10Amp. Schottky Barrier Rectifiers

MBR10200FP

$I_{F(AV)}$	2 × 5A
V_{RRM}	200V
Tj	175°C
V_F	0.7V

Features

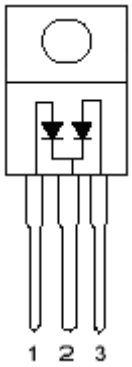
- 175℃ operating junction temperature
- Low V_F and low I_R type
- Metal silicon junction, major carrier conduction
- 10A total (5A per diode leg)
- Guardring for over voltage protection
- Low power loss, high efficiency
- High surge capability
- Insulating package, insulating voltage=2500V DC, capacitance=45pF
- For use in low voltage, high frequency inverters, free wheeling, and polarity protection application
- Pb-free lead plating 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
- Mounting torque: 5 in.-lb. maximum

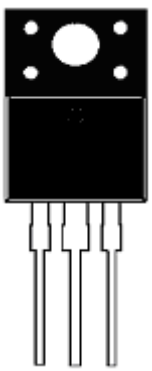
Equivalent Circuit

MBR10200FP



Outline

TO-220FP



A K A

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	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)	I_F=5A, T_C=25℃	V_F			0.90	V
	I_F=5A, T_C=125℃			0.7	0.74	
	I_F=10 A, T_C=25℃				1.00	
	I_F=10A, T_C=125℃				0.87	
Maximum Average forward rectified current @ T_C=133℃	Per Diode	$I_{F(AV)}$			5	A
	Per Device				10	
Peak repetitive forward current (square wave, 20kHz, T_C=133℃)		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℃		I_{RRM}			2	A
Maximum instantaneous reverse current at	V_R=200 V, T_C=25℃	I_R			5	μA
	V_R=200 V, T_C=125℃				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		65		pF
ESD susceptibility (Note 2)					8000	V
Operating junction and storage temperature range		T_J ; Tstg	-65		+175	℃

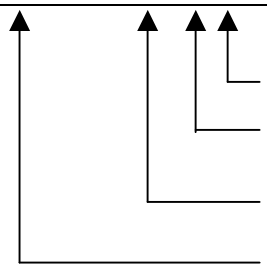
Notes : 1. 2.0μs pulse width, f=1.0kHz
2. Human body model, 1.5kΩ in series with 100pF

Thermal Data

Parameter	Symbol	Value	Unit
Maximum Thermal Resistance, Junction-to-case	$R_{th,j-c}$	3.5	°C/W
Maximum Thermal Resistance, Junction-to-ambient	$R_{th,j-a}$	60	°C/W
Lead Temperature for Soldering Purposes : 1/8” from Case for 5 seconds	T_L	300	°C

Ordering Information

Device	Package	Shipping
MBR10200FP-0-UB-S	TO-220FP (RoHS compliant package)	50 pcs / Tube, 40 Tubes/Box



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

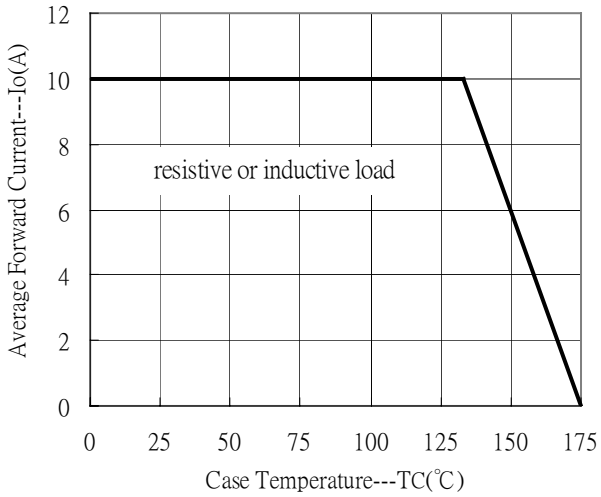
Packing spec, UB : 50 pcs / tube, 20 tubes/box

