

Dual Schottky Barrier Rectifiers

Reverse Voltage 45 Volts , Forward Current 40A

Description

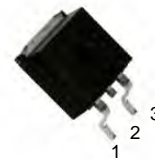
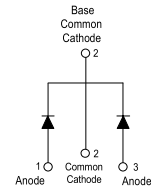
This center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150°C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

Features

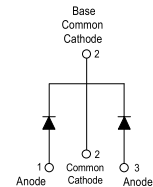
- 150°C T_J operation
- Center tap TO-220, TO-263(D²PAK) packages
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



TO-220



TO-263(D²PAK)



Maximum Ratings and Characteristics

Symbol	Characteristics	Values	Units
$I_{F(AV)}$	Rectangular waveform (Per Device)	40	A
I_{FRM}	@ $T_C = 118^\circ\text{C}$ (Per Leg)	40	A
V_{RRM}		45	V
I_{FSM}	@ $t_p = 5 \mu\text{s}$ sine	900	A
V_F	@ 20 Apk, $T_J = 125^\circ\text{C}$	0.58	V
T_J	range	-65~150	$^\circ\text{C}$



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Voltage Ratings

Symbol	Parameters	MBR4045CT MBRB4045CT
V_R	Max. DC Reverse Voltage (V)	45
V_{RWM}	Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Symbol	Parameters	Values	Units	Conditions
$I_{F(AV)}$	Max. Average Forward Current (Per Leg) (Per Device)	20	A	@ $T_C = 118^\circ\text{C}$, (Rated V_R)
		40		
I_{FRM}	Peak Repetitive Forward Current (Per Leg)	40	A	Rated V_R , square wave, 20kHz $T_C = 118^\circ\text{C}$
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg)	900	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RRM} applied
		210		
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	20	A	$T_J = 25^\circ\text{C}$, $I_{AS} = 3\text{Amps}$, $L = 4.40\text{mH}$
I_{AR}	Repetitive Avalanche Current (Per Leg)	3	A	Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Symbol	Parameters	Values	Units	Conditions
V_{FM}	Max. Forward Voltage Drop (1)	0.60	V	@ 20A $T_J = 25^\circ\text{C}$
		0.78	V	@ 40A
		0.58	V	@ 20A $T_J = 125^\circ\text{C}$
		0.75	V	@ 40A
I_{RM}	Max. Instantaneous Reverse Current (1)	1	mA	$T_J = 25^\circ\text{C}$ Rated DC voltage
		50	mA	$T_J = 100^\circ\text{C}$
		95	mA	$T_J = 125^\circ\text{C}$
C_T	Max. Junction Capacitance	900	pF	$V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C
L_S	Typical Series Inductance	8.0	nH	Measured from top of terminal to mounting plane
dv/dt	Max. Voltage Rate of Change (Rated V_R)	10,000	V/ μs	

Notes. (1) Pulse Width < 300 μs , Duty Cycle <2%

Thermal-Mechanical Specifications

Symbol	Parameters	Values	Units	Conditions
T_J	Max. Junction Temperature Range	-65 ~ 150	$^\circ\text{C}$	
T_{stg}	Max. Storage Temperature Range	-65 ~ 175	$^\circ\text{C}$	
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)	1.5	$^\circ\text{C/W}$	DC operation
R_{thCS}	Typical Thermal Resistance Case to Heatsink	0.50	$^\circ\text{C/W}$	Mounting surface, smooth and greased Only for TO-220
R_{thJA}	Max. Thermal Resistance Junction to Ambient	50	$^\circ\text{C/W}$	DC operation For TO-263(D ² PAK)
wt	Approximate Weight	2(0.07)	g (oz.)	
T	Mounting Torque	Min.	6(5)	Kg-cm (lbf-in)
		Max.	12(10)	



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Ratings and Characteristics Curves

