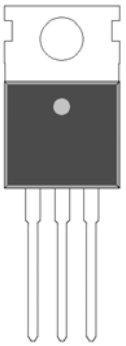
P-Channel Enhancement Mode Power MOSFET

Features:

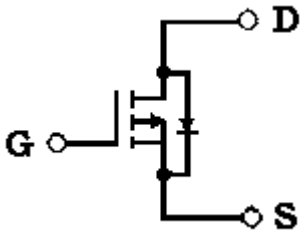
- Low Gate Charge
- Simple Drive Requirement
- Repetitive Avalanche Rated
- Fast Switching Characteristic
- RoHS compliant package

TO-220



G D S

BV_{DSS}	-200V
I_D @ V_{GS}=-10V, T_C=25°C	-9A
I_D @ V_{GS}=-10V, T_A=25°C	-1.4A
$R_{DSON(TYP)}$ @ V_{GS}=-10V, I_D=-3.9A	368mΩ



G：Gate　D：Drain S：Source

Ordering Information

Device	Package	Shipping
KE450P20	TO-220 (Pb-free lead plating package)	50 pcs/tube, 20 tubes/box, 4 boxes / carton

Absolute Maximum Ratings (T_C=25°C, unless otherwise noted)

Parameter			Symbol	Limits	Unit
Drain-Source Voltage			V_{DS}	-200	V
Gate-Source Voltage			V_{GS}	±20	
Continuous Drain Current @ T_C=25°C, V_{GS}=-10V		(Note 5)	I_D	-9	A
Continuous Drain Current @ T_C=100°C, V_{GS}=-10V		(Note 5)		-5.7	
Pulsed Drain Current		(Note 3)	I_{DM}	-30	
Continuous Drain Current @ T_A=25°C		(Note 2)	I_{DSM}	-1.4	
Continuous Drain Current @ T_A=70°C		(Note 2)		-1.1	
Avalanche Current @L=0.1mH		(Note 3)	I_{AS}	-27	
Avalanche Energy @ L=2mH, I_D=-15A, V_{DS}=-30V		(Note 4)	E_{AS}	225	mJ
Power Dissipation	T_C=25°C	(Note 1)	P_D	83	W
	T_C=100°C	(Note 1)		33	
Power Dissipation	T_A=25°C	(Note 2)	P_{DSM}	2	
	T_A=70°C	(Note 2)		1.3	
Operating Junction and Storage Temperature			Tj, Tstg	-55~+150	°C

Thermal Data

Parameter		Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max		$R_{\theta JC}$	1.5	°C/W
Thermal Resistance, Junction-to-ambient, max, t≤10s	(Note 1)	$R_{\theta JA}$	15	
Thermal Resistance, Junction-to-ambient, max	(Note 1)		62	

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 $R_{\theta JA}$ 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 $R_{\theta JA}$ 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 in tial T_J=25°C.

