

### General Description

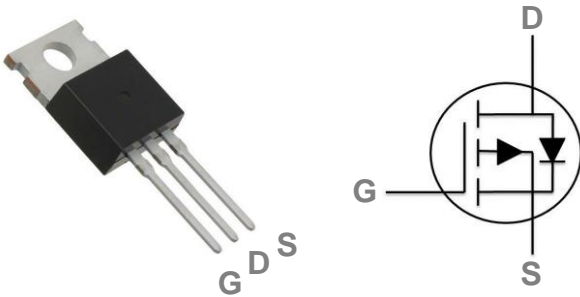
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BVDSS	R <sub>DS(ON)</sub>	ID
-100V	45mΩ	-35A

### Features

- -100V, -35A, R<sub>DS(ON)</sub> 45mΩ@V<sub>GS</sub> = -10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

### TO220 Pin Configuration



### Applications

- Networking
- Load Switch
- LED applications

### Absolute Maximum Ratings (T<sub>c</sub>=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	-100	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Drain Current – Continuous (T <sub>c</sub> =25°C)	-35	A
	Drain Current – Continuous (T <sub>c</sub> =100°C)	-22	A
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup>	-140	A
EAS	Single Pulse Avalanche Energy <sup>2</sup>	180	mJ
IAS	Single Pulse Avalanche Current <sup>2</sup>	-60	A
P <sub>D</sub>	Power Dissipation (T <sub>c</sub> =25°C)	114	W
	Power Dissipation – Derate above 25°C	0.91	W/°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJC</sub>	Thermal Resistance Junction to Case	---	1.1	°C/W
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	---	62	°C/W

**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**
**Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-100	---	---	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-100V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	-1	uA
		V <sub>DS</sub> =-80V, V <sub>GS</sub> =0V, T <sub>J</sub> =85°C	---	---	-10	uA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA

**On Characteristics**

R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-15A	---	36	45	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A	---	40	55	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-1.2	---	-2.5	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>D</sub> =-5A	---	22	---	S

**Dynamic and switching Characteristics**

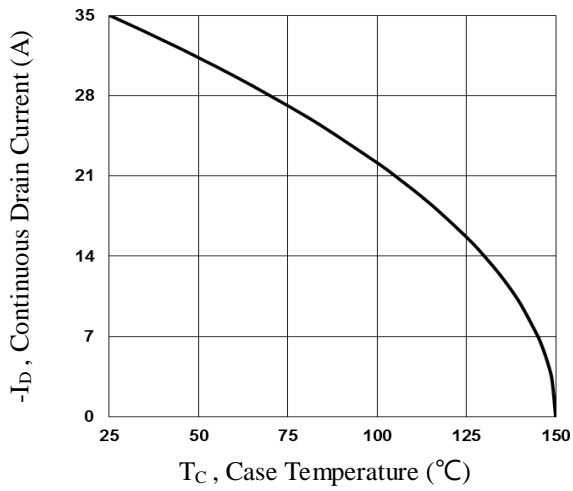
Q <sub>g</sub>	Total Gate Charge <sup>3,4</sup>	V <sub>DS</sub> =-50V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-10A	---	98	150	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>3,4</sup>		---	16.2	30	
Q <sub>gd</sub>	Gate-Drain Charge <sup>3,4</sup>		---	13.8	26	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>3,4</sup>	V <sub>DD</sub> =-50V, V <sub>GS</sub> =-10V, R <sub>G</sub> =25Ω I <sub>D</sub> =-5A	---	58	105	ns
T <sub>r</sub>	Rise Time <sup>3,4</sup>		---	24	50	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>3,4</sup>		---	215	450	
T <sub>f</sub>	Fall Time <sup>3,4</sup>		---	94	180	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V, F=1MHz	---	6315	9000	pF
C <sub>oss</sub>	Output Capacitance		---	220	330	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	50	100	

**Drain-Source Diode Characteristics and Maximum Ratings**

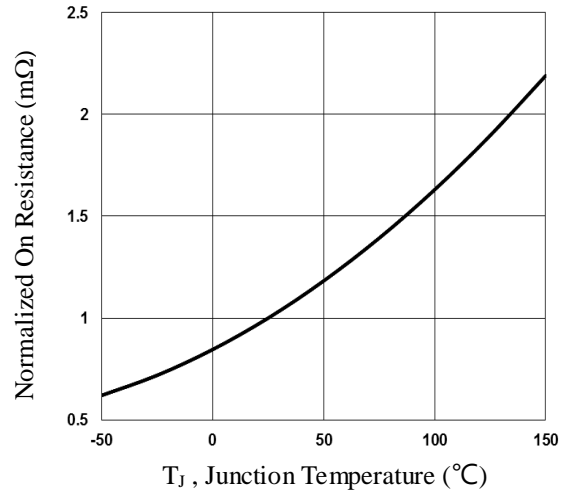
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	-35	A
I <sub>SM</sub>	Pulsed Source Current		---	---	-70	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A, T <sub>J</sub> =25°C	---	---	-1	V

