

GSMEB2516Q

20V Dual N-Channel MOSFETs

Product Description

These 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

- 20V, 11A, $R_{DS(ON)}=8.2m\Omega@V_{GS}=4.5V$
- Improved dv/dt capability
- Fast switching
- G-S ESD Protection Diode Embedded
- Green Device Available
- DFN2X3-6L package design

Applications

- Handheld Instruments
- POL Applications
- Battery Protection Applications

Packages & Pin Assignments

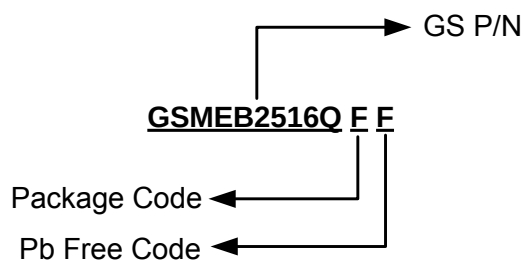
GSMEB2516QFF (DFN2X3-6L)

Bottom View

Pin	Description
1	Source 1
2	Source 1
3	Gate 1
4	Gate 2
5	Source 2
6	Source 2

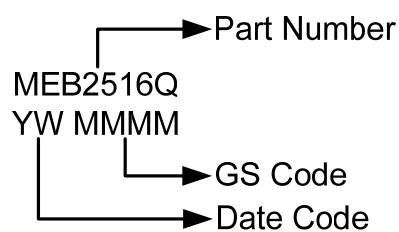
Circuit diagram showing two N-channel MOSFETs with embedded ESD protection diodes. The diodes are labeled G1, G2, S1, S2, and the MOSFETs are labeled D1/D2.

Ordering Information



Part Number	Package	Quantity
GSMEB2516QFF	DFN2X3-6L	3000pcs

Marking Information



Absolute Maximum Ratings

T_A=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 _A =25°C	11	A
		T _A =100°C	8.8	
I _{DM}	Pulsed Drain Current		70	A
P _D	Power Dissipation (T _A =25°C)		1.56	W
	Power Dissipation (Derate above 25°C)		0.0125	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		80	°C/W

Electrical Characteristics

T_A=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	0.5	0.72	1.5	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V,V _{GS} =±12V			±10	uA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =18V,V _{GS} =0V			1	uA
		V _{DS} =16V,V _{GS} =0V, T _J =70℃			10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			11	A
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =4.5V,I _D =5.5A		6	8.2	mΩ
		V _{GS} =4V,I _D =5.5A		6.2	8.5	
		V _{GS} =3.7V,I _D =5.5A		6.5	9	
		V _{GS} =3.1V,I _D =5.5A		7	9.4	
		V _{GS} =2.5V,I _D =5.5A		8.2	11	
g _{FS}	Forward Transconductance	V _{DS} =5V,I _D =5.5A		20		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V,I _S =1A			1	V
Dynamic						
Q _q	Total Gate Charge	V _{DS} =15V,V _{GS} =4.5V, I _D =11A		15	30	nC
Q _{gs}	Gate-Source Charge			2.8	5.6	
Q _{gd}	Gate-Drain Charge			4.4	8.8	
C _{iSS}	Input Capacitance	V _{DS} =10V,V _{GS} =0V, f=1MHz		1350	2500	pF
C _{oSS}	Output Capacitance			185	350	
C _{rSS}	Reverse Transfer Capacitance			160	300	
t _{d(on)}	Turn-On Time	V _{DD} =15V,I _D =5.5A, V _{GS} =10V,R _G =6Ω		28	56	ns
t _r				64	128	
t _{d(off)}	Turn-Off Time			60	120	
t _f				55	110	