4. 100% tested by conditions of L=2mH, I_{AS}= -6A, V_{GS}=-10V, V_{DD}=-50V

5. Calculated continuous drain current based on maximum allowable junction tempe.

6. The static characteristics are obtained using <30 0μs pulses, duty cycle 0.5% maximum.

7. The $R_{\theta JA}$ is the sum of thermal resistance from junction to case $R_{\theta JC}$ and case to ambient.

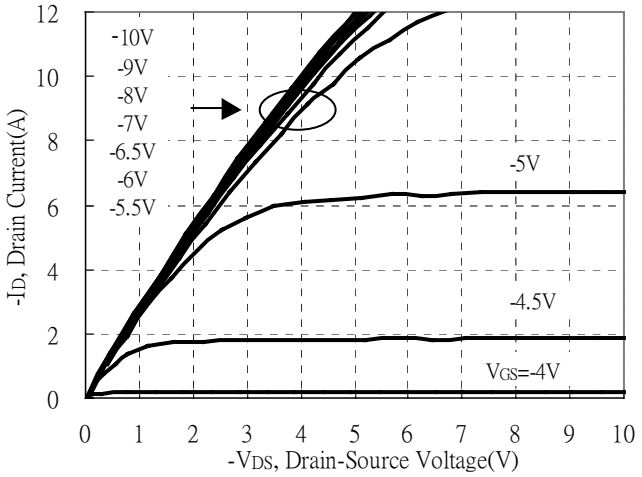
Characteristics (T_C=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-200	-	-	V	V_{GS}=0V, I_D=-250μA
$V_{GS(th)}$	-2	-	-4		V_{DS} = V_{GS}, I_D=-250μA
G_{FS}	-	9.2	-	S	V_{DS} =-10V, I_D=-5A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	-1	μA	V_{DS} =-160V, V_{GS} =0V
	-	-	-10		V_{DS} =-160V, V_{GS} =0V, Tj=125°C
*$R_{DS(ON)}$	-	368	520	mΩ	V_{GS} =-10V, I_D=-3.9A
Dynamic					
*Qg	-	29.3	-	nC	I_D=-6.5A, V_{DS}=-160V, V_{GS}=-10V
*Qgs	-	7.1	-		
*Qgd	-	9.9	-		
*$t_{d(ON)}$	-	18	-	ns	V_{DS}=-100V, I_D=-6.5A, V_{GS}=-10V, R_G=12Ω
*tr	-	29.6	-		
*$t_{d(OFF)}$	-	52.4	-		
*t_f	-	81.4	-		
Ciss	-	1351	-	pF	V_{GS}=0V, V_{DS}=-25V, f=1MHz
Coss	-	82	-		
Crss	-	37	-		
Source-Drain Diode					
*I_S	-	-	-9	A	
*I_S	-	-	-30		
*V_{SD}	-	-0.92	-1.2	V	I_S=-6.5A, V_{GS}=0V
*trr	-	75.5	-	ns	I_F=-6.5A, V_{GS}=0V, dI_F/dt=100A/μs
*Qrr	-	236	-	nC	

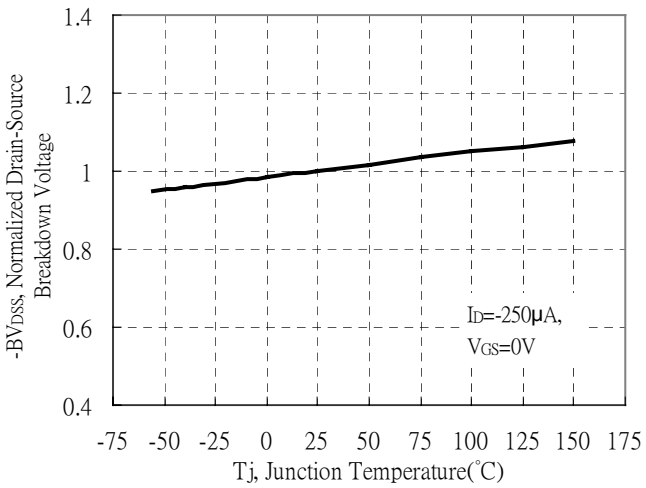
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

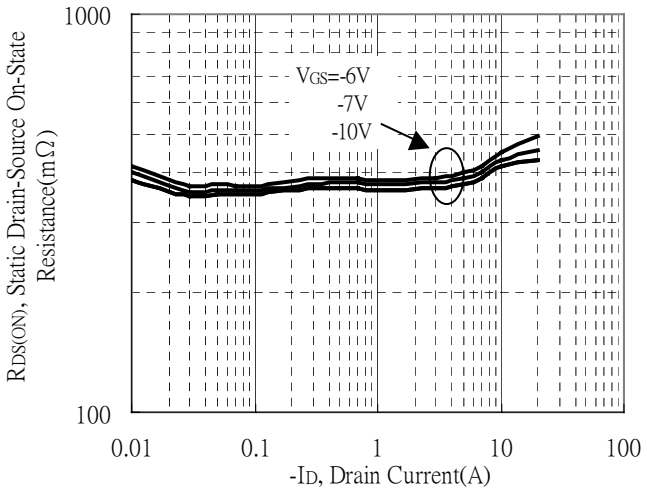
Typical Output Characteristics



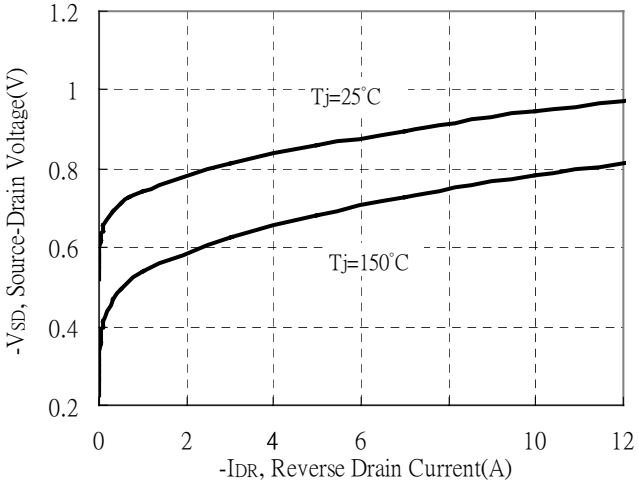
Brekdown Voltage vs Junction Temperature



