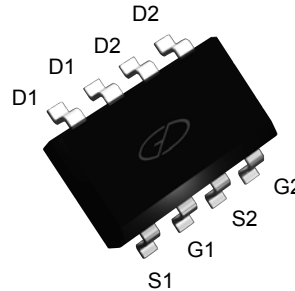
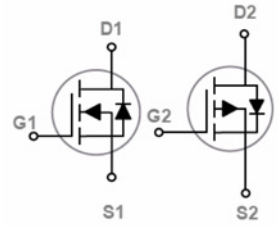


Main Product Characteristics

Channel	N-Channel	P-Channel
B_{VDSS}	30V	-30V
$R_{DS(ON)}$	13m Ω	30m Ω
I_D	10A	-6.5A



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 SSFQ3710 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	-30	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Drain Current – Continuous ($T_C=25^\circ\text{C}$)	I_D	10	-6.5	A
Drain Current – Continuous ($T_C=100^\circ\text{C}$)		6.3	-4.1	A
Drain Current – Pulsed ¹	I_{DM}	36	-26	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	5		W
Power Dissipation – Derate above 25°C		0.04		W/ $^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150		$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to +150		$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	62.5	$^\circ\text{C/W}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	25	$^\circ\text{C/W}$

N-Channel 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 _b =250uA	30	---	---	V
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	R _{DS(ON)}	V _{Gs} =10V, I _b =8A	---	10	13	mΩ
		V _{Gs} =4.5V, I _b =4A	---	14	18	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{Gs} =V _{Ds} , I _D =250uA	1.2	1.6	2.5	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)}		---	-4	---	mV/°C
Forward Transconductance	g _{fs}	V _{Ds} =10V, I _b =3A	---	6	---	S
Dynamic Characteristics						
Total Gate Charge ^{3,4}	Q _g	V _{Ds} =15V, V _{Gs} =4.5V, I _b =5A	---	7.4	12	nC
Gate-Source Charge ^{3,4}	Q _{gs}		---	2.3	5	
Gate-Drain Charge ^{3,4}	Q _{gd}		---	3	6	
Turn-On Delay Time ^{3,4}	T _{d(on)}	V _{DD} =15V, V _{Gs} =10V, R _G =6Ω I _b =1A	---	3.8	7	nS
Rise Time ^{3,4}	T _r		---	10	19	
Turn-Off Delay Time ^{3,4}	T _{d(off)}		---	22	42	
Fall Time ^{3,4}	T _f		---	6.6	13	
Input Capacitance	C _{iss}	V _{Ds} =25V, V _{Gs} =0V, F=1MHz	---	620	900	pF
Output Capacitance	C _{oss}		---	85	125	
Reverse Transfer Capacitance	C _{rss}		---	60	90	
Gate Resistance	R _g	V _{Gs} =0V, V _{Ds} =0V, F=1MHz	---	2.8	5.6	Ω
Drain-Source Diode Characteristics						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I _s	V _G =V _D =0V, Force Current	---	---	10	A
Pulsed Source Current	I _{SM}		---	---	20	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 ≤ 300uS, duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

