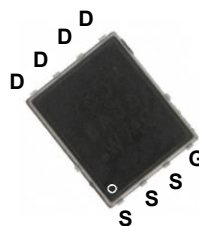


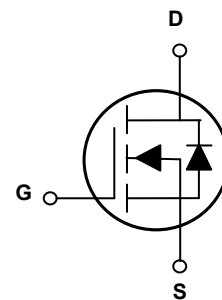


Main Product Characteristics

V_{DS}	40V
$R_{DS(ON)}$	1.0m Ω
I_D	200A



DFN5X6



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 GSGP04200 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}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	200	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		150	
Drain Current-Pulsed	I_{DM}	450	A
Maximum Power Dissipation	P_D	180	W
Derating Factor	P_D	1.44	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ⁵	E_{AS}	1800	mJ
Thermal Resistance, Junction-to-Case ²	$R_{\theta JC}$	0.67	$^\circ\text{C}/\text{W}$
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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
Zero Drain-Source Drain Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage ³	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.5	2.0	V
Static Drain-Source On-Resistance ³	$R_{DS(on)}$	$V_{GS}=10V, I_D=100A$	-	0.85	1.0	m Ω
		$V_{GS}=4.5V, I_D=100A$	-	1	1.2	
Forward Transconductance ³	g_{fs}	$V_{DS}=5V, I_D=100A$	-	90	-	S
Dynamic and Switching Characteristics						
Input Capacitance ⁴	C_{iss}	$V_{DS}=20V, V_{GS}=0V, F=1MHz$	-	8085	-	pF
Output Capacitance ⁴	C_{oss}		-	2123	-	
Reverse Transfer Capacitance ⁴	C_{rss}		-	121	-	
Turn-On Delay Time ⁴	$t_{d(on)}$	$V_{DD}=20V, R_G=1.6\Omega, V_{GS}=10V, I_D=100A$	-	13	-	nS
Rise Time ⁴	t_r		-	8	-	
Turn-Off Delay Time ⁴	$t_{d(off)}$		-	55	-	
Fall Time ⁴	t_f		-	10	-	
Total Gate Charge ⁴	Q_g	$V_{DS}=20V, I_D=100A, V_{GS}=10V$	-	137	-	nC
Gate-Source Charge ⁴	Q_{gs}		-	19	-	
Gate-Drain Charge ⁴	Q_{gd}		-	14	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Voltage ³ ($T_J=25^\circ\text{C}$)	V_{SD}	$V_{GS}=0V, I_S=100A$	-	-	1.2	V
Diode Forward Current ²	I_S	-	-	-	200	A
Reverse Recovery Time	t_{rr}	$I_f=I_S, di/dt=100A/\mu s^3, T_J=25^\circ\text{C}$	-	35	-	nS
Reverse Recovery Charge	Q_{rr}		-	120	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. E_{AS} condition : $T_J=25^\circ\text{C}, V_{DD}=20V, V_G=10V, L=0.5mH, R_g=25\Omega$

