GSM2306Z

20V 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.

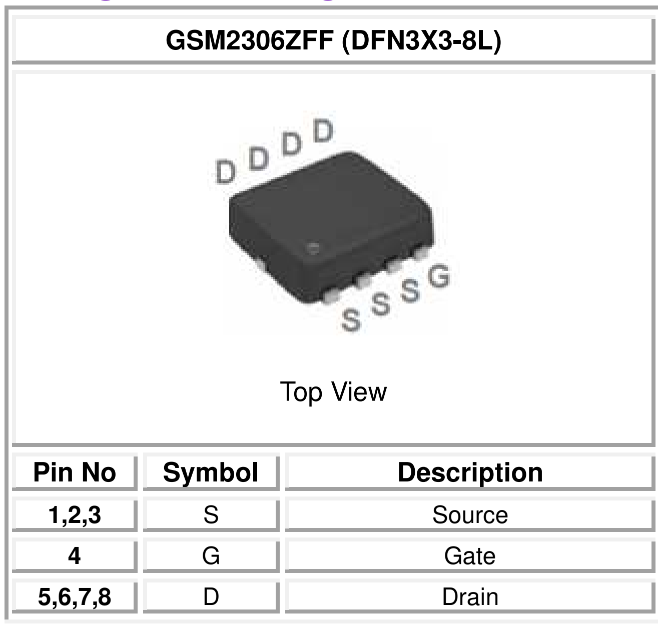
Features

- 20V, 65A, $R_{DS(ON)}$=5.4mΩ@V_{GS}=4.5V
- Improved dv/dt capability
- Suit for 1.8V Gate Drive Applications
- Green Device Available

Applications

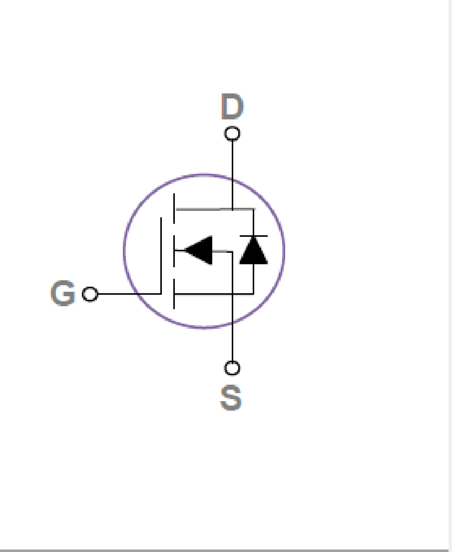
- Load Switch
- POL Applications
- SMPS 2nd SR
- Li-Battery Protection

Packages & Pin Assignments

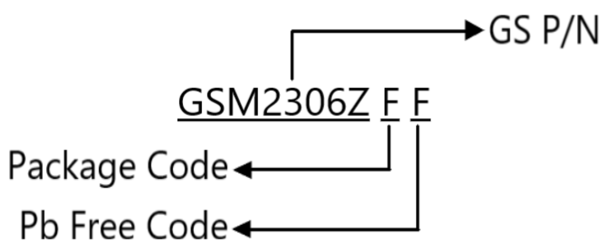


GSM2306ZFF (DFN3X3-8L)		
Pin No	Symbol	Description
1,2,3	S	Source
4	G	Gate
5,6,7,8	D	Drain

