GSMDC6906Z

60V 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

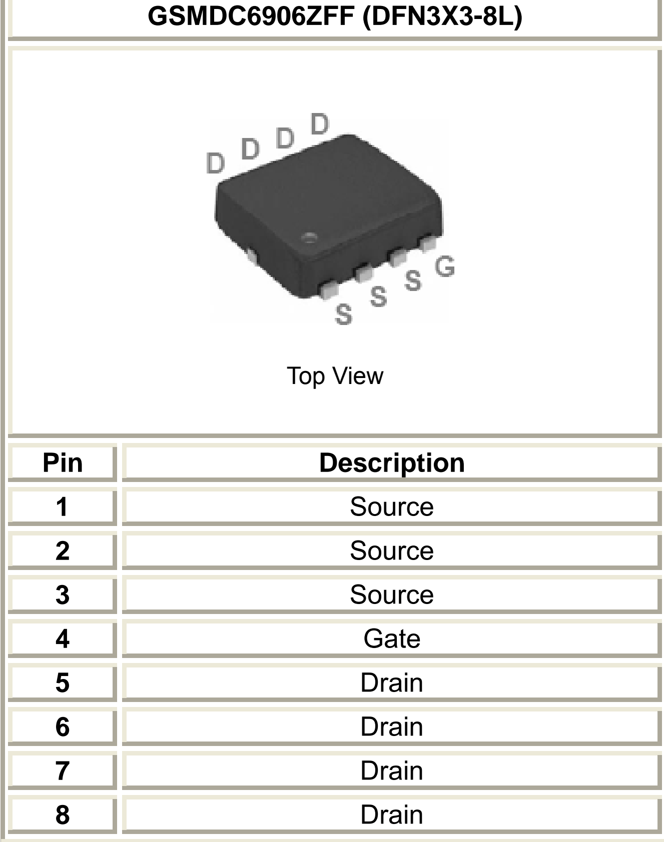
- 60V, 33A, $R_{DS(ON)}$=21mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available
- DFN3X3-8L package design

Applications

- Motor Drive
- Power Tools
- LED Lighting

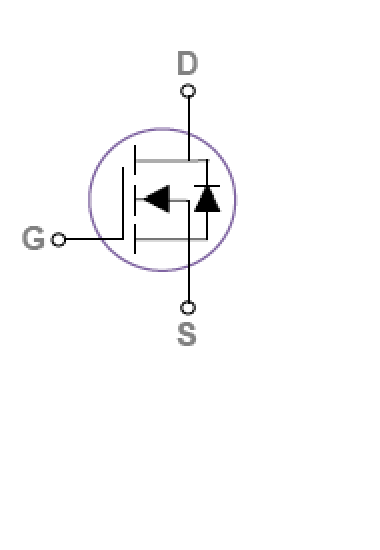
Packages & Pin Assignments

GSMDC6906ZFF (DFN3X3-8L)

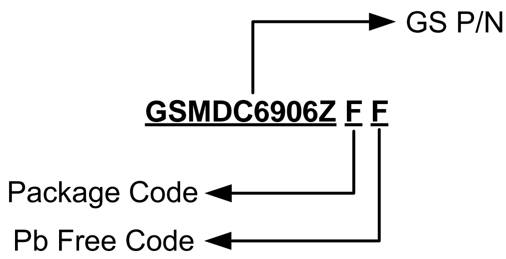


Top View

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

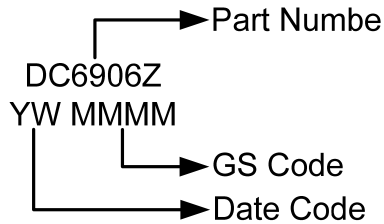


Ordering Information



Part Number	Package	Quantity
GSMDC6906ZFF	DFN3X3-8L	3000 PCS

Marking Information



Absolute Maximum Ratings

T_C=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		60	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25℃	33	A
		T_C=100℃	20	
I_{DM}	Pulsed Drain Current (Note 1)		132	A
EAS	Single Pulse Avalanche Energy (Note 2)		42	mJ
IAS	Single Pulse Avalanche Current (Note 2)		29	A
P_D	Power Dissipation (T_C=25℃)		44.6	W
	Power Dissipation (Derate above 25℃)		0.36	W/℃
T_J	Operating Junction Temperature Range		-50 to +150	℃
T_{STG}	Storage Temperature Range		-50 to +150	℃
$R_{θJA}$	Thermal Resistance-Junction to Ambient		62	℃/W
$R_{θJC}$	Thermal Resistance-Junction to Case		2.8	℃/W

Note 1: Repetitive Rating: Pulsed width limited by maximum junction temperature.
Note 2: V_{DD}=25V, V_{GS}=10V, L=0.1mH, IAS=29A, R_G=25Ω, Starting T_J=25℃.

