

### General Description

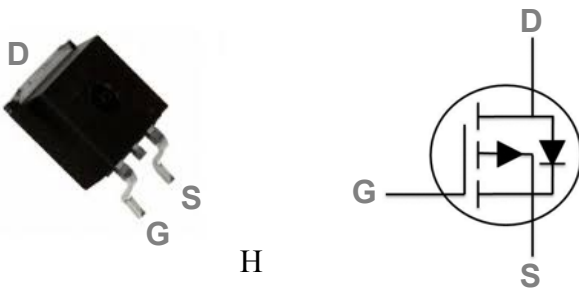
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVDSS	R <sub>DS(ON)</sub>	I <sub>D</sub>
-100V	45mΩ	-30A

### Features

- -100V,-30A, R<sub>DS(ON)</sub> 45mΩ@V<sub>GS</sub> = -10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

### TO252 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)	-30	A
	Drain Current – Continuous (T <sub>C</sub> =100°C)	-19	A
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup>	-120	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)	102	W
	Power Dissipation – Derate above 25°C	0.82	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	---	1.22	°C/W
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	---	62	°C/W

**Electrical Characteristics ( $T_J=25^\circ\text{C}$ , 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	$V_{DS}=-100V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	$\mu A$
		$V_{DS}=-80V, V_{GS}=0V, T_J=85^\circ\text{C}$	---	---	-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	$V_{GS}=-10V, I_D=-15A$	---	36	45	$m\Omega$
		$V_{GS}=-4.5V, I_D=-10A$	---	40	55	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	---	-2.5	V
gfs	Forward Transconductance	$V_{DS}=-10V, I_D=-5A$	---	22	---	S

**Dynamic and switching Characteristics**

$Q_g$	Total Gate Charge <sup>3,4</sup>	$V_{DS}=-50V, V_{GS}=-10V, I_D=-10A$	---	98	150	nC
$Q_{gs}$	Gate-Source Charge <sup>3,4</sup>		---	16.2	30	
$Q_{gd}$	Gate-Drain Charge <sup>3,4</sup>		---	13.8	26	
$T_{d(on)}$	Turn-On Delay Time <sup>3,4</sup>	$V_{DD}=-50V, V_{GS}=-10V, R_G=25\Omega, I_D=-5A$	---	58	105	ns
$T_r$	Rise Time <sup>3,4</sup>		---	24	50	
$T_{d(off)}$	Turn-Off Delay Time <sup>3,4</sup>		---	215	450	
$T_f$	Fall Time <sup>3,4</sup>		---	94	180	
$C_{iss}$	Input Capacitance	$V_{DS}=-25V, V_{GS}=0V, F=1\text{MHz}$	---	6315	9000	pF
$C_{oss}$	Output Capacitance		---	220	330	
$C_{rss}$	Reverse Transfer Capacitance		---	50	100	

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	-30	A
$I_{SM}$	Pulsed Source Current		---	---	-60	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V

