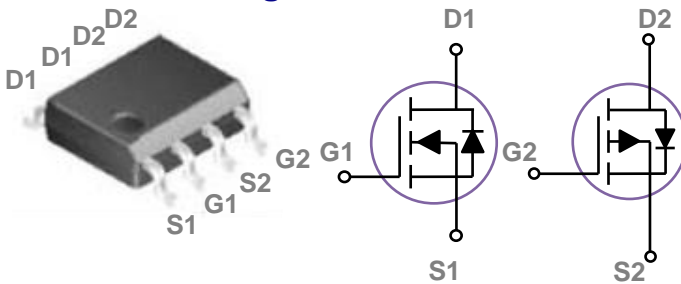


General Description

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.

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

SOP-8L Pin Configuration



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 $T_c=25^\circ\text{C}$ 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 ($T_A=25^\circ\text{C}$)	2.1	-1.7	A
	Drain Current – Continuous ($T_A=70^\circ\text{C}$)	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 ($T_A=25^\circ\text{C}$)	1.47		W
	Power Dissipation – Derate above 25°C	0.011		W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150		$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150		$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	85	$^\circ\text{C}/\text{W}$

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
gfs	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.

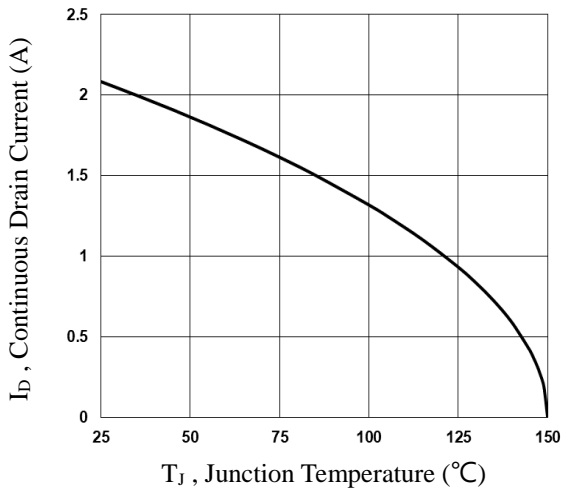


Fig.1 Continuous Drain Current vs. T_J

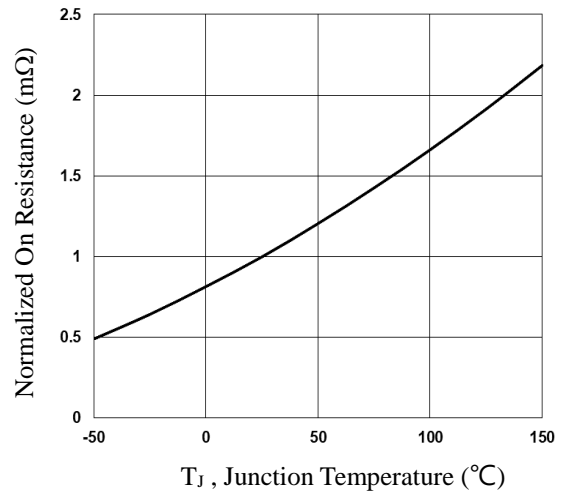


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

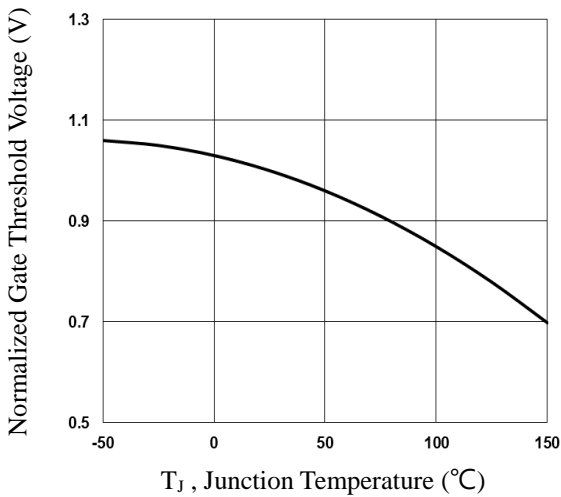


Fig.3 Normalized V_{th} vs. T_J

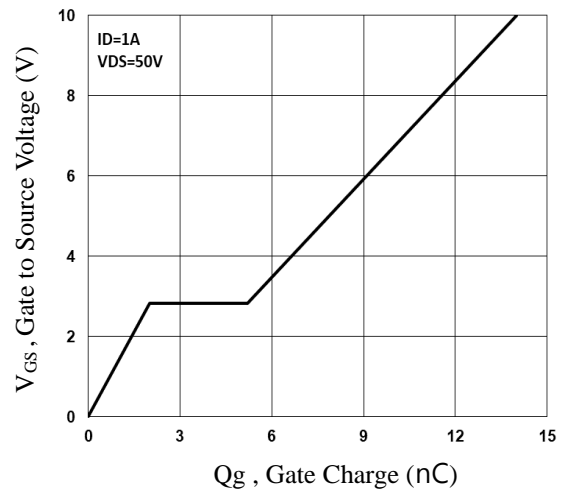


Fig.4 Gate Charge Waveform

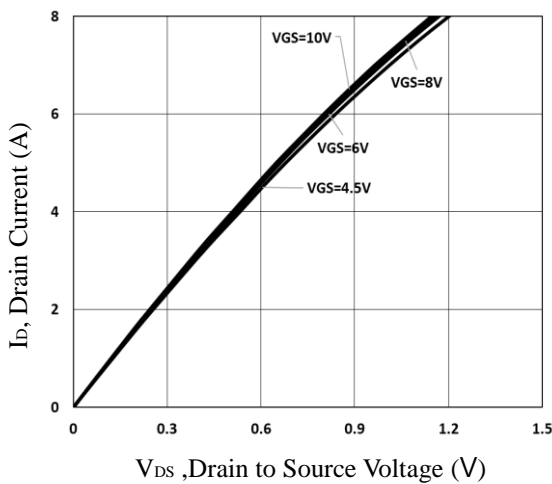


Fig.5 Typical Output Characteristics

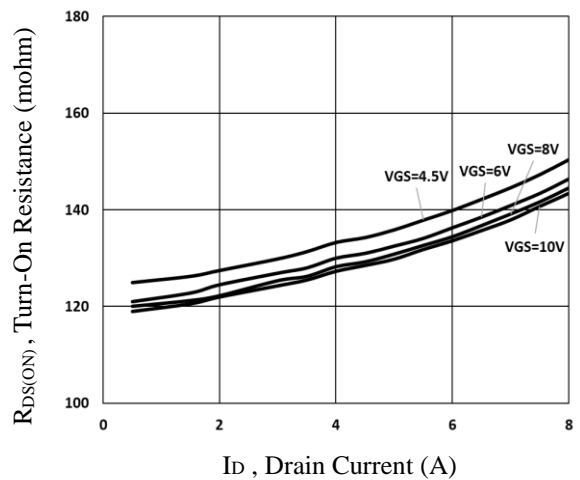


Fig.6 Turn-On Resistance vs. I_D

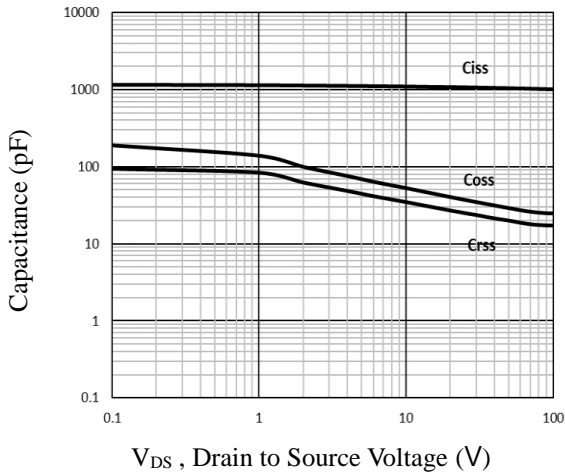


Fig.7 Capacitance Characteristics

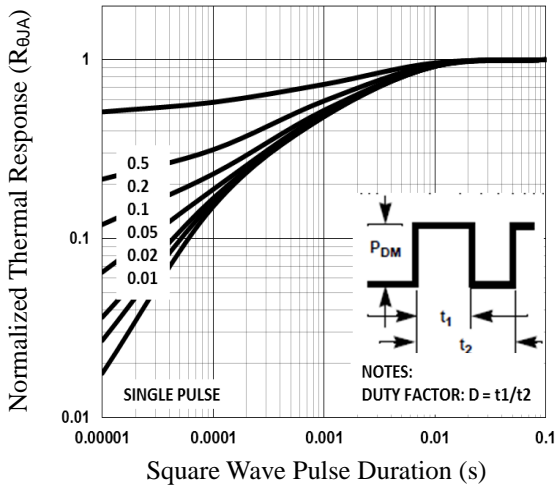


Fig.8 Normalized Transient Impedance

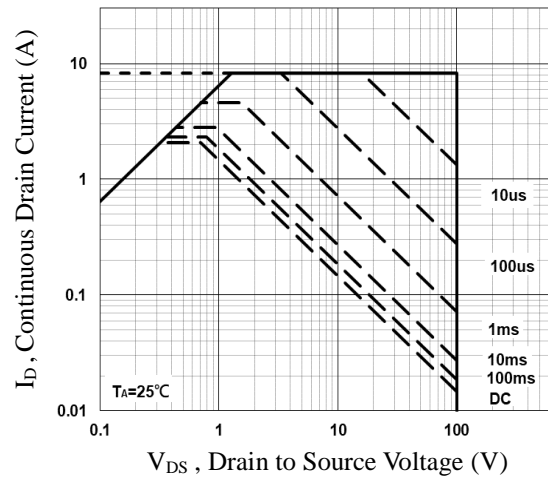


Fig.9 Maximum Safe Operation Area

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
gfs	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	

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.

