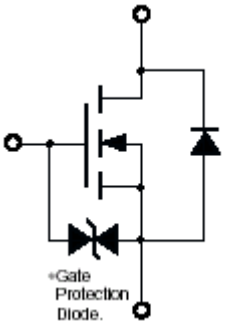
N-Channel Enhancement Mode Power MOSFET

TO-252(DPAK)

G D S

Features:

- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- ESD protected gate
- RoHS compliant package



G：Gate D：Drain S：Source

BV_{DSS}	**60V**
I_D@V_{GS}=10V, T_C=25°C	**38A**
I_D@V_{GS}=10V, T_A=25°C	**8.3A**
$R_{DS(ON)}$@V_{GS}=10V, I_D=8A	**13.4 mΩ (typ)**
$R_{DS(ON)}$@V_{GS}=4.5V, I_D=6A	**15.9 mΩ (typ)**
$R_{DS(ON)}$@V_{GS}=4V, I_D=4A	**17.2 mΩ (typ)**

Ordering Information

Device	Package	Shipping
KJB20N06K	TO-252 (Pb-free lead plating and halogen-free package)	2500 pcs / Tape & Reel

Absolute Maximum Ratings (T_C=25°C)

Parameter			Symbol	Limits	Unit
Drain-Source Voltage (Note 1)			V_{DS}	60	V
Gate-Source Voltage			V_{GS}	±20	
Continuous Drain Current @T_C=25°C, V_{GS}=10V		(Note 1)	I_D	38*	A
Continuous Drain Current @T_C=100°C, V_{GS}=10V		(Note 1)		24*	
Continuous Drain Current @T_A=25°C, V_{GS}=10V		(Note 2)	I_{DSM}	8.3	
Continuous Drain Current @T_A=70°C, V_{GS}=10V		(Note 2)		6.6	
Pulsed Drain Current		(Note 3)	I_{DM}	136*	
Single Pulse Avalanche Current			I_{AS}	20	
Single Pulse Avalanche Energy @ L=0.5mH, I_D=20 Amps, V_{DD}=30V		(Note 4)	E_{AS}	100	mJ
Repetitive Avalanche Energy		(Note 3)	E_{AR}	2.1	
Power Dissipation	T_C=25°C	(Note 1)	P_D	50	W
	T_C=100°C	(Note 1)		20	
	T_A=25°C	(Note 2)	P_{DSM}	2.5	
	T_A=70°C	(Note 2)		1.6	
Operating Junction and Storage Temperature			Tj, Tstg	-55~+150	

*Drain current limited by maximum junction temperature

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{\theta JC}$	2.5	°C/W
Thermal Resistance, Junction-to-ambient, max (Note 2)	$R_{\theta JA}$	50	

Note : 1.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 limit for cases where additional heatsinking is used.

2. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in² FR-4 board with 2 oz. copper, in a still air environment with T_A=25°C. The power dissipation P_{DSM} is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150 °C. The value in any given application depends on the user's specific board design.

3. 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.

