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Switch-mode Power Rectifiers

DPAK Surface Mount Package

MBRD320T4G, MBRD330T4G, MBRD340T4G, MBRD350T4G, MBRD360T4G

These state−of−the−art devices are designed for use as output rectifiers, free wheeling, protection and steering diodes in switching power supplies, inverters and other inductive switching circuits.

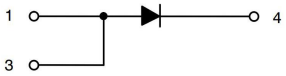
SCHOTTKY BARRIER RECTIFIERS 3.0 AMPERES, 20 – 60 VOLTS

Features

- Extremely Fast Switching
- Extremely Low Forward Drop
- Platinum Barrier with Avalanche Guardrings
- NRVBD and SBRD Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant



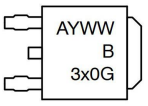
DPAK
CASE 369C



Mechanical Characteristics:

- Case: Epoxy, Molded
- Weight: 0.4 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes; 260°C Max. for 10 Seconds
- ESD Ratings:
  - Machine Model = C
  - Human Body Model = 3B

MARKING DIAGRAM



A	= Assembly Location*
Y	= Year
WW	= Work Week
B3x0	= Device Code
x	= 2, 3, 4, 5, or 6
G	= Pb−Free Package

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MAXIMUM RATINGS

Rating	Symbol	MBRD/SBRD8					Unit
		320	330	340	350	360	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	20	30	40	50	60	V
Average Rectified Forward Current (T_C = +125°C)	$I_{F(AV)}$	3					A
Peak Repetitive Forward Current, T_C = +125°C (Square Wave, Duty = 0.5)	I_{FRM}	6					A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I_{FSM}	75					A
Peak Repetitive Reverse Surge Current (2 μs, 1 kHz)	I_{RRM}	1					A
Operating Junction Temperature Range (Note 1)	T_J	−65 to +175					°C
Storage Temperature Range	T_{stg}	−65 to +175					°C
Voltage Rate of Change (Rated V_R)	dv/dt	10,000					V/μs

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. The heat generated must be less than the thermal conductivity from Junction−to−Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	6	°C/W
Maximum Thermal Resistance, Junction−to−Ambient (Note 2)	$R_{\theta JA}$	80	°C/W

2. Rating applies when surface mounted on the minimum pad size recommended.

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage (Note 3) i_F = 3 Amps, T_C = +25°C i_F = 3 Amps, T_C = +125°C i_F = 6 Amps, T_C = +25°C i_F = 6 Amps, T_C = +125°C	V_F	 0.6 0.45 0.7 0.625	V
Maximum Instantaneous Reverse Current (Note 3) (Rated dc Voltage, T_C = +25°C) (Rated dc Voltage, T_C = +125°C)	i_R	 0.2 20	mA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

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ORDERING INFORMATION

Device	Package	Shipping†
MBRD320G	DPAK (Pb−Free)	75 Units / Rail
SBRD8320G*		75 Units / Rail
SBRD8320G−VF01*		75 Units / Rail
MBRD320RLG		1,800 Tape & Reel
MBRD320T4G		2,500 Tape & Reel
SBRD8320T4G*		2,500 Tape & Reel
SBRD8320T4G−VF01*		2,500 Tape & Reel
MBRD330G		75 Units / Rail
SBRD8330G*		75 Units / Rail
SBRD8330G−VF01*		75 Units / Rail
MBRD330RLG		1,800 Tape & Reel
MBRD330T4G		2,500 Tape & Reel
SBRD8330T4G*		2,500 Tape & Reel
SBRD8330T4G−VF01*		2,500 Tape & Reel
MBRD340G		75 Units / Rail
SBRD8340G*		75 Units / Rail
SBRD8340G−VF01*		75 Units / Rail
MBRD340RLG		1,800 Tape & Reel
MBRD340T4G		2,500 Tape & Reel
SBRD8340T4G*		2,500 Tape & Reel
SBRD8340T4G−VF01*		2,500 Tape & Reel
MBRD350G		75 Units / Rail
SBRD8350G*		75 Units / Rail
SBRD8350G−VF01*		75 Units / Rail
MBRD350RLG		1,800 Tape & Reel
SBRD8350RLG*		1,800 Tape & Reel
SBRD8350RLG−VF01*		1,800 Tape & Reel
MBRD350T4G		2,500 Tape & Reel
SBRD8350T4G*		2,500 Tape & Reel
SBRD8350T4G−VF01*		2,500 Tape & Reel
MBRD360G		75 Units / Rail
SBRD8360G*		75 Units / Rail
SBRD8360G−VF01*		75 Units / Rail
MBRD360RLG		1,800 Tape & Reel
SBRD8360RLG*		1,800 Tape & Reel
SBRD8360RLG−VF01*		1,800 Tape & Reel
MBRD360T4G		2,500 Tape & Reel
NRVBD360VT4G*		2,500 Tape & Reel
SBRD8360T4G*		2,500 Tape & Reel

