

# MBR10L60CT, MBRF10L60CT

## SWITCHMODE™ Power Rectifier 60 V, 10 A

### Features and Benefits

- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capability
- 10 A Total (5 A Per Diode Leg)
- Guard-Ring for Stress Protection
- These are Pb-Free Devices

### Applications

- Power Supply – Output Rectification
- Power Management
- Instrumentation

### Mechanical Characteristics:

- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight (Approximately): 1.9 Grams
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes:  
260°C Max. for 10 Seconds

### MAXIMUM RATINGS

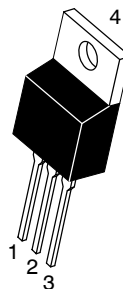
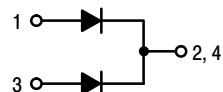
Please See the Table on the Following Page



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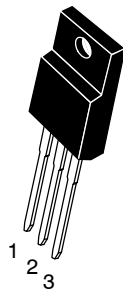
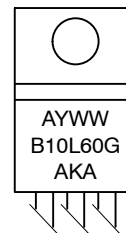
<http://onsemi.com>

## SCHOTTKY BARRIER RECTIFIER 10 AMPERES, 60 VOLTS

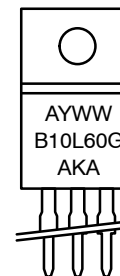


TO-220AB  
CASE 221A  
PLASTIC

### MARKING DIAGRAMS



TO-220 FULLPAK™  
CASE 221D  
STYLE 3



A = Assembly Location  
Y = Year  
WW = Work Week  
B10L60 = Device Code  
G = Pb-Free Device  
AKA = Polarity Designator

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

# MBR10L60CT, MBRF10L60CT

## MAXIMUM RATINGS (Per Diode Leg)

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	60	V
Average Rectified Forward Current (Rated $V_R$ ) $T_C = 140^\circ\text{C}$	$I_{F(AV)}$	5 10	A (Per Leg) (Per Device)
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	200	A
Operating Junction Temperature (Note 1)	$T_J$	-55 to +150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 to +175	$^\circ\text{C}$
ESD Ratings:	Machine Model = C Human Body Model = 3B	> 400 > 8000	V

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

Rating	Symbol	Value	Unit
Maximum Thermal Resistance MBR10L60CT	$R_{\theta JC}$ $R_{\theta JA}$	2.8 70	$^\circ\text{C}/\text{W}$
MBRF10L60CT	$R_{\theta JC}$ $R_{\theta JA}$	5.7 75	

## ELECTRICAL CHARACTERISTICS (Per Diode Leg)

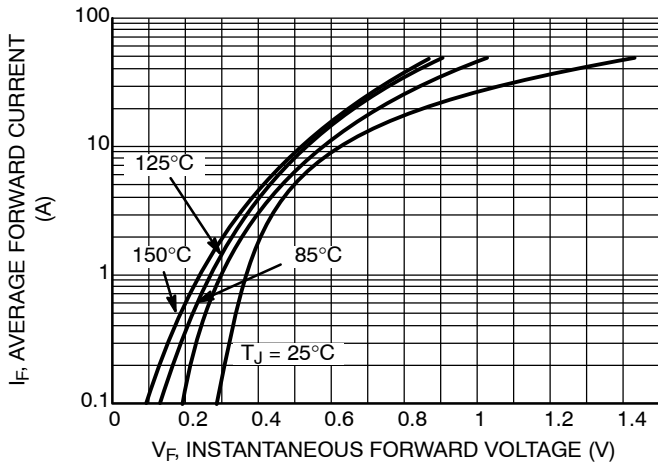
Rating	Symbol	Typ	Max	Unit
Maximum Instantaneous Forward Voltage (Note 2) ( $I_F = 5\text{ A}$ , $T_C = 25^\circ\text{C}$ ) ( $I_F = 5\text{ A}$ , $T_C = 125^\circ\text{C}$ ) ( $I_F = 10\text{ A}$ , $T_C = 25^\circ\text{C}$ ) ( $I_F = 10\text{ A}$ , $T_C = 125^\circ\text{C}$ )	$V_F$	0.49 0.43 0.60 0.53	0.57 0.49 0.66 0.61	V
Maximum Instantaneous Reverse Current (Note 2) (Rated DC Voltage, $T_C = 25^\circ\text{C}$ ) (Rated DC Voltage, $T_C = 125^\circ\text{C}$ )	$i_R$	77 33	220 60	$\mu\text{A}$ mA

2. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

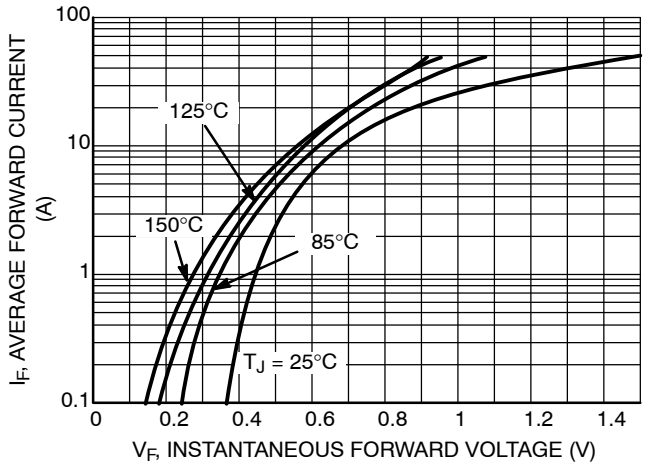
## DEVICE ORDERING INFORMATION

Device Order Number	Package Type	Shipping
MBR10L60CTG	TO-220AB (Pb-Free)	50 Units / Rail
MBRF10L60CTG	TO-220FP (Pb-Free)	50 Units / Rail

