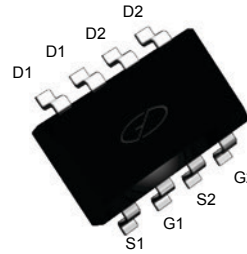
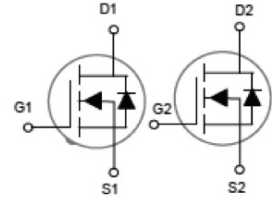


Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(ON)}$	20 mΩ@ $V_{GS}=10V$
I_D	7.5A



SOP-8



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for MB/VGA/Vcore, load switch, and SMPS applications
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The SSFQ3812 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 ($T_C=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current – Continuous ($T_C=25^{\circ}C$)	I_D	7.5	A
Drain Current – Continuous ($T_C=100^{\circ}C$)		4.8	A
Drain Current – Pulsed ¹	I_{DM}	30	A
Single Pulse Avalanche Energy ²	E_{AS}	14	mJ
Single Pulse Avalanche Current ²	I_{AS}	17	A
Power Dissipation ($T_C=25^{\circ}C$)	P_D	2.1	W
Power Dissipation – Derate above 25°C	P_D	0.017	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	$R_{\theta JA}$	---	60	°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	30	---	---	V
BV _{DSS} Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =1mA	---	0.04	---	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =24V, V _{GS} =0V, T _J =125°C	---	---	10	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
On Characteristics						
Static Drain-Source On-Resistance ³	R _{DS(ON)}	V _{GS} =10V, I _D =6A	---	15	20	mΩ
		V _{GS} =4.5V, I _D =3A	---	23	30	
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	ΔV _{GS(th)}		---	-4	---	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =10V, I _S =6A	---	13	---	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3, 4}	Q _g	V _{DS} =15V, V _{GS} =4.5V, I _D =5A	---	4.1	8	nC
Gate-Source Charge ^{3, 4}	Q _{gs}		---	1	2	
Gate-Drain Charge ^{3, 4}	Q _{gd}		---	2.1	4	
Turn-On Delay Time ^{3, 4}	T _{d(on)}	V _{DD} =15V, V _{GS} =10V, R _G =6Ω, I _D =1A	---	2.6	5	nS
Rise Time ^{3, 4}	T _r		---	7.2	14	
Turn-Off Delay Time ^{3, 4}	T _{d(off)}		---	15.8	30	
Fall Time ^{3, 4}	T _f		---	4.6	9	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, F=1MHz	---	345	500	pF
Output Capacitance	C _{oss}		---	55	80	
Reverse Transfer Capacitance	C _{rss}		---	32	55	
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1MHz	---	3.2	6.4	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	---	---	7.5	A
Pulsed Source Current ³	I _{SM}		---	---	30	A
Diode Forward Voltage ³	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. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=17A, 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

