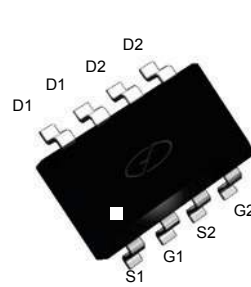
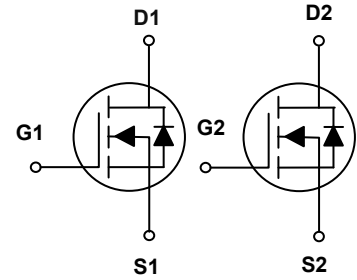


Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(ON)}$	20 m Ω @ $V_{GS}=10V$
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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_C=25^\circ\text{C}$)	I_D	7.5	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		4.8	
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 ($T_C=25^\circ\text{C}$)	P_D	2.1	W
Power Dissipation-Derate above 25°C		0.017	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	60	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^\circ\text{C}$

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. Pulse test: pulse width ≅ 300us, duty cycle ≅ 2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

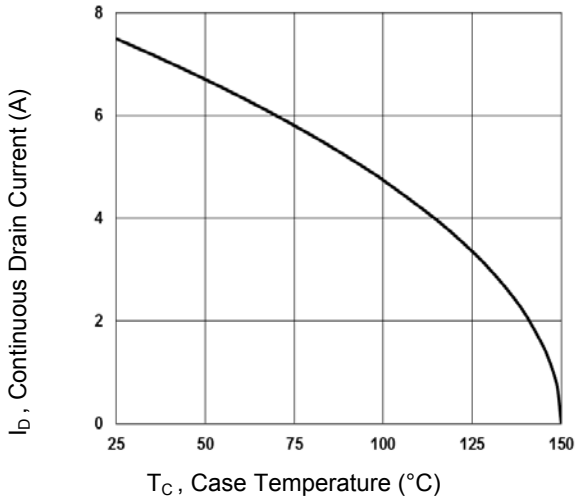


Figure 1. Continuous Drain Current vs. T_C

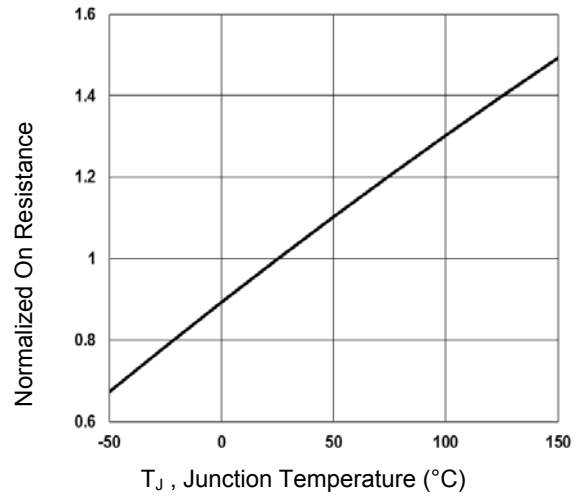


Figure 2. Normalized $R_{DS(on)}$ vs. T_J

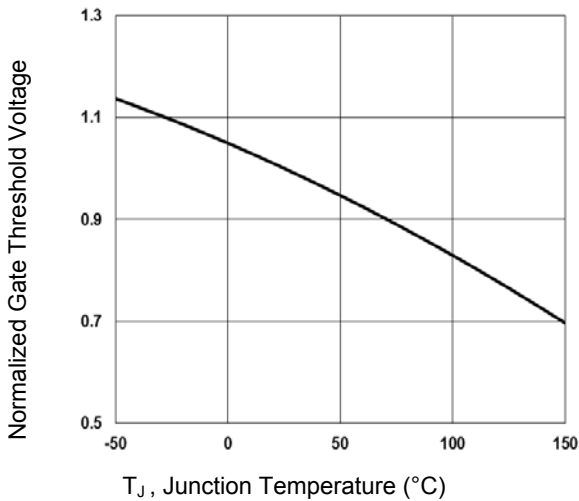


Figure 3. Normalized V_{th} vs. T_J

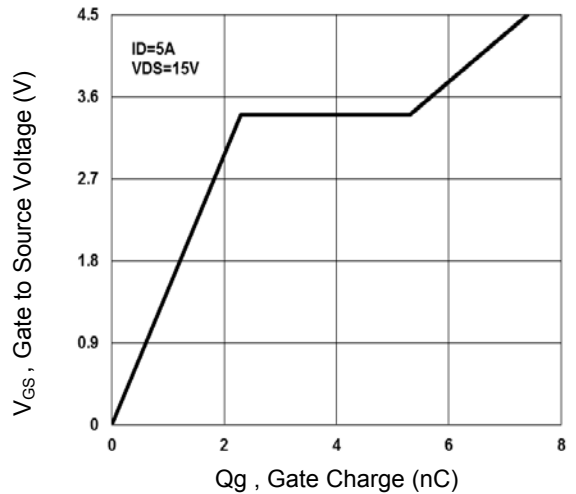


Figure 4. Gate Charge Waveform

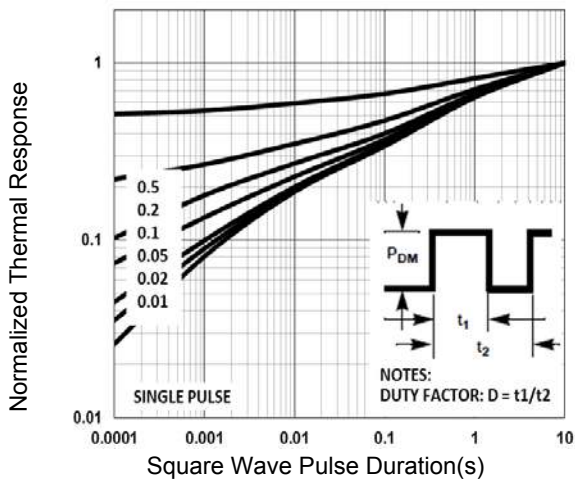


Figure 5. Normalized Transient Impedance

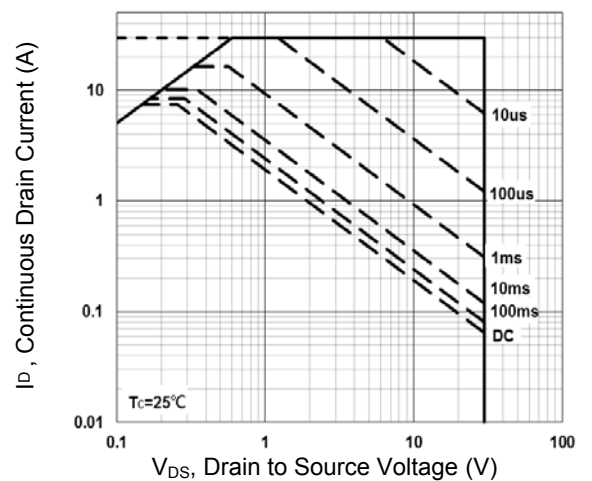


