



FCC Radio Test Report
FCC ID: K7SF9K1127V1
This report concerns (check one): ⊠Original Grant ⊡Class I Change ⊡Class II Change
Project No.: 1608251Equipment: WiFi repeaterModel Name: F9K1127Applicant: Belkin International, Inc.Address: 12045 E. Waterfront Drive, Playa Vista, CA 90094 USA
Date of Receipt : Jul. 29, 2016 Date of Test : Jul. 29, 2016 ~ Oct. 11, 2016 Issued Date : Oct. 12, 2016 Tested by : BTL Inc.
Testing Engineer : Rush Kao (Rush Kao)
Technical Manager :
Authorized Signatory :(Andy Chiu)
BTL INC. B1, No. 37, Lane 365, Yang-Guang St., Nei-Hu District, Taipei City 114, Taiwan. TEL: +886-2-2657-3299 FAX: +886-2-2657-3331



Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL**shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

BTL's report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and **BTL-self**, extracts from the test report shall not be reproduced except in full with **BTL**'s authorized written approval.

BTL's laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

Limitation

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.





Table of Contents	Page
1. CERTIFICATION	7
2 . SUMMARY OF TEST RESULTS	8
2.1 TEST FACILITY	9
2.2 MEASUREMENT UNCERTAINTY	9
3 . GENERAL INFORMATION	11
3.1 GENERAL DESCRIPTION OF EUT	11
3.2 DESCRIPTION OF TEST MODES	14
3.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING	17
3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTE	ED 19
3.5 DESCRIPTION OF SUPPORT UNITS	19
4. EMC EMISSION TEST	20
4.1 CONDUCTED EMISSION MEASUREMENT	20
4.1.1 POWER LINE CONDUCTED EMISSION	20
4.1.2 TEST PROCEDURE	20
4.1.3 DEVIATION FROM TEST STANDARD	20
4.1.4 TEST SETUP 4.1.5 EUT OPERATING CONDITIONS	21 21
4.1.6 EUT TEST CONDITIONS	21
4.1.7 TEST RESULTS	21
4.2 RADIATED EMISSION MEASUREMENT	22
4.2.1 RADIATED EMISSION LIMITS	22
4.2.2 TEST PROCEDURE	23
4.2.3 DEVIATION FROM TEST STANDARD	25
4.2.4 TEST SETUP 4.2.5 EUT OPERATING CONDITIONS	25 26
4.2.6 EUT TEST CONDITIONS	26
4.2.7 TEST RESULTS (9KHZ TO 30MHz)	26
4.2.8 TEST RESULTS (30MHZ TO 1000 MHz)	26
4.2.9 TEST RESULTS (1GHZ~10 TH HARMONIC)	26
4.3 BAND EDGE MEASUREMENT	27
4.3.1 RADIATED EMISSION LIMITS	27
4.3.2 TEST PROCEDURE	28
4.3.3 DEVIATION FROM TEST STANDARD 4.3.4 TEST SETUP LAYOUT	28 28
4.3.5 EUT OPERATING CONDITIONS	28 28
4.3.6 EUT TEST CONDITIONS	28
4.3.7 TEST RESULTS (BAND EDGE AND FUNDAMENTAL EMISSIONS)	28
5 . 26dB SPECTRUM BANDWIDTH	29





	1
Table of Contents	Page
5.1 APPLIED PROCEDURES / LIMIT	29
5.1.1 TEST PROCEDURE	29
5.1.2 DEVIATION FROM STANDARD	29
5.1.3 TEST SETUP	29
5.1.4 EUT OPERATION CONDITIONS	29
5.1.5 EUT TEST CONDITIONS	30
5.1.6 TEST RESULTS	30
6 . MAXIMUM CONDUCTED OUTPUT POWER	31
6.1 APPLIED PROCEDURES / LIMIT	31
6.1.1 TEST PROCEDURE	31
6.1.2 DEVIATION FROM STANDARD 6.1.3 TEST SETUP	32
6.1.4 EUT OPERATION CONDITIONS	32 32
6.1.5 EUT TEST CONDITIONS	32
6.1.6 TEST RESULTS	32
7 . POWER SPECTRAL DENSITY TEST	33
7.1 APPLIED PROCEDURES / LIMIT	33
8.1.1 TEST PROCEDURE	33
7.1.1 DEVIATION FROM STANDARD	34
7.1.2 TEST SETUP	34
7.1.3 EUT OPERATION CONDITIONS	34
7.1.4 EUT TEST CONDITIONS 7.1.5 TEST RESULTS	34 34
8 . FREQUENCY STABILITY MEASUREMENT	34
8.1 APPLIED PROCEDURES / LIMIT 8.1.1 TEST PROCEDURE	35 35
8.1.2 DEVIATION FROM STANDARD	35
8.1.3 TEST SETUP	36
8.1.4 EUT OPERATION CONDITIONS	36
8.1.5 EUT TEST CONDITIONS	36
8.1.6 TEST RESULTS	36
9. MEASUREMENT INSTRUMENTS LIST	37
10 . EUT TEST PHOTOS	39
ATTACHMENT A - CONDUCTED EMISSION	43
ATTACHMENT B - RADIATED EMISSION (9KHZ TO 30MHZ)	56
ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)	81
ATTACHMENT D - RADIATED EMISSION (1GHZ~10 TH HARMONIC)	94
ATTACHMENT E - BAND EDGE AND FUNDAMENTAL EMISSIONS	195





Table of Contents	Page
ATTACHMENT F - BANDWIDTH	305
ATTACHMENT G - MAXIMUM OUTPUT POWER	338
ATTACHMENT H - POWER SPECTRAL DENSITY	353
ATTACHMENT I - FREQUENCY STABILITY	420





REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-2-1608251	Original Issue.	Oct. 12, 2016





1. CERTIFICATION

Equipment : Brand Name :	
Model Name :	
Applicant :	Belkin International, Inc.
Manufacturer :	U-MEDIA Communications, Inc.
Address :	No. 90, Kuang Fu Nth.Rd., Hsinchu Industrial Park, Hu Kou, Hsinchu, 303, Taiwan
Date of Test :	Jul. 29, 2016 ~ Oct. 11, 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-2-1608251) 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).

Test results included in this report is only for the 5G WIFI UNII-1 & UNII-3 part.

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part15, Subpart E			
Standard(s) Section	Test Item	Judgment	Under Limit
15.207	AC Power Line Conducted Emissions	PASS	Limit Minimum passing margin is -3.93 dB at 0.5450 MHz
15.407(a)	26dB Spectrum Bandwidth	PASS	-
15.407(a)	Maximum Conducted Output Power	PASS	Limit Maximum output power is 18.73 dBm
15.407(a)	Power Spectral Density	PASS	-
15.407(a)	Radiated Emissions	PASS	Limit Minimum passing margin is -3.00 dB at 10360.00 MHz
15.407(b)	Band Edge Emissions	PASS	Limit Minimum passing margin is -1.55 dB at 5147.90 MHz
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:

Conducted emission Test:

C05: (VCCI RN: C-4742; FCC RN:674415; FCC DN:TW0659) No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

Radiated emission Test (Below 1GHz):

CB15: (FCC RN:674415; FCC DN:TW0659) No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

Radiated emission Test (Above 1GHz):

CB15: (FCC RN:674415; FCC DN:TW0659) No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

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 a standard 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)
C05	CISPR	150 kHz ~ 30MHz	3.06

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U,(dB)
CB15	CISPR	9kHz ~ 150kHz	2.96
(3m)	CISPR	150kHz ~ 30MHz	2.74

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)
		30MHz ~ 200MHz	V	4.76
CB15	CISPR	30MHz ~ 200MHz	Н	4.28
(3m)	CIOPK	200MHz ~ 1,000MHz	V	5.08
		200MHz ~ 1,000MHz	Н	4.50

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)
		1GHz ~ 6GHz	V	4.48
CB15	CISPR	1GHz ~ 6GHz	Н	4.50
(3m)	CIOPK	6GHz ~ 18GHz	V	4.30
		6GHz ~ 18GHz	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.





Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our U_{lab} values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR} , as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz - 1000 MHz : 5.2 dB

It can be seen that our U_{lab} values are smaller than U_{CISPR} .



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	WiFi repeater		
Brand Name	BelKin		
Model Name	F9K1127		
Mode Different	N/A		
Draduat Description	Operation Frequency	UNII-1: 5150-5250MHz UNII-3: 5725-5850MHz	
Product Description	Modulation Type	OFDM	
	Bit Rate of Transmitter	433.3Mbps	
Power Source	AC Mains Power Board: #1 Brand / Model: HON-KWANG / HK-XX12-A12 #2 Brand / Model: AMIGO / AMS174-1201000F #3 Brand / Model: UMEC / UP0121B-12		
Power Rating	I/P: 100-240V~50/60Hz 500mA	0/P: 12V1A	
	Output Power (Max.)for UNII-1 Non-Beamforming	802.11a: 18.57dBm 802.11n (20M): 18.61dBm 802.11n (40M): 18.45dBm 802.11ac (20M): 18.58dBm 802.11ac (40M): 18.38dBm 802.11ac (80M): 16.55dBm	
Output Power	Output Power (Max.)for UNII-3 Non-Beamforming	802.11a: 18.34dBm 802.11n (20M): 18.31dBm 802.11n (40M): 18.24dBm 802.11ac (20M): 18.26dBm 802.11ac (40M): 18.18dBm 802.11ac (80M): 18.37dBm	
	Output Power (Max.)for UNII-1 Beamforming	802.11n (20M): 18.42dBm 802.11n (40M): 18.21dBm 802.11ac (80M): 18.73dBm	
	Output Power (Max.)for UNII-3 Beamforming	802.11n (20M): 18.03dBm 802.11n (40M): 18.01dBm 802.11ac (80M): 18.23dBm	

Note:

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

3TL

2. Channel List:

UN	UNII-1		UNII-1		UNII-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		UNII-3		UNII-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. Table for Filed Antenna:

۰.						
	Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)
	1	Airgain	N2430LTMSSDR 4M	PCB	N/A	2.6
	2	Airgain	N2430LTMSSDR 4M	РСВ	N/A	2.6

Note:

- 1) The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and receivers (2T2R).
- 2) For EUT Non-Beamforming function with CDD mode: then, the **output power:**
 - * 802.11a : Directional Gain = Gain = 2.6 dBi < 6dBi
 - * 802.11n_HT20 \ 802.11ac_VHT20 : Directional Gain = Gain = 2.6 dBi < 6dBi
 - * 802.11n_HT40 \ 802.11ac_VHT40 : Directional Gain = Gain = 2.6 dBi < 6dBi
 - * 802.11ac_VHT80 : Directional Gain = Gain = 2.6 dBi < 6dBi
- For EUT Non-Beamforming function with CDD mode: then, the power density:
 802.11a: Directional Gain = 10*log{[10^(G1/20)+10^(G2/20)+...+10^(Gn/20)]^2/NANT} = 5.61 dBi < 6dBi
 802.11n_HT20 \ 802.11ac_VHT20 : Directional Gain =

10*log{[10^(G1/20)+10^(G2/20)+...+10^(Gn/20)]^2/NANT} = 5.61 dBi < 6dBi

- * 802.11n_HT40 > 802.11ac_VHT40 : Directional Gain =
- $10^{\log}[10^{(G1/20)+10^{(G2/20)+...+10^{(Gn/20)}^2/NANT}] = 5.61 \text{ dBi} < 6 \text{dBi}$
- * 802.11ac_VHT80 : Directional Gain =

```
10*log\{[10^{(G1/20)+10^{(G2/20)+...+10^{(Gn/20)}]^2}/NANT\} = 5.61 \text{ dBi} < 6\text{dBi}
```

3TL



- 4) For EUT with Beamforming function, then, the output power:
 * 802.11n_HT20 : Directional Gain =
 10*log{[10^(G1/20)+10^(G2/20)+...+10^(Gn/20)]^2/NANT} = 5.61 dBi < 6dBi
 * 802.11n_HT40 : Directional Gain =
 10*log{[10^(G1/20)+10^(G2/20)+...+10^(Gn/20)]^2/NANT} = 5.61 dBi < 6dBi
 * 802.11ac_VHT80 : Directional Gain =
 10*log{[10^(G1/20)+10^(G2/20)+...+10^(Gn/20)]^2/NANT} = 5.61 dBi < 6dBi
- 5) For EUT with Beamforming function, then, the **power density**: * 802.11n_HT20 : Directional Gain = 10*log{[10^(G1/20)+10^(G2/20)+...+10^(Gn/20)]^2/NANT} = 5.61 dBi < 6dBi * 802.11n_HT40 : Directional Gain = 10*log{[10^(G1/20)+10^(G2/20)+...+10^(Gn/20)]^2/NANT} = 5.61 dBi < 6dBi * 802.11ac_VHT80 : Directional Gain = 10*log{[10^(G1/20)+10^(G2/20)+...+10^(Gn/20)]^2/NANT} = 5.61 dBi < 6dBi</p>

4.

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

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 AC Power Line Conducted Emissions Test		
Final Test Mode Description		
Mode 13 TX Mode		

For 26dB Spectrum Bandwidth 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)	





For Maximum Conducted Output Power 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)	

For Power Spectral Density 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)	





For Radiated Emissions 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)	

For Band Edge Emissions 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)	

For Frequency Stability Test		
Final Test Mode Description		
Mode 1	TX A Mode / CH36 (UNII-1)	
Mode 7 TX A Mode / CH149 (UNII-3)		

Note:

(1) For radiated below 1G 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	j	
Test Software Version		ART	
Frequency (MHz)	5180	5200	5240
A Mode	16,14	16,14	16,14
N20 Mode	17,15	17,15	17,15
Frequency (MHz)	5190	5230	
N40 Mode	12,11	16,15	
	UNII-3		
Fest Software Version		ART	
Frequency (MHz)	5745	5785	5825
A Mode	17,15	17,15	17,15
N20 Mode	18,16	18,16	18,16
Frequency (MHz)	5755	5795	
N40 Mode	16,15	16,15	
est Software Version	UNII-1	ART	
	5400		5040
Frequency (MHz)	5180	5200	5240
AC20 Mode	17,15	17,15	17,15
Frequency (MHz)	5190	5230	
AC40 Mode	12,11	16,15	
Frequency (MHz)	5210		
AC80 Mode	0F,0E		
	UNII-3		
Test Software Version		ART	
Frequency (MHz)	5745	5785	5825
AC20 Mode	18,16	18,16	18,16
Frequency (MHz)	5755	5795	
AC40 Mode	16,15	16,15	
Frequency (MHz)	5775		
AC80 Mode	17,16		

Non-Beamforming

Report No.: BTL-FCCP-2-1608251





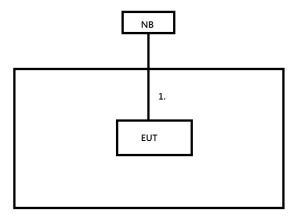
	UNII-1		
	UNII-1		
Test Software Version			
Frequency (MHz)	5180	5200	5240
N20 Mode	17,15	17,15	17,15
Frequency (MHz)	5190	5230	
N40 Mode	12,11	16,15	
Frequency (MHz)	5210		
AC80 Mode	0F,0E		

UNII-3			
Test Software Version			
Frequency (MHz)	5745	5785	5825
N20 Mode	18,16	18,16	18,16
Frequency (MHz)	5755	5795	
N40 Mode	16,15	16,15	
Frequency (MHz)	5775		
AC80 Mode	17,16		





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.
Δ	Notobook PC		cer TravelMate P446	DOC	NXVAJTA0015520042
A	Notebook PC	Acei		DOC	C7600

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	10m	RJ45





4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

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

	Class I	B (dBuV)
FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	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 equipments powered 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 ground plane 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.

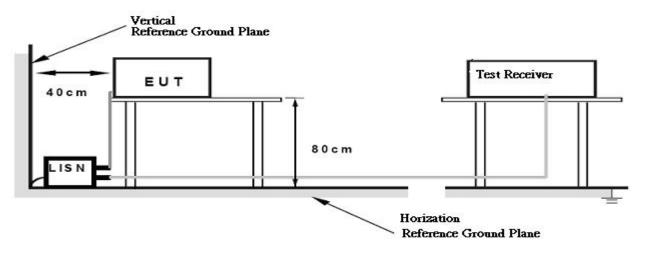
4.1.3 DEVIATION FROM TEST STANDARD

No deviation





4.1.4 TEST SETUP



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°C Relative Humidity: 53% Test Voltage: AC 120V/60Hz

4.1.7 TEST RESULTS

Please refer to the Attachment A.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS

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)
5150-5250	-27	68.3
	-27(Note 2)	68.3
E70E E9E0	10(Note 2)	105.3
5725-5850	15.6(Note 2)	110.9
	27(Note 2)	122.3

Note:

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

field strength: $E = \frac{100000 \sqrt{30P}}{3} \mu V/m$, where P is the eirp (Watts)

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 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 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 radiated 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)
- h. 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.

Beamforming Pattern:

a. circular beamforming pattern

Perform a baseline test over a circle (or portion of a circle encompassing the steerable range of the beam) with the receive antenna placed at a constant distance R from the EUT antenna and located at various settings of ϕ . The angular distance between any two adjacent ϕ points shall be less than or equal to 15°.

At each beam orientation, scan the receive antenna in small increments of θ and ϕ relative to the EUT antenna and vary the orientation of the receive antenna in small increments of (γ) relative to the receive antenna at $\xi = 0^\circ$ and 90° to maximize the emission. The receive antenna scan along θ is needed in case the peak of the beam lobe is not at an elevation of exactly 0° . If the transmit beam orientation is polarized at something other than vertical or horizontal, then vary the receive antenna ξ to find the worst-case polarization.

Starting from the ϕ orientation that produces the highest received level, perform additional investigative tests around this orientation using smaller increments of ϕ as required finding the worst-case ϕ orientation.





b. spherical beamforming pattern

Perform a baseline test over a sphere (or portion of a sphere encompassing the steerable range of the beam) with the receive antenna placed at a constant distance R from the EUT antenna and located at various combinations of (θ , ϕ). The arc length between any two adjacent (θ , ϕ) points shall be less than or equal to R \times (π /4 radians) = R \times (45°). For the three points (θ , ϕ) = (0°, 0°), (0°, 30°), and (30°, 30°), the arc length between any two of these points satisfies this condition.

For an antenna that has a steerable range of a half-sphere:

1) With θ set to 0° , ϕ is set to -90° , -60° , -30° , 0° , $+30^\circ$, $+60^\circ$, and $+90^\circ$.

2) With θ set to +30° , ϕ is set to –90° , –60° , –30° , 0° , +30° , +60° , and +90° .

3) With θ set to -30° , ϕ is set to -90° , -60° , -30° , 0° , $+30^{\circ}$, $+60^{\circ}$, and $+90^{\circ}$.

4) With θ set to +60° , ϕ is set to –90° , –45° , 0° , +45° , and +90° .

5) With θ set to –60° , ϕ is set to –90° , –45° , 0° , +45° , and +90° .

6) With θ set to +90°, ϕ is set to either an arbitrary angle or 0°.

7) With θ set to -90° , ϕ is set to either an arbitrary angle or 0° .

At each beam orientation, scan the receive antenna in small increments of θ and ϕ relative to the EUT antenna and vary the orientation of the receive antenna in small increments of (γ) relative to the receive antenna, at $\xi = 0^{\circ}$ and 90° to maximize the emission. If the transmit beam orientation is polarized at something other than vertical or horizontal, then vary the receive antenna ξ to find the worst-case polarization.

Starting from the (θ, ϕ) orientation that produces the highest received level, perform additional investigative tests around this orientation using smaller increments of (θ, ϕ) as required to find the worst-case (θ, ϕ) orientation.

c. antenna systems with lockable beam

For beam-steering arrays that have a mode (either test or operational) whereby the beam can be locked in a user-selectable orientation, perform the baseline scan with the beam locked to the orientations specified 13.2.1 and 13.2.2 in the applicable circular or spherical baseline scan methodology.

d. antenna systems with nonlockable scanning beam

For beam-steering arrays that sweep the beam in a predictable pattern but do not have a mode whereby the beam can be locked into and cannot be locked in user-selectable orientations, perform the baseline scan with the measurement receive antenna placed at the orientations specified above in the applicable circular or spherical baseline scan methodology. The instrument shall be set to peak detection, and the sweep time of the instrument shall be slow enough to capture the transmit beam as it sweeps across the orientation of the measuring antenna.

e antenna systems with adaptive scanning beam

For beam-steering arrays that automatically steer the beam to take advantage of the natural multipaths between radios in the network, a user-adjustable beam locking function shall be provided for test purposes. Use the procedures for the lockable beam version.



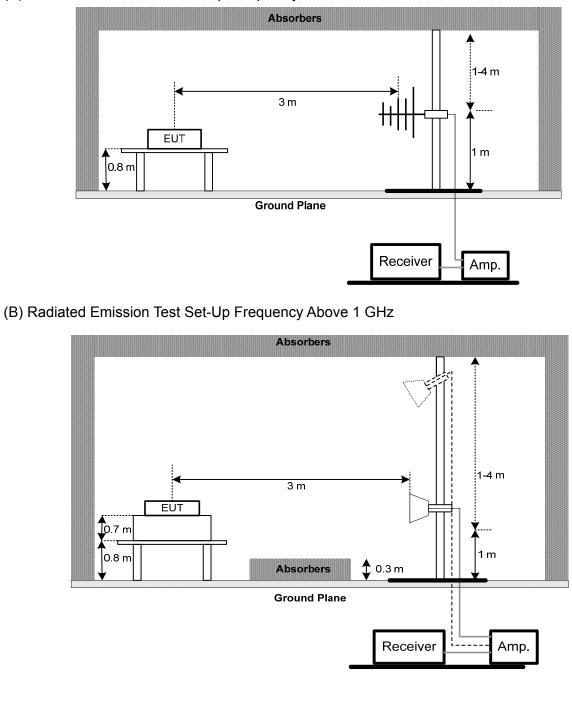


4.2.3 DEVIATION FROM TEST STANDARD

No deviation

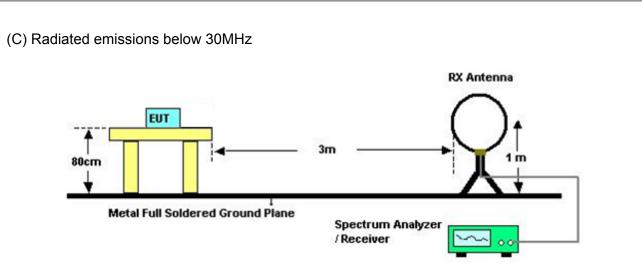
4.2.4 TEST SETUP

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









4.2.5 EUT OPERATING CONDITIONS

The EUT was placed on the test table and programmed in normal function.

4.2.6 EUT TEST CONDITIONS

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

4.2.7 TEST RESULTS (9KHZ 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 (30MHZ TO 1000 MHz)

Please refer to the Attachment C.

4.2.9 TEST RESULTS (1GHZ~10TH HARMONIC)

Please refer to the Attachment D.

Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable. For fundamental signal judgment was referred to Peak output test.



4.3 BAND EDGE MEASUREMENT

4.3.1 RADIATED EMISSION LIMITS

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)
5150-5250	-27	68.3
	-27(Note 2)	68.3
E70E E9E0	10(Note 2)	105.3
5725-5850	15.6(Note 2)	110.9
	27(Note 2)	122.3

Note:

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

field strength: $E = \frac{100000 \sqrt{30P}}{3} \mu V/m$, where P is the eirp (Watts)

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.



4.3.2 TEST PROCEDURE

For Radiated band edges Measurement:

- a. The test procedure is the same as section 4.2.2, only the frequency range investigated is limited to 100MHz around band edges.
- For Radiated Out of Band Emission Measurement:
- a. Test was performed in accordance with KDB 789033 D02 General UNII Test Procedures New Rules v01r03

4.3.3 DEVIATION FROM TEST STANDARD

No deviation

4.3.4 TEST SETUP LAYOUT

For Radiated band edges Measurement:

This test setup layout is the same as that shown in section 4.2.4.

For Radiated Out of Band Emission Measurement:

This test setup layout is the same as that shown in section 4.2.4.

4.3.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.3.6 EUT TEST CONDITIONS

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

4.3.7 TEST RESULTS (BAND EDGE AND FUNDAMENTAL EMISSIONS)

Please refer to the Attachment E

Remark:

(1) 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 was placed on the test table and programmed in normal function.





5.1.5 EUT TEST CONDITIONS

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

5.1.6 TEST RESULTS

Please refer to the Attachment F.



6. MAXIMUM CONDUCTED OUTPUT POWER

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E				
Test Item	Limit	Frequency Range (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 Fraguanay	Encompass the entire emissions bandwidth (EBW) of the
Span Frequency	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 was placed on the test table and programmed in normal function.

6.1.5 EUT TEST CONDITIONS

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

6.1.6 TEST RESULTS

Please refer to the Attachment G.

7. POWER SPECTRAL DENSITY TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E			
Test Item	Limit	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

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 Fraguanov	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, 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.
- 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.

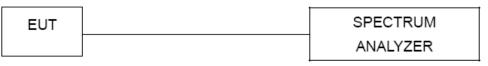




7.1.1 DEVIATION FROM STANDARD

No deviation.

7.1.2 TEST SETUP



7.1.3 EUT OPERATION CONDITIONS

The EUT was placed on the test table and programmed in normal function.

7.1.4 EUT TEST CONDITIONS

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

7.1.5 TEST RESULTS

Please refer to the Attachment H.





8. FREQUENCY STABILITY MEASUREMENT

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15, Subpart E			
Test Item	Limit	Frequency Range (MHz)	Result
Frequency Stability Specified in the user's manual	5150-5250	PASS	
		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 emissions bandwidth
	RBW	10 kHz
	VBW	10 kHz
	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 is $0^{\circ}C$ ~40°C.

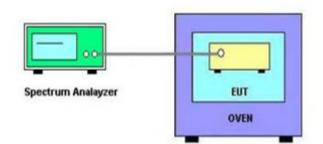
8.1.2 DEVIATION FROM STANDARD

No deviation.





8.1.3 TEST SETUP



8.1.4 EUT OPERATION CONDITIONS

The EUT was placed on the test table and programmed in normal function.

8.1.5 EUT TEST CONDITIONS

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

8.1.6 TEST RESULTS

Please refer to the Attachment I.



9. MEASUREMENT INSTRUMENTS LIST

	Conducted Emission Measurement											
Item	Kind of Equipment	Kind of Equipment Manufacturer Type No. Serial No.										
1	TWO-LINE V-NETWORK	R&S	ENV216	101050	Jan. 26, 2017							
2	Test Cable	TIMES	CFD300-NL	C02	Jun. 15, 2017							
3	EMI Test Receiver	R&S	ESR7	101433	Dec. 10, 2016							
4	Measurement Software	Measurement EZ_EMC		N/A	N/A							

		Radiated Emi	ssion Measureme	ent	
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB9168-352	9168-352	Feb. 04, 2017
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-546	Nov. 05, 2017
3	Pre-Amplifier	HP	8447D	2944A08891	Mar. 09 2017
4	Pre-Amplifier	Agilent	8449B	3008A02331	Jan. 24, 2017
5	Test Cable	EMCI	EMC8D-NM-NM -8000	150301	Mar. 09, 2017
6	Test Cable	EMCI	EMC104-SM-S M-2500	150303	Mar. 09, 2017
7	Test Cable	EMCI	EMC104-NM-S M-1000	150304	Mar. 09, 2017
8	Test Cable	EMCI	EMC104-SM-S M-5000	150302	Mar. 29, 2017
9	Test Cable	EMCI	EMC104-SM-S M-800	150305	Mar. 29, 2017
10	EXA Spectrum Analyzer			MY52220990	Feb. 24, 2017
11	EMI Test Receiver	Agilent	N9038A	MY51210215	Jan. 08, 2017
12	Loop Antenna	EMCO	6502	00042960	Nov. 06. 2016





	Spectrum Bandwidth Measurement									
Ite	em	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until				
1	1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 18, 2017				

ſ		Maximum Conducted Output Power Measurement										
Į	Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until						
	1	Power Meter	Anritsu	ML2487A 6K00004714		May 18, 2017						
ĺ	2	Power Meter Sensor	Anritsu	MA2491A	034138	May 17, 2017						

	Power Spectral Density Measurement									
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until					
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 18, 2017					

		Frequency Stability Measurement										
ĺ	Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until						
	1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 18, 2017						
	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.

