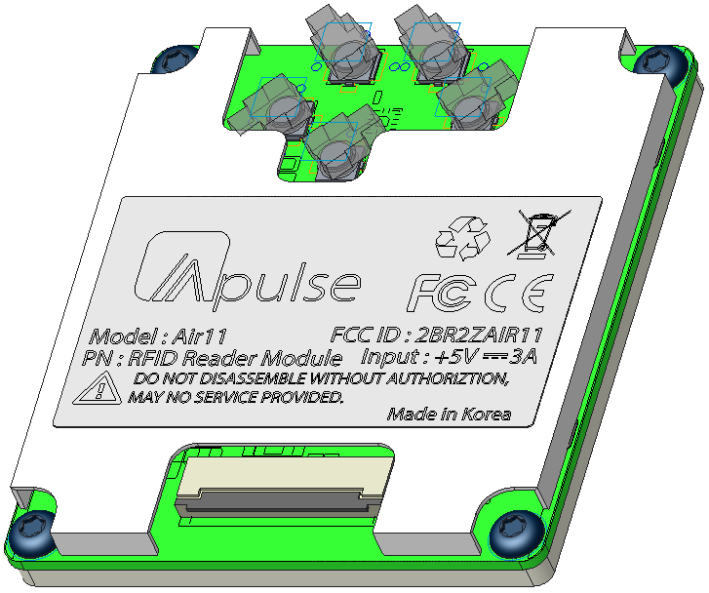
Air11

RFID UHF module
User Guide
Ver. 0.1



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Change	Date	Description
Ver.0.1	2026/01/21	Draft

1. Module Specification

ITEM	SPECIFICATION
Protocol	EPC global UHF Class1 Gen2 / ISO 18000-63
Modulation	DSB-ASK , PR-ASK
Frequency	ETSI : 865.6MHz~867.6MHZ FCC : 902.75MHz~927.25MHz
RF Output Port	4 Port(Default ANT1)
Max Tx Power	=< 30dBm (-0.5dB)
Power Control	5dBm to 30dBm (1dB step)
Operating Temperature	-10˚C to +50˚C
Communication	SPI Interface
Power Supply	Typical 5.0V /3.0A

2. Hardware Interface

2.1 Antenna Connections

Air11 has 4 RF Ports (ANT1, ANT2,ANT3,ANT4) thru MMCX Connector. The maximum RF Power that can be supplied to 50 ohm load at each port is 30dBm.

RF port can be used one at a time, default value is ANT#0.
Please refer to Command document for selecting the antenna port.

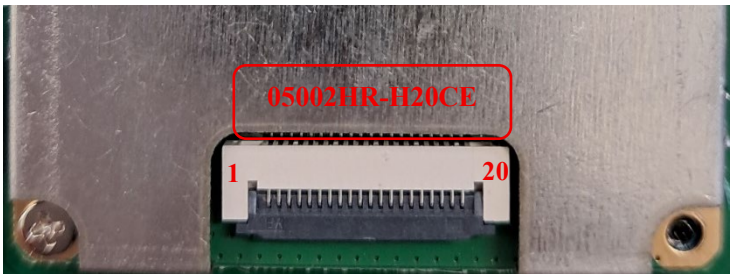
2.2 Antenna Requirements

Air11 is affected by the characteristics of the antenna. When the impedance is 50 ohm and the reflection loss is -20 dB or less in the frequency band of the applied antenna, it has good characteristics.

When RF power is output while the antenna port is open, the RF module may be damaged.

2.3 Digital/ Power Interfaces

There are power, Serial communication signal and power on/ off signal in Digital connector.
These signals are provided by Yeonho 05002HR-H16J05 and 05002HR-H30J05 on the top of the module.



