

N-Channel Enhancement Mode MOSFET

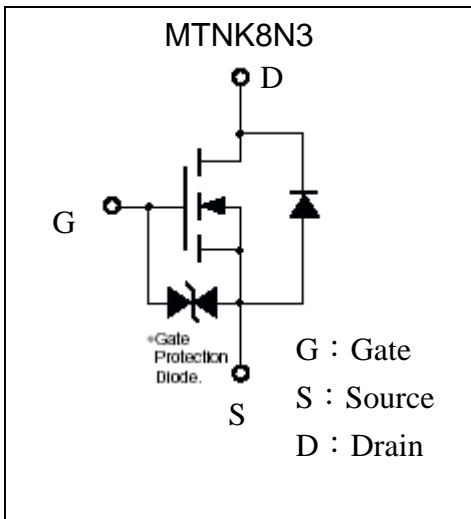
MTNK8N3

BV_{DSS}	30V
I_D@V_{GS}=10V, T_A=25°C	0.53A
R_{DS(ON)}@V_{GS}=10V, I_D=500mA	0.392Ω (typ)
R_{DS(ON)}@V_{GS}=4.5V, I_D=200mA	0.494Ω (typ)
R_{DS(ON)}@V_{GS}=3V, I_D=100mA	0.649Ω (typ)
R_{DS(ON)}@V_{GS}=2.5V, I_D=100mA	0.9Ω (typ)

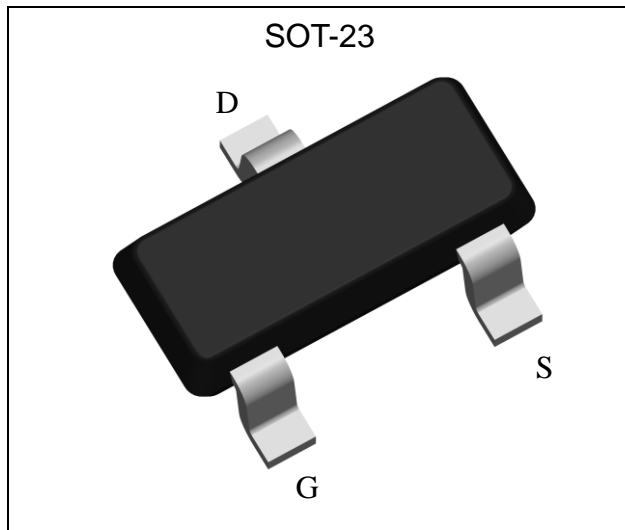
Features

- ESD protected gate , $\geq 2\text{kV}$ (HBM)
- High speed switching
- Pb-free lead plating and halogen-free package
- Easily designed drive circuits
- Low-voltage drive
- Easy to use in parallel

Symbol

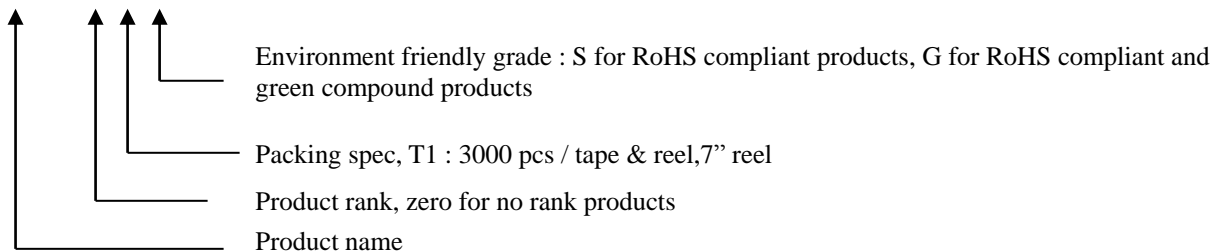


Outline



Ordering Information

Device	Package	Shipping
MTNK8N3-0-T1-G	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel





Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DSS}	30	V
Gate-Source Voltage	V _{GSS}	±20	
Continuous Drain Current @ V _{GS} =10V, T _A =25°C	I _D	530	mA
Continuous Drain Current @ V _{GS} =10V, T _A =70°C		420	
Pulsed Drain Current	I _{DM}	2100 *1	
Continuous Source-Drain Diode Current	I _S	250	
Total Power Dissipation	P _D	300 *2	mW
ESD susceptibility	V _{ESD}	2000 *3	V
Operating Junction Temperature Range	T _j	-55~+150	°C
Storage Temperature Range	T _{stg}	-55~+150	

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction to Ambient	R _{θJA}	416 *2	°C/W

Note : *1. Pulse Width ≤ 300μs, Duty cycle ≤ 2%

*2. When the device is mounted on a glass epoxy board with area measuring 1×0.75×0.62 inch

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

Electrical Characteristics (Ta=25°C)

