30V N-CHANNEL Enhancement Mode MOSFET

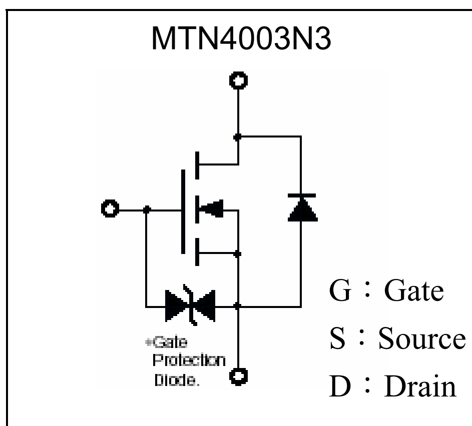
MTN4003N3

BV_{DSS}	30V
I_D	1.3A
R_{DSON}@V_{GS}=10V, I_D=500mA	305mΩ(typ)
R_{DSON}@V_{GS}=4V, I_D=100mA	450mΩ(typ)
R_{DSON}@V_{GS}=2.5V, I_D=100mA	810mΩ(typ)

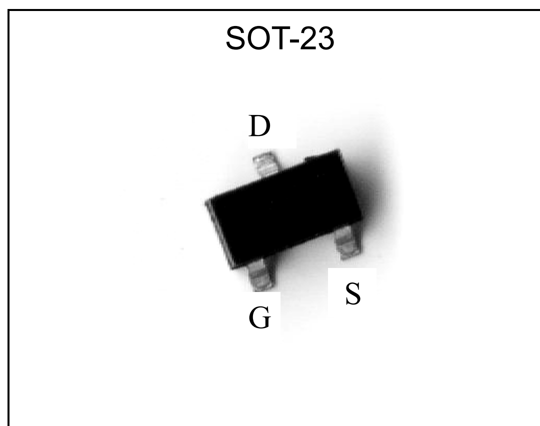
Features

- Simple drive requirement
- Small package outline
- Pb-free package

Symbol



Outline



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current @ T_A=25°C , V_{GS}=4V	I_D	1.3	A
Continuous Drain Current @ T_A=70°C, V_{GS}=4V		1.0	
Pulsed Drain Current (Notes 1, 2)	I_{DM}	3	
Maximum Power Dissipation@ T_A=25℃	P_D	1.38 (Note 3)	W
Linear Derating Factor		0.01	W/°C
ESD susceptibility		1000 (Note 4)	V
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150	°C

Note : 1. Pulse width limited by maximum junction temperature.
2. Pulse width≤ 300μs, duty cycle≤2%.
3. Surface mounted on 1 in² copper pad of FR-4 board, t≤5s.
4. Human body model, 1.5kΩ in series with 100pF.

Thermal Performance

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

Note : Surface mounted on 1 in² copper pad of FR-4 board, t≤5s; 270°C/W when mounted on minimum copper pad.

Electrical Characteristics (Tj=25°C, unless otherwise noted)

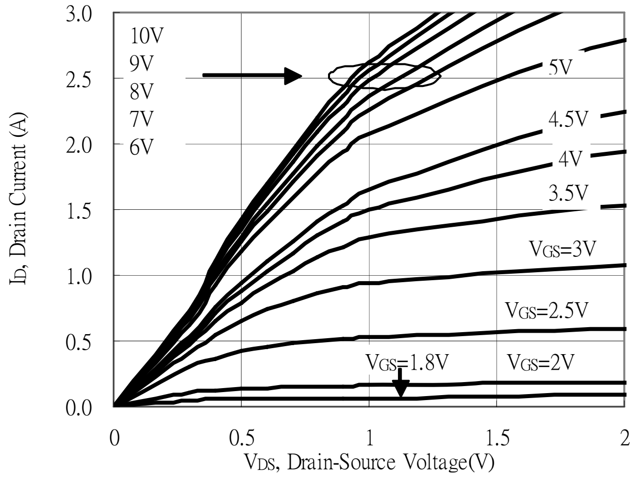
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0, I_D=250μA
$V_{GS(th)}$	1.0	1.3	1.8	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±10	μA	V_{GS}=±20V, V_{DS}=0
I_{DSS}	-	-	1	μA	V_{DS}=30V, V_{GS}=0
	-	-	10		V_{DS}=24V, V_{GS}=0 (Tj=70°C)
*$R_{DS(ON)}$	-	305	450	mΩ	V_{GS}=10V, I_D=500mA
	-	450	600		V_{GS}=4V, I_D=100mA
	-	810	1000		V_{GS}=2.5V, I_D=100mA
*G_{FS}	-	435	-	mS	V_{DS}=10V, I_D=100mA
Dynamic					
Ciss	-	43	-	pF	V_{DS}=5V, V_{GS}=0, f=1MHz
Coss	-	13	-		
Crss	-	8	-		
$t_{d(ON)}$	-	22	-	ns	V_{DS}=5V, I_D=100mA, V_{GS}=4.5V, R_G=50Ω
t_r	-	26	-		
$t_{d(OFF)}$	-	72	-		
t_f	-	55	-		
Qg	-	1.34	-	nC	V_{DS}=24V, I_D=100mA, V_{GS}=5V
Qgs	-	0.1	-		
Qgd	-	0.57	-		
Source-Drain Diode					
*V_{SD}	-	0.74	1.2	V	V_{GS}=0V, I_S=100mA

