

FCC Radio Test Report



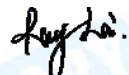
FCC ID: 2APRB-WNIP-2L-BU

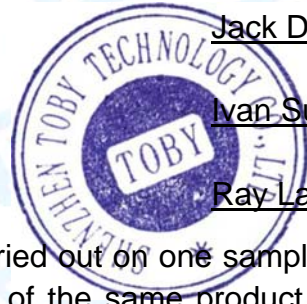
Original Grant

Report No. : TB-FCC175699
Applicant : Guangzhou Juan Intelligent Tech Joint Stock Co.,Ltd
Equipment Under Test (EUT)
EUT Name : Wireless IP Camera
Model No. : WNIP-2LTA-BS
Series Model No. : WNIP-2LTA-BS-U, CAM-2PK-WNIP2LBU, CAM-WNIP2LBU, CL-CAM-WNIP2LBU, WNIP2-4L1, CL-2WNP1-2L, CL-2WNP1-4L, CL-2WNP1-8L, WNIP21L-2-B, WNIP21L-4-B, WNIP21L-8-B
Sample ID : TBBJ-20200731-01-1#
Brand Name : NIGHT OWL
Receipt Date : 2020-09-16
Test Date : 2020-09-17 to 2020-10-22
Issue Date : 2020-10-23
Standards : FCC Part 15, Subpart C 15.247
Test Method : ANSI C63.10: 2013
Conclusions : **PASS**

In the configuration tested, the EUT complied with the standards specified above,

The EUT technically complies with the FCC and IC requirements

Test/Witness Engineer :  Jack Deng
Engineer Supervisor :  Ivan Su
Engineer Manager :  Ray Lai



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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1. General Information about EUT

1.1 Client Information

Applicant	:	Guangzhou Juan Intelligent Tech Joint Stock Co.,Ltd
Address	:	No.2 Plant, West of Shanxi country, Dashi street, Panyu District, Guangzhou City, China
Manufacturer	:	Guangzhou Juan Intelligent Tech Joint Stock Co.,Ltd
Address	:	No.2 Plant, West of Shanxi country, Dashi street, Panyu District, Guangzhou City, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Wireless IP Camera
Models No.	:	WNIP-2LTA-BS, WNIP-2LTA-BS-U, CAM-2PK-WNIP2LBU, CAM-WNIP2LBU, CL-CAM-WNIP2LBU, WNIP2-4L1, CL-2WNP1-2L, CL-2WNP1-4L, CL-2WNP1-8L, WNIP21L-2-B, WNIP21L-4-B, WNIP21L-8-B
Model Different	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name for commercial.
Product Description	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz
	Number of Channel:	802.11b/g/n(HT20):11 channels <i>see note(3)</i>
	Antenna Gain:	5 dBi Dipole Antenna
	Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n:OFDM(BPSK,QPSK,16QAM,64QAM)
	Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6 Mbps 802.11n:up to 150Mbps
Power Rating	:	DC 12V from AC/DC Adapter(CS-1201000): Input: AC 100-240V, 50/60Hz. Output: DC 12V, 1A.
Software Version	:	WNIP-2LTA-BU_20200925
Hardware Version	:	FH8852-F37-M-V3

Note:

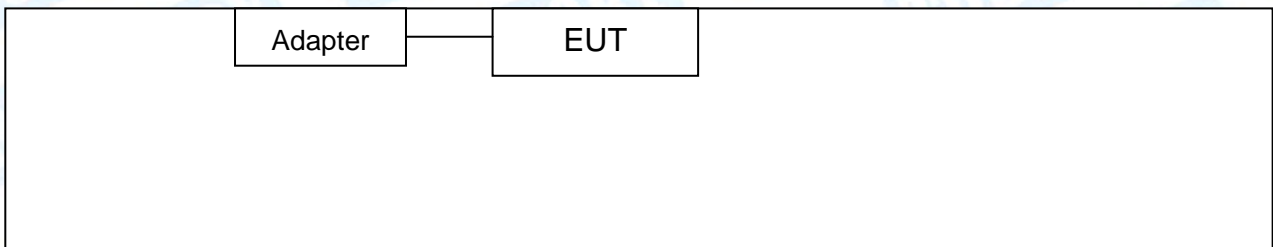
- (1) This Test Report is FCC Part 15.247 for 802.11b/g/n, the test procedure follows the FCC KDB 558074 D01 v05r02 and KDB 662911 D01 Multiple Transmitter Output v02r01.
- (2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- (3) Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	05	2432	09	2452
02	2417	06	2437	10	2457
03	2422	07	2442	11	2462
04	2427	08	2447		

