

## P-Channel Enhancement Mode Power MOSFET

### Features:

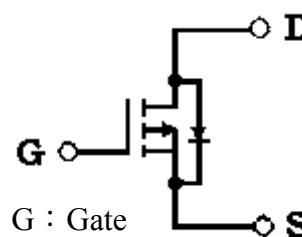
- Single Drive Requirement
- Low On-resistance
- Fast switching Characteristic
- Pb-free lead plating and halogen-free package

TO-252(DPAK)



G D S

<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>-24A</b>
<b>I<sub>D</sub>@V<sub>GS</sub>=-10V, T<sub>C</sub>=100°C</b>	<b>-17A</b>
<b>I<sub>D</sub>@V<sub>GS</sub>=-10V, T<sub>A</sub>=25°C</b>	<b>-4.1A</b>
<b>I<sub>D</sub>@V<sub>GS</sub>=-10V, T<sub>A</sub>=70°C</b>	<b>-3.3A</b>
<b>R<sub>DS(ON)</sub>@V<sub>GS</sub>=-10V, I<sub>D</sub>=-15A</b>	<b>45 mΩ (typ)</b>
<b>R<sub>DS(ON)</sub>@V<sub>GS</sub>=-4.5V, I<sub>D</sub>=-12A</b>	<b>51 mΩ (typ)</b>



G : Gate

D : Drain

S : Source

### Ordering Information

Device	Package	Shipping
KJB050P10	TO-252 (Pb-free lead plating and halogen-free package)	2500 pcs / Tape & Reel

**Absolute Maximum Ratings** (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V <sub>DS</sub>	-100	V
Gate-Source Voltage		V <sub>GS</sub>	±20	
Continuous Drain Current @ V <sub>GS</sub> =-10V, T <sub>C</sub> =25°C (Note1)		I <sub>D</sub>	-24	A
Continuous Drain Current @ V <sub>GS</sub> =-10V, T <sub>C</sub> =100°C (Note1)			-17	
Continuous Drain Current @ V <sub>GS</sub> =-10V, T <sub>A</sub> =25°C (Note4)			-4.1	
Continuous Drain Current @ V <sub>GS</sub> =-10V, T <sub>A</sub> =70°C (Note4)			-3.3	
Pulsed Drain Current (Note3)		I <sub>DM</sub>	-96	
Power Dissipation	T <sub>C</sub> =25°C (Note1)	P <sub>D</sub>	75	W
	T <sub>C</sub> =100°C (Note1)		37.5	
	T <sub>A</sub> =25°C (Note2)	P <sub>DSM</sub>	2	
	T <sub>A</sub> =70°C (Note2)		1.3	
Single Pulse Avalanche Energy @ L=1mH, I <sub>AS</sub> =-24A, V <sub>DD</sub> =-50V		E <sub>AS</sub>	288	mJ
Single Pulse Avalanche Current		I <sub>AS</sub>	-24	A
Operating Junction and Storage Temperature		T <sub>j</sub> , T <sub>stg</sub>	-55~+175	°C

**Thermal Data**

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R <sub>th,j-c</sub>	2	°C/W
Thermal Resistance, Junction-to-ambient, max (Note2)	R <sub>th,j-a</sub>	62.5	
Thermal Resistance, Junction-to-ambient, max (Note4)		90	

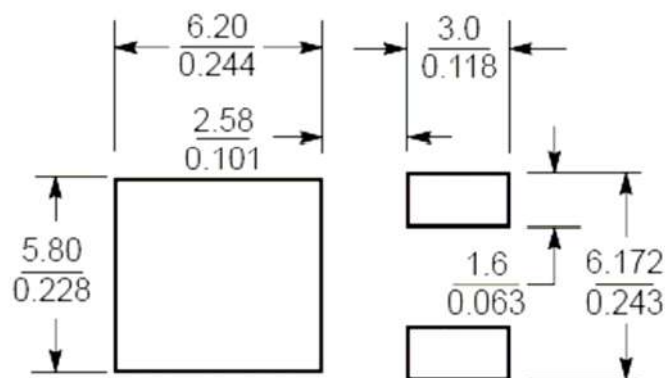
- Note : 1. The power dissipation P<sub>D</sub> is based on T<sub>J(MAX)</sub>=175 °C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
2. The value of R<sub>θJA</sub> is measured with the device mounted 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. Repetitive rating, 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. When mounted on the minimum pad size recommended (PCB mount), t≤10s.

