GSMDS3903

30V P-Channel MOSFETs

Product Description

These P-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

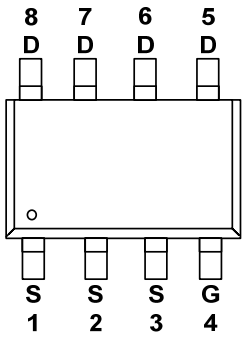
- -30V, -13A, $R_{DS(ON)}$=9.5mΩ@V_{GS}=-10V
- Fast switching
- Suit for -4.5V Gate Drive Applications
- Green Device Available
- SOP-8 package design

Applications

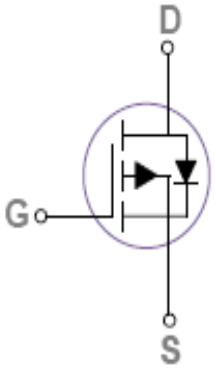
- MB / VGA / Vcore
- POL Applications
- Load Switch
- LED Application

Packages & Pin Assignments

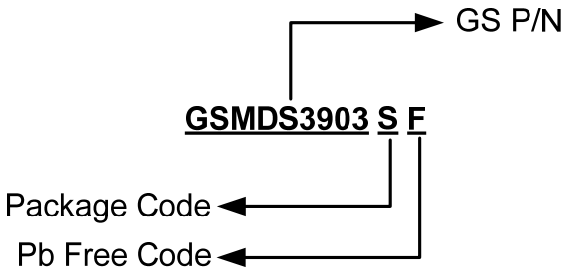
GSMDS3903SF (SOP-8)



Pin	Description	Pin	Description
1	Source	5	Drain
2	Source	6	Drain
3	Source	7	Drain
4	Gate	8	Drain

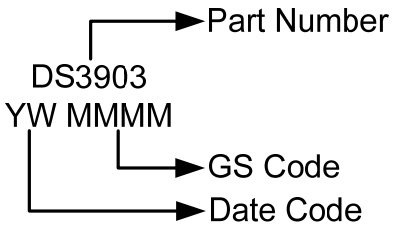


Ordering Information



Part Number	Package	Quantity Reel
GSMDS3903SF	SOP-8	4000 PCS

Marking Information



Absolute Maximum Ratings

T_A=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate –Source Voltage		±20	V
I_D	Continuous Drain Current	T_A=25℃	-13	A
		T_A=100℃	-7.8	
I_{DM}	Pulsed Drain Current		-52	A
P_D	Power Dissipation (T_A=25℃)		4.2	W
	Power Dissipation (Derate above 25℃)		0.034	W/℃
T_J	Operating Junction Temperature Range		-55 to +150	℃
T_{STG}	Storage Temperature Range		-55 to +150	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		60	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		30	℃/W

Electrical Characteristics

T_A=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	-30			V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=-1mA		-0.03		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			4		mV/℃
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V,V_{GS}=0V			-1	uA
		V_{DS}=-24V,V_{GS}=0V, T_J=125℃			-10	
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			-13	A
I_{SM}	Pulsed Source Current				-26	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS} =-10V,I_D=-10A		7.5	9.5	mΩ
		V_{GS} =-4.5V,I_D=-8A		12	15	
g_{FS}	Forward Transconductance	V_{DS}=-10V,I_D=-10A		13		S
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=-1A			-1	V
Dynamic						
Q_g	Total Gate Charge	V_{DS}=-15V,V_{GS}=-4.5V, I_D=-10A		35	55	nC
Q_{gs}	Gate-Source Charge			10.8	16	
Q_{gd}	Gate-Drain Charge			10.6	16	
C_{iss}	Input Capacitance	V_{DS}=-15V,V_{GS}=0V, f=1MHz		3300	5000	pF
C_{oss}	Output Capacitance					
C_{rss}	Reverse Transfer Capacitance					
$t_{d(on)}$	Turn-On Time	V_{DD}=-15V,I_D=-1A, V_{GS}=-10V,R_G=6Ω		24.5	38	ns
t_r				10.5	16	
$t_{d(off)}$	Turn-Off Time			156.8	230	
t_f				50	75	

