

GSM0744S

100V N+P Dual Channel MOSFETs

Product 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.

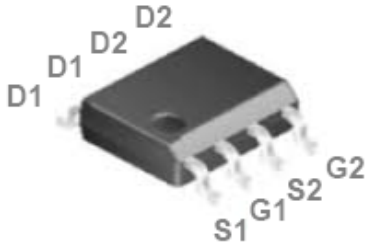
Features

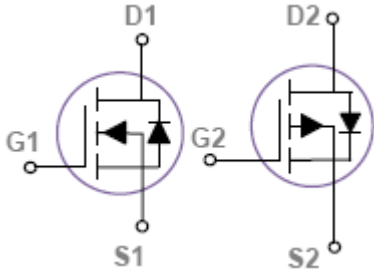
- N-Channel
100V, 2.1A, $R_{DS(ON)}=155m\Omega@V_{GS}=10V$
- P-Channel
-100V, -1.7A, $R_{DS(ON)}=290m\Omega@V_{GS}=-10V$
- Fast switching
- Suit for 4.5V / -4.5V Gate Drive Applications
- Green Device Available

Applications

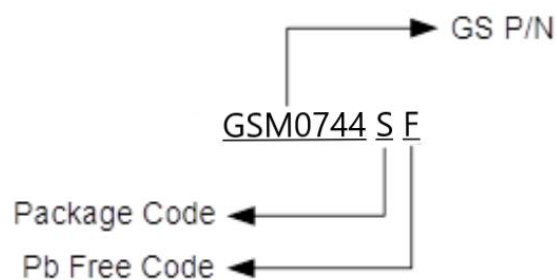
- DC Fan
- Motor Drive Applications
- Networking
- Half / Full Bridge Topology

Packages & Pin Assignments

GSM0744SF (SOP-8)	
 Top View	
Pin	Description
1	Source 1
2	Gate 1
3	Source 2
4	Gate 2
5	Drain 2
6	Drain 2
7	Drain 1
8	Drain 1

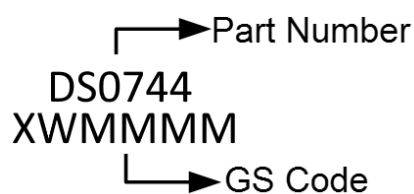


Ordering Information



Part Number	Package	Quantity Reel
GSM0744SF	SOP-8	4000 PCS

Marking Information



Absolute Maximum Ratings

T_C=25°C Unless otherwise noted

Symbol	Parameter		Typical		Unit
			N-Channel	P-Channel	
V _{DS}	Drain-Source Voltage		100	-100	V
V _{GS}	Gate-Source Voltage		±20	±20	V
I _D	Continuous Drain Current	T _A =25°C	2.1	-1.7	A
		T _A =70°C	1.7	-1.4	
I _{DM}	Pulsed Drain Current 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
		Derate above 25°C	0.011		W/°C
T _J	Operating Junction Temperature Range		-55 to +150		°C
T _{STG}	Storage Temperature Range		-55 to +150		°C
R _{θJA}	Thermal Resistance-Junction to Ambient		85		°C/W

Electrical Characteristics (N-Channel)

T_J=25°C Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	100			V
△BV _{DSS} /△T _J	BV _{DSS} Temperature Coefficient	Reference to 25℃, I _D =-1mA		0.09		V/℃
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.2	1.6	2.5	V
△V _{GS(th)}	V _{GS(th)} Temperature Coefficient			-4.2		mV/℃
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =100V, V _{GS} =0V			1	uA
		V _{DS} =80V, V _{GS} =0V, T _J =125℃			10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			2.1	A
I _{SM}	Pulsed Source Current				4.2	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =2A		128	155	mΩ
		V _{GS} =4.5V, I _D =1A		132	170	
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =1A		5		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A			1	V
Dynamic						
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	
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	
t _{d(on)}	Turn-On Time ^{3,4}	V _{DD} =50V, I _D =1A, V _{GS} =10V, R _G =6Ω		7.8	15	ns
t _r				10.2	21	
t _{d(off)}	Turn-Off Time ^{3,4}			17.4	35	
t _f				3.1	7	
R _g	Gate Resistance	V _{GS} =0V,V _{DS} =0V, f=1MHz		1.48	3	Ω

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, N-CH IAS=7A., P-CH IAS=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.

