

P-Channel Enhancement Mode Power MOSFET

Features:

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

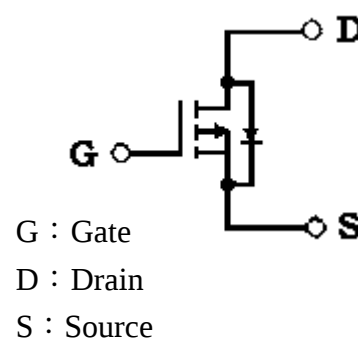
Outline

TO-252(DPAK)



Equivalent Circuit

KWE300P10J3



BV_{DSS}	-100V
I_D@V_{GS}=-10V, T_C=25°C	-6.6A
R_{DS(ON)}@V_{GS}=-10V, I_D=-5A	368mΩ (typ)

Ordering Information

Device	Package	Shipping
KWE300P10J3	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}	-100	V
Gate-Source Voltage		V _{GS}	±20	
Continuous Drain Current @T _C =25°C, V _{GS} =-10V (Note 1)		I _D	-6.6	A
Continuous Drain Current @T _C =100°C, V _{GS} =-10V (Note 1)			-4.2	
Continuous Drain Current @T _A =25°C, V _{GS} =-10V (Note 2)		I _{DSM}	-1.8	
Continuous Drain Current @T _A =70°C, V _{GS} =-10V (Note 2)			-1.4	
Pulsed Drain Current (Note 3)		I _{DM}	-26	
Avalanche Current (Note 3)		I _{AS}	-12	
Avalanche Energy @ L=1mH, I _D =-6.6A, V _{DD} =-25V (Note 2)		E _{AS}	22	mJ
Total Power Dissipation	T _C =25°C (Note 1)	P _D	31	W
	T _C =100°C (Note 1)		12	
	T _A =25°C (Note 2)	P _{DSM}	2.5	
	T _A =70°C (Note 2)		1.6	
Operating Junction and Storage Temperature Range		T _j , T _{stg}	-55~+150	°C

* 100% UIS testing in condition of V_D=-25V, L=0.1mH, V_G=-10V, I_{AS}=-12A, Rated V_{DS}=-100V

Thermal Data

Parameter	Symbol	Typical	Maximum	Unit
Thermal Resistance, Junction-to-case	R _{θJC}	3.6	4	°C/W
Thermal Resistance, Junction-to-ambient, t≤10s (Note 2)	R _{θJA}	15	18	
Thermal Resistance, Junction-to-ambient, steady state		40	50	

- 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. The value in any given application depends on the user's specific board design.
3. 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.

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

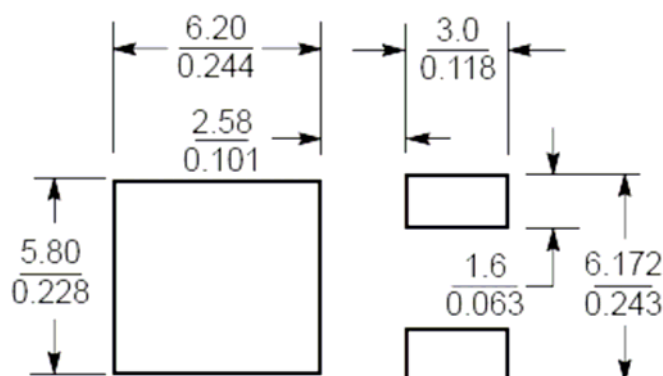
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-100	-	-	V	V _{GS} =0V, I _D =-250μA
V _{GS(th)}	-2	-	-4		V _{DS} =V _{GS} , I _D =-250μA
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	-1	μA	V _{DS} =-100V, V _{GS} =0V
	-	-	-25		V _{DS} =-80V, V _{GS} =0V, T _J =125°C
R _{DS(ON)} *1	-	368	490	mΩ	V _{GS} =-10V, I _D =-5A
G _{FS} *1	-	4	-	S	V _{DS} =-15V, I _D =-5A
Dynamic					
Q _g *1, 2	-	6.5	9.8	nC	I _D =-11A, V _{DS} =-80V, V _{GS} =-10V
Q _{gs} *1, 2	-	2.2	-		
Q _{gd} *1, 2	-	2.4	-		
t _{d(ON)} *1, 2	-	7	10.5	ns	V _{DS} =-50V, I _D =-11A, V _{GS} =-10V, R _G =25Ω
t _r *1, 2	-	17	25.5		
t _{d(OFF)} *1, 2	-	19	28.5		
t _f *1, 2	-	27.8	41.7		
C _{iss}	-	298	-	pF	V _{GS} =0V, V _{DS} =-25V, f=1MHz
C _{oss}	-	43	-		
C _{rss}	-	20	-		
R _g	-	11	-	Ω	f=1MHz
Source-Drain Diode Ratings and Characteristics					
I _S *1	-	-	-6.6	A	
I _{SM} *1	-	-	-26		
V _{SD} *1	-	-0.9	-1.2	V	I _S =-5A, V _{GS} =0V
t _{rr}	-	33	49.5	ns	I _F =-9A, dI _F /dt=100A/μs
Q _{rr}	-	47	-	nC	

