

N-Channel Enhancement Mode Power MOSFET

Features:

- Low Gate Charge
- Simple Drive Requirement
- Pb-free lead plating and halogen-free package

Outline

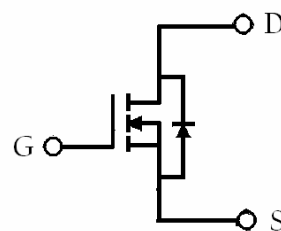
TO-252(DPAK)



BV _{DSS}		250V
I _D		8A
R _{DS(on)} (TYP)	V _{GS} =10V, I _D =5A	435mΩ
	V _{GS} =6V, I _D =3A	410mΩ

Equivalent Circuit

KWD6N25J3



G : Gate D : Drain
S : Source

Ordering Information

Device	Package	Shipping
KWD6N25J3	TO-252 (Pb-free lead plating and 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}	250	V
Gate-Source Voltage	V _{GS}	±30	
Continuous Drain Current @ V _{GS} =10V, T _C =25°C (Note 1)	I _D	8	A
Continuous Drain Current @ V _{GS} =10V, T _C =100°C (Note 1)		5	
Continuous Drain Current @ V _{GS} =10V, T _A =25°C (Note 2)		1.5	
Continuous Drain Current @ V _{GS} =10V, T _A =70°C (Note 2)		1.2	
Pulsed Drain Current (Note 3)	I _{DM}	16	
Avalanche Current (Note 3)	I _{AS}	2	mJ
Avalanche Energy @ L=50mH, I _D =2A, V _{DD} =50V (Note 2)	E _{AS}	100	
Repetitive Avalanche Energy @ L=0.1mH (Note 3)	E _{AR}	2	
Total Power Dissipation @ T _C =25°C (Note 1)	P _D	78	W
Total Power Dissipation @ T _C =100°C (Note 1)		21	
Total Power Dissipation @ T _A =25°C (Note 1)	P _{DSM}	2.5	
Total Power Dissipation @ T _A =70°C (Note 1)		1.6	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{th,j-c}	1.6	°C/W
Thermal Resistance, Junction-to-ambient, max (Note 2)	R _{θJA}	50	°C/W
Thermal Resistance, Junction-to-ambient, max (Note 4)	R _{θJA}	110	°C/W

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_{θJA} 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_{θJA} and the maximum allowed junction temperature of 150°C.

3. Repetitive rating, 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. When mounted on the minimum pad size recommended (PCB mount), t≤10s.

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

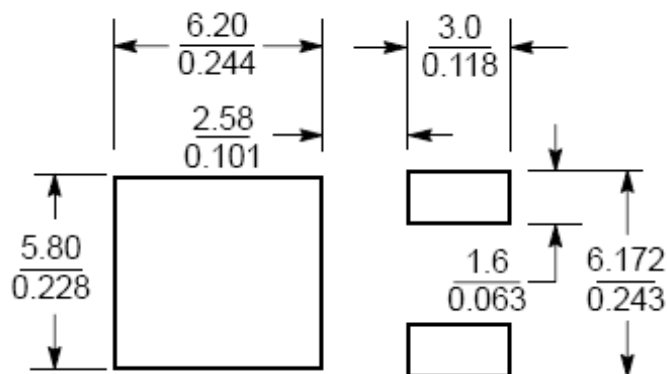
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	250	-	-	V	V _{GS} =0, I _D =250μA
V _{GS(th)}	2	3	4	V	V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±30, V _{DS} =0
I _{DSS}	-	-	1	μA	V _{DS} =200V, V _{GS} =0
	-	-	25		V _{DS} =200V, V _{GS} =0, T _J =125°C
R _{DS(ON)} *1	-	435	560	mΩ	V _{GS} =10V, I _D =5A
	-	410	530		V _{GS} =6V, I _D =3A
G _{FS} *1	-	2.5	-	S	V _{DS} =40V, I _D =1.5A
Dynamic					
Q _g *1, 2	-	7.5	-	nC	V _{DS} =200V, I _D =1.5A, V _{GS} =10V
Q _{gs} *1, 2	-	2.7	-		
Q _{gd} *1, 2	-	2	-		
t _{d(ON)} *1, 2	-	15	-	ns	V _{DS} =125V, I _D =1.5A, V _{GS} =10V, R _G =25 Ω
t _r *1, 2	-	12	-		
t _{d(OFF)} *1, 2	-	42	-		
t _f *1, 2	-	20	-		
C _{iss}	-	579	-	pF	V _{GS} =0V, V _{DS} =25V, f=1MHz
C _{oss}	-	44	-		
C _{rss}	-	20	-		
Source-Drain Diode					
I _S *1	-	-	8	A	
I _{SM} *3	-	-	16		
V _{SD} *1	-	0.73	1	V	I _S =1A, V _{GS} =0V
t _{rr}	-	80	-	ns	I _F =1.5A, dI _F /dt=100A/μs
Q _{rr}	-	290	-	nC	

