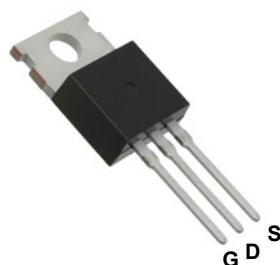
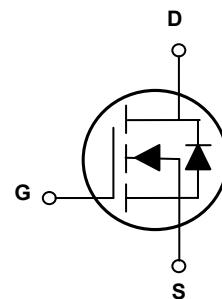


## Main Product Characteristics

BV <sub>DSS</sub>	100V
R <sub>DS(ON)</sub>	12mΩ
I <sub>D</sub>	65A



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 GSGH1066 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<sub>C</sub>=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V <sub>DS</sub>	100	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current-Continuous (T <sub>C</sub> =25°C)	I <sub>D</sub>	65	A
Drain Current-Continuous (T <sub>C</sub> =100°C)		41	
Drain Current-Pulsed <sup>1</sup>	I <sub>DM</sub>	260	A
Single Pulse Avalanche Energy <sup>2</sup>	E <sub>AS</sub>	125	mJ
Single Pulse Avalanche Current <sup>2</sup>	I <sub>AS</sub>	50	A
Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	129	W
Power Dissipation-Derate above 25°C		1.03	W/°C
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	62	°C/W
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	0.97	°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

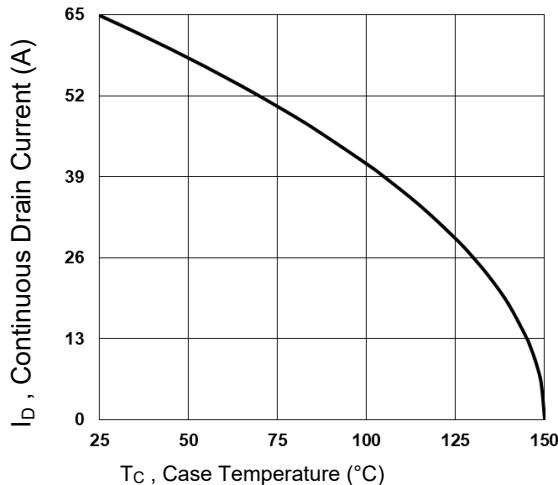
## Electrical Characteristics ( $T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	100	-	-	V
Drain-Source Leakage Current	$I_{\text{DSS}}$	$V_{\text{DS}}=80\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	$\mu\text{A}$
		$V_{\text{DS}}=80\text{V}, V_{\text{GS}}=0\text{V}, T_J=85^\circ\text{C}$	-	-	10	
Gate-Source Leakage Current	$I_{\text{GSS}}$	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance <sup>3</sup>	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=20\text{A}$	-	10	12	$\text{m}\Omega$
		$V_{\text{GS}}=6\text{V}, I_{\text{D}}=15\text{A}$	-	14	18	
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=250\mu\text{A}$	2.0	3.0	4.0	V
Forward Transconductance	$g_{\text{fs}}$	$V_{\text{DS}}=10\text{V}, I_{\text{D}}=3\text{A}$	-	10	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{\text{DS}}=50\text{V}, I_{\text{D}}=30\text{A}, V_{\text{GS}}=10\text{V}$	-	15.4	23	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{\text{gs}}$		-	3.9	6	
Gate-Drain Charge <sup>3,4</sup>	$Q_{\text{gd}}$		-	4.6	7	
Turn-On Delay Time <sup>3,4</sup>	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=50\text{V}, R_{\text{G}}=6\Omega, V_{\text{GS}}=10\text{V}, I_{\text{D}}=30\text{A}$	-	20	30	nS
Rise Time <sup>3,4</sup>	$t_r$		-	40	60	
Turn-Off Delay Time <sup>3,4</sup>	$t_{\text{d}(\text{off})}$		-	57	86	
Fall Time <sup>3,4</sup>	$t_f$		-	35	53	
Input Capacitance	$C_{\text{iss}}$	$V_{\text{DS}}=50\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	1180	1750	pF
Output Capacitance	$C_{\text{oss}}$		-	250	375	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	2.2	4.0	
Gate Resistance	$R_g$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$	-	1.0	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_s$	$V_G=V_D=0\text{V}, \text{Force Current}$	-	-	65	A
Pulsed Source Current <sup>3</sup>	$I_{\text{SM}}$		-	-	130	A
Diode Forward Voltage <sup>3</sup>	$V_{\text{SD}}$	$V_{\text{GS}}=0\text{V}, I_s=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	$t_{\text{rr}}$	$V_R=100\text{V}, I_s=10\text{A}, \frac{di}{dt}=100\text{A}/\mu\text{s}, T_J=25^\circ\text{C}$	-	165	-	nS
Reverse Recovery Charge	$Q_{\text{rr}}$		-	265	-	nC

