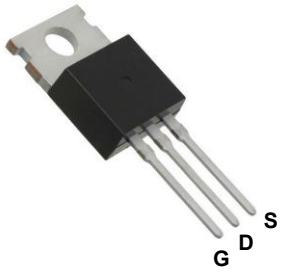
GOOD-ARK SEMICONDUCTOR

GSGH06200

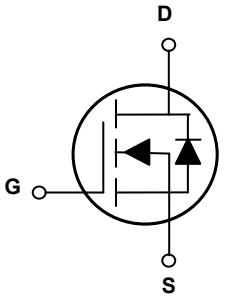
60V N-Channel MOSFET

Main Product Characteristics

V_{DS}	60V
$R_{DS(ON)}$	1.8mΩ
I_D	200A



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 GSGH06200 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}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	200	A
Drain Current-Continuous (T_C=100°C)		150	
Drain Current-Pulsed	I_{DM}	800	A
Maximum Power Dissipation	P_D	255	W
Derating Factor	P_D	1.7	W/°C
Single Pulse Avalanche Energy[5]	E_{AS}	2000	mJ
Thermal Resistance, Junction-to-Case[2]	$R_{\theta JC}$	0.59	°C/W
Operating Junction Temperature Range	T_J	-55 To +175	°C
Storage Temperature Range	T_{STG}	-55 To +175	°C

Electrical Characteristics (T_C=25°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=250μA	60	-	-	V
Zero Gate Volateg Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage[3]	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	2.2	2.7	3.5	V
Static Drain-Source On-Resistance[3]	$R_{DS(ON)}$	V_{GS}=10V, I_D=100A	-	1.8	2.2	mΩ
Forward Transconductance[3]	g_{fs}	V_{DS}=10V, I_D=100A	-	60	-	S
Dynamic and Switching Characteristics						
Input Capacitance[4]	C_{lss}	V_{DS}=30V, V_{GS}=0V, F=1MHz	-	9200	-	pF
Output Capacitance[4]	C_{oss}		-	1900	-	
Reverse Transfer Capacitance[4]	C_{rss}		-	61	-	
Turn-On Delay Time[4]	$t_{d(on)}$	V_{DD}=30V, R_G=4.7Ω, V_{GS}=10V, I_D=100A	-	23	-	nS
Rise Time[4]	t_r		-	19	-	
Turn-Off Delay Time[4]	$t_{d(off)}$		-	58	-	
Fall Time[4]	t_f		-	14	-	
Total Gate Charge[4]	Q_g	V_{DS}=30V, I_D=100A, V_{GS}=10V	-	130	-	nC
Gate-Source Charge[4]	Q_{gs}		-	31.5	-	
Gate-Drain Charge[4]	Q_{gd}		-	10.5	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Voltage[3] (T_J=25°C)	V_{SD}	V_{GS}=0V, I_S=200A	-	-	1.2	V
Diode Forward Current[2]	I_S	-	-	-	120	A
Reverse Recovery Time	t_{rr}	I_f=I_S, di/dt=100A/μs[3], T_J=25°C	-	67	-	nS
Reverse Recovery Charge	Q_{rr}		-	112	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse test: pulse width ≤300us,duty cycle≤2%.
4. Guaranteed by design, not subject to production
5. E_{AS} condition : T_J=25℃,V_{DD}=30V,V_G=10V,L=0.5mH,R_g=25Ω

