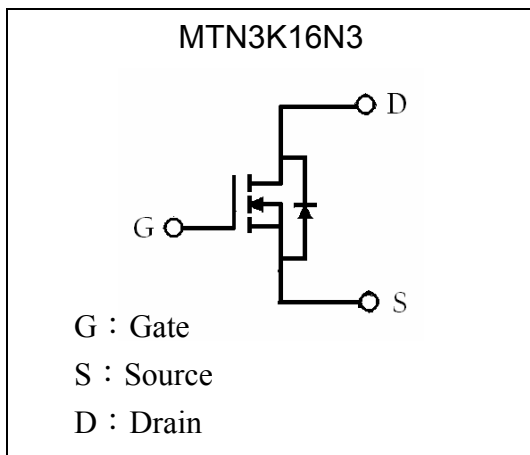
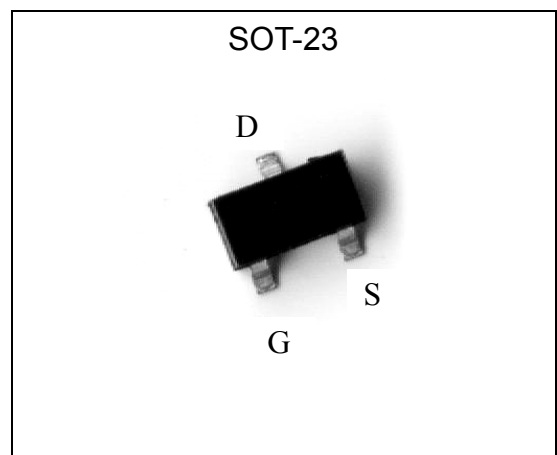


30V N-CHANNEL Enhancement Mode MOSFET

MTN3K16N3

Features

- $V_{DS}=30V$
 $R_{DS(ON)} < 65m\Omega @ V_{GS}=10V, I_D=3.6A$
 $R_{DS(ON)} < 105m\Omega @ V_{GS}=4.5V, I_D=2.8A$
- Low on-resistance
- High speed : $t_{on}=24ns(typ.)$, $t_{off}=19ns(typ.)$
- Pb-free 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}	± 20	V
Continuous Drain Current	I_D	3.6 (Note 1)	A
Pulsed Drain Current	I_{DM}	15 (Note 2 & 3)	A
Maximum Power Dissipation	P_D	1.4	W
Linear Derating Factor		0.01	W/°C
Thermal Resistance, Junction to Ambient	$R_{th, j-a}$	90 (Note 1)	°C/W
Operating Junction and Storage Temperature	T_j, T_{stg}	-55 ~ +150	°C

Note : 1. Surface mounted on 1 in² copper pad of FR4 board; 270°C/W when mounted on min. copper pad

2. Pulse width limited by maximum junction temperature

3. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$



Electrical Characteristics (Tj=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)}	1.0	-	3.0	V	V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0
I _{DSS}	-	-	1	μA	V _{DS} =30V, V _{GS} =0
	-	-	10	μA	V _{DS} =24V, V _{GS} =0, Tj=55°C
I _{D(ON)}	15	-	-	A	V _{GS} =10V, V _{DS} =5V
*R _{DS(ON)}	-	-	65	mΩ	I _D =3.6A, V _{GS} =10V
	-	-	105		I _D =2.8A, V _{GS} =4.5V
*G _{FS}	-	7	-	S	V _{DS} =5V, I _D =3.6A
Dynamic					
C _{iss}	-	460	-	pF	V _{DS} =15V, V _{GS} =0, f=1MHz
C _{oss}	-	62	-		
C _{rss}	-	106	-		
*t _{d(ON)}	-	24	-	ns	V _{DS} =15V, I _D =2A, V _{GS} =4V, R _G =10Ω
*t _r	-	15	-		
*t _{d(OFF)}	-	19	-		
*t _f	-	6	-		
*Q _g	-	5.0	-	nC	V _{DS} =24V, I _D =4A, V _{GS} =4V
Source-Drain Diode					
*V _{SD}	-	-	1.2	V	V _{GS} =0V, I _S =1.2A