Typical Performance Characteristics

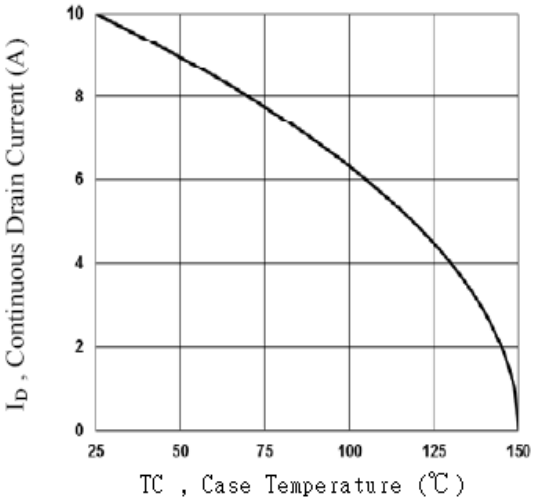


Fig.1 Continuous Drain Current vs. T_c

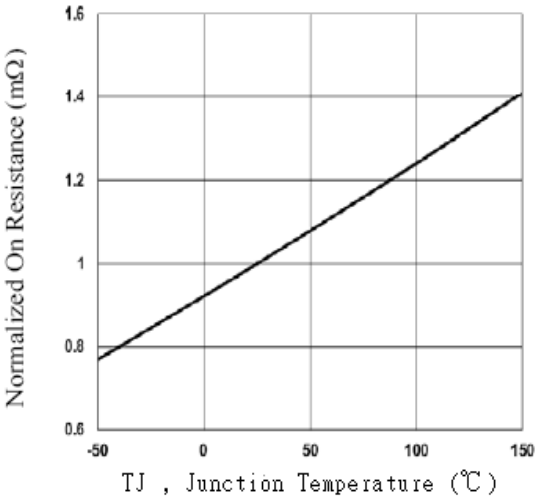


Fig.2 Normalized RDSON vs. T_J

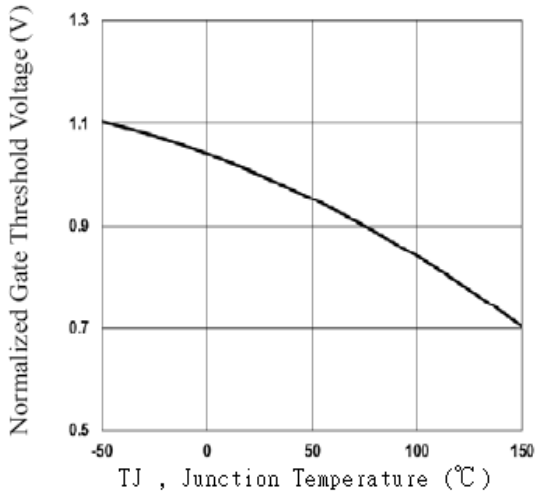


