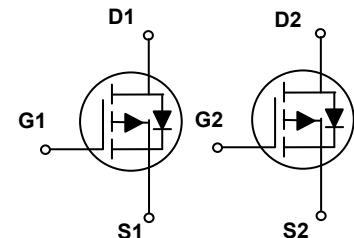
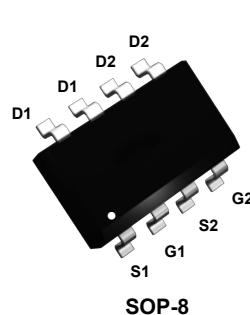


Main Product Characteristics

V_{DS}	-40V
$R_{DS(ON)}$	40mΩ
I_D	-4.6A



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 ($T_C=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_A=25^\circ C$)	I_D	-4.6	A
Drain Current-Continuous ($T_A=70^\circ C$)		-3.7	
Drain Current-Pulsed ¹	I_{DM}	-18.4	A
Single Pulse Avalanche Energy ²	E_{AS}	36.5	mJ
Single Pulse Avalanche Current ²	I_{AS}	-27	A
Power Dissipation ($T_c=25^\circ C$)	P_D	1.47	W
Power Dissipation-Derate above 25°C		0.011	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	85	°C/W
Operating Junction Temperature Range	T_J	-50 To +150	°C
Storage Temperature Range	T_{STG}	-50 To +150	°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}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=-250\mu\text{A}$	-40	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to 25°C , $I_{\text{D}}=-1\text{mA}$	-	-0.02	-	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	$I_{\text{DS}(\text{SS})}$	$V_{\text{DS}}=-40\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	-1	μA
		$V_{\text{DS}}=-32\text{V}, V_{\text{GS}}=0\text{V}, T_J=125^\circ\text{C}$	-	-	-10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-2.5\text{A}$	-	33	40	$\text{m}\Omega$
		$V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-2.5\text{A} (T_J=125^\circ\text{C})$	-	47.5	-	
		$V_{\text{GS}}=-4.5\text{V}, I_{\text{D}}=-2\text{A}$	-	46	65	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=-250\mu\text{A}$	-1.2	-1.8	-2.5	V
$V_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta V_{\text{GS}(\text{th})}$		-	4.18	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	g_{fs}	$V_{\text{DS}}=-10\text{V}, I_{\text{D}}=-1\text{A}$	-	4	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{\text{DS}}=-20\text{V}, I_{\text{D}}=-2\text{A}$ $V_{\text{GS}}=-10\text{V}$	-	16.2	32	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	1.9	4	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	3.4	6.5	
Turn-On Delay Time ^{3,4}	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=-20\text{V}, R_{\text{G}}=6\Omega$ $V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-1\text{A}$	-	12	24	nS
Rise Time ^{3,4}	t_r		-	13.2	26	
Turn-Off Delay Time ^{3,4}	$t_{\text{d}(\text{off})}$		-	46.8	90	
Fall Time ^{3,4}	t_f		-	20.4	40	
Input Capacitance	C_{iss}	$V_{\text{DS}}=-20\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	1090	2180	pF
Output Capacitance	C_{oss}		-	100	200	
Reverse Transfer Capacitance	C_{rss}		-	76	150	
Gate Resistance	R_g	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$	-	16	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_s	$V_G=V_D=0\text{V},$ Force Current	-	-	-4.6	A
Pulsed Source Current	I_{SM}		-	-	-9.2	A
Diode Forward Voltage	V_{SD}	$V_{\text{GS}}=0\text{V}, I_{\text{S}}=-1\text{A}, T_J=25^\circ\text{C}$	-	-	-1	V
Reverse Recovery Time	t_{rr}	$V_{\text{GS}}=0\text{V}, I_{\text{S}}=-4\text{A}$ $dI/dt=100\text{A}/\mu\text{s}$ $T_J=25^\circ\text{C}$	-	91.8	-	nS
Reverse Recovery Charge	Q_{rr}		-	51.3	-	nC

Note:

- Repetitive rating: Pulsed width limited by maximum junction temperature.
- $V_{\text{DD}}=25\text{V}, V_{\text{GS}}=10\text{V}, L=0.1\text{mH}, I_{\text{AS}}=27\text{A}, R_{\text{G}}=25\Omega$, starting $T_J=25^\circ\text{C}$.
- Pulse test: pulse width $\leq 300\text{us}$, duty cycle $\leq 2\%$.
- Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

