

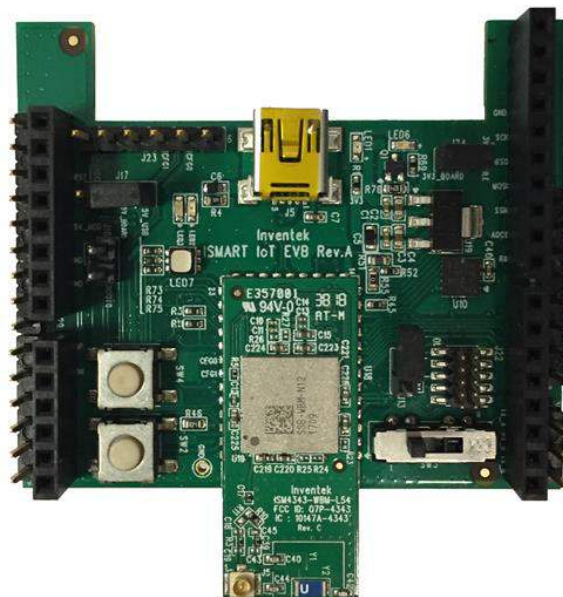


## **ISMART**

*Inventek Systems Module ARduino Test*

# IoT Evaluation Board User's Manual

802.11a/b/g/n/ac + BT/BLE



**ISMART EVB  
TOP**

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# 1 Definitions

## eS-WiFi: embedded Serial Wi-Fi

- Inventek's "modular" wireless product offering (Radio + MCU + Certified Antenna). These modules consist of 802.11 a/b/g/n/ac Wi-Fi radios and combinations of these radios with BT/BLE.
- All **eS-WiFi** module options support the same foot print enabling customers to migrate across the entire eS-WiFi portfolio without requiring any changes to the customer's original PCB design.
- **eS-WiFi** modules include antenna certifications for Chip, Etched, and u.fl antennas.

## IWIN: Inventek Systems Wireless Interoperability Network:

- Inventek's proprietary AT Command SW.
  - All associated collateral and documentation can be found at
    - <https://www.inventeksys.com/iwin/getting-started-guide/>
- Requires a Host processor to communicate to the eS-WiFi module serially.
- Video References:
  - Inventek Systems 802.11 b/g/n Serial to Wi-Fi & IWIN AT Introduction:
    - <https://www.youtube.com/watch?v=Tq2-CYm-c8Q>
  - Inventek Systems 802.11 b/g/n Serial to Wi-Fi & IWIN AT Command Set Tutorial:
    - <https://www.youtube.com/watch?v=tkPOLaNAKHo>
  - Inventek 802.11 b/g/n Serial to Wi-Fi Product Overview & AT Command Set Tutorial:
    - <https://www.youtube.com/watch?v=Mzmi-0DcUu0>

## ISMART: Inventek Systems Module ARduino Test IoT Evaluation Board

- Arduino form factor/footprint, no Arduino driver support.
- No additional hardware is required other than a PC to use the **ISMART** evaluation board.
- Please Note: The three-way switch on the **ISMART** evaluation board must be in the position closest to the Wi-Fi module (Position 1, UART USB), and use a USB cable to plug the **ISMART** evaluation board into your PC.

## 2 Introduction

The Inventek **ISMART** (Inventek Systems Module Arduino Test) IoT evaluation board platform is a user-friendly Arduino form factor compliant evaluation board suited for all of your wireless application needs. Please note that there is no Arduino software provided for this IoT development board.

The **ISMART** IoT evaluation board enables customers to quickly launch IoT products based on Inventek's **eS-WiFi** (embedded Serial Wi-Fi), portfolio of 802.11a/b/g/n/ac Wi-Fi radios and combinations of those radios with BT/BLE, a Host MCU and certified chip, etched or u.fl antenna options.

The **ISMART** IoT evaluation board is also supported by Inventek's **IWIN** (Inventek Wireless Interoperability Network), firmware which provides customers a robust user friendly AT command set to simplify and accelerate IoT design and development. **IWIN** enables customers to quickly get a Wi-Fi connected application up and running.

