

General Description

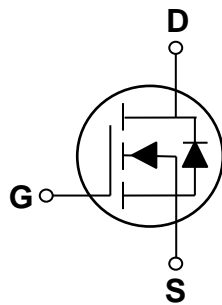
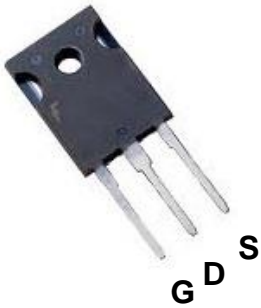
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BVDSS	RDSON	ID
60V	8mΩ	100A

Features

- 60V, 100A, $R_{DS(ON)}=8m\Omega @ V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed

TO247 Pin Configuration



Applications

- Motor Drive
- Power Tools
- LED Lighting



Absolute Maximum Ratings $T_c=25^\circ\text{C}$ 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 ($T_c=25^\circ\text{C}$)	100	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	63	A
I_{DM}	Drain Current – Pulsed ¹	400	A
EAS	Single Pulse Avalanche Energy ²	1125	mJ
IAS	Single Pulse Avalanche Current ²	150	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	235	W
	Power Dissipation – Derate above 25°C	1.88	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-50 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.54	$^\circ\text{C/W}$

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 =75A	---	---	8.0	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =25uA	2	---	4	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =A	---	---	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2, 3}	V _{DS} =50V, V _{GS} =10V, I _D =1.3A	---	475	712	nC
Q _{gs}	Gate-Source Charge ^{2, 3}		---	26	39	
Q _{gd}	Gate-Drain Charge ^{2, 3}		---	54	80	
T _{d(on)}	Turn-On Delay Time ^{2, 3}	V _{DD} =30V, V _{GS} =10V, R _G =25Ω I _D =0.5A	---	120	180	ns
T _r	Rise Time ^{2, 3}		---	270	405	
T _{d(off)}	Turn-Off Delay Time ^{2, 3}		---	1300	1950	
T _f	Fall Time ^{2, 3}		---	645	960	
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, F=1MHz	---	4800	7200	pF
C _{oss}	Output Capacitance		---	1265	1890	
C _{rss}	Reverse Transfer Capacitance		---	125	180	

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	---	---	100	A
I _{SM}	Pulsed Source Current		---	---	200	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.5	V
t _{rr}	Reverse Recovery Time ²	V _{GS} =0V, I _S =30A, dI/dt=100A/μs	---	84	---	ns
Q _{rr}	Reverse Recovery Charge ²	T _J =25°C	---	240	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=150A., R_G=25Ω, Starting T_J=25°C
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

