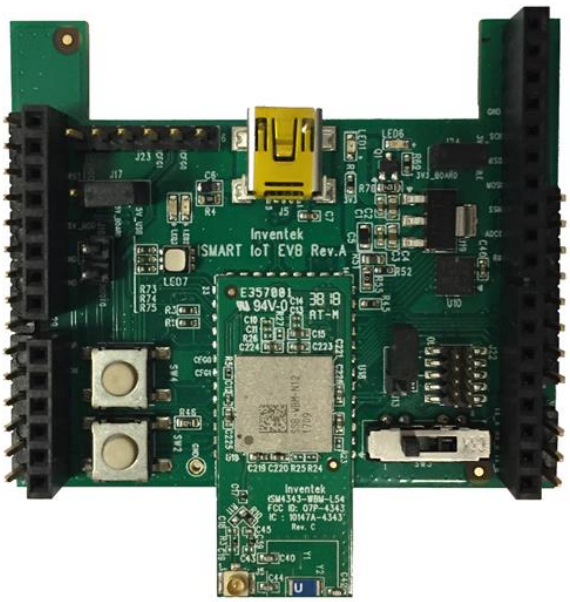
Inventek Systems
Embedding Connectivity Everywhere

ISMART

Inventek Systems Module ARduino Test

IoT Evaluation Board
User's Manual

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



ISMART EVB
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Contents

1 Definitions

eS-WiFi: **embedded Serial Wi-Fi**

- Inventek's "modular" wireless product offering (Radio + MCU + Certified Antenna). These modules consist of 802.11a/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
- 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.

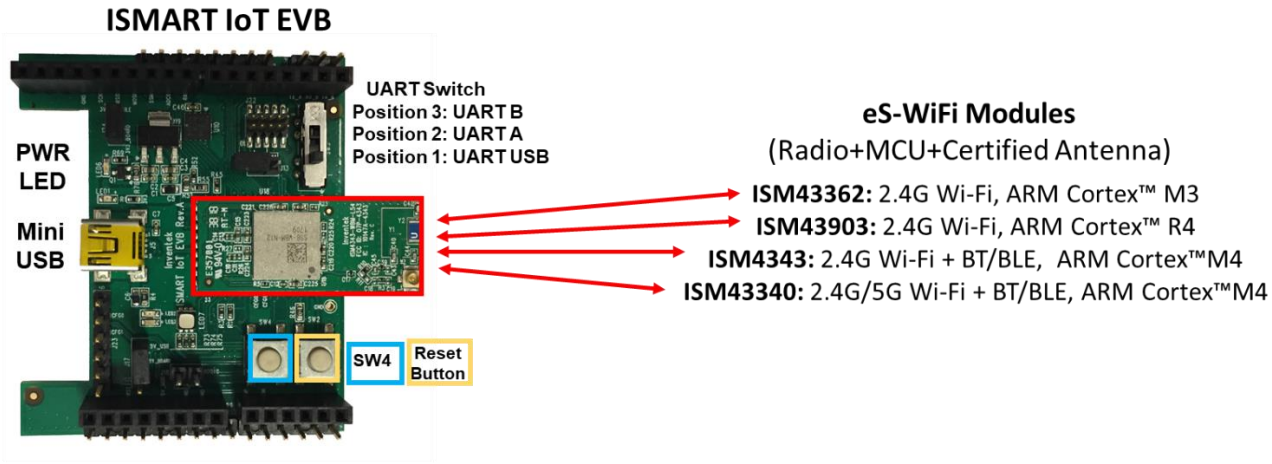
2.1 ORDERING INFORMATION

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
- 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)

