RED5 User’s Manuals

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1 Pin Description

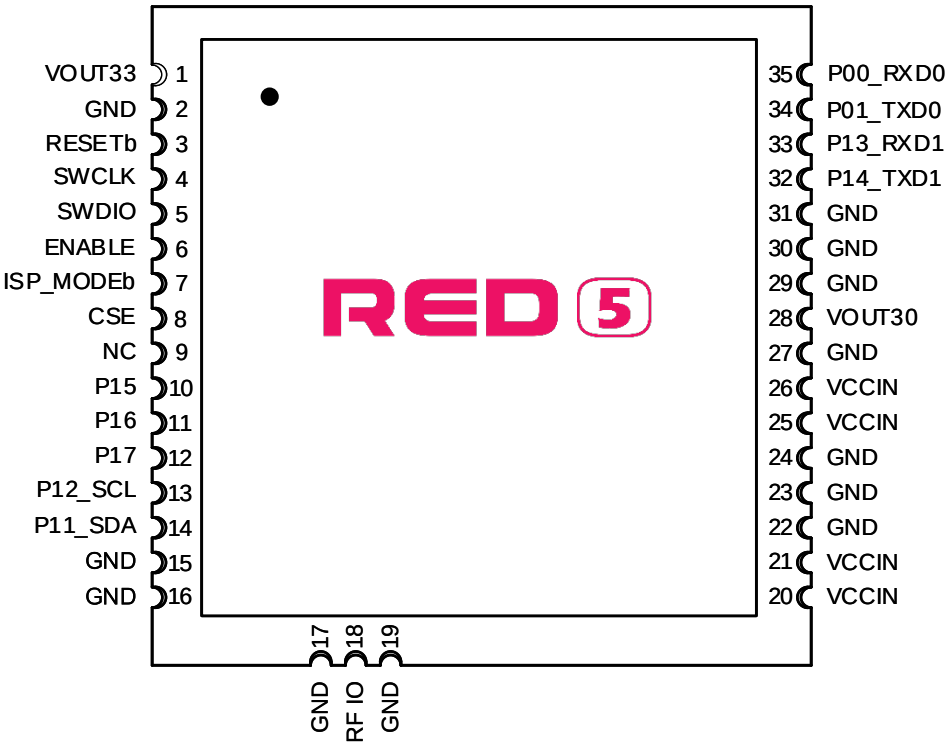


Figure 1 Pin Description

1.1 RED5 Pin Description

No.	Pin Name	Description
1	VOUT33	Internal LDO 3.3V output for PR9200 SOC
2	GND	Ground
3	RESETb	Reader SOC Reset signal 0: reset
4	SWDIO	Serial Wire Debug data in out
5	SWCLK	Serial Wire Debug Clock
6	ENABLE	Enable pin for RED5. It turns on/off internal LDOs Logic high : enable, Logic low : disable (POWER DOWN)
7	ISP_MODEb	When ISP_MODEb is Logic 'L', ISP mode is set as shown below table **Pin No.** / **7** / **12** / **11** / **10** Pin Name / ISP_MODEb / P17 / P16 / P15 Normal / 1 / GPIO/INT / GPIO/INT / GPIO/INT FLASH UART ISP / 0 / 0 / 0 / 0 [CAUTION] Except ISP mode, ISP_MODEb should be set "high" for robust stability for FLASH memory
8	CSE	Chip Select Enable. Internally connected to VCC33. For the power control of RED5, use ENABLE pin
9	NC	Not Connection
10	P15	User configurable general purpose I/O port
11	P16	User configurable general purpose I/O port or External Interrupt 4
12	P17	User configurable general purpose I/O port or External Interrupt 5
13	P12_SCL	User configurable general purpose I/O port or I2C Clock The pull-up resistor is always switched on.

