N-CHANNEL MOSFET

BSS123N3

BV_{DSS}		100V
I_D@V_{GS}=10V, T_A=25˚C		1.7A
$R_{DSON(TYP)}$	V_{GS}=10V, I_D=700mA	290mΩ
	V_{GS}=4V, I_D=400mA	310mΩ
	V_{GS}=10V, I_D=170mA	260mΩ
	V_{GS}=4V, I_D=170mA	280mΩ

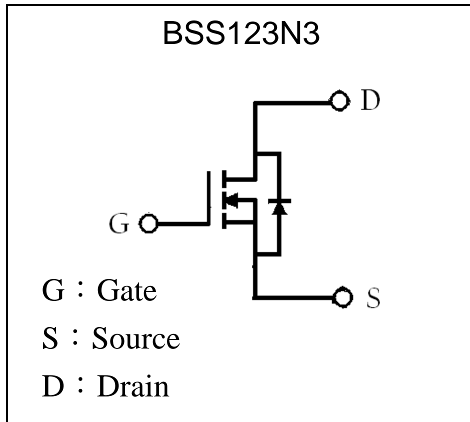
Description

The BSS123N3 is a N-channel enhancement-mode MOSFET.

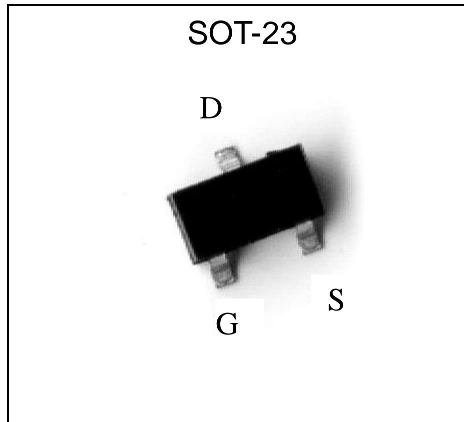
Features

• Low on-resistance
• High speed switching
• Low-voltage drive(2.5V)
• Easily designed drive circuits
• Pb-free lead plating and halogen-free package

Symbol

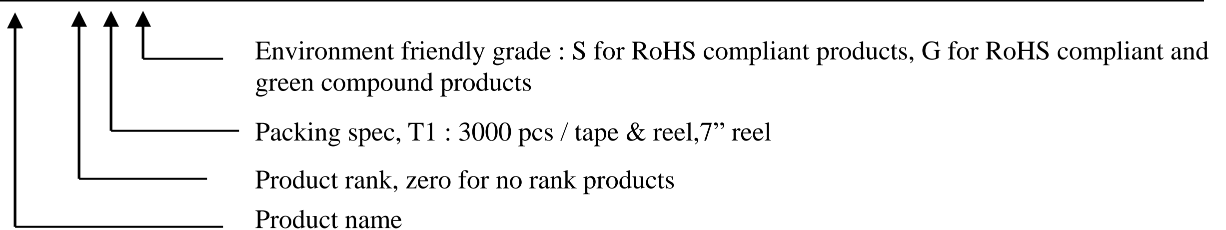


Outline



Ordering Information

Device	Package	Shipping
BSS123N3-0-T1-G	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GSS}	±20	
Continuous Drain Current @V_{GS}=10V	I_D	1.7	A
Pulsed Drain Current	I_{DP}	6.8 *1	
Total Power Dissipation	P_D	1.38 *2	W
Channel Temperature	T_{CH}	+150	°C
Junction and Storage Temperature Range	Tj ; Tstg	-55~+150	

Note : *1. Pulse Width ≤ 300μs, Duty cycle ≤2%
*2. When the device is surface mounted on 1 in² copper pad of FR-4 board with 2 oz. copper.

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient	Rth,ja	90	°C/W

Note : Surface mounted on 1 in² copper pad of FR-4 board, 350°C/W when mounted on minimum copper pad.

