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Sichuan AI-Link Technology Co., Ltd.

RF TEST REPORT

Report Type:
FCC Part 15.247 & ISED RSS-247 RF report

Model:
WF-R12C-UWD2L, WF-R12C-UWD3L

REPORT NUMBER:
210401011SHA-001

ISSUE DATE:
May 20, 2021

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TEST REPORT

Report no.: 210401011SHA-001

Applicant:	Sichuan AI-Link Technology Co., Ltd.
	Anzhou, Industrial park, Mianyang, Sichuan, China
Manufacturer:	Sichuan AI-Link Technology Co., Ltd.
	Anzhou, Industrial park, Mianyang, Sichuan, China
Product Name:	WIFI Module
Type/Model:	WF-R12C-UWD2L, WF-R12C-UWD3L
FCC ID:	2AOKI-WFR12CUWD2
IC:	23460-WFR12CUWD2

SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:

47CFR Part 15 (2019): Radio Frequency Devices (Subpart C)

ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

RSS-247 Issue 2 (February 2017): Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

RSS-Gen Issue 5 (March 2019) Amendment 1: General Requirements for Compliance of Radio Apparatus

PREPARED BY:	**REVIEWED BY:**
Project Engineer Dylan Tang	Reviewer Daniel Zhao

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Revision History

Report No.	Version	Description	Issued Date
210401011SHA-001	Rev. 01	C2PC	May 20, 2021

Measurement result summary

TEST ITEM	FCC REFERANCE	IC REFERANCE	RESULT
Minimum 6dB Bandwidth	15.247(a)(2)	RSS-247 Issue 2 Clause 5.2	Verified
Maximum conducted output power and e.i.r.p.	15.247(b)(3)	RSS-247 Issue 2 Clause 5.4	Verified
Power spectrum density	15.247(e)	RSS-247 Issue 2 Clause 5.2	Verified
Emission outside the frequency band	15.247(d)	RSS-247 Issue 2 Clause 5.5	Pass
Radiated Emissions in restricted frequency bands	15.247(d), 15.205&15.209	RSS-Gen Issue 5 Clause 8.9&8.10	Pass
Power line conducted emission	15.207(a)	RSS-Gen Issue 5 Clause 8.8	Verified
Occupied bandwidth	-	RSS-Gen Issue 5 Clause 6.6	Verified
Antenna requirement	15.203	-	Verified

Notes:
1: NA =Not Applicable
2. Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.
3: Additions, Deviations and Exclusions from Standards: None.
4. Verified= This report is based on the previous report that changed the Antenna. For specific changes, please refer to the difference declaration. After the C2PC evaluation, all technical data is referred to original report(200801864SHA).

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	WIFI Module
Type/Model:	WF-R12C-UWD2L, WF-R12C-UWD3L
Description of EUT:	The EUT is a WIFI module which supports 802.11a/b/g/n/ac mode, there have two models and they are same except the connector. We choose WF-R12C-UWD2L to test as representative.
Rating:	DC 3.3V
EUT type:	☒ Table top ☐ Floor standing
Product Marketing Name:	WF-R12C-UWD2L, WF-R12C-UWD3L
Hardware Version:	0457-3
Sample received date:	May 6, 2021
Date of test:	May 6, 2020 ~ May 14, 2021

1.2 Technical Specification

Frequency Band:	2400MHz ~ 2483.5MHz
Support Standards:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n(HT20), IEEE 802.11n(HT40)
Type of Modulation:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n(HT20): OFDM (64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n(HT40): OFDM (64-QAM, 16-QAM, QPSK, BPSK)
Operating Frequency:	2412MHz to 2462MHz for IEEE 802.11b/g/n(HT20) 2422MHz to 2452MHz for IEEE 802.11n(HT40)
Channel Number:	11 Channels for 802.11b, 802.11g and 802.11n(HT20) 7 Channels for 802.11n(HT40)
Channel Separation:	5 MHz

1.3 Antenna information

No.	Antenna Type	Gain	Note
0	PIFA Antenna	3.79dBi	On the board
1	PIFA Antenna	3.46dBi	External type
2	PIFA Antenna	1.72dBi	External type
Note: After technology evaluation, the max gain antenna 1 was choose as external antenna for all test.			

