**JSMICRO SEMICONDUCTOR**

Description：

This N+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.
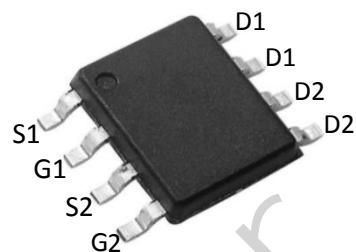
Features：

N-Channel: V_{DS}=100V, I_D=2.2A, $R_{DS(ON)}$<120mΩ @V_{GS}=10V

P-Channel: V_{DS}=-100V, I_D=-1.8A, $R_{DS(ON)}$<200mΩ @V_{GS}=-10V

1) Low gate charge.

2) Green device available.

3) Advanced high cell denity trench technology for ultra low $R_{DS(ON)}$.

4) Excellent package for good heat dissipation.
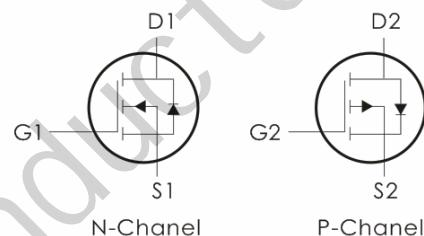
Absolute Maximum Ratings： (T_A=25℃ unless otherwise noted)

| Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	100	-100	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D	Continuous Drain Current- T_A=25℃	2.2	-1.8	A
	Continuous Drain Current- T_A=70℃	1.7	-1.4	
I_{DM}	Pulsed Drain Current[1]	13.2	-7.2	A
P_D	Power Dissipation	1.5	2	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150		℃

Thermal Characteristics：

Symbol	Parameter	N-CH	P-CH	Units
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	85	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	25	---	℃/W

N-Channel Electrical Characteristics： (T_A=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=80V, T_J=25℃	---	---	10	μA
		V_{GS}=0V, V_{DS}=80V, T_J=55℃	---	---	100	μA
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=250μA	1.2	---	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance[2]	V_{GS}=10V, I_D=2A	---	86	120	mΩ
		V_{GS}=4.5V, I_D=1A	---	96	140	
G_{FS}	Forward Transconductance	V_{DS}=5V, I_D=2A	---	10.2	---	S
R_G	Gate Resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz	---	2.1	---	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	---	1050	---	pF
C_{oss}	Output Capacitance		---	45	---	
C_{rss}	Reverse Transfer Capacitance		---	30	---	
Q_g	Gate Charge	V_{GS}=10V, V_{DS}=80V I_D=2A	---	18.4	---	nc
Q_{gs}	Gate-Source Charge		---	3	---	
Q_{gd}	Gate-Drain Charge		---	3.1	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=50V, V_{GS}=10V, R_G=3.3, I_D=2A	---	5.6	---	ns
t_r	Rise Time		---	20	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	28	---	ns
t_f	Fall Time		---	24	---	ns

Drain-Source Diode Characteristics

V_{SD}	Source-Drain Diode Forward Voltage[2]	V_{GS}=0V,I_S=1A,,T_J=25℃	---	---	1.2	V
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	2.2	ns
I_{SM}	Pulsed Source Current[2,4]		---	---	13.2	nC

