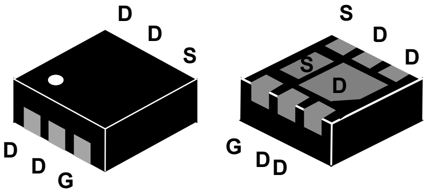
GOOD-ARK
SEMICONDUCTOR

GSFB3123

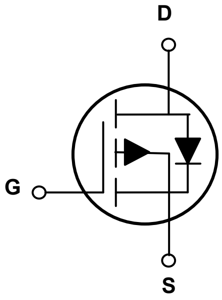
30V P-Channel MOSFET

Main Product Characteristics

BV_{DSS}	-30V
$R_{DS(ON)}$	23mΩ (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 GSFB3123 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	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±25	V
Drain Current-Continuous (T_C=25°C)	I_D	-10	A
Drain Current-Continuous (T_C=100°C)		-8	
Drain Current-Pulsed[1]	I_{DM}	-40	A
Single Pulse Avalanche Energy[2]	E_{AS}	54	mJ
Single Pulse Avalanche Current[2]	I_{AS}	-33	A
Power Dissipation (T_C=25°C)	P_D	2.2	W
Power Dissipation-Derate above 25°C		0.018	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	56.8	°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	-30	-	-	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C, I_D=-1mA	-	-0.03	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-27V, V_{GS}=0V, T_J=25°C	-	-	-1	μA
		V_{DS}=-24V, V_{GS}=0V, T_J=125°C	-	-	-10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-8A	-	18	23	mΩ
		V_{GS}=-4.5V, I_D=-6A	-	25	30	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250uA	-1.1	-1.6	-2.9	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		-	4	-	mV/°C
Forward Transconductance	gfs	V_{DS}=-10V, I_D=-8A	-	6.8	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DS}=-15V, I_D=-5A, V_{GS}=-4.5V	-	11	17	nC
Gate-Source Charge[3,4]	Q_{gs}		-	3.4	6	
Gate-Drain Charge[3,4]	Q_{gd}		-	4.2	8	
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=-15V, R_G=6Ω, V_{GS}=-10V, I_D=-1A	-	5.8	11	nS
Rise Time[3,4]	t_r		-	18.8	36	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	46.9	90	
Fall Time[3,4]	t_f		-	12.3	23	
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, F=1MHz	-	1250	2500	pF
Output Capacitance	C_{oss}		-	160	320	
Reverse Transfer Capacitance	C_{rss}		-	90	180	
Source-Drain Ratings and Characteristics						
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}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-33A, starting T_J=25°C.
3. Pulse test: pulse width ≦ 300us, duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

