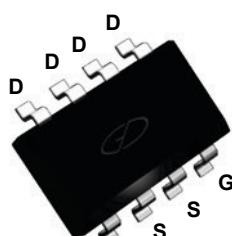
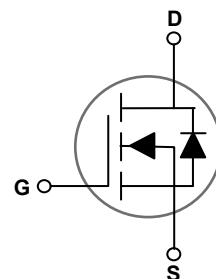


## Main Product Characteristics

BV <sub>DSS</sub>	65V
R <sub>DS(ON)</sub>	6.5mΩ
I <sub>D</sub>	12A



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 GSGQ6982 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	Rating	Unit
Drain-Source Voltage	V <sub>DS</sub>	65	V
Gate-Source Voltage	V <sub>GS</sub>	+20/-12	V
Drain Current-Continuous ( $T_A=25^\circ\text{C}$ )	I <sub>D</sub>	12	A
Drain Current-Continuous ( $T_A=70^\circ\text{C}$ )		9.6	A
Drain Current-Pulsed <sup>1</sup>	I <sub>DM</sub>	48	A
Single Pulse Avalanche Energy <sup>2</sup>	E <sub>AS</sub>	140	mJ
Single Pulse Avalanche Current <sup>2</sup>	I <sub>AS</sub>	53	A
Power Dissipation ( $T_A=25^\circ\text{C}$ )	P <sub>D</sub>	1.47	W
Power Dissipation – Derate above 25°C		0.011	W/°C
V <sub>DS</sub> Spike Voltage ( $\leq 100\text{ns}$ ) <sup>5</sup>	V <sub>SPIKE</sub>	80	V
Thermal Resistance Junction to Ambient	R <sub>θJA</sub>	85	°C/W
Operating Junction Temperature Range	T <sub>J</sub>	-50 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-50 to +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	65	-	-	V
$\text{BV}_{\text{DSS}}$ Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_{\text{D}}=1\text{mA}$	-	0.03	-	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	$I_{\text{DSS}}$	$V_{\text{DS}}=60\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	$\mu\text{A}$
		$V_{\text{DS}}=48\text{V}, V_{\text{GS}}=0\text{V}, T_J=85^\circ\text{C}$	-	-	10	$\mu\text{A}$
Gate-Source Leakage Current	$I_{\text{GS}}$	$V_{\text{GS}}=20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	100	$\text{nA}$
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=8\text{A}$	-	5.5	6.5	$\text{m}\Omega$
		$V_{\text{GS}}=4.5\text{V}, I_{\text{D}}=6\text{A}$	-	8.5	11	$\text{m}\Omega$
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=250\mu\text{A}$	1	1.6	2.5	V
$V_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta V_{\text{GS}(\text{th})}$		-	-5.5	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	$g_{\text{f}}$	$V_{\text{DS}}=10\text{V}, I_{\text{D}}=3\text{A}$	-	10	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3, 4</sup>	$Q_g$	$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=10\text{V}, I_{\text{D}}=10\text{A}$	-	34.7	70	nC
Gate-Source Charge <sup>3, 4</sup>	$Q_{\text{gs}}$		-	4.9	10	
Gate-Drain Charge <sup>3, 4</sup>	$Q_{\text{gd}}$		-	11.1	22	
Turn-On Delay Time <sup>3, 4</sup>	$T_{\text{d}(\text{on})}$	$V_{\text{DD}}=30\text{V}, V_{\text{GS}}=10\text{V}, R_{\text{G}}=6\Omega, I_{\text{D}}=1\text{A}$	-	10.2	21	nS
Rise Time <sup>3, 4</sup>	$T_r$		-	16	32	
Turn-Off Delay Time <sup>3, 4</sup>	$T_{\text{d}(\text{off})}$		-	42	84	
Fall Time <sup>3, 4</sup>	$T_f$		-	38	76	
Input Capacitance	$C_{\text{iss}}$	$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	1910	3800	pF
Output Capacitance	$C_{\text{oss}}$		-	520	1040	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	30	60	
Gate Resistance	$R_g$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$	-	1.2	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_s$	$V_{\text{G}}=V_{\text{D}}=0\text{V}, \text{Force Current}$	-	-	12	A
Pulsed Source Current	$I_{\text{SM}}$		-	-	24	A
Diode Forward Voltage	$V_{\text{SD}}$	$V_{\text{GS}}=0\text{V}, I_{\text{s}}=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	$t_{\text{rr}}$	$V_{\text{GS}}=10\text{V}, I_{\text{s}}=10\text{A}, \frac{dI}{dt}=100\text{A}/\mu\text{s}, T_J=25^\circ\text{C}$	-	48.4	-	nS
Reverse Recovery Charge	$Q_{\text{rr}}$		-	54.2	-	nC