N-Channel Typical Characteristics： (T$_C$=25℃ unless otherwise noted)
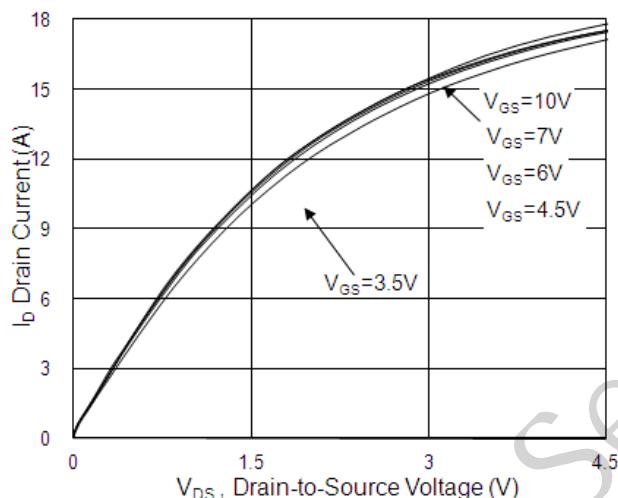
Fig.1 Typical Output Characteristics
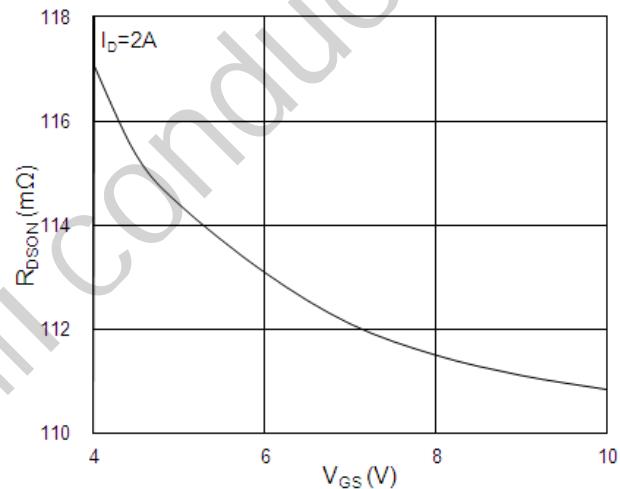
Fig.2 On-Resistance vs. Gate-Source
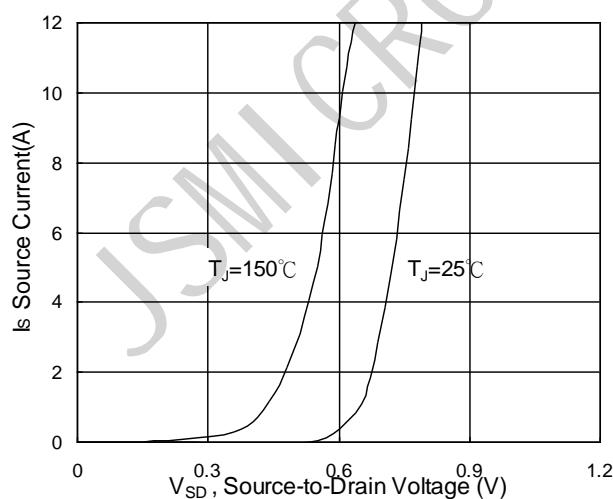
Fig.3 Forward Characteristics Of Reverse
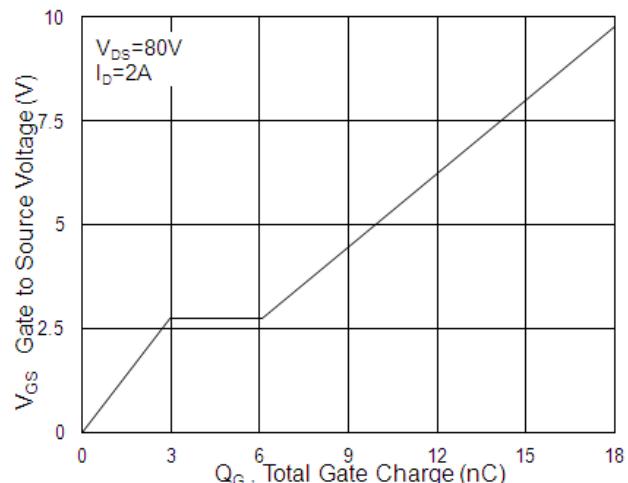
Fig.4 Gate-Charge Characteristics
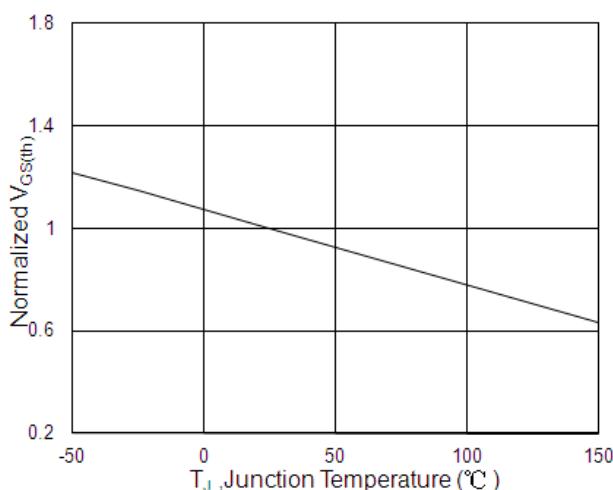
Fig.5 Normalized $V_{GS(th)}$ vs. T_J
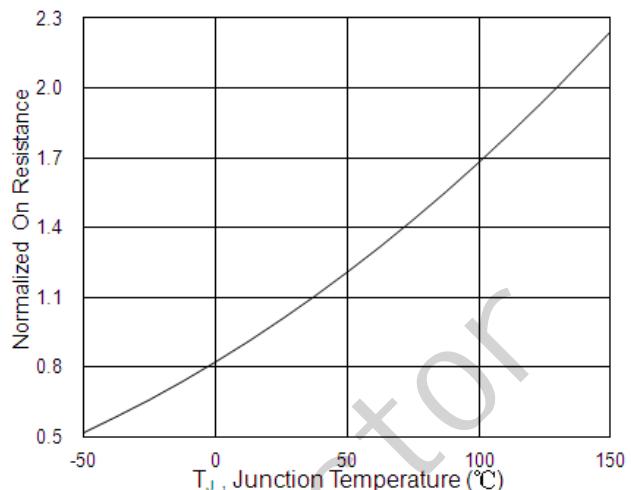
Fig.6 Normalized R_{DSON} vs. T_J
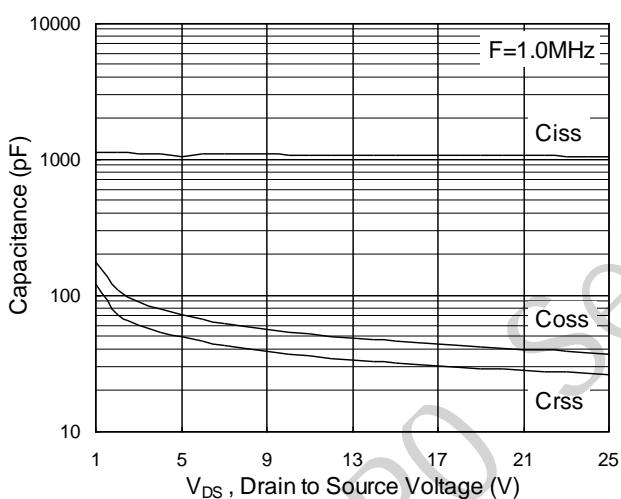
Fig.7 Capacitance
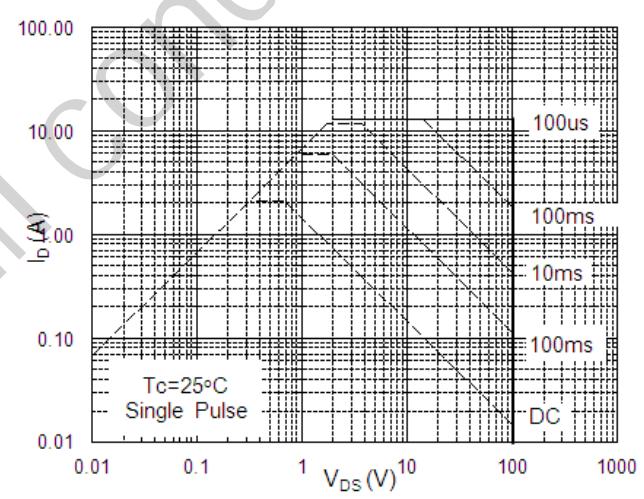
Fig.8 Safe Operating Area

