

Surface Mount Transient Voltage Suppressors
Peak Pulse Power 350W

ESRN03B01S2

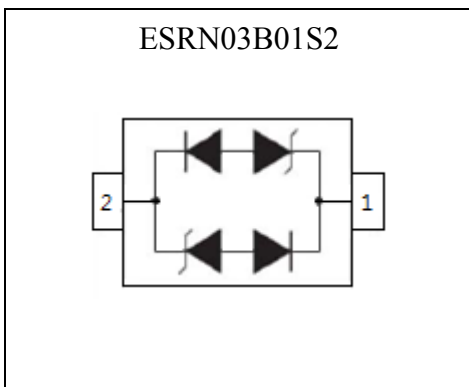
Features

- Bidirectional unit
- 350W peak pulse power capability per line with a 8/20 μ s 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) $\pm 15kV$ (air) $\pm 8kV$ (contact)
- Replacement for MLV (0805)
- Low clamping voltage
- Ultra low capacitance
- Low leakage current

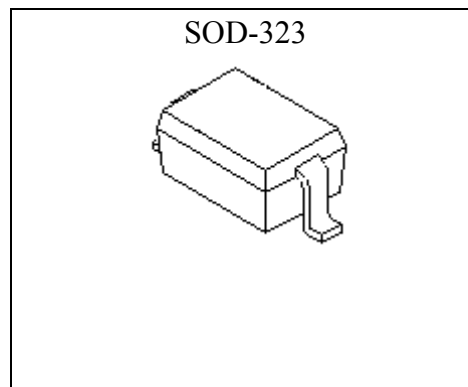
Mechanical Data

- 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

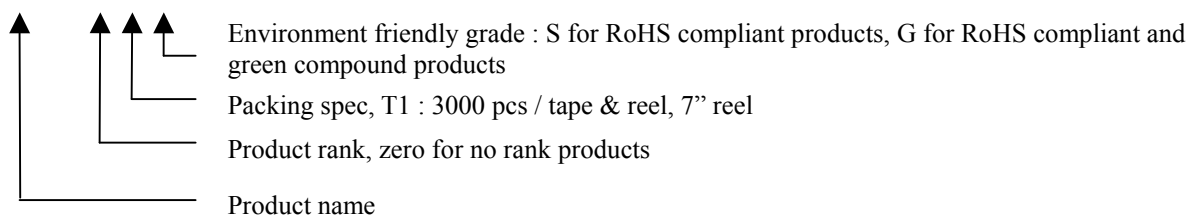


Outline



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 (TA=25°C, unless otherwise noted)

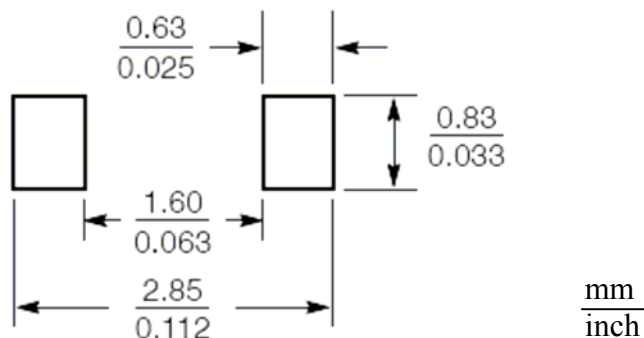
Parameter	Symbol	Value	Unit
Peak pulse power dissipation with a 8/20μs waveform (Note 1)	PPP	350	W
ESD voltage (HBM waveform per IE C61000-4-2)	VESD	30	kV
Peak forward surge current, 8.3ms single half sine wave uni-directional only (Note 2)	IFSM	6	A
Typical thermal resistance, junction to ambient air (Note 3)	RthJA	500	°C /W
Typical thermal resistance, junction to case	RthJC	300	
Power dissipation	PD	0.25	W
Operating junction and storage temperature range	TJ;TSTG	-55 ~ +150	°C

Notes:

