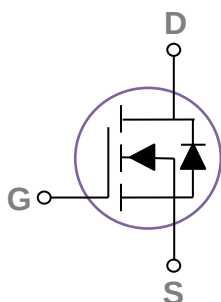


General Description

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.

TO247 Pin Configuration



BVDSS	RDS(on)	ID
60V	8mΩ	100A

Features

- 60V,100A,RDS(ON)=8mΩ@VGS=10V
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed

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 ($T_J=25^\circ\text{C}$, unless otherwise noted)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=60V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=48V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=75A$	---	---	8.0	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=25\mu A$	2	---	4	V
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=A$	---	---	---	S

Dynamic and switching Characteristics

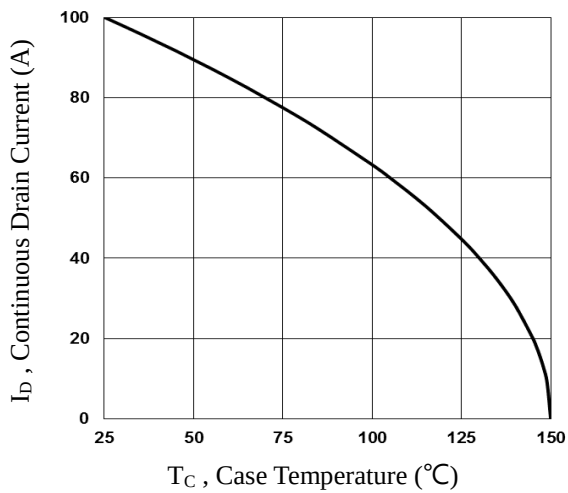
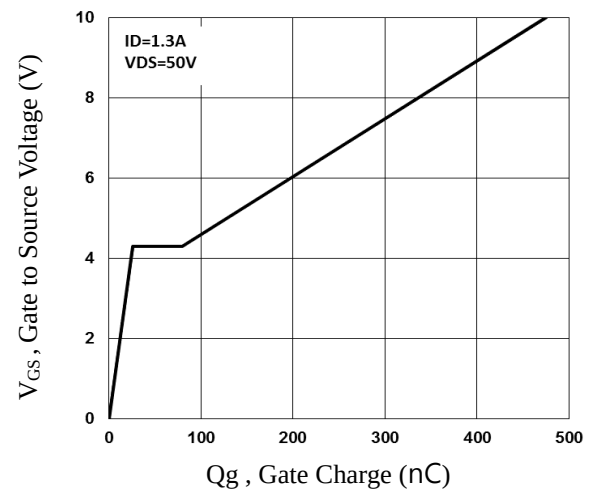
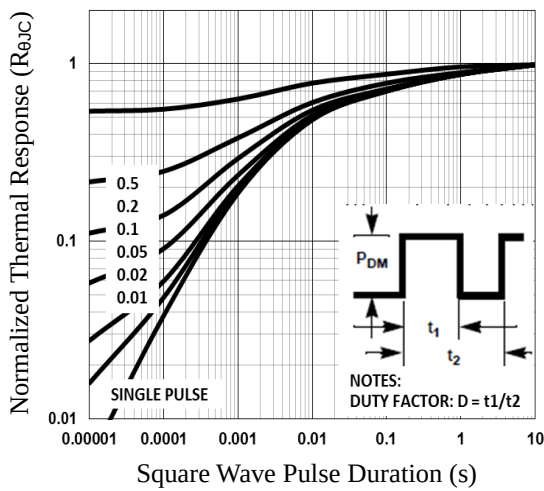
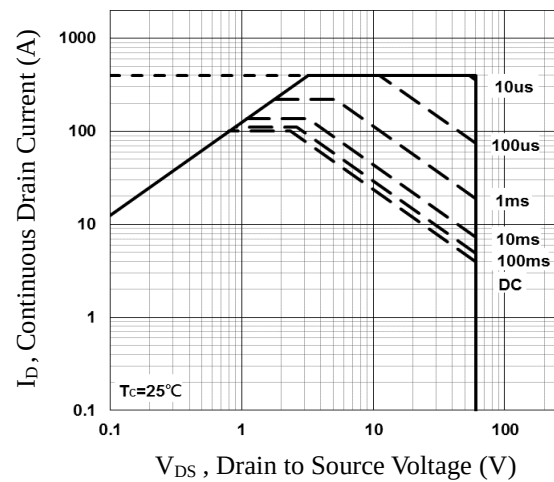
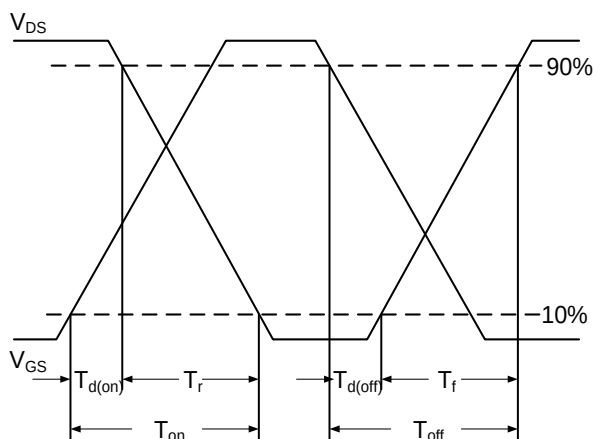
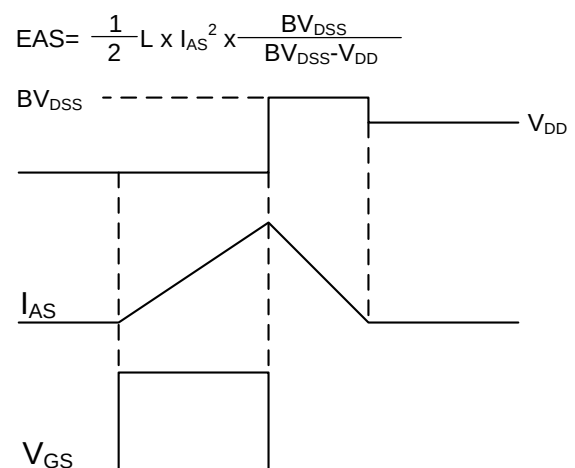
Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=50V, V_{GS}=10V, I_D=1.3A$	---	475	712	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	26	39	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	54	80	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=30V, V_{GS}=10V, R_G=25\Omega$ $I_D=0.5A$	---	120	180	ns
T_r	Rise Time ^{2, 3}		---	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	$V_G=V_D=0V, \text{Force Current}$	---	---	100	A
I_{SM}	Pulsed Source Current		---	---	200	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.5	V
t_{rr}	Reverse Recovery Time ²	$V_{GS}=0V, I_S=30A, dI/dt=100A/\mu s$	---	84	---	ns
Q_{rr}	Reverse Recovery Charge ²	$T_J=25^\circ\text{C}$	---	240	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=150A, R_G=25\Omega, \text{Starting } T_J=25^\circ\text{C}$
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. Tc

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