

### General Description

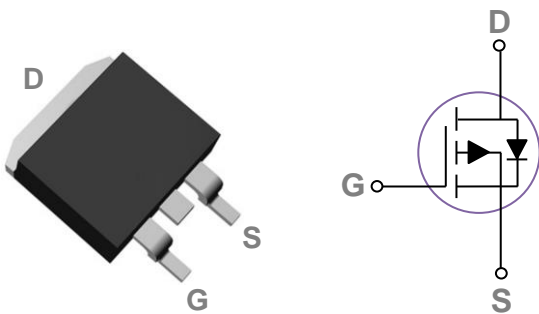
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVDSS	RDSON	ID
-100V	38mΩ	-35A

### Features

- -100V,-35A, RDS(ON) 38mΩ@VGS = -10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

### TO263 Pin Configuration



### Applications

- Networking
- Load Switch
- LED applications

### Absolute Maximum Ratings (Tc=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)	113	W
	Power Dissipation – Derate above 25°C	0.9	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	---	1.1	°C/W

**Electrical Characteristics ( $T_J=25\text{ }^\circ\text{C}$ , unless otherwise noted)**
**Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-100	---	---	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=-100V, V_{GS}=0V, T_J=25^\circ C$	---	---	-1	$\mu A$
		$V_{DS}=-80V, V_{GS}=0V, T_J=85^\circ C$	---	---	-10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA

**On Characteristics**

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-15A$	---	32	38	$m\Omega$
		$V_{GS}=-4.5V, I_D=-10A$	---	36	47	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.5	V

**Dynamic and switching Characteristics**

$Q_g$	Total Gate Charge <sup>3,4</sup>	$V_{DS}=-50V, V_{GS}=-10V, I_D=-20A$	---	92	140	nC
$Q_{gs}$	Gate-Source Charge <sup>3,4</sup>		---	13	20	
$Q_{gd}$	Gate-Drain Charge <sup>3,4</sup>		---	14	20	
$T_{d(on)}$	Turn-On Delay Time <sup>3,4</sup>	$V_{DD}=-50V, V_{GS}=-10V, R_G=6\Omega$ $I_D=-20A$	---	10	15	ns
$T_r$	Rise Time <sup>3,4</sup>		---	15	25	
$T_{d(off)}$	Turn-Off Delay Time <sup>3,4</sup>		---	20	30	
$T_f$	Fall Time <sup>3,4</sup>		---	25	40	
$C_{iss}$	Input Capacitance	$V_{DS}=-50V, V_{GS}=0V, F=1MHz$	---	5700	8550	pF
$C_{oss}$	Output Capacitance		---	160	240	
$C_{rss}$	Reverse Transfer Capacitance		---	120	180	

**Guaranteed Avalanche Energy**

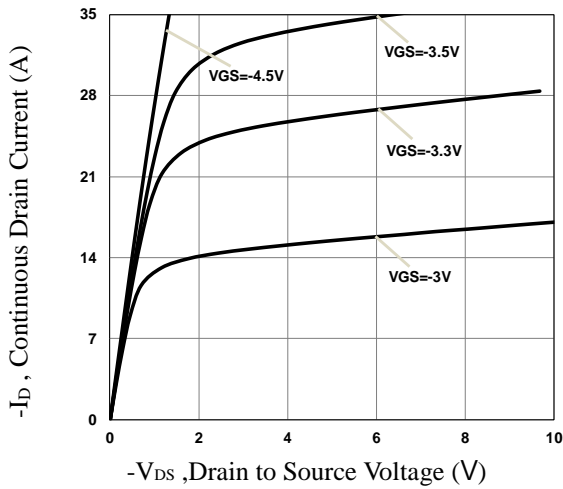
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
EAS	Single Pulse Avalanche Energy	$V_{DD}=50V, L=0.1mH, I_{AS}=46A$	105.8	---	---	mJ

