20Amp. Schottky Barrier Rectifiers

MBR20100AFP

$I_{F(AV)}$	2 × 10A
V_{RRM}	100V
Tj	175°C
V_F(typ.)	0.67V

Features

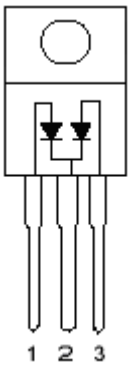
- Low V_F and low I_R type
- High junction temperature capability
- High current capability
- High surge capability
- Good tradeoff between leakage current and forward voltage drop
- Low power loss, high efficiency
- Insulating package, insulating voltage=2000V DC, capacitance=45pF
- Dual center tap Schottky rectifier designed for high frequency miniature switched mode power supplies such as adaptors and on board DC/DC converters
- RoHS compliant package

Mechanical Data

- Case: TO-220FP molded plastic
- Mounting Position: Any
- Weight: 2.2 grams, 0.078 ounce approximately
- Terminals: Pure tin plated, lead-free, solderable per MIL-STD-750 method 2026
- Epoxy: UL 94V-0 rate flame retardant
- Lead temperature for soldering purpose : 260℃ max. for 10 seconds

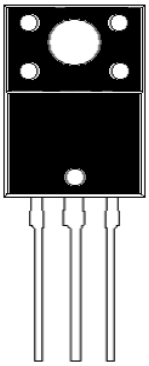
Equivalent Circuit

MBR20100AFP



Outline

TO-220FP



Maximum Ratings and Electrical Characteristics (Per Diode Leg)

(Rating at 25°C ambient temperature unless otherwise specified. Single phase, half wave, 60Hz, resistive or inductive load. For capacitive load, derate current by 20%.)

Parameter		Symbol	Value	Units
Maximum Recurrent peak reverse voltage		V_{RRM}	100	V
Maximum RMS voltage		V_{RMS}	70	V
Maximum DC blocking voltage		V_{DC}	100	V
Maximum instantaneous forward voltage at (Note 1)	I_F=10A, T_C=25℃	V_F	0.85	V
	I_F=10A, T_C=125℃		0.75	
	I_F=20 A, T_C=25℃		0.95	
	I_F=20A, T_C=125℃		0.85	
Maximum Average forward rectified current @ T_C=145℃	Per Diode	$I_{F(AV)}$	10	A
	Per Device		20	
Peak repetitive forward current (Rated V_R, square wave, 20kHz) @T_C=135℃		I_{FRM}	20	A
Peak forward surge current @8.3ms single half sine wave superimposed on rated load (JEDEC method)		I_{FSM}	150	A
Peak repetitive reverse surge current (Note 1), T_J<175℃		I_{RRM}	3.0	A
Maximum instantaneous reverse current at	V_R=100 V, T_C=25℃	I_R	5.0	μA
	V_R=100 V, T_C=125℃		1.0	mA
Voltage rate of change, (rated V_R)		dV/dt	10,000	V/μs
Typical junction capacitance @ f=1MHz and applied 4V reverse voltage		C_J	260 (typ.)	pF
ESD susceptibility (Note 2)			8000	V
Storage temperature range		Tstg	-65~ +175	℃
Operating junction temperature range		T_J	-65~ +175	℃

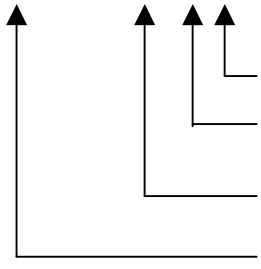
Notes : 1. 2.0μs pulse width, f=1.0kHz
2. Human body model, 1.5kΩ in series with 100pF

Thermal Data

Parameter	Symbol	Value	Unit
Maximum Thermal Resistance, Junction-to-case, per diode	$R_{th,j\text{-}c}$	3.5	°C/W
Lead Temperature for Soldering Purposes : 1/8" from Case for 5seconds	T_L	260	°C

Ordering Information

Device	Package	Shipping
MBR20100AFP-0-UB-S	TO-220FP (RoHS compliant package)	50 pcs / tube, 20 tubes/box, 10 boxes/carton



Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products

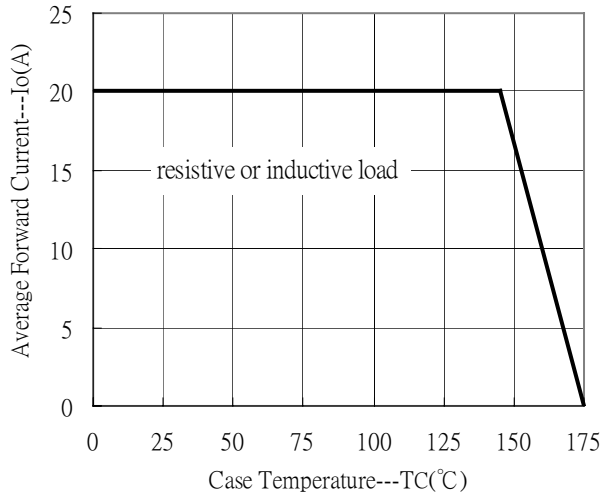
Packing spec, UB : 50 pcs / tube, 20 tubes/box

Product rank, zero for no rank products

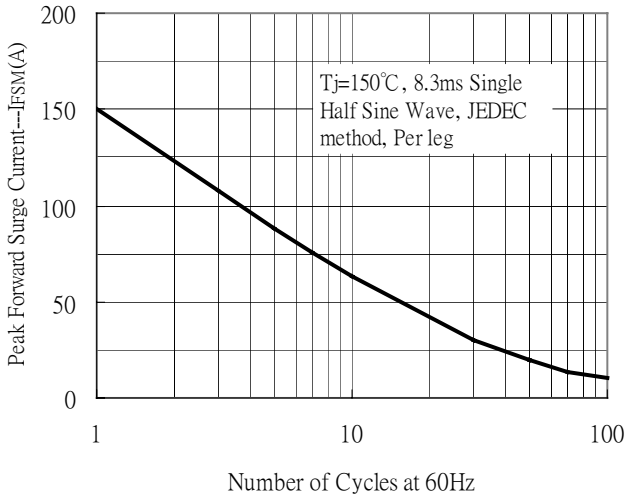
Product name

Typical Characteristics

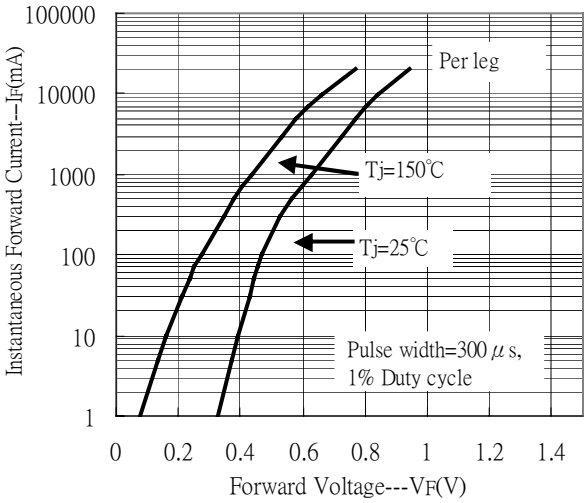
Forward Current Derating Curve



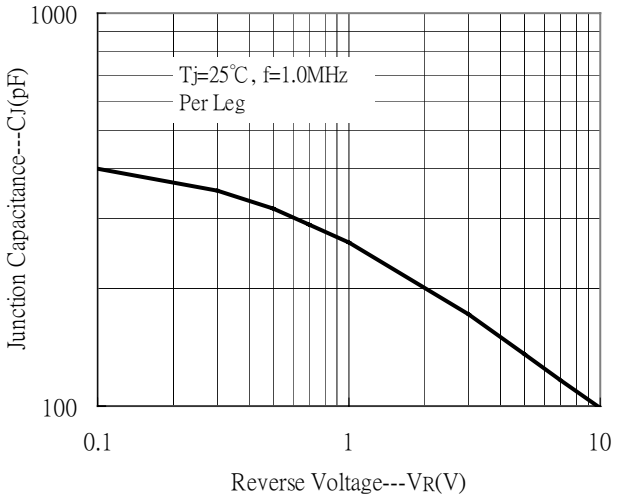
Maximum Non-Repetitive Forward Surge Current