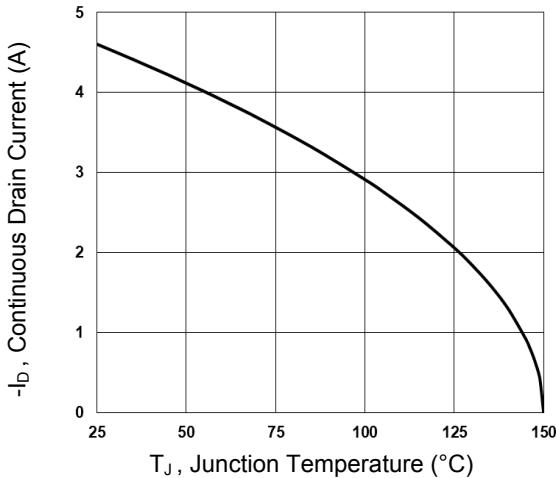


Figure 1. Continuous Drain Current vs. T_J

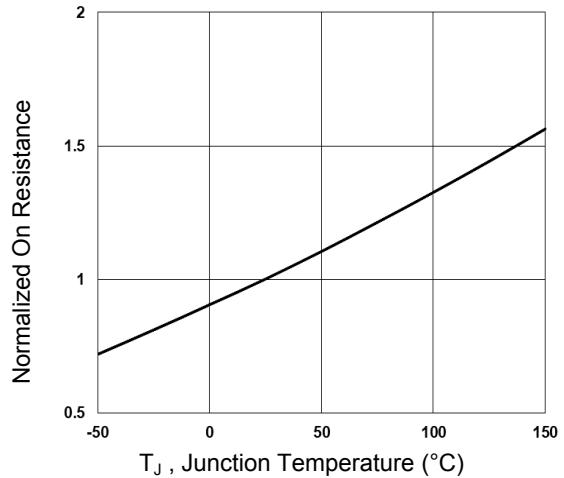


Figure 2. Normalized R_{DS(on)} vs. T_J

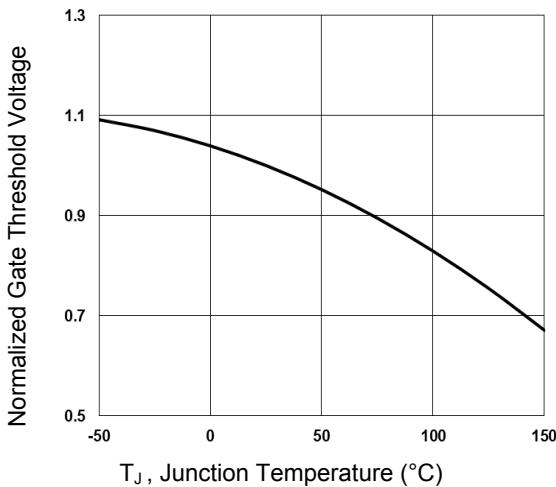


Figure 3. Normalized V_{th} vs. T_J

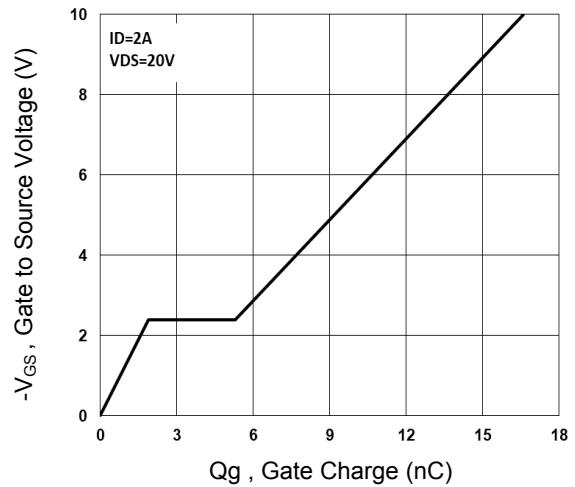


Figure 4. Gate Charge Characteristics

