

FCCRadio Test Report
FCC ID: V7TAC18
This report concerns (check one):⊠Original Grant⊡Class I Change⊡Class II Change
Project No.: 1608C055Equipment: AC1900 Enhanced Smart Dual-band Gigabit WiFi RouterModel Name: AC18Applicant: SHENZHEN TENDA TECHNOLOGY CO.,LTDAddress: 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052
Date of Receipt : Aug. 05, 2016 Date of Test : Aug. 05, 2016 ~ Aug. 29, 2016 Issued Date : Aug. 30, 2016 Tested by : BTL Inc.
Testing Engineer : <u>Shawn Xiao</u> (Shawn Xiao)
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Declaration

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For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.





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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-2-1608C055	Original Issue.	Aug. 30, 2016



1. CERTIFICATION

Equipment : Brand Name : Model Name :	
Applicant :	SHENZHEN TENDA TECHNOLOGY CO., LTD
Manufacturer :	SHENZHEN TENDA TECHNOLOGY CO., LTD
Address :	6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052
Date of Test :	Aug. 05, 2016 ~ Aug. 29, 2016
Test Sample :	ENGINEERING SAMPLE
Standard(s) :	FCC Part15, Subpart E(15.407) / ANSI C63.10-2013

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-2-1608C055) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part15, Subpart E					
Standard(s) Section	Test Item	Judgment	Remark		
15.207	AC Power Line Conducted Emissions	PASS			
15.407(a)	26dB Spectrum Bandwidth	PASS			
15.407(a)	Maximum Conducted Output Power	PASS			
15.407(a)	Power Spectral Density	PASS			
15.407(a)	Radiated Emissions	PASS			
15.407(b)	Band Edge Emissions	PASS			
15.407(g)	Frequency Stability	PASS			
15.203	Antenna Requirements	PASS			

NOTE:

(1)" N/A" denotes test is not applicable in this test report.



2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China. BTL's test firm number for FCC: 319330

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cispr} requirement.

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

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
DG-C02	CISPR	150 KHz~30MHz	1.94

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
		9kHz~30MHz	V	3.79
		9kHz~30MHz	Н	3.57
		30MHz~200MHz	V	3.82
		30MHz~200MHz	Н	3.60
DG-CB03	CISPR	200MHz~ 1,000MHz	V	3.86
DG-CB03	CIOFK	200MHz~ 1,000MHz	Н	3.94
		1GHz~18GHz	V	3.12
		1GHz~18GHz	Н	3.68
		18GHz~40GHz	V	4.15
		18GHz~40GHz	Н	4.14

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	AC1900 Enhanced Smart Dual-band Gigabit WiFi Router				
Brand Name	Tenda				
Model Name	AC18	AC18			
Mode Different	N/A				
		UNII-1: 5150-5250MHz UNII-3: 5725-5850MHz			
	Modulation Type	OFDM			
	Output Power (Max.)for UNII-1	802.11a:19.74dBm 802.11n (20M): 22.27dBm 802.11n (40M): 23.82dBm 802.11ac (20M): 21.52dBm 802.11ac (40M): 22.14dBm 802.11ac (80M): 24.32dBm			
Output Power	Output Power (Max.)for UNII-3	802.11a:24.71dBm 802.11n (20M): 26.41dBm 802.11n (40M): 27.27dBm 802.11ac (20M): 27.51dBm 802.11ac (40M): 27.19dBm 802.11ac (80M): 27.63dBm			
Power Source	DC voltage supplied from AC/DC adapter. Brand Name: SHENZHEN HEWEISHUN NETWORK TECHNOLOGY CO.,LTD. Model Name:BN059-A30012U				
Power Rating	IP: 100-240V~50/60Hz0.9A OP:12V2.5A				

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2. Channel List:

UNII-1		UN	III-1	UN	II-1
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230		
44	5220				
48	5240				

UNII-3		UN	II-3	UN	II-3
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

3. Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)
1	Tenda	AC18 V1.0	Dipole	N/A	3
2	Tenda	AC18 V1.0	Dipole	N/A	3
3	Tenda	AC18 V1.0	Dipole	N/A	3

Note:

The EUT incorporates a MIMO function. Physically, the EUT provides three completed transmitters and receivers (3T3R), all transmit signals are completely uncorrelated, then, **Direction gain = G**ANT, that is Directional gain=3.

4

TX Mode	1TX	ЗТХ
802.11a	V (ANT 1)	-
802.11n(20MHz)	-	V (ANT+1 ANT 2+ANT 3)
802.11n(40MHz)	-	V (ANT+1 ANT 2+ANT 3)
802.11ac (20MHz)	-	V (ANT+1 ANT 2+ANT 3)
802.11ac (40MHz)	-	V (ANT+1 ANT 2+ANT 3)
802.11ac (80MHz)	-	V (ANT+1 ANT 2+ANT 3)

3.2 DESCRIPTION OF TEST MODES

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

Pretest Mode	Description
Mode 1	TX A Mode/ CH36, CH40, CH48 (UNII-1)
Mode 2	TX N20 Mode/ CH36, CH40, CH48 (UNII-1)
Mode 3	TX N40 Mode/ CH38, CH46 (UNII-1)
Mode 4	TX AC20 Mode/ CH36, CH40, CH48 (UNII-1)
Mode 5	TX AC40 Mode/ CH38, CH46 (UNII-1)
Mode 6	TX AC80 Mode / CH42 (UNII-1)
Mode 7	TX A Mode / CH149,CH157,CH165 (UNII-3)
Mode 8	TX N20 Mode / CH149,CH157,CH165 (UNII-3)
Mode 9	TX N40 Mode / CH151,CH159 (UNII-3)
Mode 10	TX AC20 Mode / CH149,CH157,CH165 (UNII-3)
Mode 11	TX AC40 Mode / CH151,CH159 (UNII-3)
Mode 12	TX AC80 Mode / CH155 (UNII-3)
Mode 13	TX Mode

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

For Conducted Test		
Final Test Mode Description		
Mode 13 TX Mode		





For Radiated Test			
Final Test Mode Description			
Mode 1	TX A Mode/ CH36, CH40, CH48 (UNII-1)		
Mode 2	TX N20 Mode/ CH36, CH40, CH48 (UNII-1)		
Mode 3	TX N40 Mode/ CH38, CH46 (UNII-1)		
Mode 4	TX AC20 Mode/ CH36, CH40, CH48 (UNII-1)		
Mode 5	TX AC40 Mode/ CH38, CH46 (UNII-1)		
Mode 6	TX AC80 Mode / CH42 (UNII-1)		
Mode 7	TX A Mode / CH149,CH157,CH165 (UNII-3)		
Mode 8	TX N20 Mode / CH149,CH157,CH165 (UNII-3)		
Mode 9	TX N40 Mode / CH151,CH159 (UNII-3)		
Mode 10	TX AC20 Mode / CH149,CH157,CH165 (UNII-3)		
Mode 11	TX AC40 Mode / CH151,CH159 (UNII-3)		
Mode 12	TX AC80 Mode / CH155 (UNII-3)		

Note:

(1) For radiated below 1GHz test, the 802.11a mode is found to be the worst case and recorded.



3.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

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

UNII-1				
Test Software Version		RT3x7xQA		
Frequency (MHz)	5180	5200	5240	
A Mode	74	80	72	
N20 Mode	70	65	66	
Frequency (MHz)	5190	5230		
N40 Mode	70	80		
UNII-3				
Test Software Version	RT3x7xQA			
Frequency (MHz)	5745	5785	5825	
A Mode	96	102	100	

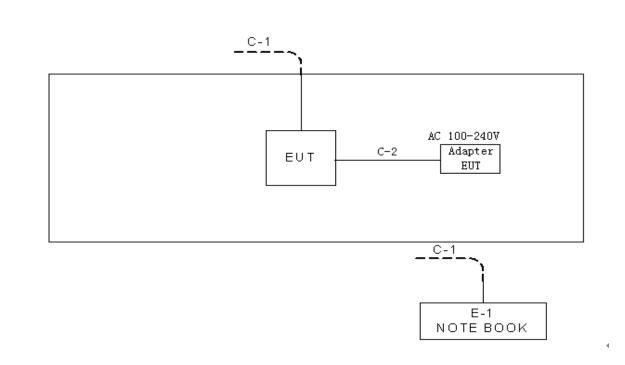
A Mode	96	102	100
N20 Mode	90	80	80
Frequency (MHz)	5755	5795	
N40 Mode	95	95	

UNII-1				
Test Software Version	RT3x7xQA			
Frequency (MHz)	5180 5200 5240			
AC20 Mode	66	60	63	
Frequency (MHz)	5190	5230		
AC40 Mode	64	72		
Frequency (MHz)	5210			
AC80 Mode	80			

UNII-3				
Test Software Version	RT3x7xQA			
Frequency (MHz)	5745 5785 5825			
AC20 Mode	95	80	85	
Frequency (MHz)	5755	5795		
AC40 Mode	95	95		
Frequency (MHz)	5775			
AC80 Mode	95			



3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.
E-1	NOTEBOOK	Dell	DCSM 745	DOC	G7K832X

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	10m	RJ45 Cable
C-2	NO	NO	1.2m	Power Cable

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150kHz-30MHz)

FREQUENCY (MHz)	Class A	(dBuV)	Class B	(dBuV)
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

4.1.2 TEST PROCEDURE

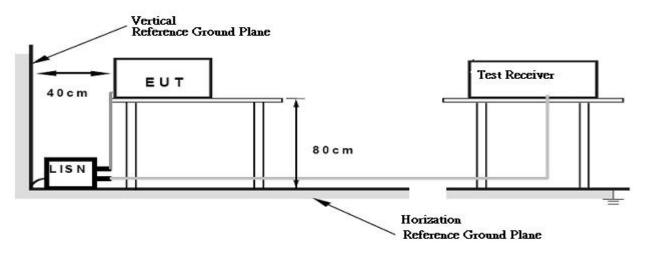
- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipmentspowered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the groundplane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

4.1.3 DEVIATIONFROMTESTSTANDARD

No deviation



4.1.4 TESTSETUP



4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT was programmed to be in continuously transmitting/TX Mode mode.

4.1.6 EUT TEST CONDITIONS

Temperature: 25°CRelative Humidity: 53%Test Voltage: AC 120V/60Hz

4.1.7 TEST RESULTS

Please refer to the Attachment A.

Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of ^ℂNote_⊥. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform ∘ In this case, a "*" marked in AVG Mode column of Interference Voltage Measured ∘
- (2) Measuring frequency range from 150kHz to 30MHz •



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS

20dBc in any 100 kHz bandwidth outside the operating frequency band. 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	Field Strength	Measurement Distance
(MHz)	(micorvolts/meter)	(meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dBµV/m) E[dBuV/m]=EIRP[dBm]+95.3
5150-5250	-27	68.3
5250-5350	-27	68.3
5470-5725	-27	68.3
	-27(Note 2)	68.3
5725-5850	10(Note 2)	105.3
	15.6(Note 2)	110.9(=95.3+15.6)
	27(Note 2)	122.3(=95.3+27)

Note:

1. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength: $F = \frac{100000\sqrt{30P}}{100000\sqrt{30P}}$

2. According to FCC 16-24,All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below theband edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above orbelow the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.



4.2.2 TEST PROCEDURE

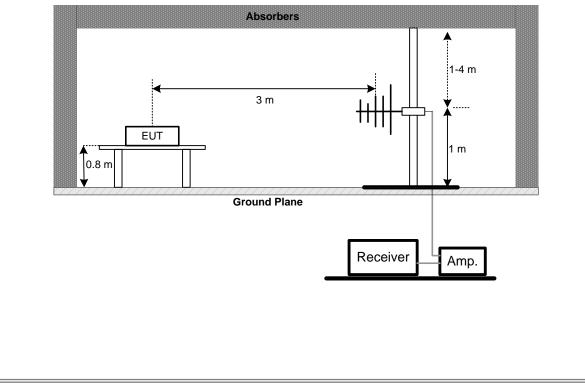
- a. The measuring distance of at 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance of at 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. 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 find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- f. The initial step in collecting conducted emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- i. For the actual test configuration, please refer to the related Item -EUT Test Photos.

4.2.3 DEVIATIONFROMTESTSTANDARD

No deviation

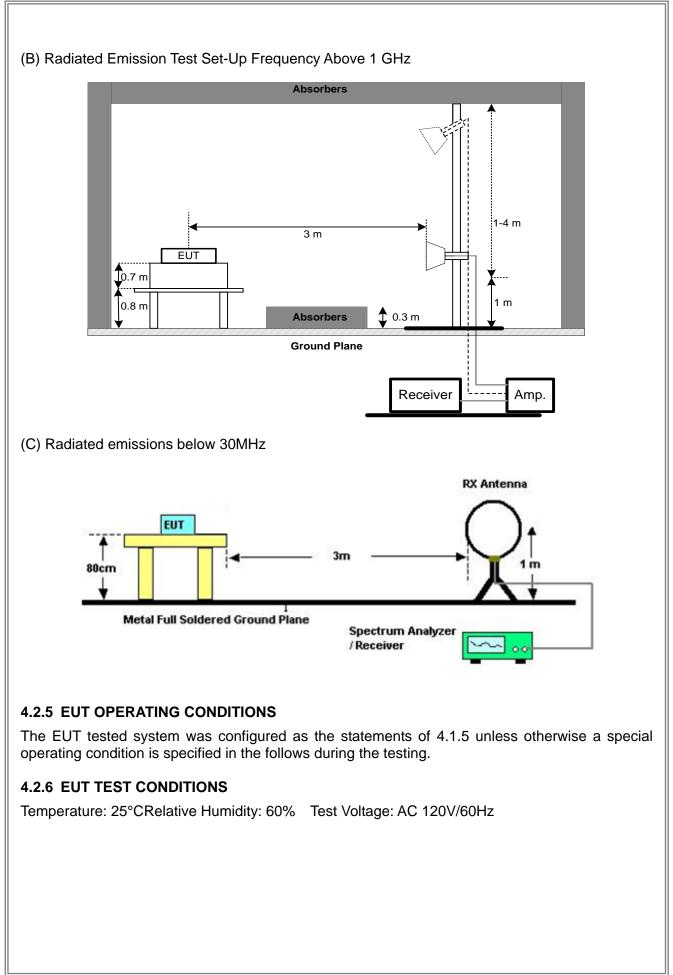
4.2.4 TESTSETUP

(A)Radiated Emission Test Set-Up Frequency Below 1GHz











4.2.7 TEST RESULTS (9K TO 30MHz)

Please refer to the Attachment B

Remark:

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB);
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

4.2.8 TEST RESULTS(BETWEEN30 TO 1000 MHz)

Please refer to the Attachment C.

Remark:

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Modewith Detector BW=120kHz ; SPA setting in RBW=120kHz, VBW =120kHz, Swp. Time = 0.3 sec./MHz \circ
- (2) All readings are Peak unless otherwise stated QP in column of <code>『Note』</code>. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform \circ
- (3) Measuring frequency range from 30MHz to 1000MHz \circ
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table \circ

4.2.9 TEST RESULTS (ABOVE1000 MHz)

Please refer to the Attachment D.

Remark:

- (1) Spectrum Setting: 30MHz 1000MHz , RBW= 100kHz, VBW=100kHz, Sweep time = 200 ms. 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time = Auto
- (2) All readings are Peak unless otherwise stated AV in column of "Note". Peak denotes that the Peak reading compliance with the AV Limits and then AV Mode measurement didn't perform.
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission \circ
- (4) Data of measurement within this frequency range shown "*" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axes: "X" - denotes Laid on Table; "Y" - denotes Vertical Stand; "Z" - denotes Side Stand
- (7) During the measurements above 1GHz it is taken care of that the EUT is always within the 3dB cone of radiation BW of the used antenna.
- (8) No limit: This is fundamental signal, the judgment is not applicable. For fundamental signal judgment was referred to Peak output test.

5. 26dB SPECTRUM BANDWIDTH

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E				
Test Item Limit Frequency Range (MHz) Result				
	26 dB Bandwidth	5150-5250	PASS	
Bandwidth	Minimum 500kHz 6dB Bandwidth	5725-5850	PASS	

5.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.	Spectrum Parameters	Setting
	Attenuation	Auto
	Span Frequency	> 26dB Bandwidth
	RBW	300 kHz
	VBW	1000 kHz
	Detector	Peak
	Trace	Max Hold
	Sweep Time	Auto

c. Measured the spectrum width with power higher than 26dB below carrier

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.



5.1.5 EUT TEST CONDITIONS

Temperature: 25°CRelative Humidity: 60% Test Voltage: AC 120V/60Hz

5.1.6 TEST RESULTS

Please refer to the Attachment E.



6.MAXIMUM CONDUCTED OUTPUT POWER

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E			
Test Item Limit Frequency Ran (MHz)			Result
	Fixed:1 Watt (30dBm)		
Conducted Output	Mobile and portable:	5150-5250	PASS
Power	250mW (24dBm)		
	1 Watt (30dBm)	5725-5850	PASS
Note: The maximum e.i.r.p at anyelevation angle above 30 degrees as measured from the			
horizon must not exceed 125mW(21dBm)			

6.1.1 TEST PROCEDURE

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,

b.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency Encompass the entire emissions bandwidth (EBV signal	
RBW	= 1MHz.
VBW	≥ 3MHz.
Detector	RMS
Trace	Max Hold
Sweep Time	auto

c. Test was performed in accordance with method of KDB 789033 D02.



6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP

EUT	Power Meter

6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 EUT TEST CONDITIONS

Temperature: 25°CRelative Humidity: 60% Test Voltage: AC 120V/60Hz

6.1.6 TEST RESULTS

Please refer to the Attachment F.

7.POWER SPECTRAL DENSITY TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E			
Test Item	Frequency Range (MHz)	Result	
Power Spectral Density	Other then Mobile and portable:17dBm/MHz Mobile and portable:11dBm/MHz	5150-5250	PASS
	30dBm/500kHz	5725-5850	PASS

7.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.	Spectrum Parameter Setting	
	Attenuation	Auto
	Span Eraquanav	Encompass the entire emissions bandwidth (EBW) of the
	Span Frequency	signal
	RBW	= 1MHz.
	VBW	≥ 3MHz.
	Detector	RMS
	Trace average	100 trace
	Sweep Time	Auto

Note:

- 1.For UNII-3, according to KDB publication 789033 D02 General UNII Test Procedures New Rules v01r02, section II.F.5., it is acceptable to set RBW at 1MHz and VBW at 3MHz if the spectrum analyzer does not have 500kHz RBW.
- 2.The value measured with RBW=1MHz is to be added with 10log(500kHz/1MHz) which is -3dB. For example, if the measured value is +10dBm using RBW=1MHz (that is +10dBm/MHz), then the converted value will be +7dBm/500kHz.



7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP

EUT	SPECTRUM	
	ANALYZER	

7.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

7.1.5 EUT TEST CONDITIONS

Temperature: 25°CRelative Humidity: 60% Test Voltage: AC 120V/60Hz

7.1.6 TEST RESULTS Please refer to the Attachment G.



8. FREQUENCY STABILITY MEASUREMENT

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E				
Test Item Limit Frequency Range Result (MHz)				
Energy of the bility	Specifiedin the user's manual	5150-5250	PASS	
Frequency Stability		5725-5850	PASS	

8.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

b.	Spectrum Parameter	Setting
	Attenuation	Auto
	Span Frequency	Entire absence of modulation emissionsbandwidth
	RBW	10 kHz
	VBW	10kHz
	Sweep Time	Auto

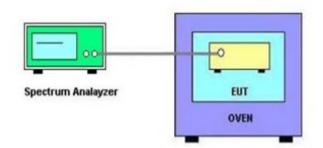
- c. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.
- d. User manual temperature is0°C~40°C.

8.1.2 DEVIATION FROM STANDARD

No deviation.



8.1.3 TEST SETUP



8.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

8.1.5 EUT TEST CONDITIONS

Temperature: 25°CRelative Humidity: 55%Test Voltage: AC 120V/60Hz

8.1.6 TEST RESULTS Please refer to the Attachment H.

9. MEASUREMENT INSTRUMENTS LIST

	Conducted Emission Measurement				
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	0052765	Mar. 27, 2017
2	LISN	R&S	ENV216	101447	Mar. 27, 2017
3	Test Cable	emci	RG223(9KHz-30 MHz)	C_17	Mar. 10, 2017
4	EMI Test Receiver	R&S	ESCI	100382	Mar. 27, 2017
5	50Ω Terminator	SHX	TF2-3G-A	08122901	Mar. 27, 2017
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

	Radiated Emission Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 27, 2017		
2	Amplifier	HP	8447D	2944A09673	Nov. 09, 2016		
3	Receiver	AGILENT	N9038A	MY52130039	Oct. 11, 2016		
4	Test Cable	emci	LMR-400(30MH z-1GHz)	C-01	Jun. 26, 2017		
5	Control	СТ	SC100	N/A	N/A		
6	Position Control	MF	MF-7802	MF780208416	N/A		
7	Antenna	ETS	3115	00075789	Mar. 27, 2017		
8	Amplifier	Agilent	8449B	3008A02274	Nov. 01, 2016		
9	Receiver	AGILENT	N9038A	MY52130039	Oct. 11, 2016		
10	Test Cable	emci	EMC104-SM-S M-10000(1GHz -26.5GHz)	C-68	Jun. 26, 2017		
11	Controller	СТ	SC100	N/A	N/A		
12	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Apr. 23, 2017		
13	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 27, 2017		
14	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Sep. 07, 2016		
15	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A		



Spectrum BandwidthMeasurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Oct. 11, 2016

	Maximum Conducted Output Power Measurement				
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	P-series Power meter	Agilent	N1911A	MY45100473	Oct. 26, 2016
2	Wireband Power sensor	Agilent	N1921A	MY51100041	Oct. 26, 2016

	Power Spectral Density Measurement					
lt	tem	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
	1	Spectrum Analyzer	R&S	FSP 40	100185	Oct. 11, 2016

	Frequency Stability Measurement					
Ite	em	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	1	Spectrum Analyzer	R&S	FSP 40	100185	Oct. 11, 2016
2	2	Precision Oven Tester	HOLINK	H-T-1F-D	BA03101701	May 22, 2017

Remark: "N/A" denotes no model name, serial no. or calibration specified. All calibration period of equipment list is one year.





10.EUT TEST PHOTOS

Conducted Measurement Photos

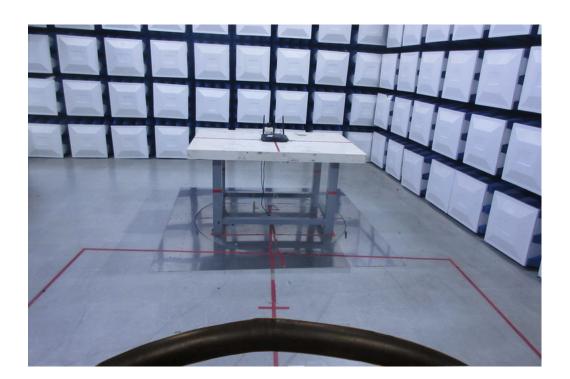


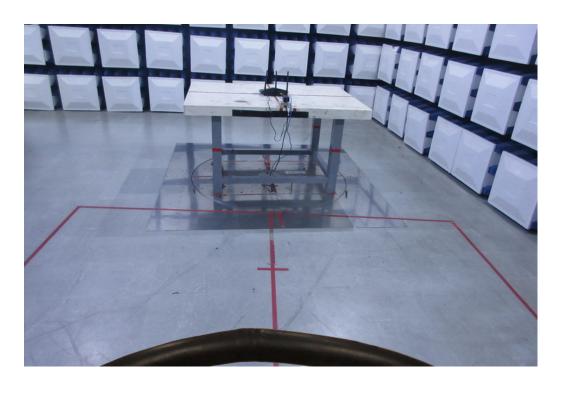






9kHz to 30MHz



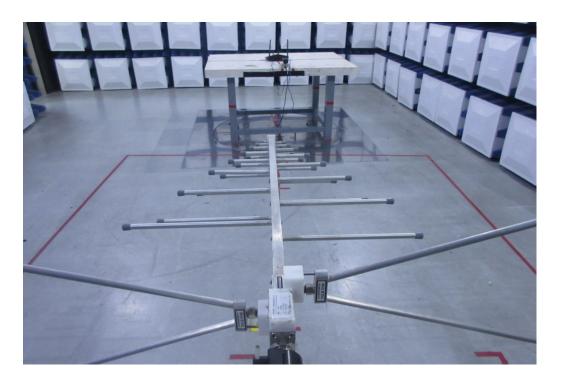




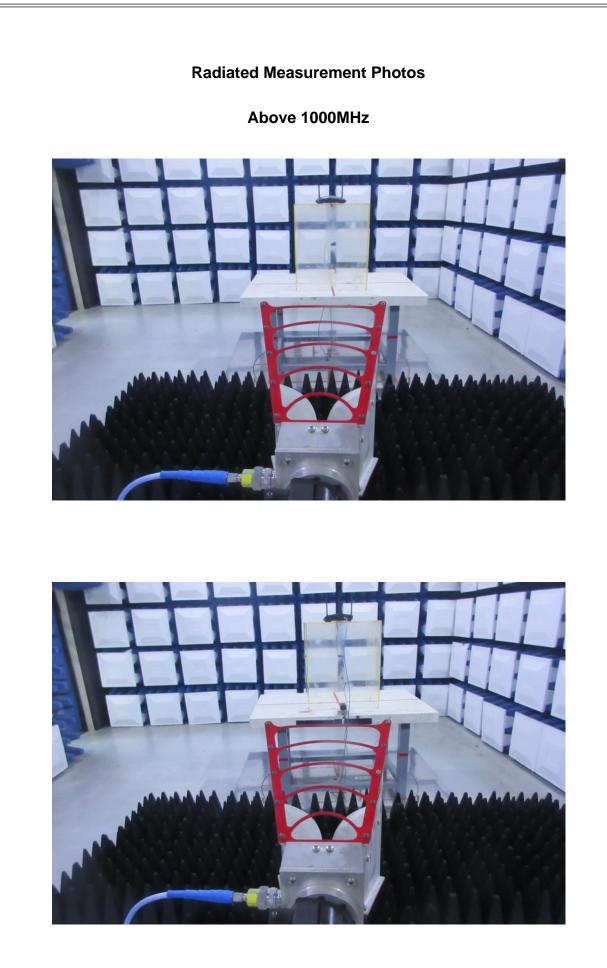
Radiated Measurement Photos

30MHz to 1000MHz







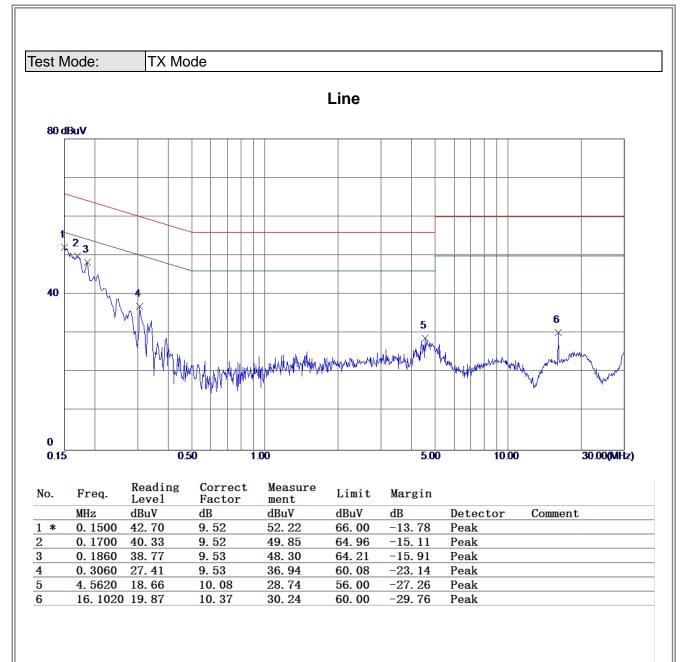




ATTACHMENT A -CONDUCTED EMISSION

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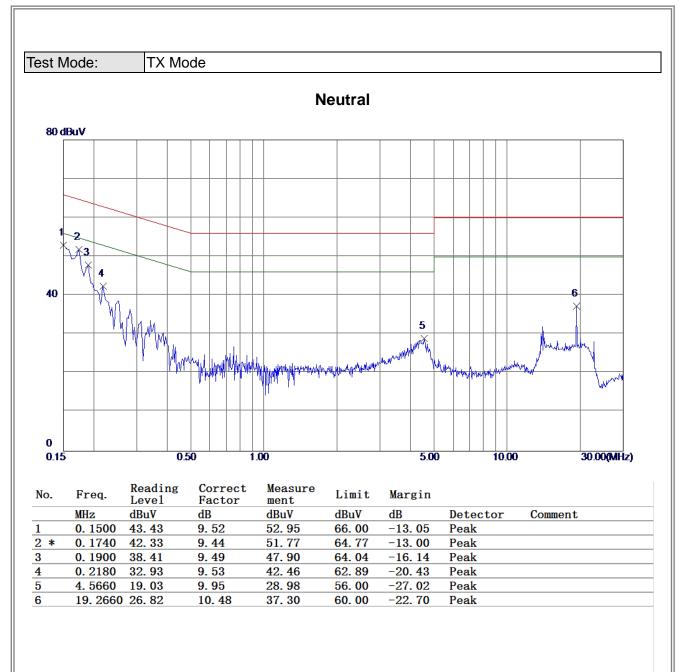




Note : The test result has included the cable loss.

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Note : The test result has included the cable loss.