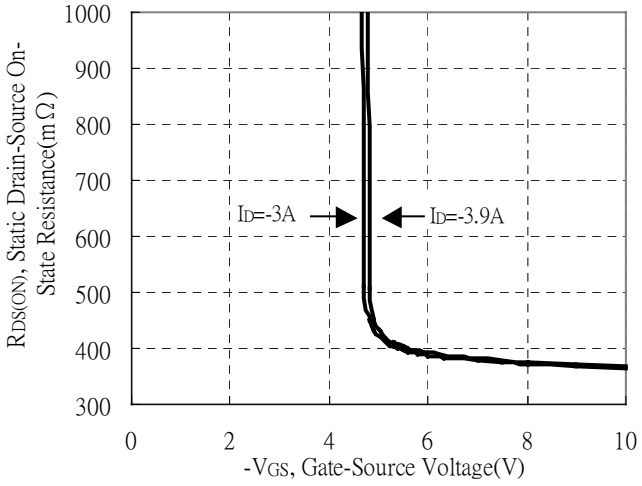
Static Drain-Source On-State resistance vs Drain Current



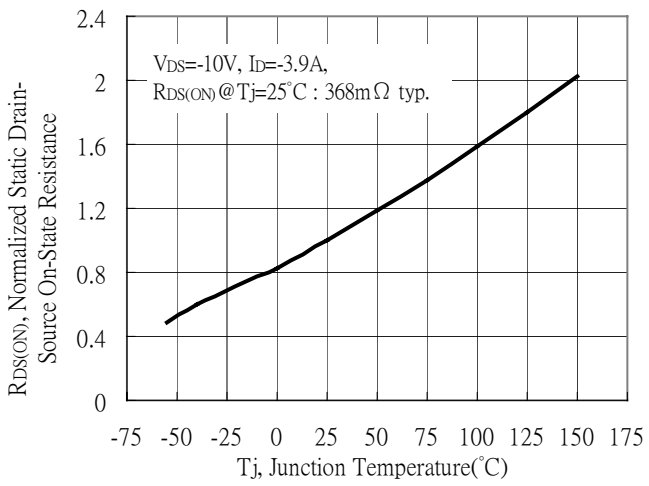
Reverse Drain Current vs Source-Drain Voltage



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

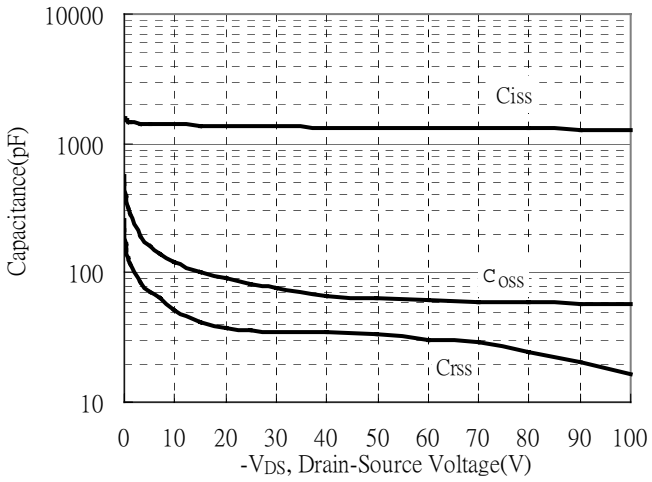


Drain-Source On-State Resistance vs Junction Tempearture

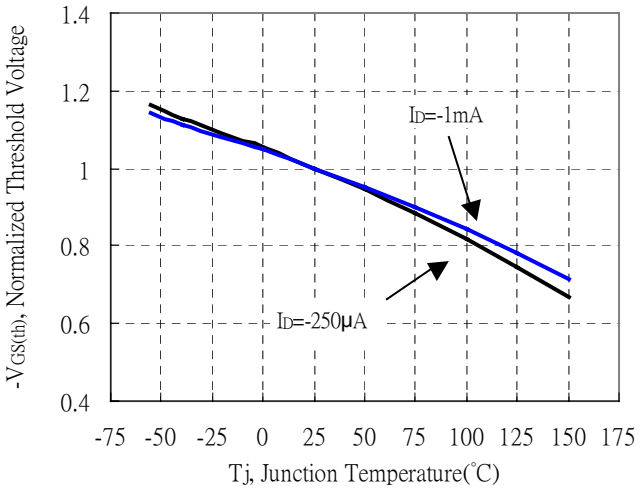


Typical Characteristics(Cont.)

