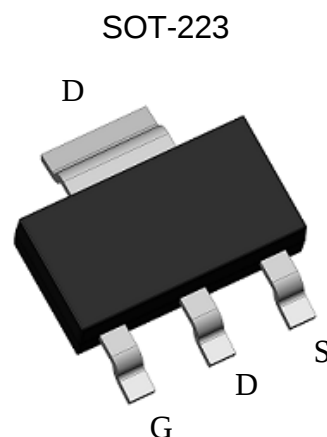


N-Channel Enhancement Mode MOSFET

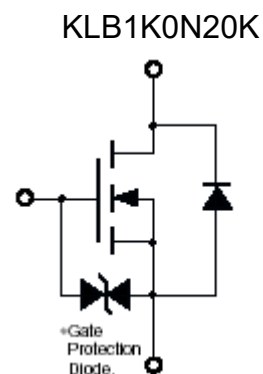
Features:

- Low Gate Charge
- Simple Drive Requirement
- ESD protected gate, HBM 6kV, typically
- Pb-free lead plating & Halogen-free package

Outline



Equivalent Circuit



G : Gate D : Drain
S : Source

BV_{DSS}	200V
I_D @ V_{GS}=10V, T_A=25°C	1A
R_{DS(on)}@V_{GS}=10V, I_D=2A	830mΩ (typ.)
R_{DS(on)}@V_{GS}=4.5V, I_D=1A	777mΩ (typ.)

Ordering Information

Device	Package	Shipping
KLB1K0N20K	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}	200	V
Gate-Source Voltage	V _{GS}	±20	
Continuous Drain Current @ T _A =25°C, V _{GS} =10V	I _D	1	A
Continuous Drain Current @ T _A =70°C, V _{GS} =10V		0.8	
Pulsed Drain Current *1	I _{DM}	4	
Avalanche Current @ L=0.1mH	I _{AS}	2	mJ
Avalanche Energy @ L=1mH, I _D =2A, V _{DD} =50V *2	E _{AS}	2	
Repetitive Avalanche Energy @ L=0.05mH	E _{AR}	0.625	
ESD susceptibility *3	V _{ESD}	6000	V
Total Power Dissipation @ T _A =25°C	P _D	2.4	W
Total Power Dissipation @ T _A =70°C		1.5	
Operating Junction and Storage Temperature Range	T _j , T _{stg}	-55~+150	°C

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

*2. Guaranteed by design, not by 100% test.

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

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{θJC}	10	°C/W
Thermal Resistance, Junction-to-ambient, max	R _{θJA}	52 (Note)	

Note : When mounted on a 1 in² pad of 2 oz. copper.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	200	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	1	-	3		V _{DS} =V _{GS} , I _D =250μA
G _{FS} *1	-	3.1	-	S	V _{DS} =10V, I _D =1A
I _{GSS}	-	-	±10	μA	V _{GS} =±16V, V _{DS} =0V
I _{DSS}	-	-	1		V _{DS} =160V, V _{GS} =0V
	-	-	25		V _{DS} =160V, V _{GS} =0V, T _j =125°C
R _{DS(ON)} *1	-	0.83	1.08	Ω	V _{GS} =10V, I _D =2A
	-	0.78	1.6		V _{GS} =4.5V, I _D =1A
Dynamic					
Q _g *1, 2	-	5.2	7.8	nC	V _{DS} =150V, V _{GS} =5V, I _D =3.6A
Q _{gs} *1, 2	-	1	1.5		
Q _{gd} *1, 2	-	2.8	4.2		
t _{d(ON)} *1, 2	-	39	58.5	ns	V _{DS} =100V, I _D =3.6A, V _{GS} =5V, R _G =25Ω
t _r *1, 2	-	80.4	120.6		
t _{d(OFF)} *1, 2	-	94.2	141.3		
t _f *1, 2	-	59.2	88.8		

