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

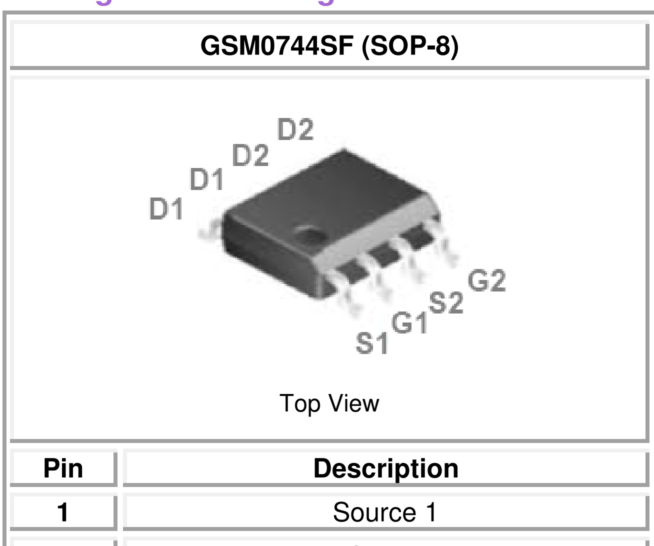
- N-Channel
  100V, 2.1A, $R_{DS(ON)}$=155mΩ@V_{GS}=10V
- P-Channel
  -100V, -1.7A, $R_{DS(ON)}$=290mΩ@V_{GS}=-10V
- Fast switching
- Suit for 4.5V / -4.5V Gate Drive Applications
- Green Device Available

Applications

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

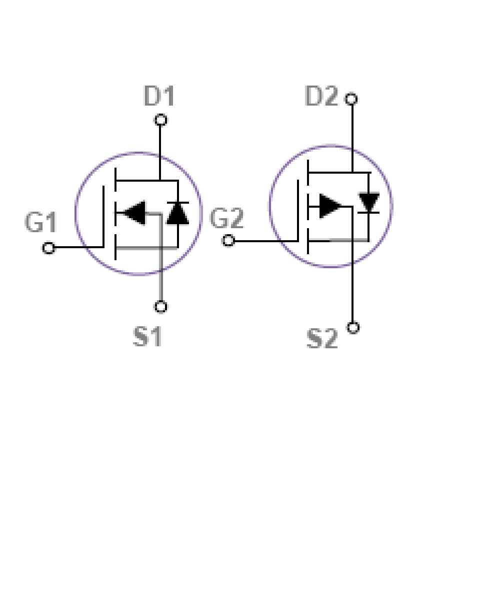
Packages & Pin Assignments

GSM0744SF (SOP-8)

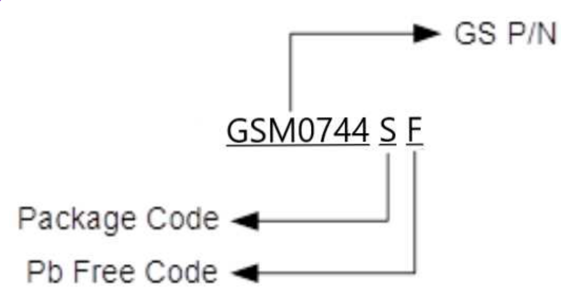


Top View

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

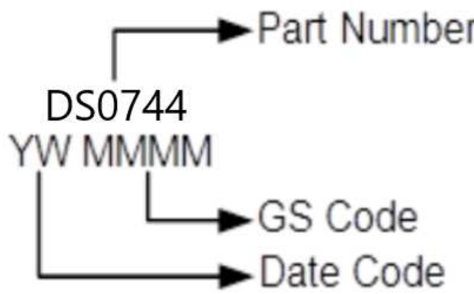


Ordering Information



Part Number	Package	Quantity Reel
GSM0744SF	SOP-8	4000 PCS

Marking Information



Absolute Maximum Ratings

T_C=25ºC 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℃	2.1	-1.7	A
		T_A=70℃	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℃	1.47		W
		Derate above 25℃	0.011		W/℃
T_J	Operating Junction Temperature Range		-55 to +150		℃
T_{STG}	Storage Temperature Range		-55 to +150		℃
$R_{θJA}$	Thermal Resistance-Junction to Ambient		85		℃/W

Electrical Characteristics (N-Channel)

T_J=25℃ 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	V_{DS}=V_{GS},I_D=250uA		-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	
Rg	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℃.
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℃ 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
$\triangle BV_{DSS}/\triangle T_J$	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
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient	V_{DS}=V_{GS},I_D=-250uA		-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	
Rg	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)

