

**ESD protected N-CHANNEL Enhancement Mode MOSFET**

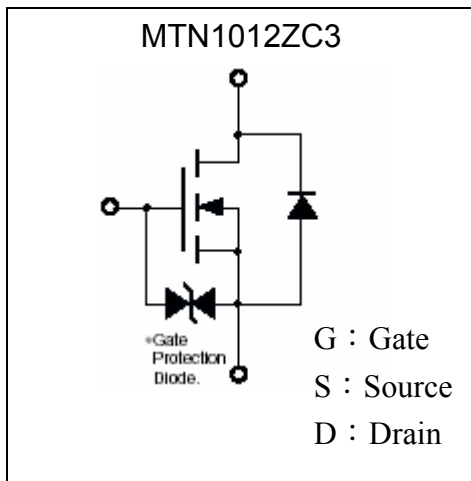
# MTN1012ZC3

BV <sub>DSS</sub>	20V
I <sub>D</sub>	0.7A
R <sub>DSON</sub> (TYP)	300mΩ @4.5V/0.6A
	340mΩ @2.5V/0.5A
	420mΩ @1.8V/0.4A

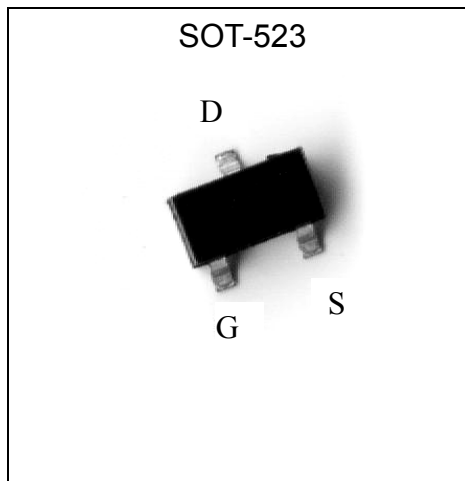
**Description**

- Low voltage drive, 1.8V
- Easy to use in parallel
- High speed switching
- ESD protected device
- Pb-free package

**Symbol**



**Outline**



**Absolute Maximum Ratings (Ta=25°C)**

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	BV <sub>DSS</sub>	20	V
Gate-Source Voltage	V <sub>GS</sub>	±12	V
Continuous Drain Current	I <sub>D</sub>	T <sub>A</sub> =25°C	0.7
		T <sub>A</sub> =70°C	0.4
Pulsed Drain Current	I <sub>DM</sub>	1 *1	A
Total Power Dissipation	P <sub>D</sub>	T <sub>A</sub> =25°C	270
		T <sub>A</sub> =70°C	160
Operating Junction and Storage Temperature Range	T <sub>j</sub> ; T <sub>stg</sub>	-55~+150	°C
Thermal Resistance, Junction-to-Ambient	R <sub>th,ja</sub>	463	°C/W