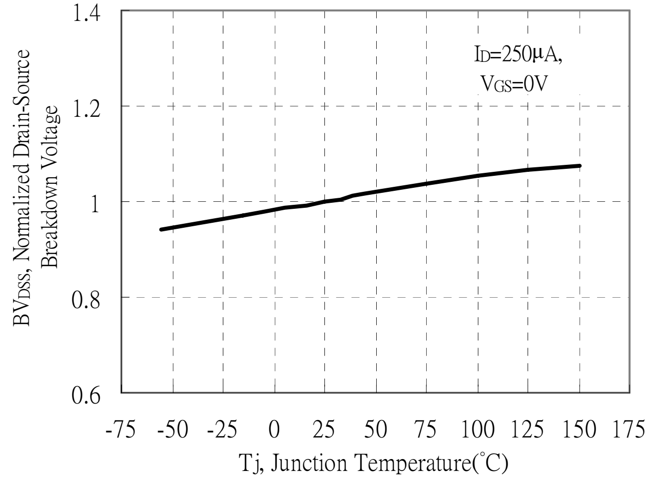
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

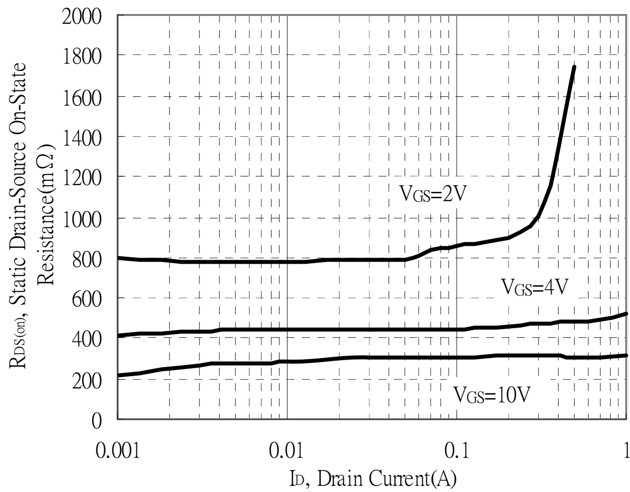
Ordering Information

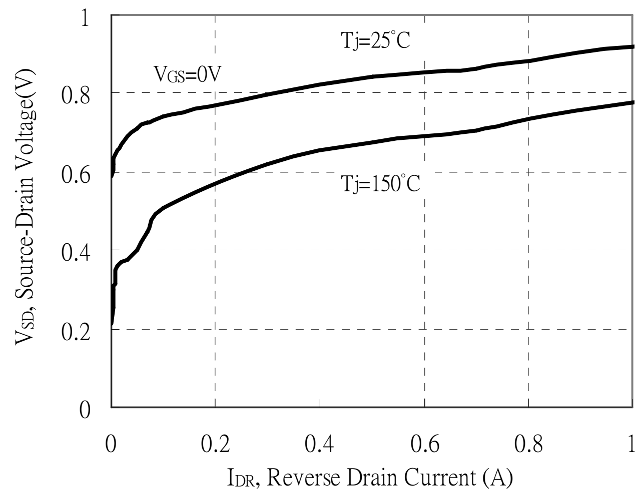
Device	Package	Shipping	Marking
MTN4003N3	SOT-23 (Pb-free)	3000 pcs / Tape & Reel	4003

