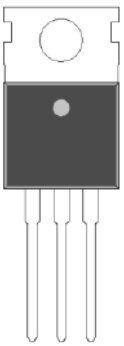
N -Channel Enhancement Mode Power MOSFET

Features:

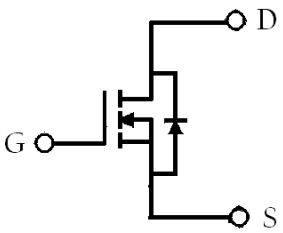
- Low Gate Charge
- Simple Drive Requirement
- Pb-free lead plating package

TO-220



G D S

BV_{DSS}		200V
I_D@V_{GS}=10V, T_C=25°C		50A
I_D@V_{GS}=10V, T_A=25°C		4.8A
$R_{DSON(TYP)}$	V_{GS}=10V, I_D=17A	28mΩ



G：Gate D：Drain S：Source

Ordering Information

Device	Package	Shipping
KE30N20	TO-220 (RoHS compliant)	50 pcs/tube, 20 tubes/box, 4 boxes / carton

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

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		VDS	200	V
Gate-Source Voltage		VGS	±20	
Continuous Drain Current @ TC=25°C, VGS=10V		ID	50	A
Continuous Drain Current @ TC=100°C, VGS=10V			35	
Continuous Drain Current @ TA=25°C, VGS=10V	(Note 2)	IDSM	4.8	
Continuous Drain Current @ TA=70°C, VGS=10V	(Note 2)		3.8	
Pulsed Drain Current	(Note 3)	IDM	200	
Avalanche Current	(Note 3)	IAS	14	
Avalanche Energy @ L=2mH, ID=14A, VDD=50V	(Note 4)	EAS	196	mJ
Repetitive Avalanche Energy@ L=0.1mH	(Note 3)	EAR	25	
Power Dissipation @TC=25℃	(Note 1)	PD	250	W
Power Dissipation @TC=100℃	(Note 1)		125	
Power Dissipation @TA=25℃	(Note 2)	PDSM	2	
Power Dissipation @TA=70℃	(Note 2)		1.3	
Operating Junction and Storage Temperature Range		Tj, Tstg	-55~+175	°C

*100% UIS tested at condition of L=2mH, IAS=8A, VDD=50V.

Thermal Data

Parameter		Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max		Rth,j-c	0.6	°C/W
Thermal Resistance, Junction-to-ambient, max	(Note 2)	Rth,j-a	62	

Note : 1.The power dissipation P_D is based on $T_{J(MAX)}$=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 $R_{\theta JA}$ 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, and the maximum temperature of 175°C may be used if the PCB allows it.
3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=175°C. Ratings are based on low frequency and low duty cycles to keep initial T_J=25°C.
4. 100% tested by conditions of L=2mH, I_{AS}=8A, V_{GS}=10V, V_{DD}=50V
5. The static characteristics are obtained using <300μs pulses, duty cycle 0.5% maximum.
6. The $R_{\theta JA}$ is the sum of thermal resistance from junction to case $R_{\theta JC}$ and case to ambient.

