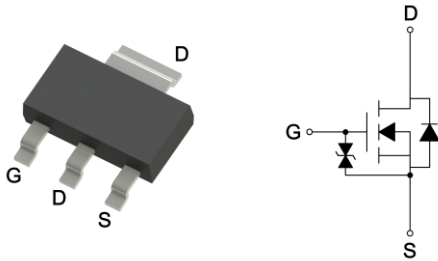


Product Summary

BV_{DSS}	100	V
$R_{DS(ON)}$ typ. @ $V_{GS}=10V, I_D=1A$	250	mΩ
$R_{DS(ON)}$ typ. @ $V_{GS}=4.5V, I_D=0.5A$	300	
I_D @ $V_{GS}=10V, T_C=25^\circ C$	3.5	A
I_D @ $V_{GS}=10V, T_A=25^\circ C$	1.7	

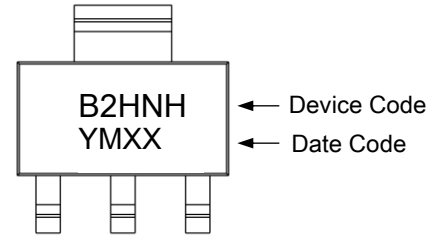
SOT-223



Features

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

Marking



YMXX: Date Code Marking

Y: Year Code, the last digit of Christian year

M: Month Code

A: Jan	B: Feb	C: Mar	D: Apr	E: May	F: Jun
G: Jul	H: Aug	J: Sep	K: Oct	L: Nov	M: Dec

XX: Production Serial Number, 01~99

Ordering Information

Device	Package	Shipping
MTB250N10KRL3-0-T3-G	SOT-223	2500pcs / Tape & Reel

0: Product rank, zero for no rank products.

T3: Packing spec, T3 : 2500pcs / tape & reel, 13" 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 @ $V_{GS}=10V, T_C=25^\circ C$	I_D	3.5	A	
Continuous Drain Current @ $V_{GS}=10V, T_C=100^\circ C$		2.2		
Continuous Drain Current @ $V_{GS}=10V, T_A=25^\circ C$		1.7		
Continuous Drain Current @ $V_{GS}=10V, T_A=70^\circ C$		1.4		
Pulsed Drain Current	I_{DM}	8		
Continuous Body Diode Forward Current @ $T_C=25^\circ C$	I_S	3.5		
Pulsed Body Diode Forward Current @ $T_C=25^\circ C$	I_{SM}	8		
Total Power Dissipation	P_D	$T_C=25^\circ C$	8	W
		$T_C=100^\circ C$	3.2	
		$T_A=25^\circ C$	1.8	
		$T_A=70^\circ C$	1.2	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^\circ C$	
Steady State Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	16	$^\circ C/W$	
Steady State Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	68		



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

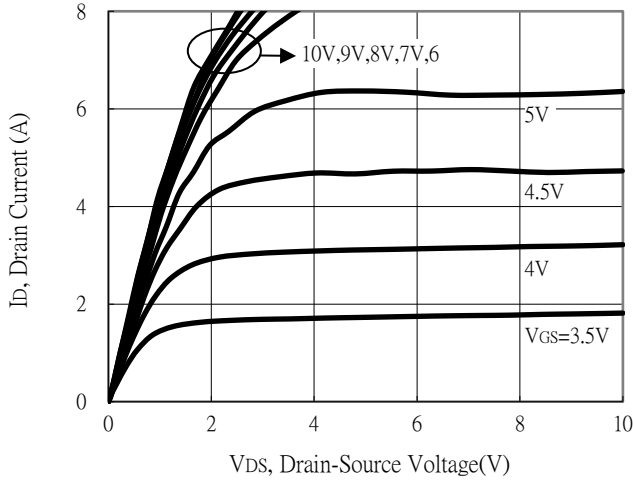
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	100	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	1	-	2.5		V _{DS} =V _{GS} , I _D =250μA
G _{FS}	-	1.5	-	S	V _{DS} =10V, I _D =1A
I _{GSS}	-	-	±10	μA	V _{GS} =±16V, V _{DS} =0V
I _{DSS}	-	-	1		V _{DS} =80V, V _{GS} =0V
R _{DS(ON)}	-	250	325	mΩ	V _{GS} =10V, I _D =1A
	-	350	500		V _{GS} =4.5V, I _D =0.5A
Dynamic					
C _{iss}	-	105	-	pF	V _{DS} =50V, V _{GS} =0V, f=1MHz
C _{oss}	-	19	-		
C _{rss}	-	14	-		
R _g	-	7	-	Ω	f=1MHz
Q _g *d,e	-	1.4	-	nC	V _{DS} =50V, I _D =1A, V _{GS} =4.5V
Q _g *d,e	-	3	-		
Q _{gs} *d,e	-	0.6	-		
Q _{gd} *d,e	-	0.4	-		
t _{d(ON)} *d,e	-	3.2	-	ns	V _{DS} =50V, I _D =1A, V _{GS} =10V
t _r *d,e	-	17	-		
t _{d(OFF)} *d,e	-	9	-		
t _f *d,e	-	15	-		
Source-Drain Diode					
V _{SD} *d	-	0.87	1.2	V	I _S =1A, V _{GS} =0V
t _{rr}	-	21	-	ns	I _F =1A, di/dt=100A/μs
Q _{rr}	-	7	-	nC	

