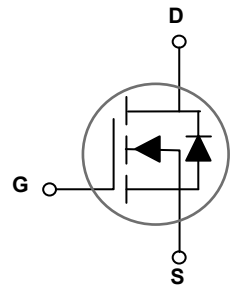


Main Product Characteristics

V_{DS}	100V
$R_{DS(ON)}$	10.8m Ω
I_D	50A



TO-251



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 GSGG1050 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	Max.	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous($T_C=25^\circ\text{C}$)	I_D	50	A
Drain Current-Continuous($T_C=100^\circ\text{C}$)		32	A
Drain Current-Pulsed ¹	I_{DM}	200	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	78	W
Power Dissipation–Derate above 25°C		0.624	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ²	E_{AS}	115	mJ
Single Pulse Avalanche Current ²	I_{AS}	48	A
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.61	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-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}	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	1	μA
		$V_{DS}=64V, V_{GS}=0V, T_J=100^{\circ}\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain-Source On-State Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	9	10.8	m Ω
		$V_{GS}=4.5V, I_D=15A$	-	11.7	15.2	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	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	$V_{DS}=50V, I_D=10A, V_{GS}=10V$	-	26.1	39	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	6.5	10	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	5.3	8	
Turn-On Delay Time ^{3,4}	$t_{d(on)}$	$V_{DD}=50V, R_G=6\Omega, V_{GS}=10V, I_D=10A$	-	14.2	28	nS
Rise Time ^{3,4}	t_r		-	20.8	42	
Turn-Off Delay Time ^{3,4}	$t_{d(off)}$		-	42	84	
Fall Time ^{3,4}	t_f		-	30	60	
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, F=1\text{MHz}$	-	1450	2145	pF
Output Capacitance	C_{oss}		-	215	322	
Reverse Transfer Capacitance	C_{rss}		-	8	20	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	1.04	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	-	-	50	A
Pulsed Source Current ³	I_{SM}		-	-	100	A
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	-	-	1	V
Reverse Recovery Time ³	t_{rr}	$V_R=100V, T_J=25^{\circ}\text{C}, I_S=10A, di/dt=100A/\mu s$	-	155	-	nS
Reverse Recovery Charge ³	Q_{rr}		-	230	-	nC

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=48A, R_G=25, \text{Starting } T_J=25^{\circ}\text{C}$.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

