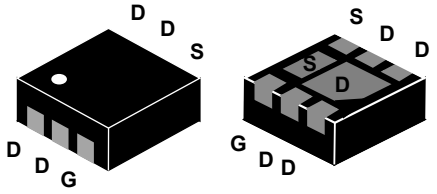
GOOD-ARK SEMICONDUCTOR

GSFB10110

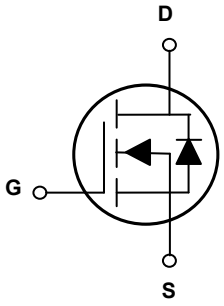
100V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	100V
$R_{DS(ON)}$	84mΩ (Typ.)
I_D	13A



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 GSFB10110 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}	100	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, @ Steady-State (T_A=25°C)[1]	I_D	13	A
Continuous Drain Current, @ Steady-State (T_A=100°C)		9	A
Pulsed Drain Current[2]	I_{DM}	54	A
Power Dissipation (T_A=25°C)	P_D	3.5	W
Linear Derating Factor (T_A=25°C)		0.028	W/°C
Single Pulse Avalanche Energy[3]	E_{AS}	11	mJ
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	35.7	°C/W
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)[4]	$R_{\theta JA}$	62	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	100	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
		T_J=125°C	-	-	50	
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=20V	-	-	100	nA
		V_{GS}=-20V	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=9A	-	84	106	mΩ
		V_{GS}=4.5V, I_D=3A	-	92	110	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.1	1.8	2.9	V
Forward Transconductance	gfs	V_{DS}=10V, I_D=5A	-	15	-	S
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f=1MHz	-	446	-	pF
Output Capacitance	C_{oss}		-	57	-	
Reverse Transfer Capacitance	C_{rss}		-	2.8	-	
Total Gate Charge	Q_g	I_D=10A, V_{DS}=50V, V_{GS}=10V	-	8.2	-	nC
Gate-to-Source Charge	Q_{gs}		-	2.8	-	
Gate-to-Drain ("Miller") Charge	Q_{gd}		-	1.6	-	
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DS}=50V, R_L=5Ω, R_{GEN}=3Ω	-	2.6	-	nS
Rise Time	t_r		-	22	-	
Turn-Off Delay Time	$t_{d(off)}$		-	8.4	-	
Fall Time	t_f		-	12	-	
Gate Resistance	R_g	f=1MHz	-	1.4	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	13	A
Pulsed Source Current (Body Diode)	I_{SM}		-	-	54	A
Diode Forward Voltage	V_{SD}	I_S=10A, V_{GS}=0V	-	1	1.3	V
Reverse Recovery Time	T_{rr}	I_S=10A, V_{GS}=0V, dI_F/dt=100A/us	-	46	-	nS
Reverse Recovery Charge	Q_{rr}		-	40	-	nC

Note:

1. Pulse test: Pulse width ≤300us, duty cycle ≤2%.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. L=0.5mH, R_G=25Ω, V_{DD}=80V, I_{AS}=6.5A, T_J=25°C.
4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Electrical and Thermal Characteristic Curves

