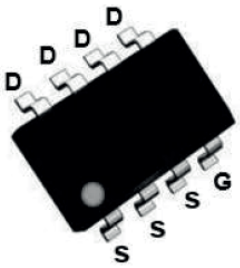
GOOD-ARK SEMICONDUCTOR

GSFQ3041

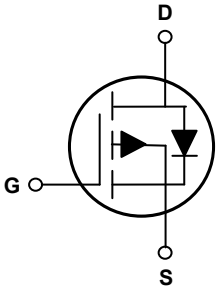
30V P-Channel MOSFET

Main Product Characteristics

BV_{DSS}	-30V
$R_{DS(ON)}$	41mΩ (Max.)
I_D	-5.6A



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 GSFQ3041 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}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25°C)	I_D	-5.6	A
Drain Current-Continuous (T_C=100°C)		-3.6	
Drain Current-Pulsed[1]	I_{DM}	-22.4	A
Single Pulse Avalanche Energy[2]	E_{AS}	30	mJ
Single Pulse Avalanche Current[2]	I_{AS}	-10.8	A
Power Dissipation (T_C=25°C)	P_D	2.7	W
Power Dissipation-Derate above 25°C		0.022	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	60	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	47	°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=-250uA	-30	-	-	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}=-30V, V_{GS}=0V, T_J=25°C	-	-	-1	μA
		V_{DS}=-24V, V_{GS}=0V, T_J=125°C	-	-	-100	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-5A	-	30	41	mΩ
		V_{GS}=-4.5V, I_D=-4A	-	41	54	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250uA	-1.1	-1.7	-2.8	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		-	4	-	mV/°C
Forward Transconductance	gfs	V_{DS}=-5V, I_D=-5A	-	8.1	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=-15V, I_D=-5A, V_{GS}=-10V	-	15	-	nC
Gate-Source Charge[2,3]	Q_{gs}		-	4	-	
Gate-Drain Charge[2,3]	Q_{gd}		-	2	-	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=-15V, R_G=3Ω, V_{GS}=-10V, I_D=-5A	-	13	-	nS
Rise Time[2,3]	t_r		-	3.4	-	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	41	-	
Fall Time[2,3]	t_f		-	9	-	
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, F=1MHz	-	739	-	pF
Output Capacitance	C_{oss}		-	54	-	
Reverse Transfer Capacitance	C_{rss}		-	44	-	
Source-Drain Ratings and Characteristics						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	-5.6	A
Pulsed Source Current	I_{SM}		-	-	-22.4	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-3A, T_J=25°C	-	-	-1.2	V

Notes:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. V_{DD}=-25V, V_{GS}=-10V, L=0.5mH, R_g=25Ω, starting T_J=25°C.
3. Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.

