

General Description

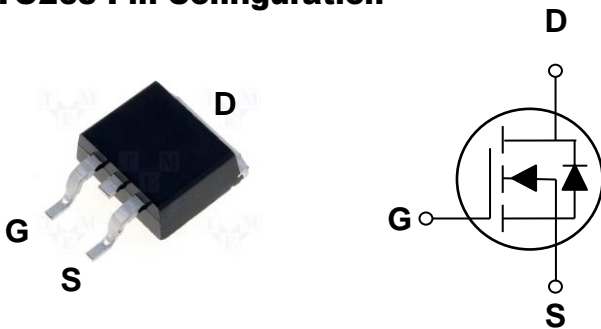
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVDSS	R _{DS(ON)}	I _D
60V	4.5mΩ	114A

Features

- 60V, 114A, R_{DS(ON)} = 4.5mΩ @ V_{GS} = 10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

TO263 Pin Configuration



Applications

- PowerTools
- Quick Charger
- LED applications
- Motor Drive Applications



Absolute Maximum Ratings T_c=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current – Continuous (T _C =25°C)	114	A
	Drain Current – Continuous (T _C =100°C)	72	A
I _{DM}	Drain Current – Pulsed ¹	456	A
EAS	Single Pulse Avalanche Energy ²	450	mJ
IAS	Single Pulse Avalanche Current ²	95	A
P _D	Power Dissipation (T _C =25°C)	183	W
	Power Dissipation – Derate above 25°C	1.47	W/°C
T _{STG}	Storage Temperature Range	-50 to 150	°C
T _J	Operating Junction Temperature Range	-50 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	62	°C/W
R _{θJC}	Thermal Resistance Junction to Case	---	0.68	°C/W

Electrical Characteristics (T_J=25 °C, unless otherwise noted)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	60	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =60V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =48V, V _{GS} =0V, T _J =125°C	---	---	10	uA
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	---	3.8	4.5	mΩ
		V _{GS} =4.5V, I _D =10A	---	4.2	5.5	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1	1.6	2.2	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =3A	---	18	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{3,4}	V _{DS} =30V, V _{GS} =4.5V, I _D =10A	---	58.2	116	nC
Q _{gs}	Gate-Source Charge ^{3,4}		---	16.2	32	
Q _{gd}	Gate-Drain Charge ^{3,4}		---	23.4	46	
T _{d(on)}	Turn-On Delay Time ^{3,4}	V _{DD} =30V, V _{GS} =10V, R _G =6Ω I _D =1A	---	19.2	40	ns
T _r	Rise Time ^{3,4}		---	56.3	120	
T _{d(off)}	Turn-Off Delay Time ^{3,4}		---	90.8	200	
T _f	Fall Time ^{3,4}		---	21.6	40	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, F=1MHz	---	6805	10000	pF
C _{oss}	Output Capacitance		---	445	680	
C _{rss}	Reverse Transfer Capacitance		---	195	280	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	1.3	2.6	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	114	A
I _{SM}	Pulsed Source Current		---	---	228	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=95A., Starting T_J=25°C
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

