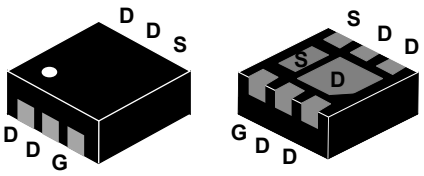
GOOD-ARK
SEMICONDUCTOR

SSFB2309L

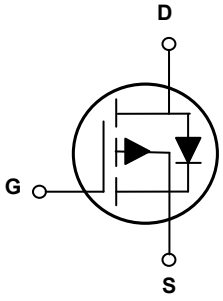
20V P-Channel MOSFET

Main Product Characteristics

BV_{DSS}	-20V
$R_{DS(ON)}$	28mΩ (Max.)
I_D	-8.5A



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 SSFB2309L 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 supplies and a wide variety of other applications.

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±10	V
Drain Current-Continuous (T_C=25°C)	I_D	-8.5	A
Drain Current-Continuous (T_C=100°C)		-5.4	
Drain Current-Pulsed[1]	I_{DM}	-34	A
Power Dissipation (T_C=25°C)	P_D	3.3	W
Power Dissipation-Derate above 25°C		0.026	W/°C
Max. Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Max. Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	38	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

Electrical Characteristics (T_J=25°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=-250uA	-20	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=-1mA	-	-0.02	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V, T_J=25°C	-	-	-1	μA
		V_{DS}=-16V, V_{GS}=0V, T_J=125°C	-	-	-10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±10V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4A	-	22	28	mΩ
		V_{GS}=-2.5V, I_D=-3A	-	27	37	
		V_{GS}=-1.8V, I_D=-2A	-	33	45	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250uA	-0.3	-0.6	-1	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	2	-	mV/°C
Forward Transconductance	gfs	V_{DS}=-10V, I_S=-3A	-	8.4	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=-10V, I_D=-4A, V_{GS}=-4.5V	-	16.1	25	nC
Gate-Source Charge[2,3]	Q_{gs}		-	1.8	3	
Gate-Drain Charge[2,3]	Q_{gd}		-	3.8	7	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=-10V, R_G=25Ω, V_{GS}=-4.5V, I_D=-1A	-	8.2	16	nS
Rise Time[2,3]	t_r		-	30	57	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	71.1	135	
Fall Time[2,3]	t_f		-	19.8	38	
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, F=1MHz	-	1440	2100	pF
Output Capacitance	C_{oss}		-	155	230	
Reverse Transfer Capacitance	C_{rss}		-	115	170	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	-8.5	A
Pulsed Source Current	I_{SM}		-	-	-17	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-1A, T_J=25°C	-	-	-1	V

Notes:
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.

