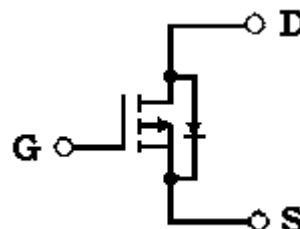
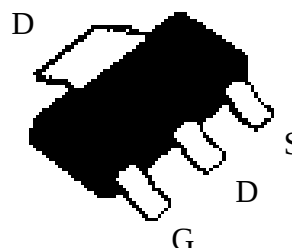


P-Channel Enhancement Mode Power MOSFET

Features:

- Low Gate Charge
- Simple Drive Requirement
- Pb-free lead plating & Halogen-free package

SOT-223



G : Gate D : Drain
S : Source

BV_{DSS}	-100V
$I_D @ T_A=25^{\circ}C, V_{GS}=-10V$	-2.2A
$R_{DS(on)}@V_{GS}=-10V, I_D=-2A$	190m Ω (typ)
$R_{DS(on)}@V_{GS}=-4.5V, I_D=-1A$	217m Ω (typ)

Ordering Information

Device	Package	Shipping
KLD190P10	SOT-223 (Pb-free lead plating & Halogen-free package)	2500 pcs / Tape & Reel

Absolute Maximum Ratings (T_c=25°C, unless otherwise noted)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DS}	-100	V
Gate-Source Voltage	V _{GS}	±20	
Continuous Drain Current @ V _{GS} =-10V, T _A =25°C	I _D	-2.2	A
Continuous Drain Current @ V _{GS} =-10V, T _A =70°C		-1.8	
Pulsed Drain Current *1	I _{DM}	-10	
Single Pulse Avalanche Current	I _{AS}	-2	mJ
Avalanche Energy @ L=6mH, I _D =-2A, R _G =25Ω	E _{AS}	12	
Repetitive Avalanche Energy @ L=0.05mH *2	E _{AR}	0.5	W
Total Power Dissipation @T _A =25°C	P _D	2.5	
Total Power Dissipation @T _A =70°C		1.6	
Operating Junction and Storage Temperature Range	T _j , T _{stg}	-55~+150	°C

Note : *1. Pulse width limited by maximum junction temperature

*2. Duty cycle ≤ 1%

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{θJC}	15	°C/W
Thermal Resistance, Junction-to-ambient, max	R _{θJA}	50 (Note)	

Note : Surface mounted on a 1 in² pad of 2 oz. copper, t≤10s; 120 °C/W when mounted on minimum copper pad.

Characteristics (T_c=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
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	-1	μA	V _{DS} =-80V, V _{GS} =0V
	-	-	-25		V _{DS} =-70V, V _{GS} =0V, T _J =125°C
R _{DS(ON)} *1	-	190	240	mΩ	V _{GS} =-10V, I _D =-2A
	-	217	285		V _{GS} =-4.5V, I _D =-1A
G _{FS} *1	-	5	-	S	V _{DS} =-15V, I _D =-2A
Dynamic					
Q _g *1, 2	-	16.5	-	nC	I _D =-2A, V _{DS} =-80V, V _{GS} =-10V
Q _{gs} *1, 2	-	2.6	-		
Q _{gd} *1, 2	-	4.3	-		
t _{d(ON)} *1, 2	-	9	-	ns	V _{DS} =-50V, I _D =-1A, V _{GS} =-10V, R _G =6Ω
t _r *1, 2	-	16.8	-		
t _{d(OFF)} *1, 2	-	40.4	-		
t _f *1, 2	-	27.2	-	pF	V _{GS} =0V, V _{DS} =-25V, f=1MHz
C _{iss}	-	729	-		
C _{oss}	-	45	-		
C _{rss}	-	35	-		