The **ISMART** IoT evaluation board plugs directly onto any target Arduino compatible MCU/CPU/Sensor Development Board offering. The **ISMART** IoT evaluation board also supports complete HW & SW IoT platform projects for various MCU requirements. Examples of the **ISMART** IoT MCU Reference Design Projects include Infineon's XMC4500 MCUs, ST Micro's STM32F MCUs, Analog Devices' Shark DSP and CUP360 MCUs, and Cypress PSoC MCUs. In addition, the **ISMART** IoT MCU Reference Design Projects also support third party Cloud applications such as AWS. For more information on complete **ISMART** IoT MCU Reference Design Projects, please visit:

- [www.inventeksys.com](http://www.inventeksys.com)
- AT Command Support
- IoT MCU Reference Designs

The **ISMART** IoT Evaluation Board User's Manual provides a detailed hardware and software requirements overview as well as all required board connections.

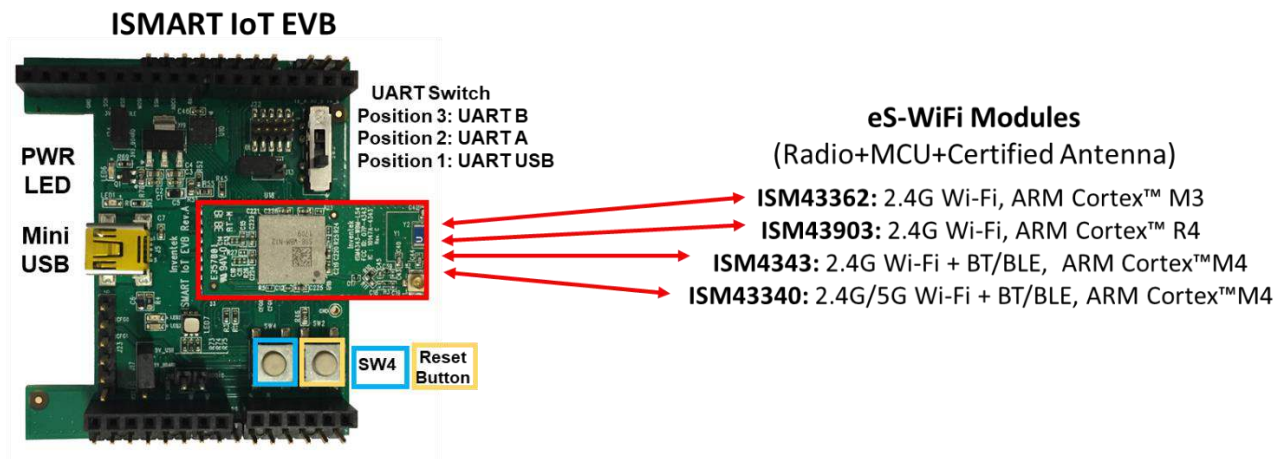
## 2.1 ORDERING INFORMATION

ISMART EVB	EVALUATION BOARD DESCRIPTION	eS-WiFi Module	ORDERING P/N ETCHED/CHIP ANTENNA OPTION	ORDERING P/N U.FL ANTENNA OPTION
ISMART43362	2.4G Wi-Fi, Cortex™ M3	ISM43362-M3G-L44	ISMART43362E-EVB	ISMART43362U-EVB
ISMART43903	2.4G Wi-Fi, Cortex™ R4	ISM43903-R48-L54	ISMART43903C-EVB	ISMART43903U-EVB
ISMART4343	2.4G Wi-Fi + BT/BLE, Cortex™ M4	ISM4343-WBM-L54	ISMART4343C-EVB	ISMART4343U-EVB
ISMART43340	2.4G/5G Wi-Fi + BT/BLE, Cortex™ M4	ISM43340-M4G-L44	ISMART43340C-EVB	ISMART43340U-EVB

### NOTE:

- All **ISMART** EVBs are configured for the UART interface option.
- For SPI support, please download the appropriate SPI FW update from Inventek's website, [www.inventeksys.com](http://www.inventeksys.com)
- Please reference your target **eS-WiFi** module of choice Data Sheet for additional information.

