N-CHANNEL MOSFET

MTN138ZN3

Description

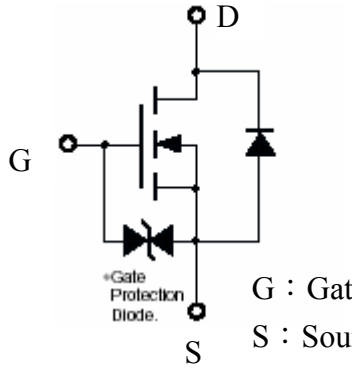
The MTN138ZN3 is a N-channel enhancement-mode MOSFET.

Features

- Low on-resistance
- High ESD
- High speed switching
- Low-voltage drive(4V)
- Easily designed drive circuits
- Easy to use in parallel
- Pb-free package

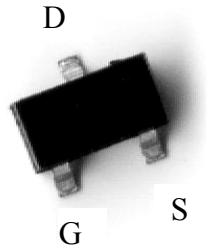
Symbol

MTN138ZN3



Outline

SOT-23



Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	200	mA
	Pulsed	I_{DP}	800 *1	mA
Drain Reverse Current	Continuous	I_{DR}	200	mA
	Pulsed	I_{DRP}	800 *1	mA
Total Power Dissipation		P_D	200 *2	mW
ESD susceptibility			1550 *3	V
Channel Temperature		T_{CH}	+150	°C
Storage Temperature		Tstg	-55~+150	°C

Note : *1. Pulse Width ≤ 300μs, Duty cycle ≤2%
*2. When the device is mounted on a glass epoxy board with area measuring 1×0.75×0.62 inch
*3. Human body model, 1.5kΩ in series with 100pF

Electrical Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSS}*	60	-	-	V	V_{GS}=0, I_D=10μA
$V_{GS(th)}$	1	1.2	2	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±10	μA	V_{GS}=±20V, V_{DS}=0
I_{DSS}	-	-	1	μA	V_{DS}=60V, V_{GS}=0
$R_{DS(ON)}$*	-	3.2	5	Ω	I_D=1mA, V_{GS}=2.5V
	-	3.2	5		I_D=10mA, V_{GS}=2.5V
	-	2	4		I_D=10mA, V_{GS}=4V
	-	2	4		I_D=200mA, V_{GS}=4V
	-	1.5	3		I_D=200mA, V_{GS}=10V
G_{FS}	100	240	-	mS	V_{DS}=10V, I_D=100mA
C_{iss}	-	30.6	-	pF	V_{DS}=10V, V_{GS}=0, f=1MHz
C_{oss}	-	5.5	-		
C_{rss}	-	4	-		

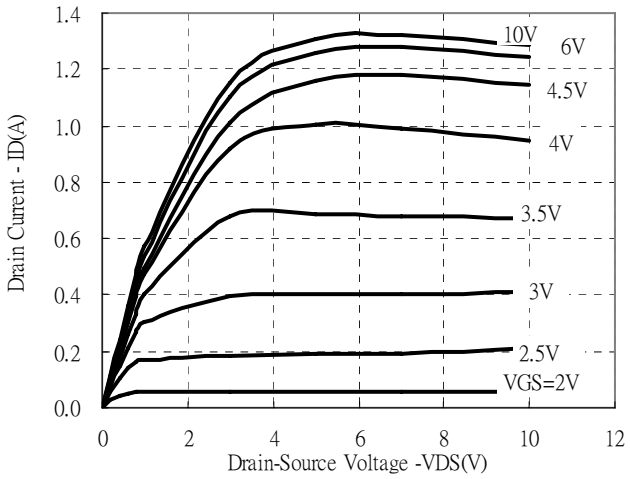
*Pulse Test : Pulse Width ≤380μs, Duty Cycle≤2%