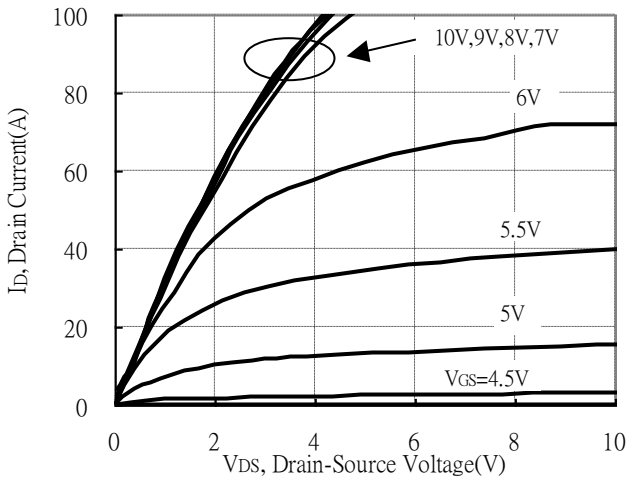
Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	200	-	-	V	V_{GS}=0V, I_D=250μA
$\Delta BV_{DSS}/\Delta Tj$	-	0.18	-	V/ ˚C	Reference to I_D=250μA
$V_{GS(th)}$	2	-	4	V	V_{DS} =V_{GS}, I_D=250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	1	μA	V_{DS} =160V, V_{GS} =0V
	-	-	25		V_{DS} =160V, V_{GS} =0V, T_J=125°C
$R_{DS(ON)}$ *1	-	28	36	mΩ	V_{GS} =10V, I_D=17A
G_{FS} *1	-	24.5	-	S	V_{DS} =15V, I_D=10A
Dynamic					
Qg *1, 2	-	71.1	-	nC	V_{DS}=160V, I_D=39A, V_{GS}=10V
Qgs *1, 2	-	12.4	-		
Qgd *1, 2	-	31.2	-		
$t_{d(ON)}$ *1, 2	-	28.4	-	ns	V_{DS}=100V, I_D=37A, V_{GS}=10V, R_G=5.6Ω
tr *1, 2	-	60	-		
$t_{d(OFF)}$ *1, 2	-	74	-		
t_f *1, 2	-	100	-		
Ciss	-	3197	-	pF	V_{GS}=0V, V_{DS}=25V, f=1MHz
Coss	-	335	-		
Crss	-	116	-		
Rg	-	1.8	-	Ω	f=1MHz
Source-Drain Diode					
I_S *1	-	-	50	A	
I_{SM} *3	-	-	200		
V_{SD} *1	-	0.8	1.2	V	I_F=25A, V_{GS}=0V
trr	-	78	-	ns	I_F=20A, dI_F/dt=100A/μs
Qrr	-	300	-	nC	

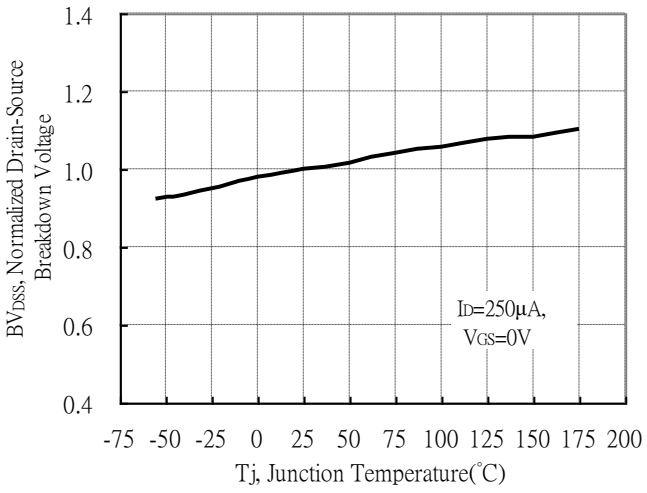
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
*2.Independent of operating temperature
*3.Pulse width limited by maximum junction temperature.

