Surface Mount Transient Voltage Suppressors
Peak Pulse Power 350W

ESRN03B01S2

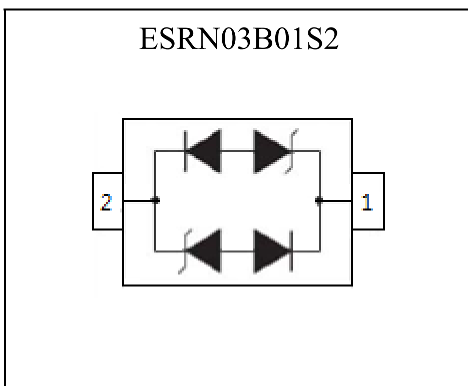
Features

- Bidirectional unit
- 350W peak pulse power capability per line with a 8/20μs waveform
- Protects one power or I/O port
- Pb-free lead plating and halogen-free package
- Transient protection for data line to
  IEC61000-4-2 (ESD) ±15kV(air) ±8kV (contact)
- Replacement for MLV (0805)
- Low clamping voltage
- Ultra low capacitance
- Low leakage current

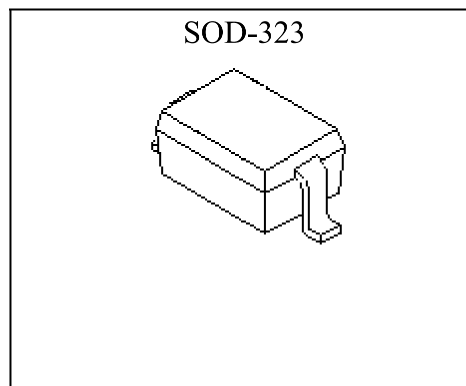
Mechanical Data

- Case : SOD-323, Molded plastic
- Terminals: Pure tin plated, solderable per MIL-STD-750 method 2026
- Mounting position : Any
- Epoxy: UL 94V-0 rate flame retardant

Equivalent Circuit

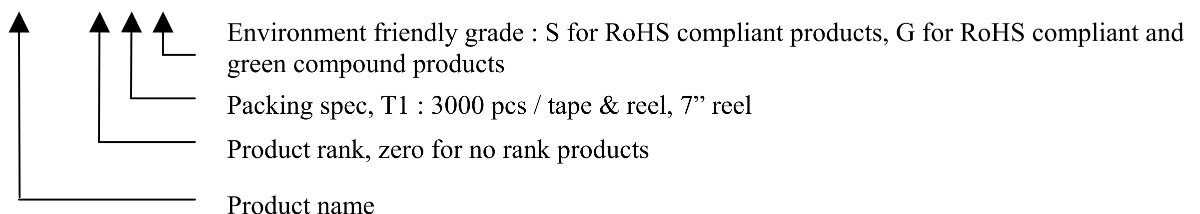


Outline



Ordering Information

Device	Package	Shipping
ESRN03B01S2-0-T1-G	SOD-323 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel



Maximum Ratings and Characteristics(T_A=25°C, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation with a 8/20μs waveform (Note 1)	P_{PP}	350	W
ESD voltage (HBM waveform per IE C61000-4-2)	V_{ESD}	30	kV
Peak forward surge current, 8.3ms single half sine wave uni-directional only (Note 2)	I_{FSM}	6	A
Typical thermal resistance, junction to ambient air (Note 3)	R_{thJA}	500	°C /W
Typical thermal resistance, junction to case	R_{thJC}	300	
Power dissipation	P_D	0.25	W
Operating junction and storage temperature range	T_J;T_{STG}	-55 ~ +150	°C

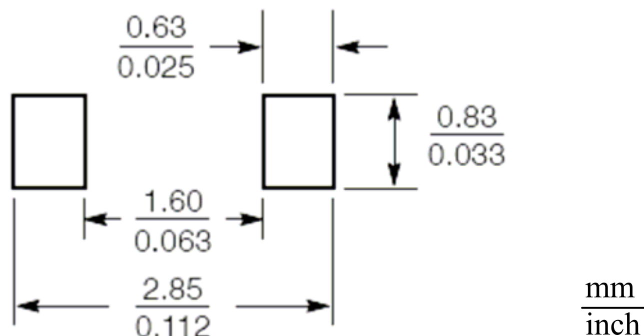
Notes:

1. Non-repetitive current pulse, per Fig. 5 and derated above T_A=25°C per Fig. 1.
2. Mounted on 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.
3. Mounted on PCB with 10mm x 10 mm x 2mm Cu pads to each terminal.