Mode	Tx/Rx Function	Beamforming function	CDD function	Directional gain (dBi)
802.11b	1Tx/1Rx	NO	NO	-
802.11g	1Tx/1Rx	NO	NO	-
802.11n(HT20)	2Tx/2Rx	NO	NO	3.24
802.11n(HT40)	2Tx/2Rx	NO	NO	3.24
Note: For 802.11b and 802.11g mode, it only supports 1TX. For 802.11n modes, it can support 2TX, all the two transmit signals are completely uncorrelated with each other, so the directional gain = 10 log $((10^{G1/10} + 10^{G2/10} + \ldots + 10^{Gn/10}) / N_{ANT}$				

1.4 Description of Test Facility

Name:	Intertek Testing Services Shanghai
Address:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L0139
	FCC Accredited Lab Designation Number: CN1175
	IC Registration Lab CAB identifier.: CN0051
	VCCI Registration Lab Registration No.: R-14243, G-10845, C-14723, T-12252
	A2LA Accreditation Lab Certificate Number: 3309.02

TEST REPORT

Name:	Shenzhen UnionTrust Quality and Technology Co., Ltd.
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Telephone:	+86 (0) 755 2823 0888
Telefax:	+86 (0) 755 2823 0886

The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L9069
	FCC Accredited Lab Designation Number: CN1194
	IC Registration Lab CAB identifier.: CN0032
	A2LA Accreditation Lab Certificate Number: 4312.01

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2019)
ANSI C63.10 (2013)
KDB 662911 D01 (v02r01)
KDB 558074 (v05r02)
RSS-247 Issue 2 (February 2017)
RSS-Gen Issue 5 (March 2019) Amendment 1

2.2 Mode of operation during the test

There have two models EUT, the Radiation emission was chosen for pretest, after this pre-scan, we find the worst-case model is “WF-R12C-UWD2”, and we choose this model for all test as representative.

While testing transmitting mode of EUT, the internal modulation and continuously transmission was applied.

Software name	Manufacturer	Version	Supplied by
REALTEK 11ac 8822CU USB WLAN NIC Massproduction Kit	REALTEK	-	Client

The lowest, middle and highest channel were tested as representatives.

Frequency Band (MHz)	Mode	Lowest (MHz)	Middle (MHz)	Highest (MHz)
2400-2483.5	802.11b	2412	2437	2462
	802.11g	2412	2437	2462
	802.11n(HT20)	2412	2437	2462
	802.11n(HT40)	2422	2437	2452

Data rate and Power setting:
The pre-scan for the conducted power with all rates in each modulation and bands was used, and the worst case was found and used in all test cases. After this pre-scan, we choose the following table of the data rata as the worst case.

Frequency Band (MHz)	Mode	Worst case data rate
2400-2483.5	802.11b	1Mbps
	802.11g	6Mbps
	802.11n(HT20)	MCS8
	802.11n(HT40)	MCS8

2.3 Test software list

Test Items	Software	Manufacturer	Version
Radiated emission	ES-K1	R&S	V1.71

2.4 Test peripherals list

Item No.	Name	Band and Model	Description
1	Laptop computer	DELL 5480	-
2	RF cable	/	0.2m length; 0.5dB loss

2.5 Test environment condition:

Test items	Temperature	Humidity
Minimum 6dB Bandwidth	18°C	51%RH
Maximum conducted output power and e.i.r.p.		
Power spectrum density		
Emission outside the frequency band		
Occupied bandwidth		
Radiated Emissions in restricted frequency bands	25.2°C	52%RH
Power line conducted emission	19°C	52%RH

2.6 Instrument list

Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Test Receiver	R&S	ESCS 30	EC 2107	2021-07-14
☑	A.M.N.	R&S	ESH2-Z5	EC 3119	2022-11-09

