FCC TEST REPORT

For

WORLD MEDIA AND TECHNOLOGY Corp

Wifi Router

Test Model: Space Station

Prepared for Address	:	WORLD MEDIA AND TECHNOLOGY Corp 600 Brickell World Plaza,Suite 1775,Miami,FL 33132, United States
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
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Web	:	www.LCS-cert.com
Mail	:	webmaster@LCS-cert.com
Date of receipt of test sample	:	Aug 12, 2016
Number of tested samples	:	1
Sample number	:	Prototype
Date of Test	:	Aug 12, 2016~Sep 02, 2016
Date of Report	:	Sep 02, 2016

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	FCC TEST REPORT			
FCC CFR 47 PART 15 E(15.407): 2015				
Report Reference No	: LCS1605120918E			
Date of Issue	: Sep 02, 2016			
Testing Laboratory Name	: Shenzhen LCS Compliance Testing Laboratory Ltd.			
Address	: 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China			
Testing Location/ Procedure	 Full application of Harmonised standards Partial application of Harmonised standards Other standard testing method 			
Applicant's Name	: WORLD MEDIA AND TECHNOLOGY Corp			
Address	: 600 Brickell World Plaza, Suite 1775, Miami, FL 33132, United States			
Test Specification				
Standard	: FCC CFR 47 PART 15 E(15.407): 2015 / ANSI C63.10: 2013			
Test Report Form No	: LCSEMC-1.0			
TRF Originator	: Shenzhen LCS Compliance Testing Laboratory Ltd.			
Master TRF	: Dated 2011-03			
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Test Item Description	: Wifi Router			
Trade Mark	wor(l)d			
Test Model	: Space Station			
Ratings	: DC 12V, 1.5A by Adapter			
Result	: Positive			
Compiled by:	Supervised by: Approved by:			

Calvin Weng

Calvin Weng/ Administrators

res m

Gravino Liang

Gavin Liang/ Manager

Glin Lu/ Technique principal

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Report No.: LCS1605120918E

FCC -- TEST REPORT

Test Report No. : LCS1605120918E

Sep 02, 2016 Date of issue

Test Model	: Space Station
EUT	: Wifi Router
Applicant	: WORLD MEDIA AND TECHNOLOGY Corp
Address	: 600 Brickell World Plaza, Suite 1775, Miami, FL 33132, United States
Telephone	: /
Fax	:/
Manufacturer	: Quality Technology Industrial Co.,Ltd
Address	: Room 201~203, 2/F, Block B3, Ming You Industrial Products,
	Procurement Center, #168 Bao Yuan Road, Bao'an District,
	Shenzhen, China
Telephone	: /
Fax	:/
Factory	: Quality Technology Industrial Co.,Ltd
Address	: Room 201~203, 2/F, Block B3, Ming You Industrial Products,
	Procurement Center, #168 Bao Yuan Road, Bao'an District,
	Shenzhen, China
Telephone	: /
Fax	:/

Test Result	Positive
l'est Result	rositive

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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Revision History

Revision	Issue Date	Revisions	Revised By
00	2016-09-02	Initial Issue	Gavin Liang

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SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: Wifi Router
Test Model	: Space Station
Hardware Version	: ZBT-WPE357 v31
Software Version	: 2.6.36
Power Supply	: DC 12V, 1.5A by Adapter
EUT Supports	: 2.4GHz WIFI/5GHz WIFI
Radios Application	
WIFI(2.4GHz Band)	:
Operating Frequency	: 2412-2462MHz
Channel Spacing	: 5MHz
Channel Number	: 11 Channels for 20MHz bandwidth(2412~2462MHz)
	7 channels for 40MHz bandwidth(2422~2452MHz)
Modulation Type	: 802.11b: DSSS; 802.11g/n: OFDM
Antenna Description	: FPC Antenna, 2dBi(Max.) for ant 1, ant 2
WIFI(5G Band)	:
Frequency Range	: 5180-5240MHz, 5745-5825MHz
Channel Number	: 9 Channels for 20MHz Bandwidth
	4 channels for 40MHz Bandwidth
	2 channels for 80MHz Bandwidth
Modulation Type	: 802.11a/n/ac: OFDM
Antenna Description	: FPC Antenna, 3dBi(Max.) for ant 3, ant 4

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1.2. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
BLUE IRON HOLDINGS LIMITED	Adapter	Bl18-120150-Cd U		VOC

1.3. External I/O

I/O Port Description	Quantity	Cable
USB Port	1	N/A
RJ45 Port	5	N/A
DC in Port	1	1.2m, unshielded

1.4. Description of Test Facility

CNAS Registration Number. is L4595.

FCC Registration Number. is 899208.

Industry Canada Registration Number. is 9642A-1.

VCCI Registration Number. is C-4260 and R-3804.

ESMD Registration Number. is ARCB0108.

UL Registration Number. is 100571-492.

TUV SUD Registration Number. is SCN1081.

TUV RH Registration Number. is UA 50296516-001

There is one 3m semi-anechoic chamber and one line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.10: 2013, CISPR 22/EN 55022 and CISPR16-1-4 SVSWR requirements.

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1.5. List Of Measuring Equipment

Instrument	Manufacture	Model No.	Serial No.	Characteristics	Cal Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Jun 17, 2017
Signal analyzer	Agilent	E4448A(Externa I mixers to 40GHz)	US443004 69	9kHz~40GHz	Jul 15, 2017
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	Jun 17, 2017
LISN	EMCO	3819/2NM	9703-1839	9KHz-30MHz	Jun 17, 2017
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	Jun 17, 2017
ISN	SCHAFFNE	ISN ST08	21653	9KHz-30MHz	Jun 17, 2017
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-H Y	30M-18GHz	Jun 17, 2017
Amplifier	SCHAFFNE	COA9231A	18667	9kHz-2GHzz	Apr 17, 2017
Amplifier	Agilent	8449B	3008A021	1GHz-26.5GHz	Apr 17, 2017
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5GHz-40GHz	Apr 17, 2017
Loop Antenna	R&S	HFH2-Z2	860004/00	9k-30MHz	Apr 17, 2017
By-log Antenna	SCHWARZB	VULB9163	9163-470	30MHz-1GHz	Apr 17, 2017
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	Apr 17, 2017
Horn Antenna	SCHWARZB	BBHA9170	BBHA9170	15GHz-40GHz	Apr 17, 2017
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	Jun 17, 2017
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-H	1GHz-40GHz	Jun 17, 2017
Power Meter	R&S	NRVS	100444	DC-40GHz	Jun 17, 2017
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	Jun 17, 2017
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	Jun 17, 2017
AC Power Source	HPC	HPA-500E	HPA-9100	AC 0~300V	Jun 17, 2017
DC power Soure	GW	GPC-6030D	C671845	DC 1V-60V	Jun 17, 2017
Temp. and Humidigy Chamber	Giant Force	GTH-225-20-S	MAB0103- 00	N/A	Jun 17, 2017
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	Jun 17, 2017
RF CABLE-2m	JYE Bao	RG142	CB035-2m	20MHz-1GHz	Jun 17, 2017
Signal Generator	R&S	SMR40	10016	10MHz~40GHz	Jul 15, 2017
Universal Radio Communication Tester	R&S	CMU200	112012	N/A	Oct 26, 2016
Wideband Radia Communication Tester	R&S	CMW500	1201.0002 K50	N/A	Nov 18, 2016
MXG Vector Signal Generator	Agilent	N5182A	MY470711 51	250KHz~6GHz	Oct 26, 2016
MXG Vector Signal Generator	Agilent	E4438C	MY420813 96	250KHz~6GHz	Oct 26, 2016
PSG Analog Signal Generator	Agilent	N8257D	MY465205 21	250KHz~20GHz	Nov 18, 2016
MXA Signal Analyzer	Agilent	N9020A	MY505101 40	10Hz~26.5GHz	Oct 26, 2016
DC Power Supply	Agilent	E3642A	/	0-8V,5A/0-20V,2	May 19, 2017
RF Control Unit	Tonscend	JS0806-1	/	/	Nov 18, 2016
LTE Test Software	Tonscend	JS1120-1	/	Version: 2.5.7.0	N/A

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X-series USB Peak an verage Power Sensor Agilent	d A Agilent	U2021XA	MY540800 22	/	Oct 26, 2016
4 Ch.Simultaneous Sa ing 14 Bits 2 MS/s	Agilent	U2531A	MY540800 16	/	Oct 26, 2016
Test Software	Ascentest	AT890-SW	20141230	Version:	N/A
Splitter/Combiner(Qty:	2) Mini-Circuits	ZAPD-50W 4.2-6.0 GHz	NN256400 424	/	Oct 26, 2016
Splitter/Combine(Qty:	2) MCLI	PS3-7	4463/4464	1	Oct 26, 2016
ATT (Qty: 1)	Mini-Circuits	VAT-30+	30912	/	Oct 26, 2016

1.6. Statement of The Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty		9KHz~30MHz	3.10dB	(1)
		30MHz~200MHz	2.96dB	(1)
	:	200MHz~1000MHz	3.10dB	(1)
		1GHz~26.5GHz	3.80dB	(1)
		26.5GHz~40GHz	3.90dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	1.63dB	(1)
Power disturbance	:	30MHz~300MHz	1.60dB	(1)

1.7. Measurement Uncertainty

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.8. Description Of Test Modes

The EUT has been tested under operating condition.

The EUT was set to transmit at 100% duty cycle. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in Y position.

For pre-testing, when performed power line conducted emission measurement, the input Voltage/Frequency AC 120V/60Hz and AC 240V/60Hz were used. Only recorded the worst case in this report.

Worst-case mode and channel used for 150kHz-30 MHz power line conducted emissions was determined to be 802.11a mode(Middle Channel, 5180-5240MHz Band).

