

# 5Amp. Schottky Barrier Rectifiers

## MBR05200J3

$I_{F(AV)}$	5A
$V_{RRM}$	200V
$T_j$	175°C
$V_F$	0.7V

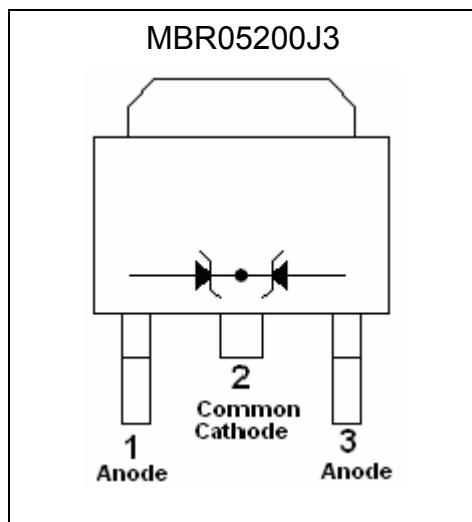
### Features

- 175°C operating junction temperature
- Low  $V_F$  and low  $I_R$  type
- Metal silicon junction, major carrier conduction
- Guardring for over voltage protection
- Low power loss, high efficiency
- High surge capability
- For use in low voltage, high frequency inverters, free wheeling, and polarity protection application
- Pb-free lead plating and halogen-free package

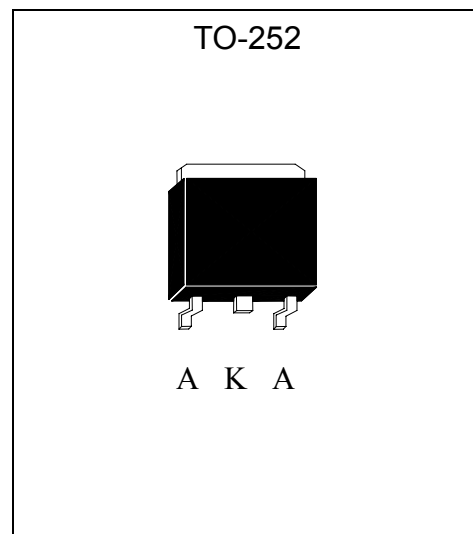
### Mechanical Data

- Case: TO-252 molded plastic
- Mounting Position: Any
- Weight: 0.34 grams approximately
- Terminals: Pure tin plated, lead-free, solderable per MIL-STD-750 method 2026
- Epoxy: UL 94V-0 rate flame retardant
- Polarity : Indicated by diode symbol

### Equivalent Circuit



### Outline



**Maximum Ratings and Electrical Characteristics**

(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	$V_{RRM}$			200	V
Maximum RMS voltage	$V_{RMS}$			140	V
Maximum DC blocking voltage	$V_{DC}$			200	V
Maximum instantaneous forward voltage at (Note 1)	$V_F$	$I_F=5A, T_C=25^\circ C$		0.90	V
		$I_F=5A, T_C=125^\circ C$	0.7	0.74	
Maximum Average forward rectified current @ $T_C=133^\circ C$	$I_{F(AV)}$			5	A
Peak repetitive forward current (square wave, 20kHz, $T_C=133^\circ C$ )	$I_{FRM}$			10	A
Non-repetitive peak forward surge current @ 8.3ms single half sine wave superimposed on rated load (JEDEC method)	$I_{FSM}$			110	A
Peak repetitive reverse surge current (Note 1), $T_J<175^\circ C$	$I_{RRM}$			2	A
Maximum instantaneous reverse current at	$I_R$	$V_R=200V, T_C=25^\circ C$		5	$\mu A$
		$V_R=200V, T_C=125^\circ C$		5	mA
Voltage rate of change, (rated $V_R$ )	$dV/dt$			10,000	V/ $\mu s$
Typical junction capacitance @ $f=1MHz$ and applied 5V reverse voltage	$C_J$		65		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 $\mu s$  pulse width,  $f=1.0kHz$ 2. Human body model, 1.5k $\Omega$  in series with 100pF**Thermal Data**