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

*2.Independent of operating temperature

*3.Pulse width limited by maximum junction temperature.

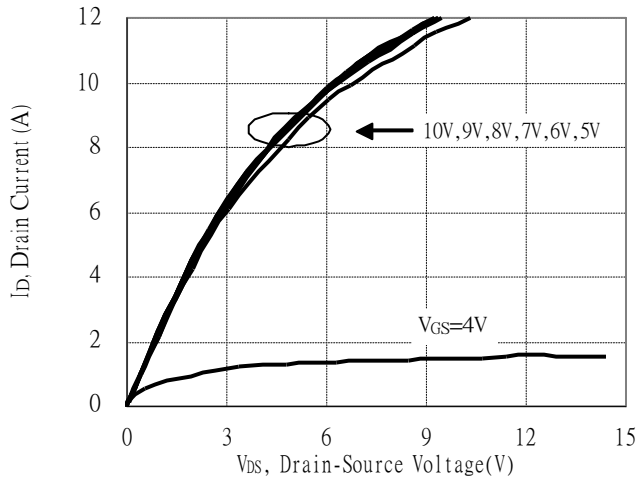
Recommended soldering footprint



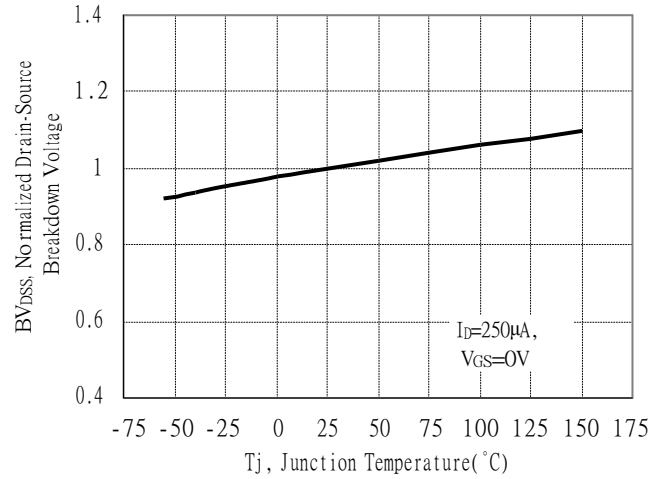
Unit ($\frac{\text{mm}}{\text{inch}}$)

