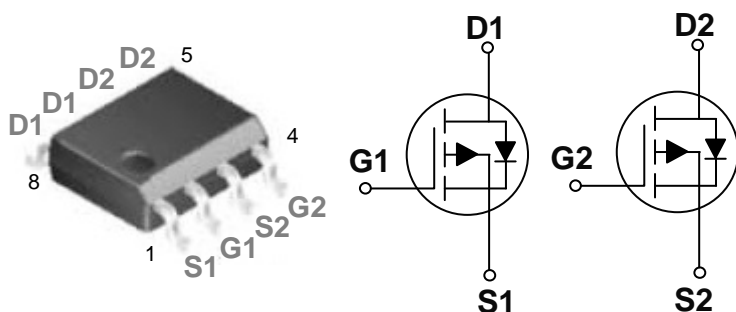


30V P-Channel MOSFETs

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.

Dual SOP-8 Pin Configuration



BVDSS	RDS(ON)	ID
-30V	16mΩ	-10A

Features

- -30V, -10A, $R_{DS(ON)} = 16m\Omega @ V_{GS} = -10V$
- Fast switching
- Green Device Available
- Suit for -4.5V Gate Drive Applications

Applications

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

Absolute Maximum Ratings ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage (base on I_{GSS1} condition)	± 20	V
V_{GS}	Gate-Source Voltage (base on I_{GSS2} condition)	± 25	V
I_D	Drain Current – Continuous ($T_C=25^\circ C$)	-10	A
	Drain Current – Continuous ($T_C=100^\circ C$)	-6.3	A
I_{DM}	Drain Current – Pulsed ¹	-40	A
P_D	Power Dissipation ($T_C=25^\circ C$)	2.1	W
	Power Dissipation – Derate above $25^\circ C$	0.017	W/ $^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	60	$^\circ C/W$



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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	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=-1\text{mA}$	---	-0.03	---	$V/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-30V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-24V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-10	μA
I_{GSS1}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
I_{GSS2}	Gate-Source Leakage Current	$V_{GS}=\pm 25V, V_{DS}=0V$	---	---	± 1	mA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-8A$	---	12	16	$m\Omega$
		$V_{GS}=-4.5V, I_D=-6A$	---	18	26	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4	---	$mV/^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=-10V, I_D=-8A$	---	10.5	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2,3}	$V_{DS}=-15V, V_{GS}=-4.5V, I_D=-8A$	---	14.6	21	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	4.1	6	
Q_{gd}	Gate-Drain Charge ^{2,3}		---	6.3	9	
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=-15V, V_{GS}=-10V, R_G=6\Omega$ $I_D=-1A$	---	9	17	ns
T_r	Rise Time ^{2,3}		---	21.8	41	
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	59.8	114	
T_f	Fall Time ^{2,3}		---	14.4	27	
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, F=1\text{MHz}$	---	1730	2510	pF
C_{oss}	Output Capacitance		---	180	260	
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	---	---	-7	A
I_{SM}	Pulsed Source Current		---	---	-14	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

