

### General Description

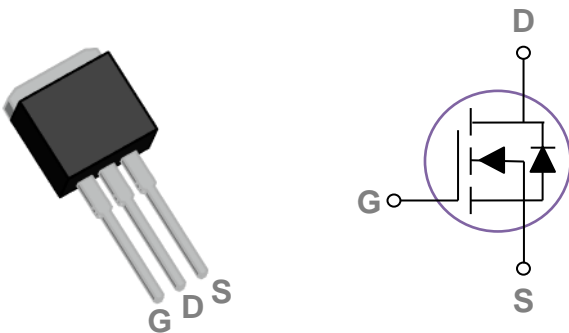
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVDSS	R <sub>DS(ON)</sub>	I <sub>D</sub>
100V	2.3mΩ	220A

### Features

- 100V,220A, R<sub>DS(ON)</sub> = 2.3mΩ @V<sub>GS</sub> = 10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

### TO262 Pin Configuration



### Applications

- Networking
- Load Switch
- LED applications
- Quick Charger

### 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)	220	A
	Drain Current – Continuous (T <sub>c</sub> =100°C)	140	A
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup>	880	A
EAS	Single Pulse Avalanche Energy <sup>2</sup>	952	mJ
IAS	Single Pulse Avalanche Current <sup>2</sup>	138	A
P <sub>D</sub>	Power Dissipation (T <sub>c</sub> =25°C)	298	W
	Power Dissipation – Derate above 25°C	2.38	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>θJA</sub>	Thermal Resistance Junction to ambient	---	62	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction to Case	---	0.42	°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> =250μA	100	---	---	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	μA
		V <sub>DS</sub> =80V, V <sub>GS</sub> =0V, T <sub>J</sub> =85°C	---	---	10	μA
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 <sup>3</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	---	1.9	2.3	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA	2	2.6	4	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =3A	---	21	---	S

**Dynamic and switching Characteristics**

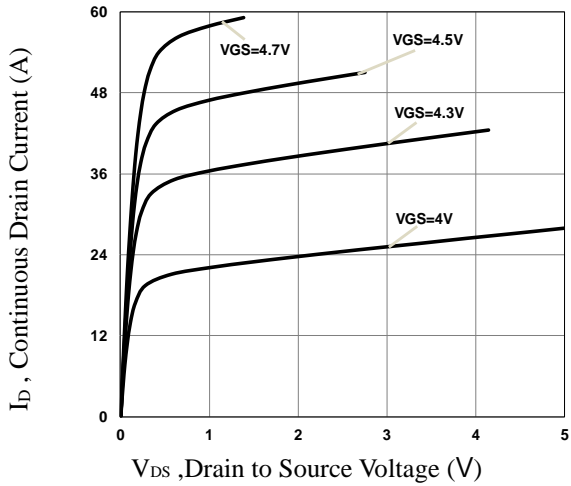
Q <sub>g</sub>	Total Gate Charge <sup>3, 4</sup>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =80A	---	122	185	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>3, 4</sup>		---	27	40	
Q <sub>gd</sub>	Gate-Drain Charge <sup>3, 4</sup>		---	33	50	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>3, 4</sup>	V <sub>DD</sub> =50V, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω I <sub>D</sub> =80A	---	20	30	ns
T <sub>r</sub>	Rise Time <sup>3, 4</sup>		---	32	50	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>3, 4</sup>		---	98	150	
T <sub>f</sub>	Fall Time <sup>3, 4</sup>		---	32	50	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, F=1MHz	---	7700	11550	pF
C <sub>oss</sub>	Output Capacitance		---	1500	2250	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	30	45	
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	---	1	---	Ω

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

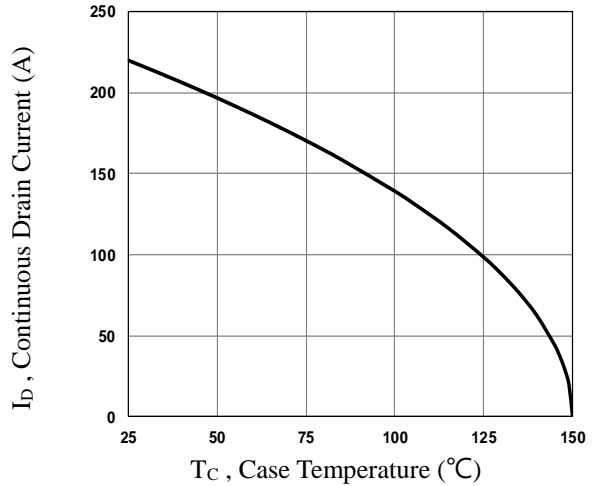
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	220	A
I <sub>SM</sub>	Pulsed Source Current		---	---	440	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>R</sub> =100V, I <sub>S</sub> =10A	---	250	---	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs, T <sub>J</sub> =25°C	---	820	---	nC

