

MBR20L300CT, MBR20L300FCT
SCHOTTKY BARRIER RECTIFIERS



VOLTAGE: 300 Volts

CURRENT: 20.0 Amperes

FEATURES

- Low forward voltage drop for high efficiency
- Low power loss for high reliability
- High forward surge capability for high reliability
- High frequency operation
- Solder bath temperature 260°C maximum, 10s, per JESD22-B106
- Component in accordance to RoHS 2011/65/EU

MECHANICAL DATA

- **Terminals:** Plated Leads Solderable per MIL-STD-202, Method 208
- **Mounting Position:** Any
- **Lead Free:** Lead Free Finish, RoHS Compliant
- **Polarity:** As marked

TYPICAL APPLICATIONS

- For use in high frequency inverters, Switch power supply
AC/DC converters, LED driver etc. applications

Marking and Polarity

**TO-220C
MBR20L300CT**



**TO-220F
MBR20L300FCT**



Remark:

- ①. NH=niuhan trademark;
- ②. FF=Product line code, According to actual changes
YWW=Data code, According to actual changes
EDDQK=Internal code, According to actual changes
- ③. MBR20L300CT/FCT=Module.

Maximum Ratings (Ratings at 25°C ambient temperature unless otherwise specified)

Parameter	Symbol	MBR20L300CT, MBR20L300FCT	Unit
Maximum repetitive peak reverse voltage	V_{RRM}	300	V
Maximum average forward rectified current (see fig.1)	$I_{F(AV)}$	20	A
Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC method at rated TL)	I_{FSM}	150	A
Peak repetitive reverse current per diode at $t_p=2\mu s$ 1KHz	I_{RRM}	10	μA
Isolation voltage (TO-220F only) from terminals to heatsink $t=1$ min	V_{AC}	1500	V
Maximum Mounting torque, M3 screw	T_{MM}	1.1	N.m

Electrical Characteristics (Ratings at 25°C ambient temperature unless otherwise specified)

Parameter	Test Conditions		Symbol	MBR20L300CT, MBR20L300FCT			Unit
				Min.	Typ.	Max.	
Instantaneous forward voltage per diode (note1)	$T_A=25^\circ C$	$I_F=10 A$	V_F	--	0.89	0.96	V
	$T_A=125^\circ C$			--	0.81	0.91	
Reverse current per diode (note1)	$T_A=25^\circ C$	$V_R=V_{RRM}$	I_R	--	1	10	μA
	$T_A=125^\circ C$	$V_R=80\% V_{RRM}$		--	0.5	5	mA
Typical junction capacitance	4V, 1MHz		C_J	--	750	--	pF

Thermal Characteristics (Ratings at 25°C ambient temperature unless otherwise specified)

Parameter	Symbol	MBR20L300CT, MBR20L300FCT		Unit
Operating junction	T_J	-55	to 175	$^\circ C$
Storage temperature range	T_{STD}	-55	to 175	
Typical thermal resistance (note2)	$R_{\theta JC}$	TO-220C	TO-220F	$^\circ C/W$
		2.5	4.5	

- No
1. Pulse test: 300 μs pulse width, 1% duty cycle
 2. Device mounted on 75mm x 45mm x 2.5mm Aluminum Plate Heatsink.

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RATING AND CHARACTERISTIC CURVES