Typical Electrical and Thermal Characteristic Curves

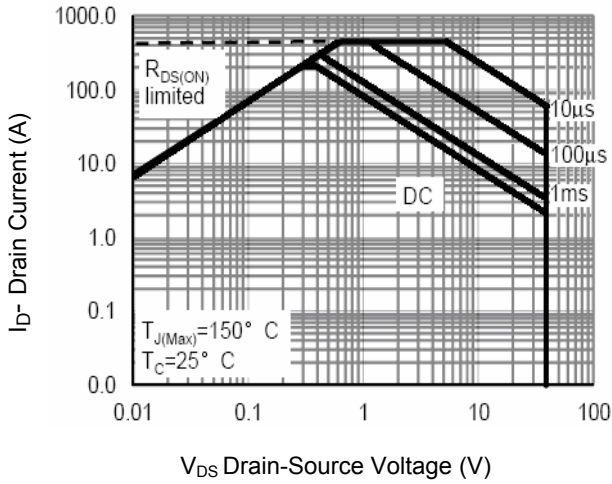


Figure 1. Safe Operating Area

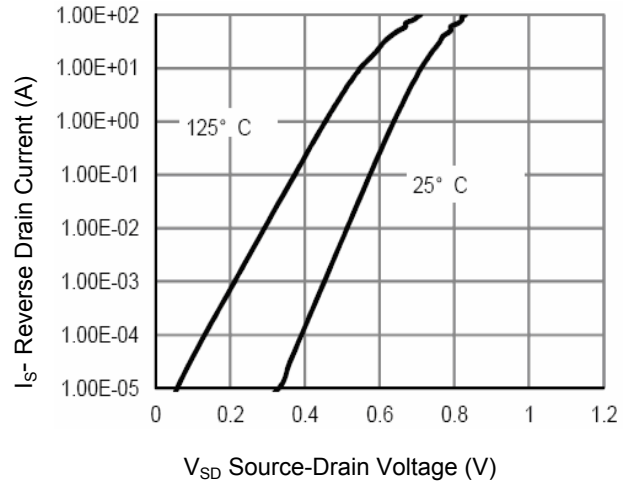


Figure 2. Source-Drain Diode Forward Voltage

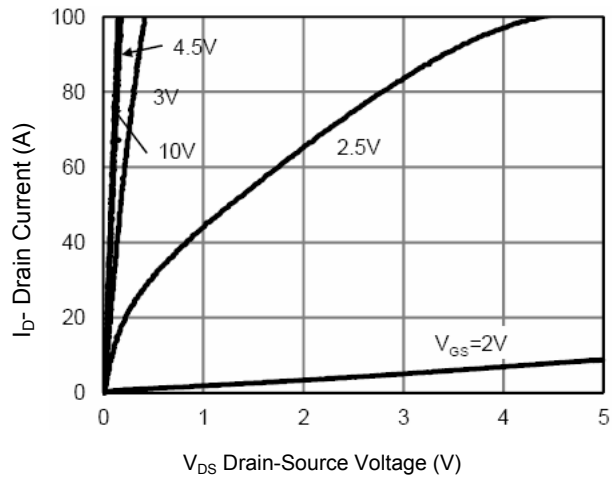


Figure 3. Output Characteristics

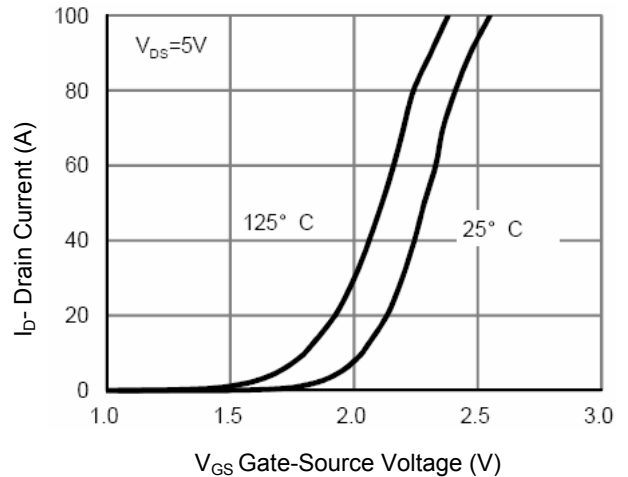