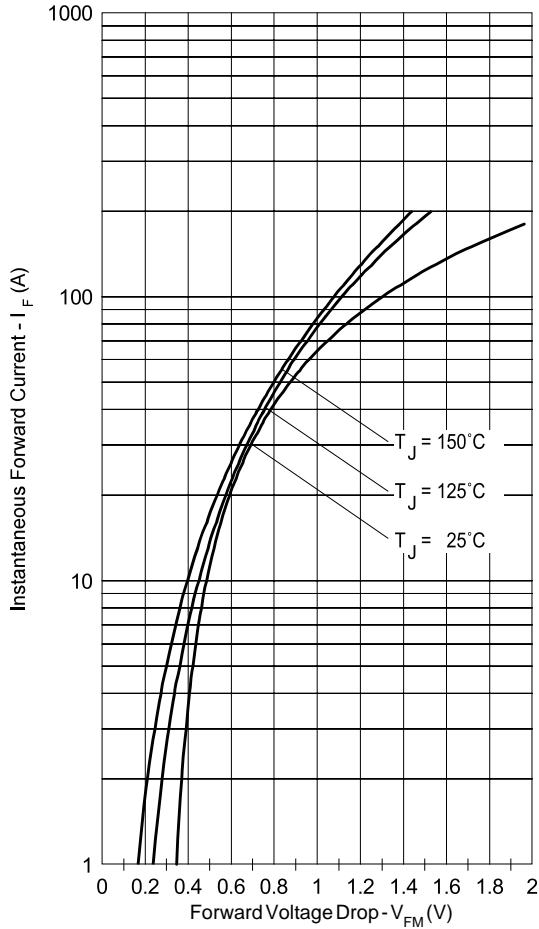


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

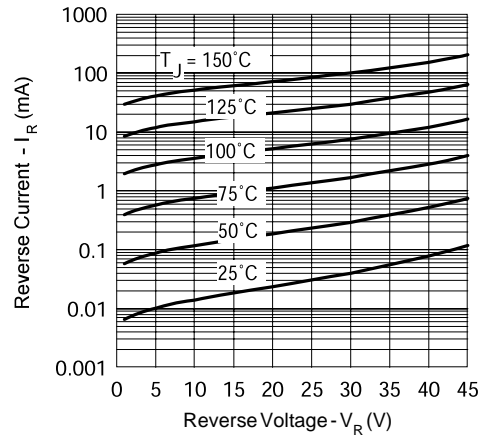


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage (Per Leg)

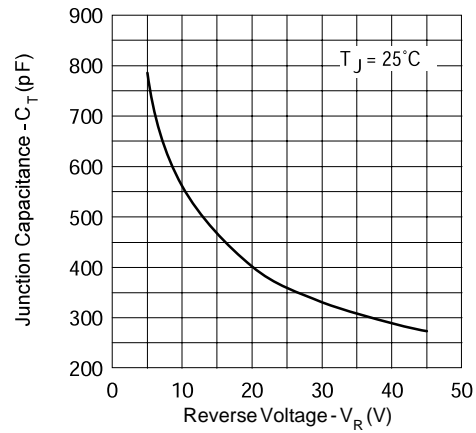


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

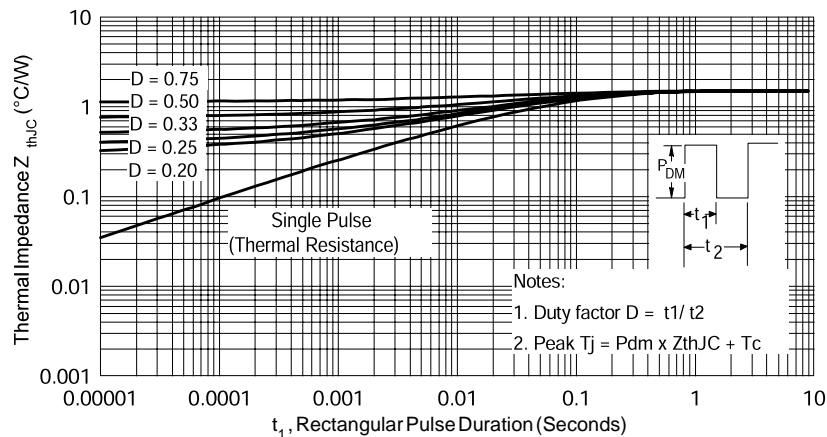


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)



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Ratings and Characteristics Curves(Con.)