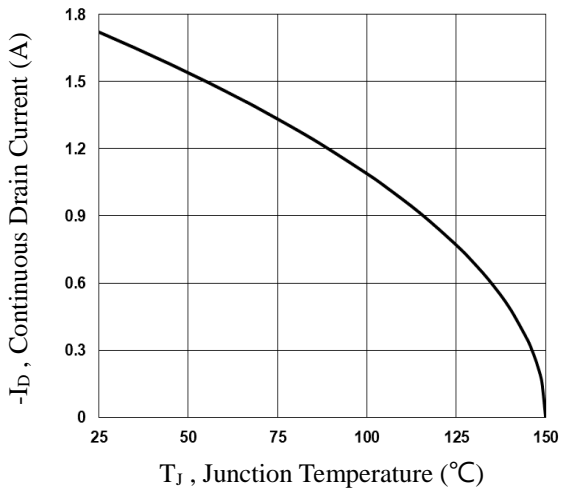


Fig.10 Continuous Drain Current vs. T_J

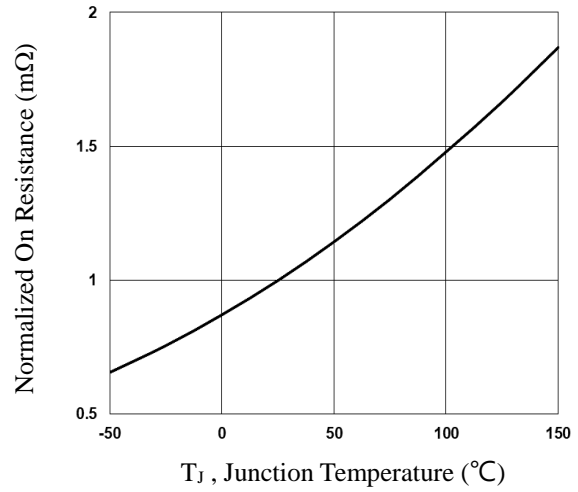


Fig.11 Normalized $R_{DS(on)}$ vs. T_J

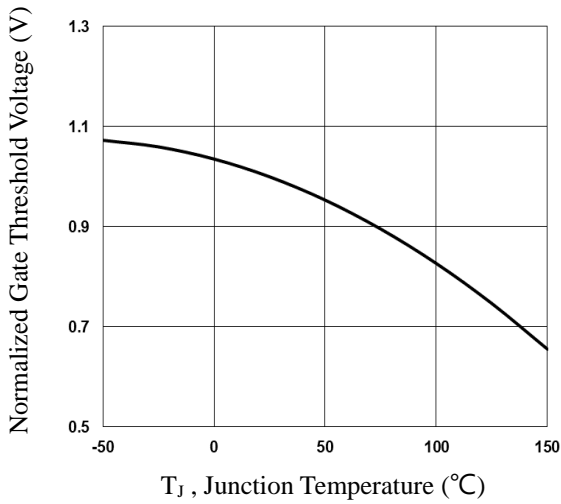


Fig.12 Normalized V_{th} vs. T_J

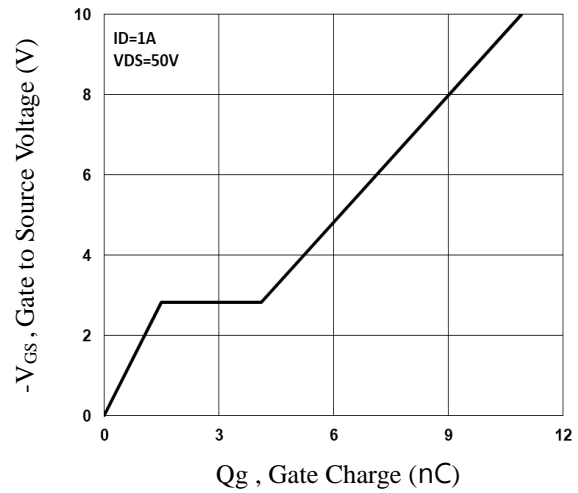


