

# GSMDC3907Z

## 30V P-Channel Enhancement Mode MOSFET

### Product Description

These 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, -30A,  $R_{DS(ON)}=18m\Omega@V_{GS}=-10V$
- Fast switching
- Suit for -4.5V Gate Drive Applications
- Green Device Available
- DFN3X3-8L package design

### Applications

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

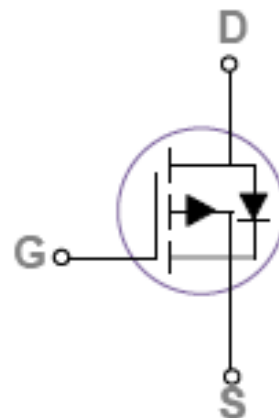
### Packages & Pin Assignments

GSMDC3907ZFF (DFN3X3-8L)

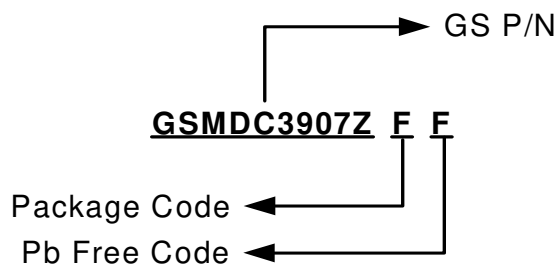


Top View

Pin	Description
1	Source
2	Source
3	Source
4	Gate
5	Drain
6	Drain
7	Drain
8	Drain

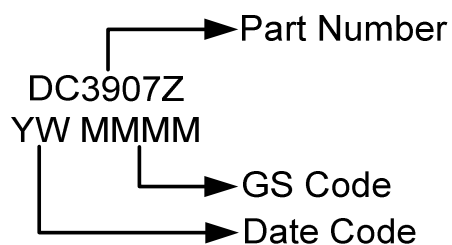


## Ordering Information



Part Number	Package	Quantity
GSMDC3907ZFF	DFN3X3-8L	5000pcs

## Marking Information



## Absolute Maximum Ratings

T<sub>c</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	-30
		T <sub>c</sub> =100°C	-19
I <sub>DM</sub>	Pulsed Drain Current <sup>1</sup>	-120	A
P <sub>D</sub>	Power Dissipation (T <sub>c</sub> =25°C)	27	W
	Power Dissipation-Derate above 25°C	0.22	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	62	°C/W
R <sub>θJC</sub>	Thermal Resistance-Junction to Case	4.6	°C/W

## Electrical Characteristics

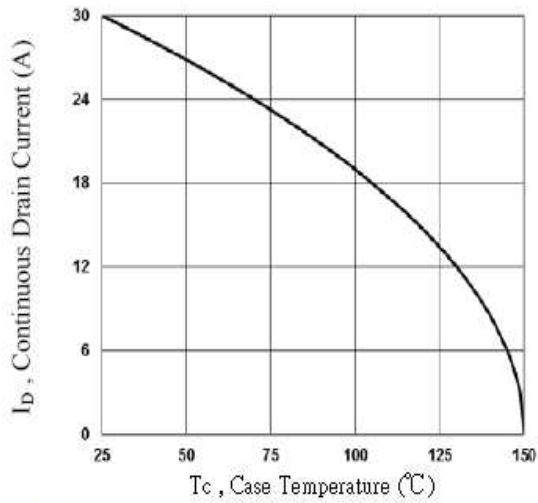
T<sub>J</sub>=25°C Unless otherwise noted

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	-30			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1.2	-1.6	-2.5	
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA		4		mV/°C
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-27V, V <sub>GS</sub> =0V			-1	μA
		V <sub>DS</sub> =-24V, 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			-30	A
I <sub>SM</sub>	Pulsed Source Current				-60	A
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> = -10V, I <sub>D</sub> = -8A		14.5	18	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -6A		23	30	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> = -10V, I <sub>D</sub> = -8A		6.8		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> = -1A, V <sub>GS</sub> = 0V			-1	V
<b>Dynamic</b>						
Q <sub>g</sub>	Total Gate Charge			11	17	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -5A		3.4	6	
Q <sub>gd</sub>	Gate-Drain Charge			4.2	8	
C <sub>iss</sub>	Input Capacitance			1250	2500	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1MHz		160	320	
C <sub>rss</sub>	Reverse Transfer Capacitance			90	180	
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> = -15V, I <sub>D</sub> = -1A, V <sub>GS</sub> = -10V, R <sub>G</sub> = 6Ω		5.8	11	ns
t <sub>r</sub>				18.8	36	
t <sub>d(off)</sub>	Turn-Off Time			46.9	90	
t <sub>f</sub>				12.3	23	

