10Amp. Schottky Barrier Rectifiers

MBR10100AJ3

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

Features

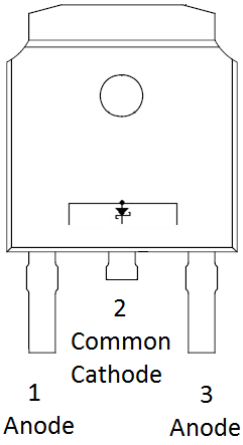
- Low VF and low IR type
- High junction temperature capability
- High current capability
- High surge capability
- Good tradeoff between leakage current and forward voltage drop
- Low power loss, high efficiency
- RoHS compliant package
- Pb-free lead plating

Mechanical Data

- Case: TO-252 molded plastic
- Mounting Position: Any
- Terminals: Pure tin plated, lead-free, solderable per MIL-STD-750 method 2026
- Lead temperature for soldering purpose : 260℃ max. for 10 seconds
- Epoxy: UL 94V-0 rate flame retardant
- Weight: 0.34 grams approximately

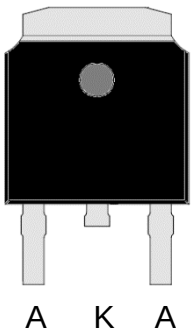
Equivalent Circuit

MBR10100AJ3



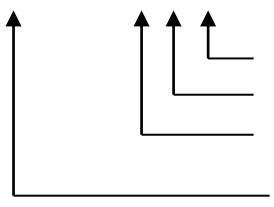
Outline

TO-252



Ordering Information

Device	Package	Shipping
MBR10100AJ3-0-T3-G	TO-252 (Pb-free lead plating and halogen-free package)	2500 pcs / Tape & Reel



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

Packing spec, T3 : 2500 pcs / tape & reel, 13” reel

Product rank, zero for no rank products

Product name

Maximum Ratings and Electrical Characteristics (Per 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	Min.	Typ.	Max.	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			0.86	V
	I_F=10A, T_C=125℃			0.67	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℃		$I_{F(AV)}$			10	A
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		pF
ESD susceptibility (Note 2)					8000	V
Storage temperature range		Tstg	-55		+175	℃
Operating junction temperature range		T_J	-65		+175	℃

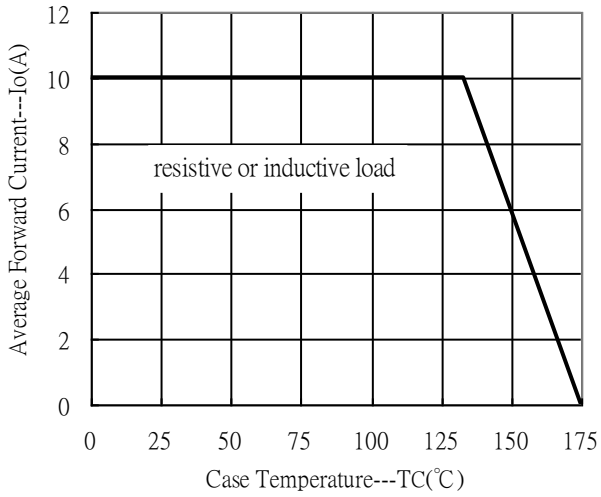
Notes : 1. 2.0μs pulse width, f=1.0kHz
2. Human body model, 1.5kΩ in series with 100pF

Thermal Data

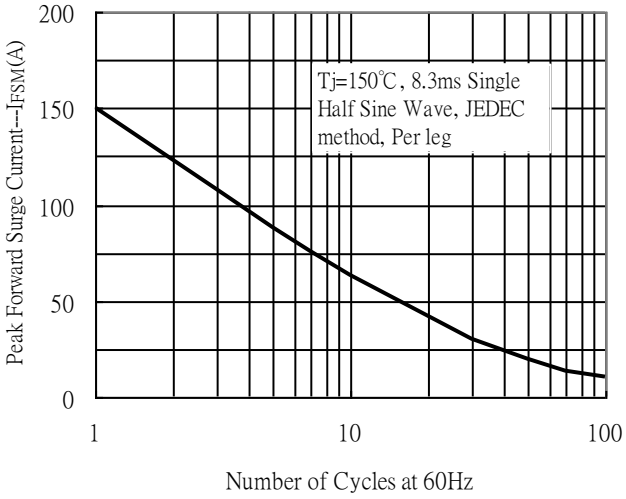
Parameter	Symbol	Value	Unit
Maximum Thermal Resistance, Junction-to-case, per diode	$R_{th,j-c}$	3.5	°C/W
Maximum Thermal Resistance, Junction-to-ambient	$R_{th,j-a}$	90	°C/W

