



Test report No. : 4789969990-US-R1-V0
Page : 1 of 118
Issued date : 2021/8/3
FCC ID : MQT-AT170R18W

RADIO TEST REPORT

Product : Terminal

Model Name : xCL_AT-170-R-18W

Series Model : Utimaco C3

FCC ID : MQT-AT170R18W

Test Regulation : FCC 47 CFR Part 15 Subpart E (Section 15.407)

Received Date : 2021/6/2

Test Date : 2021/6/2 ~ 2021/7/28

Issued Date : 2021/8/3

Applicant : XAC Automation Corporation
4F., No. 30 Industry E. Road IX, Science-Based Industrial
Park Hsin-Chu, 300, Taiwan, ROC

Issued By : Underwriters Laboratories Taiwan Co., Ltd.
Building B and Building E, No. 372-7, Sec. 4, Zhongxing
Rd., Zhudong Township, Hsinchu County, Taiwan



The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report are responsible of the test sample(s) provided by the client only and are not to be used to indicate applicability to other similar products.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Telephone :+886-2-7737-3000
Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Table of Contents

1. Attestation of Test Results	4
2. Summary of Test Results	5
3. Test Methodology and Reference Procedures.....	6
4. Facilities and Accreditation.....	6
5. Measurement Uncertainty	7
6. Equipment under Test	8
6.1. Description of EUT.....	8
6.2. Channel List.....	10
6.3. Test Condition.....	12
6.4. Description of Available Antennas.....	12
6.5. Test Mode Applicability and Tested Channel Detail.....	13
6.6. Duty cycle	15
7. Test Equipment.....	16
8. Description of Test Setup.....	18
9. Test Results.....	20
9.1. 6dB Bandwidth	20
9.2. 26dB Bandwidth	23
9.3. Occupied Bandwidth.....	26
9.4. Conducted output power	31
9.5. Power Spectral Density.....	35
9.6. Frequency Stability	42
9.7. Radiated Spurious Emission	44
9.8. AC Power Line Conducted Emission	85
Appendix I Radiated Band Edge and OOB Measurement.....	91
Appendix II Radiated Spurious Emission Measurement	108

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



1. Attestation of Test Results

APPLICANT: XAC Automation Corporation
 4F., No. 30 Industry E. Road IX, Science-Based Industrial Park
 Hsin-Chu, 300, Taiwan, ROC

MANUFACTURER: XAC Automation Corporation
 4F., No. 30 Industry E. Road IX, Science-Based Industrial
 Park Hsin-Chu, 300, Taiwan, ROC

EUT DESCRIPTION: Terminal

BRAND: XAC, Utimaco

MODEL: xCL_AT-170-R-18W

SERIES MODEL: Utimaco C3

SAMPLE STAGE: Engineering Verification Test sample

DATE of TESTED: 2021/6/2 ~ 2021/7/28

APPLICABLE STANDARDS	
STANDARD	Test Results
FCC 47 CFR PART 15 Subpart E (Section 15.407)	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

Sally Lu

Sally Lu
Project Handler

Date : 2021/8/3

Approved and Authorized By:

Mike Cai

Mike Cai
Engineer Project Associate

Date : 2021/8/3

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
 Telephone : +886-2-7737-3000
 Facsimile (FAX) : +886-3-583-7948



2. Summary of Test Results

Summary of Test Results		
FCC Clause	Test Items	Result
15.407(e)	6dB Bandwidth	PASS
15.403(i)	26dB Bandwidth	PASS
2.1049	Occupied Bandwidth	See Note2
15.407(a)(1/2/3)	Conducted Output Power	PASS
15.407(a)(1/2/3)	Power Spectral Density	PASS
15.407(g)	Frequency Stability	PASS
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions and Band Edge Measurement	PASS
15.407(b)(6)	AC Power Conducted Emission	PASS
15.203	Antenna Requirement	PASS
15.407(h)	Dynamic Frequency Selection	See Note3

Note:

1. For the Radiated Band Edge and OOB test plots were recorded in Appendix I, the Radiated Emissions test plots were recorded in Appendix II.
2. The Occupied Bandwidth was reference only.
3. The “Dynamic Frequency Selection measurement” was recorded in Report No.: 4789969990-US-R2-V0.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with 47 CFR FCC Part 2, KDB789033 D02 General UNII Test Procedure New Rules v02r01, KDB414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013.

4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398. The full scope of accreditation can be viewed at http://accreditation.taftw.org.tw/taf/public/basic/viewApplyItems.action?unitNo=3398

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948



5. Measurement Uncertainty

For statement of conformity, accuracy method (Section 8.2.4 and 8.2.5 of ISO Guide 98-4) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k=2$.

Measurement	Frequency	Uncertainty
Conducted disturbance at mains terminals ports	150kHz ~ 30MHz	± 3.1 dB
RF Conducted	9 kHz - 40GHz	± 1.9 dB
Radiated disturbance below 30MHz	9 kHz - 30 MHz	± 1.9 dB
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	± 5.4 dB
Radiated disturbance above 1 GHz	1GHz ~ 40GHz	± 4.7 dB

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



6. Equipment under Test

6.1. Description of EUT

Product	Terminal	
Brand Name	XAC, Utimaco	
Model Name	xCL_AT-170-R-18W	
Series Model	Utimaco C3	
Operating Frequency	5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5700 MHz, 5745 ~ 5825 MHz	
Modulation	64QAM, 16QAM, QPSK, BPSK	
Transfer Rate	802.11a: up to 54 Mbps 802.11n: up to MCS7	
Number of Channel	5180 ~ 5240 MHz	4 for 802.11a, 802.11n (HT20)
		2 for 802.11n (HT40)
	5260 ~ 5320 MHz	4 for 802.11a, 802.11n (HT20)
		2 for 802.11n (HT40)
	5500 ~ 5700 MHz	11 for 802.11a, 802.11n (HT20)
		5 for 802.11n (HT40)
	5745 ~ 5825 MHz	5 for 802.11a, 802.11n (HT20)
		2 for 802.11n (HT40)
Maximum Output Power	5180 ~ 5240 MHz: 15.86 dBm 5260 ~ 5320 MHz: 16.29 dBm 5500 ~ 5700 MHz: 16.41 dBm 5745 ~ 5825 MHz: 16.25 dBm	
Normal Voltage	5Vdc from adapter or host 3.8Vdc from battery	
S/N	Conducted Test: 1740D2103 Radiated Test: 1740D2107	
Sample ID	Conducted Test: 3949576 Radiated Test: 3949578	
Software Version	Android Version: 8.1.0 Kernel Version: 3.18.71 (gcc version 4.8(GCC))	

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Telephone :+886-2-7737-3000
Facsimile (FAX) :+886-3-583-7948



Note:

1. The models difference table as below:

Main Model Name		
Brand	Model	Difference
XAC	xCL_AT-170-R-18W	-
Series Model Name		
Brand	Model	Difference
Utimaco	Utimaco C3	For market segmentation

2. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

Modulation Mode	Tx,Rx Function
802.11a	1TX,1RX
802.11n (HT20)	1TX,1RX
802.11n (HT40)	1TX,1RX

3. The EUT could be supplied with rechargeable battery as the following table:

Brand Name	Model	Description
Shenzhen Rishengzhi Electronics Technology Co., Ltd.	J601	3.8Vdc, 5200mAh

4. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



6.2. Channel List

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

FOR 5260 ~ 5320MHz

4 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



FOR 5500 ~ 5700MHz

11 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz	-	-

5 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz	-	-

FOR 5745 ~ 5825MHz

5 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz	-	-

2 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz



6.3. Test Condition

Test Item	Test Site No.	Environmental Condition	Input Power	Test Date	Tested by
Antenna Port Conducted Measurement	SR4	22~26°C/ 62~68%RH	5Vdc from host	2021/06/11~ 2021/07/27	Patrick Kuan
Radiated Spurious Emission	966-2	22~26°C/ 62~68%RH	5Vdc from host	2021/06/02~ 2021/07/28	Patrick Kuan
AC power Line Conducted Emission	SR1	22~26°C/ 62~68%RH	5Vdc from host	2021/06/16~ 2021/06/29	Patrick Kuan

FCC Test Firm Registration Number: 498077

6.4. Description of Available Antennas

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Maximum Gain (dBi)
1	Chain (0)	AWAN	AYF6P-100000	PIFA	2.4GHz: 1.2 5GHz: 3.71

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer's specification or user's manual.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



6.5. Test Mode Applicability and Tested Channel Detail

- The EUT has three power source types: 3.8Vdc from battery, 5V from host and 5V from adapter. Three types were pre-tested, the worst case was found in the 5Vdc from host. Therefore, only the test data of the 5Vdc from host was recorded in this report.
- The fundamental of the EUT was investigated in three orthogonal axes X-Y/Y-Z/X-Z, it was determined that X-Z axis was worst-case. Therefore, all final radiated testing was performed with the EUT in X-Z axis.
- For Antenna Port Conducted Measurement, this item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.
- For below 1 GHz radiated emission and AC power line conducted emission have performed all modes of operation were investigated and the worst-case emissions are reported.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Test item	Mode	Frequency Band (MHz)	Modulation Technology	Available Channel	Test Channel	Data Rate
Radiated Emissions (Above 1GHz)	802.11a	5180-5240	OFDM	36 to 48	36, 44, 48	6Mbps
	802.11n HT20			36 to 48	36, 44, 48	6.5Mbps
	802.11n HT40			38 to 46	38, 46	13.5Mbps
	802.11a	5260-5320	OFDM	52 to 64	52, 60, 64	6Mbps
	802.11n HT20			52 to 64	52, 60, 64	6.5Mbps
	802.11n HT40			54 to 62	54, 62	13.5Mbps
	802.11a	5500-5700	OFDM	100 to 140	100,116,140	6Mbps
	802.11n HT20			100 to 140	100,116,140	6.5Mbps
	802.11n HT40			102 to 134	102, 110, 134	13.5Mbps
	802.11a	5745-5825	OFDM	149 to 165	149, 157, 165	6Mbps
	802.11n HT20			149 to 165	149, 157, 165	6.5Mbps
	802.11n HT40			151 to 159	151, 159	13.5Mbps
Radiated Emissions (Below 1GHz)	802.11a	5180-5240	OFDM	36 to 48	44	6Mbps
AC Power Line Conducted Emission	802.11a	5180-5240	OFDM	36 to 48	44	6Mbps

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Telephone :+886-2-7737-3000
Facsimile (FAX) :+886-3-583-7948



Test item	Mode	Frequency Band (MHz)	Modulation Technology	Available Channel	Test Channel	Data Rate
Antenna Port Conducted Measurement	802.11a	5180-5240	OFDM	36 to 48	36, 44, 48	6Mbps
	802.11n HT20			36 to 48	36, 44, 48	6.5Mbps
	802.11n HT40			38 to 46	38, 46	13.5Mbps
	802.11a	5260-5320	OFDM	52 to 64	52, 60, 64	6Mbps
	802.11n HT20			52 to 64	52, 60, 64	6.5Mbps
	802.11n HT40			54 to 62	54, 62	13.5Mbps
	802.11a	5500-5700	OFDM	100 to 140	100,116,140	6Mbps
	802.11n HT20			100 to 140	100,116,140	6.5Mbps
	802.11n HT40			102 to 134	102, 110, 134	13.5Mbps
	802.11a	5745-5825	OFDM	149 to 165	149, 157, 165	6Mbps
	802.11n HT20			149 to 165	149, 157, 165	6.5Mbps
	802.11n HT40			151 to 159	151, 159	13.5Mbps

