30V P-Channel Logic Level Enhancement Mode MOSFET

MTF44P03N3

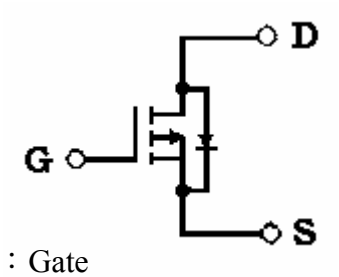
BV_{DSS}	-30V
$R_{DSON(Max)}$	44mΩ
I_D	-4A

Features

- Lower gate charge
- Pb-free lead plating and Halogen-free package

Equivalent Circuit

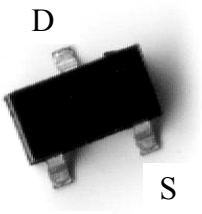
MTF44P03N3



G：Gate
S：Source
D：Drain

Outline

SOT-23



Absolute Maximum Ratings (Tc=25°C, unless otherwise noted)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	T_A=25°C	I_D	-4	A
	T_A=70°C		-3	
Pulsed Drain Current		I_{DM}	-16 (Note 1 & 2)	A
Power Dissipation	T_A=25°C	P_D	1.5 (Note 3)	W
	T_A=70°C		1 (Note 3)	
Thermal Resistance, Junction to Ambient		$R_{th, j-a}$	100 (Note 3)	°C/W
Operating Junction and Storage Temperature		Tj, Tstg	-55 ~ +175	°C

Note : 1. Pulse width limited by maximum junction temperature
2. Duty cycle ≤ 1%
3. Surface mounted on 1 in² copper pad of FR4 board; 270°C/W when mounted on min. copper pad

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-30	-	-	V	V_{GS}=0, I_D=-250μA
$V_{GS(th)}$	-0.3	-0.75	-1.2	V	V_{DS}=V_{GS}, I_D=-250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±12V, V_{DS}=0
I_{DSS}	-	-	-1	μA	V_{DS}=-24V, V_{GS}=0
	-	-	-10	μA	V_{DS}=-20V, V_{GS}=0, Tj=125°C
I_{DON} [1]	-4	-	-	A	V_{DS}=-5V, V_{GS}=-4.5V
*$R_{DS(ON)}$ [1]	-	32	38	mΩ	I_D=-4.5A, V_{GS}=-10V
	-	39	44		I_D=-4A, V_{GS}=-4.5V
	-	60	75		I_D=-3A, V_{GS}=-2.5V
*G_{FS} [1]	-	13	-	S	V_{DS}=-5V, I_D=-4A
Dynamic					
Ciss	-	1079	-	pF	V_{DS}=-15V, V_{GS}=0, f=1MHz
Coss	-	116	-		
Crss	-	93	-		
*$t_{d(ON)}$ [1] [2]	-	6	-	ns	V_{DS}=-15V, I_D=-1A,V_{GS}=-4.5V, R_G=6Ω
*t_r [1] [2]	-	7	-		
*$t_{d(OFF)}$ [1] [2]	-	45	-		
*t_f [1] [2]	-	15	-		
*Qg [1] [2]	-	10	-	nC	V_{DS}=-15V, I_D=-4A, V_{GS}=-4.5V
*Qgs [1] [2]	-	1.5	-		
*Qgd [1] [2]	-	3.5	-		
Source-Drain Diode					
I_S	-	-	-2	A	
I_{SM} [3]	-	-	-8		
V_{SD} [1]	-	-	-1.2	V	I_F=I_S, V_{GS}=0V

[1] Pulse test : Pulse width≤300μs, Duty cycle≤2%

[2] Independent of operating temperature

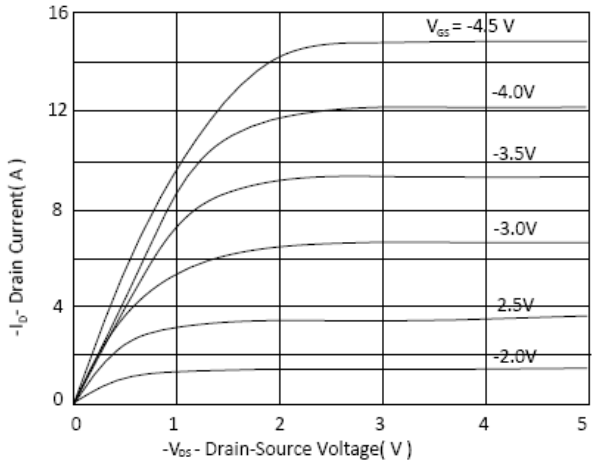
[3] Pulse width limited by maximum junction temperature

