

CyberTAN Technology, Inc.

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|-------------|-------------------------------------------------|
| Model Name | NU361-HS |
| Description | 802.11a/b/g/n/ac Wi-Fi + Bluetooth Combo Module |
| Version | Release 0.1 (xC) |
| Date | April 01, 2015 |
| Author | Cindy Fan |

Revision History

| Date | Release | Author | Description |
|------------|---------|-----------|----------------------------|
| 2015-04-01 | 0.1 | Cindy Fan | First preliminary release. |
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Related Documents

| Date | Author | Description |
|------|--------|-------------------|
| | | Broadcom BCM43569 |
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1. OVERVIEW

Makers of smart phones and home appliances can easily add full IEEE 802.11ac, Bluetooth 4.1 +EDR (Enhanced Data Rate) and their products with the NU361-HS combo module. The combo module features tiny sizes and low power consumption. The NU361-HS is the perfect way to offer high-speed, worldwide wireless connectivity in any handheld or wireless-attached digital devices.

Features and Benefits

- **Single Chip Design**

SoC minimizes component count and simplifies hardware and software design.

- **Tiny Size in a 9-pin WTB Interface**

Module's 40mm(W) × 46.45mm(L) footprint makes it ideal for high-density designs. Both Wi-Fi and Bluetooth use a common 9-pin WTB connector.

- **Seamless Wireless Connectivity**

The module supports the IEEE 802.11a/b/g/n/ac standards for high speed and transparent inter-operation with most home and business WLANs and all public hot spots around the world.

- **Up-to-date, High-level Security**

WEP, WPA, and WPA2 are supported to ensure maximum data privacy.

- **Dynamic Rate Shifting**

Wireless transmission speed is automatically adjusted on the basis of signal strength to achieve maximum availability and link reliability.

1.1 Basic Specifications

Table 1: Basic Specifications

| Model Number | NU361-HS |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Type | 802.11a/b/g/n/ac Wi-Fi + Bluetooth Combo Module |
| Main Chip(s) | Broadcom BCM43569 |
| Connector | 9 Pin WTB Connector |
| WLAN Standard(s) | IEEE 802.11a/b/g and 802.11n, Draft 802.11ac |
| WLAN Spreading | IEEE 802.11a/b/g/n OFDM/DSSS PHY specification |
| WLAN Operating Frequency | 5150~5250MHz, 5250~5350MHz and 5470~5725MHz, DFS band, 5725~5850MHz, 2400~2483.5MHz. |
| WLAN Channels | 2.4GHz: 11 (US), 13 (EU), 14 (Japan) channels 5GHz: CH. 36-64, 100-165 North America |
| WLAN Data Rates | 802.11g data rates of 6,9,12,18,24,36,48, 54Mbps 802.11b data rates of 1, 2, 5.5, and 11Mbps 802.11n data rates up to 300Mbps Draft 802.11ac data rates up to 867Mbps |
| WLAN Modulation Schemes | 802.11ac: 256QAM 802.11g/n: 64QAM (65/54/48Mbps), 16QAM (36/24Mbps) QPSK (18/12Mbps), BPSK (9/6Mbps) 802.11b: CCK (11/5.5Mbps), DQPSK (2Mbps) and DBPSK (1Mbps) |
| WLAN Rx Sensitivity (typical) | -87dBm@11Mbps -75dBm@54Mbps -68dBm HT40 (MCS7) @2.4GHz -75dBm@54Mbps -68dBm HT40 (MCS7) -60dBm VHT80 (MCS9) @5GHz |
| Bluetooth Standard(s) | BT 3.0+ High Speed (HS). BT 4.0 BLE. Compliant with BT 2.1+EDR |
| Bluetooth Operating Frequency | 2400-2483.5MHz |
| Bluetooth Data Rates | Up to 3Mbps |
| Bluetooth Modulation Schemes | FHSS/GFSK/DQPSK/8DPSK |
| Bluetooth Rx Sensitivity | GFSK: typical -87dBm π/4 DQPSK: typical -88dBm 8DPSK: typical -81dBm -94 dBm(BLE) |
| Operating System Support | Windows Mobile 5.0/6.0, Linux 2.6.9 and above (TBD) |
| Power Requirements | Supplying Voltages: 5V ± 10% Standby mode current: (TBD)mA Power Saving Mode (DTIM=1): (TBD)mA TX mode: (TBD mA (continuous TX) Rx mode: (TBD mA |

