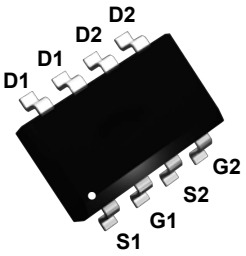
GOOD-ARK SEMICONDUCTOR

GSFQ3816K

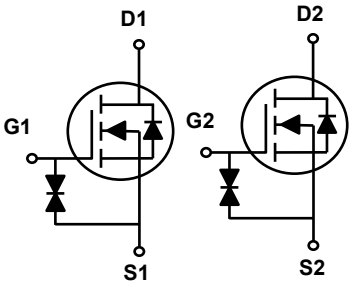
20V Dual N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	20V
$R_{DS(ON)}$	20mΩ (Max.)
I_D	9.5A



SOP-8



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

RoHS Compliant

Description

The GSFQ3816K 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}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous (T_A=25°C)	I_D	9.5	A
Drain Current-Continuous (T_A=100°C)		7.2	
Drain Current-Pulsed[1]	I_{DM}	38	A
Power Dissipation (T_A=25°C)	P_D	1.3	W
Power Dissipation-Derate above 25°C		0.011	W/°C
Max. Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	92	°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	20	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, I_D=1mA	-	0.02	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V, T_J=25 °C	-	-	1	μA
		V_{DS}=16V, V_{GS}=0V, T_J=125°C	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±10V, V_{DS}=0V	-	-	±10	μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=3A	-	14	20	mΩ
		V_{GS}=2.5V, I_D=2A	-	18	28	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	0.5	0.7	1	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-2	-	mV/°C
Forward Transconductance	gfs	V_{DS}=5V, I_S=5A	-	14	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=10V, I_D=5A, V_{GS}=4.5V	-	9.2	-	nC
Gate-Source Charge[2,3]	Q_{gs}		-	1.6	-	
Gate-Drain Charge[2,3]	Q_{gd}		-	2.1	-	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=10V, R_G=3Ω, V_{GS}=4.5V, I_D=5A	-	11	-	nS
Rise Time[2,3]	t_r		-	34	-	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	54	-	
Fall Time[2,3]	t_f		-	52	-	
Input Capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0V, F=1MHz	-	670	-	pF
Output Capacitance	C_{oss}		-	150	-	
Reverse Transfer Capacitance	C_{rss}		-	90	-	
Drain-Source Ratings and Characteristics						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	9.5	A
Pulsed Source Current	I_{SM}		-	-	38	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A, T_J=25°C	-	-	1.2	V

Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width ≤300us, duty cycle ≤2%.
3. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