ATTACHMENT B -RADIATED EMISSION (9KHZ TO 30MHZ)



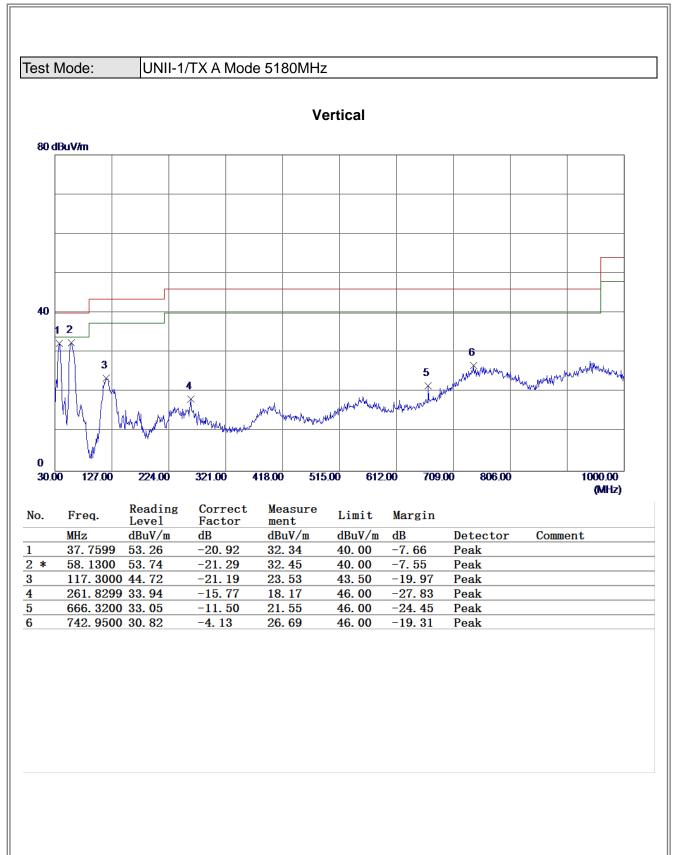
Test Mode:	TXI	Mode					
Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0095	0°	13.41	24.9650	38.3750	128.0498	-89.6748	AVG
0.0095	0°	14.28	24.9650	39.2450	148.0498	-108.8048	PEAK
0.0276	0°	6.73	23.8187	30.5487	118.7860	-88.2374	AVG
0.0276	0°	8.12	23.8187	31.9387	138.7860	-106.8474	PEAK
0.0357	0°	3.17	23.3057	26.4757	116.5509	-90.0752	AVG
0.0357	0°	5.58	23.3057	28.8857	136.5509	-107.6652	PEAK
0.0566	0°	1.16	22.2680	23.4280	112.5479	-89.1199	AVG
0.0566	0°	2.53	22.2680	24.7980	132.5479	-107.7499	PEAK
0.5034	0°	19.36	19.8109	39.1709	73.5660	-34.3951	QP
1.9529	0°	23.71	19.5047	43.2147	69.5400	-26.3253	QP
Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0119	90°	13.16	24.3000	37.4600	126.0933	-88.6333	AVG
0.0119	90°	14.89	24.3000	39.1900	146.0933	-106.9033	PEAK
0.0241	90°	7.28	24.0403	31.3203	119.9639	-88.6436	AVG
0.0241	90°	8.94	24.0403	32.9803	139.9639	-106.9836	PEAK
0.0437	90°	5.23	22.7990	28.0290	114.7946	-86.7656	AVG
0.047	90°	6.19	22.7990	28.9890	134.7946	-105.8056	PEAK
0.0554	90°	1.54	22.2920	23.8320	112.7340	-88.9020	AVG
0.0554	90°	2.86	22.2920	25.1520	132.7340	-107.5820	PEAK
0.6211	90°	22.17	20.1875	42.3575	71.7410	-29.3835	QP
2.0559	90°	24.56	19.4665	44.0265	69.5400	-25.5135	QP



ATTACHMENT C -RADIATED EMISSION (30MHZ TO 1000MHZ)

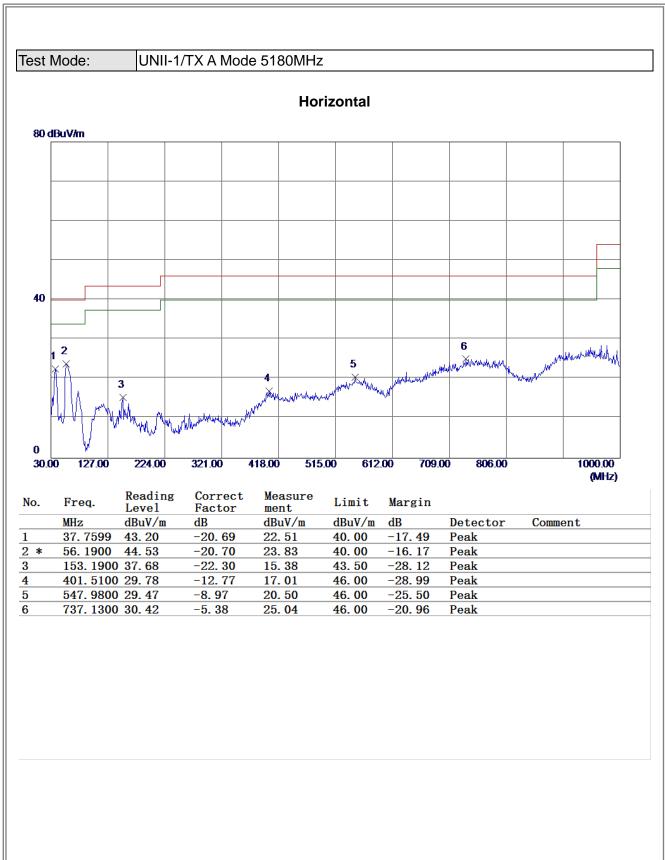






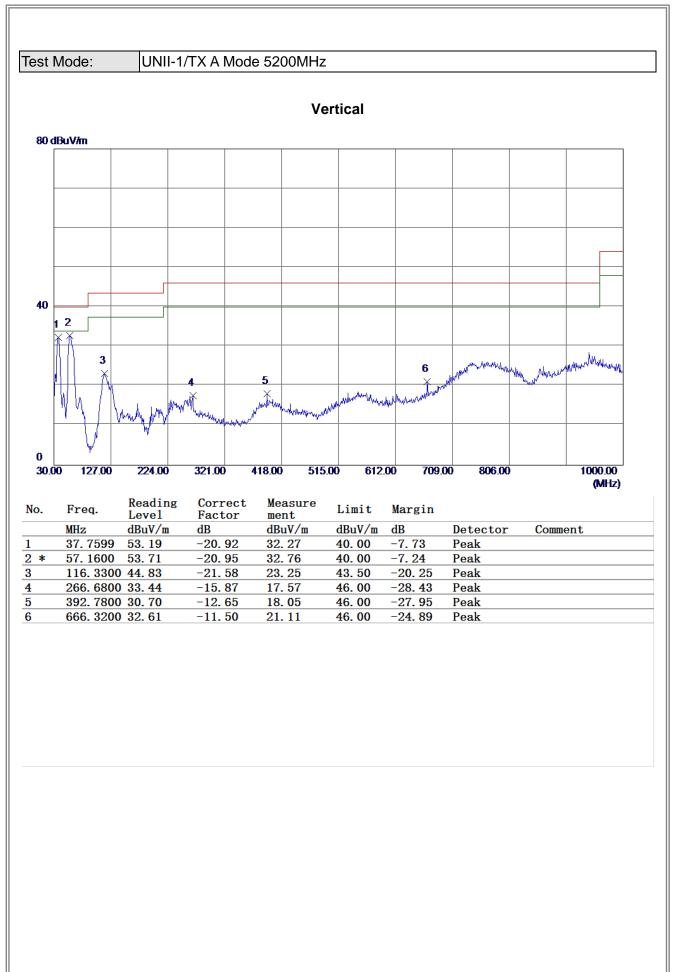






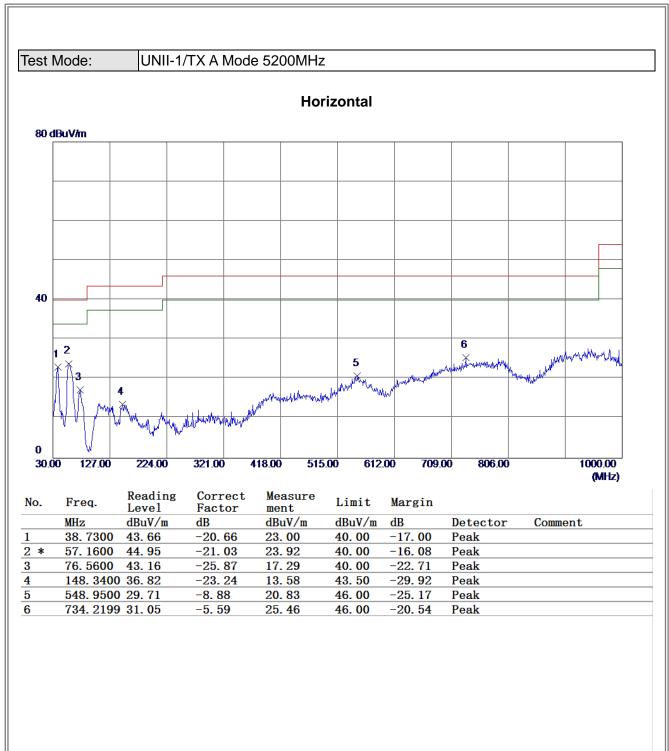






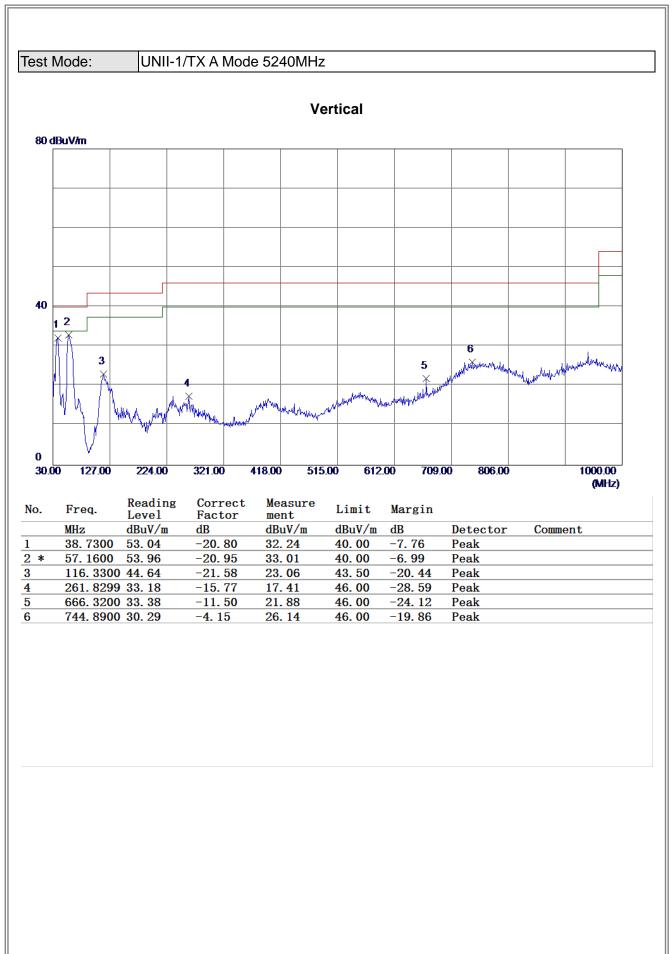






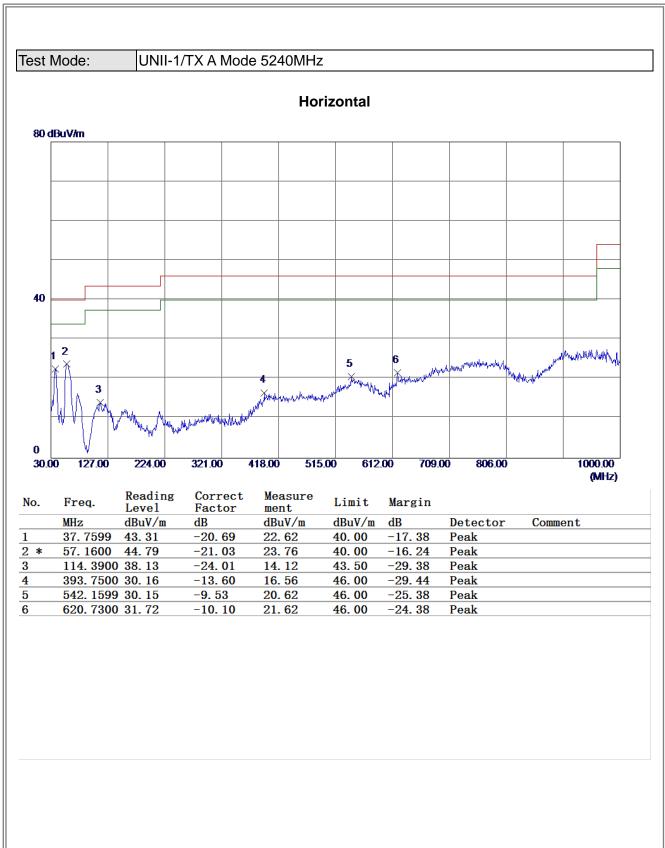






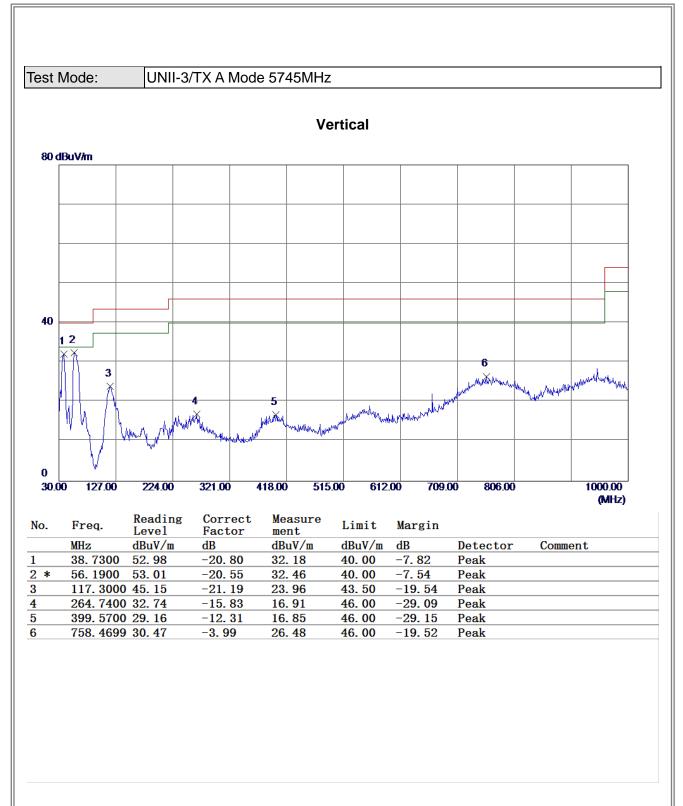






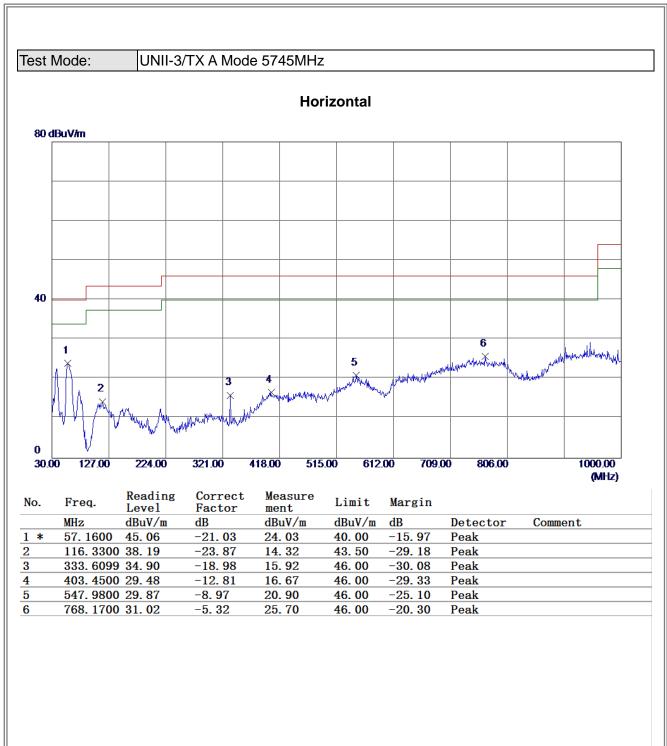






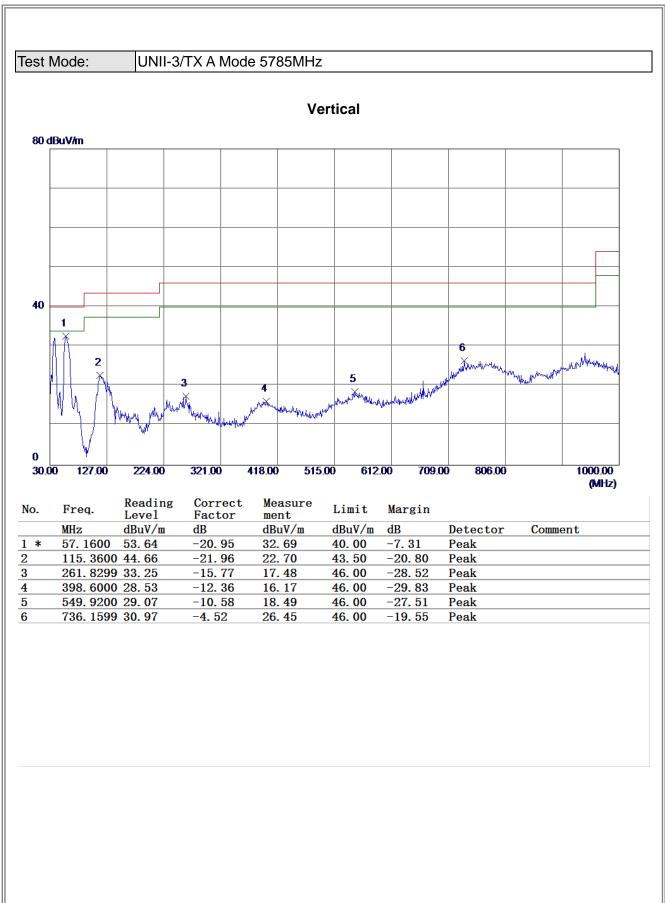






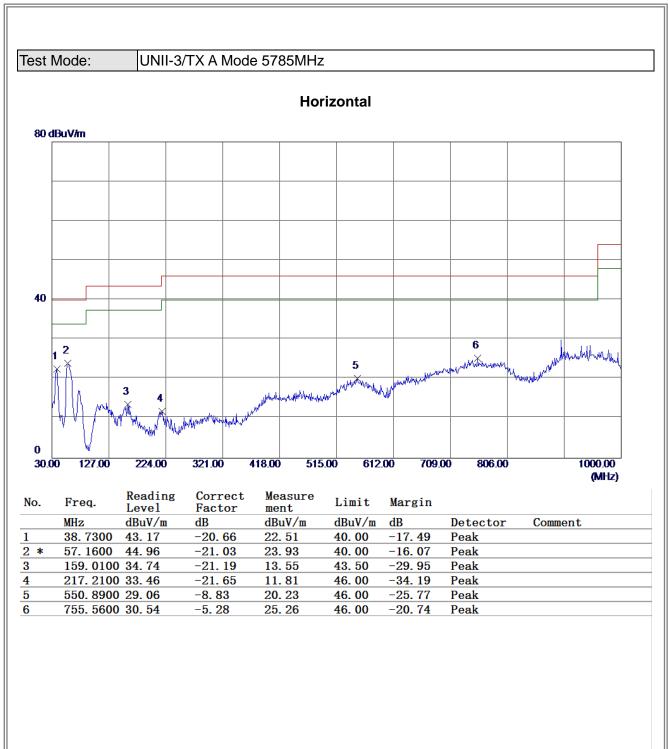






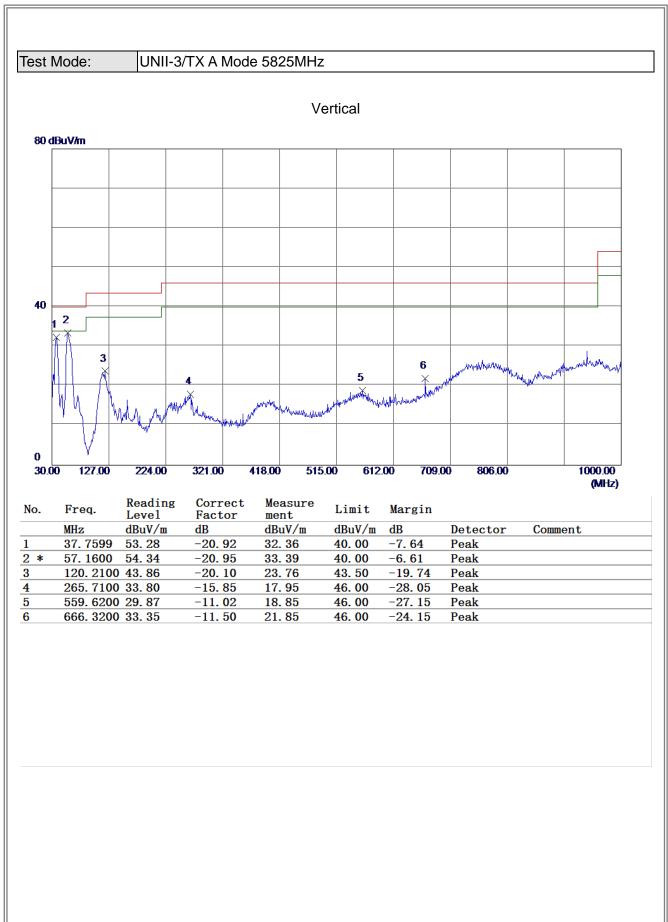






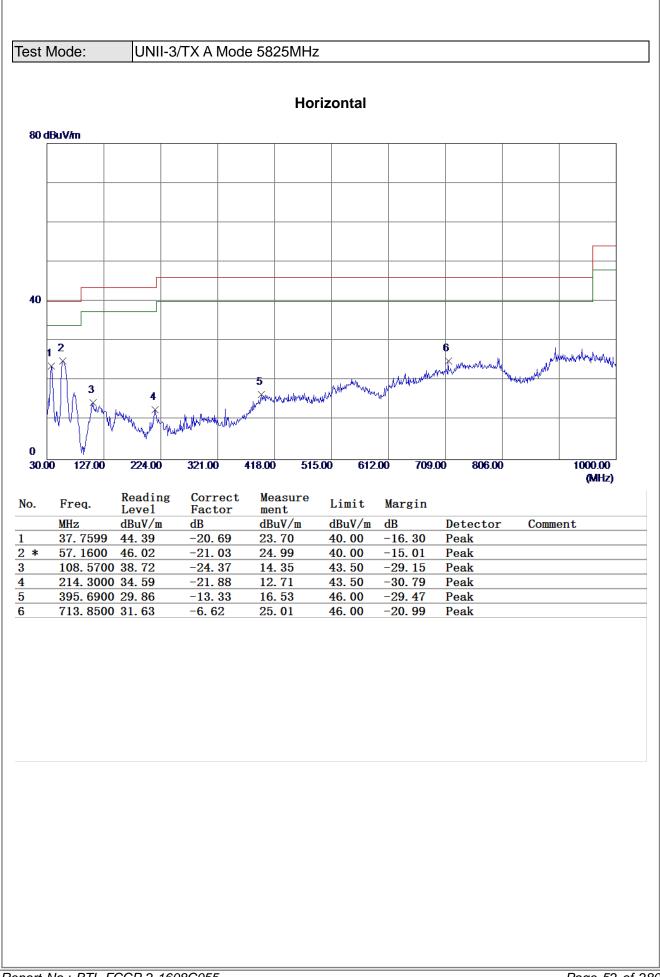










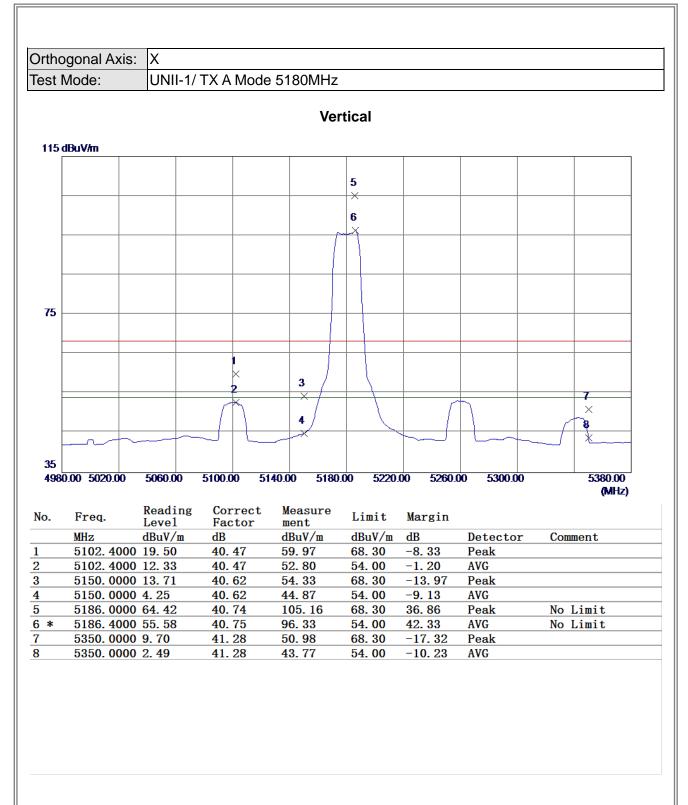




ATTACHMENT D -RADIATED EMISSION (ABOVE 1000MHZ)

