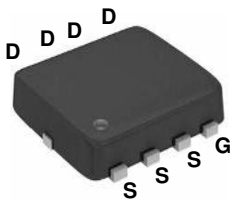
GOOD-ARK SEMICONDUCTOR

GSFN0982

100V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	100V
$R_{DS(ON)}$	13.6mΩ
I_D	48A



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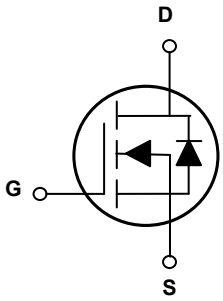

Schematic Diagram

Features and Benefits

- Advanced MOSFET processtechnology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

Description

The GSFN0982 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	+20/-12	V
Drain Current-Continuous(T_C=25°C)	I_D	48	A
Drain Current-Continuous(T_C=100°C)		30	
Drain Current-Pulsed[1]	I_{DM}	192	A
Single Pulse Avalanche Energy[2]	E_{AS}	115	mJ
Single Pulse Avalanche Current[2]	I_{AS}	48	A
Power Dissipation(T_C=25°C)	P_D	61	W
Power Dissipation-Derate above 25°C		0.49	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.04	°C/W
Storage Temperature Range	T_{STG}	-50 To +150	°C
Operating Junction Temperature Range	T_J	-50 To +150	°C

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Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	100	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, ID=1mA	-	0.06	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=80V, V_{GS}=0V, T_J=125°C	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=+20V, V_{DS}=0V	-	-	100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	-	11.3	13.6	mΩ
		V_{GS}=10V, I_D=20A, T_J=125°C	-	19	-	
		V_{GS}=4.5V, I_D=15A	-	16.7	22	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	1	1.5	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-5.1	-	mV/°C
Forward Transconductance	g_{fs}	V_{DS}=10V, I_D=3A	-	8	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DS}=50V, I_D=10A, V_{GS}=10V	-	27.8	55	nC
Gate-Source Charge[3,4]	Q_{gs}		-	3.5	7	
Gate-Drain Charge[3,4]	Q_{gd}		-	8.8	17	
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=50V, R_G=6Ω, V_{GS}=10V, I_D=1A	-	14.2	28	nS
Rise Time[3,4]	t_r		-	20.8	42	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	42	84	
Fall Time[3,4]	t_f		-	30	60	
Input Capacitance	C_{lss}	V_{DS}=50V, V_{GS}=0V, F=1MHz	-	1640	3280	pF
Output Capacitance	C_{oss}		-	240	480	
Reverse Transfer Capacitance	C_{rss}		-	4	10	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	-	1.14	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	48	A
Pulsed Source Current	I_{SM}		-	-	96	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A, T_J=25°C	-	-	1	V
Reverse Recovery Time[3]	t_{rr}	I_S=10A, di/dt=100A/μs, T_J=25°C	-	43.5	-	nS
Reverse Recovery Charge[3]	Q_{rr}		-	59.6	-	nC

Note:
1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=48A, 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 Electrical and Thermal Characteristic Curves

