

ESD protected N-CHANNEL MOSFET

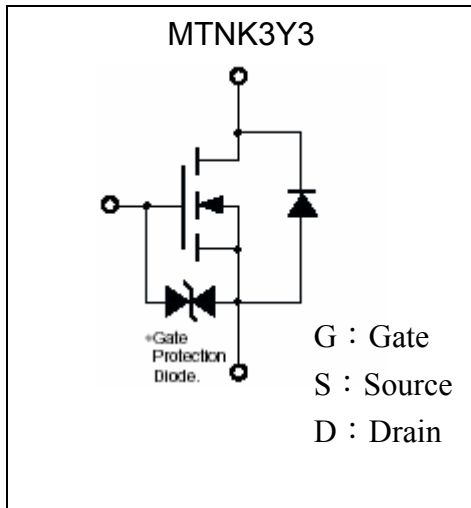
MTNK3Y3

BVDSS	20V
ID	255mA
RDSON@VGS=4.5V, ID=255mA	1.7 Ω (typ.)
RDSON@VGS=2.5V, ID=20mA	2.2 Ω (typ.)
RDSON@VGS=1.8V, ID=20mA	3.5 Ω (typ.)
RDSON@VGS=1.6V, ID=20mA	4.1 Ω (typ.)

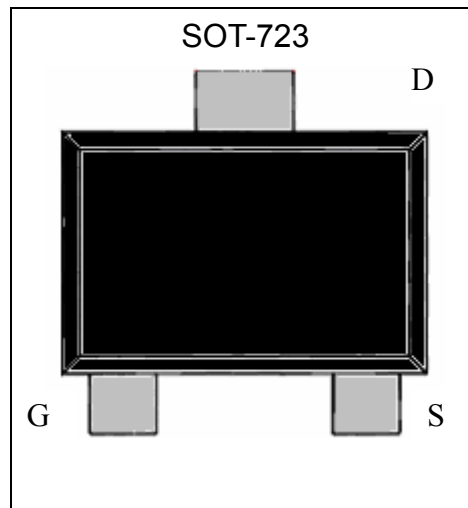
Description

- 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	BVDSS	20	V
Gate-Source Voltage	VGS	±8	V
Continuous Drain Current	ID	255 *2	mA
		210 *3	
Pulsed Drain Current	IDM	400 *1	
Total Power Dissipation	PD	440 *2	mW
		310 *3	
ESD susceptibility		350 *4	V
Operating Junction and Storage Temperature Range	Tj	-55~+150	°C
Thermal Resistance, Junction-to-Ambient	Rth,ja	280 *2	°C/W
		400 *3	



- Note : *1. Pulse Width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.
 *2. When device mounted on FR-4 board with 1 sq inch pad size.
 *3. When device mounted on FR-4 board with minimum pad size.
 *4. Human body model, $1.5\text{k}\Omega$ in series with 100pF .

Electrical Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	20	-	-	V	V _{GS} =0, I _D =100 μ A
V _{GS(th)}	0.5	-	1.0	V	V _{DS} =V _{GS} , I _D =250 μ A
I _{GSS}	-	-	± 1	μ A	V _{GS} = ± 8 V, V _{DS} =0
I _{DSS}	-	-	500	nA	V _{DS} =20V, V _{GS} =0
R _{DS(ON)}	-	1.7	3	Ω	V _{GS} =4.5V, I _D =255mA
	-	2.2	4.5		V _{GS} =2.5V, I _D =20mA
	-	3.5	6		V _{GS} =1.8V, I _D =20mA
	-	4.1	7		V _{GS} =1.6V, I _D =20mA
G _{FS}	100	-	-	mS	V _{DS} =5V, I _D =100mA
Dynamic					
C _{iss}	-	23	50	pF	V _{DS} =10V, V _{GS} =0, f=1MHz
C _{oss}	-	7.7	25		
C _{rss}	-	5.8	5		
Source-Drain Diode					
*V _{SD}	-	-	1	V	V _{GS} =0V, I _S =10mA

