ESD protected N-Channel Enhancement Mode MOSFET

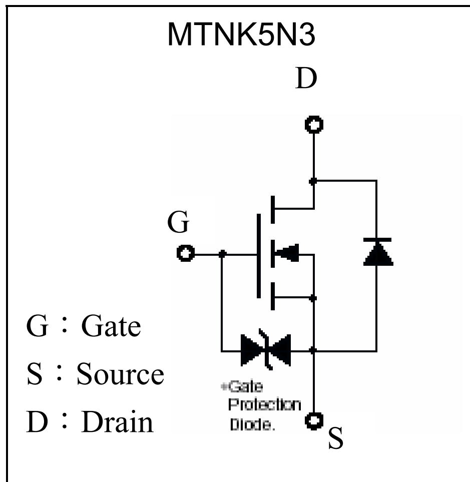
MTNK5N3

BV_{DSS}	30V
I_D	100mA
$R_{DSON(MAX)}$	8Ω

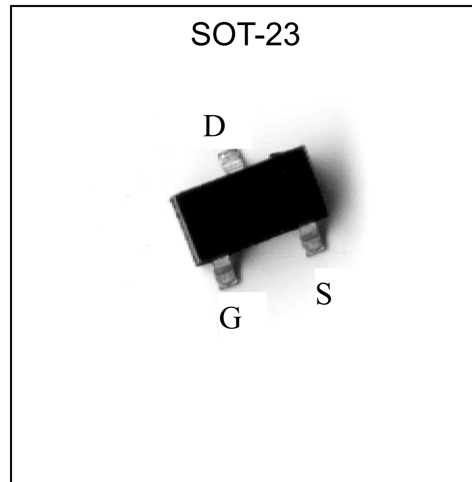
Description

- Low voltage drive(2.5V drive) makes this device ideal for portable equipment.
- High speed switching
- ESD protected device
- Pb-free lead plating & halogen-free package

Symbol

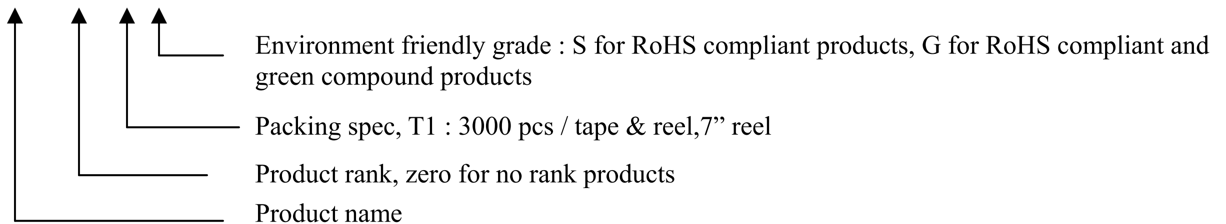


Outline



Ordering Information

Device	Package	Shipping
MTNK5N3-0-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	BV_{DSS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	±100	mA
Pulsed Drain Current (Ta=25°C)	I_{DM}	±400 *1	mA
Total Power Dissipation	P_D	300 *2	mW
ESD susceptibility		750 *3	V
Operating Junction and Storage Temperature Range	Tj ; Tstg	-55~+150	°C
Thermal Resistance, Junction-to-Ambient	Rth,ja	556	°C/W

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient, max	Rth,ja	417 *2	°C/W

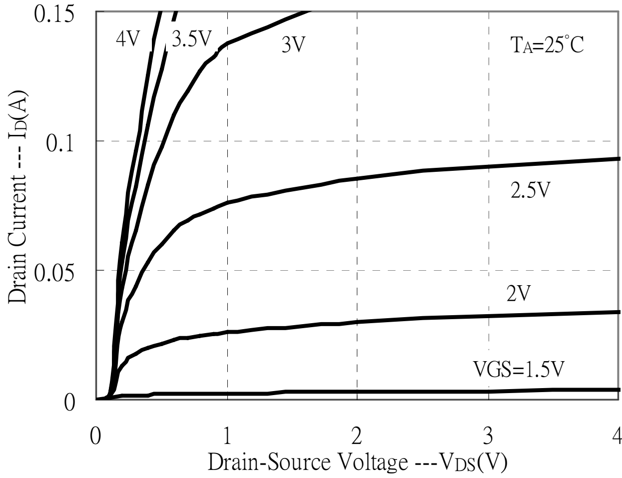
Note: *1. Pulse Width ≤ 10μs, Duty cycle ≤1%
*2. When device mounted on a FR-4 board with minimum pad size.
*3. Human body model, 1.5kΩ in series with 100pF

