# SWITCHMODE™ Power Rectifier 45 V, 20 A

#### **Features and Benefits**

- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capacity
- 150°C Operating Junction Temperature
- 20 A Total (10 A Per Diode Leg)
- Guard-Ring for Stress Protection

## **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
- Shipped 50 Units Per Plastic Tube
- This is a Pb-Free Device\*

### **MAXIMUM RATINGS**

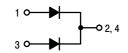
Please See the Table on the Following Page



## ON Semiconductor®

http://onsemi.com

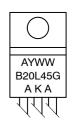
## DUAL SCHOTTKY BARRIER RECTIFIERS 20 AMPERES, 45 VOLTS



## MARKING DIAGRAMS

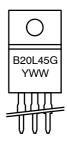


TO-220 CASE 221A PLASTIC





TO-220 CASE 221D STYLE 3



B20L45 = Device Code A = Assembly Location Y = Year

Y = Year

WW = Work Week

AKA = Polarity Designator

G = Pb-Free Device

## **ORDERING INFORMATION**

Device	Package	Shipping
MBR20L45CTG	TO-220 (Pb-Free)	50 Units/Rail
MBRF20L45CTG	TO-220FP (Pb-Free)	50 Units/Rail

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

## MAXIMUM RATINGS (Per Diode Leg)

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	45	V
Average Rectified Forward Current (Rated V <sub>R</sub> ) T <sub>C</sub> = 141 °C	I <sub>F(AV)</sub>	10	Α
Peak Repetitive Forward Current (Rated V <sub>R</sub> , Square Wave, 20 kHz)	IFRM	20	Α
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I <sub>FSM</sub>	180	Α
Operating Junction Temperature (Note 1)	T <sub>J</sub>	-55 to +150	°C
Storage Temperature	T <sub>stg</sub>	- 55 to +175	°C
Voltage Rate of Change (Rated V <sub>R</sub> )	dv/dt	10,000	V/μs
ESD Ratings: Machine Model = C Human Body Model = 3B		> 400 > 8000	V

## THERMAL CHARACTERISTICS

Maximum Thermal Resistance				°C/W
(MBR20L45CTG)	Junction-to-Case	$R_{ hetaJC}$	1.9	
	Junction-to-Ambient	$R_{ hetaJA}$	45	
(MBRF20L45CTG)	Junction-to-Case	$R_{ hetaJC}$	2.2	

## **ELECTRICAL CHARACTERISTICS** (Per Diode Leg)

Maximum Instantaneous Forward Voltage (Note 2) $ \begin{aligned} &(I_F=10~A,T_C=25^\circ\text{C})\\ &(I_F=10~A,T_C=125^\circ\text{C})\\ &(I_F=20~A,T_C=25^\circ\text{C})\\ &(I_F=20~A,T_C=125^\circ\text{C}) \end{aligned} $	VF	0.50 0.47 0.63 0.62	V
Maximum Instantaneous Reverse Current (Note 2) (Rated DC Voltage, T <sub>C</sub> = 25°C) (Rated DC Voltage, T <sub>C</sub> = 125°C)	İR	0.5 170	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.

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

## **TYPICAL CHARACTERISTICS**

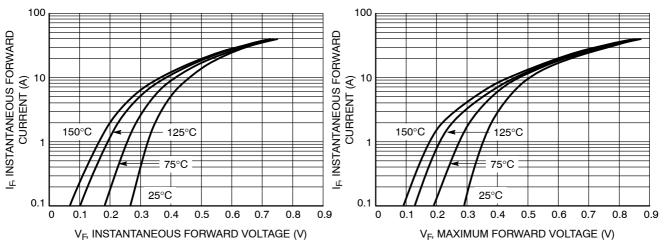
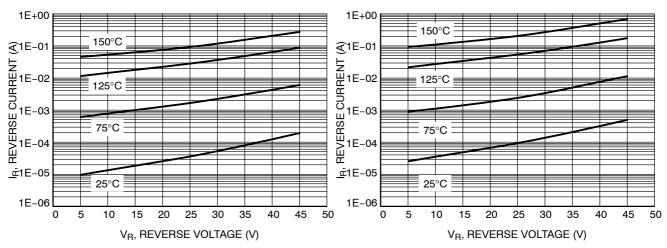