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0

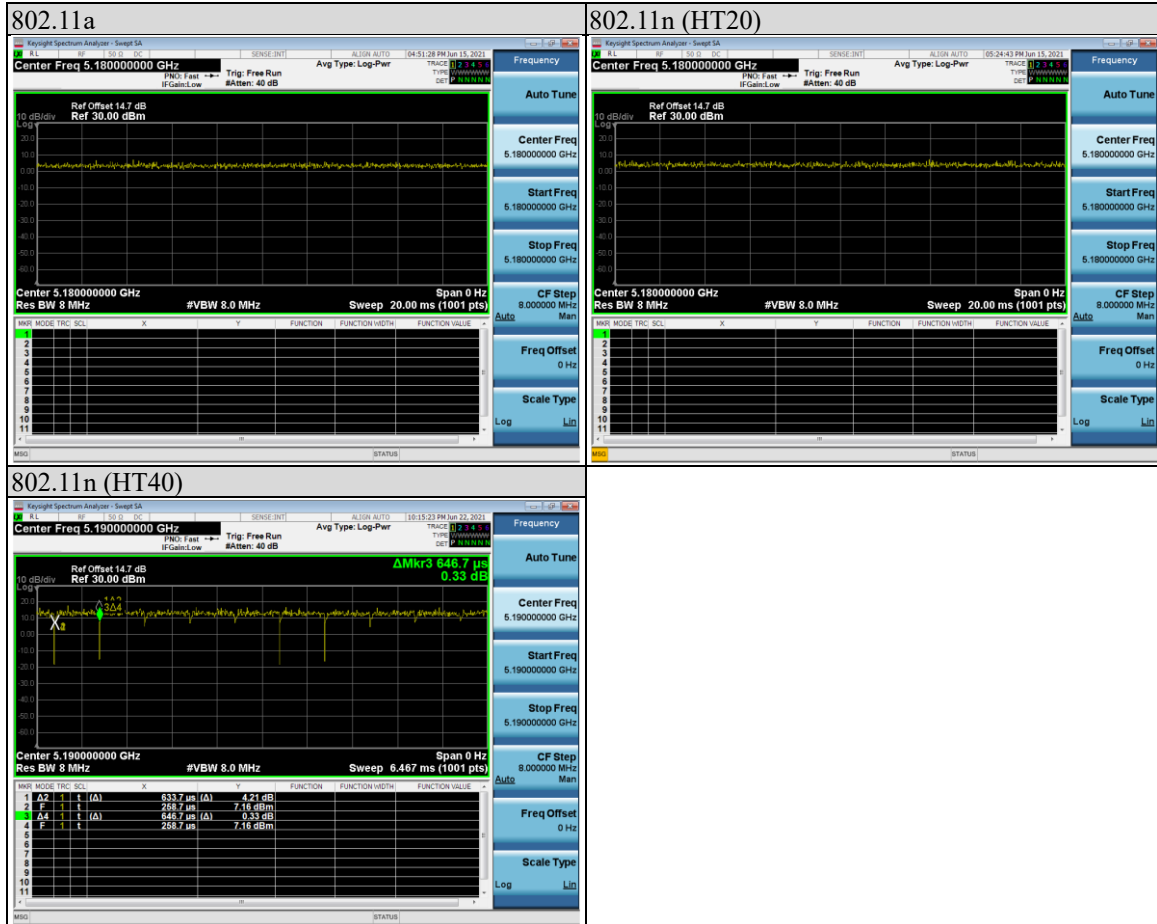


6.6. Duty cycle

802.11a: Duty cycle = 20/20 = 1 duty cycle of test signal is $\geq 98\%$, duty factor is not required.

802.11n (HT20): Duty cycle = 20/20 = 1 duty cycle of test signal is $\geq 98\%$, duty factor is not required.

802.11n (HT40): Duty cycle = 0.6337/0.6467 = 0.98 duty cycle of test signal is $\geq 98\%$, duty factor is not required.





7. Test Equipment

Test Equipment List					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Expired date
Radiated Spurious Emission					
Spectrum Analyzer	Keysight	N9010A	MY56070827	2020/11/11	2021/11/10
EMI Test Receiver	Rohde & Schwarz	ESR7	101754	2020/12/11	2021/12/10
Loop Antenna	ETS lindgren	6502	00213440	2020/12/25	2021/12/24
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT-N0538	2021/1/13	2022/1/12
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	01690	2020/12/30	2021/12/29
Horn Antenna (18-40 GHz)	Schwarzbeck	BBHA 9170	781	2020/12/30	2021/12/29
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	2020/6/9	2021/6/8
				2021/6/8	2022/6/7
Preamplifier (1-18 GHz)	EMCI	EMC051835BE	980406	2021/2/3	2022/2/2
Preamplifier (18-40GHz)	EMCI	EMC184040SEE	980426	2020/5/19	2021/5/18
				2021/5/19	2022/5/18
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-4 & 170425-2	2021/1/22	2022/1/21
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-1 & 170214-2	2021/1/22	2022/1/21

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Test report No. : 4789969990-US-R1-V0
Page : 17 of 118
Issued date : 2021/8/3
FCC ID : MQT-AT170R18W

Test Equipment List					
Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Expired date
Antenna Port Conducted Measurement					
Spectrum Analyzer	Keysight	N9010A	MY56070834	2020/11/6	2021/11/5
Pulse Power Sensor	Anritsu	MA2411B	1531202	2020/12/21	2021/12/20
Power Meter	Anritsu	ML2495A	1645002	2020/12/21	2021/12/20
Temperature & Humidity Test Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA1701-010	2021/3/22	2022/3/21
AC power Line Conducted Emission					
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	2020/11/17	2021/11/16
Two-Line V-Network	Rohde & Schwarz	ENV216	102136	2020/8/19	2021/8/18
Impuls-Begrenzer Pulse Limiter	Rohde & Schwarz	ESH3-Z2	102219-Qt	2020/8/12	2021/8/11
Cables	TITAN	CFD200	T0732ACFD20 020A300-1	2021/3/2	2022/3/1

UL Software		
Description	Name	Version
Radiated measurement	e3	6.191211 (V6)
Conducted measurement	RF Conducted Test Tools	ver 2.4.0.620b
AC power Line Conducted Emission	EZ_EMG	UL-3A1.2

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



8. Description of Test Setup

Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
A	Laptop	Lenovo	T430	PBE38AK	Mach/Model: 2349CW9
B	Headset	TECO	XYFSE005	-	Provide by Lab

I/O Cables

ID	Equipment	Brand Name	Model Name	Length (m)	Remark
1	USB to Type C Cable	N/A	N/A	1.2	Provide by Client

Test Setup

Controlled using a bespoke application (QRCT (Version: 3.0.124.0)) on a test Notebook. The application was used to enable a continuous transmission mode and to select the test channels, data rates, modulation schemes and power setting as required.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

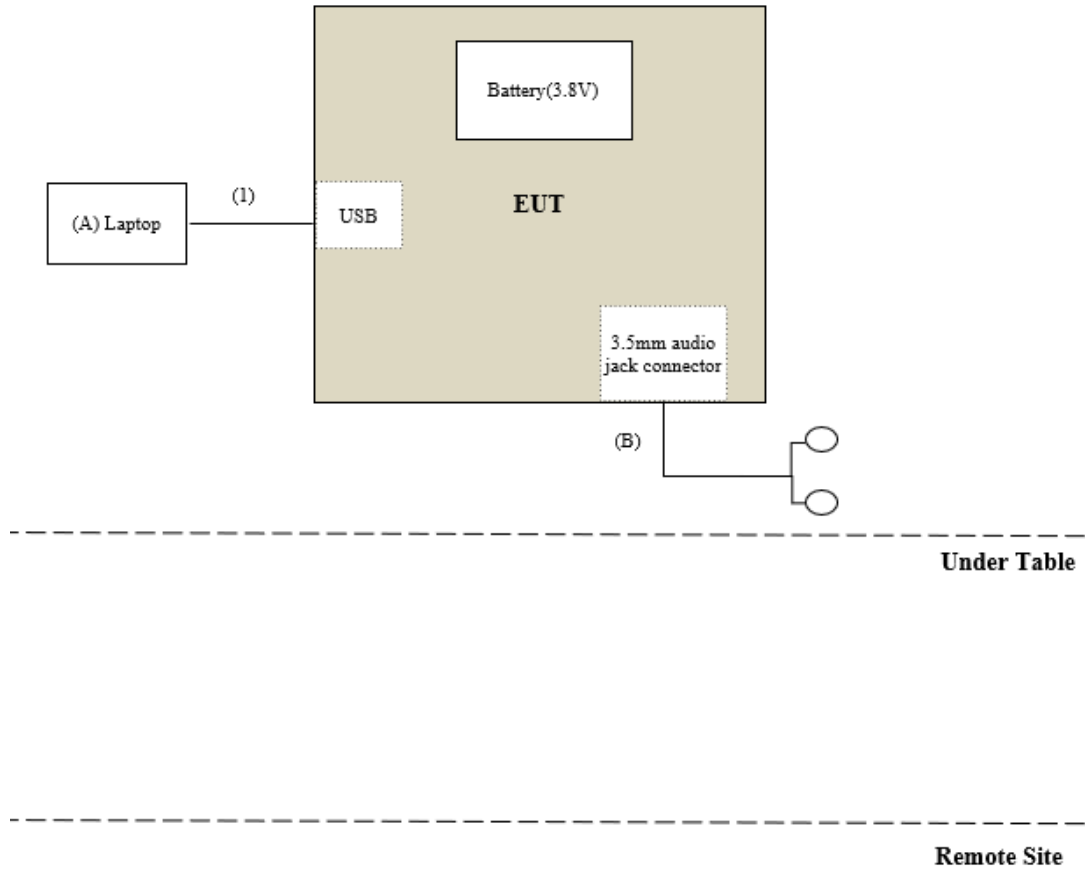
Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Setup Diagram for Test



Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



9. Test Results

9.1. 6dB Bandwidth

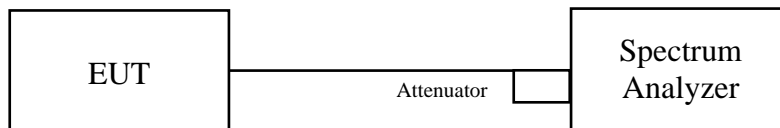
Requirements

The minimum 6 dB bandwidth shall be at least 500 kHz.

Test procedure

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Test Data

802.11a

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	16.38	0.5	PASS
157	5785	16.35	0.5	PASS
165	5825	16.44	0.5	PASS

802.11n (HT20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	17.58	0.5	PASS
157	5785	17.58	0.5	PASS
165	5825	17.58	0.5	PASS

802.11n (HT40)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
151	5755	35.16	0.5	PASS
159	5795	35.04	0.5	PASS

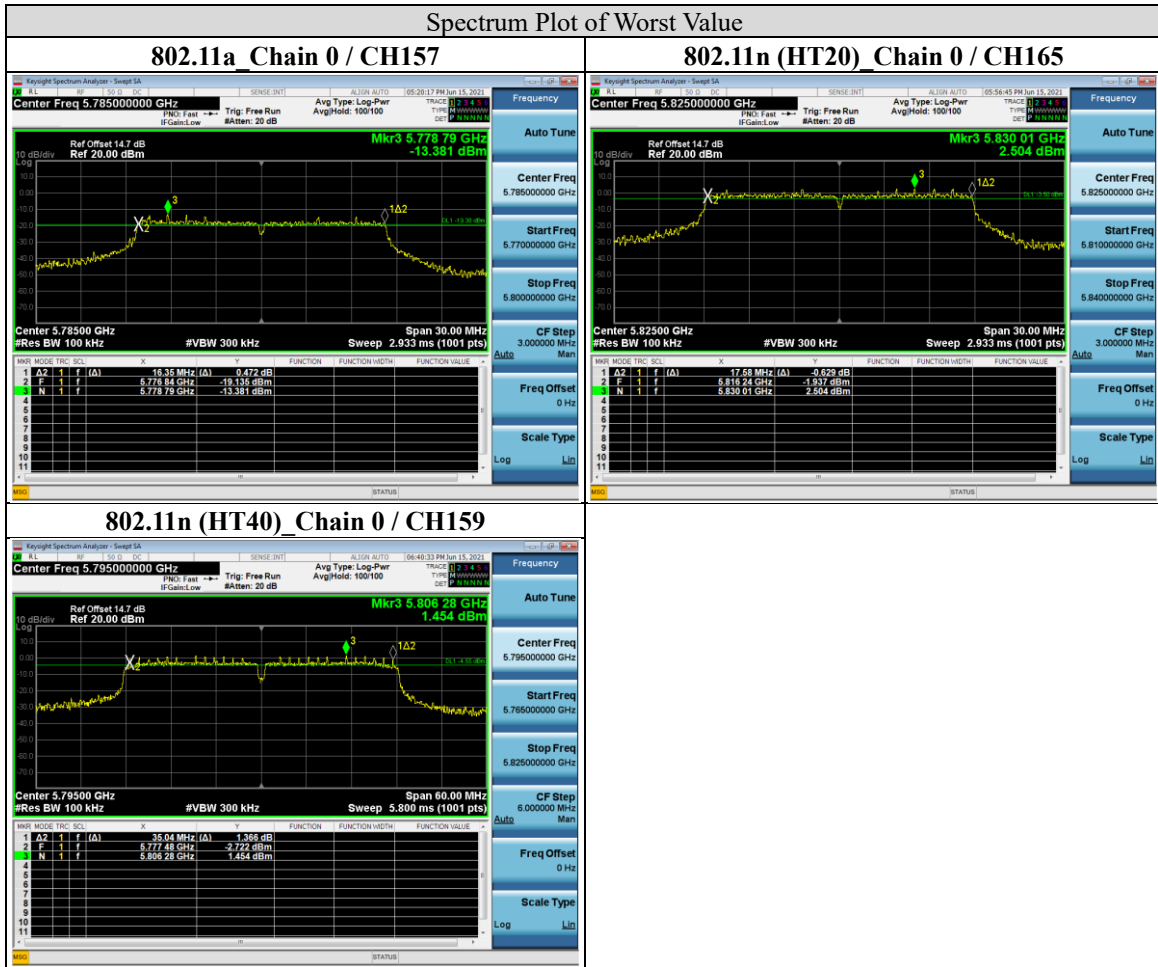
Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