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was determined to be 802.11a mode(Middle Channel, 5180-5240MHz Band).

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates used during the testing are as follows:

802.11a Mode: 6 Mbps, OFDM.

802.11n(HT20) Mode: MCS8, OFDM.

802.11n(HT40) Mode: MCS8, OFDM.

802.11ac(VHT20) Mode: MCS0, OFDM.

802.11ac(VHT40) Mode: MCS0, OFDM.

802.11ac(VHT80) Mode: MCS0, OFDM.

Support Bandwidth For 5G WIFI Part:

				-				
Antenna		Ant 3		Ant 4				
Bandwidth Mode	20MHz	40MHz	80MHz	20MHz	40MHz	80MHz		
802.11a	\checkmark			\checkmark				
802.11n(HT20)	\checkmark			V				
802.11n(HT40)					\checkmark			
802.11ac(VHT20)	\checkmark			\checkmark				
802.11ac(VHT40)		\checkmark			\checkmark			
802.11ac(VHT80)			$\mathbf{\nabla}$			\checkmark		

Channel & Frequency:

Frequency Band	Channel No.	Frequency(MHz)	Channel No.	Frequency(MHz)							
	36	5180	44	5220							
5190 5240MHz	38	5190	46	5230							
3180~3240IVITIZ	40	5200	48	5240							
	42	5210	/	/							
For 802.11a/n(HT20)/ac(VHT20), Channel 36, 44 and 48 were tested.											
For 802.11n(HT4	0)/ac(VHT40), Ch	annel 38 and 46 we	re tested.								
For 802.11ac(VH	Γ80), Channel 42	was tested.									
	149	5745	155	5775							
5745 5825MHz	151	5755	159	5795							
3743~3823IVITIZ	153	5765	161	5805							
	157	5785	165	5825							
For 802.11a/n(HT	20)/ac(VHT20), 0	Channel 149, 157 an	d 165 were tested.								
For 802.11n(HT4	0)/ac(VHT40), Ch	annel 151 and 159	were tested.								
For 802.11ac(VH	Г80), Channel 155	5 was tested.									

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10: 2013, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd..

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to FCC's request, Test Procedure 789033 D02 General UNII Test Procedures New Rules v01r02 is required to be used for this kind of FCC 15.407 UII device.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E

2.3. General Test Procedures

2.3.1 Conducted Emissions

According to the requirements in Section 6.2 of ANSI C63.10: 2013, AC power-line conducted emissions shall be measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table and the turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10: 2013

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3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmit condition.

3.2. EUT Exercise Software

N/A

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

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4. SUMMARY OF TEST RESULTS

	Applied Standard: FCC Part 15 Subpart E									
FCC Rules	Description of Test	Result								
§15.407(a)	Maximum Conducted Output Power	Compliant								
§15.407(a)	Power Spectral Density	Compliant								
§15.407(e)	§15.407(e) 6dB & 26dB Bandwidth									
§15.205, §15.407(b)	Radiated Spurious Emissions and Band Edge	Compliant								
§15.407(g)	Frequency Stability	N/A								
§15.407(h)	Transmit Power Control (TPC)	N/A								
§15.207(a)	Line Conducted Emissions	Compliant								
§15.203	Antenna Requirements	Compliant								

Note: The customer declared frequency stability is better than 20ppm which ensures that the signal remains in the allocated bands under all operational conditions stated in the user manual.

5. TEST RESULT

5.1. Maximum Conducted Output Power Measurement

5.1.1. Standard Applicable

According to \$15.407(a)(1)(i), For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

According to \$ 15.407(a)(1)(ii), For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

According to § 15.407(a)(1)(iv), For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

According to \$15.407(a)(3), For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

5.1.2. Test Procedures

The transmitter output (antenna port) was connected to the power meter.

5.1.3. Test Setup Layout



5.1.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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5.1.5. Test Result of	Maximum	Conducted	Output Power
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Temperature	25°C	Humidity	60%		
Test Engineer	Chaz	Configurations	802.11a/n/ac		

Maximum Conducted Output Power Measurement Result For 5180~5240MHz Band

Mode	Channel	Frequency		Conducted P (dBm, Avera	Max. Limit	Result	
Mode	Onamici	(MHz)	Ant 3	t 3 Ant 4 Ant 3 +An		(dBm)	ricouit
	36	5180	17.42	17.24 /		30	Complies
802.11a	44	5220	17.51	17.42	/	30	Complies
	48	5240	17.39	17.31	/	30	Complies
	36	5180	13.81	14.12	16.98	30	Complies
802.11n(HT20)	44	5220	14.02	14.53	17.29	30	Complies
	48	5240	13.63	13.71	16.68	30	Complies
902 11p(UT40)	38	5190	13.60	13.62	16.62	30	Complies
ооz.т III(H140)	46	5230	13.73	13.86	16.80	30	Complies
	36	5180	13.78	14.10	16.95	30	Complies
802.11ac(VHT20)	44	5220	14.00	14.61	17.33	30	Complies
	48	5240	13.52	13.69	16.61	30	Complies
902 11co(\/UT40)	38	5190	13.60	13.84	16.73	30	Complies
802.11ac(VH140)	46	5230	13.74	13.81	16.78	30	Complies
802.11ac(VHT80)	42	5210	13.53	13.62	16.58	30	Complies

Maximum Conducted Output Power Measurement Result For 5745~5825MHz Band

Mode	Channel	Frequency		Conducted P (dBm, Avera	Max. Limit	Result	
inicac	onamor	(MHz)	Ant 3	Ant 4 Ant 3 +Ant 4		(dBm)	riocan
	149	5745	17.27	17.17 /		30	Complies
802.11a	157	5785	17.41	17.29	/	30	Complies
	165	5825	17.11	17.10	/	30	Complies
	149	5745	13.73	14.02	16.89	30	Complies
802.11n(HT20)	157	5785	14.02	14.37	17.21	30	Complies
	165	5825	13.66	13.92	16.80	30	Complies
902 11p(UT40)	151	5755	13.76	13.98	16.88	30	Complies
802.1 m(H140)	159	5795	13.70	13.83	16.78	30	Complies
	149	5745	13.83	14.15	17.00	30	Complies
802.11ac(VHT20)	157	5785	14.02	14.52	17.29	30	Complies
	165	5825	13.52	13.56	16.55	30	Complies
902 11co(\/UT40)	151	5755	13.61	13.62	16.63	30	Complies
602.11ac(VH140)	159	5795	13.54	13.74	16.66	30	Complies
802.11ac(VHT80)	155	5775	13.75	14.00	16.89	30	Complies

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duty cycle plot:

5.2GHz band

Agiler	nt Spectrum Analyzer - Sw	ept SA								
LXI Swe	RF 50 Ω	AC		SEN	ISE:INT	Ava Type	LIGNAUTO	11:57:08 Pf	Aug 29, 2016	Sweep/Control
0.00		PN IFGa	D: Fast 🖵 iin:Low	Trig: Free #Atten: 30	e Run)dB	Avg Hold:	>100,100	TY D		Sweep Time
10 di	B/div Ref 10.00 (1Bm								12.00 ms
0.00	hall and an	ቘኯ፟ኯኯኯኯኯኯኯ	, a harry fundy of	A Washington Mary	-bangersty at the UN	, ATTEL STATE FROM THE	tates and the second second	and salving at	pubpuratura an	Sweep Setup ▶
0.00					8					
-10.0										
-20.0										
-30.0									1	
-40.0										
-50.0										
-60.0										
-70.0										Gate
-80.0										[Off,LO]
					2					Points
Cen Res	ter 5.220000000 G BW 1.0 MHz	θHZ	#VBW	1.0 MHz		;	Sweep	s) 12.00 ms	span 0 Hz 1001 pts)	1001
MSG							STATU	S		1

802.11 a

RF 50 Ω AC		SENSE:INT	ALIGNAUTO 1	1:57:34 PM Aug 29, 2016	Sweep/Control
weep Time 12.00 ms	PNO: East Trig: F	Avgiyi Free Run Avg Hol	pe:Log-Pwr d:>100/100	TYPE MWWWWW	oncopiocitator
	IFGain:Low #Atter	n: 30 dB		DET P NNNNN	Sweep Tim
0 dB/div Ref 10.00 dBm					12.00
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802.11 n40

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() 214/4	RF	50 Ω	AC		SEN	ISE:INT	Ava Tvpe	LIGNAUTO	12:01:27 AM Aug 29, 2016 TRACE 1 2 3 4 5	Sweep/Control
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802.11 ac20

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XI	R	RF 50 Ω	AC		SEN	SE:INT		ALIGN AUTO	12:01:03 A	MAug 29, 2016	Sweep/Control
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802.11 ac40

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802.11 ac80

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5.8GHz band

Agnei XI	it spectrum A	RF 50 Ω	AC		SEN	ISE:INT		LIGN AUTO	11:58:28 P	M Aug 29, 2016	
Swe	ep Time	e 12.00 m	าร		1		Avg Type	: Log-Pwi	r TRA	CE 1 2 3 4 5 6	Sweep/Control
			P IF(NO: Fast 😱 Gain:Low	#Atten: 30	e Run)dB	Avg Hold:	>100/100	E		Sweep Time 12.00 m
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Agiler	nt Spectrum A	Analyzer - Swe	pt SA								
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802.11 n20

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Agile	nt Spectrum A	nalyzer - Sw	ept SA								
lxi Swe	Rep Time	F 50 Ω	ns		SEN	ISE:INT	Avg Type	LIGN AUTO	11:58:05 F TRA	M Aug 29, 2016 CE 1 2 3 4 5 6	Sweep/Control
			P	NO: Fast 😱 Gain:Low	¹ Trig: Free Run #Atten: 30 dB		Avg Hold:	>100/100	DET P N N N N		Sweep Time 12.00 ms
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Cen Res	ter 5.7550 BW 1.0 N	000000 G /IHz	J SHZ	#VBW	1.0 MHz			Sweep	12.00 ms	Span 0 Hz (1001 pts)	1001
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802.11 n40

