30V P-CHANNEL Enhancement Mode MOSFET

MTP3LP01N3

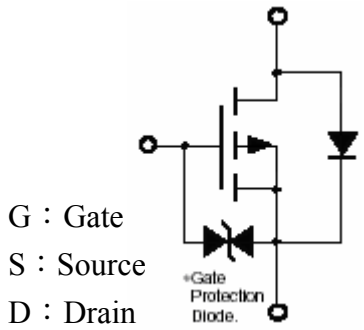
BV_{DSS}	-30V
I_D	-230mA
$R_{DSON(typ)}$	3Ω@-4V
	4.6Ω@-2.5V
	10.9Ω@-1.5V

Features

- Ultra high speed switching.
- Low gate charge.
- 2.5V drive.
- Pb-free lead plating and halogen-free package.

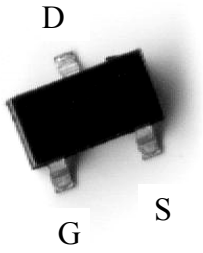
Equivalent Circuit

MTP3LP01N3



Outline

SOT-23



Ordering Information

Device	Package	Shipping
MTP3LP01N3-0-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, unless otherwise noted)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±10	V
Continuous Drain Current	I_D	-230	mA
Pulsed Drain Current (Note 1)	I_{DM}	-920	mA
Maximum Power Dissipation (Note 2)	P_D	250	mW
Thermal Resistance, Junction-to-Ambient	$R_{th,ja}$	500	°C/W
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150	°C

Note : 1. Pulse width≤ 10μs, duty cycle≤1%.
2. When mounted on a glass epoxy with a dimension of 100mm²×1mm.

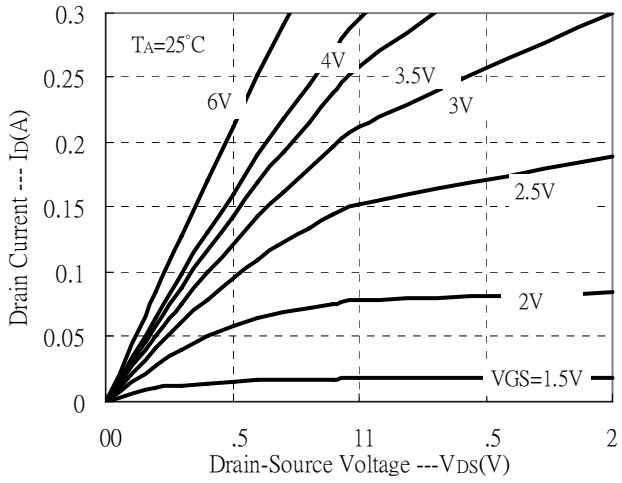
Electrical Characteristics (Ta=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-30	-	-	V	V_{GS}=0V, I_D=-250μA
$V_{GS(th)}$	-0.6	0.9	-1.1	V	V_{DS}=-10V, I_D=-100μA
G_{FS}	100	210	-	mS	V_{DS}=-10V, I_D=-100mA
I_{GSS}	-	-	±1	μA	V_{GS}=±8V, V_{DS}=0
I_{DSS}	-	-	-1	μA	V_{DS}=-30V, V_{GS}=0
	-	-	-10		V_{DS}=-24V, V_{GS}=0; Tj=125°C
*$R_{DS(ON)}$	-	3	5	Ω	V_{GS}=-4V, I_D=-100mA
	-	4.6	8		V_{GS}=-2.5V, I_D=-30mA
	-	10.9	18		V_{GS}=-1.5V, I_D=-1mA
Dynamic					
Ciss	-	35.7	-	pF	V_{DS}=-20V, V_{GS}=0, f=1MHz
Coss	-	11.9	-		
Crss	-	3.7	-		
*$t_{d(ON)}$	-	26.4	-	ns	V_{DS}=-15V, I_D=-100mA, V_{GS}=-4V, R_L=150Ω, R_G=50Ω
*t_r	-	12.8	-		
*$t_{d(OFF)}$	-	31.5	-		
*t_f	-	46.4	-		
*Qg	-	0.78	-	nC	V_{DS}=-10V, I_D=-100mA, V_{GS}=-10V
*Qgs	-	0.1	-		
*Qgd	-	0.1	-		
Source-Drain Diode					
*I_S	-	-	-230	mA	
*I_{SM}	-	-	-920		
*V_{SD}	-	0.83	-1.2	V	V_{GS}=0V, I_S=-100mA