| Model Number | NU361-HS |
|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| | Additional Current for BT: ACL with file transfer (TBD)mA SCO HV3 : (TBD)mA ; Standby host : (TBD)mA Reset : (TBD)mA ; |
| Dimensions | 40 x 46.45 x5.1 mm (typical) |
| Regulatory Conformance | EMI: FCC Part 15b, Part 15c (pre-scan on EVB only) * Official test carried out by module customers |
| Normal Operating Temperature: Functional* Temperature: *Operational with reduced performance | -10 ~ +50°C -30 ~ +70°C |

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2. MECHANICAL CHARACTERISTICS

2.1 Pin Numberings

Pin numbers are defined according to the following Figure 1.

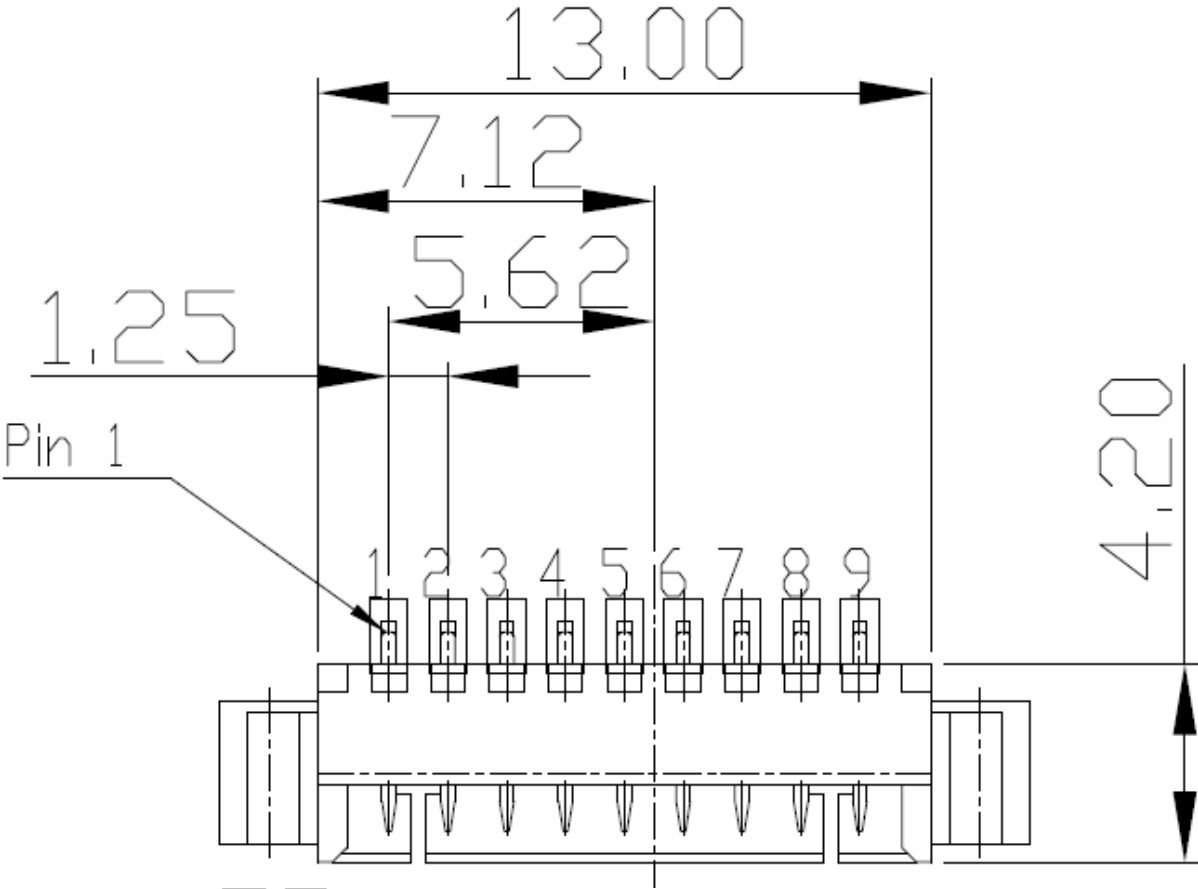


Figure 1: WTB Connector Layout

2.2 Pin Out Definitions

The logical definitions of the module's pins are depicted below.

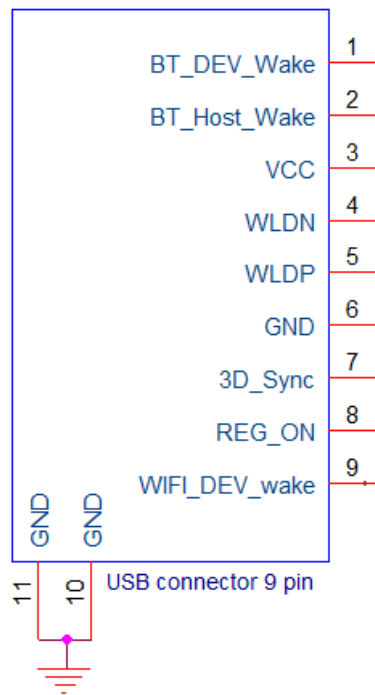
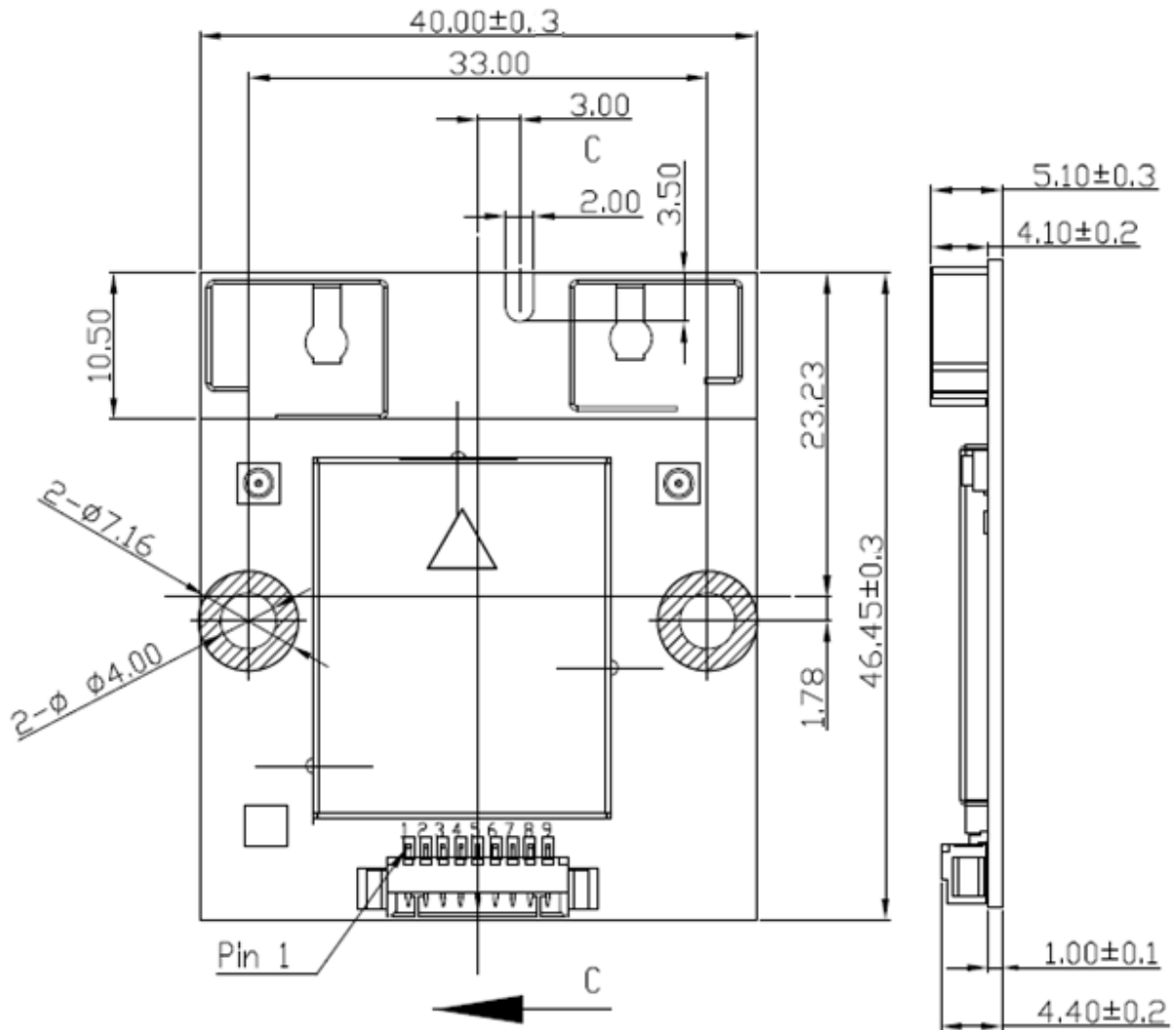