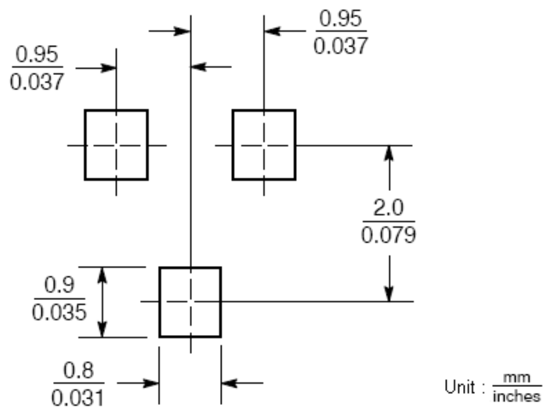
Electrical Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}*	100	-	-	V	V_{GS}=0V, I_D=10μA
$V_{GS(th)}$	1	-	2.5		V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS}=100V, V_{GS}=0V
$R_{DS(ON)}$*	-	290	400	mΩ	I_D=700mA, V_{GS}=10V
	-	310	450		I_D=400mA, V_{GS}=4V
	-	260	400		I_D=170mA, V_{GS}=10V
	-	280	400		I_D=170mA, V_{GS}=4V
G_{FS}	0.08	1	-	S	V_{DS}=10V, I_D=170mA
Dynamic					
C_{iss}	-	512	-	pF	V_{DS}=25V, V_{GS}=0V, f=1MHz
C_{oss}	-	15	-		
C_{rss}	-	11	-		
$t_{d(ON)}$	-	3.1	-	ns	V_{DD}=30V, I_D=1.7A, V_{GS}=10V, R_{GEN}=6Ω
t_r	-	1.2	-		
$t_{d(OFF)}$	-	9.7	-		
t_f	-	1.4	-		
Qg	-	3.6	-	nC	V_{DD}=30V, I_D=1.7A, V_{GS}=10V
Qgs	-	1.8	-		
Qgd	-	0.6	-		

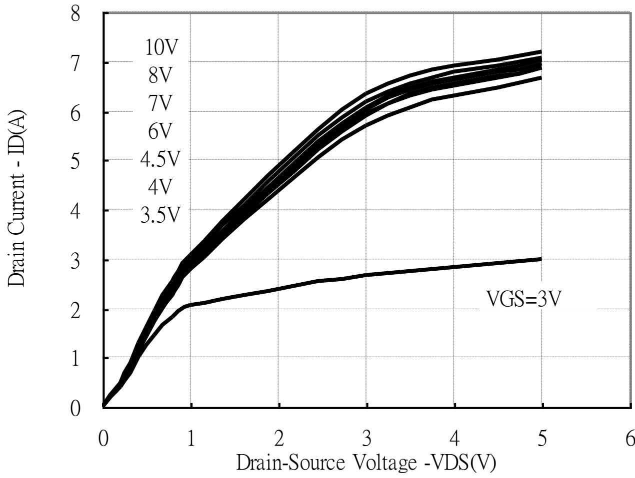
Source-Drain Diode					
*I_S	-	-	1.7	A	
*I_{SM}	-	-	6.8		
*V_{SD}	-	-	1.2	V	V_{GS}=0V, I_{SD}=1A

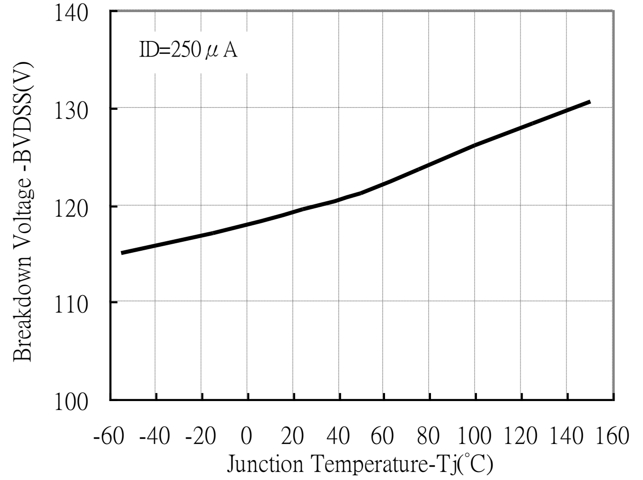
*Pulse Test : Pulse Width ≤380μs, Duty Cycle≤2%