Note: CH 01~CH 11 for 802.11b/g/n(HT20)

(4) The Antenna information about the equipment is provided by the applicant.

1.3 Block Diagram Showing the Configuration of System Tested



1.4 Description of Support Units

Name	Model	S/N	Manufacturer	Used “√”
Notebook	161301-CN	15987/00203076	Xiaomi	√

1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

For Conducted Test	
Final Test Mode	Description
Mode 1	Charging with TX B Mode
For Radiated and RF Conducted Test	
Final Test Mode	Description
Mode 2	TX Mode B Mode Channel 01/06/11
Mode 3	TX Mode G Mode Channel 01/06/11
Mode 4	TX Mode N(HT20) Mode Channel 01/06/11
Note : (1)The adapter and antenna gain provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.	

Note:

- (1) For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.
According to ANSI C63.10 standards, the measurements are performed at the highest, Middle, lowest available channels, and the worst case data rate as follows:
 - 802.11b Mode: CCK (1 Mbps)
 - 802.11g Mode: OFDM (6 Mbps)
 - 802.11n (HT20) Mode: MCS 0 (6.5 Mbps)
- (2) During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.
- (3) The EUT is considered a Mobile device; in normal use it was positioned on X-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

1.6 Description of Test Software Setting

During testing channel & Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of WLAN.

Test Software: Xshell			
Test Mode: Continuously transmitting			
Mode	Data Rate	Channel	Parameters
802.11b	CCK/ 1Mbps	01	DEF
	CCK/ 1Mbps	06	DEF
	CCK/ 1Mbps	11	DEF
802.11g	OFDM/ 6Mbps	01	39
	OFDM/ 6Mbps	06	39
	OFDM/ 6Mbps	11	39
802.11n(HT20)	MCS 0	01	38
	MCS 0	06	38
	MCS 0	11	40

1.7 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

Test Item	Parameters	Expanded Uncertainty (U_{Lab})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	± 3.50 dB ± 3.10 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	± 4.60 dB
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	± 4.50 dB
Radiated Emission	Level Accuracy: Above 1000MHz	± 4.20 dB

1.8 Test Facility

The testing was performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at:1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China.

At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.FCC Accredited Test Site Number: 854351.

IC Registration No.: (11950A)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A.

2. Test Summary

FCC Part 15 Subpart C(15.247)				
Standard Section FCC	Test Item	Test Sample(s)	Judgment	Remark
15.203	Antenna Requirement	N/A	N/A	N/A
15.207	Conducted Emission	TBBJ-20200731-01-1#	PASS	N/A
15.205	Restricted Bands	N/A	N/A	Note 3
15.247(a)(2)	6dB Bandwidth	N/A	N/A	Note 3
15.247(b)	Peak Output Power	N/A	N/A	Note 3
15.247(e)	Power Spectral Density	N/A	N/A	Note 3
15.247(d)	Band Edge	N/A	N/A	Note 3
15.247(d)&15.209	Transmitter Radiated Spurious Emission	TBBJ-20200731-01-1#	PASS	N/A

Note:(1) “/” for no requirement for this test item.
 (2)N/A is an abbreviation for Not Applicable.
 (3) the test data please refer to the original report TB-FCC172699.

