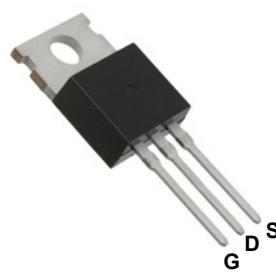
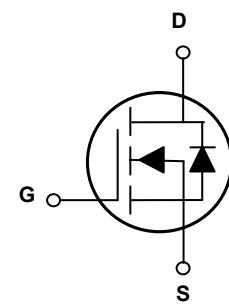


Main Product Characteristics

BV _{DSS}	100V
R _{DS(ON)}	2.4mΩ (Typ)
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 GSGH10200 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 supplies 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	V
Drain Current-Continuous	I _D	200	A
Drain Current-Continuous (T _C =100°C)		142	
Drain Current-Pulsed	I _{DM}	800	A
Single Pulse Avalanche Energy ⁵	E _{AS}	2300	mJ
Maximum Power Dissipation	P _D	300	W
Derating Factor		2	W/°C
Thermal Resistance, Junction-to-Ambient ²	R _{θJA}	60	°C/W
Thermal Resistance, Junction-to-Case ²	R _{θJC}	0.5	°C/W
Operating Junction Temperature Range	T _J	-55 To +175	°C
Storage Temperature Range	T _{STG}	-55 To +175	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	100	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=100\text{V}, V_{\text{GS}}=0\text{V}$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
Static Drain-Source On-Resistance ³	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=100\text{A}$	-	2.4	2.6	$\text{m}\Omega$
Gate Threshold Voltage ³	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=250\mu\text{A}$	2	3	4	V
Forward Transconductance ³	g_{f}	$V_{\text{DS}}=5\text{V}, I_{\text{D}}=100\text{A}$	-	90	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ⁴	Q_g	$V_{\text{DS}}=50\text{V}, I_{\text{D}}=100\text{A}$ $V_{\text{GS}}=10\text{V}$	-	240	360	nC
Gate-Source Charge ⁴	Q_{gs}		-	62	-	
Gate-Drain Charge ⁴	Q_{gd}		-	73	-	
Turn-On Delay Time ⁴	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=50\text{V}, R_{\text{G}}=1.6\Omega$ $V_{\text{GS}}=10\text{V}, I_{\text{D}}=100\text{A}$	-	34	-	nS
Rise Time ⁴	t_r		-	27	-	
Turn-Off Delay Time ⁴	$t_{\text{d}(\text{off})}$		-	78	-	
Fall Time ⁴	t_f		-	30	-	
Input Capacitance ⁴	C_{iss}	$V_{\text{DS}}=50\text{V}, V_{\text{GS}}=0\text{V},$ $F=1\text{MHz}$	-	14000	21000	pF
Output Capacitance ⁴	C_{oss}		-	1100	-	
Reverse Transfer Capacitance ⁴	C_{rss}		-	60	-	
Gate Resistance ³	R_g	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V},$ $F=1\text{MHz}$	-	2.5	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current ²	I_s	$V_G=V_D=0\text{V},$ Force Current	-	-	200	A
Diode Forward Voltage ³	V_{SD}	$V_{\text{GS}}=0\text{V}, I_s=100\text{A}$	-	-	1.2	V
Reverse Recovery Time	t_{rr}	$I_F=100\text{A}$ $dI/dt=100\text{A}/\mu\text{s}$ $T_J=25^\circ\text{C}$	-	101	-	nS
Reverse Recovery Charge	Q_{rr}		-	280	-	nC

Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10\text{s}$.
3. Pulse test: pulse width $\leq 300\text{us}$, duty cycle $\leq 2\%$.
4. Guaranteed by design.
5. EAS condition: $T_J=25^\circ\text{C}, V_{\text{DD}}=50\text{V}, V_G=10\text{V}, L=0.5\text{mH}, R_g=25\Omega$.