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

Ordering Information

Device	Package	Shipping	Marking
MTN3K16N3	SOT-23 (Pb-free)	3000 pcs / Tape & Reel	3K16

Characteristic Curves

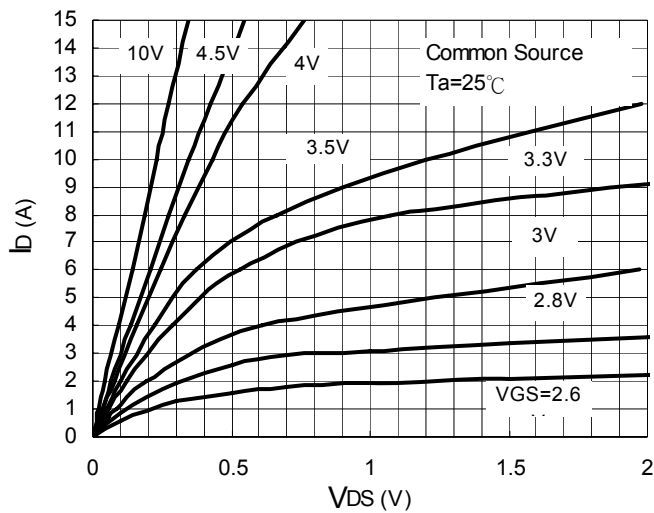


Fig 1. Typical Output Characteristics

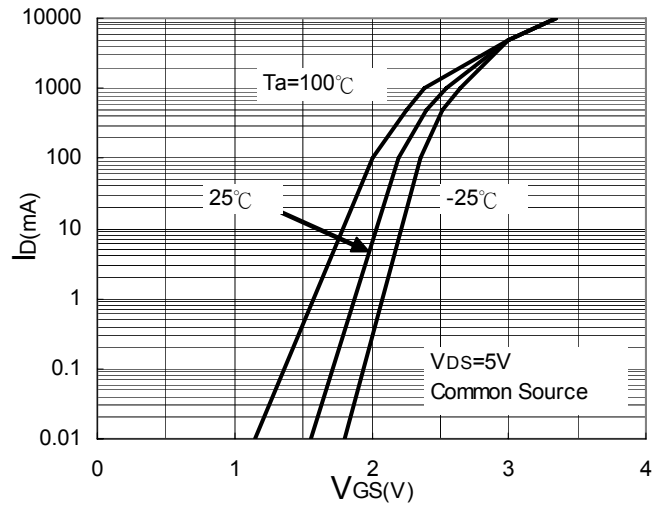


Fig 2. Transfer Characteristics

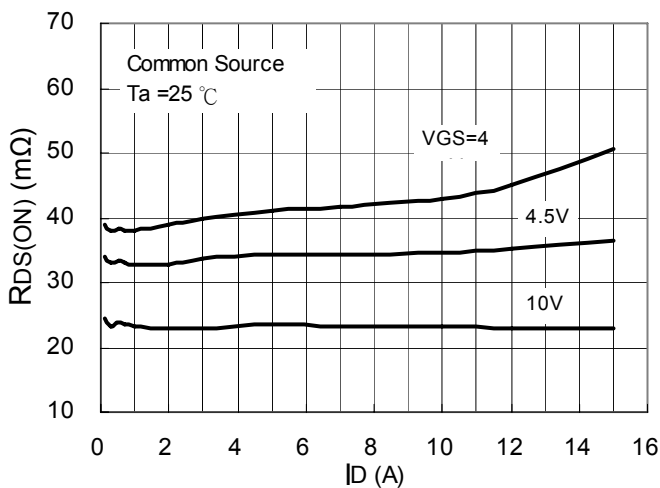


