

P-Channel Logic Level Enhancement Mode Power MOSFET

Features:

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

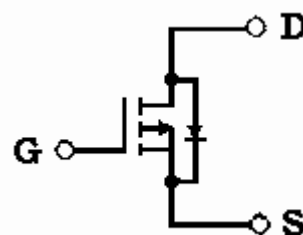
Outline

TO-252(DPAK)



Equivalent Circuit

KWB90P06J3



G : Gate D : Drain S : Source

BV_{DSS}	-60V
I_D	-12A
$R_{DS(on)}@V_{GS}=-10V, I_D=-10A$	70 m Ω (typ)
$R_{DS(on)}@V_{GS}=-5V, I_D=-8A$	90 m Ω (typ)

Ordering Information

Device	Package	Shipping
KWB90P06J3	TO-252 (Pb-free lead plating & 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}	-60	V
Gate-Source Voltage	V _{GS}	±20	
Continuous Drain Current @ T _C =25°C	I _D	-12	A
Continuous Drain Current @ T _C =100°C	I _D	-8.5	
Pulsed Drain Current *1	I _{DM}	-40	
Avalanche Current	I _{AS}	-10	
Avalanche Energy @ L=0.1mH, I _D =-10A, R _G =25Ω	E _{AS}	5	mJ
Repetitive Avalanche Energy @ L=0.05mH *2	E _{AR}	2	
Total Power Dissipation @ T _C =25°C	P _d	33	W
Total Power Dissipation @ T _C =100°C		10	
Operating Junction and Storage Temperature Range	T _j , T _{stg}	-55~+175	°C

Note : *1. Pulse width limited by maximum junction temperature

*2. Duty cycle ≤ 1%

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{th,j-c}	4.5	°C/W
Thermal Resistance, Junction-to-ambient, max	R _{th,j-a}	110	°C/W

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-60	-	-	V	V _{GS} =0, I _D =-250μA
V _{GS(th)}	-1	-1.7	-2.5		V _{DS} =V _{GS} , I _D =-250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±20, V _{DS} =0
I _{DSS}	-	-	-1	μA	V _{DS} =-32V, V _{GS} =0
	-	-	-25		V _{DS} =-30V, V _{GS} =0, T _J =125°C
I _{D(ON)} *1	-12	-	-	A	V _{DS} =-5V, V _{GS} =-4.5V
R _{DS(ON)} *1	-	70	90	mΩ	V _{GS} =-10V, I _D =-10A
	-	90	140	mΩ	V _{GS} =-5V, I _D =-8A
G _{FS} *1	-	13	-	S	V _{DS} =-5V, I _D =-10A
Dynamic					
Q _g *1, 2	-	16	-	nC	V _{DS} =-30V, I _D =-12A, V _{GS} =-10V
Q _{gs} *1, 2	-	3.7	-		
Q _{gd} *1, 2	-	5	-		
t _{d(ON)} *1, 2	-	7	-	ns	V _{DS} =-10V, I _D =-1A, V _{GS} =-10V, R _G =6Ω
t _r *1, 2	-	10	-		
t _{d(OFF)} *1, 2	-	30	-		
t _f *1, 2	-	7	-		

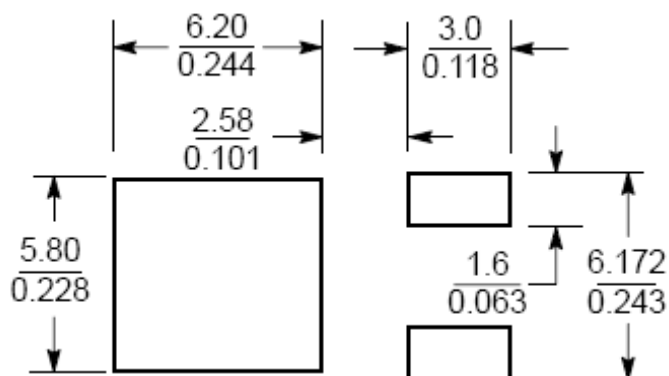
Ciss	-	1005	-	pF	V _{GS} =0V, V _{DS} =-25V, f=1MHz
Coss	-	51	-		
Crss	-	41	-		
Rg	-	6.8	-	Ω	V _{GS} =15mV, V _{DS} =0, f=1MHz
Source-Drain Diode					
I _S *1	-	-	-12	A	
I _{SM} *3	-	-	-40		
V _{SD} *1	-	-0.92	-1.3	V	I _F =-10A, V _{GS} =0V
trr	-	12	-	ns	I _F =-5A, dI _F /dt=100A/μs
Qrr	-	9	-	nC	

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

*2.Independent of operating temperature

*3.Pulse width limited by maximum junction temperature.

