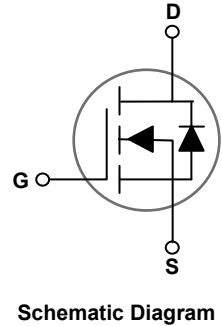
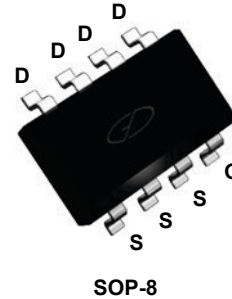


Main Product Characteristics

BV_{DSS}	65V
$R_{DS(ON)}$	16m Ω
I_D	7.4A



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 GSGQ6988 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_{DS}	65	V
Gate-Source Voltage	V_{GS}	+20/-12	V
Drain Current – Continuous ($T_A=25^\circ\text{C}$)	I_D	7.4	A
Drain Current – Continuous ($T_A=70^\circ\text{C}$)		5.9	A
Drain Current – Pulsed ¹	I_{DM}	29.6	A
Single Pulse Avalanche Energy ²	E_{AS}	9.1	mJ
Single Pulse Avalanche Current ²	I_{AS}	13.5	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	1.47	W
Power Dissipation – Derate above 25°C		0.01	W/ $^\circ\text{C}$
V_{DS} spike voltage ($\leq 100\text{ns}$) ⁵	V_{SPIKE}	80	V
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	85	$^\circ\text{C}/\text{W}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-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}	$V_{GS}=0V, I_D=250\mu A$	65	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=1mA$	-	0.03	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{DS}=48V, V_{GS}=0V,$ $T_J=85^\circ\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=20V, V_{DS}=0V$	-	-	100	nA
Static Drain-Source On-Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=3A$	-	13	16	m Ω
		$V_{GS}=10V,$ $I_D=3A (T_J=125^\circ\text{C})$	-	20	-	
		$V_{GS}=4.5V, I_D=2A$	-	23	30	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-5.1	-	$mV/^\circ\text{C}$
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=3A$	-	5	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{DS}=30V, I_D=3A,$ $V_{GS}=10V$	-	10.9	22	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	1.5	3	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	4.4	9	
Turn-On Delay Time ^{3,4}	$t_{d(on)}$	$V_{DD}=30V, R_G=3.3\Omega,$ $V_{GS}=10V, I_D=1A$	-	8	16	nS
Rise Time ^{3,4}	t_r		-	12	24	
Turn-Off Delay Time ^{3,4}	$t_{d(off)}$		-	25	50	
Fall Time ^{3,4}	t_f		-	18	36	
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V,$ $F=1MHz$	-	653	1300	pF
Output Capacitance	C_{oss}		-	192	380	
Reverse Transfer Capacitance	C_{rss}		-	27	60	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V,$ $F=1MHz$	-	0.3	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V,$	-	-	7.4	A
Pulsed Source Current ³	I_{SM}	Force Current	-	-	14.8	A
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=1A,$ $T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=5A,$ $di/dt=100A/\mu s,$	-	33.7	-	nS
Reverse Recovery Charge	Q_{rr}	$T_J=25^\circ\text{C}$	-	23.7	-	nC

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=13.5A, R_G=25\Omega, \text{Starting } T_J=25^\circ\text{C}$.
3. Pulse test, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.
5. The spike duty cycle 1% max. , limited by $T_{J(max)}=125^\circ\text{C}$.

Typical Electrical and Thermal Characteristic Curves

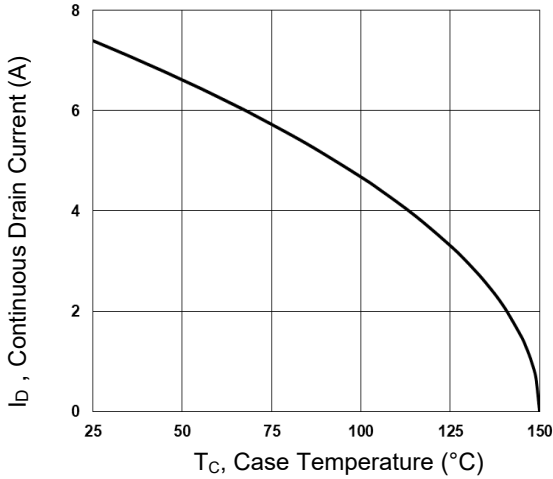


Figure 1. Continuous Drain Current vs. T_C

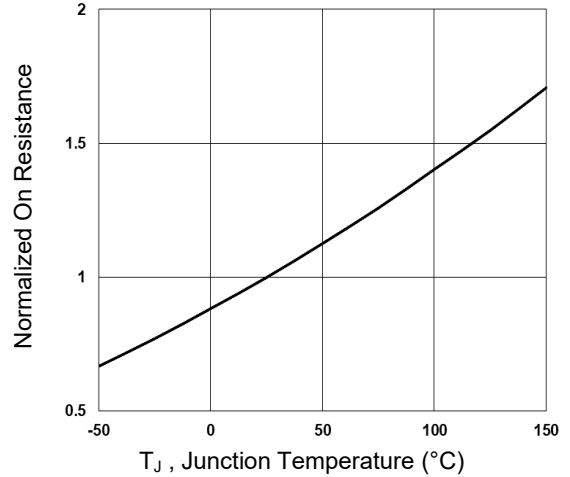


Figure 2. Normalized R_{DSON} vs. T_J

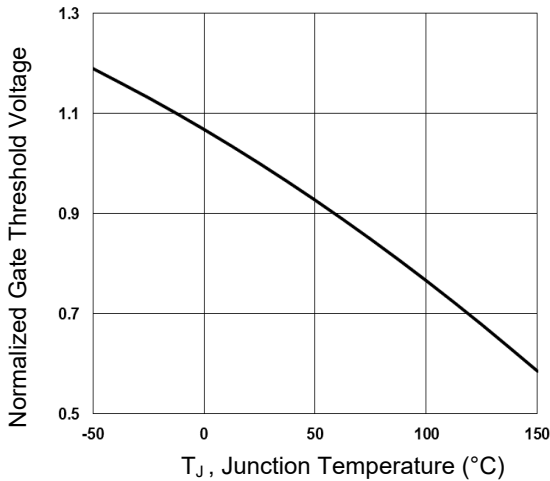


Figure 3. Normalized V_{th} vs. T_J

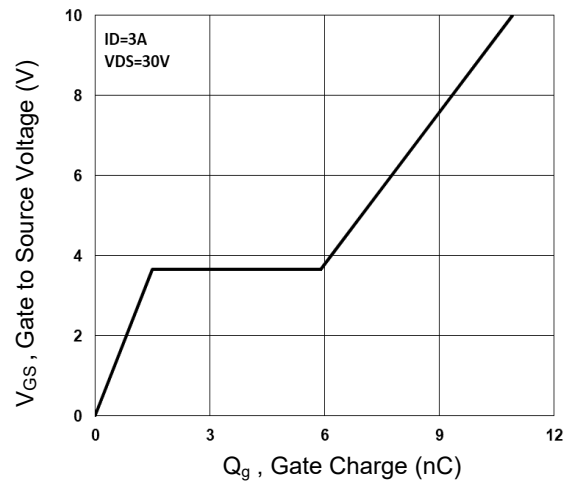


Figure 4. Gate Charge Waveform

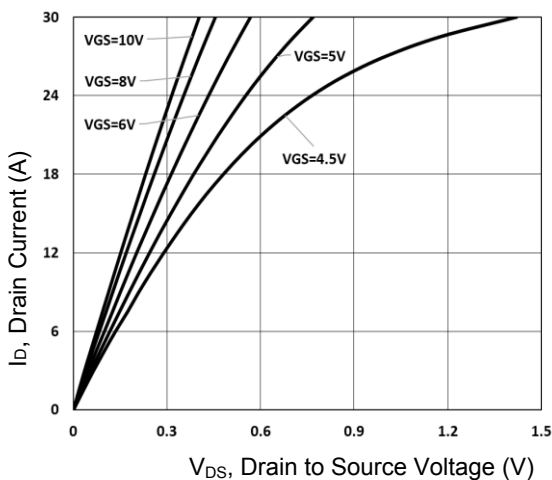


Figure 5. Typical Output Characteristics

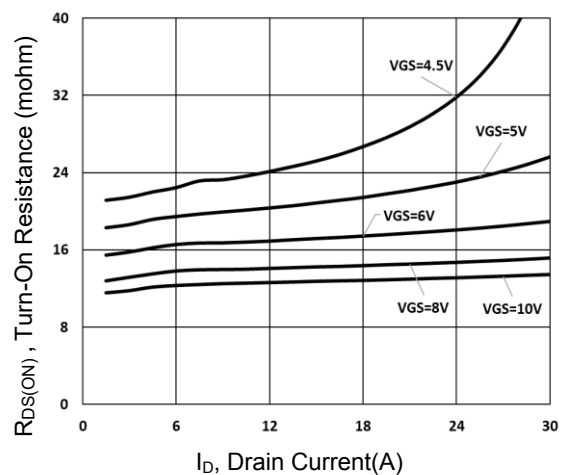


Figure 6. Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

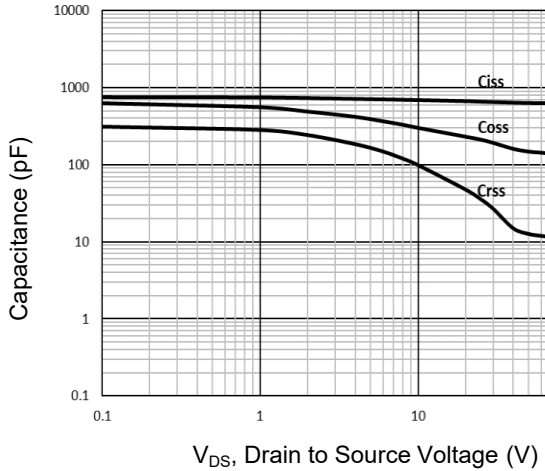


Figure 7. Capacitance Characteristics

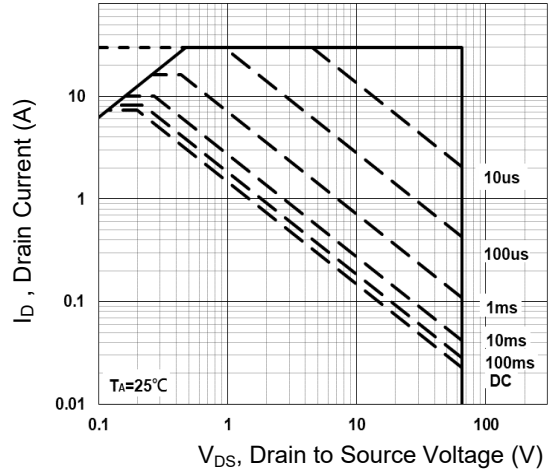


Figure 8. Maximum Safe Operation Area

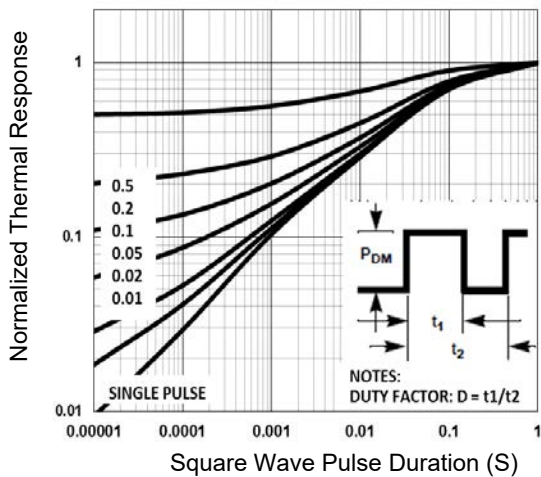


Figure 9. Normalized Transient Response

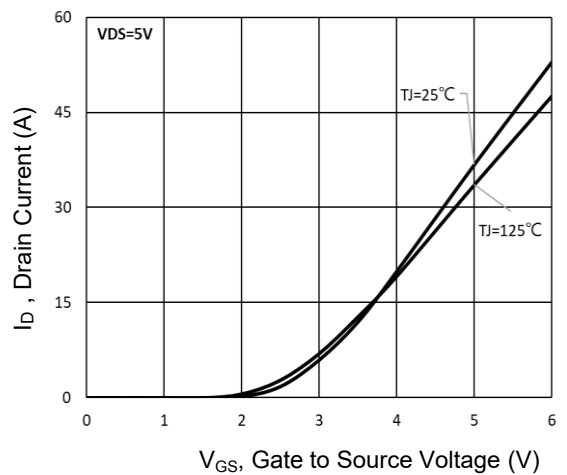


Figure 10. Transfer Characteristic

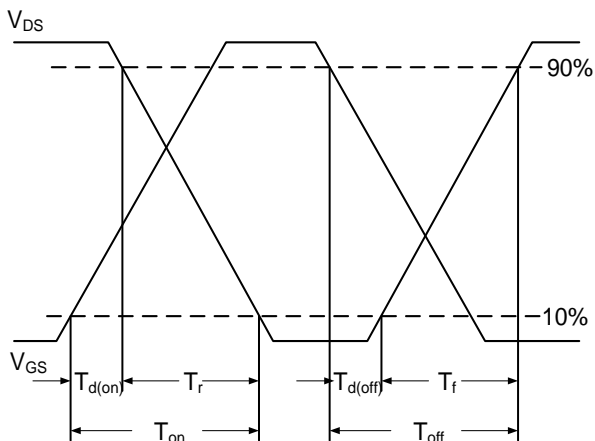


Figure 11. Switching Time Waveform

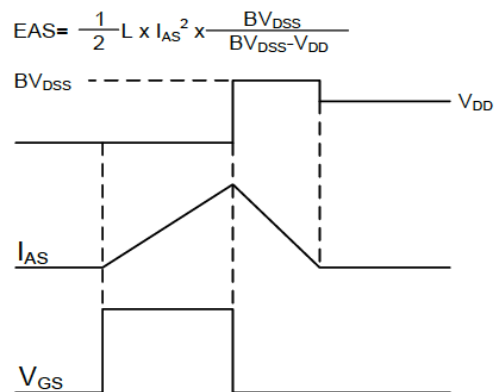
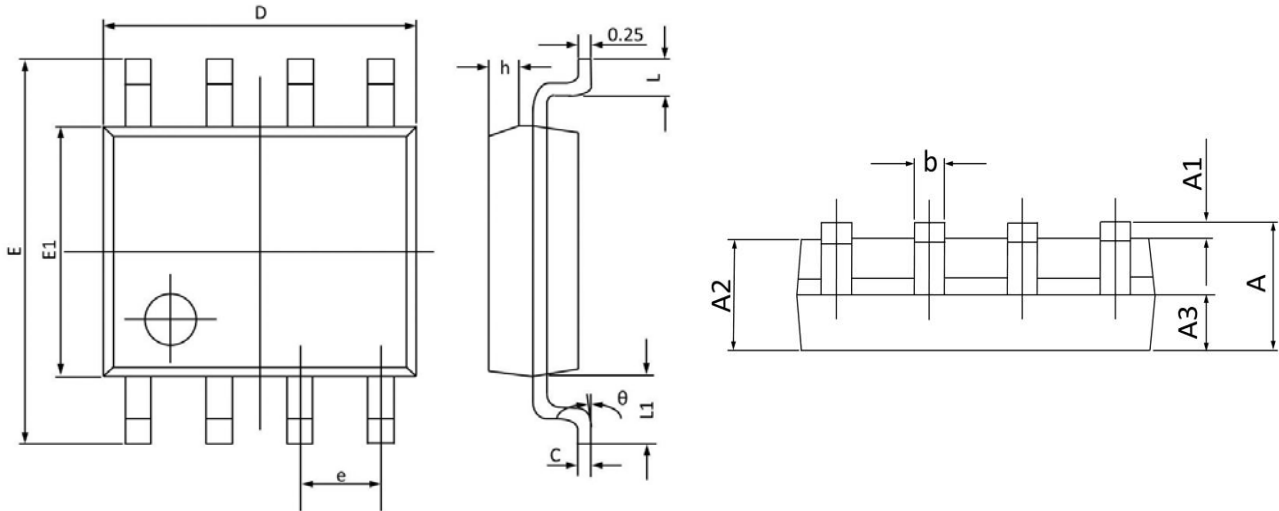


Figure 12. E_{AS} Waveform

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°

Order Information

Device	Package	Marking	Carrier	Reel Quantity
GSGQ6988	SOP-8	DS6988	Tape & Reel	3,000pcs