**Characteristics (Tj=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
ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	-	-0.08	-	V/°C	Reference to 25°C, I <sub>D</sub> =-250μA
V <sub>GS(th)</sub>	-1.0	-	-2.5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =-250μA
G <sub>FS</sub>	-	32.8	-	S	V <sub>DS</sub> = -5V, I <sub>D</sub> =-20A
I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> =±20V
I <sub>DSS</sub>	-	-	-1	μA	V <sub>DS</sub> = -80V, V <sub>GS</sub> = 0V
I <sub>DSS</sub>	-	-	-25		V <sub>DS</sub> = -80V, V <sub>GS</sub> = 0V, T <sub>j</sub> =70°C
*R <sub>DS(ON)</sub>	-	45	60	mΩ	V <sub>GS</sub> = -10V, I <sub>D</sub> =-15A
*R <sub>DS(ON)</sub>	-	51	72		V <sub>GS</sub> = -4.5V, I <sub>D</sub> =-12A
<b>Dynamic</b>					
*Q <sub>g</sub>	-	51	-	nC	V <sub>DS</sub> =-80V, I <sub>D</sub> =-15A, V <sub>GS</sub> =-10V
*Q <sub>gs</sub>	-	6.5	-		
*Q <sub>gd</sub>	-	14.3	-		
*t <sub>d(ON)</sub>	-	13	-	ns	V <sub>DS</sub> =-50V, I <sub>D</sub> =-15A, V <sub>GS</sub> =-10V, R <sub>G</sub> =2.7Ω
*t <sub>r</sub>	-	21.6	-		
*t <sub>d(OFF)</sub>	-	66.2	-		
*t <sub>f</sub>	-	15.2	-		
C <sub>iss</sub>	-	2421	-	pF	V <sub>GS</sub> =0V, V <sub>DS</sub> =-25V, f=1MHz
C <sub>oss</sub>	-	211	-		
C <sub>rss</sub>	-	93	-		
R <sub>g</sub>	-	3.6	-	Ω	f=1MHz
<b>Source-Drain Diode</b>					
*I <sub>S</sub>	-	-	-24	A	
*V <sub>SD</sub>	-	-0.83	-1.2	V	I <sub>S</sub> =-15A, V <sub>GS</sub> =0V
*t <sub>rr</sub>	-	25	-	ns	I <sub>F</sub> =-15A, V <sub>GS</sub> =0, dI <sub>F</sub> /dt=-100A/μs
*Q <sub>rr</sub>	-	33	-	nC	

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

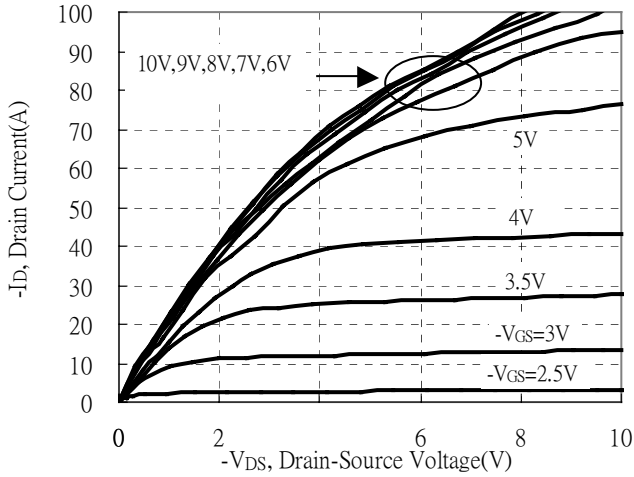
**Recommended soldering footprint**



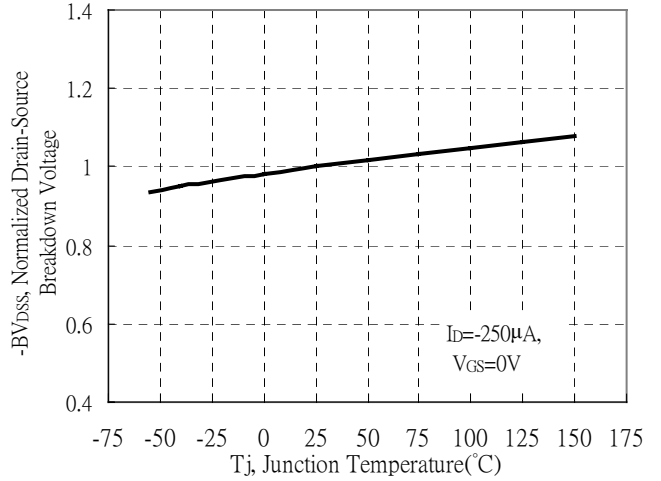
Unit (  $\frac{\text{mm}}{\text{inch}}$  )

