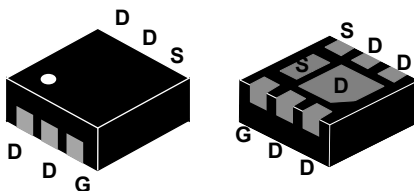
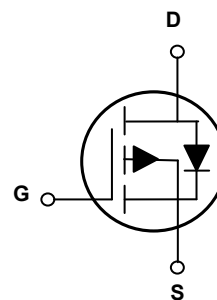


Main Product Characteristics

$V_{(BR)DSS}$	-30V
$R_{DS(ON)}$	30m Ω
I_D	-12A



DFN2x2-6L



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 SSFB3909 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	-12	A
Drain Current-Continuous ($T_C=100^{\circ}\text{C}$)		-7.6	
Drain Current-Continuous ($T_A=25^{\circ}\text{C}$)		-6.1	
Drain Current-Continuous ($T_A=70^{\circ}\text{C}$)		-4.8	
Drain Current-Pulsed ¹	I_{DM}	-48	A
Single Pulse Avalanche Energy ²	E_{AS}	39.2	mJ
Single Pulse Avalanche Current ²	I_{AS}	28	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	7.1	W
Power Dissipation-Derate above 25 $^{\circ}\text{C}$		0.06	W/ $^{\circ}\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	17.5	$^{\circ}\text{C}/\text{W}$
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 ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=-1mA$	-	-0.03	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	-	-	-1	μA
		$V_{DS}=-24V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	-	-	-10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-4A$	-	25	30	m Ω
		$V_{GS}=-4.5V, I_D=-2A$	-	35	46	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.2	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	4	-	mV/ $^\circ\text{C}$
Forward Transconductance	g_{fs}	$V_{DS}=-10V, I_D=-1A$	-	4	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{DS}=-15V, I_D=-5A$ $V_{GS}=-4.5V$	-	8	15	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	3.3	6	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	2.3	5	
Turn-On Delay Time ^{3,4}	$t_{d(on)}$	$V_{DD}=-15V, R_G=6\Omega$ $V_{GS}=-10V, I_D=-1A$	-	4.6	9	nS
Rise Time ^{3,4}	t_r		-	14	26	
Turn-Off Delay Time ^{3,4}	$t_{d(off)}$		-	34	58	
Fall Time ^{3,4}	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 and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V,$ Force Current	-	-	-12	A
Pulsed Source Current	I_{SM}		-	-	-24	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1A,$ $T_J=25^\circ\text{C}$	-	-	-1	V

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=28A, R_G=25\Omega,$ starting $T_J=25^\circ\text{C}$.
3. Pulse test: pulse width $\leq 300\mu s,$ duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