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

*2.Independent of operating temperature

*3.Pulse width limited by maximum junction temperature.

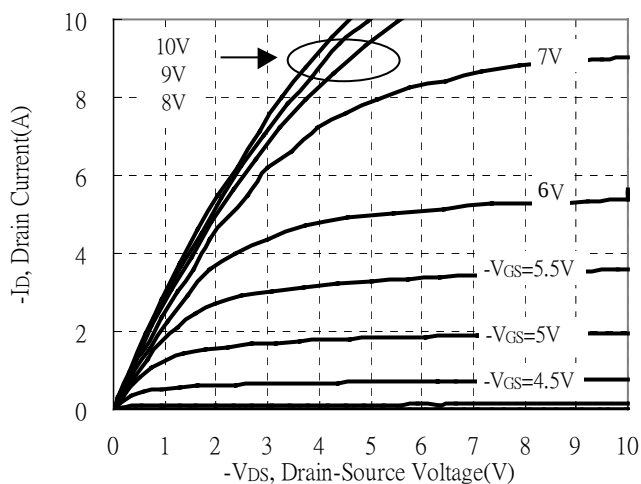
Recommended soldering footprint



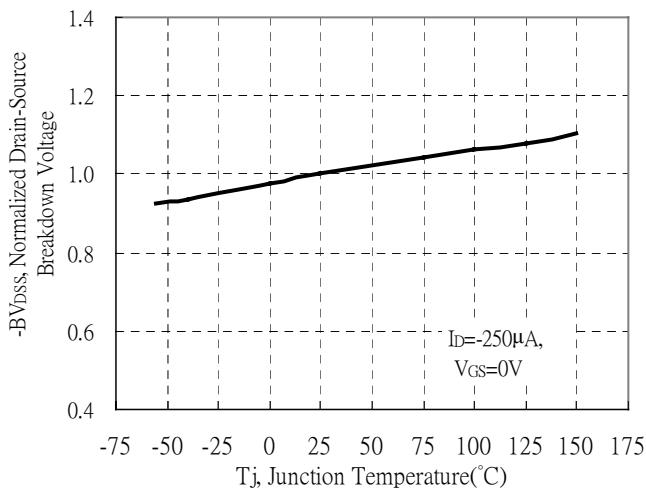
Unit ($\frac{\text{mm}}{\text{inch}}$)

