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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Content

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.

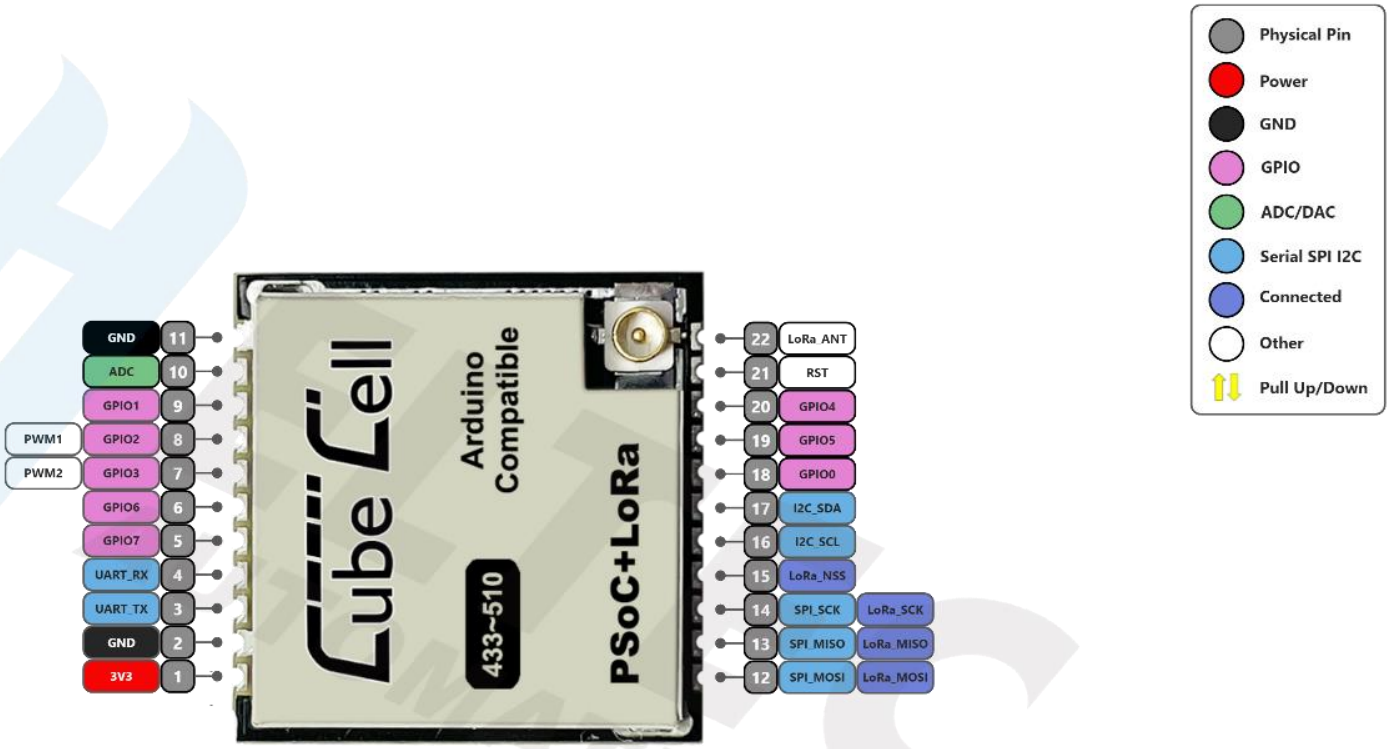
1.2 Product features

- Perfect Arduino-Compatible;
- CE and FCC certification;

- 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 impendence 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/0	I2C_SDA
18	0	I/0	GPIO0

19	5	I/0	GPIO5
20	4	I/0	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℃
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 (≥150mA)	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 ± 1
863~870	21 ± 1
902~928	21 ± 1

