



**THE DATASHEET OF  
MBR20L80CTG**



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# MBR20L80CT, MBRF20L80CT

## SWITCHMODE™ Power Rectifier 80 V, 20 A

### Features and Benefits

- Low Power Loss/High Efficiency
- High Surge Capacity
- 20 A Total (10 A Per Diode Leg)
- 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: 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
- ESD Rating: Human Body Model = 3B  
Machine Model = C

### MAXIMUM RATINGS

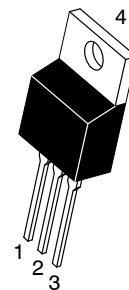
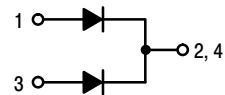
Please See the Table on the Following Page



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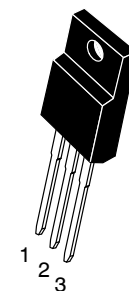
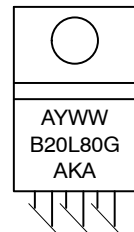
<http://onsemi.com>

## SCHOTTKY BARRIER RECTIFIER 20 AMPERES 80 VOLTS

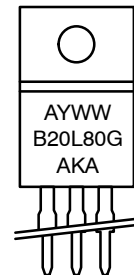


TO-220AB  
CASE 221A  
PLASTIC

### MARKING DIAGRAM



ISOLATED TO-220  
CASE 221D  
STYLE 3



A = Assembly Location  
Y = Year  
WW = Work Week  
B20L80 = Device Code  
G = Pb-Free Package  
AKA = Polarity Designator

### ORDERING INFORMATION

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

# MBR20L80CT, MBRF20L80CT

## MAXIMUM RATINGS (Per Diode Leg)

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	80	V
Average Rectified Forward Current ( $T_C = 137^\circ\text{C}$ ) Per Diode Per Device	$I_{F(AV)}$	10 20	A
Peak Repetitive Forward Current (Square Wave, 20 kHz, $T_C = 151^\circ\text{C}$ )	$I_{FM}$	20	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	175	A
Storage Temperature	$T_{stg}$	-65 to +175	$^\circ\text{C}$
Operating Junction Temperature (Note 1)	$T_J$	-20 to +150	$^\circ\text{C}$
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

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance (MBR20L80CT) - Junction-to-Case - Junction-to-Ambient	$R_{\theta JC}$ $R_{\theta JA}$	2.0 70	$^\circ\text{C}/\text{W}$
(MBRF20L80CT) - Junction-to-Case - Junction-to-Ambient	$R_{\theta JC}$ $R_{\theta JA}$	4.2 75	

## ELECTRICAL CHARACTERISTICS (Per Diode Leg)

Characteristic	Symbol	Min	Typ	Max	Unit
Maximum Instantaneous Forward Voltage (Note 2) ( $i_F = 3.0\text{ A}$ , $T_J = 25^\circ\text{C}$ ) ( $i_F = 3.0\text{ A}$ , $T_J = 125^\circ\text{C}$ ) ( $i_F = 10\text{ A}$ , $T_J = 25^\circ\text{C}$ ) ( $i_F = 10\text{ A}$ , $T_J = 125^\circ\text{C}$ ) ( $i_F = 20\text{ A}$ , $T_J = 25^\circ\text{C}$ ) ( $i_F = 20\text{ A}$ , $T_J = 125^\circ\text{C}$ )	$V_F$	-	0.45 0.35 0.56 0.51 0.69 0.62	0.50 0.44 0.67 0.61 0.85 0.74	V
Maximum Instantaneous Reverse Current (Note 2) (Rated DC Voltage, $T_J = 125^\circ\text{C}$ ) (Rated DC Voltage, $T_J = 25^\circ\text{C}$ )	$i_R$	-	30 0.06	50 0.50	mA

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

## DEVICE ORDERING INFORMATION

Device Order Number	Package Type	Shipping <sup>†</sup>
MBR20L80CTG	TO-220AB (Pb-Free)	50 Units / Rail
MBRF20L80CTG	TO-220FP (Pb-Free)	50 Units / Rail