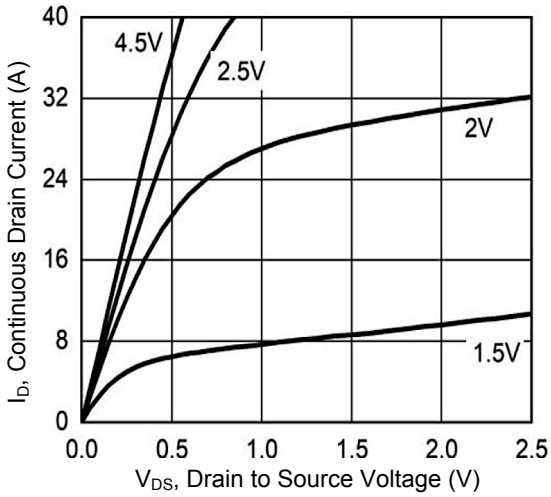


Figure 1. Output Characteristics

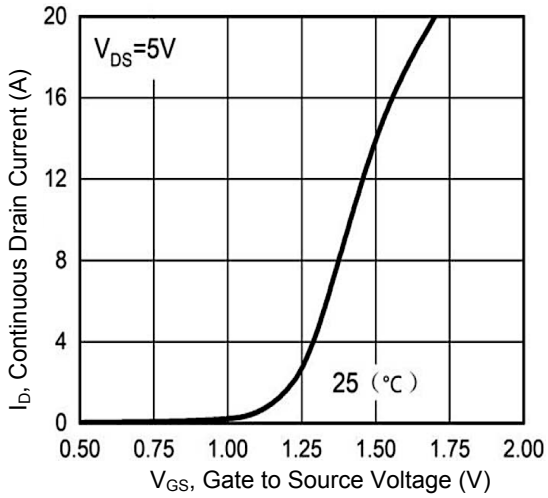


Figure 2. Transfer Characteristics

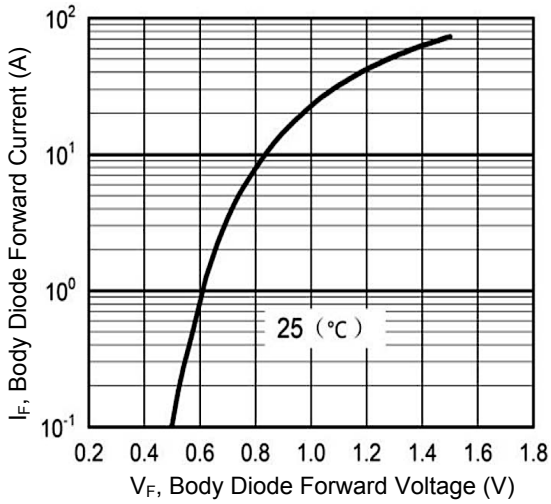


Figure 3. Body Diode Characteristics

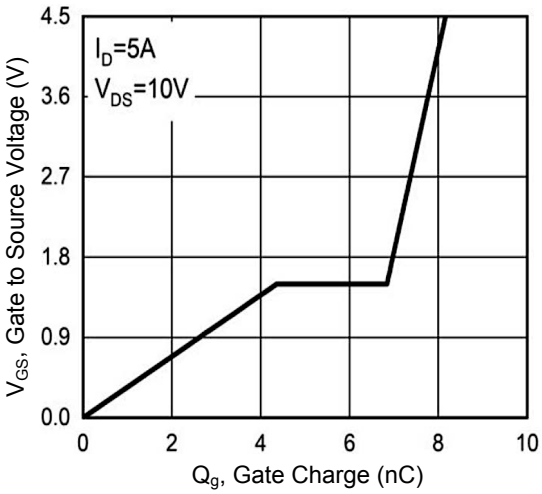


Figure 4. Gate Charge Waveform

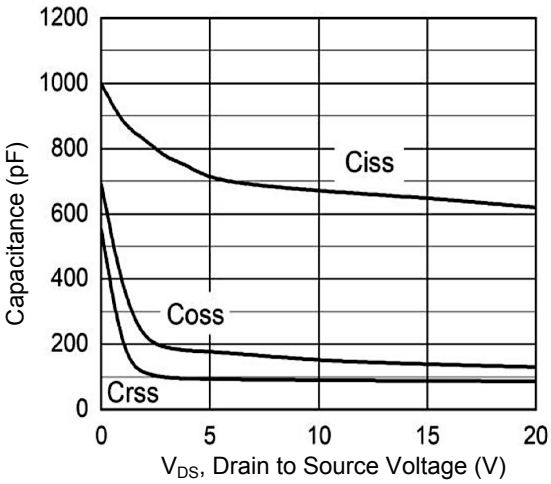


Figure 5. Capacitance Characteristics

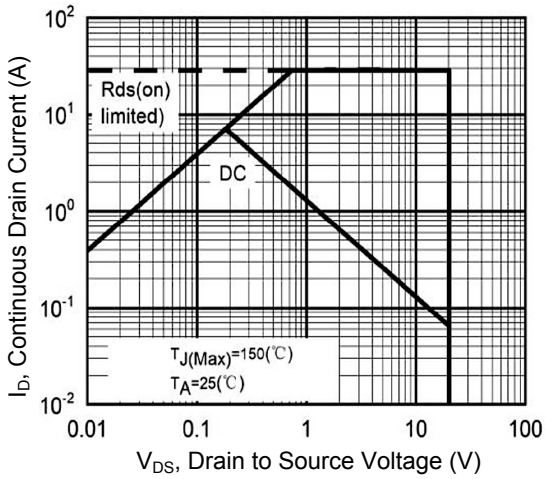
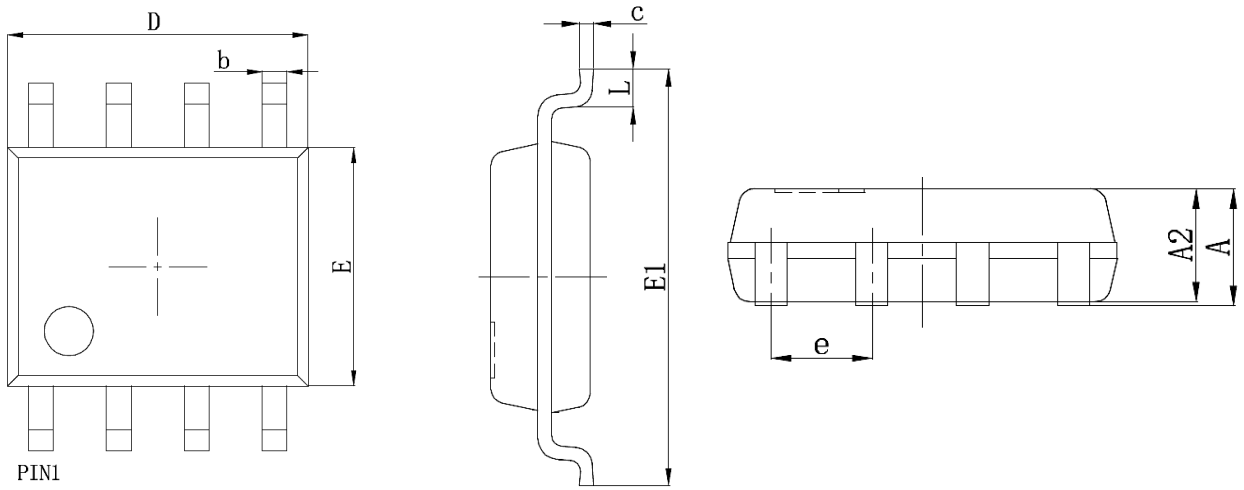


Figure 6. Maximum Safe Operation Area

Package Outline Dimensions (SOP-8)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.30	1.70	0.051	0.067
A2	1.25	1.55	0.049	0.061
c	0.17	0.25	0.007	0.010
E	3.80	4.00	0.150	0.157
E1	5.80	6.20	0.228	0.244
L	0.45	0.75	0.018	0.030
b	0.33	0.51	0.013	0.020
D	4.80	5.00	0.189	0.197
e	1.27 BSC		0.050 BSC	

Order information

Device	Package	Marking	Packaging	SPQ
GSFQ3816K	SOP-8	Q3816K	Tape & Reel	3,000 Pcs / Reel