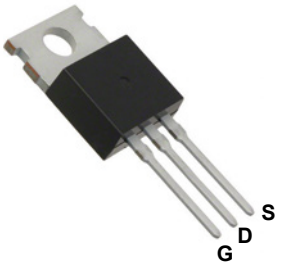
GOOD-ARK SEMICONDUCTOR

GSFH0980A

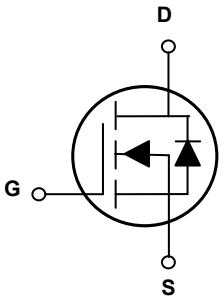
100V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	100V
$R_{DS(ON)}$	4.6mΩ
I_D	145A



TO-220



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 GSFH0980A 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	Max.	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	+20/-12	V
Drain Current-Continuous(T_C=25°C)	I_D	145	A
Drain Current-Continuous(T_C=100°C)		92	A
Drain Current-Pulsed[1]	I_{DM}	580	A
Single Pulse Avalanche Energy[2]	E_{AS}	605	mJ
Single Pulse Avalanche Current[2]	I_{AS}	110	A
Power Dissipation(T_C=25°C)	P_D	275	W
Power Dissipation – Derate above 25°C		2.22	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.45	°C/W
Storage Temperature Range	T_{STG}	-50 To +150	°C
Operating Junction Temperature Range	T_J	-50 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
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25C, I_D=1mA	-	0.06	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=100V, 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	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	-	3.8	4.6	mΩ
		V_{GS}=10V, I_D=20A (T_J=125°C)	-	6	-	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2	3	4	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-8.7	-	mV/°C
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=3A	-	20	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DS}=50V, I_D=10A, V_{GS}=10V	-	88	175	nC
Gate-Source Charge[3,4]	Q_{gs}		-	18.5	37	
Gate-Drain Charge[3,4]	Q_{gd}		-	28.3	56	
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=50V, R_G=3.3Ω V_{GS}=10V, I_D=1A	-	20.6	42	nS
Rise Time	t_r		-	19.8	40	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	66	132	
Fall Time[3,4]	t_f		-	117	234	
Input Capacitance	C_{Iss}	V_{DS}=50V, V_{GS}=0V, F=1MHz	-	5100	10200	pF
Output Capacitance	C_{oss}		-	1045	2090	
Reverse Transfer Capacitance	C_{rss}		-	35	70	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	-	1.97	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	145	A
Pulsed Source Current	I_{SM}		-	-	290	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A, T_J=25°C	-	-	1	V
Reverse Recovery Time	t_{rr}	V_{GS}=10V, T_J=25°C, I_S=10A, di/dt=100A/μs3	-	71.1	-	nS
Reverse Recovery Charge	Q_{rr}		-	165	-	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=110A.,R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

