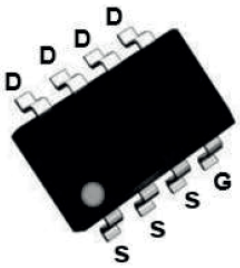
GOOD-ARK SEMICONDUCTOR

GSFQ4017

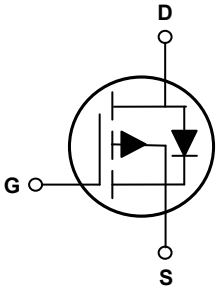
40V P-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	-40V
$R_{DS(ON)}$	17mΩ (max.)
I_D	-8.8A



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

Description

The GSFQ4017 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	Max.	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25°C), V_{GS}=10V[1]	I_D	-8.8	A
Drain Current-Continuous (T_C=100°C), V_{GS}=10V[1]		-7.2	A
Drain Current-Pulsed[2]	I_{DM}	-35	A
Pulsed Source Current (Body Diode)[2]	I_{SM}	-35	A
Maximum Power Dissipation (T_C=25°C)[3]	P_D	2.5	W
Single Pulse Avalanche Energy (L=0.3mH)	E_{AS}	245	mJ
Single Pulse Avalanche Current (L=0.3mH)	I_{AS}	40	A
Junction-to-Ambient (t ≤ 10s)[4]	$R_{\theta JA}$	62	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	50	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

Electrical Characteristics (T_A=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=-250uA	-40	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=-40V, V_{GS}=0V	-	-	-1	μA
Drain-to-Source Leakage Current		V_{DS}=-40V, V_{GS}=0V, T_J=125°C	-	-	-50	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250uA	-1.0	-1.6	-2.9	V
Drain Static-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-8A	-	12	17	mΩ
		V_{GS}=-4.5V, I_D=-5A	-	15	23	mΩ
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	V_{DD}=-20V, I_D=-8A, V_{GS}=-10V	-	60	-	nC
Gate-Source Charge	Q_{gs}		-	8.8	-	
Gate-Drain Charge	Q_{gd}		-	13	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=-30V, R_G=3Ω, R_L=1.5Ω, V_{GS}=-10V, I_D=-8A	-	8.0	-	nS
Rise Time	t_r		-	26.5	-	
Turn-Off Delay Time	$t_{d(off)}$		-	105.2	-	
Fall Time	t_f		-	142.1	-	
Input Capacitance	C_{iss}	V_{DS}=-20V, V_{GS}=0V, F=1MHz	-	3580	-	pF
Output Capacitance	C_{oss}		-	263	-	
Reverse Transfer Capacitance	C_{rss}		-	284	-	
Gate Resitance	R_g	F=1MHz	-	4.3	-	Ω
Source-Drain Ratings and Characteristics						
Maximum Body-Diode Continuous Current	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-8.8	-	A
Maximum Body-Diode Pulse Current	I_{SM}		-	-35	-	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-8A, T_J=25°C	-	-0.9	-1.3	V
Reverse Recovery Time	T_{rr}	I_F=-8A, di/dt=100A/μs, T_J=25°C	-	4.5	-	nS
Reverse Recovery Charge	Q_{rr}		-	9.5	-	nC

Notes

1. Calculated continuous current based on maximum allowable junction temperature.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. The power dissipation P_D is based on max. junction temperature, using junction-to-case thermal resistance.
4. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C