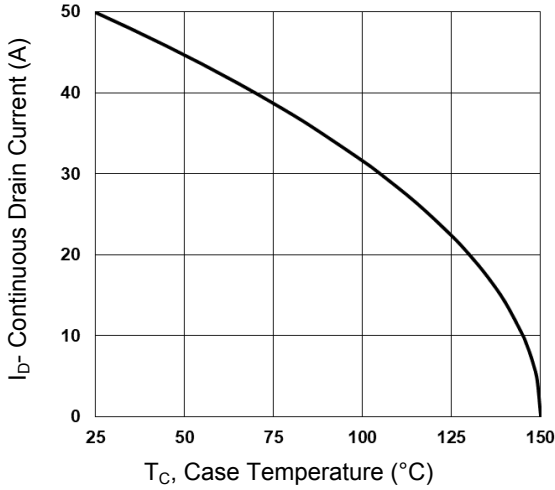


Figure 1. Continuous Drain Current vs. T_C

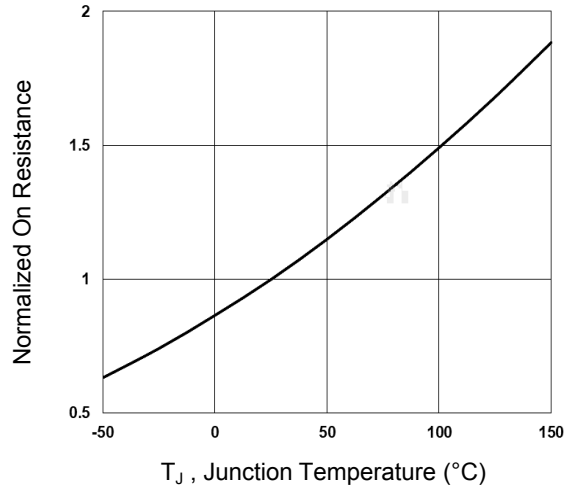


Figure 2. Normalized $R_{DS(on)}$ vs. T_J

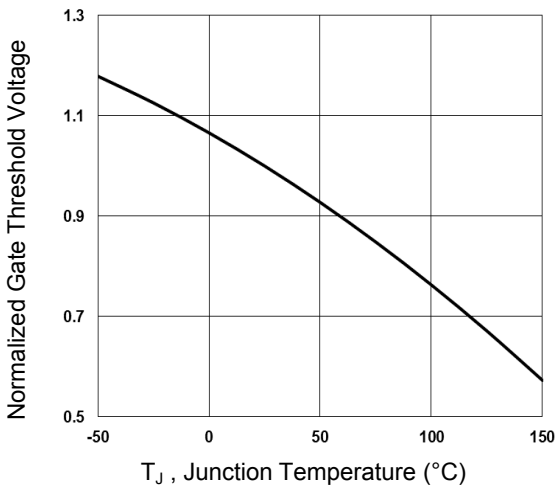


Figure 3. Normalized V_{TH} vs. T_J

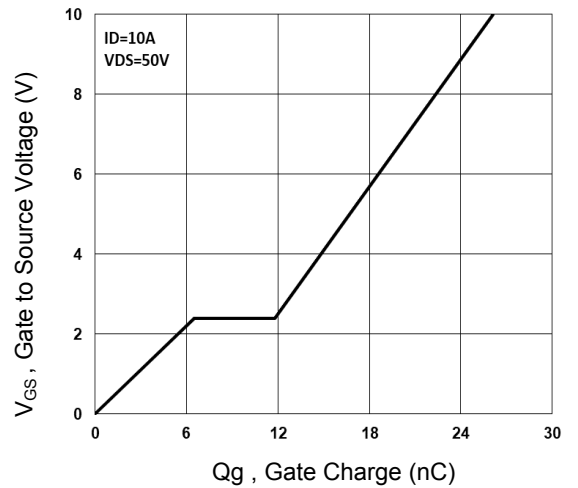


Figure 4. Gate Charge

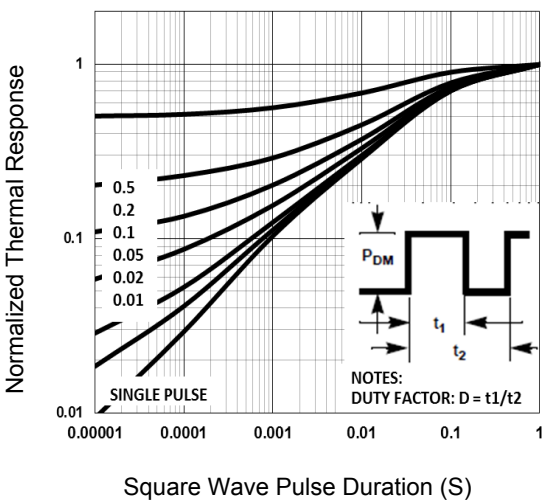


Figure 5. Normalized Transient Response

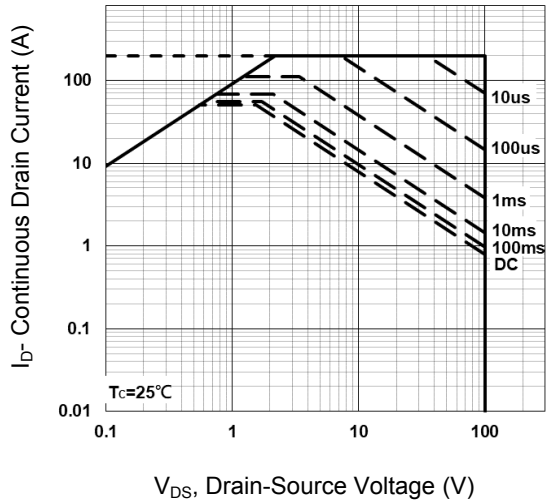


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

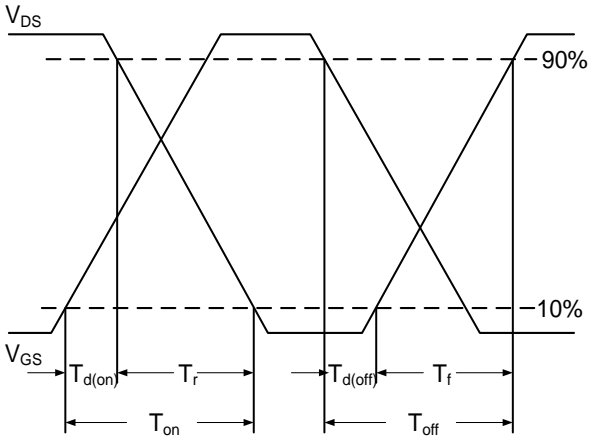