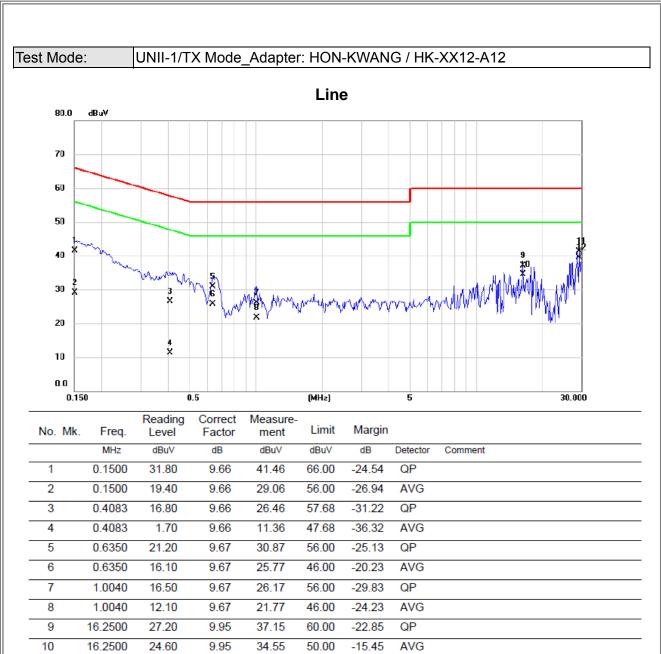




ATTACHMENT A - CONDUCTED EMISSION

STL





Note : The test result has included the cable loss.

31.30

29.50

41.28

39.48

60.00

50.00

-18.72

-10.52

QP

AVG

9.98

9.98

11

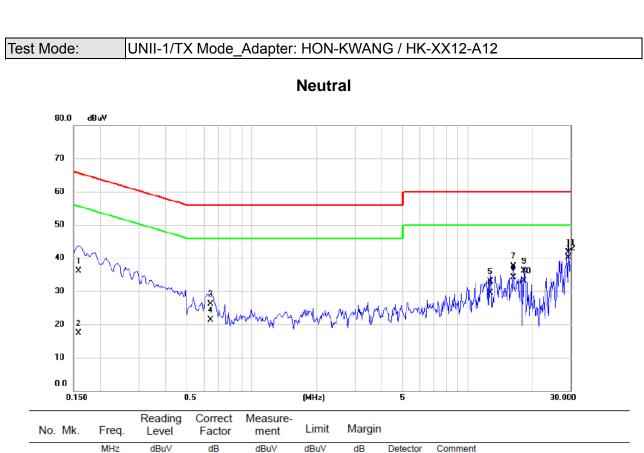
12

*

29.2500

29.2500

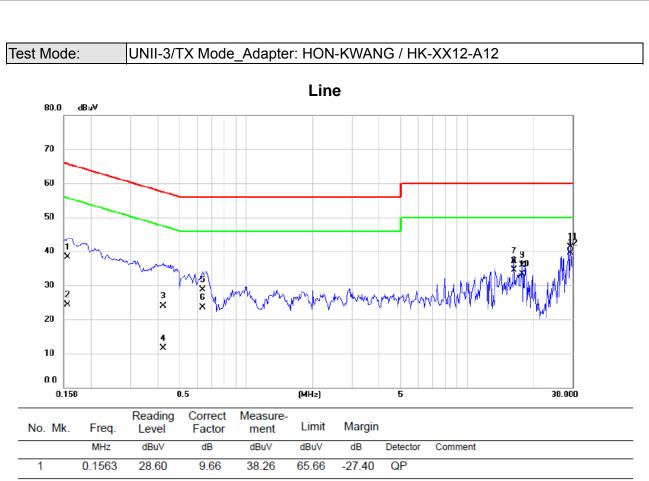




No. Mk.	Freq.	Level Factor r		ment	ment Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1584	26.50	9.67	36.17	65.55	-29.38	QP	
2	0.1584	7.60	9.67	17.27	55.55	-38.28	AVG	
3	0.6440	16.50	9.67	26.17	56.00	-29.83	QP	
4	0.6440	11.70	9.67	21.37	46.00	-24.63	AVG	
5	12.7500	23.00	9.89	32.89	60.00	-27.11	QP	
6	12.7500	19.70	9.89	29.59	50.00	-20.41	AVG	
7	16.2500	27.50	9.94	37.44	60.00	-22.56	QP	
8	16.2500	24.20	9.94	34.14	50.00	-15.86	AVG	
9	18.2500	26.20	9.96	36.16	60.00	-23.84	QP	
10	18.2500	23.10	9.96	33.06	50.00	-16.94	AVG	
11	29.2500	31.80	10.00	41.80	60.00	-18.20	QP	
12 *	29.2500	30.20	10.00	40.20	50.00	-9.80	AVG	

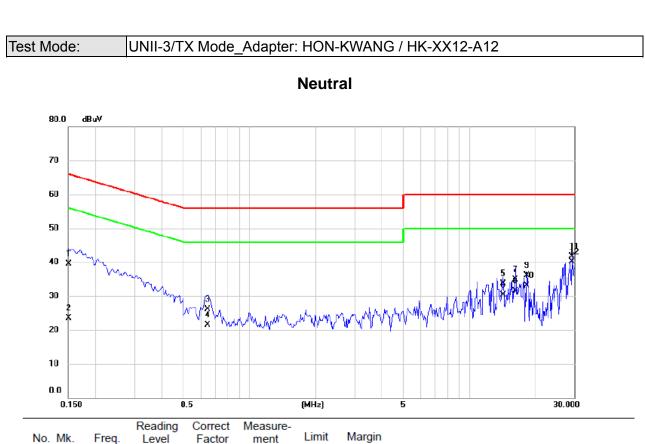






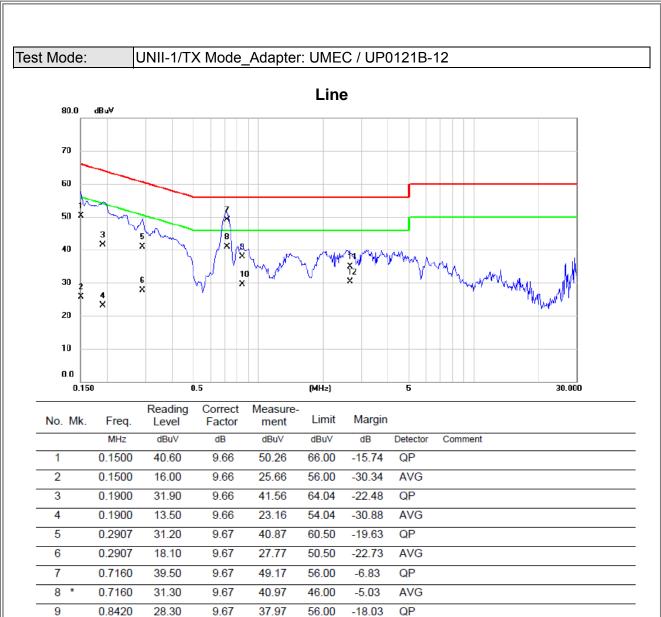
1	0.1563	28.60	9.66	38.26	65.66	-27.40	QP
2	0.1563	14.60	9.66	24.26	55.66	-31.40	AVG
3	0.4230	14.20	9.66	23.86	57.39	-33.53	QP
4	0.4230	1.80	9.66	11.46	47.39	-35.93	AVG
5	0.6350	19.10	9.67	28.77	56.00	-27.23	QP
6	0.6350	13.90	9.67	23.57	46.00	-22.43	AVG
7	16.2500	27.10	9.95	37.05	60.00	-22.95	QP
8	16.2500	24.50	9.95	34.45	50.00	-15.55	AVG
9	17.7000	25.90	9.97	35.87	60.00	-24.13	QP
10	17.7000	23.40	9.97	33.37	50.00	-16.63	AVG
11	29.2500	31.30	9.98	41.28	60.00	-18.72	QP
12 *	29.2500	29.50	9.98	39.48	50.00	-10.52	AVG





No. N	٨k.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	29.80	9.67	39.47	66.00	-26.53	QP	
2		0.1500	13.80	9.67	23.47	56.00	-32.53	AVG	
3		0.6440	16.50	9.67	26.17	56.00	-29.83	QP	
4		0.6440	11.90	9.67	21.57	46.00	-24.43	AVG	
5	1	14.2000	23.80	9.93	33.73	60.00	-26.27	QP	
6	1	14.2000	20.40	9.93	30.33	50.00	-19.67	AVG	
7	1	16.2000	24.90	9.94	34.84	60.00	-25.16	QP	
8	1	16.2000	21.50	9.94	31.44	50.00	-18.56	AVG	
9	1	18.2500	26.20	9.96	36.16	60.00	-23.84	QP	
10	1	18.2500	23.10	9.96	33.06	50.00	-16.94	AVG	
11	2	29.2500	31.80	10.00	41.80	60.00	-18.20	QP	
12 *	* 2	29.2500	30.20	10.00	40.20	50.00	-9.80	AVG	





Note : The test result has included the cable loss.

19.80

25.10

20.50

9.67

9.75

9.75

29.47

34.85

30.25

46.00

56.00

46.00

-16.53

-21.15

-15.75

AVG

AVG

QP

10

11

12

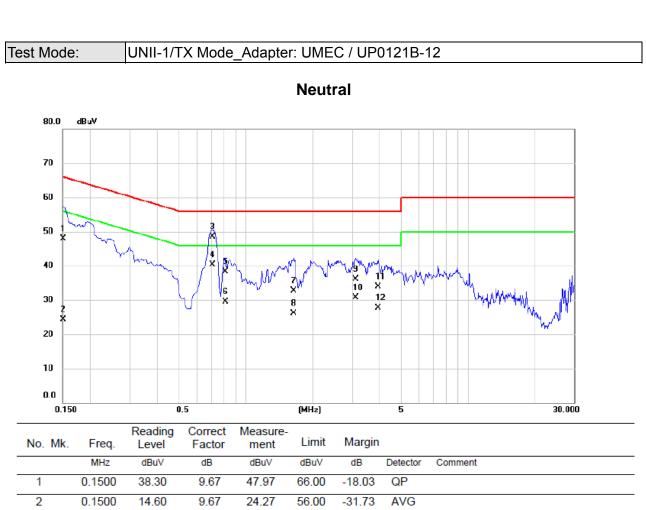
0.8420

2.6600

2.6600



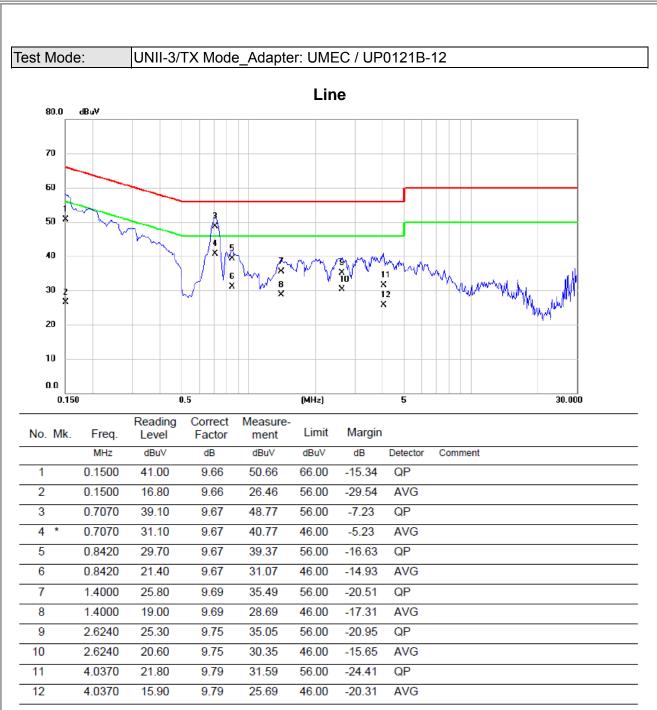




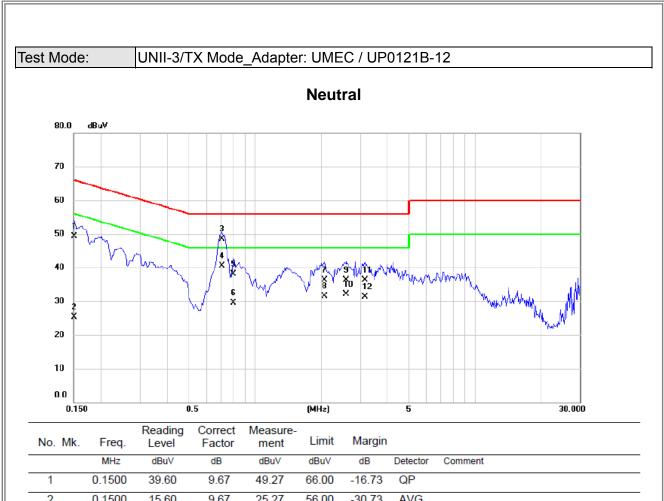
1 A A	0.1000	00.00	0.01	11.01	00.00	10.00	Sti .
2	0.1500	14.60	9.67	24.27	56.00	-31.73	AVG
3	0.7070	38.90	9.68	48.58	56.00	-7.42	QP
4 *	0.7070	30.70	9.68	40.38	46.00	-5.62	AVG
5	0.8060	28.60	9.68	38.28	56.00	-17.72	QP
6	0.8060	19.80	9.68	29.48	46.00	-16.52	AVG
7	1.6430	22.90	9.72	32.62	56.00	-23.38	QP
8	1.6430	16.30	9.72	26.02	46.00	-19.98	AVG
9	3.1100	26.40	9.77	36.17	56.00	-19.83	QP
10	3.1100	21.00	9.77	30.77	46.00	-15.23	AVG
11	3.9380	24.20	9.79	33.99	56.00	-22.01	QP
12	3.9380	17.90	9.79	27.69	46.00	-18.31	AVG

STL







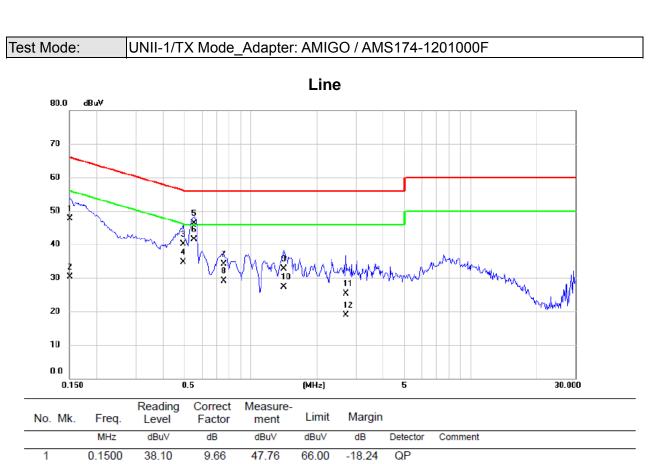


2	0.1500	15.60	9.67	25.27	56.00	-30.73	AVG
3	0.7070	38.80	9.68	48.48	56.00	-7.52	QP
4 *	0.7070	30.80	9.68	40.48	46.00	-5.52	AVG
5	0.7970	28.50	9.68	38.18	56.00	-17.82	QP
6	0.7970	19.90	9.68	29.58	46.00	-16.42	AVG
7	2.0660	26.60	9.74	36.34	56.00	-19.66	QP
8	2.0660	21.80	9.74	31.54	46.00	-14.46	AVG
9	2.5970	26.60	9.75	36.35	56.00	-19.65	QP
10	2.5970	22.30	9.75	32.05	46.00	-13.95	AVG
11	3.1640	26.60	9.77	36.37	56.00	-19.63	QP
12	3.1640	21.50	9.77	31.27	46.00	-14.73	AVG

Note : The test result has included the cable loss.

_

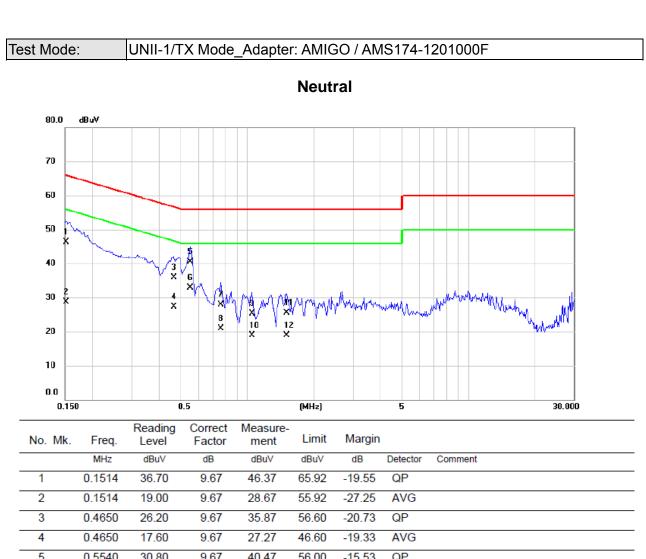




	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1500	38.10	9.66	47.76	66.00	-18.24	QP	
2	0.1500	20.60	9.66	30.26	56.00	-25.74	AVG	
3	0.4916	30.50	9.67	40.17	56.14	-15.97	QP	
4	0.4916	25.10	9.67	34.77	46.14	-11.37	AVG	
5	0.5540	36.60	9.67	46.27	56.00	-9.73	QP	
6 *	0.5540	31.90	9.67	41.57	46.00	-4.43	AVG	
7	0.7520	24.50	9.67	34.17	56.00	-21.83	QP	
8	0.7520	19.50	9.67	29.17	46.00	-16.83	AVG	
9	1.4090	23.10	9.69	32.79	56.00	-23.21	QP	
10	1.4090	17.70	9.69	27.39	46.00	-18.61	AVG	
11	2.7050	15.60	9.75	25.35	56.00	-30.65	QP	
12	2.7050	9.20	9.75	18.95	46.00	-27.05	AVG	

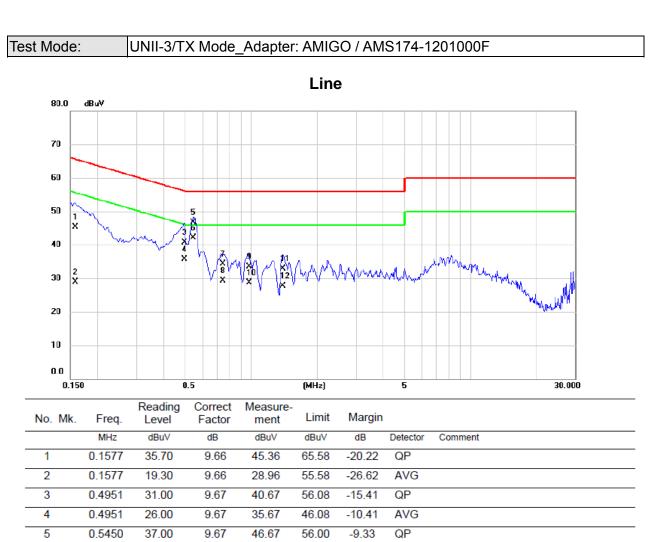






5	0.5540	30.80	9.67	40.47	56.00	-15.53	QP
6 *	0.5540	23.20	9.67	32.87	46.00	-13.13	AVG
7	0.7610	18.30	9.68	27.98	56.00	-28.02	QP
8	0.7610	11.30	9.68	20.98	46.00	-25.02	AVG
9	1.0490	15.70	9.68	25.38	56.00	-30.62	QP
10	1.0490	9.20	9.68	18.88	46.00	-27.12	AVG
11	1.5080	15.80	9.72	25.52	56.00	-30.48	QP
12	1.5080	9.20	9.72	18.92	46.00	-27.08	AVG

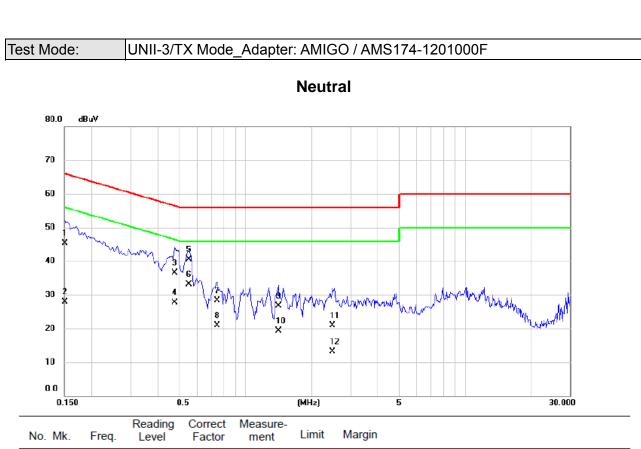




5	0.5450	37.00	9.67	46.67	56.00	-9.33	QP
6 *	0.5450	32.40	9.67	42.07	46.00	-3.93	AVG
7	0.7430	24.60	9.67	34.27	56.00	-21.73	QP
8	0.7430	19.60	9.67	29.27	46.00	-16.73	AVG
9	0.9770	23.90	9.67	33.57	56.00	-22.43	QP
10	0.9770	19.10	9.67	28.77	46.00	-17.23	AVG
11	1.3910	23.30	9.69	32.99	56.00	-23.01	QP
12	1.3910	18.00	9.69	27.69	46.00	-18.31	AVG







No. Mk.	Freq.	Level	Factor	ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1500	35.60	9.67	45.27	66.00	-20.73	QP	
2	0.1500	18.20	9.67	27.87	56.00	-28.13	AVG	
3	0.4776	26.90	9.67	36.57	56.38	-19.81	QP	
4	0.4776	18.10	9.67	27.77	46.38	-18.61	AVG	
5	0.5540	30.80	9.67	40.47	56.00	-15.53	QP	
6 *	0.5540	23.40	9.67	33.07	46.00	-12.93	AVG	
7	0.7430	18.60	9.68	28.28	56.00	-27.72	QP	
8	0.7430	11.30	9.68	20.98	46.00	-25.02	AVG	
9	1.4090	17.10	9.70	26.80	56.00	-29.20	QP	
10	1.4090	9.70	9.70	19.40	46.00	-26.60	AVG	
11	2.4800	11.20	9.75	20.95	56.00	-35.05	QP	
12	2.4800	3.40	9.75	13.15	46.00	-32.85	AVG	

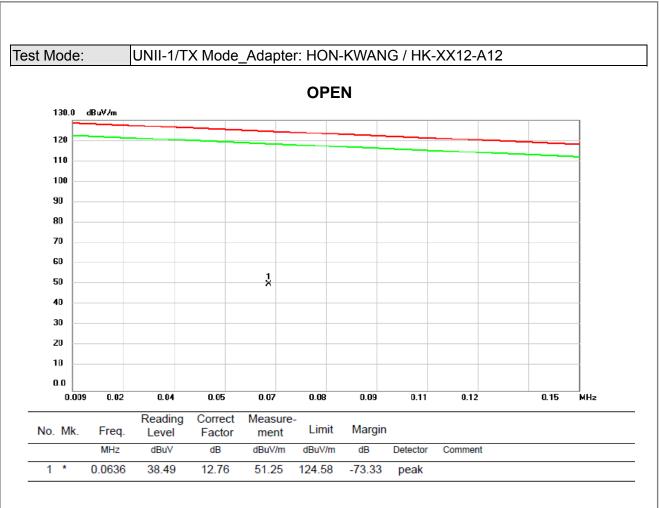




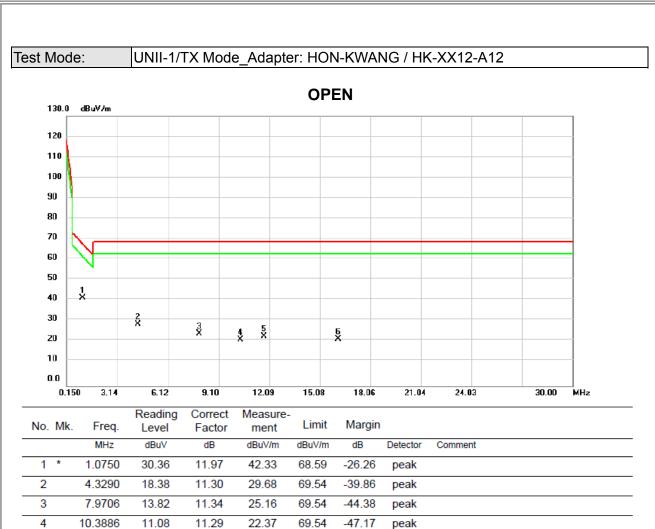
ATTACHMENT B - RADIATED EMISSION (9KHZ TO 30MHZ)