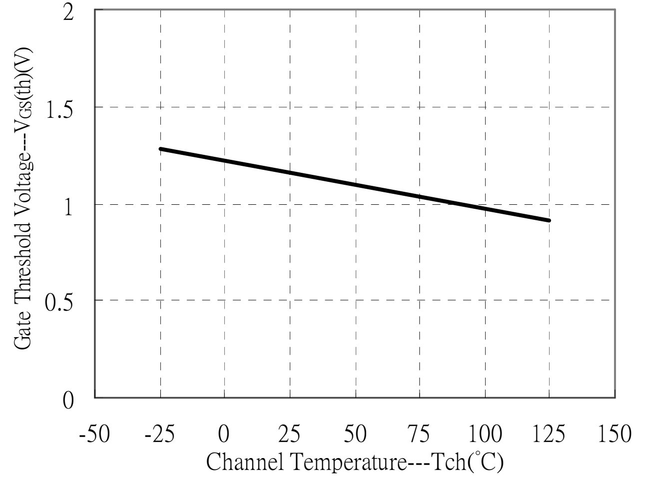
Electrical Characteristics (Ta=25°C)

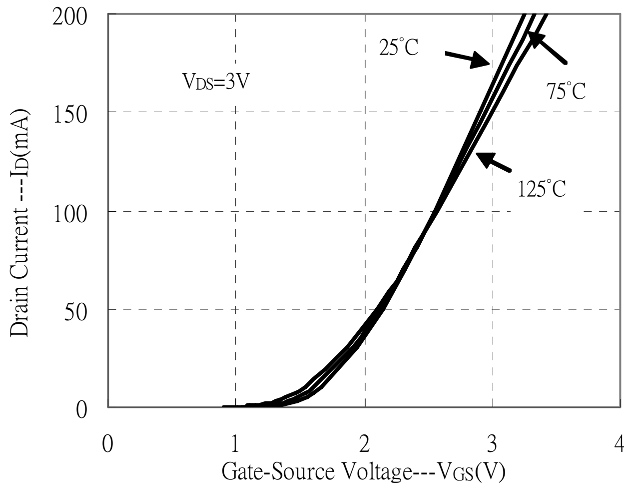
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0, I_D=100μA
$V_{GS(th)}$	0.8	1.3	1.5	V	V_{DS}=3V, I_D=100μA
I_{GSS}	-	-	±1	μA	V_{GS}=±20V, V_{DS}=0
I_{DSS}	-	-	100	nA	V_{DS}=30V, V_{GS}=0
$R_{DS(ON)}$	-	3.4	8	Ω	V_{GS}=4V, I_D=10mA
	-	6.9	13		V_{GS}=2.5V, I_D=1mA
G_{FS}	20	50	-	mS	V_{DS}=3V, I_D=10mA
Dynamic					
C_{iss}	-	12.5	-	pF	V_{DS}=5V, V_{GS}=0, f=1MHz
C_{oss}	-	7.3	-		
C_{rss}	-	3.5	-		
$t_{d(on)}$	-	15	-	ns	V_{DD}≒5V, I_D=10mA, V_{GS}=5V, R_L=500Ω, R_G=10Ω
t_r	-	35	-		
$t_{d(off)}$	-	75	-		
t_f	-	75	-		
Source-Drain Diode					
*V_{SD}	-	0.88	1.2	V	V_{GS}=0V, I_S=100mA

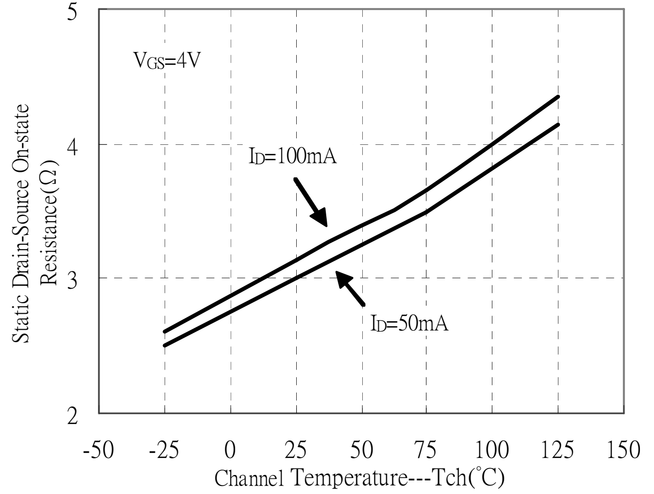
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

