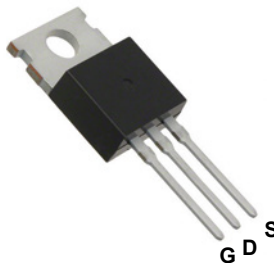
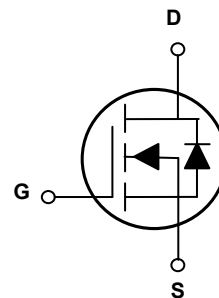


Main Product Characteristics

BV_{DSS}	65V
$R_{DS(ON)}$	5.5mΩ (max.)
I_D	100A



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 GSGH65100 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 ($T_c=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	65	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous ($T_c=25^{\circ}C$)	I_D	100	A
Drain Current-Continuous ($T_c=100^{\circ}C$)		63	
Drain Current-Pulsed ¹	I_{DM}	400	A
Single Pulse Avalanche Energy ²	E_{AS}	180	mJ
Single Pulse Avalanche Current ²	I_{AS}	60	A
Power Dissipation ($T_c=25^{\circ}C$)	P_D	129	W
Power Dissipation-Derate above 25°C		1.03	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.97	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°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
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	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	4.6	5.5	m Ω
		$V_{GS}=6V, I_D=15A$	-	14	18	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	3.0	4.0	V
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=3A$	-	10	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{DS}=30V, I_D=50A, V_{GS}=10V$	-	34	50	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	7.4	10	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	13	20	
Turn-On Delay Time ^{3,4}	$t_{d(on)}$	$V_{DD}=30V, R_G=6\Omega, V_{GS}=10V, I_D=50A$	-	10	15	nS
Rise Time ^{3,4}	t_r		-	16	24	
Turn-Off Delay Time ^{3,4}	$t_{d(off)}$		-	42	63	
Fall Time ^{3,4}	t_f		-	38	57	
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V, F=1\text{MHz}$	-	1900	2850	pF
Output Capacitance	C_{oss}		-	890	1340	
Reverse Transfer Capacitance	C_{rss}		-	17	25	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	1.2	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	-	-	100	A
Pulsed Source Current ³	I_{SM}		-	-	200	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}	$V_R=50V, I_S=10A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	-	60	-	nS
Reverse Recovery Charge	Q_{rr}		-	80	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=60A, R_G=25\Omega$, starting $T_J=25^{\circ}\text{C}$.
3. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