		Reserved Address : 0x70, 0x71
14	P11_SDA	User configurable general purpose I/O port or 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	RF input/output. Antenna port
19	GND	Ground
20	VCCIN	DC power input for module and PA
21	VCCIN	DC power input for module and PA
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	VCCIN	DC power input for module and PA
26	VCCIN	DC power input for module and PA
27	GND	Ground
28	VOUT30	Internal LDO output for PA BIAS
29	GND	Ground
30	GND	Ground
31	GND	Ground
32	P14_TXD1	User configurable general purpose I/O port or UART1 Output
33	P13_RXD1	User configurable general purpose I/O port or UART1 Input
34	P01_TXD0	User configurable general purpose I/O port or UART0 Output
35	P00_RXD0	User configurable general purpose I/O port or UART0 Input

2 Operation Method

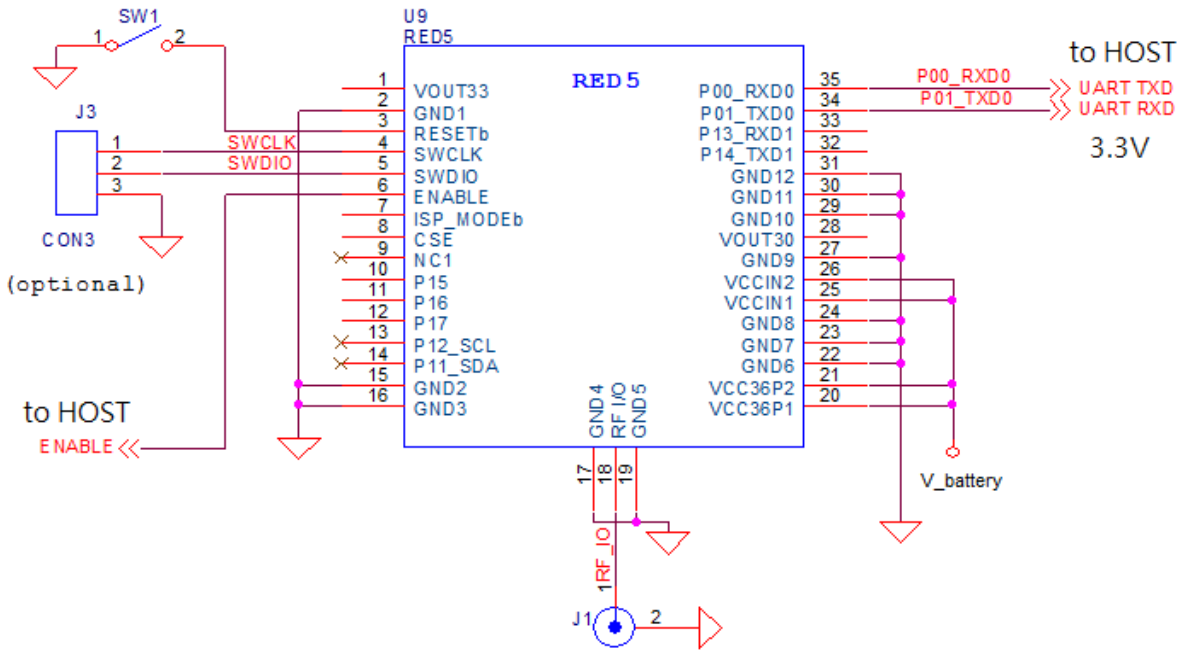


Figure 2 Application Circuit

2.1 Power Supply

DC power for RED5 is VCCIN (pin21,22,25,26). There are 2 LDO inside module. One is to supply for PR9200 which DC voltage is 3.3 volts (typ.). The other is to supply for VBIAS for power amp which is 3.0V. VCCIN is connected to input of LDOs. Total current consumption of RED5 is typically 1.37A at 30dBm Tx CW output power.

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.

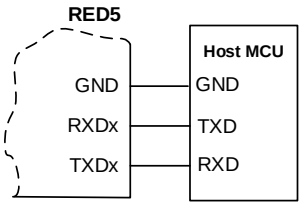


Figure 3 Host MCU Connection

RS232C transceiver is required to interface with PC that connection diagram is shown as below figure

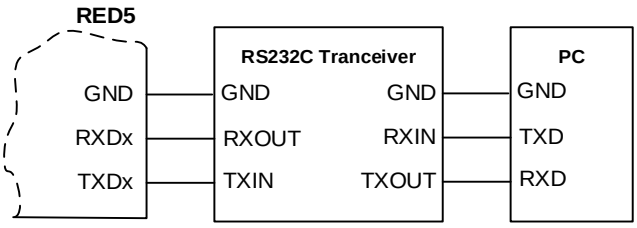


Figure 4 USB transceiver Connection

Following configuration is used for interfacing to USB transceiver.

