



HTCC-AM01 V2

LoRa module





Document version

| Version | Time | Description | Remark |
|----------|-----------|--------------------------|--------|
| Rev. 1.0 | 2022-8-16 | Preliminary version | 肖鸿 |
| Rev. 1.1 | 2022-9-17 | Typographic modification | Aaron |

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1. Description

1.1 Overview

HTCC-AM01 is [Cubecell](#)(TM) Series made by Heltect team, mainly for LoRa/LoRaWAN node applications. it has the characteristics of long communication range, high receive sensitivity, low power consumption and low cost.

HTCC-AM01 is based on ASR6052, the chip is already integrated with the PSoC® 4000 series MCU (ARM® Cortex® M0+ Core) and SX1262. Regarding the software side, we have done a lot of migration and development, made it perfectly support [Arduino](#)®.

HTCC-AM01 is a small volume, stamp hole package module, supports AT transparent transmission commands, can be directly integrated into the application circuit.

HTCC-AM01 are available in two product variants:

Table 1.1: Product model list

| No. | Model | Description |
|-----|--------------|--|
| 1 | HTCC-AM01-LF | 470~510MHz working LoRa frequency, used for China mainland (CN470) LPW band. |
| 2 | HTCC-AM01-HF | For EU868, IN865, US915, AU915, AS923, KR920 and other LPW networks with operating frequencies between 863~928MHz. |

1.2 Product features

- Perfect [Arduino-Compatible](#);
- CE and FCC certification;

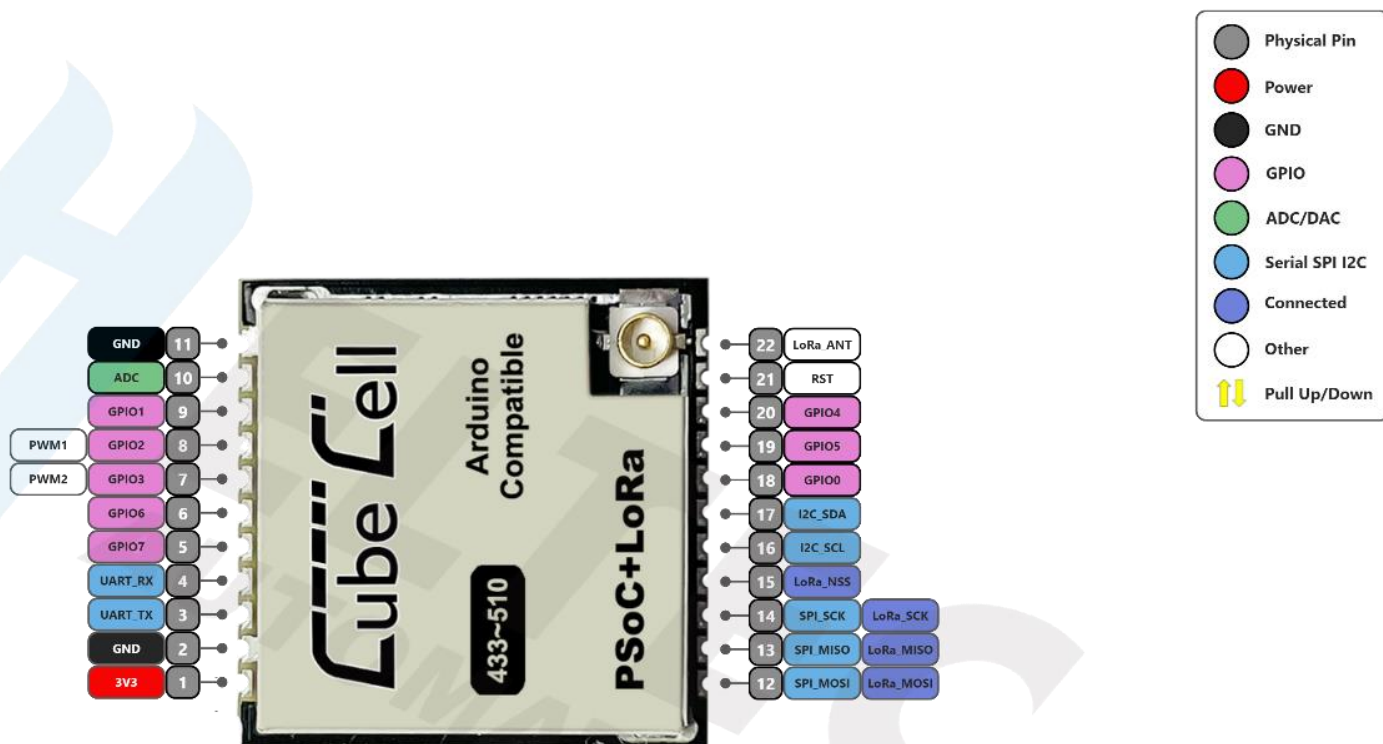
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- Based on ASR605x (ASR6501, ASR6502), those chips are already integrated the PSoC® 4000 series MCU (ARM® Cortex® M0+ Core) and SX1262;
- LoRaWAN 1.0.2 support;
- Ultra low power design, 3.5uA in deep sleep;
- 1.27 stamp edge design for SMT;
- Good impedance matching and long communication distance.

