

# 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.

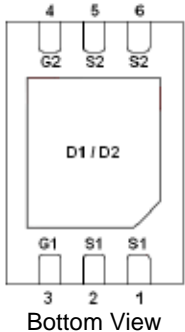
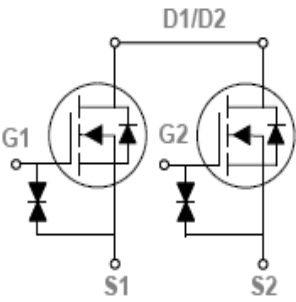
### Features

- 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

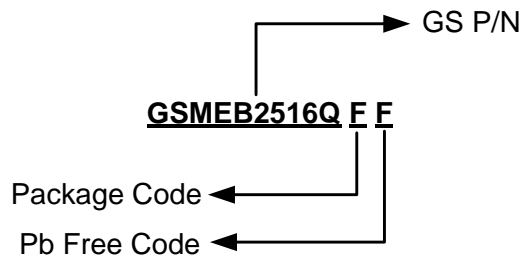
### Applications

- Handheld Instruments
- POL Applications
- Battery Protection Applications

### Packages & Pin Assignments

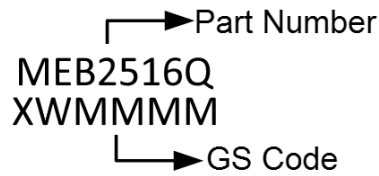
GSMEB2516QFF (DFN2X3-6L)	
 <p style="text-align: center;">Bottom View</p>	
	
Pin	Description
1	Source 1
2	Source 1
3	Gate 1
4	Gate 2
5	Source 2
6	Source 2

## Ordering Information



Part Number	Package	Quantity
GSMEB2516QFF	DFN2X3-6L	3000pcs

## Marking Information



## Absolute Maximum Ratings

T<sub>A</sub>=25°C Unless otherwise noted

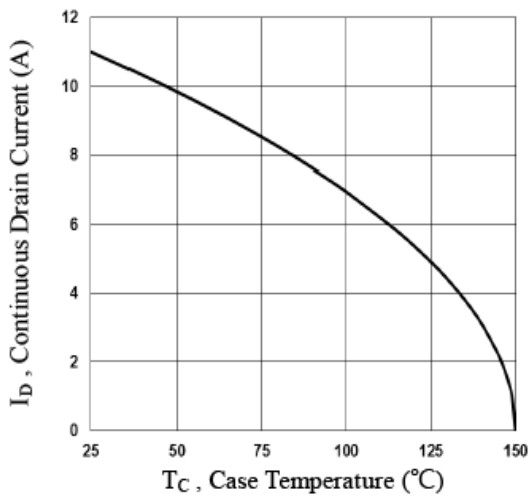
Symbol	Parameter	Typical	Unit
V <sub>DS</sub>	Drain-Source Voltage	20	V
V <sub>GS</sub>	Gate-Source Voltage	±12	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> =25°C	11
		T <sub>A</sub> =100°C	8.8
I <sub>DM</sub>	Pulsed Drain Current	70	A
P <sub>D</sub>	Power Dissipation (T <sub>A</sub> =25°C)	1.56	W
	Power Dissipation (Derate above 25°C)	0.0125	W/°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to +150	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to +150	°C
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient	80	°C/W