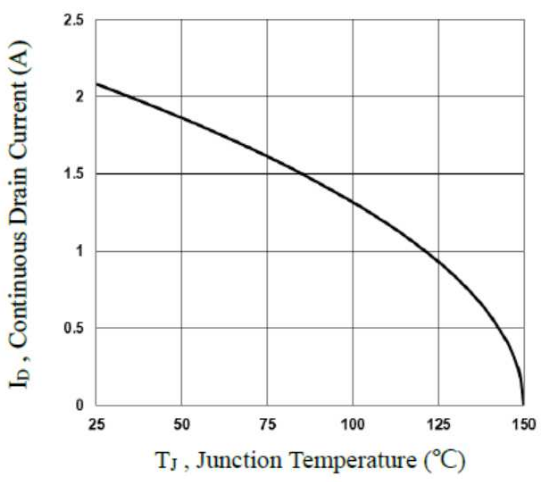


Fig.1 Continuous Drain Current vs. T_J

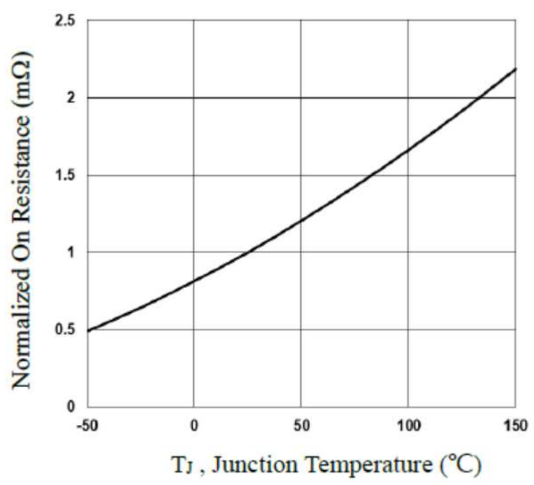


Fig.2 Normalized RDSON vs. T_J

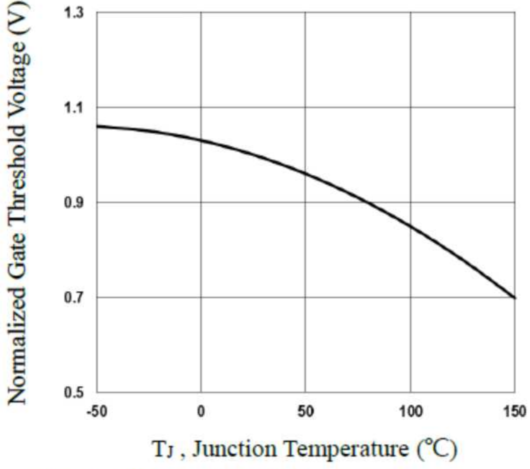


Fig.3 Normalized V_{th} vs. T_J

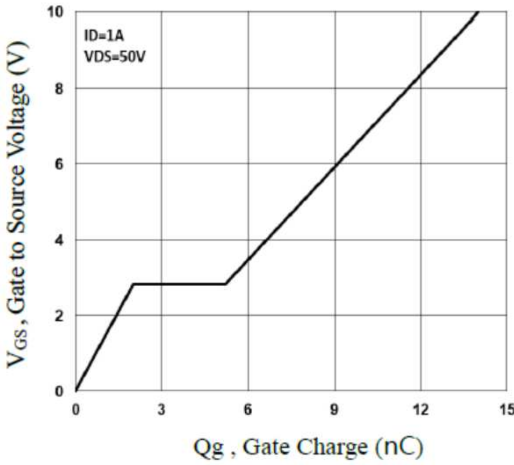


Fig.4 Gate Charge Waveform

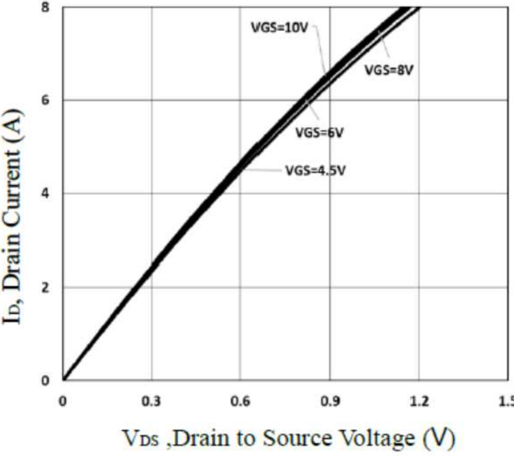


Fig.5 Typical Output Characteristics