## Typical Characteristics

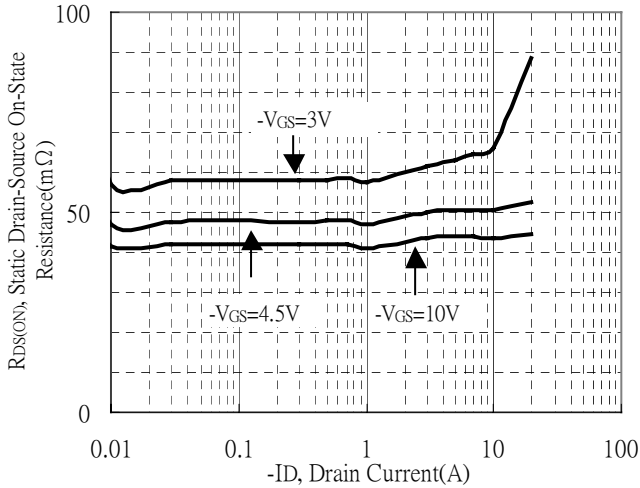
Typical Output Characteristics



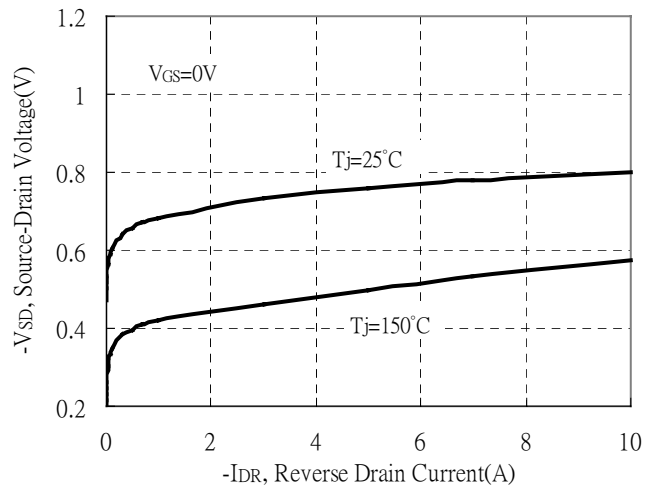
Brekdown Voltage vs Ambient Temperature



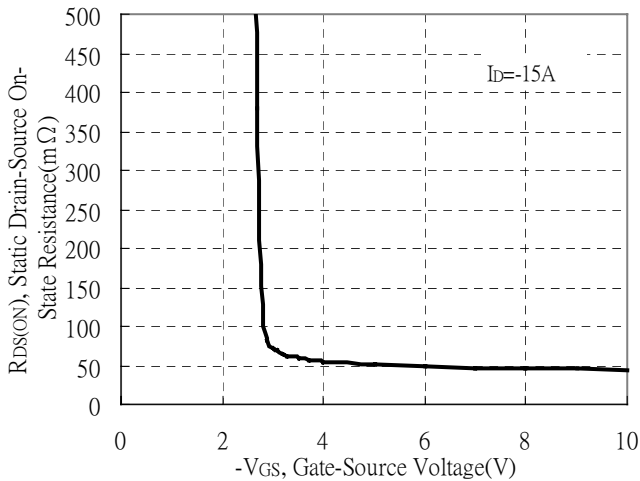
Static Drain-Source On-State resistance vs Drain Current



