

Semiconductor Product Catalog





Notes

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 - 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.
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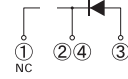



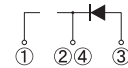
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GENERAL RECTIFYING DIODES





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

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


Single


Surface Mount							
Package	JEDEC Code JEITA Code House Name	Fig.	IF (AV) [A]	VRRM [V]			Remarks
				400	600	800	
 3.9 × 1.8 × 1.4(mm)	DO-219AA similar M1F	B2	1		M1F60 M1FE60	M1F80	
			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			
 6.5 × 4.5 × 1.1(mm)	TO-277A similar FY	G4	10		D10FY60VE		
 9.6 × 6.6 × 2.3(mm)	TO-252AA similar FR	G5	10		D10FR60V		
			15		D15FR60V		
 13.2 × 10.2 × 4.7(mm)	SC-83 similar STO-220	H1-2	25		DF25V60		
 13.2 × 10.2 × 4.6(mm)	SC-83 similar FD	H2-1	25		D25FD60V		

 : 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	
 7.0 × φ 4.4(mm)	AX10	A5-1	1.7		S2V60	S2V80	
 7.0 × φ 4.4(mm)	AX14	A7	3			S3V100D	
			3.5		S3V60	S3V80	

Single

Surface Mount													
JEDEC Code JEITA Code House Name	Fig.	Type No.	Absolute Maximum Ratings					Electrical Characteristics				Based on AEC-Q101	Automotive
			IF (AV) [A]	Conditions Ta [°C]	IFSM [A]	VRRM [V]	Tj [°C]	Vf (max) [V]	Conditions IF [A]	Ir (max) VR=VRRM [μA]	VESD (typ) [kV]		
DO-219AA similar M1F	B2	M1F60	1	25	25	600	150	1.10	1	10	—	—	○
		M1FE60	1	129 *1	30	600	150	1.10	1	10	25	○	○
		M1F80	1	25	25	800	150	1.10	1	10	—	—	○
		M1FE40	2	103 *2	25	400	150	1.10	1	10	—	○	○
DO-214AC 1F	B3-1	D1F60	1	25	25	600	150	1.10	1	10	—	—	○
		D1FE60	1	126 *1	30	600	150	1.10	1	10	25	○	○
		LN1F60 *3	1.1	25	25	600	150	1.05	0.8	10	—	—	—
SC-110B CE	B5-1	D1F60A	1.2	25	45	600	150	0.97	1.2	10	—	—	○
		D3CE60V	3	101 *1	50	600	150	1.10	3	10	—	—	○
DO-214AA similar M2F	B6	 D3CE60VE	3.5	93 *1	60	600	-55 to 150	1.10	3.5	10	25	○	■
		M2F60	1.2	51	50	600	150	0.97	1.2	10	—	—	○
		M3FE40	3	76 *1	75	400	150	1.10	3	10	30	—	○
		M3F60	3	100 *1	90	600	150	1.05	3	10	—	—	○
DO-214AA similar M3FE60	B6	M3FE60	3	76 *1	90	600	150	1.05	3	10	25	○	○
		D2F60	1.4	25	60	600	150	1.05	1.4	10	—	—	○
		D3F60	3	80 *1	150	600	150	1.05	3	10	—	—	○
DO-214AA similar 2F	B9-1	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	○	○
		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	—	○	○


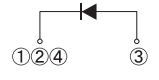
 : New product *1 : Tl *2 : Tc *3 : trr(max)=3.5μs ■ : Please contact us.

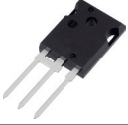
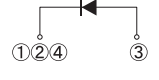
Axial													
JEDEC Code JEITA Code House Name	Fig.	Type No.	Absolute Maximum Ratings					Electrical Characteristics				Based on AEC-Q101	Automotive
			IF (AV) [A]	Conditions Ta [°C]	IFSM [A]	VRRM [V]	Tj [°C]	Vf (max) [V]	Conditions IF [A]	Ir (max) VR=VRRM [μA]	VESD (typ) [kV]		
AX057	A1	D1N60	1	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

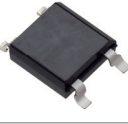
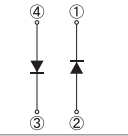

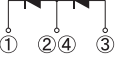
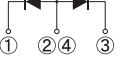
GENERAL RECTIFYING DIODES

Single


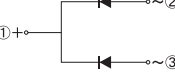
Two Terminal Type							
Package	JEDEC Code JEITA Code House Name	Fig.	I _{F(AV)} [A]	V _{RRM} [V]			Remarks
				400	600	800	
 41.0 × 16.0 × 5.0(mm)	TO-247AD — MTO-3PT	K2	30		S30V60T		

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


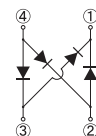






Package		Type No.	Absolute Maximum Ratings					Electrical Characteristics				Based on AEC-Q101	Automotive
JEDEC Code JEITA Code House Name	Fig.		I _{F(AV)} [A]	Conditions T _C [°C]	I _{FSM} [A]	V _{RRM} [V]	T _J [°C]	V _F (max) [V]	Conditions I _F [A]	I _R (max) V _R =V _{RRM} [μA]	V _{ESD} (typ) [kV]		
— — 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	—	—

* : TI

THD (Through Hole Device)


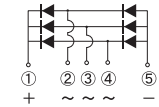


THD (Through Hole Device)													
Package		Type No.	Spec. Code	Absolute Maximum Ratings					Electrical Characteristics			UL	Automotive
JEDEC Code JEITA Code House Name	Fig.			IF (AV) [A]	Conditions Ta [°C]	IFSM [A]	VRRM [V]	Tj [°C]	VF (max) [V]	Conditions IF [A]	IR (max) VR=VRRM [μA]		
— 1Z	C3	S1ZB60	-7101	0.8	25	30	600	150	1.05	0.4	10	—	—
— 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	—	—

* : TI

BRIDGE DIODES

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


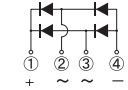

3 Phase Bridge Diodes

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	S30VT160	
 36.0 × 36.0 × 23.0(mm)	— — SVTA	E14	10	S10VTA60	S10VTA80		
			15	S15VTA60	S15VTA80		
			20	S20VTA60	S20VTA80		
			30	S30VTA60	S30VTA80	S30VTA160	
 89.0 × 50.0 × 16.6(mm)	— — MG038	F7	150		MG038B150080A	★ MG038D150160A	
			200		MG038A200080A	★ MG038C200160A	

■ : New product ★ : Under development


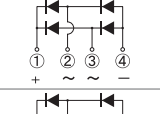

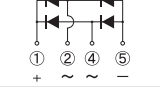
High Speed Bridge Diodes (SBD)

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)	— — 3S	D3	4	D4SBS4	D4SBS6	D4SBN20	
			10	D10SBS4			
			15		D15XBS6		
 37.5 × 30.0 × 4.6(mm)	— — 5S	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)	— — 3S	D3	4	D4SBL20U			
 47.0 × 45.7 × 7.5(mm)	— — JC(4pin)	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	UL	—
— — 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	UL	—
		★ MG038D150160A	150	125	2350	1600	150	1.05	50	10	to be certified	—
		■ MG038A200080A	200	125	2750	800	150	1.05	67	10	UL	—
		★ MG038C200160A	200	125	2750	1600	150	1.05	50	10	to be certified	—

■ : New product ★ : Under development UL : 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	UL	○	K series

UL : UL recognized (UL File No. E142422)


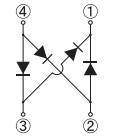

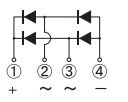
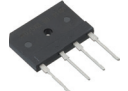
BRIDGE DIODES

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]		
—	D4	LL15XB60	15	124	200	600	150	0.90	7.5	10	3	UL	—
5S		LL25XB60	25	113	300	600	150	0.92	12.5	10	3	UL	■

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

Low Noise Bridge Diodes

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


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

SCHOTTKY BARRIER DIODES


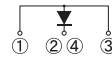
Single

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

Two Terminal Type

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

Three Terminal Type

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

Single

Axial														
Package		Type No.	Absolute Maximum Ratings					Electrical Characteristics				Based on AEC-Q101	Automotive	Series
JEDEC Code JEITA Code House Name	Fig.		V _{RRM} [V]	I _{F(AV)} [A]	Conditions T _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]			
— — AX057	A1	D1NS4	40	1	59	30	150	0.55	1	0.8	50	—	—	S series
		D1NS6	60	1	46	30	150	0.58	1	1	53	—	—	S series
— — AX078	A4-1	D2S4M	40	2	122 *1	60	150	0.55	2	2	95	—	—	S series
		D2S6M	60	2	119 *1	60	150	0.58	2	2	90	—	—	S series
— — AX14	A7	D3S4M	40	3	63	80	150	0.55	3	3.5	150	—	—	S series
		D3S6M	60	3	133 *1	80	150	0.58	3	2.5	130	—	—	S series

*1 : Tl

Two Terminal Type




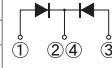

Two Terminal Type														
Package		Type No.	Absolute Maximum Ratings					Electrical Characteristics				Based on AEC-Q101	Automotive	Series
JEDEC Code JEITA Code House Name	Fig.		V _{RRM} [V]	I _{F(AV)} [A]	Conditions T _c [°C]	I _{FSM} [A]	T _j [°C]	V _F (max) [V]	Conditions I _F [A]	I _R (max) 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

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												
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			
			DF10SC6	60	10	132	150	150	0.58	5	4.5	260	—	—	S series			
— SC-83 similar STO-220	H1-1		DF10SC9	90	10	131	150	150	0.75	5	3	185	—	—	S series			
			DF10NC15	150	10	123	100	150	0.88	5	0.2	110	—	—	N series			
			DF15SC4M	40	15	129	150	150	0.55	7.5	5	340	—	—	S series			
			DF15JC10	100	15	126	150	150	0.86	7.5	0.6	200	—	—	J series			
			DF15NC15	150	15	126	150	150	0.88	7.5	0.3	155	—	—	N series			
			DF20SC4M	40	20	122	230	150	0.55	10	7.5	390	—	—	S series			
			DF20SC9M	90	20	111	200	150	0.75	10	10	370	—	—	S series			
			DF20JC10	100	20	121	200	150	0.86	10	0.7	260	—	—	J series			
			DF20NC15	150	20	121	200	150	0.88	10	0.4	200	—	—	N series			
			DF25SC6M	60	25	115	300	150	0.58	12.5	10	490	—	—	S series			
			DF30SC3ML	30	30	119	350	150	0.48	15	10	820	—	—	S series			
			DF30JC4	40	30	115	250	150	0.61	15	0.7	560	—	—	J series			
			DF30SC4M	40	30	112	360	150	0.55	15	10	590	—	—	S series			
			DF30JC6	60	30	108	250	150	0.69	15	0.7	490	—	—	J series			
			DF30JC10	100	30	116	300	150	0.86	15	1	390	—	—	J series			
			DF30NC15	150	30	115	300	150	0.88	15	0.5	300	—	—	N series			
			DF40SC3L	30	40	112	400	150	0.45	15	17	1200	—	—	S series			
			DF40SC4	40	40	106	350	150	0.55	20	14	860	—	—	S series			
			— SC-83 similar FD	H2-2		D10FDC10ST	100	10	158	150	175	0.86	5	15μA	104	○	○	SL series
						D20FDC10ST	100	20	119	250	150	0.86	10	30μA	185	○	○	N series
						D20FDC15ST	150	20	118	250	150	0.88	10	30μA	159	—	○	N series
						D30FDC4S	40	30	114	300	150	0.55	15	1.5	415	○	○	S series
D30FDC10ST	100	30				108	300	150	0.86	15	40μA	242	—	○	N series			
D30FDC15ST	150	30				107	300	150	0.88	15	40μA	209	—	○	N series			
D40FDC10ST	100	40				105	400	150	0.86	20	60μA	360	—	○	N series			
D40FDC15ST	150	40				103	400	150	0.88	20	60μA	315	—	○	N series			

■ : Please contact us.

SCHOTTKY BARRIER DIODES

SCHOTTKY BARRIER DIODES

Center Tap, Common Cathode

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

Center Tap, Common Cathode

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

SCHOTTKY BARRIER DIODES

Array

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

Diode Module

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

Array

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

Diode Module

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

FAST RECOVERY DIODES

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		
			20		SF20LC30M	SF10KC60M 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	
 41.0 × 16.0 × 5.0(mm)	TO-247AD MTO-3PV	K7-1	20			S20LC40UV	S20LC60USV	

Center Tap, Common Cathode

Three Terminal Type



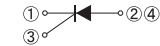



JEDEC Code JEITA Code House Name	Package	Fig.	Type No.	Absolute Maximum Ratings				Electrical Characteristics				Based on AEC-Q101	Automotive	Series	
				V _{RRM} [V]	I _{F(AV)} [A]	Conditions T _C [°C]	I _{FSM} [A]	T _J [°C]	V _F (max) [V]	Conditions I _F [A]	I _R (max) V _R =V _{RRM} [μA]				t _{rr} (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.

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



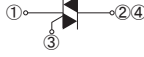
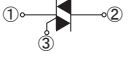
TRIACs

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 5 8 12 16 20	■ KD3FB60 ■ KD3SF60E ■ KD3SF60 ■ KD5SF60 ■ KD8SF60 ■ KD12SF60 ■ 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

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

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

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




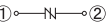
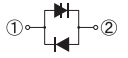
SURGE ABSORBERS

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

Thyristor Surge Suppressors

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


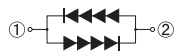
- Applications**
1. Lightning surge adsorption for communications circuits.
 2. Lightning surge adsorption for transmitters and switchboards.
 3. Surge protection for ISDN terminals.

