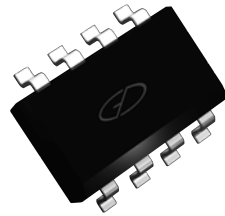


### Main Product Characteristics

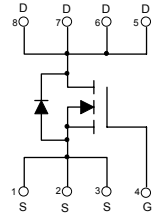
$V_{(BR)DSS}$	60V
$R_{DS(on)MAX}$	22mΩ@10V
	36mΩ@4.5V
$I_D$	8.2A



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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 SSFQ4438 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
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current (note 1)	$I_D$	8.2	A
Pulsed Drain Current (note 2)	$I_{DM}$	40	A
Power Dissipation	$P_D$	1.25	W
Thermal Resistance from Junction to Ambient (note 1)	$R_{\theta JA}$	100	$^{\circ}C/W$
Junction Temperature	$T_J$	150	$^{\circ}C$
Storage Temperature	$T_{STG}$	-55 to +150	$^{\circ}C$

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

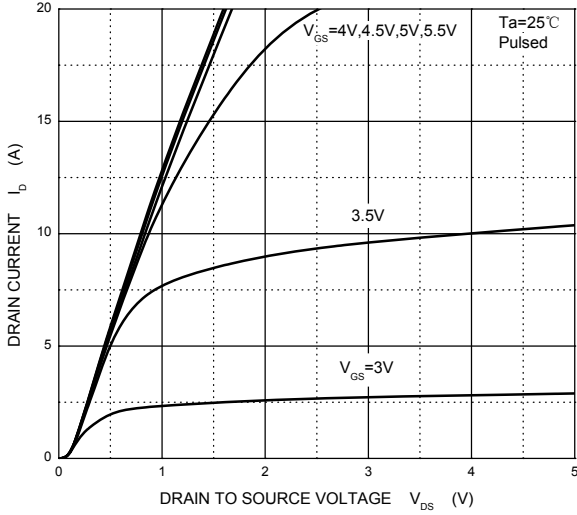
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>STATIC PARAMETERS</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60	---	---	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 60V, V_{GS} = 0V$	---	---	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	---	---	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	---	3	V
Drain-Source On-Resistance (note 3)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 8.2A$	---	---	22	m $\Omega$
		$V_{GS} = 4.5V, I_D = 7.6A$	---	---	36	m $\Omega$
Forward Transconductance (note 3)	$g_{fs}$	$V_{DS} = 5V, I_D = 8.2A$	10	---	---	S
Diode Forward Voltage (note 3)	$V_{SD}$	$I_S = 1A, V_{GS} = 0V$	---	---	1	V
<b>DYNAMIC PARAMETERS</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 30V, V_{GS} = 0V, f = 1MHz$	---	---	2300	pF
Output Capacitance	$C_{oss}$		---	155	---	pF
Reverse Transfer Capacitance	$C_{rss}$		---	116	---	pF
<b>SWITCHING PARAMETERS</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 30V$ $R_L = 3.6\Omega, R_{GEN} = 3\Omega$	---	8.2	---	ns
Turn-On Rise Time	$t_r$		---	5.5	---	ns
Turn-Off Delay Time	$t_{d(off)}$		---	29.7	---	ns
Turn-Off Fall Time	$t_f$		---	5.2	---	ns
Total Gate Charge (10V)	$Q_g$	$V_{DS} = 30V, V_{GS} = 10V, I_D = 8.2A$	---	---	58	nC
Total Gate Charge (4.5V)			---	---	30	nC
Gate-Source Charge	$Q_{gs}$		---	6	---	nC
Gate-Drain Charge	$Q_{gd}$		---	14.4	---	nC