Product rank, zero for no rank products

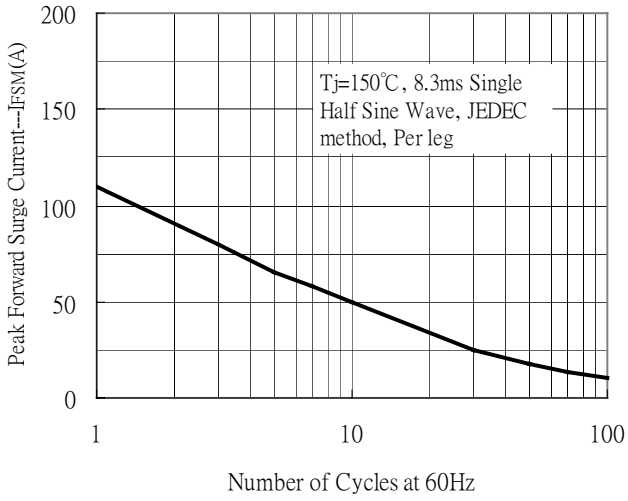
Product name

Characteristic Curves

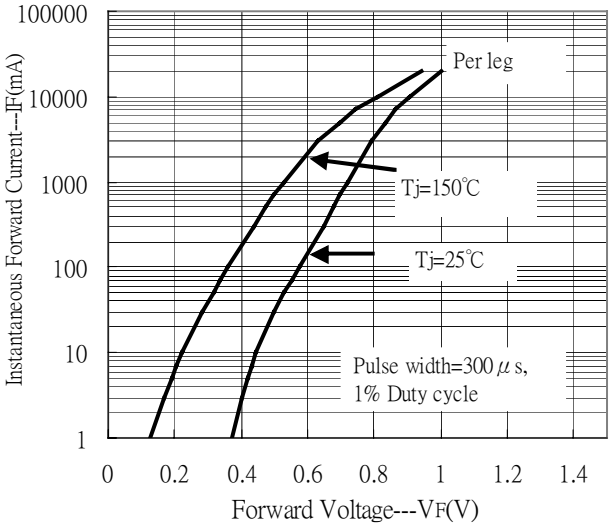
Forward Current Derating Curve



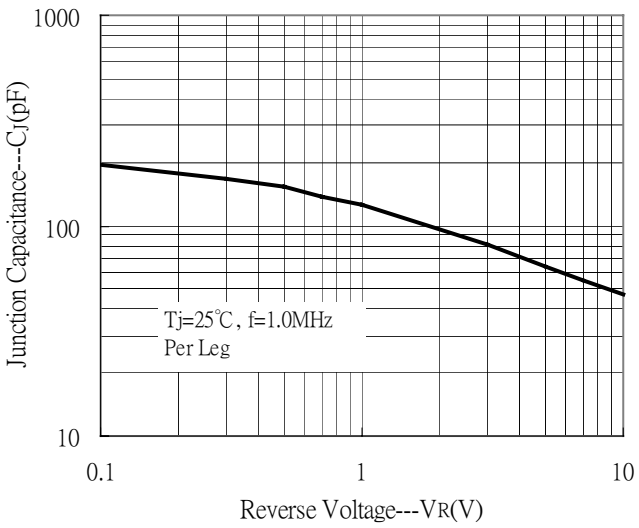
Maximum Non-Repetitive Forward Surge Current



