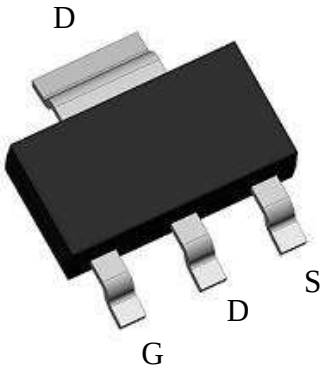
N-Channel Enhancement Mode Power MOSFET

SOT-223



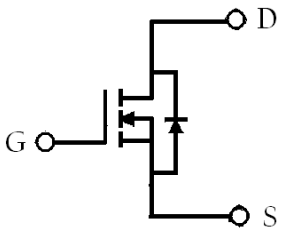
Description:

The KLB280N15 is a N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The SOT-223 package is universally preferred for all commercial-industrial surface mount applications.

Features:

- Simple Drive Requirement
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free package

BV_{DSS}	**150V**
I_D@V_{GS}=10V,T_A=25°C	**2A**
R_{DSON}@V_{GS}=10V, I_D=1.5A	**297mΩ(typ)**
R_{DSON}@V_{GS}=4.5V, I_D=1A	**304mΩ(typ)**



G：Gate　D：Drain　S：Source

Ordering Information

Device	Package	Shipping
KLB280N15	SOT-223 (Pb-free lead plating and halogen-free package)	2500 pcs / tape & reel

Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current @V_{GS}=10V, T_C=25°C		I_D	3	A
Continuous Drain Current @V_{GS}=10V, T_C=100°C			1.9	
Continuous Drain Current @V_{GS}=10V, T_A=25°C			2	
Continuous Drain Current @V_{GS}=10V, T_A=70°C			1.6	
Pulsed Drain Current		I_{DM}	8 *1	
Total Power Dissipation	T_C=25℃	P_D	6.25	W
	T_C=100℃		2.5	
	T_A=25℃		2.8	
	T_A=100℃		1.1	
Operating Junction and Storage Temperature Range		Tj, Tstg	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	20	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	45 *3	

Note : 1. Pulse width limited by maximum junction temperature
2. Duty cycle≤1%
3. Surface mounted on 1 in² copper pad of FR-4 board, 120°C/W when mounted on minimum copper pad

Characteristics (T_C=25°C, unless otherwise specified)

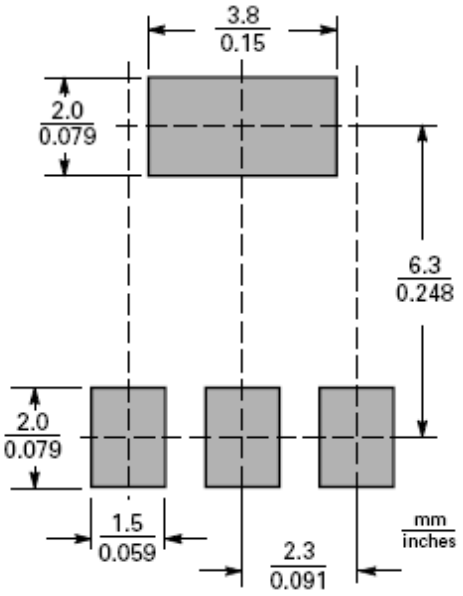
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	150	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	1	-	2.5		V_{DS} = V_{GS}, I_D=250μA
G_{FS} *1	-	5.9	-	S	V_{DS} =10V, I_D=3A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS} =120V, V_{GS} =0V
	-	-	25		V_{DS} =120V, V_{GS} =0V, Tj=125°C
$R_{DS(ON)}$ *1	-	297	360	mΩ	V_{GS} =10V, I_D=1.5A
	-	304	400		V_{GS} =4.5V, I_D=1A
Dynamic					
Ciss	-	288	374	pF	V_{GS}=0V, V_{DS}=75V, f=1MHz
Coss	-	25	50		
Crss	-	11	22		

