

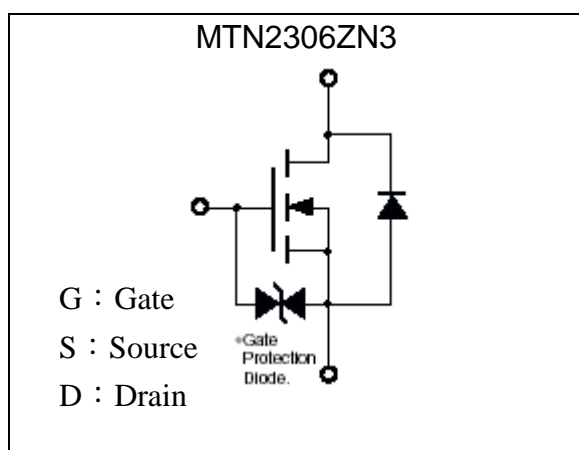
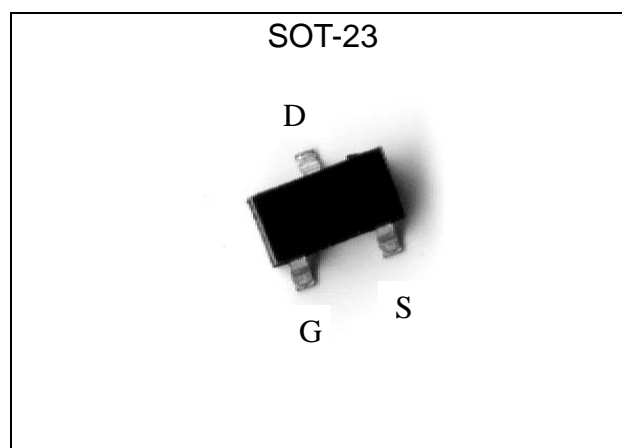
20V N-Channel Logic Level Enhancement Mode MOSFET

MTN2306ZN3

BV _{DSS}		20V
I _D		6A
R _{DS(ON)(MAX)}	V _{GS} =4.5V, I _D =5A	30mΩ
	V _{GS} =2.5V, I _D =2.6A	40mΩ
	V _{GS} =1.8V, I _D =1A	60mΩ

Features

- V_{DS}=20V
 $R_{DS(ON)}=30m\Omega @ V_{GS}=4.5V, I_D=5A$
 $R_{DS(ON)}=40m\Omega @ V_{GS}=2.5V, I_D=2.6A$
- Low on-resistance
- Low gate charge
- Excellent thermal and electrical capabilities
- Pb-free lead plating package

Equivalent Circuit

Outline

Absolute Maximum Ratings (T_a=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±8	V
Continuous Drain Current @ T _A =25°C, V _{GS} =4.5V (Note 3)	I _D	6	A
Continuous Drain Current @ T _A =70°C, V _{GS} =4.5V (Note 3)	I _D	4	A
Pulsed Drain Current (Note 1, 2)	I _{DM}	24	A
Maximum Power Dissipation @ T _A =25°C	P _D	1.38	W
Linear Derating Factor		0.01	W/°C
ESD susceptibility (Note 4)		2600	V
Thermal Resistance, Junction-to-Ambient (Note 3)	R _{th,ja}	90	°C/W
Operating Junction and Storage Temperature	T _j , T _{stg}	-55~+150	°C

Note : 1. Pulse width limited by maximum junction temperature.

