

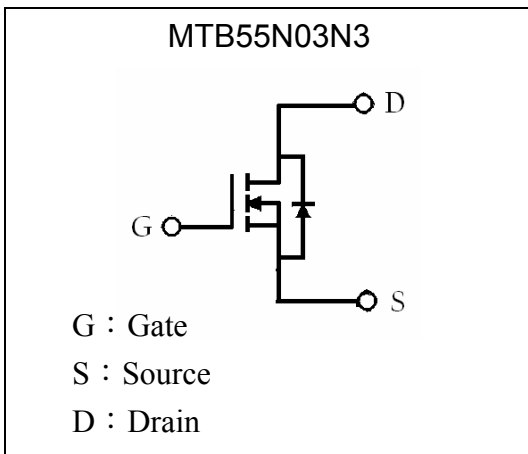
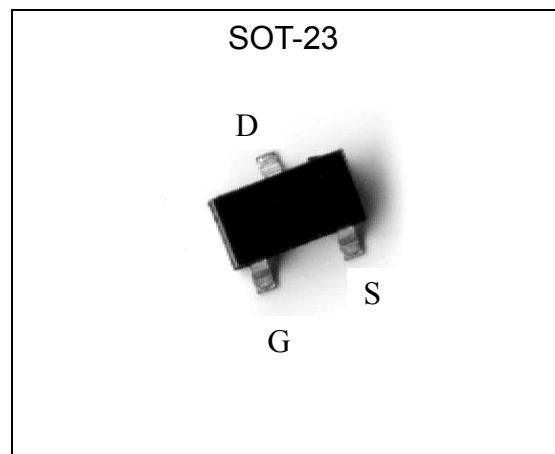
**30V N-Channel Logic Level Enhancement Mode MOSFET**

# MTB55N03N3

$BV_{DSS}$	30V
$R_{DSON(Max)}$	55m $\Omega$
$I_D$	3.5A

**Features**

- $V_{DS}=30V$   
 $R_{DS(ON)}=55m\Omega @ V_{GS}=10V, I_D=3.5A$   
 $R_{DS(ON)}=85m\Omega @ V_{GS}=4.5V, I_D=2A$
- Lower gate charge
- Pb-free lead plating and Halogen-free package

**Equivalent Circuit**

**Outline**

**Absolute Maximum Ratings** ( $T_c=25^\circ C$ , unless otherwise noted)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	$T_A=25^\circ C$	3.5
		$T_A=70^\circ C$	2.4
Pulsed Drain Current	$I_{DM}$	14 (Note 1 & 2)	A
Power Dissipation	$P_D$	$T_A=25^\circ C$	1.5 (Note 3)
		$T_A=70^\circ C$	1 (Note 3)
Thermal Resistance, Junction to Ambient	$R_{th, j-a}$	100 (Note 3)	$^\circ C/W$
Operating Junction and Storage Temperature	$T_j, T_{stg}$	-55 ~ +175	$^\circ C$

Note : 1. Pulse width limited by maximum junction temperature

 2. Duty cycle  $\leq 1\%$ 

 3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; 270 $^\circ C/W$  when mounted on min. copper pad