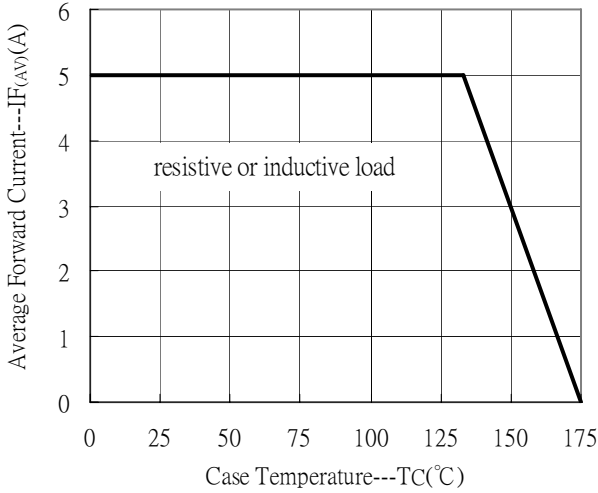
Parameter	Symbol	Value	Unit
Maximum Thermal Resistance, Junction-to-case	$R_{th,j-c}$	2.5	$^\circ C/W$
Maximum Thermal Resistance, Junction-to-ambient	$R_{th,j-a}$	125	$^\circ C/W$

**Ordering Information**

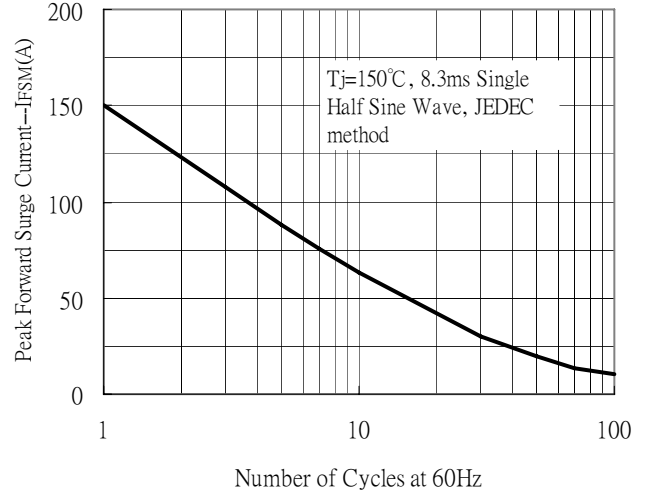
Device	Package	Shipping
MBR05200J3	TO-252 (Pb-free lead plating and Halogen-free package)	2500 pcs / Tape & Reel