# MBR20L80CT, MBRF20L80CT

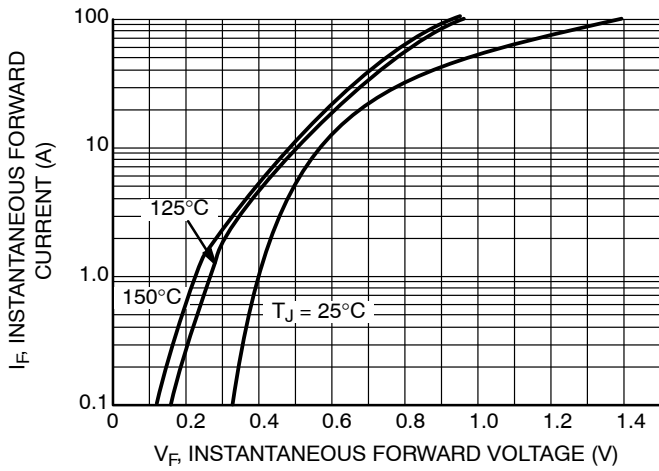


Figure 1. Typical Forward Voltage

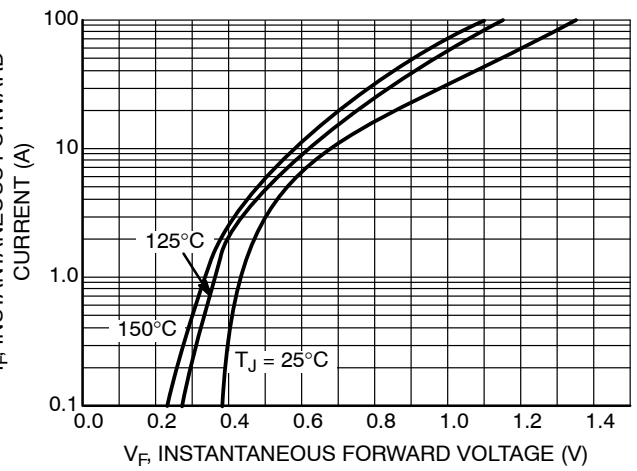


Figure 2. Maximum Forward Voltage

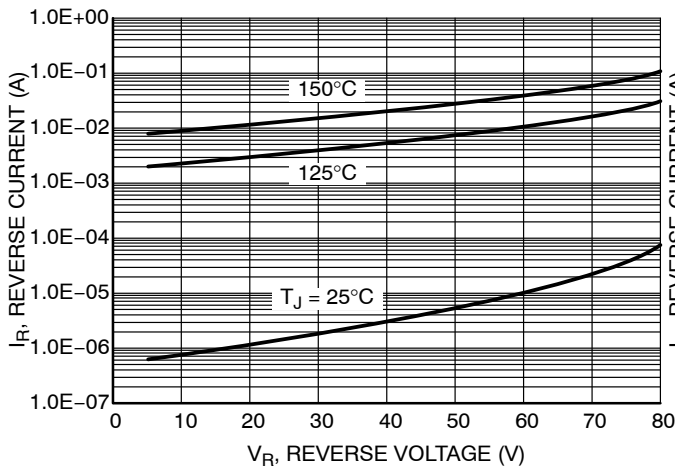


Figure 3. Typical Reverse Voltage

