

GSMDC3094X

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, 90A, $R_{DS(ON)}=4m\Omega@V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS guaranteed
- Green Device Available
- DFN5X6-8L package design

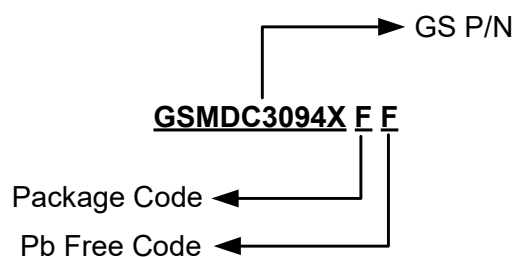
Applications

- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR

Packages & Pin Assignments

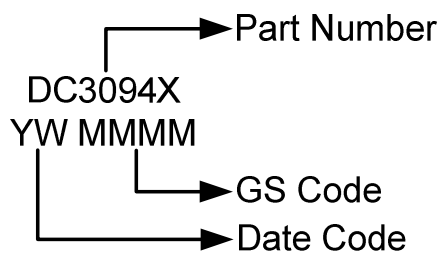
GSMDC3094XFF (DFN5X6-8L)	
<p style="text-align: center;">Bottom View</p>	
Pin	Description
1	Source
2	Source
3	Source
4	Gate
5	Drain
6	Drain
7	Drain
8	Drain

Ordering Information



Part Number	Package	Quantity Reel
GSMDC3094XFF	DFN5X6-8L	3000 PCS

Marking Information



Absolute Maximum Ratings

$T_C=25^{\circ}\text{C}$ 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	$T_C=25^{\circ}\text{C}$	90
		$T_C=100^{\circ}\text{C}$	57
I_{DM}	Pulsed Drain Current ¹	360	A
EAS	Single Pulse Avalanche Energy ²	125	mJ
IAS	Single Pulse Avalanche Current ²	50	A
P_D	Power Dissipation ($T_C=25^{\circ}\text{C}$)	115	W
	Power Dissipation (Derate above 25°C)	0.77	W/ $^{\circ}\text{C}$
T_J	Operating Junction Temperature Range	-55 to +175	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-55 to +175	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.3	$^{\circ}\text{C}/\text{W}$

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	30			V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA		0.04		V/°C
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.2	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient			-5		mV/°C
I _{GSS}	Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±20V			±100	nA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =30V, V _{GS} =0V			1	uA
		V _{DS} =24V, V _{GS} =0V, T _J =125°C			10	
I _S	Continuous Source Current	V _G =V _D =0V, Force Current			90	A
I _{SM}	Pulsed Source Current				360	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =20A		3	4	mΩ
		V _{GS} =4.5V, I _D =10A		4.2	5.5	
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =12A		20		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A			1	V
EAS	Single Pulse Avalanche Energy	V _{DD} =25V, L=0.1mH, IAS=24A	31			mJ
Dynamic						
Q _g	Total Gate Charge ^{3,4}	V _{DS} =15V, V _{GS} =4.5V, I _D =24A		24	36	nC
Q _{gs}	Gate-Source Charge ^{3,4}			4.2	8	
Q _{gd}	Gate-Drain Charge ^{3,4}			13	20	
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz		2200		pF
C _{oss}	Output Capacitance			475		
C _{rss}	Reverse Transfer Capacitance			340		
t _{d(on)}	Turn-On Time ^{3,4}	V _{DD} =15V, I _D =15A, V _{GS} =10V, R _G =3.3Ω		12.6	24	ns
t _r				19.5	37	
t _{d(off)}	Turn-Off Time ^{3,4}			42.8	81	
t _f				13.2	25	
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz		2		Ω

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, IAS=50A., R_G=25Ω, 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

