

# GSMDS3807

## 30V Dual P-Channel MOSFETs

### Product Description

These Dual P-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

- -30V, -7A,  $R_{DS(ON)}=23m\Omega@V_{GS}=-10V$
- Improved dv/dt capability
- Fast switching
- Suit for -4.5V Gate Drive Applications
- Green Device Available
- SOP-8 package design

### Applications

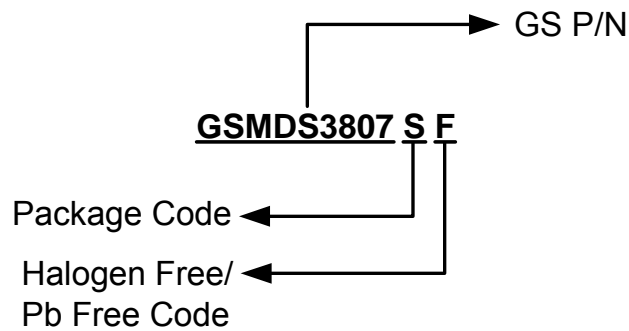
- MB / VGA / Vcore
- Load Switch
- LED Applications
- POL Applications

### Packages & Pin Assignments

**GSMDS3807SF (SOP-8)**

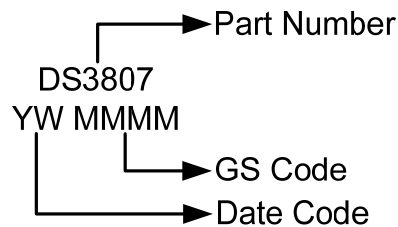
Pin No	Description	Pin No	Description
1	Source 1	5	Drain 2
2	Gate 1	6	Drain 2
3	Source 2	7	Drain 1
4	Gate 2	8	Drain 1

## Ordering Information



Part Number	Package	Quantity Reel
GSMDS3807SF	SOP-8	4000 PCS

## Marking Information



## Absolute Maximum Ratings

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

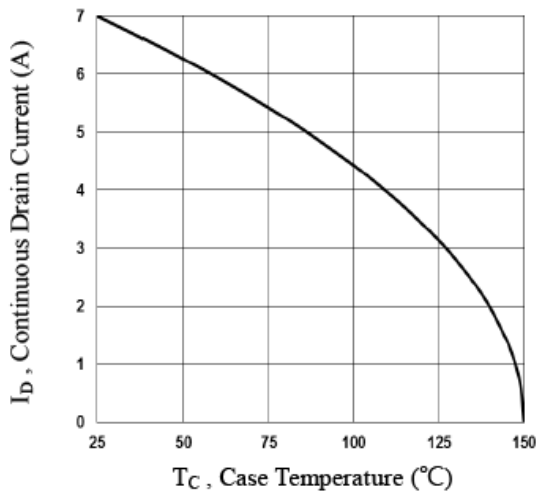
Symbol	Parameter	Typical	Unit
V <sub>DS</sub>	Drain-Source Voltage	-30	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> =25°C	-7
		T <sub>C</sub> =100°C	-4.43
I <sub>DM</sub>	Pulsed Drain Current	-28	A
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> =25°C	2.1
		Derate above 25°C	0.017
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	60	°C/ W