1. Non-repetitive current pulse, per Fig. 5 and derated above TA=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.

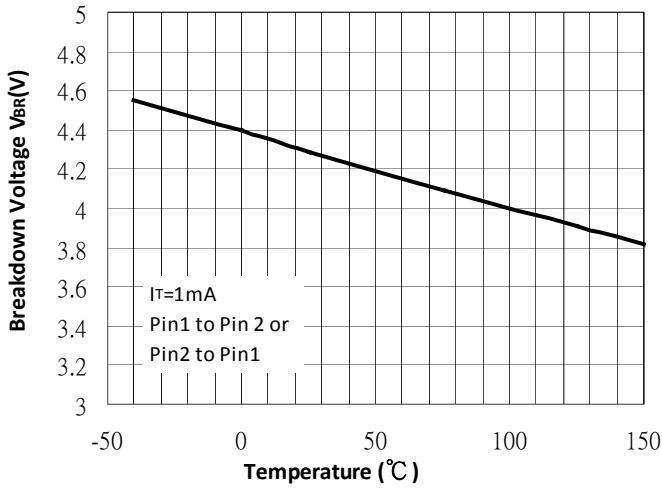
Electrical Characteristics Ratings at 25°C ambient temperature, unless otherwise noted.

Characteristic	Symbol	Condition	Min.	Typ	Max.	Unit
Reverse Stand-off Voltage	VRWM		-	-	3	V
Reverse Breakdown Voltage	VBR	IT=1mA	3.3	3.8	4.5	
Reverse Leakage Current	IR	VRWM=3V	-	-	1	μA
Clamping Voltage	VC	I _{PP} =1A, t _p =8/20μs	-	-	6.5	V
		I _{PP} =3A, t _p =8/20μs	-	-	8.5	
		I _{PP} =8A, t _p =8/20μs	-	-	13.9	
Junction Capacitance	Cj	VR=0V, f=1MHz	-	1.6	3	pF

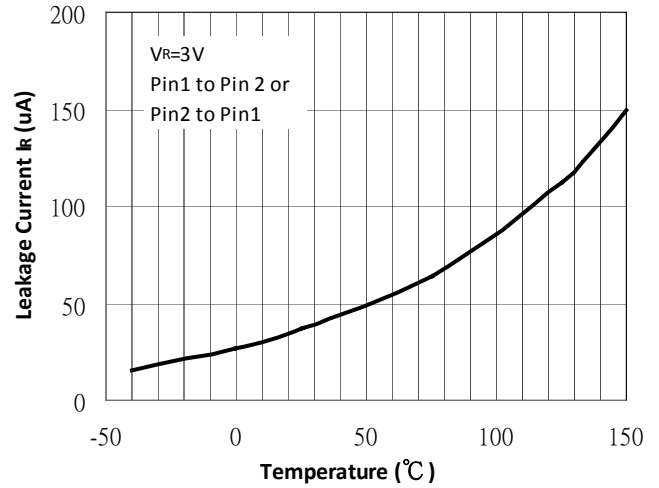
Recommended Footprint


Typical Characteristics

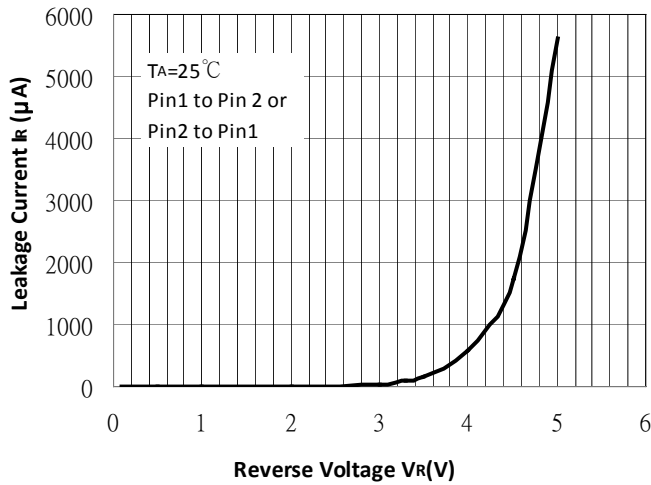
Typical Breakdown Voltage vs Temperature



