

## 20Amp. Schottky Barrier Rectifiers

# MBR20150FP

$I_{F(AV)}$	$2 \times 10A$
$V_{RRM}$	150V
$T_j$	175°C
$V_F(\text{typ.})$	0.68V

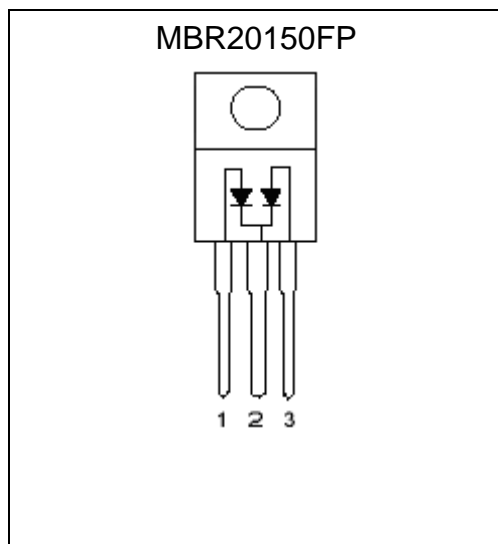
### Features

- 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

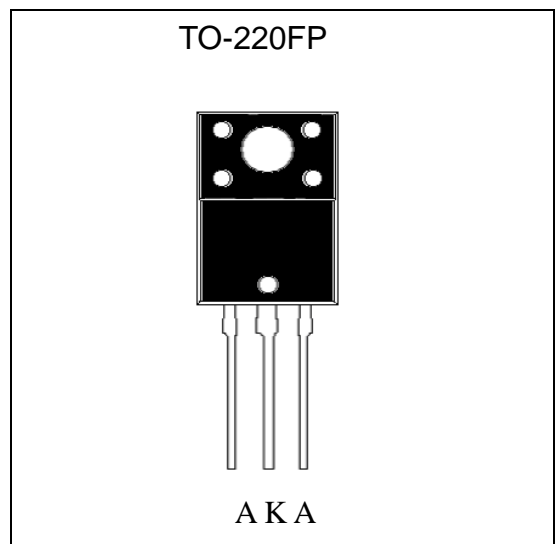
### Mechanical Data

- 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 <sub>RRM</sub>	150	V
Maximum RMS voltage	V <sub>RMS</sub>	100	V
Maximum DC blocking voltage	V <sub>DC</sub>	150	V
Maximum instantaneous forward voltage at (Note 1)	V <sub>F</sub>	I <sub>F</sub> =10A, T <sub>C</sub> =25°C	0.85
		I <sub>F</sub> =10A, T <sub>C</sub> =125°C	0.72
		I <sub>F</sub> =20 A, T <sub>C</sub> =25°C	0.95
		I <sub>F</sub> =20A, T <sub>C</sub> =125°C	0.85
Maximum Average forward rectified current @ T <sub>C</sub> =134°C	I <sub>F(AV)</sub>	Per Diode	10
		Per Device	20
Non-repetitive peak forward surge current @ 8.3ms single half sine wave superimposed on rated load (JEDEC method)	I <sub>FSM</sub>	150	A
Peak repetitive reverse surge current, T <sub>J</sub> <175°C (Note 1)	I <sub>RRM</sub>	3	A
Maximum instantaneous reverse current at	I <sub>R</sub>	V <sub>R</sub> =150 V, T <sub>C</sub> =25°C	5
		V <sub>R</sub> =150 V, T <sub>C</sub> =125°C	5
Voltage rate of change, (rated V <sub>R</sub> )	dV/dt	10,000	V/μs
Typical junction capacitance @ f=1MHz and applied 5V reverse voltage	C <sub>J</sub>	168 (typ.)	pF
ESD susceptibility (Note 2)		8000	V
Storage temperature range	T <sub>stg</sub>	-65~+175	°C
Operating junction temperature range	T <sub>J</sub>	-65~+175	°C

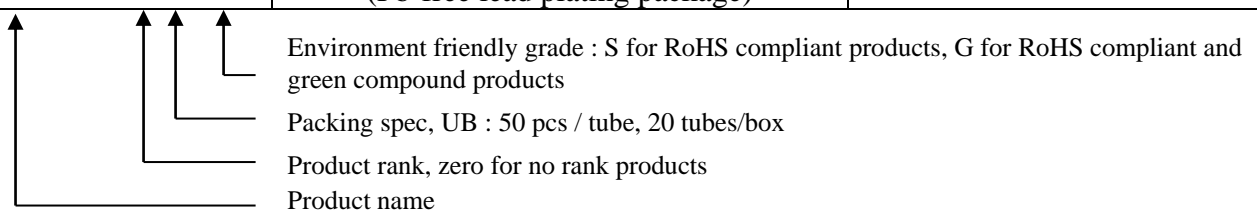
Notes : 1. 2.0μs pulse width, f=1.0kHz  
 2. Human body model, 1.5kΩ in series with 100pF