Typical Characteristics

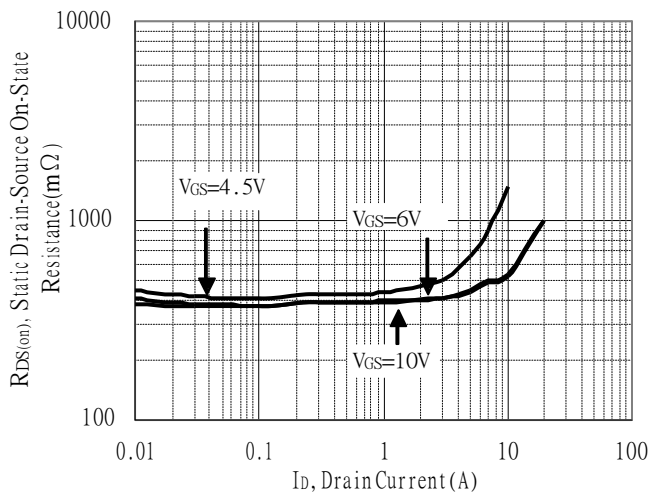
Typical Output Characteristics



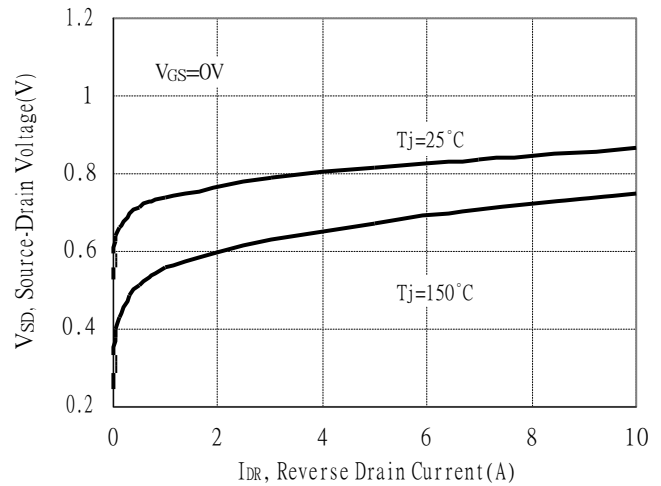
Breakdown Voltage vs Ambient Temperature



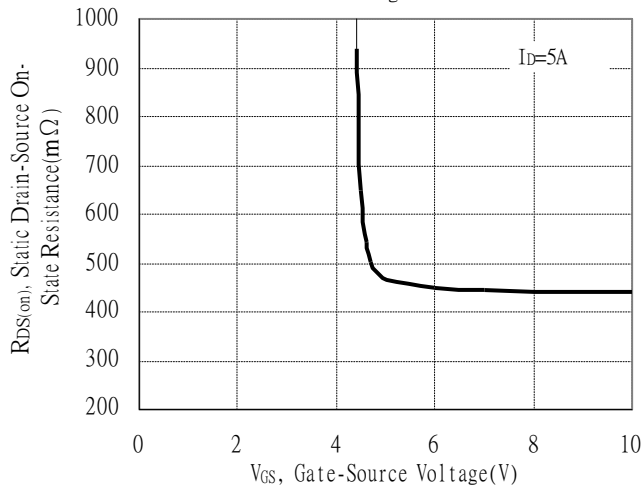
Static Drain-Source On-State resistance vs Drain Current



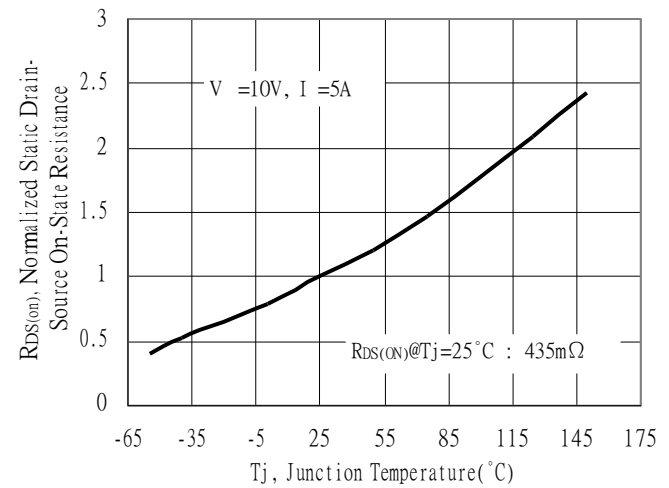
Reverse Drain Current vs Source-Drain Voltage



