

Features

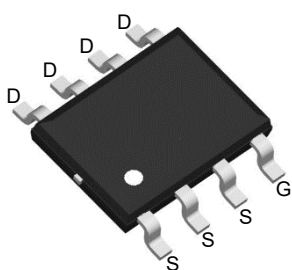
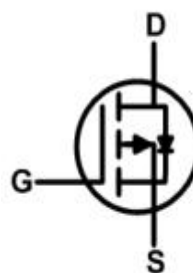
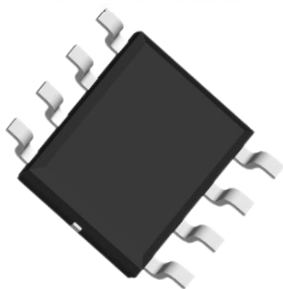
- ◆ -30V, -12A, $R_{DS(ON)} = 9.0m\Omega @ V_{GS} = -10V$
- ◆ Fast switching
- ◆ Green Device Available
- ◆ Suit for -4.5V Gate Drive Applications

Applications

- ◆ MB / VGA / Vcore
- ◆ POL Applications
- ◆ Load Switch
- ◆ LED Application

General Description

These P-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.

Top View

Bottom View

SOP-8
Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_A=25^\circ\text{C}$)	-12	A
	Drain Current – Continuous ($T_A=70^\circ\text{C}$)	-8	A
I_{DM}	Drain Current – Pulsed ¹	-40	A
EAS	Single Pulse Avalanche Energy ²	125	mJ
IAS	Single Pulse Avalanche Current ²	50	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	2	W
	Power Dissipation – Derate above 25°C	0.016	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62.5	$^\circ\text{C/W}$

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	-30	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-30V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-24V, 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 =-10A	---	9	13	mΩ
		V _{GS} =-4.5V, I _D =-8A	---	14	20	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.0	-1.6	-2.5	V
g _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-3A	---	11	---	S

