

## N-Channel Enhancement Mode Power MOSFET

### Features:

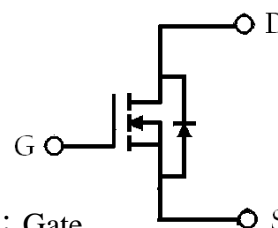
- Low Gate Charge
- Simple Drive Requirement
- Repetitive Avalanche Rated
- Fast Switching Characteristic
- RoHS compliant package

TO-252(DPAK)



G D S

KJ9971



G : Gate  
 D : Drain  
 S : Source

<b>BV<sub>DSS</sub></b>	<b>60V</b>
<b>I<sub>D</sub>@V<sub>GS</sub> = 10V, T<sub>C</sub>=25°C</b>	<b>25A</b>
<b>I<sub>D</sub>@V<sub>GS</sub> = 10V, T<sub>A</sub>=25°C</b>	<b>4.3A</b>
<b>R<sub>DS(ON)</sub>@V<sub>GS</sub>=10V, I<sub>D</sub>=18A</b>	<b>27mΩ (typ)</b>
<b>R<sub>DS(ON)</sub>@V<sub>GS</sub>=4.5V, I<sub>D</sub>=12A</b>	<b>31mΩ (typ)</b>

### Ordering Information

Device	Package	Shipping
KJ9971	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>	60	V
Gate-Source Voltage	V <sub>GS</sub>	±20	
Continuous Drain Current @V <sub>GS</sub> =10V, T <sub>C</sub> =25°C	I <sub>D</sub>	25	A
Continuous Drain Current @V <sub>GS</sub> =10V, T <sub>C</sub> =100°C		18	
Continuous Drain Current @V <sub>GS</sub> =10V, T <sub>A</sub> =25°C	I <sub>DSM</sub>	4.3	
Continuous Drain Current @V <sub>GS</sub> =10V, T <sub>A</sub> =70°C		3.6	
Pulsed Drain Current	I <sub>DM</sub>	50 *1	
Total Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	47	W
Total Power Dissipation (T <sub>C</sub> =100°C)		23.5	
Total Power Dissipation (T <sub>A</sub> =25°C)	P <sub>DSM</sub>	1.4	
Total Power Dissipation (T <sub>A</sub> =70°C)		1.0	
Operating Junction and Storage Temperature	T <sub>j</sub> , T <sub>stg</sub>	-55~+175	°C

Note : \*1. Pulse width limited by safe operating area

### Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R <sub>th,j-c</sub>	3.2	°C/W
Thermal Resistance, Junction-to-ambient, max	R <sub>th,j-a</sub>	110	°C/W

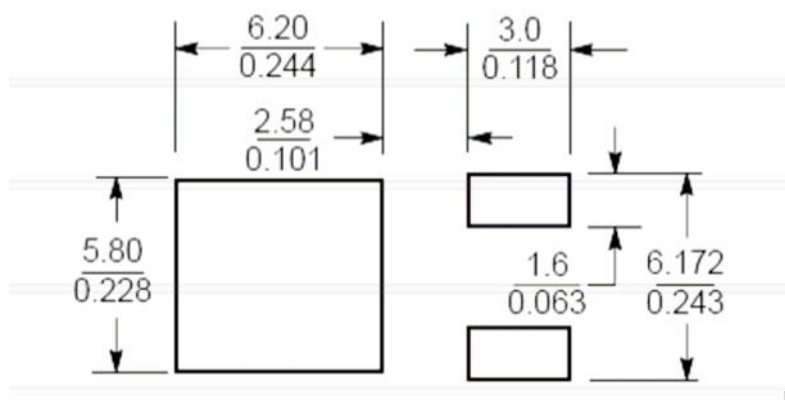
### Characteristics (T<sub>j</sub>=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>					
BV <sub>DSS</sub>	60	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =250μA
ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	-	0.05	-	V/°C	Reference to 25°C, I <sub>D</sub> =1mA
V <sub>GS(th)</sub>	1.0	1.3	2.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA
G <sub>FS</sub>	-	17	-	S	V <sub>DS</sub> =10V, I <sub>D</sub> =18A
I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> =±20
I <sub>DSS</sub>	-	-	1	μA	V <sub>DS</sub> =60V, V <sub>GS</sub> =0
I <sub>DSS</sub>	-	-	25	μA	V <sub>DS</sub> =48V, V <sub>GS</sub> =0, T <sub>j</sub> =150°C
*R <sub>DS(ON)</sub>	-	27	36	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =18A
*R <sub>DS(ON)</sub>	-	31	50	mΩ	V <sub>GS</sub> =4.5V, I <sub>D</sub> =12A
<b>Dynamic</b>					
*Q <sub>g</sub>	-	18	-	nC	I <sub>D</sub> =18A, V <sub>DS</sub> =48V, V <sub>GS</sub> =4.5V
*Q <sub>gs</sub>	-	5	-		
*Q <sub>gd</sub>	-	6	-		
*t <sub>d(ON)</sub>	-	7	-	ns	V <sub>DS</sub> =30V, I <sub>D</sub> =18A, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3Ω, R <sub>D</sub> =1.67Ω
*t <sub>r</sub>	-	9	-		
*t <sub>d(OFF)</sub>	-	23	-		
*t <sub>f</sub>	-	6	-		

