

## 40A 100V 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.

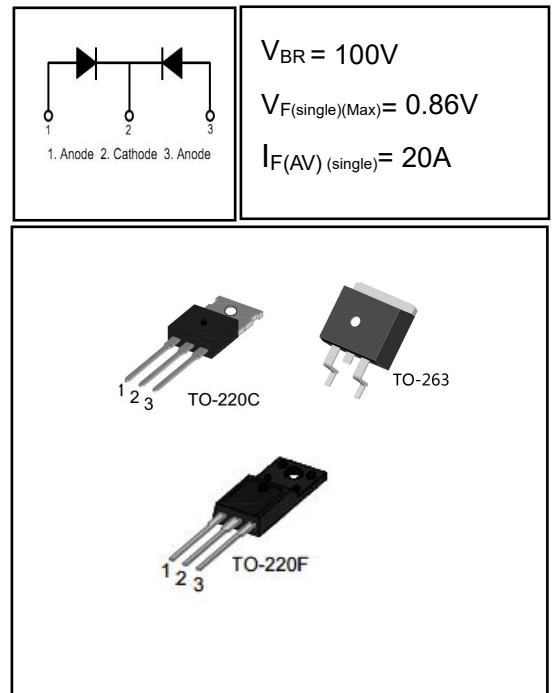
TO-220F provides insulation voltage rated at 2000V RMS from all three terminals to external heatsink.

### 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		$V_{RRM}$	100	V
Maximum RMS Voltage		$V_{RMS}$	80	V
DC Blocking Voltage		$V_R$	100	V
Average Rectified Forward Current(single)	TO-220F Tc=90°C	$I_{F(AV)}$	20	A
Average Rectified Forward Current(double)	TO-220C/252/251 Tc=120°C		40	A
Repetitive Peak Surge Current(single)		$I_{FRM}$	30	A
Nonrepetitive Peak Surge Current(single)	tp=8.3ms	$I_{FSM}$	250	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	
Thermal Resistance, Junction to Case-sink	$R_{thJC}$	1.5	2.5	°C/W

**4.3 Electrical Characteristics** (Tc=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> = 5A	-	0.62	-	V
		I <sub>F</sub> = 10A	-	0.73	-	V
		I <sub>F</sub> = 20A	-	0.82	0.86	V
		I <sub>F</sub> = 20A, T <sub>C</sub> = 125°C	-	0.70	-	V
		I <sub>F</sub> = 30A	-	0.88	1.10	V
Maximum Instantaneous Reverse (Note 2)	I <sub>R</sub>	V <sub>R</sub> = 100V	-	3.5	100	uA
		V <sub>R</sub> = 100V, T <sub>C</sub> = 125°C	-	-	10	mA
Total capacitance	C <sub>tot</sub>	V <sub>R</sub> =4V f=1MHz	-	315	-	pF
DC Blocking Voltage	V <sub>BR</sub>	I <sub>R</sub> =100uA	105	130	-	V

**DEFINITIONS**

V<sub>F</sub> = Instantaneous forward voltage (pw = 300μs, D = 2%).

I<sub>R</sub> = Instantaneous reverse current.

RθJC = Thermal resistance junction to case.

pw = pulse width.

D = duty cycle.

