

# GSMDS04N15

## 150V 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.

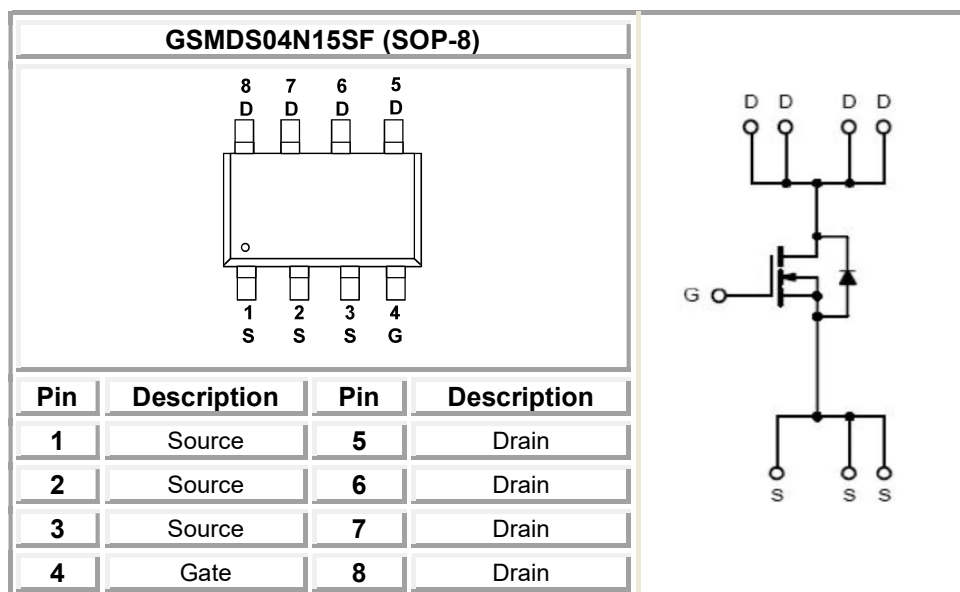
### Features

- 150V, 4A,  $R_{DS(ON)}=65m\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- SOP-8 package design

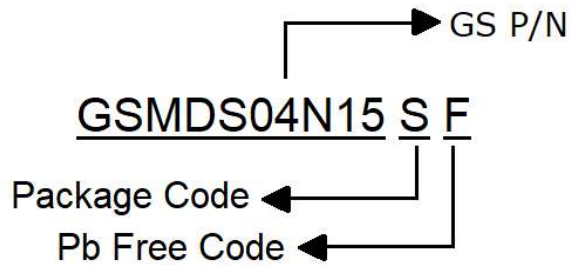
### Applications

- Notebook
- Load Switch
- LED applications

### Packages & Pin Assignments

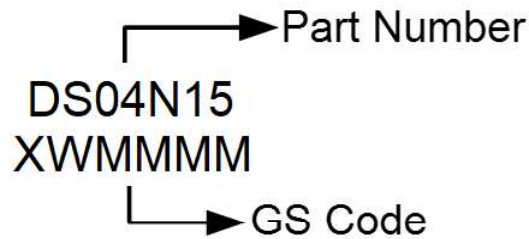


## Ordering Information



Part Number	Package	Quantity
GSMDS04N15SF	SOP-8	3000 & 4000 PCS

## Marking Information



## Absolute Maximum Ratings

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

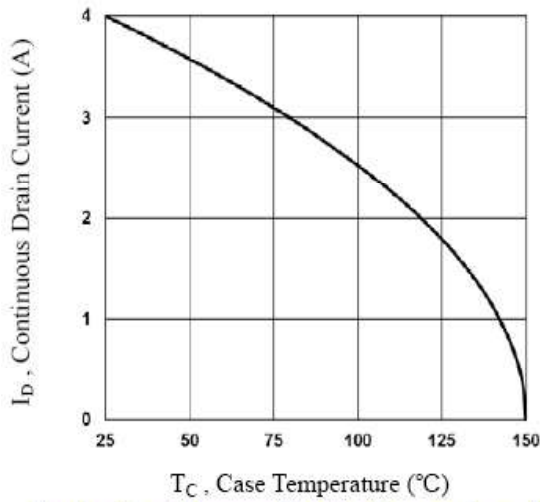
Symbol	Parameter	Typical	Unit
V <sub>DSS</sub>	Drain-Source Voltage	150	V
V <sub>GSS</sub>	Gate-Source Voltage	±25	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> =25°C	4
		T <sub>A</sub> =100°C	2.5
I <sub>DM</sub>	Pulsed Drain Current	16	A
P <sub>D</sub>	Power Dissipation (T <sub>A</sub> =25°C)	2.5	W
	Power Dissipation-Derate above 25°C	0.02	W/°C
T <sub>J</sub>	Operating Junction Temperature Range	-50 to 150	°C
T <sub>STG</sub>	Storage Temperature Range	-50 to 150	°C
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient	50	°C/W

