

# GSM2519

## 20V N&P Pair Enhancement Mode MOSFET

### Product Description

GSM2519, N & P Pair enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

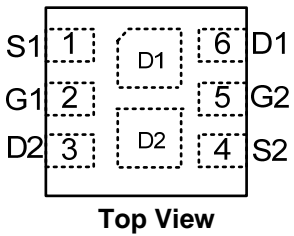
### Features

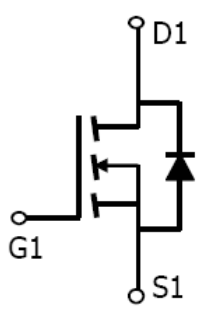
- N-Channel  
20V/4.5A,  $R_{DS(ON)}=50m\Omega@V_{GS}=4.5V$   
20V/3.6A,  $R_{DS(ON)}=60m\Omega@V_{GS}=2.5V$   
20V/2.4A,  $R_{DS(ON)}=80m\Omega@V_{GS}=1.8V$
- P-Channel  
-20V/-4.5A,  $R_{DS(ON)}=90m\Omega@V_{GS}=-4.5V$   
-20V/-3.8A,  $R_{DS(ON)}=130m\Omega@V_{GS}=-2.5V$   
-20V/-2.5A,  $R_{DS(ON)}=190m\Omega@V_{GS}=-1.8V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN2X2-6L package design

### Applications

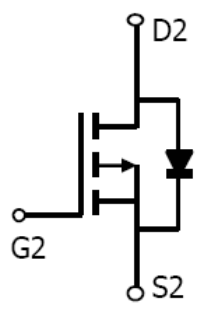
- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

### Packages & Pin Assignments

GSM2519FF (DFN2X2-6L)		
 <p style="text-align: center;">Top View</p>		
Pin	Symbol	Description
1	S1	Source 1
2	G1	Gate 1
3	D2	Drain 2
4	S2	Source 2
5	G2	Gate 2
6	D1	Drain1

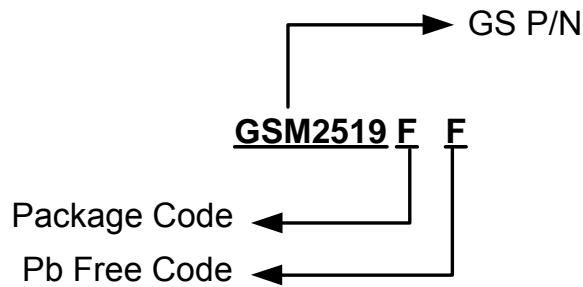


**n-channel**

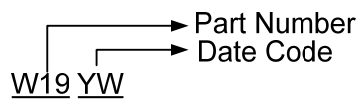


**p-channel**

## Ordering Information



## Marking Information



Part Number	Package	Part Marking	Quantity Reel
GSM2519FF	DFN2X2-6L	W19YW	3000 PCS

## Absolute Maximum Ratings

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

Symbol	Parameter	Typical		Unit	
		N-Channel	P-Channel		
V <sub>DSS</sub>	Drain-Source Voltage	20	-20	V	
V <sub>GSS</sub>	Gate -Source Voltage	±12	±12	V	
I <sub>D</sub>	Continuous Drain Current (T <sub>J</sub> =150°C)	T <sub>A</sub> =25°C	4.5	-4.5	A
		T <sub>A</sub> =70°C	2.4	-2.4	
I <sub>DM</sub>	Pulsed Drain Current	15	-15	A	
I <sub>S</sub>	Continuous Source Current (Diode Conduction)	1.5	-1.5	A	
P <sub>D</sub>	Power Dissipation	T <sub>A</sub> =25°C	6.5	W	
		T <sub>A</sub> =70°C	4.2		
T <sub>J</sub>	Operating Junction Temperature	150		°C	
T <sub>STG</sub>	Storage Temperature Range	-55/150		°C	
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient	120		°C/W	

## Electrical Characteristics

( $T_A=25^\circ\text{C}$  Unless otherwise noted)

