

GSMDC3812V

30V Dual N-Channel MOSFETs

Product Description

These Dual 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

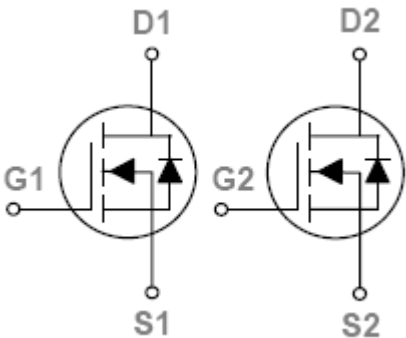
- 30V, 20A, $R_{DS(ON)}=20m\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available
- DFN3X3-8L package design

Applications

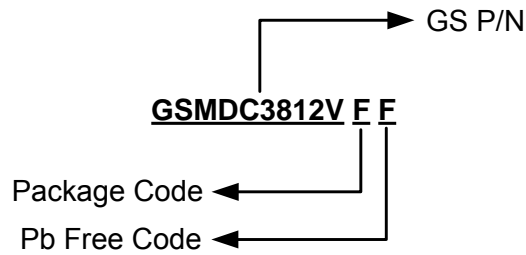
- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR
- Li-Battery Protection

Packages & Pin Assignments

GSMDC3812VFF (DFN3X3-8L)	
 <p style="text-align: center;">Top View</p>	
Pin	Description
1	Source 1
2	Gate 1
3	Source 2
4	Gate 2
5	Drain 2
6	Drain 2
7	Drain 1
8	Drain 1

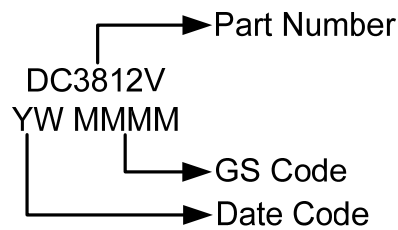


Ordering Information



Part Number	Package	Quantity Reel
GSMDC3812VFF	DFN3X3-8L	3000 PCS

Marking Information



Absolute Maximum Ratings

$T_C=25^{\circ}\text{C}$ 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	$T_C=25^{\circ}\text{C}$	20
		$T_C=100^{\circ}\text{C}$	13
I_{DM}	Pulsed Drain Current (Note 1)	80	A
EAS	Single Pulse Avalanche Energy (Note 2)	14	mJ
IAS	Single Pulse Avalanche Current (Note 2)	17	A
P_D	Power Dissipation ($T_C=25^{\circ}\text{C}$)	20	W
	Power Dissipation (Derate above 25°C)	0.16	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	6.4	$^{\circ}\text{C}/\text{W}$

Note 1: Repetitive Rating: Pulsed width limited by maximum junction temperature.

Note 2: $V_{DD}=25\text{V}$, $V_{GS}=10\text{V}$, $L=0.1\text{mH}$, $I_{AS}=17\text{A}$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$.

Electrical Characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30			V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$		0.04		$V/^{\circ}\text{C}$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.5	2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			-4		$\text{mV}/^{\circ}\text{C}$
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$			1	μA
		$V_{DS}=24V, V_{GS}=0V$, $T_J=125^{\circ}\text{C}$			10	
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current			20	A
I_{SM}	Pulsed Source Current (Note 3)				80	
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=10V, I_D=10A$		17	20	m Ω
		$V_{GS}=4.5V, I_D=6A$		23	30	
g_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=6A$		13		S
V_{SD}	Diode Forward Voltage (Note 3)	$V_{GS}=0V, I_S=1A$			1	V
Dynamic						
Q_g	Total Gate Charge (Note 3,4)	$V_{DS}=15V, V_{GS}=4.5V$, $I_D=8A$		4.1	6	nC
Q_{gs}	Gate-Source Charge (Note 3,4)			1	1.4	
Q_{gd}	Gate-Drain Charge (Note 3,4)			2.1	4	
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V$, $f=1\text{MHz}$		345	500	pF
C_{oss}	Output Capacitance			55	80	
C_{rss}	Reverse Transfer Capacitance			32	55	
$t_{d(on)}$	Turn-On Time (Note 3,4)	$V_{DD}=15V, I_D=1A$, $V_{GS}=10V, R_G=6\Omega$		2.8	5	ns
t_r				7.2	14	
$t_{d(off)}$	Turn-Off Time (Note 3,4)			15.8	30	
t_f				4.6	9	
R_g	Gate Resistance		$V_{GS}=0V, V_{DS}=0V$, $f=1\text{MHz}$		3.2	

Note 3: The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

Note 4: Essentially independent of operating temperature.