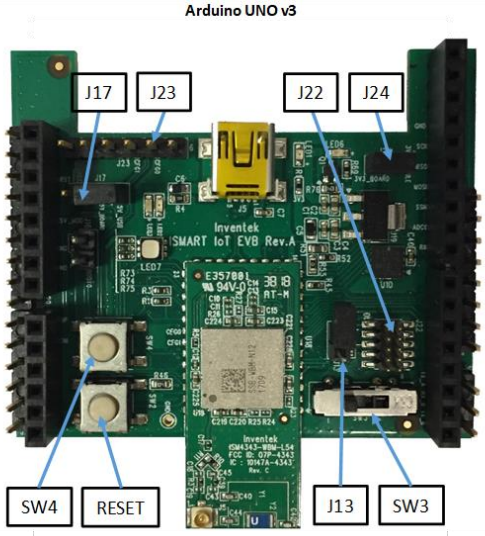
    e. Connect PC to the **ISMART** EVB using the Mini USB connector

    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

4 The ISAFE– Arduino Pin Out Map

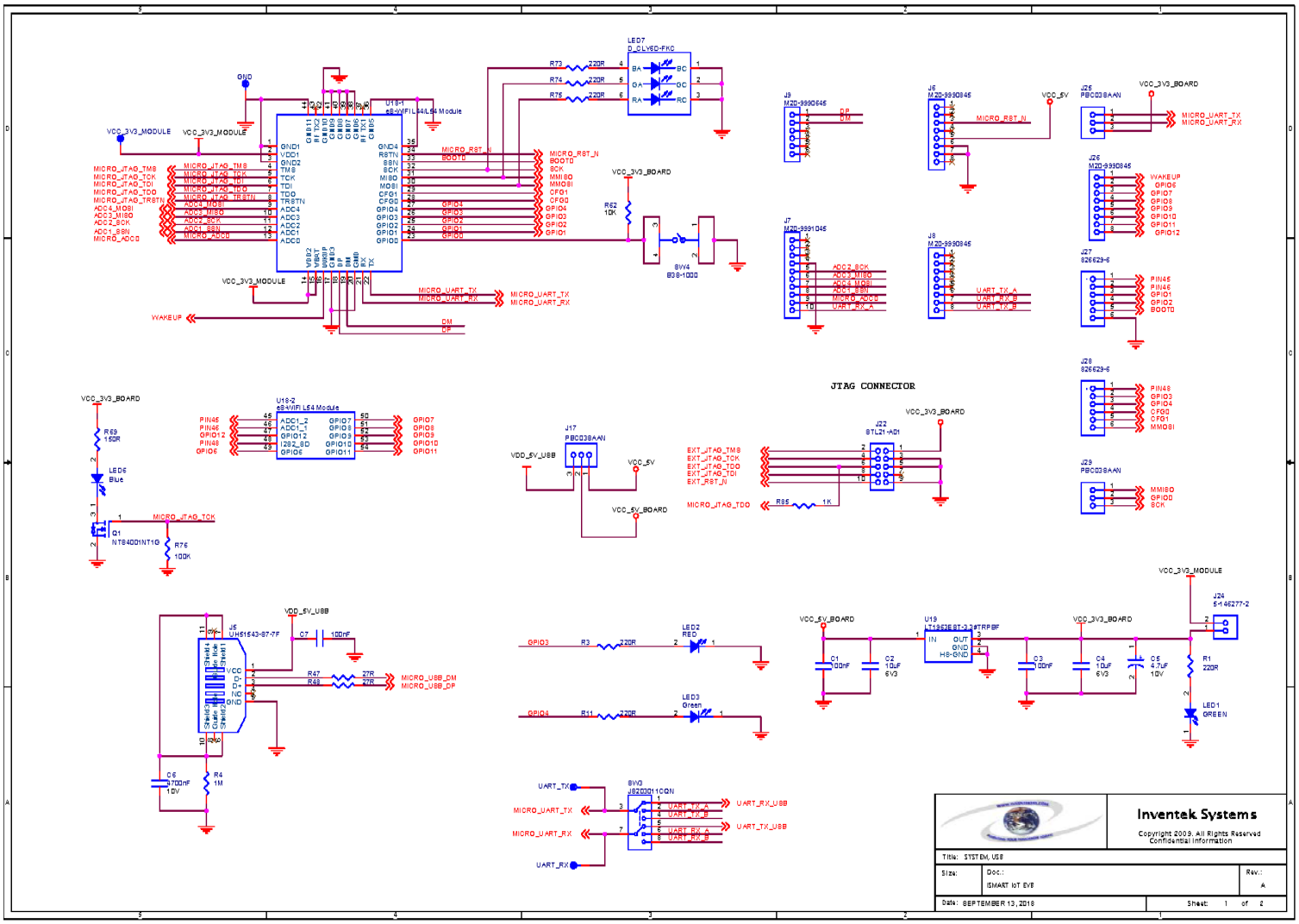
ISMART				Arduino UNO v3		Digital		ISMART	
					D15	PC5		J7	
					D14	PC4		1 - NC	
					AREF	AREF		2 - NC	
J27	J6	POWER			GND	GND		3 - NC	
1 - PIN45	1 - NC	NC			D13	PB5		4 - GND	
2 - PIN46	2 - NC	IOREF			D12	PB4		5 - ADC2_SCK	
3 - GPIO1	3 - NRST	RESET			D11	PB3		6 - ADC3_MISO	
4 - GPIO2	4 - NC	3.3V			D10	PB2		7 - ADC4_MOSI	J26
5- BOOT0	5 - 5V	5V			D9	PB1		8 - ADC1_SSN	1 - WAKEUP
6 - GND	6 - GND	GND			D8	PB0		9 - CMD/RDY(ADC0)	2 - GPIO6
1 - PIN31	7 - GND	GND						10 - UART_RX_A	3 - GPIO7
2 - GPIO0	8 - NC	Vin						J8	4 - GPIO8
3 - PIN32	J9	AIN			D7	PD7		1 - NC	5 - GPIO9
1 - PIN48	1 - Micro_UART_RTS	PC0	A0		D6	PD6		2 - NC	6 - GPIO10
2 - GPIO3	2 - Micro_UART_CTS	PC1	A1		D5	PD5		3 - NC	7 - GPIO11
3 - GPIO4	3 - NC	PC2	A2		D4	PD4		4 - NC	8 - GPIO12
4 - CFG0	4 - NC	PC3	A3		D3	PD3		5 - NC	J25
5 - CFG1	5 - NC	PC4	A4		D2	PD2		6 - UART_TX_A	3 - 3V3
6 - PIN30	6 - NC	PC5	A5		D1	TX->		7 - UART_RX_B	2 -Micro_UART_RX
J28					D0	RX<-		8 - UART_TX_B	1 -Micro_UART_TX