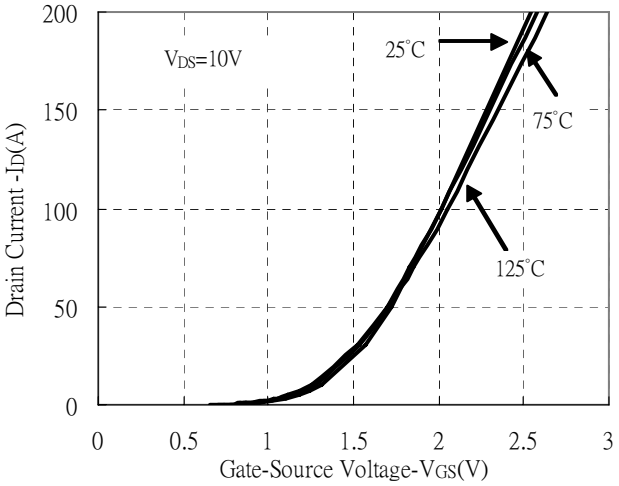
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics(The minus sign in voltage and current is omitted)

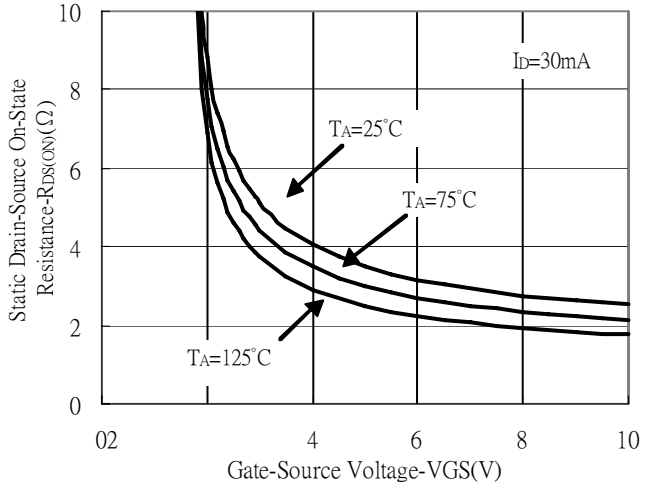
Typical Output Characteristics



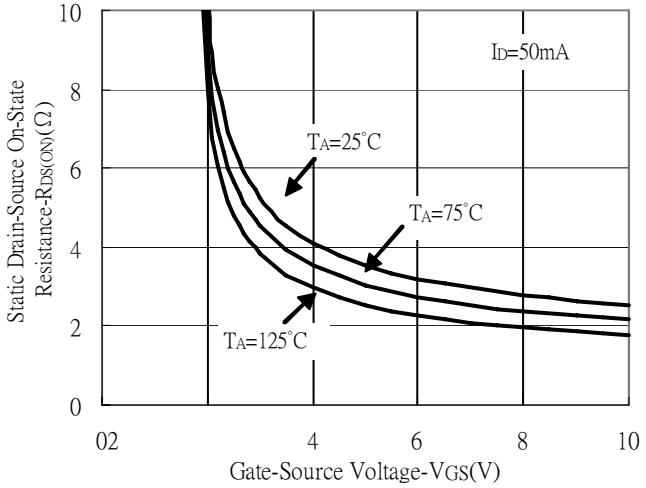
Typical Transfer Characteristics



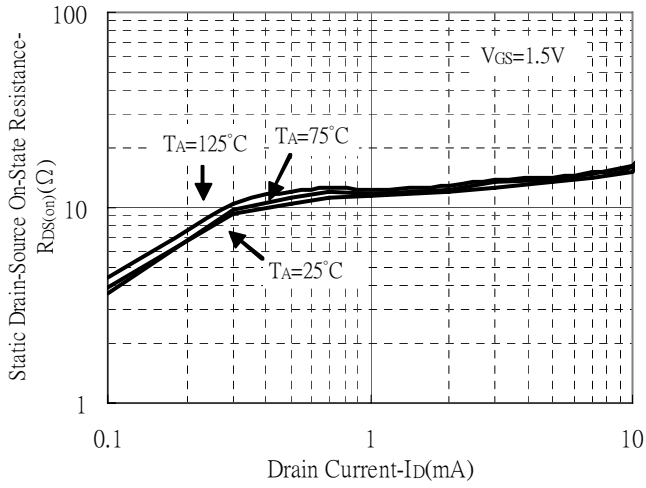
Static Drain-Source On-State Resistance vs Gate-Source Voltage



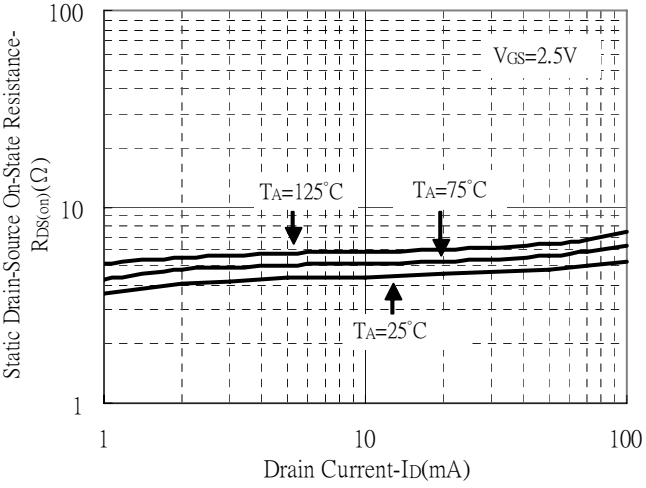
Static Drain-Source On-State Resistance vs Gate-Source Voltage