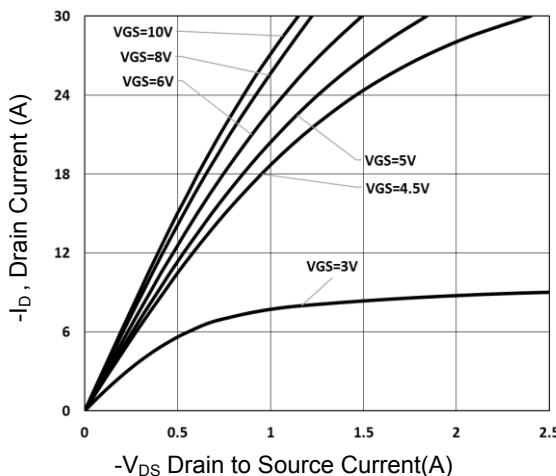


Figure 5. Typical Output Characteristics

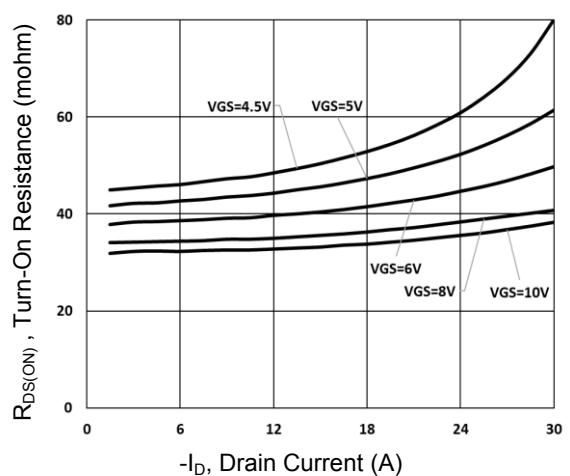


Figure 6. Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

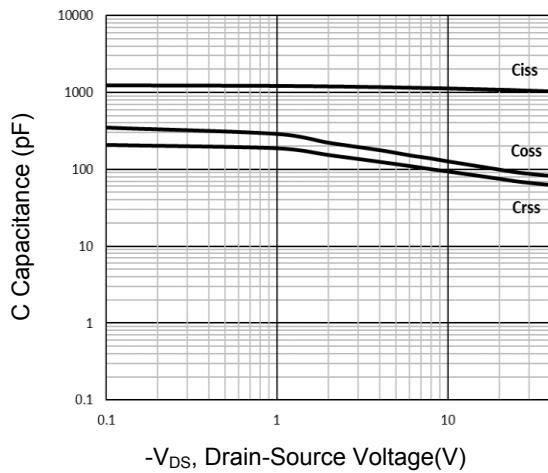


Figure 7. Capacitance vs. V_{DS}

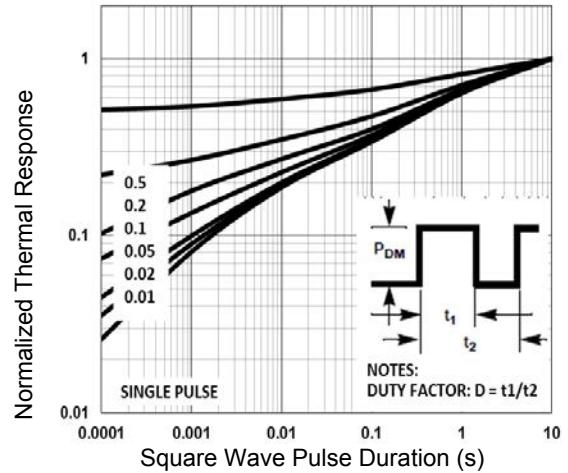


Figure 8. Normalized Transient Impedance