Ciss	-	1591	-	pF	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1MHz
Coss	-	63	-		
Crss	-	46	-		
<b>Source-Drain Diode</b>					
*V <sub>SD</sub>	-	-	1.2	V	I <sub>S</sub> =25A, V <sub>GS</sub> =0V
*trr	-	37	-	ns	I <sub>S</sub> =18A, V <sub>GS</sub> =0, dI/dt=100A/μs
*Q <sub>rr</sub>	-	38	-	nC	

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

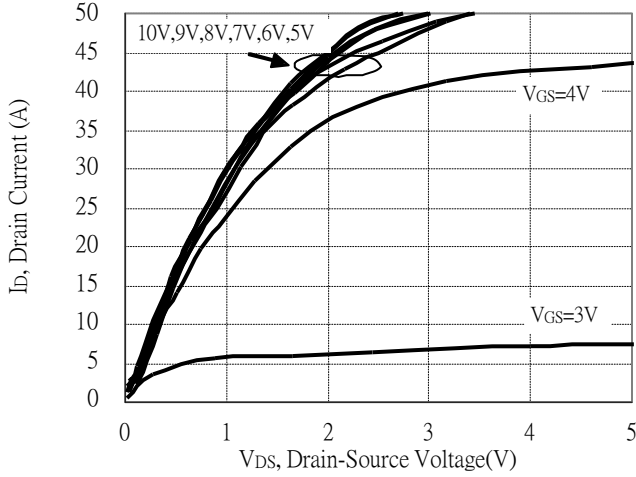
**Recommended soldering footprint**



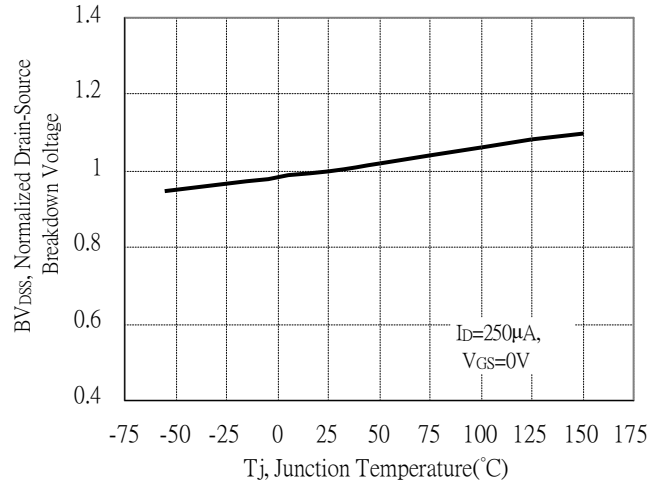
Unit (  $\frac{\text{mm}}{\text{inch}}$  )