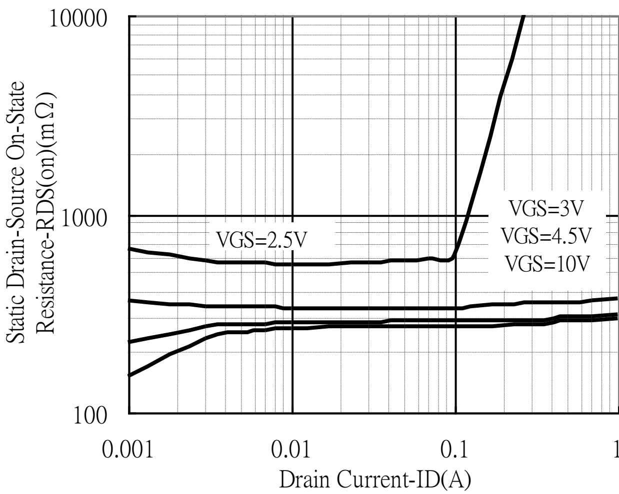
Recommended Soldering Footprint

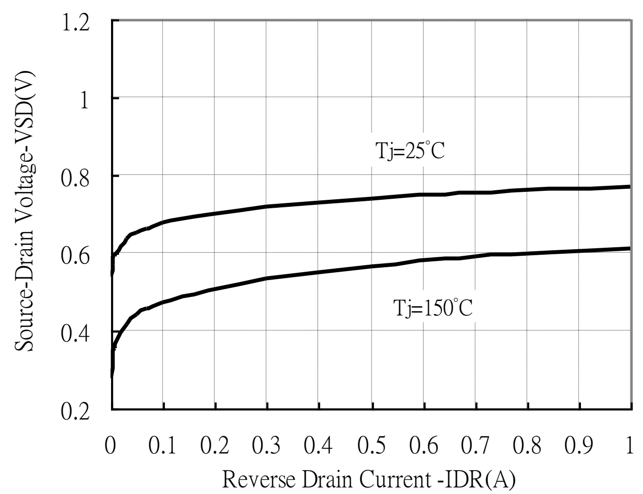


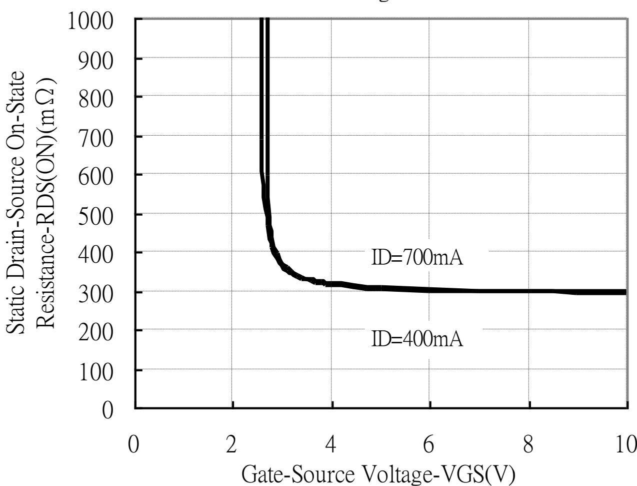
Typical Characteristics

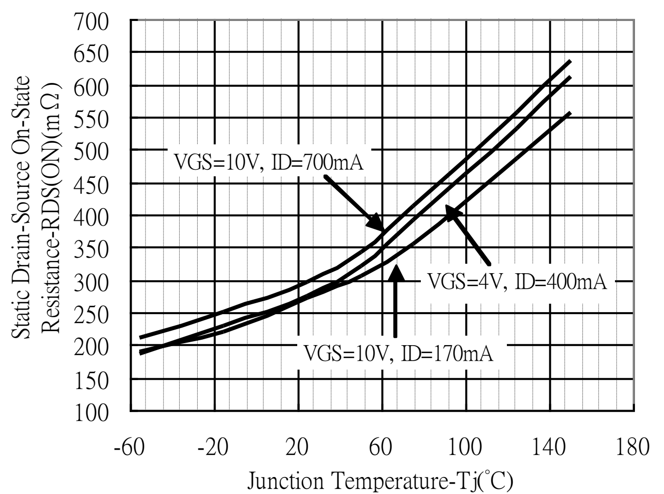