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

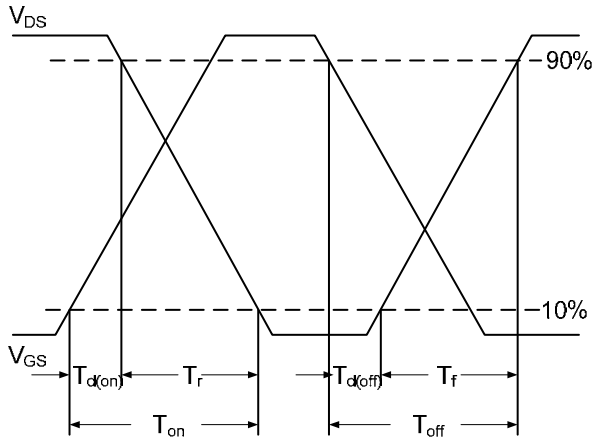


Figure 7. Switching Time Waveform

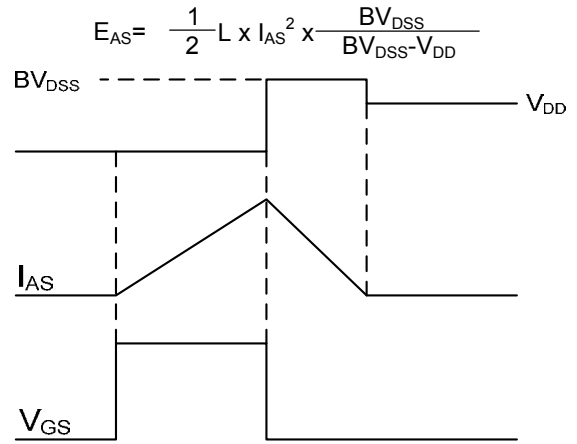
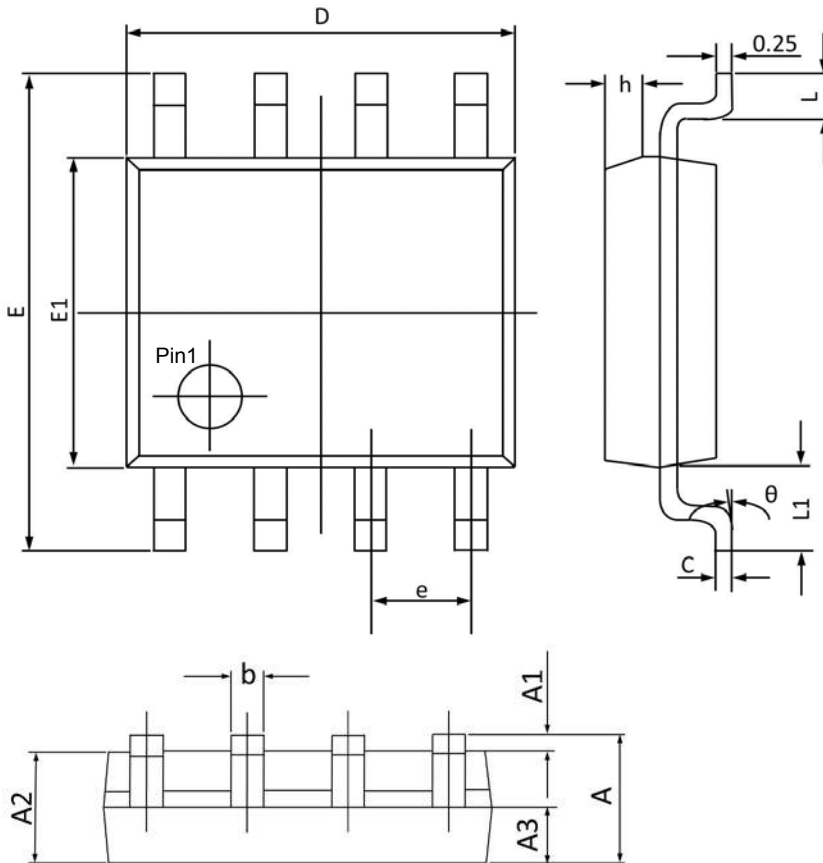


Figure 8. EAS Waveform

Package Outline Dimensions

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Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.250	1.650	0.049	0.065
A3	0.500	0.700	0.020	0.028
b	0.380	0.510	0.015	0.020
c	0.170	0.260	0.007	0.010
D	4.700	5.100	0.185	0.201
E	5.800	6.200	0.228	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	0.020
L	0.400	0.800	0.016	0.031
L1	1.050(BSC)		0.041(BSC)	
θ	0°	8°	0°	8°