Radiated Emission					
Used	Equipment	Manufacturer	Type	Serial Number	Due date
☑	3m Chamber & Accessory Equipment	ETS-LINDGREN	3m	N/A	2024-01-21
☑	Receiver	R&S	ESIB26	100114	2021-11-17
☑	Loop Antenna	ETS-LINDGREN	6502	00202525	2021-11-13
☑	Broadband Antenna	ETS-LINDGREN	3142E	00201566	2021-11-13
☑	6dB Attenuator	Talent	RA6A5-N-18	18103001	2021-11-13
☑	Preamplifier	HP	8447F	2805A02960	2021-11-09
☑	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201541	2021-05-29
☑	Pre-amplifier	ETS-LINDGREN	118385	00201874	2021-11-09
☑	Horn Antenna	ETS-LINDGREN	3116C	00200180	2021-06-18
☑	Pre-amplifier	ETS-LINDGREN	118384	00202652	2021-11-13
☑	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A

RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2022-03-15
☑	PXA Signal Analyzer	Keysight	N9030B	EC 6078	2021-06-10
☑	Power sensor	Agilent	U2021XA	EC 5338-1	2022-03-15
☑	Vector Signal Generator	Agilent	N5182B	EC 5175	2022-03-15
☑	MXG Analog Signal Generator	Agilent	N5181A	EC 5338-2	2022-03-15
☑	Test Receiver	R&S	ESCI 7	EC 4501	2021-09-16
☐	Universal Radio Communication Tester	R&S	CMW500	EC5944	2021-12-09
☐	Universal Radio Communication Tester	R&S	CMW500	Ec6209	2021-12-30
☑	Signal generator	Agilent	N5182A	Ec6172	2021-08-21
☑	Signal generator	Agilent	N5181A	Ec6171	2021-08-21
☑	Climate chamber	GWS	MT3065	EC 6021	2022-03-04

Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2022-03-02

☑	Pressure meter	YM3	Shanghai Mengde	EC 4620	2021-09-09

2.7 Measurement uncertainty

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Measurement uncertainty
Maximum peak output power	± 0.74dB
Radiated Emissions in restricted frequency bands below 1GHz	± 4.60dB
Radiated Emissions in restricted frequency bands above 1GHz	± 4.40dB
Emission outside the frequency band	± 2.70dB
Power line conducted emission	± 3.19dB

3 Minimum 6dB bandwidth

Test result: Pass

3.1 Limit

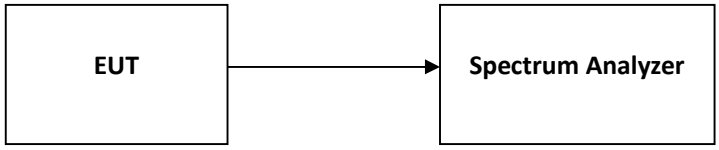
For systems using digital modulation techniques that may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz bands, the minimum 6 dB bandwidth shall be at least 500 kHz.

3.2 Measurement Procedure

The EUT was tested according to Subclause 11.8 of ANSI C63.10.

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.3 Test Configuration



3.4 Test Results of Minimum 6dB bandwidth

WLAN Occupied 6dB Bandwidth				
Mode	Test Frequency (MHz)	Ant	Occupied Bandwidth (MHz)	Result
802.11b	2412	Ant0	10.15	Pass
802.11b	2437	Ant0	10.14	Pass
802.11b	2462	Ant0	10.15	Pass
802.11g	2412	Ant0	15.83	Pass
802.11g	2437	Ant0	15.73	Pass
802.11g	2462	Ant0	16.33	Pass
802.11n (HT20)	2412	Ant0	16.58	Pass
802.11n (HT20)	2437	Ant0	16.72	Pass
802.11n (HT20)	2462	Ant0	15.47	Pass
802.11n (HT40)	2422	Ant0	35.18	Pass
802.11n (HT40)	2437	Ant0	35.21	Pass
802.11n (HT40)	2452	Ant0	35.18	Pass

Note: the max power of the antenna was selected verification.

4 Maximum conducted output power and e.i.r.p.

Test result: Pass

4.1 Limit

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 W. (The e.i.r.p. shall not exceed 4 W)

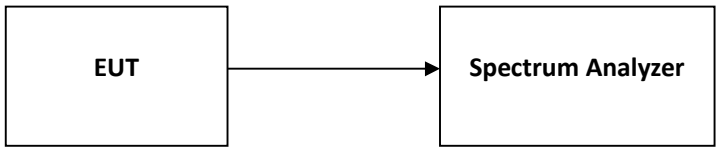
If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the minimum of 30dBm and 30+ (6 –antenna gain-beam forming gain).

