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

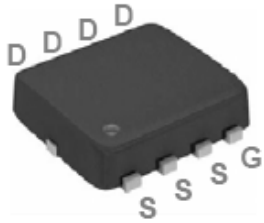
- -30V, -30A, $R_{DS(ON)}$=17mΩ@V_{GS}=-10V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- Suit for -4.5V Gate Drive Applications
- DFN3X3-8L package design

Applications

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

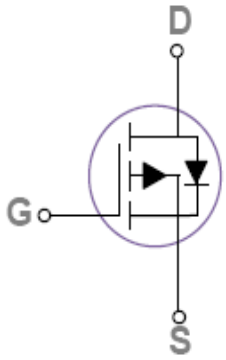
Packages & Pin Assignments

GSMDC3907ZFF (DFN3X3-8L)

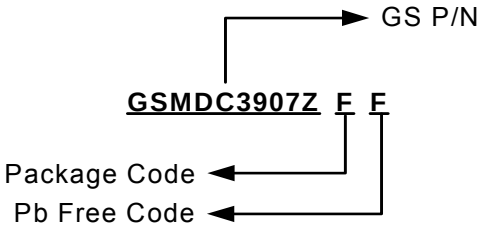


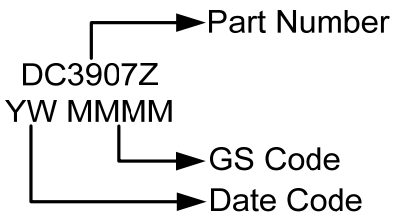
Top View

Pin No	Symbol	Description
1,2,3	S	Source
4	G	Gate
5,6,7,8	D	Drain



Ordering & Marking Information





Part Number	Package	Quantity
GSMDC3907ZFF	DFN3X3-8L	3000pcs

*YW – Date Code , MMMM – GS ID Code
*Y=Year (Ex. 2012=Y=C or D ; 2013=Y=E or F ; 2014=Y=G or H ; …)
*W=Week (Ex. 1st, 2nd =A ; 3rd, 4th =B ; 5th, 6th =C ; … ; 47th, 48th =X ; 49th, 50th =Y ; 51st, 52nd =Z)

Absolute Maximum Ratings

T_A=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A=25℃	-30	A
		T_A=70℃	-19	
I_{DM}	Pulsed Drain Current		-120	A
P_D	Power Dissipation		27	W
	Power Dissipation-Derate above 25℃		0.22	W/℃
T_J	Operating Junction Temperature Range		-55 to +150	℃
T_{STG}	Storage Temperature Range		-55 to +150	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		4.6	℃/W

Electrical Characteristics

T_A=25℃ Unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=-250uA	-30			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250uA	-1.2	-1.6	-2.5	
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient	V_{DS}=V_{GS},I_D=-250uA		4		mV/℃
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V,V_{GS}=±20V			±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℃			-10	
I_S	Continuous Source Current	V_G=V_D=0V,Force Current			-30	A
I_{SM}	Pulsed Source Current				-60	A
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS} =-10V,I_D=-8A		13.5	17	mΩ
		V_{GS} =-4.5V,I_D=-6A		23	28	
g_{FS}	Forward Transconductance	V_{DS}=-10V,I_D=-8A		6.8		S
V_{SD}	Diode Forward Voltage	I_S=-1A,V_{GS}=0V			-1	V
Dynamic						
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	2500	pF
C_{oss}	Output Capacitance			160	320	
C_{rss}	Reverse Transfer Capacitance			90	180	
$t_{d(on)}$	Turn-On Time	V_{DD}=-15V,I_D=-1A, V_{GS}=-10V,R_G=6Ω		5.8	11	ns
t_r				18.8	36	
$t_{d(off)}$	Turn-Off Time			46.9	90	
t_f				12.3	23	