Top View

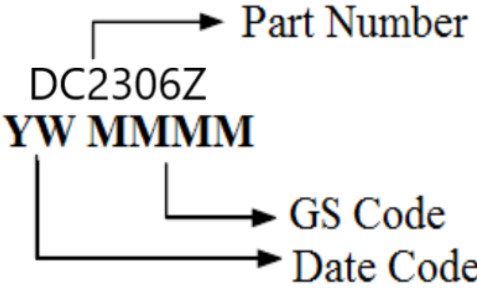


Ordering Information



Part Number	Package	Quantity
GSM2306ZFF	DFN3x3-8L	5000pcs

Marking Information



Absolute Maximum Ratings

T_C=25ºC Unless otherwise noted

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		±10	V
I_D	Continuous Drain Current	T_C=25℃	65	A
		T_C=100℃	41	
I_{DM}	Pulsed Drain Current[1]		260	A
P_D	Power Dissipation (T_C=25℃)		44.6	W
	Power Dissipation (Derate above 25℃)		0.36	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		2.8	℃/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	20			V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃, I_D=1mA		0.01		V/℃
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.3	0.6	1	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient	V_{DS}=V_{GS}, I_D=250uA		2		mV/℃
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V, V_{GS}=±20V			±100	nA
I_{DSS}	Drain-Source Leakage Current	V_{DS}=20V, V_{GS}=0V T_J=25℃			1	uA
		V_{DS}=16V, V_{GS}=0V, T_J=125℃			10	uA
I_S	Continuous Source Current	V_G=V_D=0V, Force Current			65	A
I_{SM}	Pulsed Source Current	V_G=V_D=0V, Force Current			130	A
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=4.5V, I_D=20A		4.5	5.4	mΩ
		V_{GS}=2.5V, I_D=15A,		5.5	6.8	mΩ
		V_{GS}=1.8V, I_D=10A,		6.8	8.8	mΩ
g_{FS}	Forward Transconductance	V_{DS}=10V, I_D=5A		20		S
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=1A			1	V
Dynamic						
Q_g	Total Gate Charge[2,3]	V_{DS}=10V, V_{GS}=4.5V, I_D=6A		29.8	45	nC
Q_{gs}	Gate-Source Charge[2,3]			2.7	6	nC
Q_{gd}	Gate-Drain Charge[2,3]			9	14	nC
C_{iss}	Input Capacitance	V_{DS}=10V,V_{GS}=0V, f=1MHz		1920	2790	pF
C_{oss}	Output Capacitance			280	410	pF
C_{rss}	Reverse Transfer Capacitance			180	270	pF
$t_{d(on)}$	Turn-On Time[2,3]	V_{DD}=10V, I_D=1A, V_{GS}=4.5V, R_G=25Ω		13.5	26	ns
t_r	Rise Time[2,3]			29	55	ns
$t_{d(off)}$	Turn-Off Time[2,3]			66.9	127	ns
t_f	Fall Time[2,3]			19.2	36	ns

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Typical Performance Characteristics

