

## 20A 60V SchottkyBarrierDiode

### 1 Description

Dual center tab Schottky rectifier suited for High Frequency server and telecom base station SMPS. Packaged in TO Inside the package, this device combines high current rating and low volume to enhance both reliability and power density of the application.

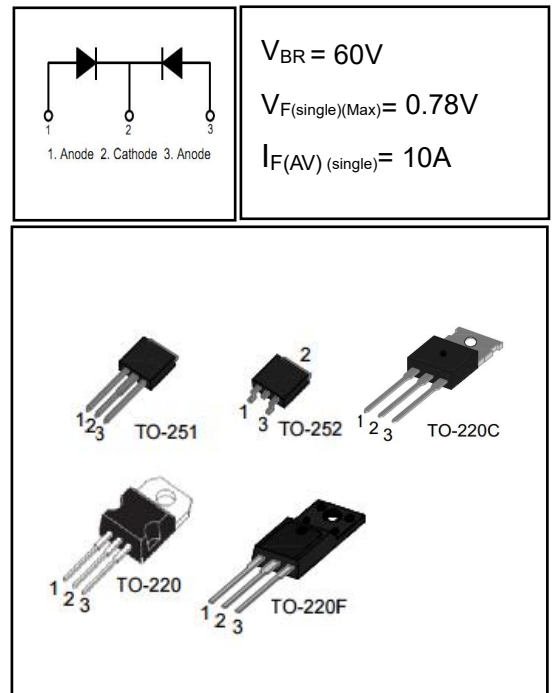
TO-220F provides insulation voltage rated at 2000V RMS from all three terminals to external heatsink.

### 2 Features

- High junction temperature capability
- Low leakage current
- Low thermal resistance
- High frequency operation

### 3 Applications

- converters
- free-wheeling diodes
- reverse battery protection
- Typical applications are in switching power



## 4 Electrical Characteristics

### 4.1 Absolute Maximum Ratings (Tc=25°C, unless otherwise noted)

PARAMETER		SYMBOL	VALUE	UNIT
Peak Repetitive Reverse Voltage		$V_{RRM}$	60	V
RMS Reverse Voltage		$V_{R(RMS)}$	48	V
DC Blocking Voltage		$V_R$	60	V
Average Rectified Forward	TO-220/251/252, Tc=120°C	$I_{F(AV)}$	10	A
Average Rectified Forward	TO-220F, Tc=90°C		20	A
Repetitive Peak Surge Current(single)		$I_{FRM}$	15	A
Nonrepetitive Peak Surge Current(single)	tp=8.3ms	$I_{FSM}$	150	A
Avalanche Energy(single)	L=1mH	$E_{AS}$	24	mJ
Operating Junction Temperature Range		$T_j$	-55~150	°C
Storage Temperature Range		$T_{stg}$	-55~150	°C

### 4.2 Thermal Characteristics

PARAMETER	SYMBOL	VALUE			UNIT
		TO-220	TO-220F	TO-252/251	
Thermal Resistance, Junction to Case-sink	$R_{thJC}$	1.35	1.5	2.5	°C/W

## 4.3 Electrical Characteristics (T<sub>c</sub>=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Maximum Instantaneous Forward Voltage (Note 3)	V <sub>F</sub>	I <sub>F</sub> = 10A	-	0.71	0.78	V
		I <sub>F</sub> = 10A, T <sub>C</sub> = 125°C	-	-	0.68	V
		I <sub>F</sub> = 20A	-	0.83	1.1	V
Maximum Instantaneous Reverse (Note 2)	I <sub>R</sub>	V <sub>R</sub> = 60V	-	3.0	100	uA
		V <sub>R</sub> = 60V, T <sub>C</sub> = 125°C	-	-	15	mA
Total capacitance	C <sub>tot</sub>	V <sub>R</sub> = 4V f = 1MHz	-	271	-	pF
DC Blocking Voltage	V <sub>BR</sub>	I <sub>R</sub> = 100uA	60	73	-	V

Notes:

- 2.0us Pulse Width, f=1.0 KHz
- Pulse Test: 300us Pulse Width, 1% Duty Cycle
- V<sub>F</sub> Instantaneous forward voltage (pw = 300us, D = 2%).