Electrical Characteristics (P-Channel)

T_J=25°C Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-100			V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25℃, I _D =-1mA		-0.06		V/℃
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-1.2	-1.6	-2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient			-4.4		mV/℃
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-100V, V _{GS} =0V			-1	uA
		V _{DS} =-80V, V _{GS} =0V, T _J =125℃			-10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			-1.7	A
I _{SM}	Pulsed Source Current				-3.4	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =-10V, I _D =-1.5A		240	290	mΩ
		V _{GS} =-4.5V, I _D =-1A		260	340	
g _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-1A		5		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A			-1	V
Dynamic						
Q _g	Total Gate Charge ^{3,4}	V _{DS} =-50V, V _{GS} =-10V, I _D =-1A		10.9	22	nC
Q _{gs}	Gate-Source Charge ^{3,4}			1.5	3	
Q _{gd}	Gate-Drain Charge ^{3,4}			2.6	5.2	
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	
t _{d(on)}	Turn-On Time ^{3,4}	V _{DD} =-50V, I _D =-1A, V _{GS} =-10V, R _G =6Ω		11.6	23	ns
t _r				4.8	10	
t _{d(off)}	Turn-Off Time ^{3,4}			35.8	72	
t _f				18.8	38	
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		15	30	Ω

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.

Typical Performance Characteristics (N-Channel)