2. Pulse width ≤ 300μs, duty cycle ≤ 2%.

3. Surface mounted on 1 in² copper pad of FR-4 board; 270°C/W when mounted on minimum copper pad.

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



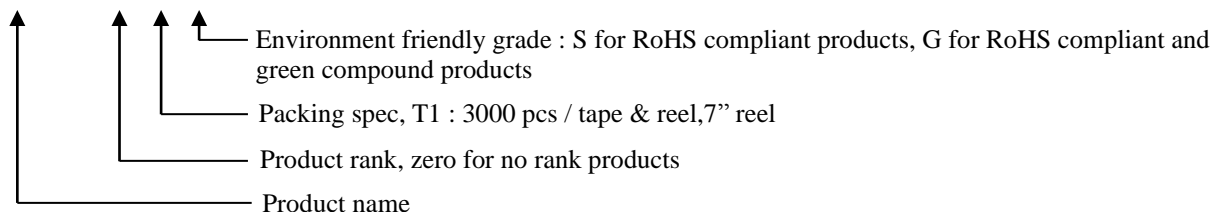
Electrical Characteristics (T_j=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	20	-	-	V	V _{GS} =0, I _D =250μA
V _{GS(th)}	0.4	-	1.2	V	V _{DS} =V _{GS} , I _D =250μA
G _{FS}	-	13	-	S	V _{DS} =5V, I _D =5A
I _{GSS}	-	-	±10	μA	V _{GS} =±8V, V _{DS} =0
I _{DSS}	-	-	1		V _{DS} =16V, V _{GS} =0
	-	-	25	V _{DS} =16V, V _{GS} =0, T _j =70°C	
*R _{DS(ON)}	-	23	30	mΩ	V _{GS} =4.5V, I _D =5A
	-	30	40		V _{GS} =2.5V, I _D =2.6A
	-	45	60		V _{GS} =1.8V, I _D =1A
Dynamic					
C _{iSS}	-	474	-	pF	V _{DS} =20V, V _{GS} =0, f=1MHz
C _{oSS}	-	77	-		
C _{rSS}	-	60	-		
*t _{d(ON)}	-	6	-	ns	V _{DS} =15V, I _D =5A, V _{GS} =4.5V, R _G =3.3Ω, R _D =3Ω
*t _r	-	20	-		
*t _{d(OFF)}	-	20	-		
*t _f	-	3	-		
*Q _g	-	8.5	-	nC	V _{DS} =16V, I _D =5A, V _{GS} =4.5V
*Q _{gs}	-	1.5	-		
*Q _{gd}	-	3.2	-		
Source-Drain Diode					
*V _{SD}	-	-	1.2	V	V _{GS} =0V, I _S =1.2A
*t _{rr}	-	14	-	ns	I _S =5A, V _{GS} =0V, dI/dt=100A/μs
*Q _{rr}	-	7	-	nC	

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

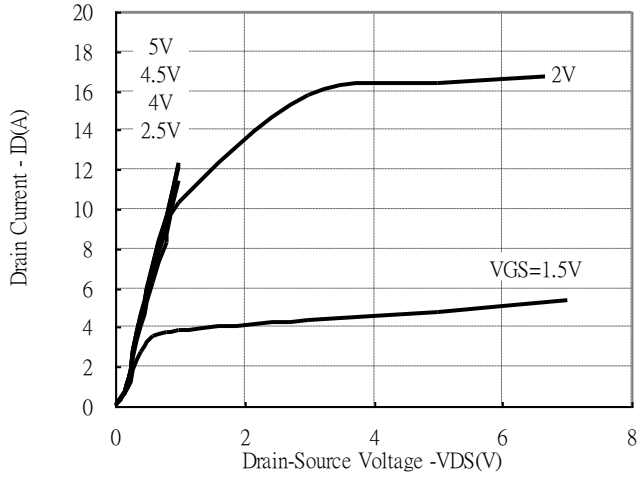
Ordering Information

Device	Package	Shipping
MTN2306ZN3-0-T1-G	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

