

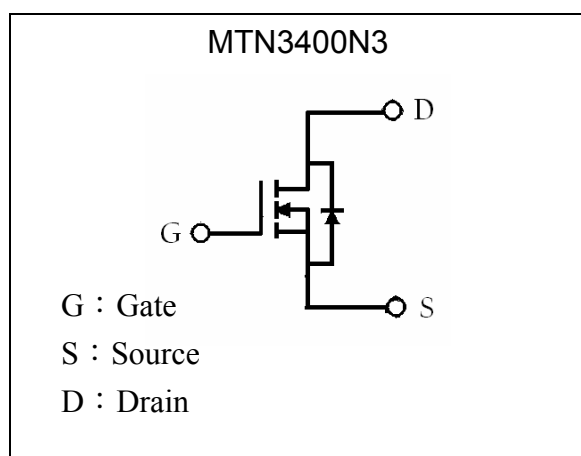
30V N-CHANNEL Enhancement Mode MOSFET

MTN3400N3

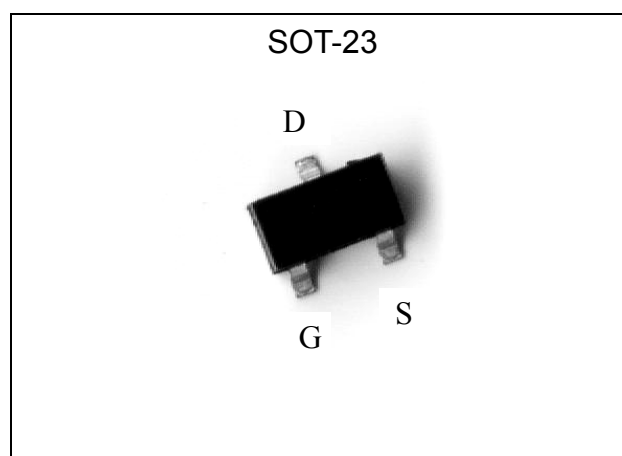
Features

- $V_{DS}=30V$
 $R_{DS(ON)}=33m\Omega @ V_{GS}=4.5V, I_D=5A$
 $R_{DS(ON)}=52m\Omega @ V_{GS}=2.5V, I_D=4A$
- Low on-resistance
- Low gate charge
- Excellent thermal and electrical capabilities
- Compact and low profile SOT-23 package

Equivalent Circuit



Outline



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current @ $T_A=25^\circ C$ (Note 3)	I_D	5.8	A
Continuous Drain Current @ $T_A=70^\circ C$ (Note 3)	I_D	4.9	A
Pulsed Drain Current (Note 1, 2)	I_{DM}	30	A
Maximum Power Dissipation @ $T_A=25^\circ C$	P_D	1.38	W
Linear Derating Factor		0.01	W/°C
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 $\leq 300\mu s$, duty cycle $\leq 2\%$.

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

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	30	-	-	V	V _{GS} =0, I _D =250μA
V _{GS(th)}	0.7	-	1.4	V	V _{DS} =V _{GS} , I _D =250μA
G _{FS}	-	15	-	S	V _{DS} =5V, I _D =5A
I _{GSS}	-	-	±100	nA	V _{GS} =±12V, V _{DS} =0
I _{DSS}	-	-	1	μA	V _{DS} =24V, V _{GS} =0
I _{DSS}	-	-	5	μA	V _{DS} =24V, V _{GS} =0, T _j =55°C
*R _{DS(ON)}	-	-	28	mΩ	V _{GS} =10V, I _D =5.8A
	-	-	33		V _{GS} =4.5V, I _D =5A
	-	-	52		V _{GS} =2.5V, I _D =4A
Dynamic					
C _{iss}	-	823	1030	pF	V _{DS} =15V, V _{GS} =0, f=1MHz
C _{oss}	-	99	-		
C _{rss}	-	77	-		
*t _{d(ON)}	-	3.3	-	ns	V _{DS} =15V, V _{GS} =10V, R _G =3 Ω , R _L =2.7 Ω
*t _r	-	4.8	-		
*t _{d(OFF)}	-	26.3	-		
*t _f	-	4.1	-		
*Q _g	-	9.7	12	nC	V _{DS} =15V, I _D =5.8A, V _{GS} =4.5V
*Q _{gs}	-	1.6	-		
*Q _{gd}	-	3.1	-		
R _g	-	1.2	3.6	Ω	f=1MHz
Source-Drain Diode					
*V _{SD}	-	-	1.0	V	V _{GS} =0V, I _S =1.0A
*I _S	-	-	2.5	A	V _D =V _G =0V, V _S =1.0V
*t _{rr}	-	16	-	ns	I _S =5A, V _{GS} =0V, dI/dt=100A/μs
*Q _{rr}	-	8.9	-	nC	

