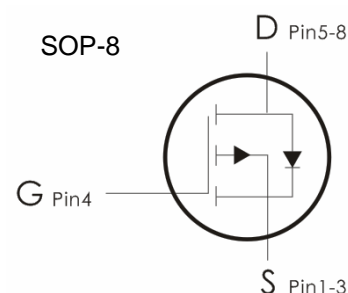
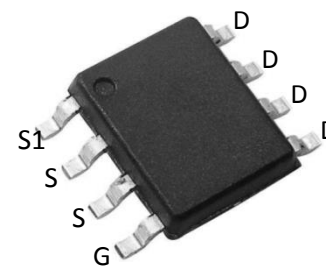


## P-Channel 30 V (D-S) MOSFET

### 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)  $V_{DS}=-30V, I_D=-15A, R_{DS(ON)}<9.5m\ \Omega @V_{GS}=-10V$
- 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	-30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C=25^\circ C$	-15	A
	Continuous Drain Current- $T_C=100^\circ C$	-7.8	
	Pulsed Drain Current <sup>1</sup>	-52	
$E_{AS}$	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	

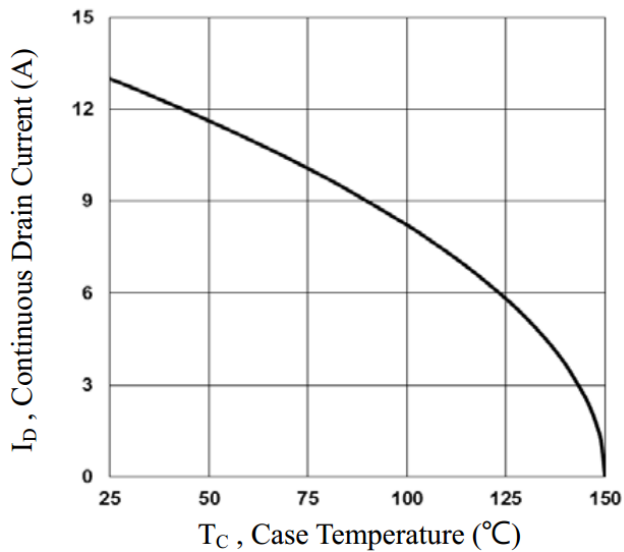
**Electrical Characteristics:** ( $T_C=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-30	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-30V, T_J=25^\circ\text{C}$	---	---	-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>	$V_{GS}=-10V, I_D=-10A$	---	8	9.5	$\text{m}\Omega$
		$V_{GS}=-4.5V, I_D=-8A$	---	12.4	15	
$G_{FS}$	Forward Transconductance	$V_{DS}=-10V, I_D=-10A$	---	13	---	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	3300	4800	$\text{pF}$
$C_{oss}$	Output Capacitance		---	410	700	
$C_{rss}$	Reverse Transfer Capacitance		---	280	500	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time <sup>2,3</sup>	$V_{DS}=-15V, V_{GS}=-10V$ $I_D=-1A, R_{GEN}=6\ \Omega$	---	24.5	38	ns
$t_r$	Rise Time <sup>2,3</sup>		---	10.5	16	ns
$t_{d(off)}$	Turn-Off Delay Time <sup>2,3</sup>		---	156.8	230	ns
$t_f$	Fall Time <sup>2,3</sup>		---	50	75	ns
$Q_g$	Total Gate Charge <sup>2,3</sup>	$V_{DS}=-15V, V_{GS}=-4.5V,$ $I_D=-10A$	---	35	56	nC
$Q_{gs}$	Gate-Source Charge <sup>2,3</sup>		---	10.8	16	nC
$Q_{gd}$	Gate-Drain "Miller" Charge <sup>2,3</sup>		---	10.6	18	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