Dynamic and switching Characteristics

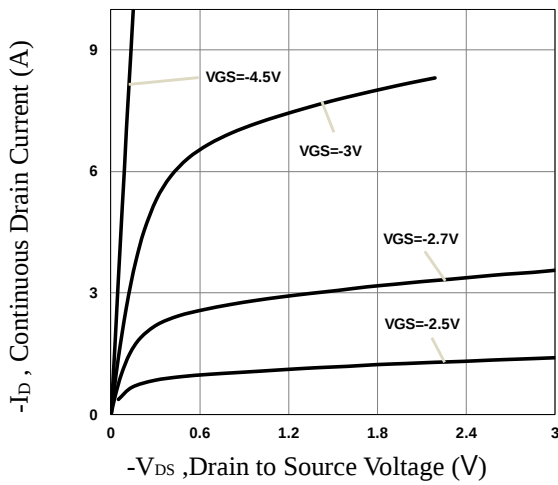
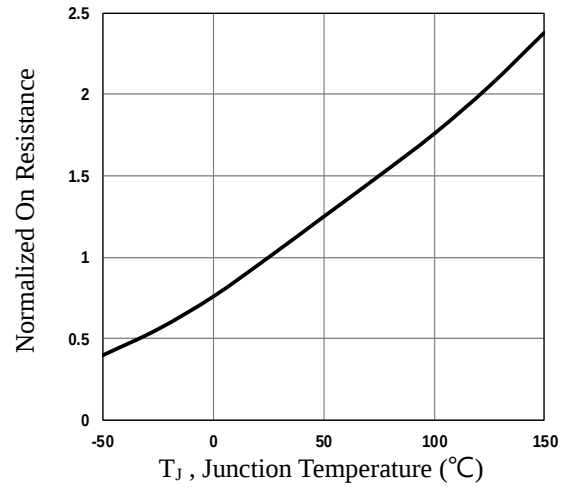
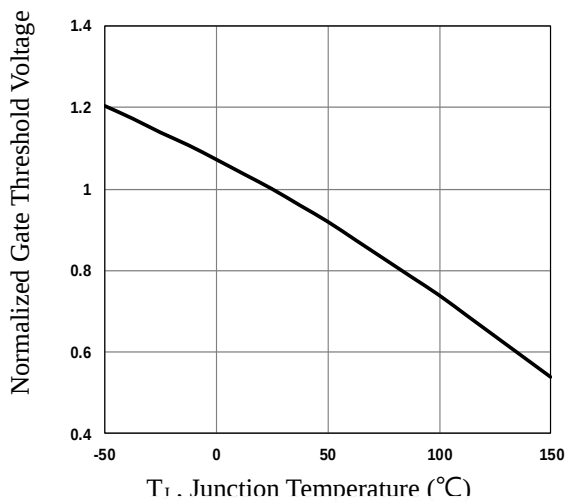
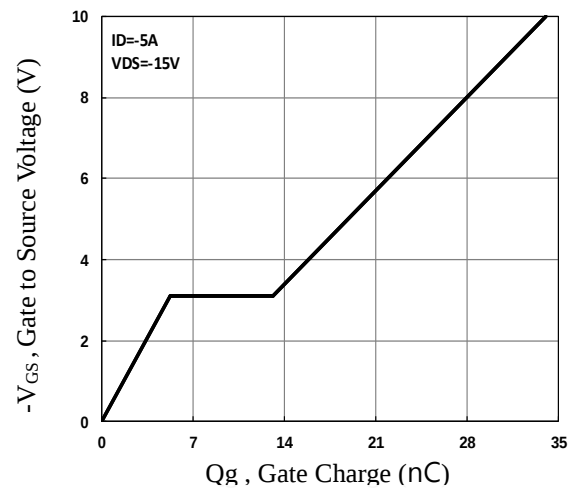
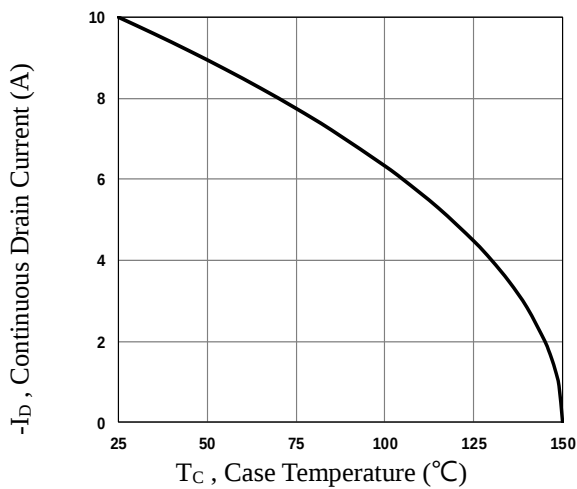
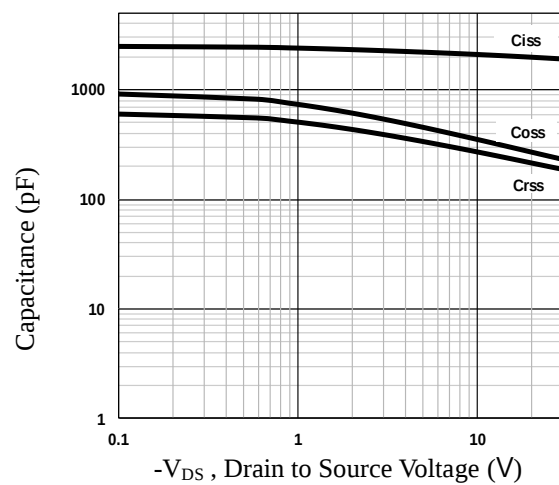
Q _g	Total Gate Charge ^{3, 4}	V _{DS} =-15V, V _{GS} =-10V, I _D =-5A	---	34	---	nC
Q _{gs}	Gate-Source Charge ^{3, 4}		---	5.2	---	
Q _{gd}	Gate-Drain Charge ^{3, 4}		---	7.9	---	
T _{d(on)}	Turn-On Delay Time ^{3, 4}	V _{DD} =-15V, V _{GS} =-10V, R _G =6Ω I _D =-5A	---	20	---	ns
T _r	Rise Time ^{3, 4}		---	15	---	
T _{d(off)}	Turn-Off Delay Time ^{3, 4}		---	40	---	
T _f	Fall Time ^{3, 4}		---	30	---	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, F=1MHz	---	2020	---	pF
C _{oss}	Output Capacitance		---	305	---	
C _{rss}	Reverse Transfer Capacitance		---	245	---	