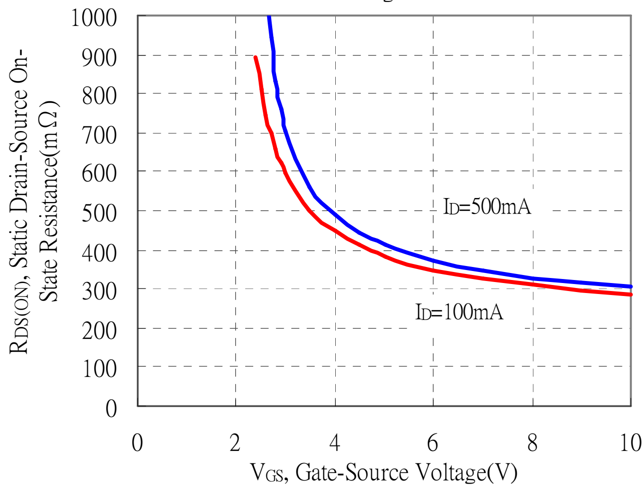
Typical Characteristics

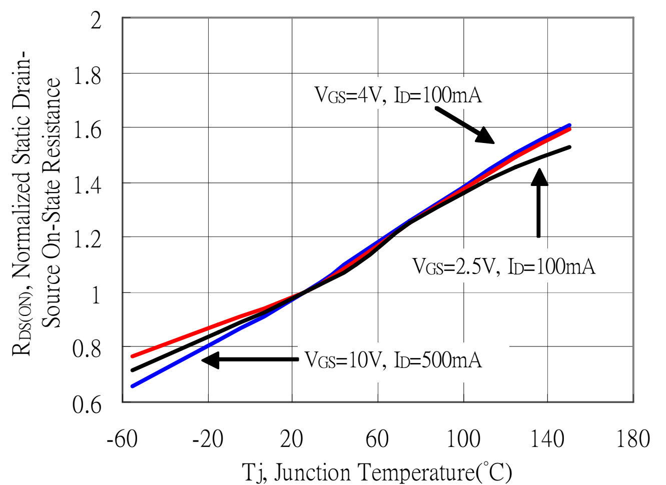




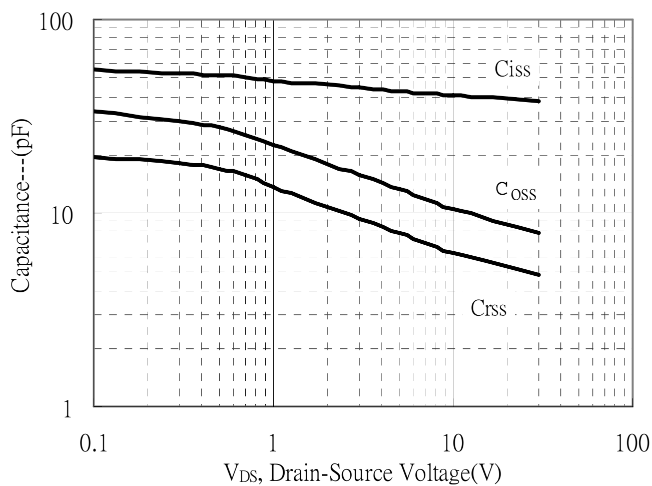


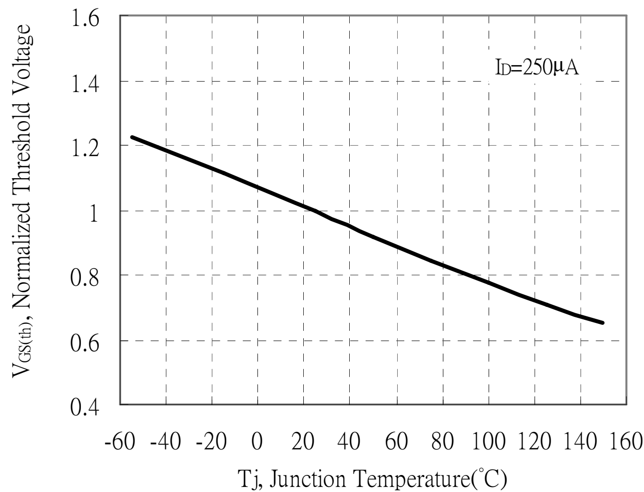