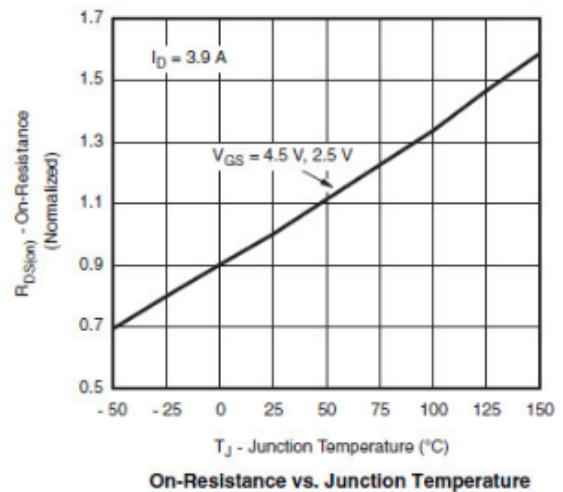
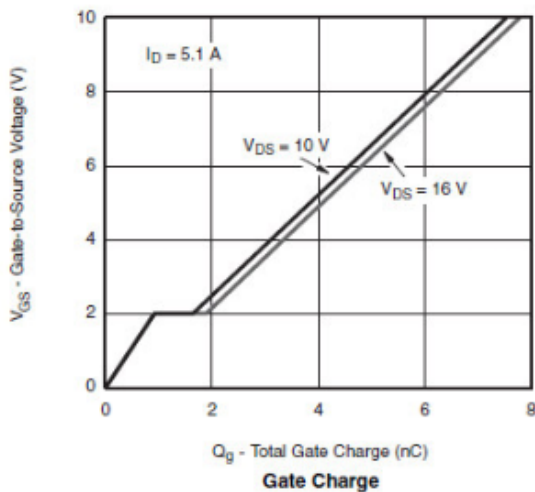
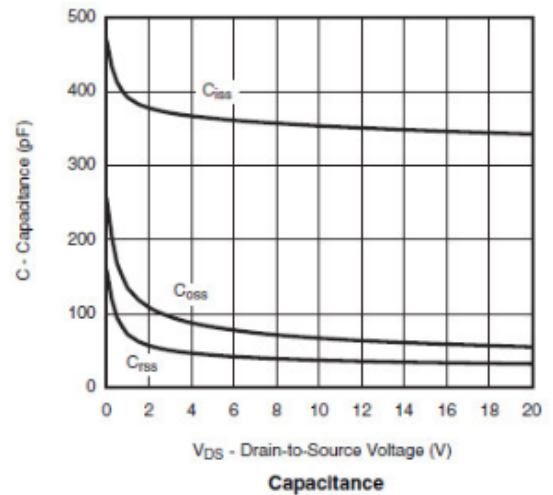
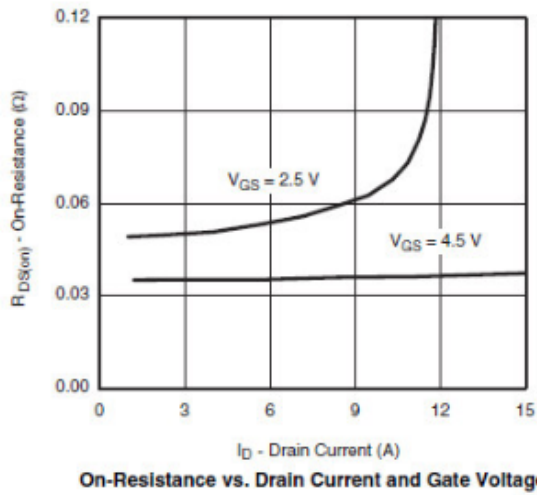
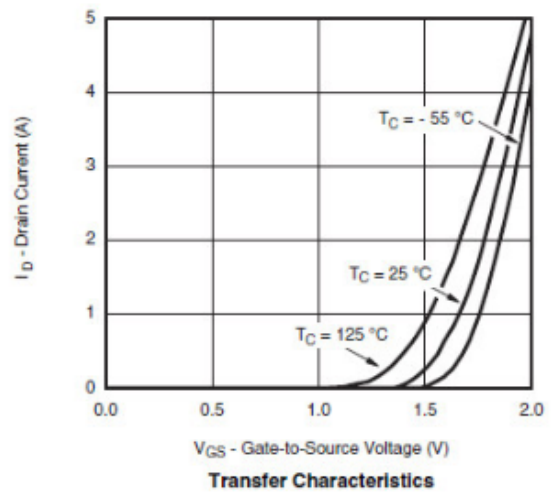
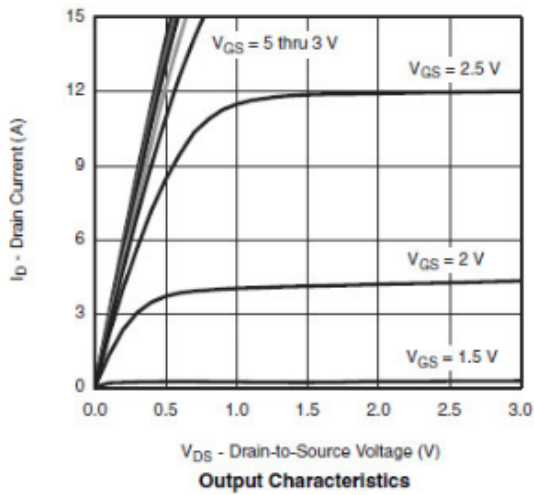
Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
<b>Static</b>							
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	N-Ch	20		V	
		$V_{GS}=0V, I_D=-250\mu A$	P-Ch	-20			
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	N-Ch	0.3	0.8		
		$V_{DS}=V_{GS}, I_D=-250\mu A$	P-Ch	-0.3	-0.8		
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$	N-Ch		$\pm 100$	nA	
		$V_{DS}=0V, V_{GS}=\pm 12V$	P-Ch		$\pm 100$		
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=16V, V_{GS}=0V$	N-Ch		1	uA	
		$V_{DS}=-16V, V_{GS}=0V$	P-Ch		-1		
		$V_{DS}=16V, V_{GS}=0V, T_J=85^\circ\text{C}$	N-Ch		10		
		$V_{DS}=-16V, V_{GS}=0V, T_J=85^\circ\text{C}$	P-Ch		-30		
$I_{D(on)}$	On-State Drain Current	$V_{DS}\geq 5V, V_{GS}=4.5V$	N-Ch	6		A	
		$V_{DS}\leq -5V, V_{GS}=-4.5V$	P-Ch	-8			
		$V_{DS}\geq 5V, V_{GS}=2.5V$	N-Ch	4			
		$V_{DS}\leq -5V, V_{GS}=-2.5V$	P-Ch	-3			
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=4.5A$	N-Ch		41	50	m $\Omega$
		$V_{GS}=-4.5V, I_D=-4.5A$	P-Ch		77	90	
		$V_{GS}=2.5V, I_D=3.6A$	N-Ch		50	60	
		$V_{GS}=-2.5V, I_D=-3.8A$	P-Ch		110	130	
		$V_{GS}=1.8V, I_D=2.4A$	N-Ch		70	80	
		$V_{GS}=-1.8V, I_D=-2.5A$	P-Ch		166	190	
$g_{fs}$	Forward Transconductance	$V_{DS}=5V, I_D=3.6A$	N-Ch		10	S	
		$V_{DS}=-5V, I_D=-2.8A$	P-Ch		6.5		
$V_{SD}$	Diode Forward Voltage	$I_S=1.6A, V_{GS}=0V$	N-Ch		0.85	1.2	V
		$I_S=-1.25A, V_{GS}=0V$	P-Ch		-0.75	-1.3	

