

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.

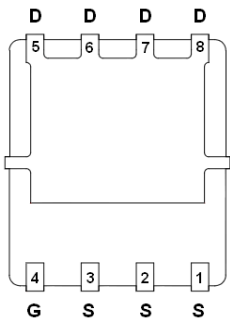
Features

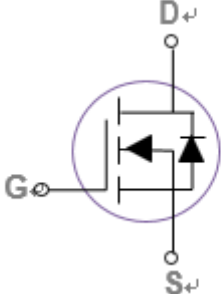
- 60V, 100A, $R_{DS(ON)} = 4.6m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

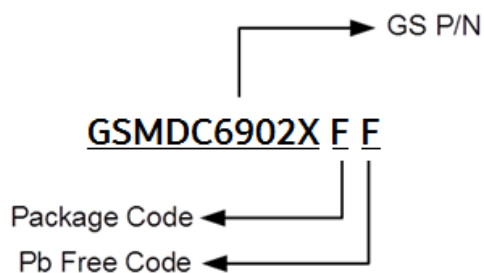
- Power Tools
- Load Switch
- LED applications
- Motor Drive Applications

Packages & Pin Assignments

GSMDC6902XFF (DFN5X6-8L)	
 <p>Bottom View</p>	
Pin	Description
1	Source
2	Source
3	Source
4	Gate
5	Drain
6	Drain
7	Drain
8	Drain

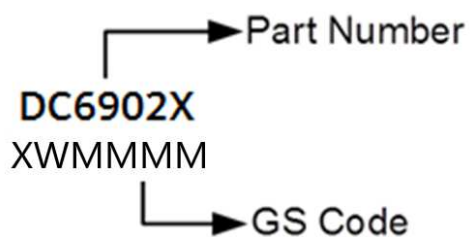


Ordering Information



Part Number	Package	Quantity
GSMDC6902XFF	DFN5X6-8L	3000 PCS

Marking Information



Absolute Maximum Ratings

T_c=25°C 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°C	100
		T _c =100°C	63
I _{DM}	Pulsed Drain Current ¹	400	A
EAS	Single Pulse Avalanche Energy ²	450	mJ
IAS	Single Pulse Avalanche Current ²	95	A
P _D	Power Dissipation (T _c =25°C)	142	W
	Power Dissipation (Derate above 25°C)	1.14	W/°C
T _J	Operating Junction Temperature Range	-55 to +150	°C
T _{STG}	Storage Temperature Range	-55 to +150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient	62	°C/W
R _{θJC}	Thermal Resistance-Junction to Case	0.88	°C/W