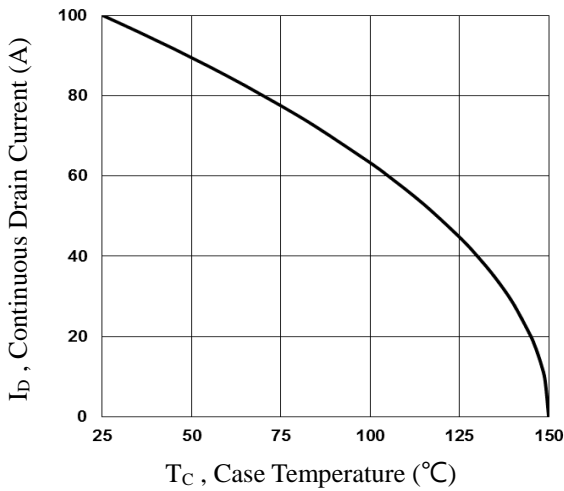


Fig.1 Continuous Drain Current vs. T_c

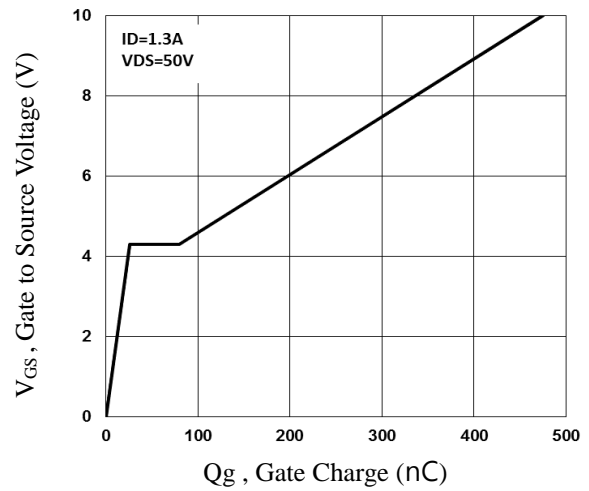


Fig.2 Gate Charge Waveform

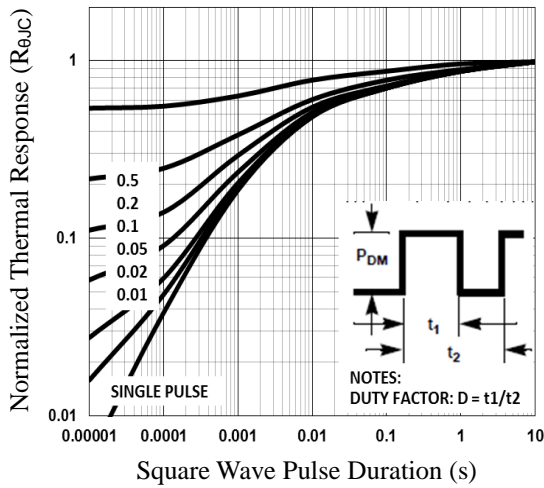


Fig.3 Normalized Transient Impedance

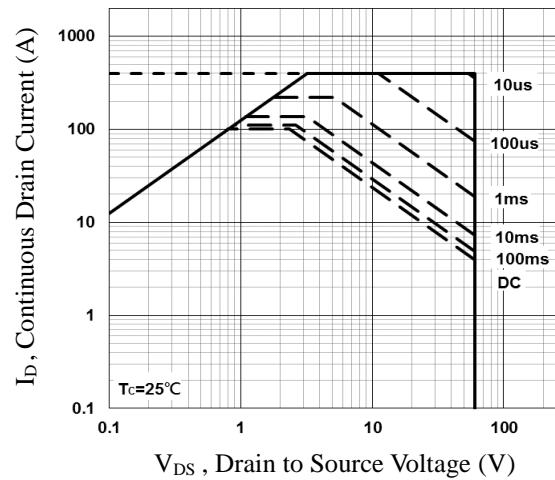


Fig.4 Maximum Safe Operation Area

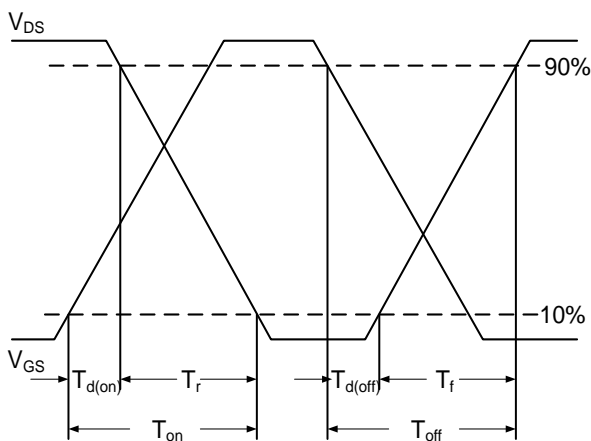


Fig.5 Switching Time Waveform

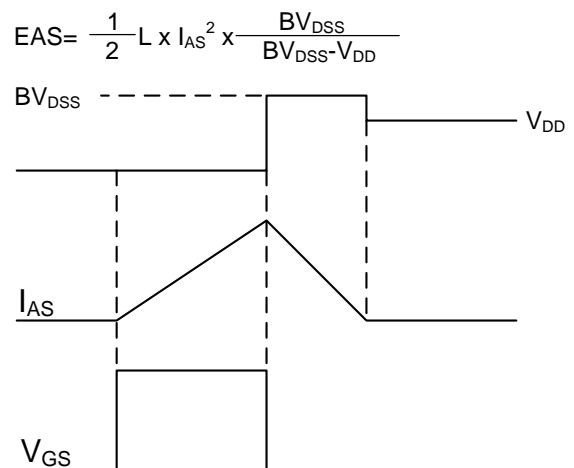


Fig.6 EAS Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$