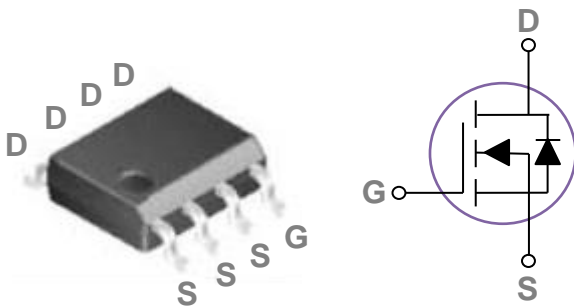


### General Description

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.

### SOP8 Pin Configuration



BVDSS	RDSON	ID
65V	8.4mΩ	10A

### Features

- 65V, 10A,  $R_{DS(ON)} = 8.4m\Omega$  @  $V_{GS} = 10V$
- Improved  $dv/dt$  capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

### Applications

- Motor Drive
- Power Tools
- LED Lighting
- Quick Charger

### Absolute Maximum Ratings $T_c=25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	65	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current – Continuous ( $T_A=25^\circ C$ )	10	A
	Drain Current – Continuous ( $T_A=70^\circ C$ )	8	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	40	A
EAS	Single Pulse Avalanche Energy <sup>2</sup>	45	mJ
IAS	Single Pulse Avalanche Current <sup>2</sup>	30	A
$P_D$	Power Dissipation ( $T_C=25^\circ C$ )	2	W
	Power Dissipation – Derate above $25^\circ C$	0.016	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	---	62.5	$^\circ C/W$

**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**
**Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	65	---	---	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	μA
		V <sub>DS</sub> =48V, V <sub>GS</sub> =0V, T <sub>J</sub> =85°C	---	---	10	μA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V	---	---	±100	nA

**On Characteristics**

R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>3</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A	---	7	8.4	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A	---	11	14.3	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA	1.2	1.6	2.5	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>S</sub> =3A	---	8	---	S

**Dynamic and switching Characteristics**

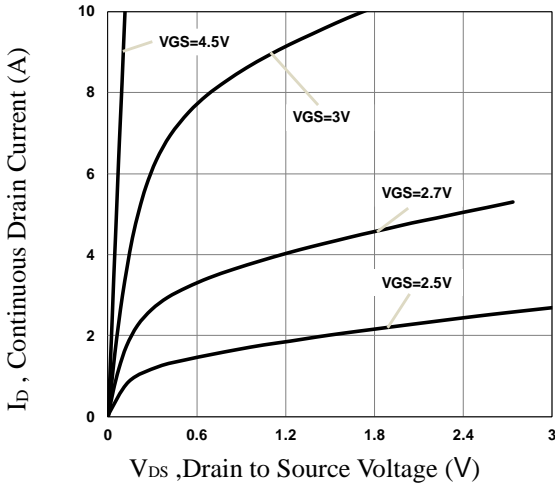
Q <sub>g</sub>	Total Gate Charge <sup>3, 4</sup>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =5A	---	15.3	30.6	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>3, 4</sup>		---	2.4	5.8	
Q <sub>gd</sub>	Gate-Drain Charge <sup>3, 4</sup>		---	5.4	10.8	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>3, 4</sup>	V <sub>DD</sub> =30V, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω I <sub>D</sub> =5A	---	10	20	ns
T <sub>r</sub>	Rise Time <sup>3, 4</sup>		---	13.5	27	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>3, 4</sup>		---	28	56	
T <sub>f</sub>	Fall Time <sup>3, 4</sup>		---	20	40	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, F=1MHz	---	975	1450	pF
C <sub>oss</sub>	Output Capacitance		---	280	420	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	30	50	
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	---	1	---	Ω

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

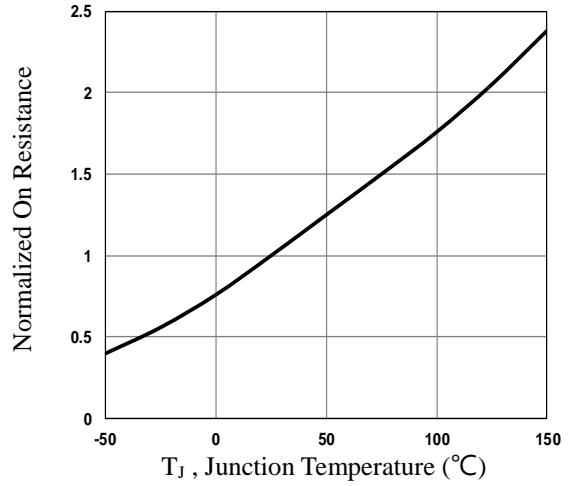
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	10	A
I <sub>SM</sub>	Pulsed Source Current <sup>3</sup>		---	---	20	A
V <sub>SD</sub>	Diode Forward Voltage <sup>3</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>R</sub> =30V, I <sub>S</sub> =10A,	---	27	---	ns
Q <sub>rr</sub>	Reverse Recovery Charge	dI/dt=100A/μs, T <sub>J</sub> =25°C	---	35	---	nC

