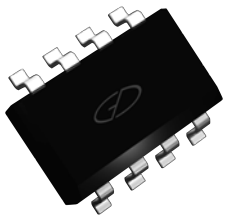
GOOD-ARK SEMICONDUCTOR

SSFQ4406

30V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(on)}$MAX	12mΩ@10V
	16mΩ@4.5V
I_D	10 A



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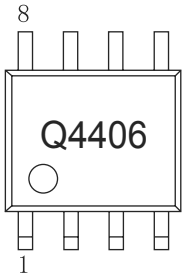
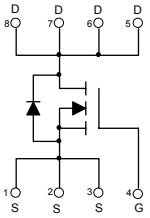


Marking and Pin Assignment



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for battery operated systems, load switching, power converters and other general purpose applications
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

Description

The SSFQ4406 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 supply and a wide variety of other applications.

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	10	A
Pulsed Drain Current	I_{DM}	40	A
Single Pulsed Avalanche Energy	E_{AS}(1)	105	mJ
Power Dissipation	P_D	1.4	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	89	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Lead Temperature for Soldering Purposes(1/8'' from case for 10s)	T_L	260	°C

(1).E_{AS} condition: V_{DD}=50V,L=0.5mH, R_G=25Ω, Starting T_J = 25°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

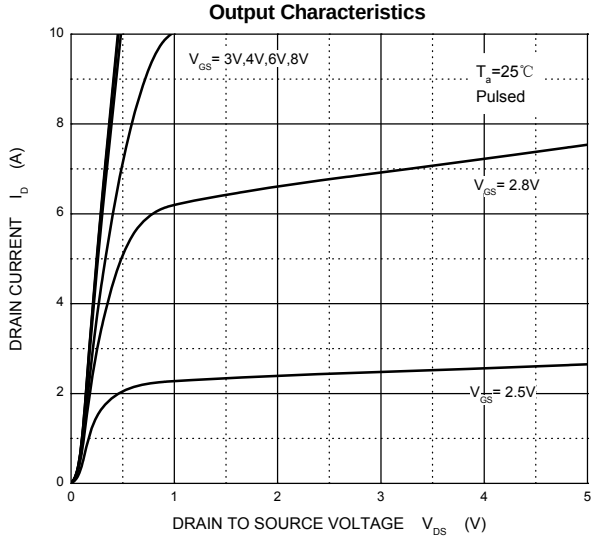
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	30	---	---	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =30V, V_{GS} =0V	---	---	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V	---	---	±100	nA
On Characteristics (note1)						
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.0	1.5	3.0	V
Static Drain-Source On-Sate Resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =12A	---	7.6	12	mΩ
		V_{GS} =4.5V, I_D =10A	---	11	16	mΩ
Forward Transconductance	g_{Fs}	V_{DS} =5V, I_D =10A	---	15	---	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} =15V,V_{GS} =0V, f =1MHz	---	1550	---	pF
Output Capacitance	C_{oss}		---	300	---	
Reverse Transfer Capacitance	C_{rss}		---	180	---	
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS}=15V, V_{GS}=5V, I_D=10A	---	13	---	nC
Gate-Source Charge	Q_{gs}		---	5.5	---	
Gate-Drain Charge	Q_{gd}		---	3.5	---	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=25V,I_D=1A, V_{GS}=10V,R_G=6Ω, R_L=6.7Ω	---	30	---	ns
Turn-on Rise Time	t_r		---	20	---	
Turn-off Delay Time	$t_{d(off)}$		---	100	---	
Turn-off Fall Time	t_f		---	80	---	
Gate Resistance	R_g	f =1MHz, V_{DS}=0V, V_{GS}=0V,	0.8	---	2.4	Ω
Drain-Source Diode Characteristics						
Drain-Source Diode Forward Voltage(note1)	V_{SD}	V_{GS} =0V, I_S=10A	---	---	1.2	V
Continuous Drain-Source Diode Forward Current	I_S		---	---	10	A
Pulsed Drain-source Diode Forward Current	I_{SM}		---	---	40	A