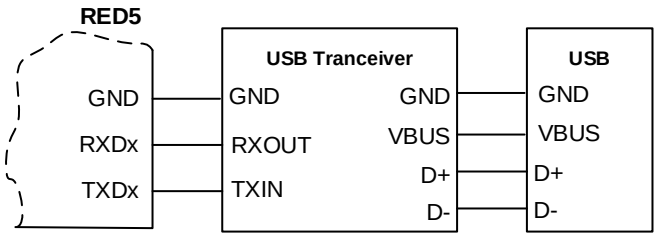


Figure 5 USB transceiver connection

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

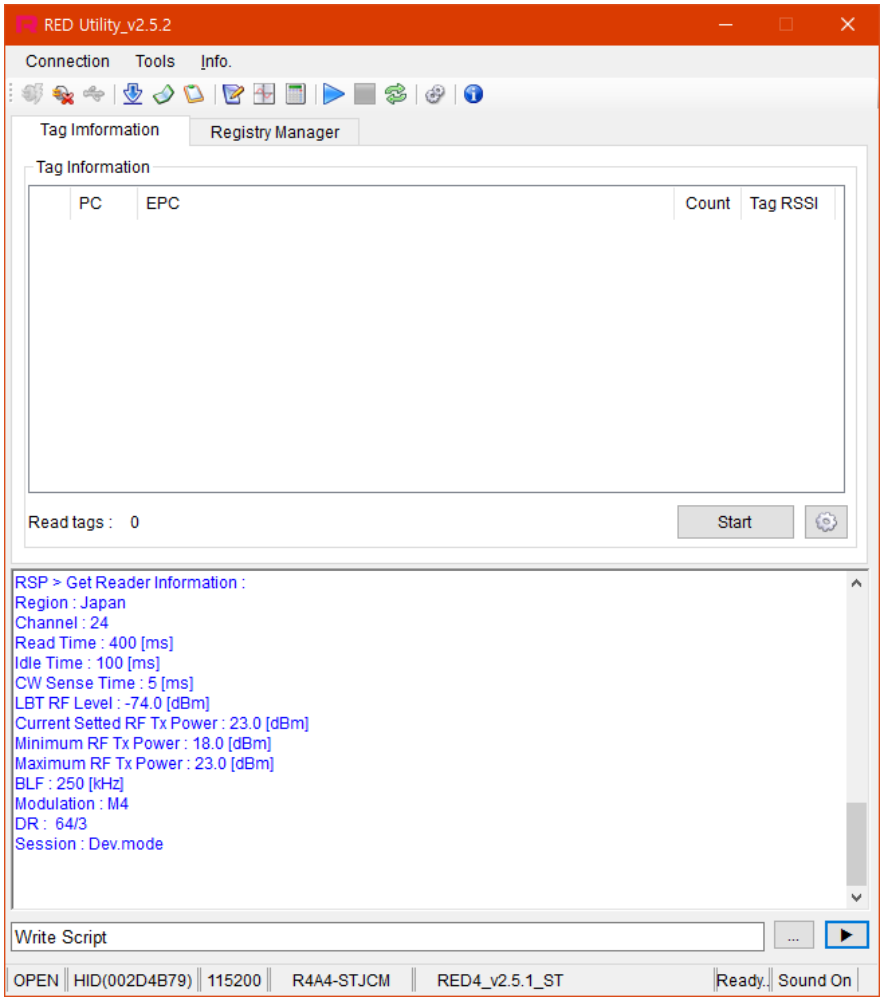


Figure 6 RED Utility_vX.X.X

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.

