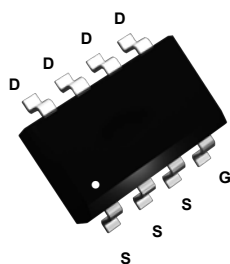
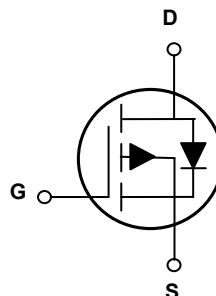


Main Product Characteristics

$V_{(BR)DSS}$	-60V
$R_{DS(ON)}$	30m Ω
I_D	-8.5A



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 GSFQ6903 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}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_c=25^\circ\text{C}$)	I_D	-8.5	A
Drain Current-Continuous ($T_c=100^\circ\text{C}$)		-5.4	
Drain Current-Pulsed ¹	I_{DM}	-34	A
Power Dissipation ($T_c=25^\circ\text{C}$)	P_D	4.1	W
Power Dissipation-Derate above 25°C		0.033	W/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	30	$^\circ\text{C}/\text{W}$
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
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-60	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-60V, V _{GS} =0V, T _J =25°C	-	-	-1	uA
		V _{DS} =-48V, V _{GS} =0V, T _J =125°C	-	-	-10	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-8A	-	23	30	mΩ
		V _{GS} =-4.5V, I _D =-6A	-	28	40	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =-250uA	-1	-1.6	-2.5	V
Forward Transconductance	g _{fs}	V _{DS} =-10V, I _D =-3A	-	18	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q _g	V _{DS} =-30V, I _D =-5A V _{GS} =-10V,	-	43.8	88	nC
Gate-Source Charge ^{2,3}	Q _{gs}		-	4.6	9	
Gate-Drain Charge ^{2,3}	Q _{gd}		-	8.3	17	
Turn-On Delay Time ^{2,3}	t _{d(on)}	V _{DD} =-30V, R _G =6Ω, V _{GS} =-10V, I _D =-1A	-	25	50	nS
Rise Time ^{2,3}	t _r		-	13.8	28	
Turn-Off Delay Time ^{2,3}	t _{d(off)}		-	148	290	
Fall Time ^{2,3}	t _f		-	51	100	
Input Capacitance	C _{iss}	V _{DS} =-25V, V _{GS} =0V, F=1MHz	-	2595	3900	pF
Output Capacitance	C _{oss}		-	162	240	
Reverse Transfer Capacitance	C _{rss}		-	115	170	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _s	V _G =V _D =0V, Force Current	-	-	-8.5	A
Pulsed Source Current	I _{SM}		-	-	-17	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _s =1A, T _J =25°C	-	-	-1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

