

GSM49B4S

40V N-Channel MOSFETs

Product Description

These N-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.

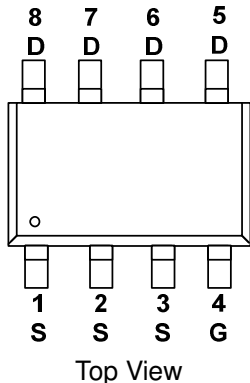
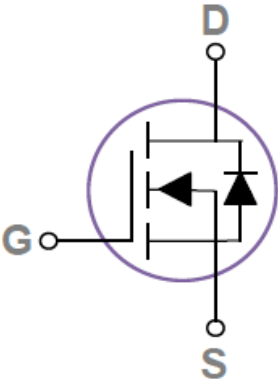
Features

- 40V, 7.9A, $R_{DS(ON)}=13.5m\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

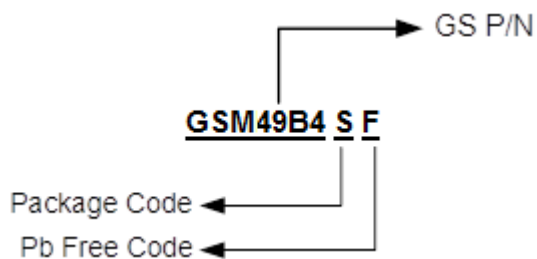
Applications

- Notebook
- Load Switch
- LED applications
- Hand-Held Device

Packages & Pin Assignments

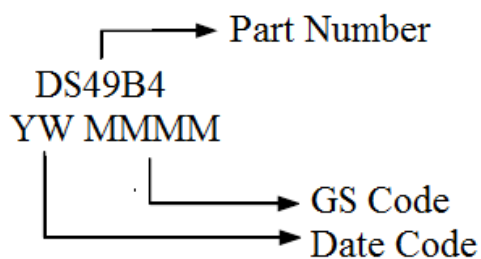
GSM49B4SF (SOP-8)		
 <p>Top View</p>		
		
Pin No	Symbol	Description
1,2,3	S	Source
4	G	Gate
5,6,7,8	D	Drain

Ordering Information



Part Number	Package	Quantity Reel
GSM49B4SF	SOP-8	4000 PCS

Marking Information



Absolute Maximum Ratings

T_c=25°C Unless otherwise noted

Symbol	Parameter	Typical	Unit
V _{DS}	Drain-Source Voltage	40	V
V _{GS}	Gate-Source Voltage	+20/-12	V
I _D	Continuous Drain Current	T _c =25°C	7.9
		T _c =70°C	6.3
I _{DM}	Pulsed Drain Current ¹	31.6	A
EAS	Single Pulse Avalanche Energy ²	24.2	mJ
IAS	Single Pulse Avalanched Current ²	22	A
P _D	Power Dissipation (T _c =25°C)	1.47	W
	Power Dissipation (Derate above 25°C)	0.12	W/°C
T _{STG}	Storage Temperature Range	-55 to +150	°C
T _J	Operating Junction Temperature Range	-55 to +150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient	85	°C/W

Electrical Characteristics

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	40	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.02	---	V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.0	1.5	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	4.0	---	mV/°C
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =+20V	---	---	100	nA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =40V, V _{GS} =0V T _J =25°C	---	---	1	uA
		V _{DS} =32V, V _{GS} =0V, T _J =85°C	---	---	10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	7.9	A
I _{SM}	Pulsed Source Current		---	---	15.8	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =4A	---	11	13.5	mΩ
		V _{GS} =10V, I _D =4A, T _J =125°C	---	16.3	---	
		V _{GS} =4.5V, I _D =3A	---	17.5	22	

