30V N-CHANNEL Enhancement Mode MOSFET

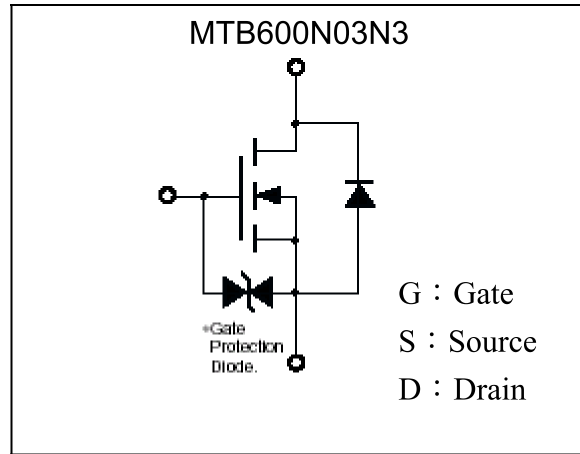
MTB600N03N3

BV_{DSS}	30V
I_D@V_{GS}=4.5V	1.6A
R_{DSON}@V_{GS}=4.5V, I_D=200mA	448mΩ(typ.)
R_{DSON}@V_{GS}=2.5V, I_D=100mA	809mΩ(typ.)

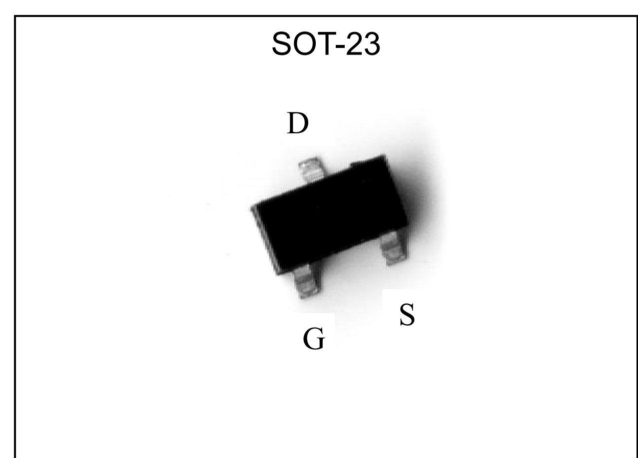
Features

- Low on-resistance
- Excellent thermal and electrical capabilities
- Compact and low profile SOT-23 package
- ESD protected gate
- Pb-free lead plating and halogen-free package

Equivalent Circuit

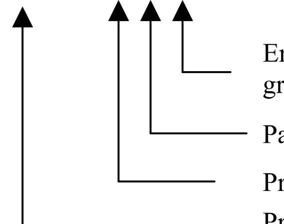


Outline



Ordering Information

Device	Package	Shipping
MTB600N03N3-0-T1-G	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel



Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products

Packing spec, T1 : 3000 pcs / tape & reel,7" reel

Product rank, zero for no rank products

Product name

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±12	
Continuous Drain Current @ T_A=25°C, V_{GS}=4.5V (Note 3)	I_D	1.6	A
Continuous Drain Current @ T_A=70°C, V_{GS}=4.5V (Note 3)		1.3	
Pulsed Drain Current (Note 1, 2)	I_{DM}	3.2	
Maximum Power Dissipation @ T_A=25℃ (Note 3)	P_D	1.38	W
Linear Derating Factor		0.01	W/°C
Thermal Resistance, Junction-to-Ambient (Note 3)	$R_{th,ja}$	90	°C/W
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 FR-4 board, t≤10sec.

Electrical Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0, I_D=250μA
$V_{GS(th)}$	0.70	1.25	1.60		V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±5	μA	V_{GS}=±12V, V_{DS}=0
I_{DSS}	-	-	1		V_{DS}=24V, V_{GS}=0
I_{DSS}	-	-	25		V_{DS}=24V, V_{GS}=0, Tj=55°C
*$R_{DS(ON)}$	-	448	650	mΩ	V_{GS}=4.5V, I_D=200mA
	-	809	1250		V_{GS}=2.5V, I_D=100mA
*G_{FS}	-	640	-	mS	V_{DS}=10V, I_D=200mA
Dynamic					
Ciss	-	41.93	-	pF	V_{DS}=15V, V_{GS}=0, f=1MHz
Coss	-	7.37	-		
Crss	-	5.33	-		
$t_{d(ON)}$	-	8.6	-	ns	V_{DD}=15V, I_D=250mA, V_{GS}=4V, R_G=10Ω
t_r	-	17.4	-		
$t_{d(OFF)}$	-	16.4	-		
t_f	-	16.4	-		
Qg	-	1.4	-	nC	V_{DS}=15V, I_D=1.6A, V_{GS}=4.5V
Qgs	-	0.32	-		
Qgd	-	0.46	-		
Source-Drain Diode					
*V_{SD}	-	0.84	1.2	V	V_{GS}=0V, I_S=300mA
*trr	-	6.7	-	ns	I_F=500mA, dI_F/dt=100A/μs
*Qrr	-	2.1	-	nC	