**Note :**

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

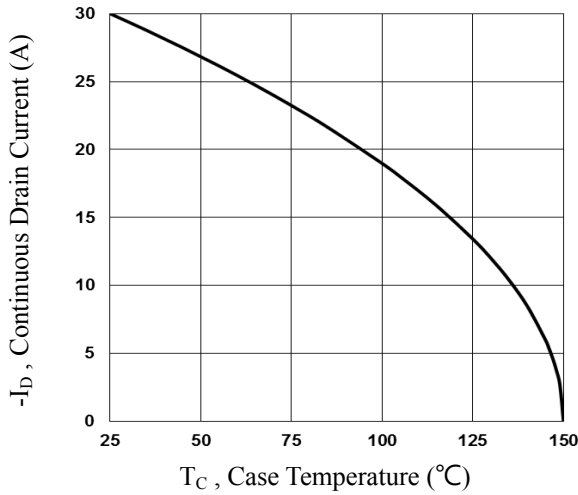


Fig.1 Continuous Drain Current vs.  $T_c$

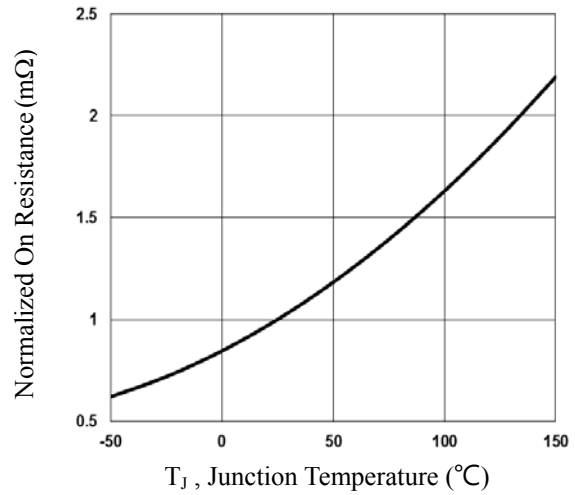


Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$

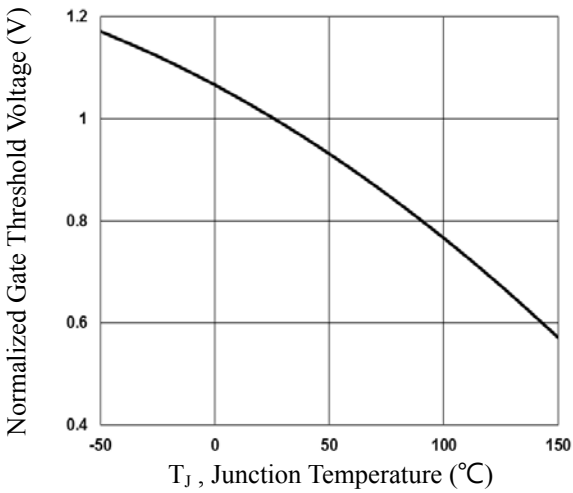


Fig.3 Normalized  $V_{th}$  vs.  $T_j$

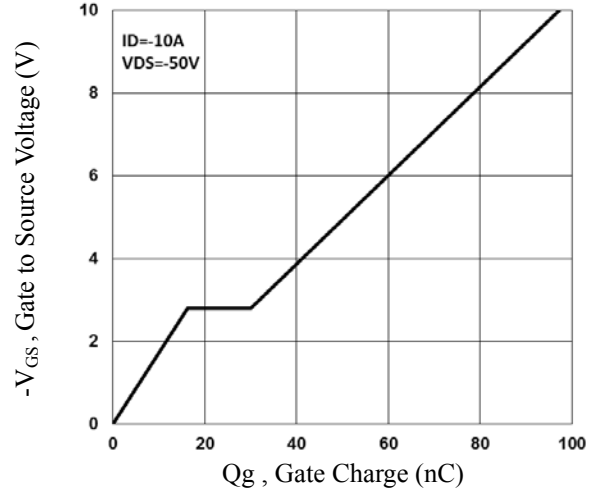


Fig.4 Gate Charge Waveform

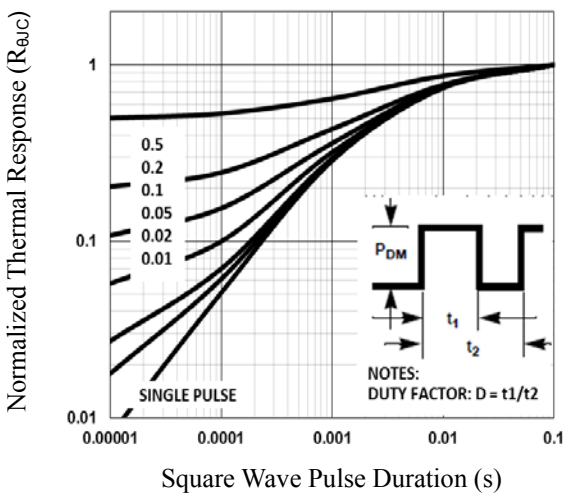


Fig.5 Normalized Transient Impedance

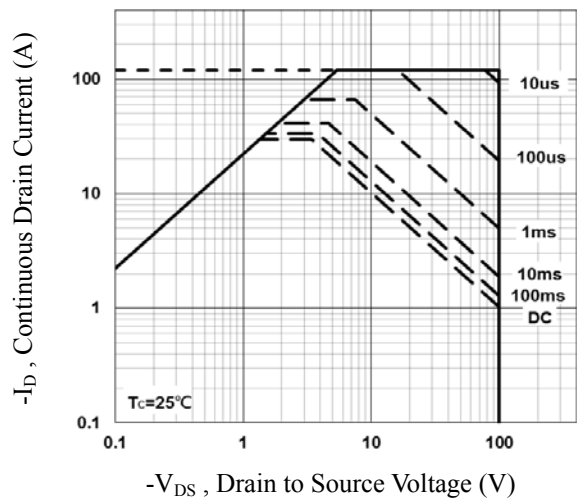


Fig.6 Maximum Safe Operation Area

