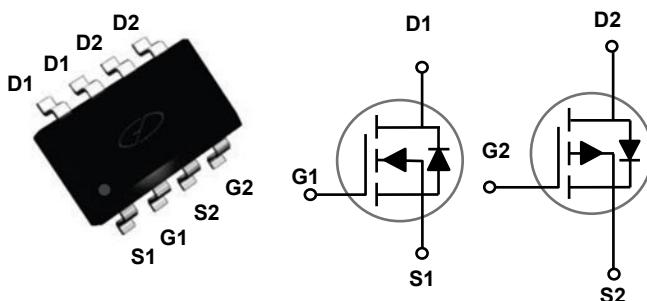


Main Product Characteristics

Channel	N-Channel	P-Channel
BV_{DSS}	30V	-30V
$R_{DS(ON)}$	22mΩ	35mΩ
I_D	6A	-6A



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

SOP-8

Schematic Diagram



Description

The GSFQ4606 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 ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating		Unit
Drain-Source Voltage	V_{DS}	30	-30	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Drain Current-Continuous ($T_C=25^\circ\text{C}$)	I_D	6	-6	A
Drain Current-Continuous ($T_C=100^\circ\text{C}$)		5	-5	A
Drain Current-Pulsed ¹	I_{DM}	30	-30	A
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	-	62.5	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	-	50	$^\circ\text{C}/\text{W}$
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	2.5		W
Power Dissipation-Derate above 25°C		0.02		$\text{W}/^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150		$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to +150		$^\circ\text{C}$



GSFQ4606

30V N-Channel + P-Channel Complementary MOSFET

N-Channel Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	30	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	μA
		$V_{\text{DS}}=24\text{V}, V_{\text{GS}}=0\text{V}, T_J=125^\circ\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{\text{DS(ON)}}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=6\text{A}$	-	18.6	22	$\text{m}\Omega$
		$V_{\text{GS}}=4.5\text{V}, I_{\text{D}}=5\text{A}$	-	30.5	38	$\text{m}\Omega$
Gate Threshold Voltage	$V_{\text{GS(th)}}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=250\mu\text{A}$	1.1	1.6	2.9	V
$V_{\text{GS(th)}}$ Temperature Coefficient	$\Delta V_{\text{GS(th)}}$		-	-4	-	mV°C
Forward Transconductance	g_{fs}	$V_{\text{DS}}=5\text{V}, I_{\text{D}}=6\text{A}$	-	15.2	-	S
Dynamic Characteristics						
Total Gate Charge ^{2,3}	Q_g	$V_{\text{DS}}=15\text{V}, V_{\text{GS}}=10\text{V}, I_{\text{D}}=6\text{A}$	-	5.4	-	nC
Gate-Source Charge ^{2,3}	Q_{gs}		-	2.4	-	
Gate-Drain Charge ^{2,3}	Q_{gd}		-	1.1	-	
Turn-On Delay Time ^{2,3}	$T_{\text{d(on)}}$	$V_{\text{DD}}=15\text{V}, V_{\text{GS}}=10\text{V}, R_{\text{G}}=3\Omega$ $I_{\text{D}}=6\text{A}$	-	4.6	-	nS
Rise Time ^{2,3}	T_r		-	2.6	-	
Turn-Off Delay Time ^{2,3}	$T_{\text{d(off)}}$		-	14.4	-	
Fall Time ^{2,3}	T_f		-	3.4	-	
Input Capacitance	C_{iss}	$V_{\text{DS}}=15\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	257	310	pF
Output Capacitance	C_{oss}		-	45	60	
Reverse Transfer Capacitance	C_{rss}		-	35	50	
Gate Resistance	R_g	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$	-	3.5	6.9	Ω
Drain-Source Diode Characteristics						
Continuous Source Current	I_s	$V_G=V_D=0\text{V}$, Force Current	-	-	6	A
Pulsed Source Current	I_{SM}		-	-	12	A
Diode Forward Voltage	V_{SD}	$V_{\text{GS}}=0\text{V}, I_s=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V

Note:

- Repetitive Rating: pulsed width limited by maximum junction temperature.
- The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- Essentially independent of operating temperature.