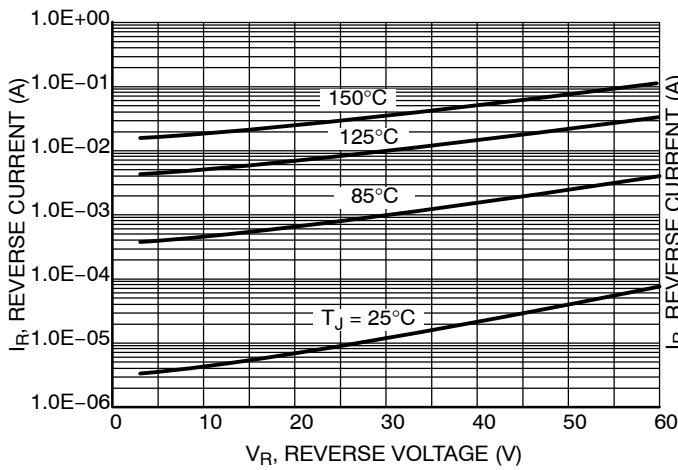
# MBR10L60CT, MBRF10L60CT



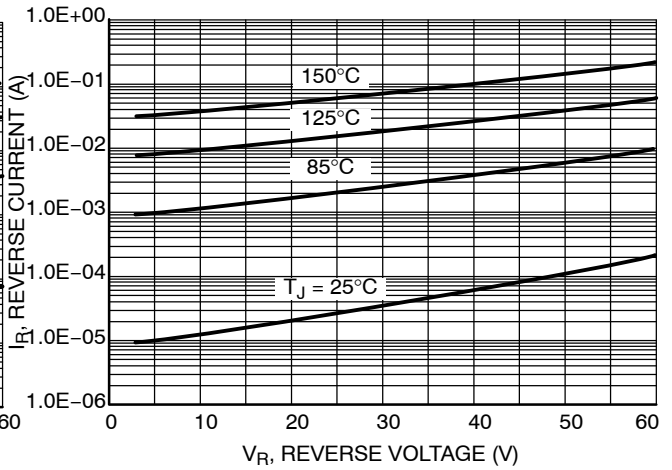
**Figure 1. Typical Forward Voltage**



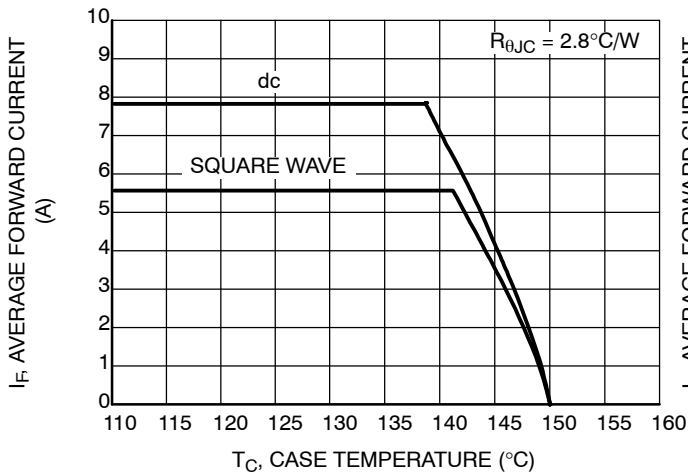
**Figure 2. Maximum Forward Voltage**



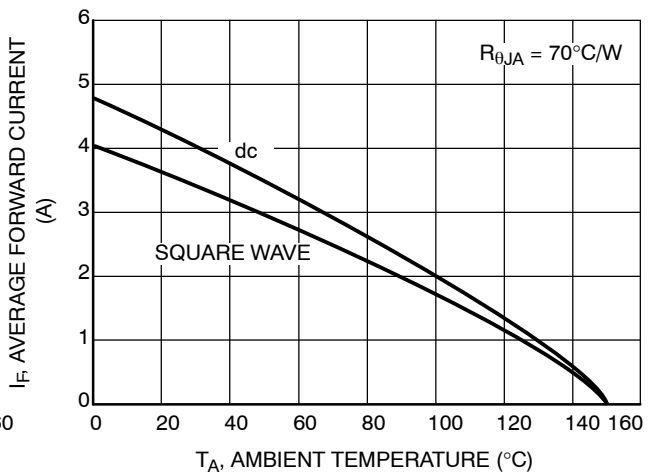
**Figure 3. Typical Reverse Current**



**Figure 4. Maximum Reverse Current**

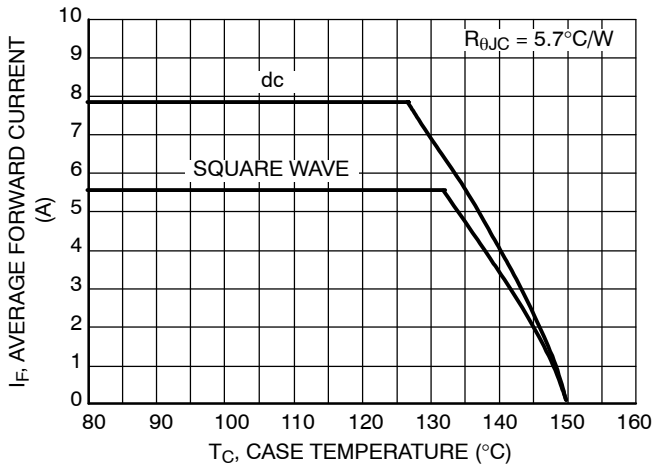