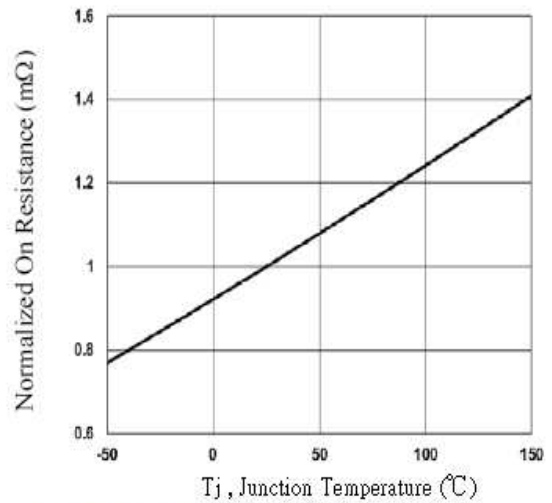
Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

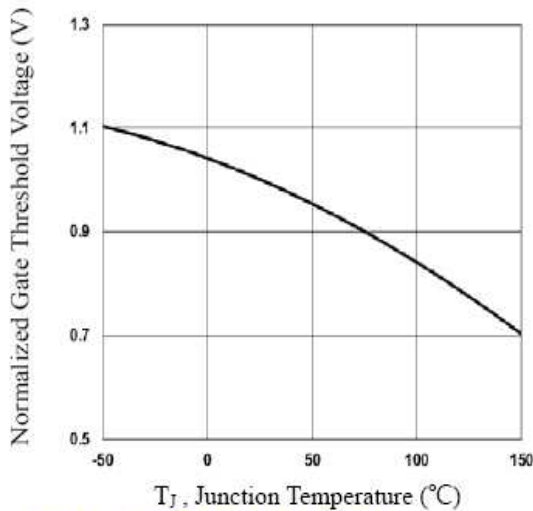
## Typical Performance Characteristics



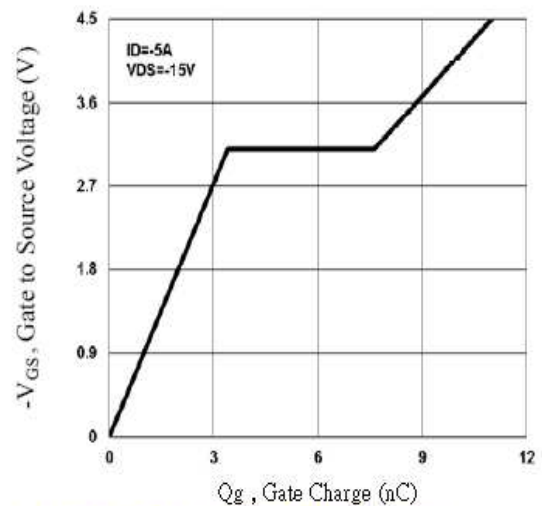
**Fig.1 Continuous Drain Current vs.  $T_c$**



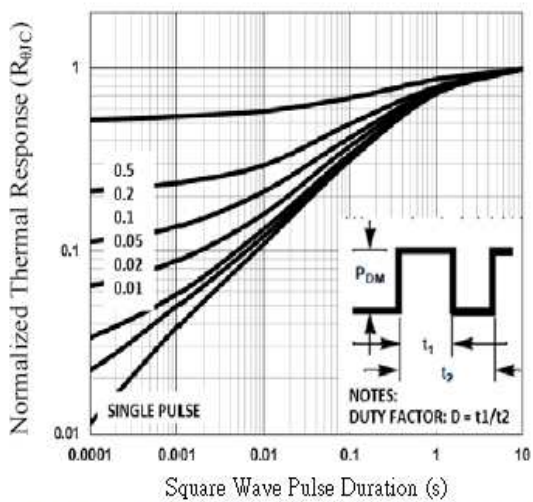
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



