

Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC175699

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FCC Radio Test Report FCC ID: 2APRB-WNIP-2L-BU

Original Grant

Report No. TB-FCC175699

Guangzhou Juan Intelligent Tech Joint Stock Co.,Ltd **Applicant**

Equipment Under Test (EUT)

: Wireless IP Camera **EUT Name**

: WNIP-2LTA-BS Model No.

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#

NIGHT OWL Brand Name Receipt Date : 2020-09-16

2020-09-17 to 2020-10-22 **Test Date**

Issue Date : 2020-10-23

: FCC Part 15, Subpart C 15.247 **Standards**

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

the report.

Engineer Supervisor

Engineer Manager

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

TB-RF-074-1.0

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Revision History

Report No.	Version	Description	Issued Date
TB-FCC172699	Rev.01	Initial issue of report	2020-05-15
TB-FCC175699	Rev.02	FCC ID Change II	2020-10-23
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1. General Information about EUT

1.1 Client Information

Applicant		Guangzhou Juan Intelligent Tech Joint Stock Co.,Ltd
Address	1	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-2WNP 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.				
		Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz			
	K	Number of Channel:	802.11b/g/n(HT20):11 channels see note(3)			
		Antenna Gain:	5 dBi Dipole Antenna			
Product Description	:	Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n:OFDM(BPSK,QPSK,16QAM,64QAM)			
		Bit Rate of	802.11b:11/5.5/2/1 Mbps			
		Transmitter:	802.11g:54/48/36/24/18/12/9/6 Mbps			
Power Rating	:	802.11n:up to 150Mbps 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:

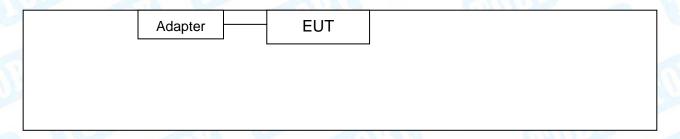
- (1) This Test Report is FCC Part 15.247 for 802.11b/g/n, the test procedure follows the FCC KDB 558074 D01 v05r02 and KDB 662911 D01 Multiple Transmitter Output v02r01.
- (2) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- (3) Channel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



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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	80	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	√



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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				
Fo	or Radiated and RF Conducted Test				
Final Test Mode	Description				
Mode 2	TX Mode B Mode Channel 01/06/11				
	TX Mode G Mode Channel 01/06/11				
Mode 3	1X Mode G Mode Charmer 01/00/11				

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.



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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.

11	WI DE	Test Software: 2	Kshell		
	Test Mode: Continuously transmitting				
Mode	Data Rate	Channel	Parameters		
	CCK/ 1Mbps	01	DEF		
802.11b	CCK/ 1Mbps	06	DEF		
	CCK/ 1Mbps	11	DEF		
6	OFDM/ 6Mbps	01	39		
802.11g	OFDM/ 6Mbps	06	39		
	OFDM/ 6Mbps	11	39		
	MCS 0	01	38		
802.11	MCS 0	06	38		
n(HT20)	MCS 0	11	40		



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1.7 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended 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.



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2. Test Summary

FCC Part 15 Subpart C(15.247)					
Standard Section FCC	Test Item	Test Item Test Sample(s) Ju		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.

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

⁽²⁾N/A is an abbreviation for Not Applicable.

⁽³⁾ the test data please refer to the original report TB-FCC172699.



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4. Test Equipment

Conducted Emissio	n 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



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5. Conducted Emission Test

5.1 Test Standard and Limit

5.1.1Test Standard

FCC Part 15.207

5.1.2 Test Limit

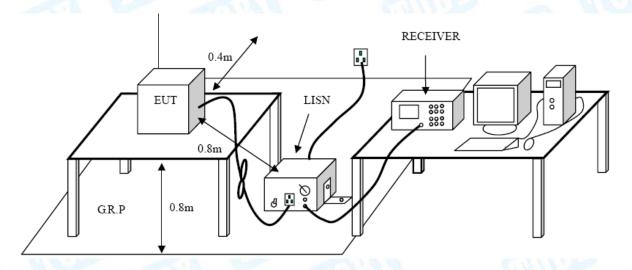
Conducted Emission Test Limit

	Maximum RF Line Voltage (dBμV)				
Frequency	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





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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.



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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	Field Strength	Measurement Distance
(MHz	(microvolt/meter)	(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	Distance of 3m	(dBuV/m)
(MHz)	Peak	Average
Above 1000	74	54

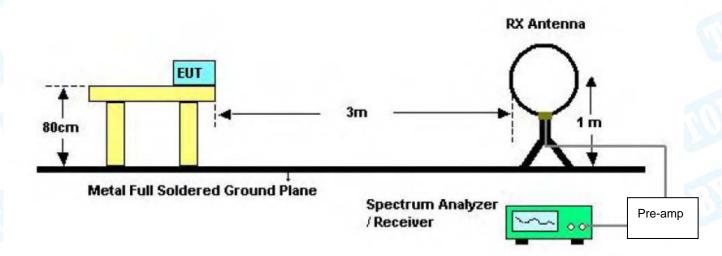
Note:

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

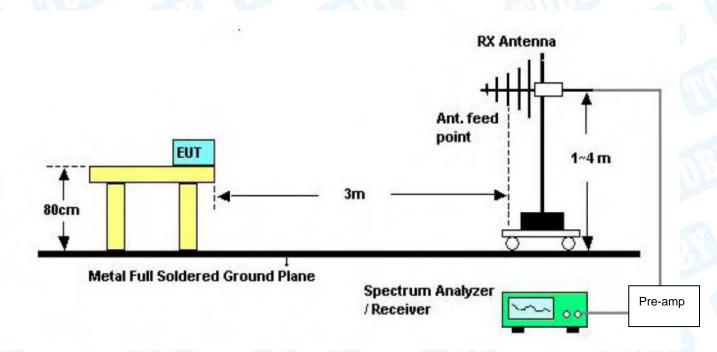


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6.2 Test Setup



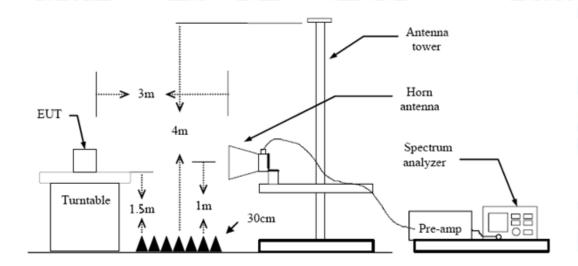
Below 30MHz Test Setup



Below 1000MHz Test Setup



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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.



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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.

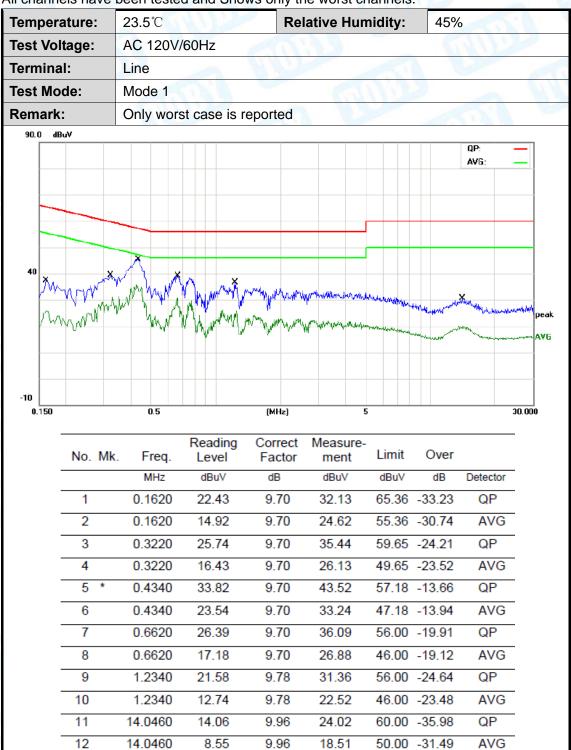


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Attachment A-- Conducted Emission Test Data

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



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



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Temp	erature:	23.5℃		Re	ative Humic	dity:	45%			
Test V	oltage:	AC 120	V/60Hz			112	2	-		
Termi	nal:	Neutral	MILLER							
Test N	lode:	Mode 1					MAY.	1		
Rema	rk:	Only wo	rst case is r	eported		20	Contract of the Contract of th	69.0		
40	dBuV Man Man Man Man Man Man Man Ma			and yell for his production	far place the year of the face of the grade and the grade	sil algorithm grant back and shape	QP: AVG:	peak AVG		
-10 0.15	D	0.5	Pooding	(MHz)	Mossure			30.000		
N	o. Mk.	Freq.	Reading Level	Factor	Measure- ment	Limit	Over			
		MHz	dBuV	dB	dBuV	dBuV	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		
1	0	1.1900	11.43	9.80	21.23	46.00	-24.77	AVG		
1	1 1	15.5260	15.11	10.00	25.11	60.00	-34.89	QP		
1	2 1	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)



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Attachment B-- Radiated Emission Test Data

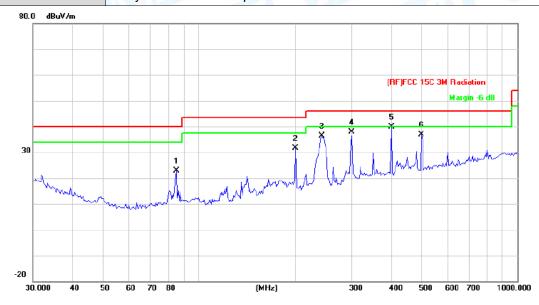
9KHz~30MHz

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℃	Relative Humidity:	55%
Test Voltage:	AC 120V/60HZ		W. S.
Ant. Pol.	Horizontal		
Test Mode:	TX B Mode 2412MHz		4/1/1/2
Remark:	Only worst case is reported.	MAN	



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	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

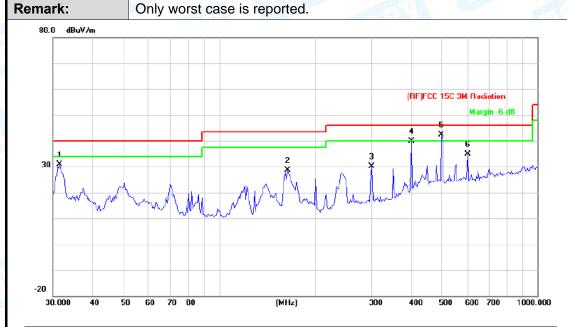
Remark

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



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	Temperature:	25 ℃	Relative Humidity:	55%				
f	Test Voltage:	AC 120V/60HZ						
	Ant. Pol.	Vertical						
	Test Mode:	TX B Mode 2412MHz						
	Dama anles	0.1						



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	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

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

----END OF REPORT----