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

Varistor

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

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

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

Thyristor Surge Suppressors

JEDEC Code JEITA Code House Name	Fig.	Type No.	Absolute Maximum Ratings			Electrical Characteristics			UL	Automotive	
			I _{TSM} [A]	Conditions [μs]	V _{DRM} [V]	T _J [°C]	V _{BO} (min) [V]	I _H (min) [mA]			C _t (max) [pF]
DO-214AC - 1F	B4-3	KL3Z07	30	10/1000	5	125	5.5 *1	50	-	-	
		KL3Z18	30	10/1000	15	125	15.5 *1	50	-	-	
		KL3L07	30	10/1000	58	125	65	100	90	-	-
		KL3N14	30	10/1000	120	125	130	100	50	-	-
DO-214AA similar - M2F	B7	KU10L08	100	10/1000	63	125	70	100	180	UL	-
		KU4F8	40	10/1000	70	125	75	100	100	-	-
	B8	KU10NU11	100	10/1000	60	125	100	150	-	-	
	B7	KU4F12	40	10/1000	100	125	110	100	100	-	-
	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)

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	ST02D-140	ST03D-140
	170	ST02D-170F2	ST02D-170	ST03D-170
	200		ST02D-200	ST03D-200
	240			ST03DH-240
	280			★ ST02DH-280
320			★ ST02DH-320	

★ : Under development

Power Clampers

Surface Mount		Type No.	Absolute Maximum Ratings				Electrical Characteristics						Automotive
Package			PrSM [W]	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

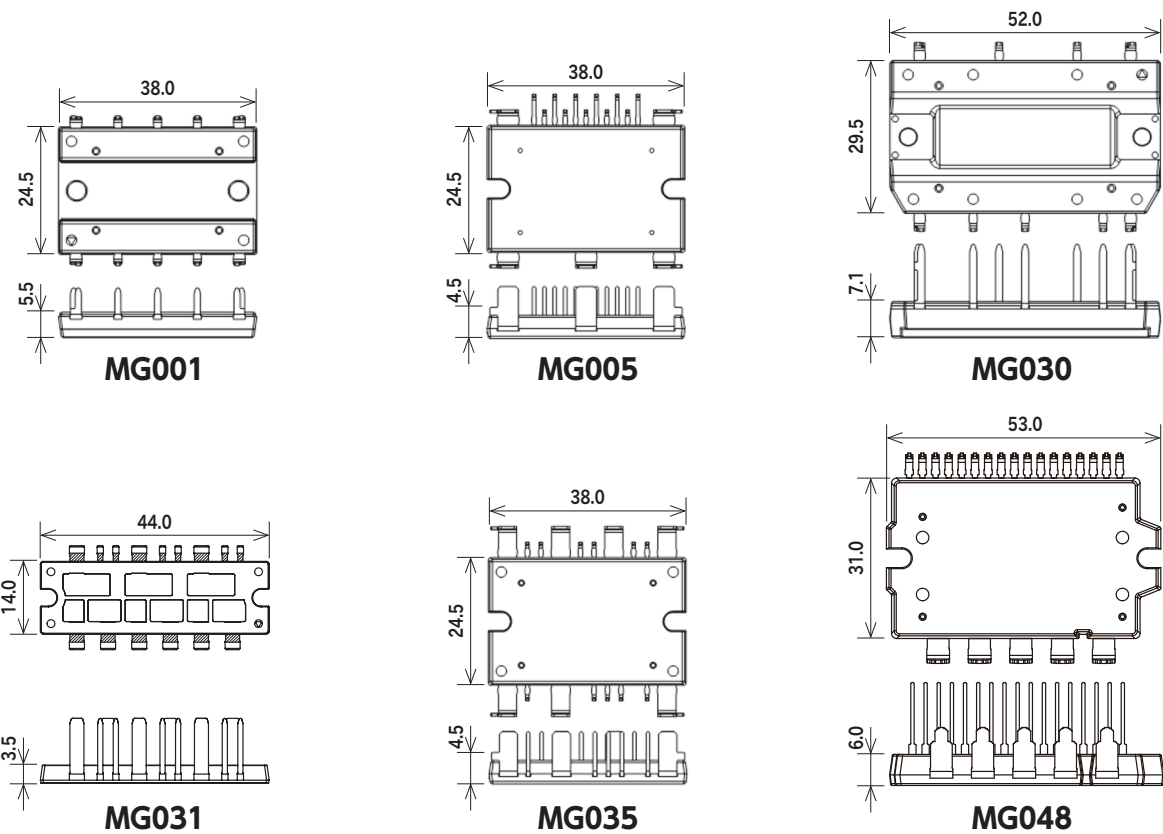
Power Modules include combinations of various power semiconductors.

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

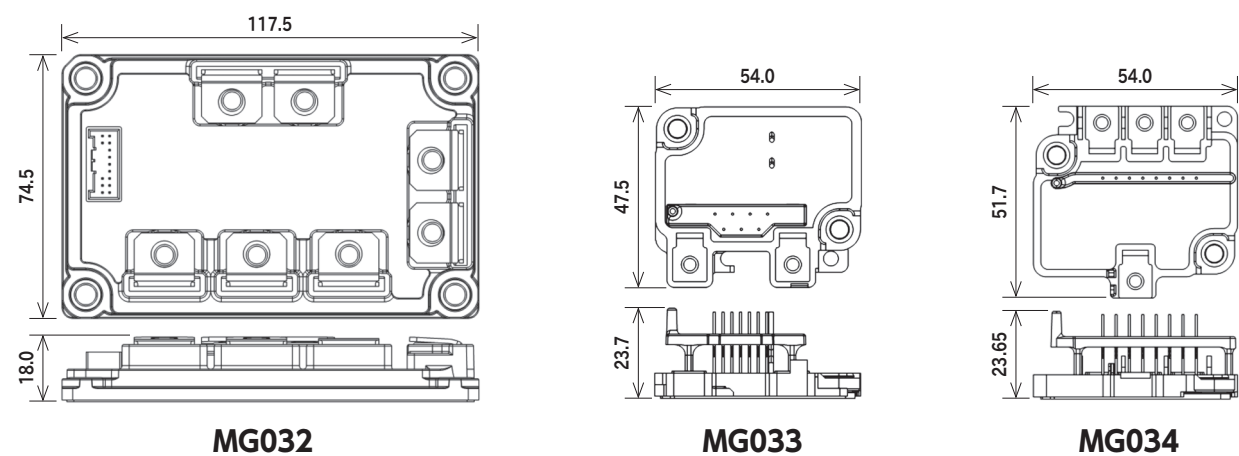
At Shindengen, a multitude of packages allow us to meet customer needs of MOSFET, diodes, and other products.

Semi customizable support and customizable package design support are available.

Transfer Type Package Sample



Potting Type Package Sample



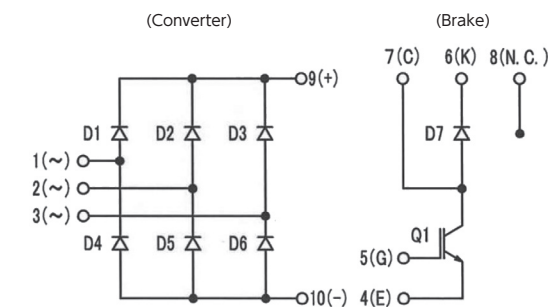
CB Module Series

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

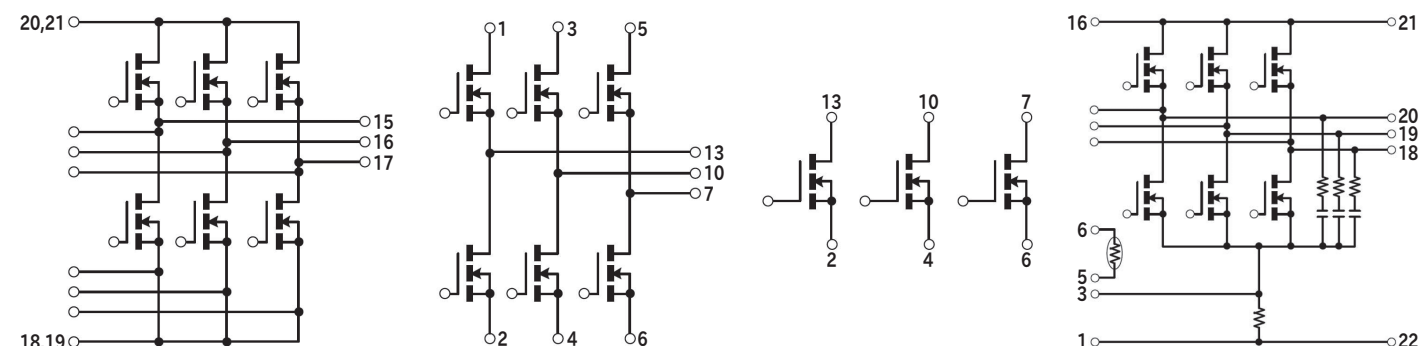
INV Module Series

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]			
	House Name	Fig.	VGS=10V	VGS=10V	VGS=10V											
MG032A4207R5A	-	-	F6	75	420	840	500	150	-	0.98	80120	505	3.0	0.25	-	○
MG032B420010A	MG032	-	F6	100	420	840	500	150	0.99	1.37	91800	500	3.0	0.25	-	○
MG031B090004A	-	-	F5	40	90	360	125	175	2.34	3.20	4180	76	2.0	1.2	-	○
★MG031E120004A	-	-	F5	40	120	480	125	175	2.44	3.10	3540	68	3.0	1.2	-	■
★MG031G148004A	-	-	F5	40	148	592	154	175	1.75	2.20	5330	96	3.0	0.97	-	○
★MG031L080006A	MG031	-	F5	60	80	320	125	175	4.47	5.60	3570	65	3.0	1.2	-	■
★MG031N110006A	MG031	-	F5	60	110	440	154	175	3.0	3.8	5630	94	3.0	0.97	-	■
★MG031MC148004A	-	-	F5	40	148	592	154	175	1.75	2.20	5330	96	3.0	0.97	-	■
★MG031MD110006A	-	-	F5	60	110	440	154	175	3.1	3.9	5630	94	3.0	0.97	-	■
★MG048A150004A	-	-	F8	40	150	600	147	150	2.1	2.7	5900	111	3.0	0.85	-	■
★MG048B100006A	MG048	-	F8	60	100	400	147	150	2.82	3.92	8186	136	3.0	0.85	-	■

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

Equivalent Circuit Schematic



MG032

MG031

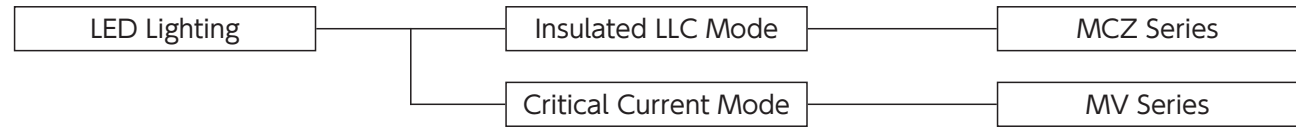
MG031
(MG031MC148004A)
(MG031MD110006A)

MG048

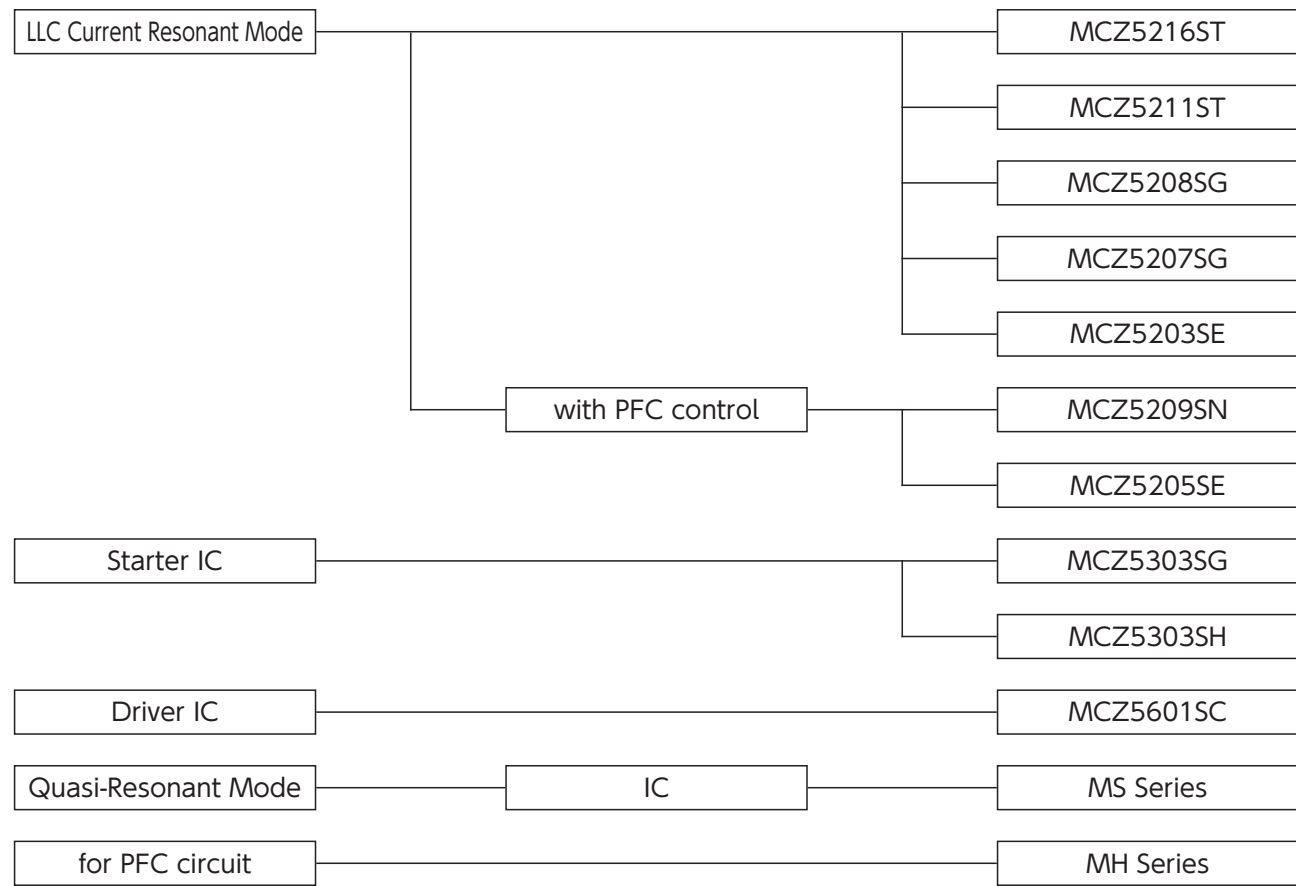
POWER ICs

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			MCZ5203SE	LLC Current Resonant Mode	No							No	300	No																		