Typical Electrical and Thermal Characteristic Curves

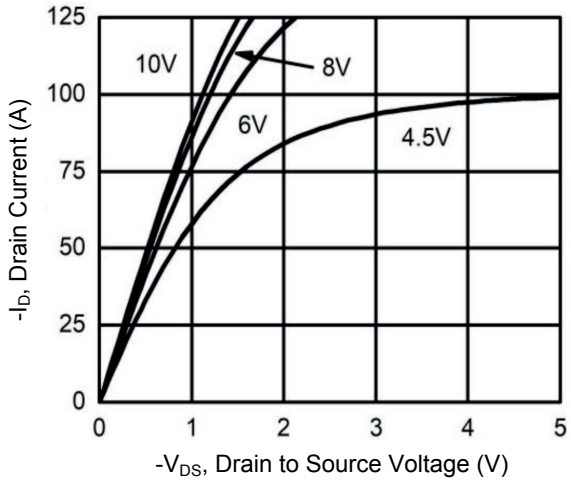


Figure 1. Output Characteristics

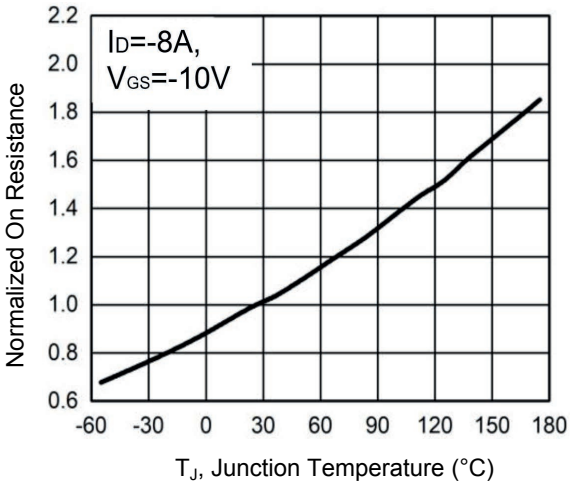


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

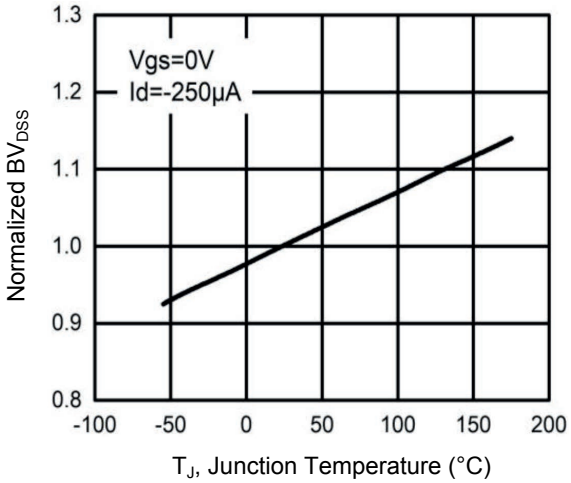


Figure 3. BV_{DSS} vs. T_J

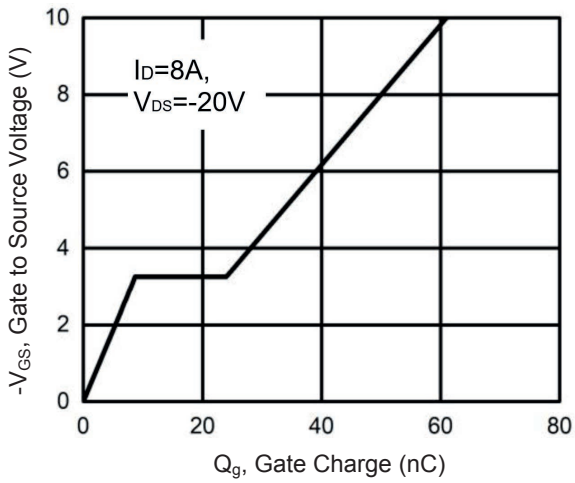


Figure 4. Gate Charge Waveform

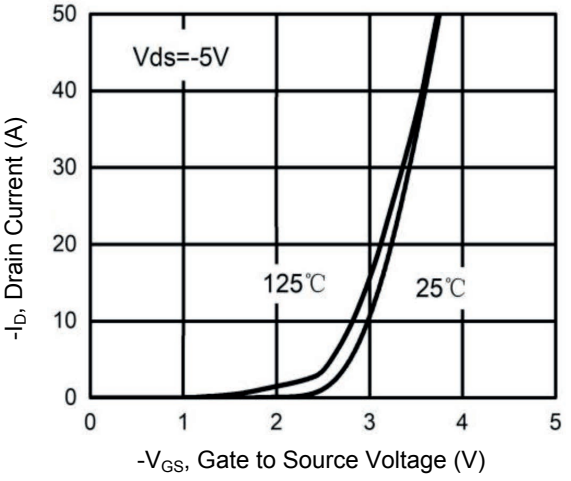


Figure 5. Transfer Characteristics

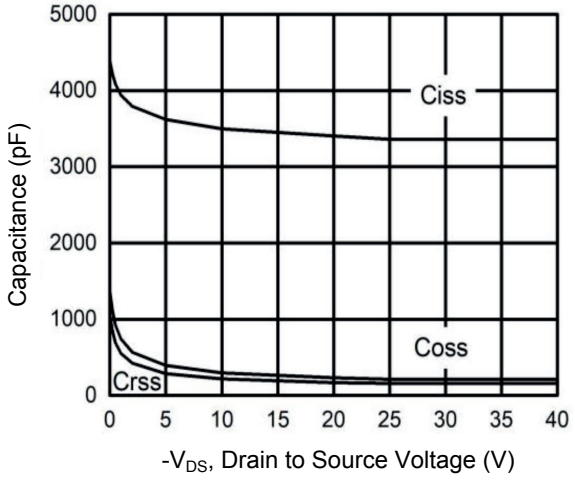