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2.  $V_{\text{DD}}=25\text{V}, V_{\text{GS}}=10\text{V}, L=0.1\text{mH}, I_{\text{AS}}=53\text{A}, R_{\text{G}}=25\Omega$ , Starting  $T_J=25^\circ\text{C}$ .
3. Pulse test, pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
4. Essentially independent of operating temperature.
5. The spike duty cycle 1% max., limited by  $T_{J(\text{max})}=125^\circ\text{C}$ .

## Typical Electrical and Thermal Characteristic Curves

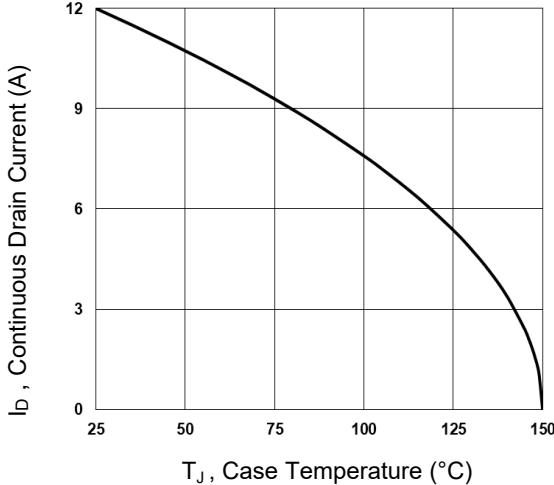


Figure 1. Continuous Drain Current vs. T<sub>J</sub>

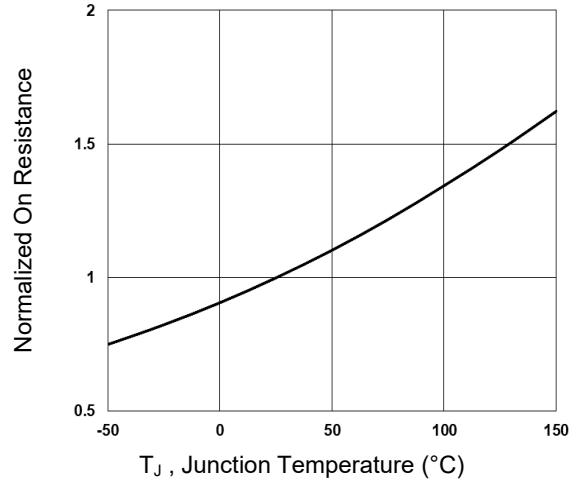


Figure 2. Normalized R<sub>DS(on)</sub> vs. T<sub>J</sub>

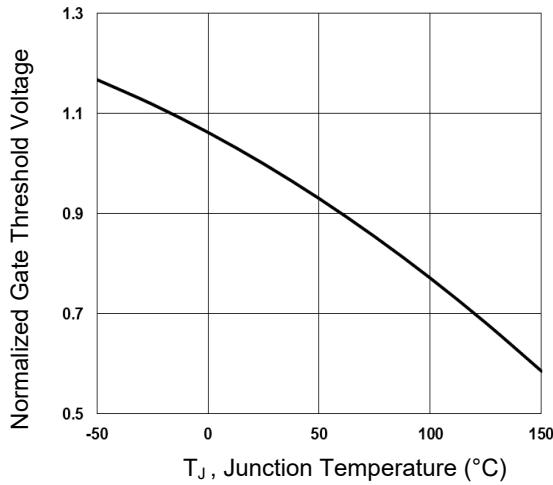


Figure 3. Normalized V<sub>th</sub> vs. T<sub>J</sub>

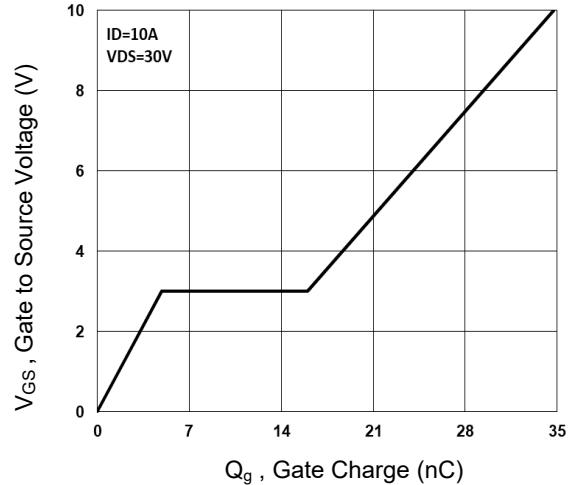