P-Channel Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

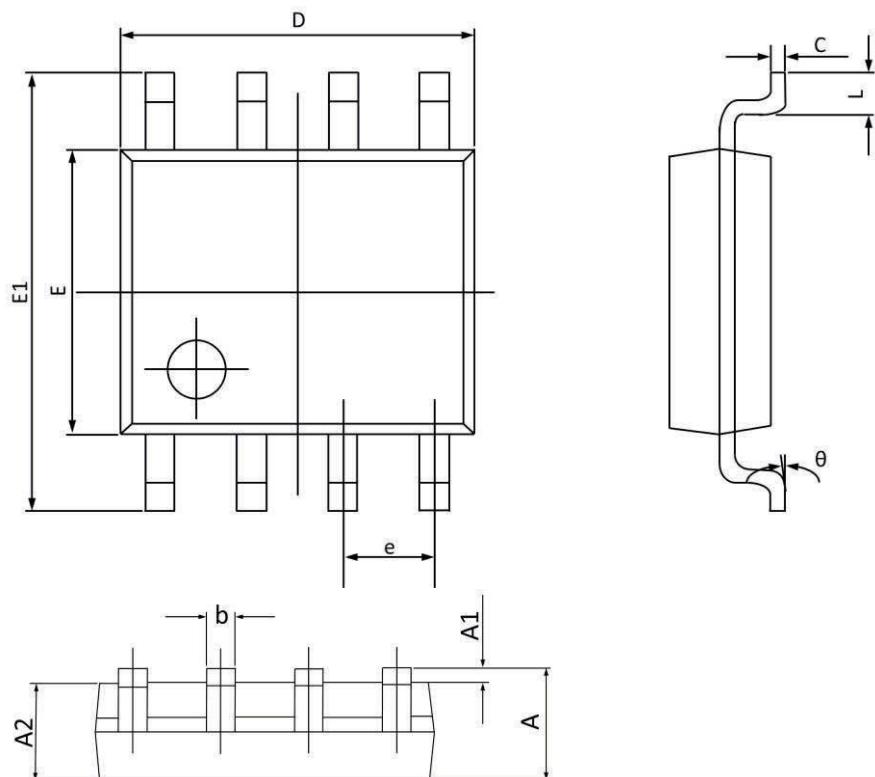
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=-250\mu\text{A}$	-30	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to 25°C , $I_{\text{D}}=-1\text{mA}$	-	-0.03	-	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{\text{DS}}=-30\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	-1	μA
		$V_{\text{DS}}=-24\text{V}, V_{\text{GS}}=0\text{V}, T_J=125^\circ\text{C}$	-	-	-10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-6\text{A}$	-	27	35	$\text{m}\Omega$
		$V_{\text{GS}}=-4.5\text{V}, I_{\text{D}}=-5\text{A}$	-	42	50	$\text{m}\Omega$
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=-250\mu\text{A}$	-0.9	-1.35	-2.0	V
$V_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta V_{\text{GS}(\text{th})}$		-	4	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	g_{fs}	$V_{\text{DS}}=-5\text{V}, I_{\text{D}}=-6\text{A}$	-	18	-	S
Dynamic Characteristics						
Total Gate Charge ^{4,5}	Q_g	$V_{\text{DS}}=-15\text{V}, V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-6\text{A}$	-	13.6	-	nC
Gate-Source Charge ^{4,5}	Q_{gs}		-	2.5	-	
Gate-Drain Charge ^{4,5}	Q_{gd}		-	3.2	-	
Turn-On Delay Time ^{4,5}	$T_{\text{d}(\text{on})}$	$V_{\text{DD}}=-15\text{V}, V_{\text{GS}}=-10\text{V}, R_{\text{G}}=3\Omega$ $I_{\text{D}}=-5\text{A}$	-	11	-	nS
Rise Time ^{4,5}	T_r		-	35	-	
Turn-Off Delay Time ^{4,5}	$T_{\text{d}(\text{off})}$		-	30	-	
Fall Time ^{4,5}	T_f		-	10	-	
Input Capacitance	C_{iss}	$V_{\text{DS}}=-15\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	760	-	pF
Output Capacitance	C_{oss}		-	140	-	
Reverse Transfer Capacitance	C_{rss}		-	95	-	
Drain-Source Diode Characteristics						
Continuous Source Current	I_s	$V_G=V_D=0\text{V}$, Force Current	-	-	-6	A
Pulsed Source Current	I_{SM}		-	-	-12	A
Diode Forward Voltage	V_{SD}	$V_{\text{GS}}=0\text{V}, I_{\text{S}}=-1\text{A}, T_J=25^\circ\text{C}$	-	-	-1	V

Note:

4. Repetitive Rating: pulsed width limited by maximum junction temperature.

5. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

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	Quantity	HSF Status
GSFQ4606	SOP-8	4606A	3,000pcs / Reel	RoHS Compliant