

# GSMS05N15

## 150V N-Channel Enhancement Mode MOSFET

### 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.

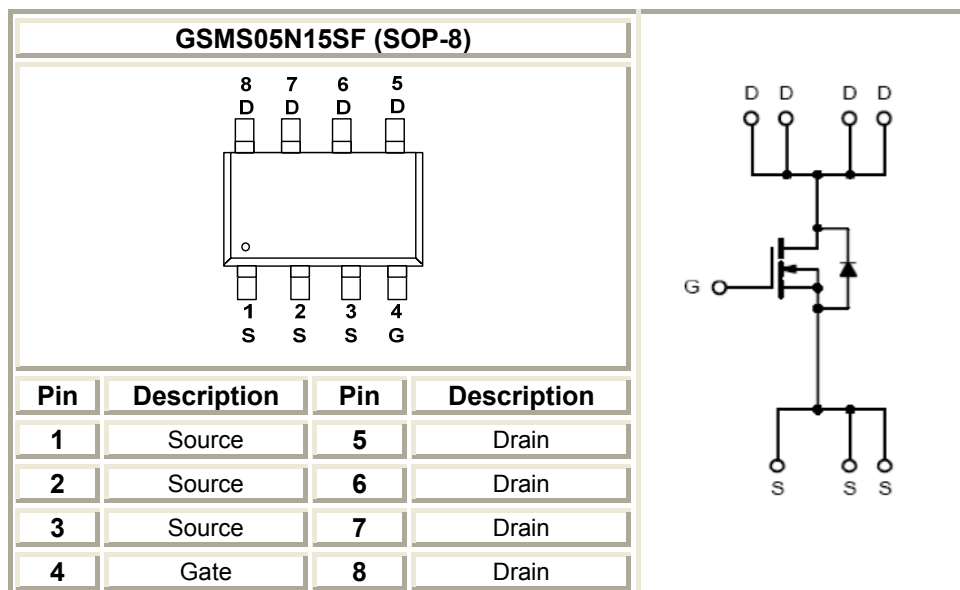
### Features

- 150V, 5A,  $R_{DS(ON)}=65m\Omega@V_{GS}=10V$
- $V_{GS}$  Guarantee  $\pm 25V$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- SOP-8 package design