Typical Electrical and Thermal Characteristic Curves

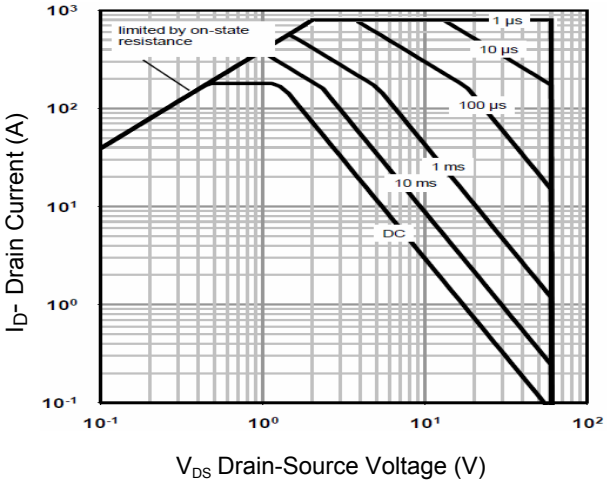


Figure 1. Safe Operating Area

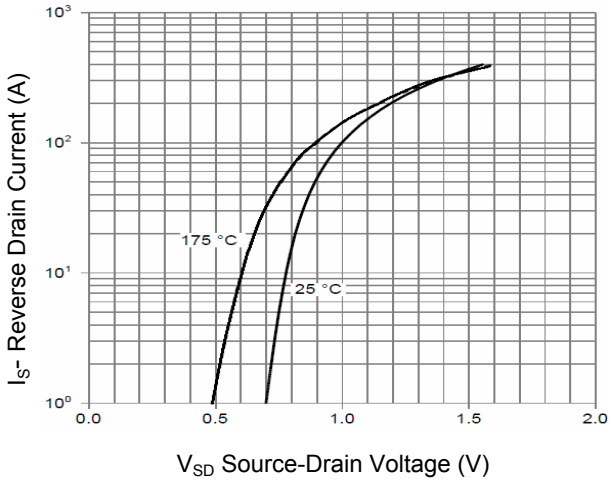


Figure 2. Source-Drain Diode Forward Voltage

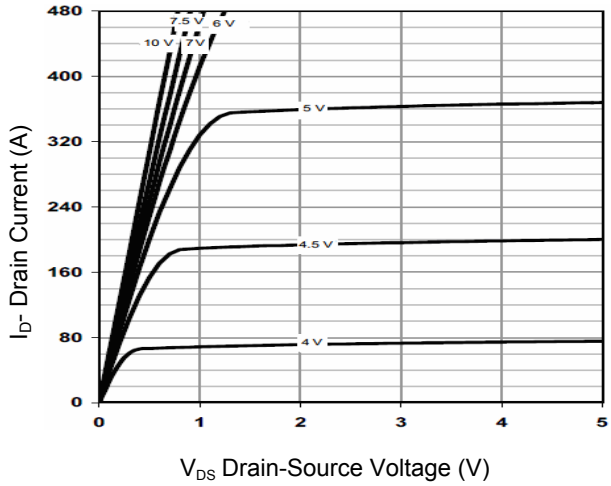


Figure 3. Output Characteristics

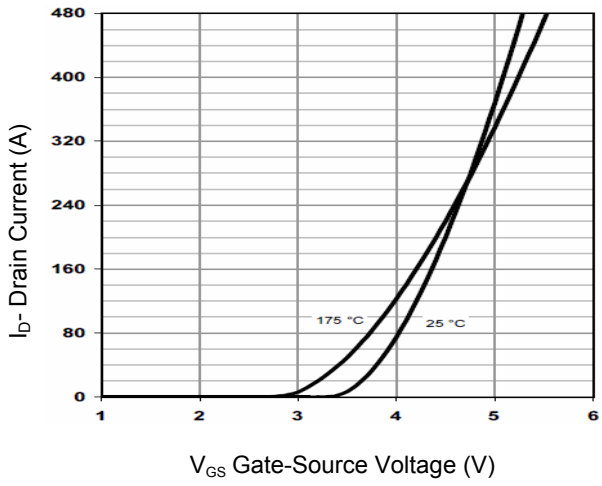


Figure 4. Transfer Characteristics

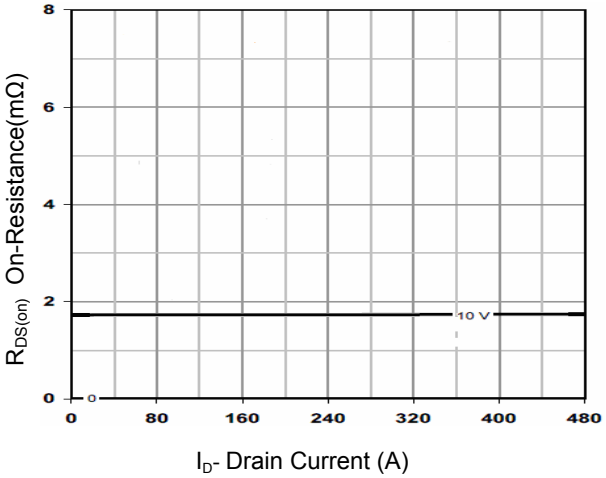


Figure 5. Rdson-Drain Current