Electrical Characteristics (Continue)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =1A	---	4	---	S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A T _J =25°C	---	---	1	V
Dynamic						
Q _g	Total Gate Charge ^{3,4}	V _{DS} =32V, V _{GS} =4.5V, I _D =4A	---	6.9	14	nC
Q _{gs}	Gate-Source Charge ^{3,4}		---	0.6	1.2	
Q _{gd}	Gate-Drain Charge ^{3,4}		---	3.2	6.4	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	451	900	pF
C _{oss}	Output Capacitance		---	210	420	
C _{rss}	Reverse Transfer Capacitance		---	27	54	
t _{d(on)}	Turn-On Time ^{3,4}	V _{DD} =20V, I _D =1A, V _{GS} =10V, R _G =1Ω	---	3.9	7.8	ns
t _r			---	18.1	38	
t _{d(off)}	Turn-Off Time ^{3,4}		---	16.2	32	
t _f			---	57.5	116	
R _g	Gate Resistance		V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.9	

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=22A, 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.

Typical Performance Characteristics

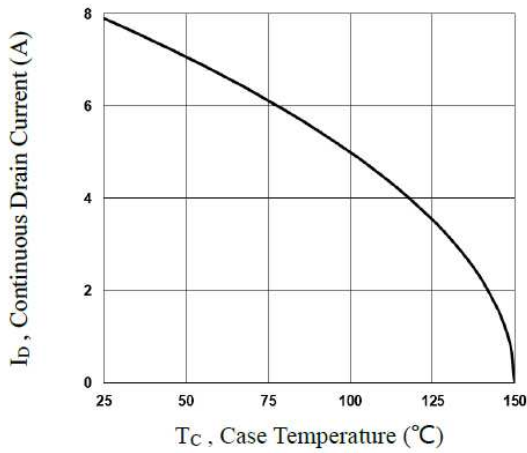


Fig.1 Continuous Drain Current vs. T_C

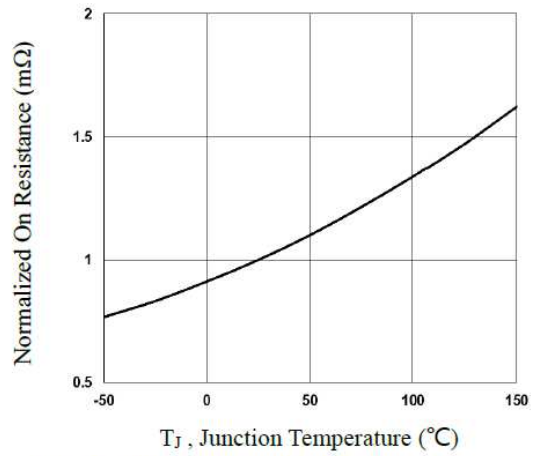


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

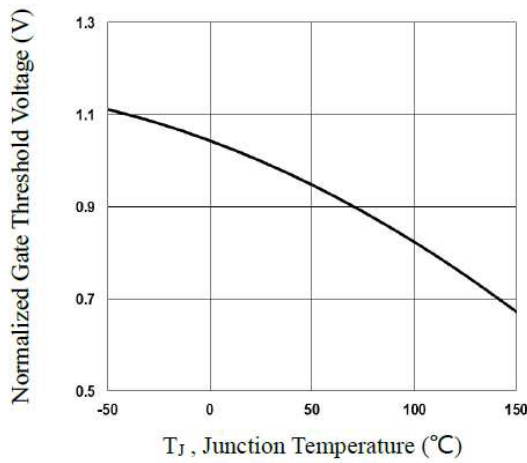


Fig.3 Normalized V_{th} vs. T_J

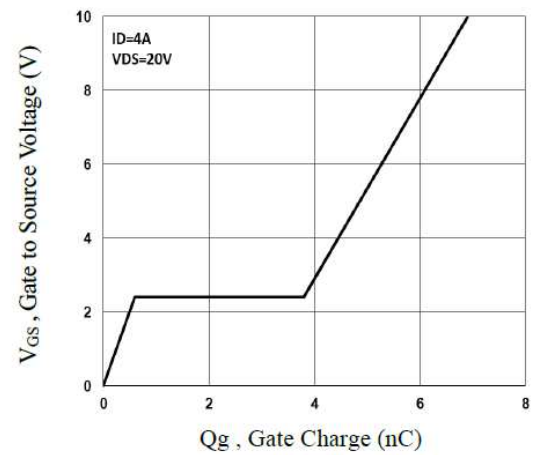


Fig.4 Gate Charge Waveform

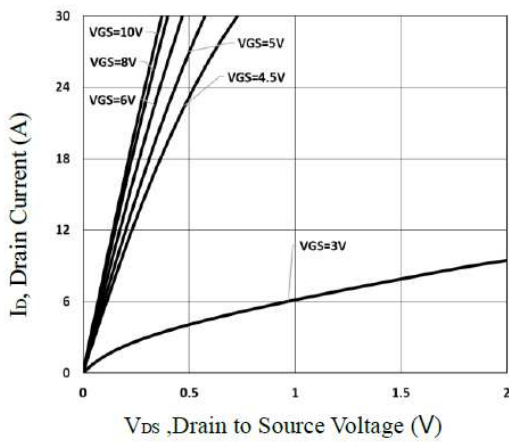


Fig.5 Typical Output Characteristics

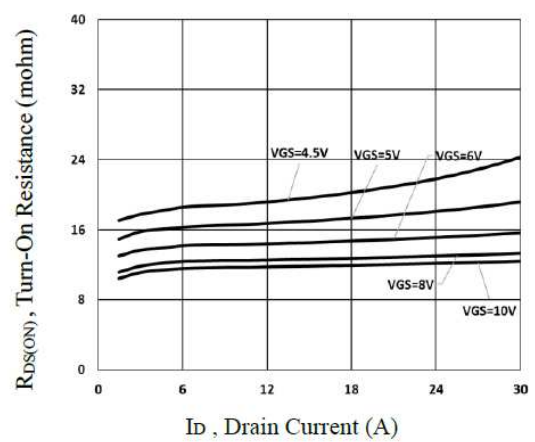


Fig.6 Turn-On Resistance vs. I_D

Typical Performance Characteristics (Continue)