11.7911

16.1794

5

6

12.65

11.63

11.25

11.11

23.90

22.74

69.54

69.54

-45.64

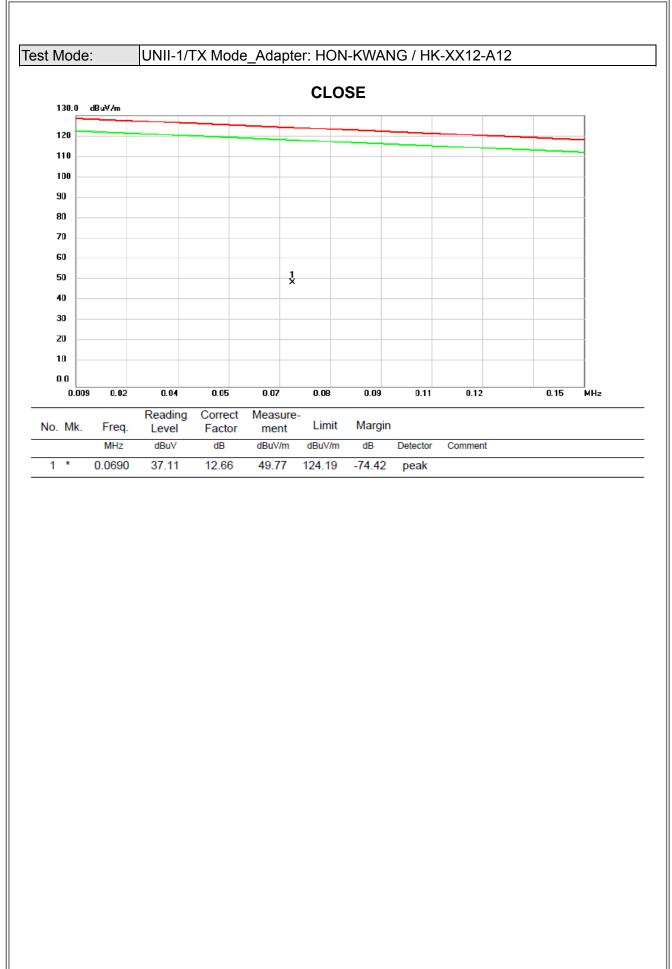
-46.80

peak

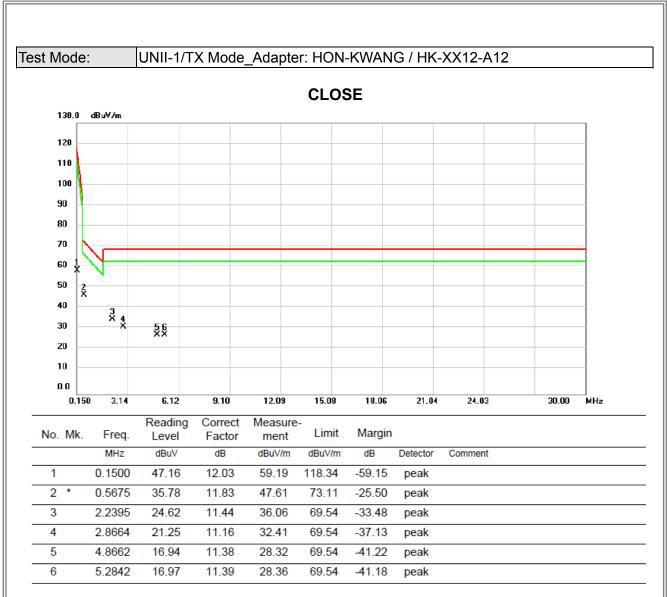
peak





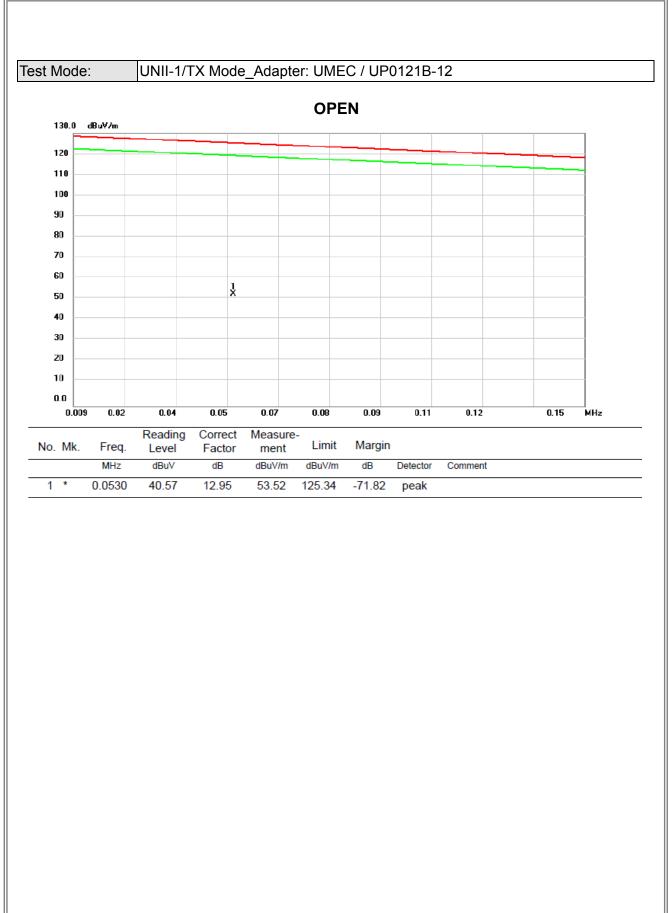






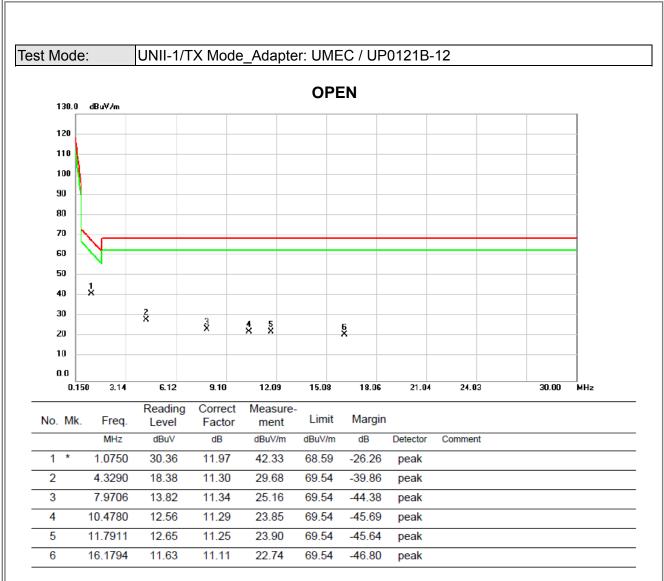






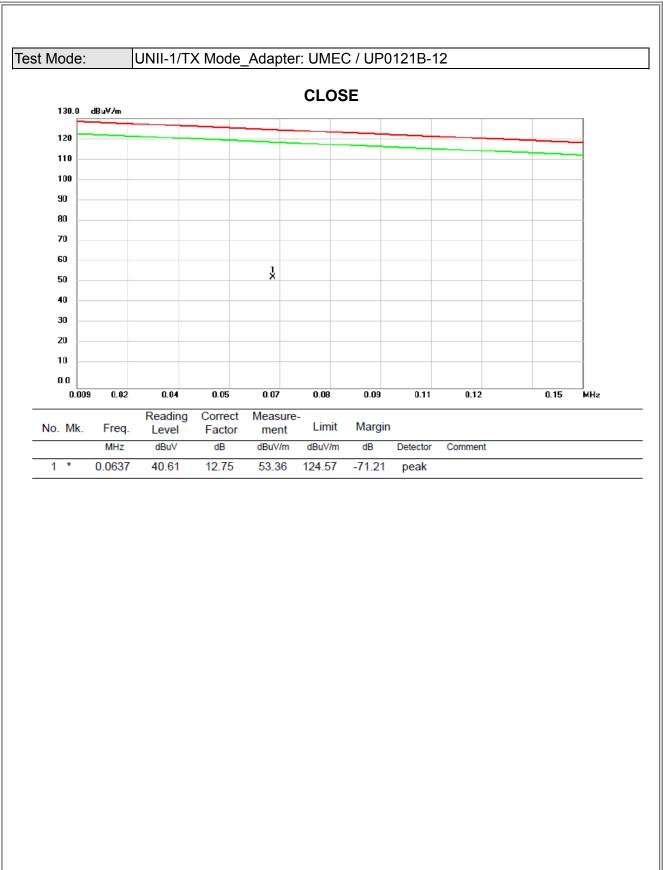




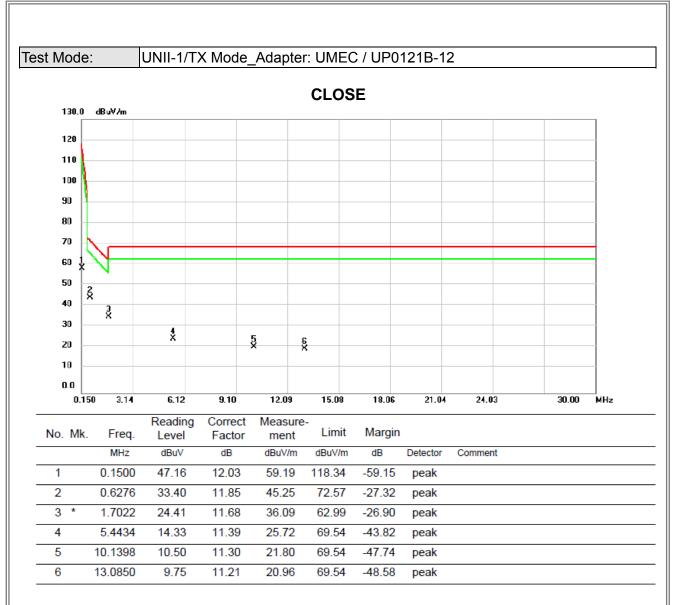






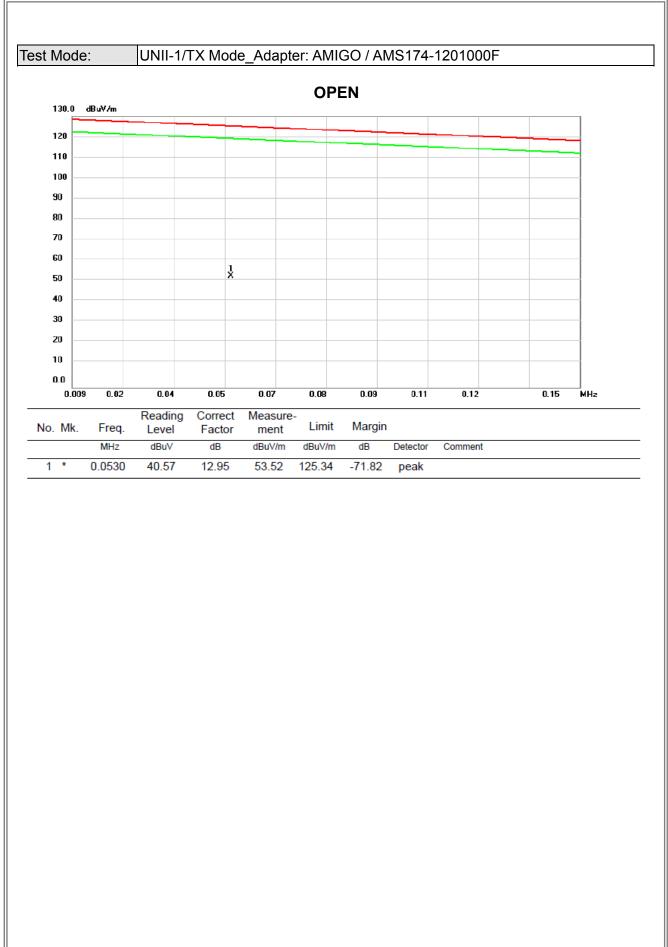












BLL

4

5

6

11.1942

11.7911

21.0450

12.82

12.65

10.60

11.25

10.81

24.08

23.90

21.41

69.54

69.54

69.54

-45.46

-45.64

-48.13

peak

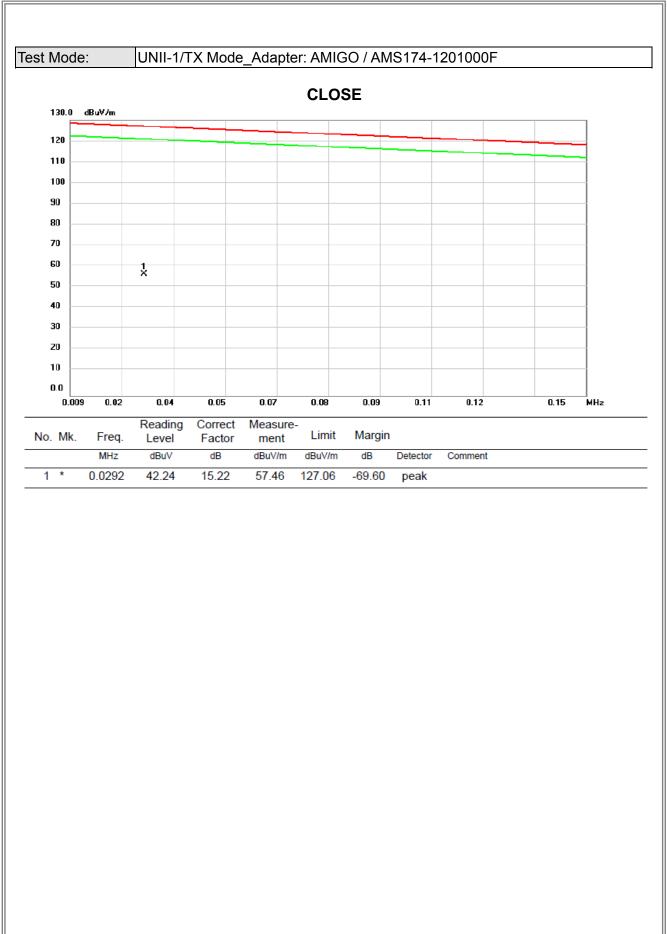
peak

peak







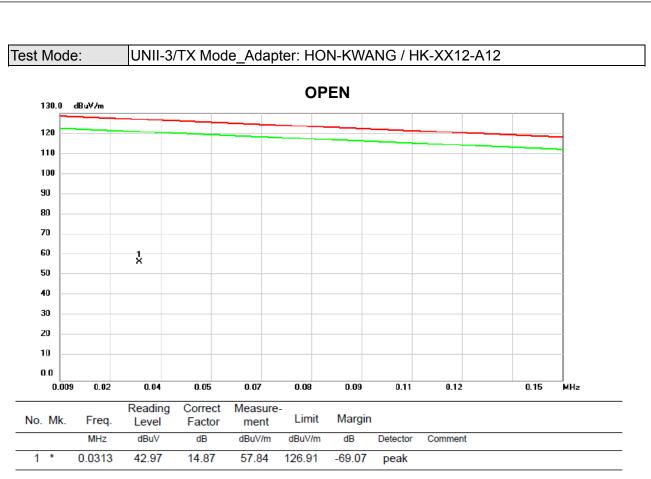






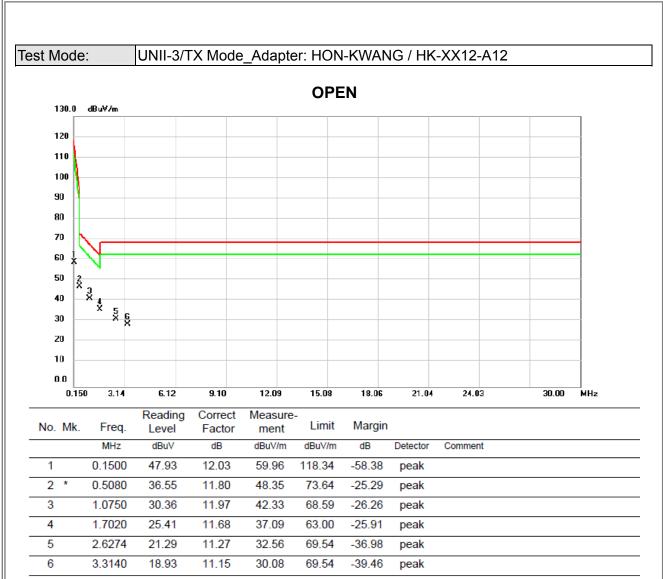




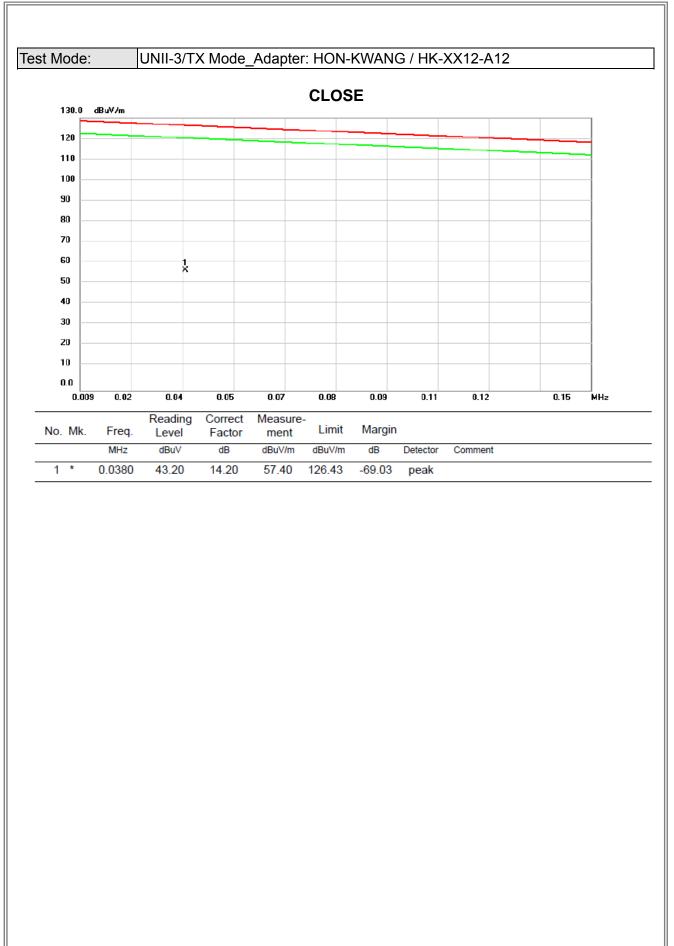




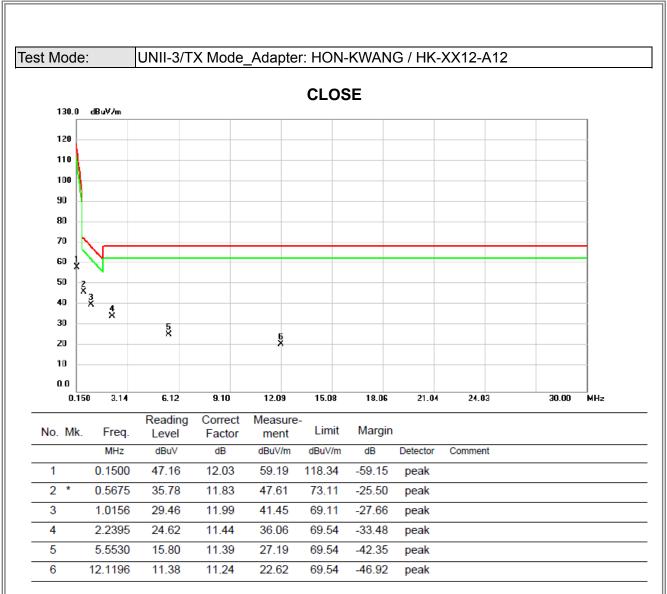






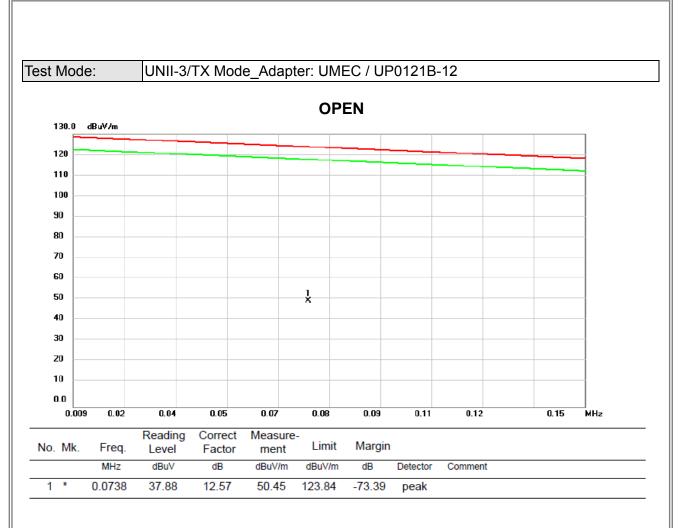










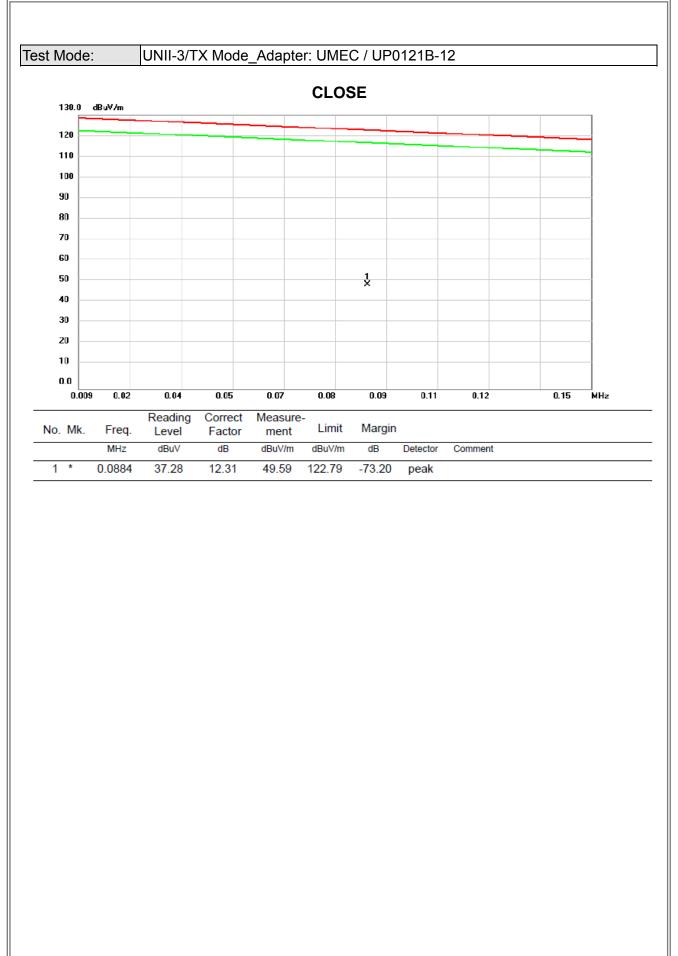














3

4

5

6

2.2395

5.2842

8.4780

9.5228

24.62

16.97

13.54

13.44

11.44

11.39

11.33

11.31

36.06

28.36

24.87

24.75

69.54

69.54

69.54

69.54

-33.48

-41.18

-44.67

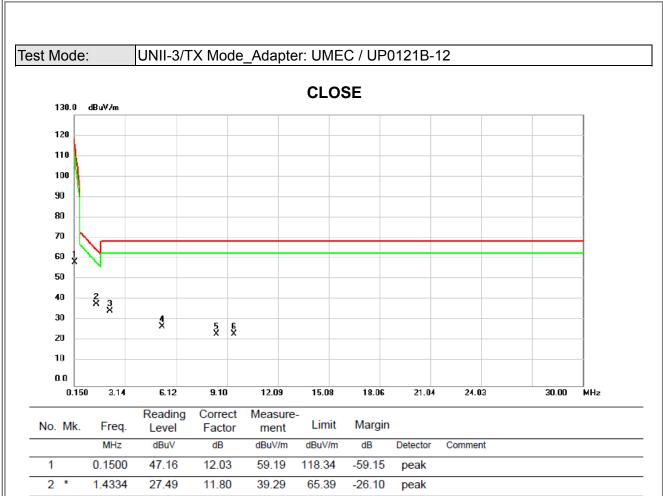
-44.79

peak

peak peak

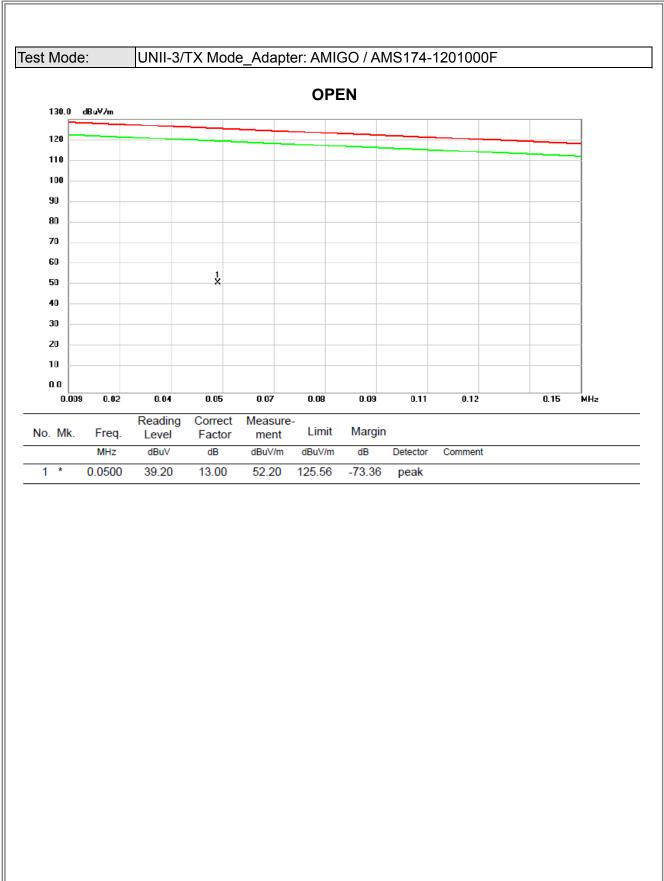
peak





3TL











66.19

69.54

69.54

69.54

-26.98

-40.64

-46.09

-49.72

peak

peak

peak

peak

1.3440

3.6524

8.7070

20.4082

3

4

5

6

27.36

17.70

12.12

8.89

11.85

11.20

11.33

10.93

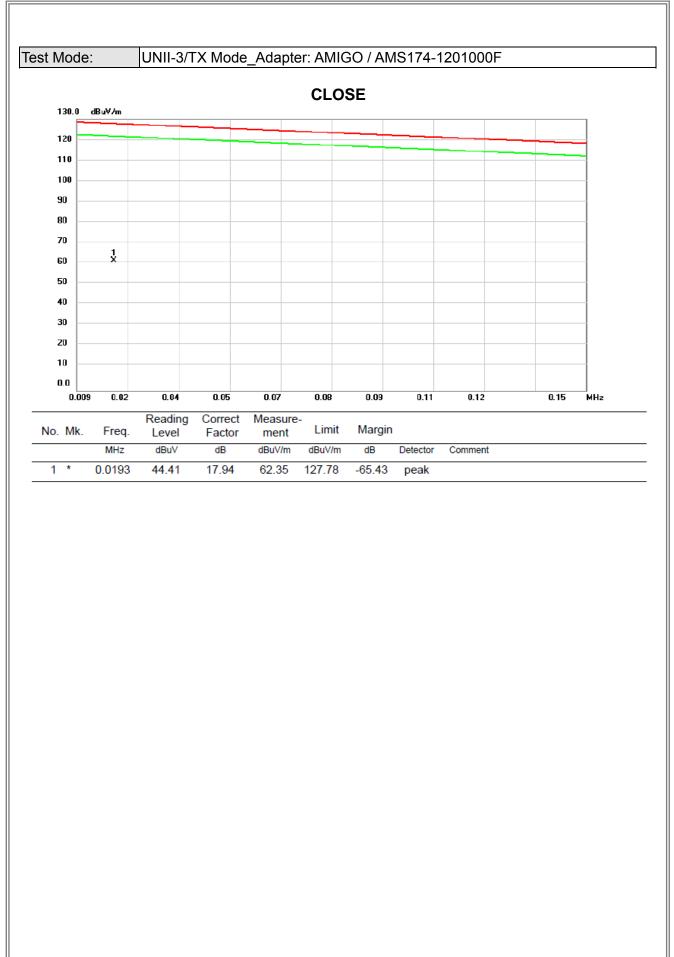
28.90

23.45

19.82

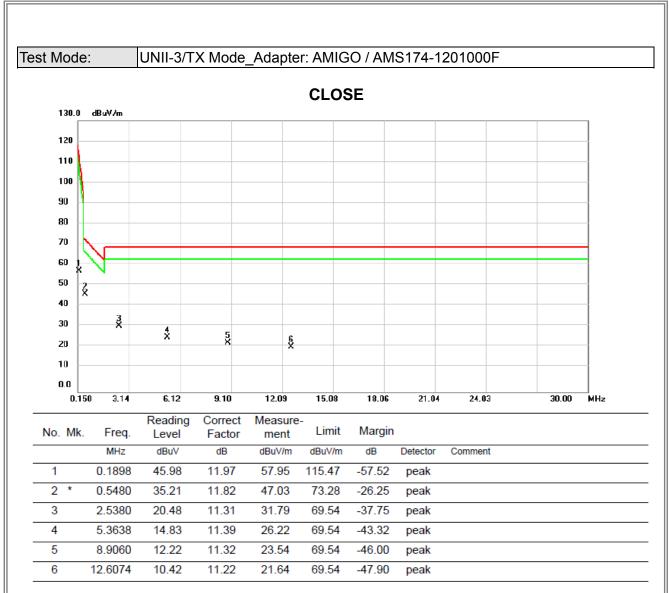
3TL





3TL





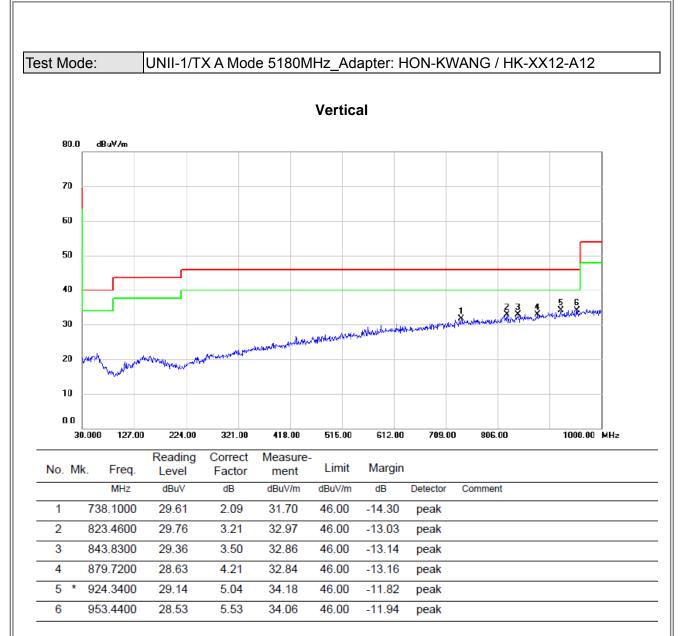




ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)

