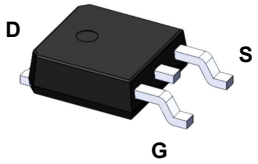
GOOD-ARK SEMICONDUCTOR

GSFD2R804

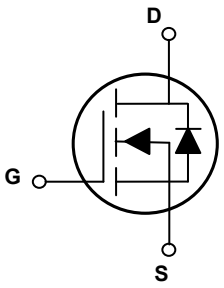
40V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	40V
$R_{DS(ON)}$	2.8mΩ (Max.)
I_D	120A



TO-252 (DPAK)



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 GSFD2R804 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	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25°C)	I_D	120	A
Drain Current-Continuous (T_C=100°C)		90	
Drain Current-Pulsed[1]	I_{DM}	480	A
Single Pulse Avalanche Energy[2]	E_{AS}	264	mJ
Single Pulse Avalanche Current[2]	I_{AS}	32.5	A
Power Dissipation (T_C=25°C)	P_D	80	W
Power Dissipation-Derate above 25°C		0.64	W/°C
Max. Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Max. Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.56	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

Electrical Characteristics (T_J=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	40	-	-	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C, I_D=1mA	-	0.03	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V, T_J=25°C	-	-	1	μA
		V_{DS}=32V, V_{GS}=0V, T_J=125°C	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance[3]	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	-	2.2	2.8	mΩ
		V_{GS}=4.5V, I_D=15A	-	2.7	3.6	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	1.1	1.8	2.8	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		-	-5	-	mV/°C
Forward Transconductance	gfs	V_{DS}=10V, I_D=3A	-	24	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[3,4]	Q_g	V_{DS}=20V, I_D=20A, V_{GS}=10V	-	51	-	nC
Gate-Source Charge[3,4]	Q_{gs}		-	9.2	-	
Gate-Drain Charge[3,4]	Q_{gd}		-	12	-	
Turn-On Delay Time[3,4]	$t_{d(on)}$	V_{DD}=20V, R_G=6Ω, V_{GS}=10V, I_D=20A	-	18.9	-	nS
Rise Time[3,4]	t_r		-	27	-	
Turn-Off Delay Time[3,4]	$t_{d(off)}$		-	41	-	
Fall Time[3,4]	t_f		-	28	-	
Input Capacitance	C_{iss}	V_{DS}=20V, V_{GS}=0V, F=1MHz	-	3565	-	pF
Output Capacitance	C_{oss}		-	931	-	
Reverse Transfer Capacitance	C_{rss}		-	115	-	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, F=1MHz	-	1.8	-	Ω
Drain-Source Ratings and Characteristics						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	120	A
Pulsed Source Current[3]	I_{SM}		-	-	480	A
Diode Forward Voltage[3]	V_{SD}	V_{GS}=0V, I_S=10A, T_J=25°C	-	-	1.4	V
Reverse Recovery Time	t_{rr}	I_F=30A, di/dt=100A/uS	-	59	-	nS
Reverse Recovery Charge	Q_{rr}		-	50	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.5mH, I_{AS}=32.5A, starting T_J=25°C.
3. Pulse test: pulse width ≤300us, duty cycle ≤2%.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