 : New product

Starter ICs with Built-in Burst Function

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



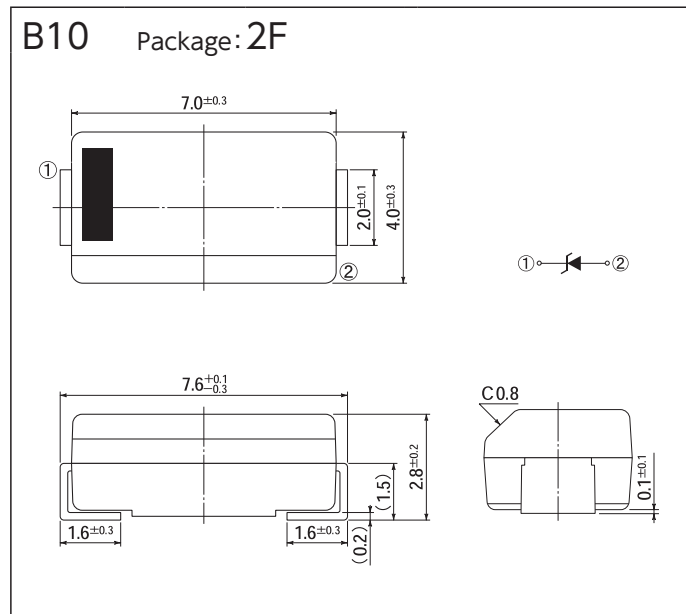
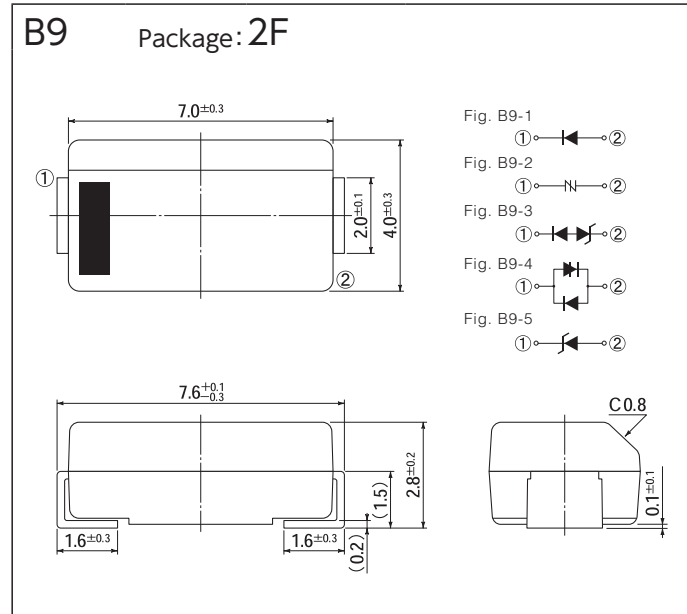
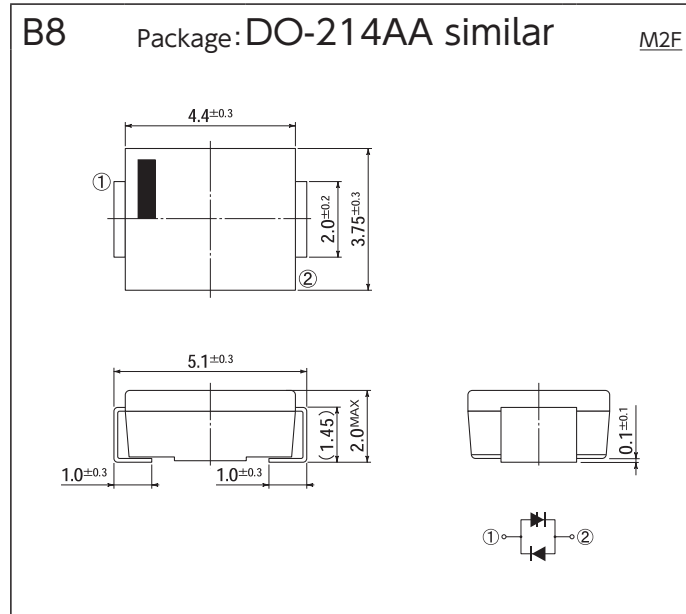
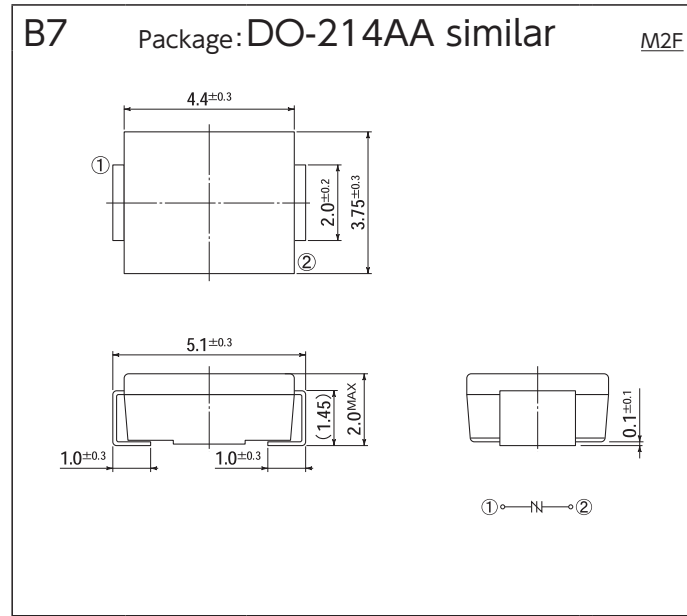
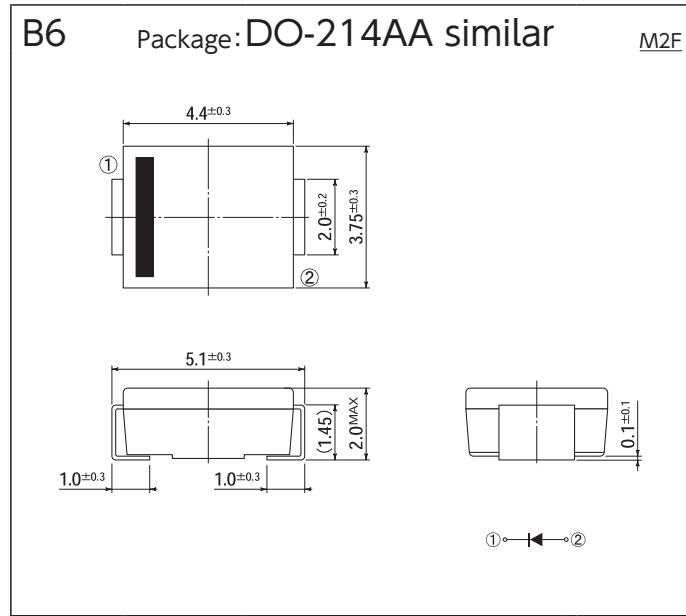
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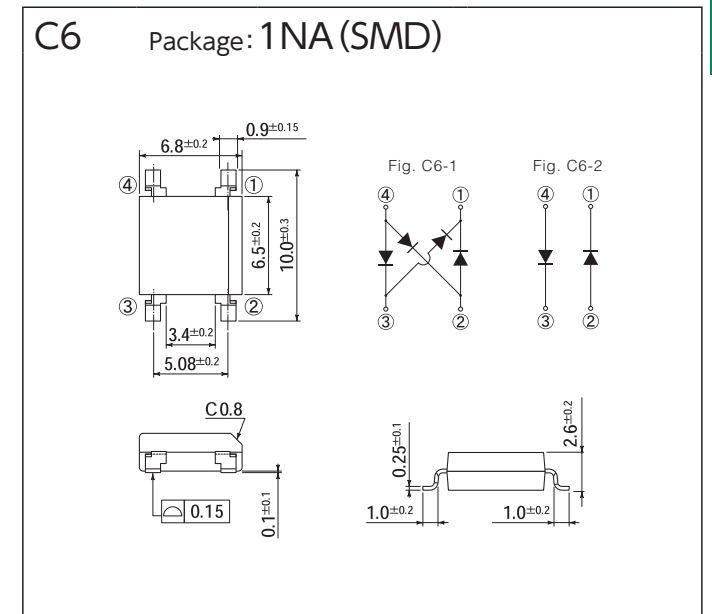
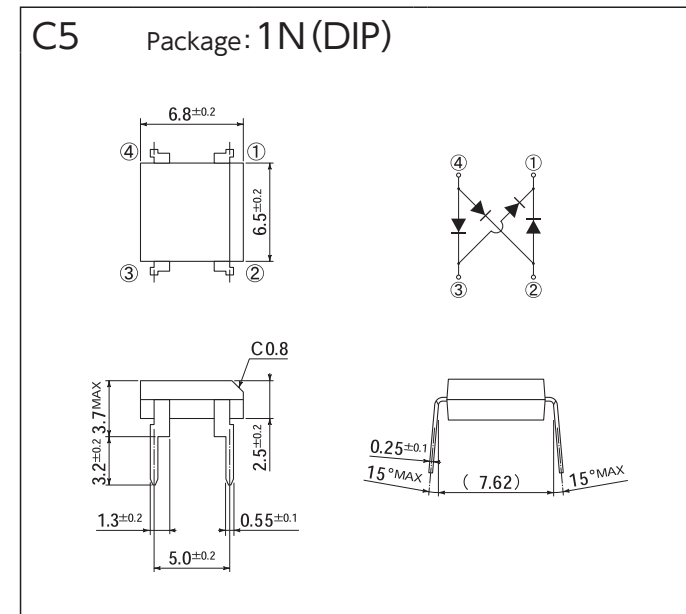
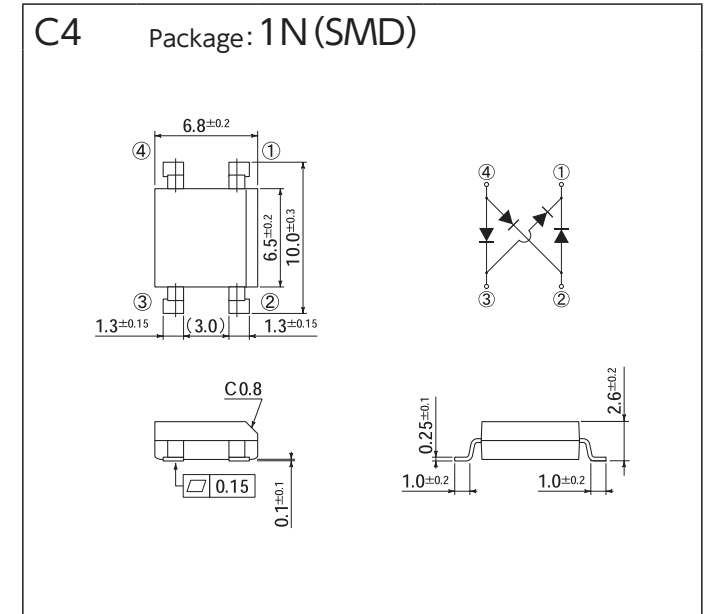
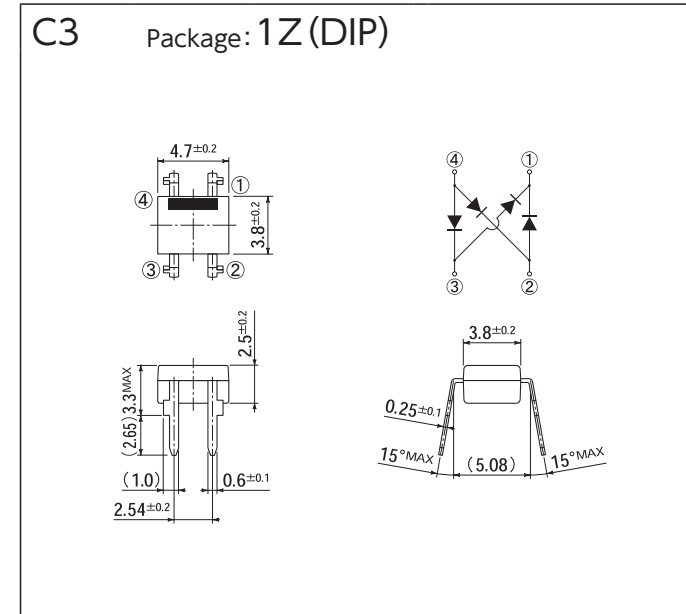
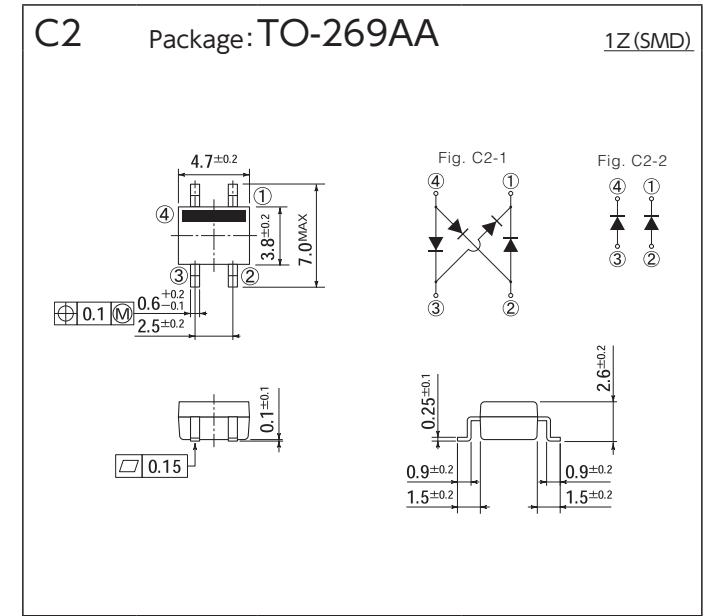
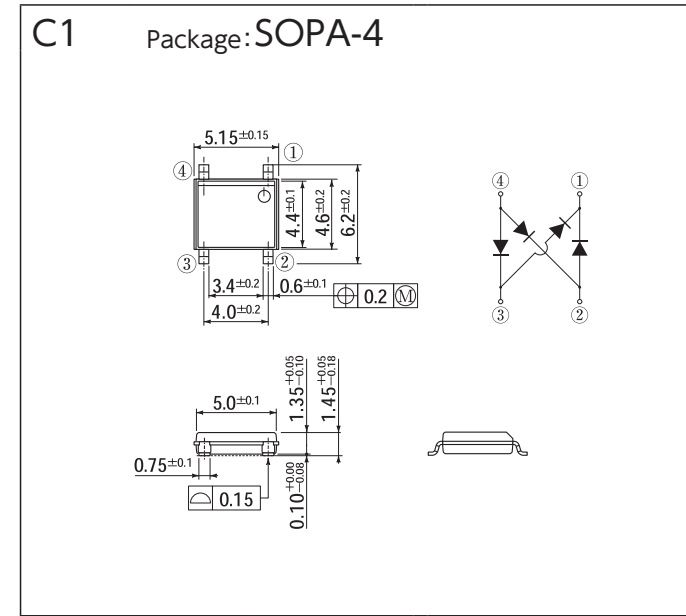
OUTLINE DIMENSIONS