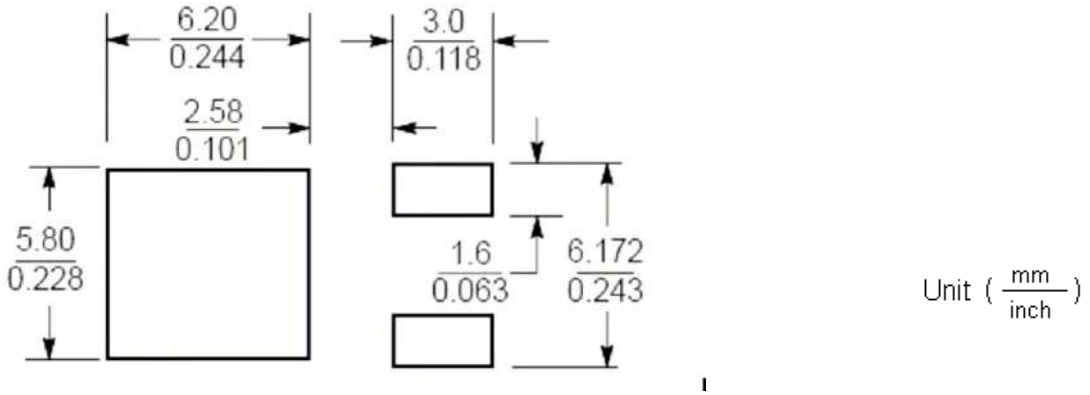
4. 100% tested by condition of V_{DD}=15V, I_D=2.4A, L=1mH, V_{GS}=10V.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	60	-	-	V	V_{GS}=0V, I_D=250μA
$\Delta BV_{DSS}/\Delta Tj$	-	50	-	mV/°C	Reference to 25°C, I_D=250μA
$V_{GS(th)}$	1	-	2.5	V	V_{DS} = 10V, I_D=1mA
*G_{FS}	-	14	-	S	V_{DS} =5V, I_D=5A
I_{GSS}	-	-	±10	μA	V_{GS}=±16V
I_{DSS}	-	-	1		V_{DS} =60V, V_{GS} =0V
	-	-	5		V_{DS} =48V, V_{GS} =0V, Tj=55°C
*$R_{DS(ON)}$	-	13.4	16.8	mΩ	V_{GS} =10V, I_D=8A
	-	15.9	21.5		V_{GS} =4.5V, I_D=6A
	-	17.2	26.0		V_{GS} =4V, I_D=4A
Dynamic					
*Qg	-	18.5	-	nC	V_{DD}=48V, I_D=22A,V_{GS}=10V
*Qgs	-	1.6	-		
*Qgd	-	8.4	-		
*$t_{d(ON)}$	-	8.6	-	ns	V_{DD}=30V, I_D=1A, V_{GS}=10V, R_G=6Ω
*tr	-	17.6	-		
*$t_{d(OFF)}$	-	39.8	-		
*t_f	-	20	-		
Ciss	-	736	-	pF	V_{GS}=0V, V_{DS}=20V, f=1MHz
Coss	-	140	-		
Crss	-	70	-		
Source-Drain Diode					
*I_S	-	-	24	A	
*I_{SM}	-	-	96		
*V_{SD}	-	0.8	1.2	V	I_S=8A, V_{GS}=0V
*trr	-	14	-	ns	V_{GS}=0V, I_F=22A, dI_F/dt=100A/μs
*Qrr	-	8.5	-	nC	

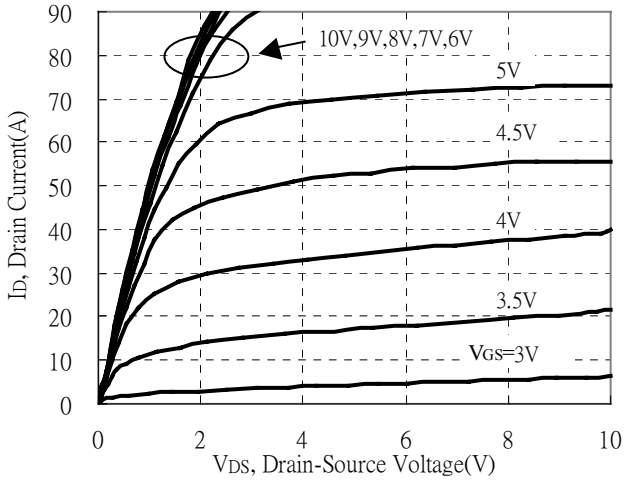
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Recommended soldering footprint