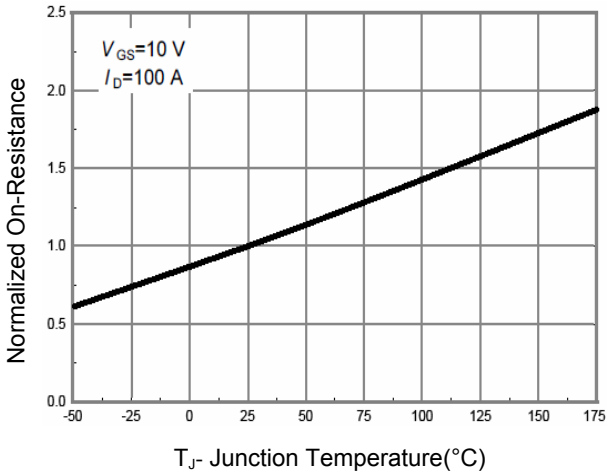


Figure 6. $R_{DS(ON)}$ vs. Junction Temperature

Typical Electrical and Thermal Characteristic Curves

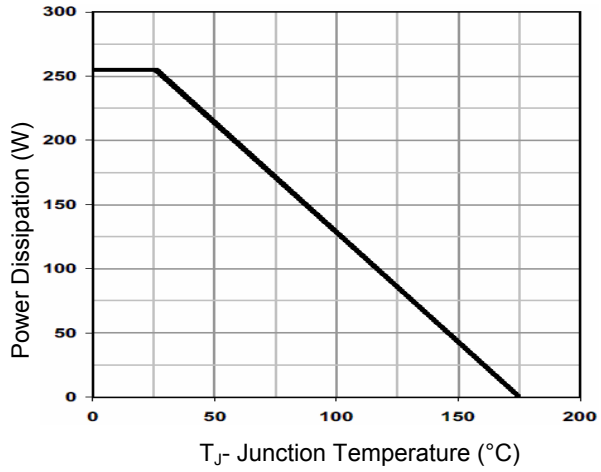


Figure 7. Power De-rating

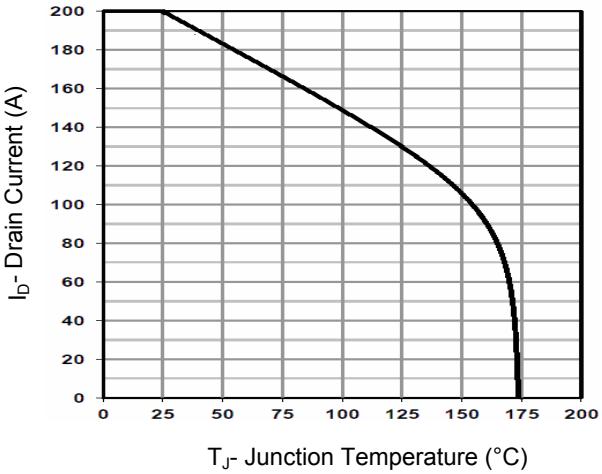


Figure 8. Current De-rating

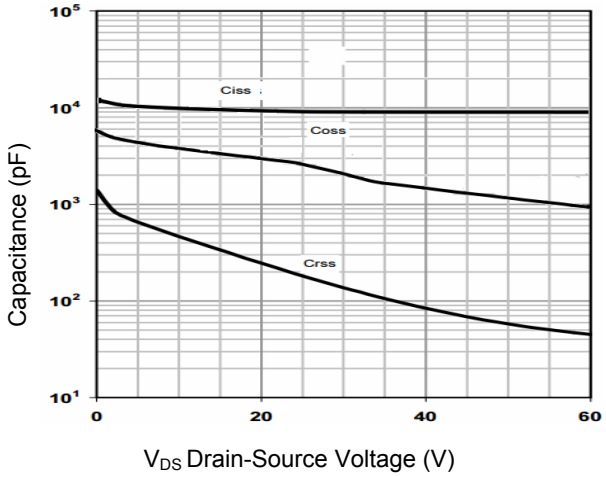


Figure 9. Capacitance

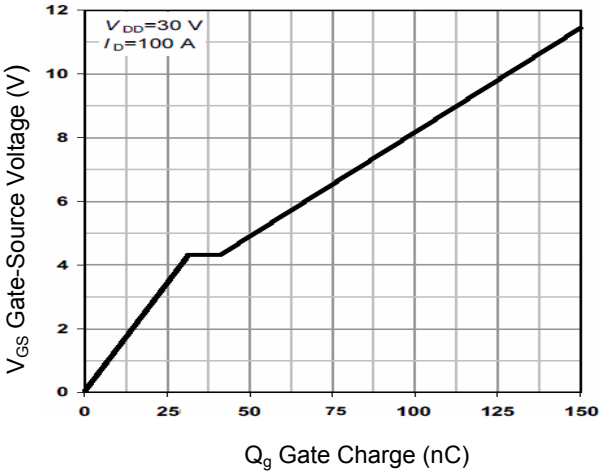


Figure 10. Gate Charge Waveforms

