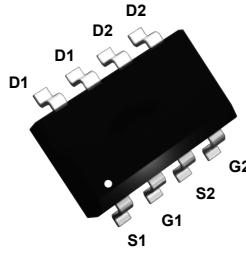
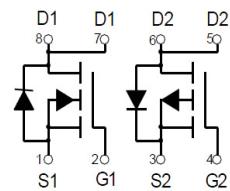


## Main Product Characteristics

$V_{(BR)DSS}$	-40V	40V
$R_{DS(on)MAX}$	35mΩ@-10V 45mΩ@-4.5V	19mΩ@10V 29mΩ@4.5V
$I_D$	-7A	8A



SOP-8



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 SSFQ4614 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 ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
<b>N-Channel MOSFET</b>			
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D$	8	A
Pulsed Drain Current ( $t_p=10\mu\text{s}$ )	$I_{DM}$	32	A
Continous Source-Drain Diode Current	$I_S$	8	A
<b>P-Channel MOSFET</b>			
Drain-Source Voltage	$V_{DS}$	-40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D$	-7	A
Pulsed Drain Current ( $t_p=10\mu\text{s}$ )	$I_{DM}$	-28	A
Continous Source-Drain Diode Current	$I_S$	-7	A
<b>Temperature and Thermal Resistance</b>			
Power Dissipation	$P_D$	2	W
Thermal Resistance from Junction to Ambient <sup>1</sup>	$R_{\theta JA}$	62.5	°C/W
Junction Temperature	$T_J$	150	°C
Storage Temperature	$T_{STG}$	-55 to +150	°C
Lead Temperature for Soldering Purposes(1/8" from case for 10 s)	$T_L$	260	°C

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>R<sub>tatic</sub> Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	40	---	---	V
Zero Gate Voltage Drain Current	$I_{\text{DSS}}$	$V_{DS} = 40V, V_{GS} = 0V$	---	---	1	$\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	---	---	$\pm 100$	nA
Gate Threshold Voltage <sup>2</sup>	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1	1.5	2	V
Drain-Source On-Resistance <sup>2</sup>	$R_{DS(\text{on})}$	$V_{GS} = 10V, I_D = 8A$	---	16	19	$\text{m}\Omega$
		$V_{GS} = 4.5V, I_D = 4A$	---	24	29	$\text{m}\Omega$
Forward Transconductance <sup>2</sup>	$g_{FS}$	$V_{DS} = 5V, I_D = 8A$	---	10	---	S
Diode Forward Voltage	$V_{SD}$	$I_S = 8A, V_{GS} = 0V$	---	---	1.2	V
<b>R<sub>dynamik</sub> Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 20V, V_{GS} = 0V, f = 1\text{MHz}$	---	415	---	pF
Output Capacitance	$C_{oss}$		---	112	---	pF
Reverse Transfer Capacitance	$C_{rss}$		---	11	---	pF
<b>R<sub>switching</sub> Characteristics<sup>3</sup></b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{GEN}=10V, V_{DD}=20V, R_G=3\Omega, R_L=2.5\Omega$	---	4	---	nS
Turn-On Rise Time	$t_r$		---	3	---	nS
Turn-Off Delay Time	$t_{d(off)}$		---	15	---	nS
Turn-Off Fall Time	$t_f$		---	2	---	nS
Total Gate Charge	$Q_g$	$V_{DS}=20V, I_D=8A, V_{GS}=10V$	---	12	---	nC
Gate-Source Charge	$Q_{gs}$		---	3.2	---	nC
Gate-Drain Charge	$Q_{gd}$		---	3.1	---	nC

