PHYCHIPS

RED4S User's Manuals

PHYCHIPS

Contents

1 Pin Description

Figure 1 Pin Description

1.1 **RED4S Pin Description**

No.	Pin Name	Description
1	VCC36	DC Power for Reader SOC
2	GND	Ground
3	P04_SPI_TXD	Quasi-bi directional I/O port or SPI Output
4	P05_SPI_RXD	Quasi-bi directional I/O port or SPI Input
5	P06_SPI_CLK	Quasi-bi directional I/O port or SPI Clock
6	P07_SPI_CS	Quasi-bi directional I/O port or SPI Chip Select
7	ISP_MODEb	When ISP_MODEb is Logic 'Low', ISP mode is set as shown below table <table><tr><td>Pin No.</td><td>7</td><td>12</td><td>11</td><td>10</td></tr><tr><td>MODE</td><td>ISP_MODEb</td><td>P17</td><td>P16</td><td>P15</td></tr><tr><td>Normal</td><td>1</td><td>GPIO/INT</td><td>GPIO/INT</td><td>GPIO/INT</td></tr><tr><td>UART ISP</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>SPI ISP</td><td>0</td><td>0</td><td>0</td><td>1</td></tr></table> [CAUTION] Except ISP mode, ISP_MODEb should be set logic 'High' for robust stability for FLASH memory
8	CSE	Chip Select enable / module power enable 0:Disable 1: Enable
9	NC	Not Connection
10	P15	Quasi-bi directional I/O port [NOTE] This pin is already used internally. So this pin should be only for ISP mode
11	P16	Quasi-bi directional I/O port or External Interrupt 4

12	P17	Quasi-bi directional I/O port or External Interrupt 5
13	P12_SCL	Quasi-bi directional I/O port I2C Clock The pull-up resistor is always switched on. **Reserved Address : 0x70, 0x71**
14	P11_SDA	Quasi-bidirectional I/O port I2C Data In / Out The pull-up resistor is always switched on. **Reserved Address : 0x70, 0x71**
15	GND	Ground
16	GND	Ground
17	GND	Ground
18	RF IO	Rx Input / Tx Output
19	GND	Ground
20	VCC36P	DC Power for Power Amp
21	VCC36P	DC Power for Power Amp
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground
26	GND	Ground
27	GND	Ground
28	SWDIO	Serial Wire Debug data in out
29	SWCLK	Serial Wire Debug Clock
30	RESETb	Reader SOC Reset signal 0: reset
31	NC	Not Connection
32	NC	Not Connection
33	NC	Not Connection
34	P01_TXD0	Quasi-bi directional I/O port or UART0 Output
35	P00_RXD0	Quasi-bi directional I/O port or UART0 Input