$D = T_{ON}/T$
$T_{Jpeak} = T_C + P_{DM} X R_{\theta JC}$
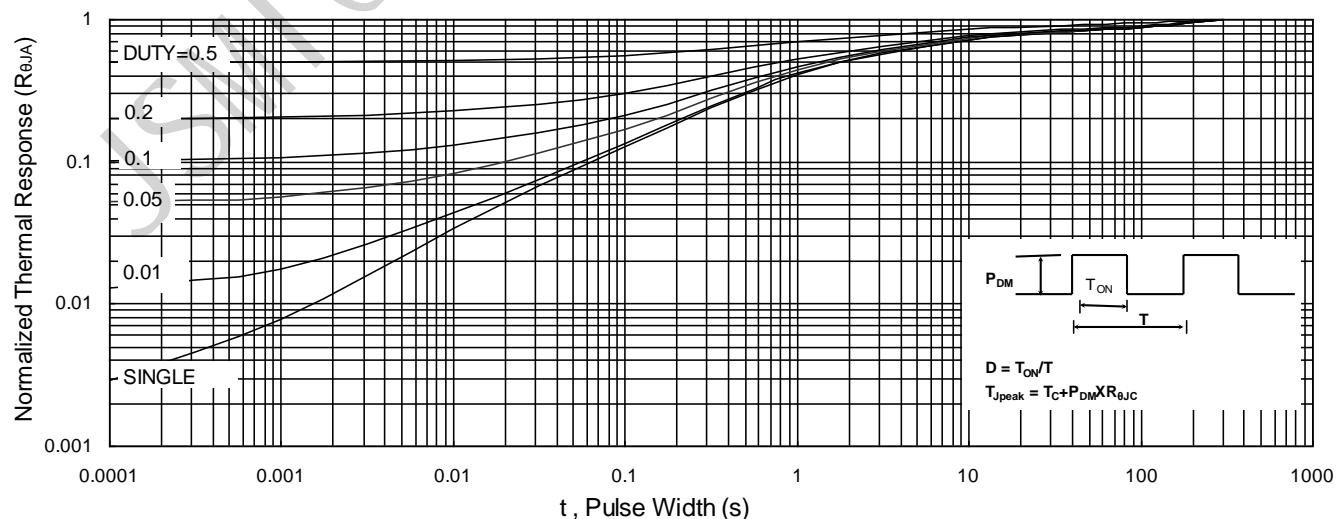
Fig.9 Normalized Maximum Transient Thermal Impedance
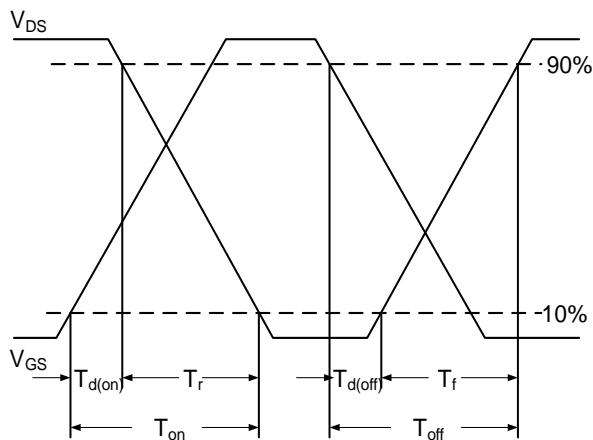
Fig.10 Switching Time Waveform
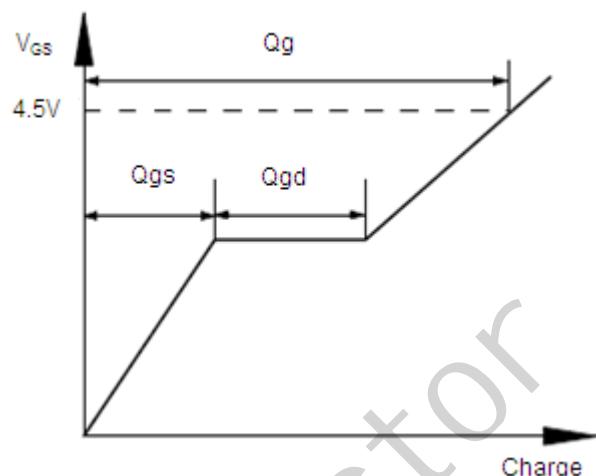
Fig.11 Gate Charge Waveform