3. Test Software

Test Item	Test Software	Manufacturer	Version No.
Conducted Emission	EZ-EMC	EZ	CDI-03A2
Radiation Emission	EZ-EMC	EZ	FA-03A2RE
RF Conducted Measurement	MTS-8310	MWRfTest	V2.0.0.0

4. Test Equipment

Conducted Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100321	Jul. 06, 2020	Jul. 05, 2021
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 06, 2020	Jul. 05, 2021
AMN	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 06, 2020	Jul. 05, 2021
LISN	Rohde & Schwarz	ENV216	101131	Jul. 06, 2020	Jul. 05, 2021
Radiation Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 06, 2020	Jul. 05, 2021
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 06, 2020	Jul. 05, 2021
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jul. 06, 2020	Jul. 05, 2021
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar.01, 2020	Feb. 28, 2021
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar.01, 2020	Feb. 28, 2022
Horn Antenna	ETS-LINDGREN	BBHA 9170	BBHA9170582	Mar.01, 2020	Feb. 28, 2022
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 06, 2020	Jul. 05, 2021
Pre-amplifier	Sonoma	310N	185903	Mar.01, 2020	Feb. 28, 2021
Pre-amplifier	HP	8449B	3008A00849	Mar.01, 2020	Feb. 28, 2021
Pre-amplifier	SKET	LNPA_1840G-50	SK201904032	Mar.01, 2020	Feb. 28, 2021
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar.01, 2020	Feb. 28, 2021
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A

5. Conducted Emission Test

5.1 Test Standard and Limit

5.1.1 Test Standard

FCC Part 15.207

5.1.2 Test Limit

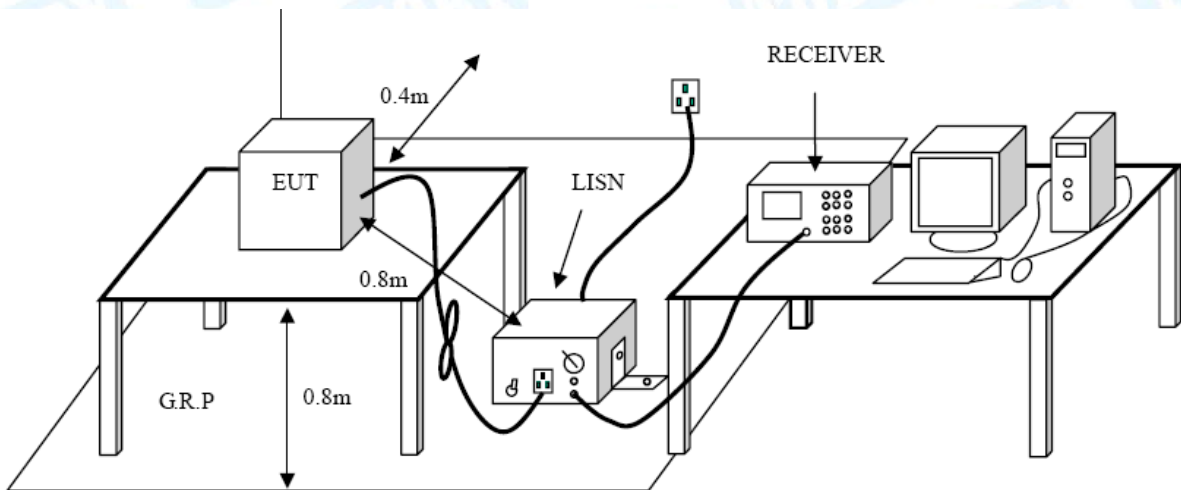
Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Notes:

- (1) *Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.2 Test Setup



5.3 Test Procedure

- (1) The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.
- (2) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (3) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (4) LISN at least 80 cm from nearest part of EUT chassis.
- (5) The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

5.4 Deviation From Test Standard

No deviation

5.5 EUT Operating Mode

Please refer to the description of test mode.

5.6 Test Data

Please refer to the Attachment A.