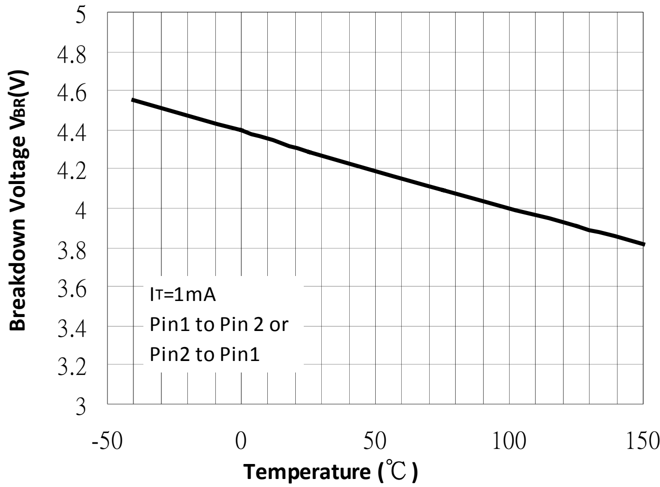
Electrical Characteristics Ratings at 25℃ ambient temperature, unless otherwise noted.

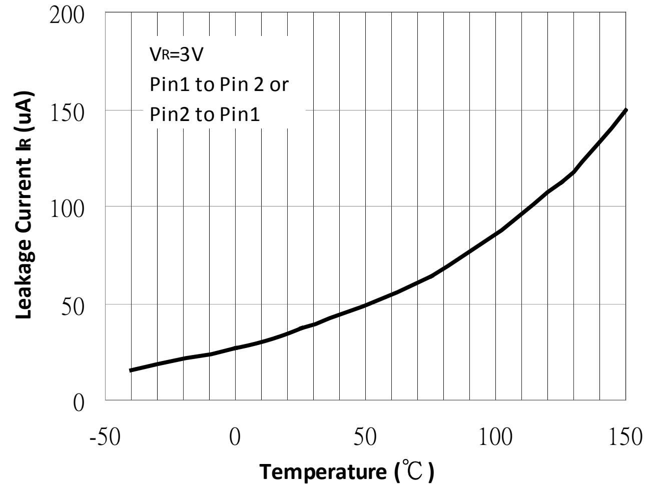
Characteristic	Symbol	Condition	Min.	Typ	Max.	Unit
Reverse Stand-off Voltage	V_{RWM}		-	-	3	V
Reverse Breakdown Voltage	V_{BR}	I_T=1mA	3.3	3.8	4.5	
Reverse Leakage Current	I_R	V_{RWM}=3V	-	-	1	μA
Clamping Voltage	V_C	I_{PP}=1A, tp=8/20μs	-	-	6.5	V
		I_{PP}=3A, tp=8/20μs	-	-	8.5	
		I_{PP}=8A, tp=8/20μs	-	-	13.9	
Junction Capacitance	Cj	V_R=0V, f=1MHz	-	1.6	3	pF