Ordering Information

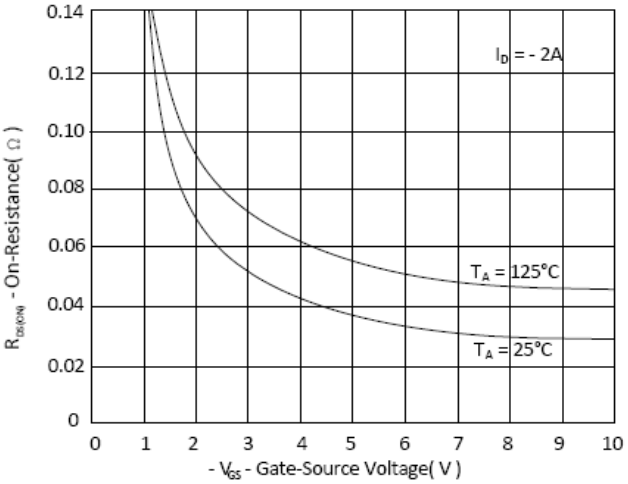
Device	Package	Shipping	Marking
MTF44P03N3	SOT-23 (Pb-free)	3000 pcs / Tape & Reel	26

Characteristic Curves

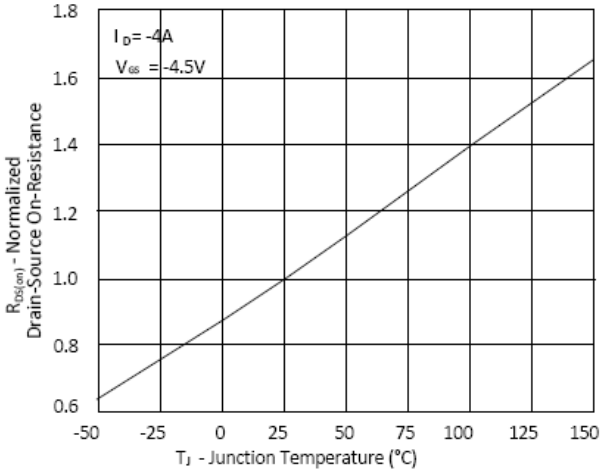
Typical output characteristics



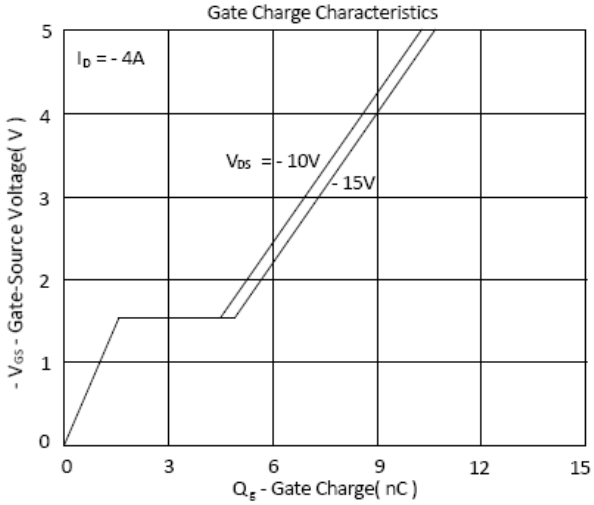
On-Resistance Variation with Gate-Source Voltage



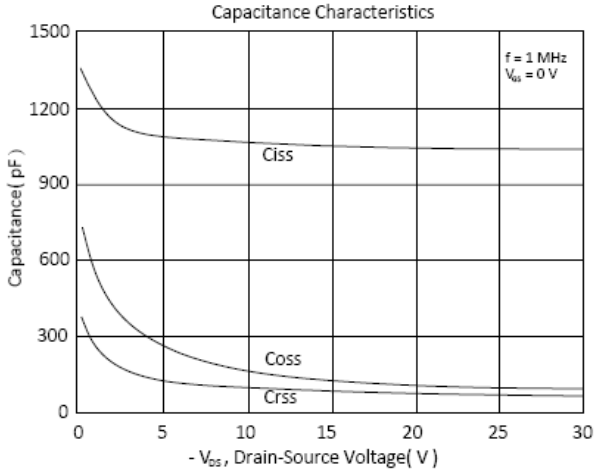
Normalized on-Resistance v.s. Junction Temperature