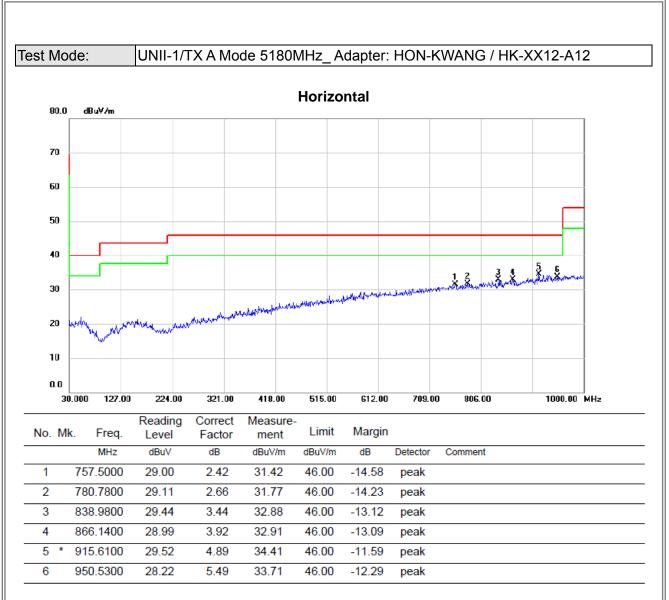






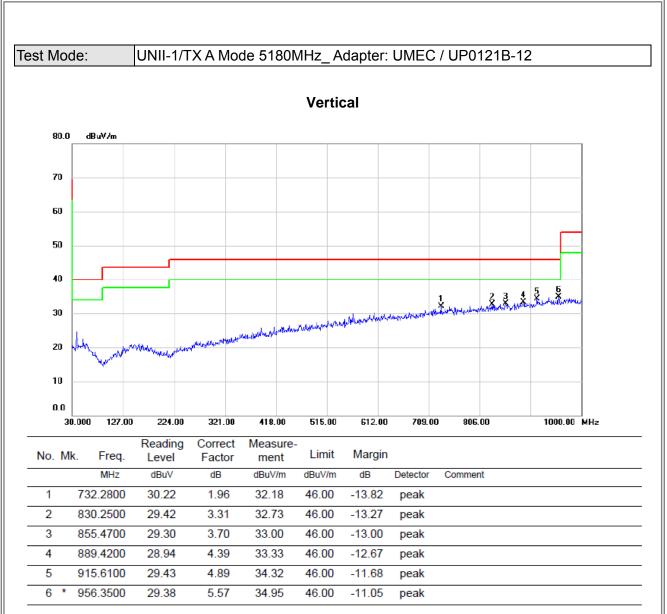






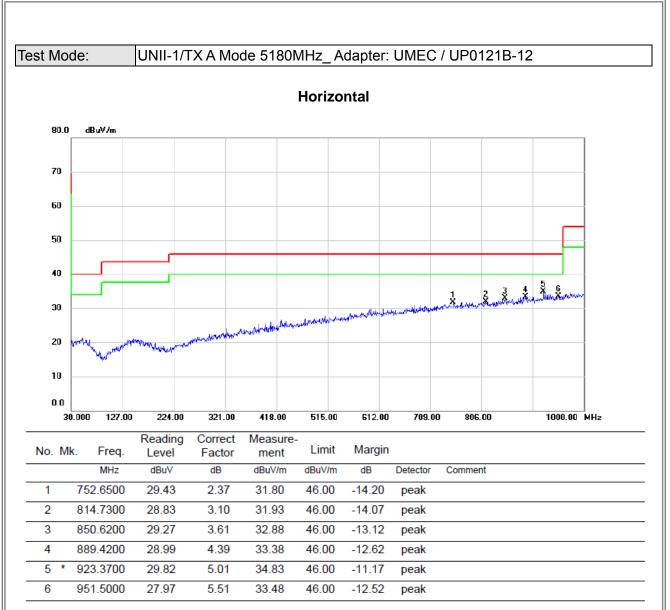






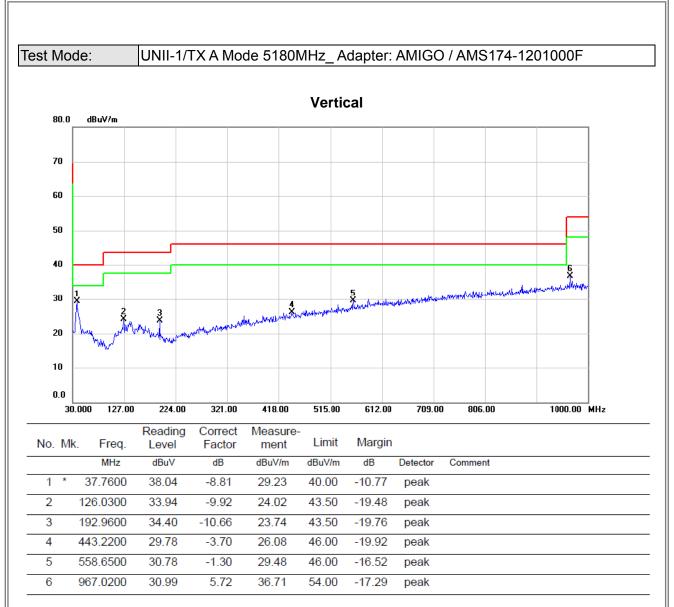






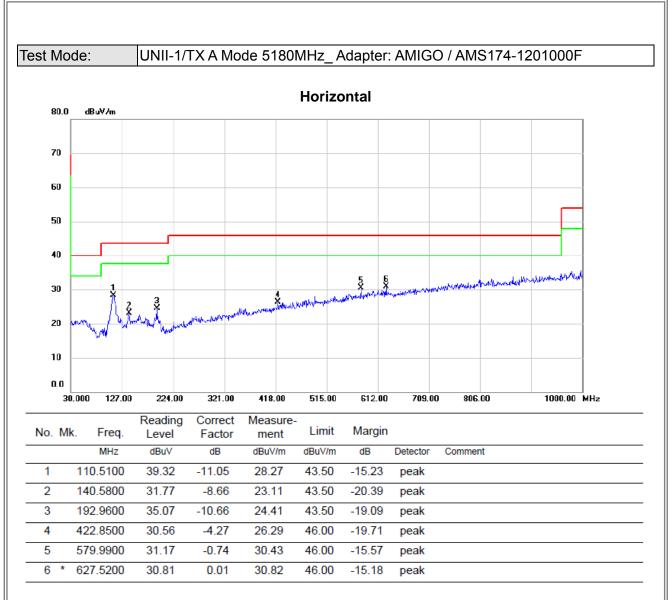






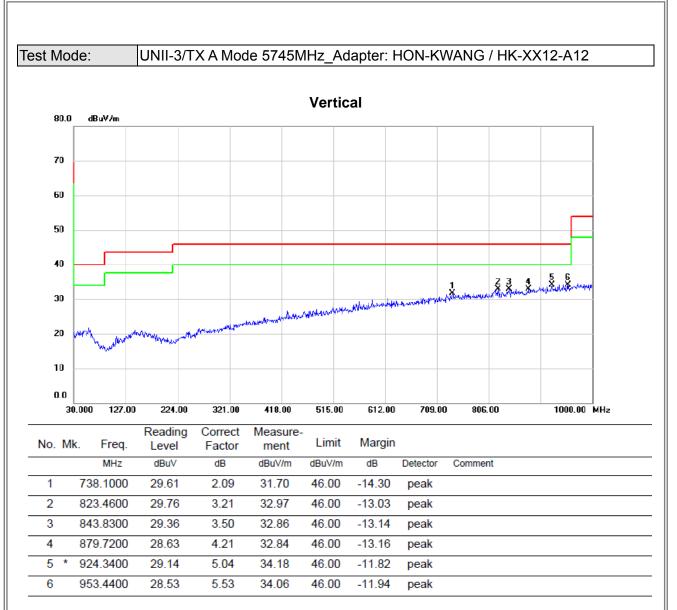






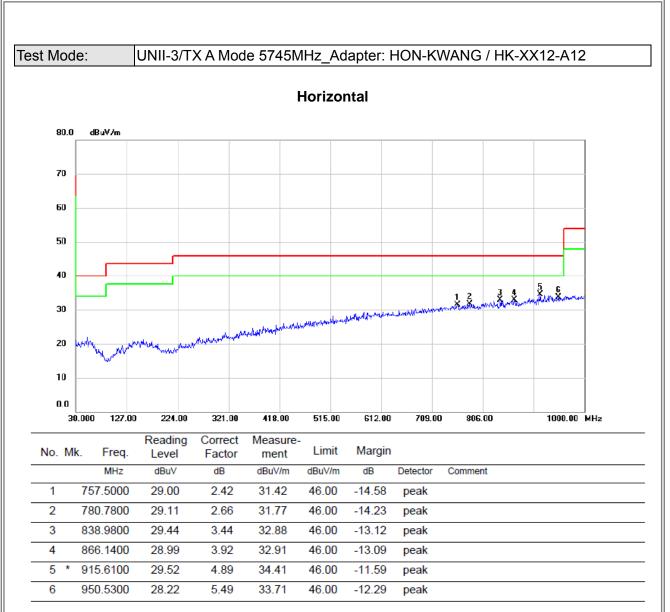






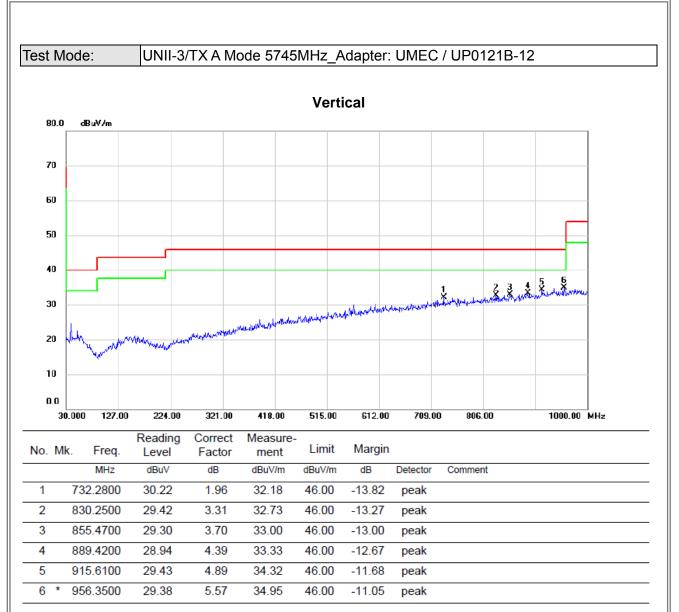






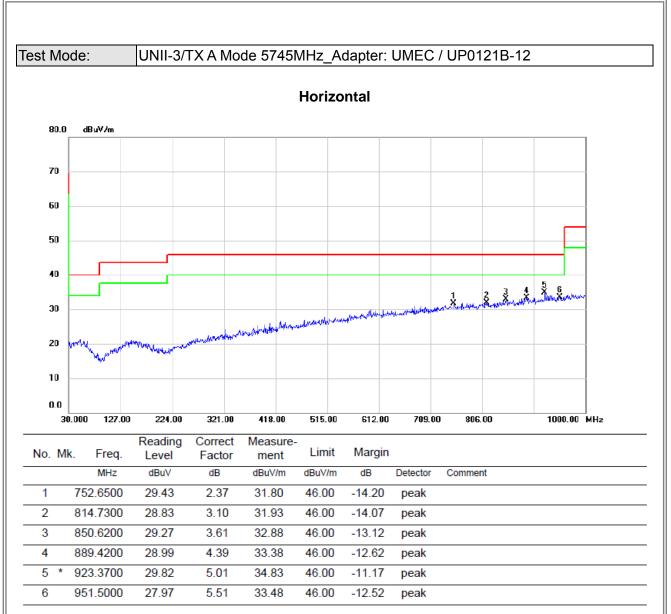






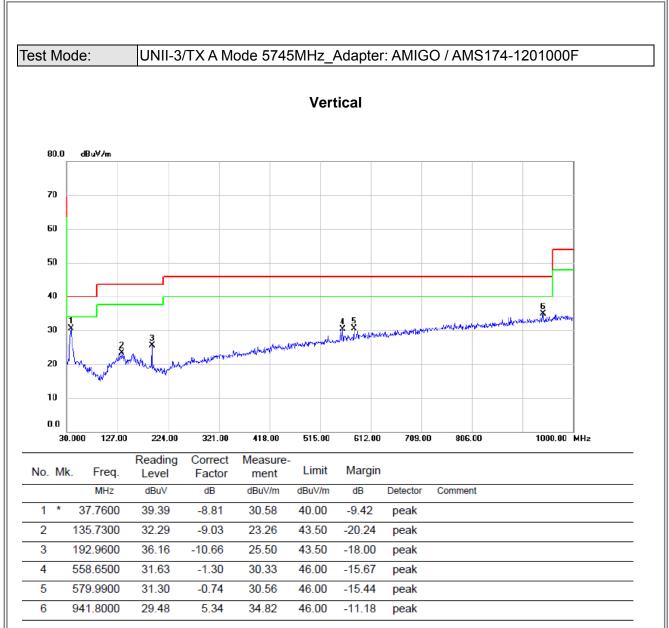






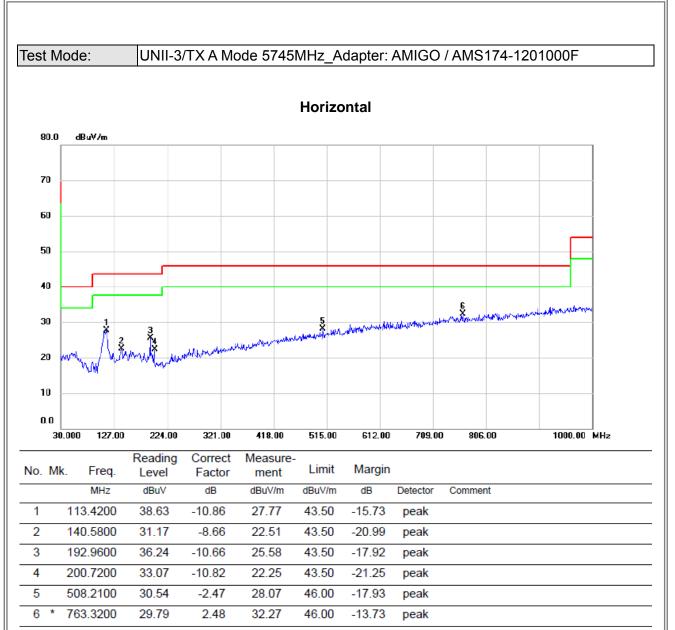














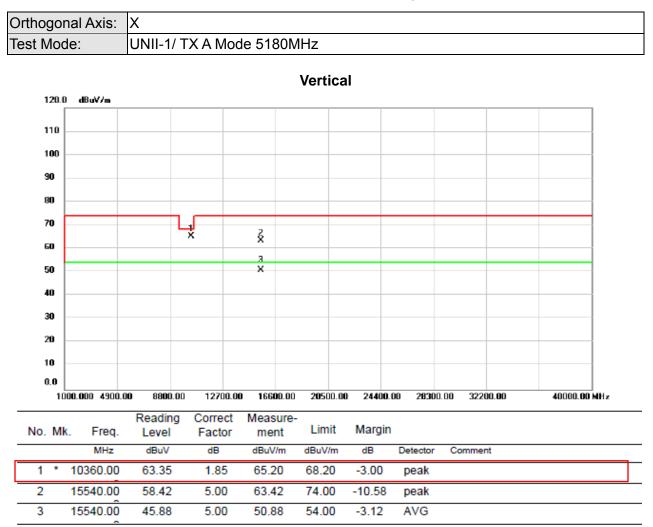


ATTACHMENT D - RADIATED EMISSION (1GHZ~10TH HARMONIC)





