Shenzhen Toplink Technology Development Co.,Ltd

User Manual

Product Name: WIFI Module

Model Name: TOP-AP01

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Introduction

The RT5350 SoC combines Ralink's IEEE 802.11b/g/n draft compliant 1T1R MAC/BBP/PA/RF, a high performance 360 MHz MIPS24KEc CPU core, a 5-port integrated 10/100 Ethernet switch/PHY and a USB host/device. With the RT5350, there are very few external components required for 2.4 GHz 802.11n wireless products. The RT5350 employs Ralink's 2nd generation 802.11n technologies for longer range and better throughput. The embedded, high performance CPU can easily manage advanced applications such as Wi-Fi data processing without overloading the host processor. In addition, the RT5350 offers a variety of hardware interfaces (SPI/I2S/I2C/PCM/UART/USB) to support a range of possible applications.

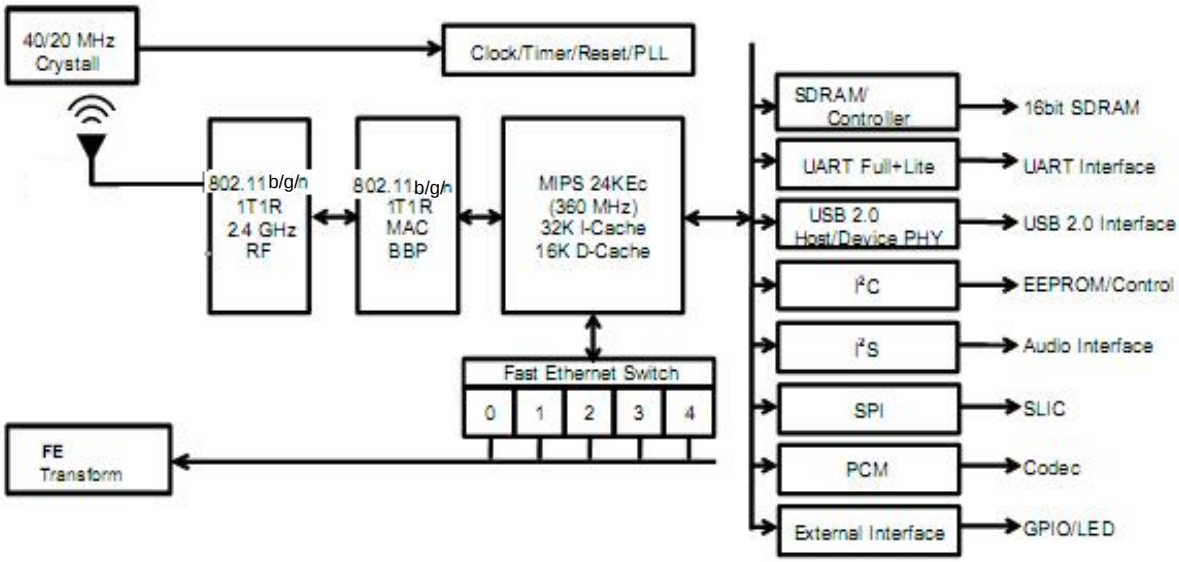
Applications

- iNIC
- AP/Router

Features

- Embedded 1T1R 2.4G CMOS RF
- Embedded 802.11n 1T1R MAC/BBP with MLD enhancement
- Embedded PA/LNA
- 150 Mbps PHY data rate
- 20 Mhz/40 MHz channel width
- Legacy and high throughout modes
- Compressed block ACK
- Bluetooth Co-existence
- Multiple BSSID (up to 16)
- WEP64/128, WPA, WPA2, WAPI engines
- QOS - WMM, WMM Power Save
- Hardware frame aggregation
- Supports 802.11h TPC
- MIPS 24KEc 360 Mhz with 32 KB I cache/16 KB D cache
- Supports 16-bit SDR SDRAM (up to 64 MB)
- Supports boot from ROM, FLASH
- USB 2.0 HOST/Device dual mode x1
- Embedded 5-port 10/100 Mbps Ethernet switch and 5-port UTP PHY
- Supports 5 10/100 UTP ports
- Slow speed I/O : GPIO, SPI, I^2C, I^2S, PCM, UART, and JTAG
- Packaging and I/O voltage
- 12 mm x 12 mm TFBGA-196 package
- I/O: 3.3 V I/O

