GSMDC6902X

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

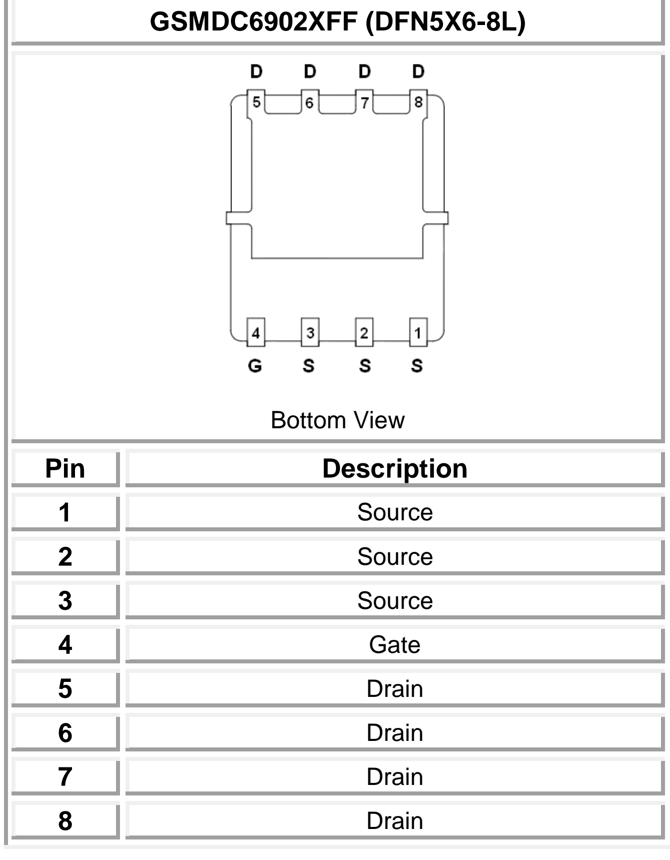
- 60V,100A, RDS(ON) =4.6mΩ@VGS = 10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- Power Tools
- Load Switch
- LED applications
- Motor Drive Applications

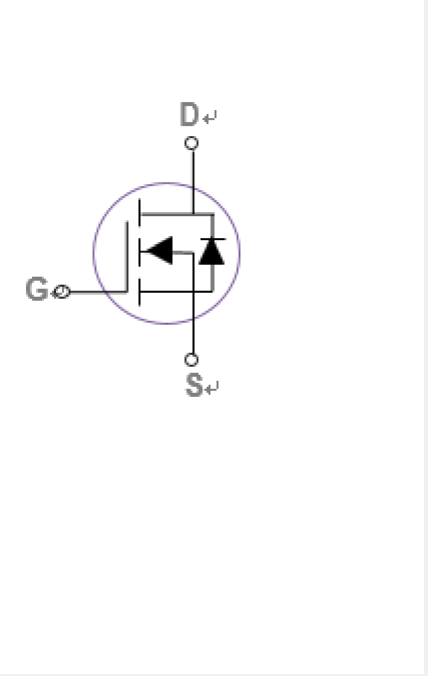
Packages & Pin Assignments

GSMDC6902XFF (DFN5X6-8L)