Agiler	nt Spectrum A	nalyzer - Swej	pt SA								
lxi Swe	ep Time	50 Ω 12.00 m	AC S		SEN	ISE:INT	Avg Type	ELIGNAUTO	11:58:53 PM TRACE	Aug 29, 2016	Sweep/Control
			P IF(NO: Fast 🖵 Gain:Low	Trig: Free #Atten: 30	e Run) dB	Avg Hold:	>100/100	TYPE DE1	PNNNN	Sweep Time 12.00 m
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802.11 ac20

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Agiler	nt Spectr	um Analyzei	r - Swept SA								
lxi Swe	ep Ti	RF ime 12.0	50 Ω AC DO ms		SEM	ISE:INT	Avg Type	ALIGNAUTO E: Log-Pwi	r 12:00:41 / TRA	MAug 29, 2016 CE 1 2 3 4 5 6	Sweep/Control
				PNO: Fast 🔾 IFGain:Low	#Atten: 3	⁴ Trig: Free Run #Atten: 30 dB		Avg Hold:>100/100		PEMWWWWW Det PNNNNN	Sweep Time 12.00 ms
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802.11 ac40

Agiler	nt Spectrum A	nalyzer - Swep	ot SA								
lxi Swe	Rep Time	50 Ω 12.00 m	AC S		SEN	ISE:INT	Avg Type	LIGNAUTO	11:59:53 P TRA	M Aug 29, 2016 CE 1 2 3 4 5 6	Sweep/Control
			P IF(NO: Fast 🖵 Gain:Low	Trig: Free #Atten: 30	e Run 0 dB	Avg Hold:	>100/100	TY D	ET P N N N N N	Sweep Time 12.00 ms
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MSG								STATUS	5		

802.11 ac80

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5.2. Power Spectral Density Measurement

5.2.1. Standard Applicable

According to \$15.407(a)(1)(i), For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

According to \$15.407(a)(1)(ii), For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

According to § 15.407(a)(1)(iv), For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

According to § 15.407(a)(3), For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz(or a narrower bandwidth) band.

5.2.2. Test Procedures

- 1) The transmitter was connected directly to a Spectrum Analyzer through a directional couple.
- 2) The power was monitored at the coupler port with a Spectrum Analyzer. The power level was set to the maximum level.
- 3) Set the RBW/VBW = 1MHz/3MHz For the 5.15-5.25GHz band;

Set the RBW/VBW = 300KHz/1MHz For the 5.725-5.85GHz band.

- 4) Set the span to encompass the entire emission bandwidth of the signal.
- 5) Detector = RMS.
- 6) Sweep time = auto couple.
- 7) Trace mode = max hold.
- 8) Allow trace to fully stabilize.
- 9) Use the peak marker function to determine the maximum amplitude level.
- 5.2.3. Test Setup Layout



5.2.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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5.2.5. Test Result of Power Spectral Density

Temperature	25°C	Humidity	60%
Test Engineer	Chaz	Configurations	802.11a/n/ac

Power Spectral Density Measurement Result For 5180~5240MHz Band

Mode	Channel	Frequency		Power Density (dBm/MHz)	,	Max. Limit	Result
		(IVIHZ)	Ant 3	Ant 4	Ant3+ant4	(abm/iviHz)	
	36	5180	1.911	1.292	/	17	Complies
802.11a	44	5220	0.745	1.302	/	17	Complies
	48	5240	1.234	1.008	/	17	Complies
	36	5180	0.665	0.645	3.67	17	Complies
802.11n(HT20)	44	5220	0.706	0.227	3.48	17	Complies
	48	5240	0.122	0.707	3.43	17	Complies
900 11p/UT40)	38	5190	-2.568	-1.444	1.04	17	Complies
802.1 III(П140)	46	5230	-1.896	-2.815	0.68	17	Complies
	36	5180	0.748	0.821	3.79	17	Complies
802.11ac(VHT20)	44	5220	0.690	0.137	3.43	17	Complies
	48	5240	0.285	0.143	3.22	17	Complies
900 11 co/\/UT40\	38	5190	-2.633	-2.417	0.49	17	Complies
002.11aC(VH140)	46	5230	-2.976	-2.251	0.41	17	Complies
802.11ac(VHT80)	42	5210	-4.299	-3.989	-1.13	17	Complies

Mode	Chann el	Frequen (MHz)	P (d Ant 3	ower Densi dBm/300kH Ant 4	ty z) Ant3+ant	Correctio n Factor	Power Density (dBm/50 kHz)	Max. Limit (dBm/ 50kHz)	Result
	149	5745	-4.165	/	/	2.22	-1.95	30	Complies
802.11a	157	5785	-5.323	/	/	2.22	-3.10	30	Complies
	165	5825	-4.070	/	/	2.22	-1.85	30	Complies
	149	5745	/	-4.171	/	2.22	-1.95	30	Complies
802.11a	157	5785	/	-5.618	/	2.22	-3.40	30	Complies
	165	5825	/	-4.756	/	2.22	-2.54	30	Complies
	149	5745	-4.101	-4.217	-1.15	2.22	1.07	30	Complies
802.11n(H12	157	5785	-4.913	-4.582	-1.73	2.22	0.49	30	Complies
0)	165	5825	-4.339	-4.401	-1.36	2.22	0.86	30	Complies
802.11n(HT4	151	5755	-6.858	-6.942	-3.89	2.22	-1.67	30	Complies
0)	159	5795	-6.753	-6.635	-3.68	2.22	-1.46	30	Complies
	149	5745	-4.644	-4.530	-1.58	2.22	0.64	30	Complies
802.11ac(VH	157	5785	-4.555	-5.539	-2.01	2.22	0.21	30	Complies
120)	165	5825	-4.505	-4.458	-1.47	2.22	0.75	30	Complies
802.11ac(VH	151	5755	-7.609	-7.001	-4.28	2.22	-2.06	30	Complies
T40)	159	5795	-6.464	-6.738	-3.59	2.22	-1.37	30	Complies
802.11ac(VH T80)	155	5775	-9.253	-9.270	-6.25	2.22	-4.03	30	Complies

Power Spectral Density Measurement Result For 5745~5825MHz Band

Note: BW correction factor = $10\log(500kHz/RBW) = 10\log(500kHz/300KHz)$ The measured power density (dBm) has the offset with cable loss already.

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5.3. 6dB & 26dB Bandwidth Measurement

5.3.1. Standard Applicable

According to §15.407(e): Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

There is no restriction limits for 26dB & 99% occupied bandwidth, report only for reference.

5.3.2. Instruments Setting

The following table is the setting of the Spectrum Analyzer.

6dB Bandwidth Measurement (Only For 5745~5825MHz Band)			
Spectrum Parameter	Setting		
Attenuation	Auto		
RBW	100KHz		
VBW	≥ 3 x RBW		
Detector	Peak		
Trace	Max Hold		

26dB & 99% Bandwidth Measurement (Only For 5180~5240MHz Band)			
Spectrum Parameter	Setting		
Attenuation	Auto		
RBW	approximately 1% of the emission bandwidth		
VBW	≥ RBW		
Detector	Peak		
Trace	Max Hold		

5

5.3.3. Test Procedures

1) The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.

2) The resolution bandwidth and the video bandwidth were set according to KDB 789033 D02 General UNII Test Procedures New Rules v01r02

3) For 5745~5825MHz Band, Measured the maximum width of the emission that is 6dB down from the peak of the emission.

4) For 5180~5240MHz Band, Measured the maximum width of the emission that is 26dB down from the peak of the emission. Record the 26dB & 99% Bandwidth.

SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.

FCC ID:2AFFB-SPST

Report No.: LCS1605120918E

5.3.4. Test Setup Layout



5.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.3.6. Test Result of Spectrum Bandwidth

Temperature	25°C	Humidity	60%
Test Engineer	Chaz	Configurations	802.11a/n/ac

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz) Ant 3	Max. Limit (kHz)	Result
	149	5745	15.14	500	Complies
802.11a	157	5785	15.09	500	Complies
	165	5825	15.53	500	Complies
	149	5745	15.15	500	Complies
802.11n(HT20)	157	5785	15.30	500	Complies
	165	5825	15.15	500	Complies
802.11n(HT40) 15	151	5755	35.16	500	Complies
	159	5795	35.06	500	Complies
	149	5745	15.46	500	Complies
802.11ac(VHT20)	157	5785	15.06	500	Complies
	165	5825	15.44	500	Complies
802.11ac(VHT40)	151	5755	35.16	500	Complies
	159	5795	35.15	500	Complies
802.11ac(VHT80)	155	5775	72.70	500	Complies

