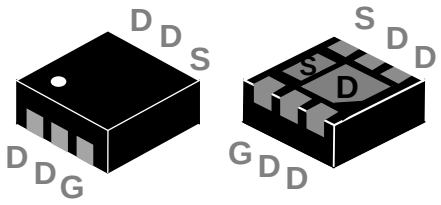
GOOD-ARK SEMICONDUCTOR

SSFB3910L

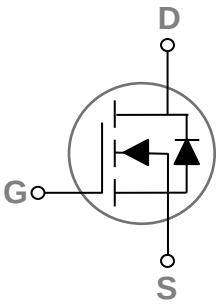
30V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(on)}$	13mΩ
I_D	10A



DFN2x2-6L



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for battery operated systems, load switching, power converters and other general purpose applications
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

Description

The SSFB3910L 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°C unless otherwise specified)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current – Continuous (T_A=25°C)	I_D	10	A
Drain Current – Continuous (T_A=70°C)		8	A
Drain Current – Pulsed[1]	I_{DM}	40	A
Single Pulse Avalanche Energy[2]	E_{AS}	13	mJ
Single Pulse Avalanched Current[2]	I_{AS}	16	A
Power Dissipation (T_C=25°C)	P_D	2.01	W
Power Dissipation – Derate above 25°C		0.016	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	$R_{\theta JA}$	---	62	°C/W

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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	$\triangle BV_{DSS}/\triangle T_J$	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}=30V , 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	---	10.2	13	mΩ
		V_{GS}=4.5V , I_D=4A	---	13.3	18	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1.2	1.8	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		---	-4	---	mV/°C
Forward Transconductance	gfs	V_{DS}=10V , I_D=3A	---	6	---	S
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DS}=15V , V_{GS}=4.5V , I_D=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_D=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 and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V , Force Current	---	---	10	A
Pulsed Source Current[3]	I_{SM}		---	---	20	A
Diode Forward Voltage[3]	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. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=16A.,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