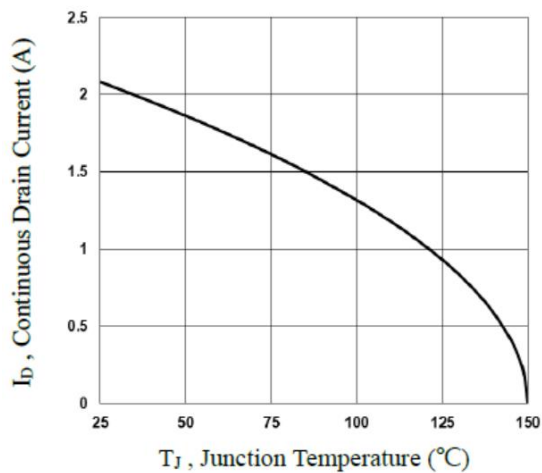


Fig.1 Continuous Drain Current vs. T_J

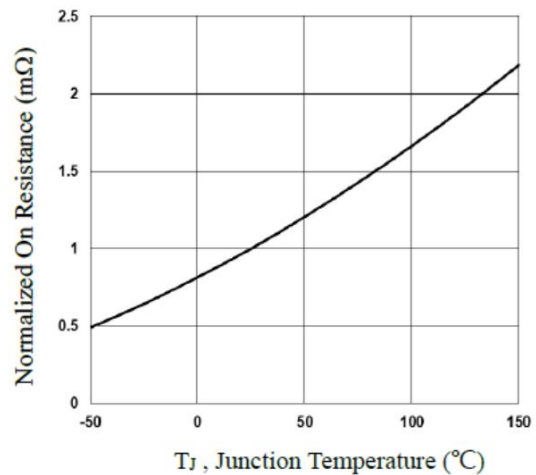


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

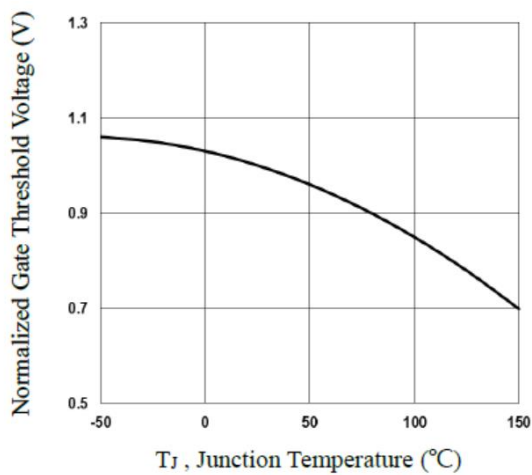


Fig.3 Normalized V_{th} vs. T_J

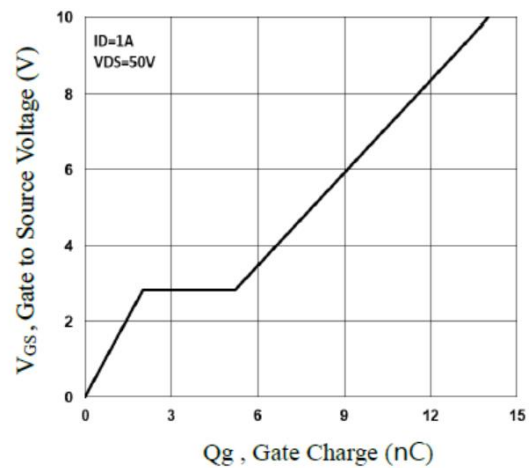


Fig.4 Gate Charge Waveform

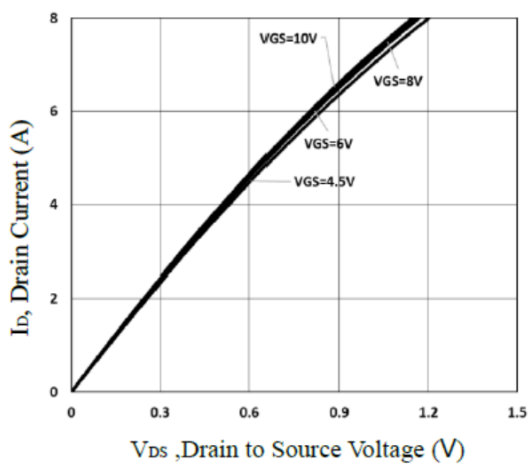


Fig.5 Typical Output Characteristics

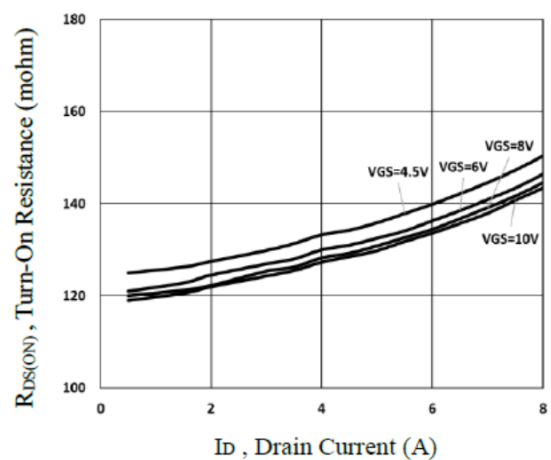


Fig.6 Turn-On Resistance vs. I_D

Typical Performance Characteristics (N-Channel)

