

N-Channel Enhancement Mode Power MOSFET

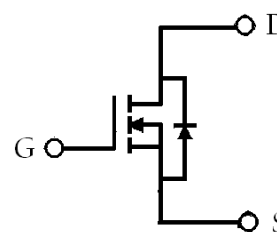
Features:

- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- Pb-free lead plating and halogen-free package

TO-252(DPAK)



BV_{DSS}	60V
I_D@ V_{GS}=10V, T_C=25°C	43A
R_{DS(ON)}@ V_{GS}=10V, I_D=20A	10.3 mΩ (typ)
R_{DS(ON)}@ V_{GS}=4.5V, I_D=20A	15.8 mΩ (typ)



G : Gate D : Drain S : Source

Ordering Information

Device	Package	Shipping
KJB010N06R	TO-252 (Pb-free lead plating & Halogen-free package)	2500 pcs / Tape & Reel

Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$)

Parameter	Symbol	Limits	Unit	
Drain-Source Voltage (Note 1)	V_{DS}	60	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current @ $T_C=25^{\circ}\text{C}$, $V_{GS}=10\text{V}$ (Note 1)	I_D	43	A	
Continuous Drain Current @ $T_C=100^{\circ}\text{C}$, $V_{GS}=10\text{V}$ (Note 1)		30.4		
Continuous Drain Current @ $T_A=25^{\circ}\text{C}$, $V_{GS}=10\text{V}$ (Note 4)	I_{DSM}	9.8		
Continuous Drain Current @ $T_A=70^{\circ}\text{C}$, $V_{GS}=10\text{V}$ (Note 4)		7.8		
Pulsed Drain Current @ $V_{GS}=10\text{V}$ (Note 3)	I_{DM}	172		
Avalanche Current (Note 3)	I_{AS}	32		
Single Pulse Avalanche Energy @ $L=0.1\text{mH}$, $I_D=32\text{A}$, $V_{DD}=30\text{V}$ (Note 2&5)	E_{AS}	51	mJ	
Repetitive Avalanche Energy (Note 3)	E_{AR}	5		
Power Dissipation	P_D	$T_C=25^{\circ}\text{C}$ (Note 1)	50	W
		$T_C=100^{\circ}\text{C}$ (Note 1)	25	
	P_{DSM}	$T_A=25^{\circ}\text{C}$ (Note 4)	3	
		$T_A=70^{\circ}\text{C}$ (Note 4)	0.96	
Operating Junction and Storage Temperature	T_j, T_{stg}	-55~+175	$^{\circ}\text{C}$	

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{\theta JC}$	3	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-ambient, max	$R_{\theta JA}$	50 (Note 4)	
		110	

- Note : 1. The power dissipation P_D is based on $T_{J(MAX)}=175^{\circ}\text{C}$, 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 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. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=175^{\circ}\text{C}$. Ratings are based on low frequency and low duty cycles to keep initial $T_J=25^{\circ}\text{C}$.
4. When the device is mounted on 1 in² FR-4 board with 2 oz. copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The value in any given application depends on the user's specific board design.
5. 100% tested by conditions of $L=0.1\text{mH}$, $V_{GS}=10\text{V}$, $I_{AS}=10\text{A}$, $V_{DD}=30\text{V}$