Characteristics (T_C=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Qg *1, 2	-	8.1	12	nC	V_{DS}=75V, V_{GS}=10V, I_D=1.7A
Qgs *1, 2	-	1	-		
Qgd *1, 2	-	1.9	-		
$t_{d(ON)}$ *1, 2	-	5.2	12	ns	V_{DS}=75V, I_D=1A, V_{GS}=10V, R_{GS}=6Ω
tr *1, 2	-	16.2	33		
$t_{d(OFF)}$ *1, 2	-	20.8	42		
t_f *1, 2	-	15.6	32		
Rg	-	4.6	-	Ω	f=1MHz
Source-Drain Diode					
I_S *1	-	-	2	A	
I_{SM} *3	-	-	8		
V_{SD} *1	-	0.79	1.2	V	I_S=1.5A, V_{GS}=0V
trr	-	39	60	ns	I_F=1.7A, dI_F/dt=100A/μs
Qrr	-	43	65	nC	

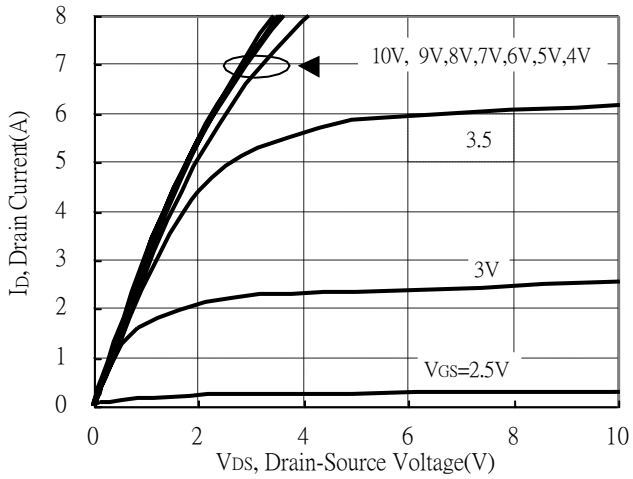
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2.Independent of operating temperature
*3.Pulse width limited by maximum junction temperature.