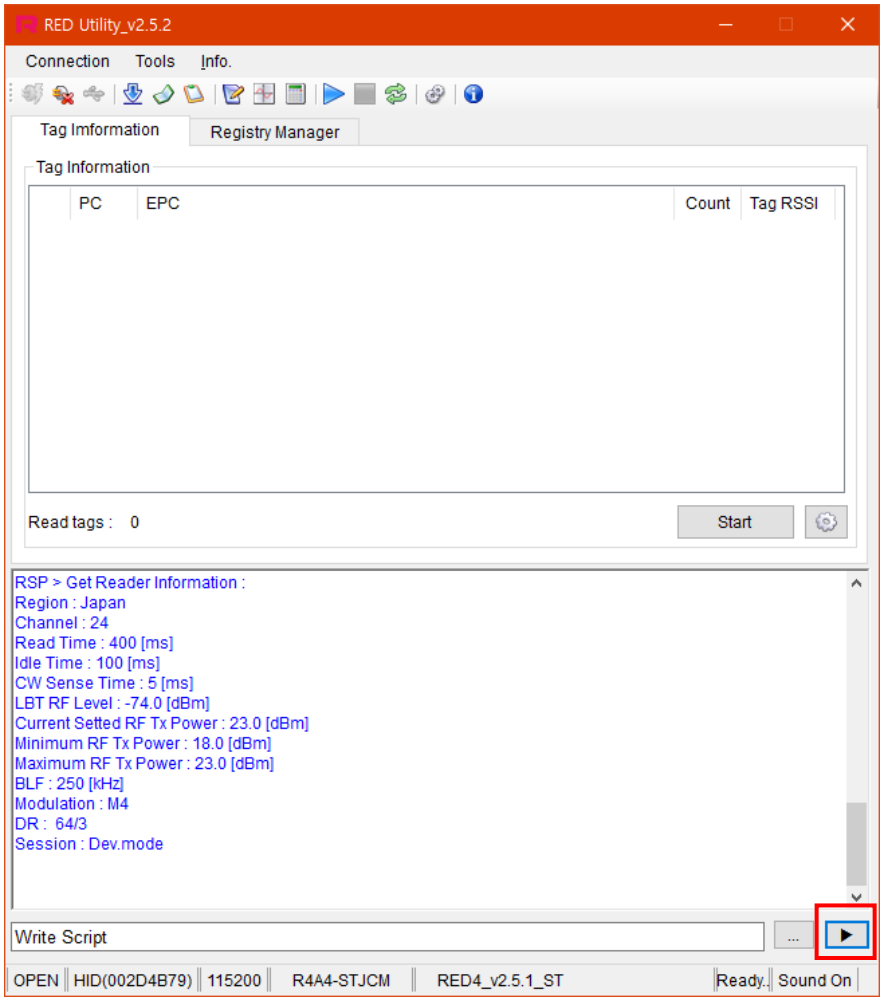


Figure 7 Basic View Mode

To change View Mode, click the extension button marked red in Figure 6 above.