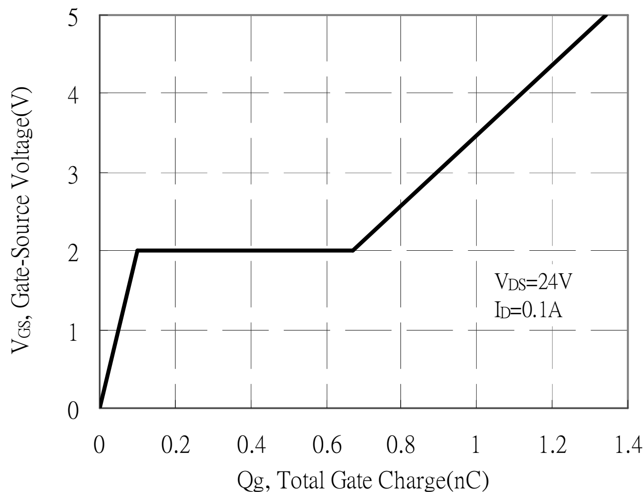


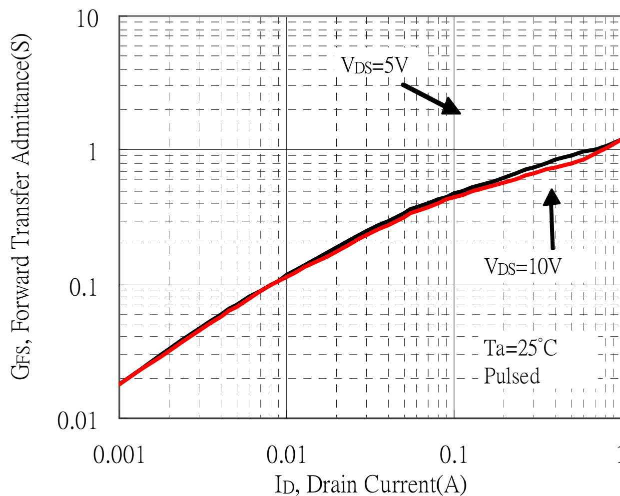


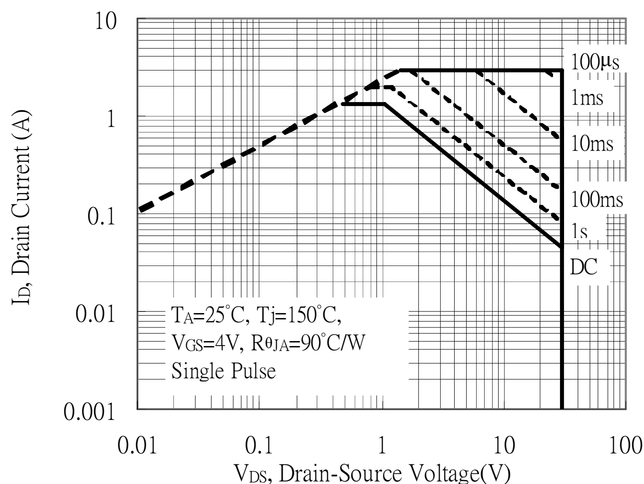
Typical Characteristics(Cont.)

