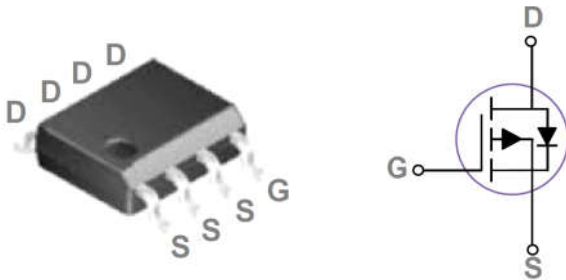


## 30V P-Channel MOSFETs

### 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.

### SOP-8 Pin Configuration



### Product Summary

$BV_{DSS}$	$R_{DS(ON)}$ Max.	$I_D$
-30 V	15 m $\Omega$	-13 A

### Features

- -30 V, -13 A,  $R_{DS(ON)}$  Max. = 15 m $\Omega$  @  $V_{GS} = -10$  V
- Fast switching
- Green Device Available
- Suit for -4.5 V Gate Drive Applications

### Applications

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

### 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	$\pm 17$	V
$I_D$	Drain Current – Continuous ( $T_C = 25^\circ\text{C}$ )	-13	A
	Drain Current – Continuous ( $T_C = 100^\circ\text{C}$ )	-8	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	-52	A
$P_D$	Power Dissipation ( $T_C = 25^\circ\text{C}$ )	2.5	W
	Power Dissipation – Derate above $25^\circ\text{C}$	0.02	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		50	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case		5.4	$^\circ\text{C}/\text{W}$

**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	$V_{GS} = 0\text{ V}$ , $I_D = -250\ \mu\text{A}$	-30			V
$\Delta BV_{DSS}/\Delta T_J$	$BV_{DSS}$ Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_D = -1\ \text{mA}$		-0.03		V/C
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS} = -30\ \text{V}$ , $V_{GS} = 0\ \text{V}$ , $T_J = 25^\circ\text{C}$			-1	$\mu\text{A}$
		$V_{DS} = -24\ \text{V}$ , $V_{GS} = 0\ \text{V}$ , $T_J = 85^\circ\text{C}$			-10	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS} = \pm 17\ \text{V}$ , $V_{DS} = 0\ \text{V}$			$\pm 100$	nA

**On Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = -10\ \text{V}$ , $I_D = -8\ \text{A}$		13	15	m $\Omega$
		$V_{GS} = -4.5\ \text{V}$ , $I_D = -6\ \text{A}$		17	20	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}$ , $I_D = -250\ \mu\text{A}$	-1.0	-1.6	-2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			4		mV/ $^\circ\text{C}$
gfs	Forward Transconductance	$V_{DS} = -10\ \text{V}$ , $I_D = -8\ \text{A}$		10.5		S

**Dynamic and switching Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$Q_g$	Total Gate Charge <sup>2, 3</sup>	$V_{DS} = -15\ \text{V}$ , $V_{GS} = -4.5\ \text{V}$ , $I_D = -8\ \text{A}$		14.6		nC
$Q_{gs}$	Gate-Source Charge <sup>2, 3</sup>			4.1		
$Q_{gd}$	Gate-Drain Charge <sup>2, 3</sup>			6.3		
$T_{d(on)}$	Turn-On Delay Time <sup>2, 3</sup>	$V_{DD} = -15\ \text{V}$ , $V_{GS} = -10\ \text{V}$ , $R_G = 6\ \Omega$ , $I_D = -1\ \text{A}$		9		nS
$T_r$	Rise Time <sup>2, 3</sup>			21.8		
$T_{d(off)}$	Turn-Off Delay Time <sup>2, 3</sup>			59.8		
$T_f$	Fall Time <sup>2, 3</sup>			14.4		
$C_{iss}$	Input Capacitance	$V_{DS} = -15\ \text{V}$ , $V_{GS} = 0\ \text{V}$ , $F = 1\ \text{MHz}$		1730		pF
$C_{oss}$	Output Capacitance			180		
$C_{rss}$	Reverse Transfer Capacitance			125		

