GSMDC4906X

40V 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.

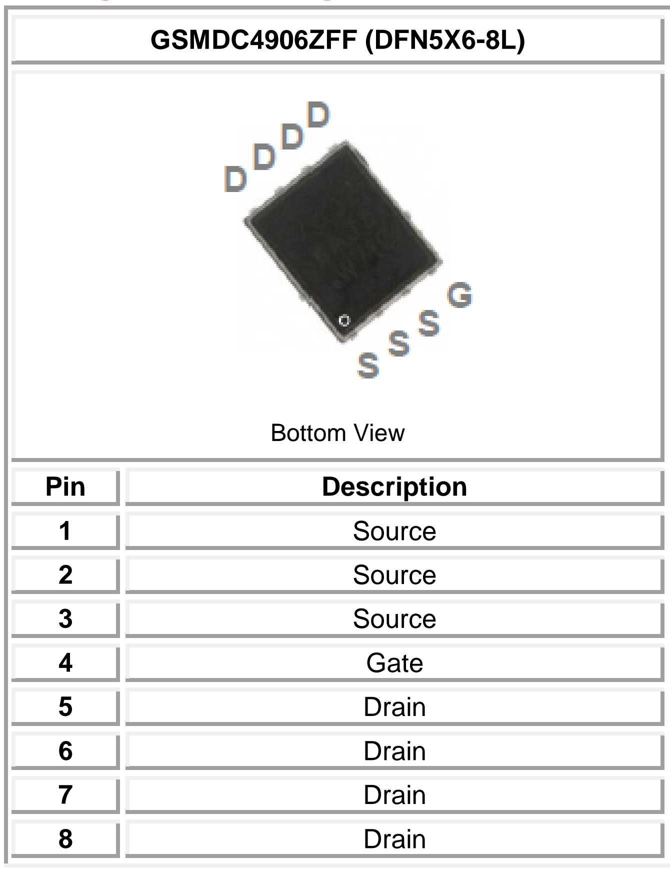
Features

- 40V, 70 A, $R_{DS(ON)}$=8.5 mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available
- DFN3X3-8L package design

Applications

- Notebook
- Load Switch
- LED applications
- Hand-Held Device

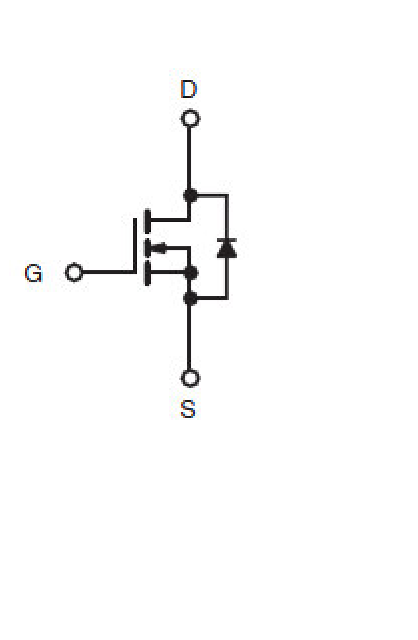
Packages & Pin Assignments



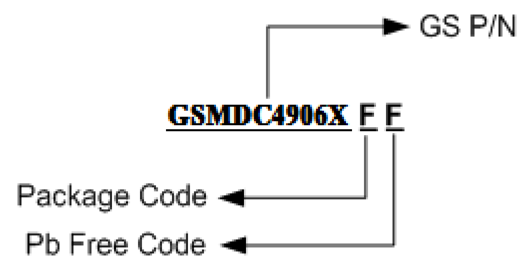
GSMDC4906ZFF (DFN5X6-8L)

Bottom View

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

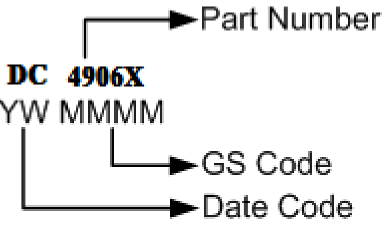


Ordering Information



Part Number	Package	Quantity
GSMDC4906XFF	DFN5X6-8L	3000 PCS

Marking Information



Absolute Maximum Ratings

T_C=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		40	V
V_{GS}	Gate –Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25℃	70	A
		T_C=100℃	44	
I_{DM}	Pulsed Drain Current (Note 1)		280	A
EAS	Single Pulse Avalanche Energy(Note 2)		76	mJ
IAS	Single Pulse Avalanche Current(Note 2)		39	A
P_D	Power Dissipation (T_C=25℃)		72.3	W
	Power Dissipation (Derate above 25℃)		0.58	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		1.73	℃/W