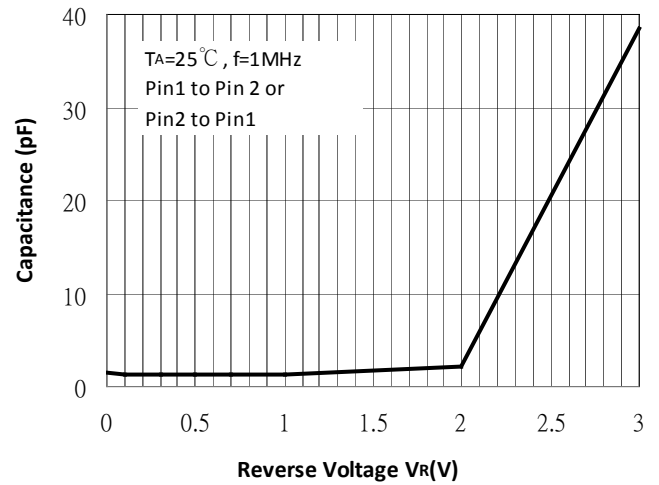
Typical Leakage Current vs Temperature



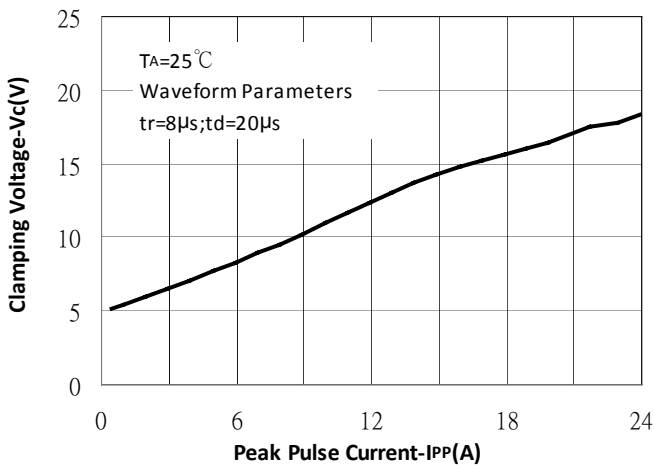
Typical Leakage Current vs Reverse Voltage