6. Radiated Emission Test

6.1 Test Standard and Limit

6.1.1 Test Standard

FCC Part 15.209

6.1.2 Test Limit

Radiated Emission Limits (9 kHz~1000 MHz)

Frequency (MHz)	Field Strength (microvolt/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

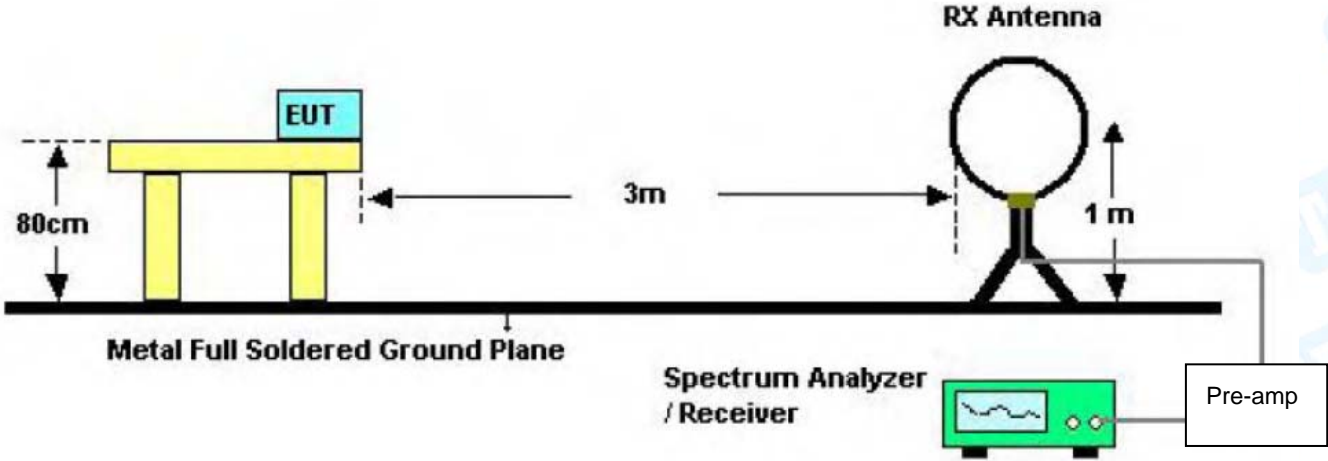
Radiated Emission Limit (Above 1000MHz)

Frequency (MHz)	Distance of 3m (dBuV/m)	
	Peak	Average
Above 1000	74	54

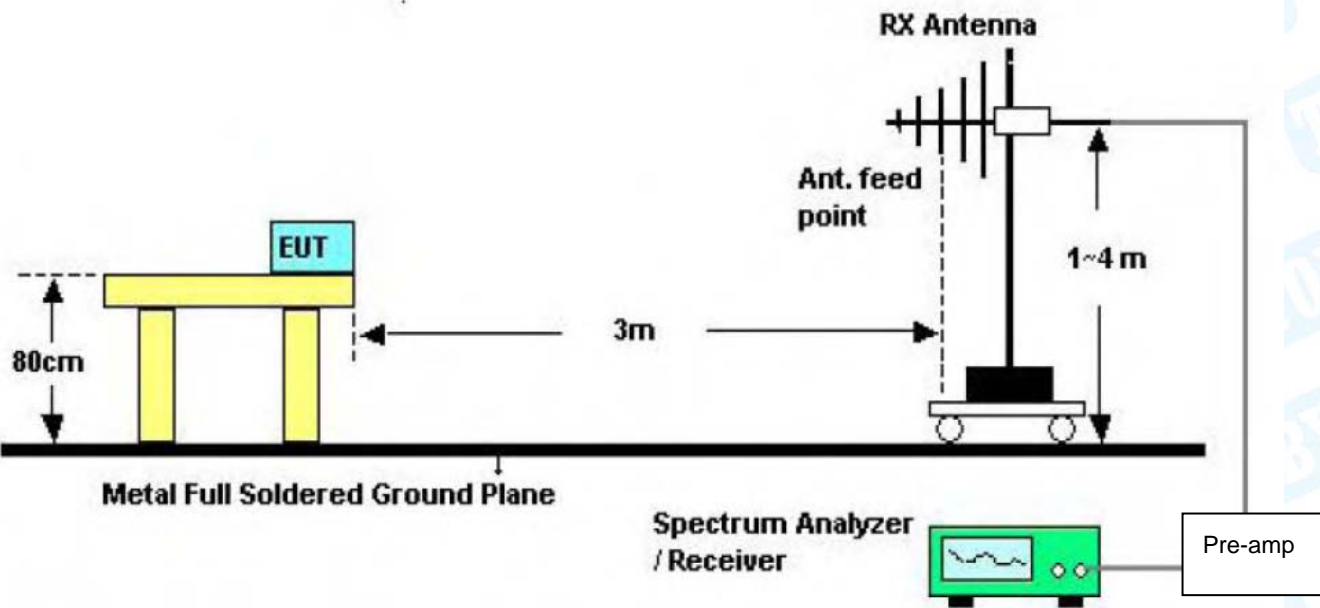
Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level(dBuV/m)=20log Emission Level(uV/m)

