GSMC3944X

30V 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

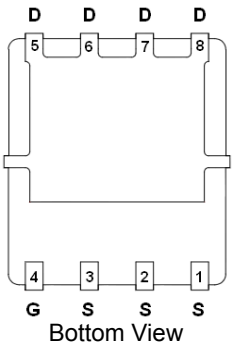
- 30V, 75A, $R_{DS(ON)}$=2.4mΩ@V_{GS}=10V
- Improved dv/dt capability
- Fast switching
- V_{GS} Guarantee ±20V
- Green Device Available
- DFN5X6-8L package design

Applications

- Server Power
- DC-DC Load Switch
- Motor Driver Applications
- BMS Application

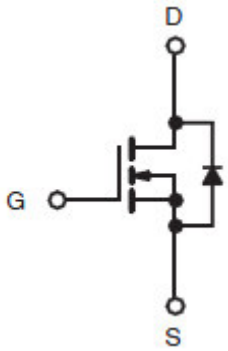
Packages & Pin Assignments

GSMC3944XFF (DFN5X6-8L)

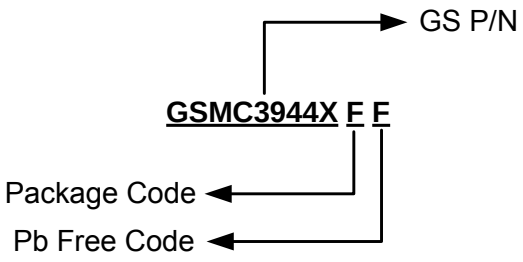


Bottom View

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

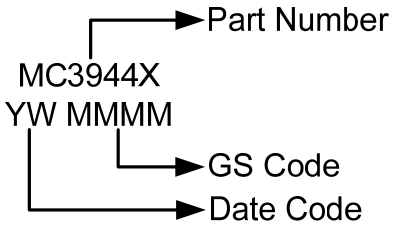


Ordering Information



Part Number	Package	Quantity Reel
GSMC3944XFF	DFN5X6-8L	3000 PCS

Marking Information



Absolute Maximum Ratings

T_C=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		30	V
V_{GS}	Gate –Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25℃	75	A
		T_C=100℃	47	
I_{DM}	Pulsed Drain Current		300	A
EAS	Single Pulse Avalanche Energy		140	mJ
IAS	Single Pulse Avalanche Current		53	A
P_D	Power Dissipation (T_C=25℃)		50	W
	Power Dissipation (Derate above 25℃)		0.4	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		50	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		2.5	℃/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	30			V
$\triangle BV_{DSS}/\triangle T_J$	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	1.7	3	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			-3.9		mV/℃
I_{GSS}	Gate Leakage Current	V_{DS}=0V,V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V,V_{GS}=0V			1	uA
		V_{DS}=20V,V_{GS}=0V, T_J=125℃			25	
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			75	A
I_{SM}	Pulsed Source Current				300	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS} =10V,I_D=30A		1.7	2.4	mΩ
		V_{GS} =4.5V,I_D=25A		2.2	3.2	
g_{FS}	Forward Transconductance	V_{DS}=10V,I_S=20A		32		S
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=1A			1	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V,I_S=1A, di/dt=100A/us		35		ns
Q_{rr}	Reverse Recovery Charge			15		nC
Dynamic						
Q_g	Total Gate Charge	V_{DS}=15V,V_{GS}=10V, I_D=30A		80	120	nC
Q_{gs}	Gate-Source Charge			19	29	
Q_{gd}	Gate-Drain Charge			38	57	
C_{iss}	Input Capacitance	V_{DS}=15V,V_{GS}=0V, f=1MHz		7032	10200	pF
C_{oss}	Output Capacitance			898	1310	
C_{rss}	Reverse Transfer Capacitance			843	1230	
$t_{d(on)}$	Turn-On Time	V_{DD}=15V,I_D=1A, V_{GS}=10V,R_G=1Ω		20	38	ns
t_r				36	68	
$t_{d(off)}$	Turn-Off Time			80	152	
t_f				33	63	
R_g	Gate Resistance	V_{DS}=0V,V_{GS}=0V, f=1MHz		1.2	2.4	Ω