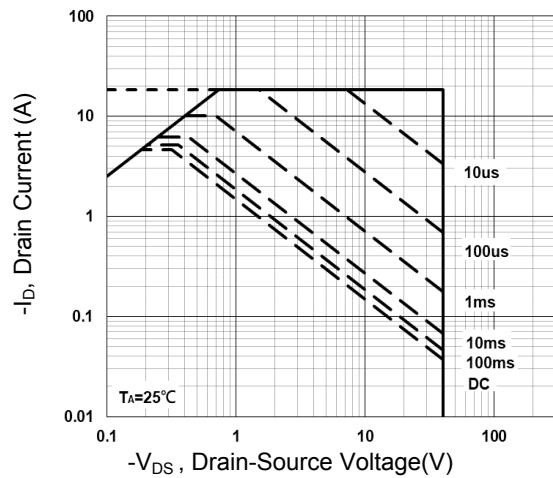


Figure 9. Safe Operation Area

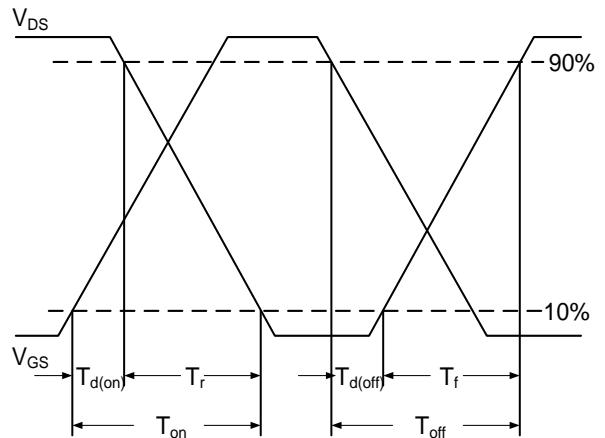


Figure 10. Switching Time Waveform

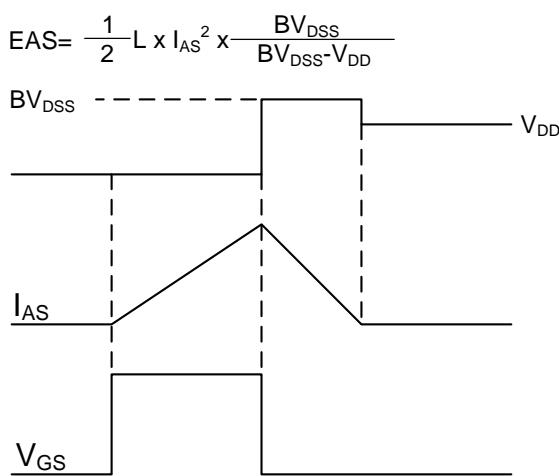
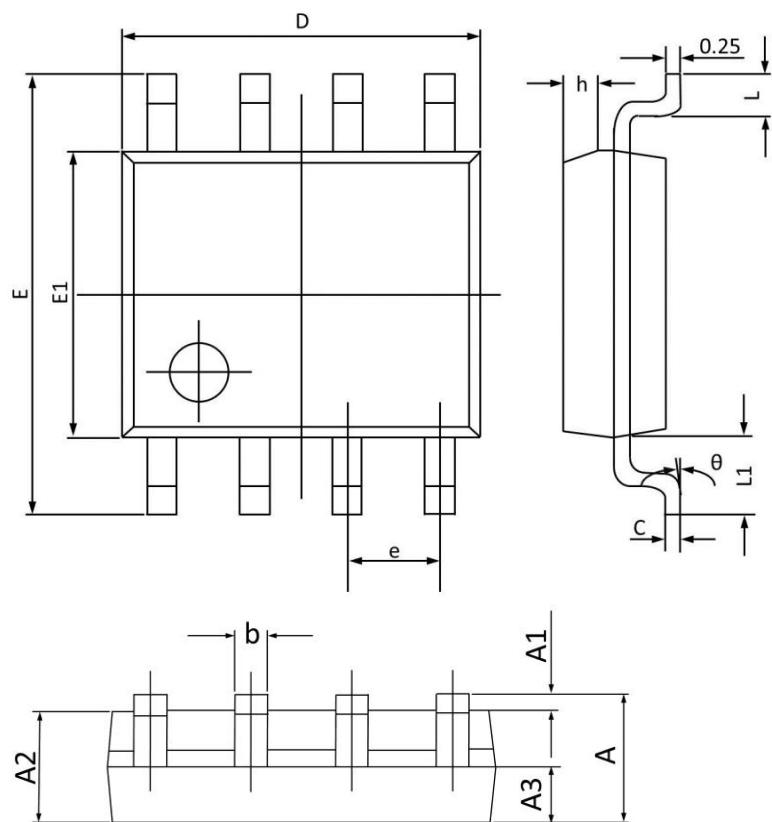


Figure 11. EAS Waveform

Package Outline Dimensions (SOP-8)



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