

### General Description

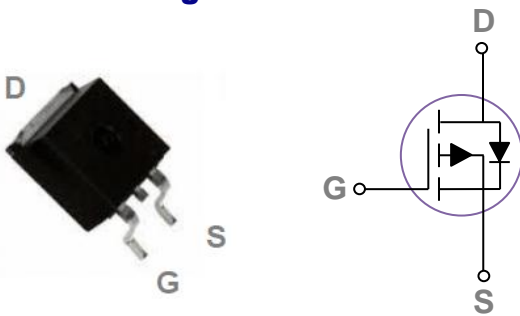
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVDSS	R <sub>DS(ON)</sub>	I <sub>D</sub>
-100V	21mΩ	-55A

### Features

- -100V,-55A, R<sub>DS(ON)</sub> =21mΩ@V<sub>GS</sub> = -10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

### TO263 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)	-55	A
	Drain Current – Continuous (T <sub>C</sub> =100°C)	-35	A
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup>	-220	A
EAS	Single Pulse Avalanche Energy <sup>2</sup>	274	mJ
IAS	Single Pulse Avalanche Current <sup>2</sup>	-74	A
P <sub>D</sub>	Power Dissipation (T <sub>C</sub> =25°C)	170	W
	Power Dissipation – Derate above 25°C	1.36	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	---	0.74	°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> =125°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> =-20A	---	17.7	21	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A	---	19	25	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-1.2	-1.6	-2.5	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>S</sub> =-5A	---	24	---	S

**Dynamic and switching Characteristics**

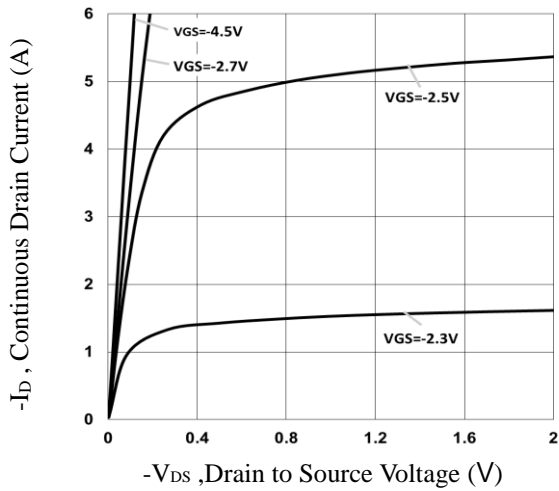
Q <sub>g</sub>	Total Gate Charge <sup>2, 3</sup>	V <sub>DS</sub> =-50V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-30A	---	200	300	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>2, 3</sup>		---	29	44	
Q <sub>gd</sub>	Gate-Drain Charge <sup>2, 3</sup>		---	30	45	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>2, 3</sup>	V <sub>DD</sub> =-50V, V <sub>GS</sub> =-10V, R <sub>G</sub> =6Ω I <sub>D</sub> =-30A	---	30	45	ns
T <sub>r</sub>	Rise Time <sup>2, 3</sup>		---	140	210	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>2, 3</sup>		---	120	180	
T <sub>f</sub>	Fall Time <sup>2, 3</sup>		---	75	120	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-50V, V <sub>GS</sub> =0V, F=1MHz	---	12000	18000	pF
C <sub>oss</sub>	Output Capacitance		---	320	480	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	245	370	
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	---	2.8	---	Ω

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

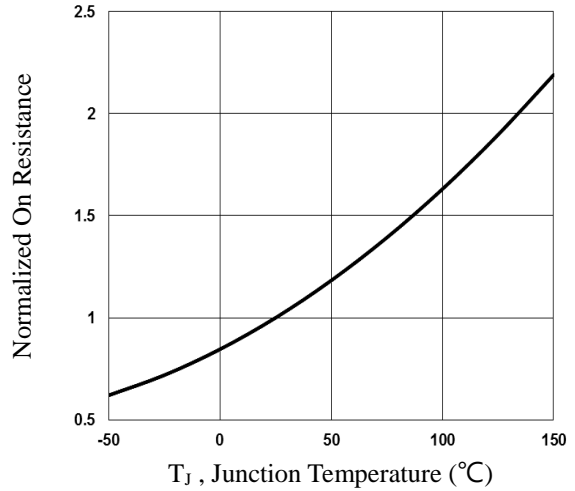
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	-55	A
I <sub>SM</sub>	Pulsed Source Current		---	---	-110	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A, T <sub>J</sub> =25°C	---	---	-1	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>R</sub> =-100V, I <sub>S</sub> =-10A	---	90	---	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs, T <sub>J</sub> =25°C	---	160	---	nC

