

## P-Channel Enhancement Mode Power MOSFET

### Features:

- Low Gate Charge
- Simple Drive Requirement
- ESD Protected Gate
- Pb-free Lead Plating & Halogen-free Package

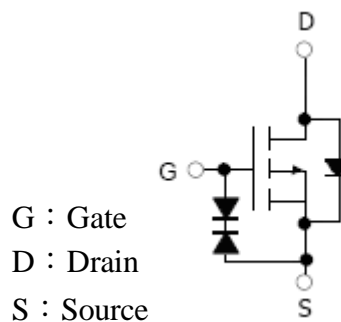
### Outline

TO-252(DPAK)



### Equivalent Circuit

<b>BV<sub>DSS</sub></b>	<b>-100V</b>
<b>I<sub>D</sub>@V<sub>GS</sub>=-10V, T<sub>C</sub>=25°C</b>	<b>-15A</b>
<b>R<sub>DS(ON)</sub>@V<sub>GS</sub>=-10V, I<sub>D</sub>=-10A</b>	<b>82mΩ (typ)</b>
<b>R<sub>DS(ON)</sub>@V<sub>GS</sub>=-4.5V, I<sub>D</sub>=-8A</b>	<b>107mΩ (typ)</b>



### Ordering Information

Device	Package	Shipping
KJB115P10K	TO-252 (Pb-free lead plating & halogen-free package)	2500 pcs / Tape & Reel

## Absolute Maximum Ratings (T<sub>C</sub>=25°C, unless otherwise noted)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V <sub>DS</sub>	-100	V
Gate-Source Voltage		V <sub>GS</sub>	±20	
Continuous Drain Current @ T <sub>J</sub> =175°C, T <sub>C</sub> =25°C, V <sub>GS</sub> =-10V (Note 1)		I <sub>D</sub>	-15	A
Continuous Drain Current @ T <sub>J</sub> =175°C, T <sub>C</sub> =100°C, V <sub>GS</sub> =-10V (Note 1)			-10.6	
Continuous Drain Current @ T <sub>A</sub> =25°C, V <sub>GS</sub> =-10V (Note 2)		I <sub>DSM</sub>	-3.5	
Continuous Drain Current @ T <sub>A</sub> =70°C, V <sub>GS</sub> =-10V (Note 2)			-2.8	
Pulsed Drain Current (Note 3)		I <sub>DM</sub>	-60	
Avalanche Current @ L=0.1mH (Note 3)		I <sub>AS</sub>	-47	
Avalanche Energy @ L=2mH, I <sub>D</sub> =-16A, R <sub>G</sub> =25Ω (Note 4)		E <sub>AS</sub>	256	mJ
Total Power Dissipation	T <sub>C</sub> =25°C (Note 1)	P <sub>D</sub>	50	W
	T <sub>C</sub> =100°C (Note 1)		25	
	T <sub>A</sub> =25°C (Note 2)	P <sub>DSM</sub>	2.5	
	T <sub>A</sub> =70°C (Note 2)		1.6	
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>stg</sub>	-55~+175	°C

## Thermal Data

Parameter	Symbol	Typical	Maximum	Unit
Thermal Resistance, Junction-to-case	R <sub>θJC</sub>	2.7	3	°C/W
Thermal Resistance, Junction-to-ambient, t≤10s (Note 2)	R <sub>θJA</sub>	15	18	
Thermal Resistance, Junction-to-ambient, steady state		40	50	

- Note : 1. The power dissipation P<sub>D</sub> is based on T<sub>J(MAX)</sub>=175°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<sub>θJA</sub> is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2 oz. copper, in a still air environment with T<sub>A</sub>=25°C. The power dissipation P<sub>DSM</sub> is based on R<sub>θJA</sub> 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<sub>J(MAX)</sub>=175°C. Ratings are based on low frequency and low duty cycles to keep initial T<sub>J</sub>=25°C.
4. 100% tested by conditions of L=0.1mH, V<sub>GS</sub>=-10V, I<sub>AS</sub>=-10A, V<sub>DD</sub>=-50V