Ordering Information

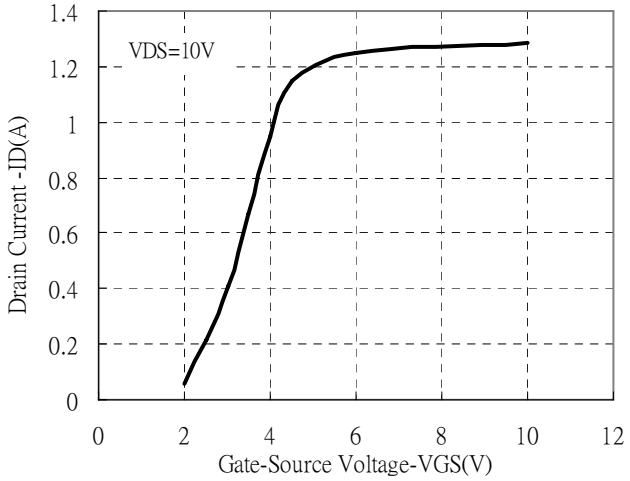
Device	Package	Shipping	Marking
MTN138ZN3	SOT-23 (Pb-free)	3000 pcs / Tape & Reel	702

Characteristic Curves

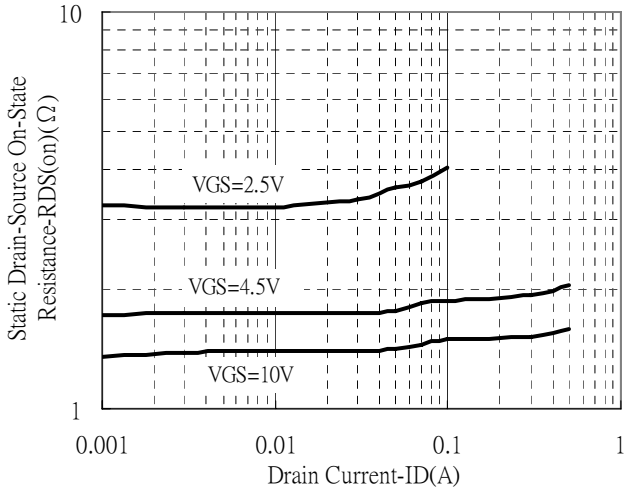
Typical Output Characteristics



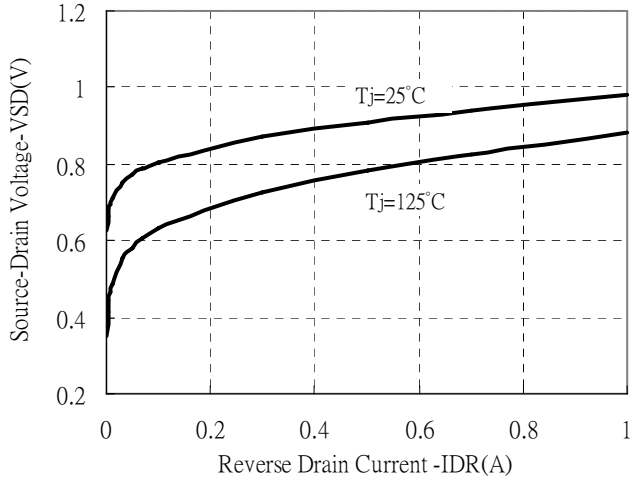
Typical Transfer Characteristics



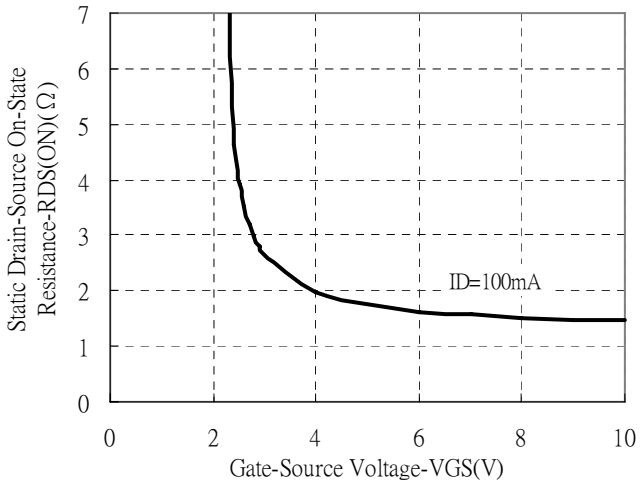
Static Drain-Source On-State resistance vs Drain Current