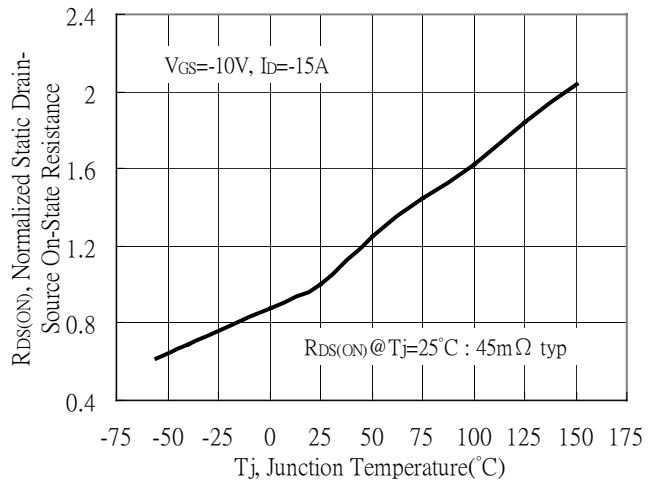
Reverse Drain Current vs Source-Drain Voltage



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

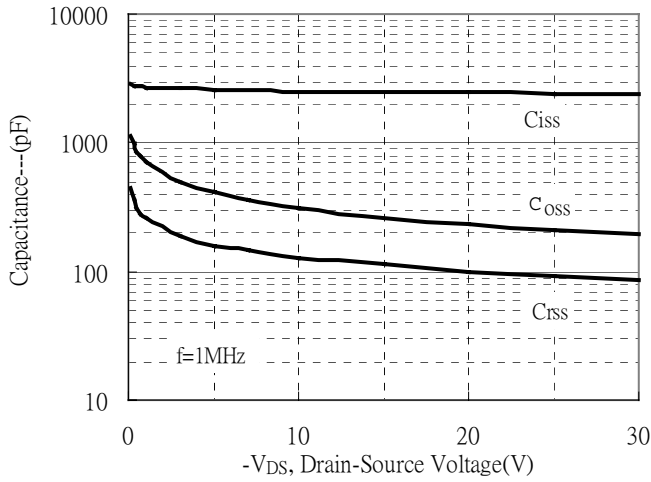


Drain-Source On-State Resistance vs Junction Temperature

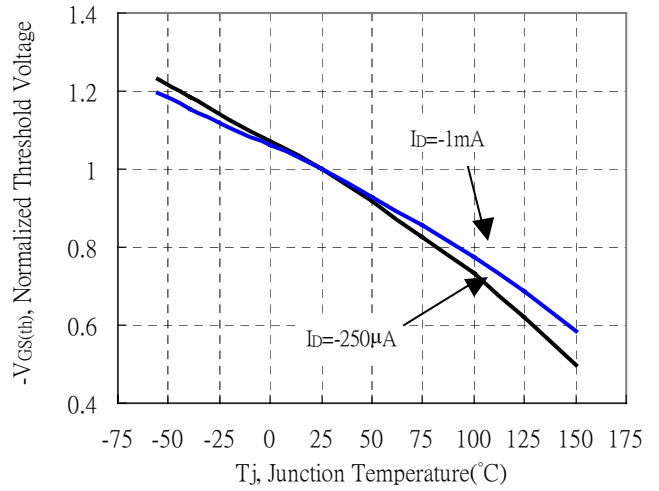


**Typical Characteristics(Cont.)**

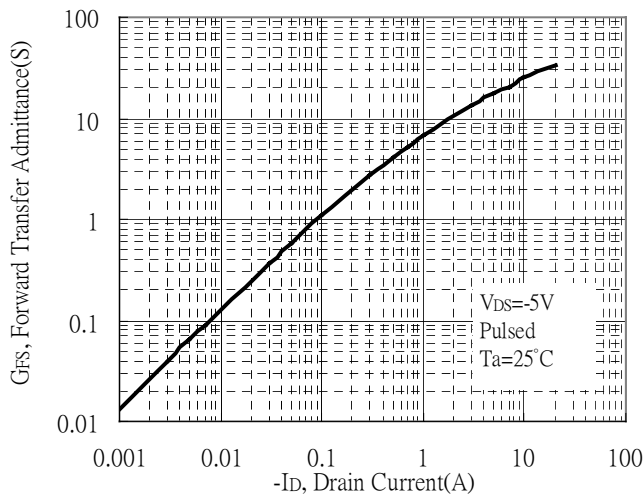
Capacitance vs Drain-to-Source Voltage



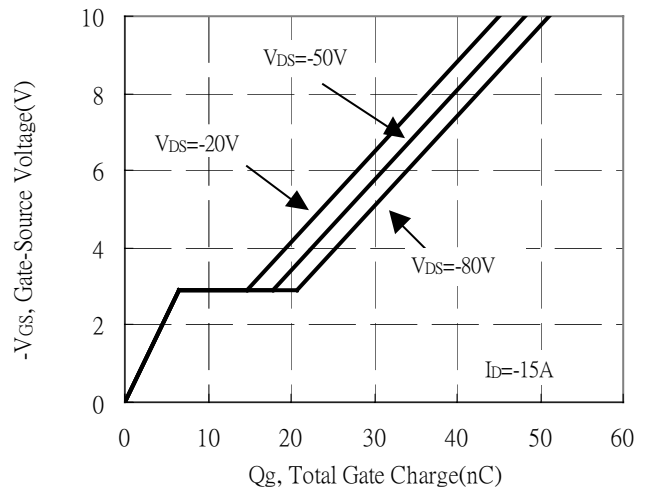
Threshold Voltage vs Junction Temperature



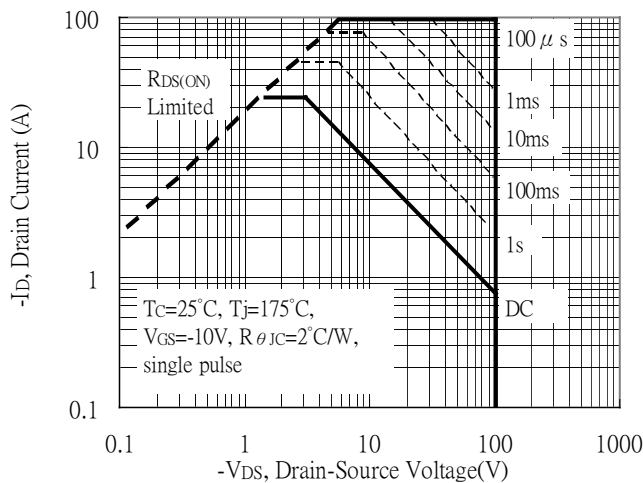
Forward Transfer Admittance vs Drain Current