Note : \*1. Pulse Width ≤ 300μs, Duty cycle ≤2%



**Electrical Characteristics (Ta=25°C)**

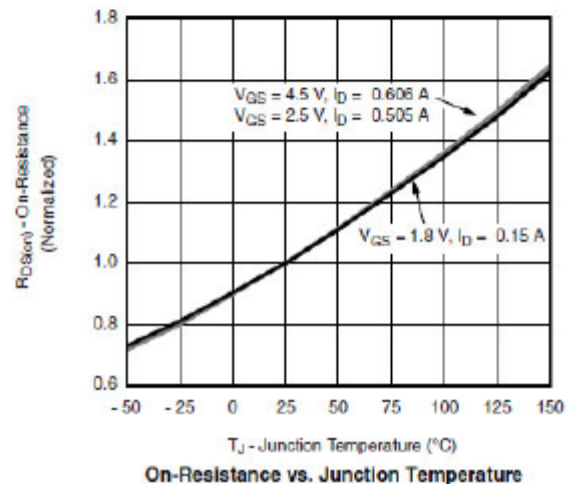
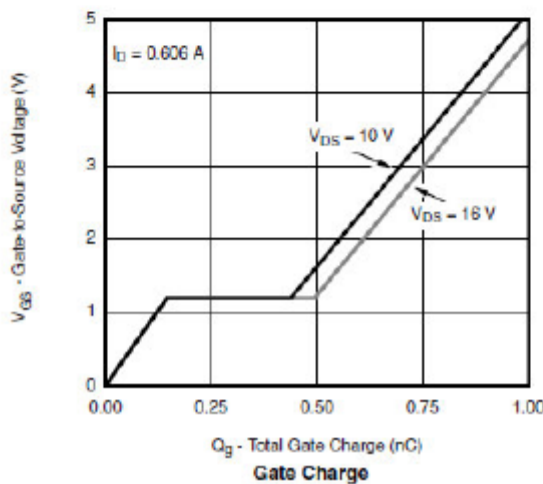
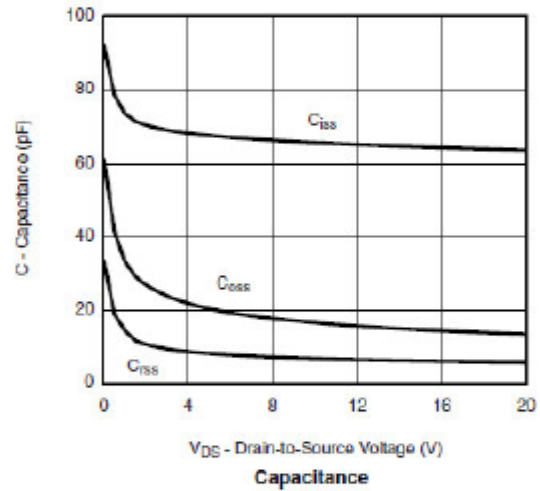
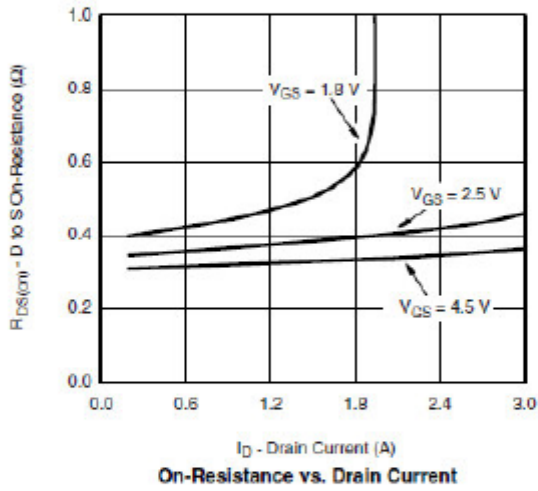
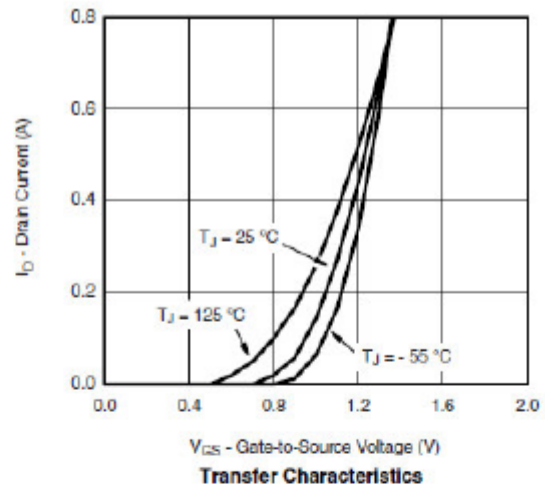
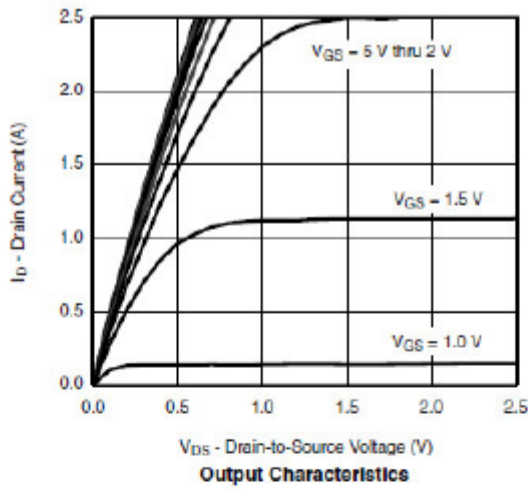
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>					
BV <sub>DSS</sub>	20	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =100μA
V <sub>GS(th)</sub>	0.3	-	0.8	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
I <sub>GSS</sub>	-	-	±1	mA	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0
I <sub>DSS</sub>	-	-	1	μA	V <sub>DS</sub> =16V, V <sub>GS</sub> =0
	-	-	5		V <sub>DS</sub> =16V, V <sub>GS</sub> =0, T <sub>J</sub> =85°C
I <sub>D(ON)</sub>	0.7	-	-	A	V <sub>DS</sub> ≥5V, V <sub>GS</sub> =4.5V