Fig 3. On-Resistance vs. Drain Current and Gate Voltage

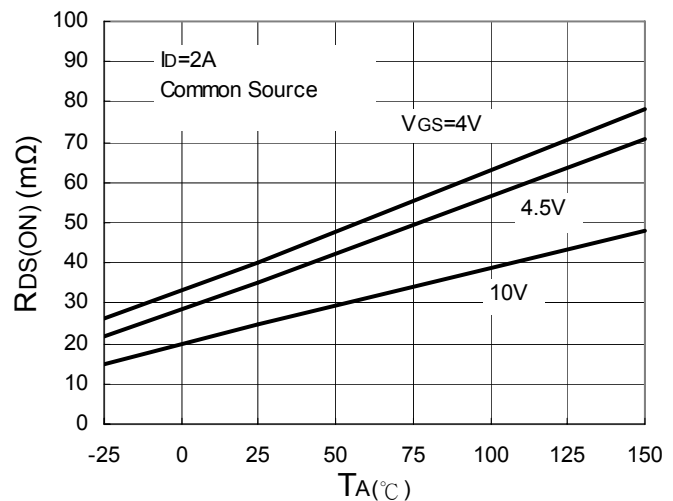


Fig 4. On-Resistance vs Ambient Temperature

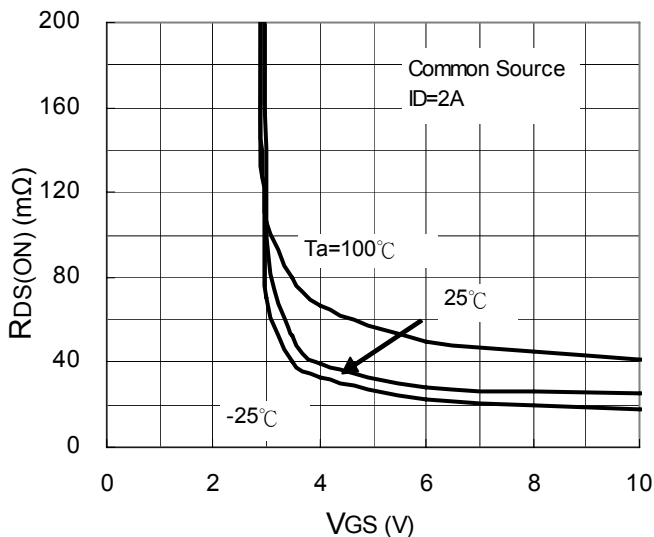


Fig 5. On-Resistance vs. Gate-Source Voltage

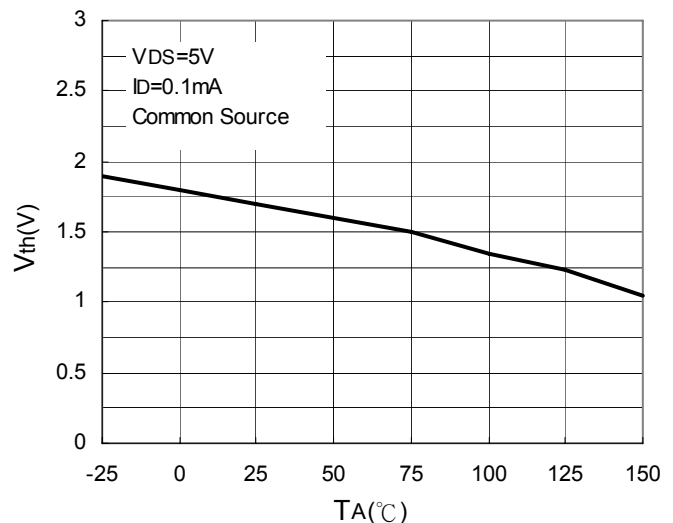


Fig 6. Gate Threshold Voltage vs Ambient Temperature

Characteristic Curves(Cont.)