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

Ordering Information

Device	Package	Shipping	Marking
MTN3400N3	SOT-23 (Pb-free)	3000 pcs / Tape & Reel	3400

Characteristic Curves

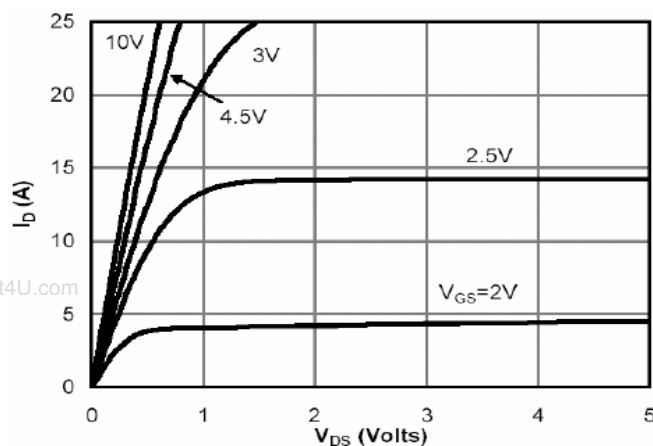


Fig 1. Typical Output Characteristics

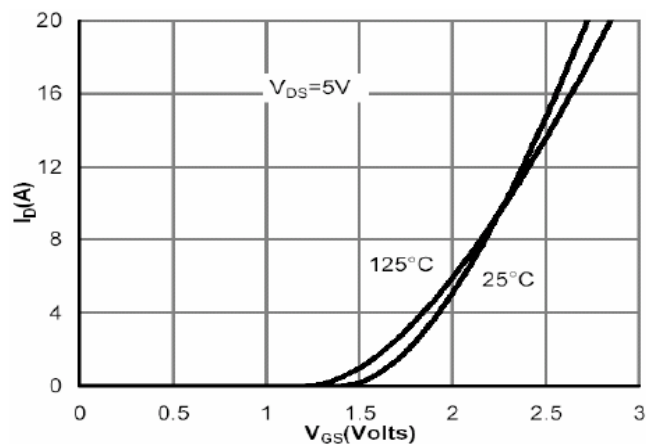


Fig 2. Transfer Characteristics

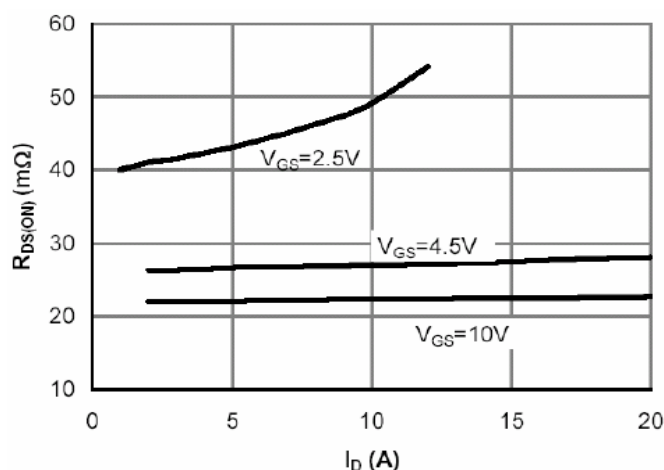