Typical Characteristics

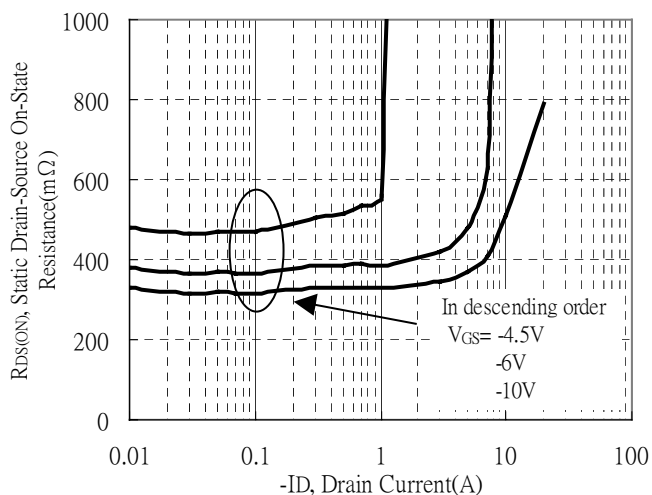
Typical Output Characteristics



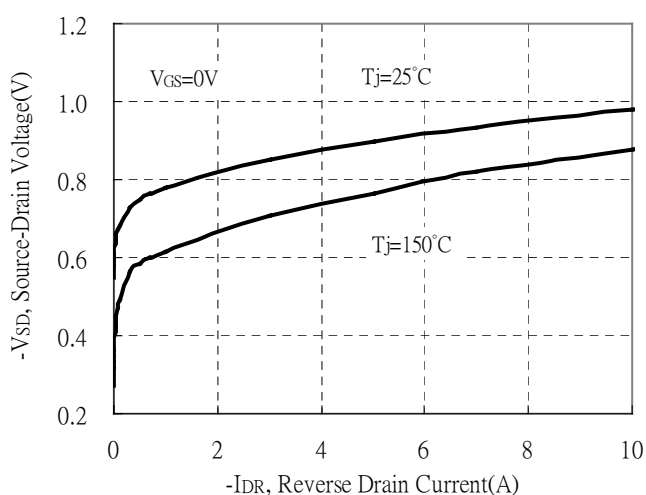
Breakdown Voltage vs Ambient Temperature



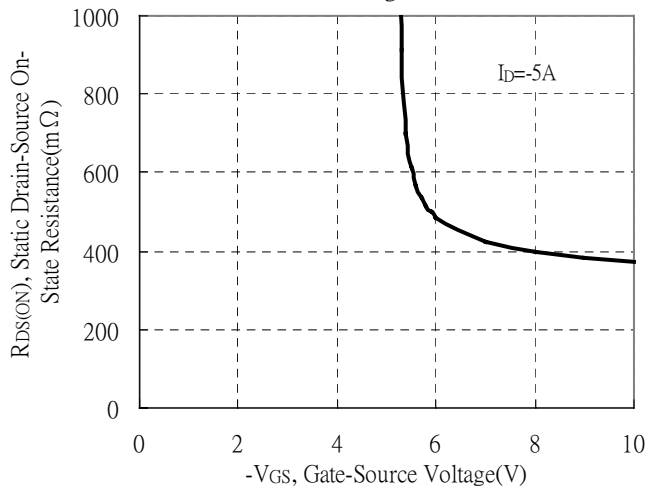
Static Drain-Source On-State resistance vs Drain Current



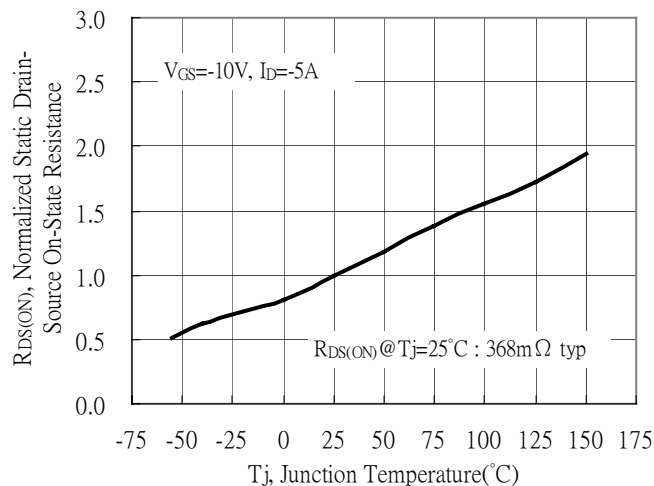
Reverse Drain Current vs Source-Drain Voltage