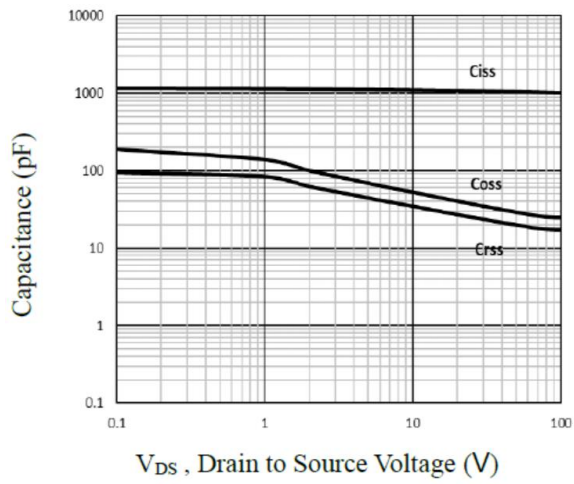


Fig.7 Capacitance Characteristics

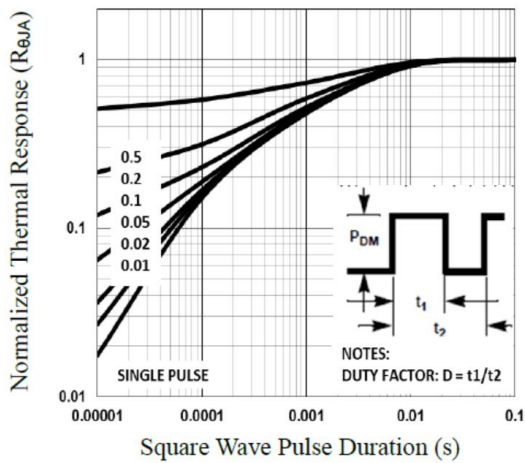


Fig.8 Normalized Transient Impedance

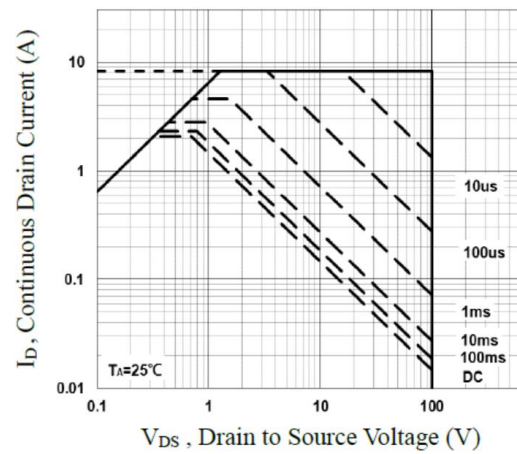


Fig.9 Maximum Safe Operation Area

Typical Performance Characteristics (P-Channel)