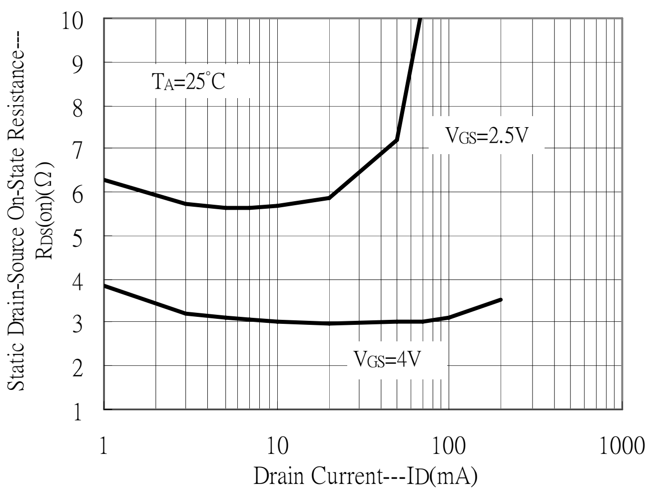
Typical Characteristics

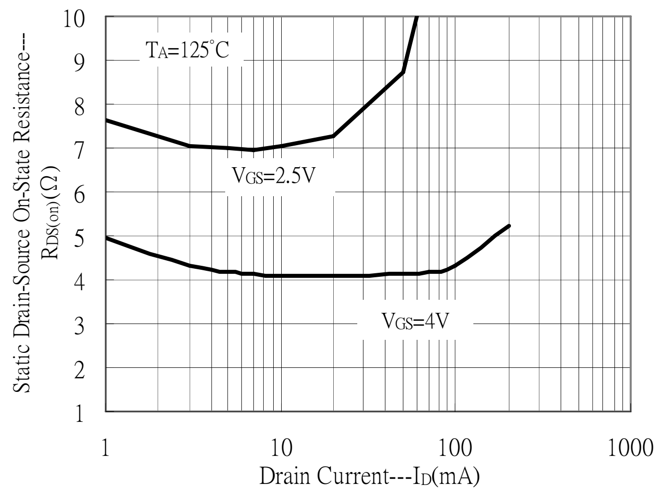




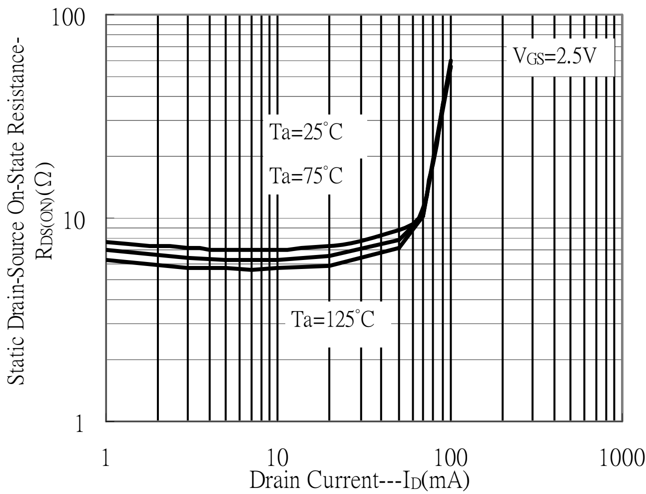


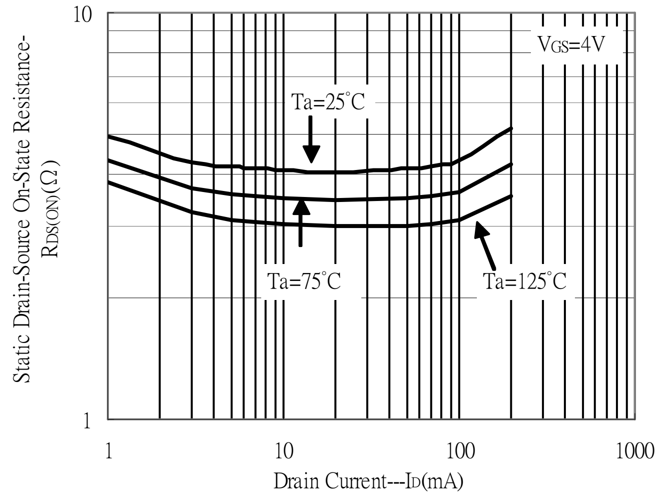