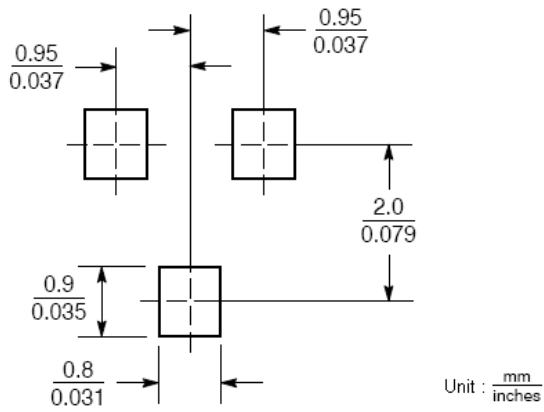
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS} *	30	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	0.7	-	1.6		V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	-	-	±10	μA	V _{GS} =±16V, V _{DS} =0V
I _{DSS}	-	-	1		V _{DS} =24V, V _{GS} =0V
	-	-	5		V _{DS} =24V, V _{GS} =0V, T _j =55°C
R _{DS(ON)} *	-	0.392	0.7	Ω	I _D =500mA, V _{GS} =10V
	-	0.494	1		I _D =200mA, V _{GS} =4.5V
	-	0.649	3		I _D =100mA, V _{GS} =3V
	-	0.9	6.5		I _D =100mA, V _{GS} =2.5V
G _{FS}	200	664	-	mS	V _{DS} =10V, I _D =500mA
Dynamic					
C _{iss}	-	29	44	pF	V _{DS} =25V, V _{GS} =0V, f=1MHz
C _{oss}	-	15	23		
C _{rss}	-	4	6		
*t _r	-	3.2	4.8	ns	V _{DS} =15V, I _D =0.5A, V _{GS} =10V, R _G =6Ω
*t _d	-	15.8	23.7		
*t _{stg}	-	9.8	14.7		
*t _f	-	13.8	20.7		
*Q _g	-	0.82	1.23		



*Qgs	-	0.35	0.525		
*Qgd	-	0.12	0.18		
Body Diode					
*VSD	-	0.85	1.2	V	IS=0.3A
*trr	-	5.1	-	ns	IF=1A, dIF/dt=100A/μs
*Qrr	-	1.3	-	nC	

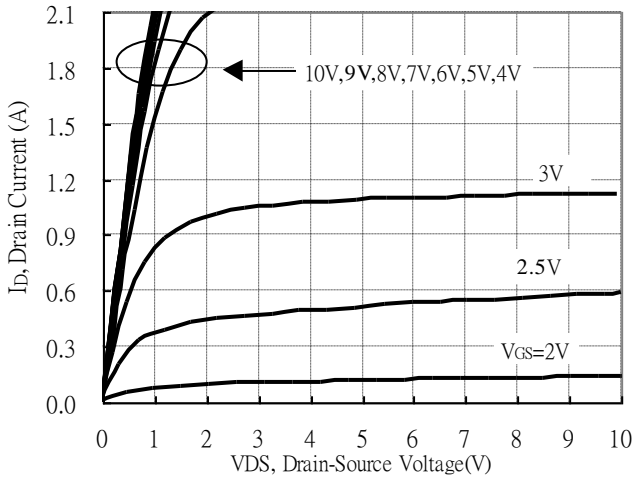
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Recommended Soldering Footprint

