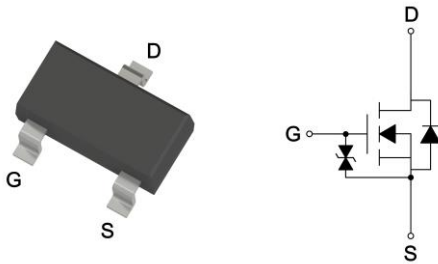


Product Summary

BV_{DSS}	100	V
$R_{DS(ON)}$ typ. @ $V_{GS}=10V, I_D=2A$	80	mΩ
$R_{DS(ON)}$ typ. @ $V_{GS}=4.5V, I_D=1A$	100	
I_D @ $V_{GS}=10V, T_A=25^\circ C$	2.3	A

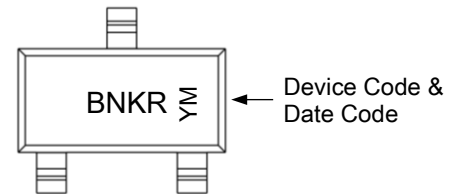
SOT-23



Features

- Low Gate Charge
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free
- ESD protected gate

Marking



YM: Date Code Marking

Y: Year Code, the last digit of Christian year

M: Month Code

1: Jan	2: Feb	3: Mar	4: Apr	5: May	6: Jun
7: Jul	8: Aug	9: Sep	A: Oct	B: Nov	C: Dec

Ordering Information

Device	Package	Shipping
MTB090N10KRN3-0-T1-G	SOT-23	3000pcs / Tape & Reel

0: Product rank, zero for no rank products.

T1: Packing spec, T1 : 3000pcs / tape & reel, 7" reel

G: Environment friendly grade: S for RoHS compliant products, G for RoHS compliant and green compound products.

Absolute Maximum Ratings ($T_A=25^\circ C$)

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	V_{DS}	100	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current @ $V_{GS}=10V, T_A=25^\circ C$	I_D	2.3	A	
Continuous Drain Current @ $V_{GS}=10V, T_A=70^\circ C$		1.8		
Pulsed Drain Current	I_{DM}	9.2		
Continuous Body Diode Forward Current @ $T_A=25^\circ C$	I_S	0.8		
Pulsed Body Diode Forward Current @ $T_A=25^\circ C$	I_{SM}	3.2		
Total Power Dissipation	P_D	$T_A=25^\circ C$	1	W
		$T_A=70^\circ C$	0.6	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ C$	
Steady State Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	130	$^\circ C/W$	



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

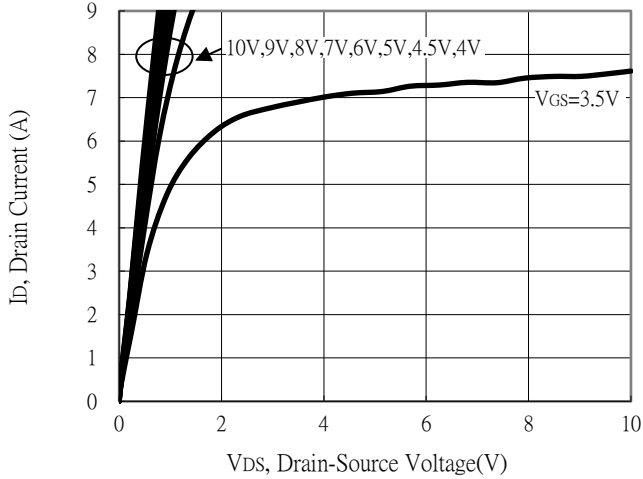
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	100	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	1	-	2.5		V _{DS} =V _{GS} , I _D =250μA
G _{FS}	-	3.5	-	S	V _{DS} =10V, I _D =2A
I _{GSS}	-	-	±20	μA	V _{GS} =±16V, V _{DS} =0V
I _{DSS}	-	-	1		V _{DS} =80V, V _{GS} =0V
R _{DS(ON)}	-	80	105	mΩ	V _{GS} =10V, I _D =2A
	-	100	145		V _{GS} =4.5V, I _D =1A
Dynamic					
C _{iSS}	-	253	-	pF	V _{DS} =50V, V _{GS} =0V, f=1MHz
C _{oss}	-	36	-		
C _{rSS}	-	19	-		
R _g	-	10	-	Ω	f=1MHz
Q _g *c,d	-	3.2	-	nC	V _{DS} =50V, I _D =2A, V _{GS} =4.5V
Q _g *c,d	-	6	-		
Q _{gs} *c,d	-	1	-		
Q _{gd} *c,d	-	1.3	-		
t _{d(ON)} *c,d	-	5.1	-	ns	V _{DS} =50V, I _D =2A, V _{GS} =10V
t _r *c,d	-	17	-		
t _{d(OFF)} *c,d	-	19	-		
t _f *c,d	-	14	-		
Source-Drain Diode					
V _{SD} *c	-	0.85	1.2	V	I _S =2A, V _{GS} =0V
t _{rr}	-	21	-	ns	I _F =2A, di/dt=100A/μs
Q _{rr}	-	11	-	nC	