Fig 3. On-Resistance v.s. Drain Current and Gate Voltage

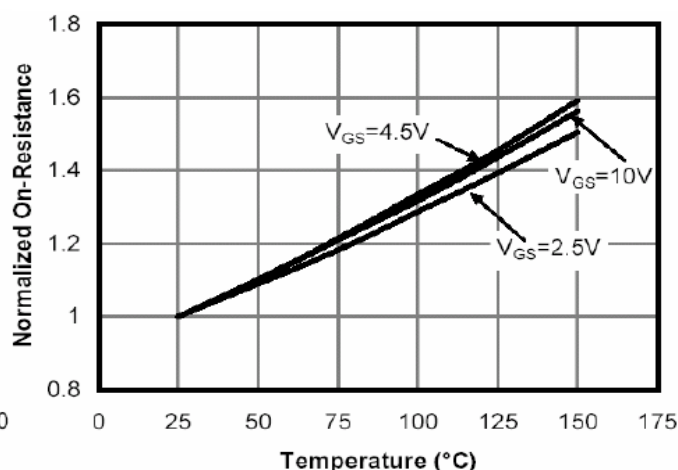


Fig 4. On-Resistance v.s. Junction Temperature

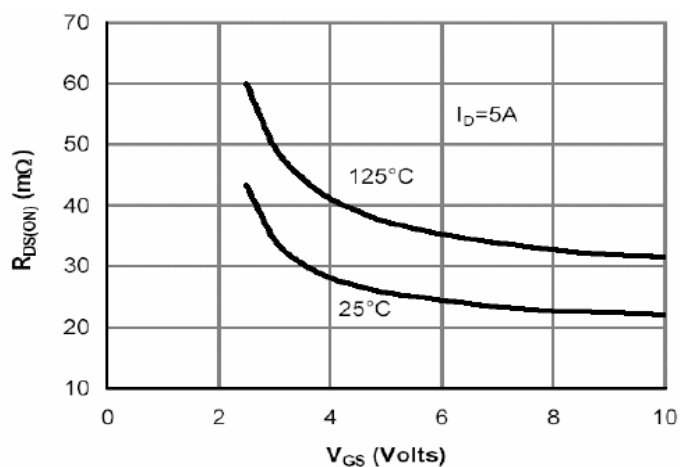


Fig 5. On-Resistance v.s. Gate-Source Voltage

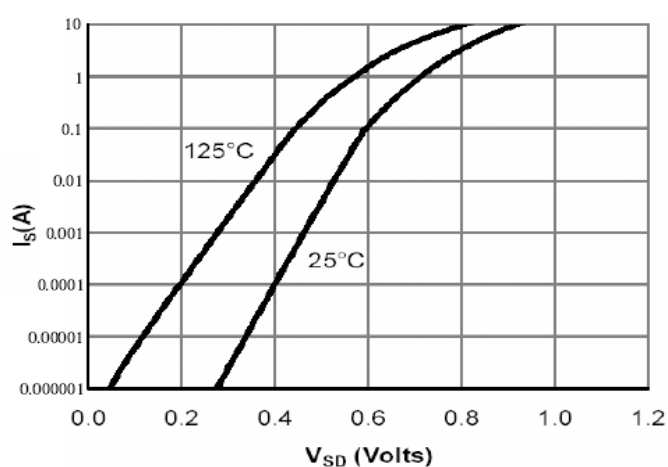


Fig 6. Body Diode Characteristics

Characteristic Curves(Cont.)