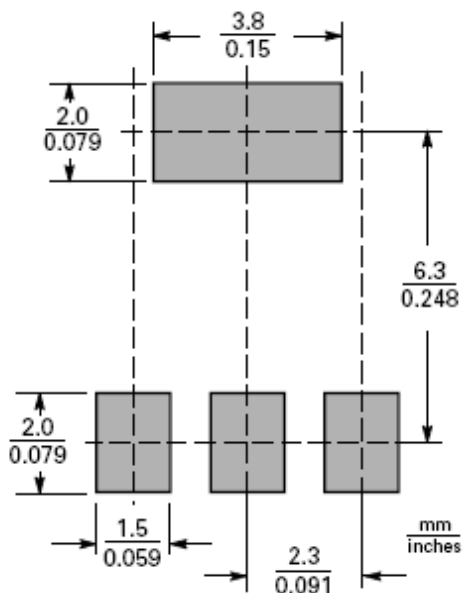
Source-Drain Diode					
I_S *1	-	-	-2.2	A	
I_{SM} *3	-	-	-10		
V_{SD} *1	-	-0.82	-1.2	V	$I_S=-2A, V_{GS}=0V$
trr	-	21	-	ns	$I_F=-2A, dI_F/dt=100A/\mu s$
Qrr	-	20	-	nC	

Note : *1.Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

*2.Independent of operating temperature

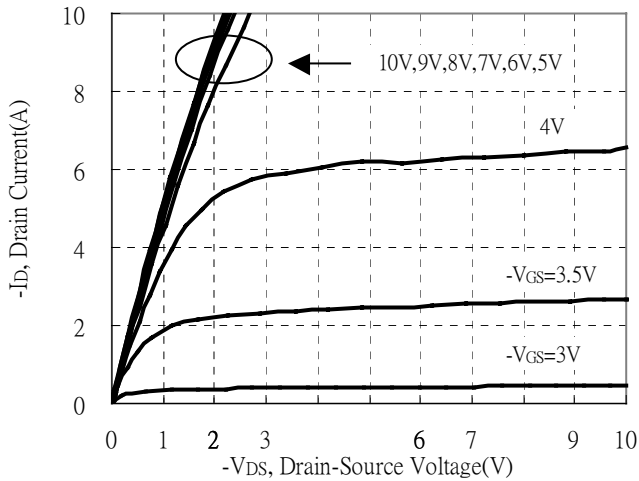
*3.Pulse width limited by maximum junction temperature.