**Notes :**

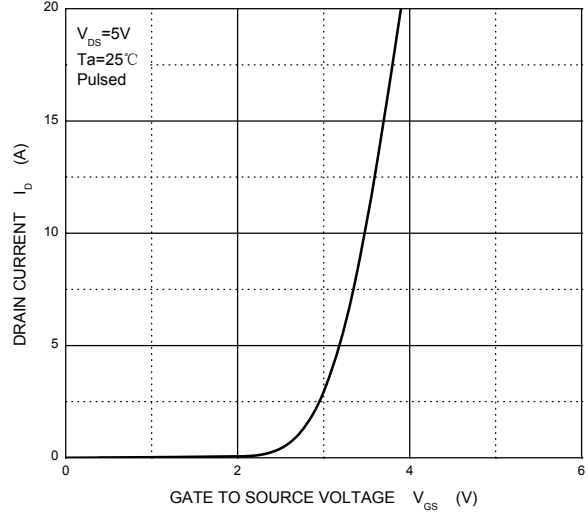
1. The value of  $R_{\theta JA}$  is measured with the device mounted on 1 in<sup>2</sup> FR4 board with 2oz. Copper, in a still air environment with  $T_a=25^{\circ}\text{C}$ . The value in any given application depends on the user's specific board design. The current rating is based on the  $t \leq 10s$  thermal resistance rating.
2. Repetitive rating : Pulse width limited by junction temperature.
3. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