### Typical Characteristics

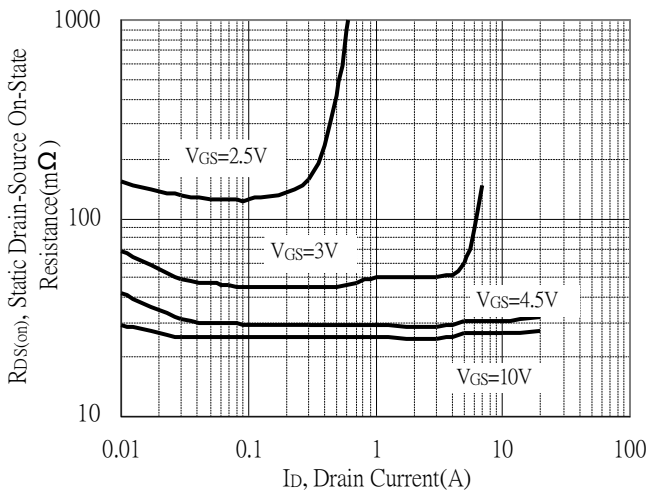
Typical Output Characteristics



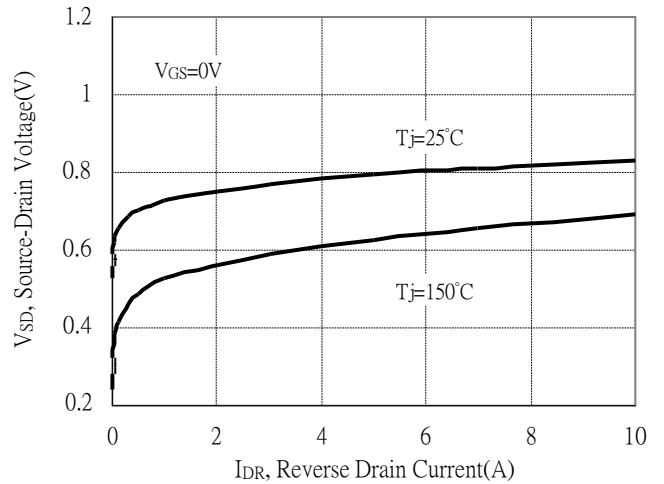
Brekdown Voltage vs Ambient Temperature



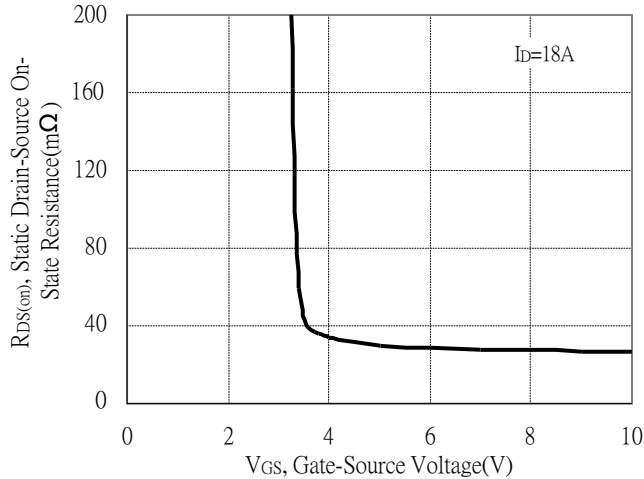
Static Drain-Source On-State resistance vs Drain Current



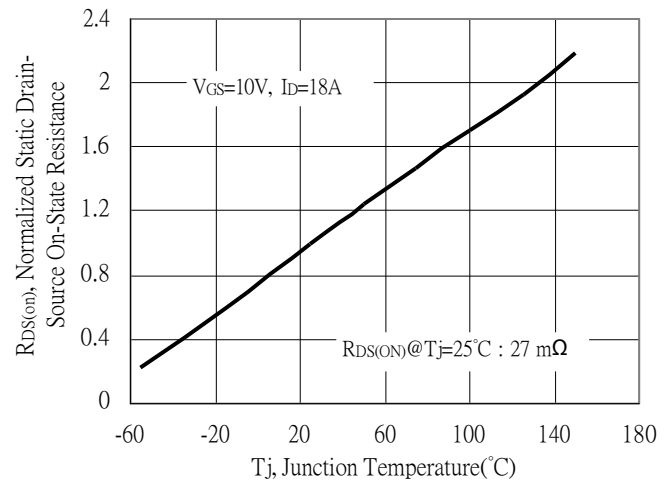
Reverse Drain Current vs Source-Drain Voltage