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=39A.,R_G=25Ω ,Starting T_J=25℃

GSMDC4906X

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	40			V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=1mA		0.03		V/℃
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.2	1.6	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient	V_{DS}=V_{GS},I_D=250uA		-5		mV/℃
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V,V_{GS}=0V			1	uA
		V_{DS}=32V,V_{GS}=0V, T_J=85℃			10	uA
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			70	A
I_{SM}	Pulsed Source Current	V_G=V_D=0V, Force Current			140	A
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V,I_D=15A		6.5	8.5	mΩ
		V_{GS}=4.5V,I_D=8A		9	12	mΩ
g_{FS}	Forward Transconductance	V_{DS}=10V,I_D=2A		13		S
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=1A			1	V
		Dynamic				
Q_g	Total Gate Charge (Note 3,4)	V_{DS}=20V,V_{GS}=10V, I_D=10A		19.7	30	nC
Q_{gs}	Gate-Source Charge (Note 3,4)	V_{DS}=20V,V_{GS}=10V, I_D=10A		2.8	4.2	nC
Q_{gd}	Gate-Drain Charge (Note 3,4)	V_{DS}=20V,V_{GS}=10V, I_D=10A		5.1	7.6	nC
C_{iss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V, f=1MHz		1278	2200	pF
C_{oss}	Output Capacitance	V_{DS}=25V,V_{GS}=0V, f=1MHz		135	250	pF
C_{rss}	Reverse Transfer Capacitance	V_{DS}=25V,V_{GS}=0V, f=1MHz		87	170	pF
$t_{d(on)}$	Turn-On Time (Note 3,4)	V_{DD}=15V,I_D=1A, V_{GS}=10V,R_G=3.3Ω		13.2	25	ns
t_r				2.2	5	ns
$t_{d(off)}$	Turn-Off Time (Note 3,4)			72	130	ns
t_f				4.5	10	ns
R_g	Gate Resistance	V_{DS}=0V,V_{GS}=0V, f=1MHz		2.2		Ω

Note 3: The data tested by pulsed, pulse width≦300us, duty cycle≦2%.

Note 4: Essentially independent of operating temperature.