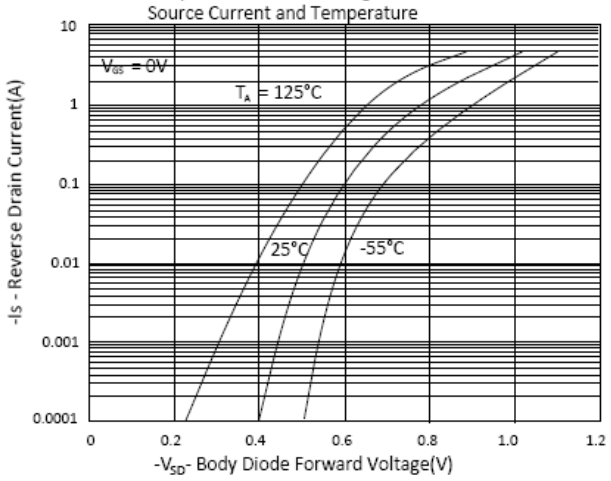
Gate Charge Characteristics



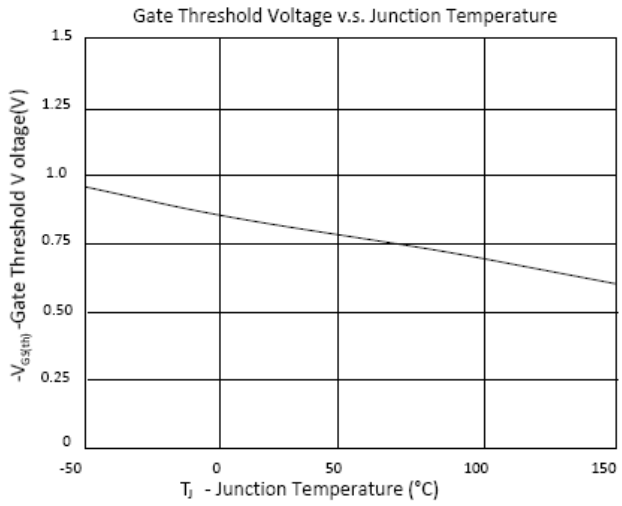
Capacitance Characteristics

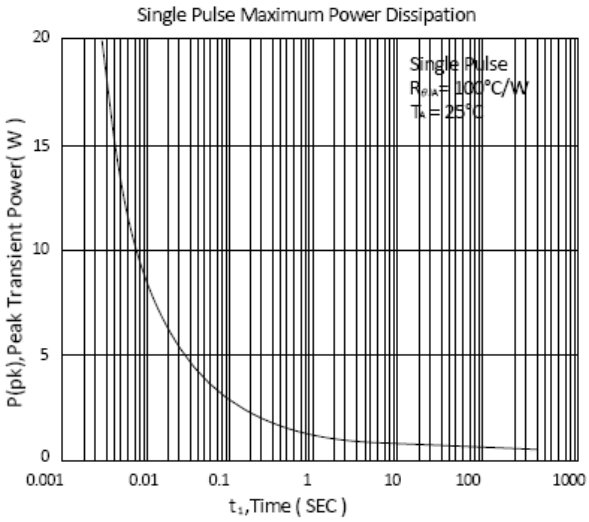