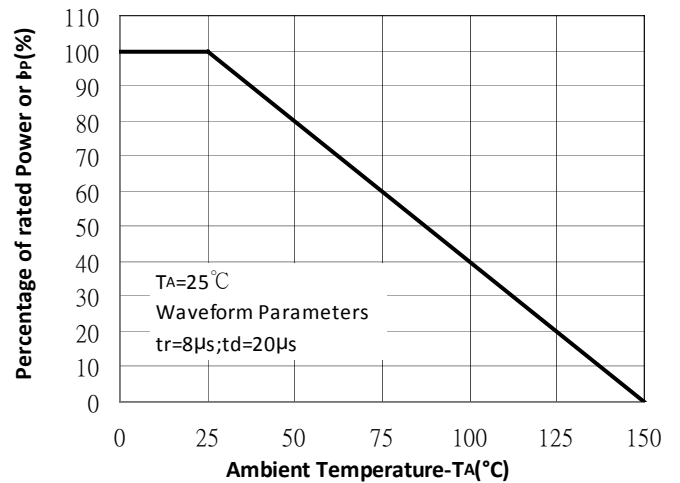
Typical Capacitance vs Reverse Voltage



Typical Clamping Voltage vs Peak Pulse Current



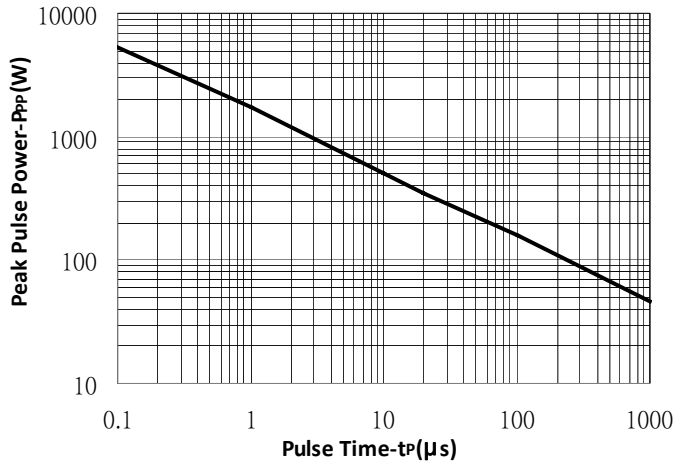
Power Derating Curve



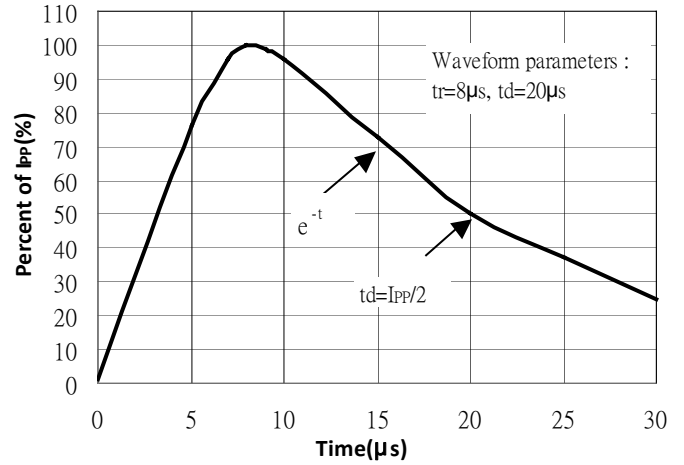


Typical Characteristics(Cont.)

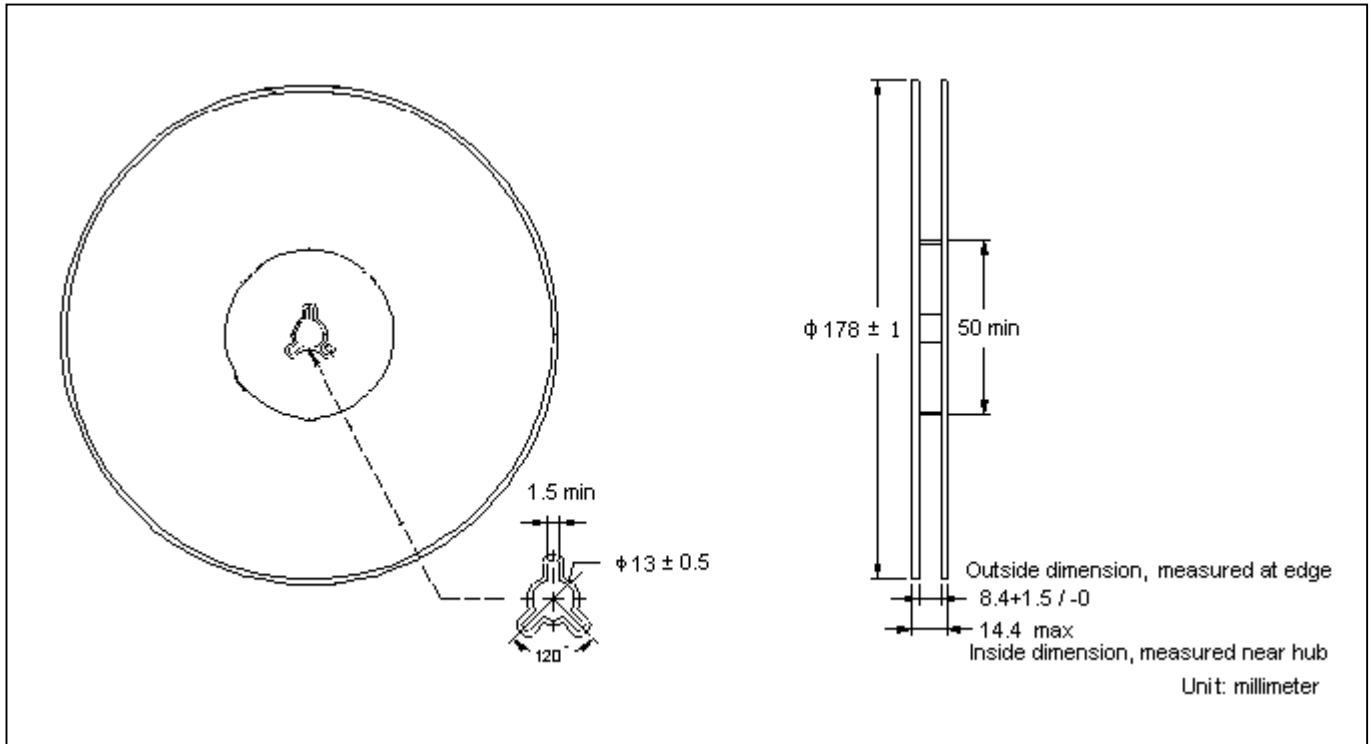
Non-repetitive Peak Pulse Power vs Pulse Time



