

MBR20L60CT MBRF20L60CT

SWITCHMODE™ Power Rectifier 60 V, 20 A

Features and Benefits

- Low Power Loss/High Efficiency
- High Surge Capacity
- 20 A Total (10 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: 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
- Shipped 50 Units Per Plastic Tube

MAXIMUM RATINGS

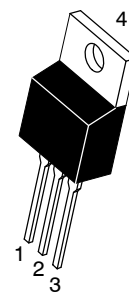
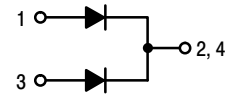
Please See the Table on the Following Page



ON Semiconductor®

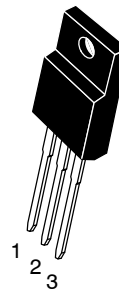
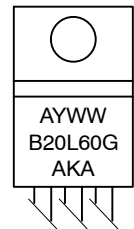
<http://onsemi.com>

SCHOTTKY BARRIER RECTIFIER 20 AMPERES 60 VOLTS

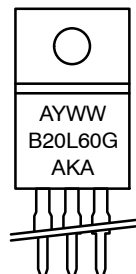


TO-220AB
CASE 221A
PLASTIC

MARKING DIAGRAM



TO-220 FULLPAK™
CASE 221D
STYLE 3



- A = Assembly Location
- Y = Year
- WW = Work Week
- B20L60 = Device Code
- G = Pb-Free Package
- AKA = Polarity Designator

ORDERING INFORMATION

Device	Package	Shipping
MBR20L60CTG	TO-220AB (Pb-Free)	50 Units / Rail
MBRF20L60CTG	TO-220FP (Pb-Free)	50 Units / Rail

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

MBR20L60CT MBRF20L60CT

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 MBR20L60CT (Rated V_R) $T_C = 138^\circ\text{C}$ Per Diode MBRF20L60CT (Rated V_R) $T_C = 123^\circ\text{C}$ Per Device	$I_{F(AV)}$	10 20	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I_{FSM}	240	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

THERMAL CHARACTERISTICS

Maximum Thermal Resistance		Symbol	Value	Unit
MBR20L60CT	- Junction-to-Case	$R_{\theta JC}$	2.3	$^\circ\text{C/W}$
	- Junction-to-Ambient	$R_{\theta JA}$	70	
MBRF20L60CT	- Junction-to-Case	$R_{\theta JC}$	5.2	
	- Junction-to-Ambient	$R_{\theta JA}$	75	

ELECTRICAL CHARACTERISTICS (Per Diode Leg)

Rating	Symbol	Typ	Max	Unit
Maximum Instantaneous Forward Voltage (Note 2) ($I_F = 10\text{ A}$, $T_C = 25^\circ\text{C}$) ($I_F = 10\text{ A}$, $T_C = 125^\circ\text{C}$) ($I_F = 20\text{ A}$, $T_C = 25^\circ\text{C}$) ($I_F = 20\text{ A}$, $T_C = 125^\circ\text{C}$)	V_F	0.53 0.49 0.68 0.64	0.57 0.54 0.73 0.69	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	118 52	380 96	μA mA

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.

- The heat generated must be less than the thermal conductivity from Junction-to-Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.
- Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

