 | MG032A4207R5A | 56 |
| D1FT10 | 22 | D4SBS4 | 18 | D15FY6SY | 22 | D45XT160 | 16 | DF16VC60R | 10 | K1V14 | 40 | KU15N14 | 44 | MG032B420010A | 56 |
| D1FT10A | 22 | D4SBS6 | 18 | D15FY10ST | 22 | D50JCB80V | 14 | DF20JC10 | 26 | K1V22 | 40 | LL15XB60 | 20 | MG038A200080A | 18 |
| D1FT15A | 22 | D5CE4S | 22 | D15FY10SY | 22 | D50XB80 | 14 | DF20L60 | 32 | K1V22(W) | 40 | LL25XB60 | 20 | MG038B150080A | 18 |
| D1N60 | 8 | D5FE60 | 8 | D15FY15ST | 22 | D70JHB80V | 14 | DF20L60U | 32 | K1V24 | 40 | LN1F60 | 8 | MG038C200160A | 18 |
| D1N80 | 8 | D5FY4R5ST | 22 | D15JAB60V | 14 | D75JFT80V | 16 | DF20LC20US | 34 | K1V24(W) | 40 | LN1WBA60 | 20 | MG038D150160A | 18 |
| D1NF60 | 32 | D5FY4R5SY | 22 | D15JAB80V | 14 | D100JHT80V | 16 | DF20LC30 | 34 | K1V26 | 40 | LN4SB60 | 20 | MG048A150004A | 56 |
| D1NK60 | 32 | D5FY6ST | 22 | D15XB60 | 14 | D100JHT120V | 16 | DF20NC15 | 26 | K1V26(W) | 40 | LN6SB60 | 20 | MG048B100006A | 56 |
| D1NK100 | 32 | D5FY6SY | 22 | D15XB60H | 14 | D100JHT160V | 16 | DF20SC4M | 26 | K1V36(W) | 40 | LN15XB60 | 20 | MH2501SC | 60 |
| D1NL20U | 32 | D5FY10ST | 22 | D15XB80 | 14 | | | DF20SC9M | 26 | K1V38(W) | 40 | LN15XB60H | 20 | MH2511SC | 60 |
| D1NL40U | 32 | D5FY10SY | 22 | D15XB100 | 14 | | | DF25SC6M | 26 | K1V(A)10 | 40 | LN25XB60 | 20 | MS1003SH | 60 |
| D1NS4 | 24 | D5FY15ST | 22 | D15XBN20 | 18 | D120SC4M | 30 | DF25V60 | 8 | K1V(A)11 | 40 | M1F60 | 8 | MS1004SH | 60 |
| D1NS6 | 24 | D5FY60K | 32 | D15XBS6 | 18 | D120SC6M | 30 | DF30JC4 | 26 | K1V(A)12 | 40 | M1F80 | 8 | MS1005SK | 60 |
| D1UBA80 | 12 | D5SB60 | 14 | D20FD60LU | 32 | D180SC4M | 30 | DF30JC6 | 26 | K1V(A)16 | 40 | M1FE40 | 8 | MS1006SK | 60 |
| D2F60 | 8 | D5SB80 | 14 | D20FDC10ST | 26 | D180SC6M | 30 | DF30JC10 | 26 | K1VZL09 | 40 | M1FE60 | 8 | MS1007SH | 60 |
| D2FK60 | 32 | D5SBA60 | 14 | D20FDC15ST | 26 | | | DF30NC15 | 26 | K1VZL20 | 40 | M1FH3 | 22 | MV1001SC | 58 |
| D2FL20U | 32 | D6FEC4ST | 26 | D20FDC20L | 34 | | | DF30SC3ML | 26 | KC3FB40H | 38 | M1FJ4 | 22 | MV1002SC | 58 |
| D2FL40 | 32 | D6FEC10ST | 26 | D20FDC20LUS | 34 | D240SC4M | 30 | DF30SC4M | 26 | KC5FB40H | 38 | M1FK60 | 32 | MV1011SC | 58 |
| D2FS4 | 22 | D6FEC12ST | 26 | D20FR4ST | 22 | D240SC6M | 30 | DF40SC3L | 26 | KC5FB60H | 38 | M1FL20U | 32 | MV1012SC | 58 |
| D2FS6 | 22 | D6FEC15ST | 26 | D20FR4R5S | 22 | D360SC4M | 30 | DF40SC4 | 26 | KC5FB60HRT | 38 | M1FL40U | 32 | MV2002SG | 58 |
| D2L20U | 32 | D6JBB60V | 14 | | | D360SC6M | 30 | DG1H3 | 22 | KC5FB60HRT | 38 | M1FM3 | 22 | MV2052SG | 58 |
| D2L40U | 32 | D6JBB80V | 14 | | | DE3L20UA | 32 | DG1H3A | 22 | KC5SF60HRT | 38 | M1FS4 | 22 | POR5B60HP2 | 54 |
| D2S4M | 24 | D6SB60L | 14 | | | | | DG1J10A | 22 | KC8SF80 | 38 | M1FS6 | 22 | P1B52HP2 | 54 |
| D2S6M | 24 | D6SB80 | 14 | D20XB60 | 14 | DE3S4M | 22 | DG1M3 | 22 | KD3FB60 | 42 | M2F60 | 8 | P1FE90VX3 | 54 |
| D2SB60 | 14 | D6SBN20 | 18 | D20XB80 | 14 | DE3S6M | 22 | DG1M3A | 22 | KD3SF60 | 42 | M2FH3 | 22 | P1R5B40HP2 | 54 |
| D2SB60A | 14 | D8FD60LUS | 32 | D20XBS6 | 18 | DE5L60A | 32 | DG1N15A | 22 | KD3SF60E | 42 | M2FL20U | 32 | P2B60HP2F | 54 |
| D2SBA60 | 14 | D8JBB60V | 14 | D25FD60V | 8 | DE5L60U | 32 | DG1S4 | 22 | KD5SF60 | 42 | M2FM3 | 22 | P2FE60VX5K | 54 |

INDEX











| Type No. | Page | Type No. | Page | Type No. | Page | Type No. | Page | Type No. | Page | Type No. | Page | Type No. | Page | Type No. | Page |
|-------------|------|-------------|------|-------------|------|--------------|------|------------|------|-------------|------|-------------|------|-----------|------|
| P2R5B52HP2F | 54 | P20FH50HP2 | 54 | P50LF10SL | 50 | P105LF4QNK | 50 | S10VB60 | 16 | S60SC3LT | 28 | SG30SC3LM | 28 | ST04-14F1 | 46 |
| P3B28HP2 | 54 | P21F28HP2 | 54 | P50LF10SLK | 50 | P126FP10SN | 52 | S10VT60 | 18 | S60SC4MT | 28 | SG30SC4M | 28 | ST04-16F1 | 46 |
| P3F60HP2 | 54 | P22F10SN | 52 | P50LF10SN | 50 | P126FP10SNK | 52 | S10VT80 | 18 | S60SC6MT | 28 | SG30SC6M | 28 | ST04-18F1 | 46 |
| P3FH90VX3 | 54 | P22FE4SBK | 52 | P50LF10SNK | 50 | P140LF4QL | 50 | S10VTA60 | 18 | S90T15V | 24 | SG30TC10M | 28 | ST04-20F1 | 46 |
| P4B40HP2 | 54 | P23F40HP2FM | 54 | P54B4SN | 50 | P140LF4QLK | 50 | S10VTA80 | 18 | SF3K60M | 34 | SG30TC12M | 28 | ST04-24F1 | 46 |
| P4B60HP2F | 54 | P23LA10SL | 50 | P55F6EN | 52 | P140LF4QN | 50 | S10WB60 | 16 | SF3L60U | 34 | SG30TC15M | 28 | ST04-27F1 | 46 |
| P4F60HP2 | 54 | P24B4SB | 50 | P56LA4SN | 50 | P140LF4QNK | 50 | S15VB60 | 16 | SF5K60M | 34 | SG40TC10M | 28 | ST04-30F1 | 46 |
| P4F90VX3 | 54 | P25B6EB | 50 | P60B4EL | 50 | P153FP6SN | 52 | S15VT60 | 18 | SF5L40UM | 34 | SG40TC12M | 28 | ST04-33F1 | 46 |
| P5B52HP2 | 54 | P25LA12SL | 50 | P60B4SN | 50 | P153FP6SNK | 52 | S15VT80 | 18 | SF5L60U | 34 | ST02-12G1 | 46 | ST04-36F1 | 46 |
| P5F50HP2 | 54 | P25LF12SL | 50 | P60B6EL | 50 | P168FP7R5SN | 52 | S15VTA60 | 18 | SF5LC40UM | 36 | ST02-14G1 | 46 | ST04-39F1 | 46 |
| P5F50HP2F | 54 | P25LF12SLK | 50 | P60B6EN | 50 | P168FP7R5SNK | 52 | S15VTA80 | 18 | SF8K60M | 34 | ST02-16G1 | 46 | ST06-18CE | 46 |
| 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 |
| P6B28HP2 | 54 | P26B10SL | 50 | P64LF6QLK | 50 | P180FP4SN | 52 | S20K100V | 34 | SF10K60M | 34 | ST02-24G1 | 46 | ST06-33CE | 46 |
| P6B40HP2 | 54 | P26B10SN | 50 | P64LF6QN | 50 | P180FP4SNK | 52 | S20LC20UST | 36 | SF10KC60M | 36 | ST02-27G1 | 46 | ST06-36CE | 46 |
| P6B52HP2 | 54 | P26F28HP2 | 54 | P64LF6QNK | 50 | P180FP6SN | 52 | S20LC30T | 36 | SF10L60U | 34 | ST02-30G1 | 46 | ST06-39CE | 46 |
| P6F50HP2 | 54 | P26FE10SLK | 52 | P66F7R5SN | 52 | P180FP6SNK | 52 | S20LC40UT | 36 | SF10L60MSM | 34 | ST02-33G1 | 46 | ST20-27F2 | 46 |
| P6FE25VX5K | 54 | P30B10EL | 50 | P66F7R5SNK | 52 | P211FZ4QMKA | 52 | S20LC40UV | 36 | SF10L60MVM | 34 | ST02-36G1 | 46 | ST20-30F2 | 46 |
| P7F60HP2 | 54 | P30FE4SLK | 52 | P70F5EN | 52 | P240FZ4QLA | 52 | S20LC60UST | 36 | SF10LC40UM | 36 | ST02-39G1 | 46 | ST20-33F2 | 46 |
| P7F90VX3 | 54 | P30FE6SLK | 52 | P70F7R5EN | 52 | P240FZ4QNKA | 52 | S20LC60USV | 36 | SF20K60M | 34 | ST02-43G1 | 46 | ST20-36F2 | 46 |
| P7FH60HP2 | 54 | P30FE7R5SLK | 52 | P70FP12SN | 52 | S1NAD80 | 10 | S20SC9MT | 28 | SF20KC60M | 36 | ST02-47G1 | 46 | ST20-47F2 | 46 |
| P8B10SB | 50 | P30LA10SL | 50 | P70FP12SNK | 52 | S1NB60 | 12 | S20VT60 | 18 | SF20L60U | 34 | ST02-58G1 | 46 | ST60-40MF | 46 |
| P8B28HP2 | 54 | P30W60HP2V | 54 | P70LF4QLK | 50 | S1NB80 | 12 | S20VT80 | 18 | SF20L60MSM | 34 | ST02-75F1 | 46 | ST60-48MF | 46 |
| P8B30HP2 | 54 | P32B12SN | 50 | P70LF4QNK | 50 | S1NBB80 | 12 | S20VTA60 | 18 | SF20L60MVM | 34 | ST02-82F1 | 46 | ST70-27F | 46 |
| P8F28HP2 | 54 | P32F12SN | 52 | P72LF7R5SL | 50 | S1NBC60 | 12 | S20VTA80 | 18 | SF20LC30M | 36 | ST02-100F1 | 46 | ST70-27FZ | 46 |
| P8F50HP2 | 54 | P32FG15SL | 52 | P72LF7R5SLK | 50 | S1NBC80 | 12 | S20WB60 | 16 | SG5L20USM | 34 | ST02-120F1 | 46 | ST70-27MF | 46 |
| P8FE10SBK | 52 | P32LF10SL | 50 | P72LF7R5SN | 50 | S1WB(A)60 | 12 | S20WB80 | 16 | SG5LC20USM | 36 | ST02-140F1 | 46 | ST70-30MF | 46 |
| P9B30HP2F | 54 | P32LF10SLK | 50 | P72LF7R5SNK | 50 | S1WB(A)60B | 12 | S25VB60 | 16 | SG5S4M | 24 | ST02-170F1 | 46 | ST80-14MF | 46 |
| P9B40HP2 | 54 | P32LF10SN | 50 | P80FG6EAL | 52 | S1WB(A)80 | 12 | S25VB80 | 16 | SG5S6M | 24 | ST02-200F1 | 46 | UD2KB80 | 14 |
| P10B28HP2 | 54 | P32LF10SNK | 50 | P80FG7R5EN | 52 | S1ZAS4 | 30 | S30K60T | 34 | SG5S9M | 24 | ST02-280F1 | 46 | UD3KB80 | 14 |
| P10F50HP2 | 54 | P34F6EL | 52 | P80FH5ENK | 52 | S1ZB60 | 12 | S30K60V | 34 | SG8SC4M | 28 | ST02-320F1 | 46 | UD4KB80 | 14 |
| P10F60HP2 | 54 | P36F28HP2 | 54 | P82F7R5SN | 52 | S1ZB80 | 12 | S30K100V | 34 | SG10L20USM | 34 | ST02D-82 | 48 | UD6KBA80 | 14 |
| P12F60HP2 | 54 | P36FH28HP2 | 54 | P85FG6EAL | 52 | S2K100 | 32 | S30SC4MT | 28 | SG10LC20USM | 36 | ST02D-140 | 48 | UD8KBA80 | 14 |
| P12FE7R5SBK | 52 | P38LF6QLK | 50 | P85W28HP2F | 54 | S2L20U | 32 | S30SC6MT | 28 | SG10SC3LM | 28 | ST02D-140F2 | 48 | VR-61F1 | 44 |
| P13F28HP2 | 54 | P38LF6QNK | 50 | P86F6SN | 52 | S2L40U | 32 | S30TC15T | 28 | SG10SC4M | 28 | ST02D-170 | 48 | | |
| P13F50HP2 | 54 | P40B10SL | 50 | P88FP10SN | 52 | S2L60 | 32 | S30V60T | 10 | SG10SC6M | 28 | ST02D-170F2 | 48 | | |
| P14FE6SBK | 52 | P40B10SN | 50 | P88FP10SNK | 52 | S2V60 | 8 | S30V80V | 10 | SG10SC9M | 28 | ST02D-200 | 48 | | |
| P15F50HP2 | 54 | P40B6SL | 50 | P90FG5R5SL | 52 | S2V80 | 8 | S30VT60 | 18 | SG10TC15M | 28 | ST02DH-280 | 48 | | |
| P15F60HP2 | 54 | P40F10SN | 52 | P94FG5R5SL | 52 | S2VB60 | 16 | S30VT80 | 18 | SG15SC4M | 28 | ST02DH-320 | 48 | | |
| P15F60HP2F | 54 | P40F12SN | 52 | P98LF6QL | 50 | S2WB(A)80 | 12 | S30VT160 | 18 | SG15SC6M | 28 | ST03-43F1 | 46 | | |
| P15FH60HP2 | 54 | P40LF12SL | 50 | P98LF6QLK | 50 | S3K60 | 32 | S30VTA60 | 18 | SG20JC6M | 28 | ST03-47F1 | 46 | | |
| P15LA12SL | 50 | P40LF12SLK | 50 | P98LF6QN | 50 | S3L20U | 32 | S30VTA80 | 18 | SG20LC20USM | 36 | ST03-58F1 | 46 | | |
| P16B6SB | 50 | P40LF12SN | 50 | P98LF6QNK | 50 | S3L40U | 32 | S30VTA160 | 18 | SG20SC3LM | 28 | ST03-68F1 | 46 | | |
| P17F28HP2 | 54 | P40LF12SNK | 50 | P100FA7R5EN | 52 | S3L60 | 32 | S40HC1R5T | 28 | SG20SC4M | 28 | ST03-240F1 | 46 | | |
| P18LA12SL | 50 | P42F6EN | 52 | P100FH4ENK | 52 | S3V60 | 8 | S40T15V | 24 | SG20SC6M | 28 | ST03D-82 | 48 | | |
| P19LA10SL | 50 | P46LF7R5SL | 50 | P100FP12SN | 52 | S3V80 | 8 | S50VB60 | 16 | SG20SC9M | 28 | ST03D-140 | 48 | | |
| P20B12SL | 50 | P46LF7R5SLK | 50 | P100FP12SNK | 52 | S3V100D | 8 | S50VB80 | 16 | SG20TC10M | 28 | ST03D-170 | 48 | | |
| P20B12SN | 50 | P46LF7R5SN | 50 | P105LF4QL | 50 | S3WB60 | 16 | S60HC1R5T | 28 | SG20TC12M | 28 | ST03D-200 | 48 | | |
| P20F50HP2 | 54 | P46LF7R5SNK | 50 | P105LF4QLK | 50 | S4VB60 | 16 | S60HC3T | 28 | SG20TC15M | 28 | ST03DH-240 | 48 | | |
| P20FE12SLK | 52 | P50F10SN | 52 | P105LF4QN | 50 | S5VB60 | 16 | S60JC10V | 28 | SG30JC6M | 28 | ST04-12F1 | 46 | | |

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 | — | — | ○ |
| | | D1F60A | 1.2 | 25 | 45 | 600 | 150 | 0.97 | 1.2 | 10 | — | — | ○ |
| SC-110B CE | B5-1 | D3CE60V | 3 | 101 *1 | 50 | 600 | 150 | 1.10 | 3 | 10 | — | — | ○ |
| | | D3CE60VE | 3.5 | 93 *1 | 60 | 600 | -55 to 150 | 1.10 | 3.5 | 10 | 25 | ○ | ■ |
| DO-214AA similar M2F | B6 | 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 | — | — | ○ |
| | | M3FE60 | 3 | 76 *1 | 90 | 600 | 150 | 1.05 | 3 | 10 | 25 | ○ | ○ |
| DO-214AA similar 2F | B9-1 | 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 | ○ | ○ |
| | | D4F60 | 4 | 68 *1 | 200 | 600 | 150 | 0.95 | 4 | 10 | — | — | ○ |
| | | D5FE60 | 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 | — | ○ | ○ |


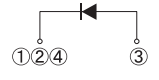
■ : New product *1 : Tl *2 : Tc *3 : trr(max)=3.5μs ■ : Please contact us.

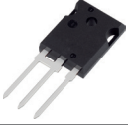
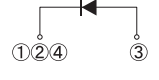
| Axial | | | | | | | | | | | | | |
|--|------|----------|--------------------------|-----------------------|----------|----------|---------|----------------------------|----------------------|--------------------------|-----------------|----------------------|------------|
| JEDEC Code JEITA Code House 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

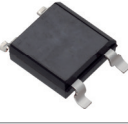
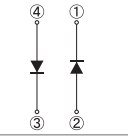

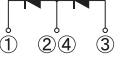
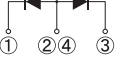
GENERAL RECTIFYING DIODES

Single


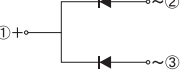
| Two Terminal Type | | | | | | | |
|--|--|------|------------------------|----------------------|---------|-----|---|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | Remarks |
| | | | | 400 | 600 | 800 | |
|  41.0 × 16.0 × 5.0(mm) | TO-247AD — MTO-3PT | K2 |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

| 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


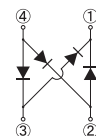






| Package | | Type No. | Absolute Maximum Ratings | | | | | Electrical Characteristics | | | | Based on AEC-Q101 | Automotive |
|--|------|----------|--------------------------|--------------------------------|----------------------|----------------------|---------------------|----------------------------|-------------------------------|--|-----------------------------|-------------------|------------|
| 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


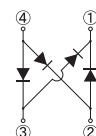





Bridge Diodes are suitable for the rectification of commercial voltage.