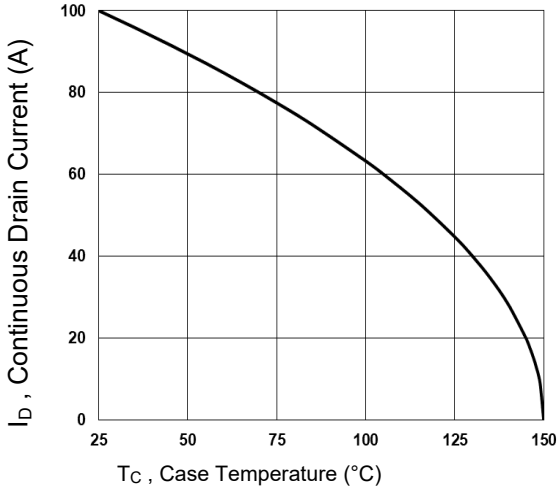


Fig.1 Continuous Drain Current vs. Tc

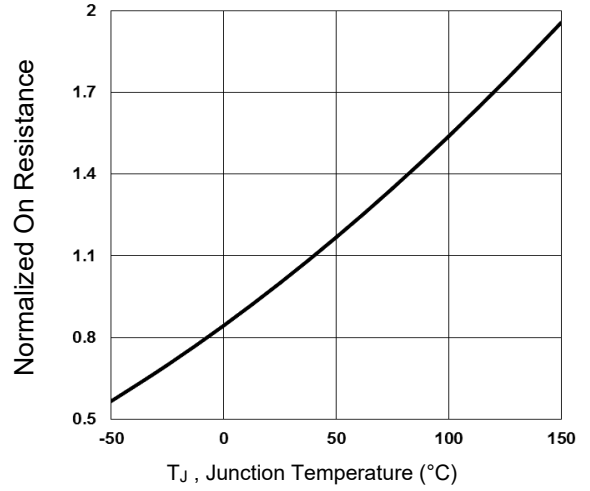


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

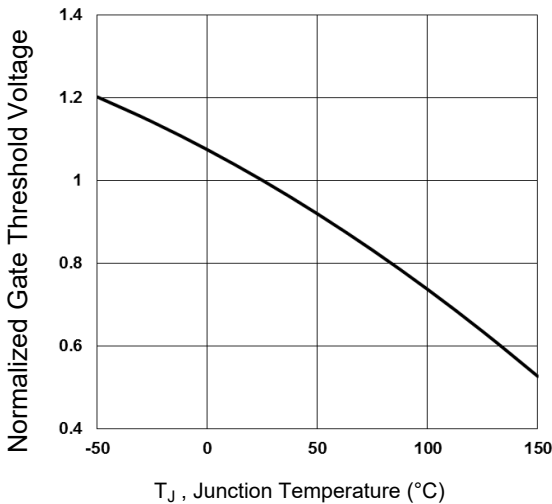


Fig.3 Normalized V_{th} vs. T_J

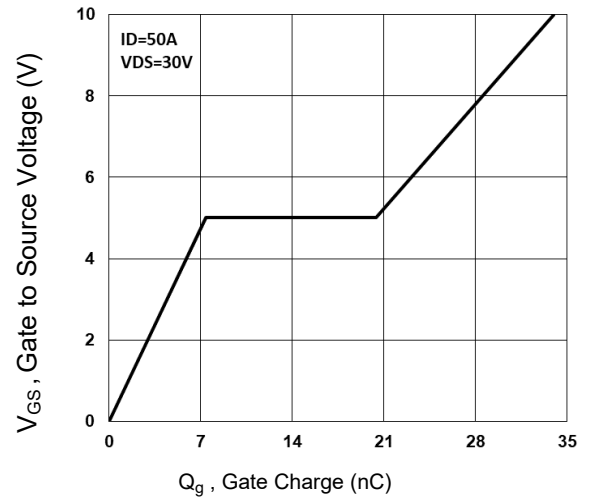


Fig.4 Gate Charge Waveform

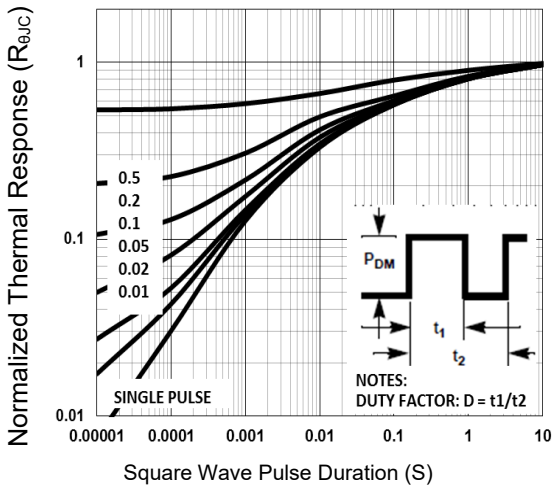


Fig.5 Normalized Transient Impedance

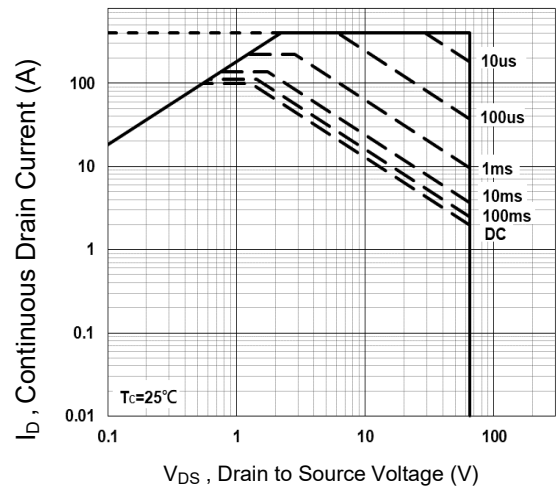