4.2 Measurement Procedure

The EUT was tested according to Subclause 11.9.2.2 of ANSI C63.10.

a) Measure the duty cycle, x, of the transmitter output signal as described in Section 6.0.
b) Set span to at least 1.5 x OBW.
c) Set RBW = 1 % to 5 % of the OBW, not to exceed 1 MHz.
d) Set VBW ≥ 3 x RBW.
e) Number of points in sweep ≥ 2 x span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
f) Sweep time = auto.
g) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
h) Do not use sweep triggering. Allow the sweep to “free run”.
i) Trace average at least 100 traces in power averaging (i.e., RMS) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the on and off periods of the transmitter.
j) Compute power by integrating the spectrum across the OBW of the signal using the instrument’s band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
k) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on- and off-times of the transmission). For example, add 10 log (1/0.25) = 6 dB if the duty cycle is 25 %.

4.3 Test Configuration



4.4 Test Results of Maximum conducted output power

WLAN AVGSA Output Power								
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	Max Power (dBm)	Total or max Power (dBm)	Limit (dBm)	EIRP (dBm)	Result
802.11b	2412	Ant0	0.24	18.08	18.08	30	21.54	Pass
802.11b	2437	Ant0	0.24	18.43	18.43	30	21.89	Pass
802.11b	2462	Ant0	0.24	17.21	17.21	30	20.67	Pass
802.11g	2412	Ant0	1.30	15.94	15.94	30	19.40	Pass
802.11g	2437	Ant0	1.30	16.10	16.10	30	19.56	Pass
802.11g	2462	Ant0	1.30	15.19	15.19	30	18.65	Pass
802.11n (HT20)	2412	Ant0	1.40	14.12	16.20	30	19.66	Pass
802.11n (HT20)	2412	Ant1	1.42	12.00				
802.11n (HT20)	2437	Ant0	1.44	15.55	17.54	30	21.00	Pass
802.11n (HT20)	2437	Ant1	1.43	13.20				
802.11n (HT20)	2462	Ant0	1.42	13.25	15.30	30	18.76	Pass
802.11n (HT20)	2462	Ant1	1.40	11.05				
802.11n (HT40)	2422	Ant0	2.52	14.10	15.85	30	19.31	Pass
802.11n (HT40)	2422	Ant1	2.52	11.05				
802.11n (HT40)	2437	Ant0	2.56	15.05	17.25	30	20.71	Pass
802.11n (HT40)	2437	Ant1	2.54	13.25				
802.11n (HT40)	2452	Ant0	2.49	13.15	15.29	30	18.75	Pass
802.11n (HT40)	2452	Ant1	2.52	11.20				

5 Power spectrum density

Test result: **Pass**

5.1 Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the minimum of 8dBm/MHz and 8+ (6 –antenna gain-beam forming gain).

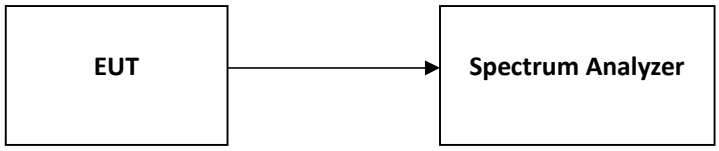
5.2 Measurement Procedure

The EUT was tested according to Subclause 11.10 of ANSI C63.10.

This procedure is applicable when the EUT cannot be configured to transmit continuously (i.e., duty cycle < 98 %), and when sweep triggering/signal gating cannot be used to measure only when the EUT is transmitting at its maximum power control level, and when the transmission duty cycle is constant (i.e., duty cycle variations are less than ± 2 %):

a) Measure the duty cycle (x) of the transmitter output signal as described in Section 6.0.
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 x OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
e) Set VBW ≥3 x RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.
m) If resultant value exceeds the limit, then reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