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 | — | — |
| — 1N | | S1NB80 | -7062 | 1 | 25 | 30 | 800 | 150 | 1.05 | 0.5 | 10 | — | — |
| — 1NA | C6-1 | S1NBB80 | -7062 | 1 | 26 | 50 | 800 | 150 | 1.05 | 0.5 | 10 | — | — |
| — 1NA | | S1NBC60 | -7062 | 1.5 | 105 * | 60 | 600 | 150 | 1.05 | 0.75 | 10 | — | — |
| — 1NA | | S1NBC80 | -7062 | 1.5 | 105 * | 60 | 800 | 150 | 1.05 | 0.75 | 10 | — | — |
| — 1W | C8 | S1WB(A)60 | -7062 | 1 | 25 | 30 | 600 | 150 | 1.00 | 0.5 | 10 | — | — |
| — 1W | | S1WB(A)60B | -7062 | 1 | 25 | 50 | 600 | 150 | 1.00 | 0.5 | 10 | — | — |
| — 1W | | S1WB(A)80 | -7062 | 1 | 25 | 30 | 800 | 150 | 1.00 | 0.5 | 10 | — | — |
| — 1W | | S2WB(A)80 | -7062 | 2 | 112 * | 50 | 800 | -40 to 150 | 1.05 | 1 | 10 | — | — |

* : Tl









THD (Through Hole Device)

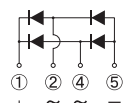
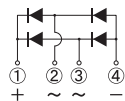
| THD (Through Hole Device) | | | | | | | | | | | | | |
|--|------|------------|------------|--------------------------|--------------------|----------|----------|------------|----------------------------|-------------------|-----------------------|----|------------|
| Package | | Type No. | Spec. Code | 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 | — | — |
| — 1Z | | 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 | — | — |
| — 1N | | S1NB80 | -7101 | 1 | 25 | 30 | 800 | 150 | 1.05 | 0.5 | 10 | — | — |
| — 1NA | C7 | S1NBB80 | -7101 | 1 | 26 | 50 | 800 | 150 | 1.05 | 0.5 | 10 | — | — |
| — 1NA | | S1NBC60 | -7101 | 1.5 | 105 * | 60 | 600 | 150 | 1.05 | 0.75 | 10 | — | — |
| — 1NA | | S1NBC80 | -7101 | 1.5 | 105 * | 60 | 800 | 150 | 1.05 | 0.75 | 10 | — | — |
| — 1W | C9 | S1WB(A)60 | -7101 | 1 | 25 | 30 | 600 | 150 | 1.00 | 0.5 | 10 | — | — |
| — 1W | | S1WB(A)60B | -7101 | 1 | 25 | 50 | 600 | 150 | 1.00 | 0.5 | 10 | — | — |
| — 1W | | S1WB(A)80 | -7101 | 1 | 25 | 30 | 800 | 150 | 1.00 | 0.5 | 10 | — | — |
| — 1W | | S2WB(A)80 | -7101 | 2 | 112 * | 50 | 800 | -40 to 150 | 1.05 | 1 | 10 | — | — |

* : Tl

BRIDGE DIODES


SIP (Single In-line Package) Bridge Diodes

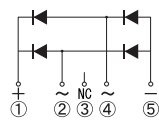
| THD (Through Hole Device) | | | | | | | |
|--|--|------|------------------------|------------------------------|------------------|----------|---------|
| Package | JEDEC Code JEITA Code House Name | Fig. | I _{F(AV)} [A] | V _{RRM} [V] | | | Remarks |
| | | | | 600 | 800 | 1000 | |
|  24.0 × 13.8 × 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 | Package | 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 | — |
| | | | 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 | — |
| | | | 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 | — |
| — — JA | D6 | | 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 | — |
| | | | 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 | ■ |


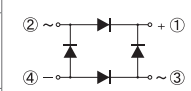






■ : New product *1 : T_a *2 : T_J ■ : Please contact us. UL : UL recognized (UL File No. E142422)

DIP (Dual In-line Package) Bridge Diode


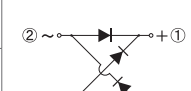



| JEDEC Code JEITA Code House Name | Package | Fig. | Type No. | Absolute Maximum Ratings | | | | Electrical Characteristics | | | UL | Automotive | |
|--|---------|------|-----------|--------------------------|-----------------------------------|----------------------|----------------------|----------------------------|--------------------------|----------------------------------|----|------------|---|
| | | | | 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


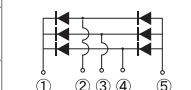




SQIP (Square In-line Package) Bridge Diodes

| 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 |

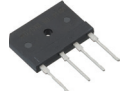
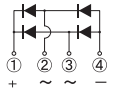
High Speed Bridge Diodes (FRD)

| 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 |


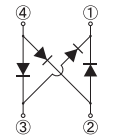
 : UL recognized (UL File No. E142422)


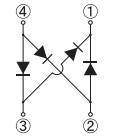

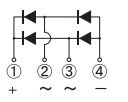
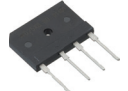
BRIDGE DIODES

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] | | |
| — — 5S | D4 | LL15XB60 | 15 | 124 | 200 | 600 | 150 | 0.90 | 7.5 | 10 | 3 | UL [®] | — |
| | | 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] | | | |
| — — 1W | C8(SMD) C9(DIP) | LN1WBA60 | 1.1 | 25 * | 50 | 600 | 150 | 1.00 | 0.55 | 10 | 5 | — | — | SMD-7072 DIP-7101 |
| — — 3S | D3 | LN4SB60 | 4 | 111 | 150 | 600 | 150 | 0.95 | 2 | 10 | 5 | UL [®] | — | |
| — — 5S | | 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 | — | — | |
| | | LN25XB60 | 25 | 85 | 350 | 600 | 150 | 1.05 | 12.5 | 10 | 5 | — | — | |


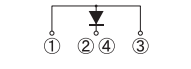
* : T_a UL[®] : UL recognized (UL File No. E142422)

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 | |
|  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 | |
|  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 |




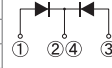

*1 : Tl

| 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 | | D6FEC45T | | | 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 | | D6FEC45T | 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 |
| — SC-83 similar STO-220 | H1-1 | | DF10SC6 | 60 | 10 | 132 | 150 | 150 | 0.58 | 5 | 4.5 | 260 | — | — | S series |
| | | | 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 |
| 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 | |

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 | | | |
|  | DO-219AA similar M1F | B2 | 1 | | | M1FK60 | | | | | | |
| | | | 1.1 | M1FL20U | | | | | | | | |
| | | | 1.5 | | M1FL40U | | | | | | | |
|  | DO-214AC 1F | B3-1 | 0.8 | | | D1FK60 | D1FK70 | | | | | |
| | | | 1 | | | | | D1FK100 | N D1FK120P D1FK120 | | | |
| | | | 1.1 | D1FL20U | | | | | | | | |
| | | | 1.5 | | D1FL40U | | | | | | | |
|  | SC-110B CE | B5-1 | 3 | D3CE20LUS | | D3CE60K | | | | | | ① → ② |
| | | | | | | | | | | | | |
|  | DO-214AA similar M2F | B6 | 1.5 | M2FL20U | | | | | | | | |
| | | | 3 | M3FL20U | | | | | | | | |
|  | DO-214AA similar 2F | B9-1 | 1.3 | | D2FL40 | | | | | | | |
| | | | 1.5 | D2FL20U | | D2FK60 | | | | | | |
| | | | 2.1 | | | D3FK60 | | | | | | |
|  | SC-63 E-pack | G1-5 | 5 | | | DE5L60U DE5L60A | | | | | | ① ④ ② N.C. ③ |
| | | | | | | | | | | | | |
|  | TO-277A similar FY | G4 | 5 | | | D5FY60K | | | | | | ① → ②③ |
| | | | | | | | | | | | | |
|  | SC-83 similar STO-220 | H1-2 | 8 | | | DF8L60US | | | | | | ① ②④ ③ |
| | | | 10 | | | DF10L60 | | | | | | |
| | | | 20 | | | DF20L60 DF20L60U | | | | | | |
|  | TO-252AA similar FR | G5 | 10 | | | D10FR60LA | | | | | | ① NC ②④ ③ |
| | | | 15 | | | D15FR60LA | | | | | | |
|  | SC-83 similar FD | H2-1 | 8 | | | D8FD60LUS | | | | | | ① NC ②④ ③ |
| | | | 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 | | | | |
|  | AX057 | A1 | 0.8 | | | D1NF60 D1NK60 | | | | | | |
| | | | 1 | D1NL20U | D1NL40U | | | | D1NK100 | | | |
|  | AX078 | A4-1 | 1.5 | D2L20U | | | | | | | | ① → ② |
| | | | 2 | | D2L40U | | | | | | | |
|  | AX10 | A5-1 | 1.5 | S2L20U | | S2L60 | | | | | | ① → ② |
| | | | 2 | | S2L40U | | | | S2K100 | | | |
|  | AX14 | A7 | 2.2 | | | S3L60 | | | | | | ① → ② |
| | | | 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 | |
| DO-214AA similar M2F | B6 | | M2FL20U | 200 | 1.5 | 31 *2 | 50 | 150 | 0.92 | 1.5 | 10 | 35 | — | ○ | — | |
| | | | M3FL20U | 200 | 3 | 75 *1 | 75 | 150 | 0.95 | 3 | 10 | 35 | ○ | ○ | — | |
| DO-214AA similar 2F | B9-1 | | D2FL40 | 400 | 1.3 | 25 *2 | 40 | 150 | 1.3 | 1.3 | 10 | 50 | — | — | — | |
| | | | 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 | |
| SC-63 E-pack | G1-5 | | D3FK60 | 600 | 2.1 | 93 *1 | 120 | 150 | 1.2 | 2.1 | 10 | 75 | — | ○ | K series | |
| | | | DE3L20UA | 200 | 3 | 137 | 60 | 150 | 0.98 | 3 | 10 | 35 | — | ■ | — | |
| | | | DE5L60U | 600 | 5 | 91 | 60 | 150 | 3.0 | 5 | 25 | 25 | — | — | — | |
| TO-277A similar FY | G4 | | DE5L60A | 600 | 5 | 119 | 60 | 150 | 2.0 | 5 | 10 | 50 | — | ■ | — | |
| | | | D5FY60K | 600 | 5 | 130 *1 | 200 | -55 to 150 | 1.25 | 5 | 10 | 95 | — | ■ | K series | |
| | | | DF8L60US | 600 | 8 | 66 | 60 | 150 | 3.6 | 8 | 50 | 25 | — | — | US series | |
| SC-83 similar STO-220 | H1-2 | | 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 | — | — | — | |
| | | | D1NK100 | 1000 | 1 | 127 *1 | 30 | 150 | 2.1 | 1 | 10 | 75 | — | — | K series | |
| 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 | — | — | — | |
| 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 | | |
| | | | 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 | | | | | | | | | | | | | | |
|--|------|------------|--------------------------|---------------------------|--------------------------------------|-------------------------|------------------------|--------------------------------|-------------------------------------|---|----------------------------------|----------------------|------------|-----------|
| 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} [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 | | | | | | | | | | | | | | |
|--|------|----------|--------------------------|---------------------------|--------------------------------------|-------------------------|------------------------|--------------------------------|-------------------------------------|---|----------------------------------|----------------------|------------|----------|
| 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} [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 |


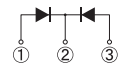


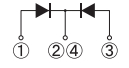

Center Tap, Common Cathode

| Surface Mount | | | | | | | | | | | | | | |
|--|------|------------|--------------------------|---------------------------|--------------------------------------|-------------------------|------------------------|--------------------------------|-------------------------------------|---|----------------------------------|----------------------|------------|--------|
| 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} [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 | | SG5LC20USM | 200 | 5 | 133 | 70 | 150 | 0.96 | 2.5 | 10 | 25 | - | - | - |
| | | | SG10LC20USM | 200 | 10 | 122 | 90 | 150 | 0.96 | 5 | 10 | 25 | - | - | - |
| | | | SG20LC20USM | 200 | 20 | 95 | 150 | 150 | 0.96 | 10 | 10 | 25 | - | - | - |
| TO-247AD MTO-3PT | K5-2 | | 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 | - | - | - |
| | | | S20LC60UST | 600 | 20 | 63 | 60 | 150 | 3.60 | 10 | 50 | 25 | - | - | - |
| TO-247AD MTO-3PV | K7-1 | | S20LC40UV | 400 | 20 | 123 | 200 | 150 | 1.25 | 10 | 10 | 30 | - | ○ | - |
| | | | S20LC60USV | 600 | 20 | 65 | 60 | 150 | 3.60 | 10 | 50 | 25 | - | ○ | - |



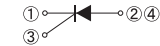

■ : Please contact us.


FAST RECOVERY DIODES

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 | | | | |
| $I_T(AV)$ [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 | - |



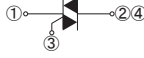
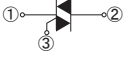








TRIACs

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 | + | — | + |




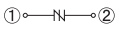
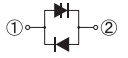
SURGE ABSORBERS

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.


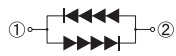
- Applications**
1. Lightning surge adsorption for communications circuits.
 2. Lightning surge adsorption for transmitters and switchboards.
 3. Surge protection for ISDN terminals.

| 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 | - | - | |
| | B7 | B8 | KU10NU11 | 100 | 10/1000 | 60 | 125 | 100 | 150 | - | - | |
| | | B7 | KU4F12 | 40 | 10/1000 | 100 | 125 | 110 | 100 | 100 | - | - |
| | | B8 | 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 | | | | | | | |
| | 3.5 x 1.6 x 0.8(mm) | 5.0 x 2.5 x 2.0(mm) | 4.7 x 2.4 x 0.98(mm) | 7.6 x 4.0 x 2.8(mm) | 9.0 x 7.0 x 9.0(mm) | 13.2 x 10.2 x 4.7(mm) | 15.0 x 10.2 x 4.0(mm) |
| JEDEC Code | DO-219AB similar | DO-214AC | DO-214AC | — | — | SC-83 similar | TO-263AB |
| JEITA Code | SC-109 | — | — | — | — | STO-220 | — |
| House Name | G1F | 1F | 1F | 2F | MCP | — | 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 | ■ | ○ | | |
| ST02-58G1 | 175 | -55 to 175 | 45 | 52 | 64 | 2 | 5 | 45 | ○ | ○ | | | | |
| 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 | ○ | ○ | | |
| — 2F | 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 | ○ | ○ | | |
| — MCP | E1 | 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 | — | ○ | | |
| | | ST60-40MF | 6000 | -40 to 150 | 32 | 36.5 | 44 | 1 | 5 | 32 | — | ○ | | |
| — 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 |  |  | |
| VBR (typ) [V] | 82 | ST02D-82 | ST03D-82 |
| | 145 | ST02D-140F2 | ST03D-140 |
| | 170 | ST02D-170F2 | 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] | Tj [°C] | VRM (max) [V] | | ZD | | | Di | | | |
| JEDEC Code | Fig. | | | | ZD | Di | VBR (min) [V] | VBR (max) [V] | Conditions IR [mA] | IR (max) [μA] | IR (max) [μA] | Conditions VR [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] | Tj [°C] | VRM (max) [V] | | ZD | | | Di | | | |
| JEDEC Code | Fig. | | | | ZD | Di | VBR (min) [V] | VBR (max) [V] | Conditions IR [mA] | IR (max) [μA] | IR (max) [μA] | Conditions VR [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 MODULES

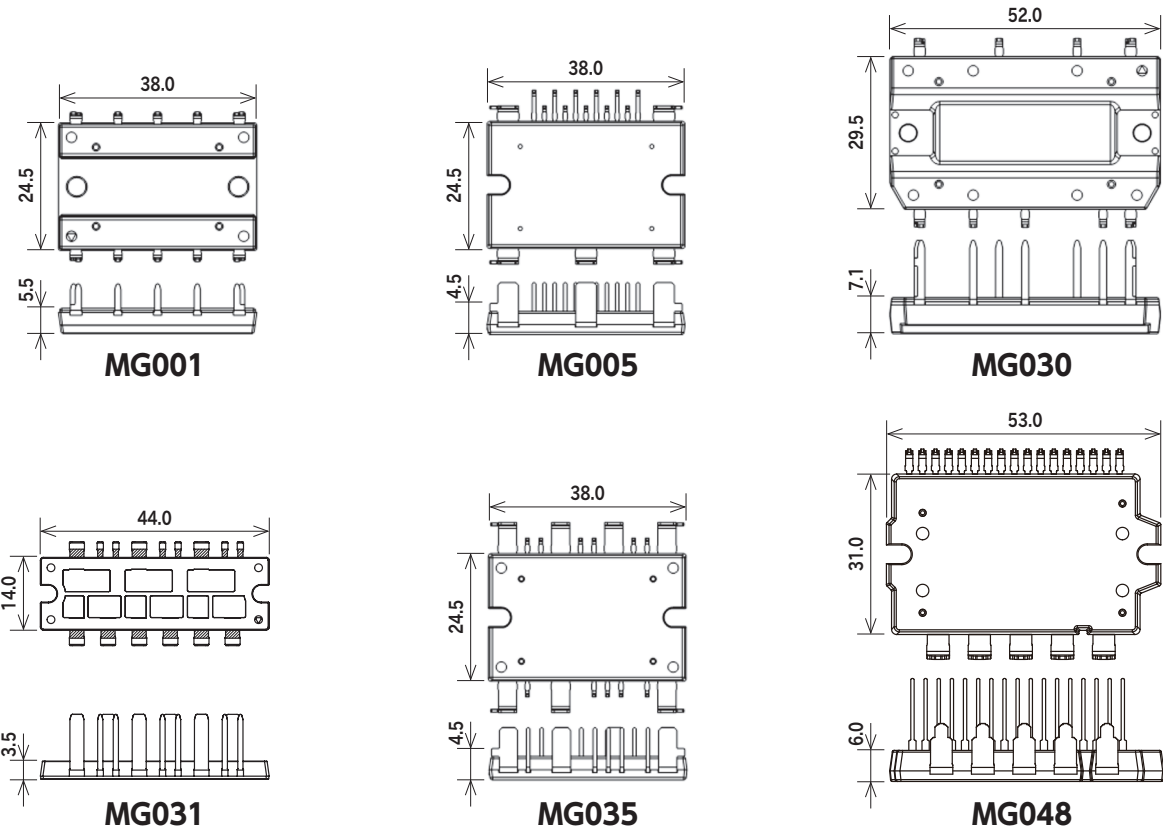
Power Modules include combinations of various power semiconductors.

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

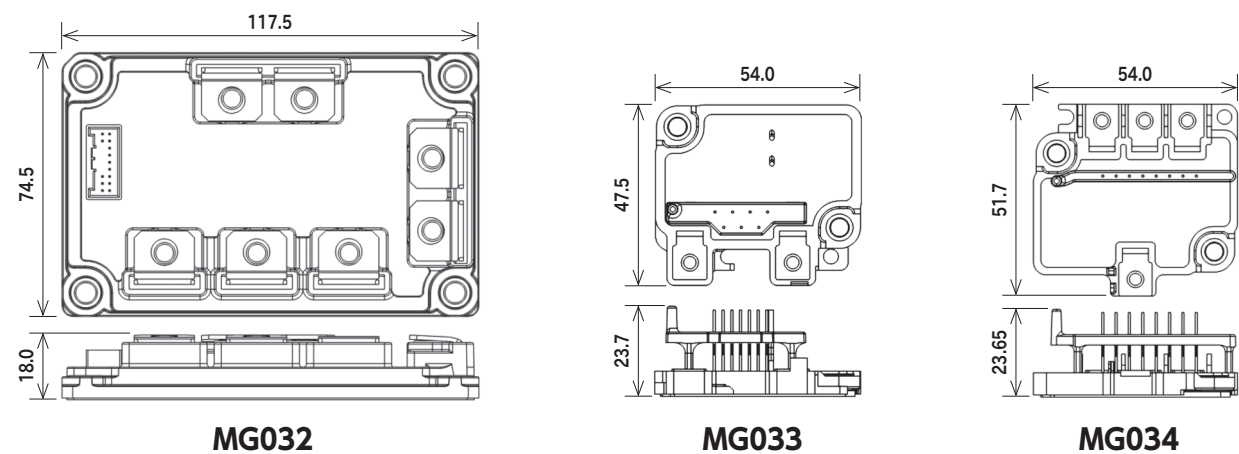
At Shindengen, a multitude of packages allow us to meet customer needs of MOSFET, diodes, and other products.

Semi customizable support and customizable package design support are available.

