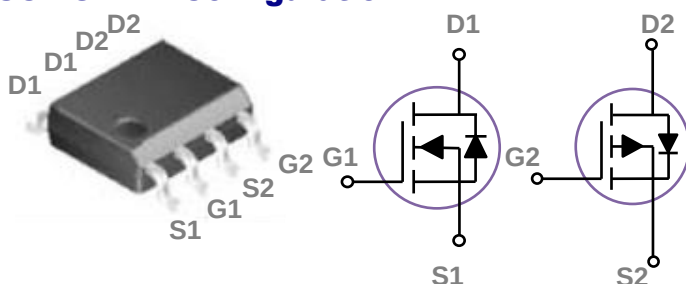


General Description

These N+P dual Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

SOP-8L Pin Configuration



BVDSS	RDSON	ID
100V	155mΩ	2.1A
-100V	290mΩ	-1.7A

Features

- Fast switching
- Green Device Available
- Suit for 4.5V Gate Drive Applications

Applications

- DC Fan
- Motor Drive Applications
- Networking
- Half / Full Bridge Topology

Absolute Maximum Ratings Tc=25°C unless otherwise noted

Symbol	Parameter	Rating		Units
V _{DS}	Drain-Source Voltage	100	-100	V
V _{GS}	Gate-Source Voltage	±20	±20	V
I _D	Drain Current – Continuous (T _A =25°C)	2.1	-1.7	A
	Drain Current – Continuous (T _A =70°C)	1.7	-1.4	A
I _{DM}	Drain Current – Pulsed ¹	8.4	6.8	A
EAS	Single Pulse Avalanche Energy ²	2.5	6.1	mJ
IAS	Single Pulse Avalanche Current ²	7	11	A
P _D	Power Dissipation (T _A =25°C)	1.47		W
	Power Dissipation – Derate above 25°C	0.011		W/°C
T _{STG}	Storage Temperature Range	-55 to 150		°C
T _J	Operating Junction Temperature Range	-55 to 150		°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to Ambient	---	85	°C/W

N-CH Electrical Characteristics (T_J=25 °C, unless otherwise)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	100	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.09	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =100V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =80V, V _{GS} =0V, T _J =125°C	---	---	10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =2A	---	128	155	mΩ
		V _{GS} =4.5V, I _D =1A	---	132	170	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-4.2	---	mV/°C
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =1A	---	5	---	S