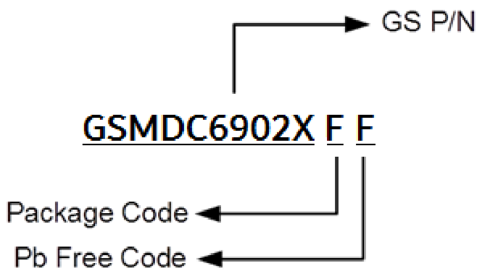


Bottom View

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

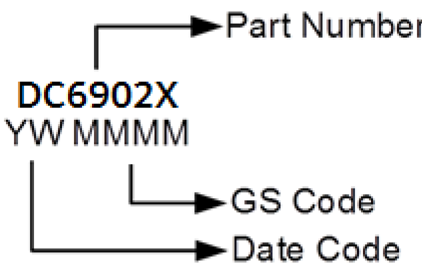


Ordering Information



Part Number	Package
GSMDC6902XFF	DFN5X6-8L

Marking Information



Absolute Maximum Ratings

Tc=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	Tc=25℃	100	A
		Tc=100℃	63	
I_{DM}	Pulsed Drain Current		400	A
EAS	Single Pulse Avalanche Energy		450	mJ
IAS	Single Pulse Avalanche Current		95	A
P_D	Power Dissipation (Tc=25℃)		142	W
	Power Dissipation (Derate above 25℃)		1.14	W/℃
T_J	Operating Junction Temperature Range		-50 to +150	℃
T_{STG}	Storage Temperature Range		-50 to +150	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.88	℃/W

Electrical Characteristics

Tj=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
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	1.6	2.5	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V			±100	nA
I_{DSS}	Drain-Source Leakage Current	V_{DS}=60V, V_{GS}=0V, T_J=25℃			1	uA
		V_{DS}=48V, V_{GS}=0V, T_J=125℃			10	uA
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			100	A
I_{SM}	Pulsed Source Current				200	A
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V,I_D=20A		3.8	4.6	mΩ
		V_{GS}=4.5V,I_D=10A		4.2	5.5	mΩ
g_{FS}	Forward Transconductance	V_{DS}=10V, I_D=3A		25		S
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=1A, T_J=25℃			1	V
Dynamic						
Q_g	Total Gate Charge	V_{DS}=30V, V_{GS}=4.5V, I_D=10A		58.2	116	nC
Q_{gs}	Gate-Source Charge			16.2	32	nC
Q_{gd}	Gate-Drain Charge			23.4	46	nC
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, F=1MHz		6805	10000	pF
C_{oss}	Output Capacitance			445	680	pF
C_{rss}	Reverse Transfer Capacitance			195	280	pF
$t_{d(on)}$	Turn-On Time	V_{DD}=30V, I_D=1A, V_{GS}=10V, R_G=6Ω		19.2	40	ns
t_r				56.3	120	ns
$t_{d(off)}$	Turn-Off Time			90.8	200	ns
t_f				21.6	40	ns
R_g	Gate Resistance	V_{DS}=0V, V_{GS}=0V, F=1MHz		1.3	2.6	Ω

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=95A., Starting T_J=25℃
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Typical Performance Characteristics