Figure 2: Pins Configuration

2.3 Module Dimensions



Note: All dimension tolerances are $\pm 0.10\text{mm}$, unless otherwise specifics.

Figure 3: Orientation and Date Markings (Top View)

Table 2: Module Dimensions

| Symbol | Dimensions in Millimeters | | |
|--------|---------------------------|---------|---------|
| | Minimum | Optimum | Maximum |
| Length | 46.15 | 46.45 | 46.75 |
| Width | 39.7 | 40.0 | 40.3 |
| Height | 4.8 | 5.10 | 5.4 |

3. PINOUTS AND SIGNAL DESCRIPTIONS

This section describes module signals and the associated pins.

3.1 Pin Definitions

Table 3: Pin Definition

| No | Definition | Description | Remark |
|----|-----------------|---------------------------|-------------------------------------------------|
| 1 | BT_DEV_Wake(I) | Host wake up BT device | Allows the SOC host to wake up to the BT device |
| 2 | BT_Host_Wake(O) | BT device wake up host | |
| 3 | VCC | +5V Voltage power | |
| 4 | USBDM | D- | USB 2.0 Differential Pair |
| 5 | USBDP | D+ | |
| 6 | GND | Ground | |
| 7 | 3D_SYNC | Glass sync | Connect Vsync |
| 8 | REG_ON | Internal regulator on/off | Connect reset pin |
| 9 | WIFI_DEV_wake | WiFi device wake up host | |

4. EMI CERTIFICATION NOTES

It is recommended that the module be entirely encased in metal shielding to ensure meeting FCC and CE requirements.

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5. REGULATORY INFORMATION

5.1 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 1~11 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 C2P.

This device is restricted for indoor use.

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.

Devices will not permit operations on channels 120-132 for 11a and 11n/a which overlap the 5600 - 5650 MHz band.

IMPORTANT NOTE:

This module is intended for OEM integrator. The OEM integrator 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.

20cm 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 20cm 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: N89-NU361 ". If the size of the end product is larger than 8x10cm, 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.

Antenna List:

| Ant. | Brand | Part No. | Antenna Type | Connector | Gain (dBi) | | |
|------|----------------|-------------------|--------------|-----------|------------|------|-----------|
| | | | | | 2.4GHz | 5GHz | Bluetooth |
| 1 | INPAQ | WAG-M-LB-00-002 | PIFA Antenna | Murata | 1.21 | 3.97 | - |
| 2 | INPAQ | WAG-M-LB-00-003 | PIFA Antenna | Murata | 1.21 | 3.97 | - |
| 3 | MAG. LAYERS | MSA-3507-25GC1-A1 | PIFA Antenna | I-PEX | - | - | 4.12 |

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