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TYPICAL CHARACTERISTICS

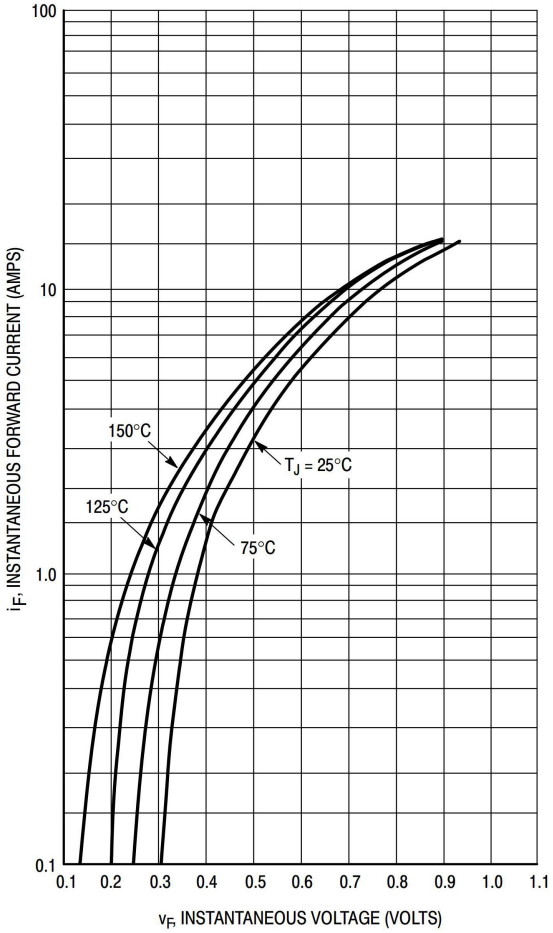
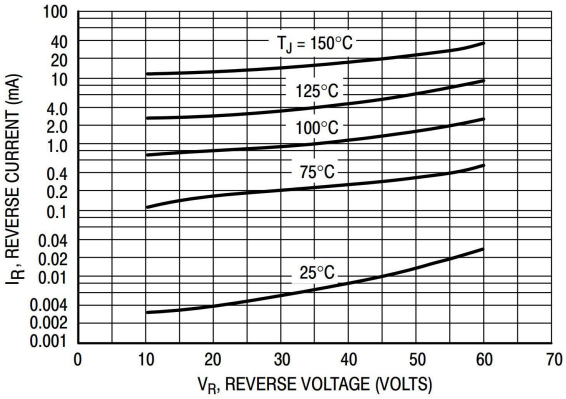


Figure 1. Typical Forward Voltage



*The curves shown are typical for the highest voltage device in the voltage grouping. Typical reverse current for lower voltage selections can be estimated from these curves if V_R is sufficient below rated V_R.