Transfer Type Package Sample



Potting Type Package Sample



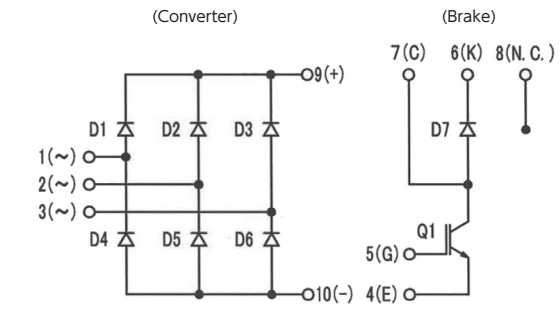
CB Module Series

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 | Fig. | VRRM | IF (AV) | Conditions | Vf (max) | Conditions | VCEs | Ic | VCE (sat) (typ) | Conditions | VRRM | IF (AV) | | | Conditions | Vf (max) | Conditions | trr (max) |
| | House Name | | [V] | [A] | Tc [°C] | [V] | [A] | [V] | [A] | [V] | [A] | [V] | [A] | [°C] | [V] | [A] | [ns] | | | |
| 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

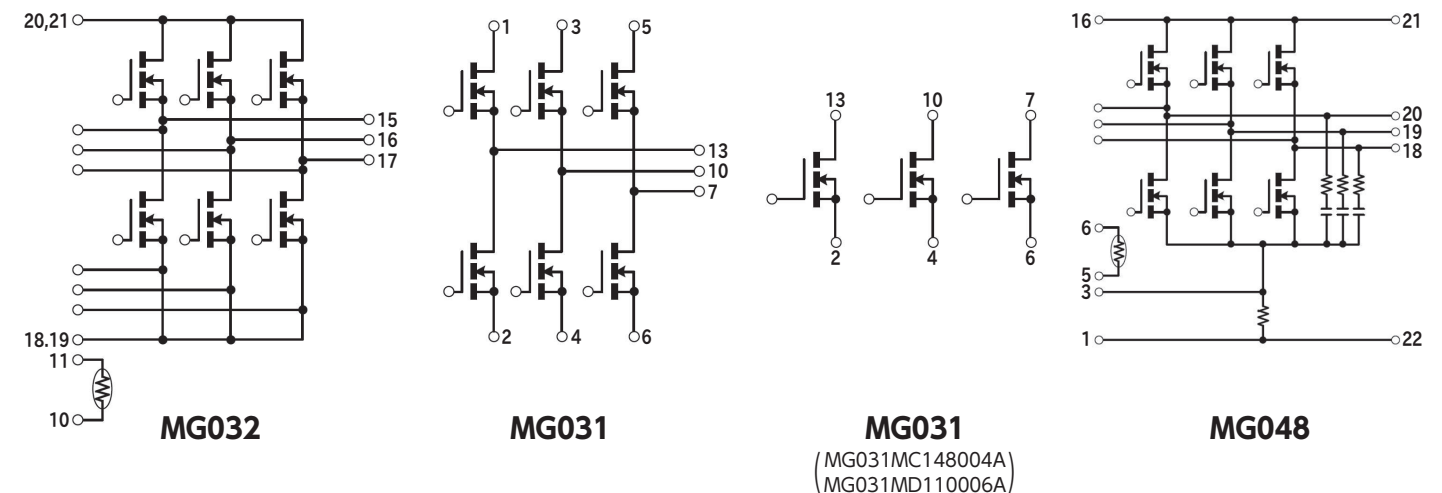
INV Module Series

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) | | |
| | JEDEC Code | JEITA Code | [V] | [A] | [A] | [W] | [°C] | [mΩ] | [mΩ] | [pF] | [nC] | [V] | [°C/W] | | |
| MG032A4207R5A | - | - | 75 | 420 | 840 | 500 | 150 | - | 0.98 | 80120 | 505 | 3.0 | 0.25 | - | ○ |
| MG032B420010A | MG032 | - | 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 | - | 60 | 80 | 320 | 125 | 175 | 4.47 | 5.60 | 3570 | 65 | 3.0 | 1.2 | - | ■ |
| ★MG031N110006A | - | - | 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 | - | 40 | 150 | 600 | 147 | 150 | 2.1 | 2.7 | 5900 | 111 | 3.0 | 0.85 | - | ■ |
| ★MG048B100006A | - | - | 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



MG032

MG031

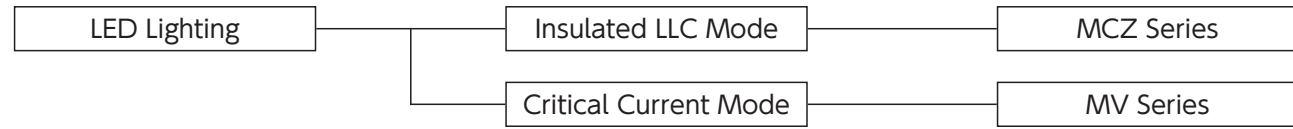
MG031
(MG031MC148004A)
(MG031MD110006A)

MG048

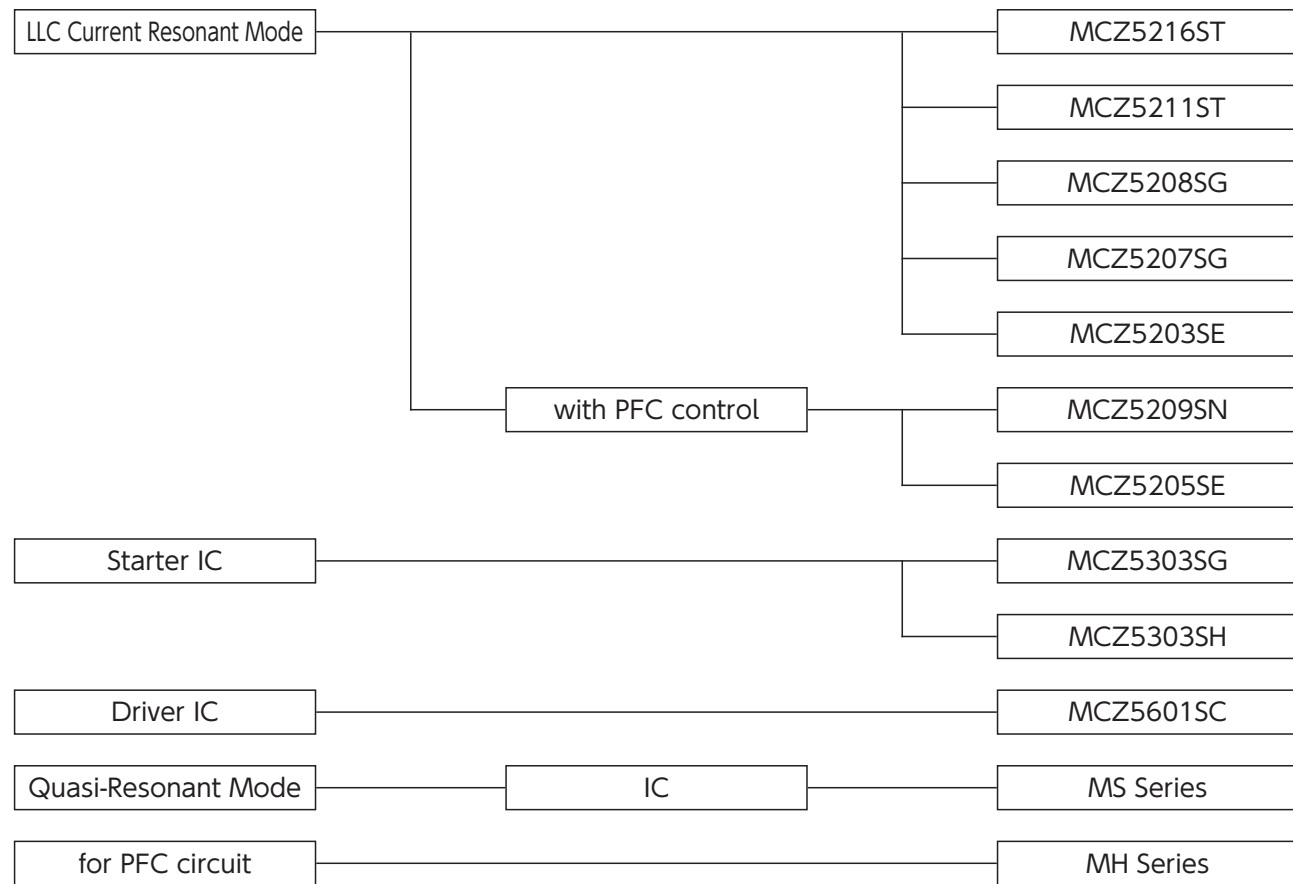
POWER ICs

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 | - | - | - | |
| | | | 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | - | 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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |


 : 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 | | | | | | | | |
|  | - | L3 | MCZ5303SH | 95 to 450 | 18.5(typ) | Yes | No | No | - |
| | SOP8/7J | | | | | | | | |



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 | | | | | | | | | | | |
|  | - | L2 | MCZ5601SC | High-side/Low-side | 600 | 22 | 2/2 | 8.2 to 9.0 | 7.2 to 8.0 | 400 | 400 | - |
| | SOP8J | | | | | | | | | | | |

 : 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 | | 11 to 24 | Vcc Latch | Timer Latch 2sec. (typ) | Auto Burst Mode/S-Stby Mode | 2 skip | - | |
| | | | MS1003SH | | | | | 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 | | | | | | 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

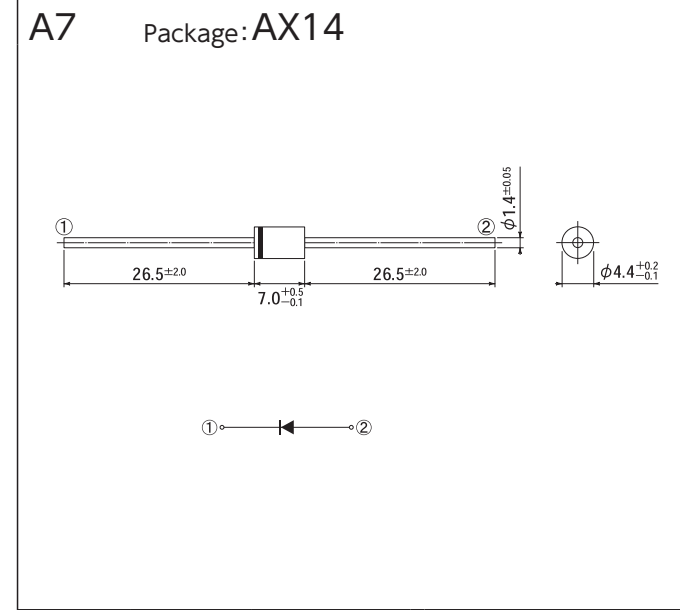
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
|---|---|--|--|---|---|---|---|---|---|--|---|
| A | A1 Package:AX057  | A2 Package:AX06  | A3 Package:AX06  | A4 Package:AX078  | A5 Package:AX10  | | A6 Package:AX10  | A7 Package:AX14  | | | |
| | | | | | | | | | | | |
| B | B1 Package:DO-219AB similar <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

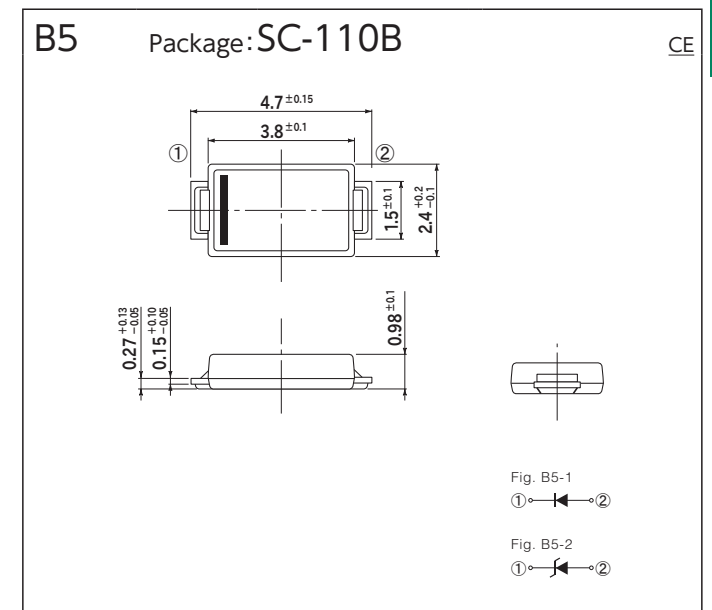
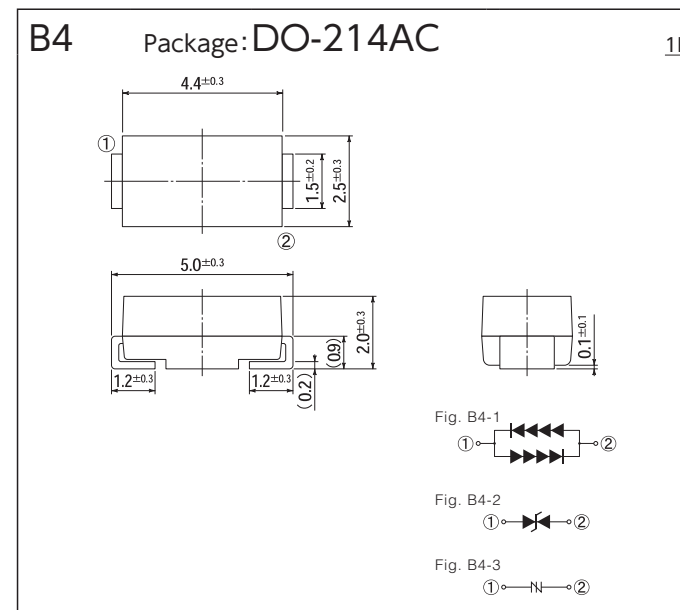
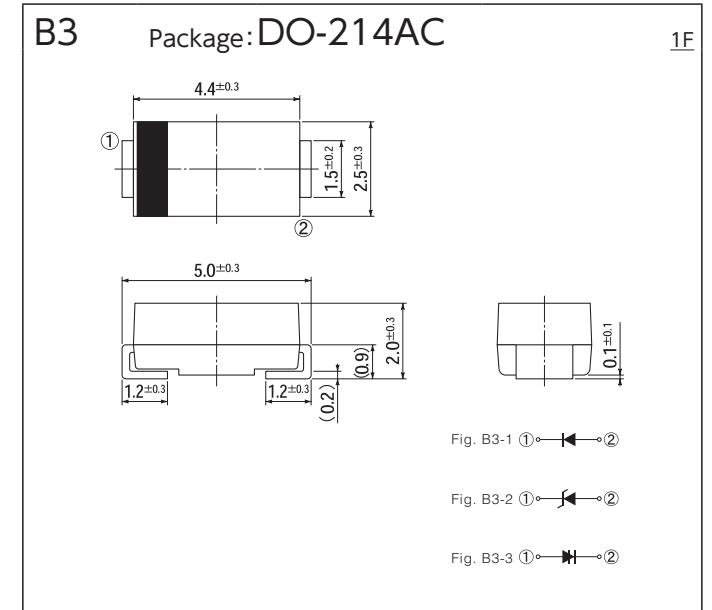
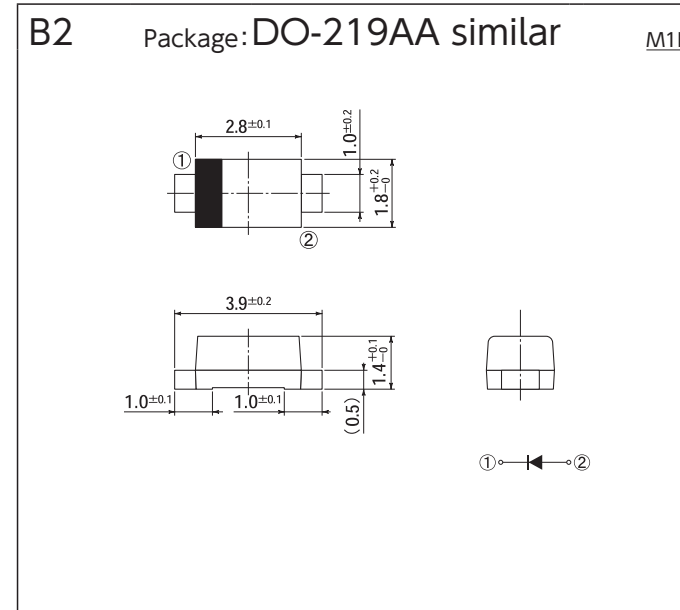
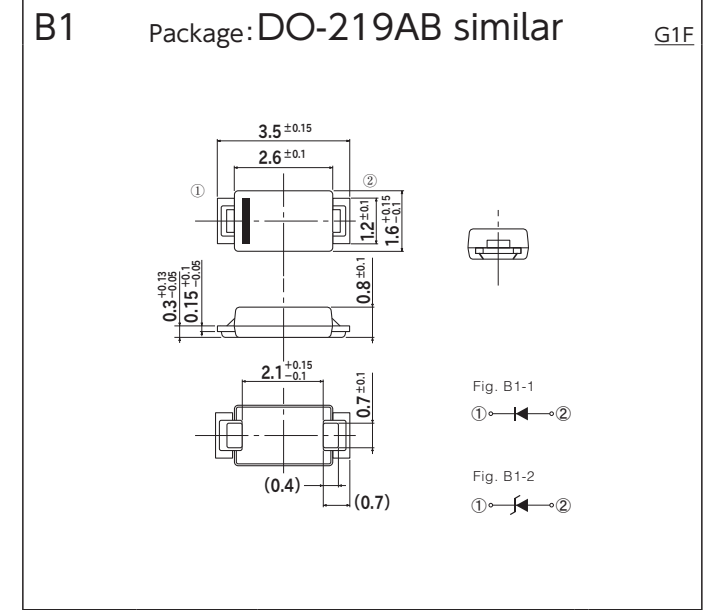
| | 1 | 2 | 3 | 4 | 5 | | 6 | 7 | 8 | 9 | 10 |
|---|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|--|-------------------------------------|-------------------------------------|--------------------------------------|-------------------------------------|----|
| 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]

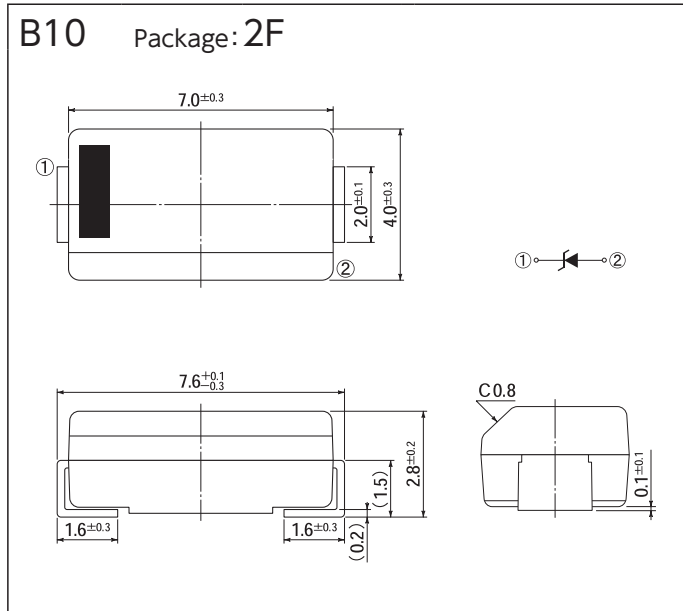
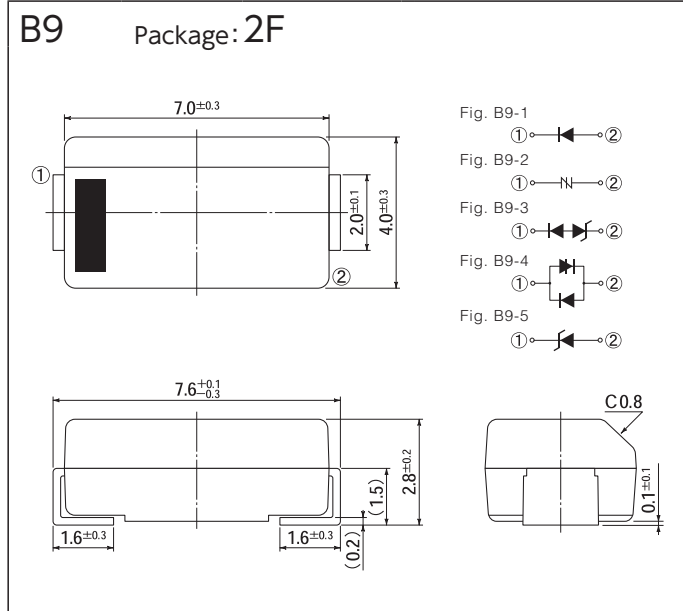
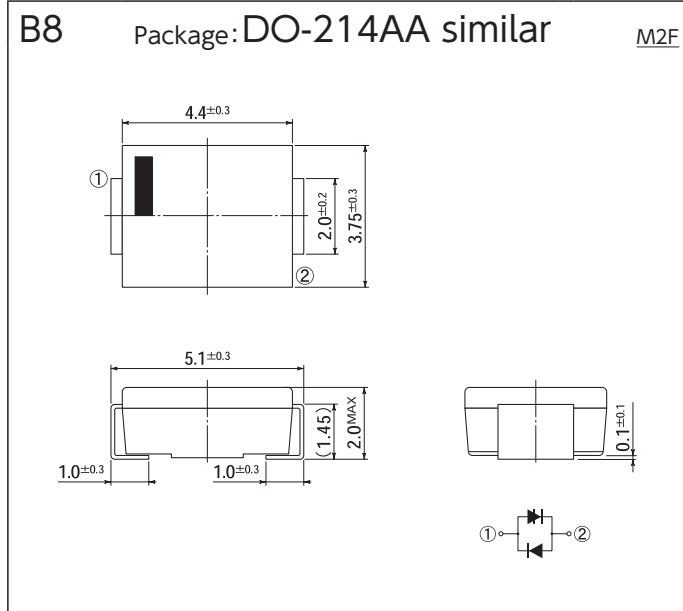
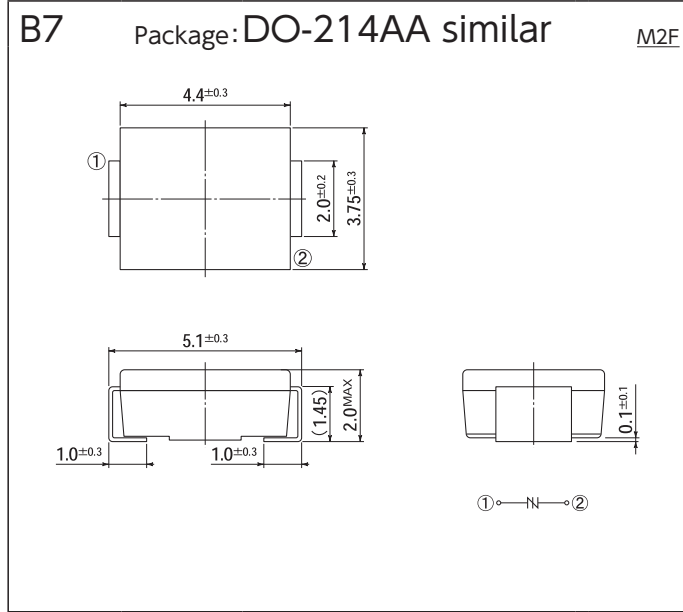