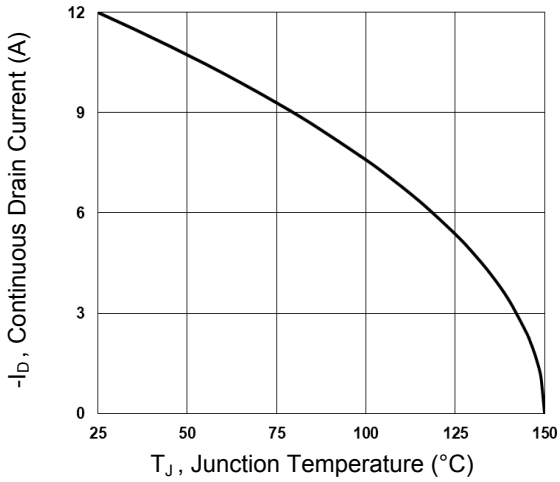


Figure 1. Continuous Drain Current vs. T_J

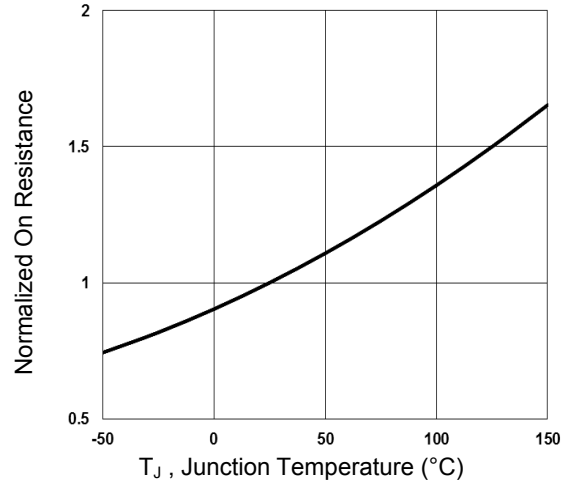


Figure 2. Normalized $R_{DS(on)}$ vs. T_J

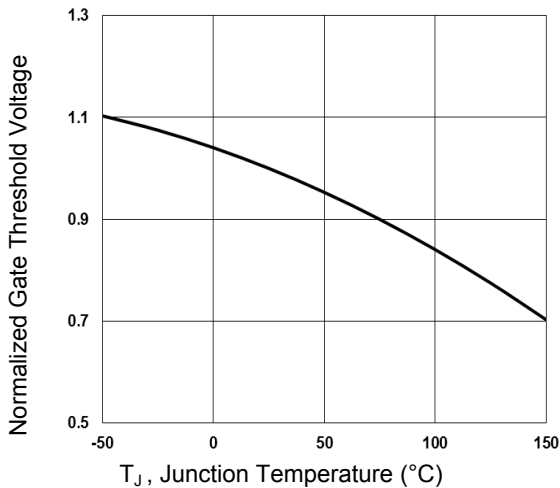


Figure 3. Normalized V_{th} vs. T_J

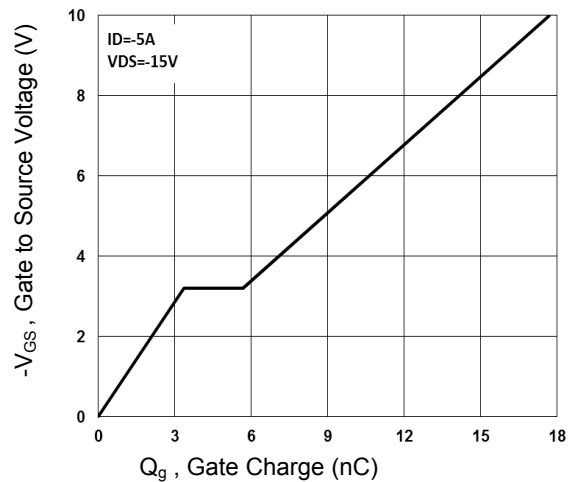


Figure 4. Gate Charge Waveform

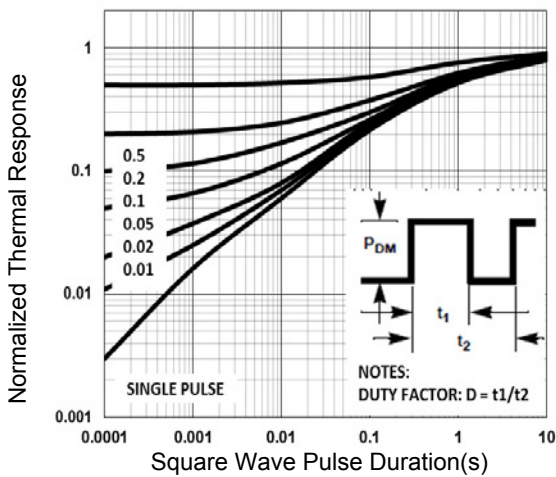


Figure 5. Normalized Transient Impedance

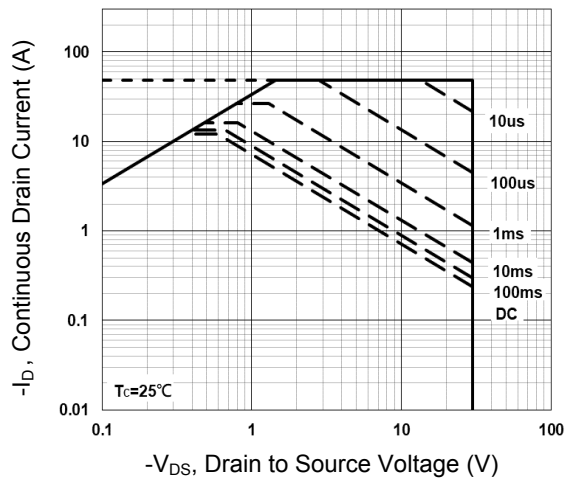


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

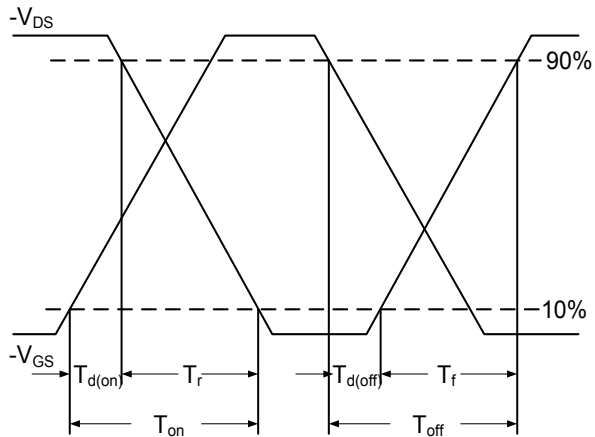


Figure 7. Switching Time Waveform

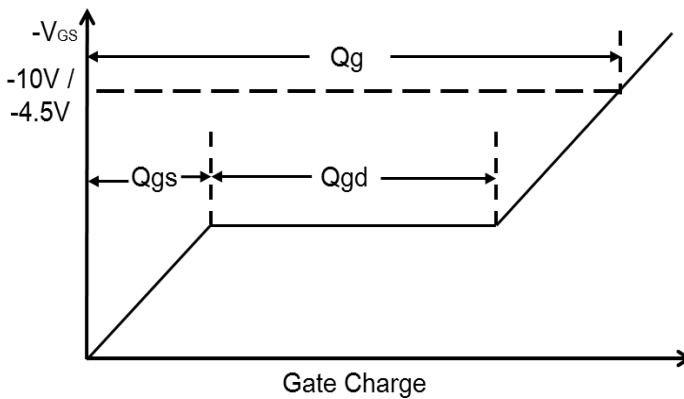
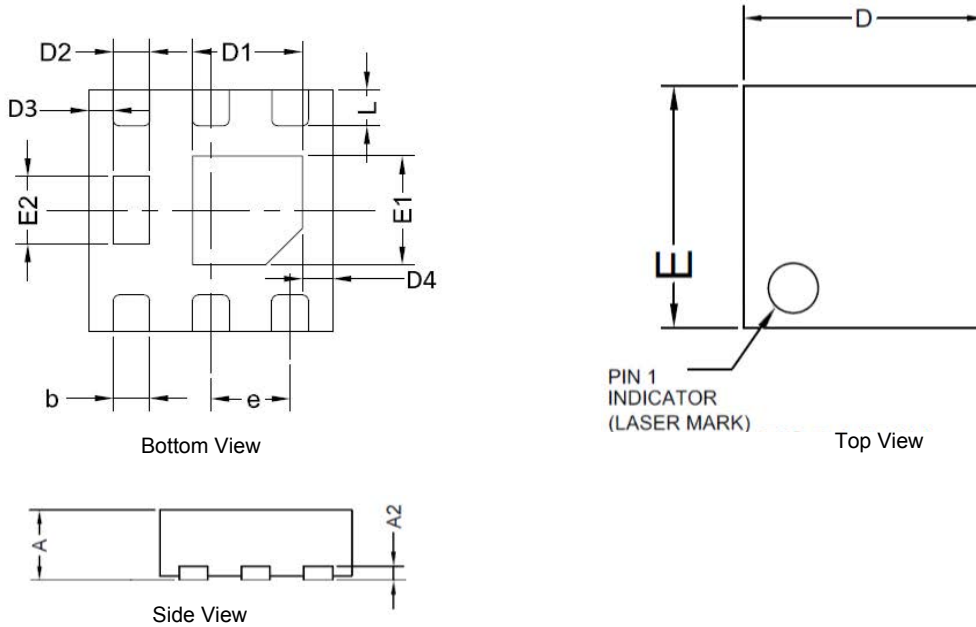