Recommended soldering footprint

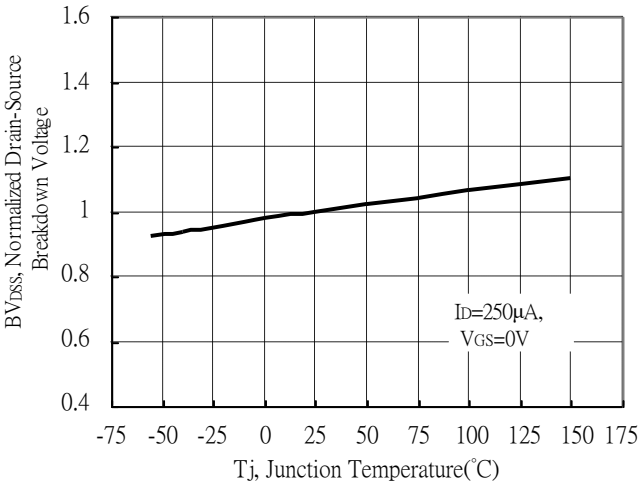


Typical Characteristics

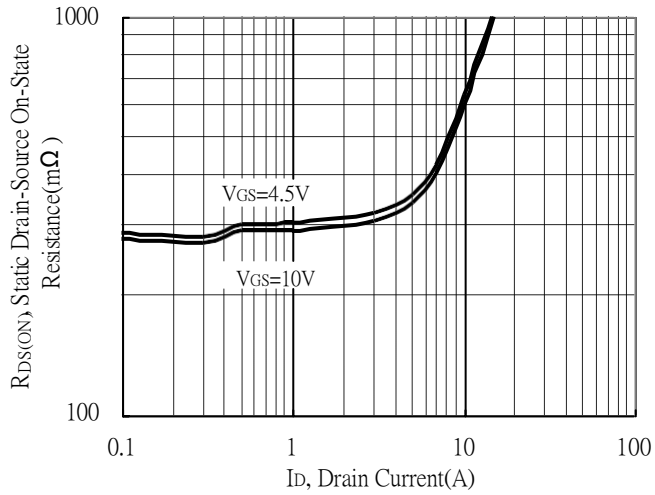
Typical Output Characteristics



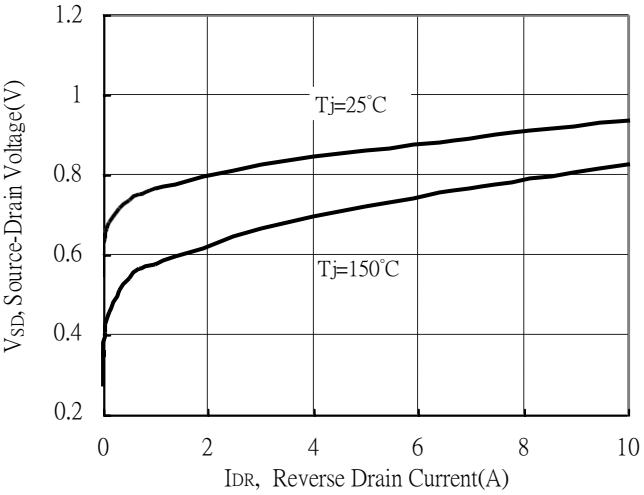
Brekdown Voltage vs Ambient Temperature



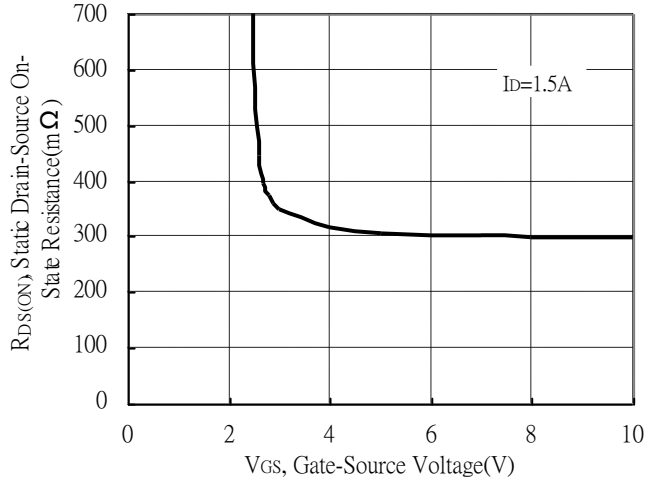
Static Drain-Source On-State resistance vs Drain Current



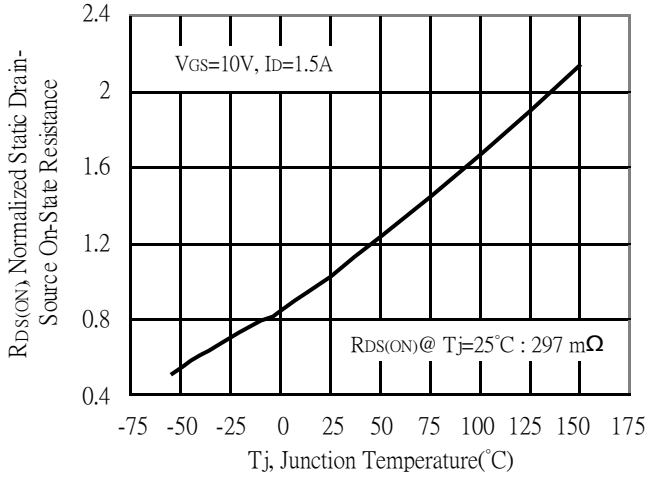
Reverse Drain Current vs Source-Drain Voltage