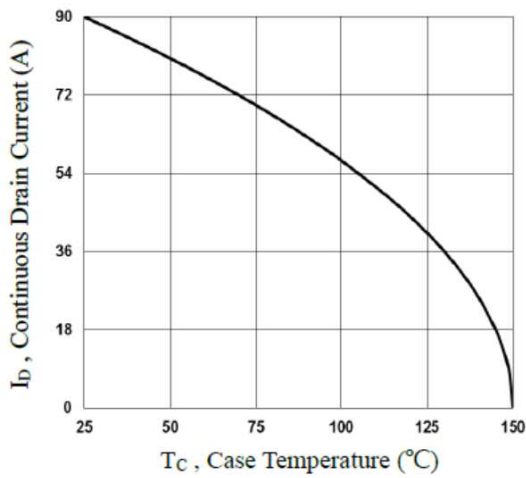


Fig.1 Continuous Drain Current vs. Tc

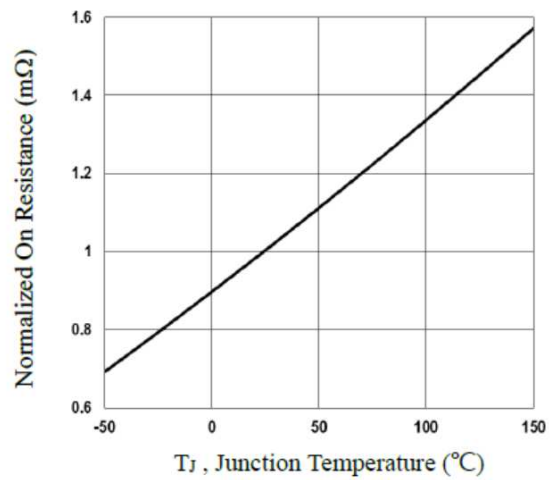


Fig.2 Normalized RDS(on) vs. Tj

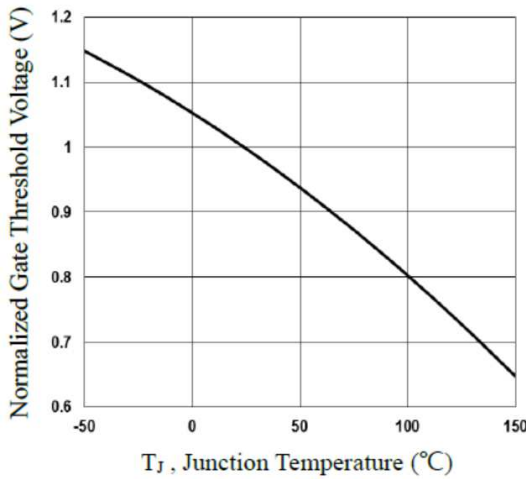


Fig.3 Normalized Vth vs. Tj

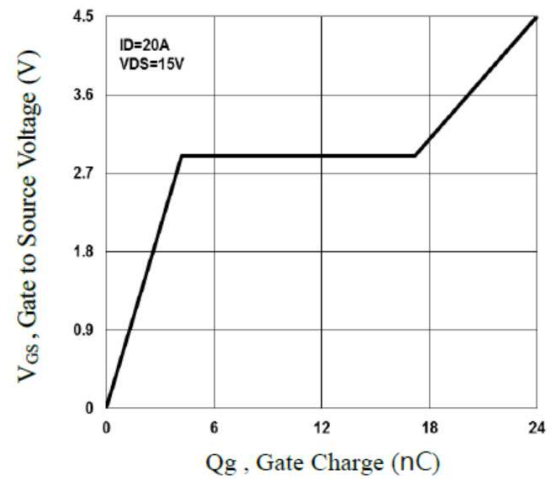


Fig.4 Gate Charge Waveform

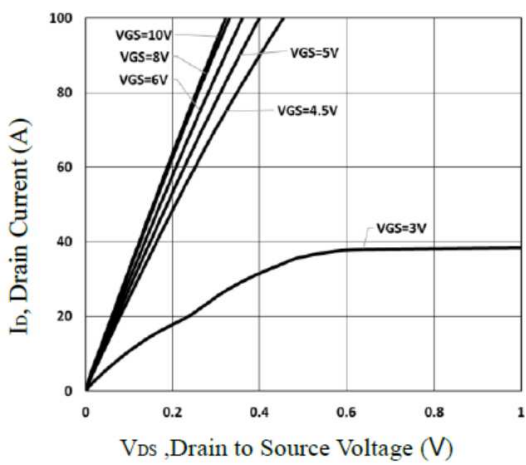


Fig.5 Typical Output Characteristics

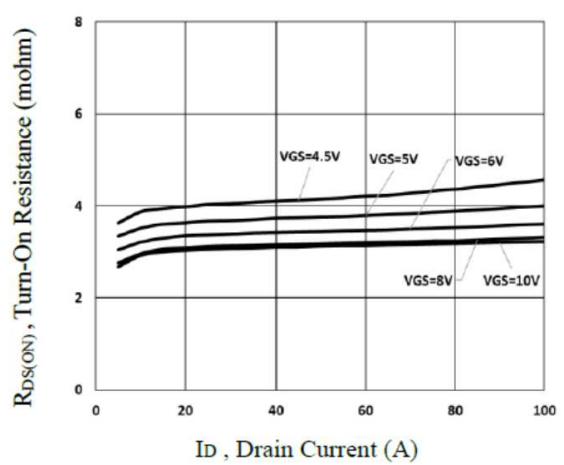


Fig.6 Turn-On Resistance vs. ID

Typical Performance Characteristics (Continue)