## Electrical Characteristics

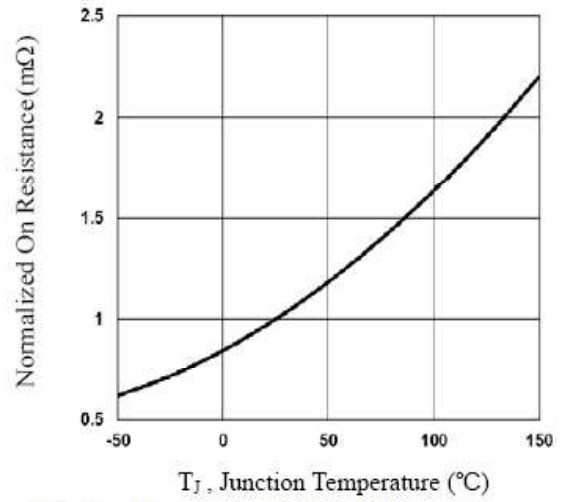
(T<sub>A</sub>=25°C unless otherwise noted)

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> =250μA	150			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2	3	4	
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA		0.07		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> =150V, V <sub>GS</sub> =0V			1	μA
		V <sub>DS</sub> =120V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C			10	
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current			4	A
I <sub>SM</sub>	Pulsed Source Current				8	
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =4A		52	65	mΩ
		V <sub>GS</sub> =6V, I <sub>D</sub> =2A		60	85	
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =1A, V <sub>GS</sub> =0V			1	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =3A		8		S
<b>Dynamic</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz		1790	3000	pF
C <sub>oss</sub>	Output Capacitance			160	300	
C <sub>rss</sub>	Reverse Transfer Capacitance			82	150	
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =75V, V <sub>GS</sub> =10V, I <sub>D</sub> =4A		30	60	nC
Q <sub>gs</sub>	Gate-Source Charge			8.7	16	
Q <sub>gd</sub>	Gate-Drain Charge			8	16	
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =75V, I <sub>D</sub> =1A, V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω		14.5	28	ns
t <sub>r</sub>				19.2	18	
t <sub>d(off)</sub>	Turn-Off Time			33.6	60	
t <sub>f</sub>				22.8	25	
R <sub>g</sub>	Gate Resistance		V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		1.4	

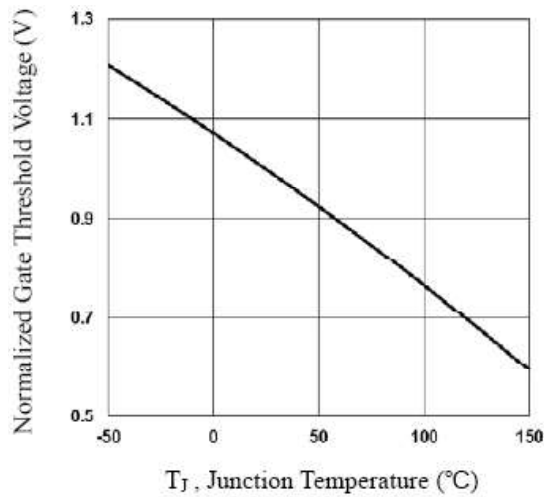
## Typical Performance Characteristics



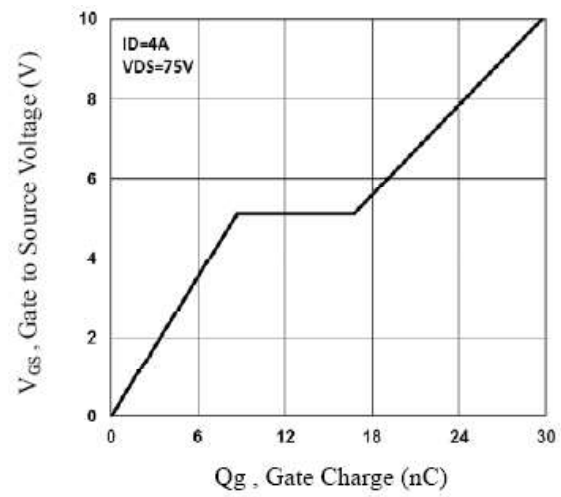
**Fig.1 Continuous Drain Current vs.  $T_c$**