5.3 Test Configuration



5.4 Test Results of Power spectrum density

WLAN AVGSA Power Spectral Density								
Mode	Test Frequency (MHz)	Ant	Duty Cycle Factor (dB)	PSD (dBm/100KHz)	Max or total PSD (dBm/100KHz)	RBW (kHz)	Limit (dBm)	Result
802.11b	2412	Ant0	0.24	0.521	0.761	100	8	Pass
802.11b	2437	Ant0	0.24	-0.587	-0.347	100	8	Pass
802.11b	2462	Ant0	0.24	-0.435	-0.195	100	8	Pass
802.11g	2412	Ant0	1.30	-3.561	-2.261	100	8	Pass
802.11g	2437	Ant0	1.30	-4.148	-2.848	100	8	Pass
802.11g	2462	Ant0	1.30	-3.881	-2.581	100	8	Pass
802.11n (HT20)	2412	Ant0	1.40	-4.825	-1.19	100	8	Pass
802.11n (HT20)	2412	Ant1	1.42	-6.564				
802.11n (HT20)	2437	Ant0	1.44	-3.950	-0.92	100	8	Pass
802.11n (HT20)	2437	Ant1	1.43	-7.473				
802.11n (HT20)	2462	Ant0	1.42	-5.558	-1.94	100	8	Pass
802.11n (HT20)	2462	Ant1	1.40	-7.354				
802.11n (HT40)	2422	Ant0	2.52	-10.015	-4.42	100	8	Pass
802.11n (HT40)	2422	Ant1	2.52	-9.883				
802.11n (HT40)	2437	Ant0	2.56	-5.985	-2.18	100	8	Pass
802.11n (HT40)	2437	Ant1	2.54	-10.737				
802.11n (HT40)	2452	Ant0	2.49	-9.015	-4.27	100	8	Pass
802.11n (HT40)	2452	Ant1	2.52	-11.004				

6 Radiated Emissions in restricted frequency bands

Test result: **Pass**

6.1 Limit

The radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified showed as below:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

6.2 Measurement Procedure

The EUT was tested according to Subclause 11.12 of ANSI C63.10.

For Radiated emission below 30MHz:

a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c) Both X and Y axes of the antenna are set to make the measurement.
d) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz:

a) The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meters chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c) The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

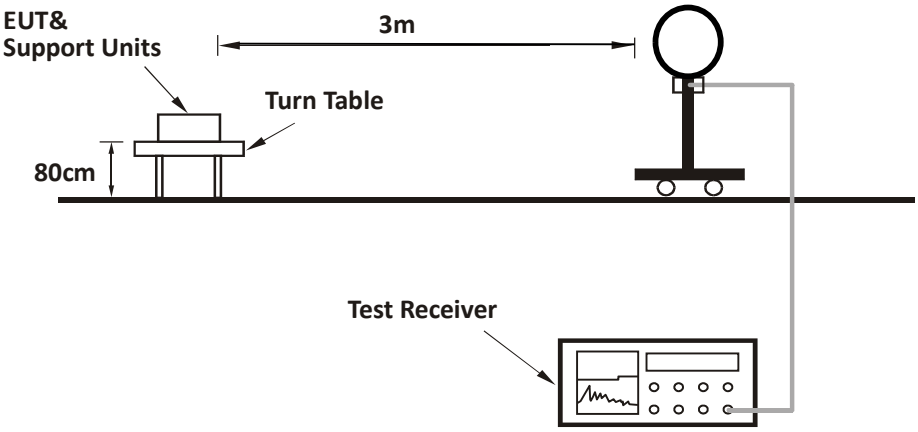
f) The test-receiver system was set to peak and average detector function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