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

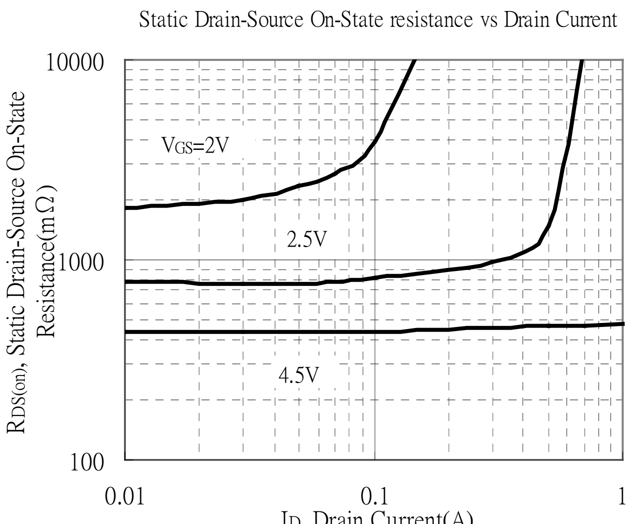
Typical Characteristics

Typical Output Characteristics

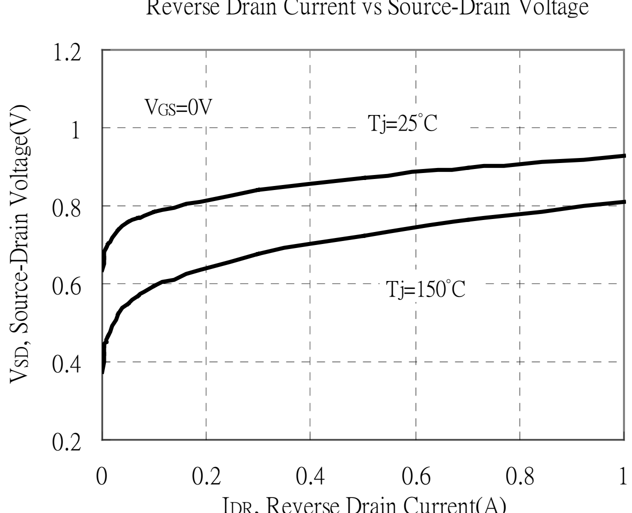
I_D, Drain Current(A) vs V_{DS}, Drain-Source Voltage(V); curves: 5V, 4.5V; 4V; 3.5V; 3V; 2.5V; V_{GS}=2V

Brekdown Voltage vs Ambient Temperature

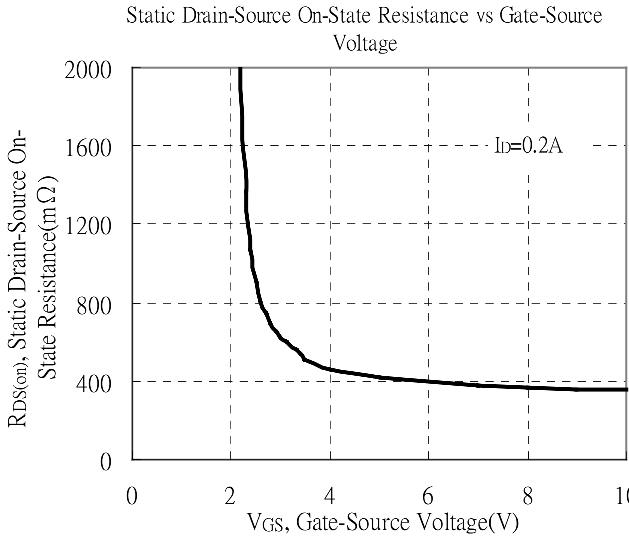
BV_{DSS}, Normalized Drain-Source Breakdown Voltage vs Tj, Junction Temperature(°C); I_D=250μA, V_{GS}=0V