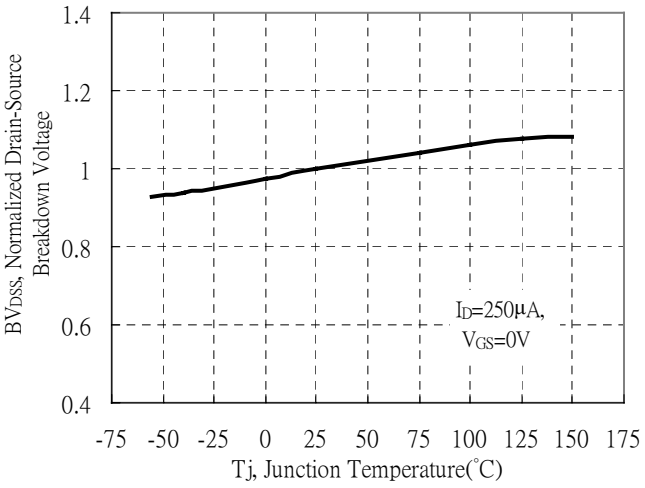


Typical Characteristics

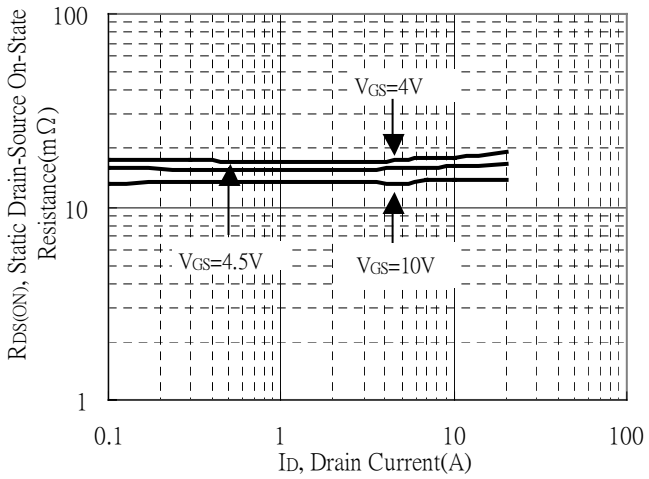
Typical Output Characteristics



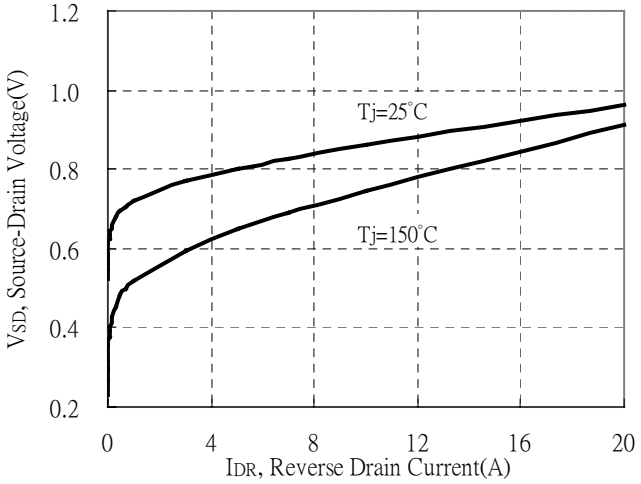
Brekdown Voltage vs Ambient Temperature



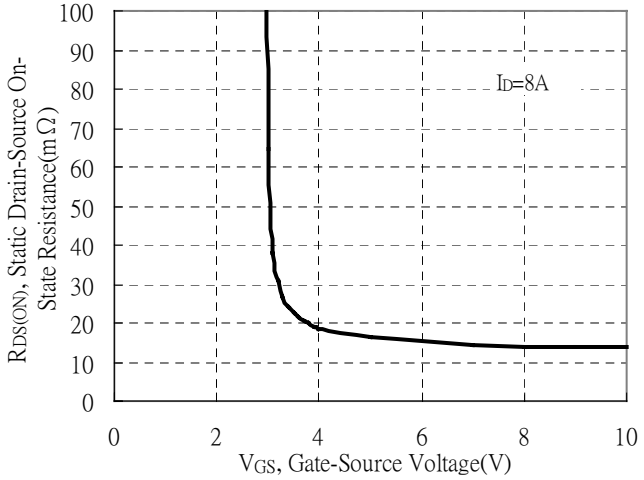
Static Drain-Source On-State resistance vs Drain Current