2   Operation Method
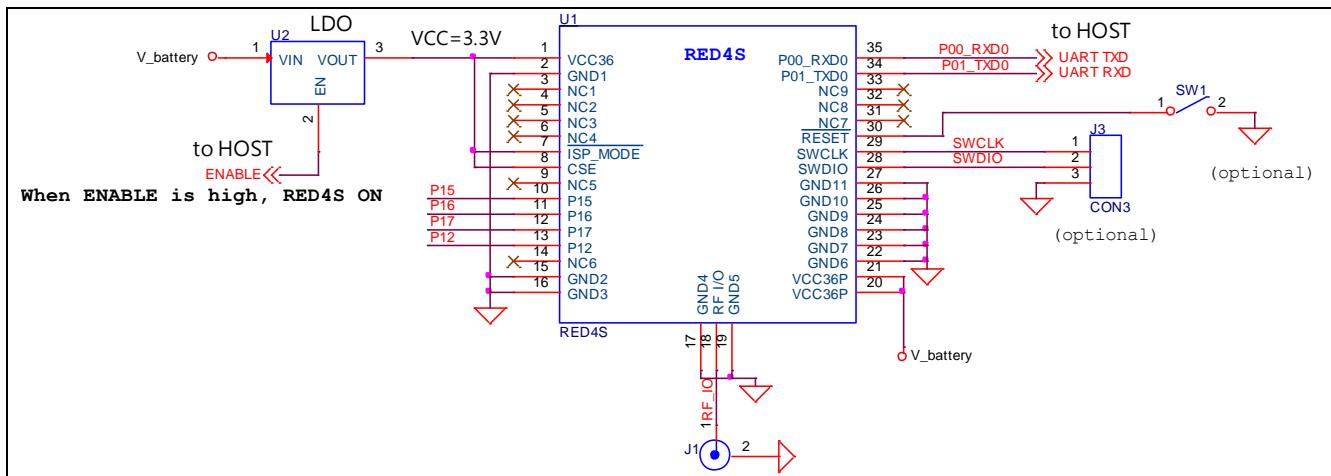
Figure 2 Application Circuit
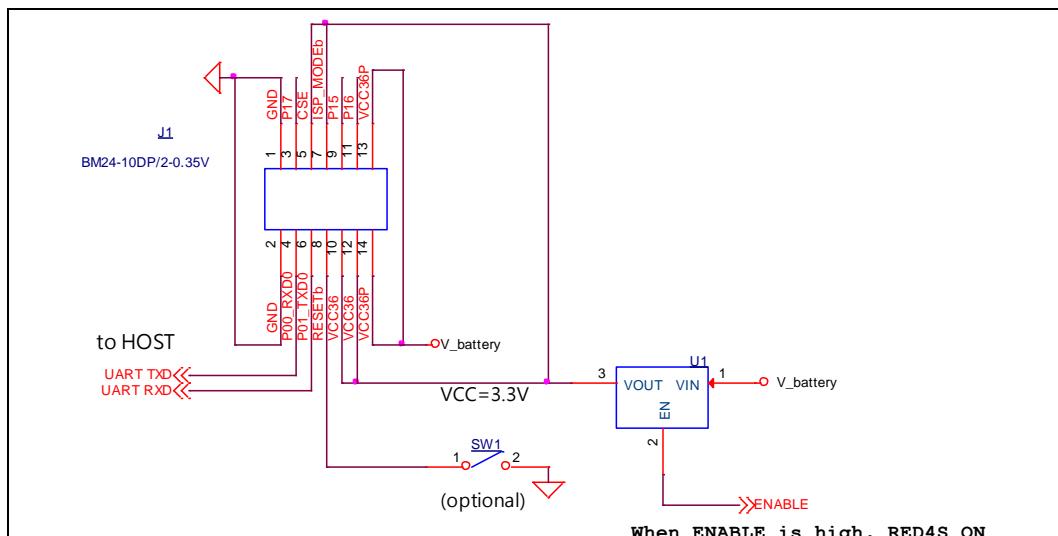
Figure 3 Application circuit: DC/Signal connector

2.1 Power Supply

DC power to operate RED4S is separated by 2 kinds. VCC36 is to supply for PR9200 which power range is 3.3 to 3.6 volts, VCC36P is to supply for power amp which power range is 3.3 to 4.2 volts.

In mobile device with battery, VCC36P can be connected to battery power directly. VCC36 pins need to external LDO (or another device). As the Host control the LDO's enable, user control power down mode of module.

If you do not control external LDO, you can control CSE pin to enter power down mode instead.

2.2 UART

The serial interface is assigned with two wires. RXD0, which pin is assigned to pin 35, is for receiving command from host and TXD0, which pin is assigned to pin 34, is for transmitting response to host. Pin connection is shown as below figure.
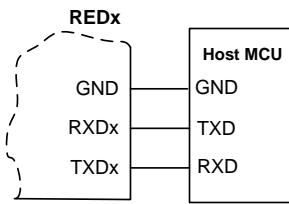
Figure 4 Host MCU Connection

Following configuration is used for interfacing to USB transceiver.
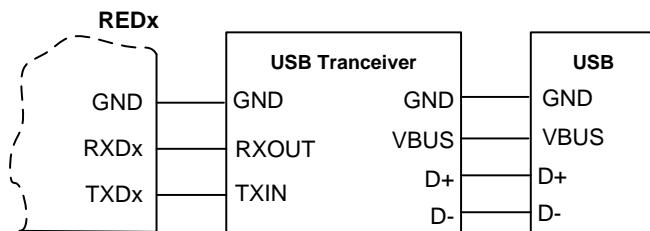
Figure 5 USB transceiver Connection

2.3 **RF In/Out**

RF I/O which assigned to Pin 18 is optimized with 50ohm impedance.