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

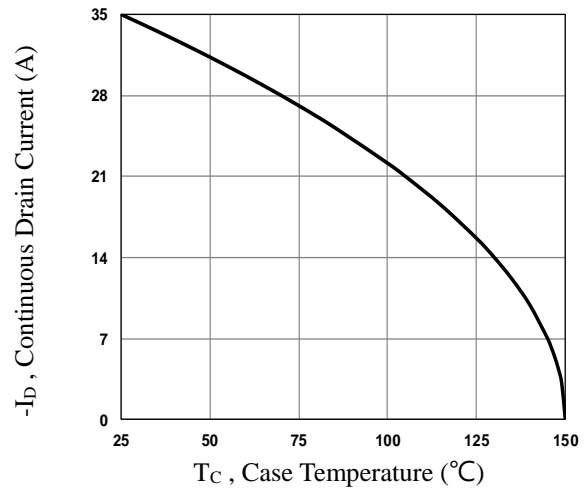
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	-35	A
$I_{SM}$	Pulsed Source Current		---	---	-70	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	---	---	-1	V
$t_{rr}$	Reverse Recovery Time	$V_R=-50V, I_S=-10A$	---	55	---	ns
$Q_{rr}$	Reverse Recovery Charge	$di/dt=100A/\mu s, T_J=25^\circ C$	---	60	---	nC

Note :

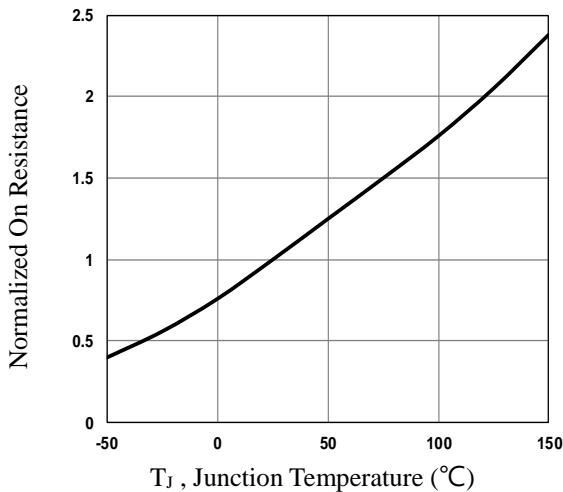
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2.  $V_{DD}=-50V, V_{GS}=-10V, L=0.1mH, I_{AS}=-60A, \text{Starting } T_J=25^\circ C$
3. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
4. Essentially independent of operating temperature.



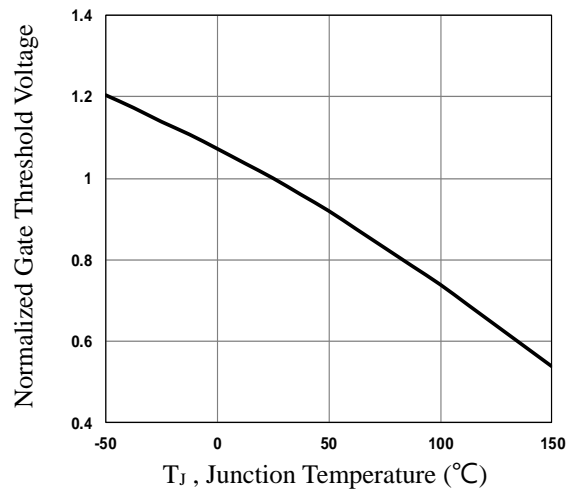
**Fig.1 Typical Output Characteristics**



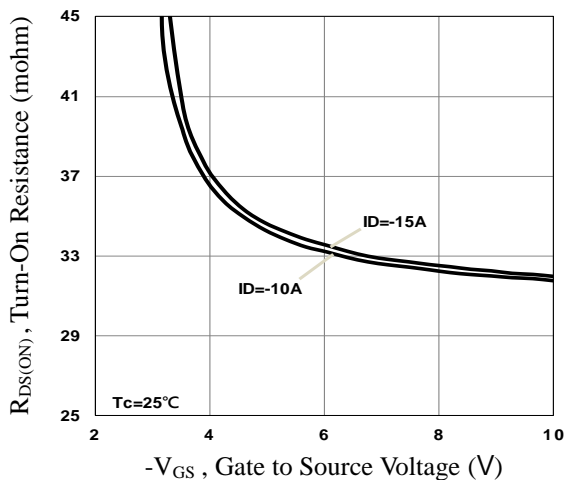
**Fig.2 Continuous Drain Current vs. T<sub>c</sub>**