**Drain-Source Diode Characteristics and Maximum Ratings**

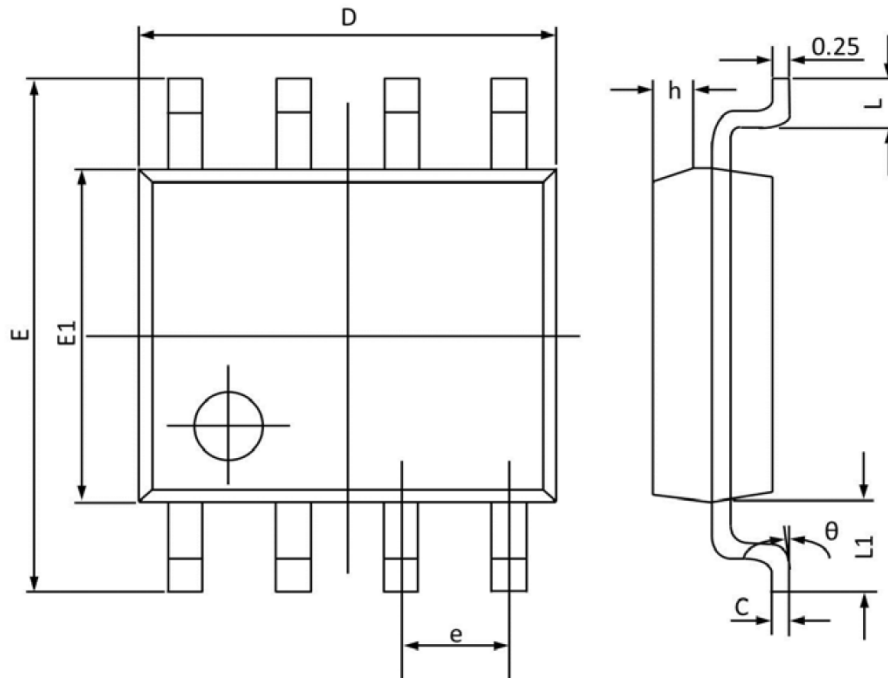
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G = V_D = 0\ \text{V}$ , Force Current			-13	A
$I_{SM}$	Pulsed Source Current				-26	A
$V_{SD}$	Diode Forward Voltage	$V_{GS} = 0\ \text{V}$ , $I_S = 1\ \text{A}$ , $T_J = 25^\circ\text{C}$			-1	V

Note :

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

## Package Information

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
<b>A</b>	<b>1.150</b>	<b>0.900</b>	<b>0.045</b>	<b>0.035</b>
<b>A1</b>	<b>0.100</b>	<b>0.000</b>	<b>0.004</b>	<b>0.000</b>
<b>A2</b>	<b>1.050</b>	<b>0.900</b>	<b>0.041</b>	<b>0.035</b>
<b>b</b>	<b>0.500</b>	<b>0.300</b>	<b>0.020</b>	<b>0.012</b>
<b>c</b>	<b>0.150</b>	<b>0.080</b>	<b>0.006</b>	<b>0.003</b>
<b>D</b>	<b>3.000</b>	<b>2.800</b>	<b>0.118</b>	<b>0.110</b>
<b>E</b>	<b>1.400</b>	<b>1.200</b>	<b>0.055</b>	<b>0.047</b>
<b>E1</b>	<b>2.550</b>	<b>2.250</b>	<b>0.100</b>	<b>0.089</b>
<b>e</b>	<b>0.95 TYP.</b>		<b>0.037 TYP.</b>	
<b>e1</b>	<b>2.000</b>	<b>1.800</b>	<b>0.079</b>	<b>0.071</b>
<b>L</b>	<b>0.55 REF.</b>		<b>0.022 REF.</b>	
<b>L1</b>	<b>0.500</b>	<b>0.300</b>	<b>0.020</b>	<b>0.012</b>
<b>L2</b>	<b>0.25 TYP.</b>		<b>0.01 TYP.</b>	
<b>θ</b>	<b>8°</b>	<b>0°</b>	<b>8°</b>	<b>0°</b>

V 1.3