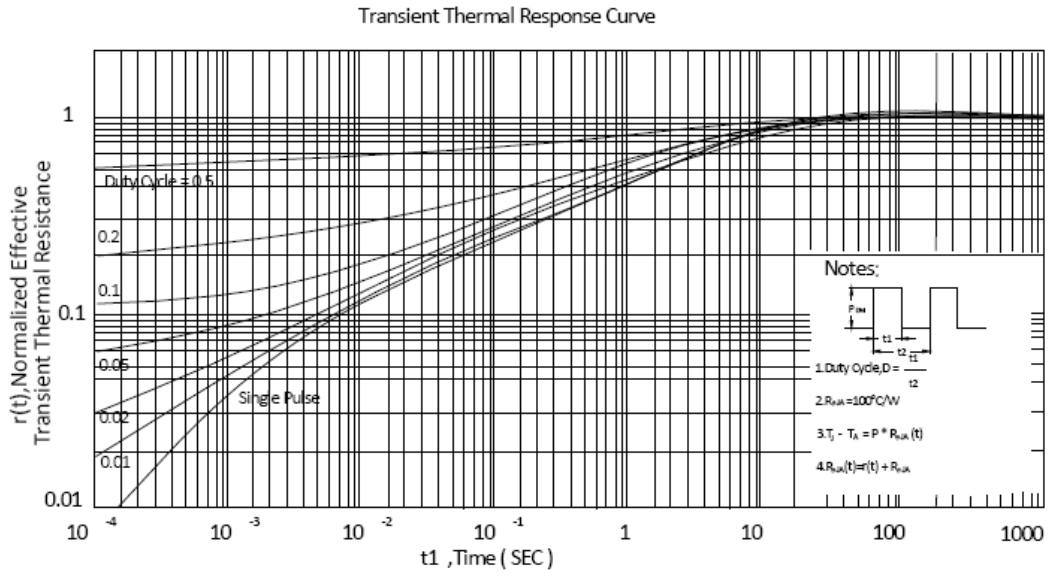
Body Diode Forward Voltage Variation with Source Current and Temperature



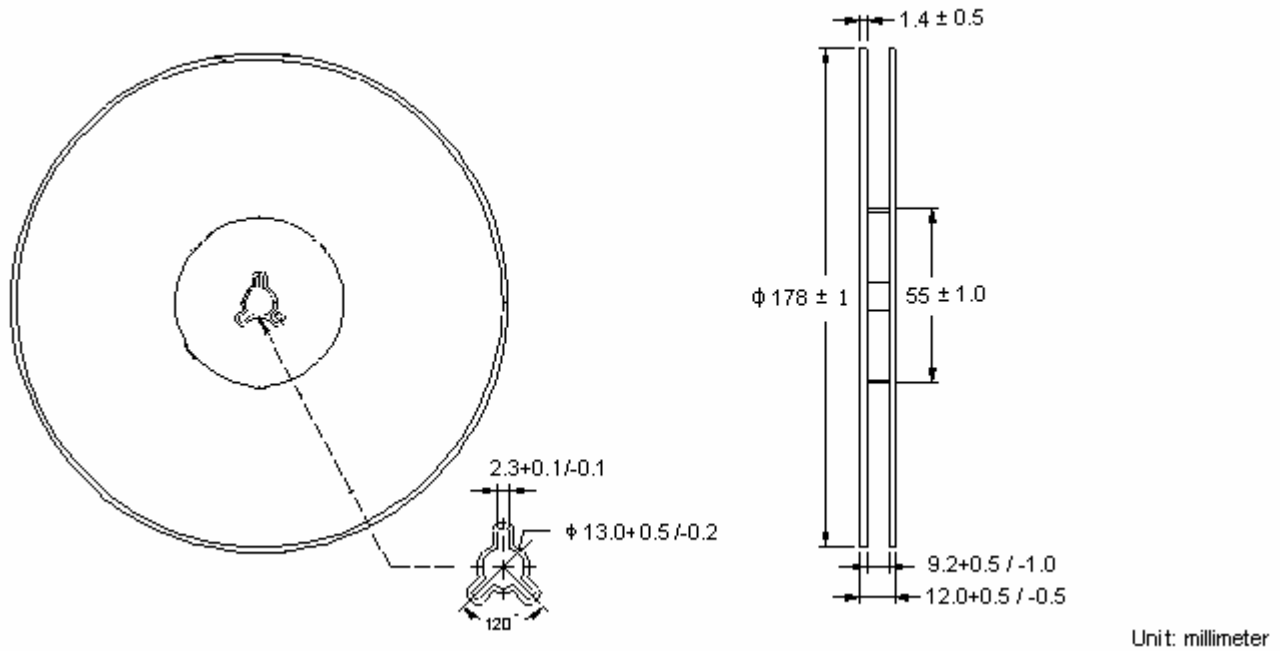
Characteristic Curves(Cont.)