Figure 4. Transfer Characteristics

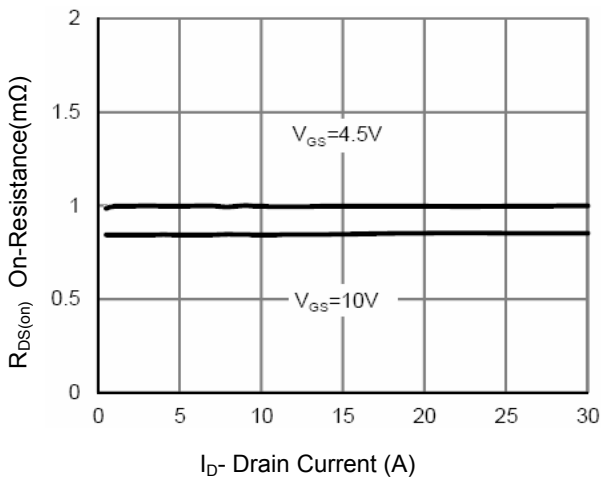


Figure 5. Rdson- Drain Current

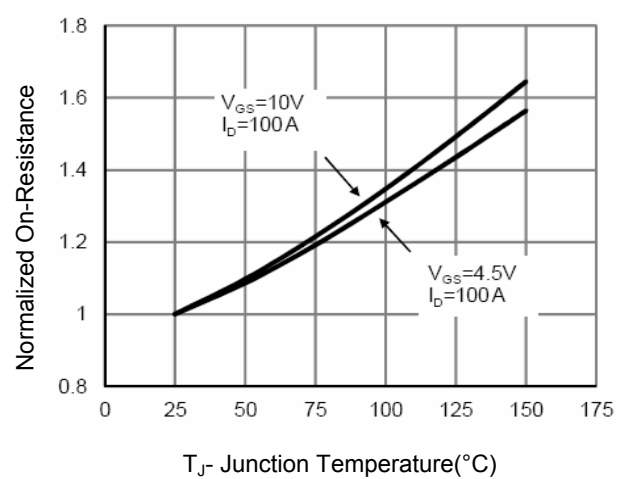


Figure 6. $R_{DS(on)}$ vs. Junction Temperature

Typical Electrical and Thermal Characteristic Curves

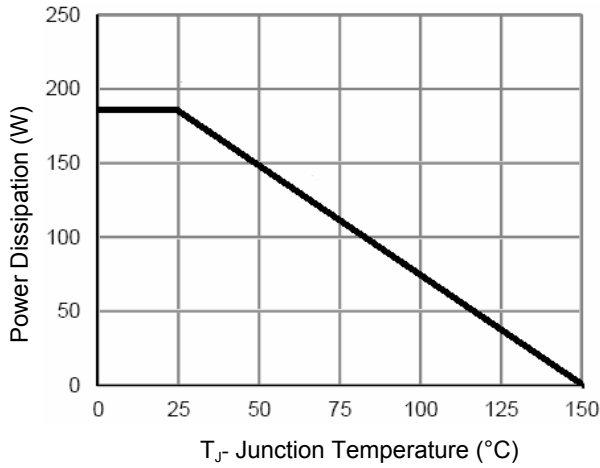


Figure 7. Power De-Rating