OUTLINE DIMENSIONS

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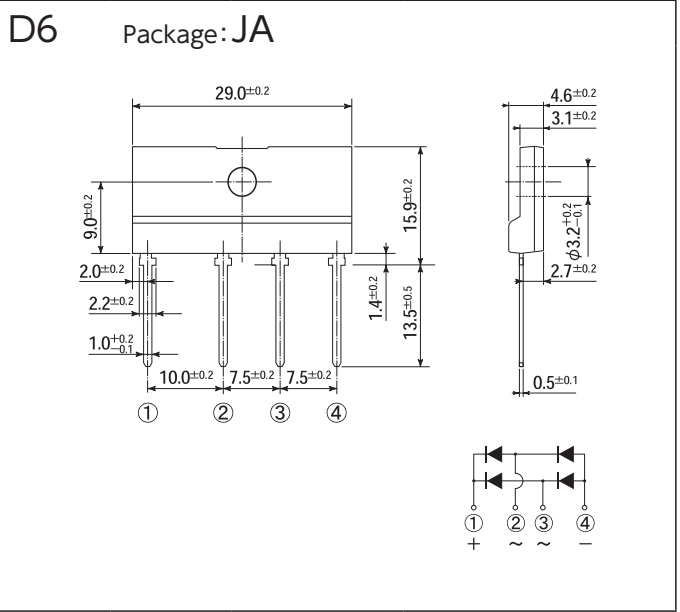
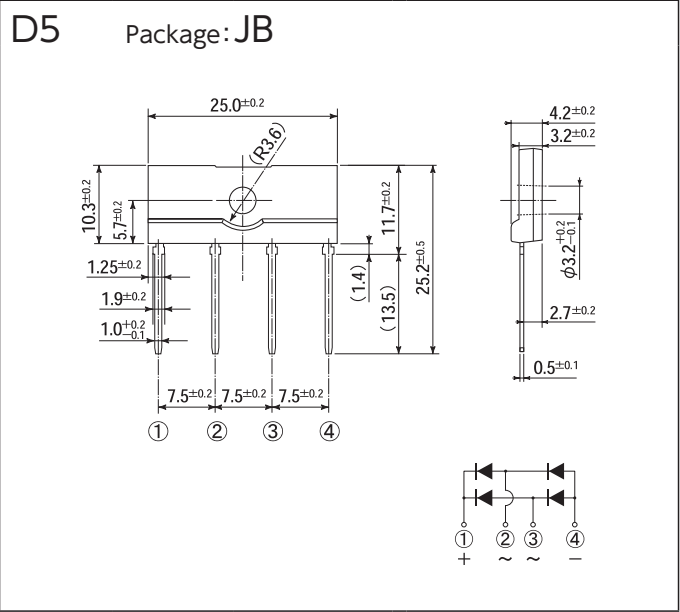
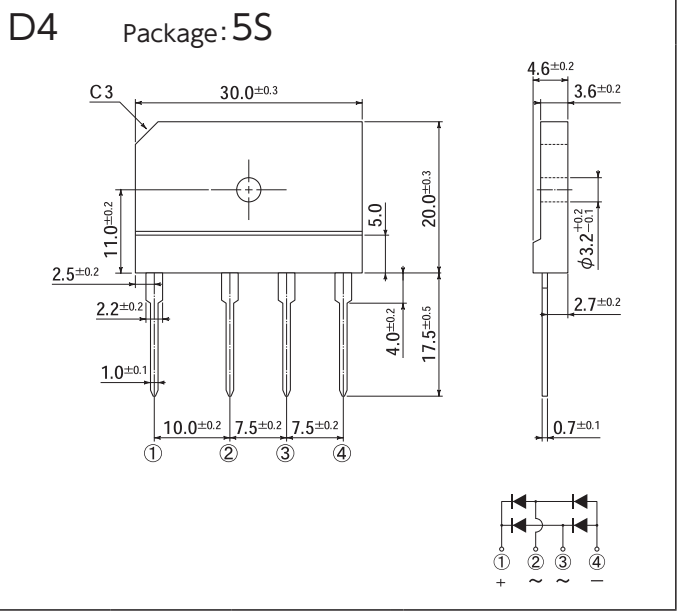
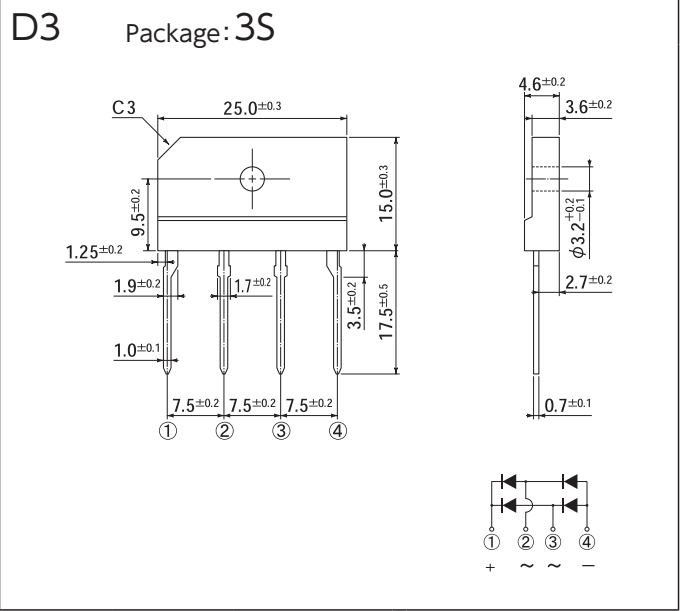
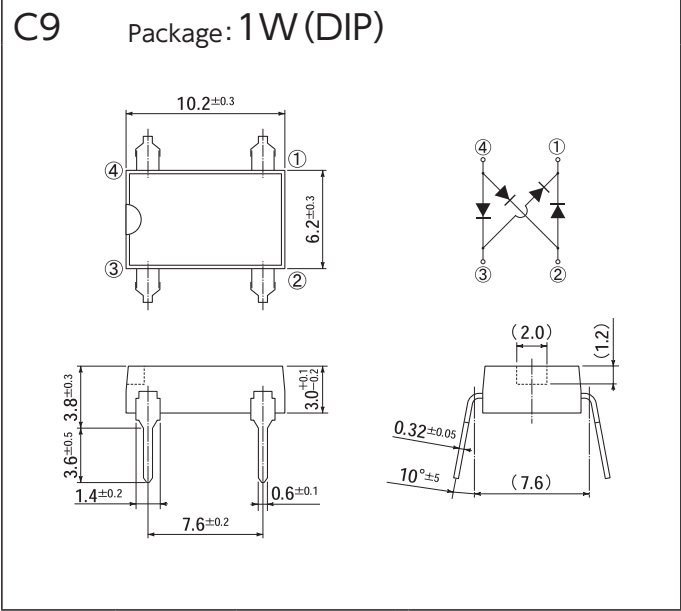
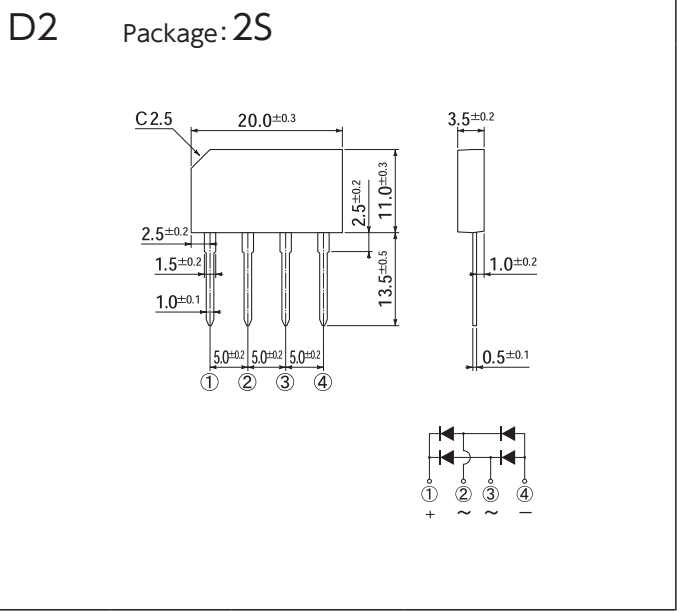
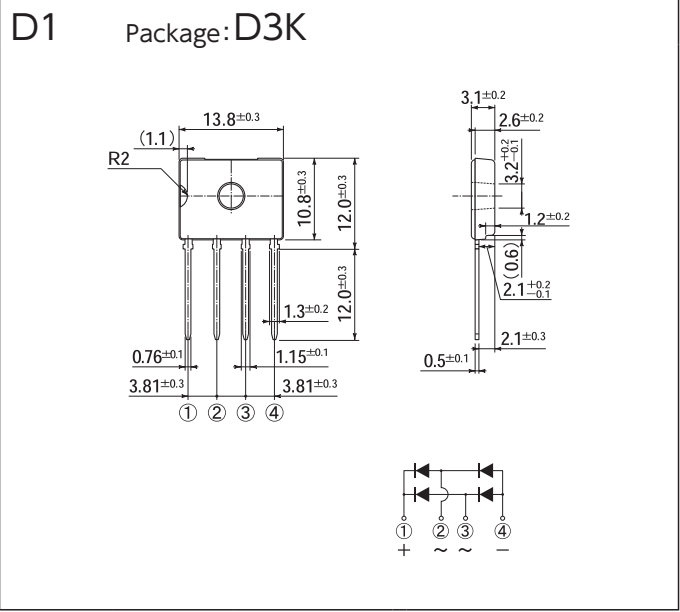
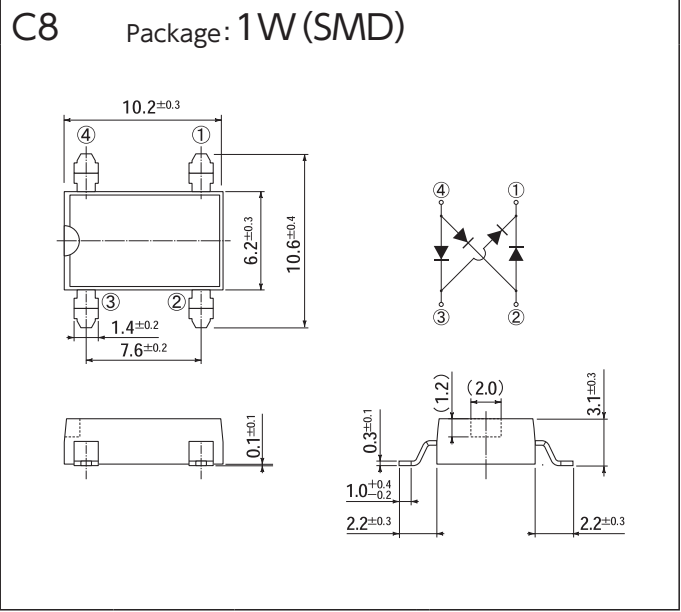
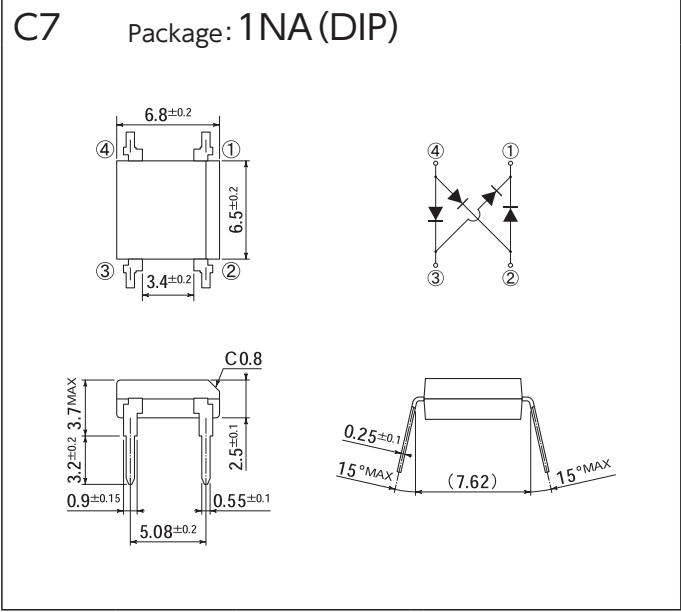