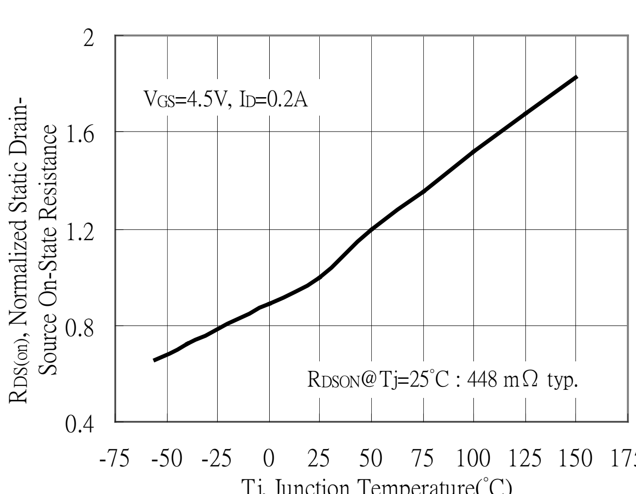
Static Drain-Source On-State resistance vs Drain Current



Reverse Drain Current vs Source-Drain Voltage

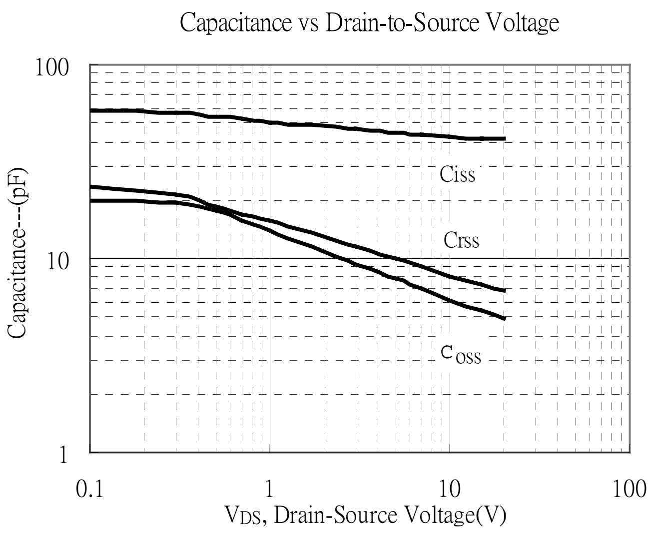


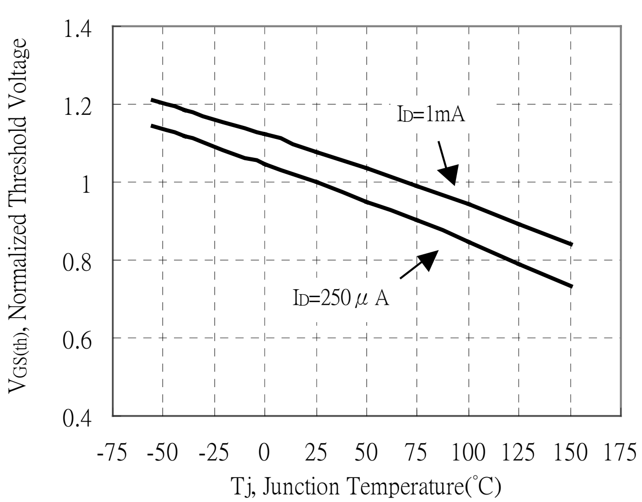
Static Drain-Source On-State Resistance vs Gate-Source Voltage

