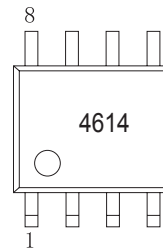


Main Product Characteristics

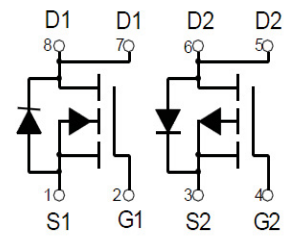
$V_{(BR)DSS}$	-40V	40V
$R_{DS(on)MAX}$	35mΩ@-10V	19mΩ@10V
	45mΩ@-4.5V	29mΩ@4.5V
I_D	-7A	8A



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

Parameter	Symbol	Value	Unit
N-Channel MOSFET			
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current ¹	I_D	8	A
Pulsed Drain Current (tp=10us)	I_{DM}	32	A
Continuous Source-Drain Diode Current	I_S	8	A
P-Channel MOSFET			
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current ¹	I_D	-7	A
Pulsed Drain Current (tp=10us)	I_{DM}	-28	A
Continuous Source-Drain Diode Current	I_S	-7	A
Temperature and Thermal Resistance			
Power Dissipation	P_D	2	W
Thermal Resistance from Junction to Ambient ¹	$R_{\theta JA}$	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
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40	---	---	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V$	---	---	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	---	---	± 100	nA
Gate Threshold Voltage ²	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.5	2	V
Drain-Source On-Resistance ²	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 8A$	---	16	19	m Ω
		$V_{GS} = 4.5V, I_D = 4A$	---	24	29	m Ω
Forward Transconductance ²	g_{FS}	$V_{DS} = 5V, I_D = 8A$	---	10	---	S
Diode Forward Voltage	V_{SD}	$I_S = 8A, V_{GS} = 0V$	---	---	1.2	V
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 20V, V_{GS} = 0V, f = 1MHz$	---	415	---	pF
Output Capacitance	C_{oss}		---	112	---	pF
Reverse Transfer Capacitance	C_{rss}		---	11	---	pF
Switching Characteristics³						
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