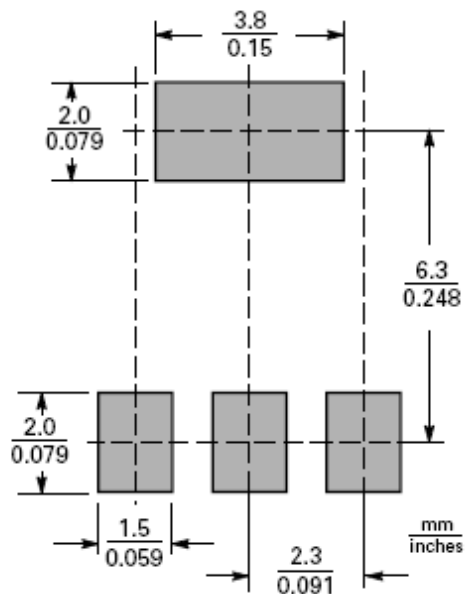
Ciss	-	273	409.5	pF	V _{GS} =0V, V _{DS} =30V, f=1MHz
Coss	-	21	31.5		
Crss	-	23	34.5		
Source-Drain Diode					
Is *1	-	-	1	A	
ISM *3	-	-	4		
VSD *1	-	0.8	1	V	IS=1A, VGS=0V
trr	-	46.8	-	ns	IF=3.6A, dIF/dt=100A/μs
Qrr	-	72.2	-	nC	

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

*2.Independent of operating temperature

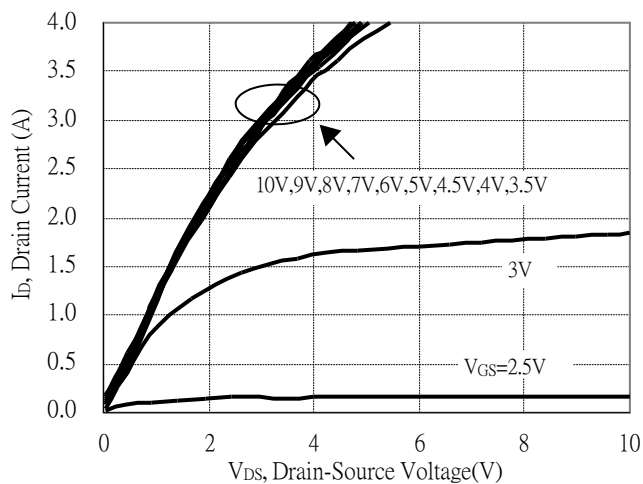
*3.Pulse width limited by maximum junction temperature.