## Electrical Characteristics

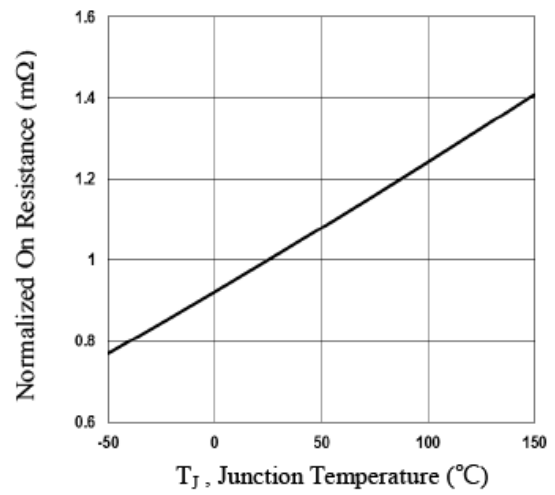
( $T_A=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30			V
$\Delta BV_{DSS}/\Delta T_J$	$BV_{DSS}$ Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_D=-1mA$		-0.03		$V/^\circ\text{C}$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	-1.6	-2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			4		$mV/^\circ\text{C}$
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-30V, V_{GS}=0V$			-1	uA
		$V_{DS}=-24V, V_{GS}=0V$ , $T_J=125^\circ\text{C}$			-10	
$I_S$	Continuous Source Current	$V_G=V_D=0V$ , Force Current			-7	A
$I_{SM}$	Pulsed Source Current				-14	
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-5A$		20	23	m $\Omega$
		$V_{GS}=-4.5V, I_D=-3A$		30	36	
$g_{FS}$	Forward Transconductance	$V_{DS}=-10V, I_D=-3A$		6.8		S
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A$			-1	V
<b>Dynamic</b>						
$Q_g$	Total Gate Charge	$V_{DS}=-15V, V_{GS}=-4.5V$ , $I_D=-5A$		11	17	nC
$Q_{gs}$	Gate-Source Charge			3.4	6	
$Q_{gd}$	Gate-Drain Charge			4.2	8	
$C_{iss}$	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V$ , $f=1MHz$		1250	1820	pF
$C_{oss}$	Output Capacitance			160	235	
$C_{rss}$	Reverse Transfer Capacitance			90	130	
$t_{d(on)}$	Turn-On Time	$V_{DD}=-15V, I_D=-1A$ , $V_{GS}=-10V, R_G=6\Omega$		5.8	11	ns
$t_r$				18.8	36	
$t_{d(off)}$	Turn-Off Time			46.9	89	
$t_f$				12.3	23	

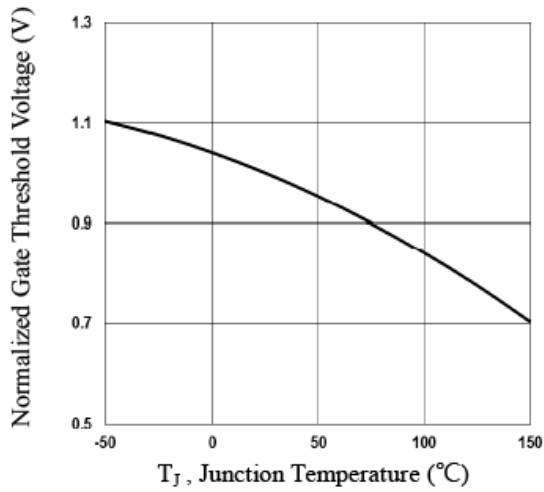
## Typical Performance Characteristics



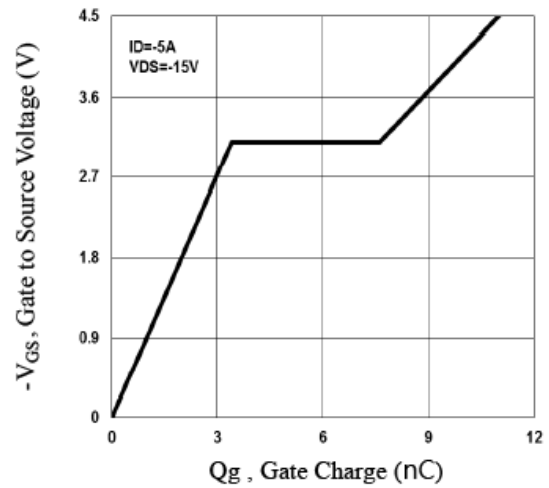
**Fig.1 Continuous Drain Current vs.  $T_C$**



