

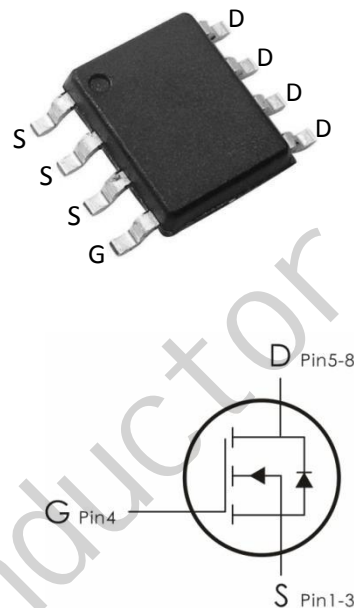
## Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge.

It can be used in a wide variety of applications.

## Features:

- 1)  $V_{DS}=30V, I_D=11A, R_{DS(ON)} < 10m\ \Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low  $R_{DS(ON)}$
- 5) Excellent package for good heat dissipation.



## Absolute Maximum Ratings: ( $T_A=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current - Continuous ( $T_A=25^\circ C$ ) <sup>1</sup>	11	A
	Drain Current - Continuous ( $T_A=100^\circ C$ ) <sup>1</sup>	7	
$I_{DM}$	Drain Current - Pulsed <sup>2</sup>	36	
$E_{AS}$	Single Pulse Avalanche Energy <sup>3</sup>	24.2	mj
$I_{AS}$	Avalanche Current	22	A
$P_D$	Power Dissipation ( $T_A=25^\circ C$ ) <sup>4</sup>	1.5	W
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

## Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case <sup>1</sup>	25	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient <sup>1</sup>	85	

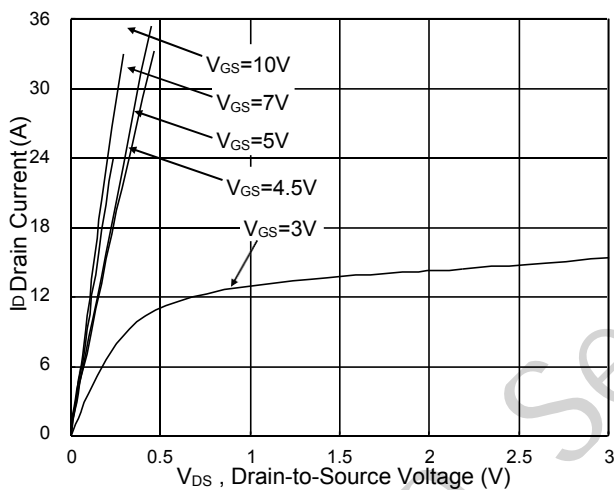
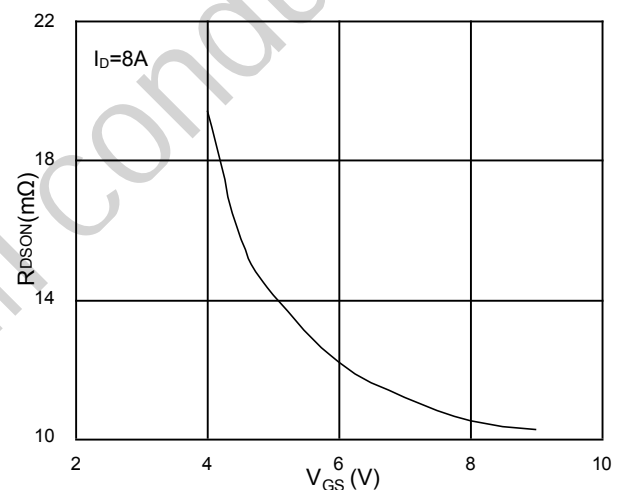
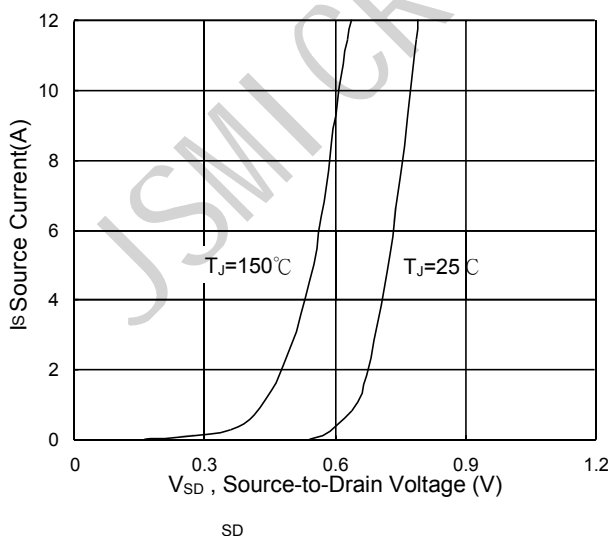
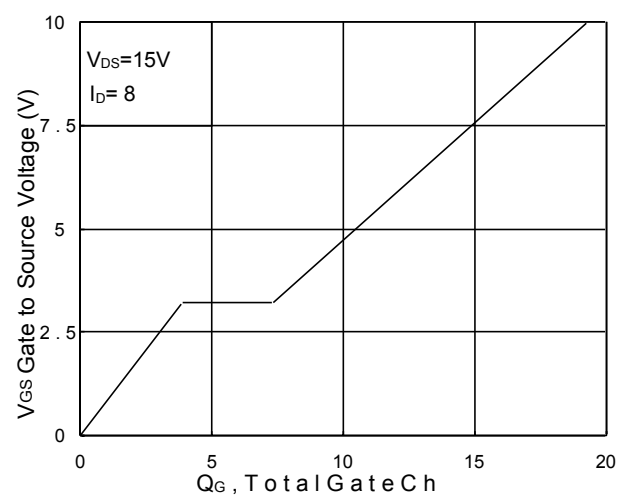
Electrical Characteristics: ( $T_A=25^\circ\text{C}$  unless otherwise noted)