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

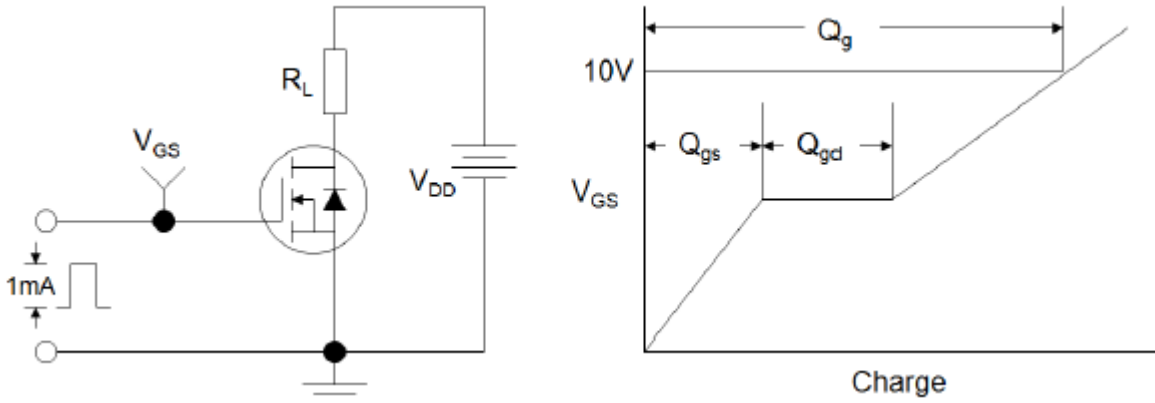


Figure 7. Gate Charge Test Circuit & Waveform

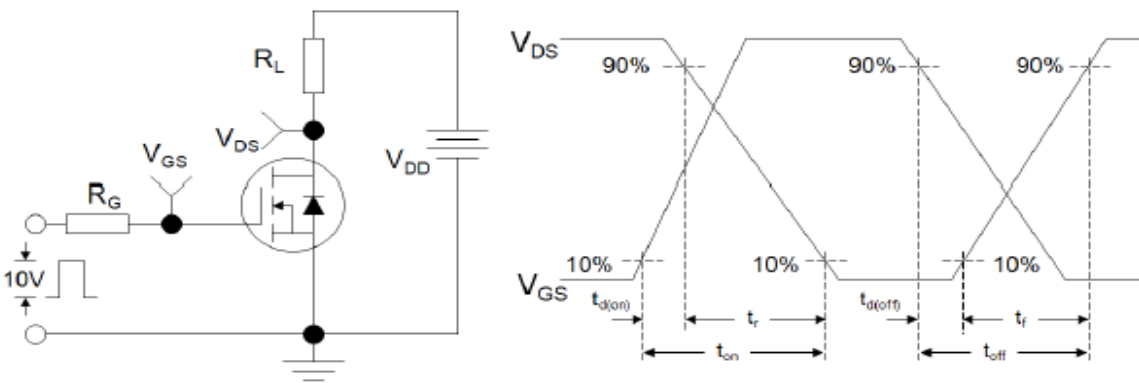


Figure 8. Resistive Switching Test Circuit & Waveforms

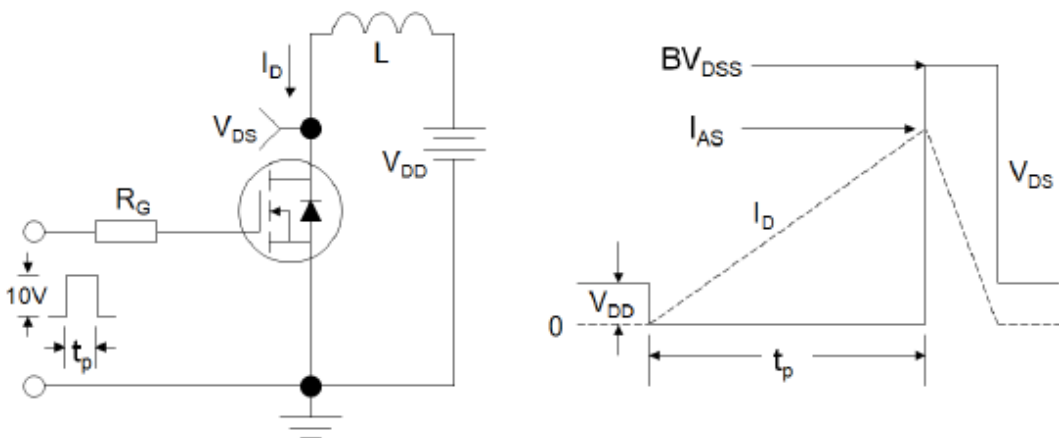
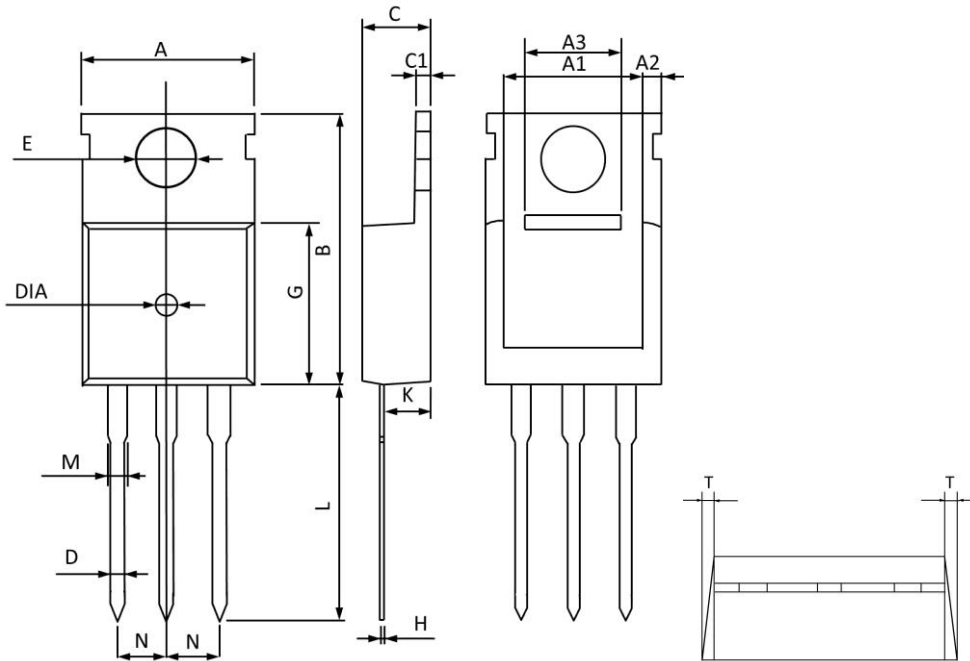


Figure 9. E_{AS} Circuit & Waveforms

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.