**Figure 5. Current Derating, Case per Leg  
MBR10L60CT**

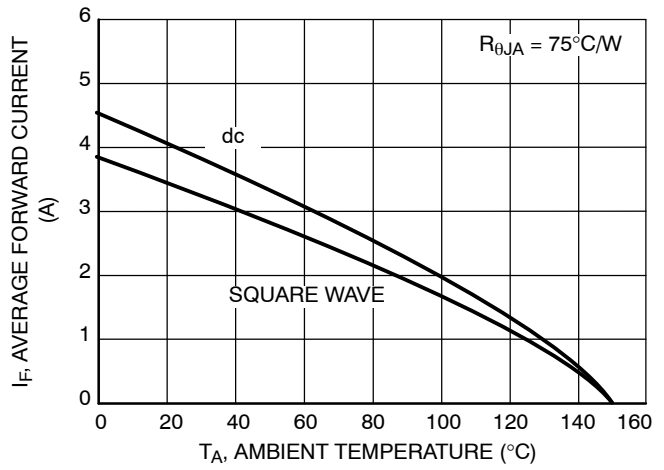


**Figure 6. Current Derating, Ambient per Leg  
MBR10L60CT**

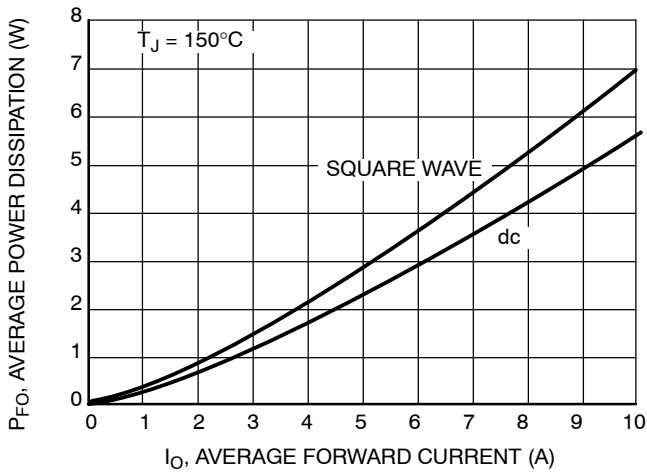
# MBR10L60CT, MBRF10L60CT



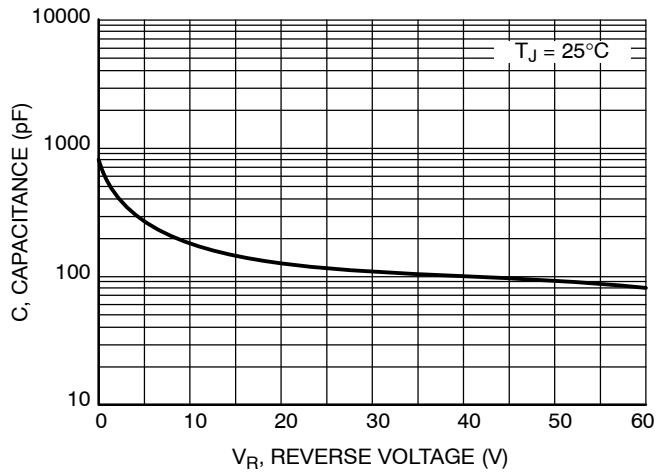
**Figure 7. Current Derating, Case per Leg MBRF10L60CT**



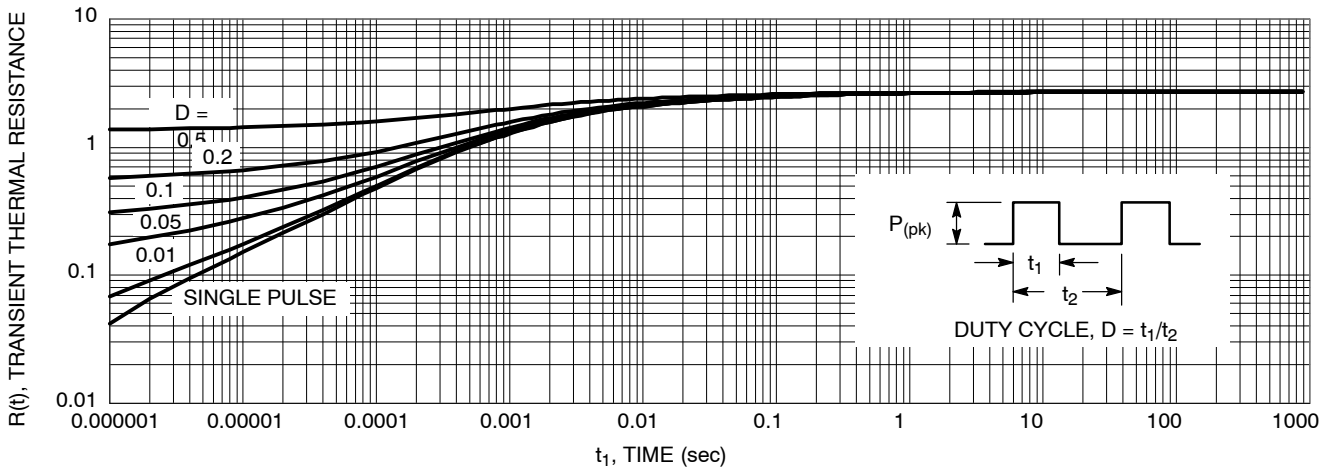
**Figure 8. Current Derating, Ambient per Leg MBRF10L60CT**