Only record the worst case data of ant 3

Report No.: LCS1605120918E

Test Result of 6dl	B Bandwidth-ant 3
Agland Spectrum Audywer - Okcepted DW OP 100 /// Completed DW Cancer Free 5.74600000 GHz Radio Static None Trig Free 5.74600000 GHz Cancer Free 5.74600000 GHz Radio Static None Free 5.74600000 GHz Radio Static None Free 5.74600000 GHz Cancer Free 5.74600000 GHz Cancer Free 5.74600000 GHz Free 5.74600000 GHz Radio Device: BTS Sector Mag X2 2010 Trig Free 6.7460000 GHz Radio Device: BTS Cancer Free 5.74600000 GHz Cancer Free 5.7460000 GHz <th< th=""><th>Agterd Spectrue Analyse - Occupied Bit 10 10 20 20 20 Conter Free 5.74500000 GHz Center Free 5.74500000 GHz Figs Free 5.74500000 GHz Figs Free 5.74500000 GHz Figs Free 5.7450000 GHz Figs Free 5.7450000 GHz Figs Free 5.745000 GHZ Figs Free 5.7450000 GHZ Figs Free 5.745000 GHZ Figs Free 5.7450000000 GHZ Figs Free 5.7450000000 GHZ Figs Free 5.74500000000000000000000000000000000000</th></th<>	Agterd Spectrue Analyse - Occupied Bit 10 10 20 20 20 Conter Free 5.74500000 GHz Center Free 5.74500000 GHz Figs Free 5.74500000 GHz Figs Free 5.74500000 GHz Figs Free 5.7450000 GHz Figs Free 5.7450000 GHz Figs Free 5.745000 GHZ Figs Free 5.7450000 GHZ Figs Free 5.745000 GHZ Figs Free 5.7450000000 GHZ Figs Free 5.7450000000 GHZ Figs Free 5.74500000000000000000000000000000000000
log clear Write	100 Clear Write
Average	Average
600	40.0
Center 5.745 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms Min Hold	Center 5.745 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms Min Hold
16.499 MHz Detector	Occupied Bandwidth Total Power 11.2 dbm 17.670 MHz Detector
Transmit Freq Error -49.287 kHz OBW Power 99.00 % Auto Man x dB Bandwidth 15.14 MHz x dB -6.00 dB	Transmit Freq Error -49.967 kHz OBW Power 99.00 % Auto Man x dB Bandwidth 15.15 MHz x dB -6.00 dB -6.00 dB -6.00 dB
57070	400 STAIL
802 11a Low Channel / 5745MHz	802 11n HT20 Low Channel / 5745MHz
billed Section Autorer, Cronkel RK	bild Sectore balance - Dynald RK
Center Freq 5.785000000 GHz FirGainLew F	Center Freq 5.7855000000 GHz Freq 5.785000000 GHz Freq 5.78500000 GHz Freq 5.785000000 GHz Freq 5.785000000000 GHz Freq 5.78500000000000000000000000000000000000
10 dBldiv Ref 10.00 dBm	10 dB/div Ref 10.00 dBm
Average	as when the Average
000	400
Center 5.785 GHz Span 30 MHz Rese BW 100 Hz Sweep 2.933 ms	Center 5,785 CHz Span 30 MHz Rese By .785 CHz Street 5,785 CHZ STRE 5,785 CHZ STR
Occupied Bandwidth Total Power 9.66 dBm	Occupied Bandwidth Total Power 9.81 dBm
Detector Transmit Freq Error -54.449 kHz OBW Power 99.00 % Auto Man x dB Bandwidth 15.09 MHz x dB -60.00 dB Man	17.674 MHz Detector Transmit Freq Error -57.549 kHz OBW Power 99.00 % Auto Man x dB Bandwidth 15.30 MHz x dB -6.00 dB
400 STATUS	NG
802.11a Middle Channel / 5785MHz	802.11n HT20 Middle Channel / 5785MHz
Agilent Spectrum Analyzer - Occupied BW	Agilent Spectrum Analyzer - Occupied SW
Kore and a state of the second state of t	Trace/Detector Trace/De
10 dB/div Ref 10.00 dBm	10 dB/div Ref 10.00 dBm
and the second s	30.0 40 Wolling Market Market Average
600	600
Center 5.825 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms Min Hold	Center 5.825 GHz Span 30 MHz Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms Min Hold
Occupied Bandwidth Total Power 10.5 dBm 16.515 MHz Detector Peaks	Occupied Bandwidth Total Power 10.2 dBm Detector 17.692 MHz Post
Transmit Freq Error -65.526 kHz OBW Power 99.00 % Auto Man x dB Bandwidth 15.53 MHz x dB -6.00 dB	Transmit Freq Error -72.445 kHz OBW Power 99.00 % Auto Man x dB Bandwidth 15.15 MHz x dB -6.00 dB
802.11a_High Channel / 5825MHz	802.11n H120_High Channel / 5825MHz

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Report No.: LCS1605120918E

Test Re	esult of 6d	B Bandwidth-ant 3
Andered Spectrum Analyzer, Orcepted BW 1000 acc (1) 000 acc (1)	S	Addent Synchrom Andyram Occupied BW (1979) (
Log 0.00 1.00 2.00 2.00 1	Clear Write	Clear Write
000	الماري Average	Average
	Max Hold	600 Max Hold
Center 5,755 GHz Span 60 A #Res BW 100 kHz #VBW 300 kHz Sweep 5.8 Occupied Bandwidth Total Power 10.6 dBm	Min Hold	Center 5.775 GHz Span 120 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 11.53 ms Occupied Bandwidth Total Power 12.5 dBm
36.052 MHz Transmit Freq Error -66.817 kHz OBW Power 99.00 % x dB Bandwidth 35.16 MHz x dB -6.00 dB	Detector Peak≯ Auto <u>Man</u>	75.288 MHz Transmit Freq Error -173.15 KHz OBW Power 99.00 % Auto Man x dB Bandwidth 72.70 MHz x dB -6.00 dB
Active Space 60 copy of the second states of the se	5MHz	802.11ac VHT80_5775MHz
10 dBidly Ref 10.00 dBm Log 0.00 10 20 20 20 20 20 20 20 20 20 2	ClearWrite	
000 000 000 000 000 000 000 000 000 00	why Average	
700 000 000 000 000 000 000 000 000 000	Max Hold	
#Res BW 100 kHz #VBW 300 kHz Sweep 5.8 Occupied Bandwidth Total Power 12.3 dBm 36.093 MHz Transmit Freq Error -119.95 kHz OBW Power 99.00 % x dB Bandwidth 35.15 MHz x dB -6.00 dB	Min Hold Detector Peak> Auto Man	

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Mode	Channel	Frequency	26dB BW (MHz)	99% BW (MHz)	Limit
	36	5180	24.92	16.70	
802.11a	44	5220	24.98	16.68	
	48	5240	24.53	16.74	
	36	5180	25.40	17.82	
802.11n(HT20)	44	5220	25.34	17.83	
	48	5240	24.52	17.82	
802.11n(HT40)	38	5190	45.39	36.14	Non-
	46	5230	43.88	36.09	specified
802.11ac(VHT20)	36	5180	25.12	17.85	
	44	5220	24.76	17.86	
	48	5240	25.52	17.88	
802.11ac(VHT40)	38	5190	46.58	36.15	
	46	5230	44.28	36.16	
802.11ac(VHT80)	38	5190	115.10	75.88	

only record the worst case data of ant 3

Test Result of 26dB Bandwi	dth & 99% Bandwidth-ant 3
Agilent Spectrum Analyzer - Occupied BW	Aglient Spectrum Analyzer - Occupied BW
Mill Store ALSTRAINTO R0223 SIME Aug 70, 2016 Trace/Detector VBW 1.0000 MHz Center Frees (\$ 50000000 GHz Radio Std: Nene Trace/Detector #IF Gaint.ow #IF Gaint.ow AvgHeld> 10/10 Radio Device: BTS	Center Freq 5. 180000000 GHz #IF GaintLaw Frig Fee Run AvgHeld> 1010 Radio Std: Nene #IF GaintLaw Radio Device: BTS
10 dBJdiv Ref 10.00 dBm	10 48Jdiv Ref 10.00 dBm
100 300 300	
400 AVErage	400 AVER 400
A00 Max Hold Max Hold Center 5.18 GHz Soan 30 MHz	000 Max H 000 San 30 MHz
#Res BW 300 kHz #VBW 1 MHz Sweep 1 ms Occupied Bandwidth Total Power 11.6 dBm	PRes BW 300 kHz #VBW 1 MHz Sweep 1 ms Min H Occupied Bandwidth Total Power 9.88 dBm
16.701 MHz Detector Transmit Freq Error -51.369 kHz OBW Power 99.00 % Auto Man x dB Bandwidth 24.92 MHz x dB -26.00 dB	17.819 MHz Detect Transmit Freq Error -63.993 kHz OBW Power 99.00 % Auto B x dB Bandwidth 25.40 MHz x dB -26.00 dB
MG STATUS	Mig
802.11a_Low Channel / 5180MHz	802.11n HT20_Low Channel / 5180MHz
Agilent Spectrum Analyzer - Occupied BW	Agilent Spectrum Analyzer - Occupied BW
Image: Context Freq 5.220000000 GHz Center Freq 5.220000000 GHz Center Freq 5.220000000 GHz Trigs Free Run Avg/Held>10/10 Radie Std: Nene Trace/Detector #IF Gain.Lew #If Free Run Avg/Held>10/10 Radie Device: BTS	Image: State State State State State State State State State State Trace/Detecto Center Freq 5.220000000 GHz Trig Free Run AvgHeld>10/10 Radio State Non Trace/Detecto #IF GainLaw Fill GainLaw AvgHeld>10/10 Radio Device: BTS Trace/Detecto
10 dB/div Ref 10.00 dBm	10 dB/div Ref 10.00 dBm
Clear Write	100 ClearW
Average	400 Aver 500 Aver
ACC ACCENT ACCENTA ACCENTA ACCENTACENT ACCENTA ACCE	400 Max H
Center 5.22 GHz Span 30 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 1 ms Min Hold	Center 5.22 GHz Span 30 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 1 ms Min H
Occupied Bandwidth Fotal Power 9.96 dbm 16.677 MHz Detector Peak	Occupied Bandwidth Total Power 11.2 dBm 17.826 MHz Deter
Transmit Freq Error -55.931 kHz OBW Power 99.00 % Auto Man x dB Bandwidth 24.98 MHz x dB -26.00 dB	Transmit Freq Error -47.462 HHz OBW Power 99.00 % Auto I x dB Bandwidth 25.34 MHz x dB -26.00 dB
NSG STATUS	MG
802.11a Middle Channel / 5220MHz	802.11n HT20 Middle Channel / 5220MHz
Addres Spectrum Analyzer: Occupied BW 20100000000000000000000000000000000000	Agtive Spectrum Analyses - Occupied Bits
Ing Free Run Avgiteid>10/10 #FGainLow Attan: 30 dB Radio Device: BTS	entrer Freq J.24000000 GFIZ Frig Free Run Avgitteld>1010 #IFGaint.ev #Atten:30 dB Radio Device: BTS
10 dBl/dv Ref 10.00 dBm Log 0 00 Clear Write	10 dB/div Ref 10.00 dBm
200 Anno and and an and and	200 menor and menor have a
Average 600	400 Aver
And	MaxH
Res BW 300 kHz #VBW 1 MHz Sweep 1 ms Min Hold Occupied Bandwidth Total Power 9.82 dBm	IRRes BW 300 kHz sweep 1 ms Occupied Bandwidth Total Power 9.63 dBm
16.741 MHz Detector	17.822 MHz Deter
Preakt Preakt Preakt Auto Man x dB Bandwidth 24.53 MHz x dB -26.00 dB <td< th=""><td>Transmit Freq Error -39.625 kHz OBW Power 99.00 % Auto 1 x dB Bandwidth 24.52 MHz x dB -26.00 dB 2</td></td<>	Transmit Freq Error -39.625 kHz OBW Power 99.00 % Auto 1 x dB Bandwidth 24.52 MHz x dB -26.00 dB 2
M50 STATUS	MSG
802.11a High Channel / 5240MHz	802.11n HT20 High Channel / 5240MHz