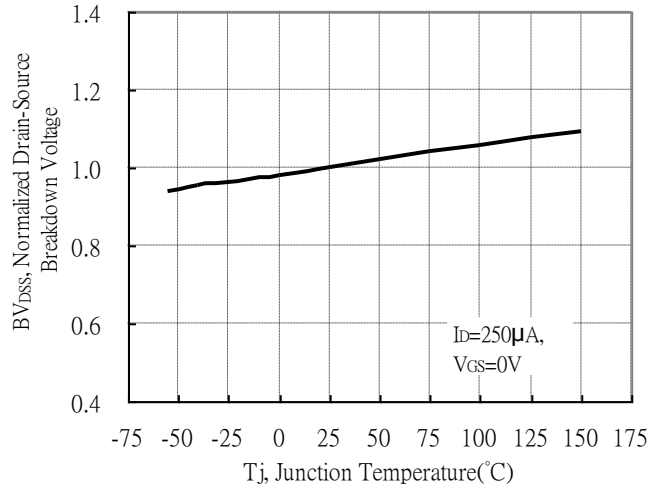


Typical Characteristics

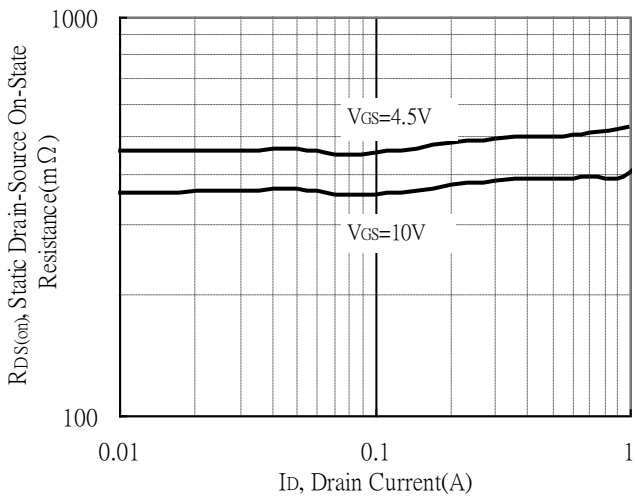
Typical Output Characteristics



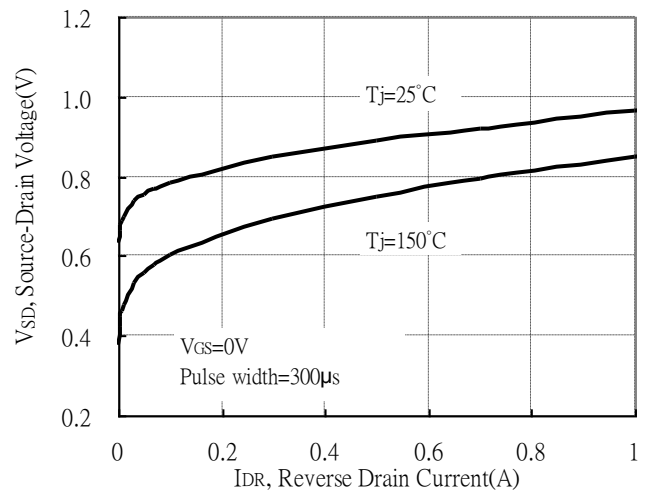
Brekdown Voltage vs Junction Temperature



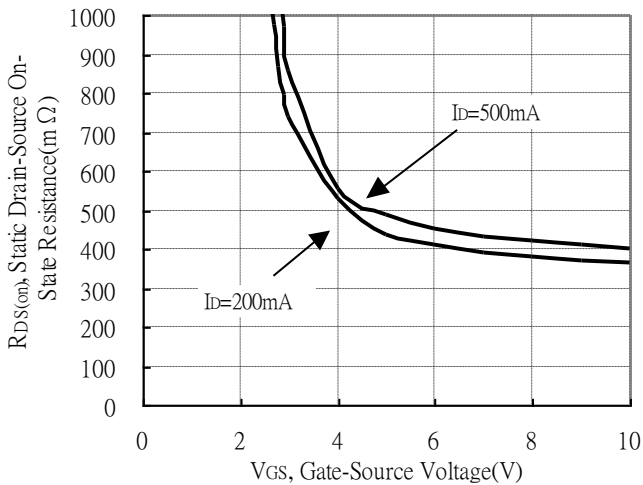
Static Drain-Source On-State resistance vs Drain Current



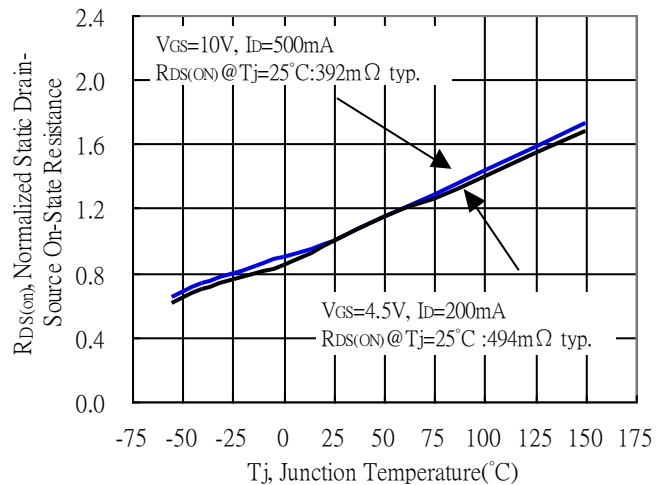
Reverse Drain Current vs Source-Drain Voltage



