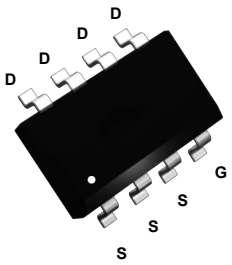
GOOD-ARK SEMICONDUCTOR

GSFQ3025

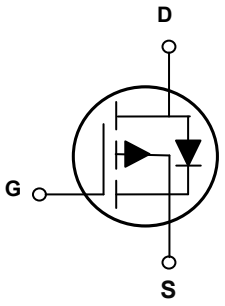
30V P-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	-30V
$R_{DS(ON)}$	25mΩ (Max.)
I_D	-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 GSFQ3025 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	-8	A
Drain Current-Continuous (T_C=100°C)		-5.6	
Drain Current-Pulsed[1]	I_{DM}	-64	A
Single Pulse Avalanche Energy[2]	E_{AS}	95	mJ
Single Pulse Avalanche Current[2]	I_{AS}	-19	A
Power Dissipation (T_C=25°C)	P_D	3.2	W
Power Dissipation-Derate above 25°C		0.023	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	39	°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=-7.5A	-	20	25	mΩ
		V_{GS}=-4.5V, I_D=-5A	-	32	39	
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	-	20	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=-15V, I_D=-7.5A V_{GS}=-10V	-	21	-	nC
Gate-Source Charge[2, 3]	Q_{gs}		-	1.4	-	
Gate-Drain Charge[2, 3]	Q_{gd}		-	4.2	-	
Turn-On Delay Time[2, 3]	$t_{d(on)}$	V_{DD}=-15V, R_G=3Ω V_{GS}=-10V, I_D=-7.5A	-	12	-	nS
Rise Time[2, 3]	t_r		-	14	-	
Turn-Off Delay Time[2, 3]	$t_{d(off)}$		-	130	-	
Fall Time[2, 3]	t_f		-	95	-	
Input Capacitance	C_{lss}	V_{DS}=-15V, V_{GS}=0V, F=1MHz	-	1134	-	pF
Output Capacitance	C_{oss}		-	184	-	
Reverse Transfer Capacitance	C_{rss}		-	117	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	-8	A
Pulsed Source Current	I_{SM}		-	-	-64	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-3A, T_J=25°C	-	-	-1	V
Reverse Recovery Time	t_{rr}	I_F=-7A, di/dt=-100A/us	-	36	-8	ns
Reverse Recovery Charge	Q_{rr}		-	34	-64	nC