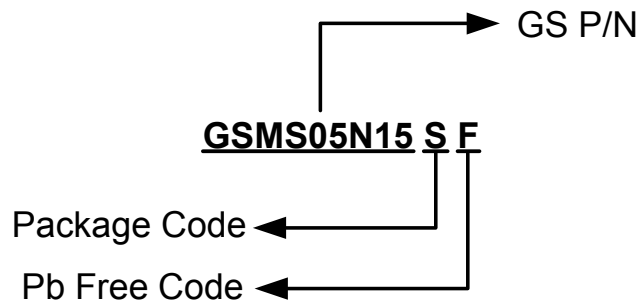
### Applications

- Notebook
- Load Switch
- LED applications
- Li battery pack application

### Packages & Pin Assignments

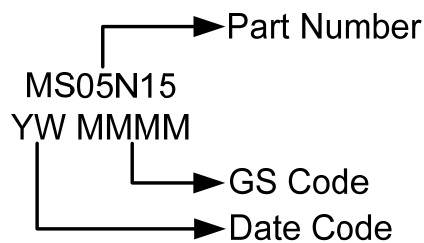


## Ordering Information



Part Number	Package	Quantity
GSMS05N15SF	SOP-8	4000 PCS

## Marking Information



## Absolute Maximum Ratings

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

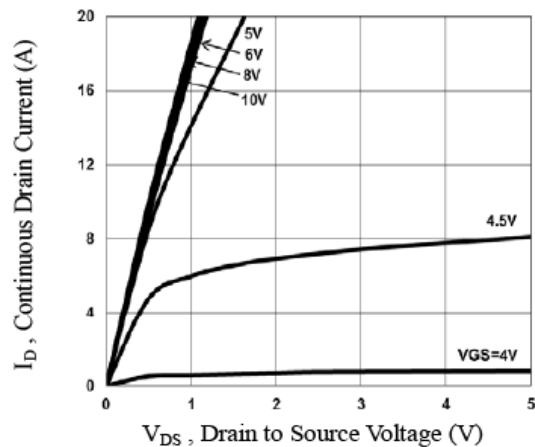
Symbol	Parameter	Typical	Unit
V <sub>DSS</sub>	Drain-Source Voltage	150	V
V <sub>GSS</sub>	Gate-Source Voltage	±25	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> =25°C	5
		T <sub>A</sub> =100°C	3.2
I <sub>DM</sub>	Pulsed Drain Current	20	A
P <sub>D</sub>	Power Dissipation	3.6	W
T <sub>J</sub>	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	35	°C/W

## Electrical Characteristics

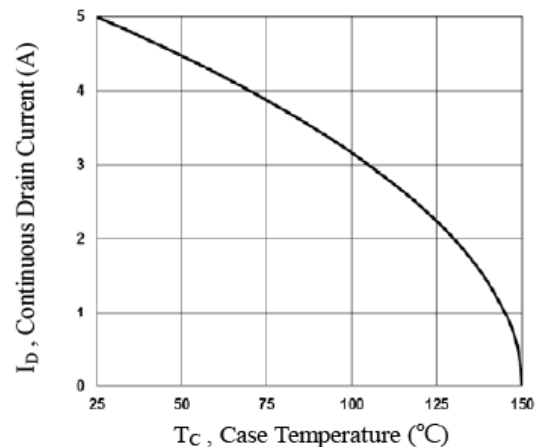
(T<sub>A</sub>=25°C unless otherwise noted)

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	150			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2.0		4.0	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA		-2.5		mV/°C
ΔBV <sub>DSS</sub> / ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA		0.02		V/°C
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±25V			±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =120V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =120V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C			30	
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =5A		52	65	mΩ
		V <sub>GS</sub> =5V, I <sub>D</sub> =3A		60	80	
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =1A, V <sub>GS</sub> =0V			1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =1A, V <sub>GS</sub> =0V, di/dt=100A/us		55		ns
Q <sub>rr</sub>	Reverse Recovery Charge	T <sub>J</sub> =25°C		130		nC
<b>Dynamic</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =75V, V <sub>GS</sub> =0V, f=1MHz		1340		pF
C <sub>oss</sub>	Output Capacitance			134		
C <sub>rss</sub>	Reverse Transfer Capacitance			60		
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =75V, V <sub>GS</sub> =10V, I <sub>D</sub> =4.1A		30		nC
Q <sub>gs</sub>	Gate-Source Charge			7		
Q <sub>gd</sub>	Gate-Drain Charge			10		
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =75V, I <sub>D</sub> =4.1A, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω		15		ns
t <sub>r</sub>				10		
t <sub>d(off)</sub>	Turn-Off Time			34		
t <sub>f</sub>				12		