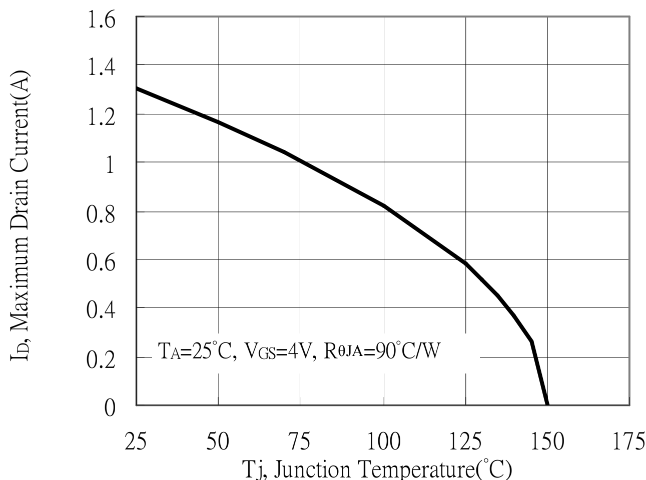




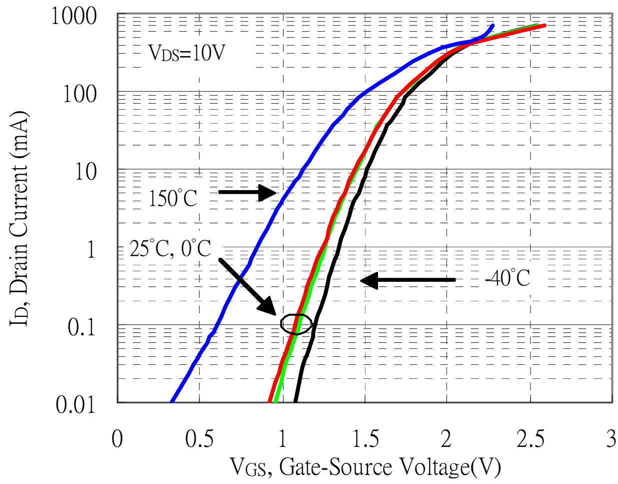


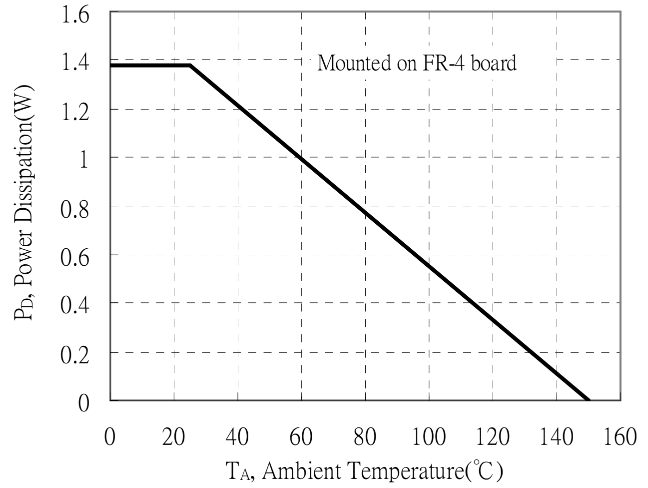


