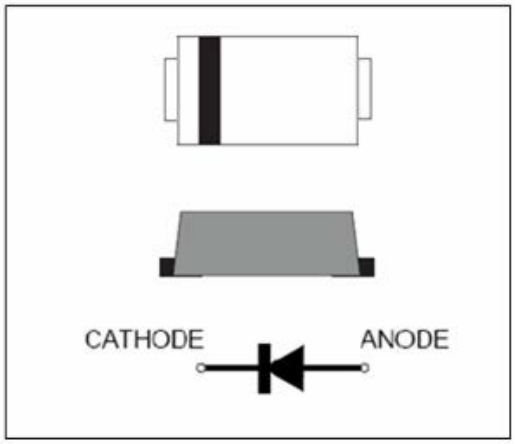
MBR0520E thru MBR0540E

Schottky Barrier Rectifiers

Reverse Voltage 20 to 40V Forward Current 0.5A

FEATURES

* Plastic package has Underwriters Laboratory Flammability Classification 94V-0
* Low power loss,high efficiency
* For use in low voltage high frequency inverters, free wheeling,and polarity protection applications
* Guardring for over voltage protection
* High temperature soldering guaranteed: 260°C/10 seconds at terminals



We declare that the material of product is Haloggen free (green epoxy compound)

Mechanical Data

Case: SOD-323HE
molded plastic over sky die
Terminals: Plated leads, solderable per MIL-STD-750, Method 2026
Polarity: Color band denotes cathode end
Mounting Position Any
Weight: 0.0053 g
Handling precautin None

1.Electrical Characteristic

Maximum & Thermal Characteristics Ratings at 25°C ambient temperature unless otherwise specified.

Parameter Symbol	symbol	MBR0520E	MBR0530E	MBR0540E	Unit
device marking code		052	053	054	
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	V
Maximum RMS voltage	V_{RMS}	14	21	28	V
Maximum DC blocking voltage	V_{DC}	20	30	40	V
Maximum average forward rectified current at TC = 75°C	$I_{F(AV)}$	0.5			A
Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	22			A
Typical thermal resistance (Note 1)	$R_{\theta JA}$ $R_{\theta JL}$	210 70			°C/W
Operating junction temperature range	T_J	–55 to +125			°C
storage temperature range	T_{STG}	–55 to +150			°C

Electrical Characteristics Ratings at 25°C ambient temperature unless otherwise specified.

Parameter Symbol	symbol	MBR0520E	MBR0530E	MBR0540E	Unit
Maximum instantaneous forward voltage at (IF = 0.5 A, TJ = 25°C)	V_F	0.43	0.45	0.55	V
Maximum DC reverse current at rated DC blocking voltage T_A = 25℃ Tj = 100 ℃	I_R	0.25 8	0.130 10	0.03 10	mA
Typical junction capacitance at 4.0V, 1MHz	C_J	160			PF

NOTES:

1. 8.0mm2 (.013mm thick) land areas

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2.Ratings and Characteristic Curves (TA = 25°C unless otherwise noted)