## Electrical Characteristics (continue)

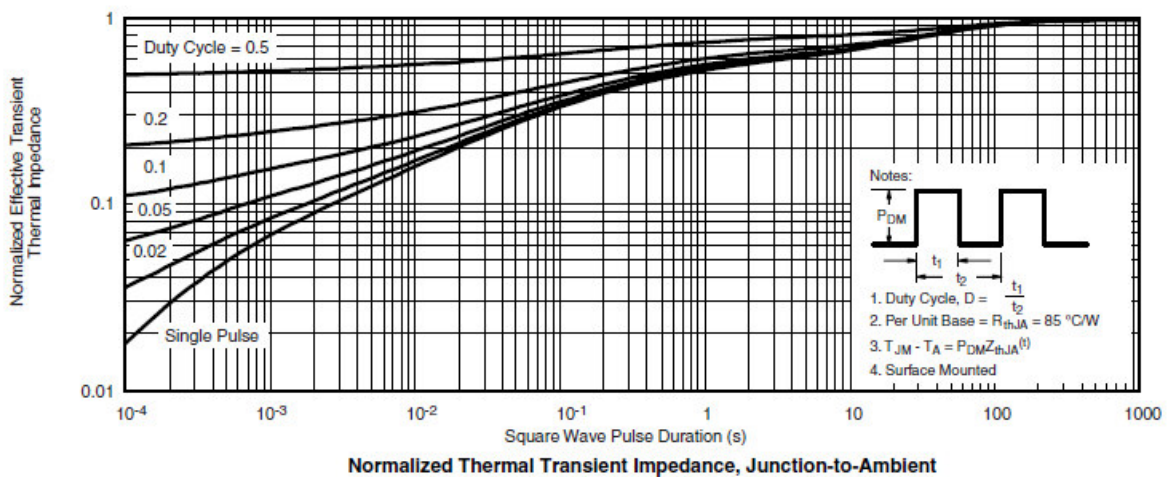
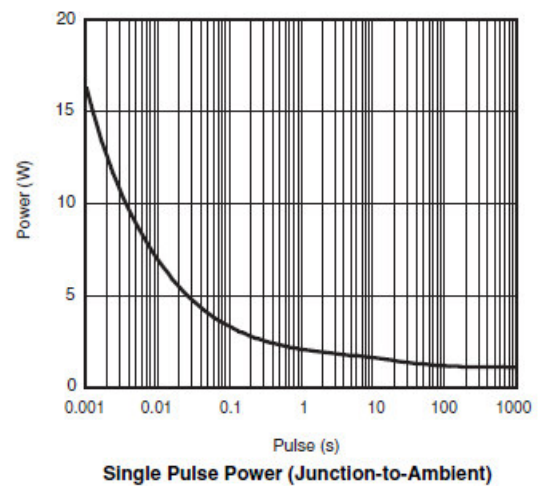
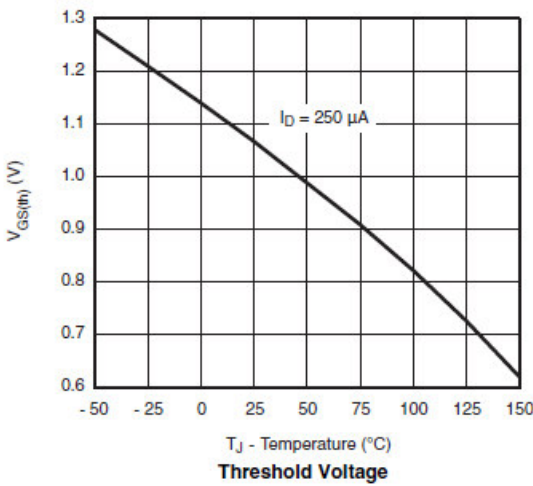
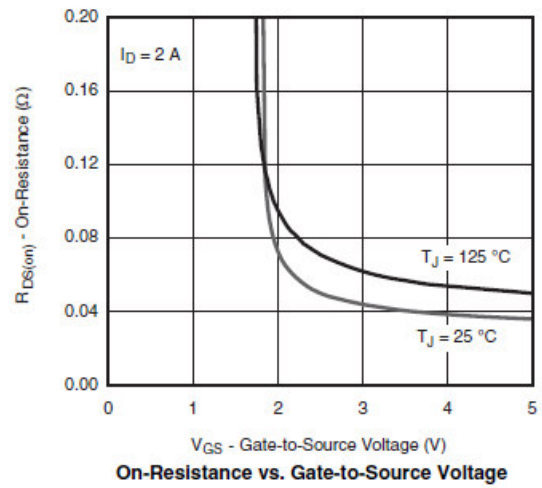
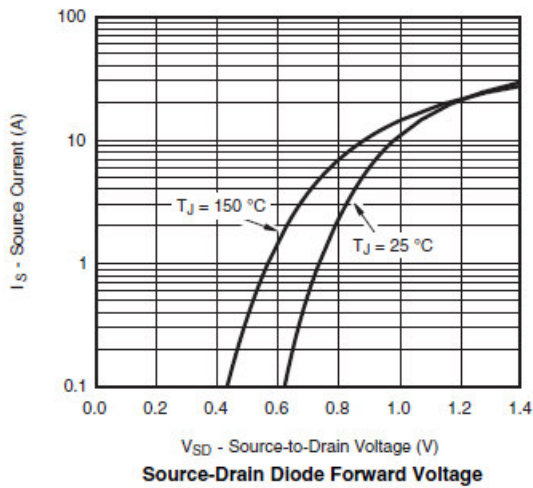
(T<sub>A</sub>=25°C Unless otherwise noted)