Dynamic and switching Characteristics

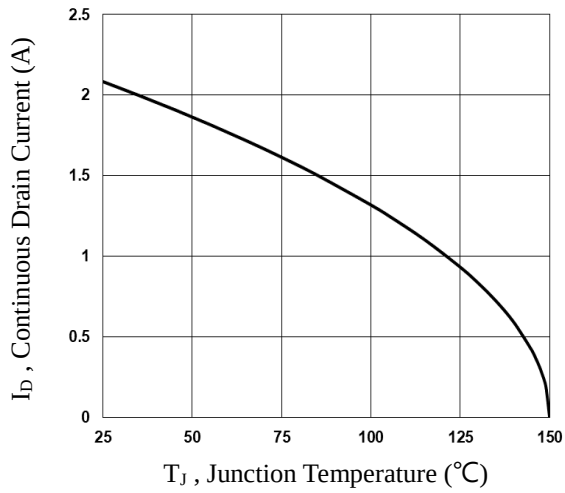
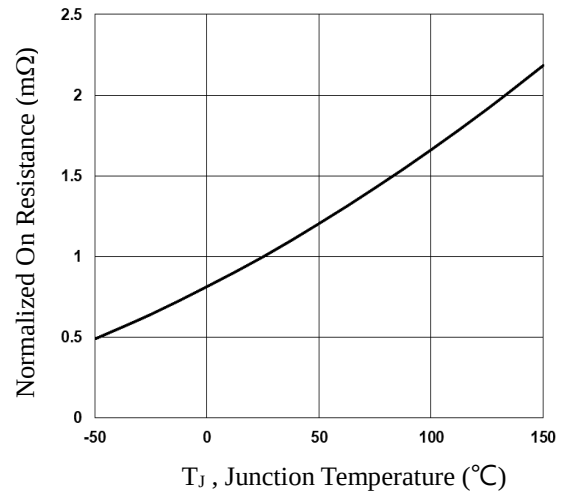
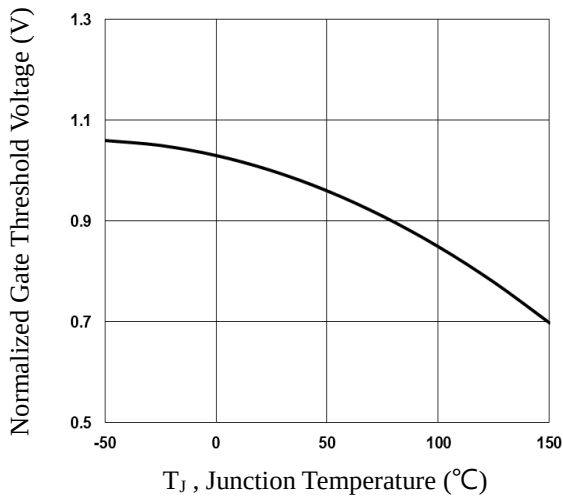
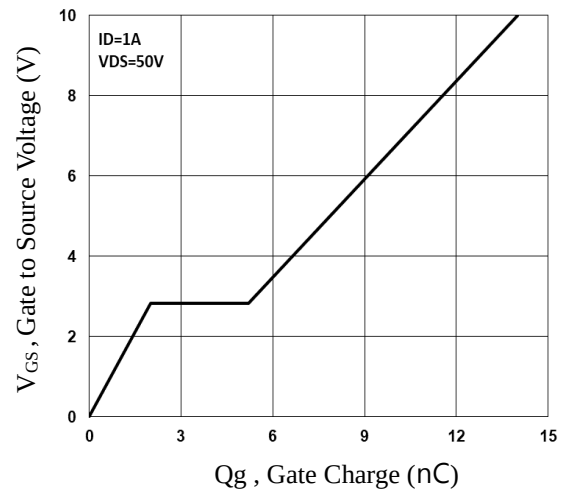
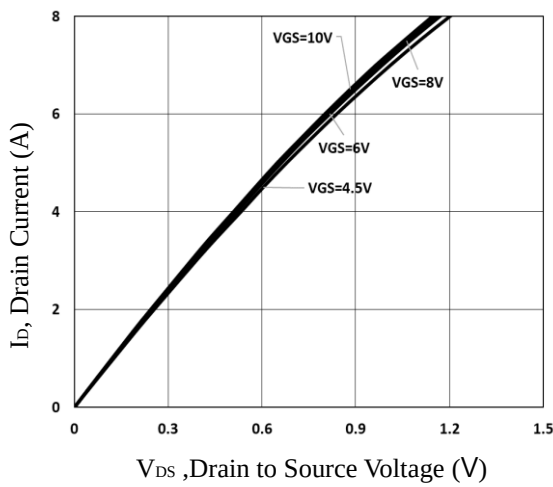
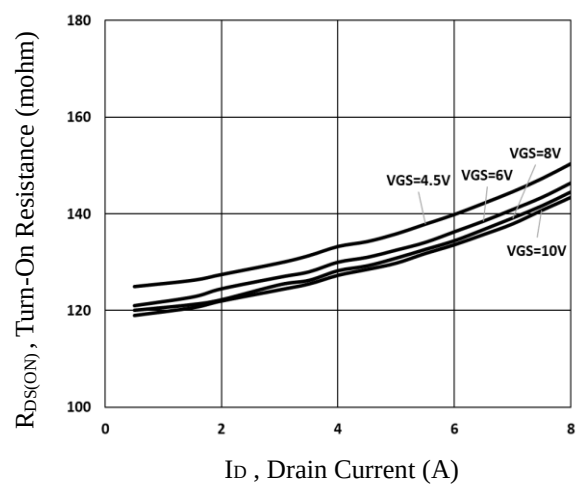
Q _g	Total Gate Charge ^{3, 4}	V _{DS} =50V, V _{GS} =10V, I _D =1A	---	14	28	nC
Q _{gs}	Gate-Source Charge ^{3, 4}		---	2	4	
Q _{gd}	Gate-Drain Charge ^{3, 4}		---	3.2	6.5	
T _{d(on)}	Turn-On Delay Time ^{3, 4}	V _{DD} =50V, V _{GS} =10V, R _G =6Ω I _D =1A	---	7.8	15	ns
T _r	Rise Time ^{3, 4}		---	10.2	21	
T _{d(off)}	Turn-Off Delay Time ^{3, 4}		---	17.4	35	
T _f	Fall Time ^{3, 4}		---	3.1	7	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, F=1MHz	---	1034	2070	pF
C _{oss}	Output Capacitance		---	29	58	
C _{rss}	Reverse Transfer Capacitance		---	20	40	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	1.48	3	Ω