Fig. 1 – Forward Current Derating Curve

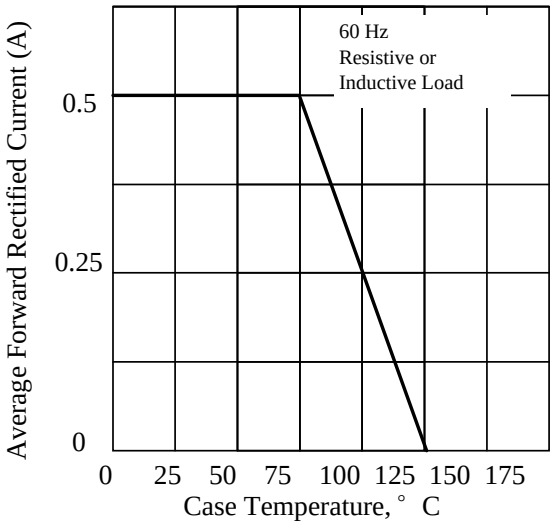


Fig. 2 – Maximum Non-repetitive Peak Forward Surge Current

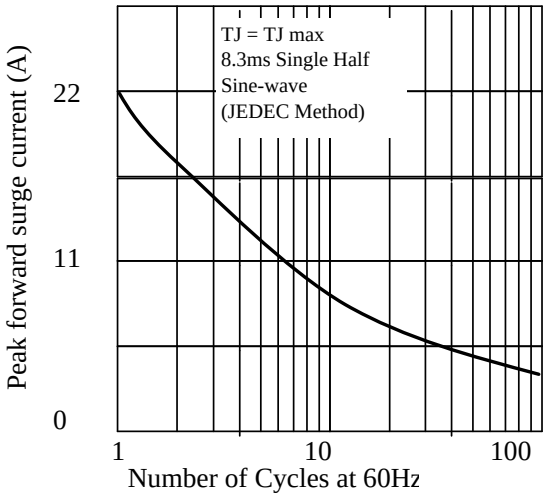


Fig 3. – Typical Instantaneous Forward Characteristics

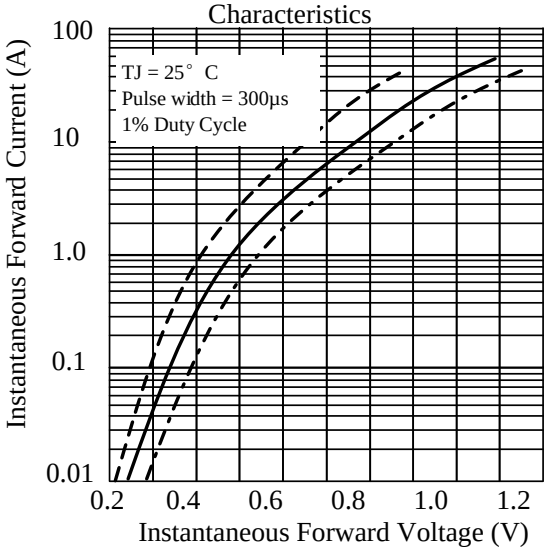


Fig 4. – Typical Reverse Characteristics

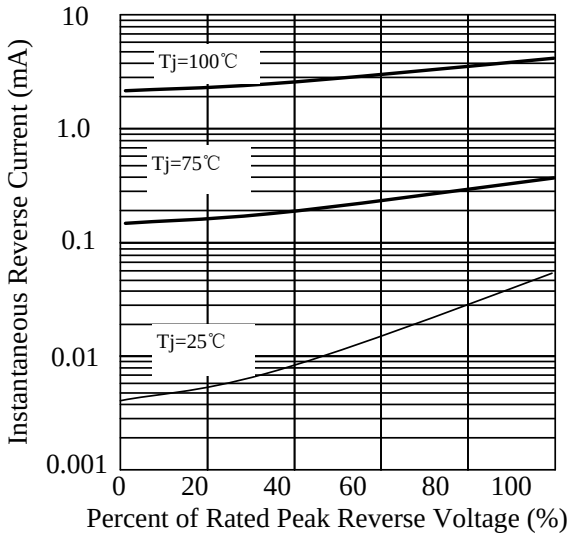


Fig 5. – typical transient thermal impedance

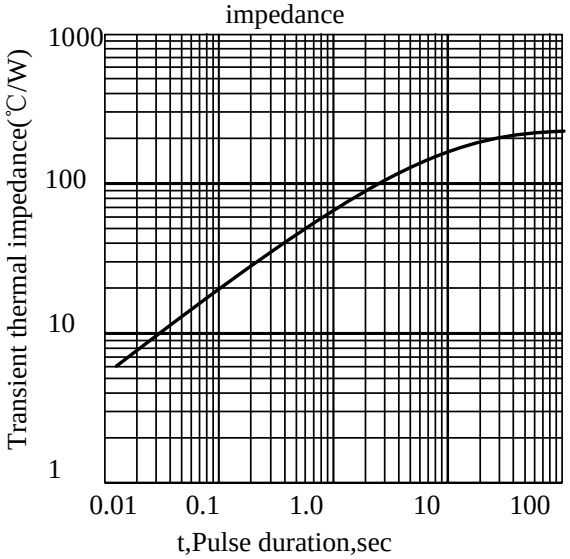
