

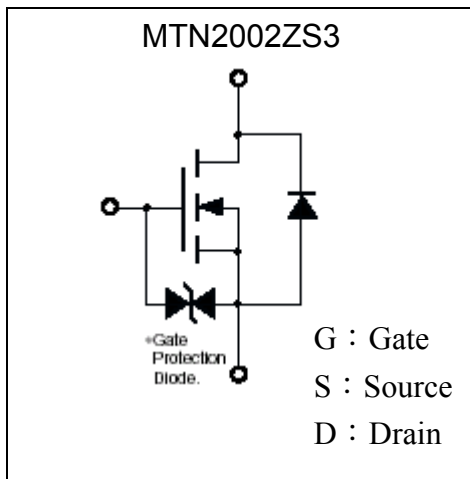
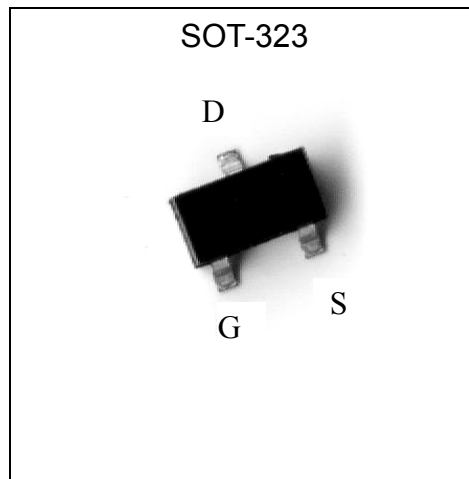
ESD protected N-CHANNEL MOSFET

MTN2002ZS3

BV_{DSS}	20V
I_D	100mA
$R_{DS(on)}$	3Ω

Description

- Low voltage drive, 1.8V
- Easy to use in parallel
- High speed switching
- ESD protected device
- Pb-free package

Symbol

Outline

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	BV_{DSS}	20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current	I_D	100	mA
Pulsed Drain Current (Ta=25°C)	I_{DM}	400 *1	mA
Total Power Dissipation (Ta=25°C)	P_D	200	mW
Total Power Dissipation (Tc=25°C)		400	
ESD susceptibility		350 *2	V
Operating Junction and Storage Temperature Range	T_j	-55~+150	°C
Thermal Resistance, Junction-to-Ambient	$R_{th,ja}$	625	°C/W
Thermal Resistance, Junction-to-Case	$R_{th,jc}$	250	°C/W
Lead Temperature, for 10 second Soldering	T_L	260	°C

Note : *1. Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$

*2. Human body model, $1.5k\Omega$ in series with 100pF

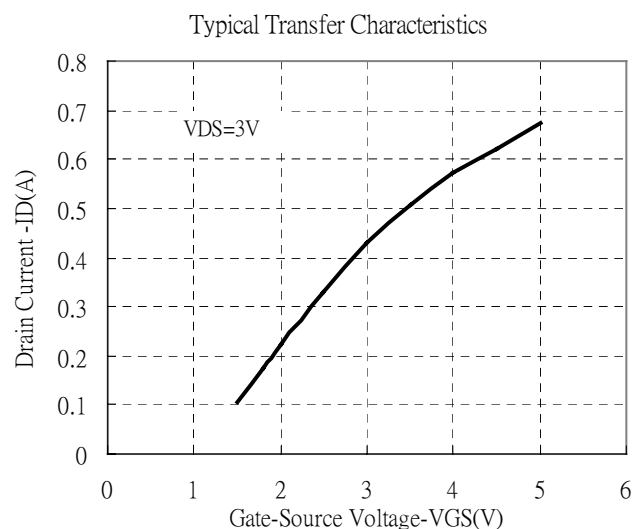
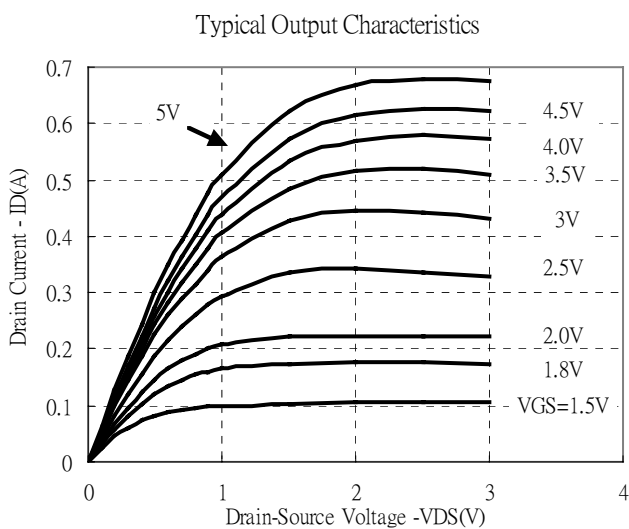
**Electrical Characteristics (Ta=25°C)**