Figure 7. Switching Time Waveform

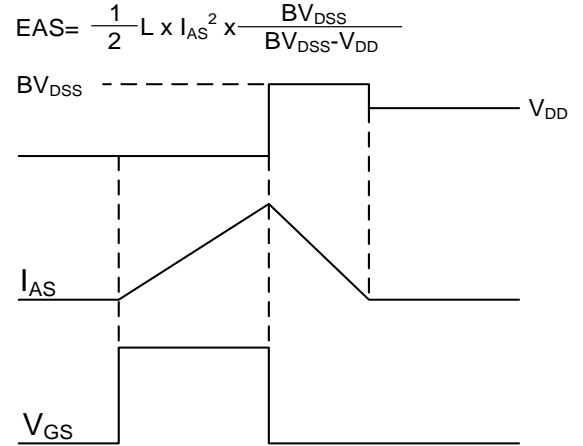
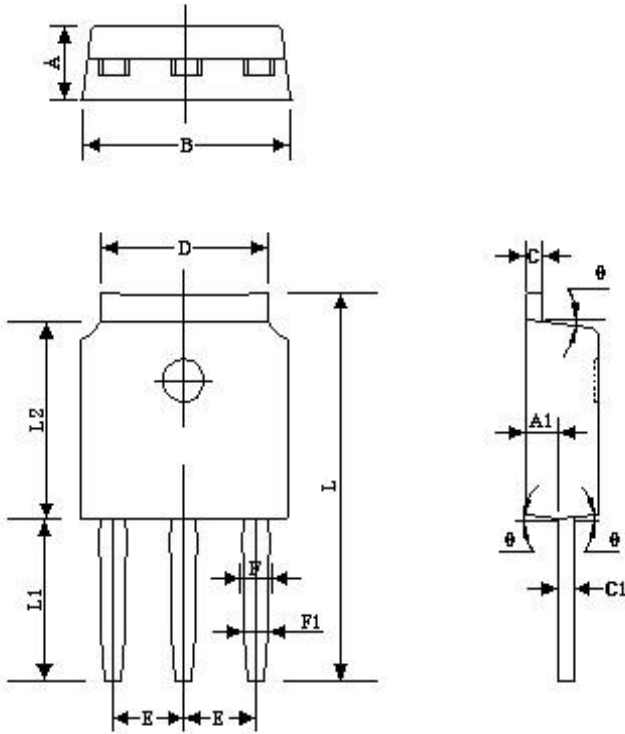


Figure 8. EAS Waveform

Package Outline Dimensions (TO-251)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.400	2.200	0.094	0.087
A1	1.110	0.910	0.044	0.036
B	6.700	6.500	0.264	0.256
C	0.580	0.460	0.023	0.018
C1	0.580	0.460	0.023	0.018
D	5.460	5.100	0.215	0.201
E	2.386	2.186	0.094	0.086
F	0.940	0.740	0.037	0.029
F1	0.860	0.660	0.034	0.026
L	12.300	11.700	0.484	0.461
L1	5.200	4.800	0.205	0.189
L2	6.200	6.000	0.244	0.236
θ	9°	3°	9°	3°