

GSMDS2603

20V 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

- -20V, -14A, $R_{DS(ON)}=8.5m\Omega@V_{GS}=-4.5V$
- Improved dv/dt capability
- Fast switching
- Suit for -1.8V Gate Drive Applications
- Green Device Available
- SOP-8 package design

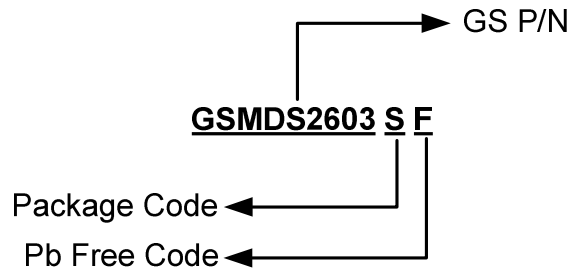
Applications

- Notebook
- Load Switch
- Networking
- Hand-Held Instruments

Packages & Pin Assignments

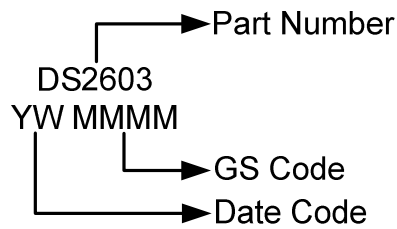
GSMDS2603SF (SOP-8)			
Pin	Description	Pin	Description
1	Source	5	Drain
2	Source	6	Drain
3	Source	7	Drain
4	Gate	8	Drain

Ordering Information



Part Number	Package	Quantity Reel
GSMDS2603SF	SOP-8	4000 PCS

Marking Information



Absolute Maximum Ratings

$T_C=25^\circ\text{C}$ Unless otherwise noted

Symbol	Parameter	Typical	Unit
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	-14
		$T_C=100^\circ\text{C}$	-8.8
I_{DM}	Pulsed ¹ Drain Current ¹	-56	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	2	W
	Power Dissipation (Derate above 25°C)	0.016	W/ $^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to +150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to +150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	17	$^\circ\text{C}/\text{W}$

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	-20			V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA		-0.01		V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-0.3	-0.6	-1.0	V
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±12V			±100	nA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-20V, V _{GS} =0V T _J =25°C			-1	uA
		V _{DS} =-16V, V _{GS} =0V, T _J =125°C			-10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			-14	A
I _{SM}	Pulsed Source Current				-28	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-8A		6.5	8.5	mΩ
		V _{GS} =-2.5V, I _D =-5A		9	12	
		V _{GS} =-1.8V, I _D =-3A		12	17	
g _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-5A		20		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A T _J =25°C			-1	V
Dynamic						
Q _g	Total Gate Charge ^{2,3}	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-5A		44.4	80	nC
Q _{gs}	Gate-Source Charge ^{2,3}			7.2	14	
Q _{gd}	Gate-Drain Charge ^{2,3}			10.2	20	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz		4060	8000	pF
C _{oss}	Output Capacitance			520	1000	
C _{rss}	Reverse Transfer Capacitance			400	800	
t _{d(on)}	Turn-On Time ^{2,3}	V _{DD} =-10V, I _D =-1A, V _{GS} =-4.5V, R _G =25Ω		13.2	26	ns
t _r				68	120	
t _{d(off)}	Turn-Off Time ^{2,3}			160	320	
t _f				154	300	