R <sub>DS(ON)</sub>	-	300	360	mΩ	V <sub>GS</sub> =4.5V, I <sub>D</sub> =600mA
	-	340	420		V <sub>GS</sub> =2.5V, I <sub>D</sub> =500mA
	-	420	560		V <sub>GS</sub> =1.8V, I <sub>D</sub> =400mA
G <sub>FS</sub>	-	1	-	S	V <sub>DS</sub> =10V, I <sub>D</sub> =400mA
<b>Dynamic</b>					
C <sub>iss</sub>	-	70	-	pF	V <sub>DS</sub> =10V, V <sub>GS</sub> =0, f=1MHz
C <sub>oss</sub>	-	20	-		
C <sub>rss</sub>	-	8	-		
Q <sub>g</sub>	-	1.06	1.38	nC	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.6A
Q <sub>gs</sub>	-	0.18	-		
Q <sub>gd</sub>	-	0.32	-		
t <sub>d(ON)</sub>	-	18	26	ns	V <sub>DD</sub> =10V, I <sub>D</sub> =0.5A, V <sub>GEN</sub> =4.5V, R <sub>L</sub> =20Ω, R <sub>G</sub> =1Ω
tr	-	20	28		
t <sub>d(OFF)</sub>	-	70	110		
t <sub>f</sub>	-	25	40		
<b>Source-Drain Diode</b>					
*V <sub>SD</sub>	-	0.65	1.2	V	V <sub>GS</sub> =0V, I <sub>S</sub> =150mA