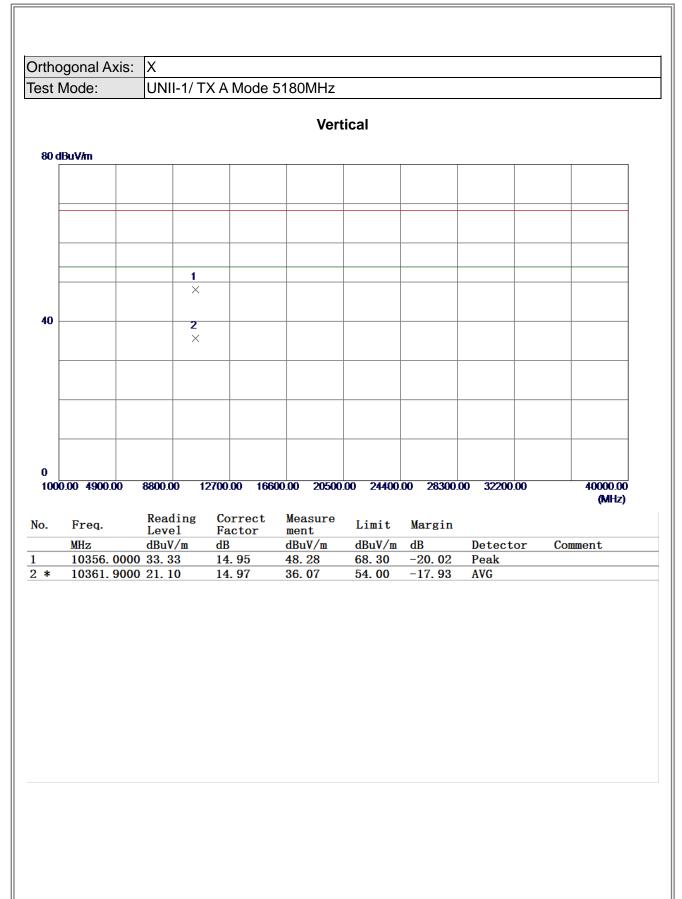






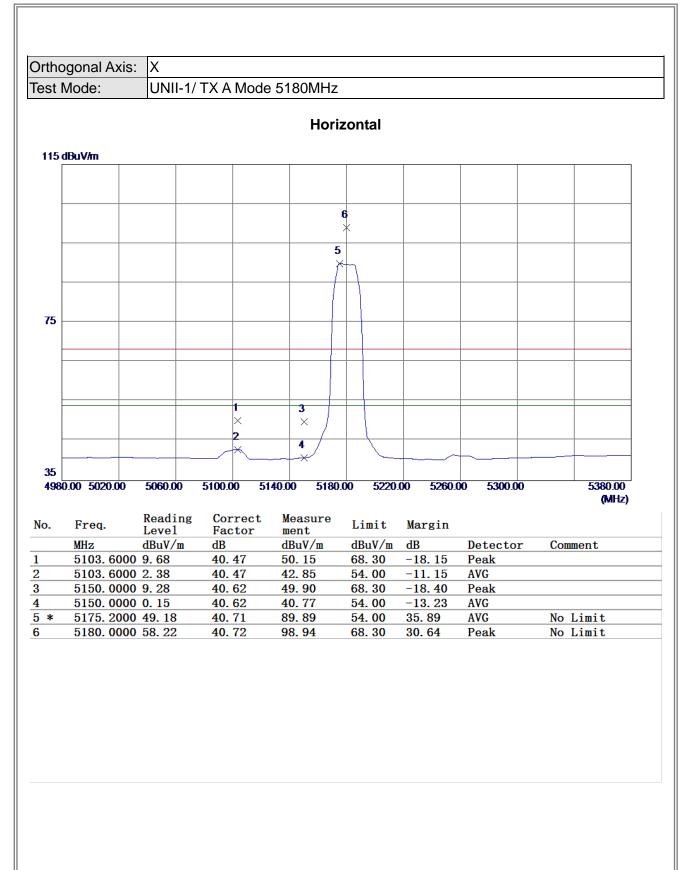






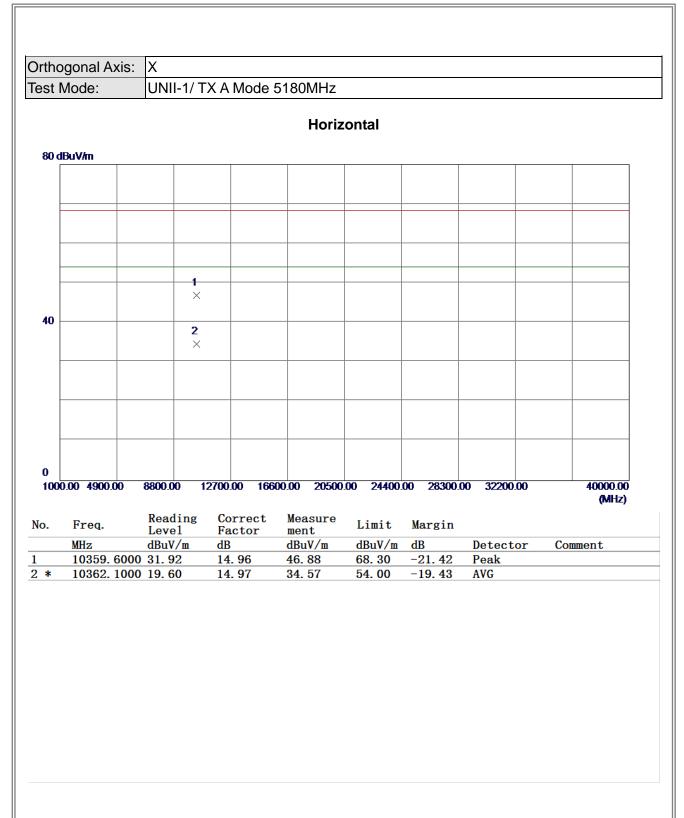






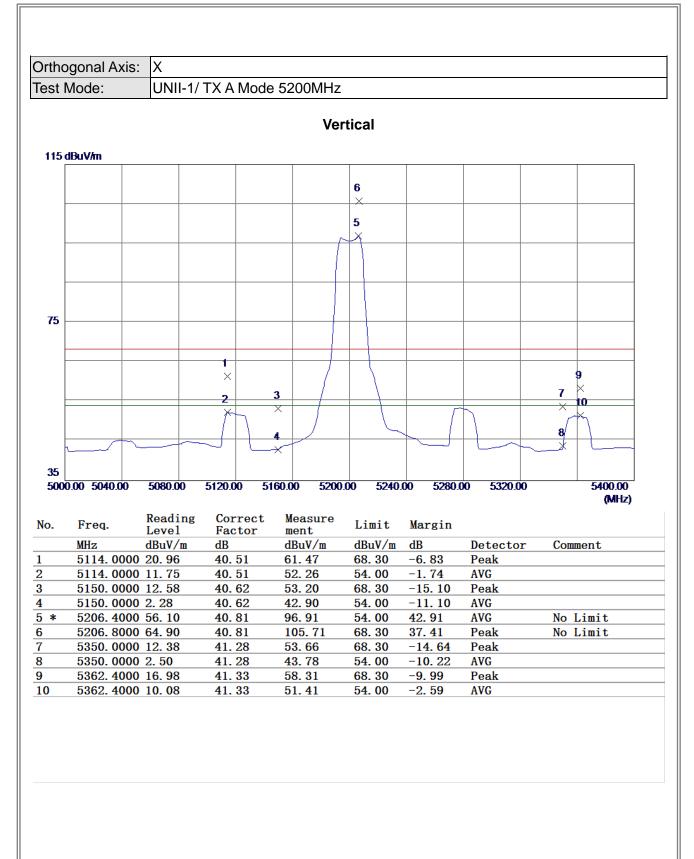






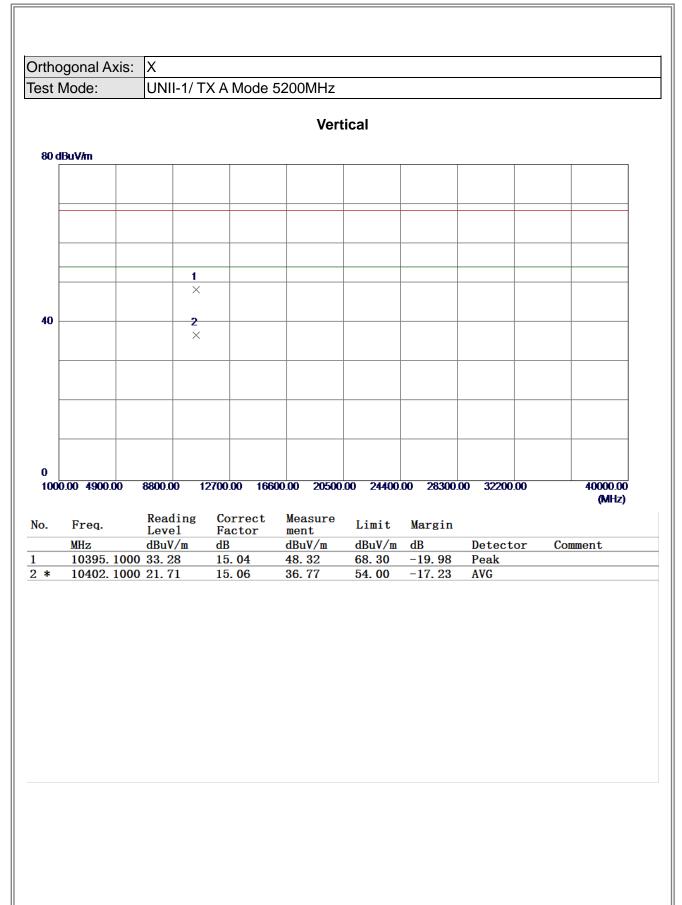






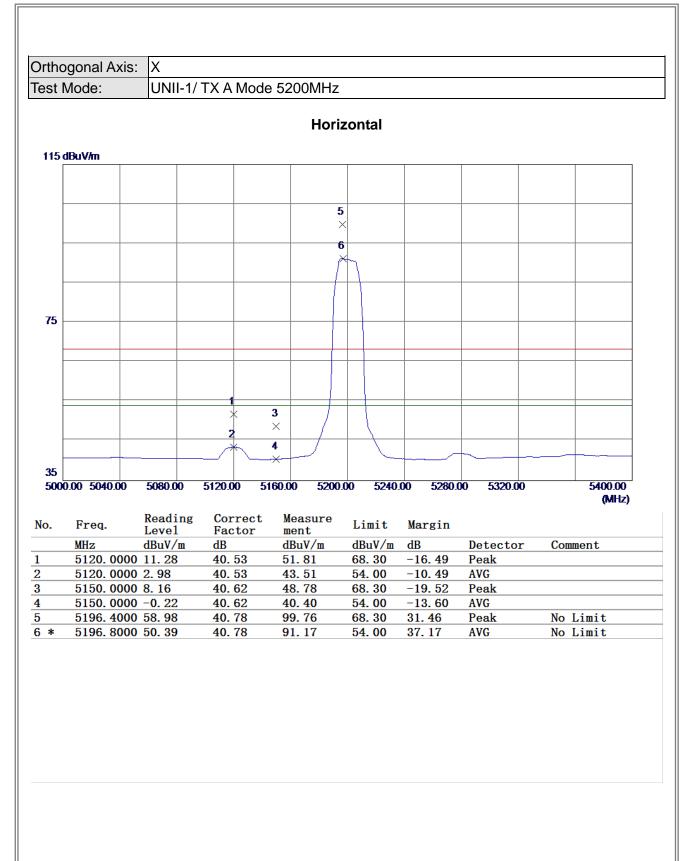






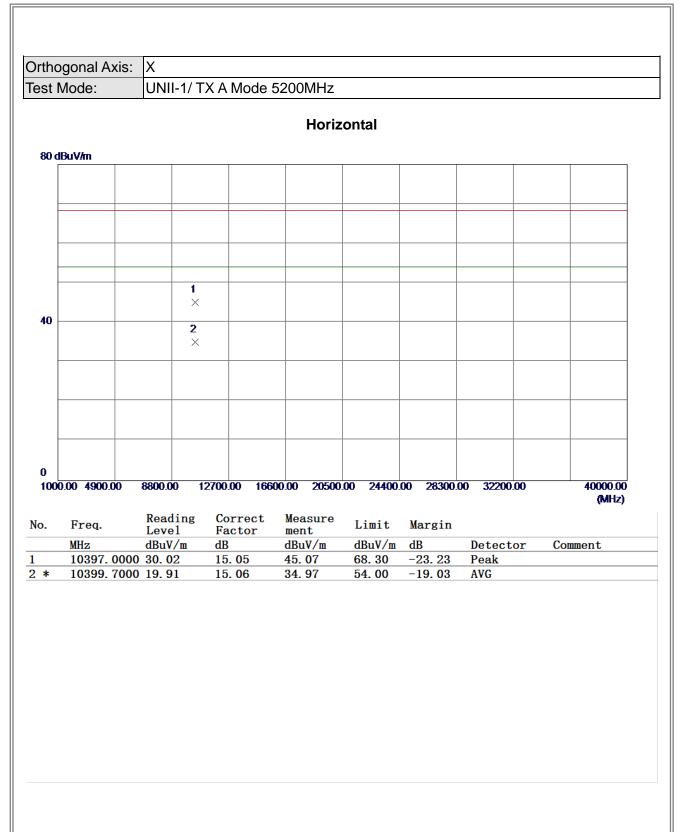






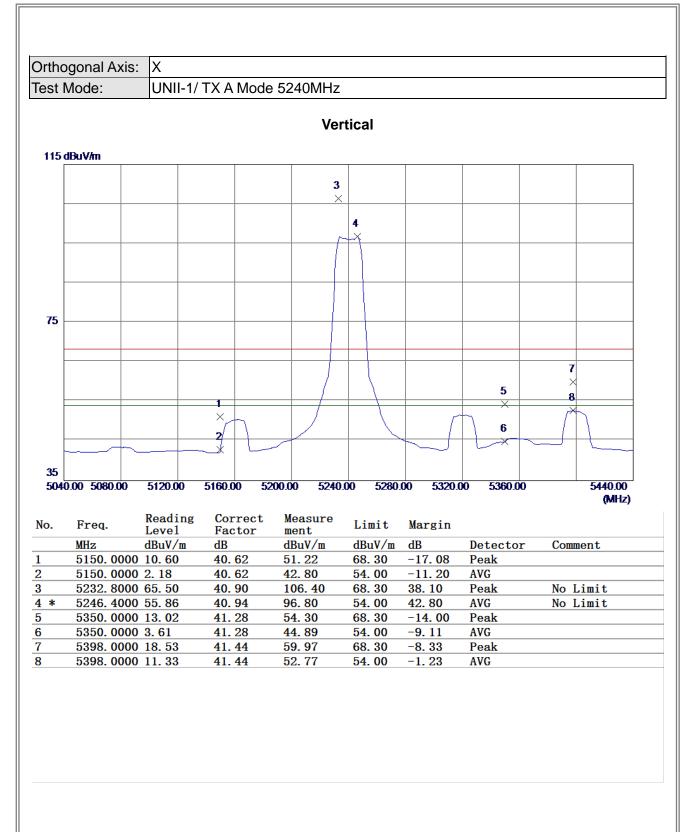






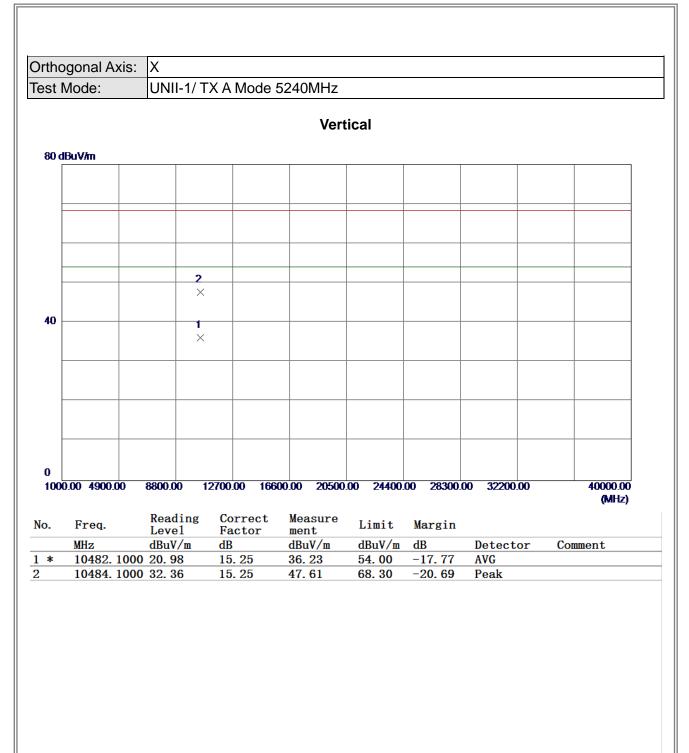






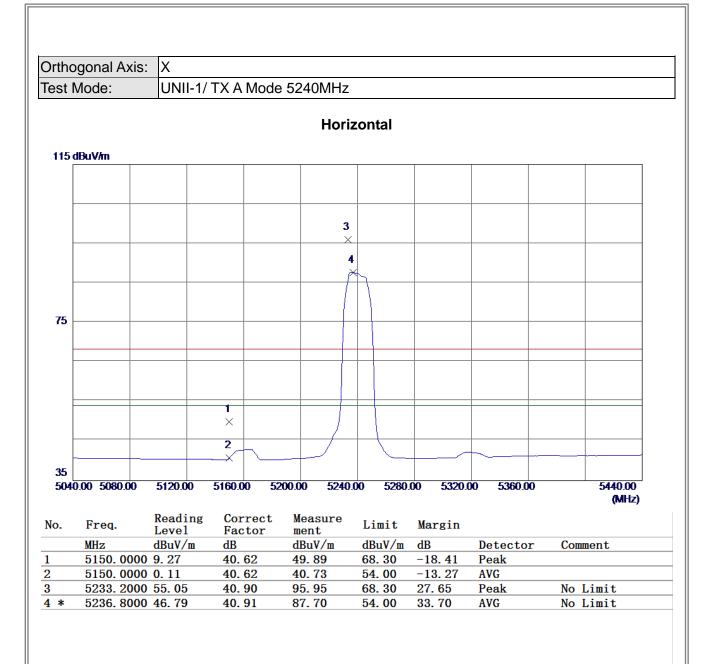






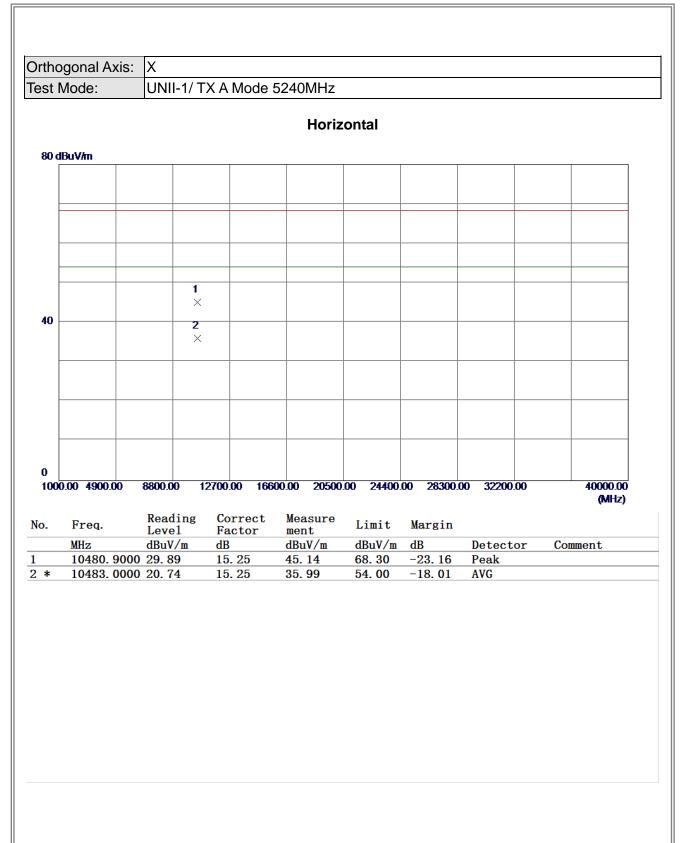






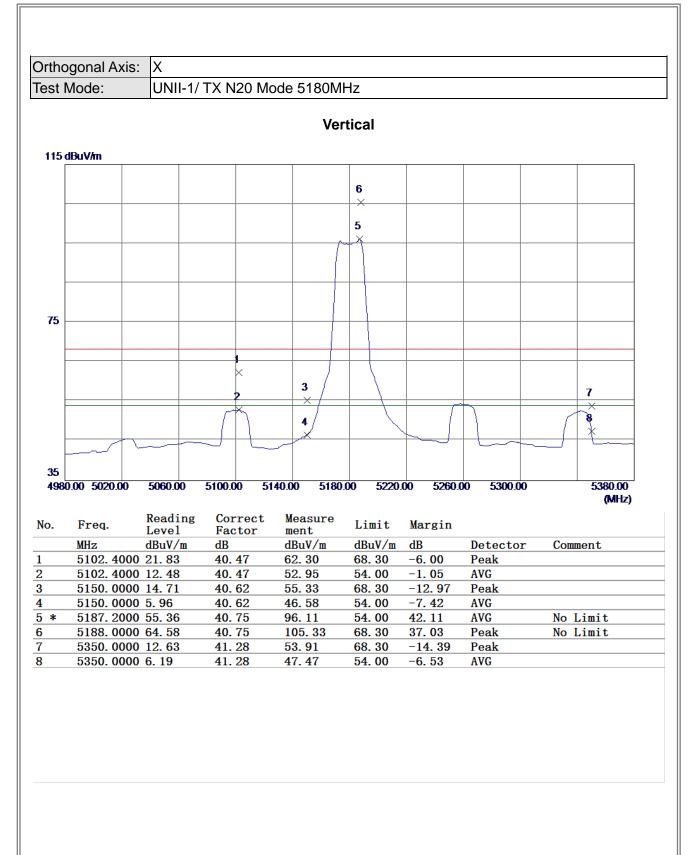






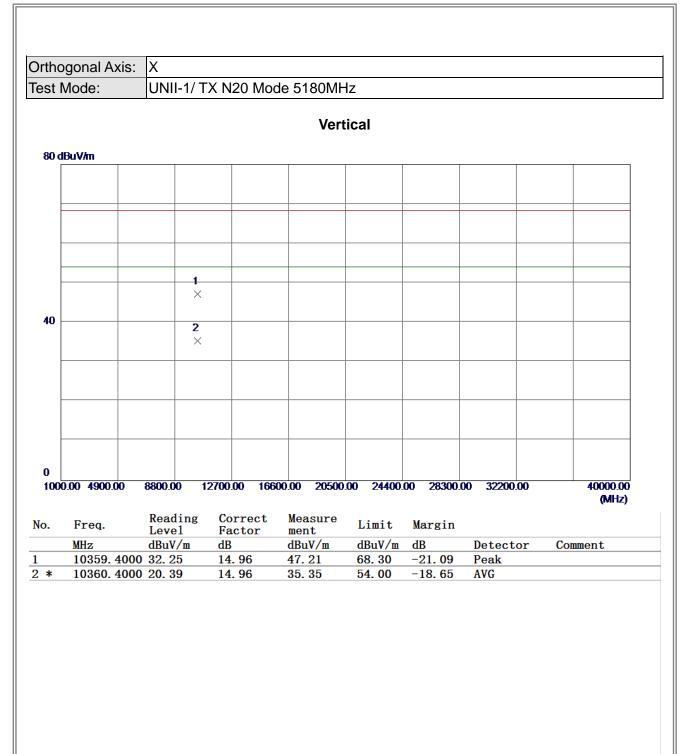






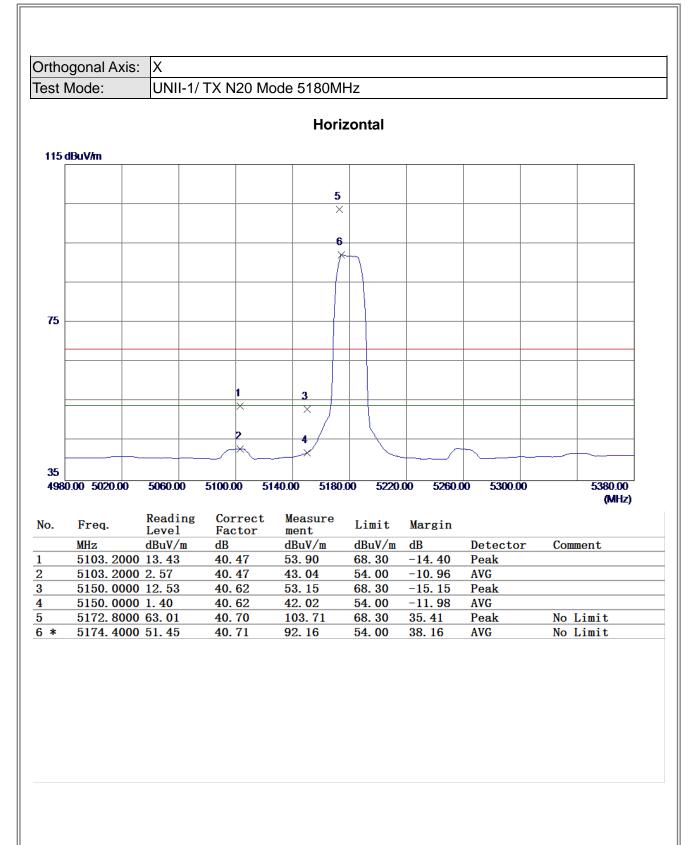






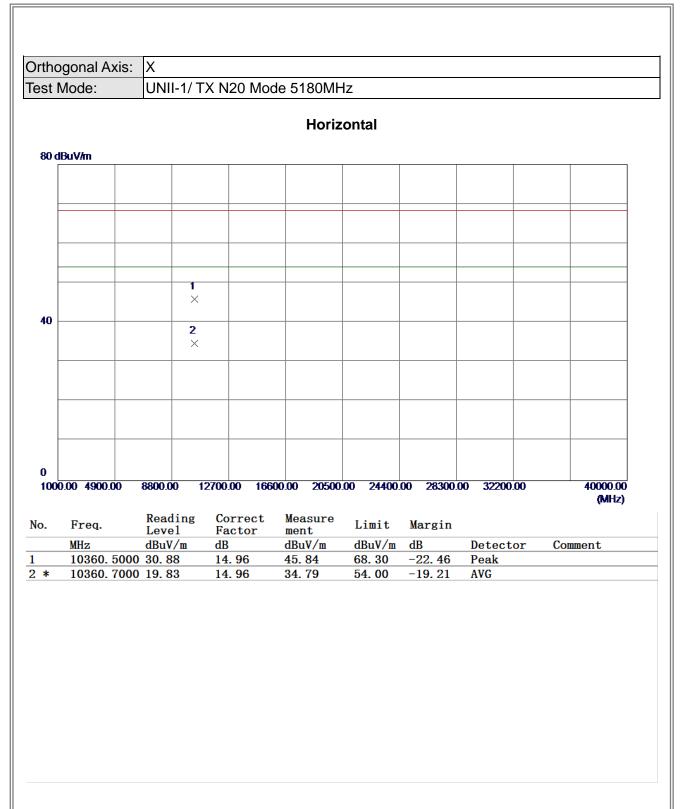






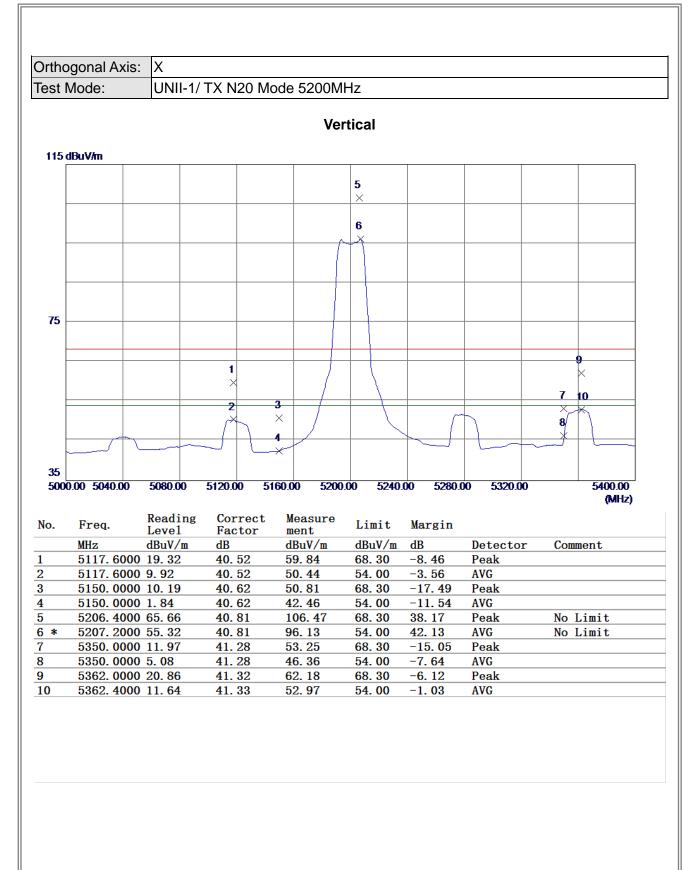






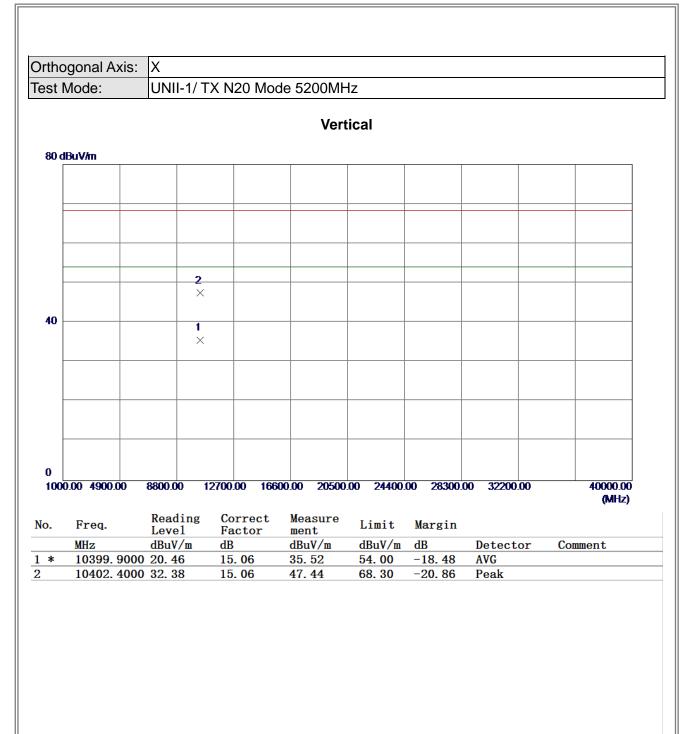






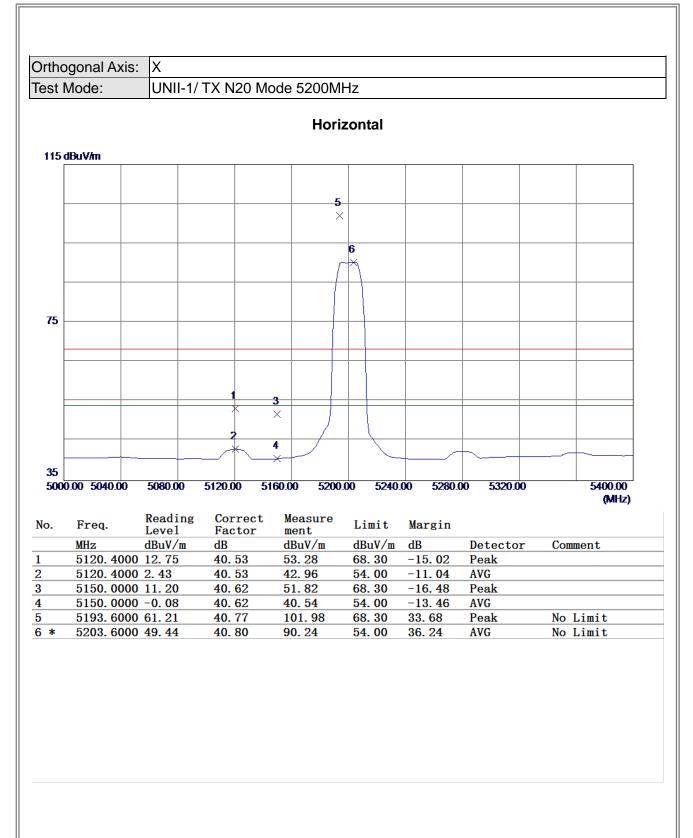






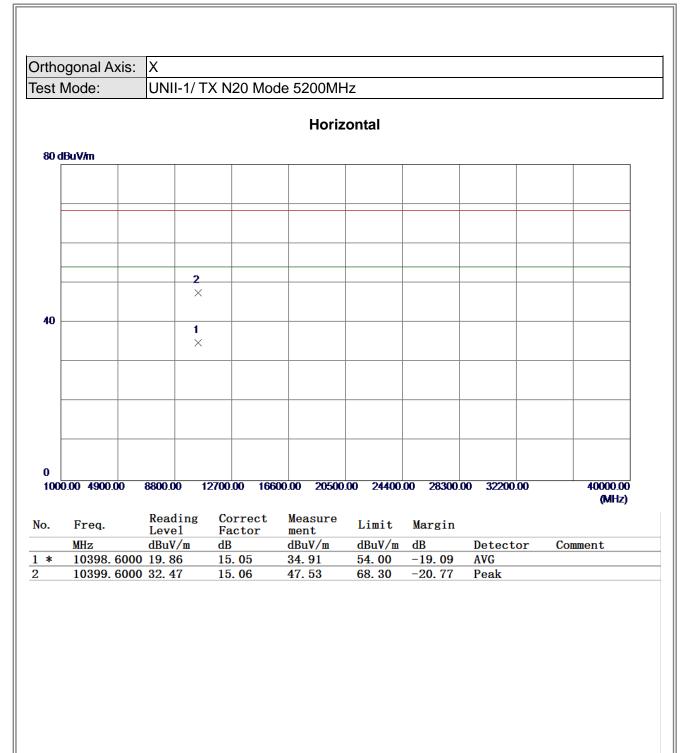






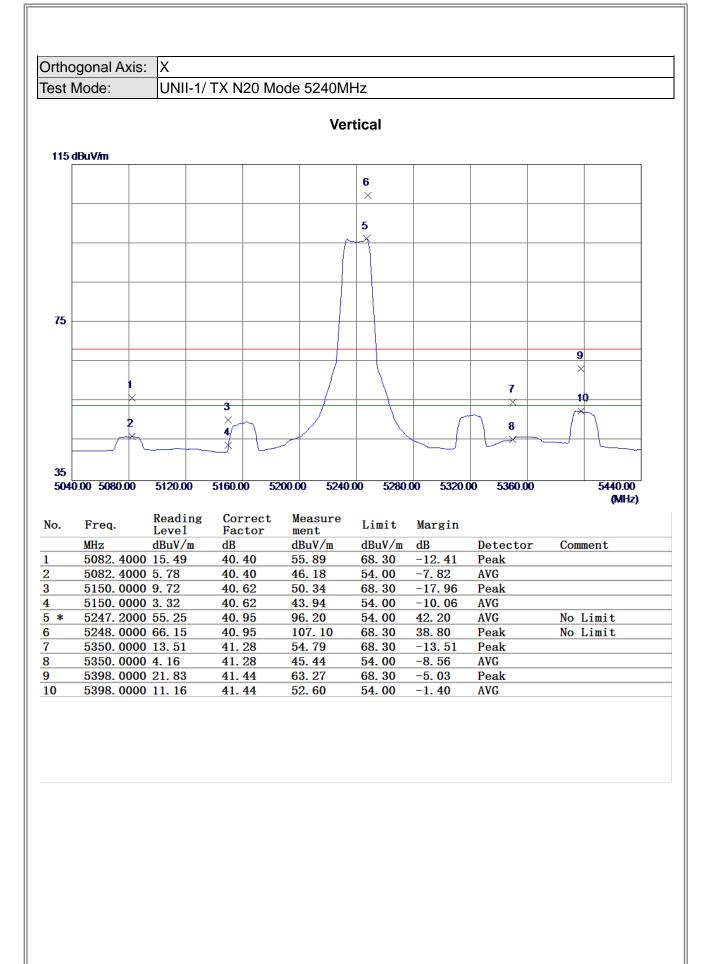






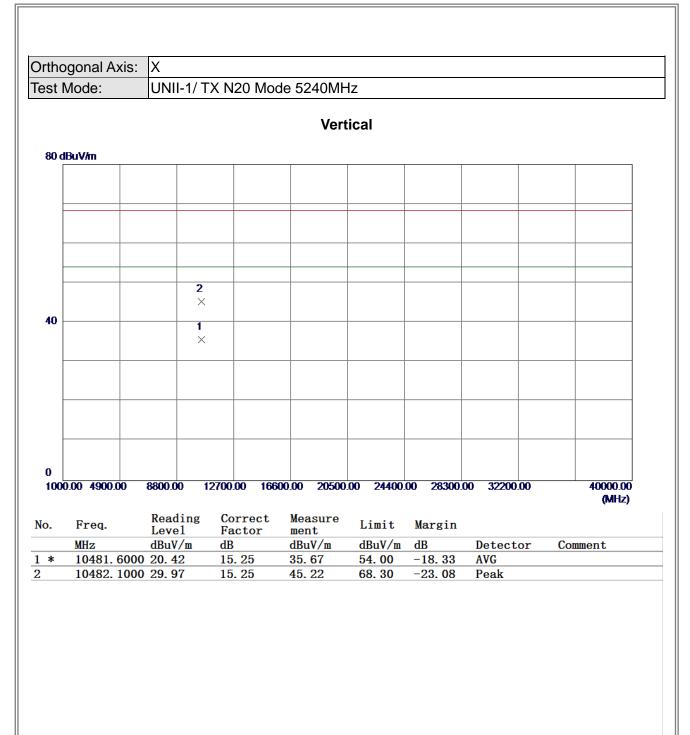






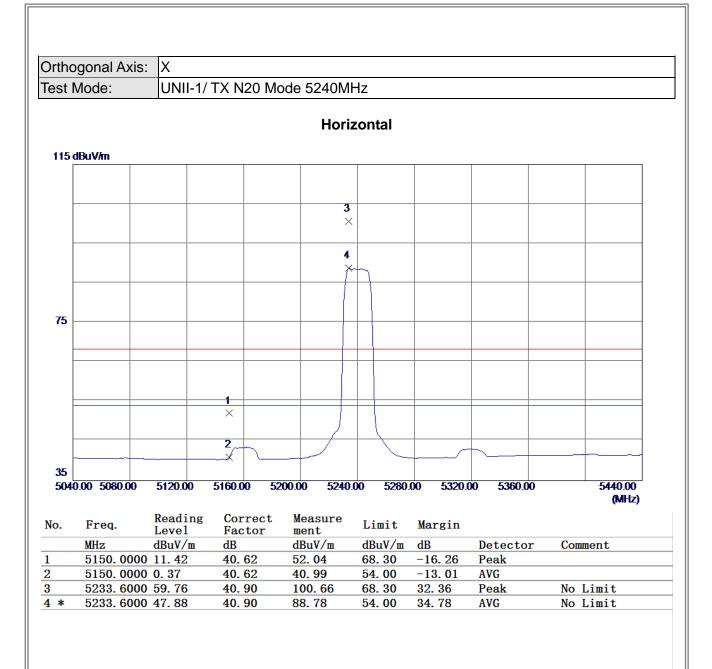






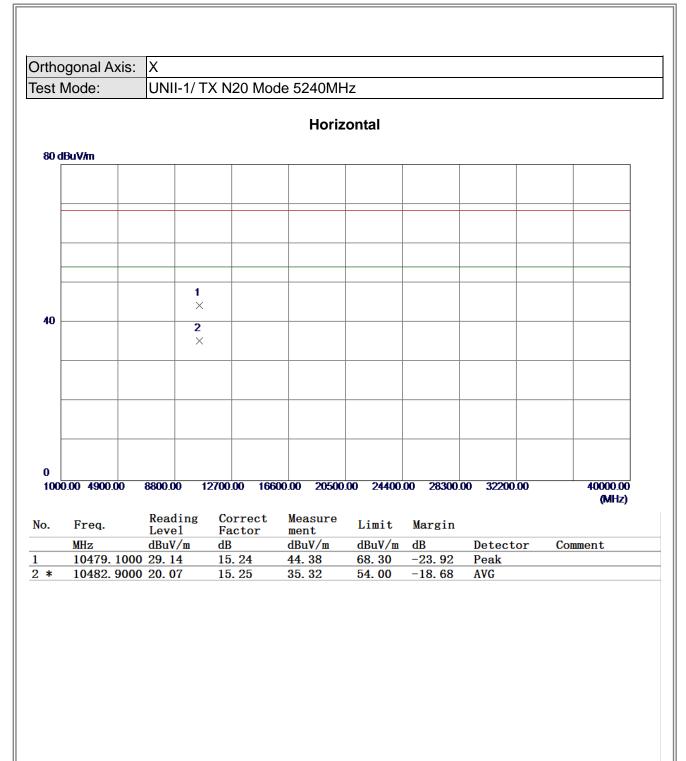






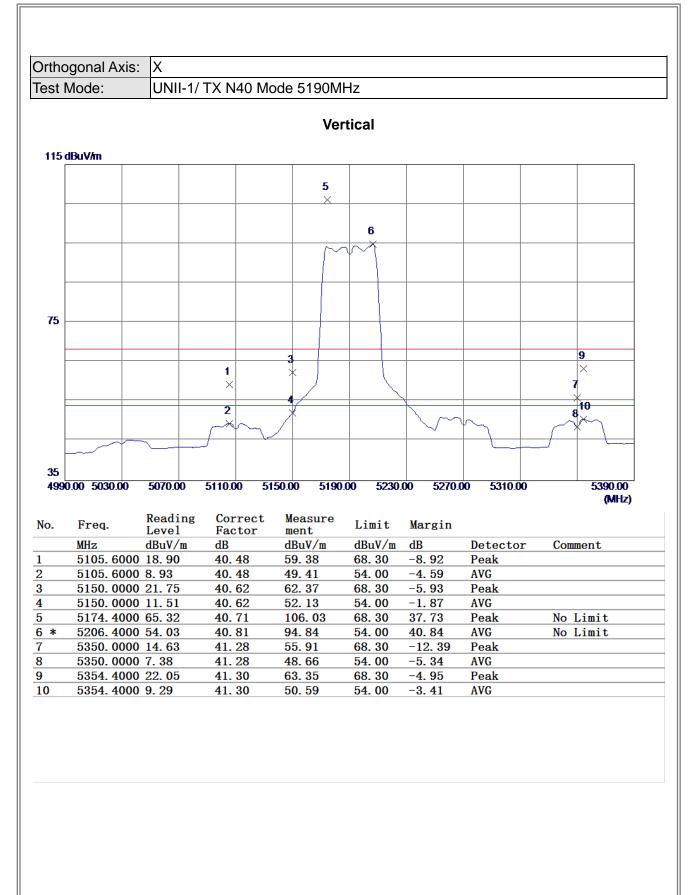






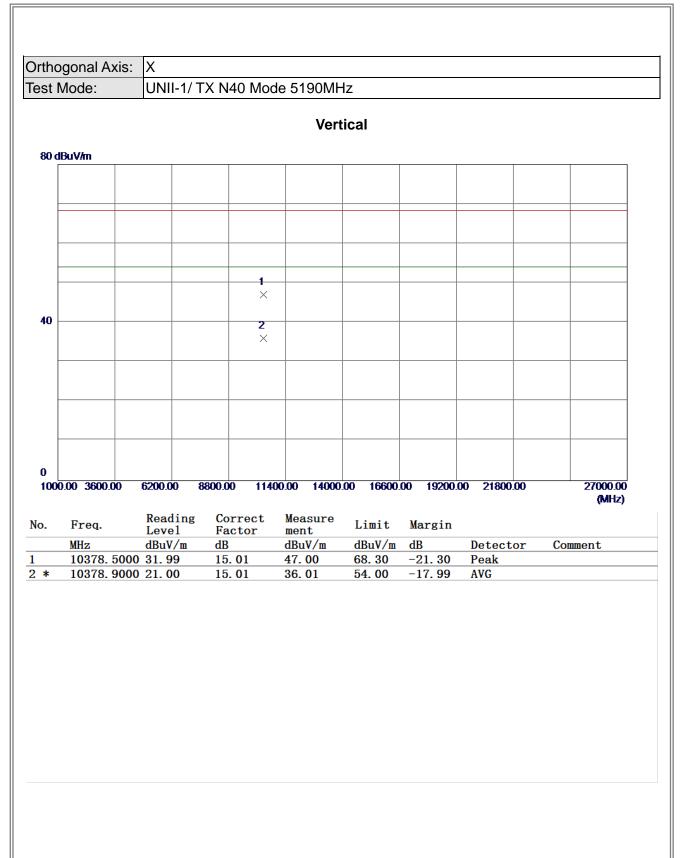