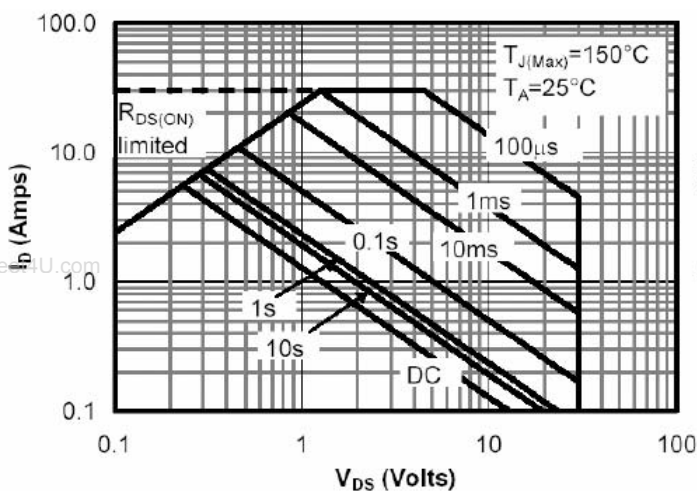
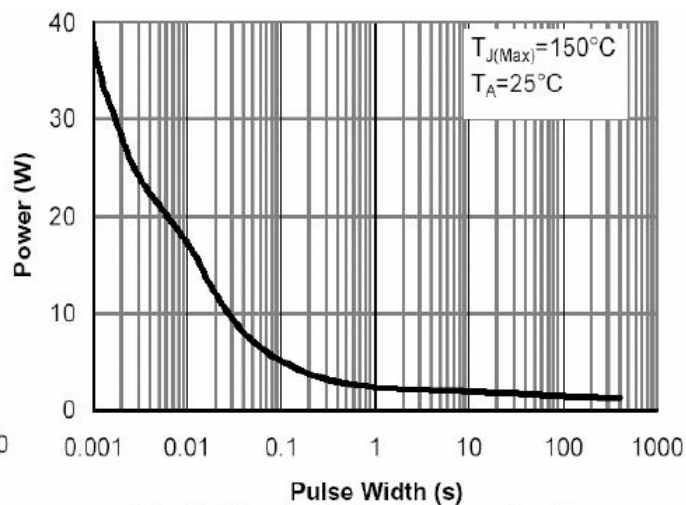