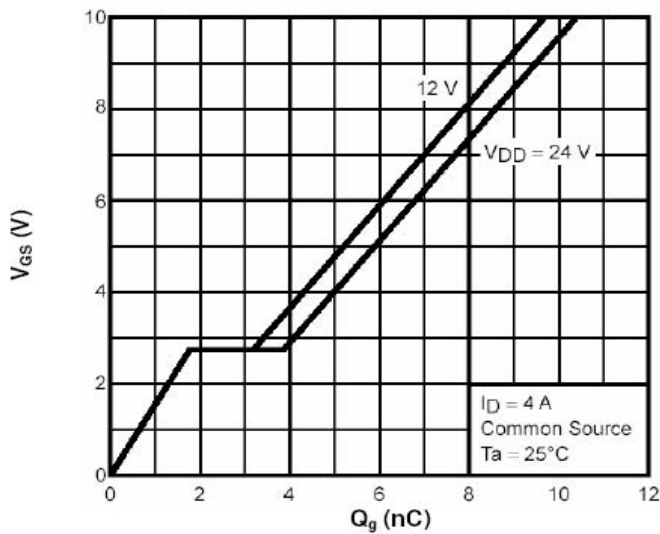


Fig 7. Gate Charge Characteristics

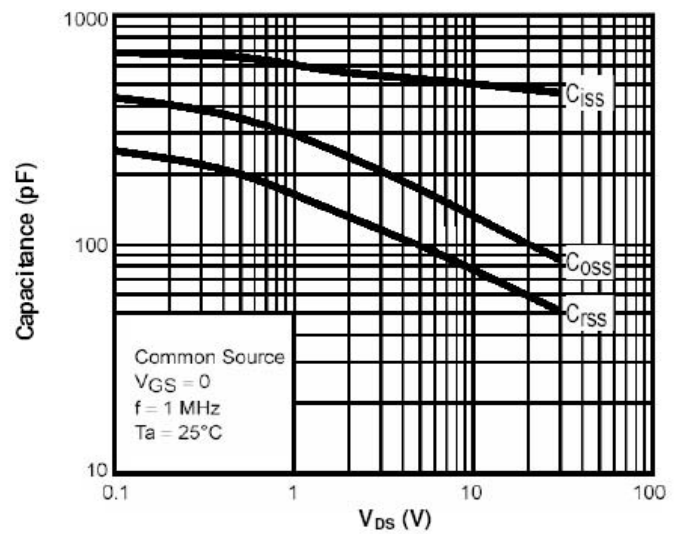


Fig 8. Typical Capacitance Characteristic