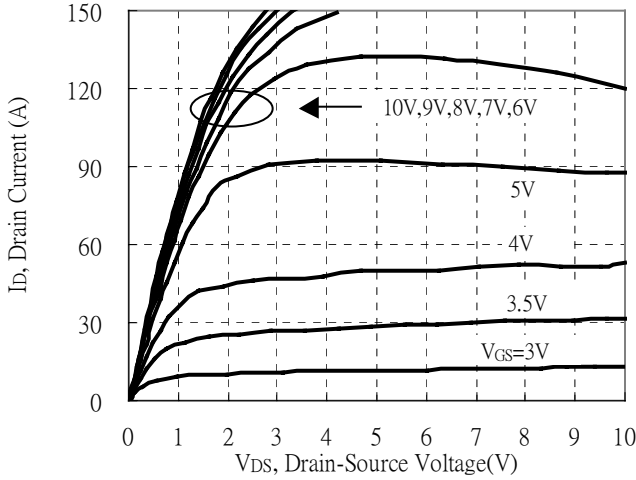
Characteristics (Tj=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	60	-	-	V	V _{GS} =0V, I _D =250μA
ΔBV _{DSS} /ΔT _j	-	0.04	-	V/°C	Reference to 25°C, I _D =250μA
V _{GS(th)}	1.0	-	2.5	V	V _{DS} = V _{GS} , I _D =250μA
*G _{FS}	-	9.5	-	S	V _{DS} =10V, I _D =5A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =48V, V _{GS} =0V
	-	-	10		V _{DS} =48V, V _{GS} =0V, T _j =125°C
*R _{DS(ON)}	-	10.3	14.5	mΩ	V _{GS} =10V, I _D =20A
	-	15.8	24.5		V _{GS} =4.5V, I _D =20A
Dynamic					
*Q _g	-	25.6	-	nC	V _{DD} =48V, I _D =20A, V _{GS} =10V
*Q _{gs}	-	5.6	-		
*Q _{gd}	-	4.9	-		
*t _{d(ON)}	-	14	-	ns	V _{DD} =30V, I _D =20A, V _{GS} =10V, R _G =1Ω
*t _r	-	14.6	-		
*t _{d(OFF)}	-	36.2	-		
*t _f	-	6	-		
C _{iSS}	-	1544	-	pF	V _{GS} =0V, V _{DS} =30V, f=1MHz
C _{oSS}	-	180	-		
C _{rSS}	-	24	-		
R _g	-	1.5	-	Ω	f=1MHz
Source-Drain Diode					
*I _S	-	-	43	A	
*I _{SM}	-	-	172		
*V _{SD}	-	0.74	1	V	I _S =1A, V _{GS} =0V
*t _{rr}	-	18.5	-	ns	V _{GS} =0, I _F =1A, dI _F /dt=100A/μs
*Q _{rr}	-	11	-	nC	

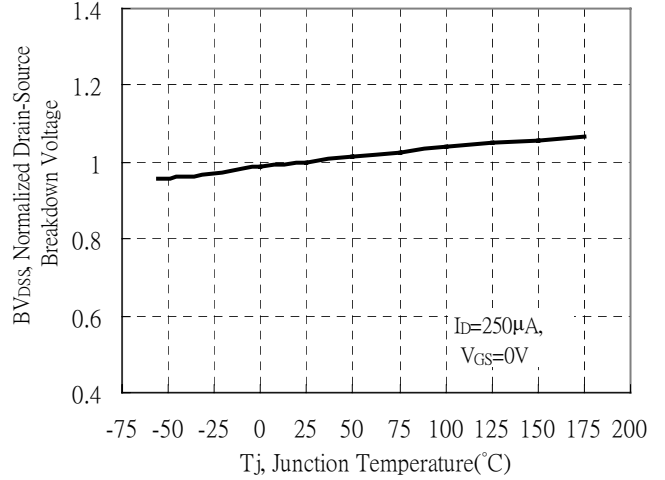
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

