

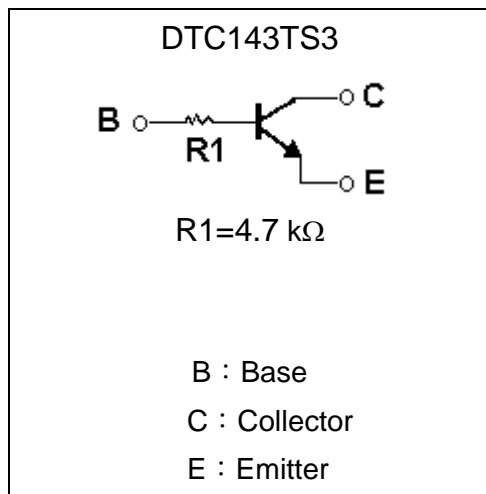
General Purpose NPN Digital Transistors (Built-in Resistors)

DTC143TS3

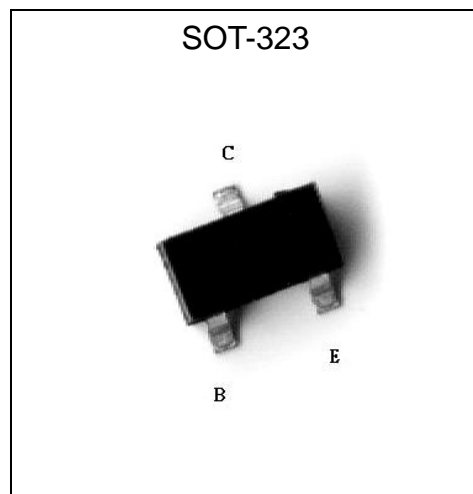
Features

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
- The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
- Only the on/off conditions need to be set for operation, making device design easy.
- Complements the DTA143TS3

Equivalent Circuit

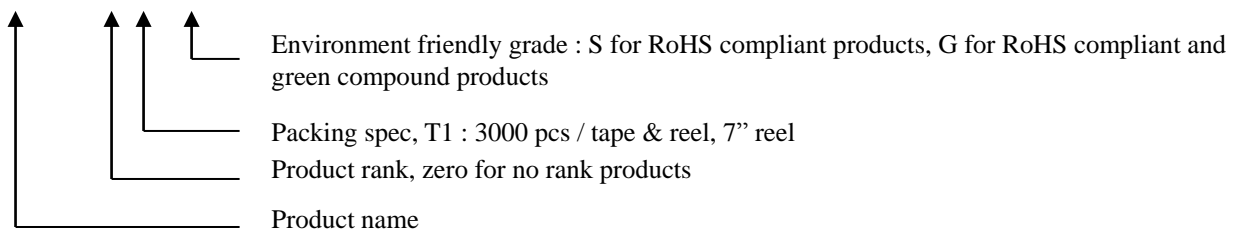


Outline



Ordering Information

| Device | Package | Shipping |
|------------------|--|------------------------|
| DTC143TS3-0-T1-G | SOT-323 (Pb-free lead plating and halogen-free package) | 3000 pcs / Tape & Reel |



**Absolute Maximum Ratings** (Ta=25°C)

| Parameter | Symbol | Limits | Unit |
|--------------------------------------|------------------|----------|------|
| Collector-Base Voltage | V _{CBO} | 50 | V |
| Collector-Emitter Voltage | V _{CEO} | 50 | V |
| Emitter-Base Voltage | V _{EBO} | 5 | V |
| Collector Current | I _C | 100 | mA |
| Power Dissipation | P _D | 200 | mW |
| Operating Junction Temperature Range | T _j | -55~+150 | °C |
| Storage Temperature Range | T _{stg} | -55~+150 | °C |

Thermal Data

| Parameter | Symbol | Value | Unit |
|--|---------------------|-------|------|
| Thermal Resistance, Junction-to-ambient, max | R _{th,j-a} | 625 | °C/W |