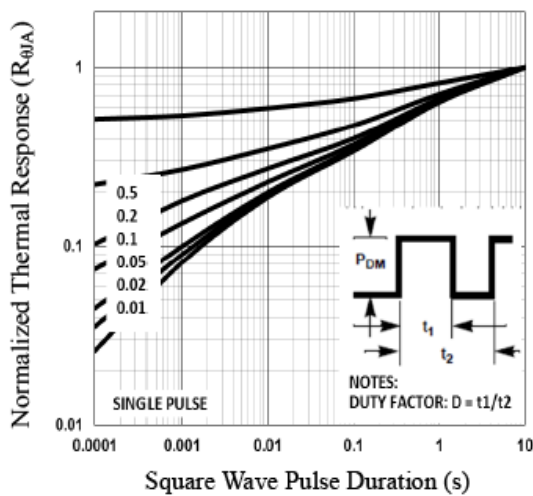
**Fig.2 Normalized RDSON vs.  $T_J$**



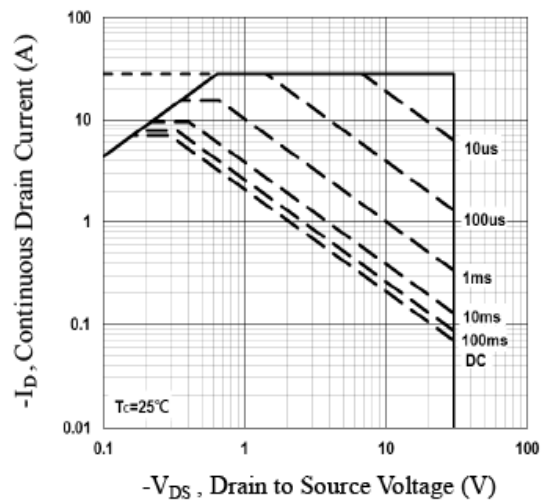
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



**Fig.4 Gate Charge Waveform**



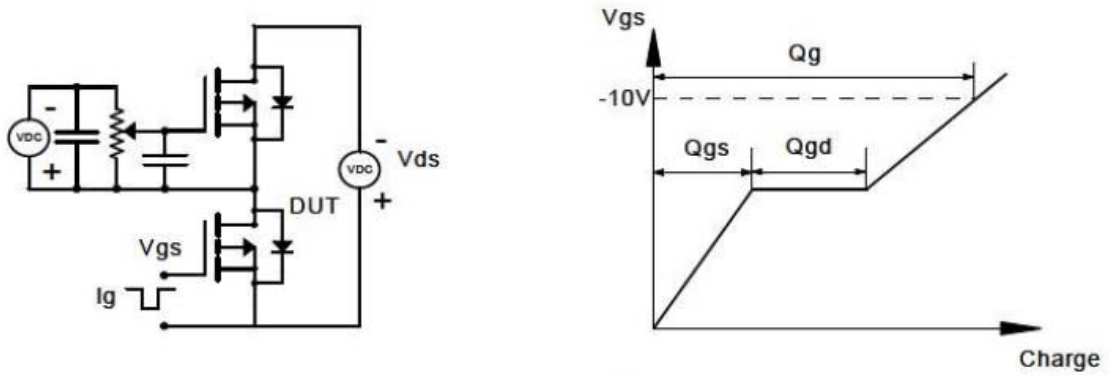
**Fig.5 Normalized Transient Impedance**