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

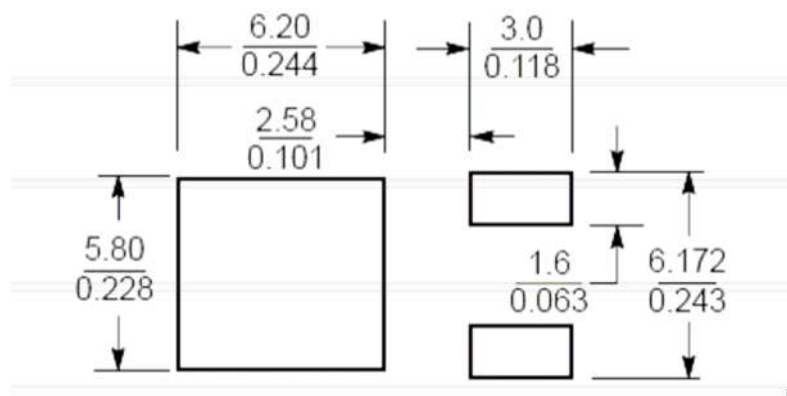
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>					
BV <sub>DSS</sub>	-100	-	-	V	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA
V <sub>GS(th)</sub>	-1	-	-2.5		V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA
I <sub>GSS</sub>	-	-	±10	μA	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V
I <sub>DSS</sub>	-	-	-1	μA	V <sub>DS</sub> =-80V, V <sub>GS</sub> =0V
	-	-	-25		V <sub>DS</sub> =-80V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C
I <sub>D(ON)</sub> *1	-15	-	-	A	V <sub>DS</sub> =-5V, V <sub>GS</sub> =-10V
R <sub>DS(ON)</sub> *1	-	82	110	mΩ	V <sub>GS</sub> =-10V, I <sub>D</sub> =-10A
	-	107	145		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-8A
G <sub>FS</sub> *1	-	16.4	-	S	V <sub>DS</sub> =-10V, I <sub>D</sub> =-10A
<b>Dynamic</b>					
Q <sub>g</sub> *1, 2	-	23.8	35.7	nC	I <sub>D</sub> =-13A, V <sub>DS</sub> =-50V, V <sub>GS</sub> =-10V
Q <sub>gs</sub> *1, 2	-	4	-		
Q <sub>gd</sub> *1, 2	-	4.8	-		
t <sub>d(ON)</sub> *1, 2	-	8.6	12.9	ns	V <sub>DS</sub> =-50V, I <sub>D</sub> =-6.5A, V <sub>GS</sub> =-10V, R <sub>G</sub> =10Ω
t <sub>r</sub> *1, 2	-	19.8	29.7		
t <sub>d(OFF)</sub> *1, 2	-	72.8	109		
t <sub>f</sub> *1, 2	-	62	93		
C <sub>iss</sub>	-	1199	-	pF	V <sub>GS</sub> =0V, V <sub>DS</sub> =-25V, f=1MHz
C <sub>oss</sub>	-	113	-		
C <sub>rss</sub>	-	51	-		
R <sub>g</sub>	-	11	-	Ω	V <sub>DS</sub> =0V, f=1MHz
<b>Source-Drain Diode Ratings and Characteristics</b>					
I <sub>S</sub> *1	-	-	-15	A	
I <sub>SM</sub> *1	-	-	-60		
V <sub>SD</sub> *1	-	-0.84	-1.2	V	I <sub>S</sub> =-10A, V <sub>GS</sub> =0V
t <sub>rr</sub>	-	27.5	41.3	ns	I <sub>F</sub> =-13A, dI <sub>F</sub> /dt=100A/μs
Q <sub>rr</sub>	-	36	-	nC	

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

\*2.Independent of operating temperature

\*3.Pulse width limited by maximum junction temperature.