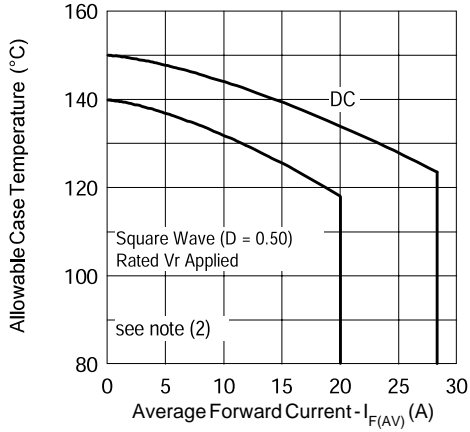


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

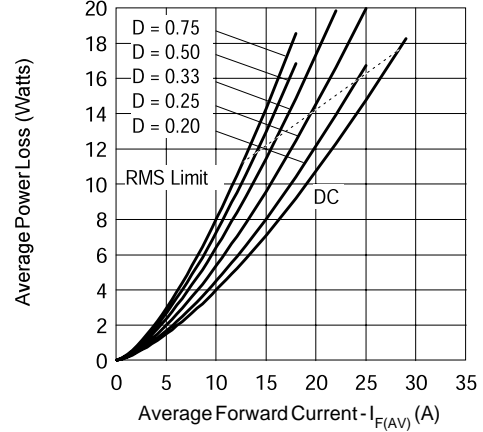


Fig. 6 - Forward Power Loss Characteristics

Notes. (2) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 $P_d = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
 $P_{d_{REV}} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = \text{rated } V_R$