## 5 Typical characteristics diagrams

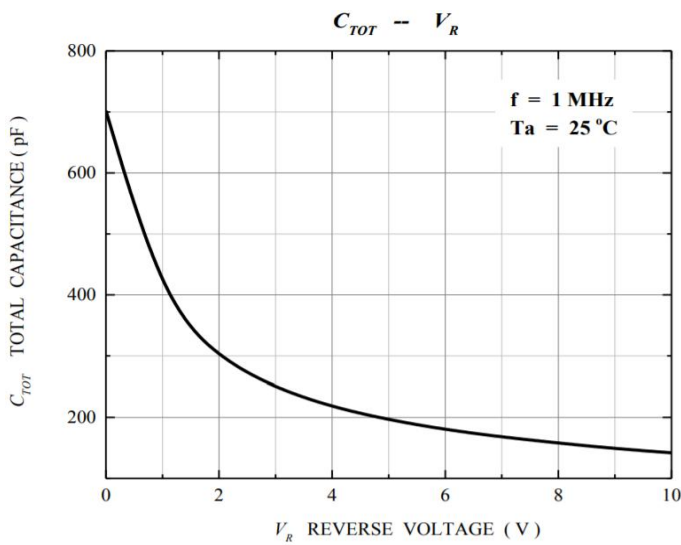


FIGURE 1. Total capacitance vs Voltage

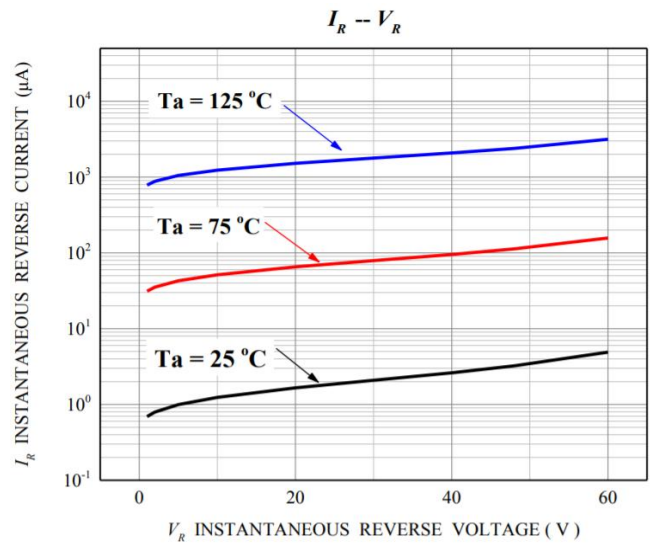


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

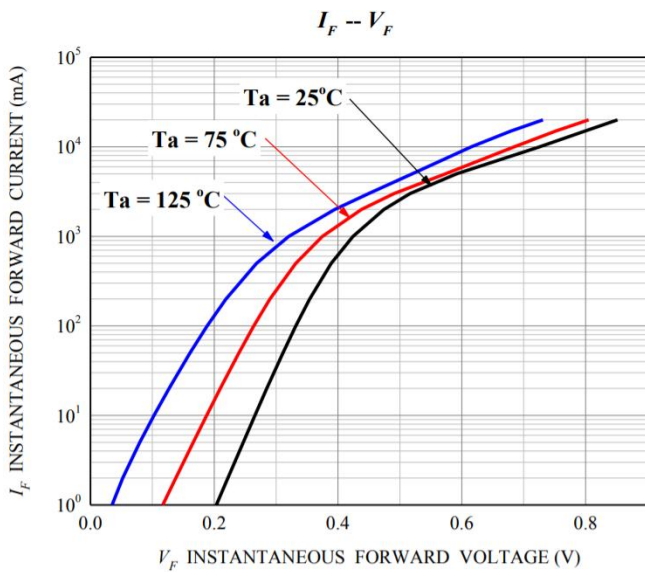


FIGURE 3. FORWARD CURRENT vs FORWARD VOLTAGE

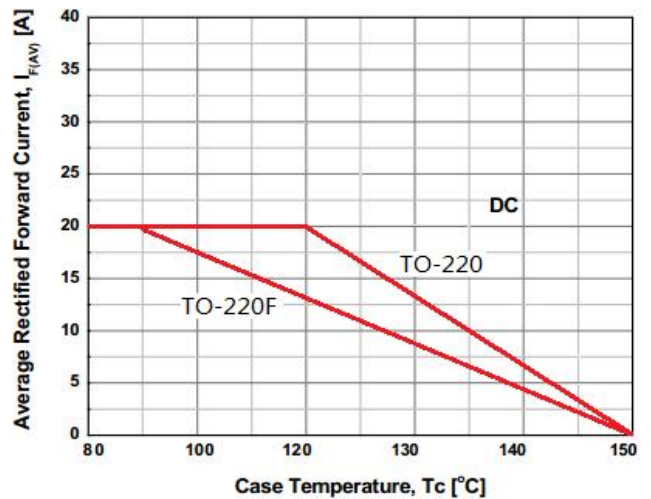