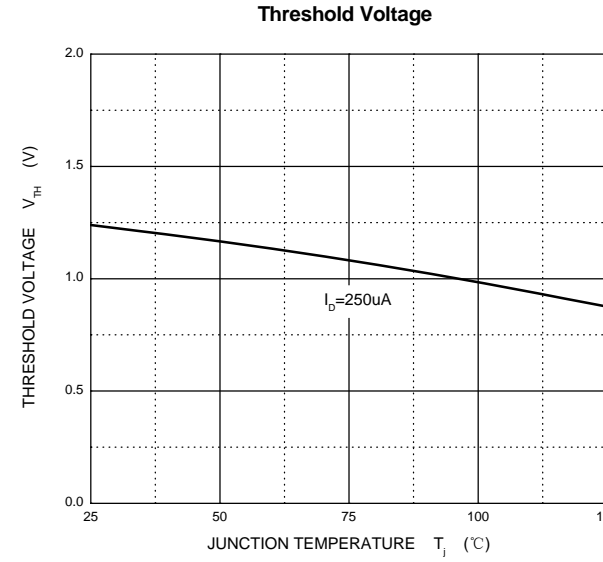
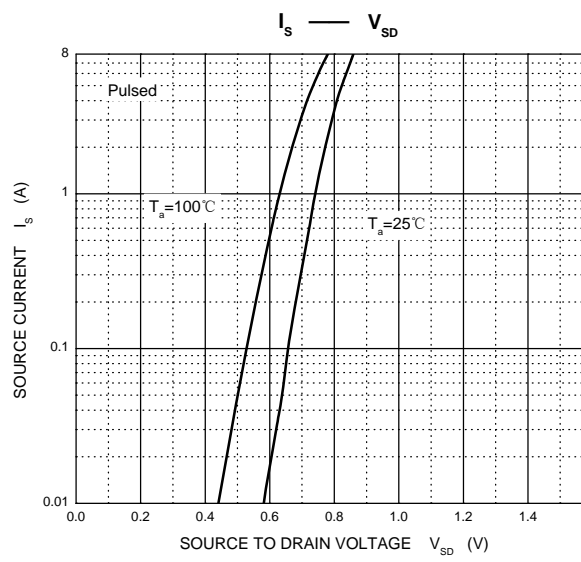
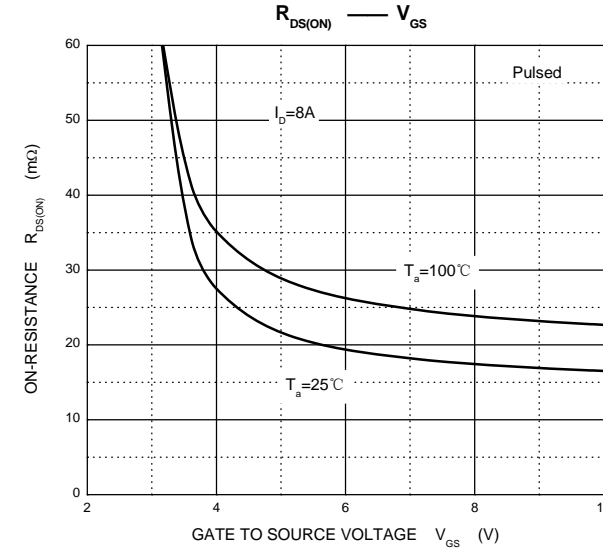
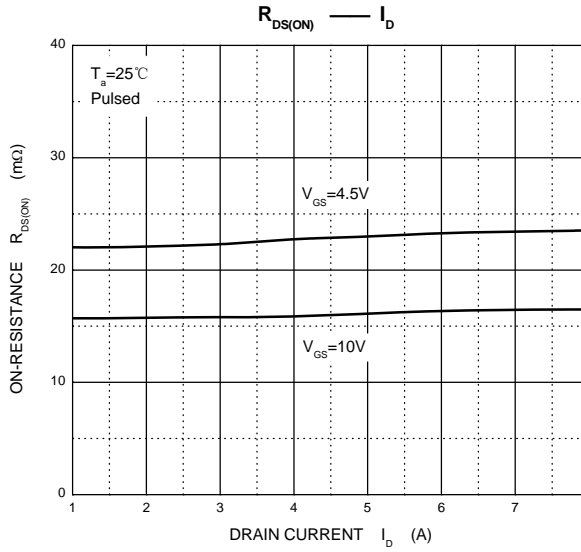
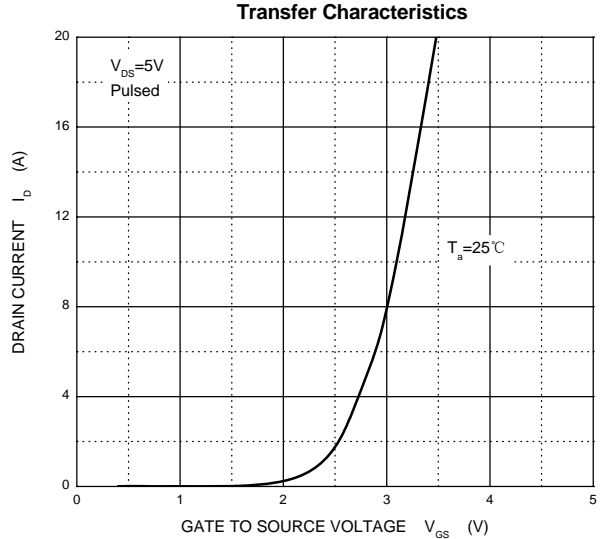
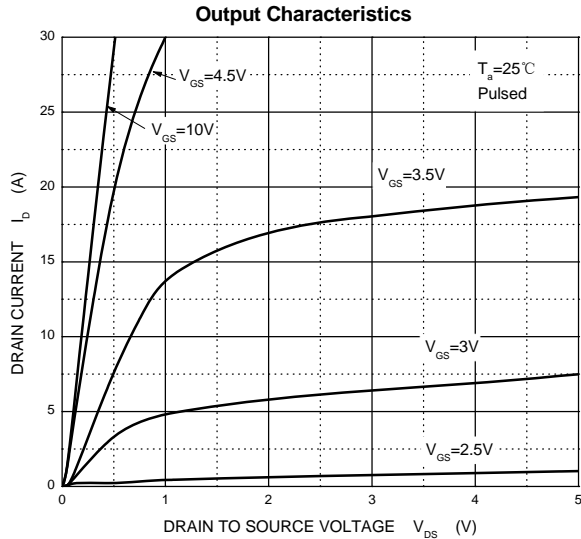
P-Channel Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-40	---	---	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -40V, V_{GS} = 0V$	---	---	-1	μ
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	---	---	± 100	nA
Gate Threshold Voltage ²	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.5	-2	V
Drain-Source On-Resistance ²	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -8A$	---	30	35	m Ω
		$V_{GS} = -4.5V, I_D = -4A$	---	40	45	m Ω
Forward Transconductance ²	g_{FS}	$V_{DS} = -5V, I_D = -8A$	---	16	---	S
Diode Forward Voltage	V_{SD}	$I_S = -10A, V_{GS} = 0V$	---	---	-1.2	V
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -20V, V_{GS} = 0V, f = 1MHz$	---	520	---	pF
Output Capacitance	C_{oss}		---	100	---	pF
Reverse Transfer Capacitance	C_{rss}		---	65	---	pF
Switching Characteristics³						
Turn-On Delay Time	$t_{d(on)}$	$V_{GEN} = -10V, V_{DD} = -20V,$ $R_G = 6\Omega,$ $R_L = 2.3\Omega$	---	7.5	---	ns
Turn-On Rise Time	t_r		---	5.5	---	ns
Turn-Off Delay Time	$t_{d(off)}$		---	19	---	ns
Turn-Off Fall Time	t_f		---	7	---	ns
Total Gate Charge	Q_g	$V_{DS} = -20V, I_D = -8A,$ $V_{GS} = -10V$	---	13	---	nC
Gate-Source Charge	Q_{gs}		---	3.8	---	nC
Gate-Drain Charge	Q_{gd}		---	3.1	---	nC