Note:

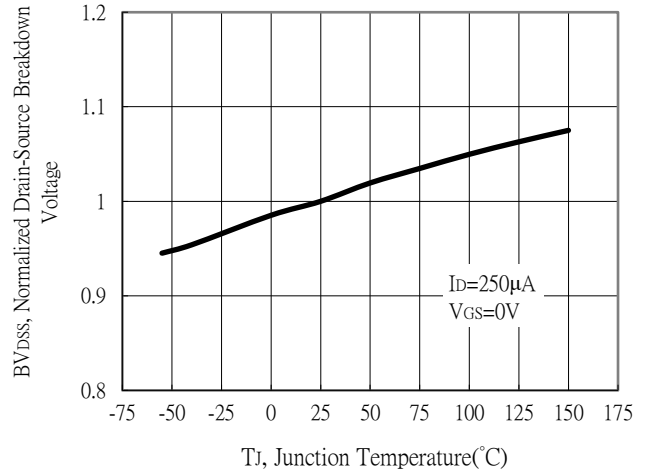
- *a. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on R_{θJA} and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
- *b. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C. Ratings are based on low frequency and low duty cycles to keep initial T_J=25°C.
- *c. Pulse Test : Pulse Width≤300μs, Duty Cycle≤2%.
- *d. Independent of operating temperature.

Typical Characteristics

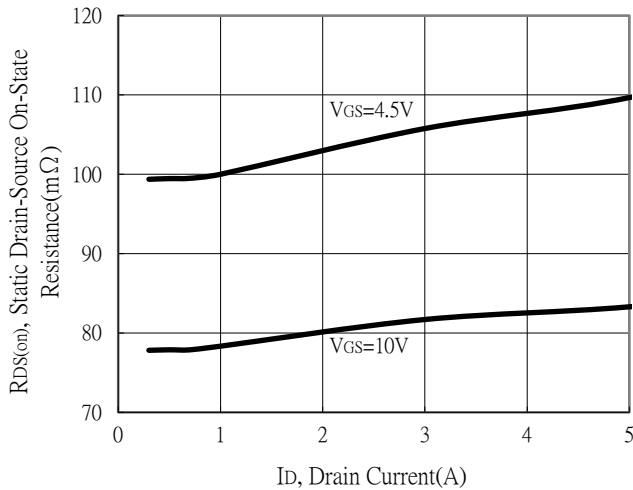
Typical Output Characteristics



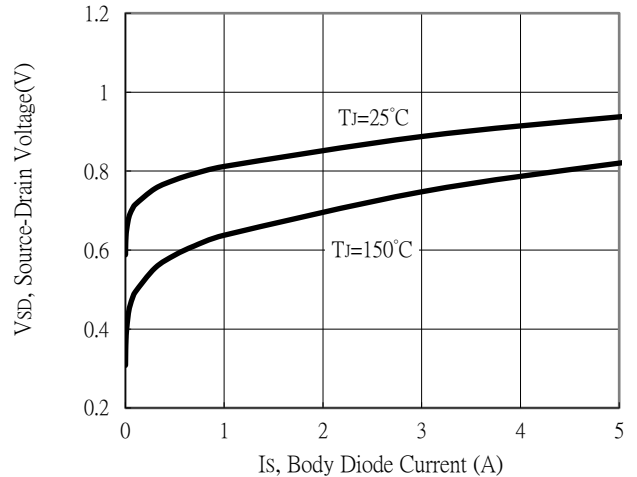
Breakdown Voltage vs Ambient Temperature