P-Channel Electrical Characteristics：(T$_A$=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV$_{DSS}$	Drain-Sourtce Breakdown Voltage	V$_{GS}$=0V,I$_D$=250μA	-100	---	---	V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{GS}$=0V, V$_{DS}$=-100V,T$_J$=25℃	---	---	-1	μA
		V$_{GS}$=0V, V$_{DS}$=-80V,T$_J$=125℃	---	---	-10	μA
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$_D$=250μA	-1.2	-1.6	-2.5	V
R$_{DS(ON)}$	Drain-Source On Resistance	V$_{GS}$=-10V,I$_D$=-1.8A	---	180	200	mΩ
		V$_{GS}$=-4.5V,I$_D$=-1.5A	---	190	225	
G$_{FS}$	Forward Transconductance	V$_{DS=}$--10V, I$_D$=-3A	---	6.5	---	S
Dynamic Characteristics						
C$_{iss}$	Input Capacitance		---	1455	2200	
C$_{oss}$	Output Capacitance	V$_{DS}$=-50V, V$_{GS}$=0V, f=1MHz	---	880	1300	pF
C$_{rss}$	Reverse Transfer Capacitance		---	58	85	
R$_g$	Gate resistance	V$_{GS}$=0V, V$_{DS}$=0V, F=1MHz	---	16	---	Ω