Figure 4. Gate Charge Waveform

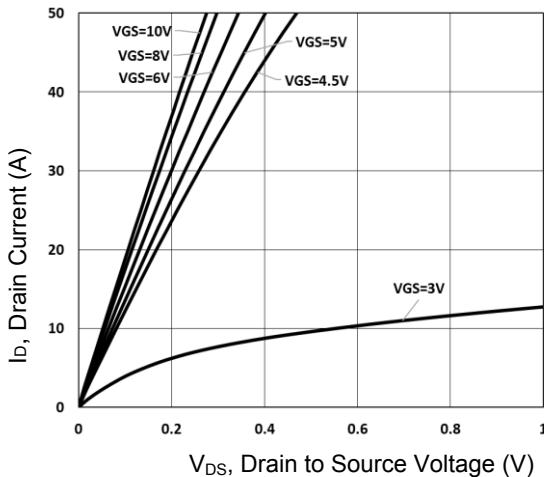


Figure 5. Typical Output Characteristics

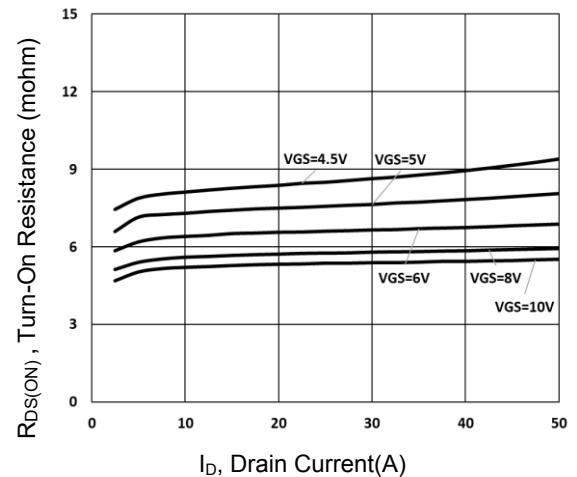


Figure 6. Turn-On Resistance vs. I<sub>D</sub>

## Typical Electrical and Thermal Characteristic Curves

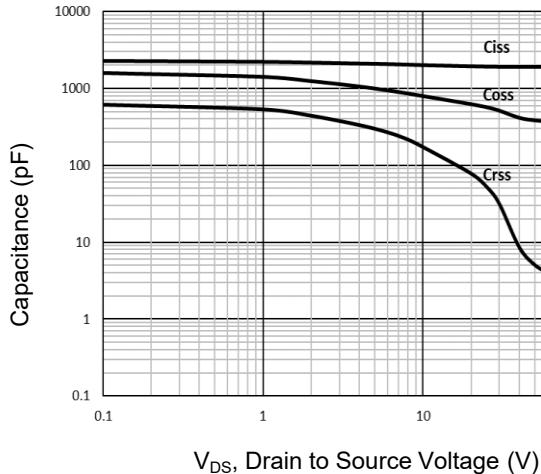


Figure 7. Capacitance Characteristics

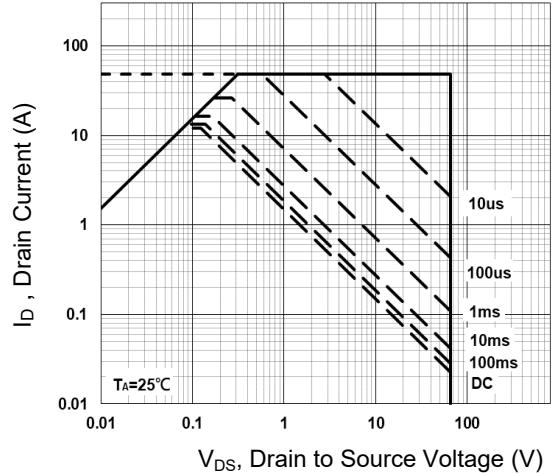


Figure 8. Maximum Safe Operation Area

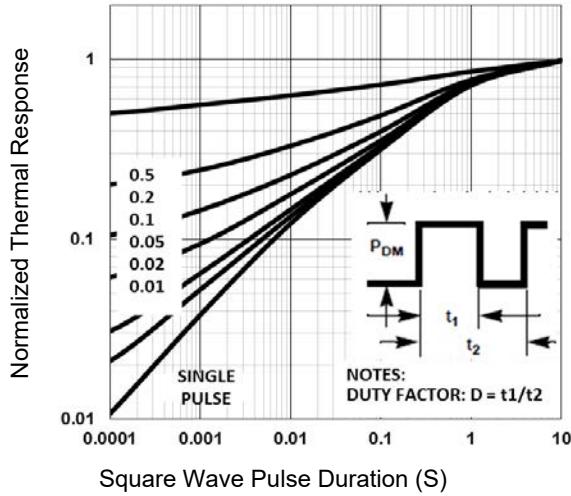


Figure 9. Normalized Transient Impedance

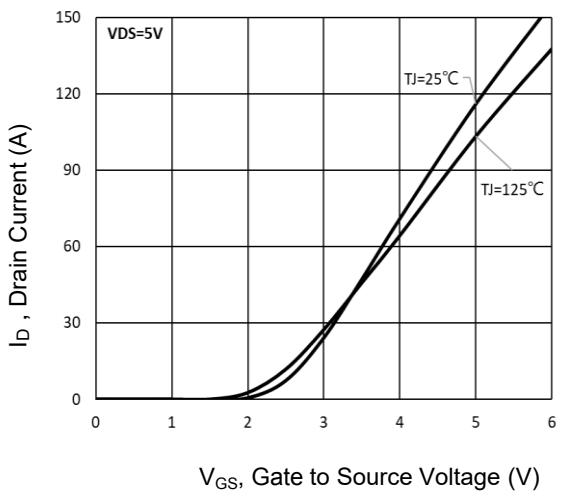


Figure 10. Transfer Characteristic

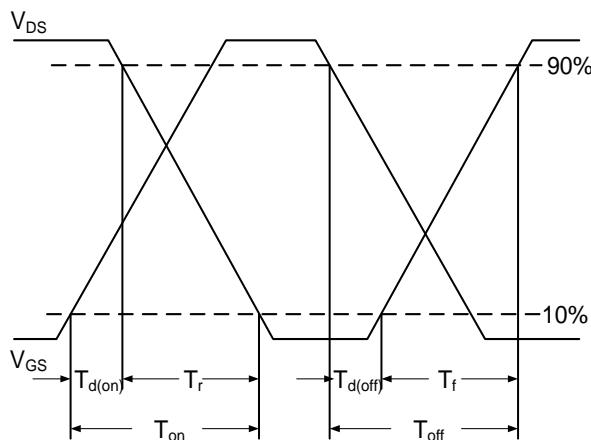


Figure 11. Switching Time Waveform

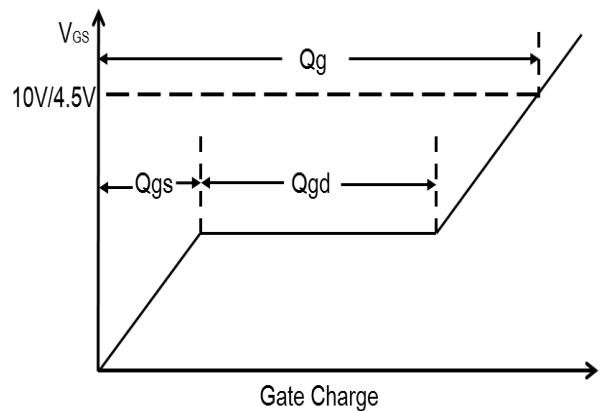
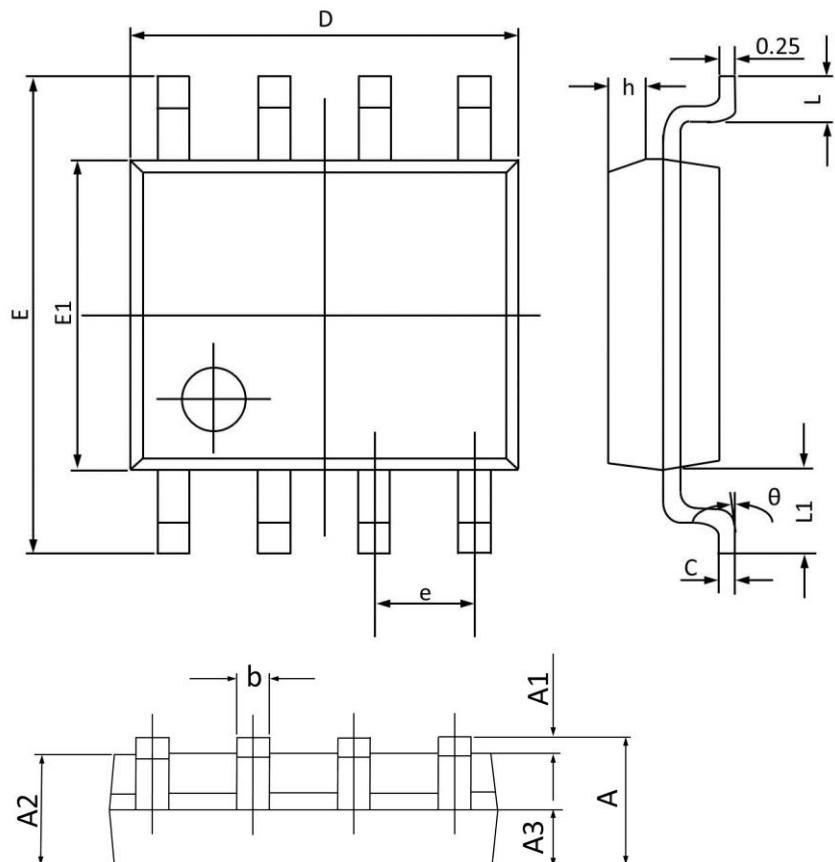


Figure 12. Gate Charge Waveform

### 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°