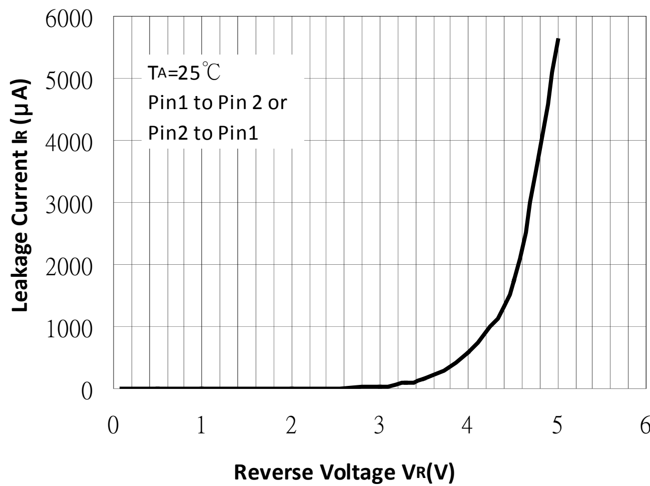
Recommended Footprint

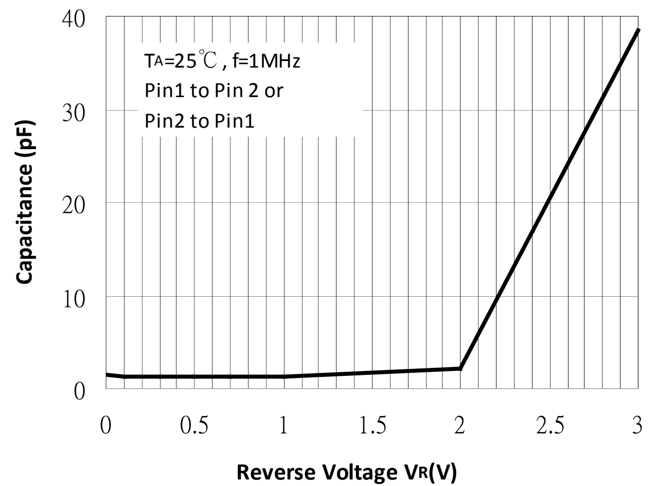


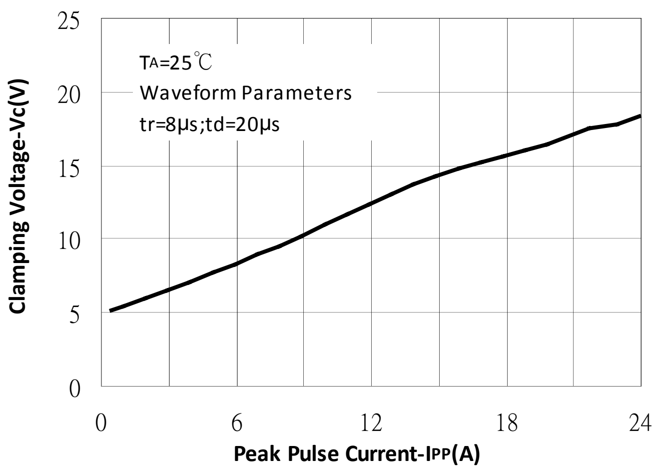
Typical Characteristics