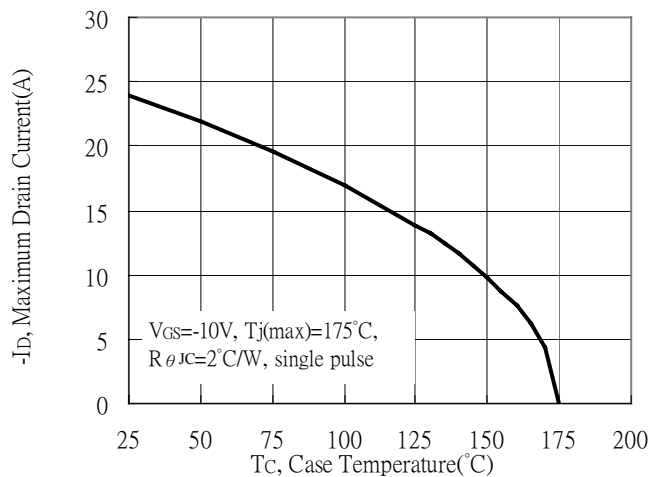
Gate Charge Characteristics



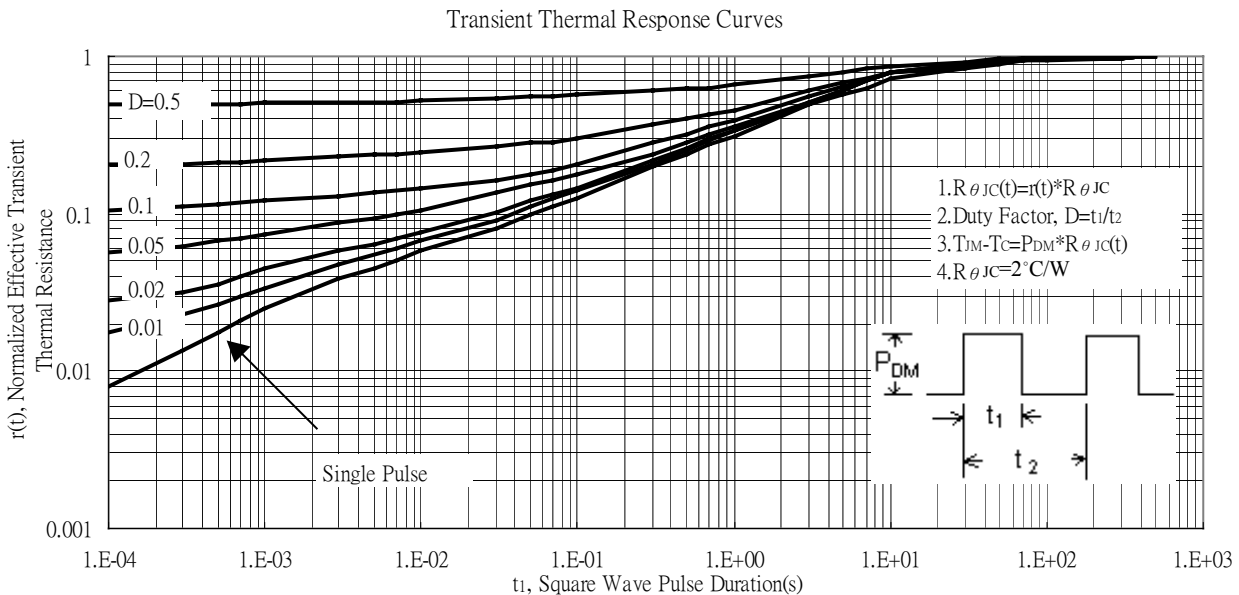
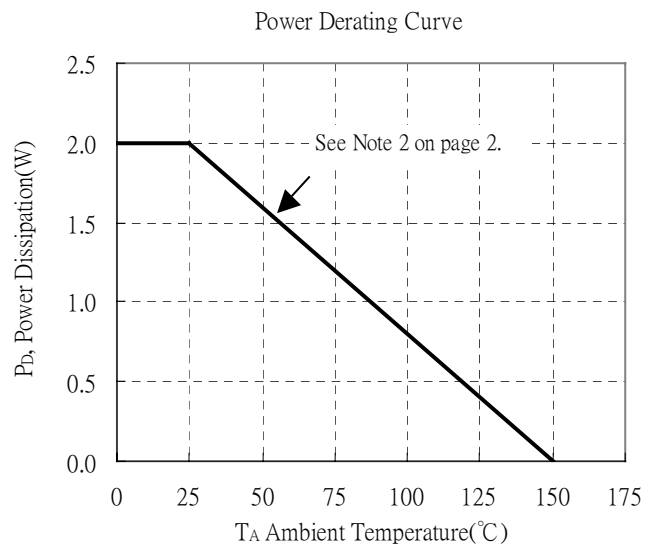