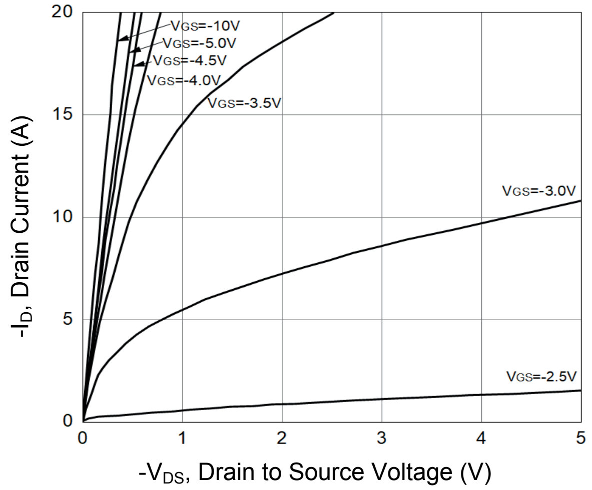


Figure 1. Typical Output Characteristics

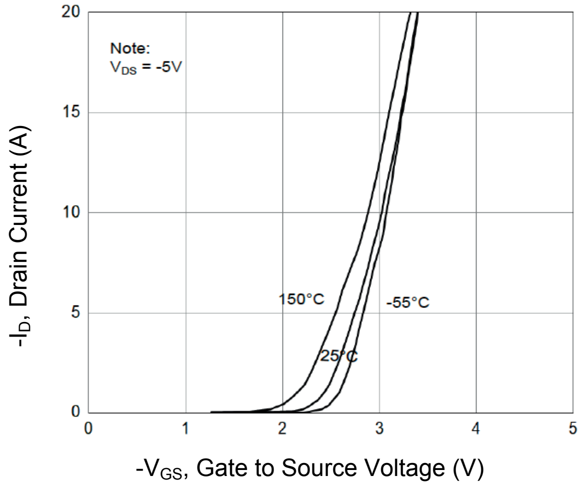


Figure 2. Typical Transfer Characteristics

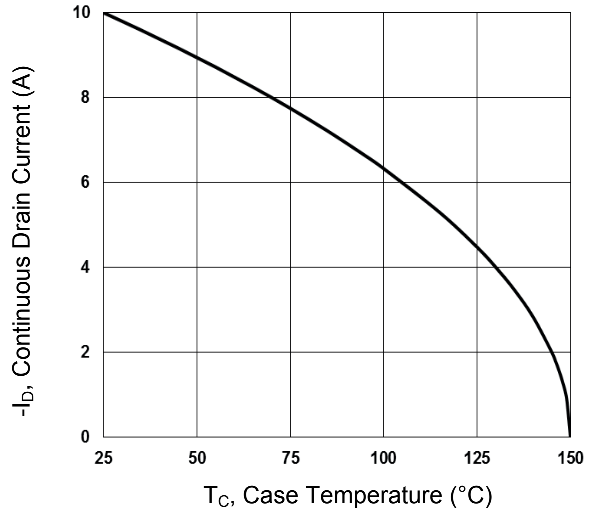


Figure 3. Continuous Drain Current vs. T_C

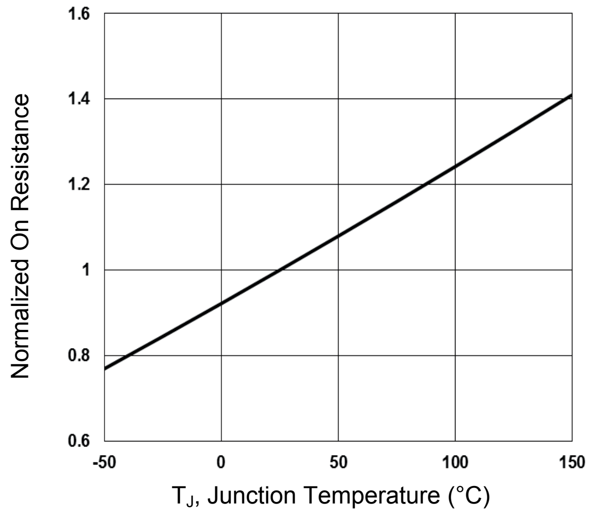


Figure 4. Normalized R_{DSON} vs. T_J

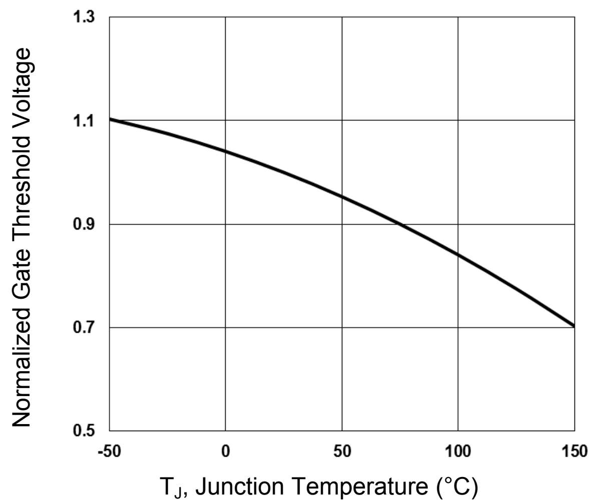


Figure 5. Normalized $V_{GS(th)}$ vs. T_J

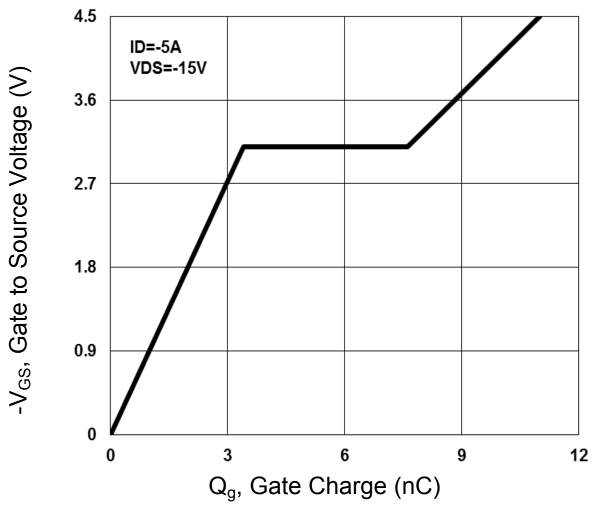


Figure 6. Gate Charge Waveform

Typical Electrical and Thermal Characteristic Curves

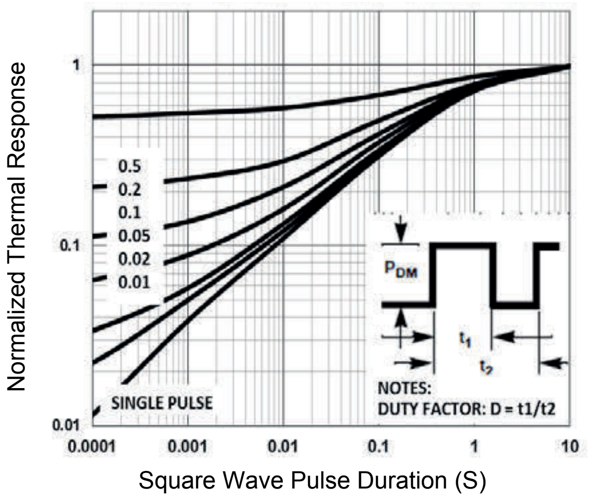


Figure 7. Normalized Transient Impedance