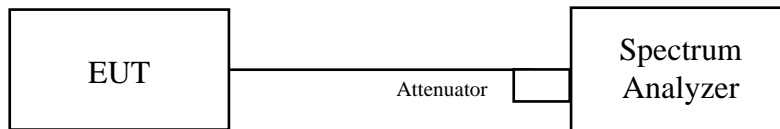


9.2. 26dB Bandwidth

Test procedure

- a. Set RBW = approximately 1% of the emission bandwidth.
- b. Set the VBW > RBW.
- c. Detector = Peak.
- d. Trace mode = max hold.
- e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Test Data

802.11a

Channel	Channel Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	24.94
44	5220	22.55
48	5240	24.07
52	5260	24.04
60	5300	23.88
64	5320	24.11
100	5500	26.39
116	5580	27.18
140	5700	25.42

802.11n (HT20)

Channel	Channel Frequency (MHz)	26 dB Bandwidth (MHz)
36	5180	24.55
44	5220	23.05
48	5240	23.03
52	5260	22.70
60	5300	24.02
64	5320	23.63
100	5500	29.35
116	5580	28.09
140	5700	28.13

802.11n (HT40)

Channel	Channel Frequency (MHz)	26 dB Bandwidth (MHz)
38	5190	44.76
46	5230	45.16
54	5270	46.97
62	5310	44.92
102	5510	49.04
110	5550	59.96
134	5670	58.77

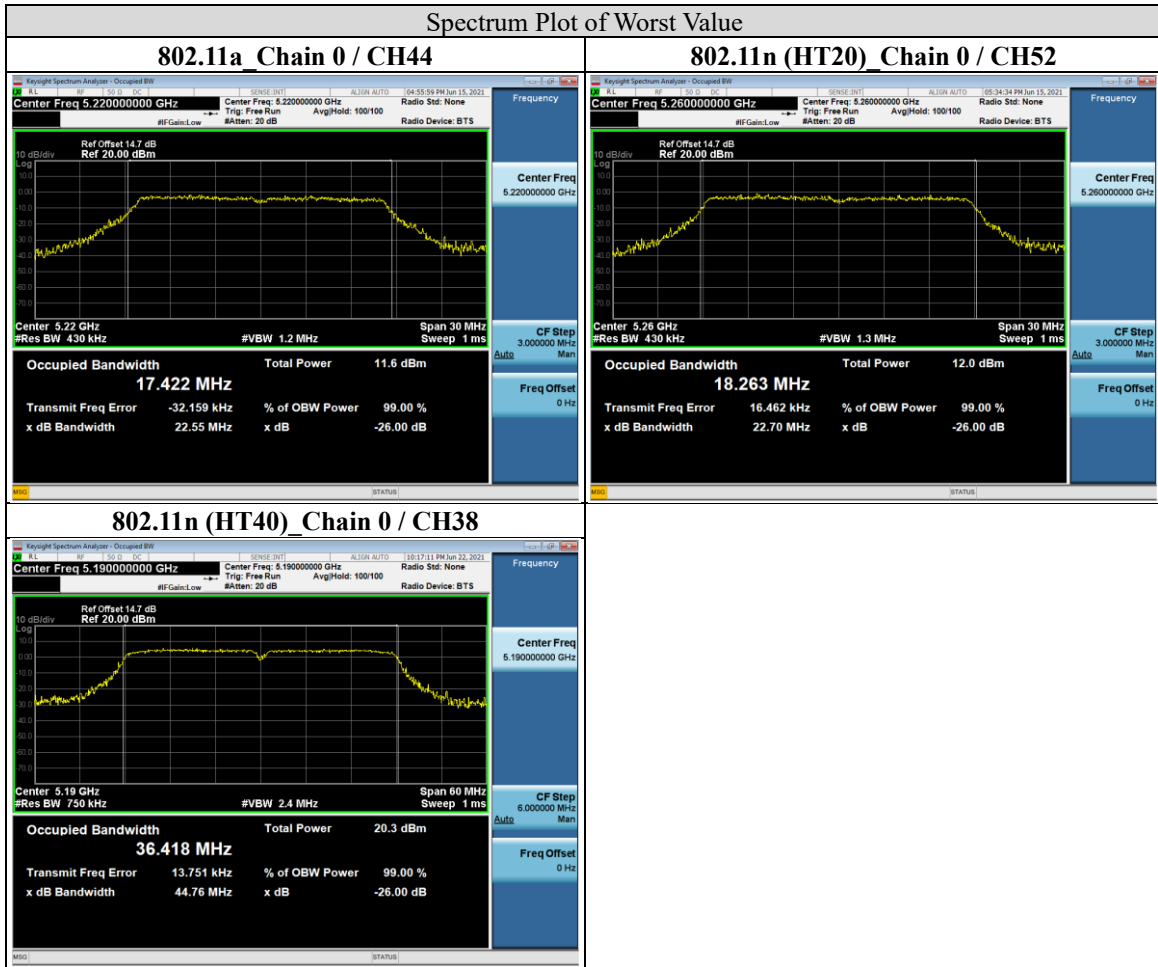
Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

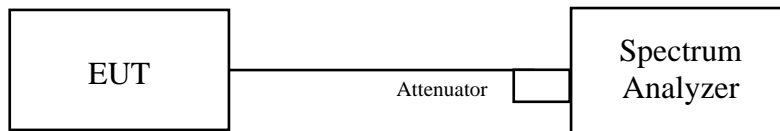


9.3. Occupied Bandwidth

Test procedure

- a. Set center frequency to the nominal EUT channel center frequency.
- b. Set span = 1.5 times to 5.0 times the OBW.
- c. Set RBW = 1% to 5% of the OBW
- d. Set VBW $\geq 3 \times$ RBW
- e. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- f. Use the 99% power bandwidth function of the instrument (if available).
- g. If the instrument does not have a 99% power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Test Data

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	17.007
44	5220	17.050
48	5240	17.022
52	5260	17.066
60	5300	17.068
64	5320	17.036
100	5500	18.141
116	5580	17.790
140	5700	17.331
149	5745	17.051
157	5785	17.118
165	5825	17.081

802.11n (HT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	18.111
44	5220	18.133
48	5240	18.096
52	5260	18.089
60	5300	18.187
64	5320	18.045
100	5500	18.760
116	5580	18.749
140	5700	18.351
149	5745	18.200
157	5785	18.188
165	5825	18.165

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



802.11n (HT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
38	5190	36.119
46	5230	36.138
54	5270	36.291
62	5310	36.381
102	5510	36.325
110	5550	37.131
134	5670	36.725
151	5755	36.382
159	5795	36.430

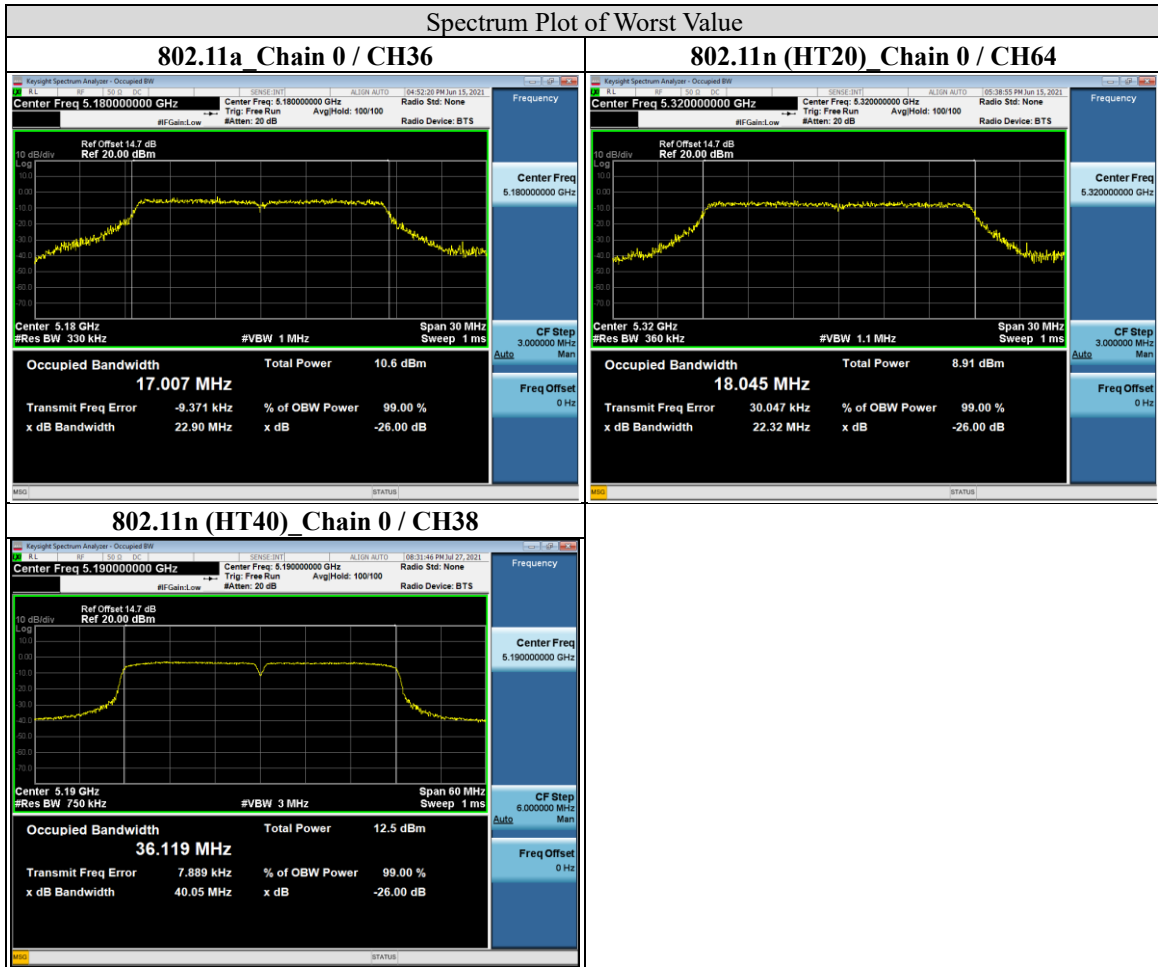
Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0