Symbol	Parameter	Conditions Min	Min	Typ	Max	Unit	
<b>Dynamic</b>							
Q <sub>g</sub>	Total Gate Charge	N-Channel V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =3.6A  P-Channel V <sub>DS</sub> =-10V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.5A	N-Ch		4.2	5.0	nc
			P-Ch		5	10	
Q <sub>gs</sub>	Gate-Source Charge		N-Ch		0.6		
			P-Ch		0.85		
Q <sub>gd</sub>	Gate-Drain Charge		N-Ch		0.4		
			P-Ch		1.5		
C <sub>ISS</sub>	Input Capacitance	N-Channel V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz  P-Channel V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHz	N-Ch		340		pF
C <sub>OSS</sub>	Output Capacitance		P-Ch		375		
			N-Ch		115		
C <sub>RSS</sub>	Reverse Transfer Capacitance		P-Ch		80		
			N-Ch		33		
P-Ch			60				
t <sub>d(on)</sub>	Turn-On Time	N-Channel V <sub>DD</sub> =10V, R <sub>L</sub> =2.8Ω, I <sub>D</sub> =3.6A V <sub>GEN</sub> =4.5V, R <sub>G</sub> =1Ω  P-Channel V <sub>DD</sub> =-10V, R <sub>L</sub> =2.85Ω, I <sub>D</sub> =-3.5A V <sub>GEN</sub> =-4.5V, R <sub>G</sub> =1Ω	N-Ch		8	15	ns
t <sub>r</sub>			P-Ch		15	25	
	t <sub>d(off)</sub>		Turn-Off Time	N-Ch		8	
P-Ch					36	60	
t <sub>r</sub>			N-Ch		25	40	
			P-Ch		25	50	
t <sub>r</sub>			N-Ch		8	15	
			P-Ch		15	25	

## Typical Performance Characteristics (N-Channel)

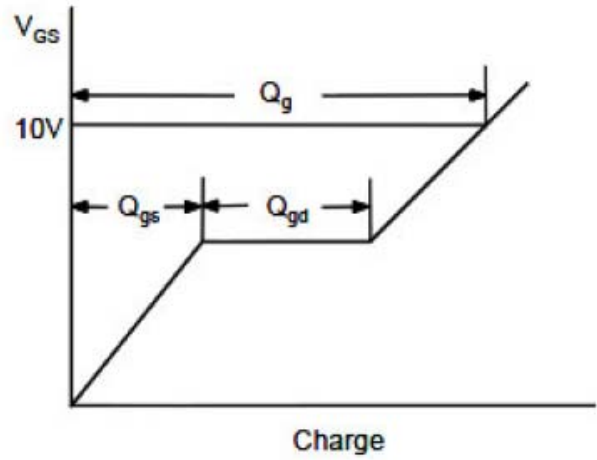
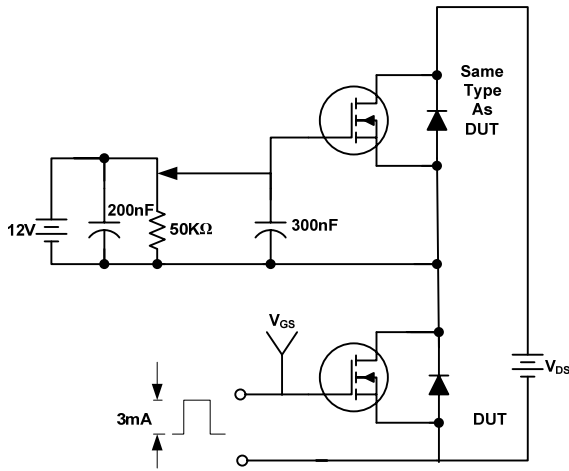


## Typical Performance Characteristics (N-Channel)

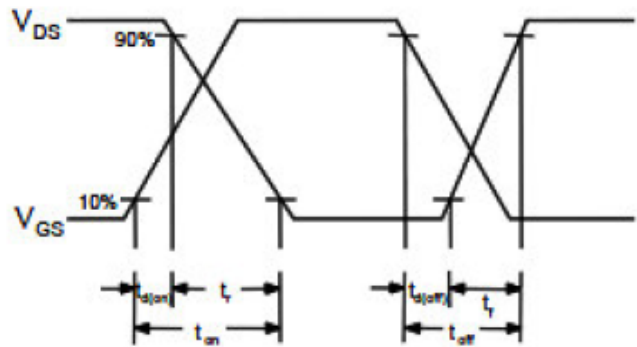
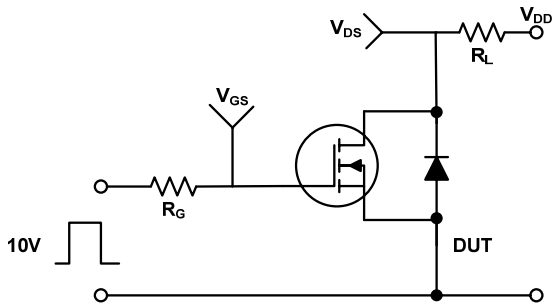