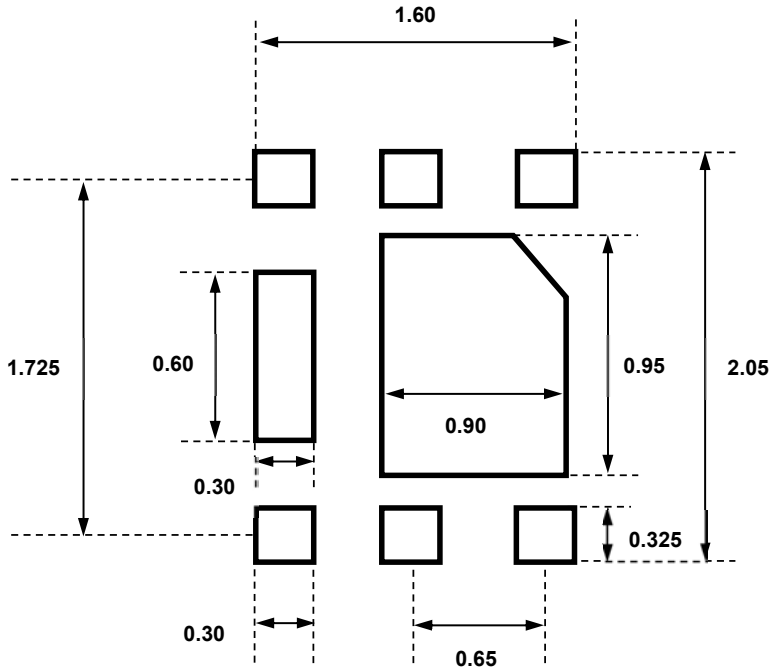
Figure 8. Gate Charge Waveform

Package Outline Dimensions (DFN2x2-6L)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.800	0.500	0.031	0.019
A2	0.250	0.145	0.010	0.006
b	0.350	0.250	0.014	0.010
D	2.100	1.900	0.083	0.075
D1	1.000	0.800	0.040	0.031
D2	0.350	0.250	0.014	0.010
D3	0.200BSC		0.008BSC	
D4	0.200BSC		0.008BSC	
E	2.100	1.900	0.083	0.075
E1	1.050	0.800	0.041	0.031
E2	0.66	0.46	0.026	0.018
e	0.650BSC		0.026BSC	
L	0.350	0.250	0.014	0.010

Recommended Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.

Order Information

Device	Package	Marking	Packaging	SPQ
SSFB3909	DFN2x2-6L	B	Tape & Reel	3,000pcs/Reel