**Figure 9. Forward Power Dissipation**



**Figure 10. Capacitance**



**Figure 11. Thermal Response Junction-to-Case for MBR10L60CT**

# MBR10L60CT, MBRF10L60CT

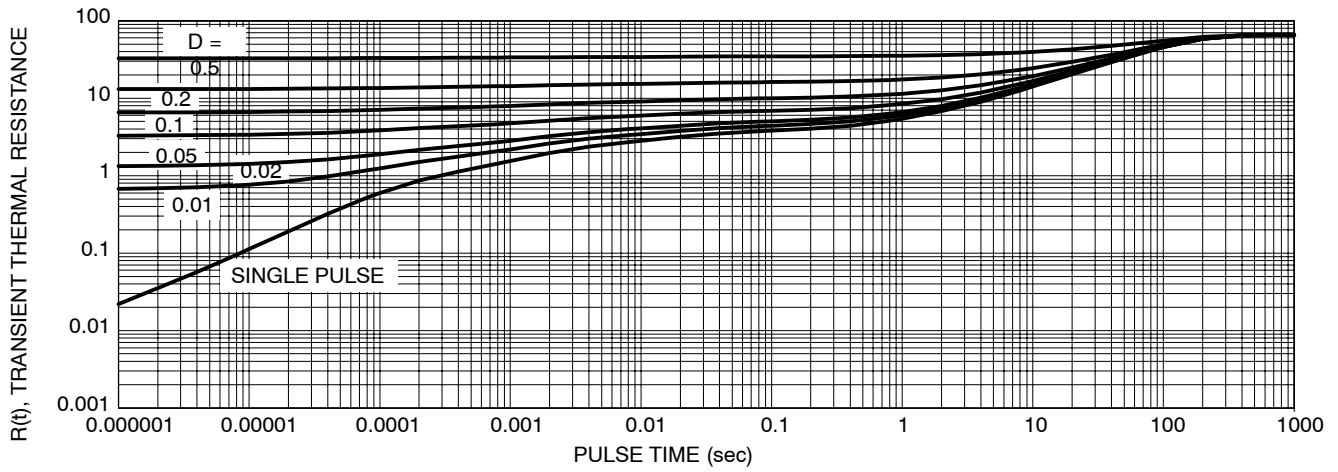


Figure 12. Thermal Response Junction-to-Ambient for MBR10L60CT

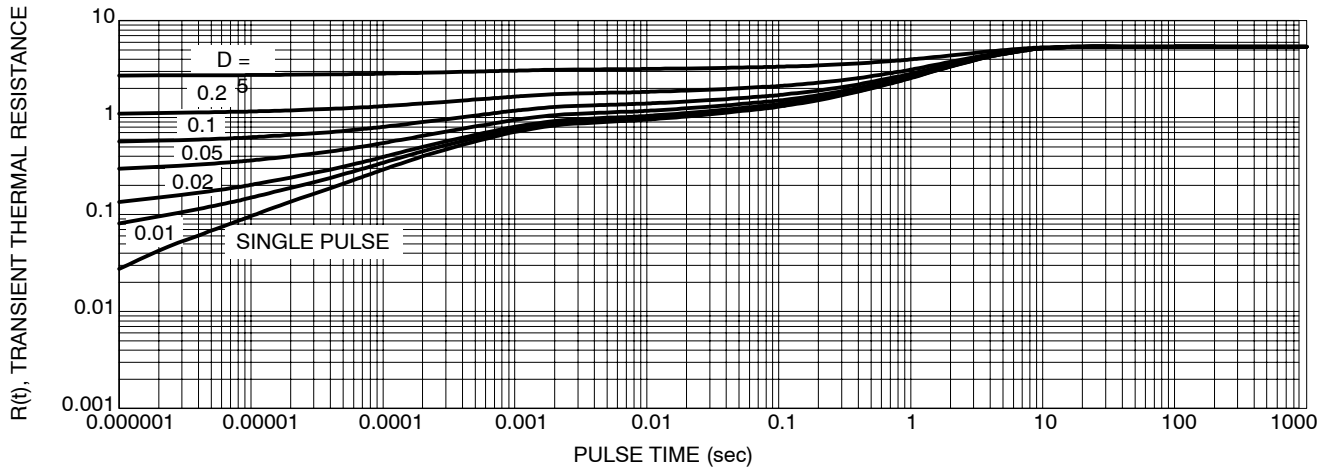


Figure 13. Thermal Response Junction-to-Case for MBRF10L60CT

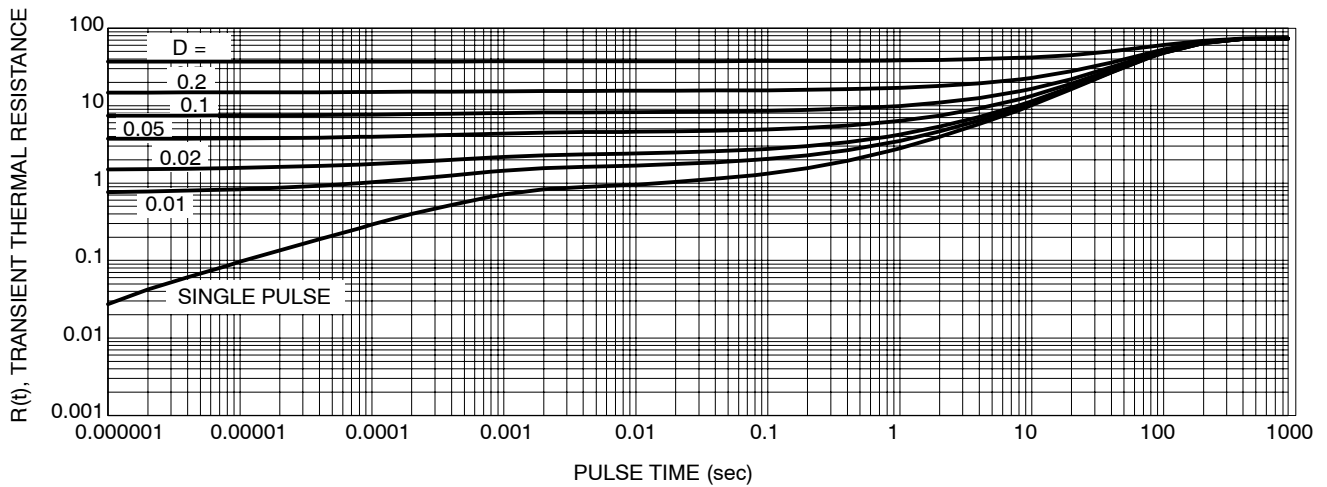
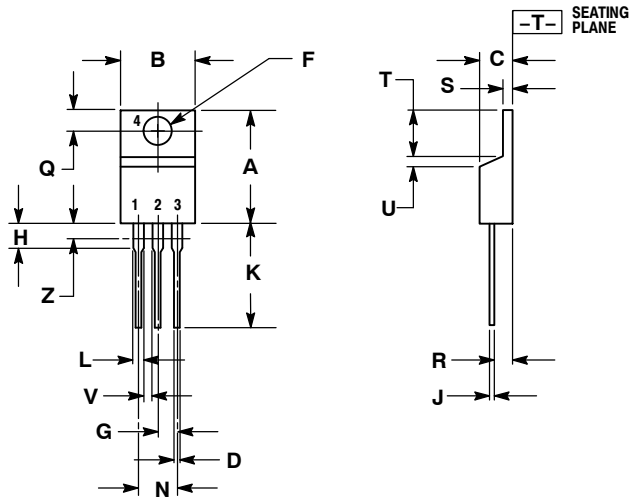


Figure 14. Thermal Response Junction-to-Ambient for MBRF10L60CT

# MBR10L60CT, MBRF10L60CT

## PACKAGE DIMENSIONS

TO-220  
CASE 221A-09  
ISSUE AF



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.161	3.61	4.09
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.014	0.025	0.36	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