Non-Beamforming



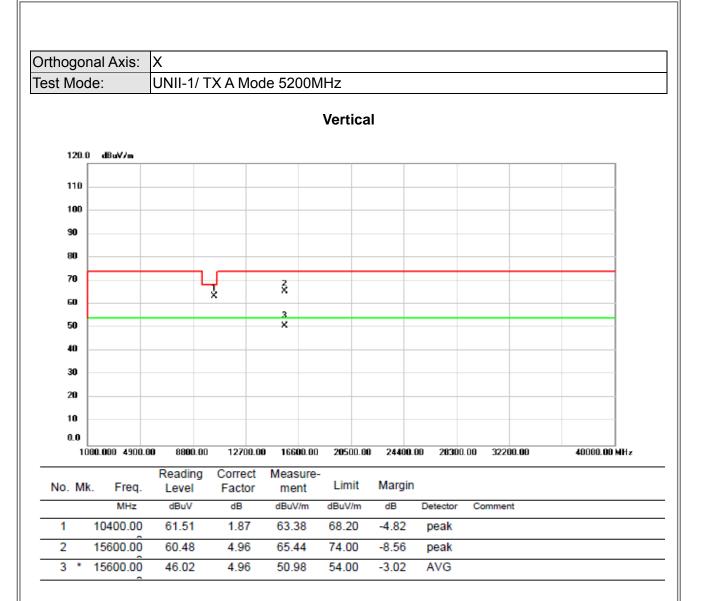






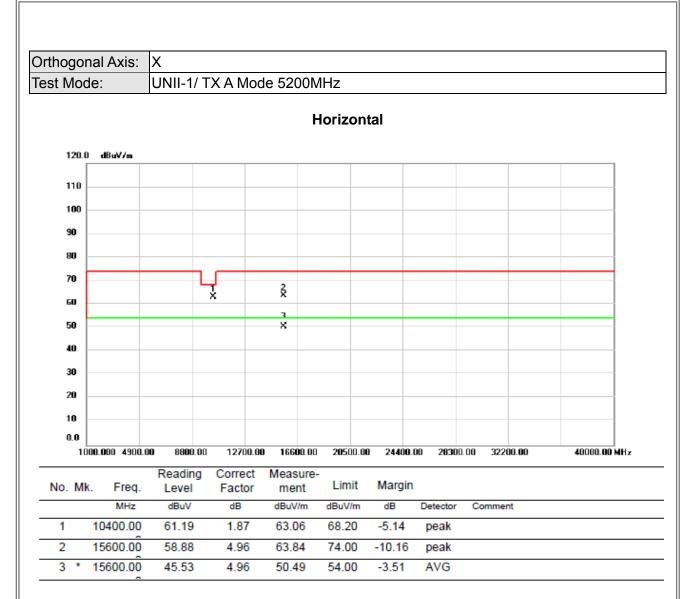






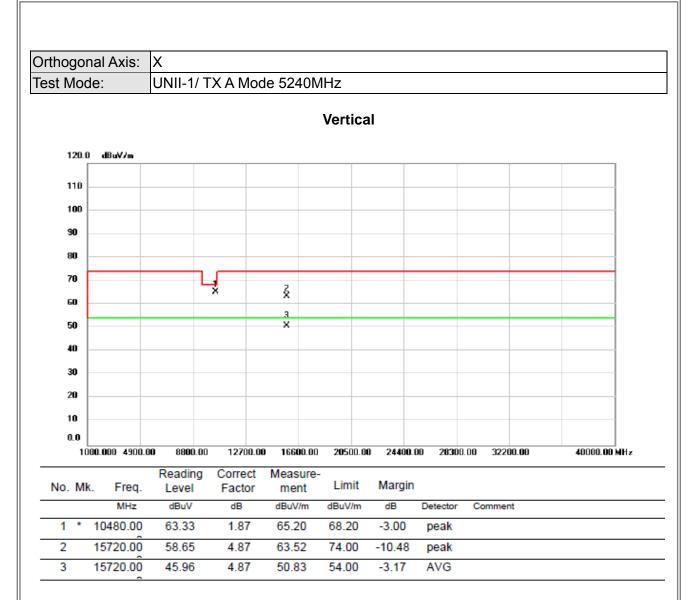












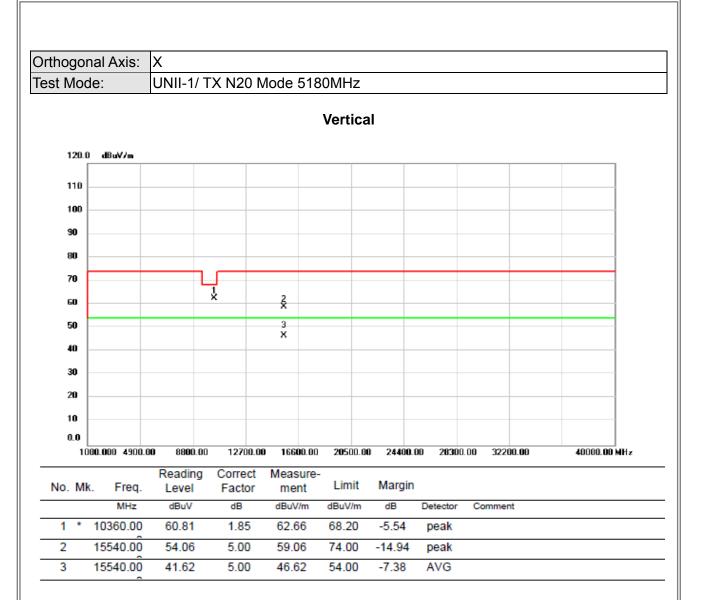












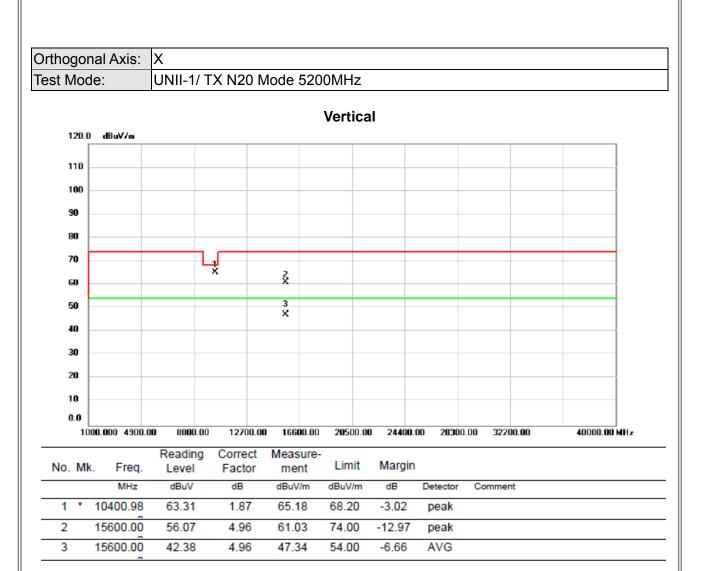






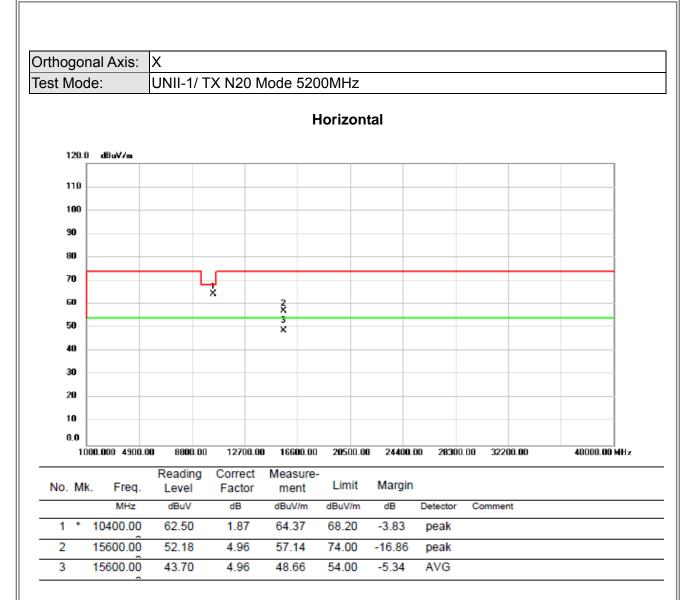






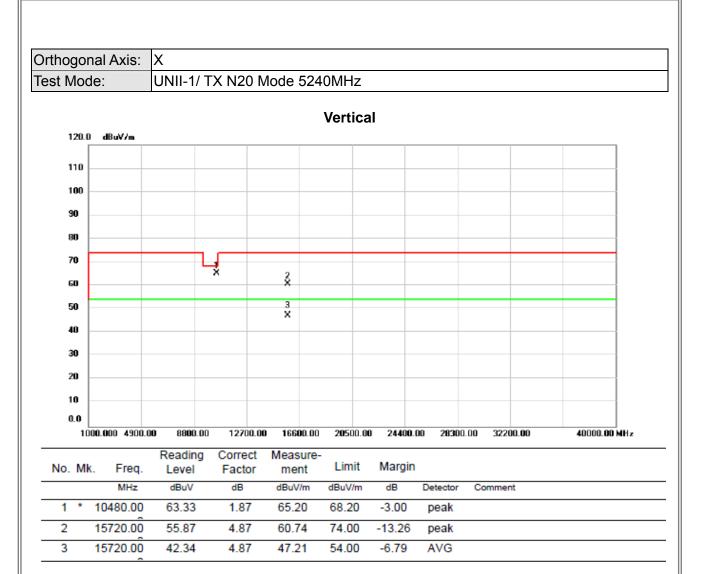






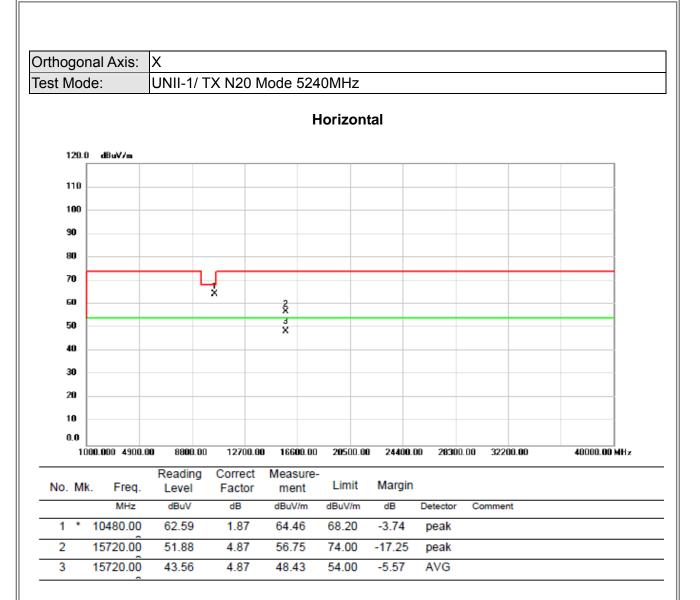






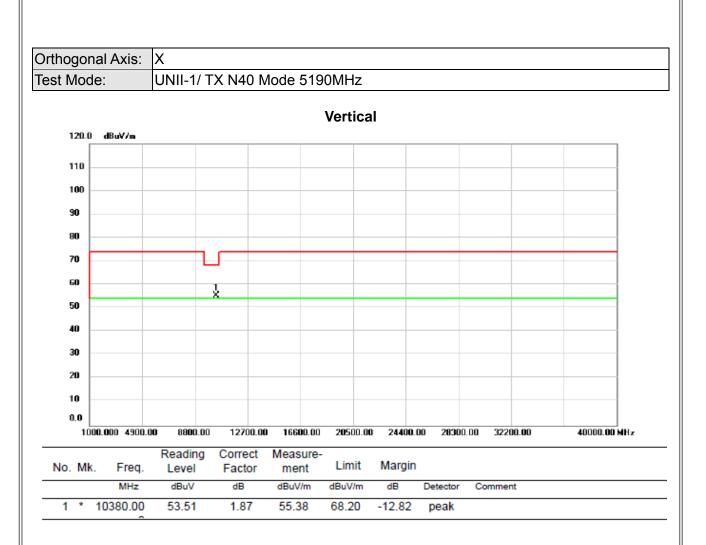






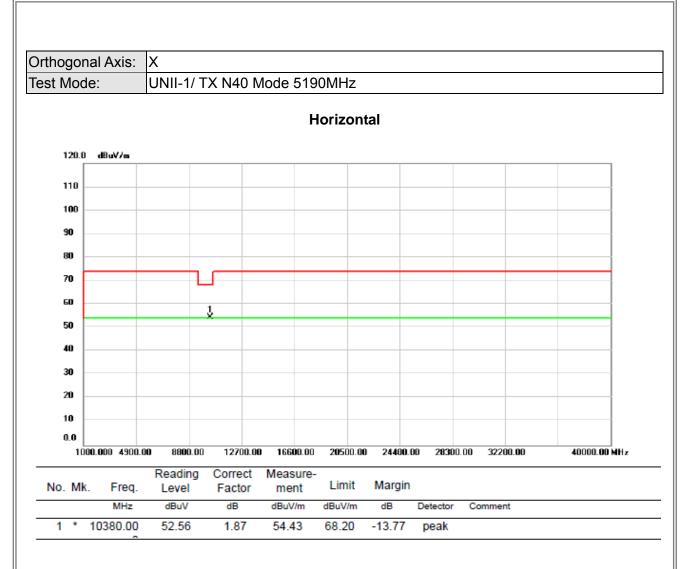






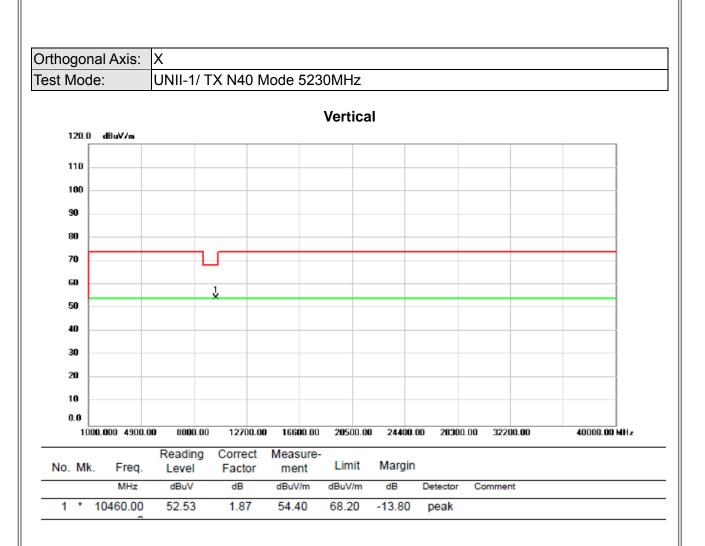






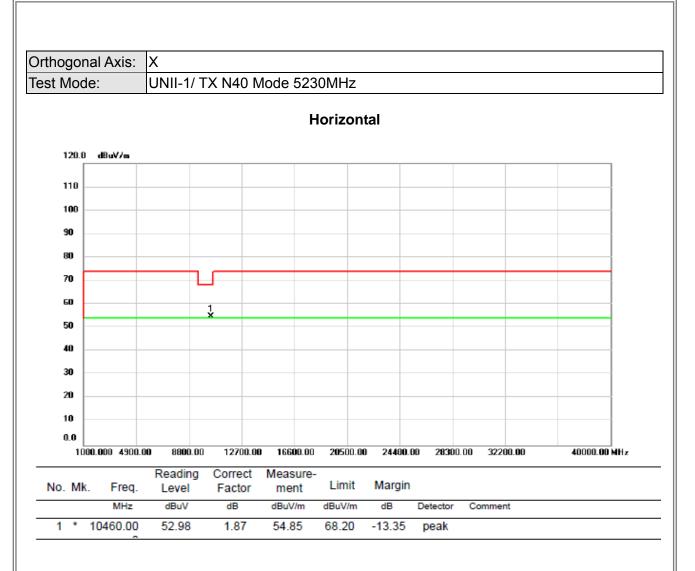






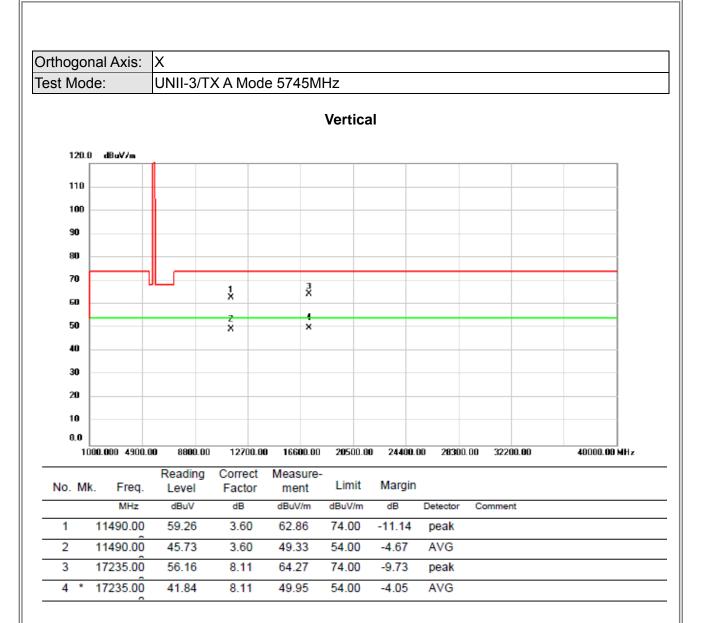






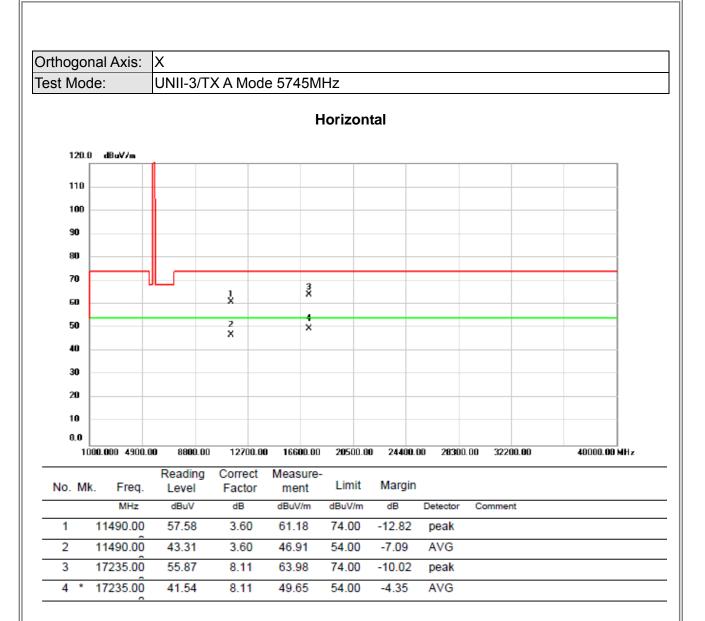






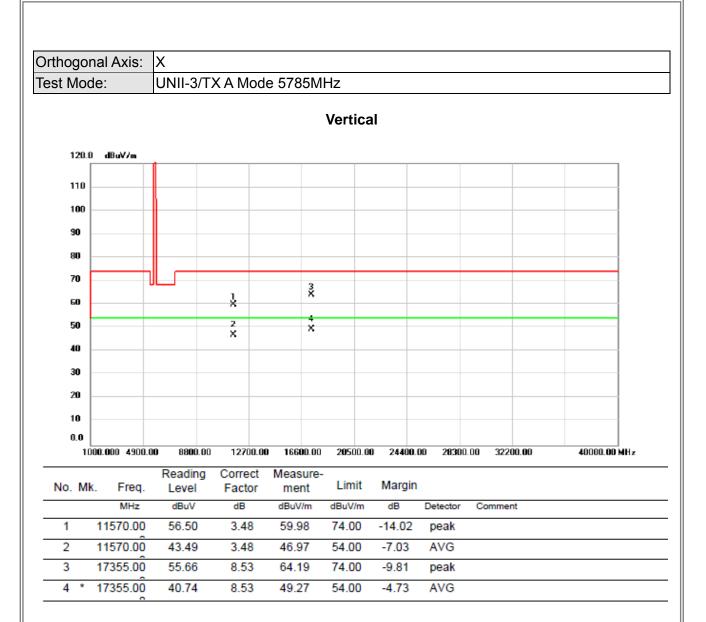






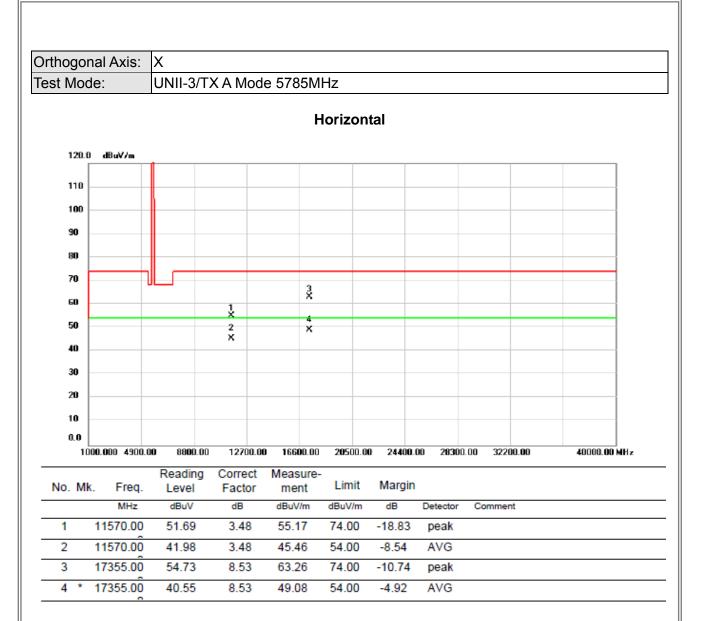






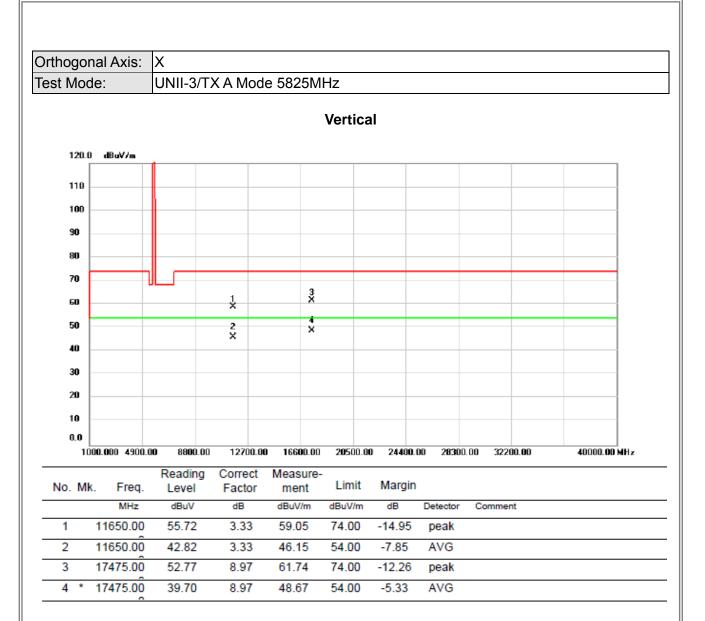






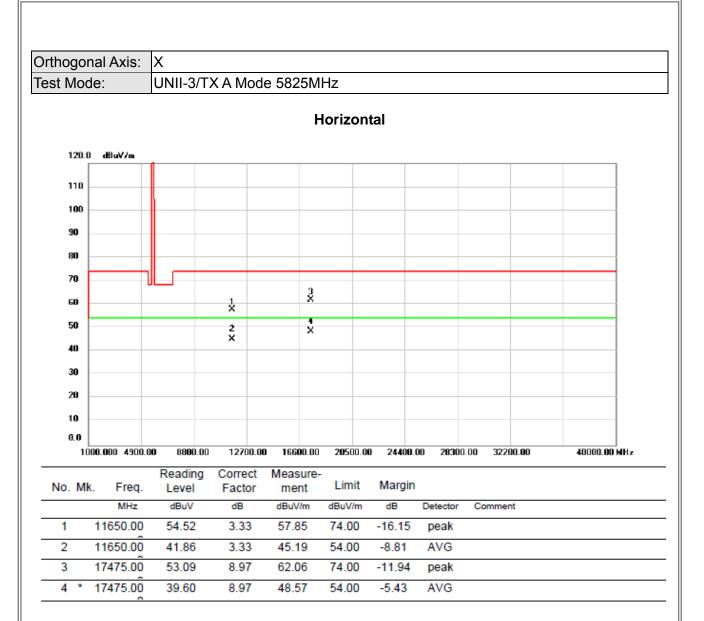






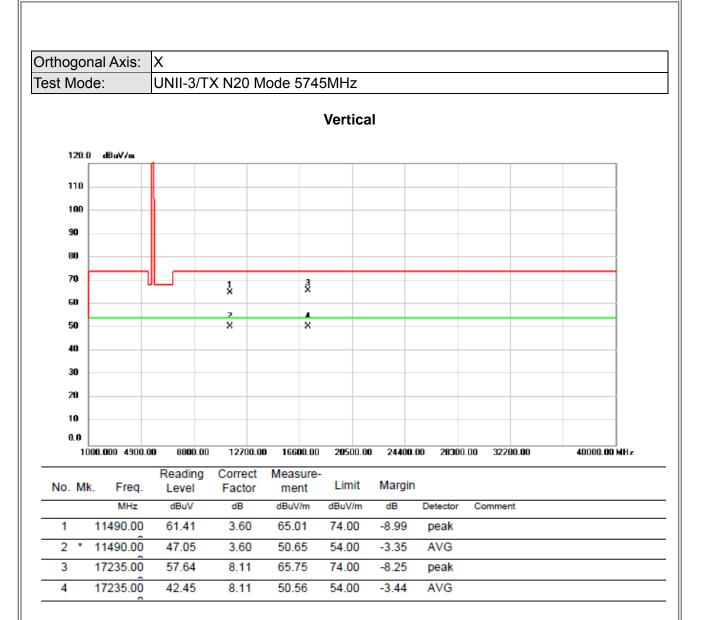






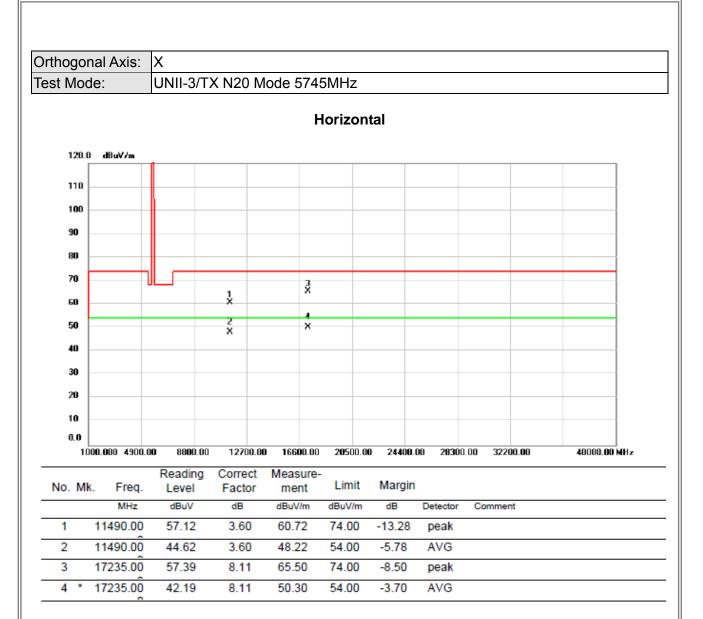






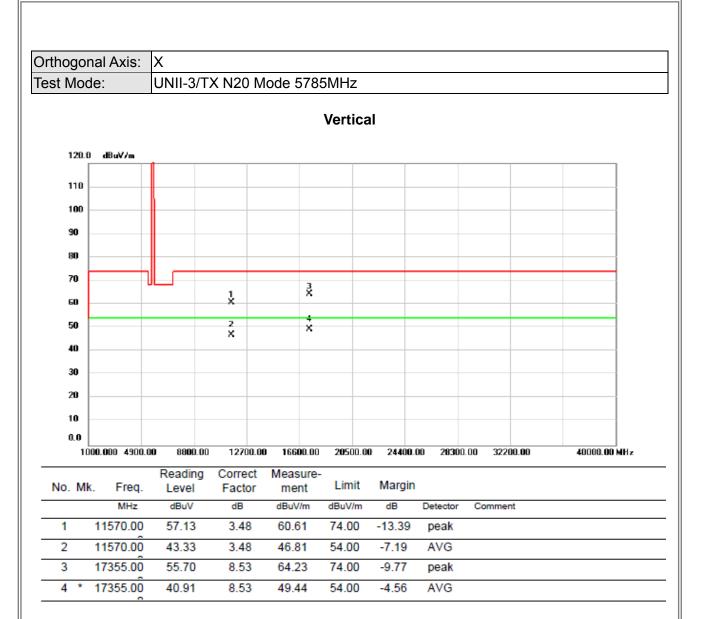






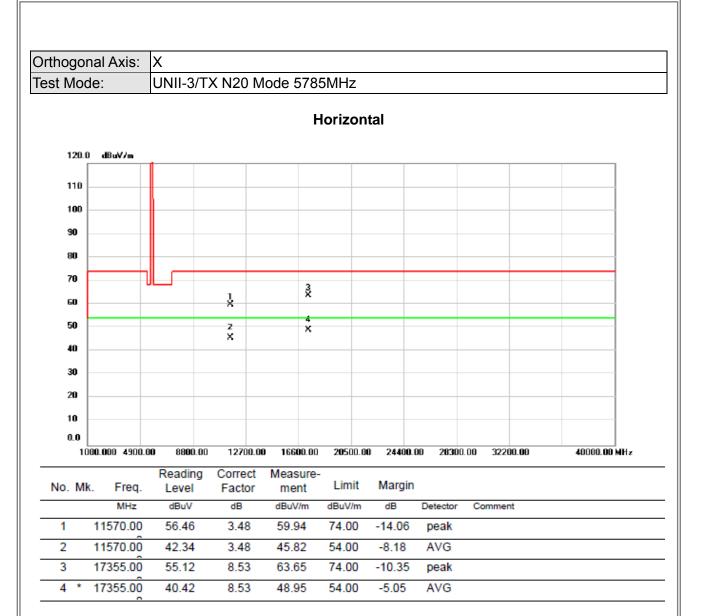






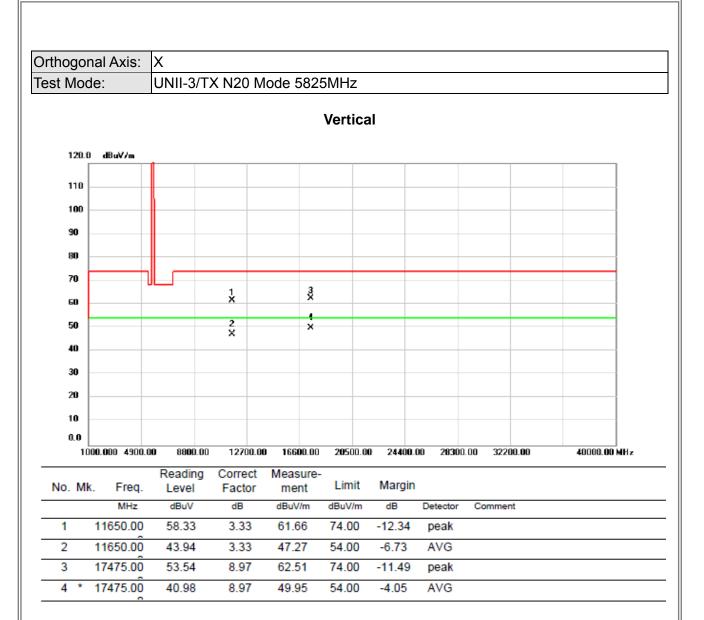






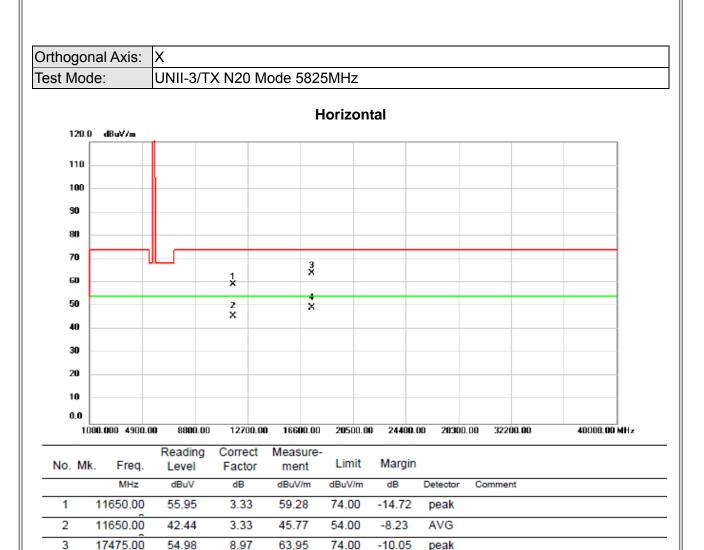












-4.72

54.00

AVG

4 *

17475.00

40.31

8.97