Static Drain-Source On-State resistance vs Drain Current

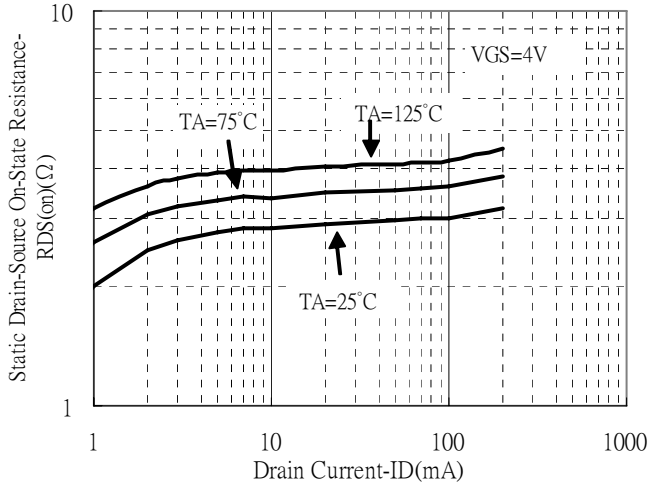


Static Drain-Source On-State resistance vs Drain Current

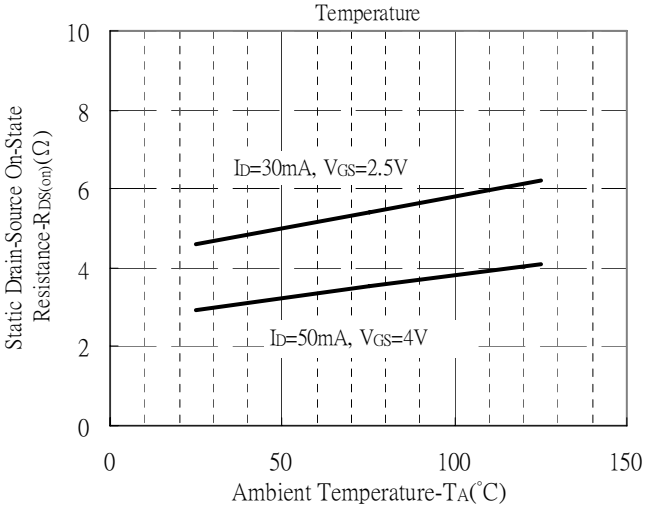


Typical Characteristics(Cont.)

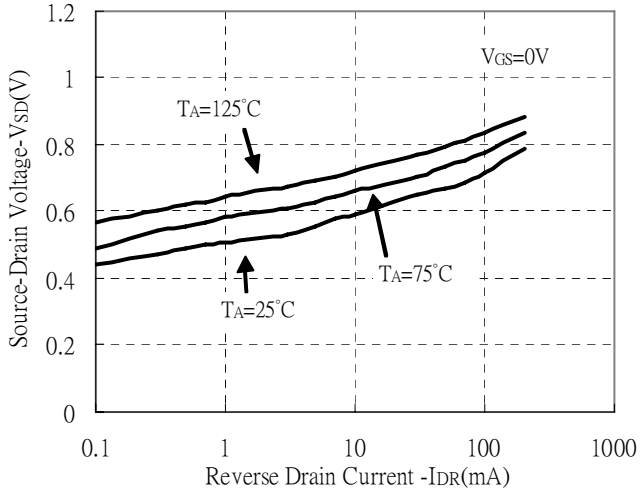
Static Drain-Source On-State resistance vs Drain Current



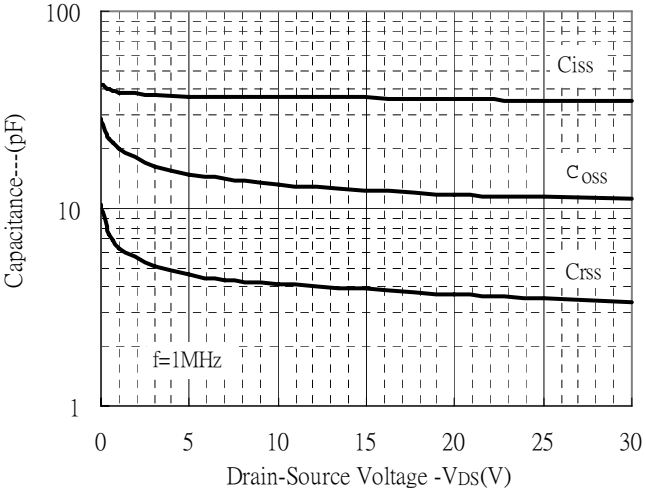
Static Drain-Source On-State resistance vs Ambient Temperature