Note :

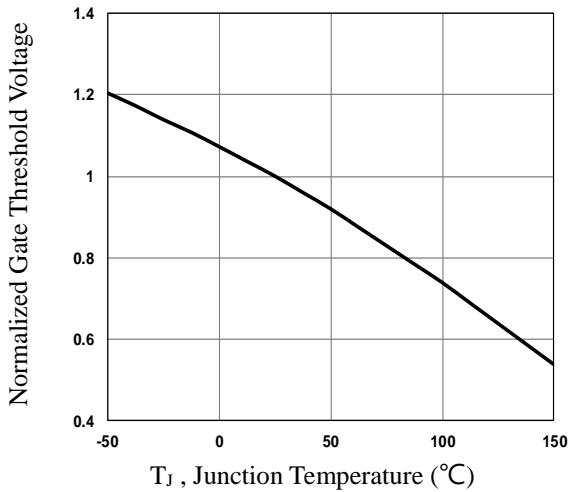
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.1mH, I<sub>AS</sub>=30A., R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.



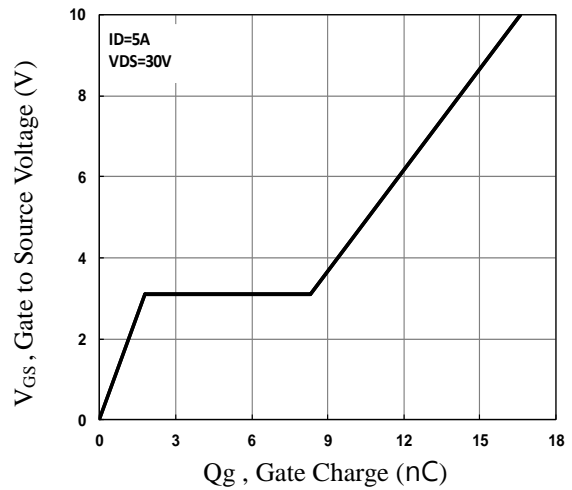
**Fig.1 Typical Output Characteristics**



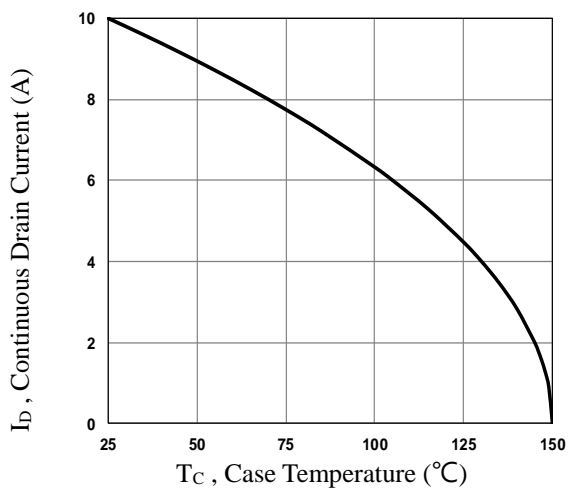
**Fig.2 Normalized RDS(on) vs.  $T_J$**



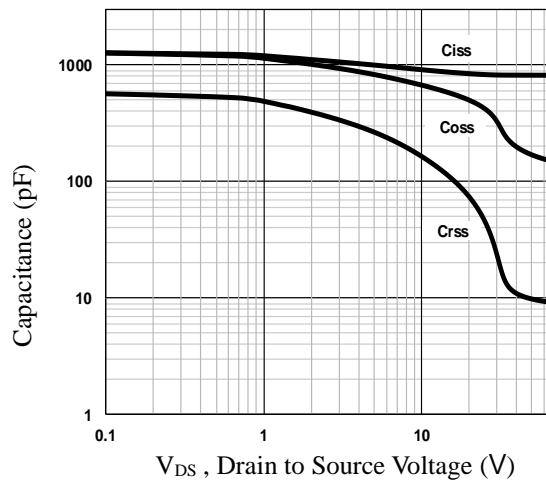
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