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

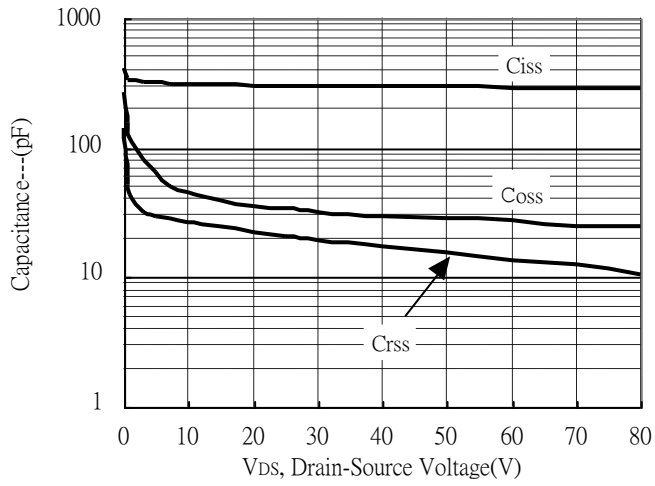


Drain-Source On-State Resistance vs Junction Tempearture

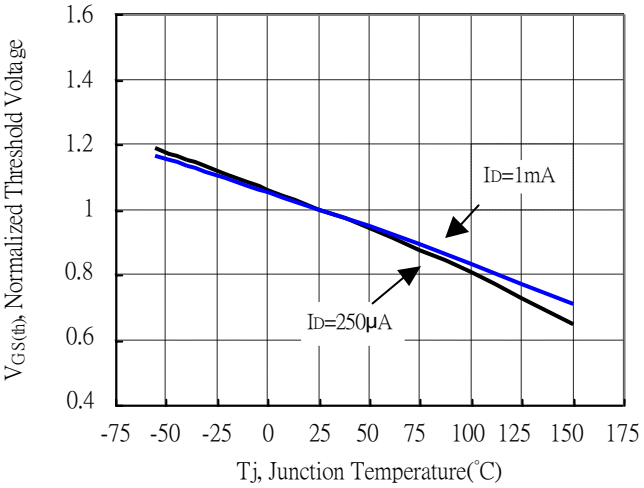


Typical Characteristics(Cont.)