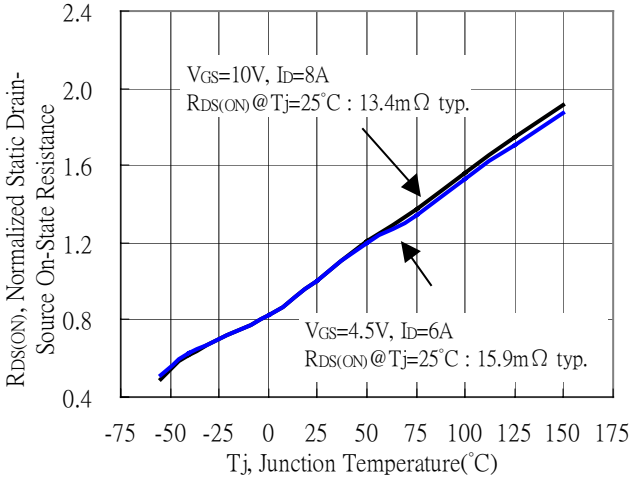
Reverse Drain Current vs Source-Drain Voltage



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

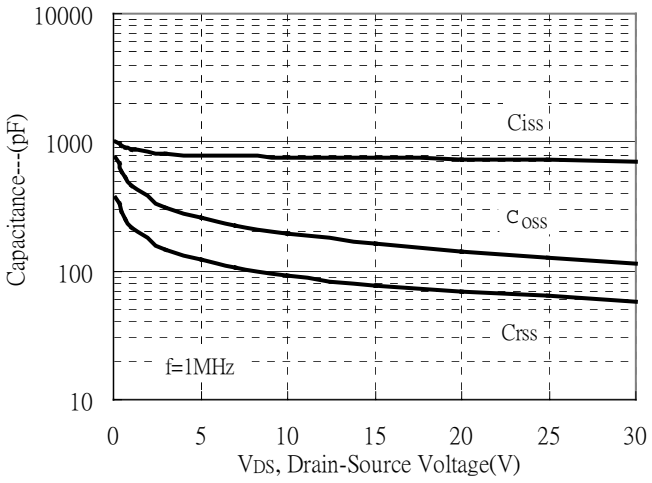


Drain-Source On-State Resistance vs Junction Tempearture

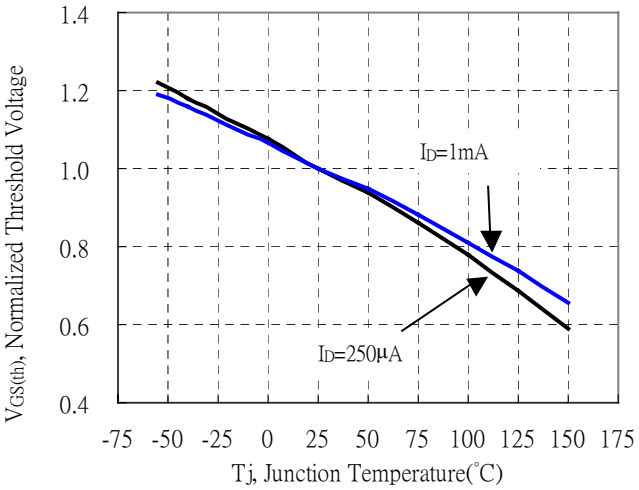


Typical Characteristics(Cont.)