Typical Performance Characteristics

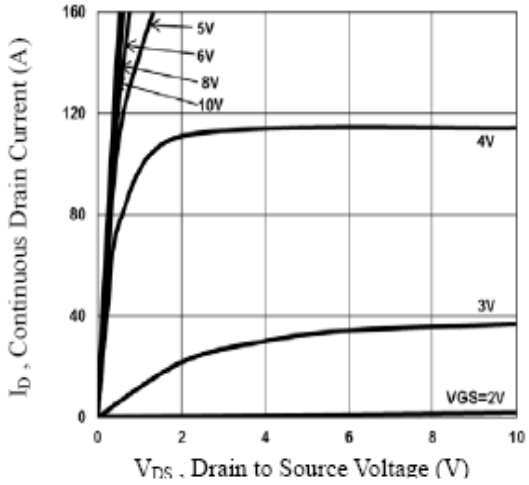


Fig.1 Output Characteristics

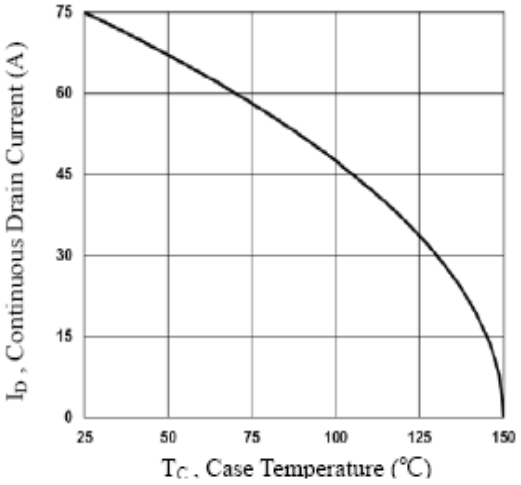


Fig.2 Continuous Drain Current vs. T_c

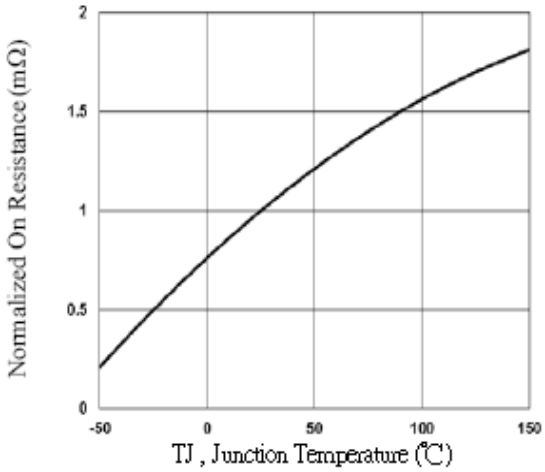


Fig.3 Normalized RDSON vs. T_J

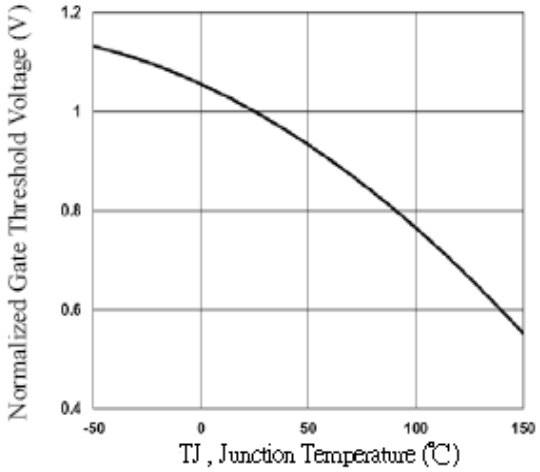


Fig.4 Normalized V_{th} vs. T_J

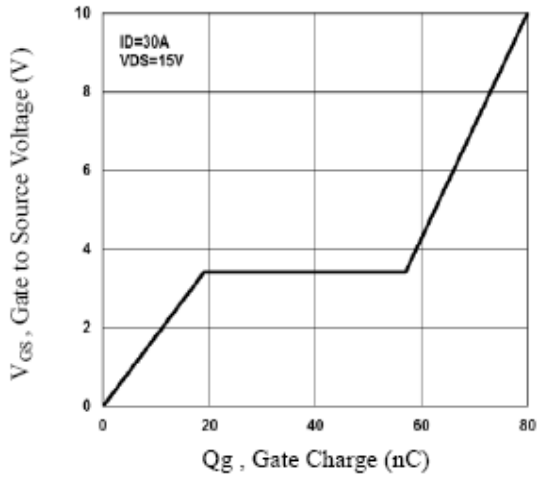


