

PRODUCT SPECIFICATION

ST-001-B1

User Manual

CONTENT

FCC Statement.....	3
PRODUCT FEATURES	6
PRODUCT SPECIFICATIONS.....	7
PIN ASSIGNMENT.....	8
MODULE PINOUT	10
MECHANICAL	11
ENVIRONMENTAL	12
OPERATING	12
STORAGE.....	12

FCC Statement:

Federal Communication Commission Interference Statement This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures: - Reorient or relocate the receiving antenna. - Increase the separation between the equipment and receiver. - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. -Consult the dealer or an experienced radio/TV technician for help. **FCC Caution:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For product available in the USA/Canada market, only channel 1~15 can be operated. Selection of other channels is not possible. This device and its antenna(s) must not be co-located with any other transmitters except in accordance with FCC multi transmitter product procedures. Referring to the multi transmitter policy, multiple transmitter(s) and module(s) can be operated simultaneously without C2PC.

IMPORTANT NOTE: FCC Radiation Exposure Statement: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

IMPORTANT NOTE: This module is intended for Equipment monitoring and equipment data collection. The Equipment monitoring and equipment data collection. is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated. Additional testing and certification may be necessary when multiple modules are used.

20 cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

USERS MANUAL OF THE END PRODUCT: In the users manual of the end product, the end user has to be informed to keep at least 20 cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

LABEL OF THE END PRODUCT: The final end product must be labeled in a visible area with the following " Contains TX FCC ID: 2AN3JST001-B1 ". If the size of the end product is larger than 38.5x24mm, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Third party Checklist

The party below will implement the ST-001-B1 Module in host systems in accordance with the instructions specified in this document and the documents referenced herein.

- 1.The Third party will ensure the Module is integrated in a host systems using only the approved antenna model(s) described in this document.
- 2.The Third party will ensure the antenna placement inside the host system will maintain the required spacing to end user for RF Exposure compliance, as specified in this document.
- 3.If other radios are integrated inside the host with the ST-001-B1 Module, the Third party will contact its test lab, TCB or EverComm Opto Ltd. to determine if additional FCC compliance evaluation is required to meet FCC collocation rules.

4. The Third party will ensure end user documentation will contain the specified regulatory wording and ensure the host system and the Module itself are labeled as specified in this document.
5. The Third party will ensure the Module is programmed in the factory with compliant transmit power not exceeding the levels specified in this document. ST-001-B1 requests that the Third party acknowledge its receipt of this document and the above instructions. You may contact EverComm Opto Ltd. with any questions concerning this document or the responsibilities of the Third party.

IMPORTANT NOTE:

IC Radiation Exposure Statement: This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body. Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

This module is intended for Third party. The Third party is still responsible for the IC compliance requirement of the end product, which integrates this module.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

USERS MANUAL OF THE END PRODUCT: In the users manual of the end product, the end user has to be informed to keep at least 20 cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the IC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

LABEL OF THE END PRODUCT: The final end product must be labeled in a visible area with the following " Contains TX IC: 2AN3JST001-B1 ".

PRODUCT FEATURES

- Star operation with up to Multiple active piconets with background scan and support for Star mode
- Does not support frequency hopping, this module uses a fixed frequency transmission method
- Low power consumption for meeting worldwide energy standards
- Operate at ISM frequency Band 2.4G
- Support 1-15 channel, 2405-2475MHz
- Programmable Output Power up to 20dBm
- 2.4-GHz IEEE 802.15.4 Compliant RF Transceiver
- Excellent Receiver Sensitivity of -97 dBm
- Robustness to Interference With ACR of 44 dB
- RoHS compliance
- Low Halogen compliance

Security Hardware Acceleration

- Future Proof AES-128/256, SHA2 Hardware Encryption Engine
- Optional – ECC-128/256, RSA Hardware Acceleration Engine for Secure Key Exchange
- Radio Command Strobe Processor and Packet Handling Processor for Low-Level MAC Functionality

Applications

- Smart Grid and Home Area Network
- Home and Building Automation

- Intelligent Lighting Systems

PRODUCT SPECIFICATIONS

MAIN CHIPSET

Texas Instruments CC2538

FUNCTIONAL SPECIFICATIONS

- 2.4-GHz IEEE 802.15.4 Compliant RF Transceiver
- Interface
 - UART:4800,9600,19200,38400,115200
 - 12-Bit ADC With 8 Channels and Configurable Resolution
- Frequency Range
 - 2405MHz – 2475MHz
- Transmit Output Power
 - Output Power up to < +20dBm
- Receiver Sensitivity
 - -97 dBm
- Data Rate
 - 250KHz
- Antenna Type