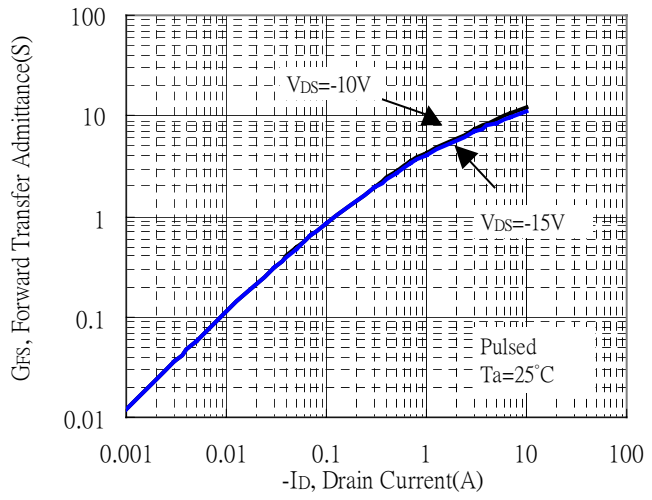
Capacitance vs Drain-to-Source Voltage



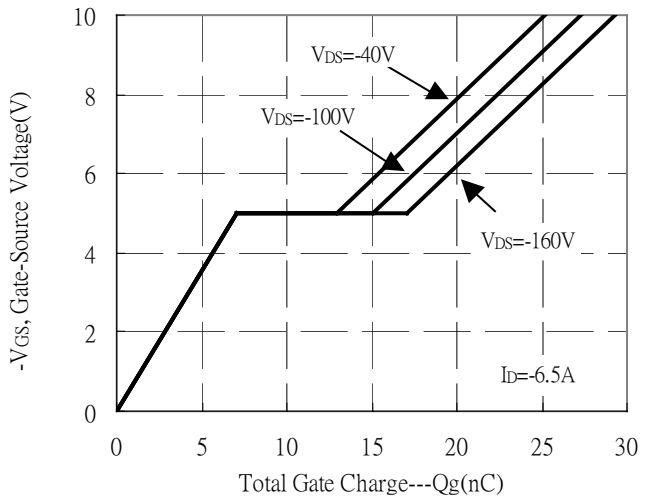
Threshold Voltage vs Junction Tempearture



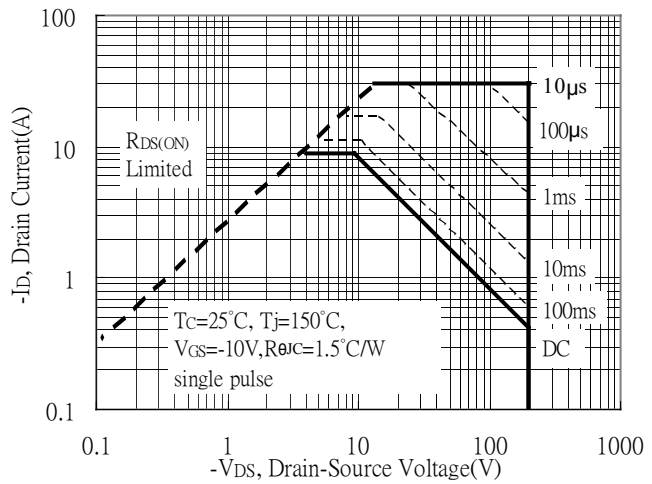
Forward Transfer Admittance vs Drain Current