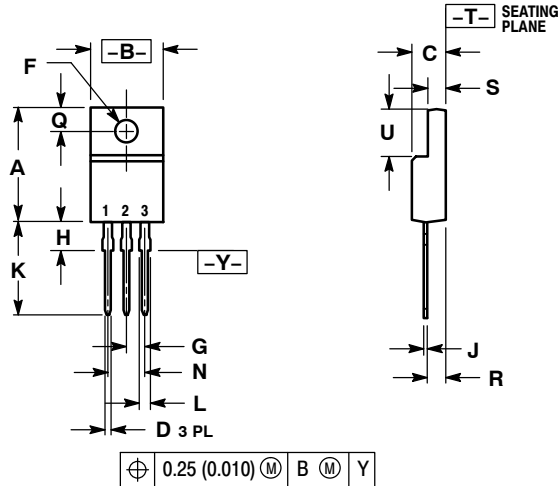
STYLE 6:

- PIN 1. ANODE  
2. CATHODE  
3. ANODE  
4. CATHODE

# MBR10L60CT, MBRF10L60CT

## PACKAGE DIMENSIONS

TO-220 FULLPAK  
CASE 221D-03  
ISSUE J



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH
3. 221D-01 THRU 221D-02 OBSOLETE, NEW STANDARD 221D-03.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.617	0.635	15.67	16.12
B	0.392	0.419	9.96	10.63
C	0.177	0.193	4.50	4.90
D	0.024	0.039	0.60	1.00
F	0.116	0.129	2.95	3.28
G	0.100 BSC		2.54 BSC	
H	0.118	0.135	3.00	3.43
J	0.018	0.025	0.45	0.63
K	0.503	0.541	12.78	13.73
L	0.048	0.058	1.23	1.47
N	0.200 BSC		5.08 BSC	
Q	0.122	0.138	3.10	3.50
R	0.099	0.117	2.51	2.96
S	0.092	0.113	2.34	2.87
U	0.239	0.271	6.06	6.88

STYLE 3:

- PIN 1. ANODE
2. CATHODE
3. ANODE

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