## Electrical Characteristics

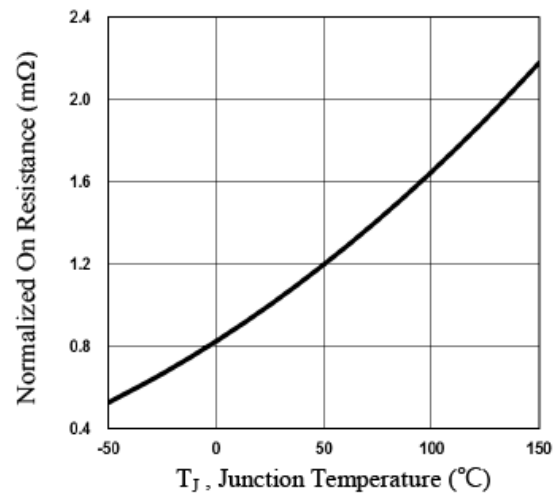
T<sub>A</sub>=25°C Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	20			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.5	0.72	1.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±10	uA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =18V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =16V, V <sub>GS</sub> =0V, T <sub>J</sub> =70°C			10	
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current			11	A
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.5A		6	8.2	mΩ
		V <sub>GS</sub> =4V, I <sub>D</sub> =5.5A		6.2	8.5	
		V <sub>GS</sub> =3.7V, I <sub>D</sub> =5.5A		6.5	9	
		V <sub>GS</sub> =3.1V, I <sub>D</sub> =5.5A		7	9.4	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =5.5A		8.2	11	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =5.5A		20		S
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1A			1	V
<b>Dynamic</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =11A		15	30	nC
Q <sub>gs</sub>	Gate-Source Charge			2.8	5.6	
Q <sub>gd</sub>	Gate-Drain Charge			4.4	8.8	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz		1350	2500	pF
C <sub>oss</sub>	Output Capacitance			185	350	
C <sub>rss</sub>	Reverse Transfer Capacitance			160	300	
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =15V, I <sub>D</sub> =5.5A, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω		28	56	ns
t <sub>r</sub>				64	128	
t <sub>d(off)</sub>	Turn-Off Time			60	120	
t <sub>f</sub>				55	110	

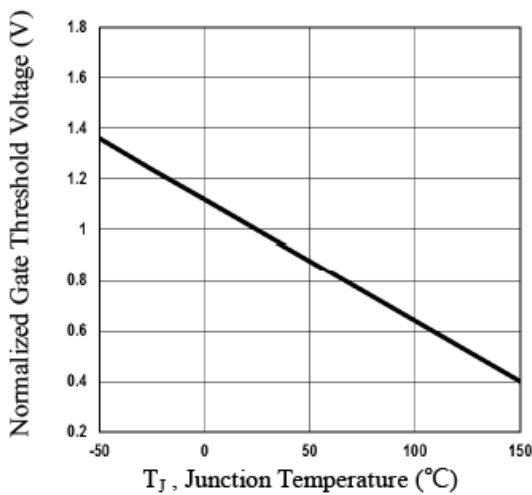
## Typical Performance Characteristics



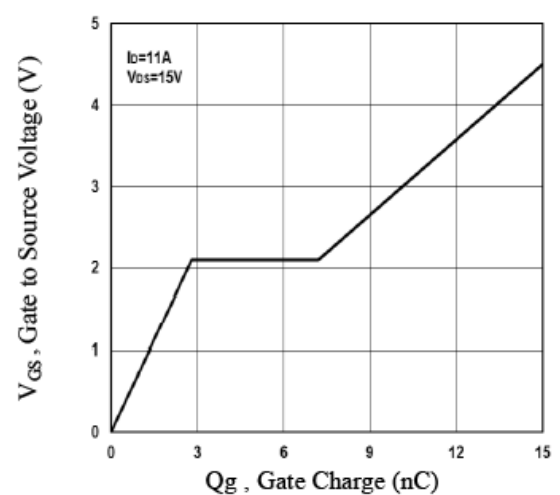
**Fig.1 Continuous Drain Current vs.  $T_C$**



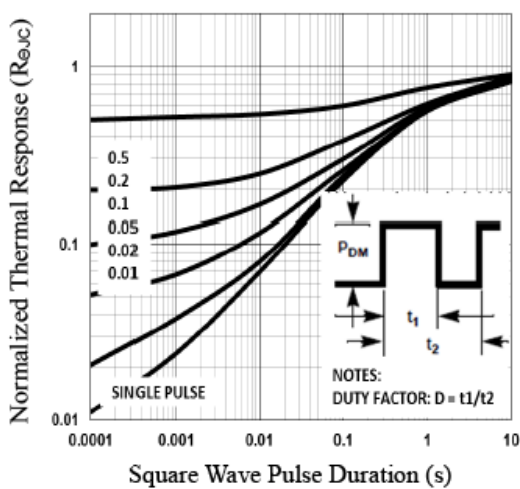
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$**