Typical Performance Characteristics

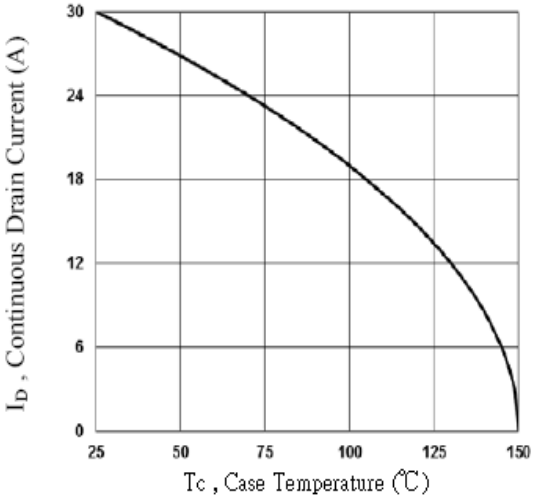


Fig.1 Continuous Drain Current vs. T_c

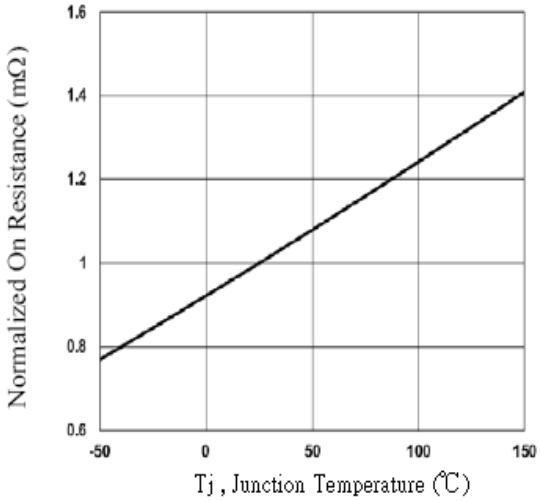


Fig.2 Normalized RDSON vs. T_J

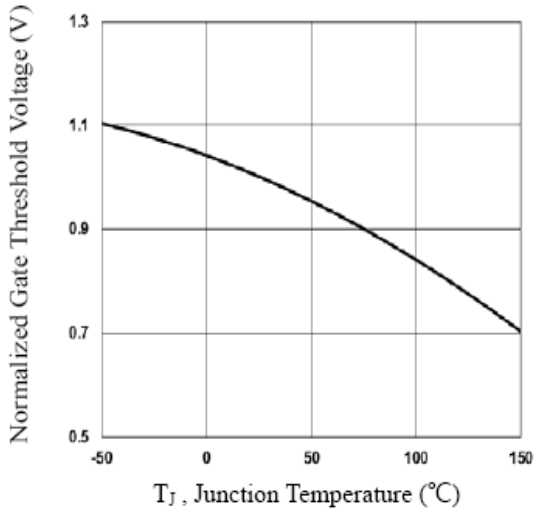


Fig.3 Normalized V_{th} vs. T_J

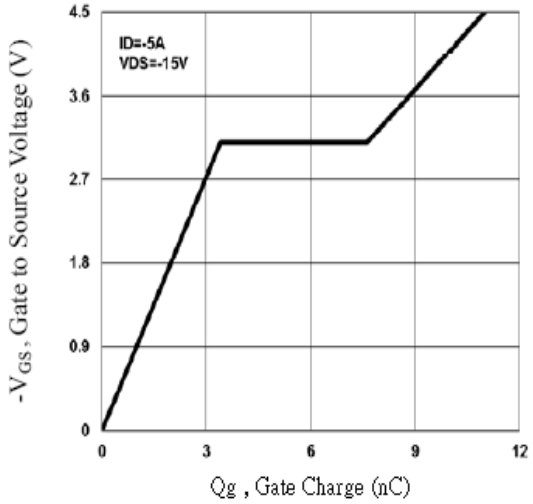