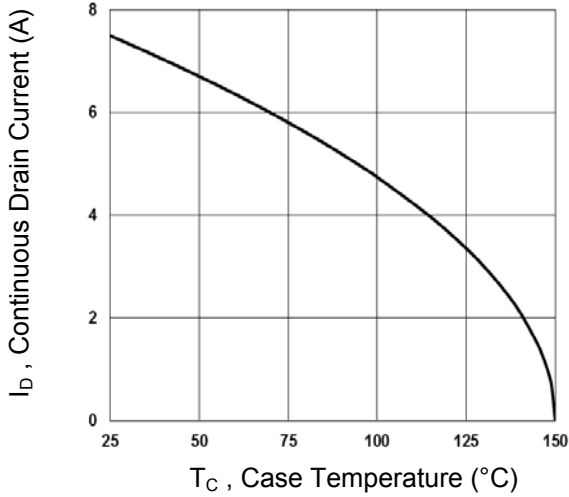


Fig.1 Continuous Drain Current vs. T_c

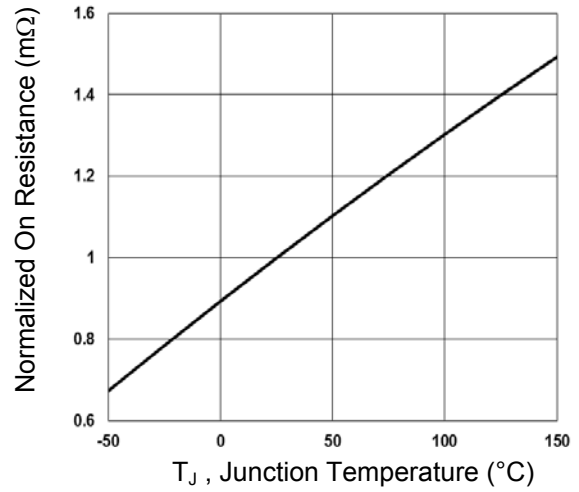


Fig.2 Normalized $R_{DS(ON)}$ vs. T_j

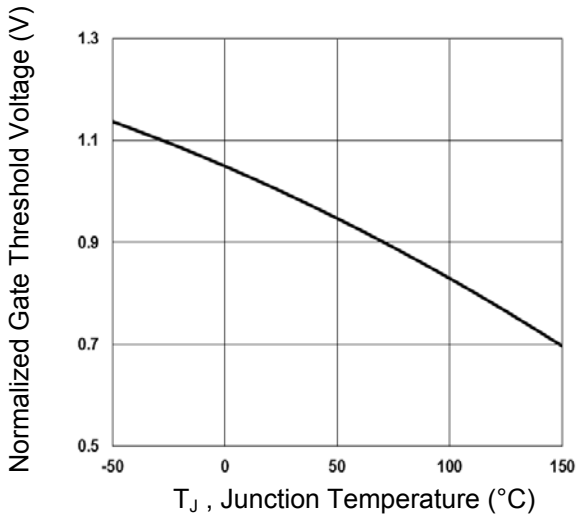


Fig.3 Normalized V_{th} vs. T_j

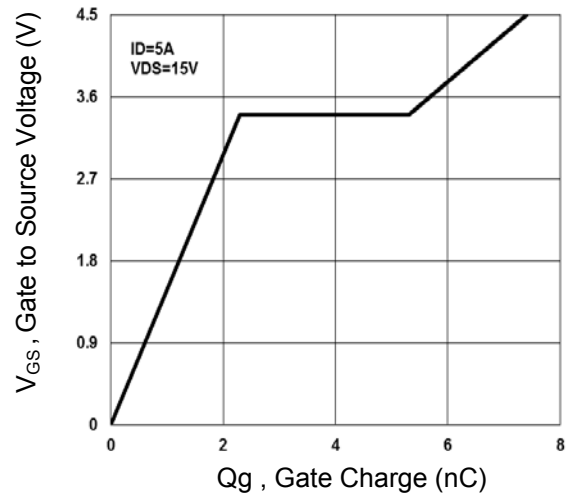


Fig.4 Gate Charge Waveform

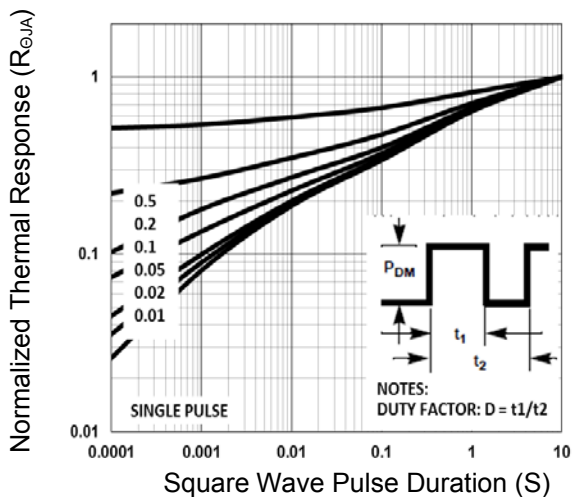