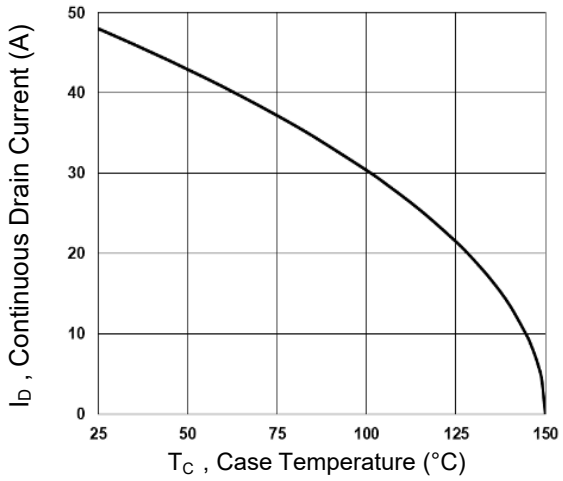

Fig.1 Continuous Drain Current vs. T_C

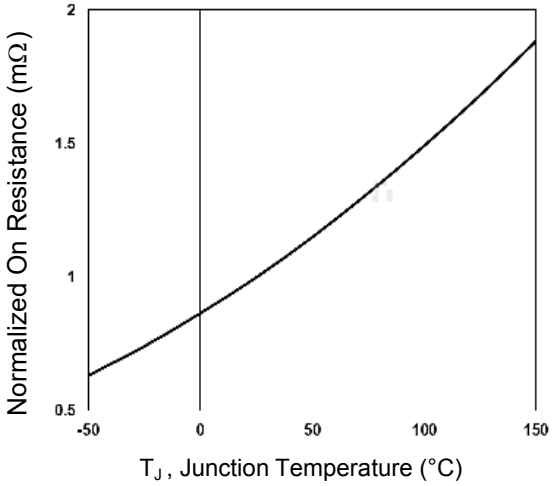

Fig.2 Normalized $R_{DS(ON)}$ vs. TJ

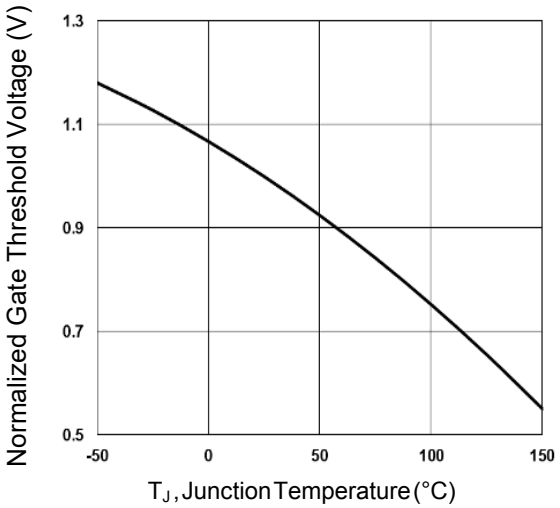

Fig.3 Normalized Vth vs. TJ

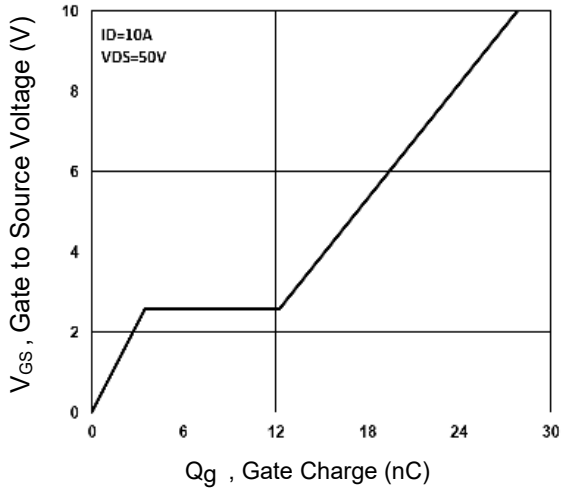

Fig.4 Gate Charge Waveform

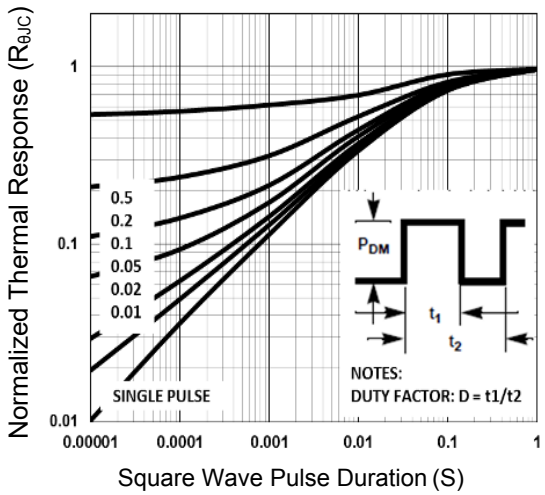

Fig.5 Normalized Transient Impedance

