

Description:

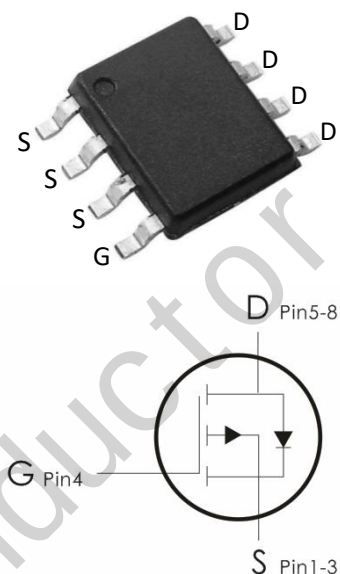
This P-Channel MOSFET uses advanced trench technology and

design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=-60V, I_D=-8.5A, R_{DS(on)}<30m\Omega$ @ $V_{GS}=-10V$
- 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: ($T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^{\circ}C$	-8.5	A
	Continuous Drain Current- $T_C=100^{\circ}C$	-5.4	
I_{DM}	Drain Current-Pulsed ¹	-34	A
E_{AS}	Single Pulse Avalanche Energy ²	105	mJ
I_{AS}	Single Pulse Avalanched Current ²	-46	A
P_D	Power Dissipation	4.1	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^{\circ}C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction to Case	30	$^{\circ}C/W$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	-60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-60V, T _J =25 °C	---	---	-1	μ A
		V _{GS} =0V, V _{DS} =-48V, T _J =125 °C	---	---	-10	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	-1	-1.6	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =-10V, I _D =-8A	---	23	30	m Ω
		V _{GS} =-4.5V, I _D =-6A	---	28	40	
G _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-3A	---	18	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-25V, V _{GS} =0V, f=1MHz	---	2550	3850	pF
C _{oss}	Output Capacitance		---	160	230	
C _{rss}	Reverse Transfer Capacitance		---	110	165	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time ^{3,4}	V _{DD} =-30V, V _{GS} =-10V I _D =-1A, R _{GEN} =6 Ω	---	25	50	ns
t _r	Rise Time ^{3,4}		---	13.8	28	ns
t _{d(off)}	Turn-Off Delay Time ^{3,4}		---	148	290	ns
t _f	Fall Time ^{3,4}		---	51	100	ns
Q _g	Total Gate Charge ^{3,4}	V _{DS} =-30V , V _{GS} =-10V , I _D =-5A	---	43.8	88	nC
Q _{GS}	Gate-Source Charge ^{3,4}		---	4.6	9	nC
Q _{gd}	Gate-Drain “Miller” Charge ^{3,4}		---	8.3	17	nC
Drain-Source Diode Characteristics						

I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	-8.5	A
I_{SM}	Pulsed Source Current		---	---	-17	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	---	---	-1	V
t_{rr}	Reverse Recovery Time	$V_R=-50V, I_S=-5A$ $di/dt=100A/\mu s, T_J=25^\circ C$	---	40	---	ns
Q_{rr}	Reverse Recovery Charge		---	30	---	nC

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-46A, R_G=25\Omega$, Starting $T_J=25^\circ C$.
3. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

