

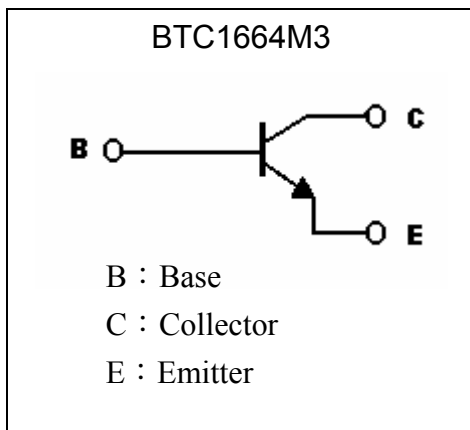
Low Vcesat NPN Epitaxial Planar Transistor

BTC1664M3

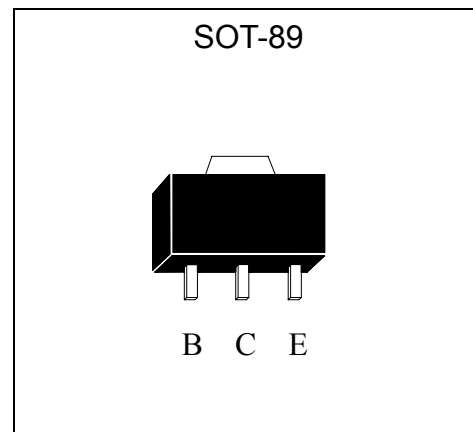
Features

- Low $V_{CE(sat)}$, $V_{CE(sat)}=0.25V$ (typical), at $I_C / I_B = 500mA / 20mA$
- Pb-free lead plating package

Symbol



Outline



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	28	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current (DC)	I_C	2	A
Collector Current (Pulse)	I_{CP}	4 (Note 1)	A
Power Dissipation	P_D	0.6	W
		1.5 (Note 2)	W
		2.1 (Note 3)	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	208	
		83.3 *2	
		59.5 *3	
Operating Junction and Storage Temperature Range	$T_j; T_{stg}$	-55~+150	°C

Note : 1. Single pulse, $P_w = 10ms$, duty $\leq 2\%$.

2. When mounted on 25mm×25mm×1.6 mm FR-4 PCB with high coverage of single sided 1 oz copper, in still air condition

3. When mounted on 50mm×50mm×1.6 mm FR-4 PCB with high coverage of single sided 1 oz copper, in still air condition

Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	50	-	-	V	$I_C=10\mu A, I_E=0$
BV_{CEO}	28	-	-	V	$I_C=1mA, I_B=0$
BV_{EBO}	6	-	-	V	$I_E=10\mu A, I_C=0$
I_{CBO}	-	-	100	nA	$V_{CB}=50V, I_E=0$
I_{EBO}	-	-	100	nA	$V_{EB}=6V, I_C=0$
$*V_{CE(sat)2}$	-	0.25	0.4	V	$I_C=500mA, I_B=20mA$
$*V_{CE(sat)3}$	-	-	0.6	V	$I_C=800mA, I_B=80mA$
$*V_{BE(on)}$	-	-	1	V	$V_{CE}=2V, I_C=500mA$
$*h_{FE1}$	180	-	560	-	$V_{CE}=1V, I_C=100mA$
$*h_{FE2}$	120	-	-	-	$V_{CE}=1V, I_C=500mA$
$*h_{FE3}$	100	-	-	-	$V_{CE}=1V, I_C=800mA$
f _T	-	150	-	MHz	$V_{CE}=5V, I_E=50mA, f=100MHz$
C _{ob}	-	15	-	pF	$V_{CB}=10V, f=1MHz$

*Pulse Test : Pulse Width $\leq 380\mu s$, Duty Cycle $\leq 2\%$

Classification Of h_{FE2}

Rank	R	S
Range	180~390	270~560

Ordering Information

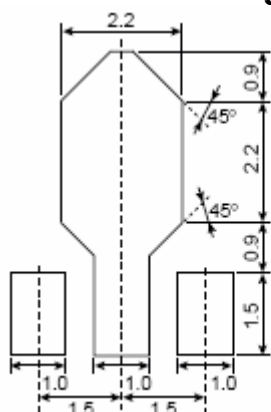
Device	Package	Shipping	Marking
BTC1664M3	SOT-89 (Pb-free lead plating package)	1000 pcs / Tape & Reel	BS