Typical Characteristics

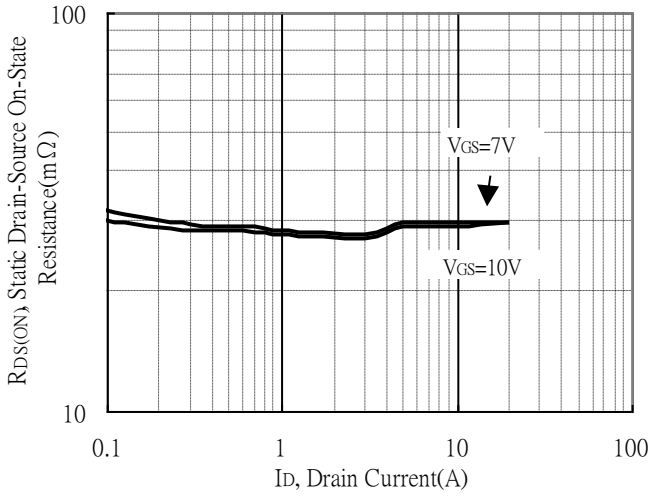
Typical Output Characteristics



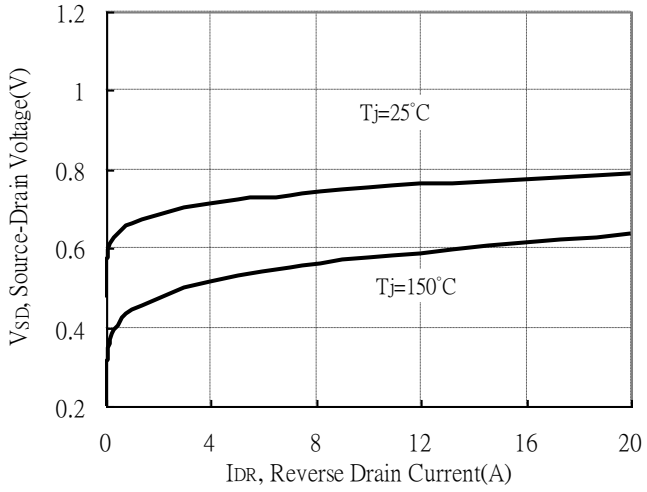
Brekdown Voltage vs Junction Temperature



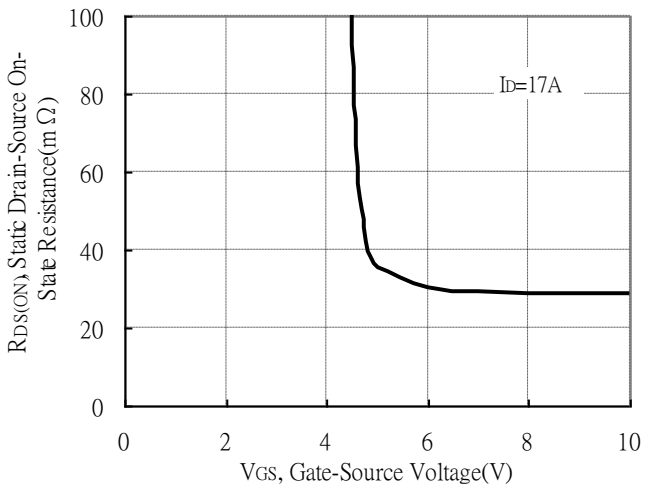
Static Drain-Source On-State resistance vs Drain Current



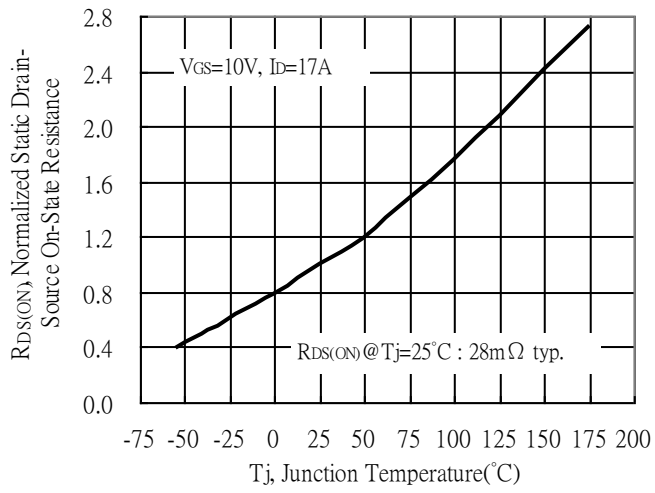
Reverse Drain Current vs Source-Drain Voltage