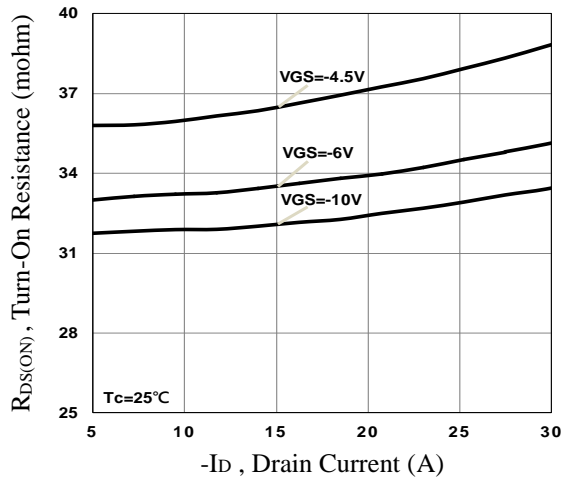
**Fig.3 Normalized R<sub>DS(on)</sub> vs. T<sub>j</sub>**



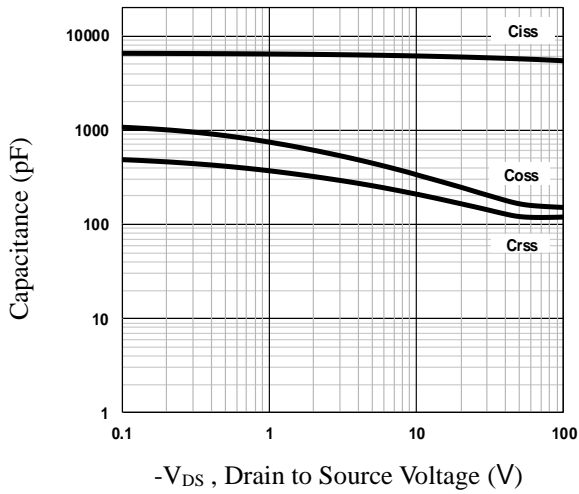
**Fig.4 Normalized V<sub>th</sub> vs. T<sub>j</sub>**



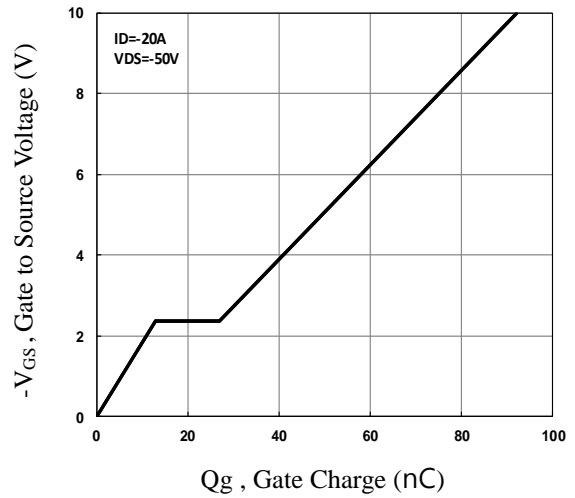
**Fig.5 Turn-On Resistance vs. V<sub>GS</sub>**