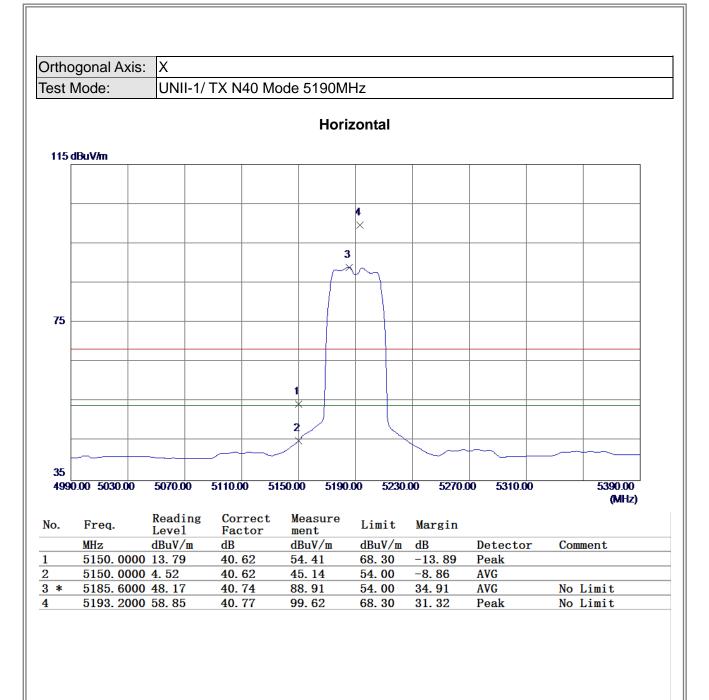






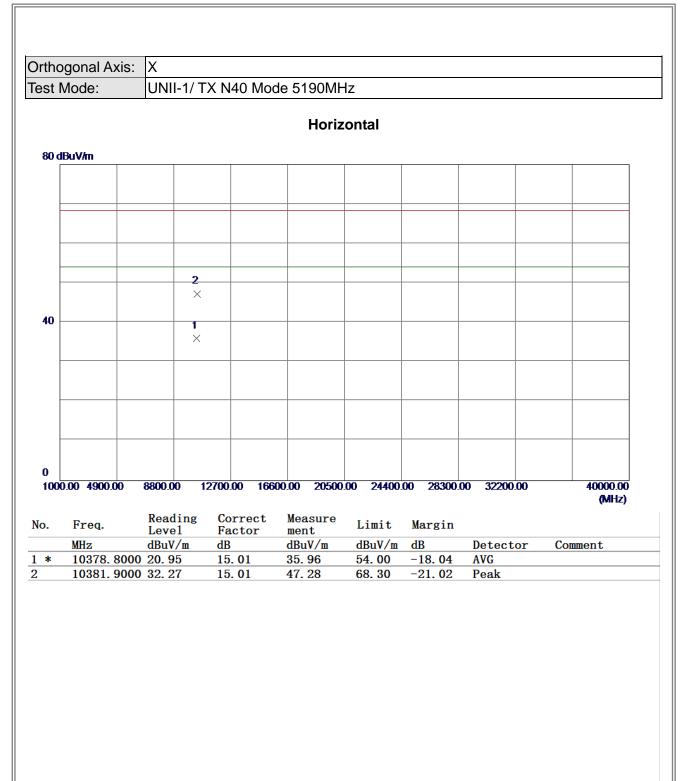






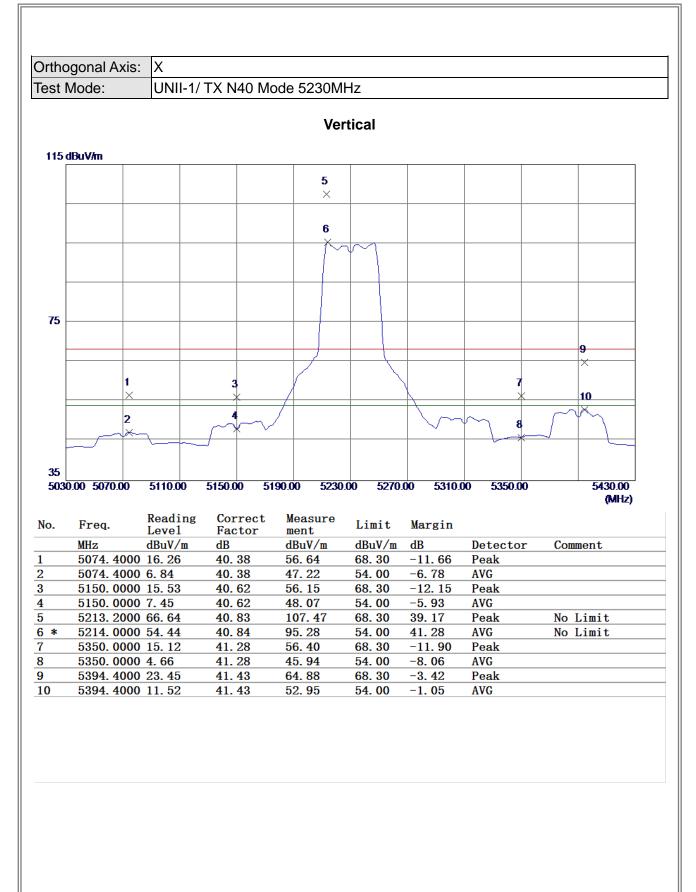






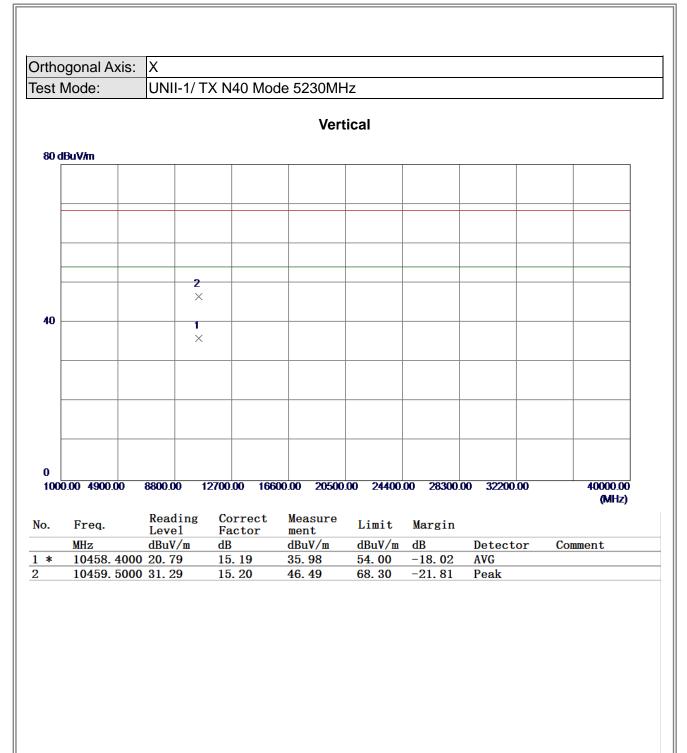






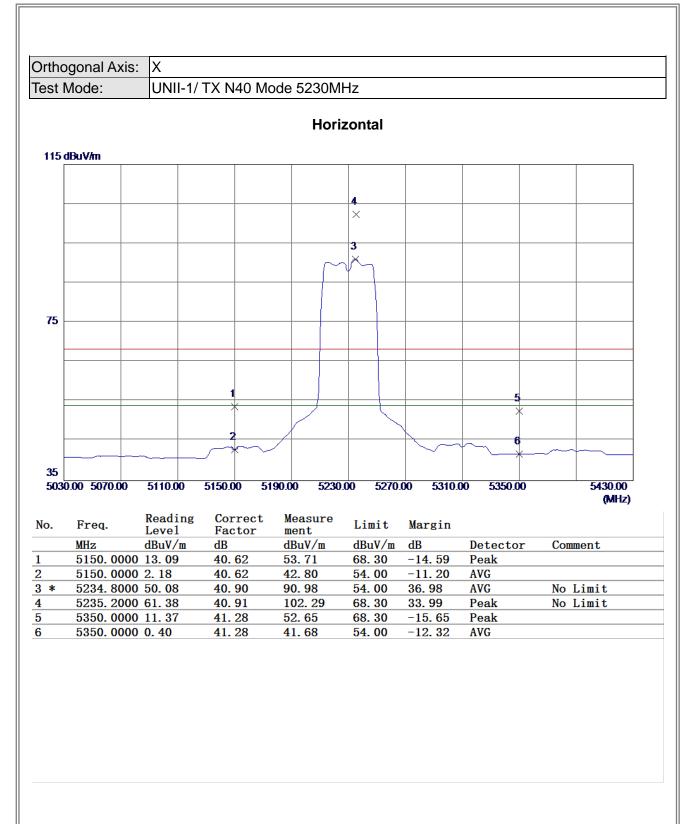






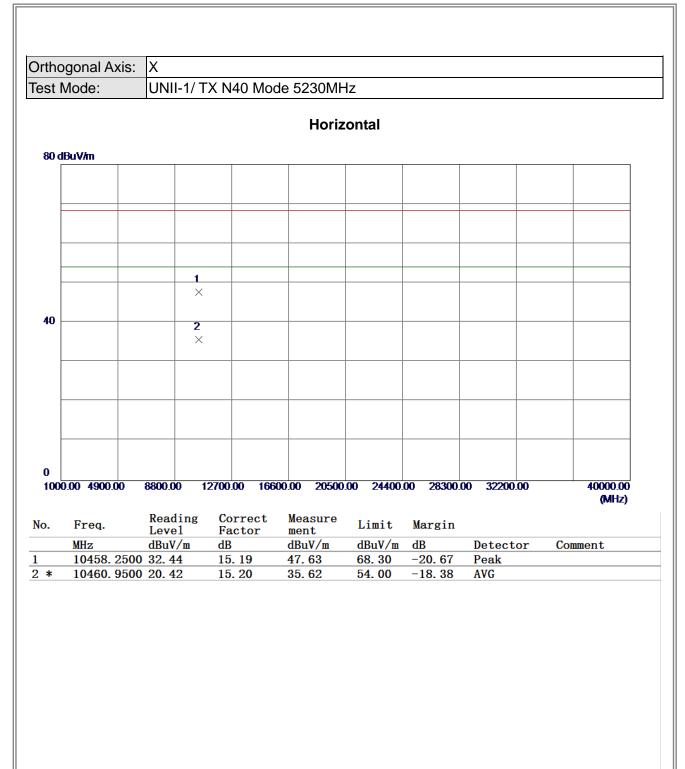






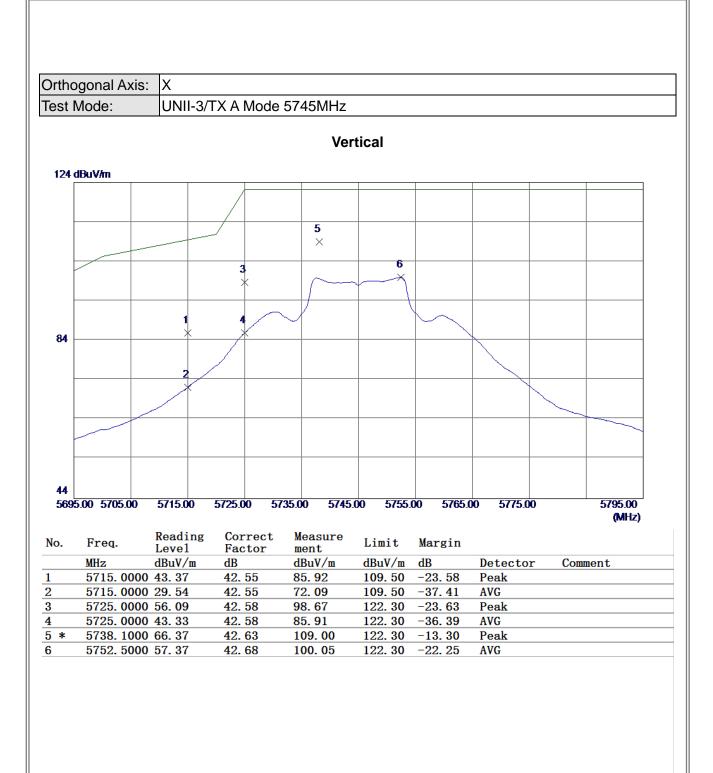






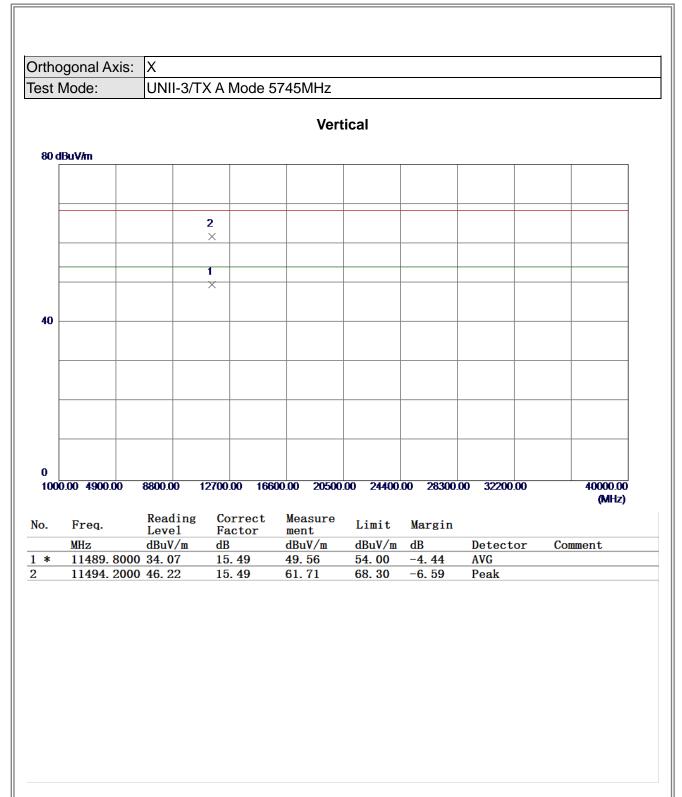






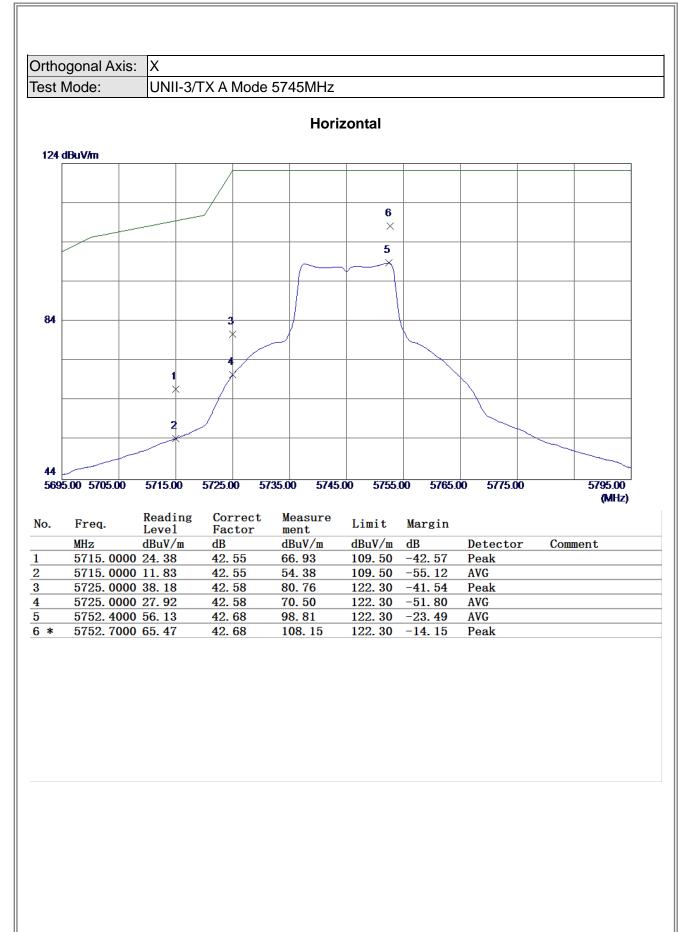






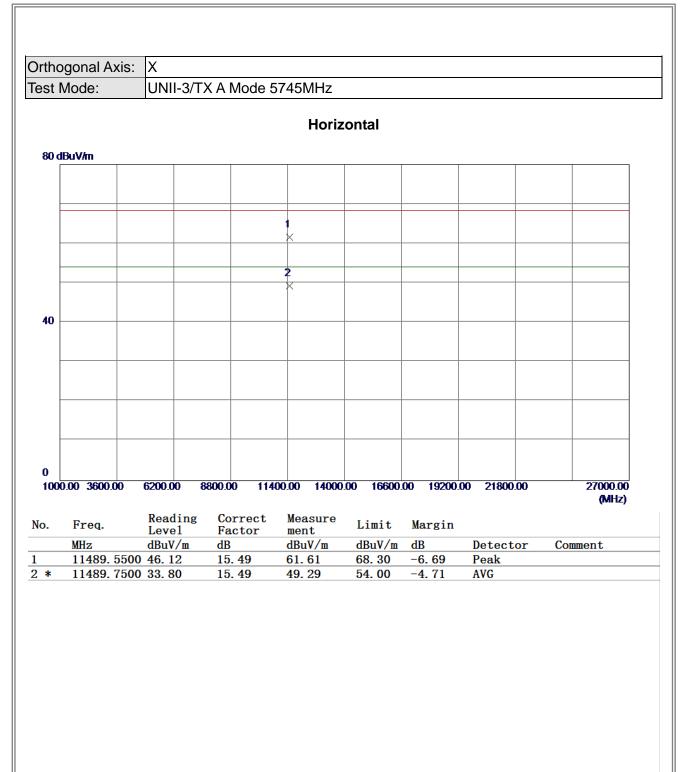






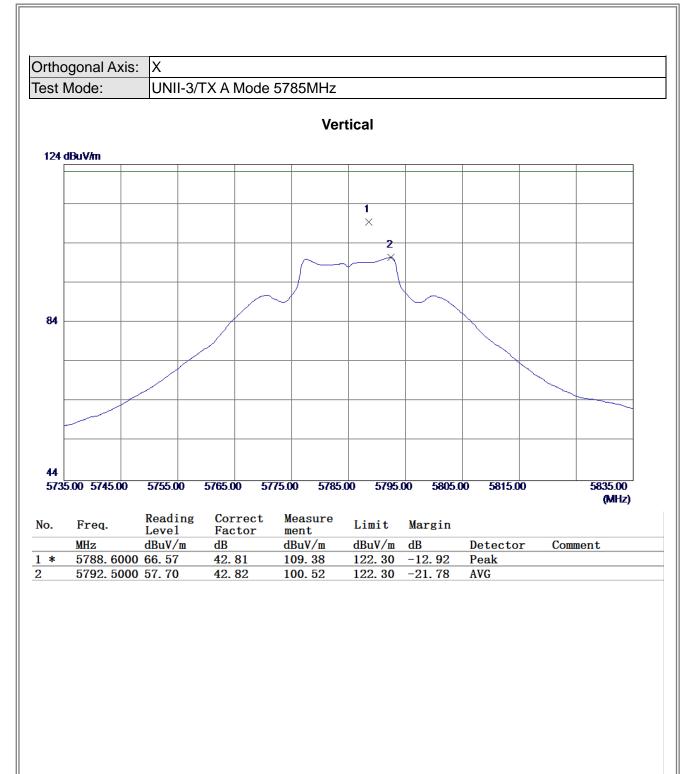






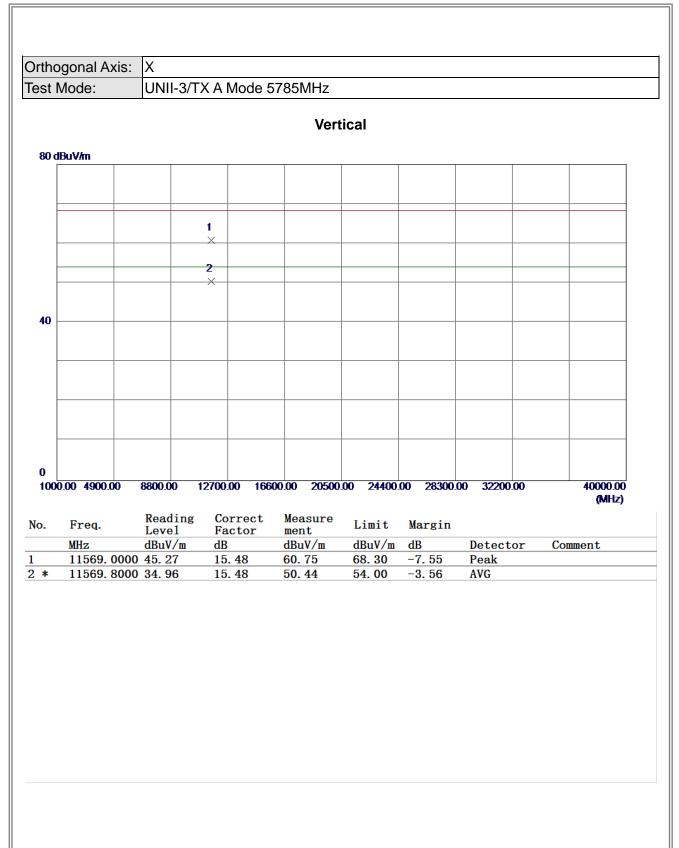






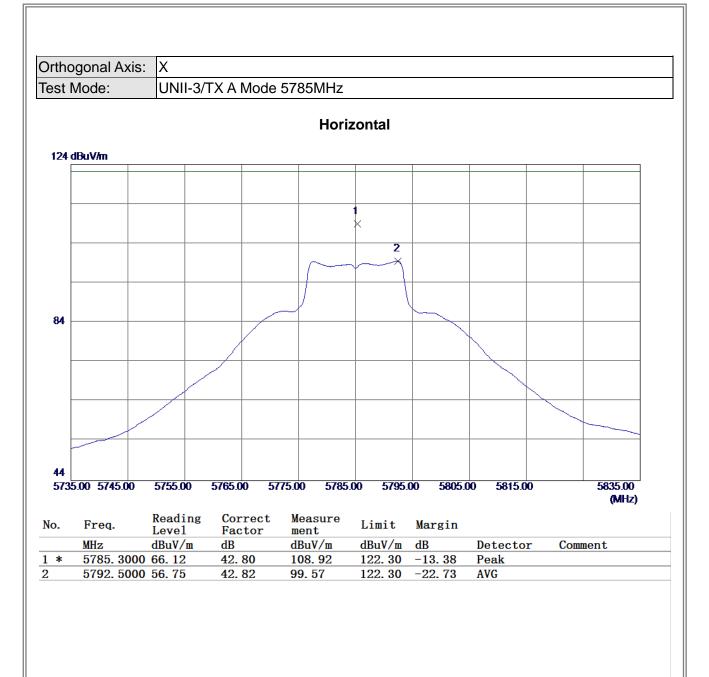






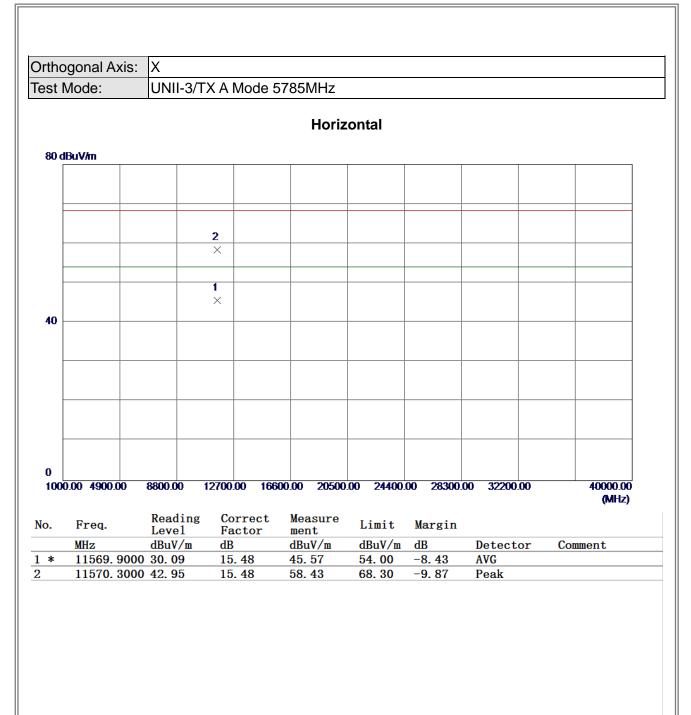






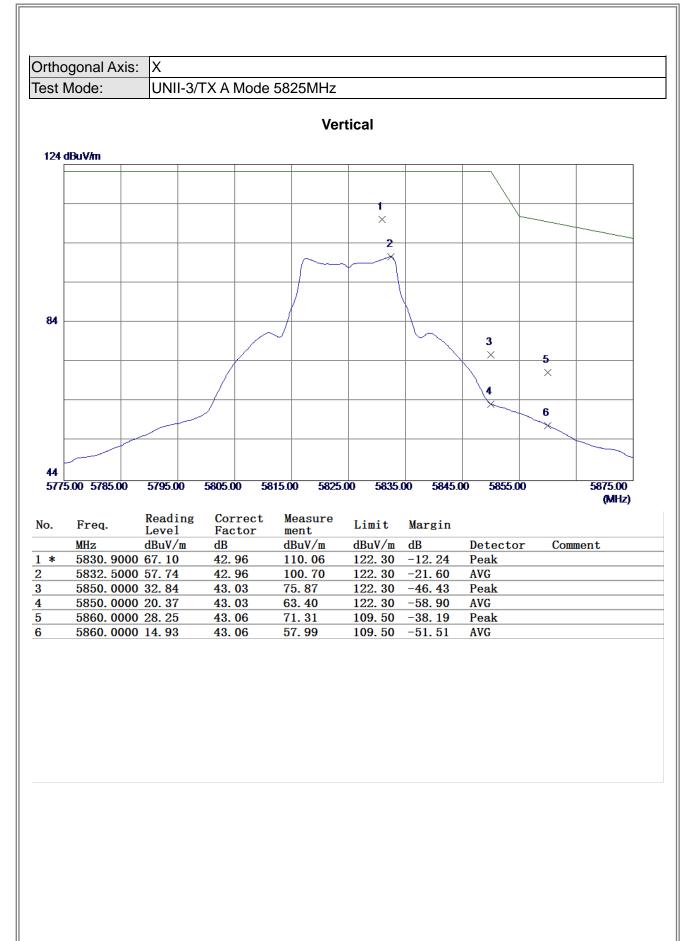






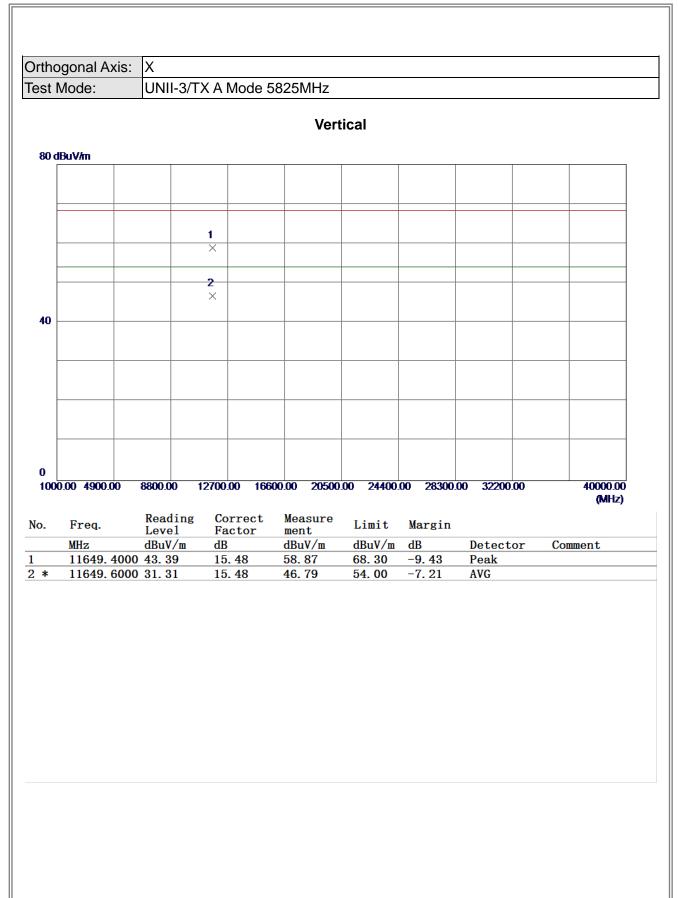






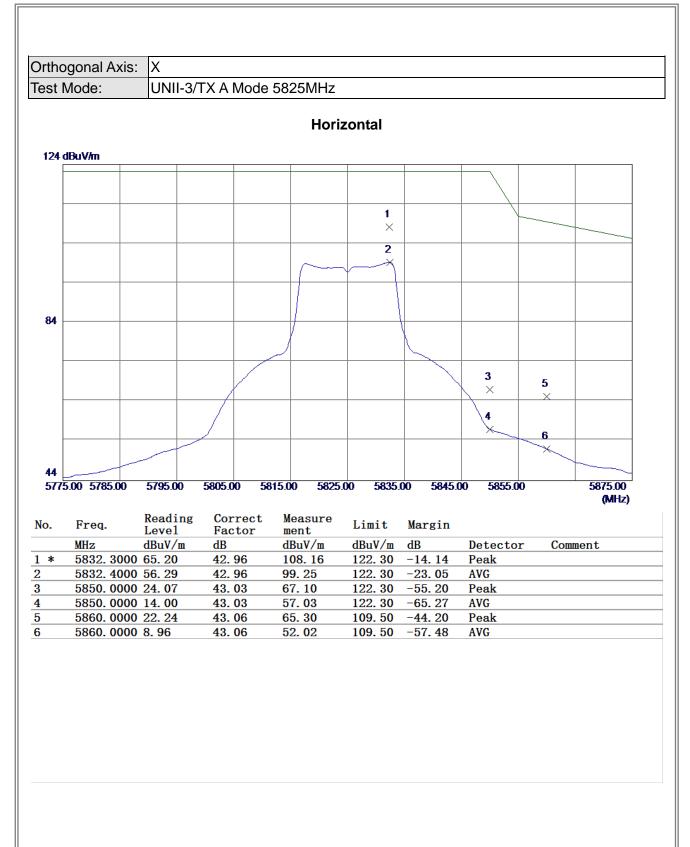






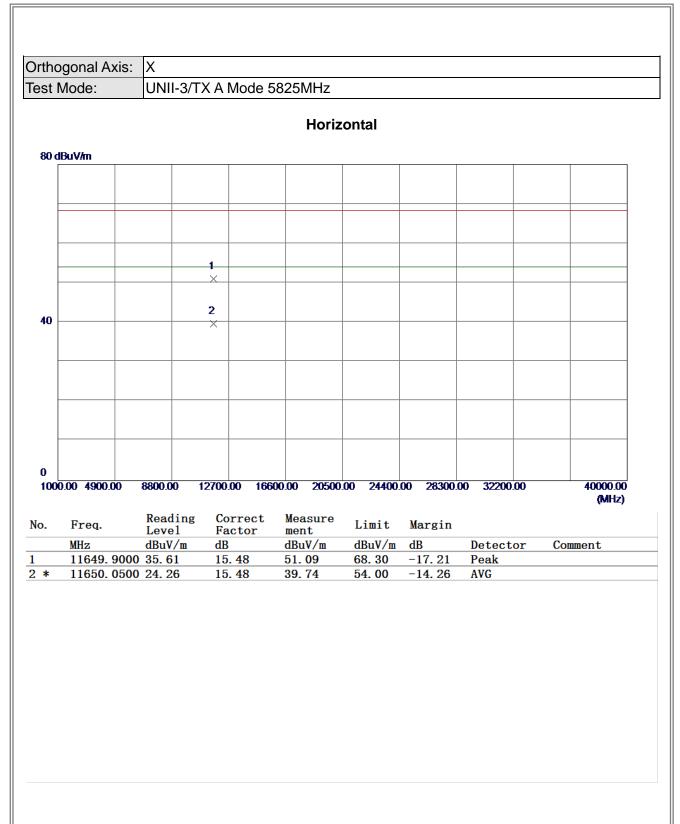






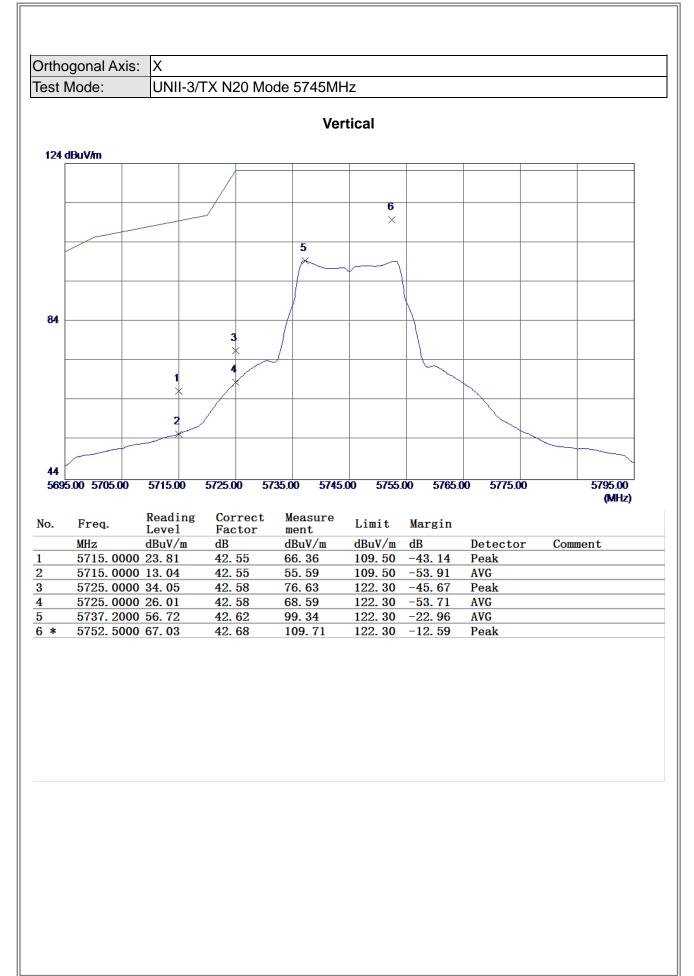






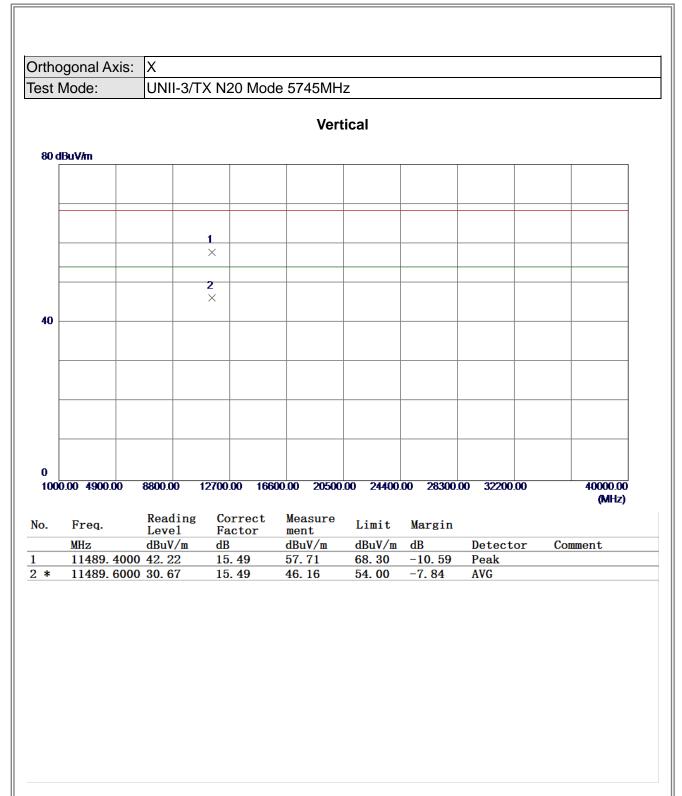






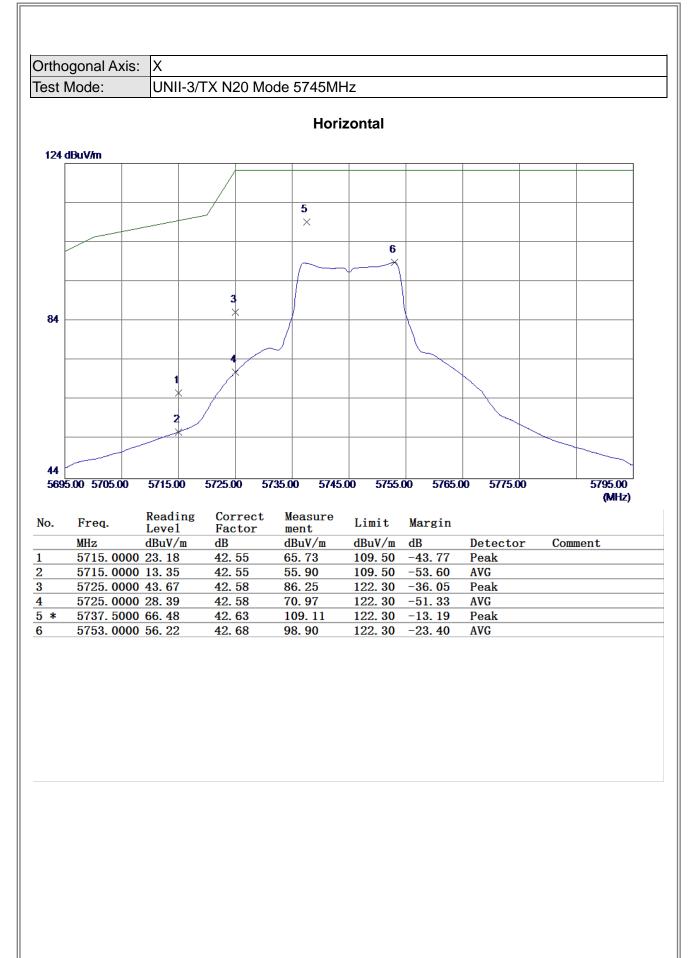






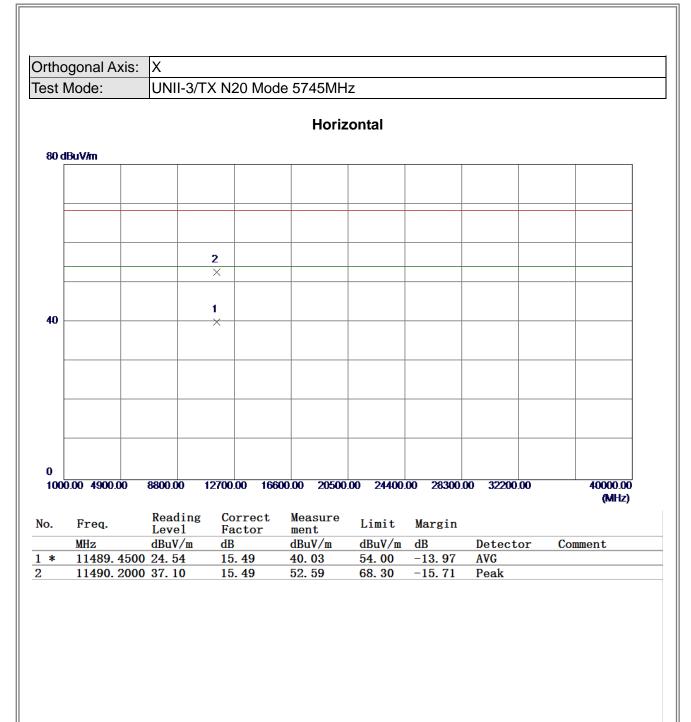






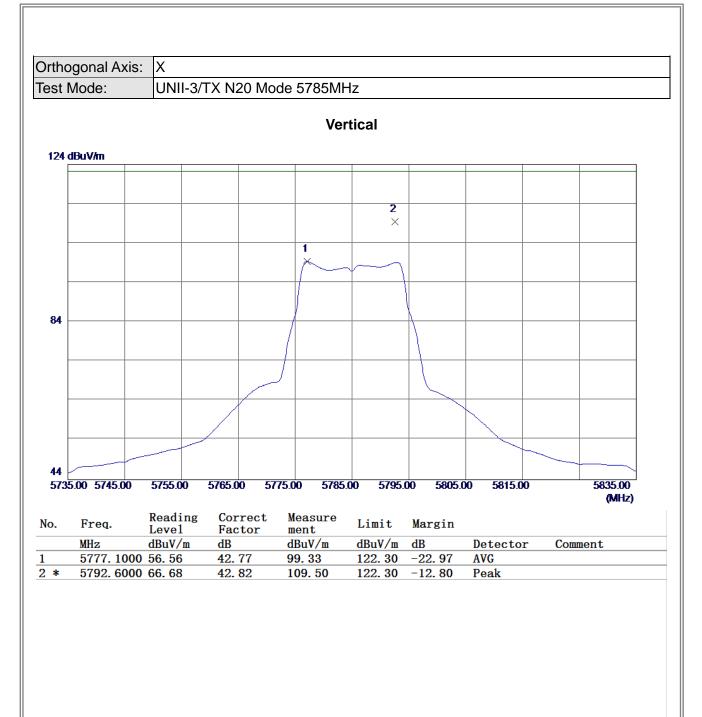






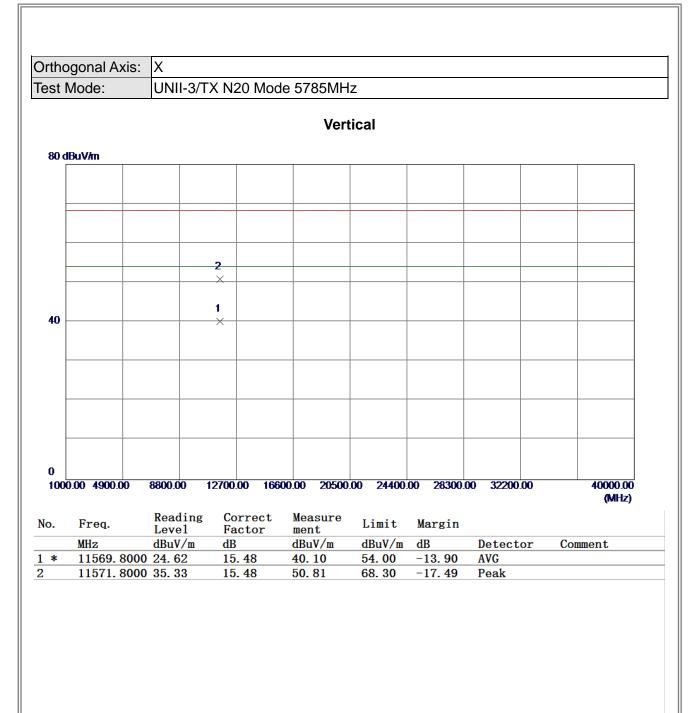






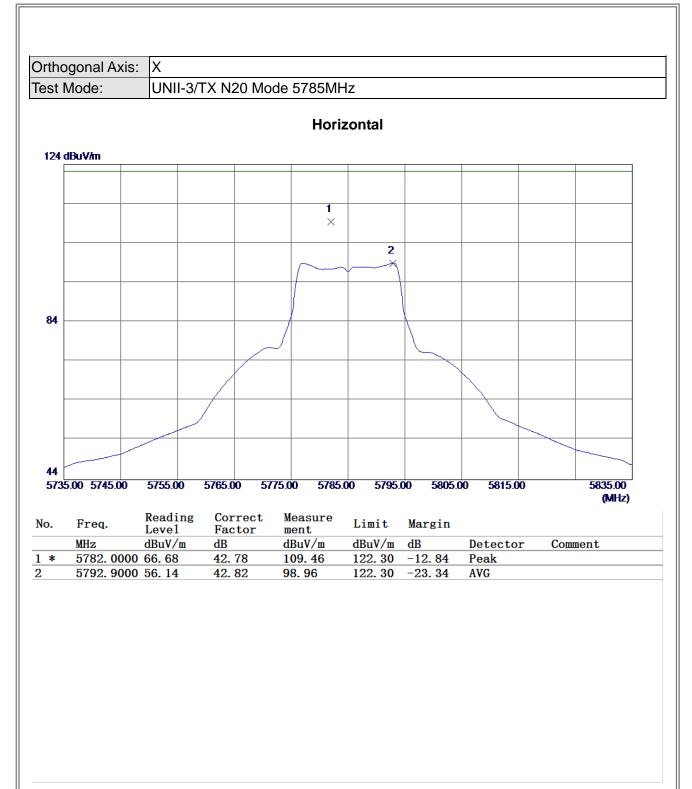