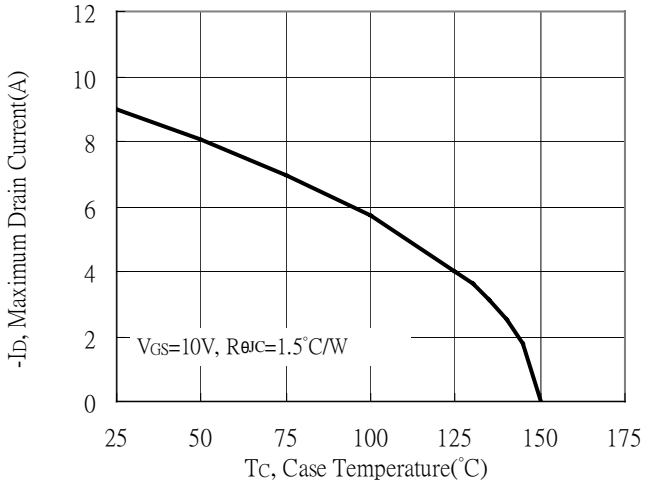
Gate Charge Characteristics



Maximum Safe Operating Area

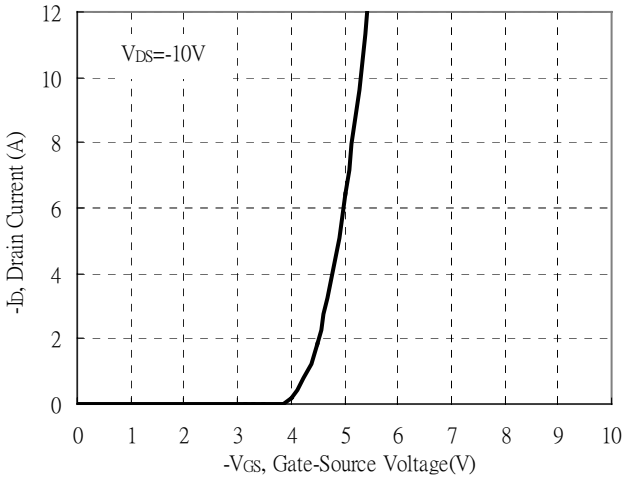


Maximum Drain Current vs Case Temperature

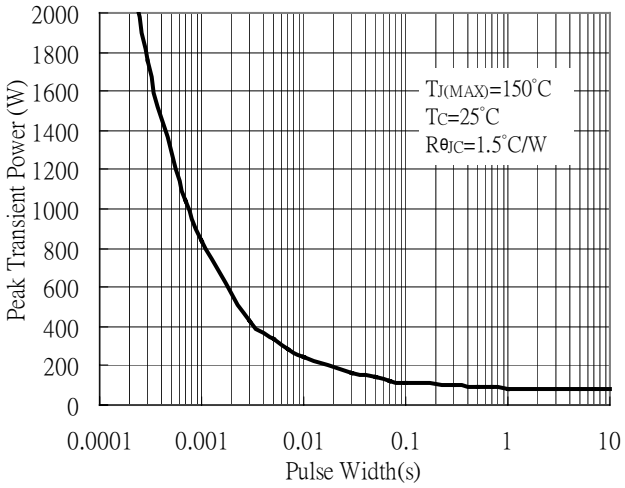


Typical Characteristics(Cont.)