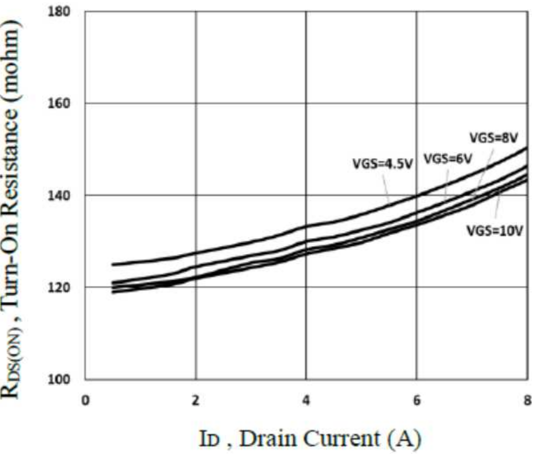


Fig.6 Turn-On Resistance vs. I_D

Typical Performance Characteristics (N-Channel)

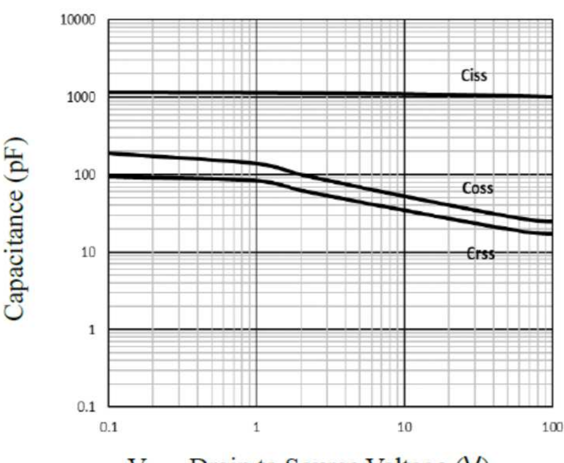


Fig.7 Capacitance Characteristics

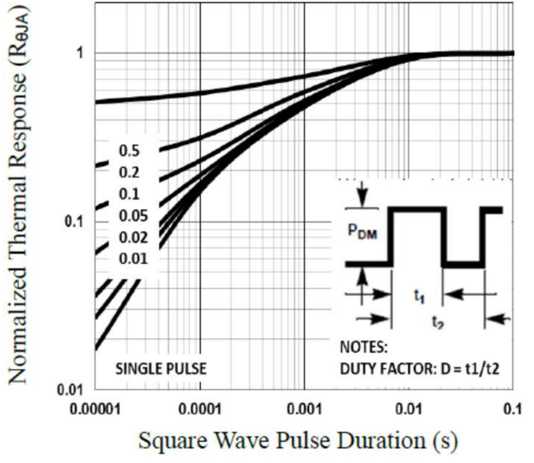


Fig.8 Normalized Transient Impedance

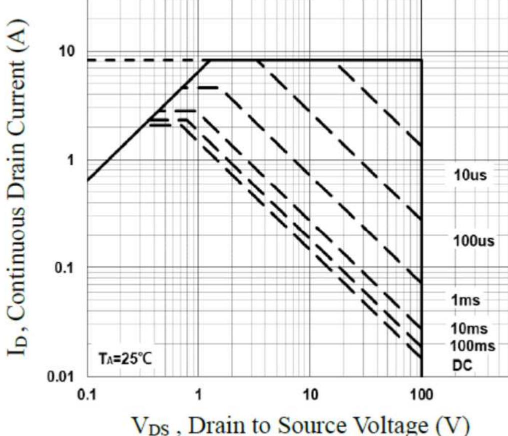


Fig.9 Maximum Safe Operation Area

Typical Performance Characteristics (P-Channel)