MBR20L60CT MBRF20L60CT

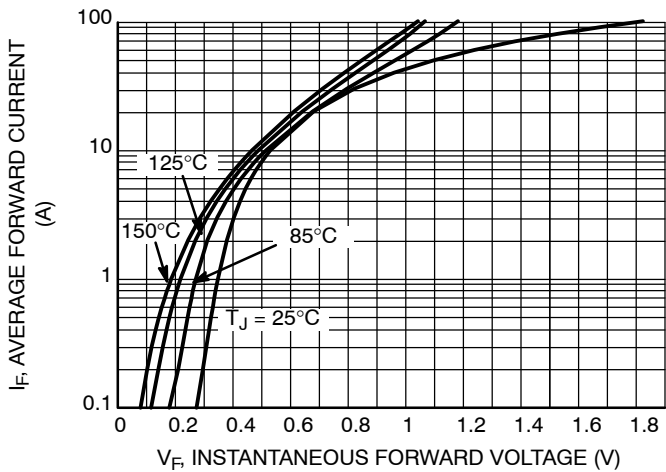


Figure 1. Typical Forward Voltage

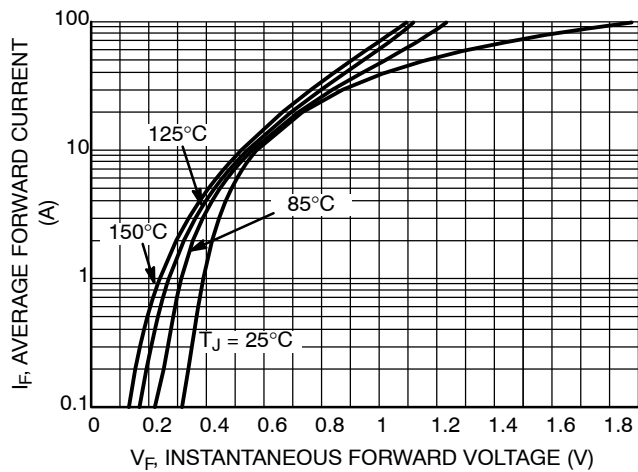


Figure 2. Maximum Forward Voltage

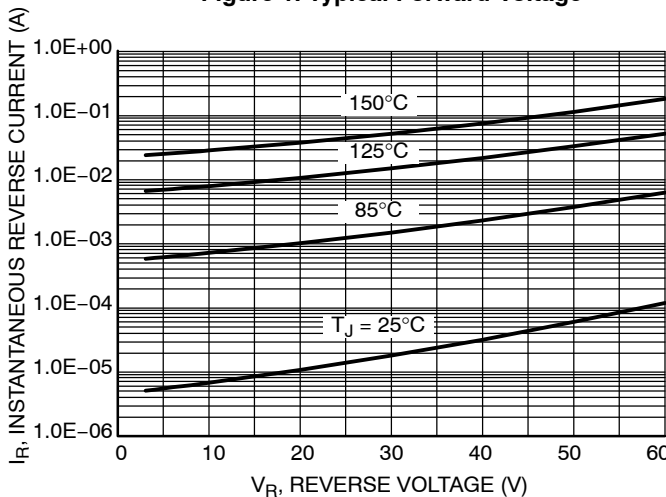


Figure 3. Typical Reverse Current

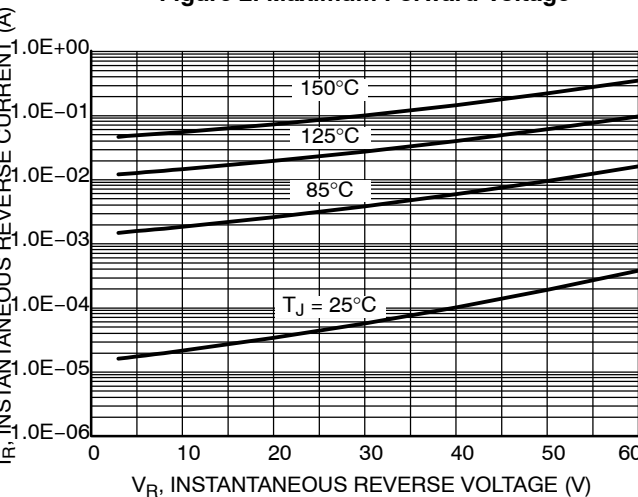
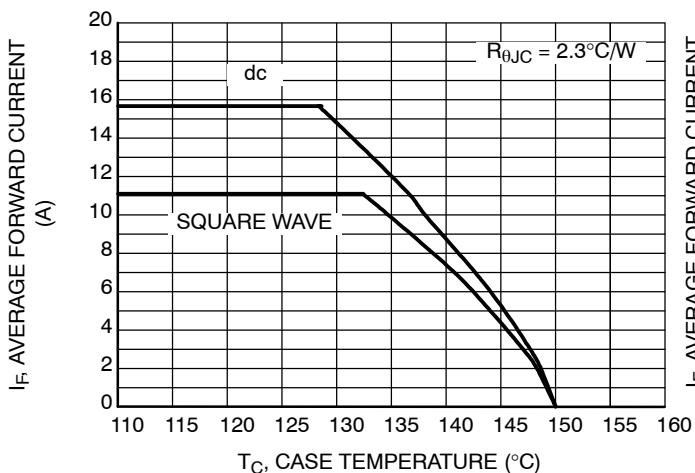
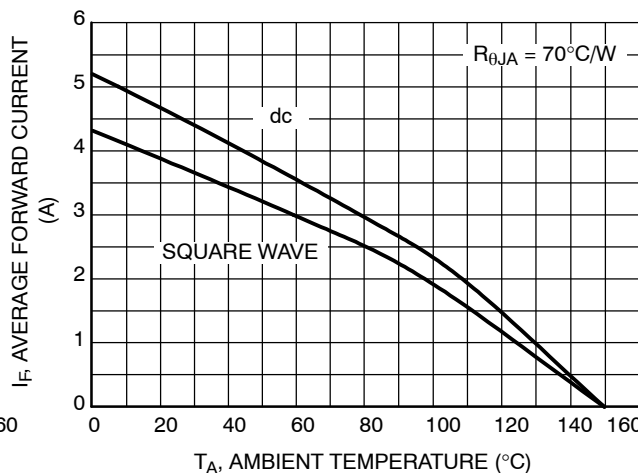