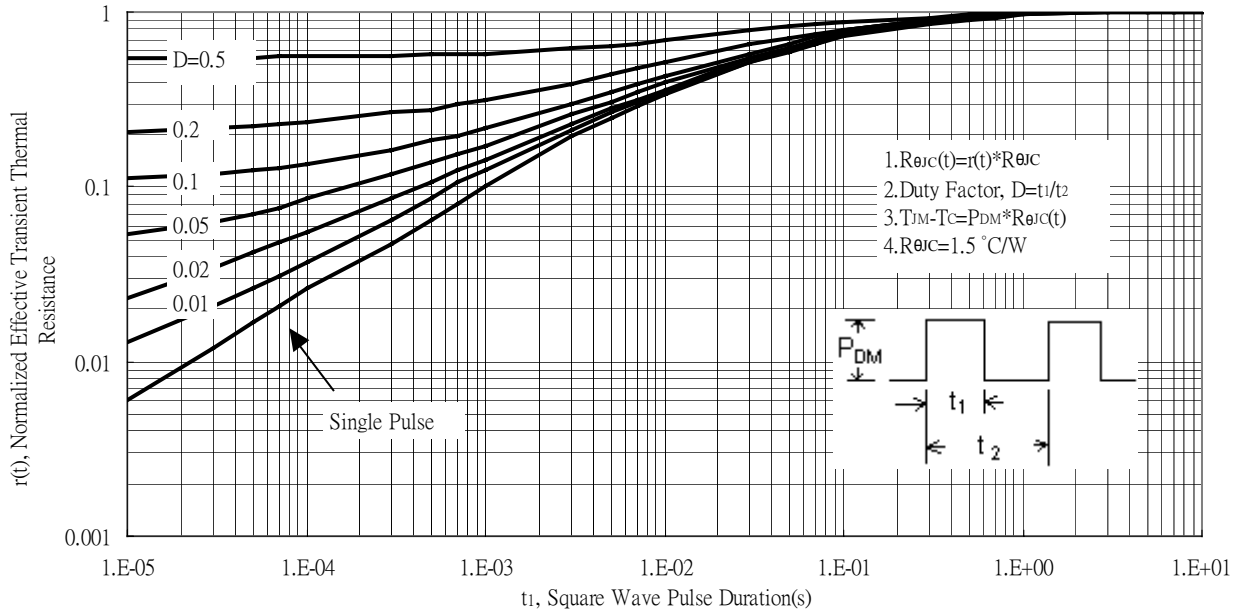
Typical Transfer Characteristics



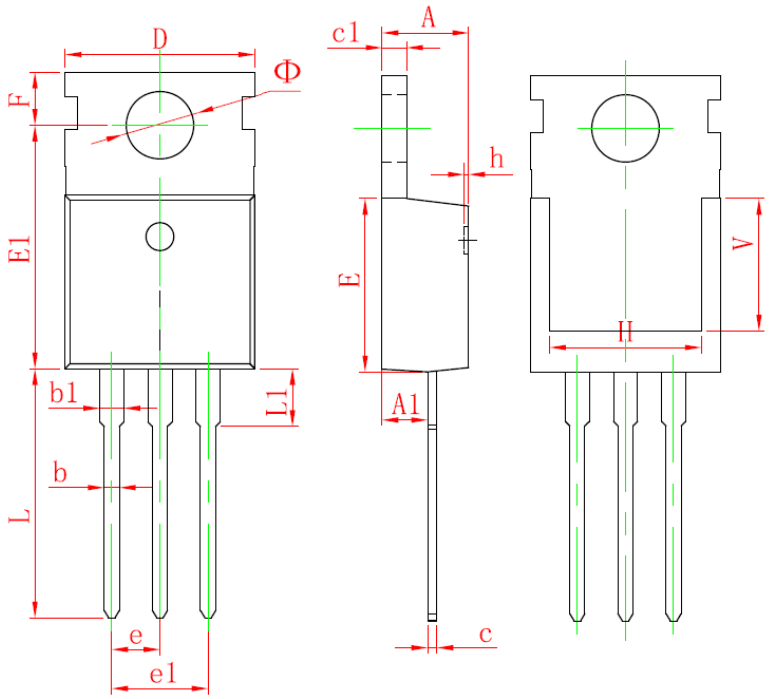
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curves

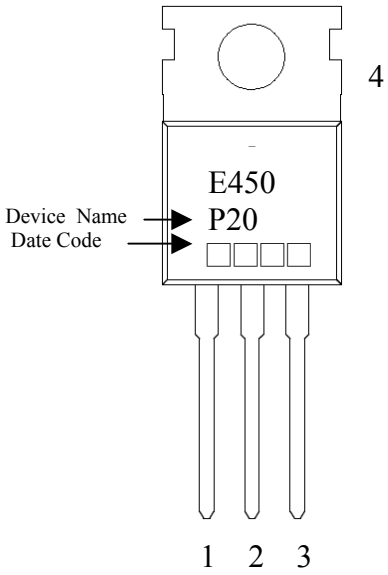


TO-220 Dimension



3-Lead TO-220 Plastic Package

Marking:



Style: Pin 1.Gate 2.Drain 3.Source 4.Drain

*: Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181	e	2.540*		0.100*	
A1	2.250	2.550	0.089	0.100	e1	4.980	5.180	0.196	0.204
b	0.710	0.910	0.028	0.036	F	2.650	2.950	0.104	0.116
b1	1.170	1.370	0.046	0.054	H	7.900	8.100	0.311	0.319
c	0.330	0.650	0.013	0.026	h	0.000	0.300	0.000	0.012
c1	1.200	1.400	0.047	0.055	L	12.900	13.400	0.508	0.528
D	9.910	10.250	0.390	0.404	L1	2.850	3.250	0.112	0.128
E	8.950	9.750	0.352	0.384	V	7.500 REF		0.295 REF	
E1	12.650	12.950	0.498	0.510	Φ	3.400	3.800	0.134	0.150