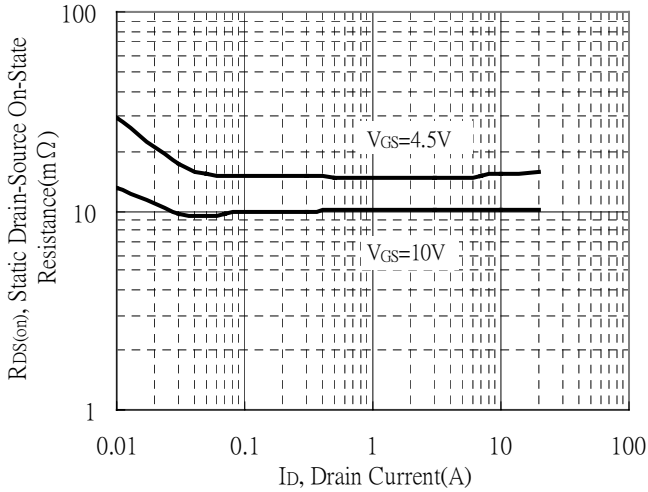
Typical Output Characteristics



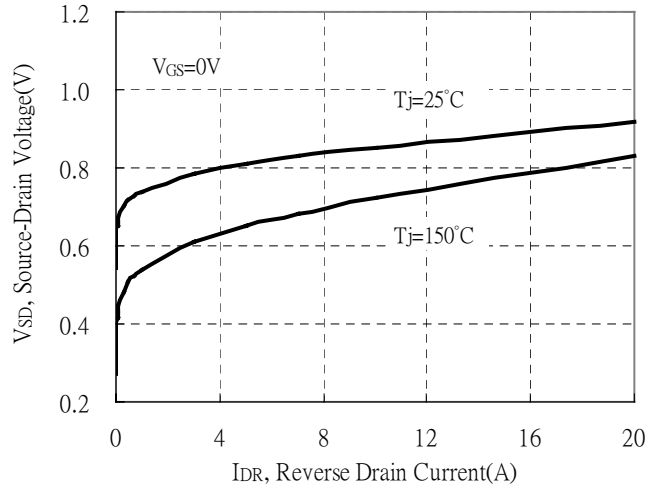
Brekdown Voltage vs Ambient Temperature



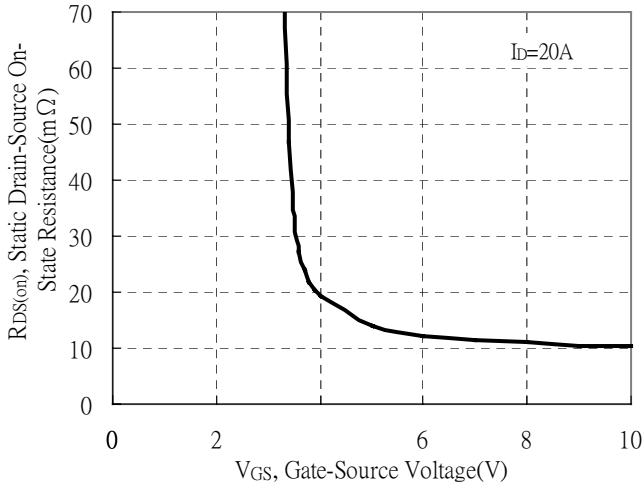
Static Drain-Source On-State resistance vs Drain Current



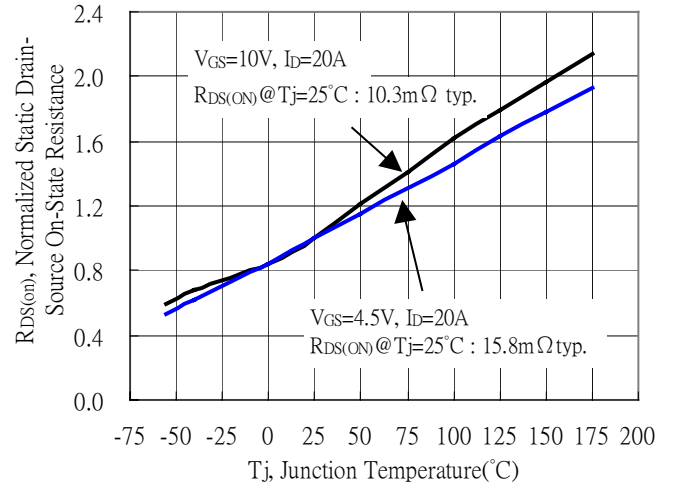
Reverse Drain Current vs Source-Drain Voltage