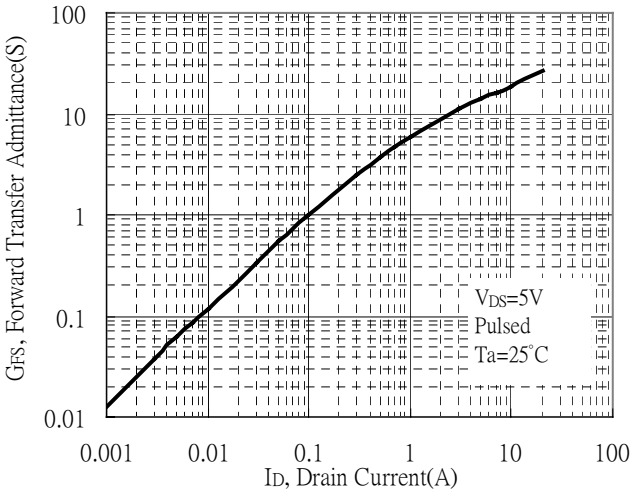
Capacitance vs Drain-to-Source Voltage



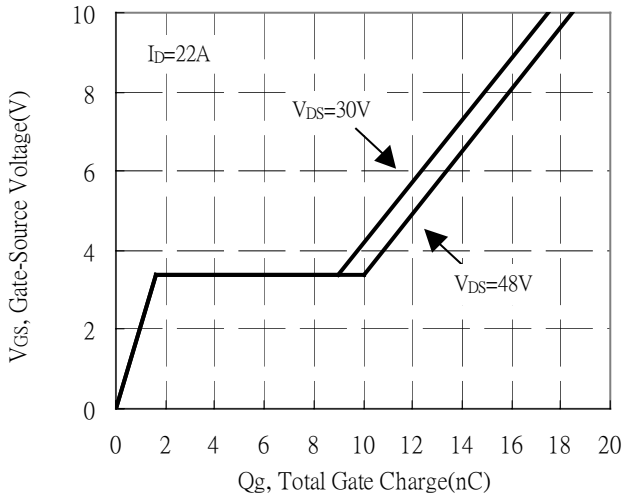
Threshold Voltage vs Junction Tempearture



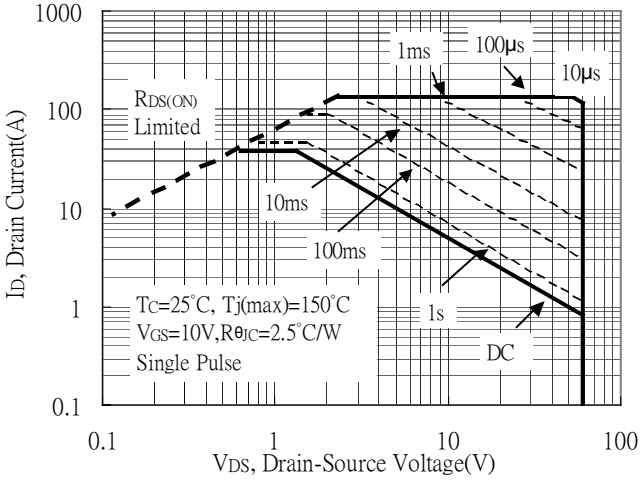
Forward Transfer Admittance vs Drain Current