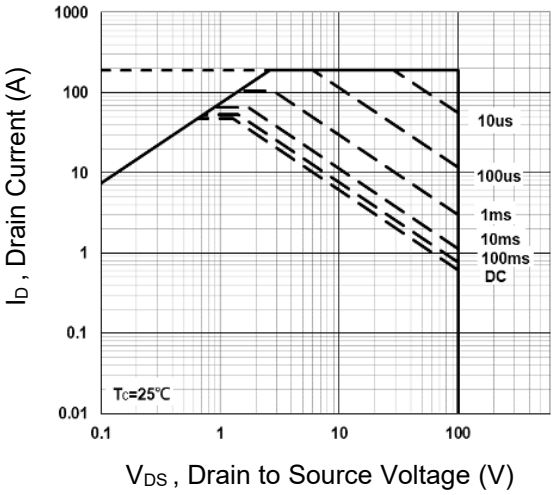

Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

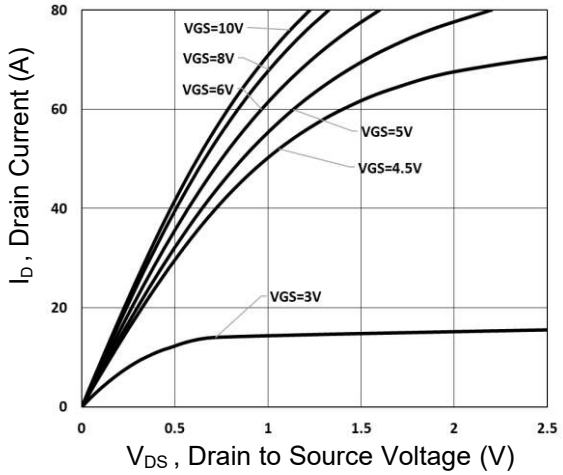

Fig.7 Typical Output Characteristics

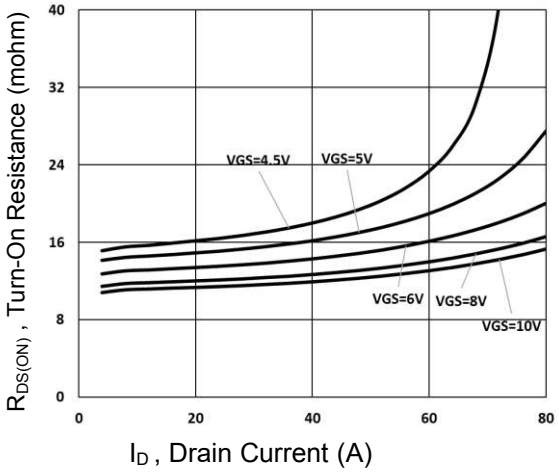

Fig.8 Turn-On Resistance vs. I_D

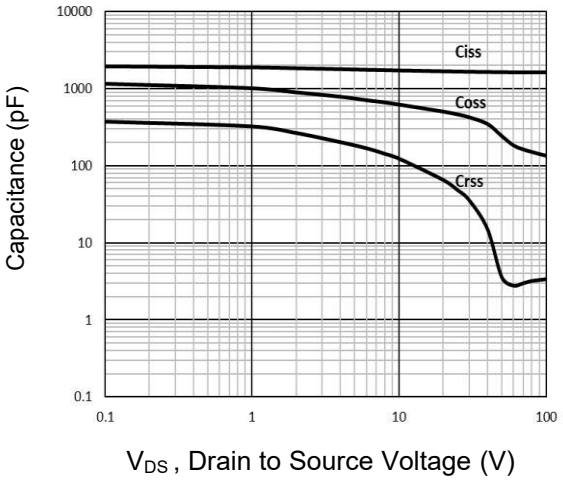

Fig.9 Capacitance Characteristics

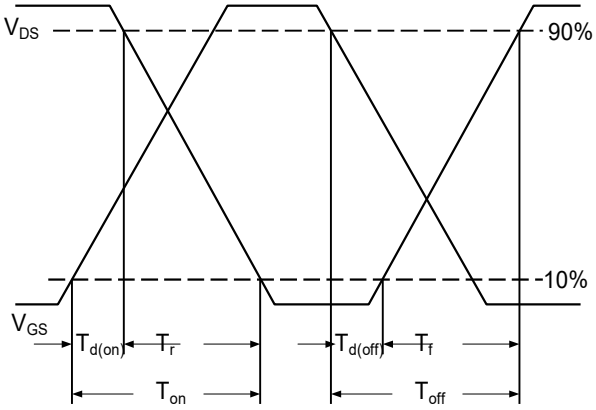

Fig.10 Switching Time Waveform