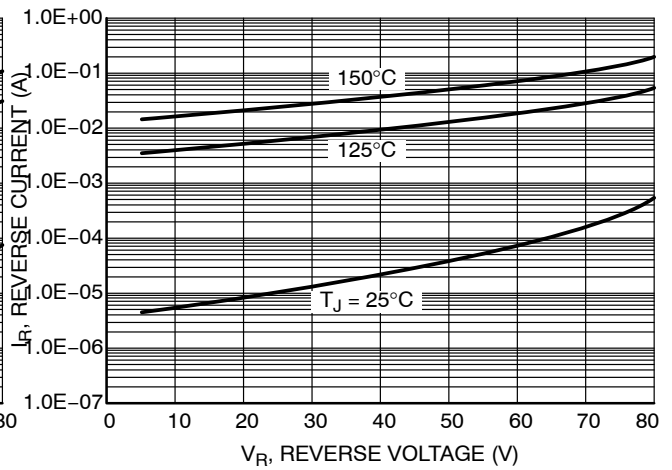


Figure 4. Maximum Reverse Voltage

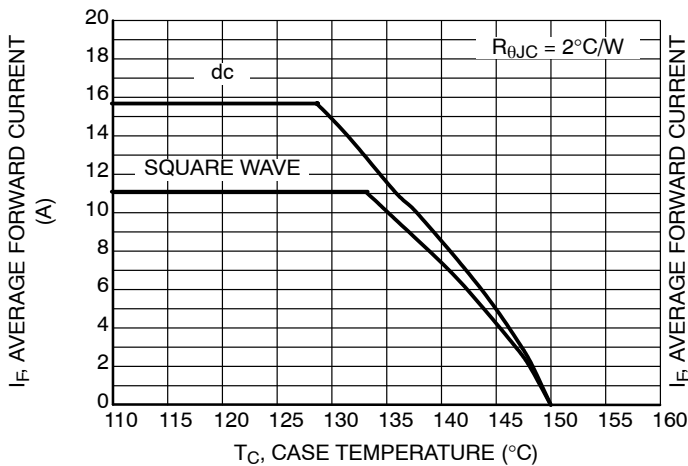


Figure 5. Current Derating, Case per Leg - MBR20L80CTG

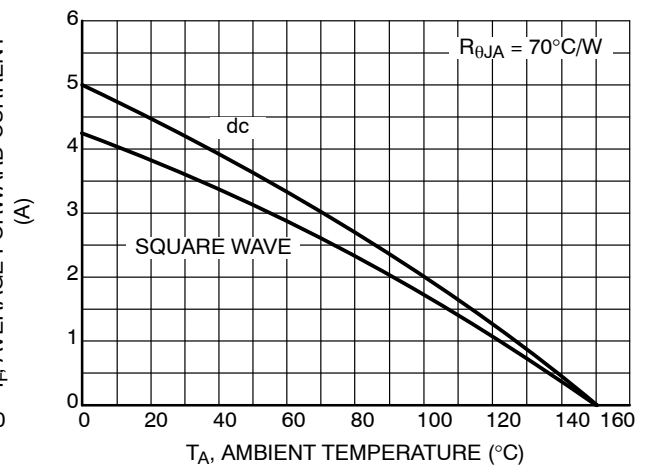
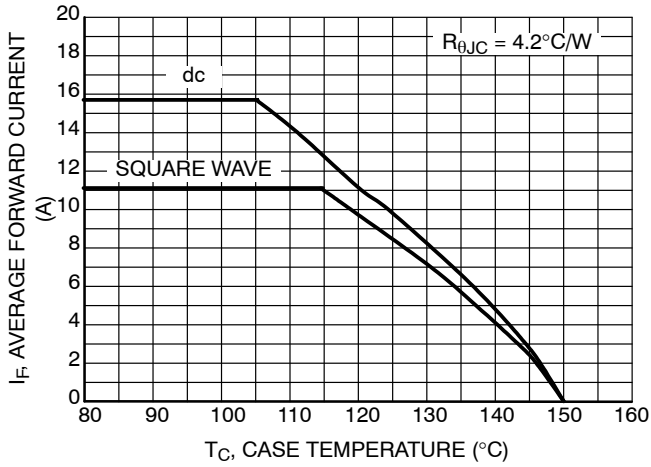
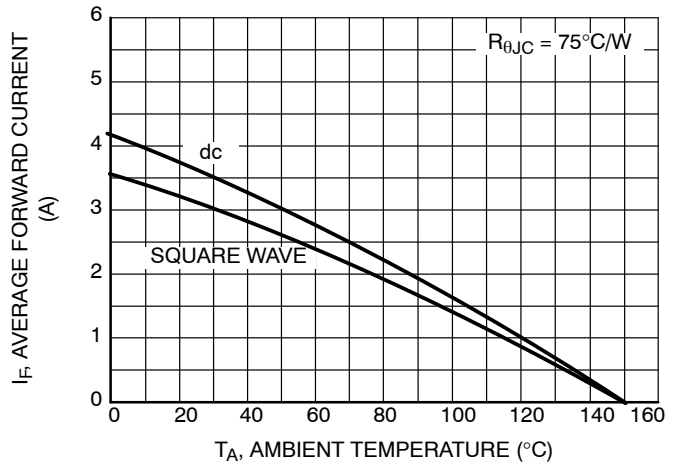