Fig 7. Maximum Safe Operating Area



**Fig 8. Single Pulse Power Rating
Junction-to-Ambient**

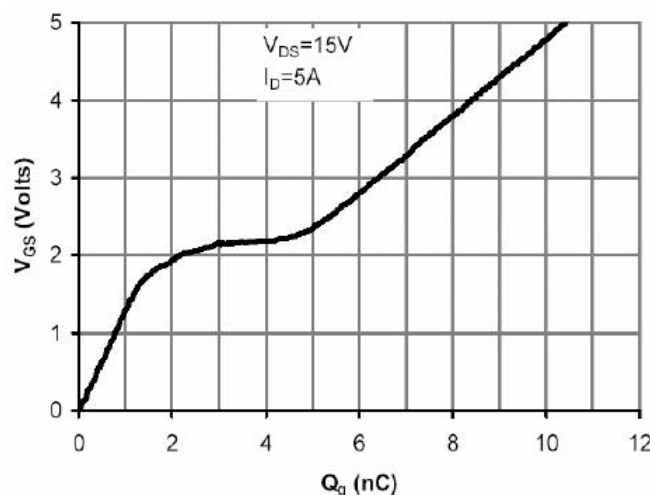


Fig 9. Gate Charge Characteristics

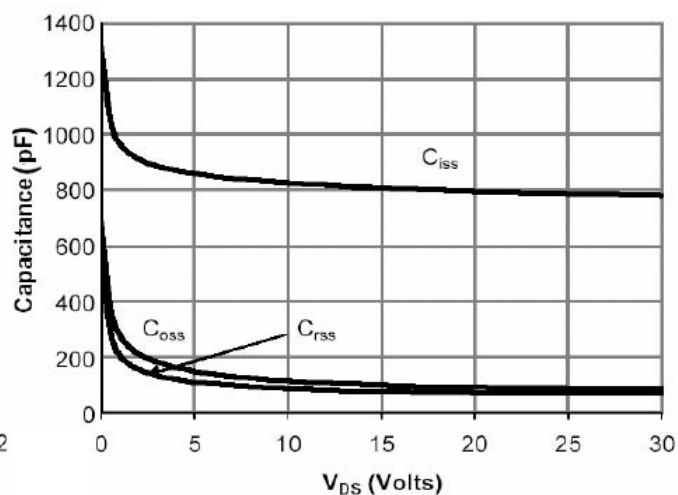


Fig 10. Typical Capacitance Characteristics