## Typical Performance Characteristics (N-Channel)

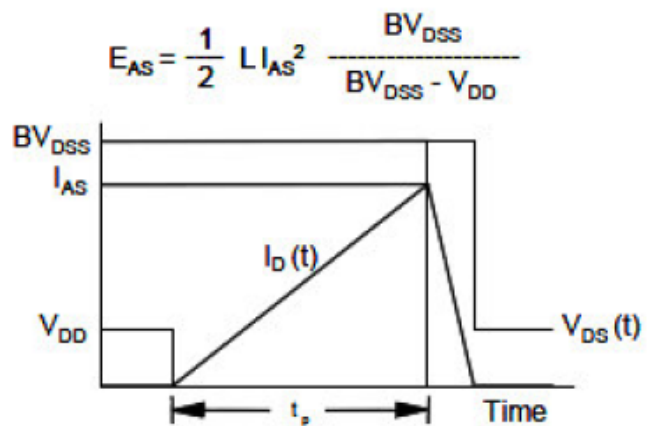
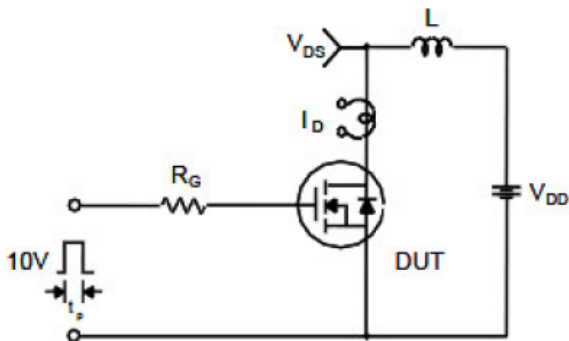
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

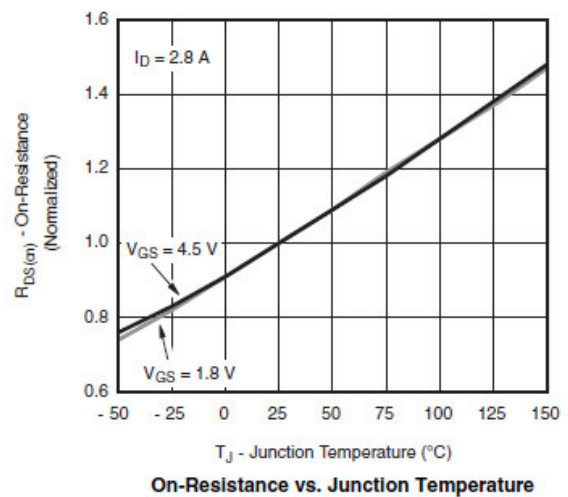
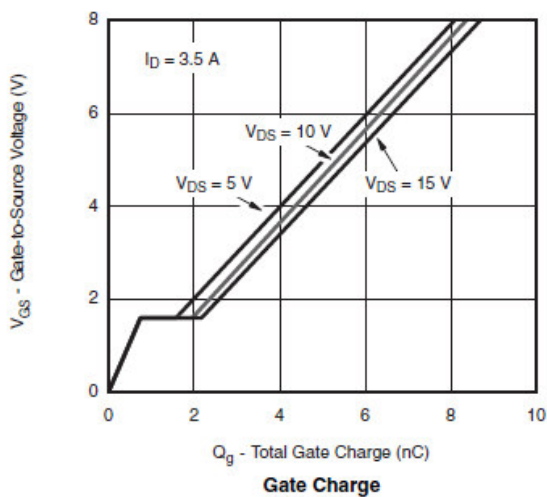
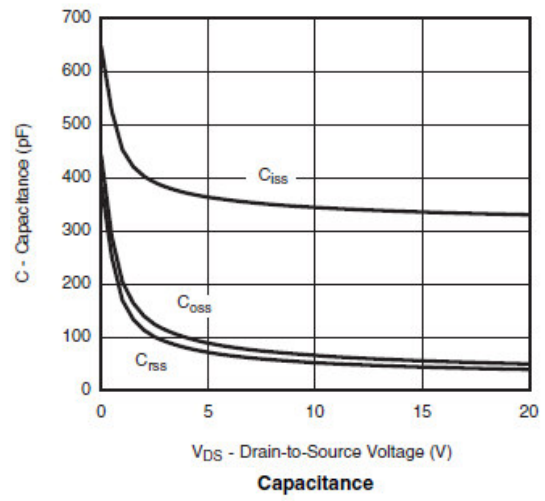
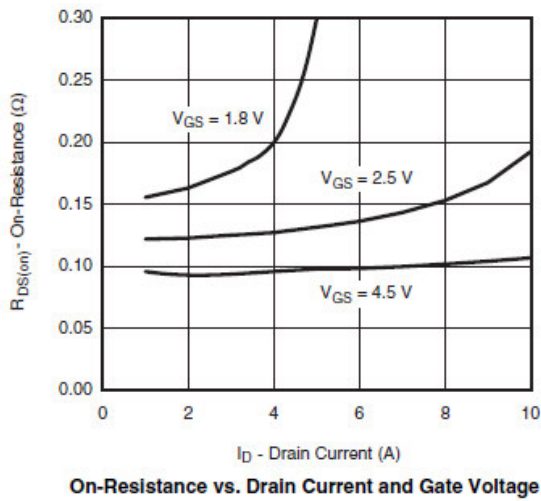
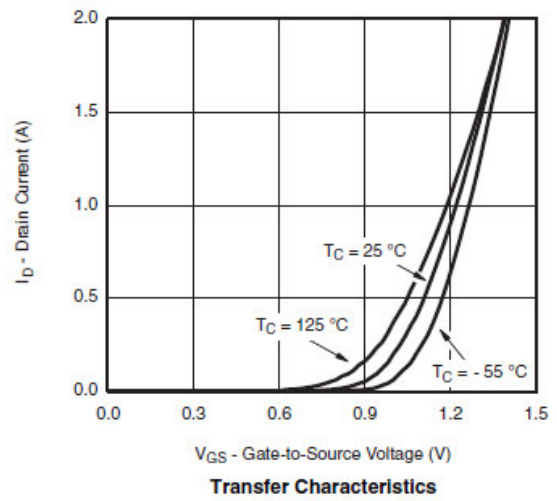
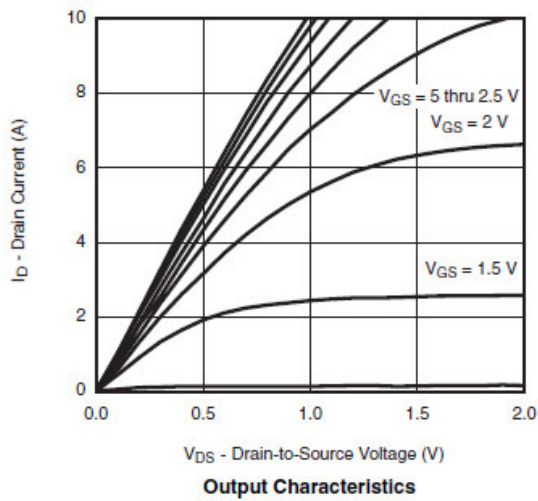


