

This series uses the Schottky Barrier principle with a platinum barrier metal. These state of the art devices have the following features:

#### FEATURES

- 20 A Total (10A Per Diode Leg)
- Guard Ring for Stress Protection
- Low Forward Voltage
- 175°C Operating Junction Temperature
- Epoxy Meets UL 94 V 0 @ 0.125 in
- Low Power Loss/High Efficiency
- High Surge Capacity
- Low Stored Charge Majority Carrier Conduction
- Shipped 50 units per plastic tube
- Pb Free Packages are Available\*

#### Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 1.9 grams (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds

Parameter	Symbol	MBRF2045HCT	MBRF2060HCT	Units
Maximum recurrent peak reverse voltage	$V_{RRM}$	45	60	V
Maximum RMS voltage	$V_{RWS}$	45	60	
Maximum DC blocking voltage	$V_{DC}$	45	60	
Maximum instantaneous forward voltage ( $i_F=10A, T_C=25^\circ C$ )(1)	$V_F$	0.70	0.75	
Average Rectified Forward Current (Rated $V_R$ , $T_C = 135^\circ C$ ) Total Device	$I_{F(AV)}$		10 20	A
Peak Repetitive Forward Current, (Rated $V_R$ , Square Wave, 20kHz, $T_C=135^\circ C$ )	$I_{FRM}$		20	
Non-Repertitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60Hz)	$I_{FSM}$		150	
Peak Repetitive Reverse Surge Current (2.0 $\mu s$ , 1.0kHz)	$I_{RRM}$		0.5	
Maximum Instantaneous Reverse Current (2) (Rated dc Voltage, $T_C = 125^\circ C$ ) (Rated dc Voltage, $T_C=25^\circ C$ )	$i_R$		6.0 0.1	mA
Operating junction temperature range (1)	$T_J$		-65 ~ +175	°C
Storage temperature range	$T_{STG}$		-65 ~ +150	
Voltage Rate of Change (Rated VR)	dv/dt		10000	V/ $\mu s$

(1). The heat generated must be less than the thermal conductivity from Junction to Ambient:  $dP_D/dT_J < 1/R_{qJA}$ .

(2). Pulse Test: Pulse Width = 300 ms, Duty Cycle  $\delta$  2.0%.

#### ■RMS Isolation Voltage (t=1second, R.H.3 $\leq$ 30%, $T_A=25^\circ C$ ) (1)

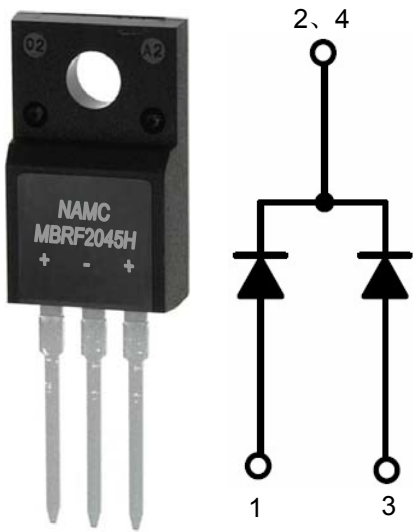
Per Figure 5 Per Figure 6 (2) Per Figure 7	Viso1 Viso2 Viso3	4500 3500 1500	V
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(1) Proper strike and creepage distance must be provided.

(2) UL Recognized mounting method is per Figure 6.

#### ■THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Maximum Thermal Resistance, Junction-to-Case	Minimum Pad	$R_{\theta JC}$	2.0	°C/W
Maximum Thermal Resistance, Junction-to-Ambient	Minimum Pad	$R_{\theta JA}$	60	°C/W