Typical Performance Characteristics

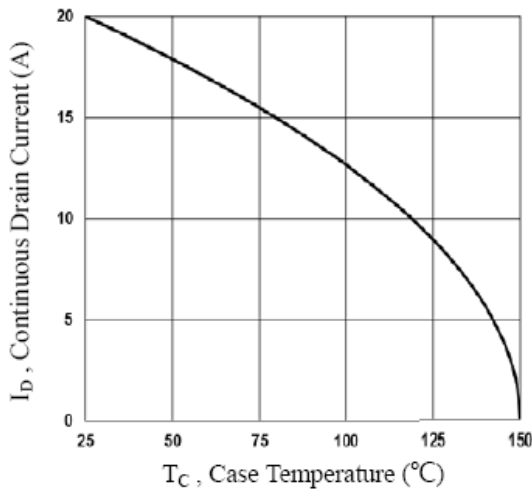


Fig.1 Continuous Drain Current vs. T_C

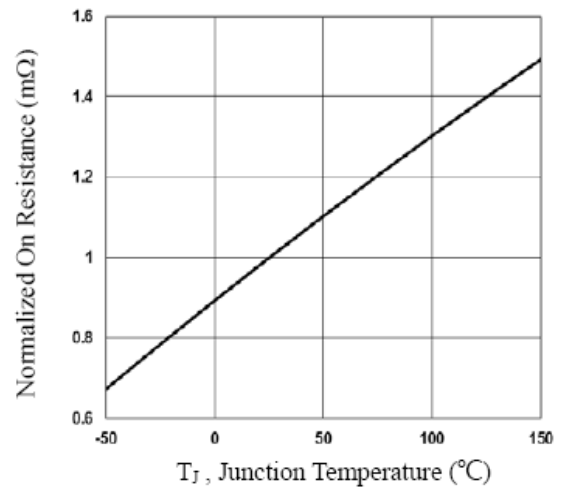


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

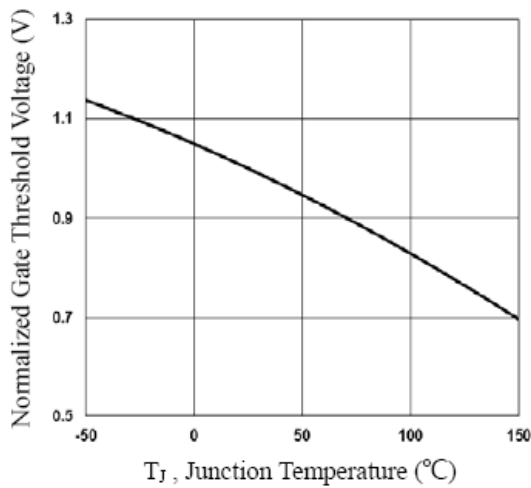


Fig.3 Normalized V_{th} vs. T_J

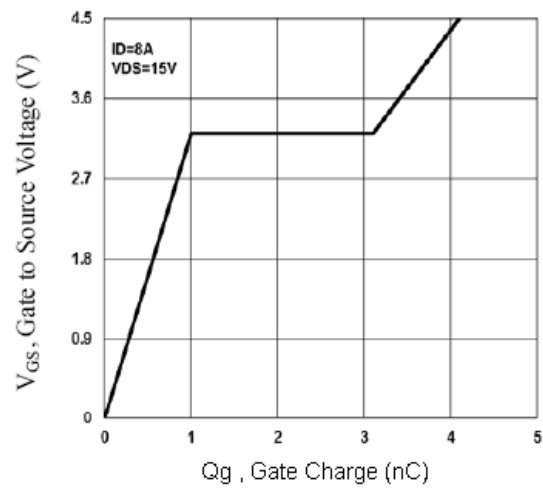


Fig.4 Gate Charge Waveform

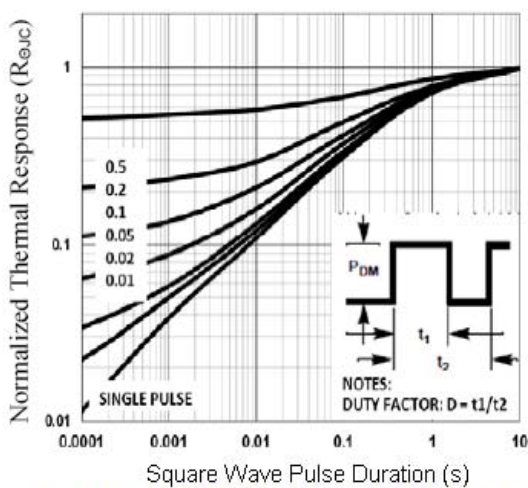


Fig.5 Normalized Transient Response