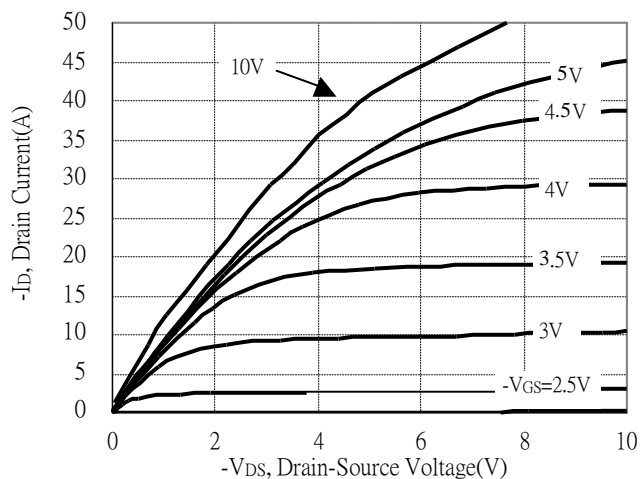
### Recommended soldering footprint



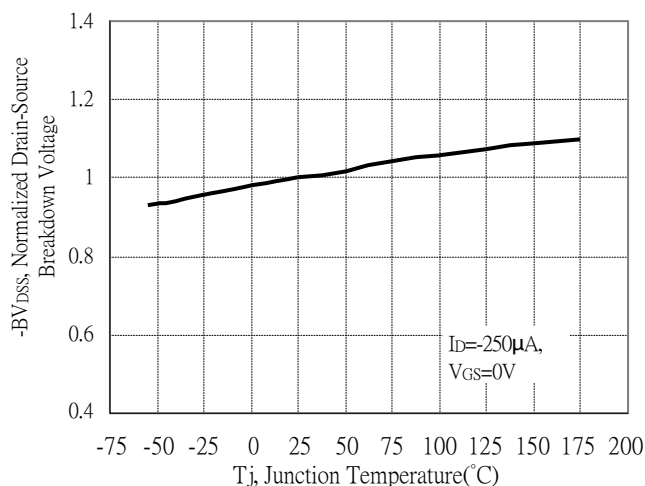
Unit (  $\frac{\text{mm}}{\text{inch}}$  )