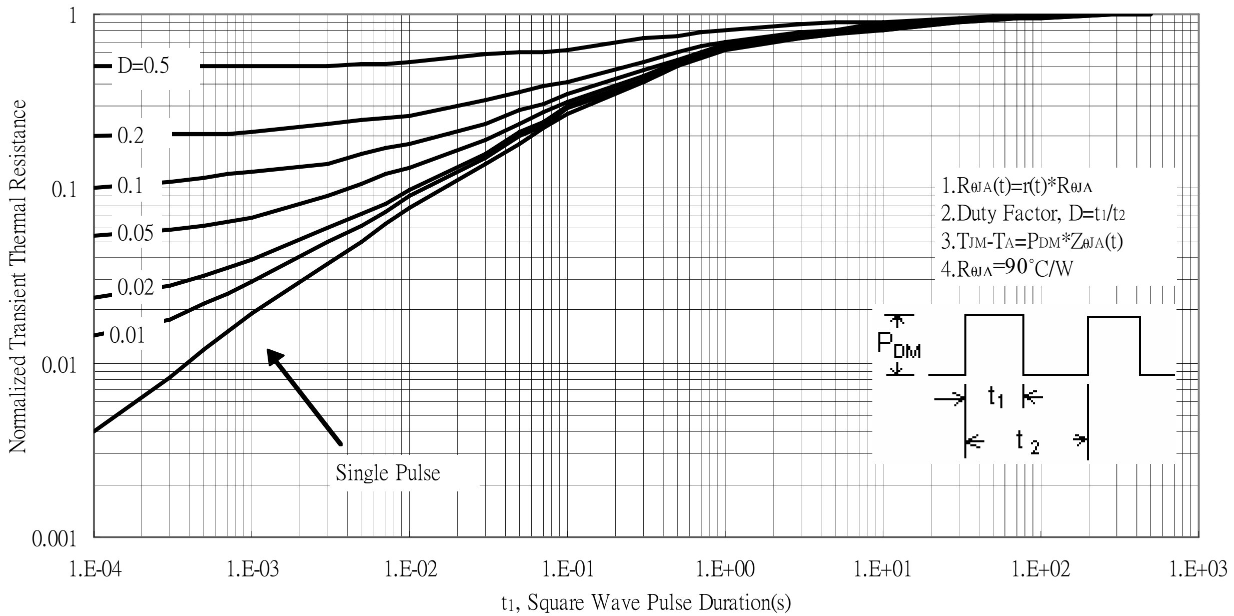




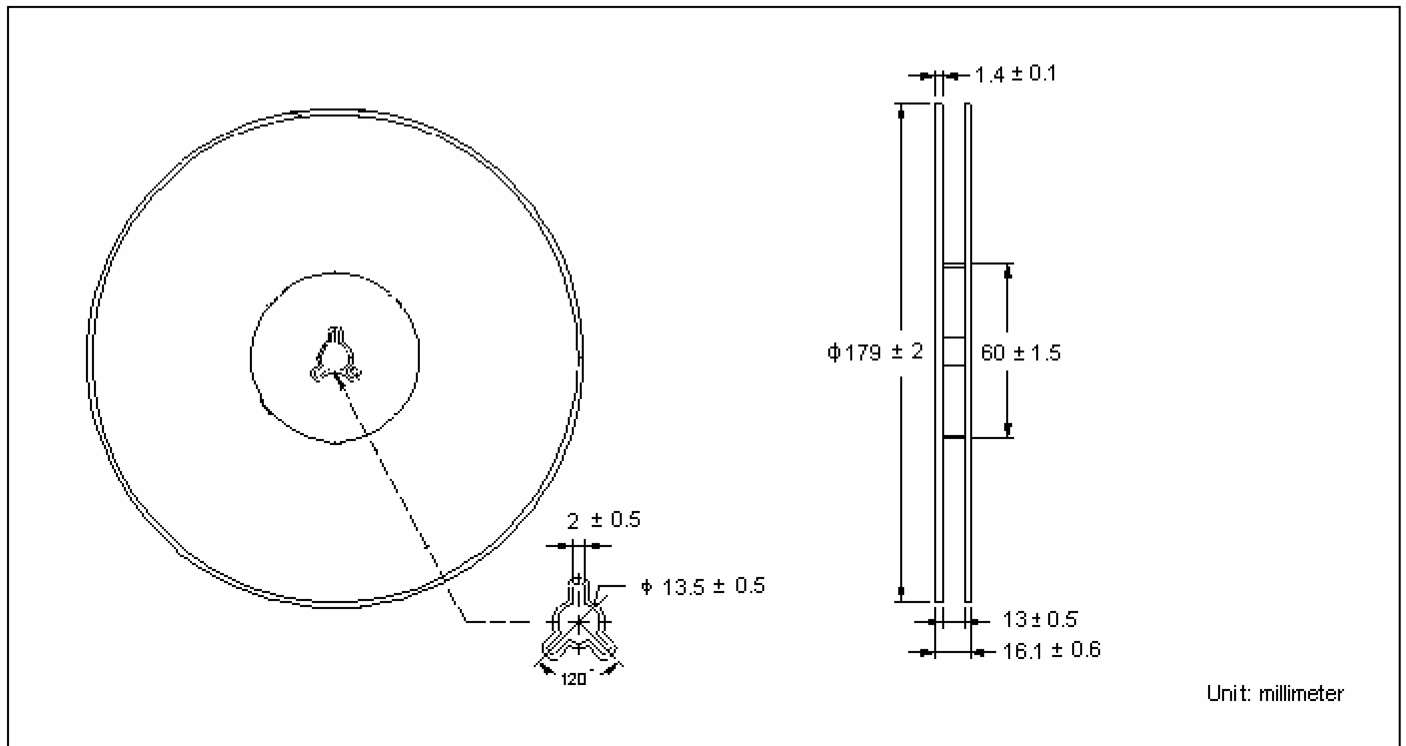
Typical Characteristics(Cont.)