## 2.2 ISMART IoT EVB Overview



### NOTE:

- The L44/L54 foot print compatible option for Inventek's **eS-WiFi** modules enables customers to migrate across Inventek's portfolio as needed without requiring any changes to a customer's original PCB layout, enabling maximum flexibility as future connectivity design requirements change.
- The **ISMART** IoT EVB is a 3.3V board not a 5V board (5V input & generates 3.3V IO)
- The **ISMART** Mini USB connects to the Dual Port FTDI (Backside of EVB)
- The **ISMART** UART Position Switch selects the required UART connection
  - Please reference Section 4, The **ISMART** – Arduino Pin Out Map for all details.

## 2.3 ISMART IoT EVB Hardware Features

- The **ISMART** EVB is a 3.3v board, not a 5v board. The **ISAFE** EVB takes 5v in but generates 3.3v IO.
- FCC/CE/IC Certification is included with all **eS-WiFi** options including Etched, Chip or u.fl antenna options.
- Configurable using Inventek **IWIN** AT Commands FW.
- Host interface: UART, SPI.
- Input Power: 5.0 V
- Dual Port FTDI for firmware development and testing.
- SPI Flash for Over The Air (OTA) updates
- All **eS-WiFi** module portfolio also support a standard L44/L54 package option to enable customers to migrate between **eS-WiFi** module options once in mass production without customers having to make any board layout changes to their original PCB.
- Please note that there is no Arduino software provided for the **ISMART** IoT development board.

## 3 System Requirements

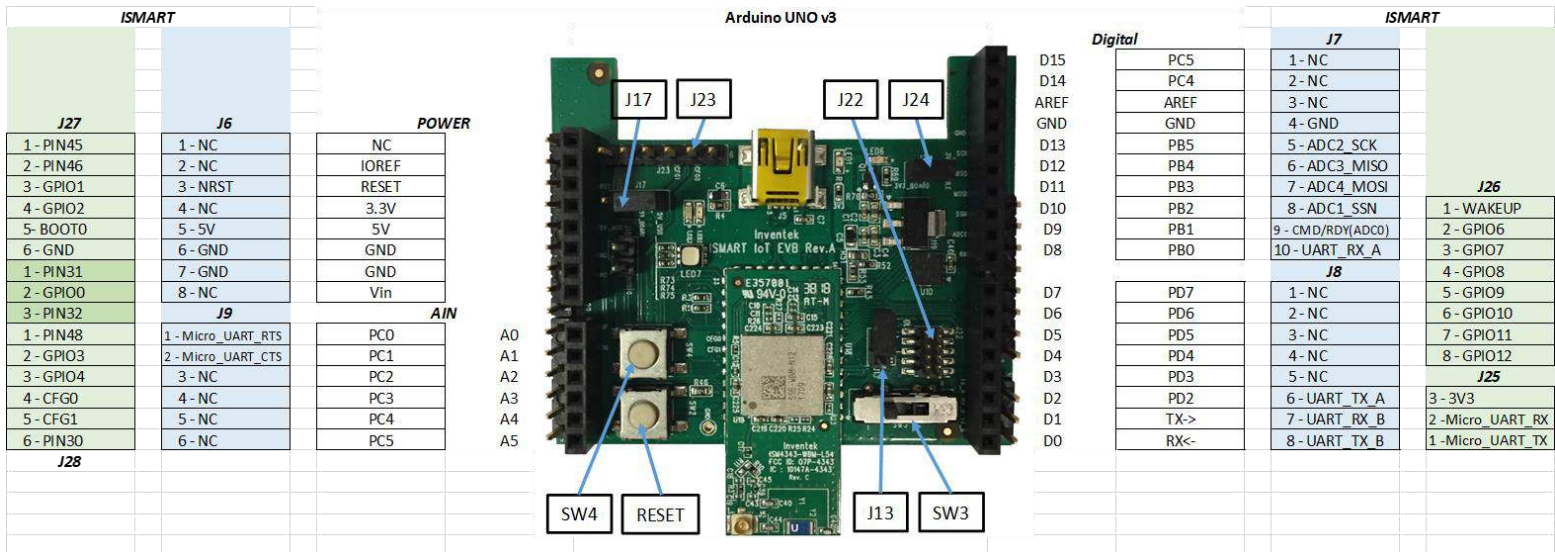
### 3.1 ISMART EVB Configuration for UART interface option

The **ISMART** EVB communication is configured using a PC over USB for all evaluation and test purposes.