2.4 **GUI Control**

The RED Utility helps the user to start working with RED DK RFID reader quickly.

Follow below steps to run GUI.

Windows Start button ➔ Program Menu ➔ RED Utility_vX.X.X
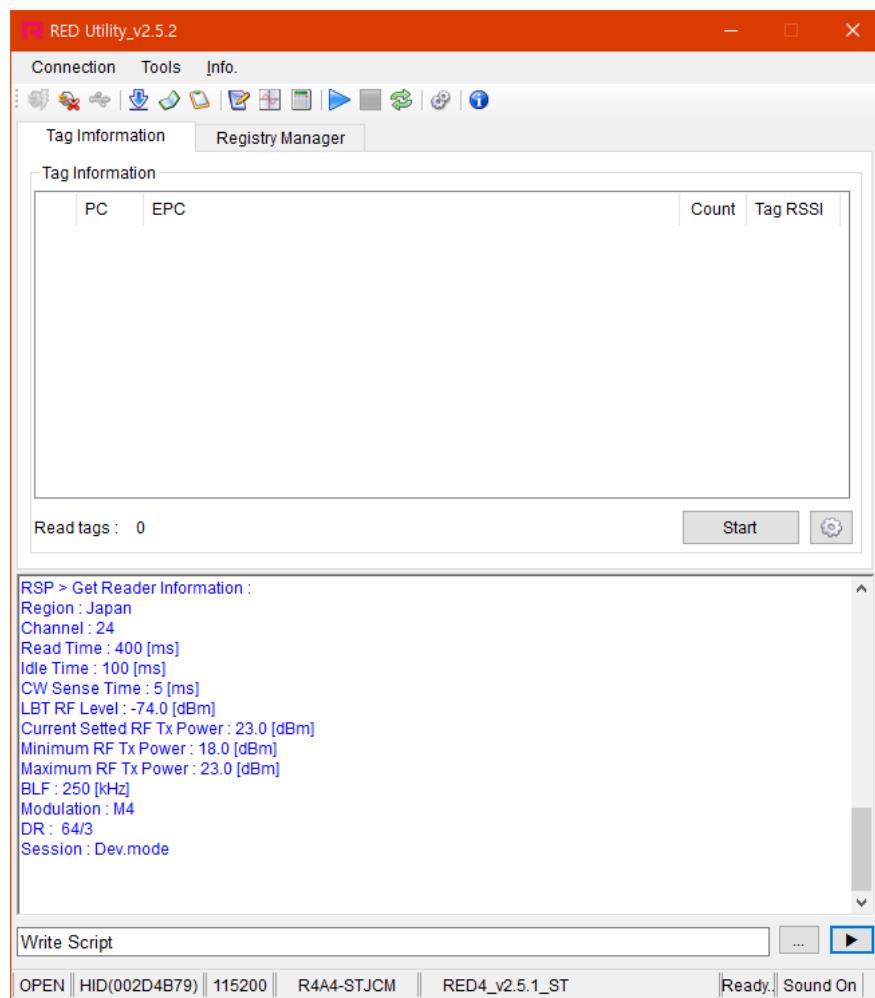