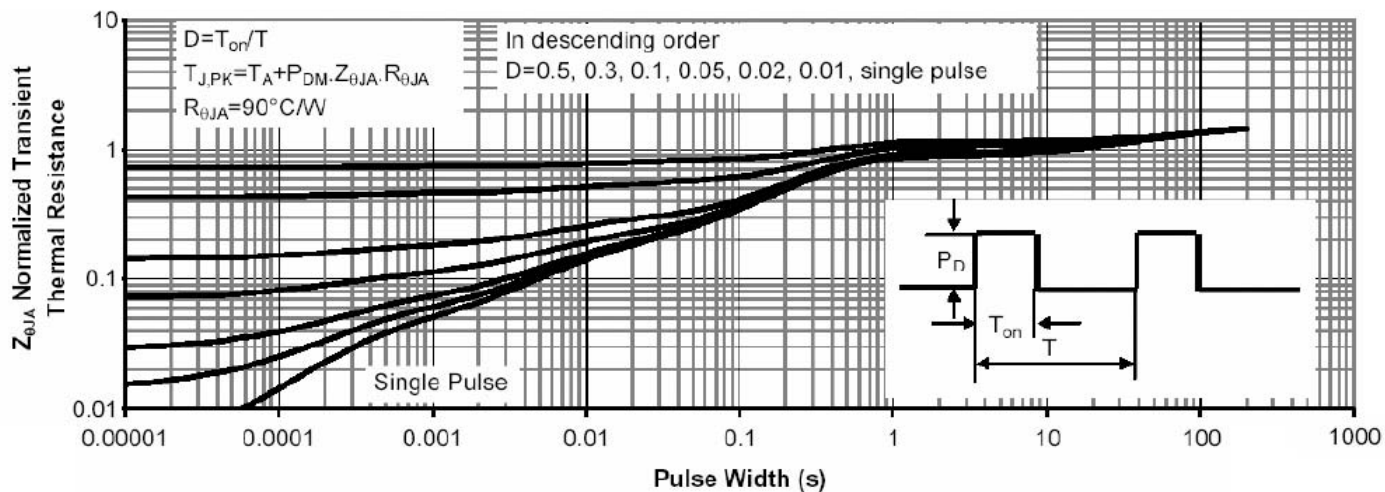
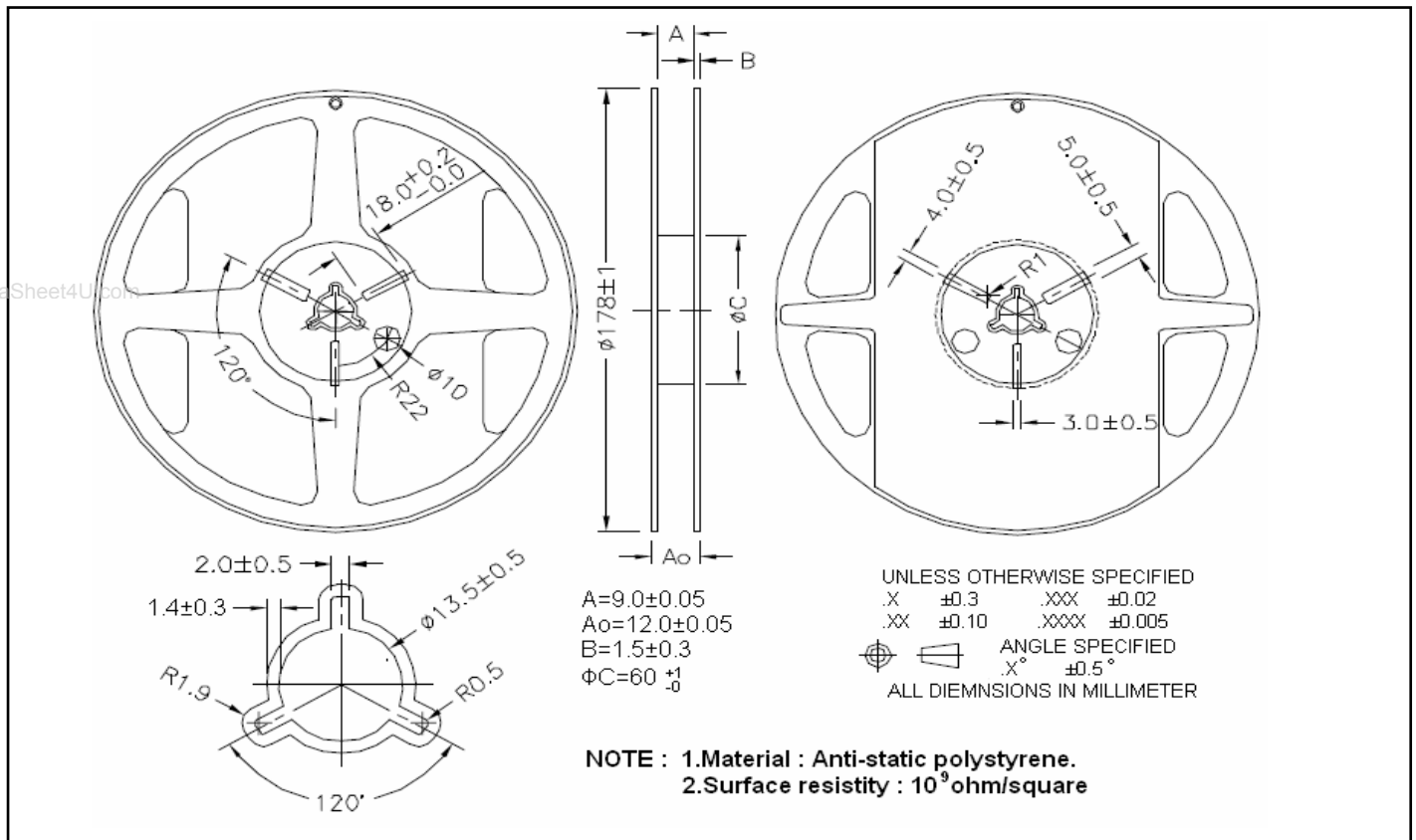
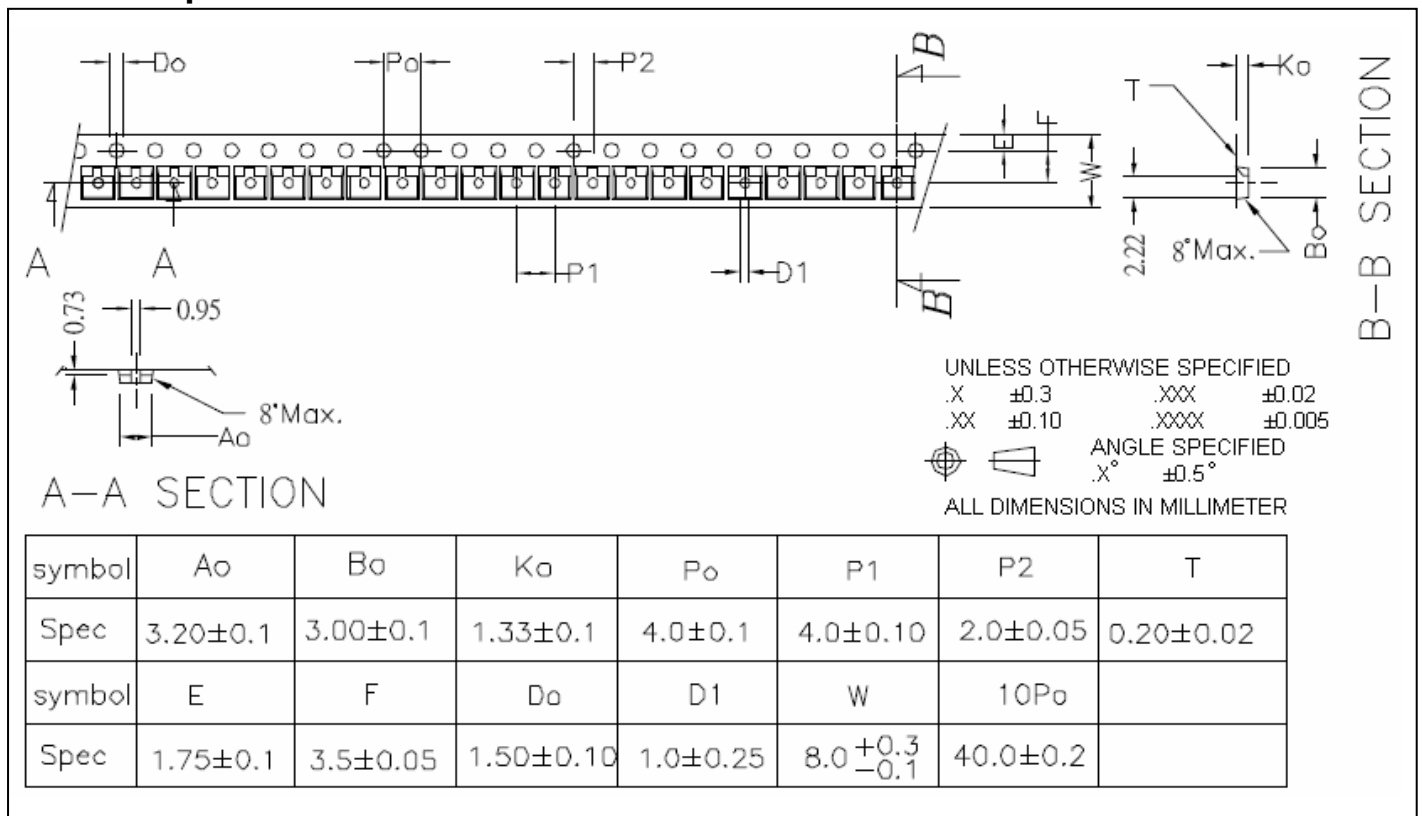