1. Set-Up:
  - a. Download and install the **eS-WiFi PC Demo**:
    - i. <https://www.inventeksys.com/iwin/demo-software/>
  - b. Run **eS-WiFi PC Demo** and Install Drivers:
    - i. Menu > Install Drivers
  - c. Set the Power source for the **ISMART** EVB by placing a jumper on J17 from Pin 1 to Pin 2
  - d. Set SW3 to Position 1, UART\_USB (i.e.: Closest to **eS-WiFi** module)
  - e. Connect PC to the **ISMART** EVB using the Mini USB connector
  - f. Configure Serial Port:
    - i. Setup > Serial Port > Configure/Open
    - ii. In the Serial Port Config window:
      - Select Serial Port
      - Baud rate: 115,200
      - Parity None
      - Data Width 8
      - Stop Bits 1
  - g. You are now ready to type **IWIN** AT Commands in to the Terminal window
    - i. **IWIN** AT Commands Quick Reference Guide can be found at:
    - ii. [https://www.inventeksys.com/iwin/wp-content/uploads/WiFi\\_AT\\_Command-Set-Quick-Reference-1.pdf](https://www.inventeksys.com/iwin/wp-content/uploads/WiFi_AT_Command-Set-Quick-Reference-1.pdf)



## 4 The ISAFE– Arduino Pin Out Map

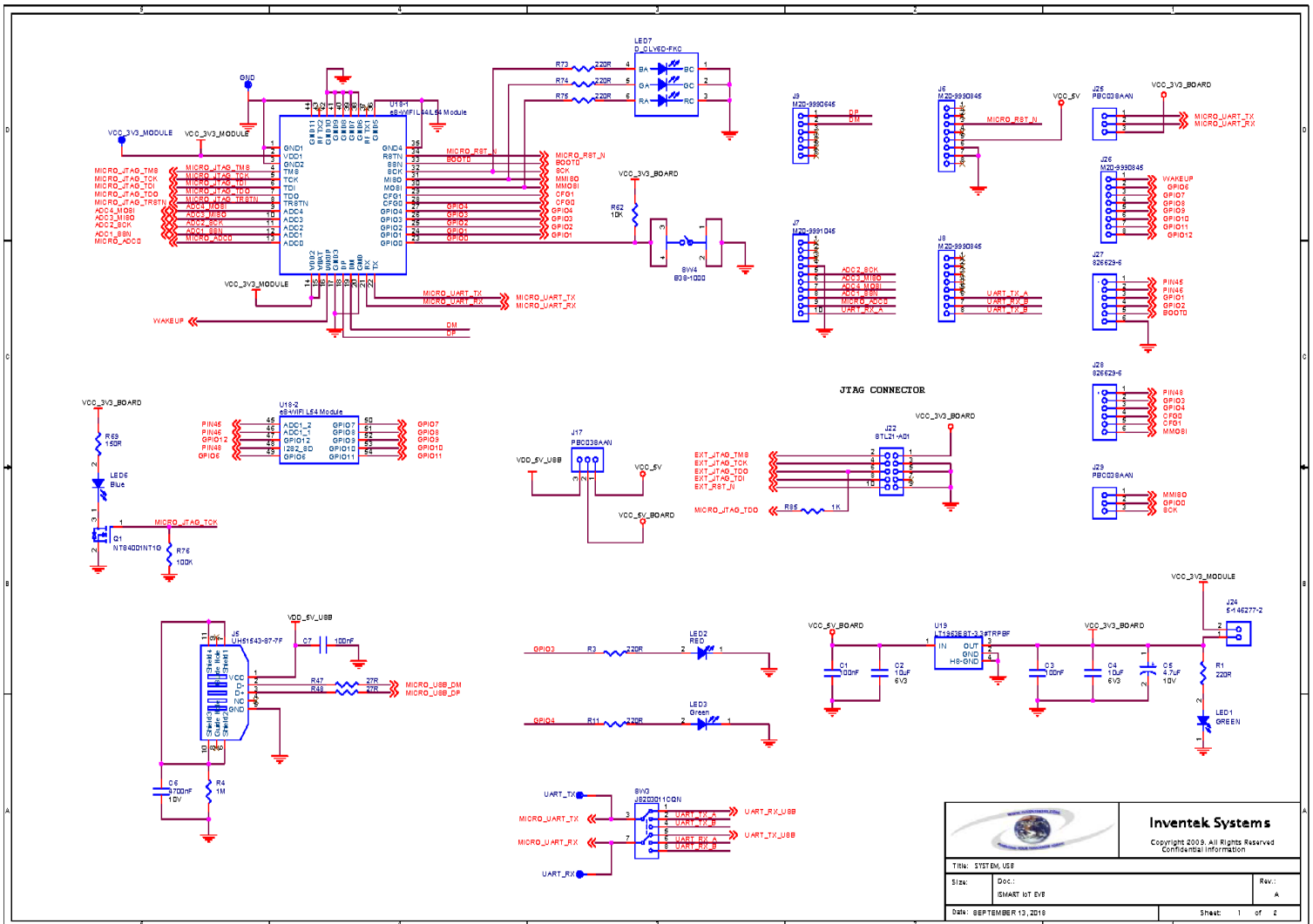