Figure 6 RED Utility_vX.X.X

2.4.1 Mode Change

RED Utility provides two view modes. User can select view mode depending on purpose of use between Basic View Mode and Extended View Mode.
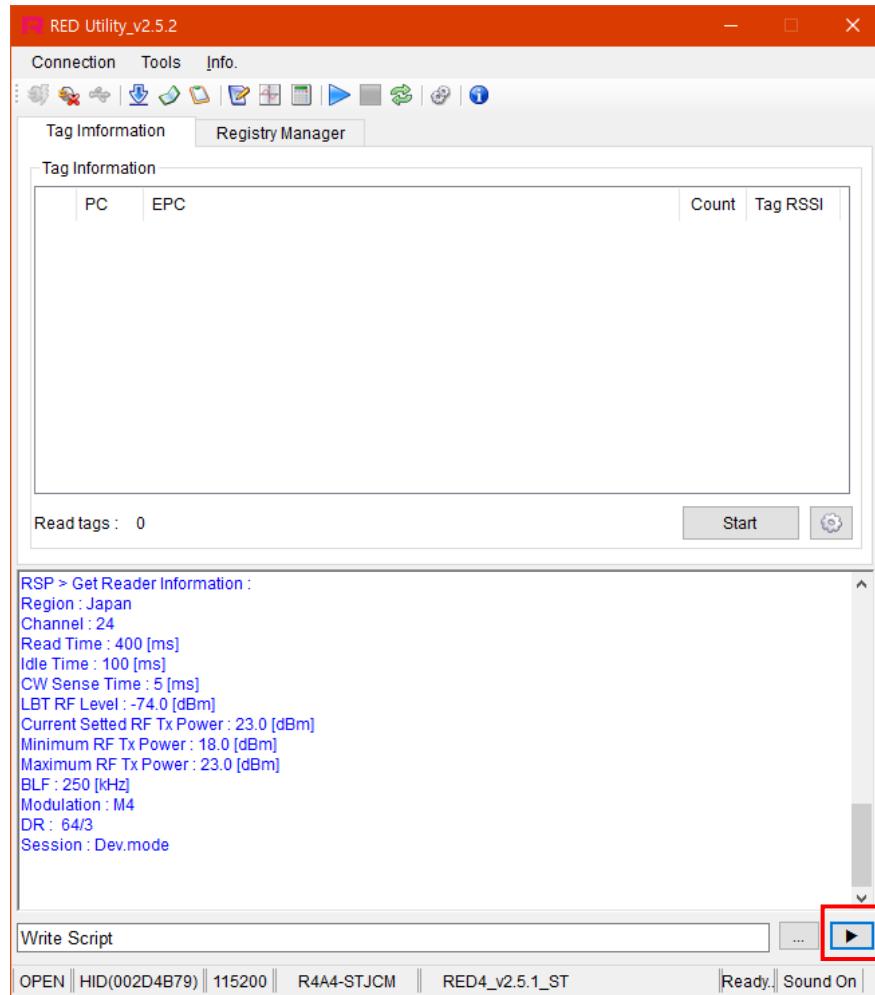
Figure 7 Basic View Mode

