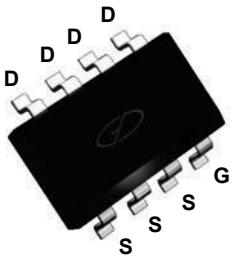
GOOD-ARK SEMICONDUCTOR

GSFQ4910

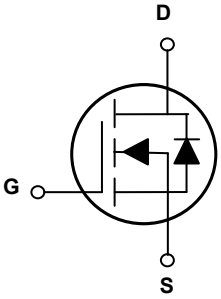
40V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	40V
$R_{DS(ON)}$	19mΩ
I_D	6.7A



SOP-8



Schematic Diagram

Features and Benefits

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

Description

The GSFQ4910 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	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current – Continuous (T_A=25°C)	I_D	6.7	A
Drain Current – Continuous (T_A=70°C)		5.4	A
Drain Current – Pulsed[1]	I_{DM}	26.8	A
Power Dissipation (T_A=25°C)	P_D	1.47	W
Power Dissipation – Derate above 25°C		0.12	W/°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	85	°C/W

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	40	---	---	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C, I_D=1mA	---	0.034	---	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V, T_J=25°C	---	---	1	uA
		V_{DS}=32V, V_{GS}=0V, T_J=85°C	---	---	10	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	---	---	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=6A	---	16	19	mΩ
		V_{GS}=4.5V, I_D=4A	---	20	25	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D =250uA	1.2	1.5	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		---	-4.3	---	mV/°C
Forward Transconductance	gfs	V_{DS}=10V, I_D=3A	---	6	---	S
Dynamic and Switching Characteristics						
Total Gate Charge[2, 3]	Q_g	V_{DS}=32V, V_{GS}=10V, I_D=6A	---	11.8	23	nC
Gate-Source Charge[2, 3]	Q_{gs}		---	1.7	3.4	
Gate-Drain Charge[2, 3]	Q_{gd}		---	4	8	
Turn-On Delay Time[2, 3]	$T_{d(on)}$	V_{DD}=20V, V_{GS}=10V, R_G=3.3Ω, I_D=1A	---	5	10	nS
Rise Time[2, 3]	T_r		---	8	16	
Turn-Off Delay Time[2, 3]	$T_{d(off)}$		---	17	34	
Fall Time[2, 3]	T_f		---	5	10	
Input Capacitance	C_{iss}	V_{DS}=20V, V_{GS}=0V, F=1MHz	---	722	1440	pF
Output Capacitance	C_{oss}		---	83	166	
Reverse Transfer Capacitance	C_{rss}		---	61	122	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	2.1	---	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	---	---	6.7	A
Pulsed Source Current	I_{SM}		---	---	13.4	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A, T_J=25°C	---	---	1	V

