GSMDC3903Z

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

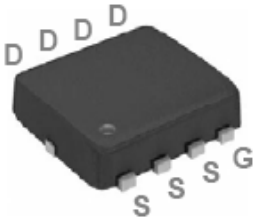
- -30V, -50A, $R_{DS(ON)}$=8.5mΩ@V_{GS}=-10V
- Fast switching
- Suit for -4.5V Gate Drive Applications
- ESD HBM Typ. 2KV Available
- Green Device Available
- DFN3X3-8L package design

Applications

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

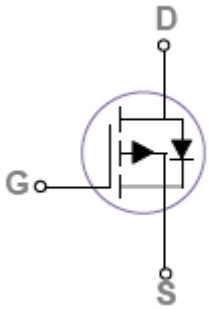
Packages & Pin Assignments

GSMDC3903ZFF (DFN3X3-8L)

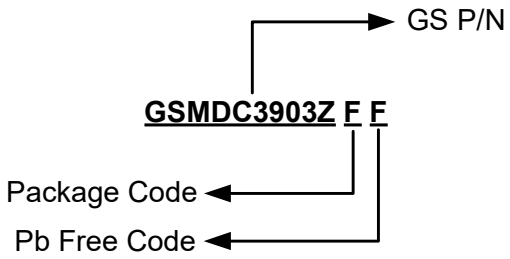


Top View

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

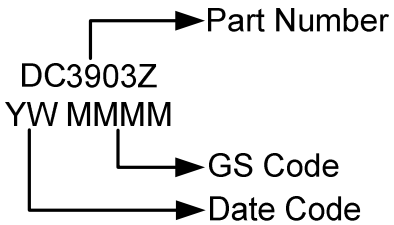


Ordering Information



Part Number	Package	Quantity Reel
GSMDC3903ZFF	DFN3X3-8L	5000 PCS

Marking Information



Absolute Maximum Ratings

T_C=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_C=25℃	-50	A
		T_C=100℃	-32	
I_{DM}	Pulsed Drain Current[1]		-200	A
P_D	Power Dissipation (T_C=25℃)		59	W
	Power Dissipation (Derate above 25℃)		0.47	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		62	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		2.1	℃/W

Electrical Characteristics

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	-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-Source Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Drain-Source Leakage 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			-50	A
I_{SM}	Pulsed Source Current				-100	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=-10V,I_D=-10A		7.1	8.5	mΩ
		V_{GS}=-4.5V,I_D=-8A		11.5	14	
g_{FS}	Forward Transconductance	V_{DS}=-10V,I_D=-10A		14		S
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=-1A			-1	V
Dynamic						
Q_g	Total Gate Charge[2,3]	V_{DS}=-15V,V_{GS}=-4.5V, I_D=-10A		35	56	nC
Q_{gs}	Gate-Source Charge[2,3]			10.8	16	
Q_{gd}	Gate-Drain Charge[2,3]			10.6	16	
C_{iss}	Input Capacitance	V_{DS}=-15V,V_{GS}=0V, f=1MHz		3300	4800	pF
C_{oss}	Output Capacitance			410	700	
C_{rss}	Reverse Transfer Capacitance			280	500	
$t_{d(on)}$	Turn-On Time[2,3]	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[2,3]			156.8	230	
t_f				50	75	
R_g	Gate resistance	V_{DS}=0V,V_{GS}=0V, f=1MHz		8.5	12	Ω