### Unclamped Inductive Switching Test Circuit & Waveforms



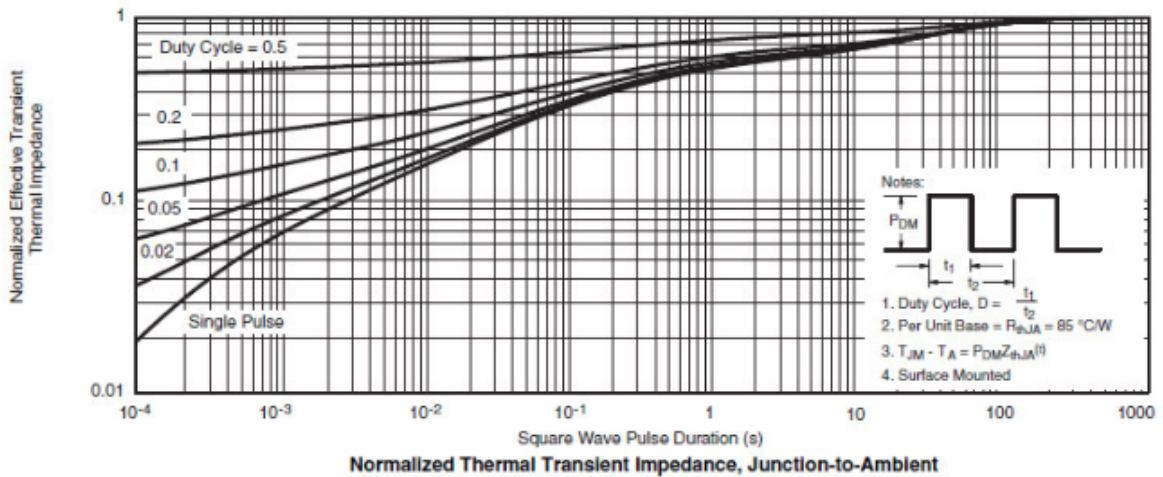
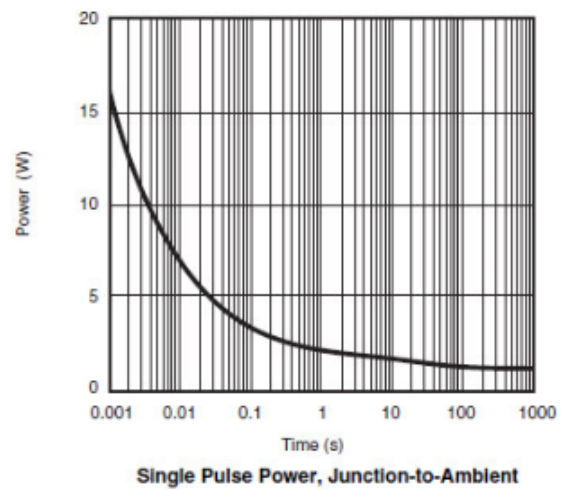
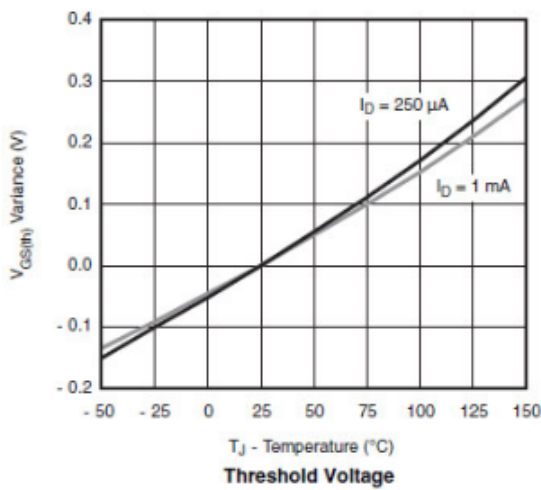
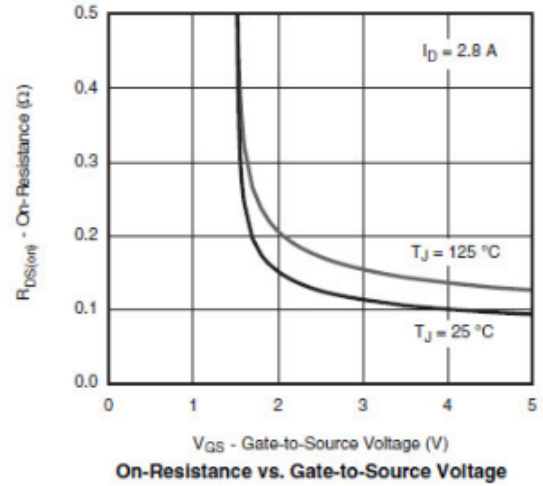
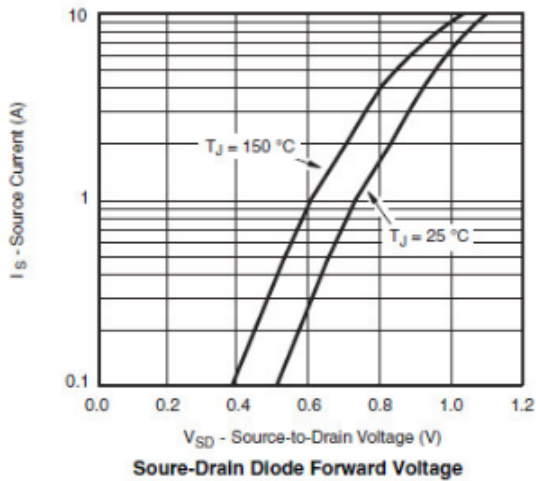