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

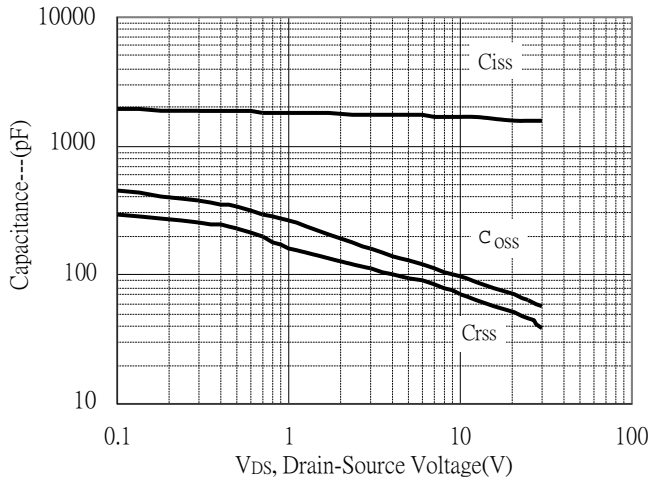


Drain-Source On-State Resistance vs Junction Temperature

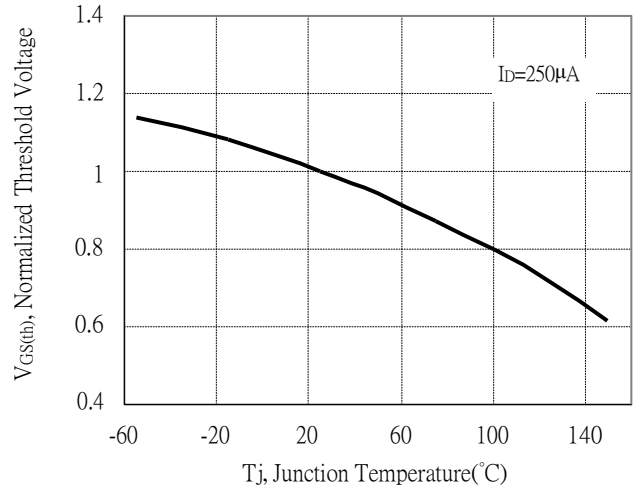


**Typical Characteristics(Cont.)**

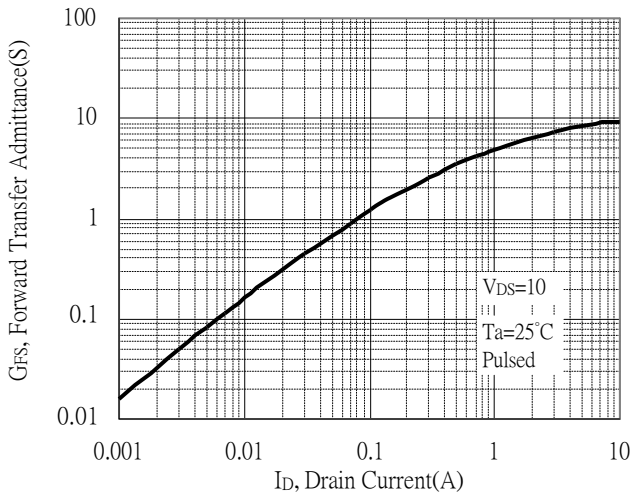
Capacitance vs Drain-to-Source Voltage



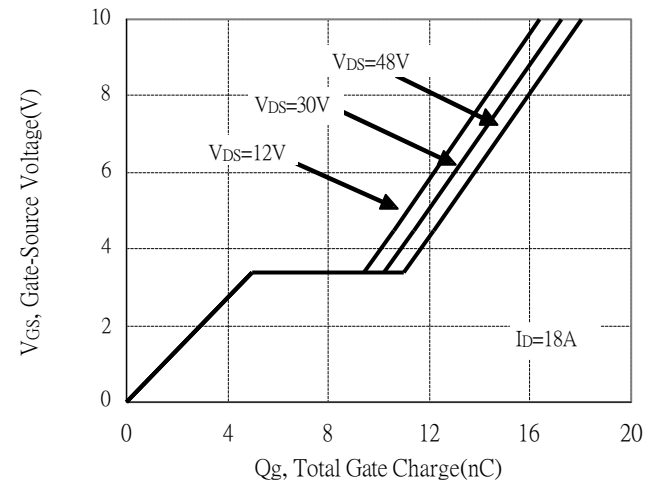
Threshold Voltage vs Junction Temperature



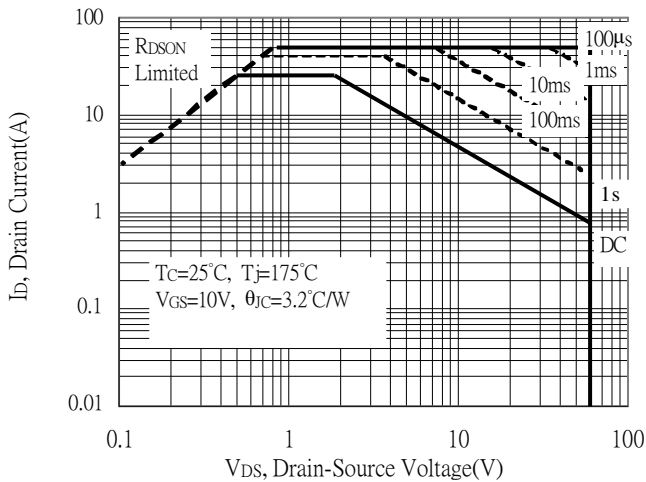
Forward Transfer Admittance vs Drain Current