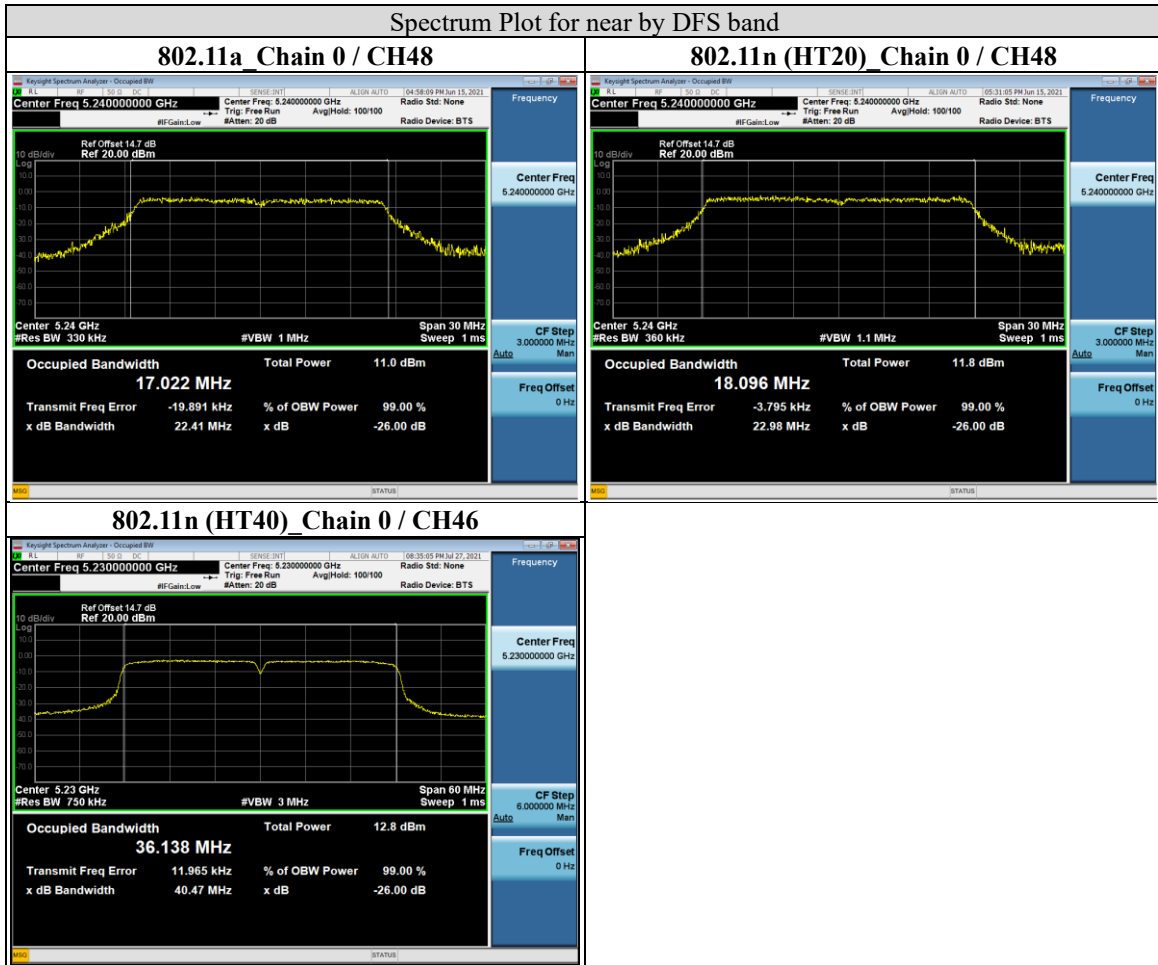


Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948



Modulation	Channel	Channel Frequency (MHz)	Highest Occupied Channel Edge (MHz)
			CHAIN 0
802.11a	CH48	5240	5248.511
802.11n (HT20)	CH48	5240	5249.048
802.11n (HT40)	CH46	5230	5248.069

Note:

- The Highest Occupied Channel Edge is all <5250 MHz, so in nearby DFS band channels no need for DFS function
- Highest Occupied Channel Edge frequency calculation = Center Frequency + (1/2*Occupied Bandwidth)

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948



9.4. Conducted output power

Requirements

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) Max. e.i.r.p \leq 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$
		Fixed point-to-point Access Point	1 Watt (30 dBm) If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$
		Indoor Access Point	1 Watt (30 dBm) If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$
	√	Client device	250mW (24 dBm) If $G_{TX} > 6$ dBi, then $P_{Out} = 23.98 - (G_{TX} - 6)$
U-NII-2A		√	250mW (24 dBm) or 11 dBm+10 log B* If $G_{TX} > 6$ dBi, then $P_{Out} = 23.98 - (G_{TX} - 6)$
U-NII-2C		√	250mW (24 dBm) or 11 dBm+10 log B* If $G_{TX} > 6$ dBi, then $P_{Out} = 23.98 - (G_{TX} - 6)$
U-NII-3		√	For Point-to-multipoint systems (P2M): 1 Watt (30 dBm). If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ For Point-to-point systems (P2P): 1 Watt (30 dBm)

Note:

1. P_{Out} = maximum conducted output power in dBm,
2. G_{TX} = the maximum transmitting antenna directional gain in dBi.
3. B is the 26 dB emission bandwidth in megahertz

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Test Procedure

For Average Power Measurement

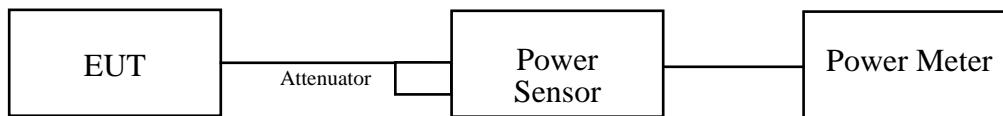
Test method PM-G

For 802.11a, 802.11n (HT20), 802.11n (HT40)

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst and set the detector to AVERAGE. Duty factor is not added to measured value.

Test Setup

For Average Power Measurement



The loss between RF output port of the EUT and the input port of the Power Meter has been taken into consideration.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Test Data

802.11a

Channel	Channel Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass/Fail
36	5180	36.559	15.63	23.98	PASS
44	5220	35.645	15.52	23.98	PASS
48	5240	36.224	15.59	23.98	PASS
52	5260	35.237	15.47	23.98	PASS
60	5300	36.308	15.60	23.98	PASS
64	5320	35.975	15.56	23.98	PASS
100	5500	37.325	15.72	23.98	PASS
116	5580	38.905	15.90	23.98	PASS
140	5700	37.154	15.70	23.98	PASS
149	5745	35.156	15.46	30	PASS
157	5785	37.844	15.78	30	PASS
165	5825	36.728	15.65	30	PASS

802.11n (HT20)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass/Fail
36	5180	36.058	15.57	23.98	PASS
44	5220	37.154	15.70	23.98	PASS
48	5240	38.548	15.86	23.98	PASS
52	5260	38.371	15.84	23.98	PASS
60	5300	37.239	15.71	23.98	PASS
64	5320	37.325	15.72	23.98	PASS
100	5500	38.905	15.90	23.98	PASS
116	5580	36.559	15.63	23.98	PASS
140	5700	36.308	15.60	23.98	PASS
149	5745	35.727	15.53	30	PASS
157	5785	35.563	15.51	30	PASS
165	5825	35.645	15.52	30	PASS

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



802.11n (HT40)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass/Fail
38	5190	23.605	13.73	23.98	PASS
46	5230	28.774	14.59	23.98	PASS
54	5270	42.56	16.29	23.98	PASS
62	5310	29.58	14.71	23.98	PASS
102	5510	32.81	15.16	23.98	PASS
110	5550	43.752	16.41	23.98	PASS
134	5670	42.954	16.33	23.98	PASS
151	5755	42.17	16.25	30	PASS
159	5795	42.073	16.24	30	PASS

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



9.5. Power Spectral Density

Requirements

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17dBm/ MHz If $G_{TX} > 6$ dBi, then $PSD = 17 - (G_{TX} - 6)$
		Fixed point-to-point Access Point	17dBm/ MHz If $G_{TX} > 23$ dBi, then $PSD = 17 - (G_{TX} - 23)$
		Indoor Access Point	17dBm/ MHz If $G_{TX} > 6$ dBi, then $PSD = 17 - (G_{TX} - 6)$
	√	Client device	11dBm/ MHz If $G_{TX} > 6$ dBi, then $PSD = 11 - (G_{TX} - 6)$
U-NII-2A		√	11dBm/ MHz If $G_{TX} > 6$ dBi, then $PSD = 11 - (G_{TX} - 6)$
U-NII-2C		√	11dBm/ MHz If $G_{TX} > 6$ dBi, then $PSD = 11 - (G_{TX} - 6)$
U-NII-3		√	For Point-to-multipoint systems (P2M): 30dBm/ 500kHz. If $G_{TX} > 6$ dBi, then $PSD = 30 - (G_{TX} - 6)$ For Point-to-point systems (P2P): 30dBm/ 500kHz

Note:

1. PSD = power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz
2. G_{TX} = the maximum transmitting antenna directional gain in dBi.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Test procedure

For U-NII-1, U-NII-2A, U-NII-2C band:

Using method as below:

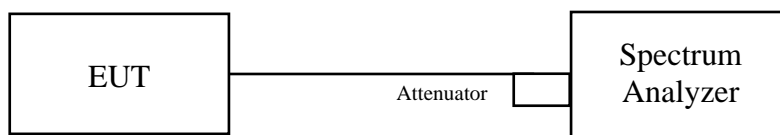
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz, Set VBW \geq 3 RBW, Detector = RMS
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value (if Duty cycle <98 %, add 10 log (1/duty cycle))

For U-NII-3 band:

Using method as below:

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz, Set VBW \geq 1 MHz, Detector = RMS
- Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
- Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10 \log (500 \text{ kHz}/300\text{kHz})$
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value. (if Duty cycle <98 %, add 10 log (1/duty cycle))

Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Test Data

For U-NII-1, U-NII-2A, U-NII-2C band

802.11a

Channel	Frequency (MHz)	PSD w/o duty factor (dBm/MHz)	Total PSD with duty factor (dBm/MHz)	PSD Maximum Limit (dBm/MHz)	Pass/Fail
36	5180	2.874	2.874	11	PASS
44	5220	1.792	1.792	11	PASS
48	5240	1.718	1.718	11	PASS
52	5260	2.257	2.257	11	PASS
60	5300	1.610	1.610	11	PASS
64	5320	1.366	1.366	11	PASS
100	5500	3.350	3.350	11	PASS
116	5580	3.286	3.286	11	PASS
140	5700	3.834	3.834	11	PASS

NOTE: Refer to section 6.6 for duty cycle spectrum plot.

802.11n (HT20)

Channel	Frequency (MHz)	PSD w/o duty factor (dBm/MHz)	Total PSD with duty factor (dBm/MHz)	PSD Maximum Limit (dBm/MHz)	Pass/Fail
36	5180	3.580	3.580	11	PASS
44	5220	2.211	2.211	11	PASS
48	5240	2.057	2.057	11	PASS
52	5260	2.043	2.043	11	PASS
60	5300	1.298	1.298	11	PASS
64	5320	1.244	1.244	11	PASS
100	5500	3.675	3.675	11	PASS
116	5580	3.376	3.376	11	PASS
140	5700	3.470	3.470	11	PASS

NOTE: Refer to section 6.6 for duty cycle spectrum plot.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



802.11n (HT40)

Channel	Frequency (MHz)	PSD w/o duty factor (dBm/MHz)	Total PSD with duty factor (dBm/MHz)	PSD Maximum Limit (dBm/MHz)	Pass/Fail
38	5190	-1.712	-1.712	11	PASS
46	5230	-1.502	-1.502	11	PASS
54	5270	-0.337	-0.337	11	PASS
62	5310	-3.083	-3.083	11	PASS
102	5510	-1.001	-1.001	11	PASS
110	5550	1.584	1.584	11	PASS
134	5670	0.937	0.937	11	PASS

NOTE: Refer to section 6.6 for duty cycle spectrum plot.

