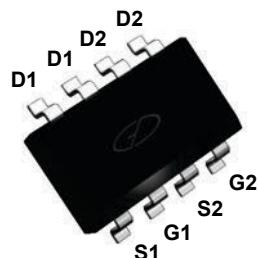
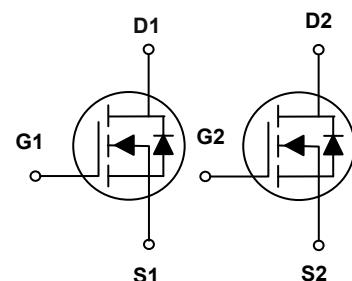


Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(ON)}$	11mΩ
I_D	9A



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 GSFQ3808 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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous ($T_A=25^\circ\text{C}$)	I_D	9	A
Drain Current – Continuous ($T_A=70^\circ\text{C}$)		7.2	A
Drain Current – Pulsed ¹	I_{DM}	36	A
Power Dissipation ($T_A=25^\circ\text{C}$)	P_D	1.47	W
Power Dissipation – Derate above 25°C		0.01	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 ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_\text{D}=250\mu\text{A}$	30	---	---	V
BV_{DSS} Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to 25°C , $\text{I}_\text{D}=1\text{mA}$	---	0.04	---	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	$\text{I}_{\text{DS}(\text{SS})}$	$\text{V}_{\text{DS}}=30\text{V}, \text{V}_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	---	---	1	μA
		$\text{V}_{\text{DS}}=24\text{V}, \text{V}_{\text{GS}}=0\text{V}, T_J=125^\circ\text{C}$	---	---	10	μA
Gate-Source Leakage Current	I_{GSS}	$\text{V}_{\text{GS}}=\pm 20\text{V}, \text{V}_{\text{DS}}=0\text{V}$	---	---	± 100	nA
On Characteristics						
Static Drain-Source On-Resistance ³	$R_{\text{DS}(\text{ON})}$	$\text{V}_{\text{GS}}=10\text{V}, \text{I}_\text{D}=6\text{A}$	---	8.6	11	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=4.5\text{V}, \text{I}_\text{D}=3\text{A}$	---	10.8	15	$\text{m}\Omega$
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{th})}$	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}, \text{I}_\text{D}=250\mu\text{A}$	1.2	1.6	2.5	V
$\text{V}_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta \text{V}_{\text{GS}(\text{th})}$		---	-4	---	$\text{mV}/^\circ\text{C}$
Forward Transconductance	g_{fs}	$\text{V}_{\text{DS}}=10\text{V}, \text{I}_\text{D}=8\text{A}$	---	10	---	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2, 3}	Q_g	$\text{V}_{\text{DS}}=15\text{V}, \text{V}_{\text{GS}}=10\text{V}, \text{I}_\text{D}=6\text{A}$	---	16.6	33	nC
Gate-Source Charge ^{2, 3}	Q_{gs}		---	1.3	3	
Gate-Drain Charge ^{2, 3}	Q_{gd}		---	4.5	9	
Turn-On Delay Time ^{2, 3}	$\text{T}_{\text{d}(\text{on})}$	$\text{V}_{\text{DD}}=15\text{V}, \text{V}_{\text{GS}}=10\text{V}, \text{R}_\text{G}=3.3\Omega, \text{I}_\text{D}=15\text{A}$	---	4.8	9	nS
Rise Time ^{2, 3}	T_r		---	12.5	25	
Turn-Off Delay Time ^{2, 3}	$\text{T}_{\text{d}(\text{off})}$		---	27.6	50	
Fall Time ^{2, 3}	T_f		---	8.2	16	
Input Capacitance	C_{iss}	$\text{V}_{\text{DS}}=25\text{V}, \text{V}_{\text{GS}}=0\text{V}, \text{F}=1\text{MHz}$	---	750	1350	pF
Output Capacitance	C_{oss}		---	150	300	
Reverse Transfer Capacitance	C_{rss}		---	110	200	
Gate Resistance	R_g	$\text{V}_{\text{GS}}=0\text{V}, \text{V}_{\text{DS}}=0\text{V}, \text{F}=1\text{MHz}$	---	2.7	4.5	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_s	$\text{V}_\text{G}=\text{V}_\text{D}=0\text{V}$, Force Current	---	---	9	A
Pulsed Source Current ³	I_{SM}		---	---	18	A
Diode Forward Voltage ³	V_{SD}	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_\text{s}=1\text{A}, T_J=25^\circ\text{C}$	---	---	1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