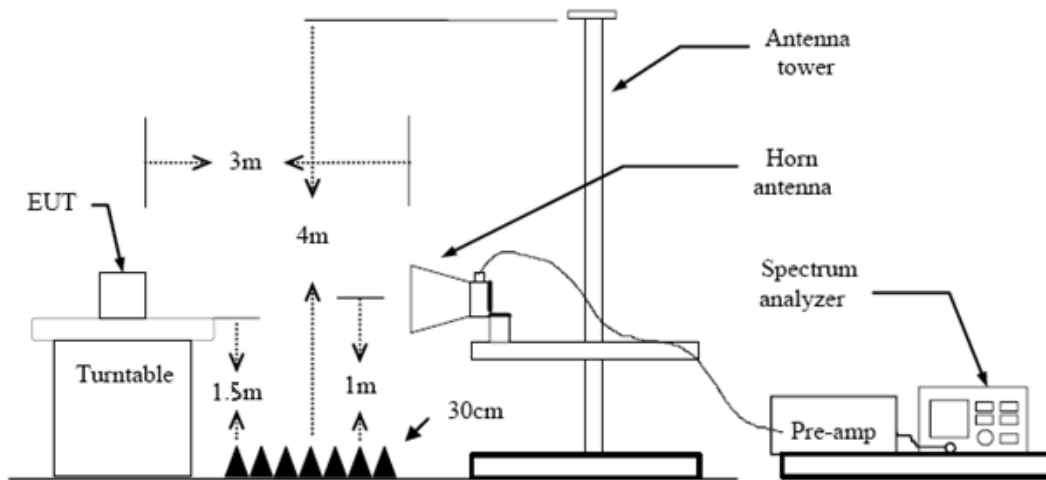
6.2 Test Setup



Below 30MHz Test Setup



Below 1000MHz Test Setup



Above 1GHz Test Setup

6.3 Test Procedure

- (1) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency Below 1GHz. The EUT was placed on a rotating 0.8m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

6.4 Deviation From Test Standard

No deviation

6.5 EUT Operating Condition

The Equipment Under Test was set to Continual Transmitting in maximum power.