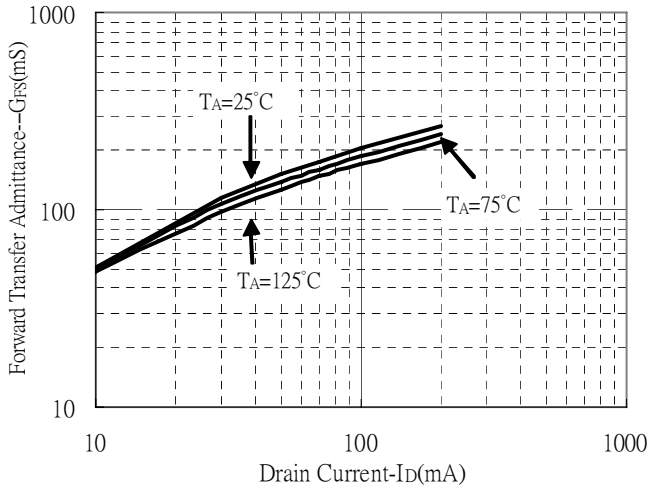
Reverse Drain Current vs Source-Drain Voltage



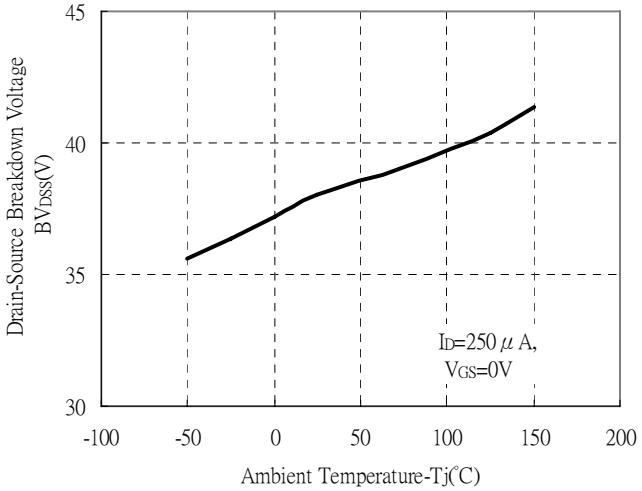
Capacitance vs Drain-to-Source Voltage



Forward Transfer Admittance vs Drain Current

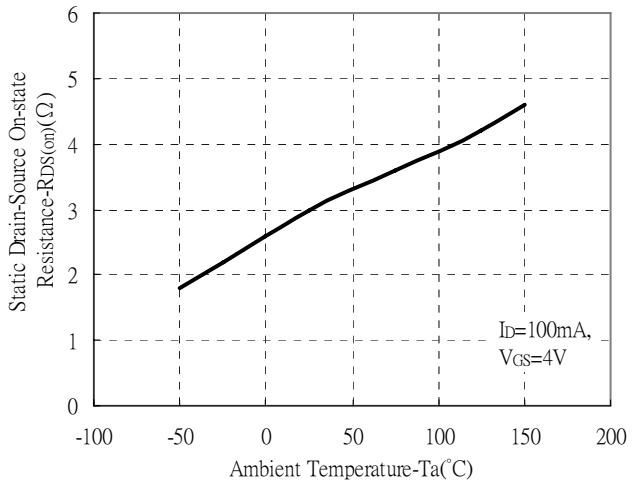


Brekdown Voltage vs Ambient Temperature

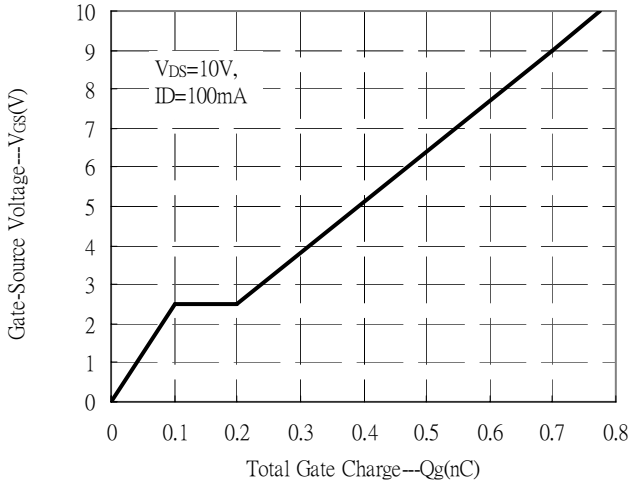


Typical Characteristics(Cont.)

