

20Amp. Schottky Barrier Rectifiers

MBR20100AFP

$I_{F(AV)}$	$2 \times 10A$
V_{RRM}	100V
T_j	175°C
$V_F(\text{typ.})$	0.67V

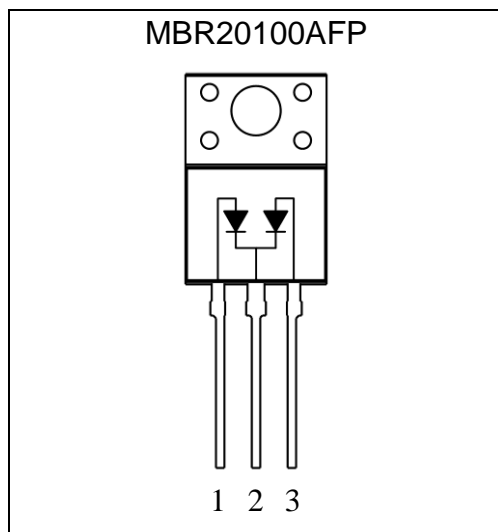
Features

- 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

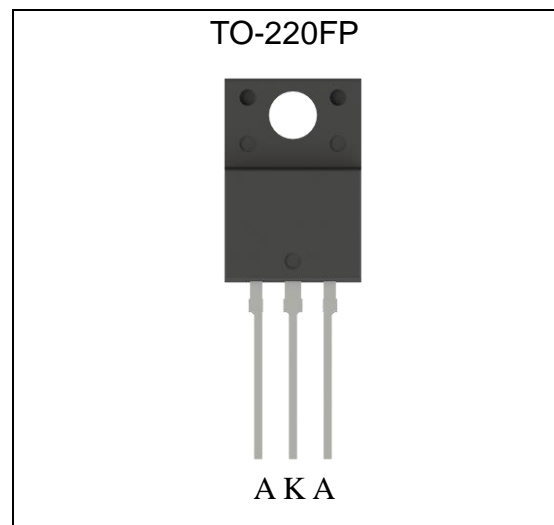
Mechanical Data

- 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°C max. for 10 seconds

Equivalent Circuit



Outline





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)	V _F	I _F =10A, T _C =25°C	0.85
		I _F =10A, T _C =125°C	0.75
		I _F =20 A, T _C =25°C	0.95
		I _F =20A, T _C =125°C	0.85
Maximum Average forward rectified current @ T _C =145°C	Per Diode	10	A
	Per Device	20	
Peak repetitive forward current (Rated V _R , square wave, 20kHz) @ T _C =135°C	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°C	I _{RRM}	3.0	A
Maximum instantaneous reverse current at	I _R	V _R =100 V, T _C =25°C	5.0
		V _R =100 V, T _C =125°C	1.0
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	T _{stg}	-65~ +175	°C
Operating junction temperature range	T _J	-65~ +175	°C

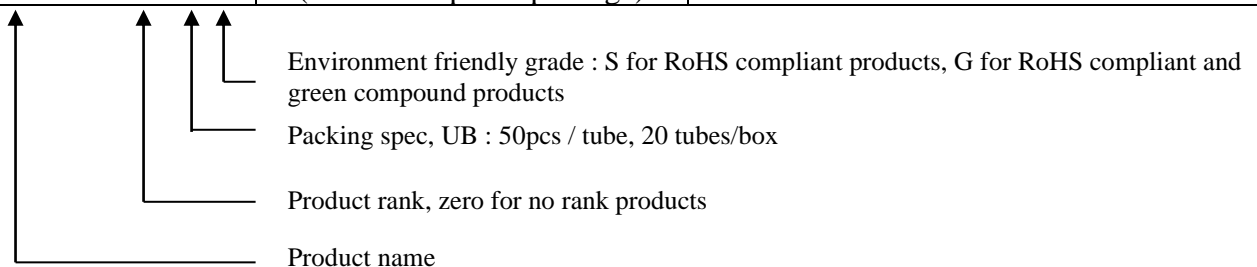
Notes : 1. 2.0μs pulse width, f=1.0kHz
 2. Human body model, 1.5kΩ in series with 100pF