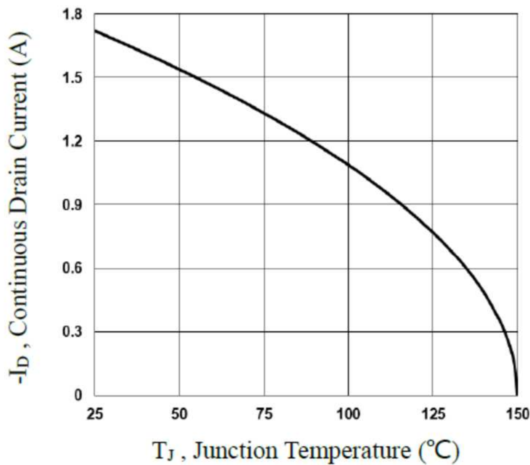


Fig.10 Continuous Drain Current vs. T_J

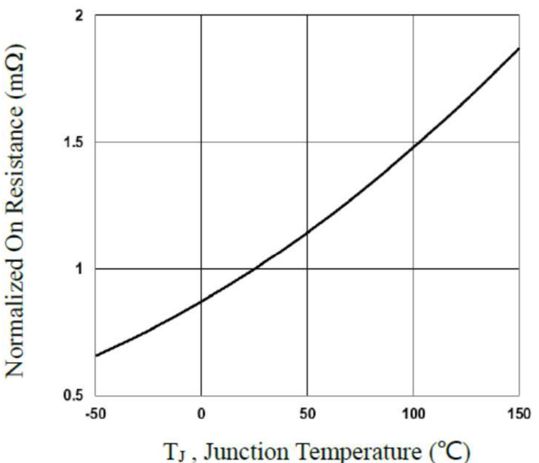


Fig.11 Normalized RDSON vs. T_J

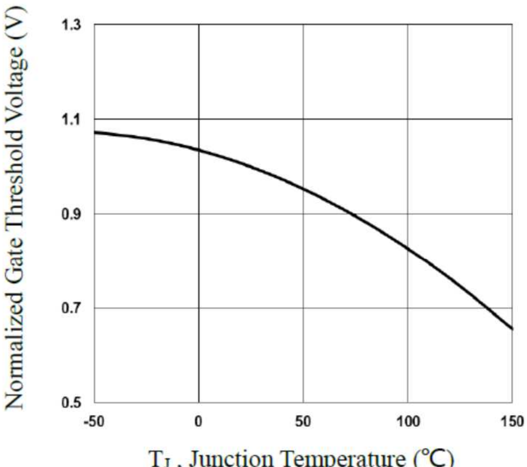


Fig.12 Normalized V_{th} vs. T_J

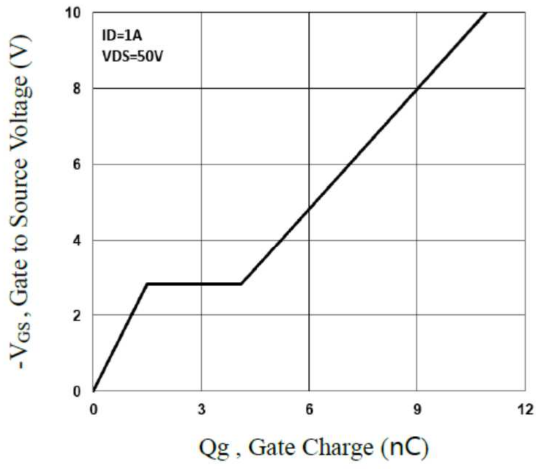


Fig.13 Gate Charge Waveform

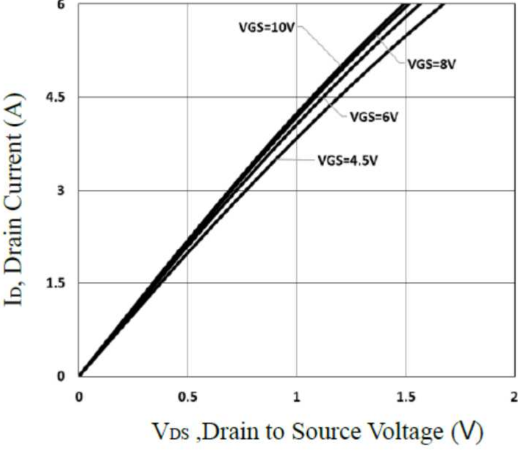


Fig.14 Typical Output Characteristics

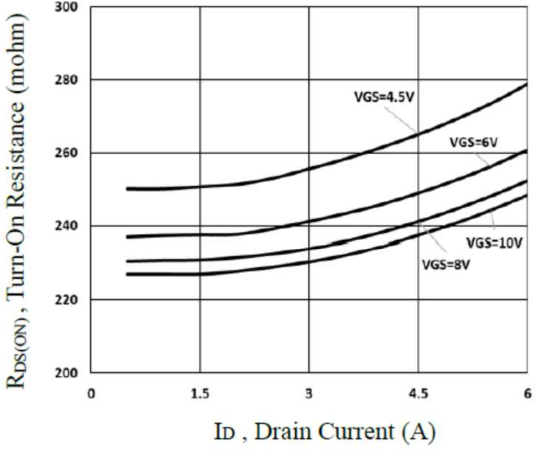
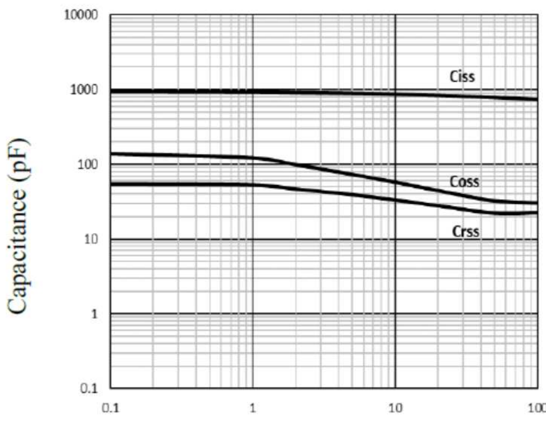