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

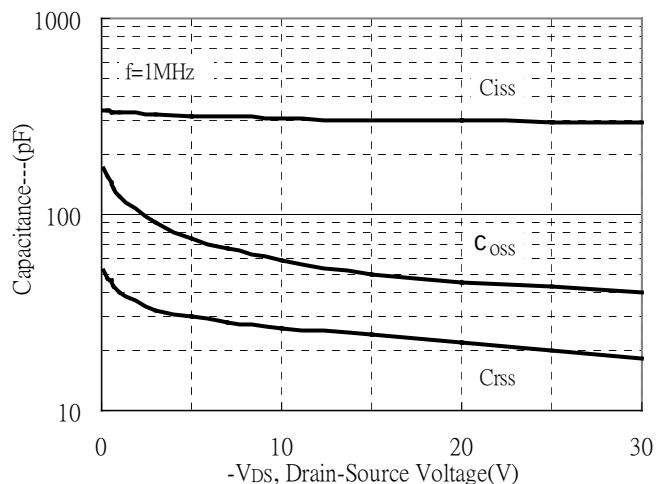


Drain-Source On-State Resistance vs Junction Temperature

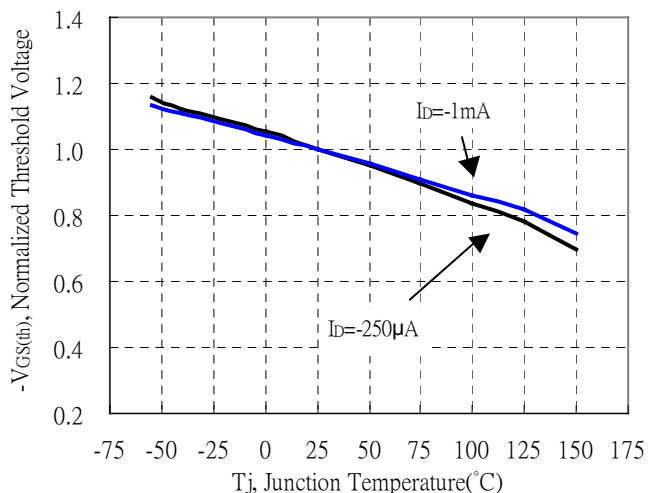


Typical Characteristics (Cont.)