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

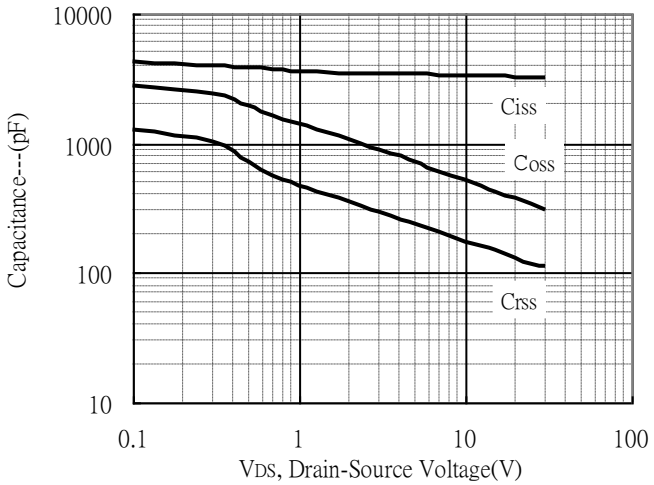


Drain-Source On-State Resistance vs Junction Tempearture

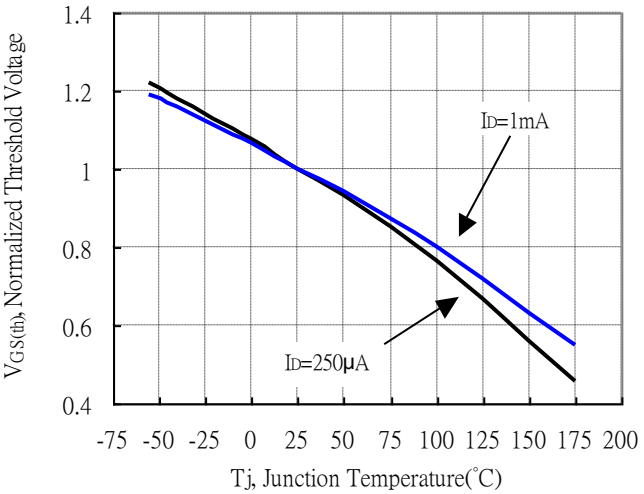


Typical Characteristics(Cont.)

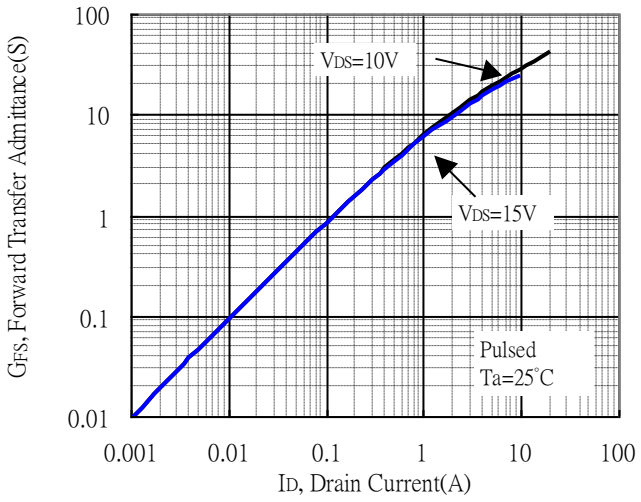
Capacitance vs Drain-to-Source Voltage



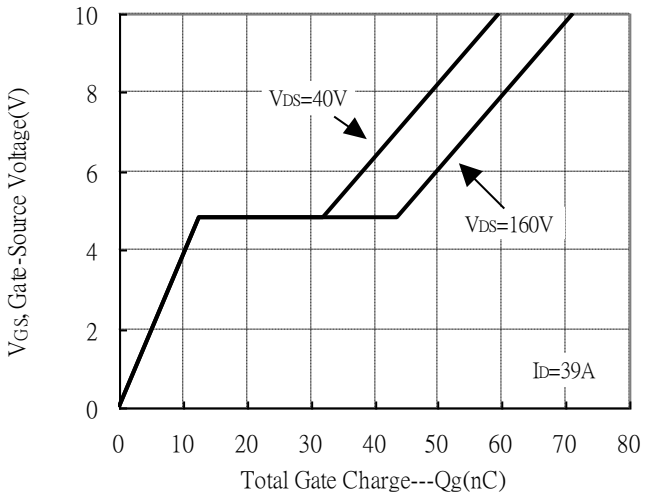
Threshold Voltage vs Junction Tempearture



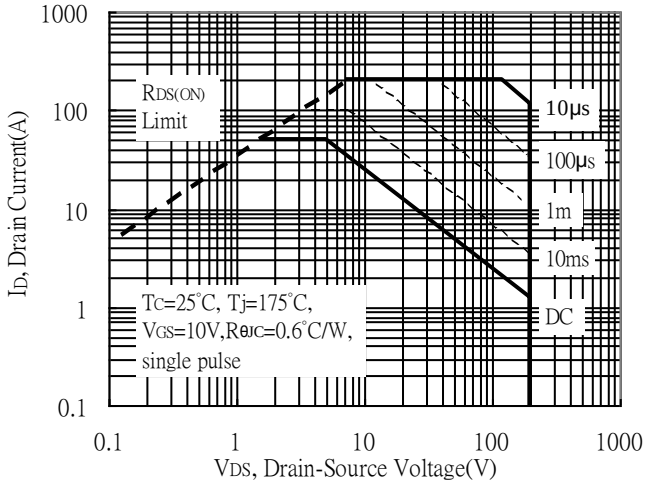
Forward Transfer Admittance vs Drain Current



