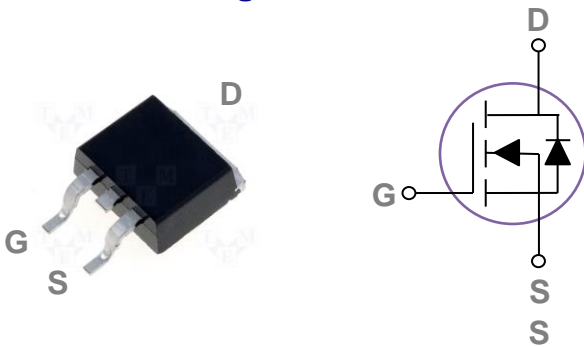


### General Description

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.

### TO263 Pin Configuration



BVDSS	RDSON	ID
80V	4.2mΩ	130A

### Features

- 80V, 130A,  $R_{DS(ON)} = 4.2m\Omega @ V_{GS} = 10V$
- Improved  $dv/dt$  capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

### Applications

- Networking
- Load Switch
- LED applications
- Quick Charger

### Absolute Maximum Ratings $T_c=25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	80	V
$V_{GS}$	Gate-Source Voltage	+20/-12	V
$I_D$	Drain Current – Continuous ( $T_c=25^\circ C$ )	130	A
	Drain Current – Continuous ( $T_c=100^\circ C$ )	82	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	520	A
EAS	Single Pulse Avalanche Energy <sup>2</sup>	451	mJ
IAS	Single Pulse Avalanche Current <sup>2</sup>	95	A
$P_D$	Power Dissipation ( $T_c=25^\circ C$ )	184	W
	Power Dissipation – Derate above $25^\circ C$	1.47	W/ $^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.68	$^\circ C/W$

**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	$V_{GS}=0V, I_D=250\mu A$	80	---	---	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu A$
		$V_{DS}=64V, V_{GS}=0V, T_J=85^\circ\text{C}$	---	---	10	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=20V, V_{DS}=0V$	---	---	100	nA

**On Characteristics**

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=20A$	---	3.5	4.2	m $\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2	3	4	V
gfs	Forward Transconductance	$V_{DS}=10V, I_D=5A$	---	18	---	S

**Dynamic and switching Characteristics**

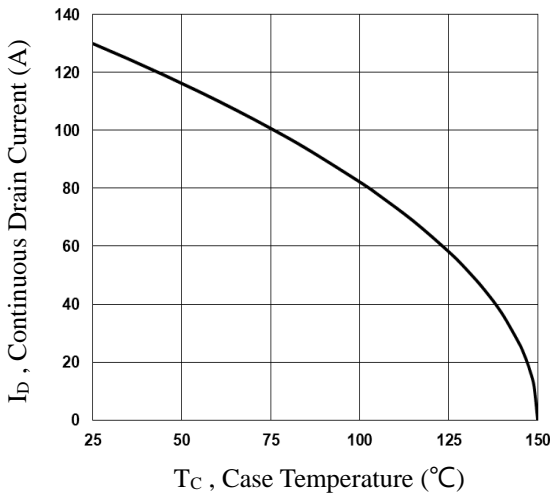
$Q_g$	Total Gate Charge <sup>3, 4</sup>	$V_{DS}=40V, V_{GS}=10V, I_D=70A$	---	95.5	143	nC
$Q_{gs}$	Gate-Source Charge <sup>3, 4</sup>		---	23.5	35	
$Q_{gd}$	Gate-Drain Charge <sup>3, 4</sup>		---	32	48	
$T_{d(on)}$	Turn-On Delay Time <sup>3, 4</sup>	$V_{DD}=40V, V_{GS}=10V, R_G=6\Omega, I_D=70A$	---	22	33	ns
$T_r$	Rise Time <sup>3, 4</sup>		---	15	23	
$T_{d(off)}$	Turn-Off Delay Time <sup>3, 4</sup>		---	40	60	
$T_f$	Fall Time <sup>3, 4</sup>		---	19	29	
$C_{iss}$	Input Capacitance	$V_{DS}=40V, V_{GS}=0V, F=1\text{MHz}$	---	5510	8265	pF
$C_{oss}$	Output Capacitance		---	1200	1800	
$C_{rss}$	Reverse Transfer Capacitance		---	70	100	
$R_g$	Gate resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	1.5	---	$\Omega$