30V P-Channel MOSFETs

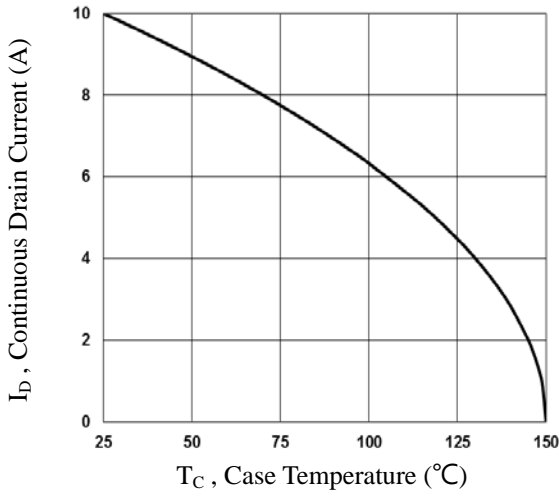


Fig.1 Continuous Drain Current vs. T_C

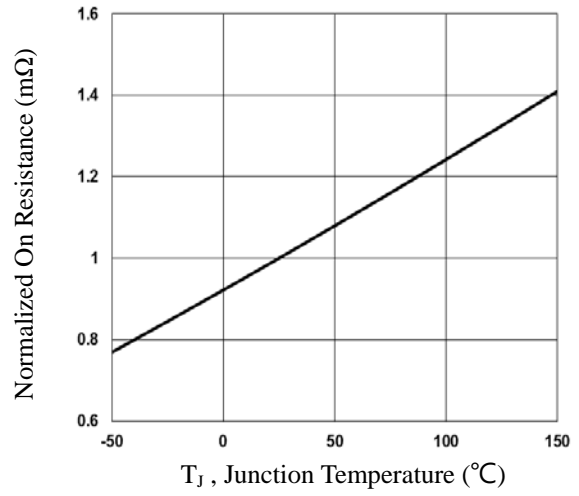


Fig.2 Normalized RDSON vs. T_J

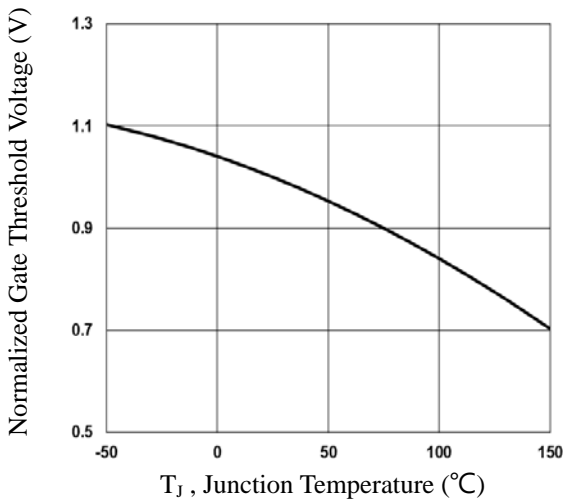


Fig.3 Normalized V_{th} vs. T_J

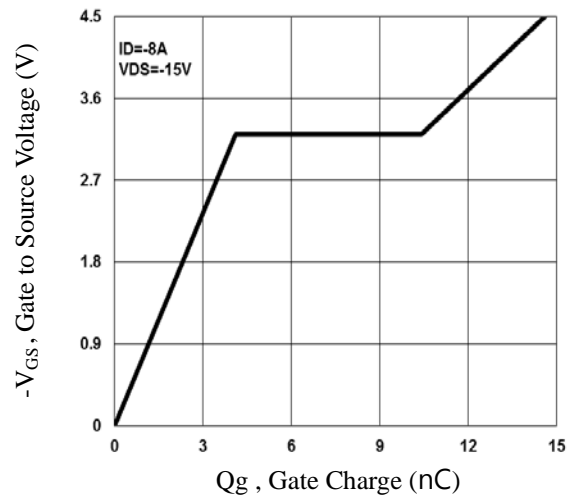


Fig.4 Gate Charge Waveform

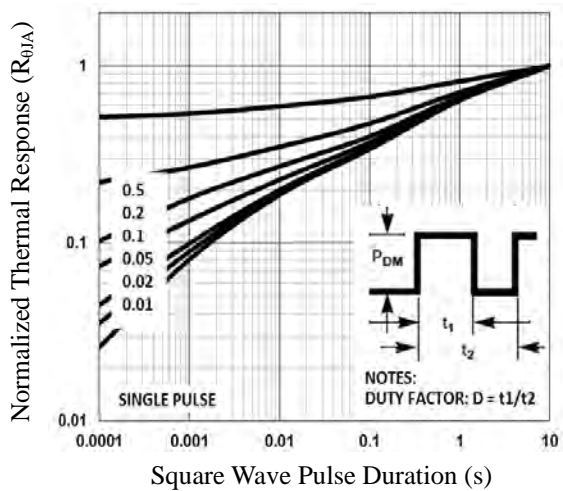


Fig.5 Normalized Transient Impedance

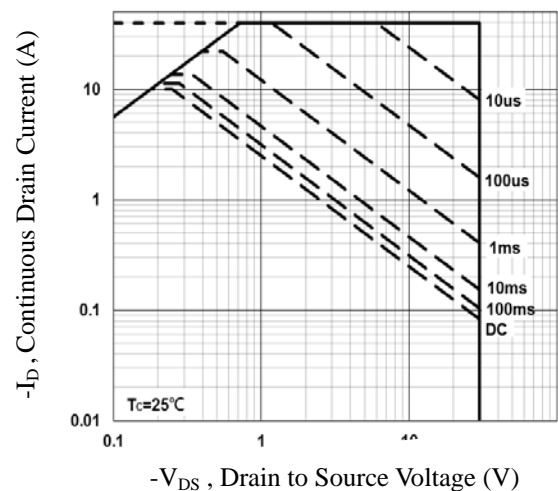


Fig.6 Maximum Safe Operation Area

30V P-Channel MOSFETs

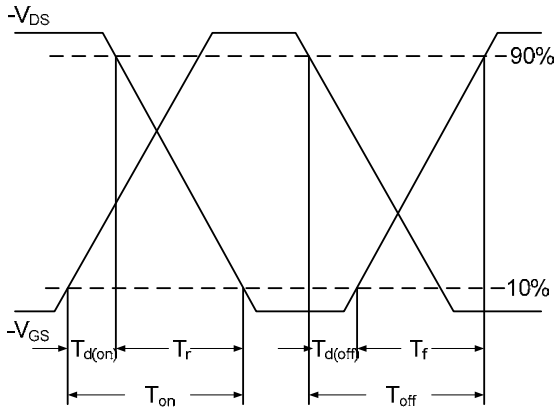