Characteristic Curves

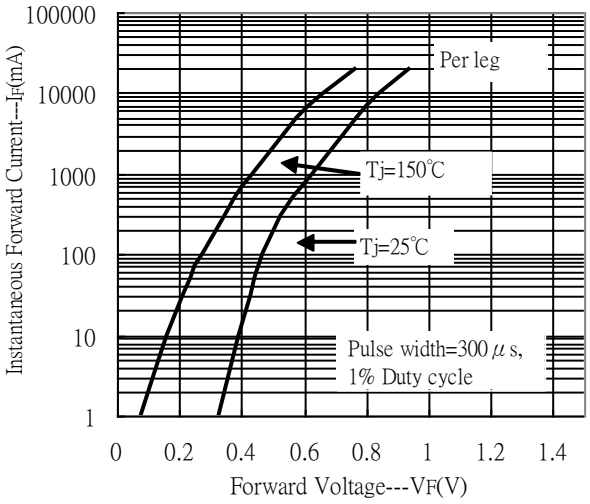
Forward Current Derating Curve



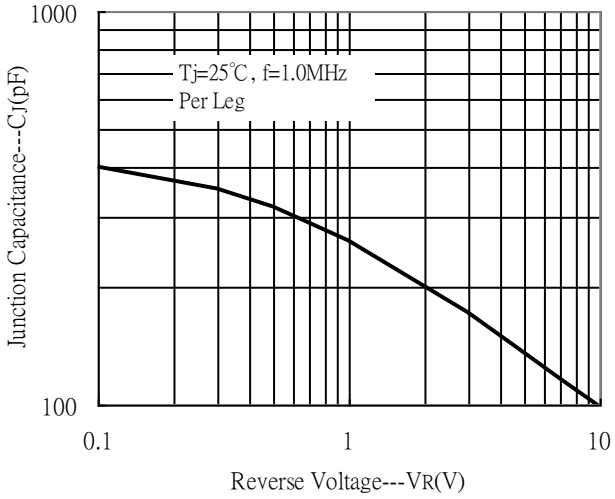
Maximum Non-Repetitive Forward Surge Current