**Fig.4 Gate Charge Waveform**



**Fig.5 Continuous Drain Current vs.  $T_c$**



**Fig.6 Capacitance Characteristics**

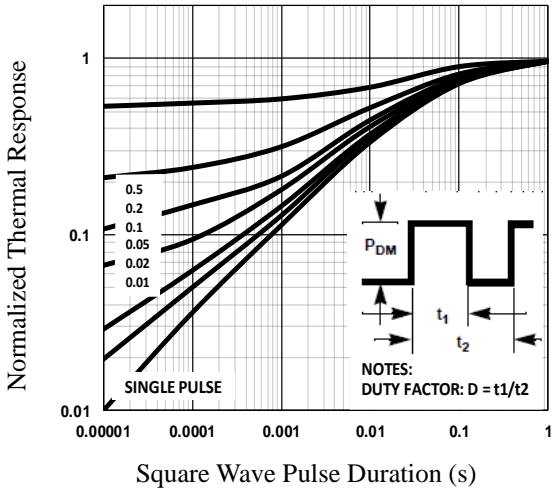


Fig.7 Normalized Transient Impedance

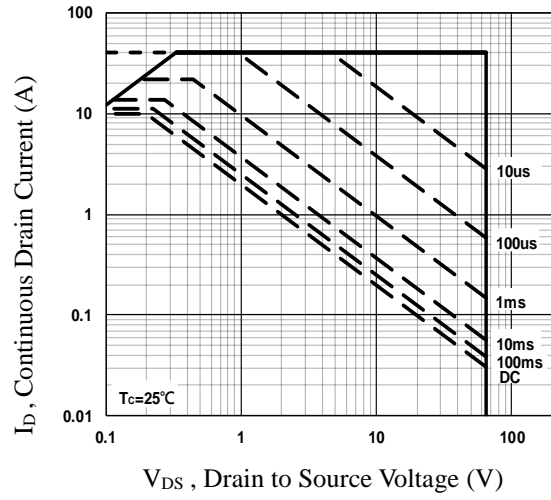


Fig.8 Maximum Safe Operation Area

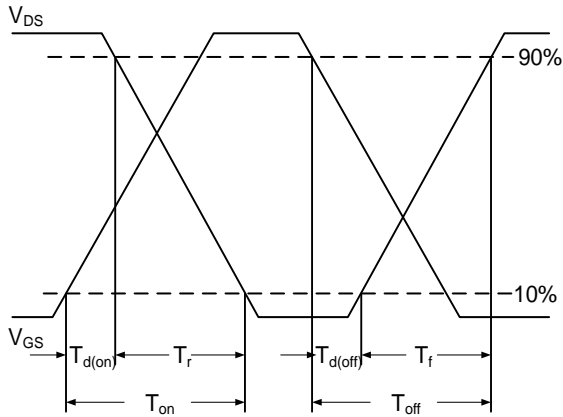


Fig.9 Switching Time Waveform

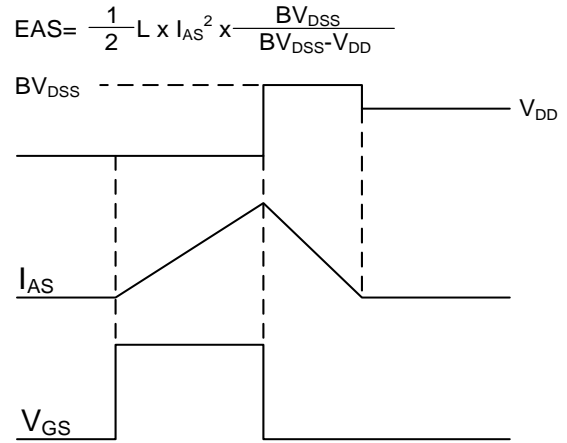
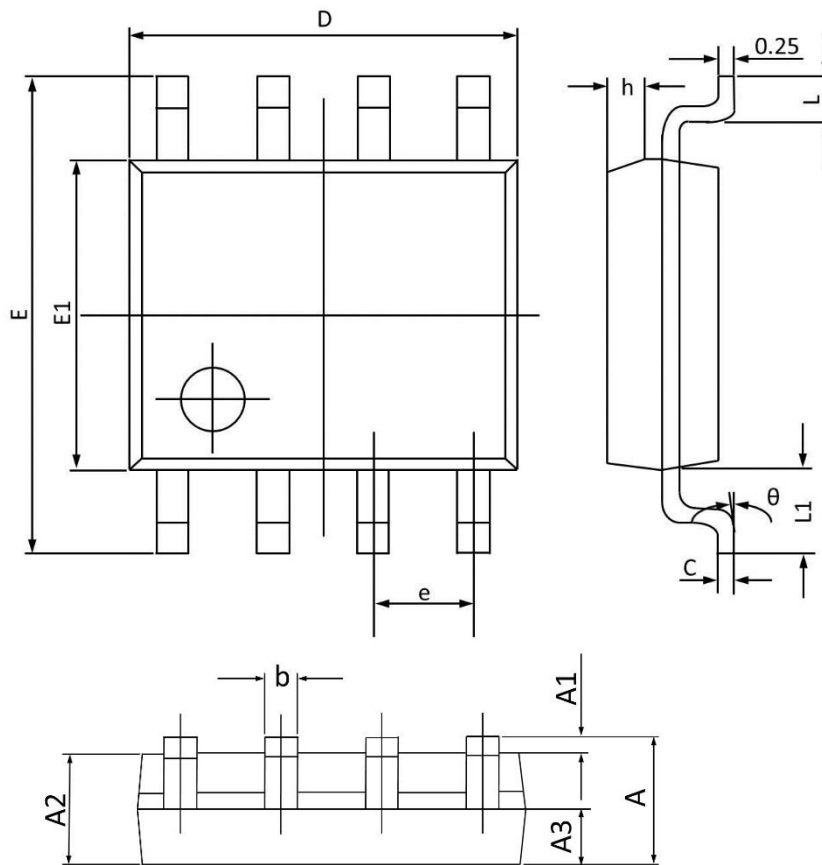


Fig.10 EAS Waveform

## SOP8 PACKAGE INFORMATION



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°