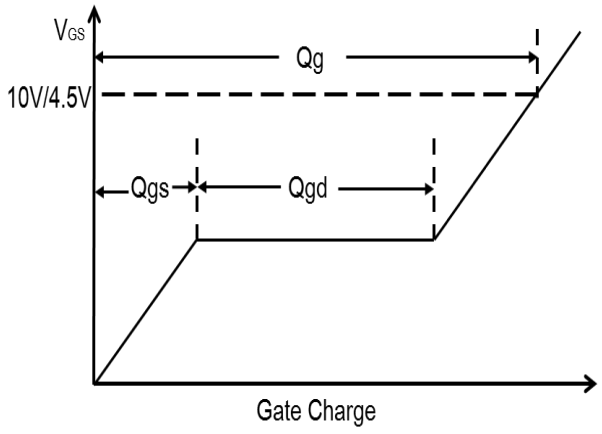

Fig. 11 Gate Charge Waveform

Package Outline Dimensions

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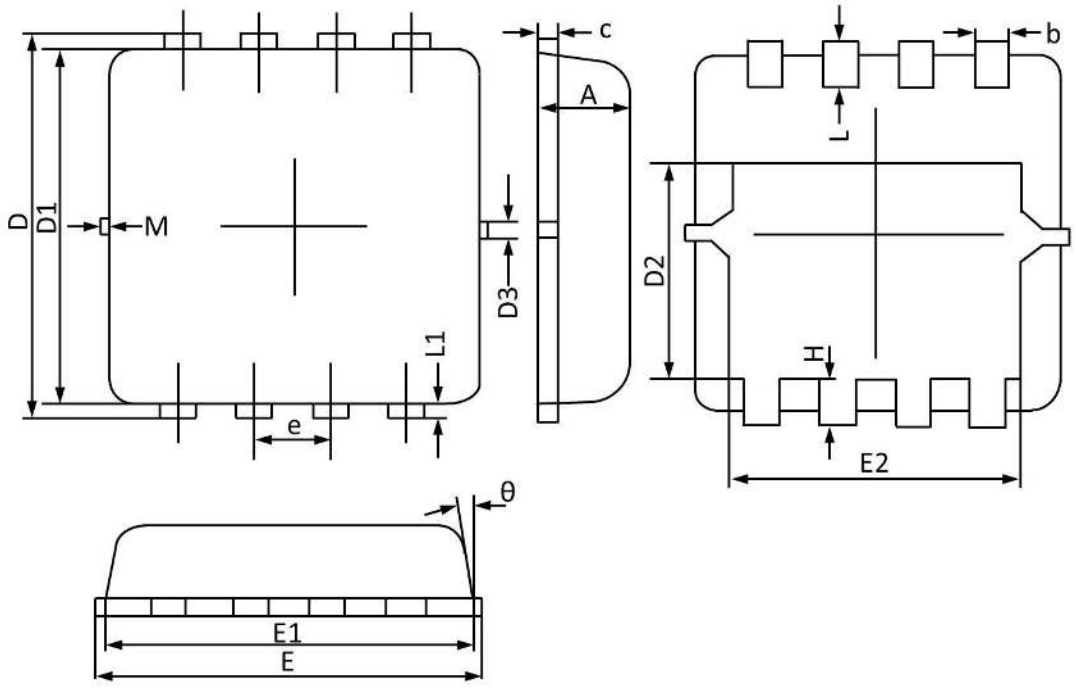

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 REF		0.005 REF	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 REF		0.005 REF	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	