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

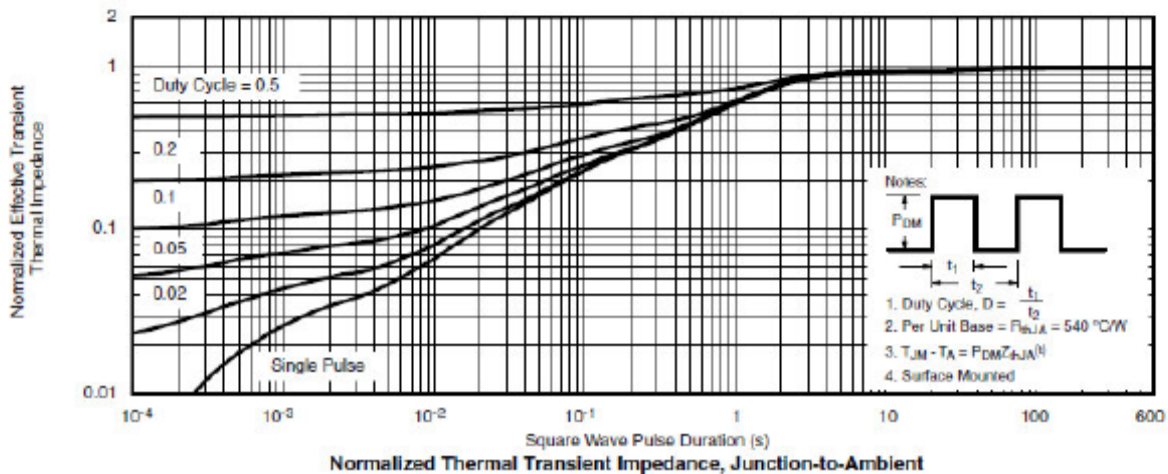
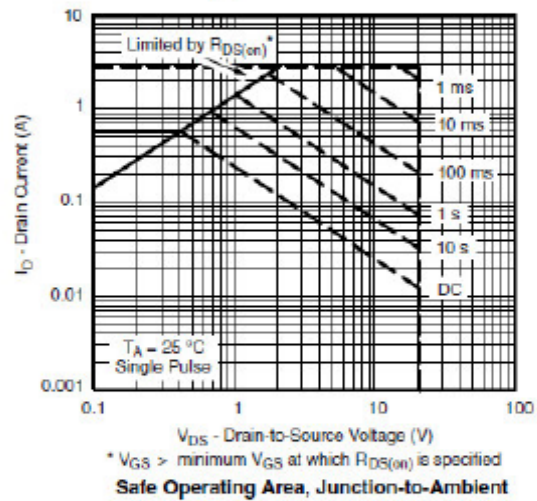
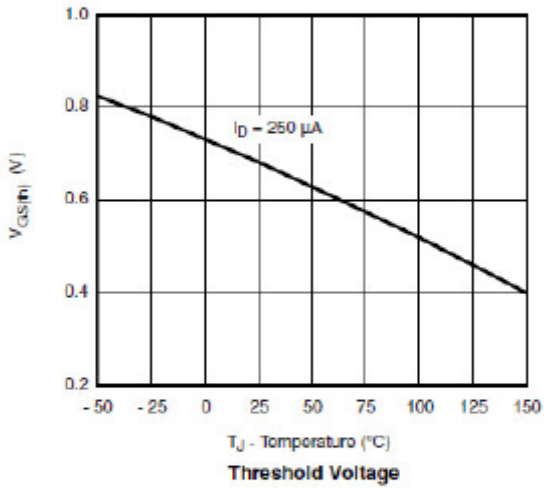
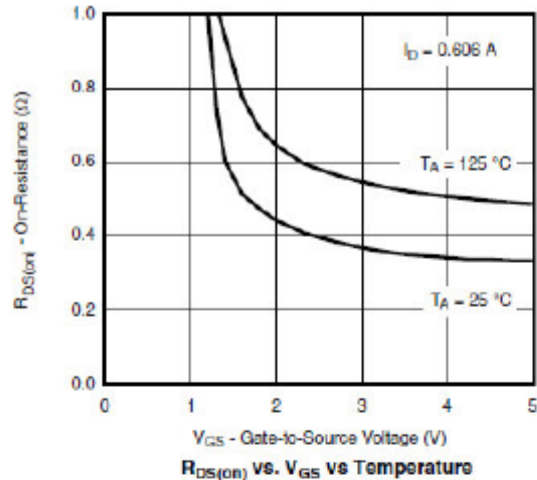
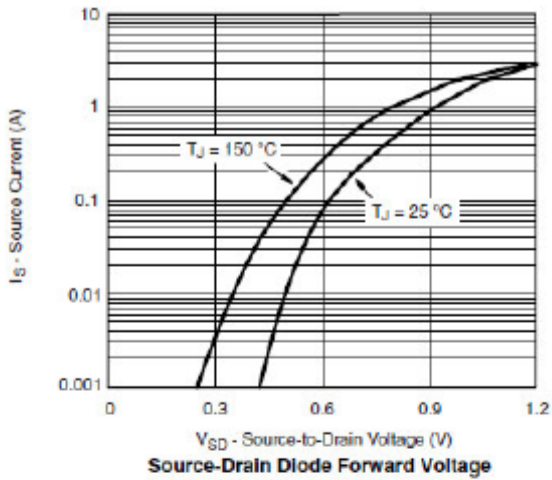
**Ordering Information**