Thermal Data

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

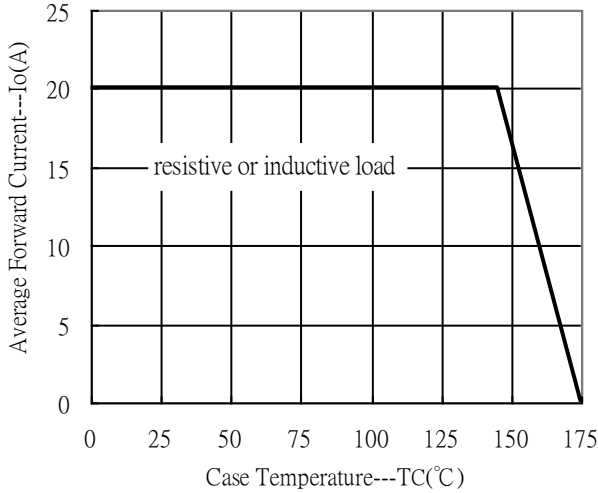
Ordering Information

Device	Package	Shipping
MBR20100AFP-0-UB-S	TO-220FP (RoHS compliant package)	50pcs / tube, 20 tubes/box, 5 boxes/carton

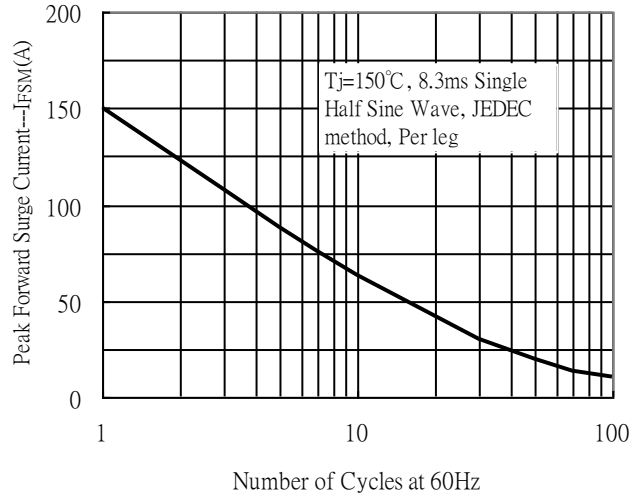


Typical Characteristics

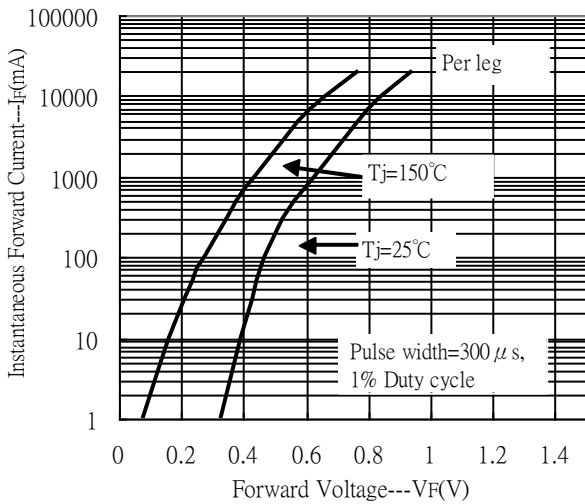
Forward Current Derating Curve



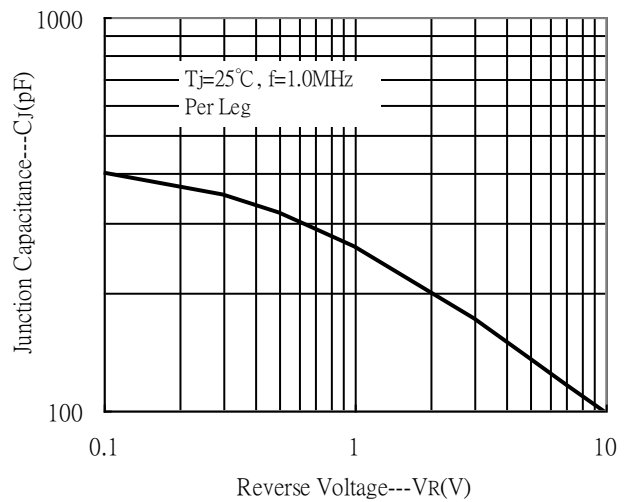
Maximum Non-Repetitive Forward Surge Current



