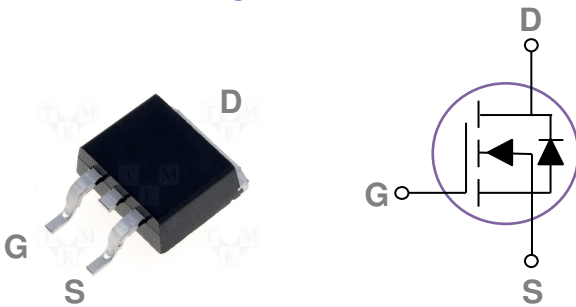


### General Description

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	7.4mΩ	85A

### Features

- 80V,85A,  $R_{DS(ON)} = 7.4m\Omega @ V_{GS} = 10V$
- 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 ( $T_c=25^\circ C$ )	85	A
	Drain Current – Continuous ( $T_c=100^\circ C$ )	53	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	340	A
EAS	Single Pulse Avalanche Energy <sup>2</sup>	210	mJ
IAS	Single Pulse Avalanche Current <sup>2</sup>	65	A
$P_D$	Power Dissipation ( $T_c=25^\circ C$ )	154	W
	Power Dissipation – Derate above $25^\circ C$	1.23	W/ $^\circ C$
$T_{STG}$	Storage Temperature Range	-50 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-50 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	---	0.81	$^\circ C/W$

**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	80	---	---	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> =64V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°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	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	---	6.5	7.4	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA	2.5	3.3	4	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =3A	---	10	---	S

**Dynamic and switching Characteristics**

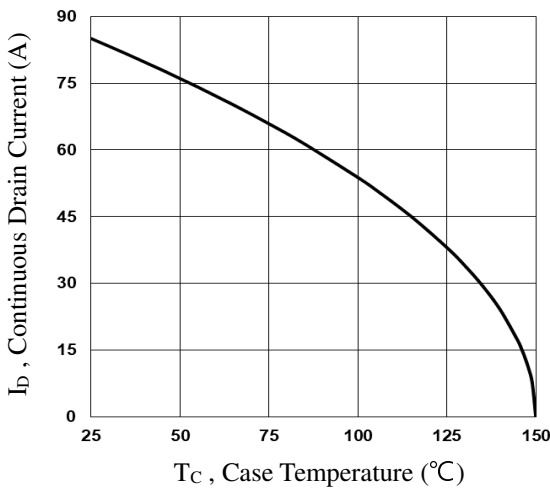
Q <sub>g</sub>	Total Gate Charge <sup>3, 4</sup>	V <sub>DS</sub> =40V, V <sub>GS</sub> =10V, I <sub>D</sub> =10A	---	40.3	60	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>3, 4</sup>		---	9.4	15	
Q <sub>gd</sub>	Gate-Drain Charge <sup>3, 4</sup>		---	16	25	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>3, 4</sup>	V <sub>DD</sub> =40V, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω I <sub>D</sub> =1A	---	14.6	30	ns
T <sub>r</sub>	Rise Time <sup>3, 4</sup>		---	21.5	42	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>3, 4</sup>		---	52	108	
T <sub>f</sub>	Fall Time <sup>3, 4</sup>		---	83.5	167	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =40V, V <sub>GS</sub> =0V, F=1MHz	---	2490	4980	pF
C <sub>oss</sub>	Output Capacitance		---	823	1640	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	44	80	
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	---	0.8	---	Ω

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

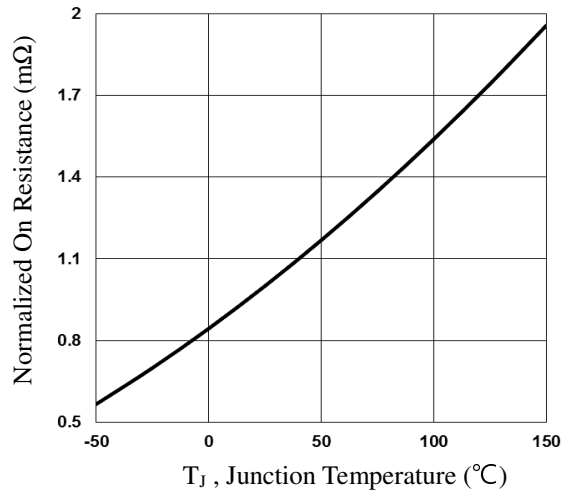
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	85	A
I <sub>SM</sub>	Pulsed Source Current		---	---	170	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1	V
T <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> =10V, I <sub>S</sub> =10A,	---	50	---	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs, T <sub>J</sub> =25°C	---	70	---	nC

Note :

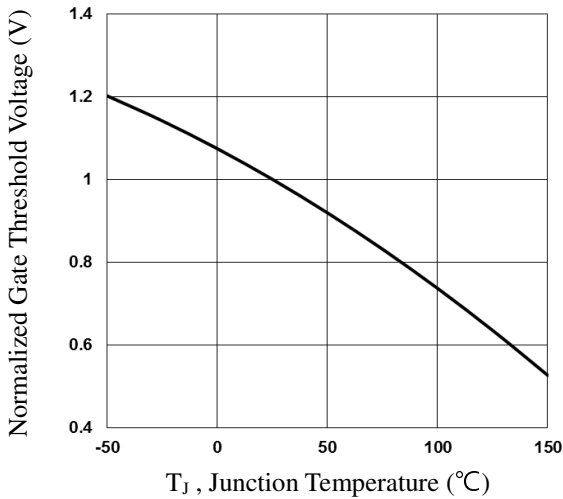
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V<sub>DD</sub>=40V, V<sub>GS</sub>=10V, L=0.1mH, I<sub>AS</sub>=65A., R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.