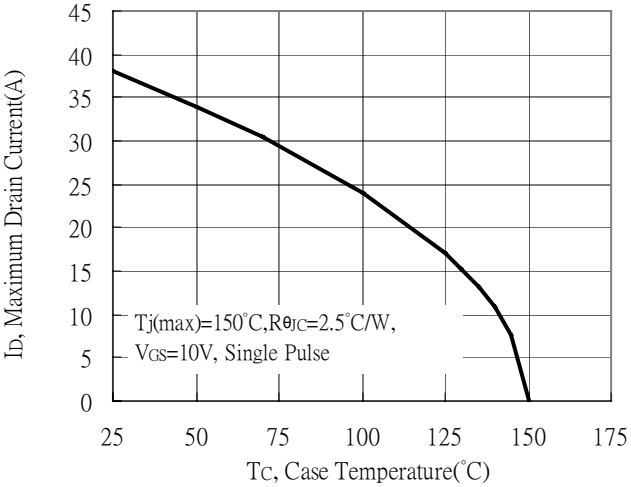
Gate Charge Characteristics



Maximum Safe Operating Area

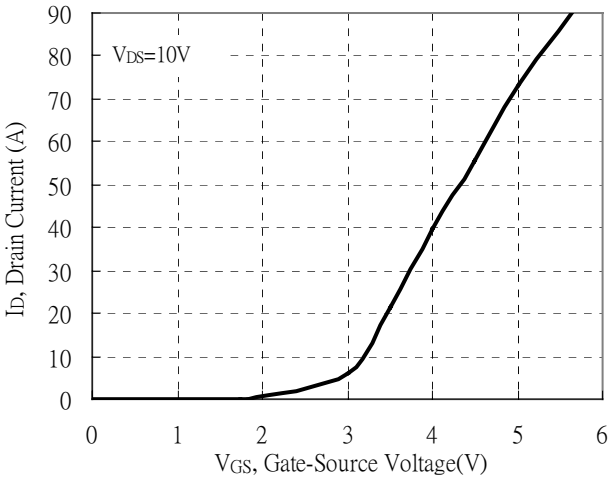


Maximum Drain Current vs Case Temperature

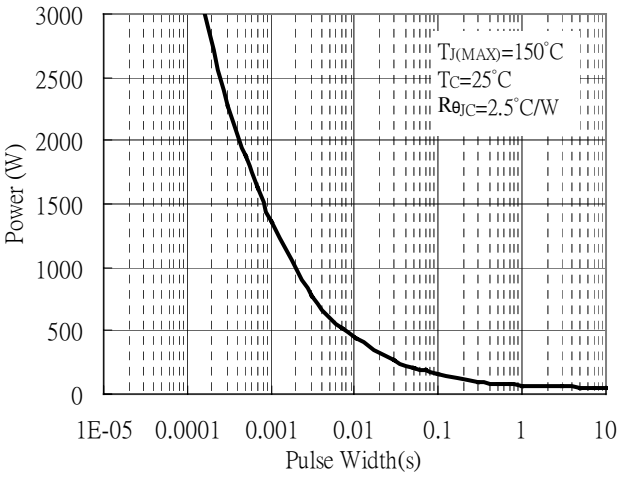


Typical Characteristics(Cont.)