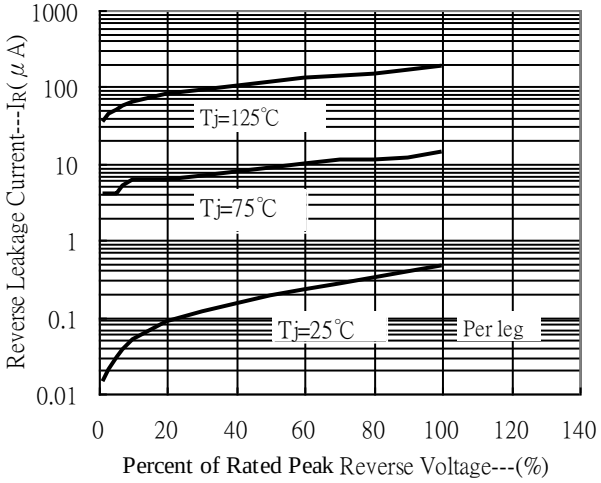
Forward Current vs Forward Voltage



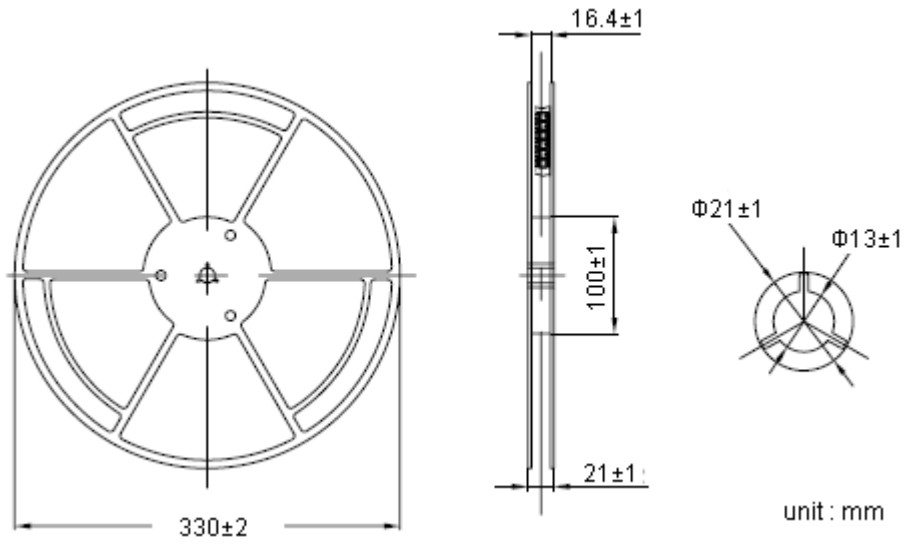
Junction Capacitance vs Reverse Voltage



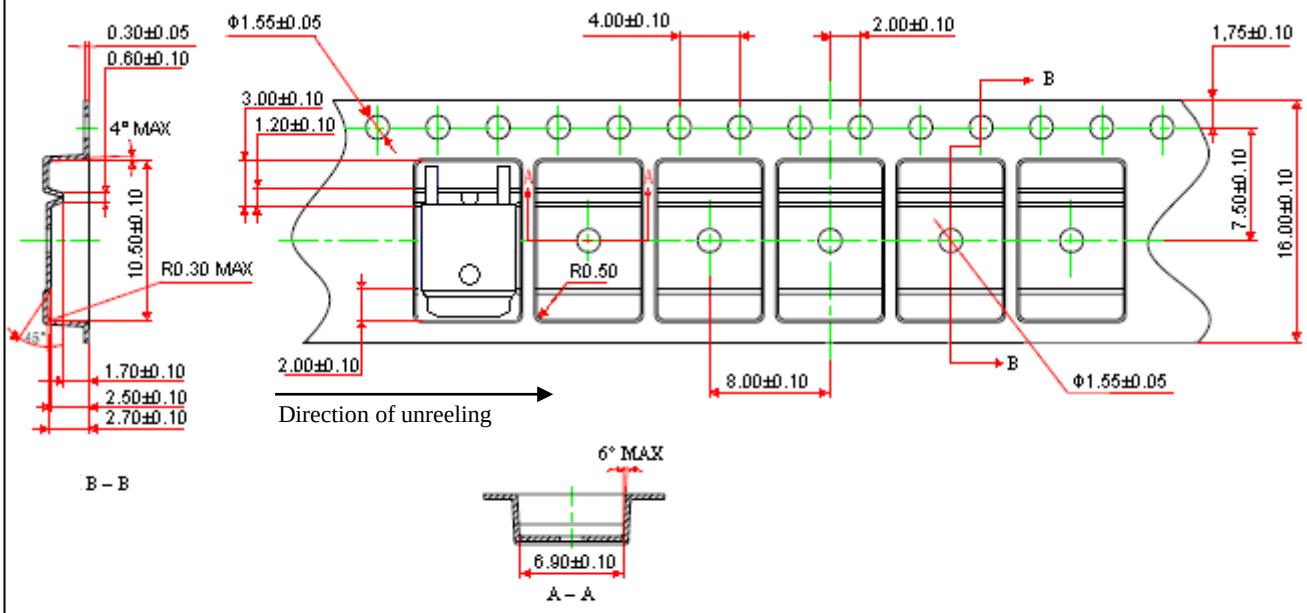
Reverse Leakage Current vs Reverse Voltage