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

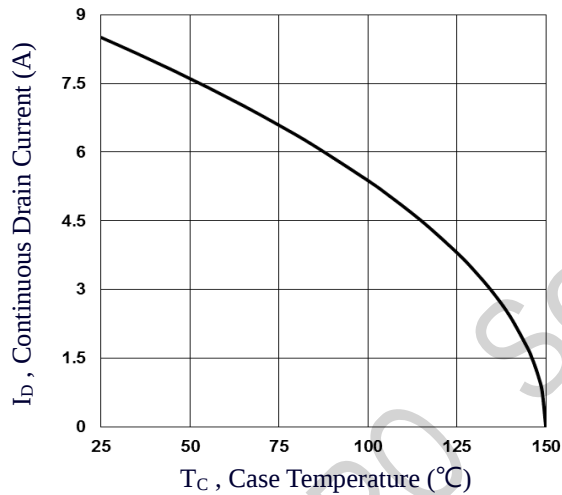


Fig.1 Continuous Drain Current vs. T_C

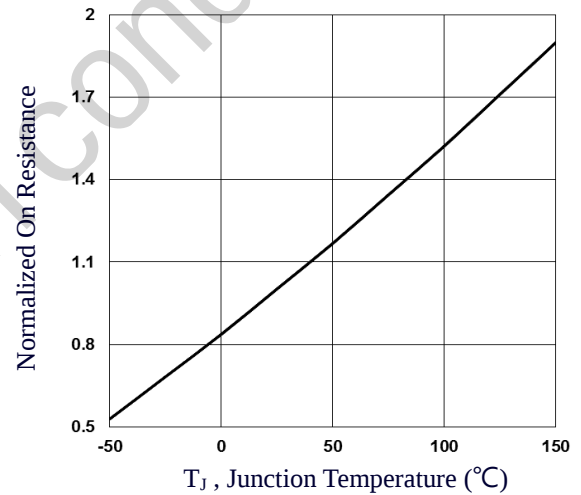


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

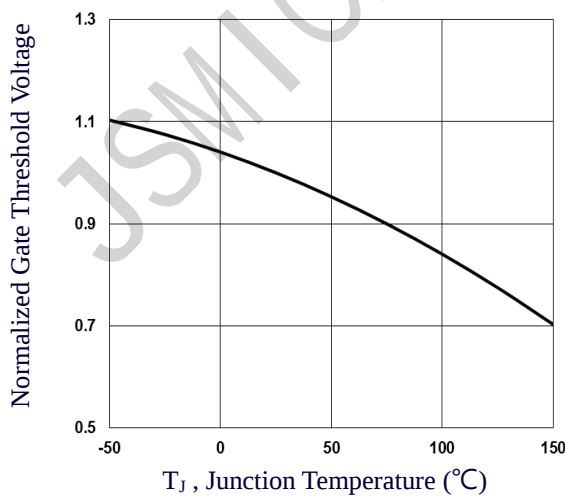


Fig.3 Normalized V_{th} vs. T_J

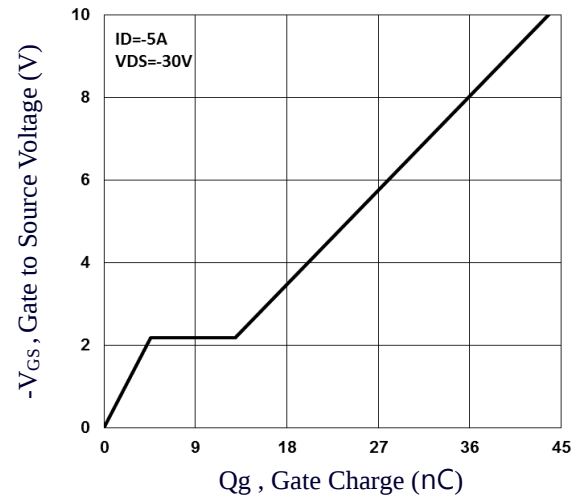
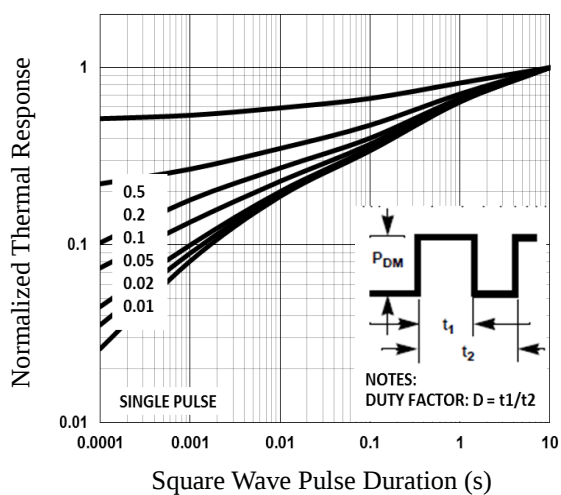
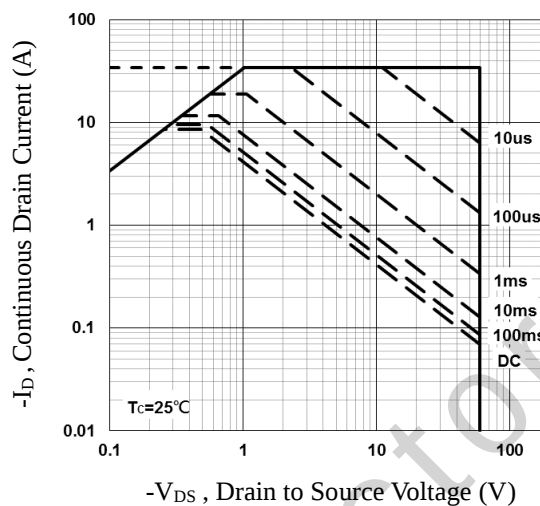
