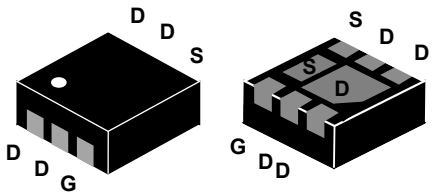
GOOD-ARK SEMICONDUCTOR

GSFB2033E

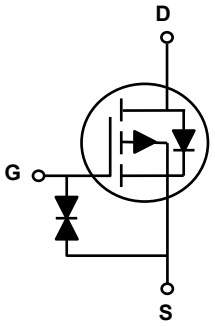
20V P-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	-20V
$R_{DS(ON)}$	33mΩ.Max.)
I_D	-8.0A



DFN2x2-6L 2EP



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 GSFB2033E 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°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_A=25°C)	I_D	-8.0	A
Drain Current-Continuous (T_A=100°C)		-4.8	
Drain Current-Pulsed[1]	I_{DM}	-24	A
Power Dissipation (T_A=25°C)	P_D	1.8	W
Power Dissipation-Derate above 25°C		0.015	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	80	°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 otherise` specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	.. DSS	V_{GS}=0V, I_D=250μA	-20	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=1mA	-	-0.02	-	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	-	-	±10	μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-2A	-	26	33	mΩ
		V_{GS}=-2.5V, I_D=-1A	-	36	41	mΩ
		V_{GS}=-1.8V, I_D=-1A	-	52	69	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250μA	-0.55	-	-1	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-2	-	mV/°C
Forward Transconductance	g_{fs}	V_{DS}=-5V, I_D=-5A	-	15	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=-10V, I_D=-5A, V_{GS}=-4.5V	-	9.1	-	nC
Gate-Source Charge[2,3]	Q_{gs}		-	1.6	-	
Gate-Drain Charge[2,3]	Q_{gd}		-	1.6	-	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=-10V, R_G=3Ω, V_{GS}=-4.5V, I_D=-5A	-	11	-	nS
Rise Time[2,3]	t_r		-	34	-	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	21	-	
Fall Time[2,3]	t_f		-	11	-	
Input Capacitance	C_{lss}	V_{DS}=-10V, V_{GS}=0V, F=1MHz	-	390	-	pF
Output Capacitance	C_{oss}		-	106	-	
Reverse Transfer Capacitance	C_{rss}		-	42	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	-8	A
Pulsed Source Current	I_{SM}		-	-	-24	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-1A, T_J=25°C	-	-	-1.3	V
Reverse Recovery Time	t_{rr}	I_F=-5AV, di/dt=100A/us	-	170	-	nS
Reverse Recovery Charge	Q_{rr}		-	60	-	nc

Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width ≤ 300us,duty cycle ≤ 2%.
3. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