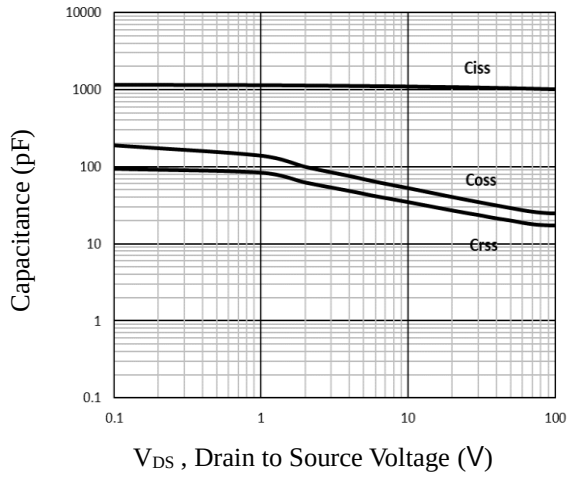
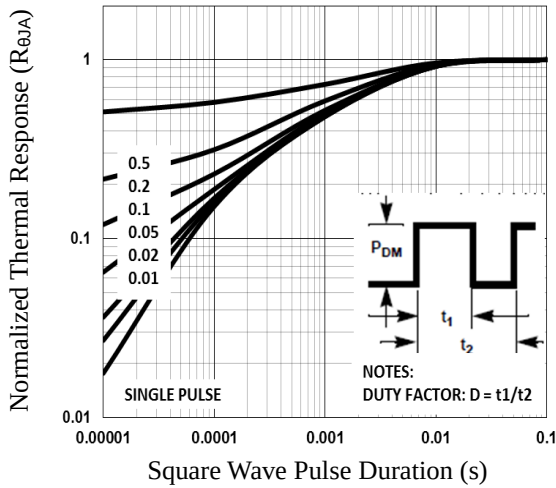
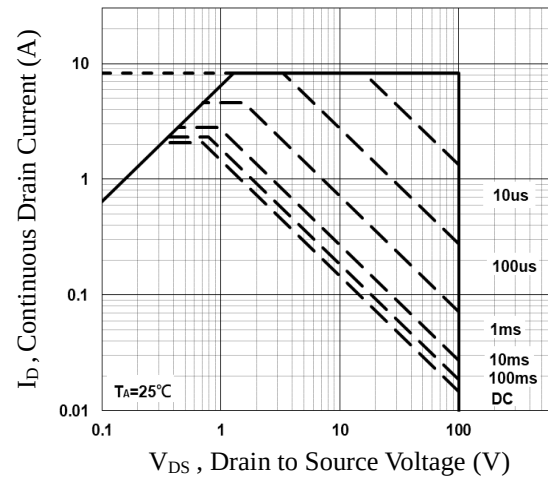
Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	2.1	A
I _{SM}	Pulsed Source Current		---	---	4.2	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, N-CH I_{AS}=7A., P-CH I_{AS}=11A, R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.


Fig.1 Continuous Drain Current vs. T_J

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

Fig.3 Normalized V_{th} vs. T_J

Fig.4 Gate Charge Waveform

Fig.5 Typical Output Characteristics

Fig.6 Turn-On Resistance vs. I_D


Fig.7 Capacitance Characteristics

Fig.8 Normalized Transient Impedance

Fig.9 Maximum Safe Operation Area

P-CH Electrical Characteristics (T_J=25 °C, unless otherwise
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-100	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	-0.06	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-100V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-80V, V _{GS} =0V, T _J =125°C	---	---	-10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-1.5A	---	240	290	mΩ
		V _{GS} =-4.5V, I _D =-1A	---	260	340	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.2	-1.6	-2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-4.4	---	mV/°C
g _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-1A	---	5	---	S