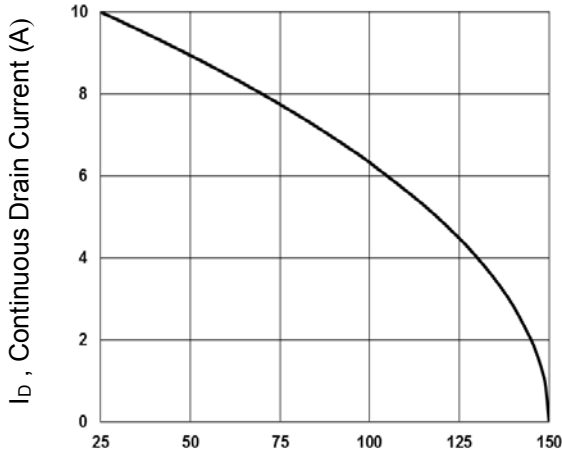
P-Channel Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _b =-250uA	-30	---	---	V
BV _{DSS} Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _b =-1mA	---	-0.03	---	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	R _{DS(ON)}	V _{GS} =-10V, I _b =-6A	---	24	30	mΩ
		V _{GS} =-4.5V, I _b =-4A	---	37	46	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{Ds} , I _D =-250uA	-1	-1.6	-2.5	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)}		---	4	---	mV/°C
Forward Transconductance	g _{fs}	V _{Ds} =-10V, I _b =-3A	---	9	---	S
Dynamic Characteristics						
Total Gate Charge ^{2,3}	Q _g	V _{Ds} =-15V, V _{GS} =-4.5V, I _b =-5A	---	8	15	nC
Gate-Source Charge ^{2,3}	Q _{gs}		---	3.3	6	
Gate-Drain Charge ^{2,3}	Q _{gd}		---	2.3	5	
Turn-On Delay Time ^{2,3}	T _{d(on)}	V _{DD} =-15V, V _{GS} =-10V, R _G =6Ω I _D =-1A	---	4.6	9	nS
Rise Time ^{2,3}	T _r		---	14	26	
Turn-Off Delay Time ^{2,3}	T _{d(off)}		---	34	58	
Fall Time ^{2,3}	T _f		---	18	35	
Input Capacitance	C _{iss}	V _{Ds} =-15V, V _{GS} =0V, F=1MHz	---	757	1280	pF
Output Capacitance	C _{oss}		---	122	210	
Reverse Transfer Capacitance	C _{rss}		---	88	175	
Drain-Source Diode Characteristics						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I _s	V _G =V _D =0V, Force Current	---	---	-6.5	A
Pulsed Source Current	I _{SM}		---	---	-13	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _s =-1A, T _J =25°C	---	---	-1	V

Note:

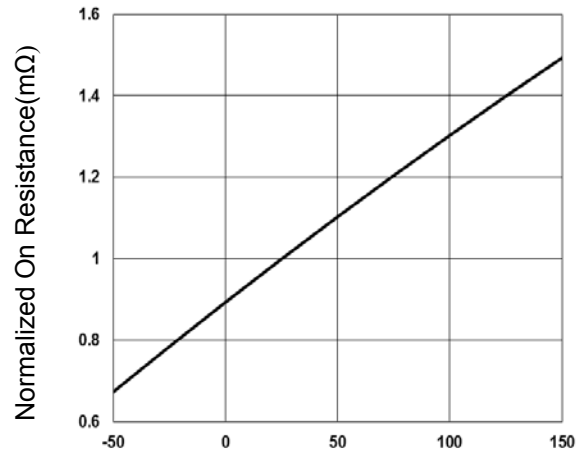
4. Repetitive Rating: Pulsed width limited by maximum junction temperature.
5. The data tested by pulsed, pulse width ≤ 300uS, duty cycle ≤ 2% .
6. Essentially independent of operating temperature.

N-Channel Typical Electrical and Thermal Characteristic Curves



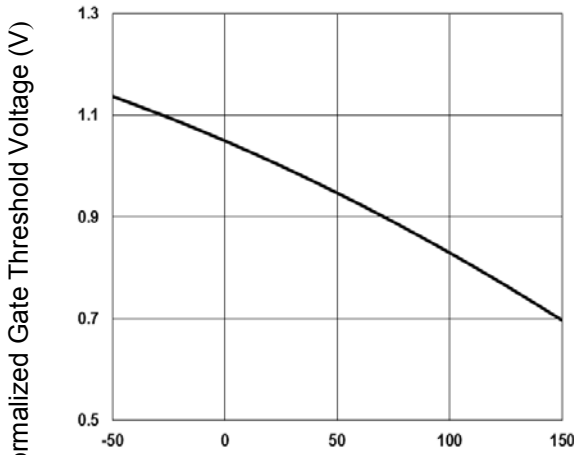
T_c , Case Temperature ($^{\circ}C$)