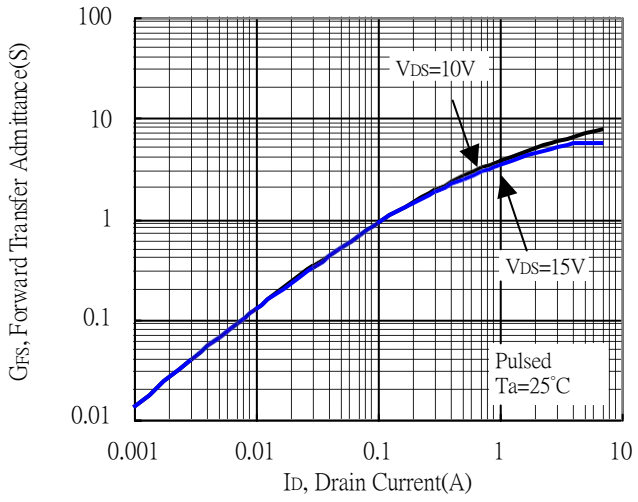
Capacitance vs Drain-to-Source Voltage



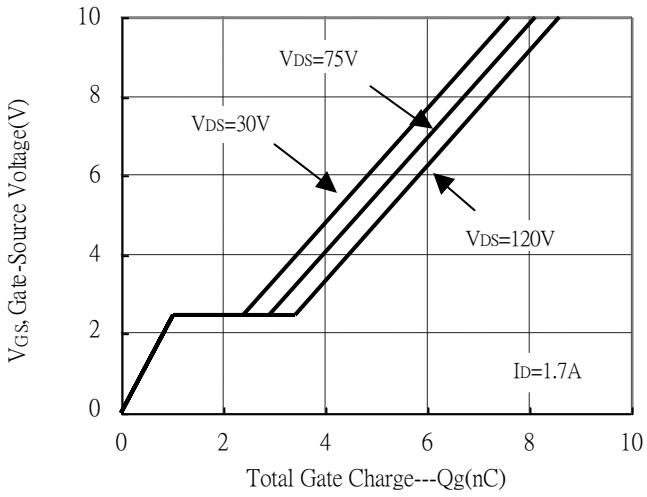
Threshold Voltage vs Junction Tempearture



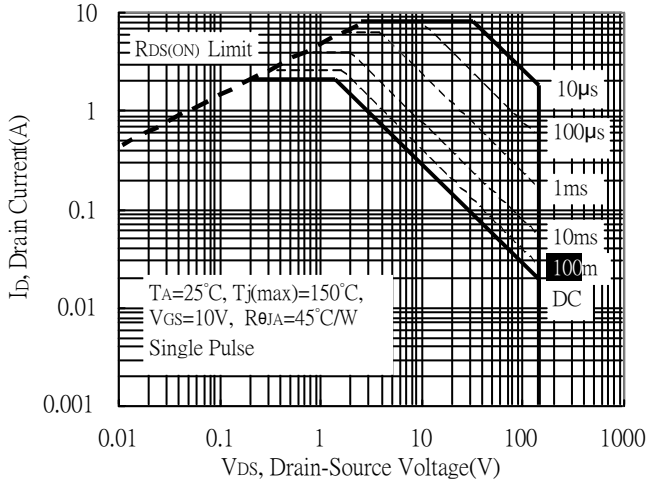
Forward Transfer Admittance vs Drain Current