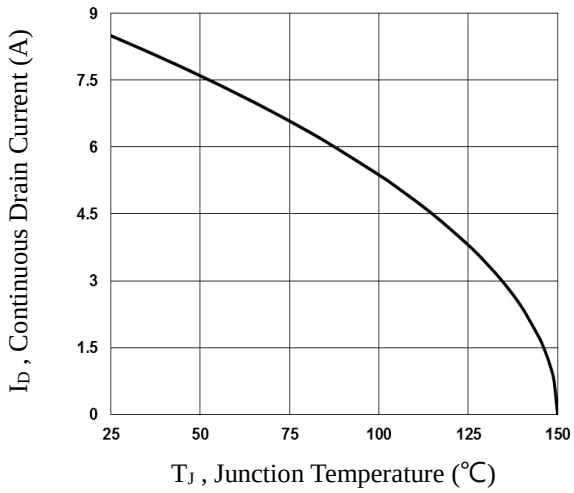


Fig.1 Continuous Drain Current vs. T_C

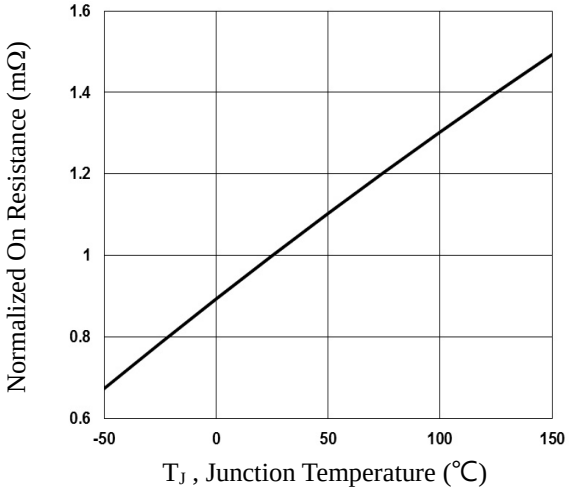


Fig.2 Normalized RDSON vs. T_J

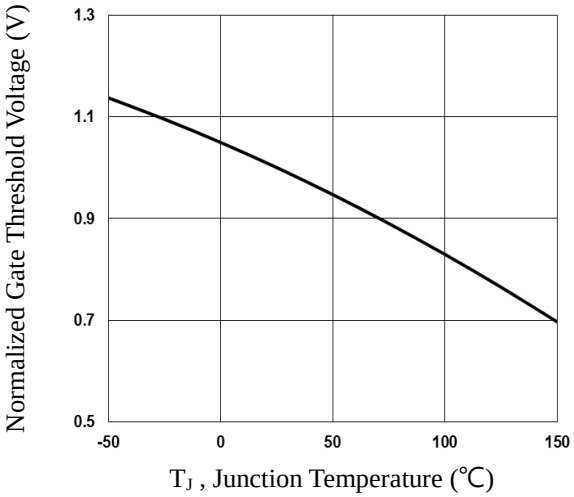


Fig.3 Normalized V_{th} vs. T_J

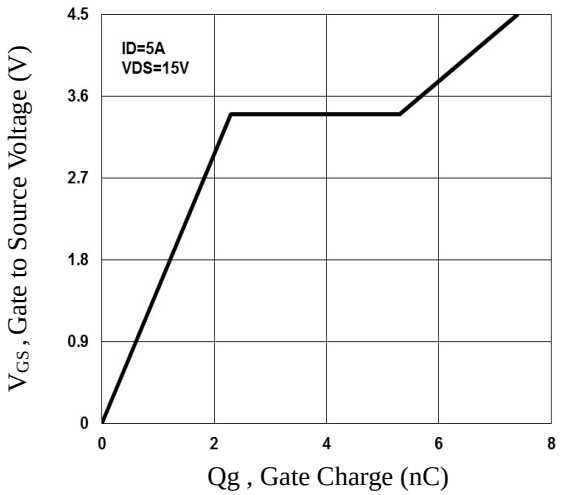


Fig.4 Gate Charge Waveform

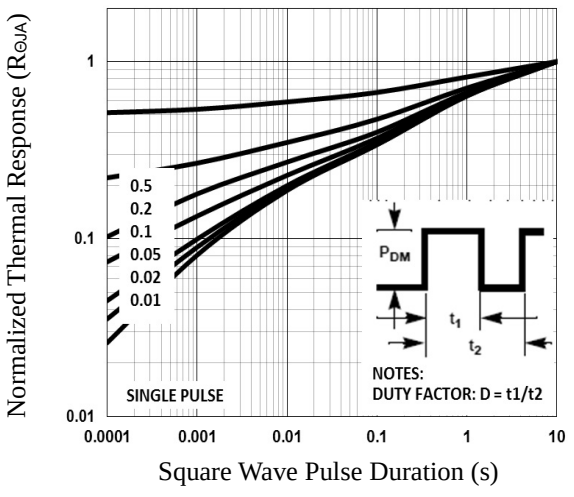


Fig.5 Normalized Transient Response

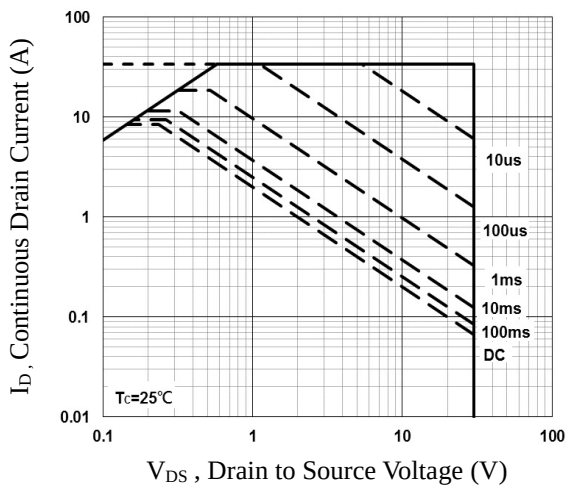


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

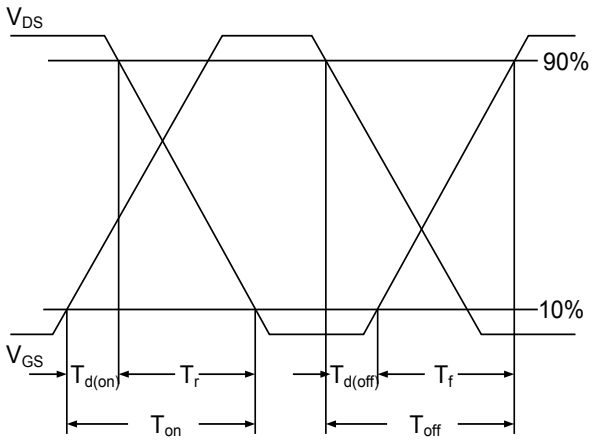