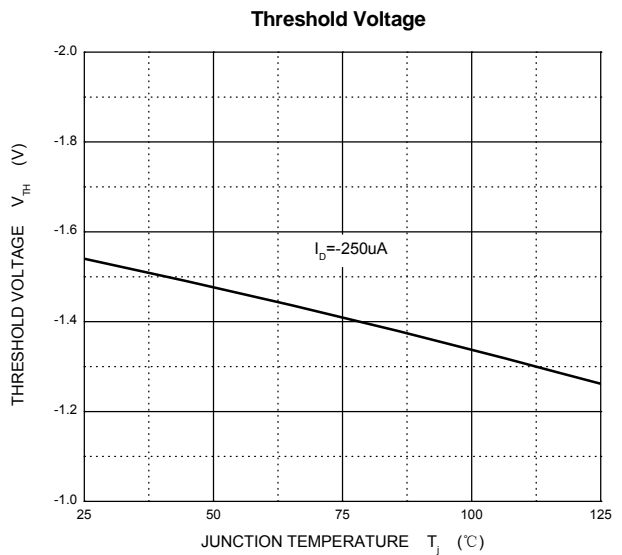
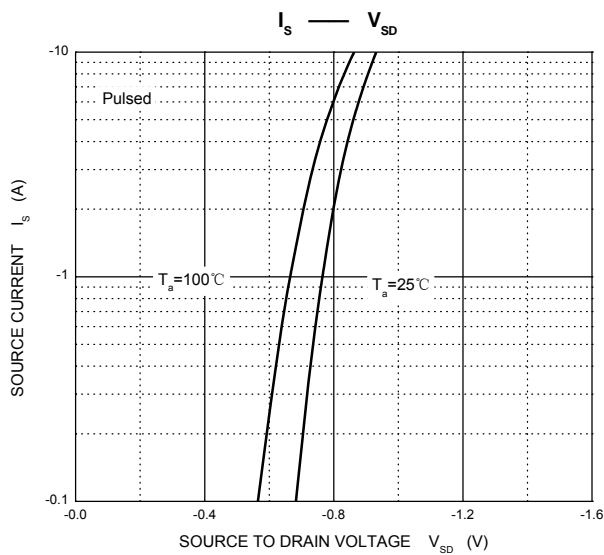
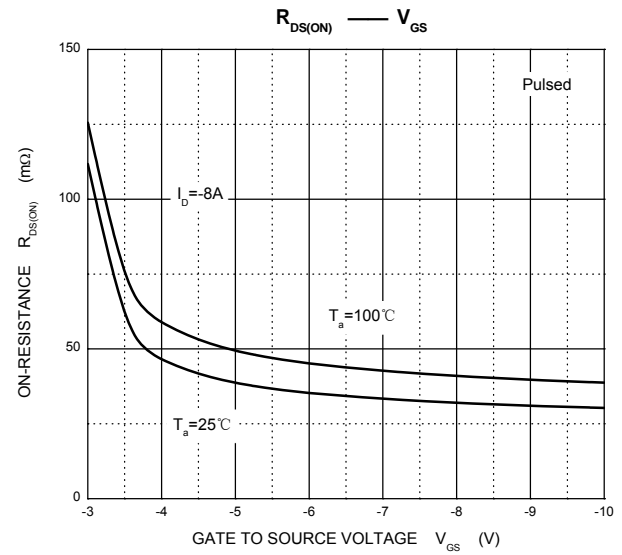
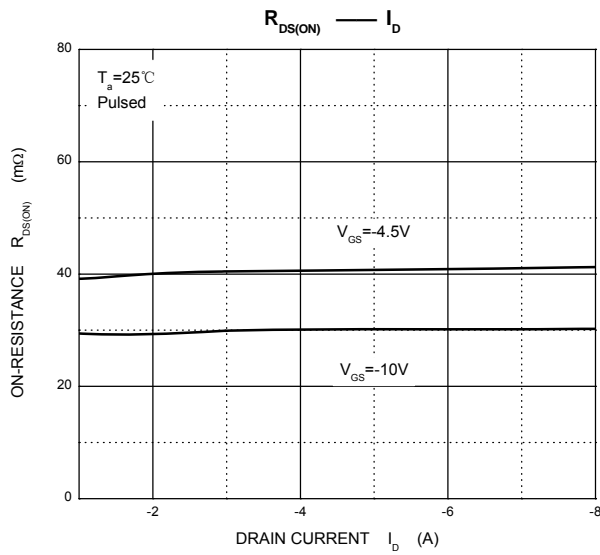
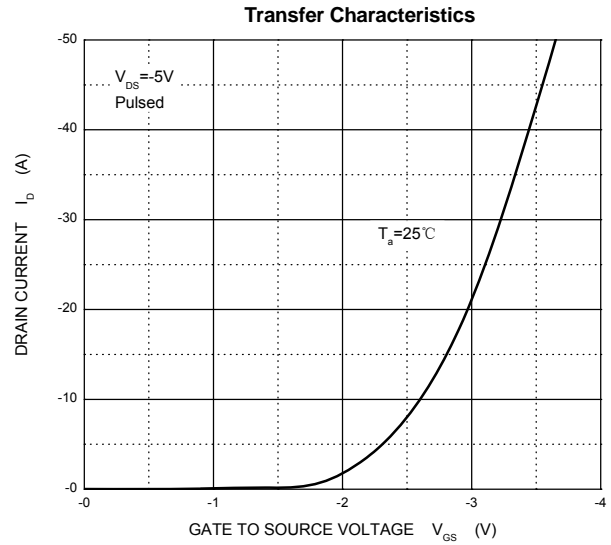
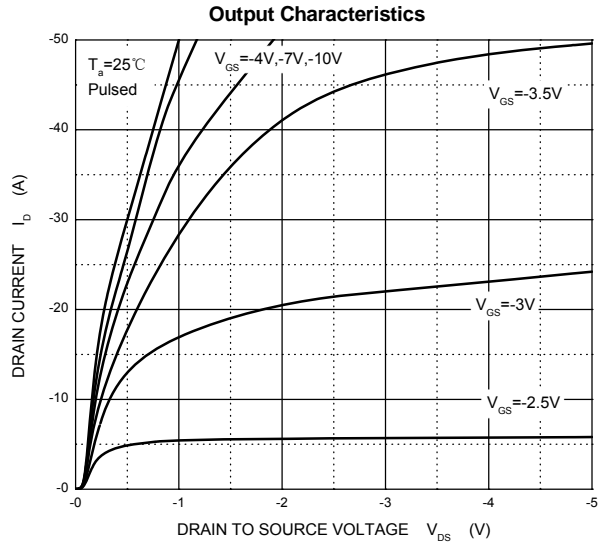
Notes :

