

N-CHANNEL MOSFET

MTNK2N3

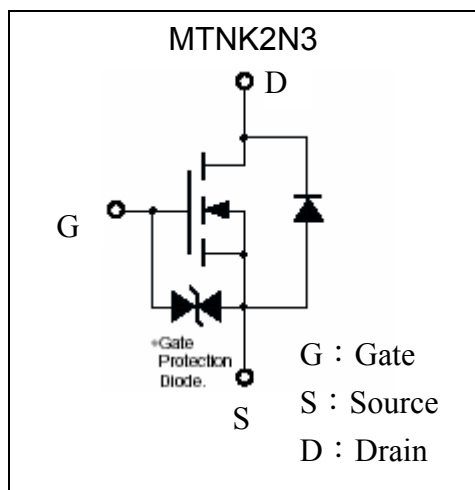
Description

The MTKN2N3 is a N-channel enhancement-mode MOSFET.

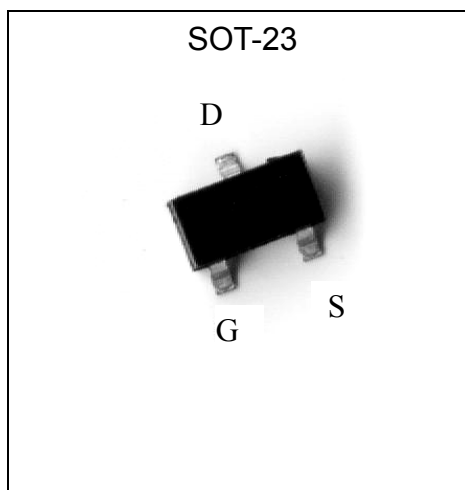
Features

- Low on-resistance
- High ESD
- High speed switching
- Low-voltage drive(4V)
- Easily designed drive circuits
- Easy to use in parallel
- Pb-free package

Symbol



Outline



Ordering Information

Device	Package	Shipping	Marking
MTKN2N3	SOT-23 (Pb-free)	3000 pcs / Tape & Reel	702.

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

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V _{DSS}	60	V
Gate-Source Voltage		V _{GSS}	±20	V
Continuous Drain Current	T _A =25°C@V _{GS} =10V	I _D	640	mA
	T _A =70°C@V _{GS} =10V		500	mA
Pulsed Drain Current *1, 2		I _{DM}	950 *1	mA
Total Power Dissipation		P _D	1.38 *2	W
Linear Derating Factor			0.01	W/°C
Thermal Resistance, Junction to Ambient		R _{th,j-a}	90 *2	°C/W
ESD susceptibility			1000 *3	V
Operating Junction Temperature Range		T _J	-55~+150	°C
Storage Temperature Range		T _{stg}	-55~+150	°C

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

*2. When the device is mounted on 1in² copper pad of FR-4 board; 270°C/W when mounted on minimum copper pad.

*3. Human body model, 1.5kΩ in series with 100pF

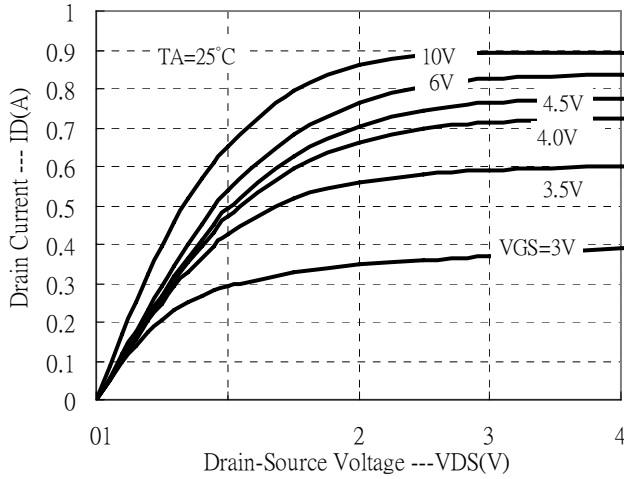
Electrical Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{DSS} *	60	-	-	V	V _{GS} =0, I _D =250μA
BV _{DSS} /ΔT _j	-	0.05	-	V/°C	Reference to 25°C, I _D =1mA
V _{GS(th)}	1	-	2.5	V	V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	-	-	±10	μA	V _{GS} =±20V, V _{DS} =0
I _{DSS}	-	-	1	μA	V _{DS} =60V, V _{GS} =0
	-	-	100		V _{DS} =48V, V _{GS} =0, T _j =70°C
R _{DS(on)} *	-	1.6	2	Ω	I _D =200mA, V _{GS} =4.5V
	-	1.23	5		I _D =100mA, V _{GS} =10V
	-	1.26	4		I _D =500mA, V _{GS} =10V
V _{SD}	-	-	1.2	V	I _S =1.2A, V _{GS} =0V
G _{FS}	-	600	-	mS	V _{DS} =10V, I _D =600mA
C _{iss}	-	62	80	pF	V _{DS} =25V, V _{GS} =0, f=1MHz
C _{oss}	-	17.6	-		
C _{rss}	-	9	-		
Q _g	-	1	-	nC	I _D =600mA, V _{DS} =50V, V _{GS} =4.5V
Q _{gs}	-	0.5	-		
Q _{gd}	-	0.5	-		
t _{d(on)}	-	12	-	ns	V _{DS} =30V, I _D =600mA, R _G =3.3Ω, V _{GS} =10V, R _D =52Ω
t _r	-	10	-		
t _{d(off)}	-	56	-		
t _f	-	29	-		