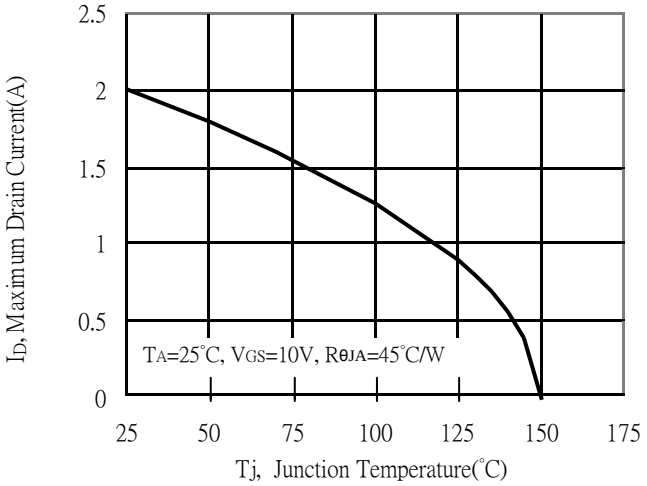
Gate Charge Characteristics



Maximum Safe Operating Area

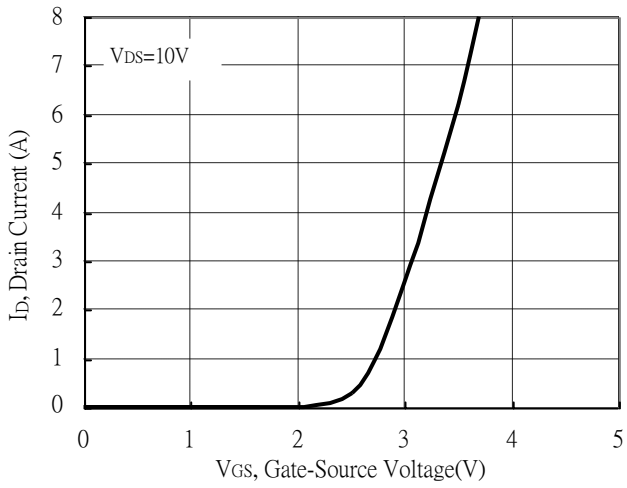


Maximum Drain Current vs Junction Temperature

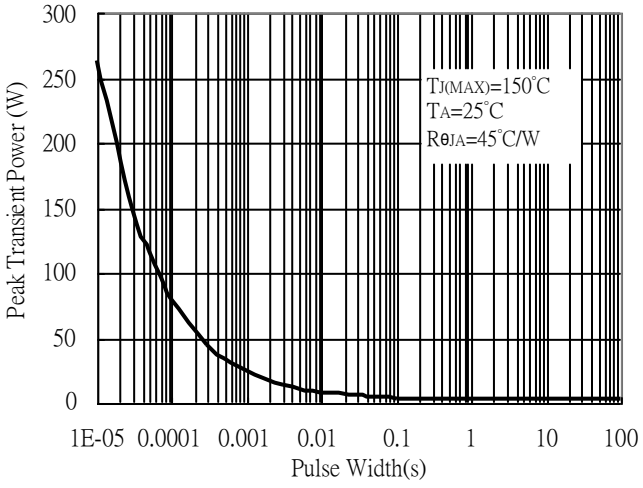


Typical Characteristics(Cont.)

