



FCC Radio T	Test Report
-------------	-------------

FCC ID: V7TAC9V3

This report concerns (check one): Original Grant Class I Change Class II Change

: AC1200 Smart Dual-Band Gigabit WiFi Router

: SHENZHEN TENDA TECHNOLOGY CO., LTD

: 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan

: 1712C162

: AC9

: N/A

Project No. Equipment Test Model Series Model Applicant Address

Road, Nanshan District, Shenzhen, China. 518052 Date of Receipt : Dec. 18, 2017 : Dec. 18, 2017 ~ Jan. 17, 2018 : Jan. 18, 2018 : BTL Inc.

**Testing Engineer** 

Date of Test

Issued Date

Tested by

**Technical Manager** 

(David Mao)

Authorized Signatory

(Steven Lu)

# BTL INC

No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China. TEL: +86-769-8318-3000 FAX: +86-769-8319-6000







#### 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

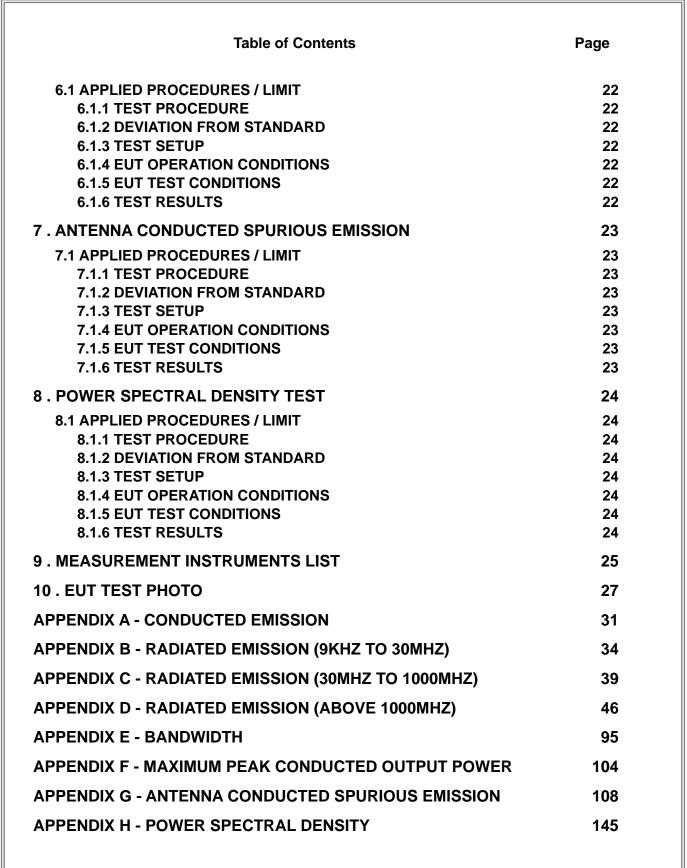
For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.



Table of Contents	Page
1. CERTIFICATION	6
2 . SUMMARY OF TEST RESULTS	7
2.1 TEST FACILITY	8
2.2 MEASUREMENT UNCERTAINTY	8
3 . GENERAL INFORMATION	9
3.1 GENERAL DESCRIPTION OF EUT	9
3.2 DESCRIPTION OF TEST MODES	10
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	13
3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TES	TED 14
3.5 DESCRIPTION OF SUPPORT UNITS	14
4. EMC EMISSION TEST	15
4.1 CONDUCTED EMISSION MEASUREMENT	15
4.1.1 POWER LINE CONDUCTED EMISSION LIMITS	15
4.1.2 TEST PROCEDURE	15
4.1.3 DEVIATION FROM TEST STANDARD	15
4.1.4 TEST SETUP	16
4.1.5 EUT OPERATING CONDITIONS	16
4.1.6 EUT TEST CONDITIONS 4.1.7 TEST RESULTS	16 16
4.2 RADIATED EMISSION MEASUREMENT	17
4.2.1 RADIATED EMISSION LIMITS	17
4.2.2 TEST PROCEDURE	18
4.2.3 DEVIATION FROM TEST STANDARD	18
4.2.4 TEST SETUP	19
4.2.5 EUT OPERATING CONDITIONS	20
4.2.6 EUT TEST CONDITIONS	20
4.2.7 TEST RESULTS (9KHZ TO 30MHZ)	20 20
4.2.8 TEST RESULTS (30MHZ TO 1000MHZ) 4.2.9 TEST RESULTS (ABOVE 1000MHZ)	20 20
5. BANDWIDTH TEST	 21
5.1 APPLIED PROCEDURES 5.1.1 TEST PROCEDURE	21 21
5.1.2 DEVIATION FROM STANDARD	21
5.1.3 TEST SETUP	21
5.1.4 EUT OPERATION CONDITIONS	21
5.1.5 EUT TEST CONDITIONS	21
5.1.6 TEST RESULTS	21
6. MAXIMUM PEAK CONDUCTED OUTPUT POWER TEST	22











## **REPORT ISSUED HISTORY**

Issued No.	Description	Issued Date
BTL-FCCP-1-1712C162	Original Issue.	Jan. 18, 2018





## **1. CERTIFICATION**

Equipment : Brand Name :	AC1200 Smart Dual-Band Gigabit WiFi Router
Test Model :	
Series Model :	
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
Factory :	N/A
Address :	N/A
Date of Test :	Dec. 18, 2017 ~ Jan. 17, 2018
Test Sample :	Engineering Sample
Standard(s) :	FCC Part15, Subpart C:(15.247) / 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-1-1712C162) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP according to the ISO-17025 quality assessment standard and technical standard(s).

Test results included in this report is only for the WLAN 2.4G part.



## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Applied Standard(s): FCC Part15 (15.247) , Subpart C				
Standard(s) Section	Test Item	Judgment	Remark	
15.207	Conducted Emission	PASS		
15.247(d)	Antenna conducted Spurious Emission	PASS		
15.247(a)(2)	6dB Bandwidth	PASS		
15.247(b)(3)	Peak Output Power	PASS		
15.247(e)	Power Spectral Density	PASS		
15.203	Antenna Requirement	PASS		
15.247(d)/ 15.205/ 15.209	Transmitter Radiated Emissions	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: 854385 BTL's designation number for FCC: CN5020

#### 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)
DG-C02	CISPR	150 KHz ~ 30MHz	2.32

#### B. Radiated Measurement:

Moded efferte.					
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	
	CISPR		30MHz ~ 200MHz	H	3.78
DG-CB03			200MHz ~ 1,000MHz	V	4.10
DG-CB03		200MHz ~ 1,000MHz	H	4.06	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	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	AC1200 Smart Dual-Band Gigabit WiFi Router			
Brand Name	Tenda	Tenda		
Test Model	AC9			
Series Model	N/A			
Model Difference	NA			
	Operation Frequency	2412~2462 MHz		
Product Description	Modulation Technology	802.11b:DSSS 802.11g:OFDM 802.11n:OFDM		
	Bit Rate of Transmitter	802.11b: 11/5.5/2/1 Mbps 802.11g: 54/48/36/24/18/12/9/6 Mbps 802.11n up to 300 Mbps		
Output Power (Max.) 802.11g: 2 802.11n(2		802.11b: 23.94dBm 802.11g: 27.9dBm 802.11n(20MHz): 29.54dBm 802.11n(40MHz): 29.77dBm		
Power Source	DC voltage supplied from AC/DC adapter. Brand/ Model: BN050-A18012U			
Power Rating	I/P: 100-240V~ 50/60Hz 0.6A O/P:12V1.5A			

Note:

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

#### 2. Channel List:

	CH01 - CH11 for 802.11b, 802.11g, 802.11n(20MHz) CH03 - CH09 for 802.11n(40MHz)						
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

#### 3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Dipole	IPEX	2
2	N/A	N/A	Dipole	IPEX	2

Note: The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers (2T2R).

#### 4 The worst case for 1TX/ 2TX as follow:

Operating Mode TX Mode	1TX	2TX
802.11b	V (ANT 1)	-
802.11g	V (ANT 1)	-
802.11n(20MHz)	-	V (ANT 1 + ANT 2)
802.11n(40MHz)	-	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 B MODE CHANNEL 01/06/11	
Mode 2	TX G MODE CHANNEL 01/06/11	
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11	
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09	
Mode 5	Normal Link	





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 5	Normal Link		

For Radiated Test		
Final Test Mode Description		
Mode 1	TX B MODE CHANNEL 01/06/11	
Mode 2	TX G MODE CHANNEL 01/06/11	
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11	
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09	

For Band Edge Test		
Final Test Mode Description		
Mode 1	TX B MODE CHANNEL 01/06/11	
Mode 2	TX G MODE CHANNEL 01/06/11	
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11	
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09	





6dB Spectrum Bandwidth		
Final Test Mode Description		
Mode 1	TX B MODE CHANNEL 01/06/11	
Mode 2	TX G MODE CHANNEL 01/06/11	
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11	
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09	

Maximum Conducted Output Power		
Final Test Mode Description		
Mode 1	TX B MODE CHANNEL 01/06/11	
Mode 2	TX G MODE CHANNEL 01/06/11	
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11	
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09	

Power Spectral Density		
Final Test Mode Description		
Mode 1	TX B MODE CHANNEL 01/06/11	
Mode 2	TX G MODE CHANNEL 01/06/11	
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11	
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09	

Note:

- (1) The measurements are performed at the high, middle, low available channels.
- (2) 802.11b mode: DBPSK (1Mbps)
  - 802.11g mode: OFDM (6Mbps)
  - 802.11n HT20 mode : BPSK (13Mbps)
  - 802.11n HT40 mode : BPSK (27Mbps)
  - For radiated emission tests, the highest output powers were set for final test.
- (3) For radiated below 1G test, the 802.11b is found to be the worst case and recorded.
- (4) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.



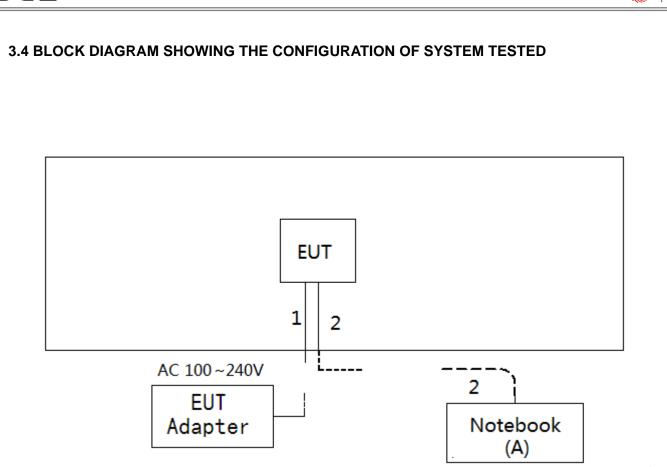
#### 3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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

Test software version	MP-Tool		
Frequency (MHz)	2412	2437	2462
802.11b	22	23	23
802.11g	27	31	30
802.11n (20MHz)	26	30	29
Frequency (MHz)	2422	2437	2452
802.11n (40MHz)	23	30	27







## **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.

	0				
Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.
А	NOTEBOOK	HP	HP NB 331	N/A	N/A
Item	Shielded Type	Ferrite Core	Length	Note	
1	NO	NO	1.5M	DC Cable	
2	NO	NO	10M	RJ45	



## 4. EMC EMISSION TEST

#### 4.1 CONDUCTED EMISSION MEASUREMENT

## 4.1.1 POWER LINE CONDUCTED EMISSION LIMITS (Frequency Range 150KHz-30MHz)

	Conducted Limit (dBµV)		
Frequency of Emission (MHz)	Quasi-peak	Average	
0.15 -0.50	66 to 56*	56 to 46*	
0.50 -5.0	56	46	
5.0 -30.0	60	50	

Note:

- (1) The limit of " \* " decreases with the logarithm of the frequency
- (2) The test result calculated as following: Measurement Value = Reading Level + Correct Factor Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use) Margin Level = Measurement Value - Limit Value