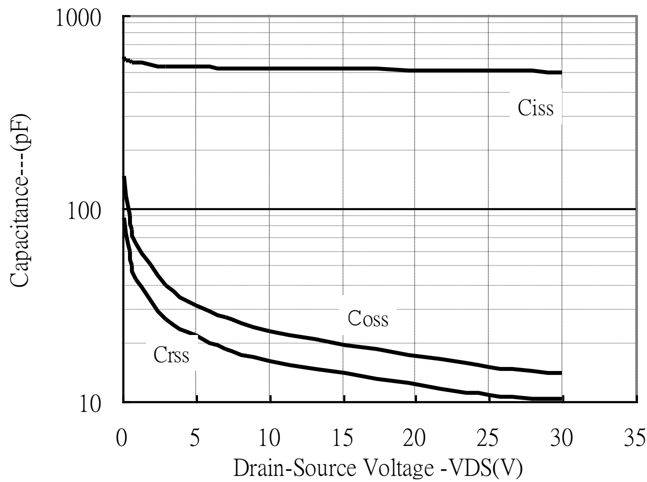


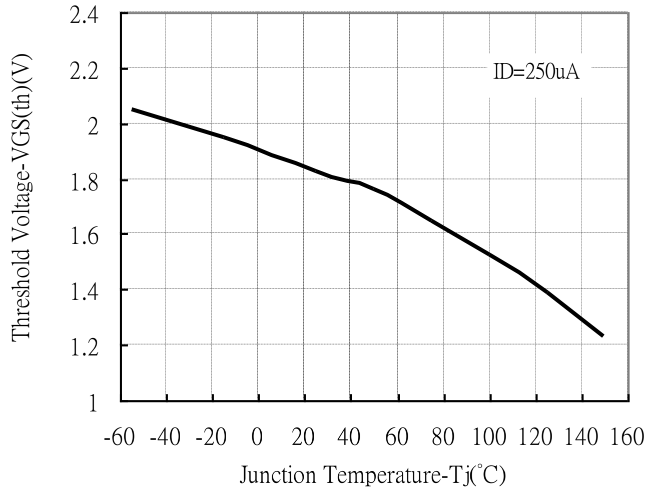


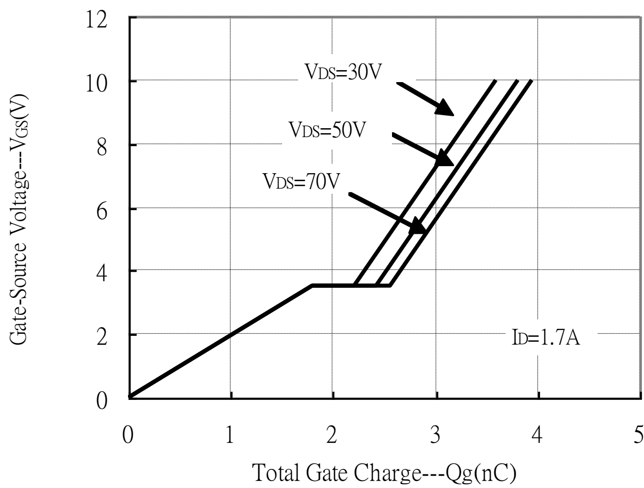


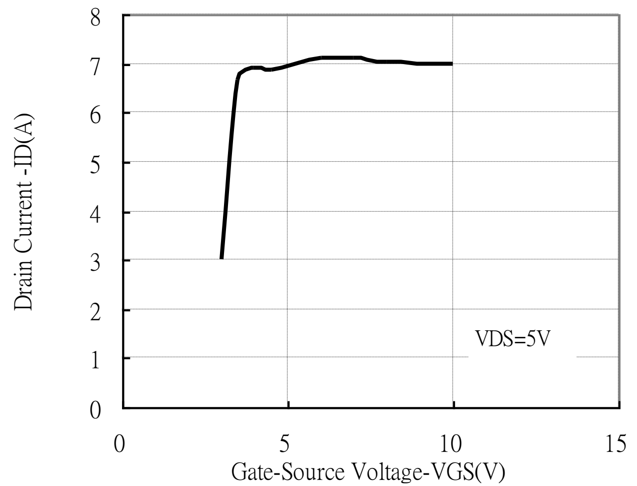


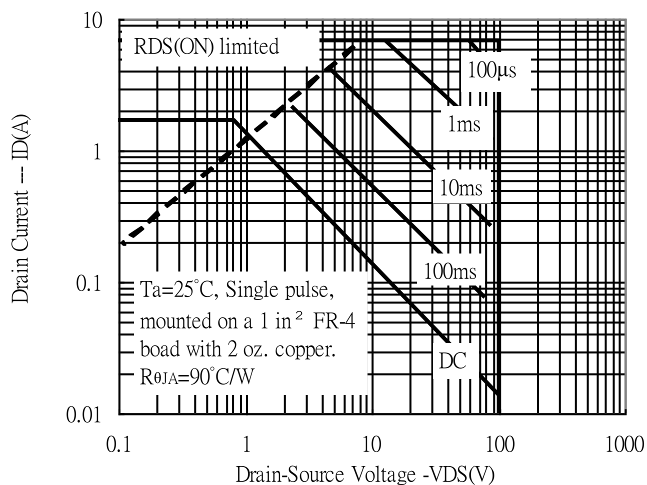
Typical Characteristics(Cont.)