Typical Electrical and Thermal Characteristic Curves

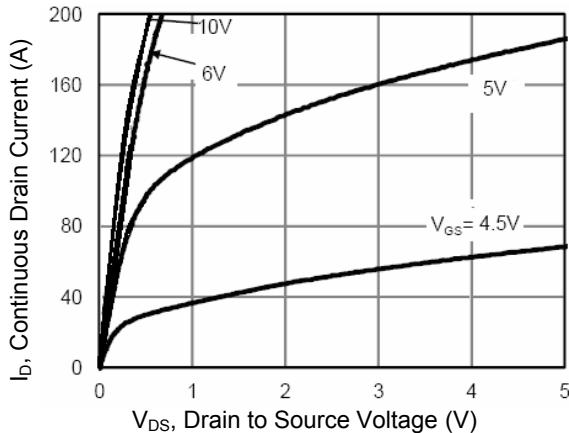


Figure 1. Typical Output Characteristics

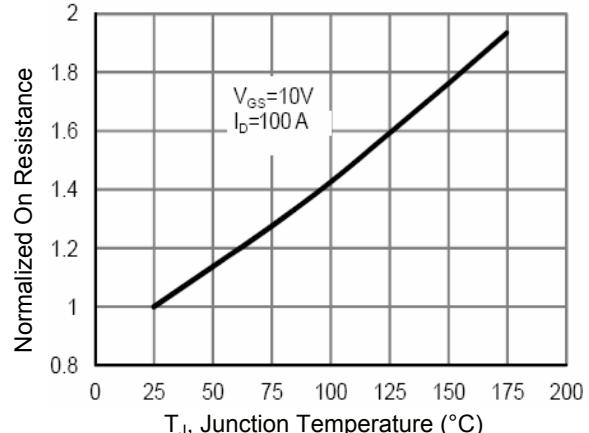


Figure 2. Normalized $R_{DS(on)}$ vs. T_J

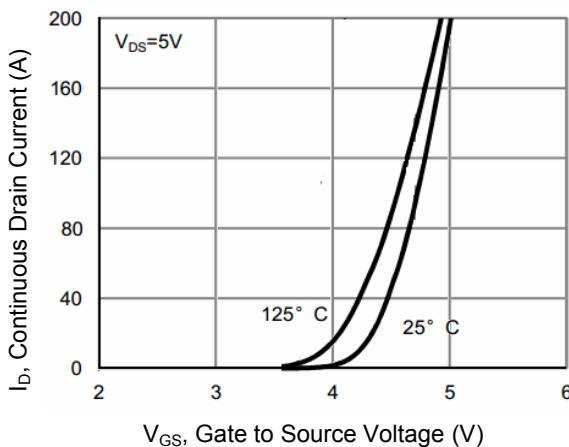


Figure 3. Typical Transfer Characteristics

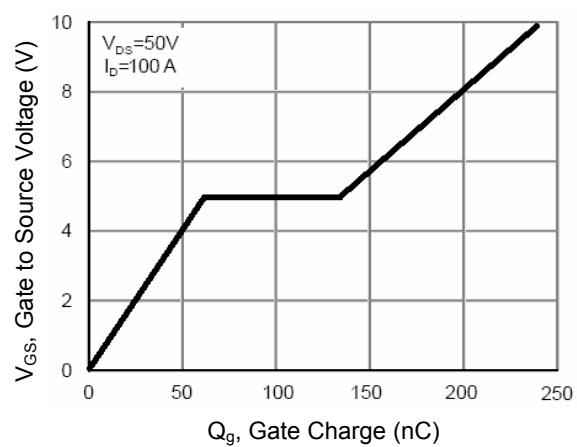


Figure 4. Gate Charge Characteristics