Recommended soldering footprint

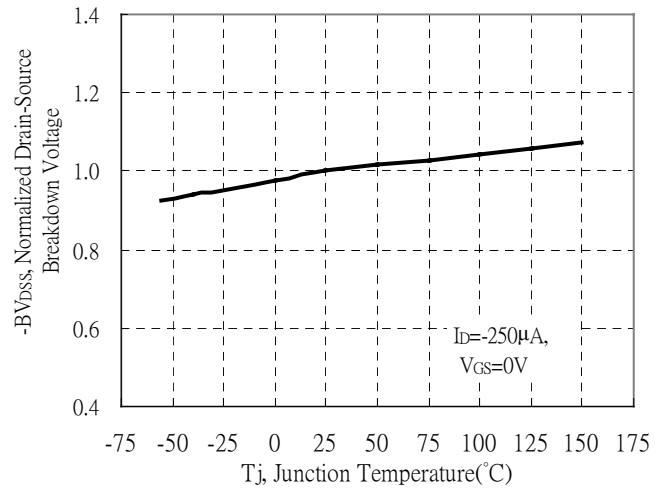


Typical Characteristics

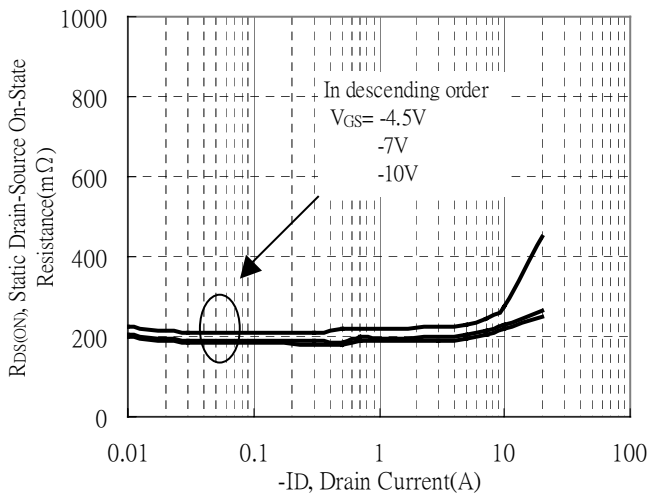
Typical Output Characteristics



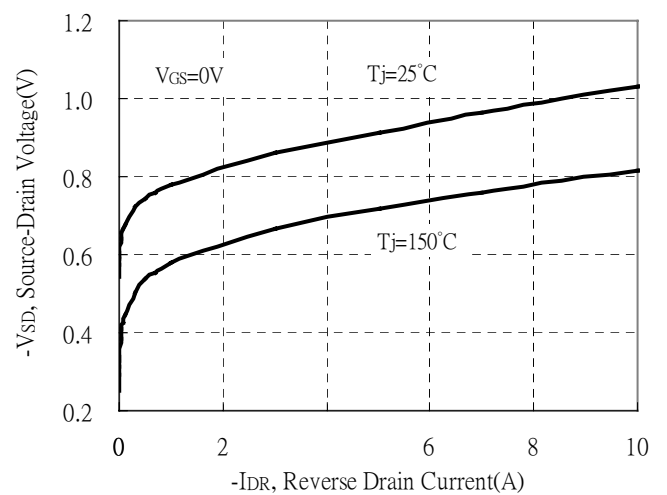
Breakdown Voltage vs Ambient Temperature



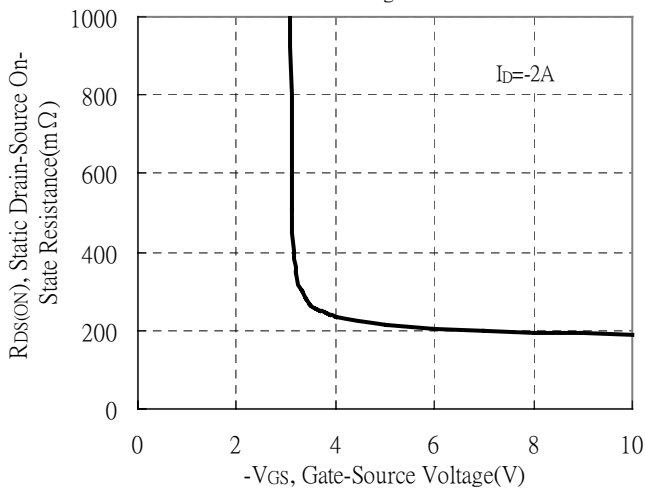
Static Drain-Source On-State resistance vs Drain Current



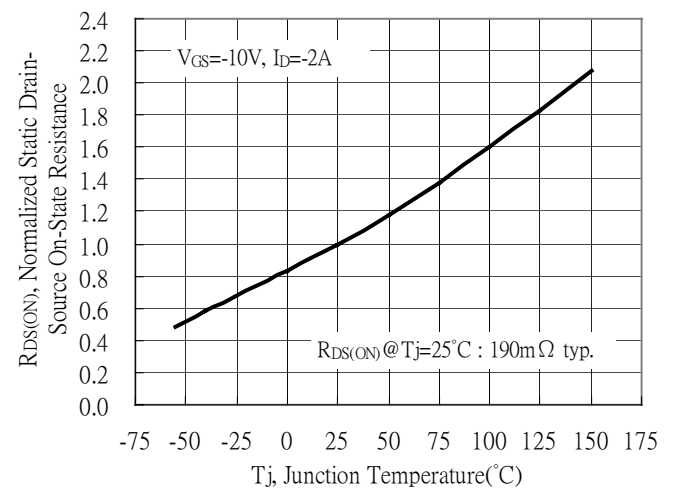
Reverse Drain Current vs Source-Drain Voltage