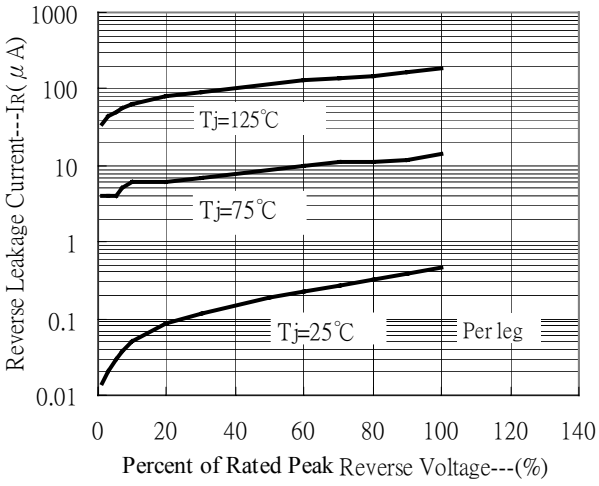
Forward Current vs Forward Voltage



Junction Capacitance vs Reverse Voltage



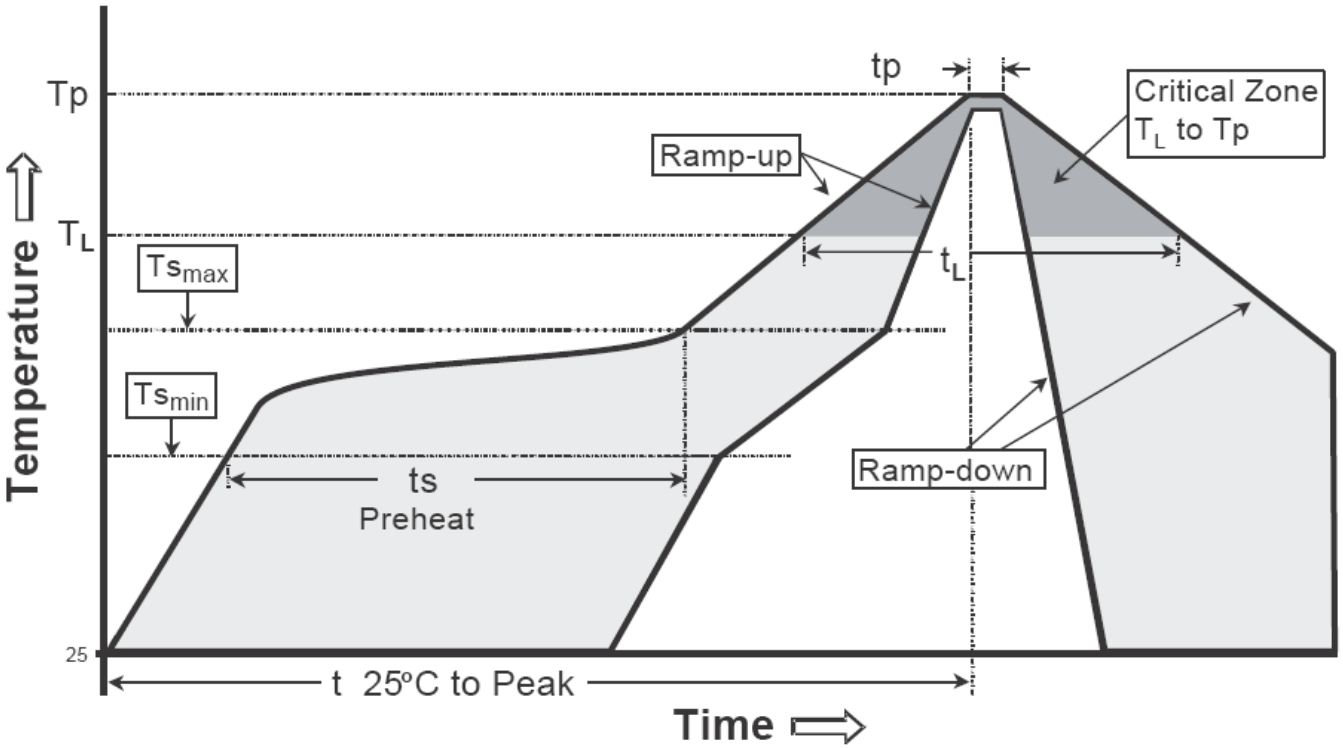
Reverse Leakage Current vs Reverse Voltage