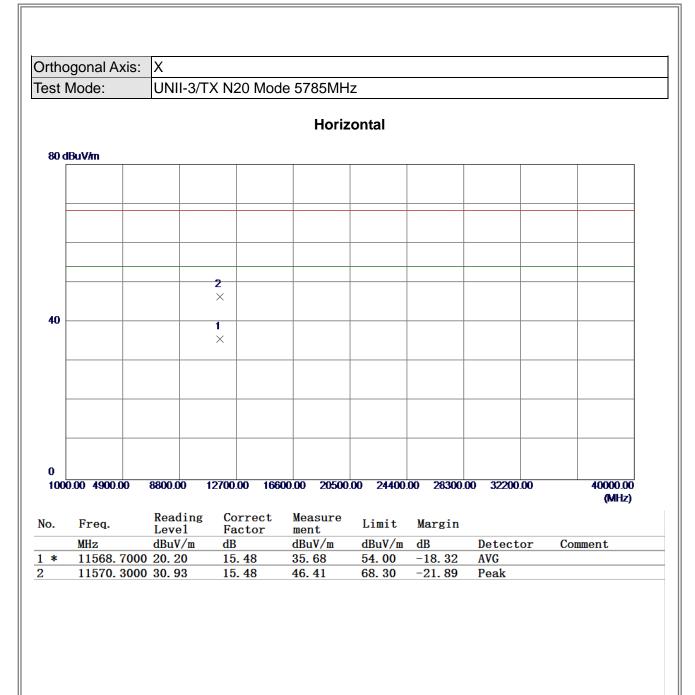






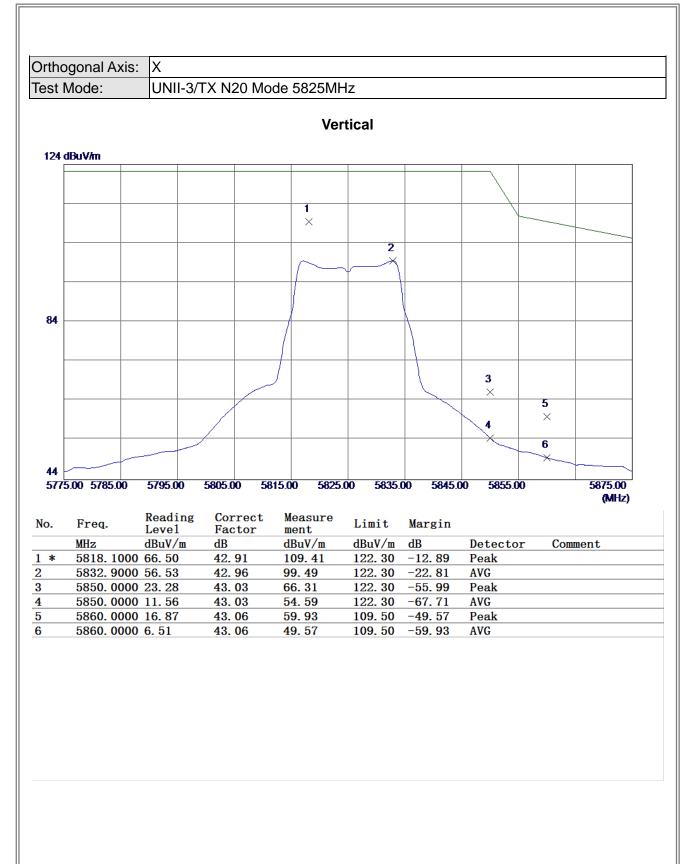






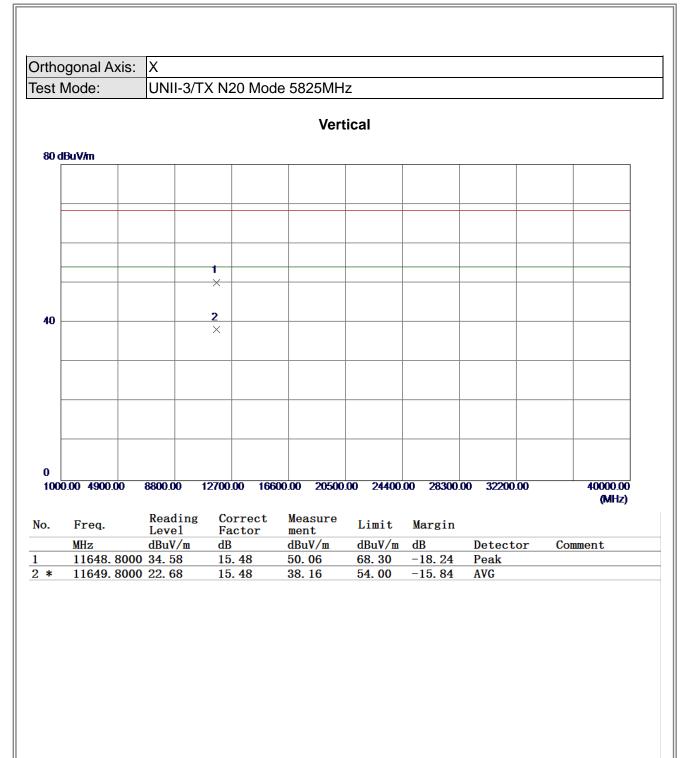






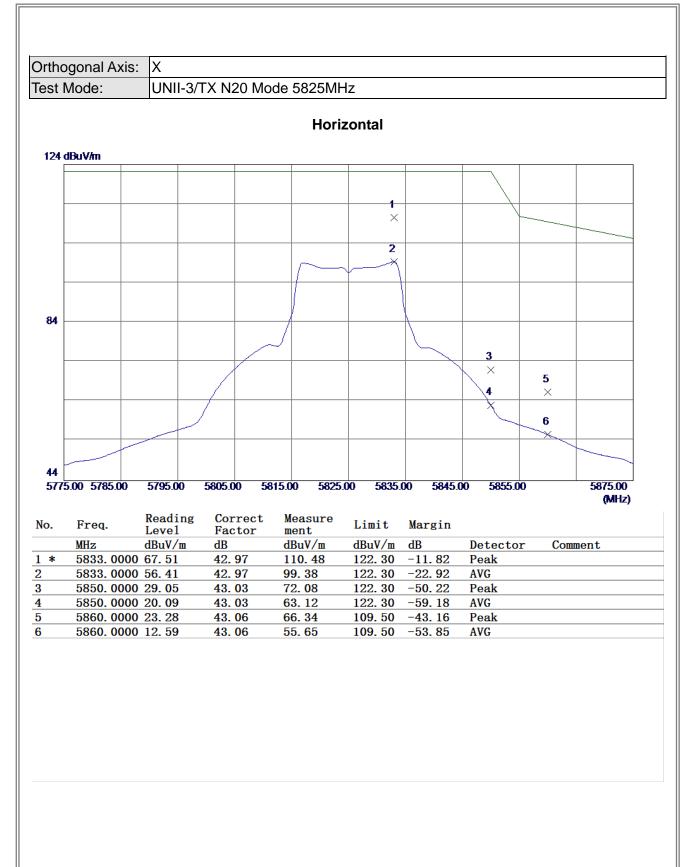






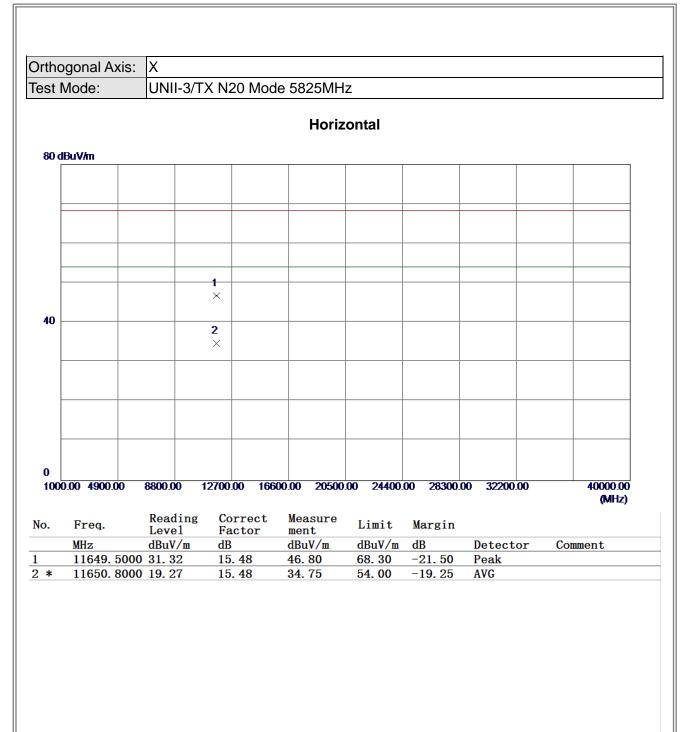






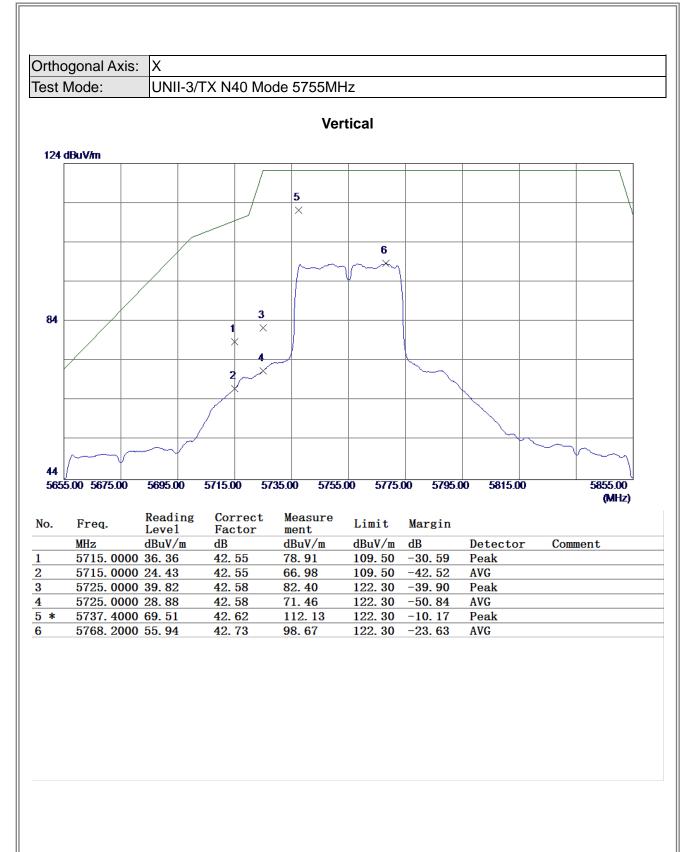






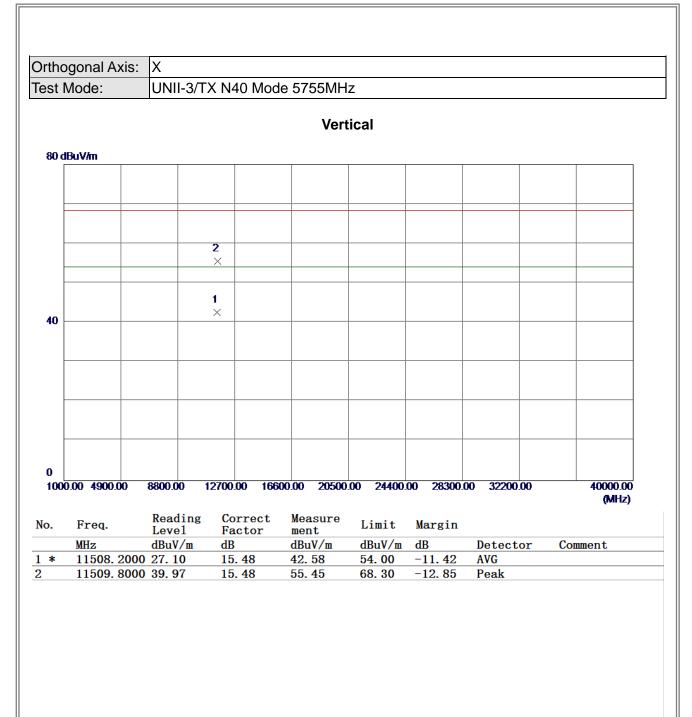






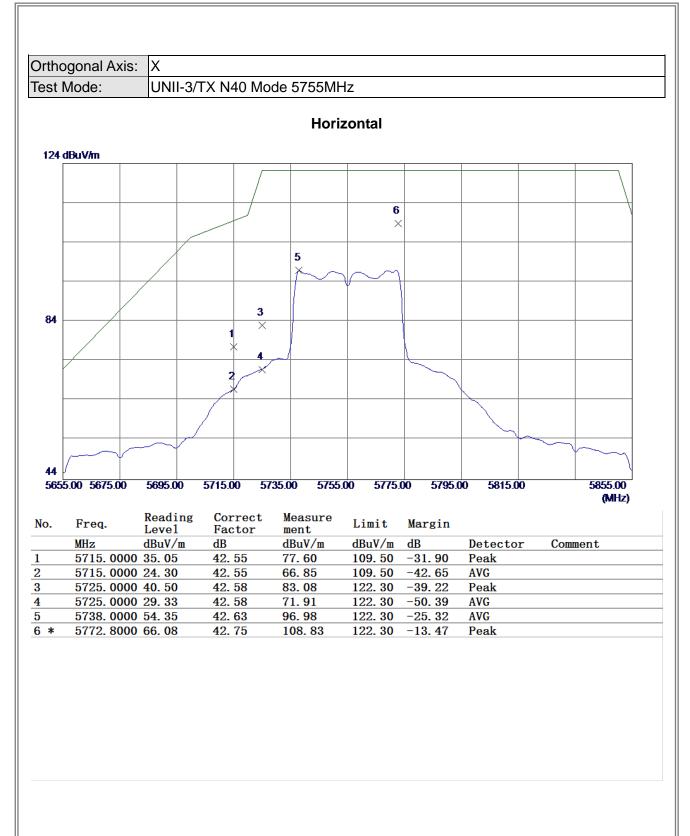






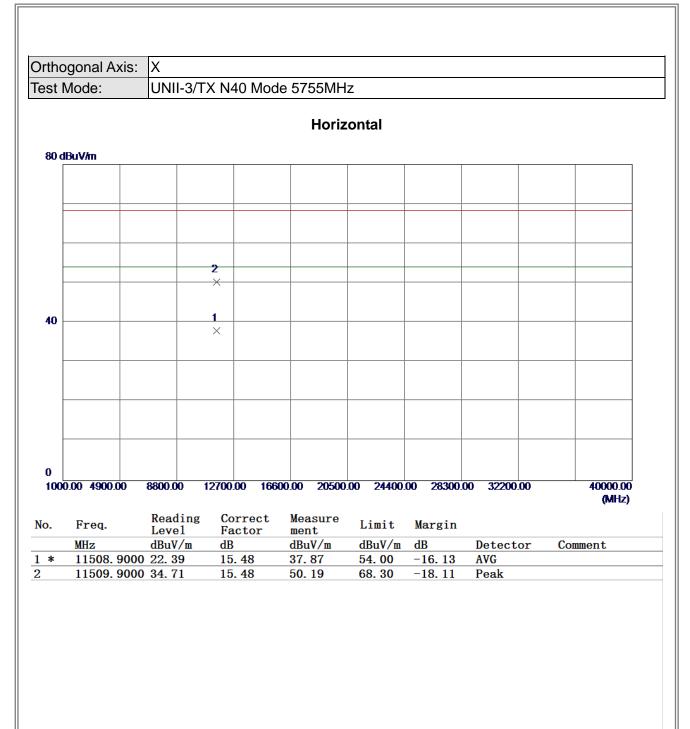






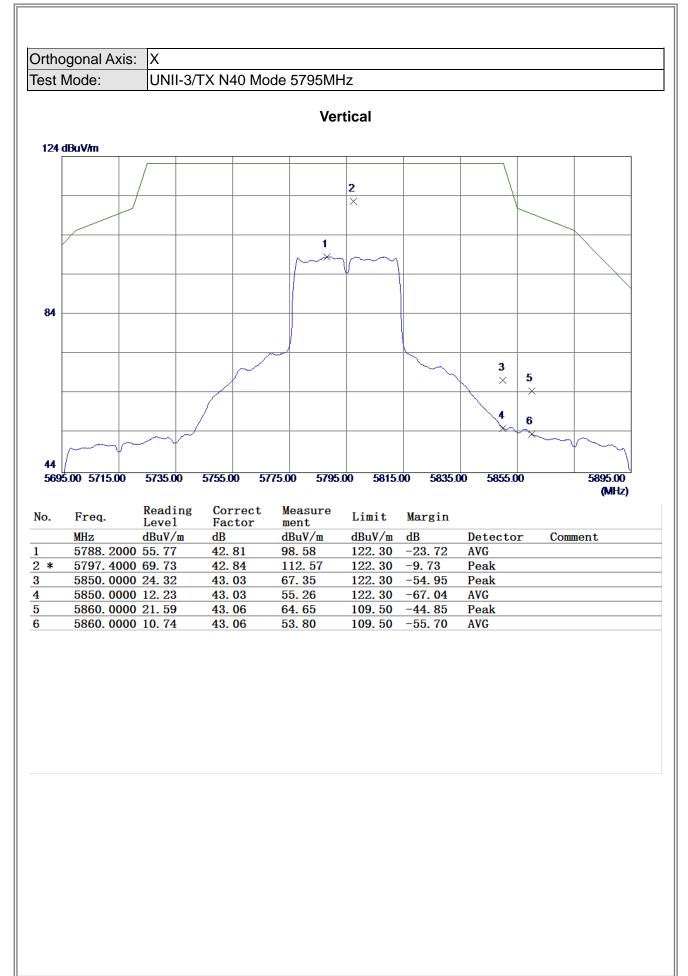






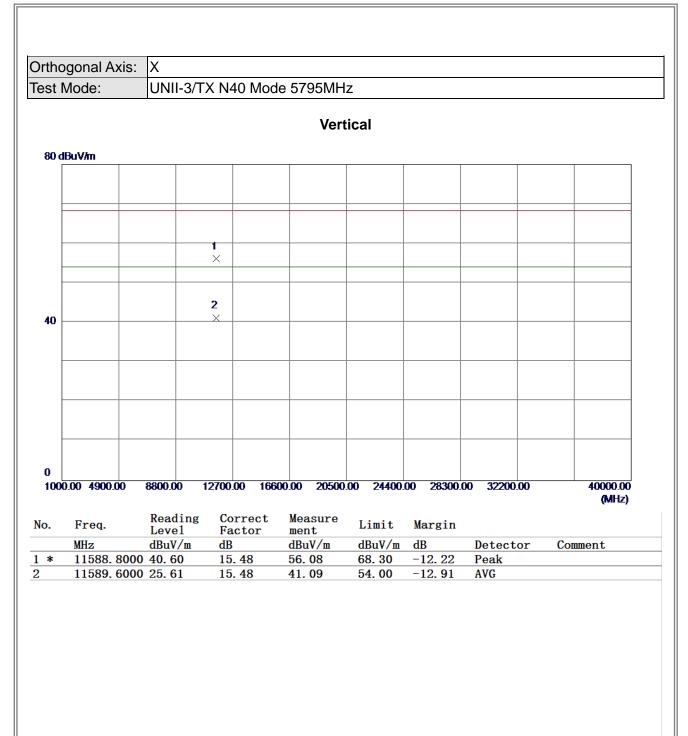






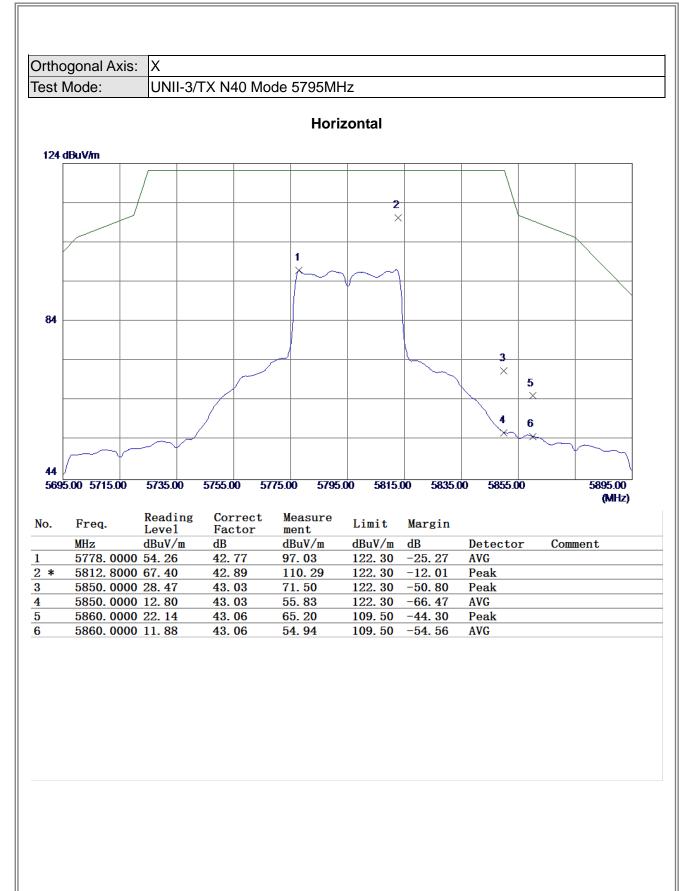






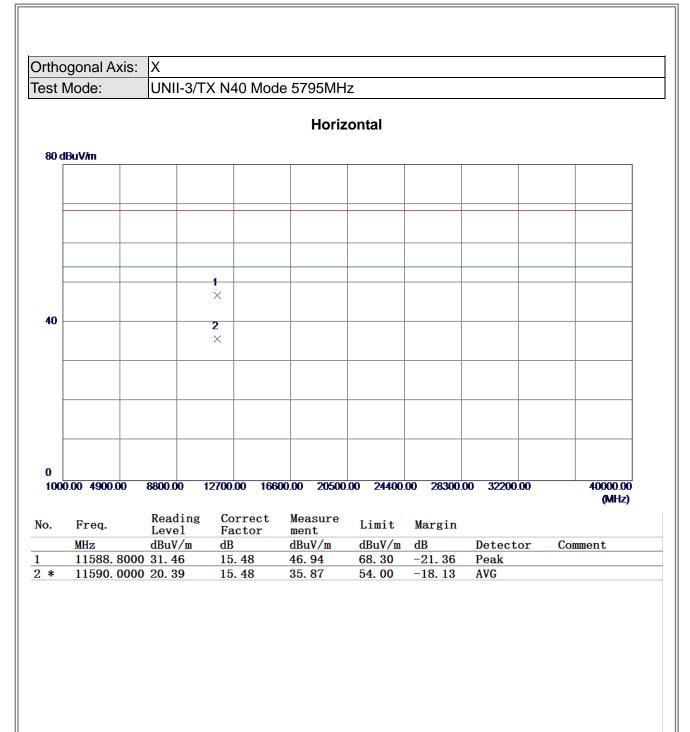






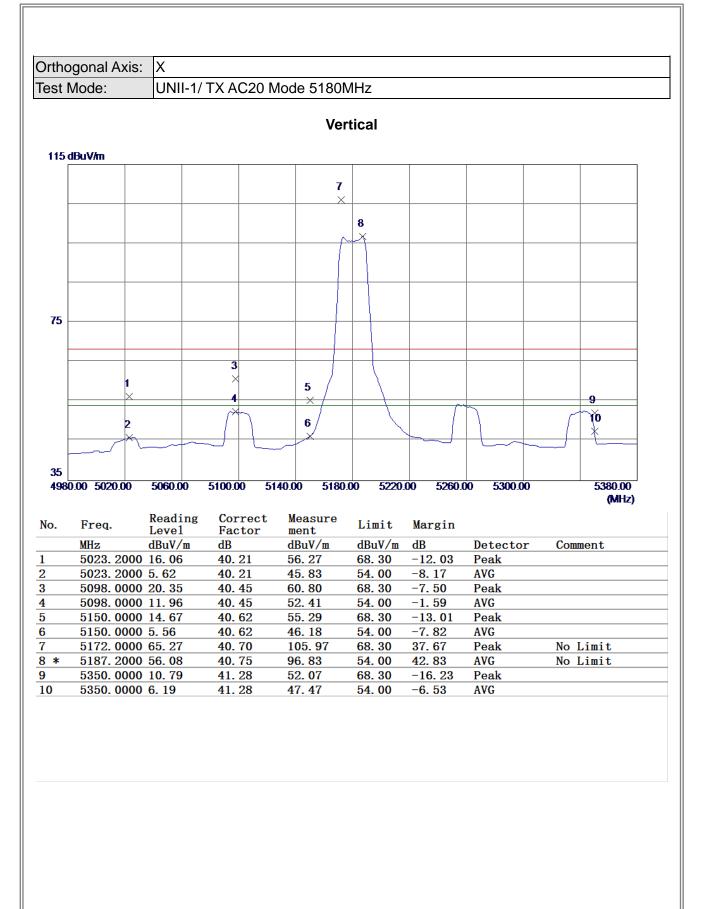






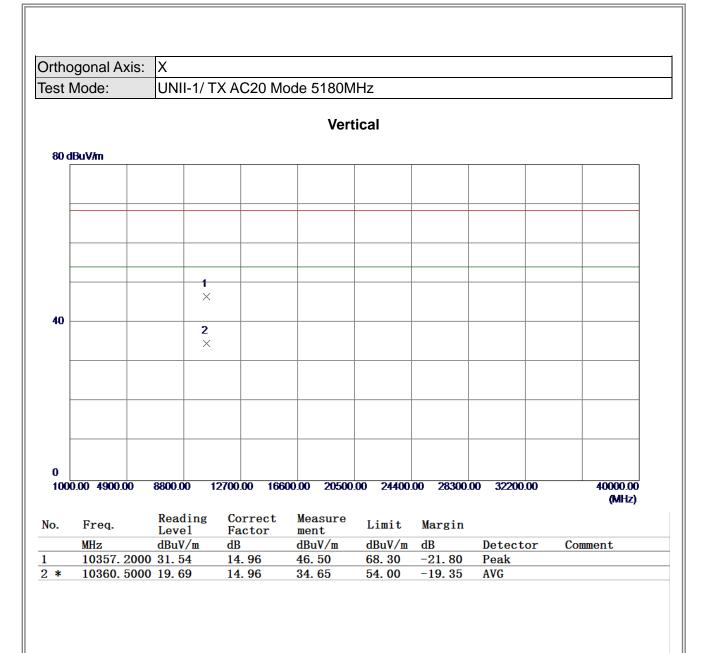






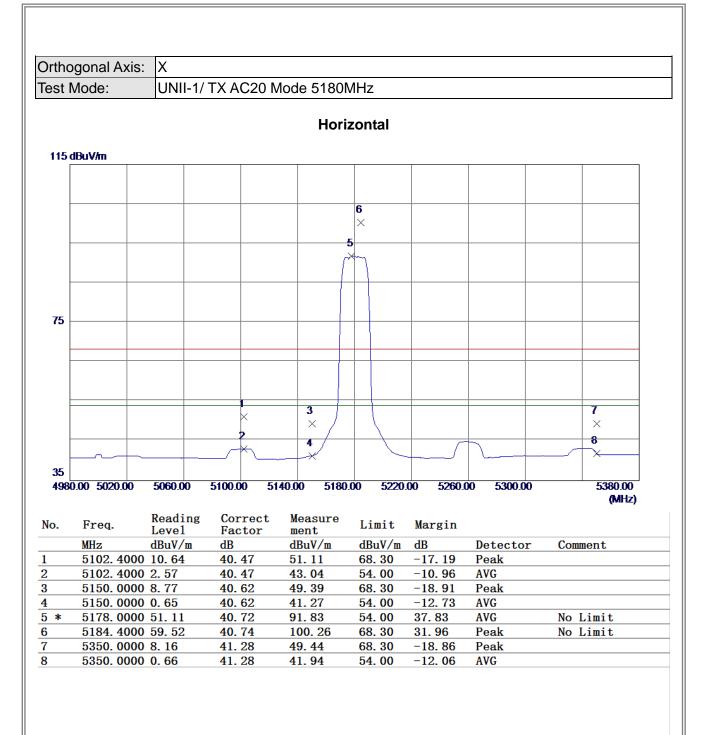






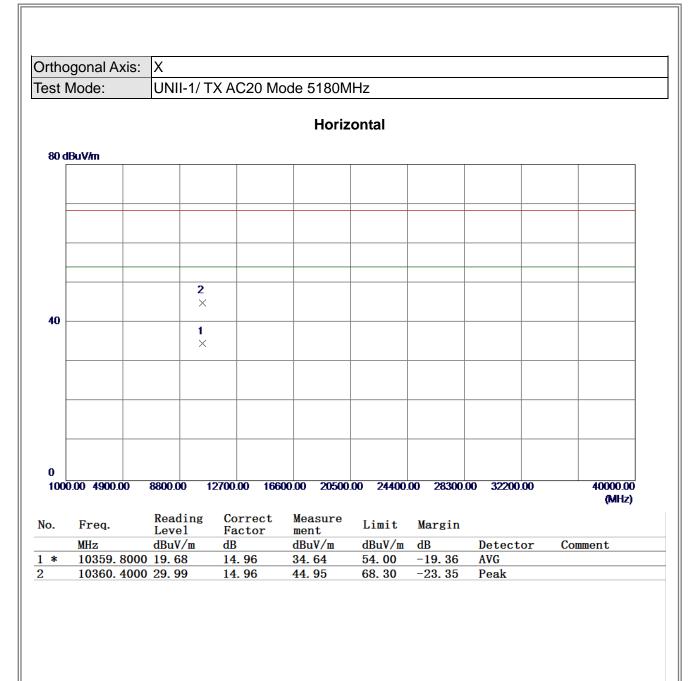






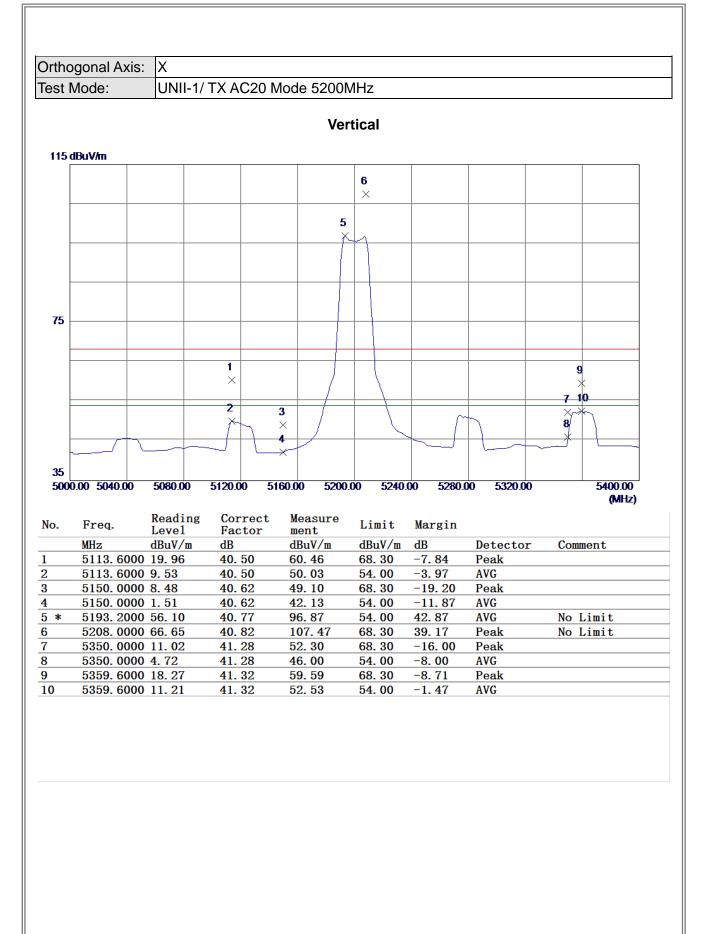






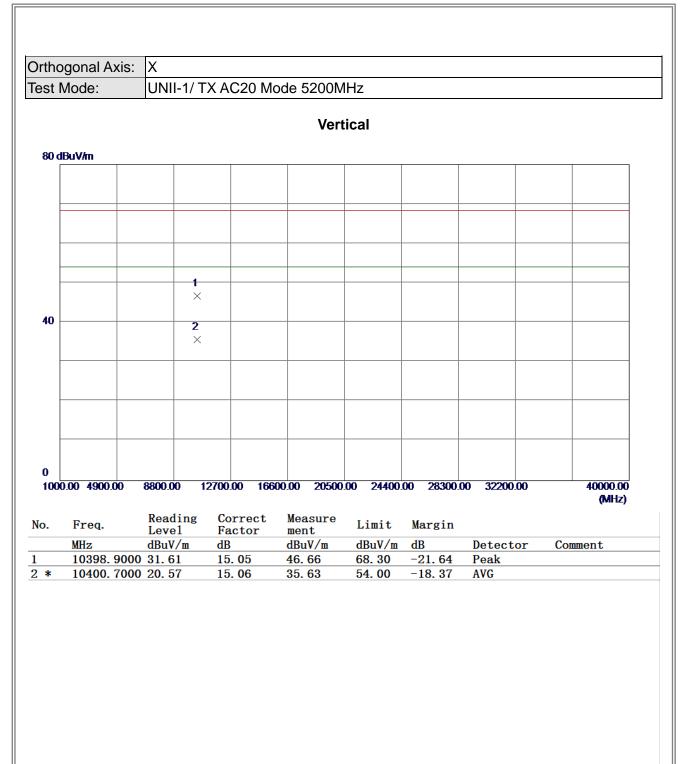






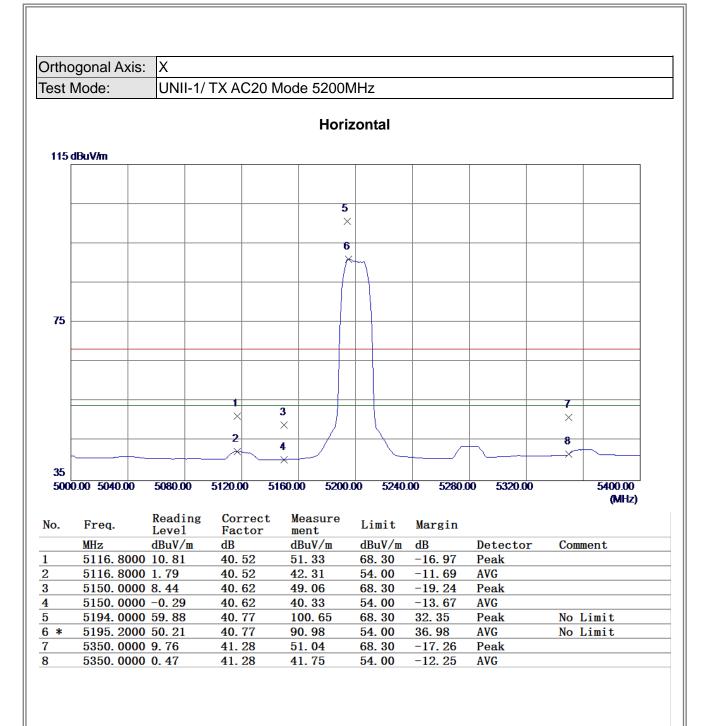






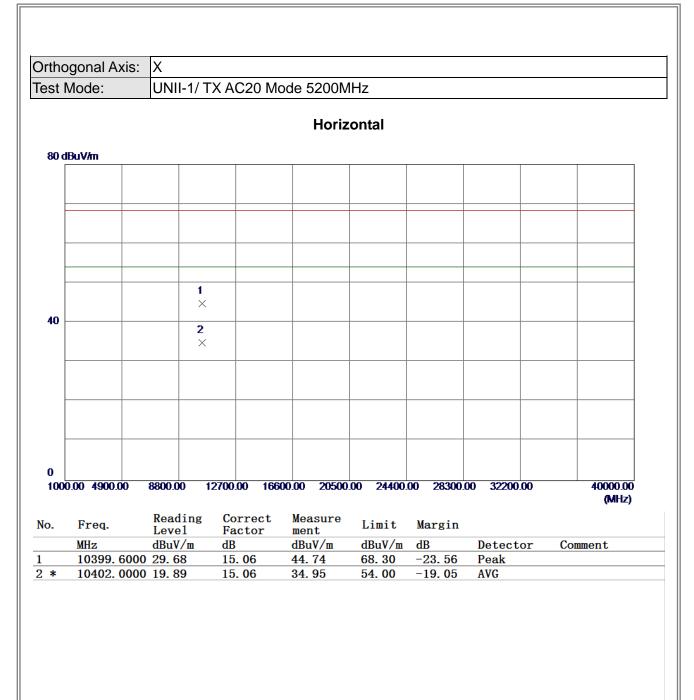






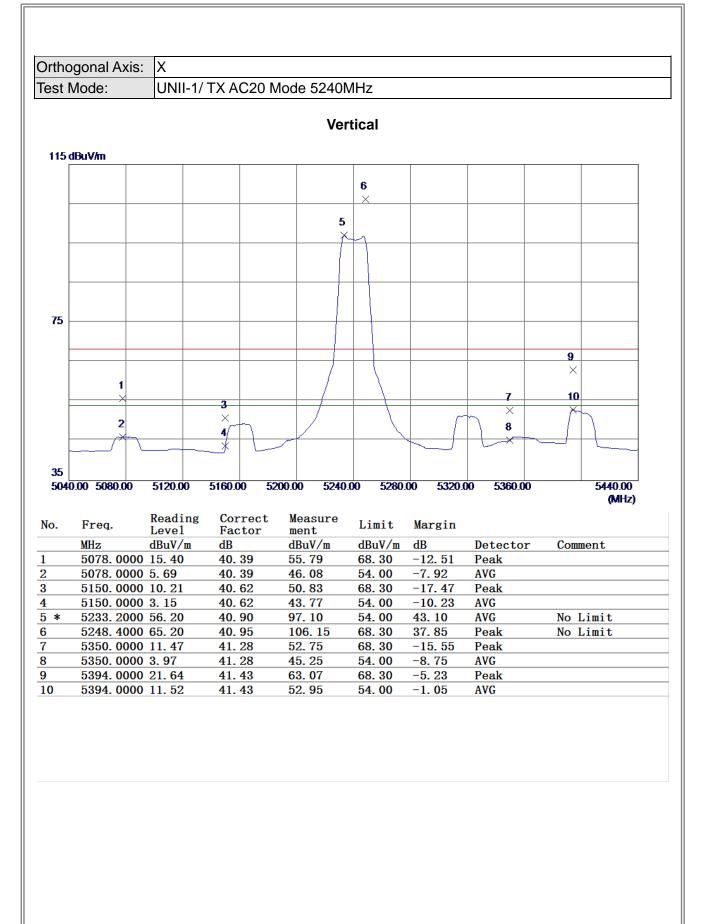






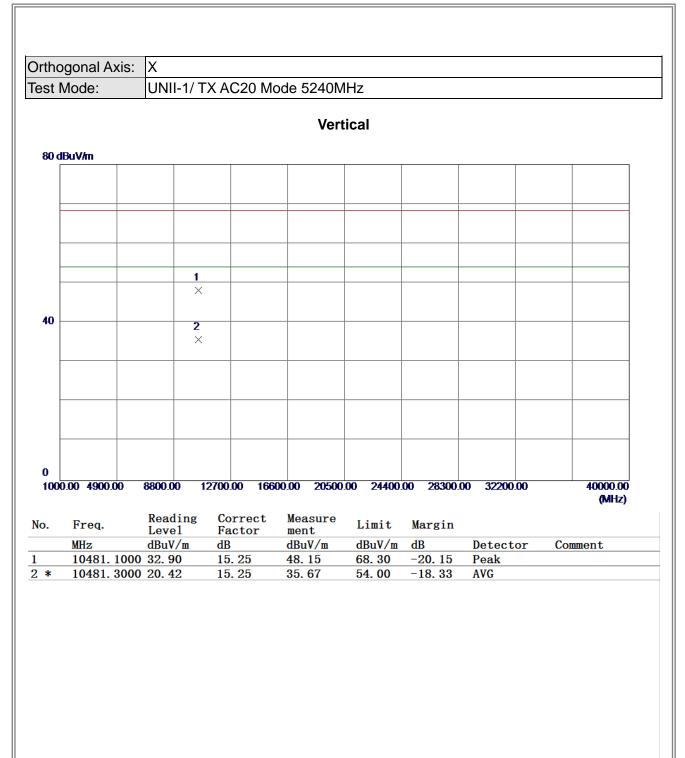






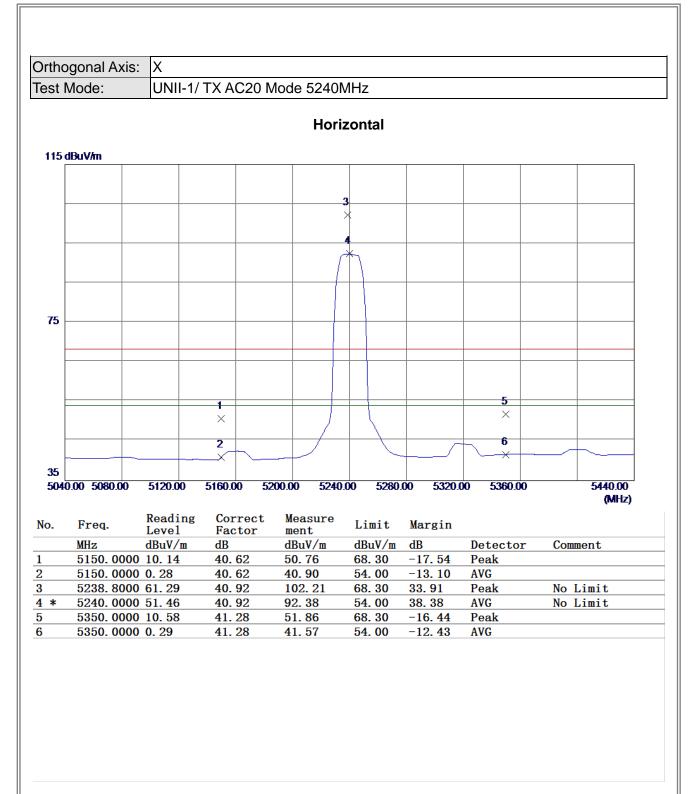






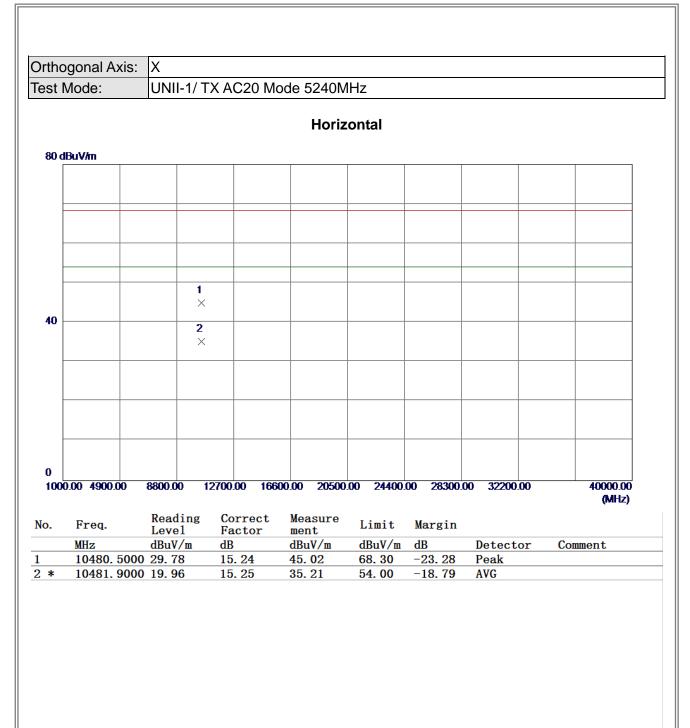






