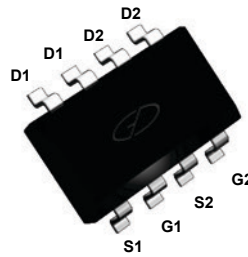
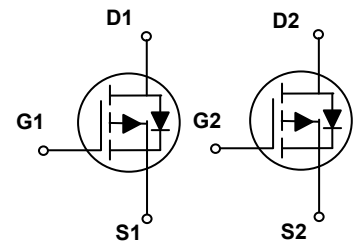


### Main Product Characteristics

$V_{DS}$	-40V
$R_{DS(ON)}$	40m $\Omega$
$I_D$	-4.6A



SOP-8



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 GSFQ4843 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 supply 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 ( $T_A=25^\circ\text{C}$ )	$I_D$	-4.6	A
Drain Current-Continuous ( $T_A=70^\circ\text{C}$ )		-3.7	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	-18.4	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	36.5	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	-27	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	1.47	W
Power Dissipation-Derate above $25^\circ\text{C}$		0.011	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	85	
Operating Junction Temperature Range	$T_J$	-50 To +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-50 To +150	$^\circ\text{C}$

### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-40	-	-	V
BV <sub>DSS</sub> Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Reference to 25°C, I <sub>D</sub> =-1mA	-	-0.02	-	V/°C
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-40V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	-	-	-1	μA
		V <sub>DS</sub> =-32V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C	-	-	-10	μA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-2.5A	-	33	40	mΩ
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-2.5A (T <sub>J</sub> =125°C)	-	47.5	-	
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2A	-	46	65	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250μA	-1.2	-1.8	-2.5	V
V <sub>GS(th)</sub> Temperature Coefficient	ΔV <sub>GS(th)</sub>		-	4.18	-	mV/°C
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-1A	-	4	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	Q <sub>g</sub>	V <sub>DS</sub> =-20V, I <sub>D</sub> =-2A V <sub>GS</sub> =-10V	-	16.2	32	nC
Gate-Source Charge <sup>3,4</sup>	Q <sub>gs</sub>		-	1.9	4	
Gate-Drain Charge <sup>3,4</sup>	Q <sub>gd</sub>		-	3.4	6.5	
Turn-On Delay Time <sup>3,4</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> =-20V, R <sub>G</sub> =6Ω V <sub>GS</sub> =-10V, I <sub>D</sub> =-1A	-	12	24	nS
Rise Time <sup>3,4</sup>	t <sub>r</sub>		-	13.2	26	
Turn-Off Delay Time <sup>3,4</sup>	t <sub>d(off)</sub>		-	46.8	90	
Fall Time <sup>3,4</sup>	t <sub>f</sub>		-	20.4	40	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V, F=1MHz	-	1090	2180	pF
Output Capacitance	C <sub>oss</sub>		-	100	200	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	76	150	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	-	16	-	Ω
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	I <sub>S</sub>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	-	-	-4.6	A
Pulsed Source Current	I <sub>SM</sub>		-	-	-9.2	A
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A, T <sub>J</sub> =25°C	-	-	-1	V
Reverse Recovery Time	t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-4A di/dt=100A/μs T <sub>J</sub> =25°C	-	91.8	-	nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	51.3	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.1mH, I<sub>AS</sub>=27A, R<sub>G</sub>=25Ω, starting T<sub>J</sub>=25°C.
3. Pulse test: pulse width ≤300us, duty cycle ≤2%.
4. Essentially independent of operating temperature.