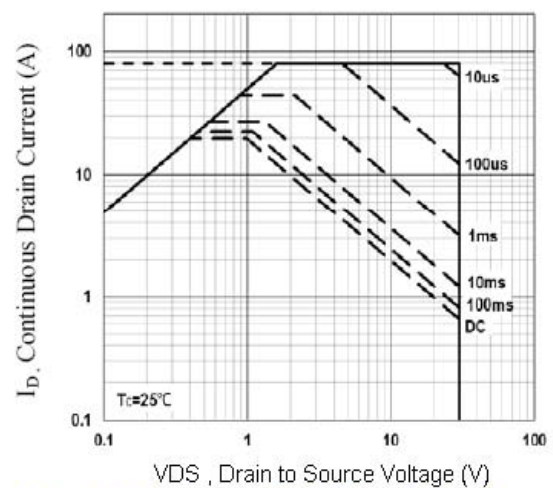
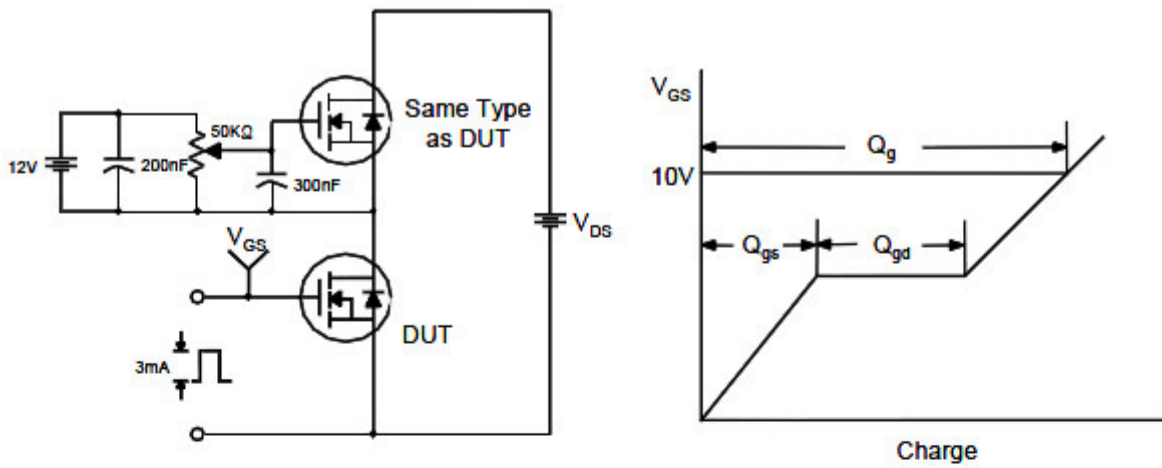


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

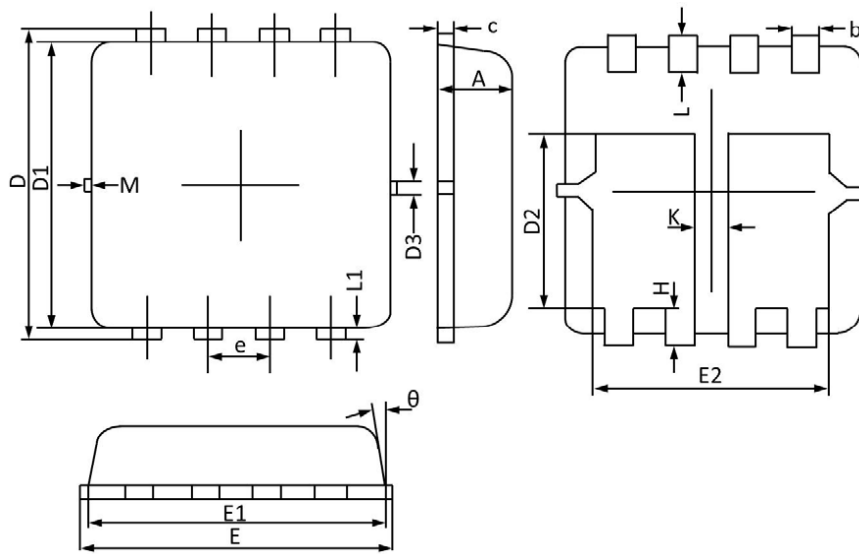


Unclamped Inductive Switching Test Circuit & Waveforms



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)	
K	0.300 (REF)		0.012 (REF)	
θ	0°	12°	0°	12°
M	0.150 (REF)		0.006 (REF)	



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