## Typical Characteristics

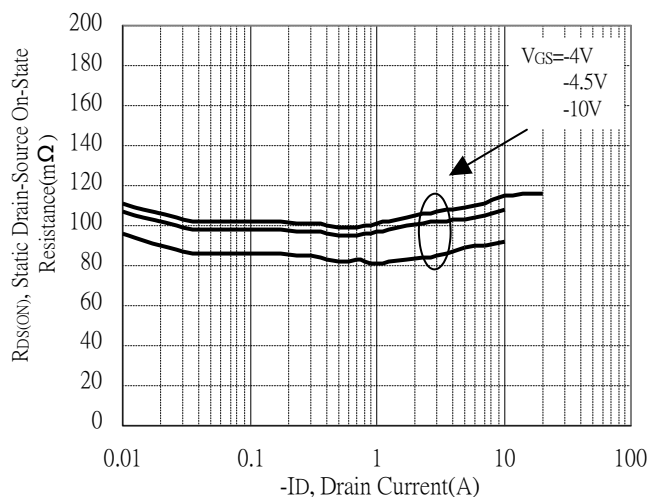
Typical Output Characteristics



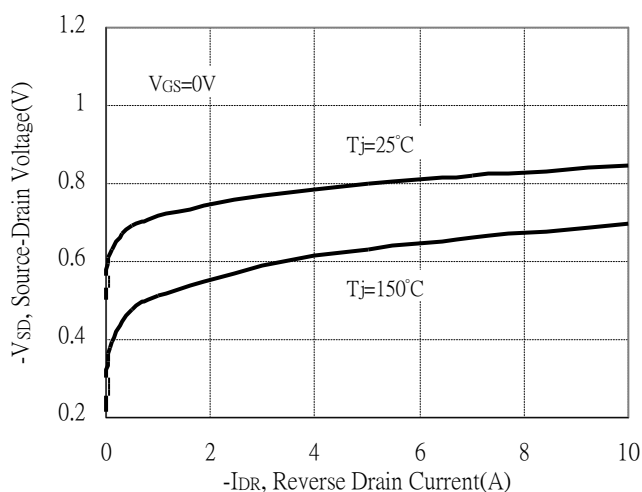
Brekdown Voltage vs Ambient Temperature



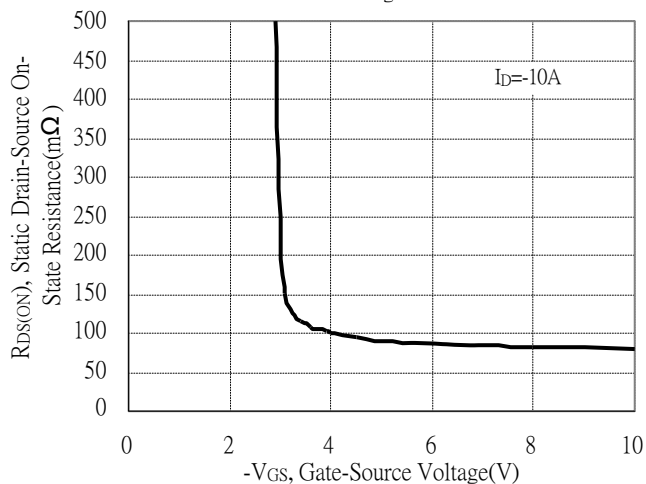
Static Drain-Source On-State resistance vs Drain Current



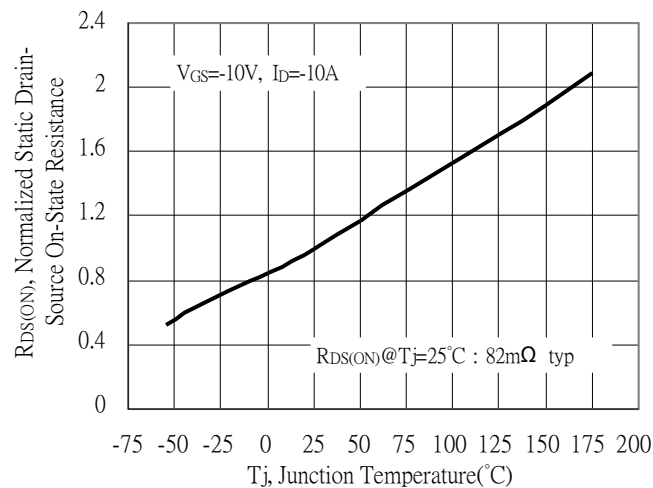
Reverse Drain Current vs Source-Drain Voltage