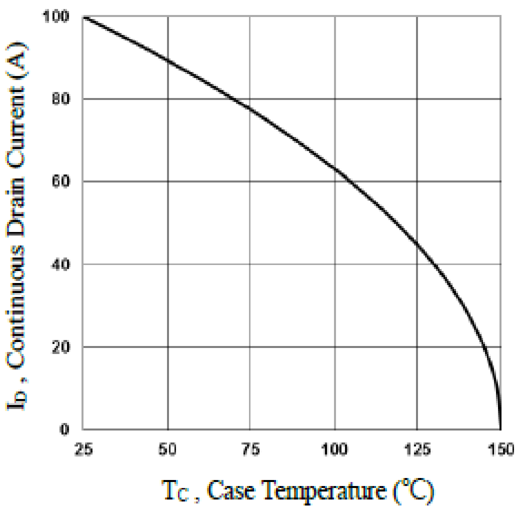


Fig.1 Continuous Drain Current vs. T_C

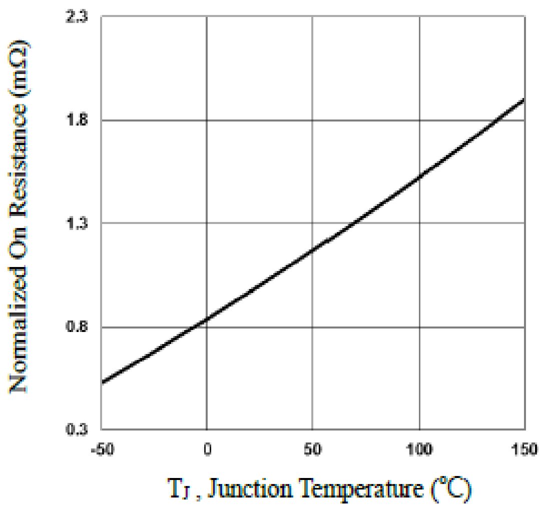


Fig.2 Normalized RDSON vs. T_J

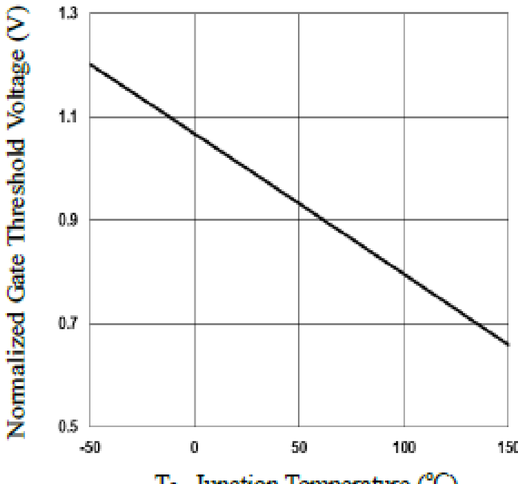


Fig.3 Normalized Vth vs. T_J

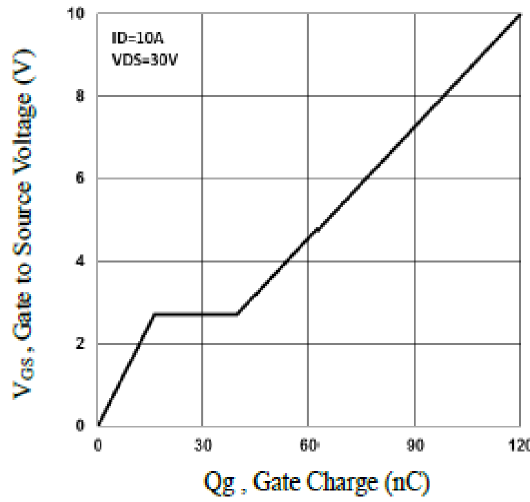


Fig.4 Gate Charge Characteristics

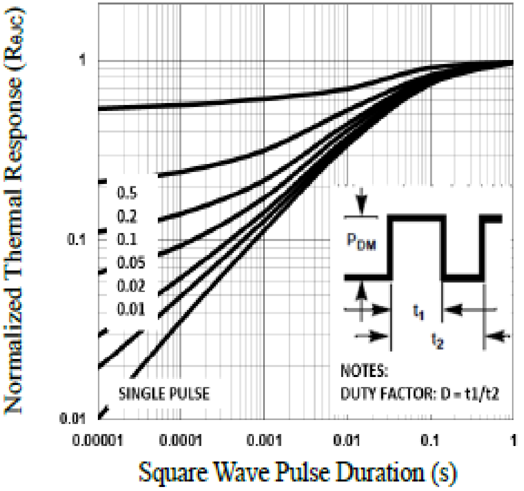


Fig.5 Normalized Transient Impedance