Fig.7 Switching Time Waveform

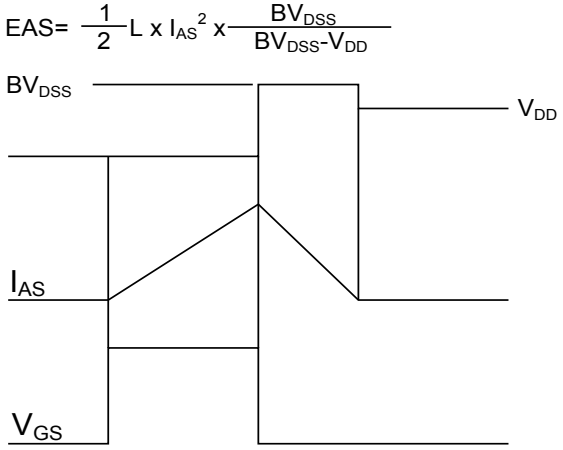
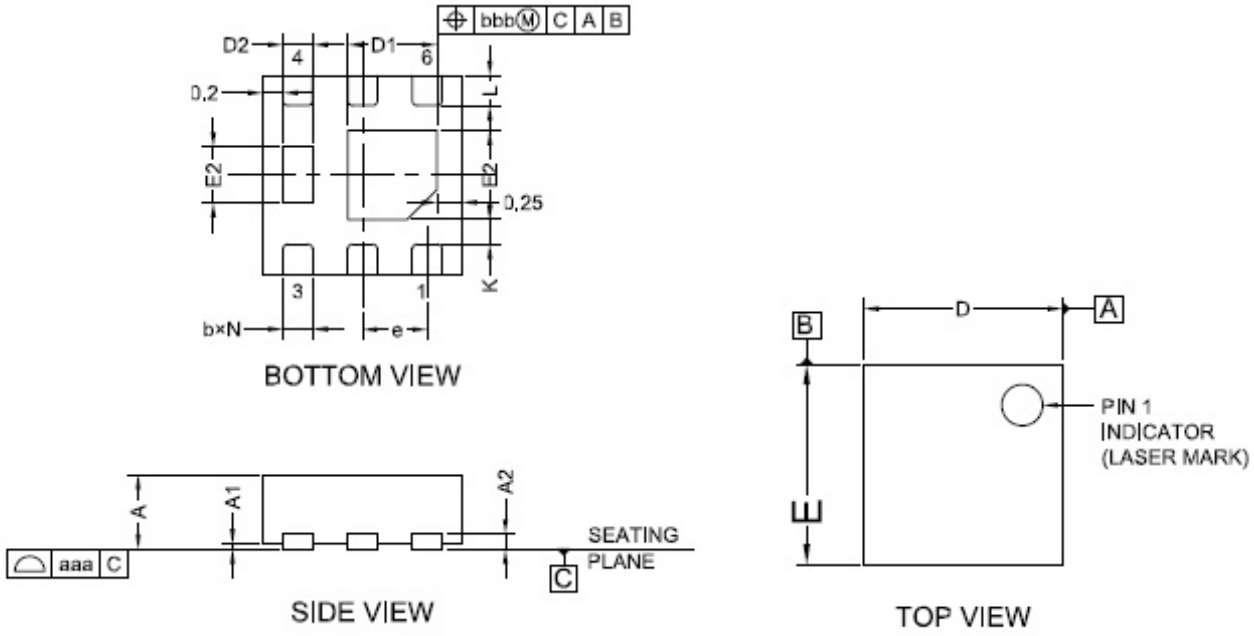


Fig.8 EAS Waveform

Package Outline Dimensions DFN2x2-6L 2EP



Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	0.50	0.55	0.60
A1	0.00	0.02	0.05
A2	0.152REF		
b	0.25	0.30	0.35
D	1.95	2.00	2.05
D1	0.80	0.90	1.00
D2	0.25	0.30	0.35
E	1.95	2.00	2.05
E1	0.80	0.90	1.00
E2	0.46	0.56	0.66
e	0.65BSC		
L	0.25	0.30	0.35
J	0.40BSC		
K	0.20MIN		
N	6.00		
aaa	0.08		
bbb	0.10		