**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>					
$BV_{DSS}$	30	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$
$V_{GS(th)}$	1	1.5	3	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 20\text{V}, V_{DS}=0$
$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS}=24\text{V}, V_{GS}=0$
	-	-	10	$\mu\text{A}$	$V_{DS}=20\text{V}, V_{GS}=0, T_j=125^{\circ}\text{C}$
$I_{DON}^1$	3.5	-	-	A	$V_{DS}=5\text{V}, V_{GS}=10\text{V}$
$*R_{DS(ON)}^1$	-	45	55	m $\Omega$	$I_D=3.5\text{A}, V_{GS}=10\text{V}$
	-	65	85		$I_D=2\text{A}, V_{GS}=4.5\text{V}$
$*G_{FS}^1$	-	5	-	S	$V_{DS}=5\text{V}, I_D=3.5\text{A}$
<b>Dynamic</b>					
$C_{iss}$	-	319	-	pF	$V_{DS}=10\text{V}, V_{GS}=0, f=1\text{MHz}$
$C_{oss}$	-	66	-		
$C_{rSS}$	-	53	-		
$*t_{d(ON)}^{1\ 2}$	-	8	-	ns	$V_{DS}=10\text{V}, I_D=1\text{A}, V_{GS}=10\text{V}, R_G=6\Omega$
$*t_r^{1\ 2}$	-	2.5	-		
$*t_{d(OFF)}^{1\ 2}$	-	20	-		
$*t_f^{1\ 2}$	-	5	-		
$*Q_g^{1\ 2}$	-	6	-	nC	$V_{DS}=10\text{V}, I_D=3.5\text{A}, V_{GS}=4.5\text{V}$
$*Q_{gs}^{1\ 2}$	-	0.8	-		
$*Q_{gd}^{1\ 2}$	-	1.8	-		
<b>Source-Drain Diode</b>					
$I_S$	-	-	2	A	
$I_{SM}^3$	-	-	8		
$V_{SD}^1$	-	-	1.2	V	$I_F=I_S, V_{GS}=0\text{V}$

<sup>1</sup> Pulse test : Pulse width $\leq 300\mu\text{s}$ , Duty cycle $\leq 2\%$