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

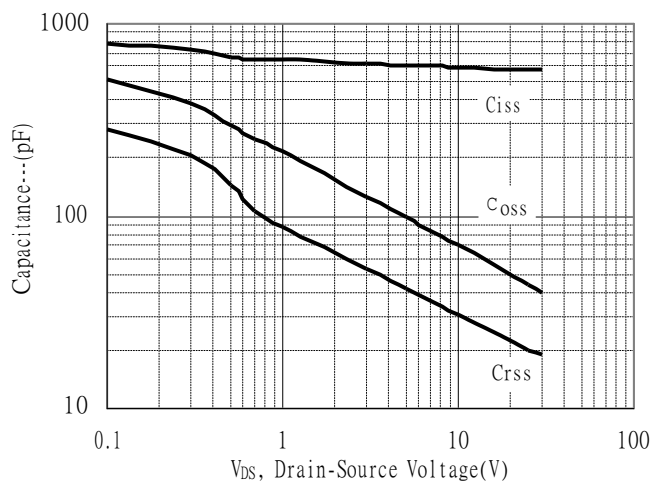


Drain-Source On-State Resistance vs Junction Temperature

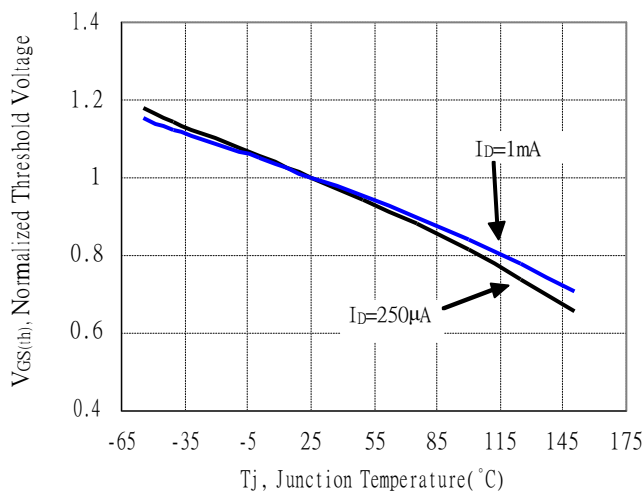


Typical Characteristics(Cont.)

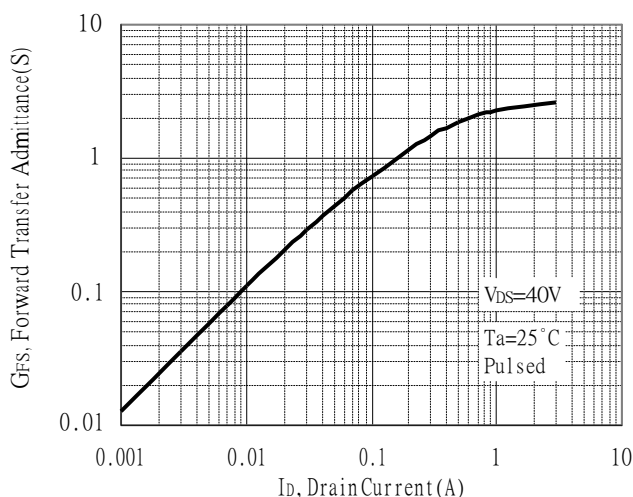
Capacitance vs Drain-to-Source Voltage



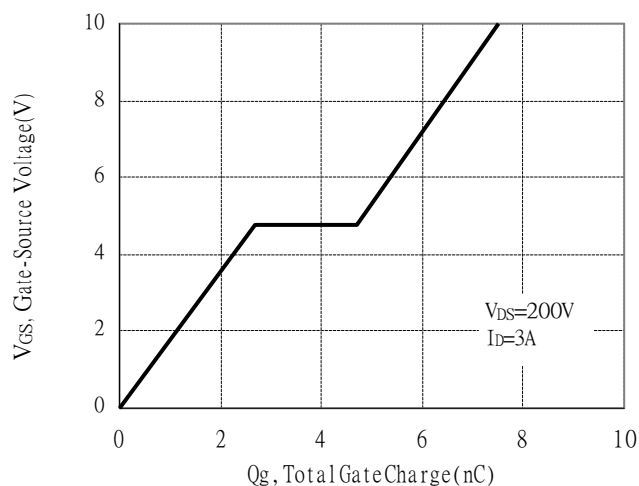
Threshold Voltage vs Junction Temperature



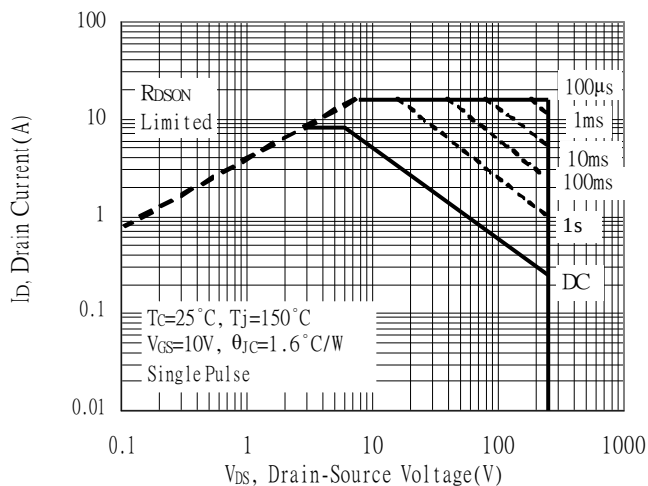
Forward Transfer Admittance vs Drain Current