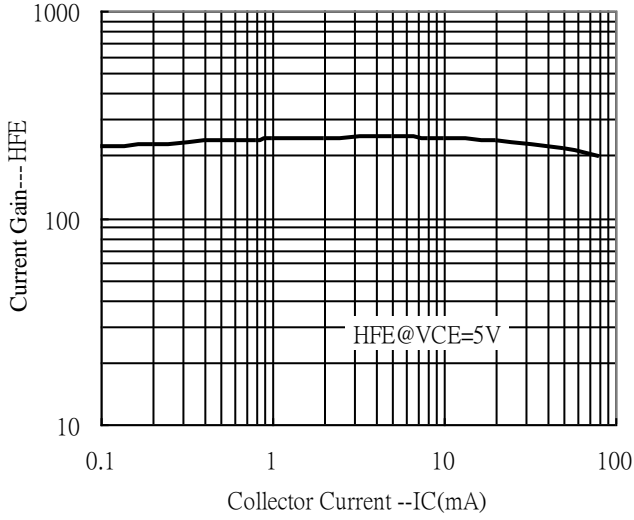
Electrical Characteristics (Ta=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|--------------------------------------|----------------------|------|------|------|------|---|
| Collector-Base Breakdown Voltage | V _{CBO} | 50 | - | - | V | I _C =50μA |
| Collector-Emitter Breakdown Voltage | V _{CEO} | 50 | - | - | V | I _C =1mA |
| Emitter-Base Breakdown Voltage | V _{EBO} | 5 | - | - | V | I _E =50μA |
| Collector-Base Cutoff Current | I _{CBO} | - | - | 0.5 | μA | V _{CB} =50V |
| Emitter-Base Cutoff Current | I _{EBO} | - | - | 0.5 | μA | V _{EB} =4V |
| Collector-Emitter Saturation Voltage | V _{CE(sat)} | - | - | 0.3 | V | I _C =5mA, I _B =0.25mA |
| DC Current Gain | h _{FE} | 100 | - | 600 | - | V _{CE} =5V, I _C =1mA |
| Input Resistance | R | 3.29 | 4.7 | 6.11 | kΩ | - |
| Transition Frequency | f _T | - | 250 | - | MHz | V _{CE} =10V, I _C =5mA, f=100MHz * |