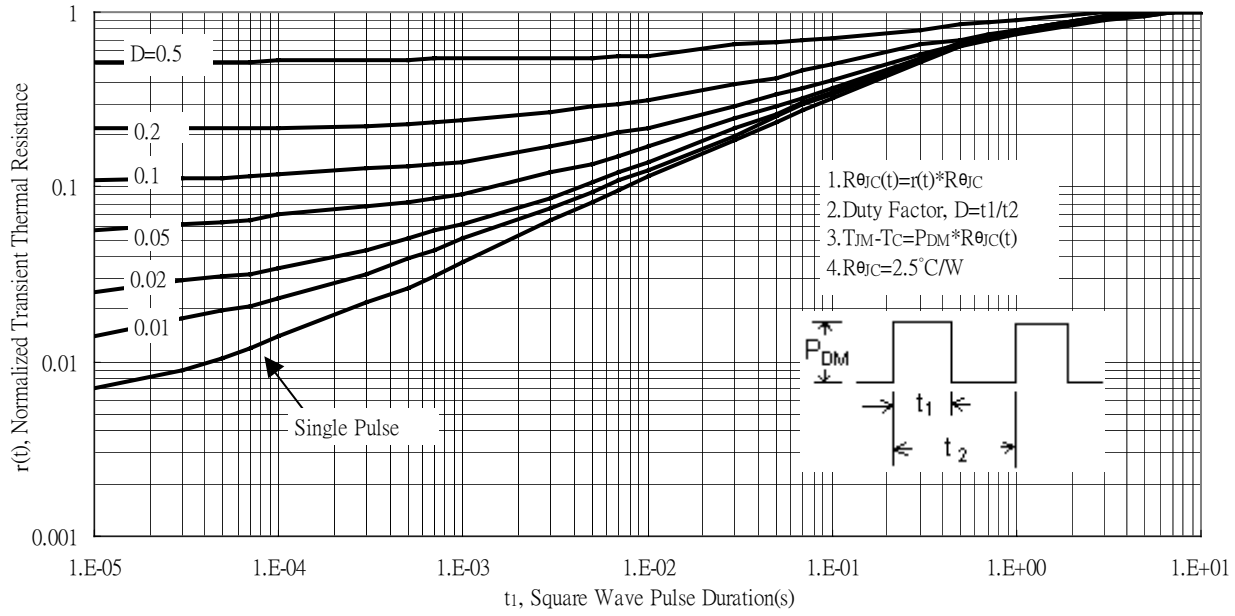
Typical Transfer Characteristics



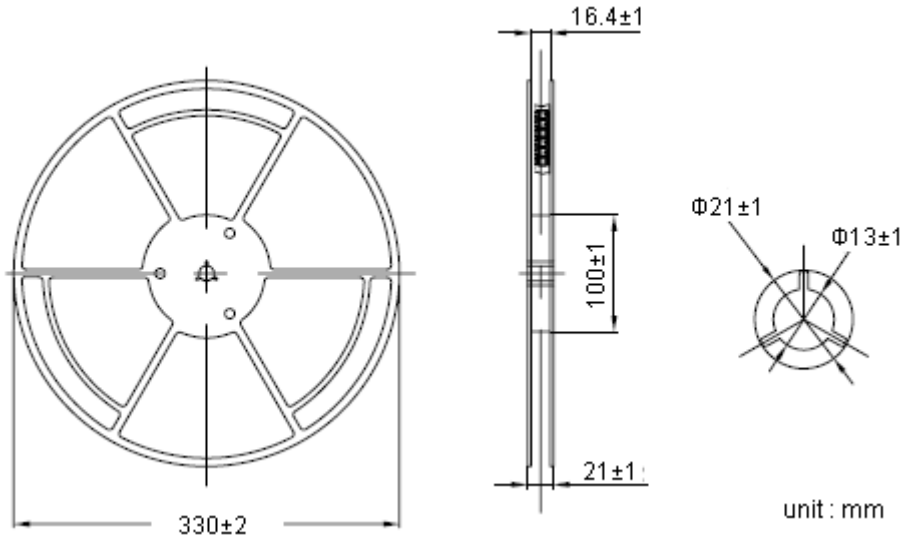
Single Pulse Power Rating, Junction to Case