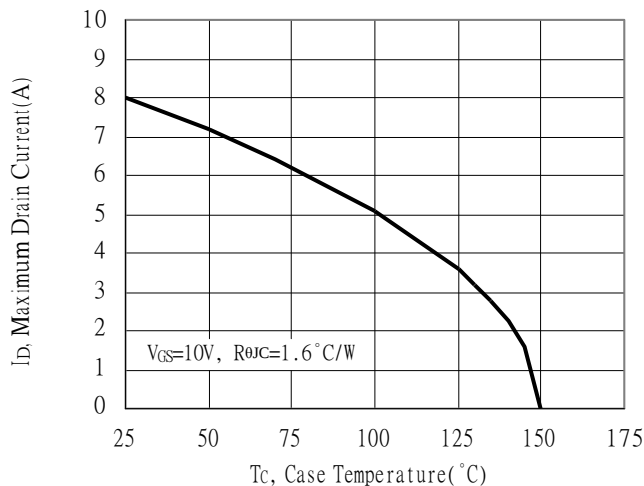
Gate Charge Characteristics



Maximum Safe Operating Area

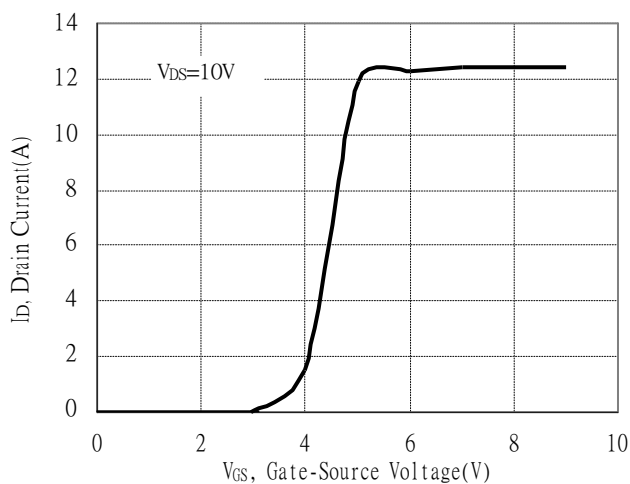


Maximum Drain Current vs Case Temperature

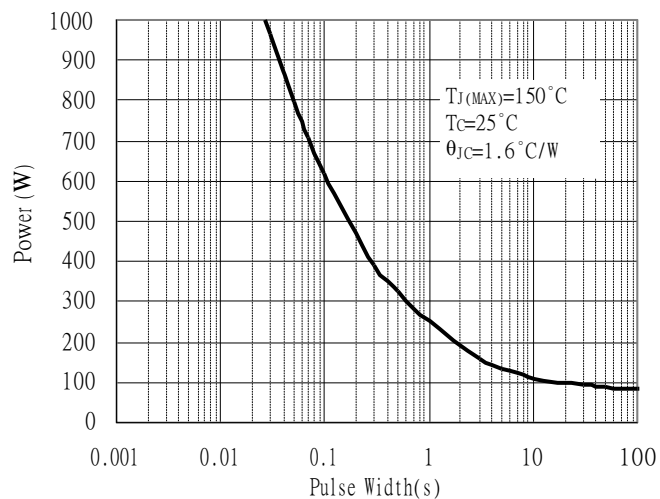


Typical Characteristics(Cont.)