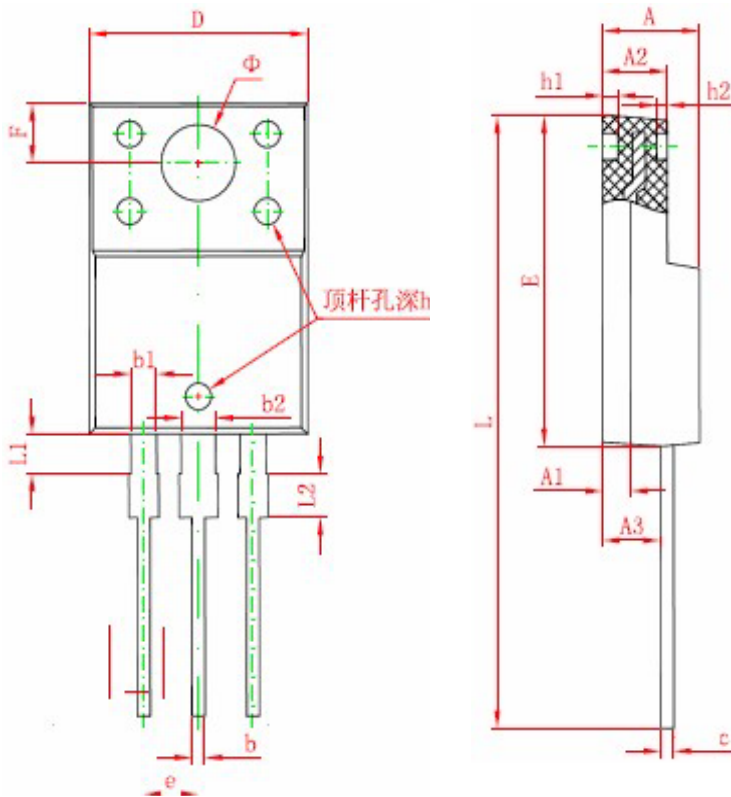


TO-220F  
or  
TO-220FP  
or  
CASE 221A  
PLASTIC  
or  
iTO-220AB  
or  
CASE 221D-02  
ISOLATED TO-220

TO-220F 3 pin Packing  
50 Pcs / tube  
1000 Pcs / Box  
5000 Pcs / case

TO-220F 或 TO-220FP  
3引脚全塑封  
包装规格:  
每管50只  
每盒1000只  
每箱5000只

TO-220F、TO-220FP、iTO-220AB、CASE 221A PLASTIC  
Package Dimensions      Dimensions in millimeters



TO-220F、TO-220FP、CASE 221A PLASTIC

封装尺寸数据				
DIM	英寸单位		毫米单位	
	最小	最大	最小	最大
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.169	0.185	4.300	4.700
A1	0.051 REF.		1.300 REF.	
A2	0.110	0.126	2.800	3.200
A3	0.098	0.114	2.500	2.900
b	0.020	0.030	0.500	0.750
b1	0.043	0.053	1.100	1.350
b2	0.059	0.069	1.500	1.750
c	0.020	0.030	0.500	0.750
D	0.392	0.408	9.960	10.36
E	0.583	0.598	14.80	15.20
e	0.100 TYP.		2.540 TYP.	
F	0.106 REF.		2.700 REF.	
	0.138 REF.		3.500 REF.	
h	0.000	0.012	0.000	0.300
h1	0.031 REF.		0.800 REF.	
h2	0.020 REF.		0.500 REF.	
L	1.102	1.118	28.00	28.40
L1	0.067	0.075	1.700	1.900
L2	0.075	0.083	1.900	2.100