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

Typical Electrical and Thermal Characteristic Curves

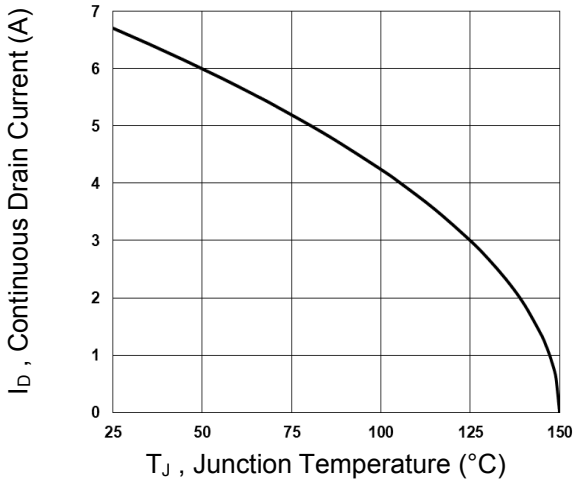


Fig.1 Continuous Drain Current vs. T_J

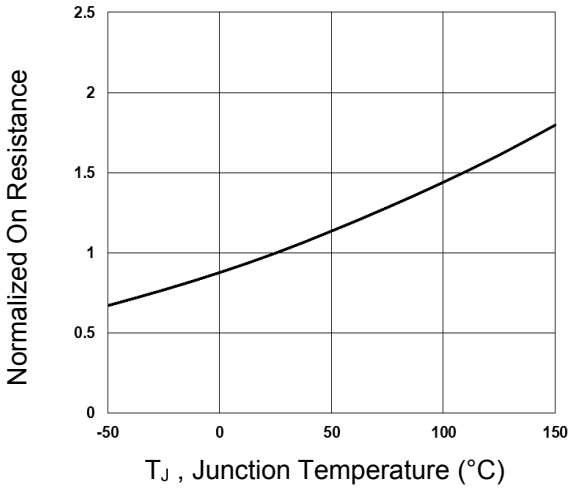


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

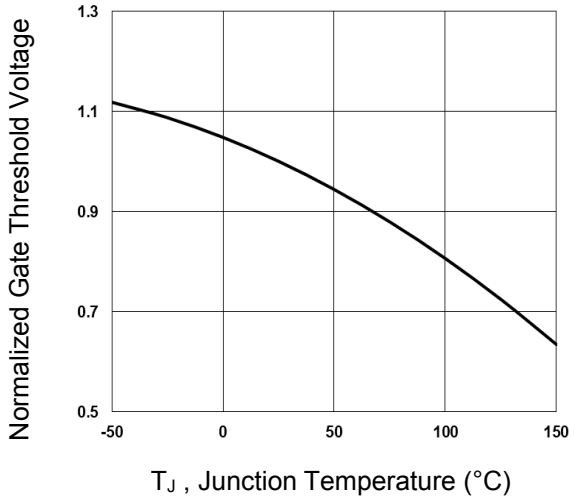


Fig.3 Normalized V_{th} vs. T_J

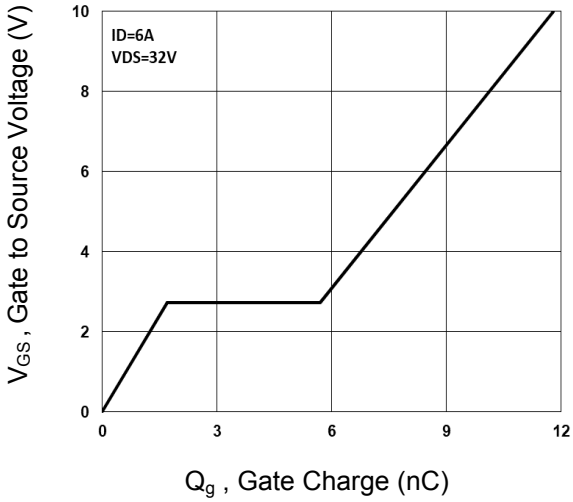


Fig.4 Gate Charge Waveform

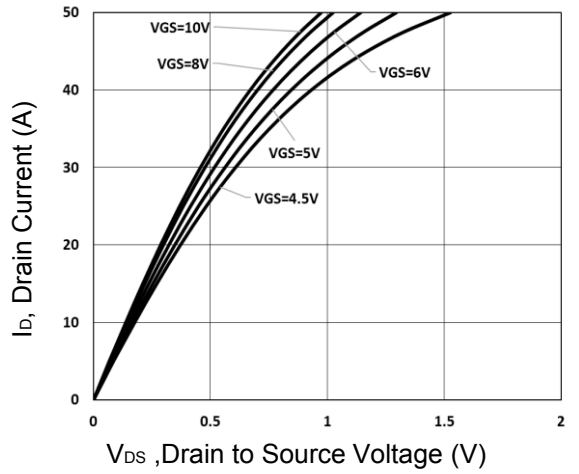


Fig.5 Typical Output Characteristics