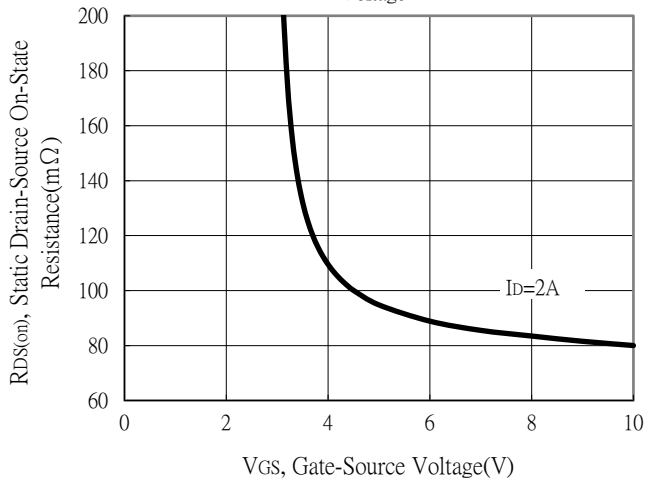
Static Drain-Source On-State resistance vs Drain Current



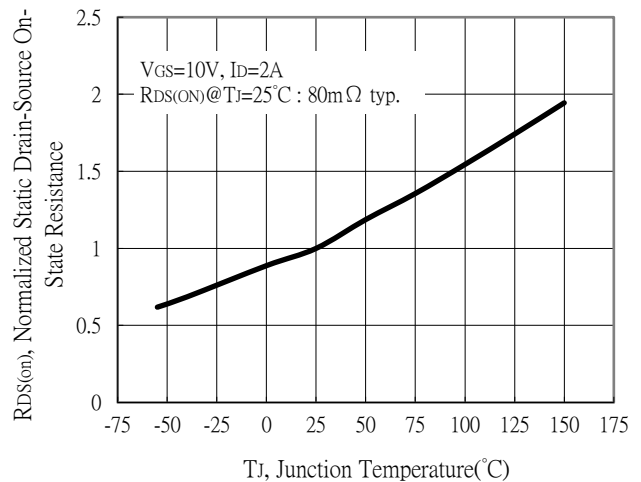
Body Diode Current vs Source-Drain Voltage