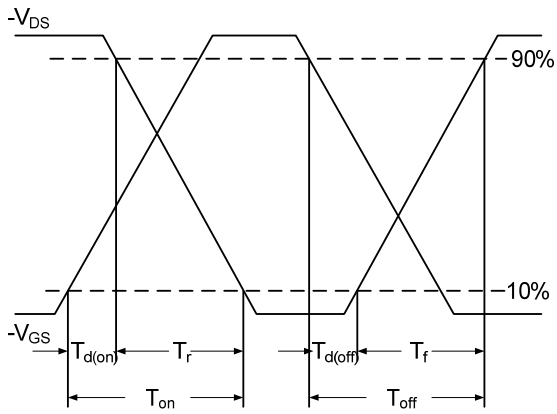


Fig.7 Switching Time Waveform

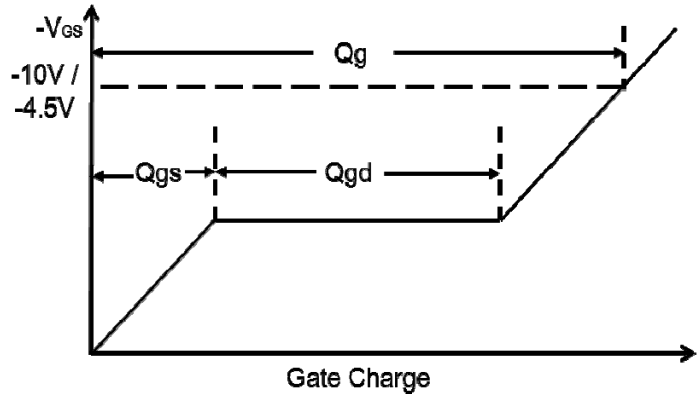
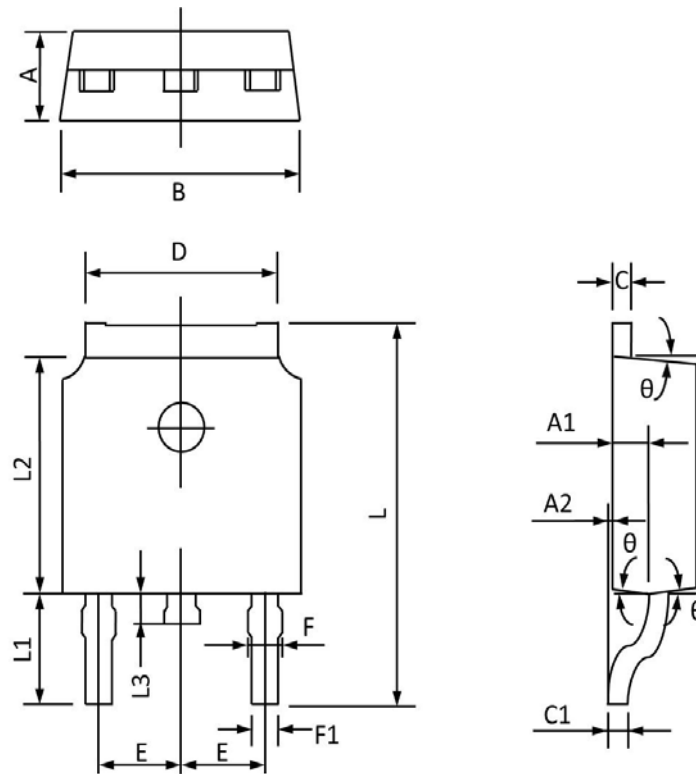


Fig.8 Gate Charge Waveform

## TO252 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.400	2.200	0.094	0.087
A1	1.110	0.910	0.044	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.400	0.268	0.252
C	0.580	0.450	0.023	0.018
C1	0.580	0.460	0.023	0.018
D	5.500	5.100	0.217	0.201
E	2.386	2.186	0.094	0.086
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.400	0.244	0.213
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°