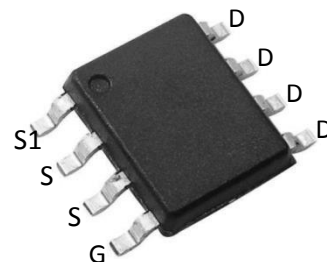


## Description:

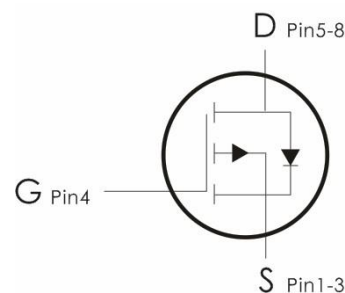
This P-Channel MOSFET uses advanced trench technology and design to provide excellent  $R_{DS(on)}$  with low gate charge.

It can be used in a wide variety of applications.



## Features:

- 1)  $V_{DS}=-40V, I_D=-10A, R_{DS(ON)}<15m\ \Omega @V_{GS}=-10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra  $R_{DS(ON)}$ .
- 5) Excellent package for good heat dissipation.



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

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	-40	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C=25^\circ C$	-10	A
	Continuous Drain Current- $T_C=100^\circ C$	-6.3	
	Pulsed Drain Current <sup>1</sup>	-40	
$E_{AS}$	Single Pulse Avalanche Energy	---	mJ
$P_D$	Power Dissipation	4.2	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	30	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	60	

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

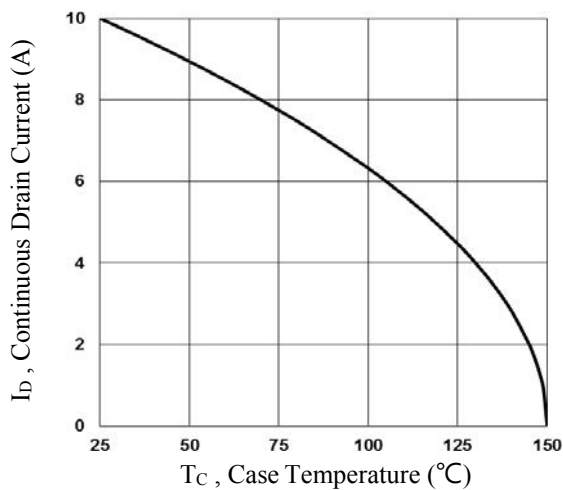
Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-40	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-40V, T_J=25^\circ\text{C}$	---	---	-1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	-1.0	-1.6	-2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance <sup>2</sup>	$V_{GS}=-10V, I_D=-10A$	---	11.5	15	$\text{m}\Omega$
		$V_{GS}=-4.5V, I_D=-8A$	---	16	22	
$G_{FS}$	Forward Transconductance	$V_{DS}=-10V, I_D=-10A$	---	13	---	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=-25V, V_{GS}=0V, f=1\text{MHz}$	---	2757	4000	pF
$C_{oss}$	Output Capacitance		---	240	360	
$C_{rss}$	Reverse Transfer Capacitance		---	137	200	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time <sup>2,3</sup>	$V_{DS}=-20V, V_{GS}=-10V$ $I_D=-1A, R_{GEN}=6\ \Omega$	---	23	40	ns
$t_r$	Rise Time <sup>2,3</sup>		---	10	20	ns
$t_{d(off)}$	Turn-Off Delay Time <sup>2,3</sup>		---	135	250	ns
$t_f$	Fall Time <sup>2,3</sup>		---	46	90	ns
$Q_g$	Total Gate Charge <sup>2,3</sup>	$V_{DS}=-32V, V_{GS}=-4.5V,$ $I_D=-10A$	---	22.2	40	nC
$Q_{gs}$	Gate-Source Charge <sup>2,3</sup>		---	8.2	16	nC
$Q_{gd}$	Gate-Drain "Miller" Charge <sup>2,3</sup>		---	8.8	16	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>LS</b>	Continuous Source Current	$V_G=V_D=0V$ , Force Current	---	-10	A
<b>LSM</b>	Pulsed Source Current		---	-20	A

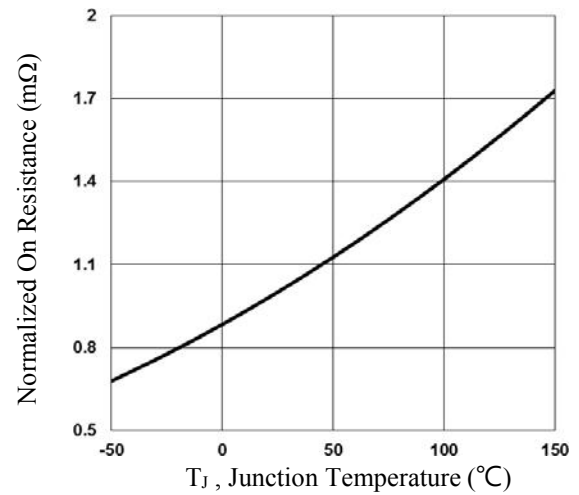
### Notes:

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.