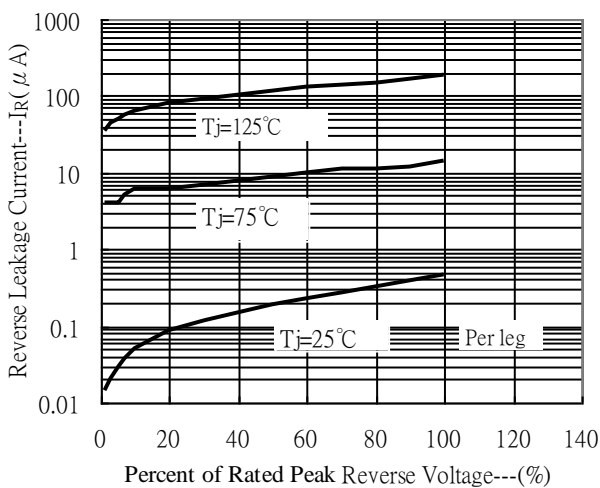
Forward Current vs Forward Voltage



Junction Capacitance vs Reverse Voltage



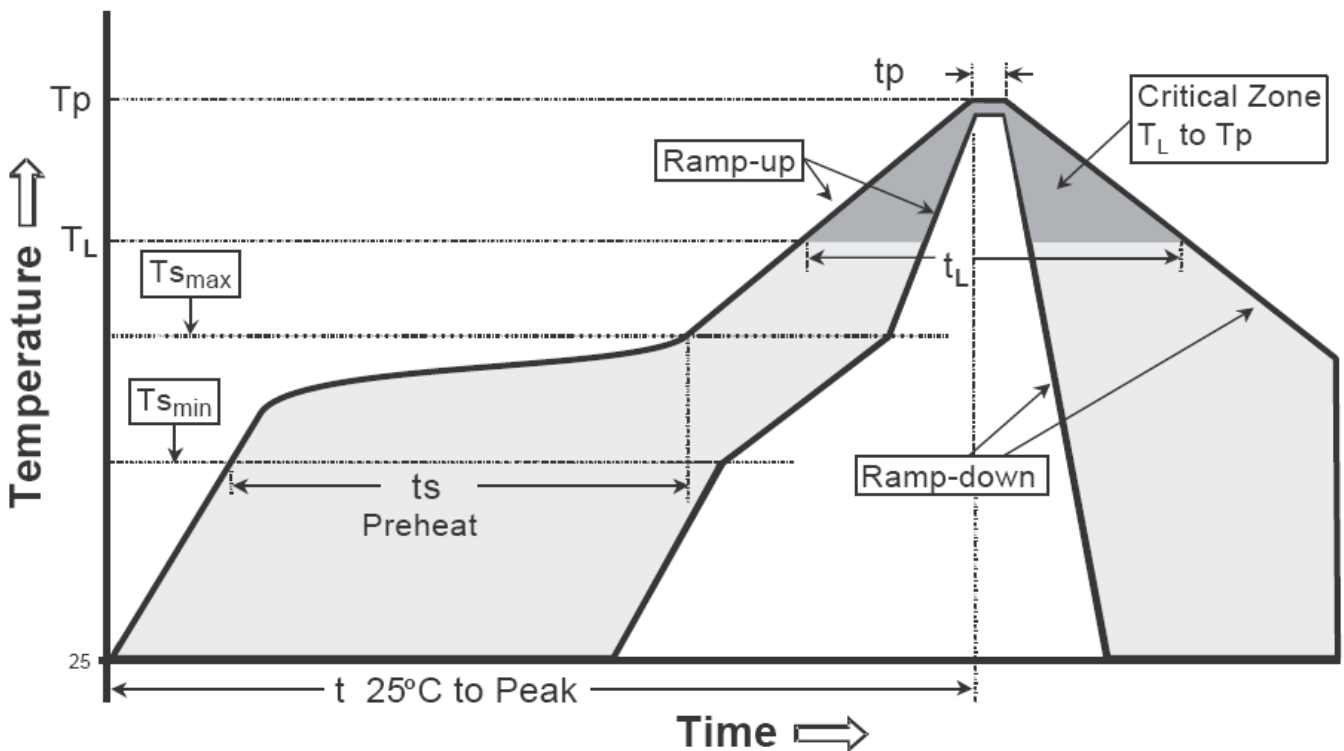
Reverse Leakage Current vs Reverse Voltage