#### The following table is the setting of the receiver

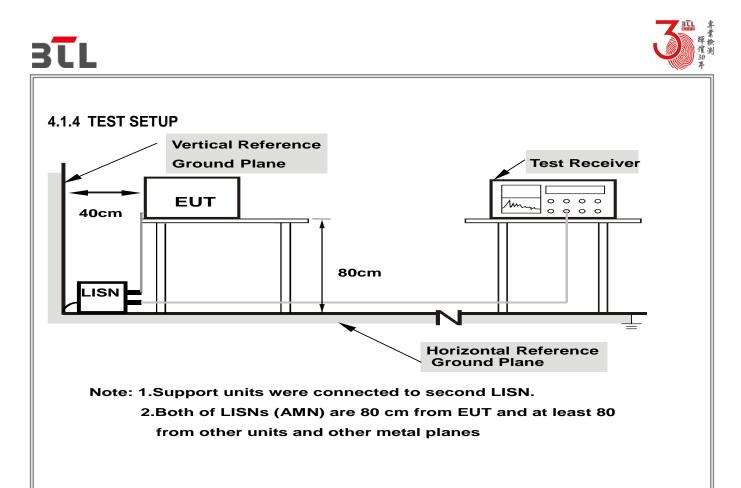
Receiver Parameters	Setting	
Attenuation	10 dB	
Start Frequency	0.15 MHz	
Stop Frequency	30 MHz	
IF Bandwidth	9 KHz	

#### 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 equipment 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



#### 4.1.5 EUT OPERATING CONDITIONS

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

#### 4.1.6 EUT TEST CONDITIONS

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

## 4.1.7 TEST RESULTS

Please refer to the Appendix 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.

#### LIMITS OF RADIATED EMISSION MEASUREMENT (9KHz-1000MHz)

Frequency	Field Strength	Measurement Distance
(MHz)	(microvolts/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
960~1000	500	3

#### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	(dBuV/m) (at 3 meters)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

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

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

- (3) Emission level (dBuV/m)=20log Emission level (uV/m).
- (4) The test result calculated as following: Measurement Value = Reading Level + Correct Factor Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use) Margin Level = Measurement Value - Limit Value





Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW	1MHz / 3MHz for Peak,
(Emission in restricted band)	1MHz / 1/T for Average

Receiver Parameter	Setting		
Attenuation Auto			
Start ~ Stop Frequency	9KHz~90KHz for PK/AVG detector		
Start ~ Stop Frequency	90KHz~110KHz for QP detector		
Start ~ Stop Frequency	110KHz~490KHz for PK/AVG detector		
Start ~ Stop Frequency	490KHz~30MHz for QP detector		
Start ~ Stop Frequency	30MHz~1000MHz for QP detector		

#### 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.

#### 4.2.3 DEVIATION FROM TEST STANDARD

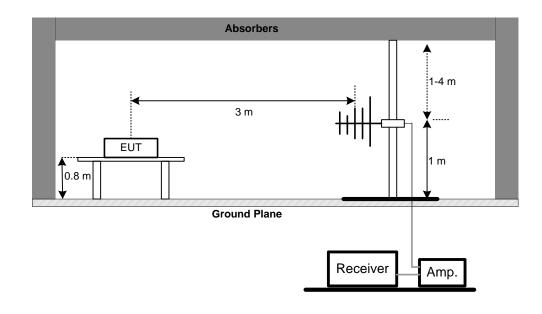
No deviation



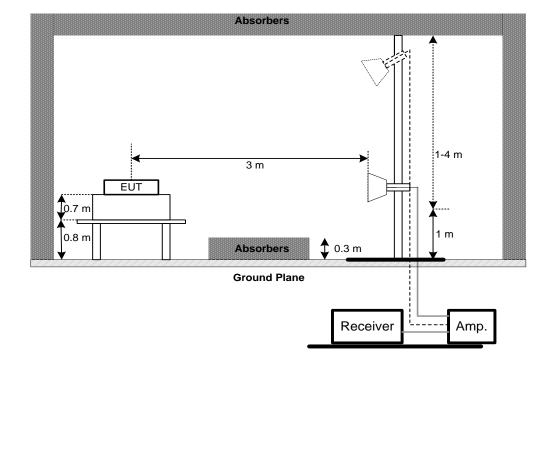


## 4.2.4 TEST SETUP

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

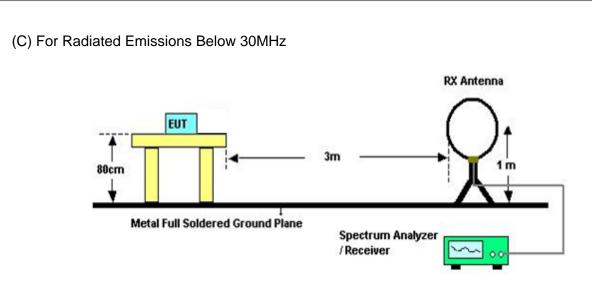


## (B) Radiated Emission Test Set-Up Frequency Above 1 GHz









## 4.2.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 4.2.6 EUT TEST CONDITIONS

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

#### 4.2.7 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Appendix 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 1000MHZ)

Please refer to the Appendix C.

#### 4.2.9 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix D.

#### Remark:

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



## 5. BANDWIDTH TEST

#### 5.1 APPLIED PROCEDURES

FCC Part15 (15.247), Subpart C					
Section	Frequency Range (MHz)	Result			
15.247(a)(2)	2400-2483.5	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 Setting: RBW= 100KHz, VBW=300KHz, Sweep time = 2.5 ms.

#### 5.1.2 DEVIATION FROM STANDARD

No deviation.

## 5.1.3 TEST SETUP



#### 5.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 5.1.5 EUT TEST CONDITIONS

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

#### 5.1.6 TEST RESULTS

Please refer to the Appendix E.



## 6. MAXIMUM PEAK CONDUCTED OUTPUT POWER TEST

#### 6.1 APPLIED PROCEDURES / LIMIT

	FCC Part15 (15.247), Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result	
15.247(b)(3)	Maximum Output Power	1 Watt or 30dBm	2400-2483.5	PASS	

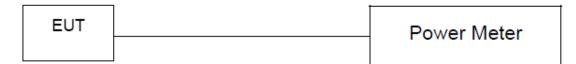
#### 6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,
- b. The maximum peak conducted output power was performed in accordance with method 9.1.2 of FCC KDB 558074 D01 DTS Meas Guidance and FCC KDB 662911 D01 Multiple Transmitter Output.

#### 6.1.2 DEVIATION FROM STANDARD

No deviation.