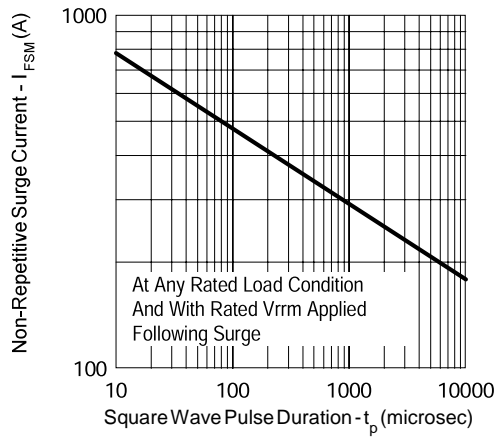


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

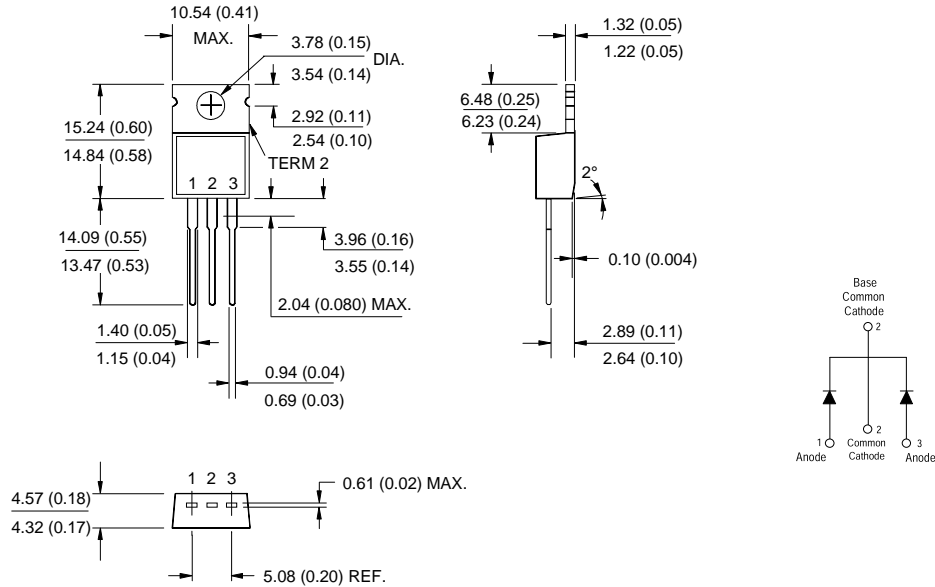


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Outline Dimensions

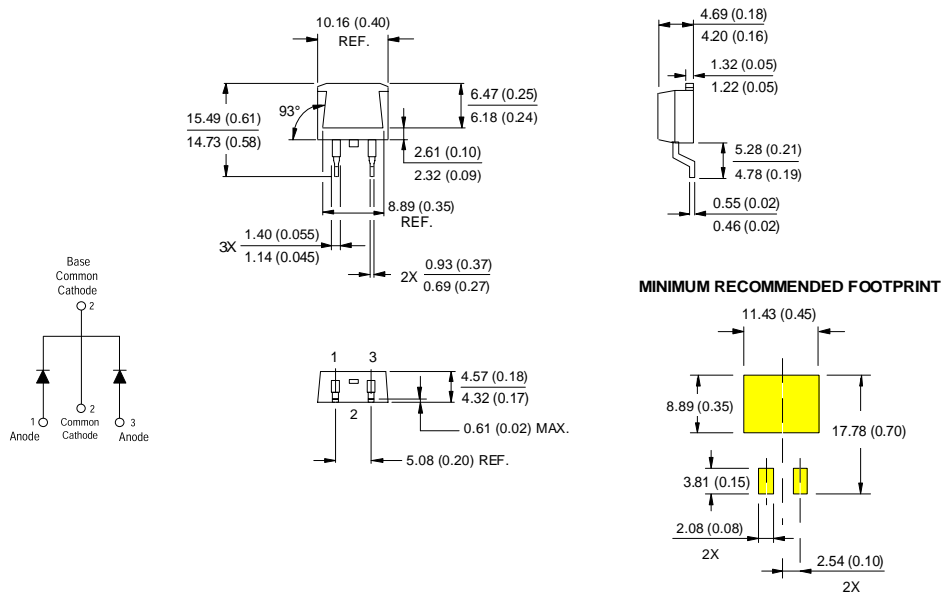
TO-220

Unit: mm(inches)



TO-263(D² PAK)

Unit: mm(inches)



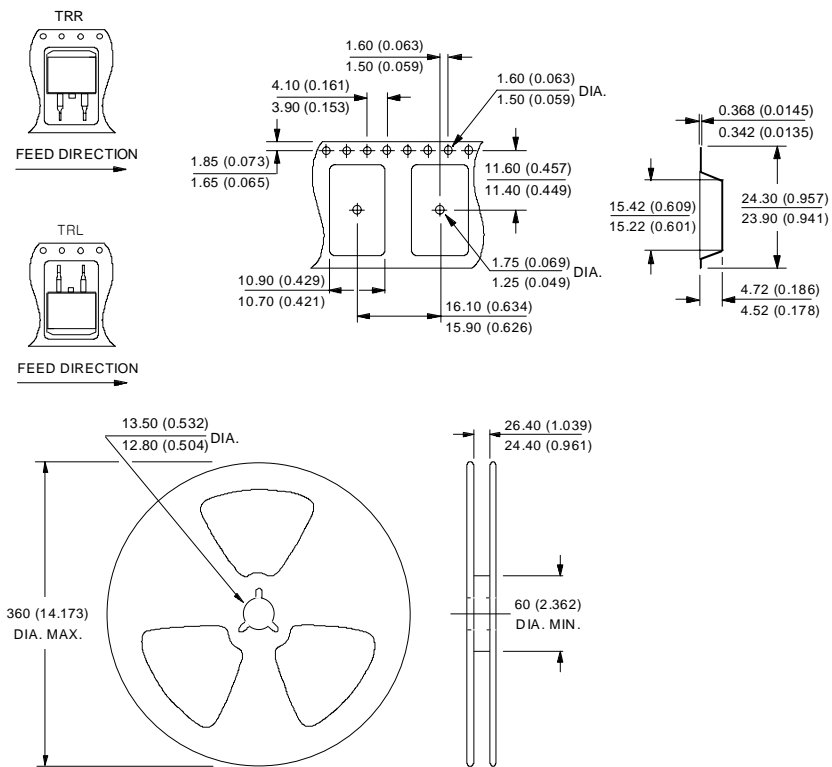


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Tape & Reel Information

TO-263(D²PAK)

Unit: mm(inches)



800 pieces per reel for both TRL and TRR.