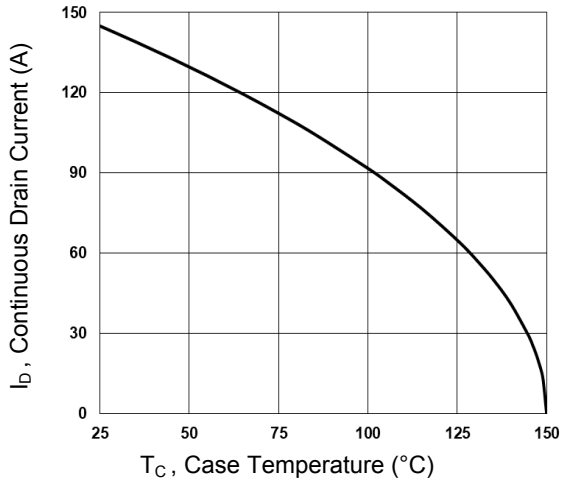


Figure 1. Continuous Drain Current vs. T_C

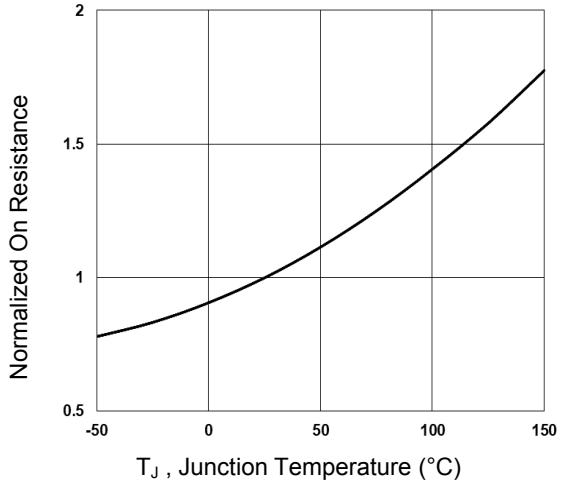


Figure 2. Normalized R_{DSON} vs. T_J

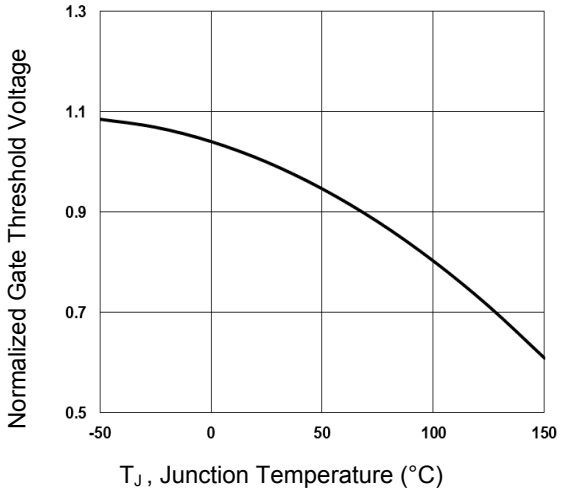


Figure 3. Normalized V_{th} vs. T_J

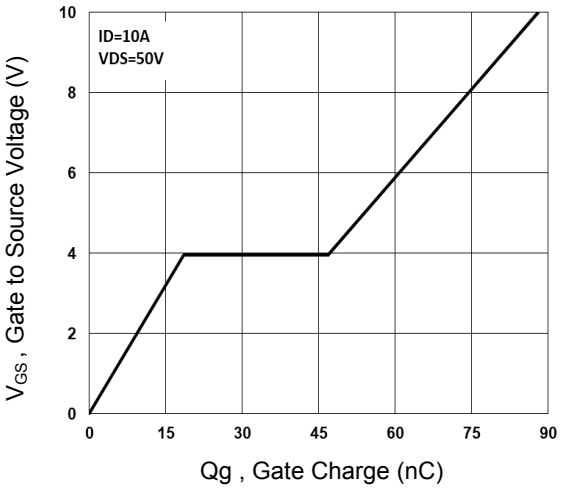


Figure 4. Gate Charge Characteristics

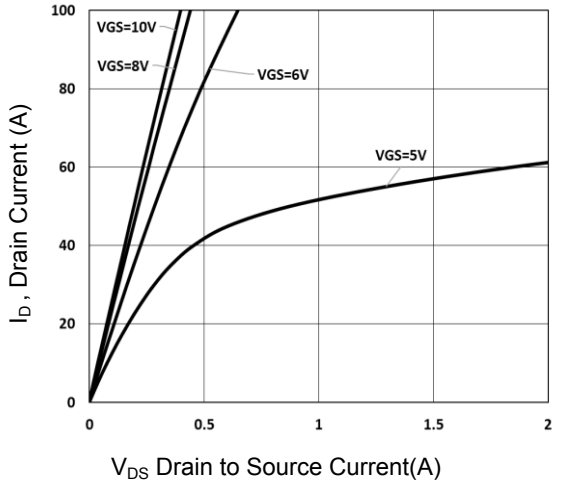


Figure 5. Typical Output Characteristics

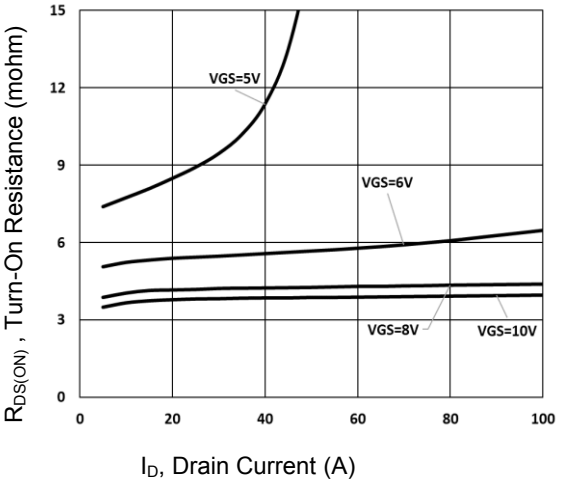


Figure 6. Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