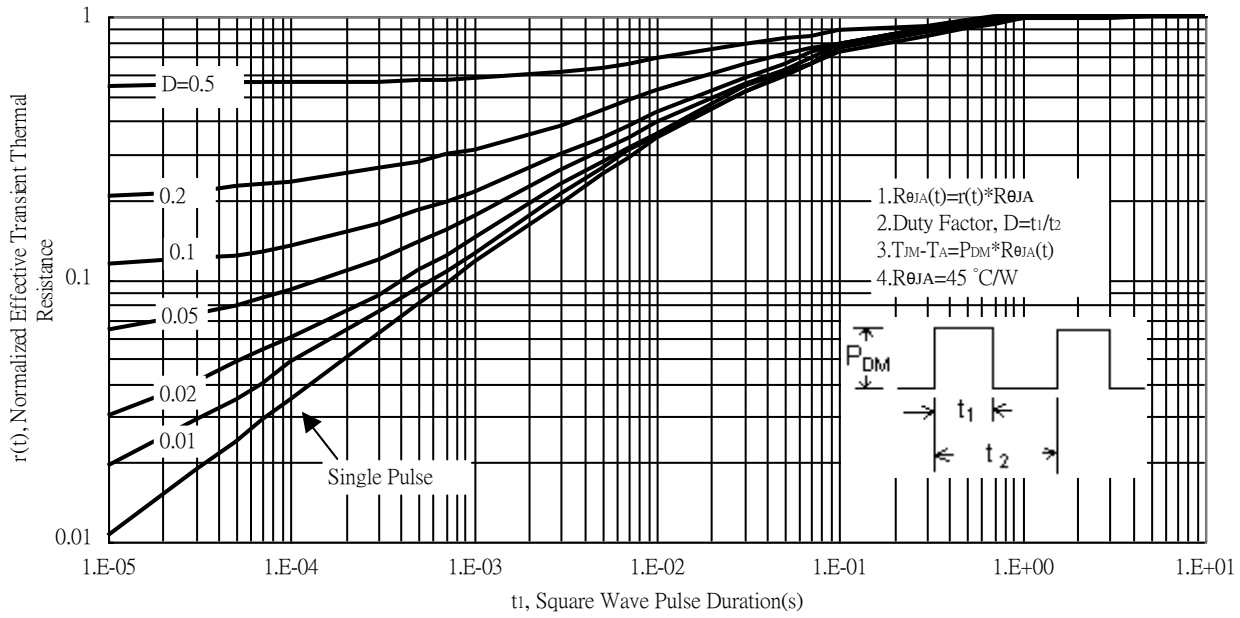
Typical Transfer Characteristics



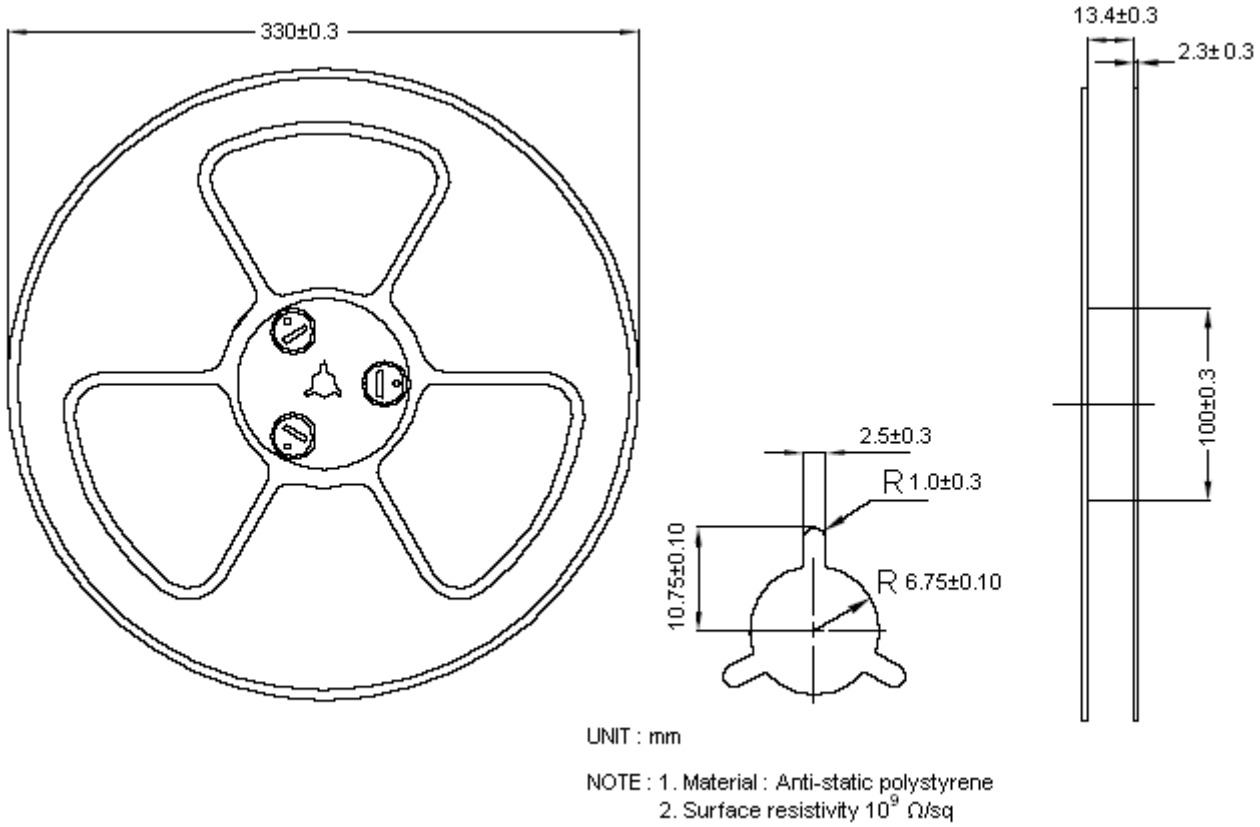
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curves