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

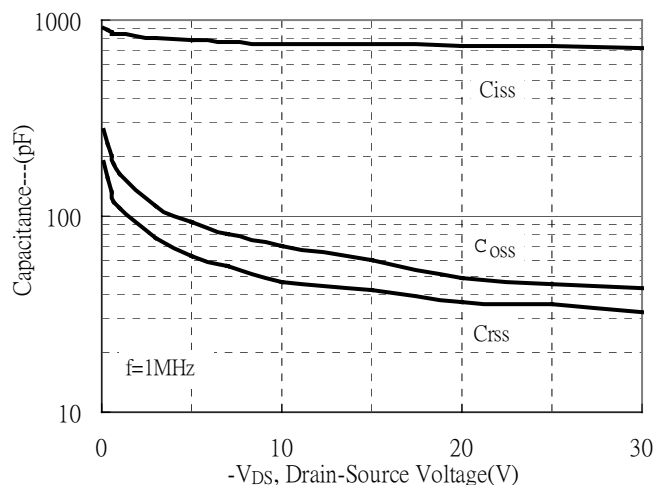


Drain-Source On-State Resistance vs Junction Temperature

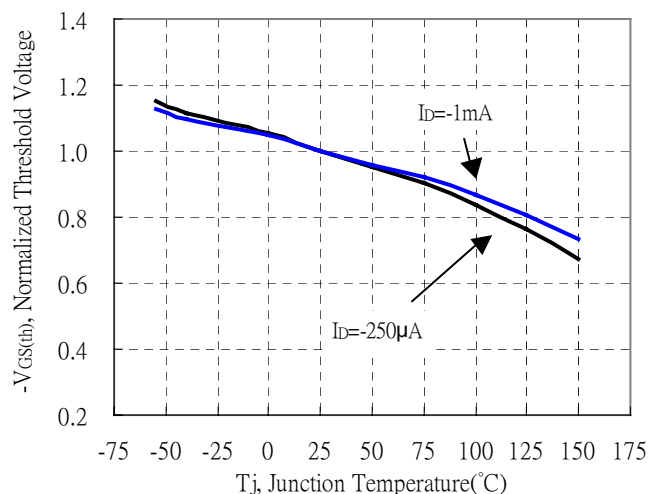


Typical Characteristics(Cont.)

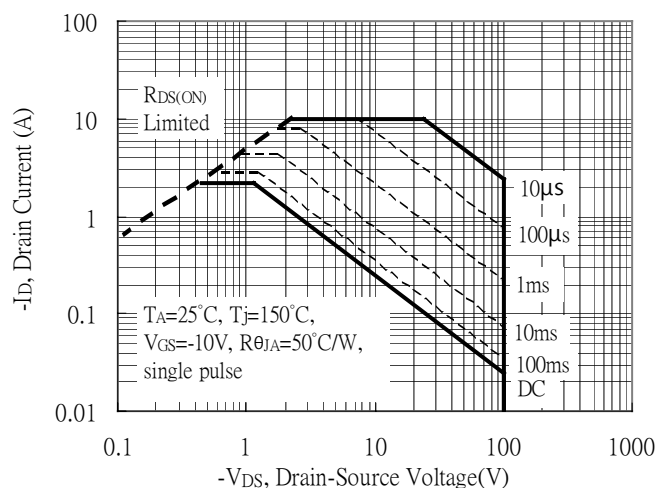
Capacitance vs Drain-to-Source Voltage



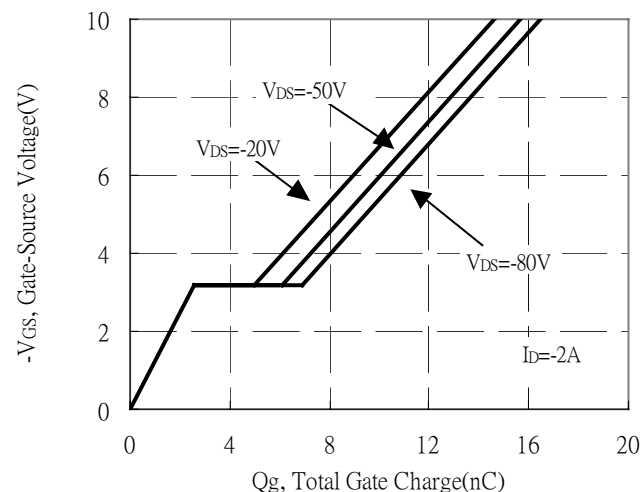
Threshold Voltage vs Junction Temperature