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

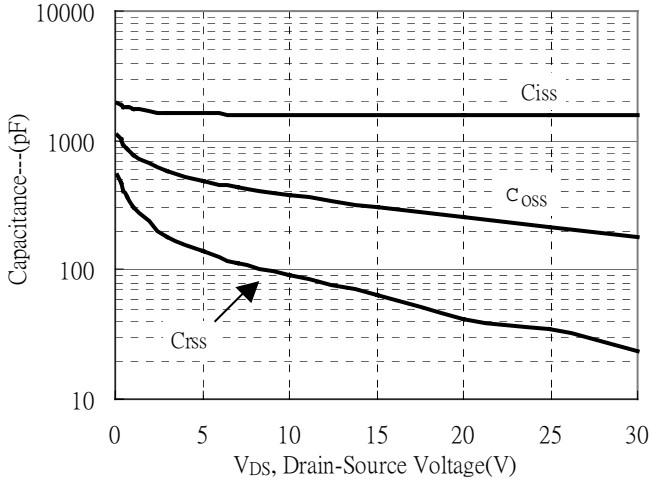


Drain-Source On-State Resistance vs Junction Temperature

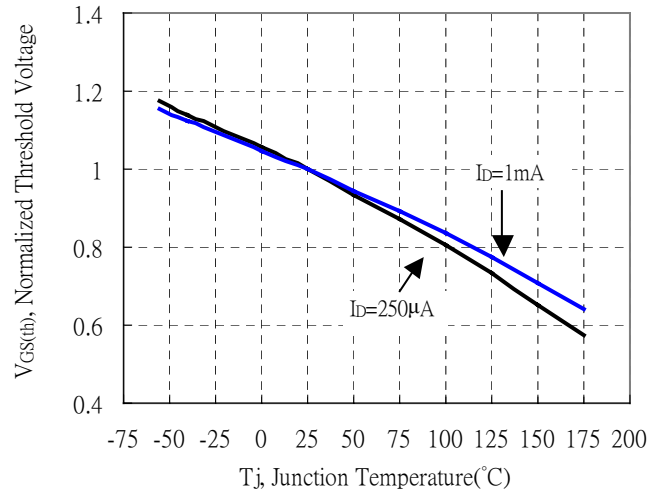


Typical Characteristics(Cont.)

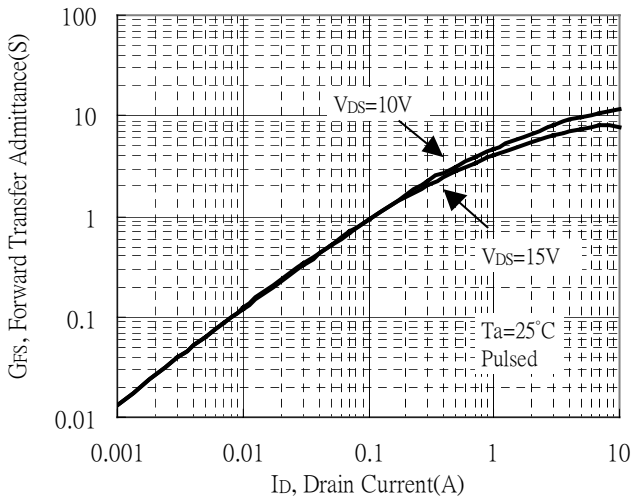
Capacitance vs Drain-to-Source Voltage



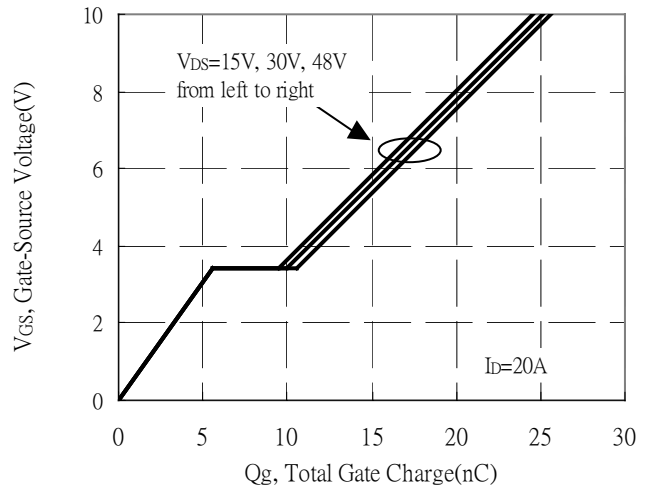
Threshold Voltage vs Junction Temperature



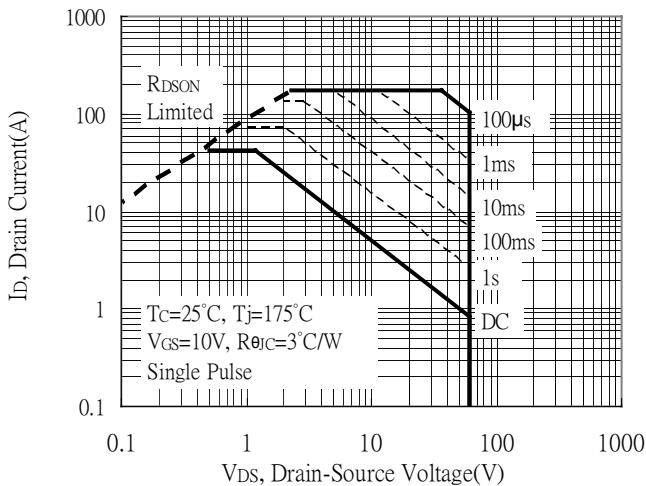
Forward Transfer Admittance vs Drain Current