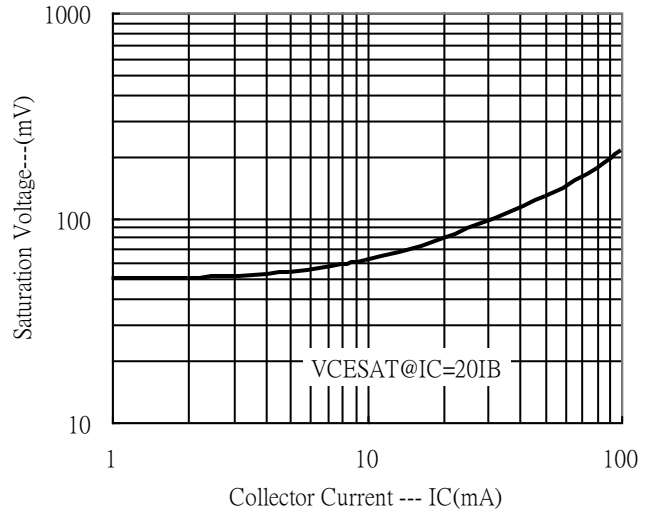
* Transition frequency of the device

Typical Characteristics

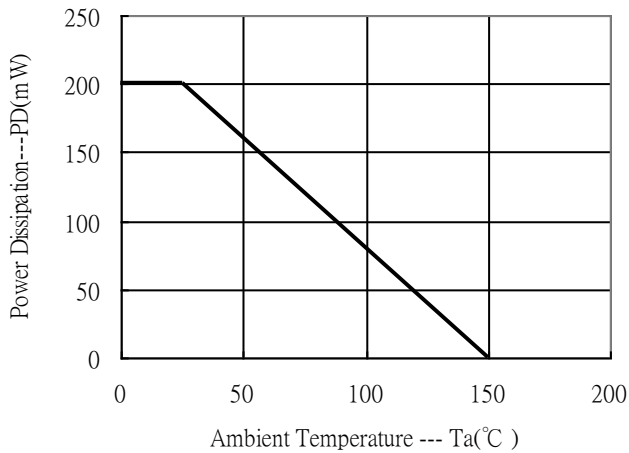
Current Gain vs Collector Current



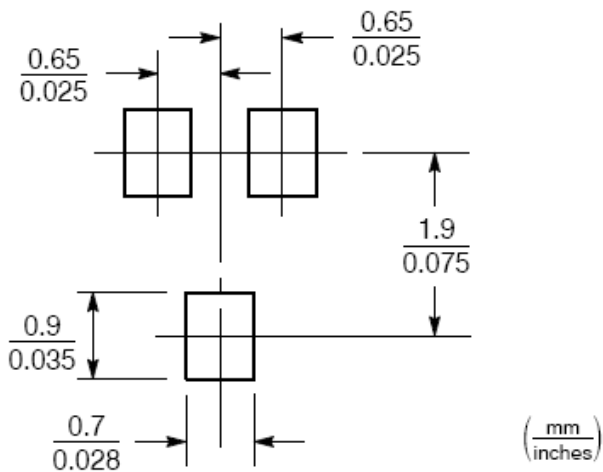
Saturation Voltage vs Collector Current



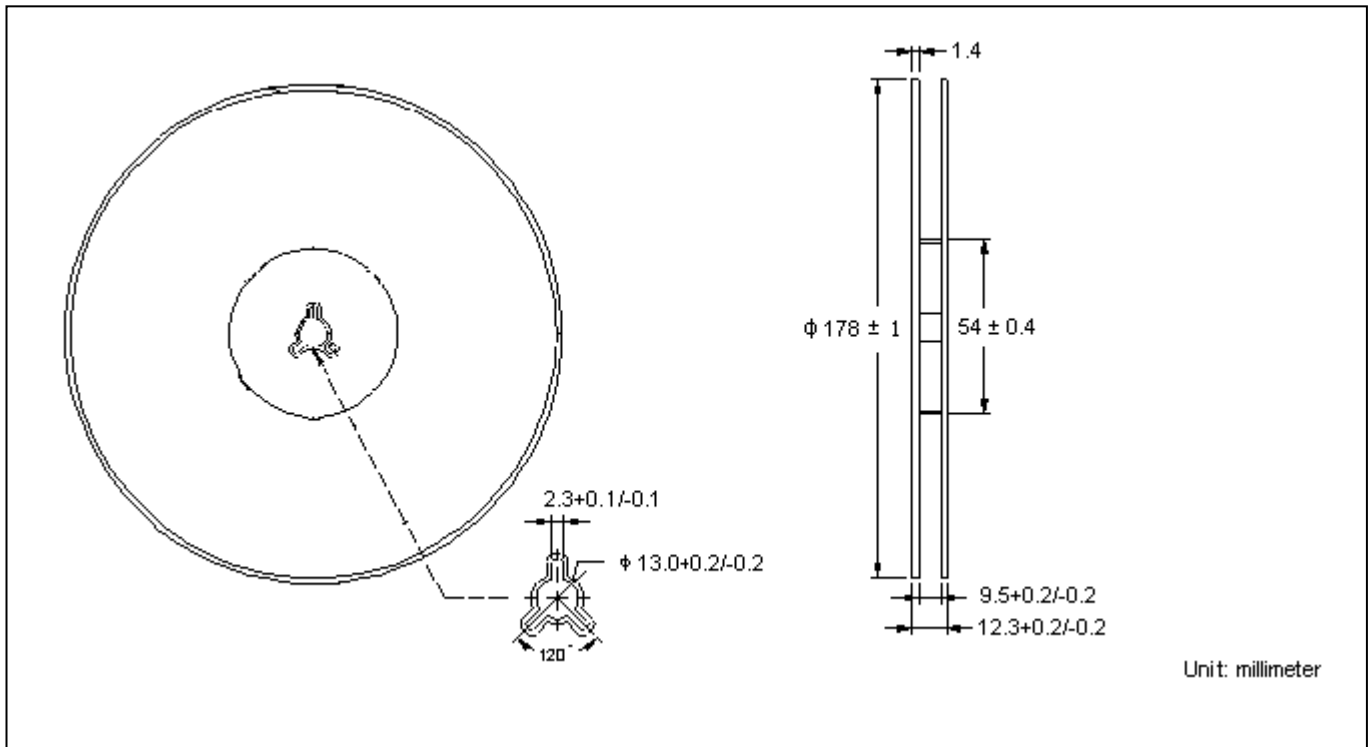
Power Derating Curve