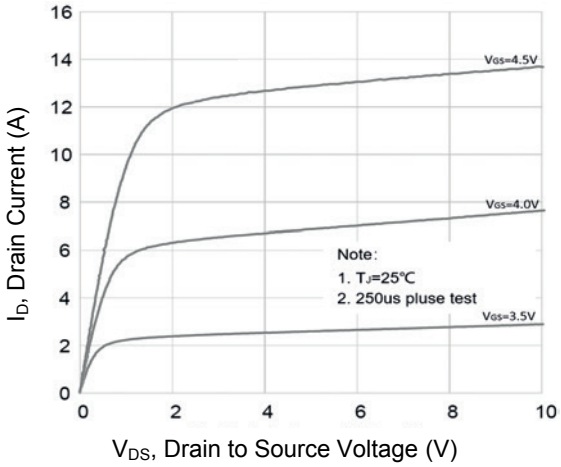


Figure 1. Typical Output Characteristics

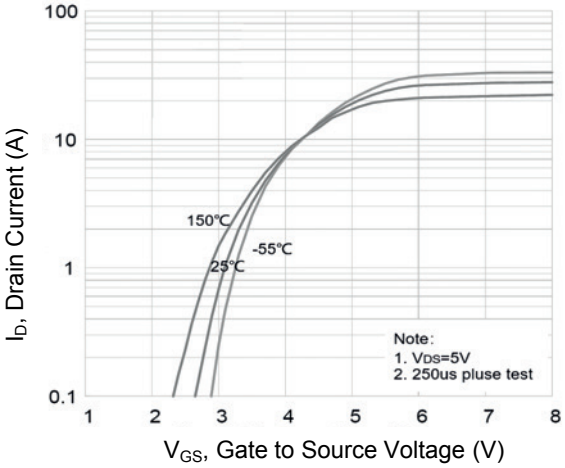


Figure 2. Transfer Characteristics

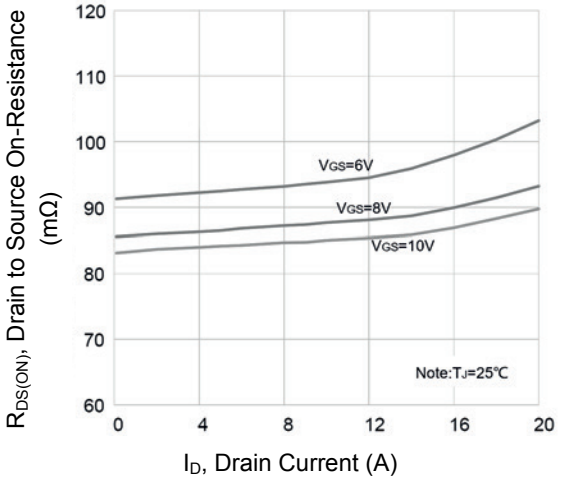


Figure 3. $R_{DS(ON)}$ vs. Drain Current

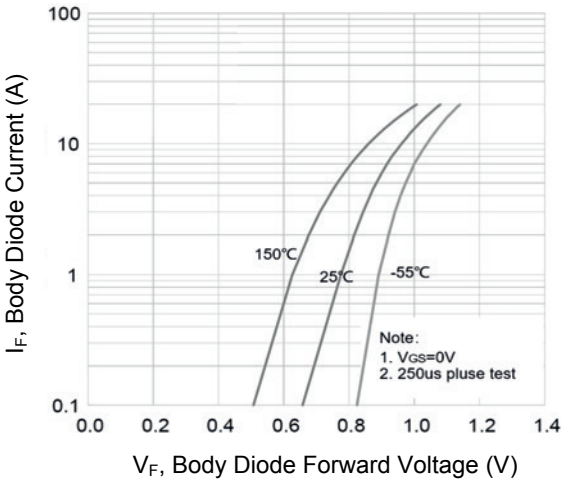


Figure 4. Body Diode Characteristics

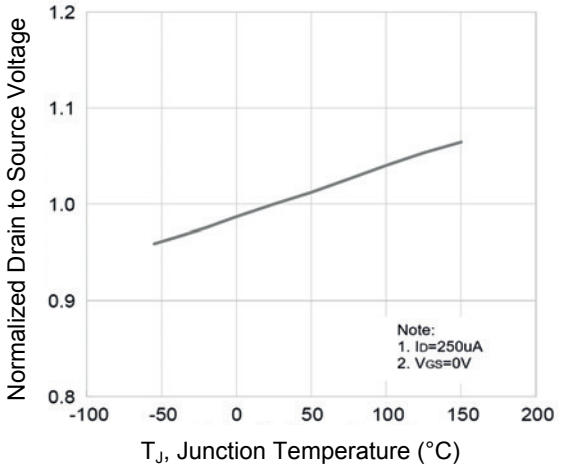


Figure 5. Normalized BV_{DSS} vs. T_J

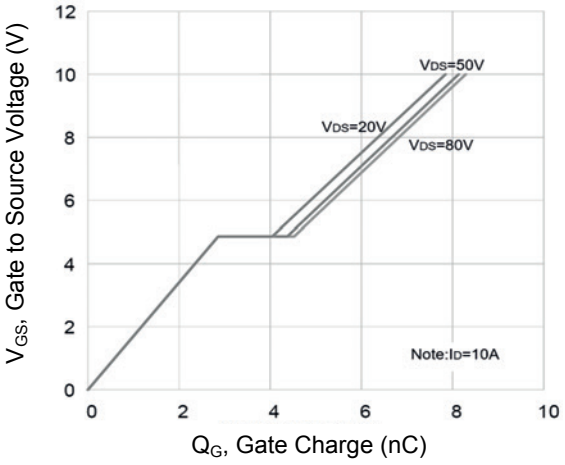


Figure 6. Gate Charge