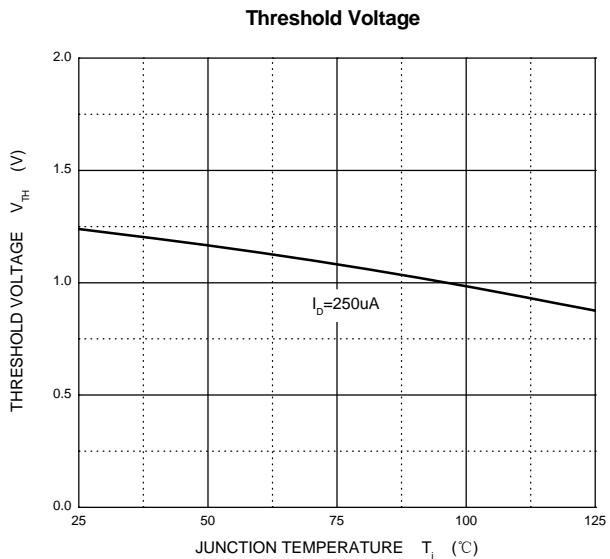
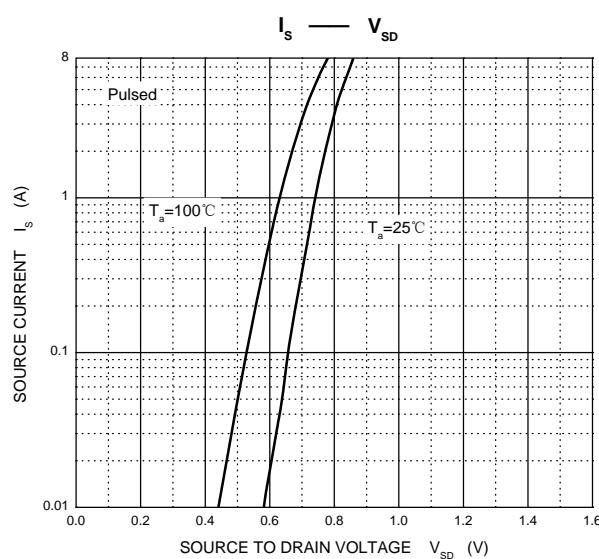
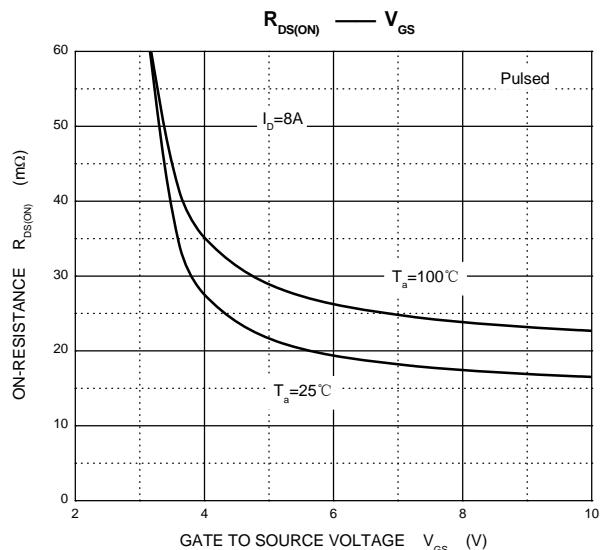
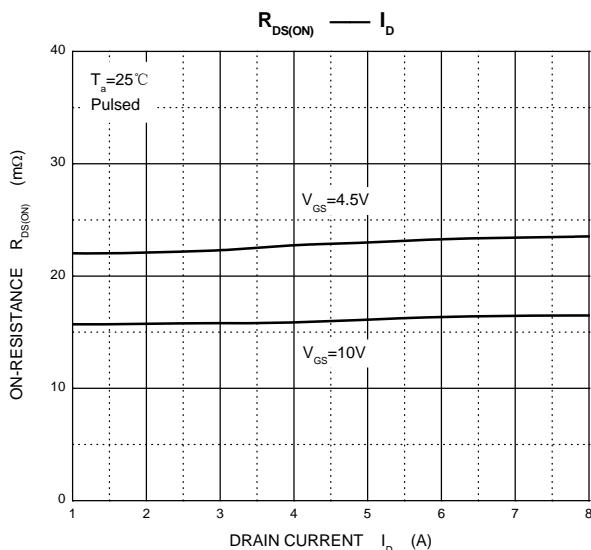
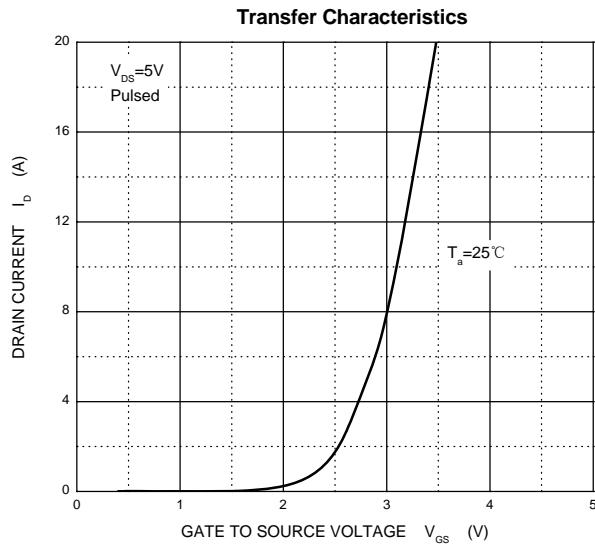
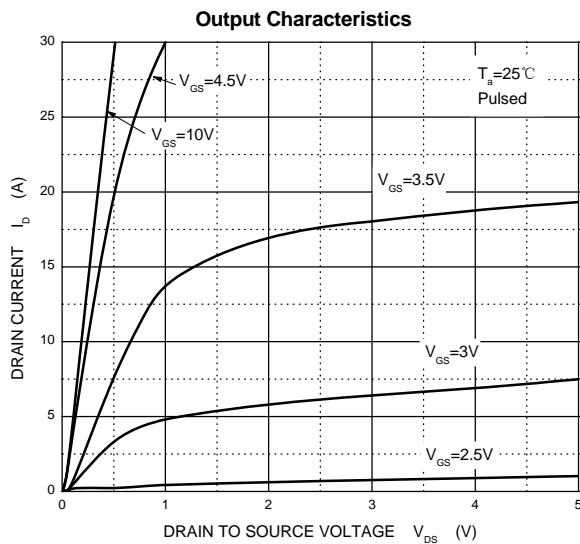
**P-Channel Electrical Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise specified)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>R<sub>t</sub>atick characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-40	---	---	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -40V, V <sub>GS</sub> = 0V	---	---	-1	μ
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	---	---	±100	nA
Gate Threshold Voltage <sup>2</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1	-1.5	-2	V
Drain-Source On-Resistance <sup>2</sup>	R <sub>D(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -8A	---	30	35	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4A	---	40	45	mΩ
Forward Transconductance <sup>2</sup>	g <sub>Fs</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -8A	---	16	---	S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = -10A, V <sub>GS</sub> = 0V	---	---	-1.2	V
<b>Dynamick characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V, f = 1MHz	---	520	---	pF
Output Capacitance	C <sub>oss</sub>		---	100	---	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		---	65	---	pF
<b>R<sub>witching</sub> characteristics<sup>3</sup></b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GEN</sub> = -10V, V <sub>DD</sub> = -20V, R <sub>G</sub> = 6Ω , R <sub>L</sub> = 2.3 Ω	---	7.5	---	nS
Turn-On Rise Time	t <sub>r</sub>		---	5.5	---	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		---	19	---	nS
Turn-Off Fall Time	t <sub>f</sub>		---	7	---	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -20V, I <sub>D</sub> = -8A, V <sub>GS</sub> = -10V	---	13	---	nC
Gate-Source Charge	Q <sub>gs</sub>		---	3.8	---	nC
Gate-Drain Charge	Q <sub>gd</sub>		---	3.1	---	nC