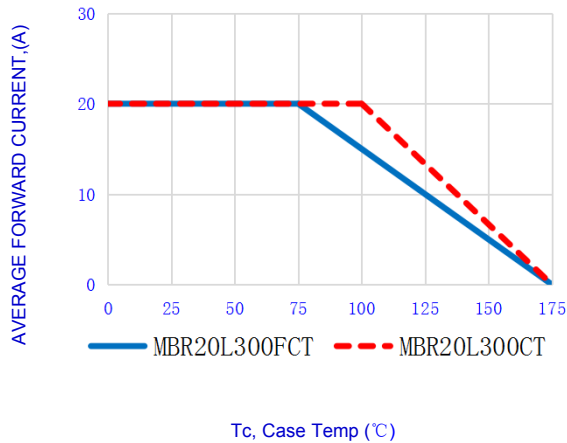


Fig.1-FORWARD CURRENT DERATING CURVE

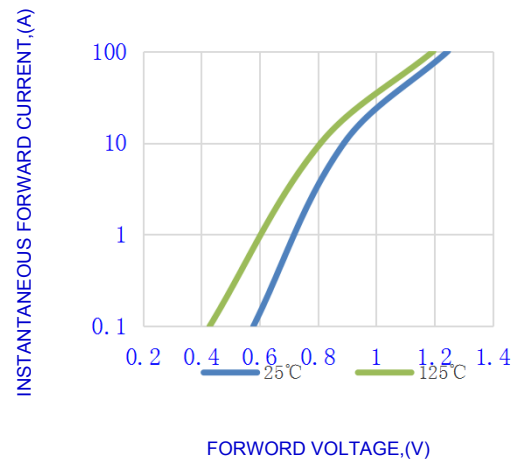


Fig.2- TYPICAL INSTANTANEOUS FORWARD

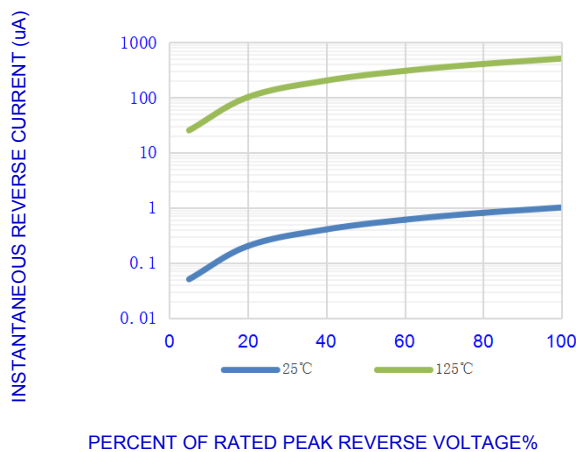


Fig.3- TYPICAL REVERSE CHARACTERISTICS

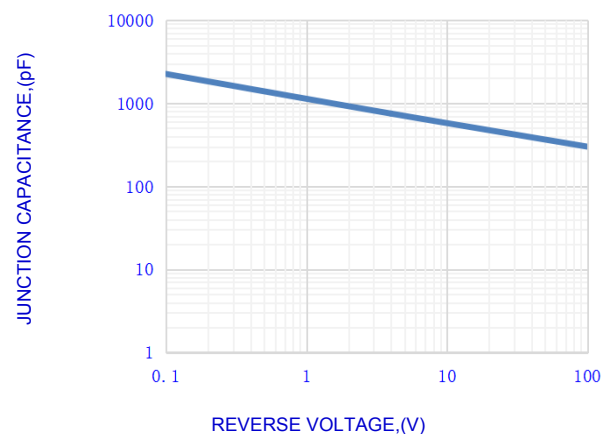


Fig.4- TYPICAL JUNCTION CAPACITANCE

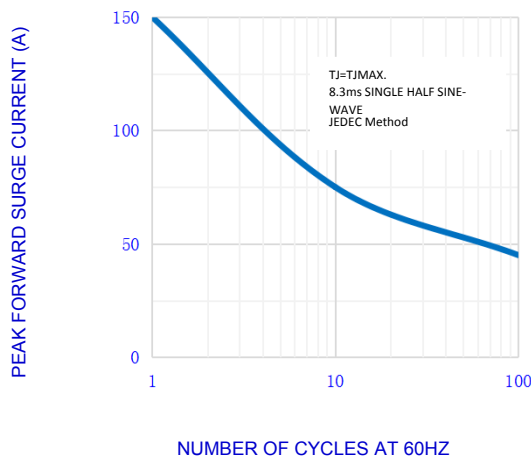


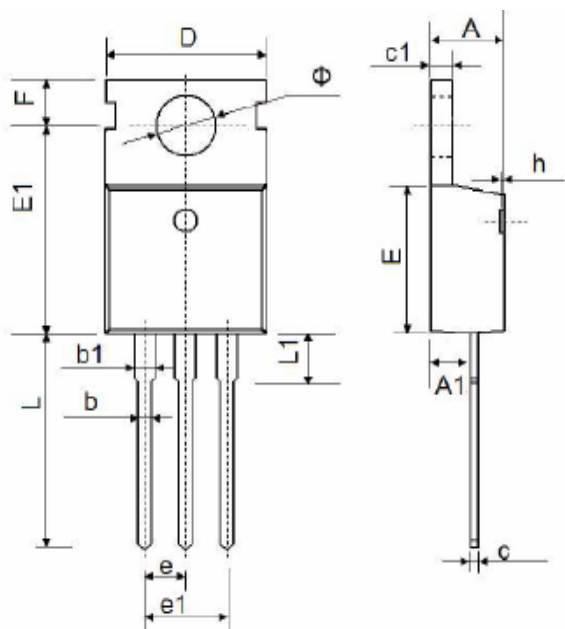
Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