Notes:

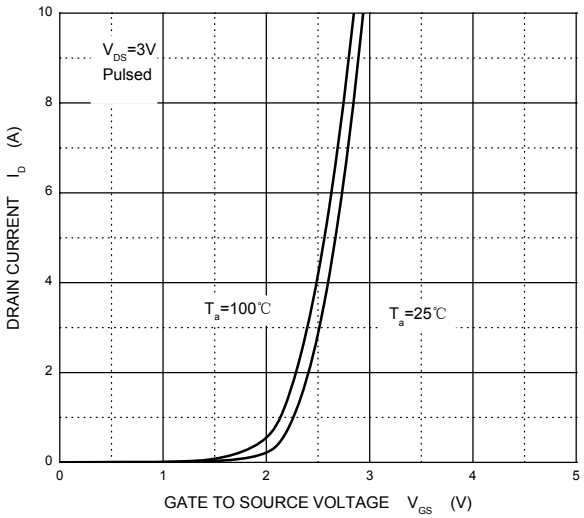
1. Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.

Typical Electrical and Thermal Characteristic Curves

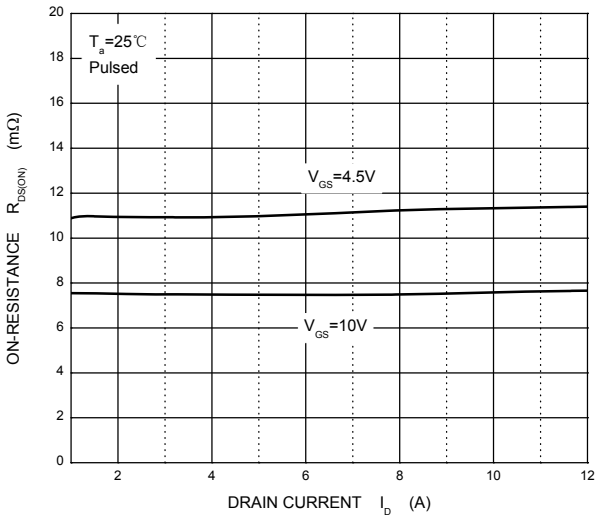
Output Characteristics



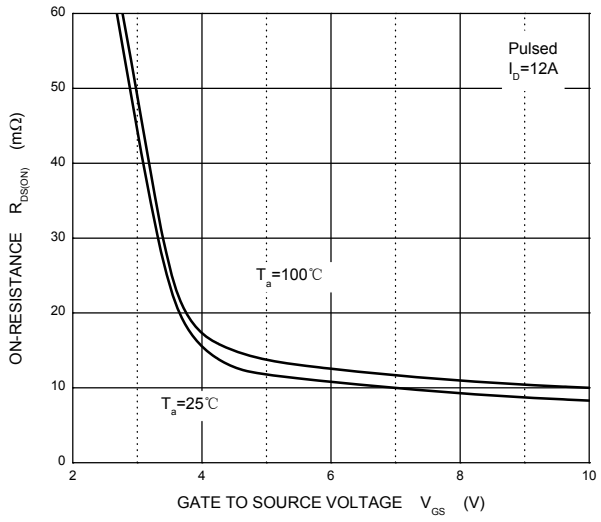
Transfer Characteristics



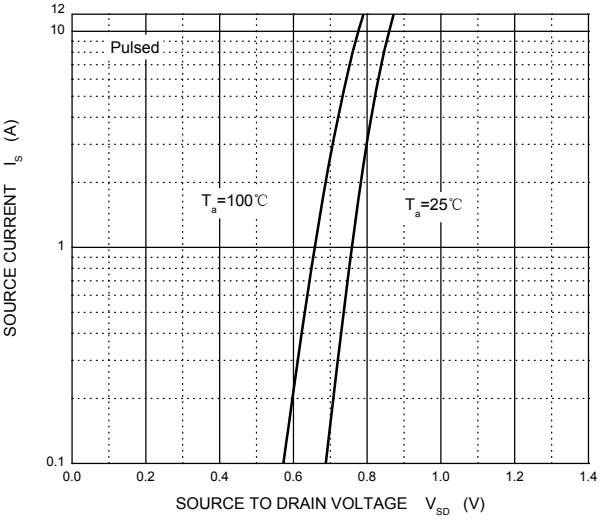
$R_{DS(ON)}$ —— I_D



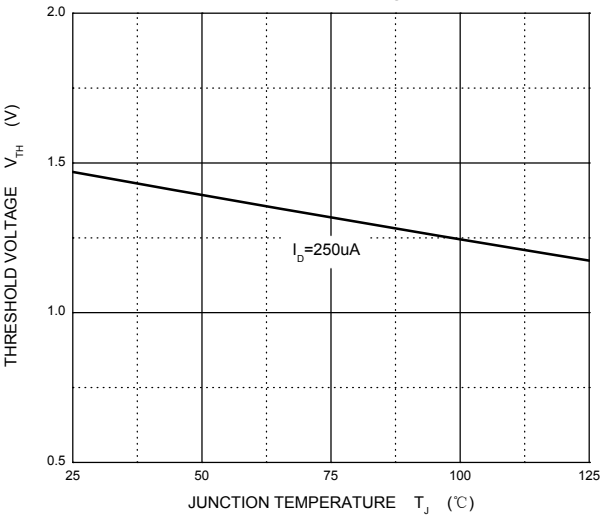
$R_{DS(ON)}$ —— V_{GS}