Figure 6. Current Derating, Ambient per Leg - MBR20L80CTG

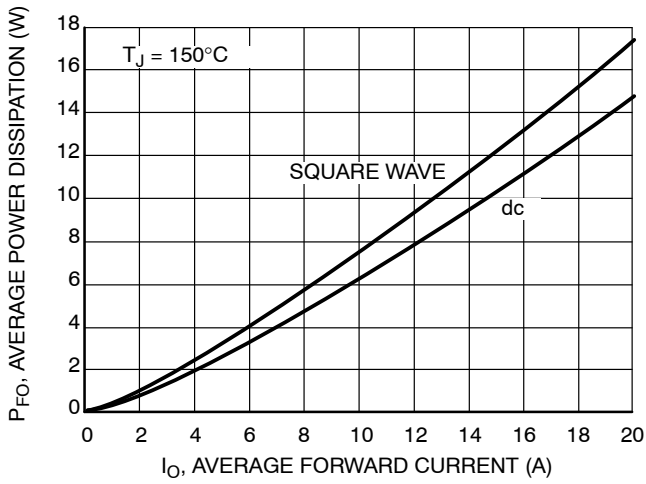
# MBR20L80CT, MBRF20L80CT



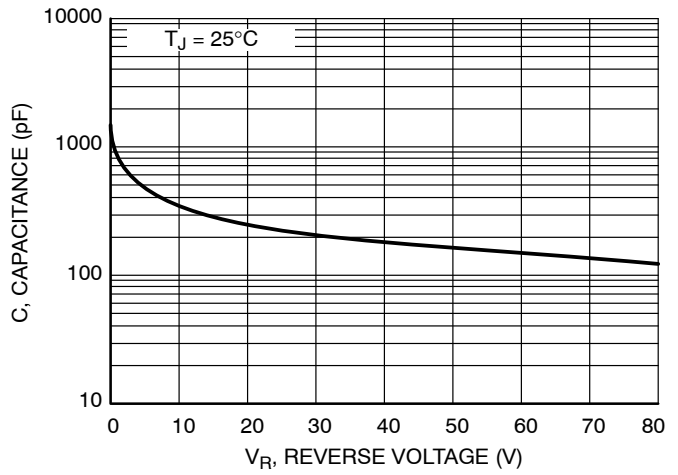
**Figure 7. Current Derating, Case per Leg - MBRF20L80CTG**



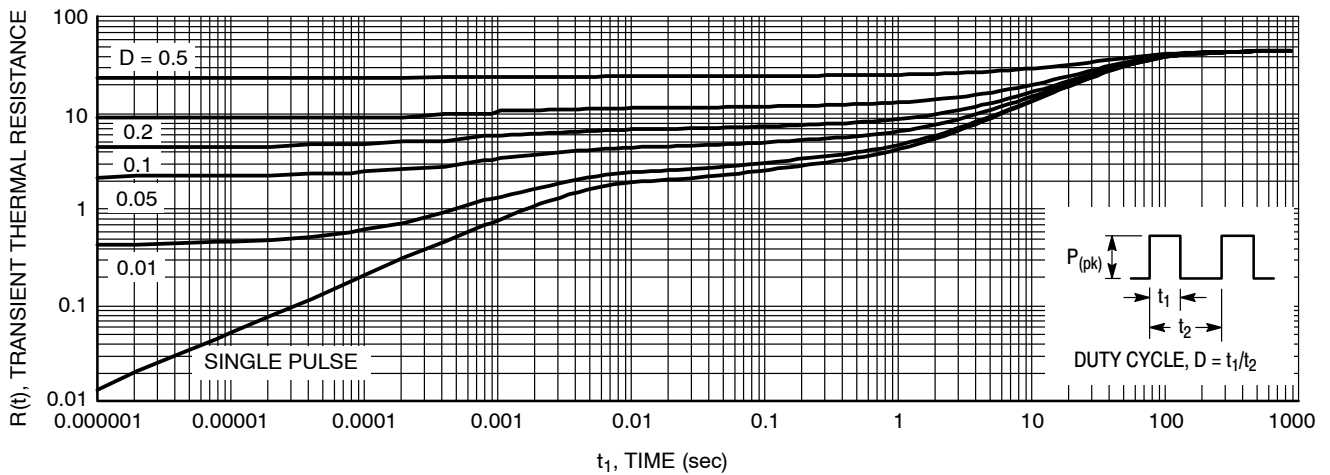
**Figure 8. Current Derating, Ambient per Leg - MBRF20L80CTG**