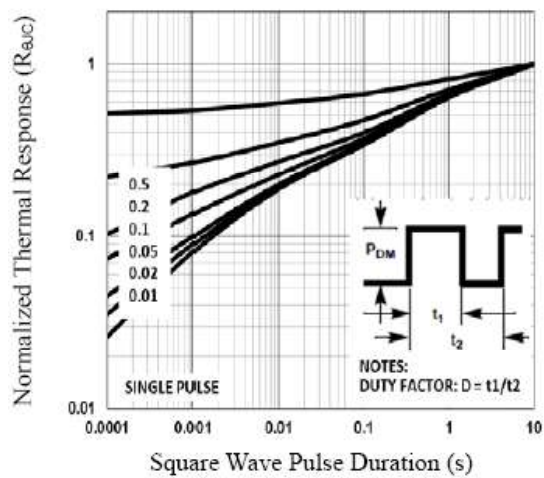
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



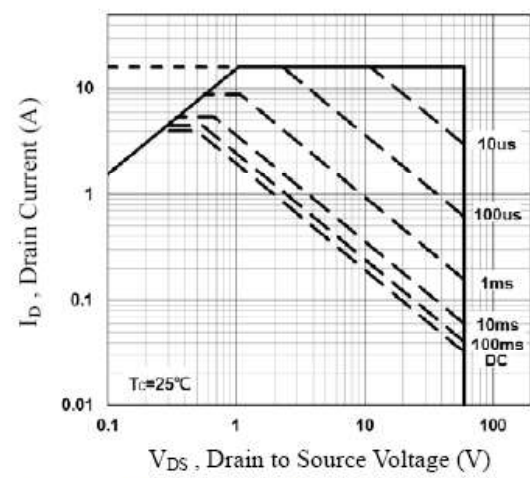
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



**Fig.4 Gate Charge Characteristics**



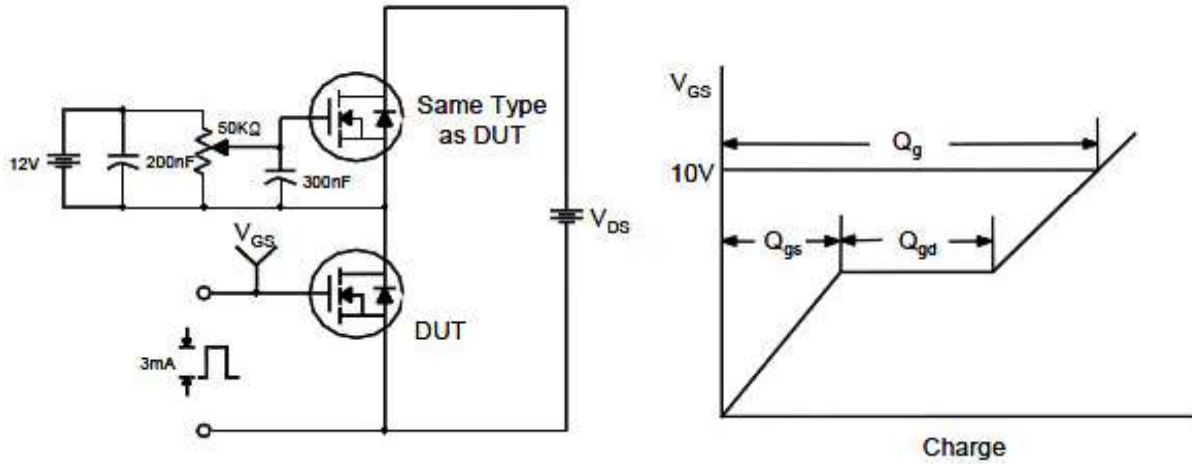
**Fig.5 Normalized Transient Impedance**