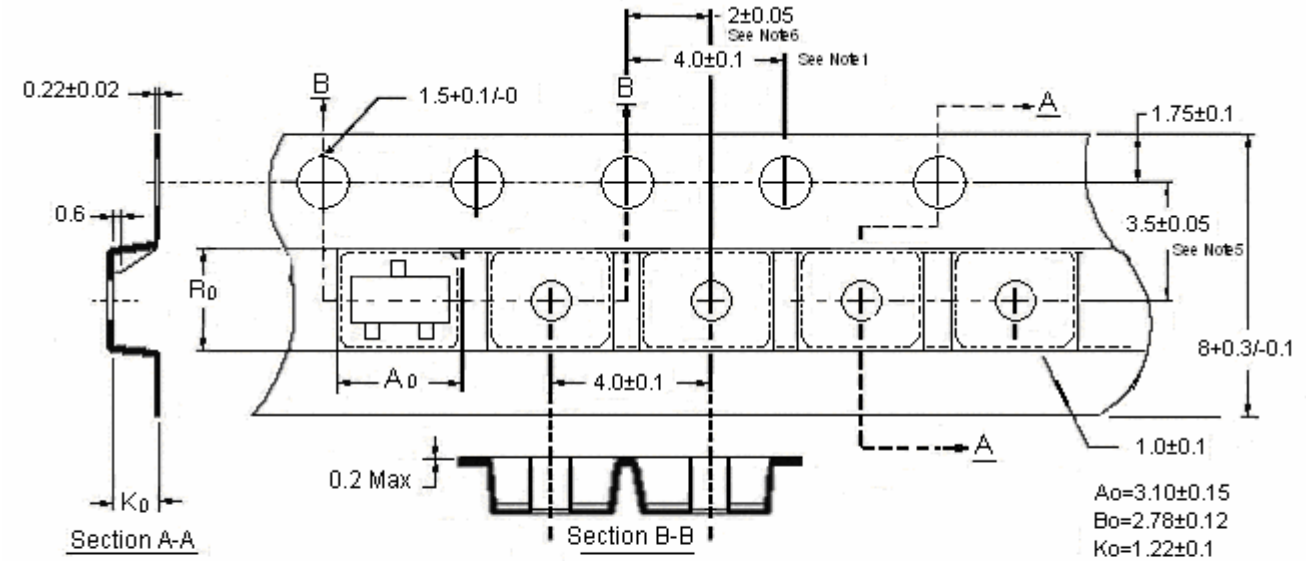




Reel Dimension



Carrier Tape Dimension



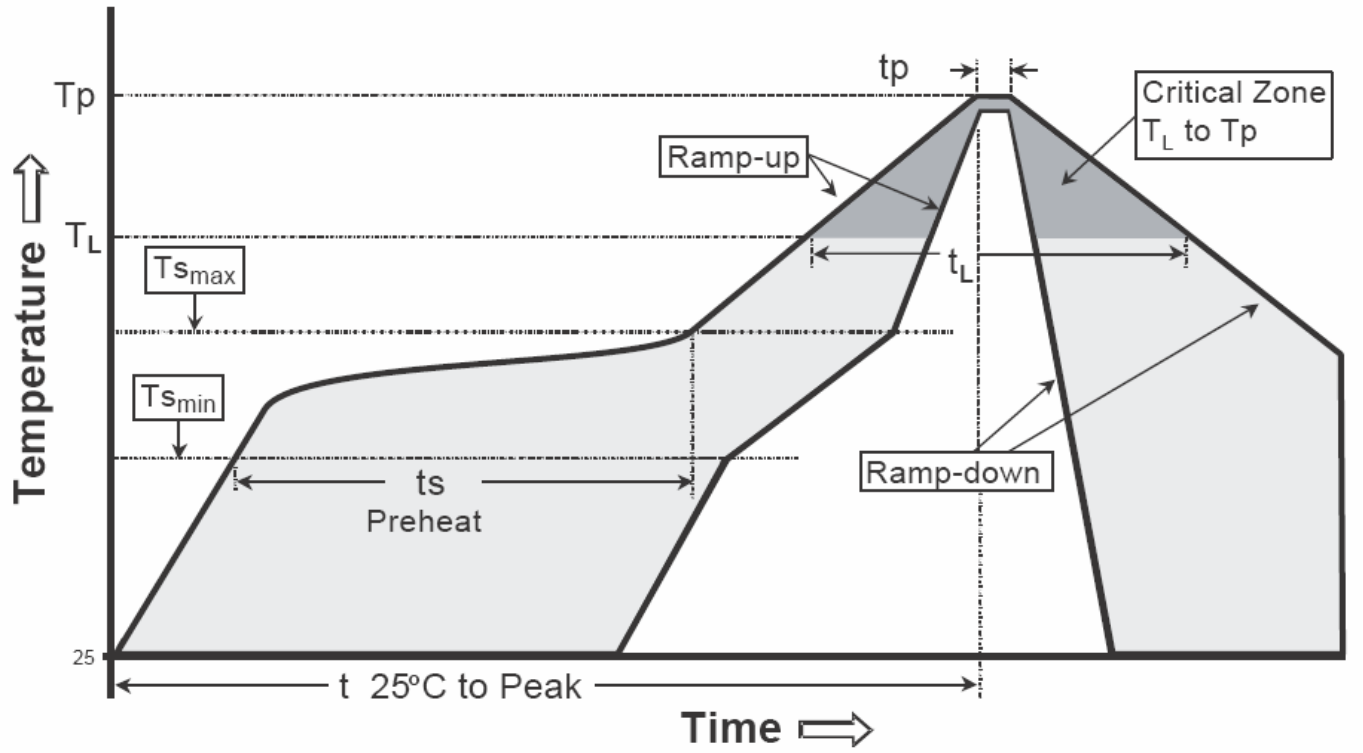
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