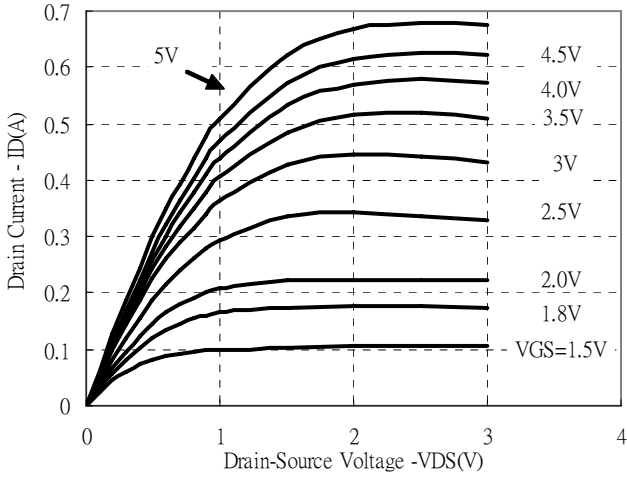
*Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

Ordering Information

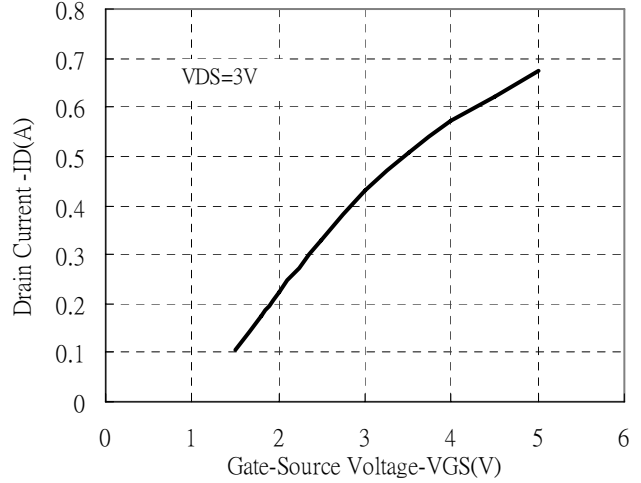
Device	Package	Shipping	Marking
MTNK3Y3	SOT-723 (Pb-free)	8000 pcs / Tape & Reel	K3