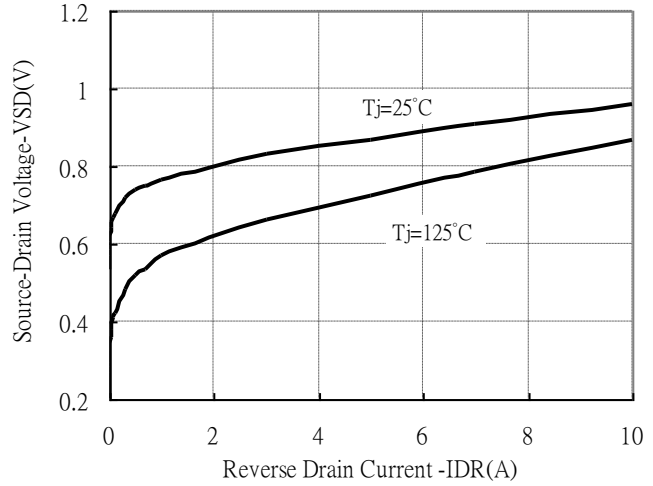


Typical Characteristics

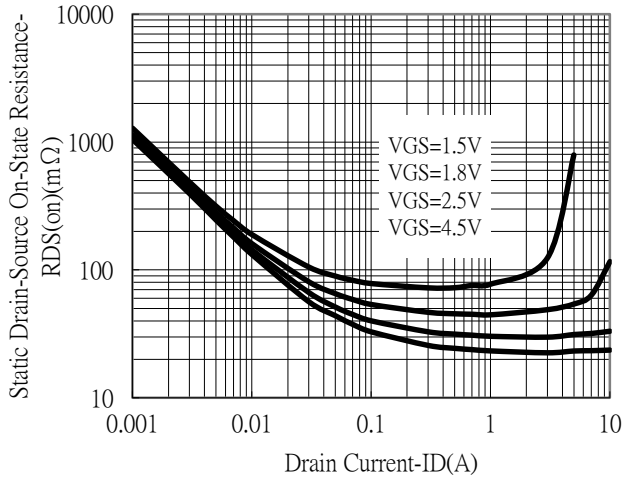
Typical Output Characteristics



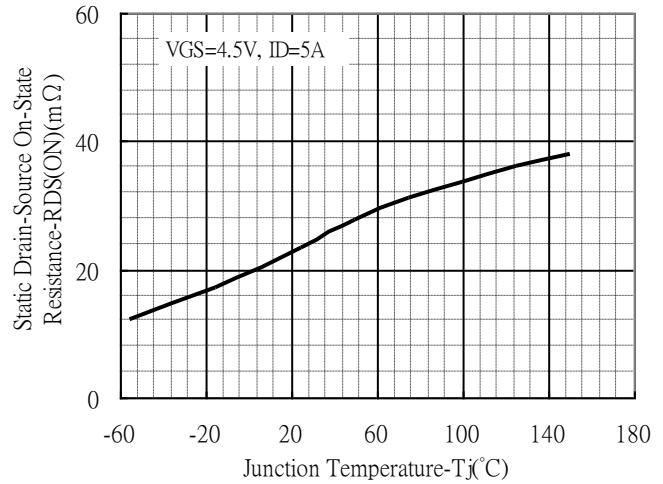
Reverse Drain Current vs Source-Drain Voltage



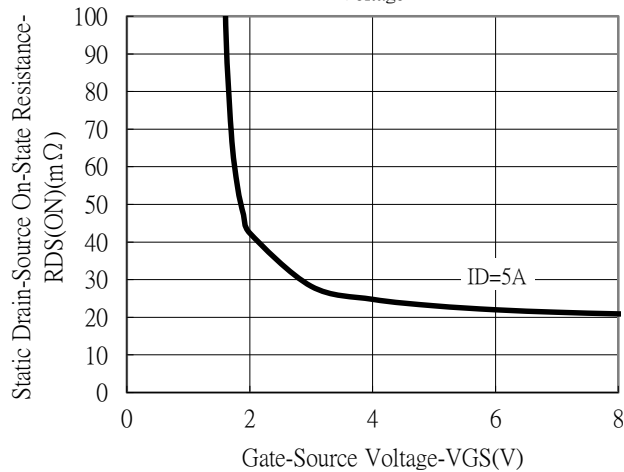
Static Drain-Source On-State resistance vs Drain Current



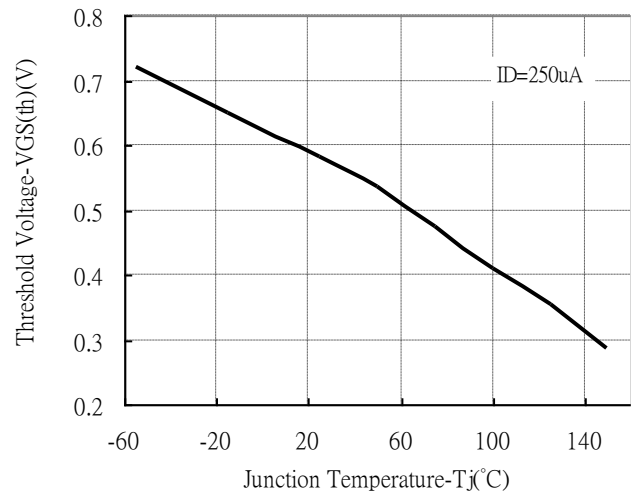
Drain-Source On-State Resistance vs Junction Temperature