Recommended soldering footprint

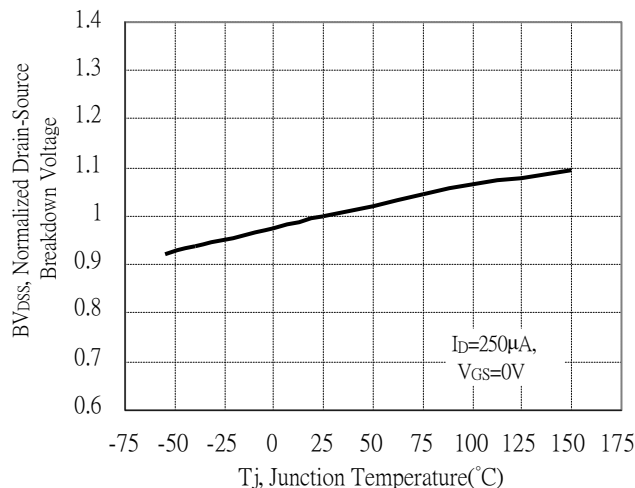


Typical Characteristics

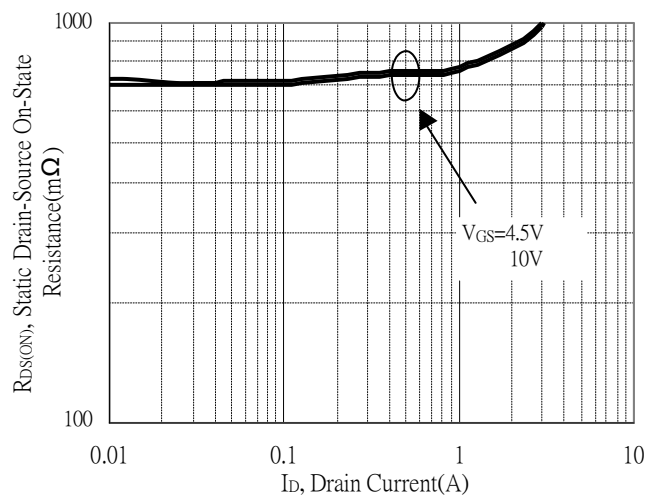
Typical Output Characteristics



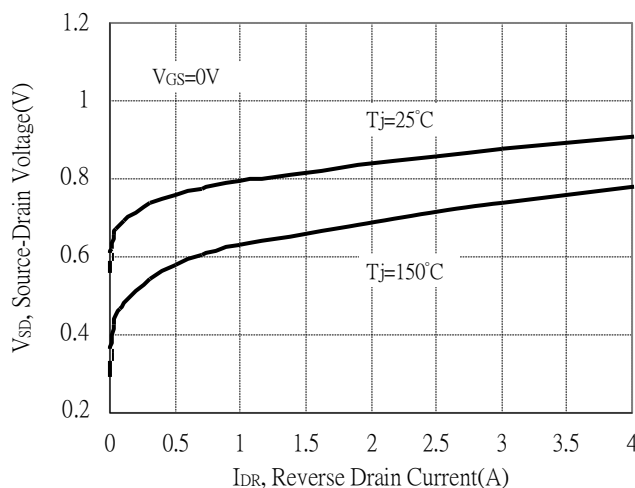
Breakdown Voltage vs Junction Temperature



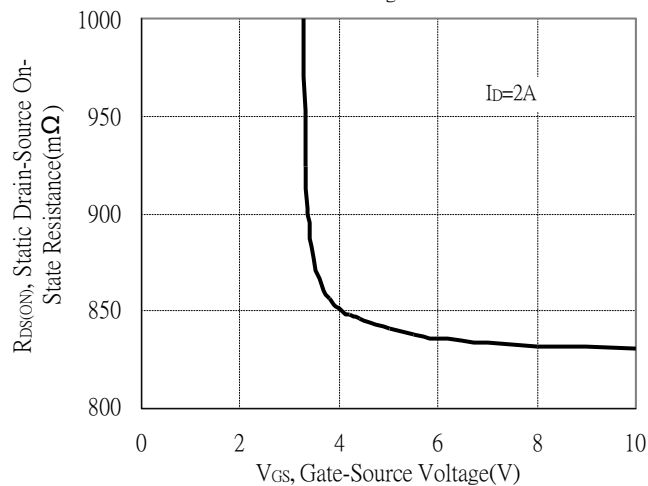
Static Drain-Source On-State resistance vs Drain Current



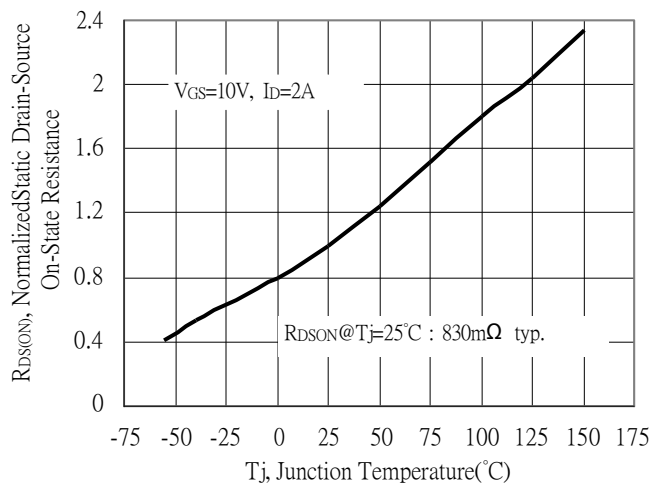
Reverse Drain Current vs Source-Drain Voltage