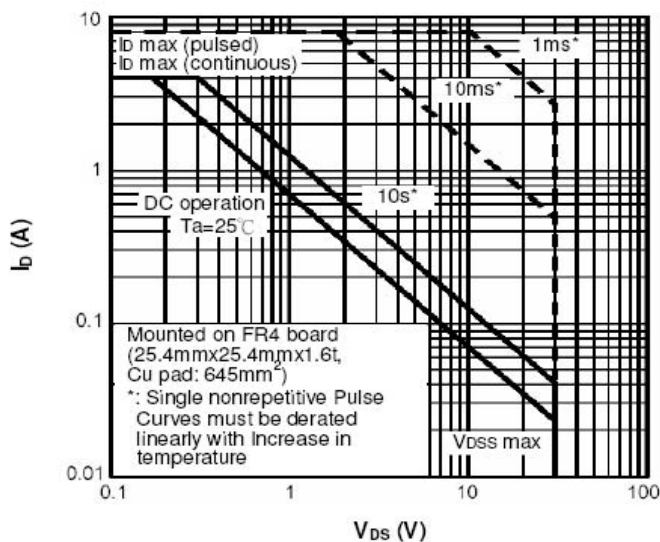


Fig 9. Maximum Safe Operating Area

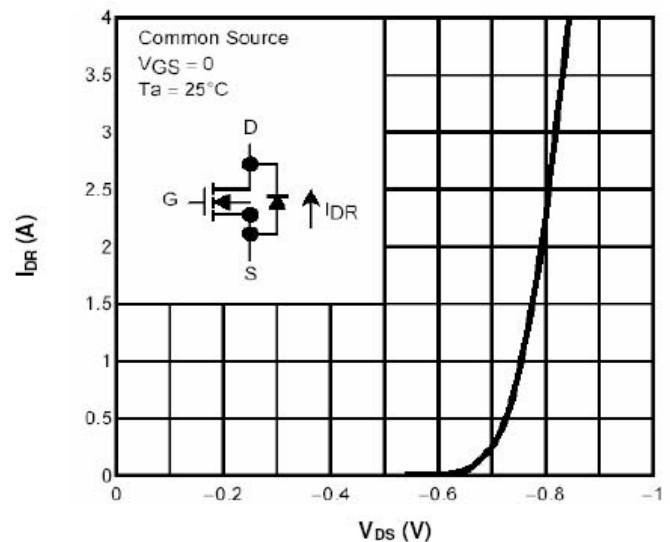