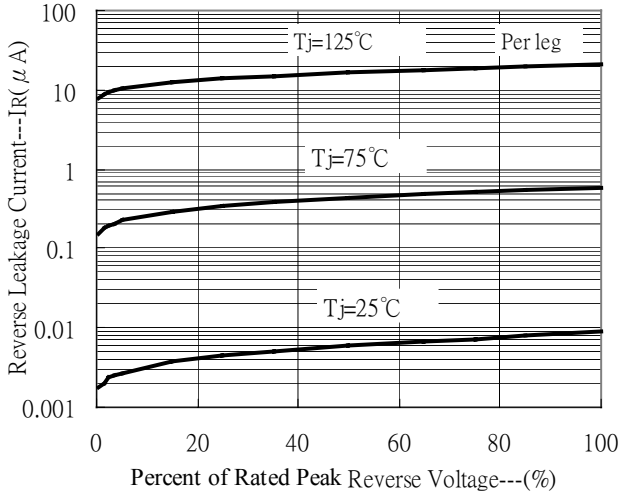
Forward Current vs Forward Voltage



Junction Capacitance vs Reverse Voltage



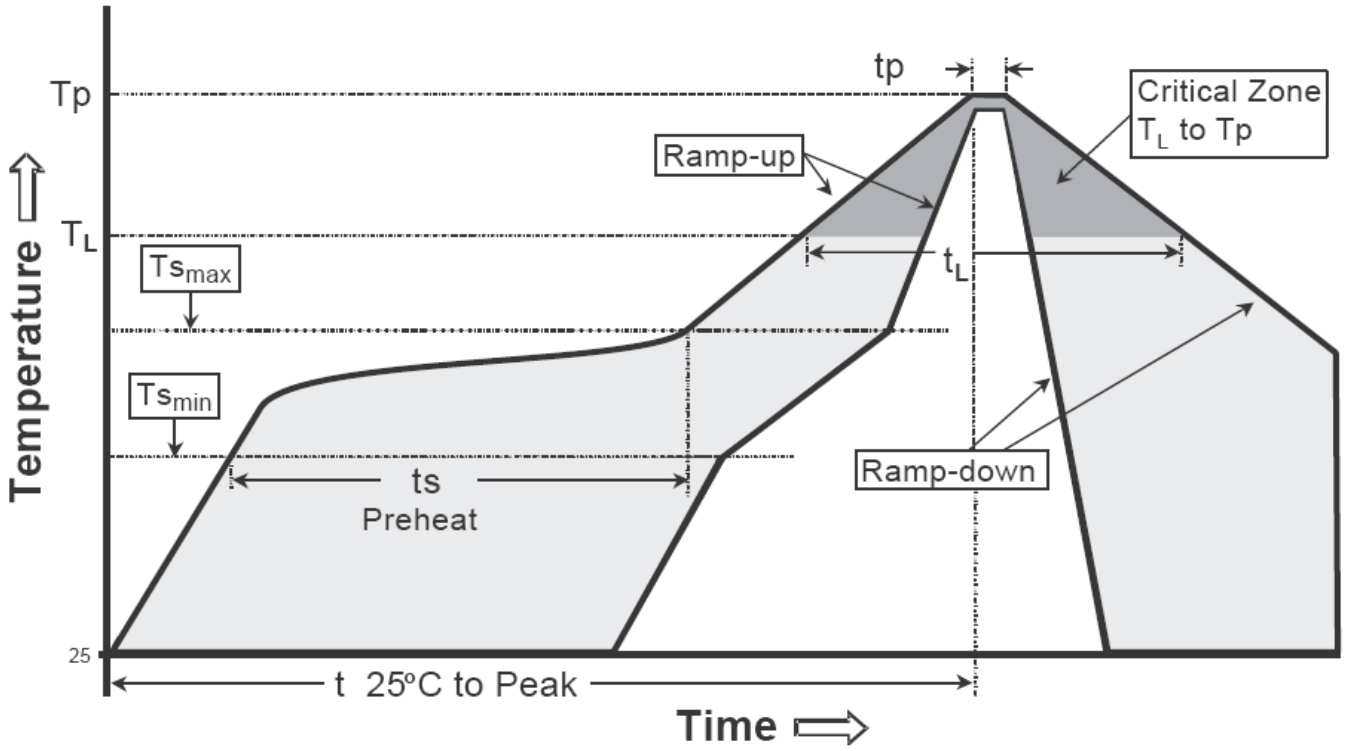
Reverse Leakage Current vs Reverse Voltage



Recommended wave soldering condition

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

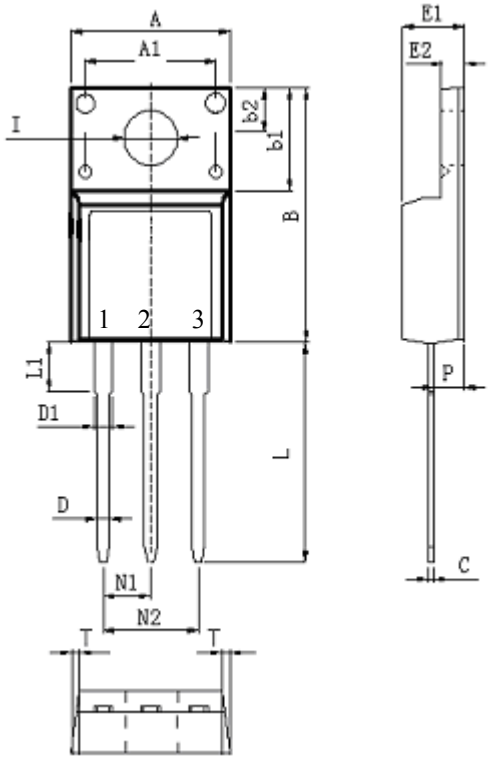
Recommended temperature profile for IR reflow