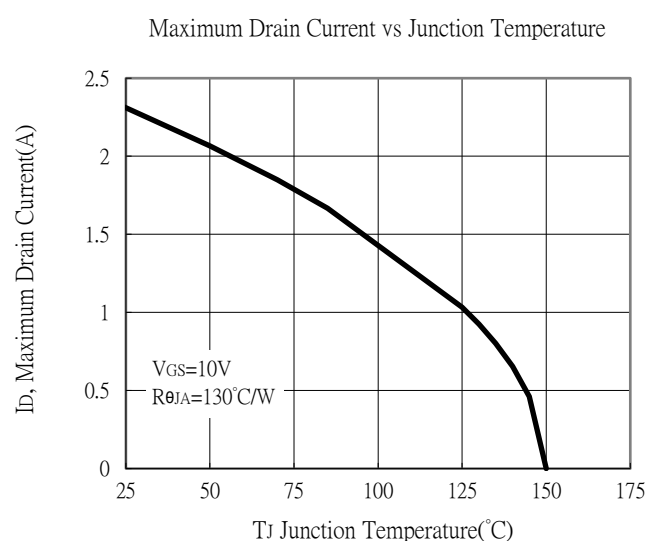
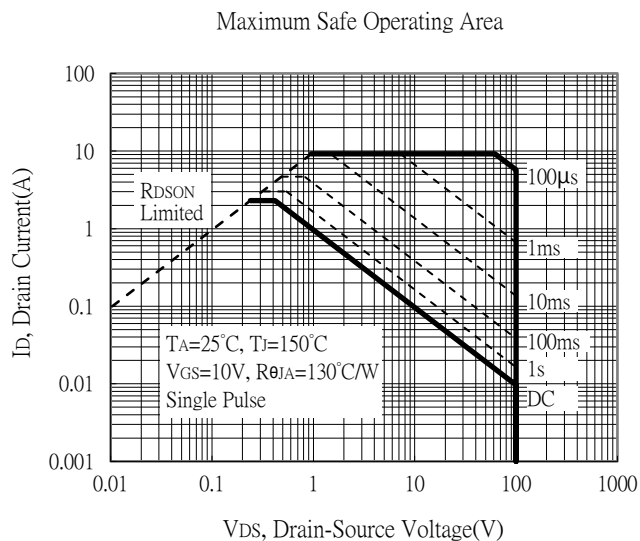
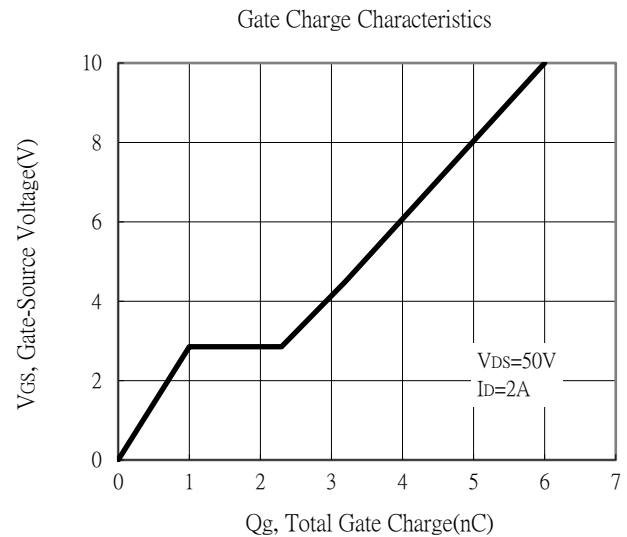
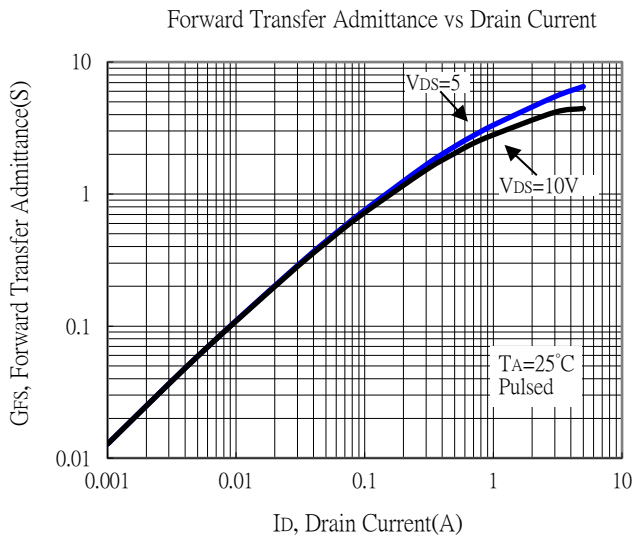
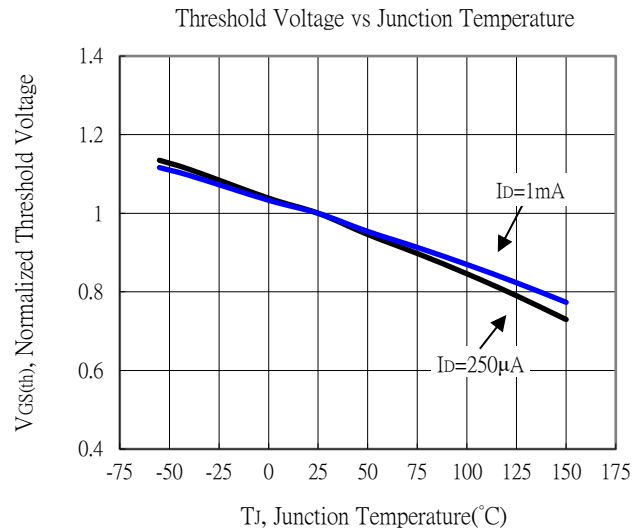
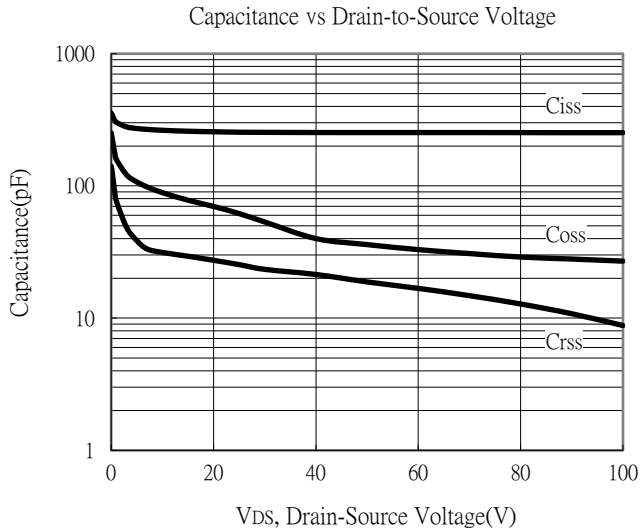
Static Drain-Source On-State Resistance vs Gate-Source Voltage