2. Functional block diagram

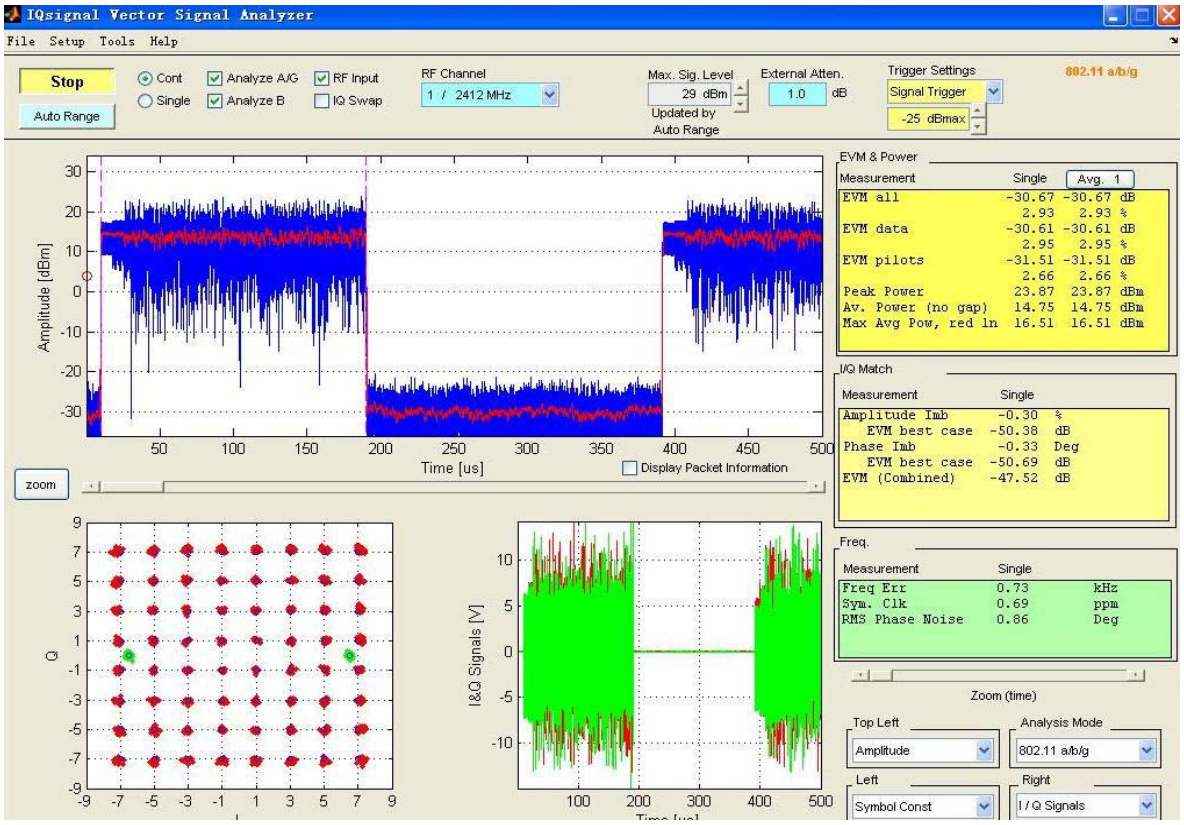


3 General Specifications

Model Name	TOP-AP01-38pin/TOP-AP01-52pin
Product Description	**Wireless AP/ROUTER Module**
WLAN Standard	**IEEE 802.11b/g/n ,Wi-Fi compliant**
Host Interface	**LAN/USB**
Major Chipset	**Ralink RT5350**
Dimension	**48 *30 *1MM 42 *29 *1MM**
Weight	**10g**
Operating Conditions	
Voltage	**3.3V +1.8V**
Temperature	**-10~55℃**
Humidity Non-Operating	**90% RH non-condensing (12 months among 0~40℃)**
Electrical Specfications	
Frequency Range	**2.412~2.462GHZ**
Transmission	**300m**
Data Rate	**IEEE 802.11b: 1-11Mbps IEEE 802.11g: 6-54Mbps IEEE 802.11n: MCS0-MCS7**
Transmit power	**15.48dbm**
Data security	**WEP64/128, WPA,WPA2,WAPI**
Receiver Sensitivity	**150M:-68dbm@10%PER**
	135M: -68dbm@10%PER
	54M:-70dbm@10%PER
	11M:-83dbm@10%PER