Typical Characteristics

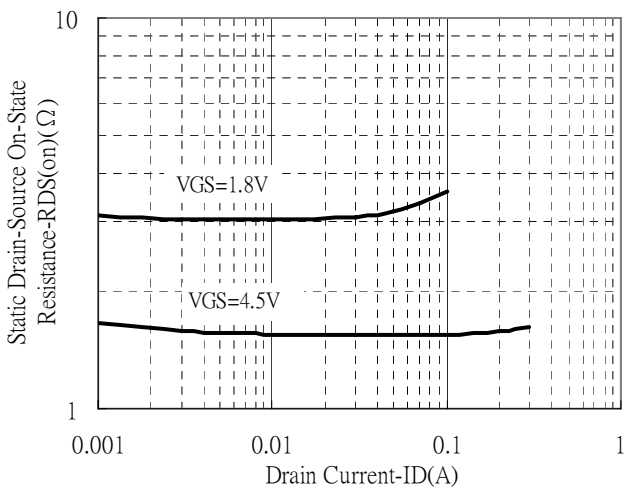
Typical Output Characteristics



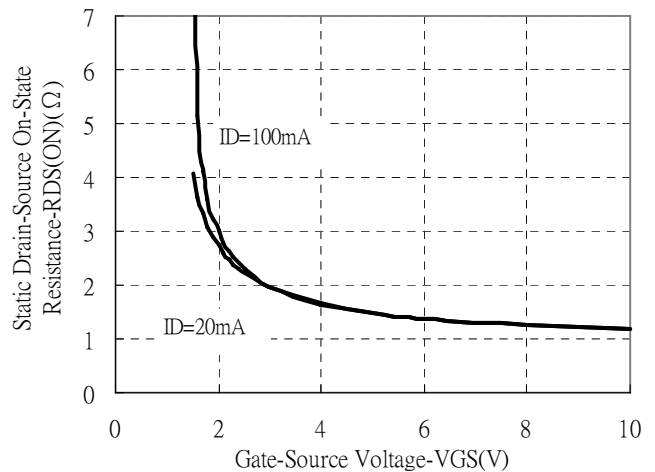
Typical Transfer Characteristics



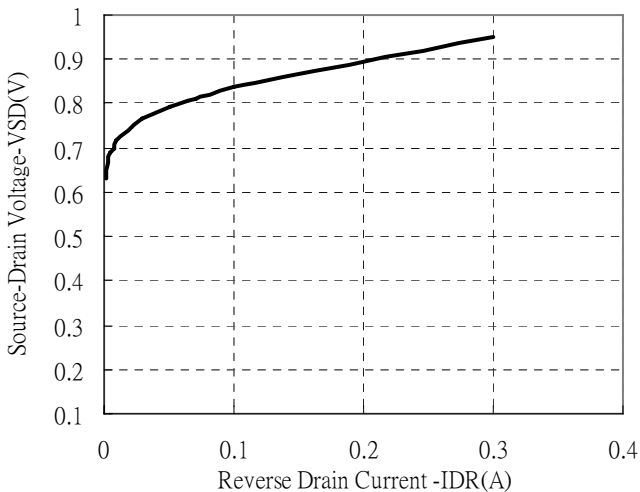