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time[2,3]		---	18	36	ns
t_r	Rise Time[2,3]	V_{GS}=-10V,V_{DD}=-50V	---	8	16	ns
$t_{d(off)}$	Turn-Off Delay Time[2,3]	R_G=25 Ω ,I_D=-1.8A	---	100	200	ns
t_f	Fall Time[2,3]		---	30	60	ns
Q_g	Total Gate Charge[2,3]		---	20	40	nC
Q_{gs}	Gate-Source Charge[2,3]	V_{GS}=-10V,V_{DS}=-80V,I_D=-1.8A	---	3.5	7	nC
Q_{gd}	Gate-Drain Charge[2,3]		---	4.6	9	nC

Drain-Source Diode Characteristics

V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=-1A,T_J=25℃	---	---	-1	V
I_S	Continuous Source Current		---	---	-1.8	V
I_{SM}	Pulsed Source Current	V_G=V_D=0V , Force Current	---	---	-3.6	V
T_{rr}	Reverse Recovery Time	V_R=-100V, I_S=-1A	---	13	---	ns
Q_{rr}	Reverse Recovery Charge	di/dt=100A/ μ s, T_J=25℃	---	15	---	nC

Notes:

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

P-Channel Typical Characteristics： (T$_C$=25℃ unless otherwise noted)
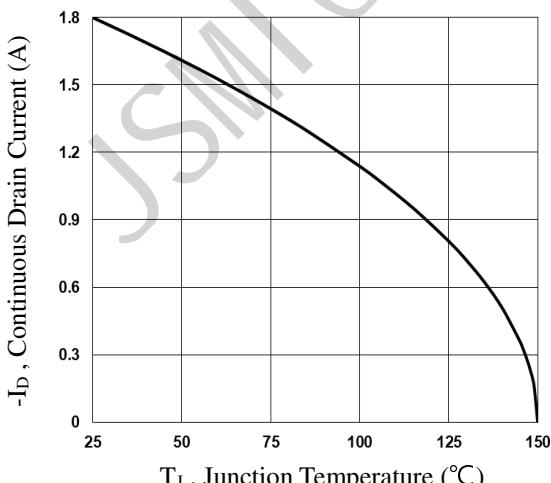
Fig.1 Continuous Drain Current vs. T$_J$
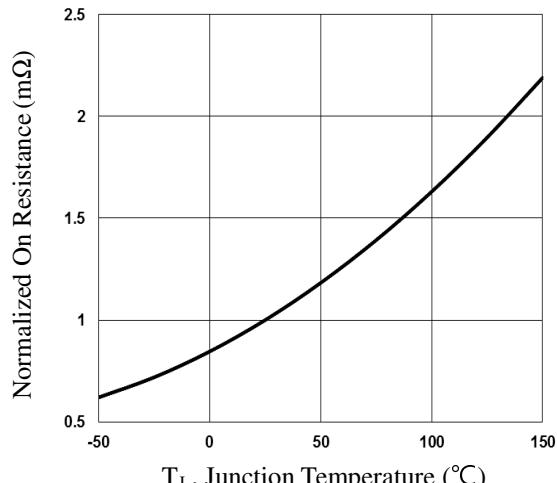
Fig.2 Normalized RDSON vs. T$_J$
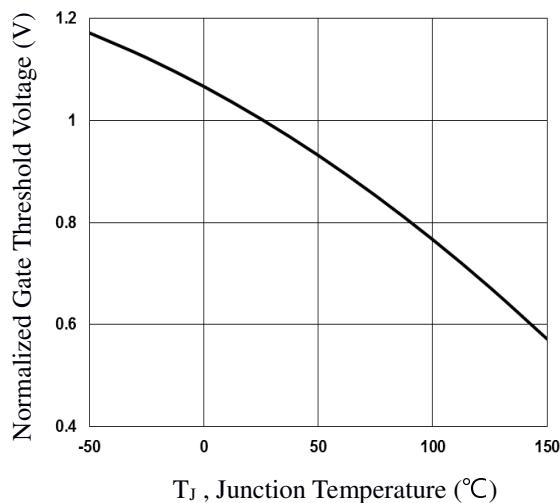
Fig.3   Normalized V$_{th}$ vs. T$_J$
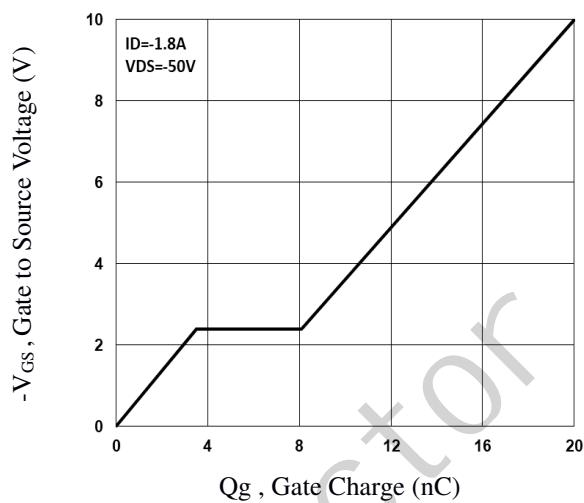
Fig.4   Gate Charge Waveform
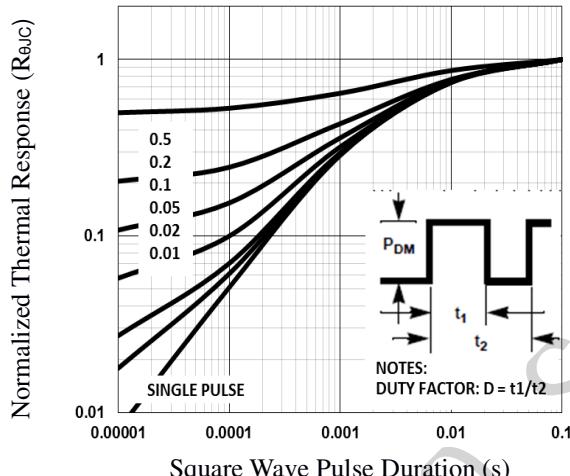
Fig.5   Normalized Transient Impedance
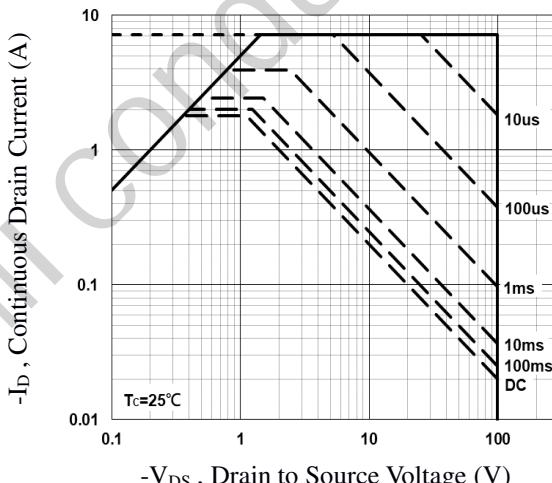
Fig.6   Maximum Safe Operation Area
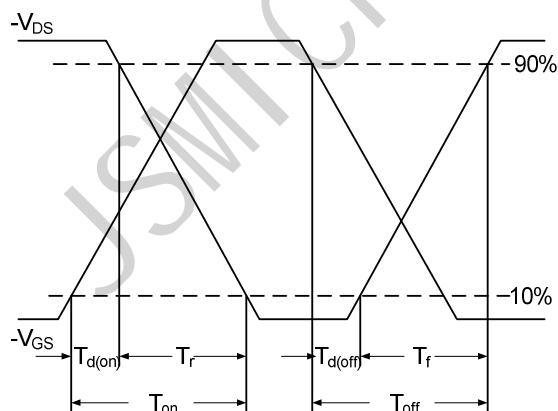
Fig.7   Switching Time Waveform
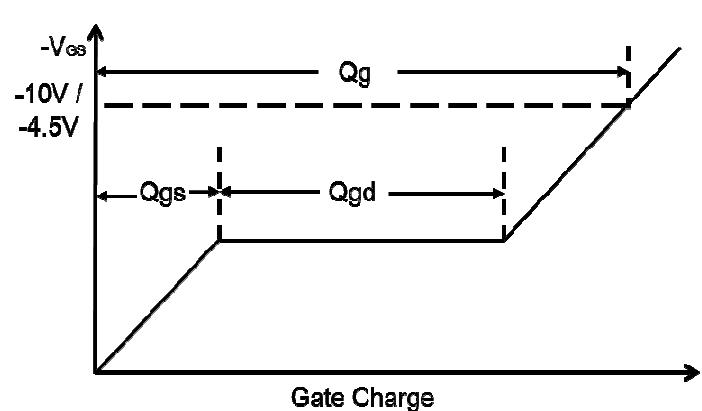
Fig.8   Gate Charge Waveform