	6M:-86dbm@10%PER
	1M:-90dbm@10%PER
Environment	Storage Temperature:-40~70℃(-40℉ ~158℉)
	Relative humidity:10%-90%
	Non-condensing
	Storage Humidity:<10% RH
	Non-condensing
Modulation Type	OFDM/CCK/16-QAM/64-QAM

4. TEST PARAMETER



Test item	TX POWER	EVM	Freq ERR	RX SENS
Test result (54M)	14.75 dbm	-30.67dbm	0.73 khz	-70 dbm

5. Power Consumption

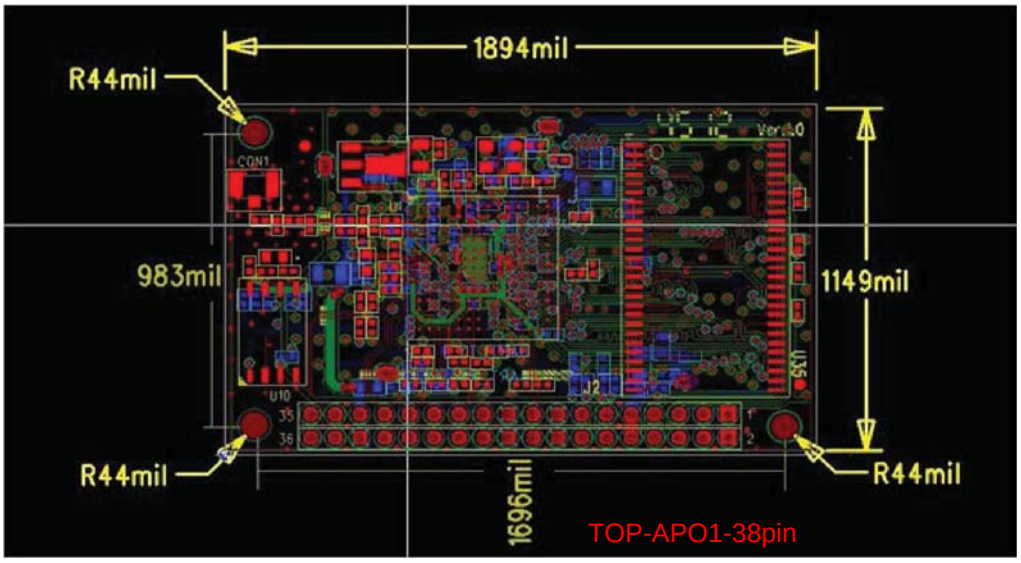
Parameters	Sym	Conditions	Min	Typ	Max	Unit
3.3V Supply Voltage	Vcc33		3.15	3.3	3.6	V
1.2V Supply Voltage	Vcc12		1.14	1.2	1.26	V
3.3V Current Consumption	Icc33			650		mA
1.5V Current Consumption	Icc15			535		mA
1.8V Current Consumption (@transformer center tap)	Icc18	EPHY speed 100M		220		mA