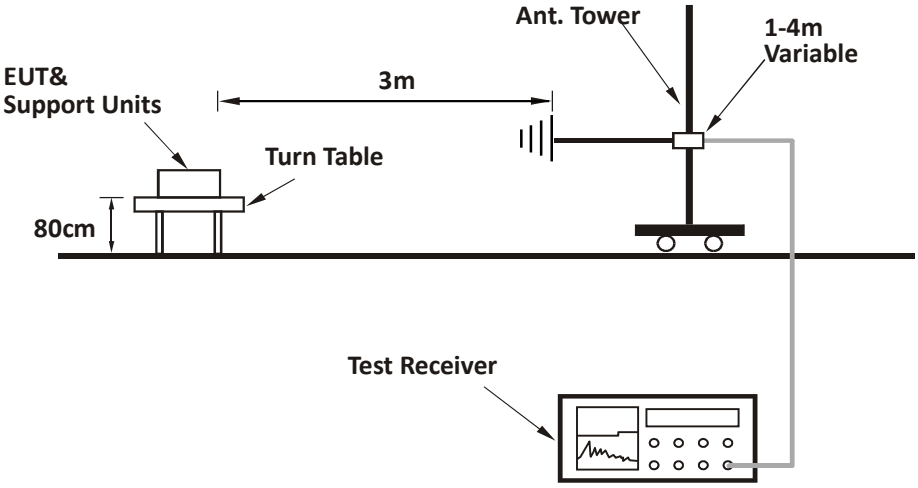
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 3 x RBW (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions were reported.

6.3 Test Configuration

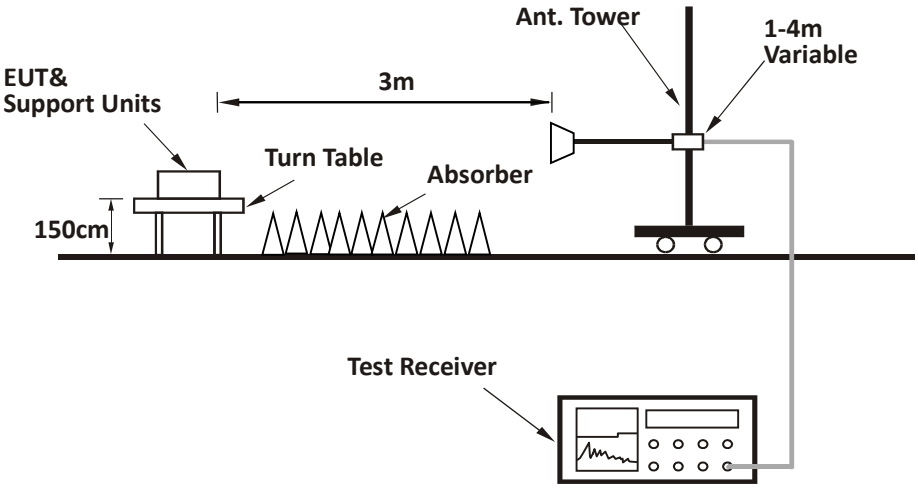
For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



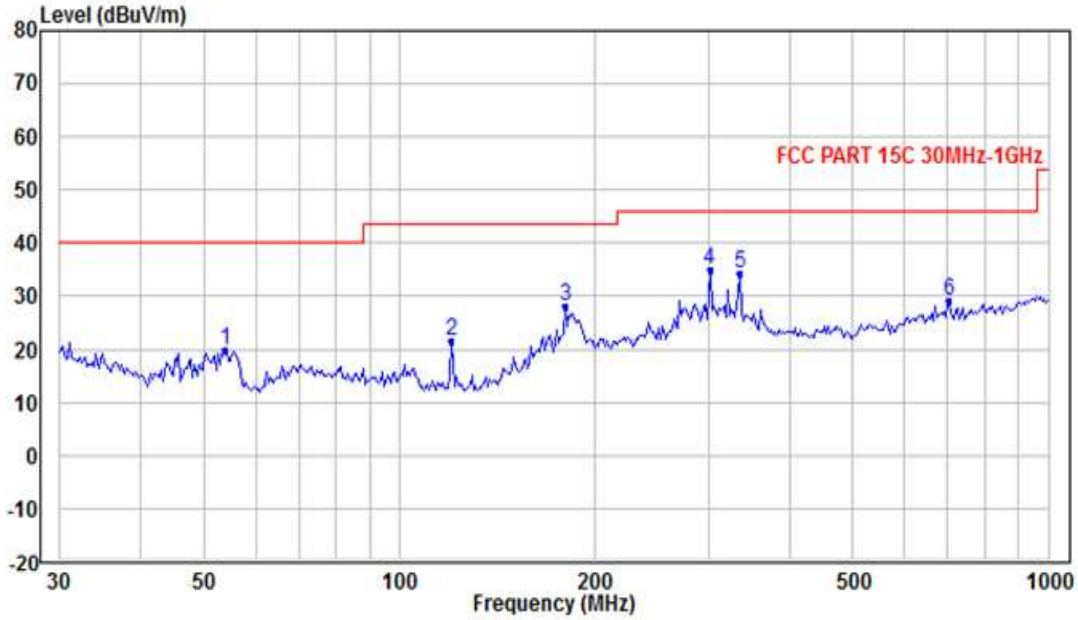
For Radiated emission above 1GHz:

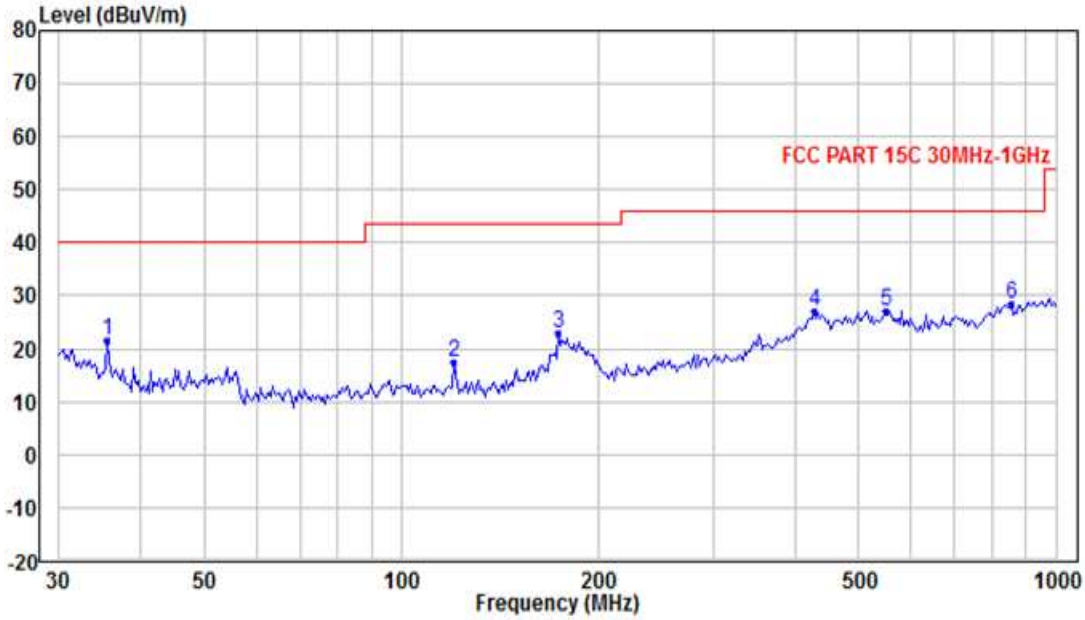


6.4 Test Results of Radiated Emissions

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Horizontal





Test data below 1GHz

Antenna	Frequency (MHz)	Corrected Reading (dBµV/m)	Correct Factor (dB/m)	Limit (dBµV/m)	Margin (dB)	Detector
H	53.756	19.91	-14.87	40.00	20.09	PK
H	120.612	21.44	-13.09	43.50	22.06	PK
H	180.030	28.13	-10.76	43.50	15.37	PK
H	300.699	34.93	-6.63	46.00	11.07	PK
H	334.126	34.24	-5.56	46.00	11.76	PK
H	703.731	29.06	1.65	46.00	16.94	PK
V	35.511	-8.88	-8.88	40.00	18.39	PK
V	120.612	-13.09	-13.09	43.50	26.10	PK
V	173.815	-11.23	-11.23	43.50	20.68	PK
V	427.292	-3.11	-3.11	46.00	18.95	PK
V	550.290	-1.21	-1.21	46.00	18.78	PK
V	856.760	2.24	2.24	46.00	17.53	PK