Figure 4. Maximum Reverse Current

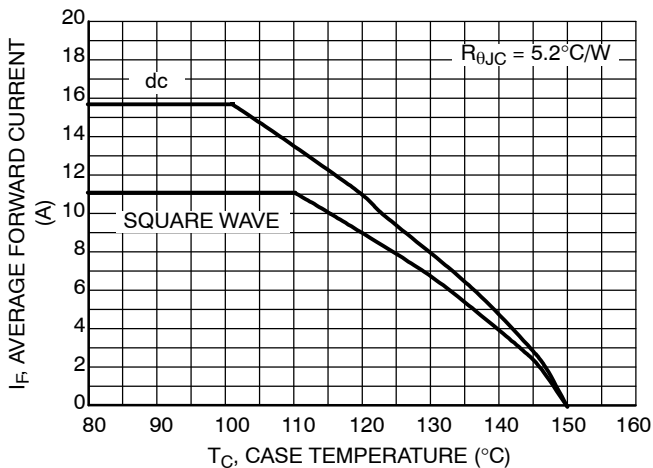


**Figure 5. Current Derating, Case per Leg
MBR20L60CT**

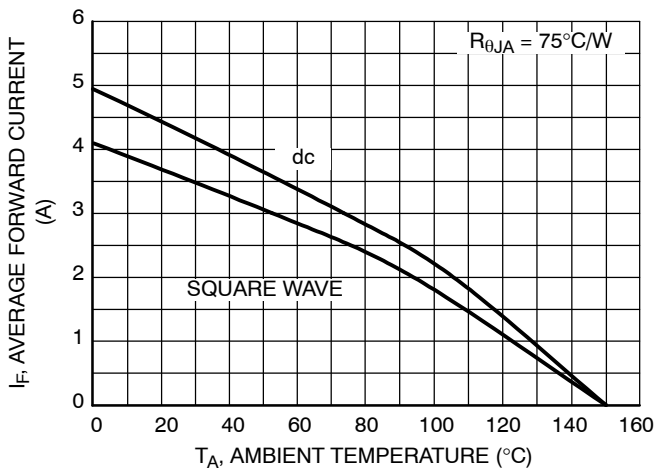


**Figure 6. Current Derating, Ambient per Leg
MBR20L60CT**

MBR20L60CT MBRF20L60CT



**Figure 7. Current Derating, Case per Leg
MBRF20L60CT**



**Figure 8. Current Derating, Ambient per Leg
MBRF20L60CT**