**Thermal Data**

Parameter	Symbol	Value	Unit
Maximum Thermal Resistance, Junction-to-case	R <sub>th,j-c</sub>	3.5	°C/W
Lead Temperature for Soldering Purposes : 1/8" from Case for 5seconds	T <sub>L</sub>	260	°C

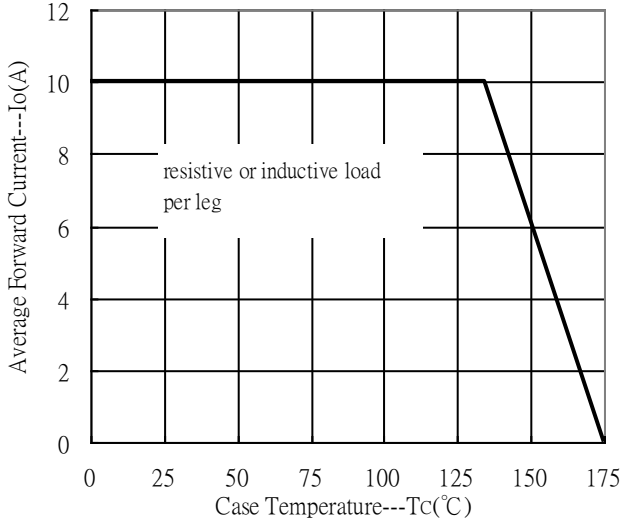
**Ordering Information**

Device	Package	Shipping
MBR20150FP-0-UB-X	TO-220FP (Pb-free lead plating package)	50 pcs / Tube, 40 Tubes/Box