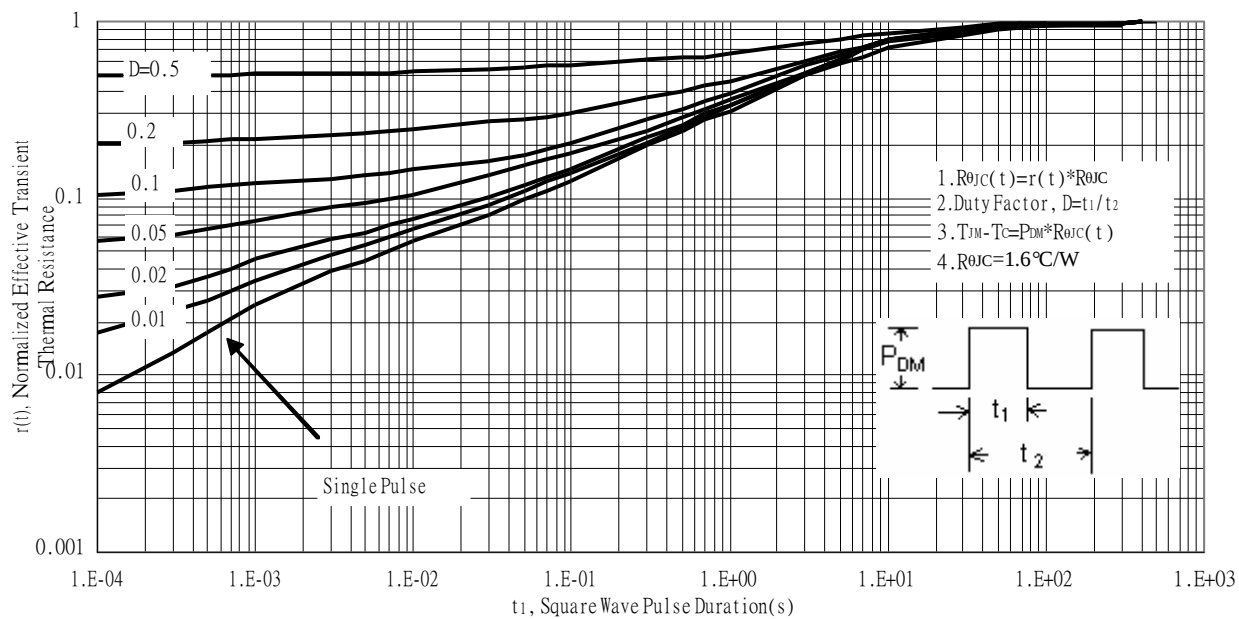
Typical Transfer Characteristics



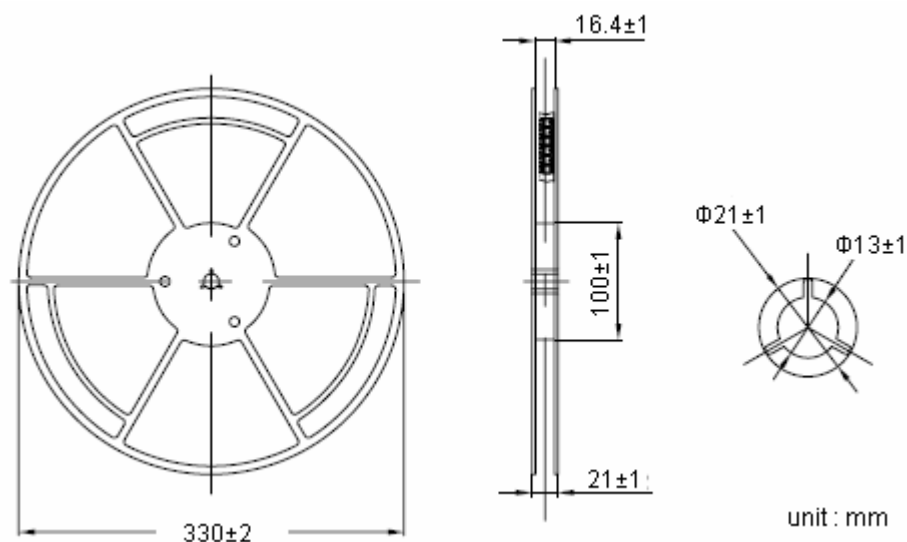
Single Pulse Power Rating, Junction to Case