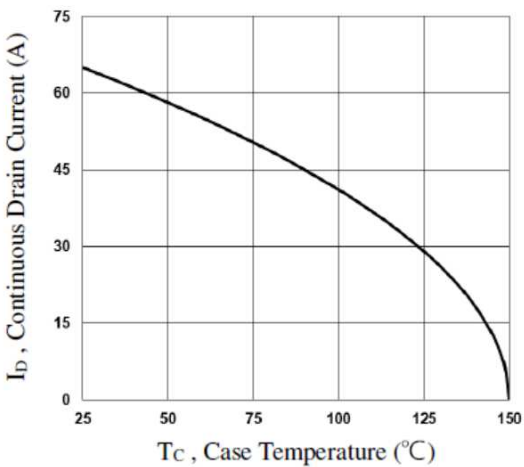


Fig.1 Continuous Drain Current vs. T_C

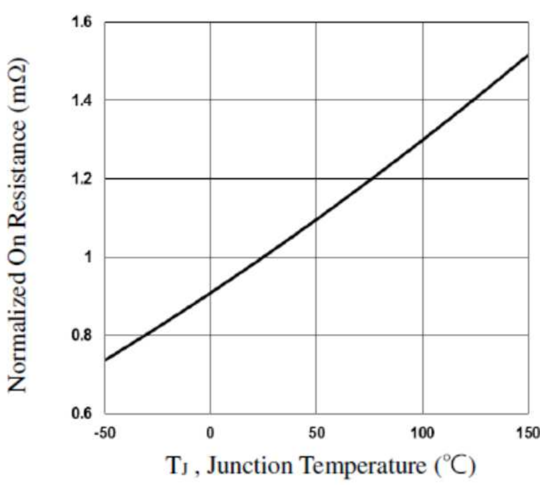


Fig.2 Normalized RDSON vs. T_J

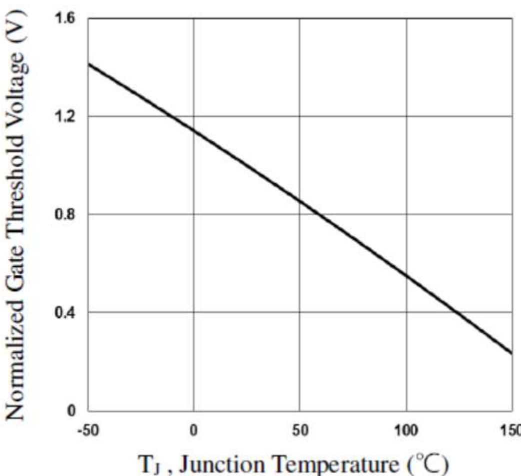


Fig.3 Normalized V_{th} vs. T_J

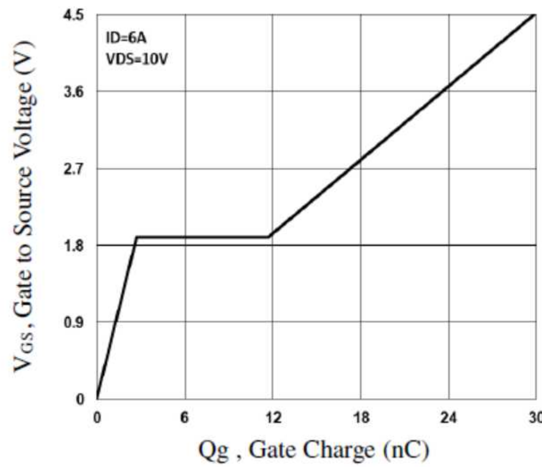


Fig.4 Gate Charge Waveform

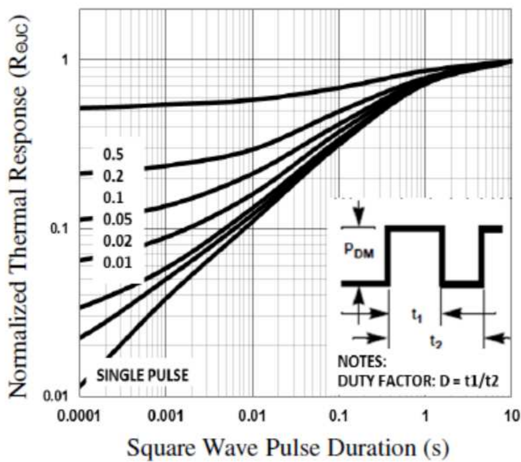


Fig.5 Normalized Transient Response

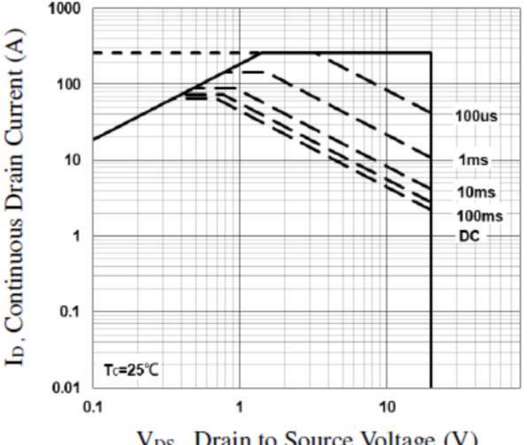


Fig.6 Maximum Safe Operation Area

Typical Performance Characteristics (Continue)