Fig.5 Gate Charge Waveform

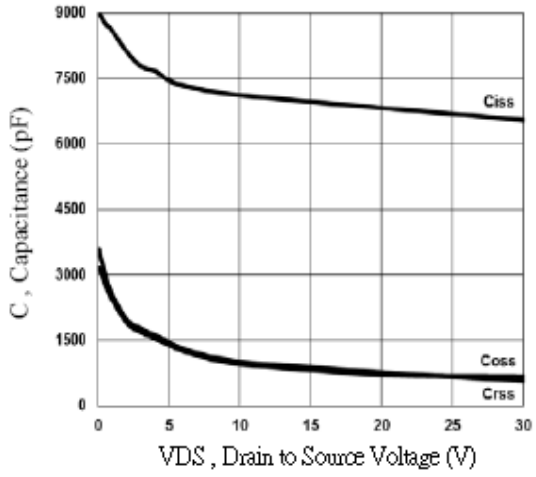


Fig.6 Capacitance Characteristics

Typical Performance Characteristics (Continue)

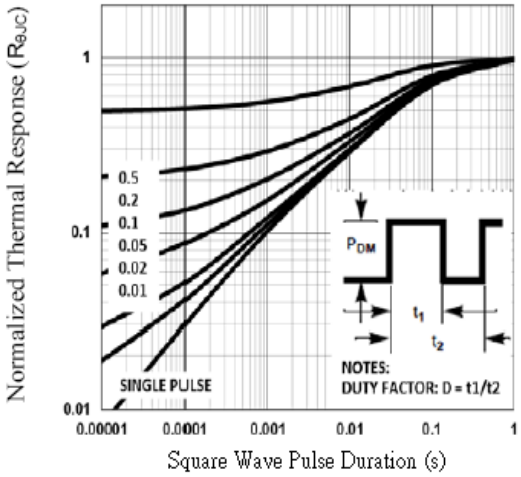


Fig.7 Normalized Transient Impedance

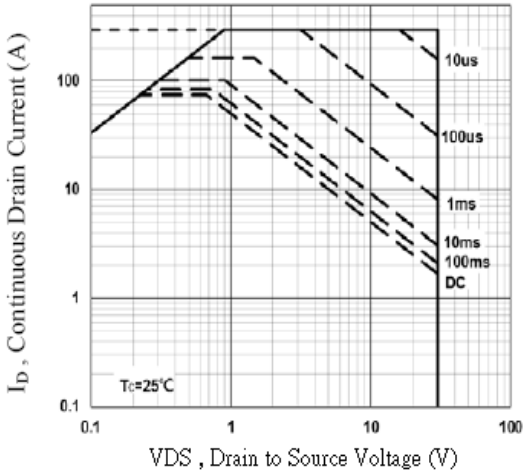
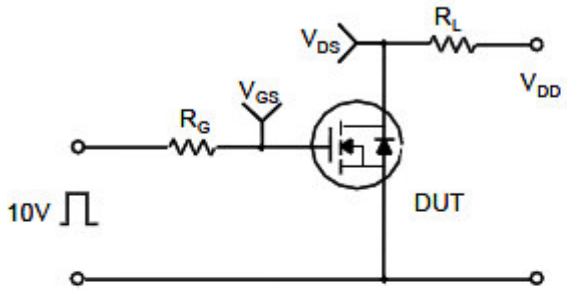
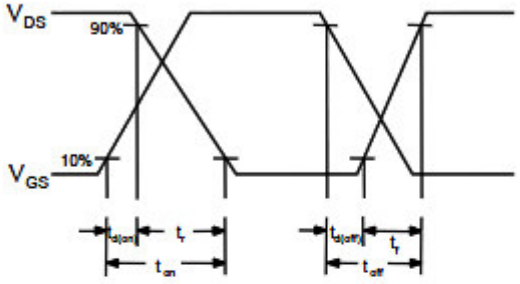