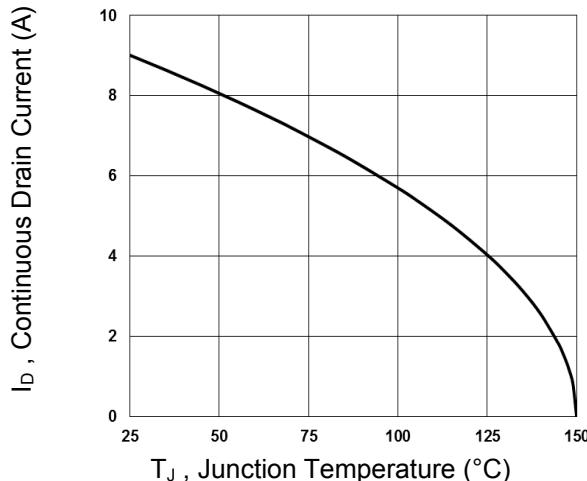


Fig.1 Continuous Drain Current vs. T_J

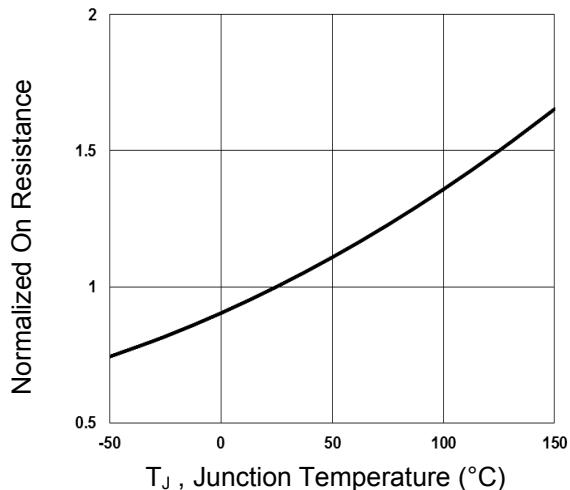


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

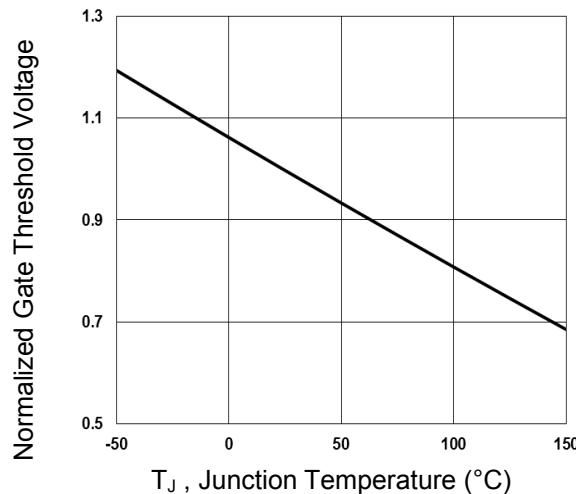


Fig.3 Normalized V_{th} vs. T_J

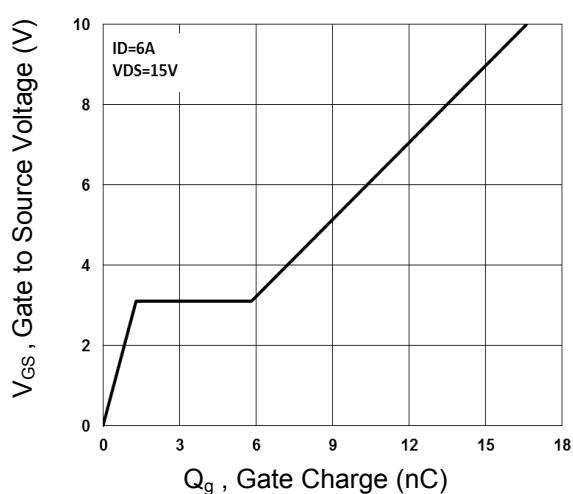


Fig.4 Gate Charge Waveform

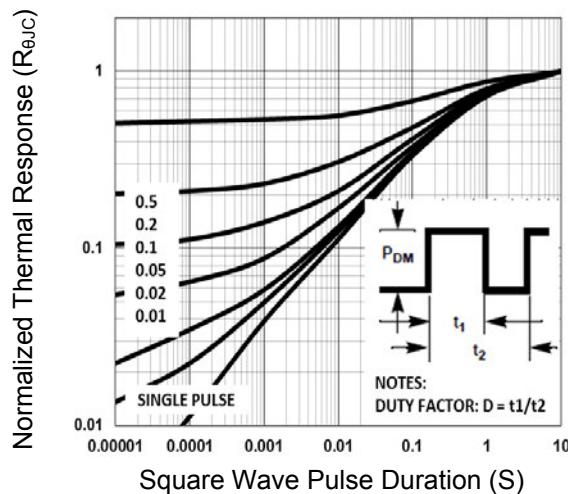


