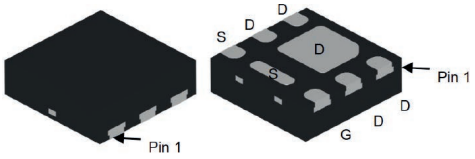
GOOD-ARK
SEMICONDUCTOR

GSFN4004

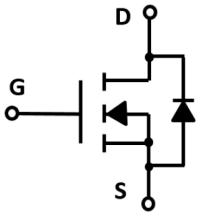
40V N-Channel MOSFET

Main Product Characteristics

BV_{DSS}	40V
$R_{DS(ON)}$	6mΩ (Max.)
I_D	17.8A



DFN2x2-6L



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 GSFN4004 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_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_A=25°C)	I_D	17.8	A
Continuous Drain Current (T_A=70°C)		14.2	A
Pulsed Drain Current[1]	I_{DM}	71	A
Total Power Dissipation (T_A=25°C)[2]	P_D	3.8	W
Thermal Resistance Junction-to-Ambient[2]	$R_{\theta JA}$	33	°C/W
Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V, T_C=25°C	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1	-	2.2	V
Static Drain-Source on-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=10A	-	4.9	6	mΩ
		V_{GS}=4.5V, I_D=8A	-	7.1	9.3	
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{DS}=20V, V_{GS}=0V, f=1MHz	-	980	-	pF
Output Capacitance	C_{oss}		-	270	-	
Reverse Transfer Capacitance	C_{rss}		-	26	-	
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=20V, I_D=10A	-	18.5	-	nC
Gate Source Charge	Q_{gs}		-	6	-	
Gate Drain Charge	Q_{gd}		-	4.5	-	
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DD}=20V, I_D=10A, R_{GEN}=3Ω	-	8	-	nS
Turn-on Rise Time	t_r		-	20	-	
Turn-off Delay Time	$t_{d(off)}$		-	17	-	
Turn-off Fall Time	t_f		-	6	-	
Source-Drain Ratings and Characteristics						
Diode Forward Voltage	V_{SD}	I_S=10A, V_{GS}=0V	-	0.8	1.2	V
Maximum Body-Diode Continuous Current	I_S	-	-	-	17.8	A

Notes:

1. Pulse test: pulse width ≤300us, duty cycle ≤2%.
2. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch. With 2oz Copper, t ≤10s.

