

GSM2603Z

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, -60A, $R_{DS(ON)}=8m\Omega@V_{GS}=-4.5V$
- Fast switching
- Suit for -1.8V Gate Drive Applications
- Green Device Available
- Improved dv/dt capability

Applications

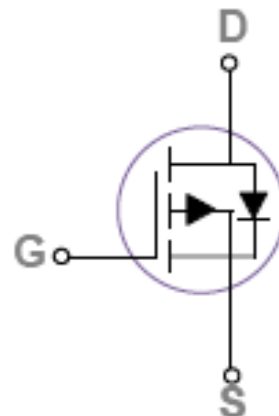
- Notebook
- Networking
- Load Switch
- Hand-Held instruments

Packages & Pin Assignments

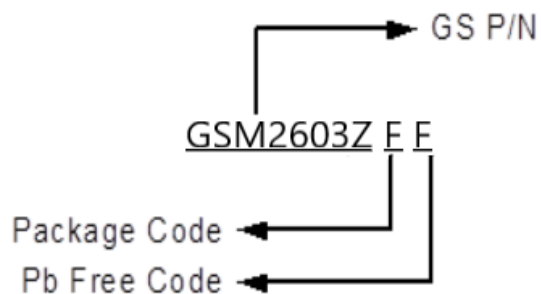
GSM2603ZFF (DFN3X3-8L)



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

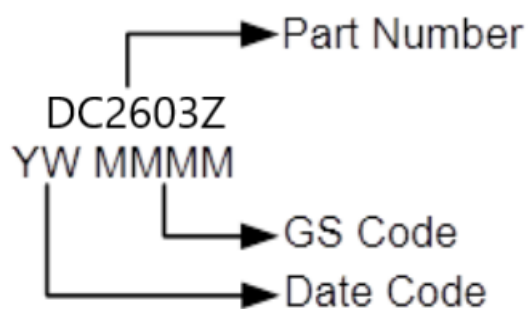


Ordering Information



Part Number	Package	Quantity
GSM2603ZFF	DFN3X3-8L	5000pcs

Marking Information



Absolute Maximum Ratings

T_C=25°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°C	-60	A
		T _C =100°C	-38	
I _{DM}	Pulsed Drain Current ¹		-240	A
P _D	Power Dissipation (T _C =25°C)		62.5	W
	Power Dissipation-Derate above 25°C		0.5	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		62	°C/W
R _{θJC}	Thermal Resistance-Junction to Case		2	°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	-20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _D =-250uA	-0.3	-0.6	-1.0	
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			-1	uA
		V _{DS} =-16V,V _{GS} =0V T _J =125℃			-10	
I _S	Continuous Source Current	V _G =V _D =0V,Force Current			-60	A
I _{SM}	Pulsed Source Current				-120	A
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =-4.5V,I _D =-8A		6	8	mΩ
		V _{GS} =-2.5V,I _D =-5A		8	11	
		V _{GS} =-1.8V,I _D =-3A		11	16	
g _{FS}	Forward Transconductance	V _{DS} =-10V,I _D =-5A		20		S
V _{SD}	Diode Forward Voltage	I _S =-1A,V _{GS} =0V			-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

