

Voltage Ratings

Part number	MBR4045PT
V_R Max. DC Reverse Voltage (V)	45
V_{RWM} Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	MBR4045PT	Units	Conditions		
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	40	A	50% duty cycle @ $T_C = 103^{\circ}\text{C}$, rectangular wave form		
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	1020	A	5 μs Sine or 3 μs Rect. pulse	Following any rated load condition and with rated V_{RWM} applied	
	265		10ms Sine or 6ms Rect. pulse		
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	20	mJ	$T_J = 25^{\circ}\text{C}$, $I_{AS} = 3\text{ Amps}$, $L = 4.4\text{ mH}$		
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

Parameters		MBR4045PT		Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.59	V	@ 20A	$T_J = 25^\circ\text{C}$	
		0.78	V	@ 40A		
		0.56	V	@ 20A	$T_J = 125^\circ\text{C}$	
		0.72	V	@ 40A		
I_{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1.75	mA	$T_J = 25^\circ\text{C}$	$V_R = \text{rated } V_R$	
		70	mA	$T_J = 125^\circ\text{C}$		
C_T	Max. Junction Capacitance (Per Leg)	900	pF	$V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C		
L_s	Typical Series Inductance (Per Leg)	7.5	nH	Measured lead to lead 5mm from package body		
dv/dt	Max. Voltage Rate of Change (Rated V_R)	10,000	V/ μs			

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

Thermal-Mechanical Specifications

Parameters		MBR4045PT	Units	Conditions
T_J	Max. Junction Temperature Range	-55 to 150	$^{\circ}\text{C}$	
T_{stg}	Max. Storage Temperature Range	-55 to 150	$^{\circ}\text{C}$	
$R_{\theta JC}$	Max. Thermal Resistance Junction to Case (Per Leg)	2.20	$^{\circ}\text{C/W}$	DC operation * See Fig. 4
$R_{\theta JC}$	Max. Thermal Resistance Junction to Case (Per Package)	1.10	$^{\circ}\text{C/W}$	DC operation
$R_{\theta CA}$	Typical Thermal Resistance, Case to Heatsink	0.24	$^{\circ}\text{C/W}$	Mounting surface , smooth and greased
wt	Approximate Weight	6 (0.21)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Non-lubricated threads
		Max.	12 (10)	
Case Style		TO-247AC(TO-3P)	JEDEC	

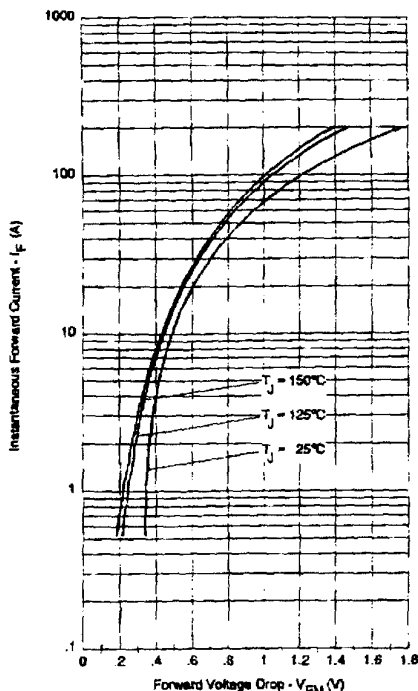


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

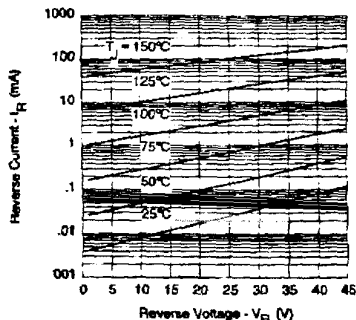


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

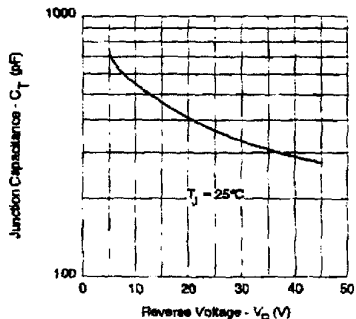
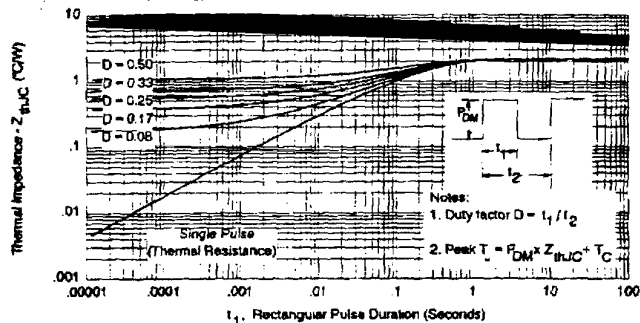


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)


 Fig. 4 - Max. Thermal Impedance $Z_{\theta JC}$ Characteristics (Per Leg)

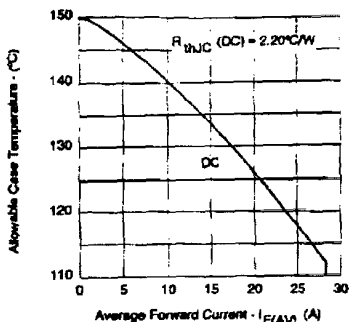


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

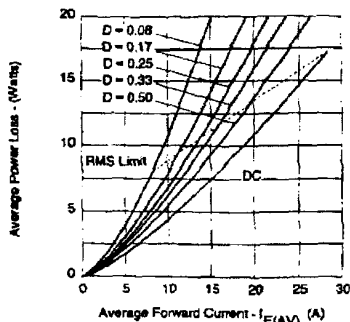


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

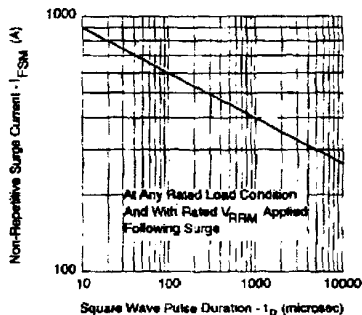


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

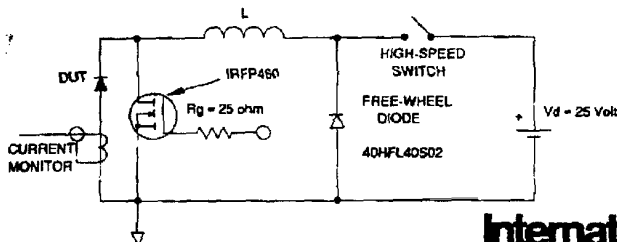


Fig. 8 - Undamped Inductive Test Circuit

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