#### 6.1.3 TEST SETUP



#### 6.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 6.1.5 EUT TEST CONDITIONS

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

#### 6.1.6 TEST RESULTS

Please refer to the Appendix F.



## 7. ANTENNA CONDUCTED SPURIOUS EMISSION

#### 7.1 APPLIED PROCEDURES / LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

#### 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 Setting: RBW= 100KHz, VBW=300KHz, Sweep time = Auto.
- c. Offset=antenna gain+cable loss

#### 7.1.2 DEVIATION FROM STANDARD

No deviation.

#### 7.1.3 TEST SETUP



#### 7.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 7.1.5 EUT TEST CONDITIONS

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

#### 7.1.6 TEST RESULTS

Please refer to the Appendix G.



## 8. POWER SPECTRAL DENSITY TEST

#### 8.1 APPLIED PROCEDURES / LIMIT

	FCC Part15 (15.247) , Subpart C					
Section	Test Item	Limit	Frequency Range (MHz)	Result		
15.247(e)	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	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 Setting: RBW=3KHz, VBW=10KHz, Sweep time = Auto.

#### 8.1.2 DEVIATION FROM STANDARD

No deviation.

#### 8.1.3 TEST SETUP

EUT	SPECTRUM
	ANALYZER

#### 8.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 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 Appendix H.



## 9. MEASUREMENT INSTRUMENTS LIST

	Conducted Emission					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	LISN	EMCO	3816/2	0052765	Mar. 26, 2018	
2	LISN	R&S	ENV216	101447	Mar. 26, 2018	
3	Test Cable	emci	RG223(9KHz-30 MHz)	C_17	Mar. 09, 2018	
4	EMI Test Receiver	R&S	ESCI	100382	Mar. 26, 2018	
5	50Ω Terminator	SHX	TF2-3G-A	08122901	Mar. 26, 2018	
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	

Radiated Emission Below 1GHz						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 26, 2018	
2	Amplifier	HP	8447D	2944A09673	Aug. 20, 2018	
3	Receiver	Agilent	N9038A	MY52130039	Aug. 20, 2018	
4	Cable	emci	LMR-400(30MHz-1 GHz)(8m+5m)	N/A	Jun. 26, 2018	
5	Controller	СТ	SC100	N/A	N/A	
6	Controller	MF	MF-7802	MF780208416	N/A	
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A	
8	Antenna	EM	EM-6876-1	230	Mar. 06, 2018	

	Radiated Emission Above 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 26, 2018	
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 08, 2018	
3	Amplifier	Agilent	8449B	3008A02274	May. 16, 2018	
4	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 26, 2018	
5	Receiver	Agilent	N9038A	MY52130039	Aug. 20, 2018	
6	Antenna	EM	EM-6876-1	230	Jul. 07, 2018	
7	Controller	СТ	SC100	N/A	N/A	
8	Controller	MF	MF-7802	MF780208416	N/A	
9	Cable	emci	EMC104-SM-SM-1 2000(12m)	N/A	Jun. 26, 2018	
10	Measurement Software	Farad	EZ-ÈMC Ver.NB-03A1-01	N/A	N/A	





6dB Bandwidth					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018

	Peak Output Power					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Power Meter	ANRITSU	ML2495A	1128009	Mar. 26, 2018	
2	Pulse Power Sensor	ANRITSU	MA 2411B	1027500	Mar. 26, 2018	

	Antenna Conducted Spurious Emission				
Item Kind of Equipment Manufacturer Type No. Serial No. Calibrated u					Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018

Power Spectral Density					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018