Electrical Characteristics

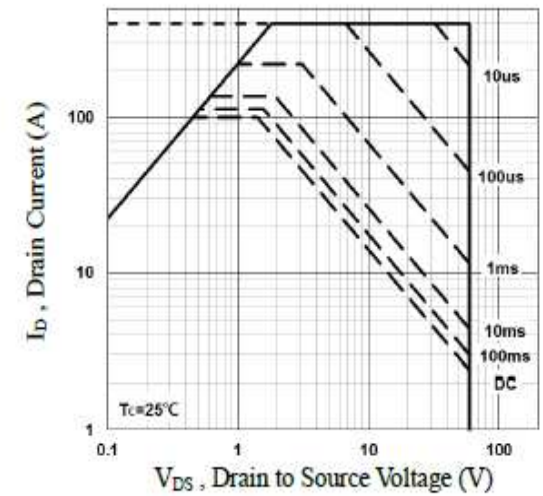
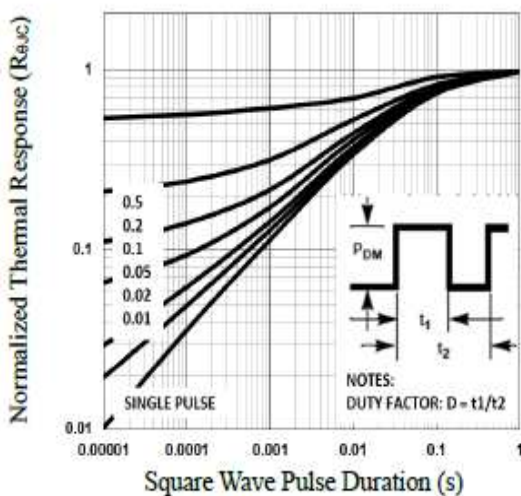
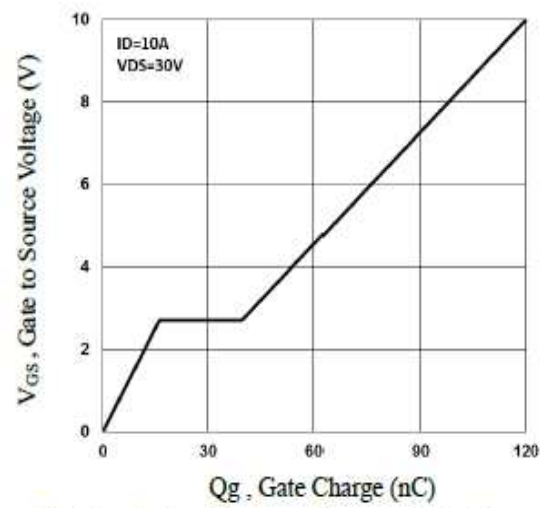
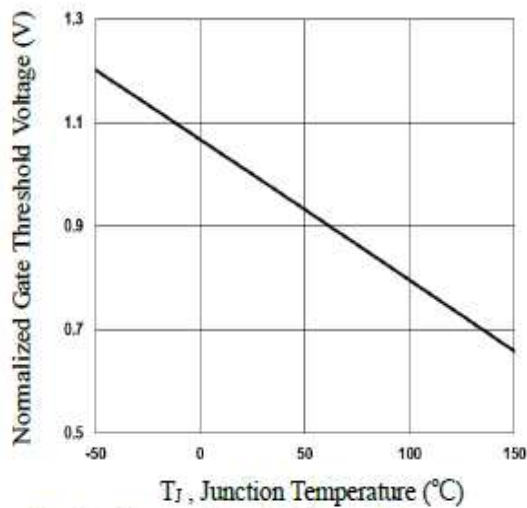
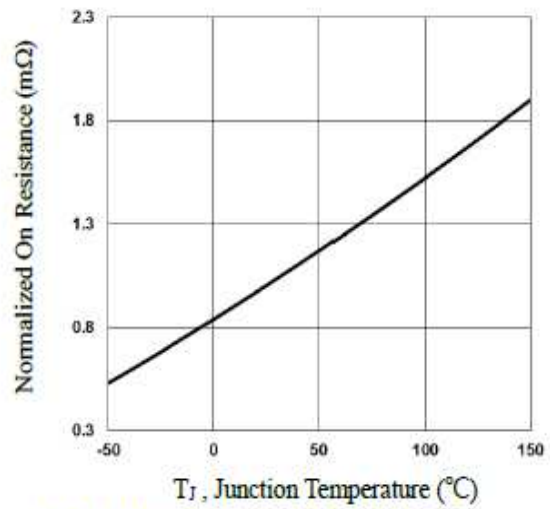
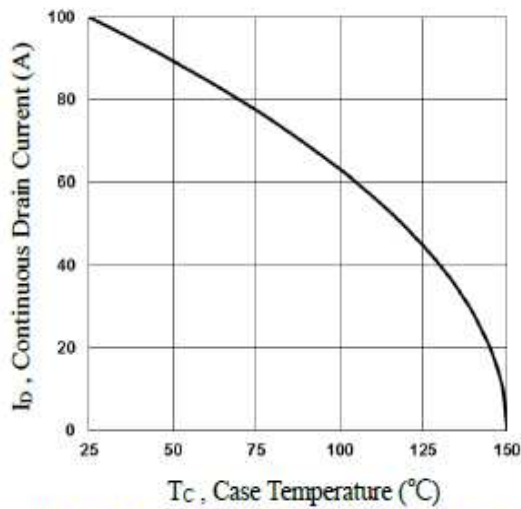
T_j=25°C Unless otherwise noted