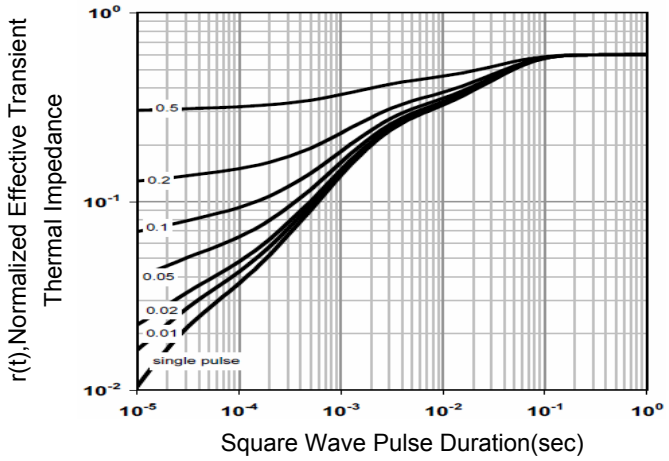


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

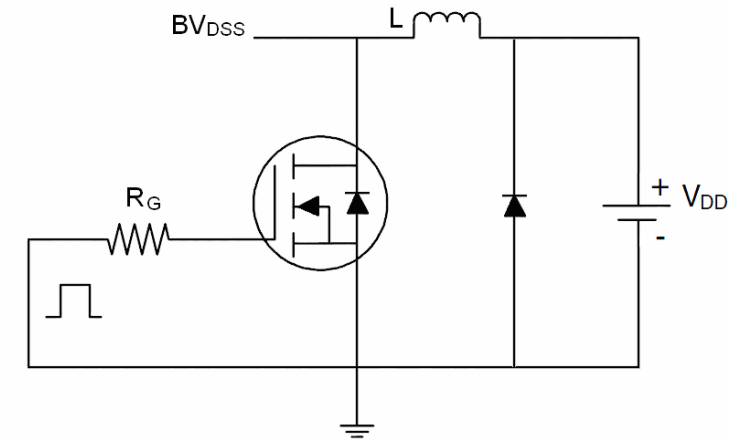


Figure 12. E_{AS} Test Circuit

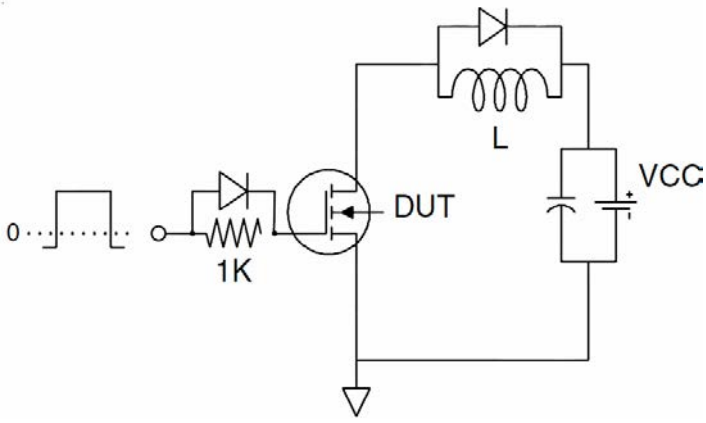


Figure 13. Gate Charge Test Circuit

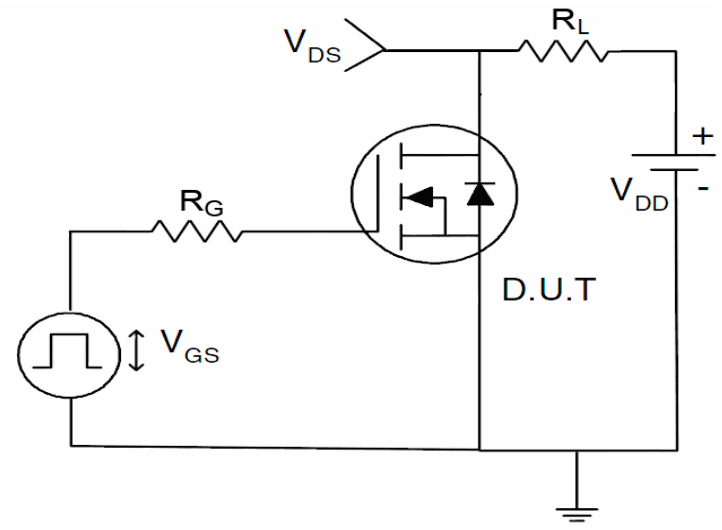
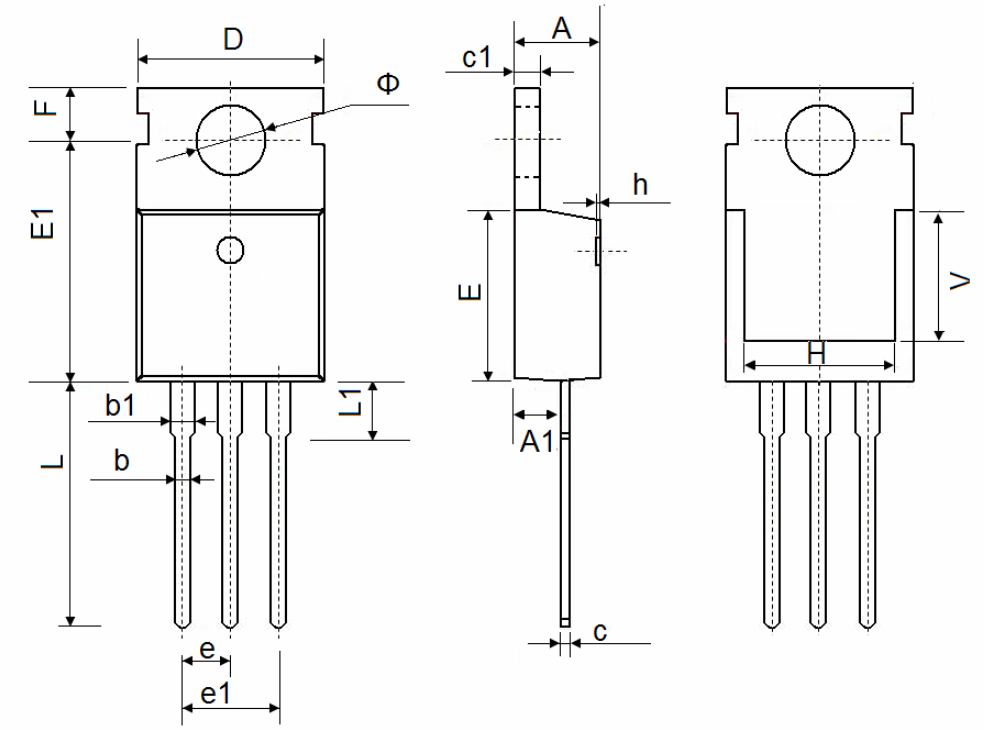


Figure 14. Switch Time Test Circuit

Package Outline Dimensions (TO-220)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
A1	2.25	2.55	0.089	0.1
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
c	0.33	0.65	0.013	0.026
c1	1.2	1.4	0.047	0.055
D	9.91	10.25	0.39	0.404
E	8.95	9.75	0.352	0.384
E1	12.65	12.95	0.498	0.51
e	2.540 TYP.		0.100 TYP.	
e1	4.98	5.18	0.196	0.204
F	2.65	2.95	0.104	0.116
H	7.9	8.1	0.311	0.319
h	0	0.3	0	0.012
L	12.9	13.4	0.508	0.528
L1	2.85	3.25	0.112	0.128
V	7.500 REF.		0.295 REF.	
Φ	3.4	3.8	0.134	0.15