Note :

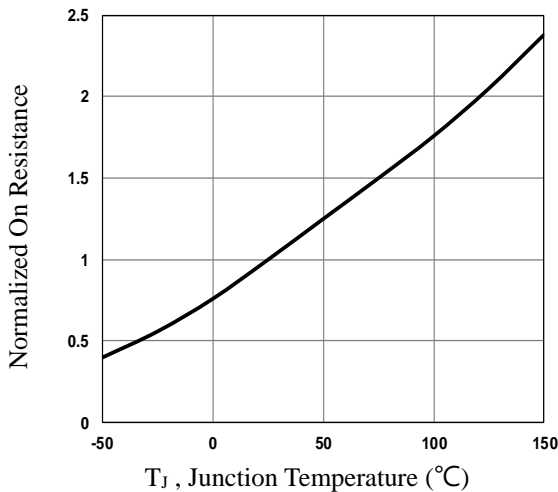
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V<sub>DD</sub>=50V, V<sub>GS</sub>=10V, L=0.1mH, I<sub>AS</sub>=138A., R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.



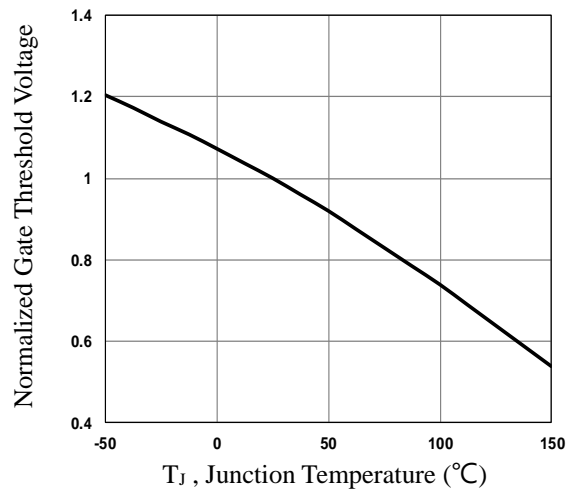
**Fig.1 Typical Output Characteristics**



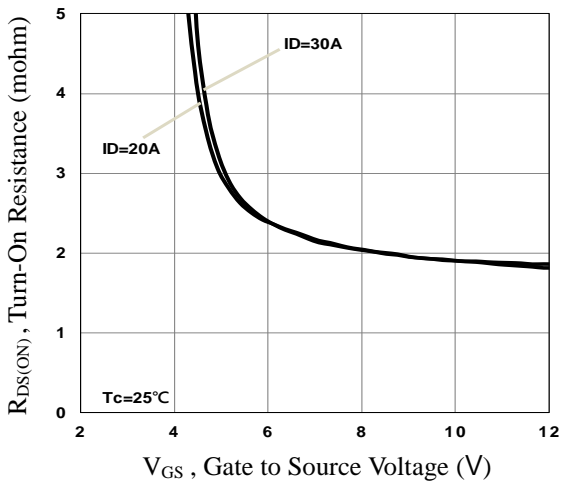
**Fig.2 Continuous Drain Current vs. T<sub>c</sub>**



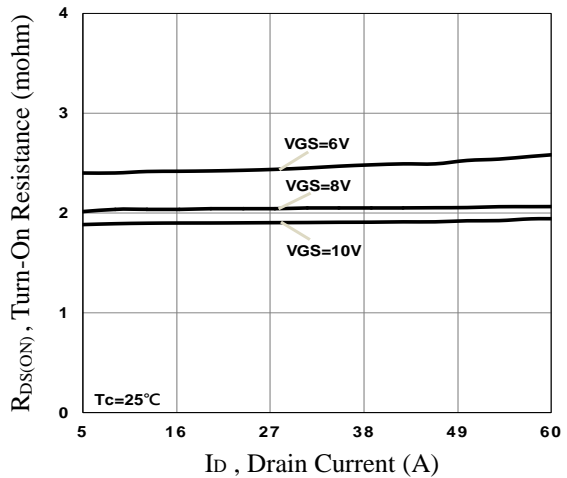
**Fig.3 Normalized R<sub>DS(on)</sub> vs. T<sub>j</sub>**