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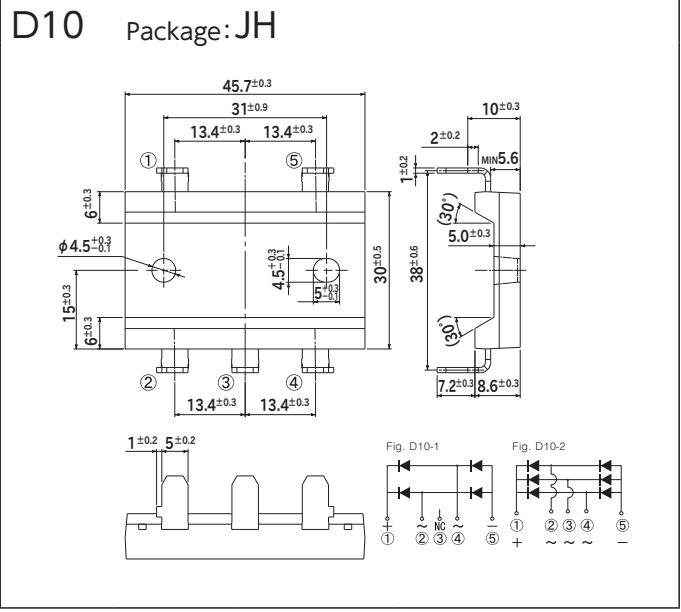
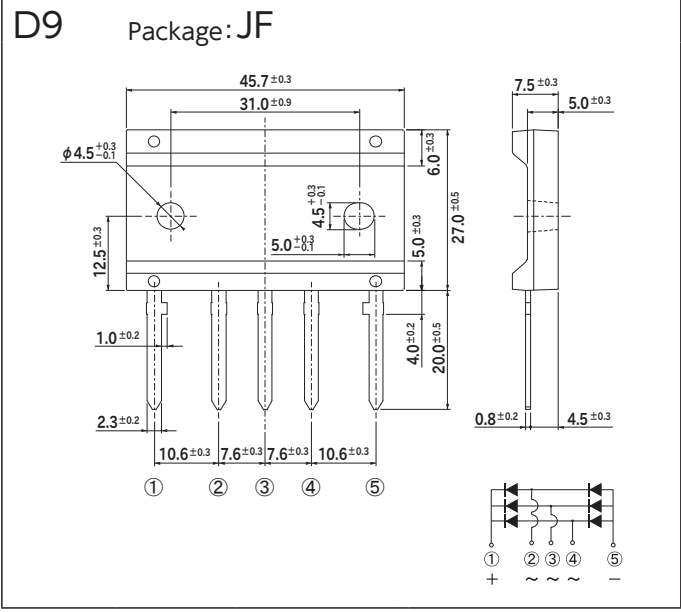
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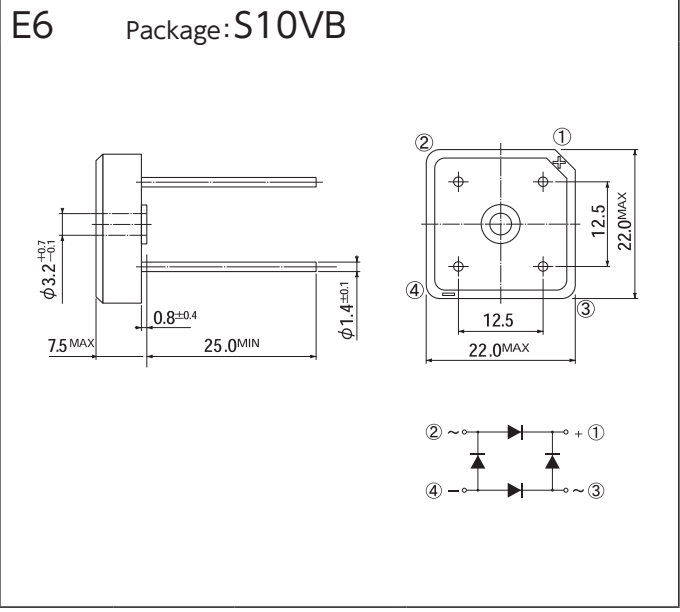
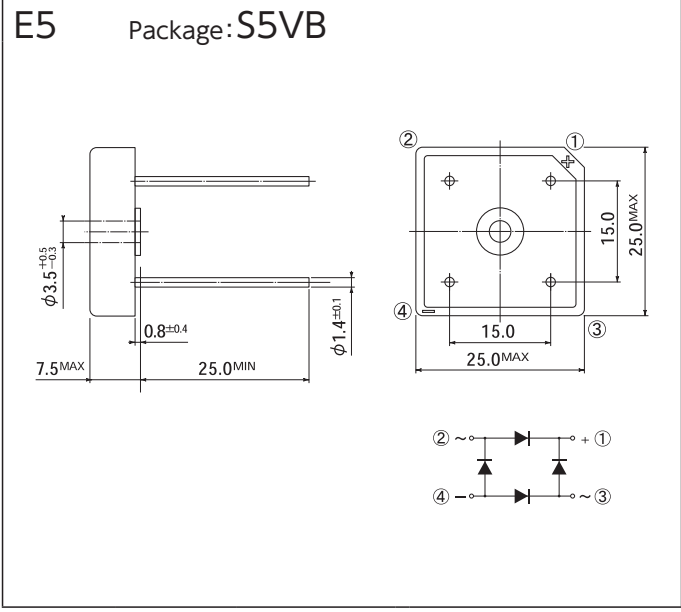
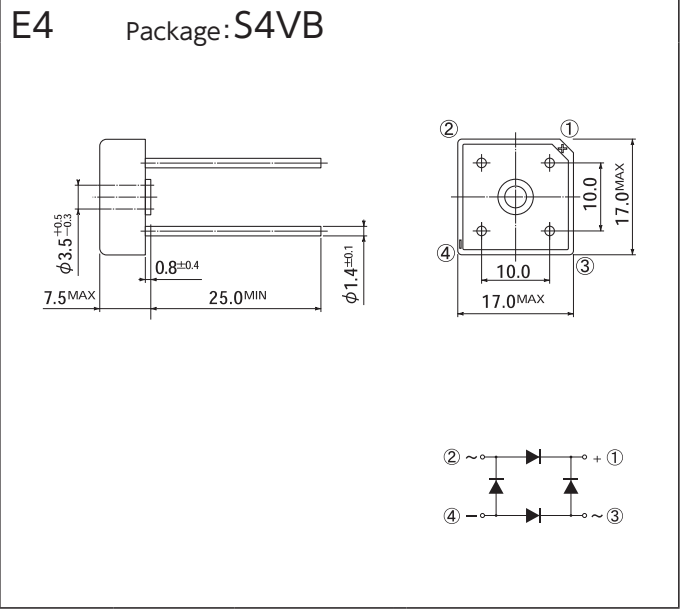
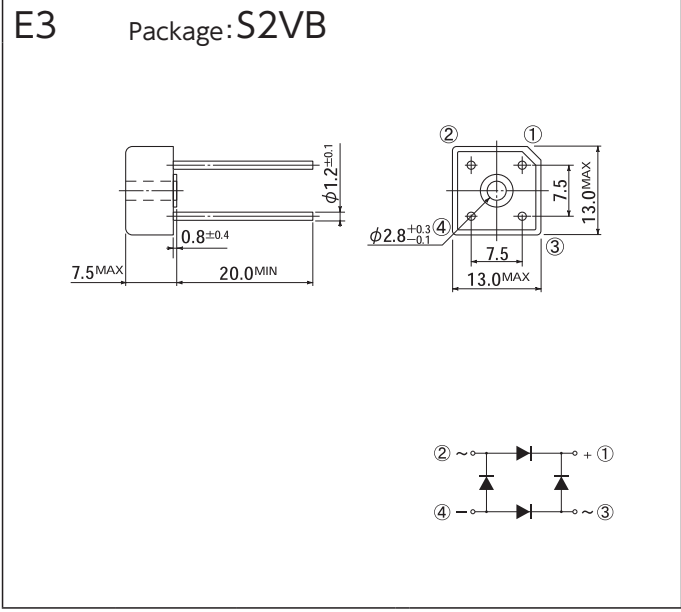
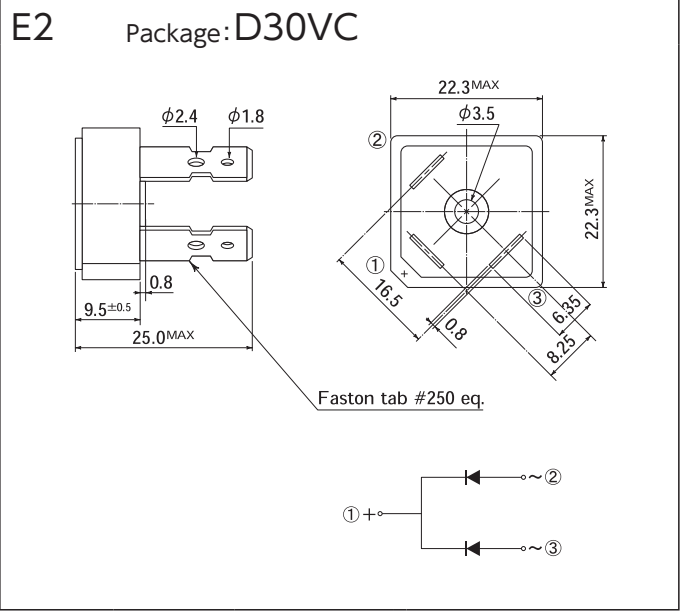
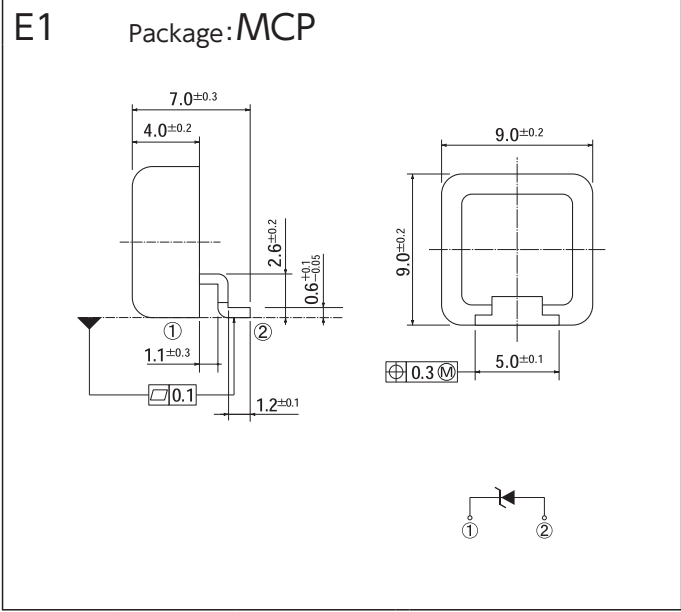


OUTLINE DIMENSIONS

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[Unit:mm]