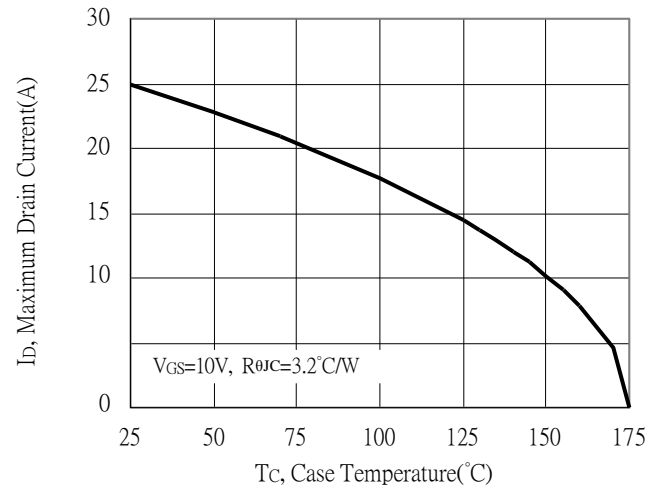
Gate Charge Characteristics



Maximum Safe Operating Area

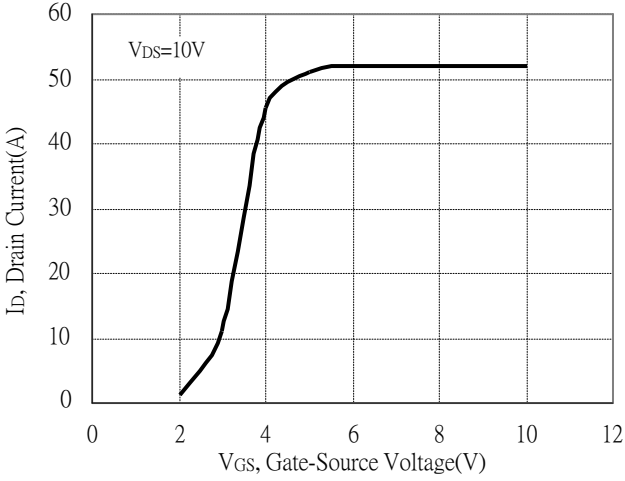


Maximum Drain Current vs Case Temperature

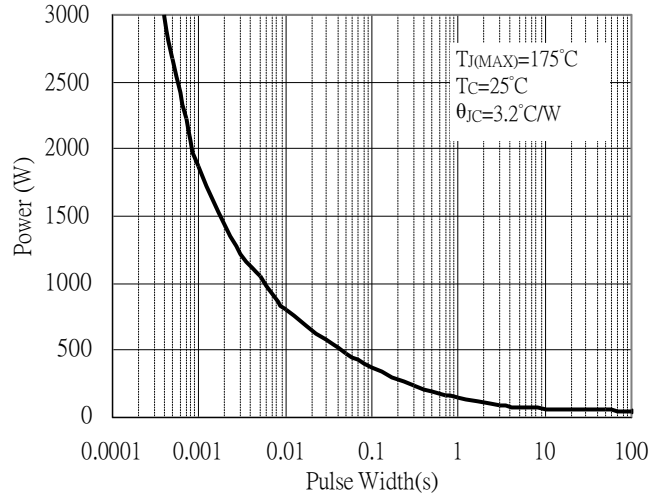


**Typical Characteristics(Cont.)**

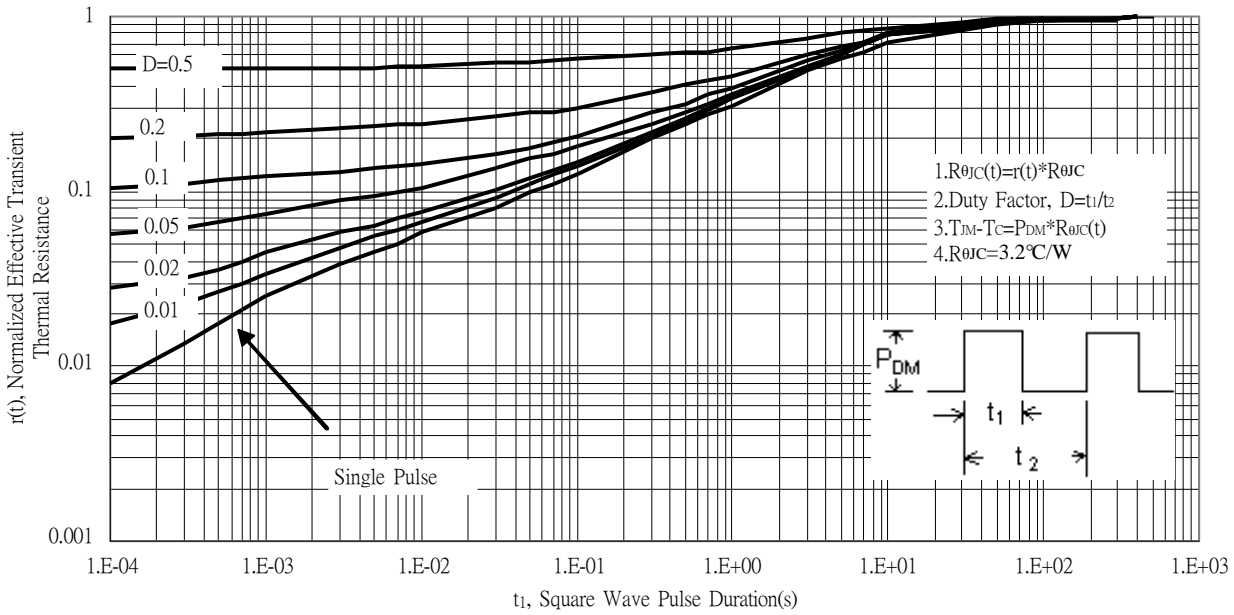