Typical Performance Characteristics

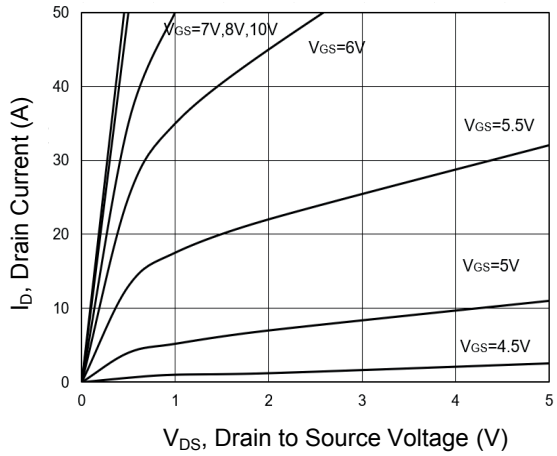


Figure 1. Output Characteristics

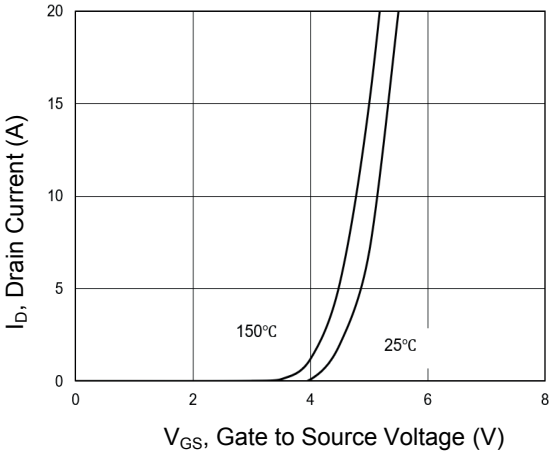


Figure 2. Transfer Characteristics

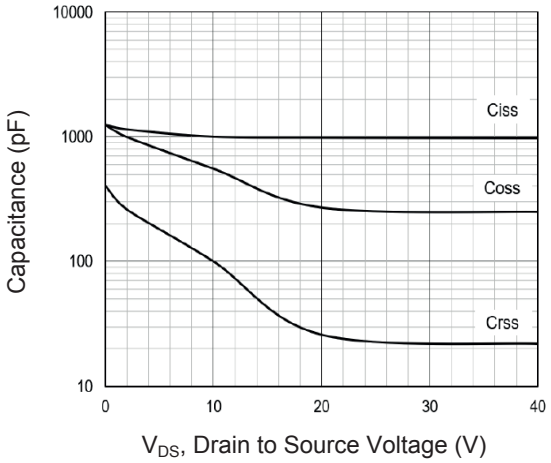


Figure 3. Capacitance Characteristics

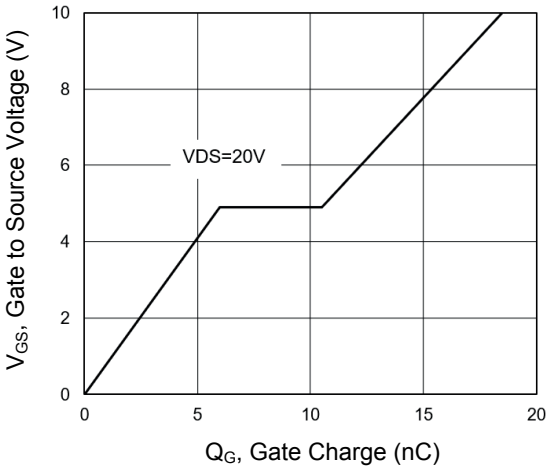


Figure 4. Gate Charge

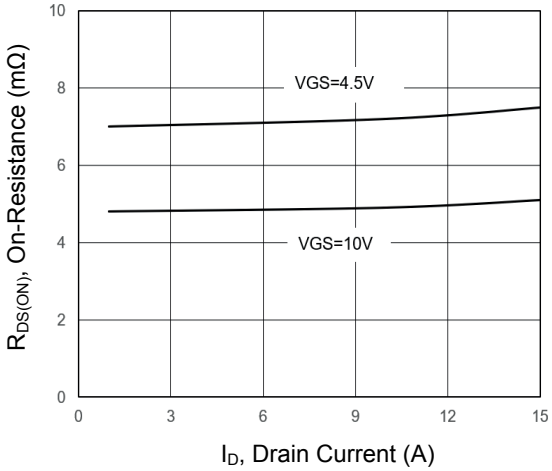


Figure 5. Drain to Source On Resistance

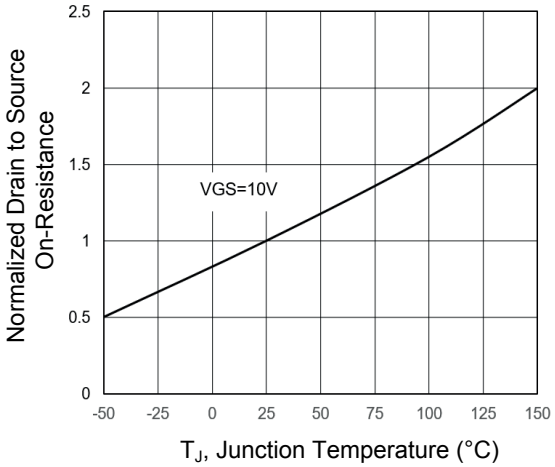


Figure 6. Normalized On-Resistance vs. T_J

Typical Performance Characteristics

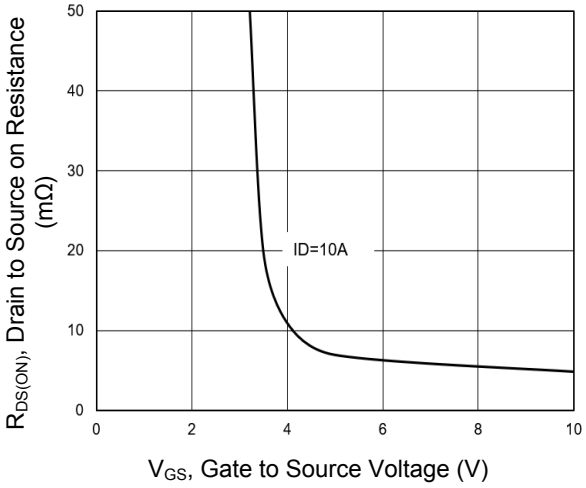


Figure 7. Typical Drain to Source On Resistance vs. Gate Voltage

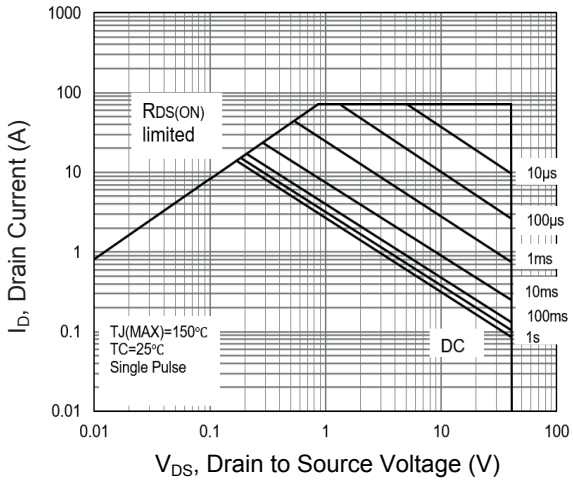


Figure 8. Safe Operation Area

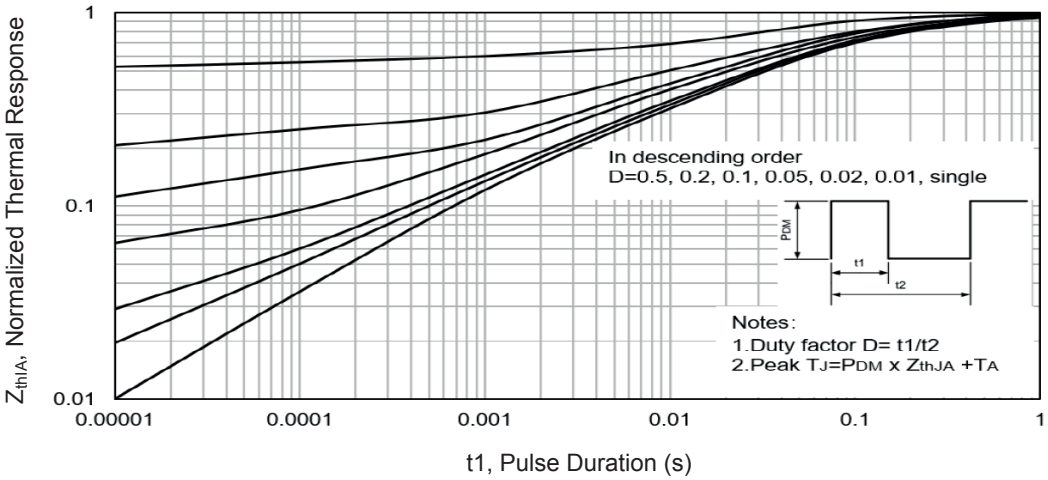
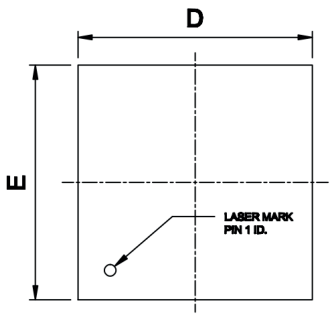