Electrical Characteristics

T_J=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	60			V
△BV_{DSS}/△T_J	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=1mA		0.07		V/℃
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.2	1.8	2.2	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			5		mV/℃
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V			1	uA
		V_{DS}=48V,V_{GS}=0V, T_J=125℃			10	
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			33	A
I_{SM}	Pulsed Source Current				66	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS} =10V,I_D=15A		17	21	mΩ
		V_{GS} =4.5V,I_D=8A		20	24	
g_{FS}	Forward Transconductance	V_{DS}=10V,I_D=10A		9		S
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=1A			1	V
t_{rr}	Reverse Recovery Time (Note 3,4)	V_{GS}=0V,I_S=1A, di/dt=100A/us		19.6		ns
Q_{rr}	Reverse Recovery Charge (Note 3,4)			14.2		nC
Dynamic						
Q_g	Total Gate Charge (Note 3,4)	V_{DS}=30V,V_{GS}=10V, I_D=15A		28	42	nC
Q_{gs}	Gate-Source Charge (Note 3,4)			3.5	7	
Q_{gd}	Gate-Drain Charge (Note 3,4)			6.5	10	
C_{iss}	Input Capacitance	V_{DS}=20V,V_{GS}=0V, f=1MHz		1680	2440	pF
C_{oss}	Output Capacitance			115	170	
C_{rss}	Reverse Transfer Capacitance			85	125	
$t_{d(on)}$	Turn-On Time (Note 3,4)	V_{DD}=30V,I_D=1A, V_{GS}=10V,R_G=6Ω		7.2	14	ns
t_r				38	72	
$t_{d(off)}$	Turn-Off Time (Note 3,4)			34	65	
t_f				8.2	16	
R_g	Gate Resistance	V_{DS}=0V,V_{GS}=0V, f=1MHz		2.2	4.4	Ω

Note 3: The data tested by pulsed, pulse width≦300us, duty cycle≦2%.
Note 4: Essentially independent of operating temperature.