Dynamic and switching Characteristics

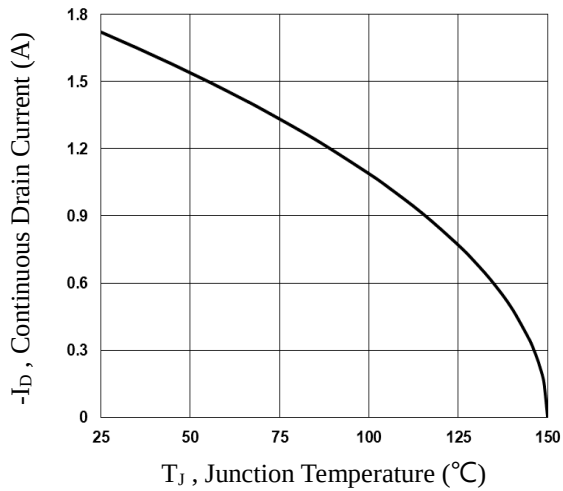
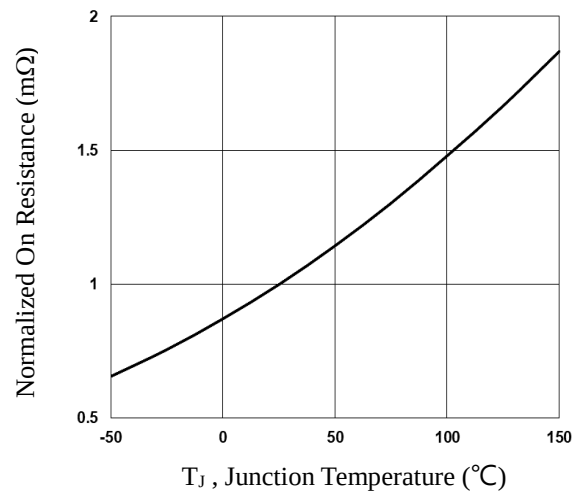
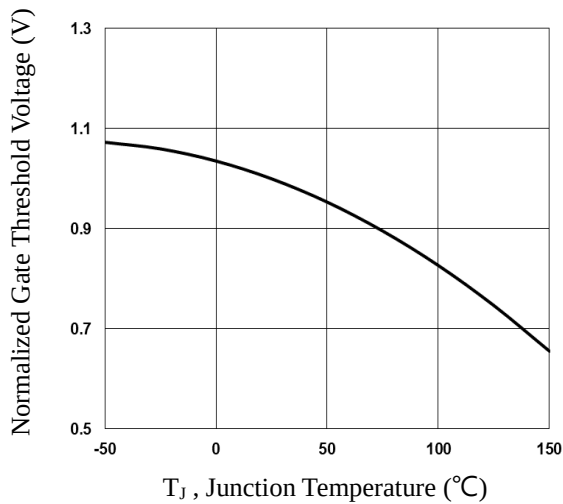
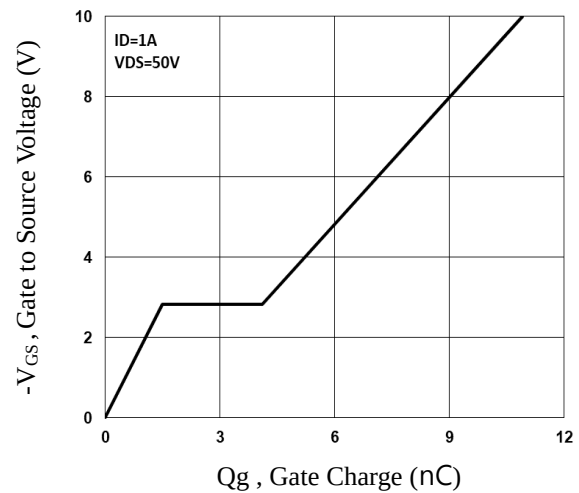
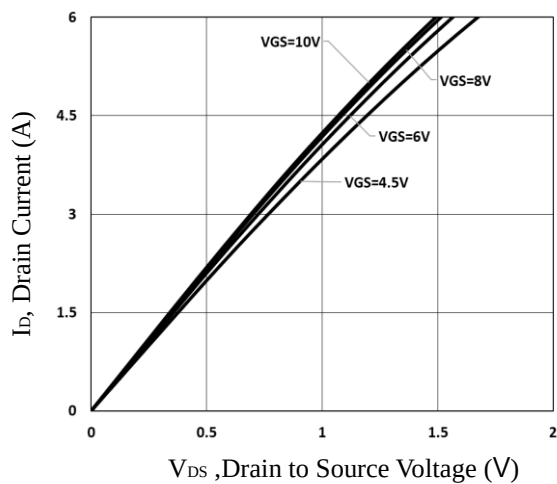
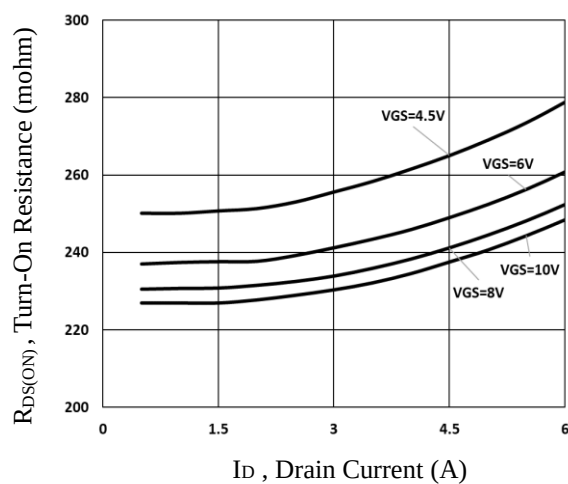
Q _g	Total Gate Charge ^{2, 3}	V _{DS} =-50V, V _{GS} =-10V, I _D =-1A	---	10.9	22	nC
Q _{gs}	Gate-Source Charge ^{2, 3}		---	1.5	3	
Q _{gd}	Gate-Drain Charge ^{2, 3}		---	2.6	5.2	
T _{d(on)}	Turn-On Delay Time ^{2, 3}	V _{DD} =-50V, V _{GS} =-10V, R _G =6Ω I _D =-1A	---	11.6	23	ns
T _r	Rise Time ^{2, 3}		---	4.8	10	
T _{d(off)}	Turn-Off Delay Time ^{2, 3}		---	35.8	72	
T _f	Fall Time ^{2, 3}		---	18.8	38	
C _{iss}	Input Capacitance	V _{DS} =-50V, V _{GS} =0V, F=1MHz	---	783	1560	pF
C _{oss}	Output Capacitance		---	33	66	
C _{rss}	Reverse Transfer Capacitance		---	22	45	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	15	30	Ω

