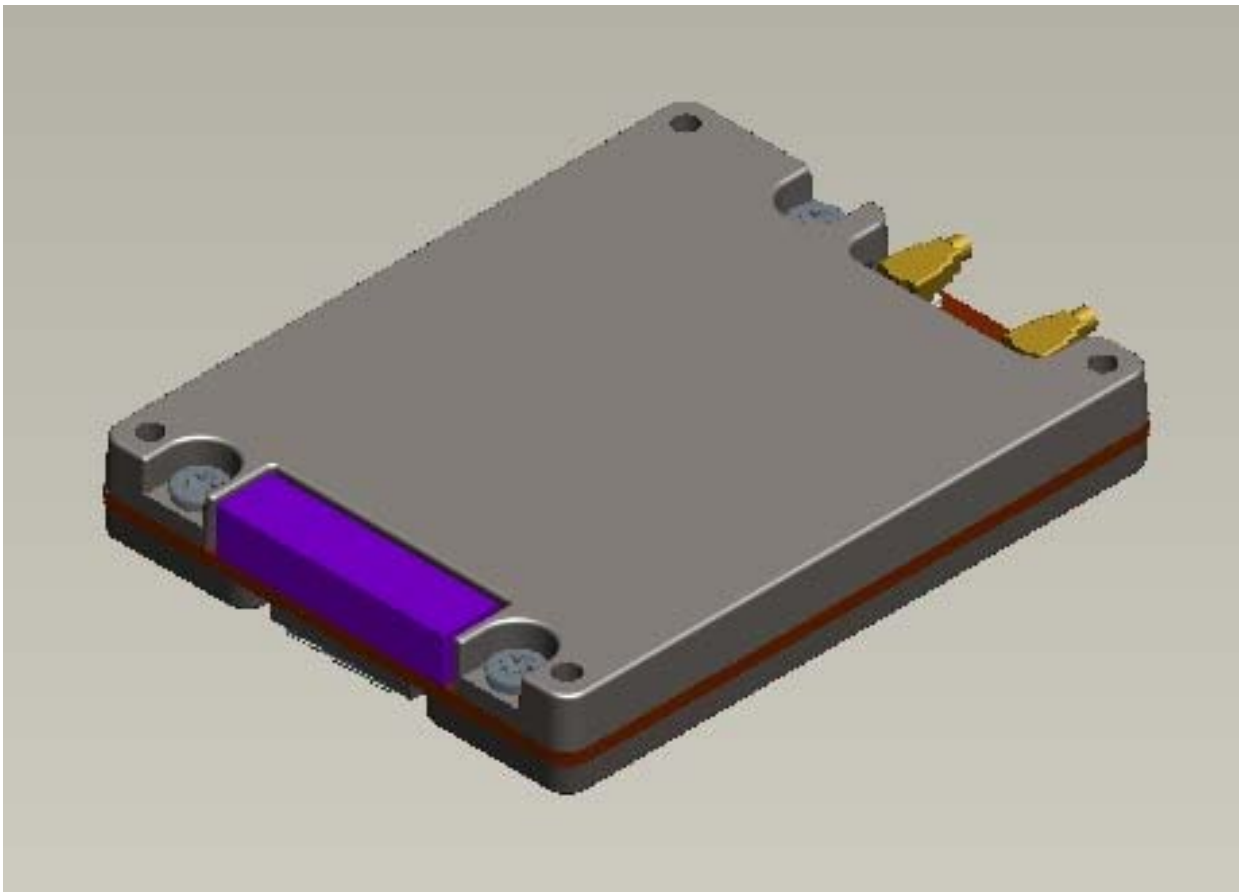
KCTM-2000 RFID UHF Module



1. Contents

2. Revision history

Revision Number	Release Date	nature of revision	Approved By
0.5	2019. 08. 22	Initial release	
0.6	2020. 09. 23	Add contents (packing specification, storage condition..)	

3. Specifications

ITEM	SPECIFICATION
Protocol	EPC global UHF Class1 Gen2 V2 / ISO 18000-63
Modulation	PR-ASK
Frequency	865MHz~868MHZ / 902MHz~928MHz
RF Output Port	2 Port(Default ANT0)
Max Tx Power	=< 30dBm (+/-1.0dB)
Power Control	5dBm to 30dBm (1dB step)
Operating Temperature	-10˚C to +50˚C
Storage Temperature	-20°C to +80°C
Communication	UART (Default Baud rate:115200bps)

4. Hardware Interface

A. Antenna Connections

KCTM-2000 has two RF ports (Ant0, Ant1). (U.FL Connector)

The maximum power supplied to each port is 30dBm.

Note : Only one RF Port can be used at a time, and default setting is ANT0.

