



20Amp. Schottky Barrier Rectifiers MBR20200FP

$I_{F(AV)}$	$2 \times 10A$
V_{RRM}	200V
T_j	175°C
V_F (typ.)	0.68V

Features

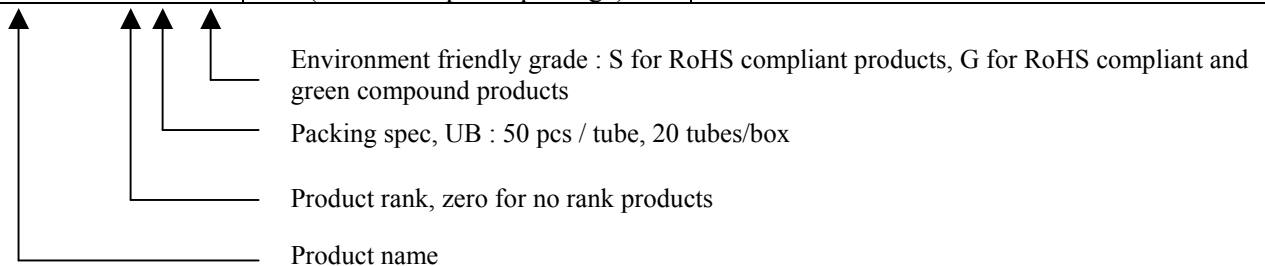
- 175°C operating junction temperature
- Low V_F and low I_r type
- Metal silicon junction, major carrier conduction
- 20A total (10A per diode leg)
- Guardring for over voltage protection
- Low power loss, high efficiency
- High surge capability
- Insulating package, insulating voltage=2000V DC, capacitance=45pF
- High temperature soldering guaranteed : 260°C/10s, 0.25”(6.35mm) from case
- For use in low voltage, high frequency inverters, free wheeling, and polarity protection application
- RoHS compliant package

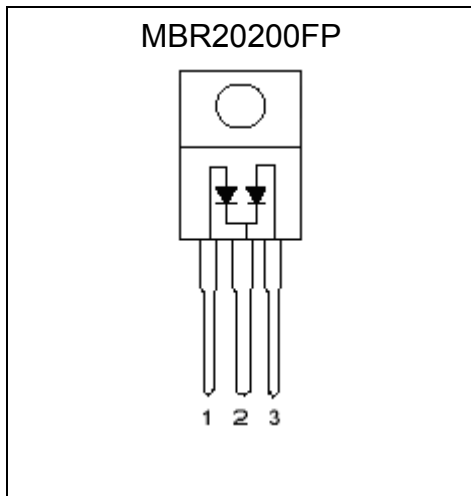
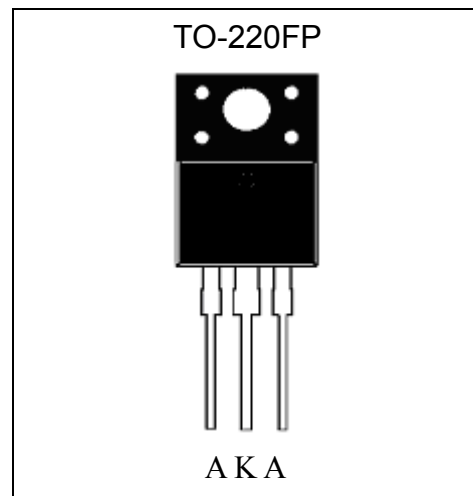
Mechanical Data

- Case: JEDEC 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
- Mounting Torque : 5 in-lbs max

Ordering Information

Device	Package	Shipping
MBR20200FP-0-UB-X	TO-220FP (RoHS compliant package)	50 pcs/tube, 20 tubes/box, 4 boxes / carton



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}	200	V
Maximum RMS voltage	V_{RMS}	140	V
Maximum DC blocking voltage	V_{DC}	200	V
Maximum instantaneous forward voltage at (Note 1)	V_F	$I_F=10A, T_C=25^\circ C$	0.90
		$I_F=10A, T_C=125^\circ C$	0.80
		$I_F=20A, T_C=25^\circ C$	1.00
		$I_F=20A, T_C=125^\circ C$	0.90
Maximum Average forward rectified current @ $T_C=125^\circ C$	Per Diode	10	A
	Per Device	20	
Peak repetitive forward current (square wave, 20kHz, $T_C=90^\circ C$)	I_{FRM}	20	A
Non-repetitive 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), $T_J<175^\circ C$	I_{RRM}	2.5	A
Maximum instantaneous reverse current at	I_R	$V_R=200V, T_C=25^\circ C$	10 μA
		$V_R=200V, T_C=125^\circ C$	5 mA
Voltage rate of change, (rated V_R)	dV/dt	10,000	V/ μs
Typical junction capacitance @ $f=1MHz$ and applied 5V reverse voltage	C_J	130 (typ)	pF
ESD susceptibility (Note 2)		8000	V
Storage temperature range	T_{stg}	-65 ~ +175	$^\circ C$
Operating junction temperature range	T_J	-65 ~ +175	$^\circ C$