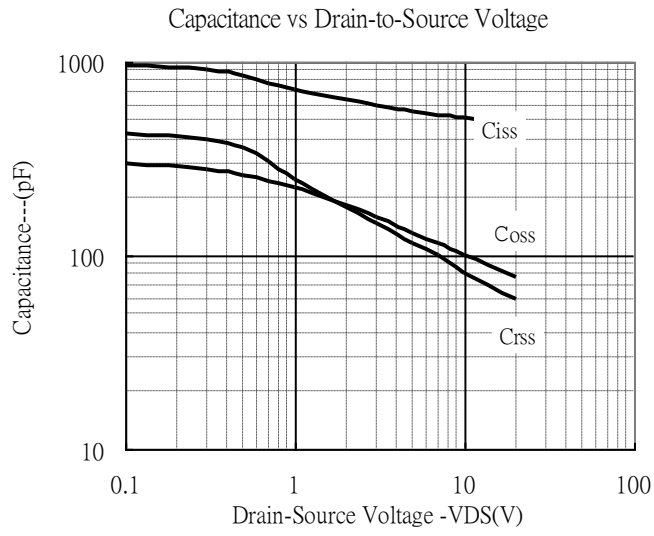
Static Drain-Source On-State Resistance vs Gate-Source Voltage



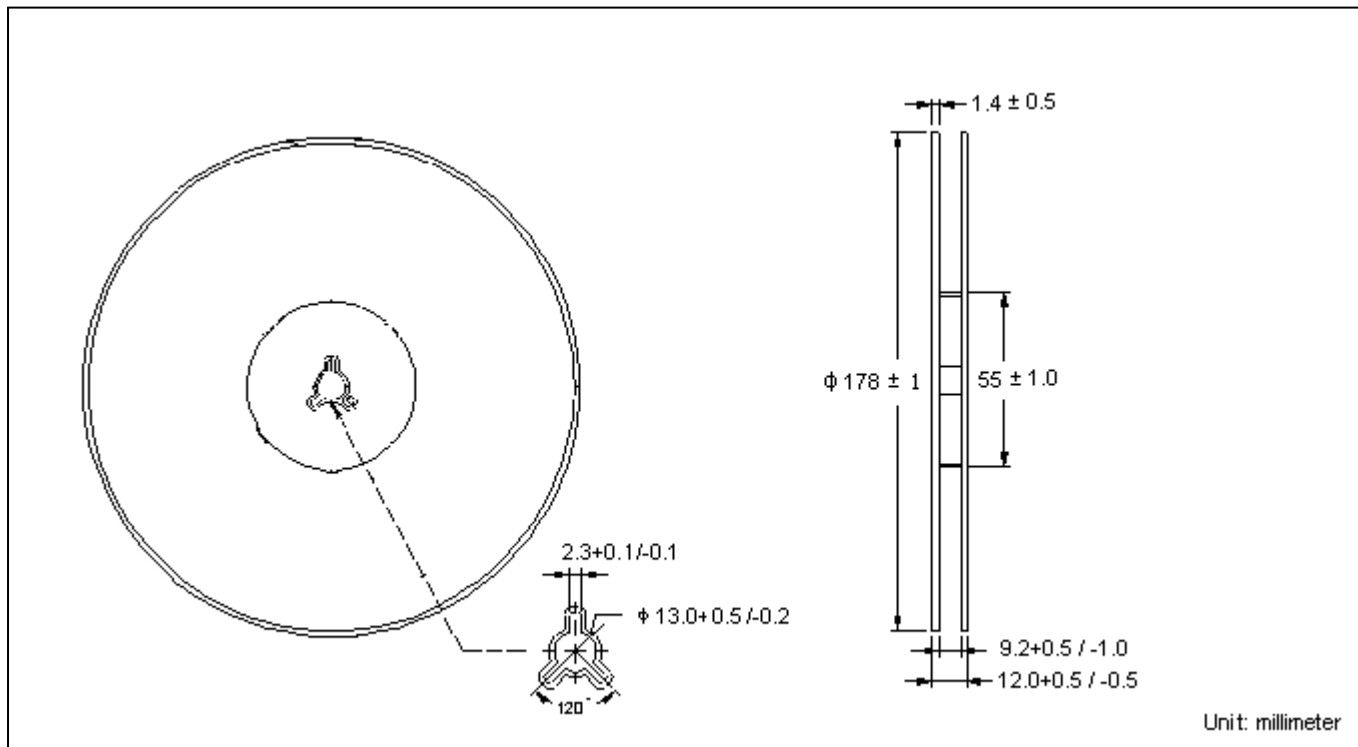
Threshold Voltage vs Junction Temperature