6. Mechanical Information

Positive Negative

TOP-AP01-38pin

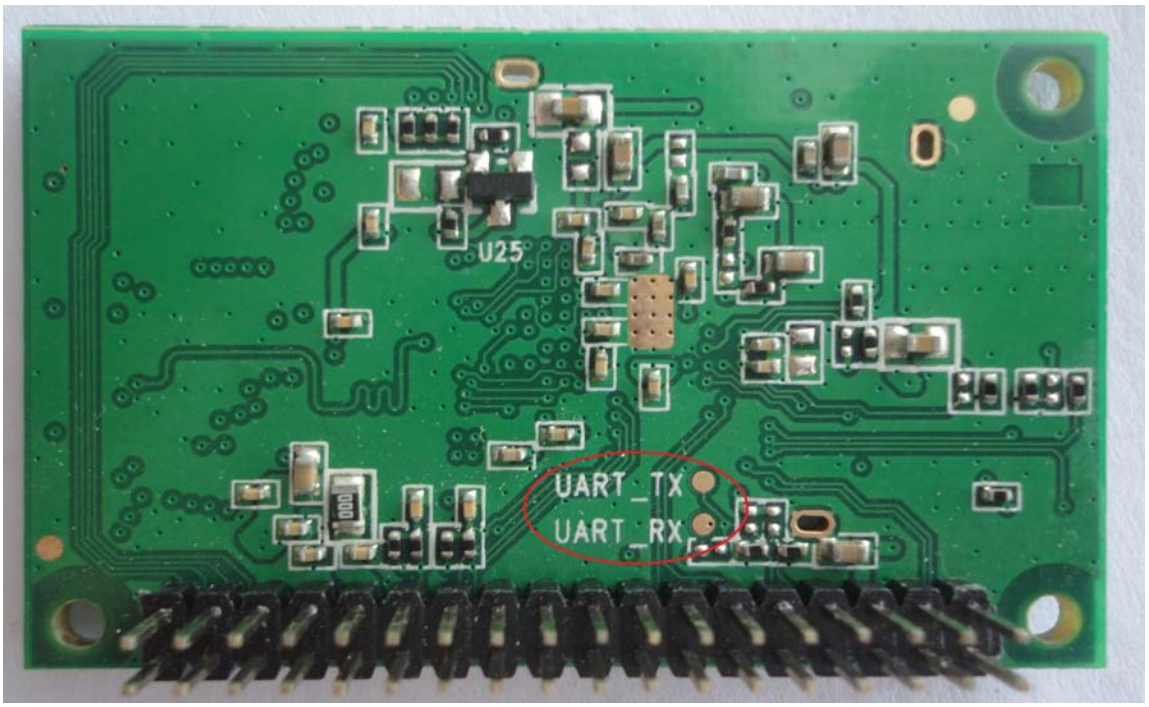
TOP-AP01-52pin



7. PIN DEFINITION

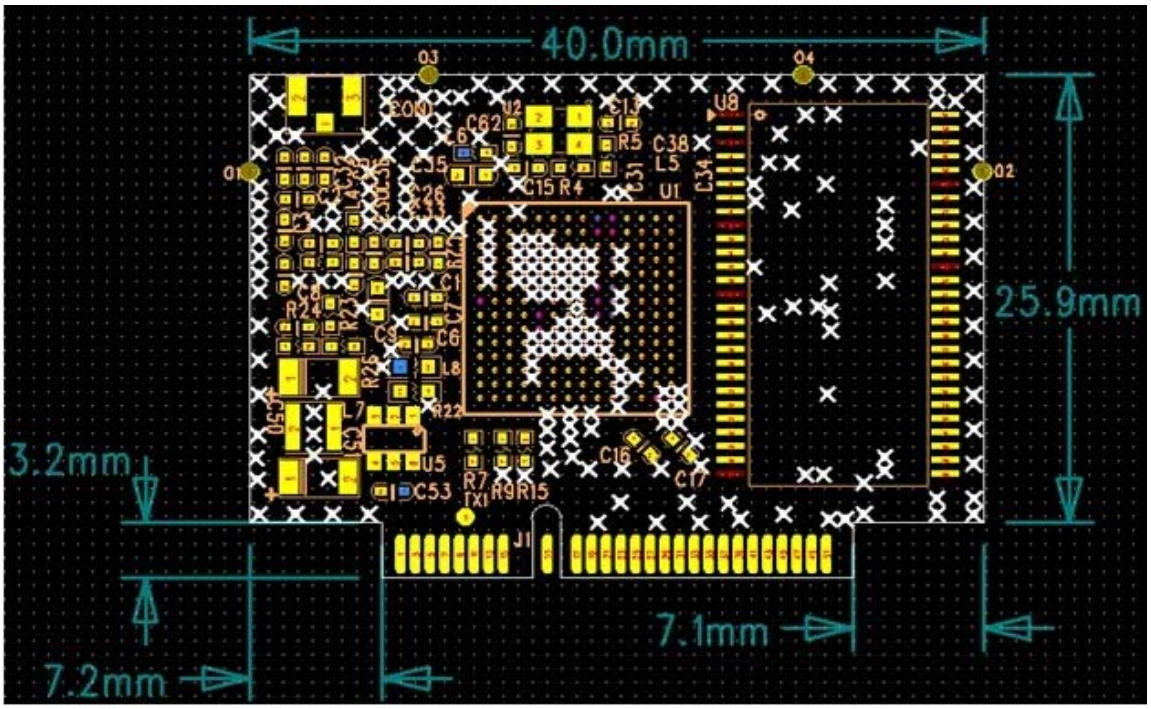
TOP-AP01-38pin

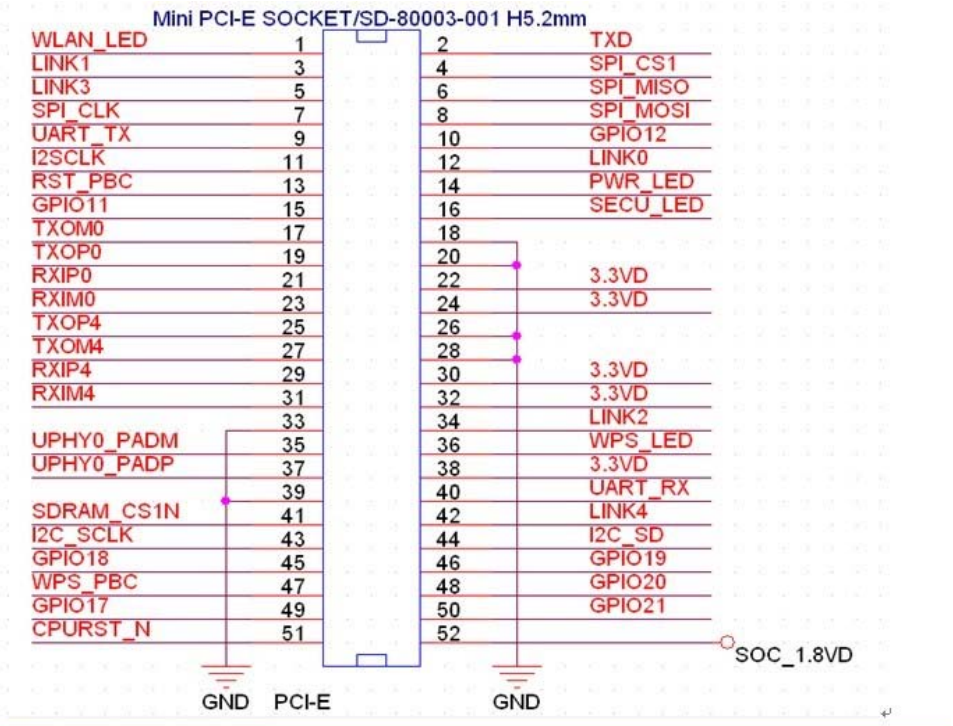
pin definition			
pin	definition	pin	definition
1	TRST_N	19	GND
2	TDO	20	GND
3	TCLK	21	DSR_N
4	GPIO0	22	LED2
5	TMS	23	DTR_N
6	TDI	24	LED4
7	I2C_SD	25	SPI_CS1
8	I2C-SCLK	26	RIN
9	3.3V	27	LED0
10	3.3V	28	LED3
11	RXN_P	29	DCD_N
12	RXP_P	30	LED1
13	TXN_P	31	1.8V
14	TXP_P	32	GND
15	GND	33	RXD
16	GND	34	RTS_N
17	PADP	35	CTS_N
18	PADM	36	TXD
37	GND	38	AMCLK



Note: the red oval tag is the UART serial port TX and UART RX two test points can be used as a serial port debugging use

TOP-AP01-52pin





8 .Antenna And Interface Connection Information

Interface and the antenna have the option

about antenna and voltage support

9 .Product ordering information

TOP-AP01 only support 802.11b/g/n, 3.3V and 1.8V voltage support

And pls mark clearly your need information.

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:

o Reorient or relocate the receiving antenna.
o Increase the separation between the equipment and receiver.
o Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
o Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modi?ations to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

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

To comply with FCC RF exposure compliance requirements,this grant isapplicable to only mobile configurations. The antennas used for this transmittermust be installed to provide a separation distance of at least 20 cm from allpersons and must not be co-located or operating in conjunction with any otherantenna or transmitter.