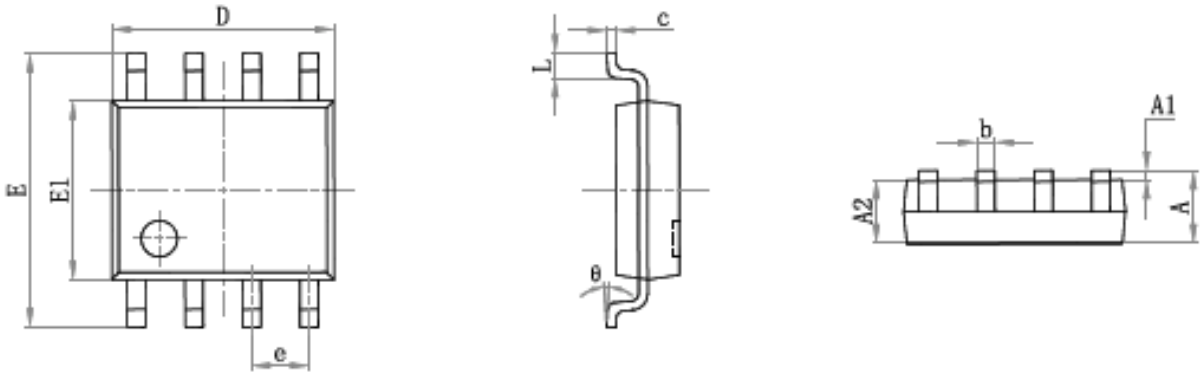
I_S —— V_{SD}



Threshold Voltage



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	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270（BSC）		0.050（BSC）	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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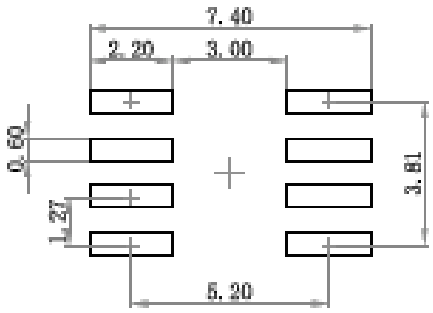
Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.