[Unit:mm]

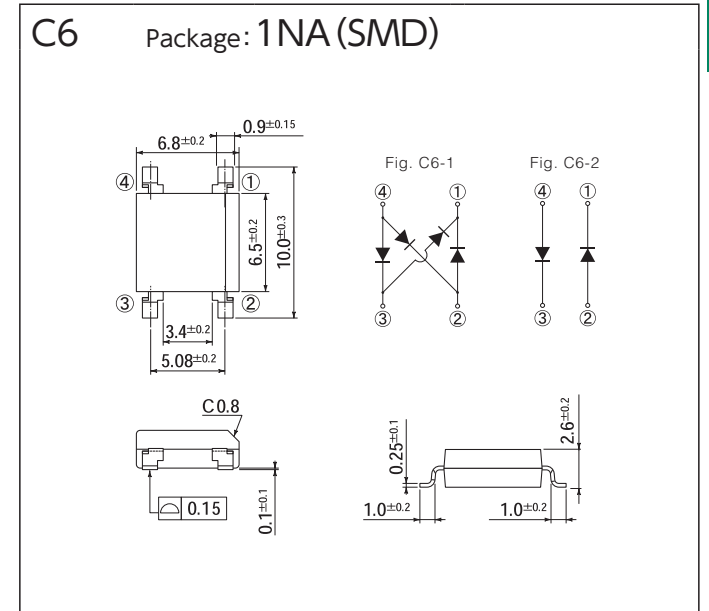
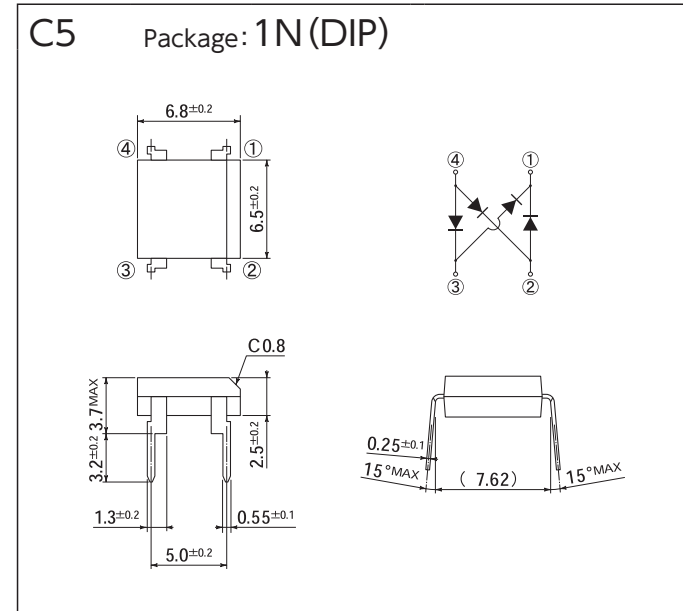
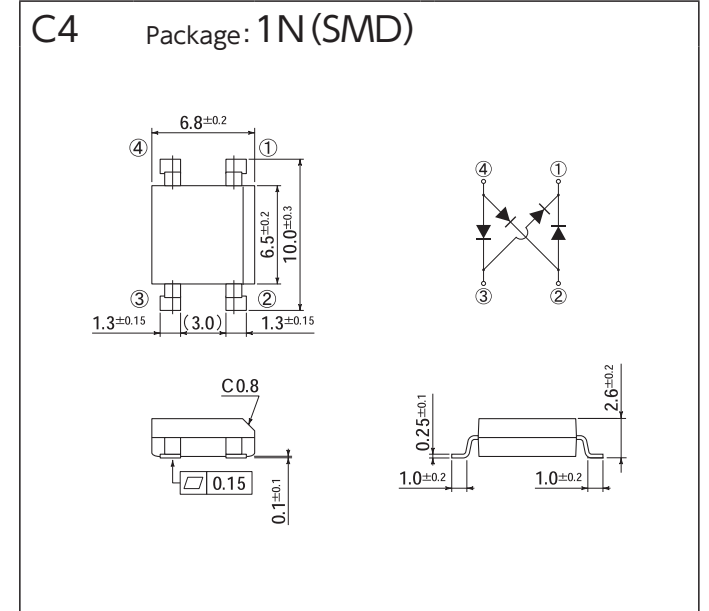
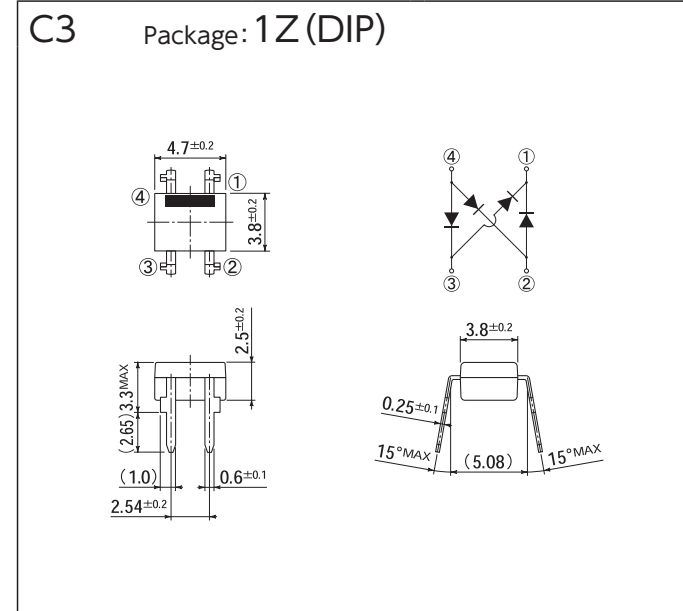
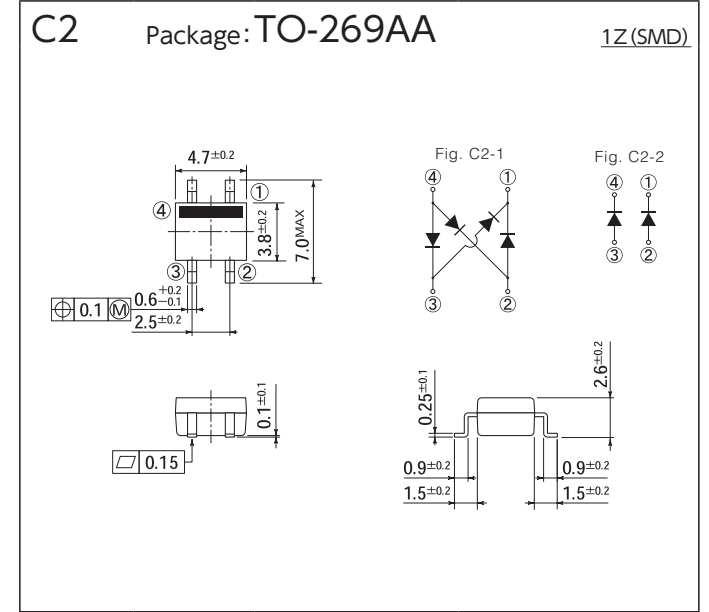
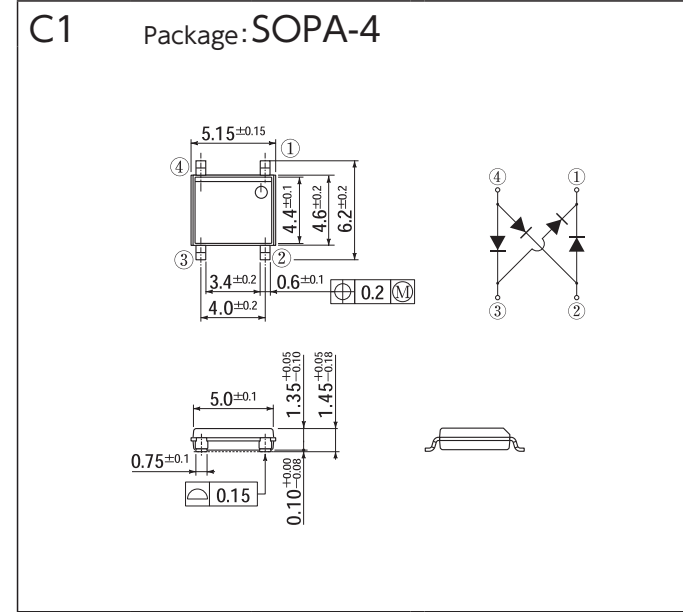


OUTLINE DIMENSIONS

[Unit:mm]



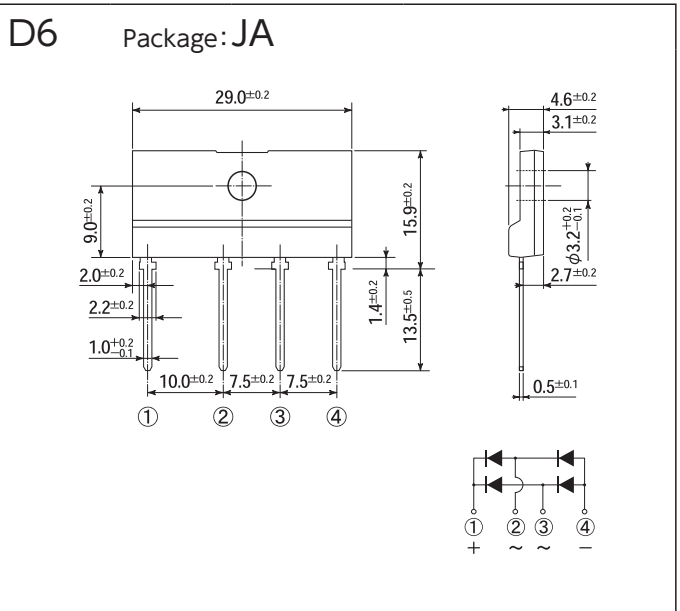
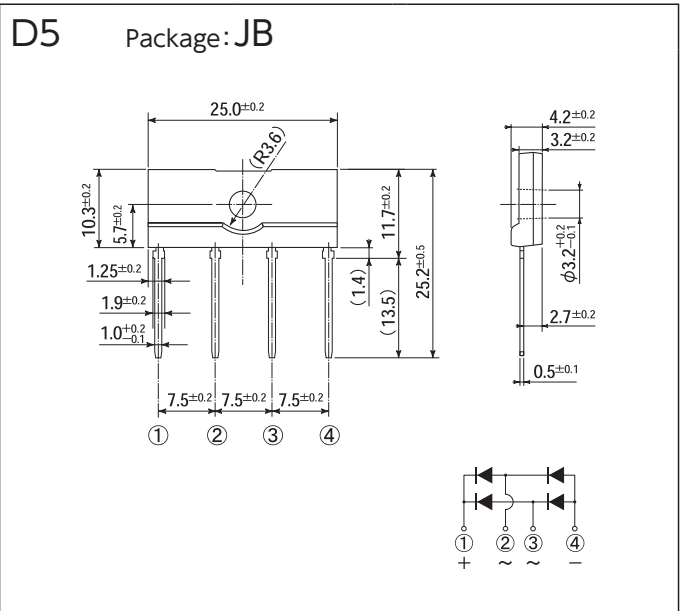
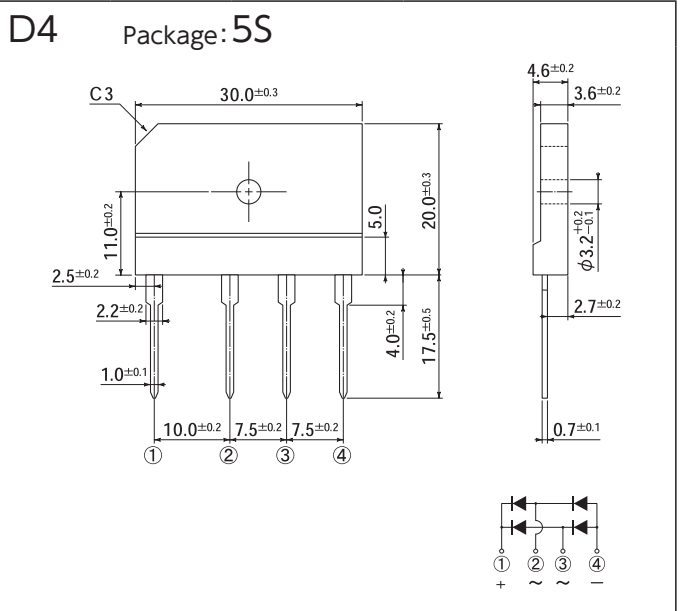
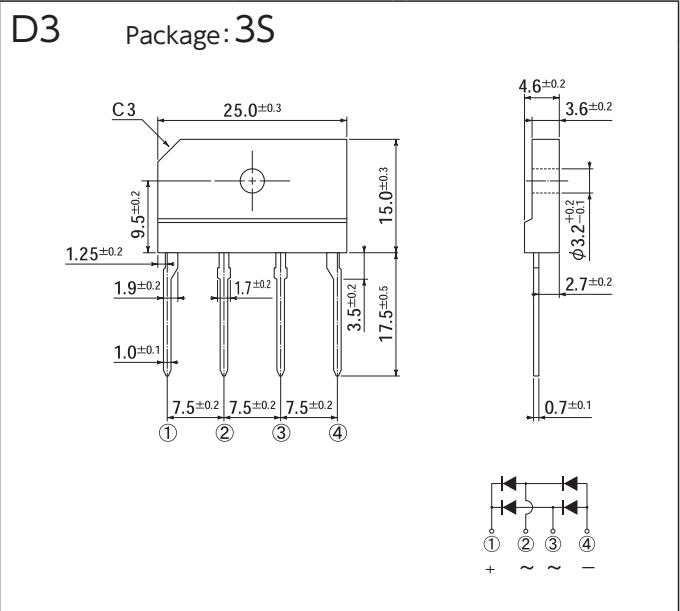
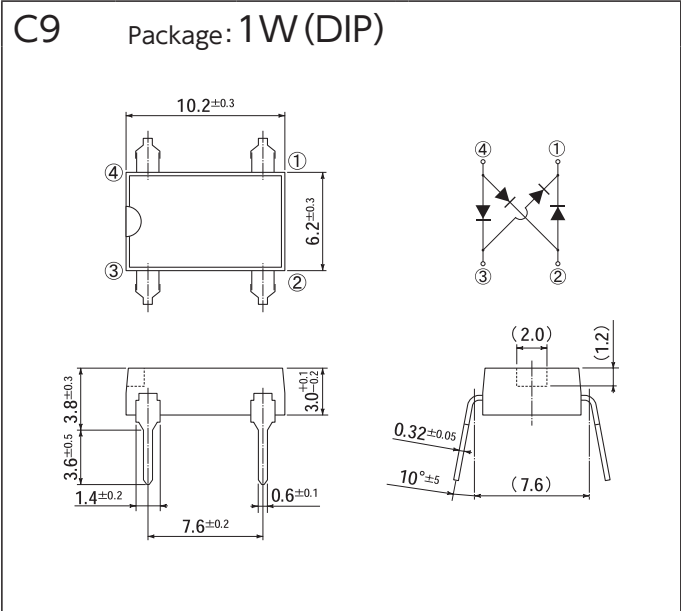
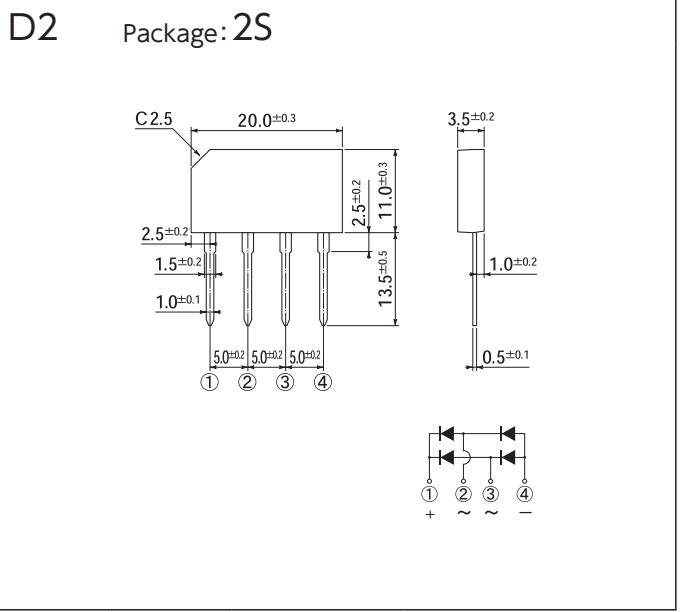
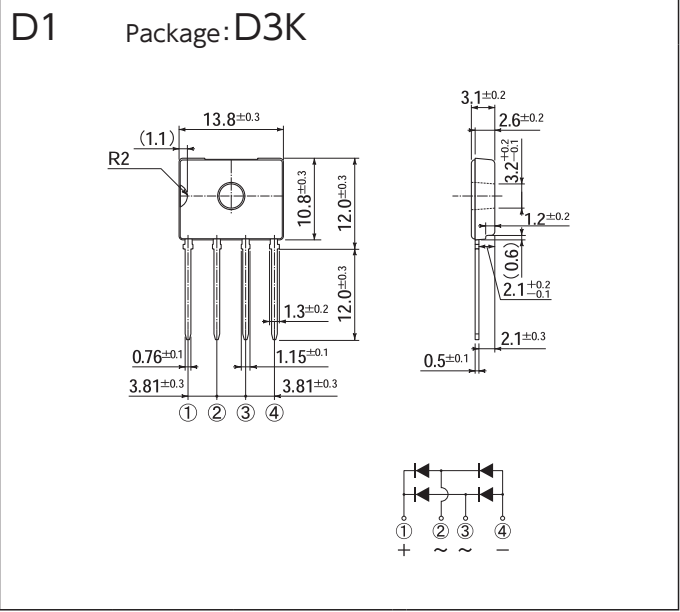
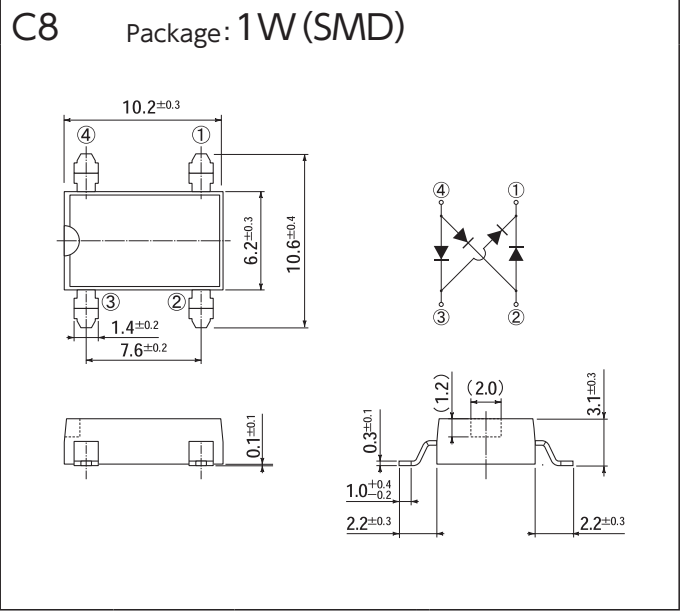
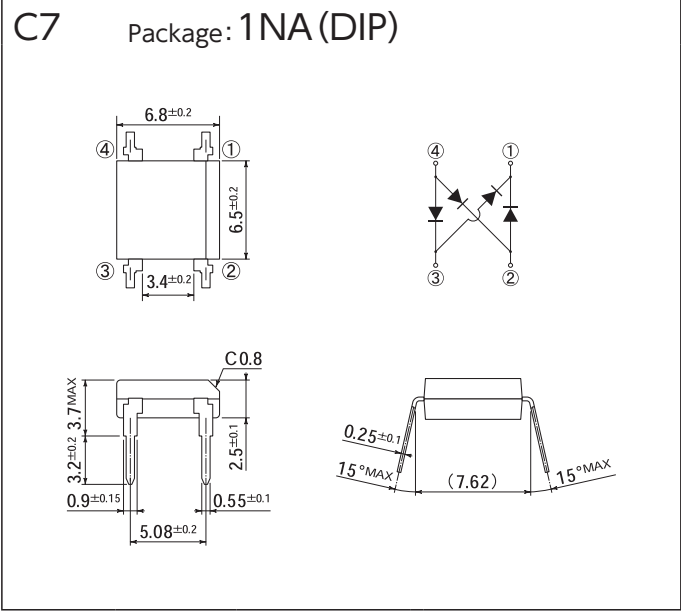
[Unit:mm]