**Figure 9. Forward Power Dissipation**



**Figure 10. Capacitance**



**Figure 11. Thermal Response Junction-to-Ambient for MBR20L80CT**

# MBR20L80CT, MBRF20L80CT

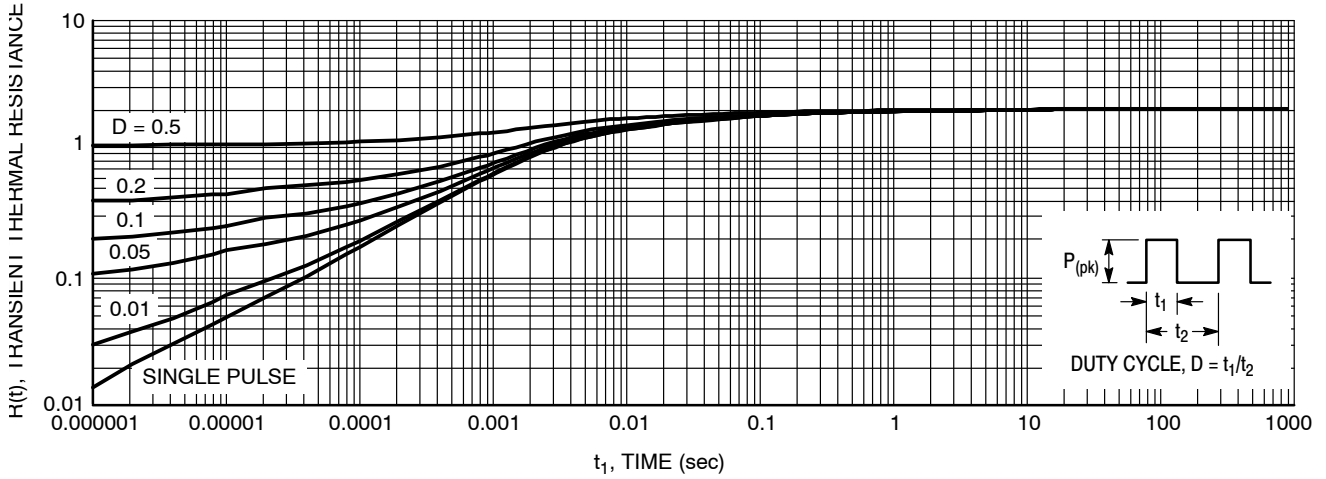


Figure 12. Thermal Response Junction-to-Case for MBR20L80CT

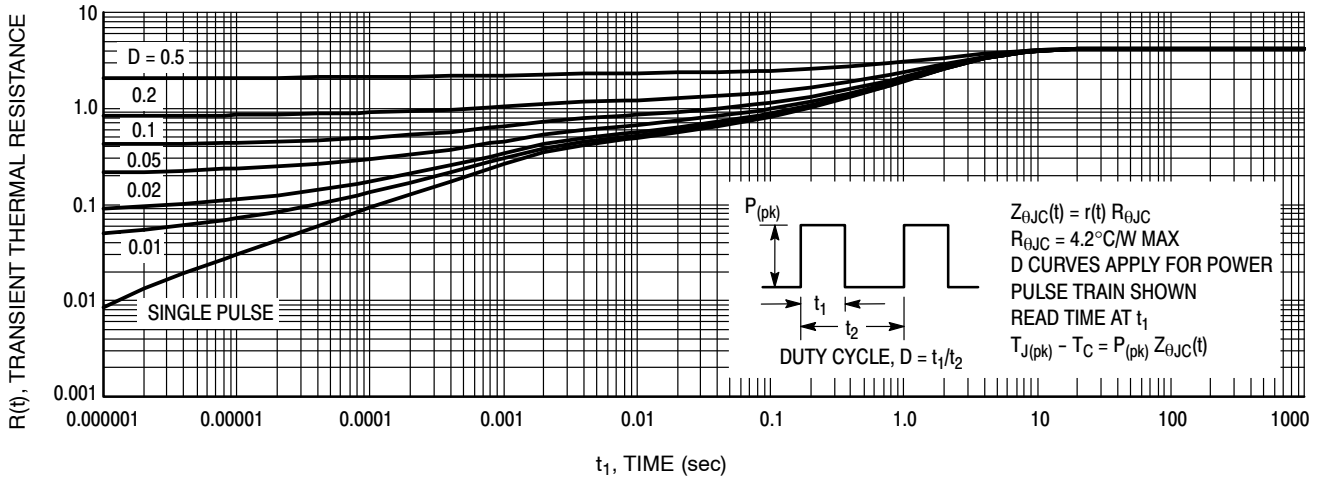


Figure 13. Thermal Response Junction-to-Case for MBRF20L80CT

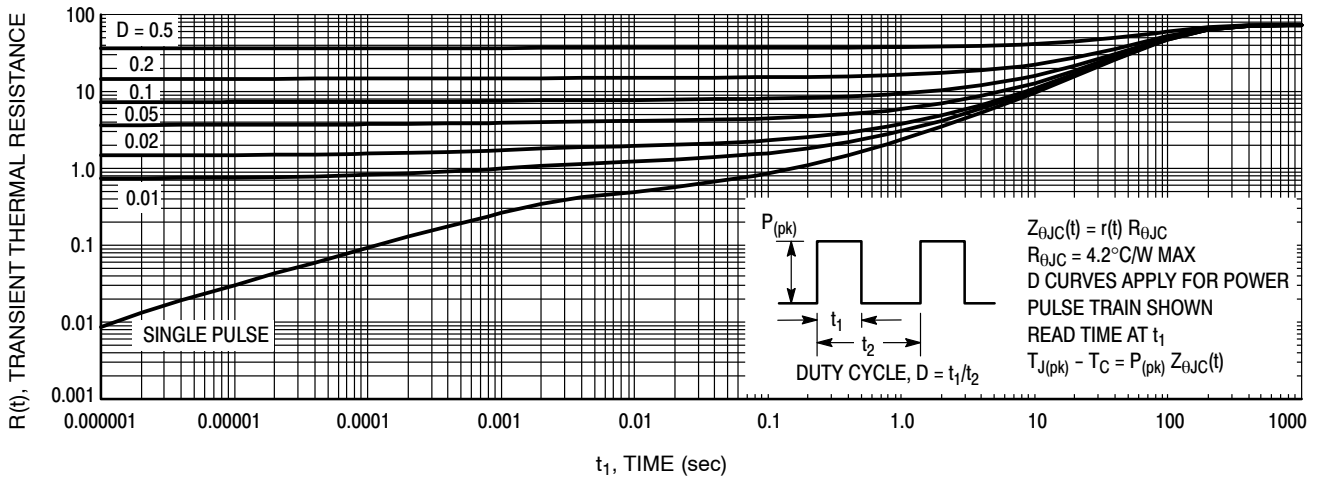