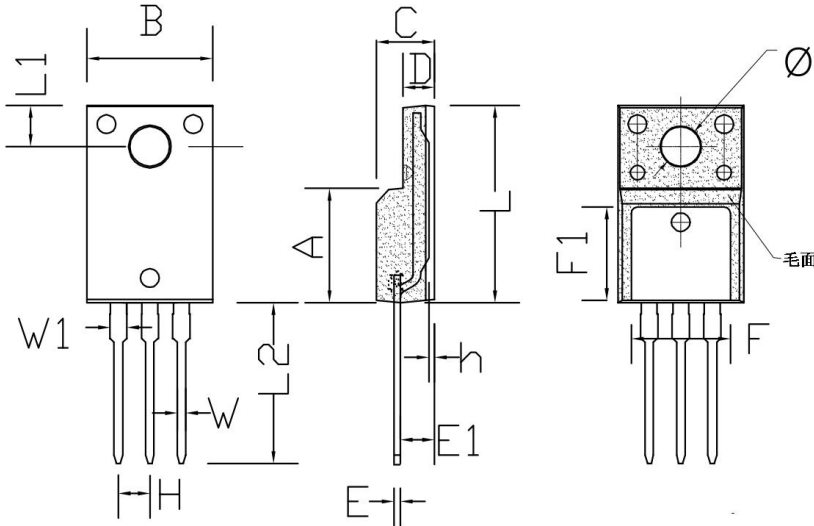
FIGURE 4. CURRENT DERATING CURVE

## 6 Product Specifications and Packaging Models

Product Model	Package Type	Mark Name	RoHS	Package	Quantity
MBR2060CT	TO-252	MBR2060CT	Pb-free	Braid	3000/disc
MBR2060CT	TO-220	MBR2060CT	Pb-free	Tube	1000/box
MBRF2060CT	TO-220F	MBRF2060CT	Pb-free	Tube	1000/box