## Characteristic Curves

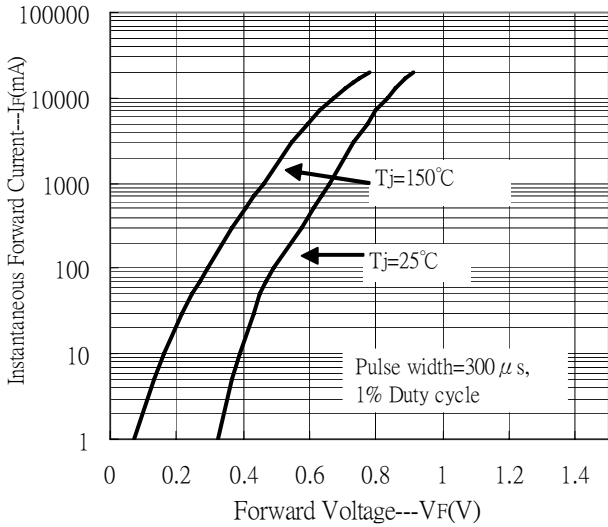
Forward Current Derating Curve



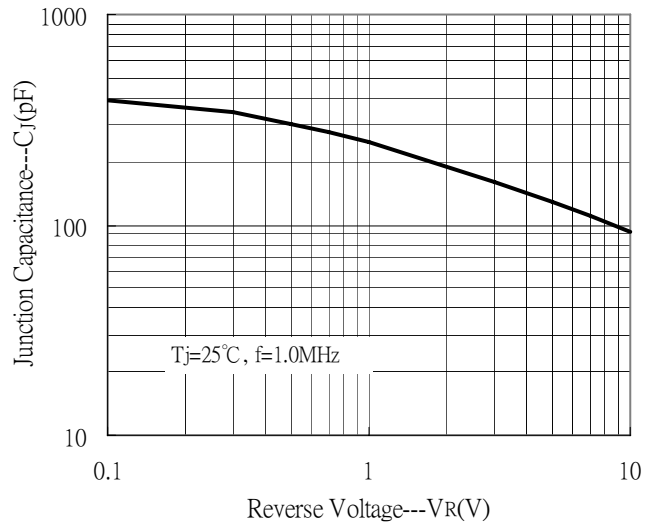
Maximum Non-Repetitive Forward Surge Current