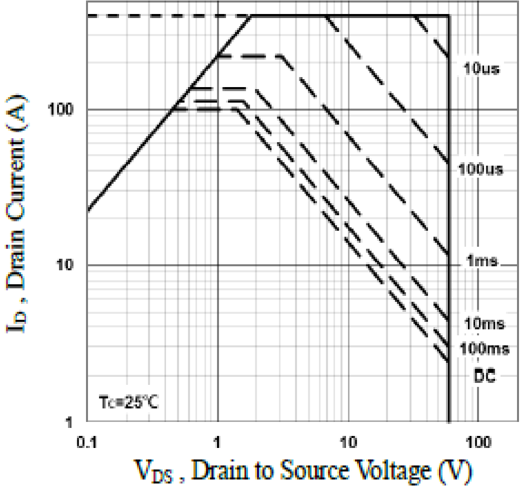


Fig.6 Maximum Safe Operation Area

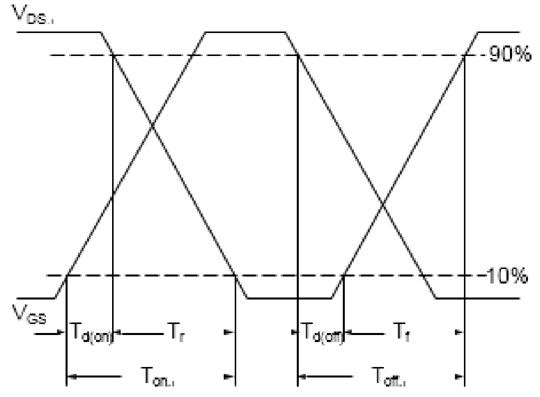


Fig.7 Switching Time Waveform

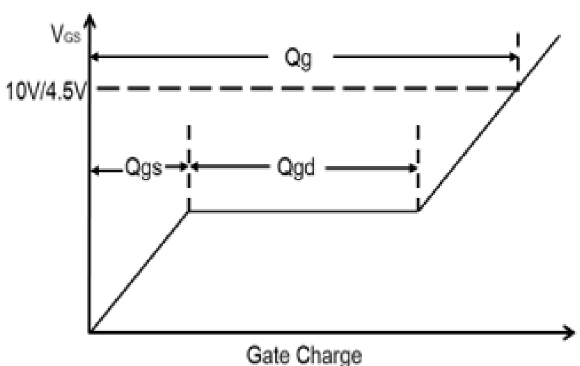
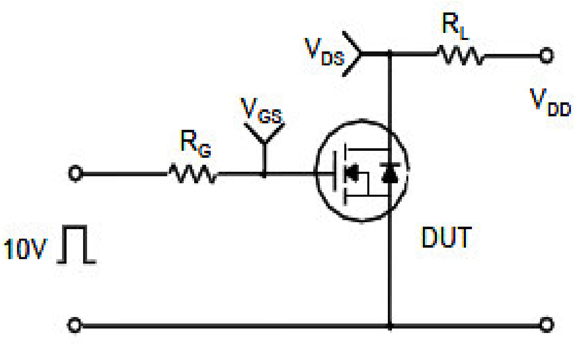
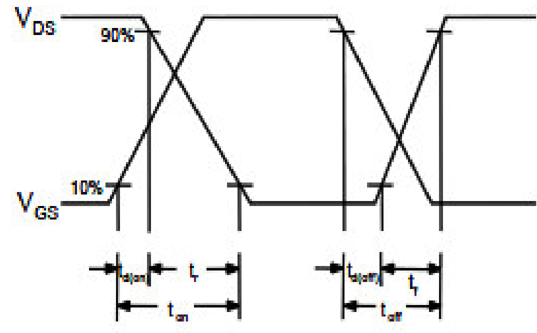


Fig.8 Gate Charge Waveform

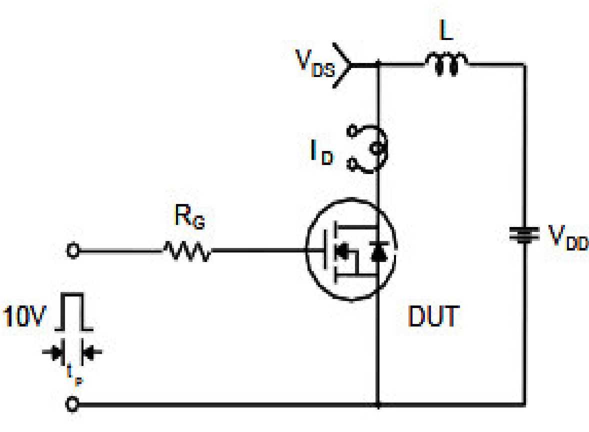
Typical Performance Characteristics (Continue)