Moisture Sensitivity Level : Conform to JEDEC Level 3

Recommended Storage Condition:

Temperature : $\leq 30^{\circ}\text{C}$, Humidity : $\leq 60\% \text{ RH}$

Recommended soldering footprint

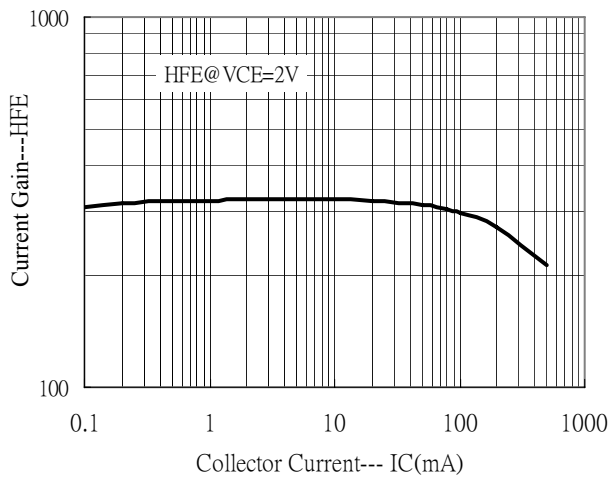


unit : mm

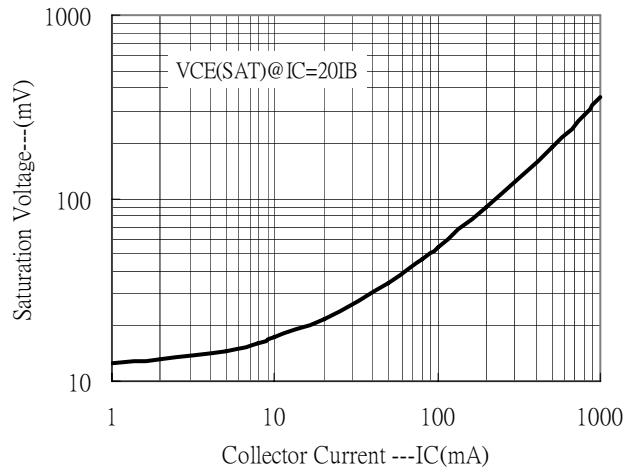


Typical Characteristics

