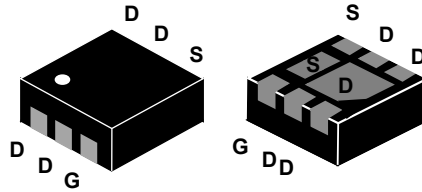
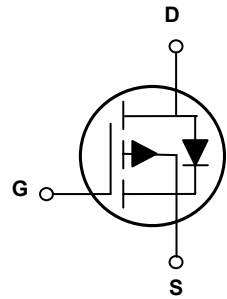


### Main Product Characteristics

$V_{(BR)DSS}$	-40V
$R_{DS(ON)}$	45m $\Omega$ (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 GSFB4045 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	$V_{DS}$	-40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	-10	A
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ )		-6.8	A
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	-40	A
Maximum Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	14	W
Single Pulse Avalanche Energy (L=0.5mH)	$E_{AS}$	64	mJ
Single Pulse Avalanche Current (L=0.5mH)	$I_{AS}$	16	A
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Maximum Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	8.92	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^\circ\text{C}$

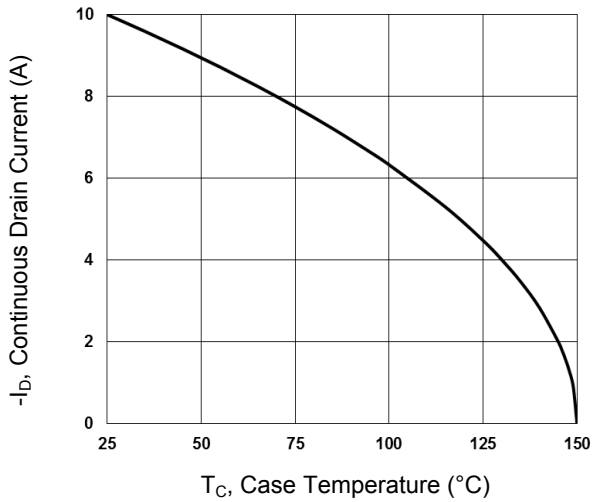
**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-40	-	-	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=-1\text{mA}$	-	-0.04	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-40V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	-1	$\mu A$
		$V_{DS}=-32V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	-	-10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-4A$	-	35	45	$m\Omega$
		$V_{GS}=-4.5V, I_D=-3A$	-	45	60	$m\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.1	-1.6	-2.7	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	3	-	$mV/^\circ\text{C}$
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=-20V, V_{GS}=-10V, I_D=-8A$	-	19.7	-	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	2.7	-	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	5.6	-	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=-20V, V_{GS}=-10V, R_G=3\Omega, I_D=-6A$	-	13	-	nS
Rise Time <sup>2,3</sup>	$t_r$		-	16	-	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	150	-	
Fall Time <sup>2,3</sup>	$t_f$		-	66	-	
Input Capacitance	$C_{iss}$	$V_{DS}=-20V, V_{GS}=0V, F=1\text{MHz}$	-	1030	-	pF
Output Capacitance	$C_{oss}$		-	64	-	
Reverse Transfer Capacitance	$C_{rss}$		-	49	-	
Forward Transconductance	$R_g$	$V_{GS}=0V, V_{DS}=0V, F=1.0\text{MHz}$	-	4.7	-	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	-	-	-10	A
Pulsed Source Current	$I_{SM}$		-	-	-40	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-2A, T_J=25^\circ\text{C}$	-	-	-1.2	V
Reverse Recovery Time	$T_{rr}$	$I_F=-6A, di/dt=-100A/s$	-	33	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	35	-	nC

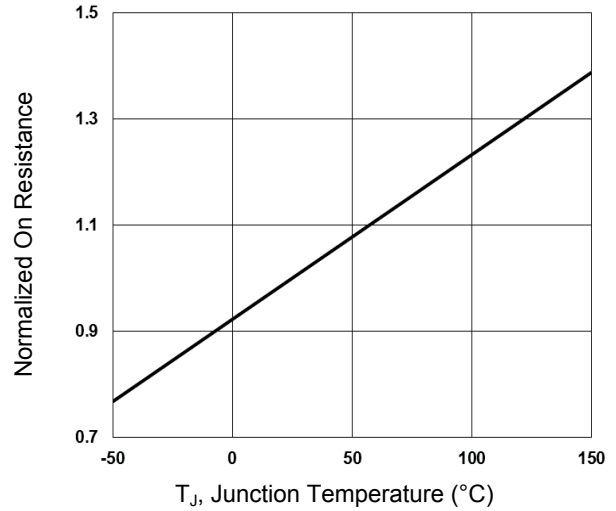
Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

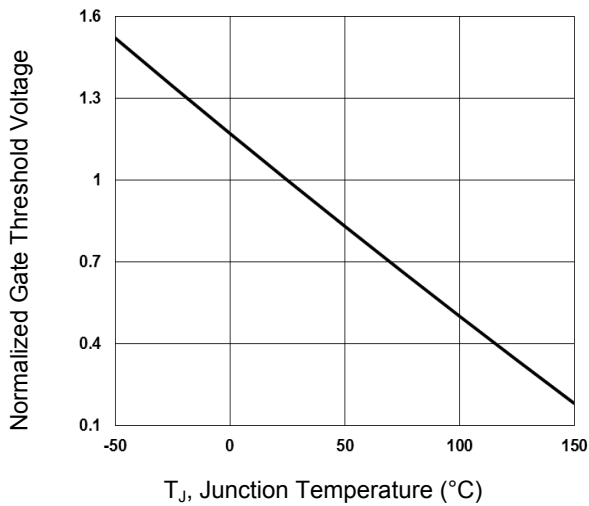
**Typical Electrical and Thermal Characteristic Curves**