OUTLINE DIMENSIONS

OUTLINE DIMENSIONS

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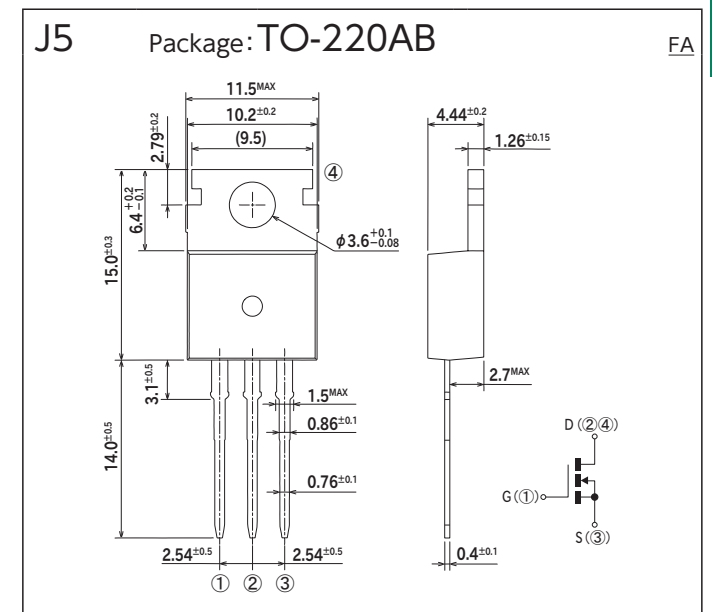
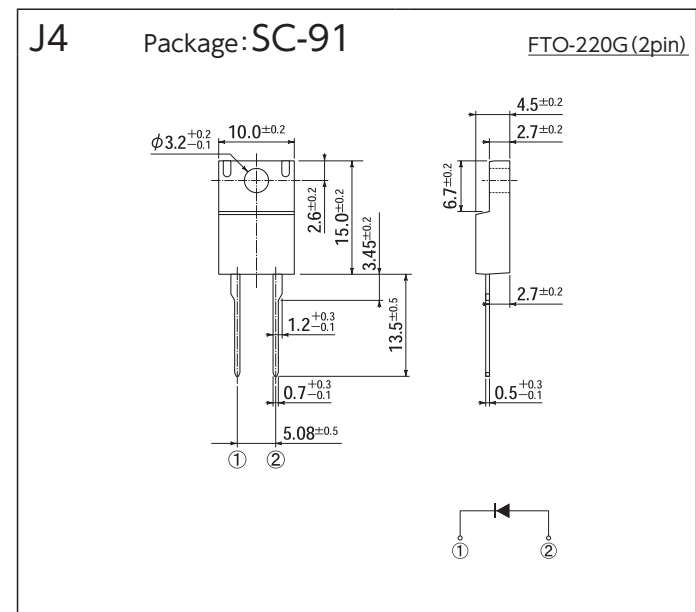
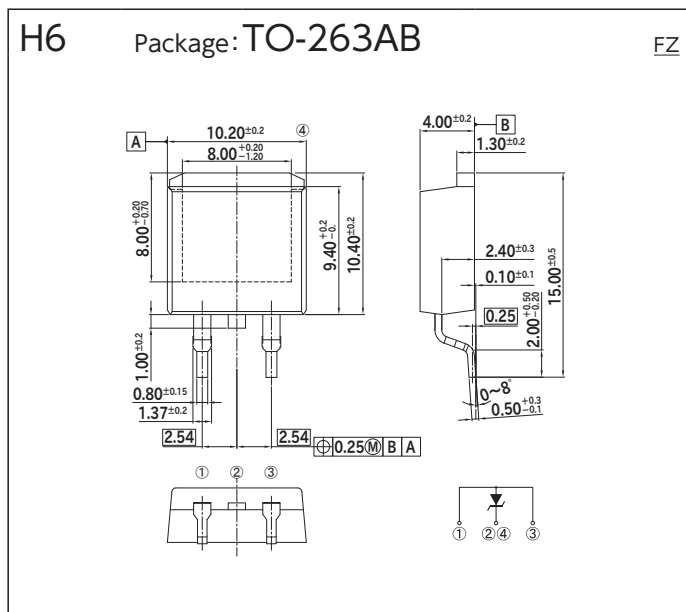
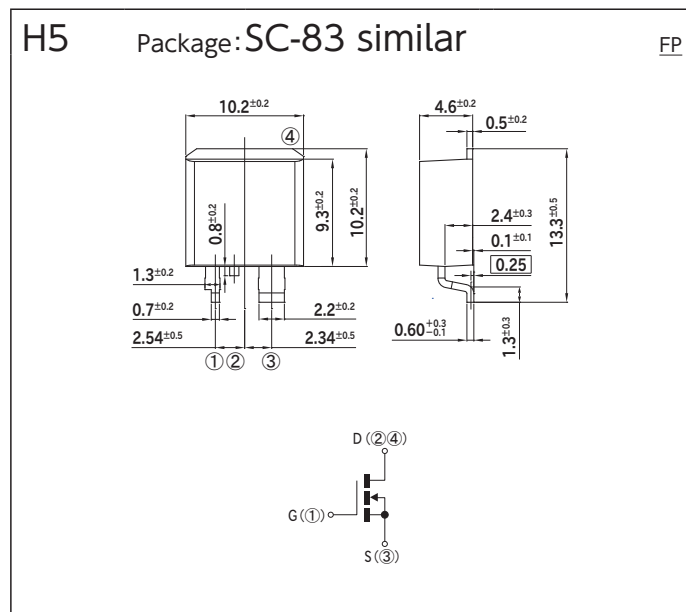
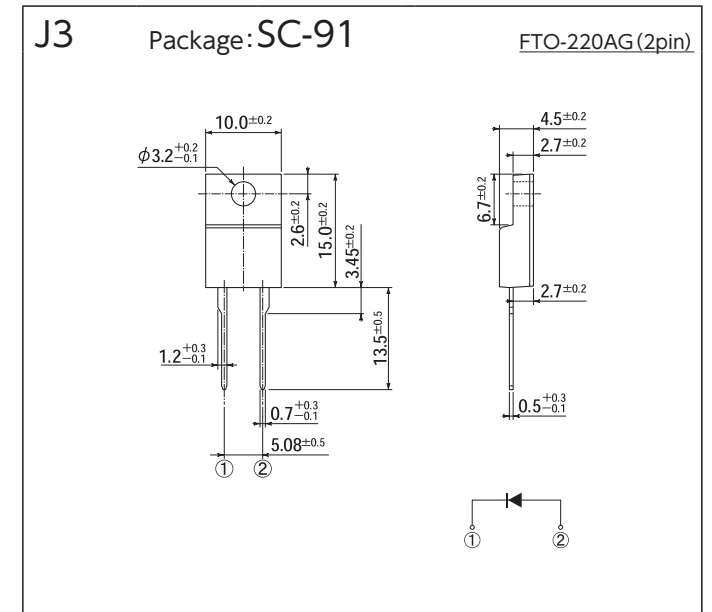
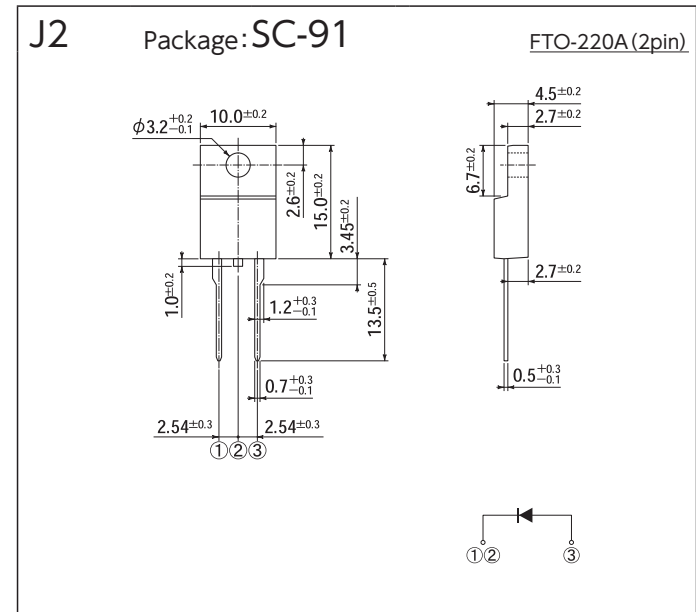
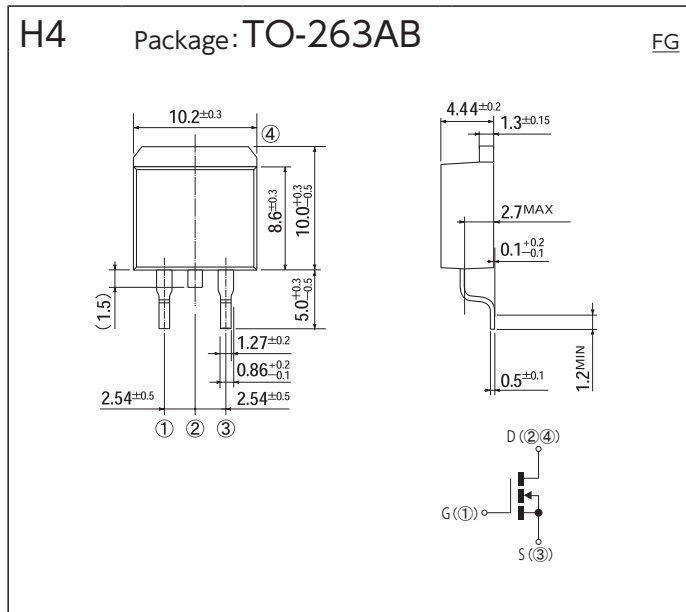
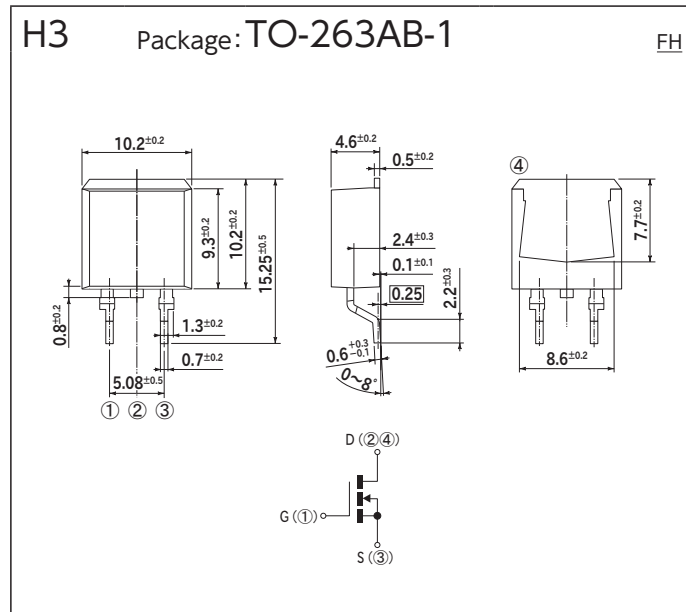
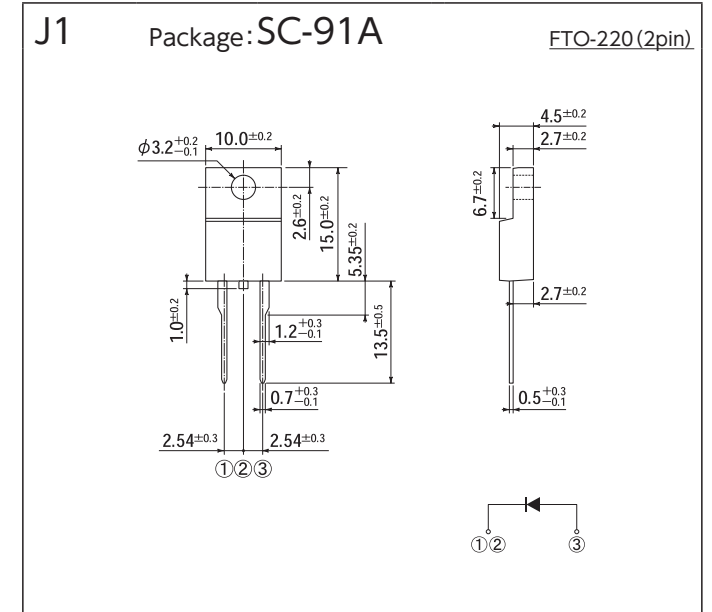
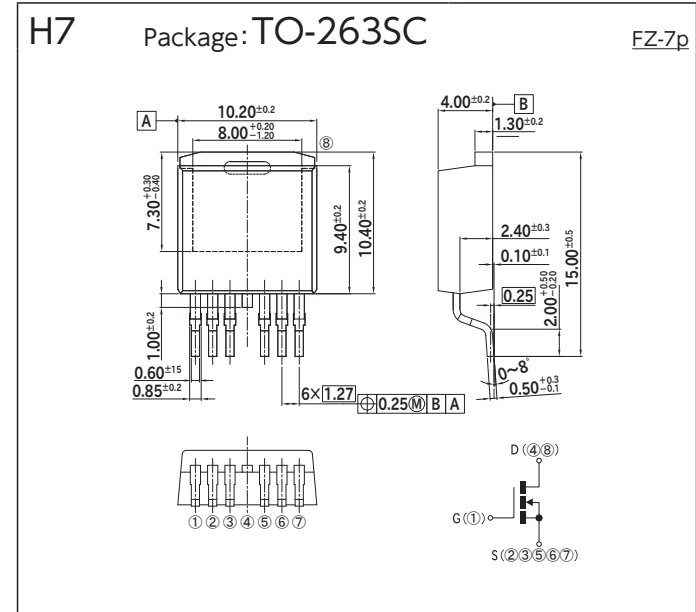
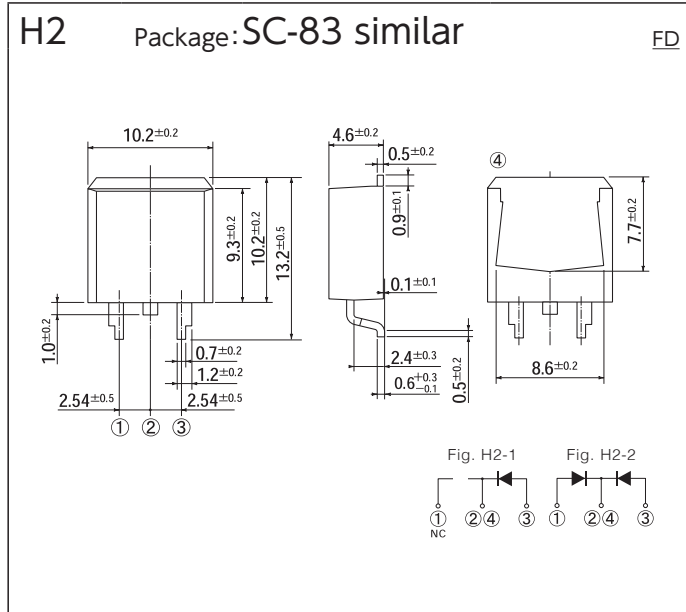
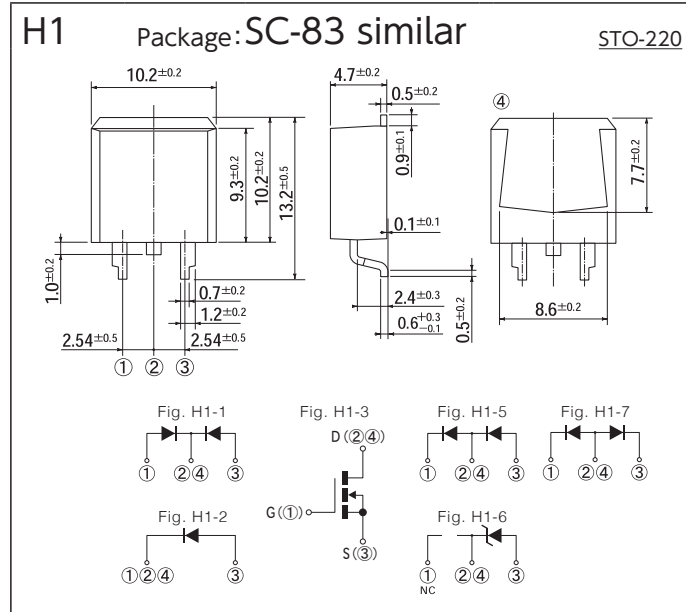