Please refer to the command document for the antenna selection method.

B. Antenna Requirements

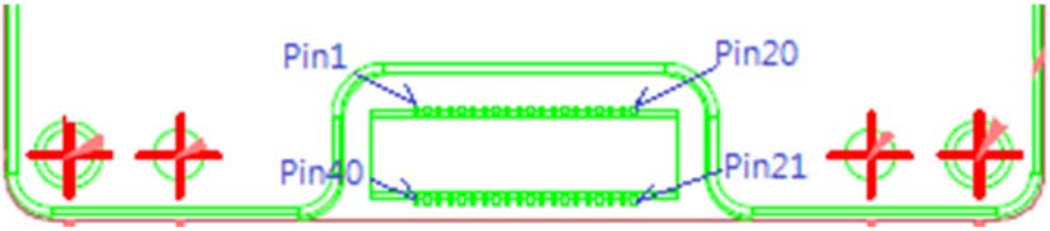
KCTM-2000 is affected by the characteristics of the antenna. In the frequency band of the antenna, it is recommended to use an impedance of 50 ohm and VSWR value (less than 1.25).

WARNING : If you output RF power while the antenna port is open, the module may be damaged.

C. HOST Interfaces

The connector pins consists of power pins, serial communication pins and power on/off signal pin. It has two connectors(YEONHO 12505WR-10, HIROSE DF40C-40P-04951) that connect to the host.

YEONHO 12505WR-10 (Top View)



HIROSE Header DF40C-40P-0.4V(51) (Top view)

Note : Receptacle : DF40C-(2.0)-40DS-0.4V(51) (Total T=2.0mm)

12505WR-10 Pin No.	DF40C-40P Pin No.	Name	I/O	Description
1,2,3	31 ~ 40	BAT	Power	+3.8~4.8V input
4,5,6	21 ~29	GND	Power	Ground
7	18	TXD	Out	UART TX Data
8	19	RXD	In	UART RX Data
9	20	ENABLE	In	Module Power Enable (Active "High")
10	7	FW_DN	In	Module Firmware Download (Active "Low")

Note : Down load mode : Reset or power on after setting pin10(FW_DN) to low

WARNING : All of the supply pins (BAT pins and GND pins) must be used in order to minimize voltage drop at the connector junctions.

D. Control Signal Specification

KCTM-2000 communicates with the host through the TTL logic level UART Signal Port.
For Standard DC12V RS232 Device, Level converter must be applied.
Hardware Handshaking is not supported.

Baud Rates Support :

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

Note : Please refer to Command document to get information about how to change the Baud Rate.

E. Default Parameter Setting

The default parameter setting values are as follows. It is important to set the appropriate setting value according to the operating environment.

Parameter	Value	
Session	1	Flag return time when reading tag
Q	5	Set a low value when there are few tags, and a high value when there are many tags
Flag	A	Flag setting of reading tags

Note : Please refer to the Command document for details on how to change it.

F. Electrical Characteristics

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	VCC	3.8	4.0	4.8	V
TX Max. Current	ICC	1.3 (Output Power : 30dBm, Voltage : 4.0V)			A
Stand-By Current	ICC	32			mA
TXD (→HOST)	VOH	2.0		3.3	V
	VOL	0		0.4	V
RXD (←HOST)	VIH	2.0		3.3	V
	VIL	0		0.4	V
GPIO	VIH	2.0		3.3	V
	VIL	0		0.4	V
ENABLE(Active "**H**")	VIH	1.2		VCC	V
	VIL	0		0.4	V

5. Supported Regions

KCTM-2000 is divided into 4 modules (FCC, CHINA, JAPAN, ETSI).

FCC module can be applied by setting the area of 900MHz band (including KOREA) excluding JAPAN and CHINA.

The ETSI module can be applied by setting an area of the 866MHz band.

Module	NAME	National	Freq	Setting
FCC	BRA	Brazil	902~907.5/915~928	Brazil1
	KOR	Korea	917~920.8	KOREA
	MYS	Malaysia	919~923	MALAYSIA
	SGP	Singapore	920~925	SINGAPORE
	THA	Thailand	920~925	THAILAND
	TWN	Taiwan	922~928	TAIWAN
	IDN	Indonesia	923-925	INDONESIA
	FCC	FCC	902~928	FCC
	PHL	Philippines	918.25~919.75	PHILIPPINES
	URY	Uruguay	902~928	US
	PER	Peru	915~928	PERU
	ISR	Israel	915-917	ISRAEL
	VNM	Vietnam	920~925	VIETNAM
	AUS	Australia	920~926	Australia
	NZL	New Zealand	920~928	NEWZEALAND
	HKG	Hong Kong	920~925	HONGKONG
	RUS	Russian Federation	915~921	RUSSIAN
	ZAF	South Africa	915~919	
		Total	**Freq**	**Setting**
CHINA	CHN	China	920.5~924.5	China
		Total	**Freq**	**Setting**
JAPAN	JP1	JAPAN1	916.7~920.9	JAPAN1
	JP2	JAPAN2	916.7~923.5	JAPAN2
		Total	**Freq**	**Setting**
ETSI	EU1	EU1	865.6~867.6	EU
	IND	India	865-867	INDIA
	MAR	Morocco	867.8	27dBm

Note : Please refer to the Command document for how to set the region.