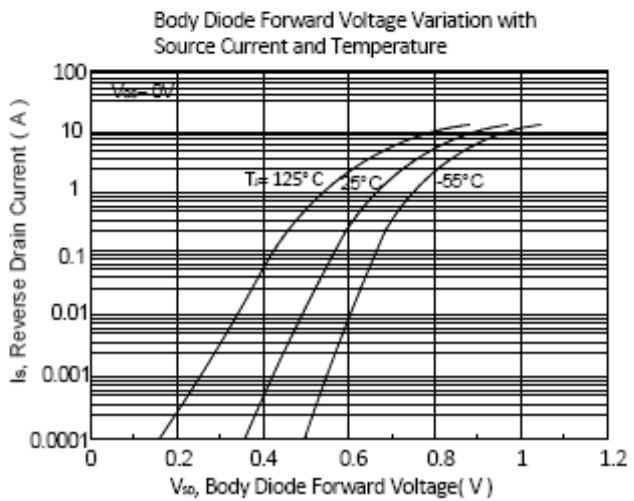
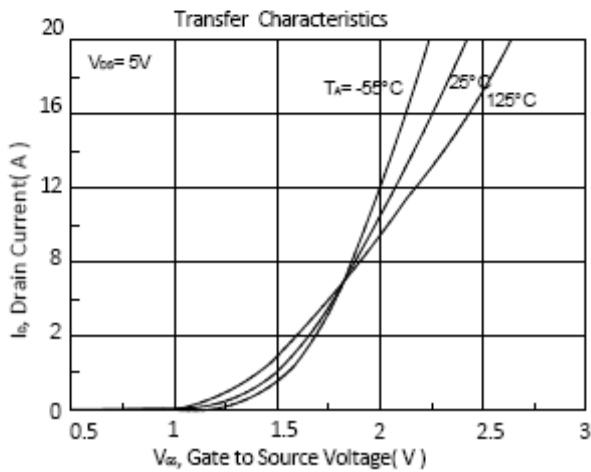
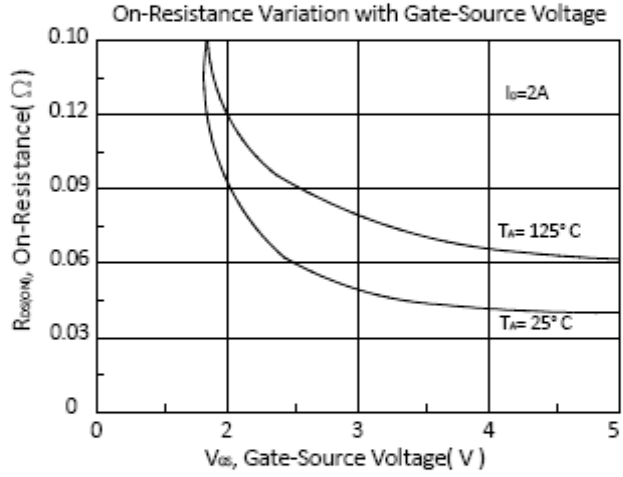
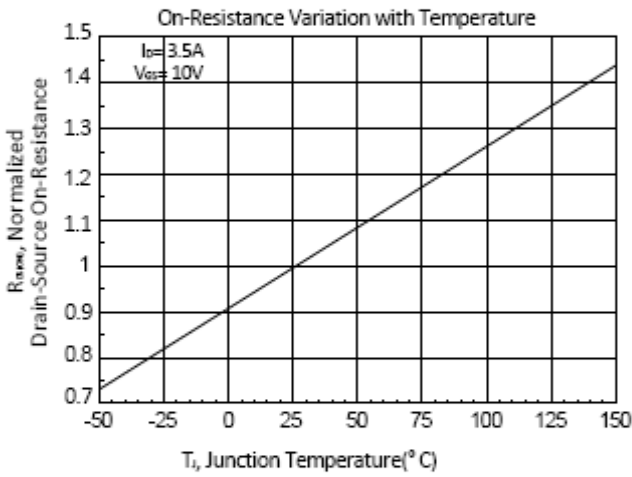
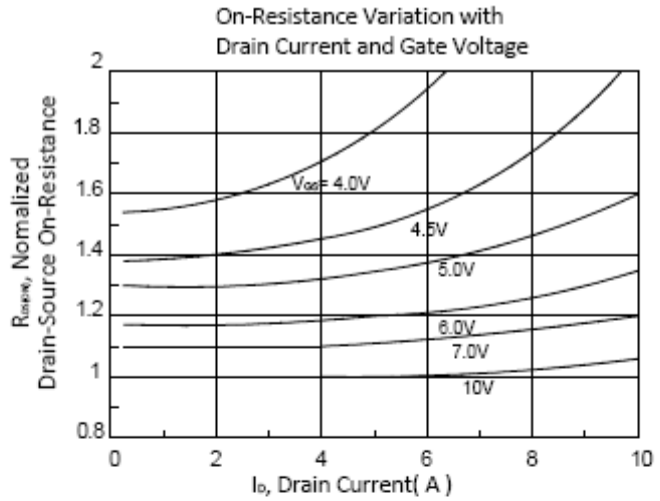
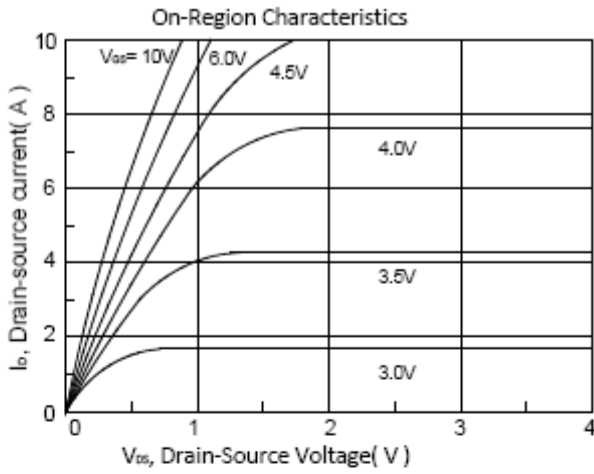
<sup>2</sup> Independent of operating temperature