Typical Electrical and Thermal Characteristic Curves

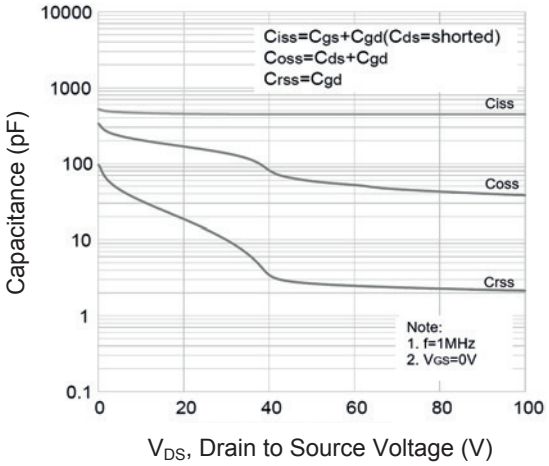


Figure 7. Capacitance Characteristics

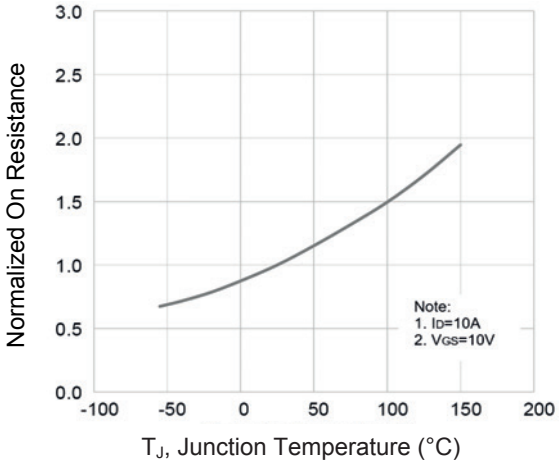


Figure 8. Normalized $R_{DS(ON)}$ vs. T_J

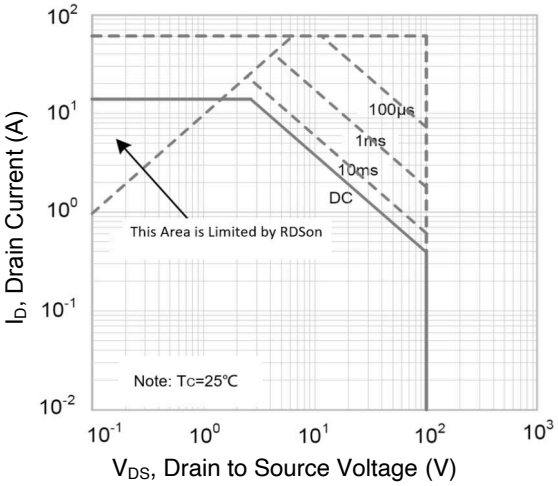
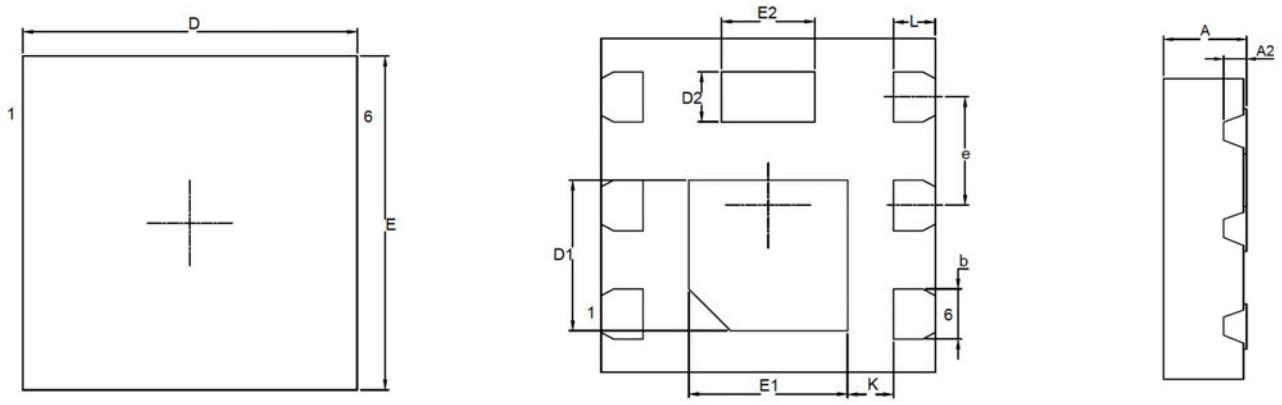


Figure 9. Safe Operation Area

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	

Order Information

Device	Package	Marking	Carrier	Quantity
GSFB10110	DFN2x2-6L	B10110	Tape & Reel	3,000 Pcs / Reel