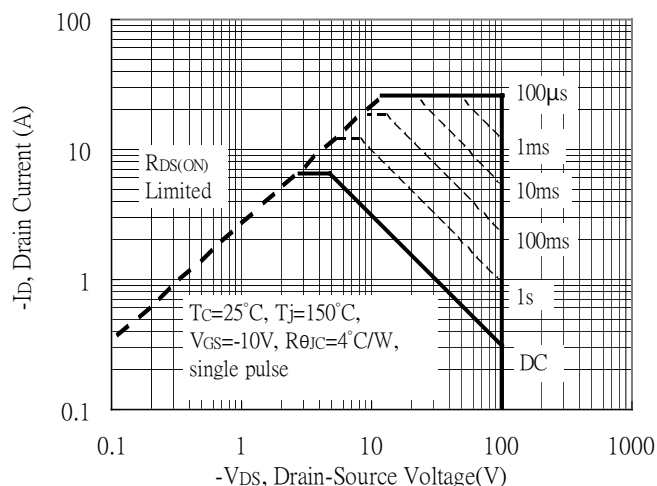
Capacitance vs Drain-to-Source Voltage



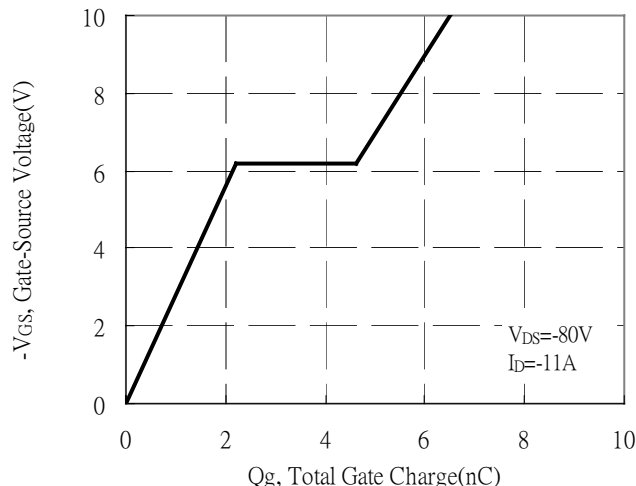
Threshold Voltage vs Junction Temperature