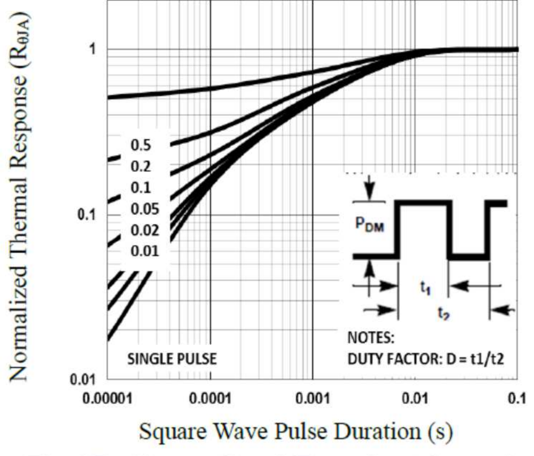
Fig.15 Turn-On Resistance vs. I_D

Typical Performance Characteristics (P-Channel)



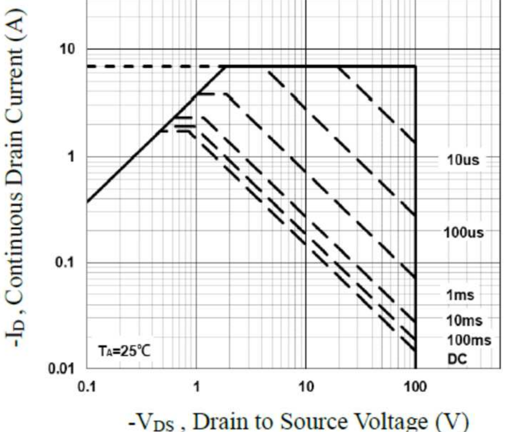
VDS , Drain to Source Voltage (V)

Fig.16 Capacitance Characteristics



Square Wave Pulse Duration (s)

Fig.17 Normalized Transient Impedance

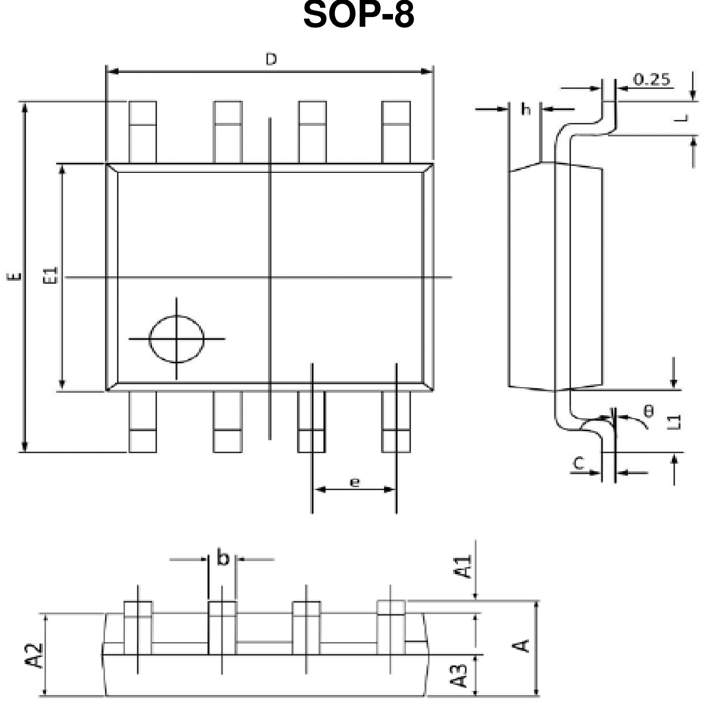


-VDS , Drain to Source Voltage (V)

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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