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

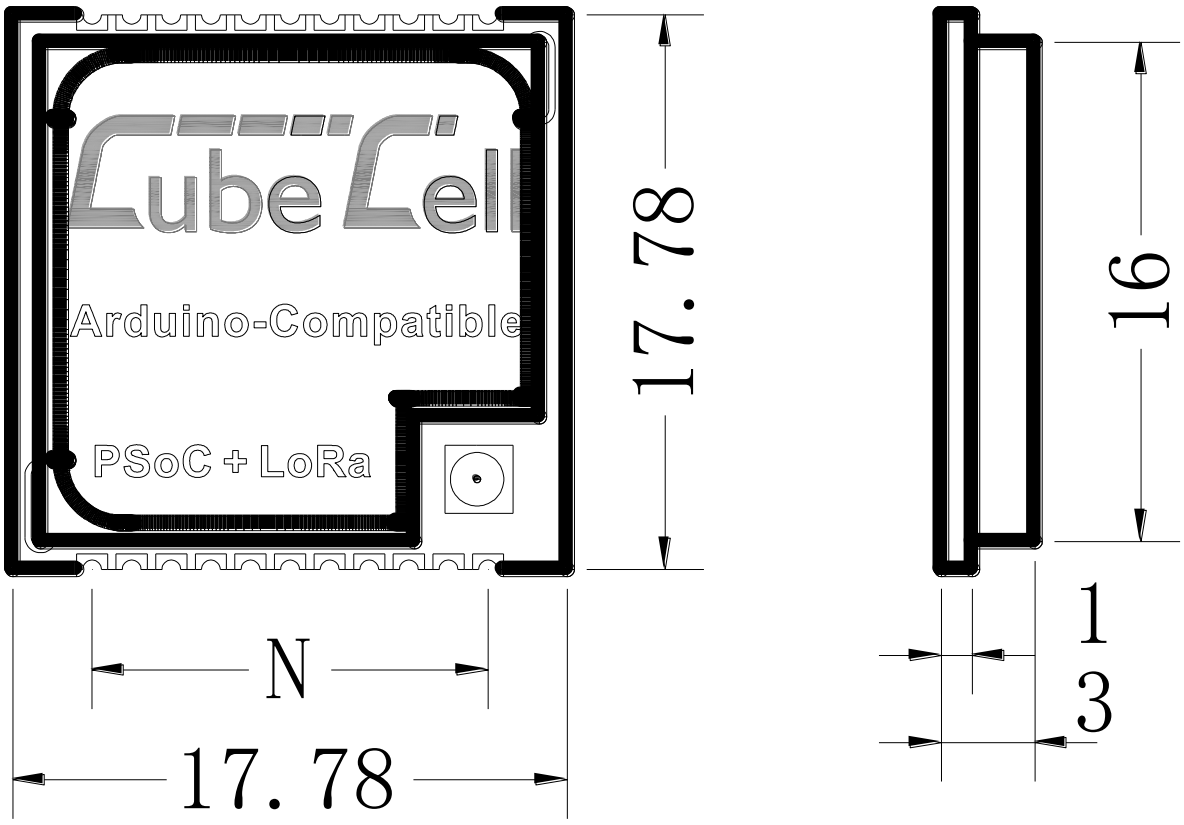
HTCC-AM01 supports LoRaWAN frequency channels and models corresponding table.

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

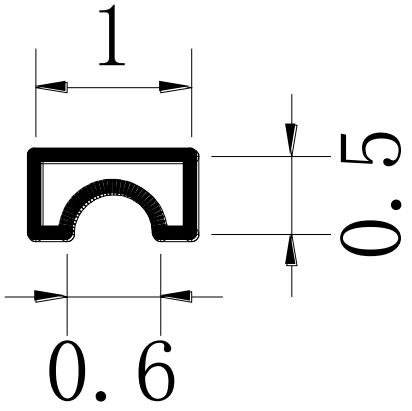
4. Hardware resource

4.1 Physical dimensions



N=10 x 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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