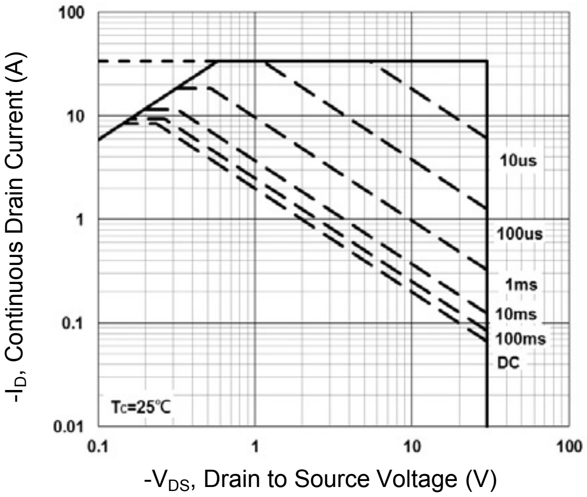
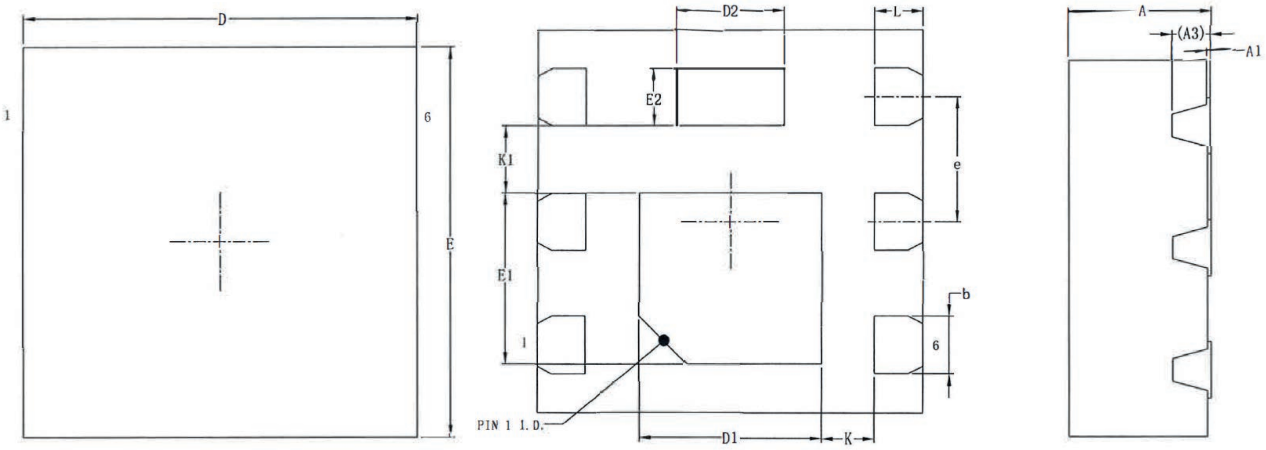


Figure 8. Maximum Safe Operation Area

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
A1	0.00	0.05	0.000	0.002
A3	0.203 REF		0.008 REF	
b	0.25	0.35	0.010	0.014
D	1.90	2.10	0.075	0.083
D1	0.85	1.05	0.033	0.041
D2	0.46	0.66	0.018	0.026
E	1.90	2.10	0.075	0.083
E1	0.80	1.00	0.031	0.039
E2	0.20	0.40	0.008	0.016
e	0.650 BSC		0.026 BSC	
L	0.25	0.30	-	0.012
K	0.275 REF		0.011 REF	
K1	0.350 REF		0.014 REF	

Order Information

Device	Package	Marking	Packaging	SPQ
GSFB3123	DFN2x2-6L	BXY* (Varied by lot)	Tape & Reel	3,000 pcs / Reel