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

Applications

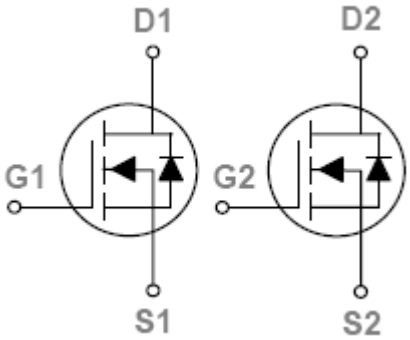
- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR
- Li-Battery Protection

Packages & Pin Assignments

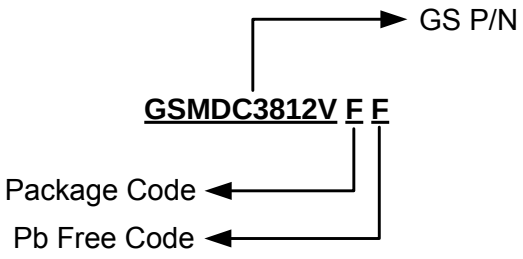
GSMDC3812VFF (DFN3X3-8L)

Top View

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

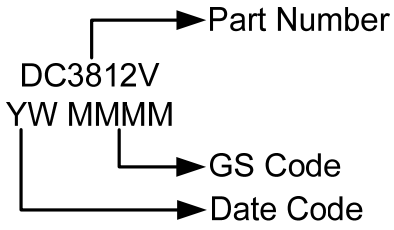


Ordering Information



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

Marking Information



Absolute Maximum Ratings

T_C=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℃	20	A
		T_C=100℃	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℃)		20	W
	Power Dissipation (Derate above 25℃)		0.16	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		6.4	℃/W

Note 1: Repetitive Rating: Pulsed width limited by maximum junction temperature.
Note 2: V_{DD}=25V, V_{GS}=10V, L=0.1mH, IAS=17A, R_G=25Ω, Starting T_J=25℃.

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		0.04		V/℃
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.2	1.5	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			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	mΩ
		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=1MHz		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=6Ω		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=1MHz		3.2	6.4	Ω

Note 3: The data tested by pulsed, pulse width≦300us, duty cycle≦2%.

Note 4: Essentially independent of operating temperature.