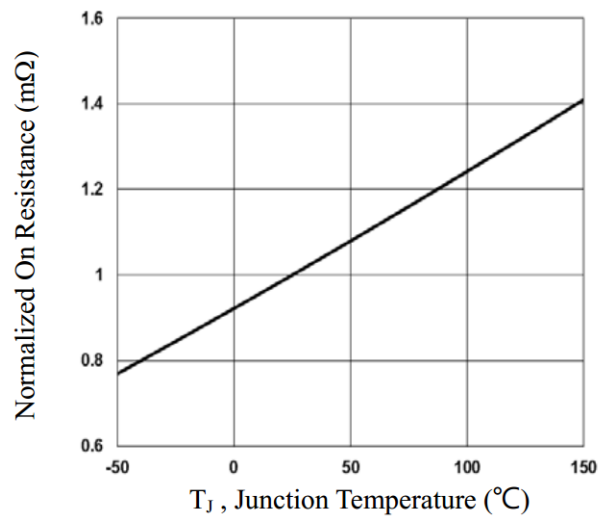
## Notes:

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

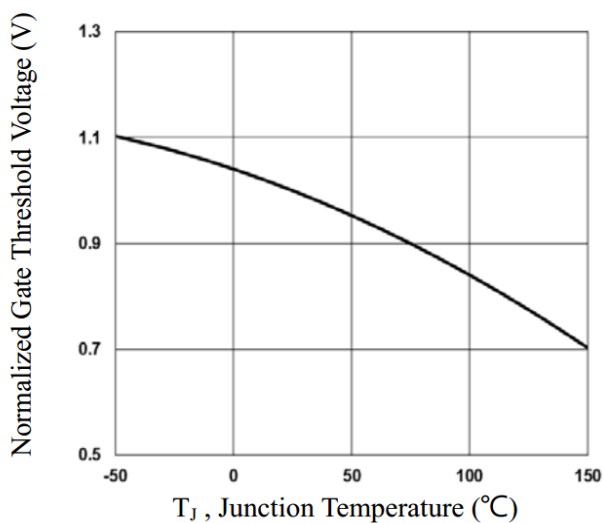
## Typical Characteristics: ( $T_C=25^\circ\text{C}$ unless otherwise noted)



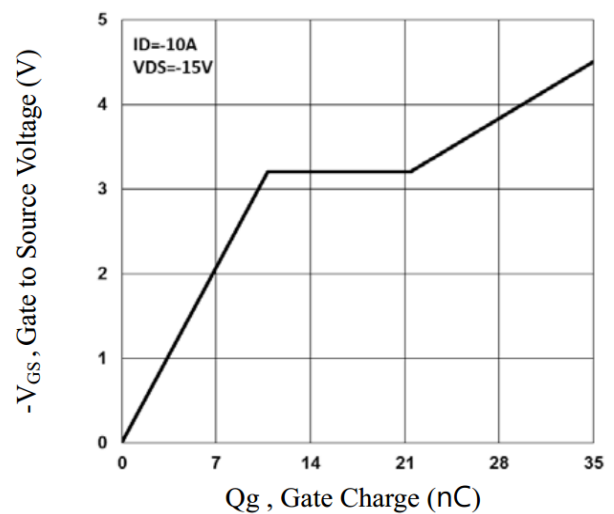
**Fig.1 Continuous Drain Current vs.  $T_C$**



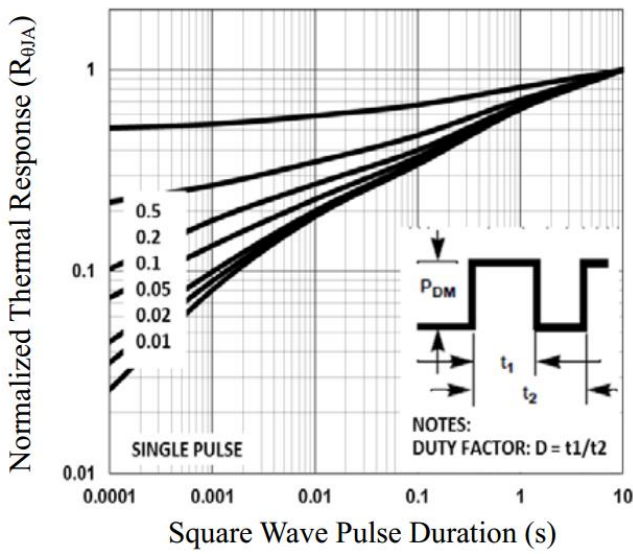
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$**