Fig 10. Body Diode Characteristics

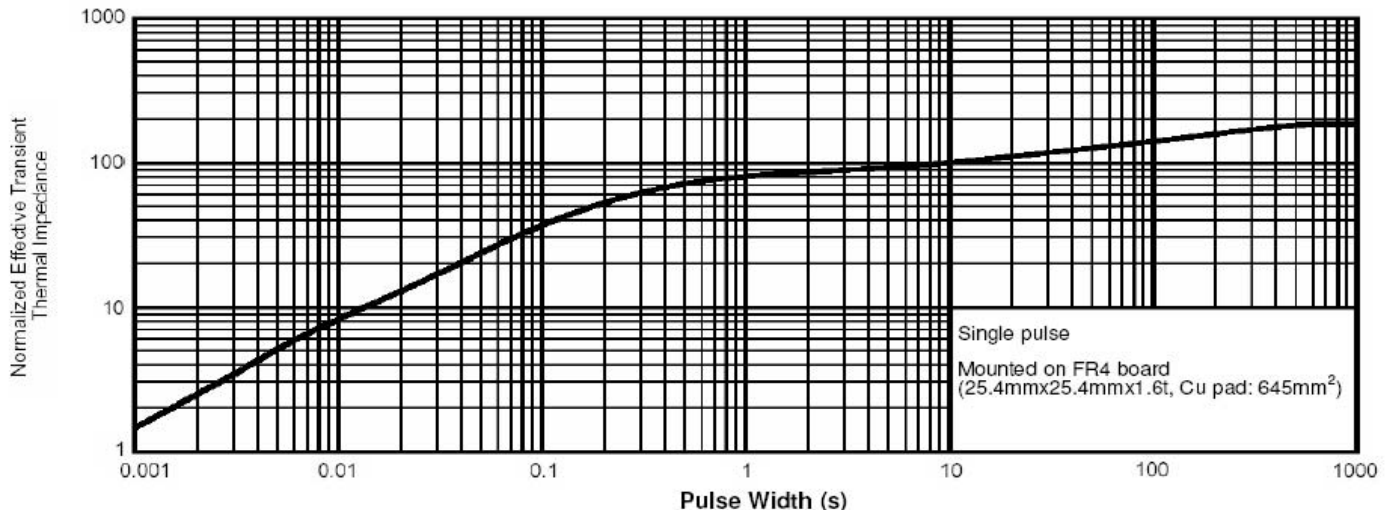
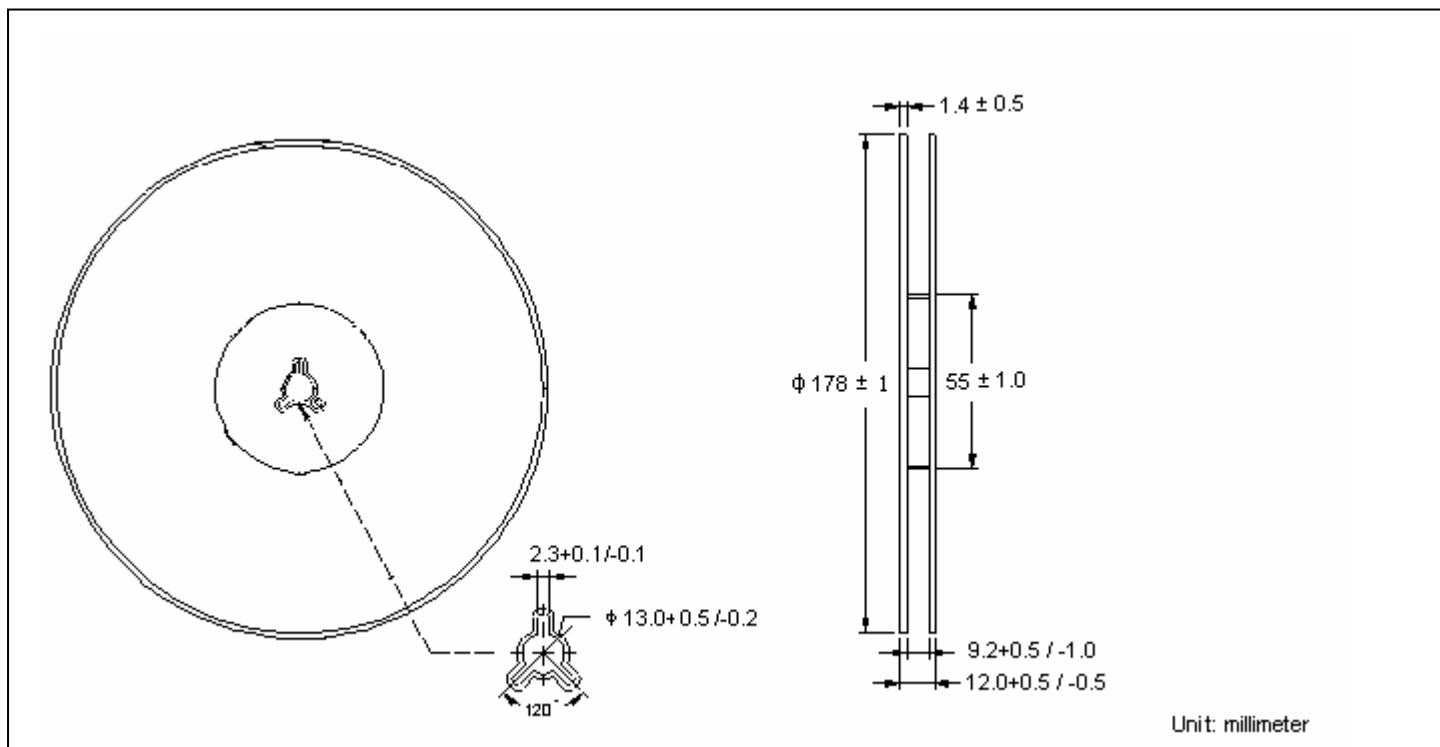
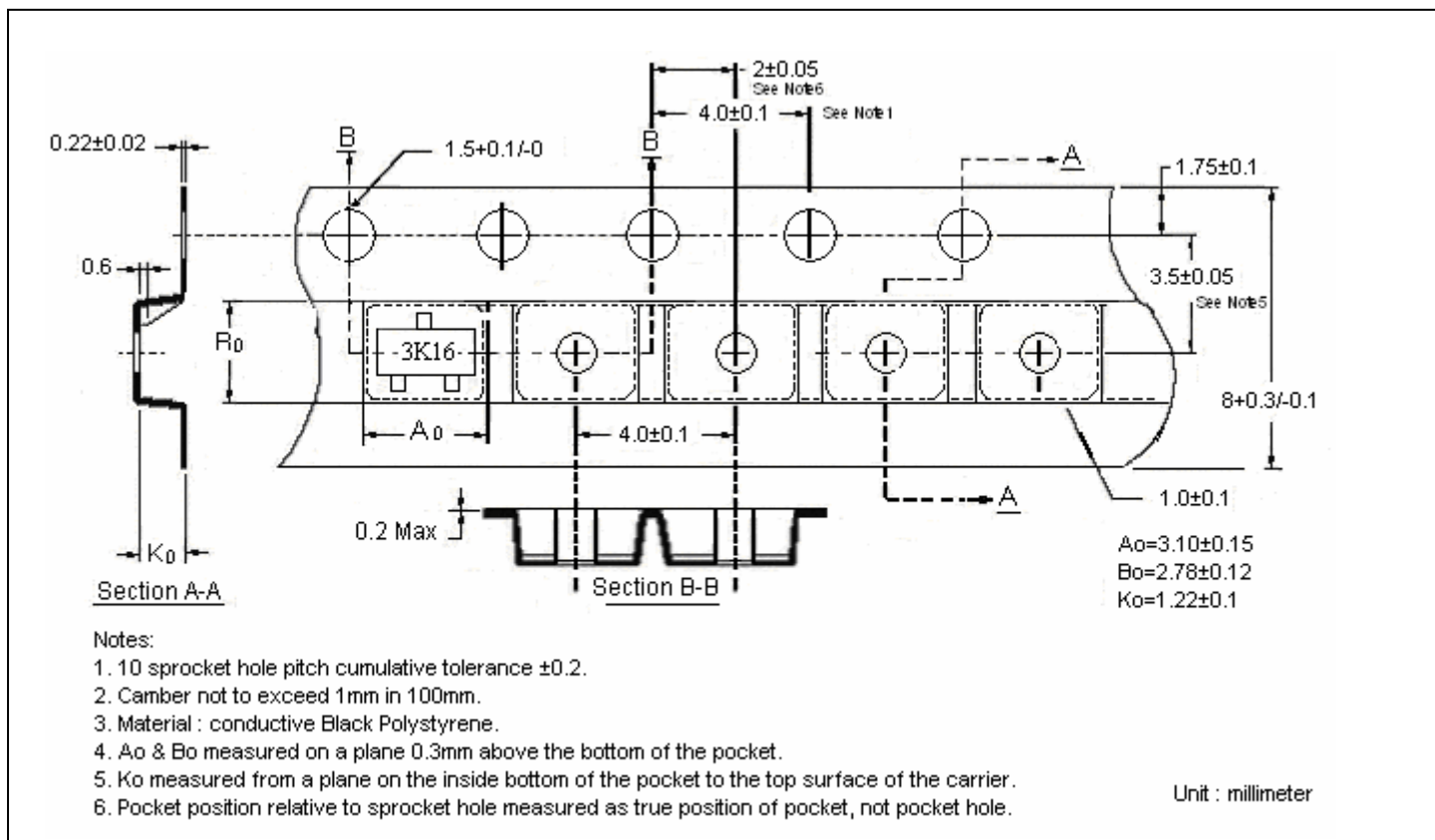