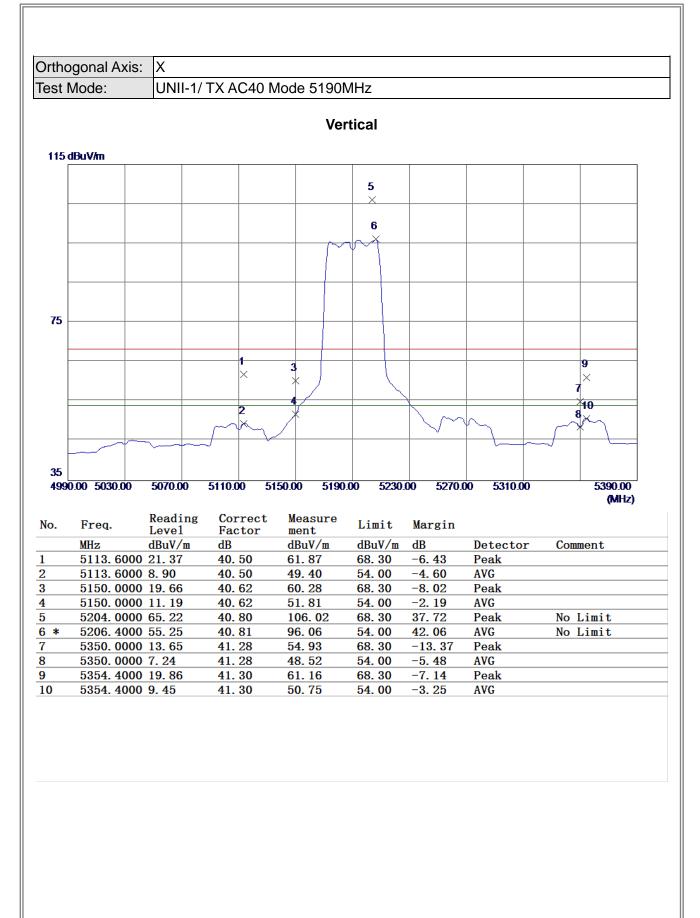






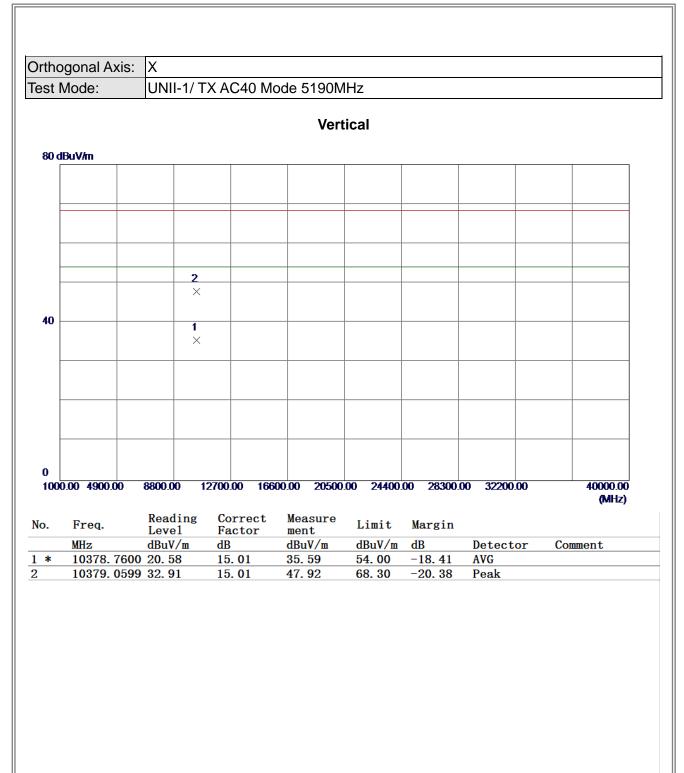






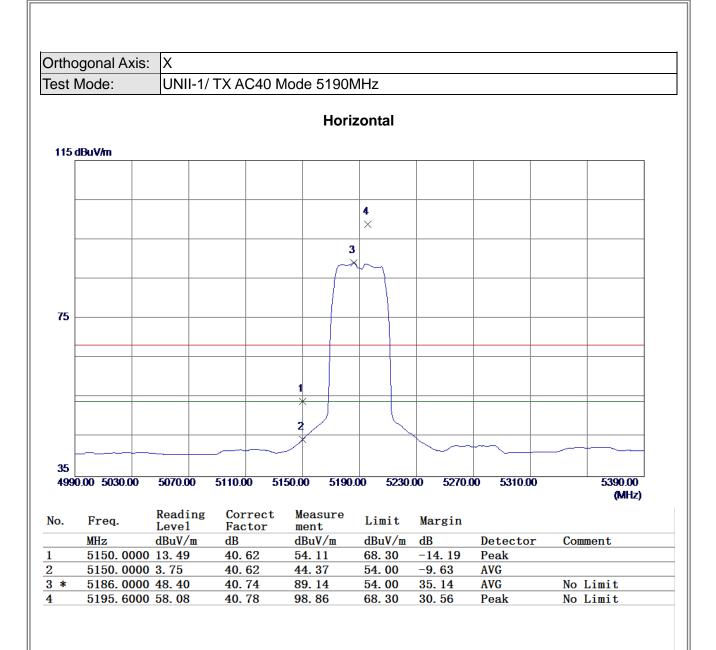






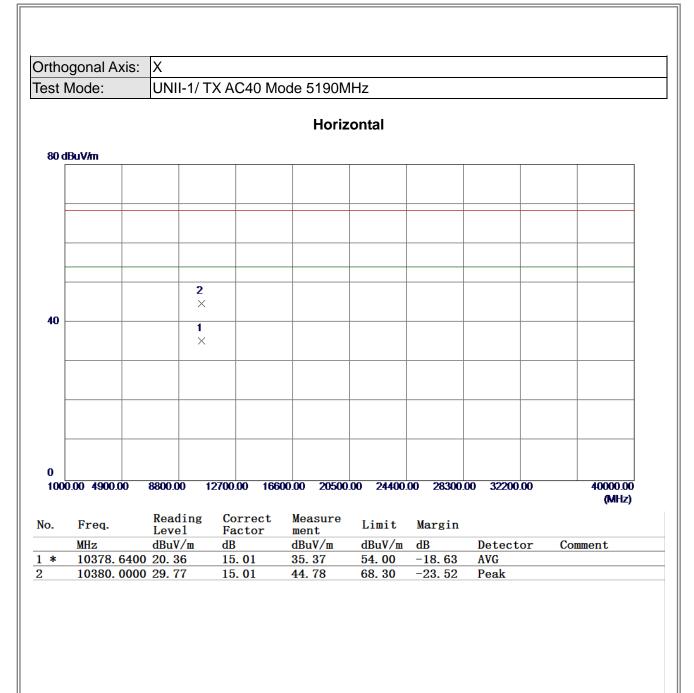






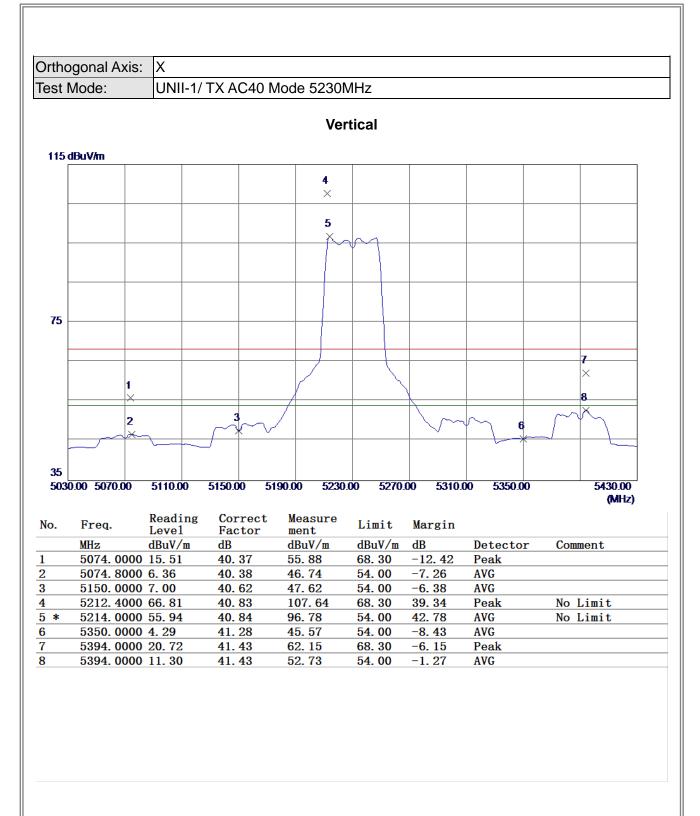






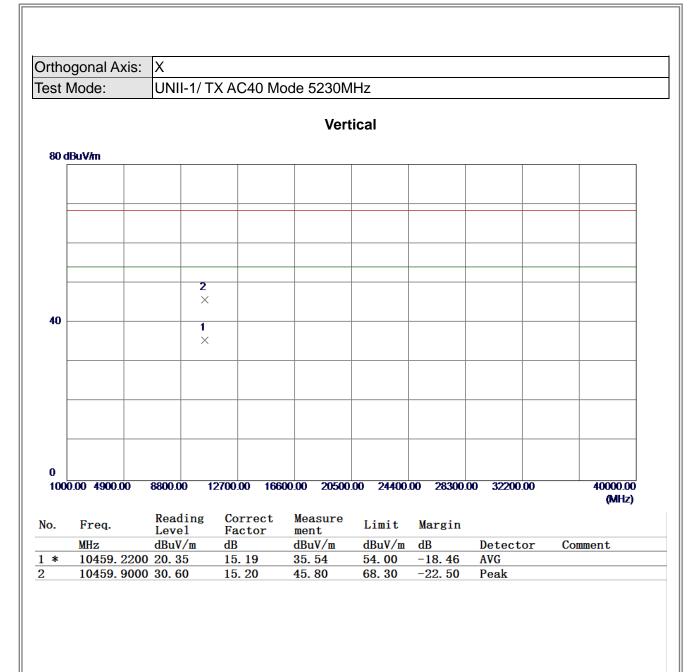






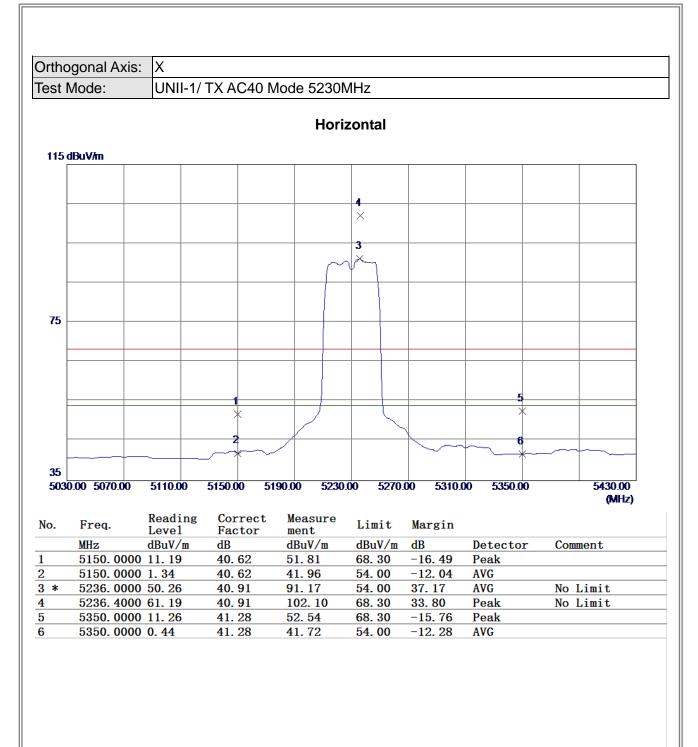






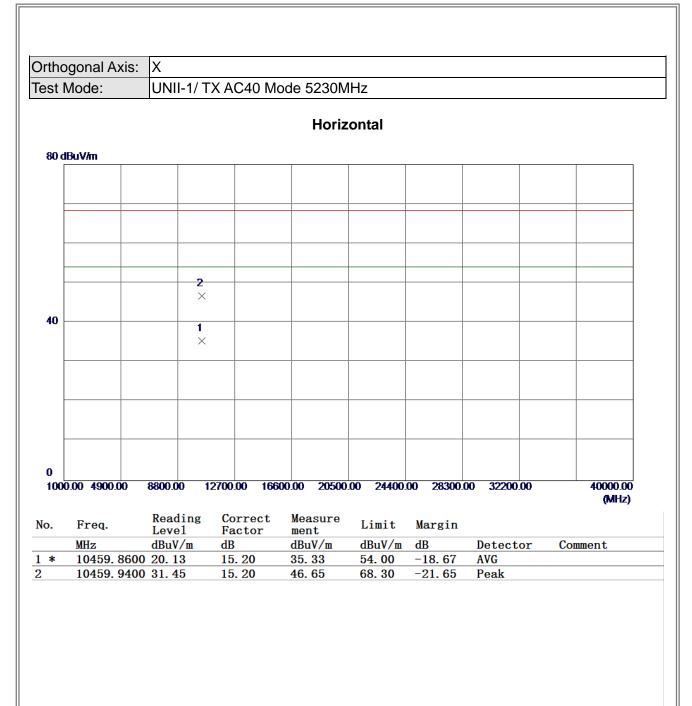






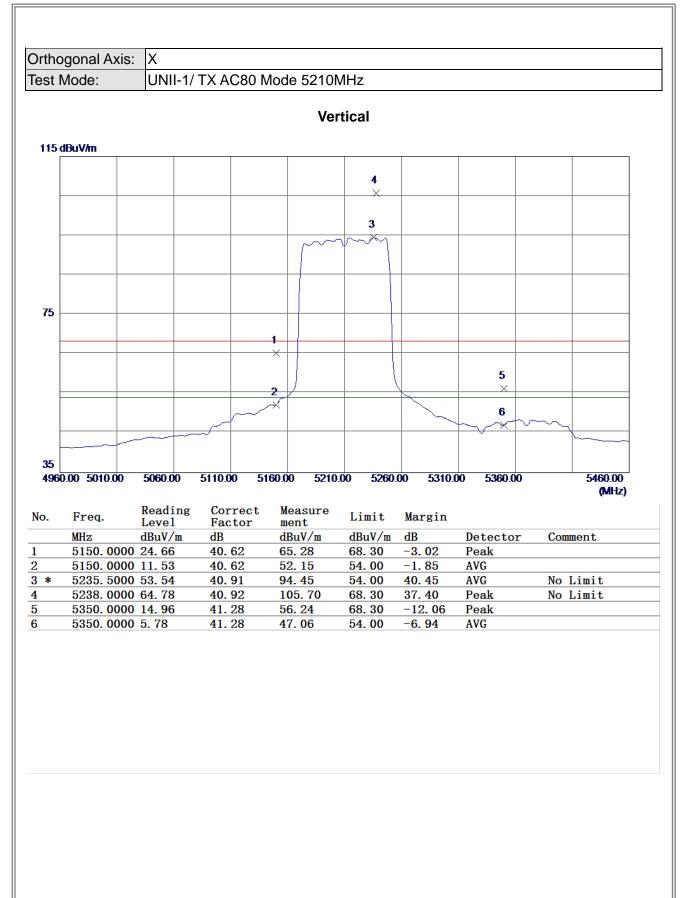






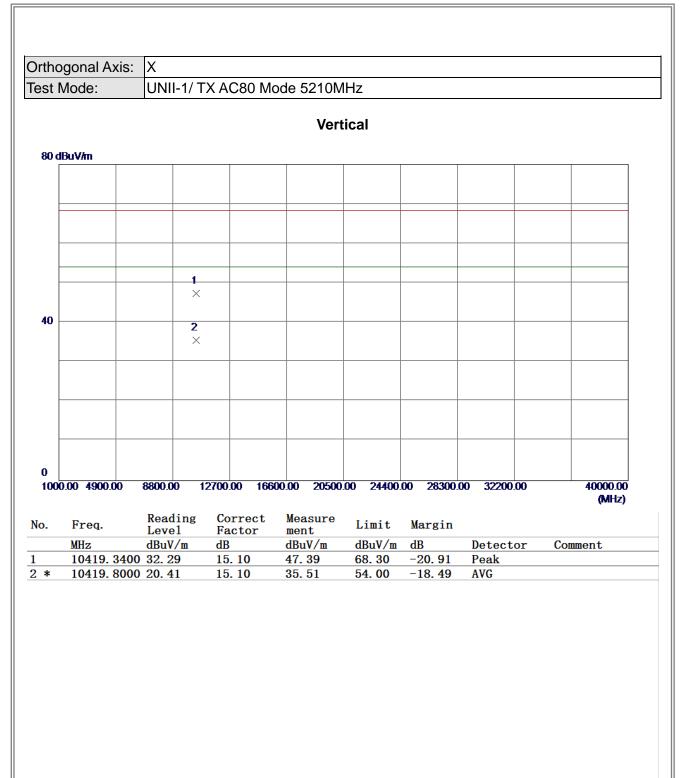






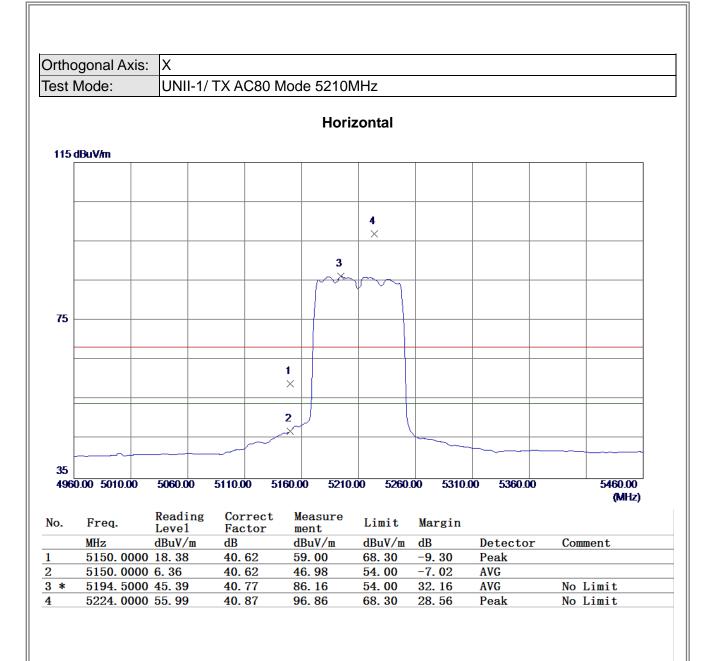






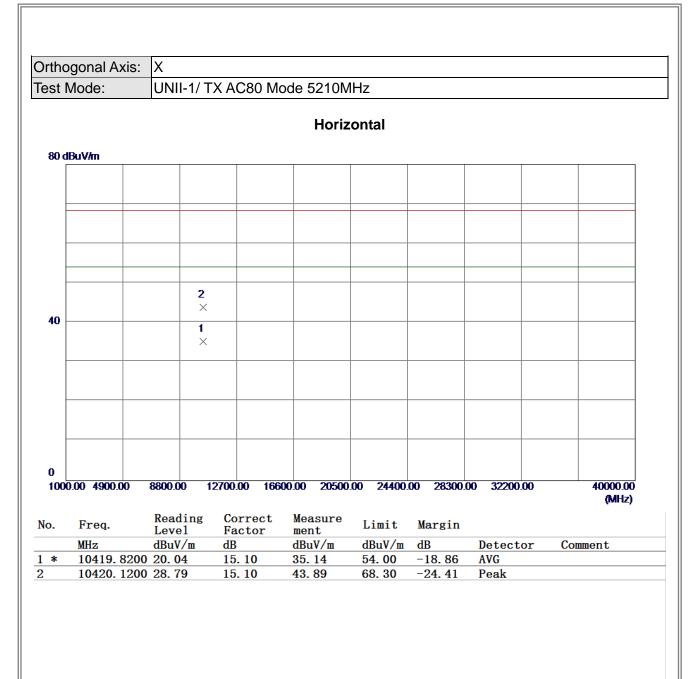






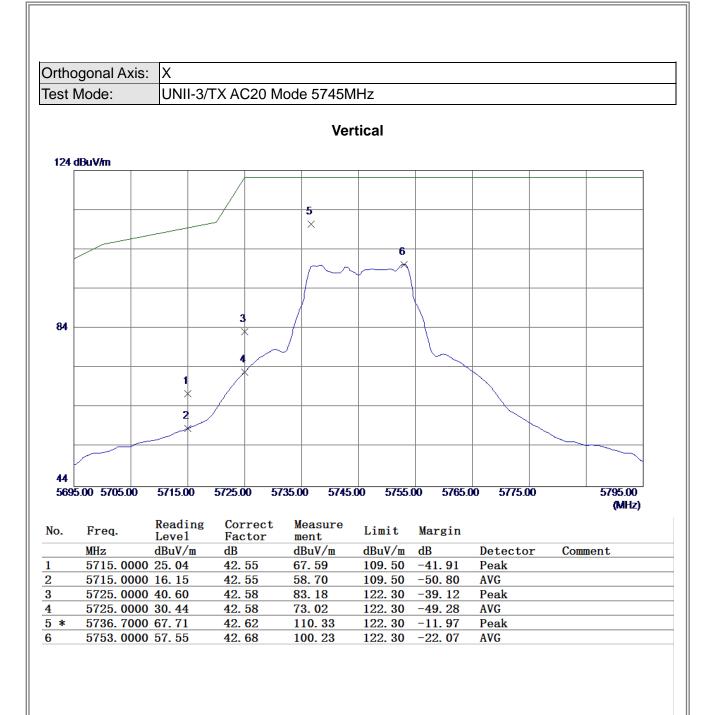






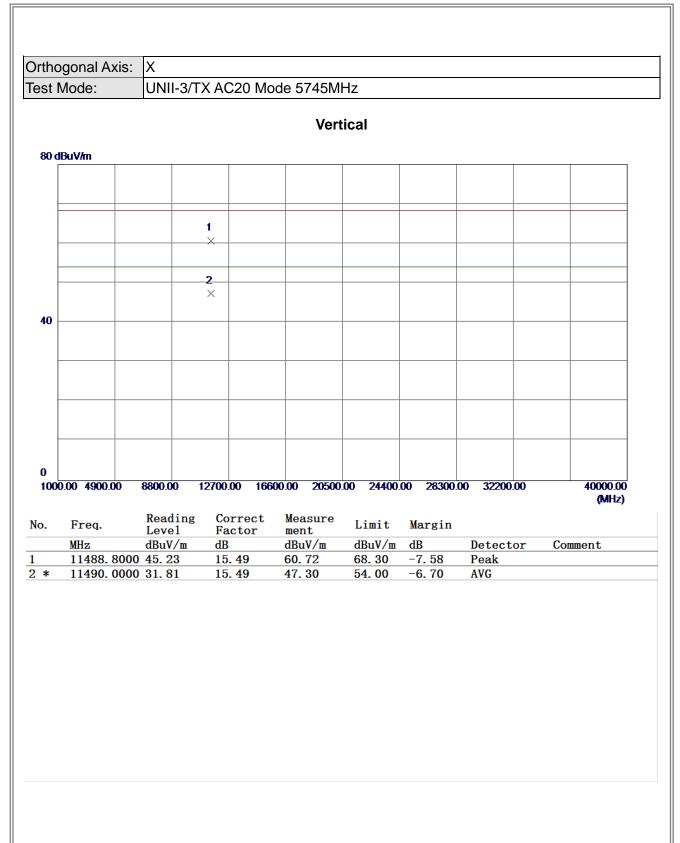






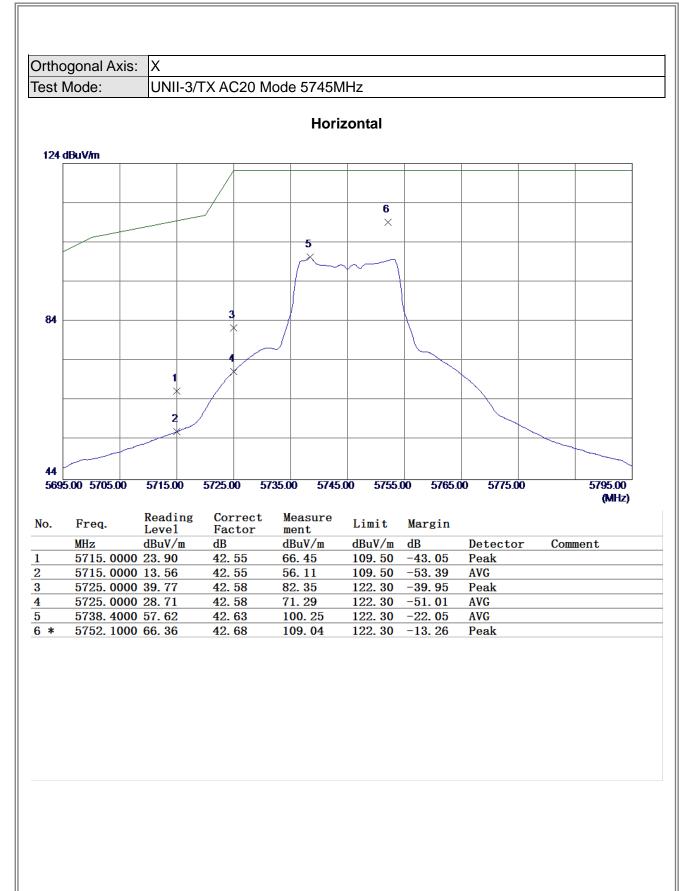






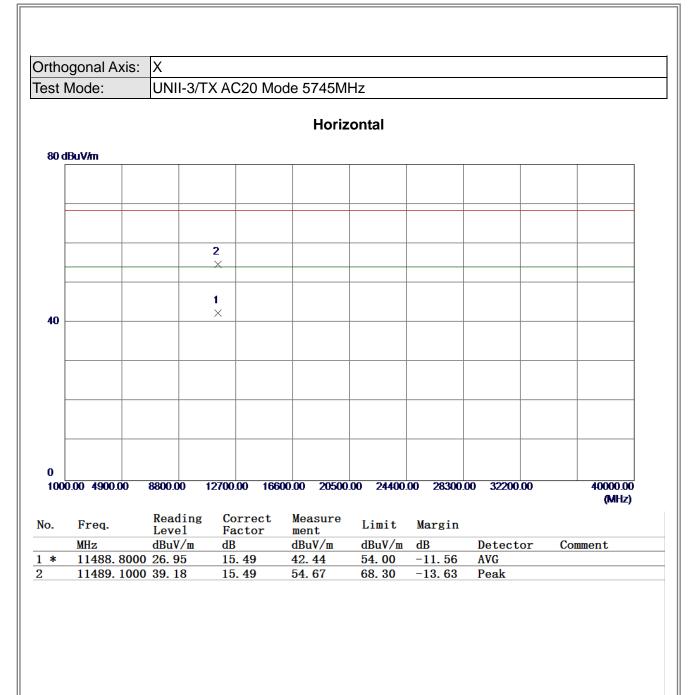






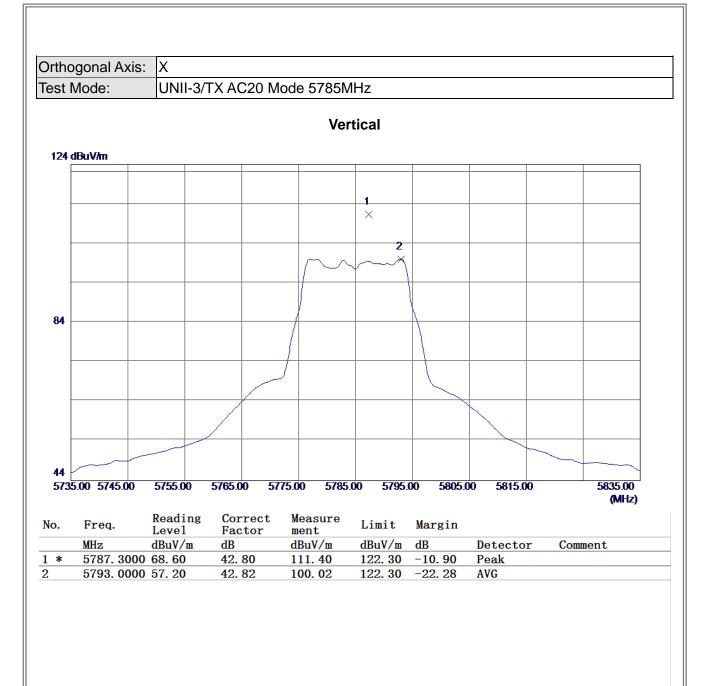






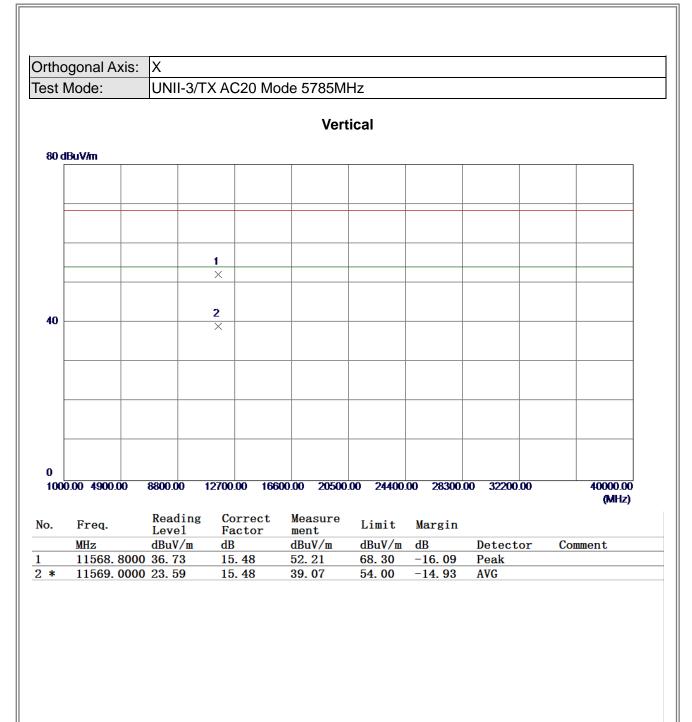






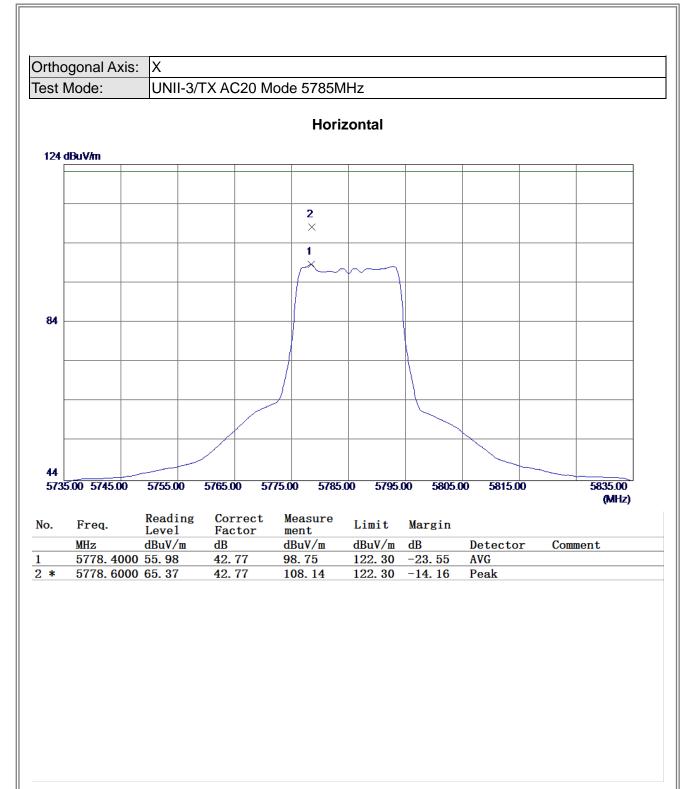






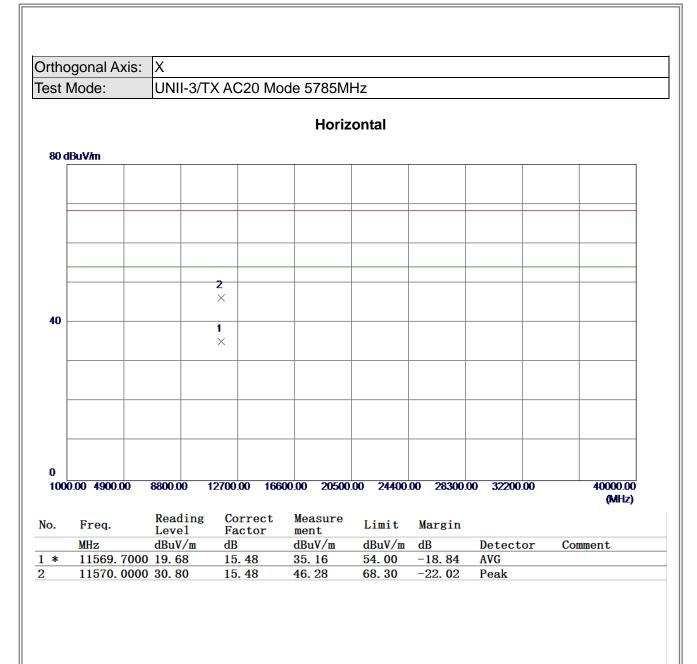






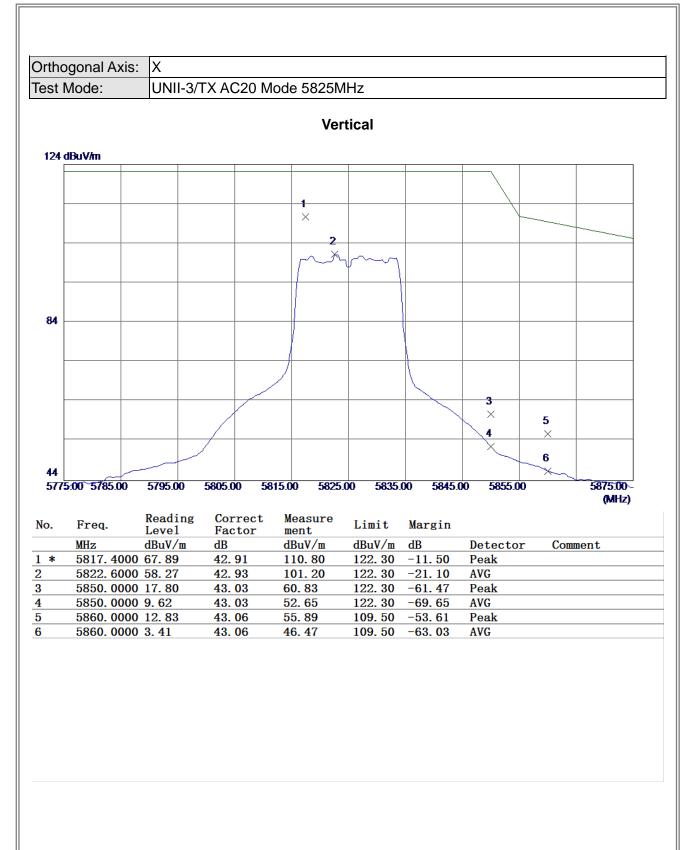






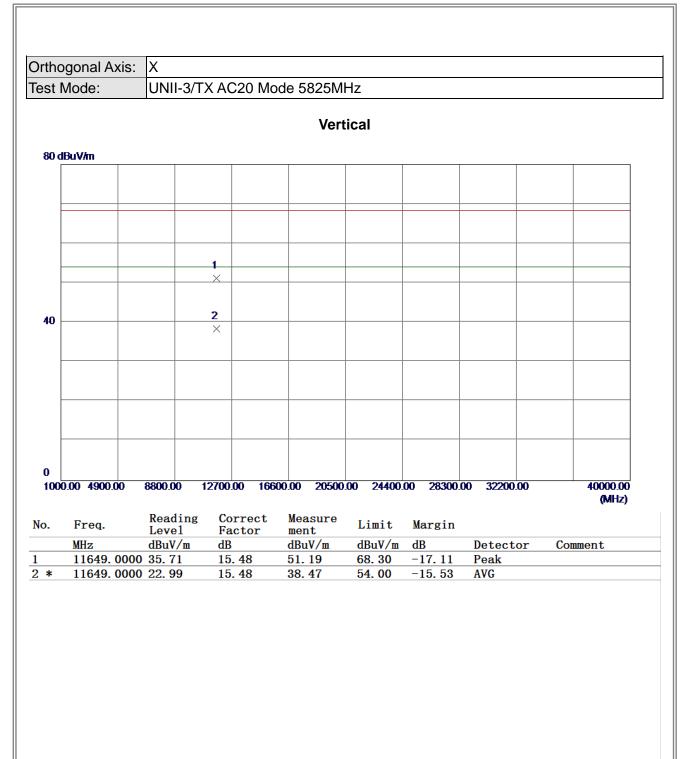






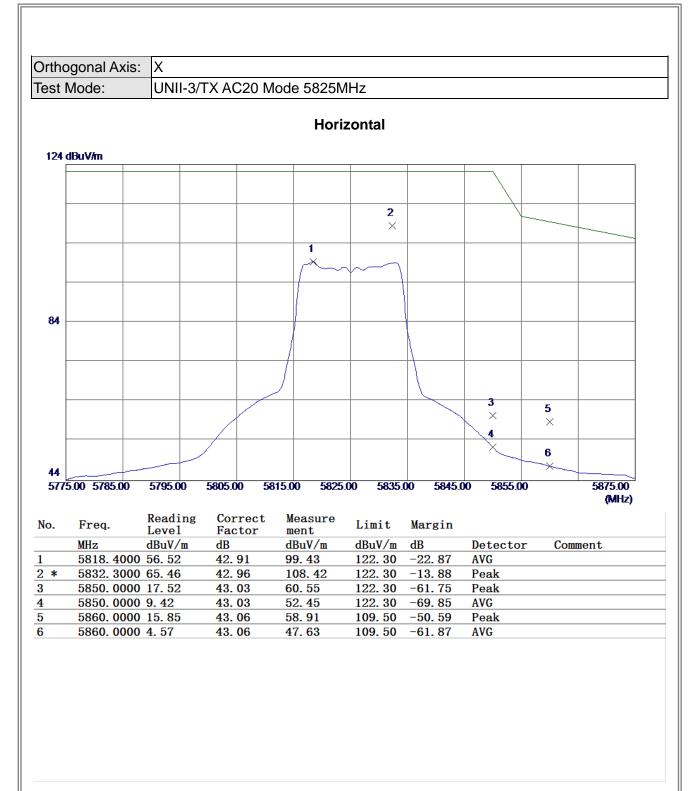






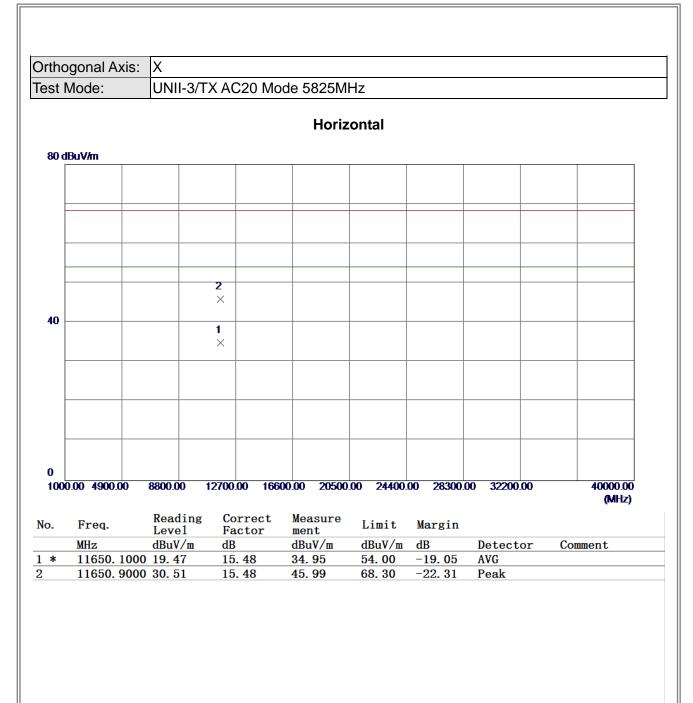






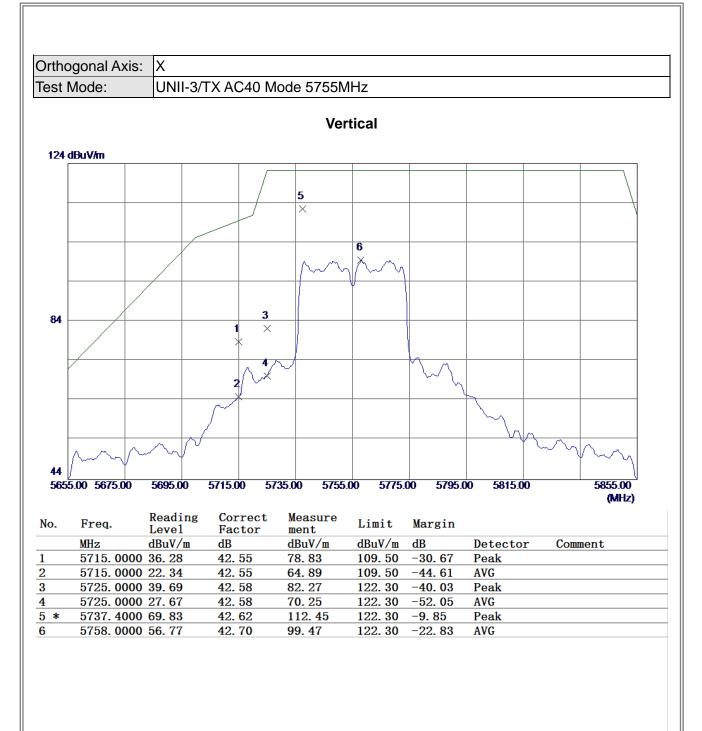