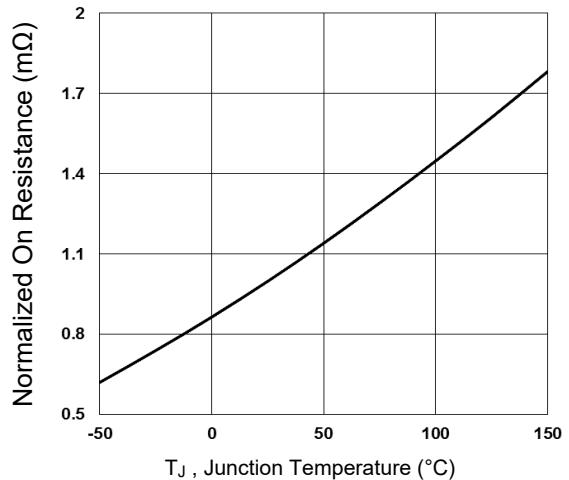
Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2.  $V_{\text{DD}}=50\text{V}, V_{\text{GS}}=10\text{V}, L=0.1\text{mH}, I_{\text{AS}}=50\text{A}, R_{\text{G}}=25\Omega$ , starting  $T_J=25^\circ\text{C}$ .
3. Pulse test: pulse width  $\leq 300\text{us}$ , duty cycle  $\leq 2\%$ .
4. Essentially independent of operation temperature.

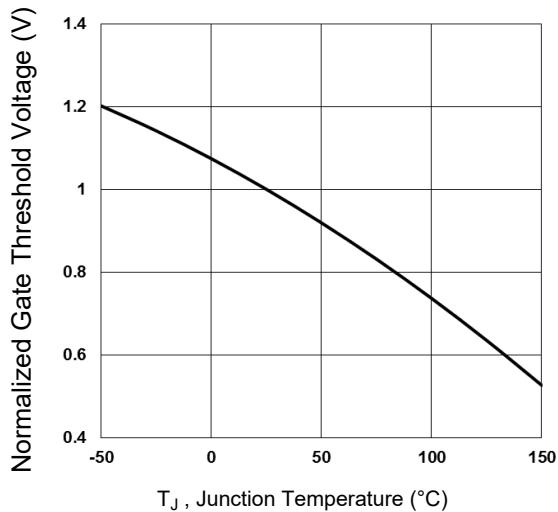
## Typical Electrical and Thermal Characteristic Curves



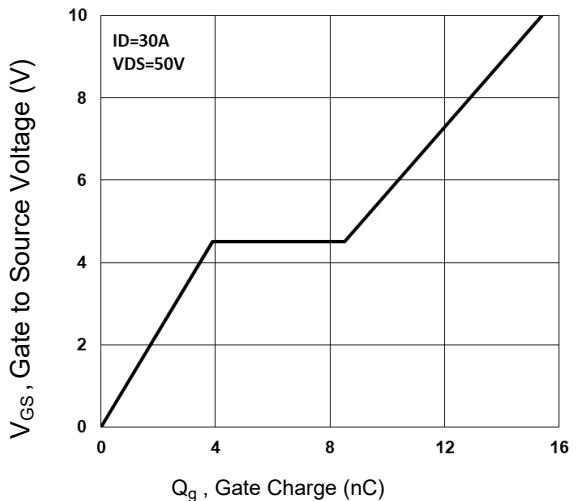
**Fig.1 Continuous Drain Current vs. T<sub>c</sub>**