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

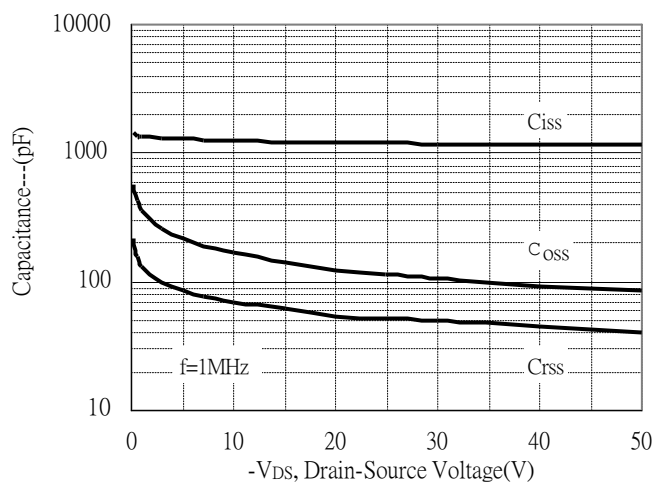


Drain-Source On-State Resistance vs Junction Temperature

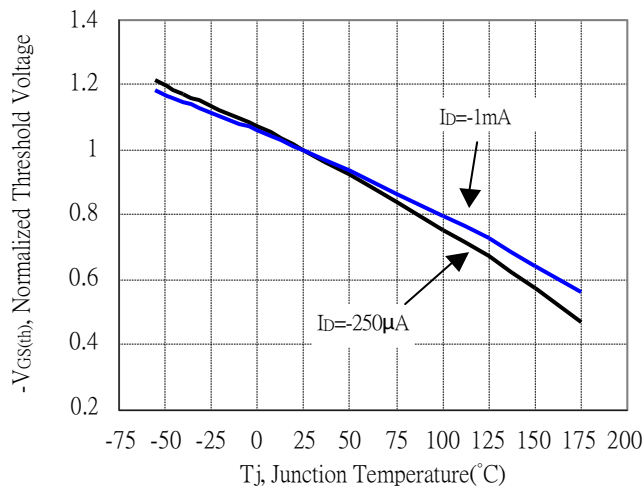


## Typical Characteristics (Cont.)

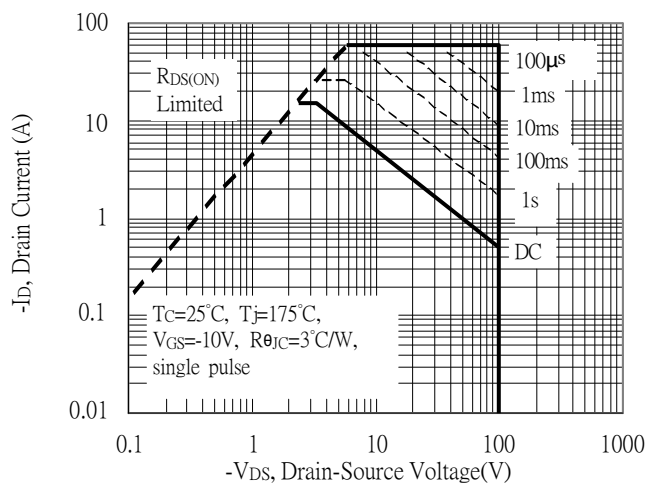
Capacitance vs Drain-to-Source Voltage



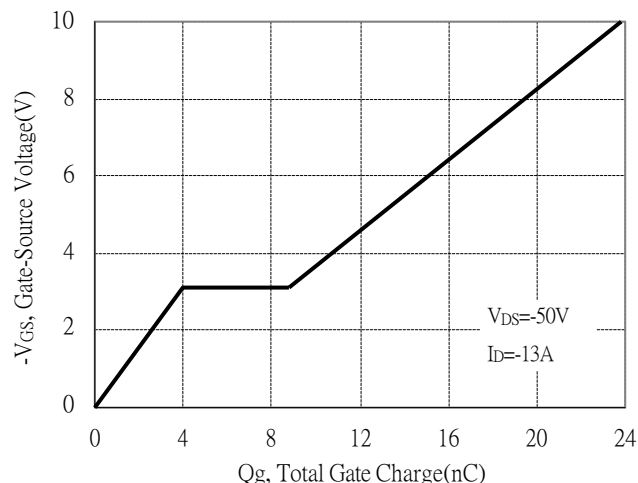
Threshold Voltage vs Junction Temperature