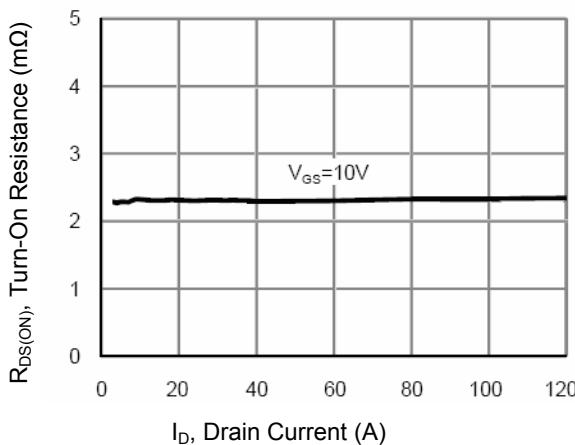


Figure 5. Turn-On Resistance vs. I_D

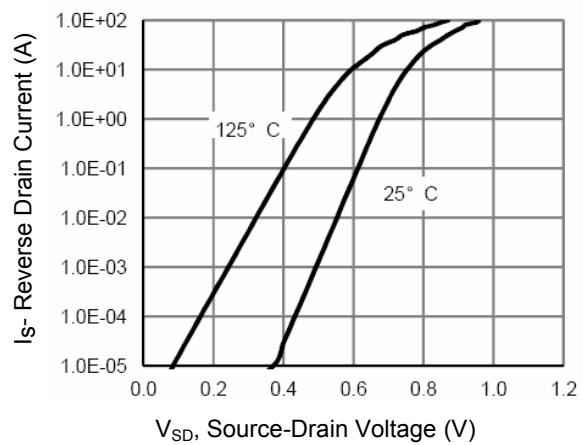


Figure 6. Source-Drain Diode Forward

Typical Electrical and Thermal Characteristic Curves

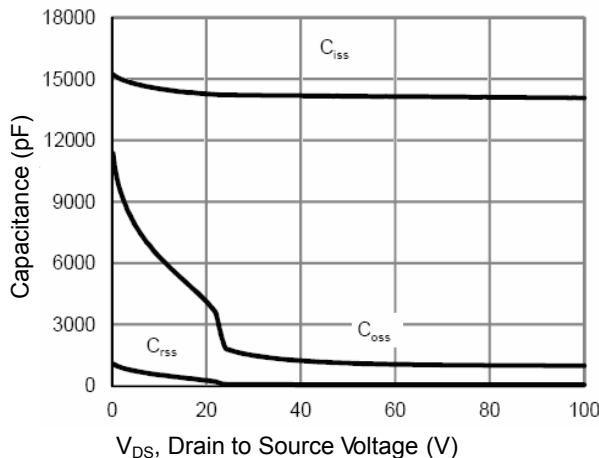


Figure 7. Capacitance Characteristics

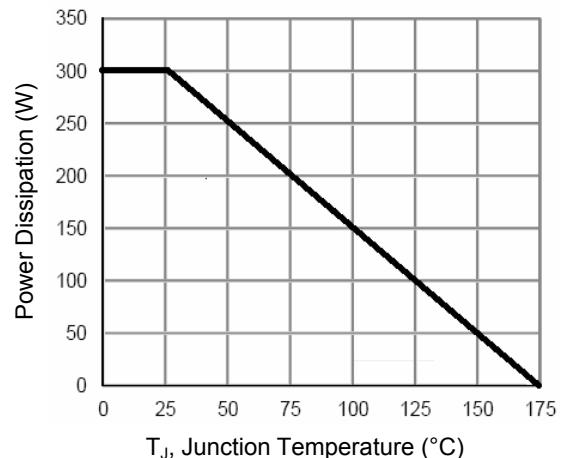


Figure 8. Power De-rating