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

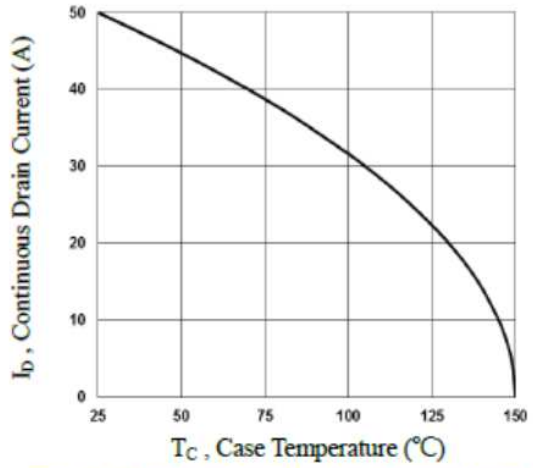


Fig.1 Continuous Drain Current vs. T_c

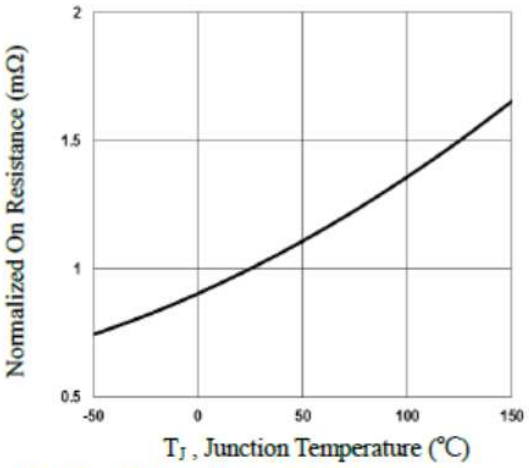


Fig.2 Normalized RDSON vs. T_J

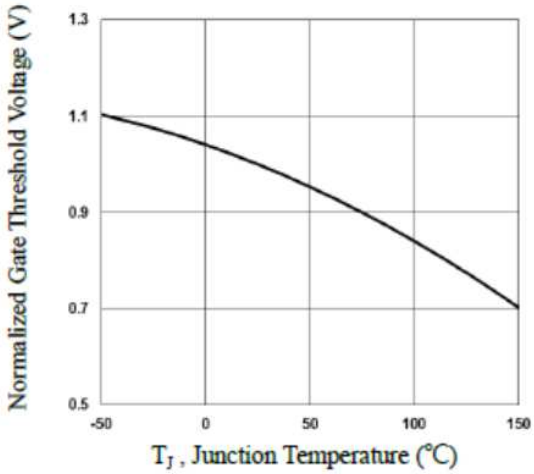


Fig.3 Normalized V_{th} vs. T_J

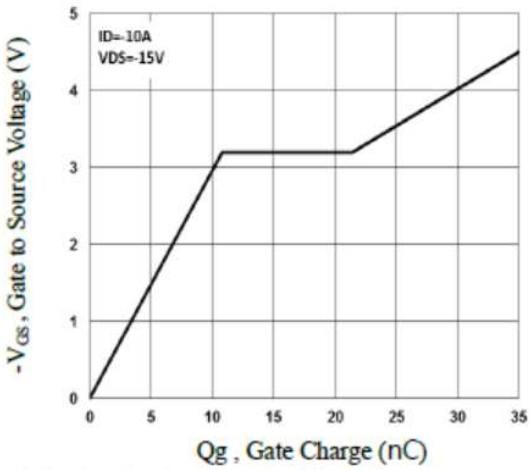


Fig.4 Gate Charge Waveform

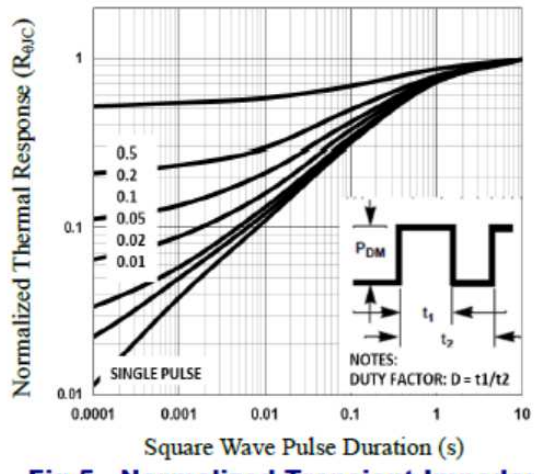


Fig.5 Normalized Transient Impedance

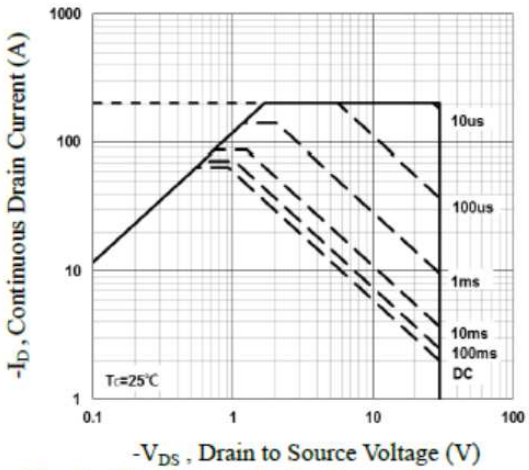
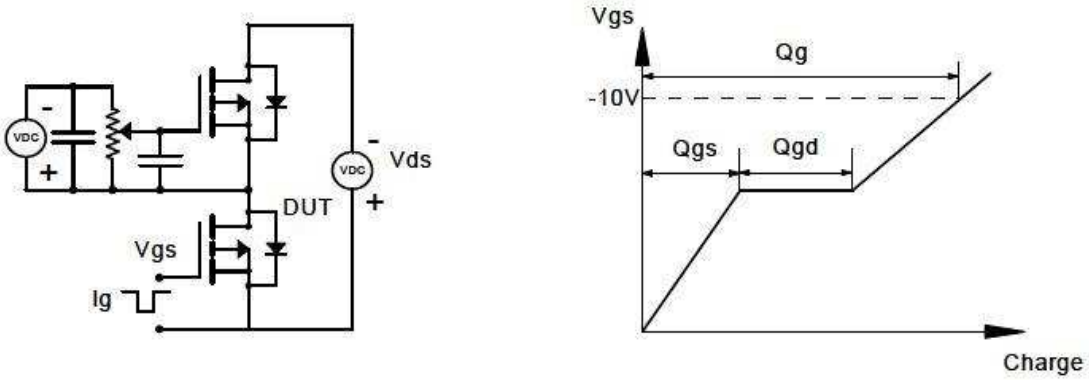