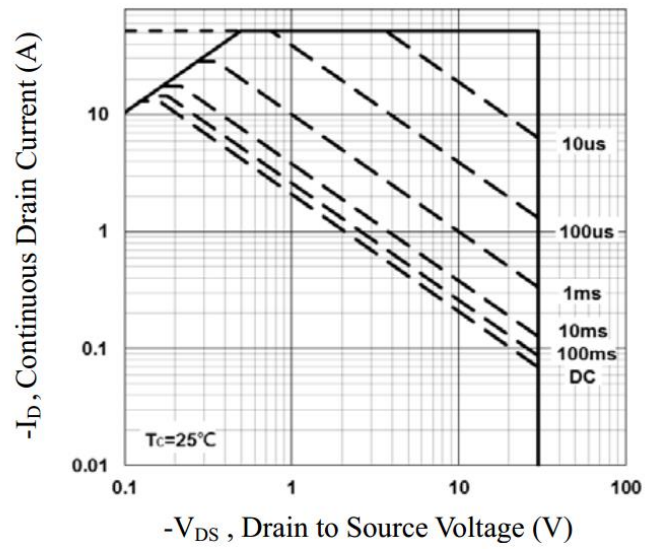
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



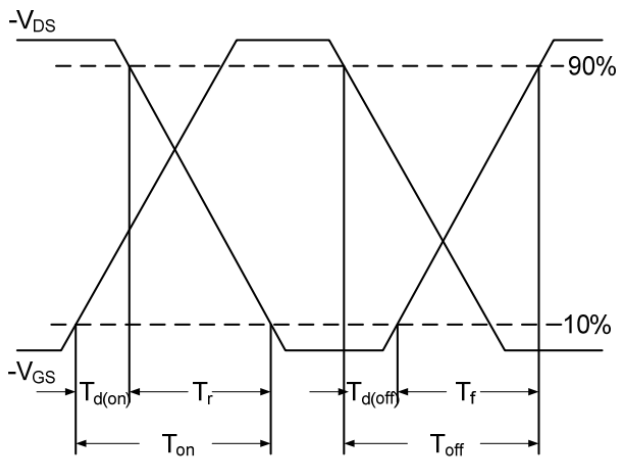
**Fig.4 Gate Charge Waveform**



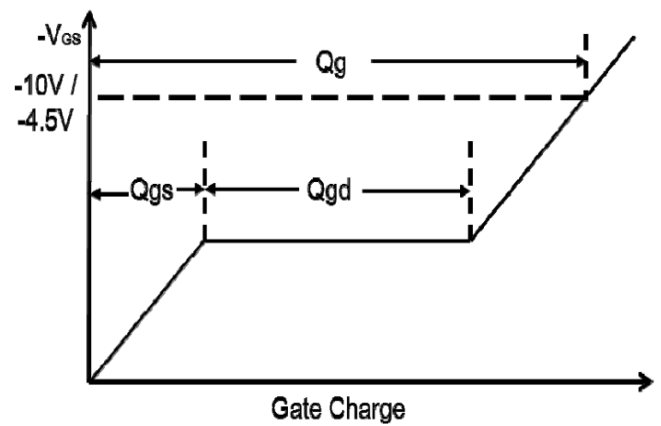
**Fig.5 Normalized Transient Impedance**



