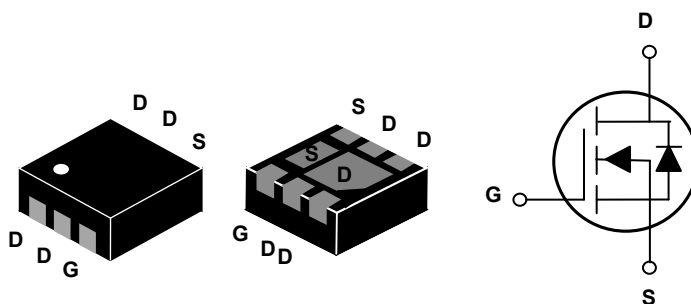


Main Product Characteristics

$V_{(BR)DSS}$	200V
$R_{DS(ON)}$	700m Ω (Max.)
I_D	4A



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 GSFB2004 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 ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_A=25^{\circ}\text{C}$)	I_D	4	A
Drain Current-Continuous ($T_A=100^{\circ}\text{C}$)		2.8	
Drain Current-Pulsed ¹	I_{DM}	16	A
Single Pulse Avalanche Energy ²	E_{AS}	10.6	mJ
Power Dissipation ($T_A=25^{\circ}\text{C}$)	P_D	20	W
Power Dissipation-De-rate above 25°C		0.16	
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	6.3	$^{\circ}\text{C/W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 To +150	$^{\circ}\text{C}$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	200	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^{\circ}\text{C}, I_D=1mA$	-	0.055	-	V/ $^{\circ}\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=200V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	1	μA
		$V_{DS}=160V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=3A$	-	510	700	m Ω
		$V_{GS}=4.5V, I_D=2A$	-	550	750	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.8	2.9	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-5	-	mV/ $^{\circ}\text{C}$
Forward Transconductance	gfs	$V_{DS}=10V, I_D=3A$	-	8	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q_g	$V_{DS}=100V, I_D=4A, V_{GS}=10V$	-	12.6	-	nC
Gate-Source Charge ^{2,3}	Q_{gs}		-	2.1	-	
Gate-Drain Charge ^{2,3}	Q_{gd}		-	2.2	-	
Turn-On Delay Time ^{2,3}	$t_{d(on)}$	$V_{DD}=100V, R_G=5\Omega, V_{GS}=10V, I_D=4A$	-	13	-	nS
Rise Time ^{2,3}	t_r		-	10	-	
Turn-Off Delay Time ^{2,3}	$t_{d(off)}$		-	40	-	
Fall Time ^{2,3}	t_f		-	10	-	
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V, F=1MHz$	-	775	-	pF
Output Capacitance	C_{oss}		-	12.5	-	
Reverse Transfer Capacitance	C_{rss}		-	4.4	-	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	-	1.4	3	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current	I_S	$V_G=V_D=0V,$ Force Current	-	-	4	A
Pulsed Source Current	I_{SM}		-	-	16	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=2A, T_J=25^{\circ}\text{C}$	-	-	1.2	V
Reverse Recovery Time ²	T_{rr}	$V_R=50V, I_S=4A,$ $di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	-	86	-	nS
Reverse Recovery Charge ²	Q_{rr}		-	280	-	nC

Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=40V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$, starting $T_J=25^{\circ}\text{C}$.
3. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Typical Electrical and Thermal Characteristic Curves