<sup>3</sup> Pulse width limited by maximum junction temperature

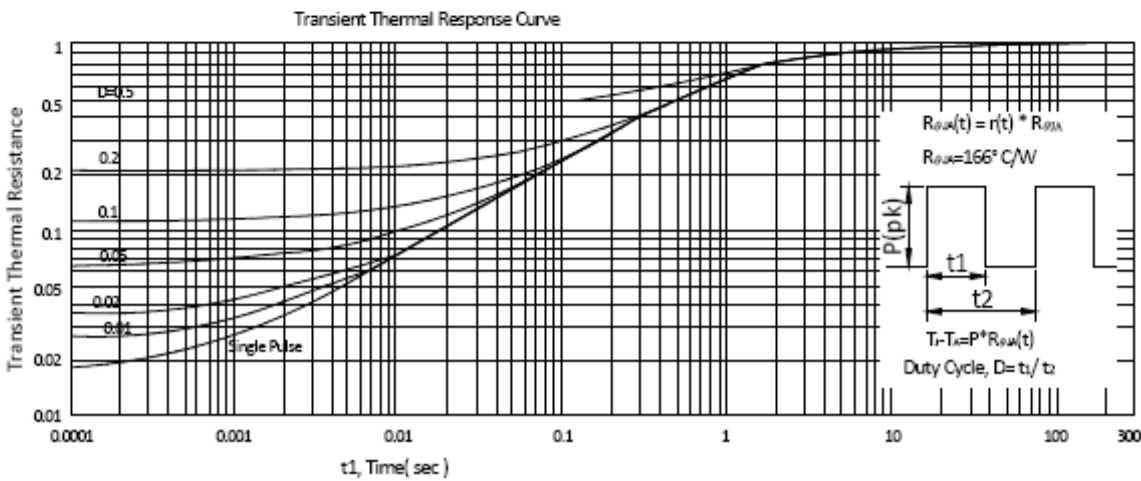
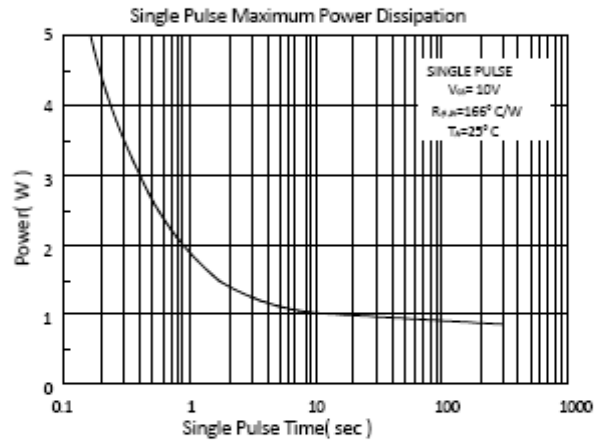
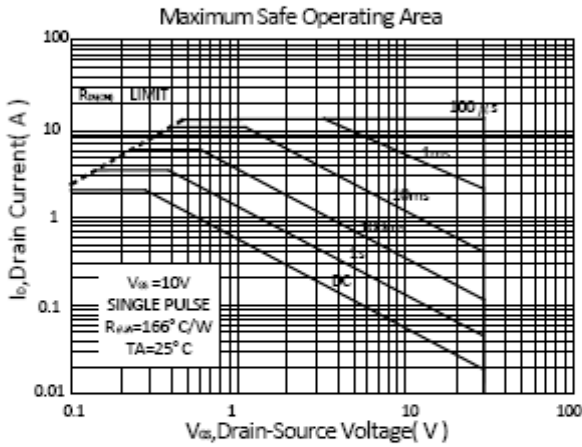
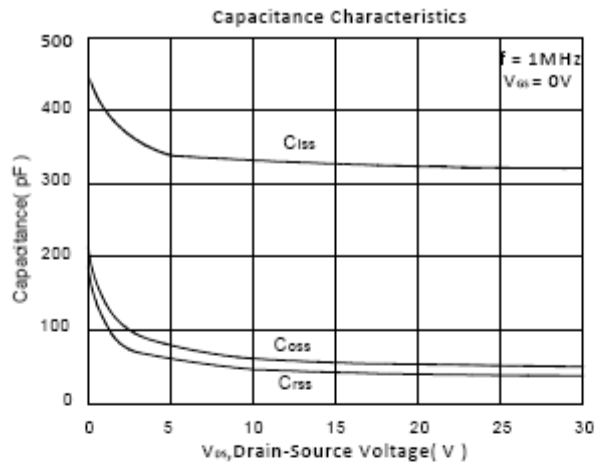
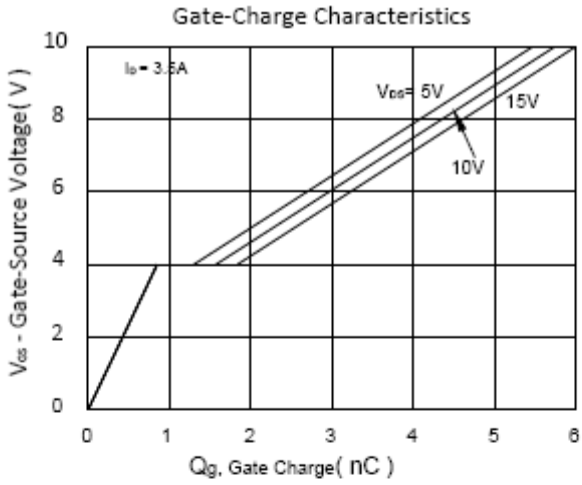
**Ordering Information**