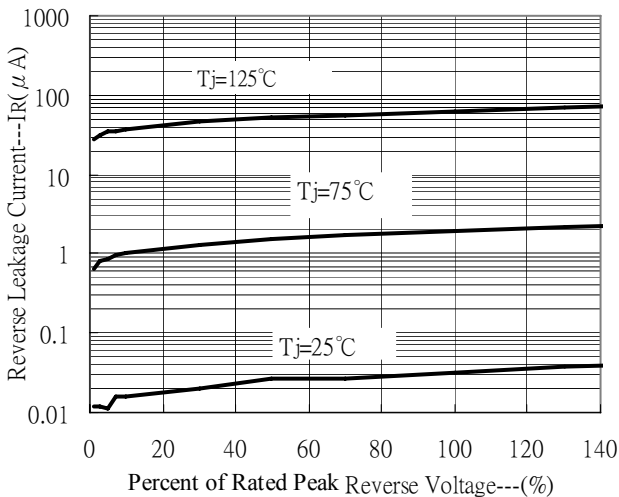
Forward Current vs Forward Voltage



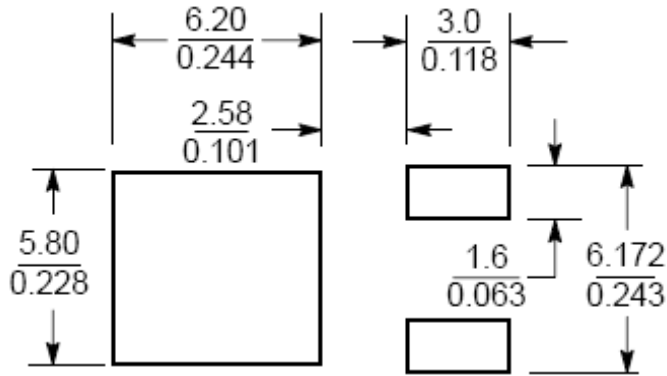
Junction Capacitance vs Reverse Voltage



Reverse Leakage Current vs Reverse Voltage