Device	Package	Shipping	Marking
MTN1012ZC3	SOT-523 (Pb-free)	3000 pcs / Tape & Reel	<u>X</u>

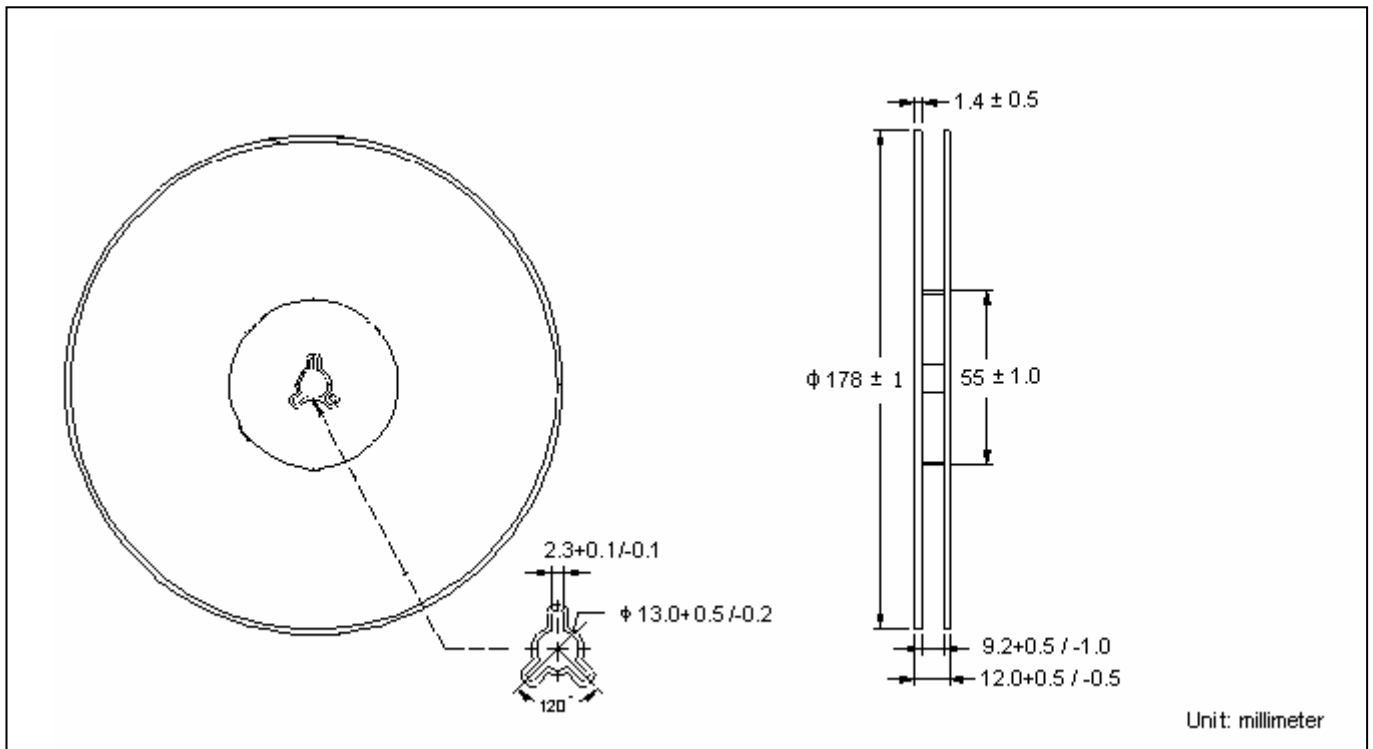
## Typical Characteristics



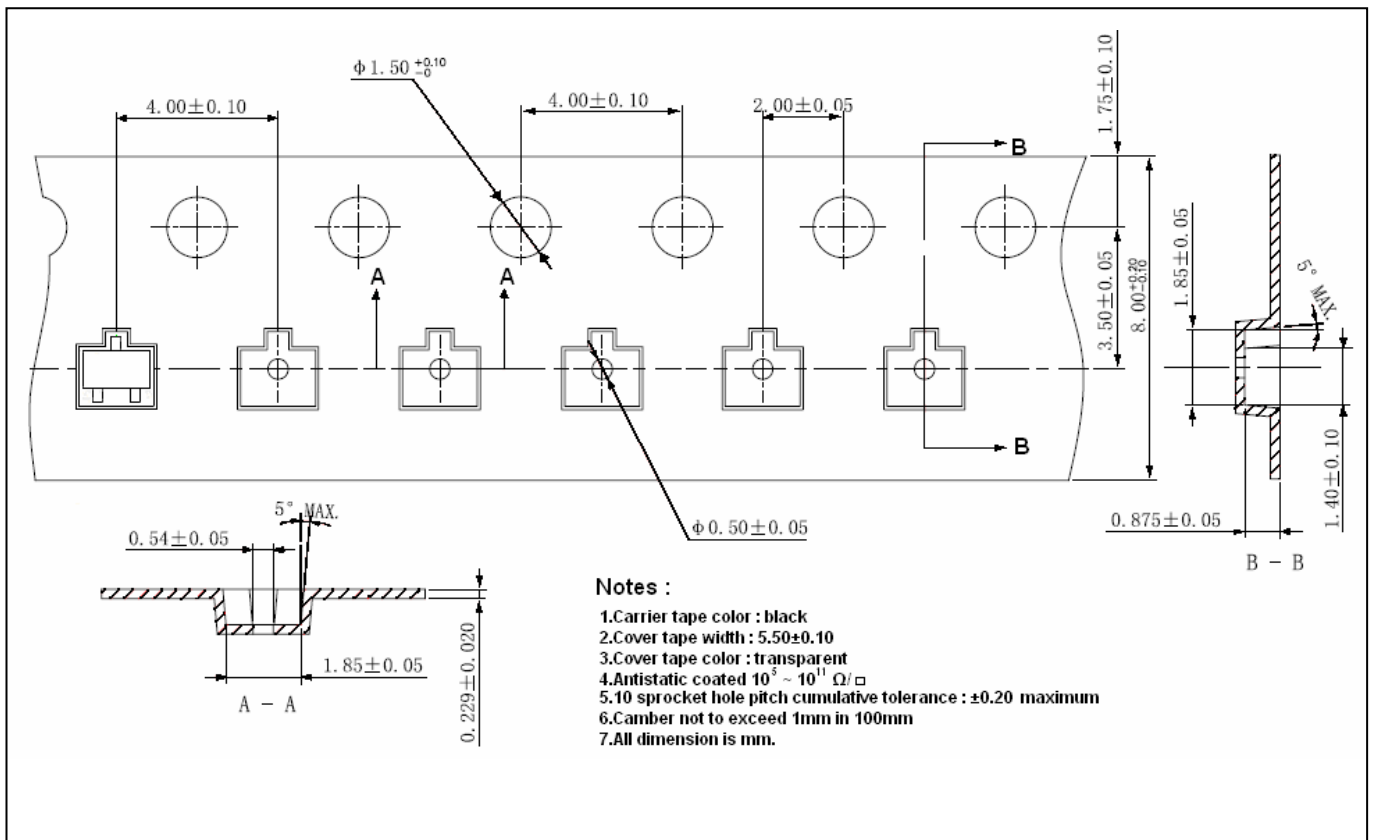
**Typical Characteristics(Cont.)**



### Reel Dimension



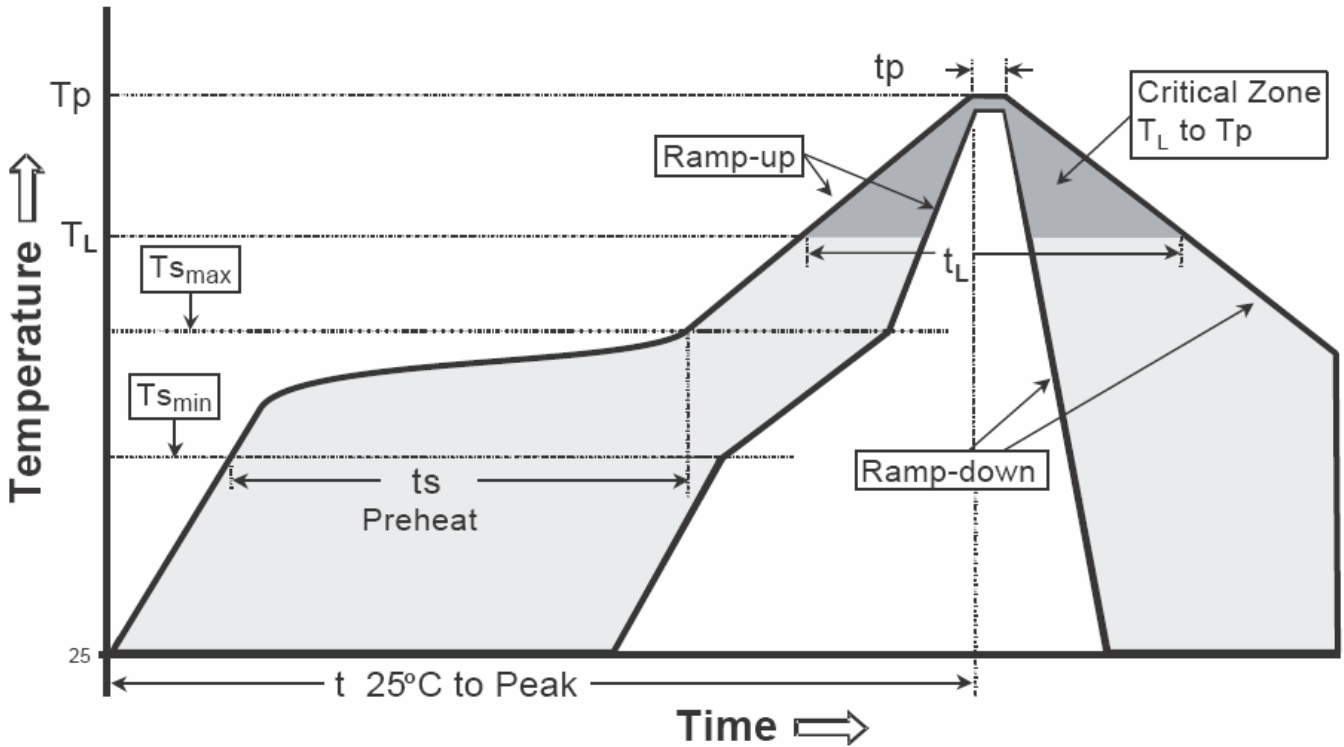
