GSM0976X

100V 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

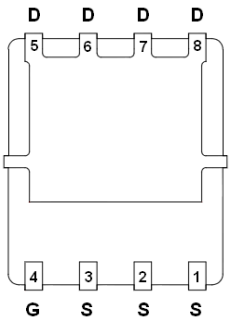
- 100V, 62A, $R_{DS(ON)}$=9.2mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available

Applications

- Networking
- Load Switch
- LED Applications
- Quick Charger

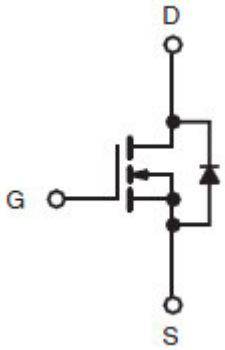
Packages & Pin Assignments

GSM0976XFF (DFN5X6-8L)

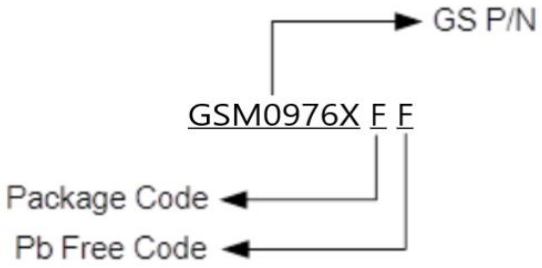


Bottom View

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

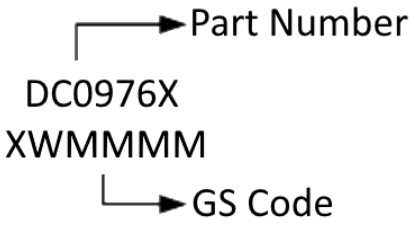


Ordering Information



Part Number	Package	Quantity Reel
GSM0976XFF	DFN5X6-8L	3000 PCS

Marking Information



Absolute Maximum Ratings

T_C=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate –Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25℃	62	A
		T_C=100℃	39.2	
I_{DM}	Pulsed Drain Current[1]		248	A
EAS	Single Pulse Avalanche Energy[2]		211	mJ
IAS	Single Pulse Avalanche Current[2]		65	A
P_D	Power Dissipation (T_C=25℃)		125	W
	Power Dissipation (Derate above 25℃)		1	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		1	℃/W

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	100			V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=1mA		0.054		V/℃
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1	1.6	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			-5.5		mV/℃
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V,V_{GS}=0V			1	μA
		V_{DS}=80V,V_{GS}=0V, T_J=125℃			10	
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			62	A
I_{SM}	Pulsed Source Current				124	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V,I_D=15A		7.2	9.2	mΩ
		V_{GS}=4.5V,I_D=8A		10.8	14	
g_{FS}	Forward Transconductance	V_{DS}=10V,I_D=3A		11		S
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=1A			1	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V,I_S=10A di/dt=100A/μs		49.2		ns
Q_{rr}	Reverse Recovery Charge			75.1		nc
Dynamic						
Q_g	Total Gate Charge[3,4]	V_{DS}=50V,V_{GS}=10V, I_D=8.5A		37.8	76	nC
Q_{gs}	Gate-Source Charge[3,4]			7.8	16	
Q_{gd}	Gate-Drain Charge[3,4]			8.4	17	
C_{iss}	Input Capacitance	V_{DS}=50V,V_{GS}=0V, f=1MHz		2250	4500	pF
C_{oss}	Output Capacitance			410	820	
C_{rss}	Reverse Transfer Capacitance			25	50	
$t_{d(on)}$	Turn-On Time[3,4]	V_{DD}=50V,I_D=1A, V_{GS}=10V,R_G=6Ω		14.6	30	ns
t_r				21.5	44	
$t_{d(off)}$	Turn-Off Time[3,4]			54	108	
t_f				84.3	168	
R_g	Gate Resistance	V_{DS}=0V,V_{GS}=0V, f=1MHz		1.43		Ω

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. VDD=50V,VGS=10V,L=0.1mH,IAS=65A.,RG=25Ω,Starting TJ=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Typical Performance Characteristics