Typical Performance Characteristics

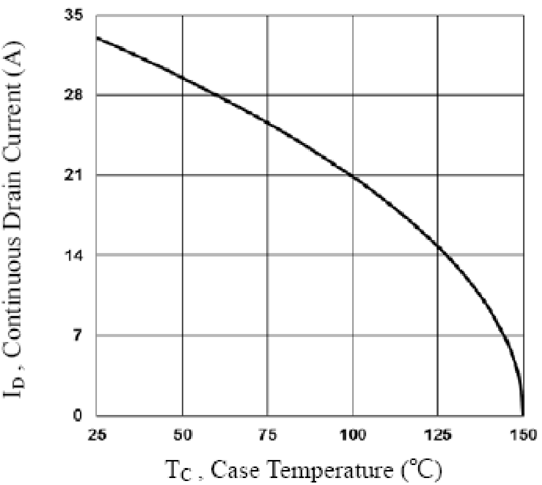


Fig.1 Continuous Drain Current vs. T_C

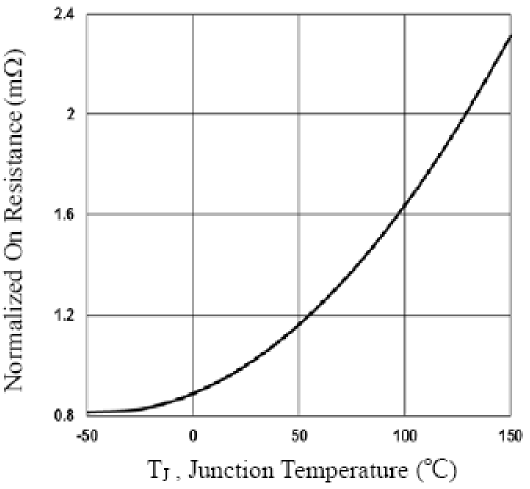


Fig.2 Normalized RDSON vs. T_J

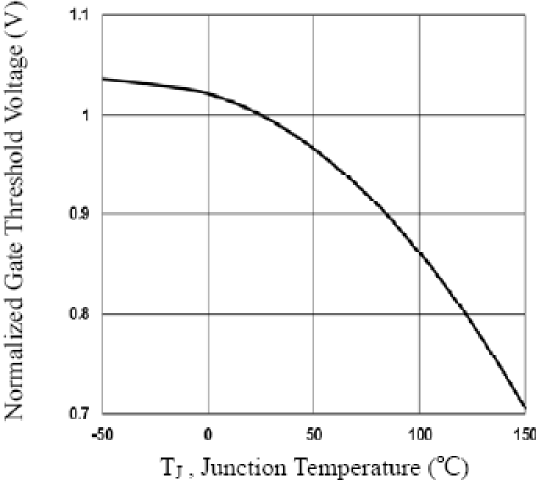


Fig.3 Normalized V_{th} vs. T_J

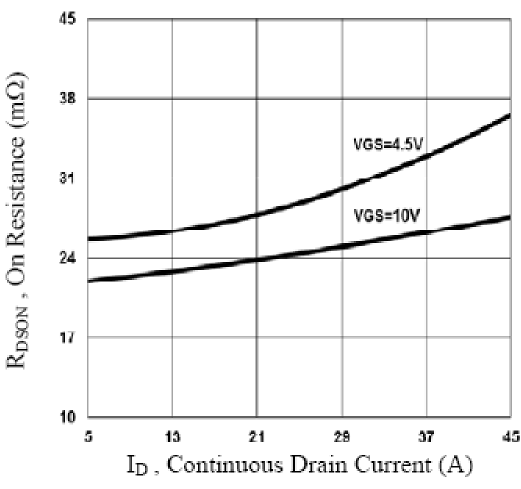


Fig.4 RDSON vs. Continuous Drain Current

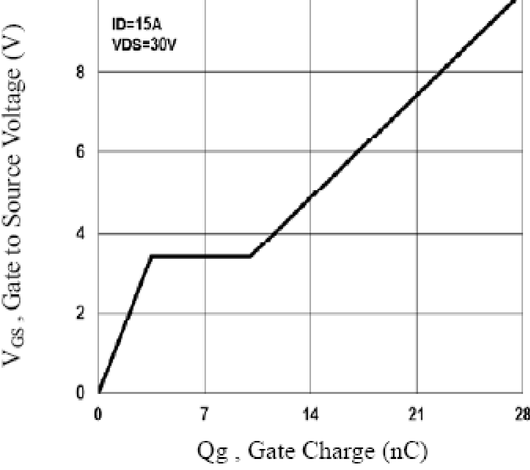


Fig.5 Gate Charge Waveform

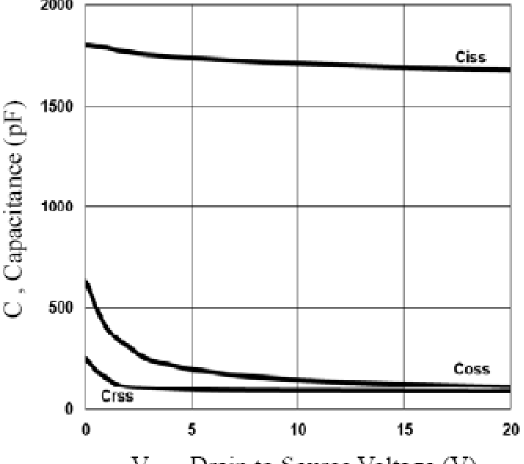


Fig.6 Capacitance Characteristics

Typical Performance Characteristics (Continue)

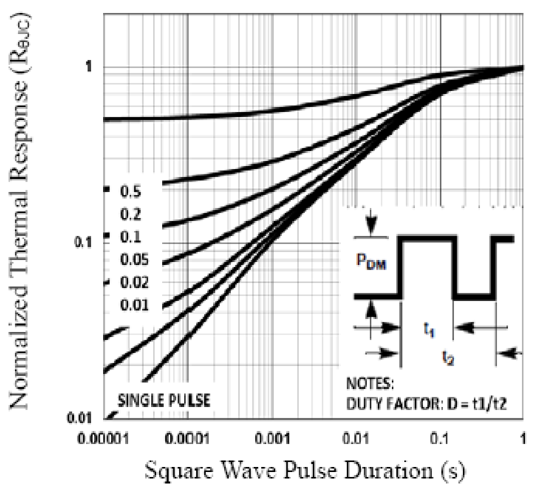
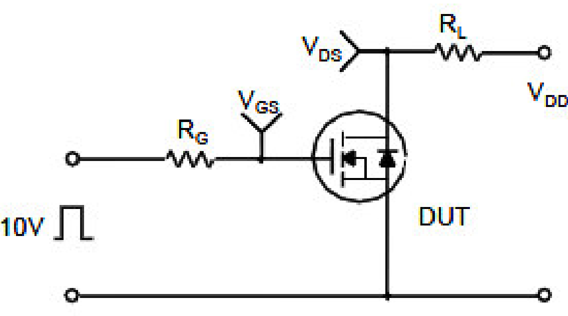
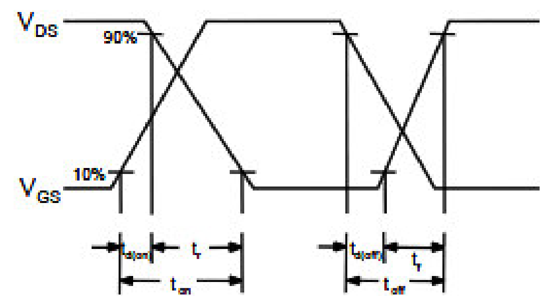