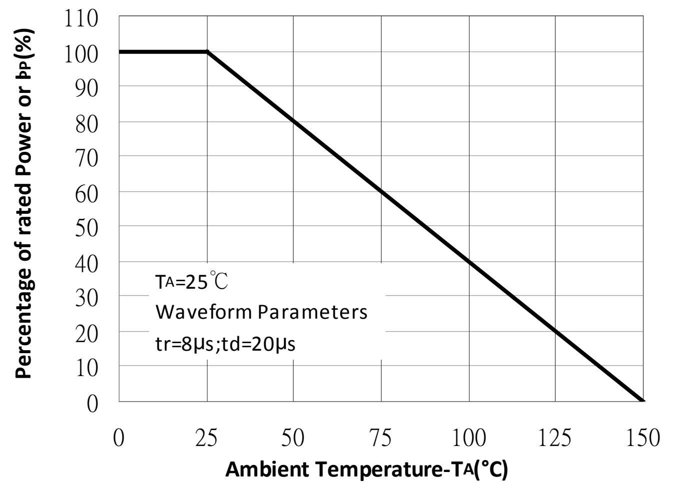




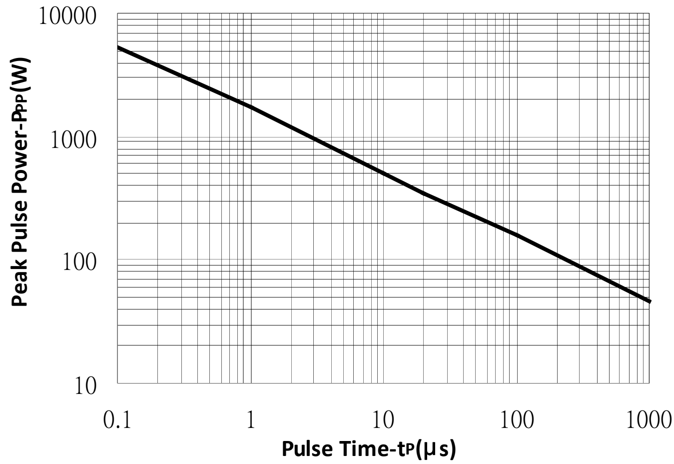


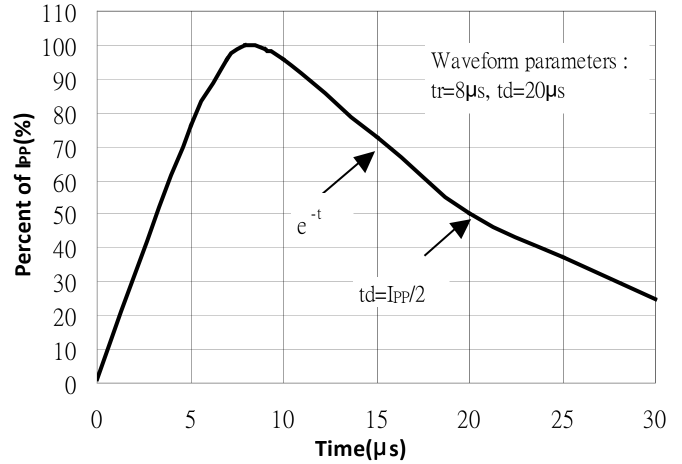




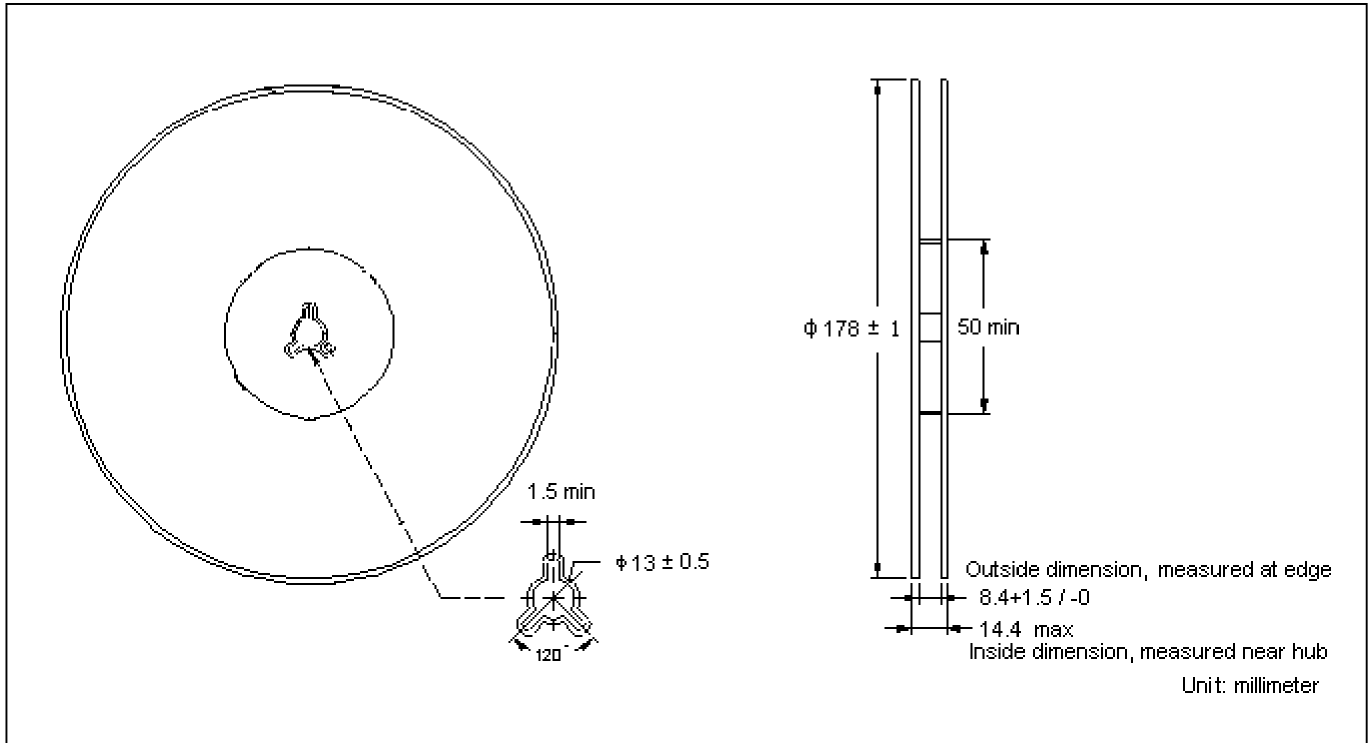


Typical Characteristics(Cont.)