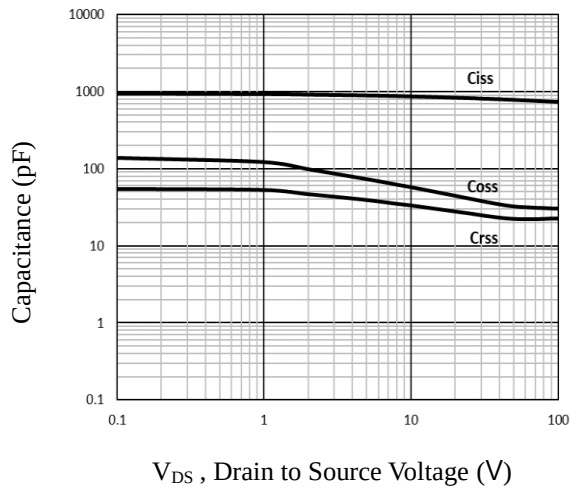
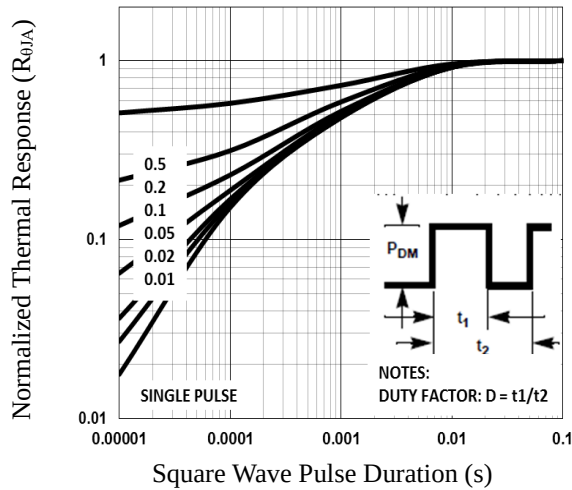
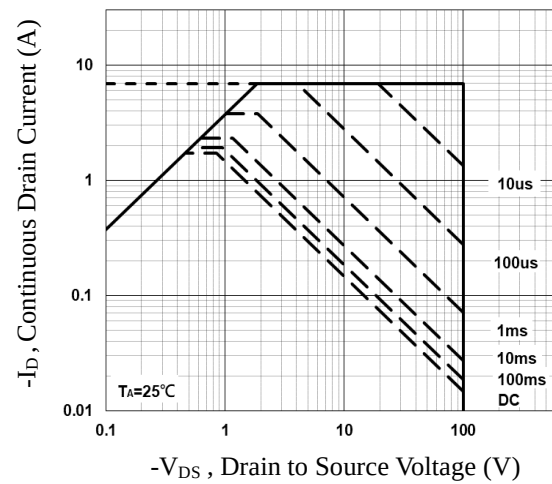
Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	-1.7	A
I _{SM}	Pulsed Source Current		---	---	-3.4	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1	V