Note :

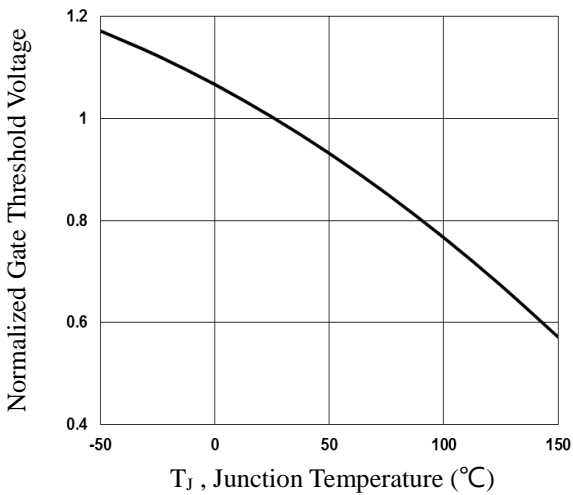
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V<sub>DD</sub>=-50V, V<sub>GS</sub>=-10V, L=0.1mH, I<sub>AS</sub>=-74A., Starting T<sub>J</sub>=25°C
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.



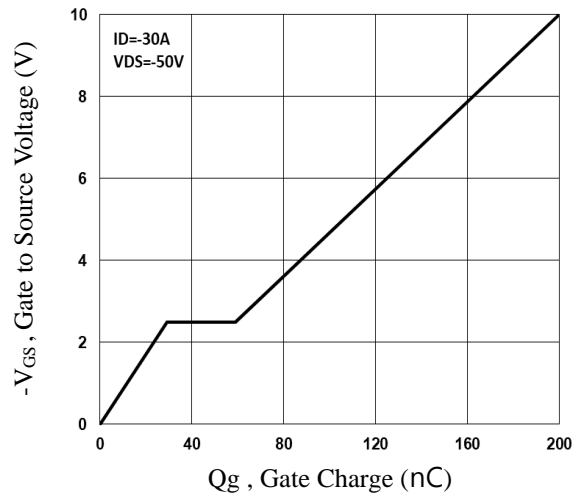
**Fig.1 Typical Output Characteristics**



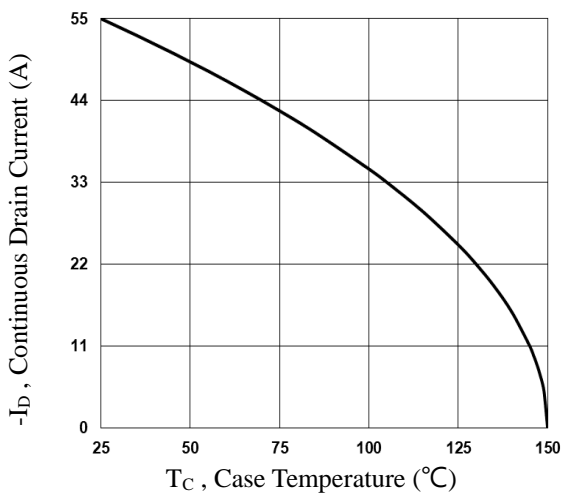
**Fig.2 Normalized R<sub>DSON</sub> vs. T<sub>J</sub>**