49.28



4 *

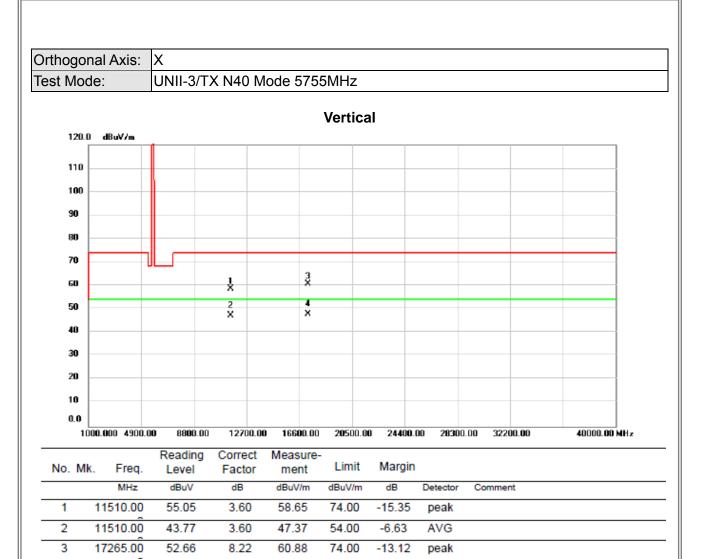
17265.00

39.73

8.22

47.95





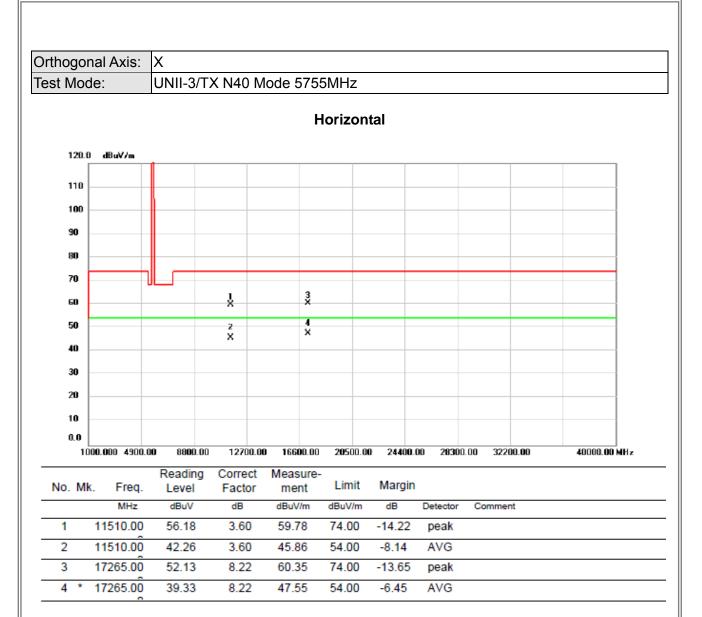
-6.05

54.00

AVG

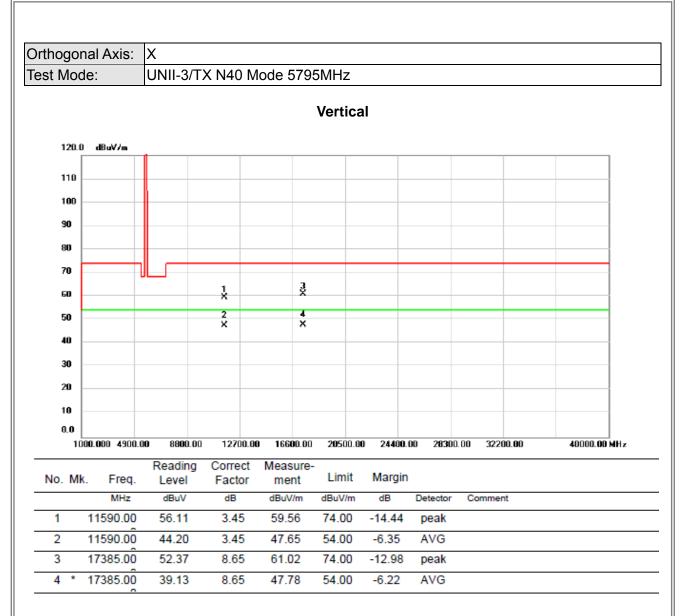






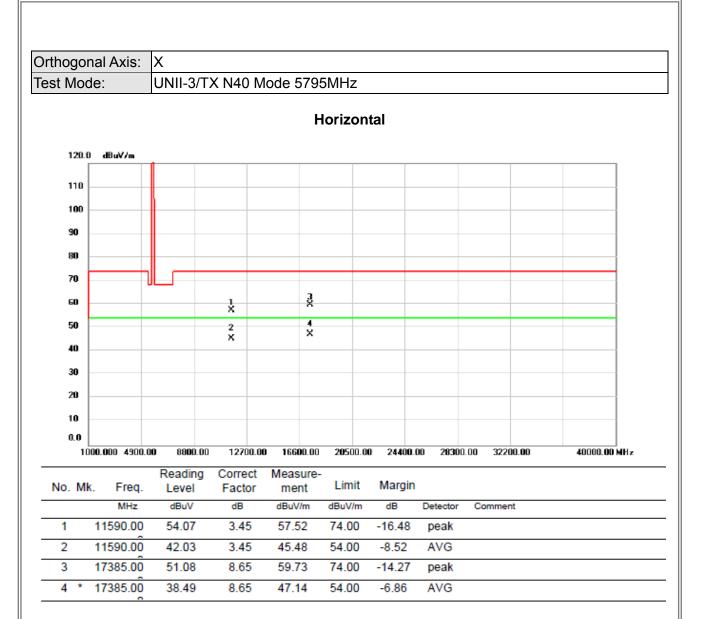






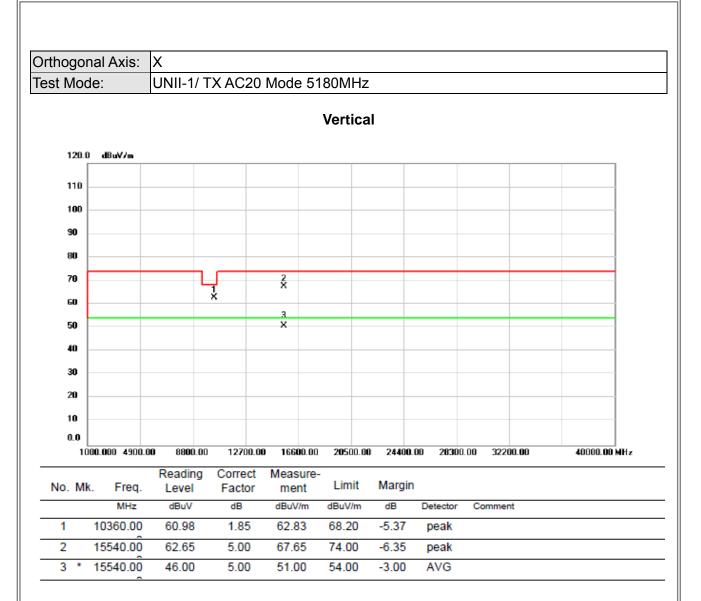






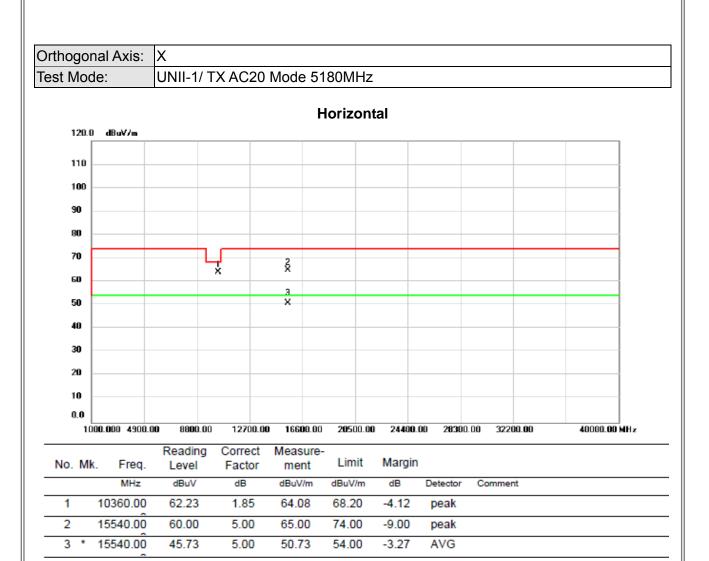






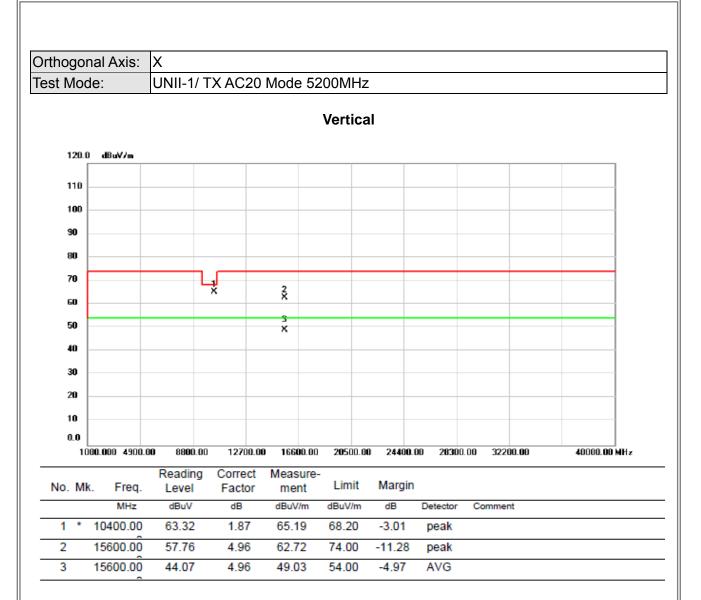






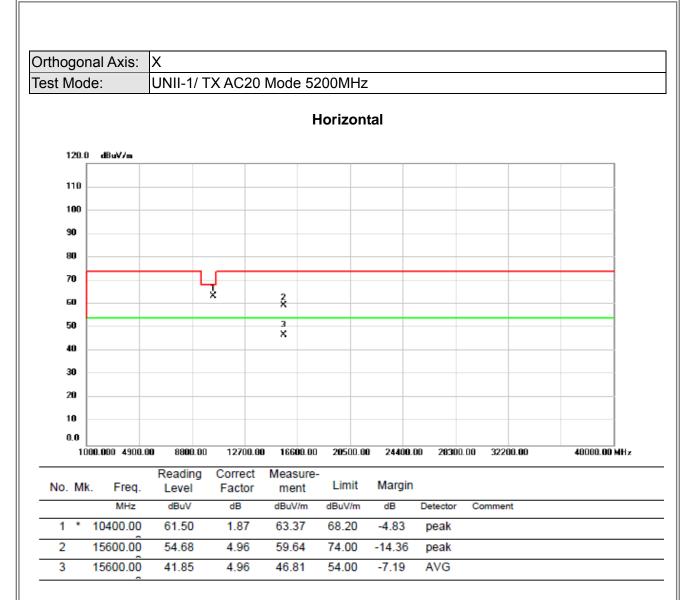






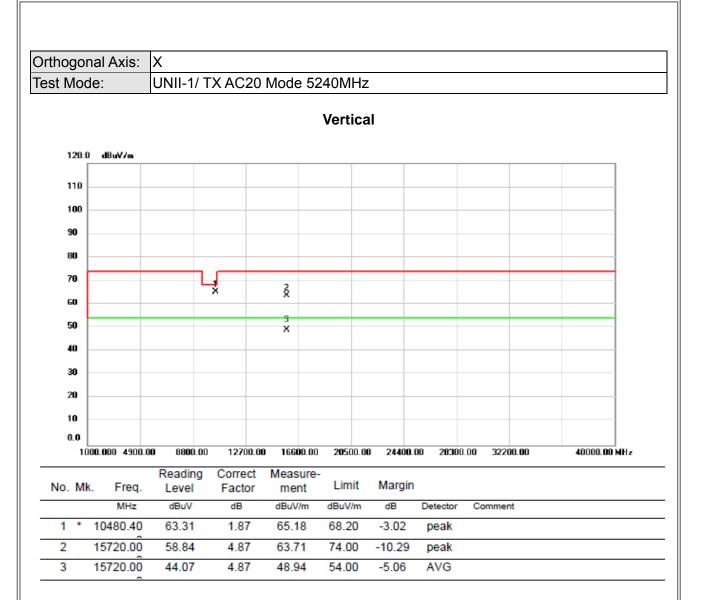






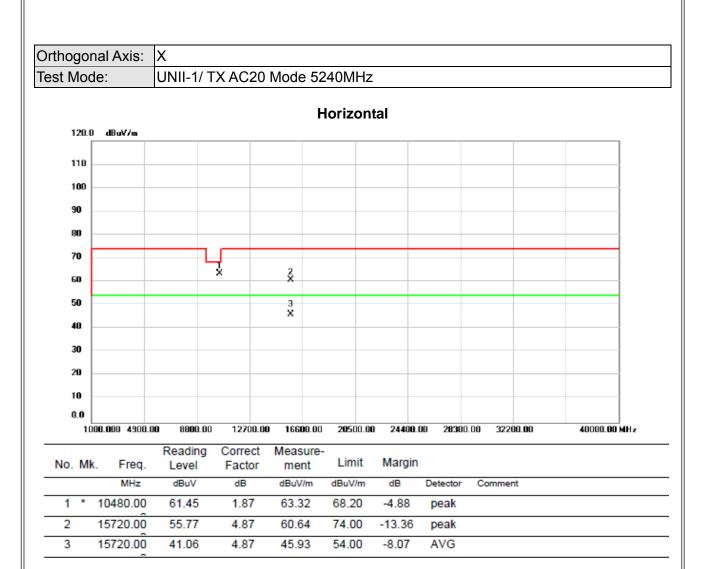






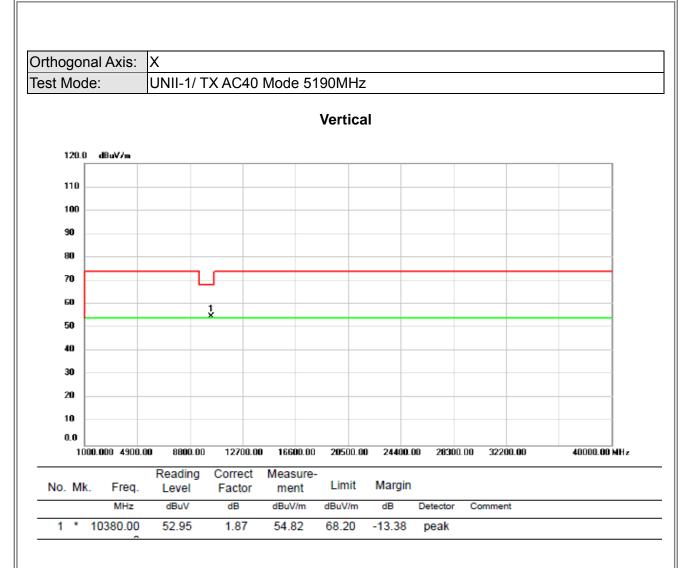






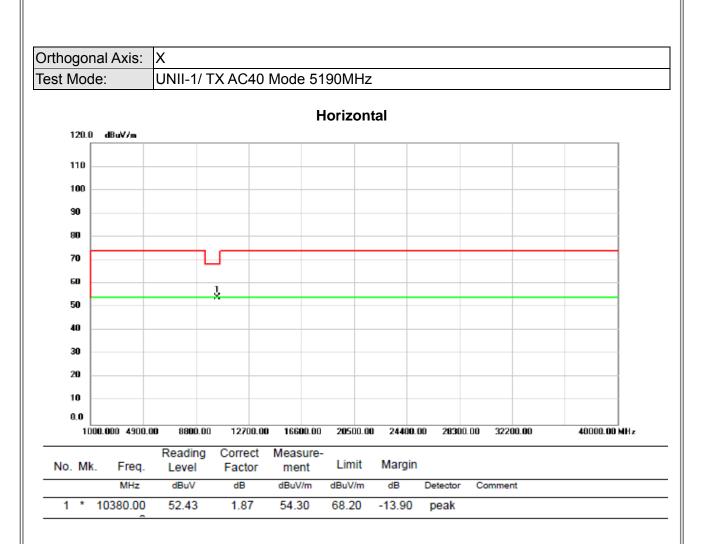






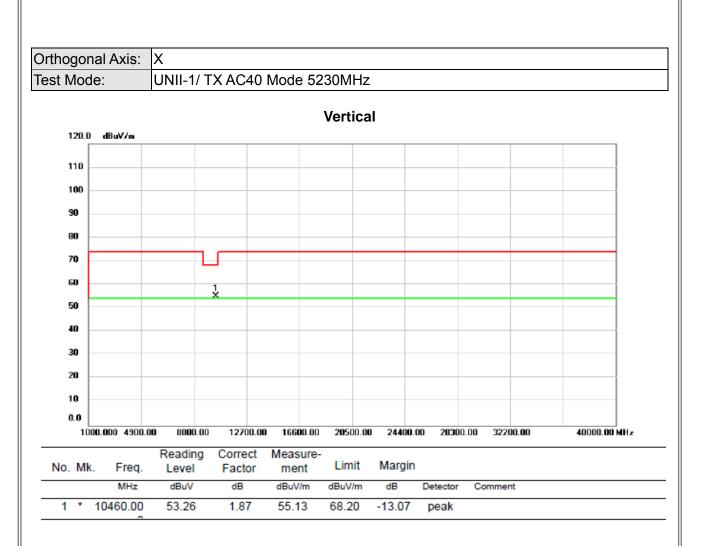






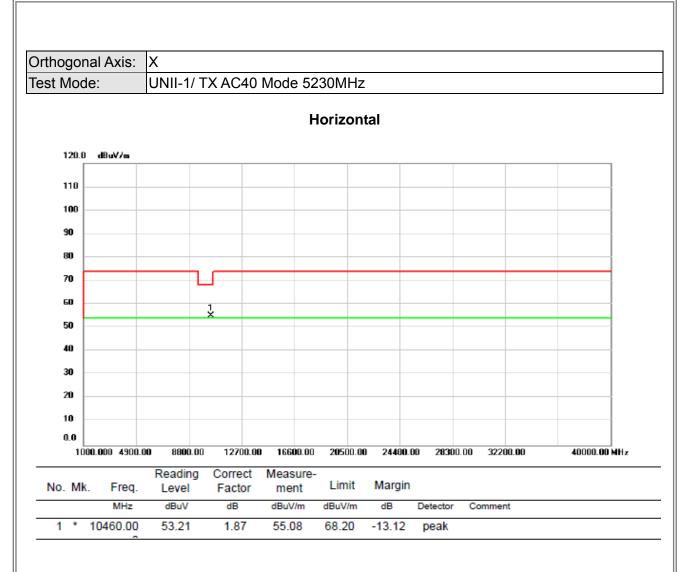






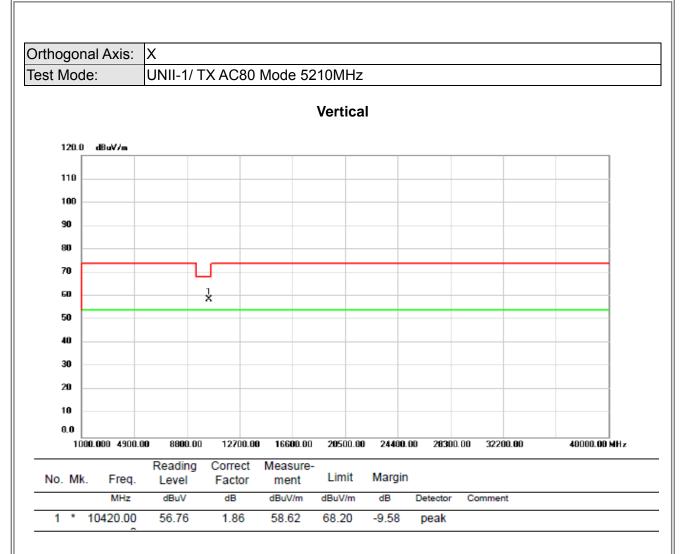






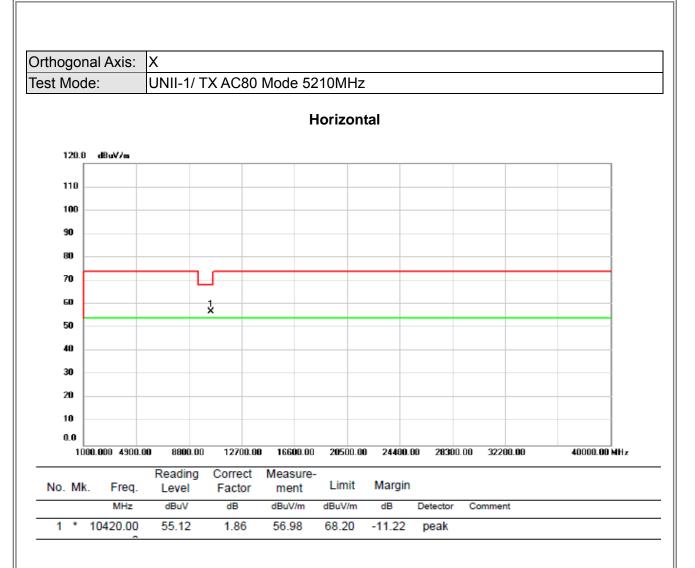






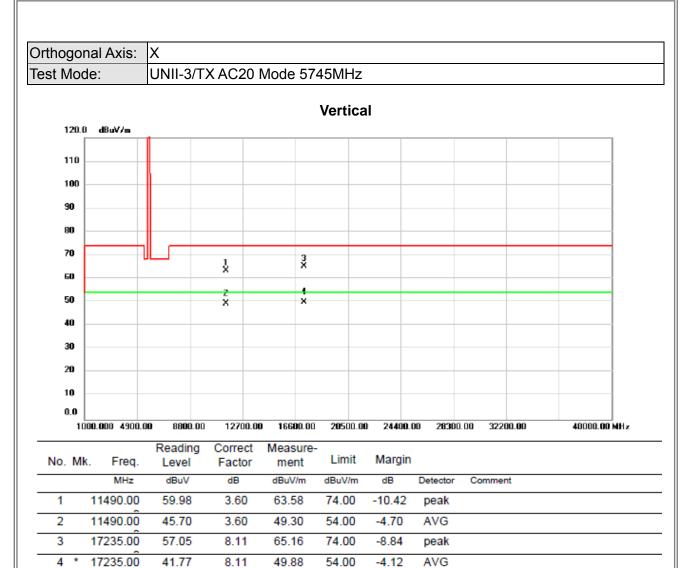






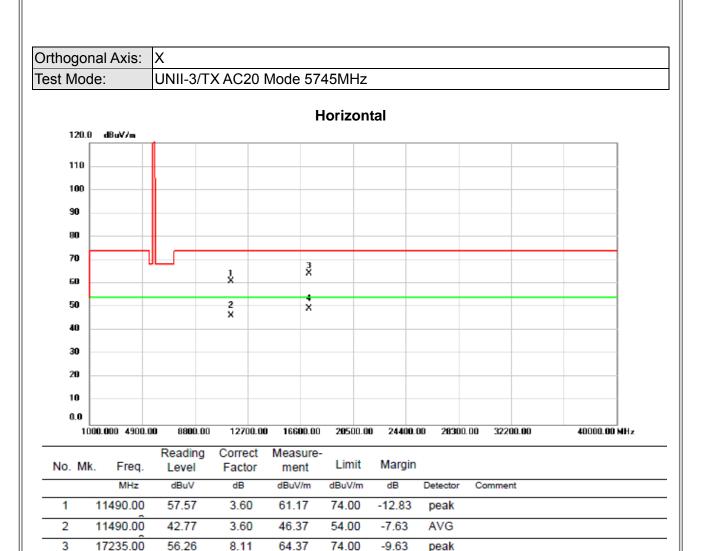












-4.70

54.00

AVG

4 *

17235.00

41.19

8.11

49.30



4 *

17355.00

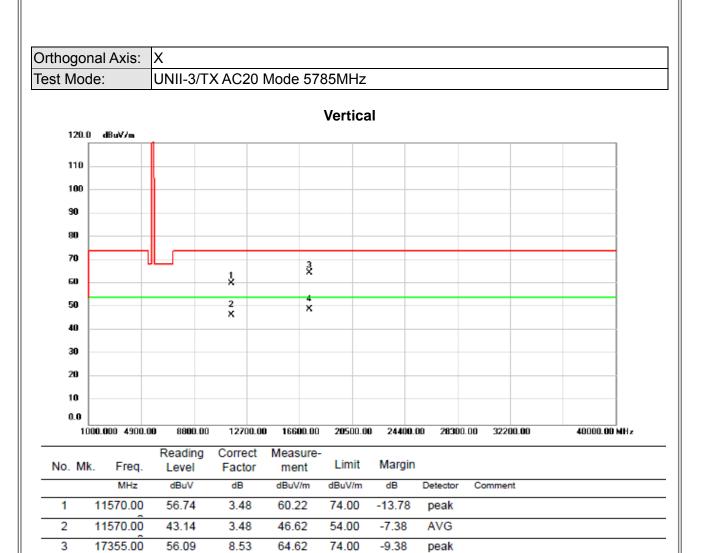
40.42

8.53

48.95

54.00



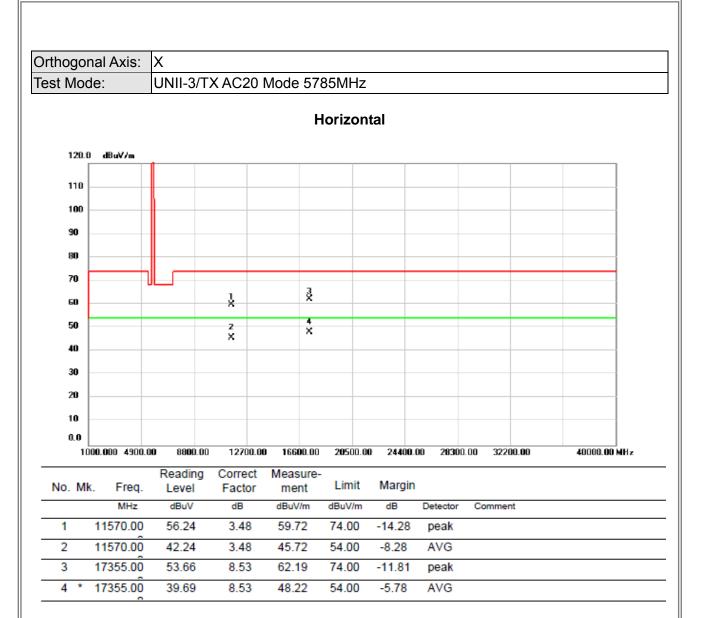


AVG

-5.05

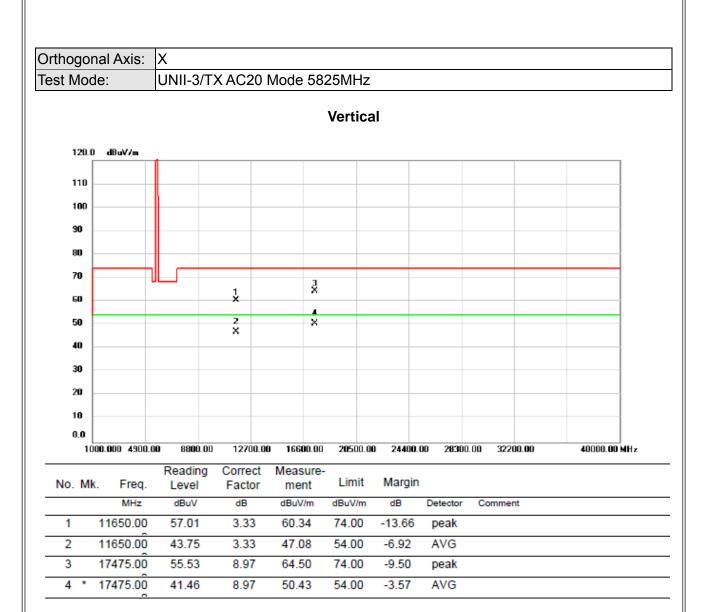






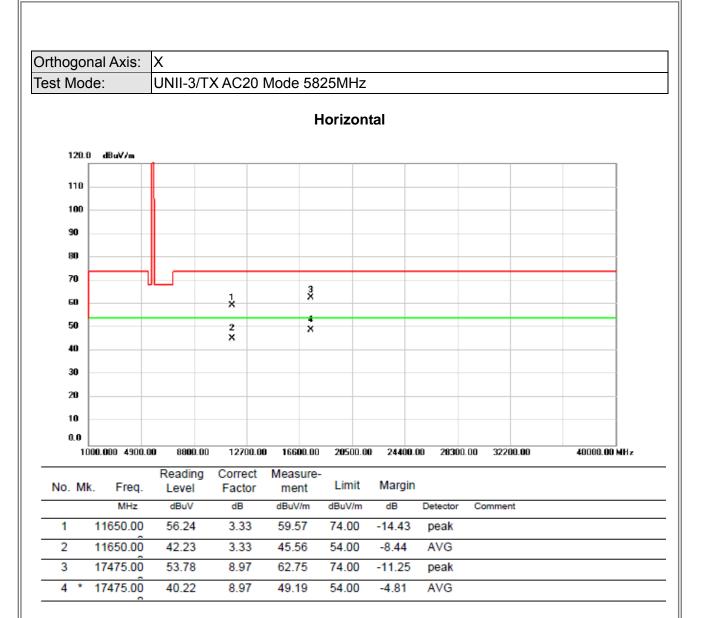