Note :

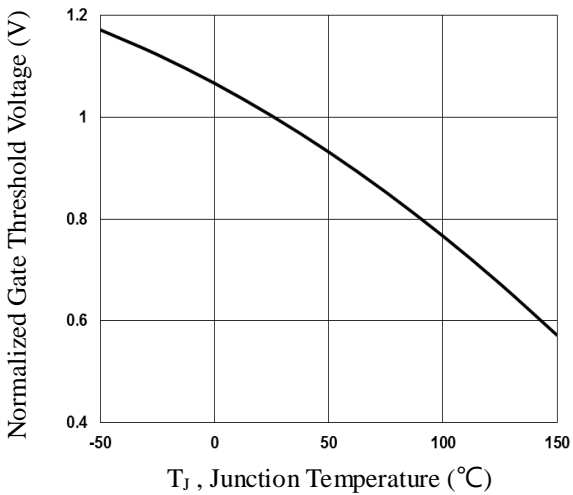
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V<sub>DD</sub>=-50V, V<sub>GS</sub>=-10V, L=0.1mH, I<sub>AS</sub>=-60A., Starting T<sub>J</sub>=25°C
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.



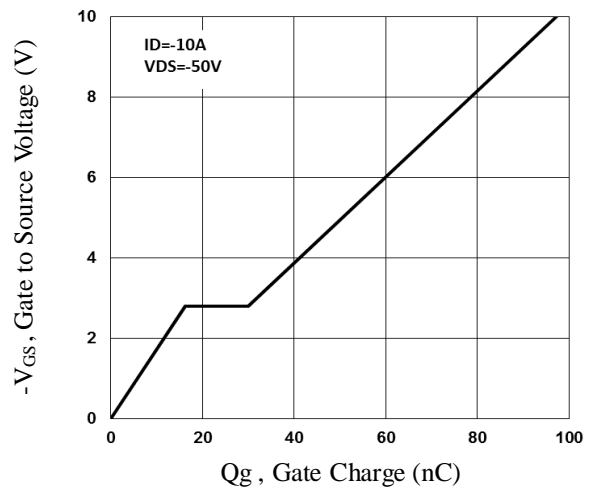
**Fig.1 Continuous Drain Current vs.  $T_c$**



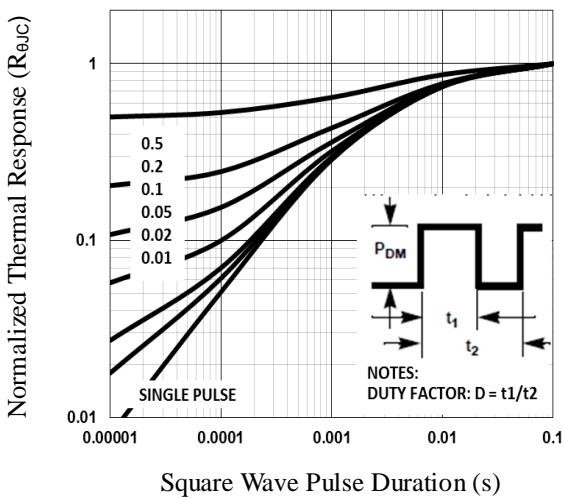
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



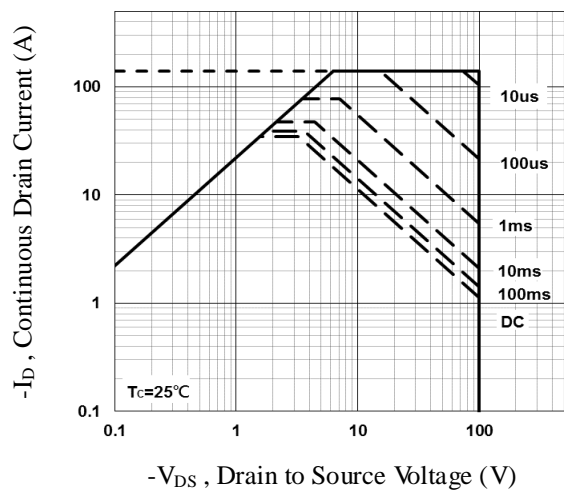
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