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	20	-	-	V	V _{GS} =0, I _D =100μA
V _{GS(th)}	0.5	-	1.0	V	V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	-	-	±1	μA	V _{GS} =±8V, V _{DS} =0
I _{DSS}	-	-	500	nA	V _{DS} =20V, V _{GS} =0
R _{DS(ON)}	-	1.7	3	Ω	V _{GS} =4.5V, I _D =100mA
	-	3.5	6		V _{GS} =1.8V, I _D =20mA
G _{FS}	100	-	-	mS	V _{DS} =5V, I _D =100mA
Dynamic					
C _{iss}	-	-	50	pF	V _{DS} =10V, V _{GS} =0, f=1MHz
C _{oss}	-	-	25		
C _{rss}	-	-	5		
Source-Drain Diode					
*V _{SD}	-	-	1	V	V _{GS} =0V, I _S =10mA

*Pulse Test : Pulse Width ≤300μs, Duty Cycle ≤2%

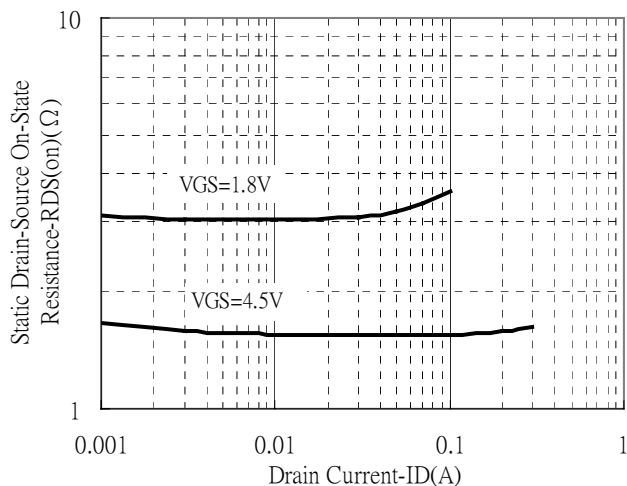
Ordering Information

Device	Package	Shipping	Marking
MTN2002ZS3	SOT-323 (Pb-free)	3000 pcs / Tape & Reel	22

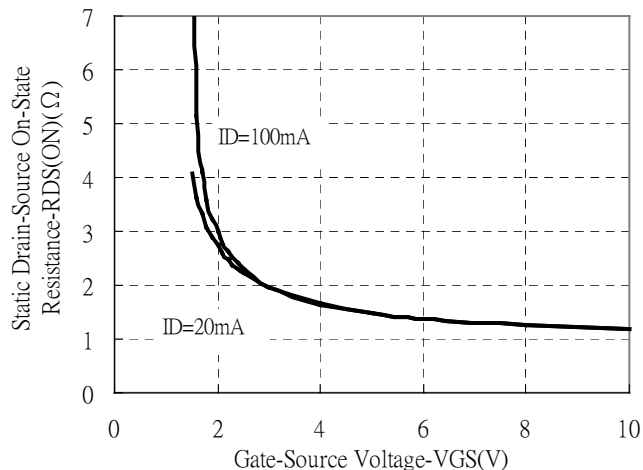
Characteristic Curves

Characteristic Curves(Cont.)