Drain-Source On-State Resistance vs Junction Temperature

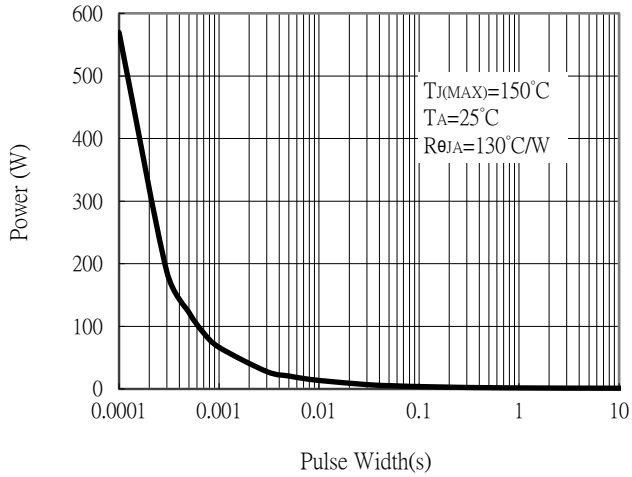


Typical Characteristics

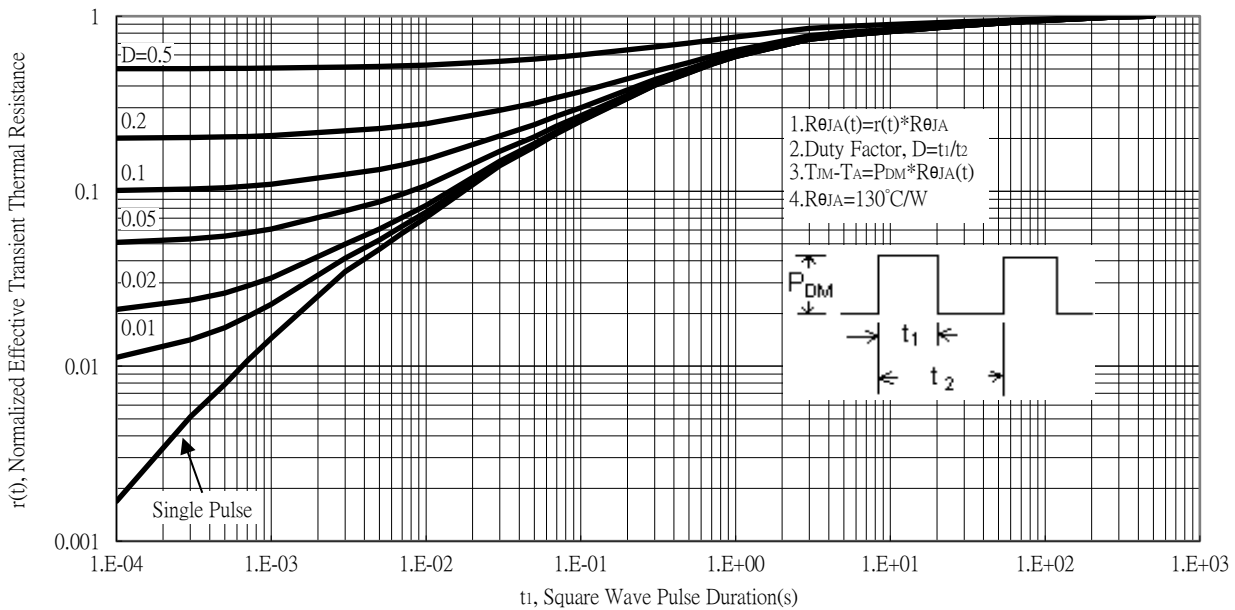


Typical Characteristics

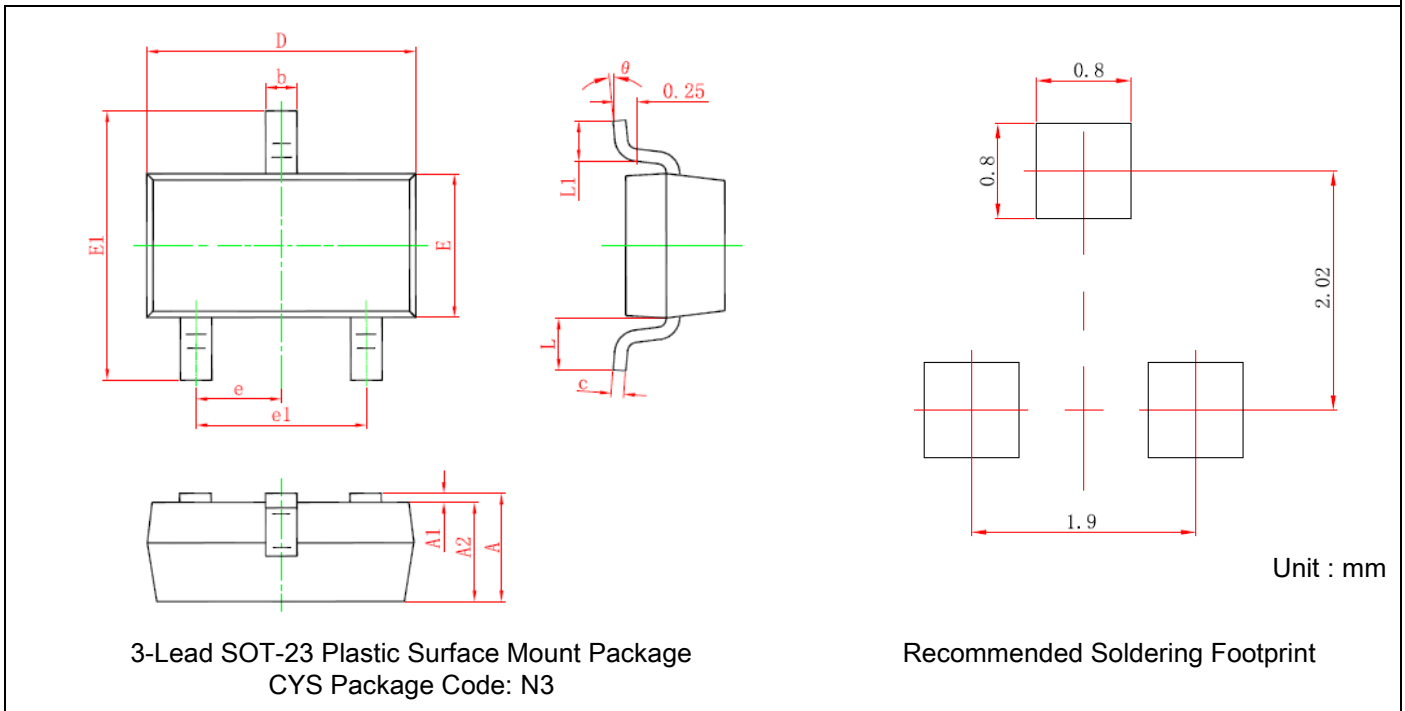
Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves



SOT-23 Dimension



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.035	0.045	0.900	1.150	E1	0.089	0.100	2.250	2.550
A1	0.000	0.004	0.000	0.100	e	0.037	TYP.	0.095	TYP.
A2	0.035	0.041	0.900	1.050	e1	0.071	0.079	1.800	2.000
b	0.012	0.020	0.300	0.500	L	0.022	REF.	0.550	REF.
c	0.003	0.006	0.080	0.150	L1	0.012	0.020	0.300	0.500
D	0.110	0.118	2.800	3.000	θ	0°	8°	0°	8°
E	0.047	0.055	1.200	1.400					

Note:

- Controlling dimension: millimeters.
- Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
- 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.