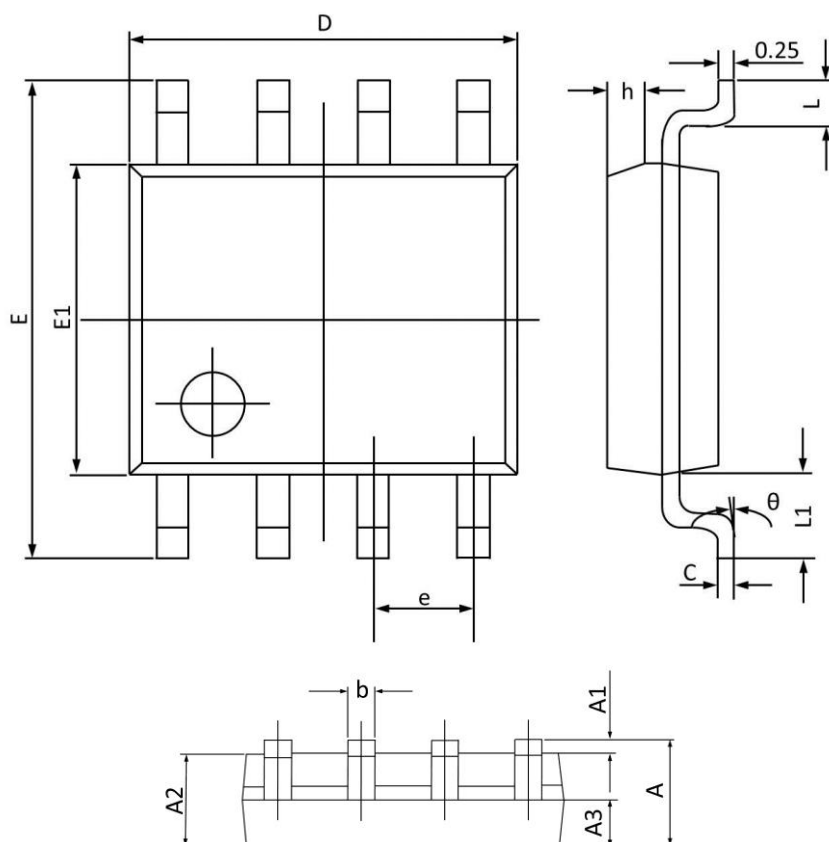
Note :

5. Repetitive Rating : Pulsed width limited by maximum junction temperature.
6. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
7. Essentially independent of operating temperature.


Fig.10 Continuous Drain Current vs. T_J

Fig.11 Normalized $R_{DS(on)}$ vs. T_J

Fig.12 Normalized V_{th} vs. T_J

Fig.13 Gate Charge Waveform

Fig.14 Typical Output Characteristics

Fig.15 Turn-On Resistance vs. I_D


Fig.16 Capacitance Characteristics

Fig.17 Normalized Transient Impedance

Fig.18 Maximum Safe Operation Area

SOP-8L PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.068
A1	0.100	0.250	0.004	0.009
A2	1.300	1.500	0.052	0.059
A3	0.600	0.700	0.024	0.027
b	0.390	0.480	0.016	0.018
c	0.210	0.260	0.009	0.010
D	4.700	5.100	0.186	0.200
E	5.800	6.200	0.229	0.244
E1	3.700	4.100	0.146	0.161
e	1.270(BSC)		0.050(BSC)	
h	0.250	0.500	0.010	0.019
L	0.500	0.800	0.019	0.031
L1	1.050(BSC)		0.041(BSC)	
θ	0°	8°	0°	8°