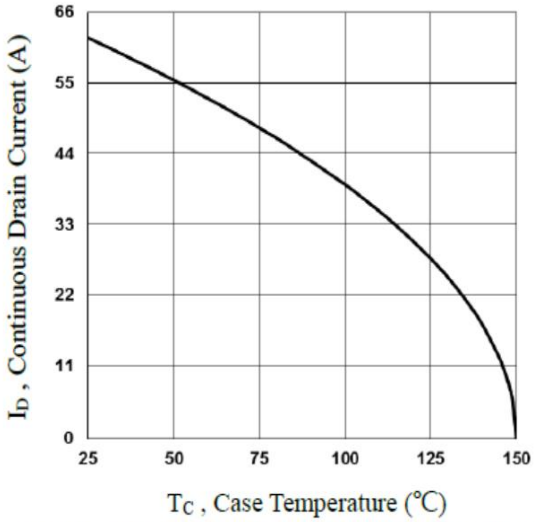


Fig.1 Continuous Drain Current vs. T_c

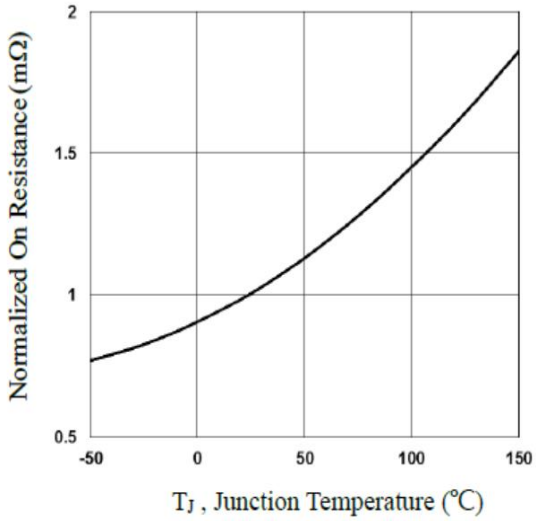


Fig.2 Normalized RDSON vs. T_J

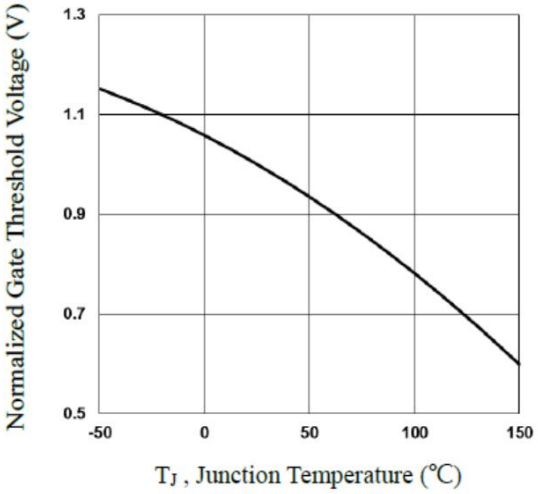


Fig.3 Normalized Vth vs. T_J

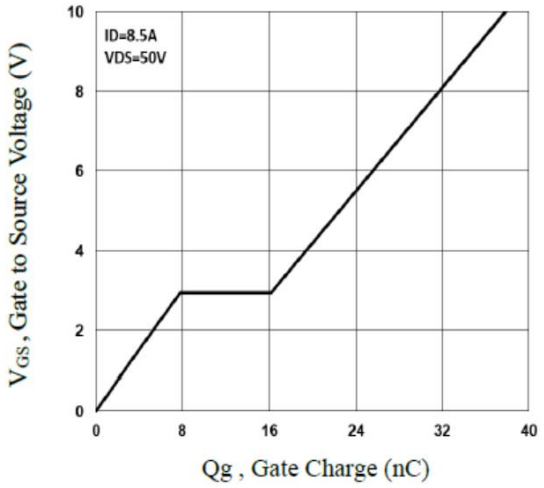


Fig.4 Gate Charge Characteristics

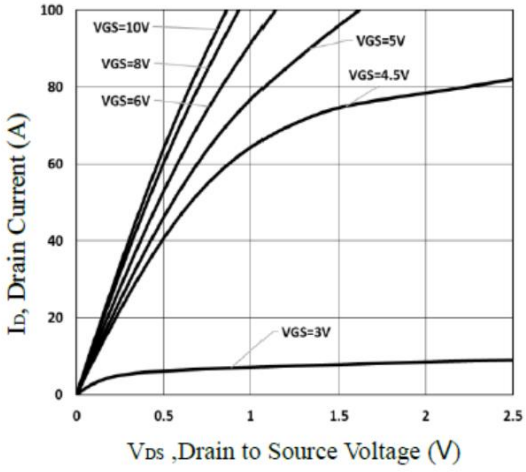


Fig.5 Typical Output Characteristics

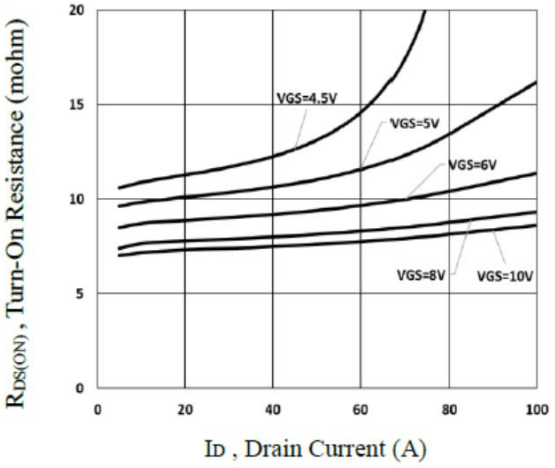


Fig.6 Turn-On Resistance vs. I_D

Typical Performance Characteristics (Continue)