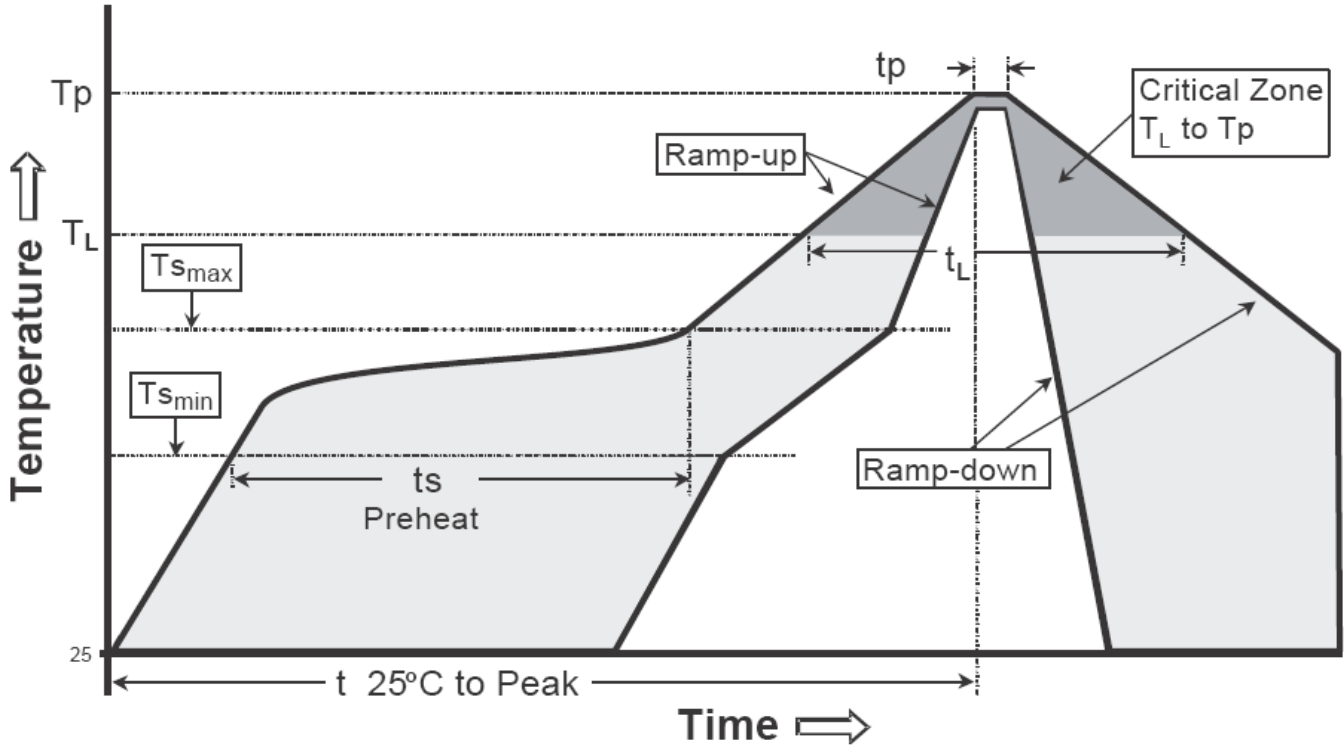
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Recommended wave soldering condition

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 _S max to T _P)	3°C/second max.	3°C/second max.
Preheat -Temperature Min (T _S min) -Temperature Max (T _S max) -Time (t _s min to t _s max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (T _L) -Time (t _L)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature (T _P)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature (t _p)	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.