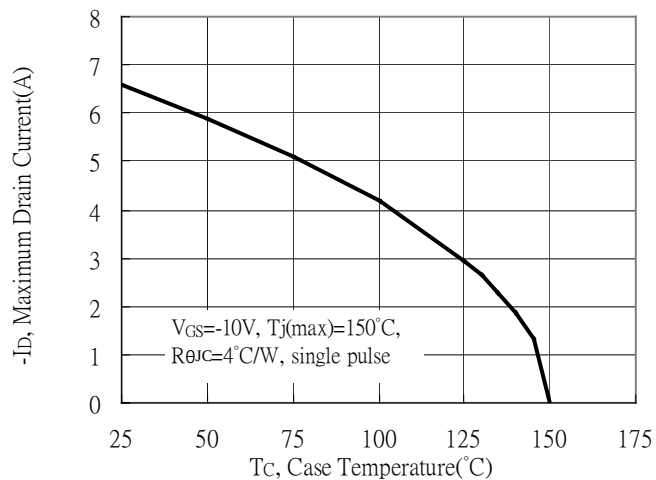
Maximum Safe Operating Area



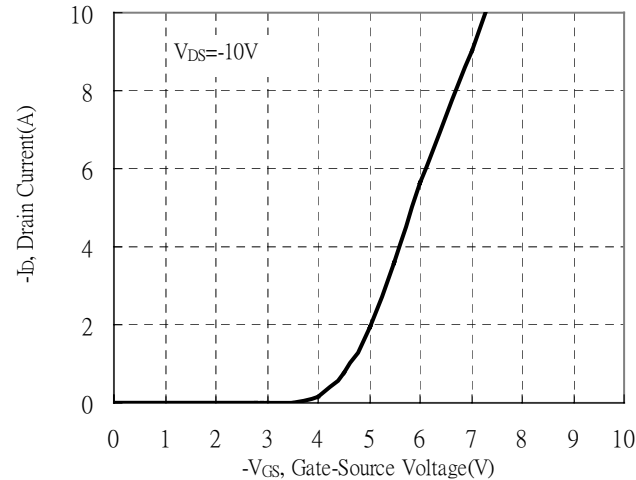
Gate Charge Characteristics



Maximum Drain Current vs Case Temperature

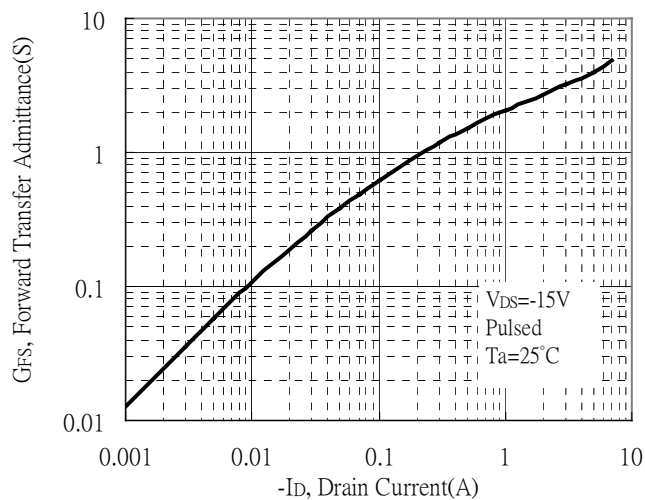


Typical Transfer Characteristics

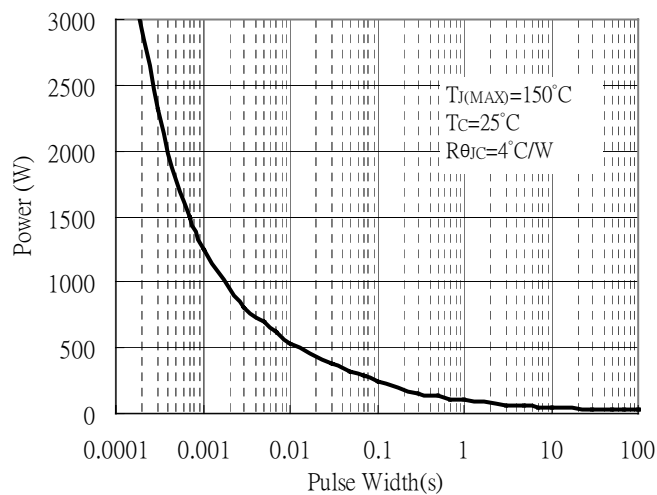


Typical Characteristics (Cont.)

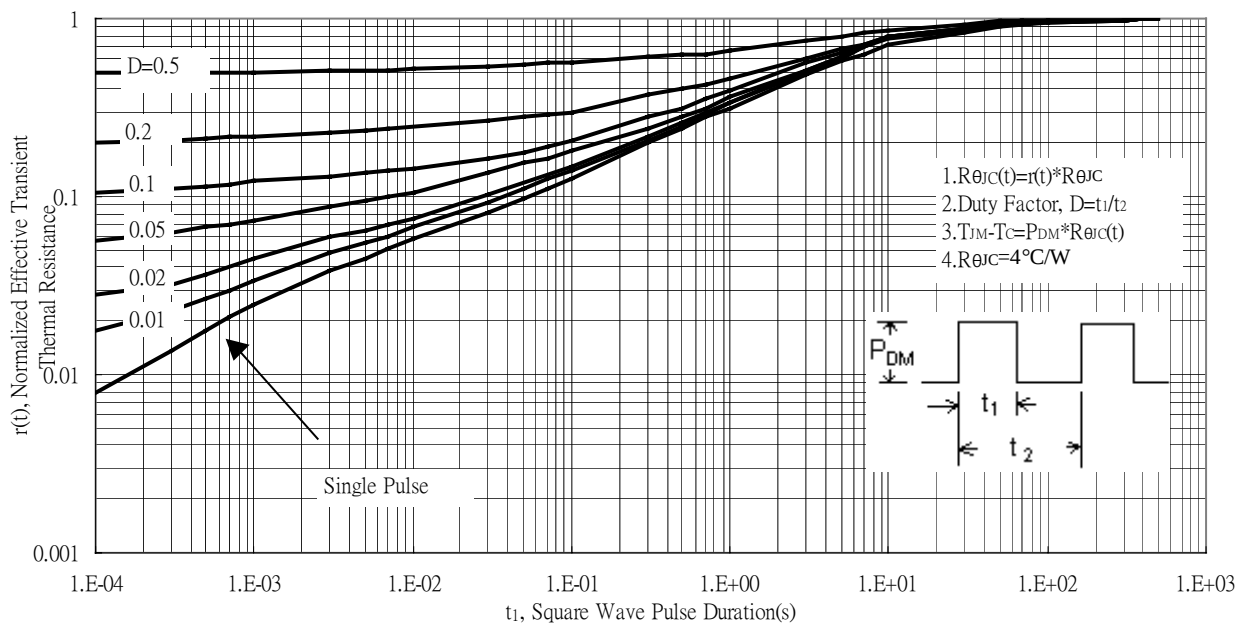
Forward Transfer Admittance vs Drain Current