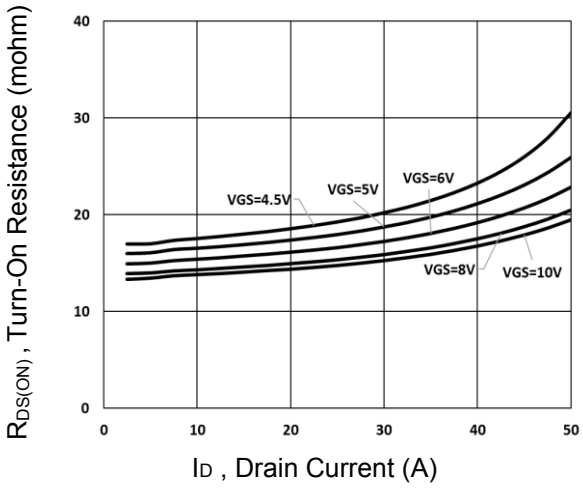


Fig.6 Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

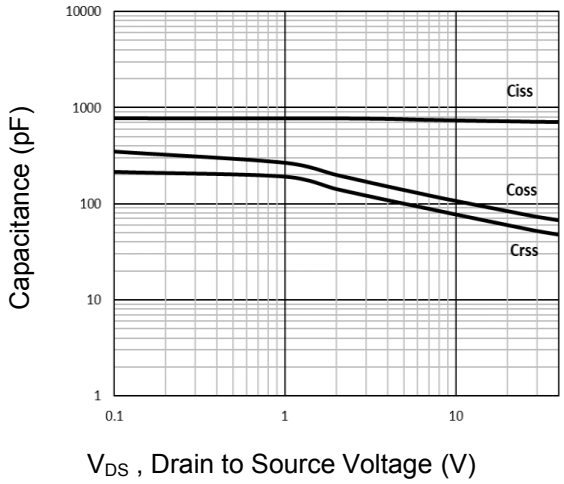


Fig.7 Capacitance Characteristics

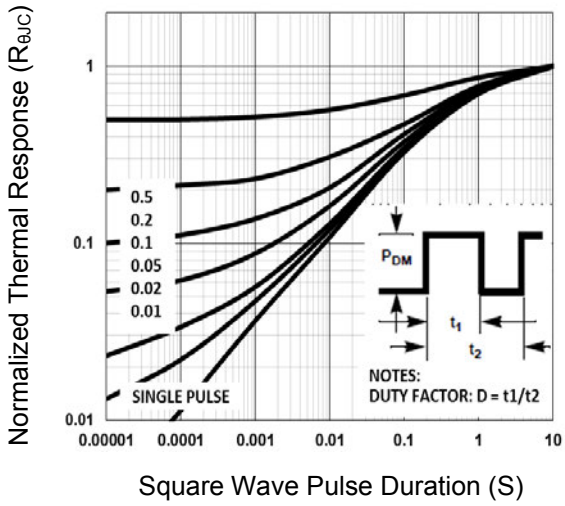


Fig.8 Normalized Transient Impedance

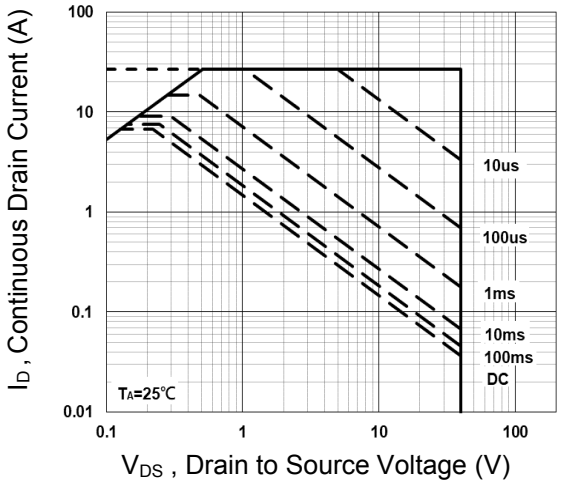


Fig.9 Maximum Safe Operation Area

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

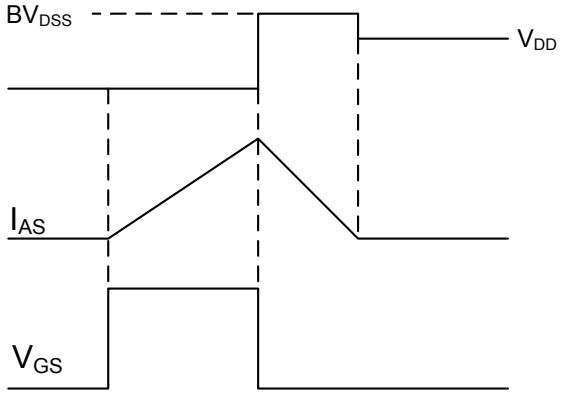


Fig.10 E_{AS} Waveform

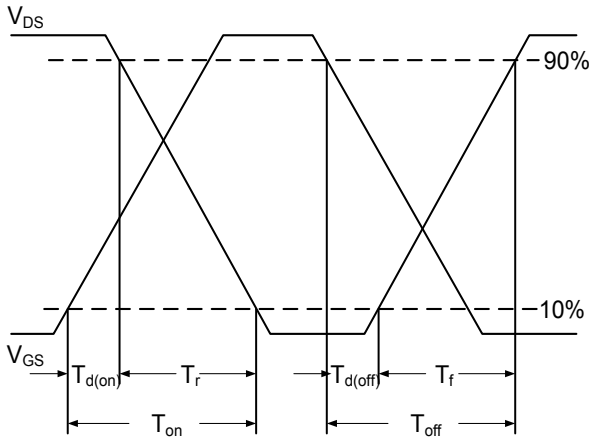