Device	Package	Shipping	Marking
MTB55N03N3	SOT-23 (Pb-free)	3000 pcs / Tape & Reel	10

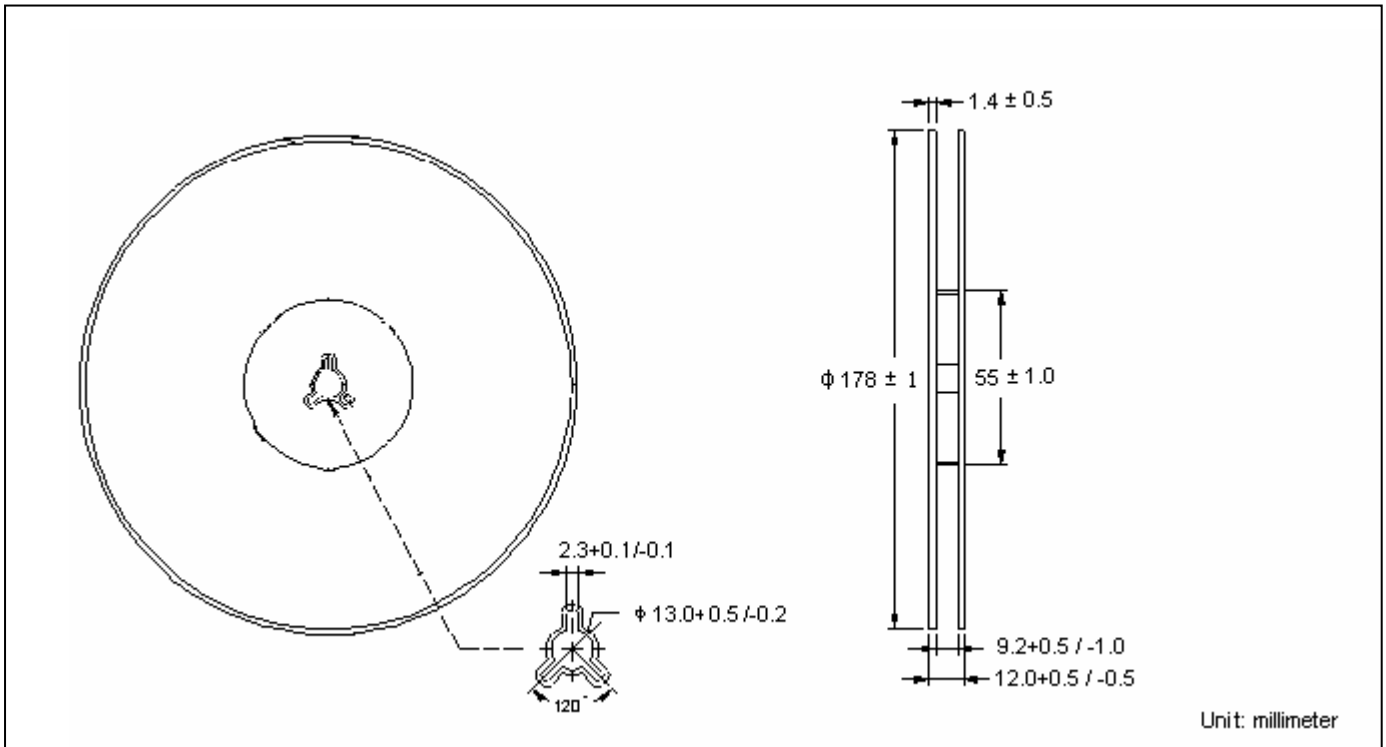