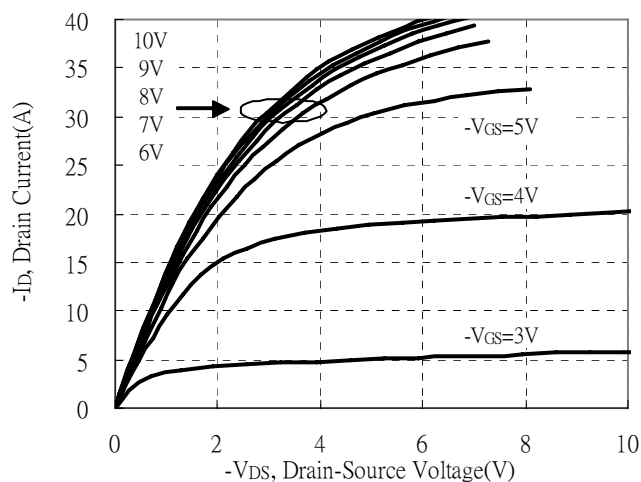
Recommended soldering footprint



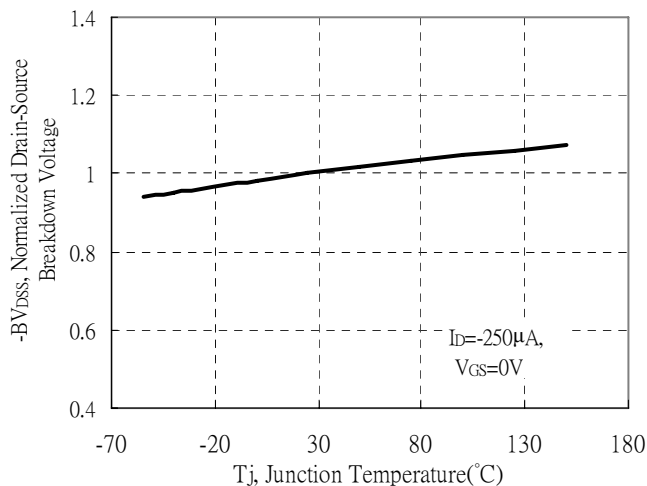
Unit ($\frac{\text{mm}}{\text{inch}}$)