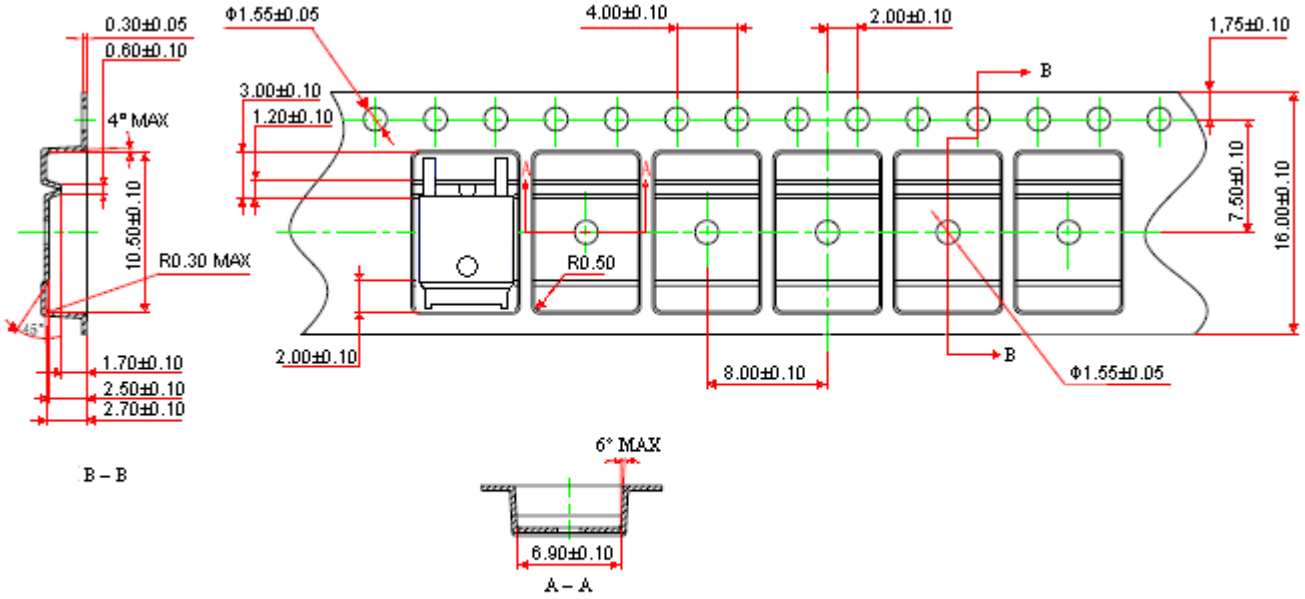
Transient Thermal Response Curves



Reel Dimension

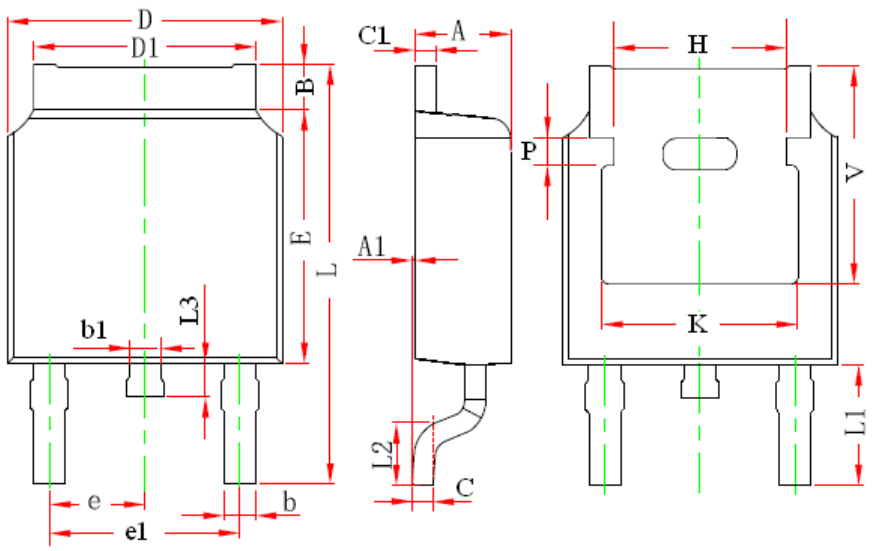


Carrier Tape Dimension

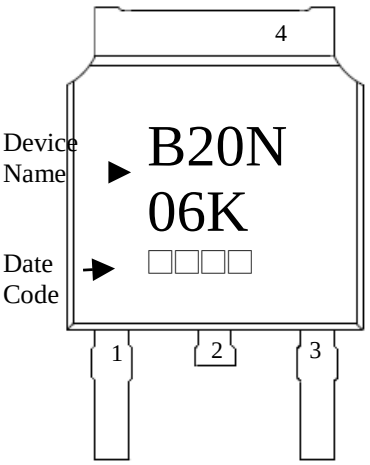


Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene, antistatic coated : 10^{5} Ω/□~ 10^{11} Ω/□ unit : mm

TO-252 Dimension



Marking:



3-Lead TO-252 Plastic Surface Mount Package

Style: Pin 1.Gate 2.Drain 3.Source 4.Drain

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.087	0.094	2.200	2.400	e	0.086	0.094	2.186	2.386
A1	0.000	0.005	0.000	0.127	e1	0.172	0.188	4.372	4.772
B	0.039	0.048	0.990	1.210	H	0.163	REF	4.140	REF
b	0.026	0.034	0.660	0.860	K	0.190	REF	4.830	REF
b1	0.026	0.034	0.660	0.860	L	0.386	0.409	9.800	10.400
C	0.018	0.023	0.460	0.580	L1	0.114	REF	2.900	REF
C1	0.018	0.023	0.460	0.580	L2	0.055	0.067	1.400	1.700
D	0.256	0.264	6.500	6.700	L3	0.024	0.039	0.600	1.000
D1	0.201	0.215	5.100	5.460	P	0.026	REF	0.650	REF
E	0.236	0.244	6.000	6.200	V	0.211	REF	5.350	REF