## Typical Performance Characteristics

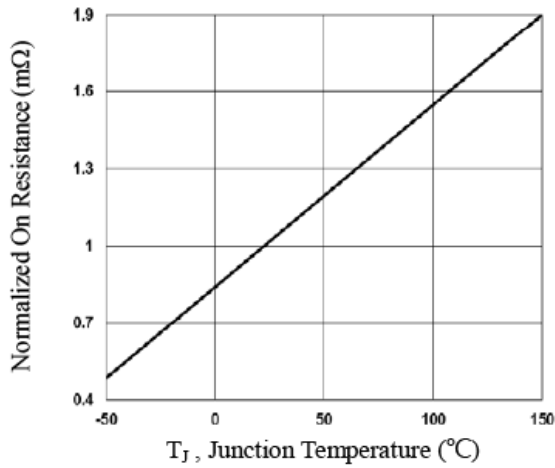


**Fig.1 Output Characteristics**

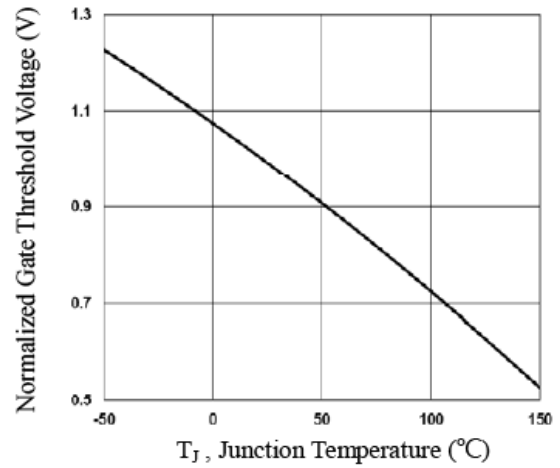


**Fig.2 Continuous Drain Current vs. T<sub>c</sub>**

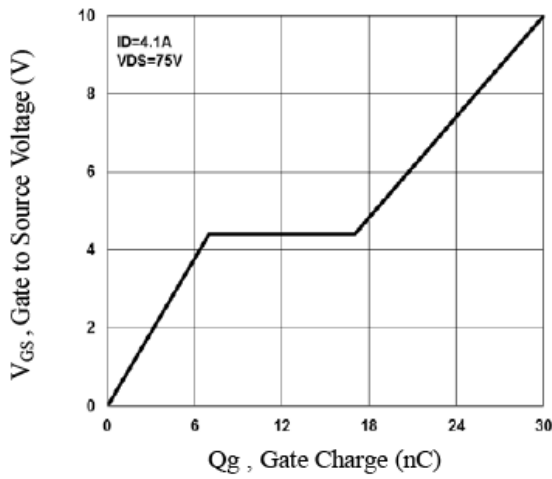
## Typical Performance Characteristics (Continue)



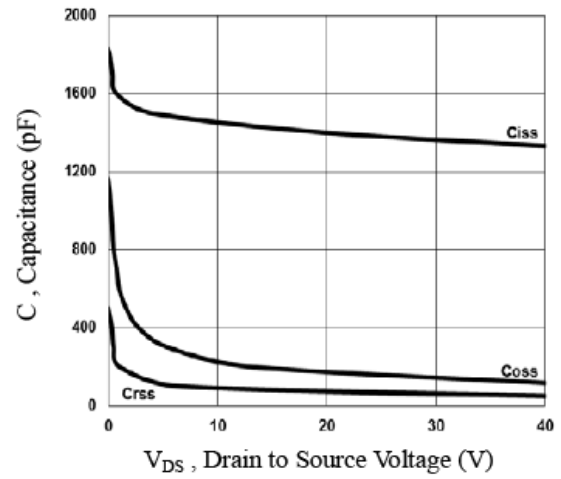
**Fig.3 Normalized RDSON vs.  $T_J$**



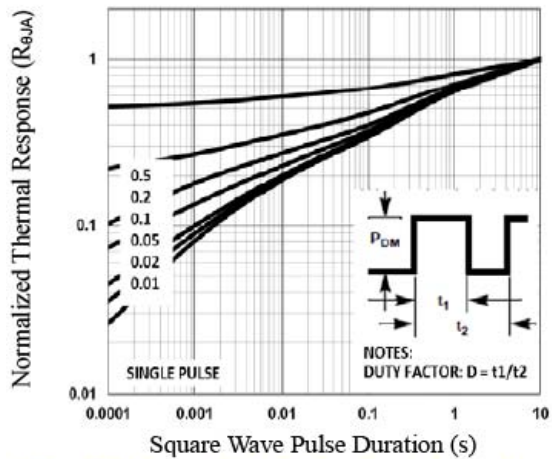
**Fig.4 Normalized  $V_{th}$  vs.  $T_J$**