Fig.13 Gate Charge Waveform

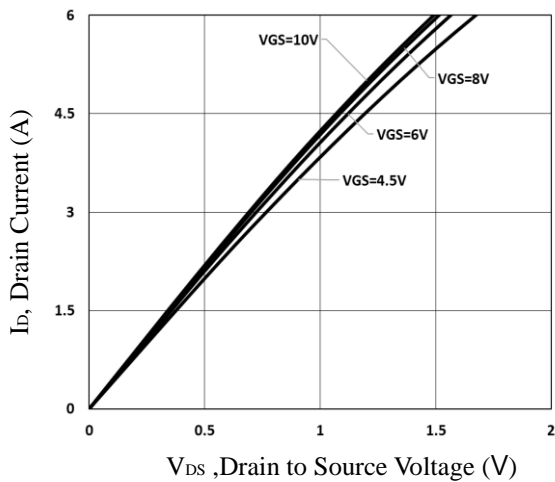


Fig.14 Typical Output Characteristics

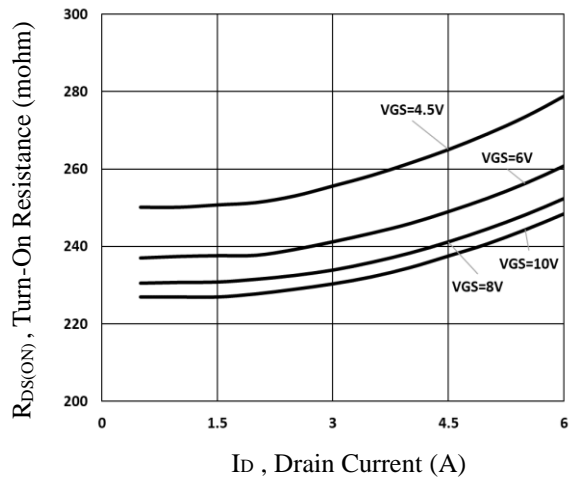


Fig.15 Turn-On Resistance vs. I_D

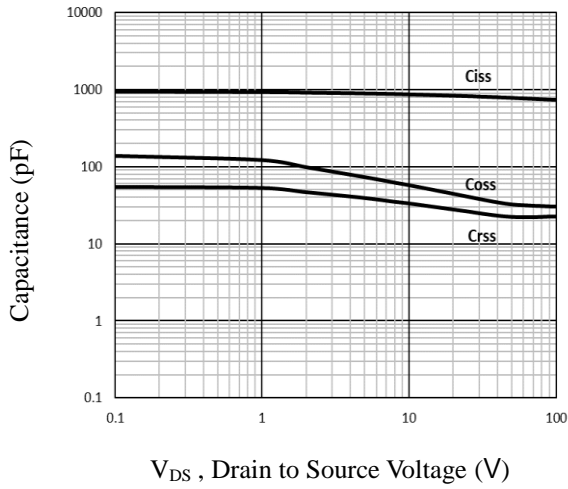


Fig.16 Capacitance Characteristics