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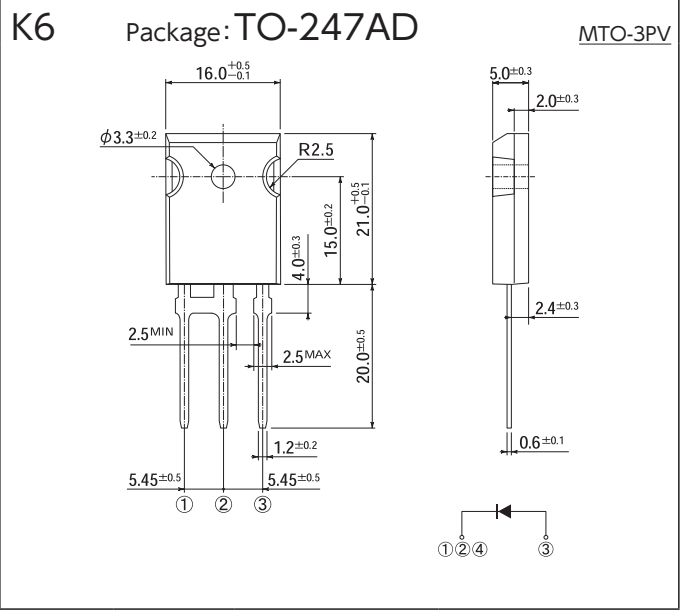
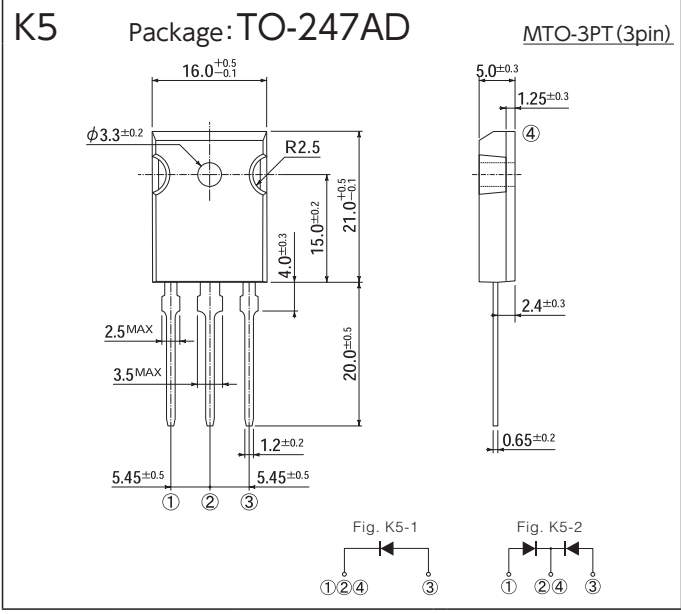
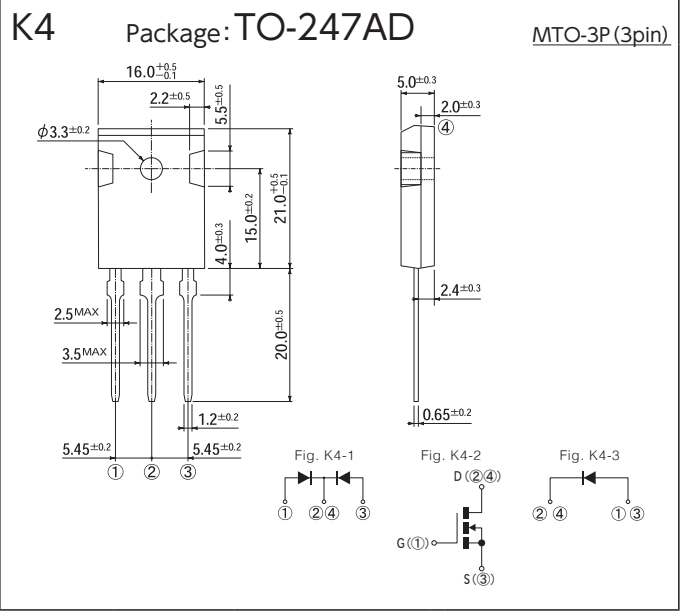
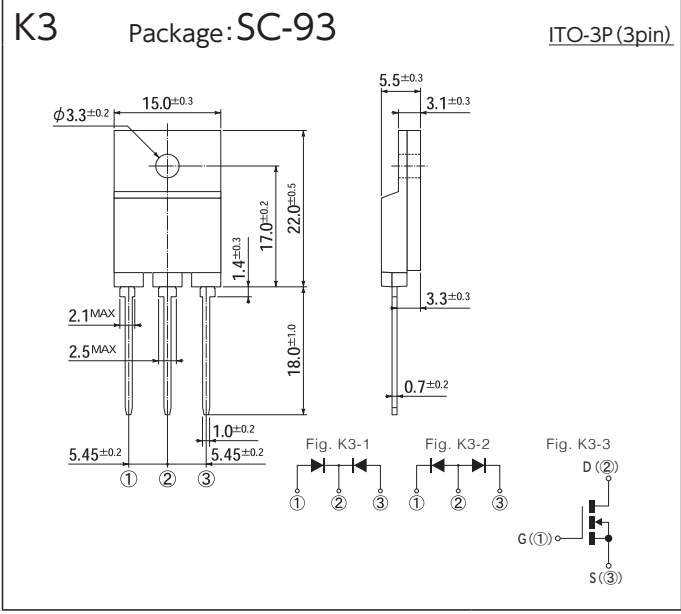
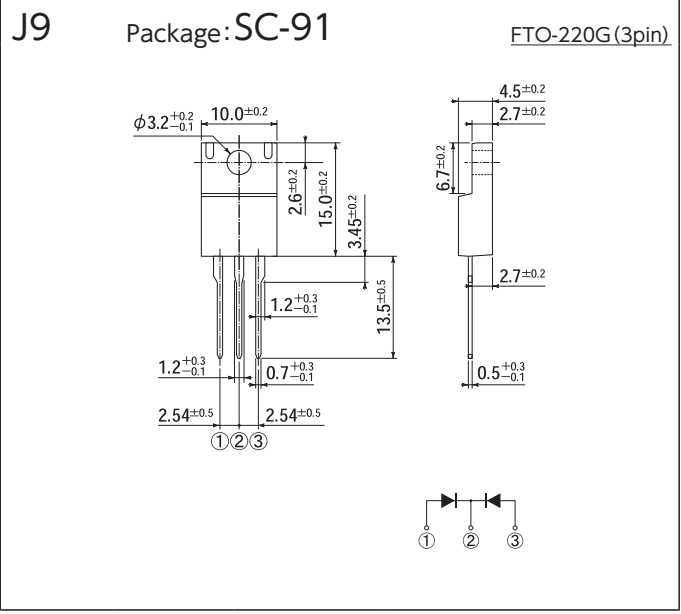
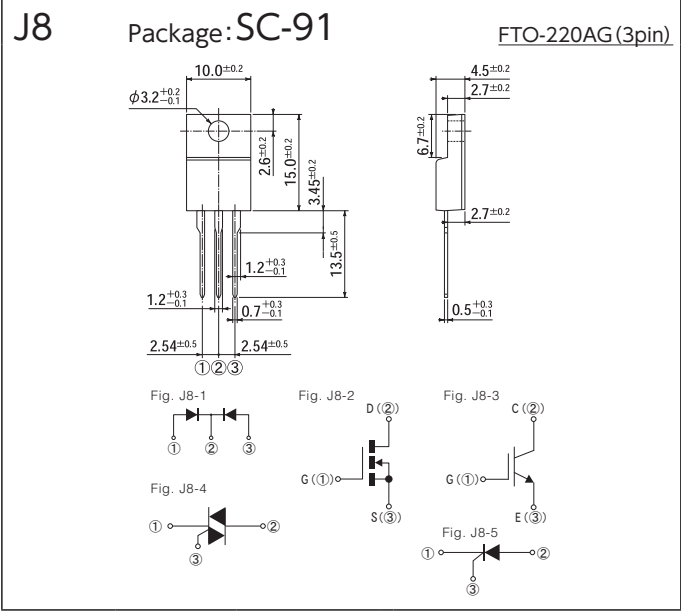
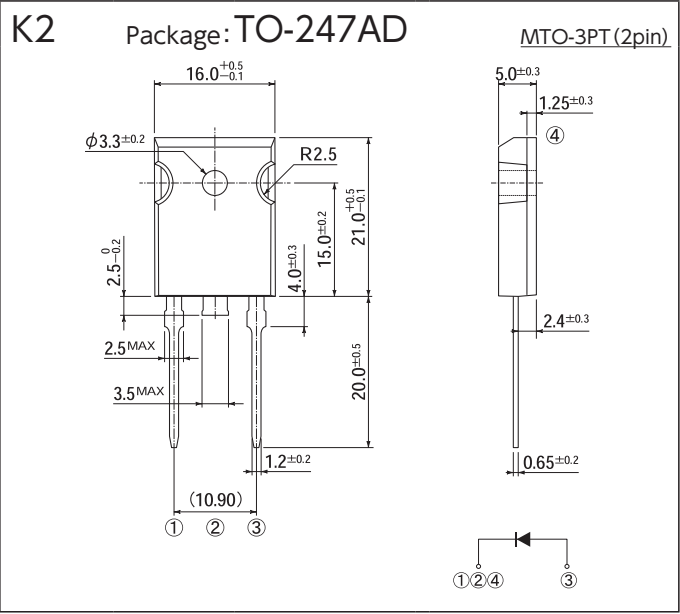
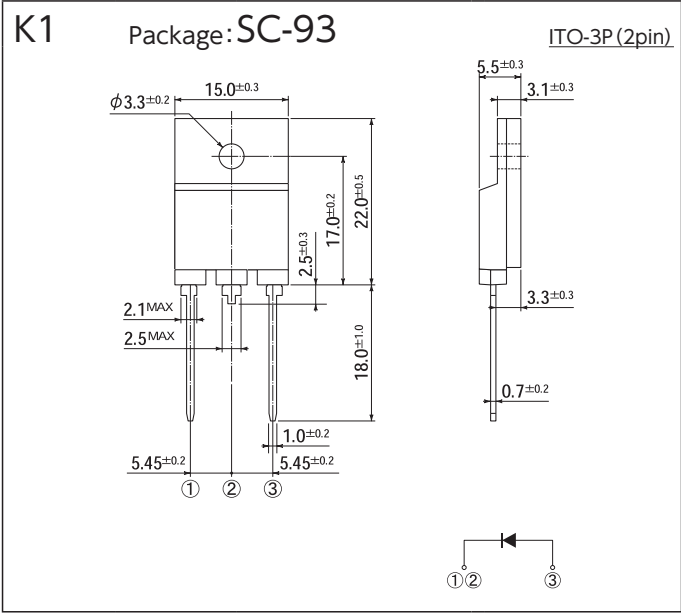
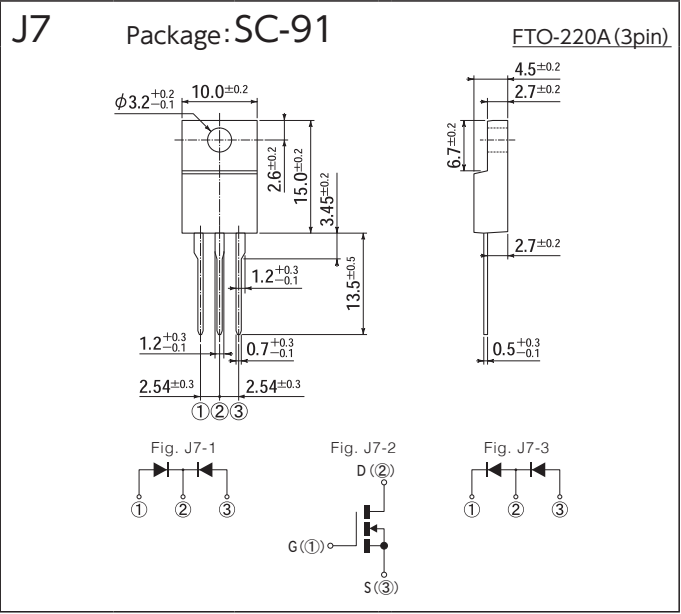
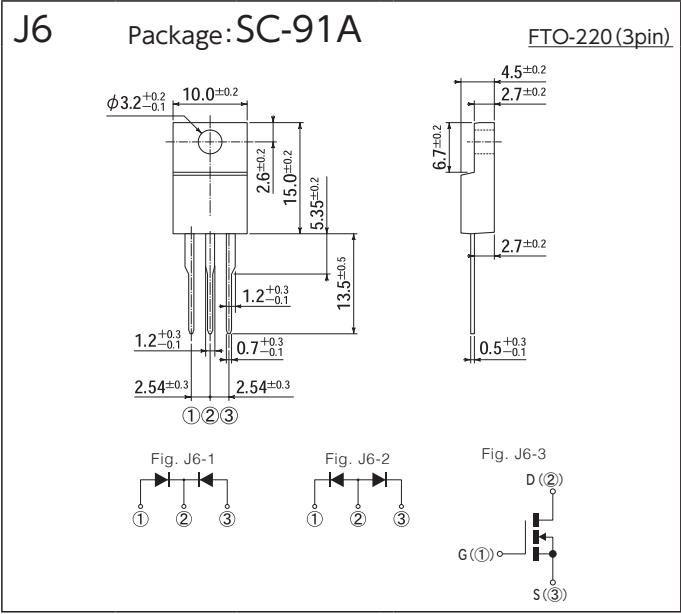
OUTLINE DIMENSIONS