Figure 1. Typical Forward Voltage

Figure 2. Maximum Forward Voltage



**Figure 3. Typical Reverse Current** 

**Figure 4. Maximum Reverse Current** 

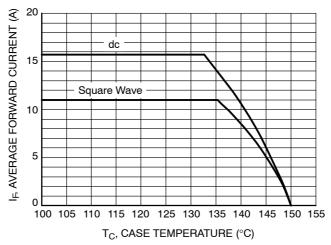


Figure 5. Current Derating

## **TYPICAL CHARACTERISTICS**

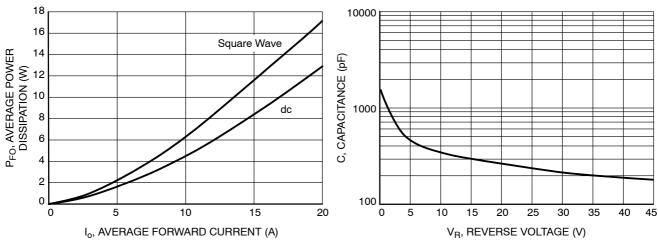


Figure 6. Forward Power Dissipation

Figure 7. Typical Capacitance

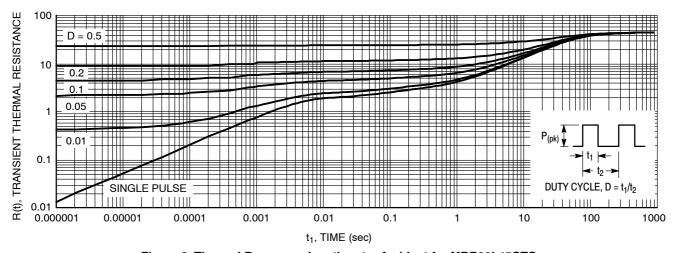


Figure 8. Thermal Response Junction-to-Ambient for MBR20L45CTG

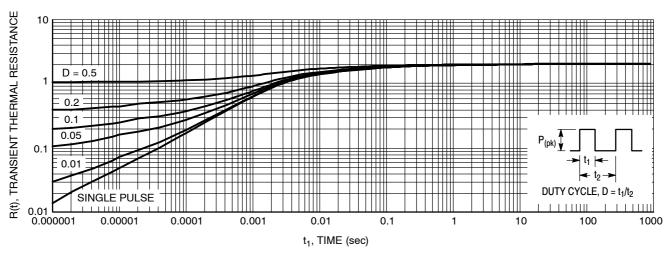


Figure 9. Thermal Response Junction-to-Case for MBR20L45CTG

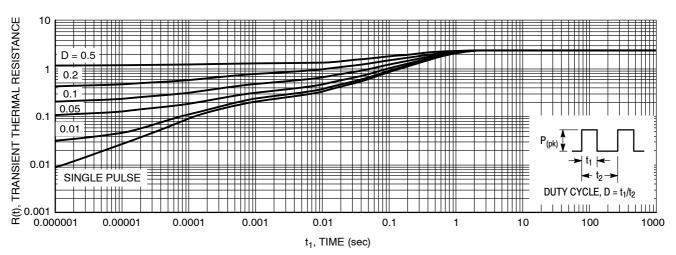
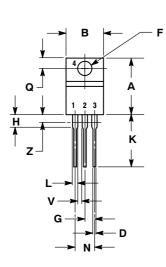
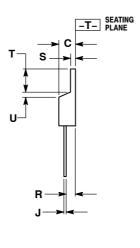


Figure 10. Thermal Response Junction-to-Case for MBRF20L45CTG

#### PACKAGE DIMENSIONS

## TO-220 CASE 221A-09 **ISSUE AF**





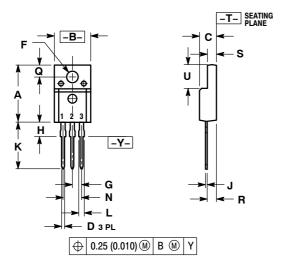
#### NOTES

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

	INCHES		MILLIN	IETERS
DIM	MIN	MAX	MIN	MAX
Α	0.570	0.620	14.48	15.75
В	0.380	0.405	9.66	10.28
С	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
Н	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
٧	0.045		1.15	
Z		0.080		2.04

## TO-220 FULLPAK

CASE 221D-03 ISSUE K



- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- 2 CONTROLLING DIMENSION: INCH
- 3. 221D-01 THRU 221D-02 OBSOLETE, NEW STANDARD 221D-03
  - INCHES **MILLIMETERS** MIN MAX DIM MIN MAX A 0.617 0.635 15.67 **B** 0.392 0.419 **C** 0.177 0.193 9.96 10.63 4.50 4.90 **D** 0.024 0.039 0.60 1.00 F 0.116 0.129 2.95 G 0.100 BSC 2.54 BSC H 0.118 0.135 3.43 3.00 J 0.018 0.025 0.45 0.63 K 0.503 0.541 L 0.048 0.058 12.78 13.73 1.23 1.47 N 0.200 BSC 5.08 BSC Q 0.122 0.138 R 0.099 0.117 S 0.092 0.113 3.10 3.50 2.51 2.96 2.34 2.87

6.06 6.88

**U** 0.239 0.271 STYLE 3:

PIN 1. ANODE

CATHODE 2.

ANODE

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