OUTLINE DIMENSIONS

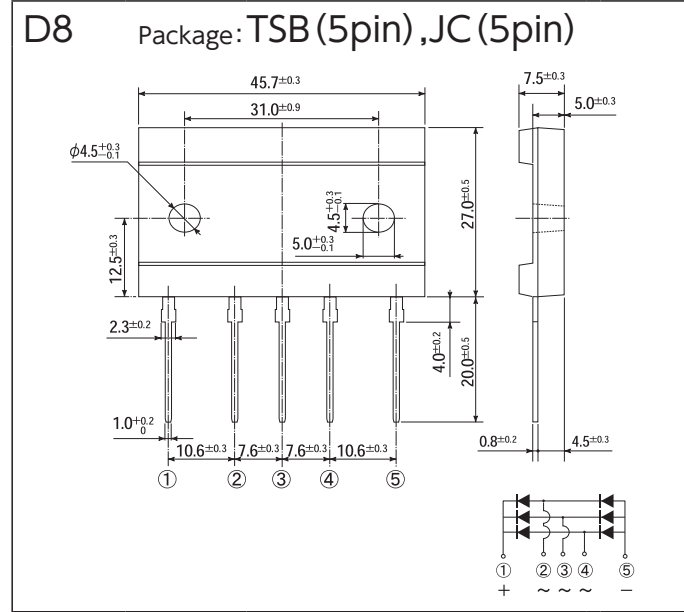
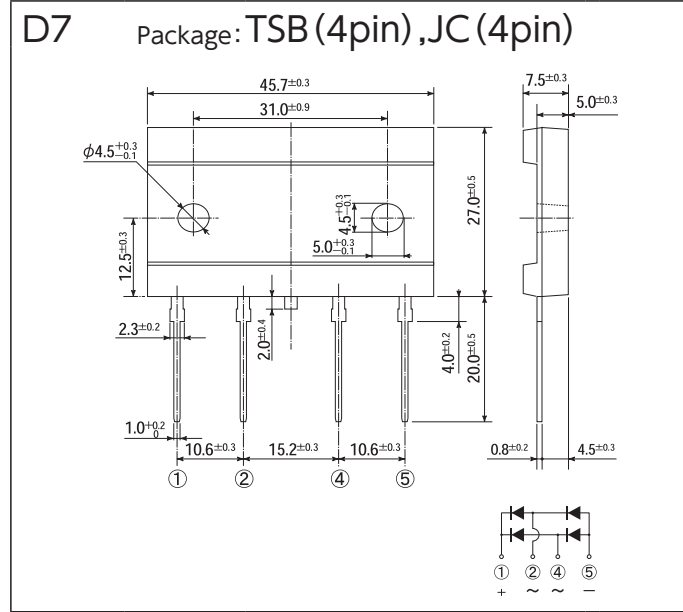
OUTLINE DIMENSIONS

[Unit:mm]

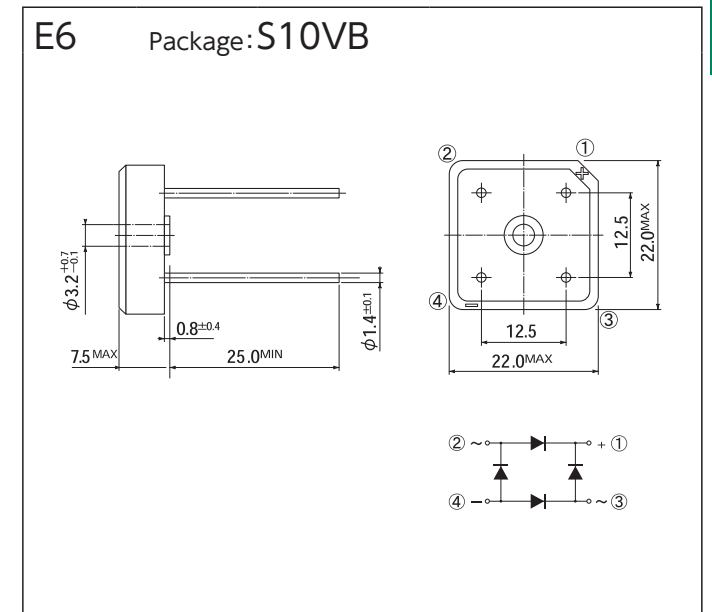
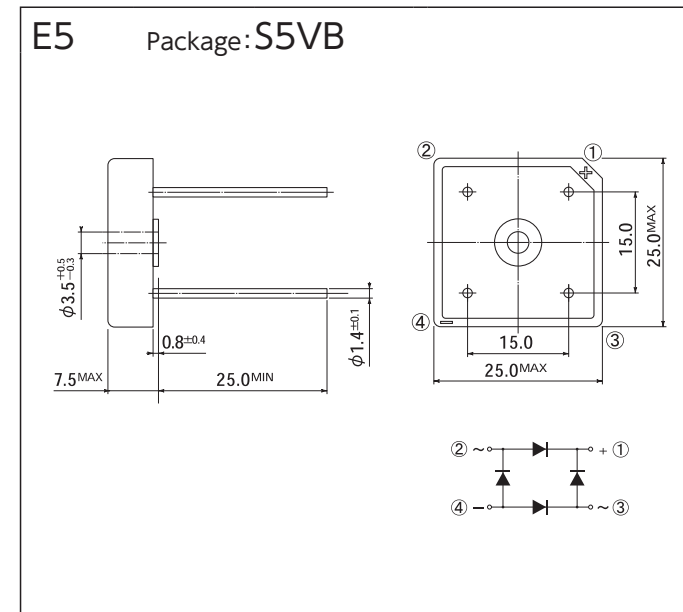
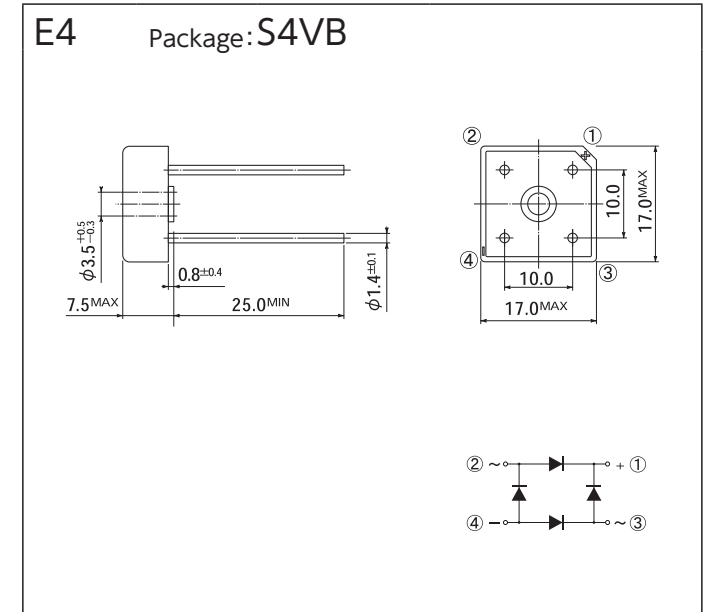
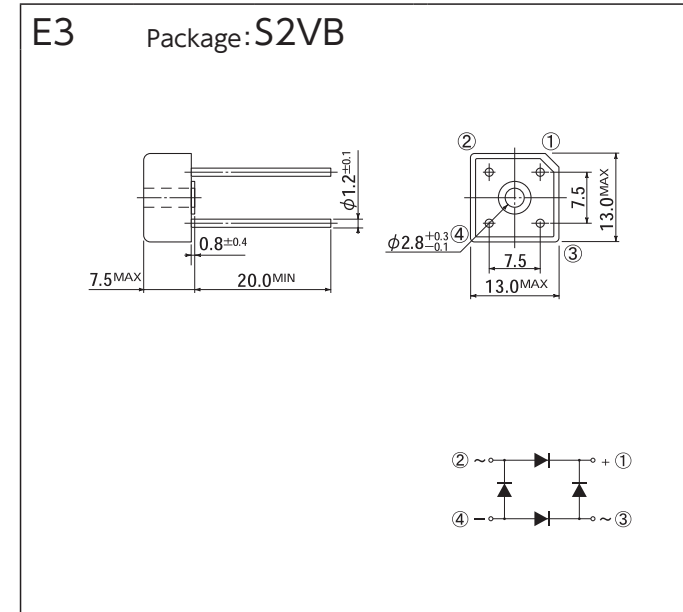
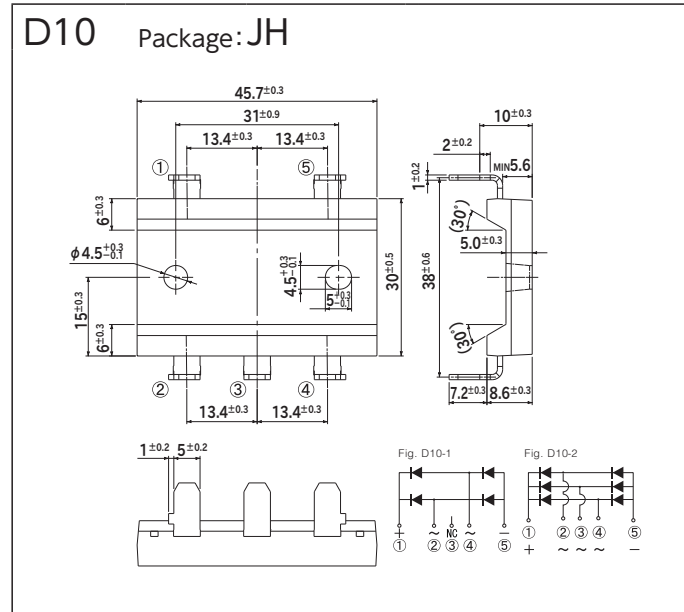
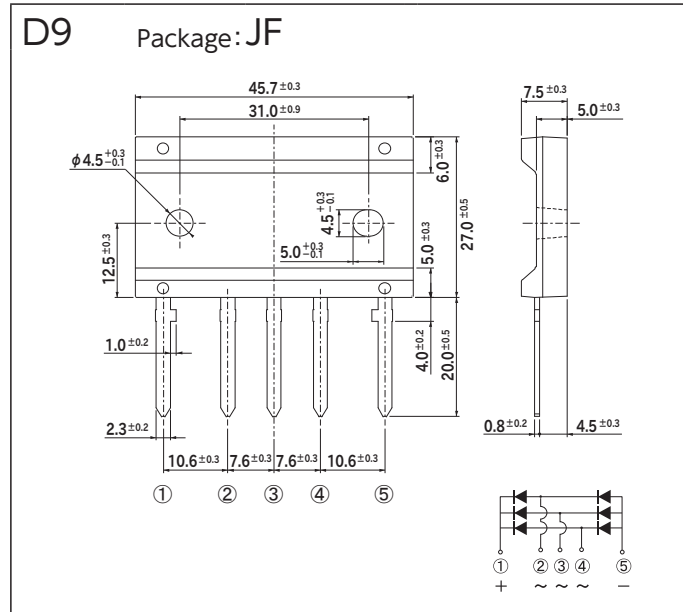
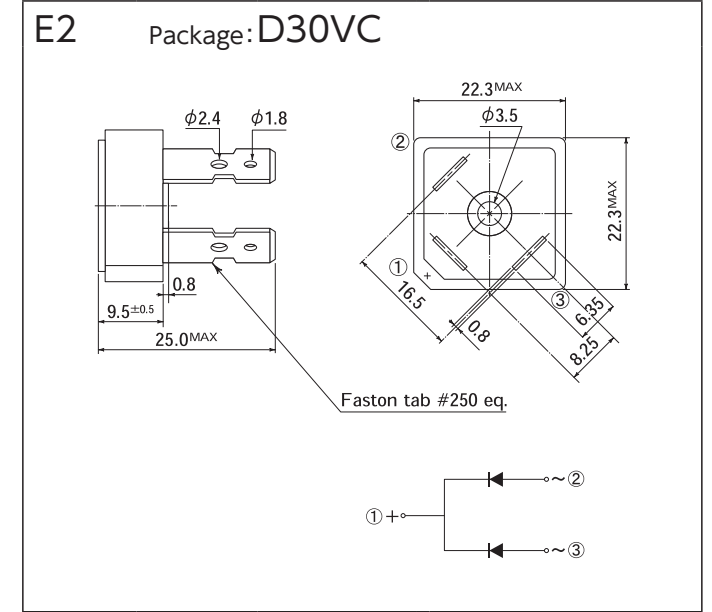
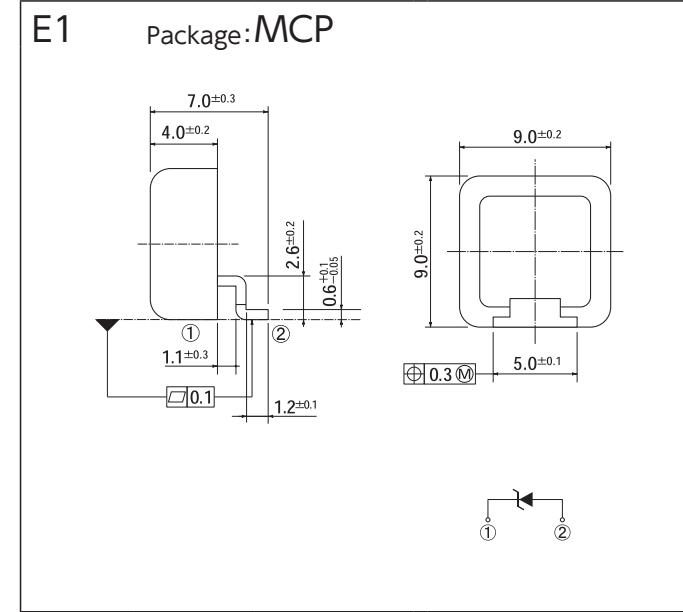


OUTLINE DIMENSIONS

[Unit:mm]



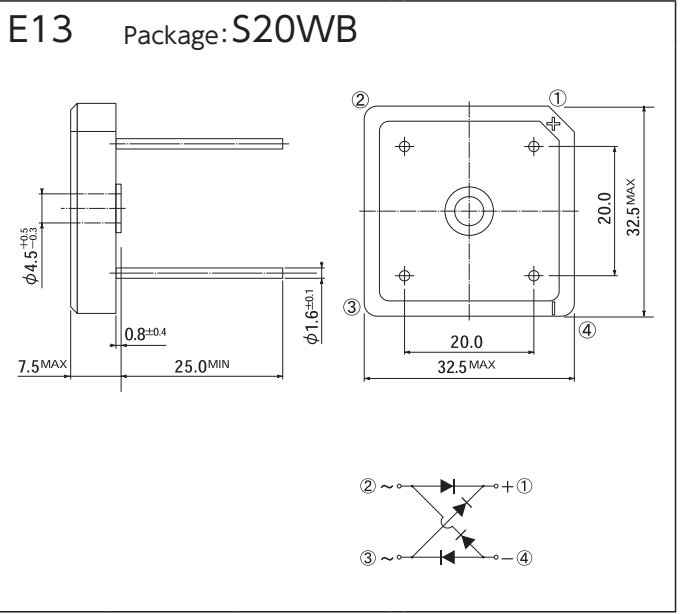
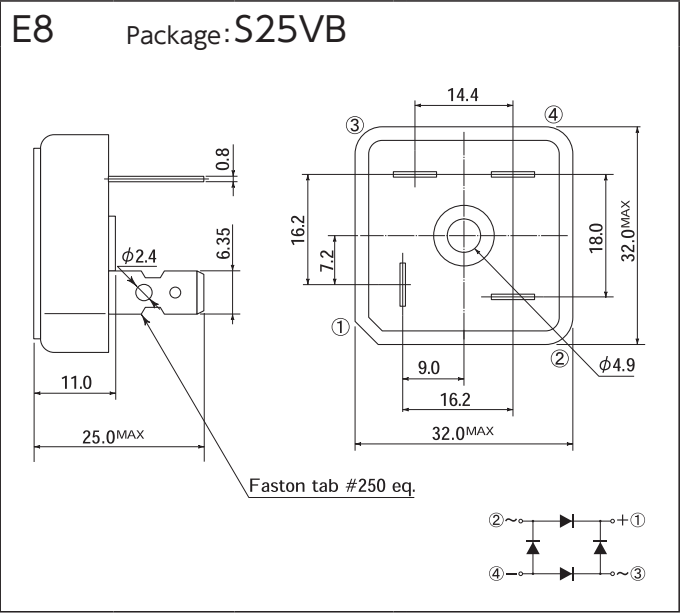
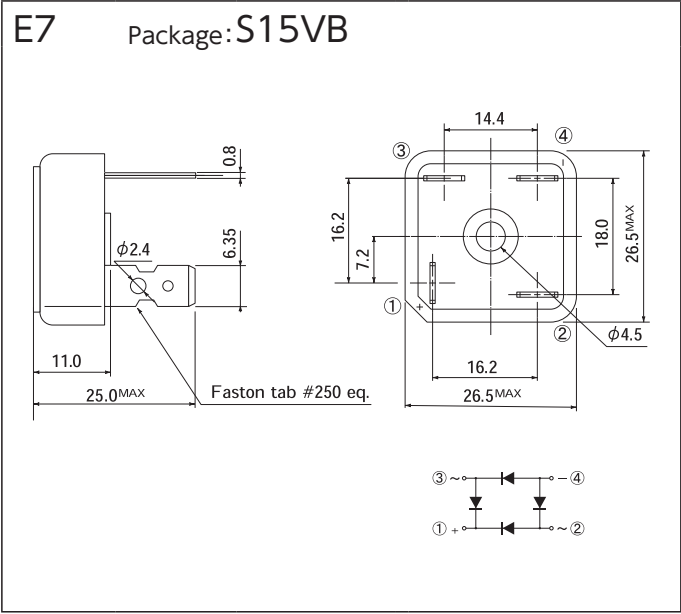
[Unit:mm]