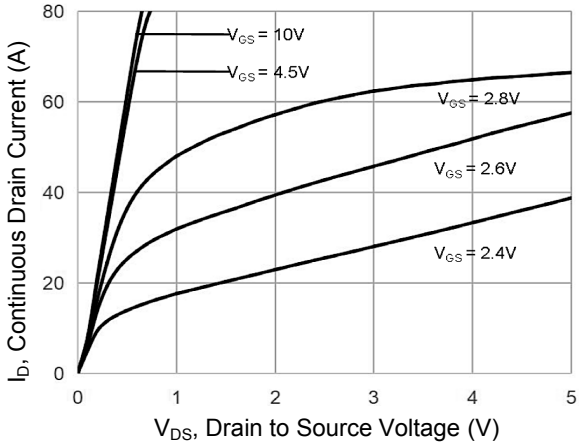


Figure 1. Output Characteristics

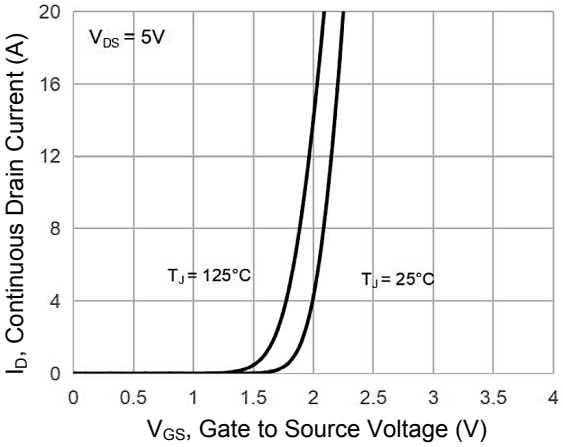


Figure 2. Transfer Characteristics

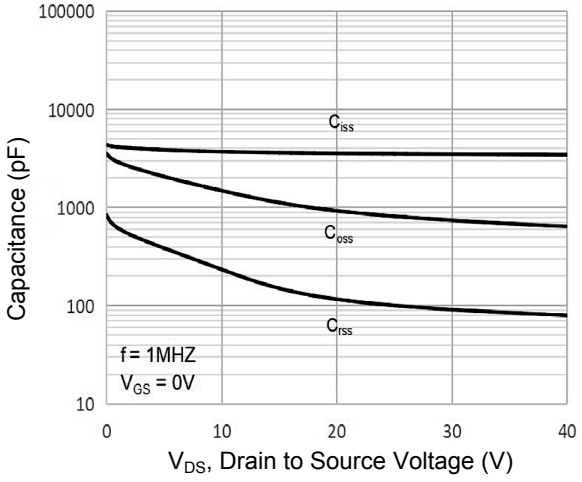


Figure 3. Capacitance Characteristics

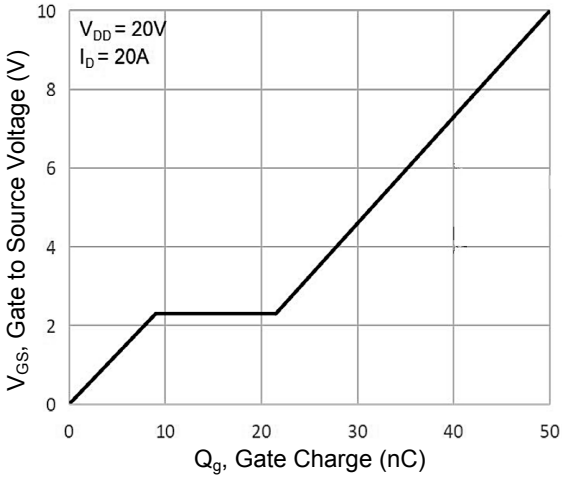


Figure 4. Gate Charge Waveform

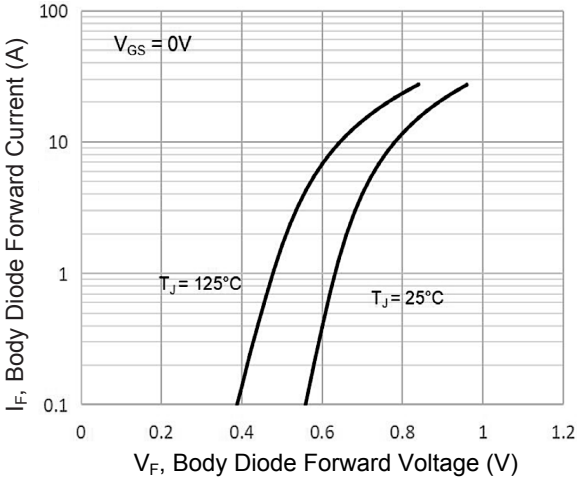


Figure 5. Body Diode Characteristics

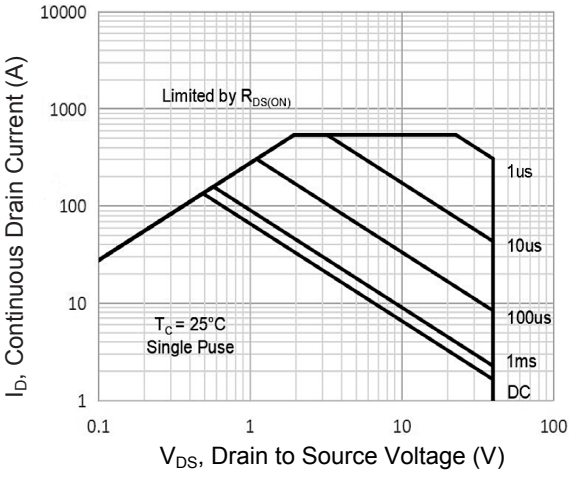
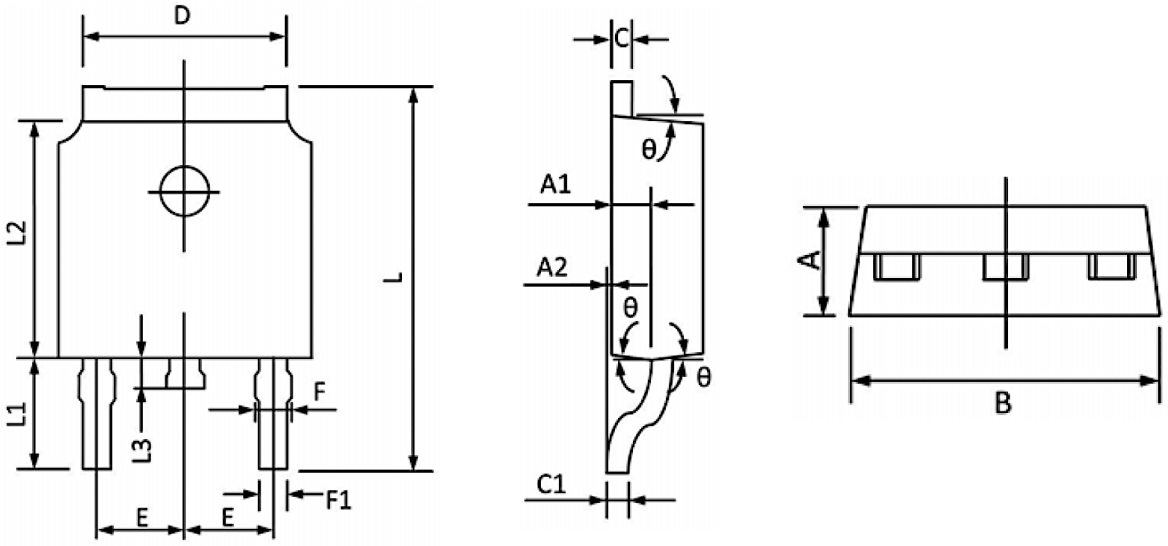


Figure 6. Maximum Safe Operation Area

Package Outline Dimensions TO-252 (DPAK)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.910	1.110	0.036	0.044
A2	0.000	0.150	0.000	0.006
B	6.400	6.800	0.252	0.268
C	0.450	0.580	0.018	0.023
C1	0.460	0.580	0.018	0.023
D	5.100	5.500	0.201	0.217
E	2.186	2.386	0.086	0.094
F	0.600	0.940	0.024	0.037
F1	0.500	0.860	0.020	0.034
L	9.400	10.400	0.370	0.409
L1	2.400	3.000	0.094	0.118
L2	5.400	6.200	0.213	0.244
L3	0.600	1.200	0.024	0.047
θ	3°	9°	3°	9°

Order Information

Device	Package	Marking	Packaging	SPQ
GSFD2R804	TO-252 (DPAK)	D2R804	Tape & Reel	2,500 Pcs / Reel