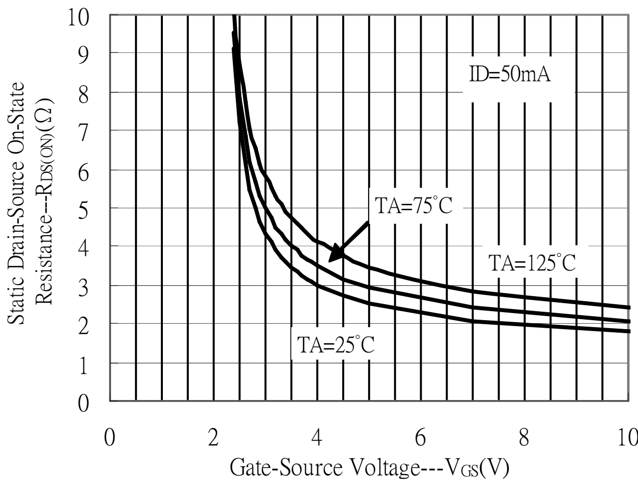


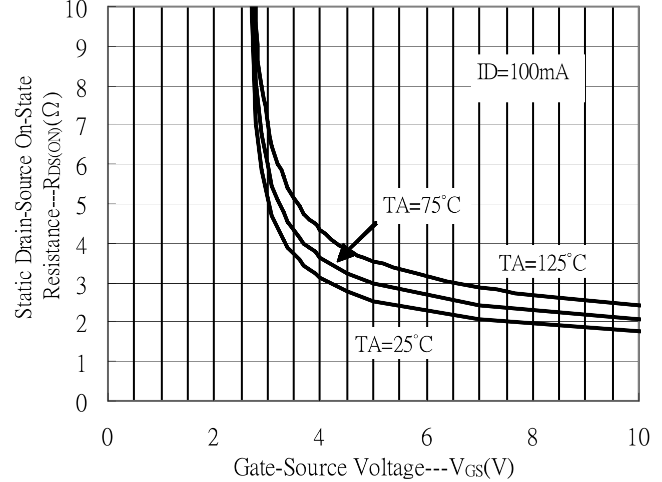


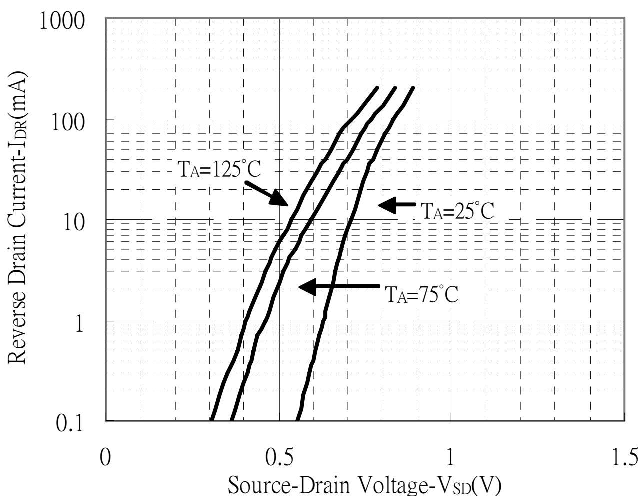
Typical Characteristics(Cont.)