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





## **10. EUT TEST PHOTO**

#### **Conducted Measurement Photos**







## **Radiated Measurement Photos**







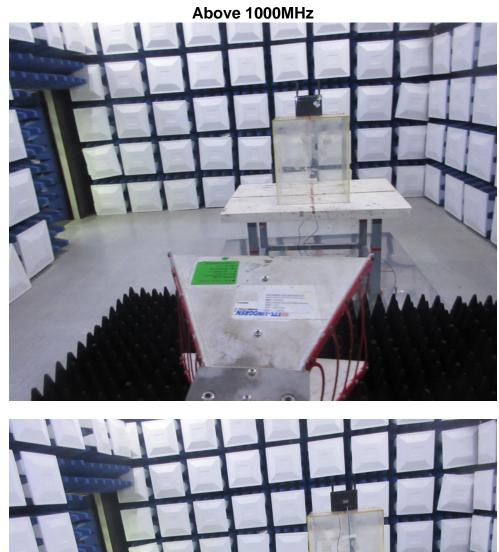
## **Radiated Measurement Photos**







## **Radiated Measurement Photos**









## **APPENDIX A - CONDUCTED EMISSION**



4

5

6

7

8

0.2310

0.2985

0.5955

9.7800

20.0355 25.34

12.90

34.82

24.91

24.61