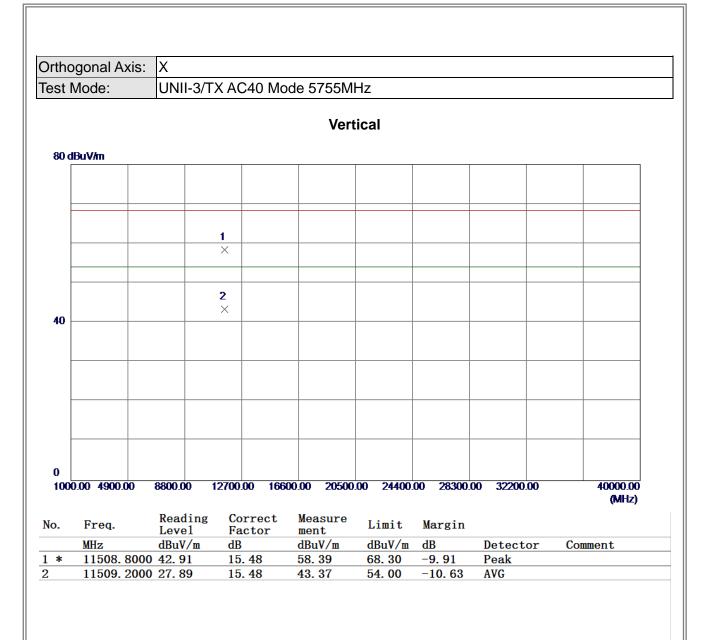






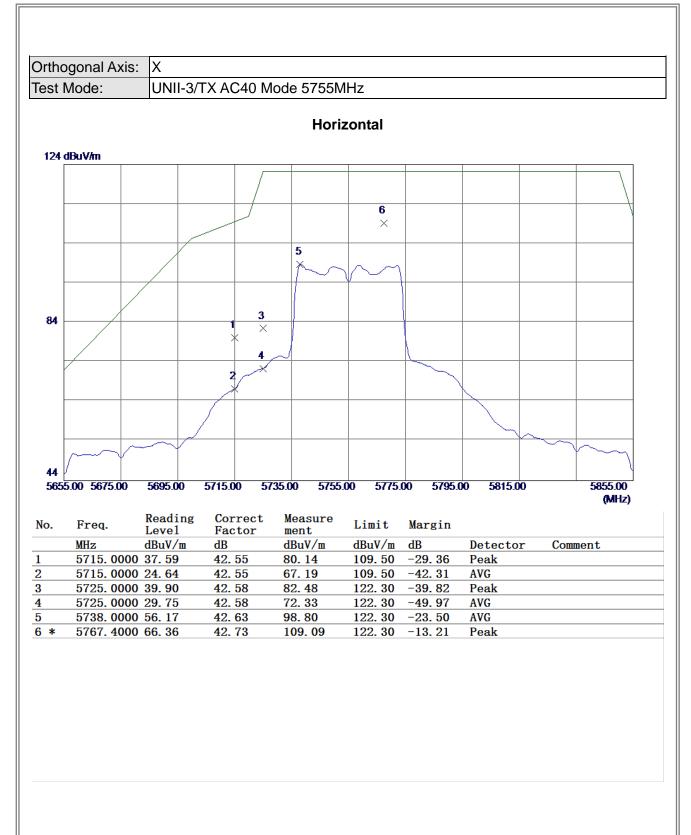






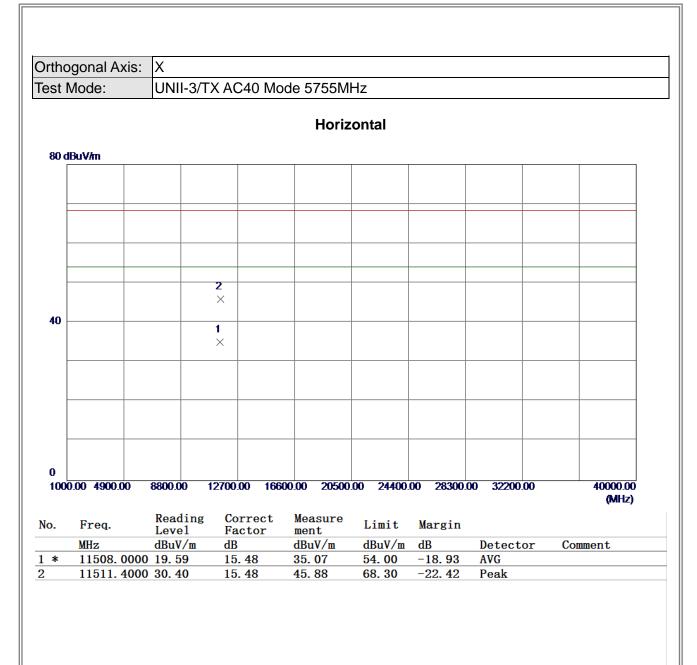






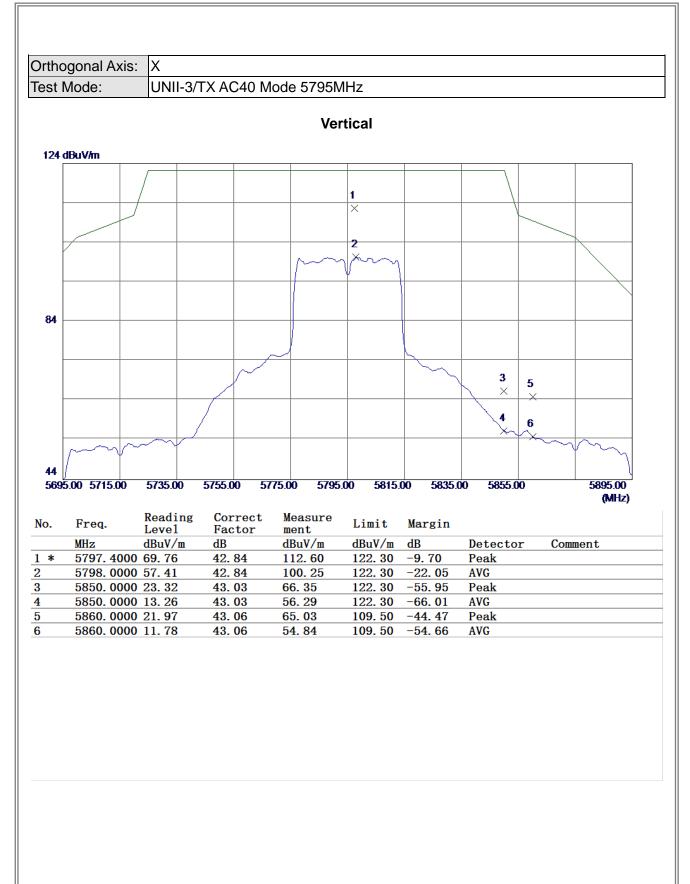






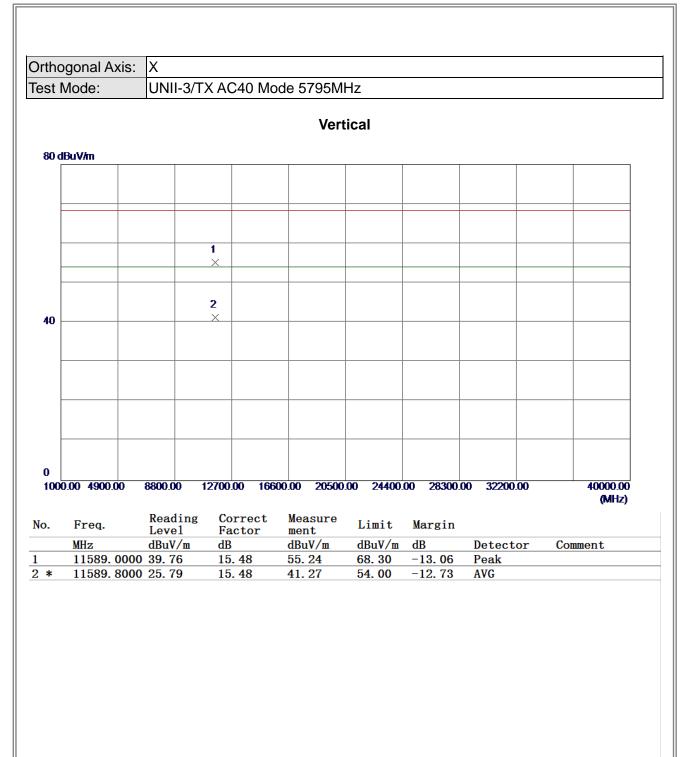






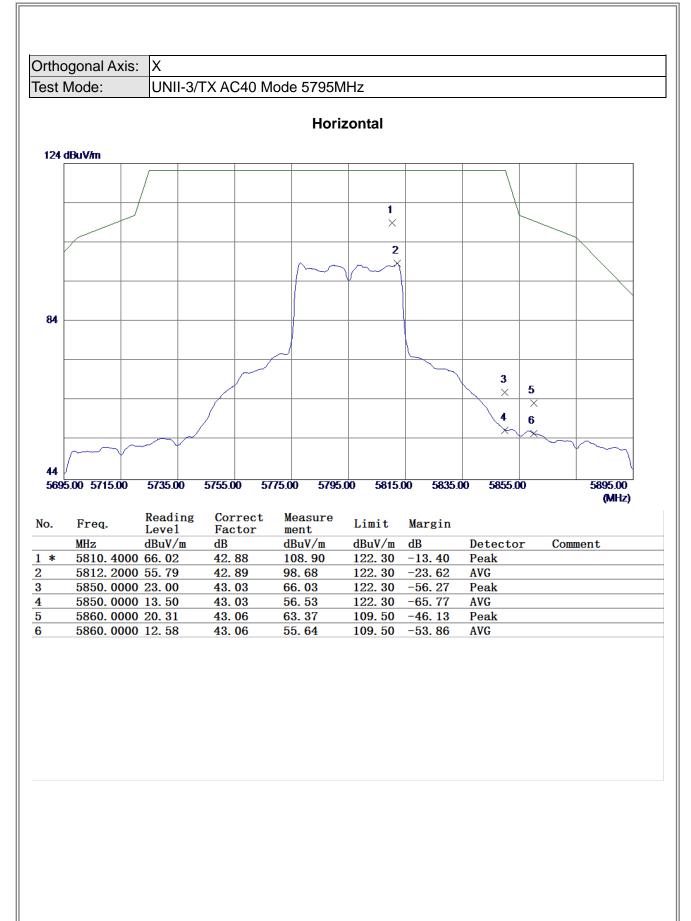






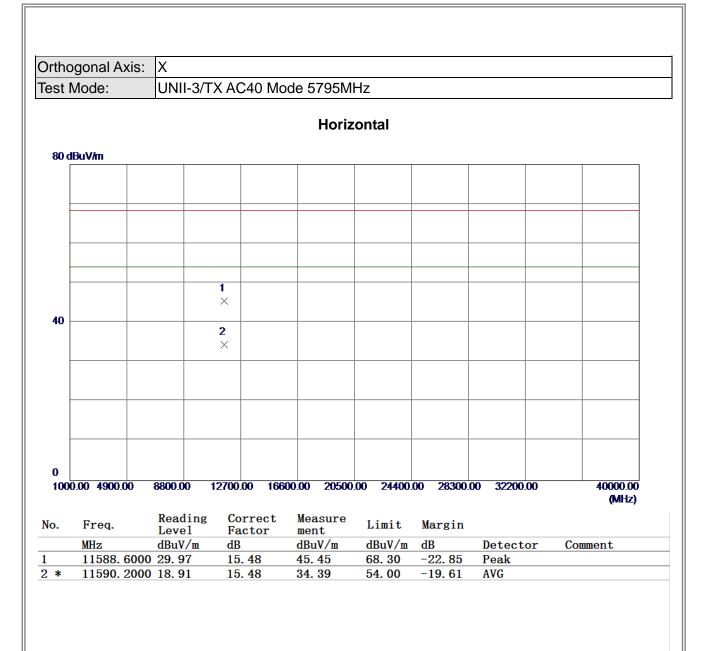






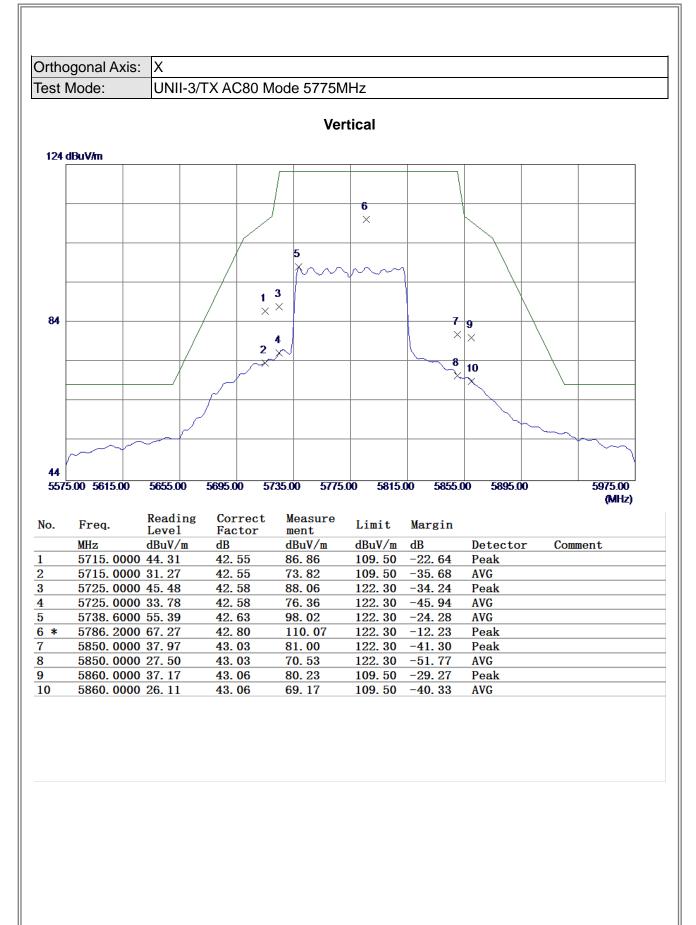






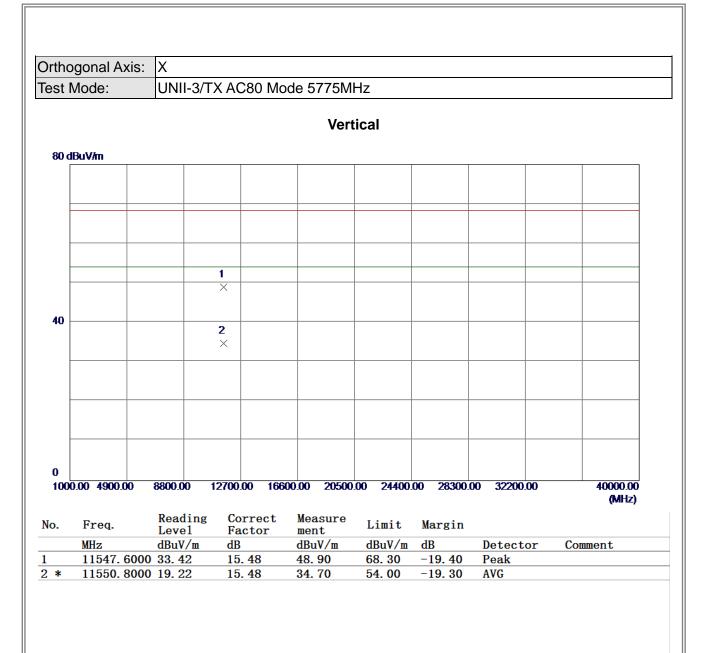






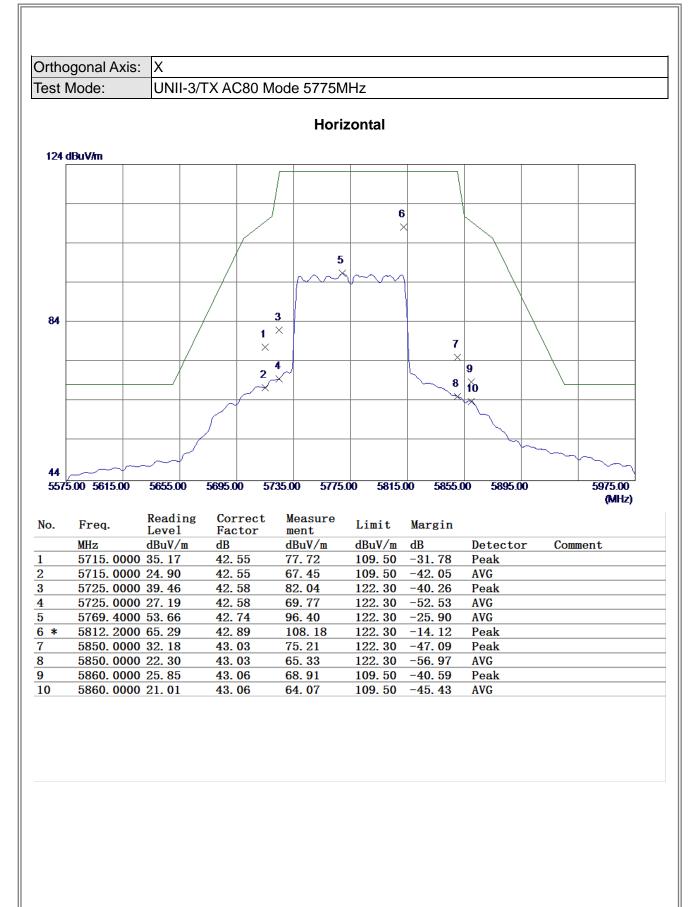






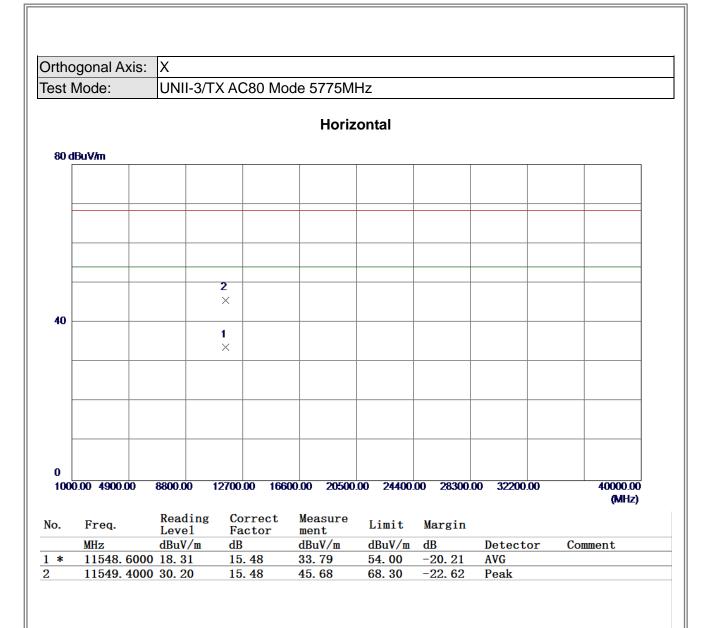




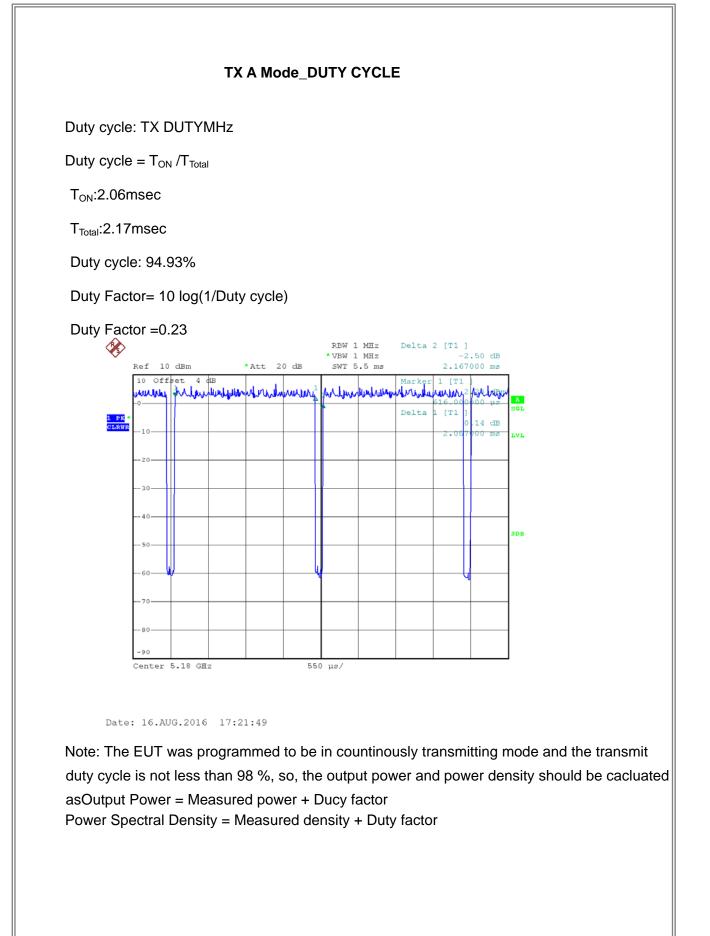




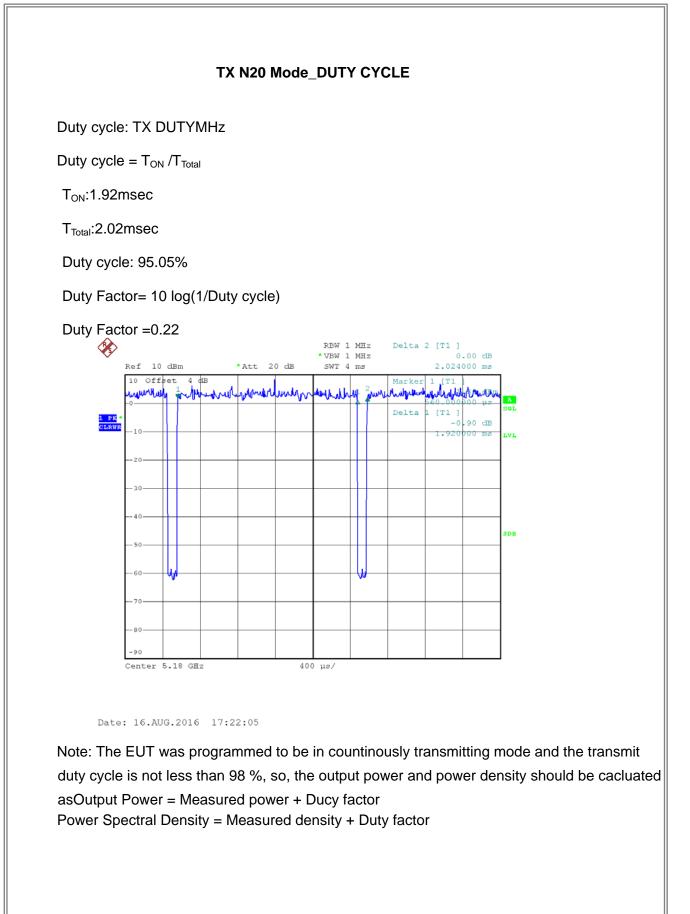




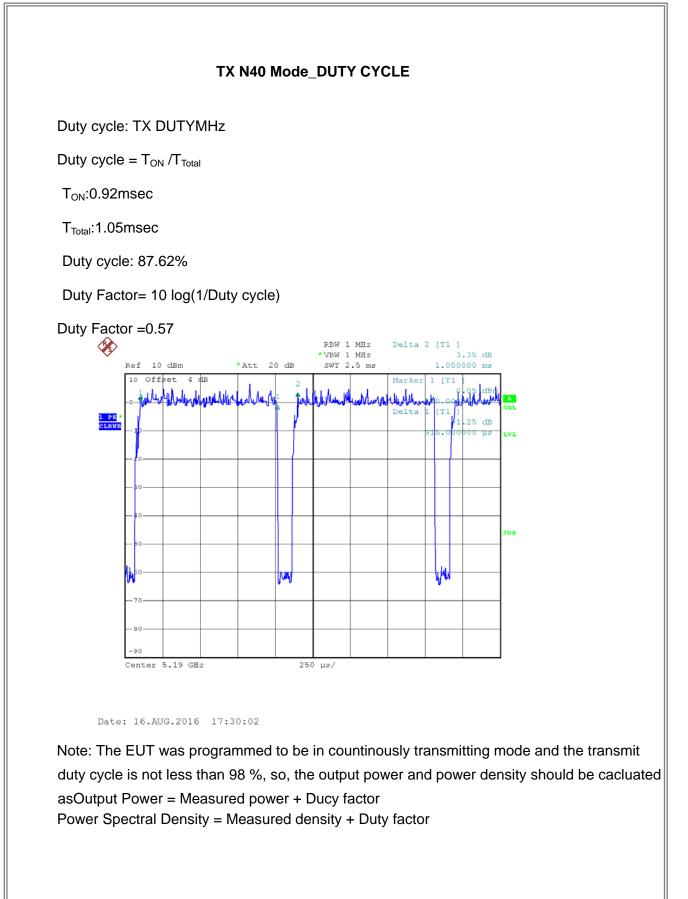




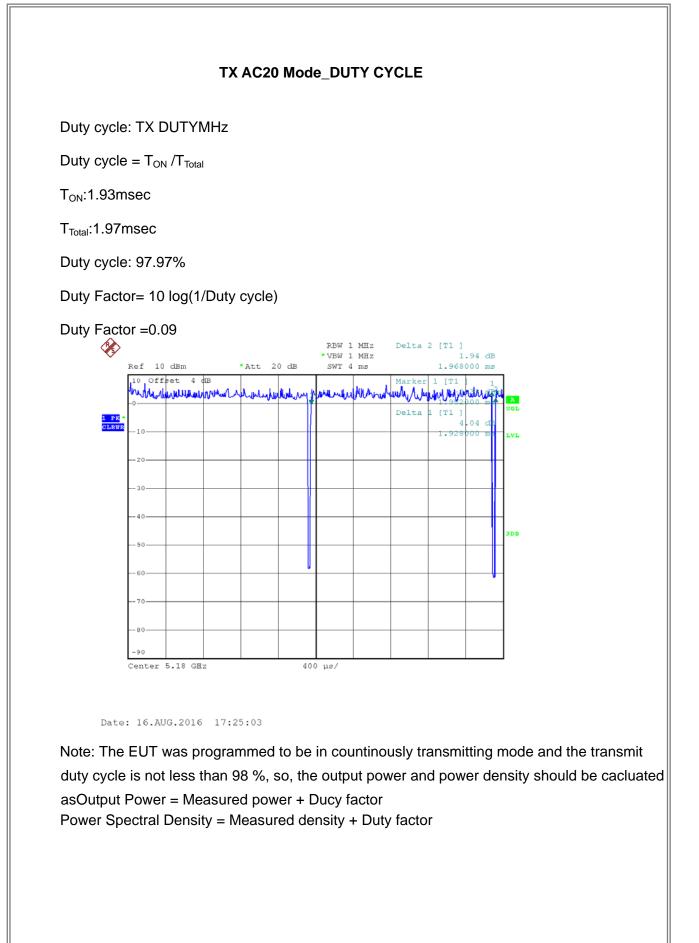




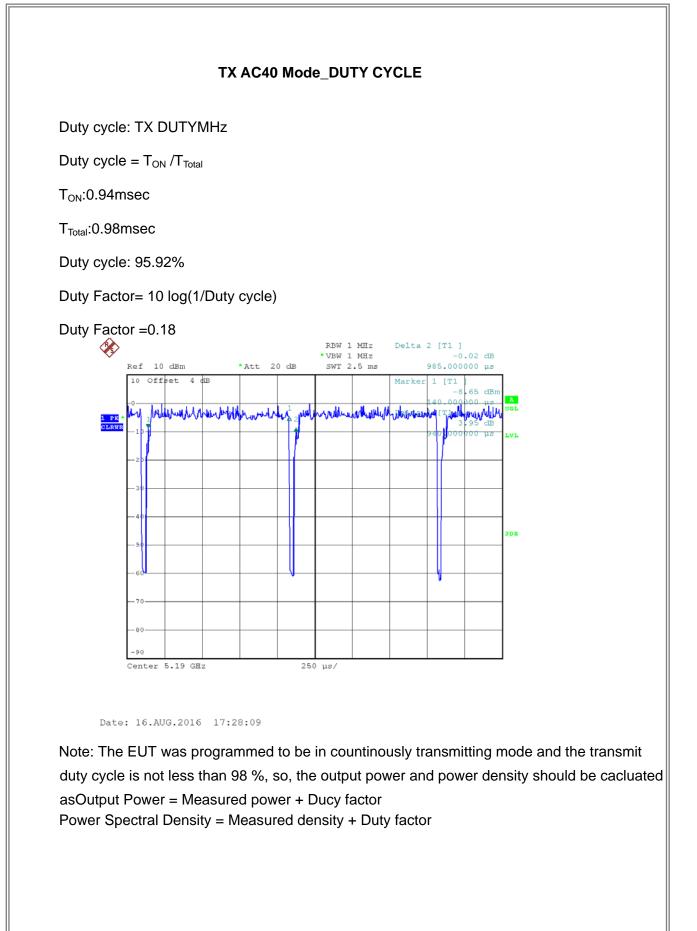




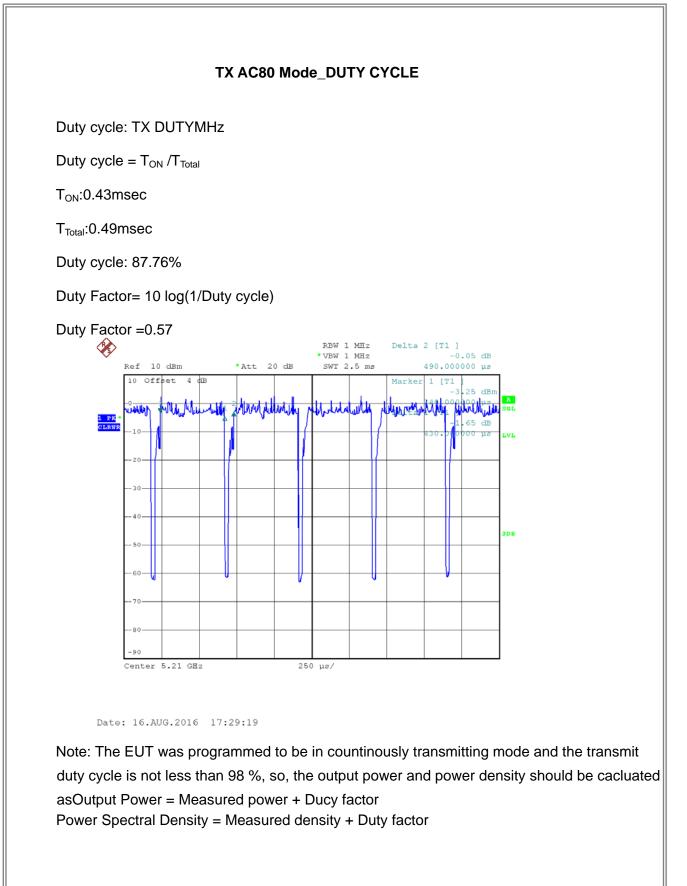












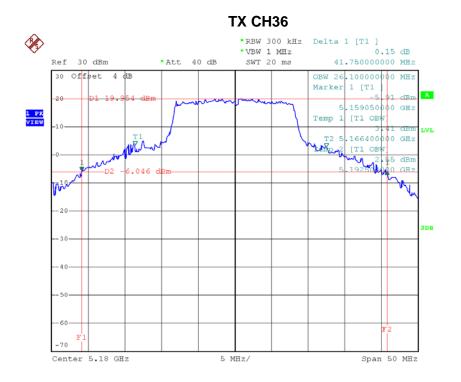


ATTACHMENT E -BANDWIDTH



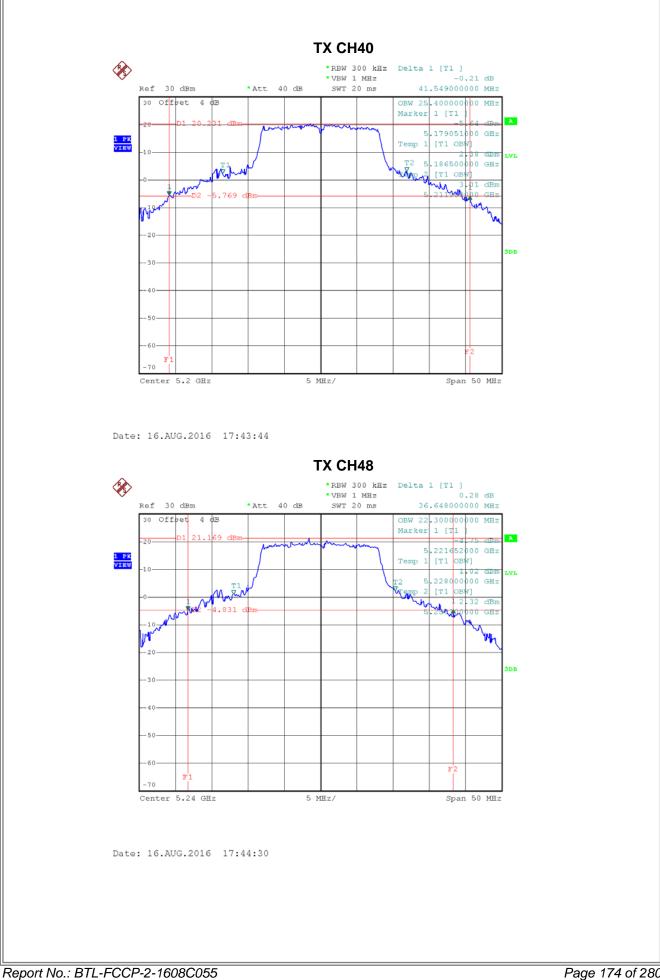
Test Mode: UNII-1/TX A Mode_CH36/CH40/CH48

Channel	Frequency	26dB Bandwidth	99% Occupied Bandwidth
	(MHz)	(MHz)	(MHz)
CH36	5180	41.75	26.10
CH40	5200	41.55	25.40
CH48	5240	36.65	22.30



Date: 16.AUG.2016 17:42:27

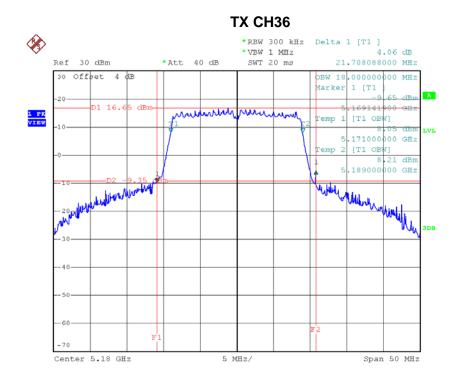