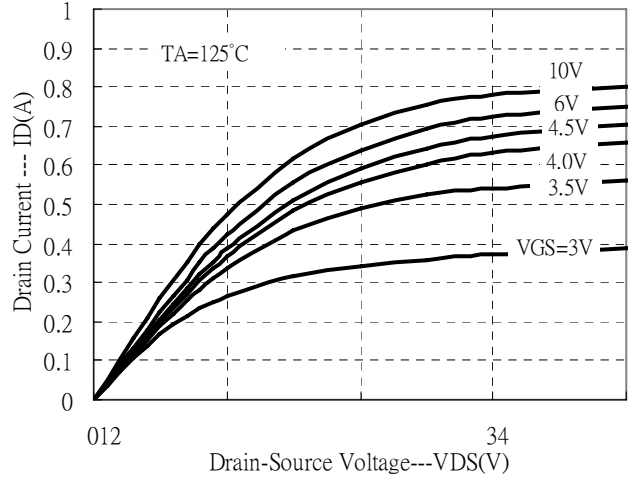
*Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

Typical Characteristics

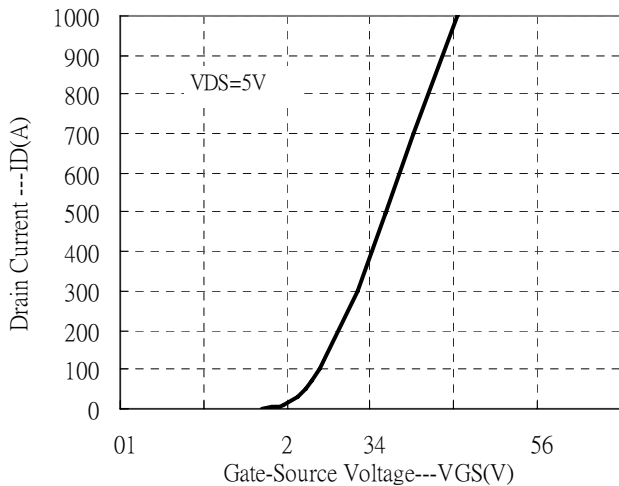
Typical Output Characteristics



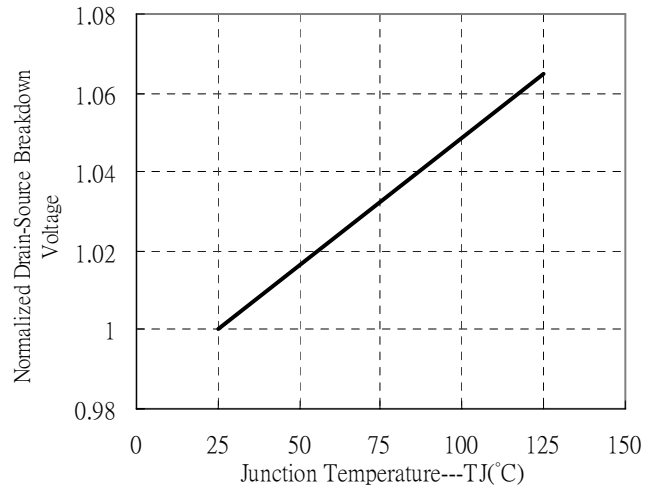
Typical Output Characteristics



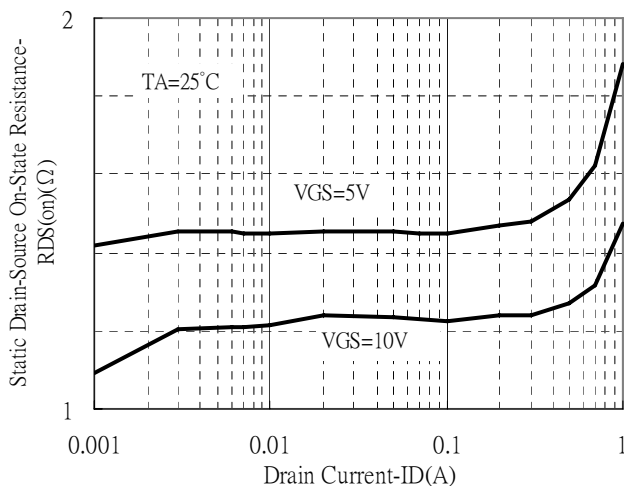
Typical Transfer Characteristics