**Fig.6 Maximum Safe Operation Area**



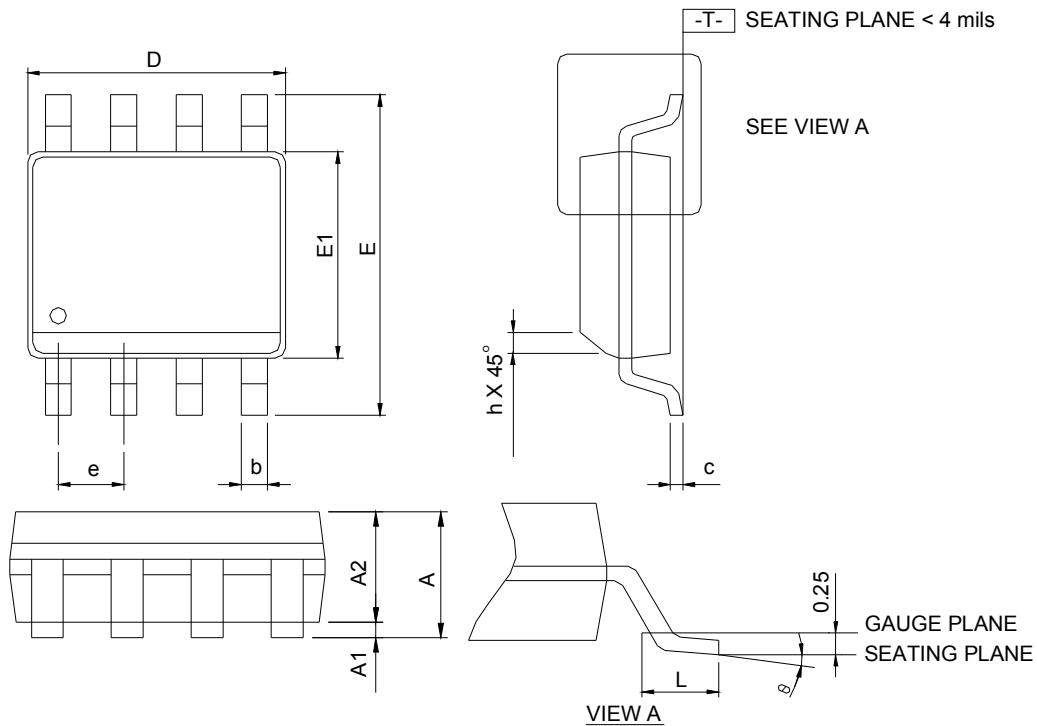
**Fig.7 Switching Time Waveform**



**Fig.8 Gate Charge Waveform**

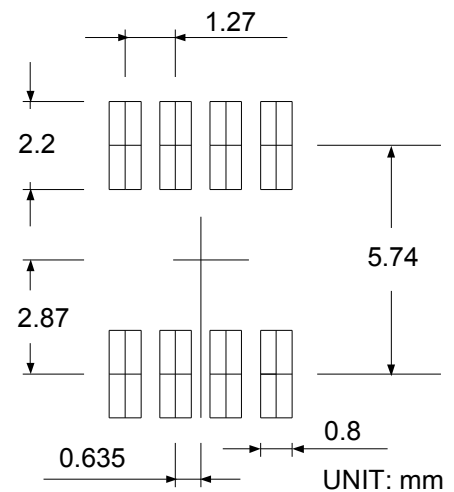
## Package Information

SOP-8



DIMENSIONS	SOP-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.75	-	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	-	0.049	-
b	0.31	0.51	0.012	0.020
c	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
h	0.25	0.50	0.010	0.020
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°

### RECOMMENDED LAND PATTERN



- Note: 1. Follow JEDEC MS-012 AA.  
 2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.  
 3. Dimension "E" does not include inter-lead flash or protrusions. Inter-lead flash and protrusions shall not exceed 10 mil per side.

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