Note:

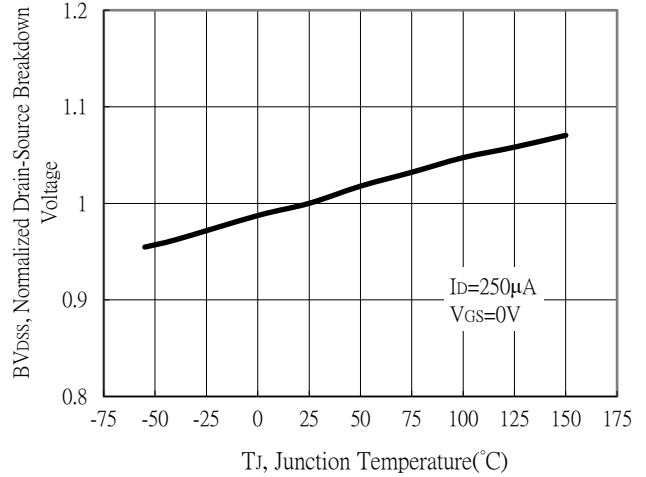
- *a. The power dissipation P_D is based on T_{J(MAX)}=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper Dissipation.
- *b. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz copper, in a still air environment with T_A=25°C. The 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.
- *c. 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.
- *d. Pulse Test : Pulse Width≤300μs, Duty Cycle≤2%.
- *e. Independent of operating temperature.