To change View Mode, click the extension button marked red in Figure 7 above.
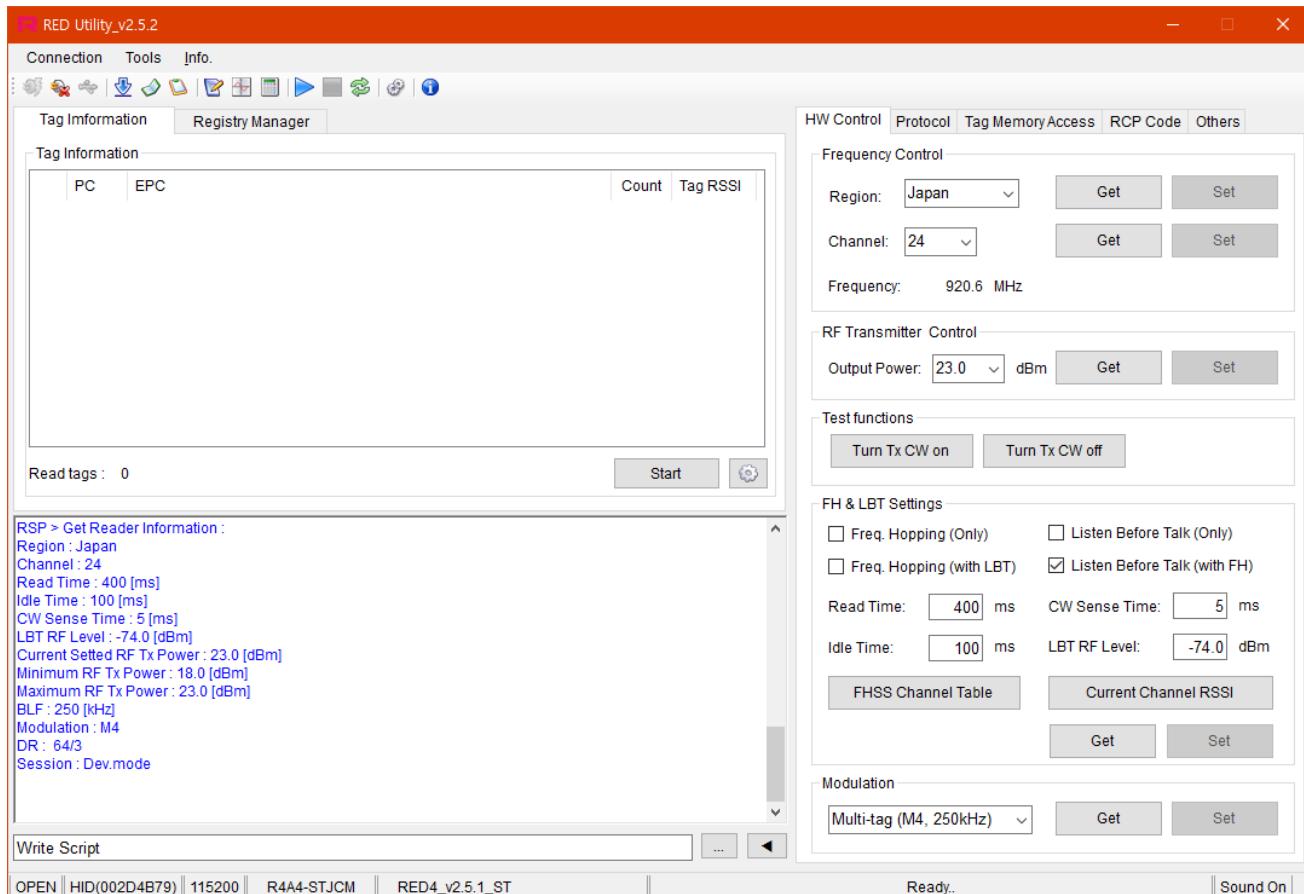
Figure 8 Extended View Mode

Always use Extended View Mode for measurement.

2.4.2 RED4S Connection

If hardware connection is valid, RED utility connect module REDx automatically.

If utility cannot connect hardware, please follow below step
Click "Connection->Connect" to connect to REDx-DK through USB-to-UART at main window
GUI will find the Device and synchronize parameters with REDx module automatically. If the GUI cannot find the device automatically, Click "Connection->Port Setting" and select other Device. Default Baud rate is 115200 bit/s.
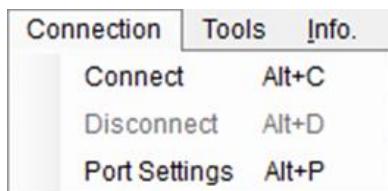
If the Device connected successfully, status bar will display "OPEN" state and device number and so on.

2.4.3   Hardware Control

Click 'H/W Control Tab.' To control hardware.

2.4.3.1 Band(Region) Setting

To select operating band, band setting should be required. Select band in combo box and click Set button to set operating band in group box 'Frequency Control.'

Region:	Korea	Get	Set

2.4.3.2 Power Class Setting

Some countries classify channel number by power class. Click Get button and choose required power class. And then click Set button to set finally.

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Channel:	1	Get	Set

2.4.3.3 Output Power setting

To set RED output power, select the Output Power combo box and click Set button.

RF Transmitter Control

Output Power:	25.0	dBm	Get	Set

2.4.3.4 CW (Continuous Wave) setting

It is only used for hardware debugging.
To set CW on, click Turn Tx CW on button. To set CW off, click Tx CW off button.