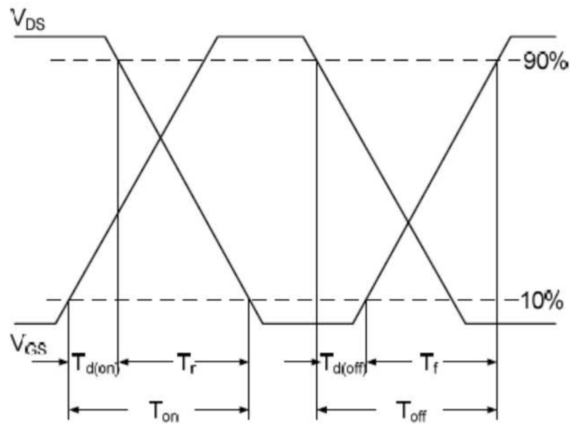


Fig.7 Switching Time Waveform

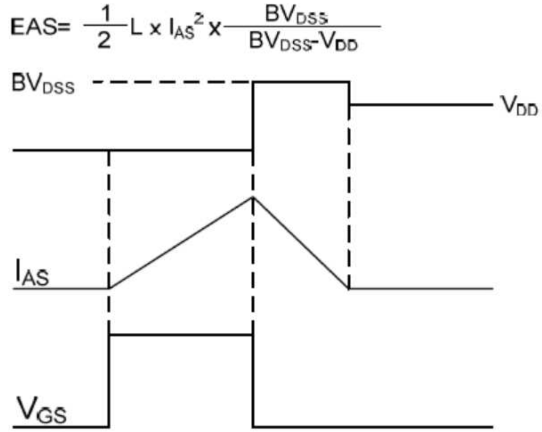
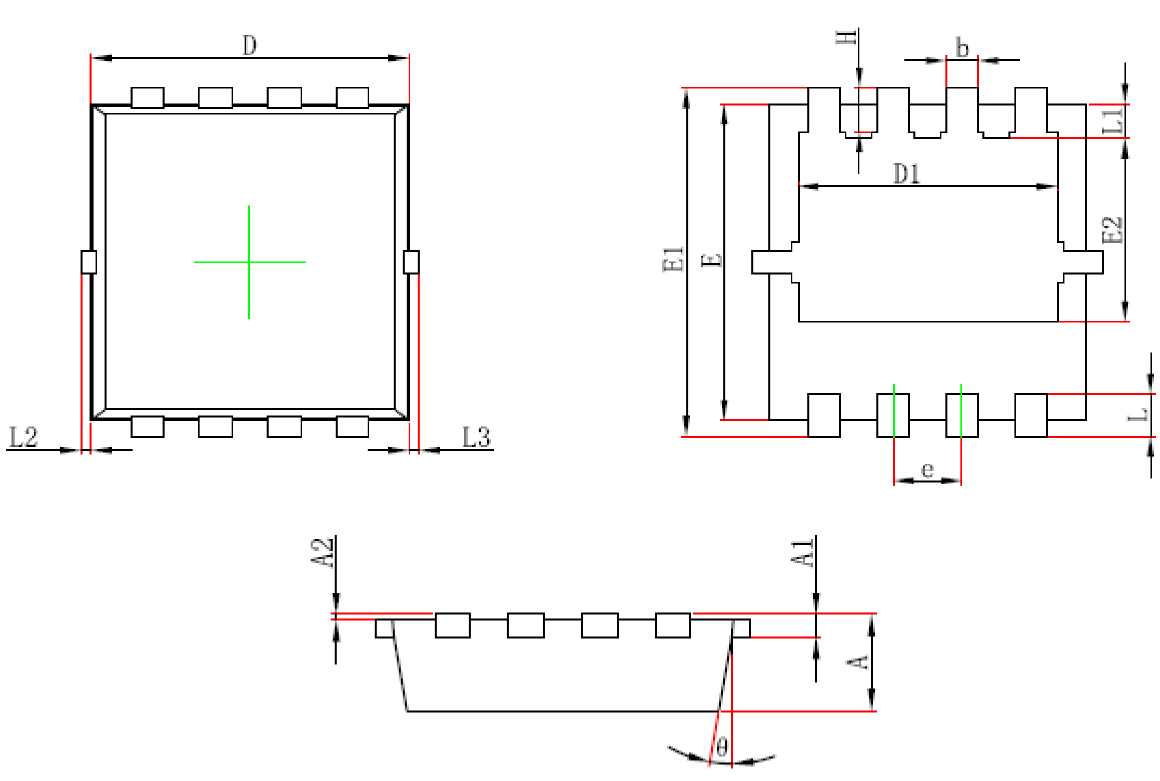


Fig.8 EAS Waveform

Package Dimension

DFN3X3-8L



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13	9°	13°

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CONTACT US

GS Headquarter	
Address	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd Neihu District Taipei City 114, Taiwan (R.O.C)
Tel	886-2-2657-9980
Fax	886-2-2657-3630
Email	sales_twn@gs-power.com

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