9.69

9.68

9.71

9.83

9.95

22.59

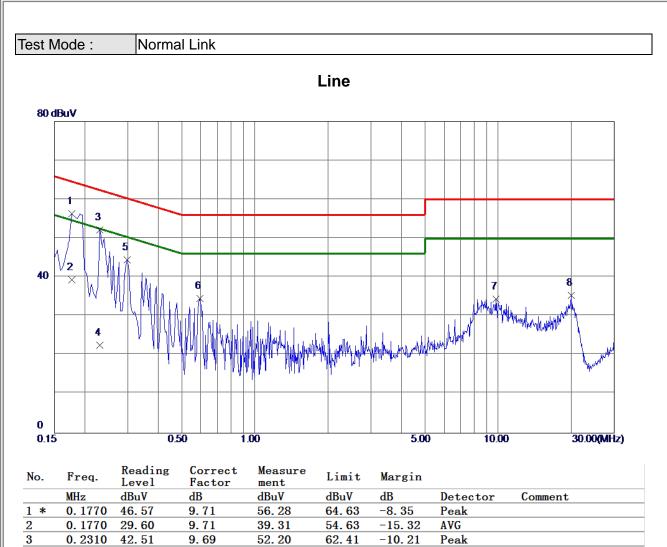
44.50

34.62

34.44

35.29





-29.82

-15.78

-21.38

-25.56

-24.71

AVG

Peak Peak

Peak

Peak

52.41

60.28

56.00

60.00

60.00



5

6

7

8

0.2985

0.5955

11.4135 26.45

20. 2200 28. 33

35.58

27.78

9.60

9.61

9.85

10.05

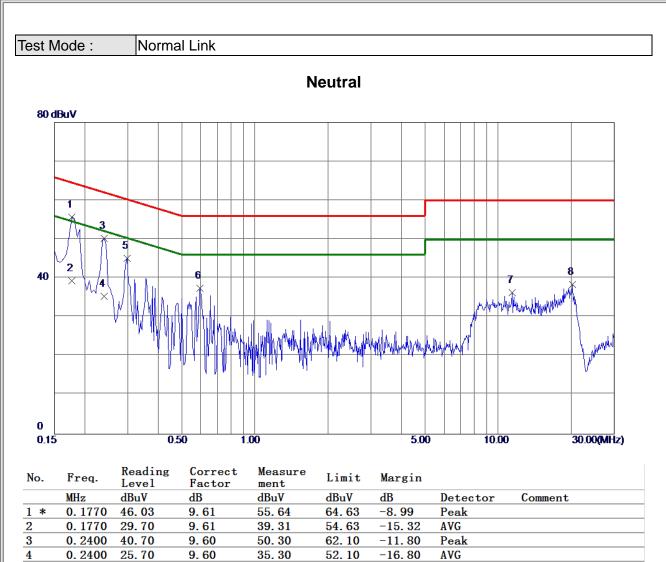
45.18

37.39

36.30

38.38





60.28

56.00

60.00

60.00

-15.10

-18.61

-23.70