Fig.4 Gate Charge Waveform

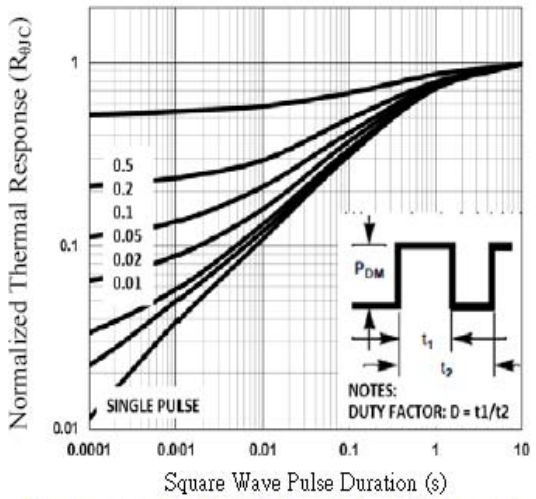


Fig.5 Normalized Transient Impedance

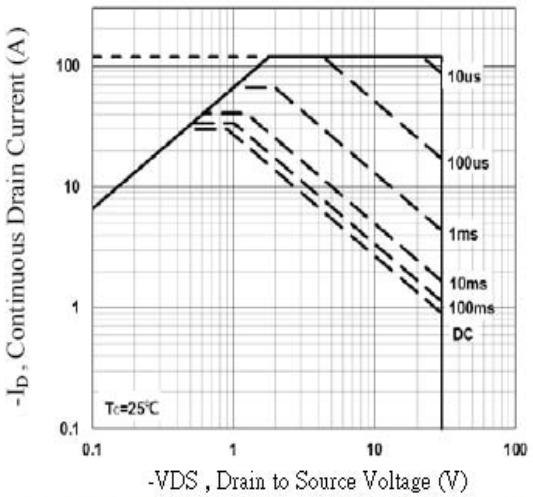
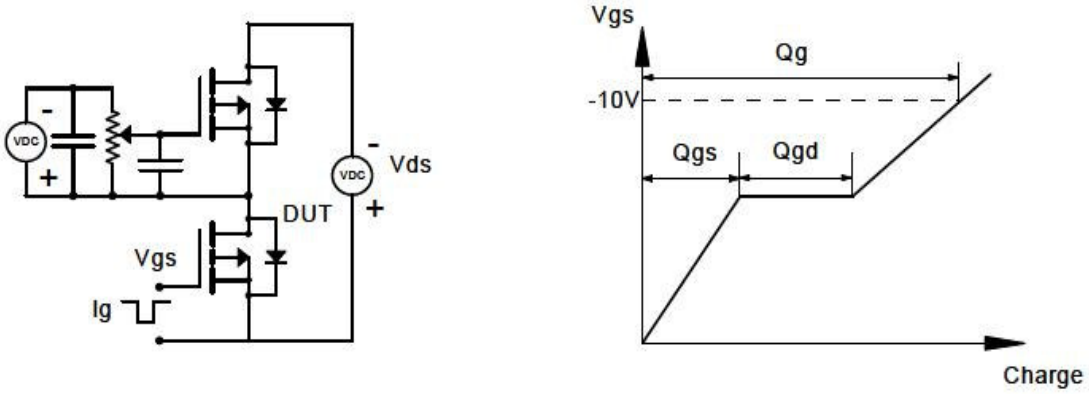


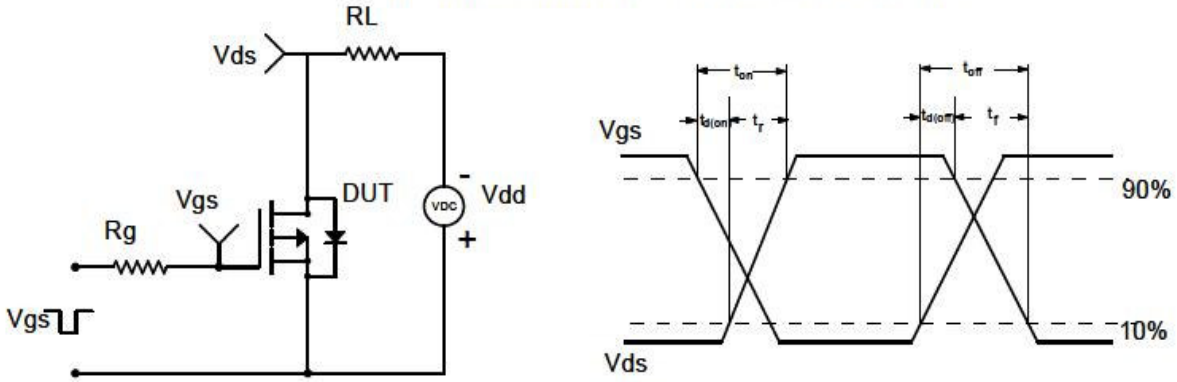
Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