Fig.5 Normalized Transient Impedance

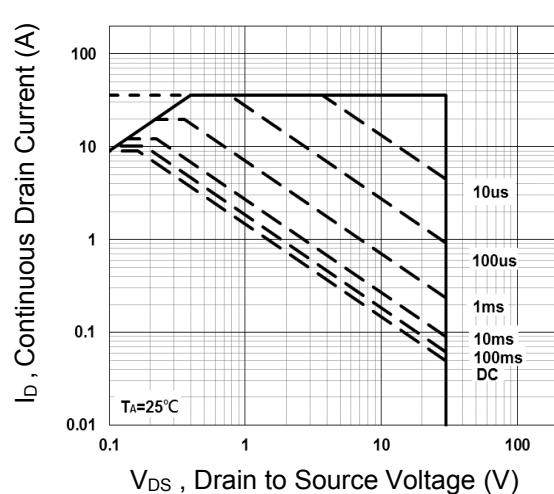


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

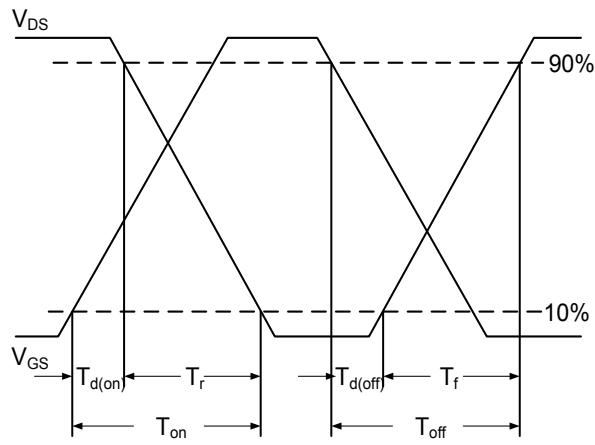


Fig.7 Switching Time Waveform

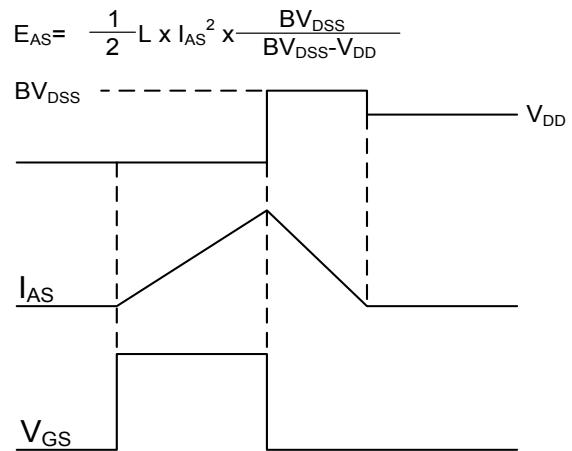
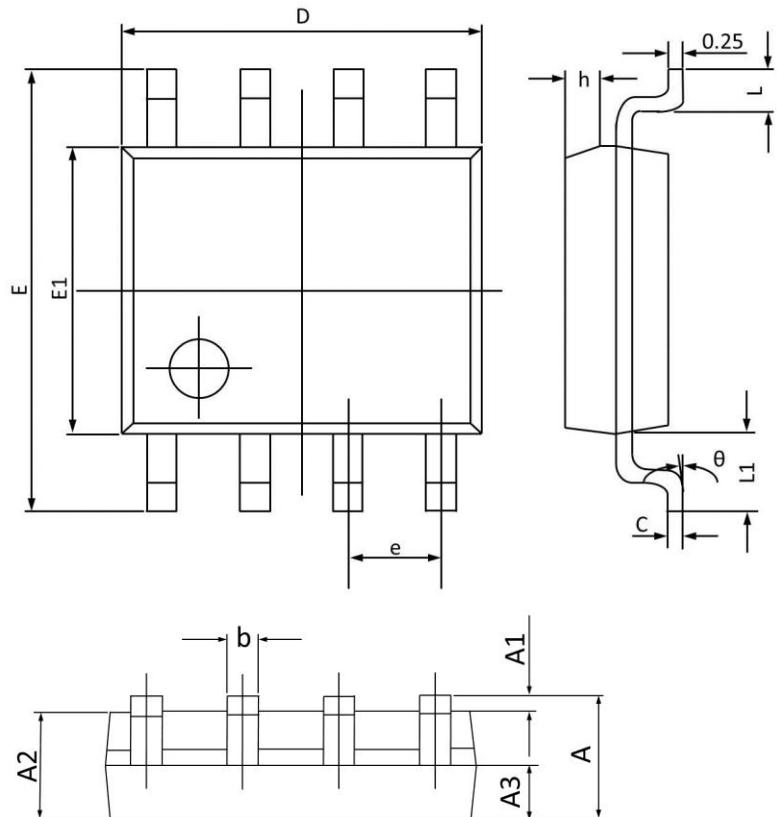


Fig.8 E_{AS} Waveform

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°