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°C			1	uA
		V _{DS} =48V, V _{GS} =0V, T _J =125°C			10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			100	A
I _{SM}	Pulsed Source Current				200	
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	
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°C			1	V
Dynamic						
Q _g	Total Gate Charge ^{3,4}	V _{DS} =30V, V _{GS} =4.5V, I _D =10A		58.2	116	nC
Q _{gs}	Gate-Source Charge ^{3,4}			16.2	32	
Q _{gd}	Gate-Drain Charge ^{3,4}			23.4	46	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, F=1MHz		6805	10000	pF
C _{oss}	Output Capacitance			445	680	
C _{rss}	Reverse Transfer Capacitance			195	280	
t _{d(on)}	Turn-On Time ^{3,4}	V _{DD} =30V, I _D =1A, V _{GS} =10V, R _G =6Ω		19.2	40	ns
t _r				56.3	120	
t _{d(off)}	Turn-Off Time ^{3,4}			90.8	200	
t _f				21.6	40	
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°C
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

Typical Performance Characteristics



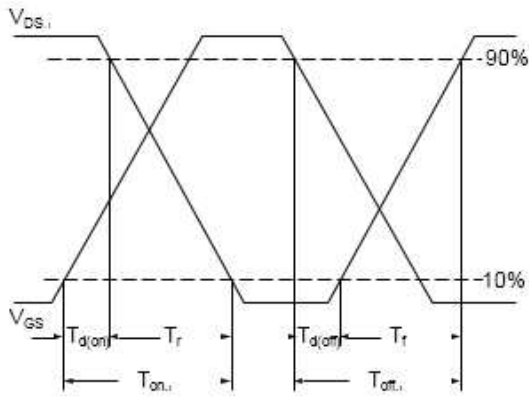


Fig.7 Switching Time Waveform

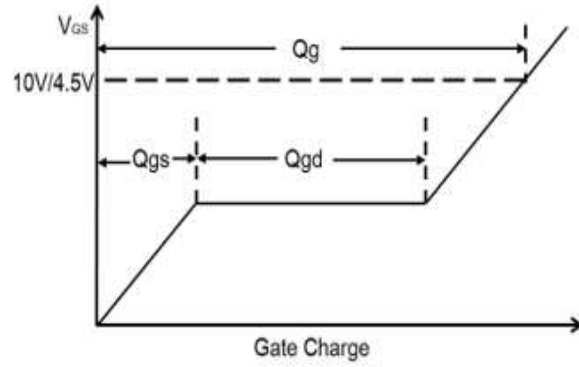
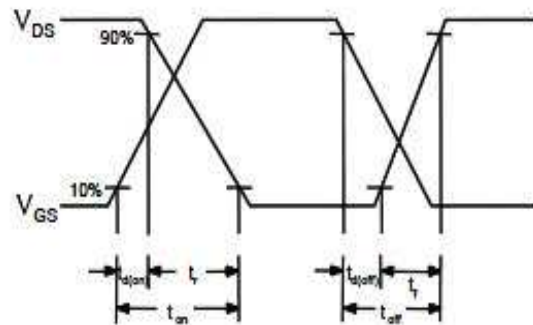
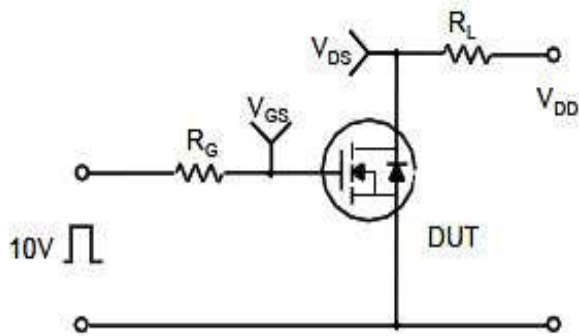