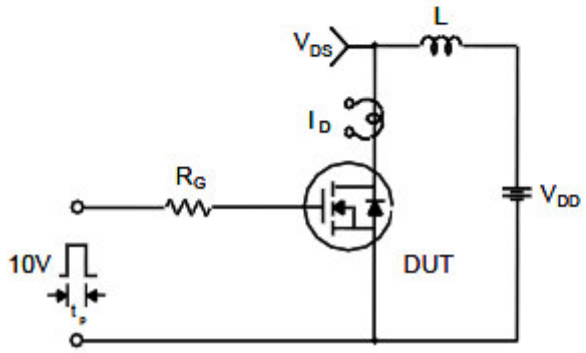
Fig.8 Maximum Safe Operation Area

Resistive Switching Test Circuit & Waveforms

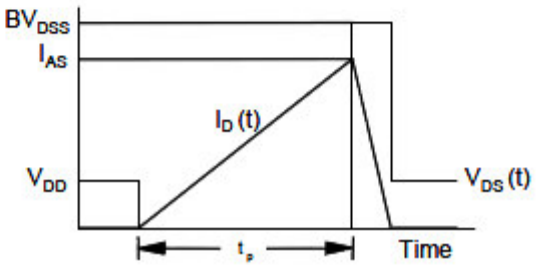




Unclamped Inductive Switching Test Circuit & Waveforms

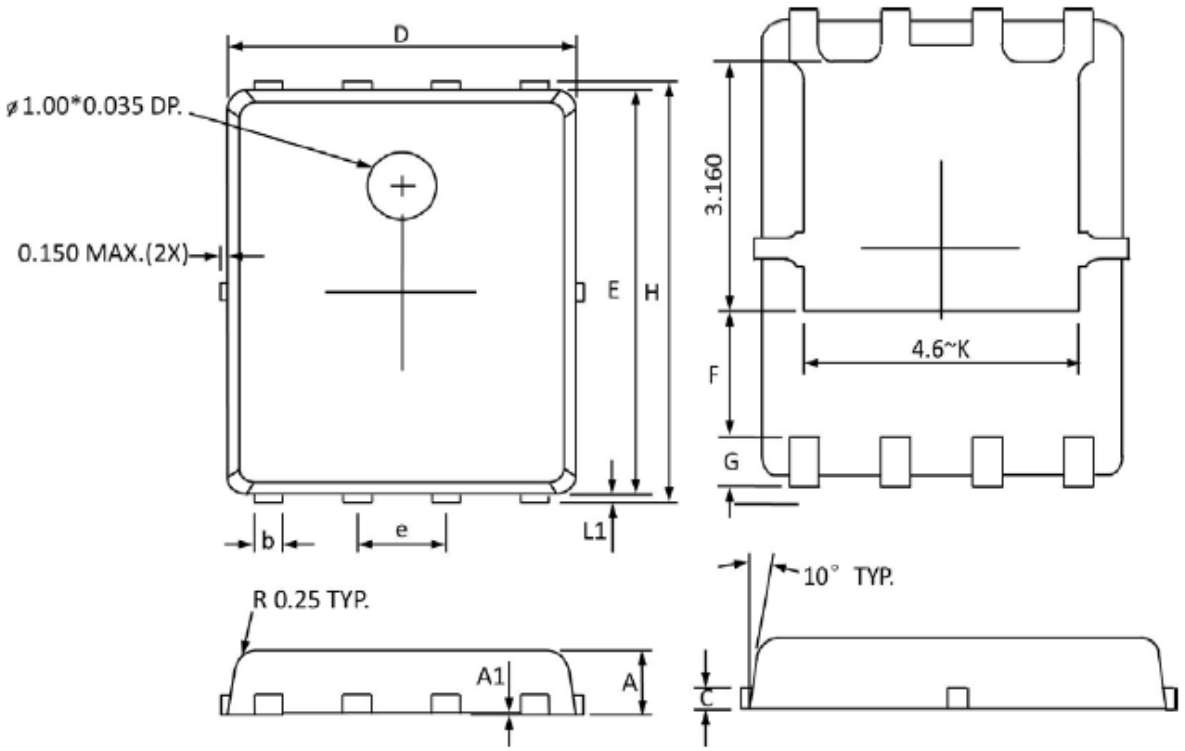


$$E_{AS} = \frac{1}{2} L I_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



Package Dimension

DFN5X6-8L



Dimensions				
Symbol	Millimeters		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	1.600 (REF)		1.600 (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	3.200 (REF)		3.200 (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	
	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

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

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