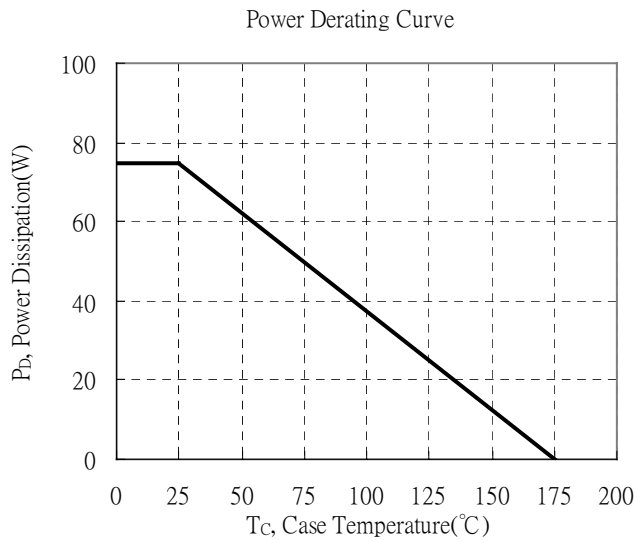
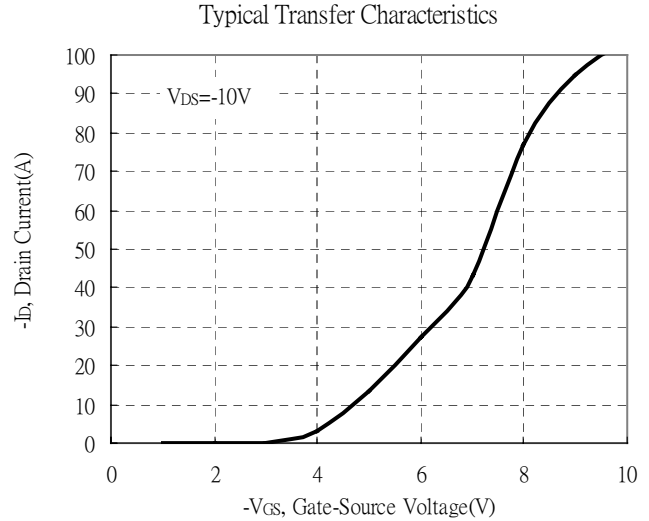
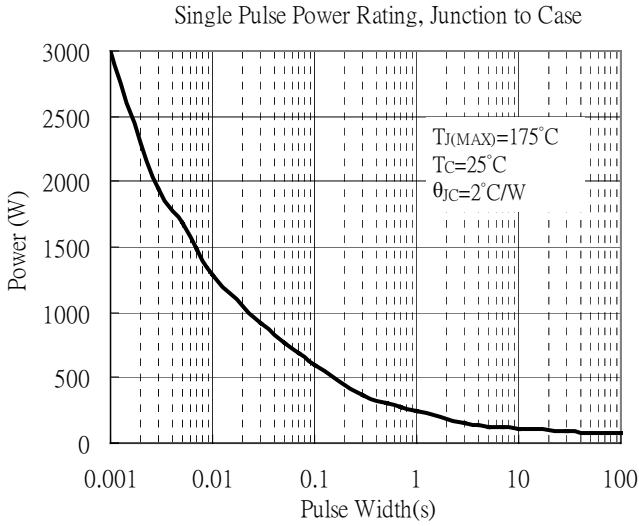
Maximum Safe Operating Area