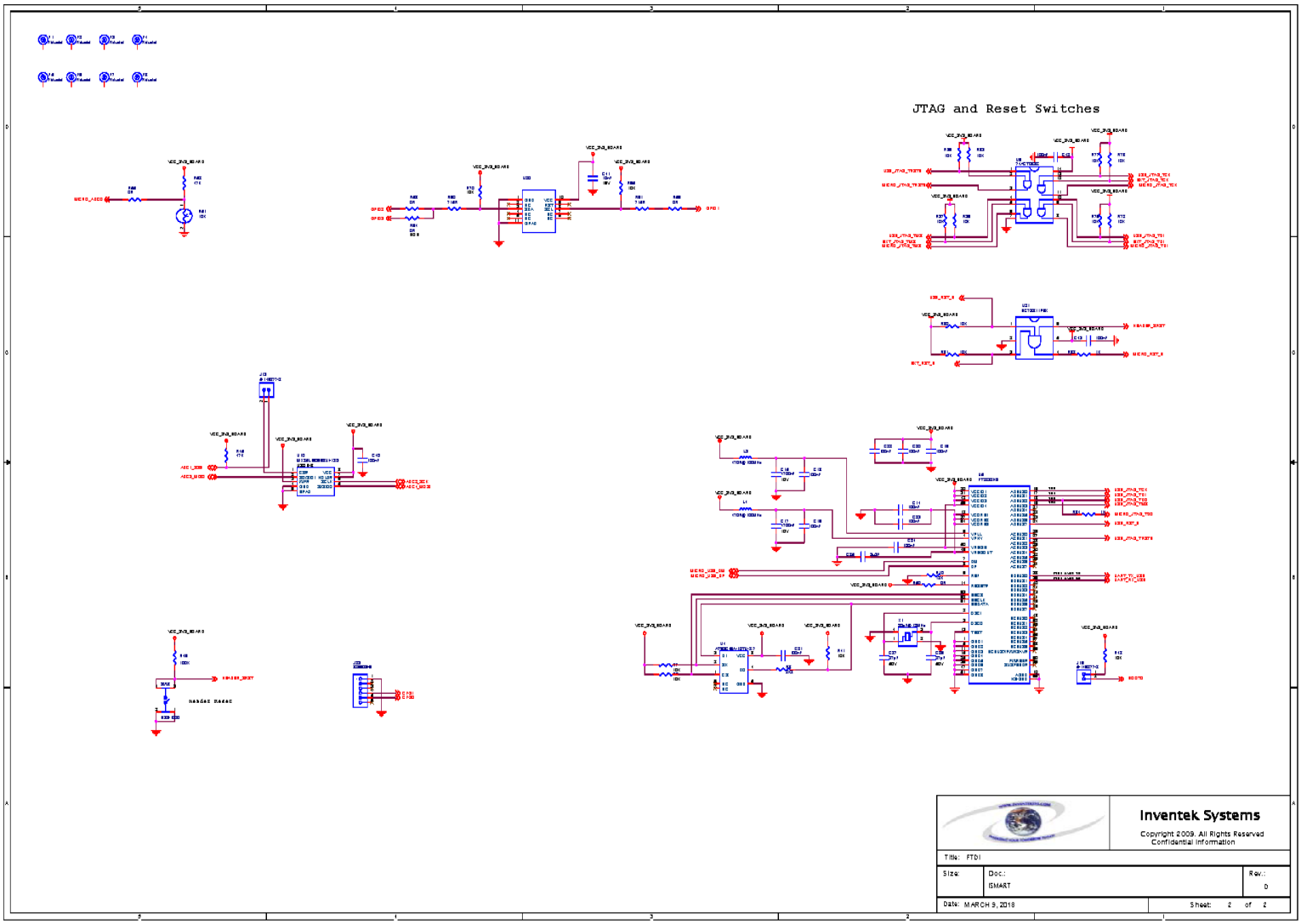
					SW3 - UART Selection			
					1	UART_USB	Default	
LED7 - RGB LED			J22 - JTAG		2	UART_A		
Pin 32	R73	Blue	1 - VCC_3V3_BOARD		3	UART_B		
Pin 31	R74	Green	2 - TMS					
Pin 30	R75	Red	3 - GND		J17 - 5V Source			
			4 - TCK		1	VCC_5V (J6-5)	Default: 1-2	
LED2			5 - GND		2	VCC_5V_BOARD		
GPIO3	R3	Red	6 - TDO		3	VDD_5V_USB		
			7 - NC					
LED3			8 - TDI		J24 - Module Power			
GPIO4	R11	Green	9 - GND		1	VCC_3V3_MODULE	Default: 1-2	
			10 - RST_N		2	VCC_3V3_BOARD		
SW4 - Application Button								
GPIO0	R62 (Pullup)	Momontary Switch(NO)	J23 - AUX UART		J16 - BOOT0 (STM32F uP Only)			
			1 - GND		1	VCC_3V3_BOARD(10K)	Default: Open	
Thermistor			2 - NC		2	BOOT0		
Micro_ADC0	R55	NCP18xH103F03RB	3 - NC					
To Isolate remove resistor(s)			4 - CFG1		J13 - On Board SFLASH CS			
			5 - CFG0		1	ADC1_SSN	Default: Open	
			6 - NC		2	U10-CS#		

5 ISAFE EVB Schematics

5.1 USB Schematic



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: **ISMART** IoT User's Manual	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

8 Contact Information

Inventek Systems
2 Republic Road
Billerica MA, 01862
Tel: 978-667-1962
Sales@inventeksys.com

www.inventeksys.com

Mouser Electronics

Authorized Distributor

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