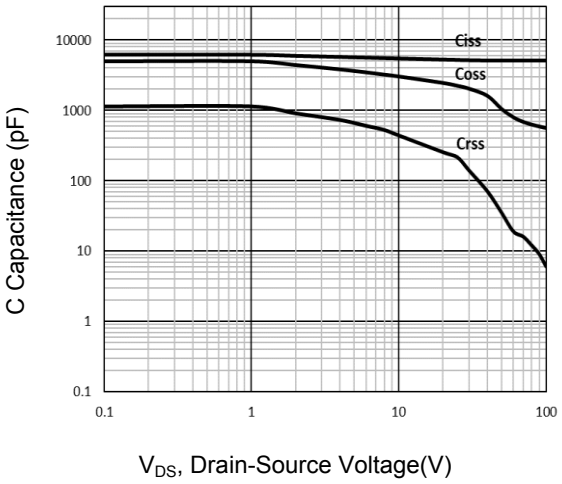


Figure 7. Capacitance vs. V_{DS}

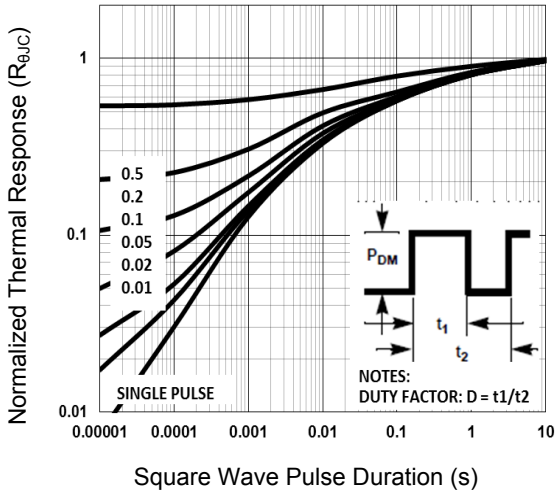


Figure 8. Normalized Transient Impedance

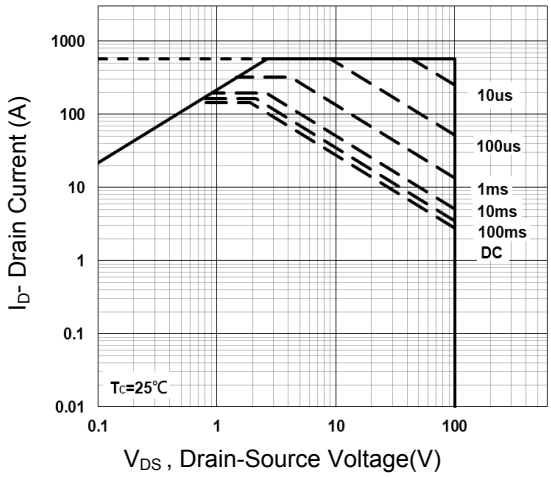


Figure 9. Safe Operation Area

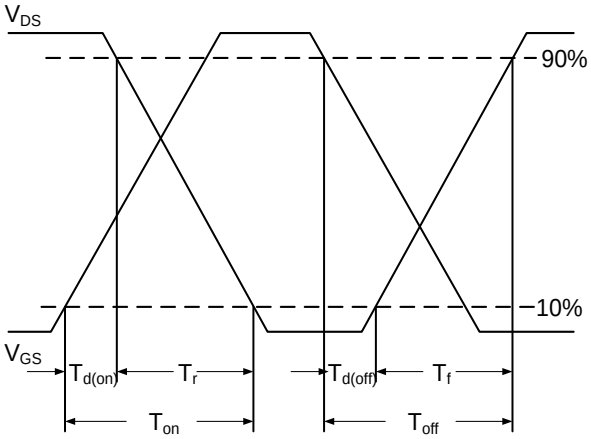


Figure 10. Switching Time Waveform

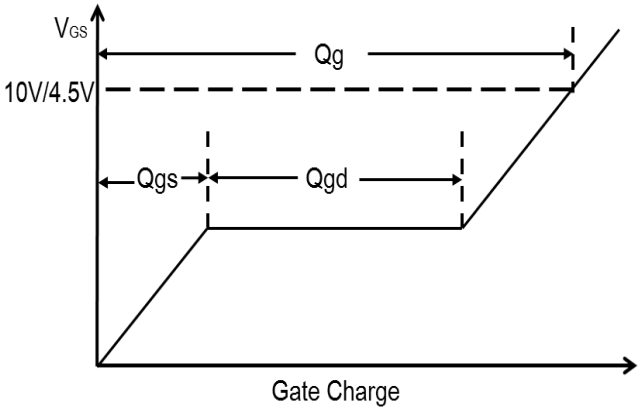
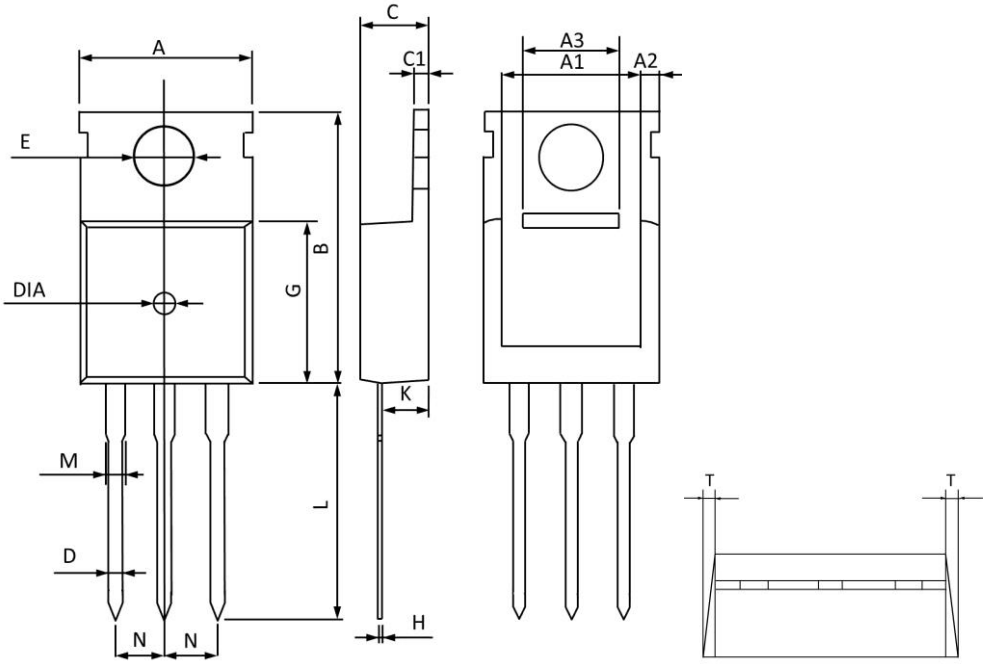


Figure 11. Gate Charge Waveform

Package Outline Dimensions (TO-220)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.300	9.700	0.406	0.382
A1	8.840	8.440	0.348	0.332
A2	1.250	1.050	0.049	0.041
A3	5.300	5.100	0.209	0.201
B	16.200	15.400	0.638	0.606
C	4.680	4.280	0.184	0.169
C1	1.500	1.100	0.059	0.043
D	1.000	0.600	0.039	0.024
E	3.800	3.400	0.150	0.134
G	9.300	8.700	0.366	0.343
H	0.600	0.400	0.024	0.016
K	2.700	2.100	0.106	0.083
L	13.600	12.800	0.535	0.504
M	1.500	1.100	0.059	0.043
N	2.590	2.490	0.102	0.098
T	W0.35		W0.014	
DIA	Φ1.5 TYP.	deep0.2 TYP.	Φ0.059 TYP.	deep0.008 TYP.