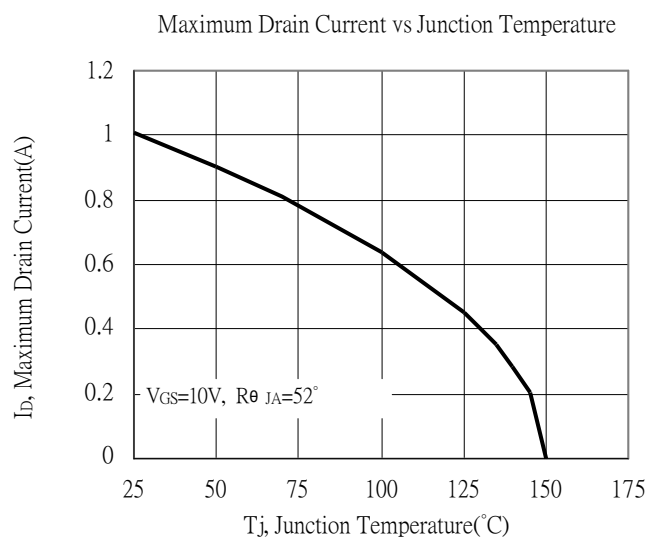
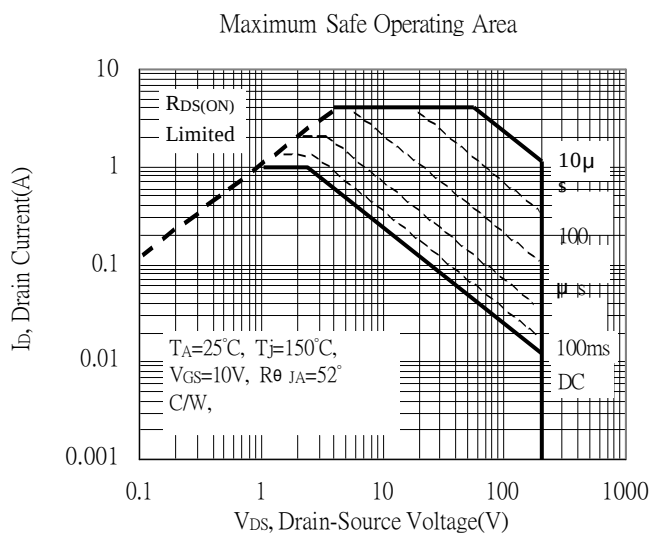
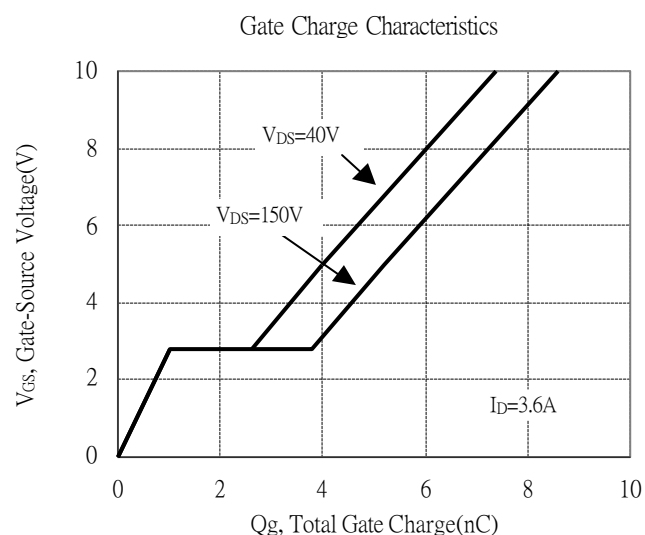
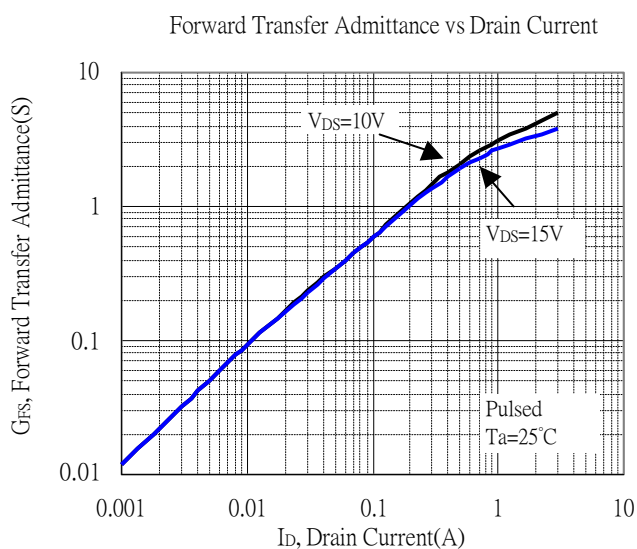