Fig.3 Normalized V_{th} vs. T_J

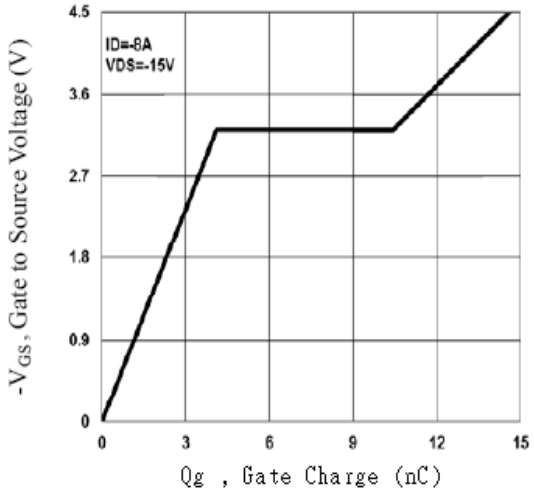


Fig.4 Gate Charge Waveform

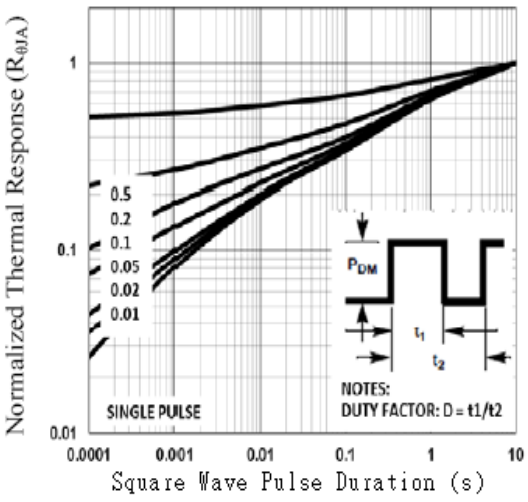


Fig.5 Normalized Transient Impedance

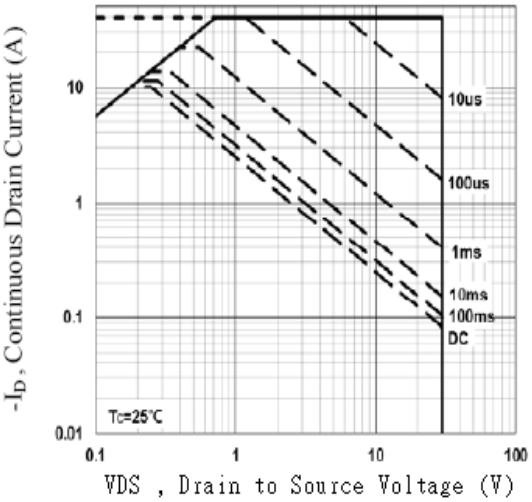
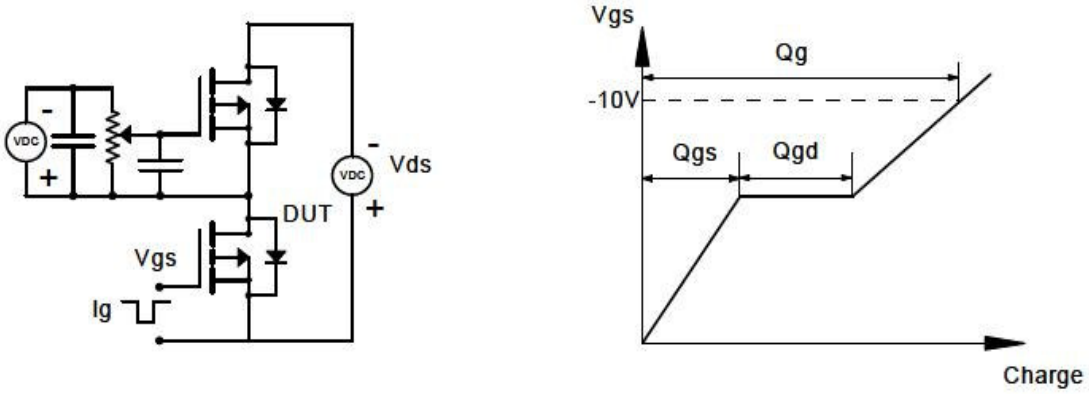