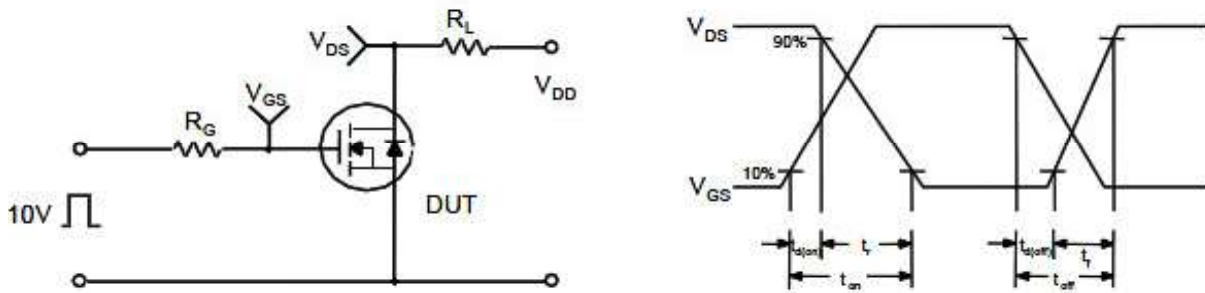
**Fig.6 Maximum Safe Operation Area**

## Typical Characteristics

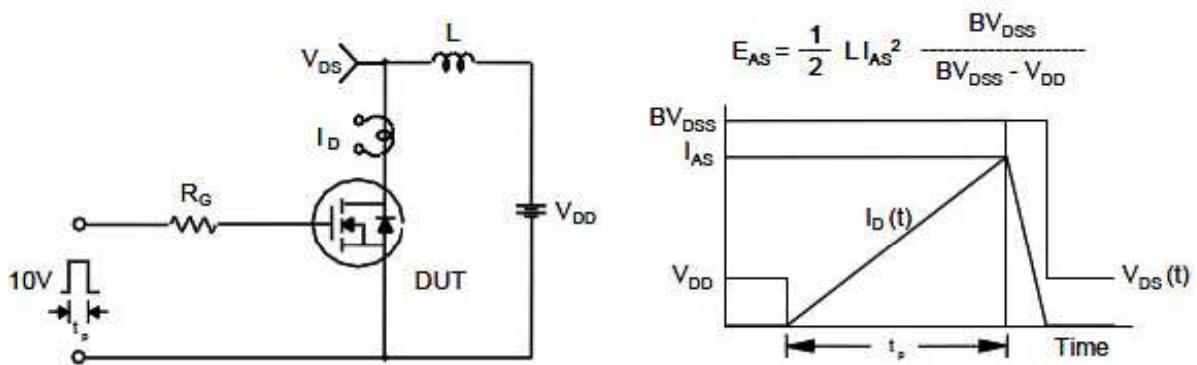
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

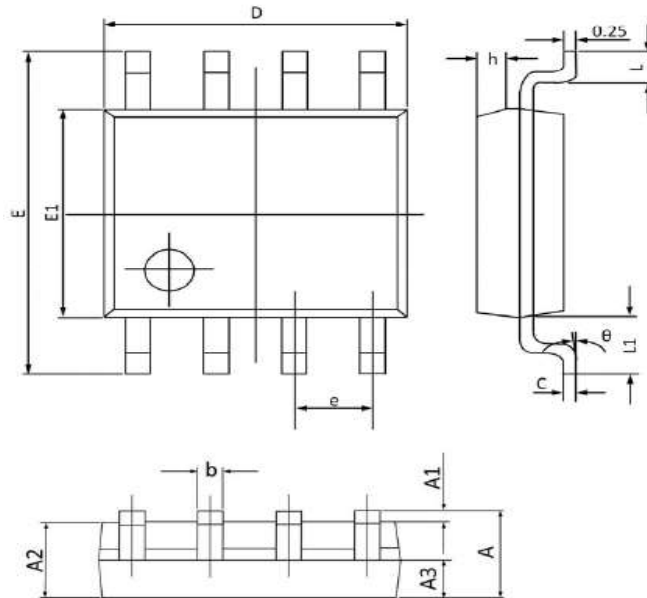


Unclamped Inductive Switching Test Circuit & Waveforms



## Package Dimension

### SOP-8









Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
<b>A</b>	1.350	1.750	0.053	0.068
<b>A1</b>	0.100	0.250	0.004	0.009
<b>A2</b>	1.300	1.500	0.052	0.059
<b>A3</b>	0.600	0.700	0.024	0.027
<b>b</b>	0.390	0.480	0.016	0.018
<b>c</b>	0.210	0.260	0.009	0.010
<b>D</b>	4.700	5.100	0.186	0.200
<b>E</b>	5.800	6.200	0.229	0.244
<b>E1</b>	3.700	4.100	0.146	0.161
<b>e</b>	1.270 (BSC)		0.050 (BSC)	
<b>h</b>	0.250	0.500	0.010	0.019
<b>L</b>	0.500	0.800	0.019	0.031
<b>L1</b>	1.050 (BSC)		0.041 (BSC)	
<b>θ</b>	0°	8°	0°	8°

## NOTICE

Information furnished is believed to be accurate and reliable. However Globaltech Semiconductor assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties, which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Globaltech Semiconductor. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information without express written approval of Globaltech Semiconductor.

## 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

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