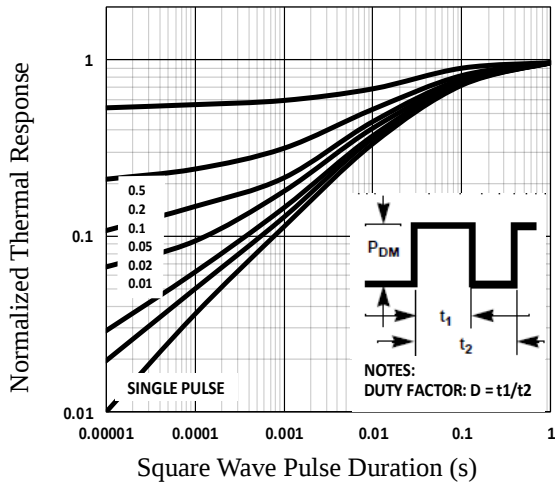
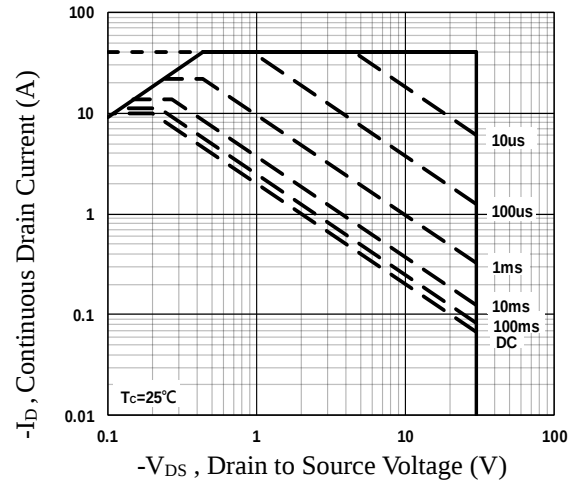
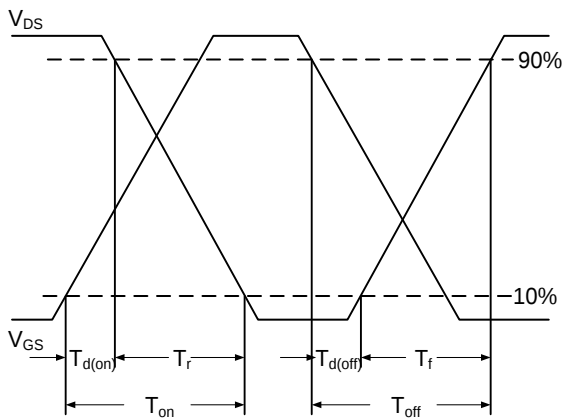
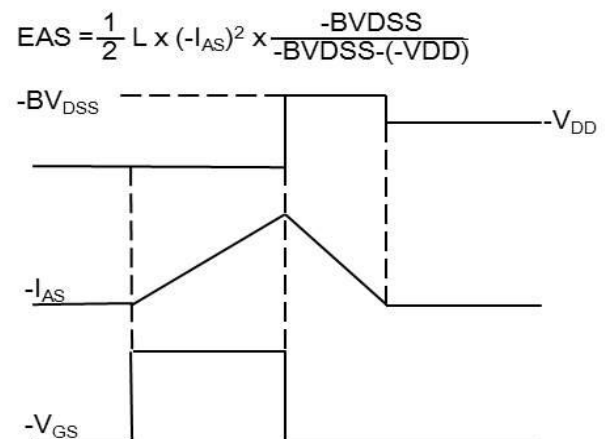
Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	-12	A
I _{SM}	Pulsed Source Current		---	---	-24	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1.2	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=50A., 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 Typical Output Characteristics

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

Fig.3 Normalized V_{th} vs. T_J

Fig.4 Gate Charge Waveform

Fig.5 Continuous Drain Current vs. T_C

Fig.6 Capacitance Characteristics


Fig.7 Normalized Transient Impedance

Fig.8 Maximum Safe Operation Area

Fig.9 Switching Time Waveform

Fig.10 EAS Waveform

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.800	0.053	0.069
A1	0.050	0.250	0.002	0.010
A2	1.250	1.650	0.049	0.065
A3	0.500	0.700	0.020	0.028
b	0.300	0.510	0.012	0.020
c	0.150	0.260	0.006	0.010
D	4.700	5.100	0.185	0.201
E	5.800	6.200	0.228	0.244
E1	3.700	4.100	0.146	0.161
e	1.270(BSC)		0.050(BSC)	
h	0.250	0.500	0.010	0.020
L	0.400	1.000	0.016	0.039
L1	1.050(BSC)		0.041(BSC)	
θ	0°	8°	0°	8°