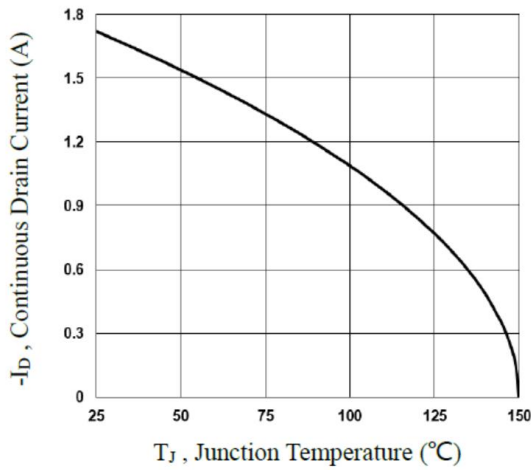


Fig.10 Continuous Drain Current vs. T_J

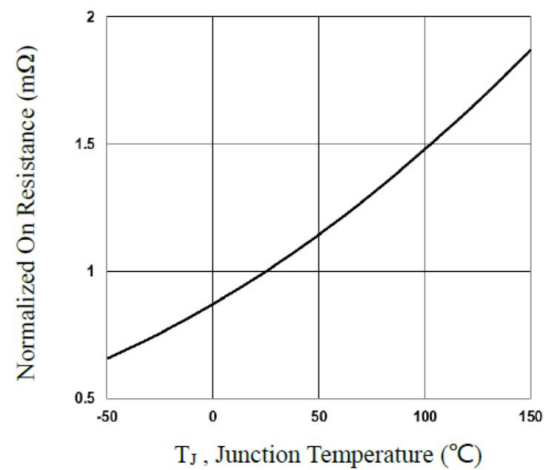


Fig.11 Normalized $R_{DS(on)}$ vs. T_J

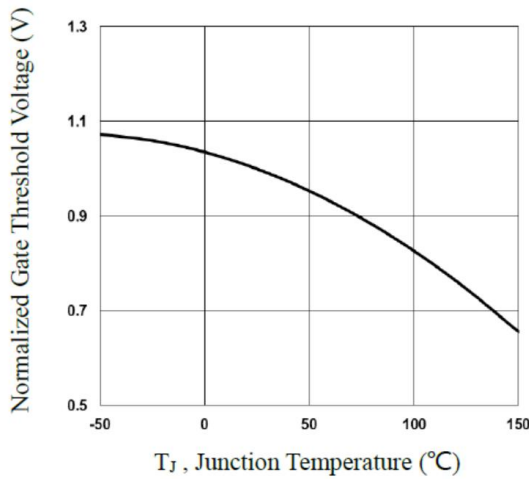


Fig.12 Normalized V_{th} vs. T_J

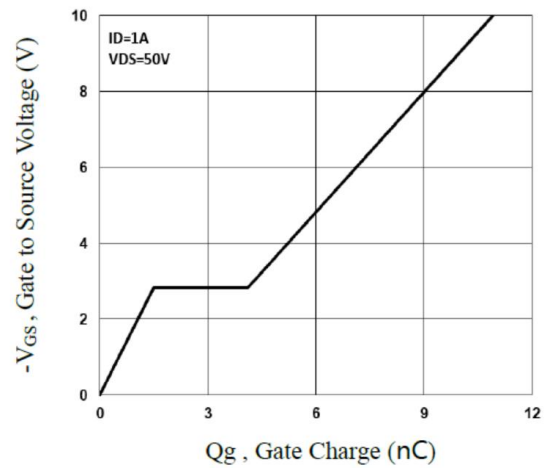


Fig.13 Gate Charge Waveform

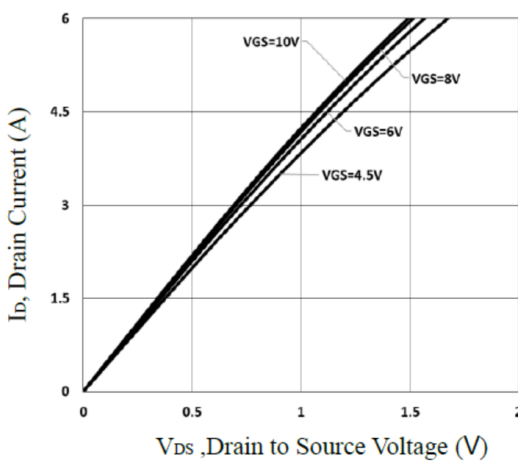


Fig.14 Typical Output Characteristics

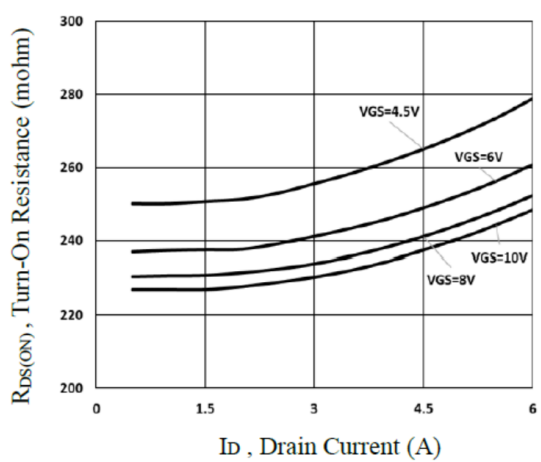


Fig.15 Turn-On Resistance vs. I_D

Typical Performance Characteristics (P-Channel)