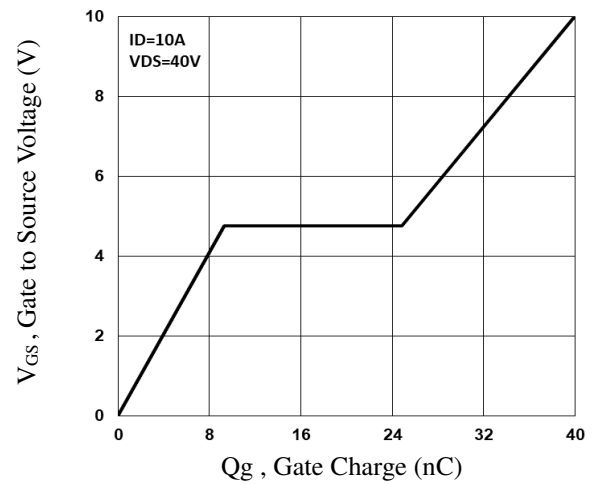
**Fig.1 Continuous Drain Current vs. T<sub>c</sub>**



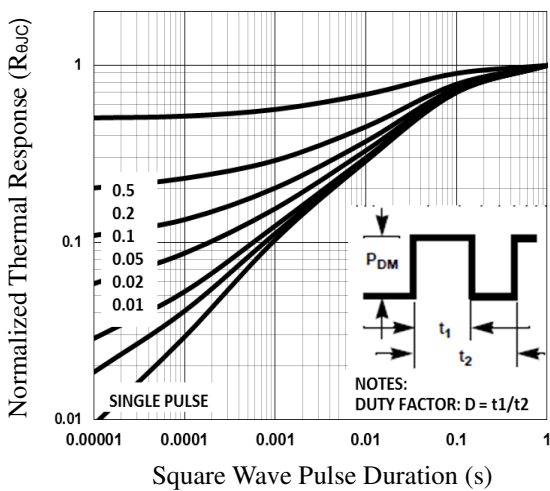
**Fig.2 Normalized R<sub>DS(on)</sub> vs. T<sub>j</sub>**



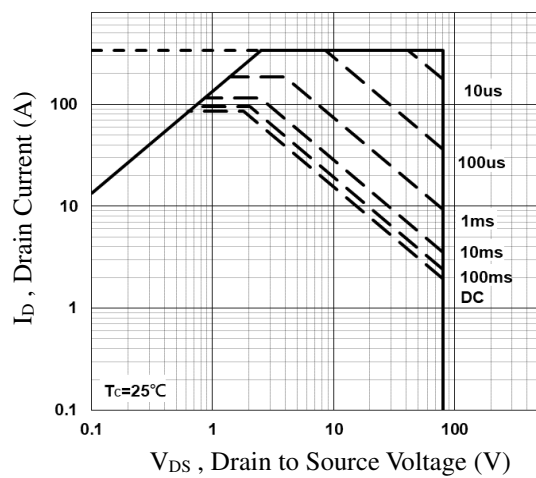
**Fig.3 Normalized V<sub>th</sub> vs. T<sub>j</sub>**



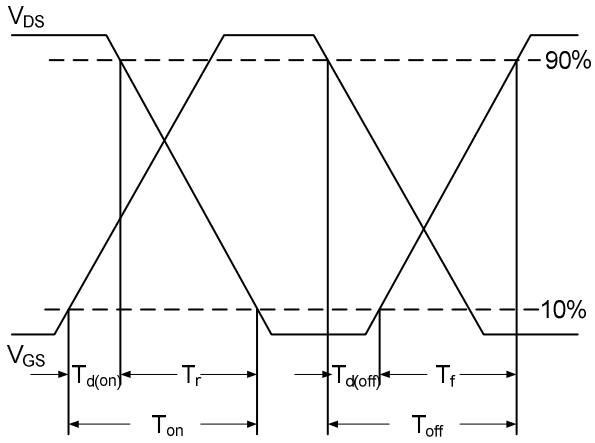
**Fig.4 Gate Charge Characteristics**



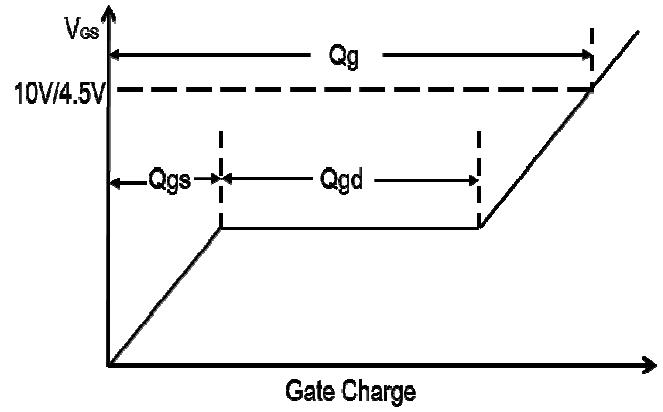
**Fig.5 Normalized Transient Impedance**



**Fig.6 Maximum Safe Operation Area**



**Fig.7 Switching Time Waveform**



**Fig.8 Gate Charge Waveform**

TO263 PACKAGE INFORMATION