Typical Performance Characteristics

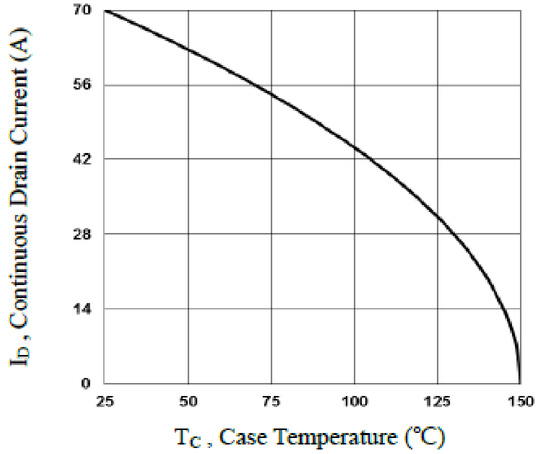


Fig.1 Continuous Drain Current vs. T_C

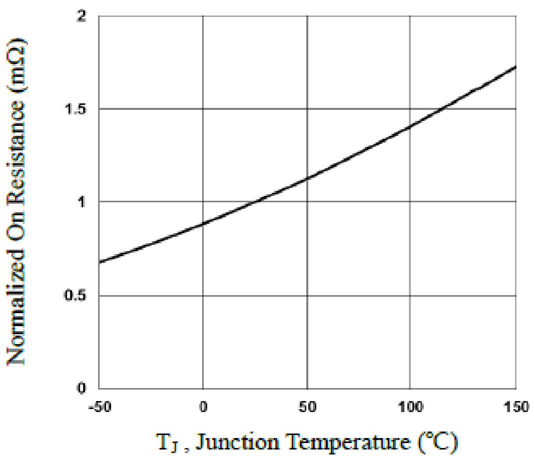


Fig.2 Normalized RDSON vs. T_J

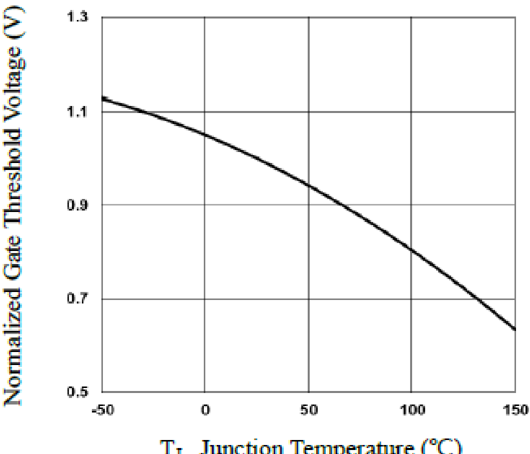


Fig.3 Normalized V_{th} vs. T_J

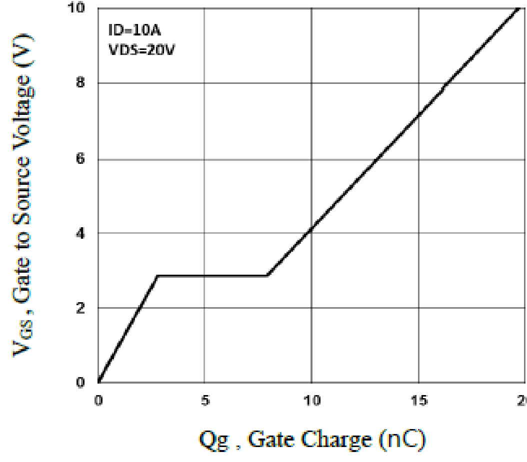


Fig.4 Gate Charge Waveform

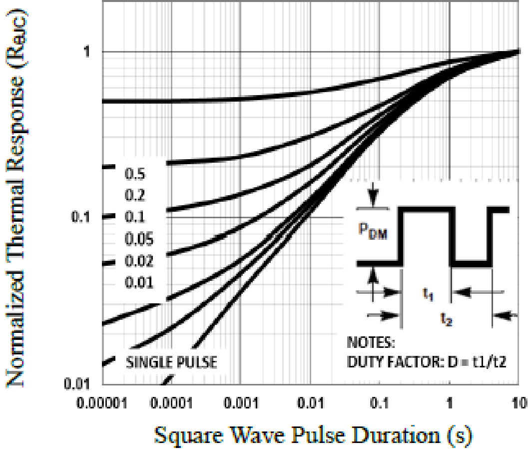


Fig.5 Normalized Transient Impedance

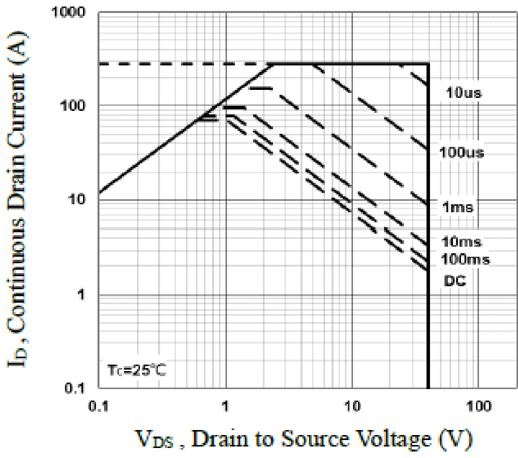


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics

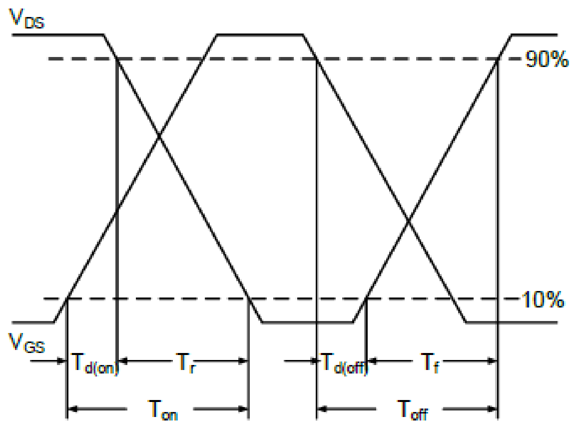