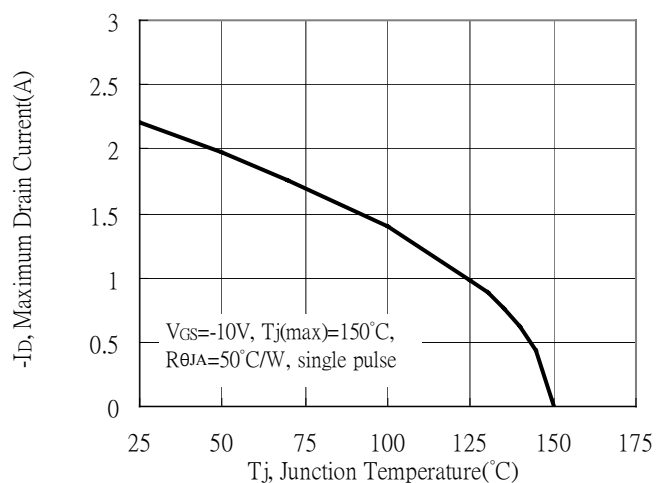
Maximum Safe Operating Area



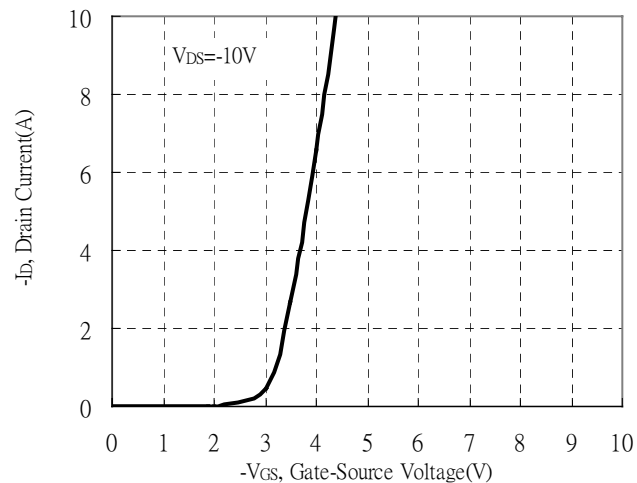
Gate Charge Characteristics



Maximum Drain Current vs Junction Temperature

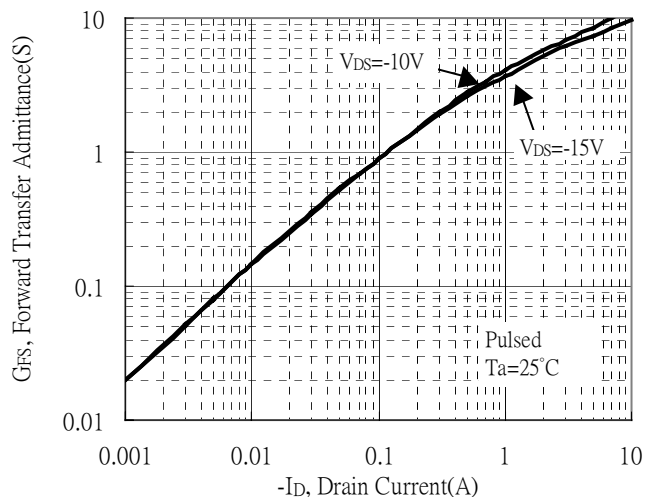