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

N-Channel Typical Electrical and Thermal Characteristic Curves

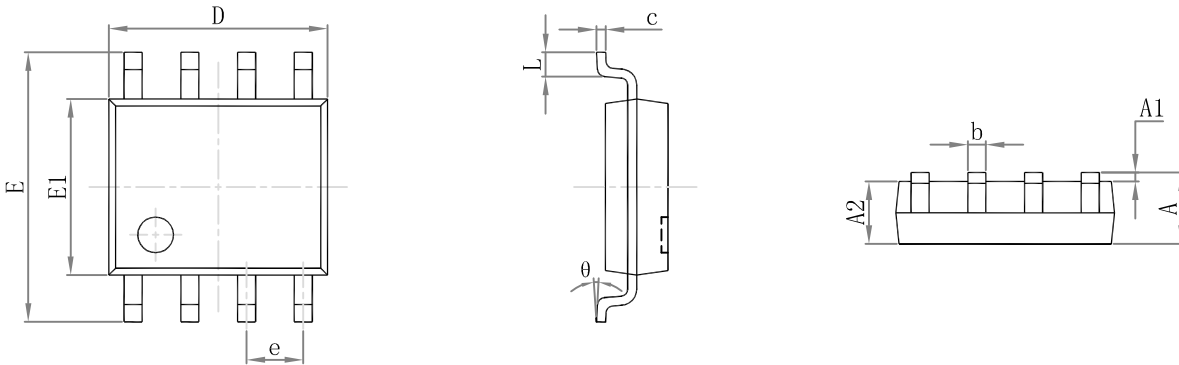


P-Channel Typical Electrical and Thermal Characteristic Curves



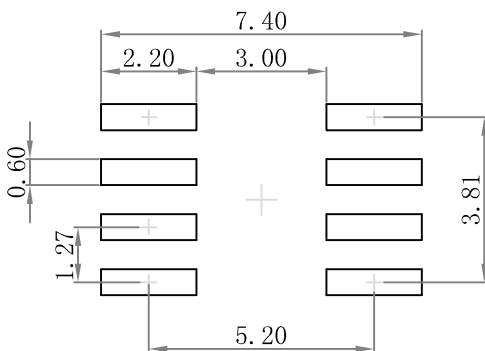
Package Outline Dimensions

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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.