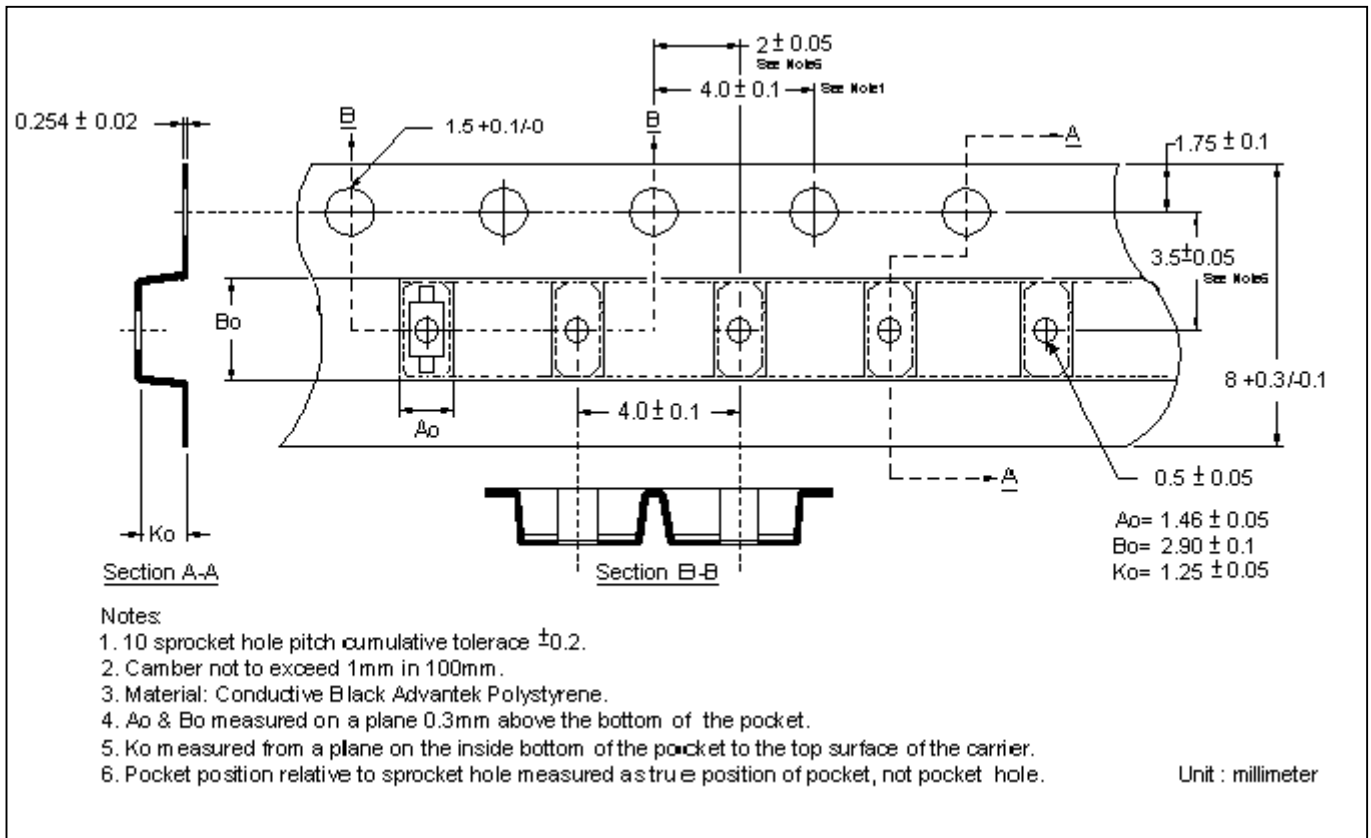
Non-repetitive Peak Pulse Power vs Pulse Time