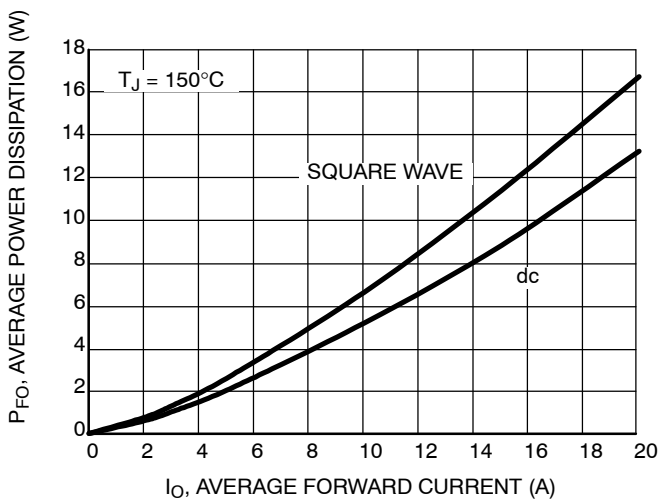


Figure 9. Forward Power Dissipation

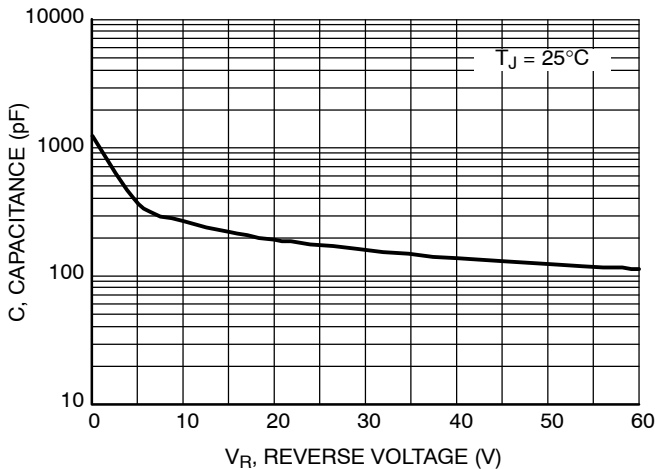


Figure 10. Capacitance

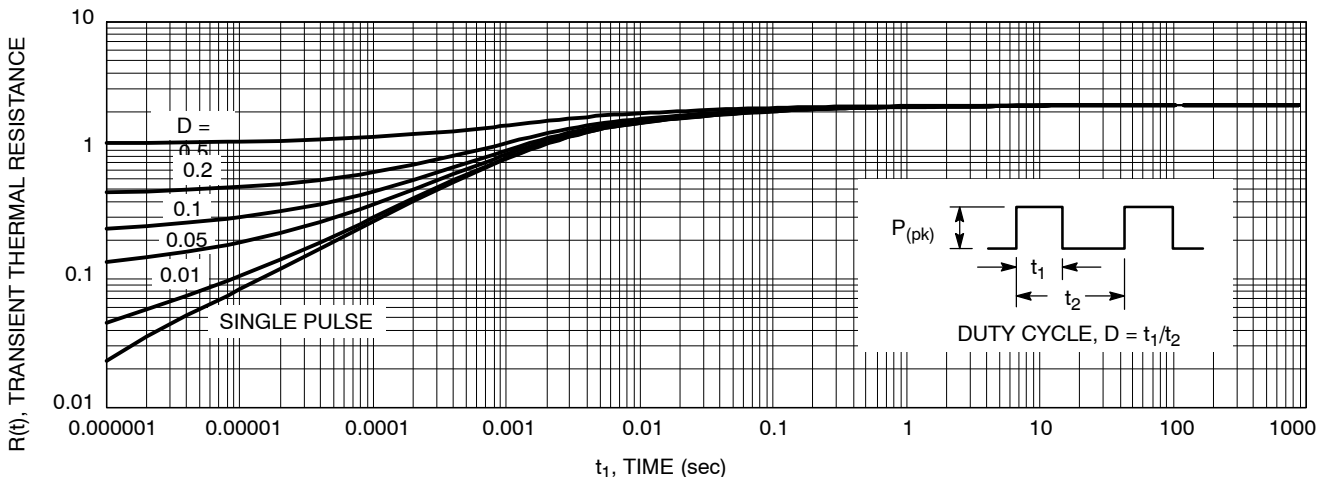


Figure 11. Thermal Response Junction-to-Case, per Leg for MBR20L60CT

MBR20L60CT MBRF20L60CT

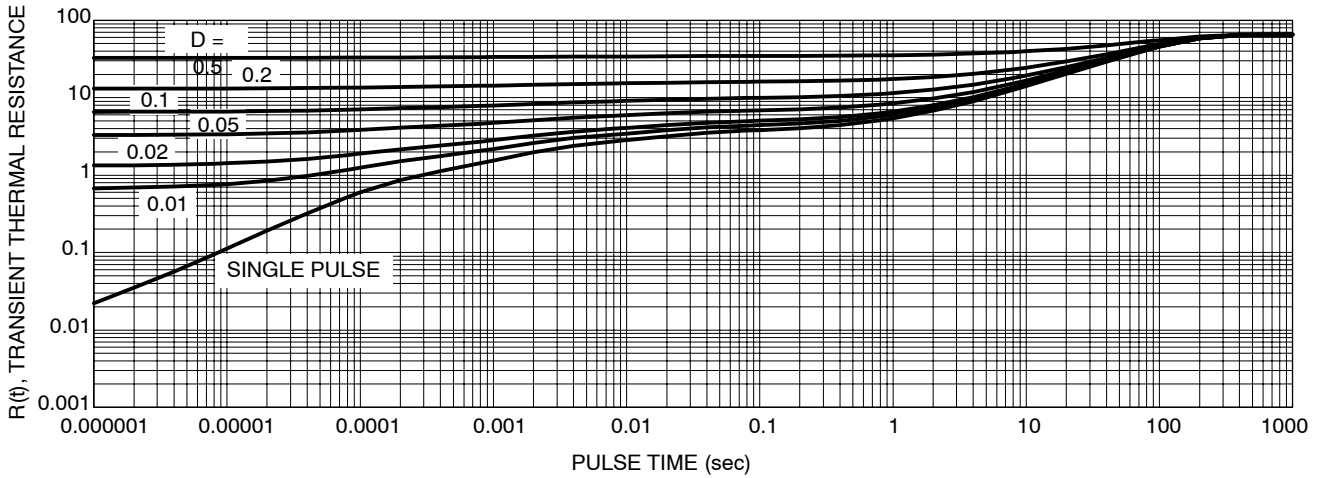


Figure 12. Thermal Response Junction-to-Ambient, per Leg for MBR20L60CT