Typical Electrical and Thermal Characteristics

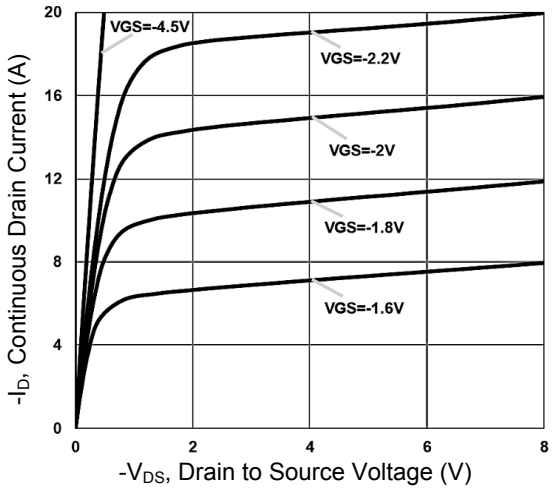


Figure 1. Typical Output Characteristics

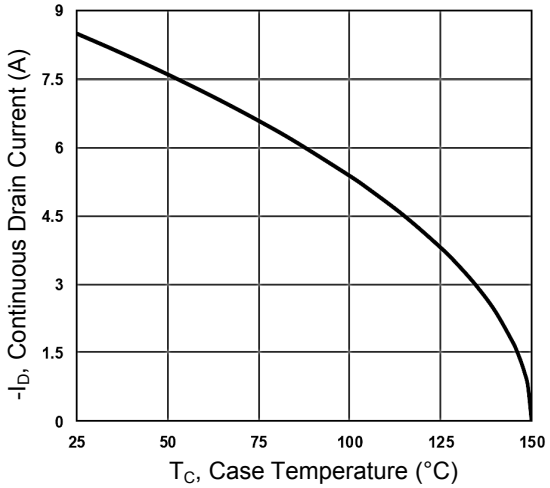


Figure 2. Continuous Drain Current vs. T_C

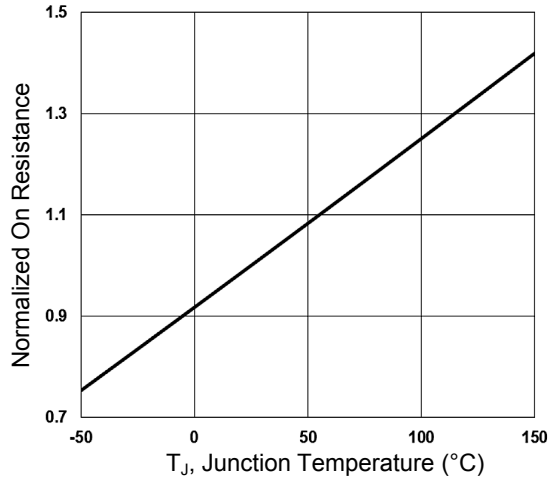


Figure 3. Normalized $R_{DS(ON)}$ vs. T_J

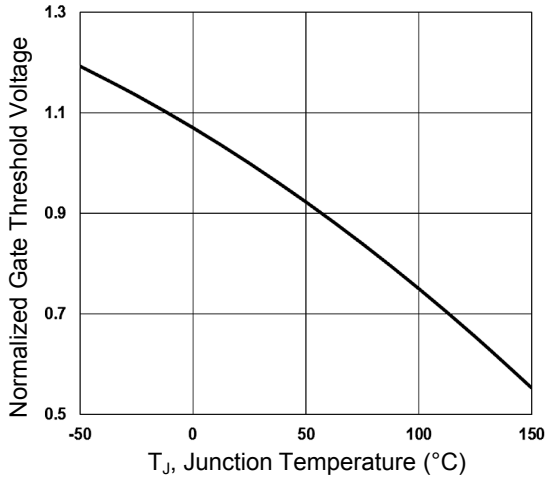


Figure 4. Normalized V_{th} vs. T_J

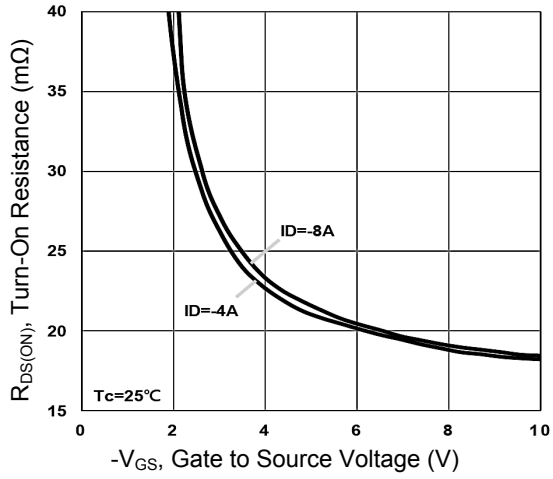


Figure 5. Turn-On Resistance vs. V_{GS}

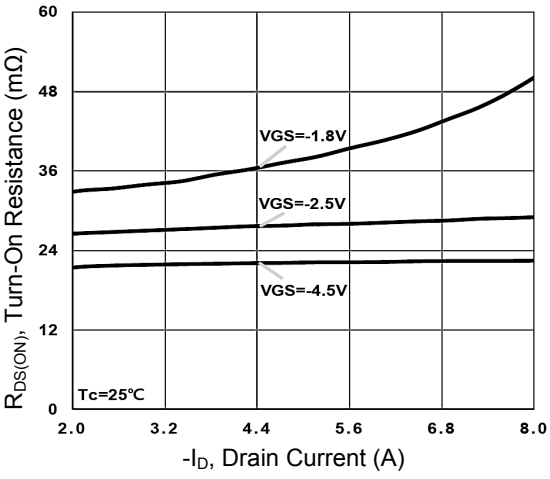


Figure 6. Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristics

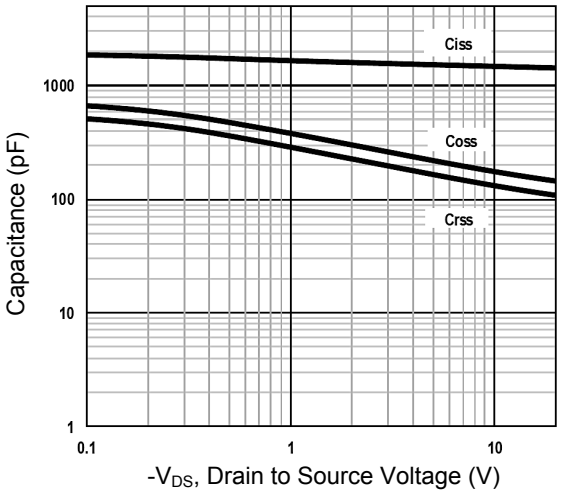


Figure 7. Capacitance Characteristics

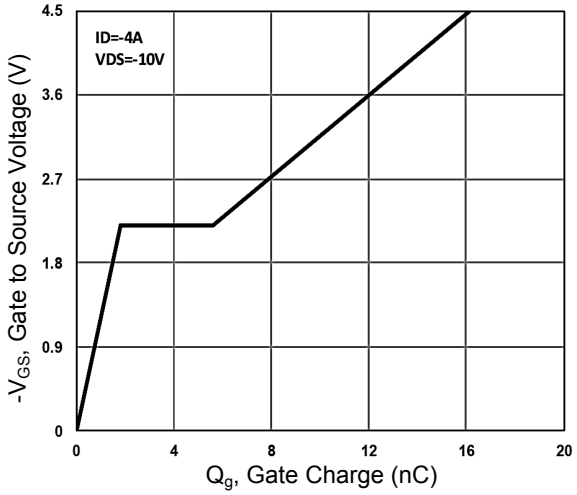


Figure 8. Gate Charge Characteristics

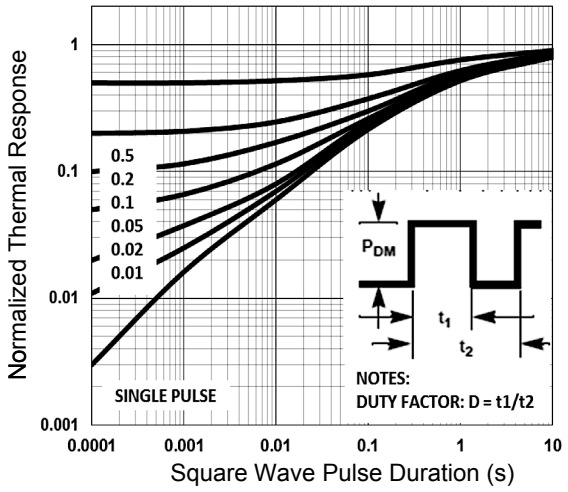