Typical Performance Characteristics

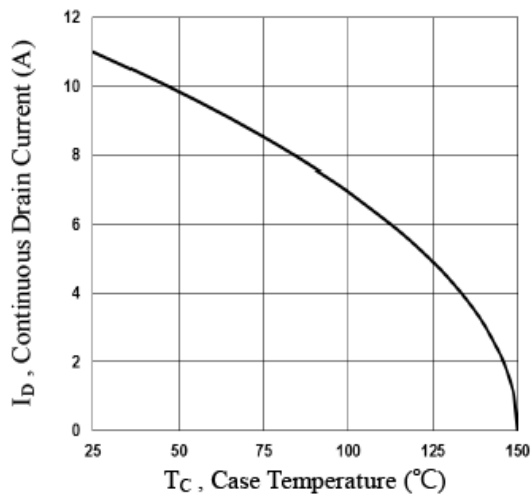


Fig.1 Continuous Drain Current vs. T_C

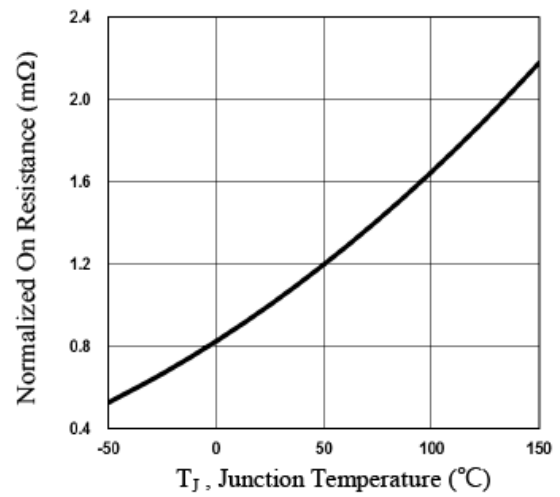


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

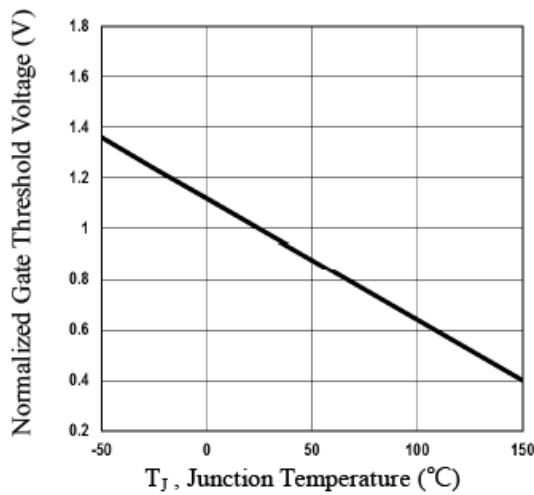


Fig.3 Normalized V_{th} vs. T_J