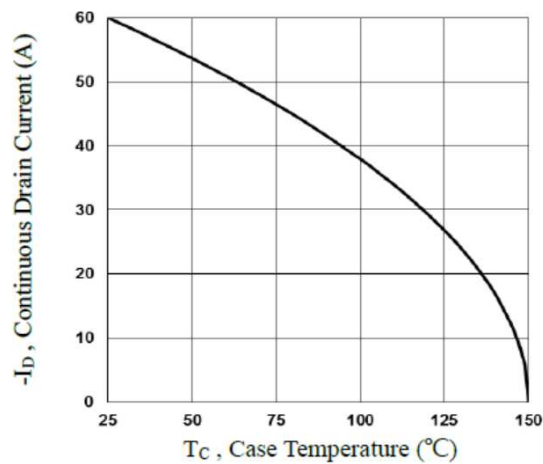


Fig.1 Continuous Drain Current vs. T_C

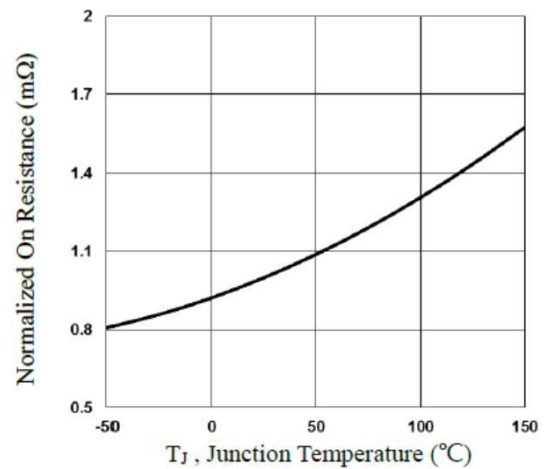


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

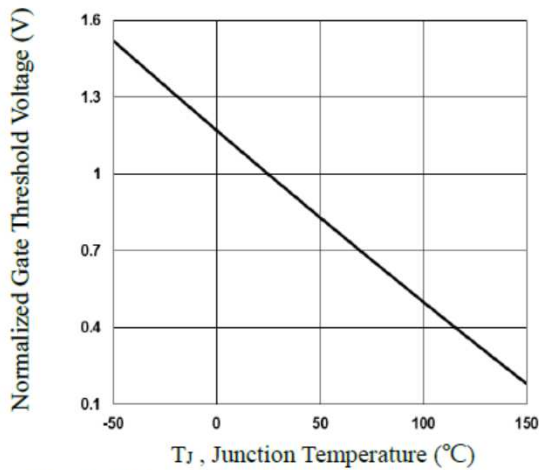


Fig.3 Normalized V_{th} vs. T_J

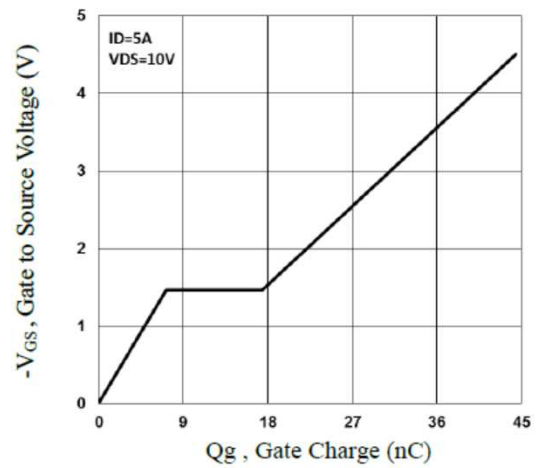


Fig.4 Gate Charge Waveform

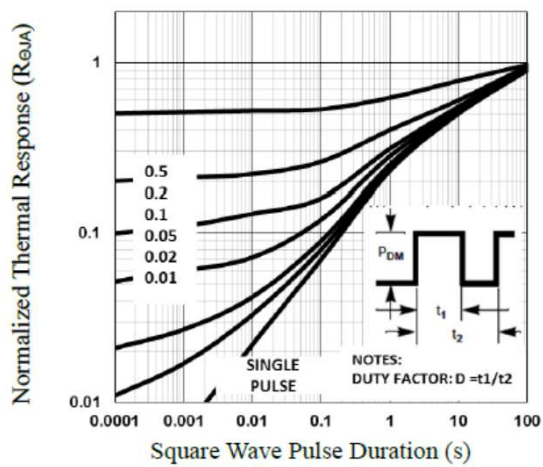


Fig.5 Normalized Transient Response

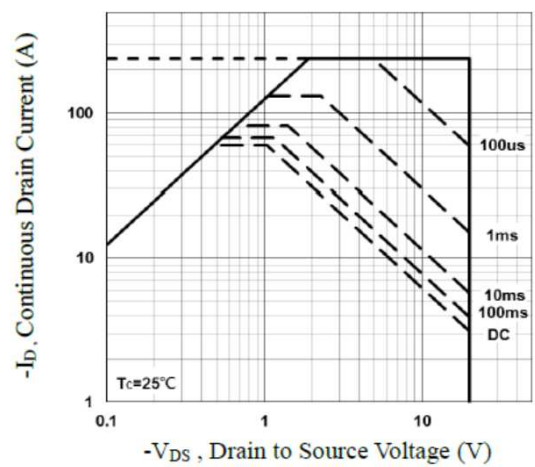


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

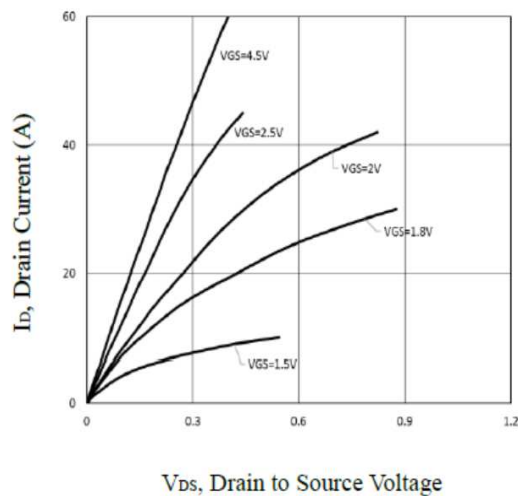