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Test Result of 26dB Bandwi	dth & 99% Bandwidth-ant 3
Agtert Spectrum Androver - Occupied SW ALSYARTO 000050551M4 Ag 21,2010 Center Freg 5, 190000000 GHz Conter Freg 5, 190000000 GHz Radie Std: None //FGaint.cv Argitekt>10/10 Radie Std: None //FGaint.cv Argitekt>10/10 Radie Device: BTS	Agtivet Spectrum Analyzer - Occupied BW Span 30.000 MHz Freq 5.15000000 OHz Freq 5.15000000 Freq 5.15000000 Freq 5.15000000 Freq 5.15000000 Freq 5.15000000 Freq 5.1500000 Freq 5.1500000 Freq 5.15000000 Freq 5.1500000 Freq 5.15000000 Freq 5.150000000 Freq 5.1500000000 Freq 5.1500000000 Freq 5.1500000000 Freq 5.150000000000 Freq 5.150000000000 Freq 5.1500000000000 Freq 5.150000000000 Freq 5.150000000000 Freq 5.150000000000 Freq 5.150000000000 Freq 5.150000000000000 Freq 5.150000000000000 Freq 5.15000000000000000000 Freq 5.1500000000000000000000000000000000000
Clear Write	Log Clear Write
Average	Average
400	400 A00 _
Center 5.19 GHz Span 60 MHz #Res BW 430 kHz #VBW 1.5 MHz Sweep 1 ms Coopcied Pandwidth Total Power 10.2 dBm Min Hold	Center 5.18 GHz Span 30 MHz PRes BW 300 kHz #VBW 1 MHz Sweep 1 ms Cocursied Bandwidth Total Power 10 1 dBm Min Hold
Star Ford Total Ford Total Ford Total Ford Detector Transmit Freq Error -117.21 kHz OBW Power 99.00 % Auto Man x dB Bandwidth 45.39 MHz x dB -26.00 dB Man	Transmit Freq Error -66.915 kHz Detector x dB Bandwidth 25.12 MHz x dB -26.00 dB
MIG	MIG
802.11n HT40_Low Channel / 5190MHz	802.11ac VHT20_Low Channel / 5180MHz
Aglieft Spectrum Analymer - Occupied International Spectrum Analymer	Agtivit Sectrum Analyzer - Occupied BW P 100 a AC Center Freq 5.2200000000 GHz Fil Gaint.ew Fil Gaint.ew Fil Gaint.ew Center Freq 5.220000000 GHz Fil Gaint.ew Fil Gaint.ew
10 dBlaiv Ref 10.00 dBm	10 Bildiu Ref 10.00 dBm
300 March - March Average 600	400 Average
400 Max Hold Center 5.23 GHz Span 60 MHz	Center 5.22 GHz Span 30 MHz
#Res BW 430 kHz #VBW 1.5 MHz Sweep 1 ms Occupied Bandwidth Total Power 9.47 dBm Min Hold	PRes BW 300 kHz #VBW 1 MHz Sweep 1 ms Occupied Bandwidth Total Power 9.99 dBm
36.087 MHZ Detector Transmit Freq Error -63.338 kHz OBW Power 99.00 % Auto Man x dB Bandwidth 43.88 MHz x dB -26.00 dB Man	17.858 MHZ Detector Transmit Freq Error -55.499 kHz OBW Power 99.00 % Auto Man x dB Bandwidth 24.76 MHz x dB -26.00 dB Man
MG	MBG
802.11n HT40_ High Channel / 5230MHz	802.11ac VHT20_Middle Channel / 5220MHz
	Agtherd Spectrum Analyzer - Occupied 1997 Teleform Freq 5.2400000000 GHz Center Freq 5.240000000 GHz Radio Stat: Nene FFGaint.ev Trig Fra Canalyzer - Avgiteda - 1017 FFGaint.ev Argenta - 1018 FFGaint.ev Radio Device: BTS
	10 dBidiy Ref 10.00 dBm
	300 300 400 500 500 500 500 500 500 5
	Center 5.24 GHz Span 30 MHz
	PRES BW 300 KHz FVBW 1 MHz Sweep 1 ms Occupied Bandwidth Total Power 10.6 dBm
	17.8// IMHZ Detector Transmit Freq Error -30.028 kHz OBW Power 99.00 % Auto Man x dB Bandwidth 25.52 MHz x dB -26.00 dB Man
	M6G 37347US
	802.11ac VHT20_High Channel / 5240MHz

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	Test Res	sult of 26dB	Bandwi	dth & 99% Bandwidth-ant 3
Agtient Spectrum Analyzer - Occupied BW BB 50.9 ac VBW 1.5000 MHz #IF Gain:t.ew	Center Free; 5.19000000 GHz Trig: Free Run Avg Hold>10/1 #Atten: 30 dB	Radio Device: BTS	Trace/Detector	Astirut Seetrue Analyzer - Occupied BW B 190 200 4C Center Freq 5.2100000000 GHz BIF GainLew BIF GainLew Freq 5.210000000 GHz Trace/Detector Freq 5.210000000 GHz Trace/Detector Freq 5.210000000 GHz BIF GainLew Freq 5.210000000 GHz Freq 5.2100000000 GHz Freq 5.210000000 GHz BIF GainLew Freq 5.210000000 GHz Freq 5.2100000000 GHZ Freq 5.210000000 GHZ Freq 5.210000000 GHZ Freq 5.2100000000 GHZ Freq 5.2100000000 GHZ Freq 5.210000000 GHZ Freq 5.210000000 GHZ Freq 5.210000000 GHZ Freq 5.210000000 GHZ Freq 5.210000000 GHZ Freq 5.21000000 GHZ Freq 5.210000000 GHZ Freq 5.210000000 GHZ Freq 5.210000000 GHZ Freq 5.210000000 GHZ Freq 5.210000000 GHZ Freq 5.210000000 GHZ Freq 5.2100000000 GHZ Freq 5.210000000 GHZ Freq 5.210000000 GHZ Freq 5.210000000 GHZ Freq 5.2100000000 GHZ Freq 5.2100000000 GHZ Freq 5.2100000000 GHZ Freq 5.2100000000 GHZ Freq 5.2100000000 GHZ Freq 5.2100000000 GHZ Freq 5.21000000000 GHZ Freq 5.210000000000000 GHZ Freq 5.210000000000000000 GHZ Freq 5.21000000000000000000000000000000000000
10 dB/div Ref 10.00 dBm	and the second		Clear Write	10 dB/div Ref 10.00 dBm
-30.0 -40.0 50.0		and we are a second	Average	300 mount here's Average Avera
-60.0			Max Hold	46.0
Center 5.19 GHz #Res BW 430 kHz	#VBW 1.5 MHz	Span 60 MHz Sweep 1 ms	Min Hold	Center 5.21 GHz Span 120 MHz Span 120 MHz Sweep 1 ms Min Hol
36.151 M Transmit Freq Error -94.89 x dB Bandwidth 46.54	MHZ 99 kHz OBW Power 8 MHz x dB	99.00 % -26.00 dB	Detector Peak≯ Auto <u>Man</u>	Transmit Freq Error -293.88 kHz OBW Power 99.00 % Auto Mat x dB Bandwidth 115.1 MHz x dB -26.00 dB -26.00 dB
802 11aa VII	T40 Low Chon	status		902 1100 VHT90 5210MHz
Addent Spectrum Analyzer - Occupied DW Market Spectrum Analyzer - Occupied DW Center Freq 5.230000000 GHz #IFGainLaw	Center Free Run AvgiHeid> 1019 Free Run AvgiHeid> 1019 #Atten: 30 dB	AUTO 00:52:30 PM Aug 30, 2016 Radio Std: None Radio Device: BTS	Trace/Detector	
10 dB/div Ref 10.00 dBm	union with the second		Clear Write	
40.0 50.0		hat and a meneral	Average	
-70.0			Max Hold	
Center 5.23 GHz #Res BW 430 kHz	#VBW 1.5 MHz	Span 60 MHz Sweep 1 ms 9.49 dBm	Min Hold	
36.157 M Transmit Freq Error -80.28 x dB Bandwidth 44.20	VHz 66 kHz OBW Power 8 MHz x dB	99.00 % -26.00 dB	Detector Peak► Auto <u>Man</u>	
MSG		STATUS		
802.11ac VHT	Г40_ High Char	nnel / 5230N	AHz	

5.4. Radiated Emissions Measurement

5.4.1. Standard Applicable

According to §15.407 (b)(1) to (6):

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz (68.3dBuV/m at 3m).