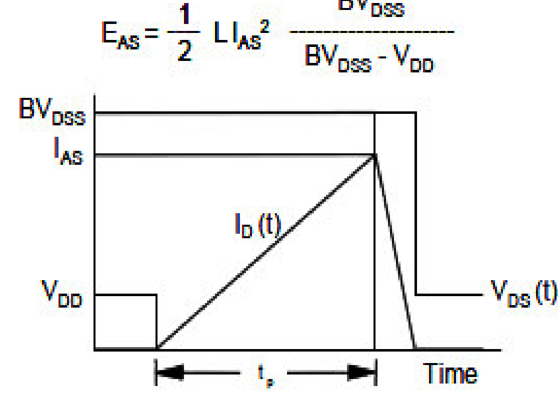
Resistive Switching Test Circuit & Waveforms





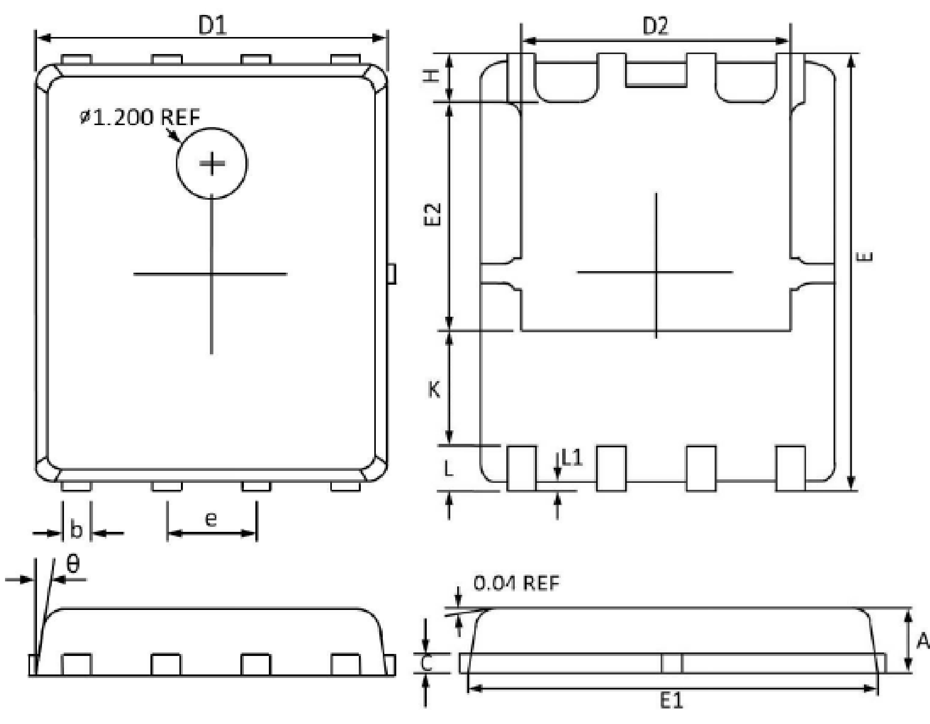
Unclamped Inductive Switching Test Circuit & Waveforms





Package Dimension

DFN5X6-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
b	0.510	0.330	0.020	0.013
C	0.300	0.200	0.012	0.008
D1	5.100	4.800	0.201	0.189
D2	4.100	3.610	0.161	0.142
E	6.200	5.900	0.244	0.232
E1	5.900	5.700	0.232	0.224
E2	3.780	3.350	0.149	0.132
e	1.27BSC		0.05BSC	
H	0.700	0.410	0.028	0.016
K	1.500	1.100	0.059	0.043
L	0.710	0.510	0.028	0.020
L1	0.200	0.060	0.008	0.002
θ	12°	0°	12°	0°

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