Figure 2. Typical Reverse Current

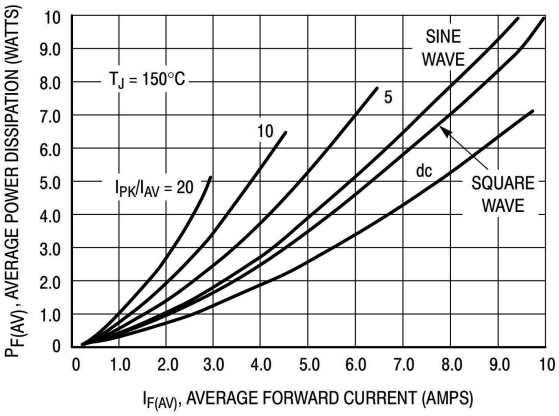


Figure 3. Average Power Dissipation

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TYPICAL CHARACTERISTICS

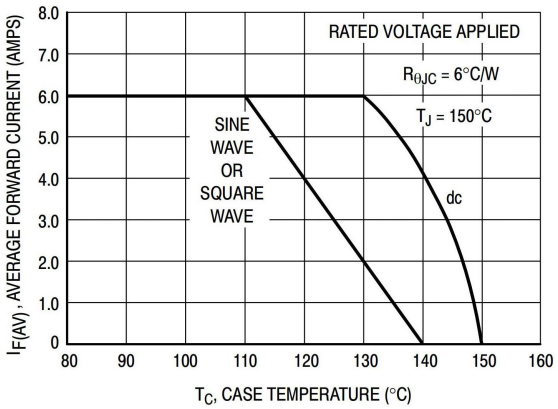

Figure 4. Current Derating, Case

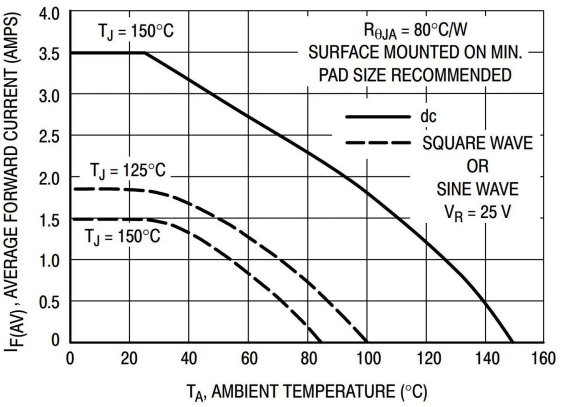

Figure 5. Current Derating, Ambient

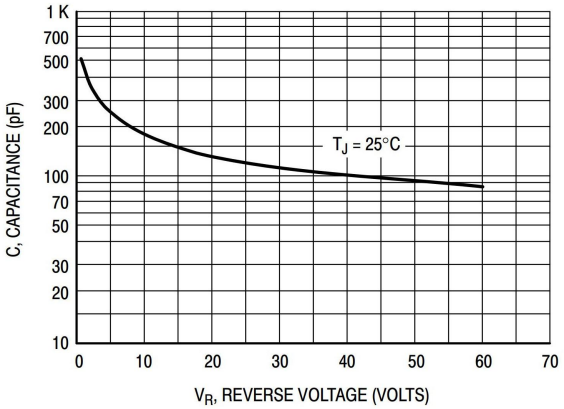

Figure 6. Typical Capacitance

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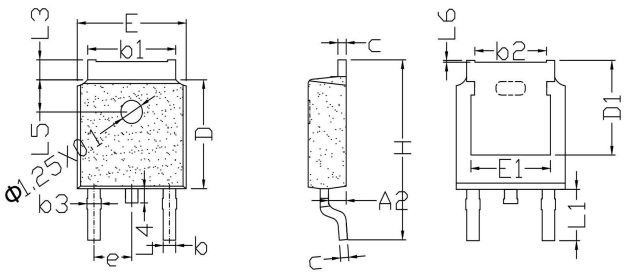
Ordering Information

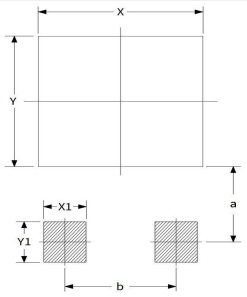
PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
TO-252	R3	0.305	2500	5000	25000	13''

Package Outline Dimensions (TO-252)



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A2	0.90	1.10	0.035	0.043
b	0.66	0.86	0.026	0.034
b1	5.10	5.46	0.201	0.215
b2	4.27	4.37	0.168	0.172
b3	0.78	0.90	0.031	0.035
c	0.45	0.55	0.018	0.022
D	5.90	6.30	0.232	0.248
D1	5.35 REF.		0.211REF.	
E	6.30	6.70	0.248	0.264
E1	4.83 REF.		0.190 REF.	
e	2.18	2.38	0.086	0.094
H	9.80	10.4	0.386	0.409
L1	2.70	3.10	0.106	0.122
L3	0.80	1.20	0.031	0.047
L4	0.60	1.00	0.024	0.039
L5	1.8 REF.		0.071 REF.	
L6	-	0.12	-	0.005

Suggested Pad Layout



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
a	3.70	-	0.146	-
b	4.37	-	0.172	-
X	-	5.80	-	0.228
X1	-	1.20	-	0.047
Y	-	5.85	-	0.230
Y1	-	2.00	-	0.079