For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz (78.3dBuV/m at 3m); for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz (68.3dBuV/m at 3m).

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

5.4.2. Instruments Setting

The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 100kHz for QP

5.4.3. Test Procedures

1) Sequence of testing 9 kHz to 30 MHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna height is 0.8 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

Final measurement:

--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

- --- The measurement distance is 3 meter.
- --- The EUT was set into operation.

Premeasurement:

- --- The turntable rotates from 0° to 315° using 45° steps.
- --- The antenna is polarized vertical and horizontal.
- --- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position $(\pm 45^\circ)$ and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 2.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position $(\pm 45^\circ)$ and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz

Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

Premeasurement:

--- The antenna is moved spherical over the EUT in different polarisations of the antenna.

Final measurement:

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.

--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.



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Above 1GHz

Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

5.4.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

Temperature	25°C	Humidity	60%
Test Engineer	Chaz	Configurations	802.11a/n/ac

\sim

Freq.	Level	Over Limit	Over Limit	Remark
(MHz)	(dBuV)	(dB)	(dBuV)	
-	-	-	-	See Note

Note:

The radiated emissions from 9kHz to 30MHz are at least 20dB below the official limit and no need to report.

5.4.7. Results of Radiated Emissions (30MHz~1GHz) Note: Only record the worst test result(TX at 802.11a:5220MHz, ant 3) in this report. Horizontal:

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***Note:

Pre-scan all mode and recorded the worst case results in this report (802.11a mode(Middle Channel, 5180-5240MHz Band, ant 3)).

Emission level (dBuV/m) = $20 \log Emission level (uV/m)$.

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level. Only recorded the worst test case in this report.

5.4.8. Results for Radiated Emissions (Above 1GHz)

Note: Only recorded the worst test result in this report.

The Worst Test Result For 5180~5240MHz Band.

802.11a / Channel 36:(ant 3)

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.36	45.45	33.21	35.82	9.52	52.36	74	-21.64	Peak	Horizontal
10.36	34.78	33.21	35.82	9.52	41.69	54	-12.31	Average	Horizontal
10.36	46.53	32.82	35.82	9.52	53.05	74	-20.95	Peak	Vertical
10.36	35.39	32.82	35.82	9.52	41.91	54	-12.09	Average	Vertical

802.11a / Channel 44:(ant 3)

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.44	45.84	33.21	35.82	9.52	52.75	74	-21.25	Peak	Horizontal
10.44	35.24	33.21	35.82	9.52	42.15	54	-11.85	Average	Horizontal
10.44	47.00	32.82	35.82	9.52	53.52	74	-20.48	Peak	Vertical
10.44	35.76	32.82	35.82	9.52	42.28	54	-11.72	Average	Vertical

802.11a / Channel 48:(ant 3)

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.48	46.57	33.21	35.82	9.52	53.48	74	-20.52	Peak	Horizontal
10.48	35.66	33.21	35.82	9.52	42.57	54	-11.43	Average	Horizontal
10.48	47.67	32.82	35.82	9.52	54.19	74	-19.81	Peak	Vertical
10.48	36.09	32.82	35.82	9.52	42.61	54	-11.39	Average	Vertical

802.11n(HT20) / Channel 36:(ant 3+ant 4)

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.36	45.27	33.21	35.82	9.52	52.18	74	-21.82	Peak	Horizontal
10.36	34.49	33.21	35.82	9.52	41.40	54	-12.60	Average	Horizontal
10.36	46.41	32.82	35.82	9.52	52.93	74	-21.07	Peak	Vertical
10.36	34.85	32.82	35.82	9.52	41.37	54	-12.63	Average	Vertical

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Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.44	45.93	33.21	35.82	9.52	52.84	74	-21.16	Peak	Horizontal
10.44	34.92	33.21	35.82	9.52	41.83	54	-12.17	Average	Horizontal
10.44	47.09	32.82	35.82	9.52	53.61	74	-20.39	Peak	Vertical
10.44	35.38	32.82	35.82	9.52	41.90	54	-12.10	Average	Vertical

802.11n(HT20) / Channel 44:(ant 3+ant 4)

802.11n(HT20) / Channel 48:(ant 3+ant 4)

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.48	46.30	33.21	35.82	9.52	53.21	74	-20.79	Peak	Horizontal
10.48	35.58	33.21	35.82	9.52	42.49	54	-11.51	Average	Horizontal
10.48	47.46	32.82	35.82	9.52	53.98	74	-20.02	Peak	Vertical
10.48	35.87	32.82	35.82	9.52	42.39	54	-11.61	Average	Vertical

802.11n(HT40) / Channel 38 / Ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.38	45.81	33.21	35.82	9.52	52.72	74	-21.28	Peak	Horizontal
10.38	34.94	33.21	35.82	9.52	41.85	54	-12.15	Average	Horizontal
10.38	47.21	32.82	35.82	9.52	53.73	74	-20.27	Peak	Vertical
10.38	35.55	32.82	35.82	9.52	42.07	54	-11.93	Average	Vertical

802.11n(HT40) / Channel 46 / Ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.46	46.14	33.21	35.82	9.52	53.05	74	-20.95	Peak	Horizontal
10.46	35.40	33.21	35.82	9.52	42.31	54	-11.69	Average	Horizontal
10.46	47.33	32.82	35.82	9.52	53.85	74	-20.15	Peak	Vertical
10.46	35.62	32.82	35.82	9.52	42.14	54	-11.86	Average	Vertical

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Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.36	45.23	33.21	35.82	9.52	52.14	74	-21.86	Peak	Horizontal
10.36	34.69	33.21	35.82	9.52	41.60	54	-12.40	Average	Horizontal
10.36	46.49	32.82	35.82	9.52	53.01	74	-20.99	Peak	Vertical
10.36	34.90	32.82	35.82	9.52	41.42	54	-12.58	Average	Vertical

802.11ac(VHT20) / Channel 36 / Ant 3+ant 4

802.11ac(VHT20) / Channel 40 / Ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.44	45.70	33.21	35.82	9.52	52.61	74	-21.39	Peak	Horizontal
10.44	35.04	33.21	35.82	9.52	41.95	54	-12.05	Average	Horizontal
10.44	46.94	32.82	35.82	9.52	53.46	74	-20.54	Peak	Vertical
10.44	35.60	32.82	35.82	9.52	42.12	54	-11.88	Average	Vertical

802.11ac(VHT20) / Channel 48 / Ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.48	46.47	33.21	35.82	9.52	53.38	74	-20.62	Peak	Horizontal
10.48	35.41	33.21	35.82	9.52	42.32	54	-11.68	Average	Horizontal
10.48	47.64	32.82	35.82	9.52	54.16	74	-19.84	Peak	Vertical
10.48	36.20	32.82	35.82	9.52	42.72	54	-11.28	Average	Vertical

802.11ac(VHT40) / Channel 38 / Ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.38	45.59	33.21	35.82	9.52	52.50	74	-21.50	Peak	Horizontal
10.38	34.57	33.21	35.82	9.52	41.48	54	-12.52	Average	Horizontal
10.38	46.66	32.82	35.82	9.52	53.18	74	-20.82	Peak	Vertical
10.38	35.04	32.82	35.82	9.52	41.56	54	-12.44	Average	Vertical

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Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.46	45.94	33.21	35.82	9.52	52.85	74	-21.15	Peak	Horizontal
10.46	35.12	33.21	35.82	9.52	42.03	54	-11.97	Average	Horizontal
10.46	47.29	32.82	35.82	9.52	53.81	74	-20.19	Peak	Vertical
10.46	35.76	32.82	35.82	9.52	42.28	54	-11.72	Average	Vertical

802.11ac(VHT40) / Channel 46 / Ant 3+ant 4

802.11ac(VHT80) / Channel 42 / Ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
10.42	45.18	33.21	35.82	9.52	52.09	74	-21.91	Peak	Horizontal
10.42	34.22	33.21	35.82	9.52	41.13	54	-12.87	Average	Horizontal
10.42	46.34	32.82	35.82	9.52	52.86	74	-21.14	Peak	Vertical
10.42	34.76	32.82	35.82	9.52	41.28	54	-12.72	Average	Vertical

Notes:

- 1. Measuring frequencies from 9k~40GHz, No emission found between lowest internal used/generated frequency to 30MHz.
- 2. Radiated emissions measured in frequency range from 30MHz~40GHz were made with an instrument using Peak detector mode.
- 3. The radiated emissions from 18GHz to 40GHz are at least 20dB below the official limit and no need to report.

The Worst Test Result For 5745~5825MHz Band.