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OUTLINE DRAWINGS

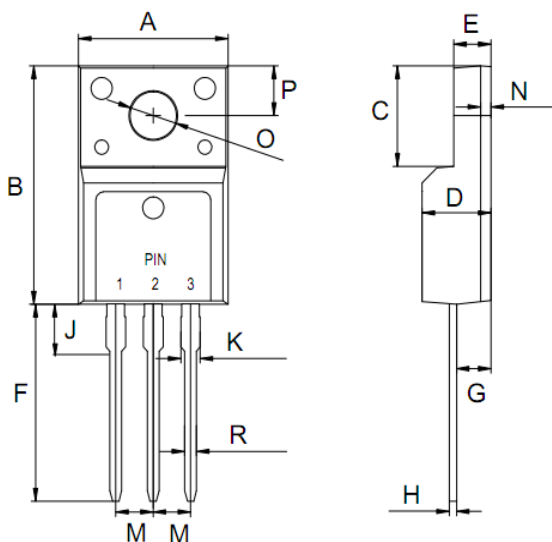
TO-220C



OUTLINE DIMENSIONS						
Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40	-	4.60	0.17	-	0.18
A1	2.00	-	2.50	0.08	-	0.10
b	0.70	-	0.90	0.03	-	0.04
b1	1.10	-	1.40	0.04	-	0.06
c	0.40	-	0.70	0.02	-	0.03
c1	1.20	-	1.40	0.05	-	0.06
D	9.80	-	10.40	0.39	-	0.41
E	8.90	-	9.80	0.35	-	0.39
E1	12.50	-	12.95	0.49	-	0.51
e	-	2.54	-	-	0.10	-
e1	4.90	-	5.20	0.19	-	0.20
F	2.65	-	3.00	0.10	-	0.12
h	0.00	-	0.30	0.00	-	0.01
L	12.90	-	13.40	0.51	-	0.53
L1	2.80	-	3.40	0.11	-	0.13
Φ	3.40	-	3.80	0.13	-	0.15

OUTLINE DRAWINGS

TO-220F



OUTLINE DIMENSIONS						
Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.91	10.21	10.41	0.3902	0.4020	0.4098
B	15.30	16.00	16.50	0.6024	0.6299	0.6496
C	6.20	6.75	7.20	0.2441	0.2657	0.2835
D	4.44	4.70	4.80	0.1748	0.1850	0.1890
E	2.45	2.57	3.55	0.0965	0.1012	0.1398
F	12.50	13.50	14.50	0.4921	0.5315	0.5709
G	2.25	2.40	2.60	0.0886	0.0945	0.1024
H	0.35	0.50	0.58	0.0138	0.0197	0.0228
J	2.60	2.88	4.00	0.1024	0.1134	0.1575
M	2.41	2.50	2.67	0.0949	0.0984	0.1051
N	4.88	5.00	5.28	0.1921	0.1969	0.2079
R	0.58	0.82	0.94	0.0228	0.0323	0.0370
O	3.25	3.55	3.75	0.1280	0.1398	0.1476
P	2.15	3.30	3.50	0.0846	0.1299	0.1378

PACKING INFORMATION

Package Code	Package Method	Tube Size L×W×H(mm)	Quantity (pcs/Tube)	Inner Box Size L×W×H(mm)	Quantity (pcs/Inner Box)	Outer Carton Size L×W×H(mm)	Quantity (pcs/carton)
TO-220C	Tube	530x35x8	50	560x155x55	1000	570×284×185	5000
TO-220F	Tube	530x35x8	50	560x155x55	1000	570×284×185	5000

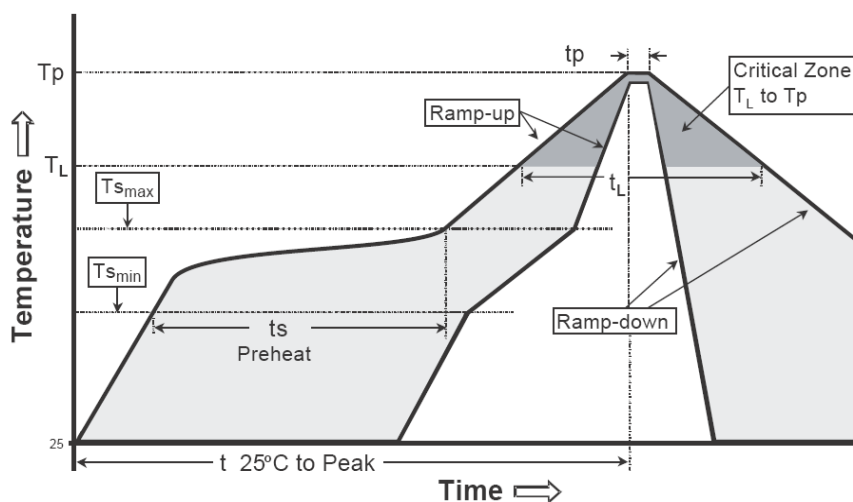
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Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to TP)	3°C/second max.	3°C/second max.
Preheat -Temperature Min(TS min) -Temperature Max(TS max) -Time(ts min to ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (TL) - Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.



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