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

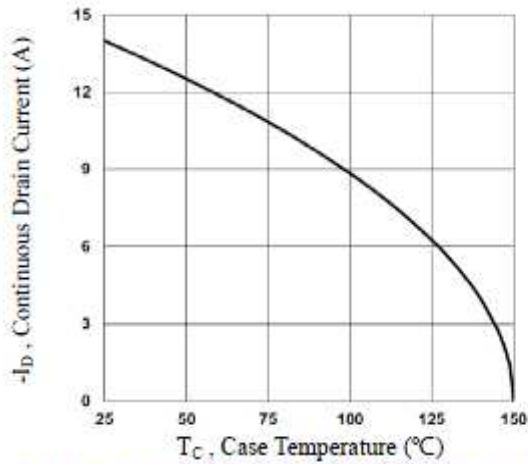


Fig.1 Continuous Drain Current vs. T_C

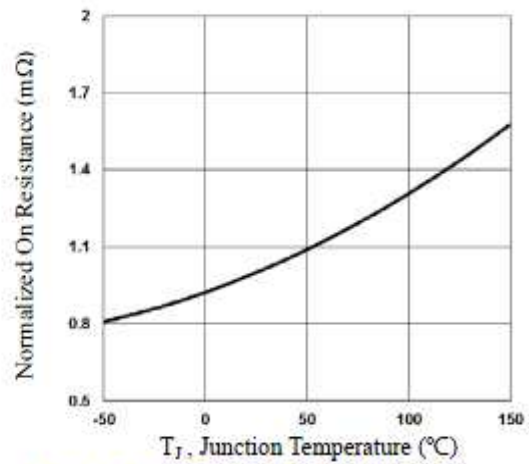


Fig.2 Normalized RDS(on) vs. T_J

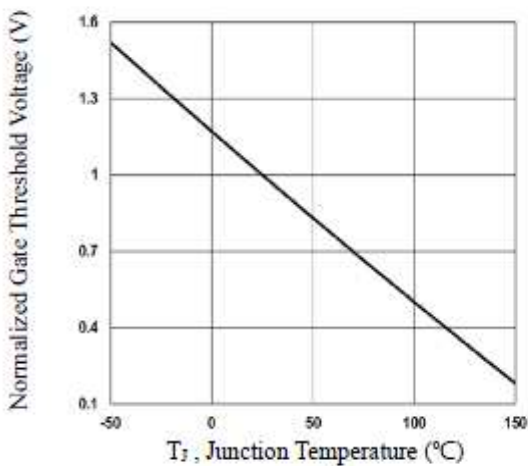


Fig.3 Normalized V_{th} vs. T_J

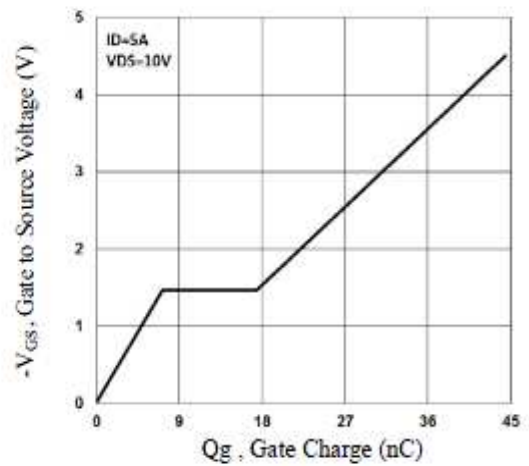


Fig.4 Gate Charge Waveform

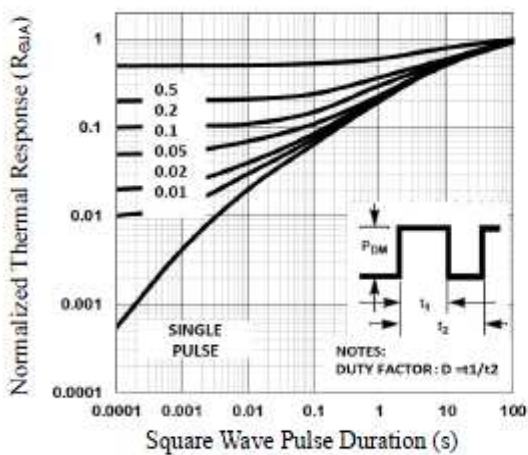