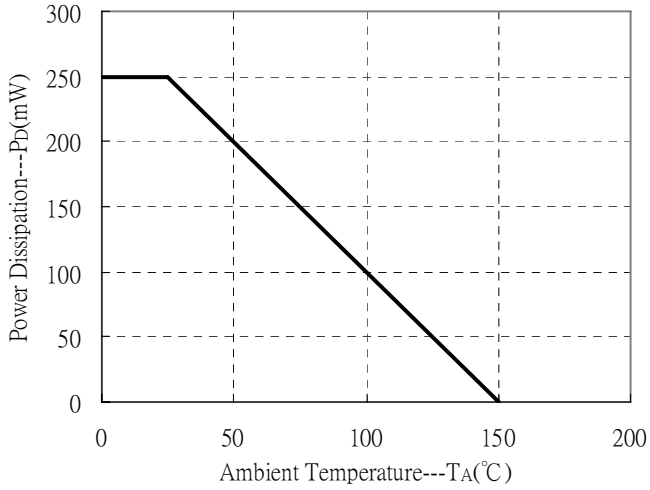
Static Drain-Source On-resistance vs Ambient Temperature



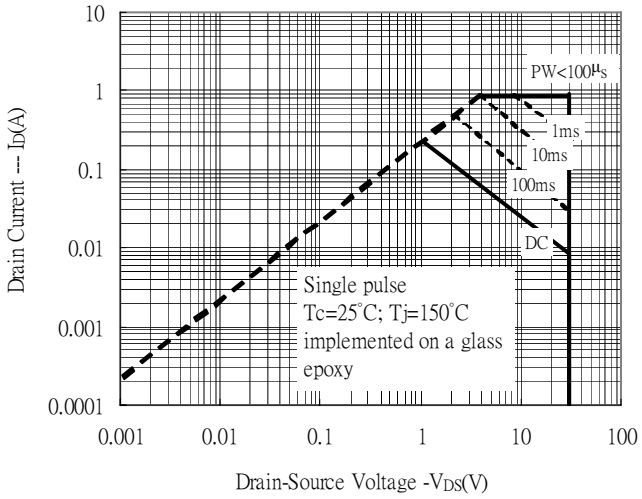
Gate Charge Characteristics