Fig.5 Normalized Transient Response

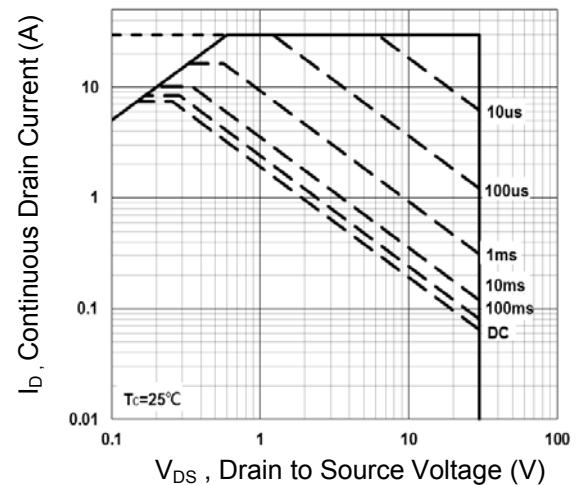


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

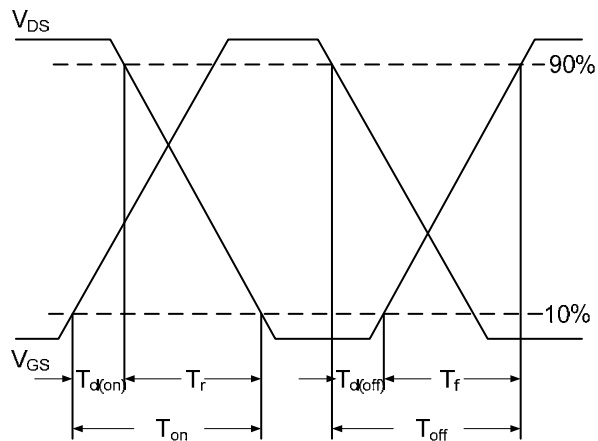


Fig.7 Switching Time Waveform

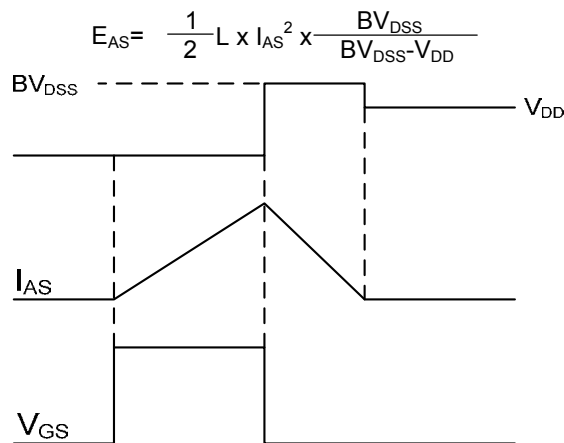
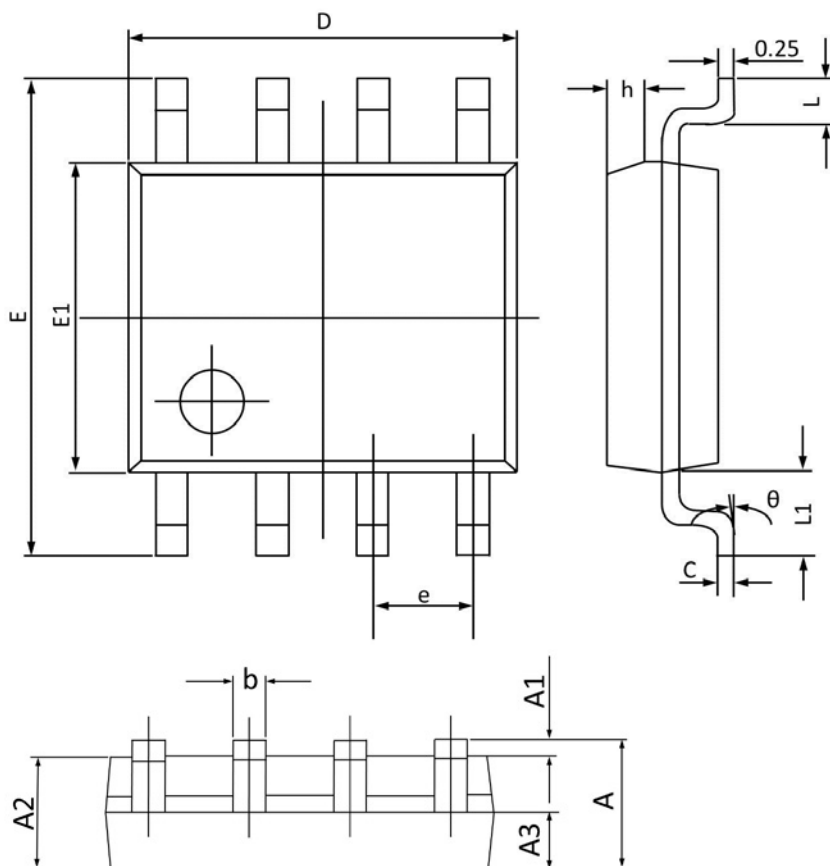


Fig.8 E_{AS} Waveform

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°