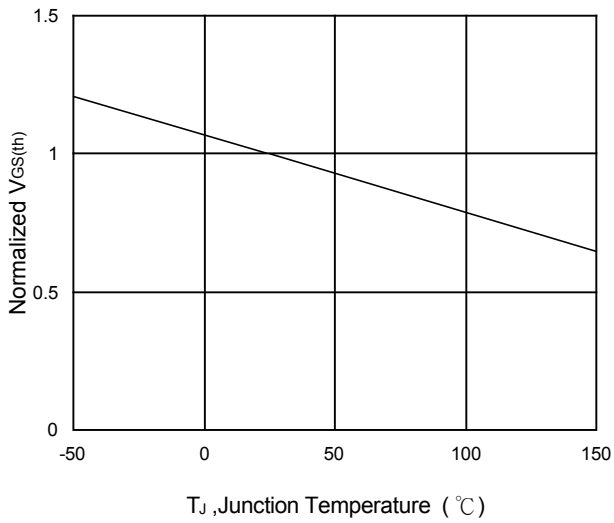
Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	30	---	---	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=150V, V_{GS}=0V$	---	---	1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
<b>On Characteristics<sup>3</sup></b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1.2	1.5	2.5	V
$R_{DS(on)}$	Static Drain-Source On Resistance <sup>2</sup>	$V_{GS}=10V, I_D=8A$	---	9	10	$\text{m}\Omega$
		$V_{GS}=4.5V, I_D=6A$	---	12	18	
$G_{FS}$	Forward Transconductance	$V_{DS}=5V, I_D=8A$	---	24	---	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	940	1316	pF
$C_{oss}$	Output Capacitance		---	131	183	
$C_{rss}$	Reverse Transfer Capacitance		---	109	153	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V, R_{GEN}=1.5\ \Omega, V_{GS}=10V, I_D=8A$	---	4.2	8.4	ns
$t_r$	Rise Time		---	8.2	15	ns
$t_{d(off)}$	Turn-Off Delay Time		---	31	62	ns
$t_f$	Fall Time		---	4	8	ns
$Q_g$	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=15V, I_D=8A$	---	9.63	13.5	nC
$Q_{gs}$	Gate-Source Charge		---	3.88	5.4	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		---	3.44	4.8	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Source-Drain Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1	V

<b>I<sub>s</sub></b>	Continuous Source Current <sup>1,5</sup>	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	9	A
<b>I<sub>SM</sub></b>	Pulsed Source Current <sup>2,5</sup>		---	---	36	
<b>T<sub>rr</sub></b>	Body Diode Reverse Recovery Time	I <sub>F</sub> =8A , dI/dt=100A/μs , T <sub>J</sub> =25°C	---	8	---	Ns
<b>Q<sub>rr</sub></b>	Body Diode Reverse Recovery Charge		---	2.9	---	Nc