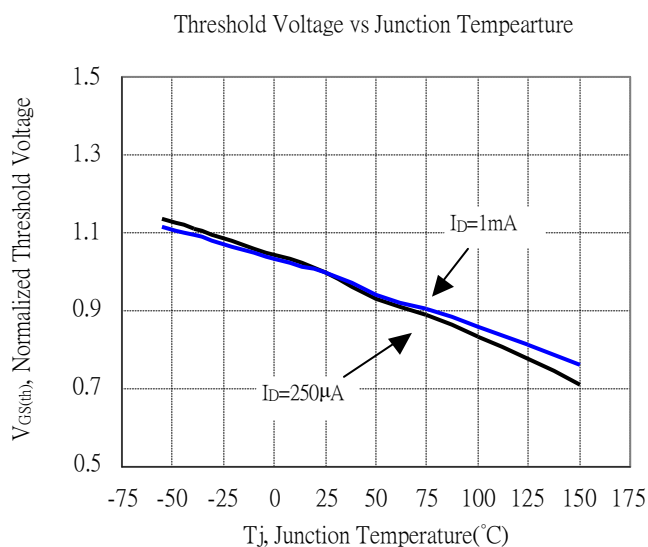
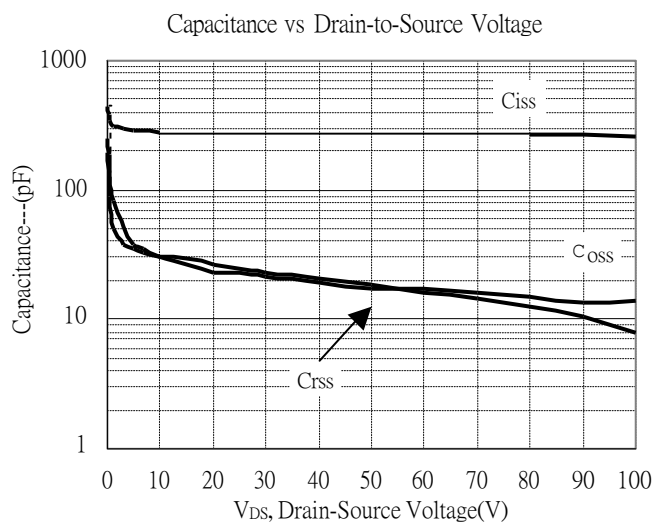
Static Drain-Source On-State Resistance vs Gate-Source Voltage