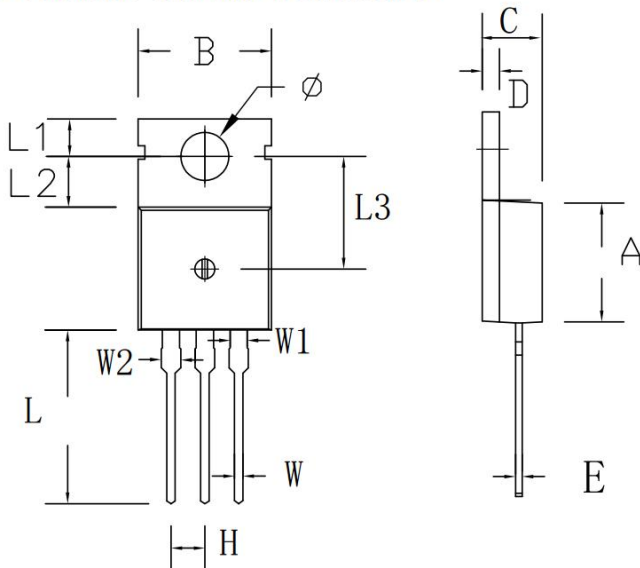
## 7 Dimensions

TO-220F PACKAGE OUTLINE DIMENSIONS



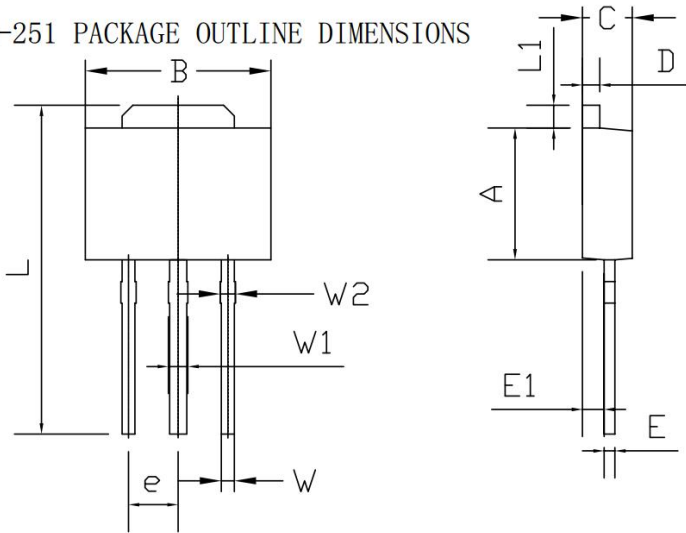
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	8.80	9.30	0.346	0.366
B	10.00	10.50	0.394	0.413
C	4.30	4.90	0.169	0.193
D	2.30	2.70	0.091	0.106
L	15.55	16.15	0.612	0.636
h	0.40	0.60	0.016	0.024
L1	3.15	3.55	0.124	0.140
L2	12.65	13.35	0.498	0.526
W	0.70	0.90	0.028	0.035
W1	1.15	1.55	0.045	0.061
H	2.54 TYP		0.100 TYP	
E	0.48	0.53	0.019	0.021
$\phi$	2.90	3.40	0.114	0.134
E1	2.40	2.90	0.094	0.114
F	7.75	8.25	0.305	0.325
F1	7.35	7.85	0.289	0.309

TO-220C PACKAGE OUTLINE DIMENSIONS



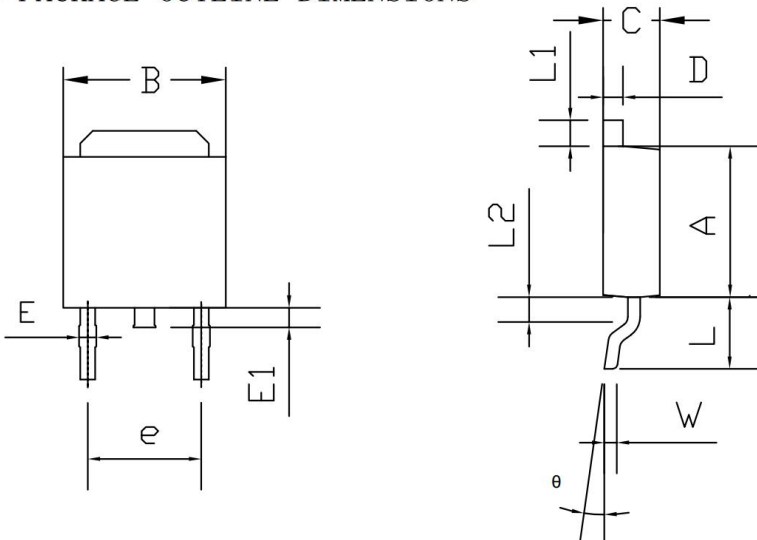
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	8.80	9.30	0.346	0.366
B	9.70	10.30	0.382	0.406
C	4.25	4.75	0.167	0.187
D	1.20	1.45	0.047	0.057
E	0.40	0.60	0.016	0.024
H	2.54 TYP		0.100 TYP	
W	0.60	0.95	0.024	0.037
W1	1.05	1.45	0.041	0.057
W2	1.20	1.60	0.047	0.063
L	12.60	13.40	0.496	0.528
L1	2.45	2.95	0.096	0.116
L2	3.45	3.95	0.136	0.156
L3	8.15	8.65	0.321	0.341
$\phi$	3.50	3.90	0.138	0.154