▷Environmental Specification

KCTM-2000 can be connected to the Host in two ways. One is to connect using the Board to Board Connector, and the other is to use a 10pin Harness Cable.

In both cases, it is recommended to fix the module to the main board. When the KCTM-2000 is operated at Max Power (30dBm), a lot of heat is generated, it is possible to mitigate the temperature rise during operation of the module by spreading the heat of the module to the main board.

When mounting the module on the main board, open the PSR in the module area so that the main board and the ground of the module are sufficiently contacted.

It is recommended to shield the module because harmonic generated from the Host Processor may flow into the antenna of the KCTM-2000 and cause performance degradation.

Note: 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 or more 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.

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.

Caution : Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

End Product Labeling

The module is labeled with its own FCC. If the FCC ID 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. In that case, the final end product must be labeled in a visible area with the following:
"Contains FCC ID: 2ARHH-KCTM-2000"

OEM Responsibilities to comply with FCC
The module has been certified for integration into products only by OEM integrators under the following condition:

- The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times.
- The module is limited to installation in mobile or fixed applications.
- The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.
- Separate approval will be required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations other than supplied antennas.

As long as the two condition above is met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

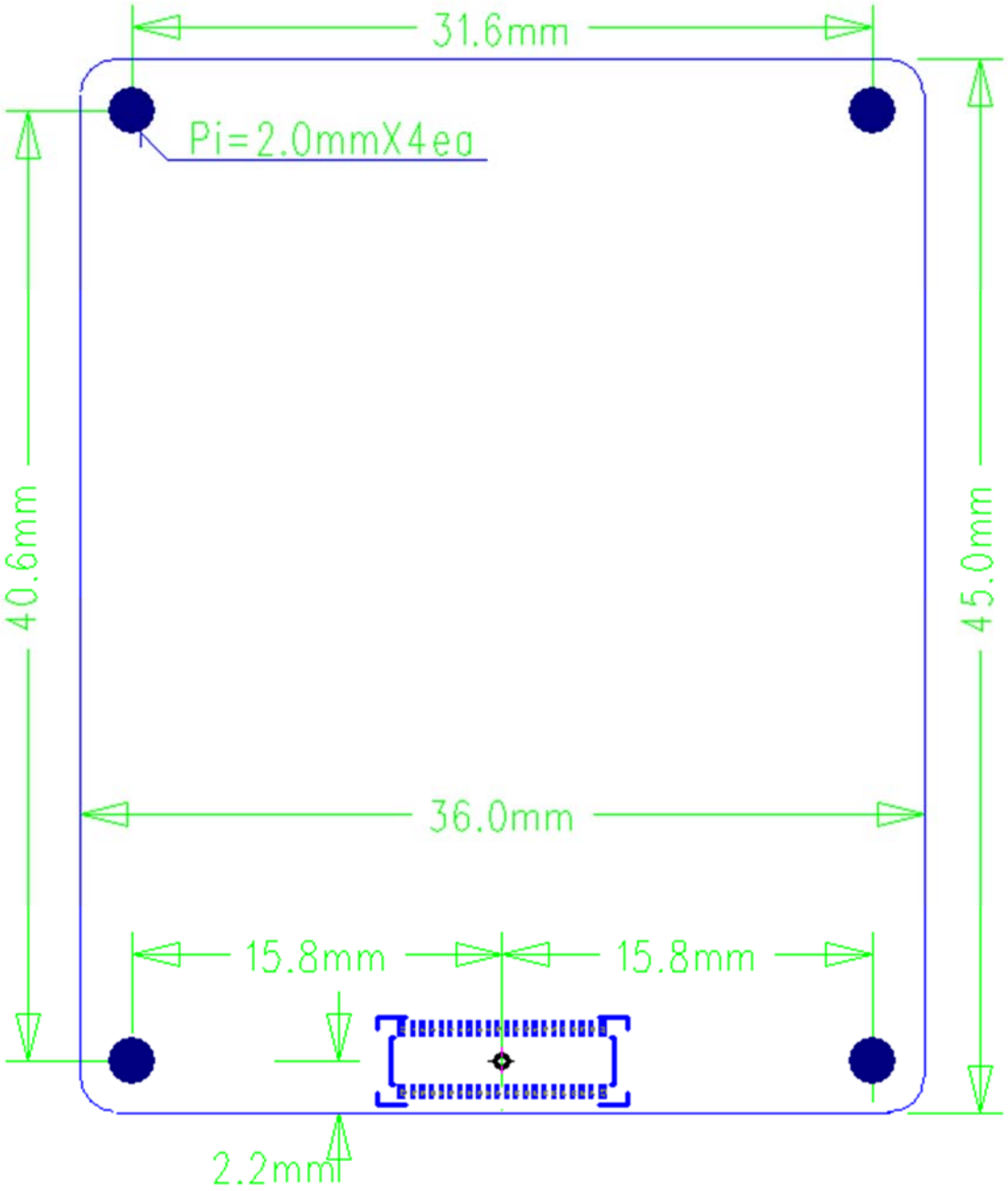
In the event that these conditions cannot be met, then the FCC authorizations are no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product including this module and obtaining separate FCC authorizations.