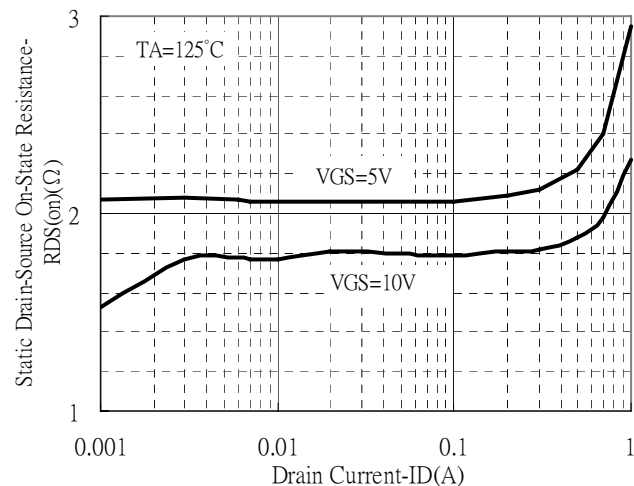
Breakdown Voltage Variation with Temperature



Static Drain-Source On-State resistance vs Drain Current

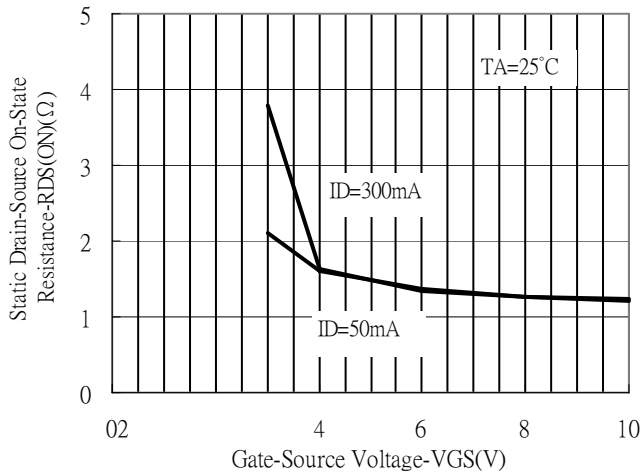


Static Drain-Source On-State resistance vs Drain Current

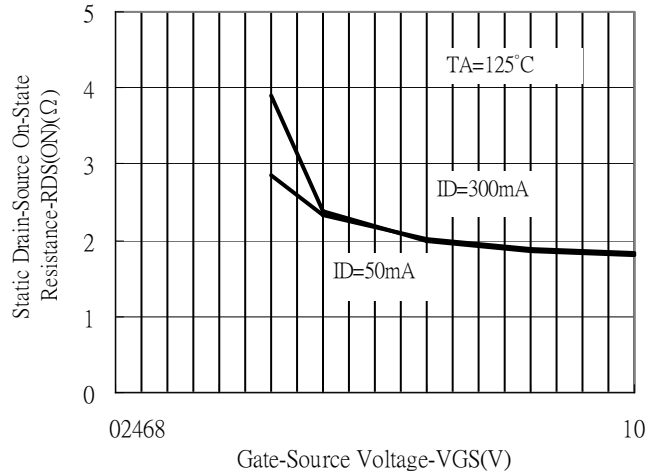


Characteristic Curves(Cont.)