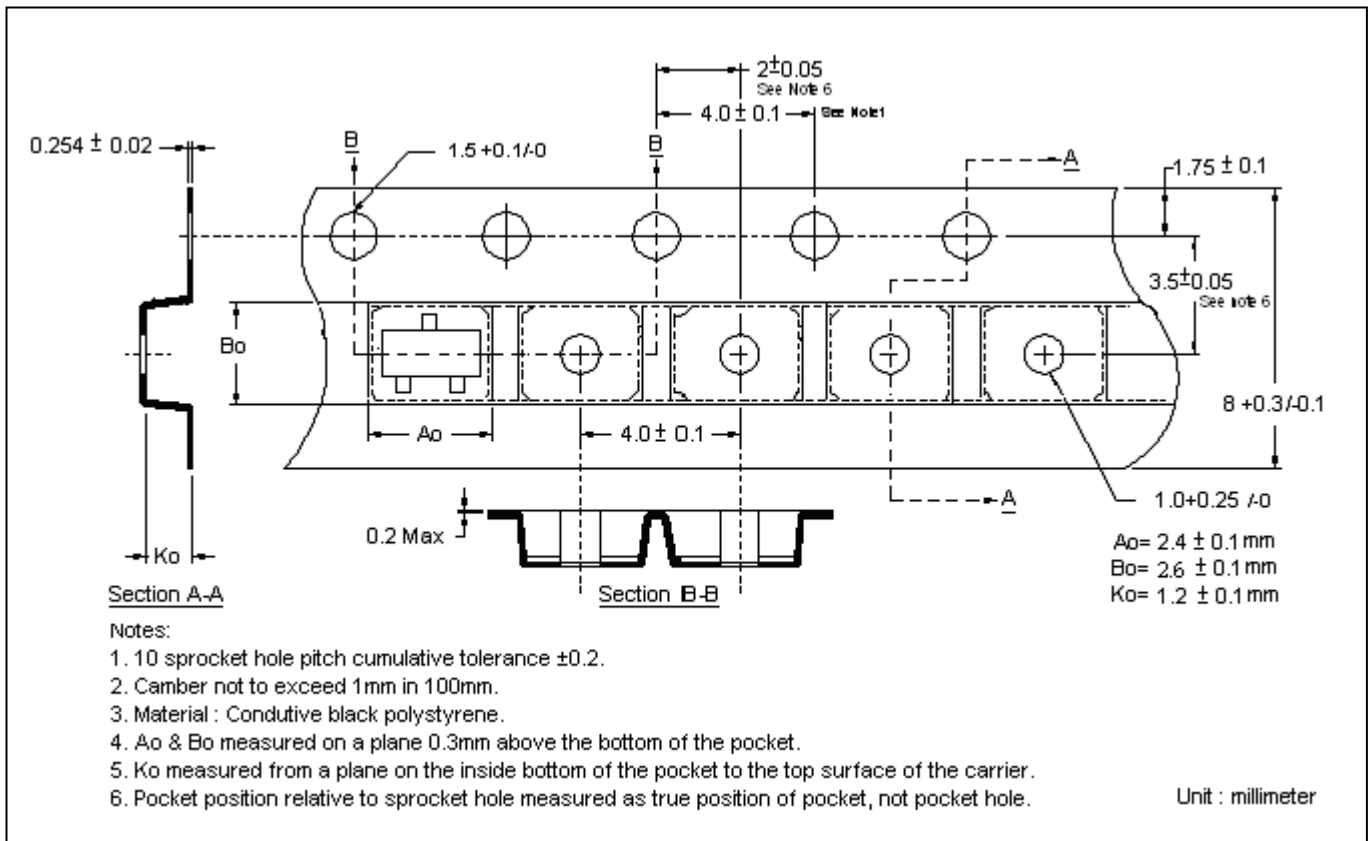
Recommended Soldering Footprint



Reel Dimension



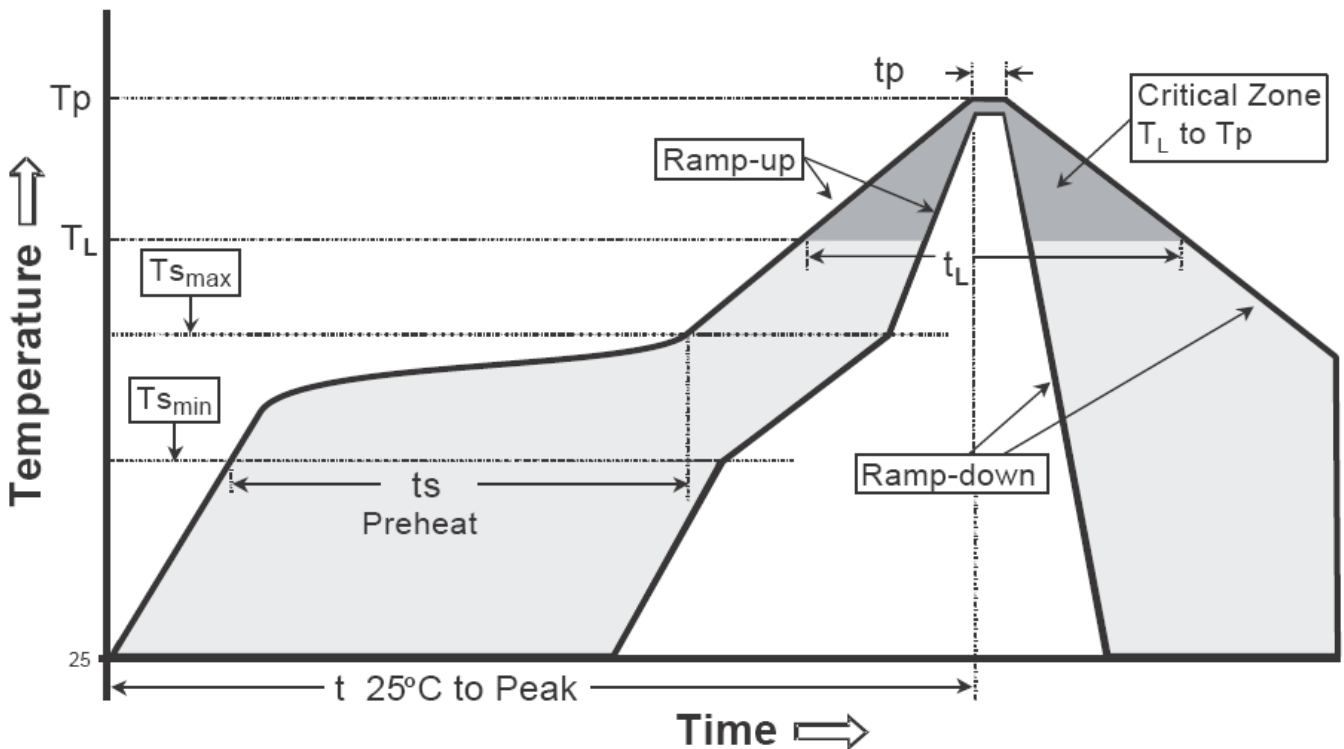
Carrier Tape Dimension



Recommended wave soldering condition

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

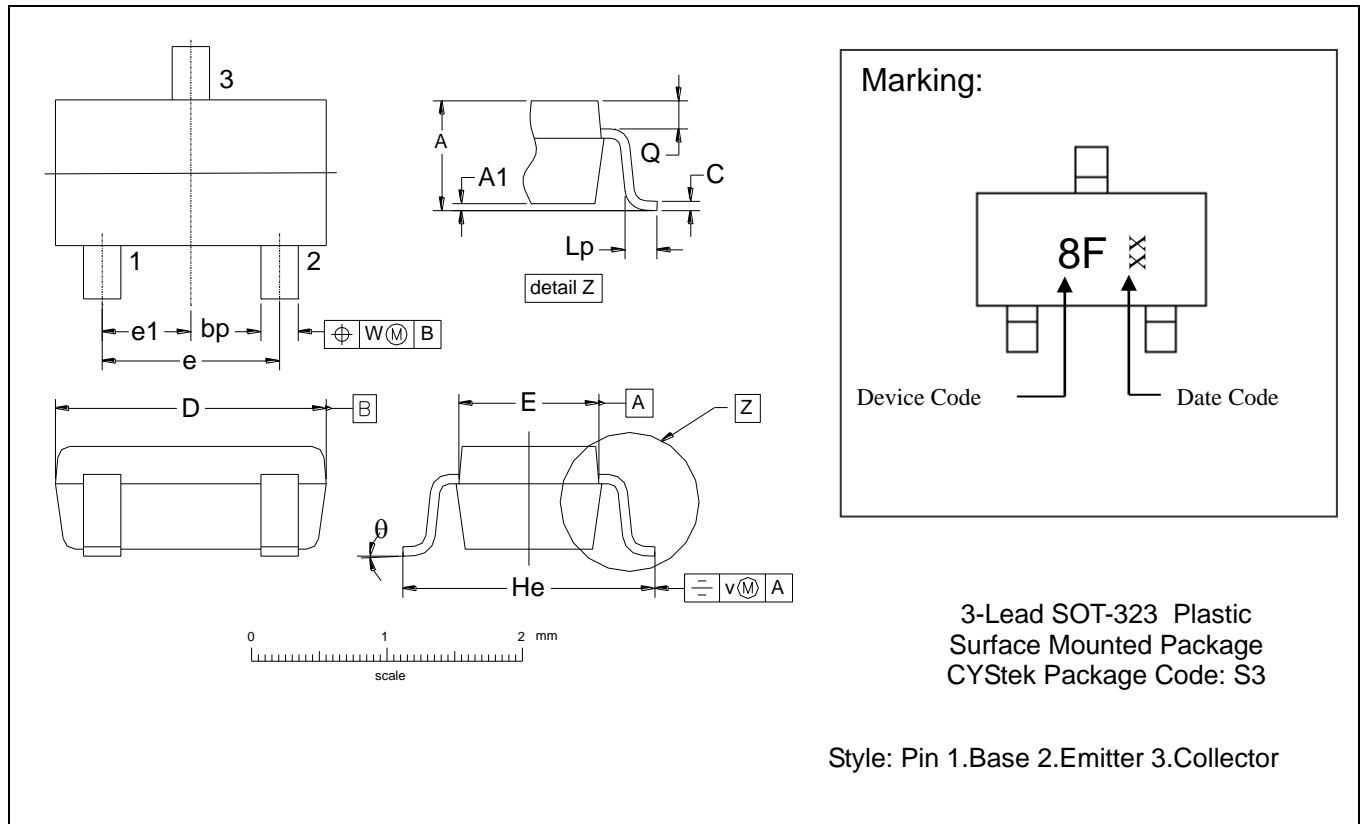
Recommended temperature profile for IR reflow



| Profile feature | Sn-Pb eutectic Assembly | Pb-free Assembly |
|---|-------------------------|------------------|
| Average ramp-up rate (T _{smax} 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-323 Dimension



*: Typical

| 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 | 0.0846 | 0.0965 | 2.15 | 2.45 |
| bp | 0.0078 | 0.0157 | 0.20 | 0.40 | Lp | 0.0105 | 0.0181 | 0.26 | 0.46 |
| C | 0.0031 | 0.0059 | 0.08 | 0.15 | 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 | 0.0472 | 0.0551 | 1.20 | 1.40 | θ | 0° | 8° | 0° | 8° |

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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