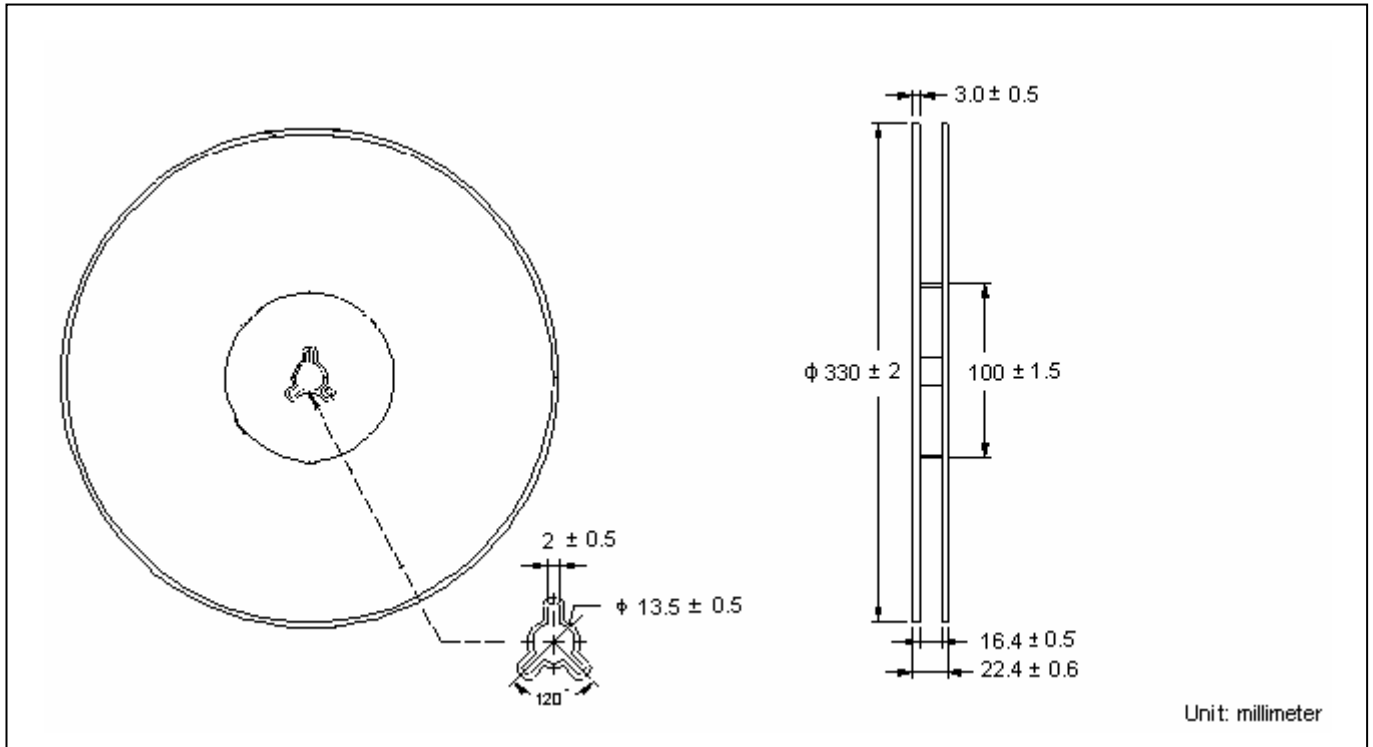


**Recommended soldering footprint**

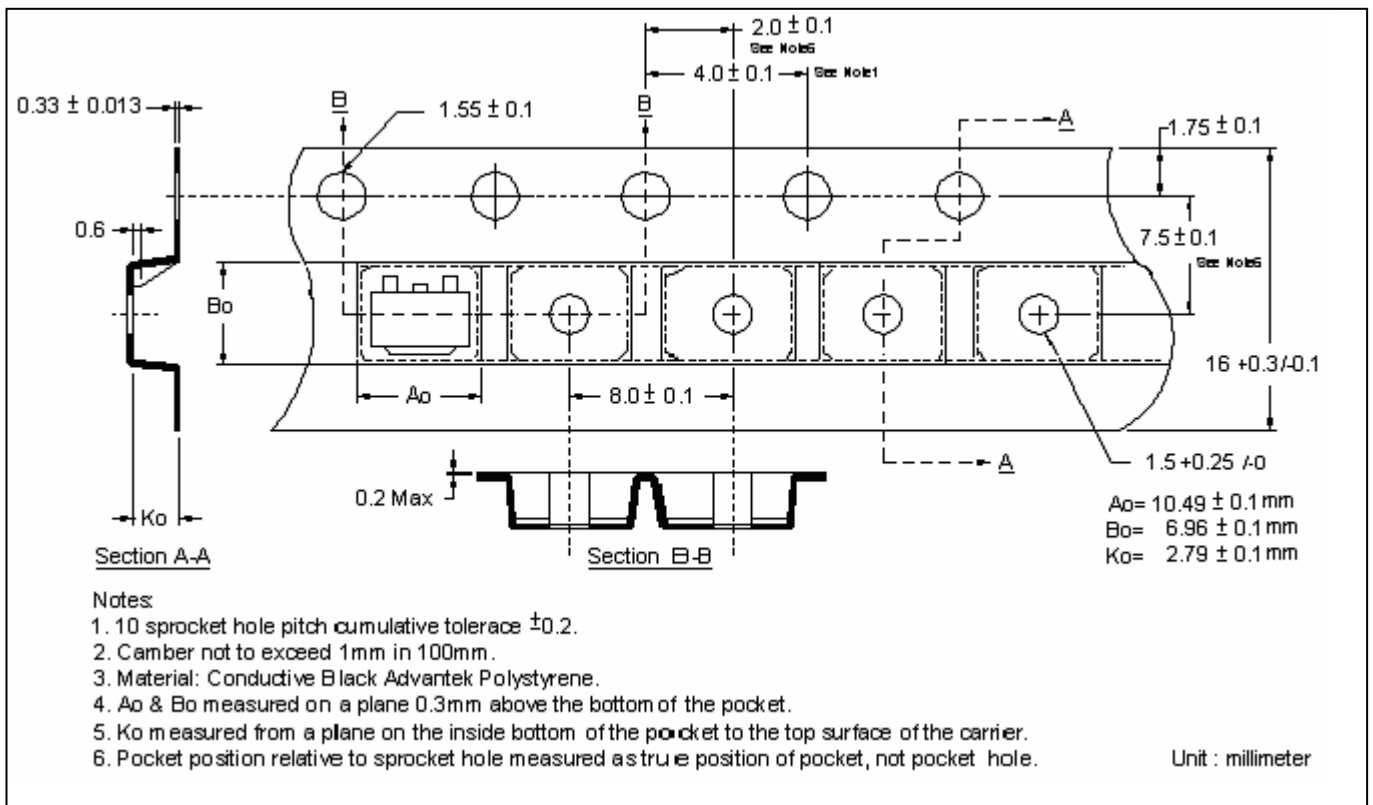


Unit (  $\frac{\text{mm}}{\text{inch}}$  )