Typical Transfer Characteristics

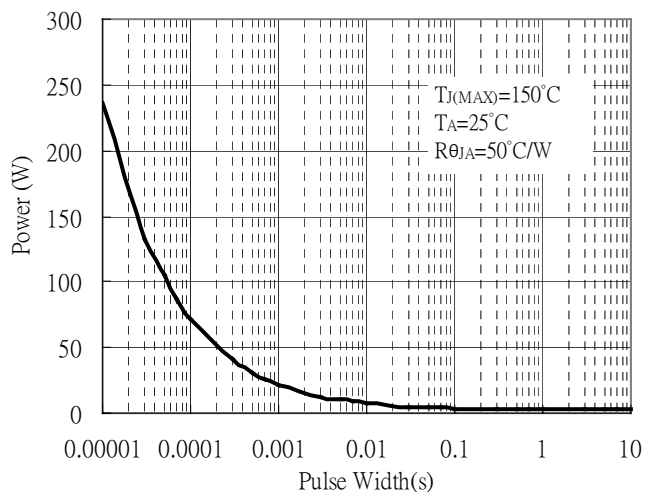


Typical Characteristics(Cont.)

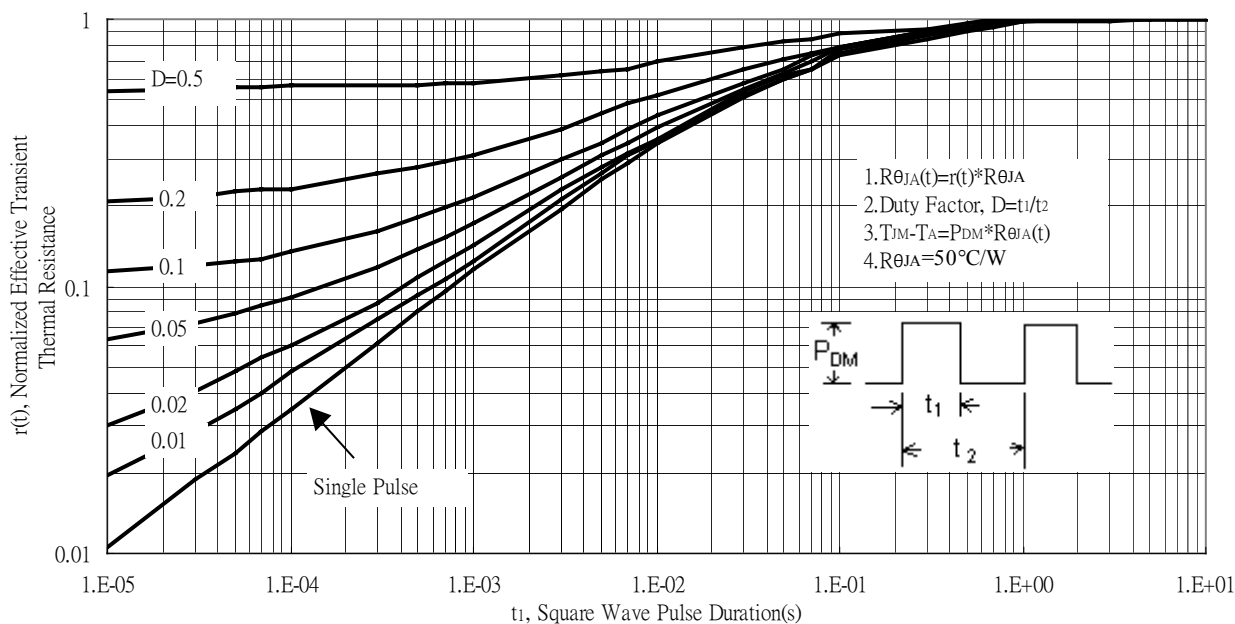
Forward Transfer Admittance vs Drain Current