Fig.7 Typical Output Characteristics

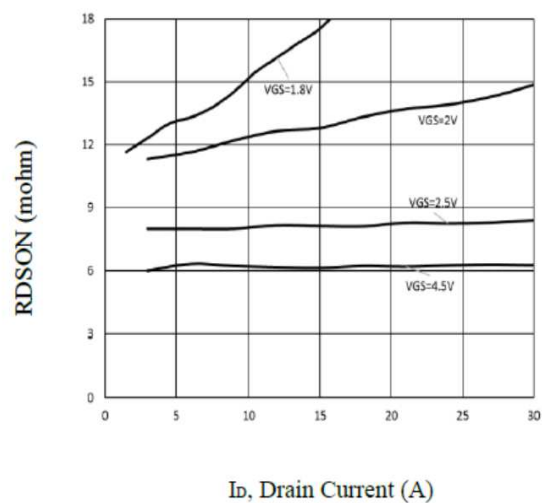


Fig.8 $R_{DS(on)}$ vs. Drain Current

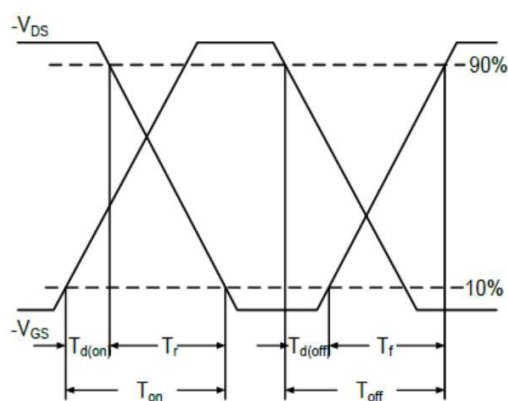


Fig.9 Switching Time Waveform

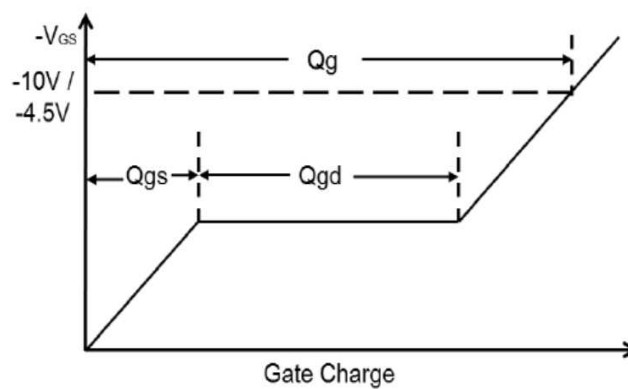
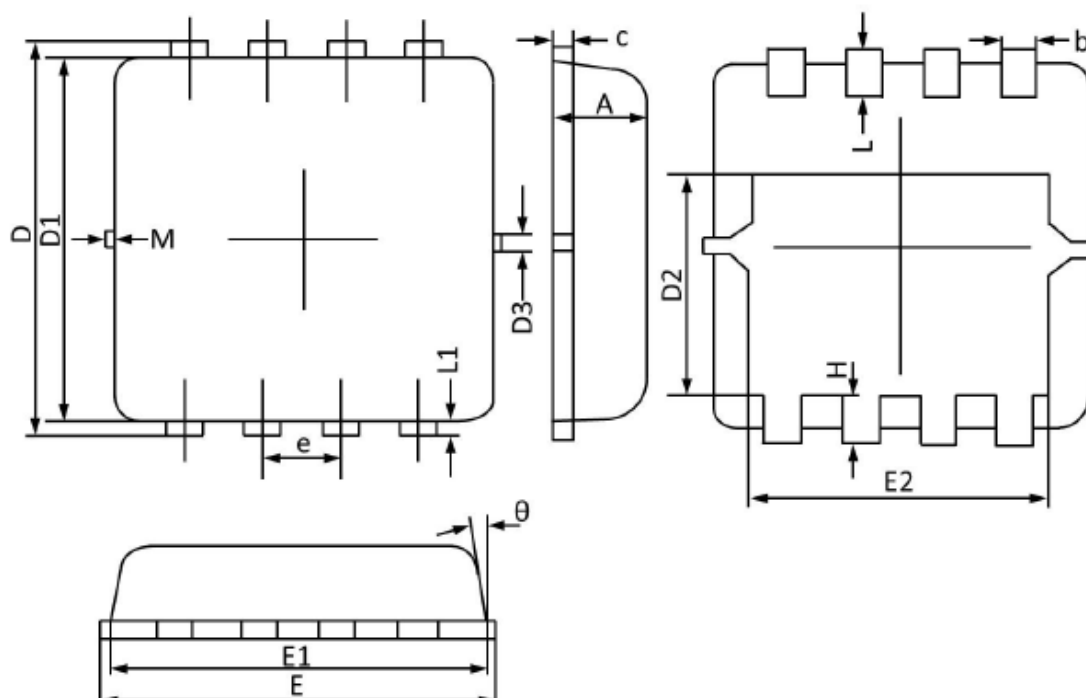


Fig.10 Gate Charge Waveform

Package Dimension

DFN3X3-8L



Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 REF		0.005 REF	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 REF		0.005 REF	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	

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