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.

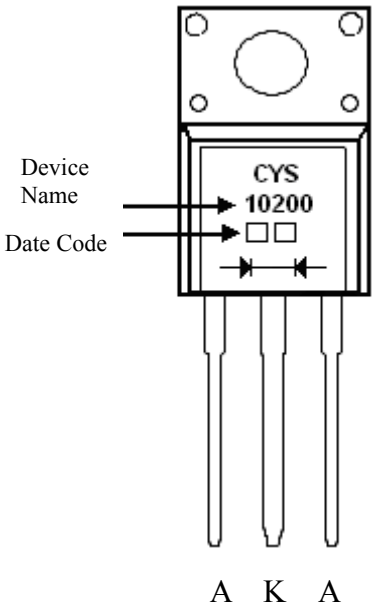
Note : All temperatures refer to topside of the package, measured on the package body surface.

TO-220FP Dimension(K Forming)



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

Marking:



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

*: Typical

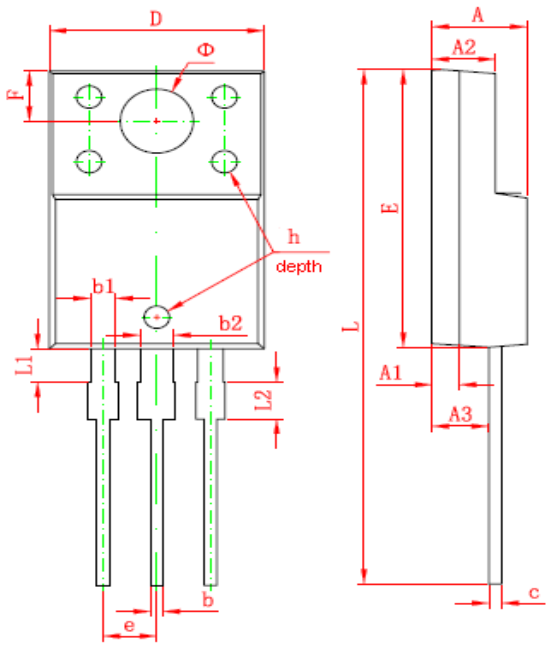
DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.3740	0.4134	9.50	10.50	E2	0.0984	0.1063	2.50	2.70
A1	*0.2756		*7.00		N1	0.0961	0.1039	2.44	2.64
B	0.6063	0.6299	15.40	16.00	N2	0.1921	0.2079	4.88	5.28
b1	0.2480	0.2717	6.30	6.90	P	0.0984	0.1142	2.50	2.90
b2	0.0984	0.1181	2.50	3.00	L	0.5276	0.5354	13.40	13.60
C	0.0138	0.0295	0.35	0.75	L1	0.1378	0.1772	3.50	4.50
D	0.0276	0.0354	0.70	0.90	I	0.1181	0.1339	3.00	3.40
D1	0.0394	0.0551	1.00	1.40	T	0.0059	0.0138	0.15	0.35
E1	0.1693	0.1850	4.30	4.70					

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.