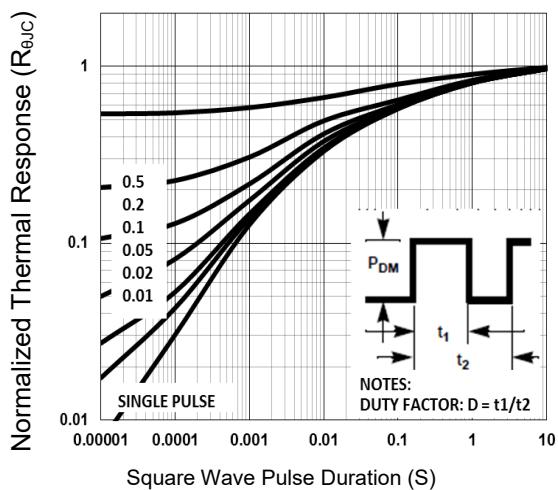
**Fig.2 Normalized R<sub>DS(ON)</sub> vs. T<sub>J</sub>**



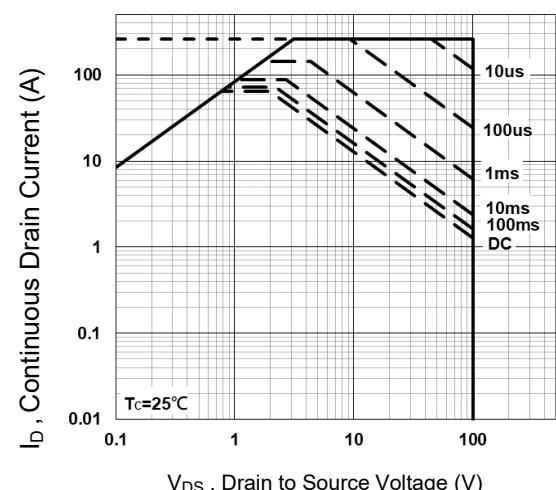
**Fig.3 Normalized V<sub>th</sub> vs. T<sub>J</sub>**