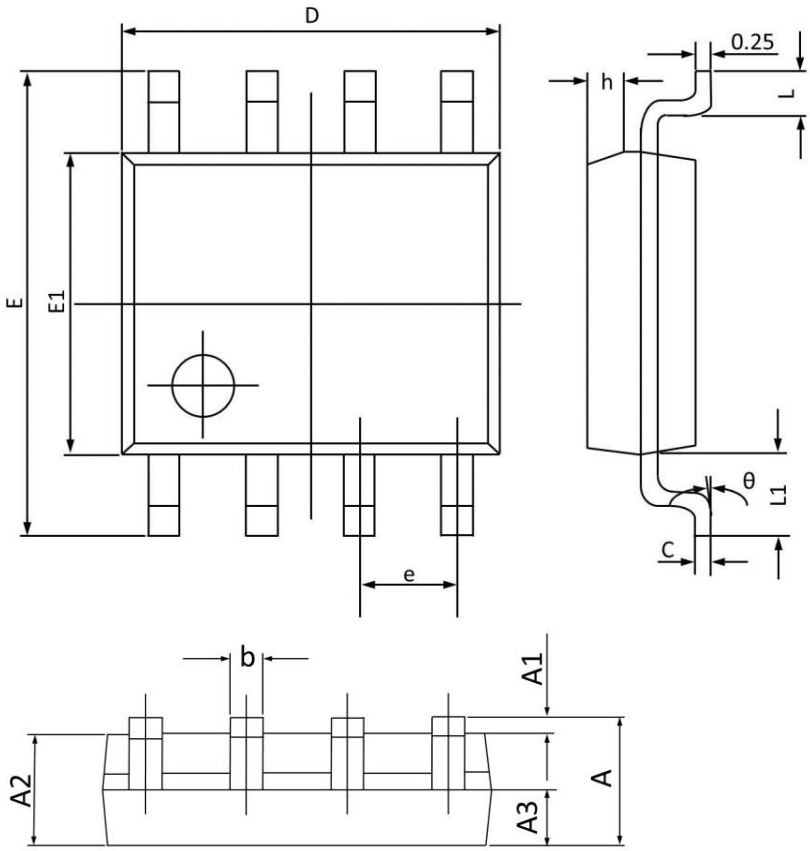


Fig.11 Switching Time Waveform

Package Outline Dimensions SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.068
A1	0.100	0.250	0.004	0.009
A2	1.300	1.500	0.052	0.059
A3	0.600	0.700	0.024	0.027
b	0.390	0.480	0.016	0.018
c	0.210	0.260	0.009	0.010
D	4.700	5.100	0.186	0.200
E	5.800	6.200	0.229	0.244
E1	3.700	4.100	0.146	0.161
e	1.270(BSC)		0.050(BSC)	
h	0.250	0.500	0.010	0.019
L	0.500	0.800	0.019	0.031
L1	1.050(BSC)		0.041(BSC)	
θ	0°	8°	0°	8°