Typical Characteristics

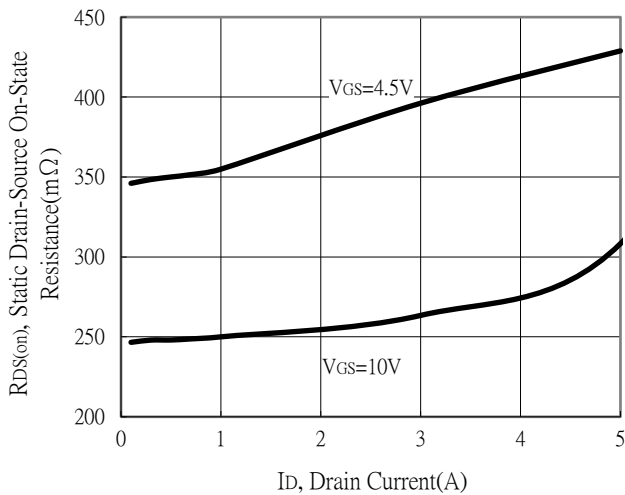
Typical Output Characteristics



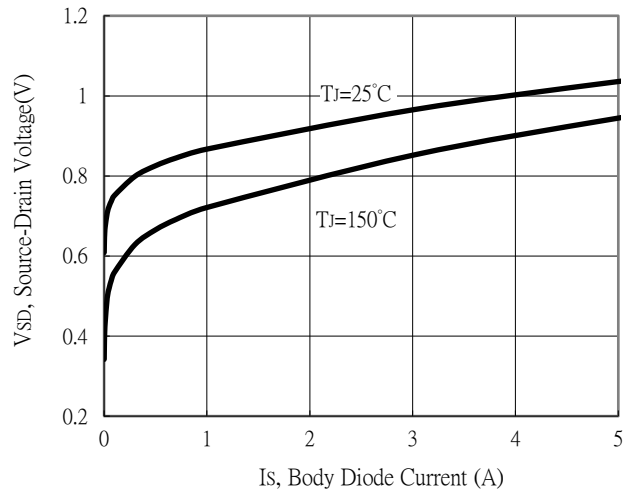
Breakdown Voltage vs Ambient Temperature



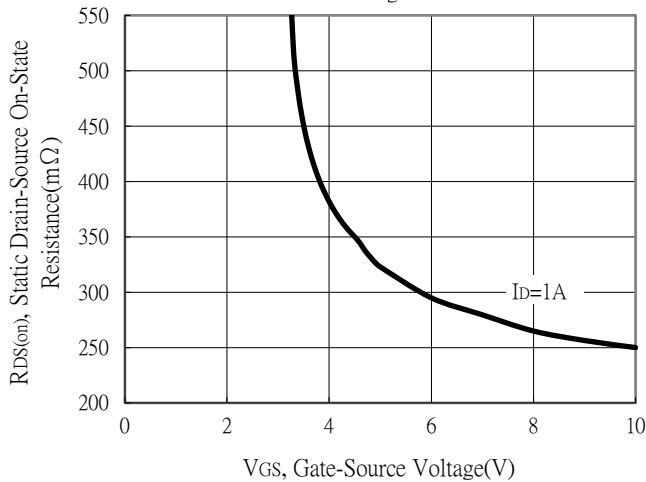
Static Drain-Source On-State resistance vs Drain Current



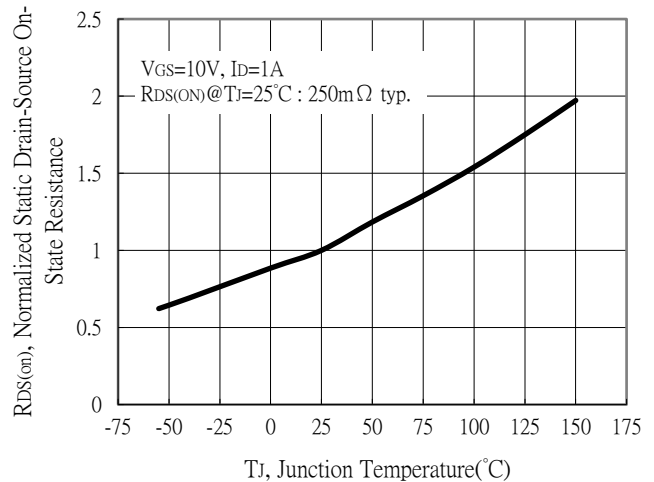
Body Diode Current vs Source-Drain Voltage