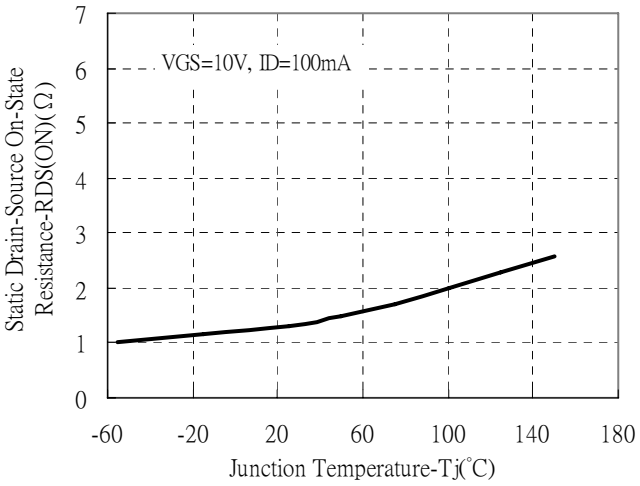
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

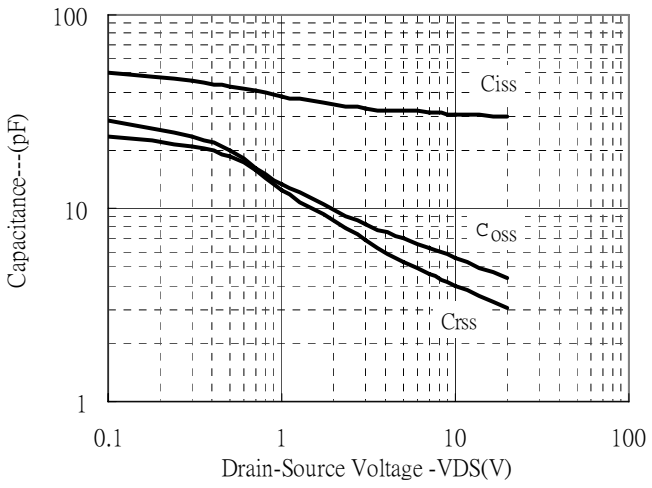


Drain-Source On-State Resistance vs Junction Tempearture

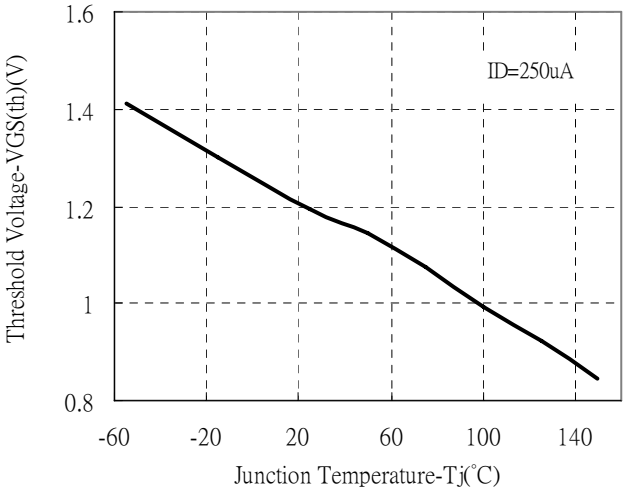


Characteristic Curves(Cont.)