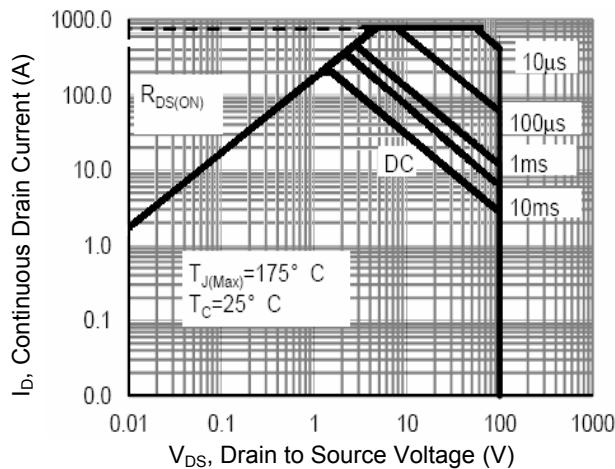


Figure 9. Maximum Safe Operation Area

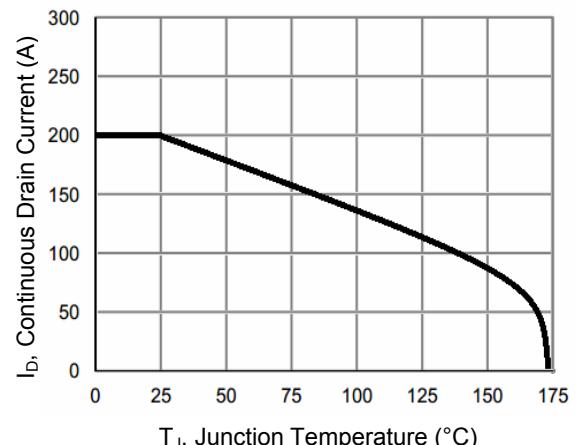


Figure 10. Continuous Drain Current vs. T_J

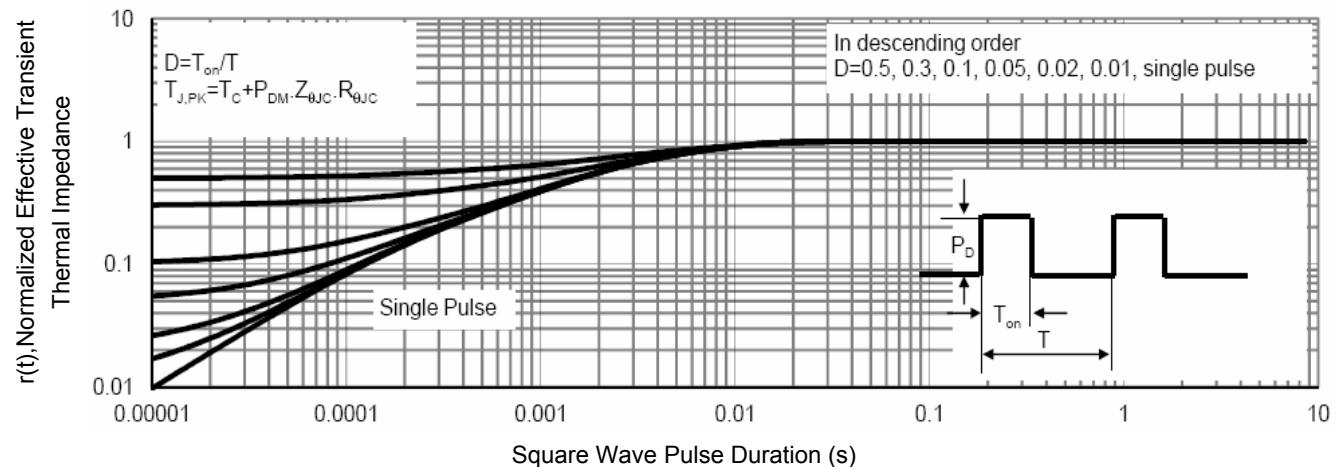
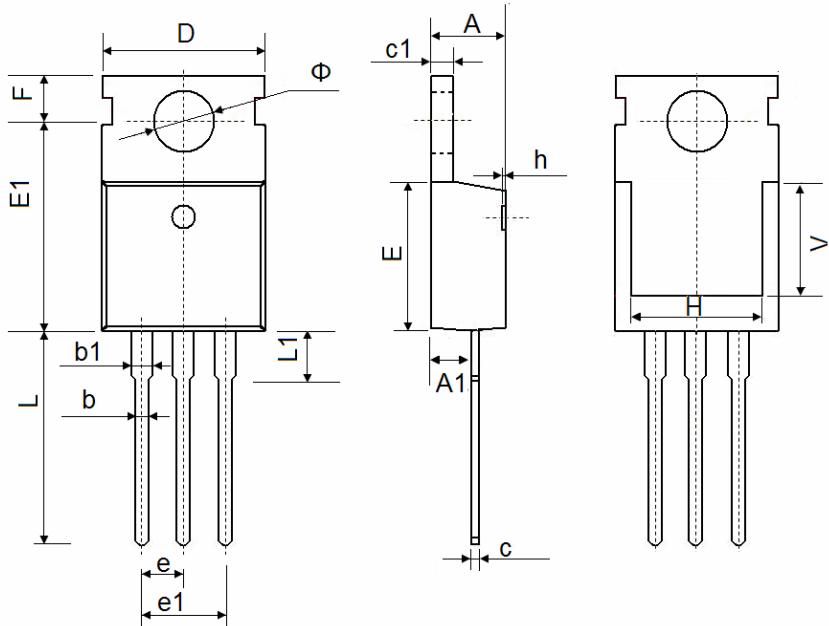


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions TO-220



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150