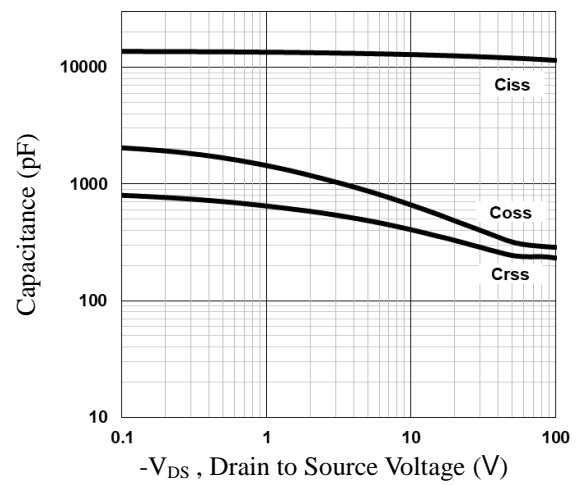
**Fig.3 Normalized V<sub>th</sub> vs. T<sub>J</sub>**



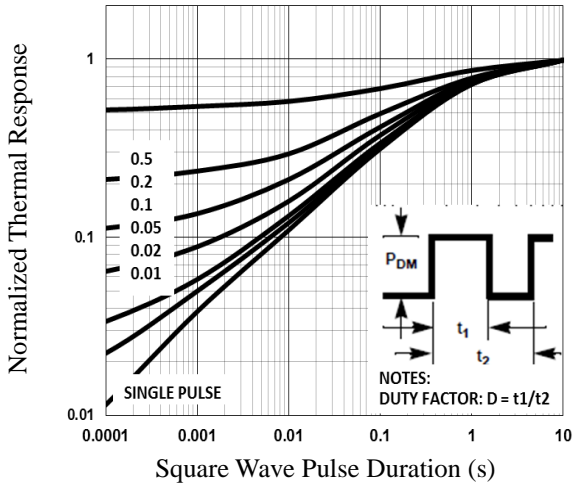
**Fig.4 Gate Charge Waveform**



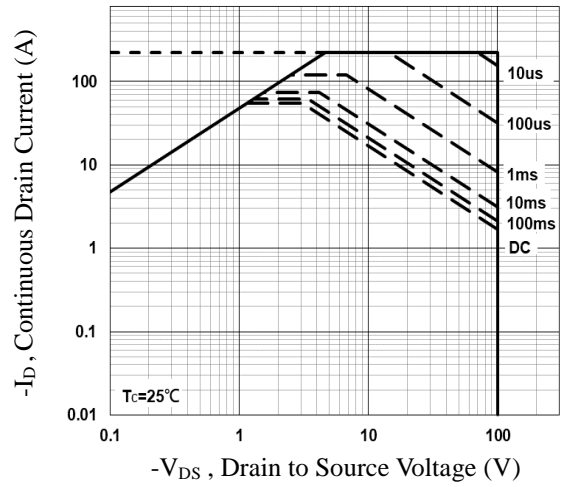
**Fig.5 Continuous Drain Current vs. T<sub>c</sub>**



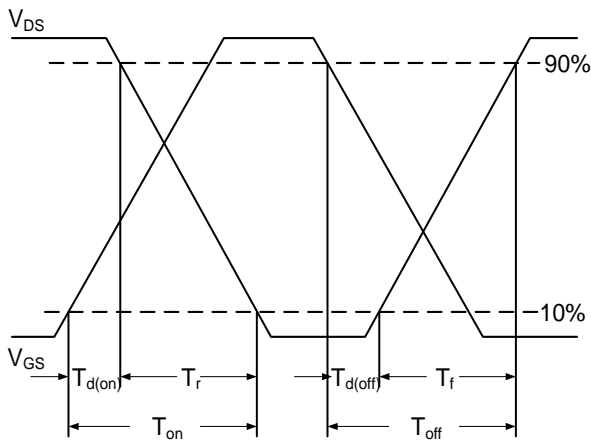
**Fig.6 Capacitance Characteristics**



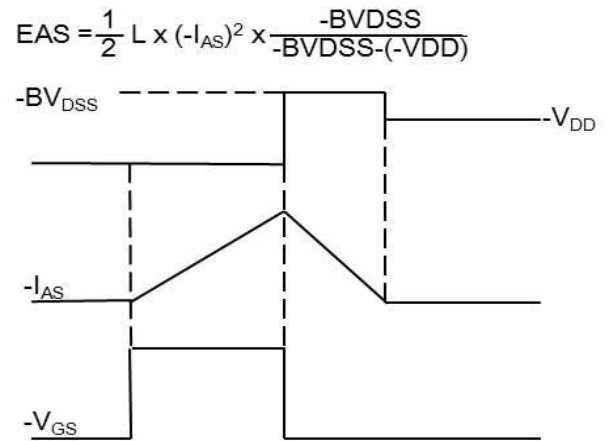
**Fig.7 Normalized Transient Impedance**