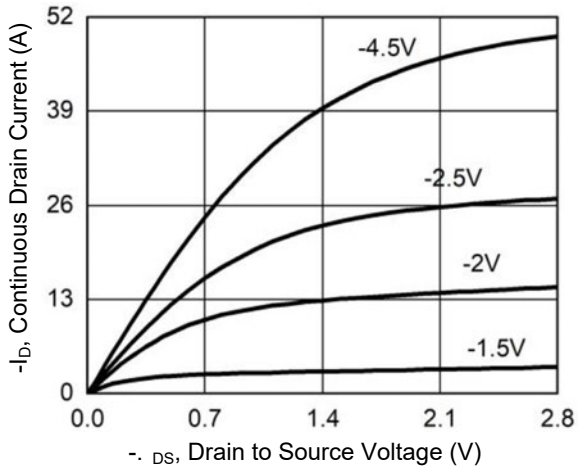


Figure 1. Output Characteristics

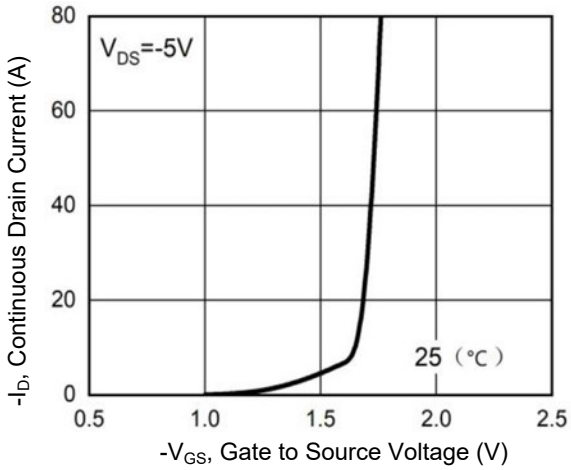


Figure 2. Transfer Characteristics

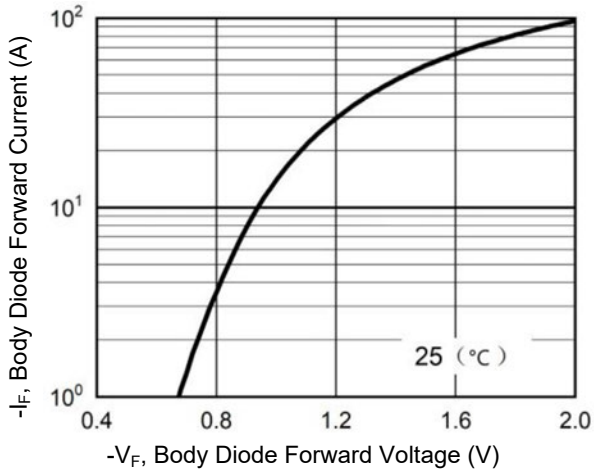


Figure 3. Body Diode Characteristics

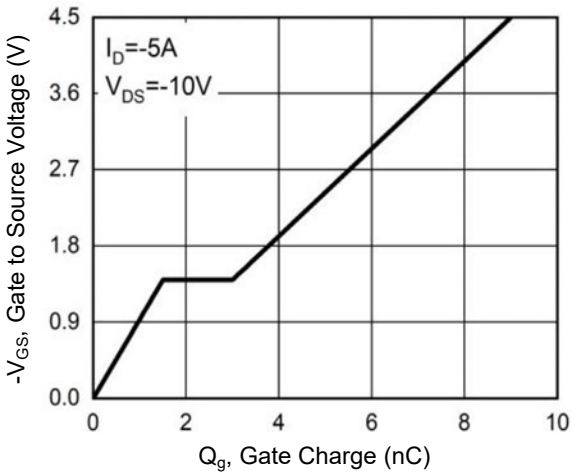


Figure 4. Gate Charge Waveform

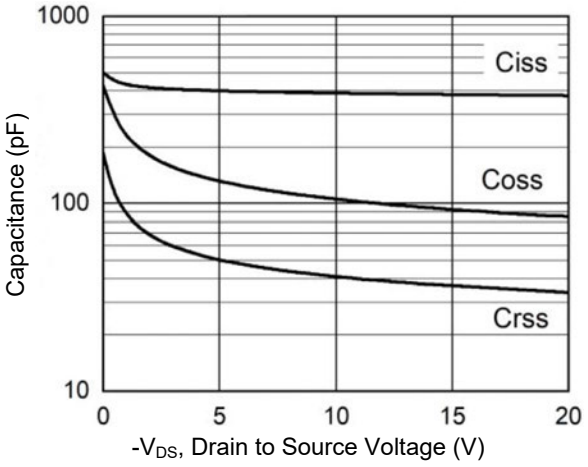


Figure 5. Capacitance Characteristics

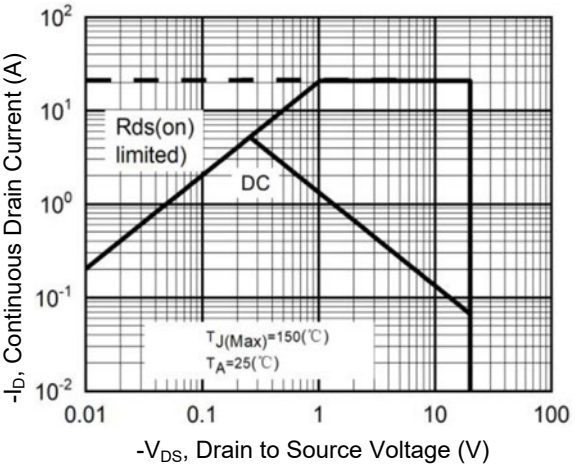


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

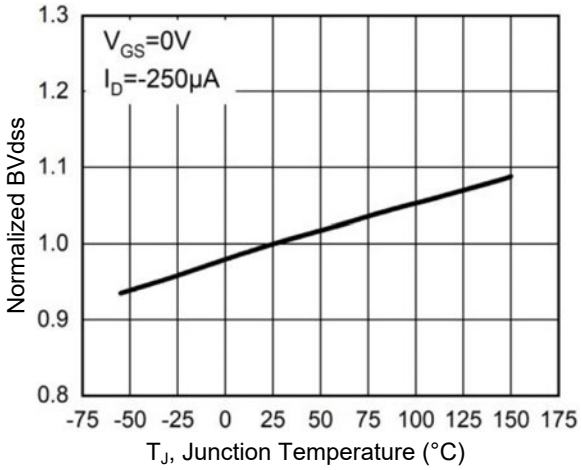


Figure 7. Normalized BVdss vs. T_J

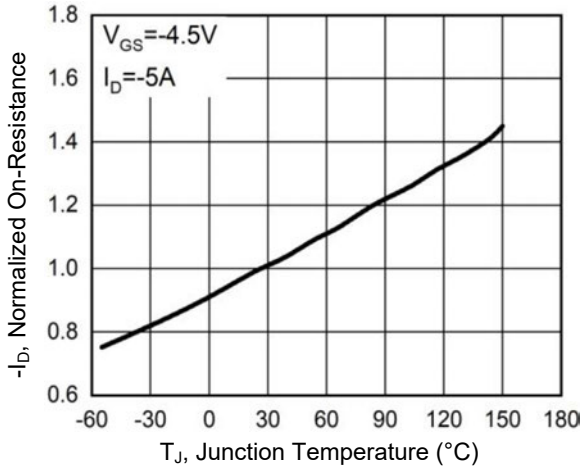
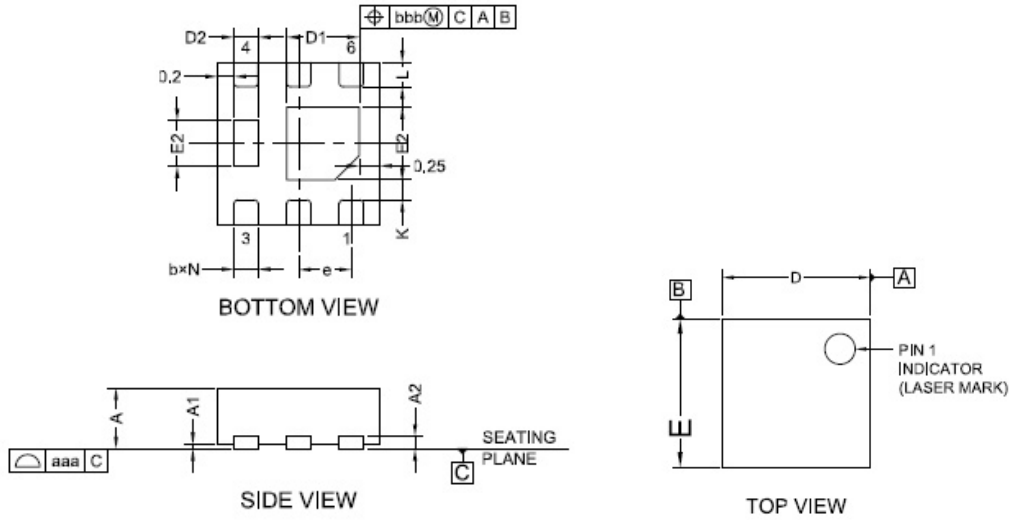


Figure 8. Normalized Ron vs. T_J

Package Outline Dimensions (DFN2x2-6L 2EP)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.500	0.600	0.020	0.024
A1	0.000	0.050	0.000	0.002
A2	0.152 REF		0.006 REF	
b	0.250	0.350	0.010	0.014
D	1.950	2.050	0.077	0.081
D1	0.800	1.000	0.031	0.039
D2	0.250	0.350	0.010	0.014
E	1.950	2.050	0.077	0.081
E1	0.800	1.000	0.031	0.039
E2	0.460	0.660	0.018	0.026
e	0.650 BSC		0.026 BSC	
L	0.250	0.350	0.010	0.014
J	0.400 BSC		0.016 BSC	
K	0.200 MIN		0.008 MIN	
N	6.000		6.00	
aaa	0.080		0.003	
bbb	0.100		0.004	

Order Information

Device	Package	Marking	Quantity	Carrier
GSFB2033E	DFN2x2-6L 2EP	B2033E	3,000pcs / Reel	Tape & Reel