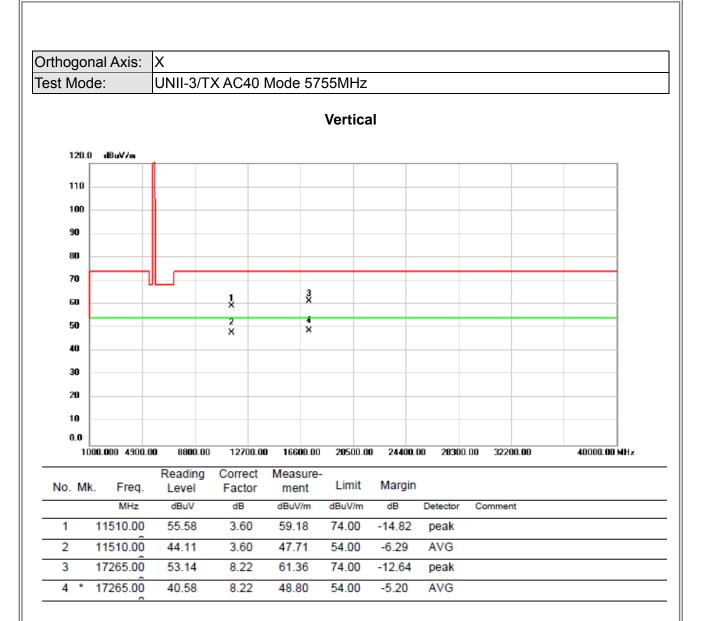




















4 *

17385.00

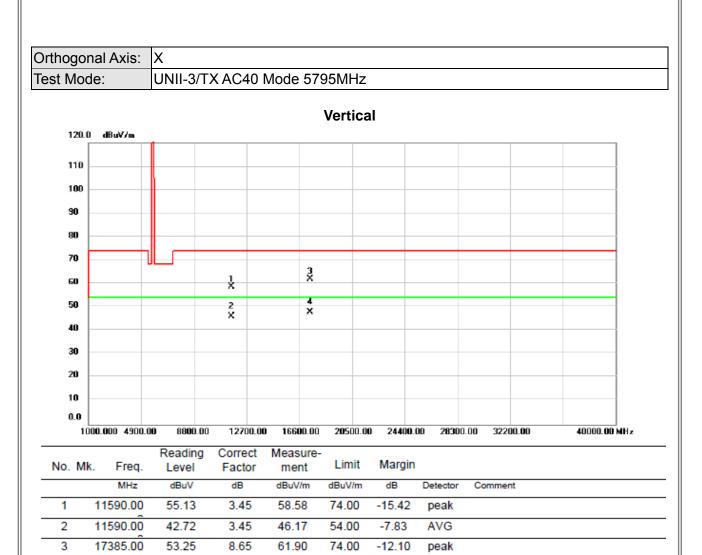
39.24

8.65

47.89

54.00



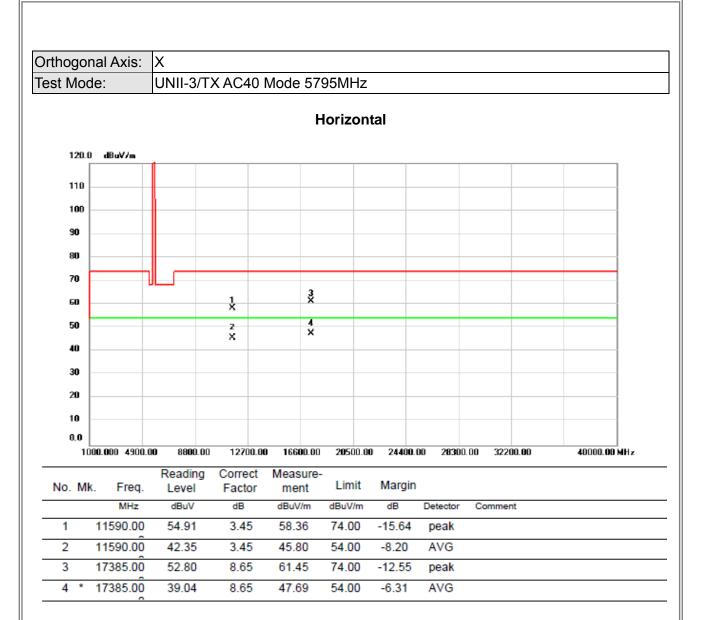


AVG

-6.11

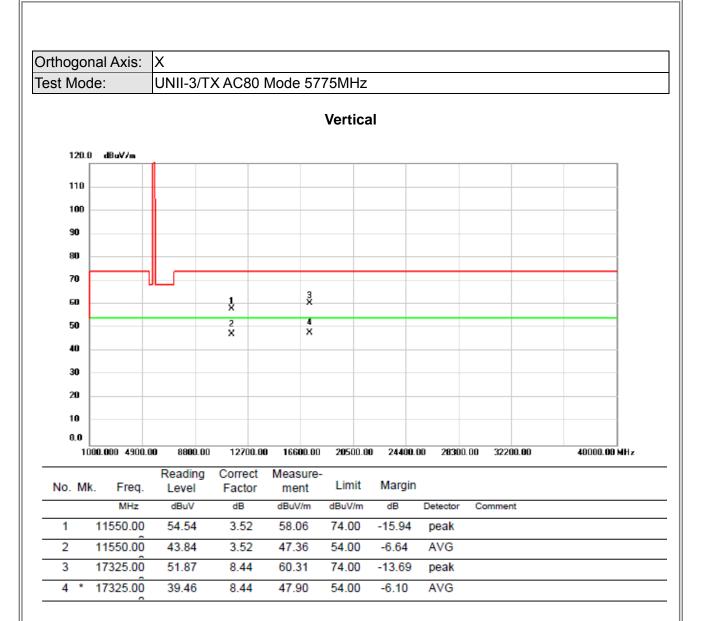






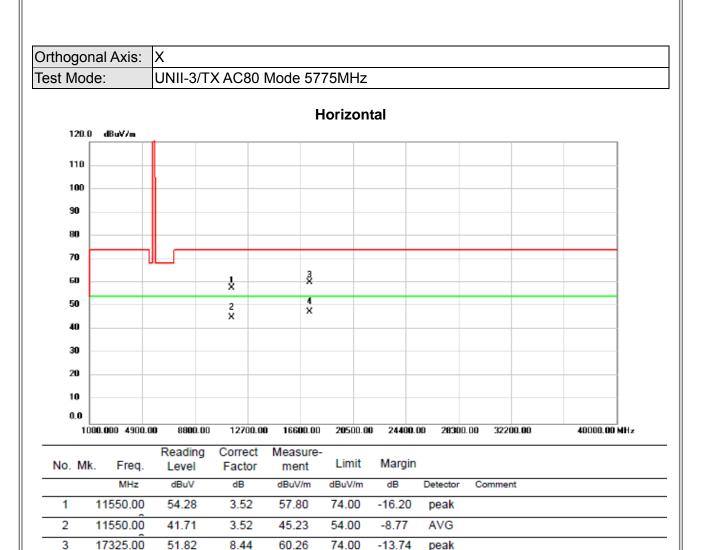












-6.55

54.00

AVG

4 *

17325.00

39.01

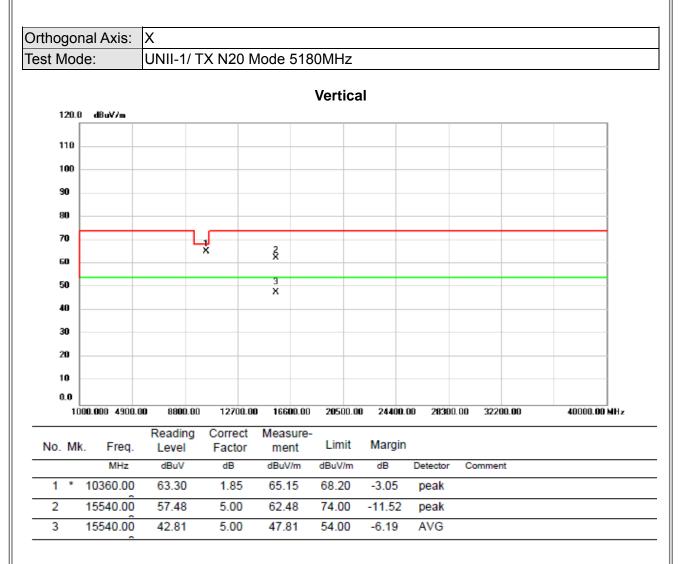
8.44

47.45





Beamforming



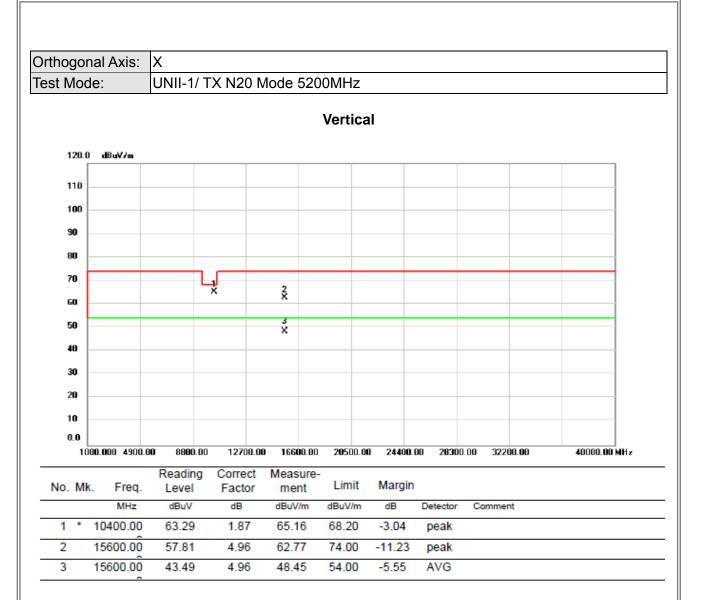






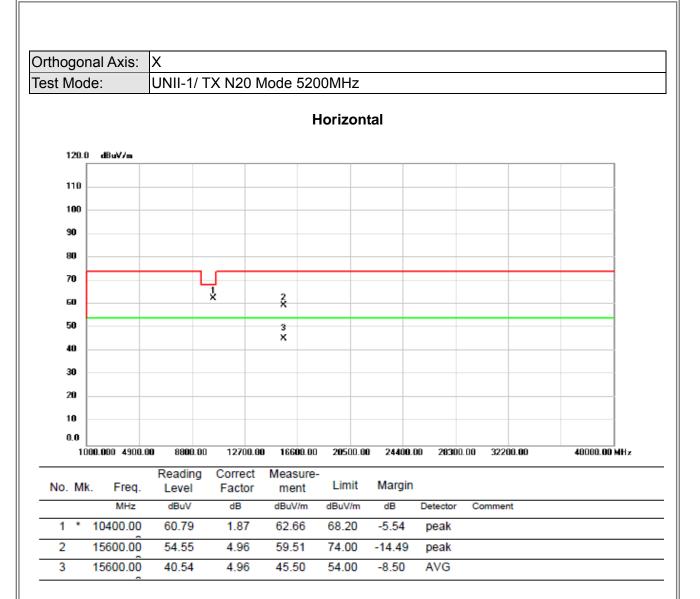






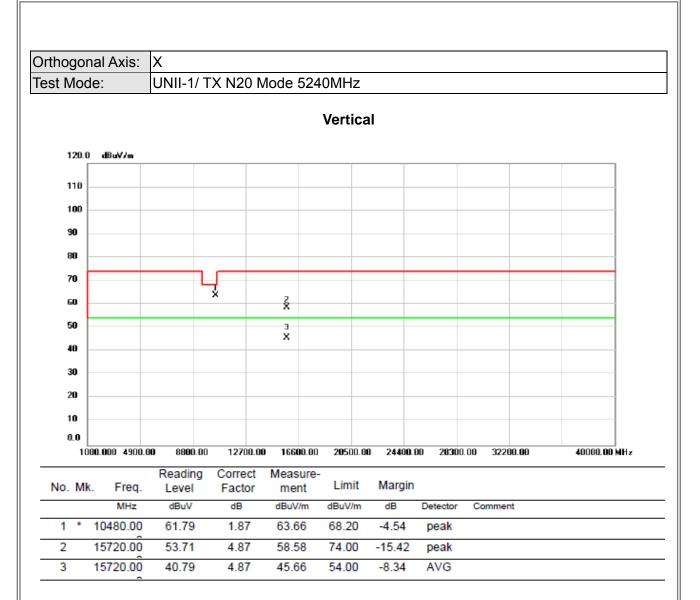












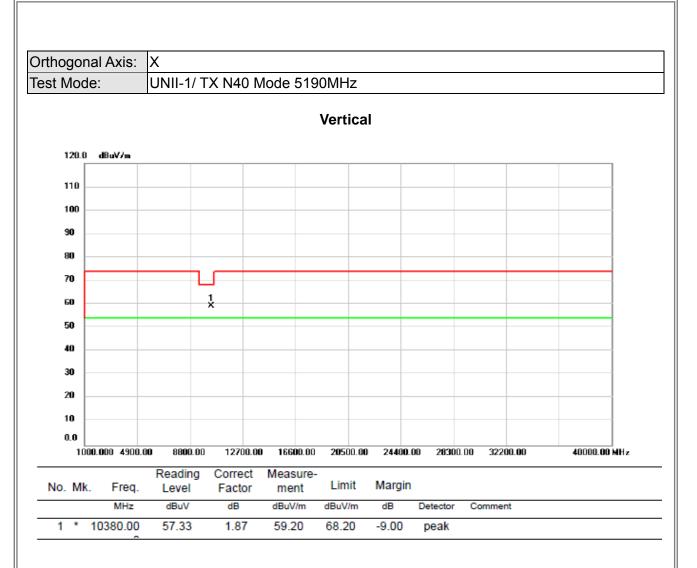






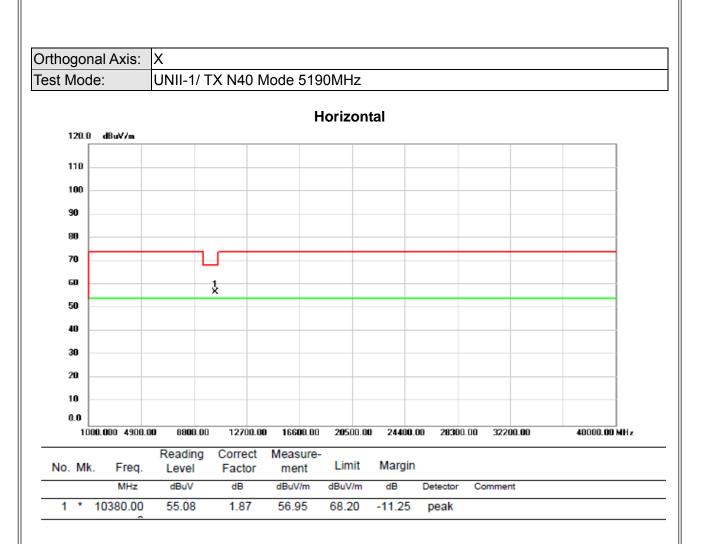






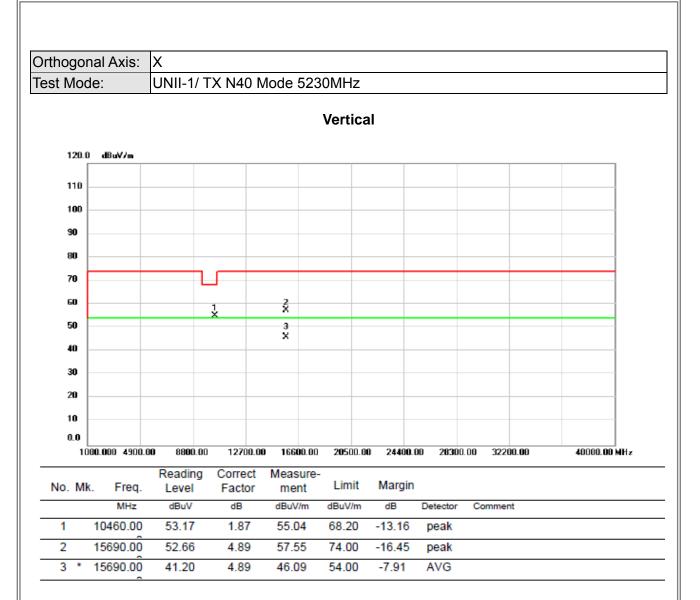












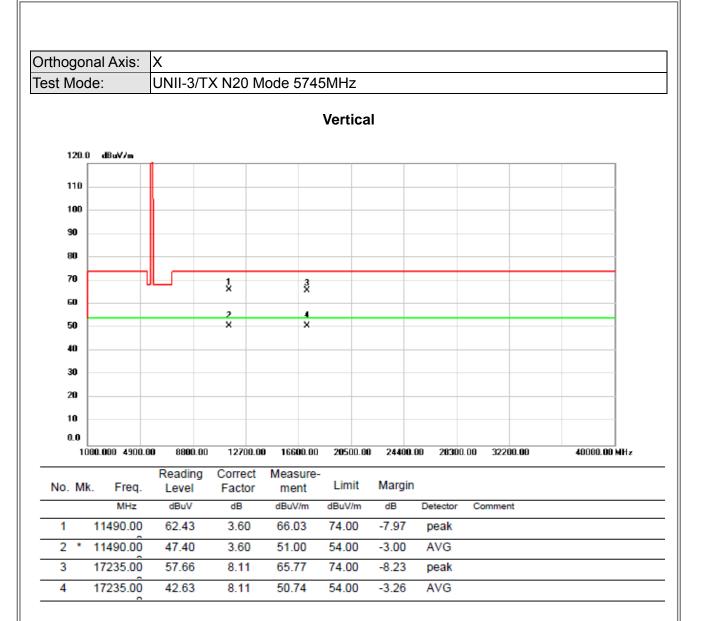






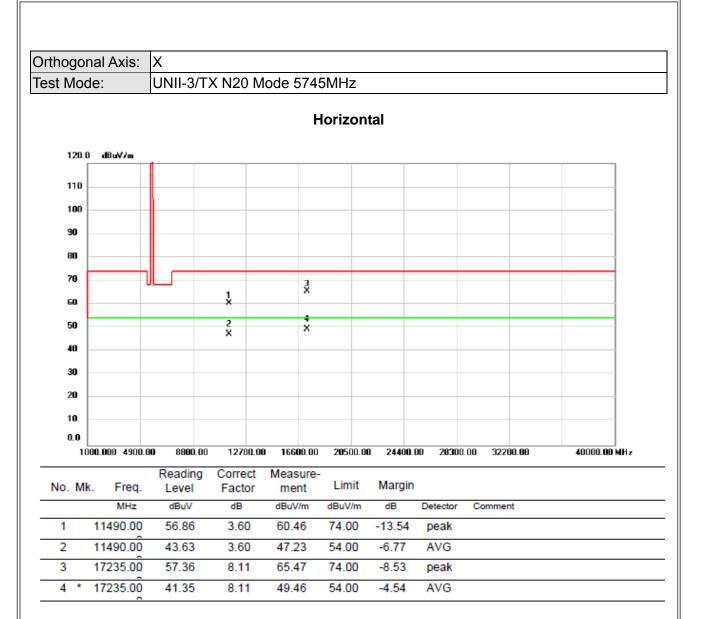














4 *

17355.00

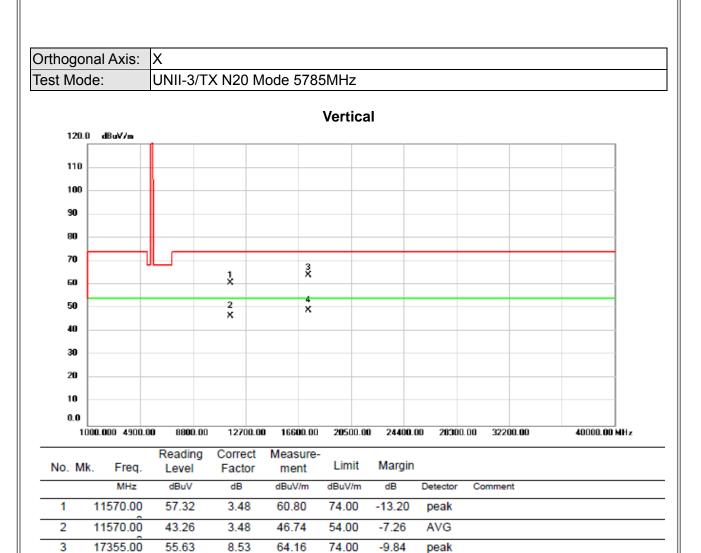
40.56

49.09

54.00

8.53





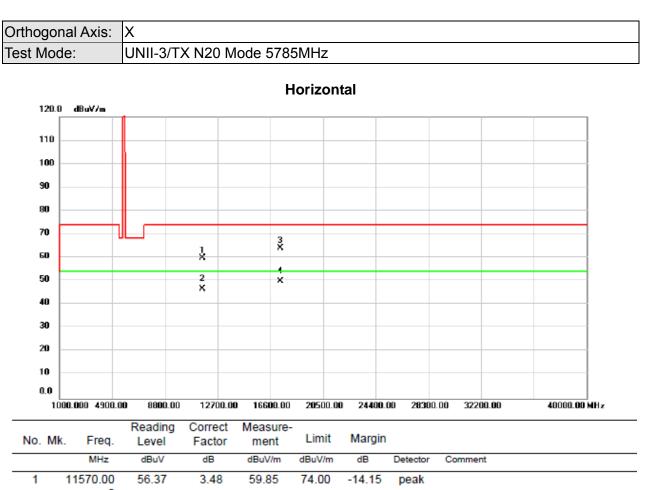
AVG

-4.91



_

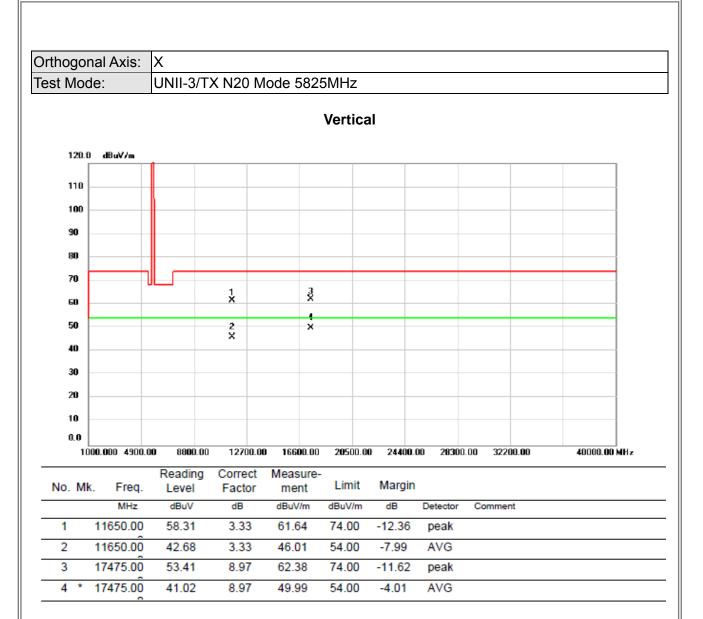




		0201	00		0000	02	Detteolor	oominent
1	11570.00	56.37	3.48	59.85	74.00	-14.15	peak	
2	11570.00	43.12	3.48	46.60	54.00	-7.40	AVG	
3	17355.00	55.47	8.53	64.00	74.00	-10.00	peak	
4 *	17355.00	41.35	8.53	49.88	54.00	-4.12	AVG	