2.4GHz 2dBi-dipole
- Module Operating Voltage

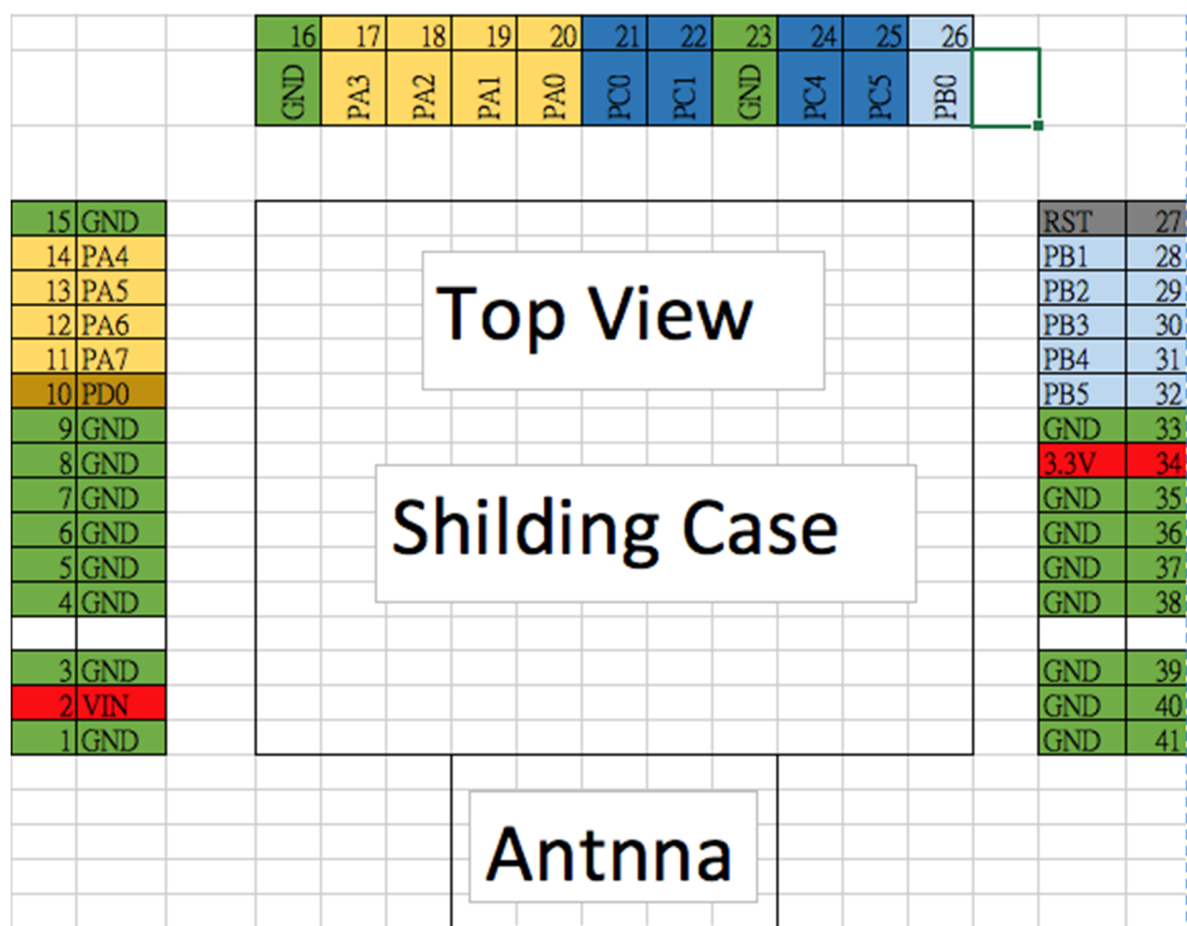
+5V ±5% supply voltage

PIN ASSIGMENT

Pin	Pin Define	I/O	Description
1	GND	G	Ground
2	VIN	I	Input Voltage Maxima :+5V±5% Supply module voltage
3-9	GND	G	Ground
10	PD0	I/O	GPIO port D pin 0
11	PA7	I/O	GPIO port A pin 7, ADC3 analog input AIN7
12	PA6	I/O	GPIO port A pin 6, ADC3 analog input AIN6
13	PA5	I/O	GPIO port A pin 5, ADC3 analog input AIN5
14	PA4	I/O	GPIO port A pin 4, ADC3 analog input AIN4
15	GND	G	Ground
16	GND	G	Ground
17	PA3	I/O	GPIO port A pin 3, ADC3 analog input AIN3
18	PA2	I/O	GPIO port A pin 2, ADC2 analog input AIN2
19	PA1	I/O	GPIO port A pin 1, ADC1 analog input AIN1 UART TX
20	PA0	I/O	GPIO port A pin 0, ADC1 analog input AIN0 UART RX
21	PC0	I/O	GPIO port C pin 0

22	PC1	I/O	GPIO port C pin 1
23	GND		Ground
24	PC4	I/O	GPIO port C pin 4
25	PC5	I/O	GPIO port C pin 5
26	PB0	I/O	GPIO port B pin 0
27	RST	I/O	SYSTEM Reset PIN
28	PB1	I/O	GPIO port B pin 1
29	PB2	I/O	GPIO port B pin 2
30	PB3	I/O	GPIO port B pin 3
31	PB4	I/O	GPIO port B pin 4
32	PB5	I/O	GPIO port B pin 5
33	GND	G	Ground
34	+3.3V	O	Voltage regulator Output
35-41	GND	G	Ground

MODULE PINOUT



Top view of the PCB layout showing dimensions and component placement. The overall dimensions are 23.80mm by 38.56mm. Key dimensions include 20.00mm, 30.00mm, 2.00mm, 4.00mm, 3.00mm, 7.28mm, and 11.77mm. Components shown include a microcontroller (ST-001 Rev. B1), capacitors (C1, C2, C12), resistors (R1, R2, R3, R4, R5), and a diode (D1). A red circle highlights a specific area on the left side of the board.

Module Thickness:3.51mm

ENVIRONMENTAL

OPERATING

Operating Temperature: 0 to 50 °C (32 to 122 °F)

Relative Humidity: 5-90% (non-condensing)

STORAGE

Temperature: -40 to 80 °C (-40 to 176 °F)

Relative Humidity: 5-95% (non-condensing)