**Notes :**

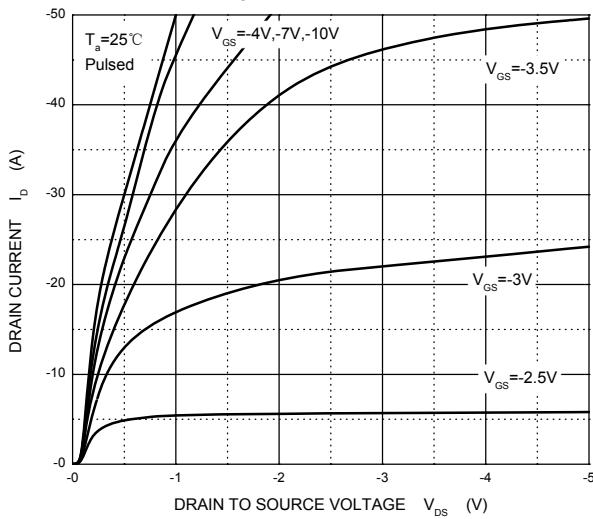
1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse width=300μS, duty cycle≤2%.
3. Switching characteristics are independent of operating junction temperature.

## N-Channel Typical Electrical and Thermal Characteristic Curves

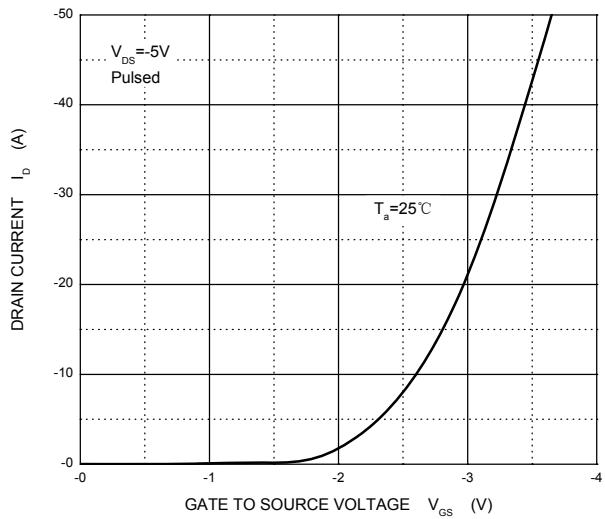


## P-Channel Typical Electrical and Thermal Characteristic Curves

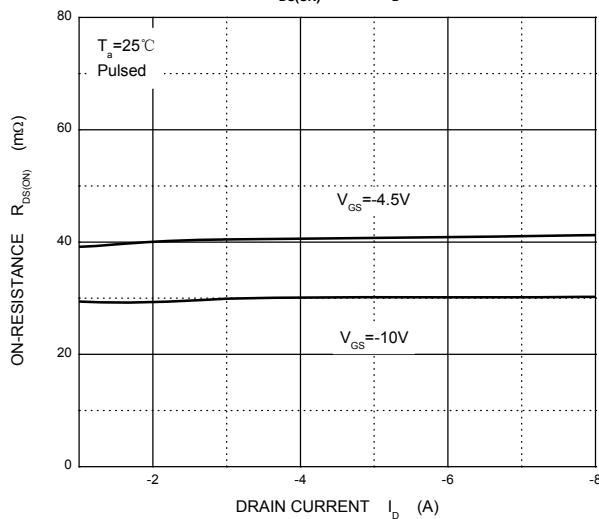
**Output Characteristics**



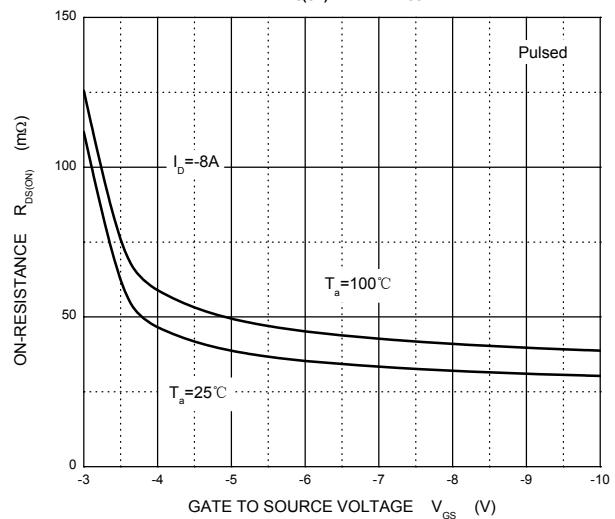