Typical Performance Characteristics

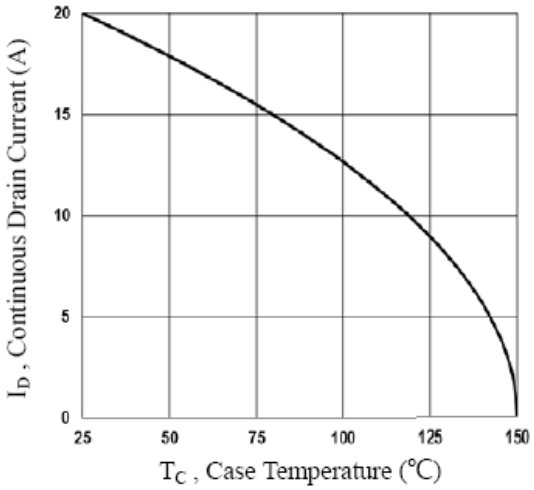


Fig.1 Continuous Drain Current vs. T_c

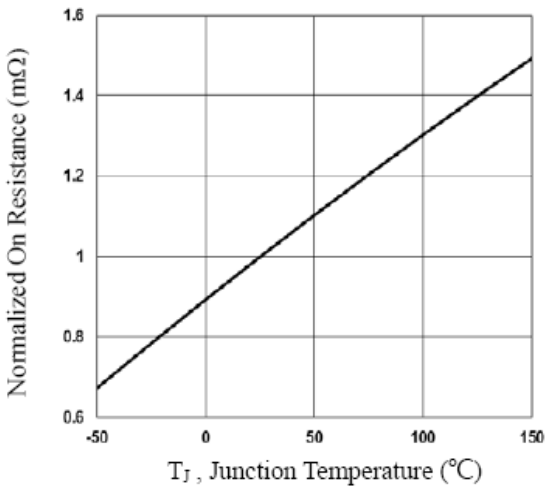


Fig.2 Normalized RDSON vs. T_J

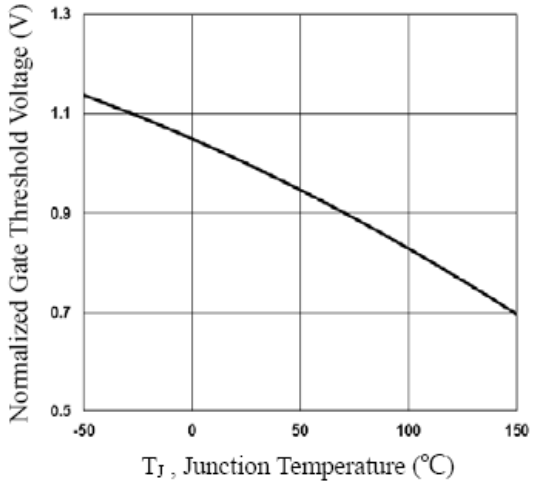


Fig.3 Normalized V_{th} vs. T_J

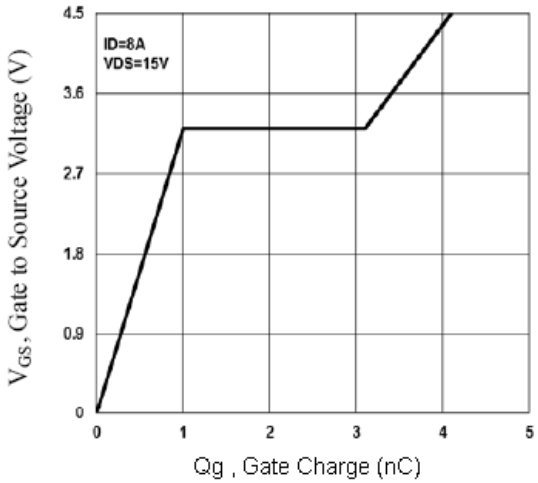


Fig.4 Gate Charge Waveform

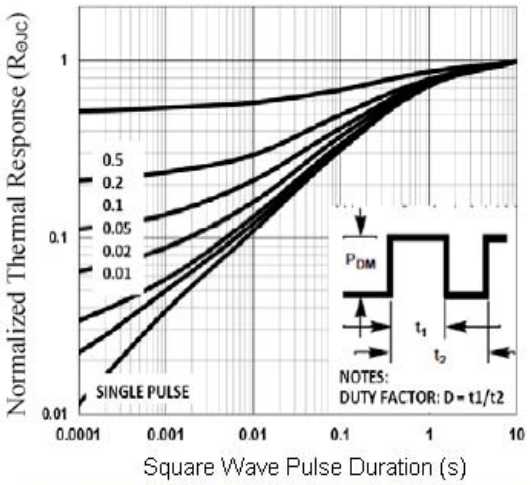


Fig.5 Normalized Transient Response

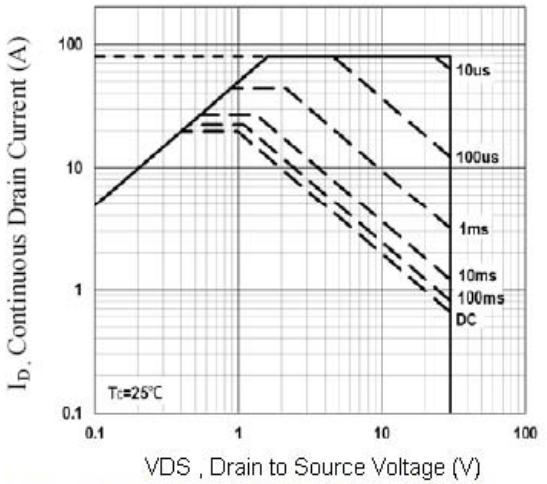
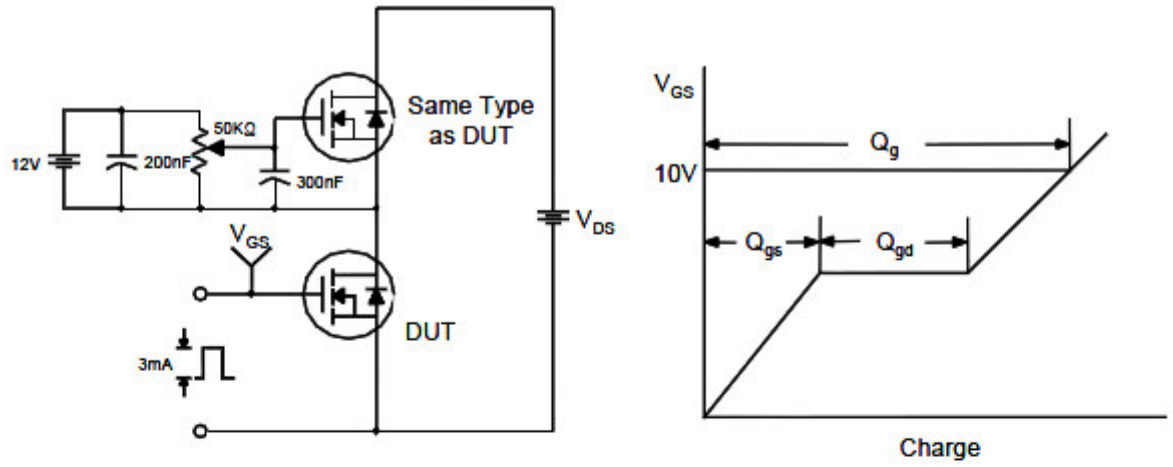