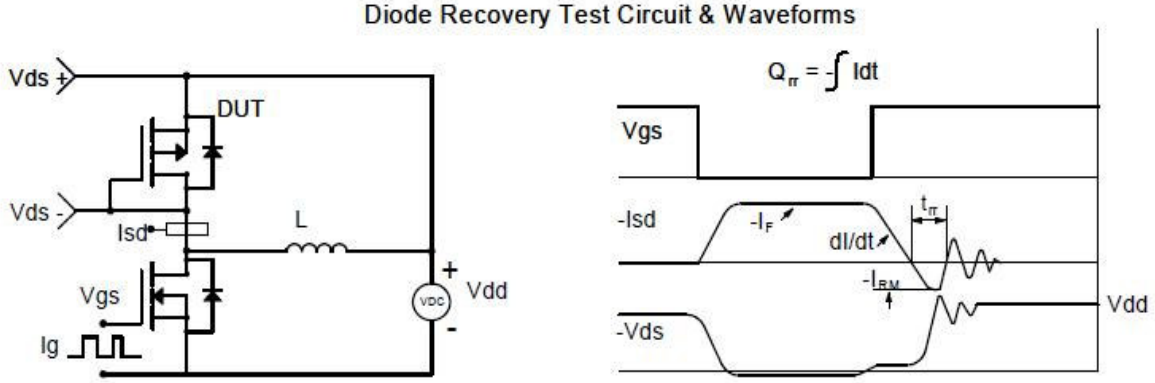
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

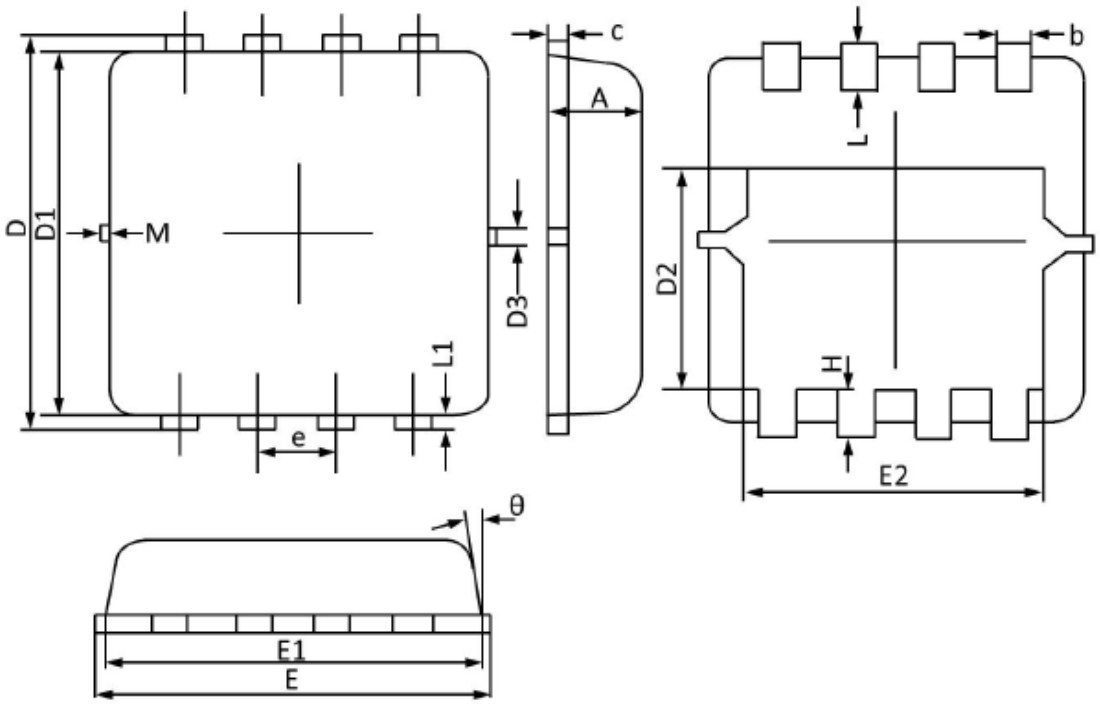


Diode Recovery Test Circuit & Waveforms



Package Dimension

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	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	

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