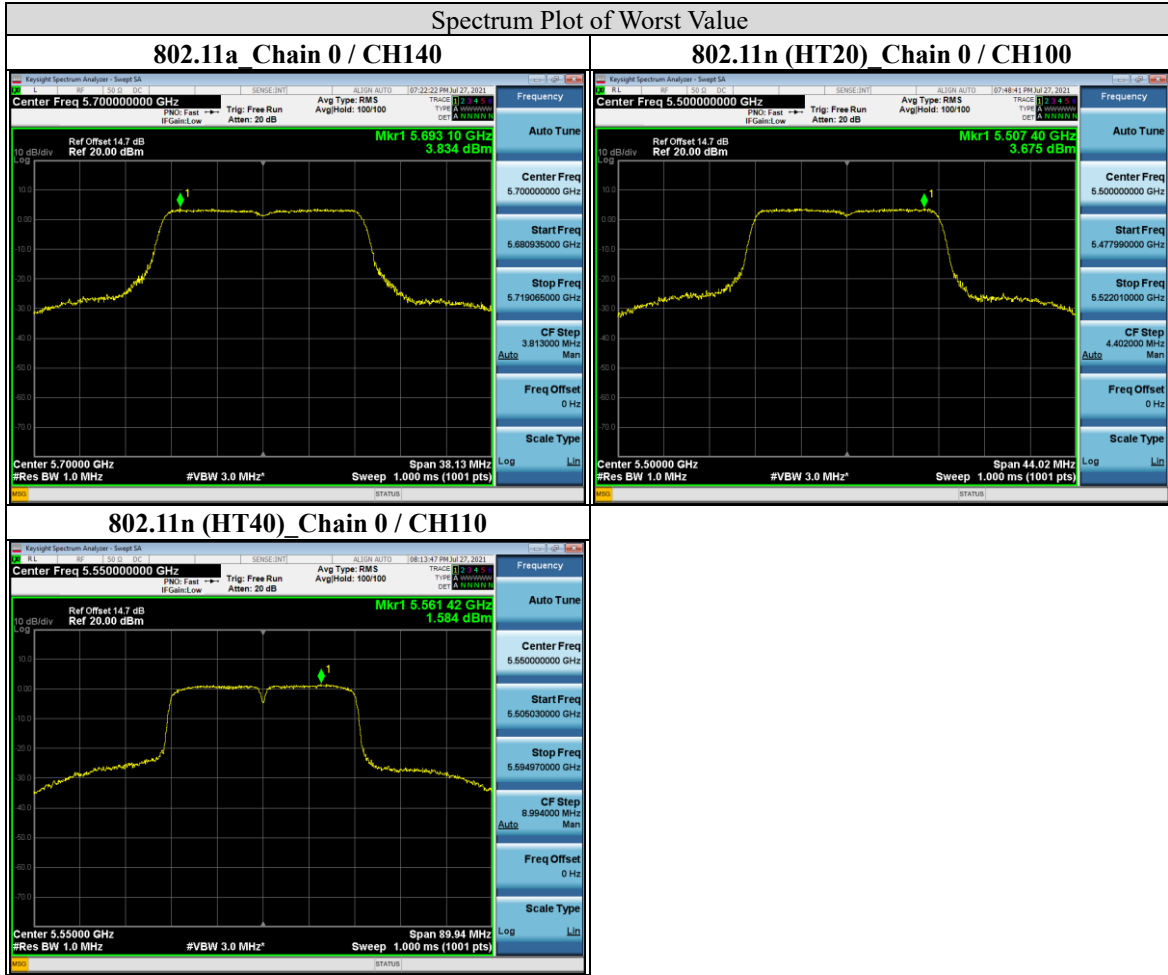
Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948



For U-NII-3 Band

802.11a

Channel	Frequency (MHz)	Total PSD w/o BWCF (dBm/300 kHz)	Total PSD with BWCF (dBm/500 kHz)	Total PSD with duty factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass/Fail
149	5745	-2.912	-0.69	-0.69	30.00	PASS
157	5785	-3.331	-1.11	-1.11	30.00	PASS
165	5825	-2.712	-0.49	-0.49	30.00	PASS

Note:

1. Refer to section 6.6 for duty cycle spectrum plot.
2. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$.

802.11n (HT20)

Channel	Frequency (MHz)	Total PSD w/o BWCF (dBm/300 kHz)	Total PSD with BWCF (dBm/500 kHz)	Total PSD with duty factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass/Fail
149	5745	-3.822	-1.60	-1.60	30.00	PASS
157	5785	-4.111	-1.89	-1.89	30.00	PASS
165	5825	-3.386	-1.17	-1.17	30.00	PASS

Note:

1. Refer to section 6.6 for duty cycle spectrum plot.
2. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$.

802.11n (HT40)

Channel	Frequency (MHz)	Total PSD w/o BWCF (dBm/300 kHz)	Total PSD with BWCF (dBm/500 kHz)	Total PSD with duty factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass/Fail
151	5755	-5.689	-3.47	-3.47	30.00	PASS
159	5795	-5.573	-3.35	-3.35	30.00	PASS

Note:

1. Refer to section 6.6 for duty cycle spectrum plot.
2. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948



Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 6.0

9.6. Frequency Stability

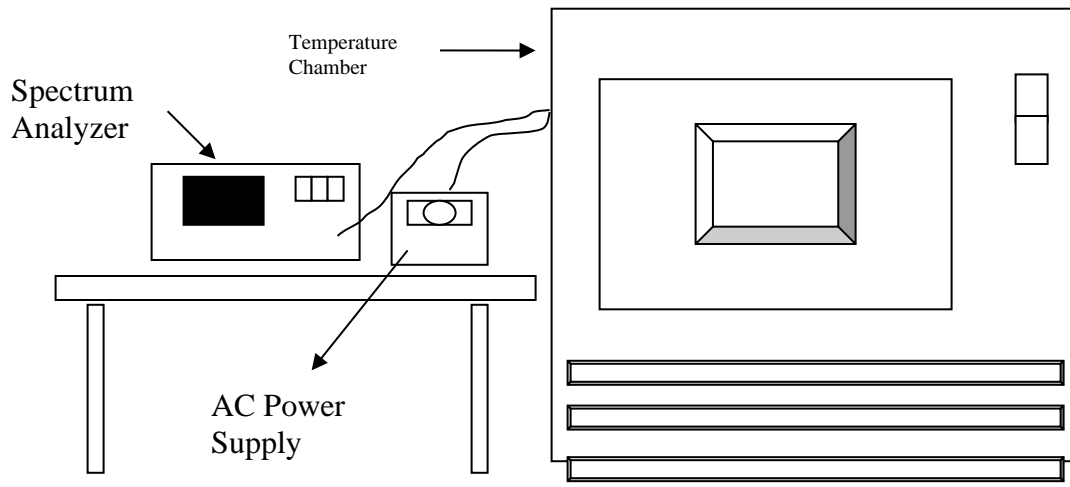
Requirements

The frequency of the carrier signal shall be maintained within band of operation.

Test procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

Test Setup





Test Data

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)
50	120	5179.9743	-4.96	5179.9759	-4.65	5179.9774	-4.36	5179.9728	-5.25
40	120	5180.008	1.54	5180.0089	1.72	5180.0071	1.37	5180.0096	1.85
30	120	5179.9909	-1.76	5179.9877	-2.37	5179.9902	-1.89	5179.9892	-2.08
20	120	5180.0065	1.25	5180.01	1.93	5180.0063	1.22	5180.0097	1.87
10	120	5179.979	-4.05	5179.9812	-3.63	5179.9786	-4.13	5179.9781	-4.23
0	120	5179.9853	-2.84	5179.9874	-2.43	5179.9841	-3.07	5179.9849	-2.92
-10	120	5179.9977	-0.44	5179.9954	-0.89	5179.9973	-0.52	5179.9969	-0.60
-20	120	5179.974	-5.02	5179.9767	-4.50	5179.9736	-5.10	5179.975	-4.83
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)
20	138	5180.0062	1.20	5180.009	1.74	5180.0067	1.29	5180.009	1.74
20	120	5180.0065	1.25	5180.01	1.93	5180.0063	1.22	5180.0097	1.87
20	102	5180.0066	1.27	5180.011	2.12	5180.0054	1.04	5180.0104	2.01

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



9.7. Radiated Spurious Emission

Requirements

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequency(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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK:74 (dBμV/m)	AV:54 (dBμV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 68.2(dBμV/m) *1 PK:105.2 (dBμV/m) *2 PK: 110.8(dBμV/m) *3 PK:122.2 (dBμV/m) *4
*1 beyond 75 MHz or more above of the band edge. *2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above. *3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above. *4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.			

Note:

The following formula is used to convert the effective isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Test Procedures

[For 9 kHz ~ 30 MHz]

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter 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. Parallel, perpendicular, and ground-parallel orientations 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. For measurement below 30MHz, 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. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

NOTE:

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

[For above 30 MHz]

- 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 meter 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. For measurement below 1GHz, 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. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
- f. The test-receiver system was set to peak and average detects 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.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0

Note:

- a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- b. 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.
- c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.

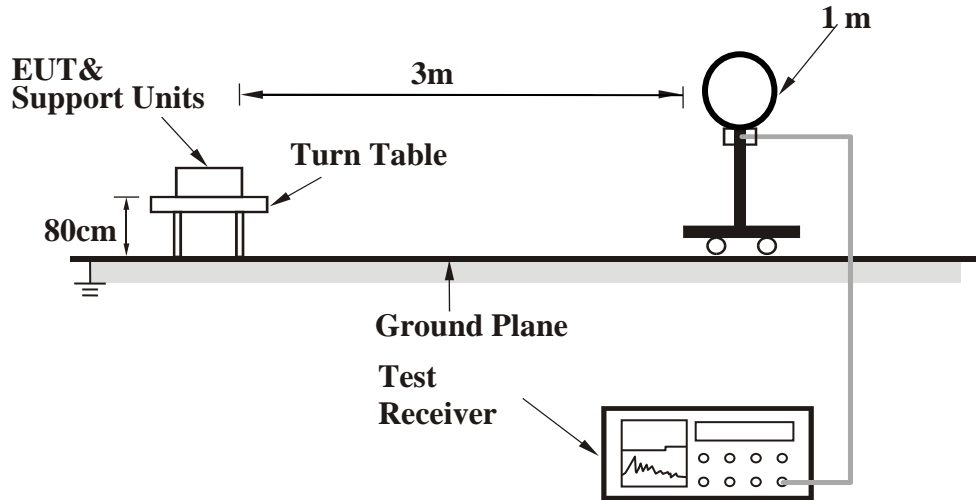
Configuration	Average	
	RBW	VBW
802.11a	1MHz	10Hz
802.11n (HT20)		10Hz
802.11n (HT40)		10Hz

Note: Refer to section 6.6 for duty cycle.

- d. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported.

Test Setup

<Frequency Range 9 kHz ~ 30 MHz>



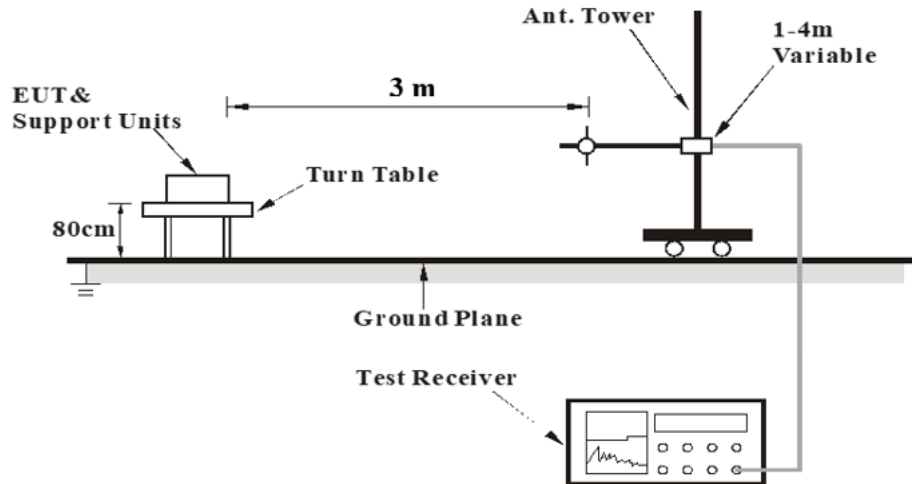
Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

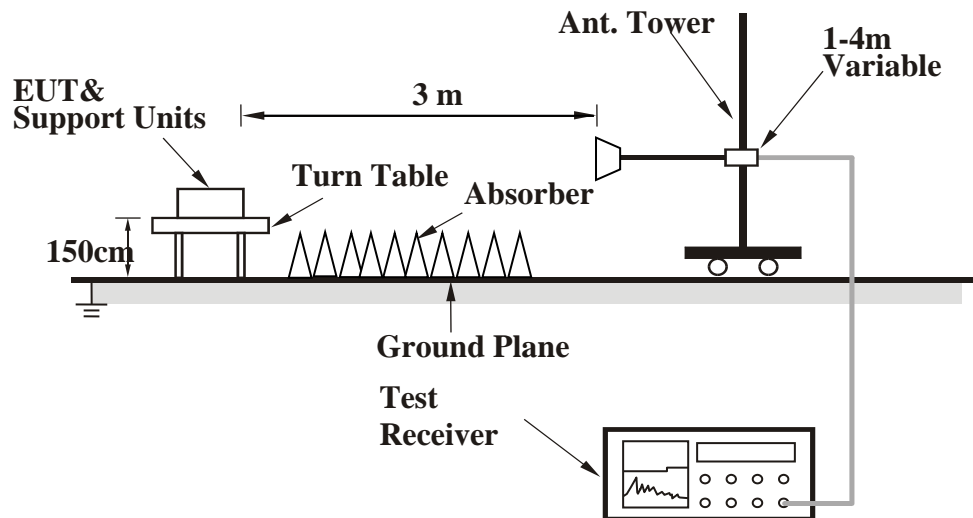
Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

<Frequency Range 30 MHz ~ 1 GHz >



<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the Setup Configurations.