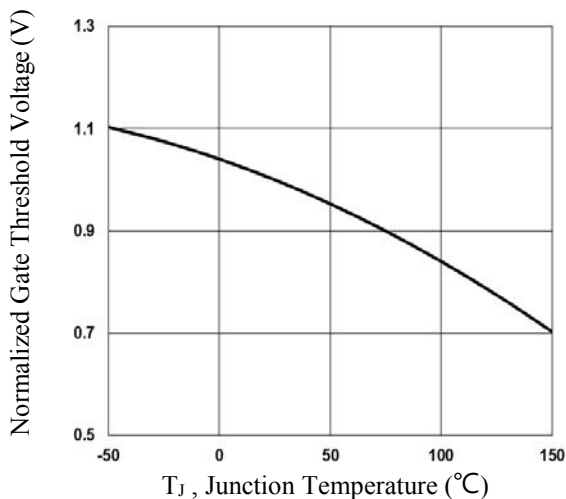
### Typical Characteristics: $(T_C=25^\circ C$ unless otherwise noted)



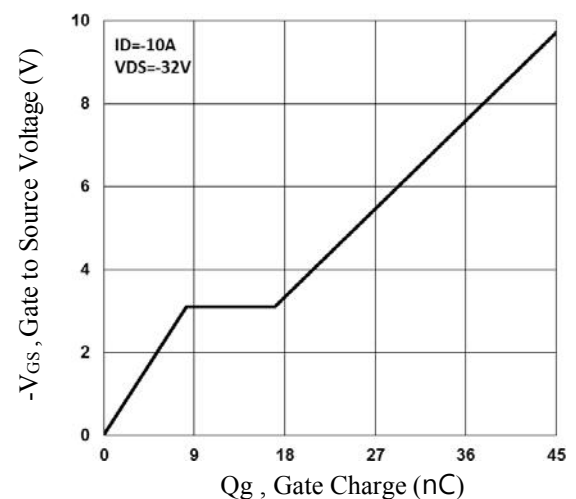
**Fig.1 Continuous Drain Current vs.  $T_C$**



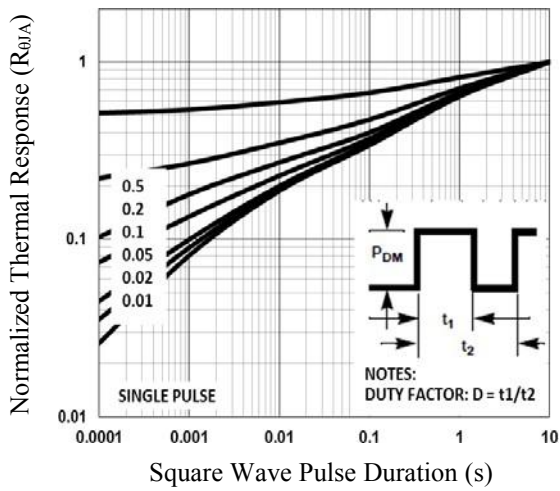
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$**



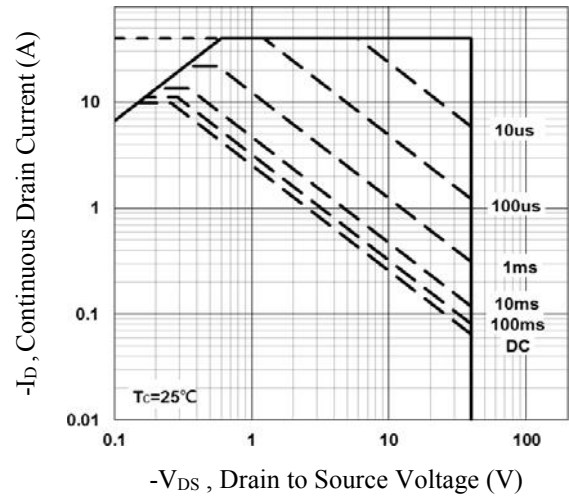
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