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

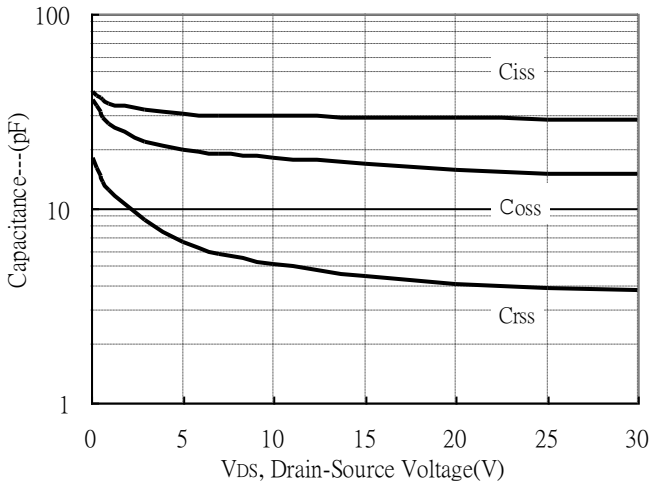


Drain-Source On-State Resistance vs Junction Temperature

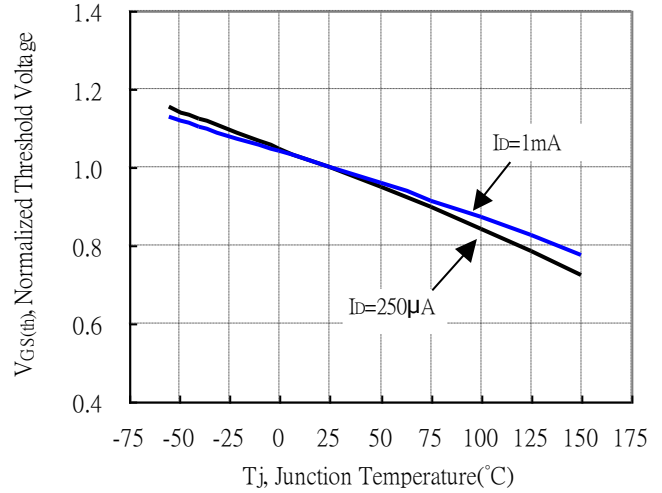


Typical Characteristics(Cont.)

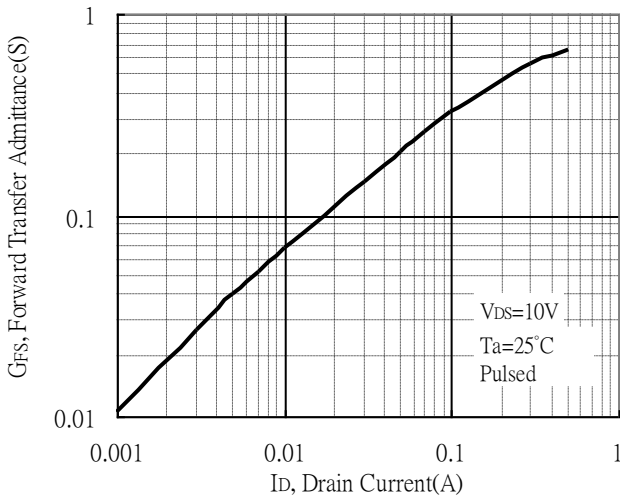
Capacitance vs Drain-to-Source Voltage



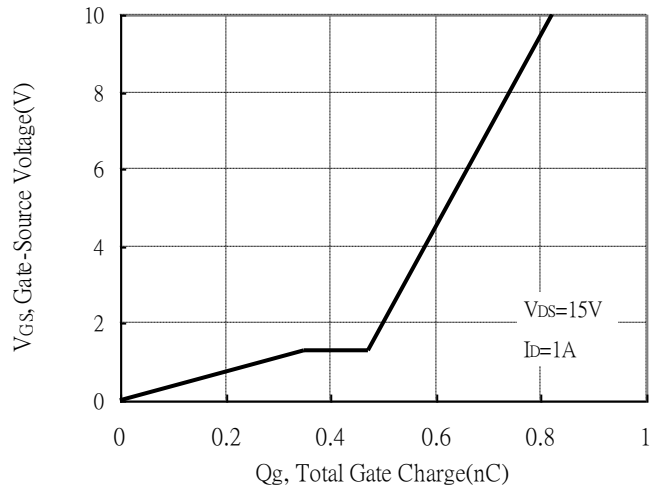
Threshold Voltage vs Junction Temperature



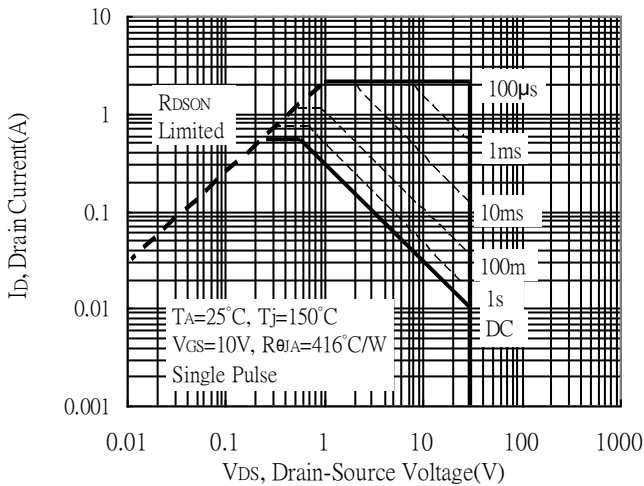
Forward Transfer Admittance vs Drain Current