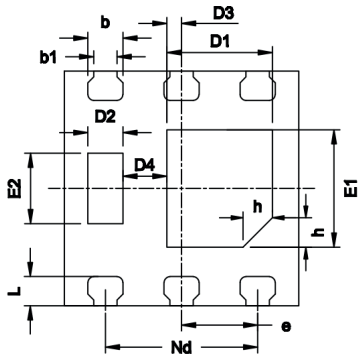


Figure 9. Maximum Effective Transient Thermal Impedance, Junction-to-Case

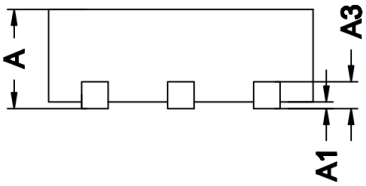
Package Outline Dimensions (DFN2x2-6L)



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.70	0.80	0.028	0.031
A1	0.00	0.05	0.000	0.002
A3	0.203 REF		0.008 REF	
b	0.25	0.35	0.010	0.014
b1	0.15	0.25	0.006	0.010
D	1.95	2.05	0.077	0.081
E	1.95	2.05	0.077	0.081
D1	0.85	0.95	0.033	0.037
E1	0.95	1.05	0.037	0.041
D2	0.25	0.35	0.010	0.014
E2	0.55	0.65	0.022	0.026
e	0.650 BSC		0.026 BSC	
D3	0.08	0.17	0.003	0.007
D4	0.33	0.43	0.013	0.017
L	0.20	0.30	0.008	0.012
h	0.20	0.30	0.008	0.012
Nd	1.300 BSC		0.051 BSC	

Order Information

Device	Package	Marking	Packaging	SPQ
GSFN4004	DFN2x2-6L	N4004GNF2	Tape & Reel	3,000 pcs / Reel