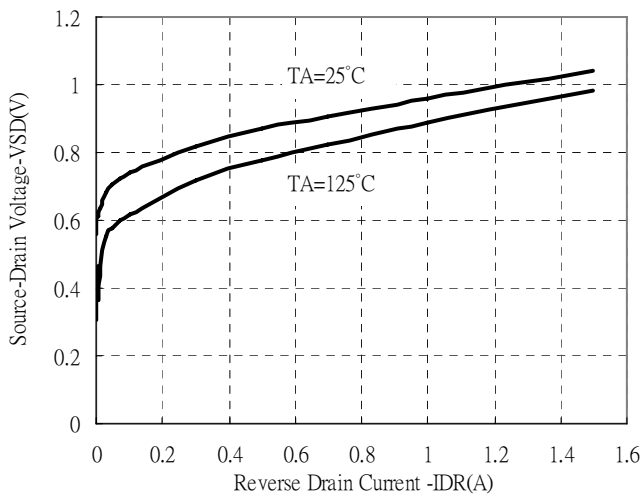
Static Drain-Source On-State Resistance vs Gate-Source Voltage



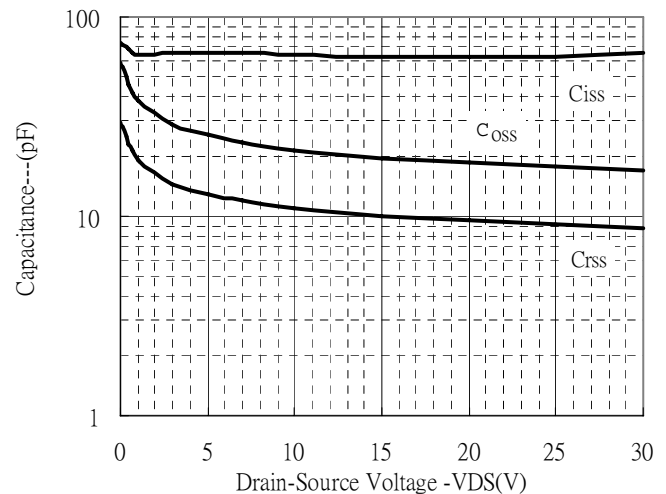
Static Drain-Source On-State Resistance vs Gate-Source Voltage



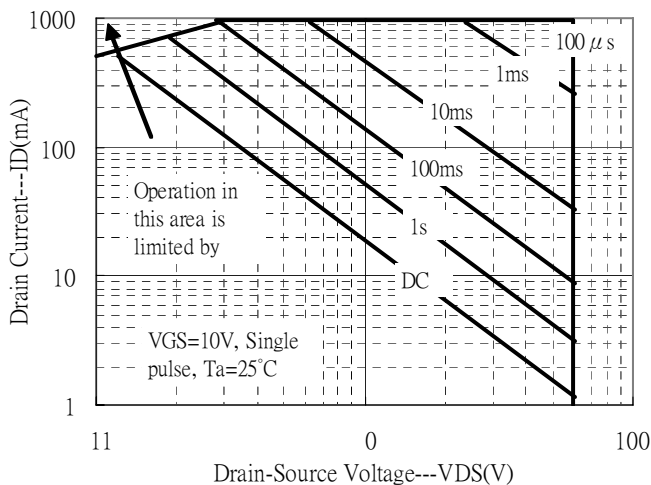
Reverse Drain Current vs Source-Drain Voltage