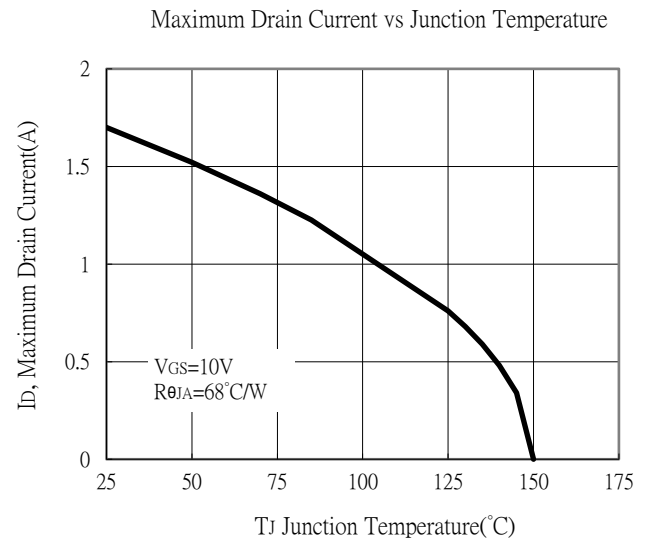
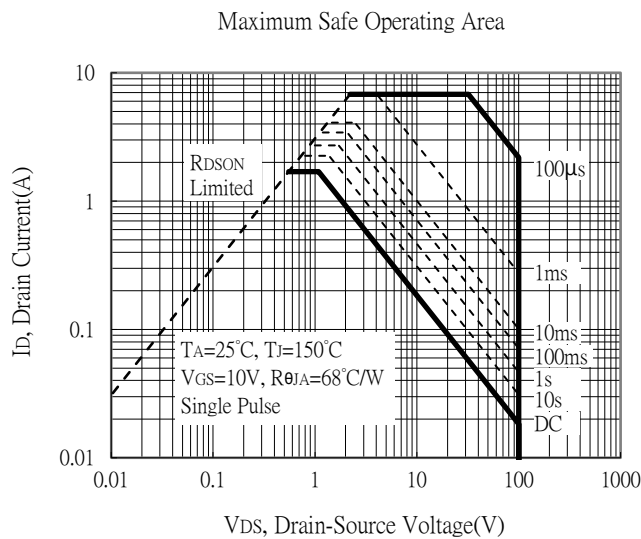
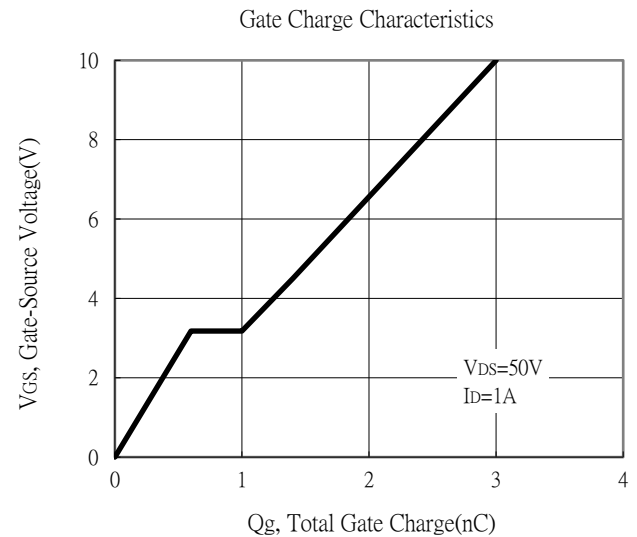
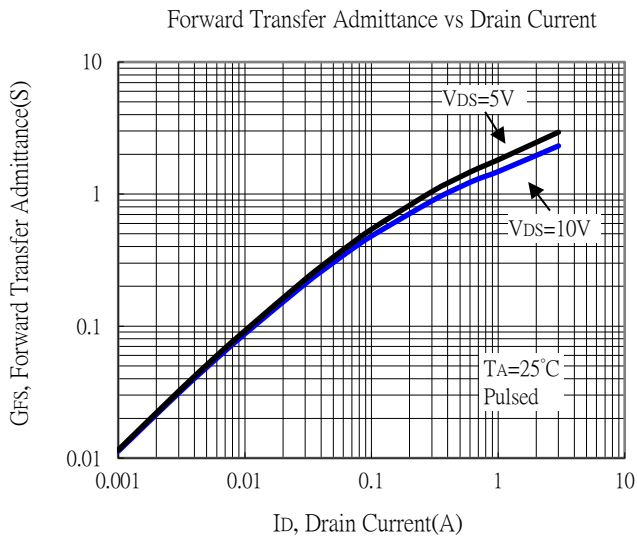