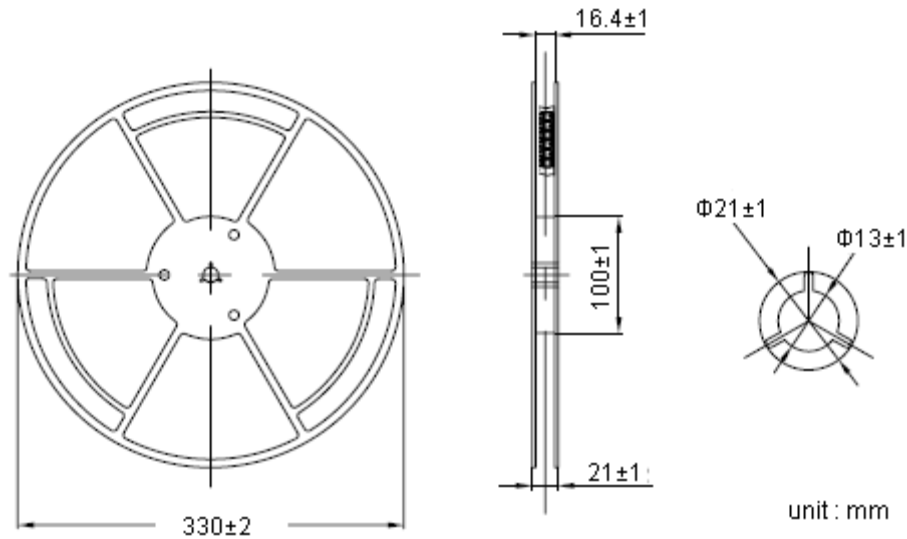
Maximum Drain Current vs Case Temperature



