

General Purpose NPN Epitaxial Planar Transistor

BTD1768S3

BV_{CEO}	80V
I_C	1A
$R_{CESAT(MAX)}$	0.5 Ω

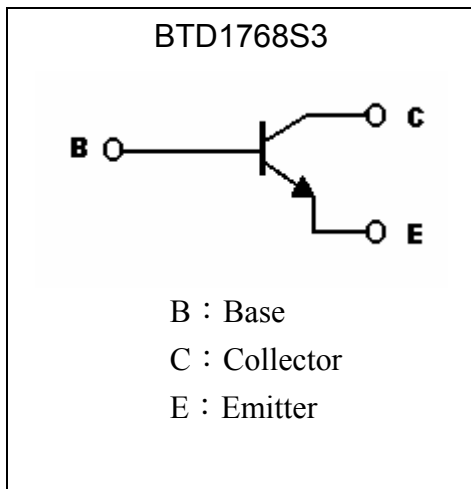
Description

The BTD1768S3 is designed for use in driver and output stages of AF amplifier and general purpose application.

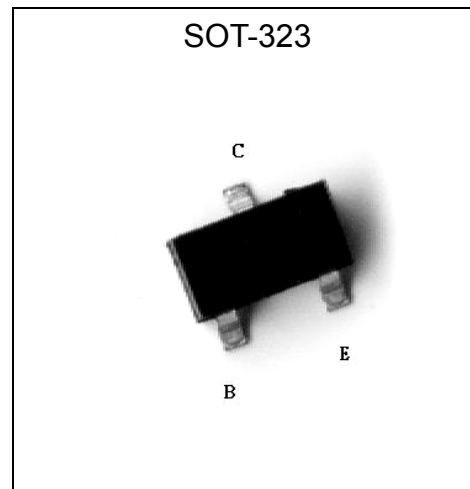
Features

- Low collector saturation voltage
- High breakdown voltage, $V_{CEO}=80V$ (min.)
- High collector current, $I_{C(max)}=1A$ (DC)
- Pb-free package

Symbol



Outline



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	180	V
Collector-Emitter Voltage	V_{CEO}	80	V
Emitter-Base Voltage	V_{EBO}	7	V
Collector Current (DC)	I_C	1	A
Collector Current (Pulse)	I_{CP}	2 (Note)	A
Power Dissipation	P_D	200	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	625	°C/W
Operating Junction Temperature Range	T_j	-55~+150	°C
Storage Temperature	T_{stg}	-55~+150	°C

Note : Pulse test, $P_w \leq 10ms$, Duty $\leq 2\%$.

**Characteristics (Ta=25°C)**

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	180	-	-	V	$I_C=50\mu A$
BV_{CEO}	80	-	-	V	$I_C=1mA$
BV_{EBO}	7	-	-	V	$I_E=50\mu A$
I_{CBO}	-	-	100	nA	$V_{CB}=180V, I_E=0$
I_{EBO}	-	-	100	nA	$V_{EB}=7V, I_C=0$
* $V_{CE(SAT)1}$	-	0.15	0.3	V	$I_C=500mA, I_B=20mA$
* $V_{CE(SAT)2}$	-	0.3	0.5	V	$I_C=1A, I_B=50mA$
* $V_{BE(SAT)}$	-	0.96	1.2	V	$I_C=1A, I_B=50mA$
* $V_{BE(ON)}$	0.6	0.66	0.7	V	$V_{CE}=2V, I_C=50mA$
* h_{FE1}	180	-	560	-	$V_{CE}=2V, I_C=100mA$
* h_{FE2}	60	-	-	-	$V_{CE}=2V, I_C=500mA$
* h_{FE3}	20	-	-	-	$V_{CE}=2V, I_C=1A$
f_T	-	250	-	MHz	$V_{CE}=10V, I_C=50mA, f=100MHz$
C_{ob}	-	6	15	pF	$V_{CB}=10V, I_E=0A, f=1MHz$

*Pulse Test: Pulse Width $\leq 380\mu s$, Duty Cycle $\leq 2\%$ **Classification Of h_{FE1}**