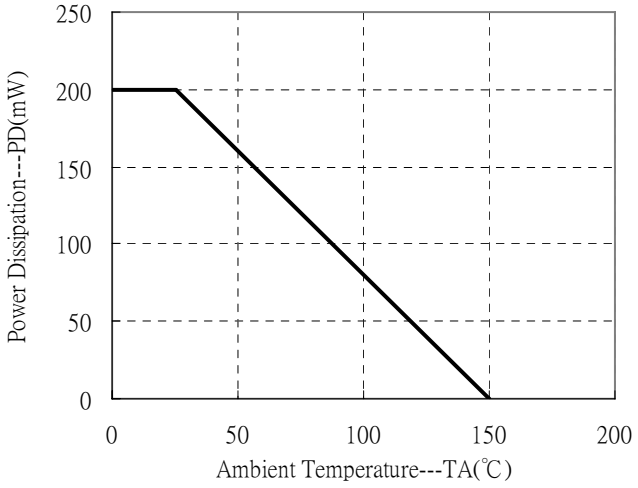
Capacitance vs Drain-to-Source Voltage



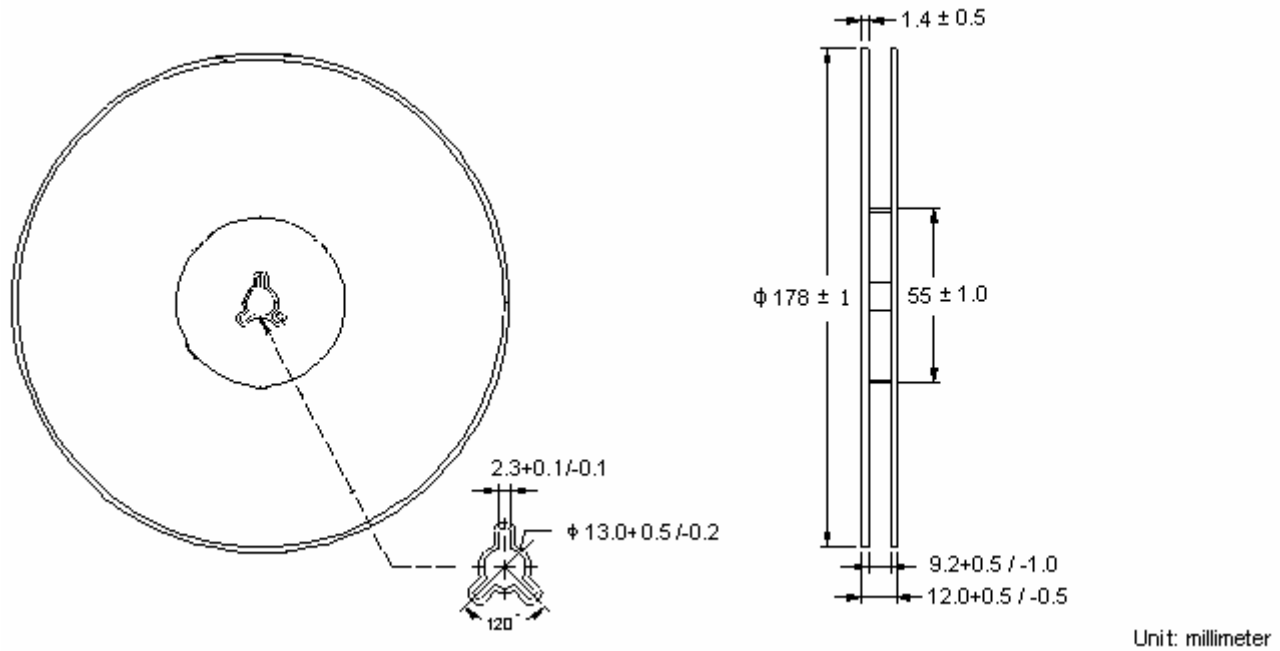
Threshold Voltage vs Junction Tempearture