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

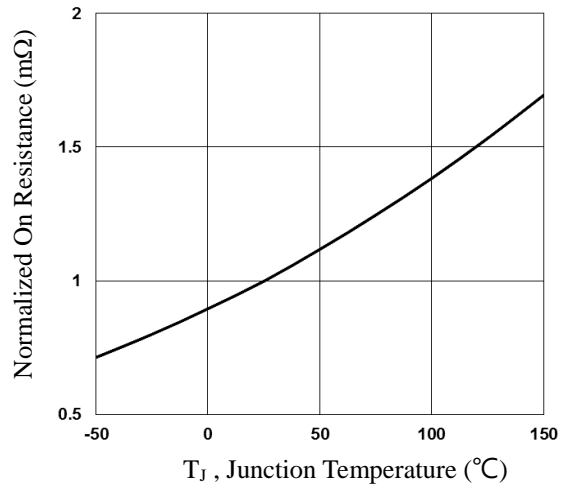
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	130	A
$I_{SM}$	Pulsed Source Current		---	---	260	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1	V
$t_{rr}$	Reverse Recovery Time	$V_R=50V, I_S=10A,$		65		nS
$Q_{rr}$	Reverse Recovery Charge	$di/dt=100A/\mu s, T_J=25^\circ\text{C}$		125		nC

Note :

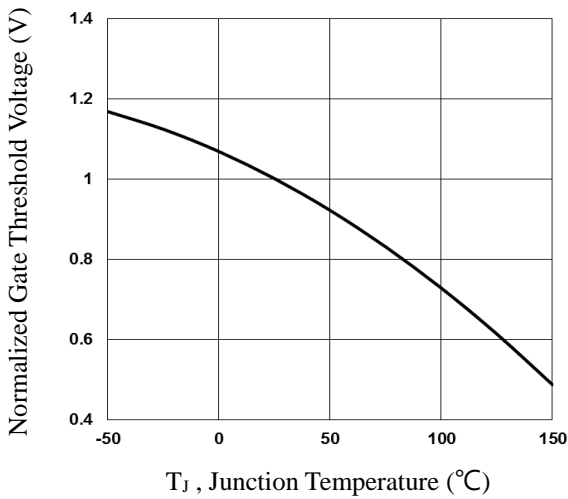
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2.  $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=95A., R_G=25\Omega, \text{Starting } T_J=25^\circ\text{C}.$
3. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
4. Essentially independent of operating temperature.



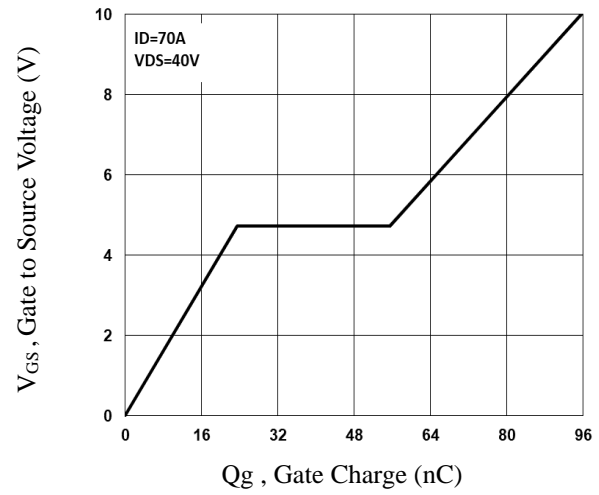
**Fig.1 Continuous Drain Current vs. T<sub>c</sub>**