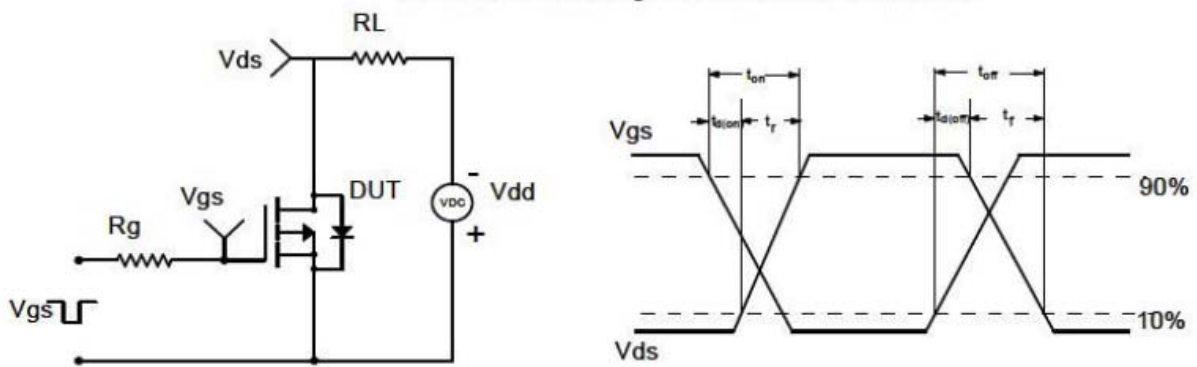
**Fig.6 Maximum Safe Operation Area**

## Typical Performance Characteristics (continue)

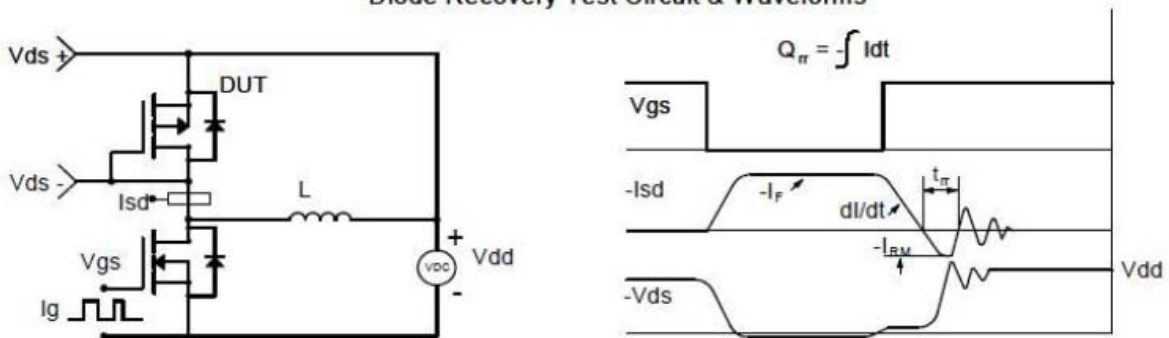
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

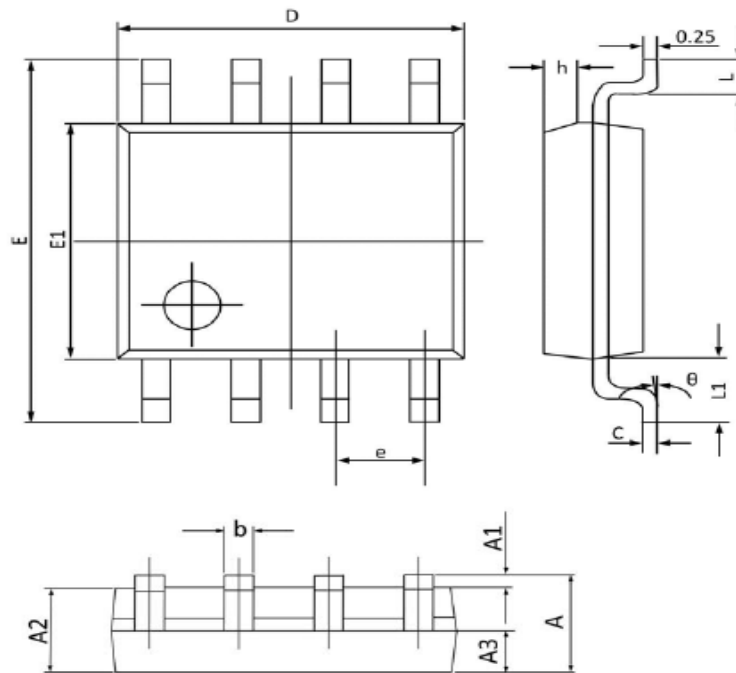


### Diode Recovery Test Circuit & Waveforms



## Package Dimension

### SOP-8



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

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