## Typical Performance Characteristics (P-Channel)

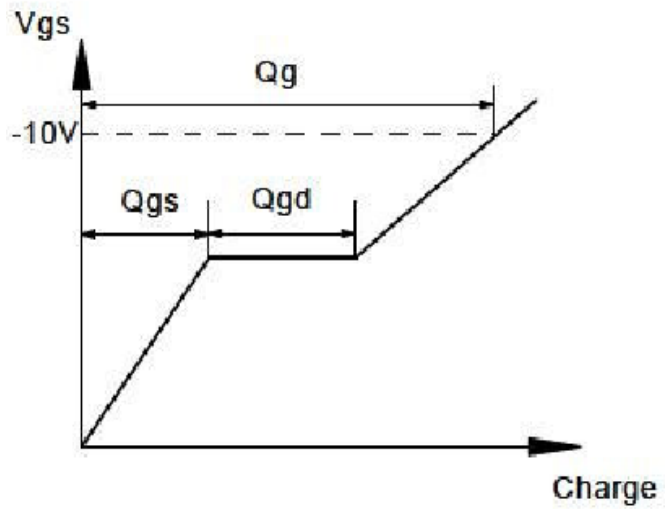
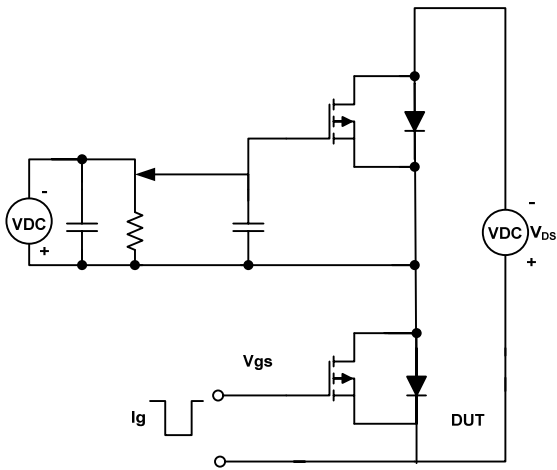




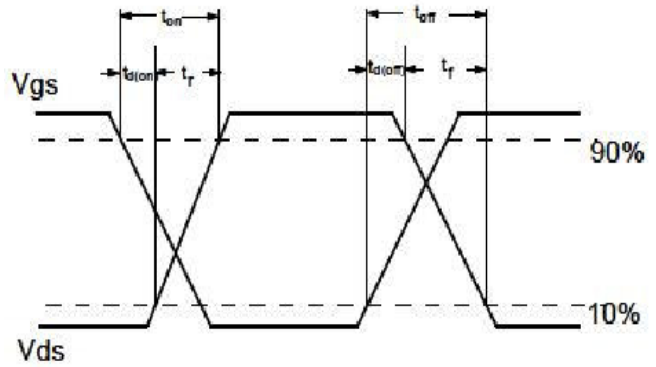
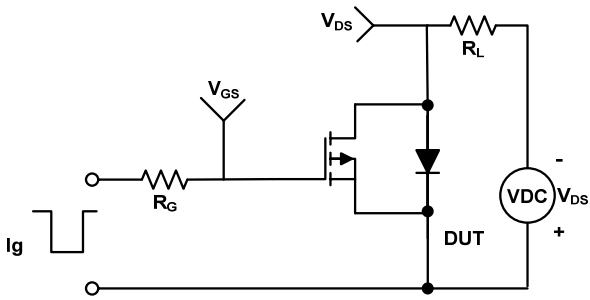
## Typical Performance Characteristics (P-Channel)