Host Connector	Part No. : 05002HR-H30CE Manufacturer : Yeonho Electronics

- **05002HR-H30CE Pin Map**

Pin No.	Pin Name	Direction	Description
1,2,3,4	VCC	Input	DC5.0V 3A Must connect all VCC pins to Power
5,6,7	GND	Input	Must connect all GND pins to ground
8	ANT2	Output	ANT Switch Indicator
9	ANT1	Output	
10	SPI_MISO	Output	SPI Data Interface
11	SPI_MOSI	Input	
12	PWR_EN	Input	Module Power Enable. High : On, Low : Off
13	E710_ENABLE	Input	E710 Chip Enable. High : On, Low : Off
14	SPI_CLK	Input	SPI Data Interface
15	SPI_CS	Input	
16	E710_TEST	Input	
17	/E710_RST	Input	
18	E710_IRQ	Output	
19	/E710_READY	Input	
20	E710_DIO6	Input	

2.4 Control Signal Specification

Air11 communicates with Host through the TTL Logic level UART Signal Port. Level converter must be applied for Standard 12V RS232 Device and Hardware Handshaking is not supported.

The receiver of the connected Host Processor should be able to receive 256 bytes at a time without overflow.

Baud Rates Support :

- 9600
- 19200
- 38400
- 115200 (Default)
- 230400
- 460800
- 921600

Please refer to Command document for changing Baud Rate.

2.5 Default Parameter Setting

The basic parameter setting value of Air11 is as follows. Depending on the conditions of the environment, it is important to set the setting value.

Parameter	Value	
Session	1	Time to return to the flag during tag reading
Q	5	Set a low value when there are fewer tags and a high value when there are more tags.
Flag	A	Flag setting for reading tags

Please refer to Command document for more details.

2.6 Electrical Characteristics

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	VCC	4.8	5.0	5.2	V
TX Max. Current	ICC			3.0	A
Stand-By Current	ICC		75		mA
IO Pin	VOH	2.0		3.3	V
	VOL	0		0.4	V
ENABLE(Active "**H**")	VIH	1.2		VCC	V
	VIL	0		0.4	V

3. Environmental Specification

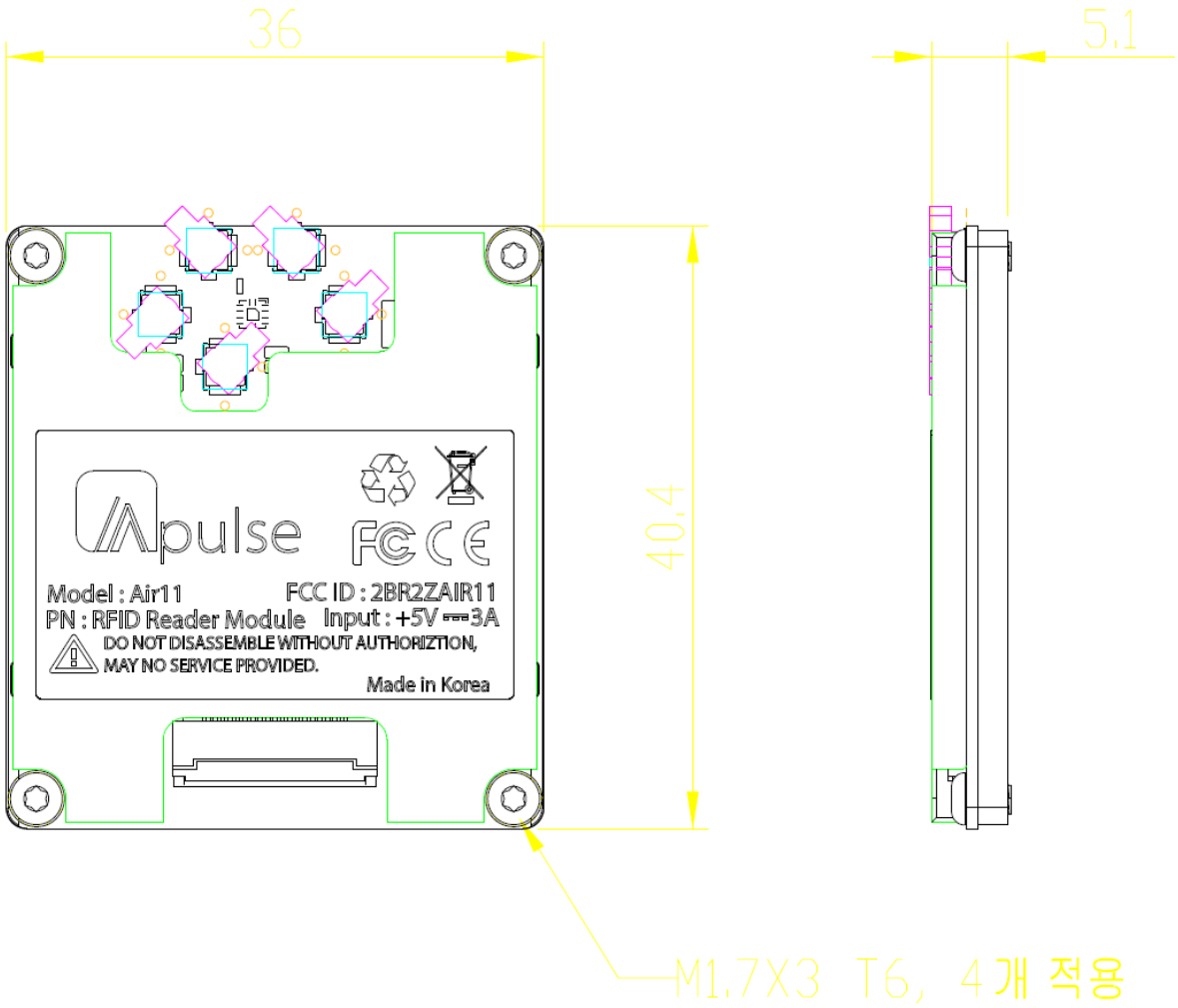
Air11 can be connected to the Host in two ways. The 16-pin zip connector can be used by connecting to the host using the UART interface. And if you use a 30-pin zip connector, you can implement the desired terminal with only Air11.