Reel Dimension

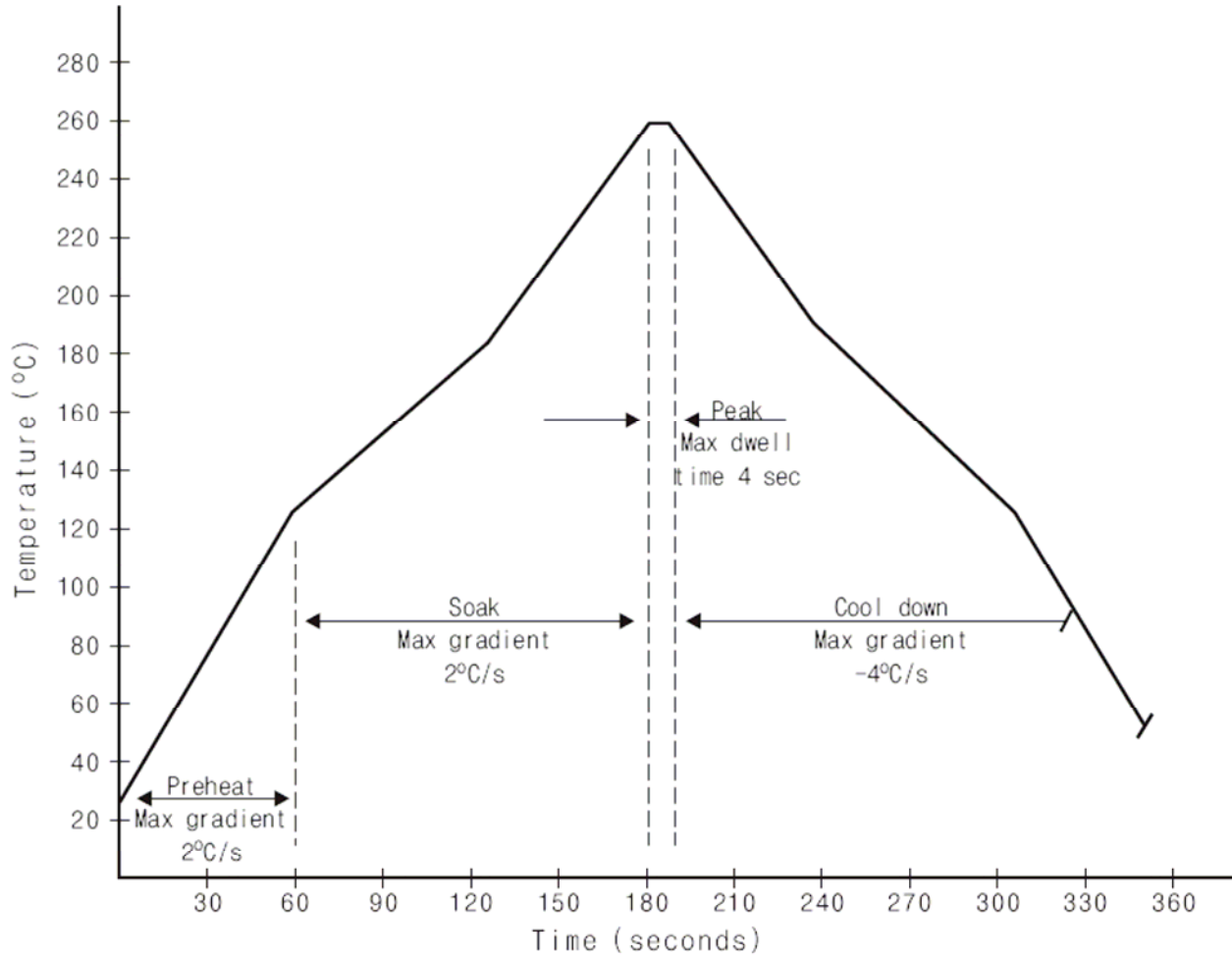


Carrier Tape Dimension



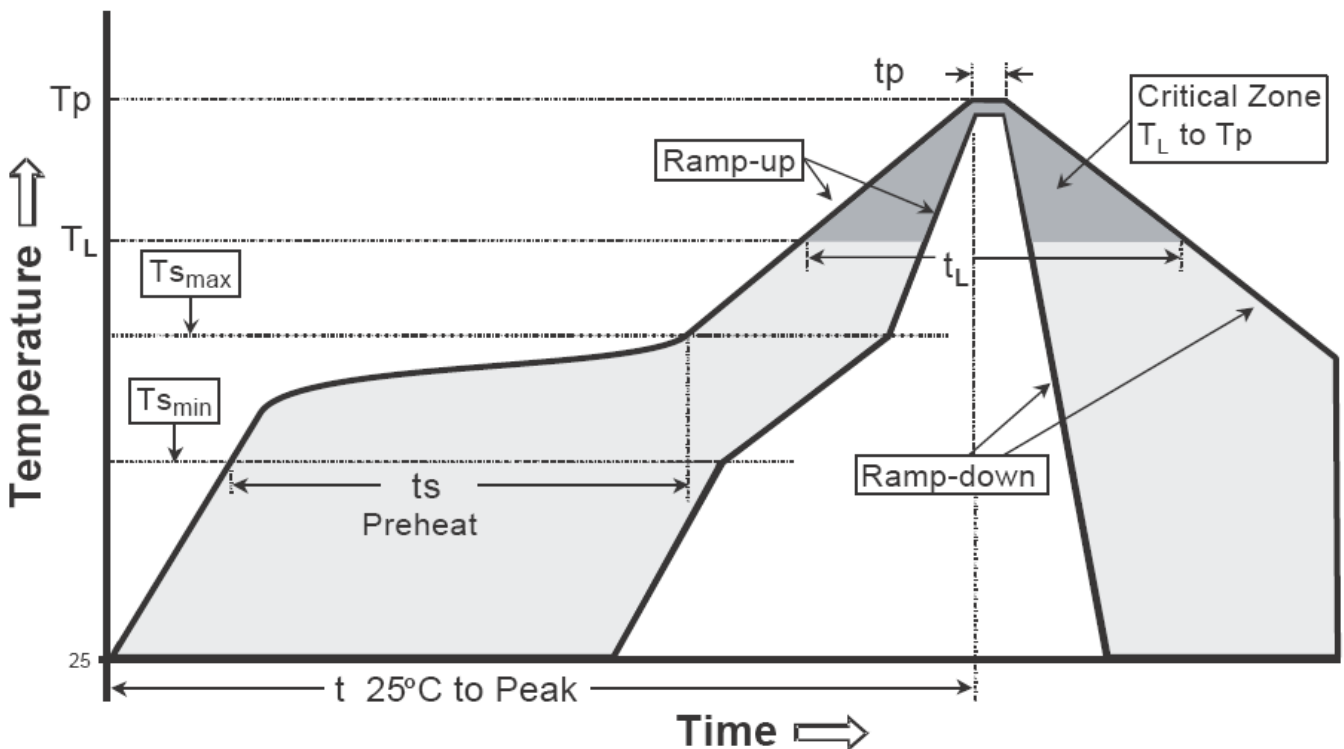


Recommended Wave Soldering Profile



Recommended wave soldering condition

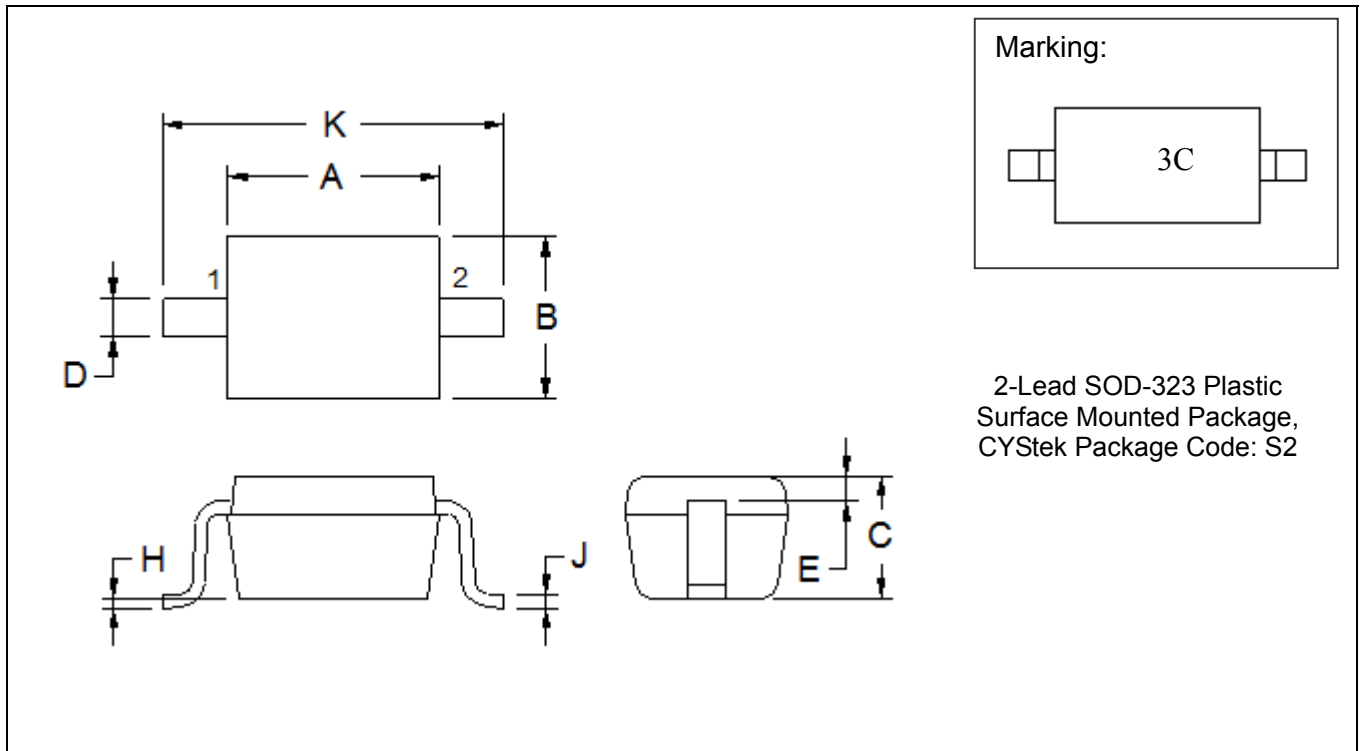
Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (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.

SOD-323 Dimension



2-Lead SOD-323 Plastic Surface Mounted Package, CYStek Package Code: S2

*: 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.

Important Notice:

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of CYStek.
- CYStek reserves the right to make changes to its products without notice.
- CYStek **semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.**
- CYStek assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.