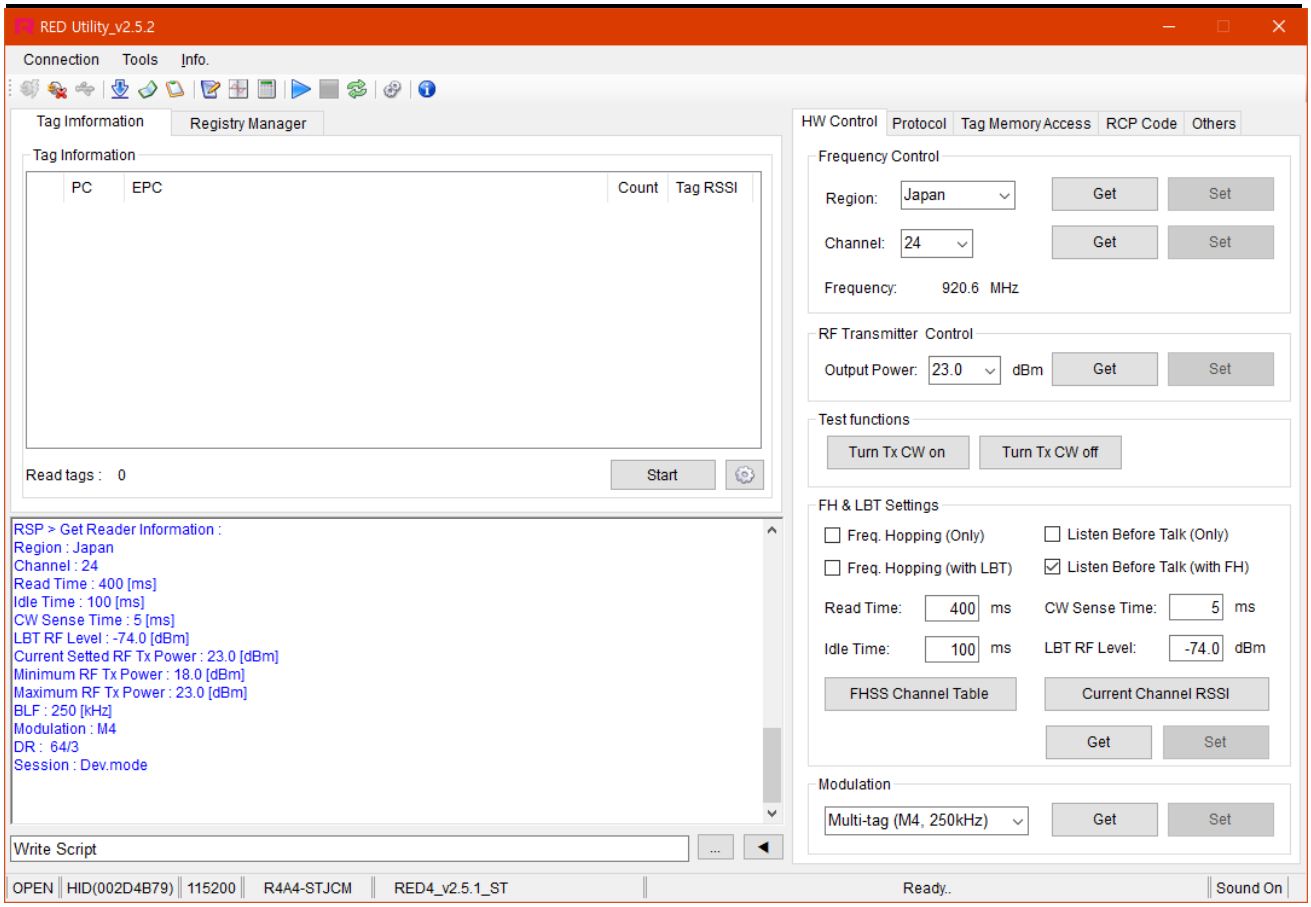


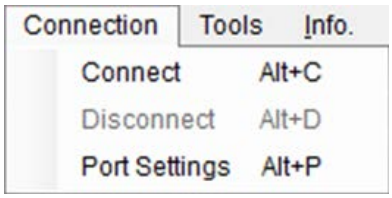
Figure 8 Extended View Mode

Always use Extended View Mode for measurement.

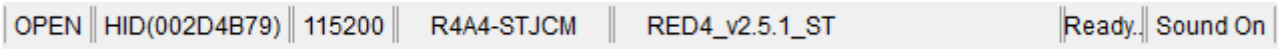
2.4.2 RED5 Connection

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.'

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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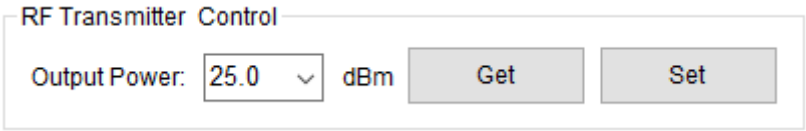
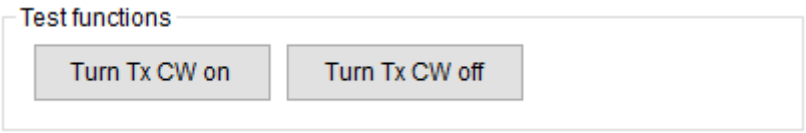
2.4.3.3 Output Power setting