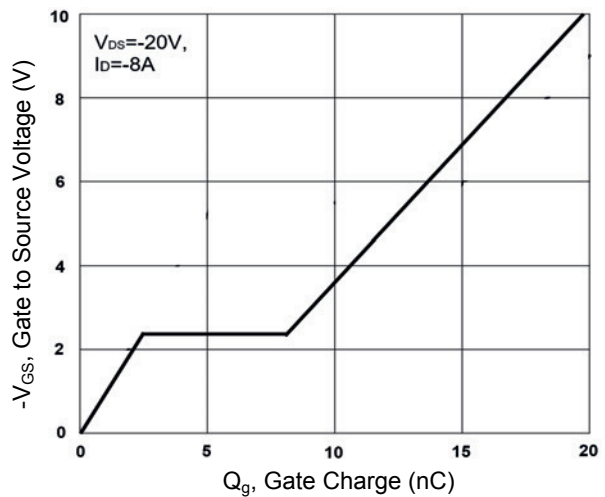
**Figure 1. Continuous Drain Current vs.  $T_c$**



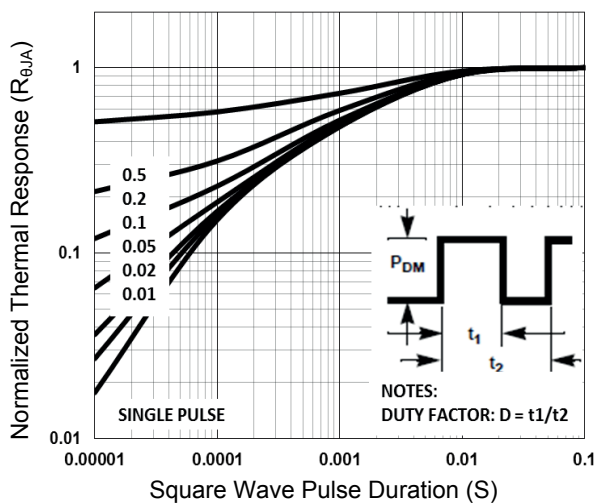
**Figure 2. Normalized  $R_{DS(on)}$  vs.  $T_j$**



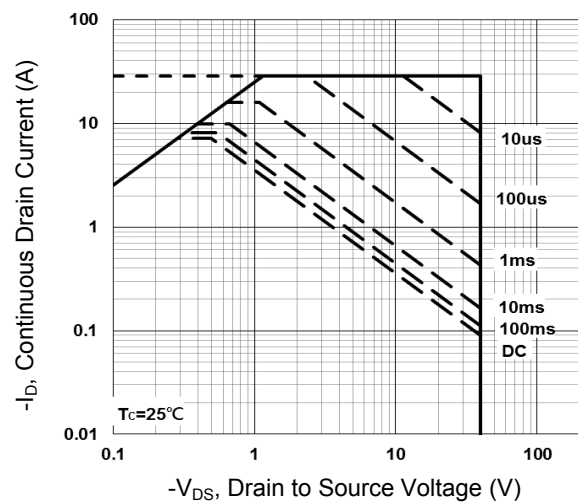
**Figure 3. Normalized  $V_{th}$  vs.  $T_j$**



**Figure 4. Gate Charge Waveform**

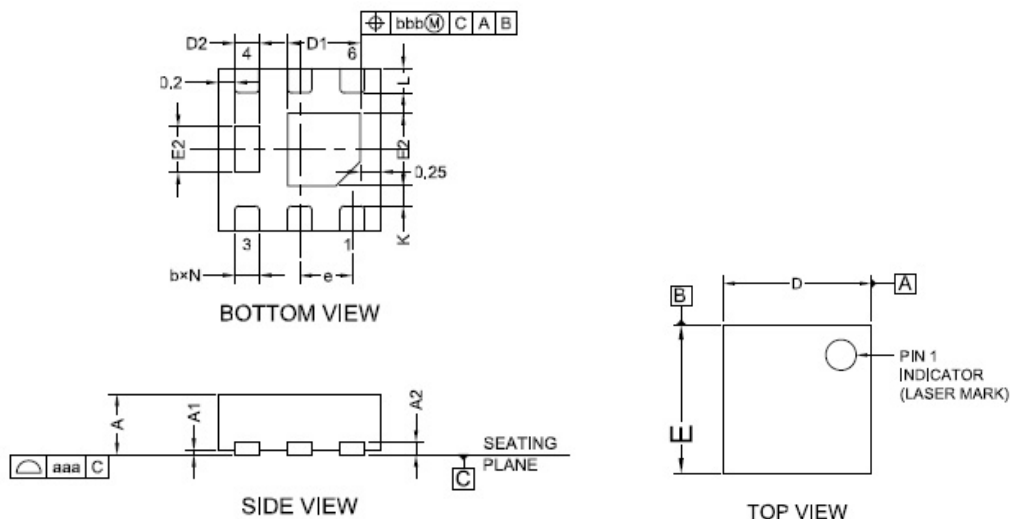


**Figure 5. Normalized Transient Impedance**



**Figure 6. Maximum Safe Operation Area**

**Package Outline Dimensions (DFN2x2-6L)**



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	SPQ	Packaging
GSFB4045	DFN2x2-6L	B4045	3,000pcs / Reel	Tape & Reel

For more information, please contact us at: [inquiry@goodarksemi.com](mailto:inquiry@goodarksemi.com)