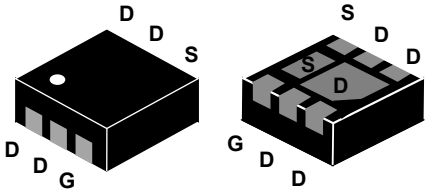
GOOD-ARK SEMICONDUCTOR

GSFB2121A

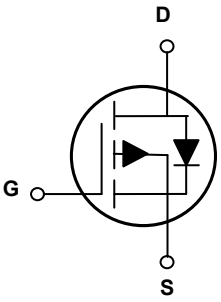
20V P-Channel MOSFET

Main Product Characteristics

BV_{DSS}	-20V
$R_{DS(ON)}$	21mΩ (Max.)
I_D	-10A



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 GSFB2121A 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_A=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous (T_C=25°C)	I_D	-10	A
Drain Current-Continuous (T_C=100°C)		-7	
Drain Current-Pulsed[1]	I_{DM}	-40	A
Single Pulse Avalanche Energy[2]	E_{AS}	20	mJ
Single Pulse Avalanche Current[2]	I_{AS}	-8.8	A
Power Dissipation (T_C=25°C)	P_D	1.9	W
Power Dissipation-Derate above 25°C		0.015	W/°C
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	66	°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	-	-0.01	-	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	uA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-5A	-	16	21	mΩ
		V_{GS}=-2.5V, I_D=-4A	-	21	29	mΩ
		V_{GS}=-1.8V, I_D=-3A	-	30	41	mΩ
Forward Transconductance	gfs	V_{DS}=-10V, I_S=-5A	-	15	-	S
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250uA	-0.5	-0.7	-1	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	3	-	mV/°C
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=-10V, I_D=-5A V_{GS}=-4.5V	-	15	-	nC
Gate-Source Charge[2,3]	Q_{gs}		-	2.6	-	
Gate-to-Drain Charge[2,3]	Q_{gd}		-	4.3	-	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=-10V, R_G=3Ω V_{GS}=-4.5V, I_D=-5A	-	9	-	nS
Rise Time[2,3]	t_r		-	28	-	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	24	-	
Fall Time[2,3]	t_f		-	7	-	
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, F=1MHz	-	1980	-	pF
Output Capacitance	C_{oss}		-	242	-	
Reverse Transfer Capacitance	C_{rss}		-	126	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	-10	A
Pulsed Source Current	I_{SM}		-	-	-40	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. V_{DD}=-20V, V_{GS}=-10V, L=0.5mH, R_G=25Ω, starting T_J=25°C.
3. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%.