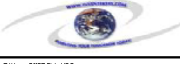
<b>LED7 - RGB LED</b>			<b>J22 - JTAG</b>			<b>SW3 - UART Selection</b>			
Pin 32	R73	Blue	1 - VCC_3V3_BOARD	1	UART_USB	<b>Default</b>			
Pin 31	R74	Green	2 - TMS	2	UART_A				
Pin 30	R75	Red	3 - GND	3	UART_B				
<b>LED2</b>			<b>J23 - AUX UART</b>			<b>J17 - 5V Source</b>			
GPIO3	R3	Red	4 - TCK	1	VCC_5V (J16-5)	<b>Default: 1-2</b>			
<b>LED3</b>			5 - GND	2	VCC_5V_BOARD				
GPIO4	R11	Green	6 - TDO	3	VDD_5V_USB				
<b>SW4 - Application Button</b>			7 - NC	<b>J24 - Module Power</b>					
GPIO0	R62 (Pullup)	Momontary Switch(NO)	8 - TDI	1	VCC_3V3_MODULE	<b>Default: 1-2</b>			
<b>Thermistor</b>			9 - GND	<b>J16 - BOOT0 (STM32F uP Only)</b>					
Micro_ADC0	R55	NCP18xH103F03RB	10 - RST_N	1	VCC_3V3_BOARD(10K)	<b>Default: Open</b>			
<b>To Isolate remove resistor(s)</b>			<b>J25 - On Board SFLASH CS</b>						
			1 - GND	1	ADC1_SSN	<b>Default: Open</b>			
			2 - NC	2	BOOT0				
			3 - NC	<b>J13 - On Board SFLASH CS</b>					
			4 - CFG1	1	ADC1_SSN	<b>Default: Open</b>			
			5 - CFG0	2	U10-CS#				
			6 - NC						