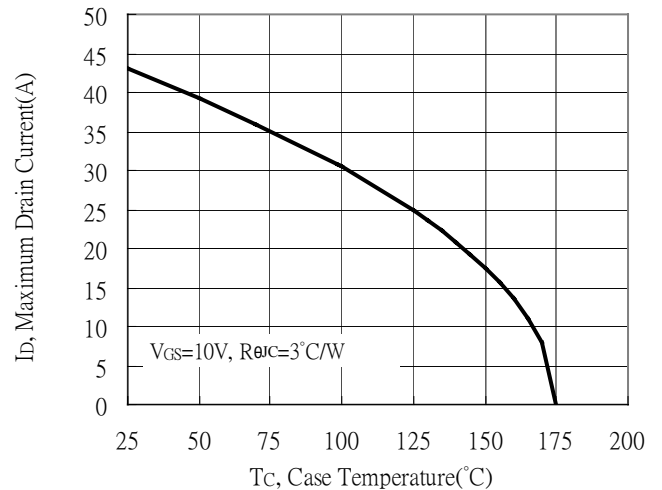
Gate Charge Characteristics



Maximum Safe Operating Area

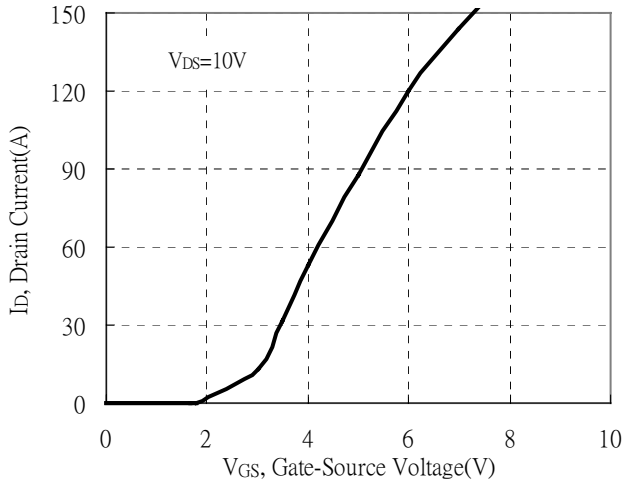


Maximum Drain Current vs Case Temperature

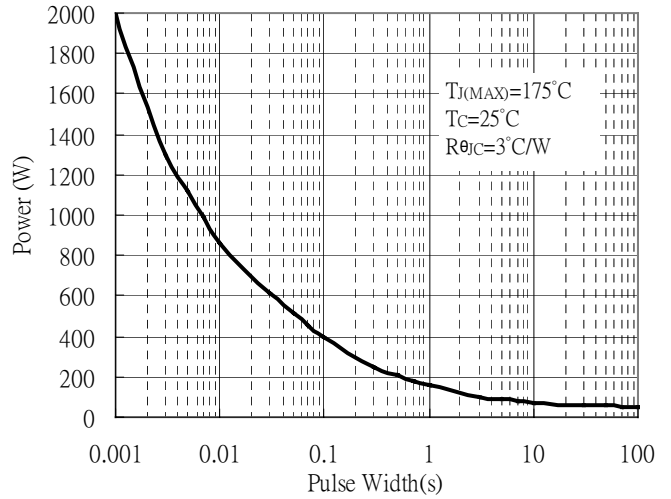


Typical Characteristics(Cont.)