It is recommended that fixing the module to the main board in any of connection ways. Air11 generates a lot of heat when it is operating a Max power (30dBm), it can alleviate temperature rise during operation of the module by diffusing the heat of the module to the main board.

In addition, when the module is mounted on the main board, the PSR is opened in the module area so that the main board and the ground of the module can sufficiently contact each other.
Shield is recommended because harmonics generated by the Host Processor may be emitted and introduced into the antenna of Air11, which may cause performance degradation.

4. Mechanical Drawing

Air11 Module Dimension



FCC Operation Guide

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

FCC Information

This device complies with Part 15 of the FCC Results. Operation is subject to the following two conditions:

(1) This Device may not cause harmful interface, and

(2)This Device must accept any interference received, including interference that may cause undesired operation.

Note : This equipment has been tested and found to comply with the limits for CLASS B digital device, pursuant to Part 15 FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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 correct the interference by one or more of the following measures ;

1.1. Reorient or relocate the receiving antenna.

1.2. Increase the separation between the equipment and receiver.

1.3. Connect the equipment into an outlet on a circuit different from that to which receiver is connected.

1.4. Consult the dealer or experienced radio/TV technician for help.

WARNING

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

CAUTION : Exposure to Radio Frequency Radiation.

To comply with FCC's RF exposure limits for general population / uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Federal Communication Commission Interference Statement

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.

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.

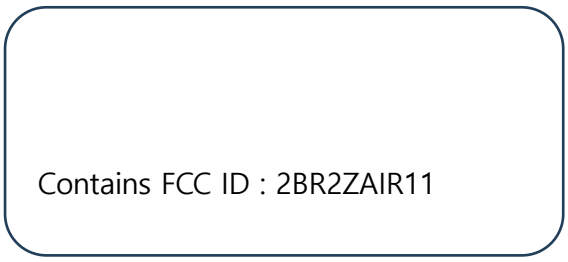
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

FOR PORTABLE DEVICE USAGE

Radiation Exposure Statement:

The product comply with the FCC portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output

power if such function is available.

Host Labeling : per47 CFR 15.212(a)(a)(vi)(A):

“If using a permanently affixed label, the modular transmitter must be labeled with its own FCC identification number, and, if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module.
Please write "Contains FCC ID : 2BR2ZAIR11" at the bottom of the label on the terminal where the module is installed.