Typical Transfer Characteristics



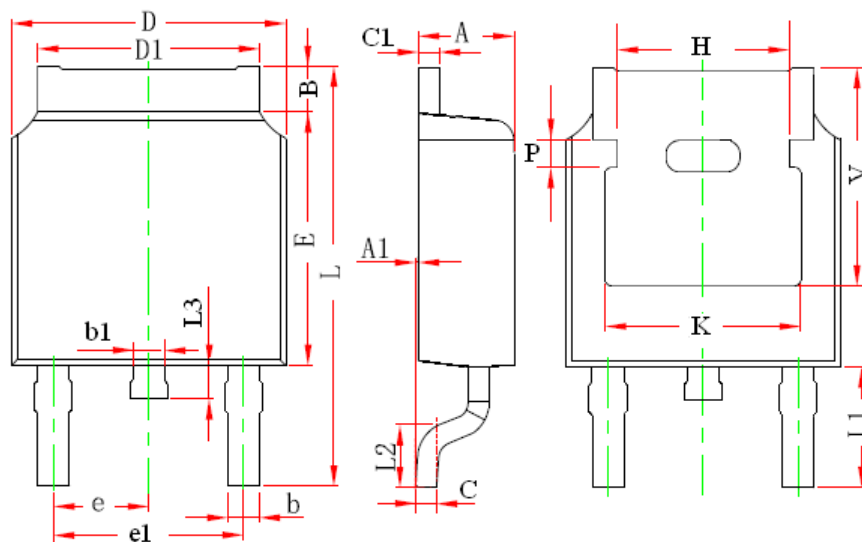
Single Pulse Maximum Power Rating



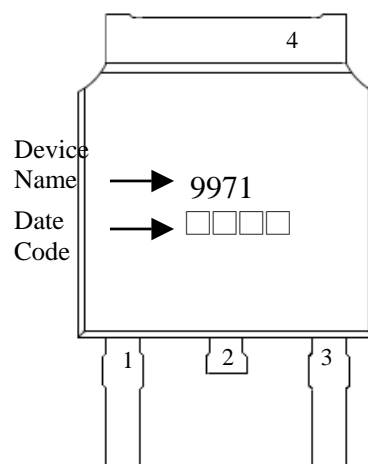
Transient Thermal Response Curves



**TO-252 Dimension**



Marking:



3-Lead TO-252 Plastic Surface Mount 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