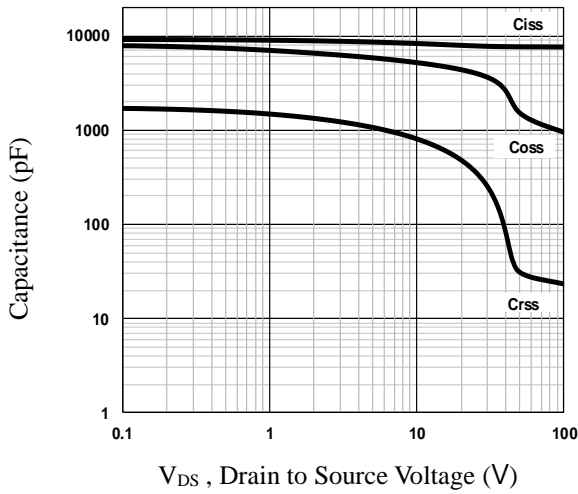
**Fig.4 Normalized V<sub>th</sub> vs. T<sub>j</sub>**



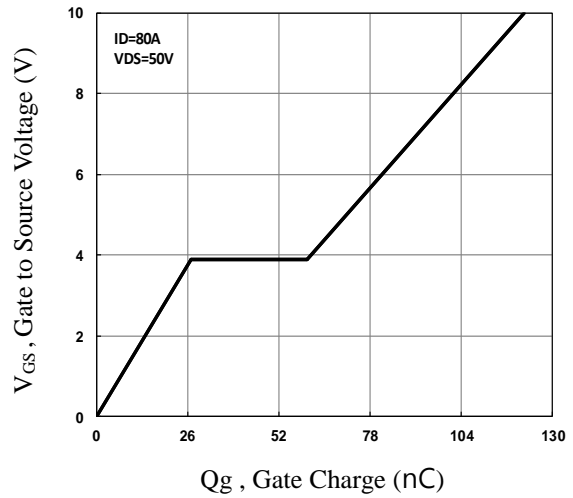
**Fig.5 Turn-On Resistance vs. V<sub>GS</sub>**



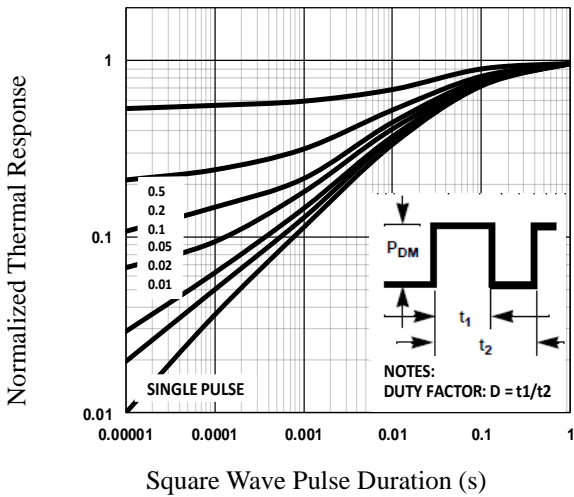
**Fig.6 Turn-On Resistance vs. I<sub>D</sub>**