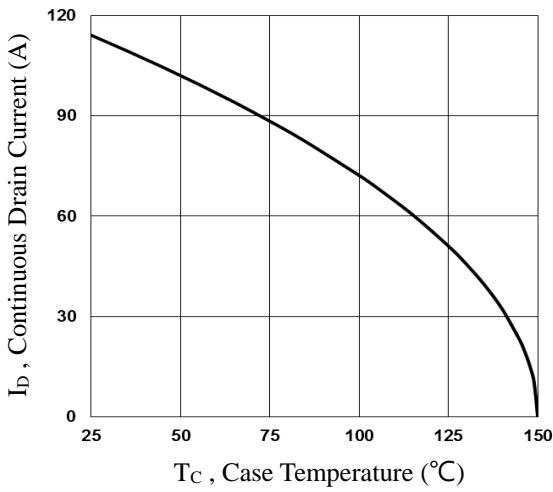


Fig.1 Continuous Drain Current vs. T_C

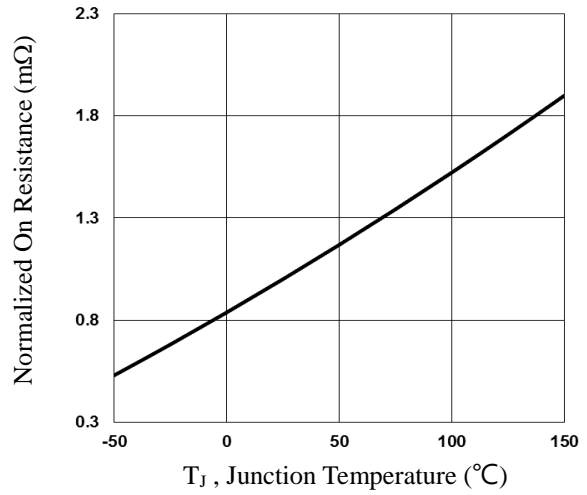


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

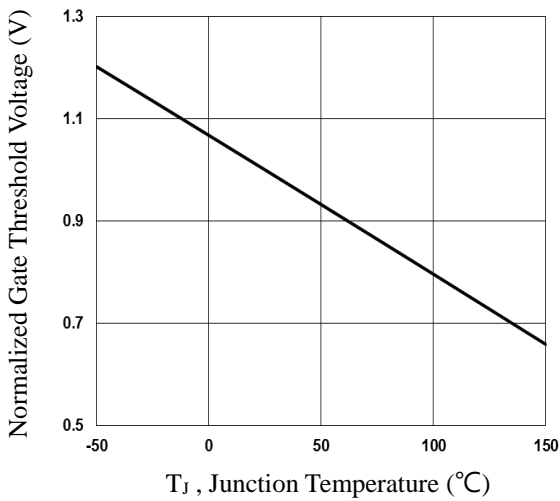


Fig.3 Normalized V_{th} vs. T_J

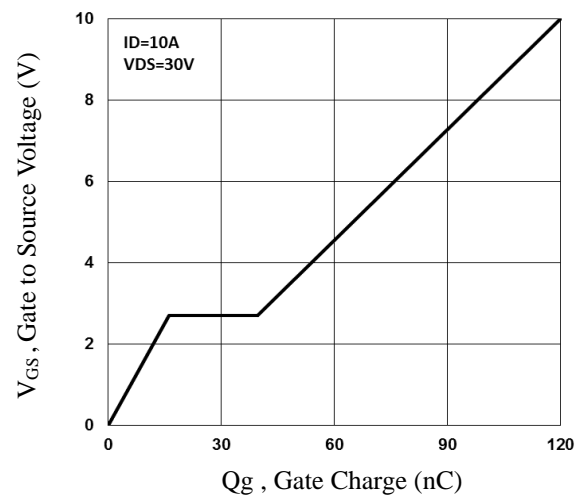


Fig.4 Gate Charge Characteristics

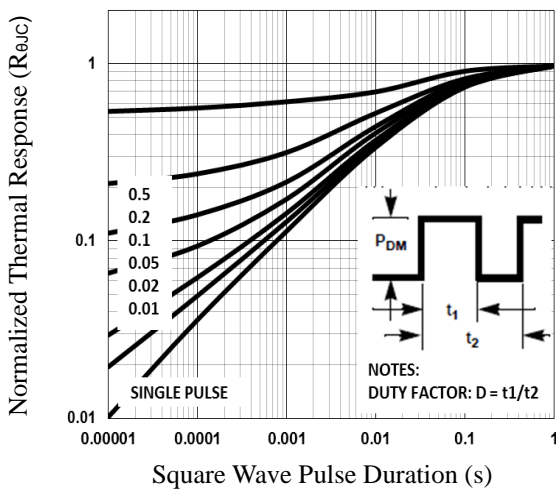


Fig.5 Normalized Transient Impedance

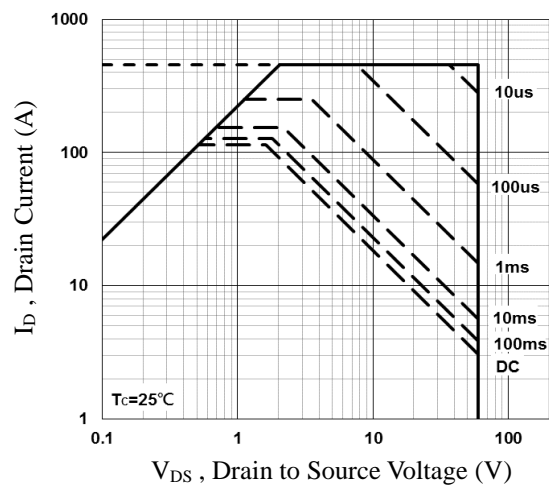


Fig.6 Maximum Safe Operation Area

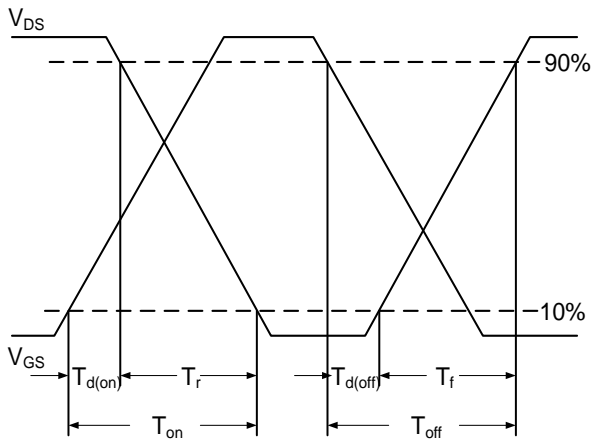


Fig.7 Switching Time Waveform

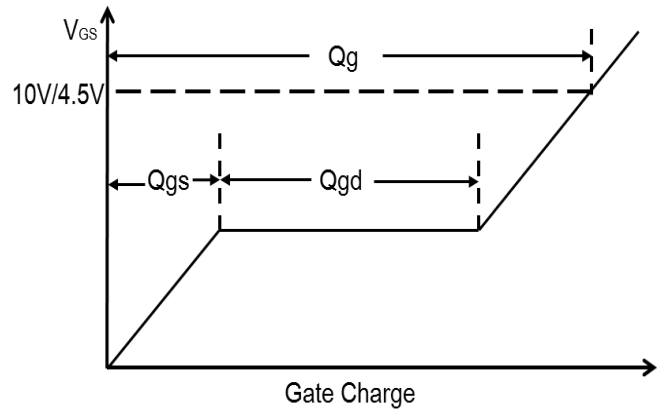


Fig.8 Gate Charge Waveform