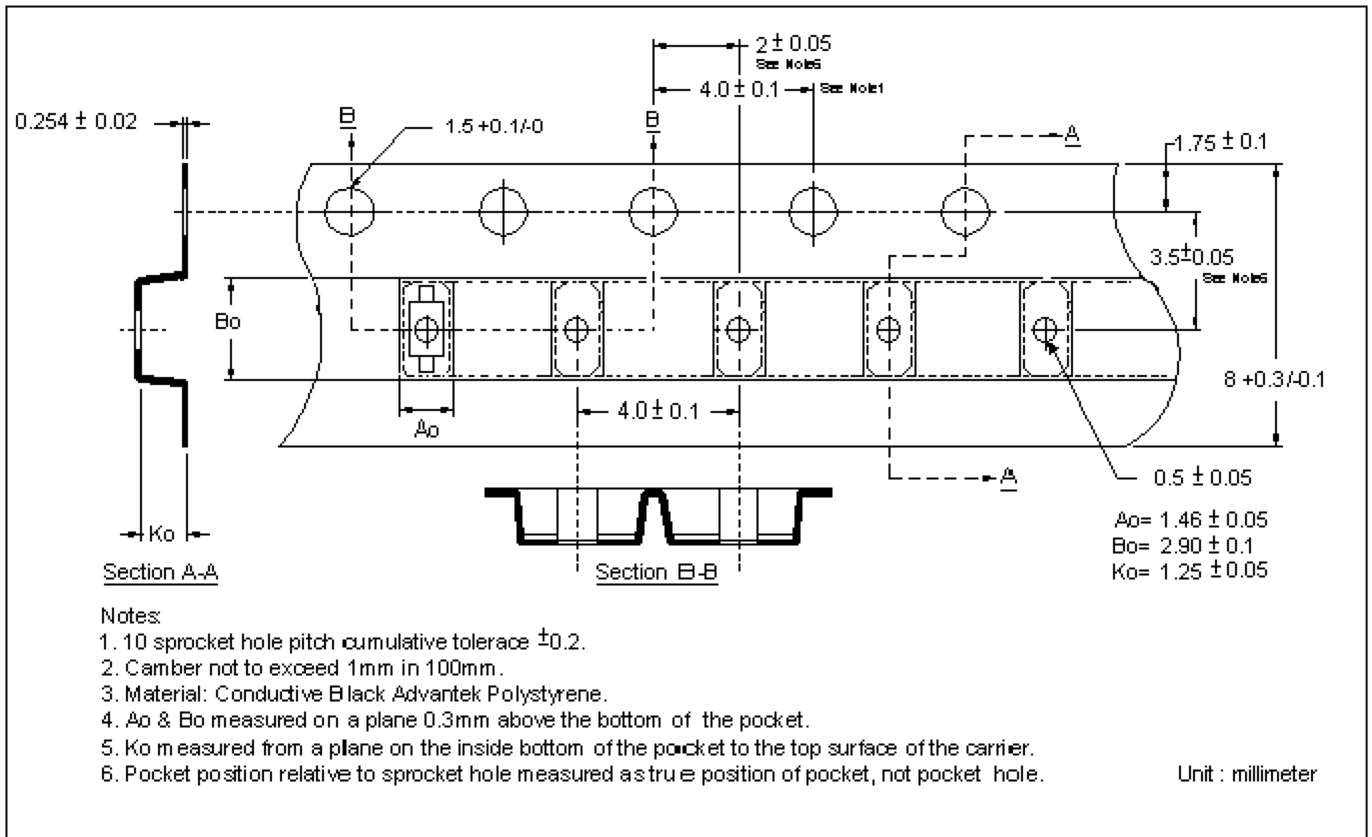




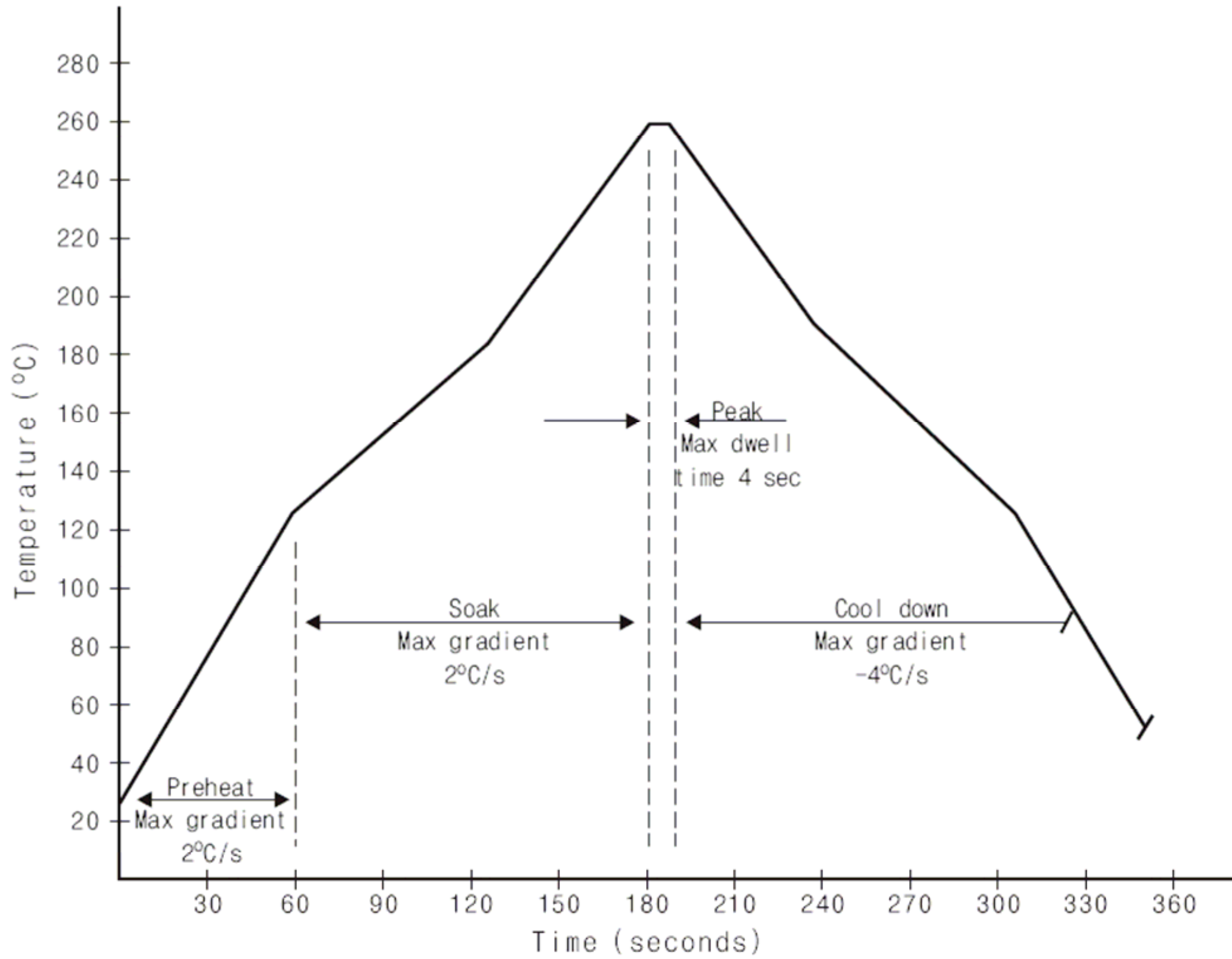
Reel Dimension



Carrier Tape Dimension



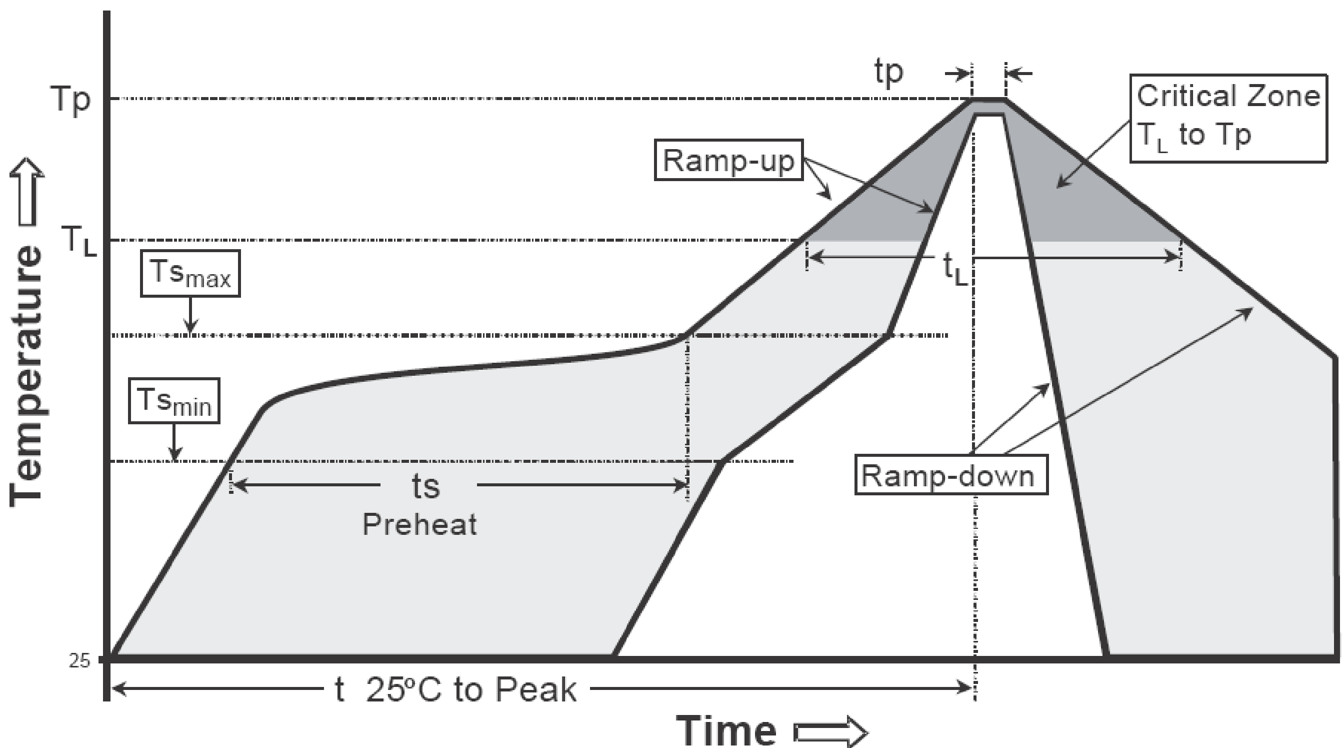
Recommended Wave Soldering Profile



Recommended wave soldering condition