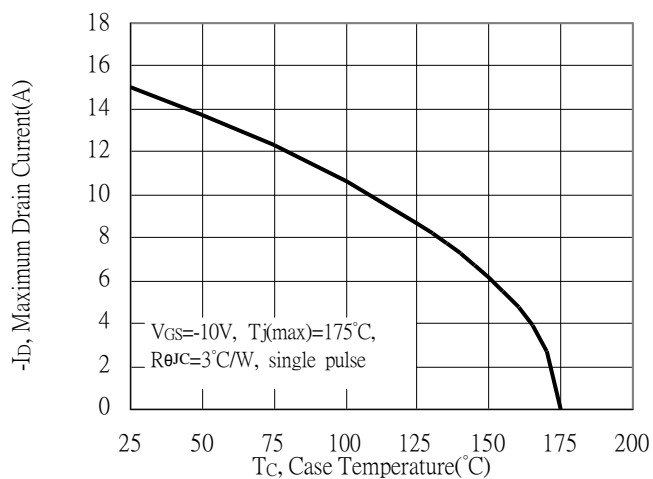
Maximum Safe Operating Area



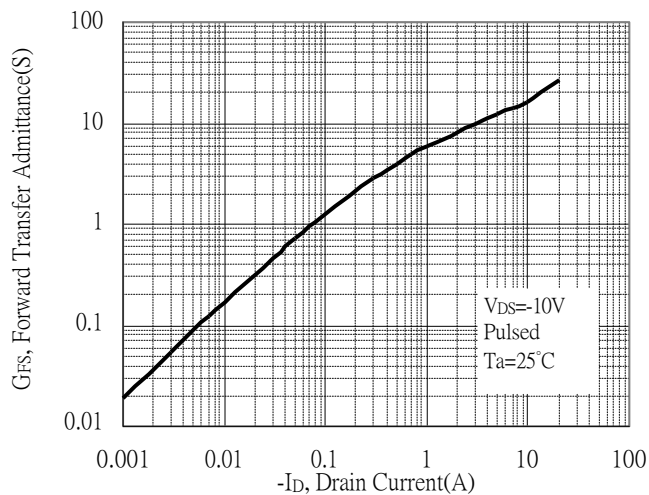
Gate Charge Characteristics



Maximum Drain Current vs Case Temperature

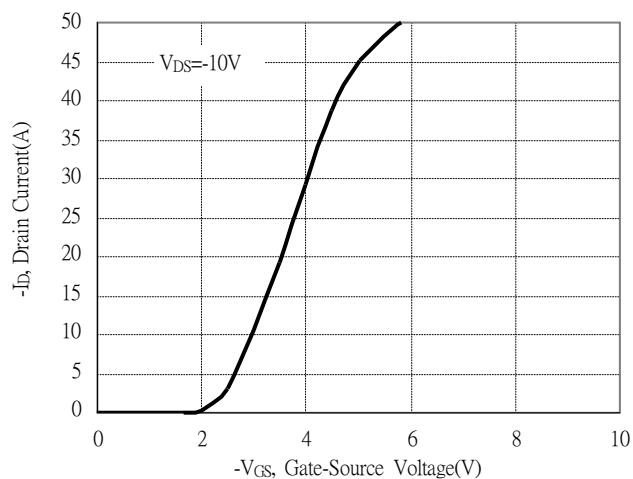


Forward Transfer Admittance vs Drain Current

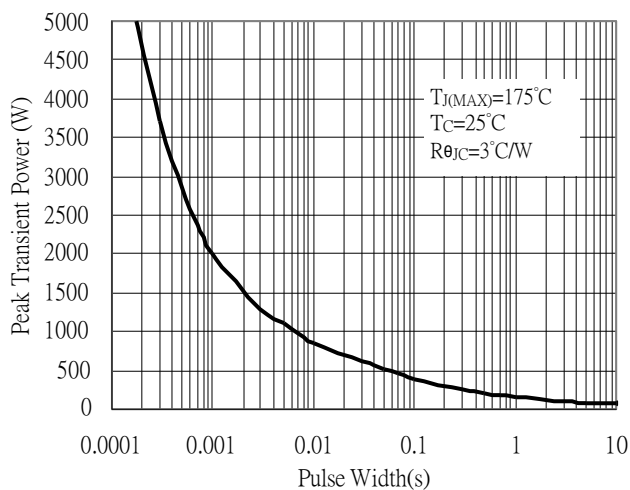