-21.62

Peak

Peak

Peak

Peak

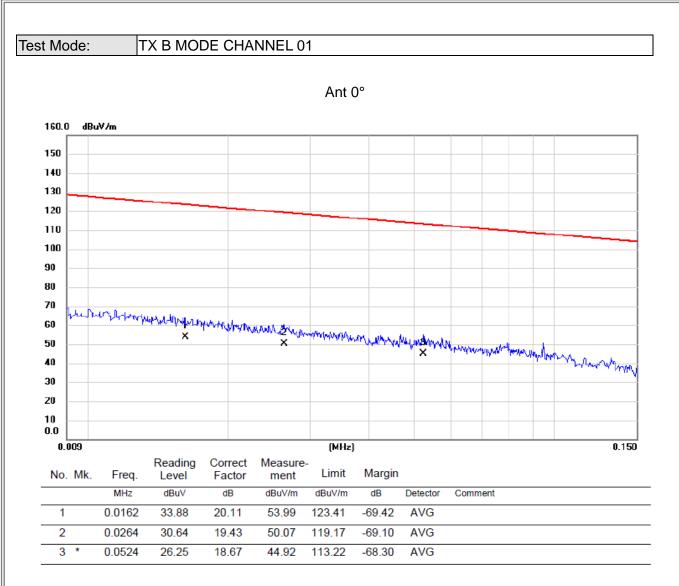




## APPENDIX B - RADIATED EMISSION (9KHZ TO 30MHZ)

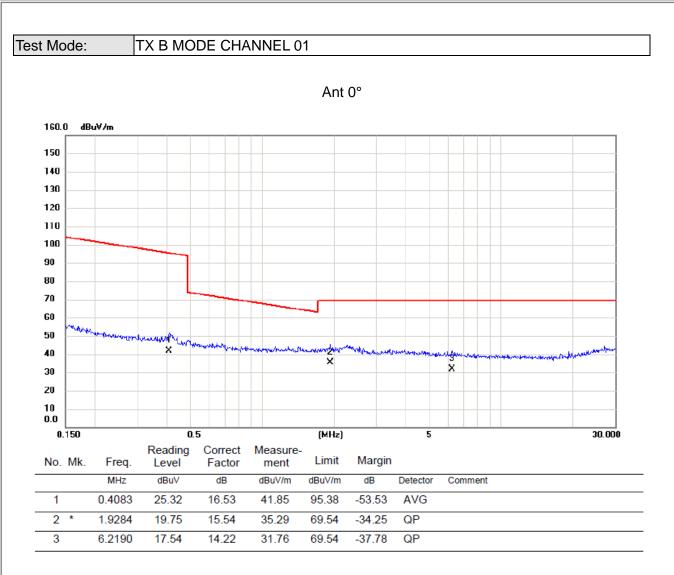






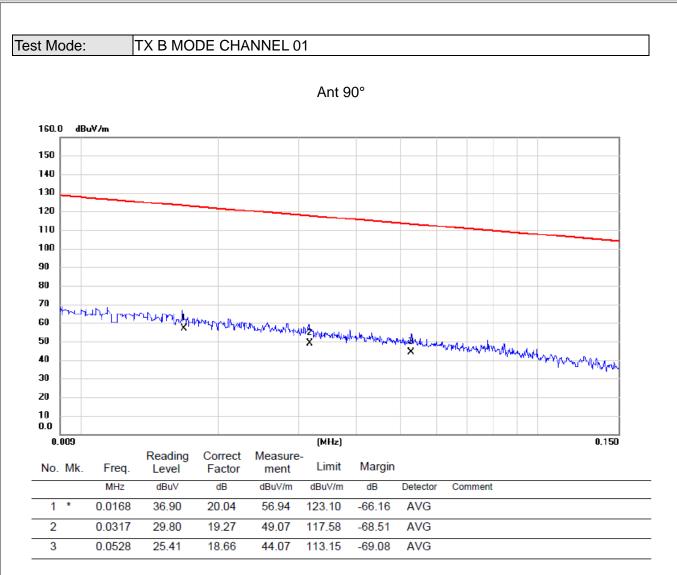






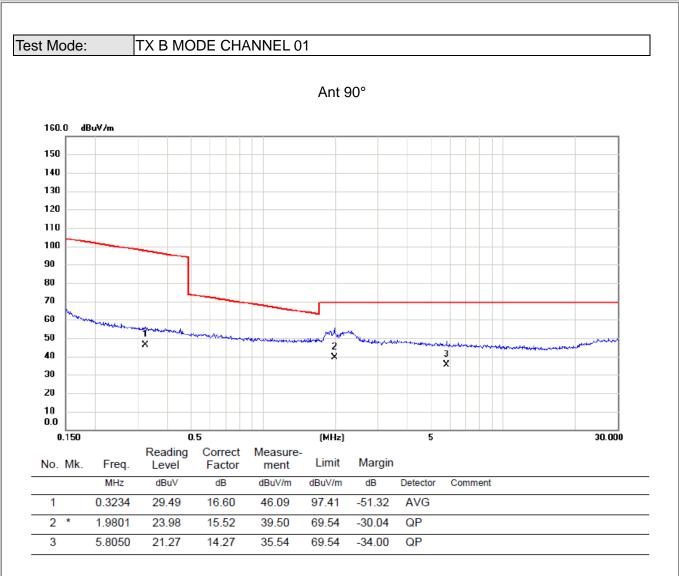












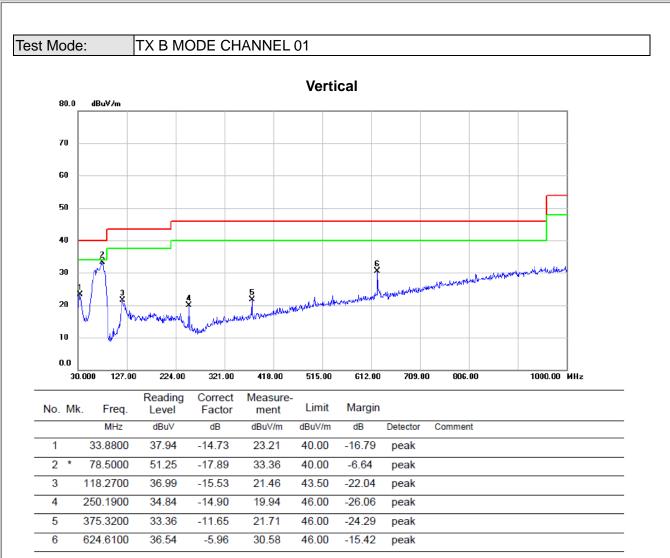




## APPENDIX C - RADIATED EMISSION (30MHZ TO 1000MHZ)

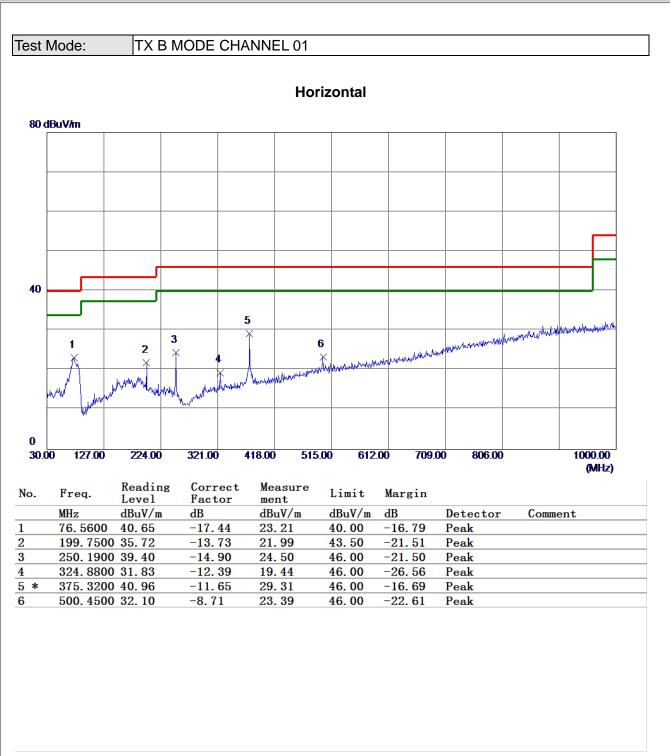