Drain-Source On-State Resistance vs Junction Temperature

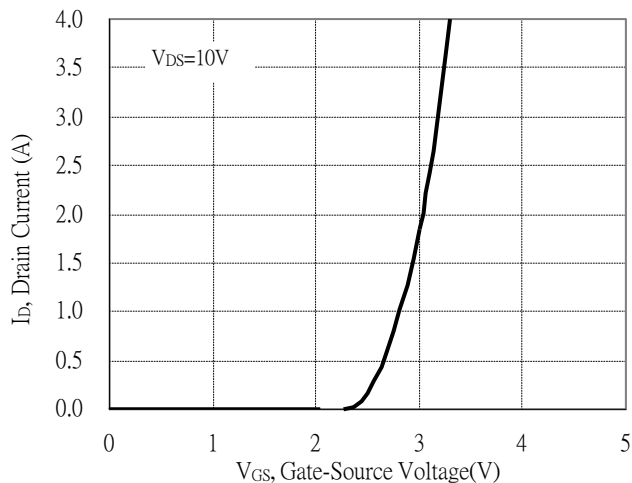


Typical Characteristics(Cont.)

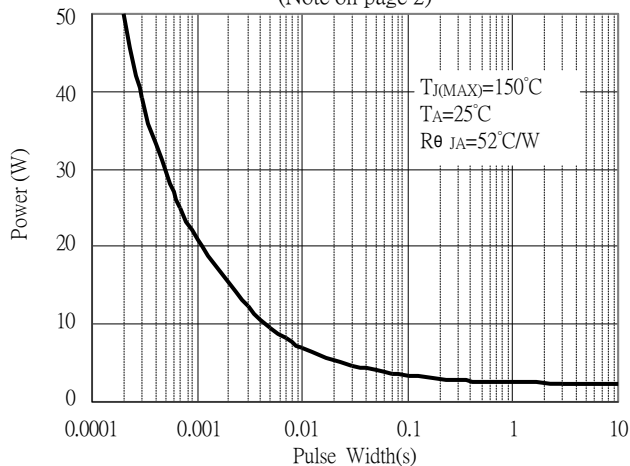


Typical Characteristics(Cont.)