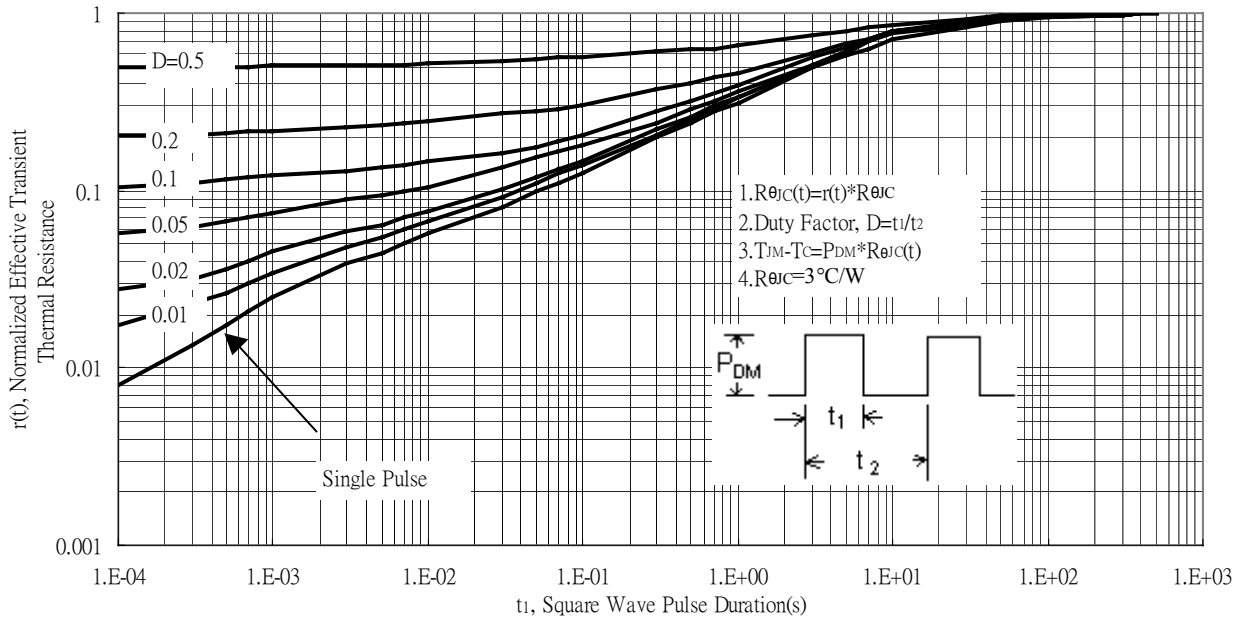
Typical Transfer Characteristics



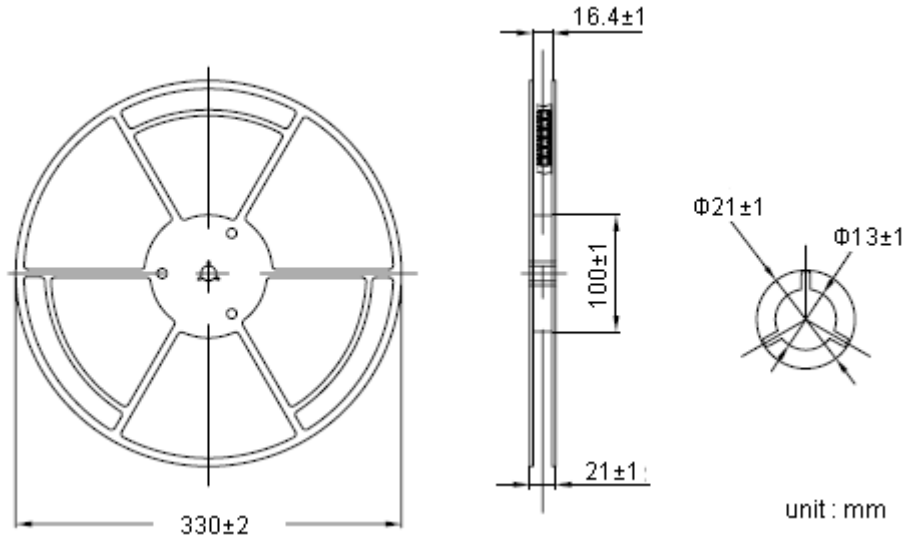
Single Pulse Power Rating, Junction to Case