**5 Typical characteristics diagrams**

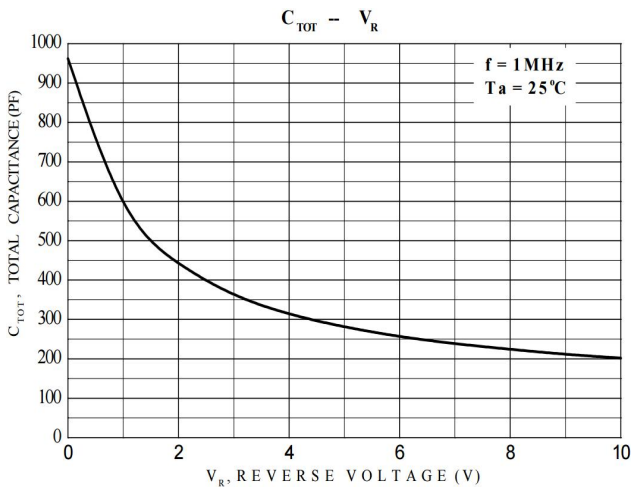


FIGURE 1. Total capacitance vs Voltage

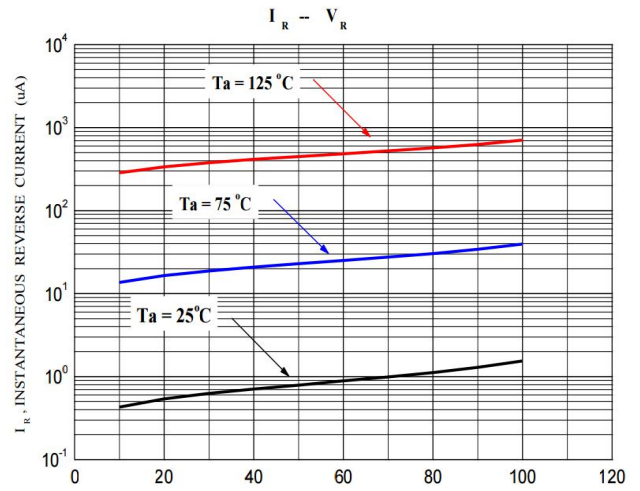


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

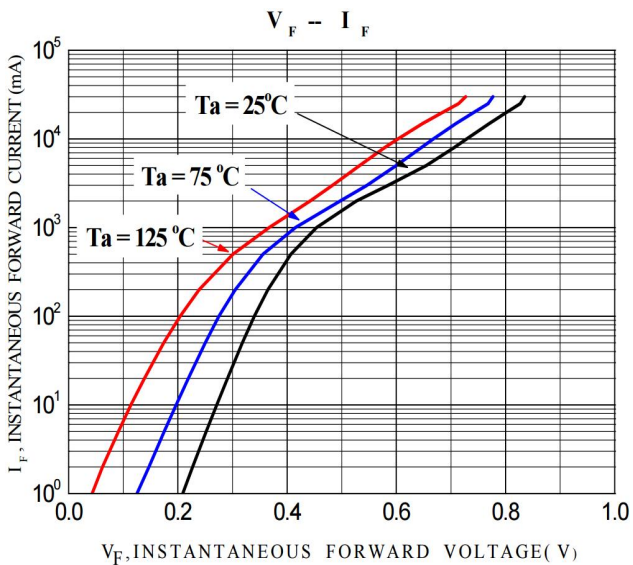


FIGURE 3. FORWARD CURRENT vs FORWARD VOLTAGE

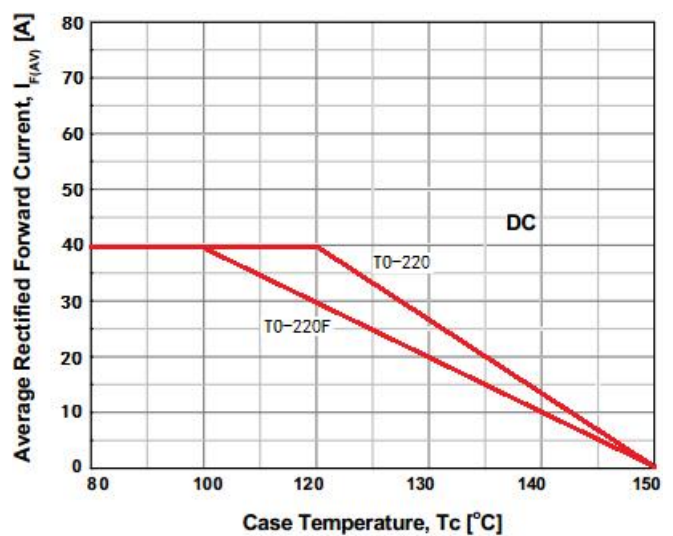


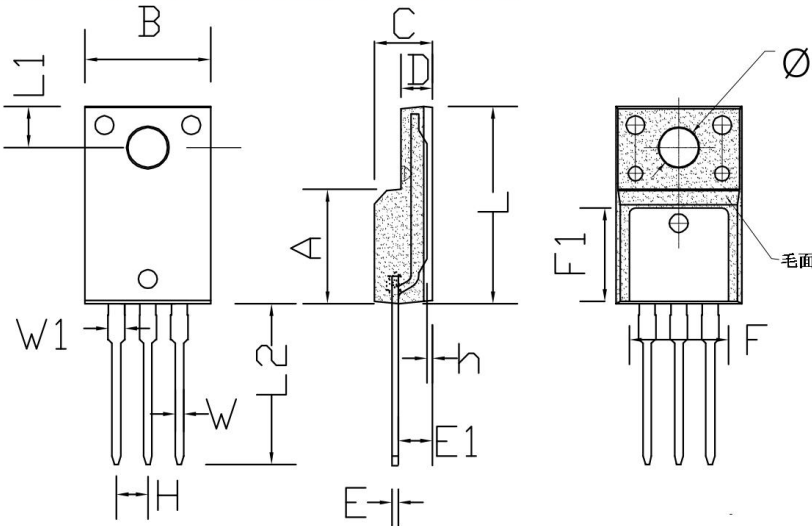
FIGURE 4. CURRENT DERATING CURVE

## 6 Product Specifications and Packaging Models

Product Model	Package Type	Mark Name	RoHS	Package	Quantity
MBRF40100CT	TO-220F	MBRF40100CT	Pb-free	Tube	1000/box
MBR40100CT	TO-220	MBR40100CT	Pb-free	Tube	1000/box

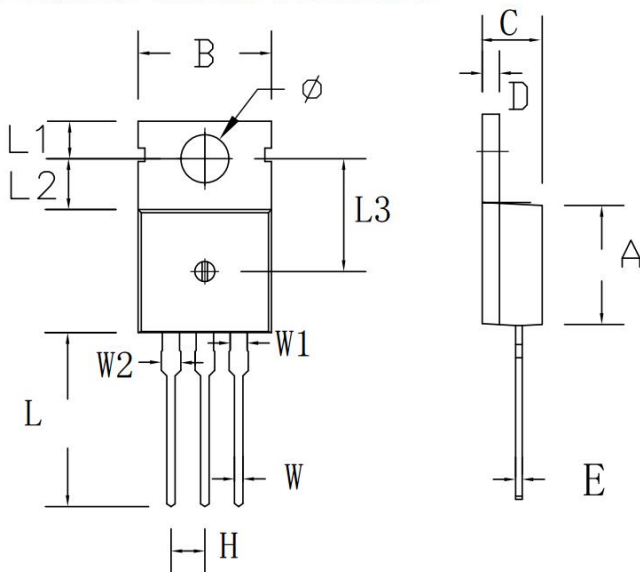
## 7 Dimensions

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

## 8 Attentions

- Jiangsu Donghai Semiconductor Co.,Ltd., Ltd. reserves the right to change the specification without prior notice! The customer should obtain the latest version of the information before making the order and verify that the information is complete and up to date.
- It is the responsibility of the purchaser for any failure or failure of any semiconductor product under certain conditions. It is the responsibility of the purchaser to comply with safety standards and to take safety measures in the system design and machine manufacturing of Jiangsu Donghai Semiconductor Co.,Ltd. products in order to avoid potential risk of failure. Injury or property damage.
- Product promotion is endless, our company will be dedicated to provide customers with better products.

## 9 Appendix

Revision history:

Date	REV.	Description	Page
2023.3.5	1.0	Original	