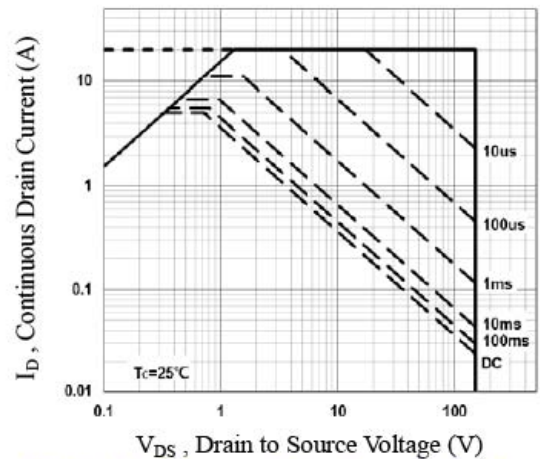
**Fig.5 Gate Charge Waveform**



**Fig.6 Capacitance Characteristics**



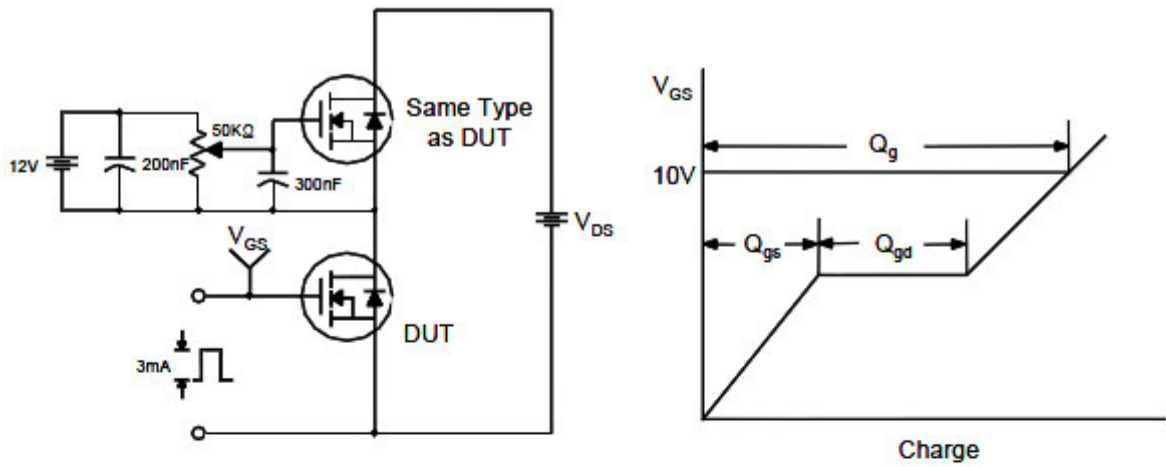
**Fig.7 Normalized Transient Impedance**