## TO-251 PACKAGE OUTLINE DIMENSIONS



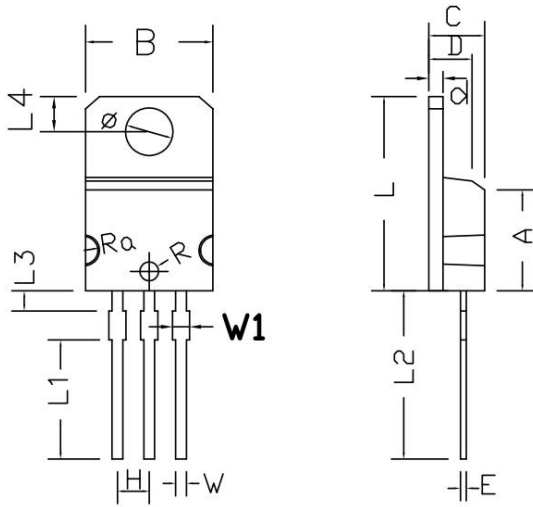
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	6.00	6.20	0.236	0.244
B	2.25	2.35	0.089	0.093
C	2.45	2.65	0.097	0.104
D	0.75	0.85	0.030	0.033
E	8.48	8.52	0.3341	0.3357
E1	5.10	5.46	0.201	0.215
e	2.29	2.31	0.0902	0.0910
L	15.00	15.40	0.5910	0.6068
L1	1.00	1.10	0.0394	0.0433
W	0.55	0.65	0.0217	0.0256
W1	0.85	0.95	0.0335	0.0374
W2	0.65	0.75	0.0256	0.0296

## TO-252 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	6.00	6.20	0.236	0.244
B	6.49	6.69	0.256	0.263
C	2.20	2.40	0.087	0.094
D	0.75	0.85	0.030	0.033
E	0.65	0.75	0.0256	0.0296
E1	0.70	0.90	0.028	0.035
e	4.58	4.62	0.1805	0.1820
L	2.85	2.95	0.112	0.116
L1	1.00	1.10	0.0394	0.0433
L2	0.70	0.90	0.0276	0.0355
W	0.48	0.52	0.019	0.020
$\theta$	0	8	0	8

**TO-220M PACKAGE OUTLINE DIMENSIONS**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
	MIN	MAX	MIN	MAX
A	7.55	8.05	0.297	0.317
B	9.85	10.25	0.388	0.404
C	4.20	4.80	0.165	0.189
D	3.20	3.60	0.126	0.142
E	0.42	0.47	0.017	0.019
L	15.20	15.60	0.598	0.614
H	2.52	2.56	0.099	0.101
W	0.78	0.88	0.031	0.035
Φ	3.60	3.90	0.142	0.154
R	0.72	0.78	0.028	0.031
Ra	9.00	10.5	0.354	0.413
d	1.10	1.40	0.043	0.055
L1	9.3	9.7	0.366	0.382
L2	13.00	13.60	0.512	0.535
L3	1.20	1.70	0.047	0.067
L4	2.60	3.0	0.102	0.118
W1	1.10	1.50	0.043	0.059

**8 Attentions**

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- Product promotion is endless, our company will be dedicated to provide customers with better products.

**9 Appendix**

Revision history:

Date	REV.	Description	Page
2018.09.20	1.0	Original	
2022.01.01	1.1	Modify company name	All