Reel Dimension



Carrier Tape Dimension

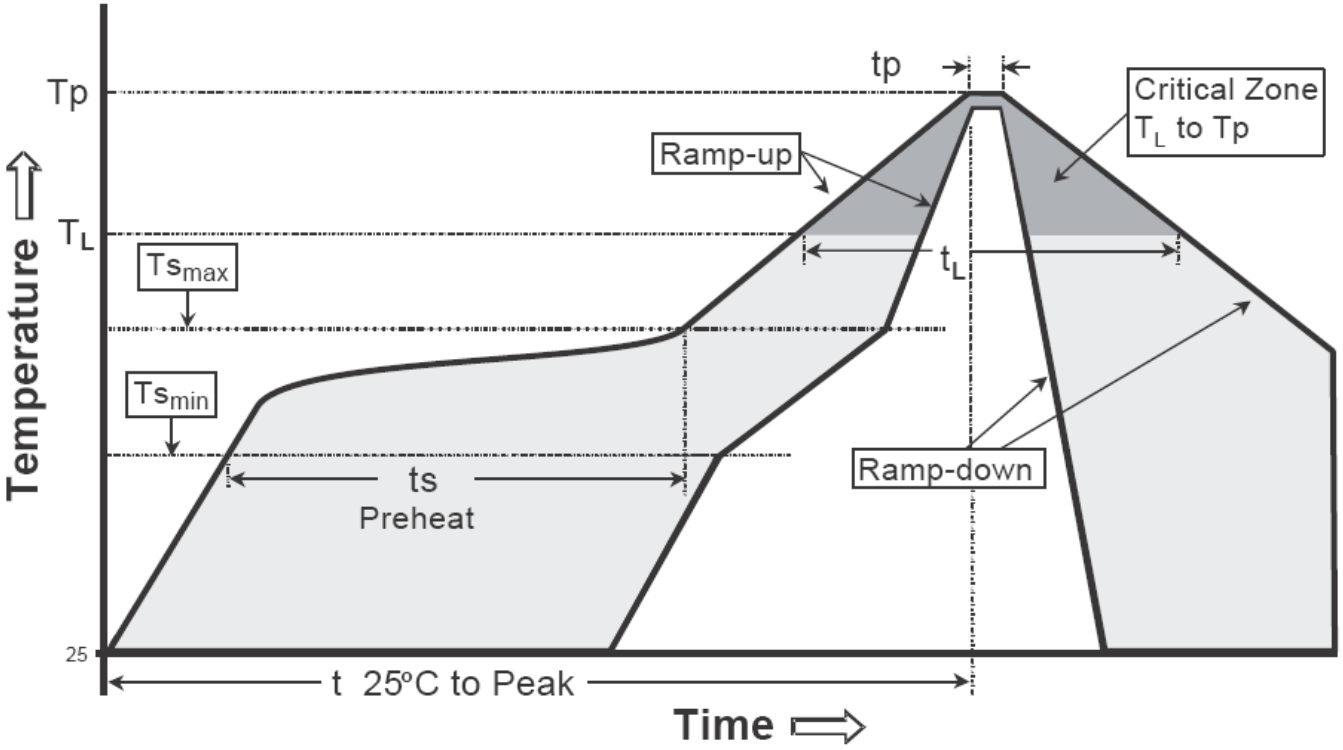


Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene, antistatic coated : 10^{5} Ω/□~ 10^{11} Ω/□ unit : mm

Recommended wave soldering condition

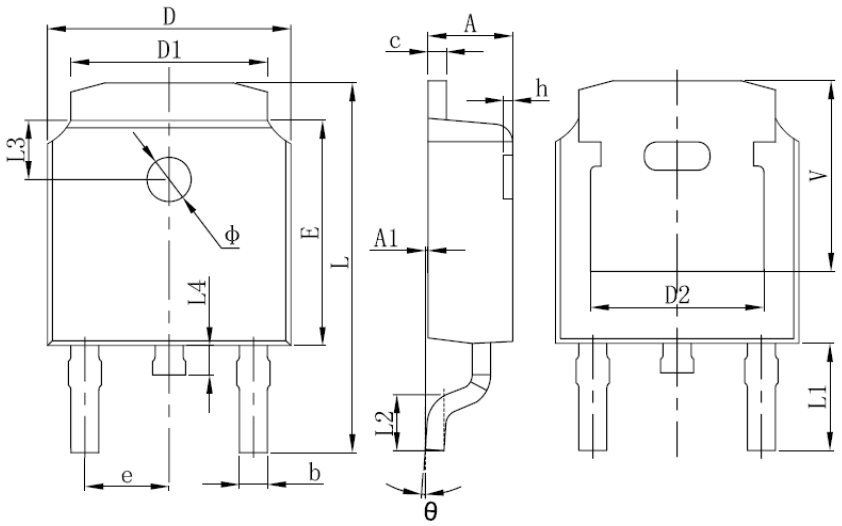
Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

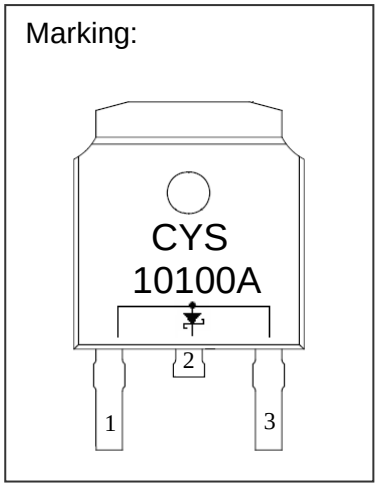
Recommended temperature profile for IR reflow



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.

TO-252 Dimension





3-Lead TO-252 Plastic Surface Mount Package
CYStek Package Code: J3

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

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.087	0.094	2.200	2.400	L	0.382	0.406	9.712	10.312
A1	0.000	0.005	0.000	0.127	L1	0.114	REF	2.900	REF
b	0.025	0.030	0.635	0.770	L2	0.055	0.067	1.400	1.700
c	0.018	0.023	0.460	0.580	L3	0.063	REF	1.600	REF
D	0.256	0.264	6.500	6.700	L4	0.024	0.039	0.600	1.000
D1	0.201	0.215	5.100	5.460	Φ	0.043	0.051	1.100	1.300
D2	0.190	REF	4.830	REF	θ	0°	8°	0°	8°
E	0.236	0.244	6.000	6.200	h	0.000	0.012	0.000	0.300
e	0.086	0.094	2.186	2.386	v	0.207	REF	5.250	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.