Recommended wave soldering condition

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

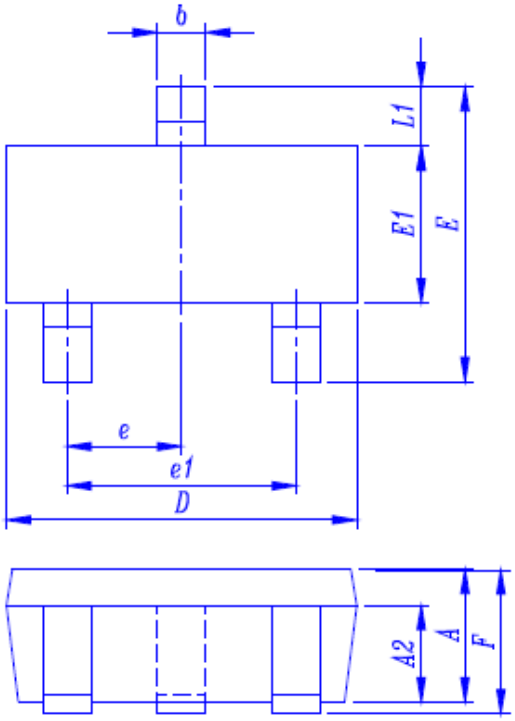
Recommended temperature profile for IR reflow

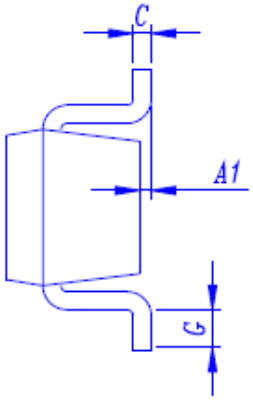


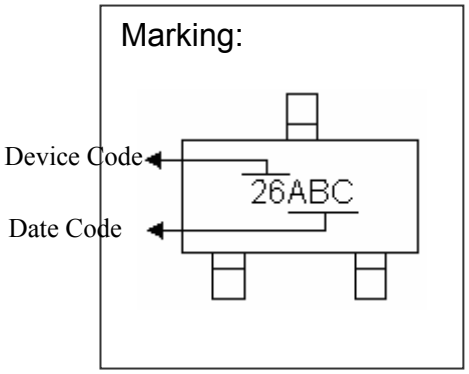
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL) − Time (tL)	 183°C 60-150 seconds	 217°C 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-23 Dimension







3-Lead SOT-23 Plastic
Surface Mounted Package
CYStek Package Code: N3

Style: Pin 1.Gate 2.Source 3.Drain

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0335	0.0492	0.85	1.25	E1	0.0532	0.0709	1.35	1.80
A1	0.0000	0.0051	0.00	0.13	e	0.0374*		0.95*	
A2	0.0315*		0.80*		e1	0.0748*		1.90*	
b	0.0118	0.0197	0.30	0.50	F	0.0335	0.0543	0.85	1.38
C	0.0032	0.0079	0.08	0.20	G	0.0079	0.0236	0.20	0.60
D	0.1083	0.1220	2.75	3.10	L1	0.0138	0.0295	0.35	0.75
E	0.0906	0.1063	2.30	2.70					

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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