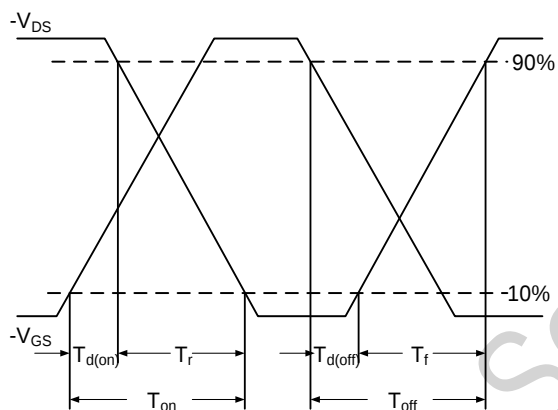
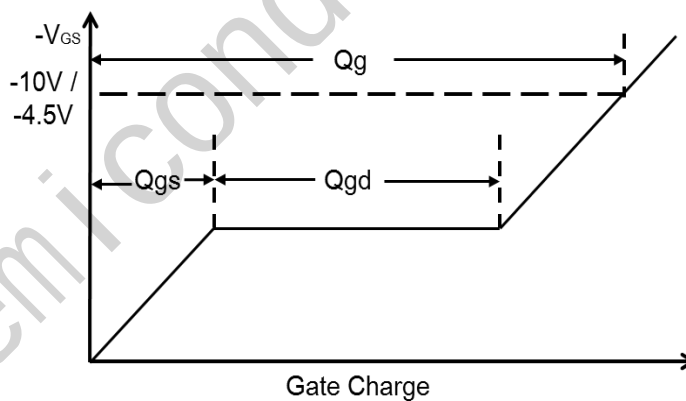
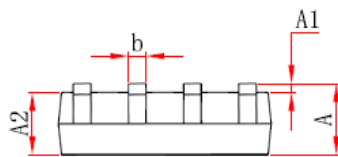
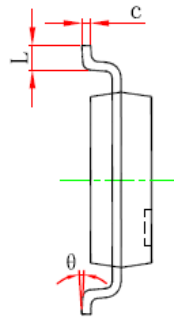
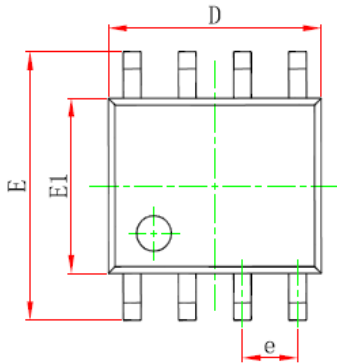


Fig.4 Gate Charge Waveform


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	1.450	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	0.007	0.010
D	4.700	5.100	0.185	0.201
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°