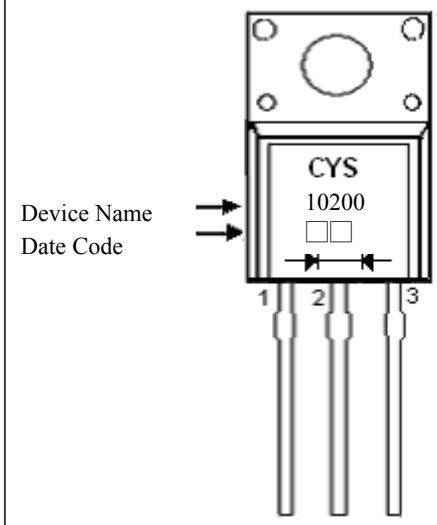
Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

TO-220FP (C Forming) Dimension



Marking:



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

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

*Typical

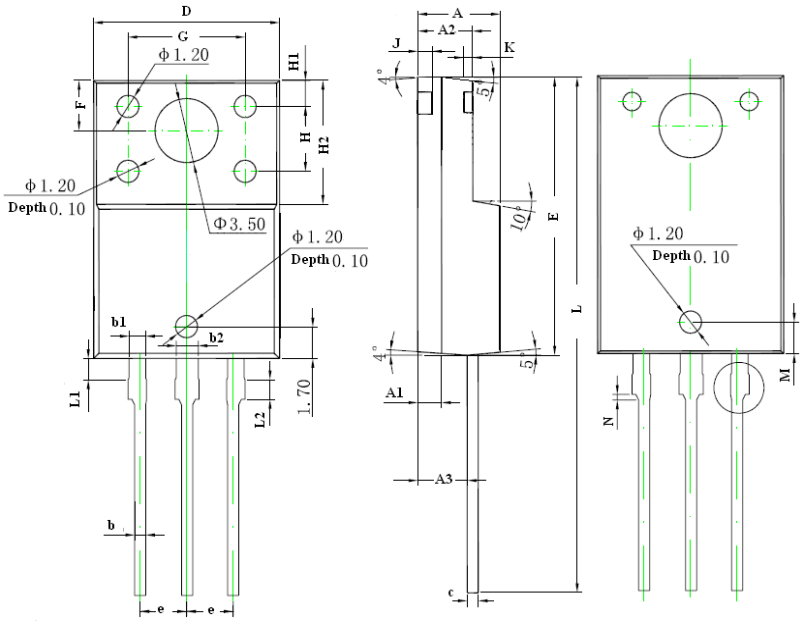
DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.169	0.185	4.300	4.700	E	0.583	0.598	14.800	15.200
A1	0.051 REF		1.300 REF		e	0.100*		2.540*	
A2	0.110	0.126	2.800	3.200	F	0.106 REF		2.700 REF	
A3	0.098	0.114	2.500	2.900	Φ	0.138 REF		3.500 REF	
b	0.020	0.030	0.500	0.750	h	0.000	0.012	0.000	0.300
b1	0.043	0.053	1.100	1.350	L	1.102	1.118	28.000	28.400
b2	0.059	0.069	1.500	1.750	L1	0.067	0.075	1.700	1.900
c	0.020	0.030	0.500	0.750	L2	0.075	0.083	1.900	2.100
D	0.392	0.408	9.960	10.360					

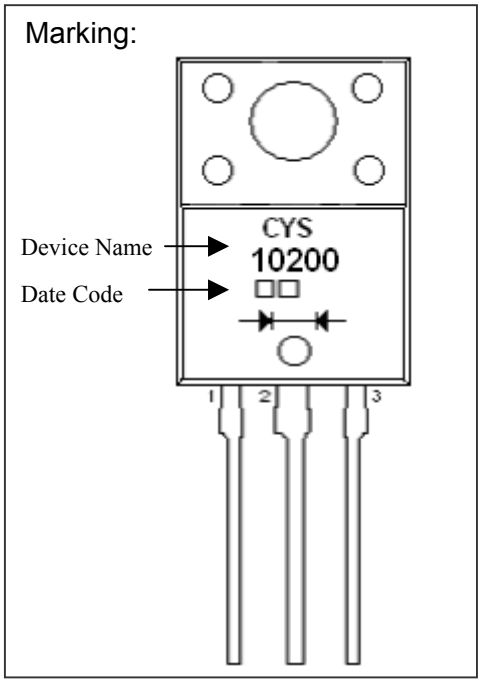
Notes: 1.Controlling dimension: millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

TO-220FP (S Forming) Dimension





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

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: 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.

Important Notice:

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of CYStek.
- CYStek reserves the right to make changes to its products without notice.
- CYStek ***semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.***
- CYStek assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.