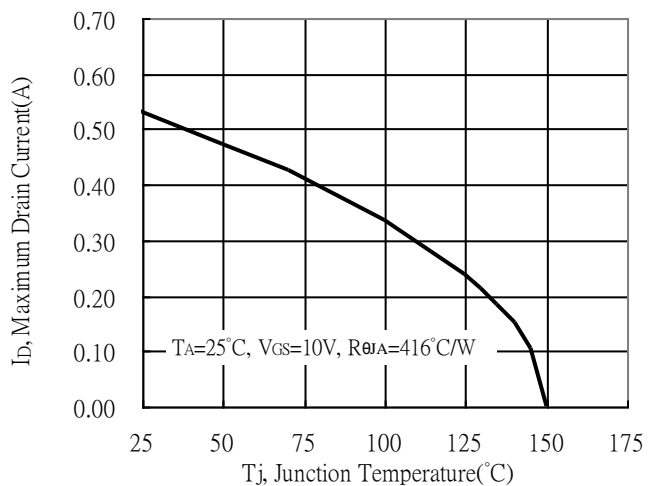
Gate Charge Characteristics



Maximum Safe Operating Area



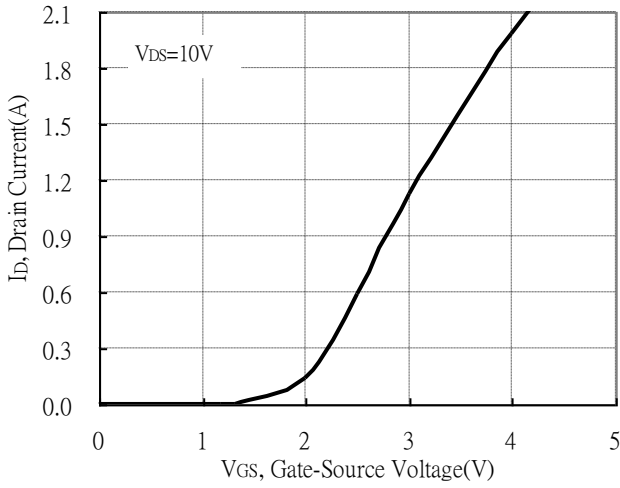
Maximum Drain Current vs Junction Temperature



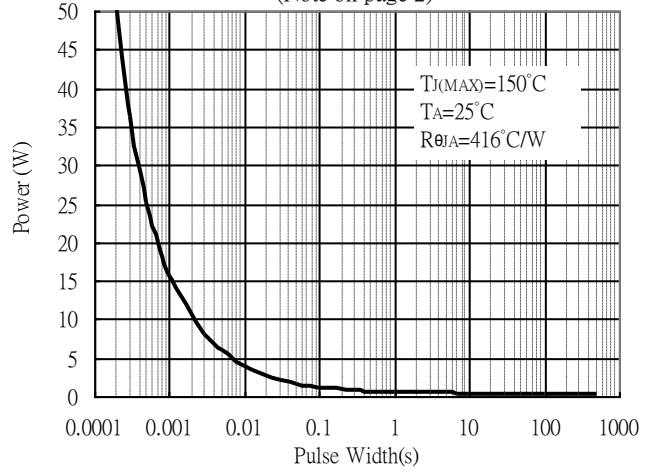


Typical Characteristics(Cont.)