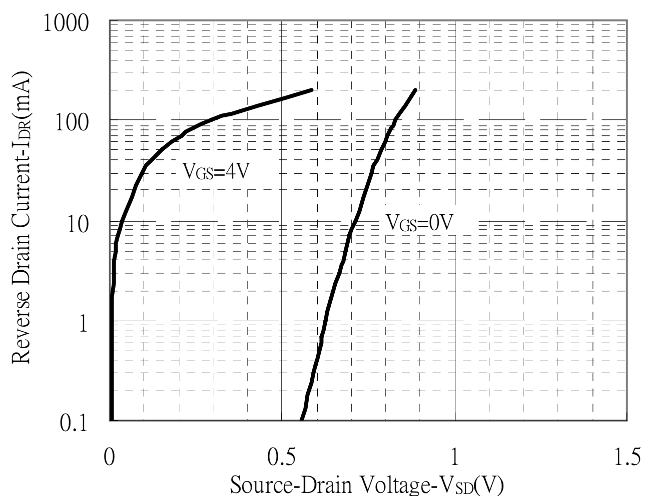




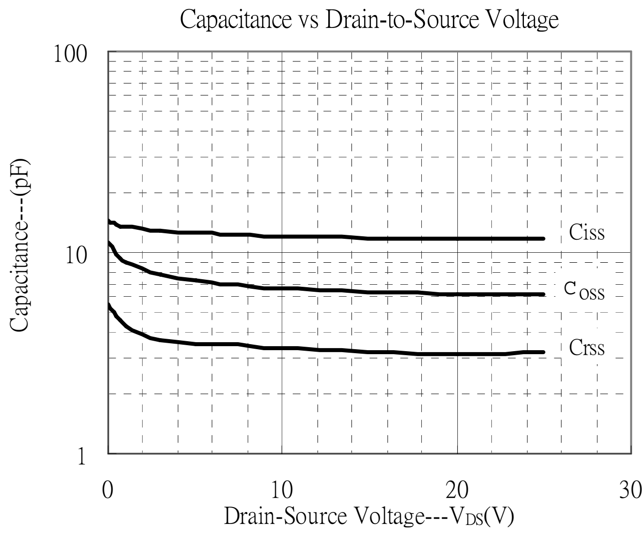


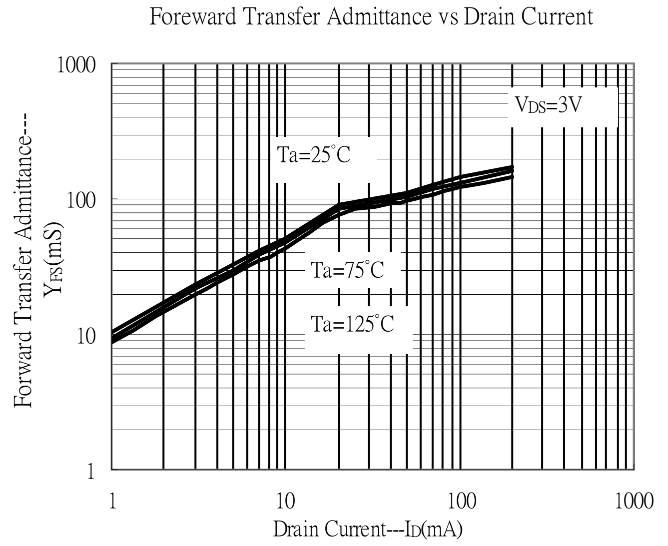




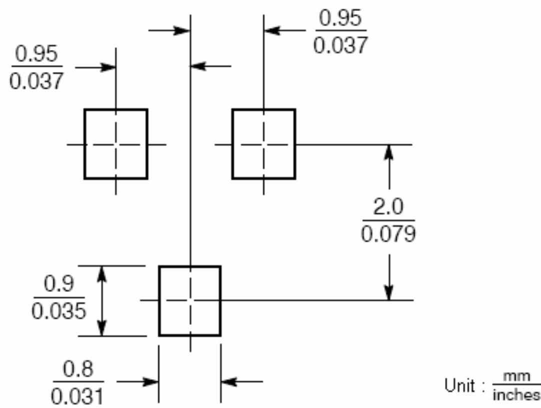


Typical Characteristics(Cont.)