### Typical Electrical and Thermal Characteristic Curves

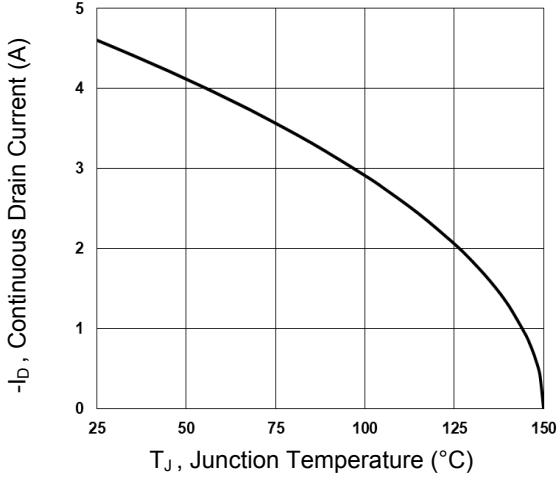


Figure 1. Continuous Drain Current vs.  $T_J$

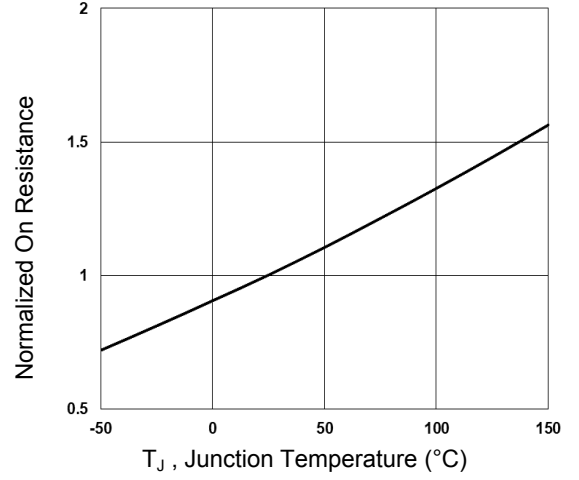


Figure 2. Normalized  $R_{DSON}$  vs.  $T_J$

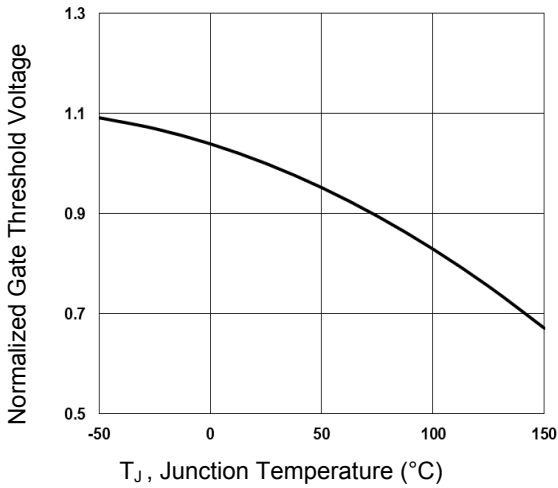


Figure 3. Normalized  $V_{th}$  vs.  $T_J$

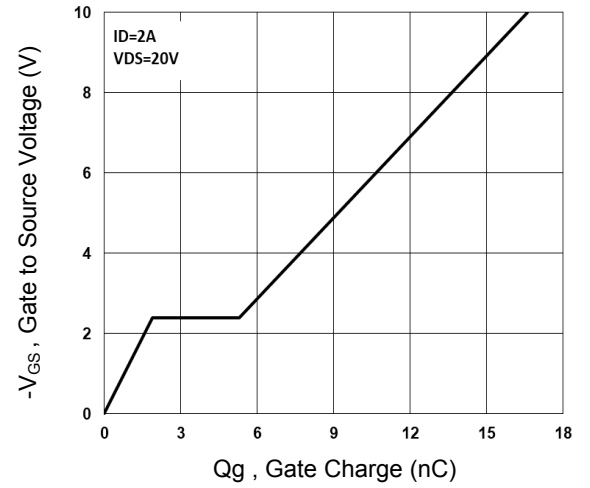


Figure 4. Gate Charge Characteristics

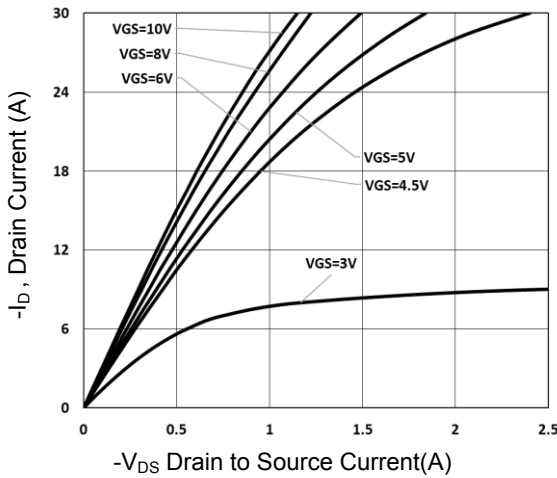


Figure 5. Typical Output Characteristics

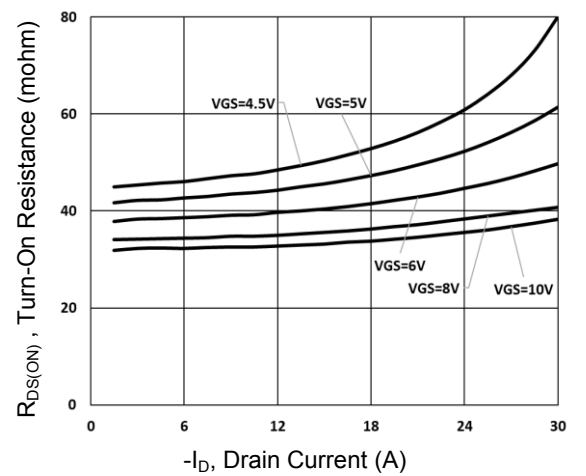