Test result above 1GHz:
The emission was conducted from 1GHz to 18GHz

802.11b

CH	Antenna	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Over Limit (dB)	Limit (dBµV/m)	Factor (dB)	Type
L	V	2390.00	54.21	45.90	28.10	74.00	-8.31	PK
	V	2390.00	40.01	31.70	22.30	54.00	-8.31	AV
	H	9648.00	47.90	54.44	19.56	74.00	6.54	PK
	H	9648.00	29.72	36.26	17.74	54.00	6.54	AV
	V	9648.00	46.39	52.93	21.07	74.00	6.54	PK
M	H	9748.00	49.83	56.44	17.56	74.00	6.61	PK
	H	9748.00	31.28	37.89	16.11	54.00	6.61	AV
	V	9748.00	45.45	52.06	21.94	74.00	6.61	PK
H	V	2483.50	56.04	47.96	26.04	74.00	-8.08	PK
	V	2483.50	39.91	31.83	22.17	54.00	-8.08	AV
	H	9848.00	44.26	50.93	23.07	74.00	6.67	PK
	V	9848.00	45.69	52.36	21.64	74.00	6.67	PK

802.11g

CH	Antenna	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Over Limit (dB)	Limit (dBµV/m)	Factor (dB)	Type
L	V	2390.00	66.31	58.00	16.00	74.00	-8.31	PK
	V	2390.00	48.75	40.44	13.56	54.00	-8.31	AV
	H	9648.00	41.39	47.93	26.07	74.00	6.54	PK
	V	9648.00	41.68	48.22	25.78	74.00	6.54	PK
M	H	9748.00	43.40	50.01	23.99	74.00	6.61	PK
	V	9748.00	41.49	48.10	25.90	74.00	6.61	PK
H	V	2483.50	68.61	60.53	13.47	74.00	-8.08	PK
	V	2483.50	46.14	38.06	15.94	54.00	-8.08	AV

	H	9848.00	41.44	48.11	25.89	74.00	6.67	PK
	V	9848.00	43.03	49.70	24.30	74.00	6.67	PK

802.11n(HT20)

CH	Antenna	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Over Limit (dB)	Limit (dBµV/m)	Factor (dB)	Type
L	V	2390.00	81.66	73.35	0.65	74.00	-8.31	PK
	V	2390.00	61.77	53.46	0.54	54.00	-8.31	AV
	H	7236.00	42.46	43.35	30.65	74.00	0.89	PK
	V	7236.00	41.59	42.48	31.52	74.00	0.89	PK
M	H	9748.00	42.26	48.87	25.13	54.00	6.61	PK
	V	9748.00	42.08	48.69	25.31	74.00	6.61	PK
H	V	2483.50	81.04	72.96	1.04	74.00	-8.08	PK
	V	2483.50	60.18	52.10	1.90	54.00	-8.08	AV
	H	9848.00	41.19	47.86	26.14	74.00	6.67	PK
	V	9848.00	41.68	48.35	25.65	74.00	6.67	PK

802.11n (HT40):

CH	Antenna	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Over Limit (dB)	Limit (dBµV/m)	Factor (dB)	Type
L	V	2390.00	81.26	72.95	1.05	74.00	-8.31	PK
	V	2390.00	61.20	52.89	1.11	54.00	-8.31	AV
	H	9688.00	40.84	47.41	26.59	74.00	6.57	PK
	V	9688.00	40.57	47.14	26.86	74.00	6.57	PK
M	H	9748.00	41.27	47.88	26.12	74.00	6.61	PK
	V	9748.00	40.83	47.44	26.56	74.00	6.61	PK
H	V	2483.50	76.96	68.88	5.12	74.00	-8.08	PK
	V	2483.50	59.49	51.41	2.59	54.00	-8.08	AV
	H	9808.00	40.42	47.06	26.94	74.00	6.64	PK
	V	9808.00	40.27	46.91	27.09	74.00	6.64	PK

TEST REPORT

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz), the value was added to Original Receiver Reading by the software automatically.
2. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = Limit - Corrected Reading
4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBμV,
Limit = 40.00dBμV/m.
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m;
Corrected Reading = 10dBμV + 0.20dB/m = 10.20dBμV/m;
Margin = 40.00dBμV/m - 10.20dBμV/m = 29.80dB.

7 Antenna requirement

Requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Result:
EUT uses of a permanently attached antenna and a unique coupling to the intentional radiator, so it can comply with the provisions of this section.

********** END **********