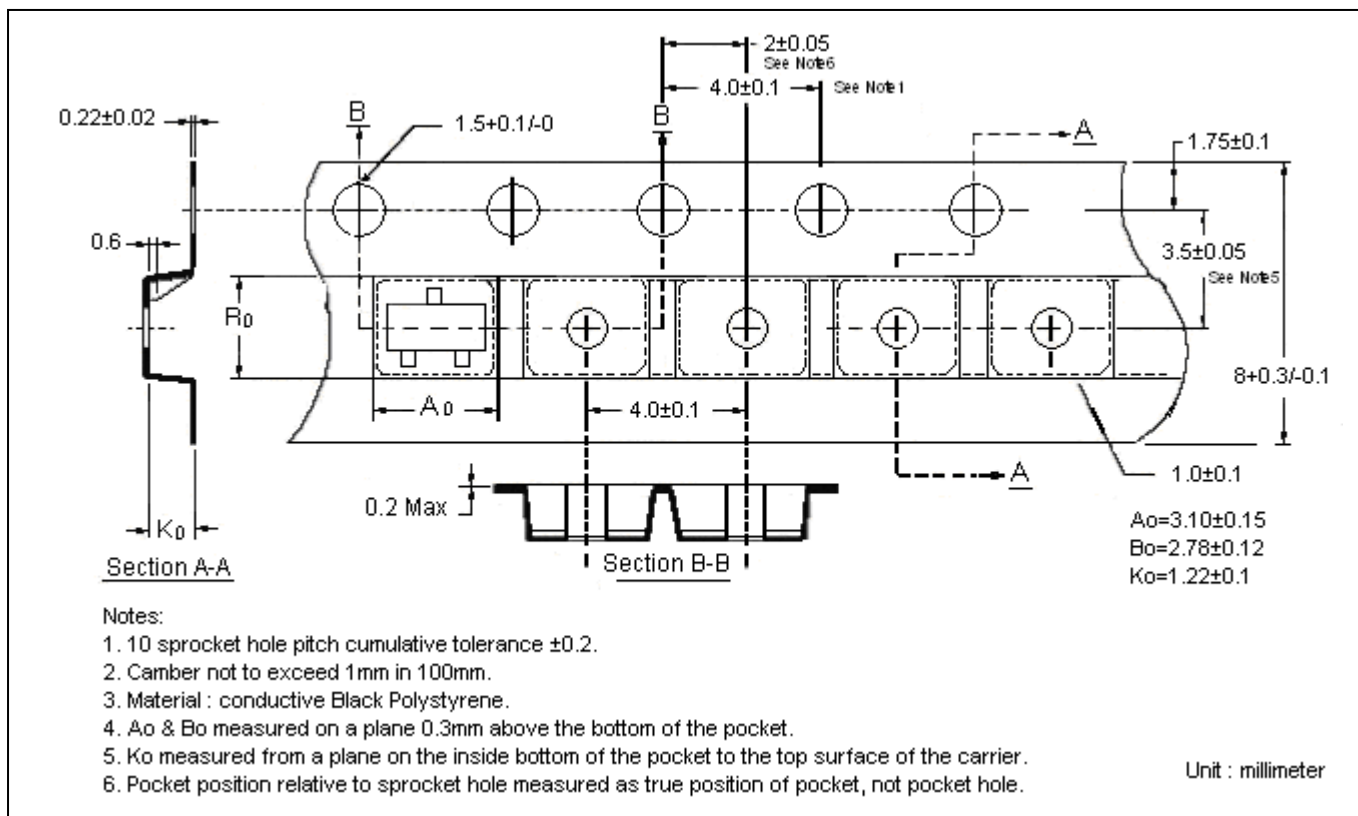
Typical Characteristics(Cont.)