Fig 11. Normalized Maximum Transient Thermal Impedance

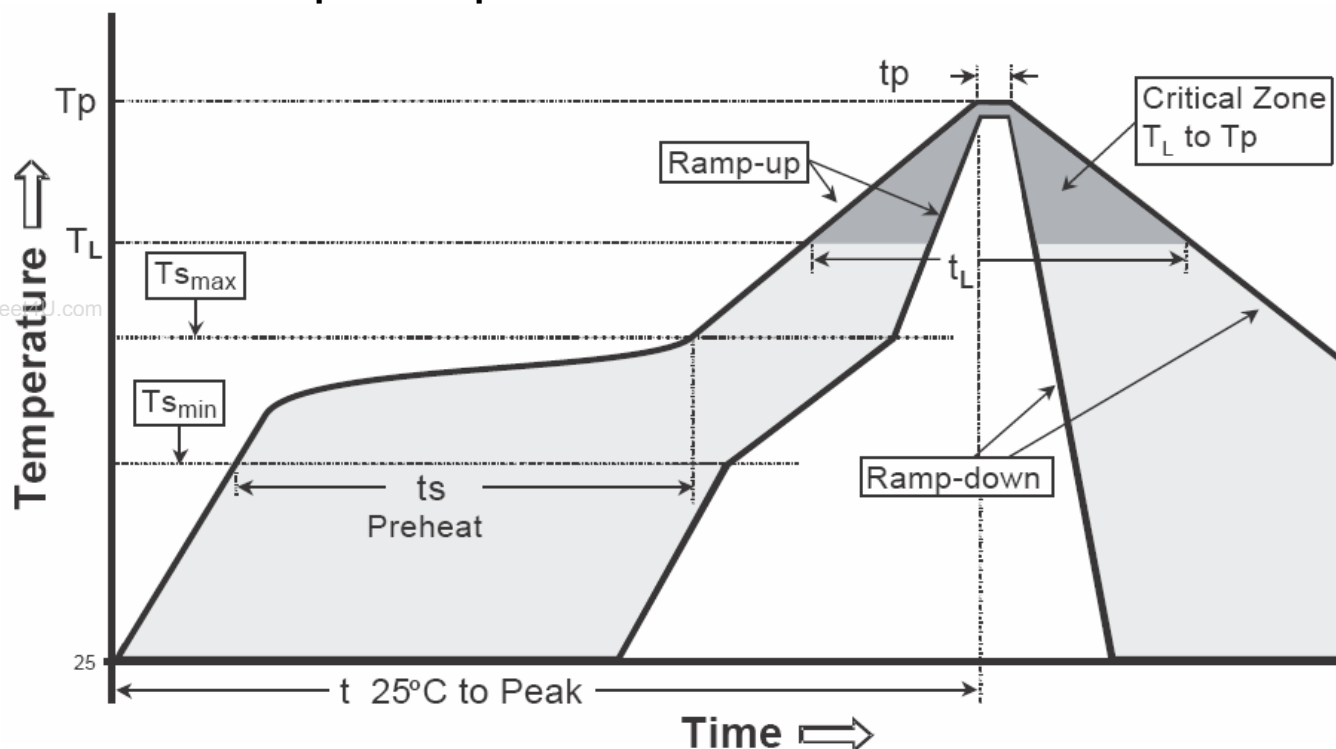
Reel Dimension



Carrier Tape Dimension



Recommended temperature profile for IR reflow



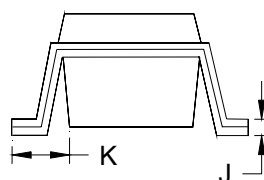
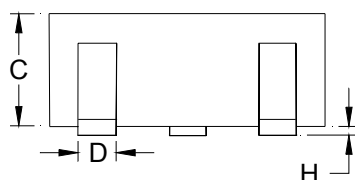
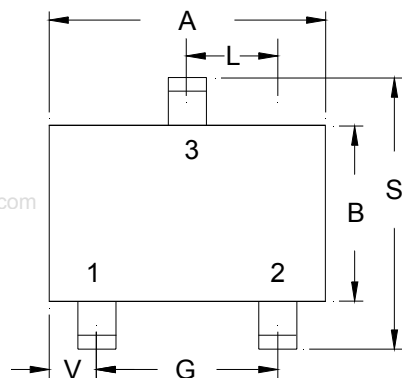
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (TL)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

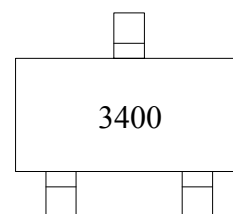
Recommended wave soldering condition

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

SOT-23 Dimension



Marking:



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	0.1102	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: 42 Alloy ; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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