## Typical Characteristics (Cont.)

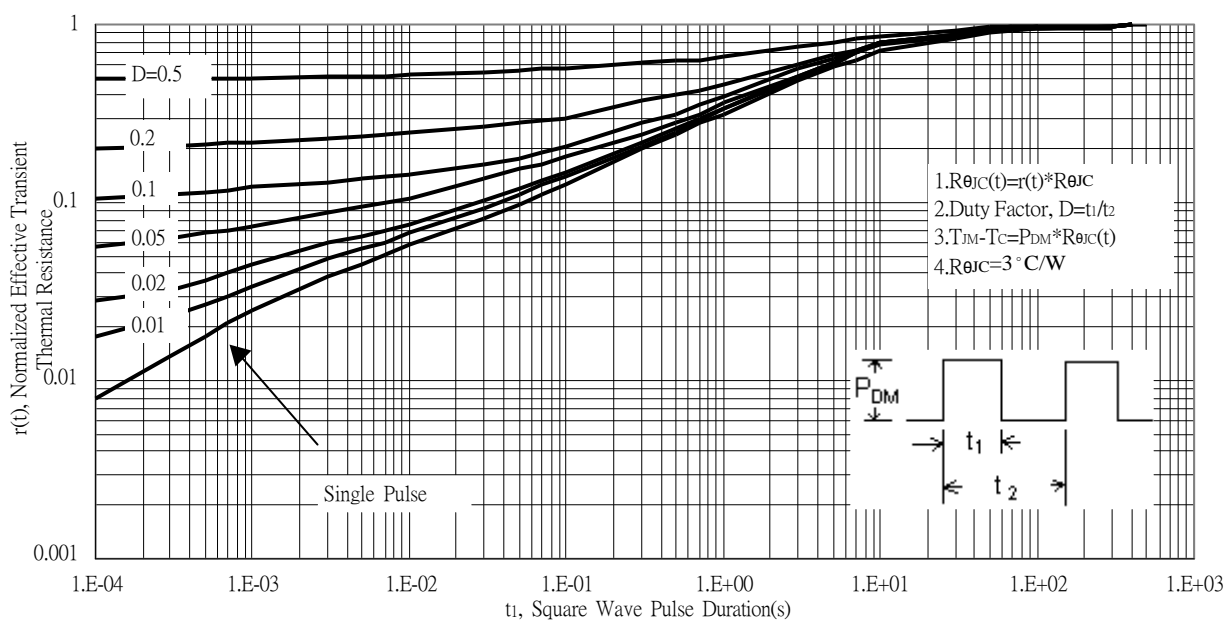
Typical Transfer Characteristics



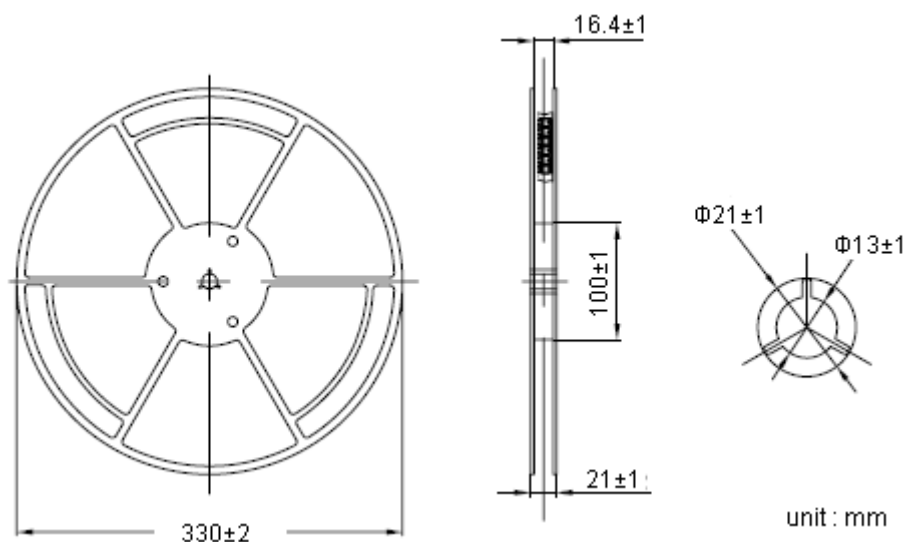
Single Pulse Maximum Power Dissipation



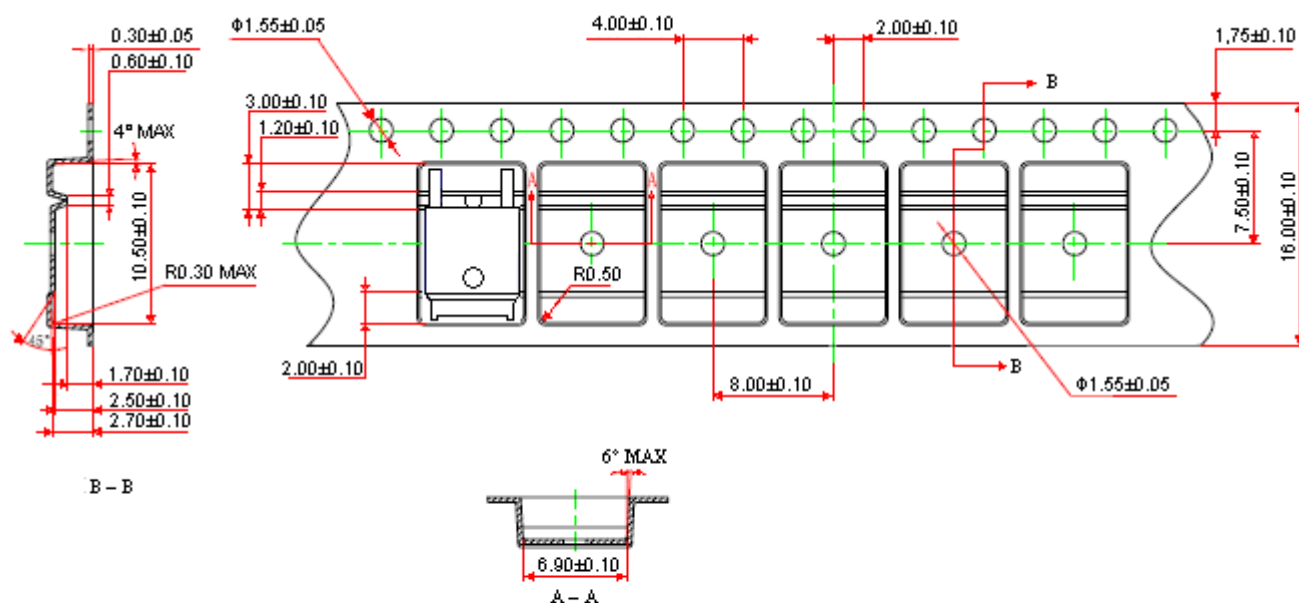
Transient Thermal Response Curves



## Reel Dimension



## Carrier Tape Dimension

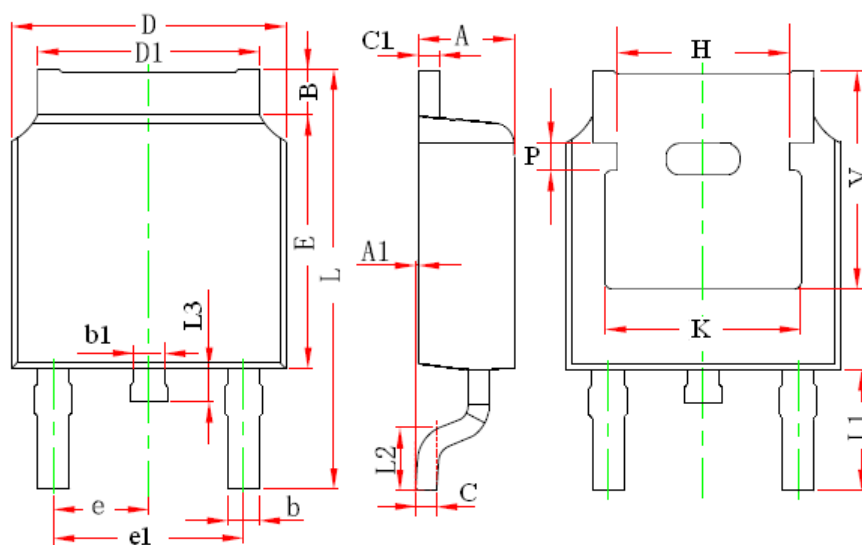


### Notes:

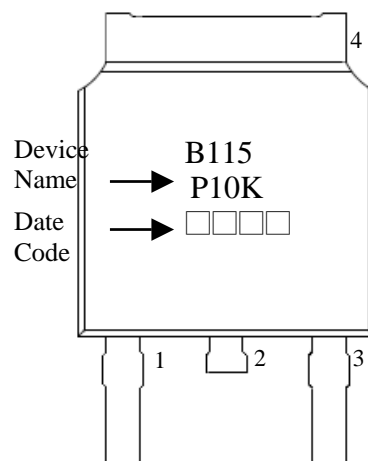
1. 10 sprocket hole pitch cumulative tolerance  $\pm 0.2$ .
2. Camber not to exceed 1mm in 100mm.
3. Material: conductive black polystyrene, antistatic coated :  $10^5 \Omega/\square \sim 10^{11} \Omega/\square$

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