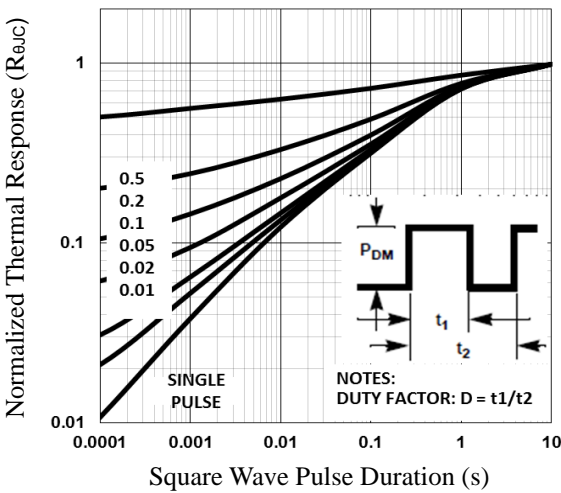
**Fig.2 Normalized R<sub>DS(on)</sub> vs. T<sub>J</sub>**



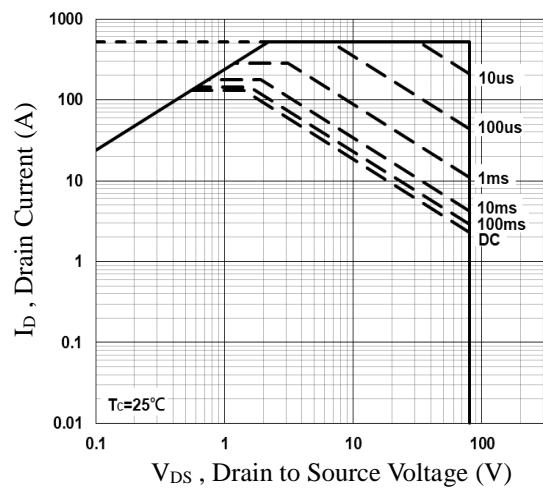
**Fig.3 Normalized V<sub>th</sub> vs. T<sub>J</sub>**



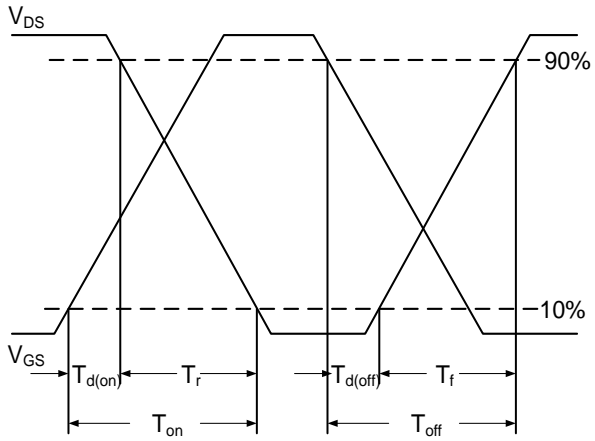
**Fig.4 Gate Charge Characteristics**



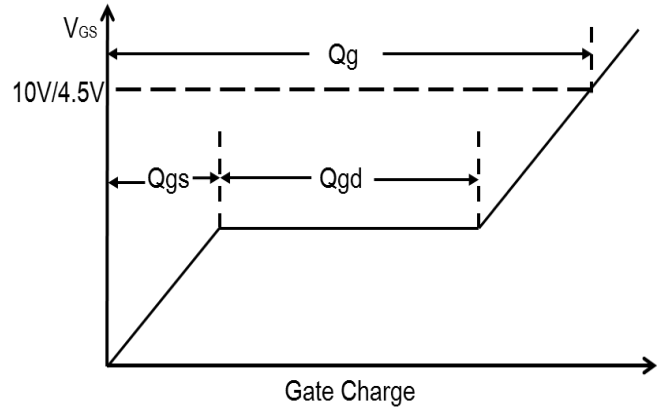
**Fig.5 Normalized Transient Impedance**



**Fig.6 Maximum Safe Operation Area**



**Fig.7 Switching Time Waveform**



**Fig.8 Gate Charge Waveform**

### TO263 PACKAGE INFORMATION