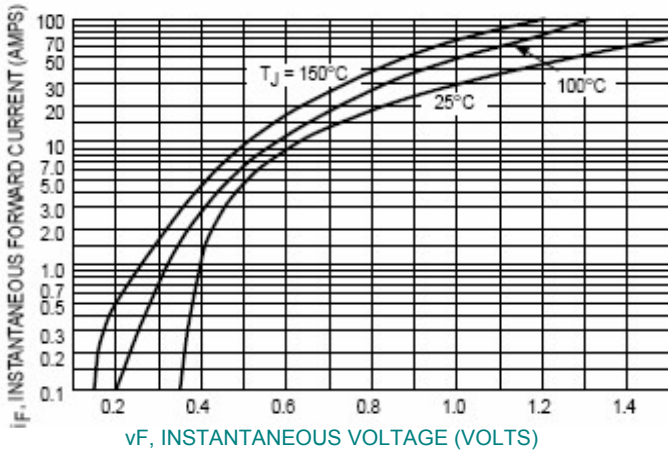


Figure 1. Maximum Forward Voltage

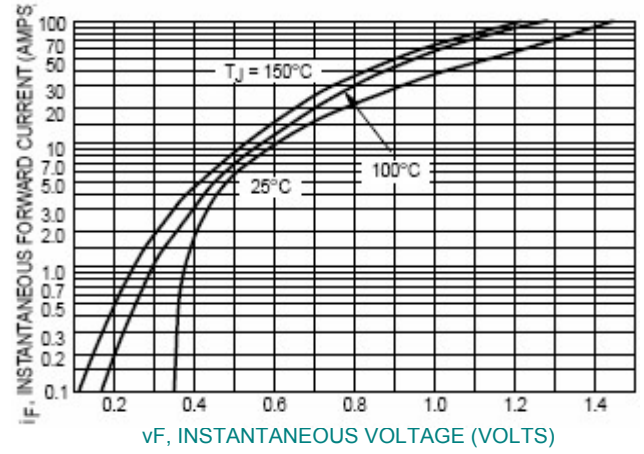


Figure 2. Typical Forward Voltage

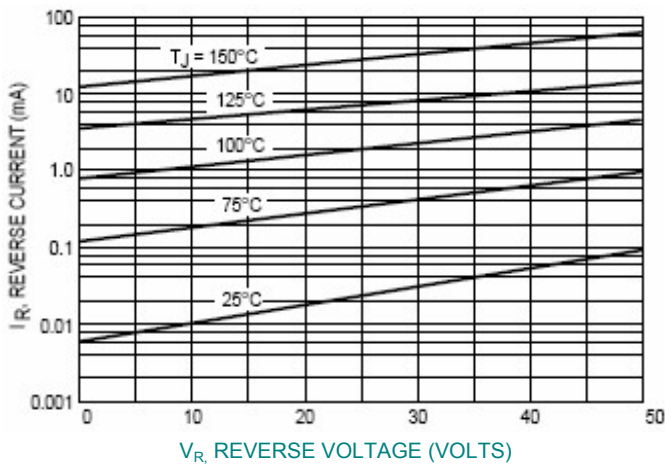


Figure 3. Maximum Reverse Current

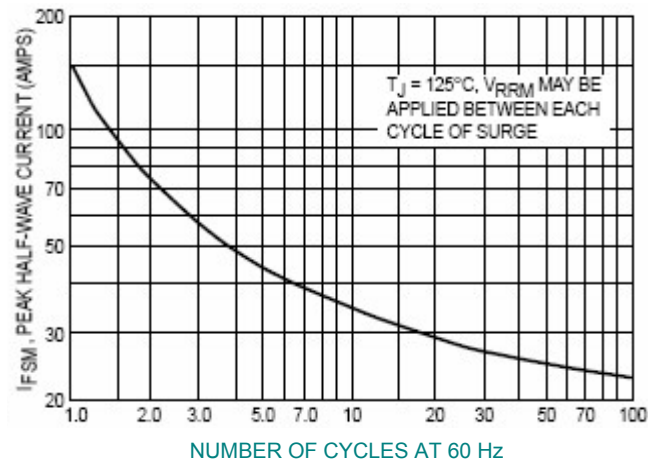
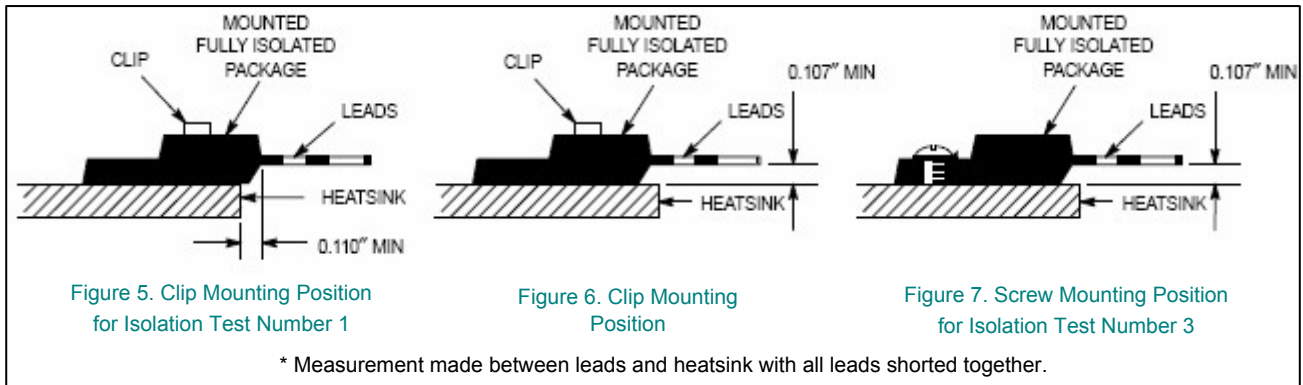
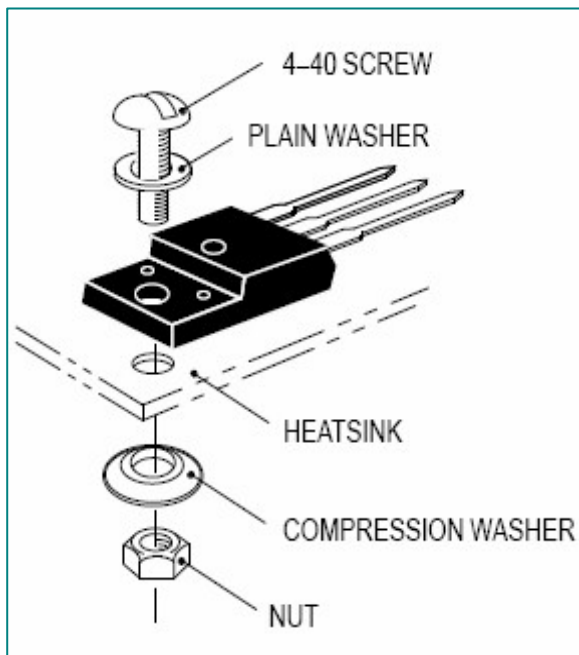


Figure 4. Maximum Surge Capability

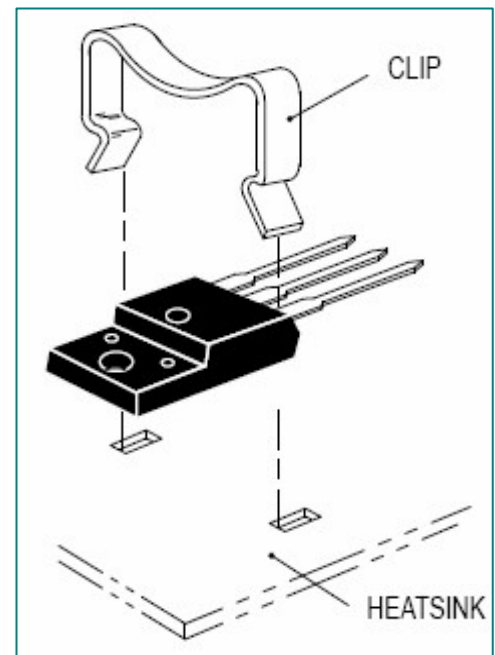
TEST CONDITIONS FOR ISOLATION TESTS\*



MOUNTING INFORMATION



8a. Screw-Mounted



8b. Clip-Mounted

Figure 8. Typical Mounting Techniques

Laboratory tests on a limited number of samples indicate, when using the screw and compression washer mounting technique, a screw torque of 6 to 8 in . lbs is sufficient to provide maximum power dissipation capability. The compression washer helps to maintain a constant pressure on the package over time and during large temperature excursions.

Destructive laboratory tests show that using a hex head 4-40 screw, without washers, and applying a torque in excess of 20 in . lbs will cause the plastic to crack around the mounting hole, resulting in a loss of isolation capability.

Additional tests on slotted 4-40 screws indicate that the screw slot fails between 15 to 20 in . lbs without adversely affecting the package. However, in order to positively ensure the package integrity of the fully isolated device, Motorola does not recommend exceeding 10 in . lbs of mounting torque under any mounting conditions.



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