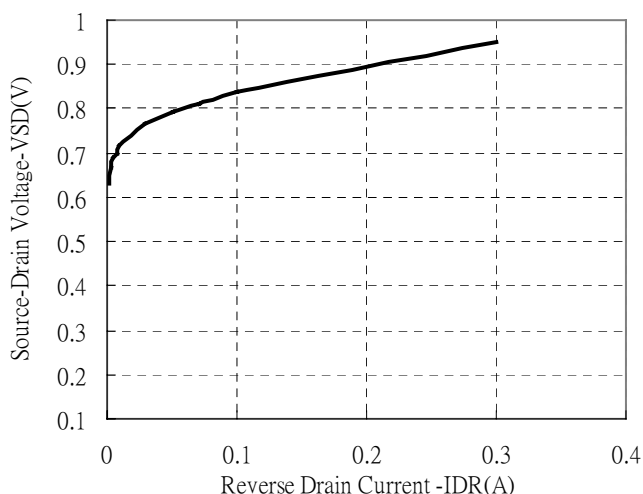
Static Drain-Source On-State resistance vs Drain Current



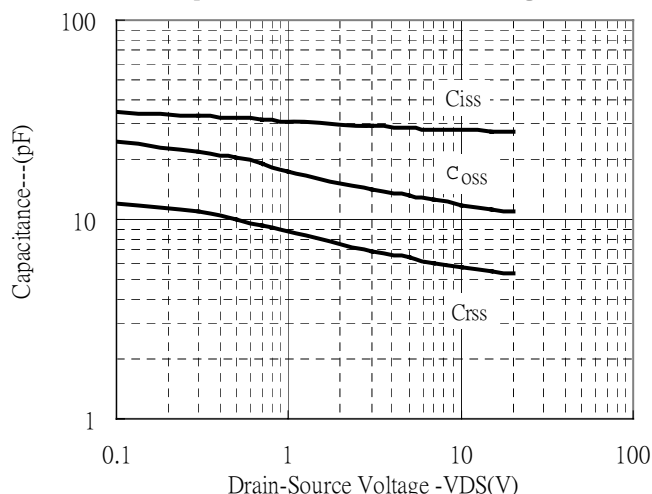
Static Drain-Source On-State Resistance vs Gate-Source Voltage



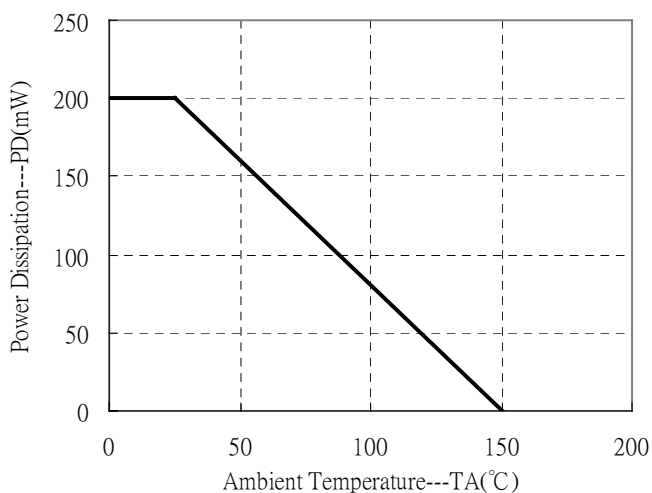
Reverse Drain Current vs Source-Drain Voltage