**Characteristic Curves**



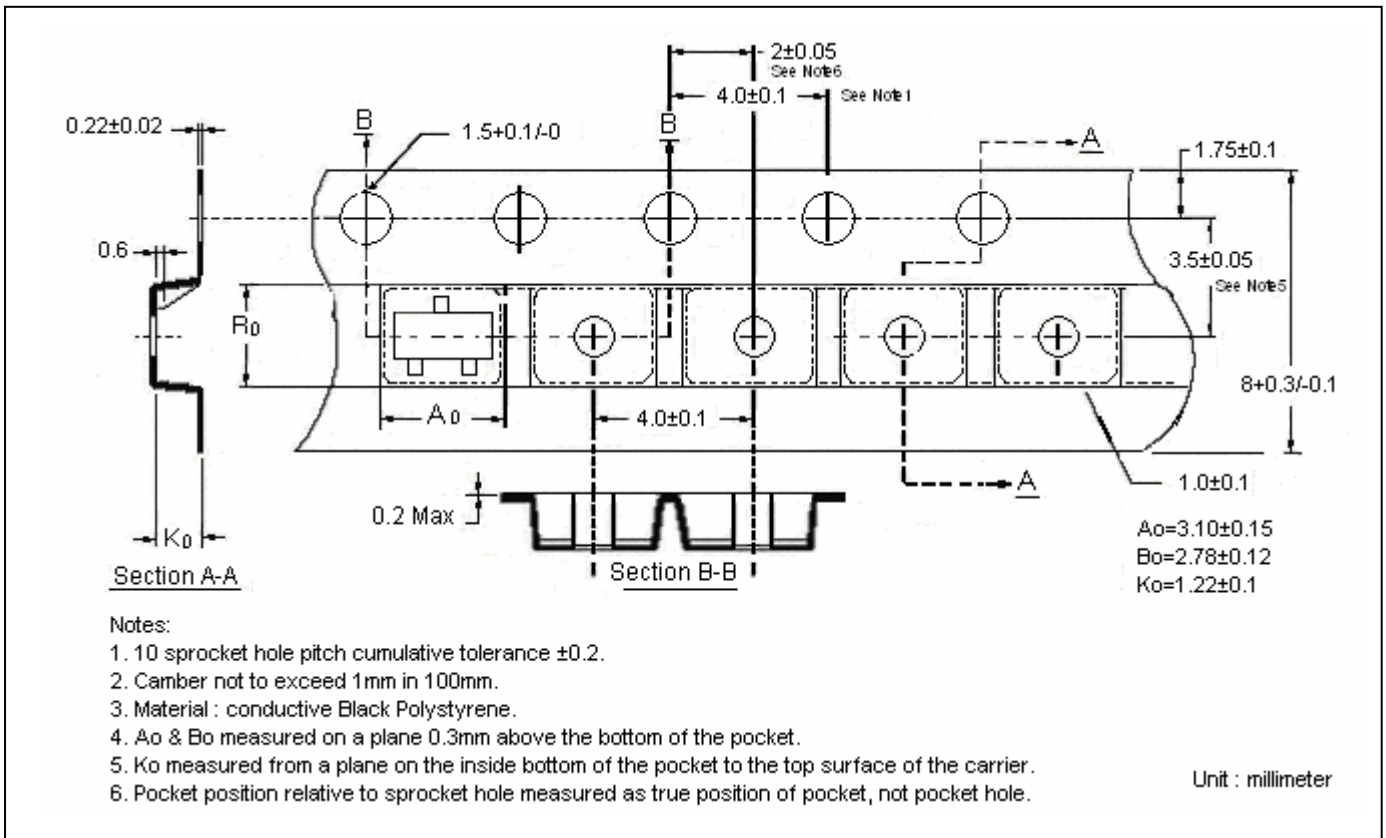
Characteristic Curves(Cont.)