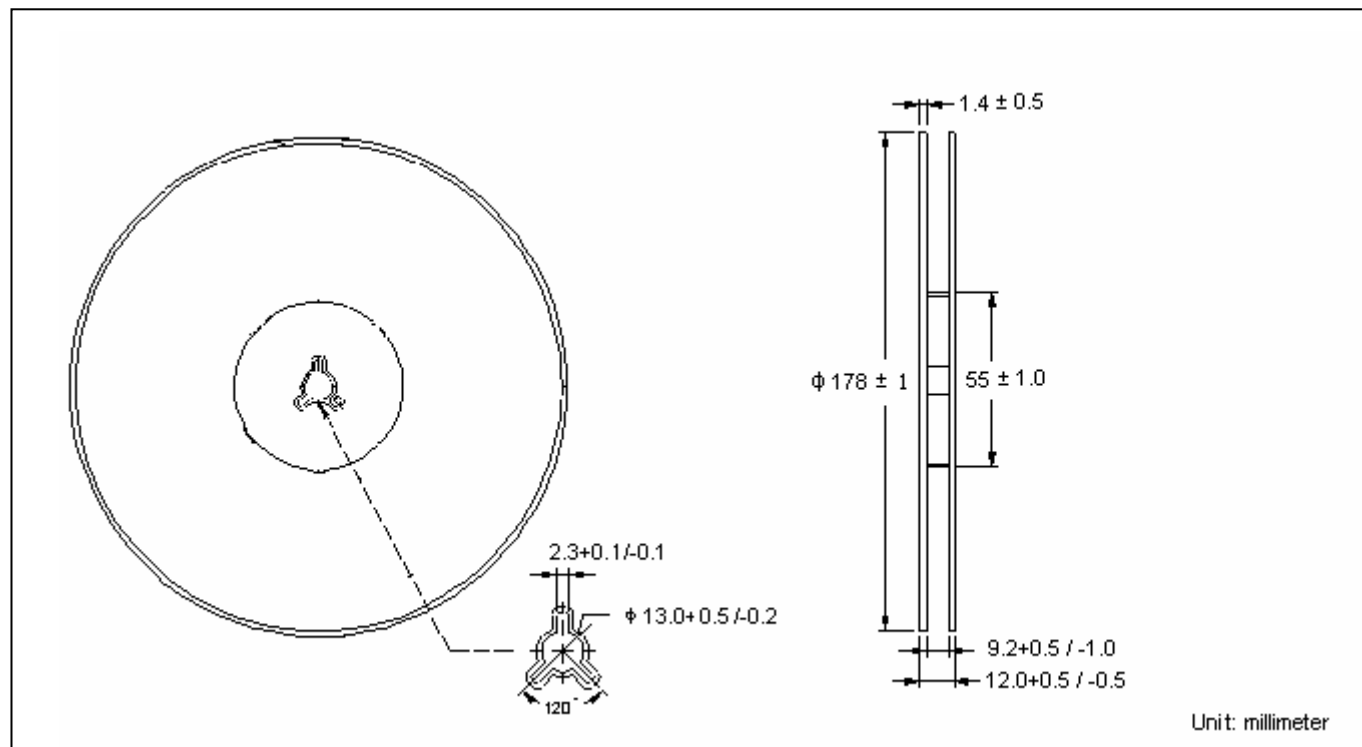
Capacitance vs Drain-to-Source Voltage



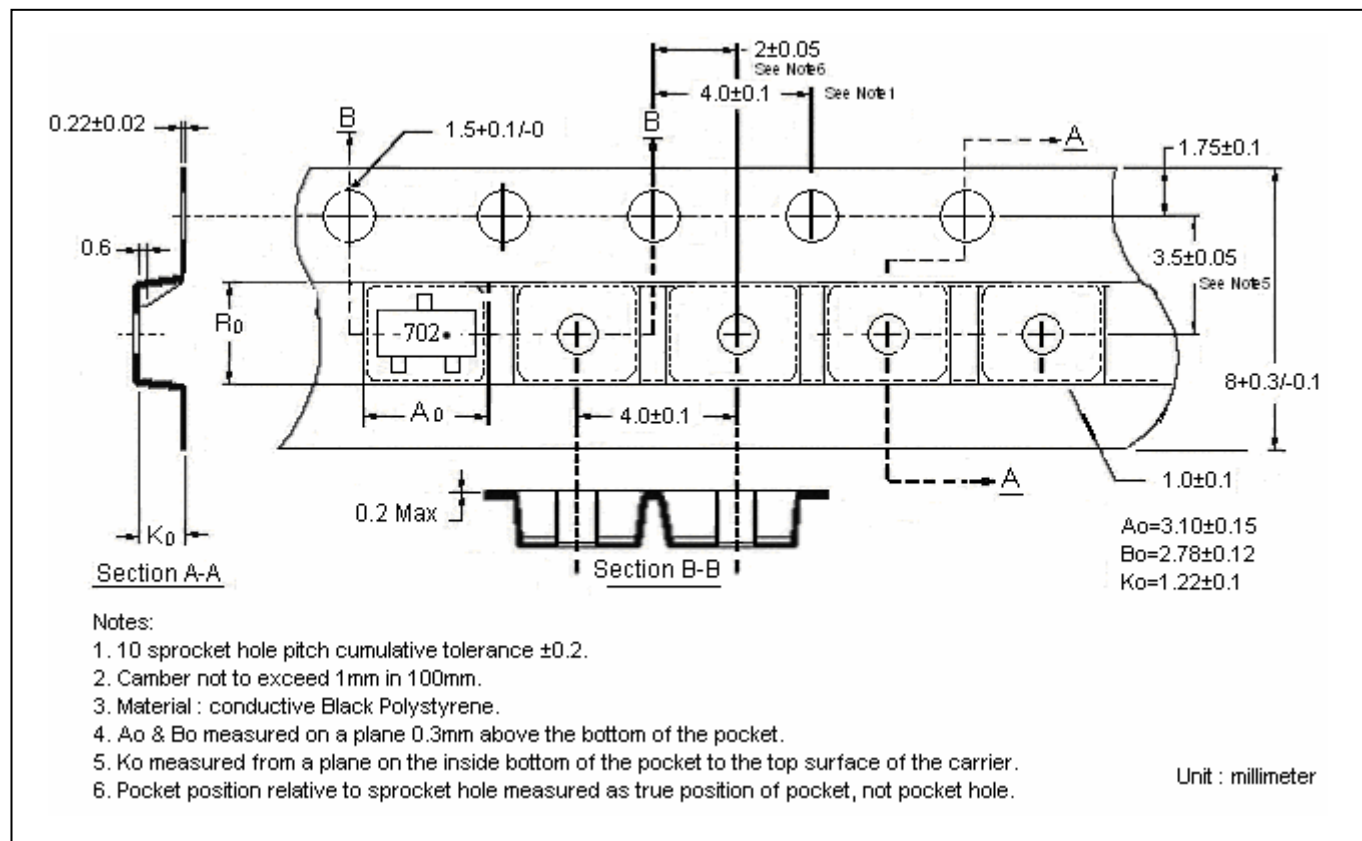
Safe Operating Area



Reel Dimension



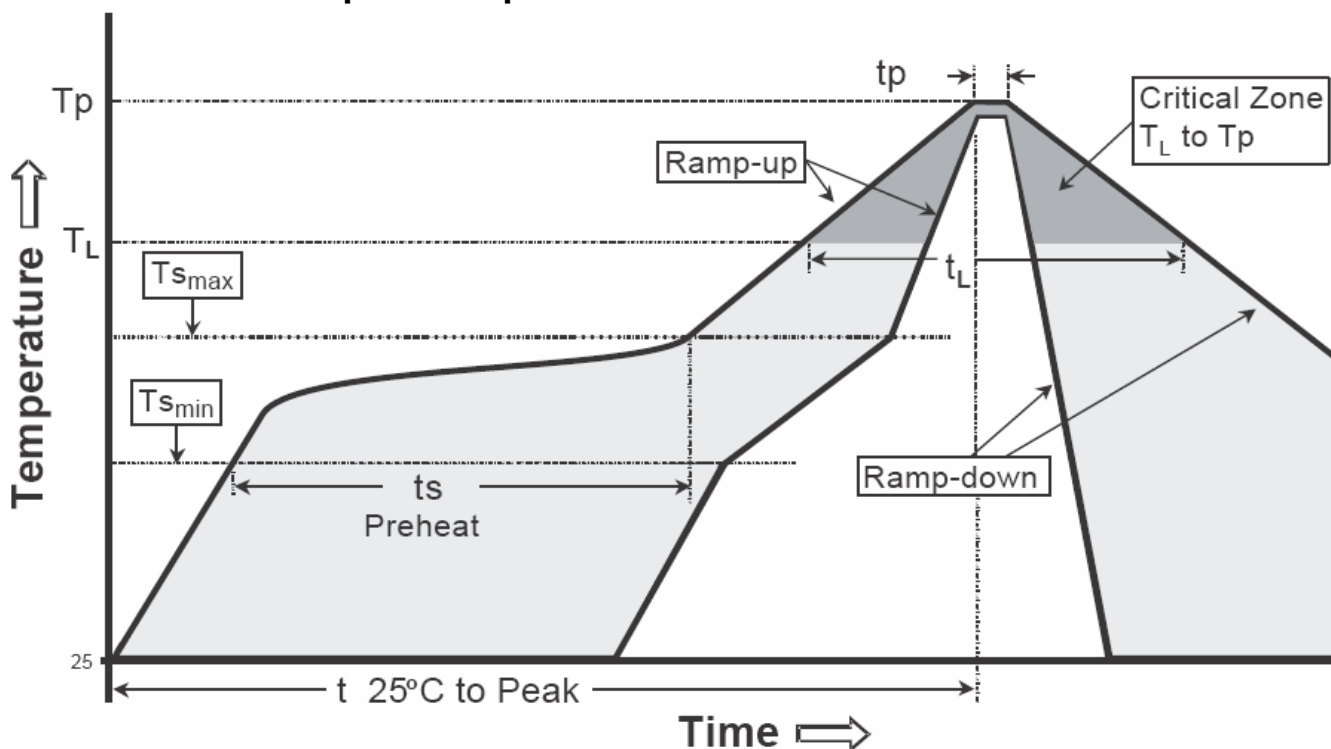
Carrier Tape Dimension



Recommended wave soldering condition

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