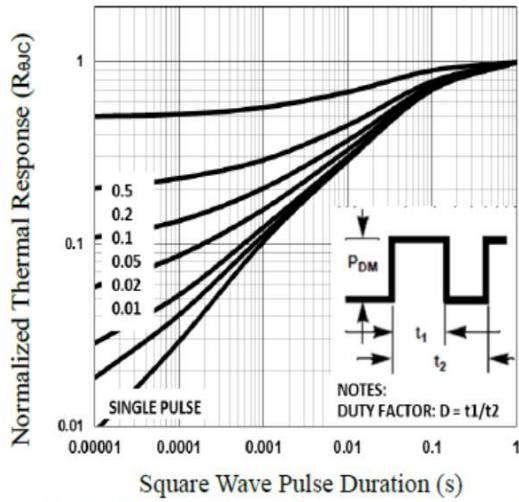


Fig.7 Normalized Transient Impedance

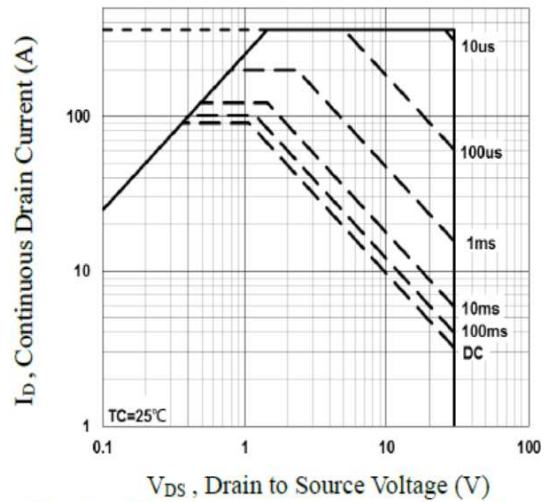


Fig.8 Maximum Safe Operation Area

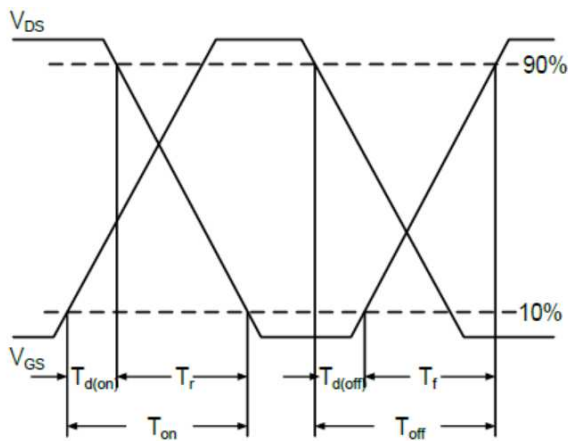


Fig.9 Switching Time Waveform

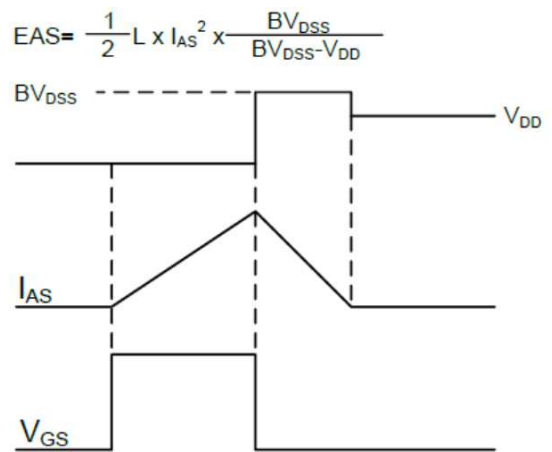
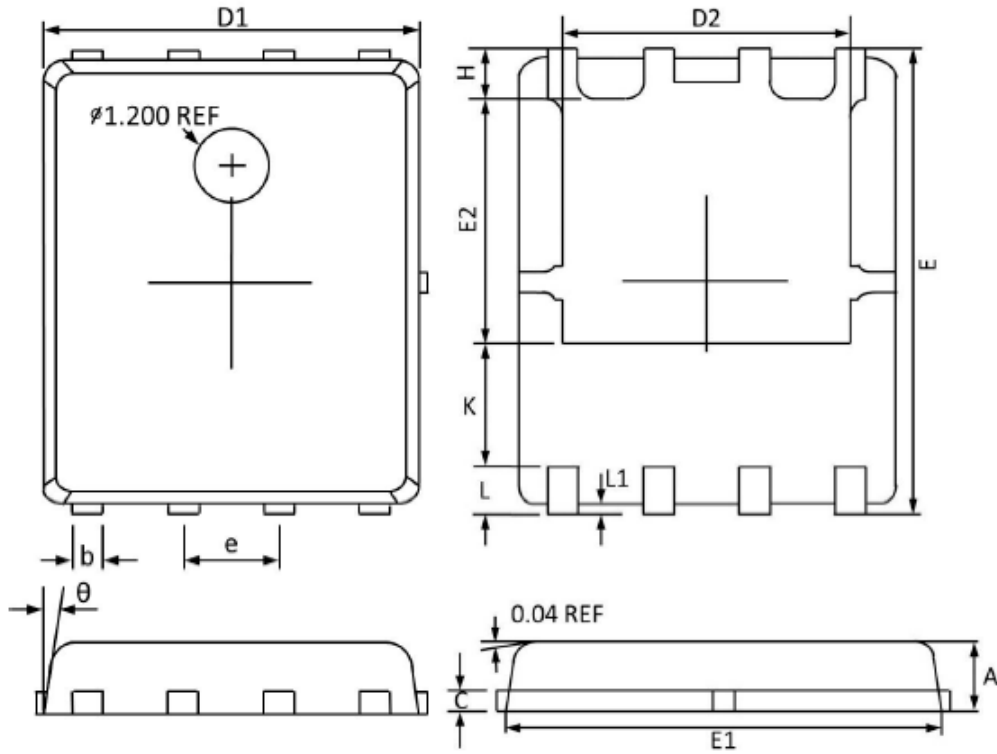


Fig.10 EAS Waveform

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	5.000	0.189	0.196
D2	3.610	3.960	0.143	0.155
E	5.900	6.100	0.225	0.232
e	1.270 (BSC)		0.050 (BSC)	
H	0.410	0.610	0.017	0.024
K	1.100 (REF)		0.043 (REF)	
L	0.510	0.710	0.020	0.027
L1	0.060	0.200	0.003	0.007
θ	0°	12°	0°	12°

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