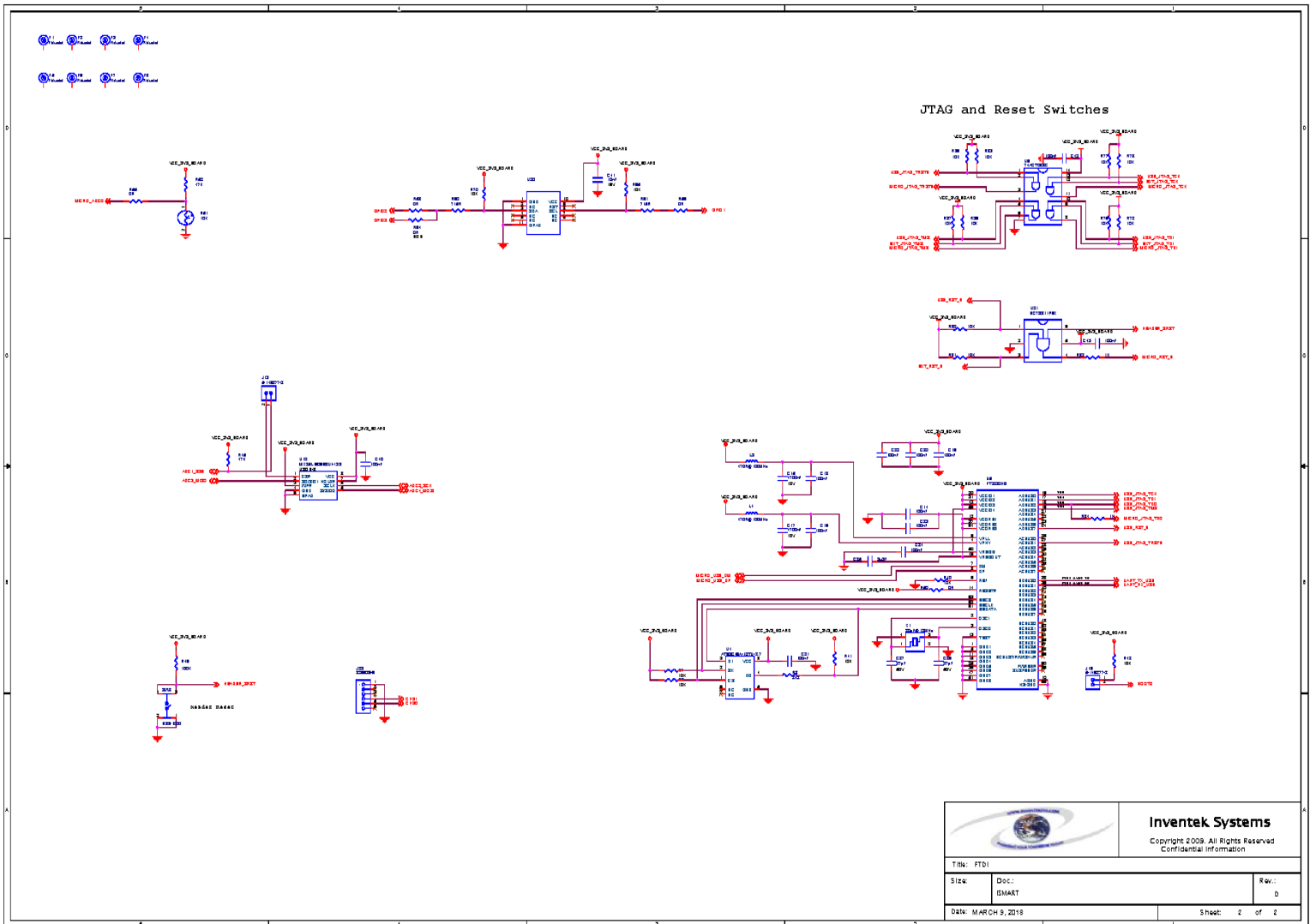
# 5 ISAFE EVB Schematics

## 5.1 USB Schematic



 <p><b>Inventek Systems</b> Copyright 2009. All Rights Reserved Confidential Information</p>		Title: SYSTEM USB Size: DOC: Doc: ISMArt IoT EVB Date: SEPTEMBER 13, 2010	Rev: A Sheet: 1 of 2

## 5.2 FTDI Schematic



## 6 Temp Rating

Symbol	Description	MIN	TYP	MAX	UNIT
TA	Temperature(ambient)	0		70	°C

**NOTE:** Functionality is guaranteed, but specifications require derating at extreme temperatures

## 7 Revision Control

Document: <b>ISMART IoT User's Manual</b>	Evaluation Board
External Release	DOC-DS-201904

Date	Author	Revision	Comment
4/1/19	AS	1.0	Preliminary Release
4/10/19	AS	2.0	Draft Release
4/19/19	AS	3.0	Release

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