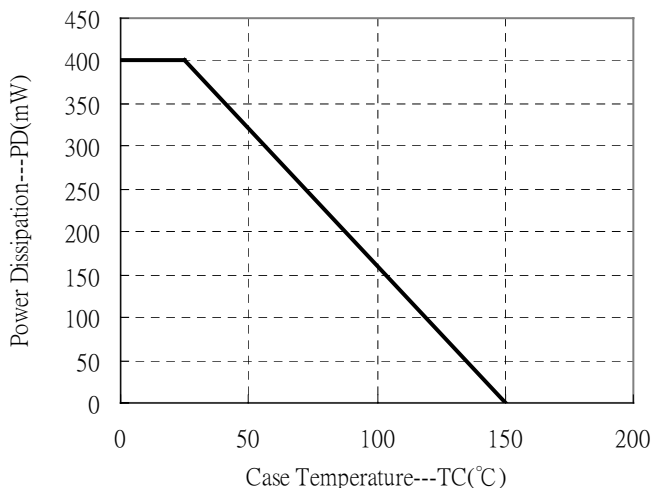
Capacitance vs Drain-to-Source Voltage



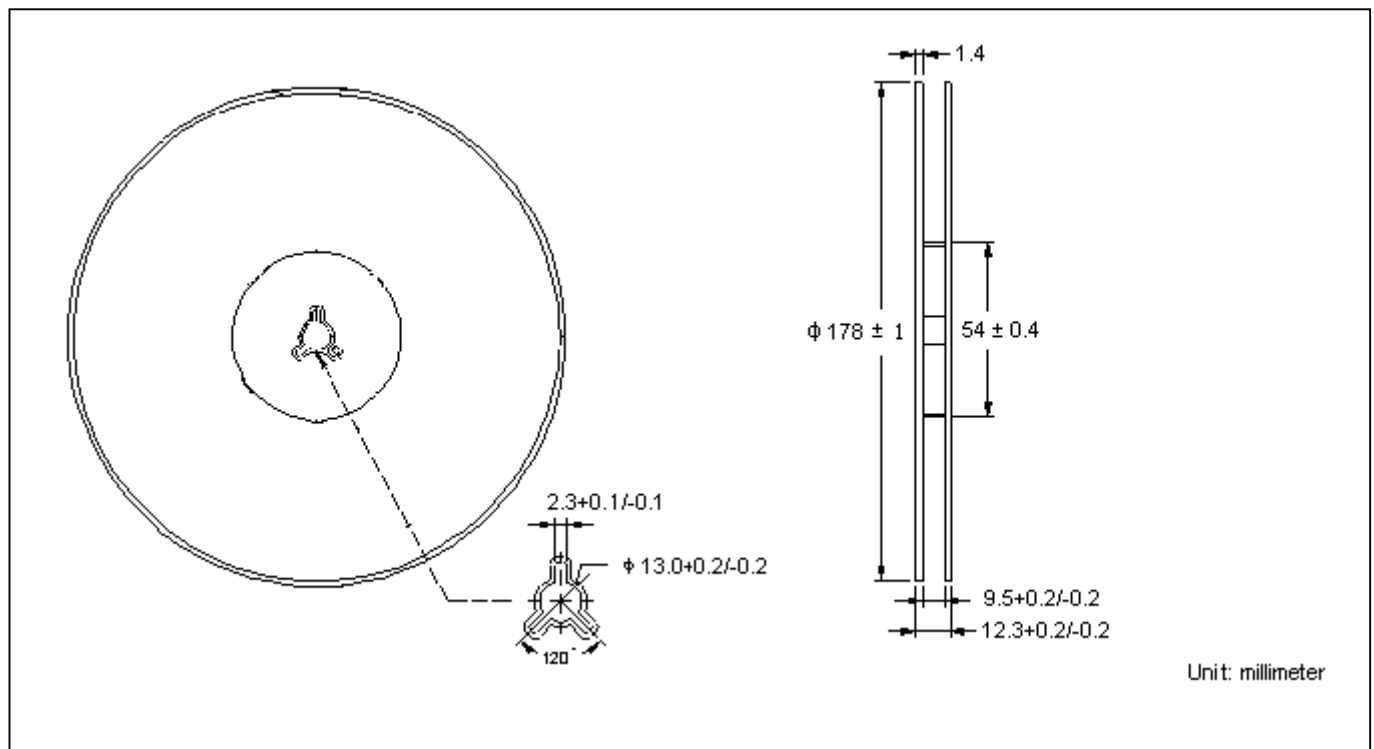
Power Derating Curve



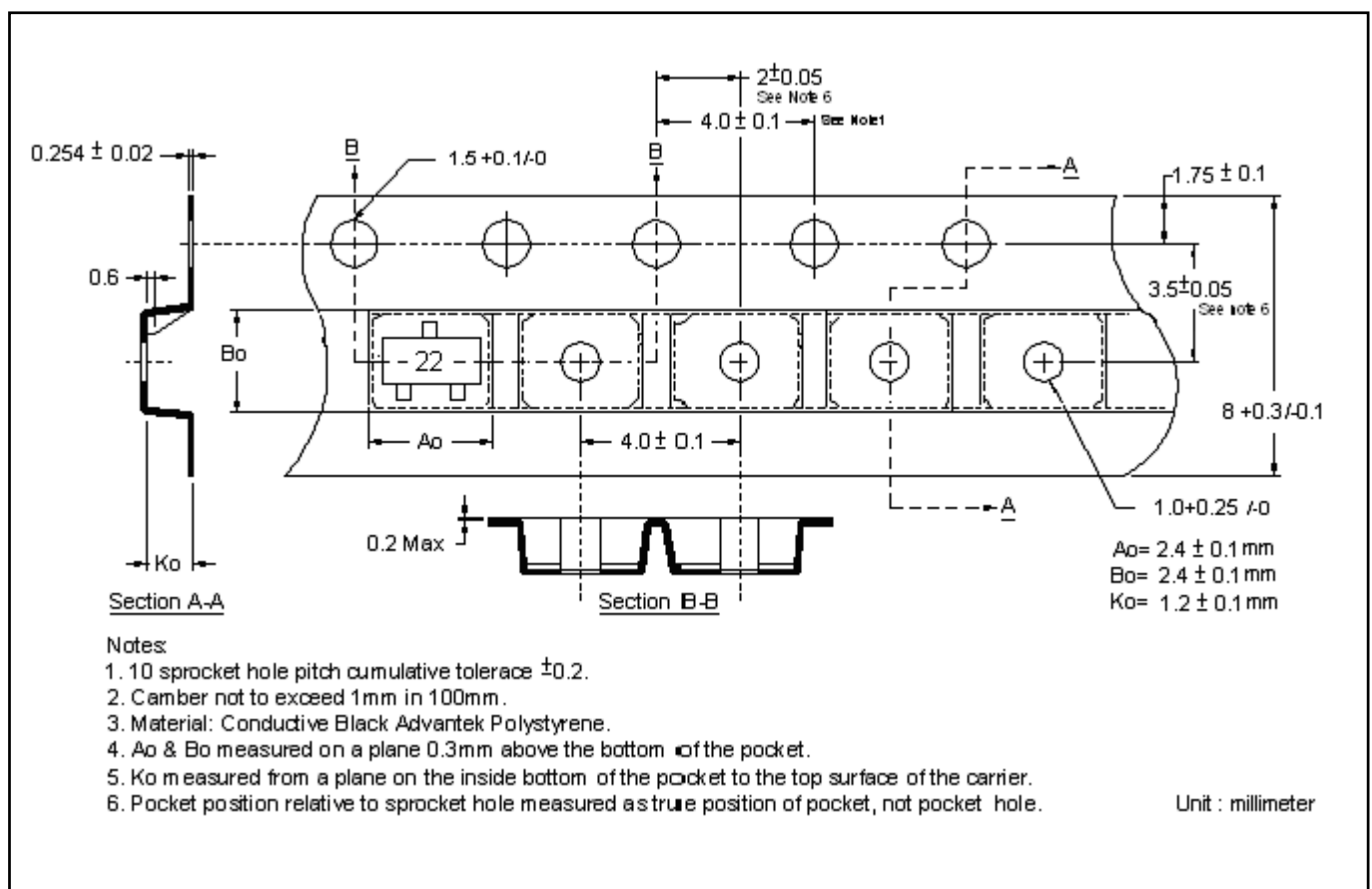
Power Derating Curve



Reel Dimension