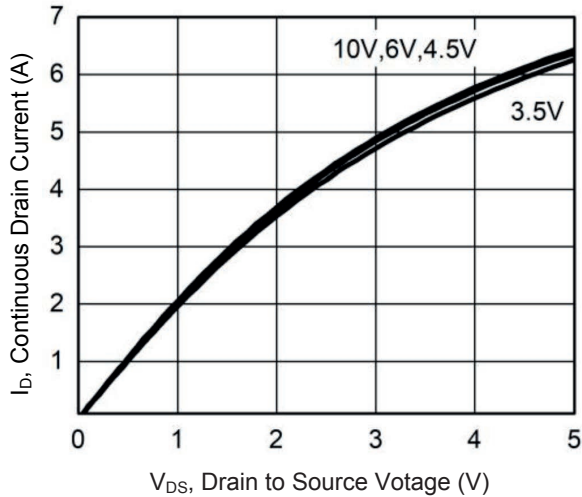


Figure 1. Typical Output Characteristics

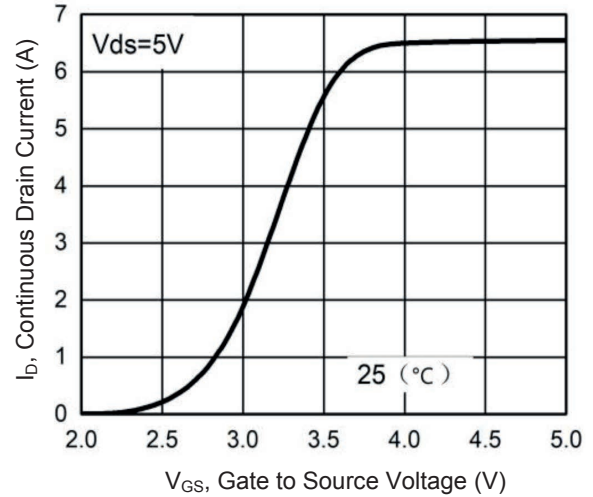


Figure 2. Transfer Characteristics

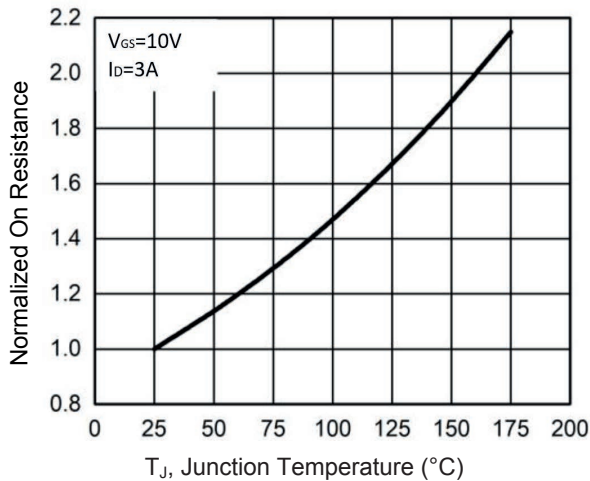


Figure 3. Normalized $R_{DS(on)}$ vs. T_J

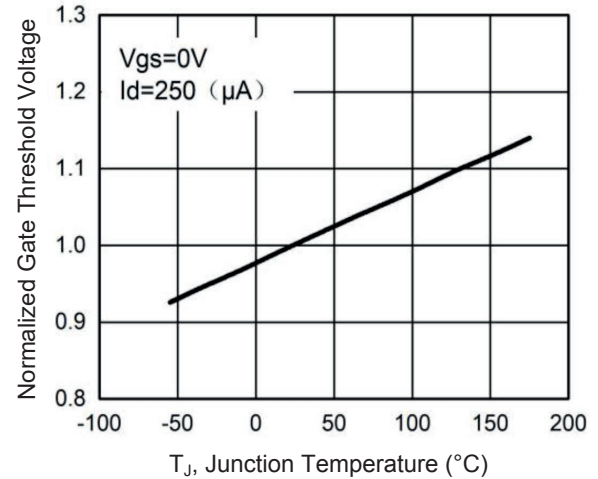


Figure 4. Normalized BV_{DSS} vs. T_J

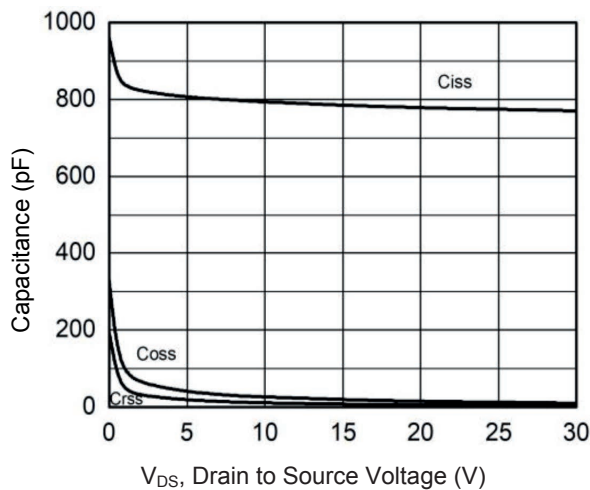


Figure 5. Capacitance Characteristics

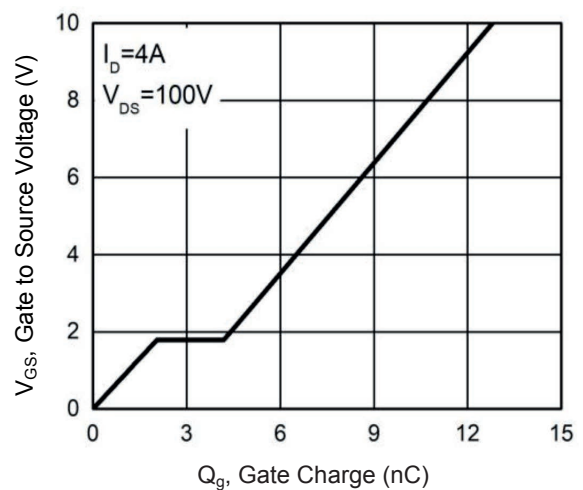