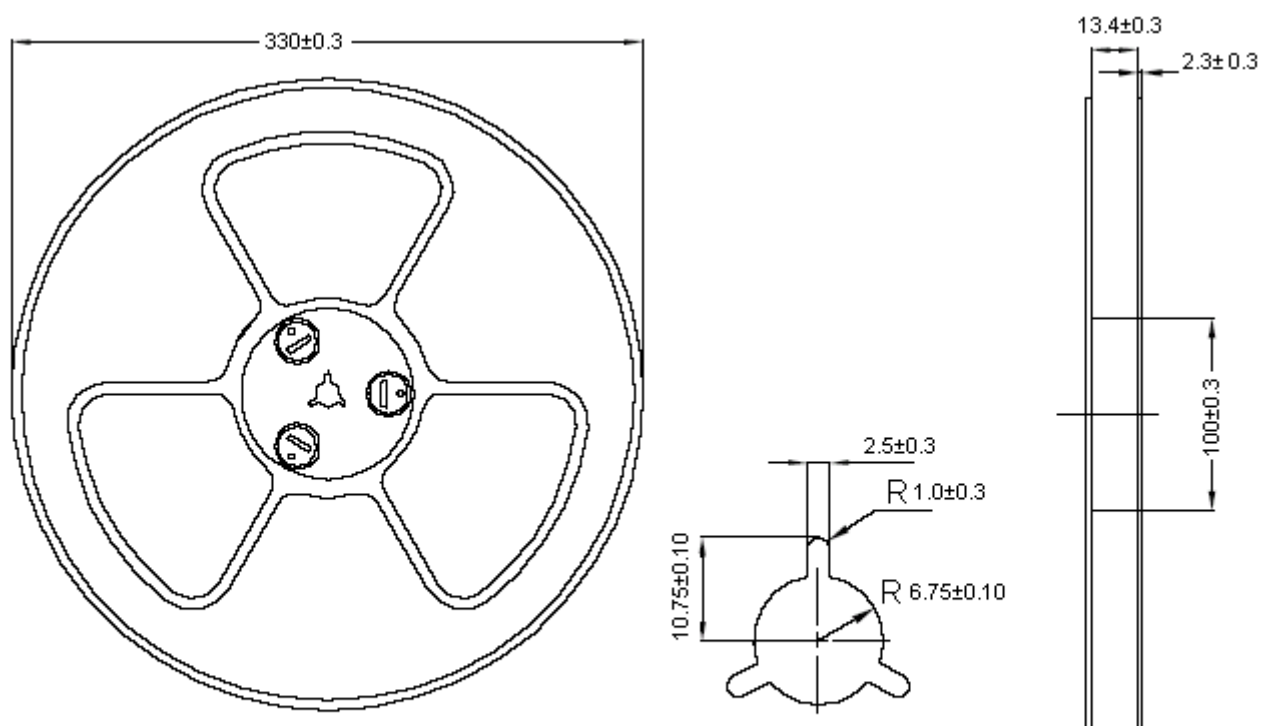
Single Pulse Power Rating, Junction to Case