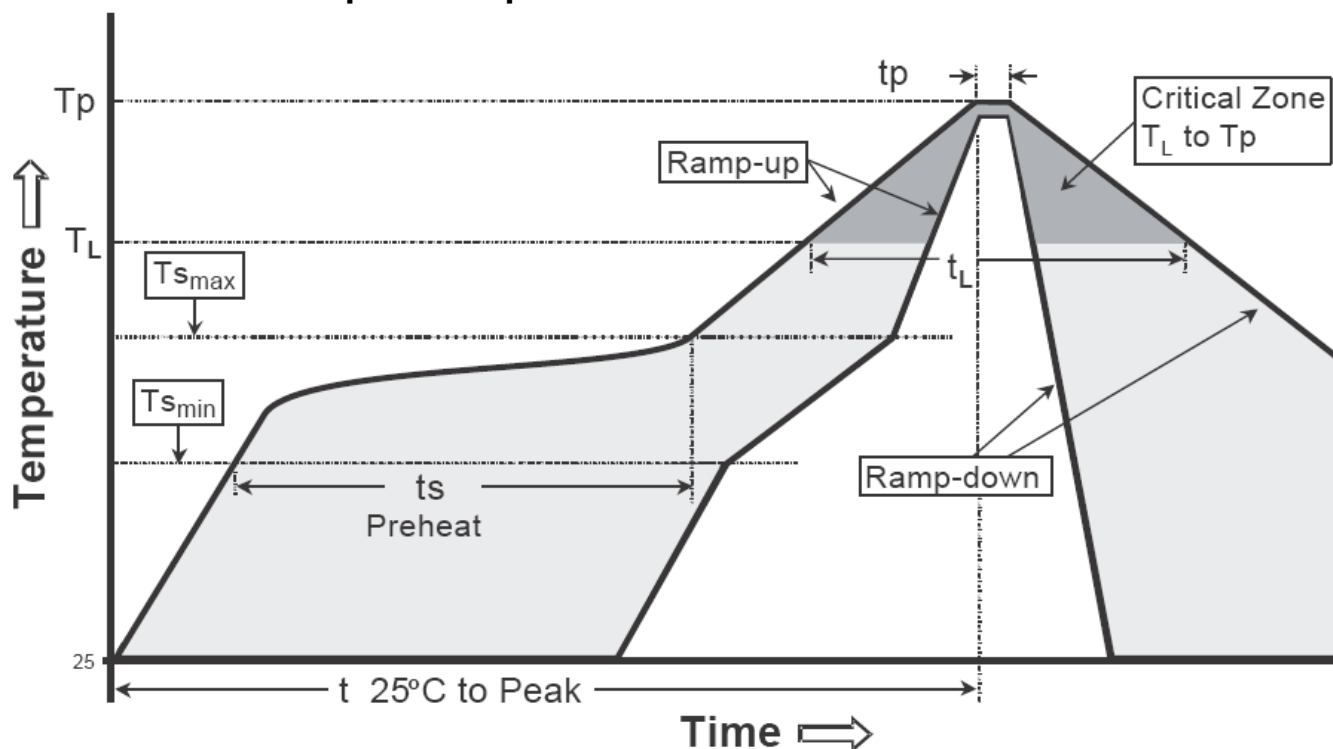
Carrier Tape Dimension



Recommended wave soldering condition

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

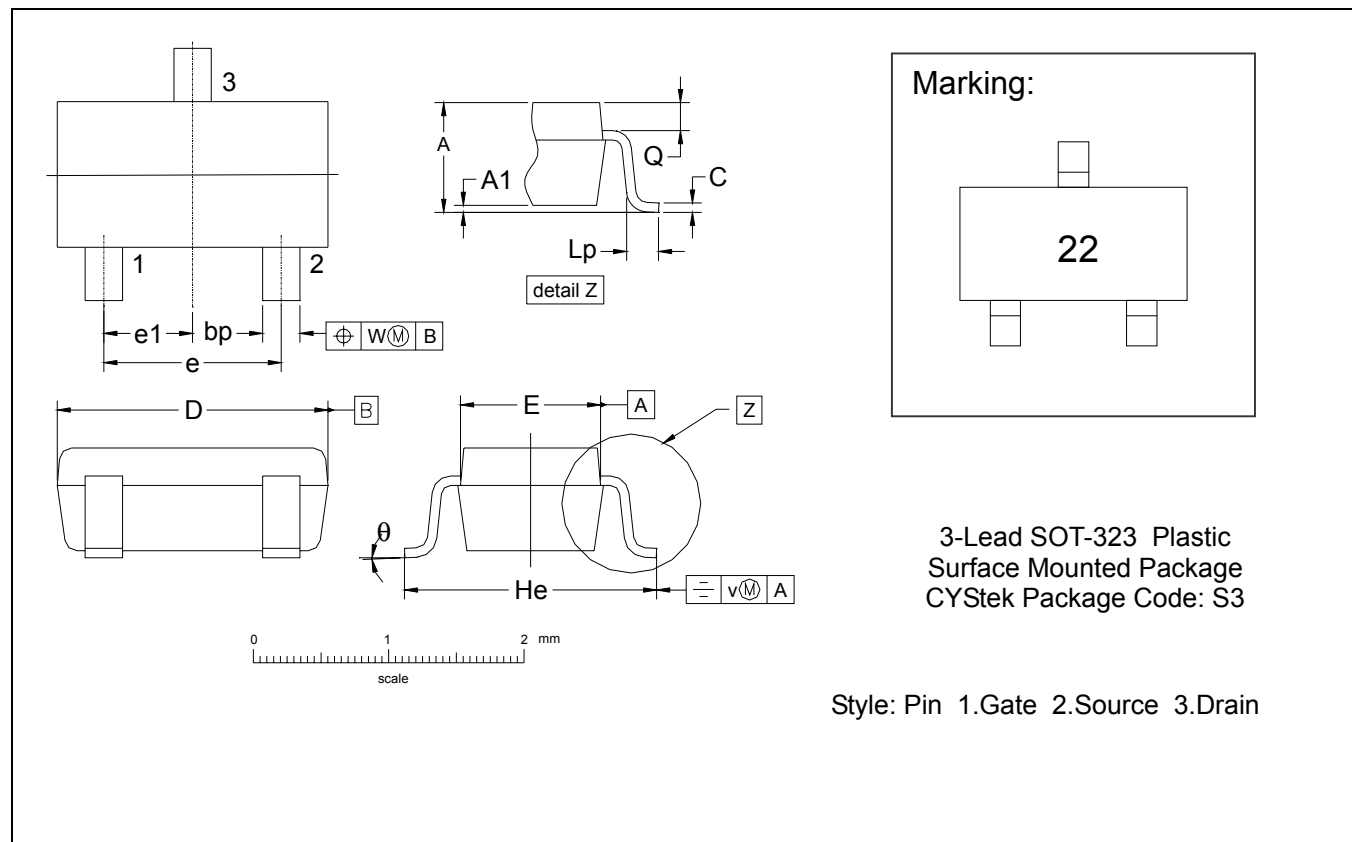
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T_{smax} to T_p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T_{smin})	100°C	150°C
-Temperature Max(T_{smax})	150°C	200°C
-Time(t_{smin} to t_{smax})	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(t_p)	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: 42 Alloy ; pure tin plated
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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