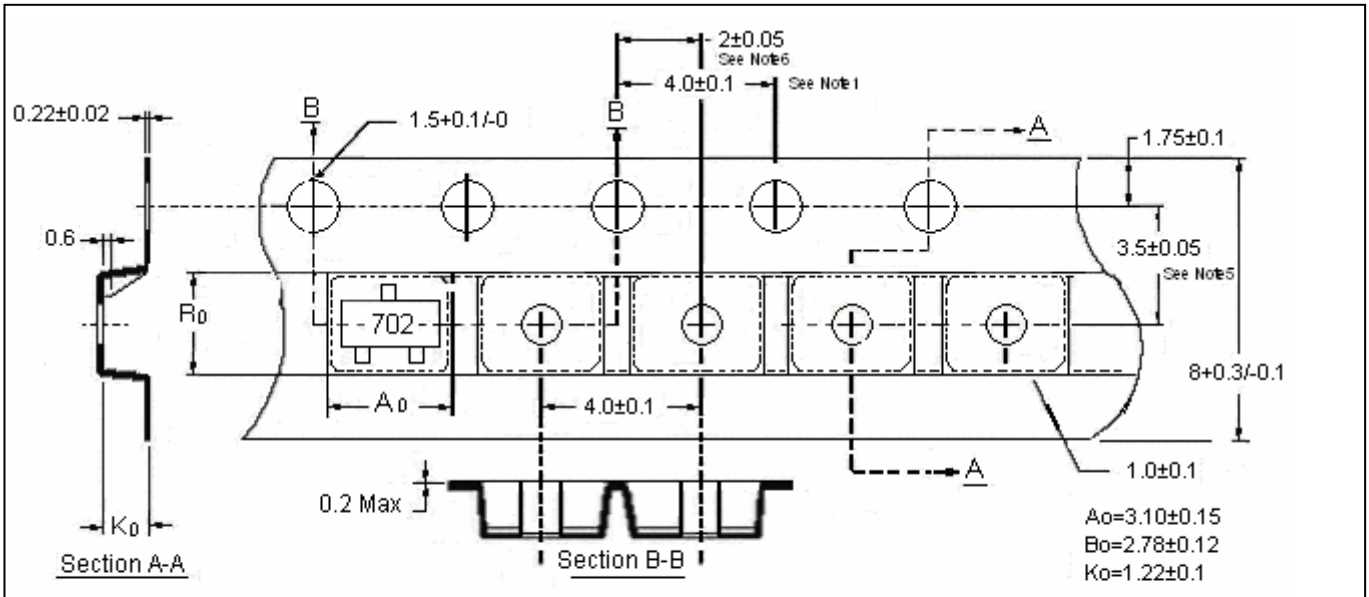
Power Derating Curve



Reel Dimension



Carrier Tape Dimension



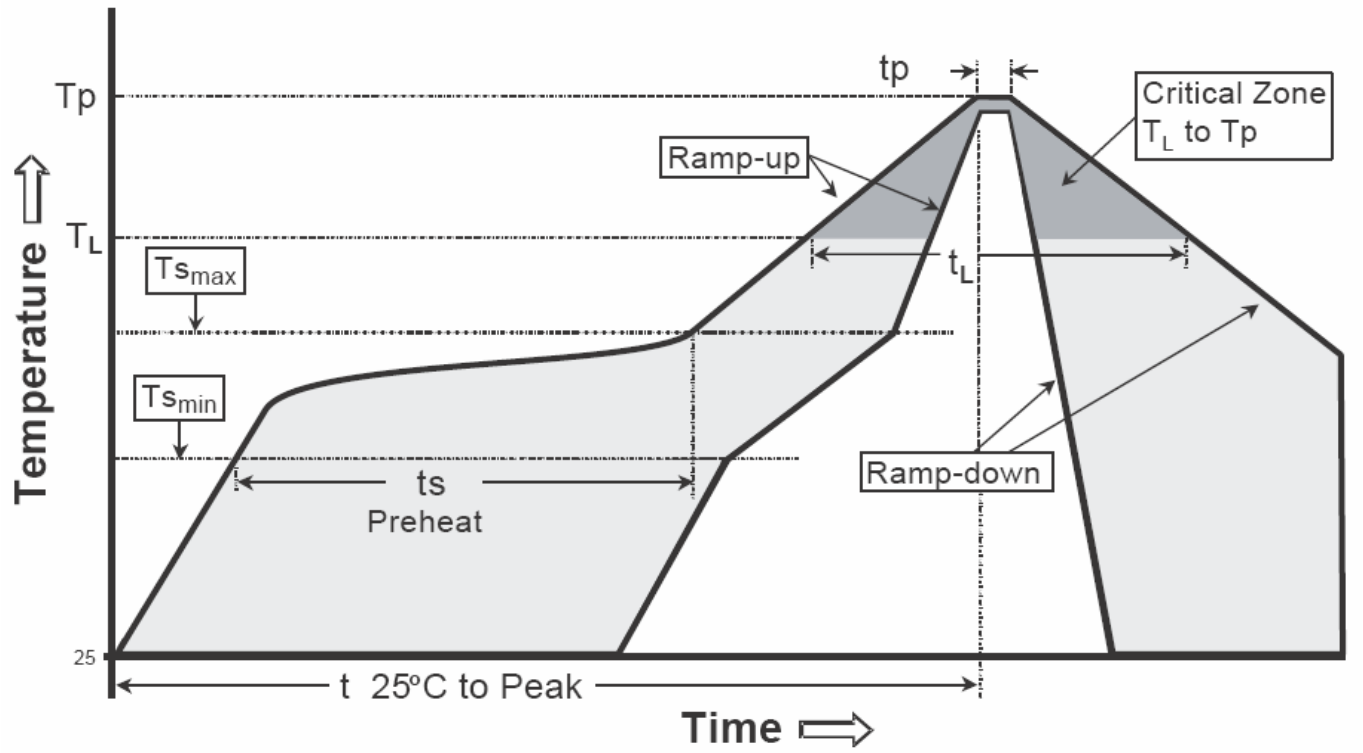
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

Recommended wave soldering condition

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

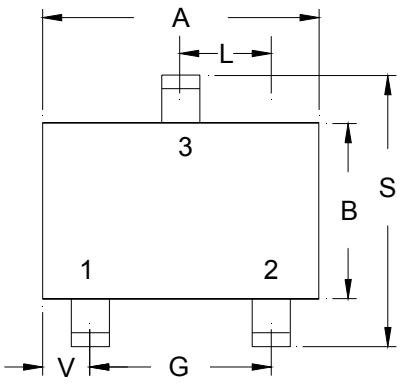
Recommended temperature profile for IR reflow

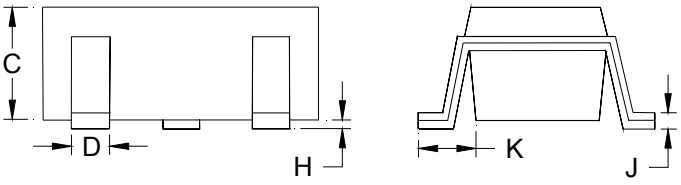


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL) − Time (tL)	 183°C 60-150 seconds	 217°C 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.

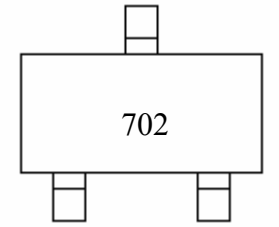
Note : All temperatures refer to topside of the package, measured on the package body surface.

SOT-23 Dimension





Marking:



3-Lead SOT-23 Plastic
Surface Mounted Package
CYStek Package Code: N3

Style : Pin 1.Gate 2.Source 3.Drain

*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1102	0.1204	2.80	3.04	J	0.0034	0.0070	0.085	0.177
B	0.0472	0.0630	1.20	1.60	K	0.0128	0.0266	0.32	0.67
C	0.0335	0.0512	0.89	1.30	L	0.0335	0.0453	0.85	1.15
D	0.0118	0.0197	0.30	0.50	S	0.0830	0.1083	2.10	2.75
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0005	0.0040	0.013	0.10					

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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