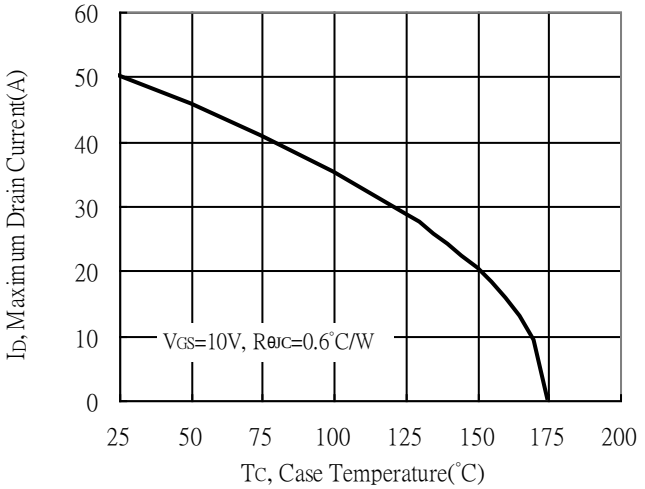
Gate Charge Characteristics



Maximum Safe Operating Area

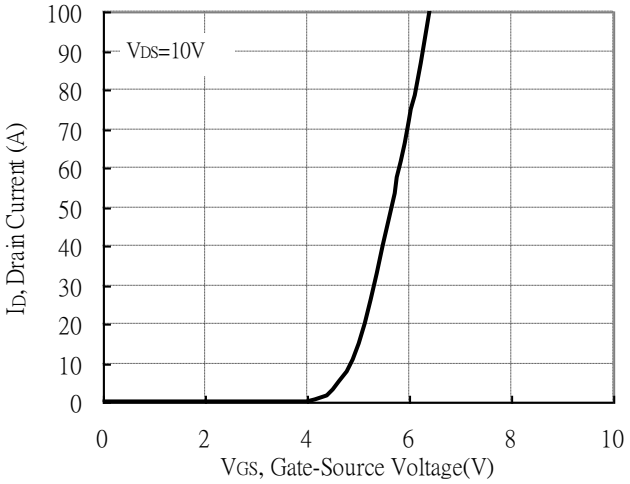


Maximum Drain Current vs Case Temperature

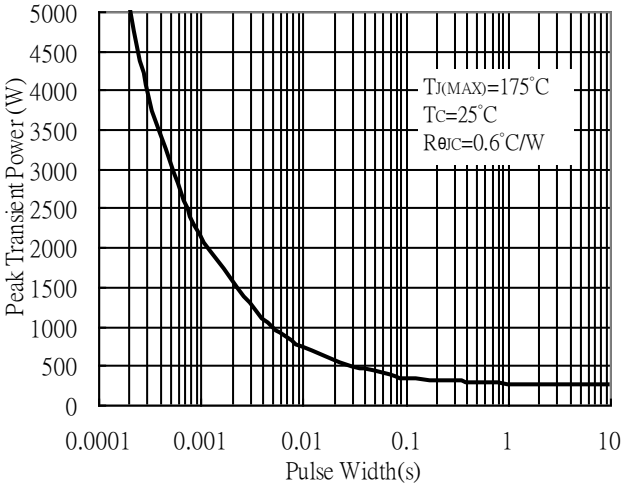


Typical Characteristics(Cont.)