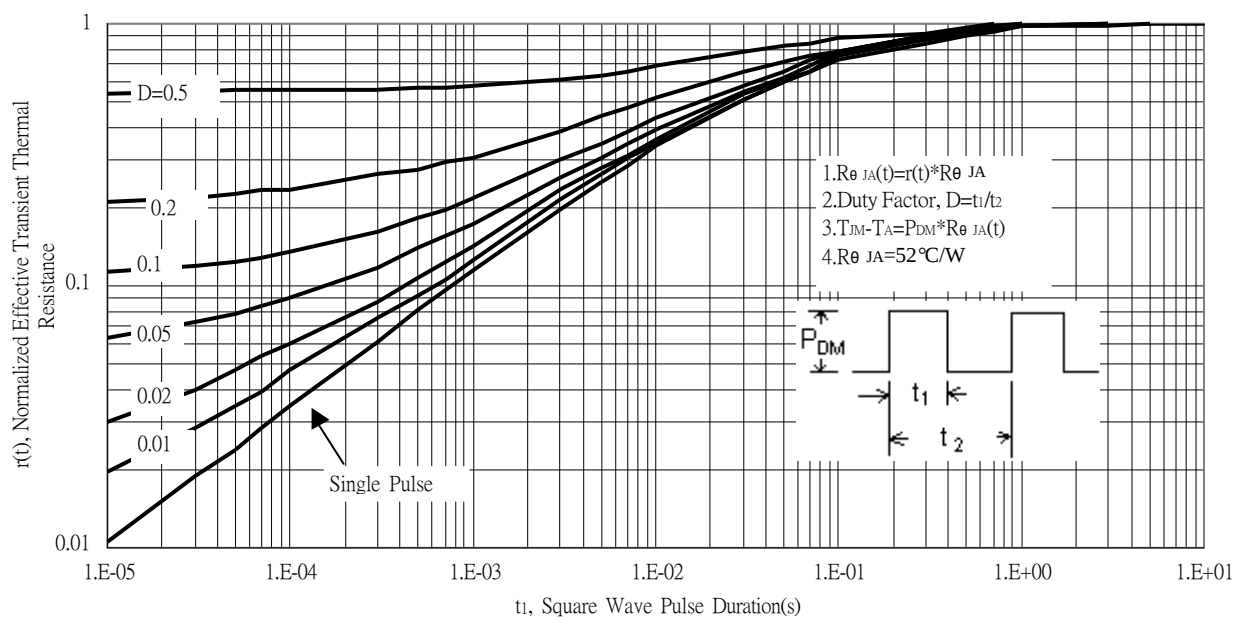
Typical Transfer Characteristics



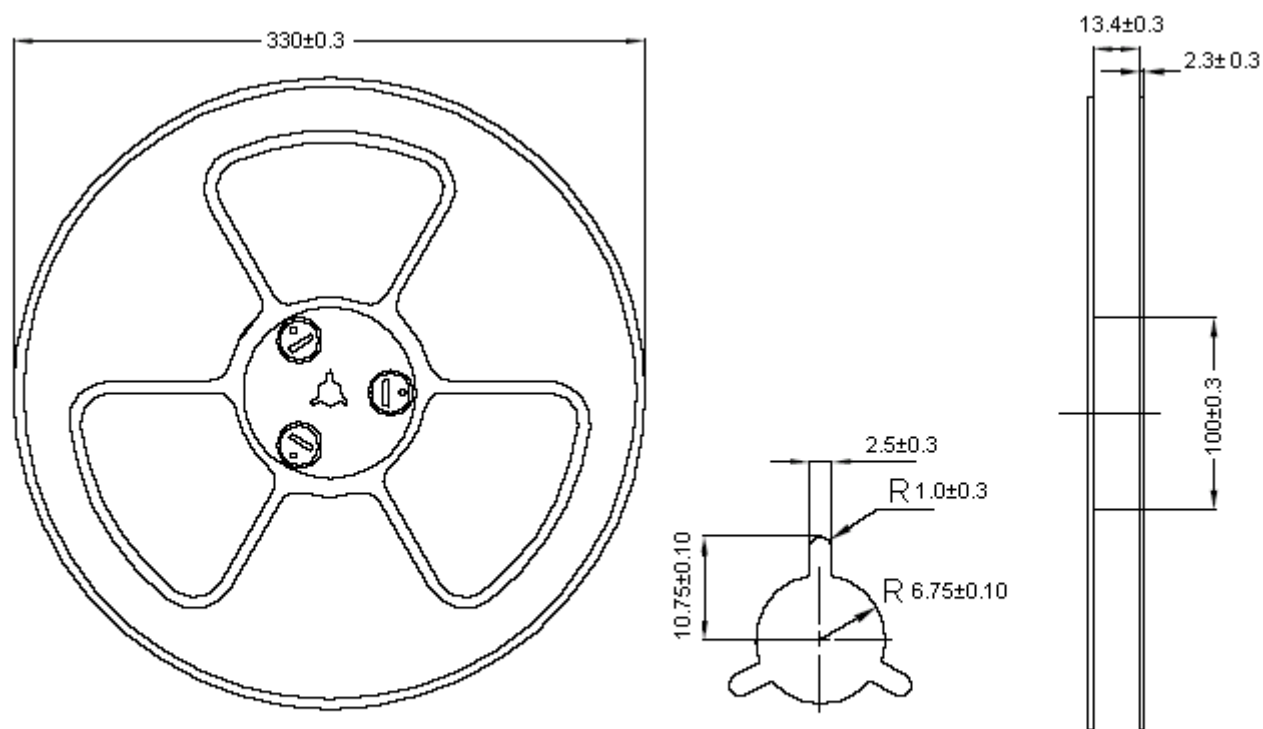
Single Pulse Power Rating, Junction to Ambient
 (Note on page 2)