Figure 6. Turn-On Resistance vs.  $I_D$

### Typical Electrical and Thermal Characteristic Curves

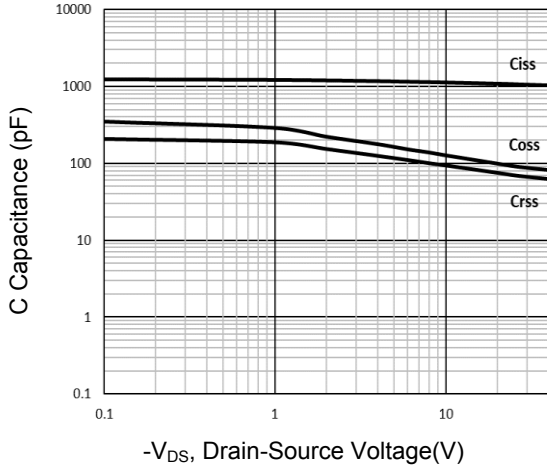


Figure 7. Capacitance vs.  $V_{DS}$

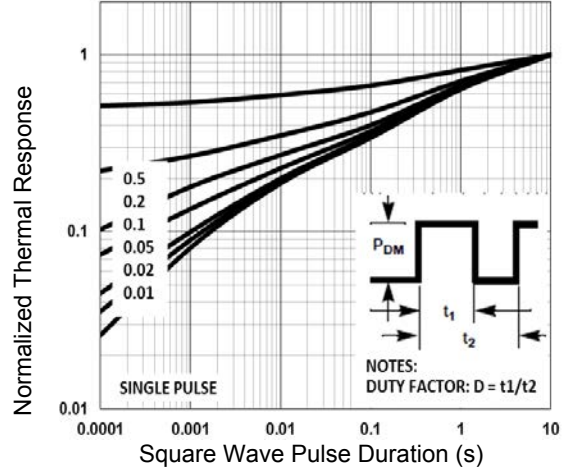


Figure 8. Normalized Transient Impedance

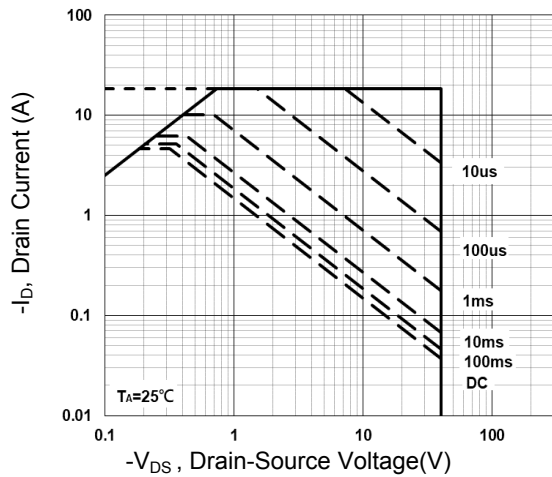


Figure 9. Safe Operation Area

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

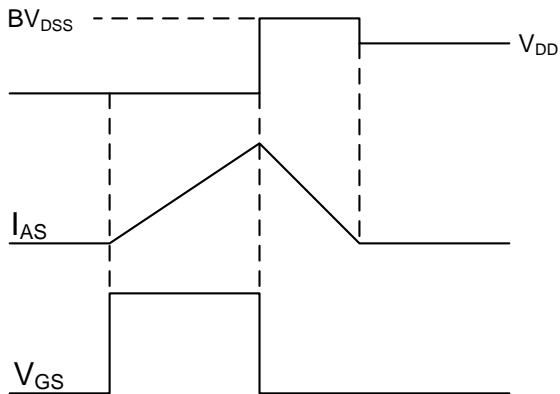


Figure 11. EAS Waveform

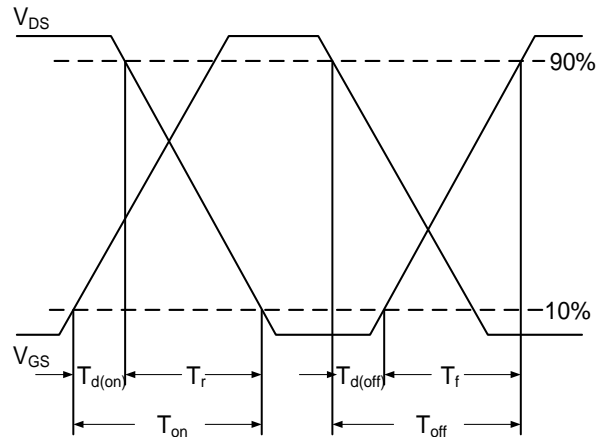
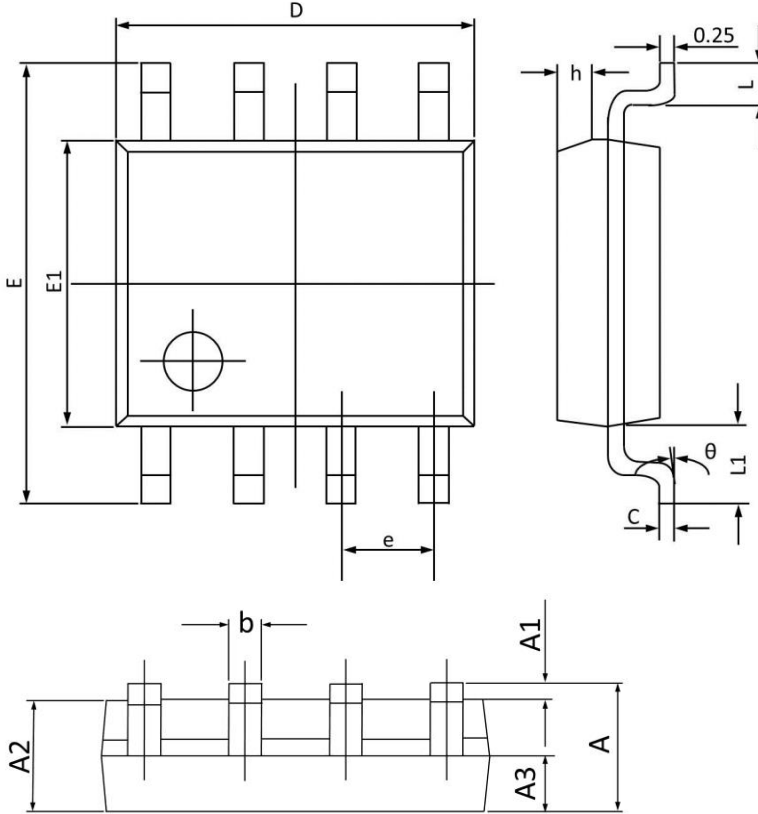


Figure 10. Switching Time Waveform

**Package Outline Dimensions (SOP-8)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
<b>A</b>	1.350	1.750	0.053	0.068
<b>A1</b>	0.100	0.250	0.004	0.009
<b>A2</b>	1.300	1.500	0.052	0.059
<b>A3</b>	0.600	0.700	0.024	0.027
<b>b</b>	0.390	0.480	0.016	0.018
<b>c</b>	0.210	0.260	0.009	0.010
<b>D</b>	4.700	5.100	0.186	0.200
<b>E</b>	5.800	6.200	0.229	0.244
<b>E1</b>	3.700	4.100	0.146	0.161
<b>e</b>	1.270(BSC)		0.050(BSC)	
<b>h</b>	0.250	0.500	0.010	0.019
<b>L</b>	0.500	0.800	0.019	0.031
<b>L1</b>	1.050(BSC)		0.041(BSC)	
<b>theta</b>	0°	8°	0°	8°