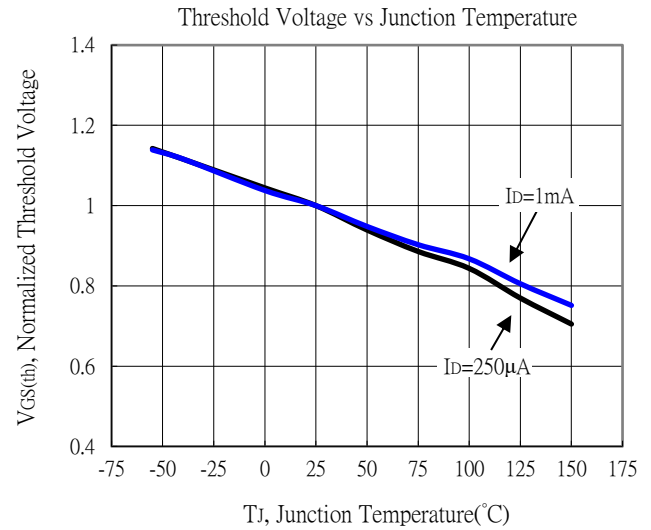
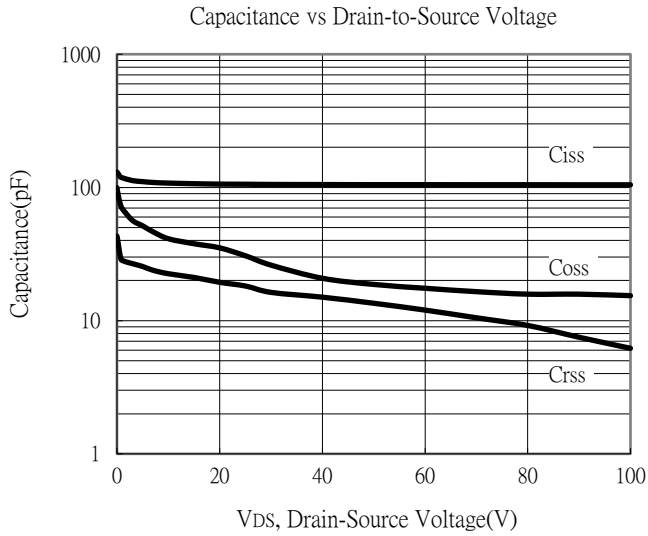
Static Drain-Source On-State Resistance vs Gate-Source Voltage