Fig 11. Normalized Maximum Transient Thermal Impedance

Reel Dimension



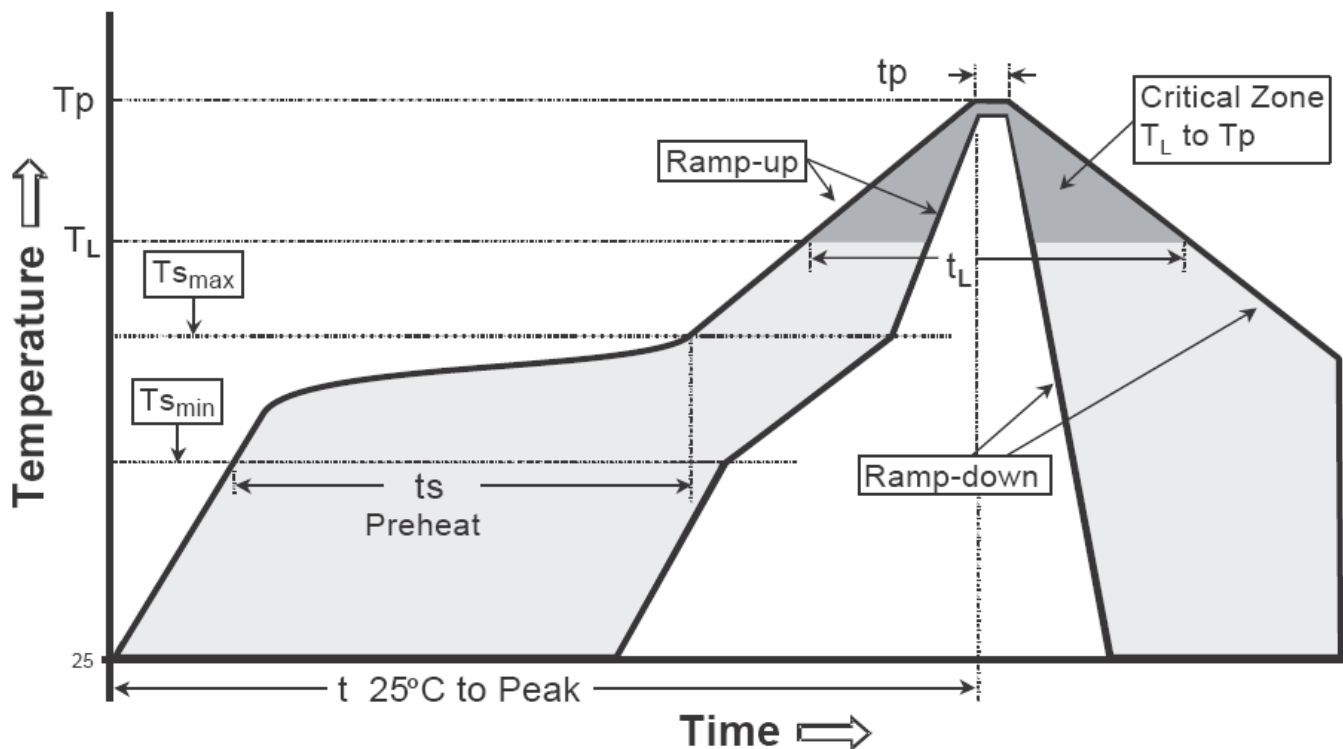
Carrier Tape Dimension



Recommended wave soldering condition

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