**Typical Electrical and Thermal Characteristic Curves**

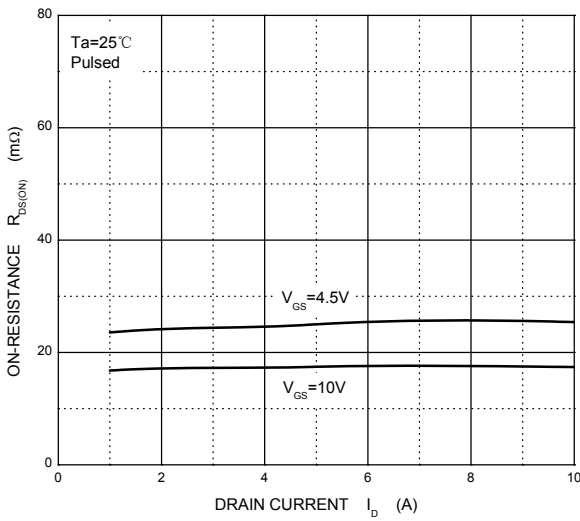
**Output Characteristics**



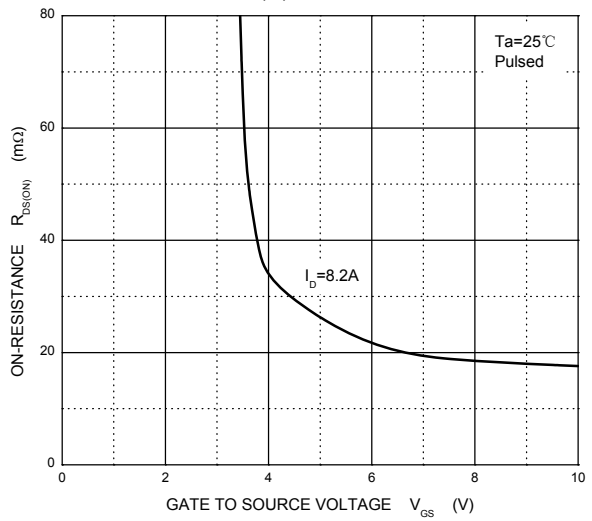
**Transfer Characteristics**



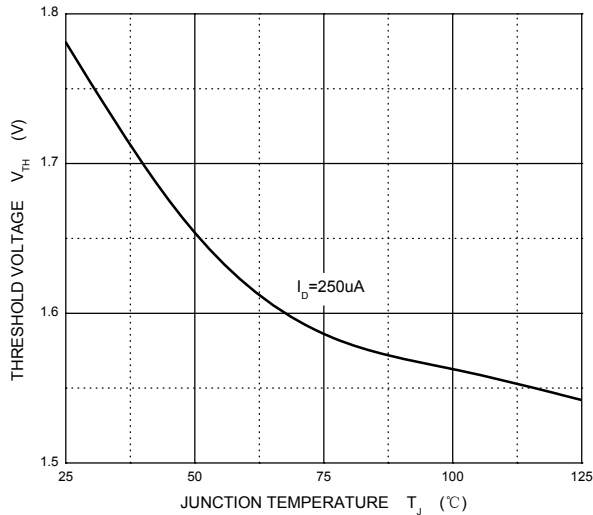
**$R_{DS(ON)}$  —  $I_D$**



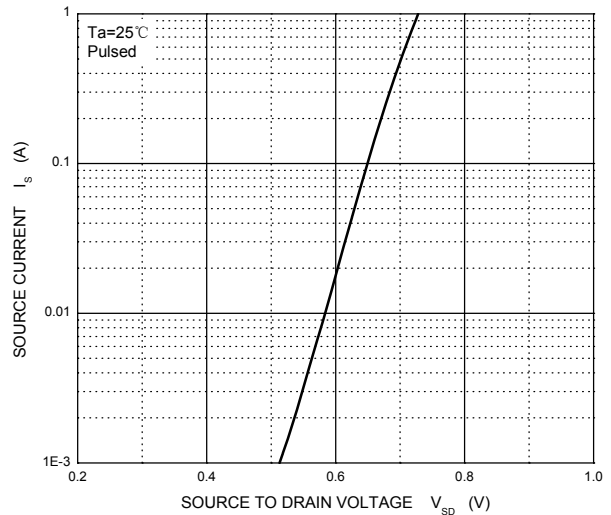
**$R_{DS(ON)}$  —  $V_{GS}$**



**Threshold Voltage**

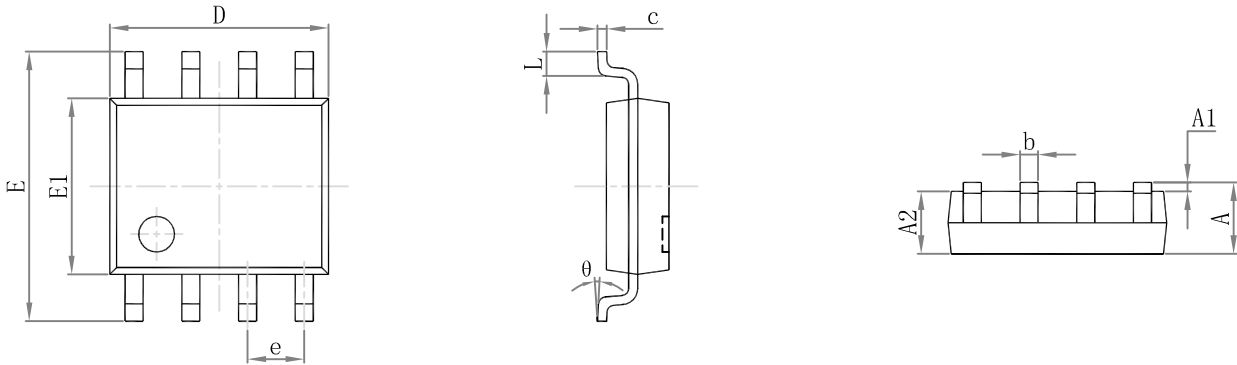


**$I_S$  —  $V_{SD}$**



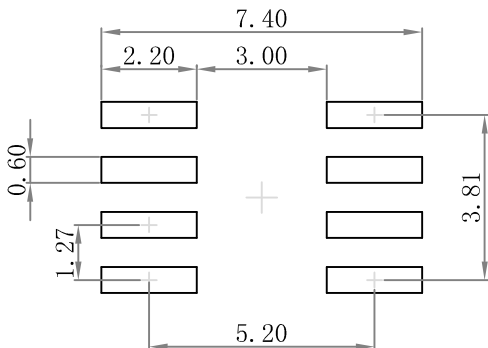
**Package Outline Dimensions**

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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.