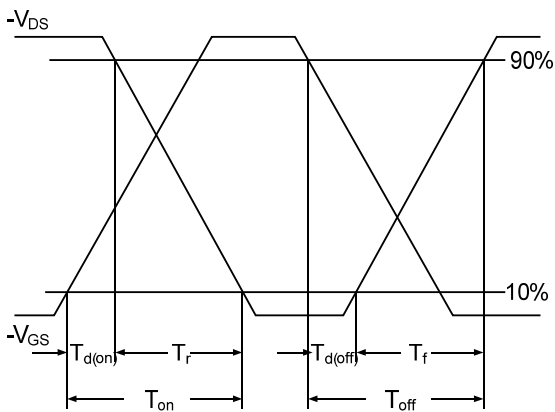
**Fig.4 Gate Charge Waveform**



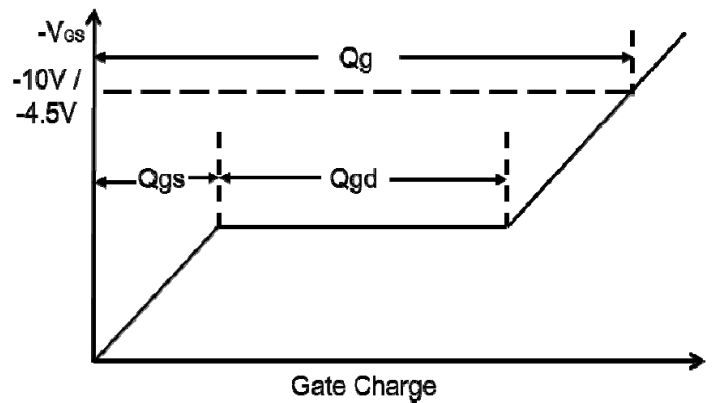
**Fig.5 Normalized Transient Impedance**



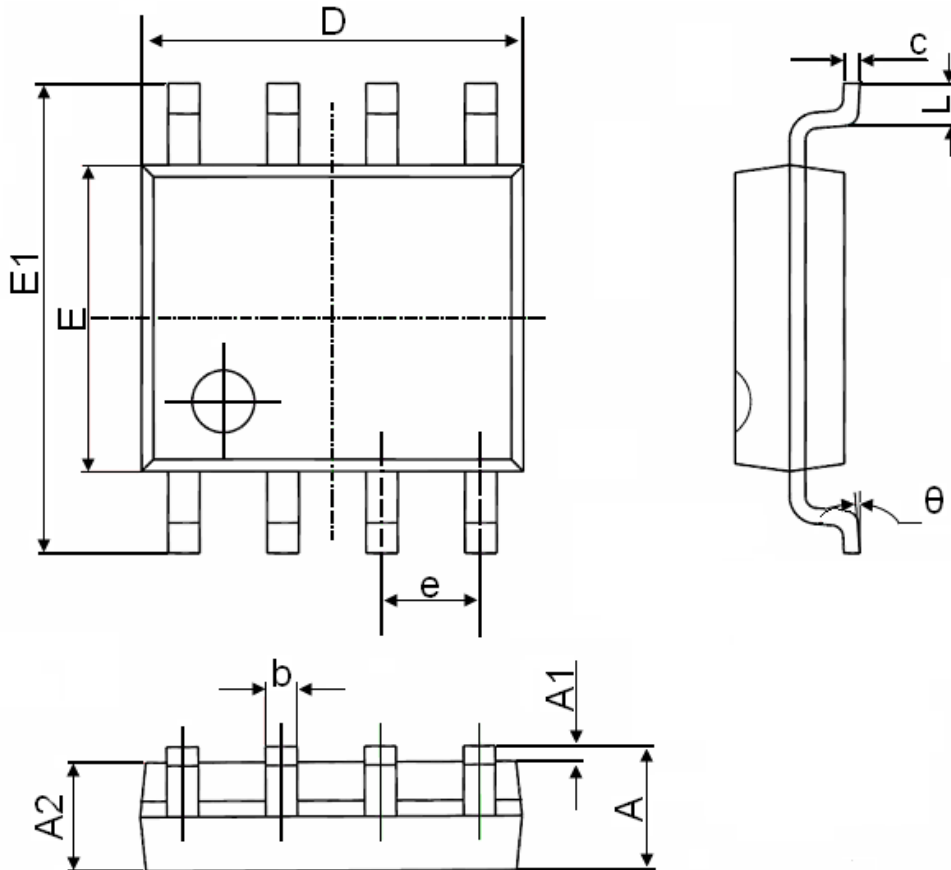
**Fig.6 Maximum Safe Operation Area**



**Fig.7 Switching Time Waveform**



**Fig.8 Gate Charge Waveform**

**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
$\theta$	0°	8°	0°	8°