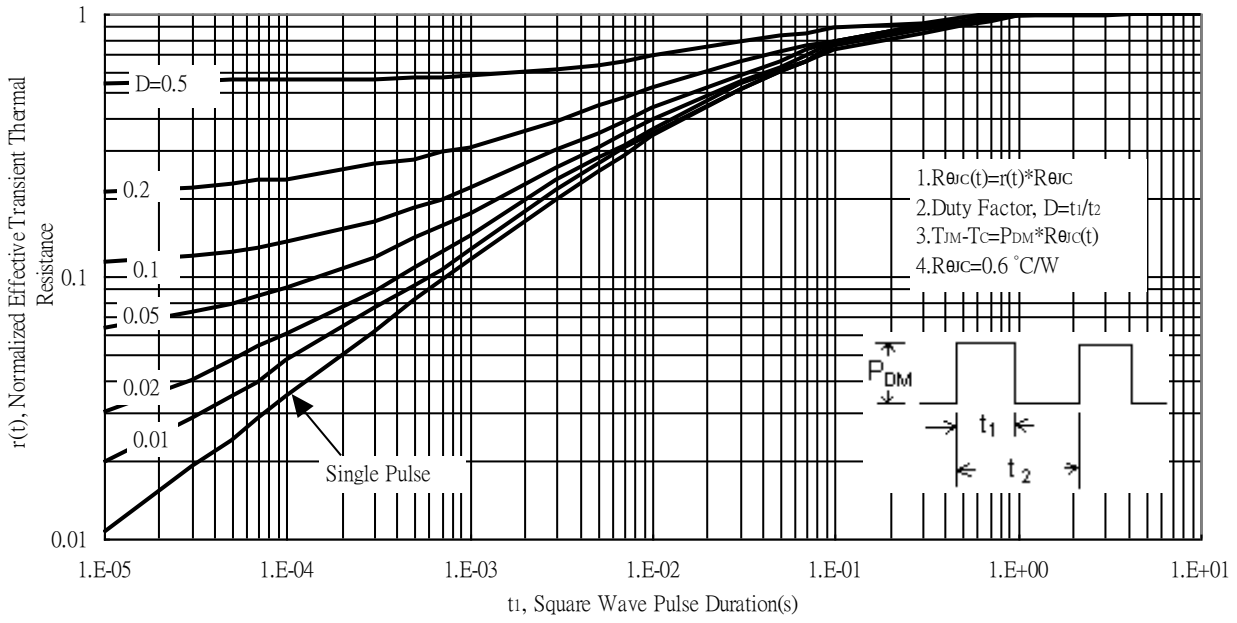
Typical Transfer Characteristics



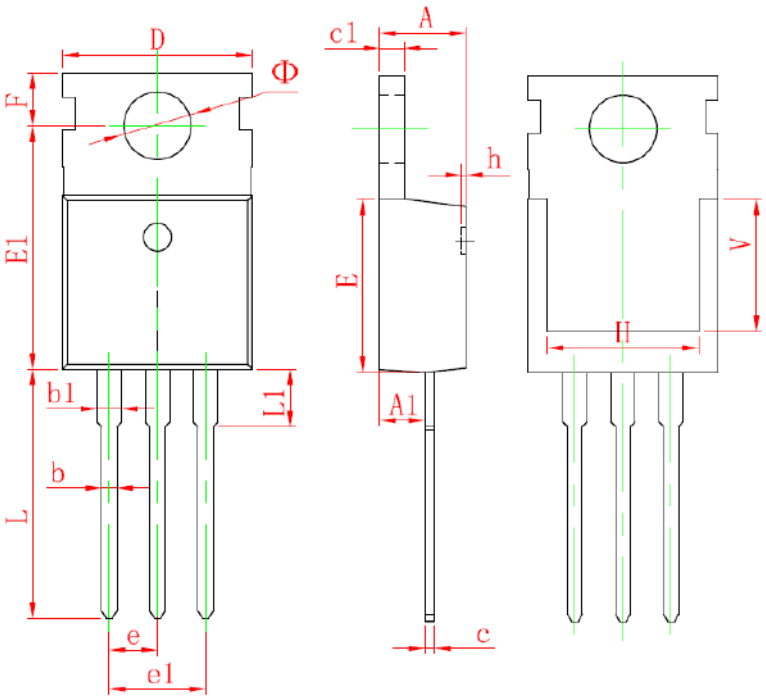
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curves

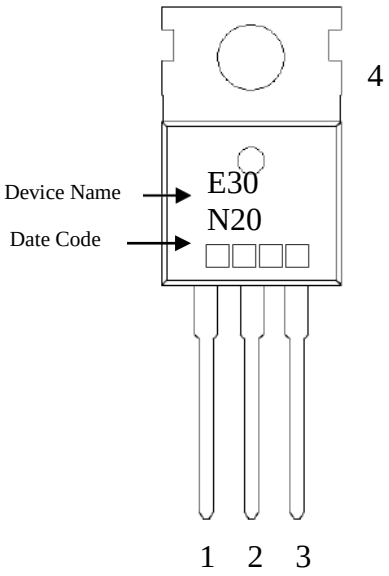


TO-220 Dimension



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