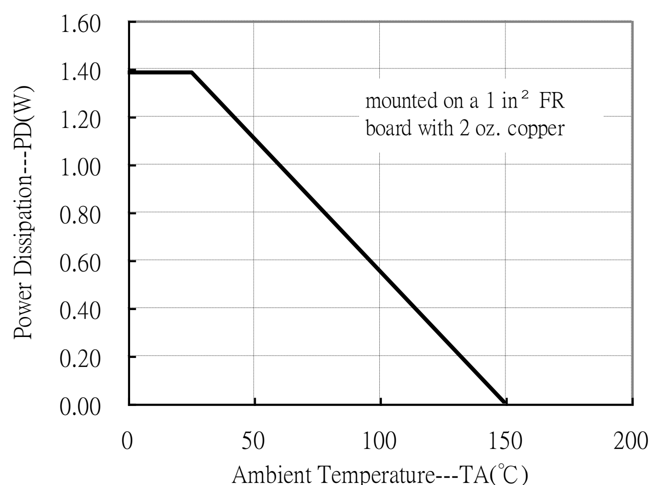




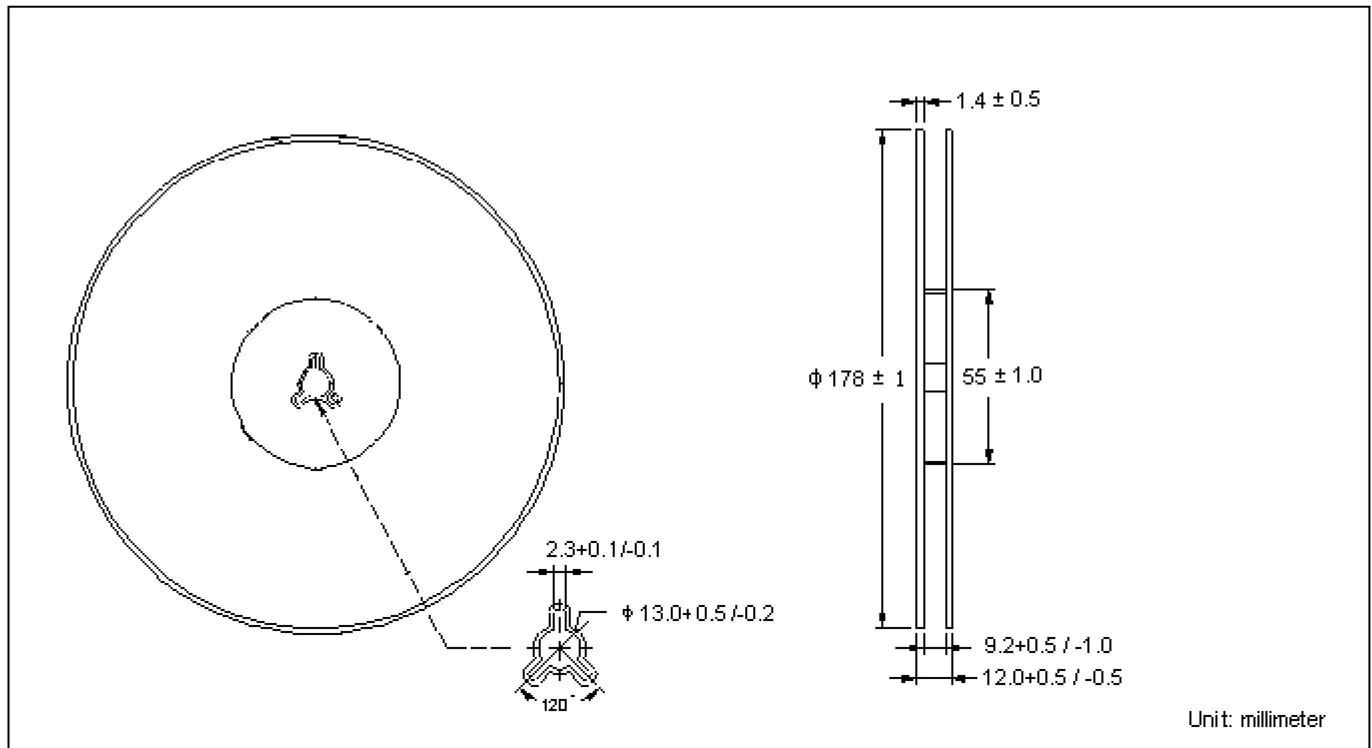




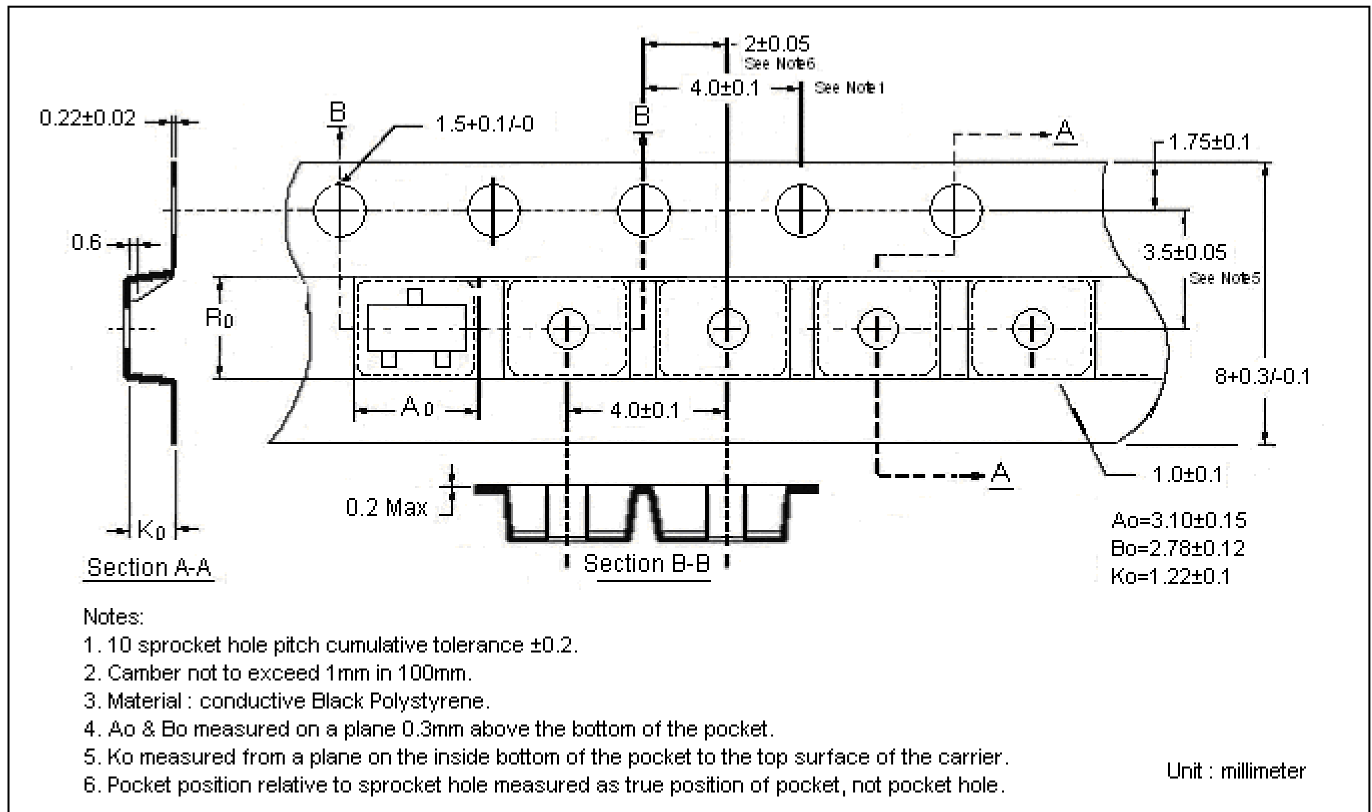




Reel Dimension



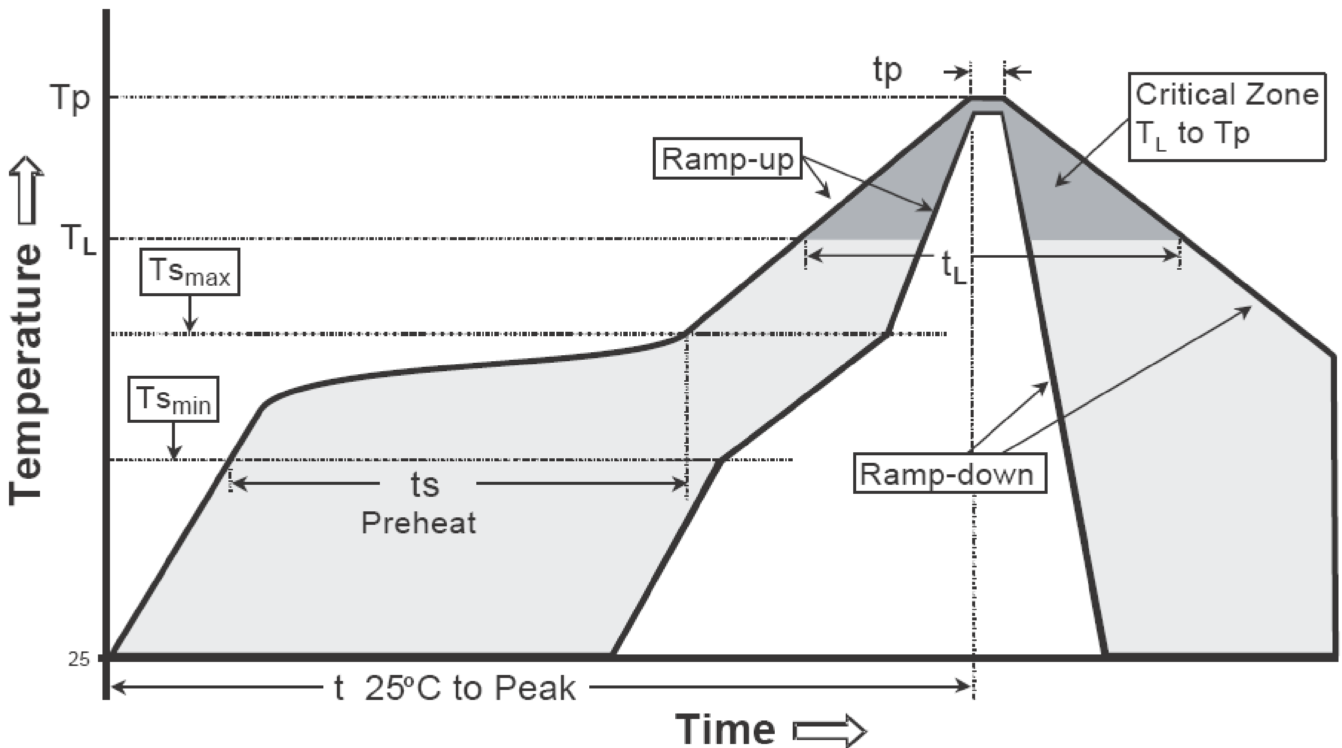
Carrier Tape Dimension



Recommended wave soldering condition