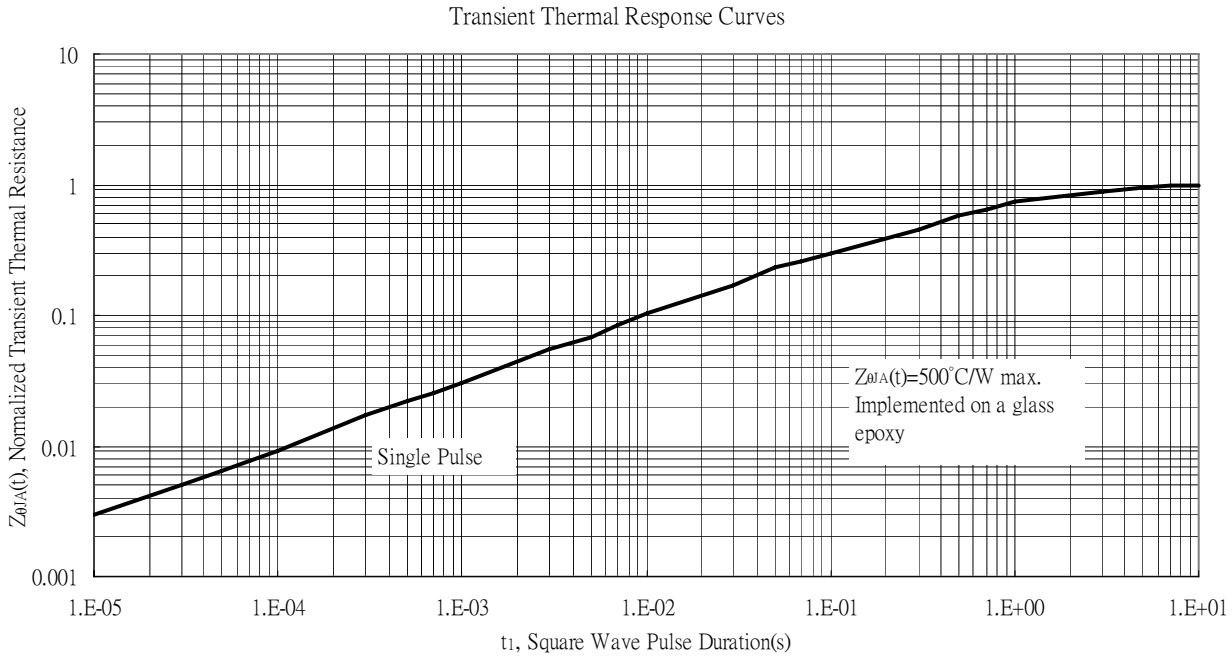
Power Derating Curves



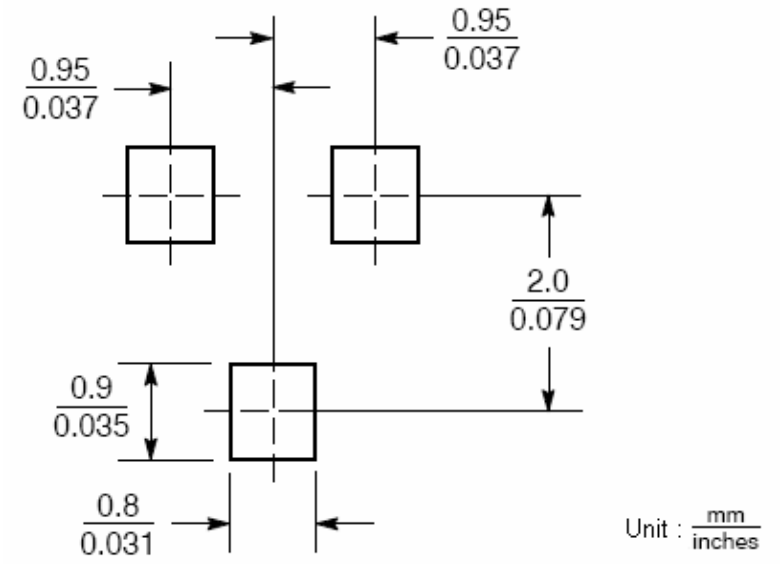
Maximum Safe Operating Area



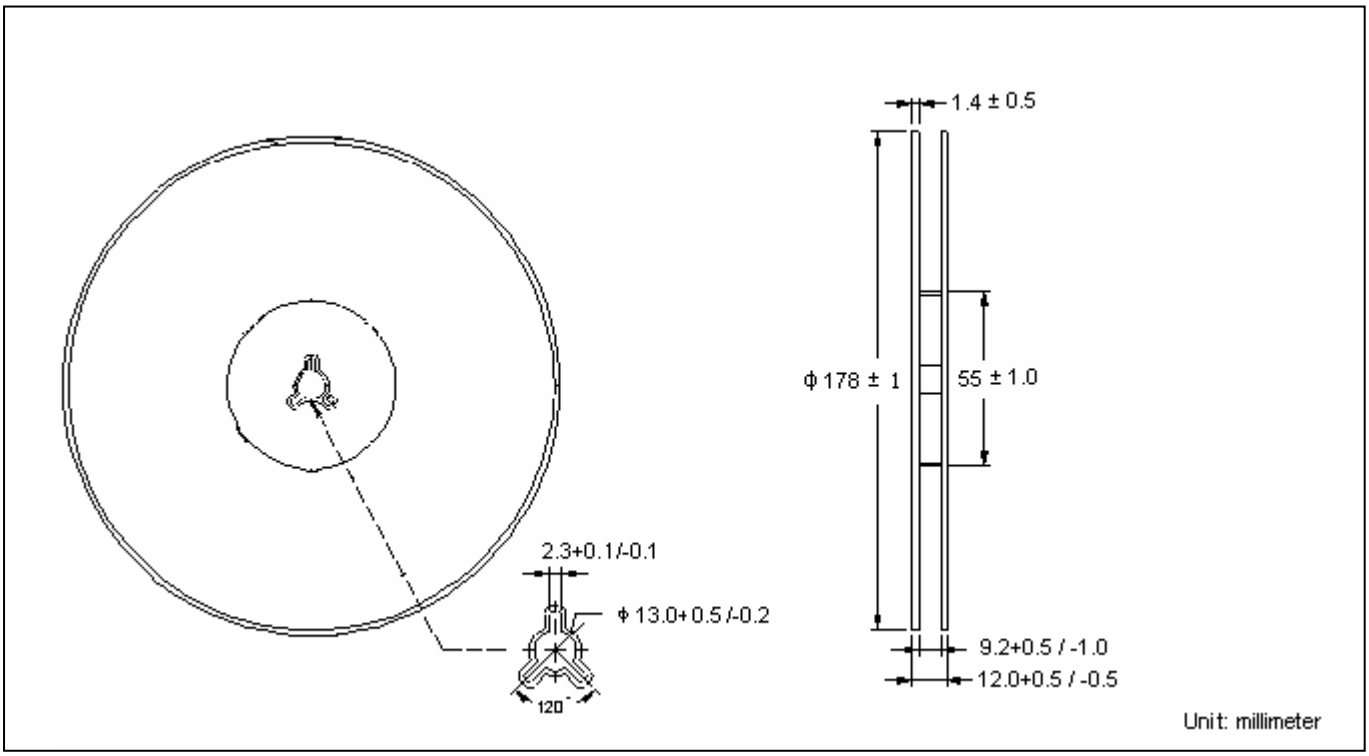
Typical Characteristics(Cont.)