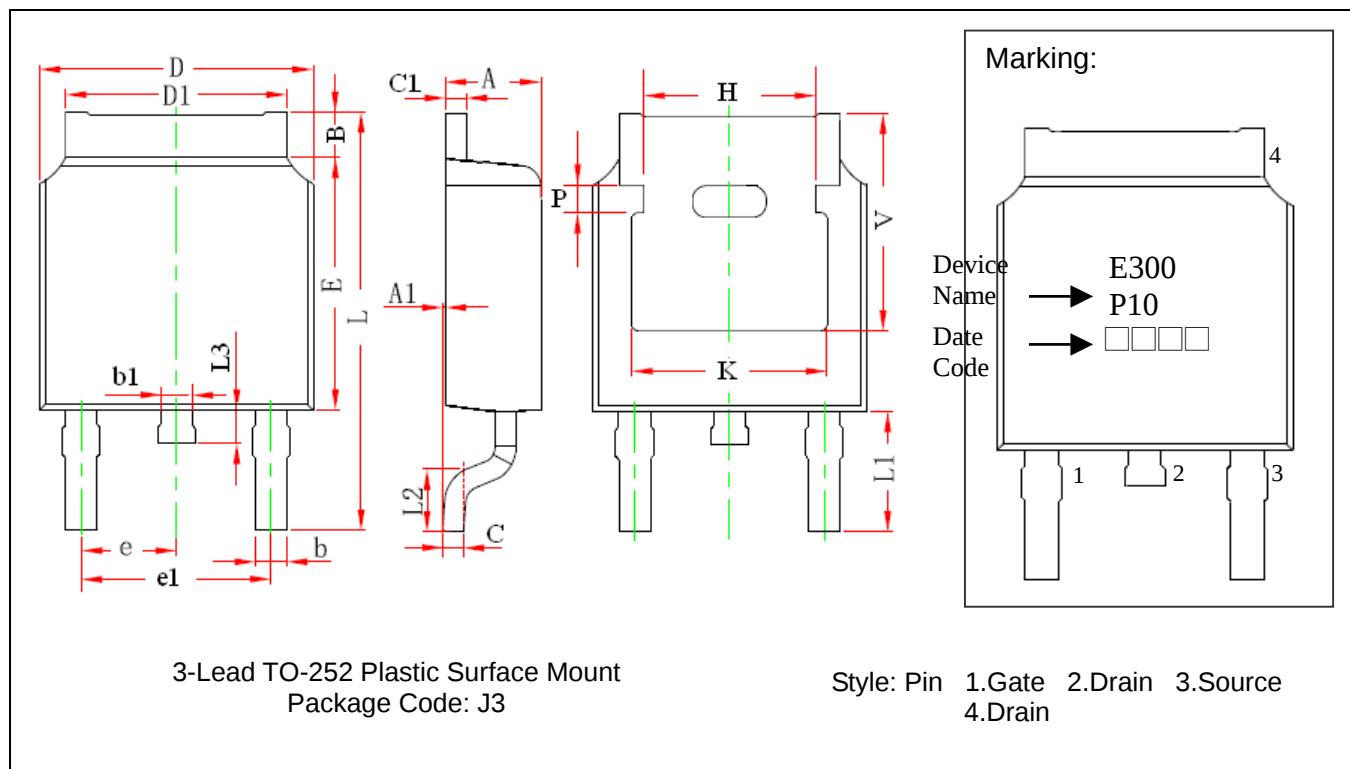
Single Pulse Power Rating, Junction to Case



Transient Thermal Response Curves



TO-252 Dimension



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