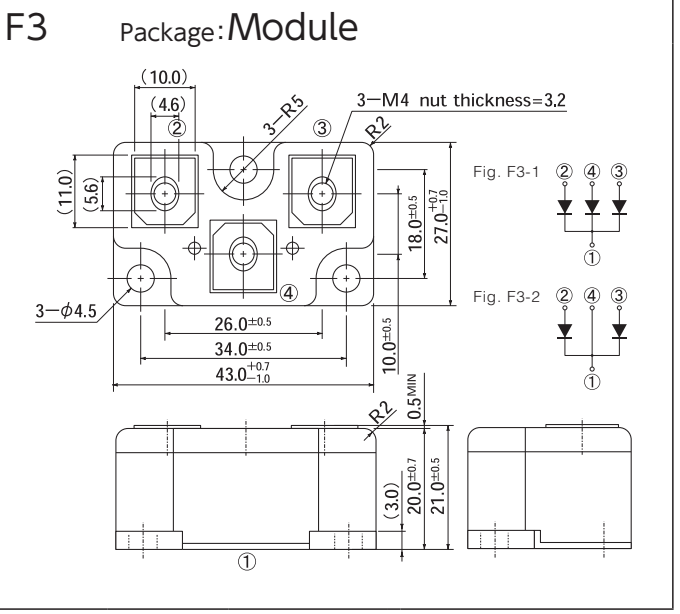
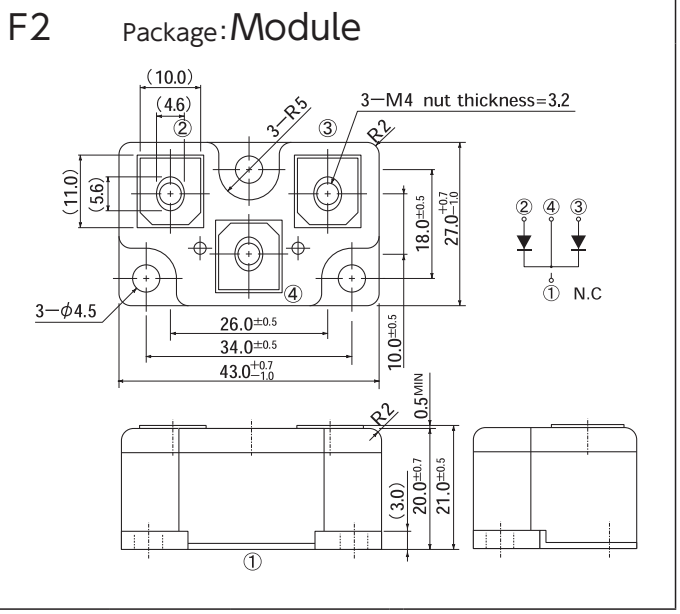
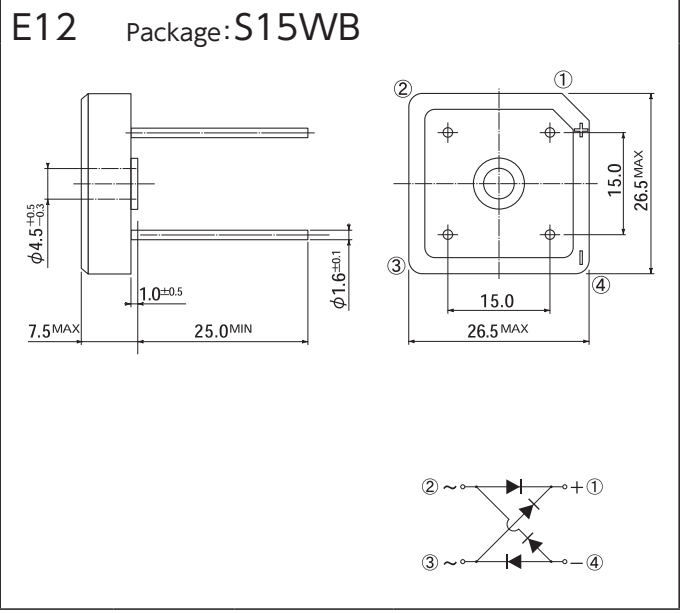
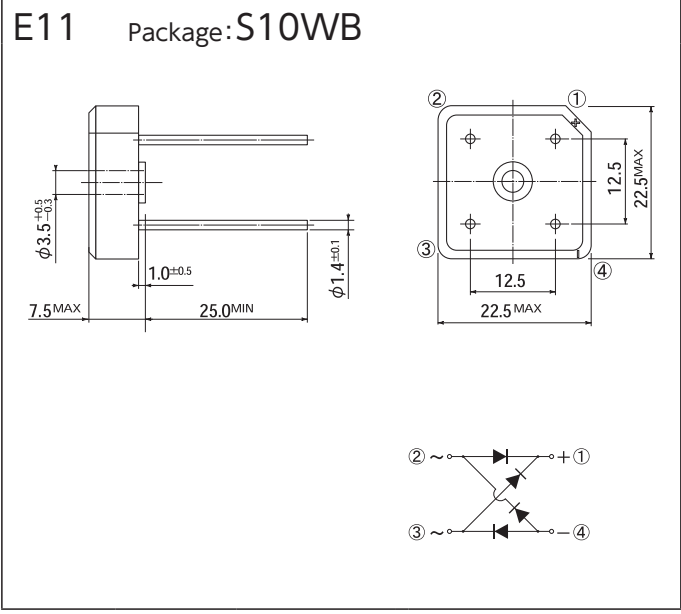
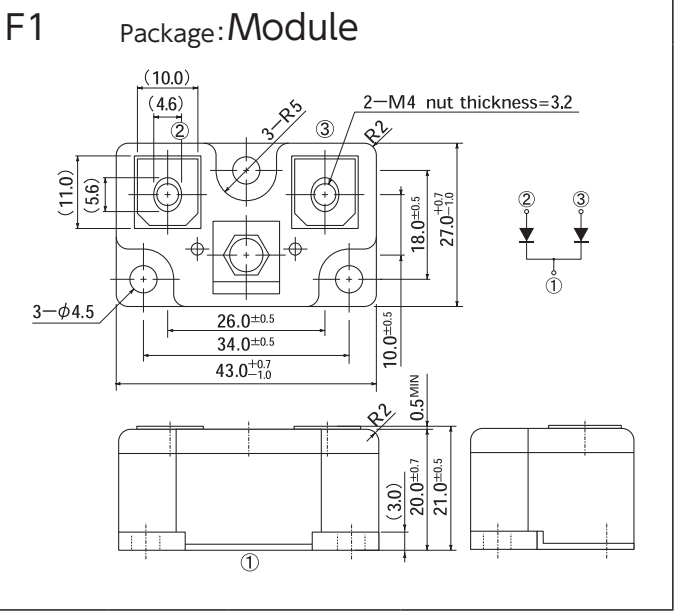
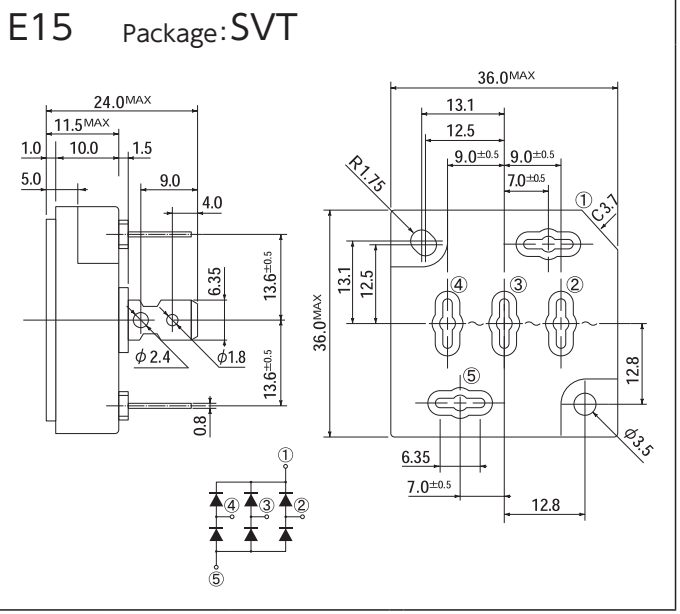
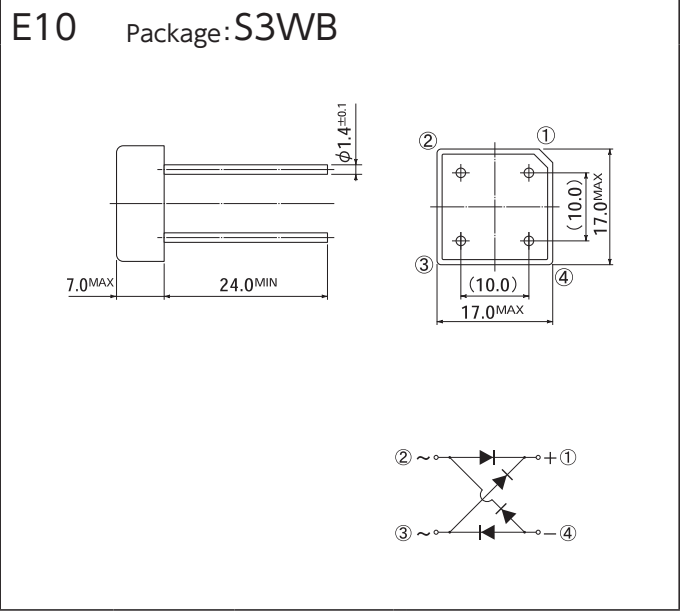
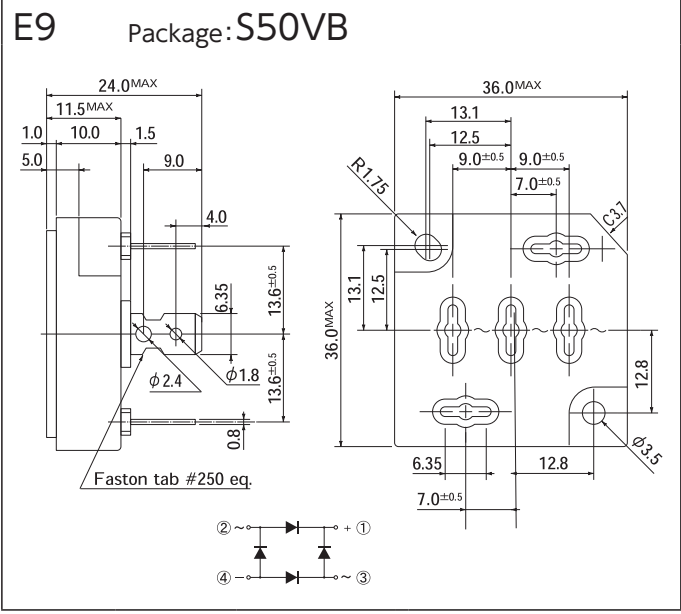
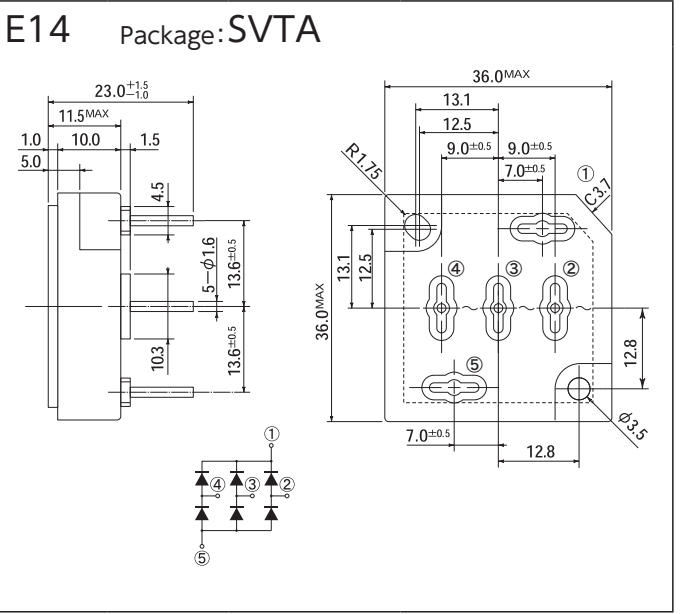
OUTLINE DIMENSIONS

OUTLINE DIMENSIONS

[Unit:mm]

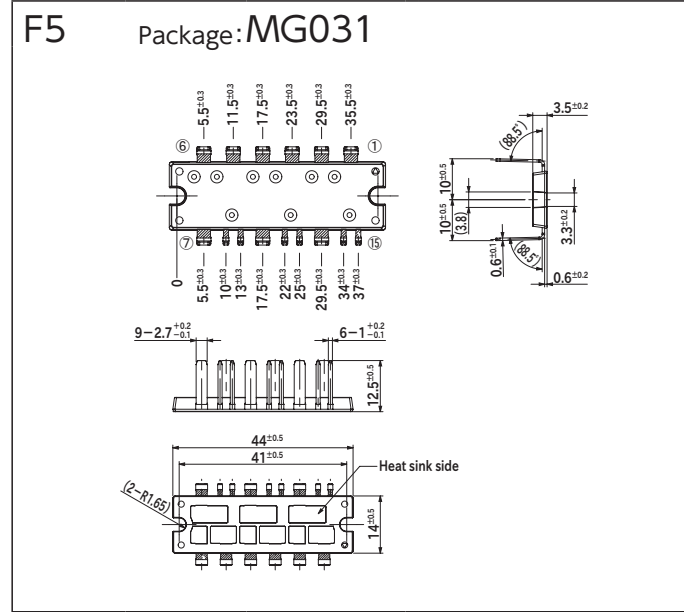
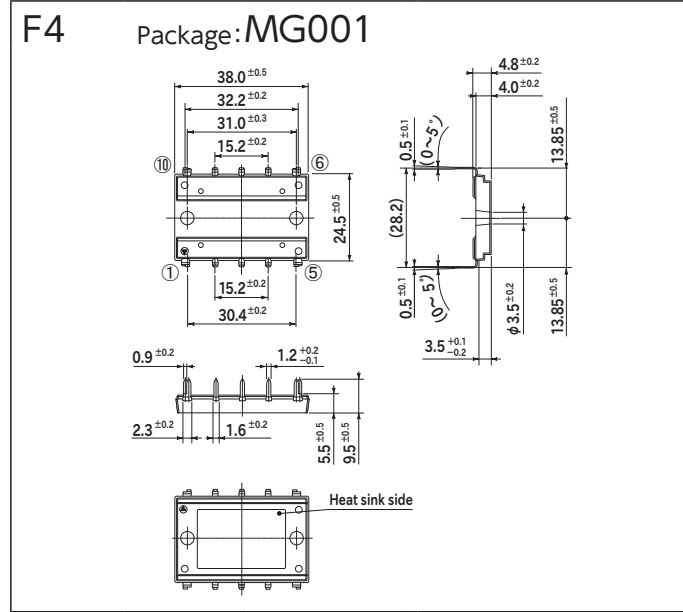


[Unit:mm]

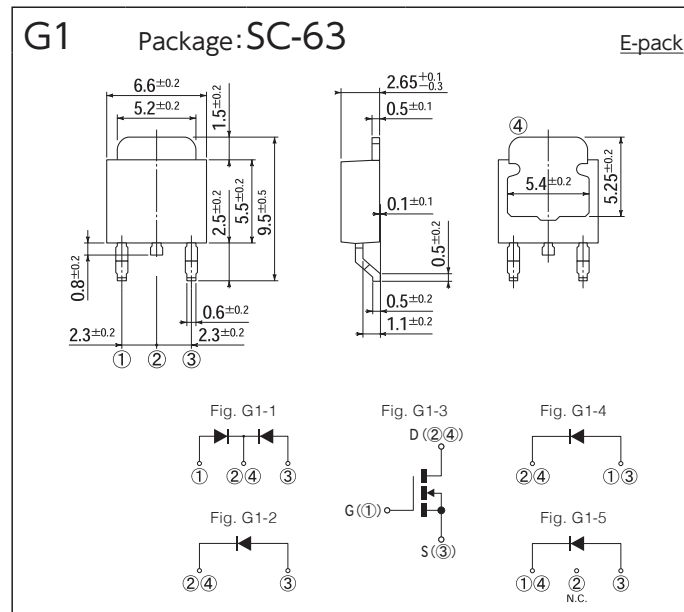
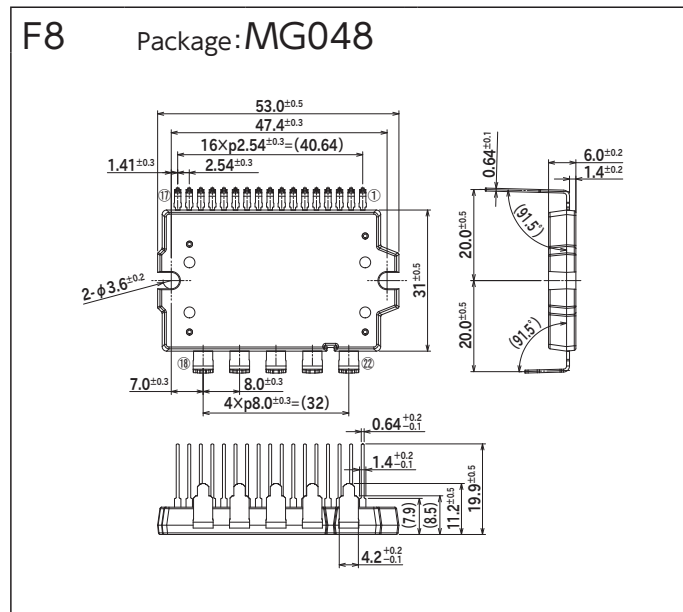
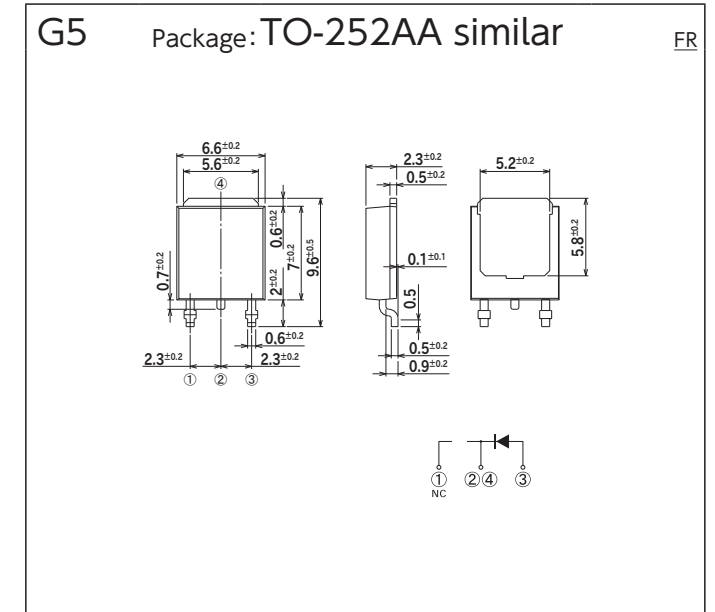
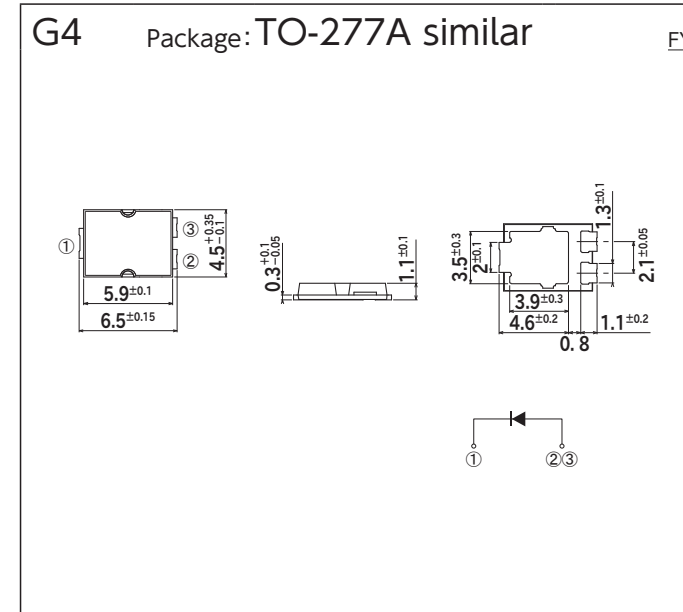
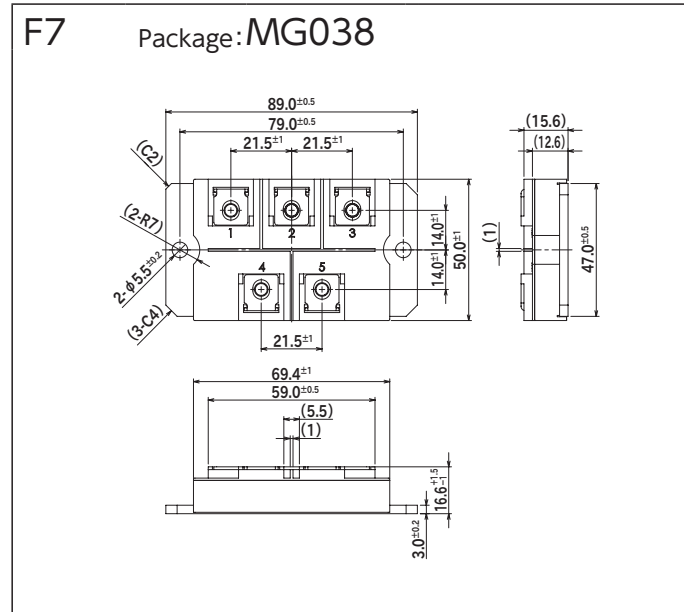
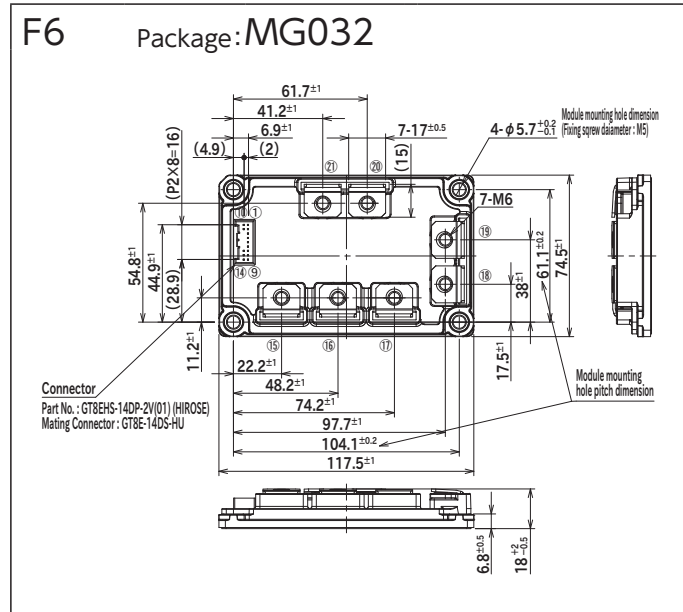
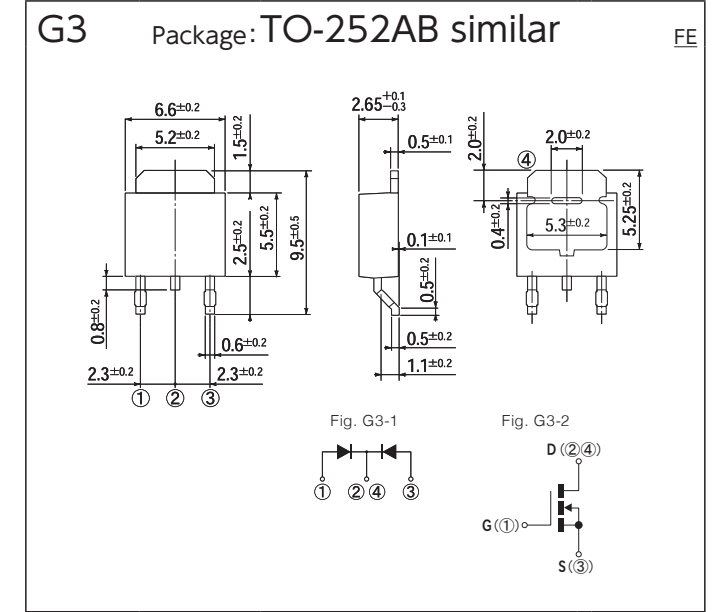
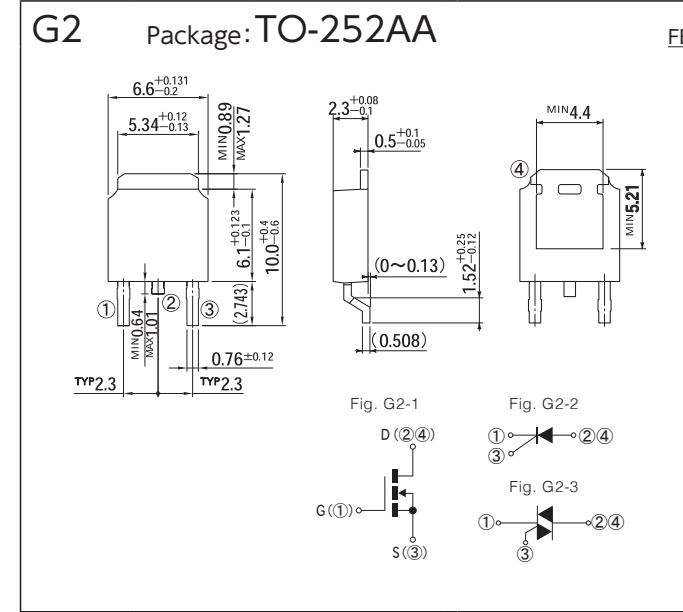