Typical Electrical and Thermal Characteristic Curves

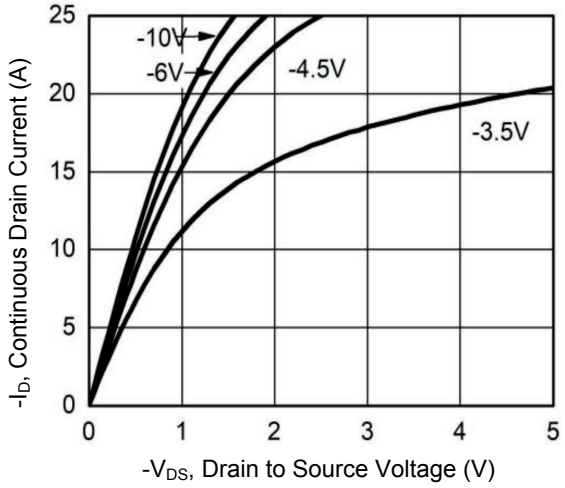


Figure 1. Output Characteristics

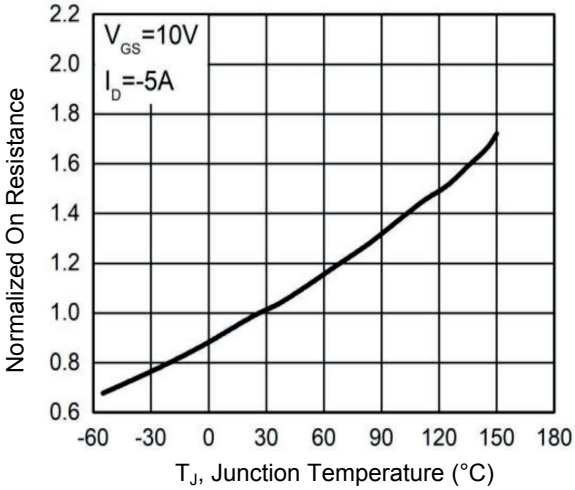


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

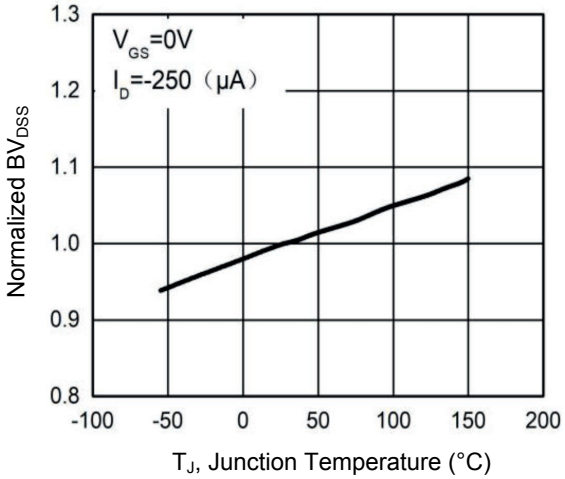


Figure 3. Normalized BV_{DSS} vs. T_J

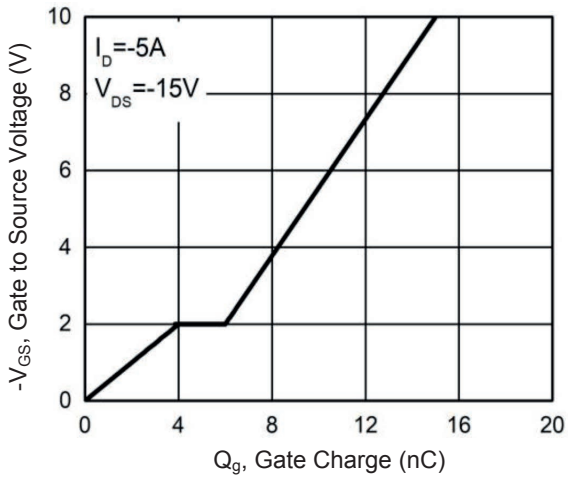


Figure 4. Gate Charge Waveform

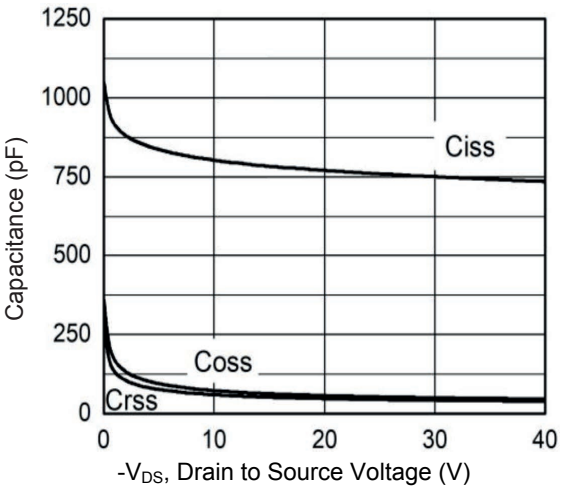


Figure 5. Capacitance Characteristics

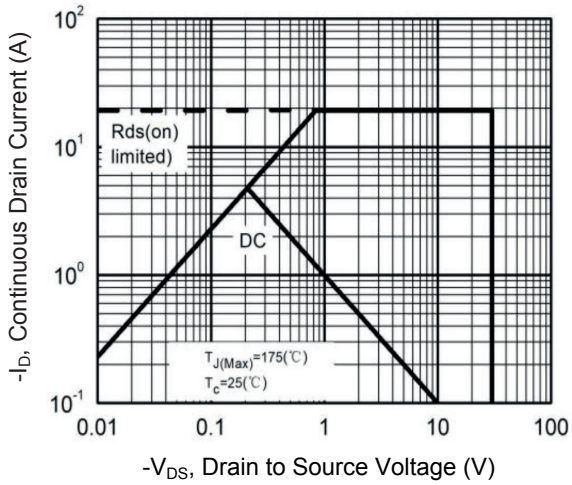
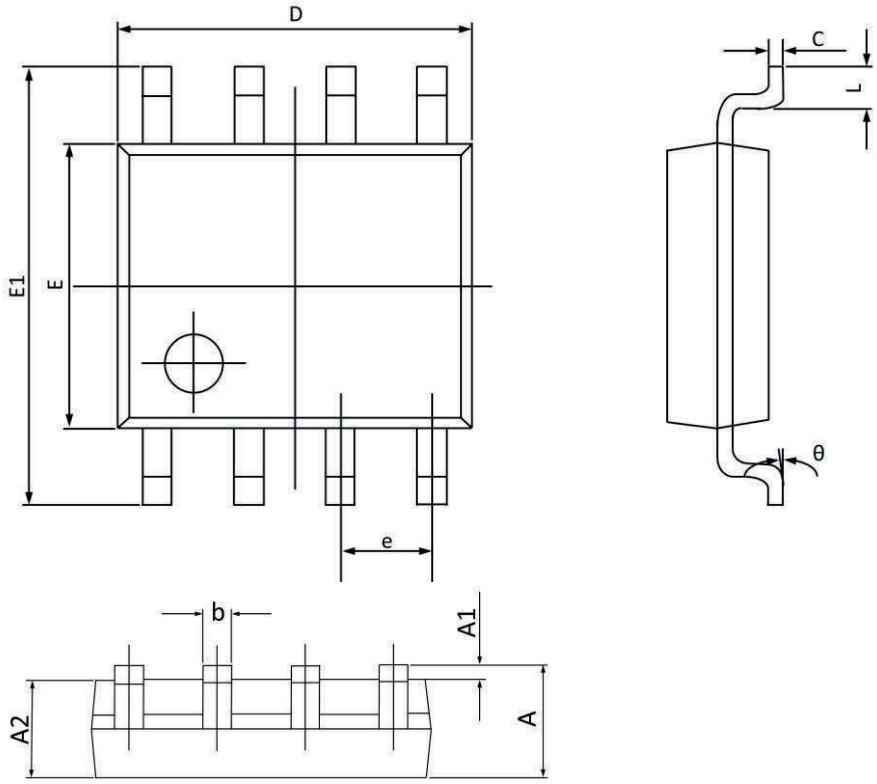


Figure 6. Maximum Safe Operation Area

Package Outline Dimensions (SOP-8)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	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
GSFQ3041	SOP-8	Q3041	Tape & Reel	3,000 Pcs / Reel