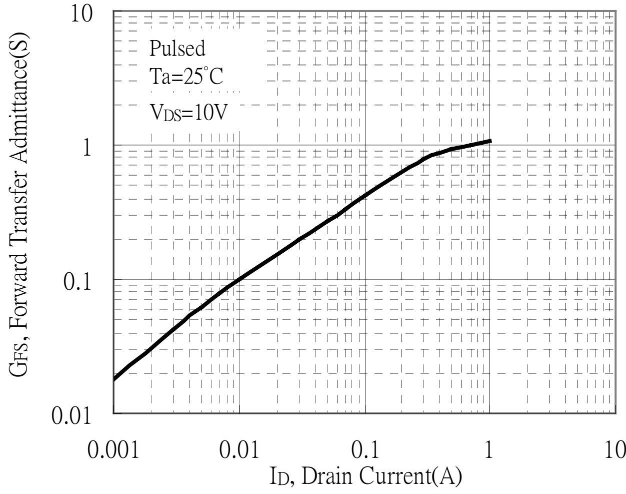


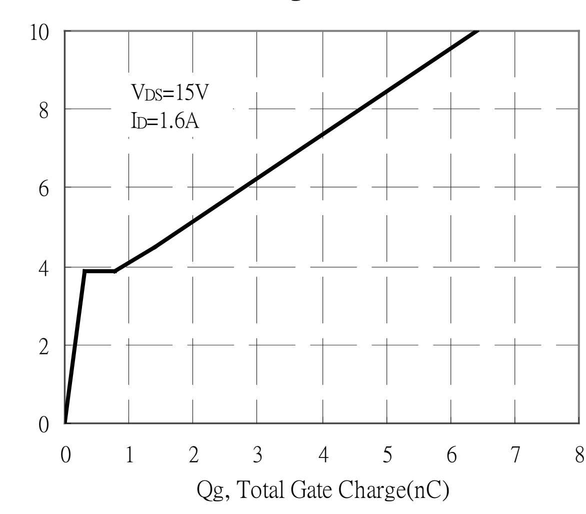
Drain-Source On-State Resistance vs Junction Tempearture

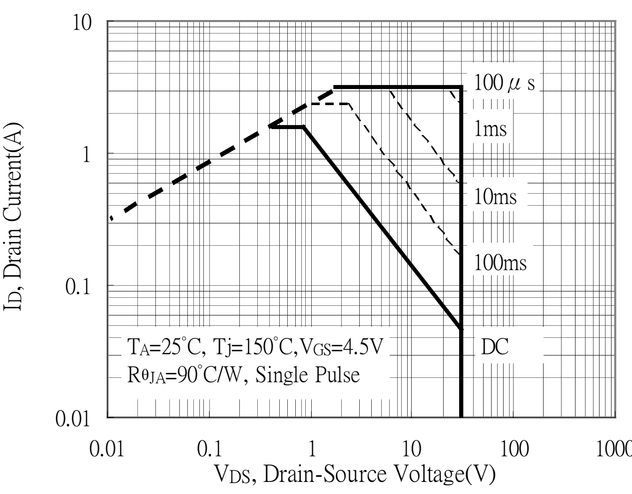
Typical Characteristics(Cont.)