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



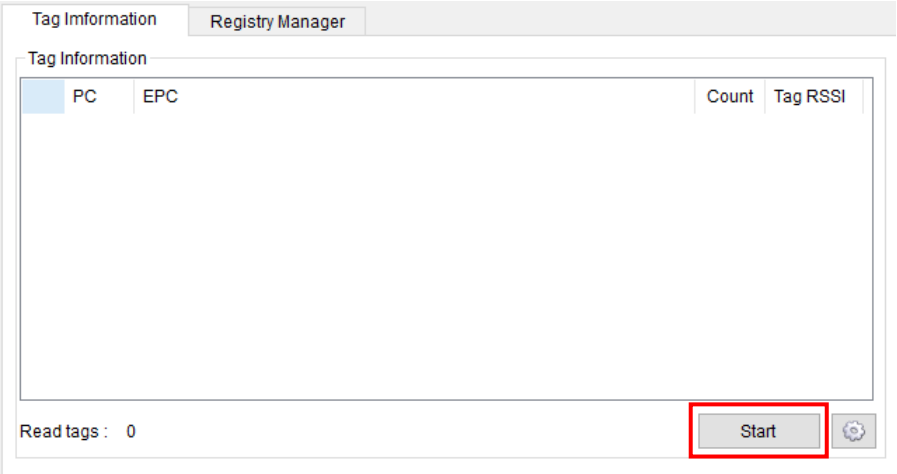
2.4.3.4 CW (Continuous Wave) setting

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.

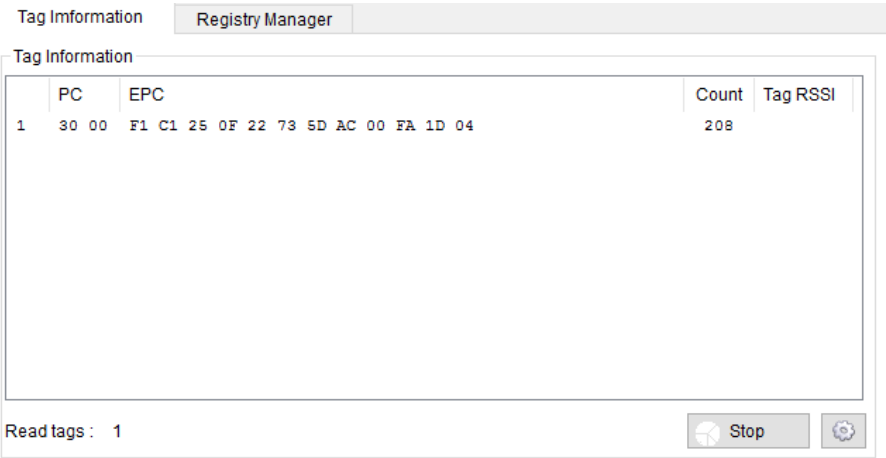


2.4.4 Tag Inventory Procedure

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				29.5	
3	Spurious		dBm		US (FCC 15C)			
4	Impedance		Ω			50		RF I/O
5	DC Power	VCCIN	V		2.5		5.5	
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	mA				20	
		Active				1,370		
9	Size		mm	24.0 * 24.0 * 3.0				
10	Weight		g	3				

•Device Name(Model Name) : RED5
•Certification No.:
•Name of Grantee: PHYCHIPS Inc.
•Production year, month, date:
•Manufacturer/Country:

* Power supply regulation information

- This module uses the input voltage of DC 2.5V ~ 5.5V, this input voltage is converted to DC 3.3V constant voltage through a regulator to operate the product.

FCC Information to User

This equipment has been tested and found to comply with the limits for a digital device, pursuant to part 15 of the 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 instruction manual, may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

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: Y3D-RED5"

OEM Responsibilities to comply with FCC and Industry Canada Regulations
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.*

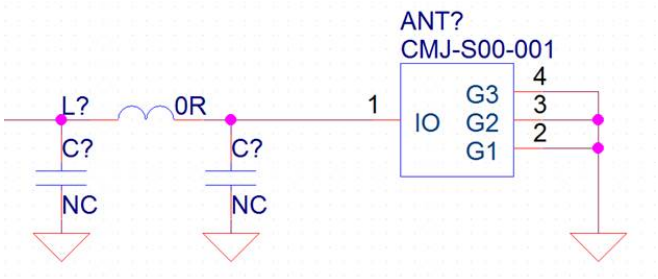
As long as the two condition above is met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral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

	Peak Gain	Part Name
ANT1	6.00 dBi	MACRO260-919
ANT2	2.50 dBi	KSA-921A6010B100B
ANT3	0.00 dBi	KSA-921A4010B100B

The antenna matching circuit is a Pi as shown below, and the minimum loss is 0dB. The antenna connector is CMJ type, and the distance to the connector is Max 100mm.