Transient Thermal Response Curves



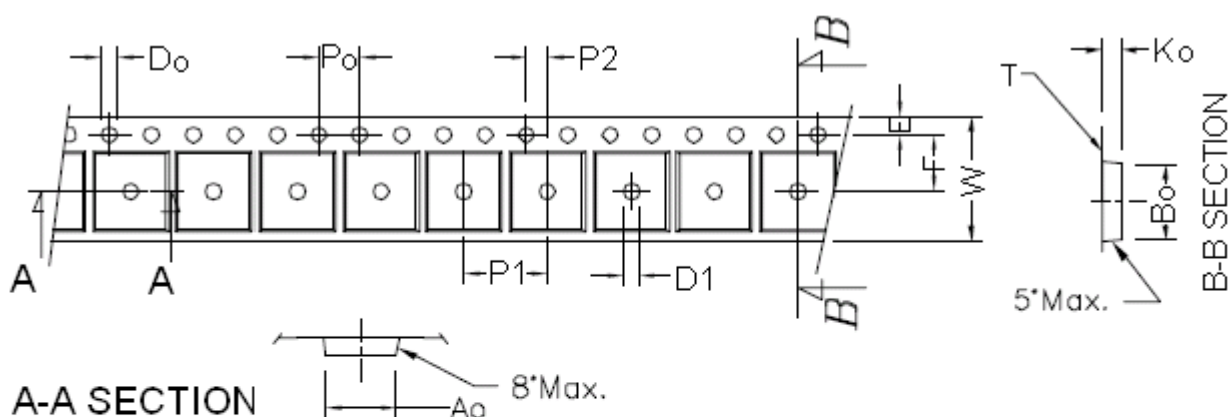
Reel Dimension



UNIT : mm

NOTE : 1. Material : Anti-static polystyrene
2. Surface resistivity $10^9 \Omega/\text{sq}$

Carrier Tape Dimension



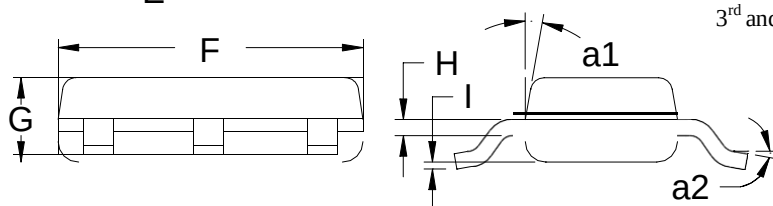
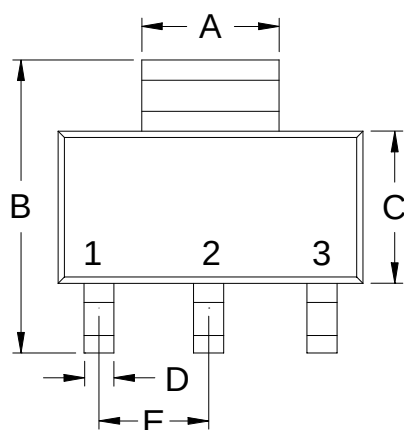
A-A SECTION

8°Max.
 Ao

Symbol	Ao	Bo	Ko	Po	$P1$	$P2$	T
Spec	6.83 ± 0.1	7.42 ± 0.1	1.88 ± 0.1	4.0 ± 0.1	8.0 ± 0.10	2.0 ± 0.05	0.292 ± 0.02
Symbol	E	F	Do	$D1$	W	$10Po$	
Spec	1.75 ± 0.1	5.5 ± 0.05	1.60 ± 0.1	1.5 ± 0.25	$12^{+0.3}_{-0.1}$	40.0 ± 0.2	

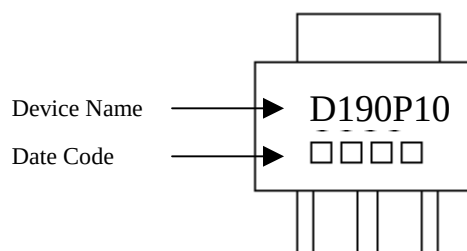
Unit : mm

SOT-223 Dimension



Style: Pin 1.Gate 2.Drain 3.Source

Marking:



Date Code(counting from left to right) :
 1st code: year code, the last digit of Christian year
 2nd code : month code, Jan→A, Feb→B, Mar→C, Apr→D, May→E, Jun→F, Jul→G, Aug→H, Sep→J, Oct→K, Nov→L, Dec→M
 3rd and 4th codes : production serial number, 01~99

3-Lead SOT-223 Plastic
 Surface Mounted Package

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1142	0.1220	2.90	3.10	G	0.0551	0.0709	1.40	1.80
B	0.2638	0.2874	6.70	7.30	H	0.0098	0.0138	0.25	0.35
C	0.1299	0.1457	3.30	3.70	I	0.0008	0.0039	0.02	0.10
D	0.0236	0.0315	0.60	0.80	a1	*13 ⁰	-	*13 ⁰	-
E	*0.0906	-	*2.30	-	a2	0 ⁰	10 ⁰	0 ⁰	10 ⁰
F	0.2480	0.2638	6.30	6.70					