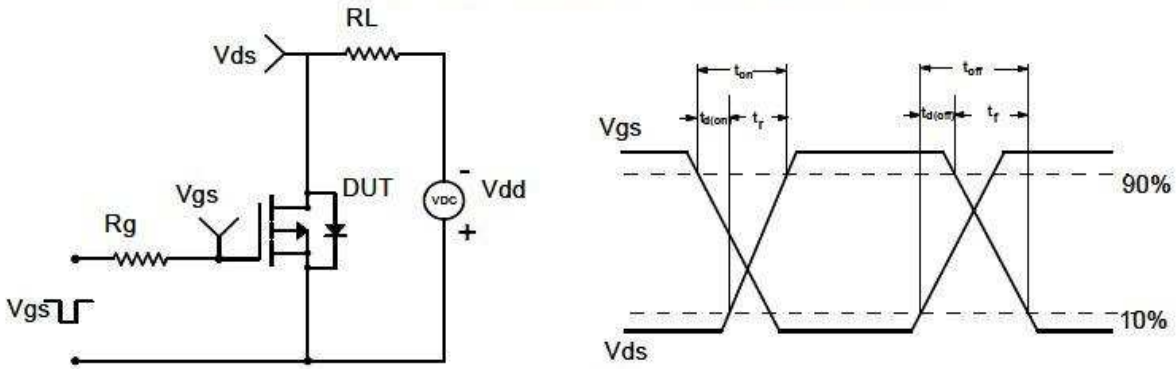
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

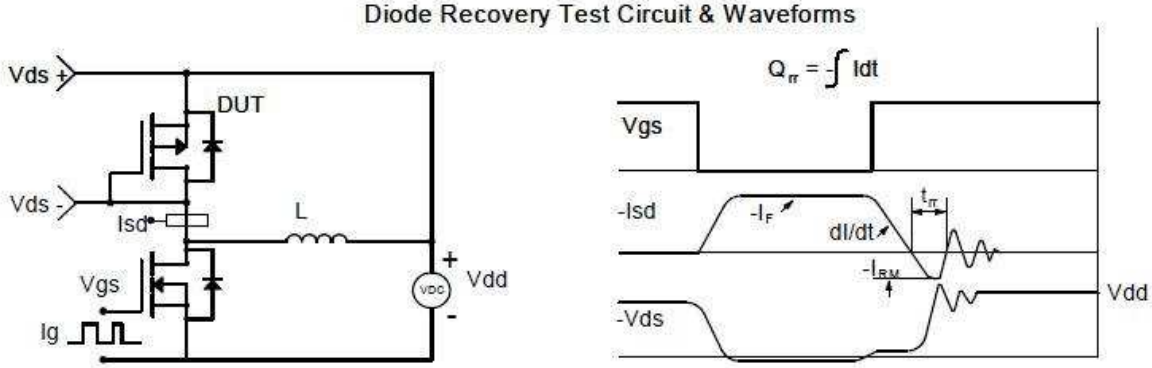
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

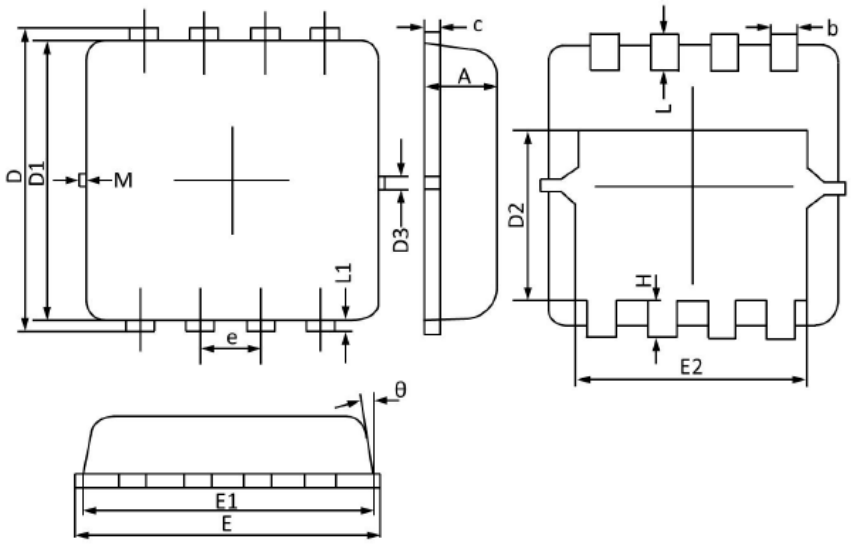


Diode Recovery Test Circuit & Waveforms



Package Dimension

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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