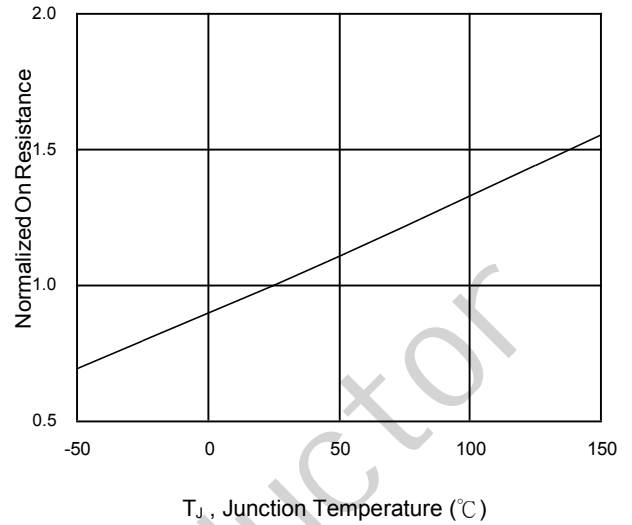
**Notes:**

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
3. The EAS data shows Max. rating . The test condition is V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.1mH, I<sub>AS</sub>=22A
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.

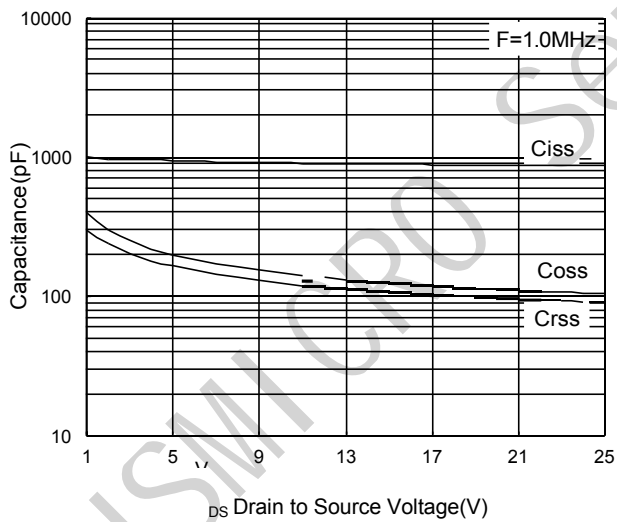
**Typical Characteristics:**

**Fig.1 Typical Output Characteristics**

**Fig.2 On-Resistance vs. G-S Voltage**

**Fig.3 Forward Characteristics of Reverse**

**Fig.4 Gate-Charge Characteristics**



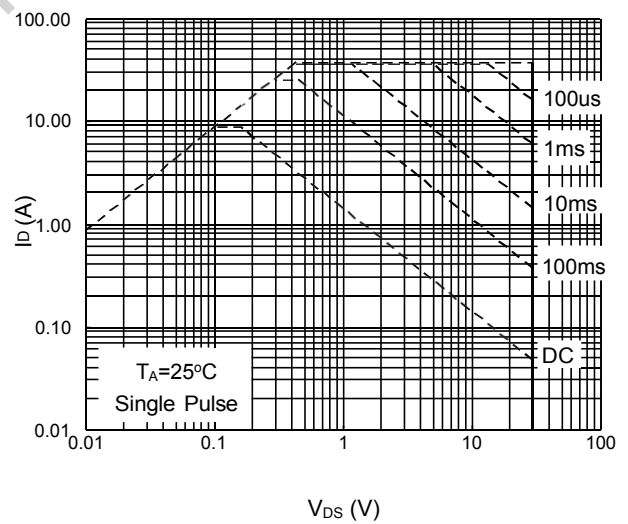
**Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$**