Fig.5 Normalized Transient Response

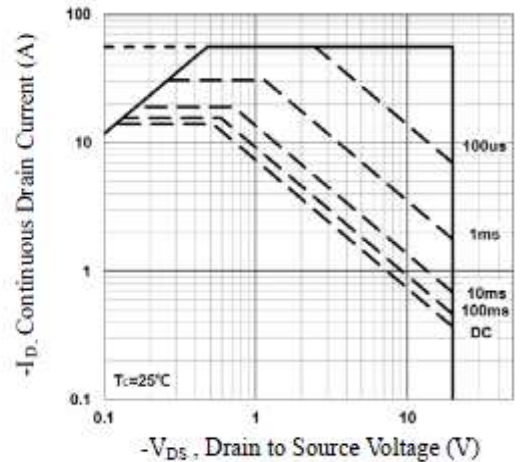


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics(continue)

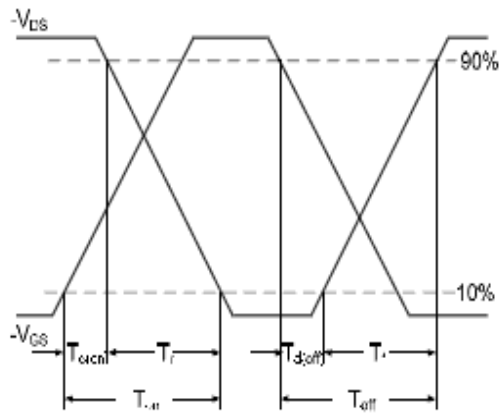


Fig.7 Switching Time Waveform

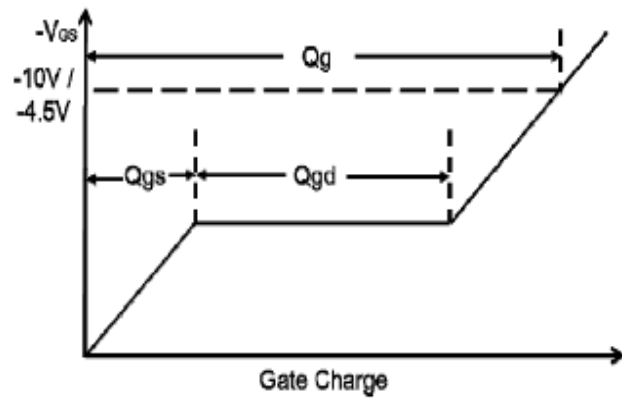
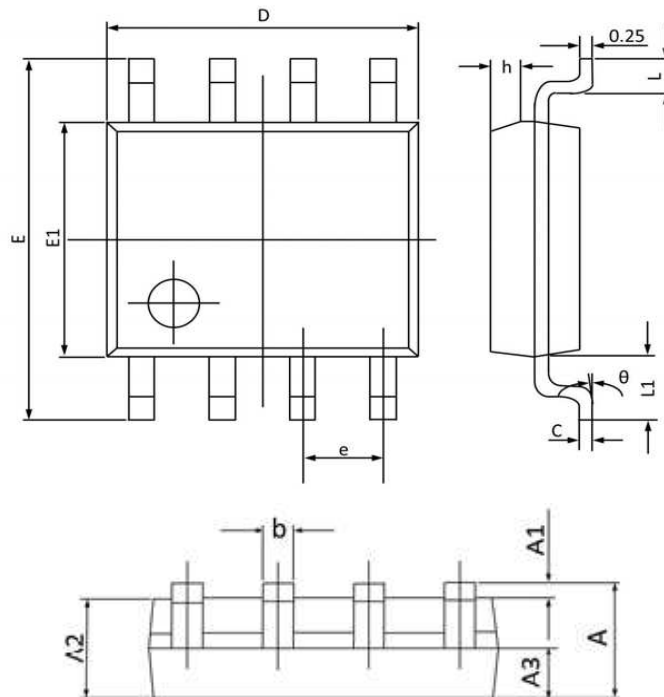


Fig.8 Gate Charge Waveform

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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