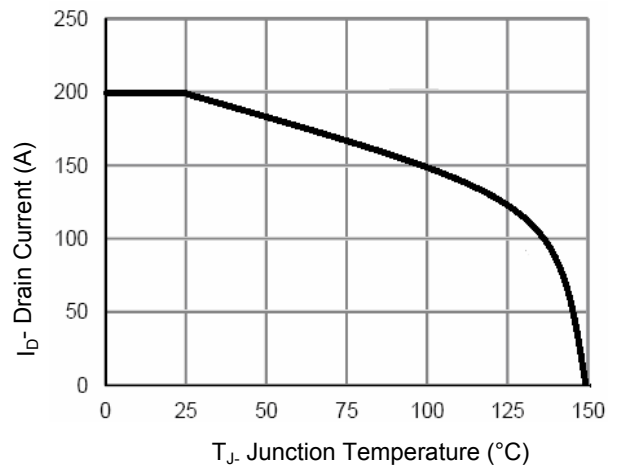


Figure 8. Current De-Rating

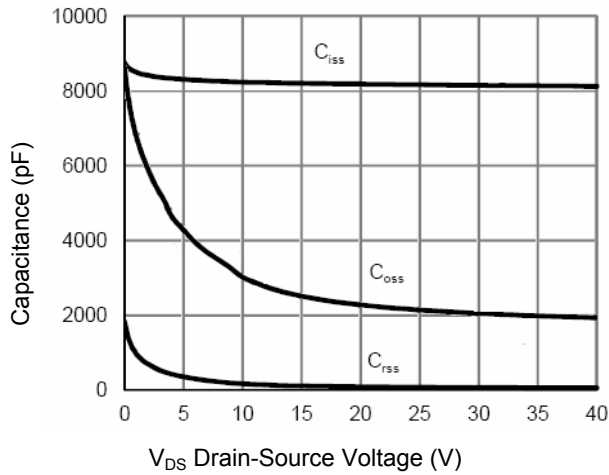


Figure 9. Capacitance

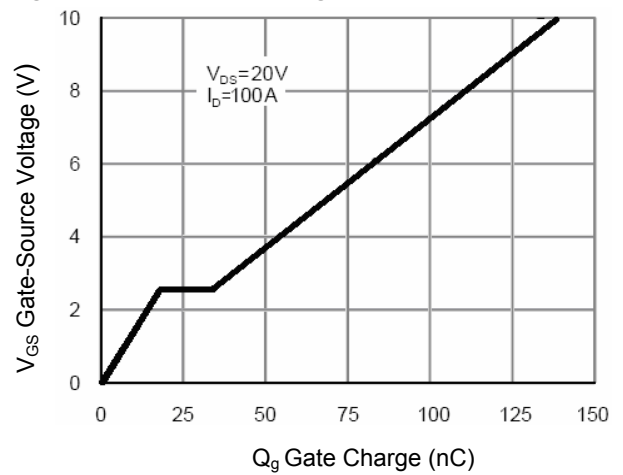


Figure 10. Gate Charge Waveforms

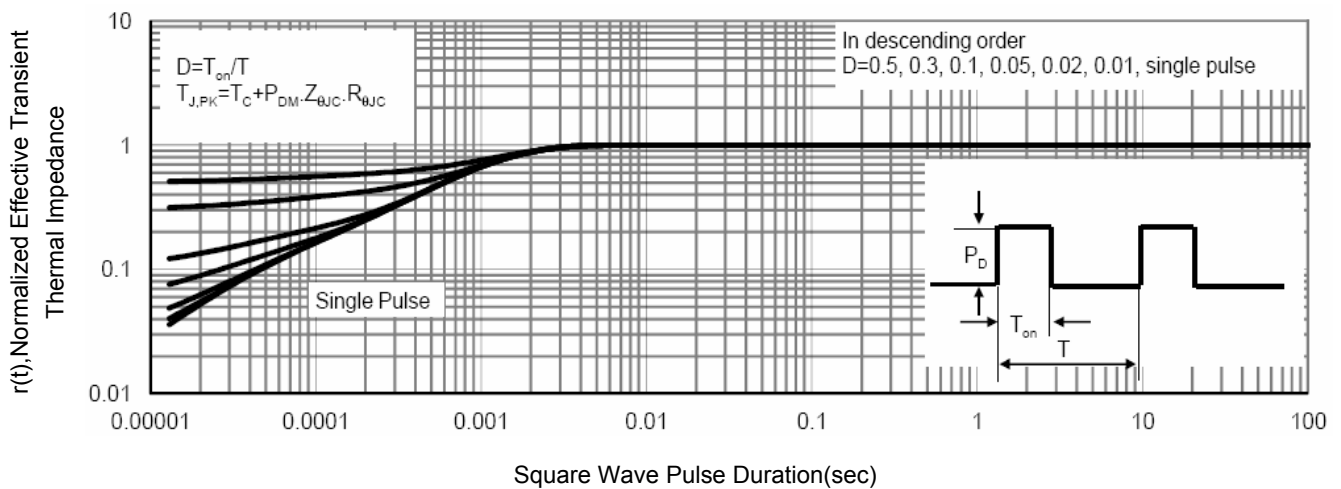


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions (DFN5X6)

