



ASR-1 Schematic Checklist

Updated: 6-Jun-16

1. Mode		
	a.	Is your device in standalone or companion mode? If it is in companion mode, skip to Interface.
2. GPIOs		
	a.	Are the devices connected to your GPIOs compatible with VCC_SIP?
	b.	Are the signals open-drain, or do they need pull-resistors?
	i.	If so, they can be configured using the Afero Profile Editor to support this.
3. A/D converts and/or comparators		
	a.	Do you want to reference VCC_IP?
	i.	If not, you need to connect a voltage reference to AREF (pin 5).
4. Interface		
	a.	SPI
	i.	SPI is connected with the host micro as a slave device.
		1. SPI_SCLK is driven by the host micro.
		2. SPI_CS is driven by the host micro.
		3. SPI_MOSI is driven by the host micro.
		4. SPI_MISO is driven by ASR-1.
	b.	UART
	i.	UART is connected to the host as a two-wire interface.
		1. UART_HOST_RX is driven by the host micro.
		2. UART_HOST_TX is driven by ASR-1.
	c.	Control (RESET_B and HOST_INT_B)
	i.	RESET_B is driven by the host micro.
	ii.	HOST_INT_B is driven by ASR-1.
	iii.	It is possible to configure these lines as open-drain to share them with other peripherals. In that configuration, they need pullup resistors (10K is fine).
	d.	Is host VCC higher than 3.6V? If not, move on to Power Supplies.
	e.	If your host VCC is higher than 3.6V, you need to add level-shifters.
	i.	Add push-pull level-shifters on serial lines. Feel free to use bidirectional level-shifters, or standard single-directional level-shifters.
	ii.	Add open-drain level shifters on RESET_B and HOST_INT_B if you are using them in that mode.



5. Power Supplies	
a. Level	
	i. VCC_SIP must be between 2.1-3.6V. That is the operating range for ASR-1.
b. Decoupling	
	i. There must be a 22uF bulk cap on VCC_SIP.
	ii. There should be a 6.8pF decoupling cap on VCC_SIP.
6. RF	
a. RF trace should be controlled 50ohm impedance.	
b. Plan for a Pi matching network placeholder by having shunt (DNI), Series 0ohm, shunt (DNI) for possible antenna matching (see picture below).	
c. If RF connector is used, add a placeholder for ESD diode in case it was needed (shunt DNI pad).	
Pi network:	
7. Manufacturing	
a. In order to program your profile into your device, you must pin out the following pins to test points:	
	i. Pin 12 (RES1)
	ii. Pin 13 (RES2). You must be able to short pins 12 and 13 to program a profile to ASR-1.
	iii. Pin 14 (DBGUARTRX). This is should be tied to the TX line of your programming fixture.
	iv. Pin 15 (DBGUARTTX). This should be tied to the RX line of your programming fixture.