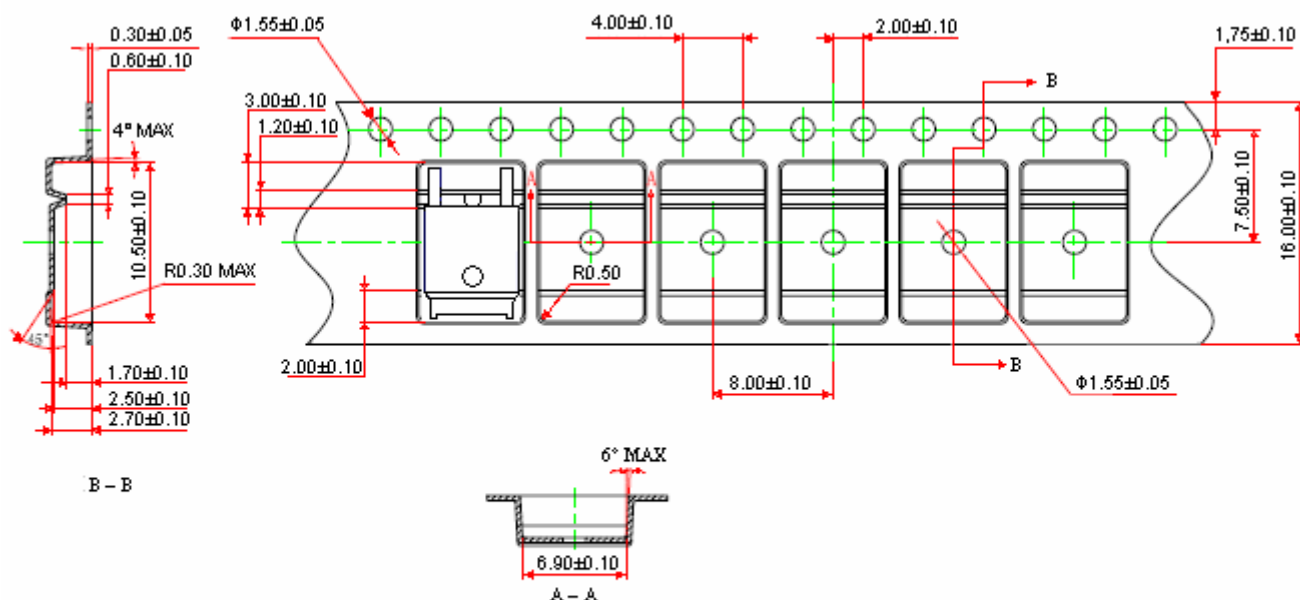
Transient Thermal Response Curves



Reel Dimension



Carrier Tape Dimension

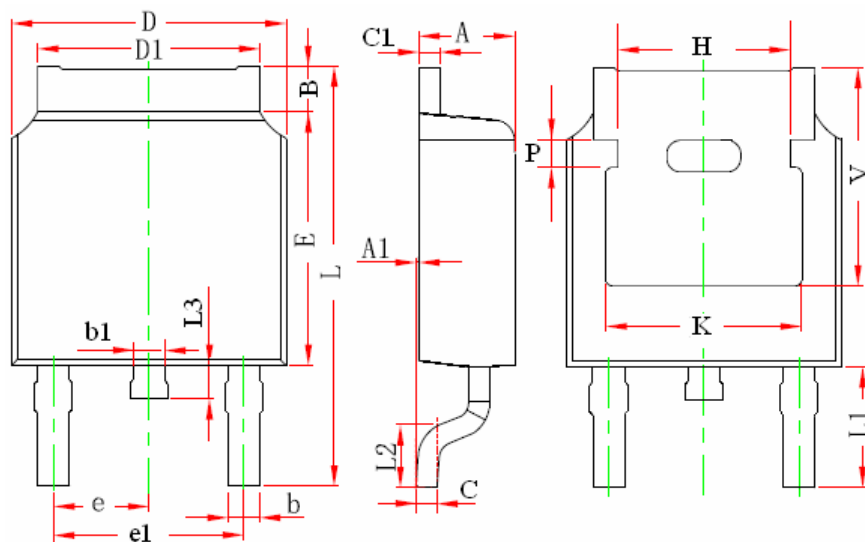


Notes:

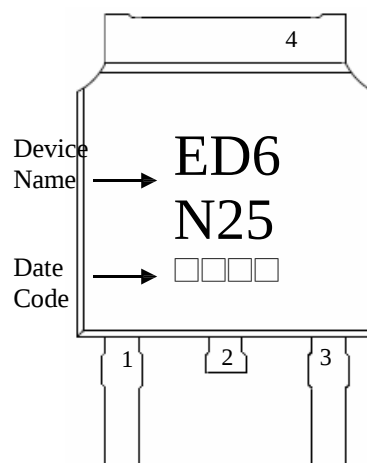
1. 10 sprocket hole pitch cumulative tolerance ± 0.2 .
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene, antistatic coated : $10^5 \Omega/\square \sim 10^{11} \Omega/\square$

unit : mm

TO-252 Dimension



Marking:



3-Lead TO-252 Plastic Surface Mount Package
 Package Code: J3

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