Recommended wave soldering condition

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

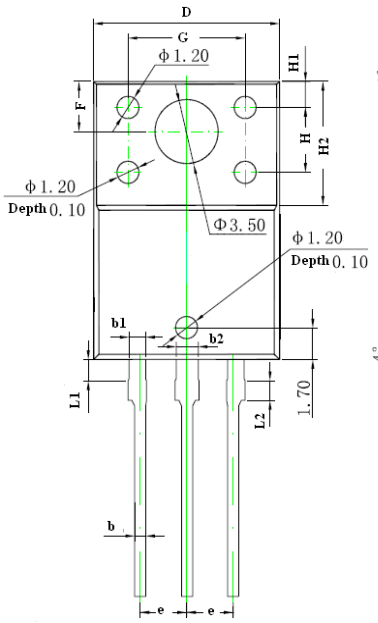
Recommended temperature profile for IR reflow

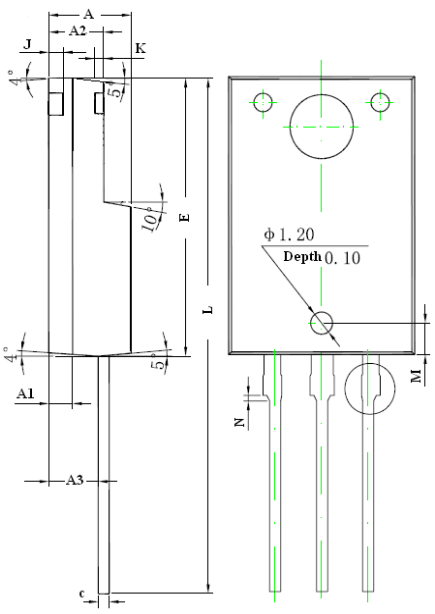


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak Temperature(T_P)	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.

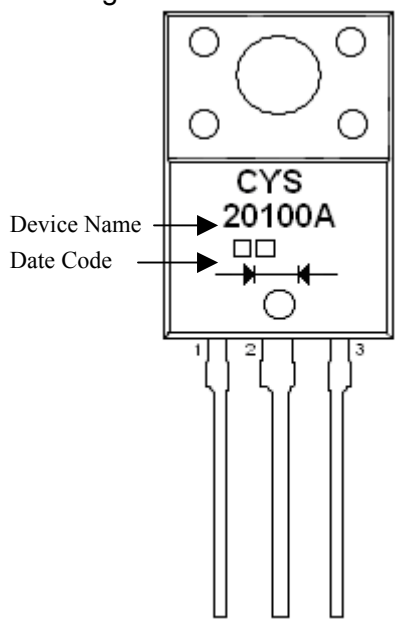
Note : All temperatures refer to topside of the package, measured on the package body surface.

TO-220FP Dimension





Marking:



3-Lead TO-220FP Plastic Package
CYStek Package Code: FP

Style: Pin 1.Anode 2.Cathode 3.Anode

*Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.171	0.183	4.35	4.65	G	0.246	0.258	6.25	6.55
A1	0.051 REF		1.300 REF		H	0.138 REF		3.50 REF	
A2	0.112	0.124	2.85	3.15	H1	0.055 REF		1.40 REF	
A3	0.102	0.110	2.60	2.80	H2	0.256	0.272	6.50	6.90
b	0.020	0.030	0.50	0.75	J	0.031 REF		0.80 REF	
b1	0.031	0.041	0.80	1.05	K	0.020		0.50 REF	
b2	0.047 REF		1.20 REF		L	1.102	1.118	28.00	28.40
c	0.020	0.030	0.500	0.750	L1	0.043	0.051	1.10	1.30
D	0.396	0.404	10.06	10.26	L2	0.036	0.043	0.92	1.08
E	0.583	0.598	14.80	15.20	M	0.067 REF		1.70 REF	
e	0.100 *		2.54*		N	0.012 REF		0.30 REF	
F	0.106 REF		2.70 REF						

Notes: 1.Controlling dimension: millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.