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



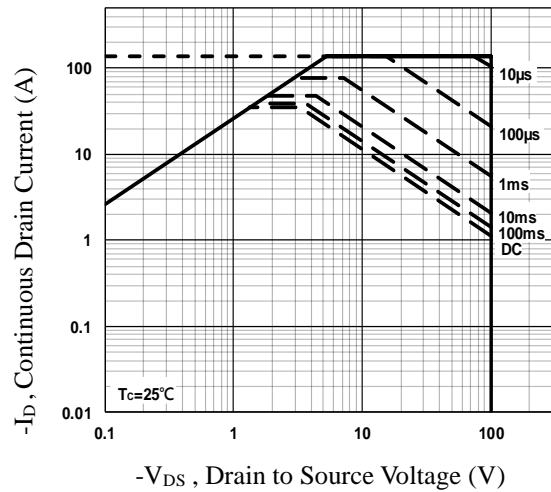
**Fig.7 Capacitance Characteristics**



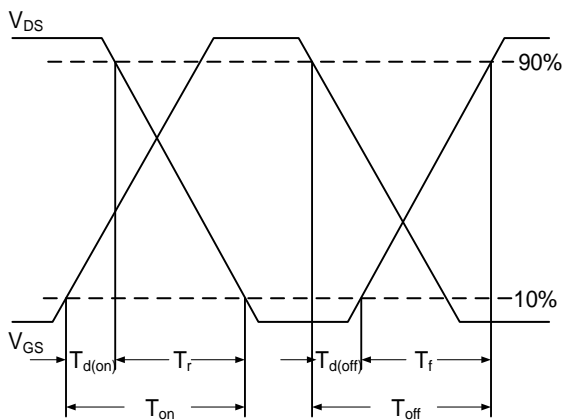
**Fig.8 Gate Charge Characteristics**



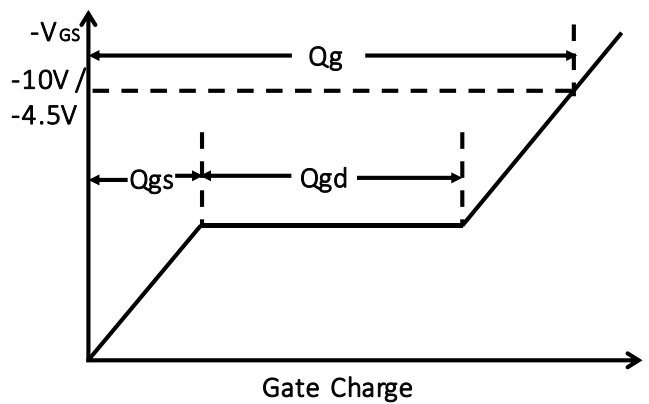
**Fig.9 Normalized Transient Impedance**