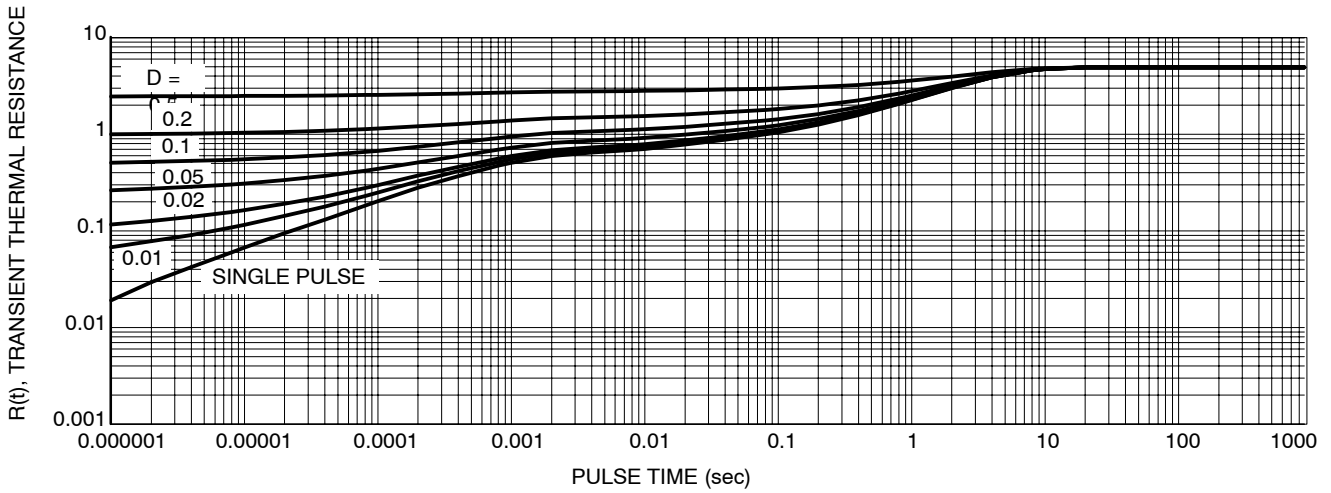


Figure 13. Thermal Response Junction-to-Case, per Leg for MBRF20L60CT

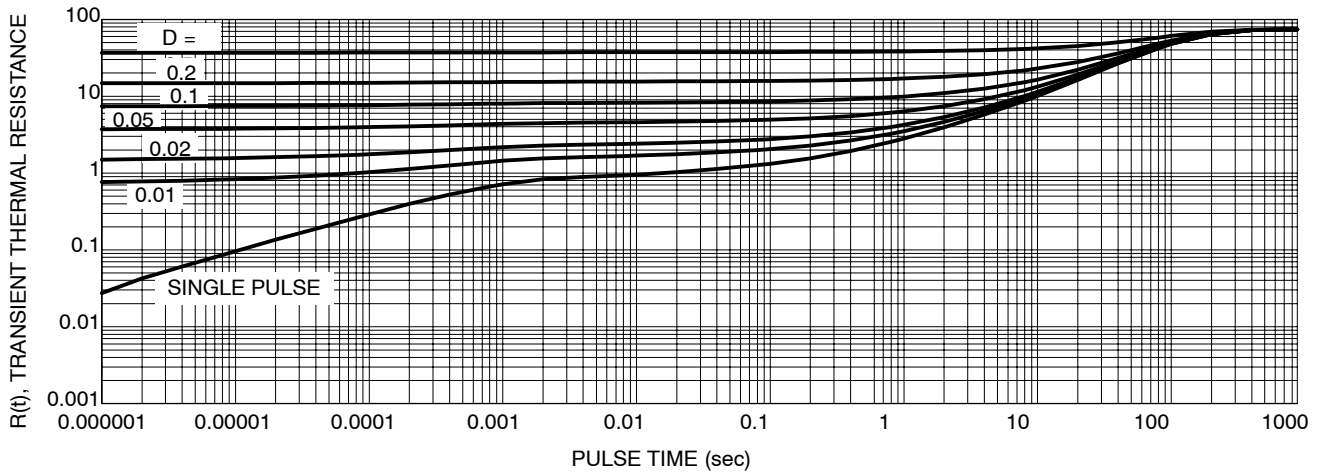
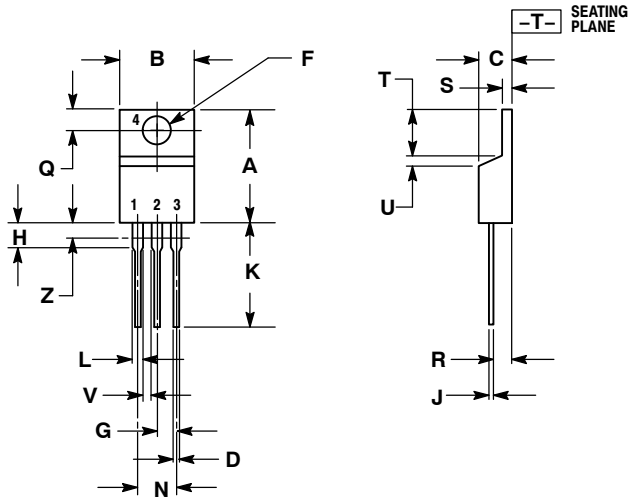


Figure 14. Thermal Response Junction-to-Ambient, per Leg for MBRF20L60CT

MBR20L60CT MBRF20L60CT

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

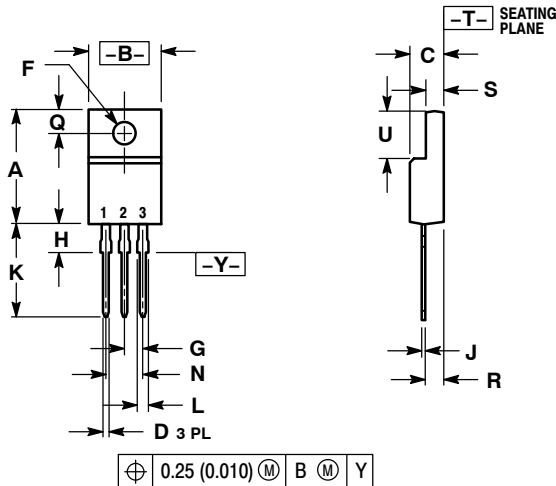
STYLE 6:

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

MBR20L60CT MBRF20L60CT

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:

1. ANODE
2. CATHODE
3. ANODE

FULLPAK and SWITCHMODE are trademarks of Semiconductor Components Industries, LLC.

ON Semiconductor and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5773-3850

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative