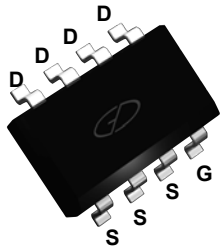
GOOD-ARK SEMICONDUCTOR

GSFQ1008

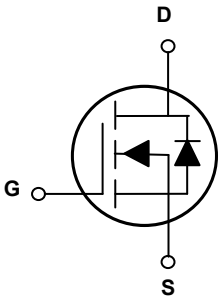
100V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	100V
$R_{DS(ON)}$	15mΩ
I_D	8A



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 GSFQ1008 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°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_A=25°C)	I_D	8	A
Drain Current-Continuous (T_A=70°C)		6.4	A
Drain Current-Pulsed[1]	I_{DM}	32	A
Single Pulse Avalanche Energy[2]	E_{AS}	72	mJ
Single Pulse Avalanche Current[2]	I_{AS}	38	A
Power Dissipation (T_A=25°C)	P_D	2	W
Power Dissipation-Derate Above 25°C		0.016	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	°C/W
Storage Temperature Range	T_{STG}	-55 To +150	°C
Operating Junction Temperature Range	T_J	-55 To +150	°C

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	100	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=80V , V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=80V , V_{GS}=0V, T_J=85°C	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
On Characteristics						
Static Drain-Source On-Resistance[3]	$R_{DS(ON)}$	V_{GS}=10V, I_D=5A	-	12.5	15	mΩ
		V_{GS}=4.5V, I_D=3A	-	16	21	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.2	1.6	2.5	V
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=3A	-	10	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DS}=50V, I_D=4A, V_{GS}=10V	-	14.5	22	nC
Gate-Source Charge[3,4]	Q_{gs}		-	1.5	3	
Gate-Drain Charge[3,4]	Q_{gd}		-	4.8	7.5	
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=50V, R_G=6Ω V_{GS}=10V, I_D=4A	-	4.8	7.2	nS
Rise Time[3,4]	t_r		-	12.5	19	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	27.6	42	
Fall Time[3,4]	t_f		-	8.2	13	
Input Capacitance	C_{lss}	V_{DS}=50V, V_{GS}=0V, F=1MHz	-	850	1300	pF
Output Capacitance	C_{oss}		-	190	285	
Reverse Transfer Capacitance	C_{rss}		-	6.5	10	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	-	0.9	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	8	A
Pulsed Source Current	I_{SM}		-	-	16	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A, T_J=25°C	-	-	1	V
Reverse Recovery Time	T_{rr}	V_R=100V, I_S=8A, di/dt=100A/μs, T_J=25°C	-	140	-	nS
Reverse Recovery Charge	Q_{rr}		-	180	-	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V,V_{GS}=10V,L=0.1mH,I_{AS}=38A.,R_G=25Ω, Starting T_J=25
3. Pulse test: pulse width≦ 300us , duty cycle≦2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

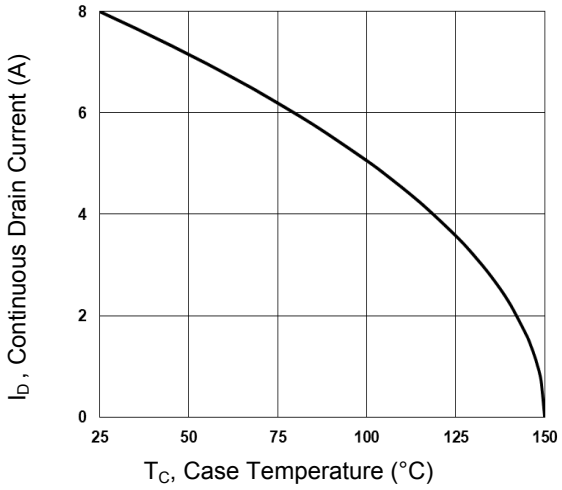


Figure 1. Continuous Drain Current vs. T_C

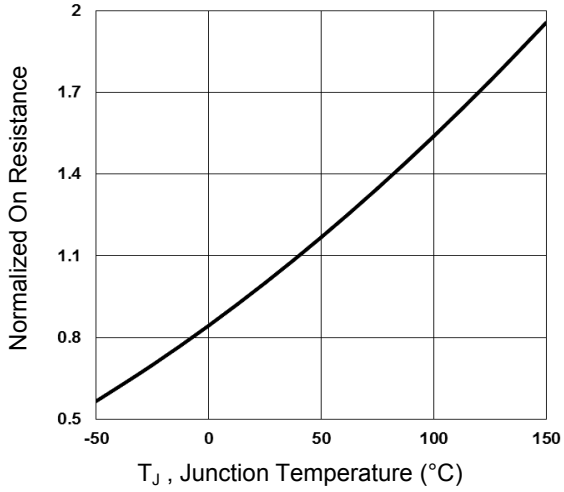


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

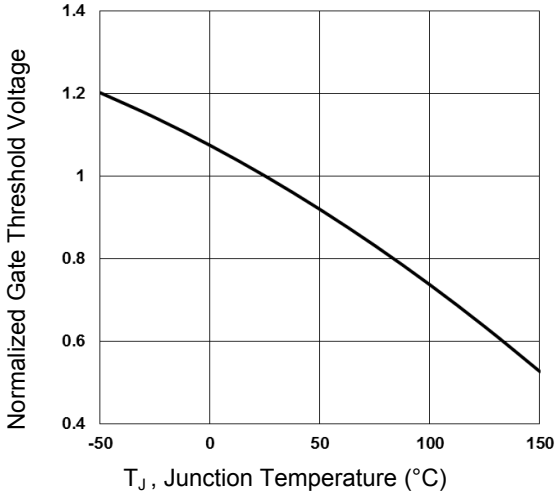


Figure 3. Normalized V_{th} vs. T_J

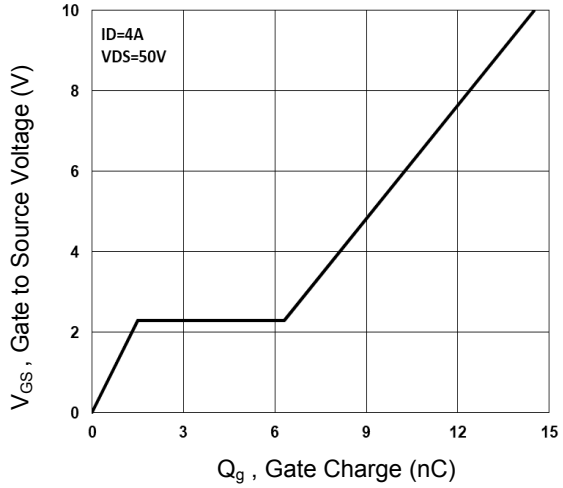


Figure 4. Gate Charge Characteristics

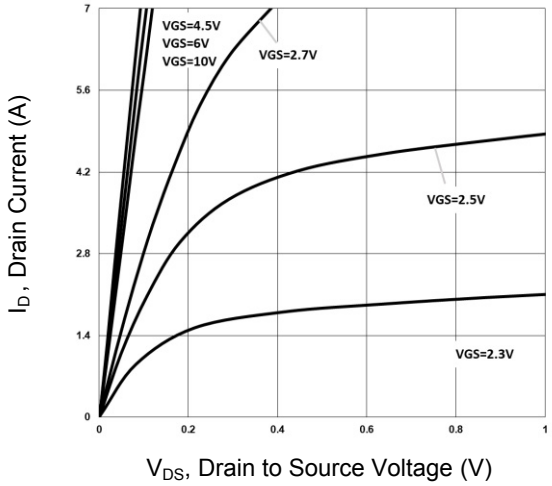


Figure 5. Typical Output Characteristics

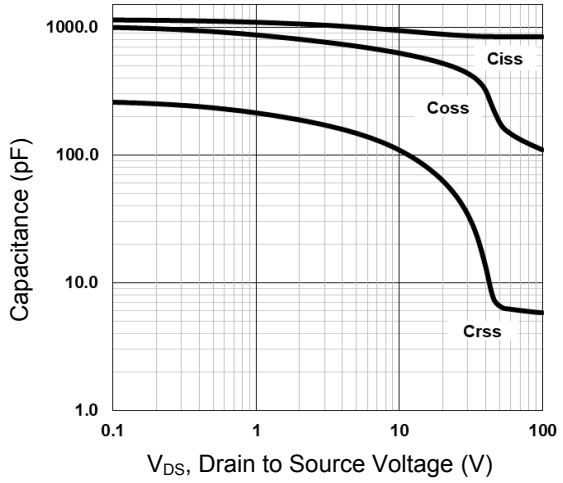


Figure 6. Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

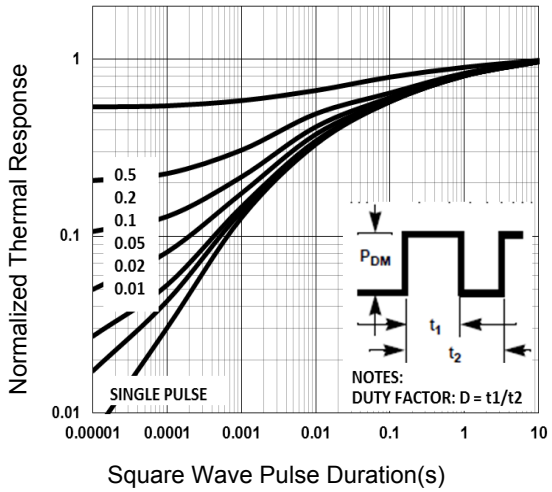


Figure 7. Normalized Transient Impedance

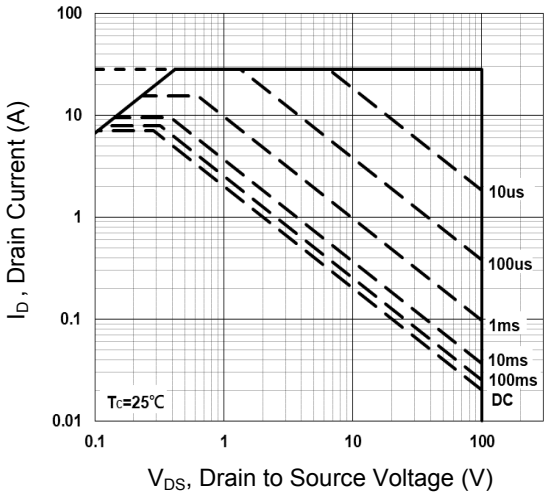
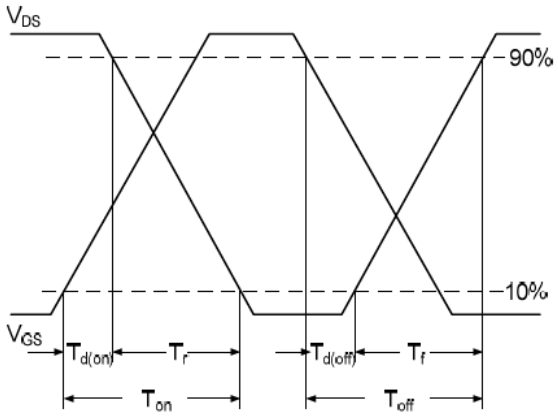
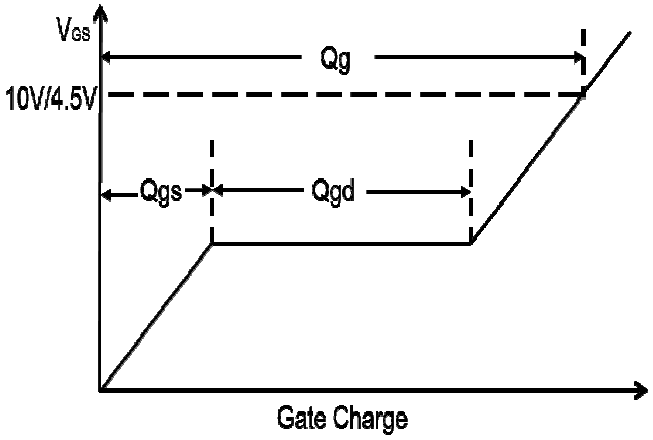


Figure 8. Maximum Safe Operation Area

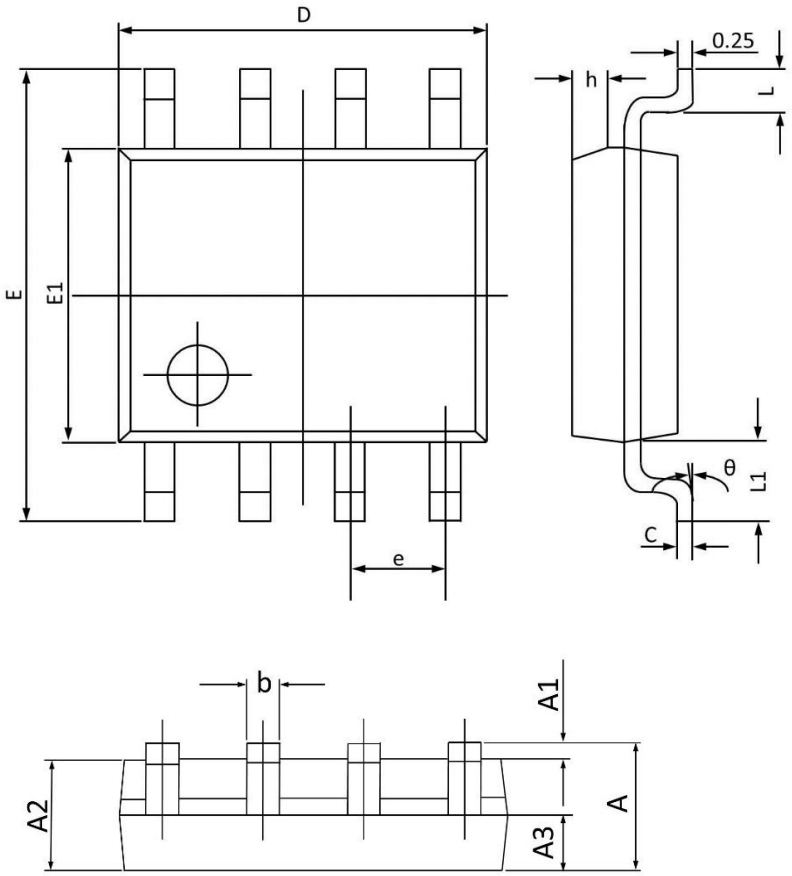


Firgure 9. Switching Time Waveform



Firgure 10. Gate Charge Waveform

Package Outline Dimensions (SOP-8)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.800	0.053	0.069
A1	0.050	0.250	0.002	0.010
A2	1.250	1.650	0.049	0.065
A3	0.500	0.700	0.020	0.028
b	0.300	0.510	0.012	0.020
c	0.150	0.260	0.006	0.010
D	4.700	5.100	0.185	0.201
E	5.800	6.200	0.228	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	0.020
L	0.400	1.000	0.016	0.039
L1	1.050(BSC)		0.041(BSC)	
θ	0°	8°	0°	8°