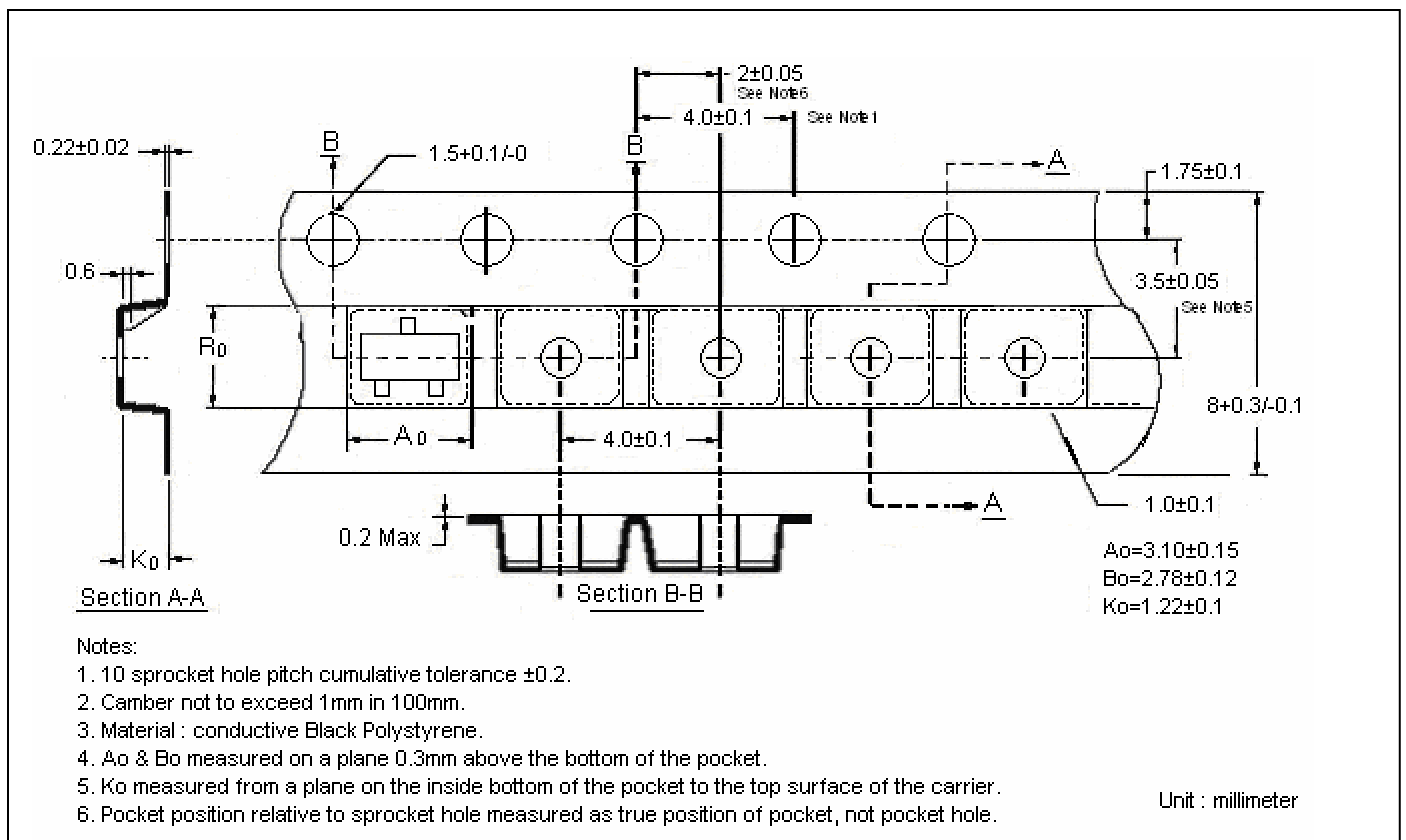




Reel Dimension



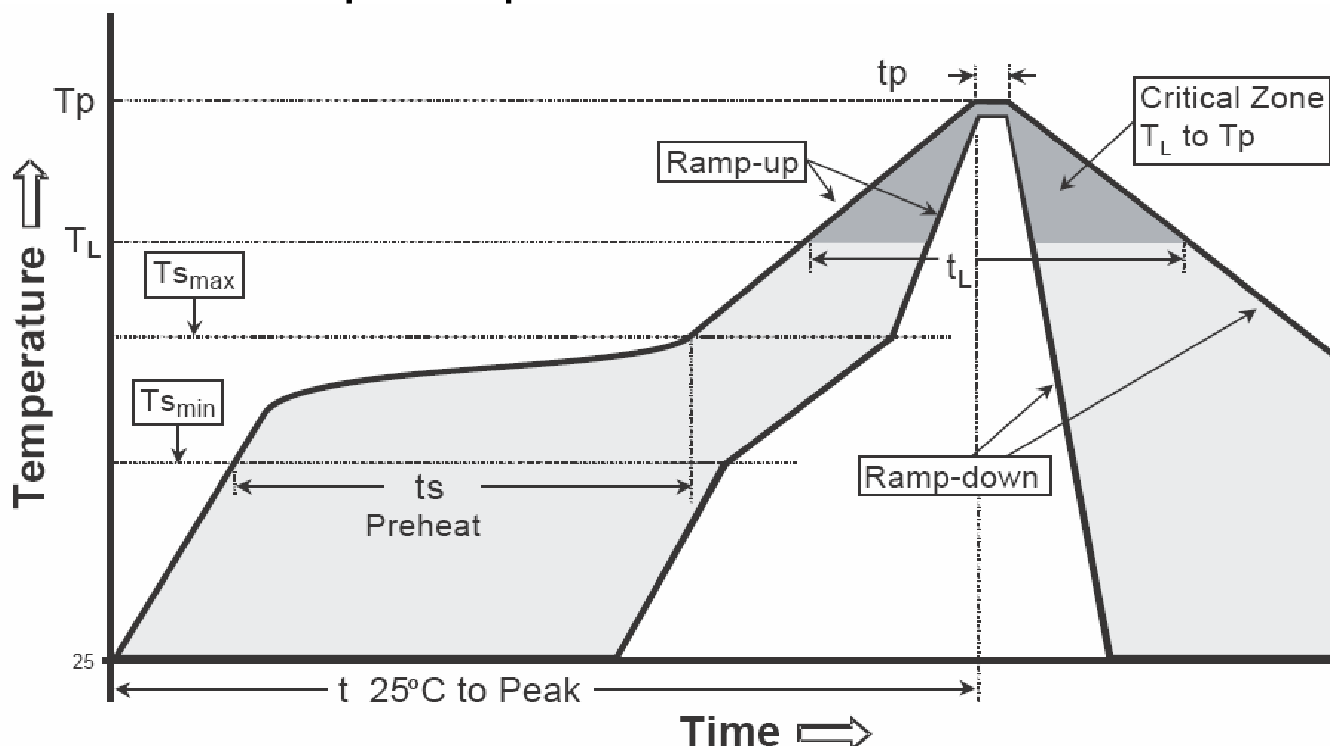
Carrier Tape Dimension



Recommended wave soldering condition

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

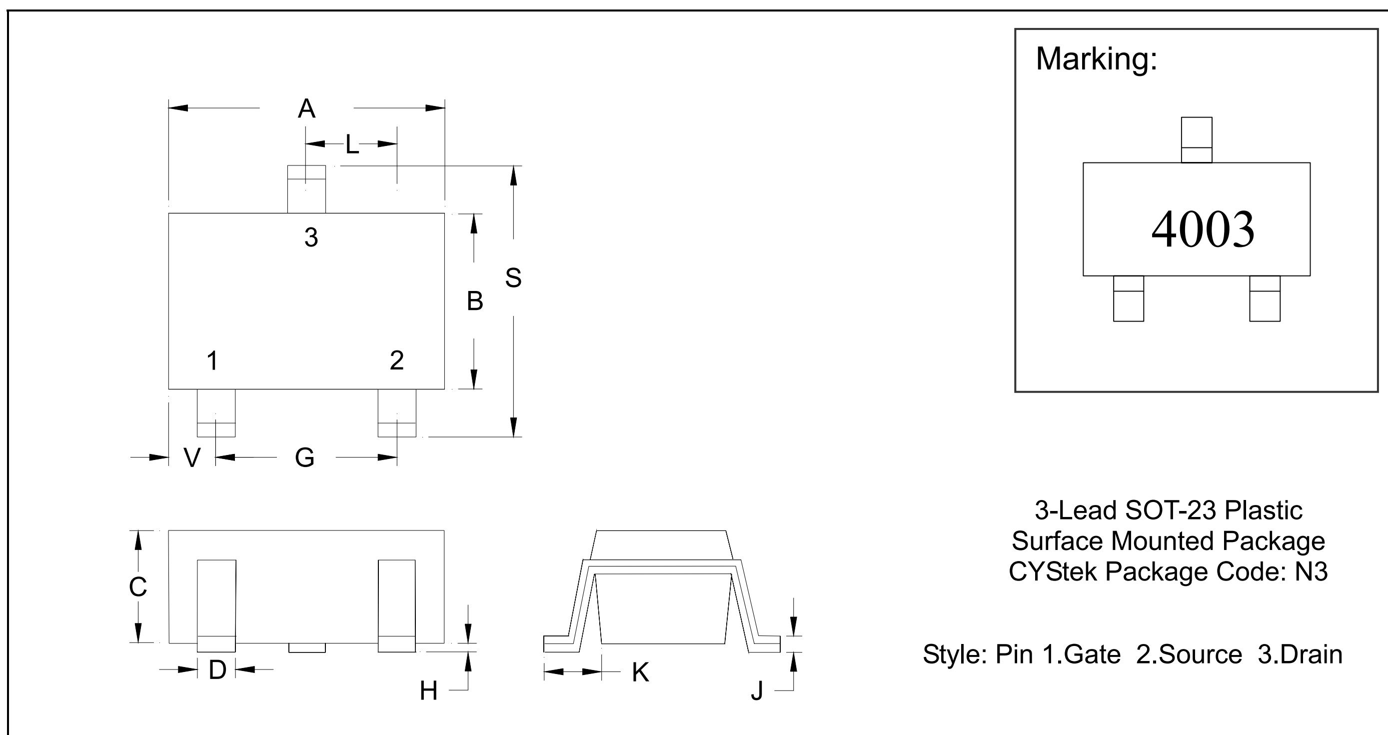
Recommended temperature profile for IR reflow



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



*: 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	0.0032	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					

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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