Typical Characteristics

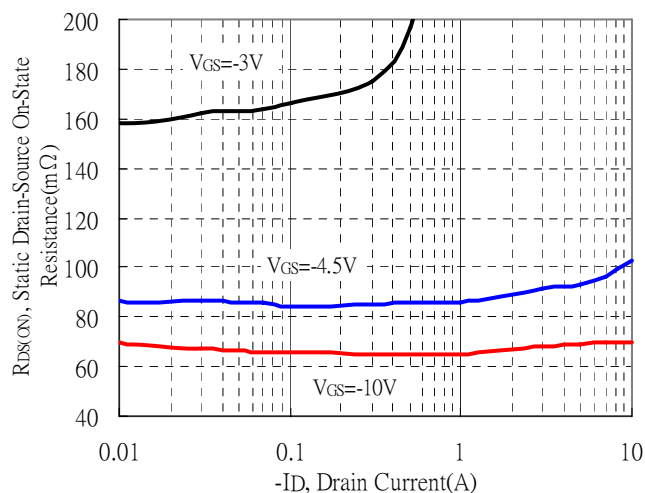
Typical Output Characteristics



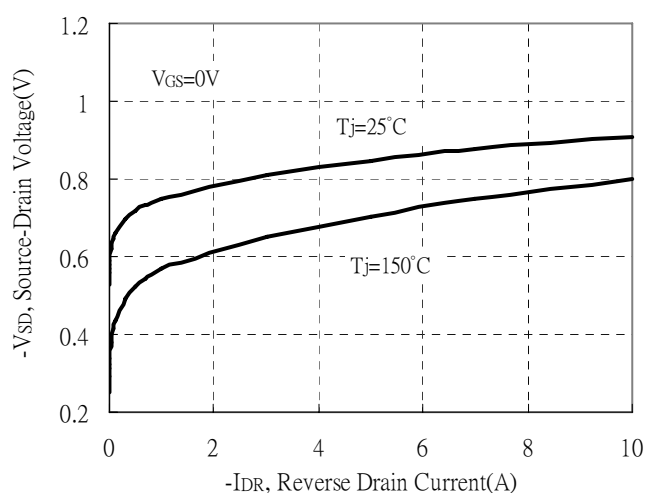
Breakdown Voltage vs Ambient Temperature



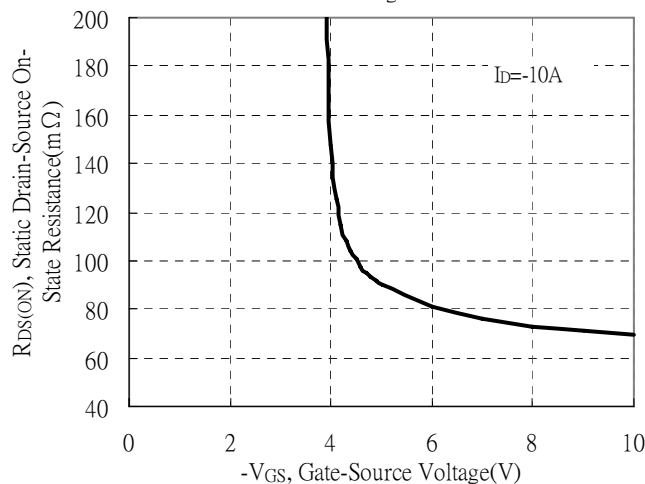
Static Drain-Source On-State resistance vs Drain Current



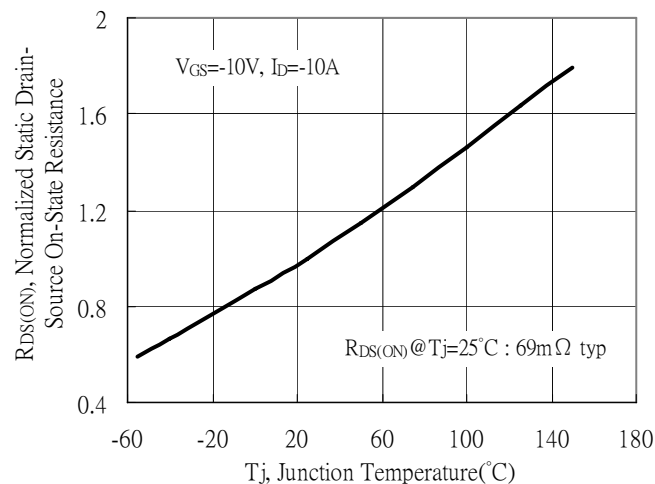
Reverse Drain Current vs Source-Drain Voltage