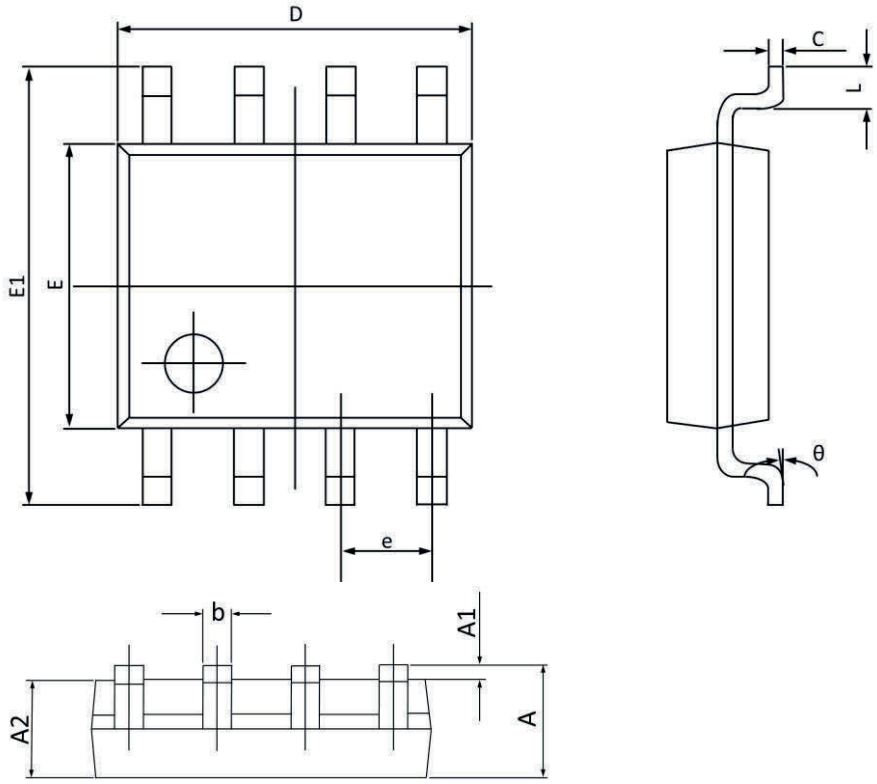


Figure 6. Capacitance Characteristics

Package Outline Dimensions (SOP-8)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.300	1.500	0.051	0.059
b	0.350	0.490	0.014	0.019
C	0.190	0.260	0.007	0.010
D	4.700	5.100	0.185	0.201
E	3.700	4.100	0.146	0.161
E1	5.800	6.200	0.228	0.244
e	1.27 BSC		0.05 BSC	
L	0.400	0.900	0.016	0.035
θ	0°	8°	0°	8°

Order Information

Device	Package	Marking	Carrier	Quantity
GSFQ4017	SOP-8	Q4017	Tape & Reel	3,000 Pcs / Reel