Test Data

Above 1GHz Data

802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 36	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10360	31.53	17.39	48.92	68.2	-19.28	Peak
-	5149.8	35.14	13.43	48.57	54	-5.43	Average
@	5180	84.08	13.4	97.48	-	-	Average
-	5149.8	45.24	13.43	58.67	74	-15.33	Peak
@	5180	90.96	13.4	104.36	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10360	31.37	17.39	48.76	68.2	-19.44	Peak
-	5149.8	35.13	13.43	48.56	54	-5.44	Average
@	5180	83.71	13.4	97.11	-	-	Average
-	5104.65	42.53	13.46	55.99	74	-18.01	Peak
@	5180	84.78	13.4	98.18	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Telephone :+886-2-7737-3000
Facsimile (FAX) :+886-3-583-7948



EUT Test Condition		Measurement Detail	
Channel	Channel 44	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10440	31.37	17.63	49	68.2	-19.2	Peak
-	5106.05	32.6	13.46	46.06	54	-7.94	Average
@	5220	83.5	13.33	96.83	-	-	Average
-	5144.9	42.78	13.43	56.21	74	-17.79	Peak
@	5220	90.35	13.33	103.68	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10440	32.16	17.63	49.79	68.2	-18.41	Peak
-	5103.6	32.3	13.46	45.76	54	-8.24	Average
@	5220	83.28	13.33	96.61	-	-	Average
-	5097.3	42.2	13.45	55.65	74	-18.35	Peak
@	5220	85.45	13.33	98.78	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10480	31.16	17.69	48.85	68.2	-19.35	Peak
-	5113.75	32.45	13.45	45.9	54	-8.1	Average
@	5240	83.41	13.27	96.68	-	-	Average
-	5027.65	43.4	13.05	56.45	74	-17.55	Peak
@	5240	90.58	13.27	103.85	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10480	31.54	17.69	49.23	68.2	-18.97	Peak
-	5126.35	32.3	13.44	45.74	54	-8.26	Average
@	5240	83.37	13.27	96.64	-	-	Average
-	5124.25	42.5	13.45	55.95	74	-18.05	Peak
@	5240	91.75	13.27	105.02	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 52	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10520	31.16	17.73	48.89	68.2	-19.31	Peak
@	5260	84.08	13.24	97.32	-	-	Average
-	5350	29.09	13.26	42.35	54	-11.65	Average
@	5260	90.62	13.24	103.86	-	-	Peak
-	5350	35.2	13.26	48.46	74	-25.54	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10520	30.92	17.73	48.65	68.2	-19.55	Peak
@	5260	83.81	13.24	97.05	-	-	Average
-	5350	29.09	13.26	42.35	54	-11.65	Average
@	5260	91.18	13.24	104.42	-	-	Peak
-	5350	36.94	13.26	50.2	74	-23.8	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 60	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10600	31.03	17.73	48.76	68.2	-19.44	Peak
@	5300	83.13	13.21	96.34	-	-	Average
-	5350	29.45	13.26	42.71	54	-11.29	Average
@	5300	89.97	13.21	103.18	-	-	Peak
-	5350	36.69	13.26	49.95	74	-24.05	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10600	31.71	17.73	49.44	68.2	-18.76	Peak
@	5300	81.99	13.21	95.2	-	-	Average
-	5350	29.13	13.26	42.39	54	-11.61	Average
@	5300	89.84	13.21	103.05	-	-	Peak
-	5350	36.31	13.26	49.57	74	-24.43	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 64	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	10640	31.32	17.82	49.14	74	-24.86	Peak
@	5320	82.56	13.23	95.79	-	-	Average
-	5350	33.42	13.26	46.68	54	-7.32	Average
@	5320	88.6	13.23	101.83	-	-	Peak
-	5350	38.94	13.26	52.2	74	-21.8	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	10640	32.09	17.82	49.91	74	-24.09	Peak
@	5320	80.58	13.23	93.81	-	-	Average
-	5350	31.38	13.26	44.64	54	-9.36	Average
@	5320	88.46	13.23	101.69	-	-	Peak
-	5350	38.04	13.26	51.3	74	-22.7	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 100	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11000	31.05	18.28	49.33	74	-24.67	Peak
-	5451.8	29.08	13.67	42.75	54	-11.25	Average
-	5451.8	40.53	13.67	54.2	74	-19.8	Peak
-	5469.3	40.86	13.74	54.6	68.2	-13.6	Peak
@	5500	78.49	13.83	92.32	-	-	Average
@	5500	89.42	13.83	103.25	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11000	30.69	18.28	48.97	74	-25.03	Peak
-	5459.15	28.73	13.7	42.43	54	-11.57	Average
-	5459.15	45.64	13.7	59.34	74	-14.66	Peak
-	5468.25	39.59	13.74	53.33	68.2	-14.87	Peak
@	5500	72.6	13.83	86.43	-	-	Average
@	5500	80.78	13.83	94.61	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11160	31.32	18.32	49.64	74	-24.36	Peak
-	5408.75	28.5	13.47	41.97	54	-12.03	Average
-	5408.75	40.12	13.47	53.59	74	-20.41	Peak
-	5466.85	39.52	13.72	53.24	68.2	-14.96	Peak
@	5580	76.78	13.98	90.76	-	-	Average
@	5580	85.48	13.98	99.46	-	-	Peak
-	5725.85	40.81	14.18	54.99	68.2	-13.21	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11160	31.25	18.32	49.57	74	-24.43	Peak
-	5433.25	28.78	13.59	42.37	54	-11.63	Average
-	5433.25	40.66	13.59	54.25	74	-19.75	Peak
-	5469.3	40.06	13.74	53.8	68.2	-14.4	Peak
@	5580	72.82	13.98	86.8	-	-	Average
@	5580	80.44	13.98	94.42	-	-	Peak
-	5741.6	40.62	14.27	54.89	68.2	-13.31	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11400	30.6	18.74	49.34	74	-24.66	Peak
@	5700	79.65	14.05	93.7	-	-	Average
@	5700	88.2	14.05	102.25	-	-	Peak
-	5728.65	49.7	14.19	63.89	68.2	-4.31	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11400	30.26	18.74	49	74	-25	Peak
@	5700	69.37	14.05	83.42	-	-	Average
@	5700	80.2	14.05	94.25	-	-	Peak
-	5742.3	42.38	14.27	56.65	68.2	-11.55	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 149	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11490	30.53	19.02	49.55	74	-24.45	Peak
-	5620	42.21	14.02	56.23	68.2	-11.97	Peak
-	5692.5	43.13	14.05	57.18	99.67	-42.49	Peak
@	5745	77.17	14.28	91.45	-	-	Average
@	5745	83.68	14.28	97.96	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11490	31.05	19.02	50.07	74	-23.93	Peak
-	5571.5	41.34	13.95	55.29	68.2	-12.91	Peak
-	5692	40.02	14.04	54.06	99.3	-45.24	Peak
@	5745	70.42	14.28	84.7	-	-	Average
@	5745	79.83	14.28	94.11	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 157	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11570	30.65	18.88	49.53	74	-24.47	Peak
-	5597.5	40.68	14.03	54.71	68.2	-13.49	Peak
-	5670.5	40.43	14.02	54.45	83.41	-28.96	Peak
@	5785	84.34	14.48	98.82	-	-	Average
@	5785	87.85	14.48	102.33	-	-	Peak
-	5883.5	40.74	14.92	55.66	98.89	-43.23	Peak
-	5970.5	40.82	15.07	55.89	68.2	-12.31	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11570	29.14	18.88	48.02	74	-25.98	Peak
-	5544.5	40.5	13.88	54.38	68.2	-13.82	Peak
-	5665	40.69	14.01	54.7	79.33	-24.63	Peak
@	5785	70.45	14.48	84.93	-	-	Average
@	5785	78.9	14.48	93.38	-	-	Peak
-	5915.5	41.36	14.98	56.34	75.21	-18.87	Peak
-	5935	42.07	15	57.07	68.2	-11.13	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 165	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11650	30.42	18.63	49.05	74	-24.95	Peak
@	5825	75.74	14.69	90.43	-	-	Average
@	5825	87.83	14.69	102.52	-	-	Peak
-	5895	41.96	14.95	56.91	90.36	-33.45	Peak
-	5983.5	40.6	15.12	55.72	68.2	-12.48	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11650	29.89	18.63	48.52	74	-25.48	Peak
@	5825	74.84	14.69	89.53	-	-	Average
@	5825	82.02	14.69	96.71	-	-	Peak
-	5878	40.89	14.9	55.79	102.97	-47.18	Peak
-	5995	40.79	15.15	55.94	68.2	-12.26	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 36	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10360	30.56	17.39	47.95	68.2	-20.25	Peak
-	5149.8	34.6	13.43	48.03	54	-5.97	Average
@	5180	81.01	13.4	94.41	-	-	Average
-	5128.1	43.05	13.43	56.48	74	-17.52	Peak
@	5180	91.19	13.4	104.59	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10360	30	17.39	47.39	68.2	-20.81	Peak
-	5149.8	33.17	13.43	46.6	54	-7.4	Average
@	5180	77.99	13.4	91.39	-	-	Average
-	5086.8	37.4	13.42	50.82	74	-23.18	Peak
@	5180	82.19	13.4	95.59	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 44	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10440	30.82	17.63	48.45	68.2	-19.75	Peak
-	5049	32.75	13.29	46.04	54	-7.96	Average
@	5220	83.41	13.33	96.74	-	-	Average
-	5101.15	42.95	13.46	56.41	74	-17.59	Peak
@	5220	89.95	13.33	103.28	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10440	30.56	17.63	48.19	68.2	-20.01	Peak
-	5101.5	32.4	13.46	45.86	54	-8.14	Average
@	5220	83.61	13.33	96.94	-	-	Average
-	5149.8	38.06	13.43	51.49	74	-22.51	Peak
@	5220	84.06	13.33	97.39	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10480	29.8	17.69	47.49	68.2	-20.71	Peak
-	5065.1	31.33	13.35	44.68	54	-9.32	Average
@	5240	78.52	13.27	91.79	-	-	Average
-	5034.65	41.96	13.13	55.09	74	-18.91	Peak
@	5240	86.12	13.27	99.39	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10480	30.6	17.69	48.29	68.2	-19.91	Peak
-	5110.95	31.25	13.46	44.71	54	-9.29	Average
@	5240	78.56	13.27	91.83	-	-	Average
-	5070	42.15	13.37	55.52	74	-18.48	Peak
@	5240	83.51	13.27	96.78	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 52	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10520	30.73	17.73	48.46	68.2	-19.74	Peak
@	5260	84.24	13.24	97.48	-	-	Average
-	5441.4	29.82	13.64	43.46	54	-10.54	Average
@	5260	92.16	13.24	105.4	-	-	Peak
-	5410.5	39.91	13.47	53.38	74	-20.62	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10520	30.47	17.73	48.2	68.2	-20	Peak
@	5260	80.14	13.24	93.38	-	-	Average
-	5457.3	29.39	13.69	43.08	54	-10.92	Average
@	5260	87.94	13.24	101.18	-	-	Peak
-	5355.3	40.82	13.28	54.1	74	-19.9	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 60	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10600	30.82	17.73	48.55	68.2	-19.65	Peak
@	5300	82.78	13.21	95.99	-	-	Average
-	5351.7	32.44	13.26	45.7	54	-8.3	Average
@	5300	88.2	13.21	101.41	-	-	Peak
-	5373.9	41.4	13.34	54.74	74	-19.26	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10600	31.36	17.73	49.09	68.2	-19.11	Peak
@	5300	78.95	13.21	92.16	-	-	Average
-	5458.5	29.6	13.7	43.3	54	-10.7	Average
@	5300	88.21	13.21	101.42	-	-	Peak
-	5437.2	39.47	13.61	53.08	74	-20.92	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 64	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	10640	32.25	17.82	50.07	74	-23.93	Peak
@	5320	82.57	13.23	95.8	-	-	Average
-	5350.2	35.21	13.26	48.47	54	-5.53	Average
@	5320	85.73	13.23	98.96	-	-	Peak
-	5355	41.81	13.28	55.09	74	-18.91	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	10640	31.1	17.82	48.92	74	-25.08	Peak
@	5320	77.61	13.23	90.84	-	-	Average
-	5350.2	30.94	13.26	44.2	54	-9.8	Average
@	5320	86.83	13.23	100.06	-	-	Peak
-	5373	41.04	13.34	54.38	74	-19.62	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 100	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11000	29.69	18.28	47.97	74	-26.03	Peak
-	5454.25	30.48	13.69	44.17	54	-9.83	Average
-	5454.25	40.31	13.69	54	74	-20	Peak
-	5469.65	44.74	13.74	58.48	68.2	-9.72	Peak
@	5500	83.72	13.83	97.55	-	-	Average
@	5500	91.73	13.83	105.56	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11000	30.79	18.28	49.07	74	-24.93	Peak
-	5447.25	29.66	13.66	43.32	54	-10.68	Average
-	5447.25	40.05	13.66	53.71	74	-20.29	Peak
-	5470	43.9	13.74	57.64	68.2	-10.56	Peak
@	5500	82.52	13.83	96.35	-	-	Average
@	5500	88.15	13.83	101.98	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11160	30.16	18.32	48.48	74	-25.52	Peak
-	5457.05	29.62	13.69	43.31	54	-10.69	Average
-	5457.05	40.14	13.69	53.83	74	-20.17	Peak
-	5460.9	39.83	13.71	53.54	68.2	-14.66	Peak
@	5580	84.97	13.98	98.95	-	-	Average
@	5580	90.56	13.98	104.54	-	-	Peak
-	5740.55	41.21	14.26	55.47	68.2	-12.73	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11160	30.65	18.32	48.97	74	-25.03	Peak
-	5442.35	29.53	13.64	43.17	54	-10.83	Average
-	5442.35	40.17	13.64	53.81	74	-20.19	Peak
-	5468.95	39.87	13.74	53.61	68.2	-14.59	Peak
@	5580	79.16	13.98	93.14	-	-	Average
@	5580	87.19	13.98	101.17	-	-	Peak
-	5725	40.33	14.18	54.51	68.2	-13.69	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11400	29.87	18.74	48.61	74	-25.39	Peak
@	5700	82.65	14.05	96.7	-	-	Average
@	5700	86.94	14.05	100.99	-	-	Peak
-	5727.6	43.92	14.19	58.11	68.2	-10.09	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11400	30.77	18.74	49.51	74	-24.49	Peak
@	5700	78.66	14.05	92.71	-	-	Average
@	5700	86.16	14.05	100.21	-	-	Peak
-	5725	45.12	14.18	59.3	68.2	-8.9	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 149	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11490	31.94	19.02	50.96	74	-23.04	Peak
-	5594	40.94	14.02	54.96	68.2	-13.24	Peak
-	5675.5	41.24	14.02	55.26	87.11	-31.85	Peak
@	5745	82.26	14.28	96.54	-	-	Average
@	5745	88.76	14.28	103.04	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11490	29.94	19.02	48.96	74	-25.04	Peak
-	5631	41.65	14.02	55.67	68.2	-12.53	Peak
-	5690.5	40.77	14.04	54.81	98.2	-43.39	Peak
@	5745	74.54	14.28	88.82	-	-	Average
@	5745	83.32	14.28	97.6	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 157	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11570	30.55	18.88	49.43	74	-24.57	Peak
-	5574.5	41.55	13.97	55.52	68.2	-12.68	Peak
-	5692	40.92	14.04	54.96	99.3	-44.34	Peak
@	5785	73.09	14.48	87.57	-	-	Average
@	5785	86.1	14.48	100.58	-	-	Peak
-	5918.5	40.63	14.98	55.61	72.99	-17.38	Peak
-	5937.5	41.09	15.01	56.1	68.2	-12.1	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11570	30.05	18.88	48.93	74	-25.07	Peak
-	5609	40.8	14.03	54.83	68.2	-13.37	Peak
-	5686.5	41.62	14.04	55.66	95.24	-39.58	Peak
@	5785	79.07	14.48	93.55	-	-	Average
@	5785	84.96	14.48	99.44	-	-	Peak
-	5901	41.07	14.97	56.04	85.92	-29.88	Peak
-	5948.5	41.18	15.02	56.2	68.2	-12	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 165	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11650	29.93	18.63	48.56	74	-25.44	Peak
@	5825	81.67	14.69	96.36	-	-	Average
@	5825	89.22	14.69	103.91	-	-	Peak
-	5882	41.73	14.91	56.64	100	-43.36	Peak
-	6022.5	41.04	15.2	56.24	68.2	-11.96	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11650	30.04	18.63	48.67	74	-25.33	Peak
@	5825	79.11	14.69	93.8	-	-	Average
@	5825	86.53	14.69	101.22	-	-	Peak
-	5906.5	41.31	14.97	56.28	81.85	-25.57	Peak
-	6032.5	41.02	15.22	56.24	68.2	-11.96	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 38	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10380	31.2	17.49	48.69	68.2	-19.51	Peak
-	5149.8	37.08	13.43	50.51	54	-3.49	Average
@	5190	75.8	13.4	89.2	-	-	Average
-	5148.4	49.12	13.42	62.54	74	-11.46	Peak
@	5190	86.07	13.4	99.47	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10380	30.47	17.49	47.96	68.2	-20.24	Peak
-	5148.75	34.74	13.42	48.16	54	-5.84	Average
@	5190	72.7	13.4	86.1	-	-	Average
-	5147.35	45.18	13.43	58.61	74	-15.39	Peak
@	5190	84.09	13.4	97.49	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 46	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10460	30.54	17.66	48.2	68.2	-20	Peak
-	5093.8	32.27	13.44	45.71	54	-8.29	Average
@	5230	79.56	13.3	92.86	-	-	Average
-	5127.4	42.94	13.44	56.38	74	-17.62	Peak
@	5230	87.19	13.3	100.49	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10460	30.99	17.66	48.65	68.2	-19.55	Peak
-	5074.55	32.43	13.38	45.81	54	-8.19	Average
@	5230	79.71	13.3	93.01	-	-	Average
-	5085.05	42.28	13.42	55.7	74	-18.3	Peak
@	5230	86.33	13.3	99.63	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 54	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10540	30.44	17.72	48.16	68.2	-20.04	Peak
@	5270	81.19	13.22	94.41	-	-	Average
-	5352.3	31.12	13.26	44.38	54	-9.62	Average
@	5270	88.82	13.22	102.04	-	-	Peak
-	5449.5	39.68	13.67	53.35	74	-20.65	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	10540	30.17	17.72	47.89	68.2	-20.31	Peak
@	5270	80.4	13.22	93.62	-	-	Average
-	5372.7	30.43	13.34	43.77	54	-10.23	Average
@	5270	88.36	13.22	101.58	-	-	Peak
-	5437.2	40.06	13.61	53.67	74	-20.33	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 62	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	10620	30.58	17.78	48.36	74	-25.64	Peak
@	5310	77.84	13.21	91.05	-	-	Average
-	5350.5	38.71	13.26	51.97	54	-2.03	Average
@	5310	84.39	13.21	97.6	-	-	Peak
-	5351.7	42.37	13.26	55.63	74	-18.37	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	10620	30.87	17.78	48.65	74	-25.35	Peak
@	5310	76.23	13.21	89.44	-	-	Average
-	5350.5	36.84	13.26	50.1	54	-3.9	Average
@	5310	82.98	13.21	96.19	-	-	Peak
-	5351.4	46.16	13.26	59.42	74	-14.58	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 102	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11020	31.25	18.32	49.57	74	-24.43	Peak
-	5459.85	38.71	13.7	52.41	54	-1.59	Average
-	5459.85	43.62	13.7	57.32	74	-16.68	Peak
-	5467.2	50.72	13.72	64.44	68.2	-3.76	Peak
@	5510	79.39	13.84	93.23	-	-	Average
@	5510	87.31	13.84	101.15	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11020	31.04	18.32	49.36	74	-24.64	Peak
-	5458.8	36	13.7	49.7	54	-4.3	Average
-	5458.8	41.46	13.7	55.16	74	-18.84	Peak
-	5463.7	48.06	13.72	61.78	68.2	-6.42	Peak
@	5510	77.69	13.84	91.53	-	-	Average
@	5510	86.78	13.84	100.62	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Telephone :+886-2-7737-3000
Facsimile (FAX) :+886-3-583-7948