Fig.1 Continuous Drain Current vs. T_c



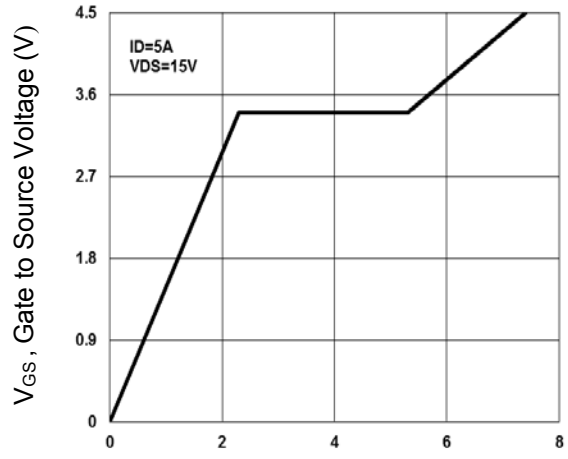
T_j , Junction Temperature ($^{\circ}C$)

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



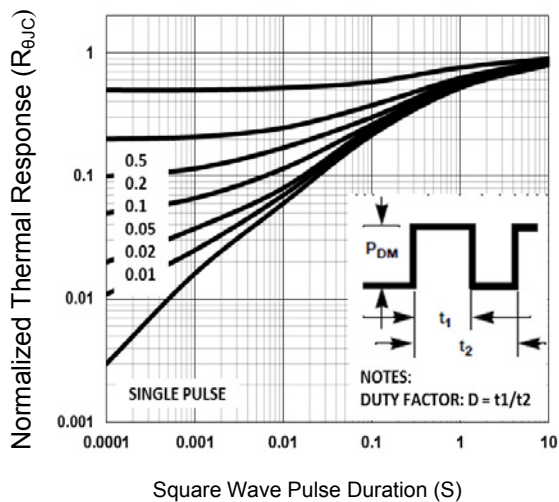
T_j , Junction Temperature ($^{\circ}C$)

Fig.3 Normalized V_{th} vs. T_j



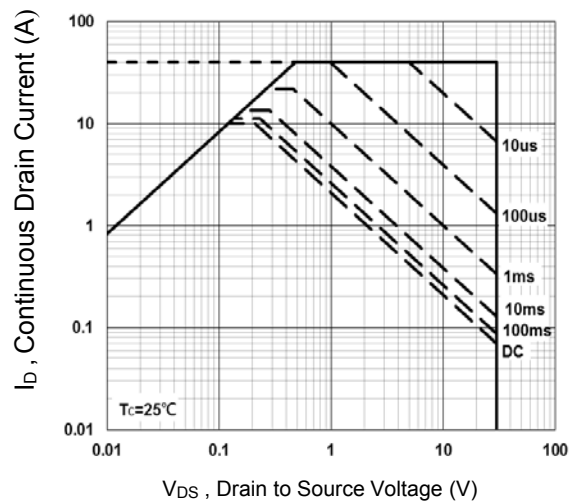
Q_g , Gate Charge (nC)

Fig.4 Gate Charge Characteristics



Square Wave Pulse Duration (S)

Fig.5 Normalized Transient Impedance



V_{DS} , Drain to Source Voltage (V)