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

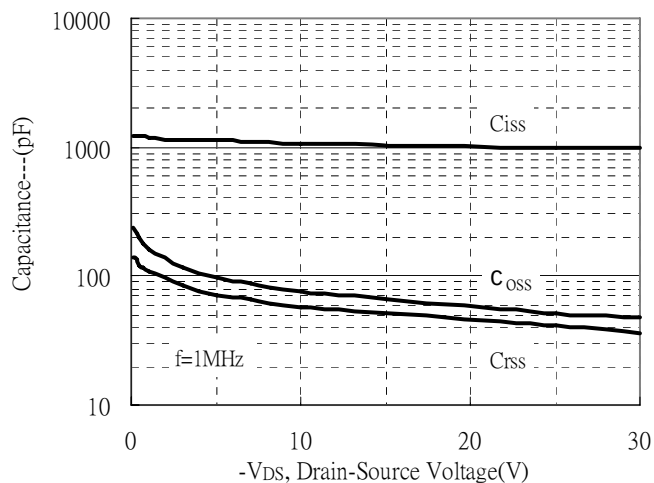


Drain-Source On-State Resistance vs Junction Temperature

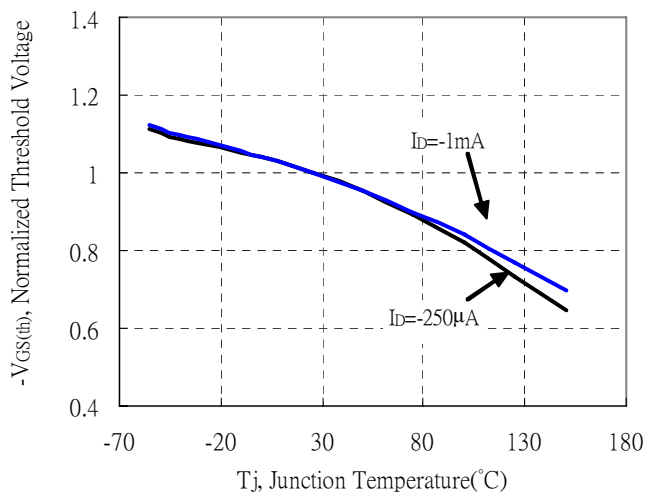


Typical Characteristics(Cont.)

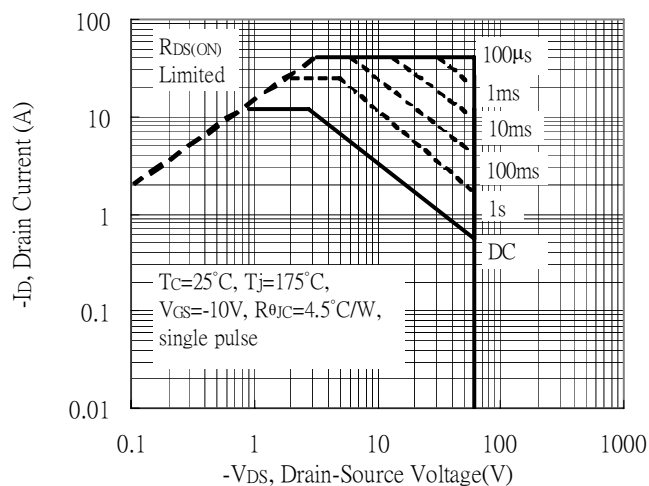
Capacitance vs Drain-to-Source Voltage



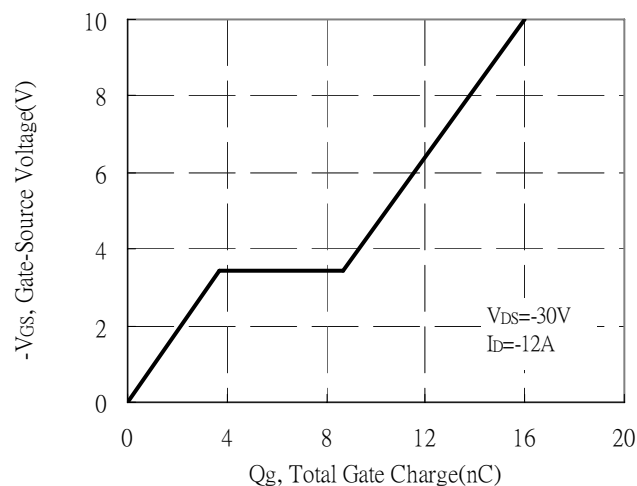
Threshold Voltage vs Junction Temperature