## Reel Dimension



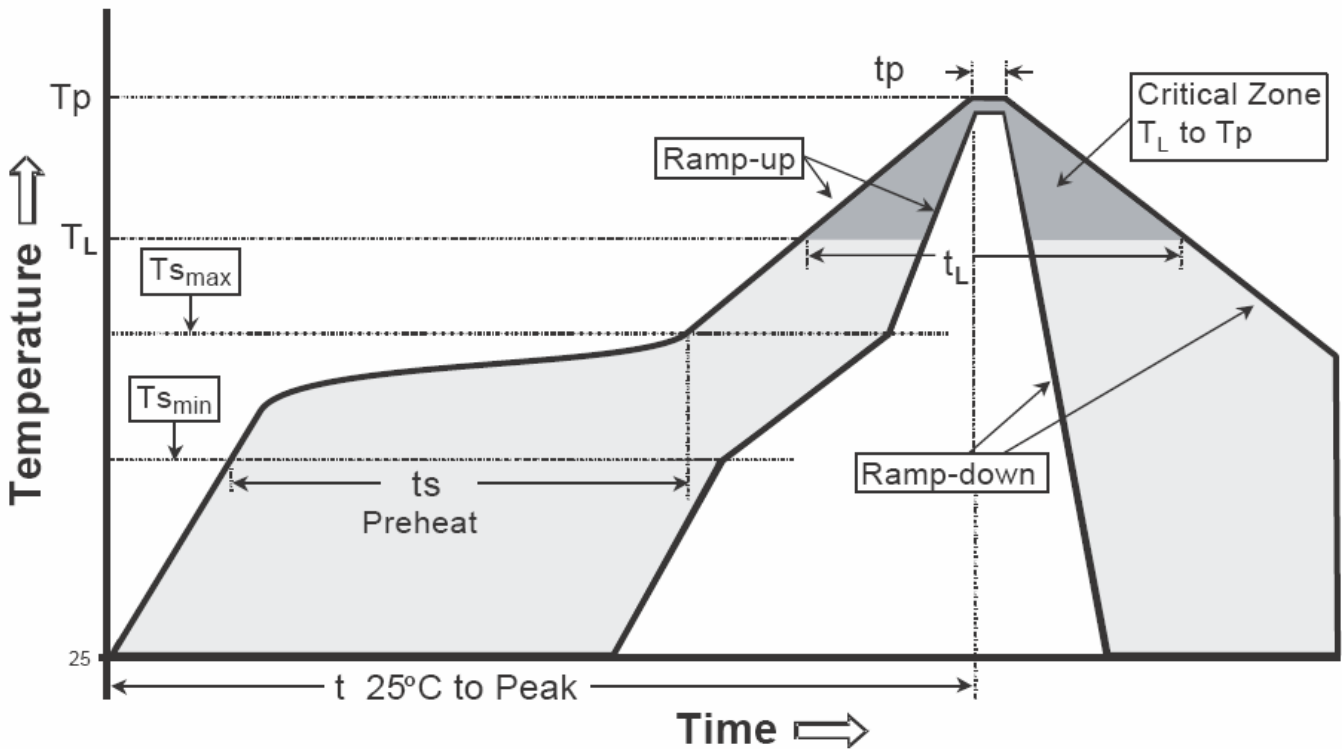
## Carrier Tape Dimension



**Recommended wave soldering condition**

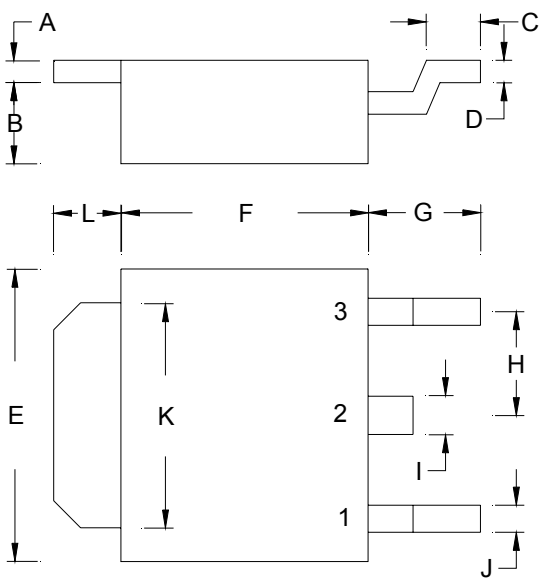
Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

**Recommended temperature profile for IR reflow**

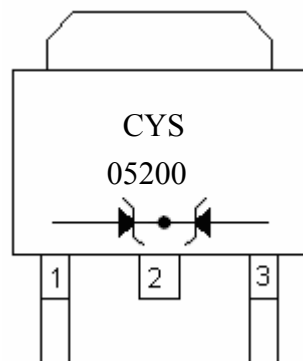


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T <sub>s min</sub> )	100°C	150°C
-Temperature Max(T <sub>s max</sub> )	150°C	200°C
-Time(t <sub>s min</sub> to t <sub>s max</sub> )	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.

## TO-252 Dimension



Marking:



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

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

\*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0157	0.0236	0.40	0.60	G	0.0984	0.1142	2.50	2.90
B	0.0591	0.0827	1.50	2.10	H	-	*0.0906	-	*2.30
C	0.0157	0.0315	0.40	0.80	I	0.0315	0.0394	0.80	1.00
D	0.0157	0.0236	0.40	0.60	J	0.0315	0.0394	0.80	1.00
E	0.2480	0.2638	6.30	6.70	K	0.2008	0.2165	5.10	5.50
F	0.2283	0.2441	5.80	6.20	L	0.0315	0.0394	0.80	1.00

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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