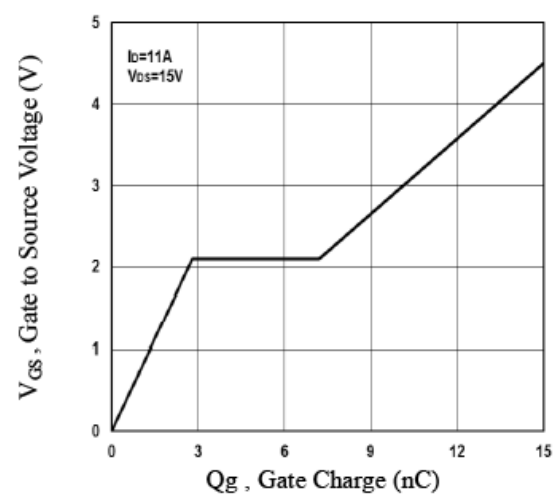


Fig.4 Gate Charge Waveform

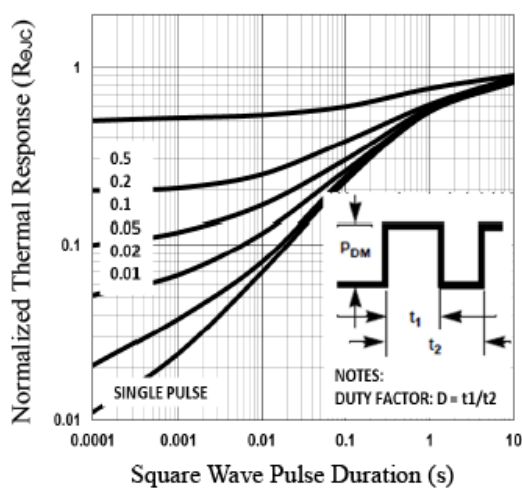


Fig.5 Normalized Transient Response

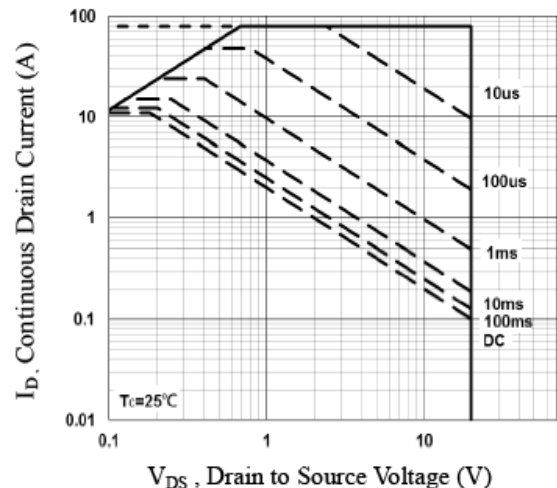
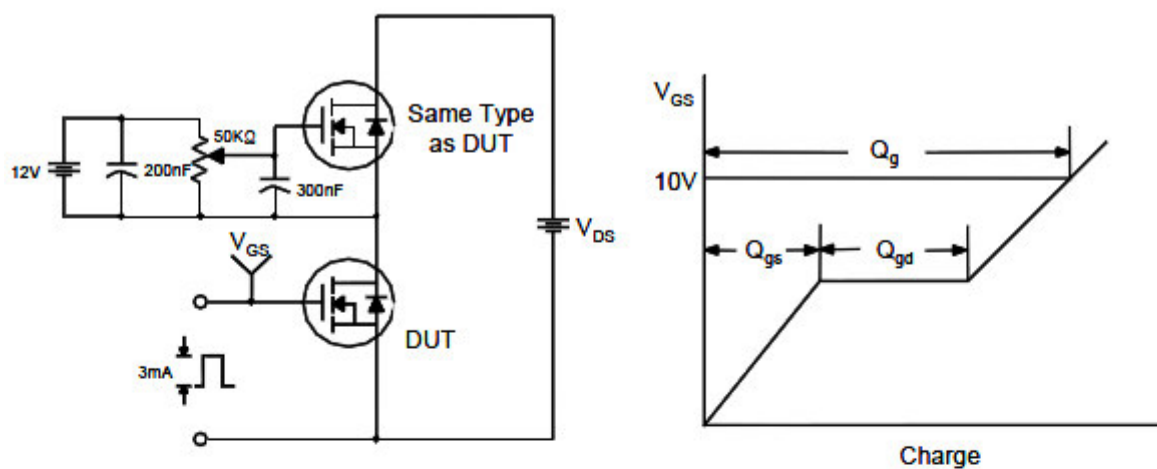


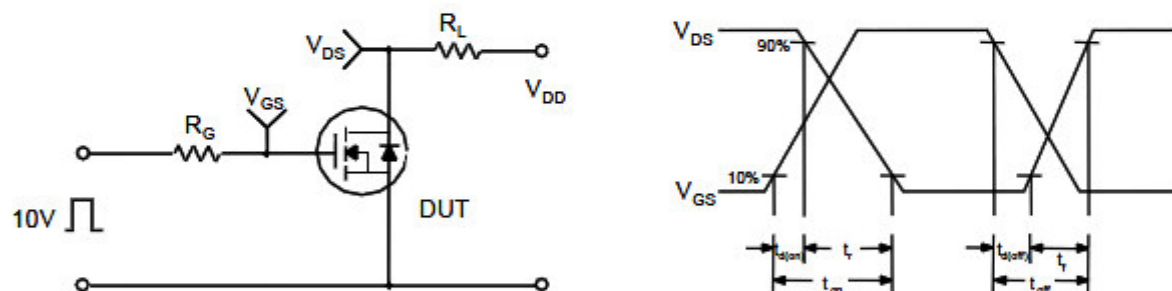
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