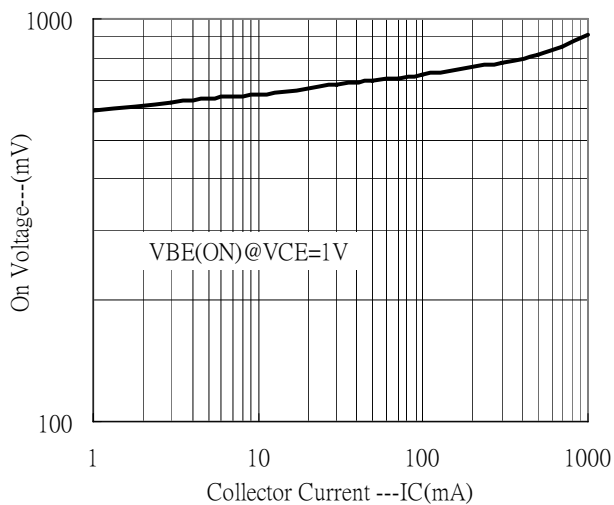
Current Gain vs Collector Current



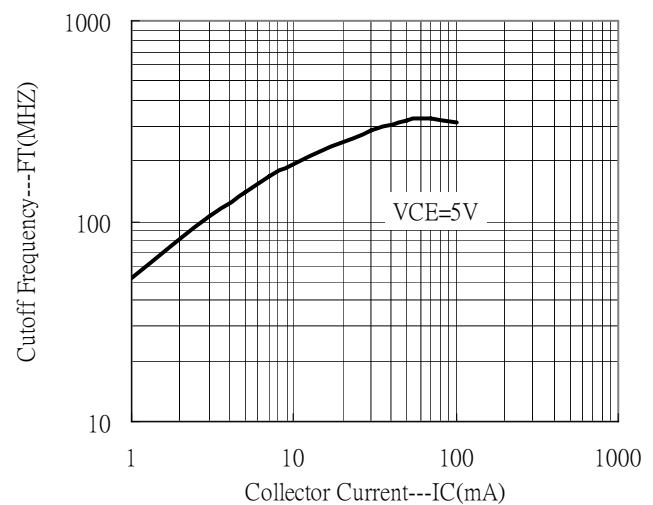
Saturation Voltage vs Collector Current



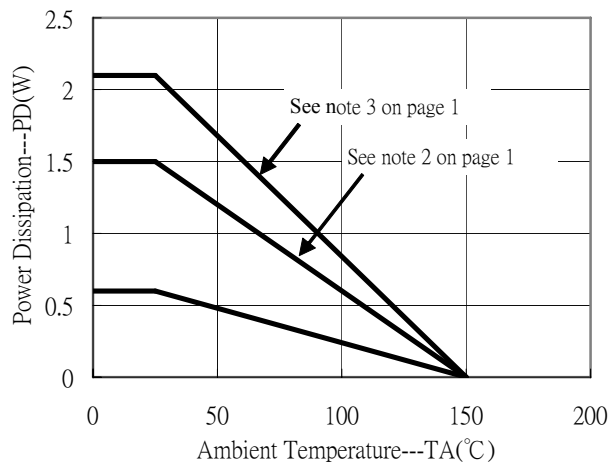
On Voltage vs Collector Current



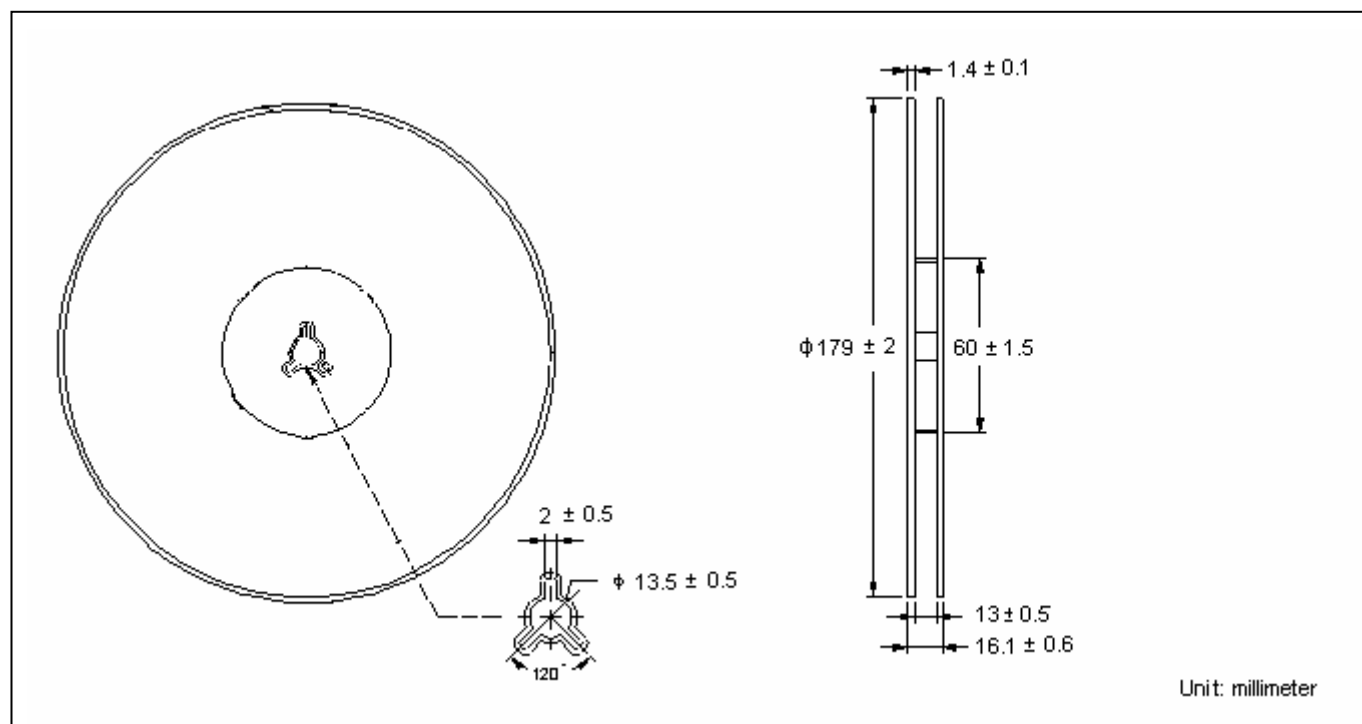
Cutoff Frequency vs Collector Current



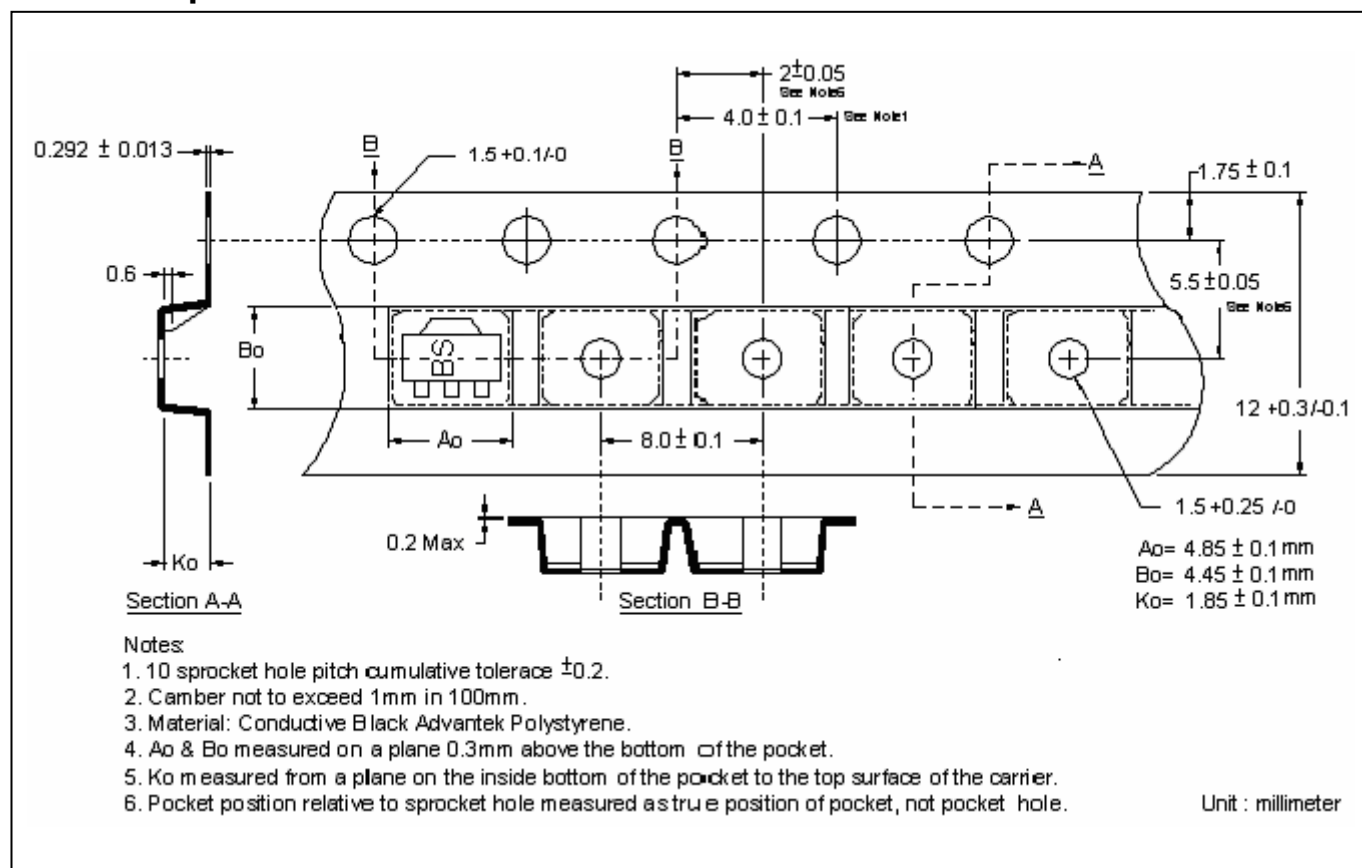