**Reel Dimension**



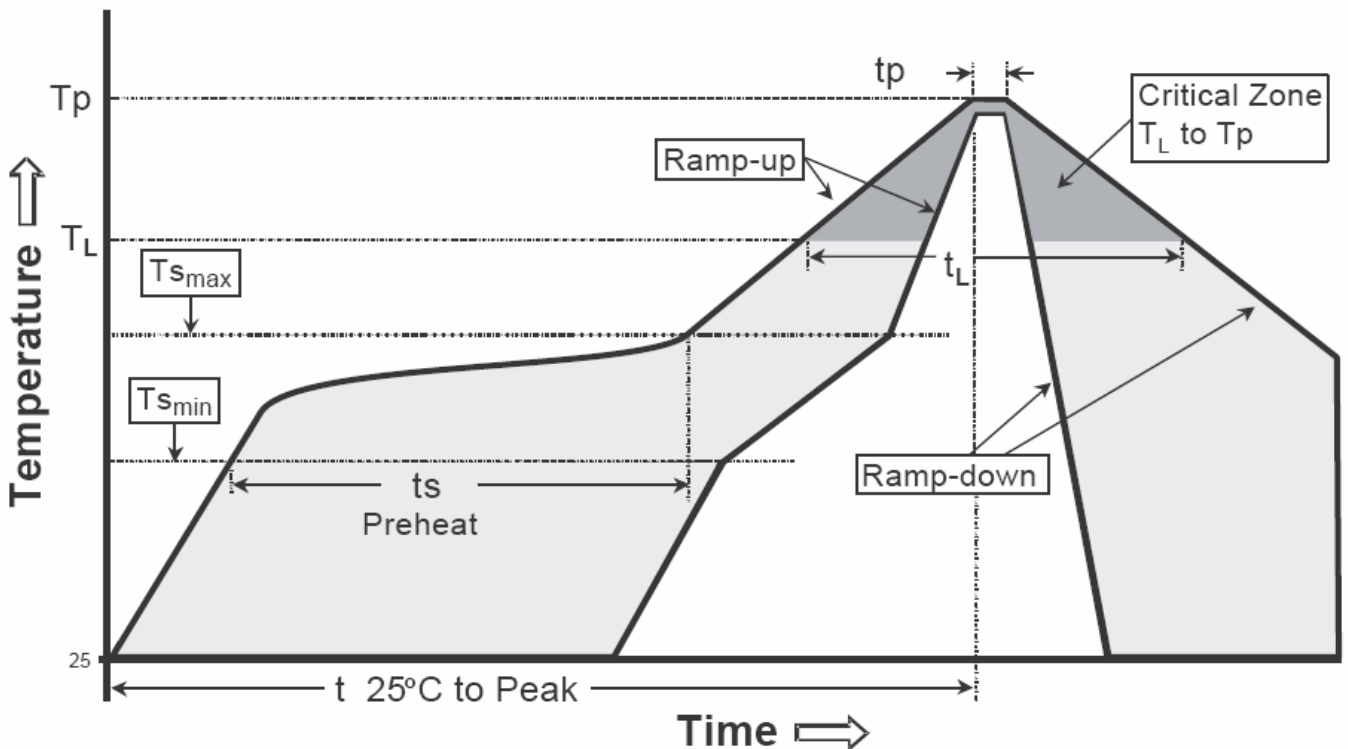
**Carrier Tape Dimension**



**Recommended wave soldering condition**

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

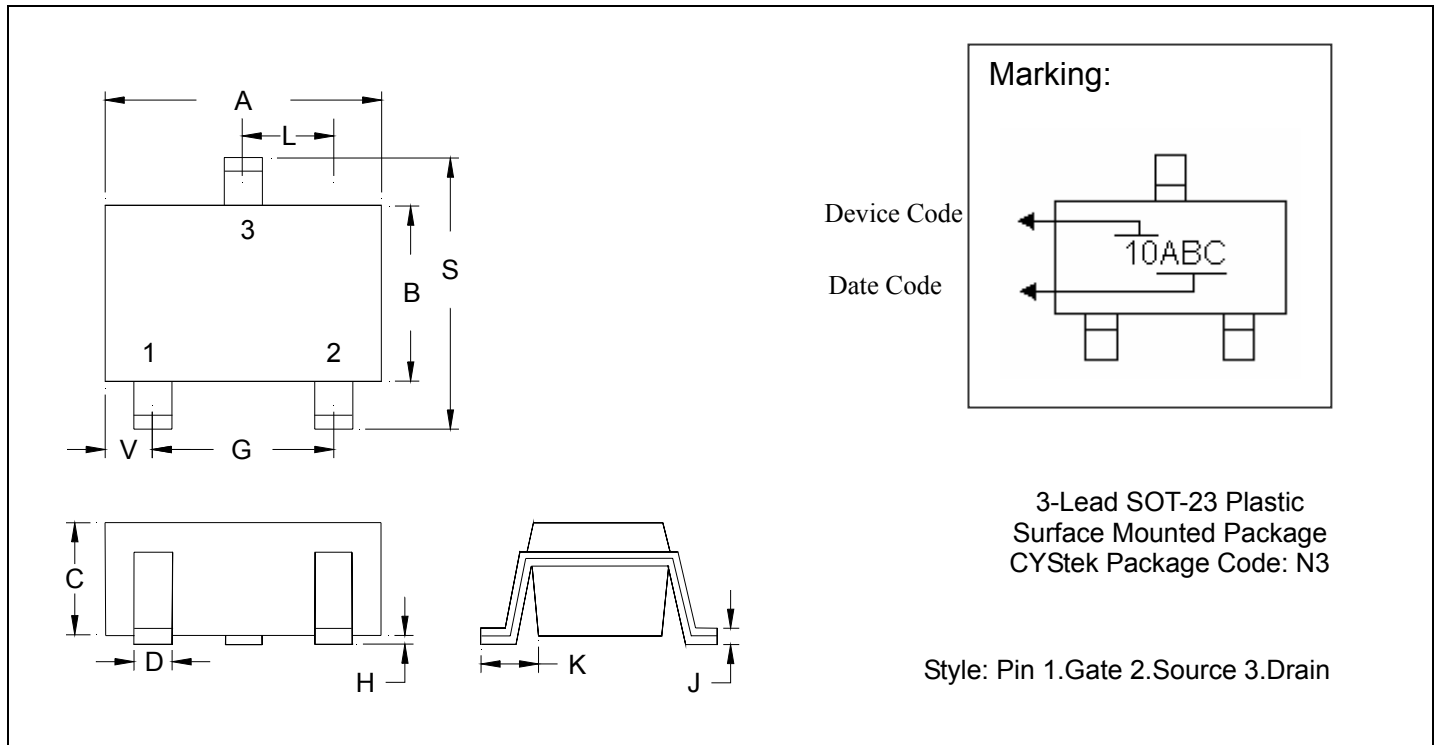
**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T <sub>s min</sub> )	100°C	150°C
-Temperature Max(T <sub>s max</sub> )	150°C	200°C
-Time(t <sub>s min</sub> to t <sub>s max</sub> )	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T <sub>L</sub> )	183°C	217°C
- Time (t <sub>L</sub> )	60-150 seconds	60-150 seconds
Peak Temperature(T <sub>P</sub> )	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	0.0034	0.0070	0.085	0.177
B	0.0472	0.0630	1.20	1.60	K	0.0128	0.0266	0.32	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	0.1083	2.10	2.75
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0005	0.0040	0.013	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: 42 Alloy ; pure tin plated
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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