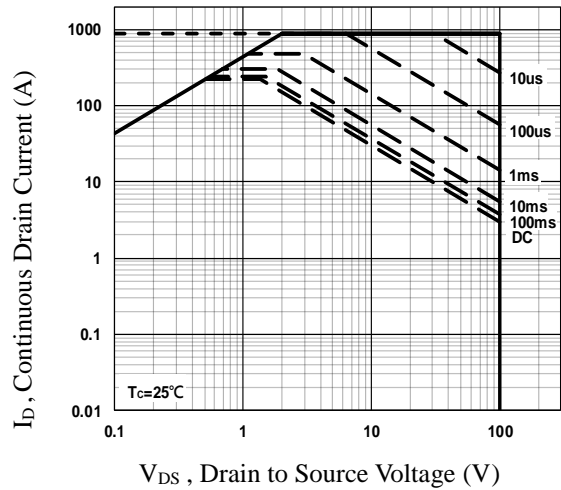
**Fig.7 Capacitance Characteristics**



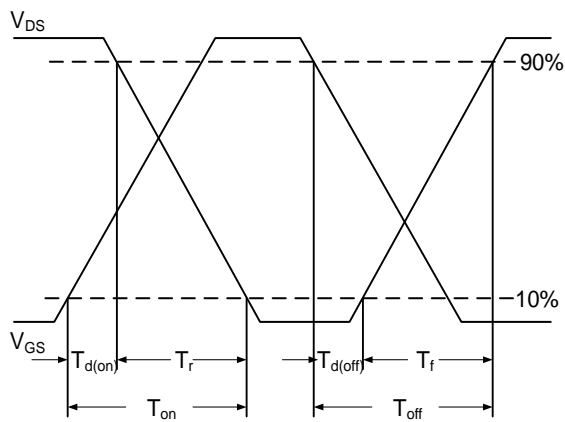
**Fig.8 Gate Charge Characteristics**



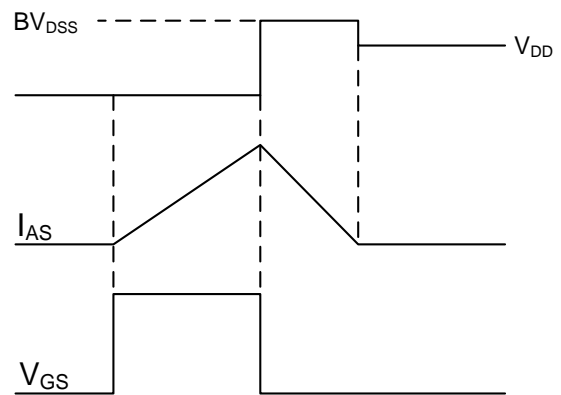
**Fig.9 Normalized Transient Impedance**



**Fig.10 Maximum Safe Operation Area**

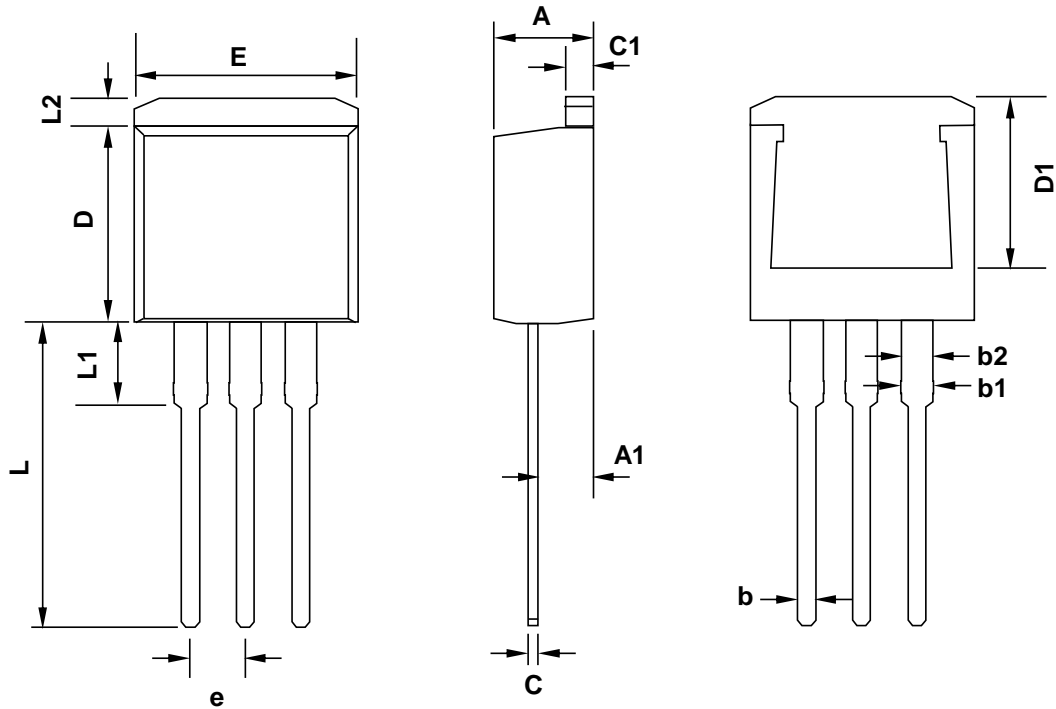


**Fig.11 Switching Time Waveform**



**Fig.12 EAS Waveform**

**TO262 PACKAGE INFORMATION**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Max	Min	Max	Min
A	4.900	4.240	0.193	0.167
A1	2.850	2.300	0.112	0.091
b	0.910	0.700	0.036	0.028
b1	1.750	1.070	0.069	0.042
b2	1.700	1.070	0.067	0.042
C	0.600	0.280	0.024	0.011
C1	1.400	1.150	0.055	0.045
D	9.020	8.450	0.355	0.333
D1	---	6.600	---	0.260
E	10.40	9.960	0.409	0.392
e	2.540 BSC		0.100 BSC	
L	14.20	13.47	0.559	0.530
L1	4.000	3.550	0.157	0.140
L2	1.360 REF.		0.054 REF.	