Power Derating Curves



Reel Dimension



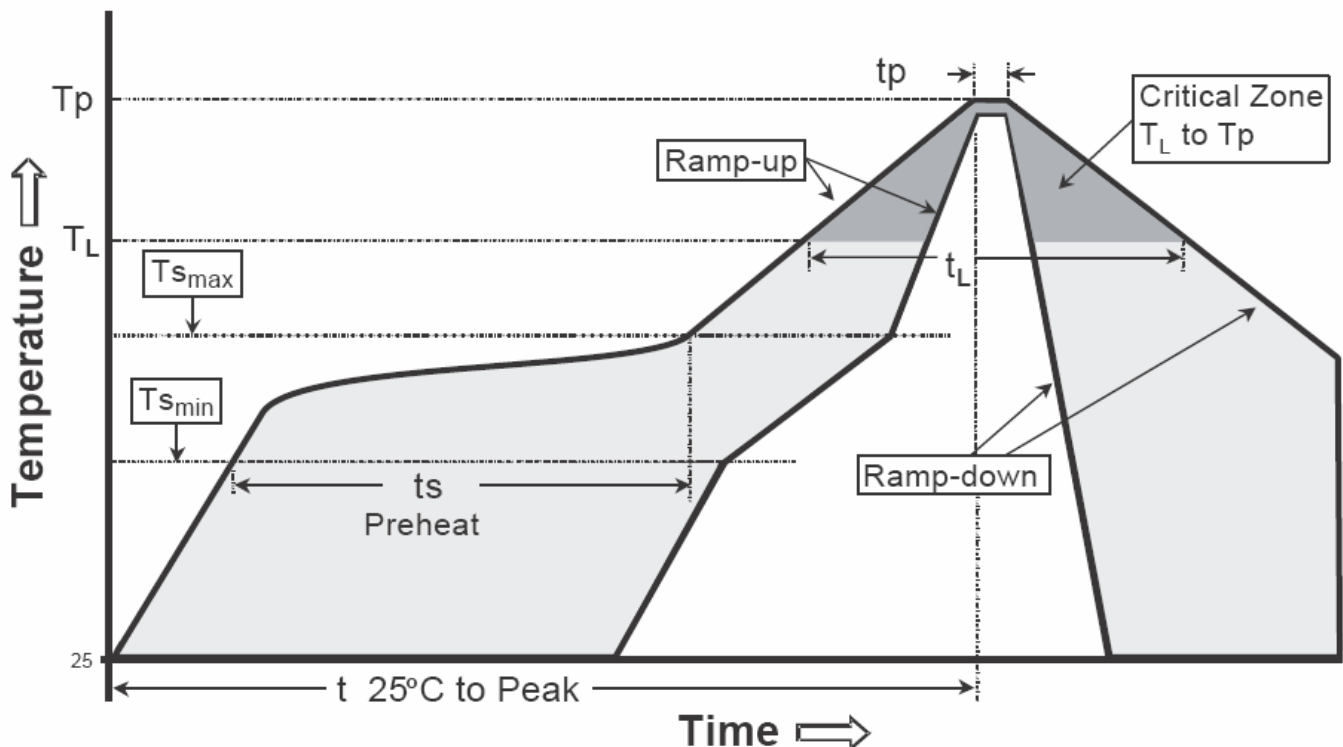
Carrier Tape Dimension



Recommended wave soldering condition

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

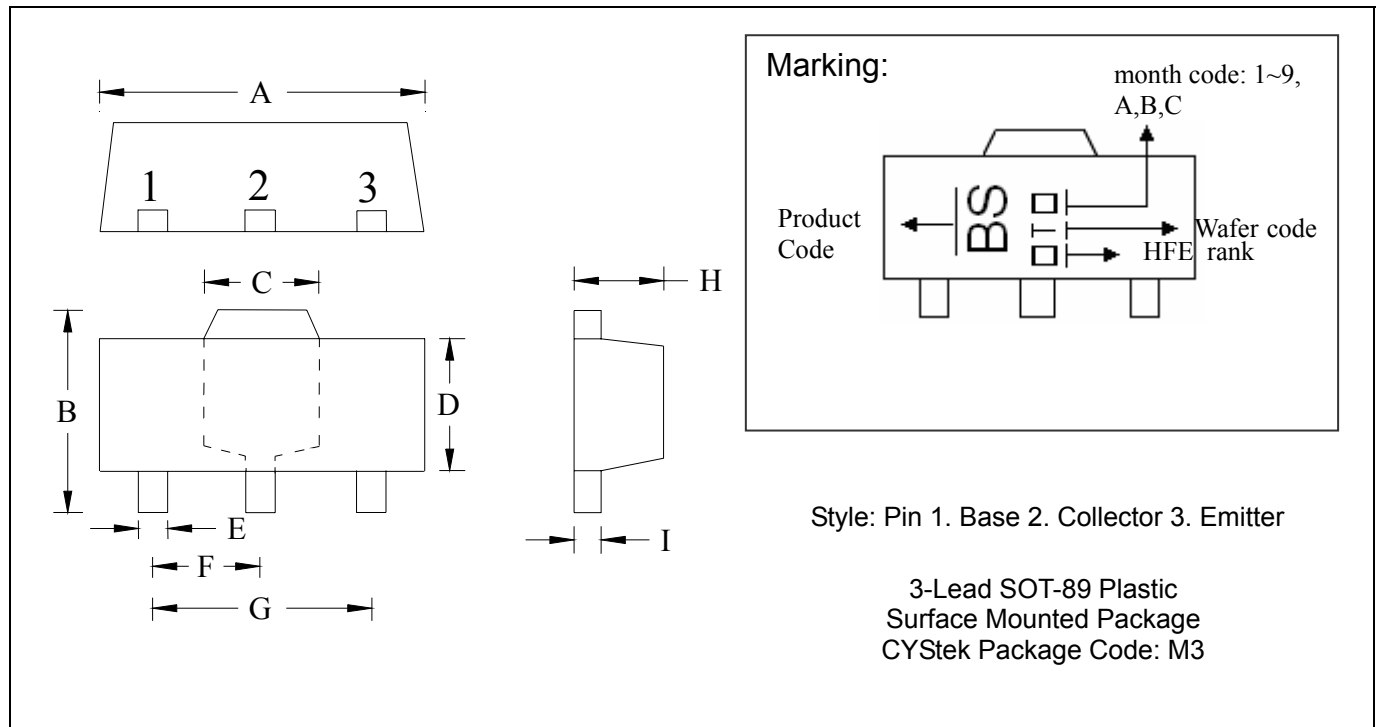
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _s max to T _p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T _s min)	100°C	150°C
-Temperature Max(T _s max)	150°C	200°C
-Time(t _s min to t _s max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T _L)	183°C	217°C
- Time (t _L)	60-150 seconds	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.

SOT-89 Dimension



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1732	0.1811	4.40	4.60	F	0.0591	TYP	1.50	TYP
B	0.1551	0.1673	3.94	4.25	G	0.1181	TYP	3.00	TYP
C	0.0610	REF	1.55	REF	H	0.0551	0.0630	1.40	1.60
D	0.0906	0.1024	2.30	2.60	I	0.0138	0.0173	D	0.0906
E	0.0126	0.0205	0.32	0.52					

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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