Fig.7 Switching Time Waveform

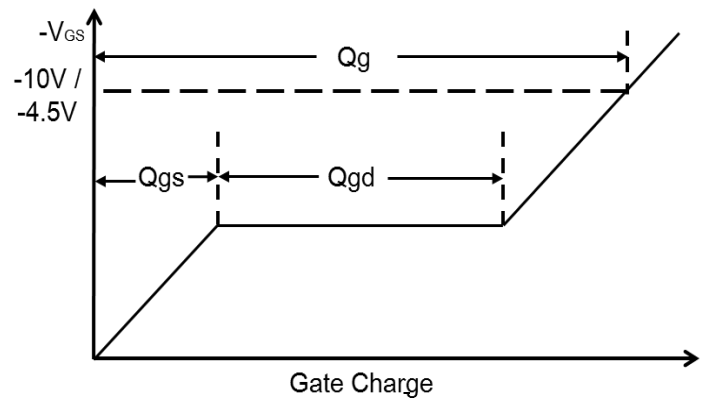
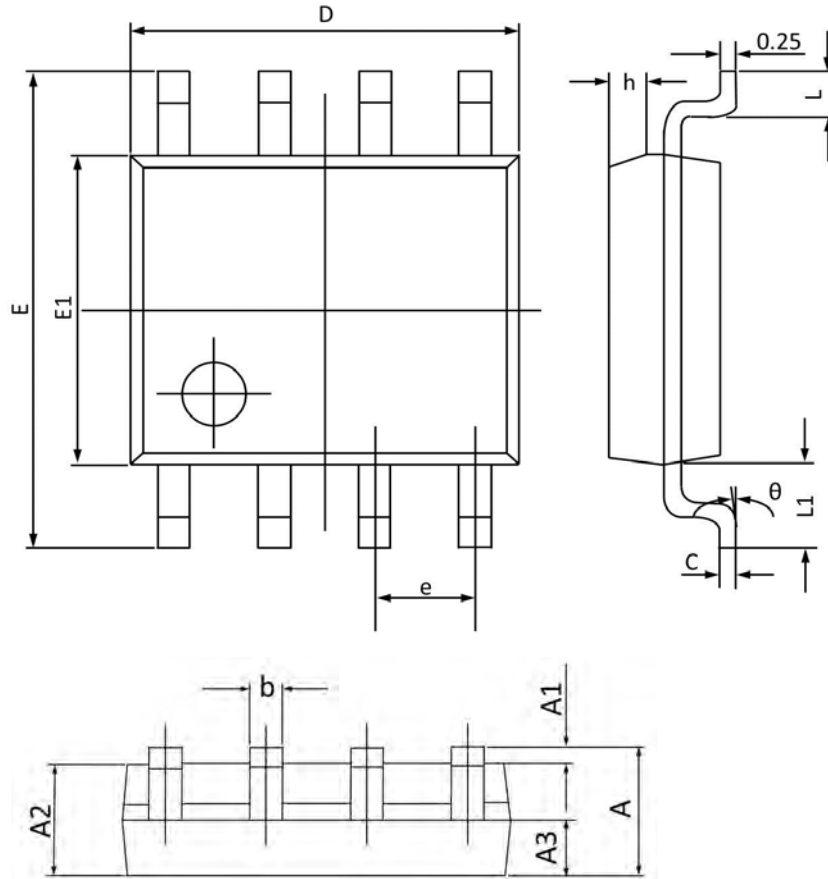


Fig.8 Gate Charge Waveform

30V P-Channel MOSFETs

SOP-8 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.068
A1	0.100	0.250	0.004	0.009
A2	1.300	1.500	0.052	0.059
A3	0.600	0.700	0.024	0.027
b	0.390	0.480	0.016	0.018
c	0.210	0.260	0.009	0.010
D	4.700	5.100	0.186	0.200
E	5.800	6.200	0.229	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	0.019
L	0.500	0.800	0.019	0.031
L1	1.050(BSC)		0.041(BSC)	
theta	0°	8°	0°	8°