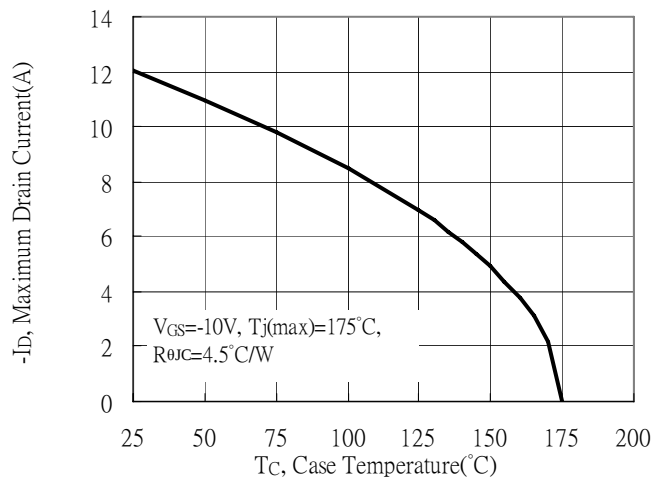
Maximum Safe Operating Area



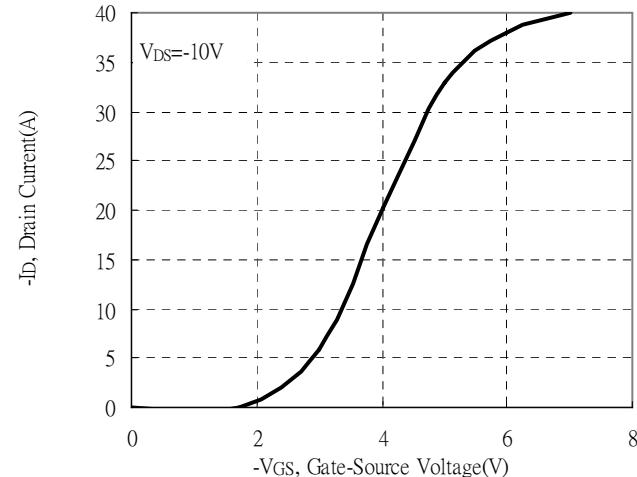
Gate Charge Characteristics



Maximum Drain Current vs Case Temperature

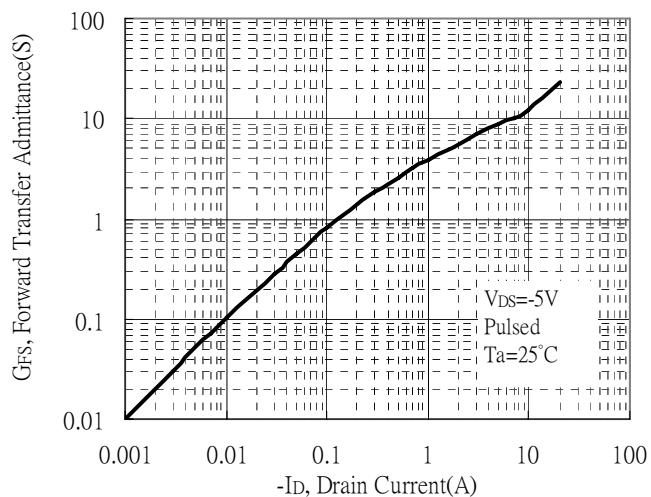


Typical Transfer Characteristics

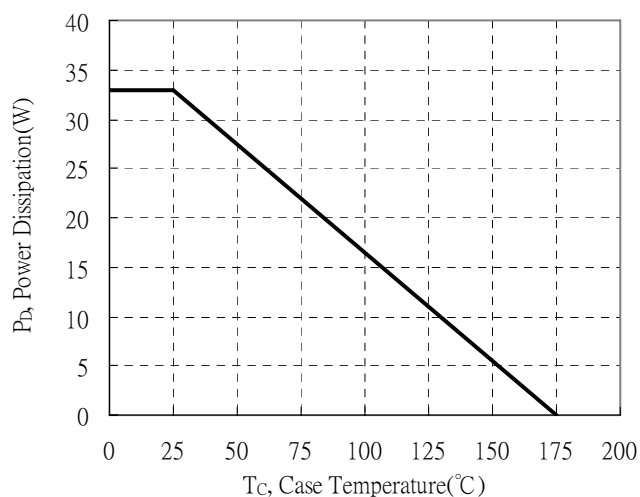


Typical Characteristics(Cont.)