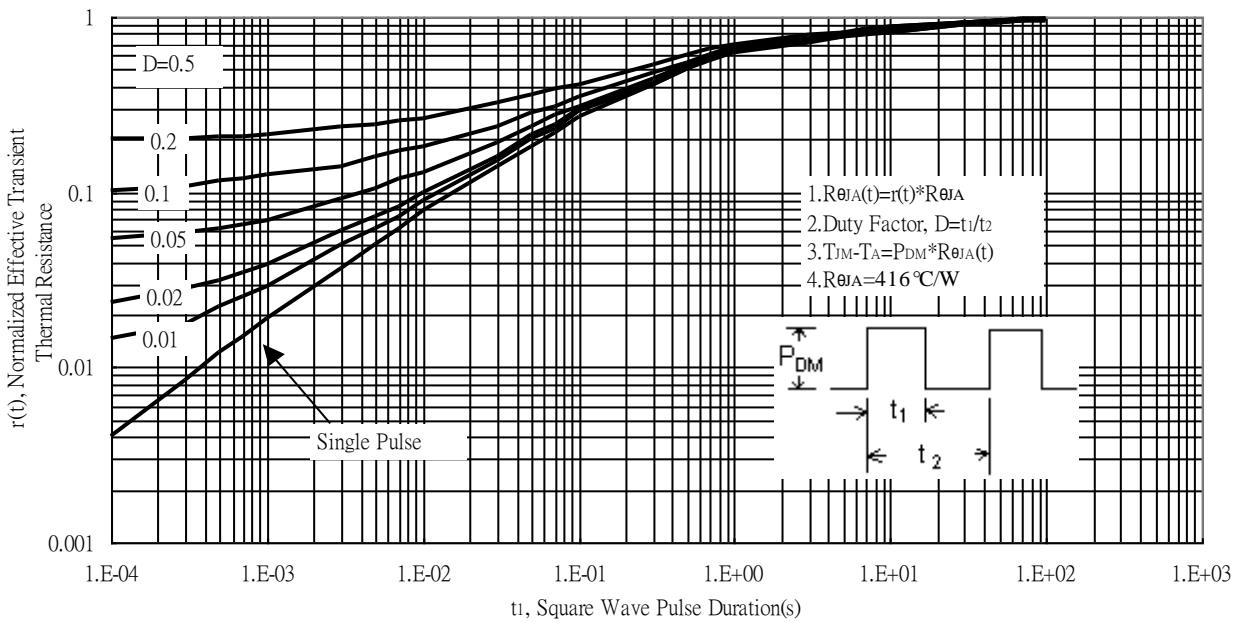
Typical Transfer Characteristics



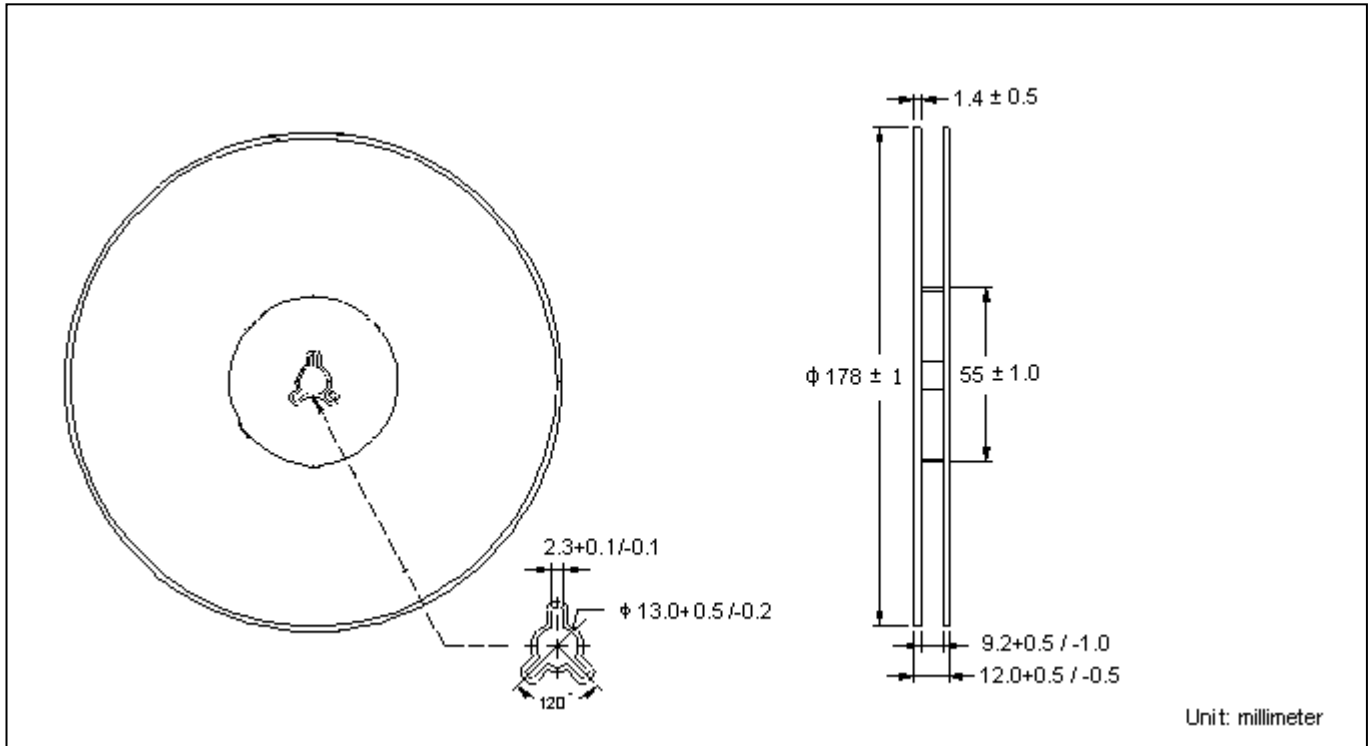
Single Pulse Power Rating, Junction to Ambient
(Note on page 2)