6.6 Test Data

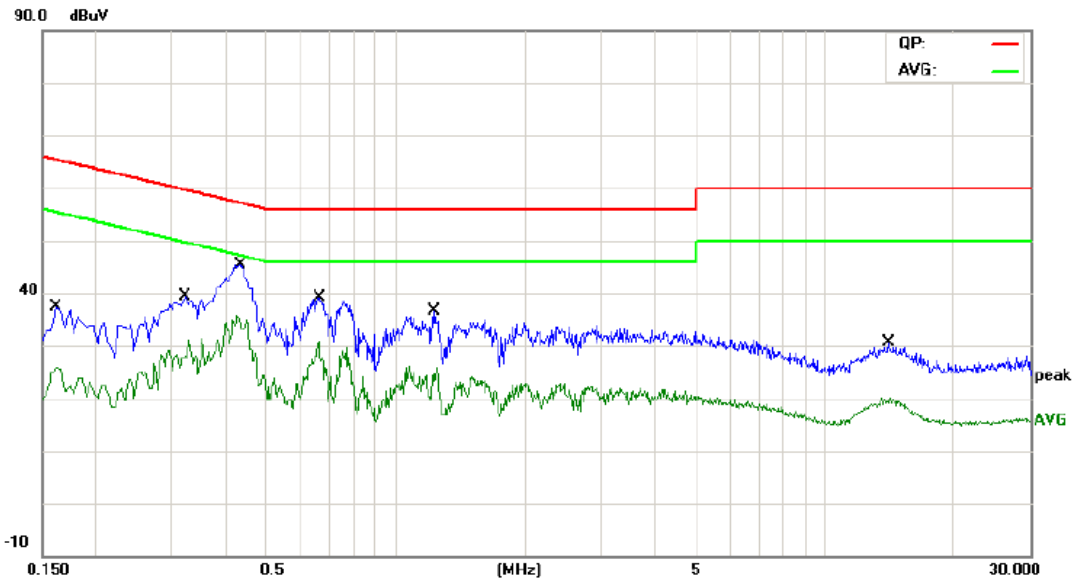
Remark: During testing above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.

Please refer to the Attachment B.

Attachment A-- Conducted Emission Test Data

Remark: All channels have been tested and Shows only the worst channels.

Temperature:	23.5°C	Relative Humidity:	45%
Test Voltage:	AC 120V/60Hz		
Terminal:	Line		
Test Mode:	Mode 1		
Remark:	Only worst case is reported		