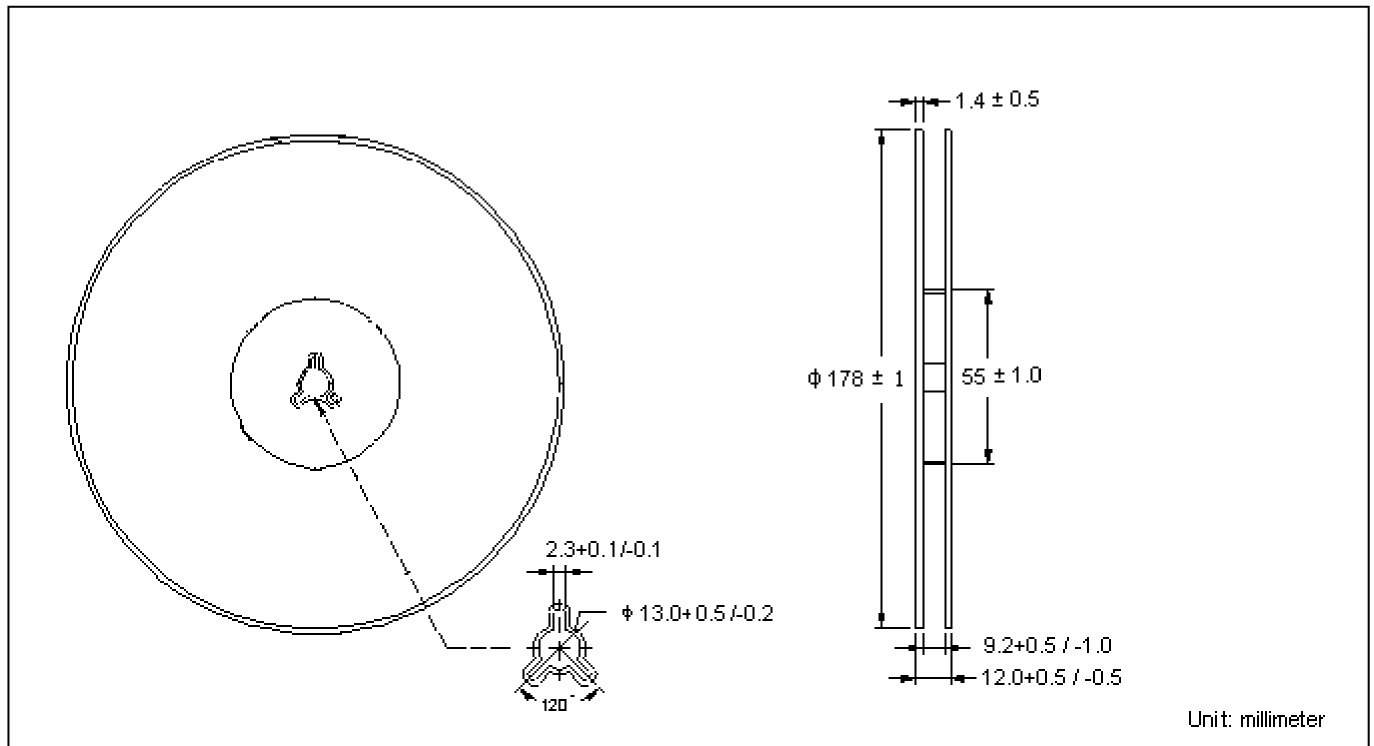




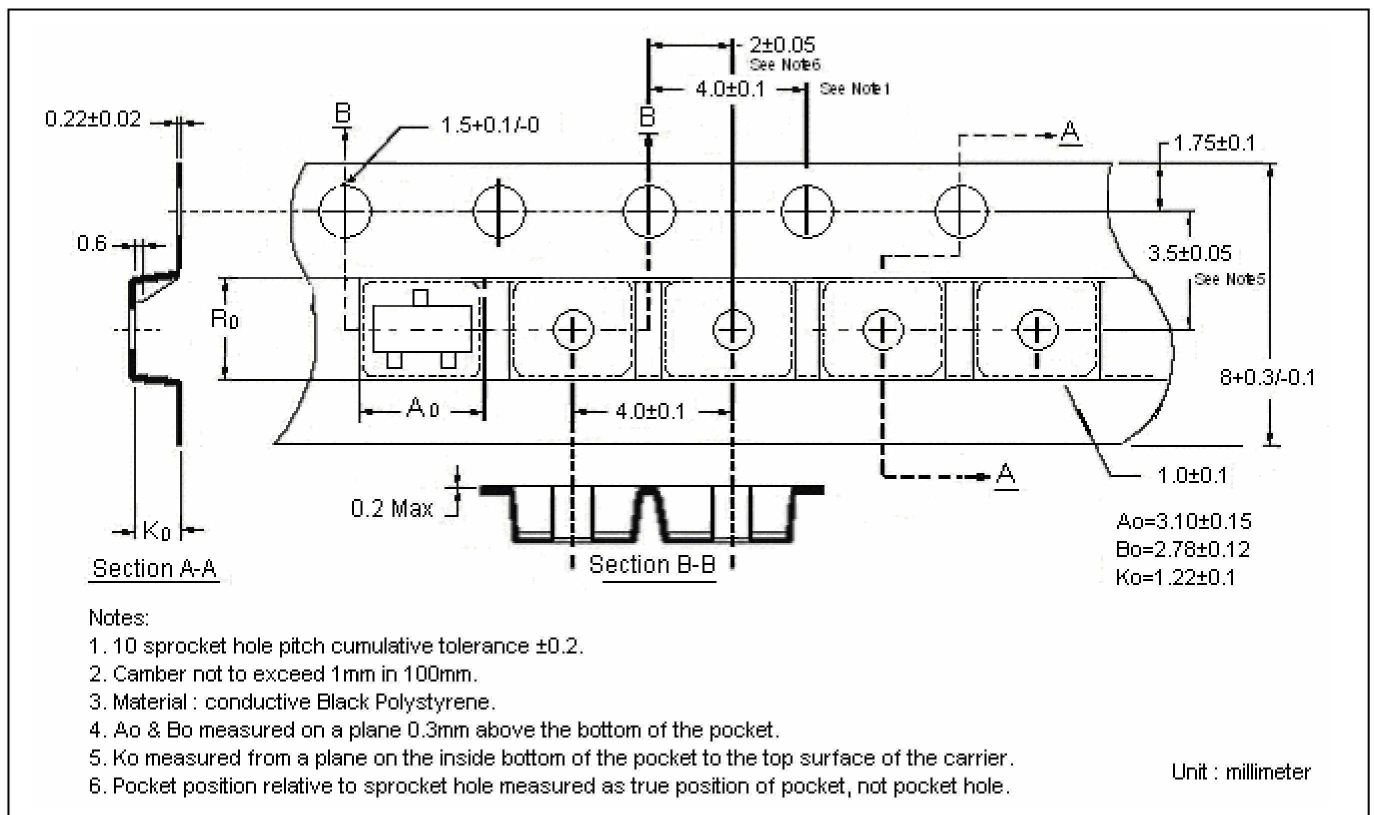
Recommended Soldering Footprint



Reel Dimension



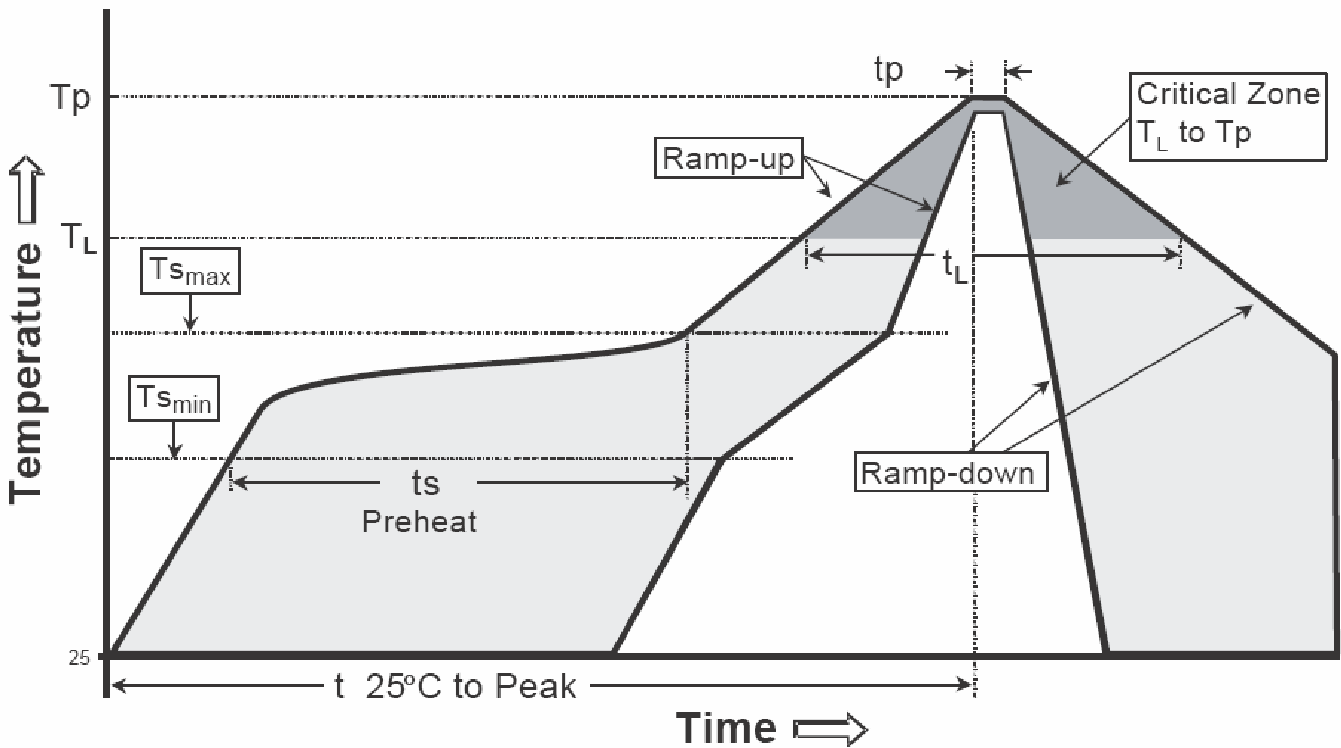
Carrier Tape Dimension



Recommended wave soldering condition

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