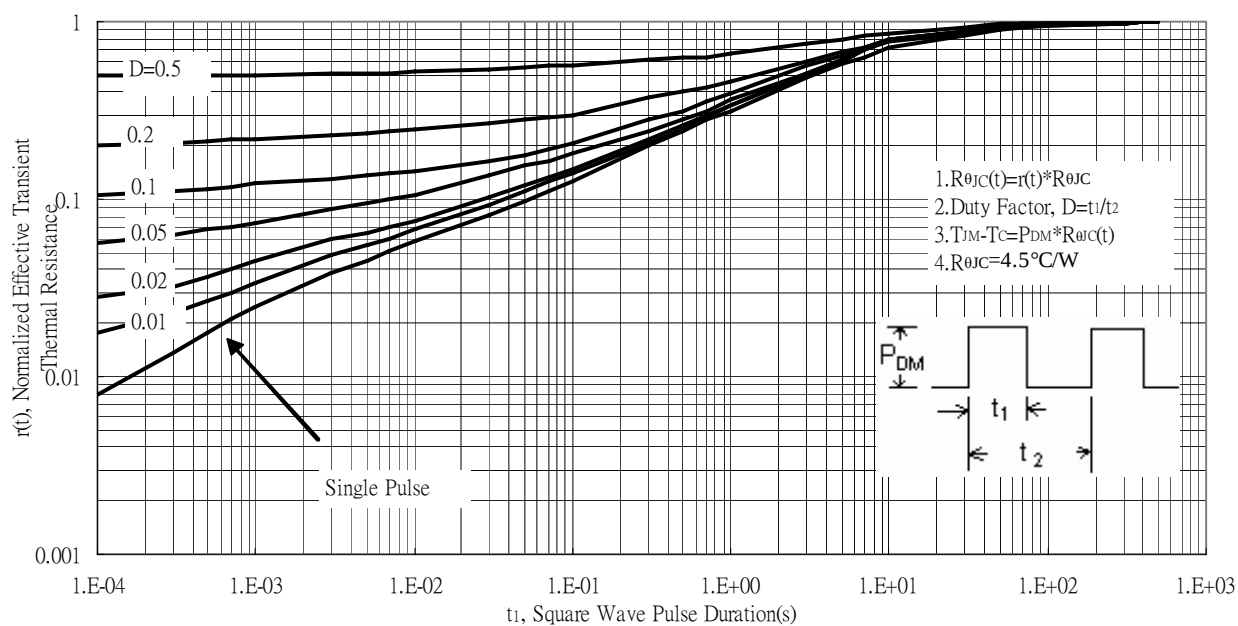
Forward Transfer Admittance vs Drain Current



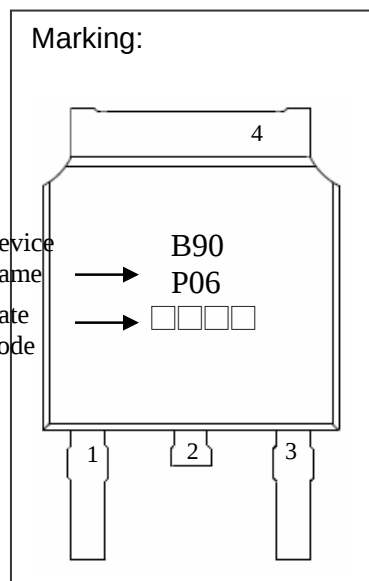
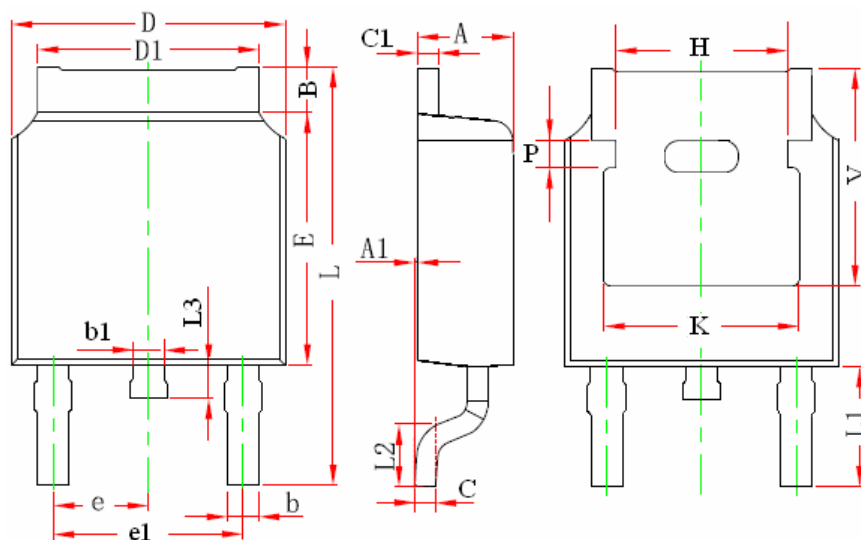
Power Derating Curve



Transient Thermal Response Curves



TO-252 Dimension



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