Fig.7 Switching Time Waveform

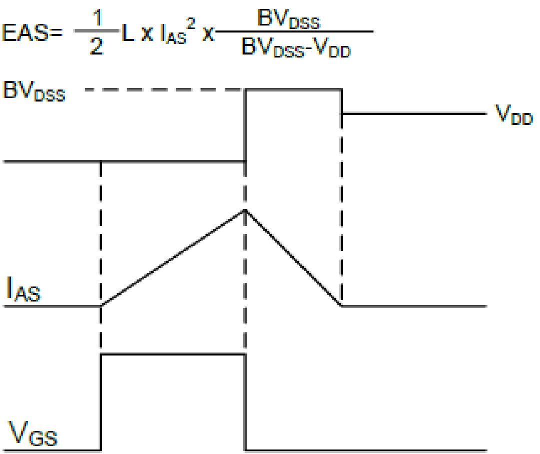
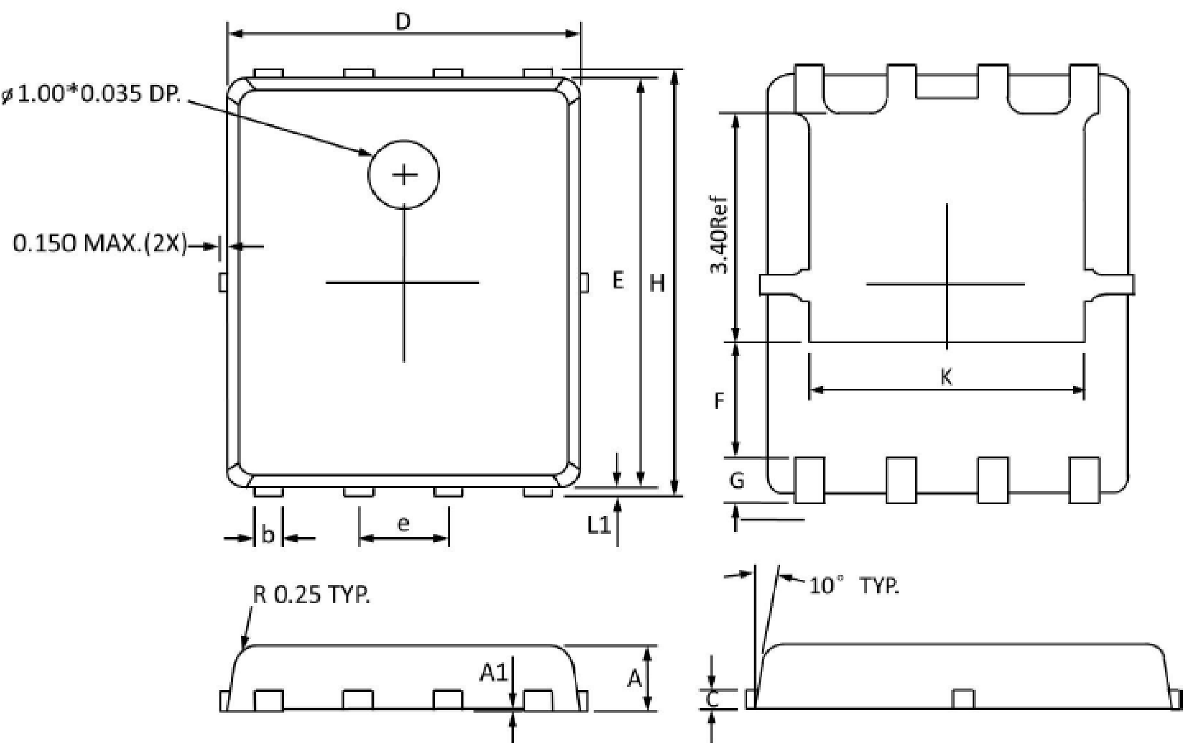


Fig.8 EAS Waveform

Package Dimension

DFN5X6-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.800	1.000	0.032	0.039
A1	0.000	0.005	0.000	0.000
b	0.350	0.490	0.014	0.019
C	0.254 Ref		0.254 Ref	
D	4.900	5.100	0.193	0.200
E	5.700	5.900	0.225	0.232
e	1.27 BSC		1.27 BSC	
F	1.400 Ref		1.400 Ref	
G	0.600 Ref		0.600 Ref	
H	5.950	6.200	0.235	0.244
L1	0.100	0.180	0.004	0.007
K	4.000 Ref		4.000 Ref	

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