Reel Dimension



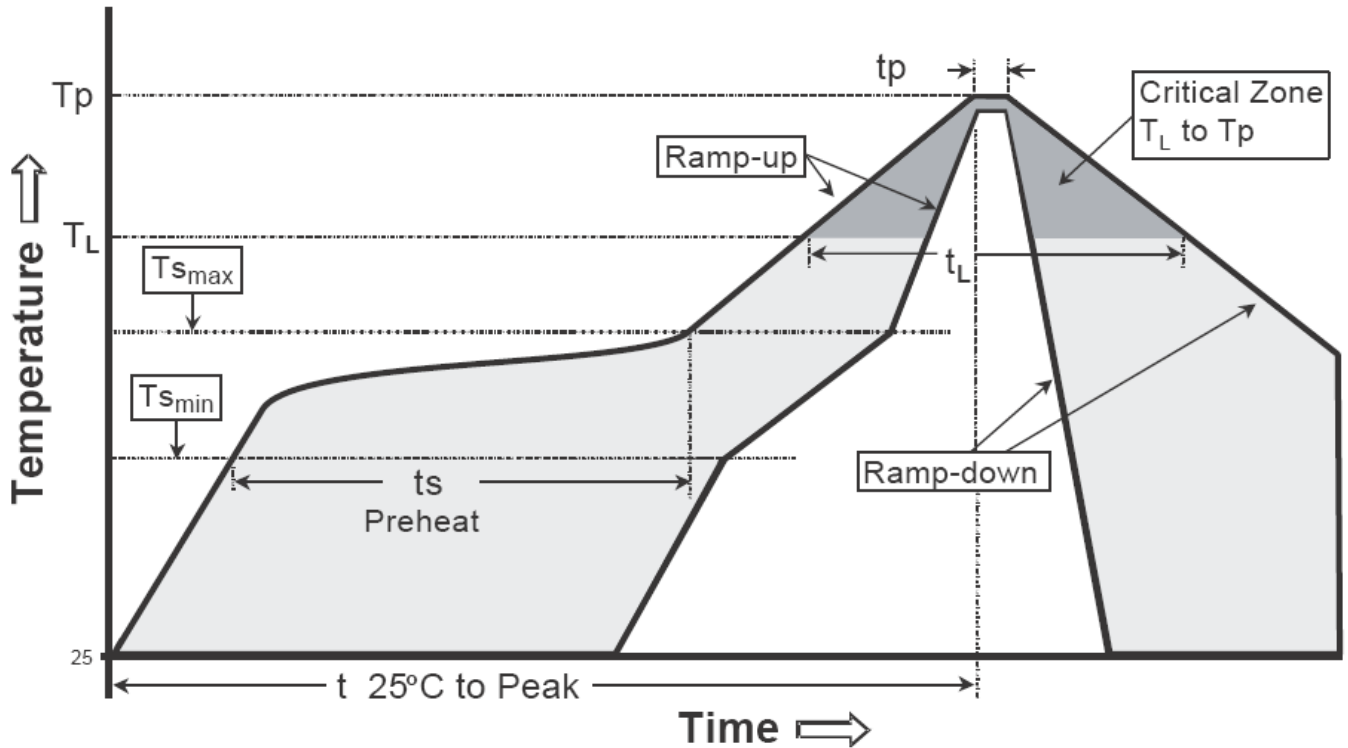
Carrier Tape Dimension



Recommended wave soldering condition

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

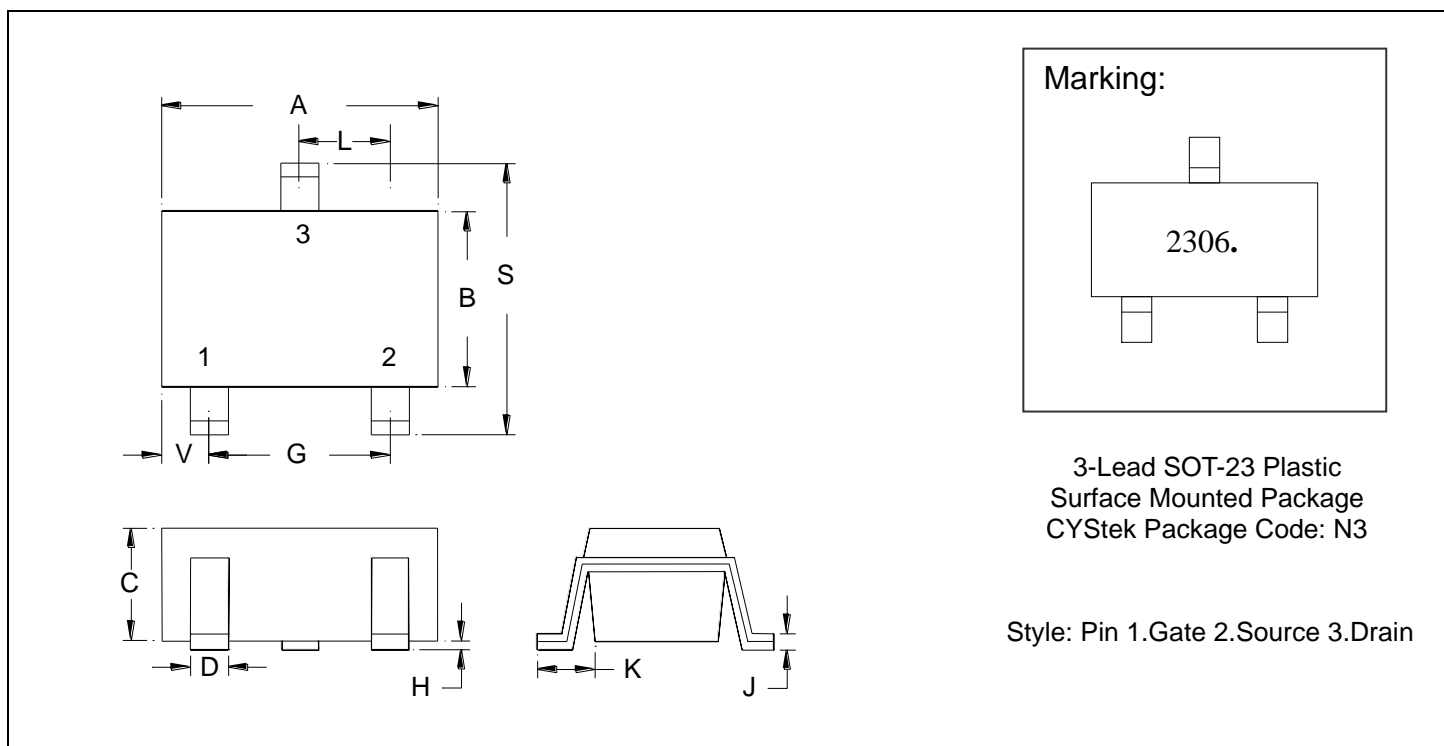
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T _{s min})	100°C	150°C
-Temperature Max(T _{s max})	150°C	200°C
-Time(t _{s min} to t _{s max})	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(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	0.1181	2.80	3.00	J	0.0032	0.0059	0.08	0.15
B	0.0472	0.0551	1.20	1.40	K	0.0216 REF		0.55 REF	
C	0.0354	0.0453	0.90	1.15	L	0.0354	0.0394	0.90	1.00
D	0.0118	0.0197	0.30	0.50	S	0.0885	0.1004	2.25	2.55
G	0.0709	0.0787	1.80	2.00	V	0.0098	0.0256	0.25	0.65
H	0.0000	0.0040	0.00	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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