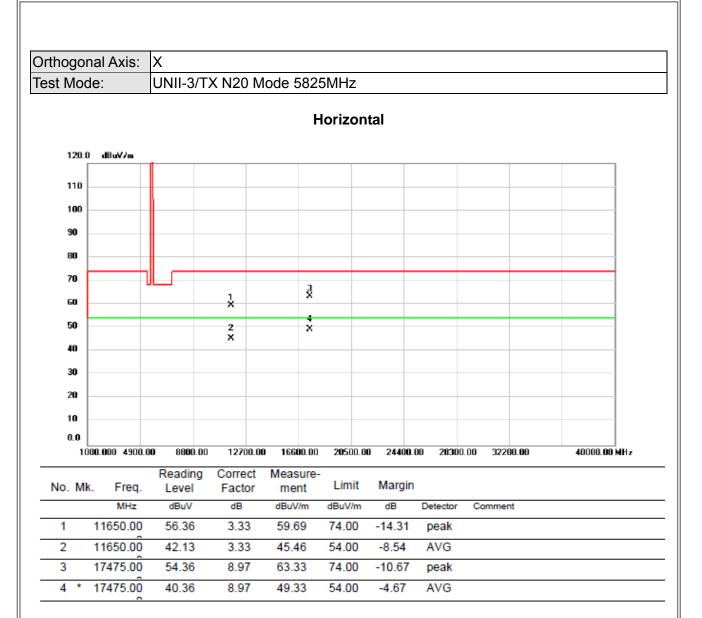






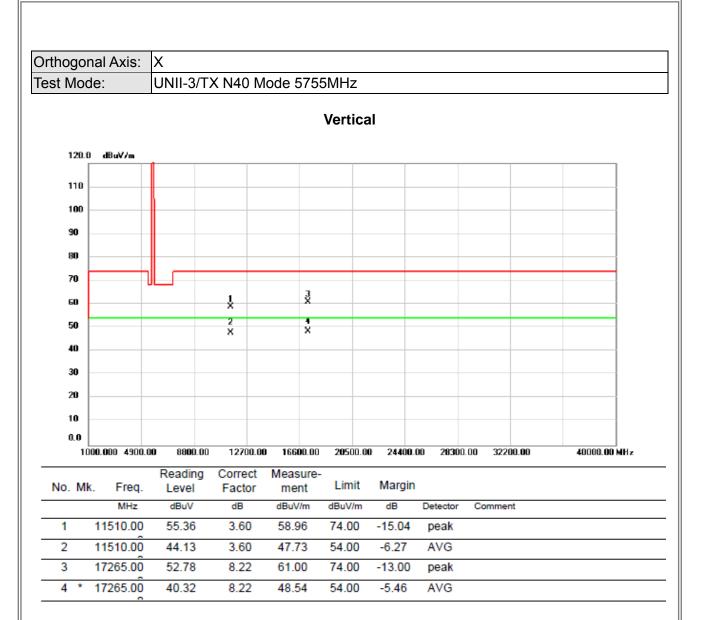






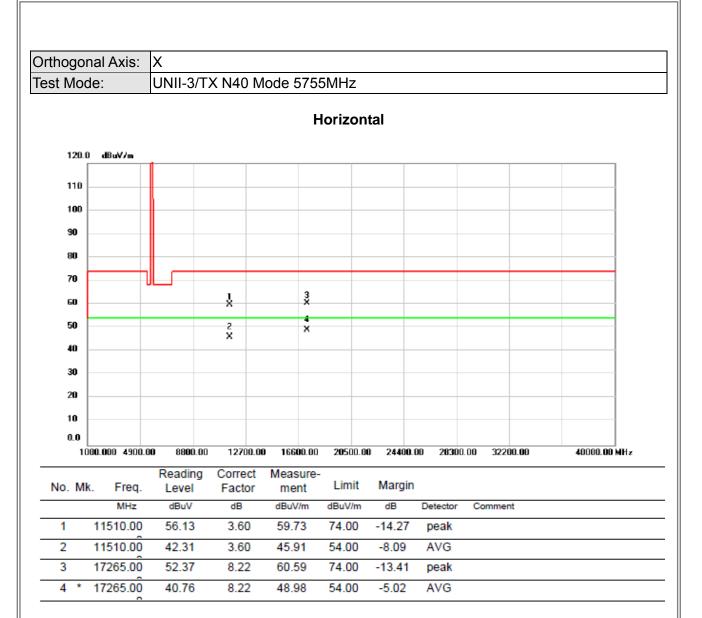












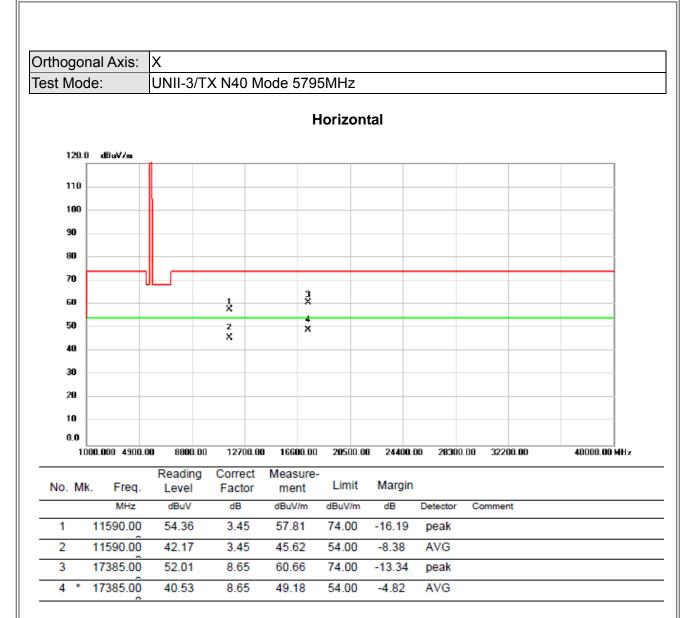






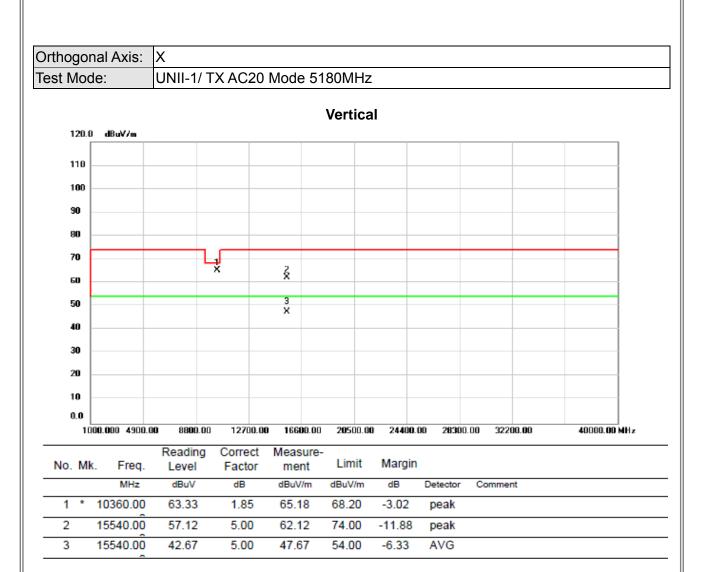






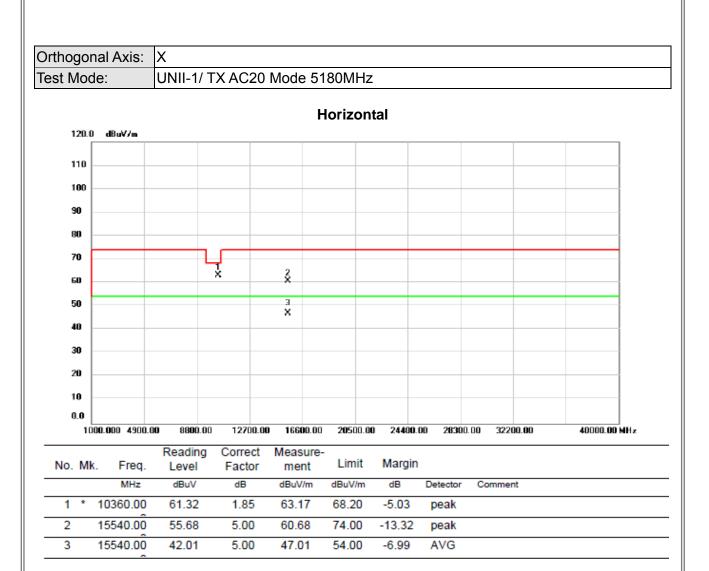






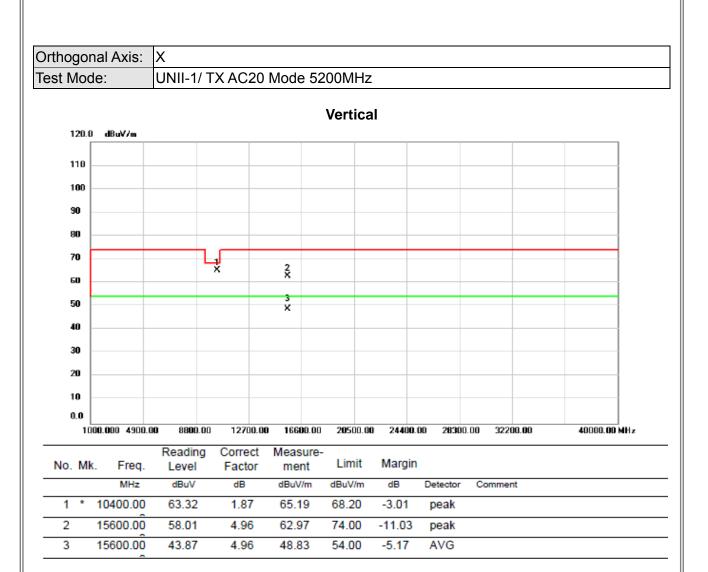






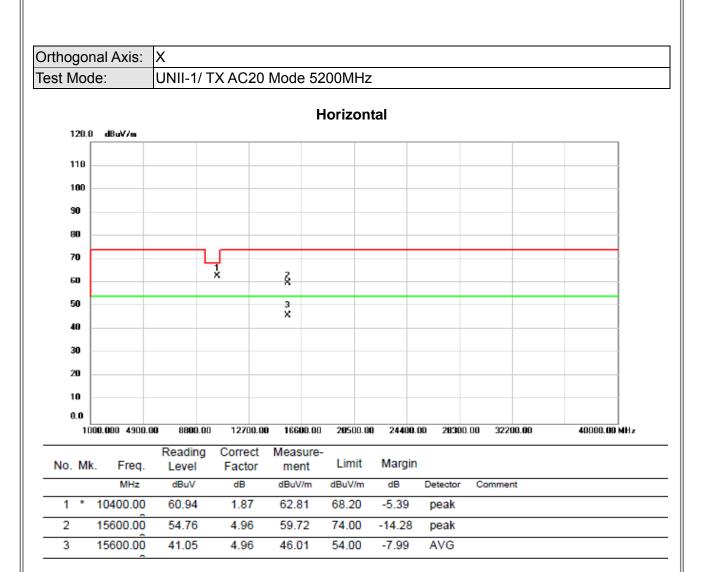






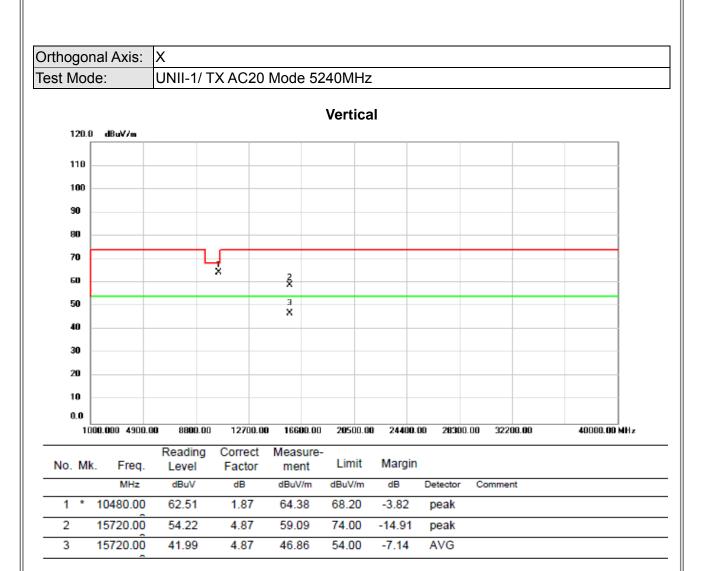






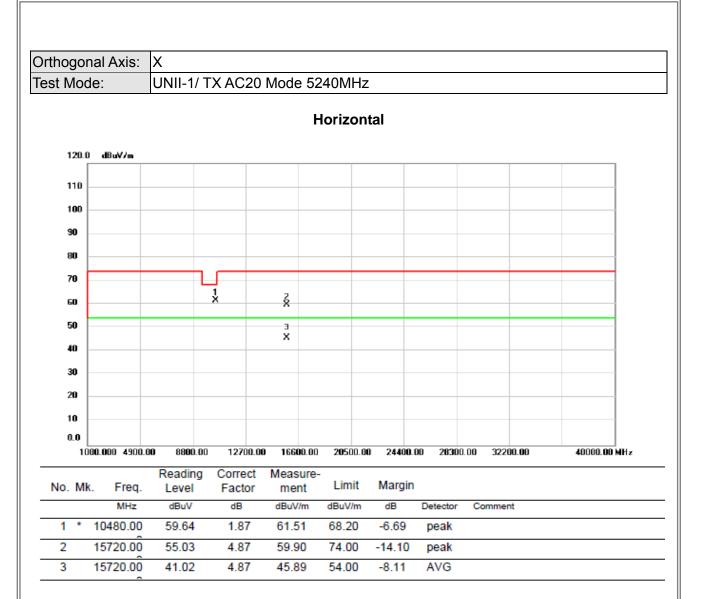






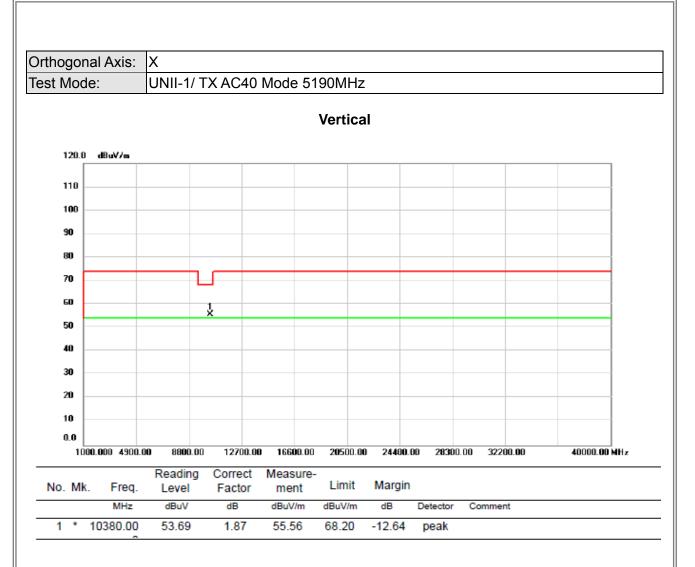






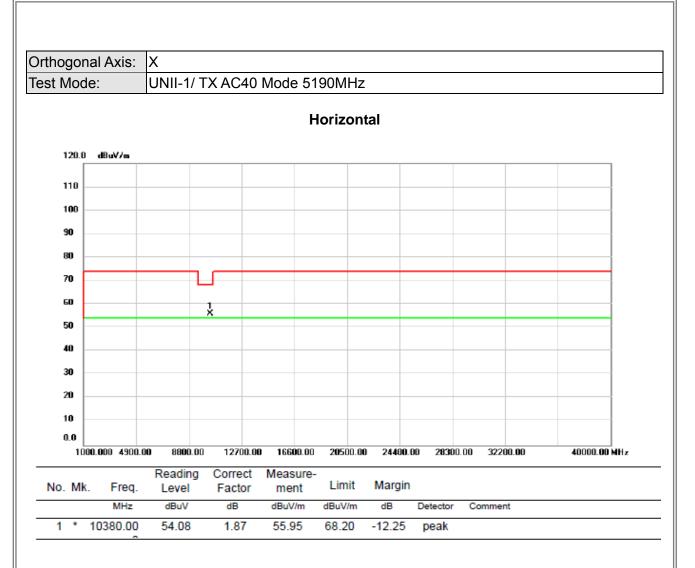






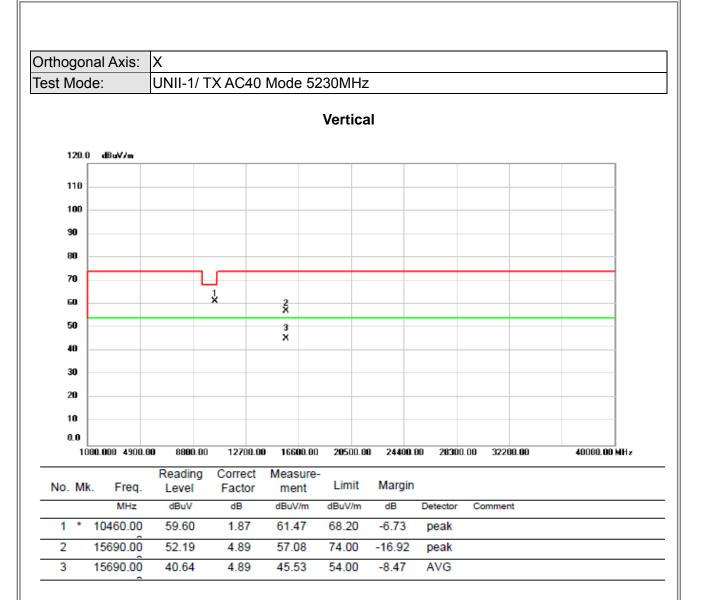






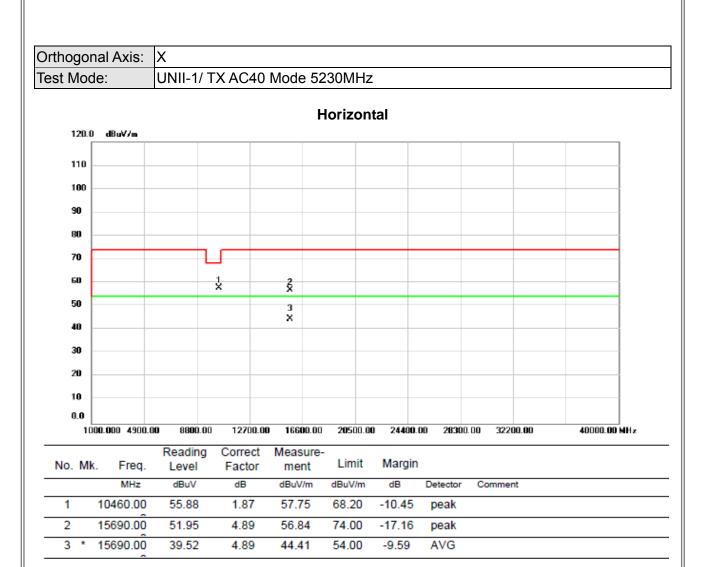






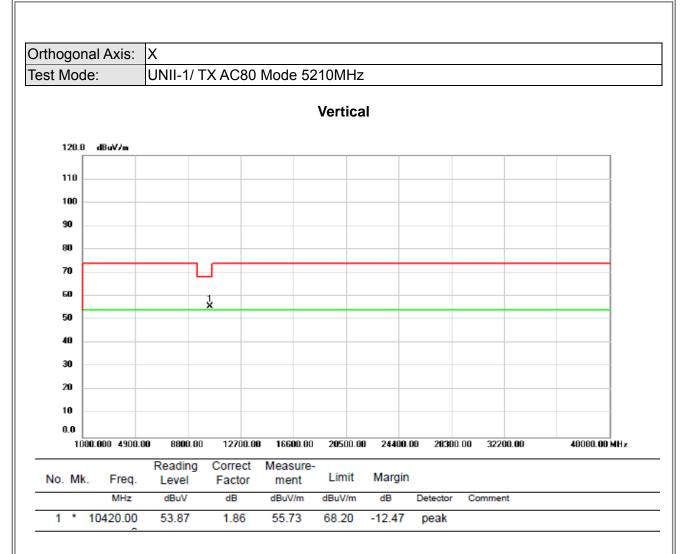






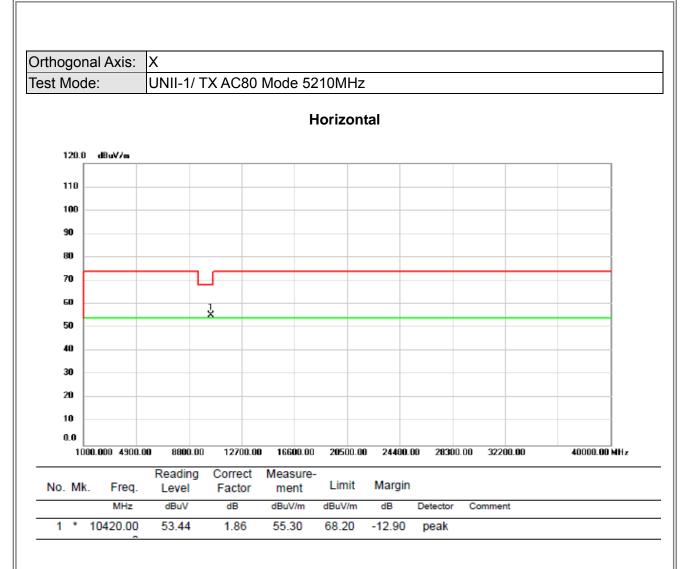






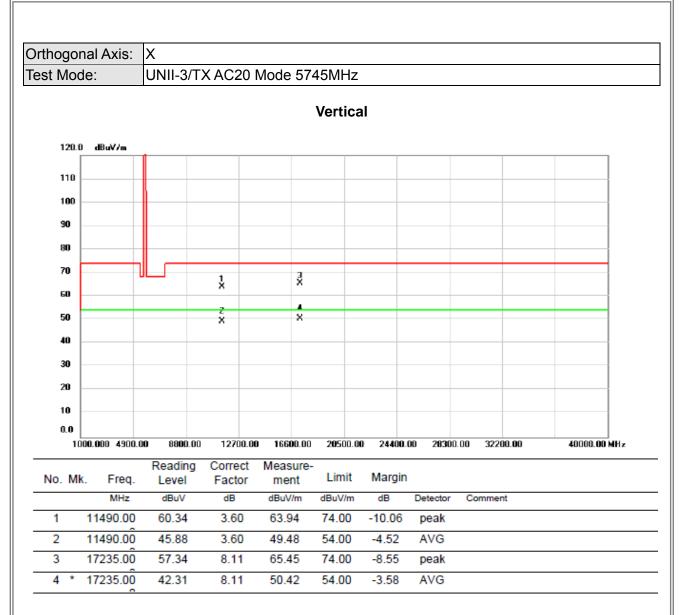






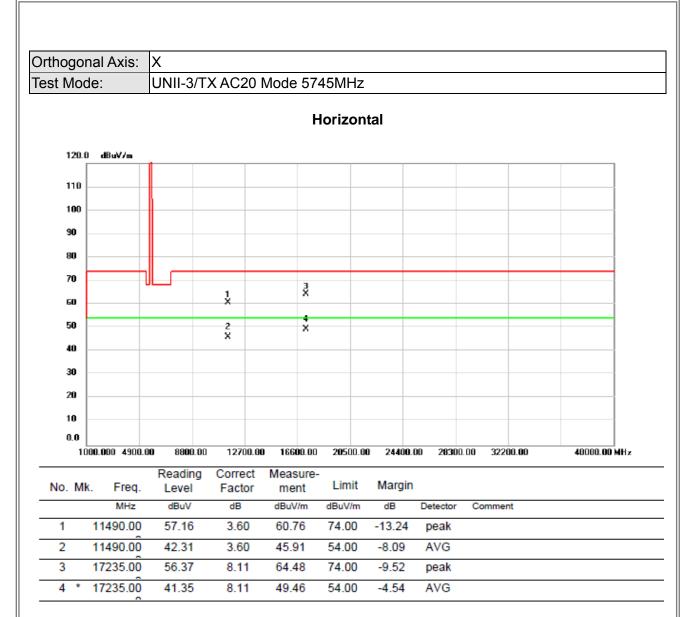






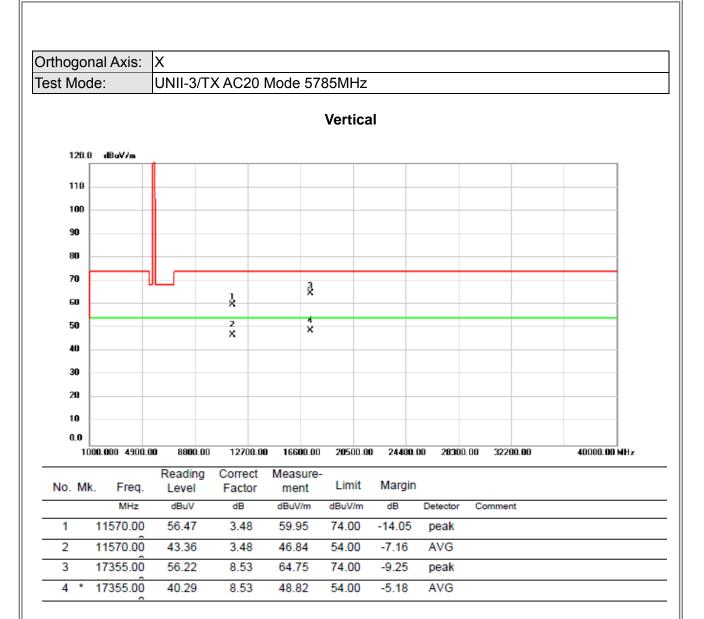






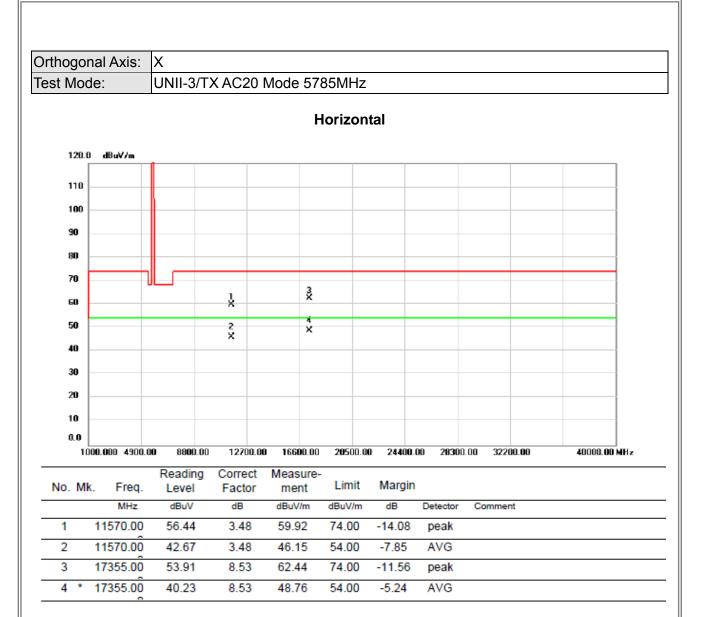






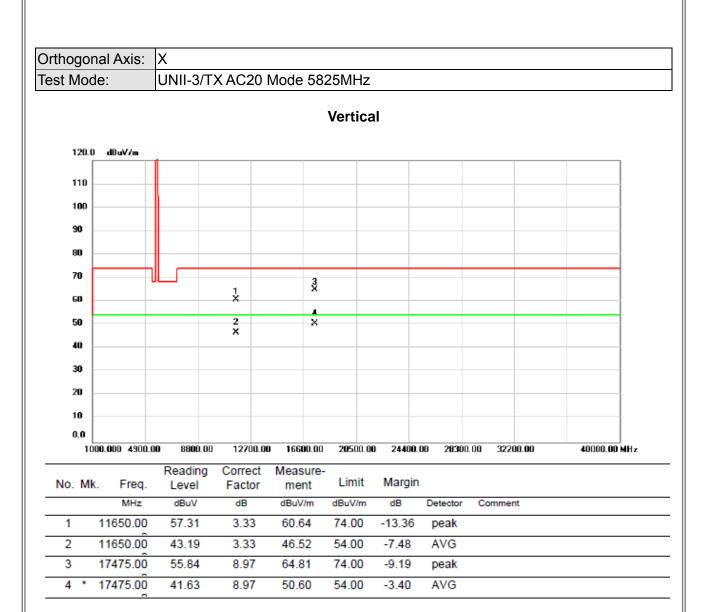






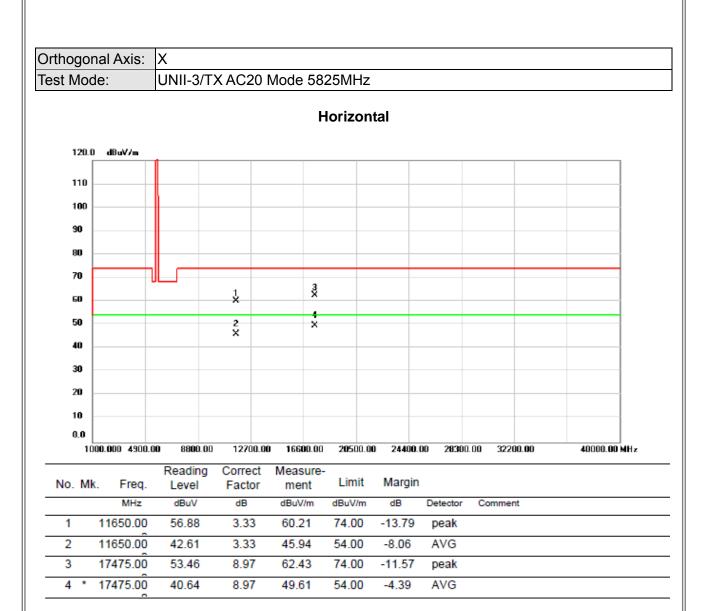






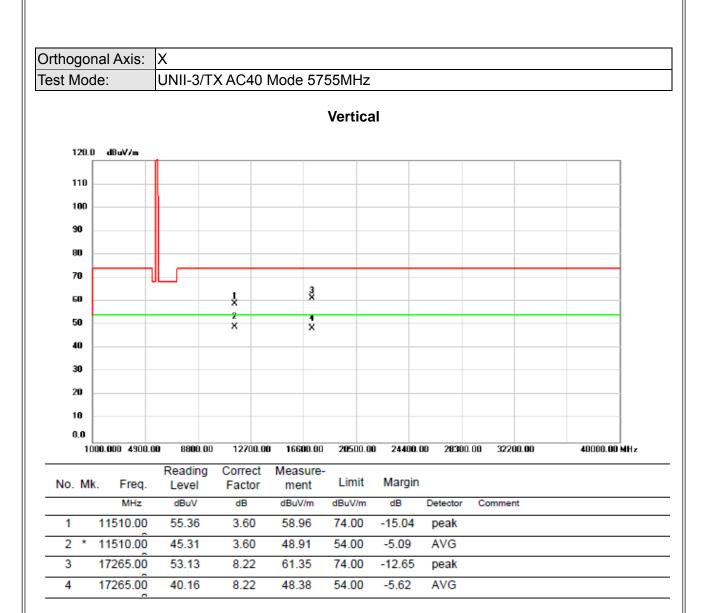






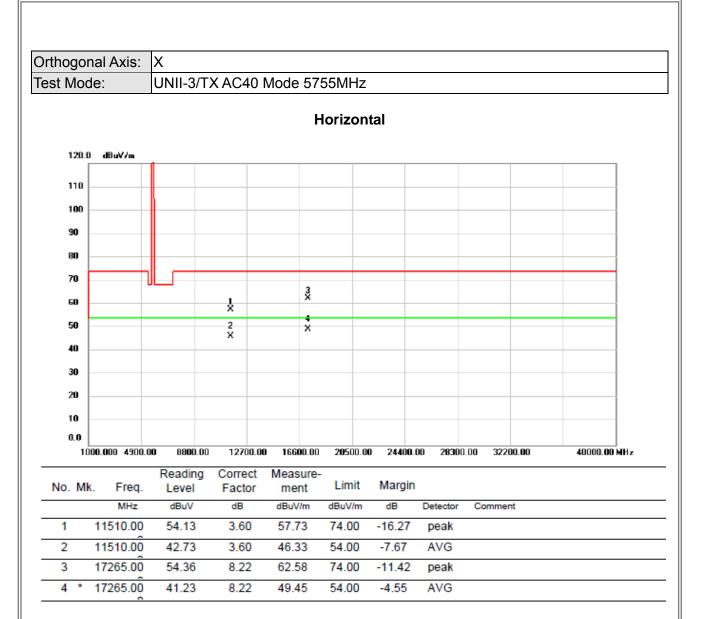






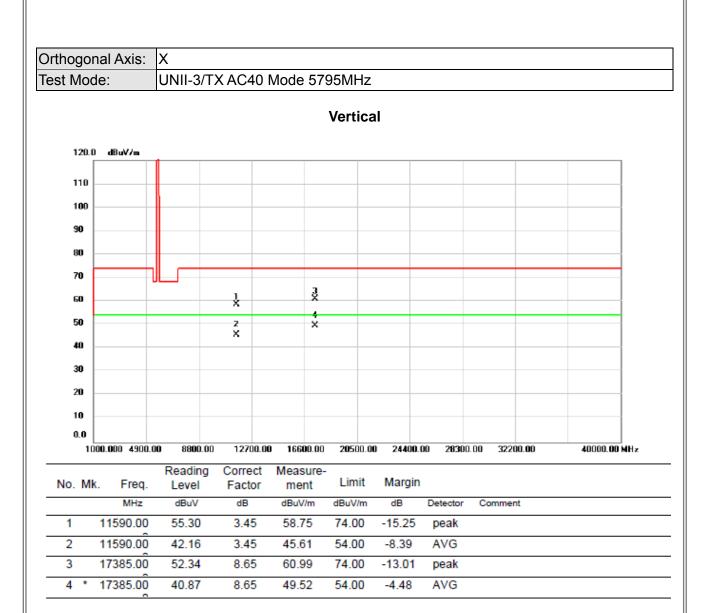






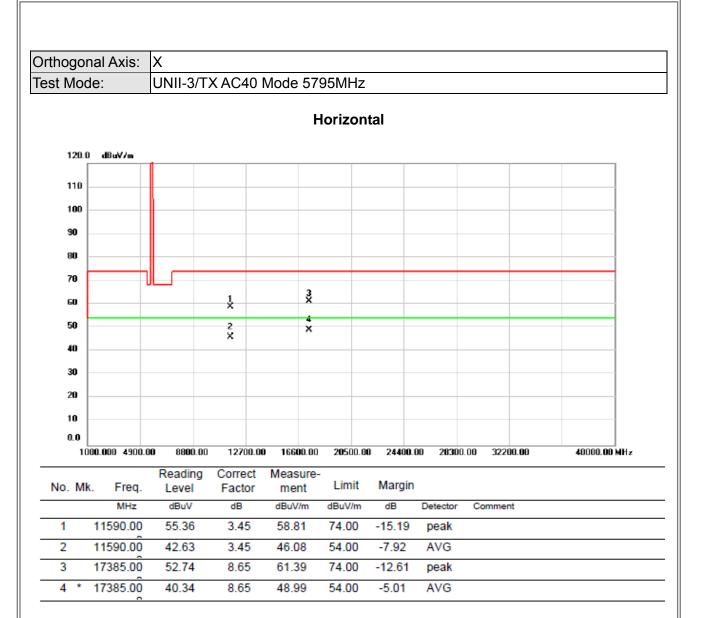






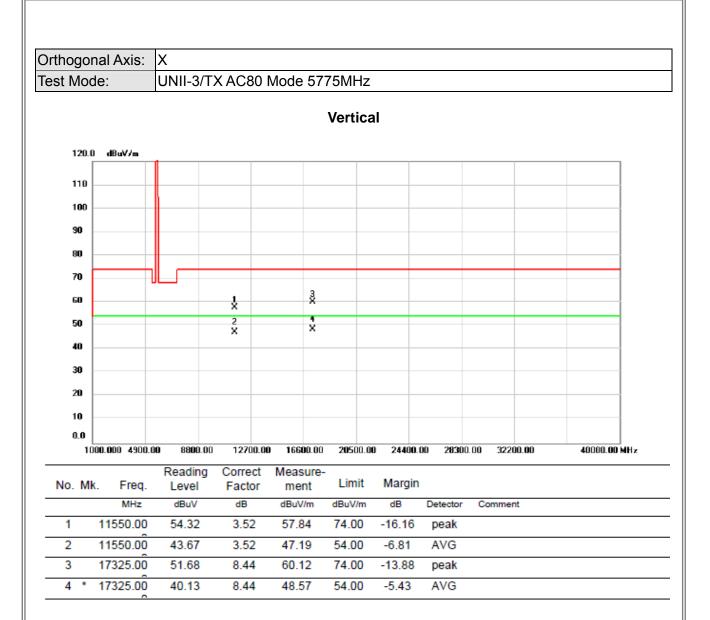






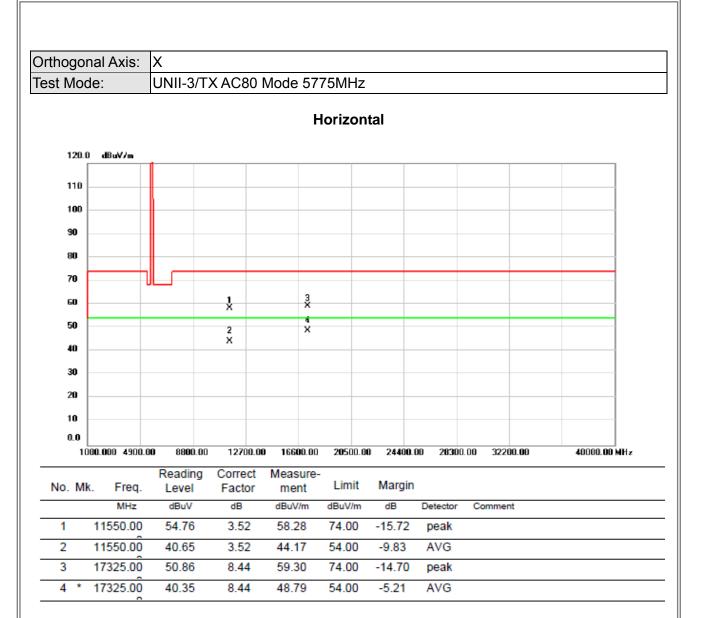
















ATTACHMENT E - BAND EDGE AND FUNDAMENTAL EMISSIONS





Non-Beamforming