Fig.7 Normalized Transient Impedance

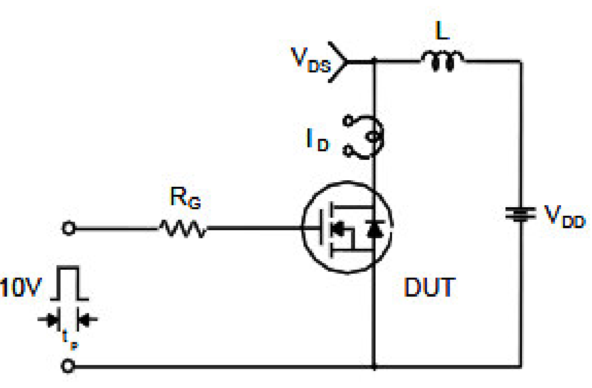
Fig.8 Maximum Safe Operation Area

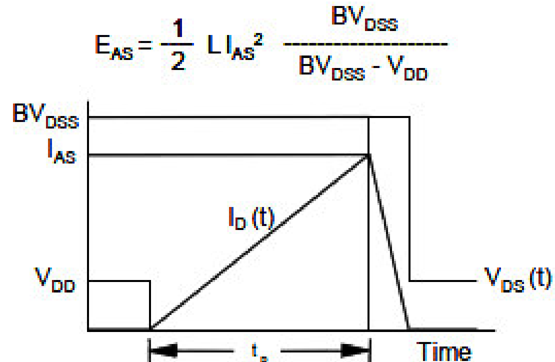
Resistive Switching Test Circuit & Waveforms





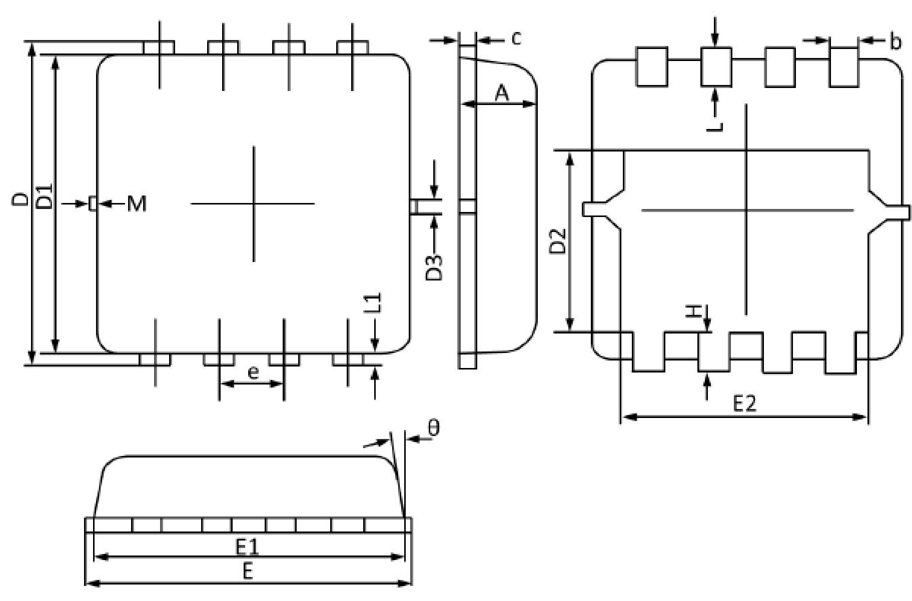
Unclamped Inductive Switching Test Circuit & Waveforms





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)	

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	
Address	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd Neihu District Taipei City 114, Taiwan (R.O.C)
Tel	886-2-2657-9980
Fax	886-2-2657-3630
Email	sales_twn@gs-power.com

Shenzhen Branch(China)	
Address	1113 B Building, Happiness Washington, Baoan Nan Road, Luohu District, Shenzhen City, China
Tel	0755-22208941
Email	sales_cn@gs-power.com

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