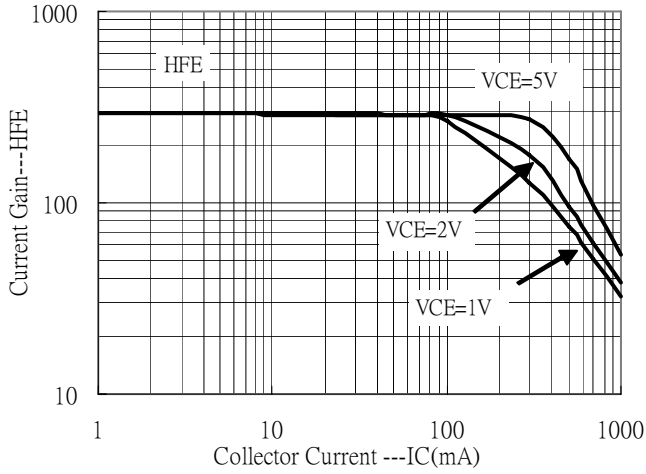
Rank	R	S
Range	180~390	270~560

Ordering Information

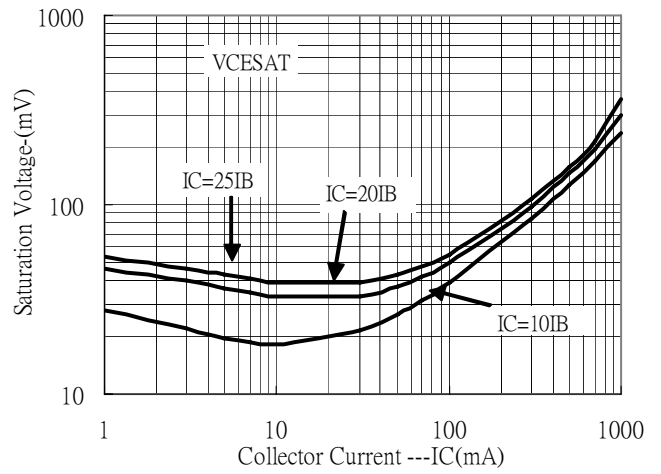
Device	Package	Shipping
BTD1768S3	SOT-323 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Characteristic Curves