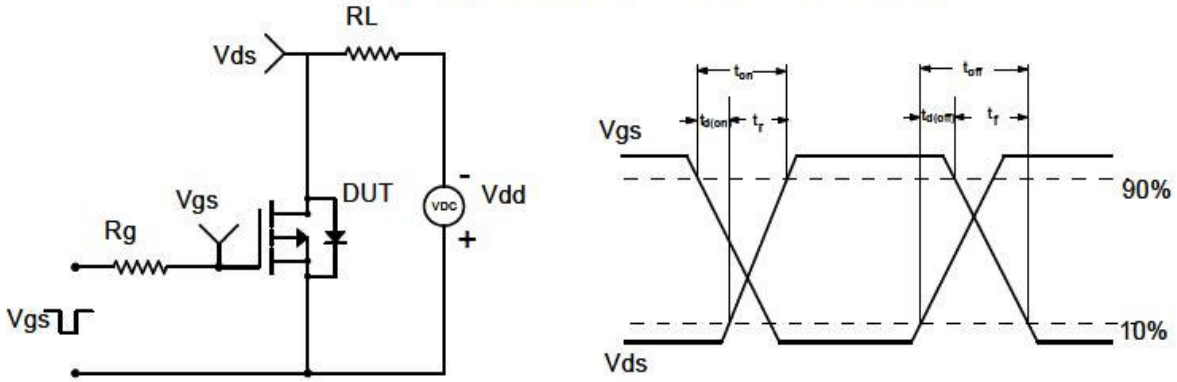
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

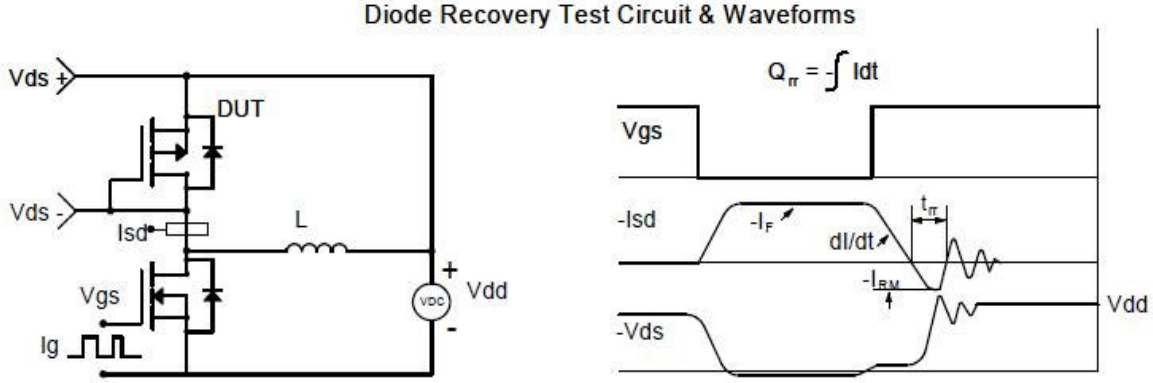
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

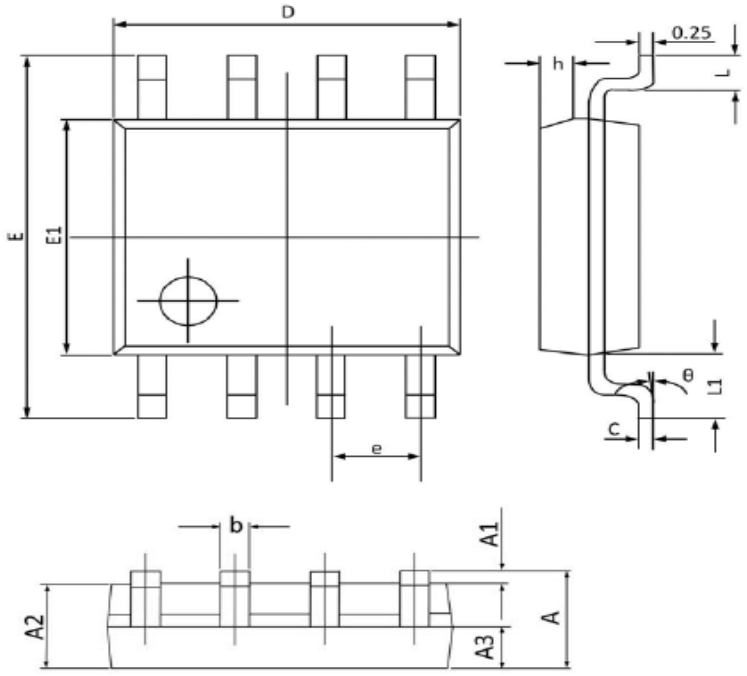


Diode Recovery Test Circuit & Waveforms



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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