Figure 6. Gate Charge Characteristics

Typical Electrical and Thermal Characteristic Curves

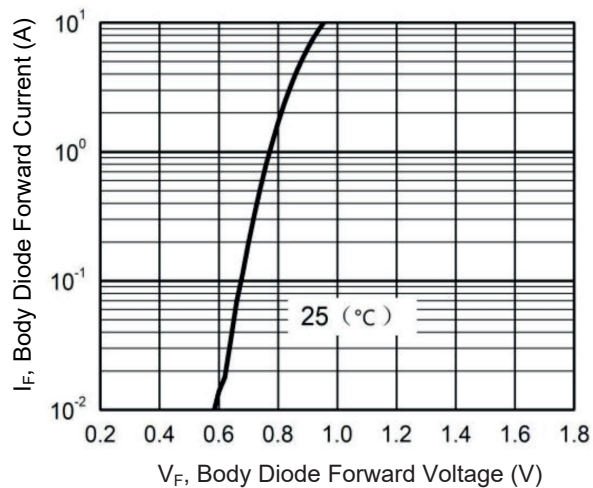


Figure 7. Body Diode Characteristics

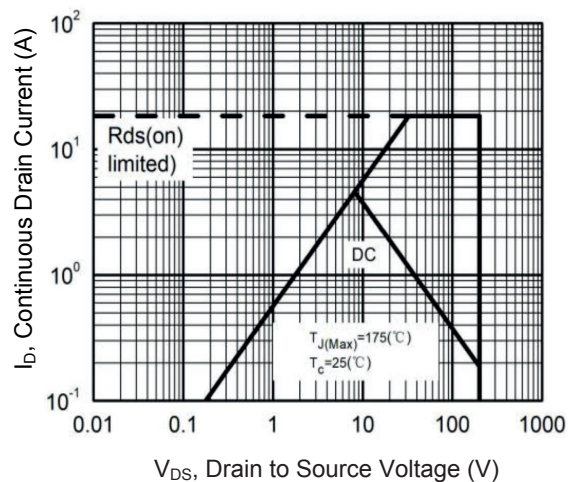
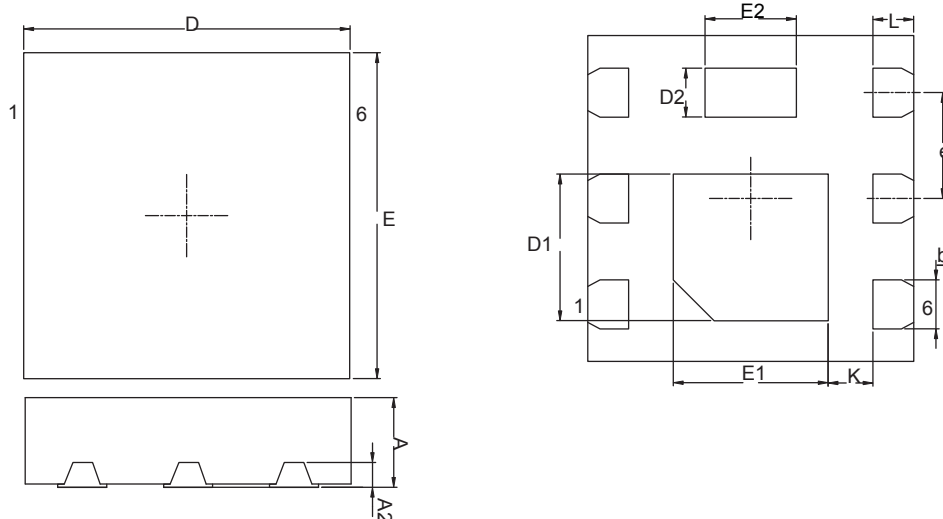


Figure 8. Maximum Safe Operation Area

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
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
GSFB2004	DFN2x2-6L	B2004	Tape & Reel	3,000pcs / Reel