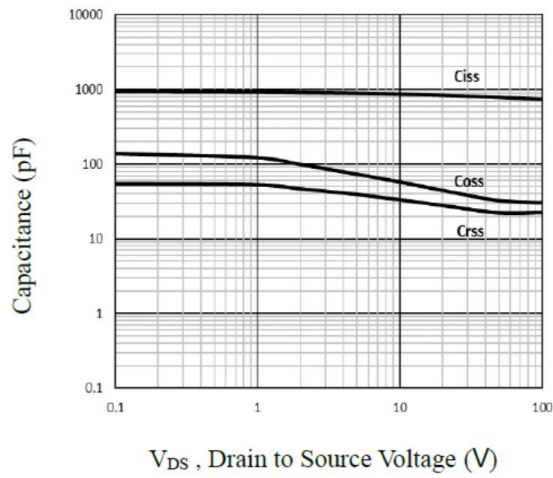


Fig.16 Capacitance Characteristics

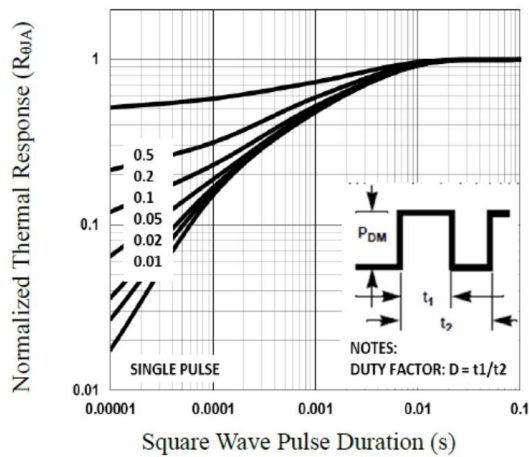


Fig.17 Normalized Transient Impedance

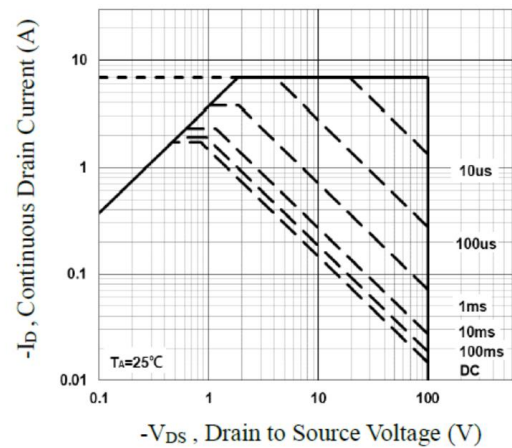
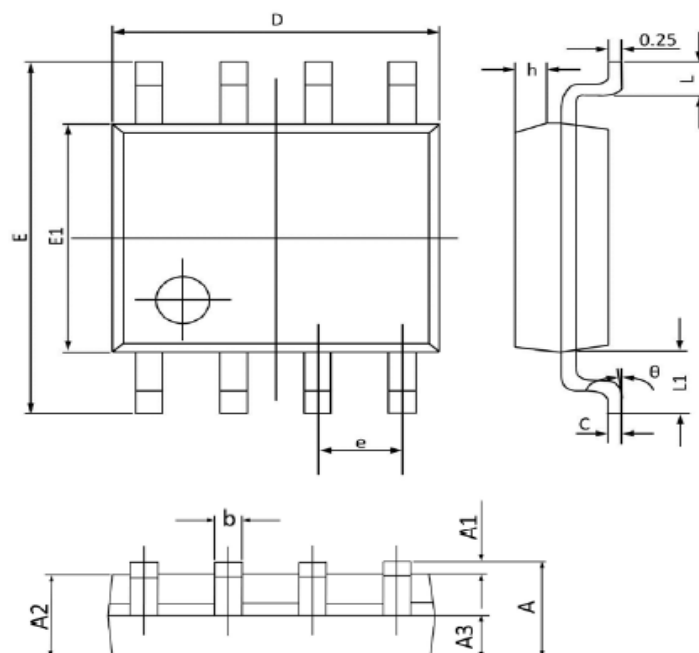


Fig.18 Maximum Safe Operation Area

Package Dimension

SOP-8



Dimensions

Symbol	Millimeters		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°

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