**Fig.8 Maximum Safe Operation Area**

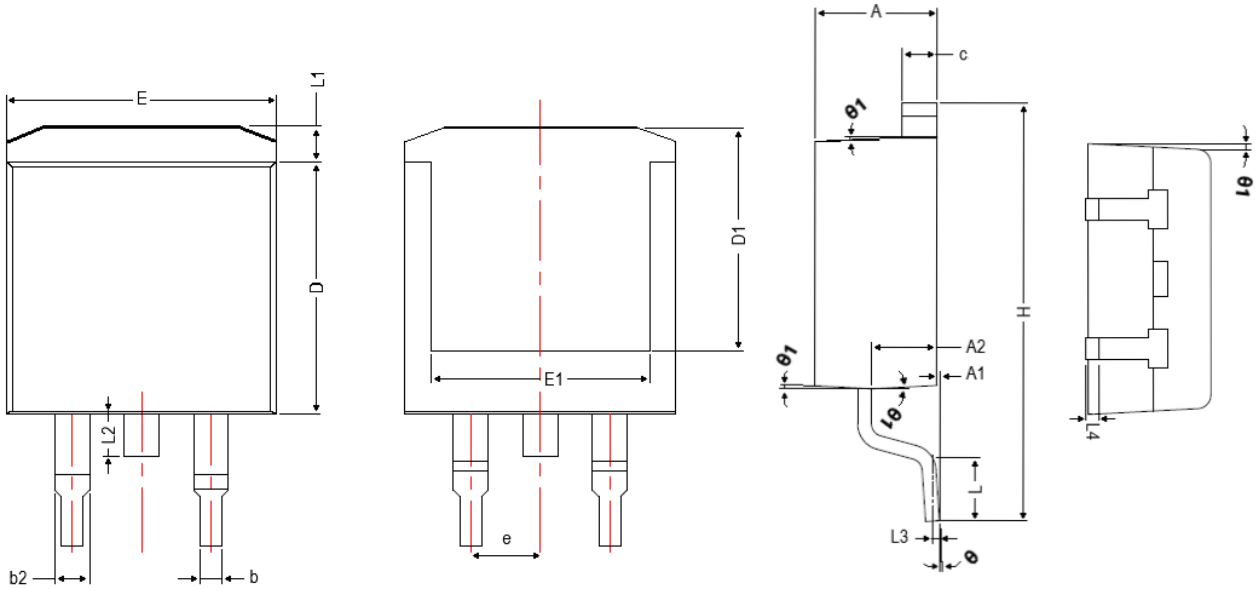


**Fig.9 Switching Time Waveform**



**Fig.10 EAS Waveform**

## TO263 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	4.850	4.250	0.191	0.167
A1	0.250	0.000	0.001	0.000
A2	2.900	2.350	0.114	0.093
b	0.950	0.700	0.037	0.028
b2	1.600	1.000	0.063	0.039
c	1.450	1.200	0.057	0.047
D	9.500	8.350	0.374	0.329
D1	9.150	6.400	0.360	0.252
E	10.500	9.600	0.413	0.378
E1	8.900	7.500	0.350	0.295
e	2.540 BSC		0.100 BSC	
H	15.900	14.600	0.626	0.575
L	2.800	2.000	0.110	0.079
L1	1.700	1.150	0.067	0.045
L2	2.100	1.400	0.083	0.055
L3	0.250 BSC		0.010 BSC	
L4	0.750	0.200	0.030	0.001
θ	0°	8°	0°	8°
θ1	5°	1°	5°	1°