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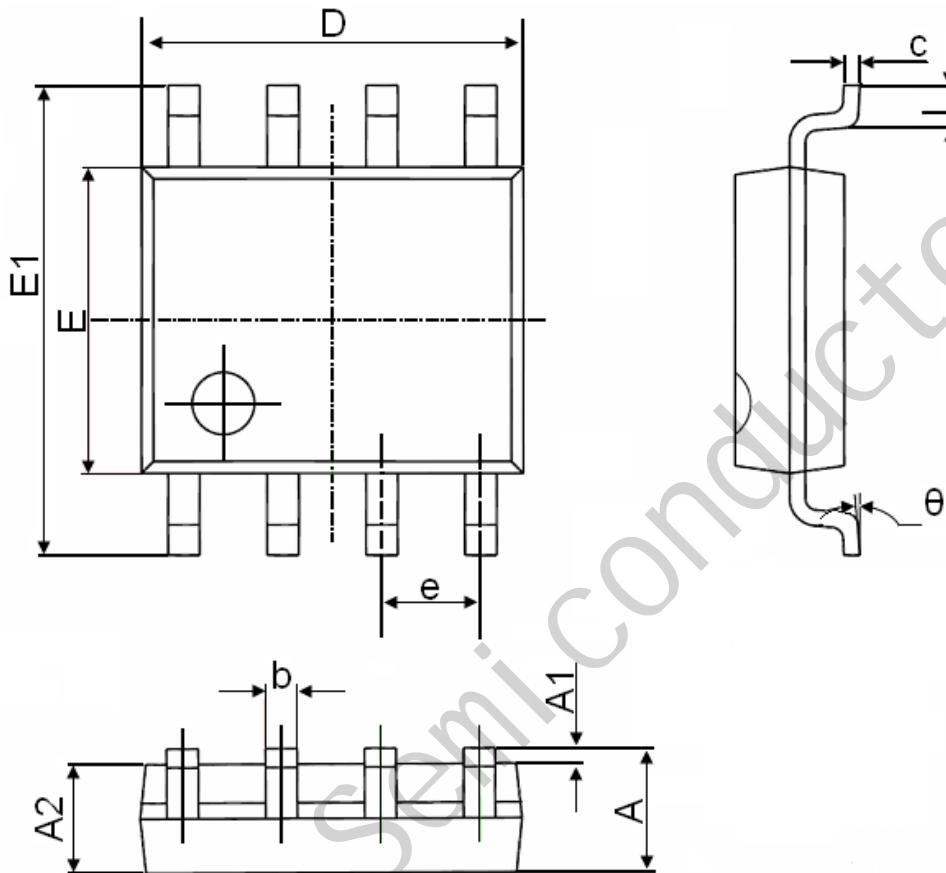
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)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

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