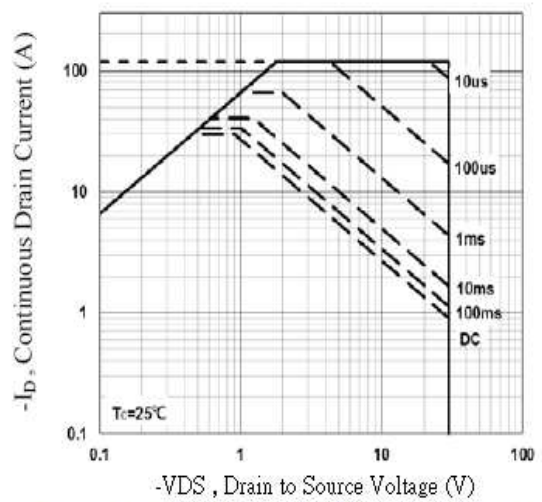
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



**Fig.4 Gate Charge Waveform**



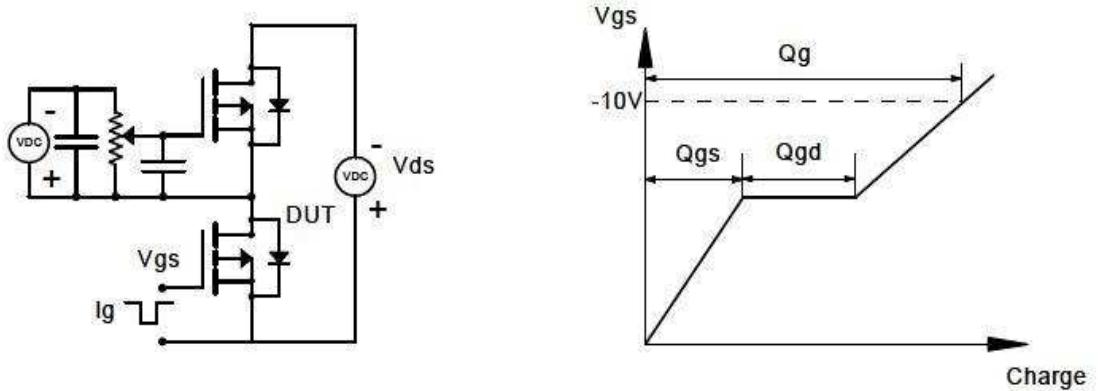
**Fig.5 Normalized Transient Impedance**