- This device is intended only for OEM integrators
- For OEM integration only – device cannot be sold to general public.
- Manual Information to the End User

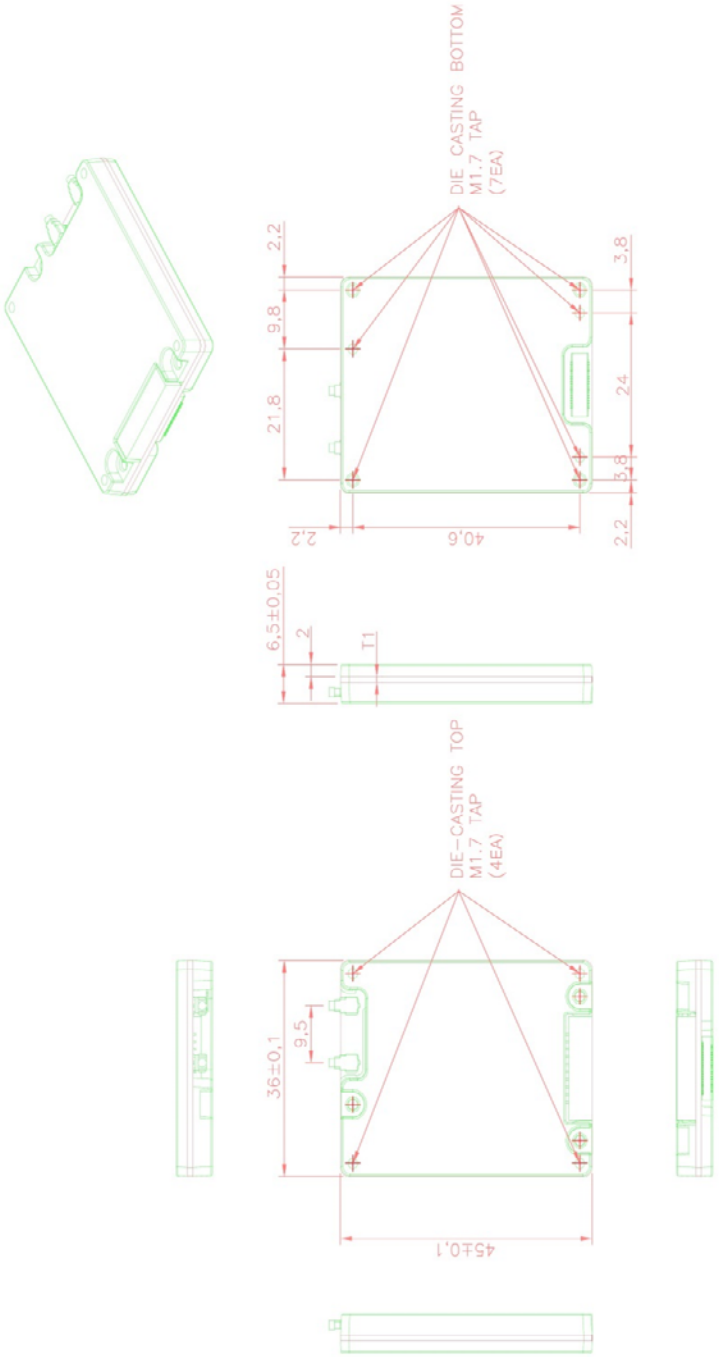
  The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

▷Mechanical Drawing

KCTM-2000 Board Dimension



KCTM-2000 Module Dimension



Note : Please refer to the provided 2D and 3D drawings

▷Packing specification