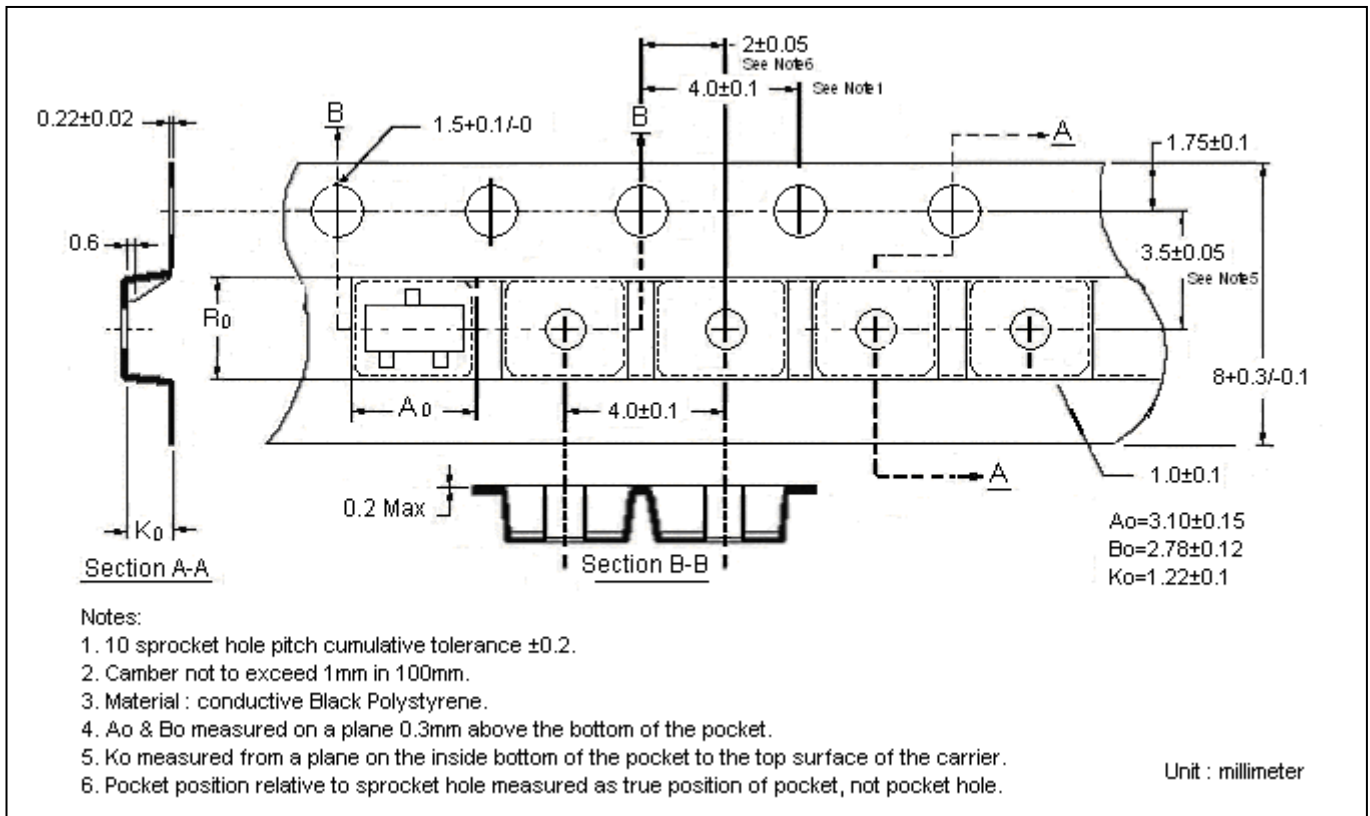
Transient Thermal Response Curves



Reel Dimension



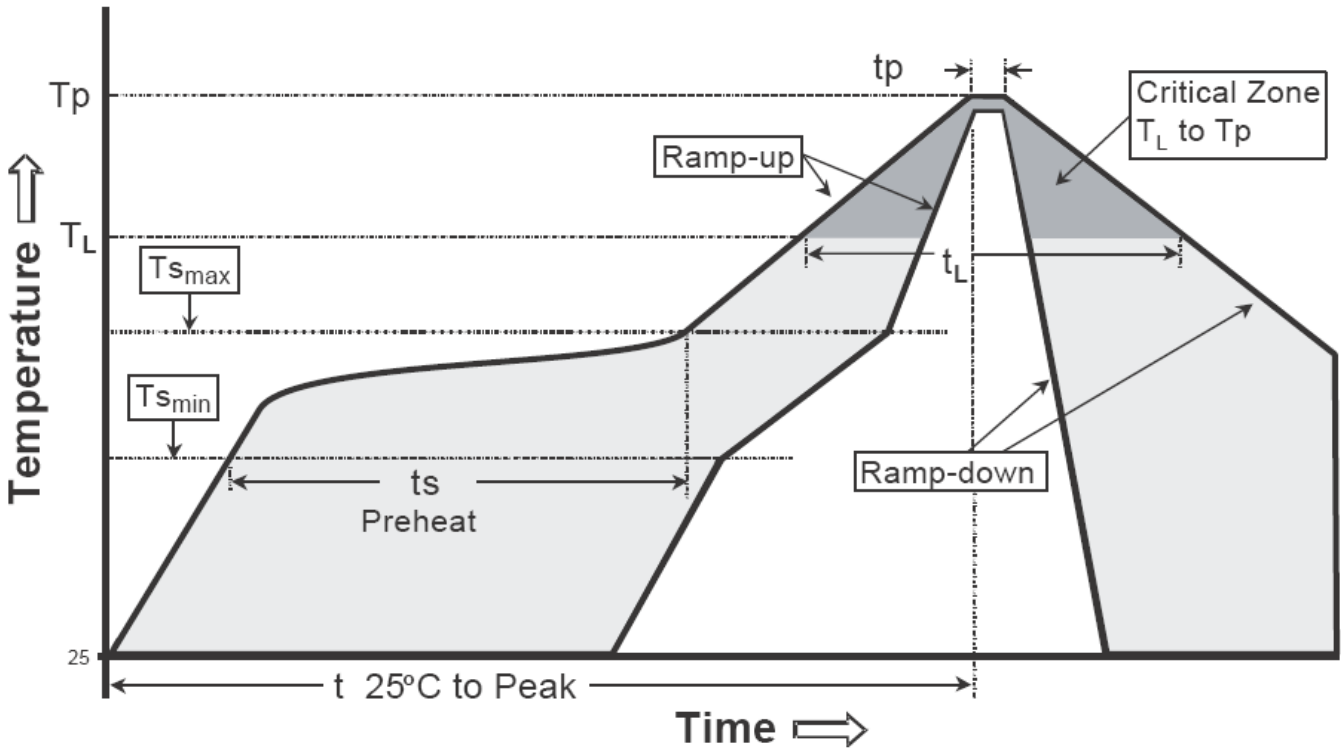
Carrier Tape Dimension



Recommended wave soldering condition

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

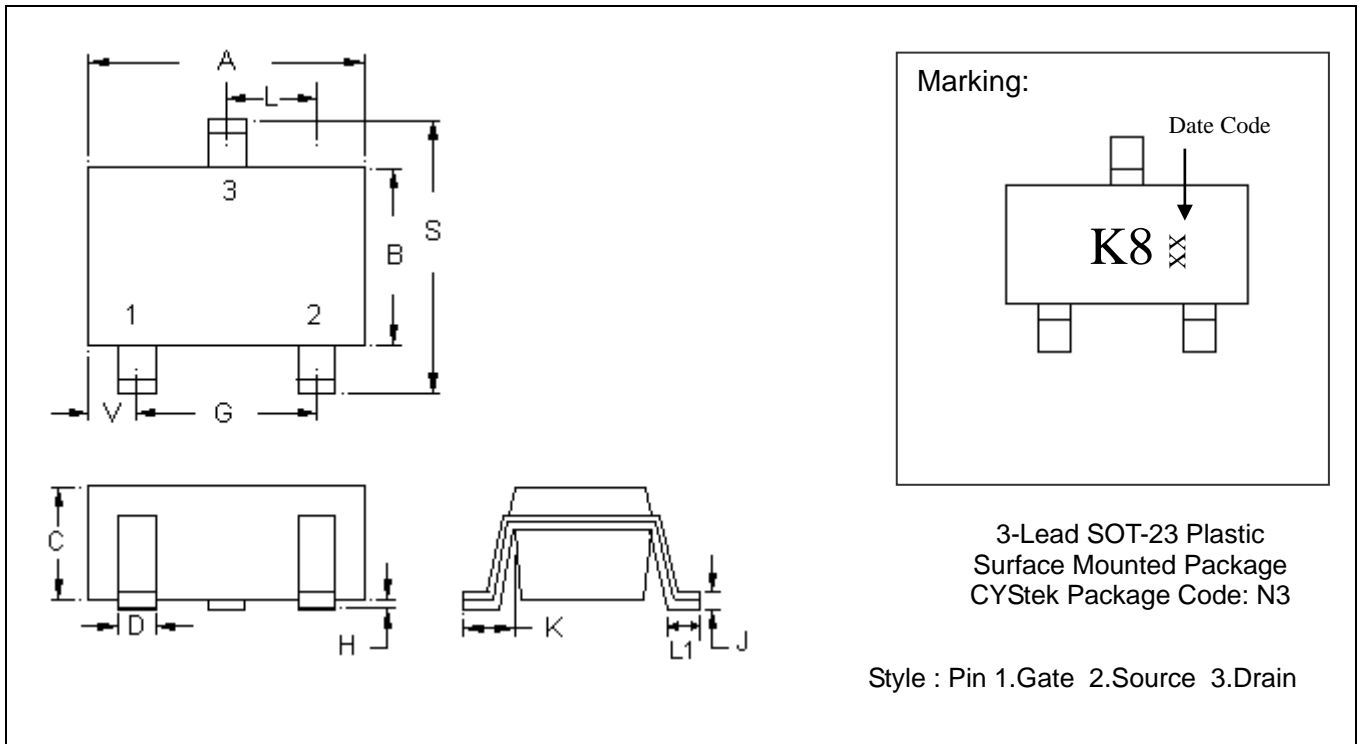
Recommended temperature profile for IR reflow



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 :1. All temperatures refer to topside of the package, measured on the package body surface.
 2. For devices mounted on FR-4 PCB of 1.6mm or equivalent grade PCB. If other grade PCB is used, care should be taken to match the coefficients of thermal expansion between components and PCB. If they are not matched well, the solder joints may crack or the bodies of the parts may crack or shatter as the assembly cools.

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	0.0032	0.0079	0.08	0.20
B	0.0472	0.0669	1.20	1.70	K	0.0118	0.0266	0.30	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	0.1161	2.10	2.95
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0000	0.0040	0.00	0.10	L1	0.0118	0.0197	0.30	0.50

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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