**Fig.10 Maximum Safe Operation Area**

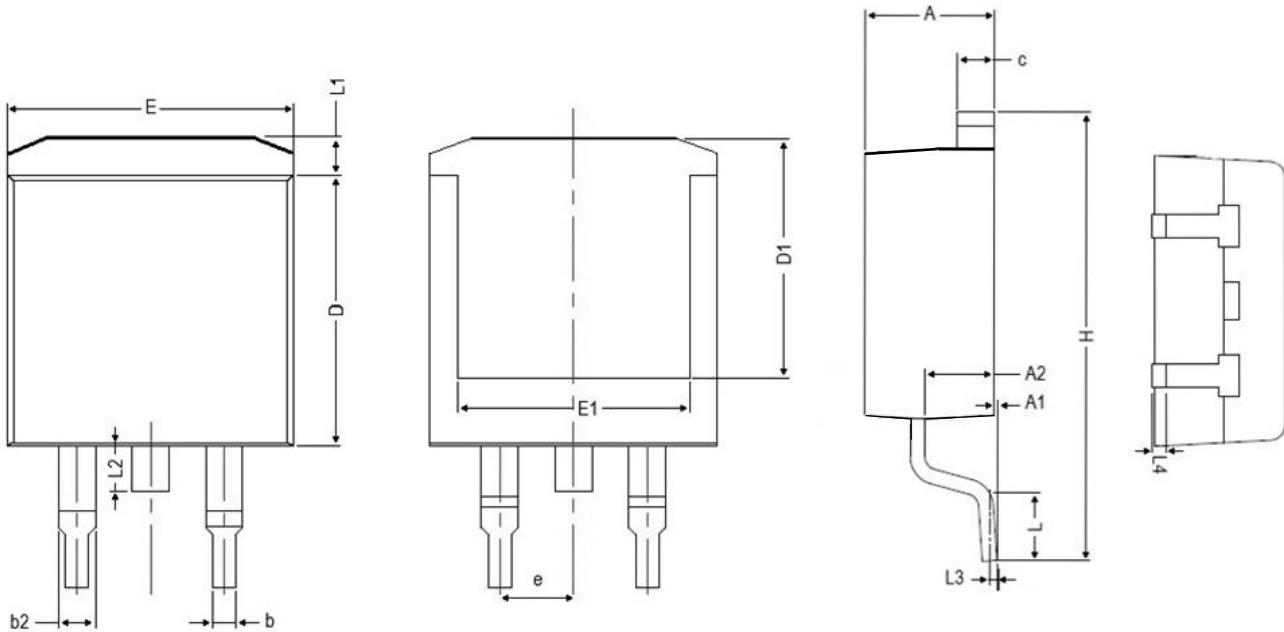


**Fig.11 Switching Time Waveform**



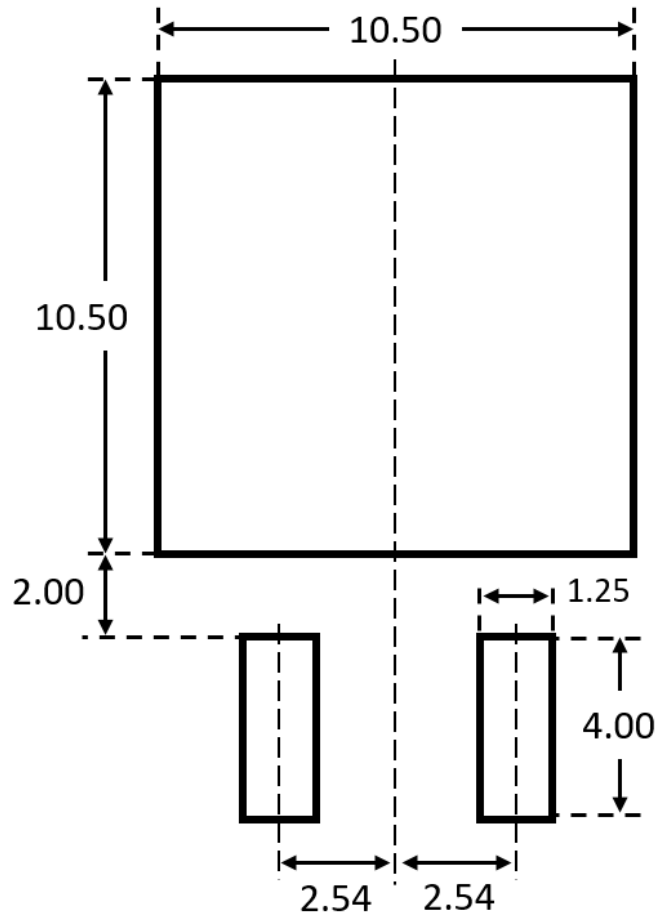
**Fig.12 Gate Charge Waveform**

## TO263 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	4.850	4.200	0.191	0.165
A1	0.300	0.000	0.012	0.000
A2	2.900	2.200	0.114	0.087
b	0.950	0.700	0.037	0.028
b2	1.700	1.000	0.067	0.039
c	1.450	1.150	0.057	0.045
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	6.850	0.350	0.270
e	2.540 BSC		0.100 BSC	
H	15.900	14.600	0.626	0.575
L	2.800	1.700	0.110	0.067
L1	1.700	1.050	0.067	0.041
L2	2.100	1.300	0.083	0.051
L3	0.250 BSC		0.010 BSC	
L4	0.750	0.200	0.030	0.008

### TO263 RECOMMENDED LAND PATTERN



unit : mm