**Fig.4 Gate Charge Waveform**



**Fig.5 Normalized Transient Impedance**



**Fig.6 Maximum Safe Operation Area**

## Test Circuit & Waveform

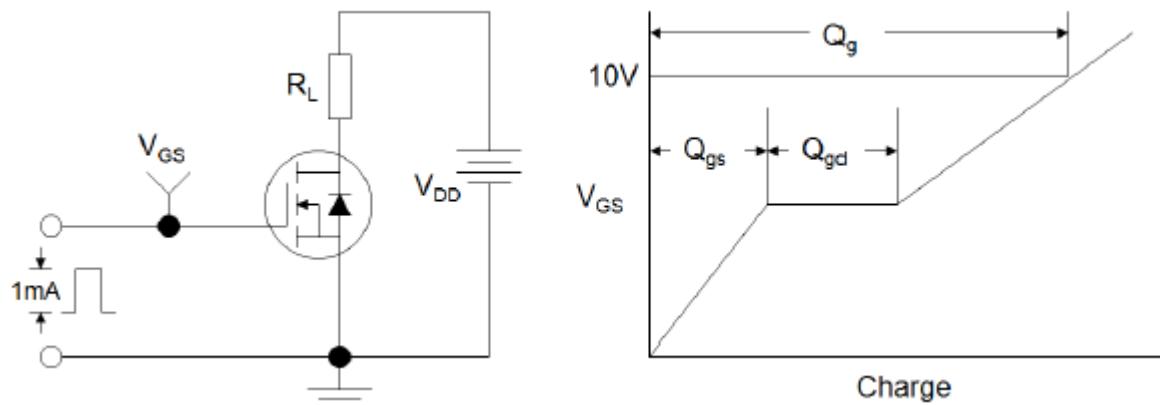


Figure 7. Gate Charge Test Circuit & Waveform

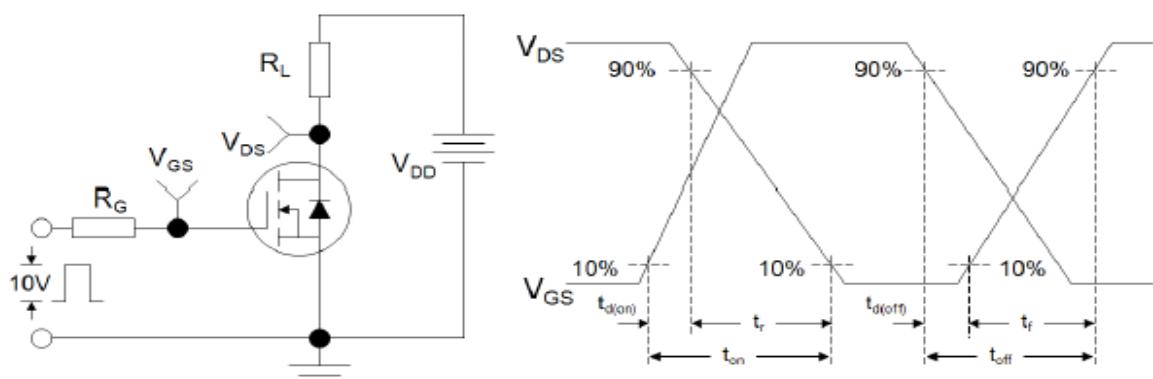


Figure 8. Resistive Switching Test Circuit & Waveforms

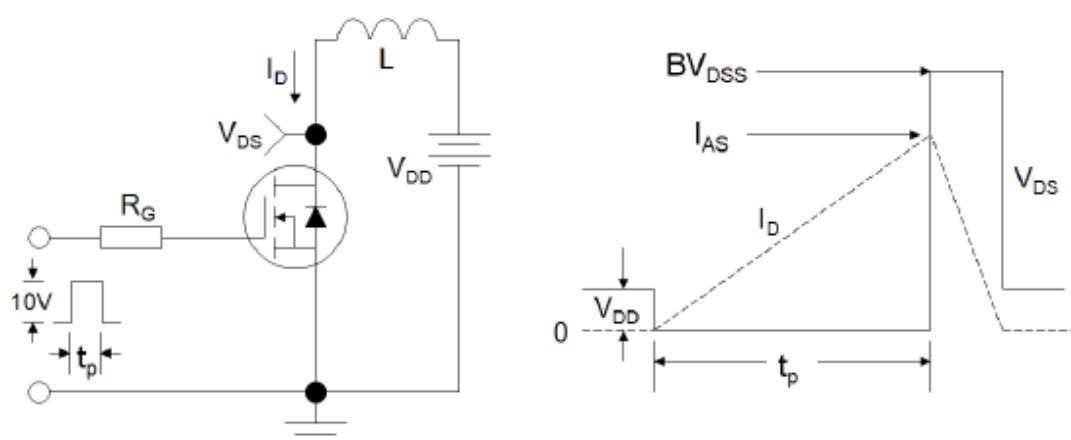
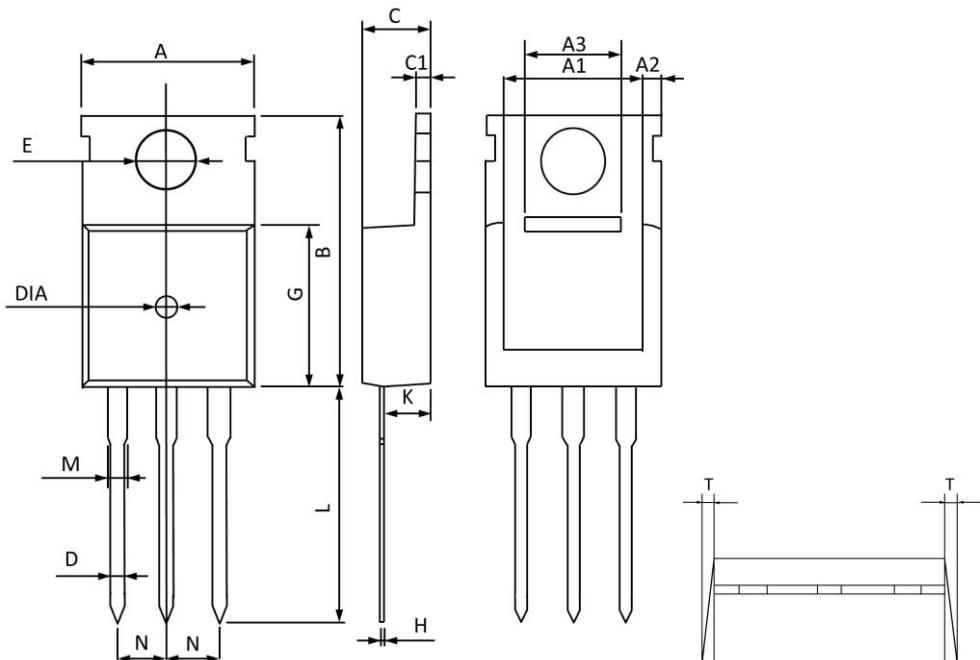


Figure 9. EAS Circuit & Waveforms

**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.