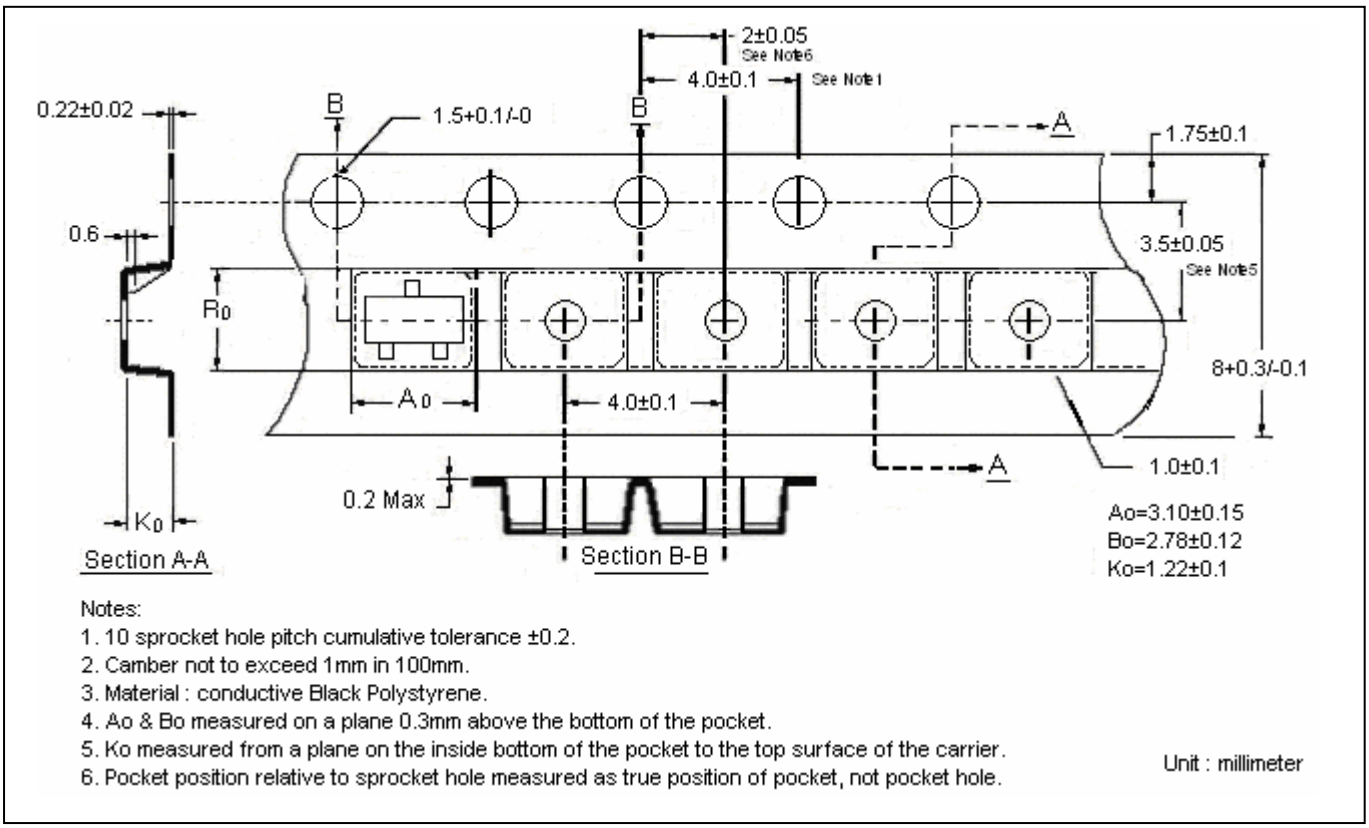
Recommended Soldering Footprint



Reel Dimension



Carrier Tape Dimension



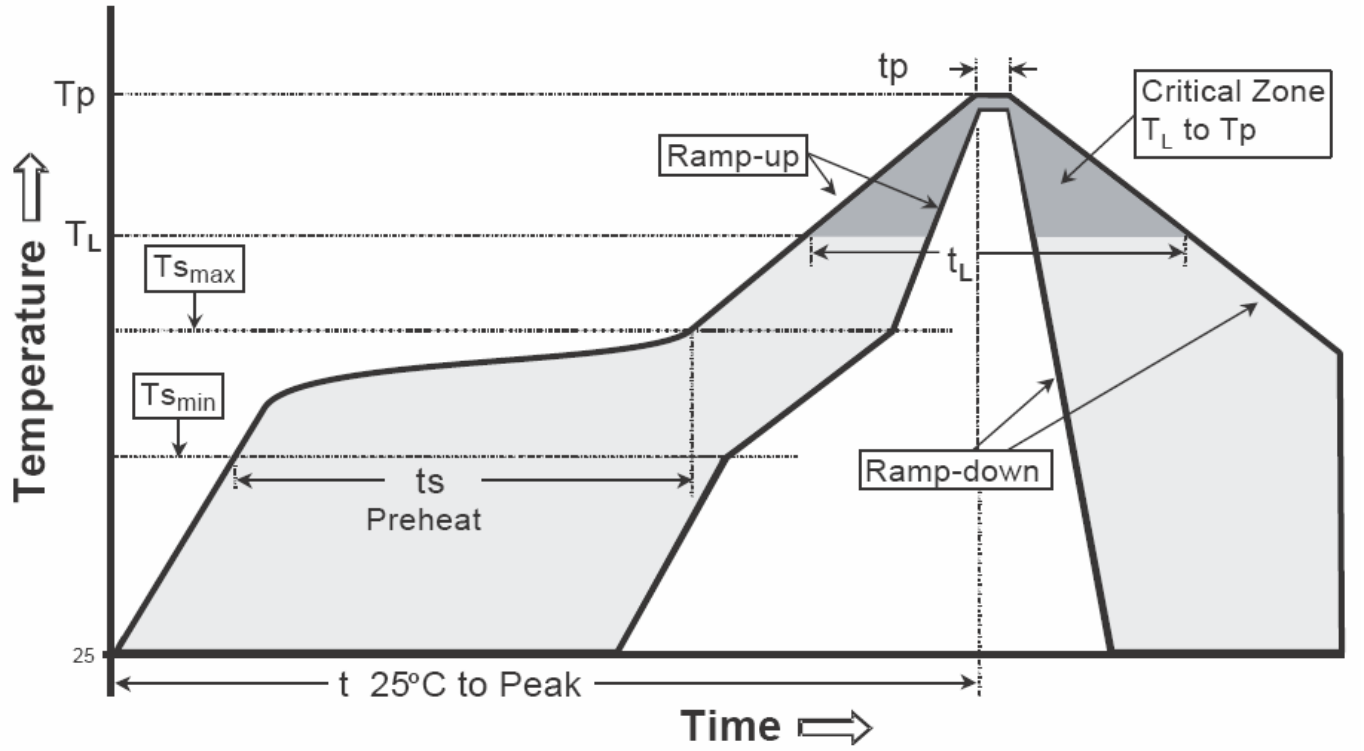
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

Recommended wave soldering condition

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

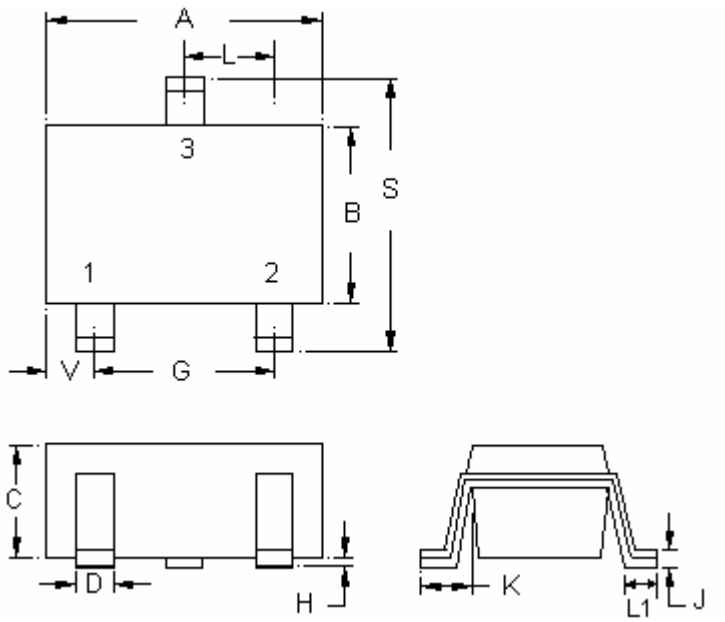
Recommended temperature profile for IR reflow

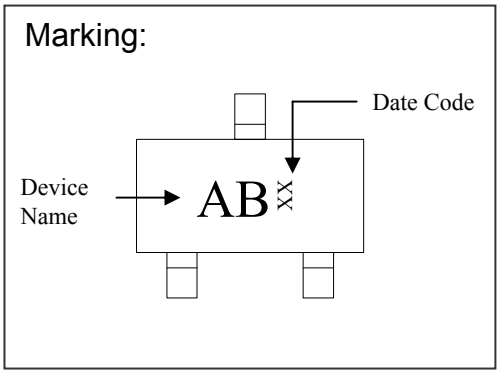


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L)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





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	0.0032	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.