Fig.6 Maximum Safe Operation Area

P-Channel Typical Electrical and Thermal Characteristic Curves

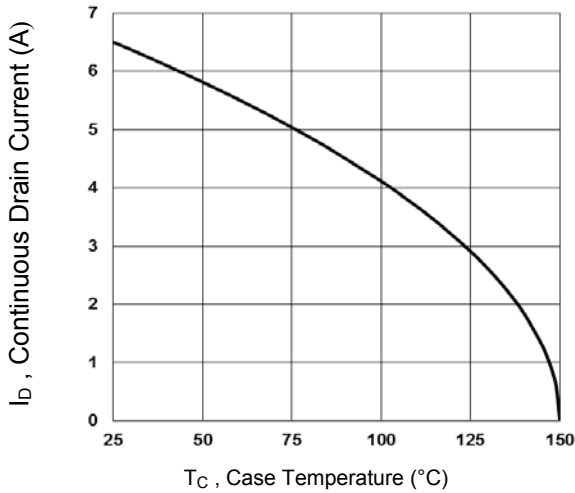


Fig.1 Continuous Drain Current vs. T_C

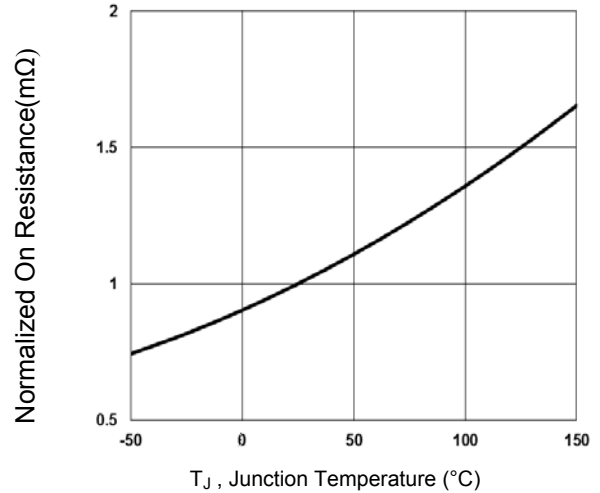


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

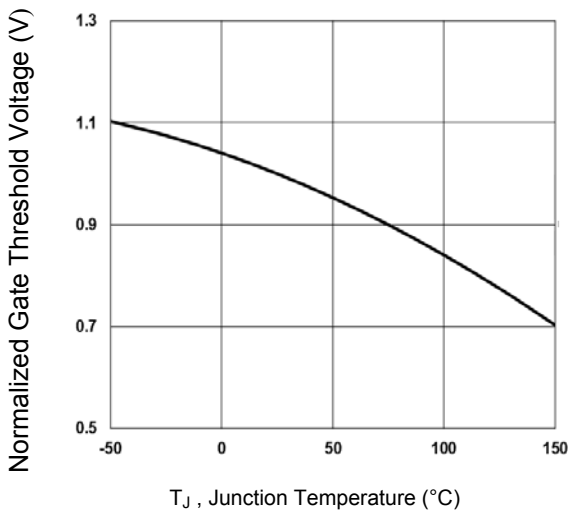


Fig.3 Normalized V_{th} vs. T_J

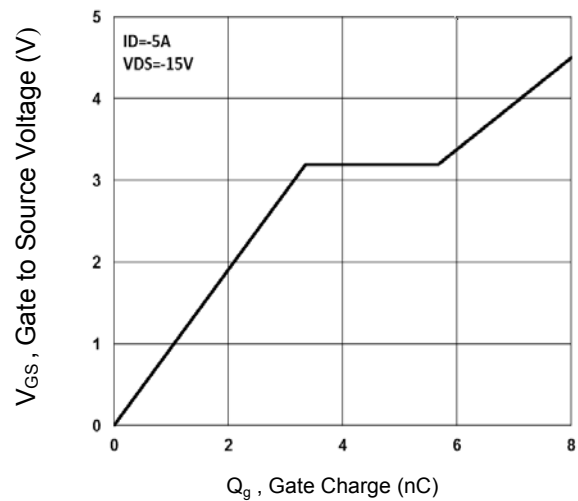


Fig.4 Gate Charge Characteristics

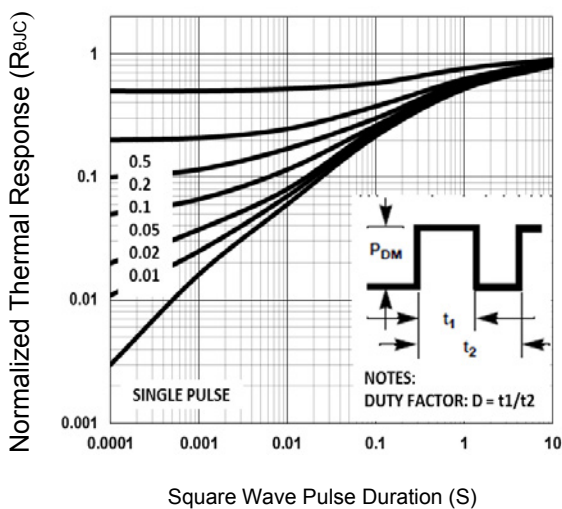