### Carrier Tape Dimension



**Recommended wave soldering condition**

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

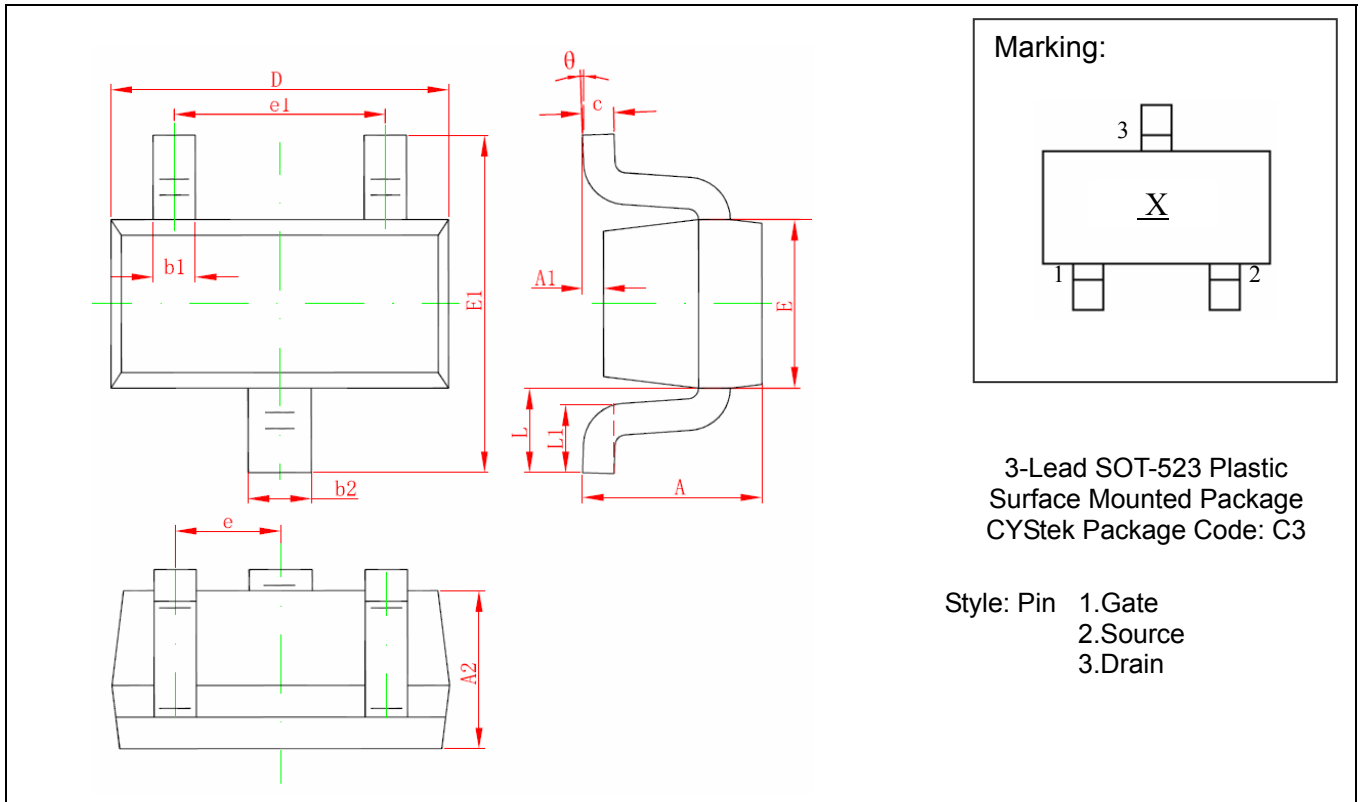
**Recommended temperature profile for IR reflow**



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)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (TL)	183°C	217°C
- Time (tL)	60-150 seconds	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-523 Dimension**



\*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.028	0.035	0.700	0.900	E	0.028	0.035	0.700	0.900
A1	0.000	0.004	0.000	0.100	E1	0.057	0.069	1.450	1.750
A2	0.028	0.031	0.700	0.800	e	0.020*		0.500*	
b1	0.006	0.010	0.150	0.250	e1	0.035	0.043	0.900	1.100
b2	0.010	0.014	0.250	0.350	L	0.016	REF	0.400	REF
c	0.004	0.008	0.100	0.200	L1	0.010	0.018	0.260	0.460
D	0.059	0.067	1.500	1.700	θ	0°	8°	0°	8°

- 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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