EUT Test Condition		Measurement Detail	
Channel	Channel 110	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11100	29.74	18.49	48.23	74	-25.77	Peak
-	5445.5	31.16	13.65	44.81	54	-9.19	Average
-	5445.5	40.79	13.65	54.44	74	-19.56	Peak
-	5469.65	40.62	13.74	54.36	68.2	-13.84	Peak
@	5550	81.13	13.88	95.01	-	-	Average
@	5550	90.13	13.88	104.01	-	-	Peak
-	5731.8	40.69	14.21	54.9	68.2	-13.3	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11100	30.71	18.49	49.2	74	-24.8	Peak
-	5458.1	29.83	13.7	43.53	54	-10.47	Average
-	5458.1	40.25	13.7	53.95	74	-20.05	Peak
-	5463	39.9	13.72	53.62	68.2	-14.58	Peak
@	5550	81.13	13.88	95.01	-	-	Average
@	5550	89.29	13.88	103.17	-	-	Peak
-	5746.15	40.71	14.28	54.99	68.2	-13.21	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 134	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11340	31.24	18.55	49.79	74	-24.21	Peak
@	5670	82.34	14.02	96.36	-	-	Average
@	5670	89.89	14.02	103.91	-	-	Peak
-	5733.2	46.8	14.22	61.02	68.2	-7.18	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11340	29.77	18.55	48.32	74	-25.68	Peak
@	5670	78.33	14.02	92.35	-	-	Average
@	5670	87.33	14.02	101.35	-	-	Peak
-	5731.45	42.32	14.21	56.53	68.2	-11.67	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 151	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11510	31.41	19.03	50.44	74	-23.56	Peak
-	5644.5	41.23	14	55.23	68.2	-12.97	Peak
-	5696.5	46.15	14.05	60.2	102.62	-42.42	Peak
@	5755	80.15	14.33	94.48	-	-	Average
@	5755	87.44	14.33	101.77	-	-	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11510	30.86	19.03	49.89	74	-24.11	Peak
-	5557	42	13.9	55.9	68.2	-12.3	Peak
-	5697	42.83	14.05	56.88	102.99	-46.11	Peak
@	5755	73.4	14.33	87.73	-	-	Average
@	5755	82.22	14.33	96.55	-	-	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



EUT Test Condition		Measurement Detail	
Channel	Channel 159	Frequency Range	1 GHz ~ 40 GHz

Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11590	31.03	18.84	49.87	74	-24.13	Peak
@	5795	80.47	14.53	95	-	-	Average
@	5795	87.99	14.53	102.52	-	-	Peak
-	5920	40.96	14.98	55.94	71.89	-15.95	Peak
-	5947	40.71	15.02	55.73	68.2	-12.47	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
*	11590	30.21	18.84	49.05	74	-24.95	Peak
@	5795	77.43	14.53	91.96	-	-	Average
@	5795	85.18	14.53	99.71	-	-	Peak
-	5894	40.54	14.95	55.49	91.1	-35.61	Peak
-	6017.5	40.76	15.2	55.96	68.2	-12.24	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. "* * ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



9 kHz ~ 30 MHz Data:

For 9 kHz to 30 MHz radiated emission have performed all modes of operation were investigated. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

No non-compliance noted:

KDB 414788 D01 OATS and Chamber Correlation Justification

- Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

- OATs and chamber correlation testing had been performed and chamber measured test results is the worst case test result.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0