Typical Electrical and Thermal Characteristic Curves

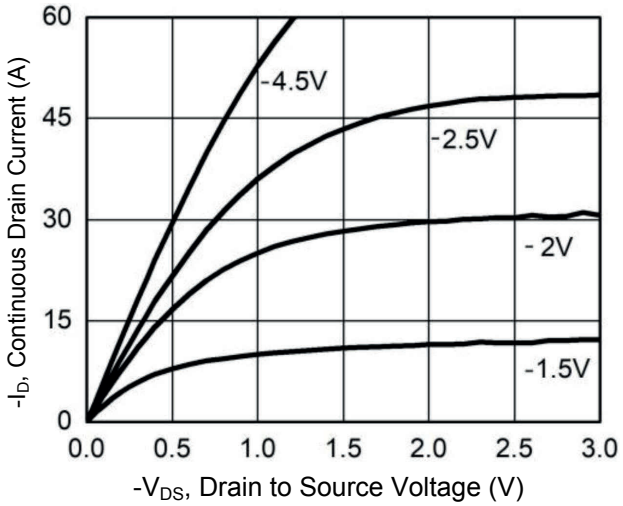


Figure 1. Output Characteristics

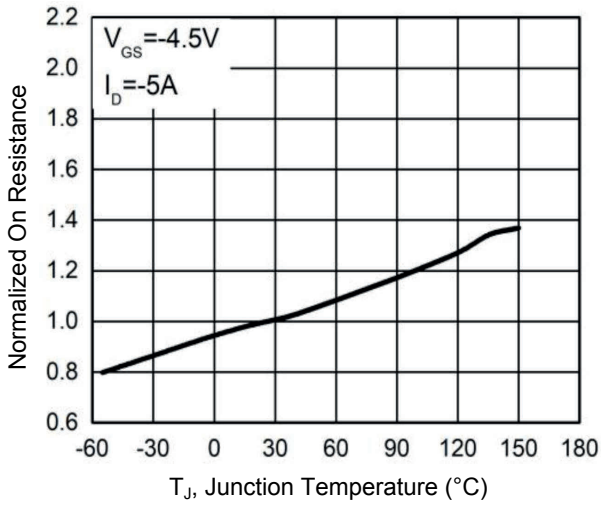


Figure 2. Normalized R_{DSON} vs. T_J

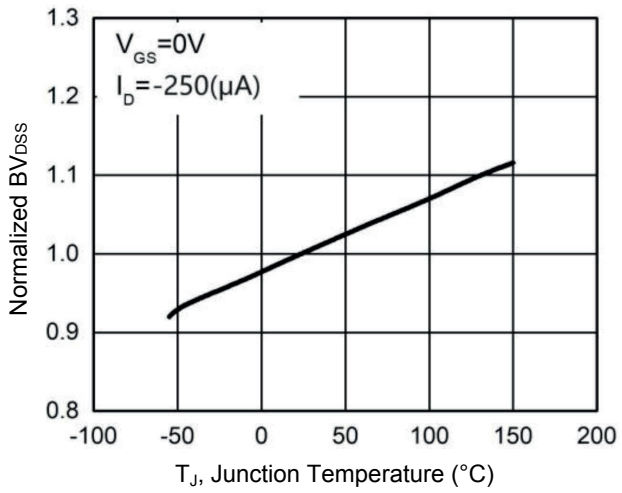


Figure 3. Normalized BV_{DSS} vs. T_J

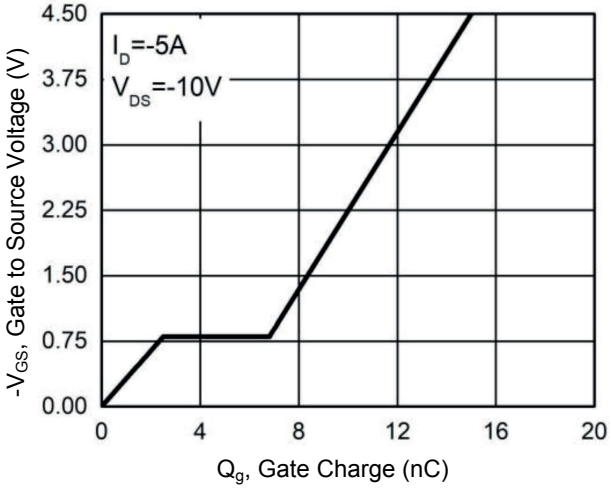


Figure 4. Gate Charge Waveform

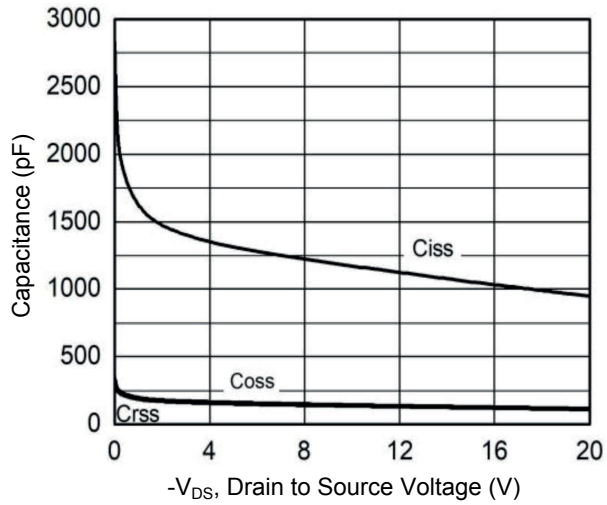


Figure 5. Capacitance Characteristics

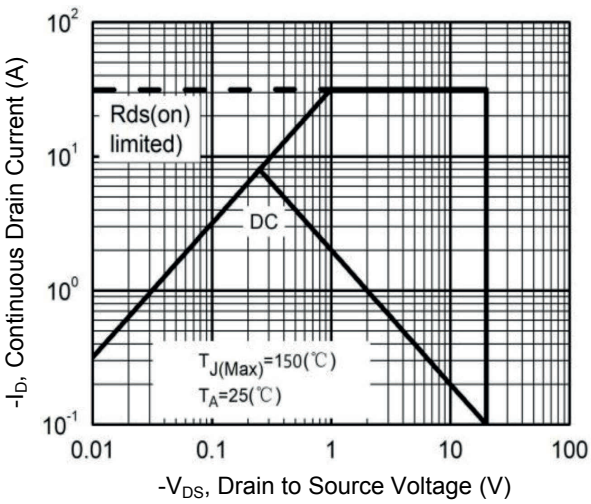
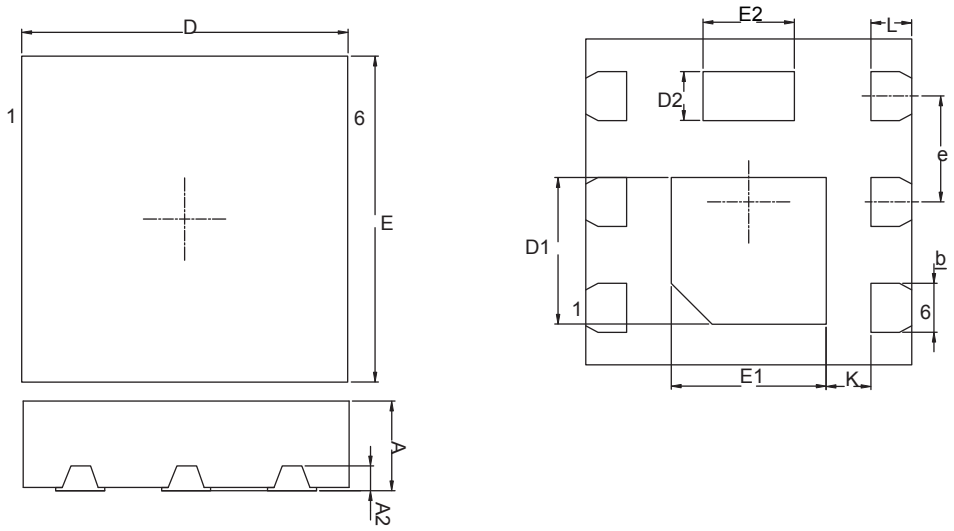


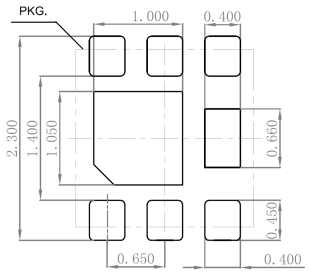
Figure 6. Maximum Safe Operation Area

Package Outline Dimensions (DFN2x2-6L)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.70	0.80	0.028	0.031
A2	0.152 REF		0.006 REF	
b	0.25	0.35	0.010	0.014
D	1.95	2.05	0.077	0.081
D1	0.80	1.05	0.031	0.041
D2	0.25	0.35	0.010	0.014
E	1.95	2.05	0.077	0.081
E1	0.80	1.00	0.031	0.039
E2	0.46	0.66	0.018	0.026
e	0.650 BSC		0.026 BSC	
L	0.25	0.35	0.010	0.014
K	0.200 MIN		0.008 MIN	

Recommended Pad Layout



unit: mm

Order Information

Device	Package	Marking	Packaging	SPQ
GSFB2121A	DFN2x2-6L	B2121	Tape & Reel	3,000pcs / Reel