Test functions

Turn Tx CW on	Turn Tx CW off

2.4.4 Tag Inventory Procedure

Click Start button in Tag Information Tab to read UHF RFID tag with RED Utility.
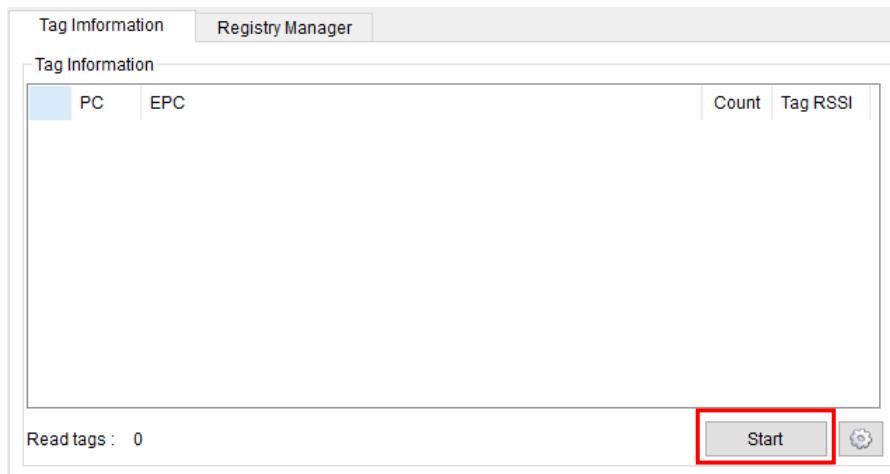
Click Start button and Tag's EPC information is displayed.
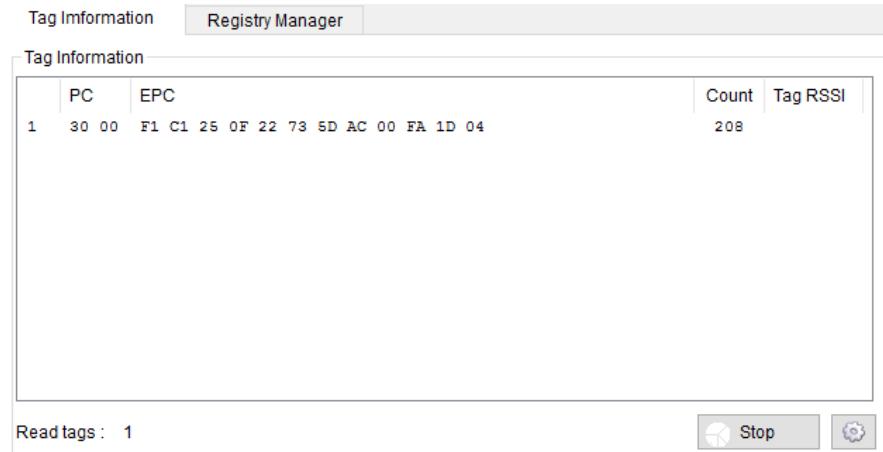
3   Specification

No.	Item		Unit	Test Condition	Specification			Remark
					min	Typ.	max	
1	Frequency Range		MHz		917.1		926.9	
2	Tx Power		dBm			26	27	PEAK
3	Spurious		dBm		US (FCC 15C)			
4	Impedance		Ω			50		RF I/O
5	DC Power	VCC36P	V		3.3	3.6	4.2	
		VCC36			3.3		3.6	
6	Operating Temperature		°C		-20		70	
7	Operating Humidity		%		0		90	
8	Current	Power Down	uA	Active current is measured at 25dBm with 50ohm load			20	
		Idle					20	
		Active	mA			-		
9	Size		mm	24.0 * 24.0 * 3.0				
10	Weight		g	3				

•Device Name(Model Name) : RED4S

•FCC ID: Y3D-RED4S

•Name of Grantee: PHYCHIPS Inc.

•Production year, month, date:

•Manufacturer/Country: Korea

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:
(1) the device may not cause interference, and
(2) the device must accept any interference, including interference that may cause undesired operation of this device.

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

This device 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 technical for help.*

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: 2AGUB-73000"

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.

This module has to be installed with the input voltage 3.3V, because there is no regulator in the device.

This device may only operate using an antenna of a type and maximum (or lesser) gain approved by Phychips. Antenna types not included in the list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this transmitter.

Note

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	Peak Gain	Part Name
ANT	3.72 dBi	$KSA-921A6015B100B$