Static Drain-Source On-State resistance vs Drain Current



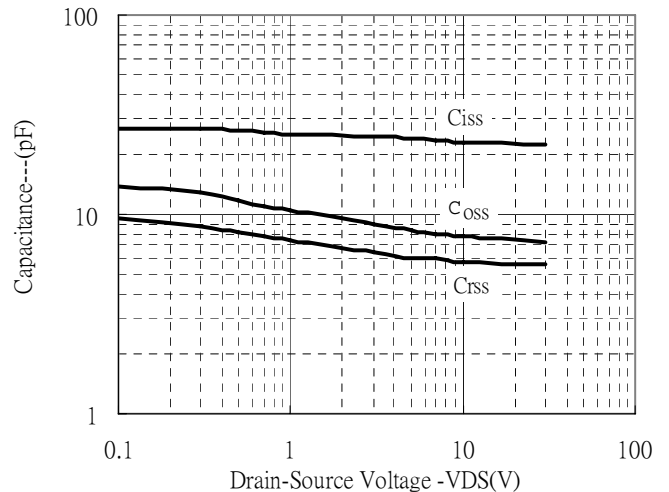
Static Drain-Source On-State Resistance vs Gate-Source Voltage



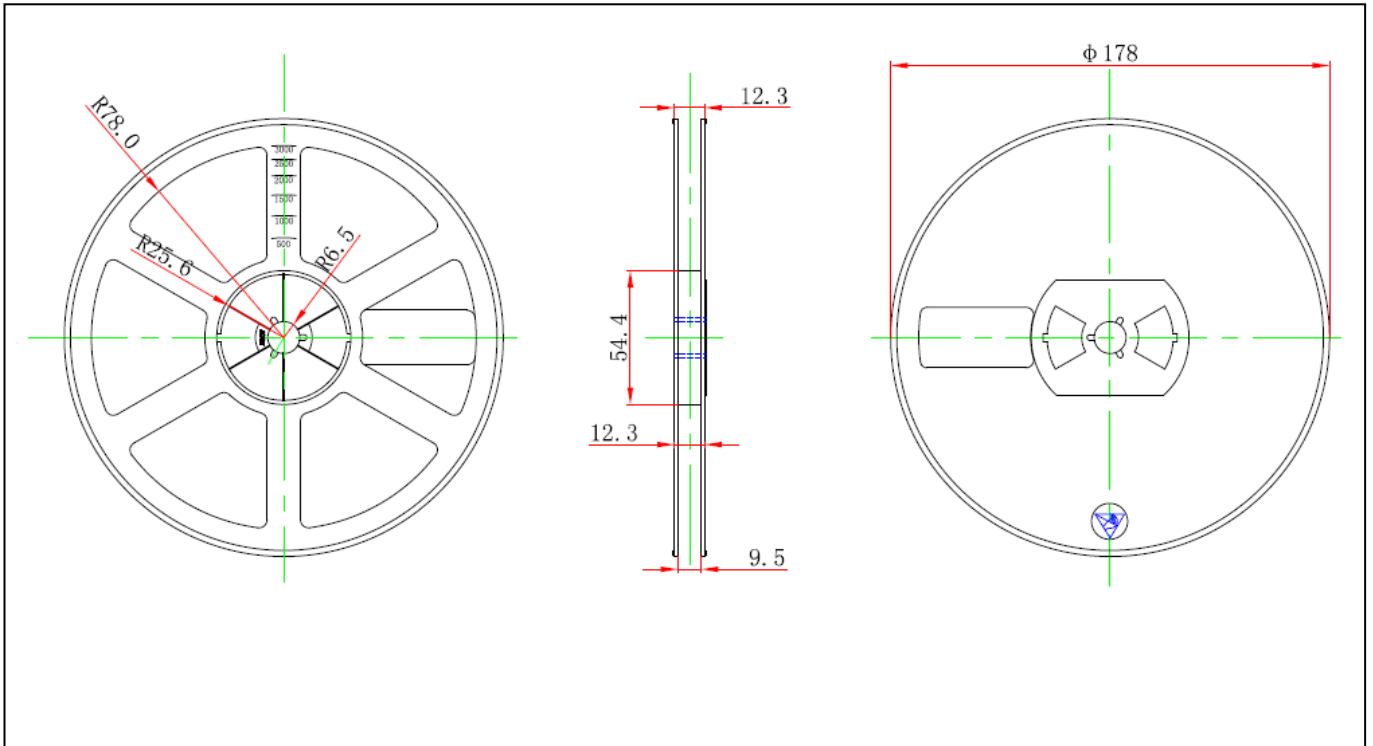
Reverse Drain Current vs Source-Drain Voltage