2. Pin Definition

2.1 Pin assignment



HTCC-AM01_V2 Pin map



2.2 Pin description

Table 2.2: Pin description

| No. | Name | Type | Function |
|-----|------|------|----------------------------------|
| 1 | VDD | P | Power supply |
| 2 | GND | P | Ground |
| 3 | TXD | I/O | UART_TX |
| 4 | RX | I/O | UART_TX |
| 5 | 7 | I/O | GPIO7 |
| 6 | 6 | I/O | GPIO6 |
| 7 | 3 | I/O | GPIO3, PWM2 |
| 8 | 2 | I/O | GPIO2, PWM1 |
| 9 | 1 | I/O | GPIO1 |
| 10 | ADC | I | ADC_IN2 |
| 11 | GND | P | Ground |
| 12 | MOSI | I/O | Internal connection to LoRa MOSI |
| 13 | MISO | I/O | Internal connection to LoRa MISO |
| 14 | SCK | I/O | Internal connection to LoRa SCK |
| 15 | NSS | I/O | Internal connection to LoRa NSS |
| 16 | SCL | I/O | I2C_SCL |
| 17 | SDA | I/O | I2C_SDA |
| 18 | 0 | I/O | GPIO0 |



| | | | |
|----|-----|-----|----------|
| 19 | 5 | I/O | GPIO5 |
| 20 | 4 | I/O | GPIO4 |
| 21 | RST | I | RESRT |
| 22 | ANT | O | LoRa ANT |

3. Specifications

3.1 General specifications

Table 3.1: General specifications

| Parameters | Description |
|-----------------------------------|---|
| Master Chip | ASR6502 (48 MHz ARM® Cortex® M0+ MCU) |
| LoRa Chipset | SX1262 |
| Frequency | 470~510MHz, 863~928MHz |
| Max. TX Power | 21±1dBm |
| Max. Receiving sensitivity | -134dBm |
| Hardware Resource | 1*SPI; 1*I2C; 1*UART; 1*12-bit ADC; 1*SWD; 8*GPIO; 2*PWM; 8-Channel DMA engine |
| Memory | 128Kbites FLASH; 16Kbites SRAM |
| Interface | LoRa ANT (IPEX 1.0); 1.27 spacing Stamp hole |
| Power consumption | Deep Sleep 3.5uA |
| Operating temperature | -40~85°C |
| Dimensions | 18 * 18 * 3 mm |
| Package | Tape & Reel Packaging |



3.2 Electrical characteristics

3.2.1 Power supply

Table 3.2.1: Power supply

| Power supply mode | Minimum | Typical | Maximum | Company |
|---------------------------------|---------|---------|---------|---------|
| 3V3 pin ($\geq 150\text{mA}$) | 2.7 | 3.3 | 3.5 | V |

3.2.2 Power characteristics

Table3.2.2: Power characteristics

| Mode | Condition | Min. | Typical | Max. | Company |
|-------|-----------------------------|------|---------|------|---------|
| TX | 868MHz, 3.3V powered, 14dBm | | 60 | | mA |
| | 868MHz, 3.3V powered, 17dBm | | 85 | | mA |
| | 868MHz, 3.3V powered, 22dBm | | 100 | | mA |
| RX | 868MHz, 3.3V powered | | 20 | | mA |
| Sleep | 3.3V powered | | 3.5 | | uA |

3.3 RF characteristics

3.3.1 Transmit power

Table3.3.1: Transmit power

| Operating frequency band (MHz) | Maximum power value/[dBm] |
|--------------------------------|---------------------------|
| 470~510 | 21 \pm 1 |
| 863~870 | 21 \pm 1 |
| 902~928 | 21 \pm 1 |

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3.3.2 Receiving sensitivity

The following table gives typically sensitivity level of the HTCC-AM01.

Table3.3.2: Receiving sensitivity

| Signal Bandwidth/[KHz] | Spreading Factor | Sensitivity/[dBm] |
|------------------------|------------------|-------------------|
| 125 | SF12 | -134 |
| 125 | SF10 | -130 |
| 125 | SF7 | -122 |

3.4 Operation frequencies

HTCC-AM01 supports LoRaWAN frequency channels and models corresponding table.