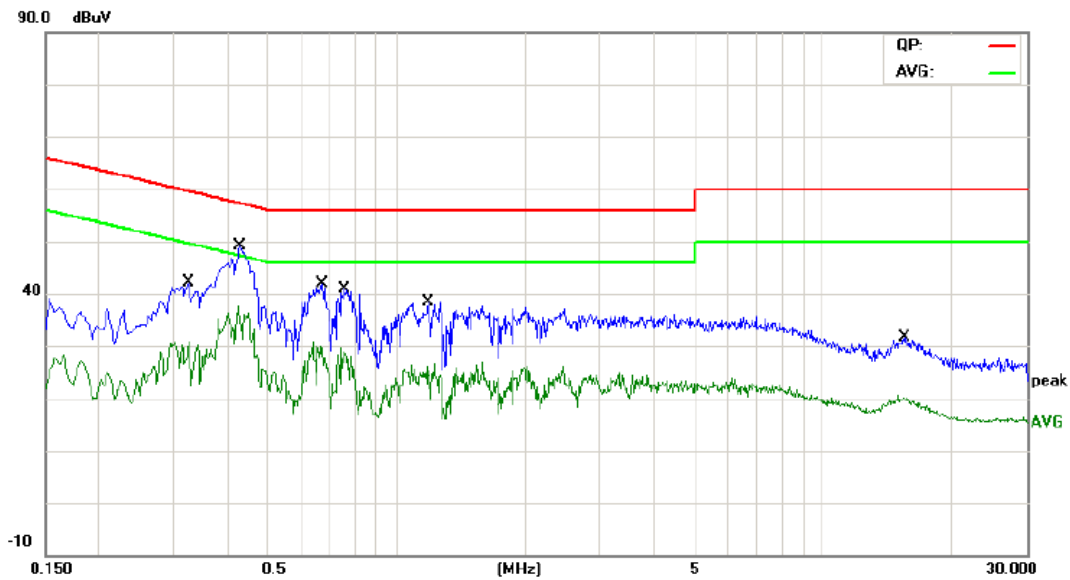


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1620	22.43	9.70	32.13	65.36	-33.23	QP
2		0.1620	14.92	9.70	24.62	55.36	-30.74	AVG
3		0.3220	25.74	9.70	35.44	59.65	-24.21	QP
4		0.3220	16.43	9.70	26.13	49.65	-23.52	AVG
5	*	0.4340	33.82	9.70	43.52	57.18	-13.66	QP
6		0.4340	23.54	9.70	33.24	47.18	-13.94	AVG
7		0.6620	26.39	9.70	36.09	56.00	-19.91	QP
8		0.6620	17.18	9.70	26.88	46.00	-19.12	AVG
9		1.2340	21.58	9.78	31.36	56.00	-24.64	QP
10		1.2340	12.74	9.78	22.52	46.00	-23.48	AVG
11		14.0460	14.06	9.96	24.02	60.00	-35.98	QP
12		14.0460	8.55	9.96	18.51	50.00	-31.49	AVG

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = QuasiPeak/Average (dBuV) - Limit (dBuV)

Temperature:	23.5°C	Relative Humidity:	45%
Test Voltage:	AC 120V/60Hz		
Terminal:	Neutral		
Test Mode:	Mode 1		
Remark:	Only worst case is reported		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.3260	29.37	9.80	39.17	59.55	-20.38	QP
2		0.3260	18.73	9.80	28.53	49.55	-21.02	AVG
3	*	0.4300	37.46	9.80	47.26	57.25	-9.99	QP
4		0.4300	26.99	9.80	36.79	47.25	-10.46	AVG
5		0.6700	28.79	9.80	38.59	56.00	-17.41	QP
6		0.6700	17.83	9.80	27.63	46.00	-18.37	AVG
7		0.7580	29.10	9.80	38.90	56.00	-17.10	QP
8		0.7580	18.63	9.80	28.43	46.00	-17.57	AVG
9		1.1900	20.96	9.80	30.76	56.00	-25.24	QP
10		1.1900	11.43	9.80	21.23	46.00	-24.77	AVG
11		15.5260	15.11	10.00	25.11	60.00	-34.89	QP
12		15.5260	8.78	10.00	18.78	50.00	-31.22	AVG

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = QuasiPeak/Average (dBuV) - Limit (dBuV)

Attachment B-- Radiated Emission Test Data

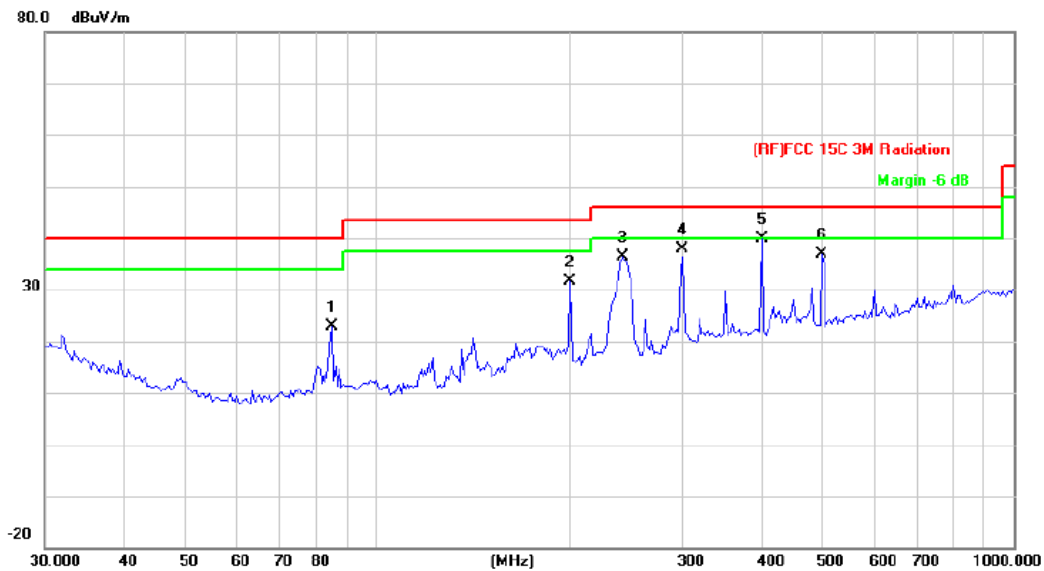
9KHz~30MHz

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

30MHz~1GHz

Temperature:	25°C	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worst case is reported.		