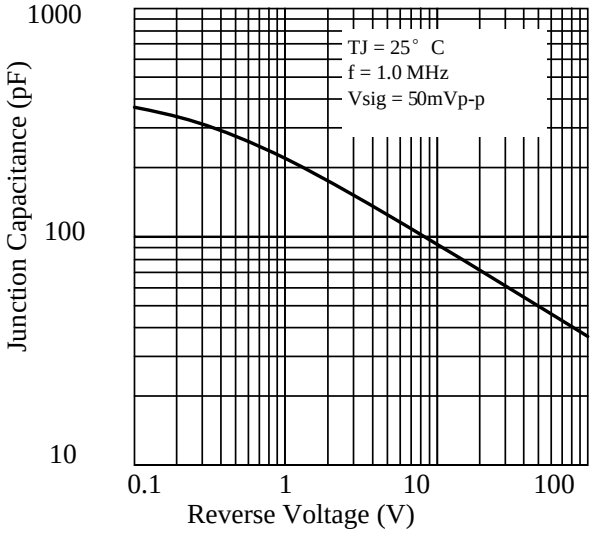


Fig 6. – Typical Junction Capacitance



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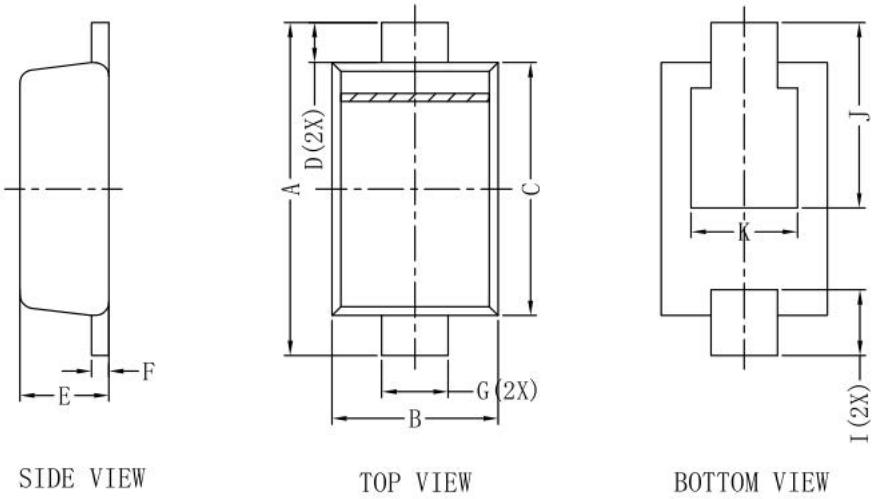
3. dimension:



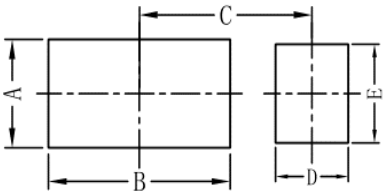
SOD323HE			
DIM	MIN	MAX	Typ.
A	2.30	2.70	2.55
B	1.20	1.35	1.25
C	1.75	1.95	1.90
D	-	-	0.30
E	0.55	0.75	0.67
F	0.10	0.20	0.15
G	0.45	0.65	0.50
I	0.40	0.70	0.50
J	1.15	1.55	1.40
K	-	-	0.80
All Dimensions in mm			