Notes : 1. 2.0 μs pulse width, $f=1.0kHz$

2. Human body model, 1.5k Ω in series with 100pF



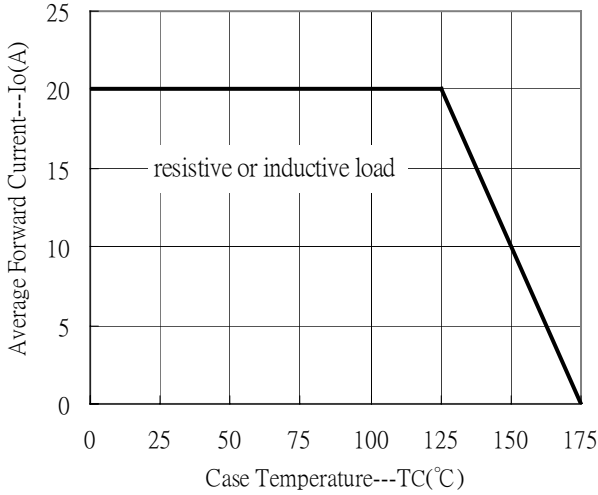
Thermal Data

Parameter	Symbol	Value	Unit
Maximum Thermal Resistance, Junction-to-case	$R_{th,j-c}$	3.5	$^{\circ}C/W$
Maximum Thermal Resistance, Junction-to-ambient	$R_{th,j-a}$	60	$^{\circ}C/W$

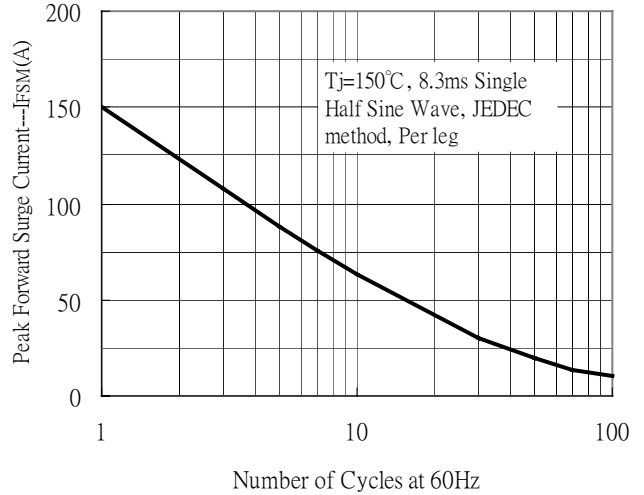


Typical Characteristics

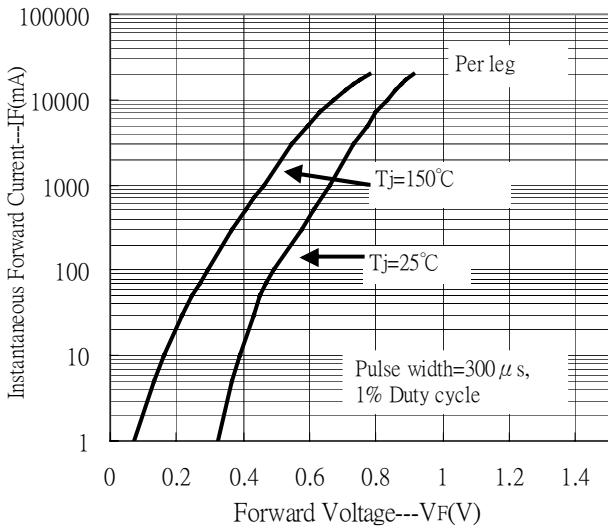
Forward Current Derating Curve



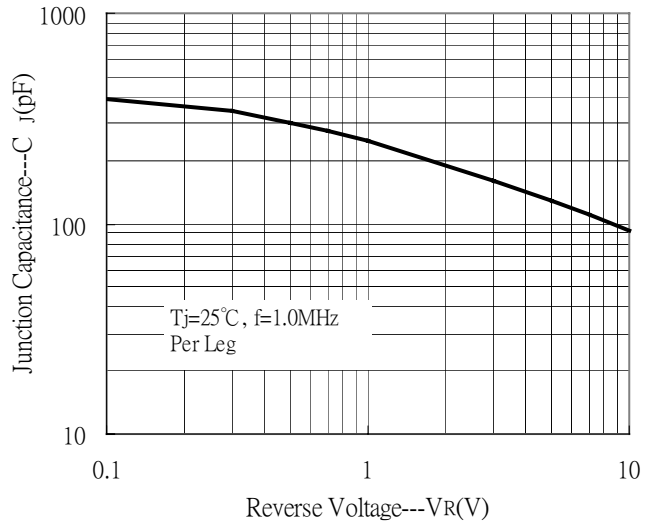
Maximum Non-Repetitive Forward Surge Current