OUTLINE DIMENSIONS

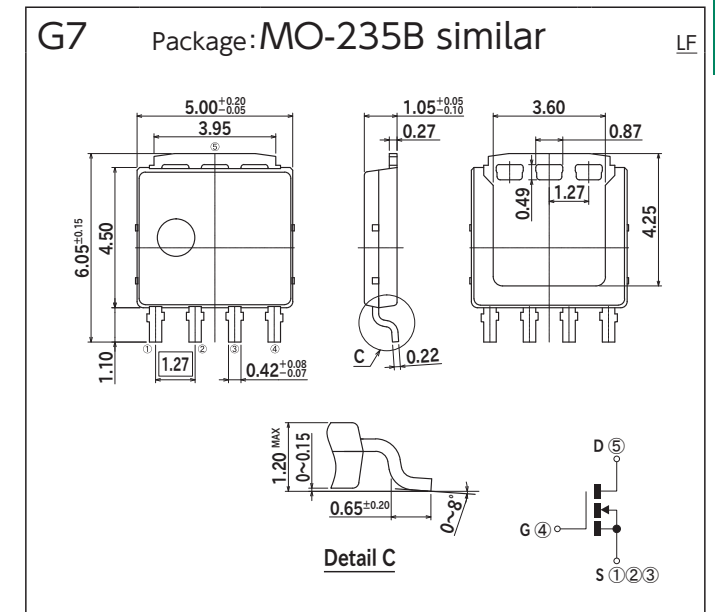
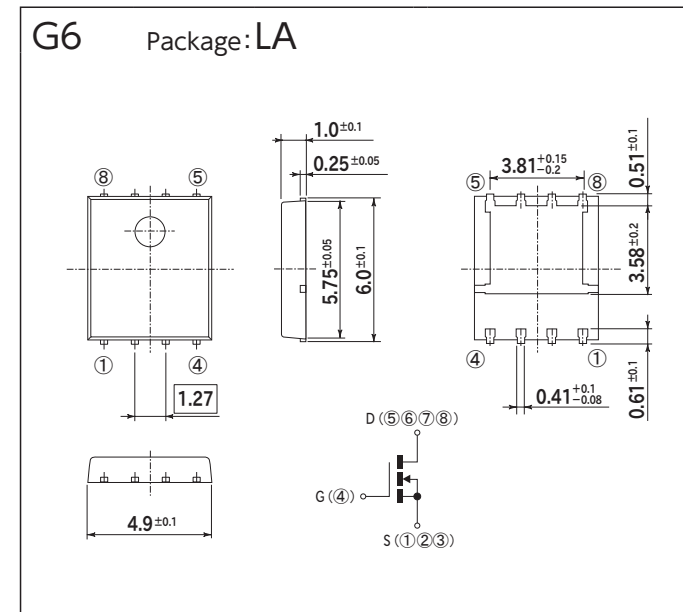
[Unit:mm]



[Unit:mm]



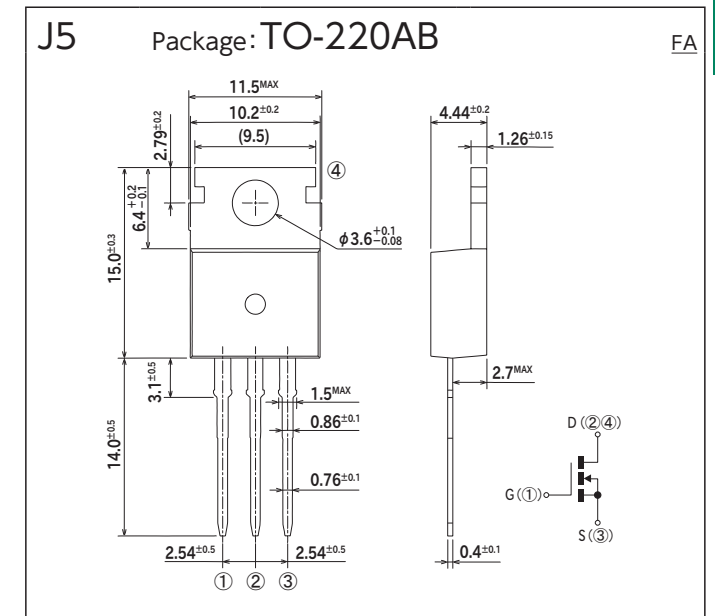
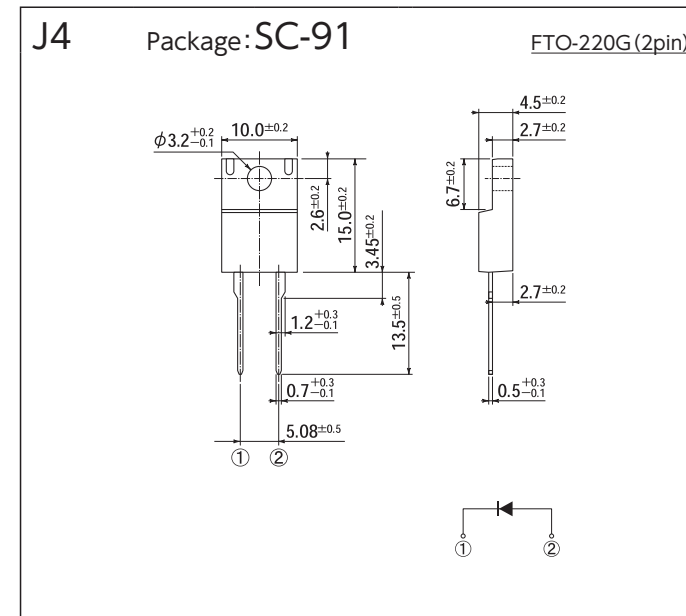
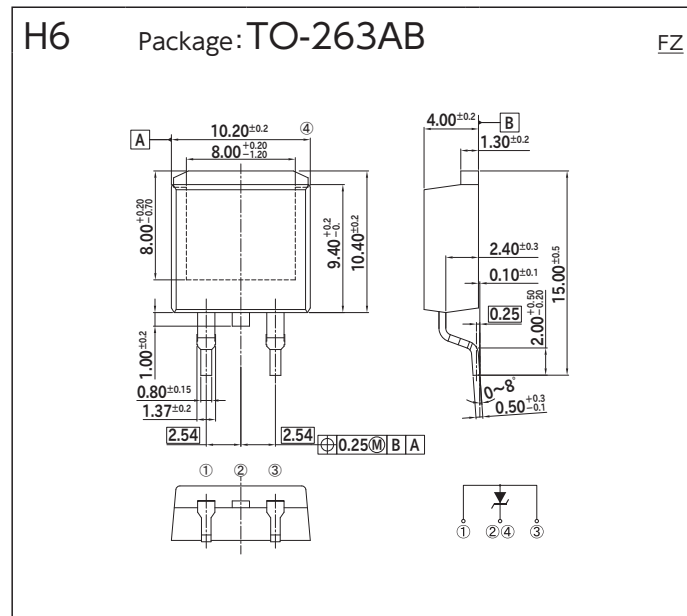
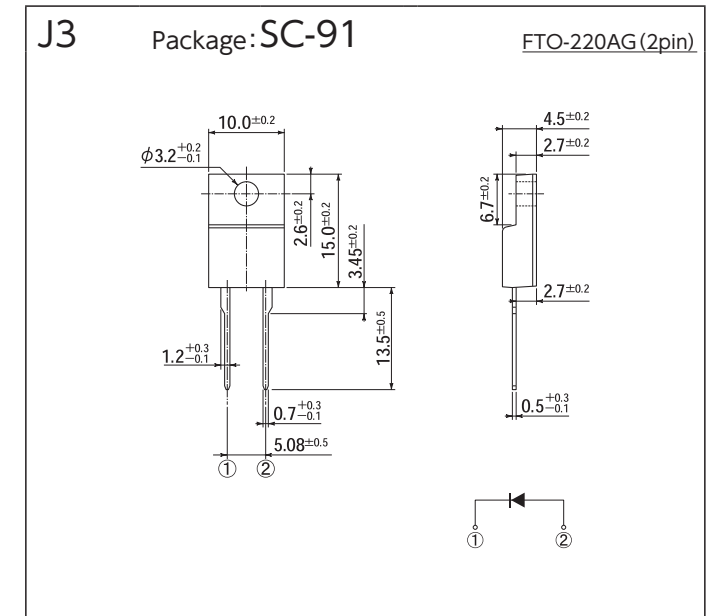
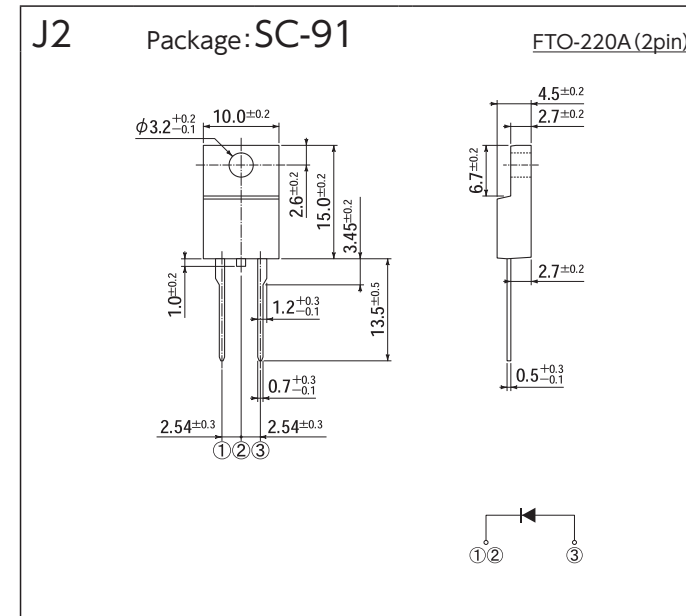
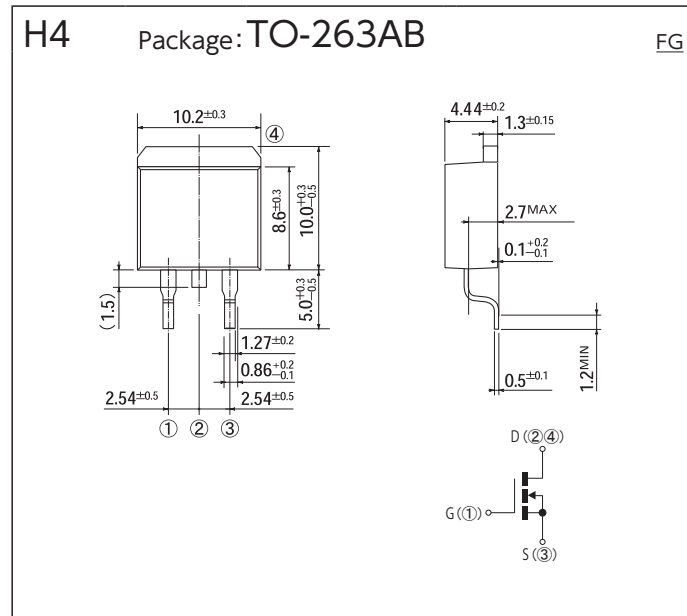
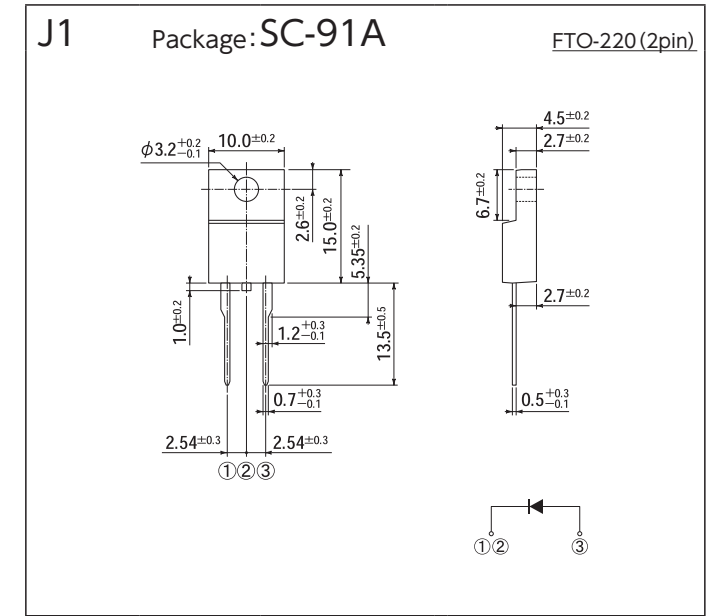
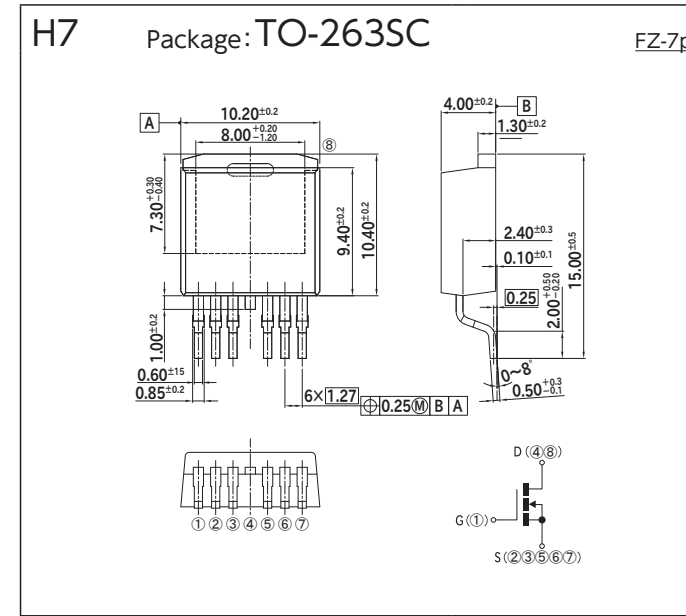
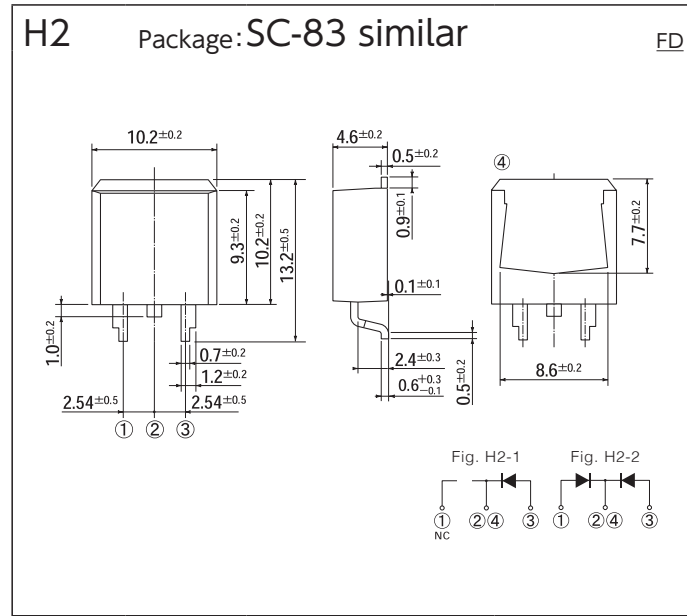
E-pack