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

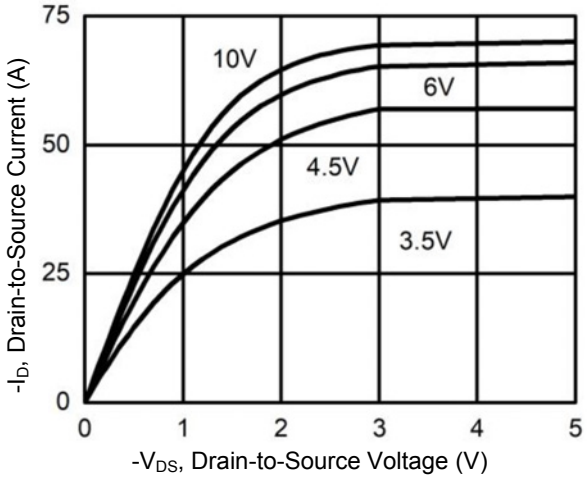


Figure 1. Output Characteristics

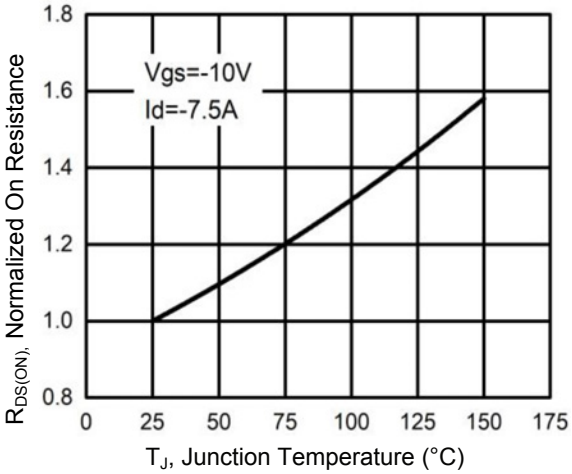


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

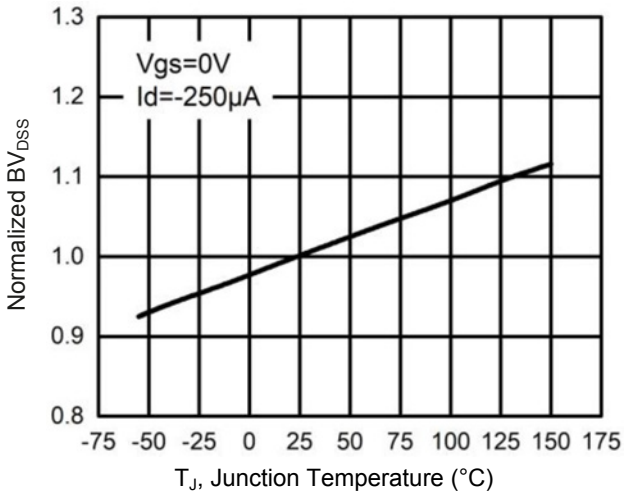


Figure 3. Normalized BV_{DSS} vs. T_J

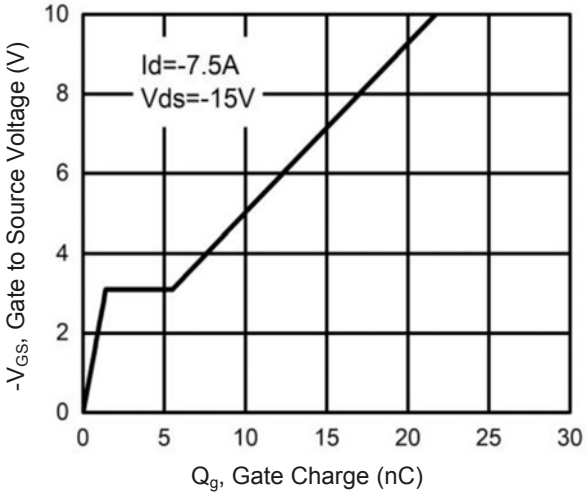


Figure 4. Gate Charge Waveform

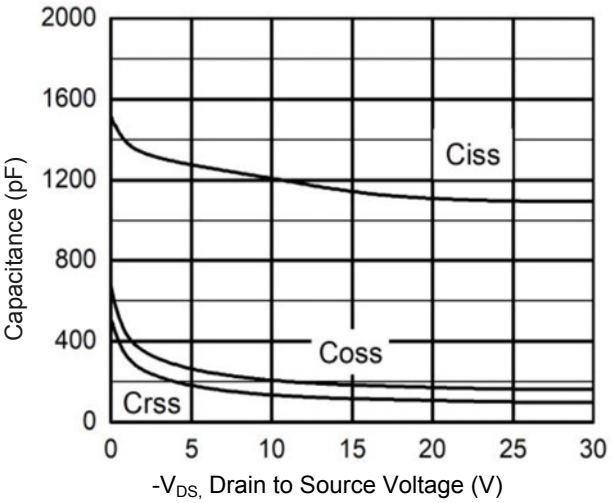


Figure 5. Capacitance Characteristics

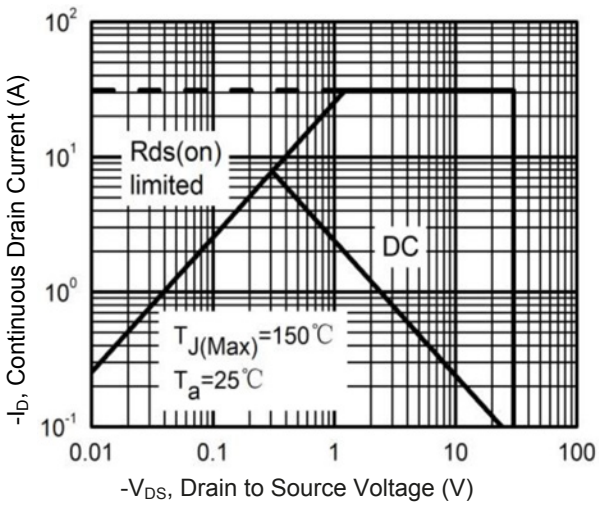
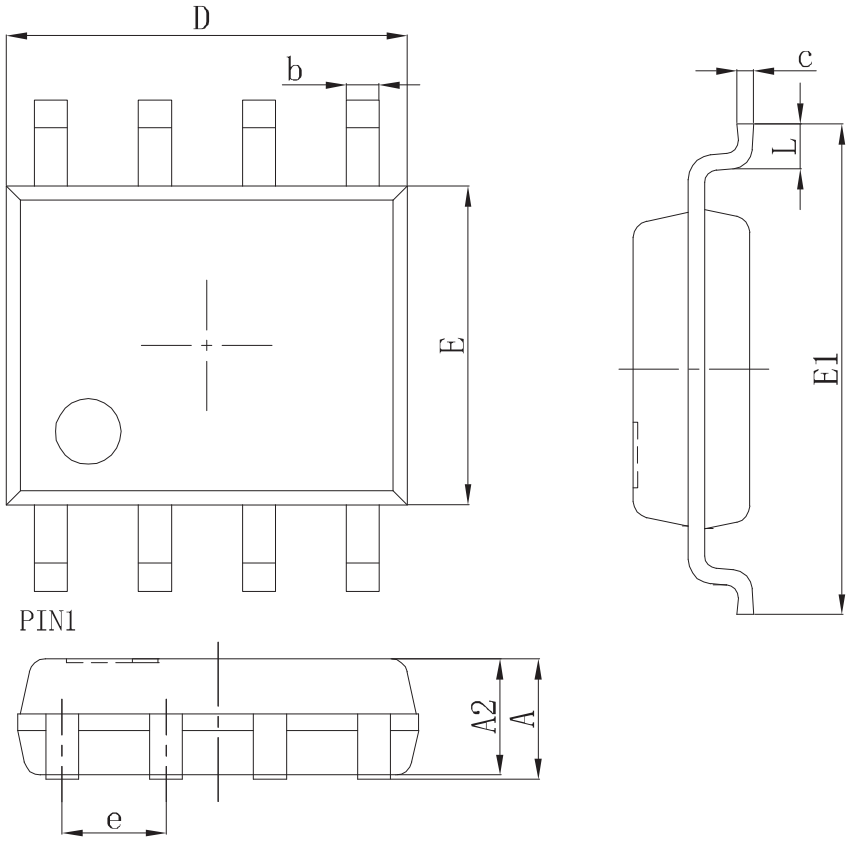


Figure 6. Safe Operation Area

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
GSFQ3025	SOP-8	Q3025	Tape & Reel	3,000pcs / Reel