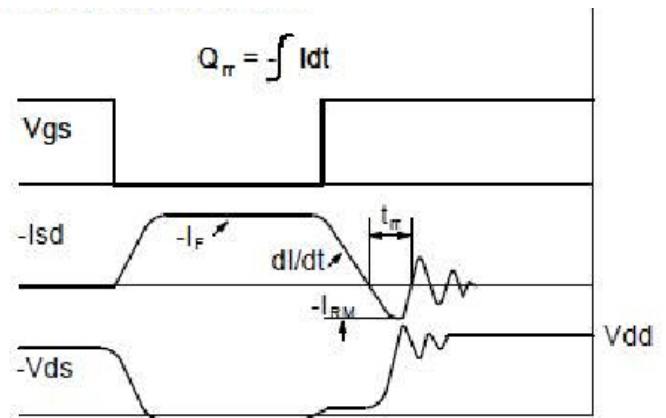
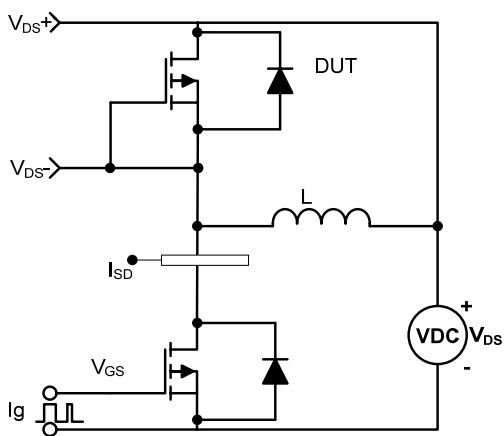
## Typical Performance Characteristics (P-Channel)



## Resistive Switching Test Circuit & Waveforms

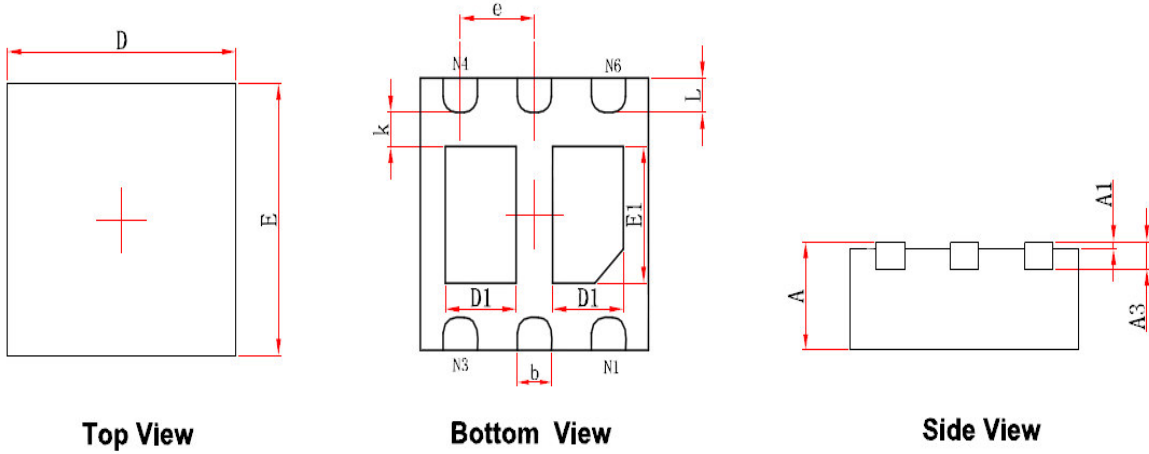


## Unclamped Inductive Switching Test Circuit & Waveforms



## Package Dimension

### DFN2x2-6L



Top View

Bottom View

Side View





### Dimensions

SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.700/0.800	0.800/0.900	0.028/0.031	0.031/0.035
A1	0.000	0.050	0.000	0.002
A3	0.203 (REF)		0.008 (REF)	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.076	0.082
D1	0.520	0.720	0.020	0.028
E1	0.900	1.100	0.035	0.043
k	0.200 (MIN)		0.008 (MIN)	
b	0.250	0.350	0.010	0.014
e	0.650 (TYP)		0.026 (TYP)	
L	0.174	0.326	0.007	0.013



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## CONTACT US

GS Headquarter	
	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd NeiHu District Taipei City 114, Taiwan (R.O.C)
	886-2-2657-9980
	886-2-2657-3630
	sales_twn@gs-power.com

Wu-Xi Branch	
	No.21 Changjiang Rd., WND, Wuxi, Jiangsu, China (INFO. & TECH. Science Park Building A 210 Room)
	86-510-85217051
	86-510-85211238
	sales_cn@gs-power.com

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	1-408-457-0587