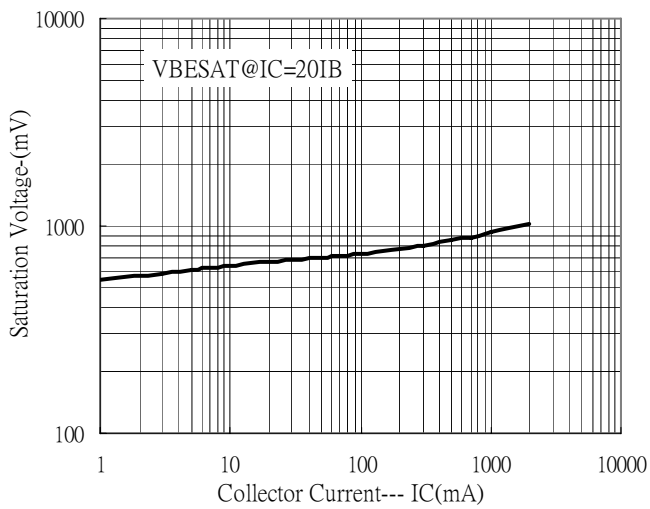
Current Gain vs Collector Current



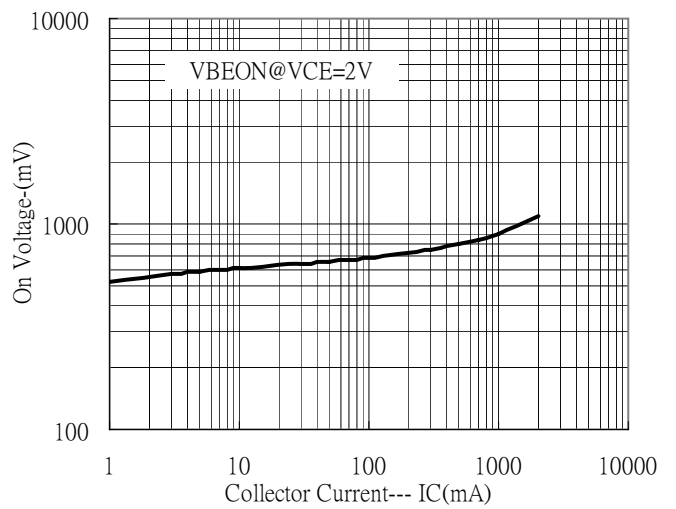
Saturation Voltage vs Collector Current



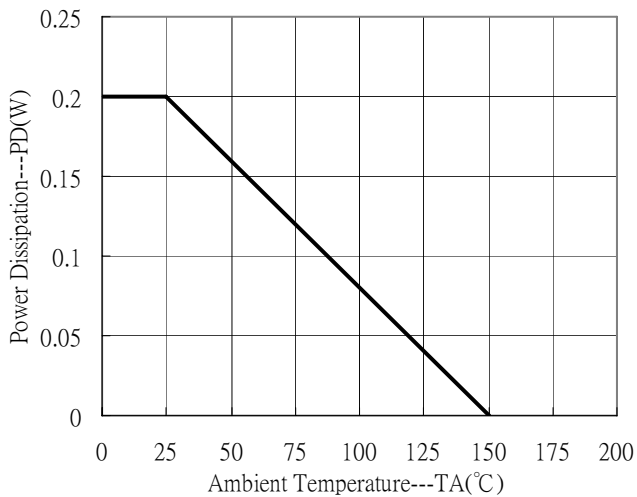
Saturation Voltage vs Collector Current



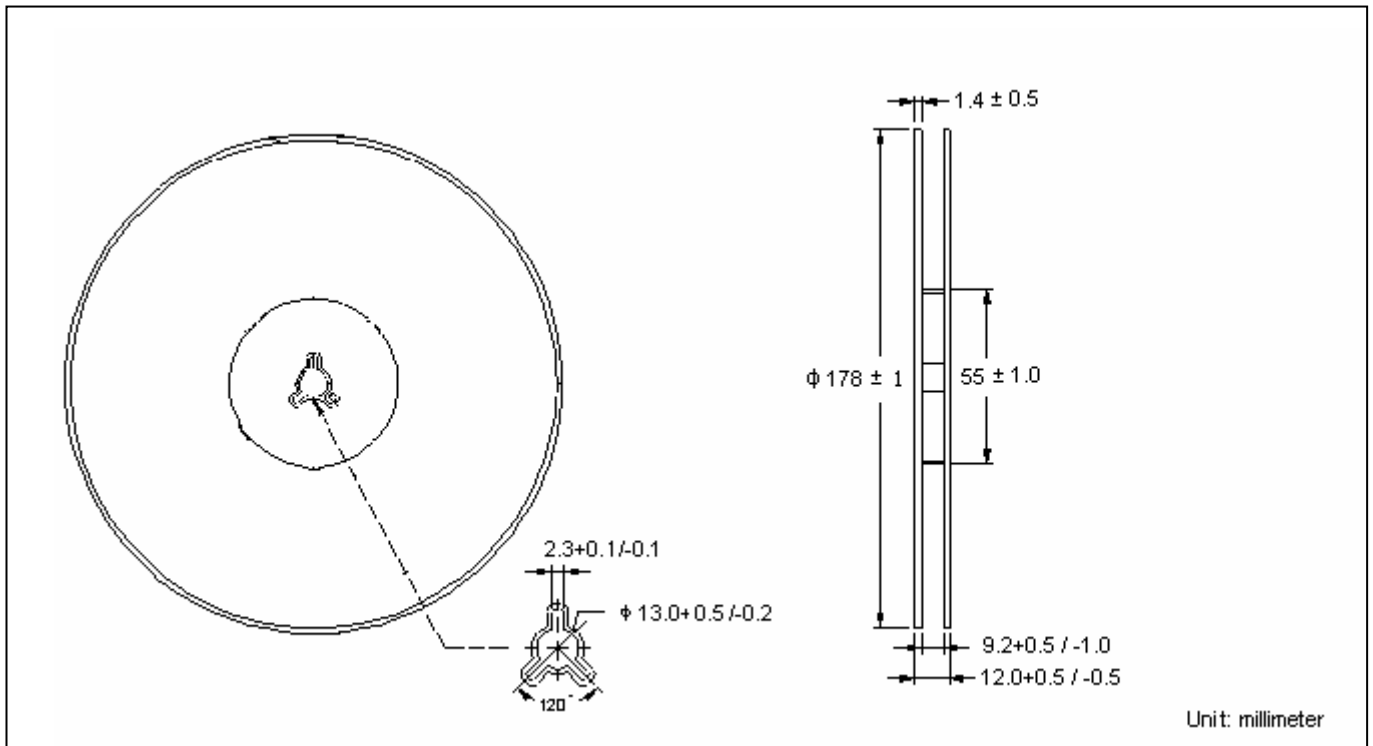
On Voltage vs Collector Current