Recommended wave soldering condition

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

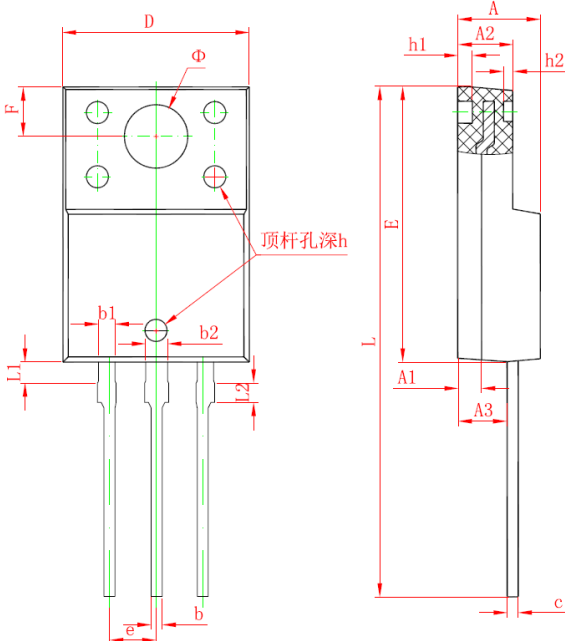
Recommended temperature profile for IR reflow



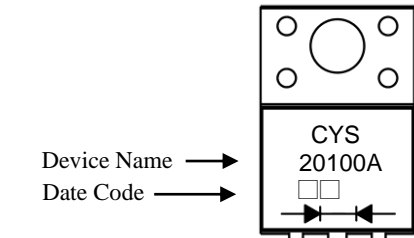
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T _{s min})	100°C	150°C
-Temperature Max(T _{s max})	150°C	200°C
-Time(t _{s min} to t _{s max})	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T _L)	183°C	217°C
- Time (t _L)	60-150 seconds	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.

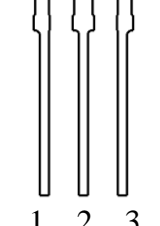
TO-220FP Dimension



Marking:



Device Name →
Date Code →



1 2 3

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

Date Code: Year+Month
 Year: 3→2003, 4→2004
 Month: 1→1, 2→2, . . .
 9→9, A→10, B→11, C→12

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

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.169	0.185	4.35	4.65	e	0.100 TYP		2.54 TYP	
A1	0.051 REF		1.300 REF		F	0.106 REF		2.70 REF	
A2	0.112	0.124	2.85	3.15	Φ	0.138 REF		3.50 REF	
A3	0.102	0.110	2.60	2.80	h	0.000	0.012	0.00	0.30
b	0.020	0.030	0.50	0.75	h1	0.031 REF		0.80 REF	
b1	0.031	0.041	0.80	1.05	h2	0.020 REF		0.50 REF	
b2	0.043	0.053	1.10	1.35	L	1.102	1.118	28.00	28.40
c	0.020	0.030	0.50	0.75	L1	0.043	0.051	1.10	1.30
D	0.392	0.408	9.96	10.36	L2	0.036	0.043	0.92	1.08
E	0.583	0.598	14.80	15.20					

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.

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