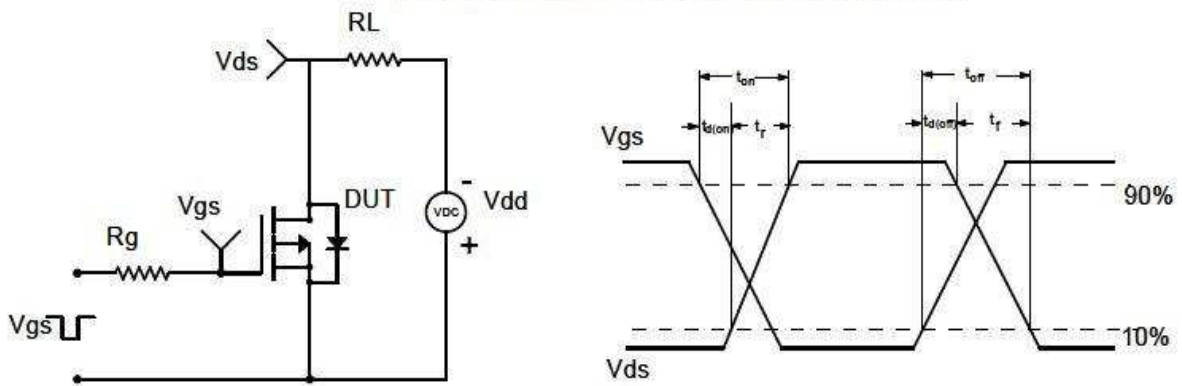
**Fig.6 Maximum Safe Operation Area**

## Typical Performance Characteristics (Continue)

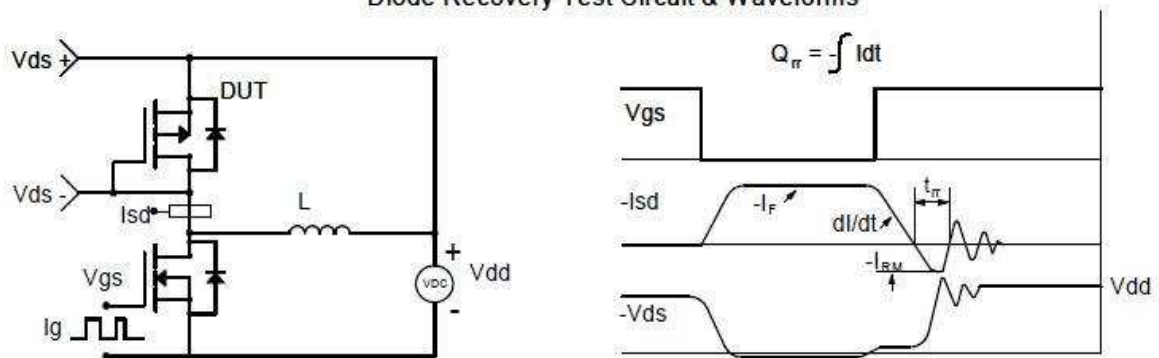
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

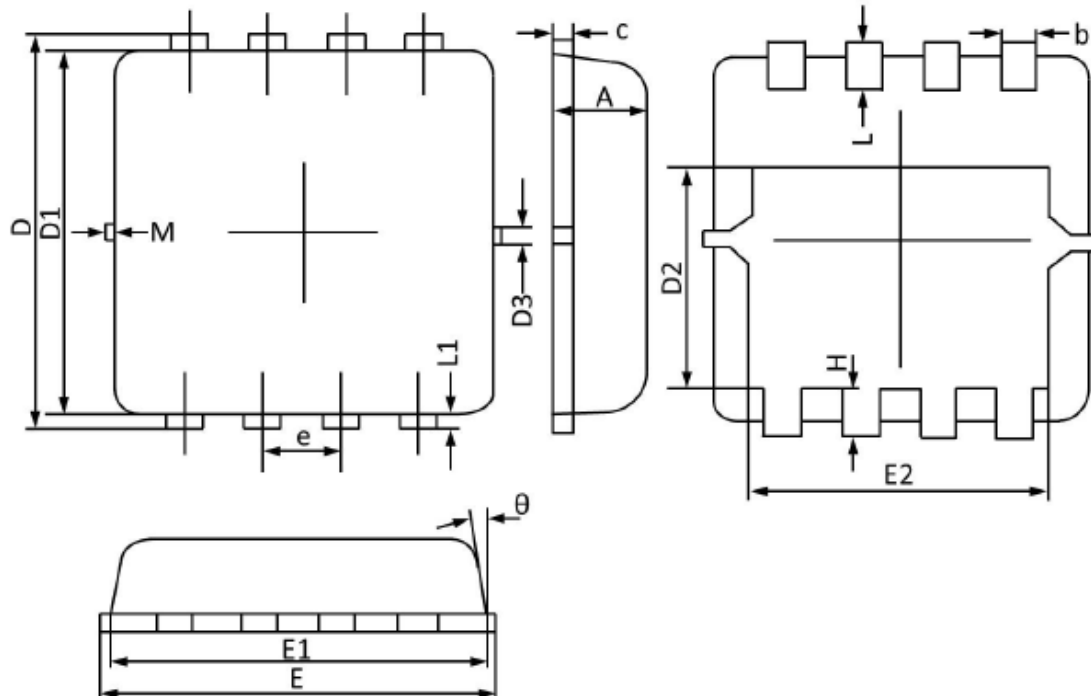


### Diode Recovery Test Circuit & Waveforms



## Package Dimension

### DFN3X3-8L









Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 REF		0.005 REF	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 REF		0.005 REF	
$\theta$	0°	12°	0°	12°
M	0.150 REF		0.006 REF	

## 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