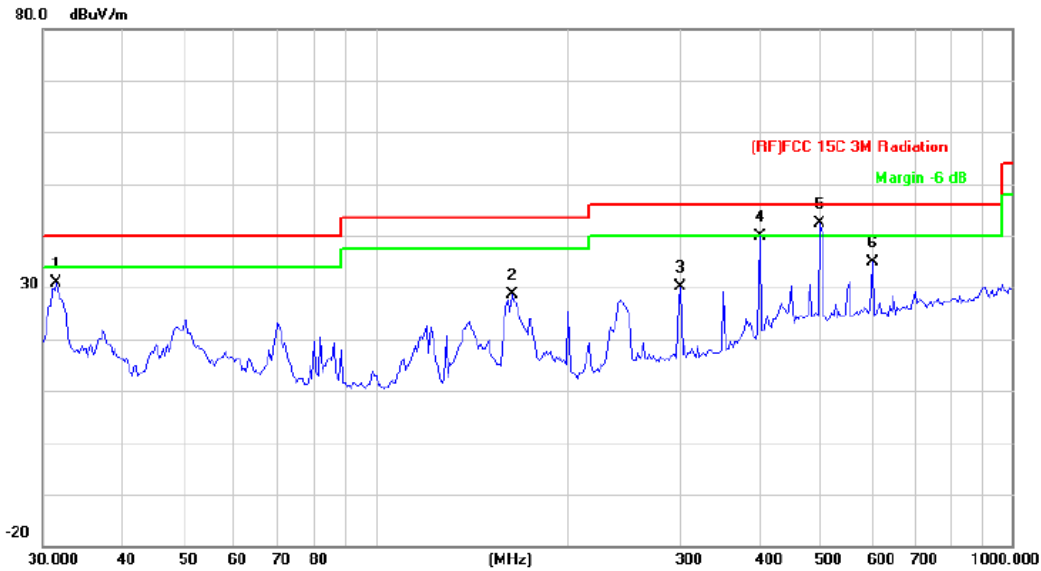
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		84.7018	45.17	-22.18	22.99	40.00	-17.01	QP
2		200.6880	51.59	-19.91	31.68	43.50	-11.82	QP
3		242.5252	53.94	-17.63	36.31	46.00	-9.69	QP
4		301.4223	54.07	-16.25	37.82	46.00	-8.18	QP
5	*	401.8385	52.23	-12.28	39.95	46.00	-6.05	QP
6		499.4246	47.35	-10.48	36.87	46.00	-9.13	QP

*:Maximum data x:Over limit !:over margin

Remark:

- 1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
- 2. QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
- 3. Margin (dB) = QuasiPeak (dBμV/m)-Limit QPK(dBμV/m)

Temperature:	25°C	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		
Ant. Pol.	Vertical		
Test Mode:	TX B Mode 2412MHz		
Remark:	Only worst case is reported.		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		31.5095	44.84	-14.08	30.76	40.00	-9.24	QP
2		163.7550	49.37	-20.68	28.69	43.50	-14.81	QP
3		301.4224	46.44	-16.25	30.19	46.00	-15.81	QP
4		401.8385	52.23	-12.28	39.95	46.00	-6.05	QP
5	*	499.4247	52.76	-10.48	42.28	46.00	-3.72	QP
6		603.5392	43.21	-8.28	34.93	46.00	-11.07	QP

*:Maximum data x:Over limit !:over margin

Remark:

1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBμV/m)= Corr. (dB/m)+ Read Level (dBμV)
3. Margin (dB) = QuasiPeak (dBμV/m)-Limit QPK(dBμV/m)

-----END OF REPORT-----