**Transfer Characteristics**



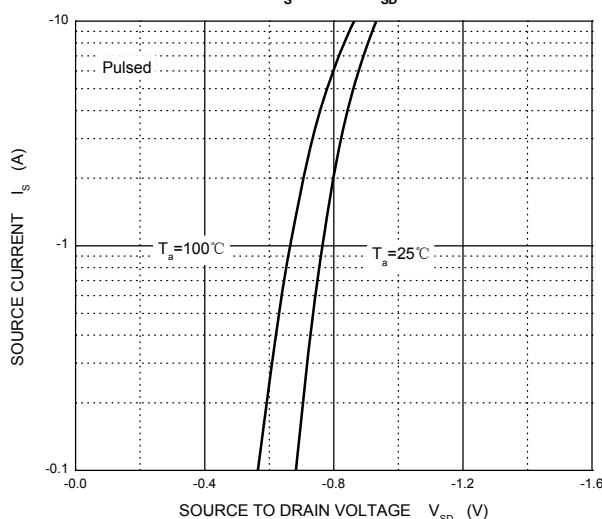
$R_{DS(ON)}$  —  $I_D$



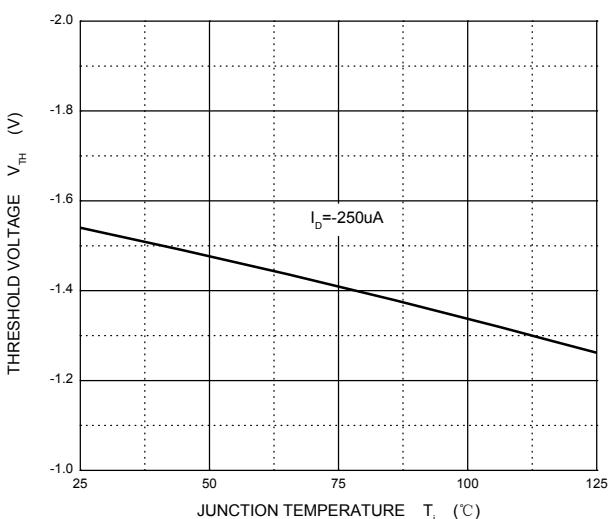
$R_{DS(ON)}$  —  $V_{GS}$



$I_S$  —  $V_{SD}$

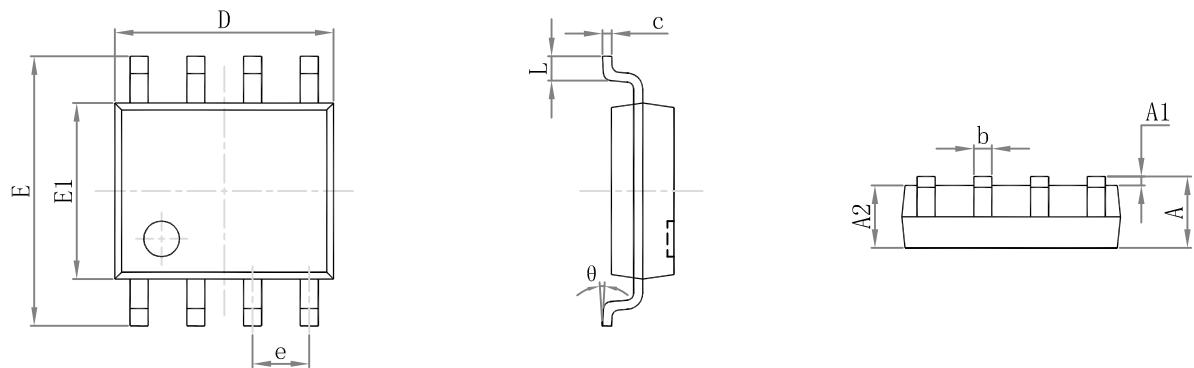


**Threshold Voltage**



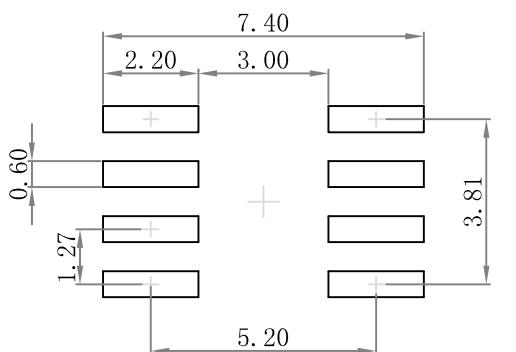
## Package Outline Dimensions

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°

## Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.