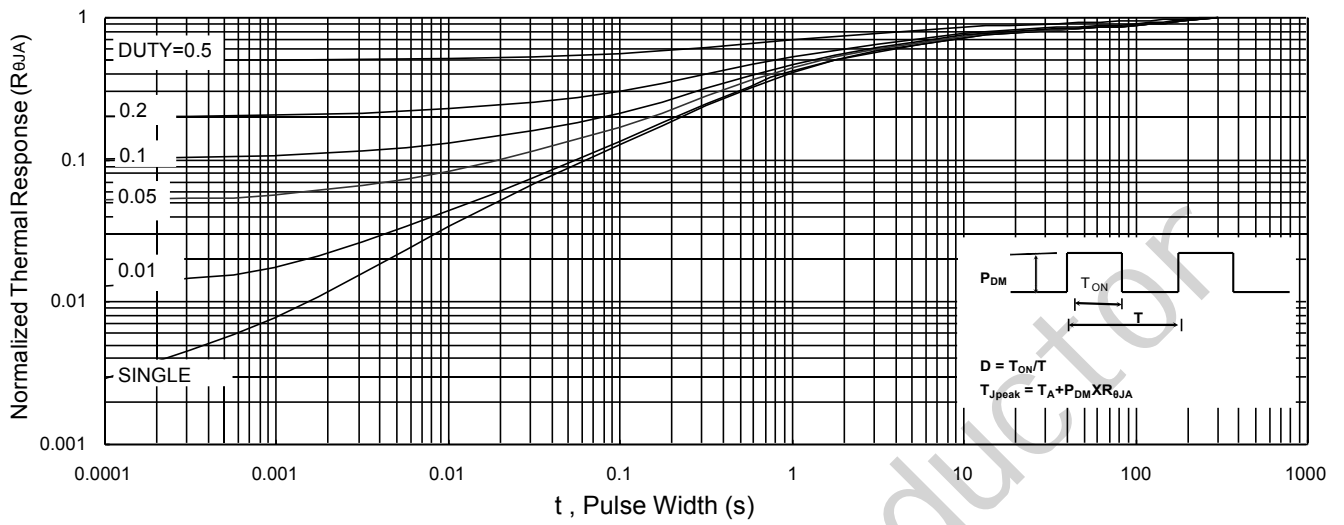
**Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$**



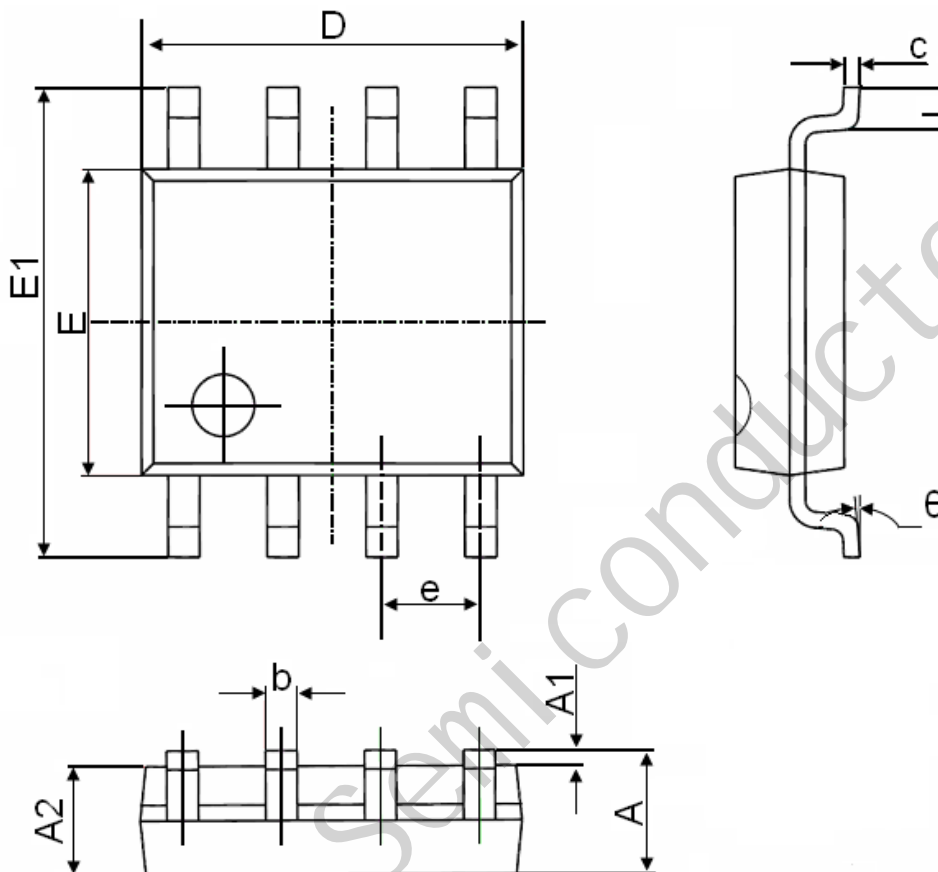
**Fig.7 Capacitance**



**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**

**SOP-8 Package Information**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°