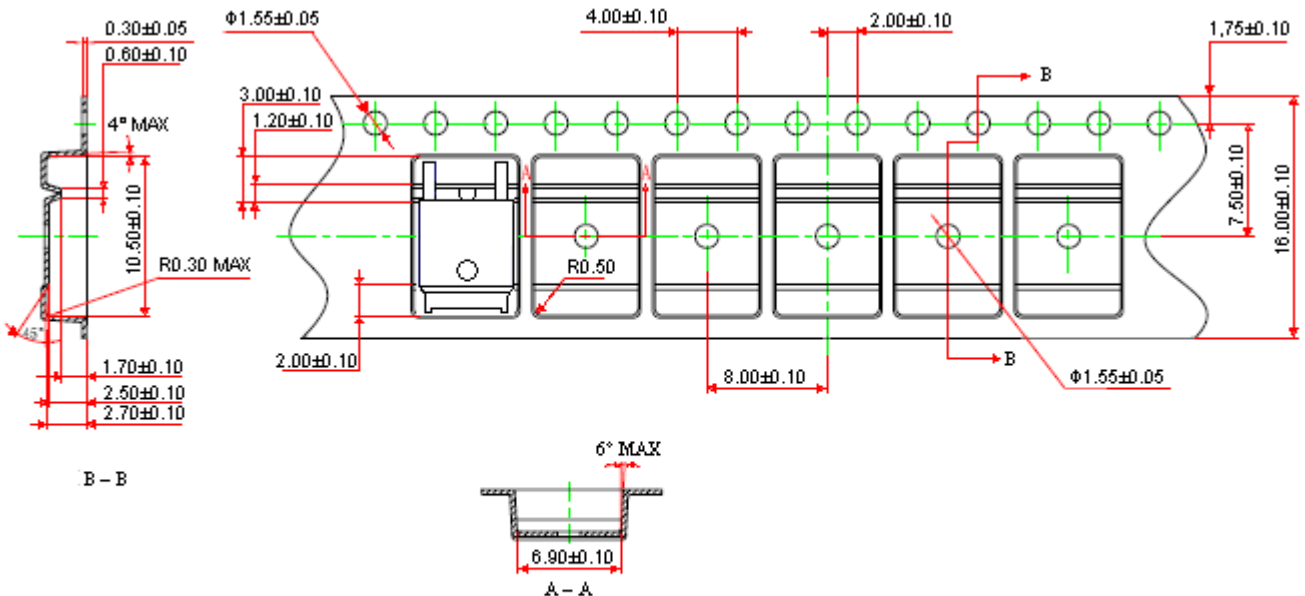
Transient Thermal Response Curves



Reel Dimension



Carrier Tape Dimension

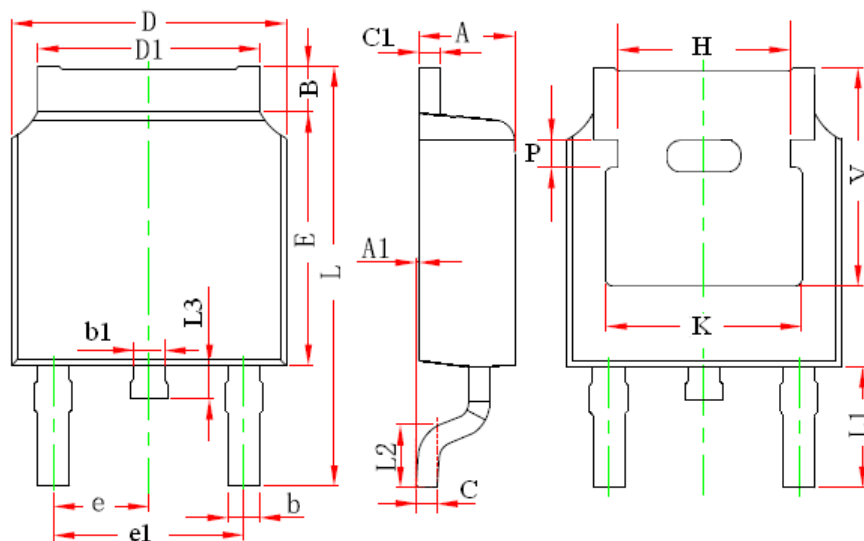


Notes:

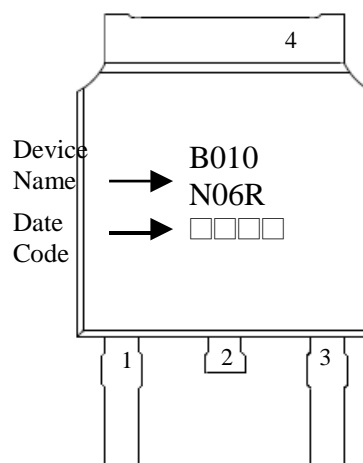
1. 10 sprocket hole pitch cumulative tolerance ± 0.2 .
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene, antistatic coated : $10^5 \Omega/\square \sim 10^{11} \Omega/\square$

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