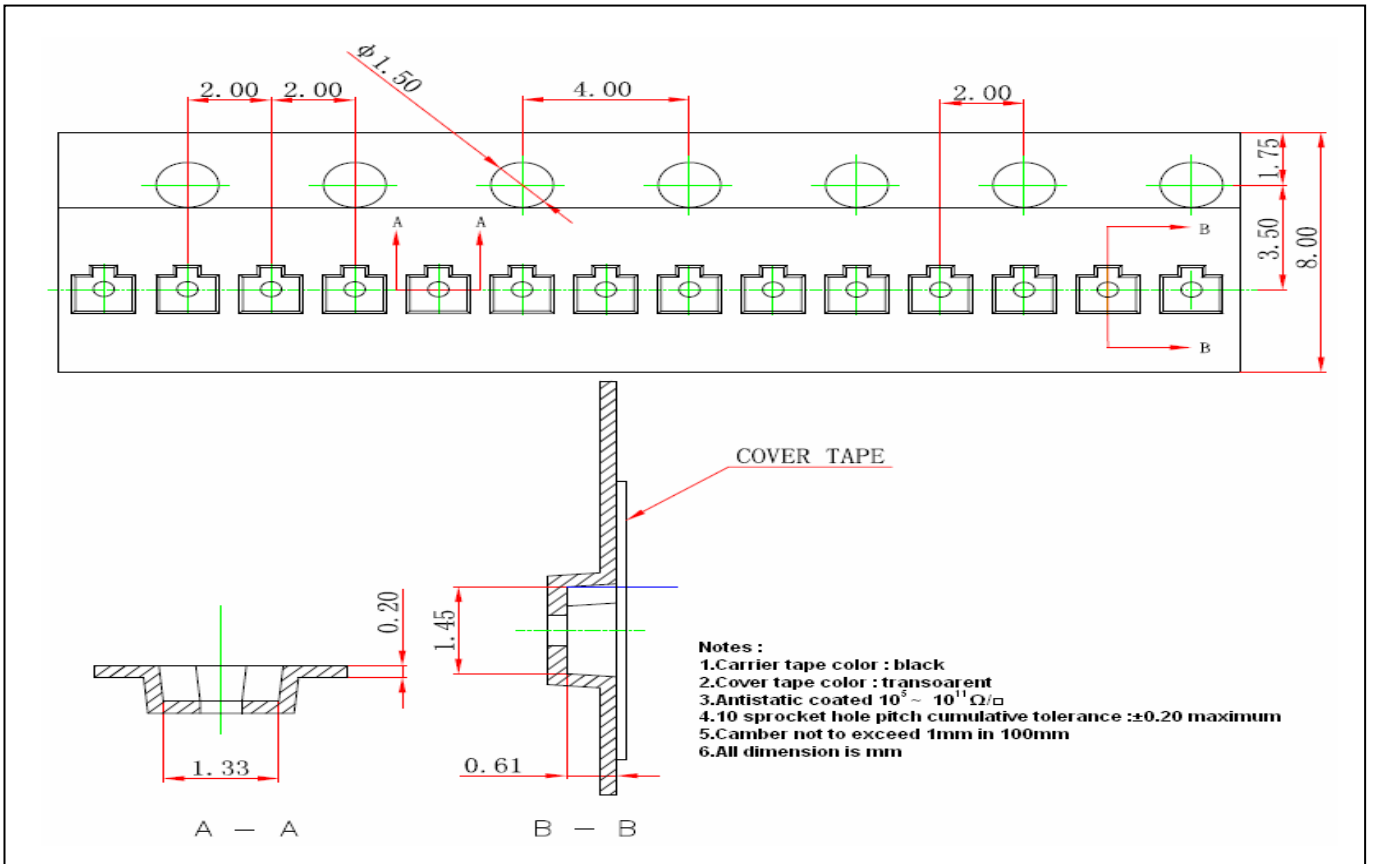
Capacitance vs Drain-to-Source Voltage



Reel Dimension



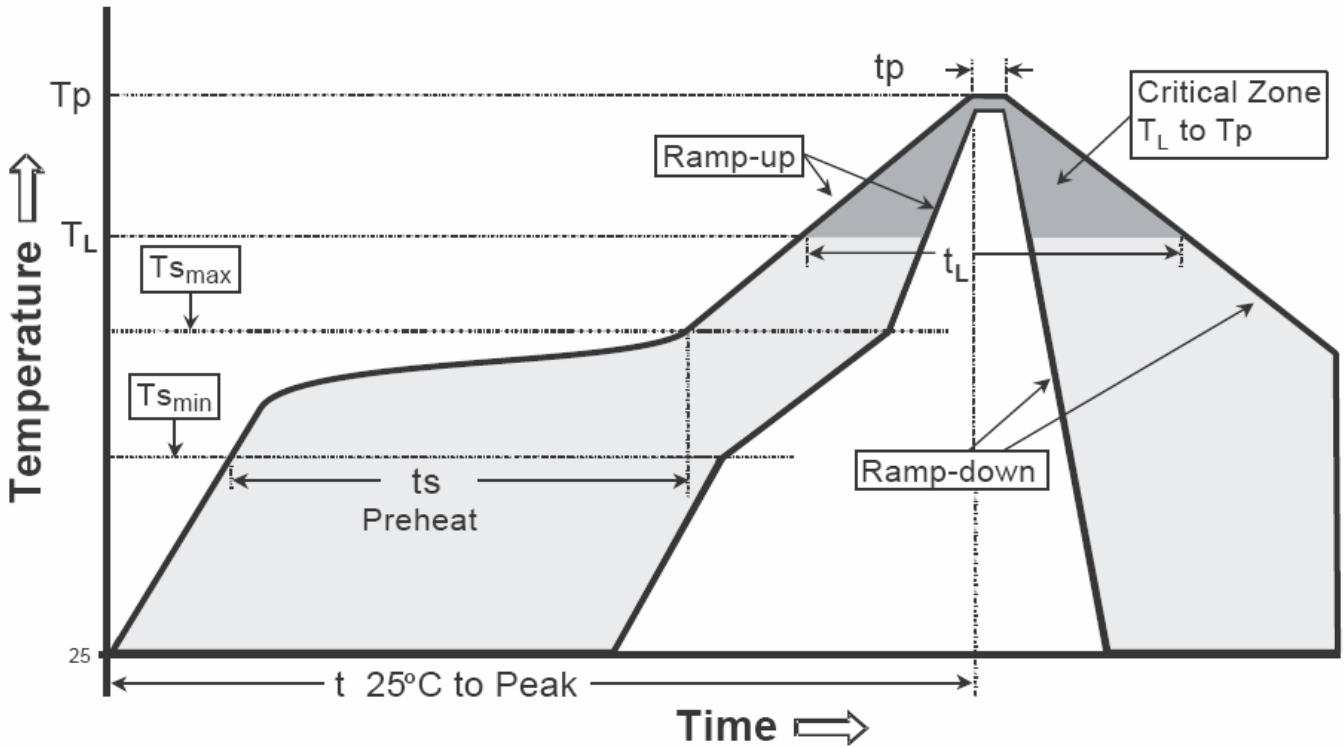
Carrier Tape Dimension



Recommended wave soldering condition

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

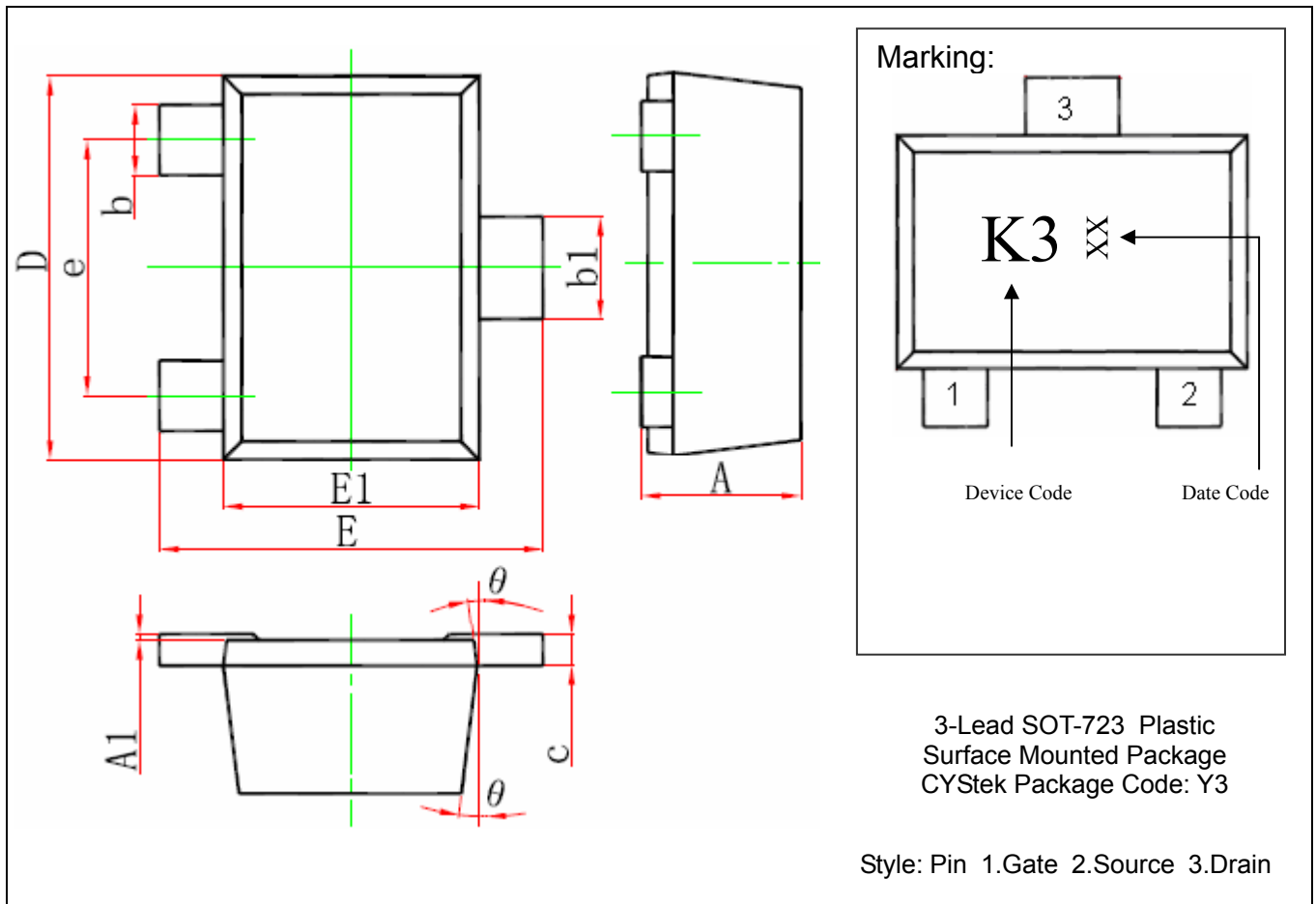
Recommended temperature profile for IR reflow



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-723 Dimension



*Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.000	0.500	0.000	0.020	D	1.150	1.250	0.045	0.049
A1	0.000	0.050	0.000	0.002	E	1.150	1.250	0.045	0.049
b	0.170	0.270	0.007	0.011	E1	0.750	0.850	0.030	0.033
b1	0.270	0.370	0.011	0.015	e	0.800*		0.031*	
c	0.000	0.150	0.000	0.006	θ	7° REF		7° REF	

- 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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