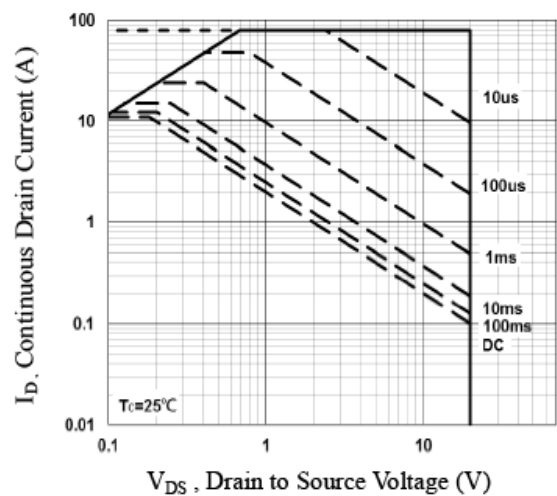
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



**Fig.4 Gate Charge Waveform**



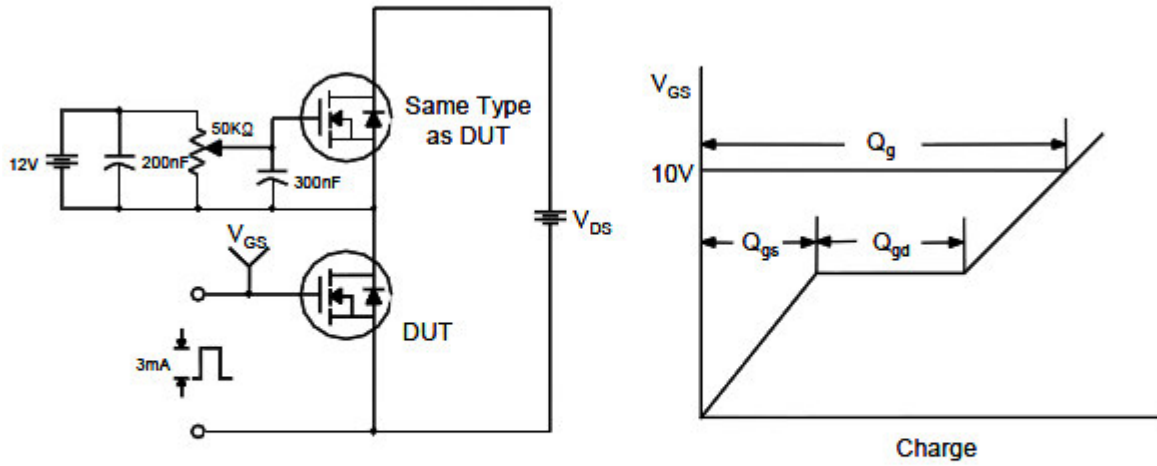
**Fig.5 Normalized Transient Response**



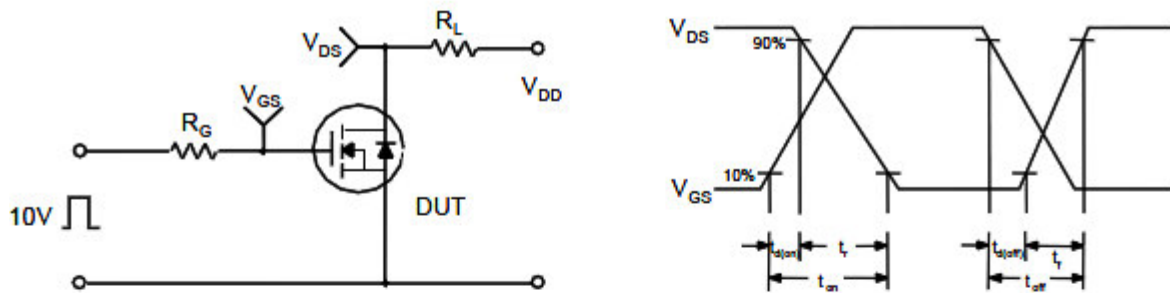
**Fig.6 Maximum Safe Operation Area**

## Typical Performance