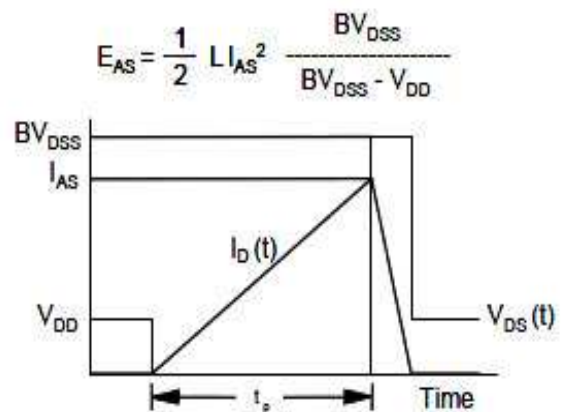
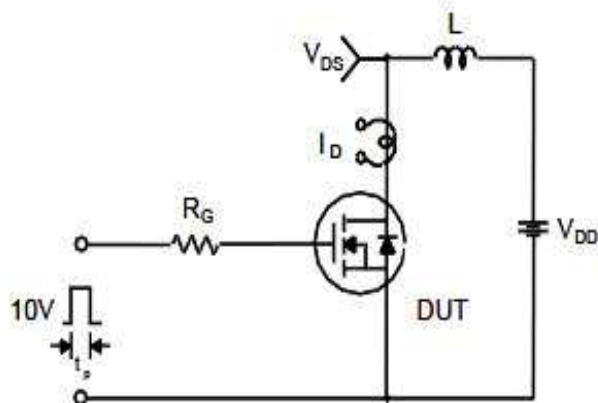
Fig.8 Gate Charge Waveform

Typical Performance Characteristics (Continue)

Resistive Switching Test Circuit & Waveforms

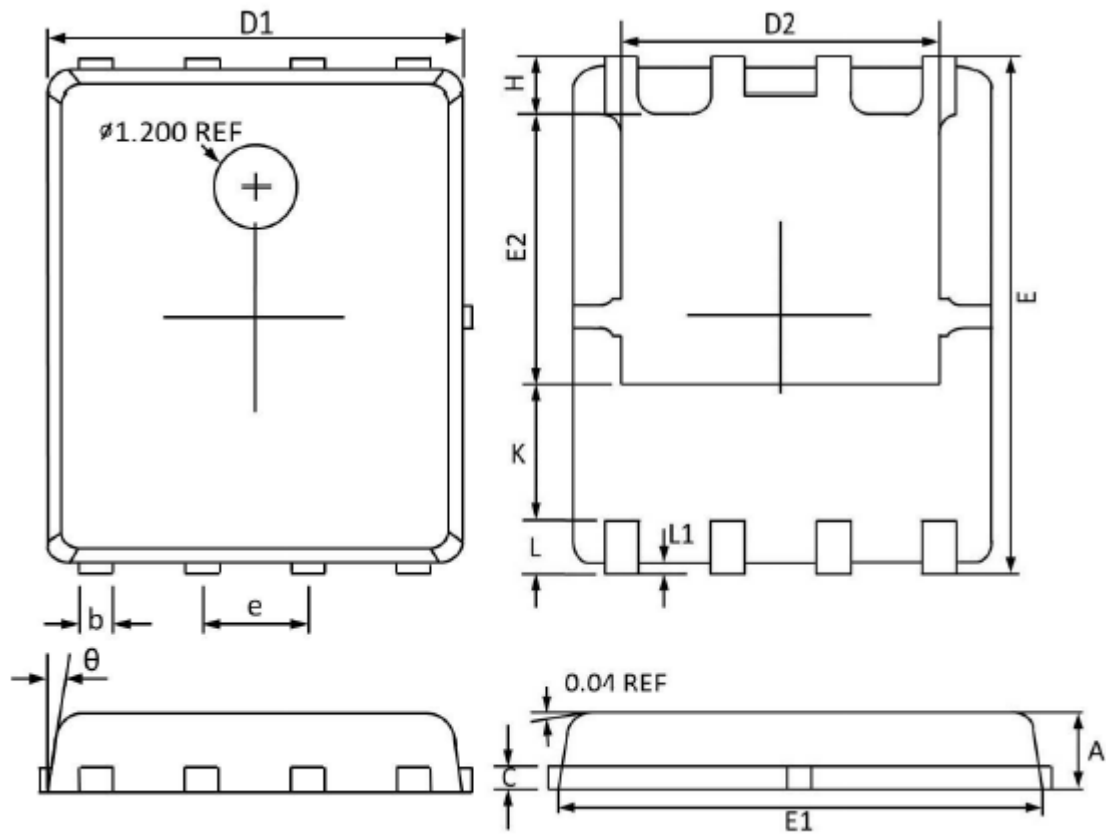


Unclamped Inductive Switching Test Circuit & Waveforms



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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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