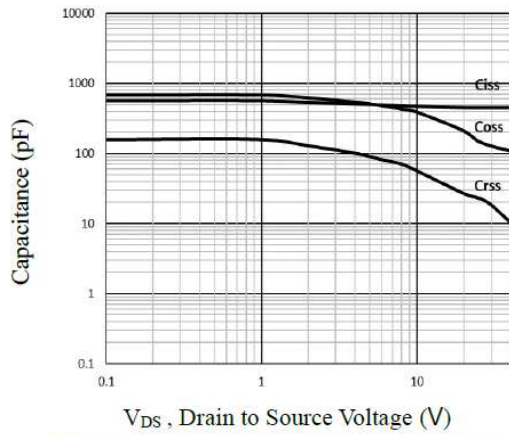


Fig.7 Capacitance Characteristics

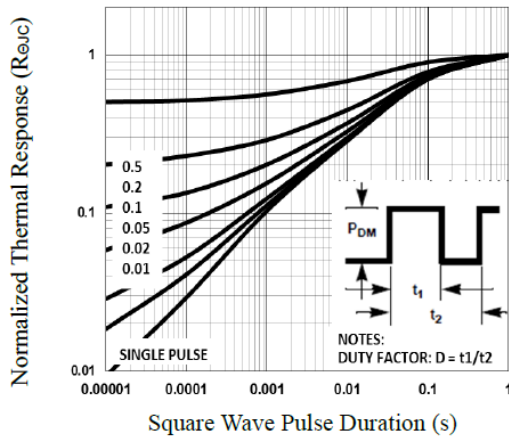


Fig.8 Normalized Transient Response

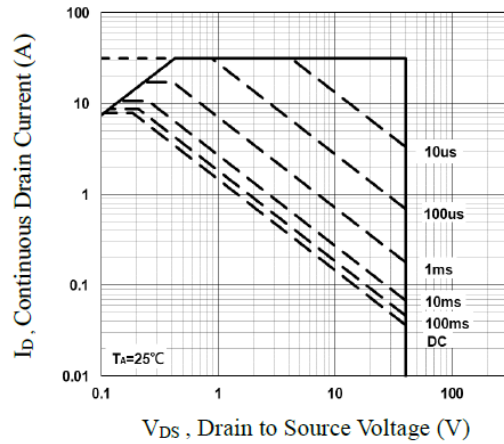


Fig.9 Maximum Safe Operation Area

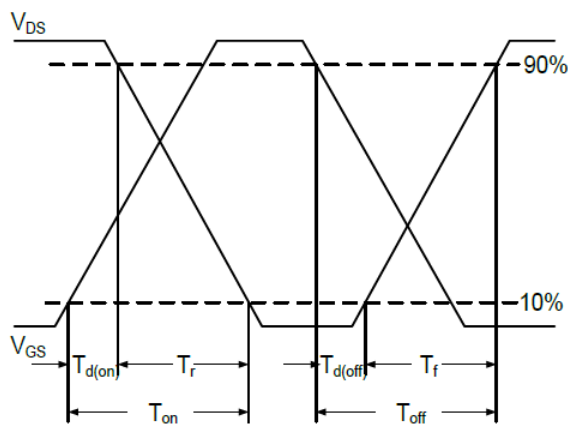


Fig.10 Switching Time Waveform

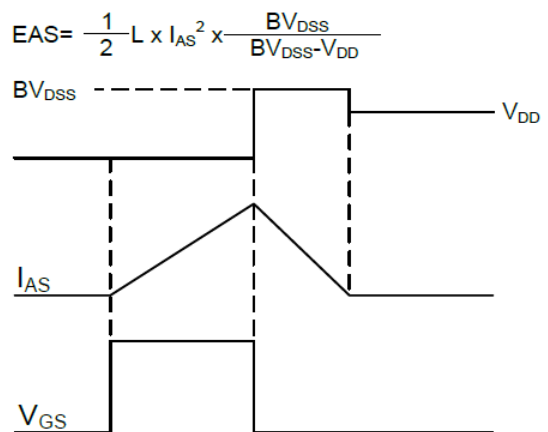
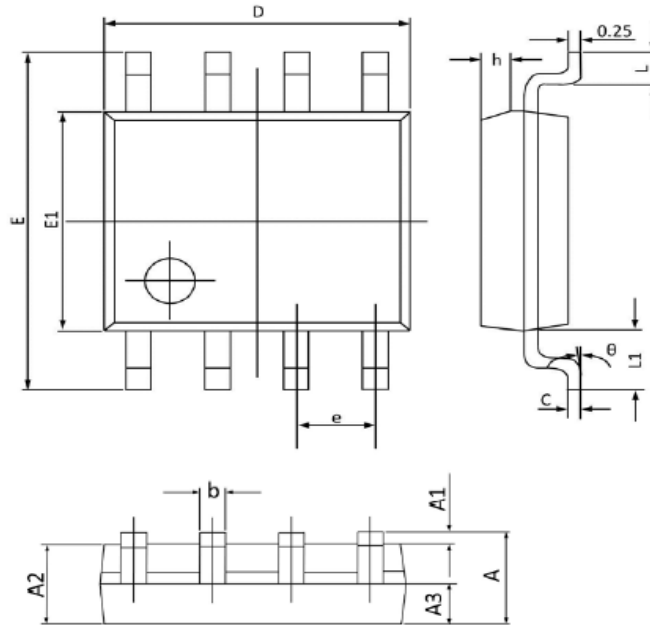


Fig.11 EAS Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

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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