Characteristics (Continue)

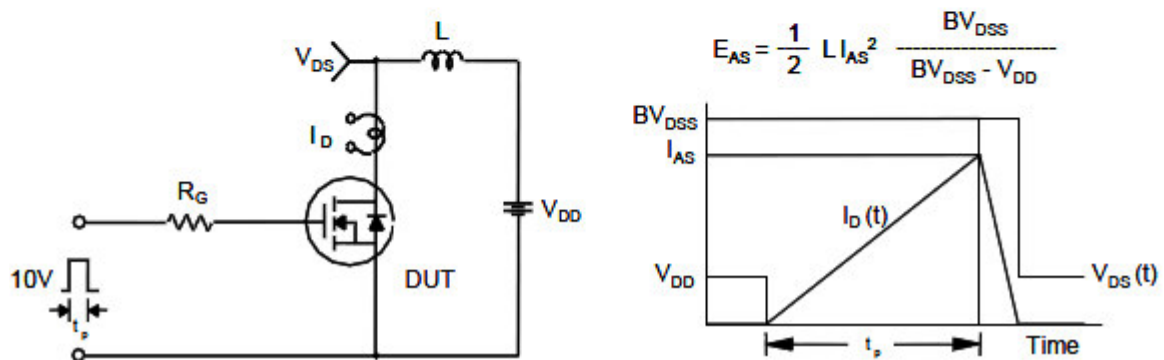
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

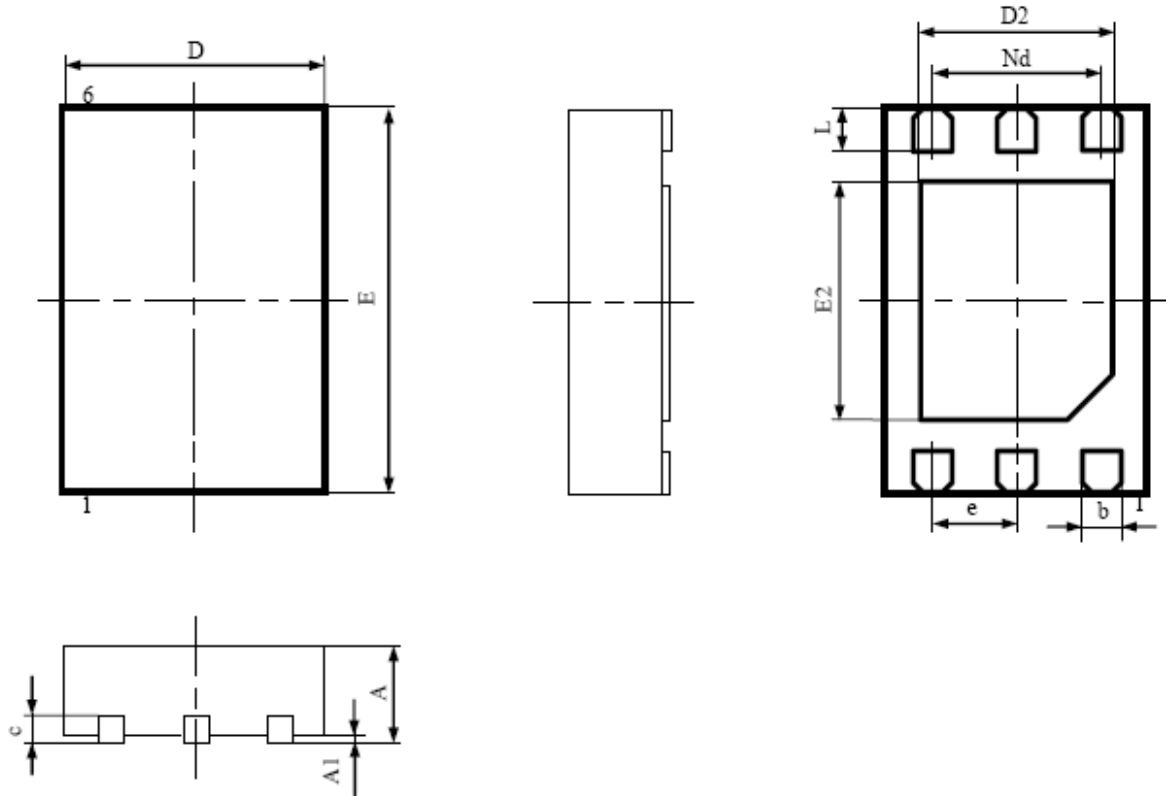


### Unclamped Inductive Switching Test Circuit & Waveforms



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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