Fig.5 Normalized Transient Impedance

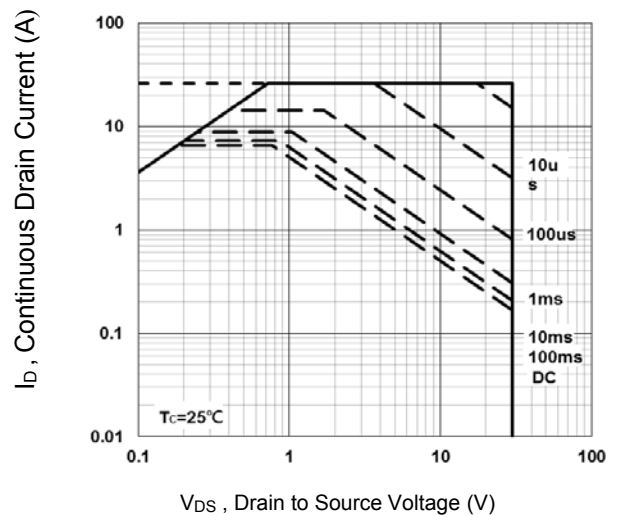
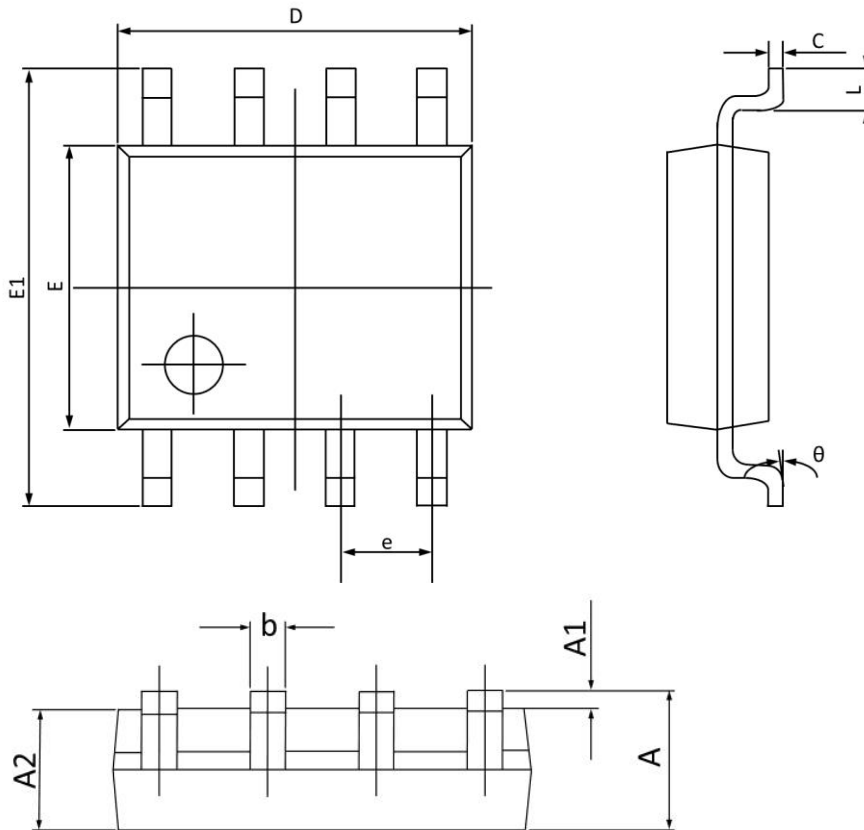


Fig.6 Maximum Safe Operation Area

Package Outline Dimensions

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.750	1.350	0.069	0.053
A1	0.250	0.100	0.010	0.004
A2	1.500	1.300	0.059	0.051
b	0.490	0.350	0.019	0.014
C	0.260	0.190	0.010	0.007
D	5.100	4.700	0.201	0.185
E	4.100	3.700	0.161	0.146
E1	6.200	5.800	0.244	0.228
e	1.27BSC		0.05BSC	
L	0.900	0.400	0.035	0.016
θ	8°	0°	8°	0°