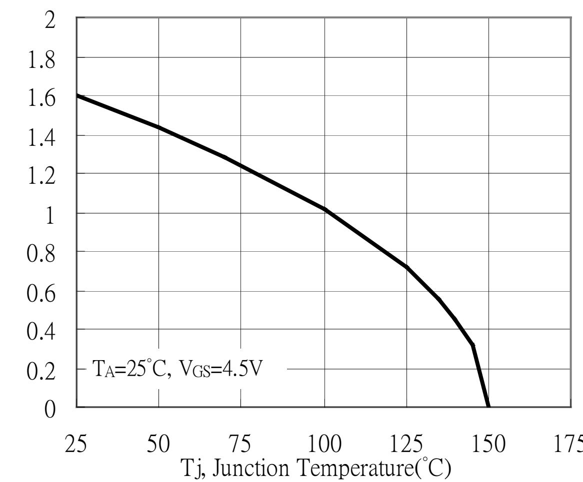




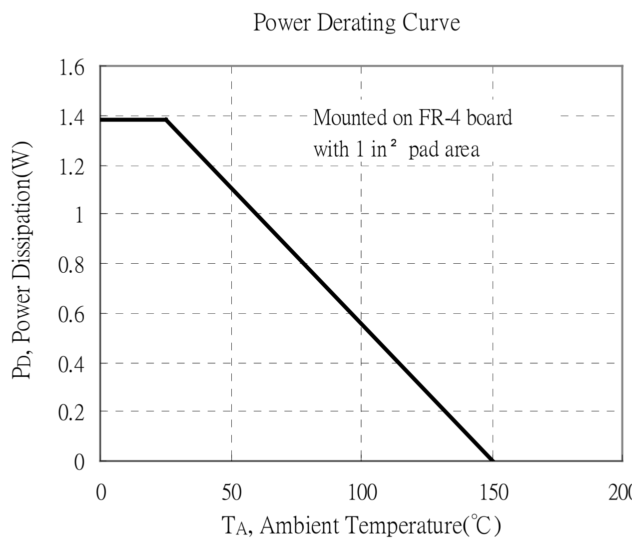


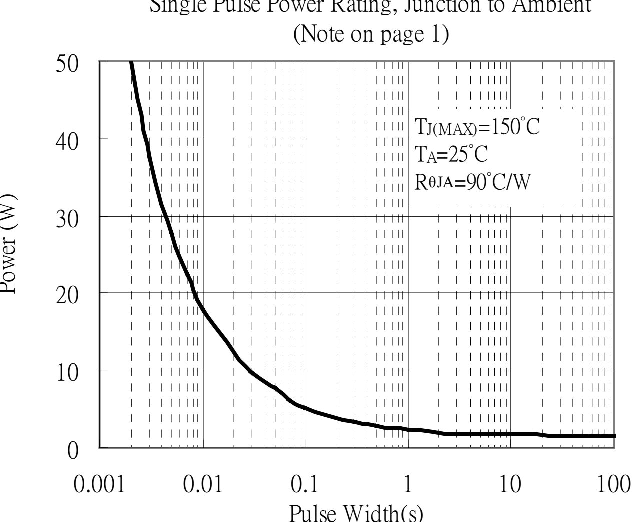


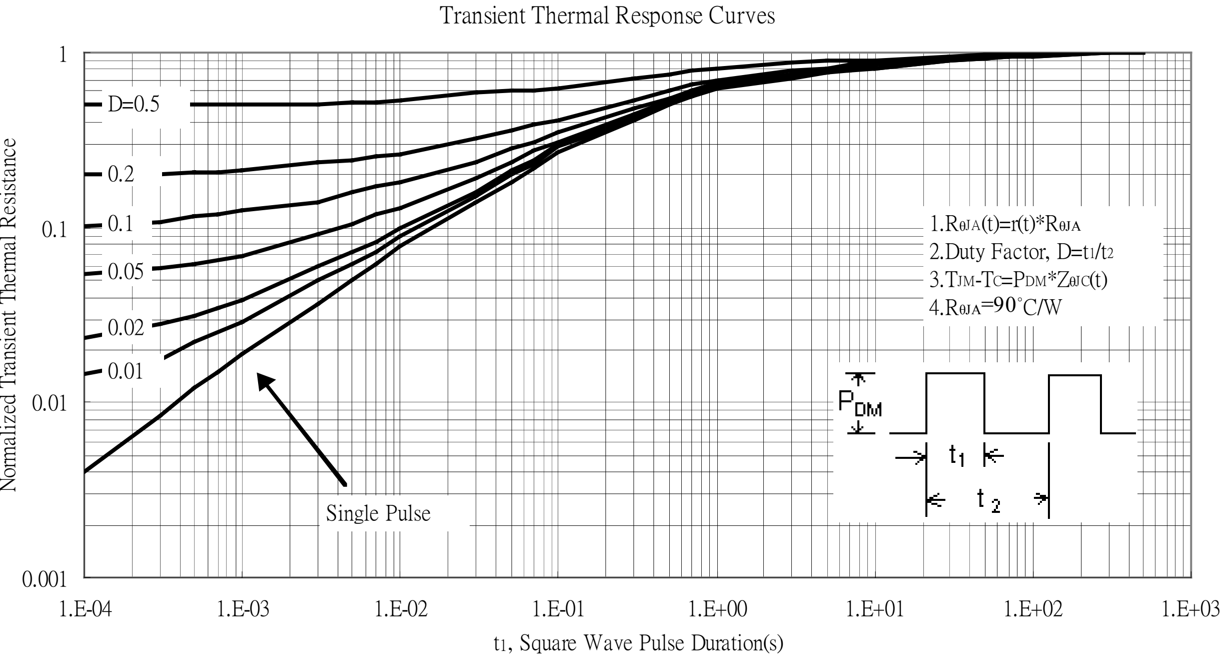




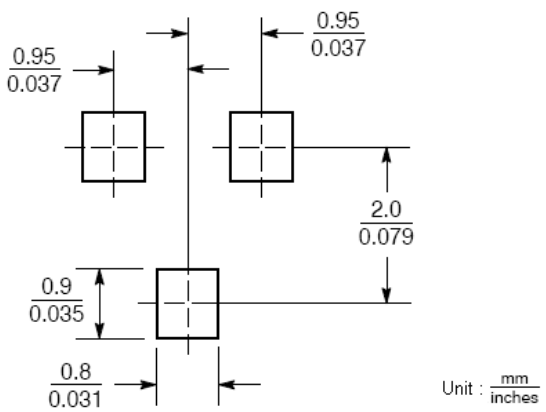
Typical Characteristics(Cont.)