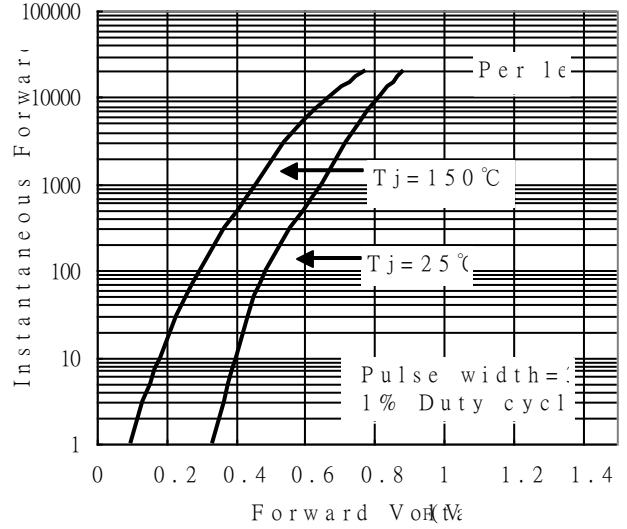


**Typical Characteristics**

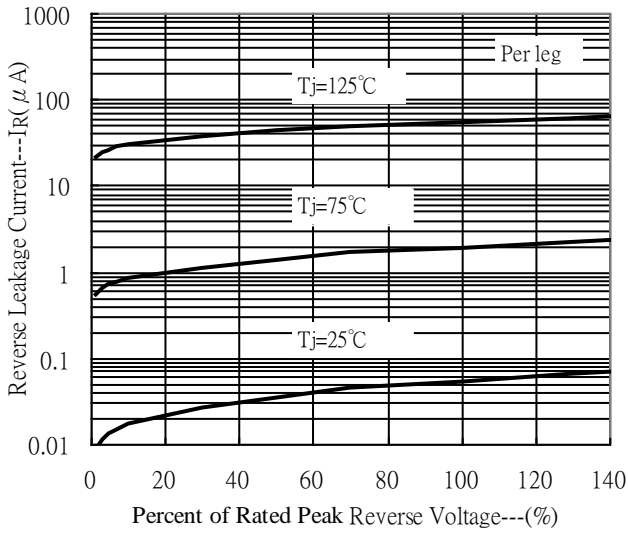
Forward Current Derating Curve



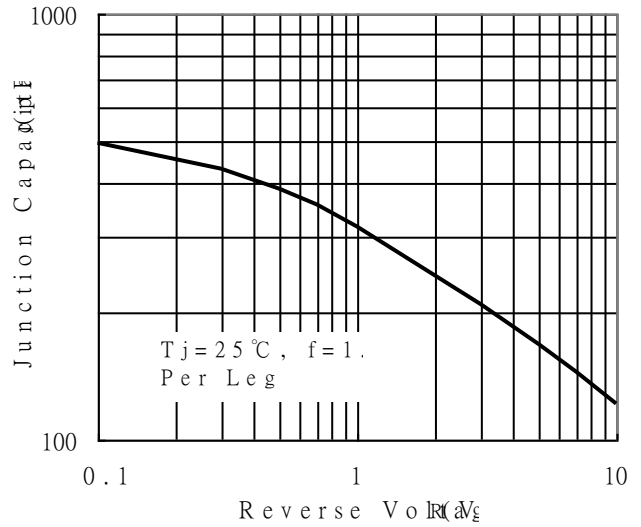
Forward Current vs F



Reverse Leakage Current vs Reverse Voltage



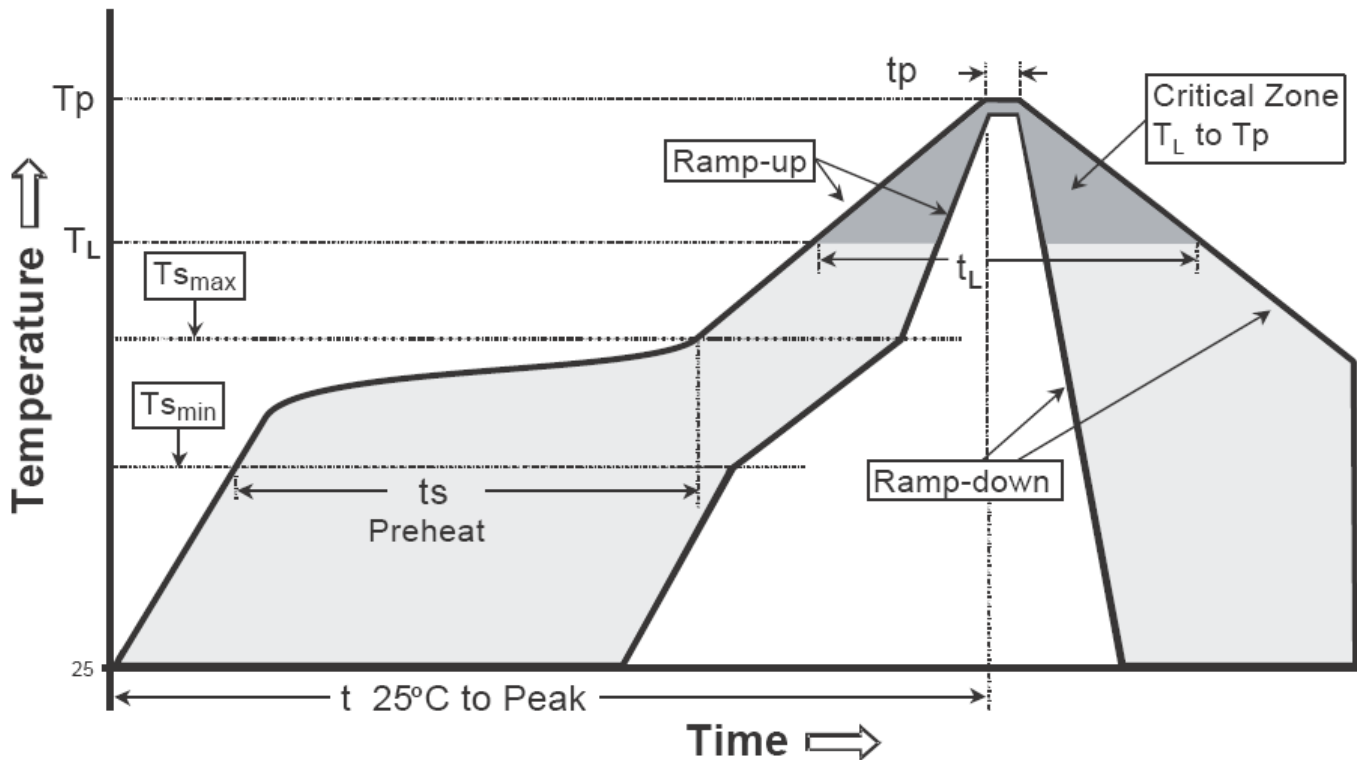
Junction Capacitance vs



**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 <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T <sub>s min</sub> )	100°C	150°C
-Temperature Max(T <sub>s max</sub> )	150°C	200°C
-Time(t <sub>s min</sub> to t <sub>s max</sub> )	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T <sub>L</sub> )	183°C	217°C
- Time (t <sub>L</sub> )	60-150 seconds	60-150 seconds
Peak Temperature(T <sub>P</sub> )	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 20150**  
 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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