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.490	46.93	33.92	36.09	10.26	55.02	74	-18.98	Peak	Horizontal
11.490	36.37	33.92	36.09	10.26	44.46	54	-9.54	Average	Horizontal
11.490	48.27	33.99	35.99	10.26	56.53	74	-17.47	Peak	Vertical
11.490	36.90	33.99	35.99	10.26	45.16	54	-8.84	Average	Vertical

802.11a / Channel 149:ant 3

802.11a / Channel 157:ant 3

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.570	46.63	33.92	36.09	10.26	54.72	74	-19.28	Peak	Horizontal
11.570	35.92	33.92	36.09	10.26	44.01	54	-9.99	Average	Horizontal
11.570	47.86	33.99	35.99	10.26	56.12	74	-17.88	Peak	Vertical
11.570	36.47	33.99	35.99	10.26	44.73	54	-9.27	Average	Vertical

802.11a / Channel 165:ant 3

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.650	46.39	33.92	36.09	10.26	54.48	74	-19.52	Peak	Horizontal
11.650	35.87	33.92	36.09	10.26	43.96	54	-10.04	Average	Horizontal
11.650	47.30	33.99	35.99	10.26	55.56	74	-18.44	Peak	Vertical
11.650	36.13	33.99	35.99	10.26	44.39	54	-9.61	Average	Vertical

802.11n(HT20) / Channel 149:ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.490	46.84	33.92	36.09	10.26	54.93	74	-19.07	Peak	Horizontal
11.490	36.12	33.92	36.09	10.26	44.21	54	-9.79	Average	Horizontal
11.490	47.87	33.99	35.99	10.26	56.13	74	-17.87	Peak	Vertical
11.490	36.77	33.99	35.99	10.26	45.03	54	-8.97	Average	Vertical

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Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.570	47.08	33.92	36.09	10.26	55.17	74	-18.83	Peak	Horizontal
11.570	36.25	33.92	36.09	10.26	44.34	54	-9.66	Average	Horizontal
11.570	48.02	33.99	35.99	10.26	56.28	74	-17.72	Peak	Vertical
11.570	36.76	33.99	35.99	10.26	45.02	54	-8.98	Average	Vertical

802.11n(HT20) / Channel 157:ant 3+ant 4

802.11n(HT20) / Channel 165:ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.650	46.65	33.92	36.09	10.26	54.74	74	-19.26	Peak	Horizontal
11.650	35.79	33.92	36.09	10.26	43.88	54	-10.12	Average	Horizontal
11.650	47.76	33.99	35.99	10.26	56.02	74	-17.98	Peak	Vertical
11.650	36.16	33.99	35.99	10.26	44.42	54	-9.58	Average	Vertical

802.11n(HT40) / Channel 151 / Ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.510	49.86	33.92	36.09	10.26	57.95	74	-16.05	Peak	Horizontal
11.510	38.98	33.92	36.09	10.26	47.07	54	-6.93	Average	Horizontal
11.510	50.64	33.99	35.99	10.26	58.90	74	-15.10	Peak	Vertical
11.510	39.32	33.99	35.99	10.26	47.58	54	-6.42	Average	Vertical

802.11n(HT40) / Channel 159 / Ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.590	49.90	33.92	36.09	10.26	57.99	74	-16.01	Peak	Horizontal
11.590	39.00	33.92	36.09	10.26	47.09	54	-6.91	Average	Horizontal
11.590	50.85	33.99	35.99	10.26	59.11	74	-14.89	Peak	Vertical
11.590	39.48	33.99	35.99	10.26	47.74	54	-6.26	Average	Vertical

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802.11ac(VHT20) / Channel 149 / Ant 3+ant 4
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Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.490	49.61	33.92	36.09	10.26	57.70	74	-16.30	Peak	Horizontal
11.490	38.80	33.92	36.09	10.26	46.89	54	-7.11	Average	Horizontal
11.490	50.71	33.99	35.99	10.26	58.97	74	-15.03	Peak	Vertical
11.490	39.55	33.99	35.99	10.26	47.81	54	-6.19	Average	Vertical

802.11ac(VHT20) / Channel 157 / Ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.570	49.34	33.92	36.09	10.26	57.43	74	-16.57	Peak	Horizontal
11.570	38.94	33.92	36.09	10.26	47.03	54	-6.97	Average	Horizontal
11.570	50.38	33.99	35.99	10.26	58.64	74	-15.36	Peak	Vertical
11.570	39.35	33.99	35.99	10.26	47.61	54	-6.39	Average	Vertical

802.11ac(VHT20) / Channel 165 / Ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.650	49.05	33.92	36.09	10.26	57.14	74	-16.86	Peak	Horizontal
11.650	38.59	33.92	36.09	10.26	46.68	54	-7.32	Average	Horizontal
11.650	50.26	33.99	35.99	10.26	58.52	74	-15.48	Peak	Vertical
11.650	39.07	33.99	35.99	10.26	47.33	54	-6.67	Average	Vertical

802.11ac(VHT40) / Channel 151 / Ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.510	49.36	33.92	36.09	10.26	57.45	74	-16.55	Peak	Horizontal
11.510	38.81	33.92	36.09	10.26	46.90	54	-7.10	Average	Horizontal
11.510	50.69	33.99	35.99	10.26	58.95	74	-15.05	Peak	Vertical
11.510	39.09	33.99	35.99	10.26	47.35	54	-6.65	Average	Vertical

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Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.590	49.21	33.92	36.09	10.26	57.30	74	-16.70	Peak	Horizontal
11.590	38.20	33.92	36.09	10.26	46.29	54	-7.71	Average	Horizontal
11.590	49.92	33.99	35.99	10.26	58.18	74	-15.82	Peak	Vertical
11.590	38.72	33.99	35.99	10.26	46.98	54	-7.02	Average	Vertical

802.11ac(VHT40) / Channel 159 / Ant 3+ant 4

802.11ac(VHT80) / Channel 155 / Ant 3+ant 4

Freq. GHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
11.550	49.45	33.92	36.09	10.26	57.54	74	-16.46	Peak	Horizontal
11.550	38.64	33.92	36.09	10.26	46.73	54	-7.27	Average	Horizontal
11.550	50.25	33.99	35.99	10.26	58.51	74	-15.49	Peak	Vertical
11.550	38.90	33.99	35.99	10.26	47.16	54	-6.84	Average	Vertical

Notes:

- 1. Measuring frequencies from 9k~40GHz, No emission found between lowest internal used/generated frequency to 30MHz.
- 2. Radiated emissions measured in frequency range from 30MHz~40GHz were made with an instrument using Peak detector mode.
- 3. The radiated emissions from 18GHz to 40GHz are at least 20dB below the official limit and no need to report.

5.4.9. Results of Band Edges Test (Radiated)

Note: Only recorded the worst test result in this report.

The Worst Test Result For 5180~5240MHz Band.

802.11a / Channel 36: ant 3

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5150.00	48.68	33.79	36.42	7.80	53.85	74	-20.15	Peak	Horizontal
5150.00	38.34	33.79	36.42	7.80	43.51	54	-10.49	Average	Horizontal
5150.00	50.00	34.24	36.42	7.80	55.62	74	-18.38	Peak	Vertical
5150.00	39.22	34.24	36.42	7.80	44.84	54	-9.16	Average	Vertical

802.11a / Channel 48: ant 3

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5350.00	49.66	34.66	36.59	7.98	55.71	74	-18.29	Peak	Horizontal
5350.00	39.04	34.66	36.59	7.98	45.09	54	-8.91	Average	Horizontal
5350.00	51.50	34.69	36.59	7.98	57.58	74	-16.42	Peak	Vertical
5350.00	41.39	34.69	36.59	7.98	47.47	54	-6.53	Average	Vertical

802.11n(HT20) / Channel 36: ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5150.00	48.50	33.79	36.42	7.80	53.67	74	-20.33	Peak	Horizontal
5150.00	38.34	33.79	36.42	7.80	43.51	54	-10.49	Average	Horizontal
5150.00	49.83	34.24	36.42	7.80	55.45	74	-18.55	Peak	Vertical
5150.00	38.77	34.24	36.42	7.80	44.39	54	-9.61	Average	Vertical

802.11n(HT20) / Channel 48: ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5350.00	49.15	34.66	36.59	7.98	55.20	74	-18.80	Peak	Horizontal
5350.00	38.45	34.66	36.59	7.98	44.50	54	-9.50	Average	Horizontal
5350.00	50.84	34.69	36.59	7.98	56.92	74	-17.08	Peak	Vertical
5350.00	40.76	34.69	36.59	7.98	46.84	54	-7.16	Average	Vertical

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Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5150.00	47.94	33.79	36.42	7.80	53.11	74	-20.89	Peak	Horizontal
5150.00	37.76	33.79	36.42	7.80	42.93	54	-11.07	Average	Horizontal
5150.00	49.61	34.24	36.42	7.80	55.23	74	-18.77	Peak	Vertical
5150.00	38.32	34.24	36.42	7.80	43.94	54	-10.06	Average	Vertical

802.11n(HT40) / Channel 38 / Ant 3+ant 4

802.11n(HT40) / Channel 46 / Ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5350.00	49.00	34.66	36.59	7.98	55.05	74	-18.95	Peak	Horizontal
5350.00	38.34	34.66	36.59	7.98	44.39	54	-9.61	Average	Horizontal
5350.00	50.87	34.69	36.59	7.98	56.95	74	-17.05	Peak	Vertical
5350.00	40.28	34.69	36.59	7.98	46.36	54	-7.64	Average	Vertical

802.11ac(VHT20) / Channel 36: ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5150.00	48.53	33.79	36.42	7.8	53.70	74	-20.30	Peak	Horizontal
5150.00	38.46	33.79	36.42	7.8	43.63	54	-10.37	Average	Horizontal
5150.00	49.92	34.24	36.42	7.8	55.54	74	-18.46	Peak	Vertical
5150.00	38.80	34.24	36.42	7.8	44.42	54	-9.58	Average	Vertical

802 11ac(VHT20) / Channel 48: ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5350.00	49.39	34.66	36.59	7.98	55.44	74	-18.56	Peak	Horizontal
5350.00	38.68	34.66	36.59	7.98	44.73	54	-9.27	Average	Horizontal
5350.00	51.06	34.69	36.59	7.98	57.14	74	-16.86	Peak	Vertical
5350.00	40.77	34.69	36.59	7.98	46.85	54	-7.15	Average	Vertical