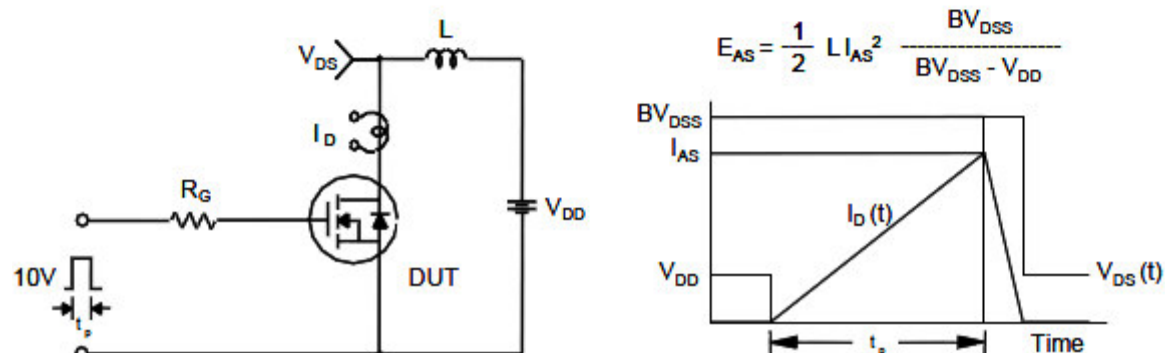
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

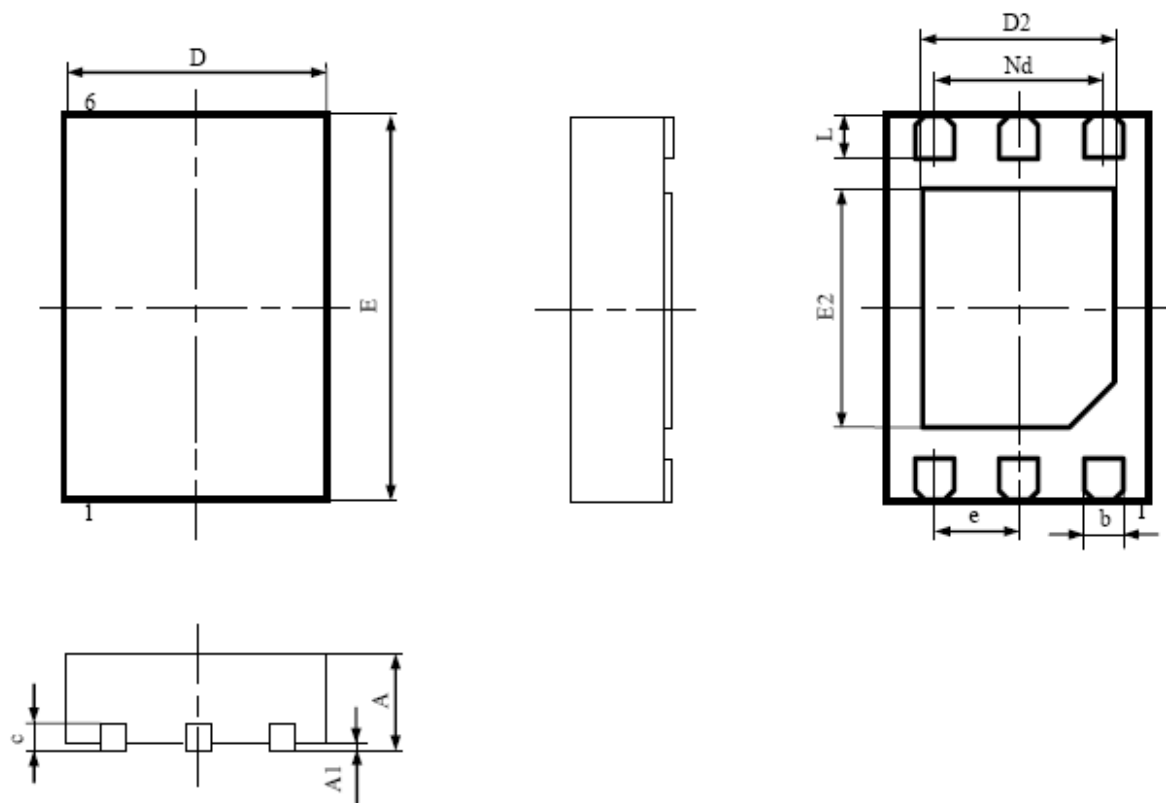


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

DFN2X3-6L



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
A1	0.02 (TYP)		0.001 (TYP)	
b	0.200	0.350	0.008	0.014
c	0.180	0.250	0.007	0.010
D	1.900	2.100	0.075	0.083
D2	1.400	1.600	0.055	0.063
E	0.500 (BSC)		0.020 (BSC)	
Nd	1.000 (BSC)		0.040 (BSC)	
E	2.900	3.100	0.114	0.122
E2	1.650	1.750	0.065	0.069
L	0.300	0.400	0.012	0.016

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