**Fig.4 Gate Charge Waveform**



**Fig.5 Normalized Transient Impedance**



**Fig.6 Maximum Safe Operation Area**

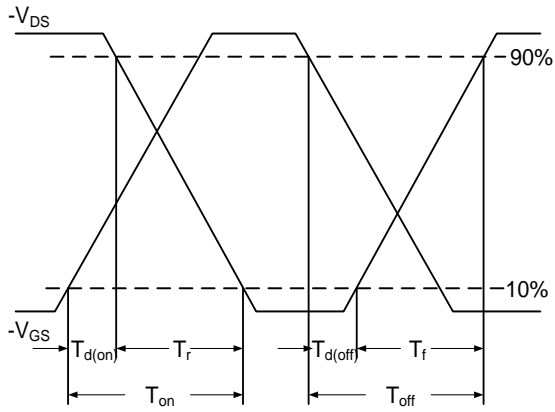


Fig.7 Switching Time Waveform

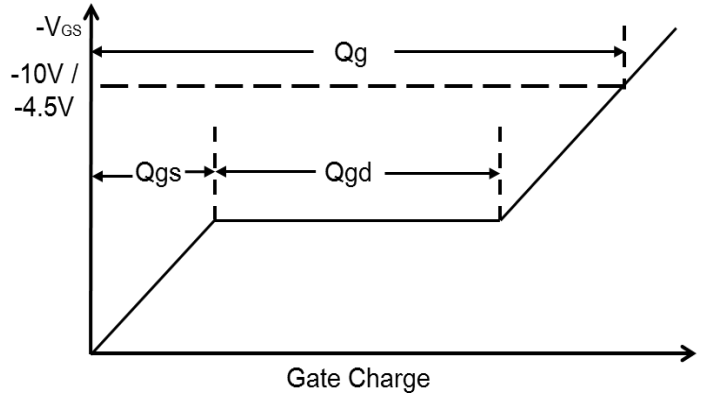
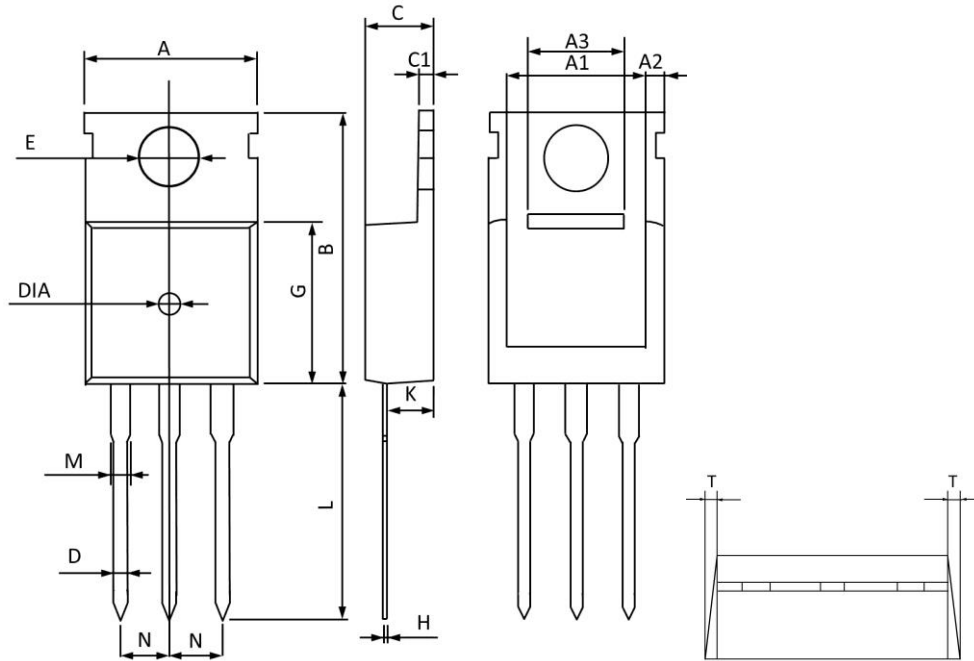


Fig.8 Gate Charge Waveform

## TO220 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.300	9.700	0.406	0.382
A1	8.840	8.440	0.348	0.332
A2	1.250	1.050	0.049	0.041
A3	5.300	5.100	0.209	0.201
B	16.200	15.400	0.638	0.606
C	4.680	4.280	0.184	0.169
C1	1.500	1.100	0.059	0.043
D	1.000	0.600	0.039	0.024
E	3.800	3.400	0.150	0.134
G	9.300	8.700	0.366	0.343
H	0.600	0.400	0.024	0.016
K	2.700	2.100	0.106	0.083
L	13.600	12.800	0.535	0.504
M	1.500	1.100	0.059	0.043
N	2.590	2.490	0.102	0.098
T	W0.35		W0.014	
DIA	Φ1.5 TYP.	deep0.2 TYP.	Φ0.059 TYP.	deep0.008 TYP.

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