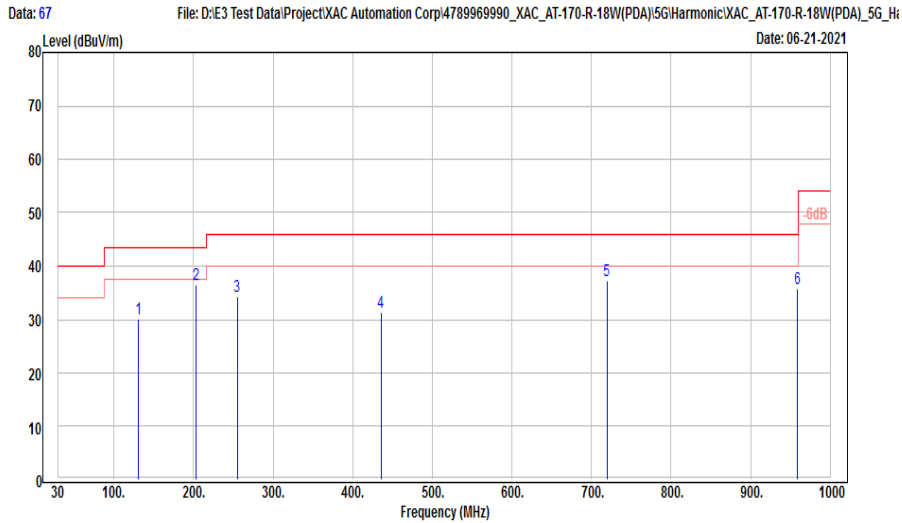


30 MHz ~ 1 GHz Data

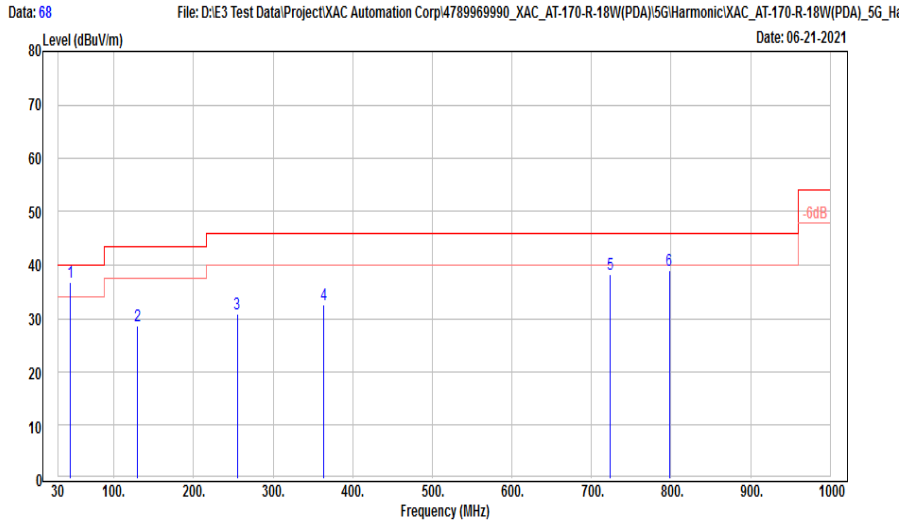
802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 44	Frequency Range	30 MHz ~ 1 GHz

Horizontal



Vertical



Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948



Antenna Polarity & Test Distance: Horizontal at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	130.88	43.28	-13.21	30.07	43.5	-13.43	Peak
-	203.63	50.57	-13.96	36.61	43.5	-6.89	Peak
-	255.04	45.83	-11.6	34.23	46	-11.77	Peak
-	435.46	37.46	-6.13	31.33	46	-14.67	Peak
-	719.67	37.27	0.13	37.4	46	-8.6	Peak
-	959.26	31.84	3.88	35.72	46	-10.28	Peak
Antenna Polarity & Test Distance: Vertical at 3 m							
Notation	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
-	45.52	48.13	-11.3	36.83	40	-3.17	Peak
-	129.91	41.85	-13.23	28.62	43.5	-14.88	Peak
-	255.04	42.44	-11.6	30.84	46	-15.16	Peak
-	363.68	40.76	-8.05	32.71	46	-13.29	Peak
-	723.55	38.14	0.15	38.29	46	-7.71	Peak
-	798.24	38.12	0.96	39.08	46	-6.92	Peak

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The peak result complies with QP limit, QP result is deemed to comply with QP limit.
5. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



9.8. AC Power Line Conducted Emission

Requirements

Frequency (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

Test Procedures

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

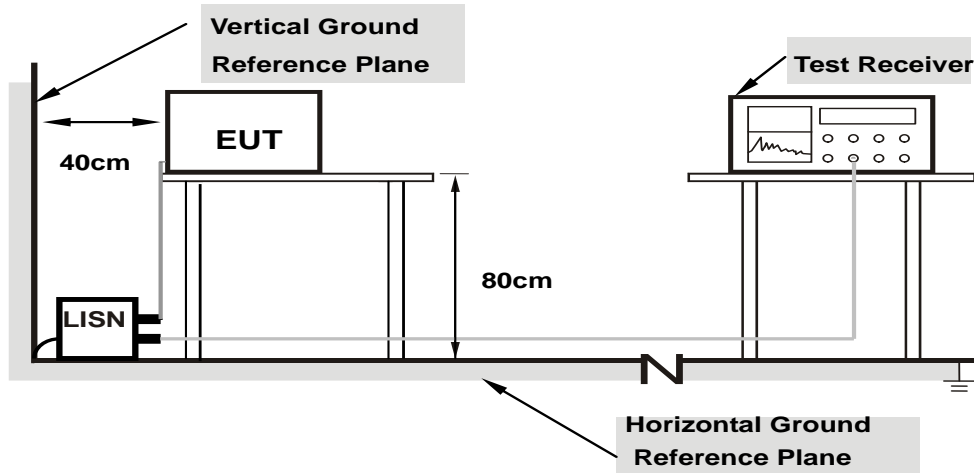
Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the Setup Configurations.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0

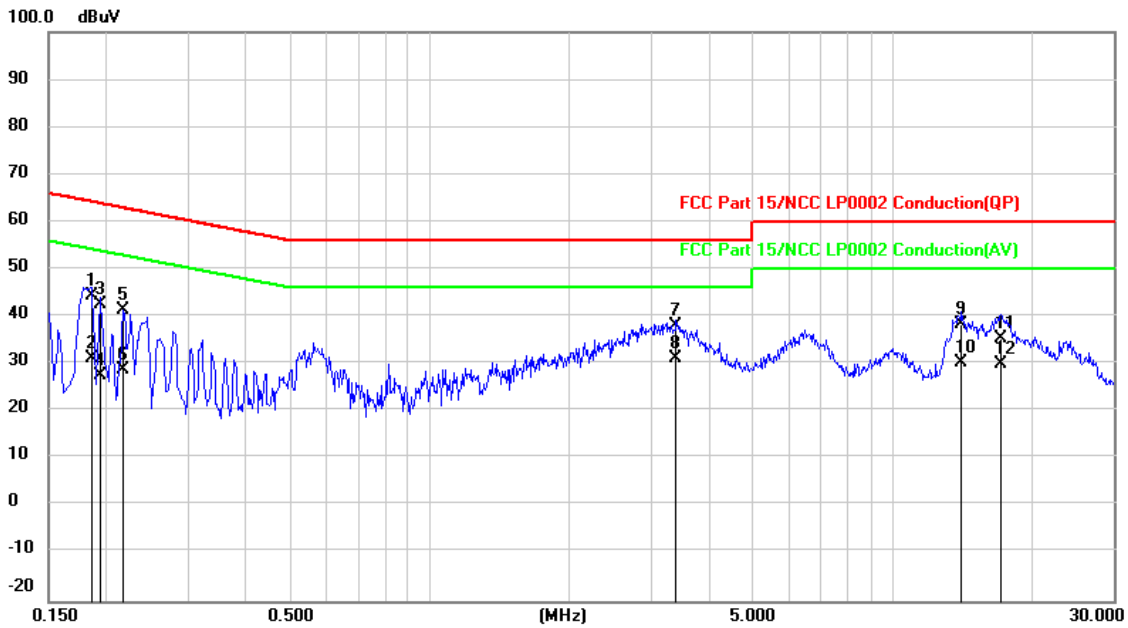


Test Data

802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 44	Frequency Range	150 kHz ~ 30 MHz

Phase of Power : Line (L)



Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1860	25.00	19.49	44.49	64.21	-19.72	QP
2	0.1860	11.53	19.49	31.02	54.21	-23.19	AVG
3	0.1940	23.02	19.49	42.51	63.86	-21.35	QP
4	0.1940	7.93	19.49	27.42	53.86	-26.44	AVG
5	0.2180	21.78	19.49	41.27	62.89	-21.62	QP
6	0.2180	9.36	19.49	28.85	52.89	-24.04	AVG
7	3.4020	18.62	19.56	38.18	56.00	-17.82	QP
8	3.4020	11.54	19.56	31.10	46.00	-14.90	AVG
9	14.0860	18.65	19.71	38.36	60.00	-21.64	QP
10	14.0860	10.63	19.71	30.34	50.00	-19.66	AVG
11	17.1180	15.48	19.74	35.22	60.00	-24.78	QP
12	17.1180	10.22	19.74	29.96	50.00	-20.04	AVG

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

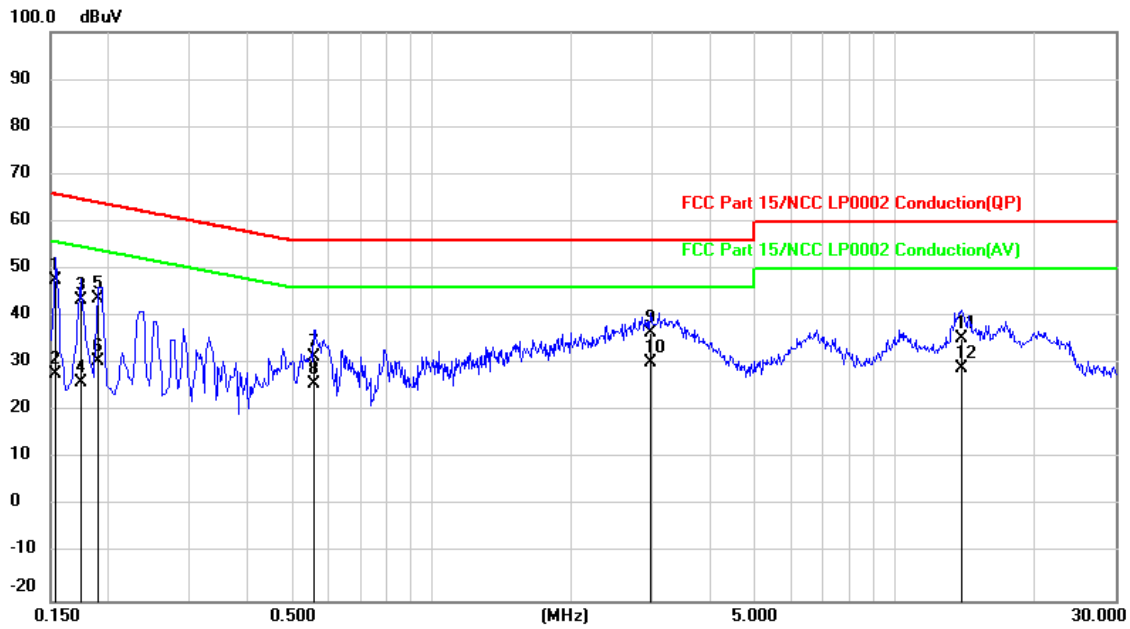
Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



Phase of Power : Neutral (N)



Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 6.0



No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1539	28.16	19.50	47.66	65.79	-18.13	QP
2	0.1539	8.25	19.50	27.75	55.79	-28.04	AVG
3	0.1740	24.04	19.50	43.54	64.77	-21.23	QP
4	0.1740	6.64	19.50	26.14	54.77	-28.63	AVG
5	0.1900	24.26	19.49	43.75	64.04	-20.29	QP
6	0.1900	11.06	19.49	30.55	54.04	-23.49	AVG
7	0.5580	11.92	19.49	31.41	56.00	-24.59	QP
8	0.5580	6.31	19.49	25.80	46.00	-20.20	AVG
9	2.9739	16.88	19.54	36.42	56.00	-19.58	QP
10	2.9739	10.70	19.54	30.24	46.00	-15.76	AVG
11	13.9380	15.67	19.75	35.42	60.00	-24.58	QP
12	13.9380	9.28	19.75	29.03	50.00	-20.97	AVG

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 6.0