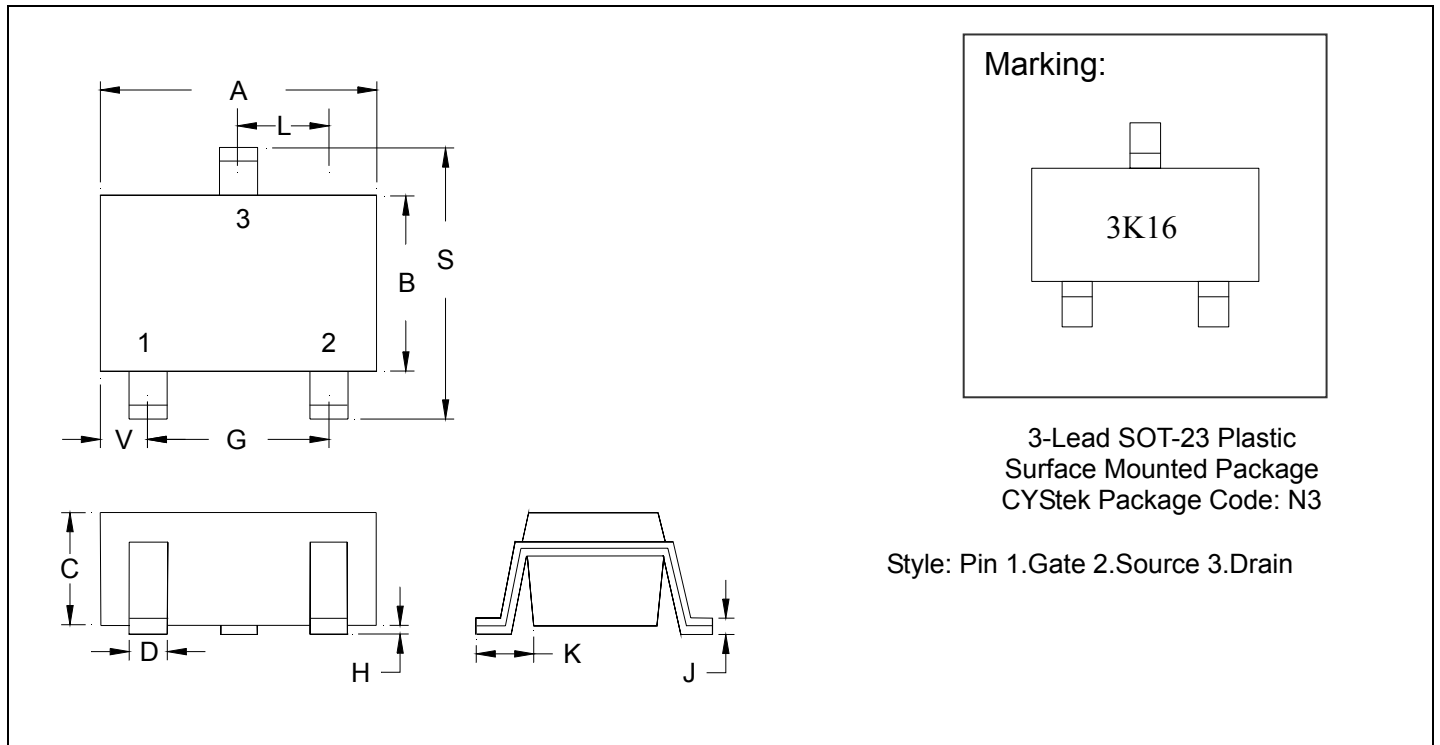
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (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.

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

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