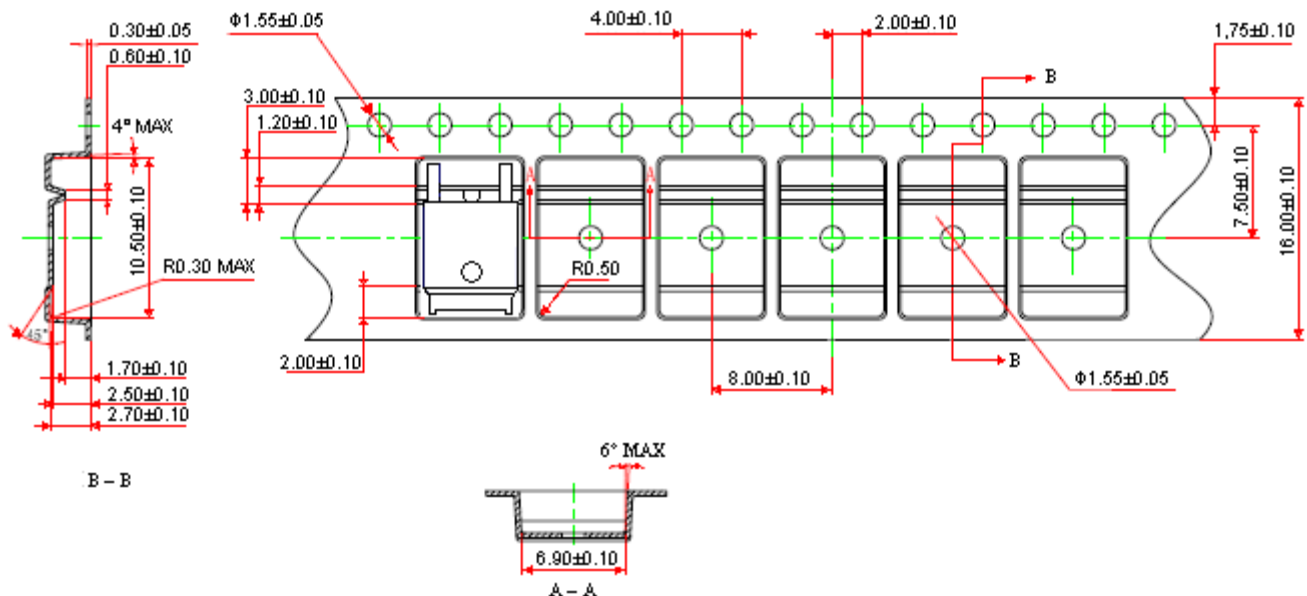
**Typical Characteristics(Cont.)**



## Reel Dimension



## Carrier Tape Dimension

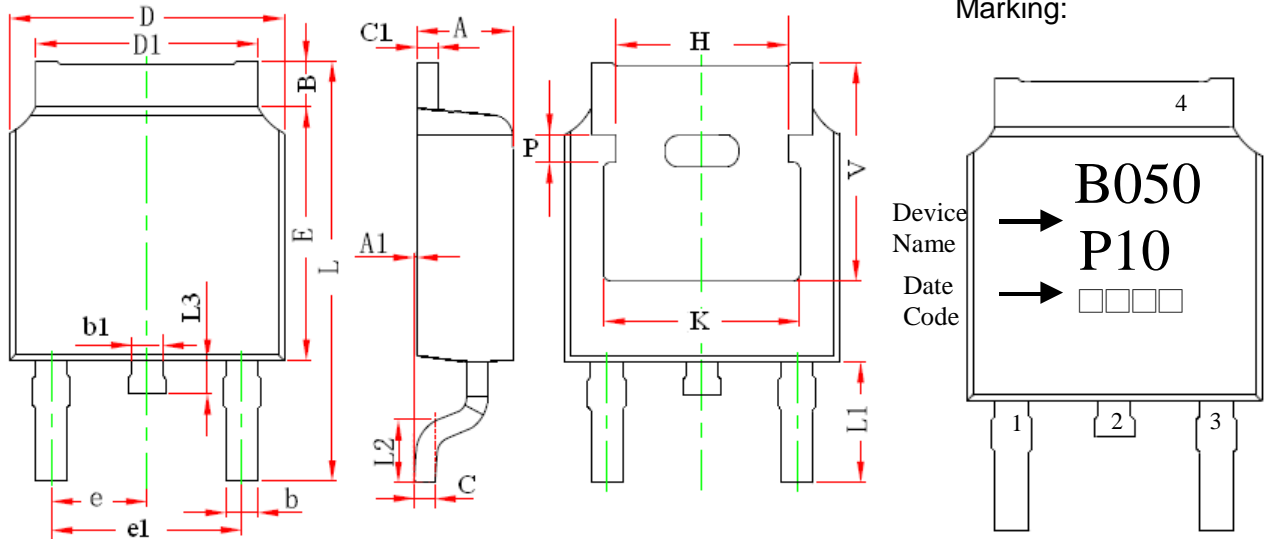


Notes:

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**



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