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Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5150.00	48.71	33.79	36.42	7.8	53.88	74	-20.12	Peak	Horizontal
5150.00	38.47	33.79	36.42	7.8	43.64	54	-10.36	Average	Horizontal
5150.00	49.83	34.24	36.42	7.8	55.45	74	-18.55	Peak	Vertical
5150.00	38.80	34.24	36.42	7.8	44.42	54	-9.58	Average	Vertical

802.11ac(VHT40) / Channel 38: ant 3+ant 4

802.11ac(VHT40) / Channel 46: ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5350.00	49.28	34.66	36.59	7.98	55.33	74	-18.67	Peak	Horizontal
5350.00	38.50	34.66	36.59	7.98	44.55	54	-9.45	Average	Horizontal
5350.00	50.88	34.69	36.59	7.98	56.96	74	-17.04	Peak	Vertical
5350.00	41.03	34.69	36.59	7.98	47.11	54	-6.89	Average	Vertical

802.11ac(VHT80) / Channel 42 / Ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5150.00	48.40	33.79	36.42	7.80	53.57	74	-20.43	Peak	Horizontal
5150.00	38.23	33.79	36.42	7.80	43.40	54	-10.60	Average	Horizontal
5150.00	49.61	34.24	36.42	7.80	55.23	74	-18.77	Peak	Vertical
5150.00	38.69	34.24	36.42	7.80	44.31	54	-9.69	Average	Vertical
5350.00	49.19	34.66	36.59	7.98	55.24	74	-18.76	Peak	Horizontal
5350.00	38.21	34.66	36.59	7.98	44.26	54	-9.74	Average	Horizontal
5350.00	50.82	34.69	36.59	7.98	56.90	74	-17.10	Peak	Vertical
5350.00	40.42	34.69	36.59	7.98	46.50	54	-7.50	Average	Vertical

The Worst Test Result For 5745~5825MHz Band.

	002.11a		147.am J	,					
Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5725.00	46.45	34.46	36.75	8.19	52.35	74	-21.65	Peak	Horizontal
5725.00	34.85	34.46	36.75	8.19	40.75	54	-13.25	Average	Horizontal
5725.00	48.02	34.52	36.75	8.19	53.98	74	-20.02	Peak	Vertical
5725.00	36.26	34.52	36.75	8.19	42.22	54	-11.78	Average	Vertical

802 11a / Channel 149 ant 3

802.11a / Channel 165:ant 3

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5850.00	47.75	34.82	36.80	8.30	54.07	74	-19.93	Peak	Horizontal
5850.00	36.44	34.82	36.80	8.30	42.76	54	-11.24	Average	Horizontal
5850.00	49.31	34.86	36.80	8.30	55.67	74	-18.33	Peak	Vertical
5850.00	38.31	34.86	36.80	8.30	44.67	54	-9.33	Average	Vertical

802.11n(HT20) / Channel 149:ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5725.00	46.51	34.46	36.75	8.19	52.41	74	-21.59	Peak	Horizontal
5725.00	34.78	34.46	36.75	8.19	40.68	54	-13.32	Average	Horizontal
5725.00	47.87	34.52	36.75	8.19	53.83	74	-20.17	Peak	Vertical
5725.00	36.35	34.52	36.75	8.19	42.31	54	-11.69	Average	Vertical

802.11n(HT20) / Channel 165:ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5850.00	47.66	34.82	36.80	8.30	53.98	74	-20.02	Peak	Horizontal
5850.00	36.46	34.82	36.80	8.30	42.78	54	-11.22	Average	Horizontal
5850.00	49.04	34.86	36.80	8.30	55.40	74	-18.60	Peak	Vertical
5850.00	38.09	34.86	36.80	8.30	44.45	54	-9.55	Average	Vertical

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Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5725.00	46.64	34.46	36.75	8.19	52.54	74	-21.46	Peak	Horizontal
5725.00	35.06	34.46	36.75	8.19	40.96	54	-13.04	Average	Horizontal
5725.00	48.24	34.52	36.75	8.19	54.20	74	-19.80	Peak	Vertical
5725.00	36.39	34.52	36.75	8.19	42.35	54	-11.65	Average	Vertical

802.11n(HT40) / Channel 151:ant 3+ant 4

802.11n(HT40) / Channel 159:ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5850.00	47.90	34.82	36.8	8.3	54.22	74	-19.78	Peak	Horizontal
5850.00	36.52	34.82	36.8	8.3	42.84	54	-11.16	Average	Horizontal
5850.00	49.49	34.86	36.8	8.3	55.85	74	-18.15	Peak	Vertical
5850.00	38.51	34.86	36.8	8.3	44.87	54	-9.13	Average	Vertical

802.11ac(VHT20) / Channel 149:ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5725.00	46.77	34.46	36.75	8.19	52.67	74	-21.33	Peak	Horizontal
5725.00	34.83	34.46	36.75	8.19	40.73	54	-13.27	Average	Horizontal
5725.00	48.11	34.52	36.75	8.19	54.07	74	-19.93	Peak	Vertical
5725.00	36.62	34.52	36.75	8.19	42.58	54	-11.42	Average	Vertical

802.11ac(VHT20) / Channel 165:ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5850.00	47.71	34.82	36.8	8.3	54.03	74	-19.97	Peak	Horizontal
5850.00	36.59	34.82	36.8	8.3	42.91	54	-11.09	Average	Horizontal
5850.00	49.28	34.86	36.8	8.3	55.64	74	-18.36	Peak	Vertical
5850.00	38.15	34.86	36.8	8.3	44.51	54	-9.49	Average	Vertical

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Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5725.00	46.57	34.46	36.75	8.19	52.47	74	-21.53	Peak	Horizontal
5725.00	34.89	34.46	36.75	8.19	40.79	54	-13.21	Average	Horizontal
5725.00	47.88	34.52	36.75	8.19	53.84	74	-20.16	Peak	Vertical
5725.00	36.49	34.52	36.75	8.19	42.45	54	-11.55	Average	Vertical

802.11ac(VHT40) / Channel 151:ant 3+ant 4

802.11ac(VHT40) / Channel 159:ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5850.00	47.87	34.82	36.8	8.3	54.19	74	-19.81	Peak	Horizontal
5850.00	36.55	34.82	36.8	8.3	42.87	54	-11.13	Average	Horizontal
5850.00	49.20	34.86	36.8	8.3	55.56	74	-18.44	Peak	Vertical
5850.00	38.31	34.86	36.8	8.3	44.67	54	-9.33	Average	Vertical

802.11ac(VHT80) / Channel 155 / ant 3+ant 4

Freq. MHz	Reading Level dBuV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol.
5725.00	49.83	34.46	36.75	8.19	55.73	74	-18.27	Peak	Horizontal
5725.00	38.27	34.46	36.75	8.19	44.17	54	-9.83	Average	Horizontal
5725.00	51.37	34.52	36.75	8.19	57.33	74	-16.67	Peak	Vertical
5725.00	39.84	34.52	36.75	8.19	45.80	54	-8.20	Average	Vertical
5850.00	50.77	34.82	36.80	8.30	57.09	74	-16.91	Peak	Horizontal
5850.00	39.49	34.82	36.80	8.30	45.81	54	-8.19	Average	Horizontal
5850.00	52.50	34.86	36.80	8.30	58.86	74	-15.14	Peak	Vertical
5850.00	41.41	34.86	36.80	8.30	47.77	54	-6.23	Average	Vertical

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5.5. Power line conducted emissions

5.5.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range	Limits (dBµV)					
(MHz)	Quasi-peak	Average				
0.15 to 0.50	66 to 56	56 to 46				
0.50 to 5	56	46				
5 to 30	60	50				

5.5.2 Block Diagram of Test Setup

5.5.3 Test Results

PASS.

Only recorded the worst test case in this report.

The test data please refer to following page.

Report No.: LCS1605120918E

Test Result For Line Power Input AC 120V/60Hz (Worst Case)

Note: Pre-scan all modes and recorded the worst case(TX at 802.11a 5.22GHz, ant 3) results in this report.

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5.6. Antenna Requirements

5.6.1. Standard Applicable

According to antenna requirement of §15.203.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

5.6.2. Antenna Connector Construction

The antenna used for transmitting is permanently attached and no consideration of replacement. Please see EUT photo for details.

The WLAN share two same FPC antennas, the maximum gain is 3dBi for 5.2G & 5.8G WLAN; more information as follows.

5.6.3. Results: Compliance.

Measurement

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

Conducted power refer ANSI C63.10:2013 Output power test procedure for U-NII devices.

Radiated power refers to ANSI C63.10:2013 Radiated emissions tests.
Measurement parameters	5
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Measurement parameter				
Detector:	Av			
Sweep Time:	Auto			
Resolution bandwidth:	1MHz			
Video bandwidth:	3MHz			
Trace-Mode:	Max hold			

Limits

FCC	IC				
Antenna Gain					
6 dBi					

Note: The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For 5G WLAN devices, the 802.11a mode is used.

T _{nom}	V _{nom}	Lowest Channel 5180 MHz	Middle Channel 5220 MHz	Highest Channel 5240 MHz
Conducted Measu 802.11a	power [dBm] red with modulation	17.42	17.51	17.39
Radiated power [dBm] Measured with 802.11a modulation		18.37	17.85	18.29
Gain [dBi]	Calculated	0.95	0.34	0.90
Measurement uncertainty		± 1.6 dB (cond.) / ± 3.8 dB (rad.)		

T _{nom}	V _{nom}	Lowest Channel 5745 MHz	Middle Channel 5785 MHz	Highest Channel 5825 MHz
Conducted Measu 802.11a	power [dBm] red with nodulation	17.27	17.41	17.11
Radiated power [dBm] Measured with 802.11a modulation		17.56	17.43	17.30
Gain [dBi]	Calculated	0.29	0.02	0.19
Measurement uncertainty		± 1.6 dB (cond.) / ± 3.8 dB (rad.)		

Result: -/-

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

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