Figure 9. Normalized Transient Impedance

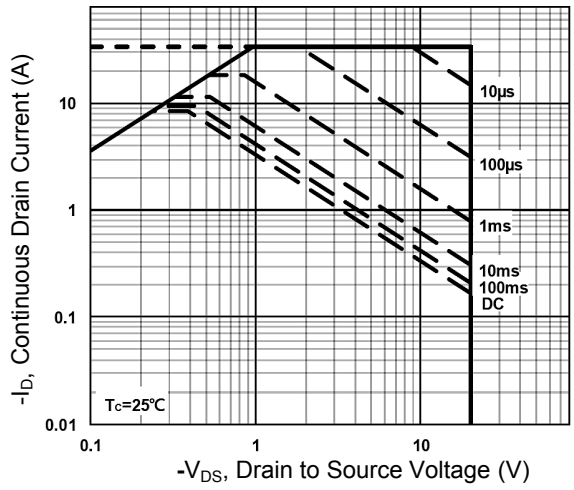
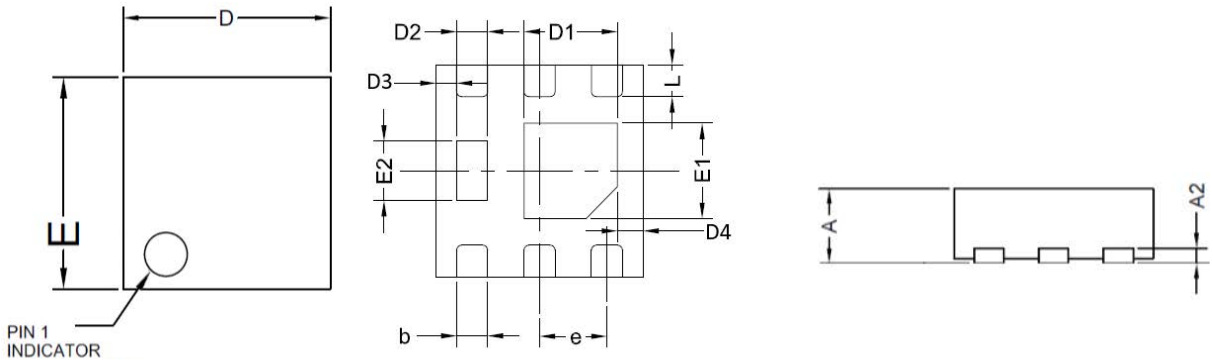


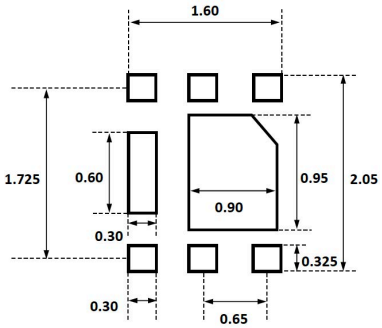
Figure 10. Maximum Safe Operation Area

Package Outline Dimensions (DFN2x2-6L)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.500	0.800	0.019	0.031
A2	0.145	0.250	0.006	0.010
b	0.250	0.350	0.010	0.014
D	1.900	2.100	0.075	0.083
D1	0.800	1.050	0.031	0.041
D2	0.250	0.430	0.010	0.017
D3	0.200 BSC		0.008 BSC	
D4	0.200 BSC		0.008 BSC	
E	1.900	2.100	0.075	0.083
E1	0.800	1.250	0.031	0.049
E2	0.460	0.750	0.018	0.029
e	0.650 BSC		0.026 BSC	
L	0.225	0.350	0.009	0.014

Recommended Pad Layout



Unit: mm

Order Information

Device	Package	Marking	Packaging	SPQ
SSFB2309L	DFN2x2-6L	S	Tape & Reel	3,000 Pcs / Reel