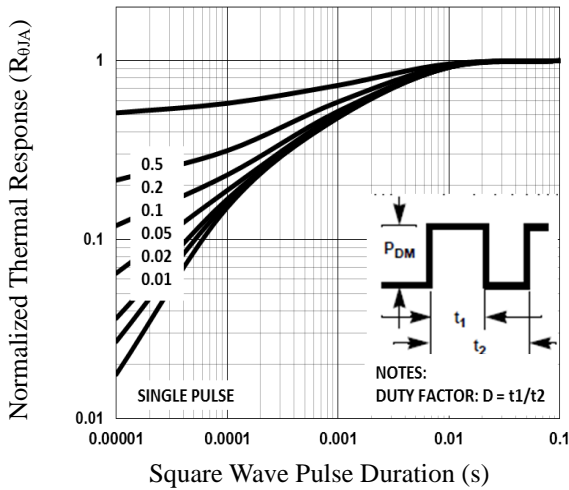


Fig.17 Normalized Transient Impedance

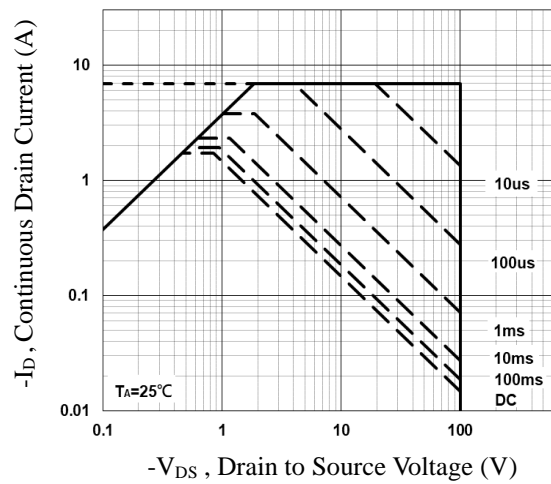
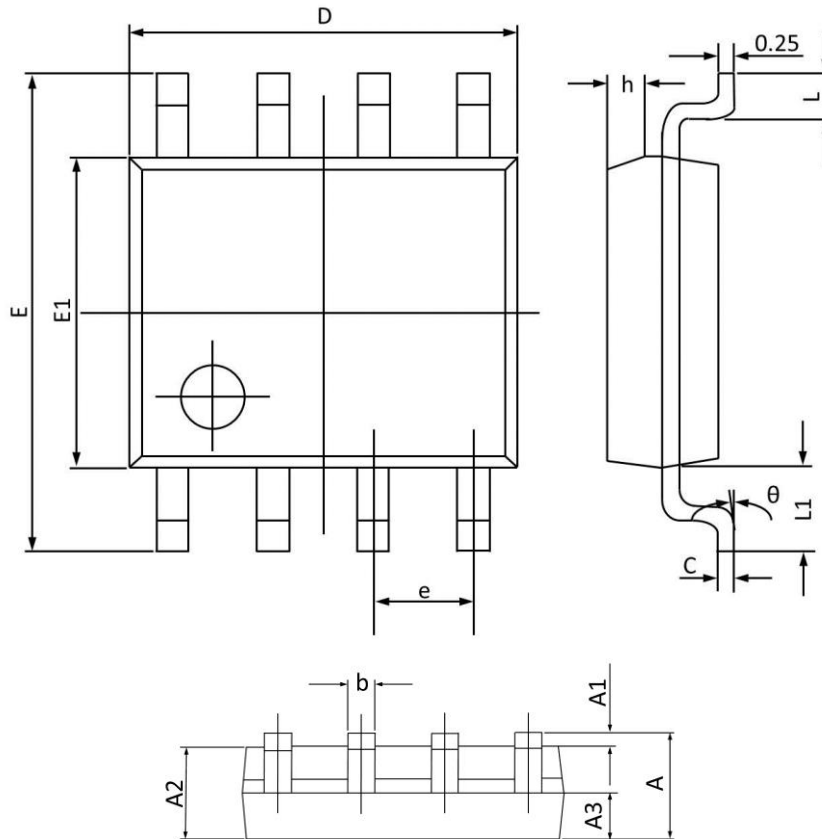


Fig.18 Maximum Safe Operation Area

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°