[Unit:mm]



OUTLINE DIMENSIONS

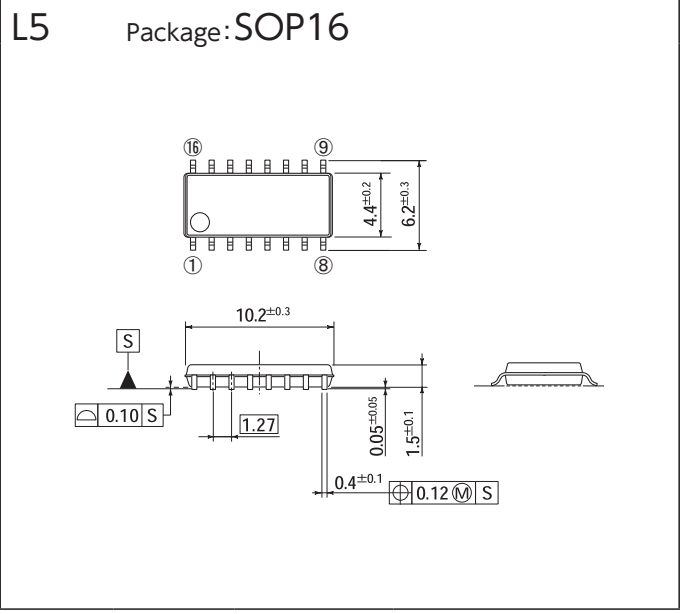
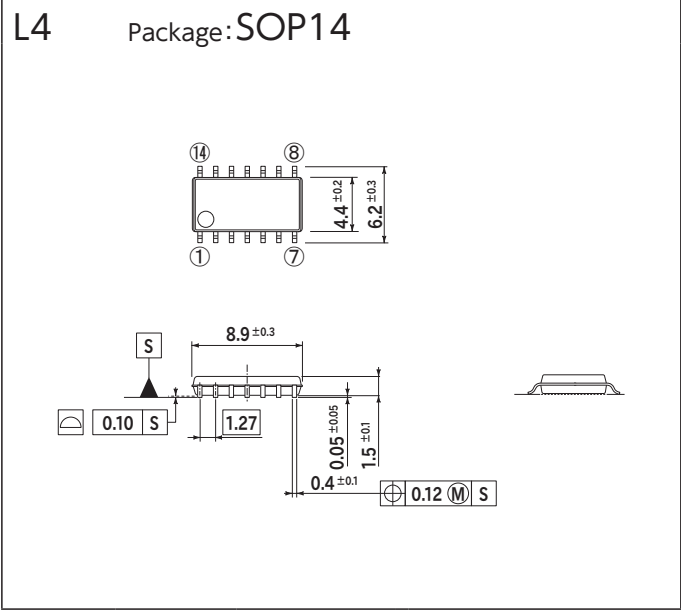
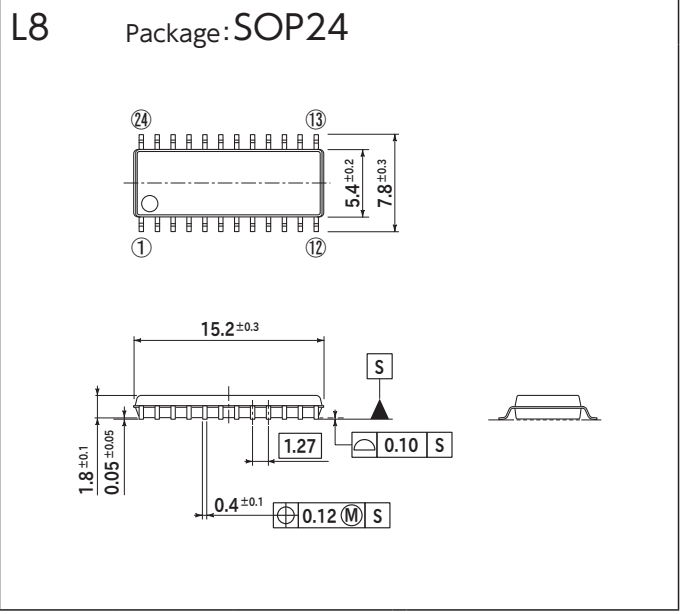
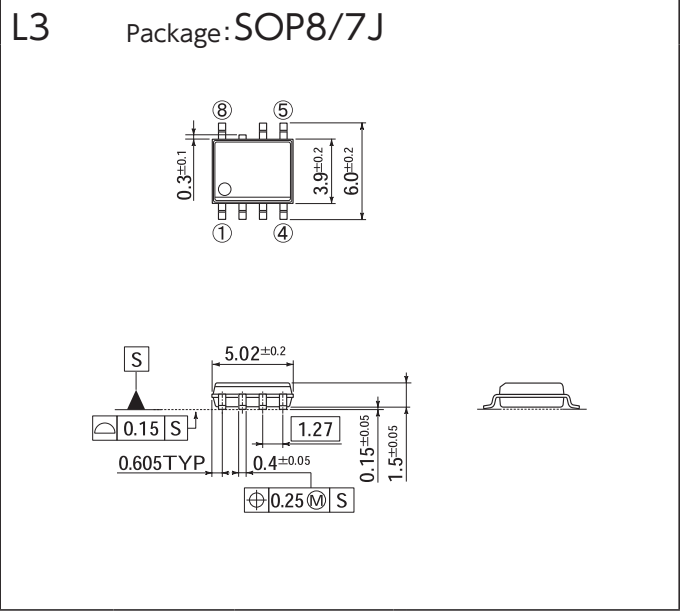
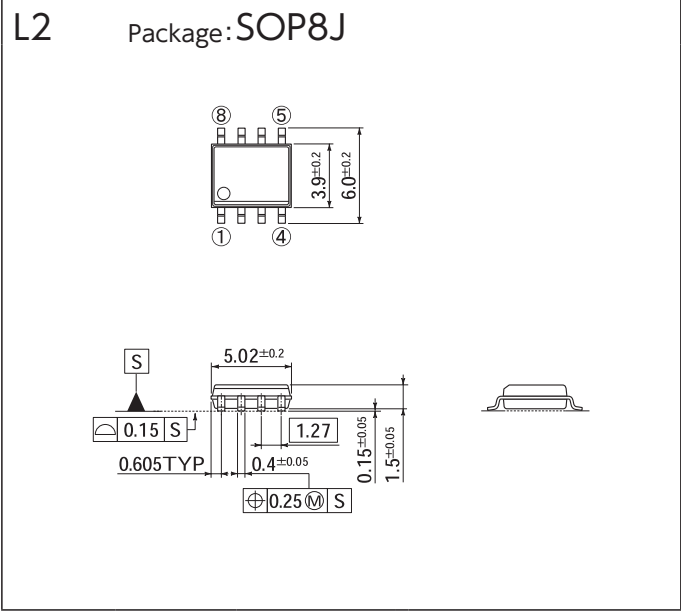
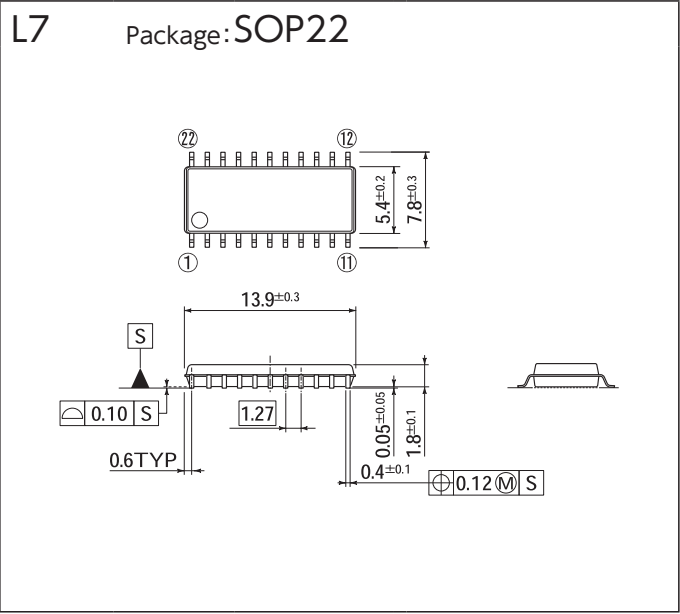
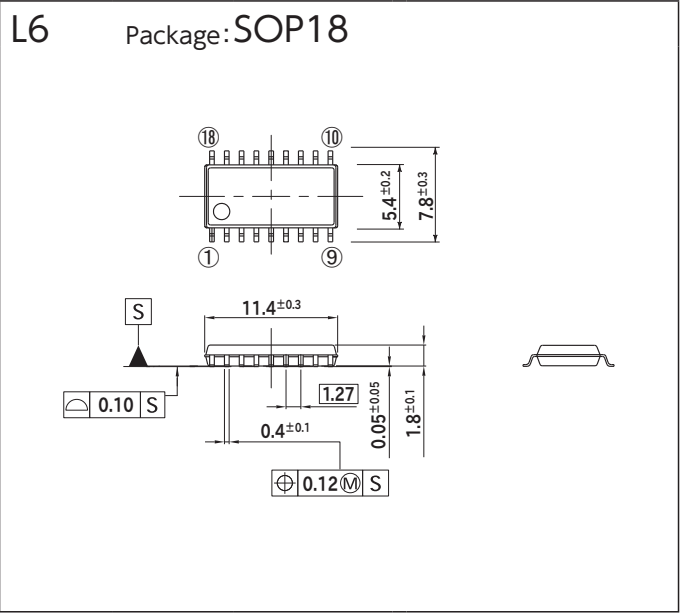
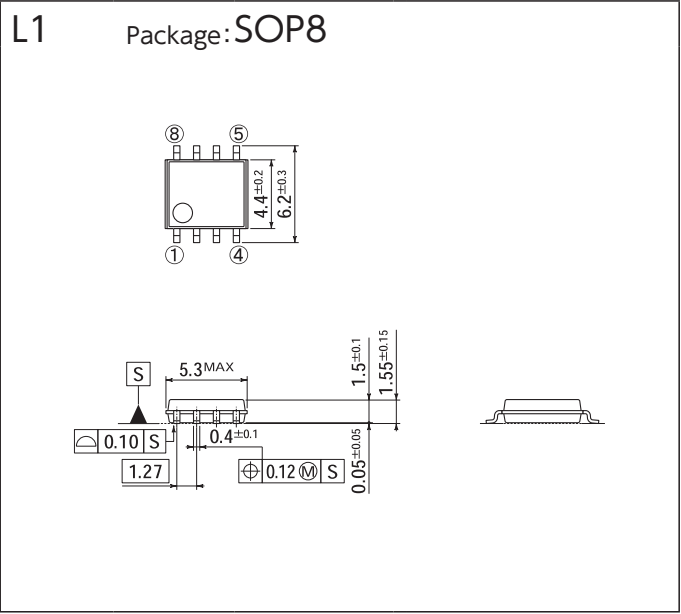
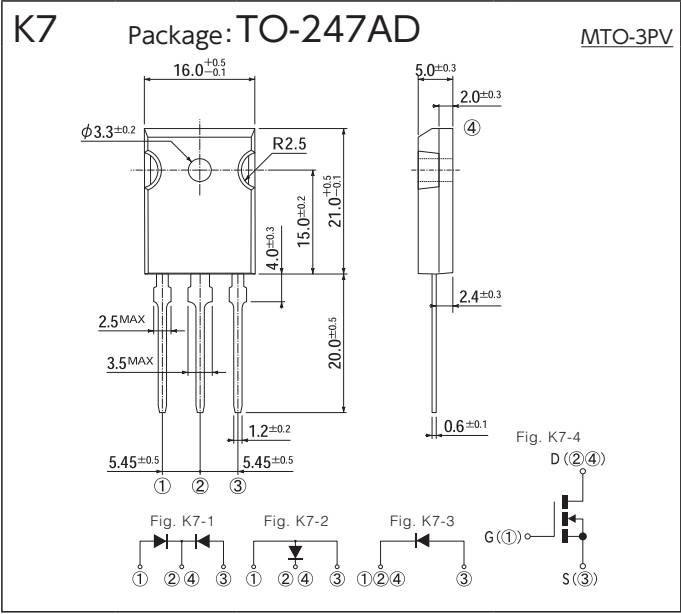
[Unit:mm]



OUTLINE DIMENSIONS

OUTLINE DIMENSIONS

[Unit:mm]



OUTLINE DIMENSIONS

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.



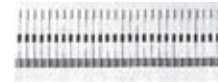
- Magazine : The form in which parts are inserted into resin cartridges designated for automatic inserters.



- Taping
 - Reel (Surface mounting devices)

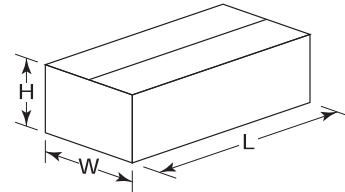


- Box (Axial devices)



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.

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- 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.

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