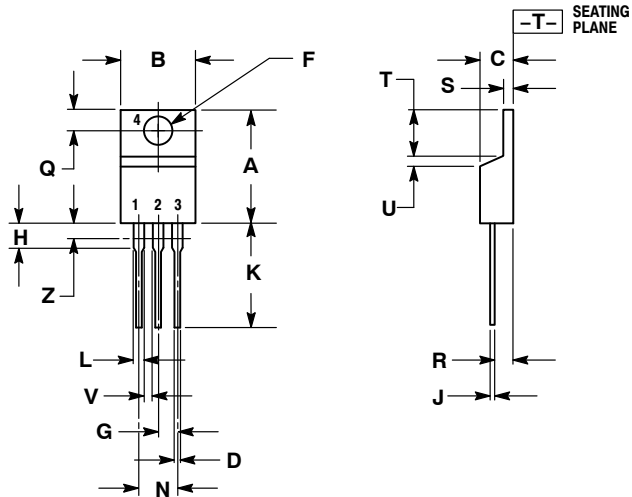


Figure 14. Thermal Response Junction-to-Ambient for MBRF20L80CT

# MBR20L80CT, MBRF20L80CT

## 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

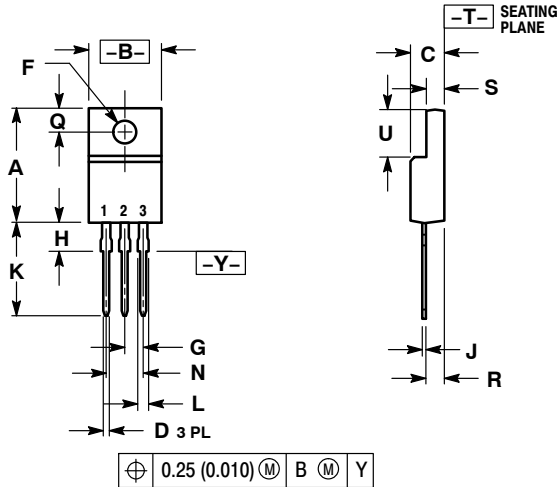
STYLE 6:

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

# MBR20L80CT, MBRF20L80CT

## 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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