Transient Thermal Response Curves



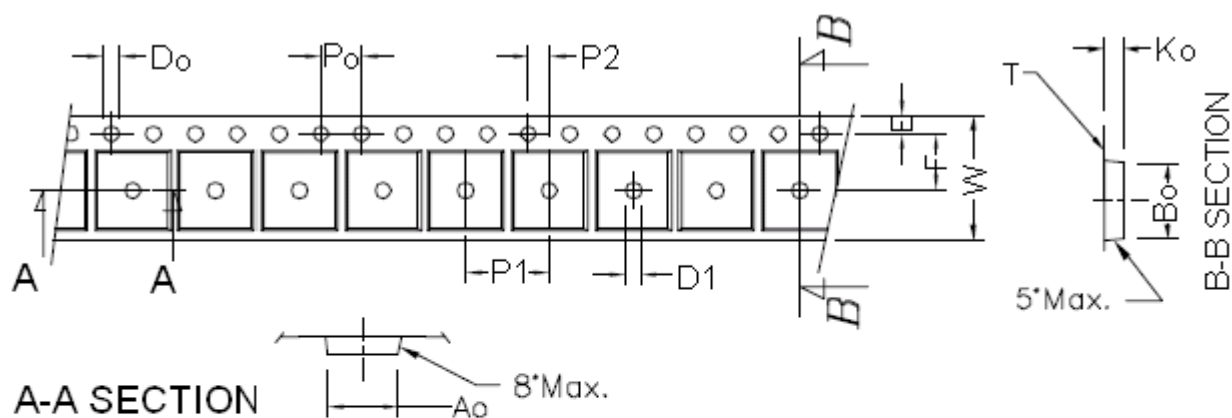
Reel Dimension



UNIT : mm

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

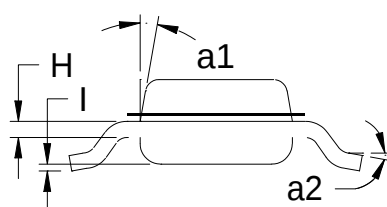
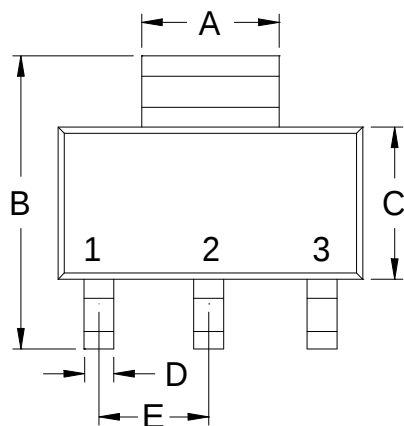
Carrier Tape Dimension



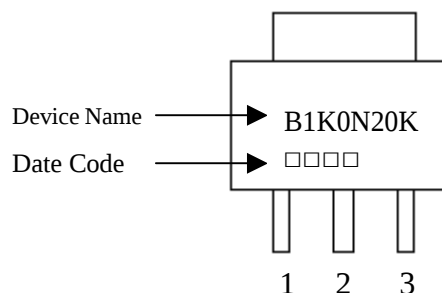
Symbol	A ₀	B ₀	K ₀	P ₀	P1	P2	T
Spec	6.83±0.1	7.42±0.1	1.88±0.1	4.0±0.1	8.0±0.10	2.0±0.05	0.292±0.02
Symbol	E	F	D ₀	D1	W	10P ₀	
Spec	1.75±0.1	5.5±0.05	1.60±0.1	1.5±0.25	12 ^{+0.3} _{-0.1}	40.0±0.2	

Unit: mm

SOT-223 Dimension



Marking:



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

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