Test Mode: UNII-1/TXN20 Mode_CH36/CH40/CH48

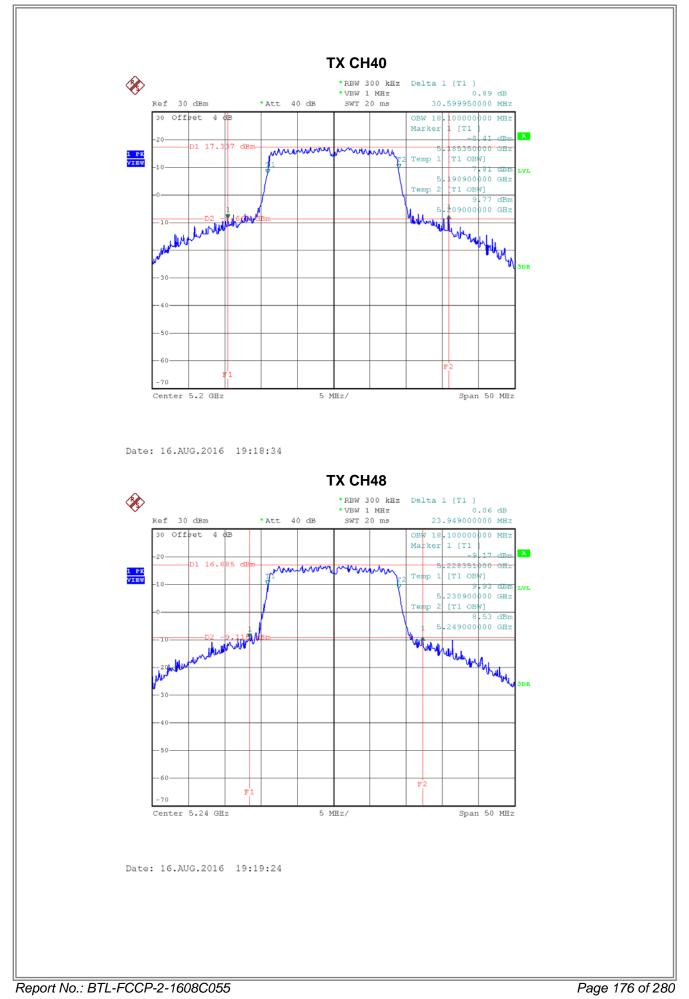
Channel	Frequency	26dB Bandwidth	99% Occupied Bandwidth
	(MHz)	(MHz)	(MHz)
CH36	5180	21.71	18.00
CH40	5200	30.60	18.10
CH48	5240	23.95	18.10



Date: 16.AUG.2016 19:17:39

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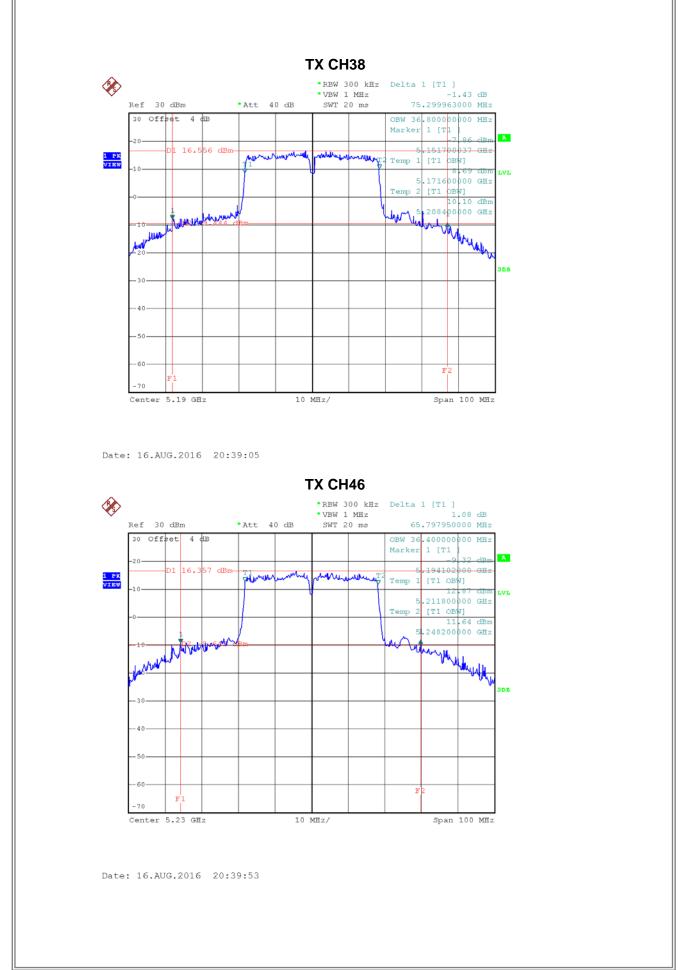




Test Mode: UNII-1/TX N40 Mode_CH38/CH46

Channel	Frequency	26dB Bandwidth	99% Occupied Bandwidth
	(MHz)	(MHz)	(MHz)
CH38	5190	75.30	36.80
CH46	5230	65.80	36.40





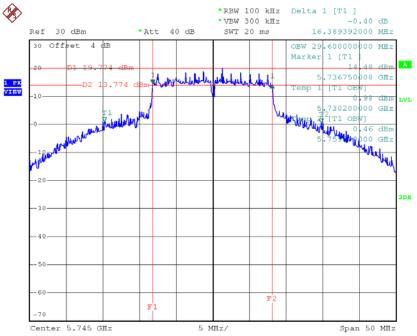




Test Mode: UNII-3/ TX A Mode_CH149/CH157/CH165				
Channel	Frequency	6dB Bandwidth	99% Occupied Bandwidth	Limit
••••••	(MHz)	(MHz)	(MHz)	(kHz)
CH149	5745	16.39	29.60	>=500
CH157	5785	16.45	30.40	>=500
CH165	5825	16.45	31.70	>=500



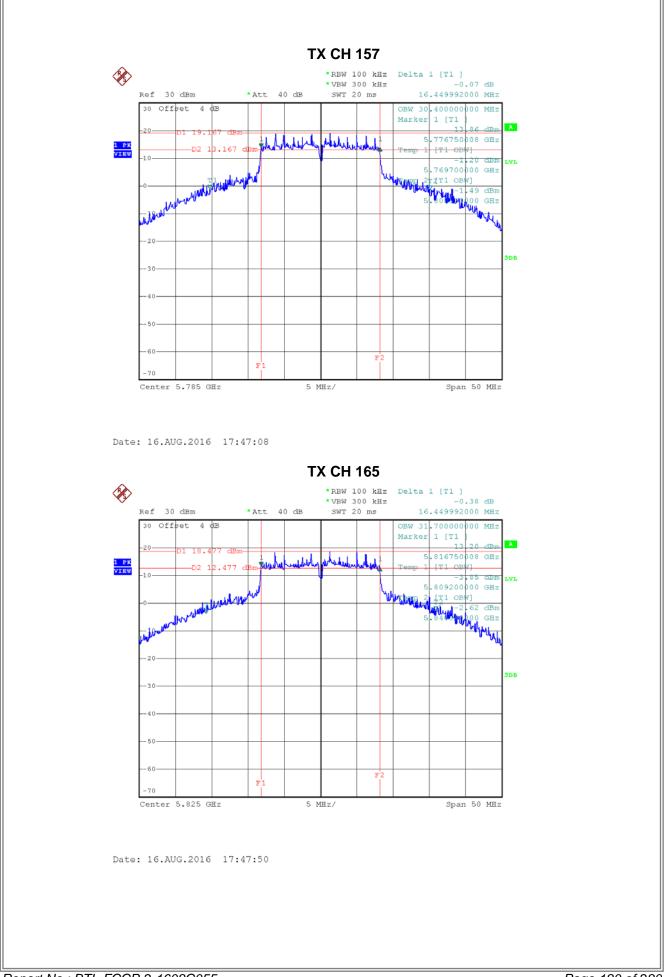




Date: 16.AUG.2016 17:46:22

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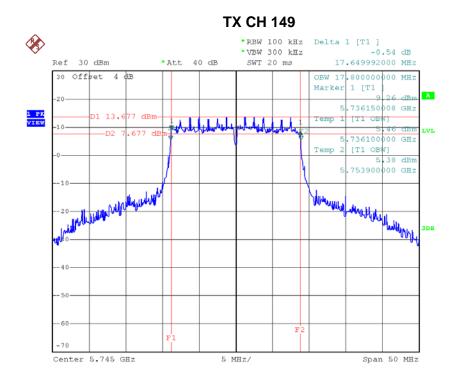






Test Mode: UNII-3/ TX N20 Mode_CH149/CH157/CH165

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (kHz)
CH149	5745	17.65	17.80	>=500
CH157	5785	17.65	17.80	>=500
CH165	5825	17.65	17.80	>=500



Date: 16.AUG.2016 19:20:19