Drain-Source On-State Resistance vs Junction Temperature

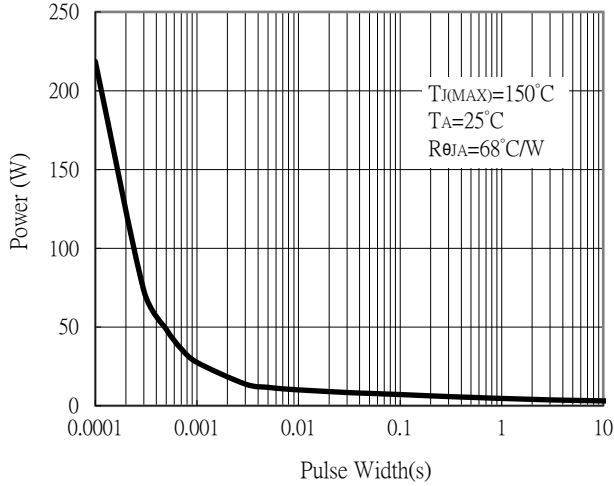


Typical Characteristics

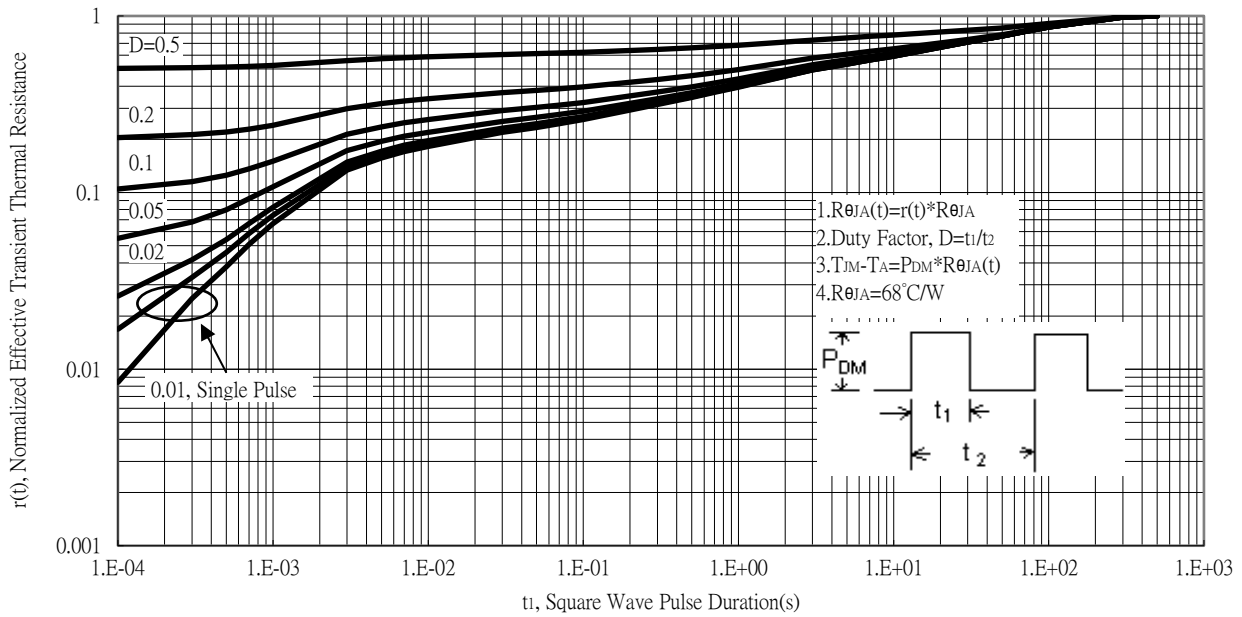


Typical Characteristics

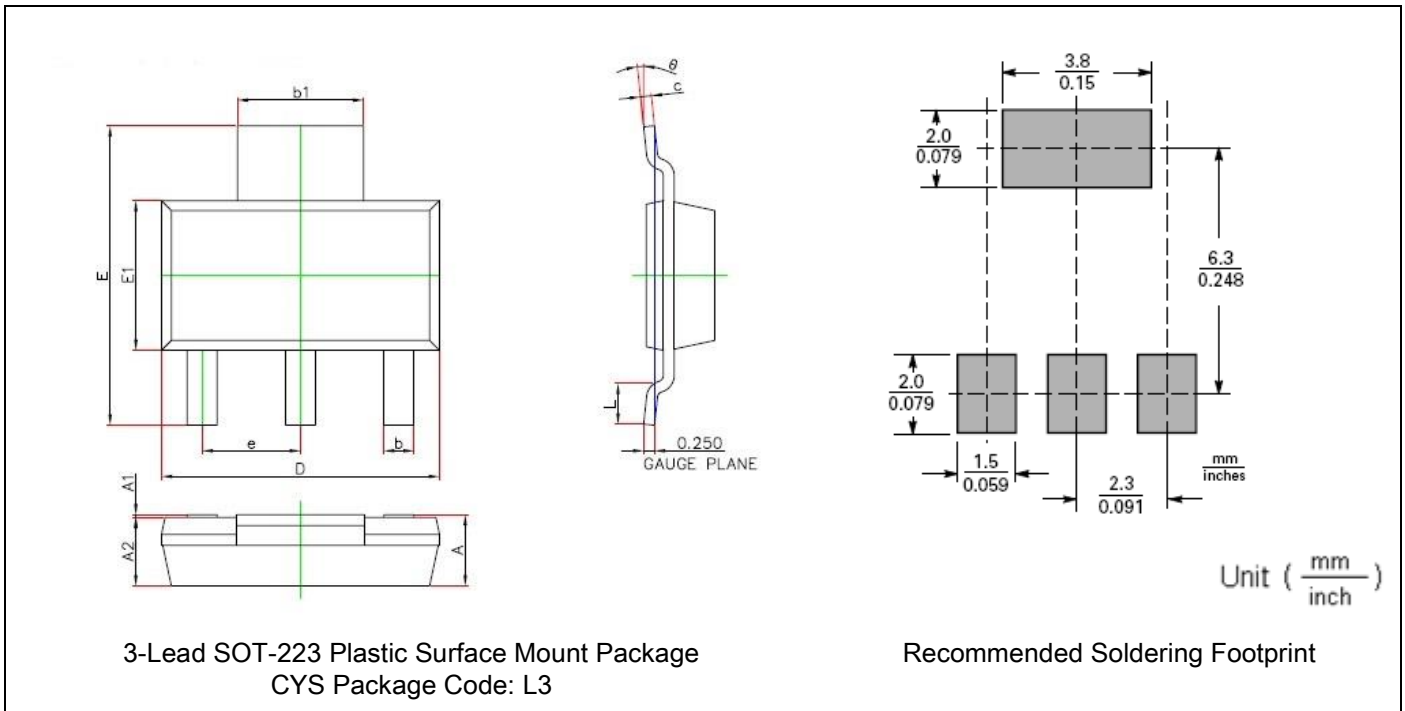
Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves



SOT-223 Dimension



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	-	0.071	-	1.800	D	0.248	0.264	6.300	6.700
A1	0.001	0.004	0.020	0.100	E	0.264	0.287	6.700	7.300
A2	0.059	0.067	1.500	1.700	E1	0.130	0.146	3.300	3.700
b	0.026	0.033	0.660	0.840	e	0.091	BSC	2.300	BSC
b1	0.114	0.122	2.900	3.100	L	0.030	-	0.750	-
c	0.009	0.014	0.230	0.350	theta	0°	10°	0°	10°

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.

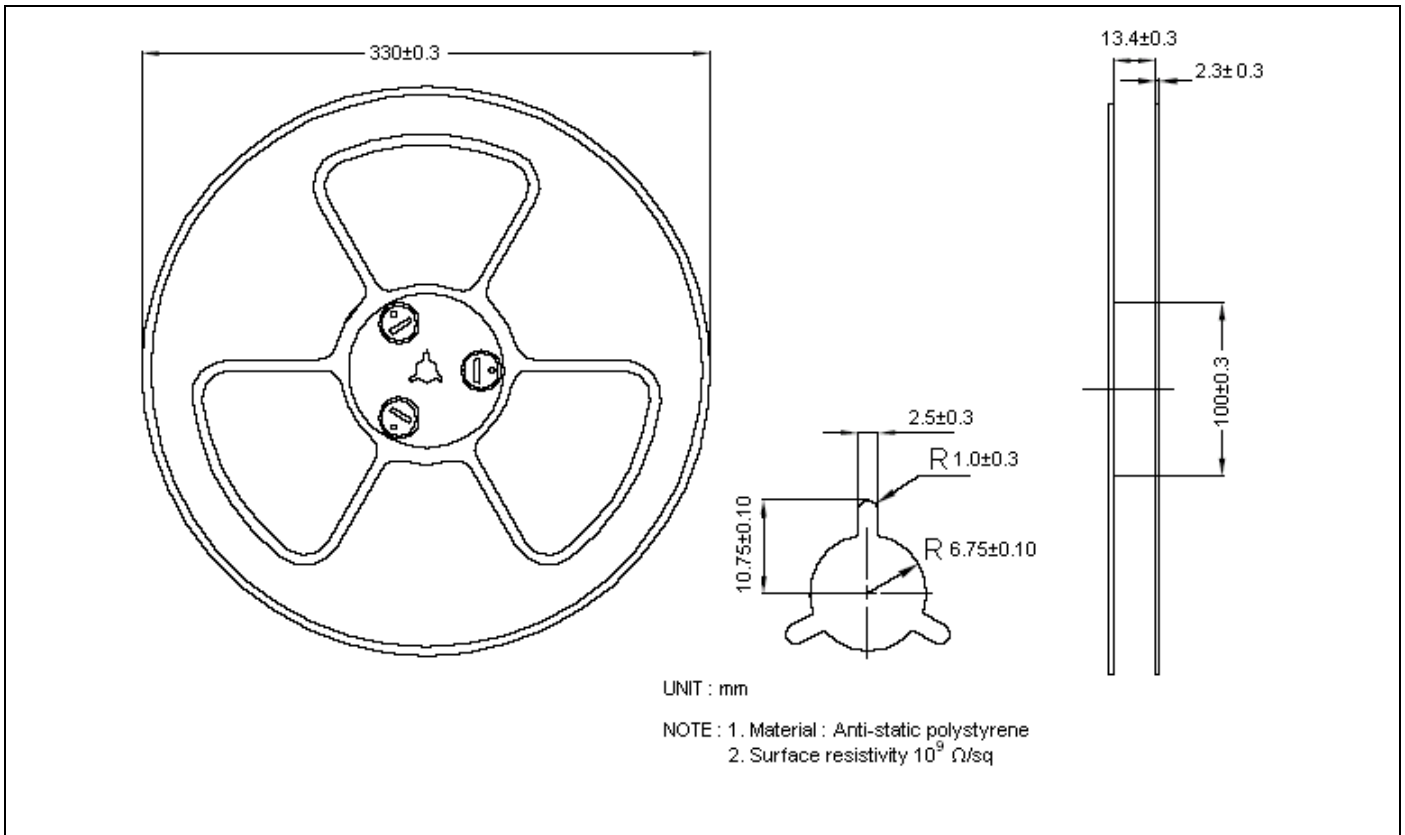
Material:

- Lead: pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

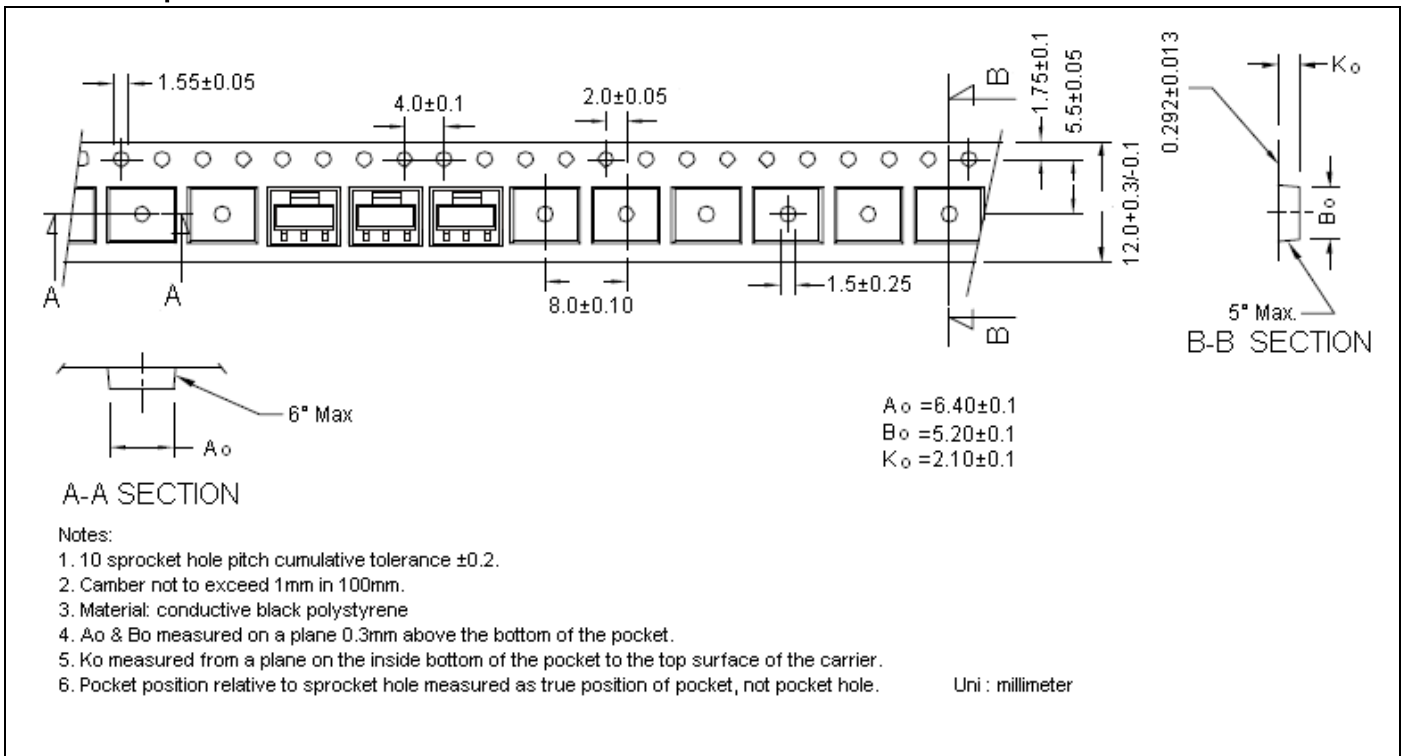
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Reel Dimension



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 (TS max 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.