GENERAL NOTES

1. Top package surface finish Ra0.4±0.2um
2. Bottom package surface finish Ra0.7±0.2um

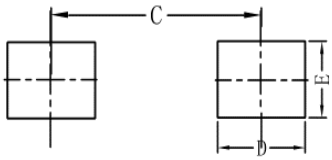
Suggested solder pad layout

RECOMMENDED PAD



SOD323HE	
DIM	(mm)
A	1.1
B	2.0
C	1.9
D	0.8
E	1.0

COMPATIBLE PAD



SOD323HE	
DIM	(mm)
D	1.0
E	0.8
C	2.4

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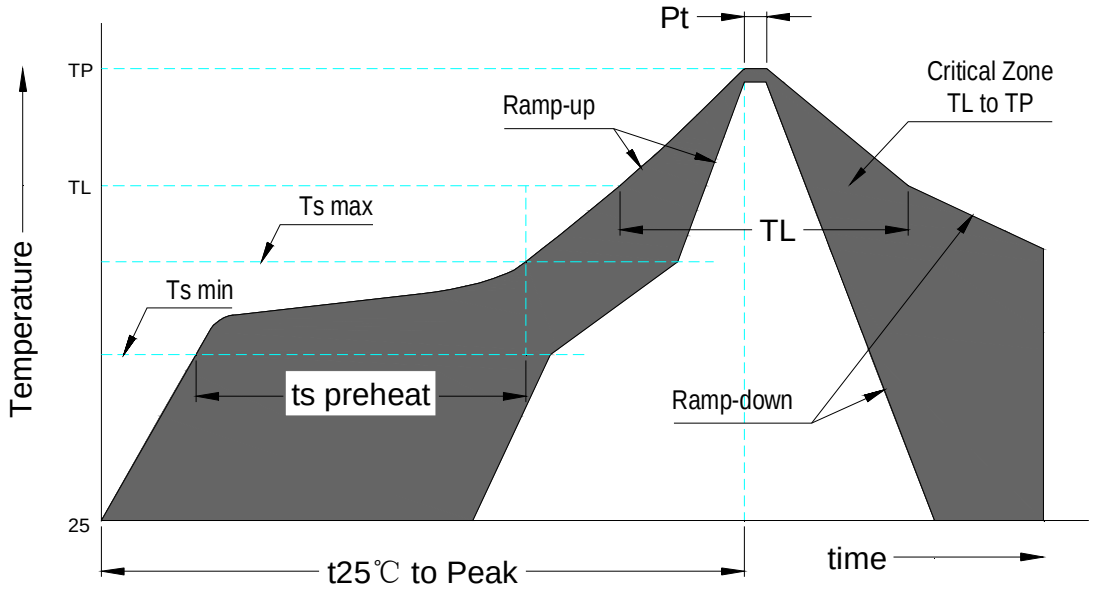
5.Suggested thermal profile for soldering process

1. Storage environment：Temperature=5~40℃ Humidity=55±25%
2. Reflow soldering of surface-mount device



3. Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	<3℃/sec
Preheat - Temperature Min(Tsmin) - Temperature Max(Tsmax) - Time(min to max)(t_s)	 150℃ 200℃ 60~120sec
Tsmax to T_L - Ramp-up Rate	 <3sec
Time maintained above: - Temperature (T_L) - Time(t_L)	 217℃ 60-260sec
Peak Temperature(T_P)	255 -0/+5℃
Time within 5℃ of actual Peak Temperature(T_P)	10~30sec
Ramp-down Rate	<6℃/sec
Time 25℃ to Peak Temperature	<6minutes

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6.High reliability test capabilities

Item Test	Condition	Reference
Solder Resistance	at 260±5℃ for 10±2sec immerse	MIL-STD-750D METHOD-2031
Solderability	at 245±5℃ for 5 sec	MIL-STD-202F METHOD-208
High Temperature Reverse Bias	V_R=80% rate at T_j=125℃ for 168hrs	MIL-STD-750D METHOD-1038
Forward Operation Life	Rated average rectifier current T_A=25℃ for 500hrs	MIL-STD-750D METHOD-1027
Intermittent Operation Life	T_A=25℃，I_F=I_O	MIL-STD-750D METHOD-1036
Pressure Cooker	15P_{SIG} at T_A=121℃ for 4hrs	JESD22-A102
Temperature Cycling	-55℃ to +125℃ dwelled for 30 min. and transferred for 5min. Total 10 cycles	MIL-STD-750D METHOD-1051
Thermal Shock	0℃ for 5min. Rise to 100℃ for 5min. Total 10 cycles	MIL-STD-750D METHOD-1056
Forward Surge	8.3ms single half sine-wave superimposed on rated load,one surge	MIL-STD-750D METHOD-4066-2
Humidity	at T_A=85℃，R_H=85% for 1000hrs	MIL-STD-750D METHOD-1021
High Temperature Storage Life	at 150℃ for 1000hrs	MIL-STD-750D METHOD-1031