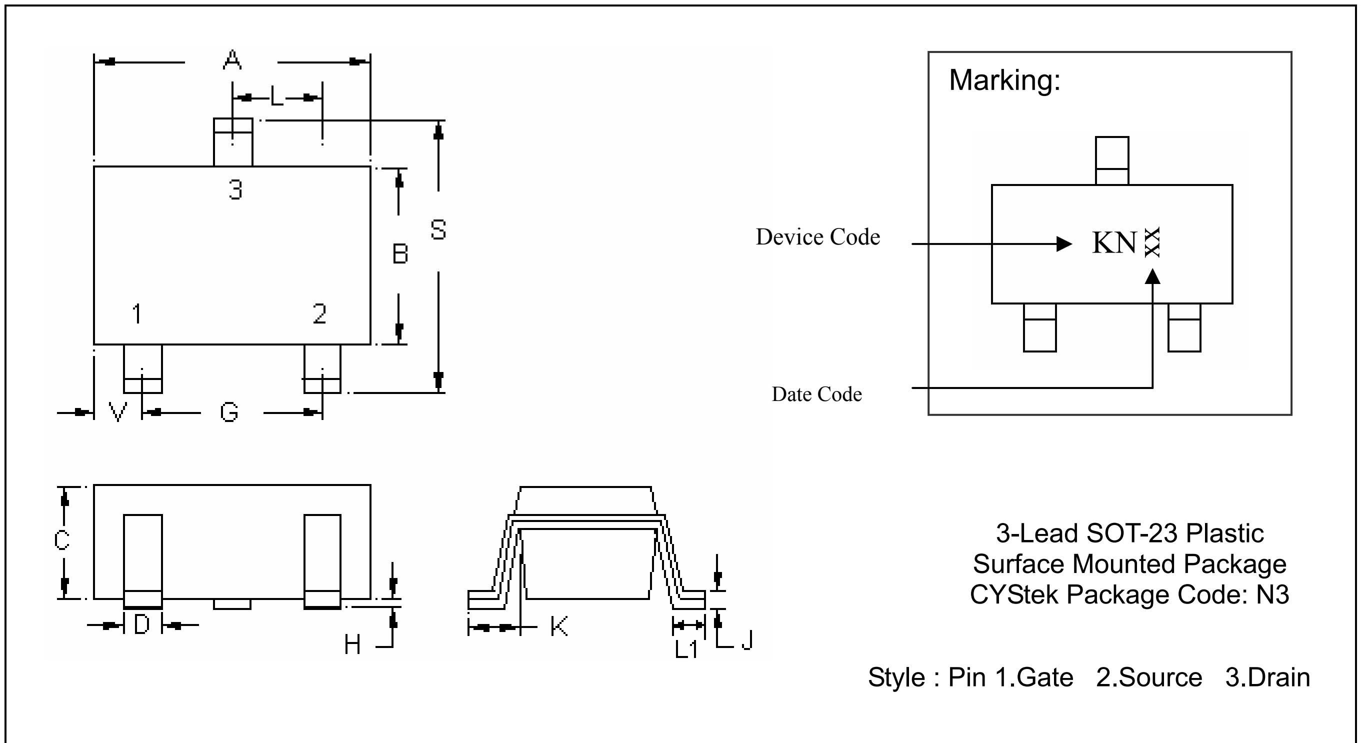
Recommended temperature profile for IR reflow



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



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1102	0.1204	2.80	3.04	J	0.0032	0.0079	0.08	0.20
B	0.0472	0.0669	1.20	1.70	K	0.0118	0.0266	0.30	0.67
C	0.0335	0.0512	0.89	1.30	L	0.0335	0.0453	0.85	1.15
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	0.0000	0.0040	0.00	0.10	L1	0.0118	0.0197	0.30	0.50

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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