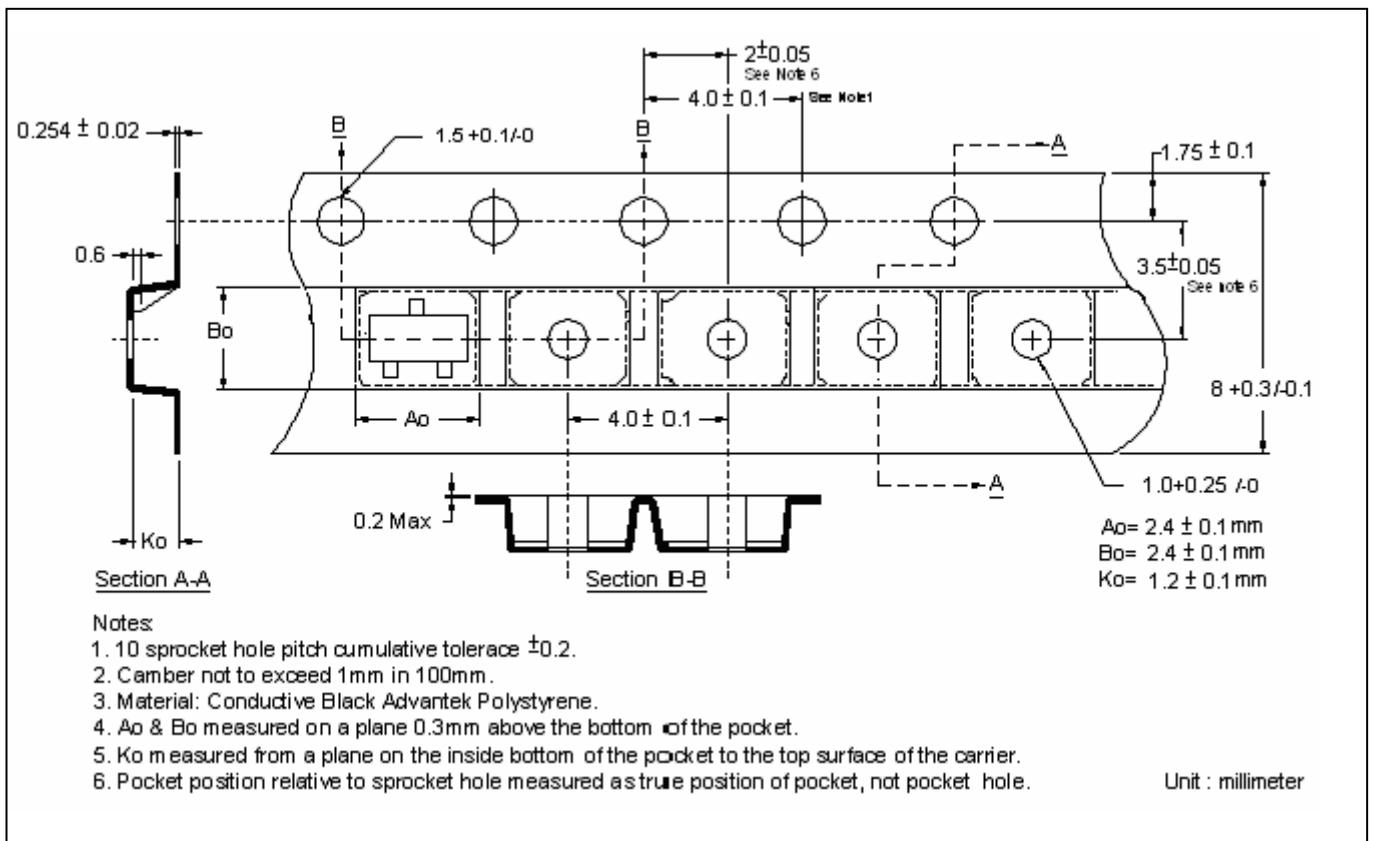
Power Derating Curve



Reel Dimension



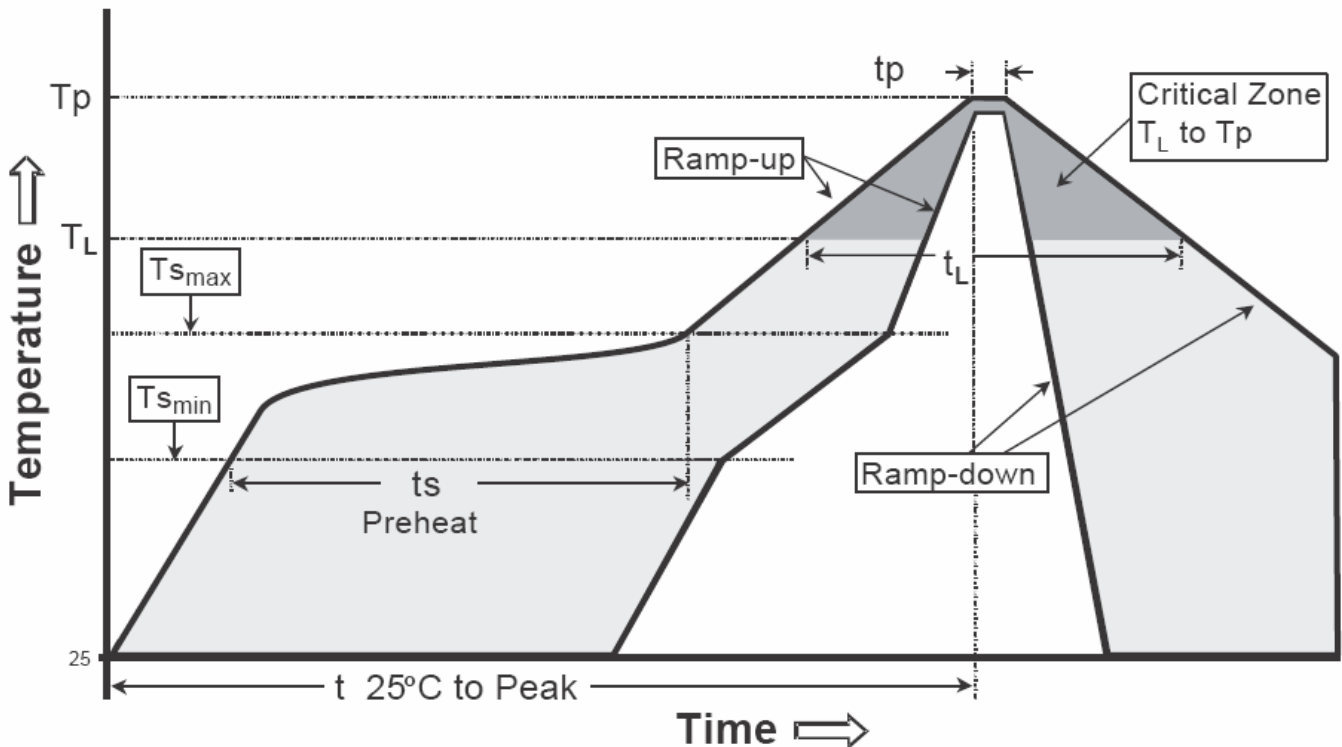
Carrier Tape Dimension



Recommended wave soldering condition

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

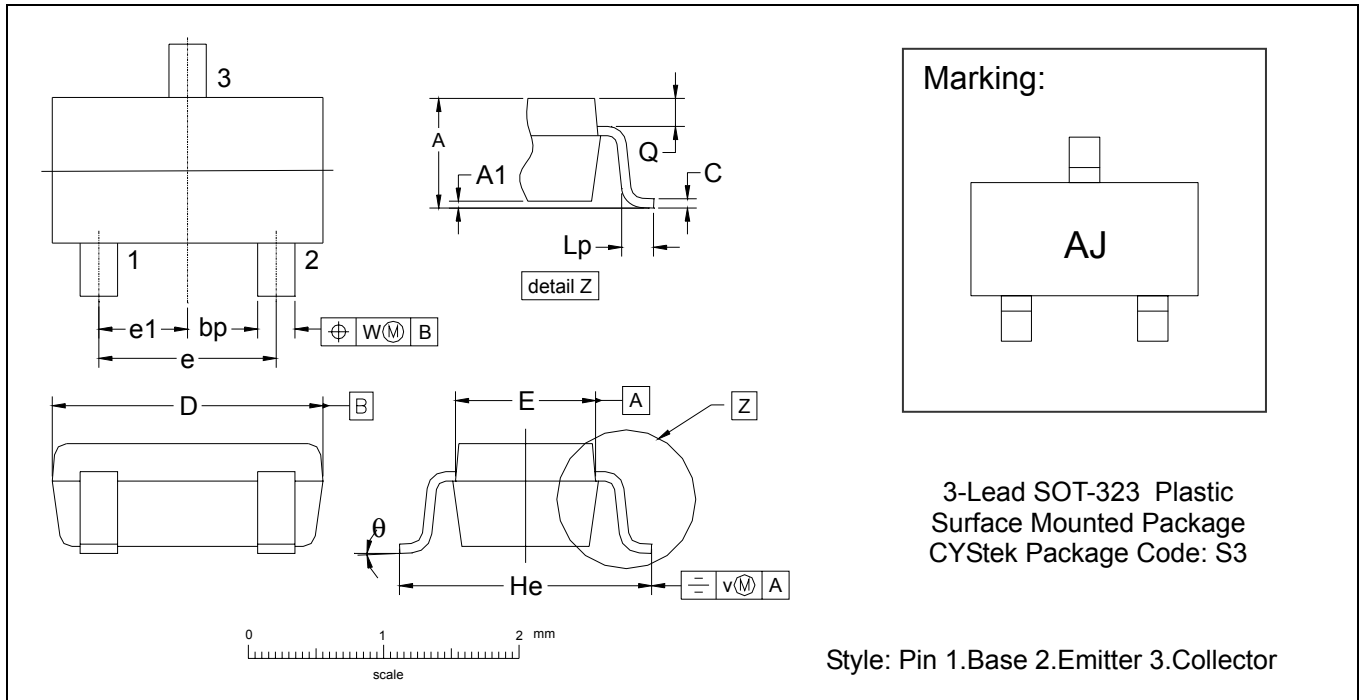
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmmax to Tp)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (Tl)	183°C	217°C
- Time (tl)	60-150 seconds	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-323 Dimension



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0315	0.0433	0.80	1.10	e1	0.0256	-	0.65	-
A1	0.0000	0.0039	0.00	0.10	He	0.0787	0.0886	2.00	2.25
bp	0.0118	0.0157	0.30	0.40	Lp	0.0059	0.0177	0.15	0.45
C	0.0039	0.0098	0.10	0.25	Q	0.0051	0.0091	0.13	0.23
D	0.0709	0.0866	1.80	2.20	v	0.0079	-	0.2	-
E	0.0453	0.0531	1.15	1.35	w	0.0079	-	0.2	-
e	0.0512	-	1.3	-	θ	-	-	10°	0°

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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