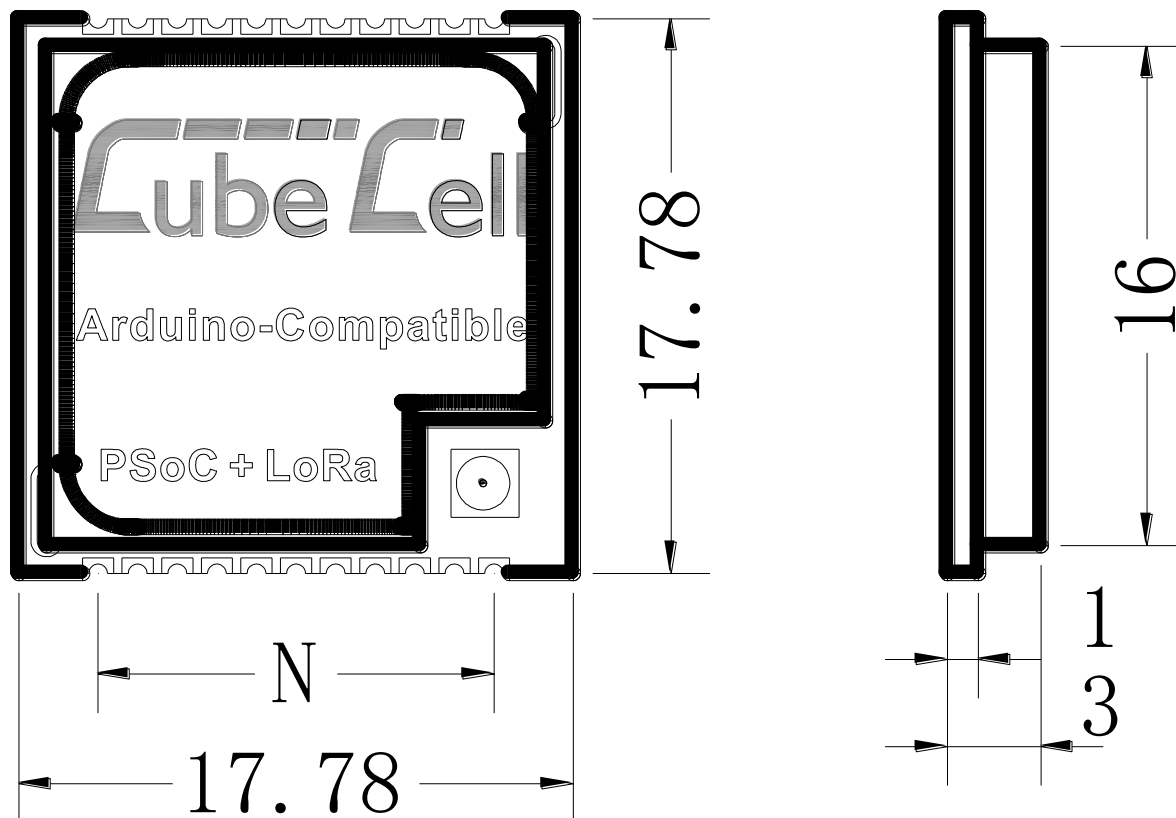
Table3.4: Operation frequencies

| Region | Frequency (MHz) | Model |
|--------|-----------------|--------------|
| EU433 | 433.175~434.665 | HTCC-AM01-LF |
| CN470 | 470~510 | HTCC-AM01-LF |
| IN868 | 865~867 | HTCC-AM01-HF |
| EU868 | 863~870 | HTCC-AM01-HF |
| US915 | 902~928 | HTCC-AM01-HF |
| AU915 | 915~928 | HTCC-AM01-HF |
| KR920 | 920~923 | HTCC-AM01-HF |
| AS923 | 920~925 | HTCC-AM01-HF |



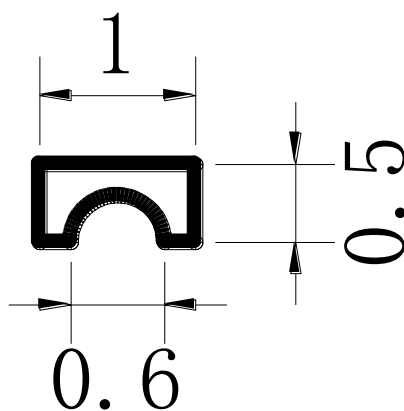
4. Hardware resource

4.1 Physical dimensions



$$N=10 \times 1.27$$

PAD





5. Resource

5.1 Relevant Resource

- Source Code
 - [Cubecell-Arduino framework](#)
- Recommend hardware design
 - [Arduino](#)
 - [AT](#)
- [Pin map](#)
- [Downloadable resource](#)
- [Footprint](#)

5.2 Contact Information

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