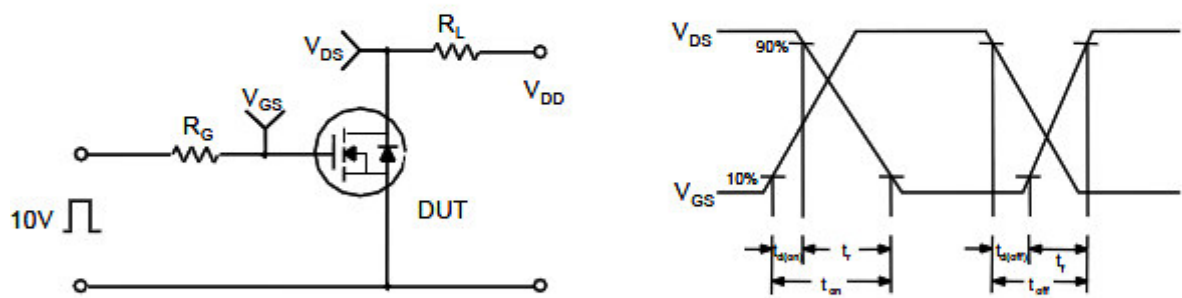
**Fig.8 Maximum Safe Operation Area**

## Typical Characteristics

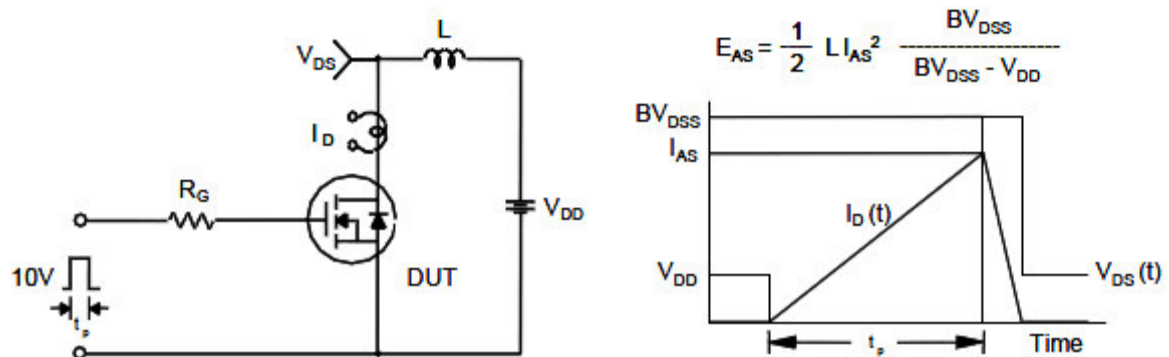
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

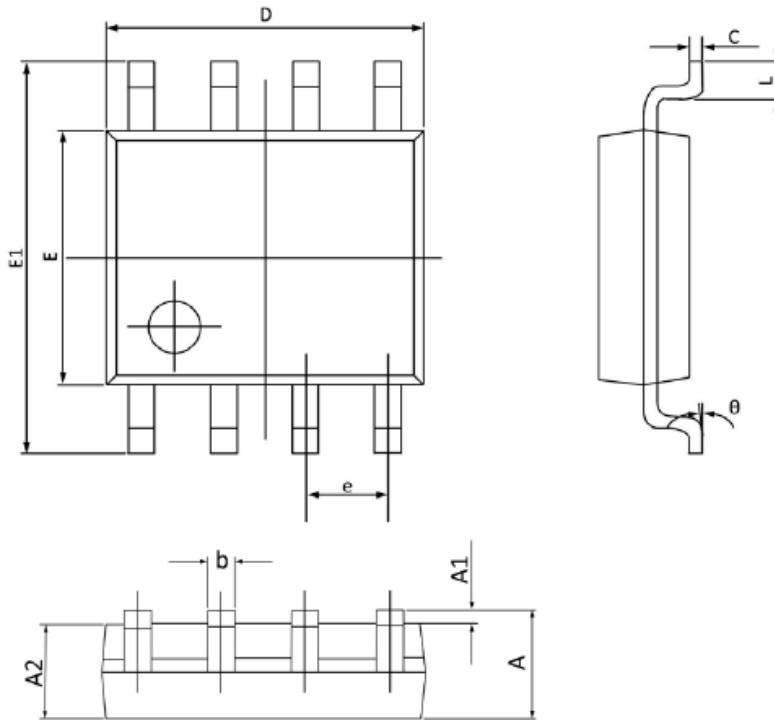


Unclamped Inductive Switching Test Circuit & Waveforms



## Package Dimension

### SOP-8



#### Dimensions

Symbol	Millimeters		Inches	
	Min	Max	Min	Max
<b>A</b>	1.35	1.75	0.053	0.069
<b>A1</b>	0.10	0.25	0.004	0.010
<b>A2</b>	1.35	1.55	0.053	0.061
<b>b</b>	0.33	0.51	0.013	0.020
<b>c</b>	0.17	0.25	0.006	0.010
<b>D</b>	4.70	5.10	0.185	0.200
<b>E</b>	3.80	4.00	0.150	0.157
<b>E1</b>	5.80	6.20	0.228	0.244
<b>e</b>	1.27(BSC)		0.050(BSC)	
<b>L</b>	0.40	1.27	0.016	0.050
<b>θ</b>	0°	8°	0°	8°


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