OUTLINE DIMENSIONS

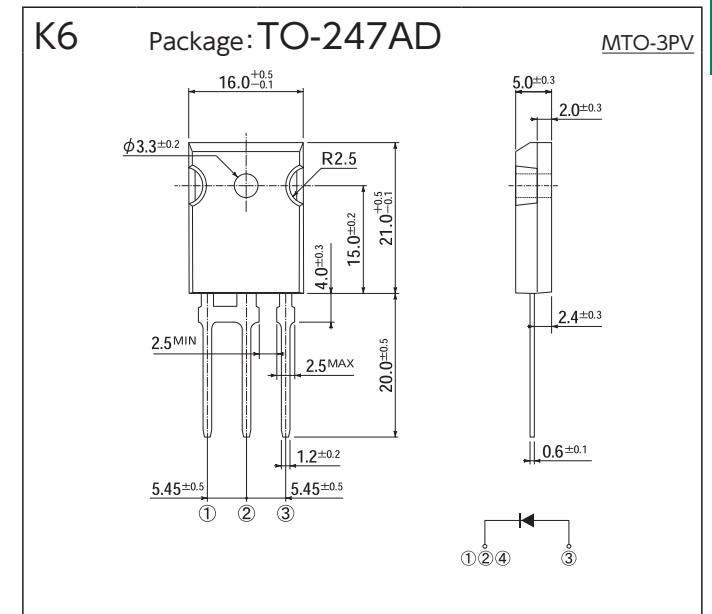
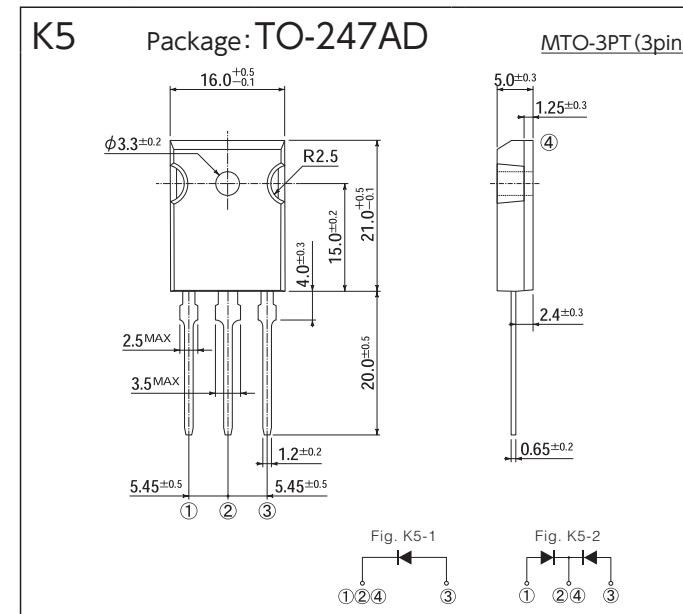
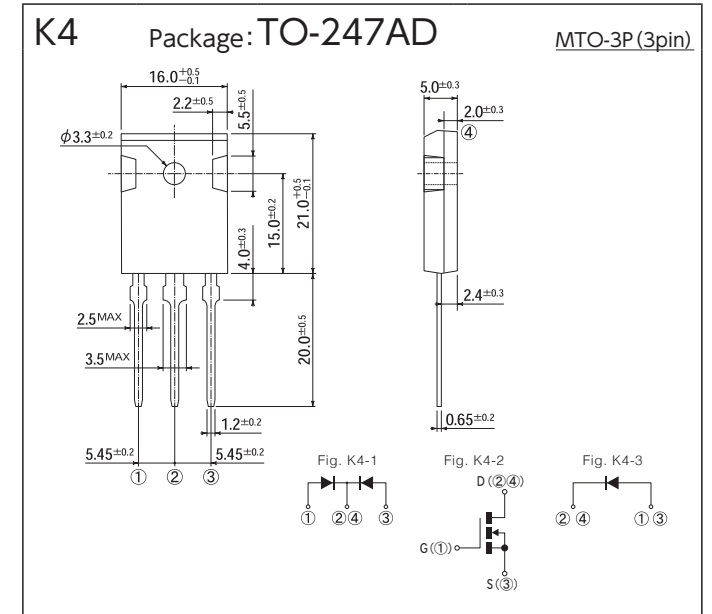
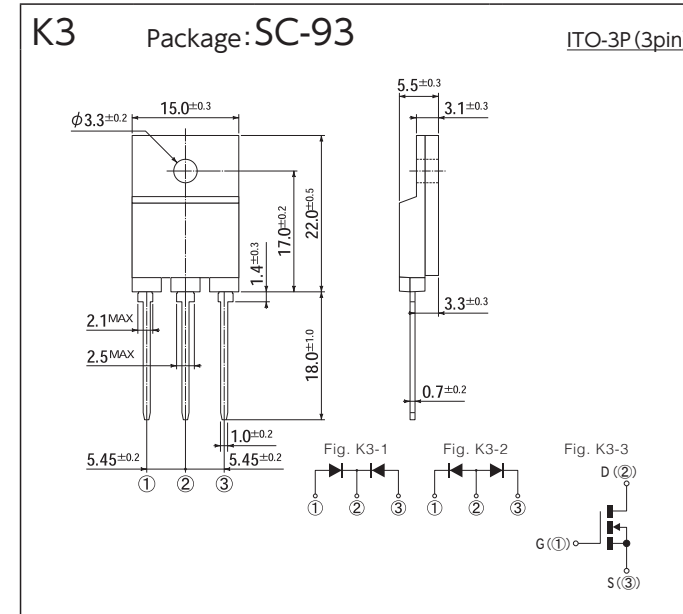
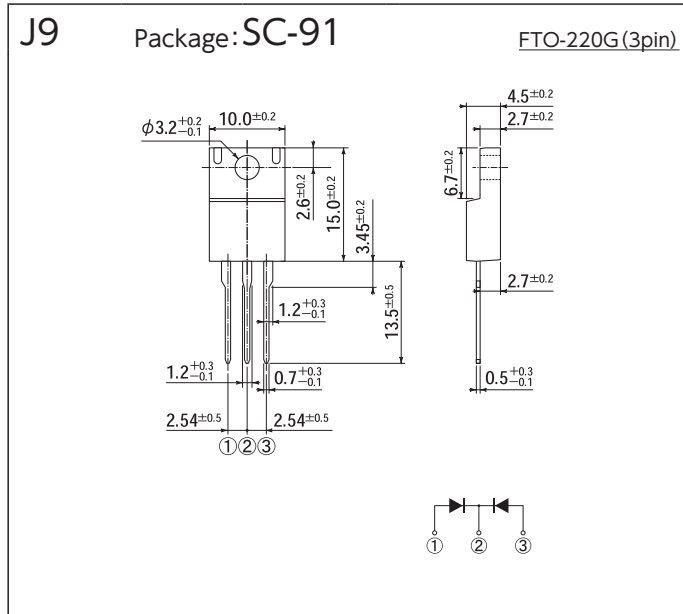
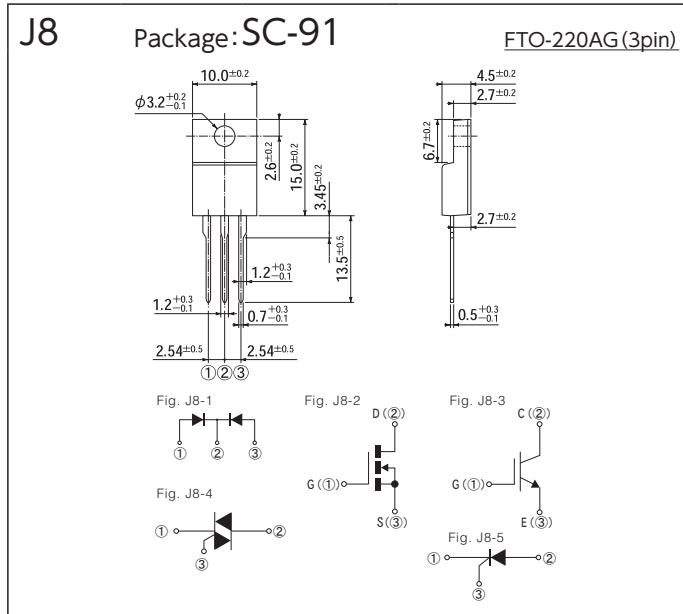
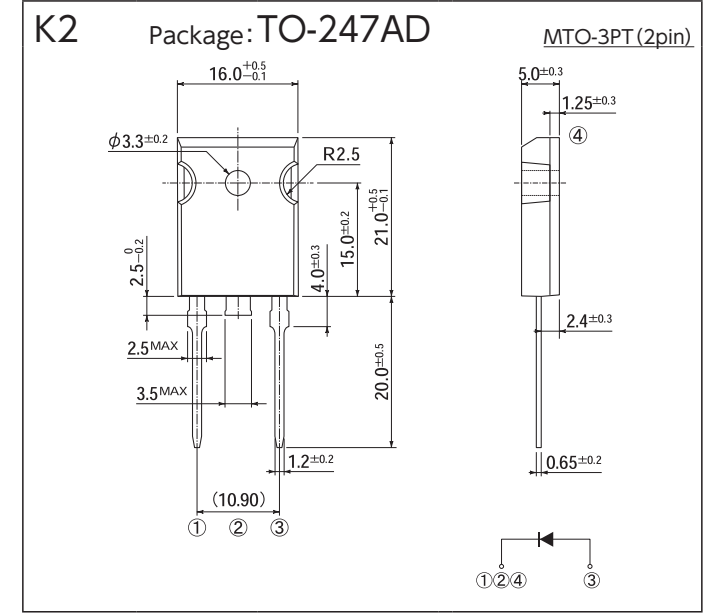
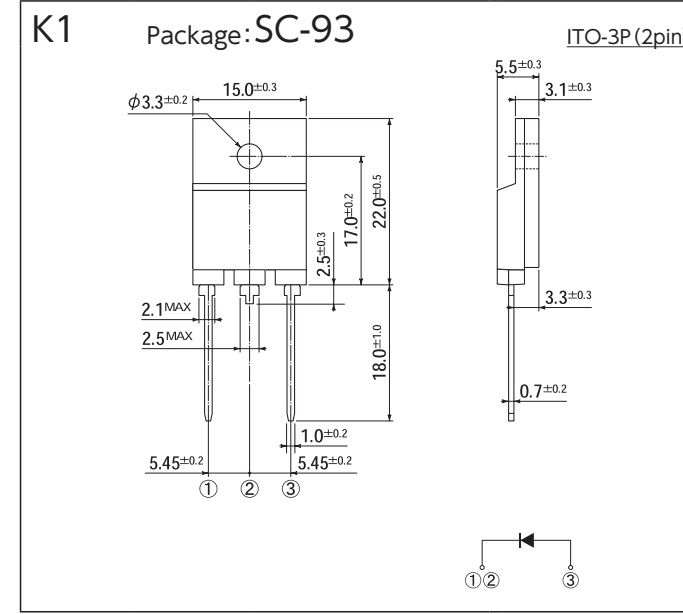
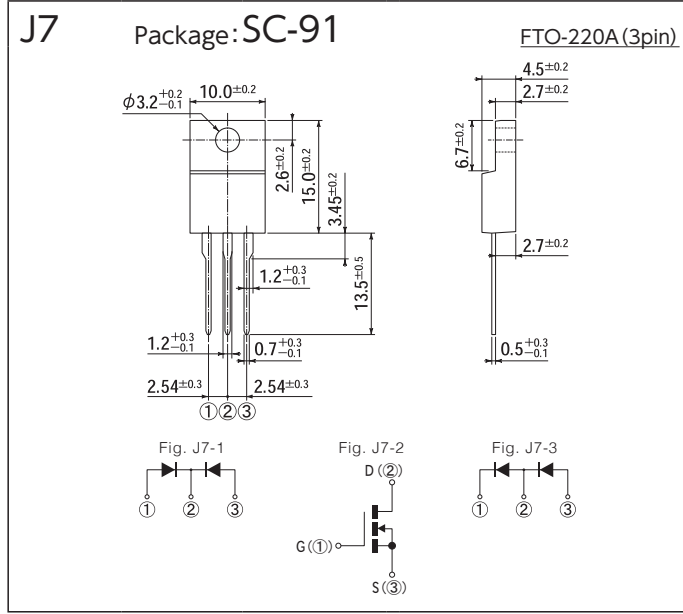
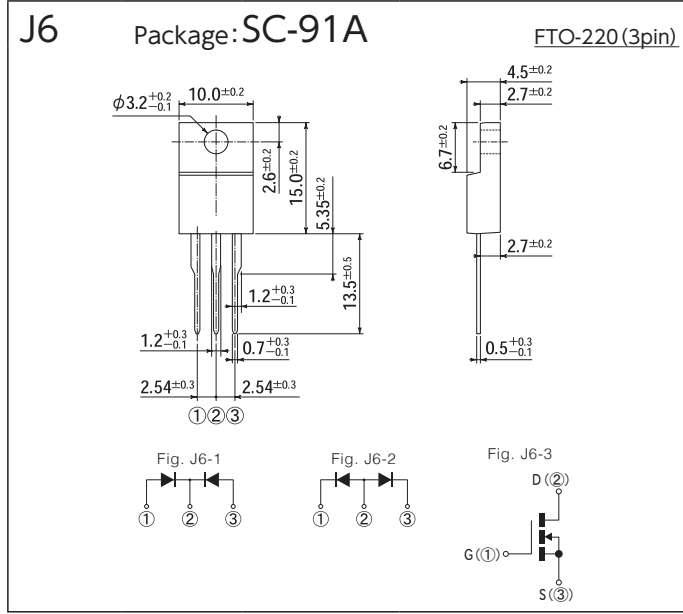
OUTLINE DIMENSIONS

[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 | |
| | | | | -5070 | | | Standard | | 3,000 | Tape, Ammo-Pack 26mm | 3,000 | 36,000 | 6.2 | 340 | 275 | 230 | |
| | | | | -7000 | | | | | 200 | Bulk | 200 | 20,000 | 5.9 | 480 | 355 | 230 | |
| | | | | -7060 | | | Standard | | 4,000 | Tape, Ammo-Pack 52mm | 4,000 | 64,000 | 14.0 | 325 | 325 | 420 | |
| | | | | -7061 | | | | | 4,000 | Tape&Reel, Diameter 300 φ 52mm | 4,000 | 20,000 | 6.3 | 325 | 325 | 420 | |
| | | | | -7070 | | | | | 3,000 | Tape, Ammo-Pack 26mm | 3,000 | 72,000 | 15.7 | 325 | 325 | 420 | |
| | | | | -7000 | | | | | 200 | Bulk | 200 | 16,000 | 7.9 | 480 | 355 | 230 | |
| | | | | -7060 | | | Standard | | 2,000 | Tape, Ammo-Pack 52mm | 2,000 | 32,000 | 14.7 | 325 | 325 | 420 | |
| | | | | -7070 | | | | | 1,500 | Tape, Ammo-Pack 26mm | 1,500 | 18,000 | 7.2 | 325 | 325 | 260 | |
| | | | | -5000 | | | | | 200 | Bulk | 200 | 16,000 | 7.9 | 480 | 355 | 230 | |
| | | | | -5060 | | | Standard | | 2,000 | Tape, Ammo-Pack 52mm | 2,000 | 16,000 | 7.5 | 325 | 325 | 260 | |
| | | | | -5070 | | | | | 1,500 | Tape, Ammo-Pack 26mm | 1,500 | 18,000 | 7.2 | 325 | 325 | 260 | |
| | | | | -7000 | | | | | 200 | Bulk | 200 | 16,000 | 11.1 | 480 | 355 | 230 | |
| | | | | -7060 | | | Standard | | 1,200 | Tape, Ammo-Pack 52mm | 1,200 | 18,000 | 14.4 | 325 | 325 | 420 | |
| | | | | -7061 | | | | | 2,500 | Tape&Reel, Diameter 300 φ 52mm | 2,500 | 12,500 | 10.8 | 325 | 325 | 420 | |
| | | | | -5000 | | | | | 200 | Bulk | 200 | 16,000 | 11.1 | 480 | 355 | 230 | |
| | | | | -5060 | | | Standard | | 1,200 | Tape, Ammo-Pack 52mm | 1,200 | 9,600 | 7.3 | 325 | 325 | 260 | |
| | | | | -5061 | | | | | 2,500 | Tape&Reel, Diameter 300 φ 52mm | 2,500 | 12,500 | 10.8 | 325 | 325 | 420 | |
| | | | | -5000 | | | | | 200 | Bulk | 200 | 16,000 | 17.5 | 480 | 355 | 230 | |
| | | | | -5060 | | | Standard | | 1,200 | Tape, Ammo-Pack 52mm | 1,200 | 9,600 | 11.2 | 325 | 325 | 260 | |
| | | | | -5061 | | | | | 2,500 | Tape&Reel, Diameter 300 φ 52mm | 2,500 | 10,000 | 13.0 | 350 | 355 | 350 | |
| DO-219AB similar | SC-109 | G1F | SMD | 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 | SMD | B2 | -6063 | Sn | 25mg | 1 | 2,500 | Tape&Reel, Diameter 180 φ | 15,000 | 75,000 | 4.5 | 405 | 210 | 220 | |
| | | | | | -5103 | | | | 100 | Magazine | 100 | 15,000 | 2.3 | 545 | 145 | 110 | |
| | | | | | -5053 | | | Standard | 2,000 | Tape&Reel, Diameter 180 φ | 8,000 | 40,000 | 4.1 | 340 | 195 | 205 | |
| | | | | | -5073 | | | | 7,500 | Tape&Reel, Diameter 330 φ | 45,000 | 90,000 | 10.8 | 395 | 245 | 395 | |
| | | | | | -5063R | | | | 3,000 | Tape&Reel, Diameter 180 φ | 12,000 | 24,000 | 1.6 | 180 | 205 | 210 | |
| | | | | | -5063 | | | Standard | 1,000 | Tape&Reel, Diameter 180 φ | 4,000 | 20,000 | 3.4 | 340 | 195 | 205 | |
| | | | | | -5073 | | | | 4,000 | Tape&Reel, Diameter 330 φ | 4,000 | 48,000 | 8.6 | 395 | 245 | 395 | |
| | | | | | -5103 | | | | 60 | Magazine | 60 | 18,000 | 5.2 | 545 | 145 | 110 | |
| | | | | | -5063 | | | Standard | 750 | Tape&Reel, Diameter 180 φ | 3,000 | 15,000 | 4.2 | 340 | 195 | 205 | |
| | | | | | -5073 | | | | 3,000 | Tape&Reel, Diameter 330 φ | 3,000 | 36,000 | 9.2 | 395 | 245 | 395 | |
| | | | | | -7062 | | | | 1,000 | Tape&Reel, Diameter 180 φ | 1,000 | 20,000 | 3.6 | 340 | 195 | 205 | |
| | | | | | -7102 | | | | 100 | Magazine | 100 | 15,000 | 3.2 | 545 | 145 | 110 | |
| | | | | | -7062 | | | | S1ZA | 750 | Tape&Reel, Diameter 180 φ | 3,000 | 15,000 | 4.0 | 340 | 195 | 205 |
| | | | | | -7062 | | | | S1ZB | 750 | Tape&Reel, Diameter 180 φ | 3,000 | 15,000 | 4.0 | 405 | 210 | 220 |
| | | | | | -7072 | | | Standard | 3,000 | Tape&Reel, Diameter 330 φ | 3,000 | 15,000 | 4.6 | 340 | 340 | 120 | |
| | | | | | -7101 | | | | S1ZB | 100 | Magazine | 100 | 10,000 | 2.1 | 545 | 145 | 110 |
| | | | | | -7102 | | | | 70 | Magazine | 70 | 5,600 | 4.1 | 545 | 145 | 100 | |
| | | | | | -7062 | | | | 1,000 | Tape&Reel, Diameter 250 φ | 1,000 | 10,000 | 5.5 | 275 | 285 | 295 | |
| | | | | | -7101 | | | | 70 | Magazine | 70 | 5,600 | 4.1 | 545 | 145 | 100 | |
| | | | | | -7102 | | | | 70 | Magazine | 70 | 5,600 | 4.1 | 545 | 145 | 100 | |
| | | | | | -7102 | | | | 50 | Magazine | 50 | 4,000 | 4.4 | 545 | 145 | 110 | |
| | | | | | -7062 | | | | 1,000 | Tape&Reel, Diameter 330 φ | 3,000 | 6,000 | 5.5 | 395 | 245 | 395 | |
| | | | | | -7072 | | | | 2,000 | Tape&Reel, Diameter 380 φ | 2,000 | 10,000 | 7.8 | 395 | 245 | 395 | |
| | | | | | -7101 | | | | 50 | Magazine | 50 | 4,000 | 4.4 | 545 | 145 | 110 | |
| | | | | | -7000 | | | | 500 | Bulk | 500 | 2,500 | 4.0 | 210 | 188 | 200 | |
| | | | | | -7000 | | | | 100 | Bulk | 100 | 500 | 6,000 | 14.4 | 410 | 380 | 170 |
| | | | | | -7000 | | | | 50 | Bulk | 250 | 2,000 | 9.5 | 310 | 285 | 196 | |
| | | | | | -7000 | | | | 50 | Bulk | 250 | 2,000 | 14.5 | 330 | 330 | 215 | |
| | | | | | -7000 | | | | 250 | Bulk | 250 | 2,000 | 7.4 | 287 | 301 | 169 | |
| | | | | | -7000 | | | | 250 | Bulk | 250 | 2,000 | 9.0 | 327 | 329 | 185 | |
| | | | | | -7000 | | | | 100 | Bulk | 100 | 400 | 9.8 | 351 | 269 | 164 | |
| | | | | | -7500 | | | | 40 | Tray | 40 | 200 | 5.6 | 503 | 356 | 135 | |
| | | | | | -7500 | | | | 40 | Tray | 40 | 200 | 5.6 | 503 | 356 | 135 | |
| | | | | | -7501 | | | | 40 | Tray | 40 | 200 | 5.6 | 503 | 356 | 135 | |
| | | | | | -4062 | | | | 300 | Tape&Reel, Diameter 255 φ | 300 | 1,500 | 5.0 | 280 | 275 | 190 | |
| | | | | | -4072 | | | 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 | 9.0 | 425 | 360 | 155 | | |
| - | - | MG048 | THD | F8 | -7101 | Sn-Bi | 7.7g | - | 9 | Magazine | 9 | - | - | - | - | - | | |
| - | - | SC-63 | E-pack | Only DE5VE40 | -5101 | Sn | 310mg | 1 | 80 | Magazine | 80 | 10,000 | 6.9 | 560 | 130 | 109 | | |
| | | | | | -5061 | | | Standard | 1,500 | Tape&Reel, Diameter 250 φ | 1,500 | 6,000 | 2.9 | 260 | 260 | 99 | | |
| | | | | | -5071 | | | | 3,000 | Tape&Reel, Diameter 330 φ | 3,000 | 12,000 | 5.5 | 335 | 335 | 99 | | |
| | | | | | -7101 | | | | 80 | Magazine | 80 | 10,000 | 6. | | | | | |

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.



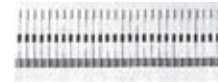
- Magazine : The form in which parts are inserted into resin cartridges designated for automatic inserters.



- Taping
 - Reel (Surface mounting devices)

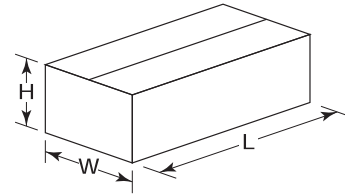


- Box (Axial devices)



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

This catalog includes the products which might be subject to the foreign exchange and foreign trade laws.