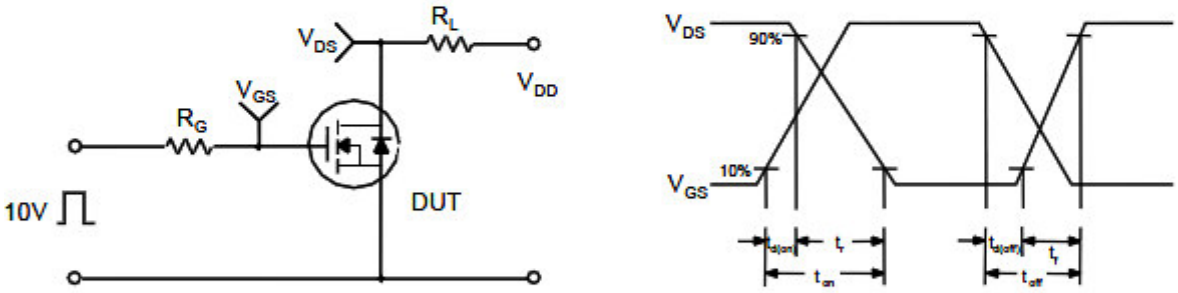
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

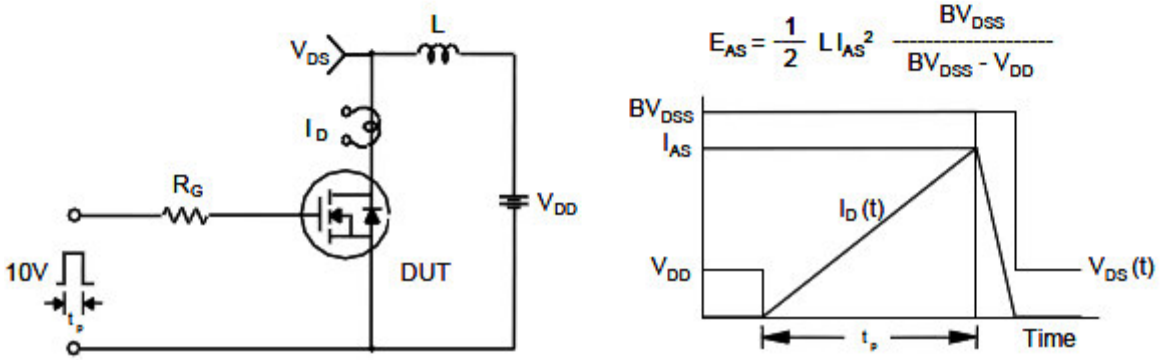
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

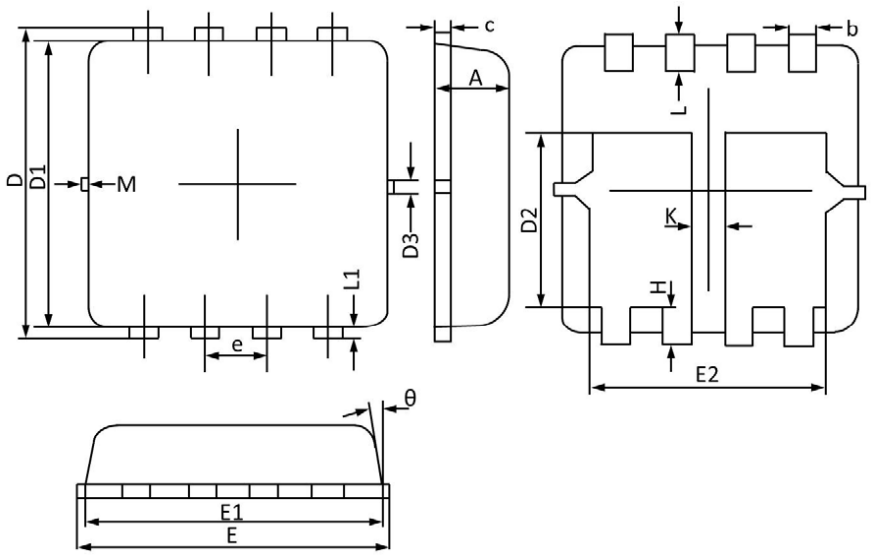


Unclamped Inductive Switching Test Circuit & Waveforms



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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