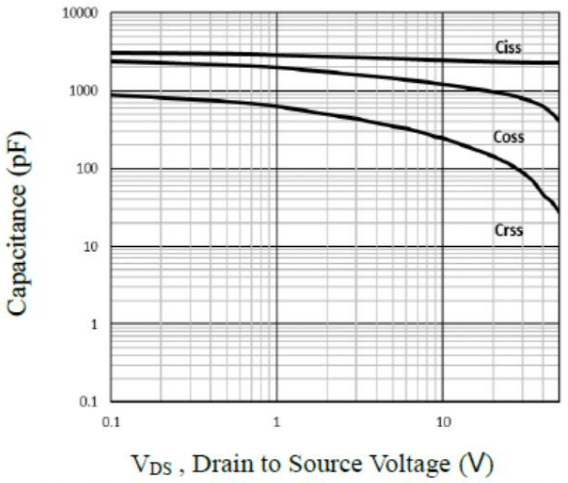


Fig.7 Capacitance Characteristics

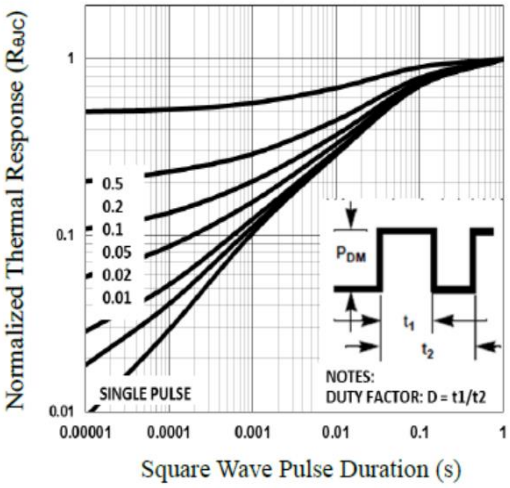


Fig.8 Normalized Transient Impedance

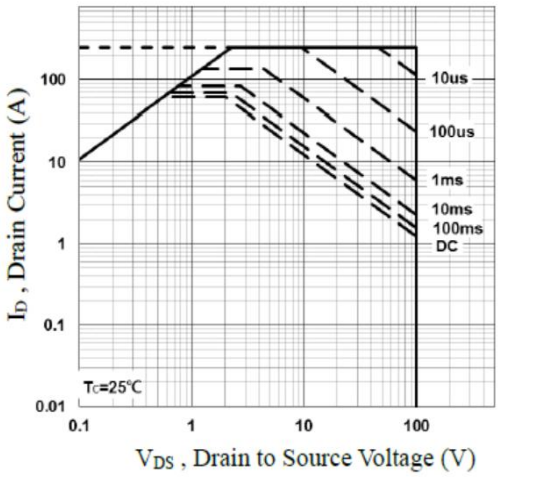


Fig.9 Maximum Safe Operation Area

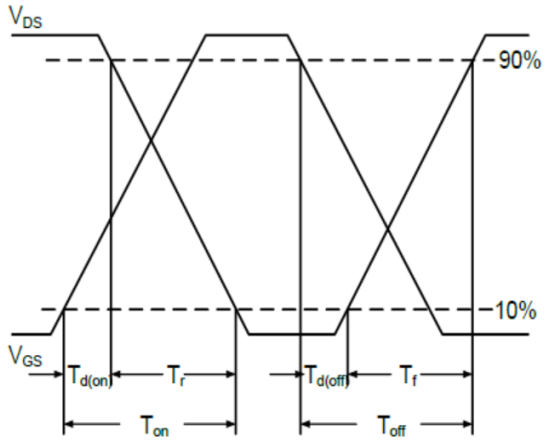


Fig.10 Switching Time Waveform

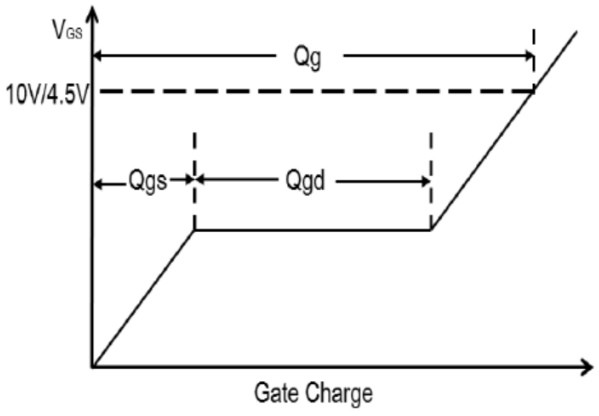
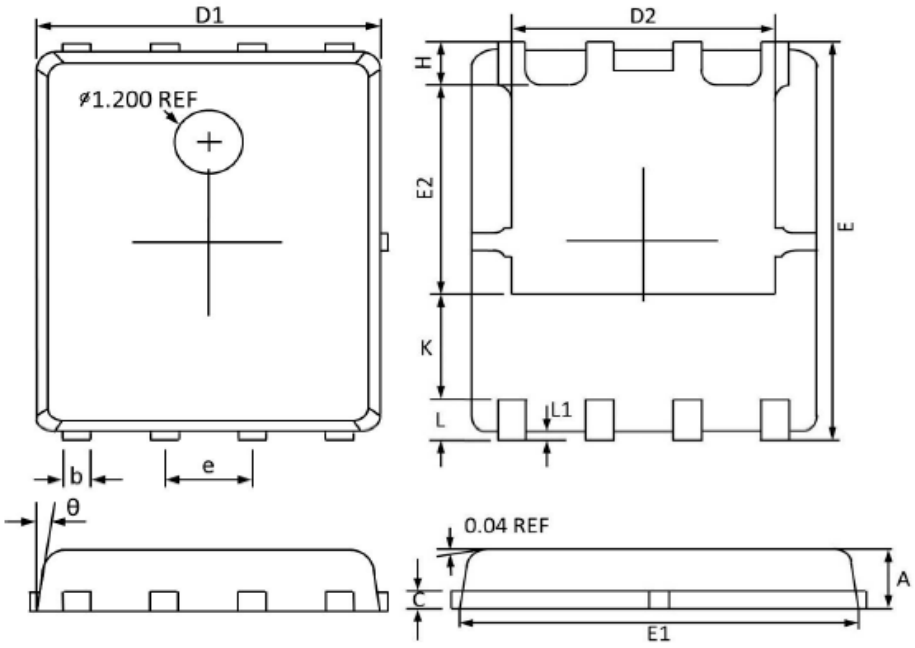


Fig.11 Gate Charge Waveform

Package Dimension

DFN5X6-8L



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.036	0.043
b	0.330	0.510	0.013	0.020
c	0.200	0.300	0.008	0.011
D1	4.800	5.100	0.189	0.201
D2	3.610	4.100	0.142	0.161
E	5.900	6.200	0.232	0.244
E1	5.700	5.900	0.224	0.232
E2	3.350	3.780	0.132	0.149
e	1.270 (BSC)		0.050 (BSC)	
H	0.410	0.700	0.016	0.028
K	1.100	1.500	0.043	0.059
L	0.510	0.710	0.020	0.028
L1	0.060	0.200	0.002	0.008
θ	0°	12°	0°	12°

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