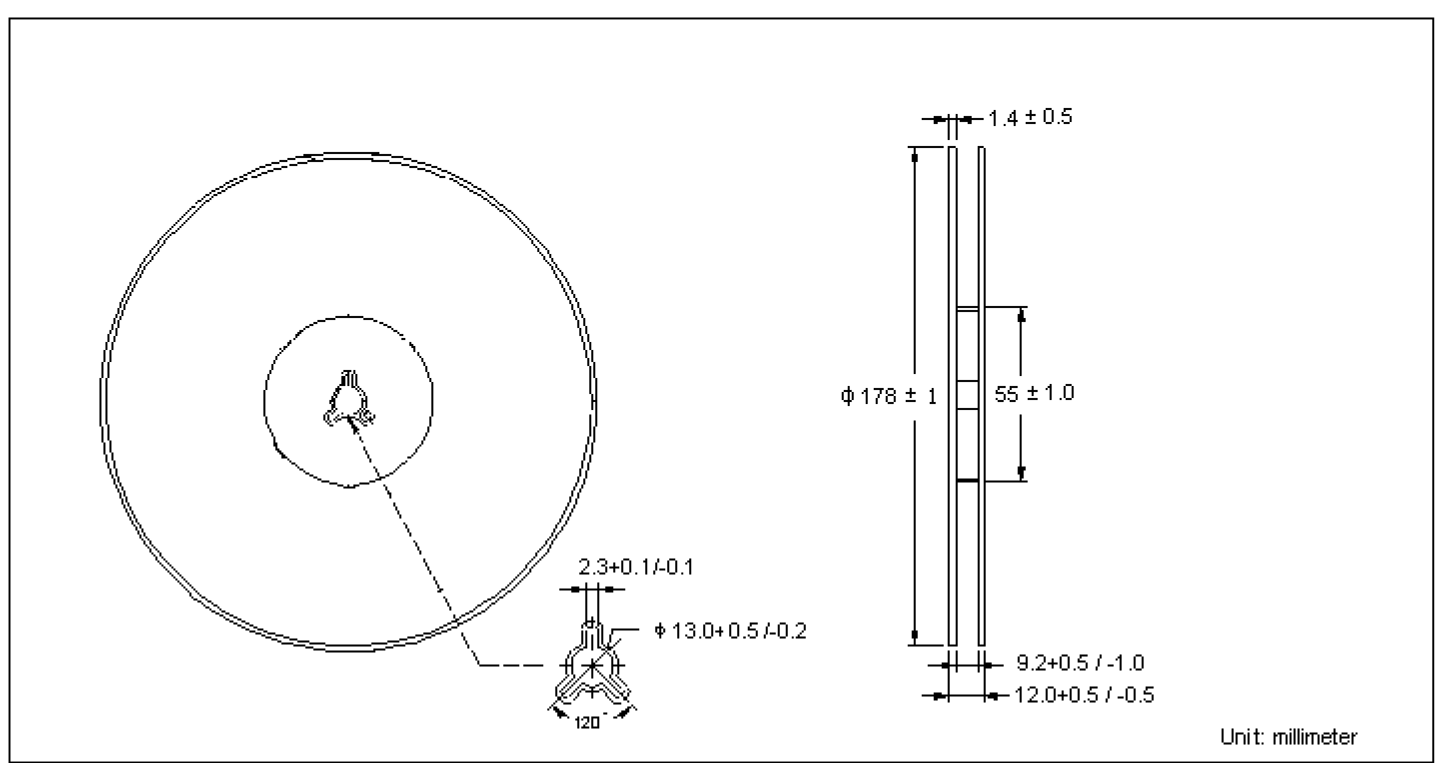




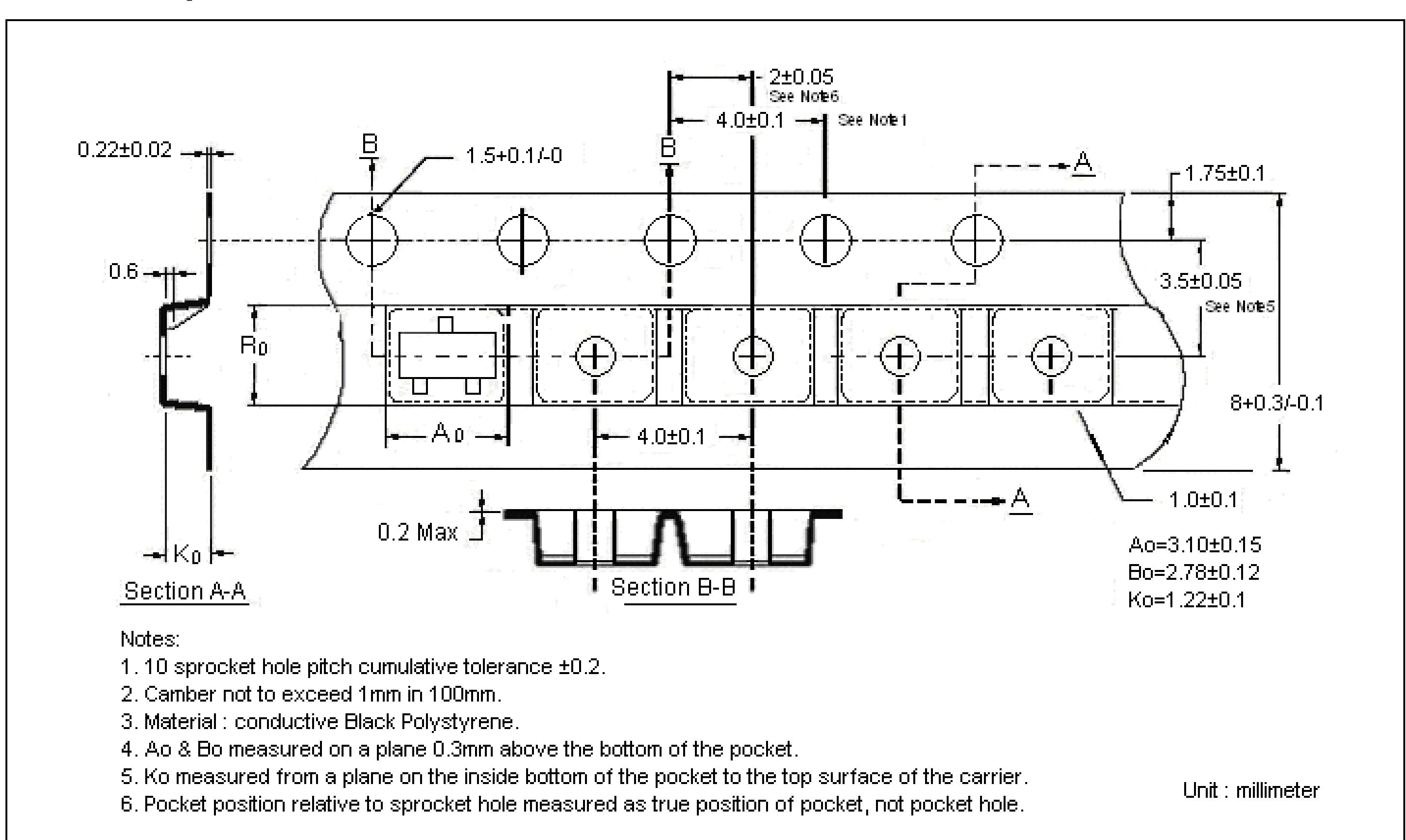
Recommended Soldering Footprint



Reel Dimension



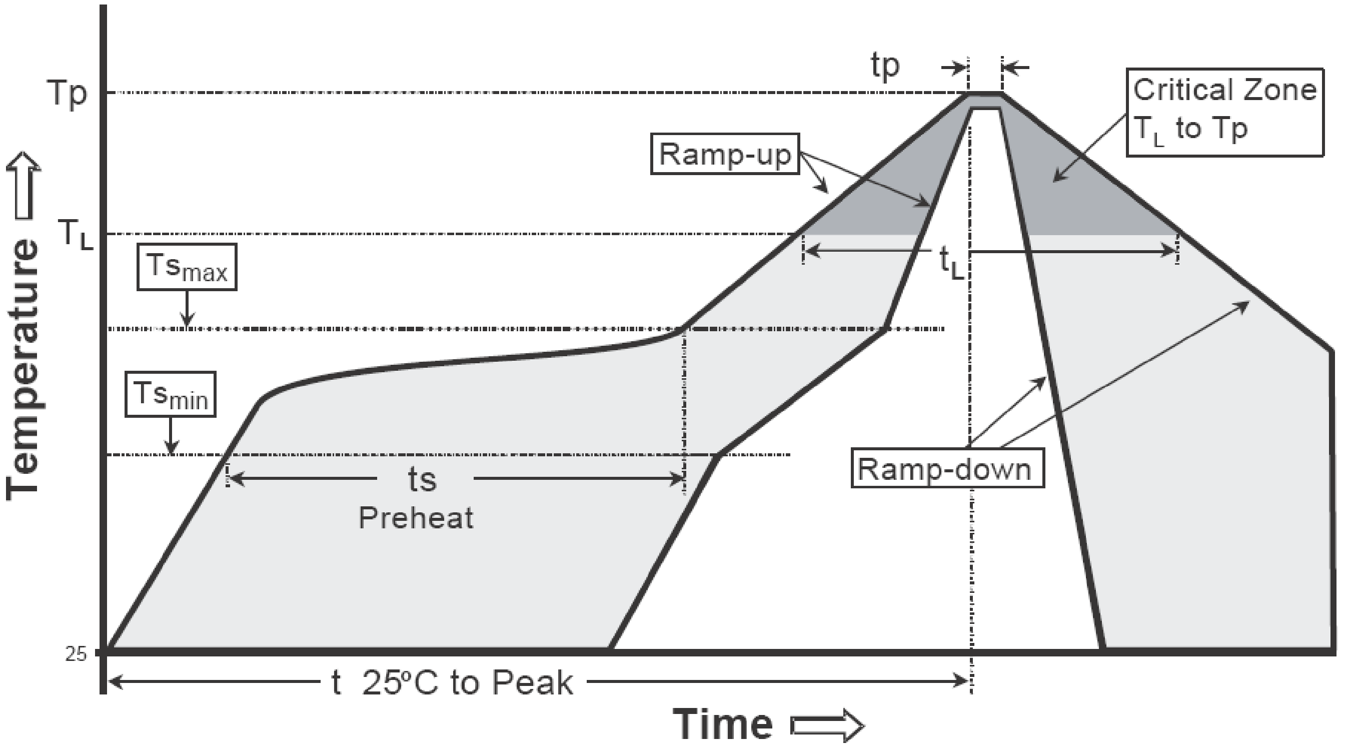
Carrier Tape Dimension



Recommended wave soldering condition

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