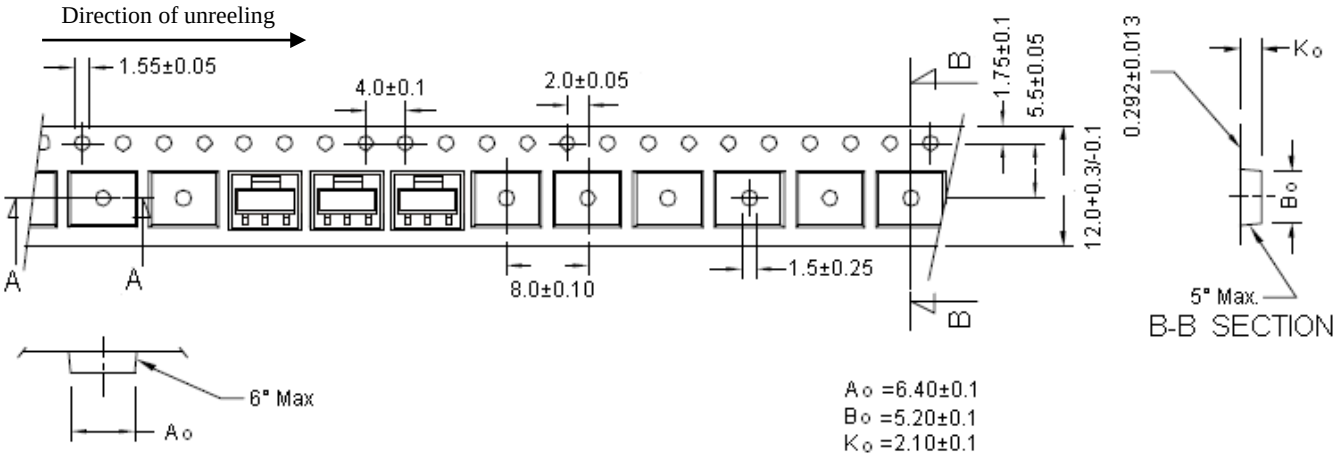
Reel Dimension



UNIT : mm

NOTE : 1. Material : Anti-static polystyrene
2. Surface resistivity 10^9 Ω/sq

Carrier Tape Dimension

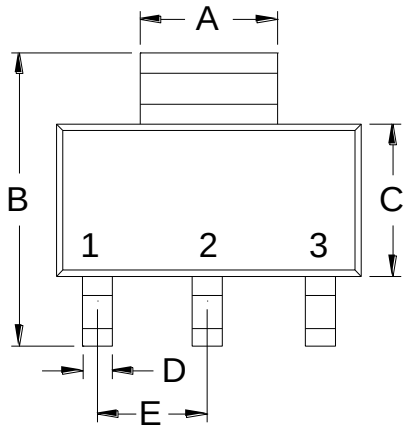


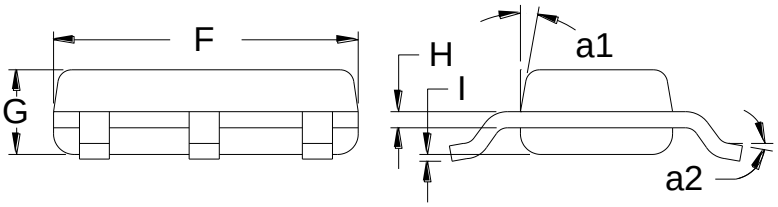
Ao =6.40±0.1
Bo =5.20±0.1
Ko =2.10±0.1

Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

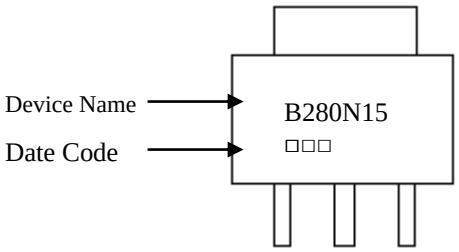
Uni : millimeter

SOT-223 Dimension





Marking:



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

3-Lead SOT-223 Plastic
Surface Mounted Package

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

*: 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	0.23	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°	-	*13°	-
E	*0.0906	-	*2.30	-	a2	0 °	10 °	0 °	10 °
F	0.2480	0.2638	6.30	6.70					