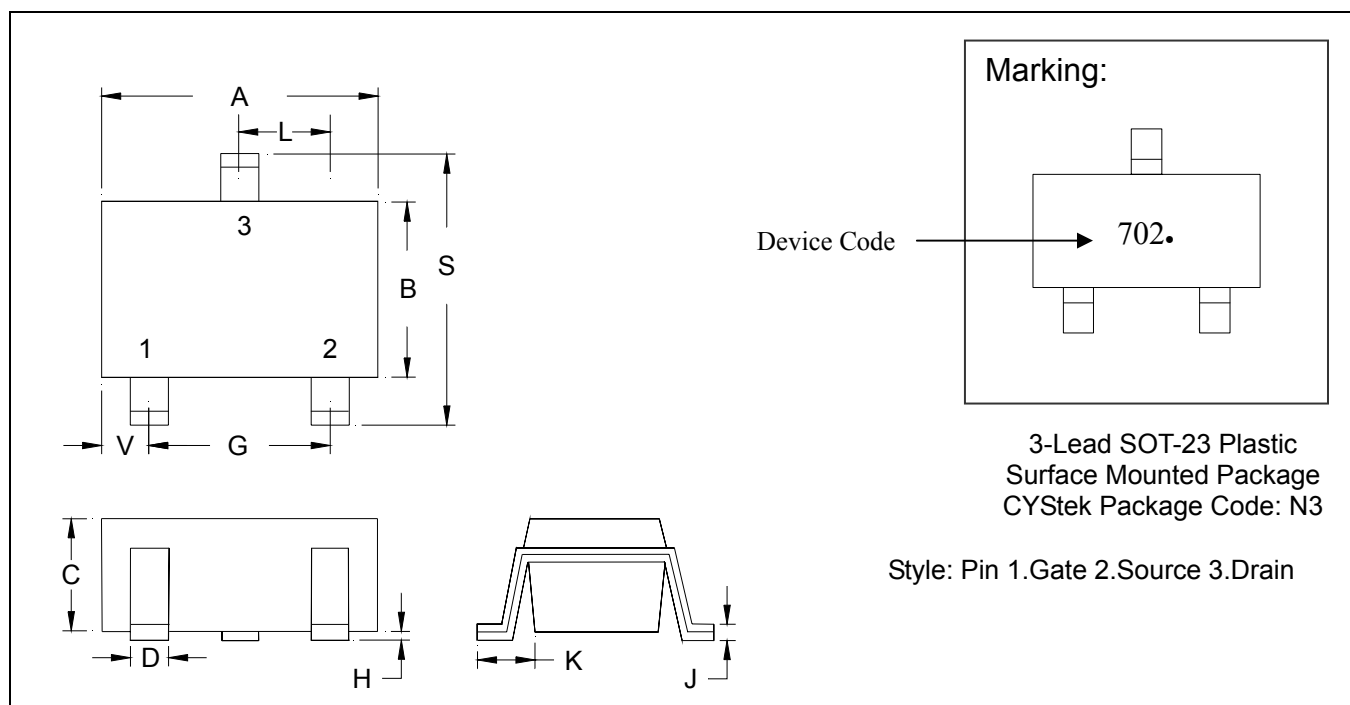
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T_{smax} to T_p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T_{smin})	100°C	150°C
-Temperature Max(T_{smax})	150°C	200°C
-Time(t_{smin} to t_{smax})	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T_L)	183°C	217°C
- Time (t_L)	60-150 seconds	60-150 seconds
Peak Temperature(T_p)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(t_p)	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: Pure tin plated
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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