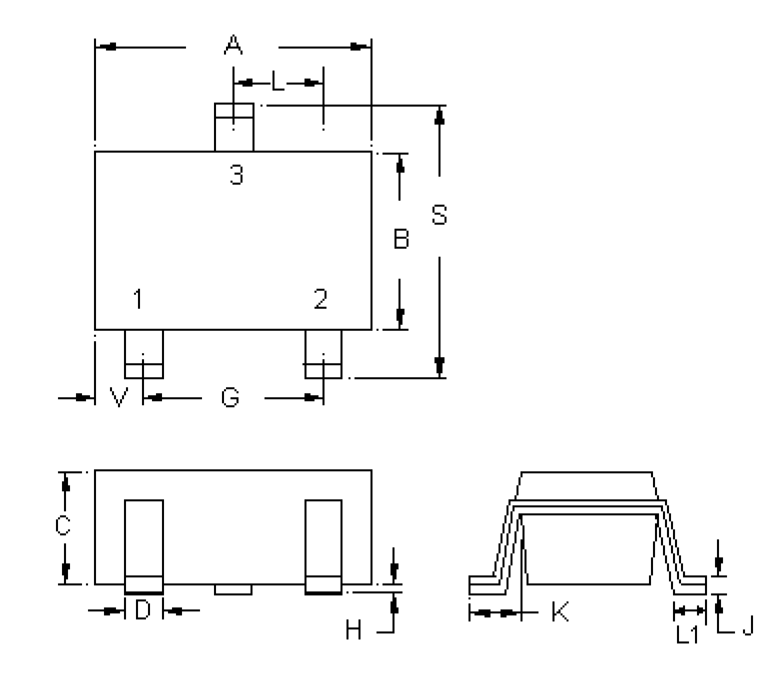
Recommended temperature profile for IR reflow

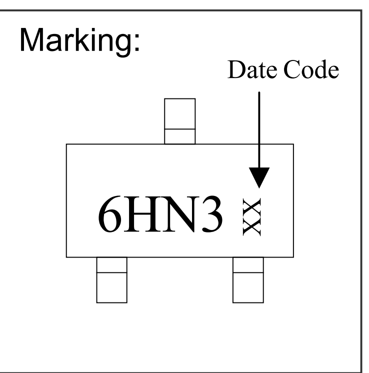


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time(t_S min to t_S max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	 183°C 60-150 seconds	 217°C 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.

SOT-23 Dimension





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

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

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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