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

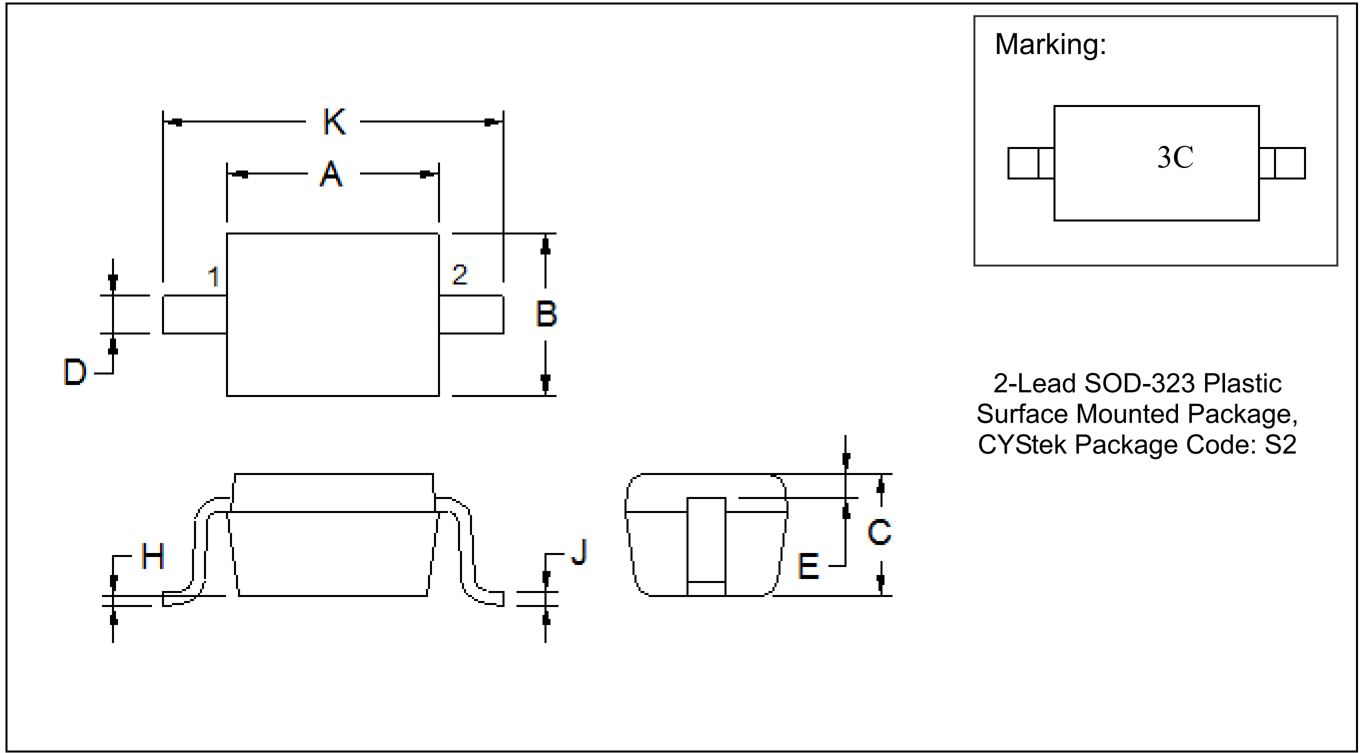
Recommended temperature profile for IR reflow



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(ts $_{min}$ to ts $_{max}$)	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.

SOD-323 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0630	0.0709	1.60	1.80	E	0.0060 REF		0.15 REF	
B	0.0453	0.0531	1.15	1.35	H	0.0000	0.0040	0.00	0.10
C	0.0315	0.0394	0.80	1.00	J	0.0035	0.0070	0.089	0.177
D	0.0098	0.0157	0.25	0.40	K	0.0906	0.1063	2.30	2.70

Notes: 1.Controlling dimension : millimeters.
2.Lead thickness specified per L/F drawing with solder plating.
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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