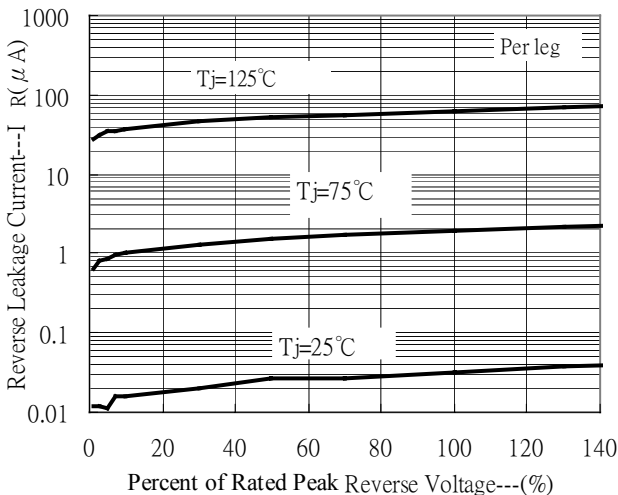
Forward Current vs Forward Voltage



Junction Capacitance vs Reverse Voltage

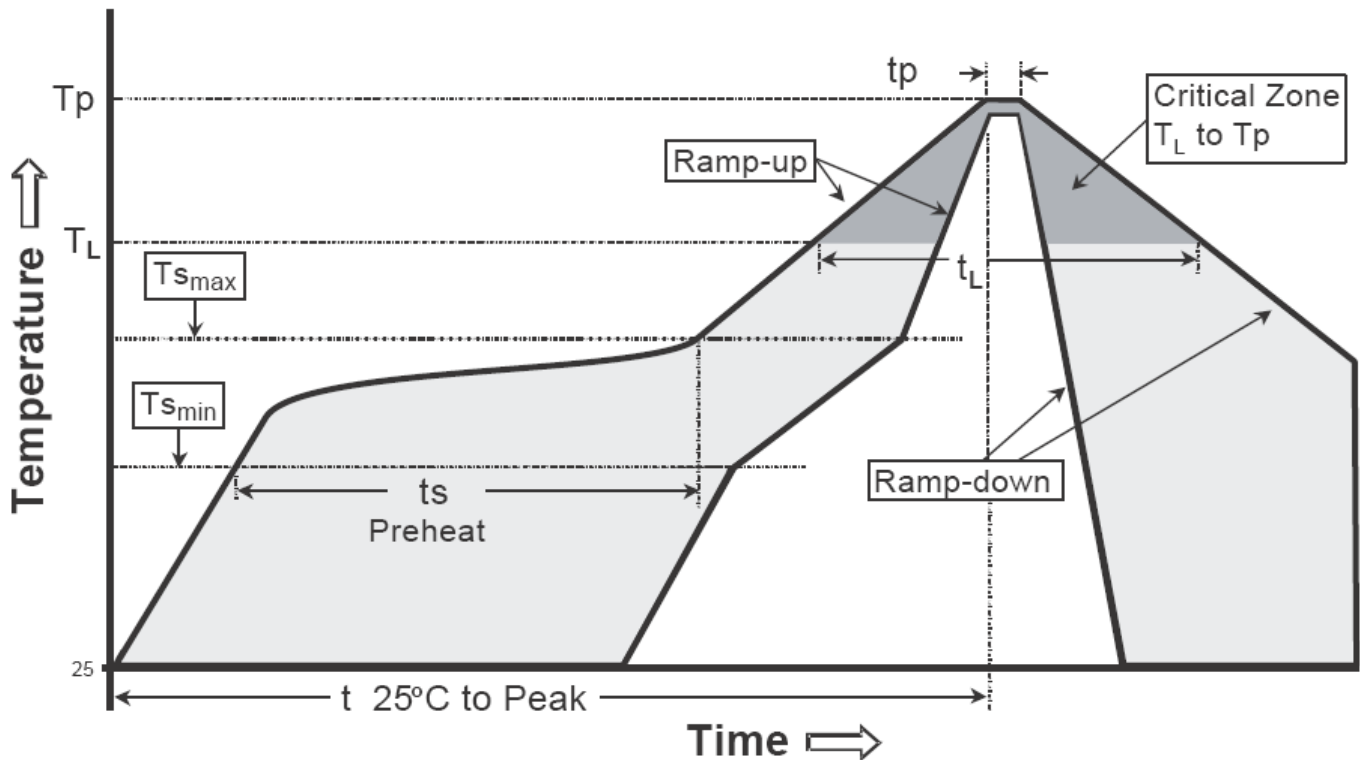


Reverse Leakage Current vs Reverse Voltage



Recommended wave soldering condition

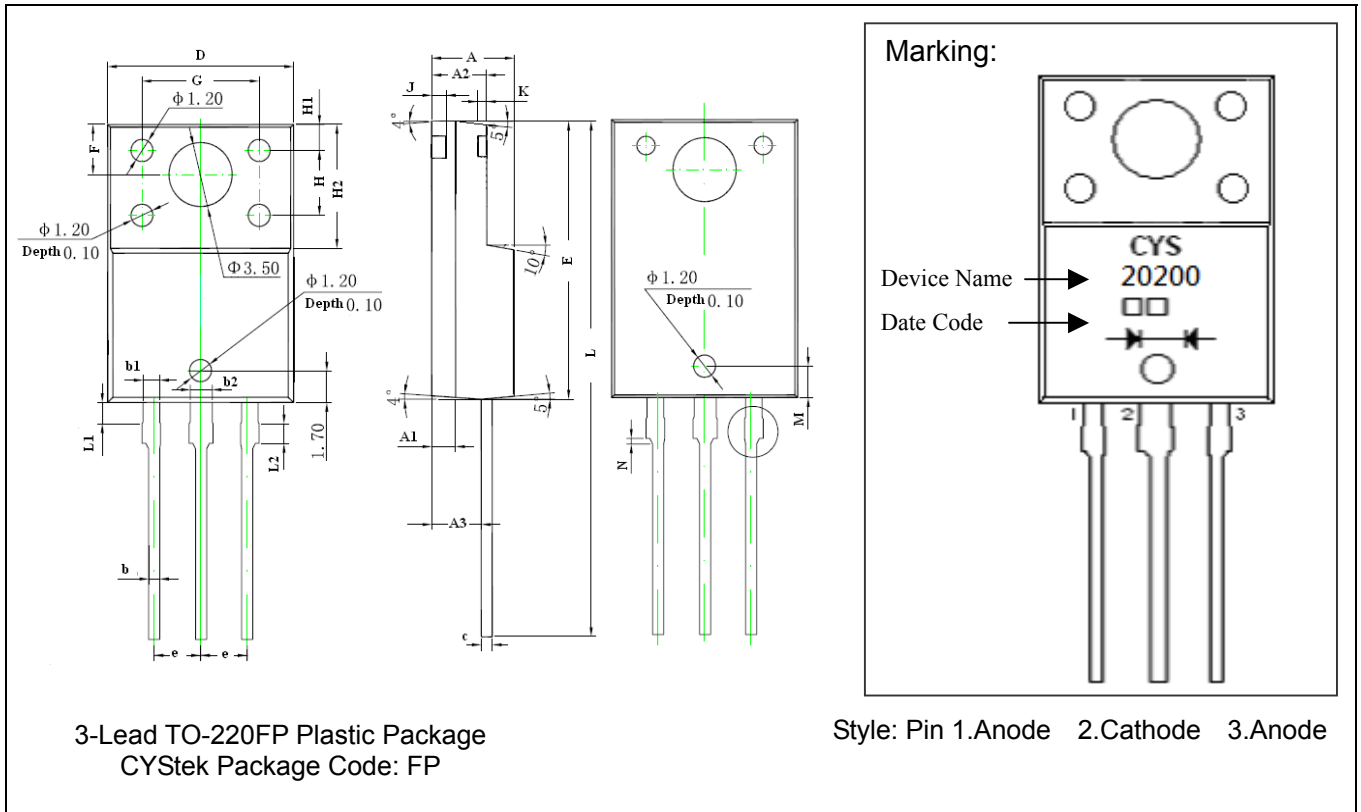
Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

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(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (Tl)	183°C	217°C
- Time (tl)	60-150 seconds	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.

TO-220FP Dimension



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

Marking:

Device Name → **CYS 20200**
 Date Code → **□□**

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:**
- Controlling dimension: millimeters.
 - Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 - 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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