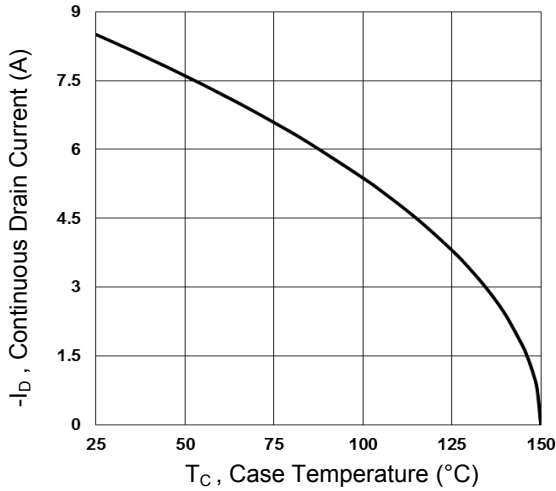


Figure 1. Continuous Drain Current vs. T_c

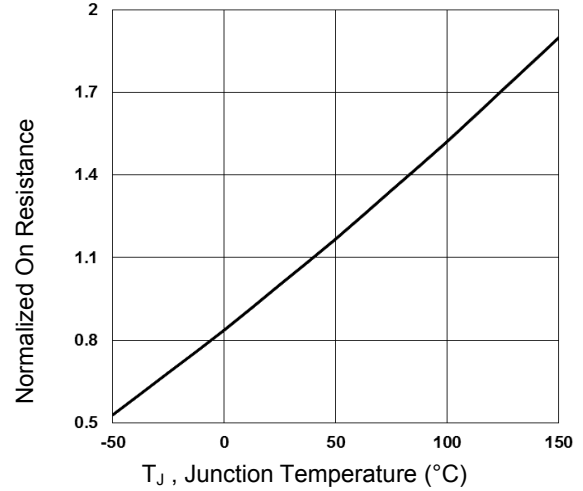


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

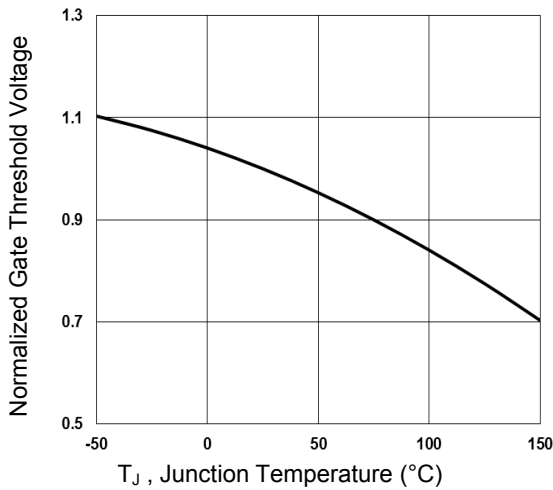


Figure 3. Normalized V_{th} vs. T_J

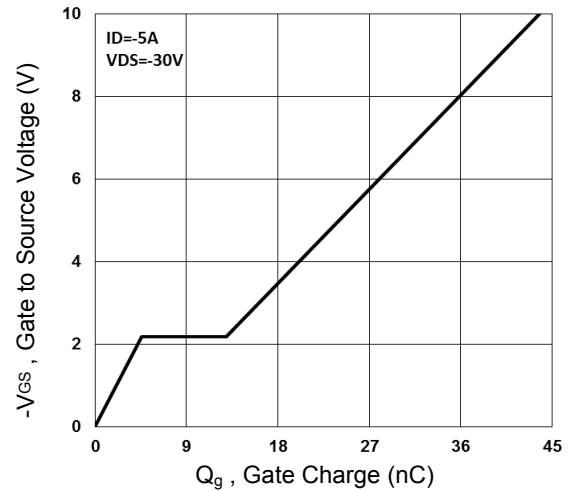


Figure 4. Gate Charge Waveform

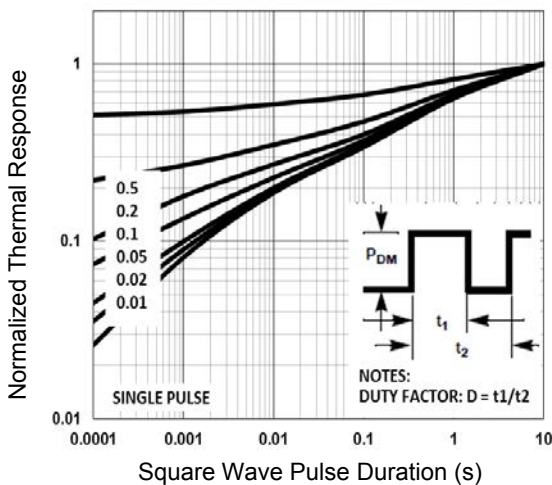


Figure 5. Normalized Transient Impedance

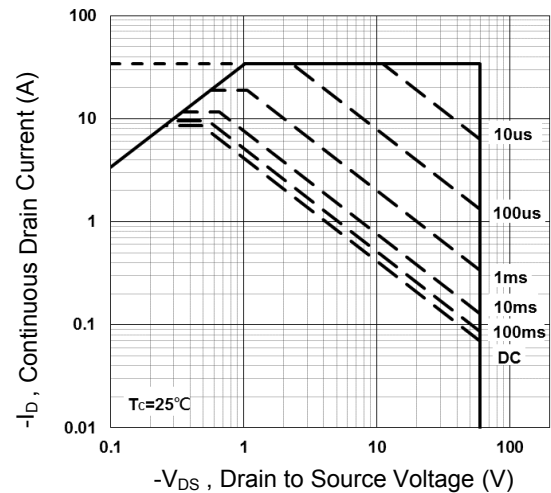


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

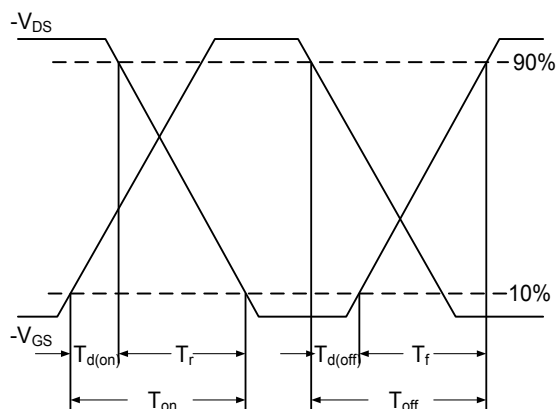


Figure 7. Switching Time Waveform

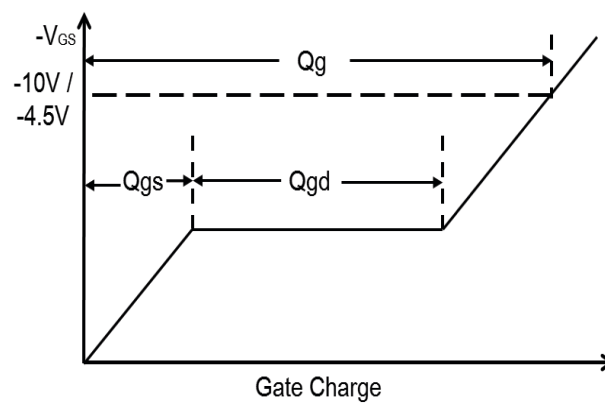
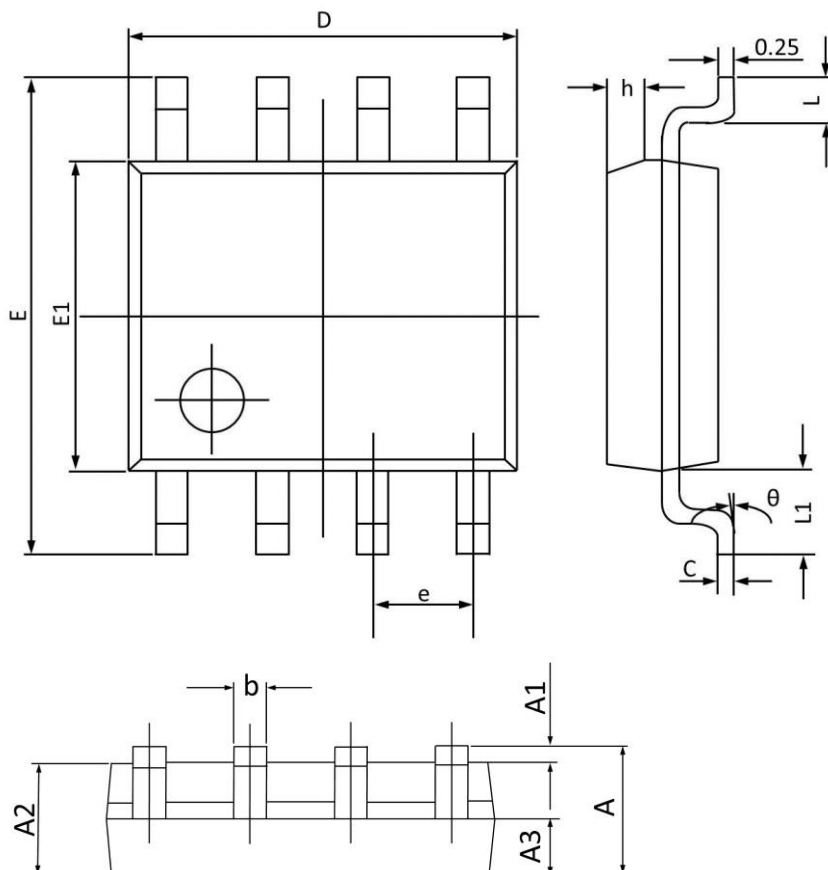


Figure 8. Gate Charge Waveform

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°