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

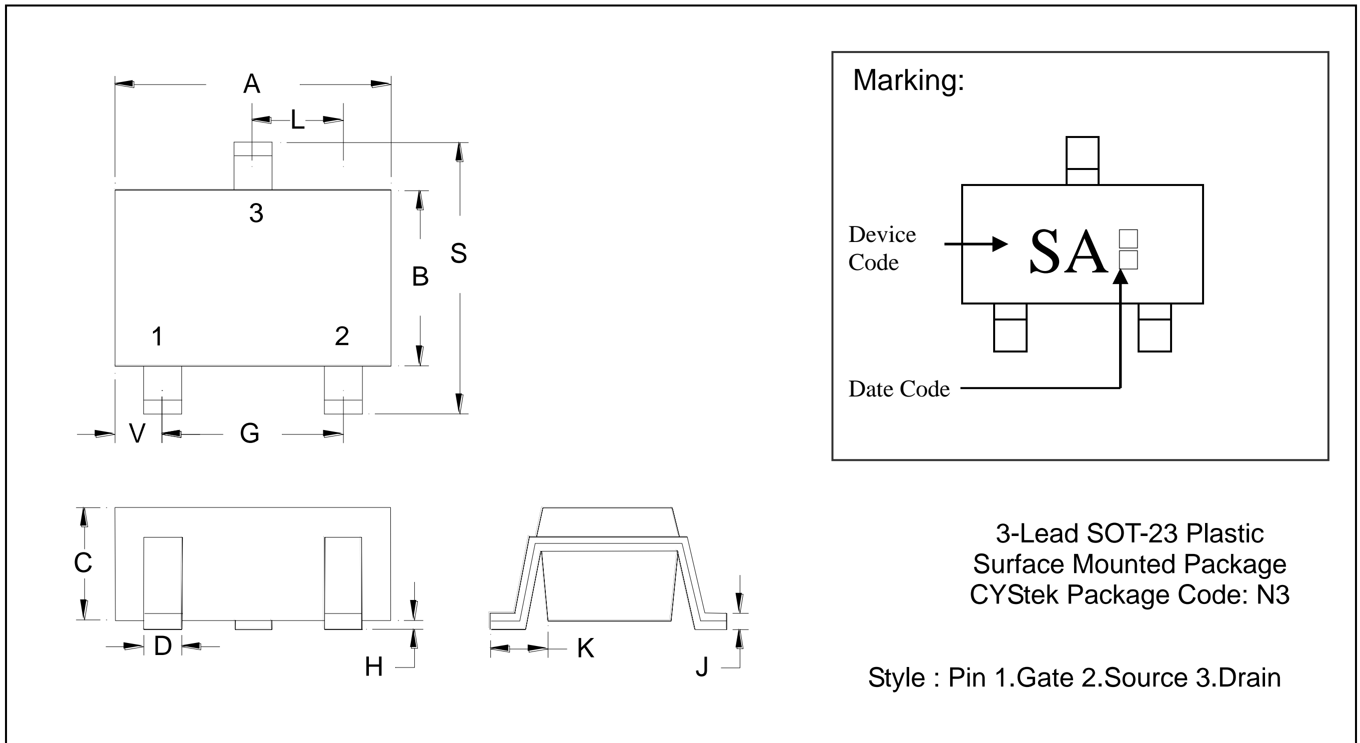
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts 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 (TL) − Time (tL)	183°C 60-150 seconds	217°C 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-23 Dimension



3-Lead SOT-23 Plastic
Surface Mounted Package
CYStek Package Code: N3

Style : Pin 1.Gate 2.Source 3.Drain

*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1102	0.1204	2.80	3.04	J	0.0035	0.0071	0.09	0.18
B	0.0472	0.0669	1.20	1.70	K	0.0276 REF		0.70 REF	
C	0.0335	0.0512	0.89	1.30	L	0.0374*		0.95*	
D	0.0118	0.0197	0.30	0.50	S	0.0830	0.1161	2.10	2.95
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0004	0.0040	0.01	0.10					

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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