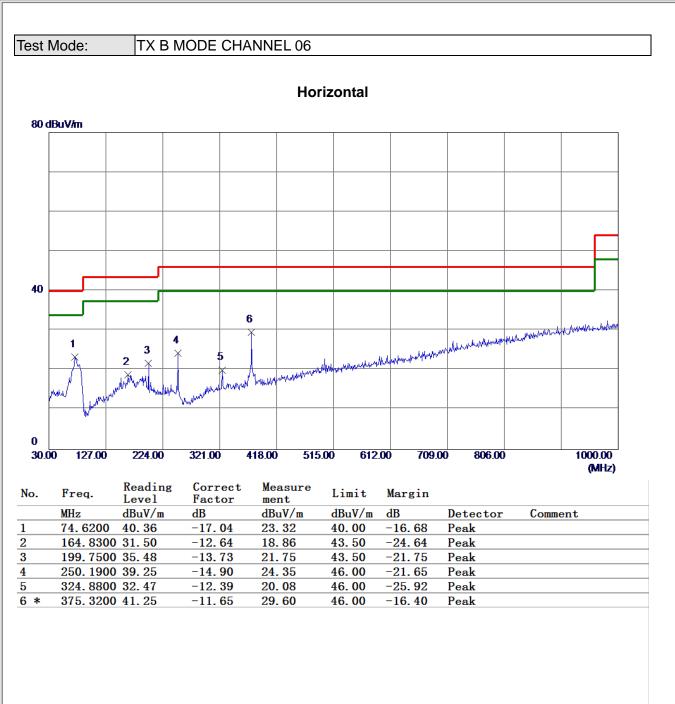






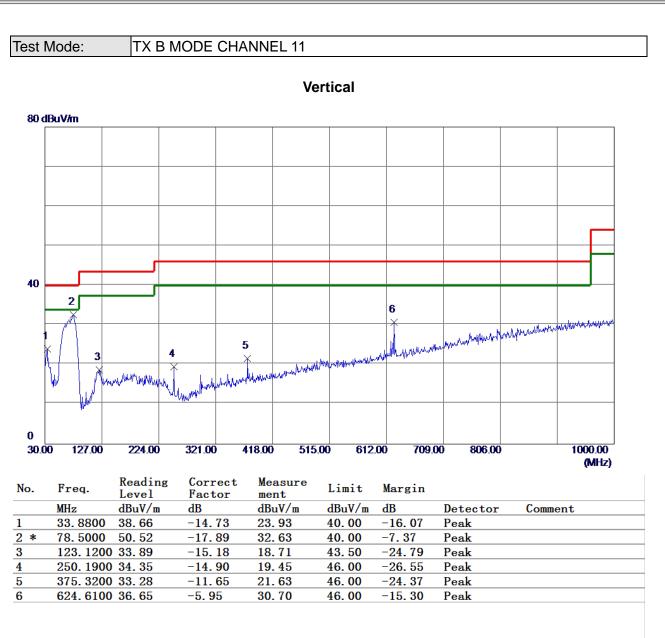






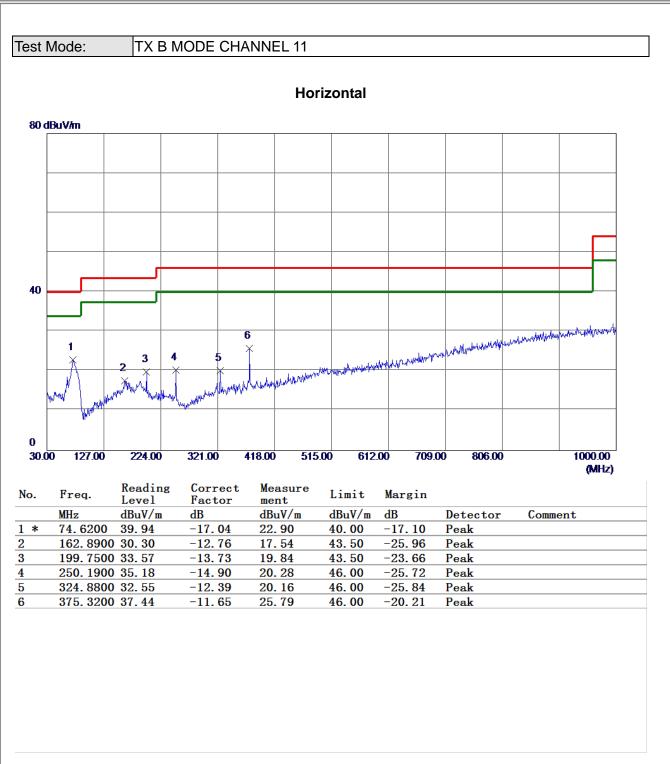












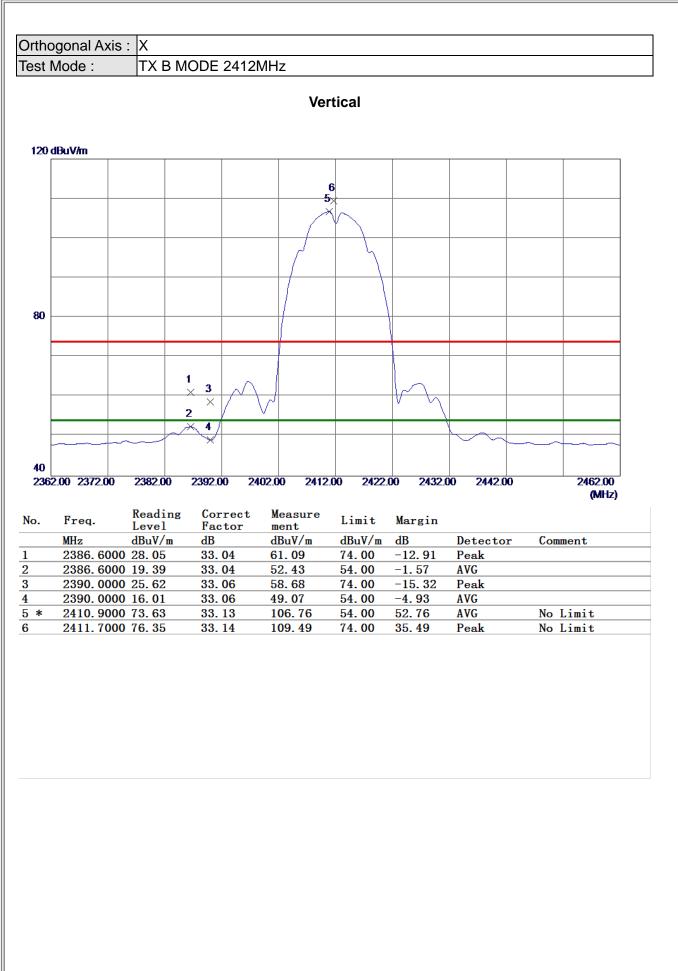




## **APPENDIX D - RADIATED EMISSION (ABOVE 1000MHZ)**

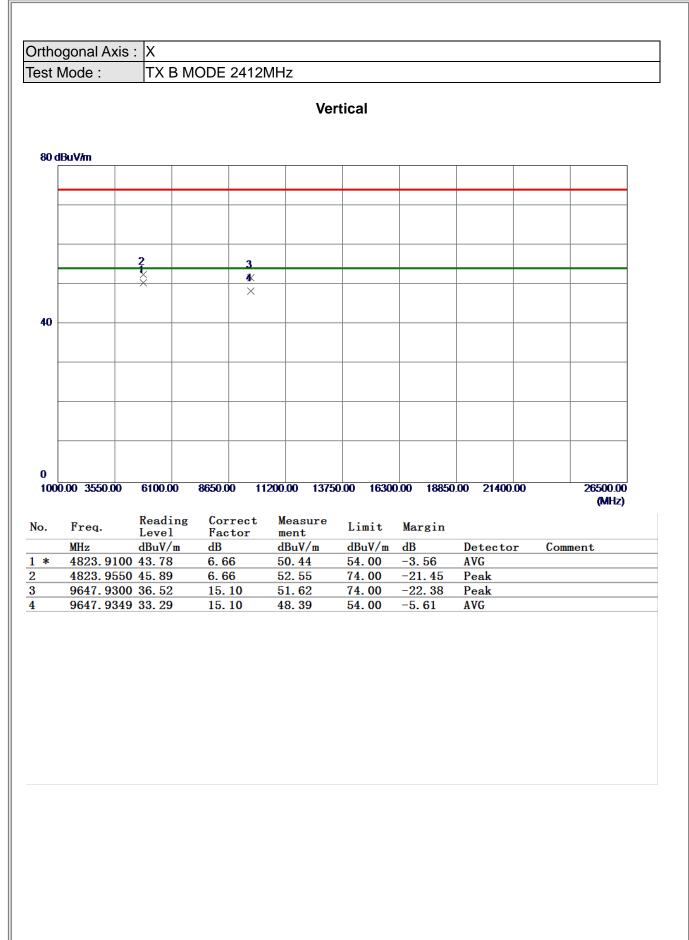






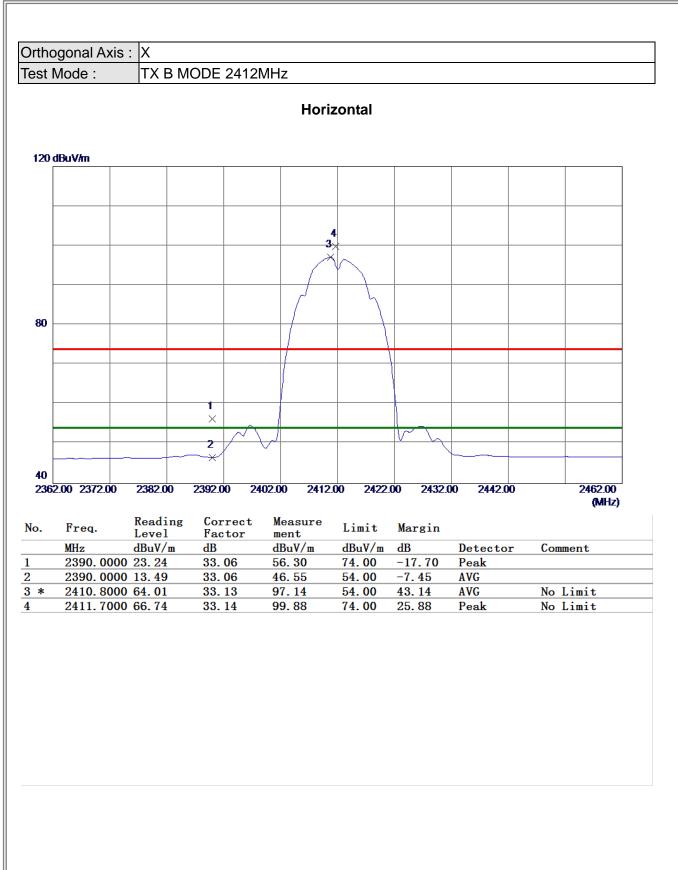






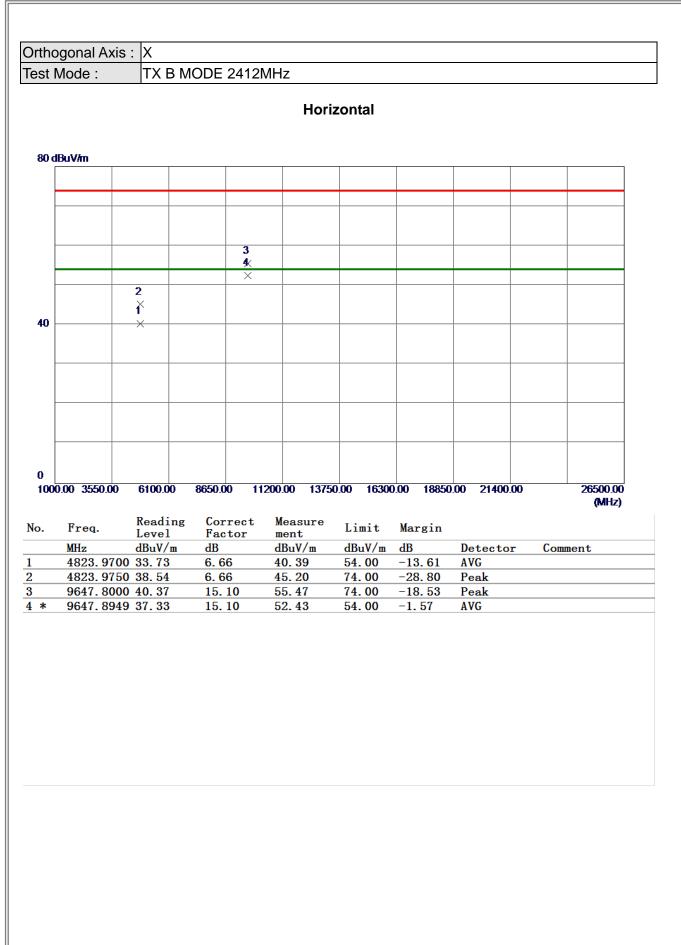






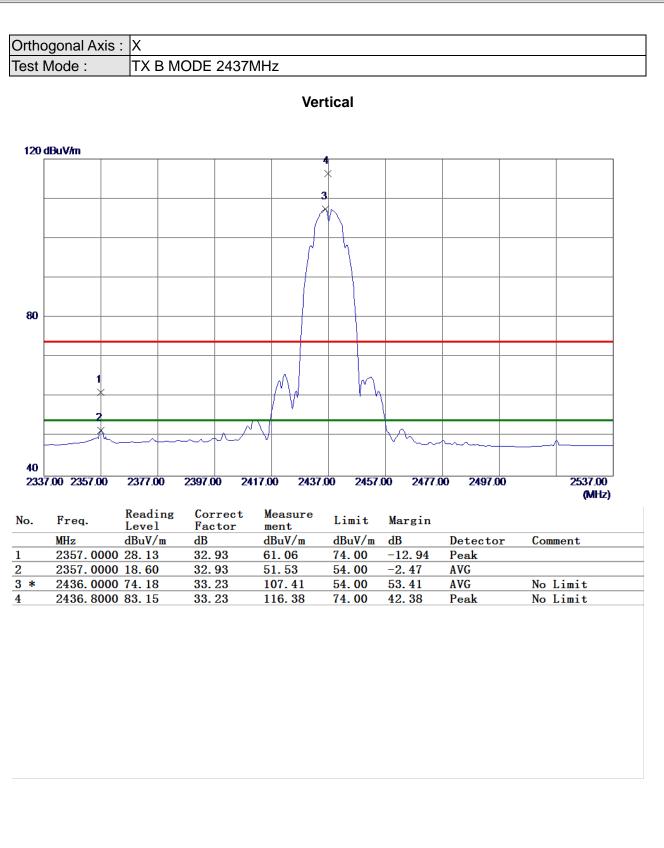












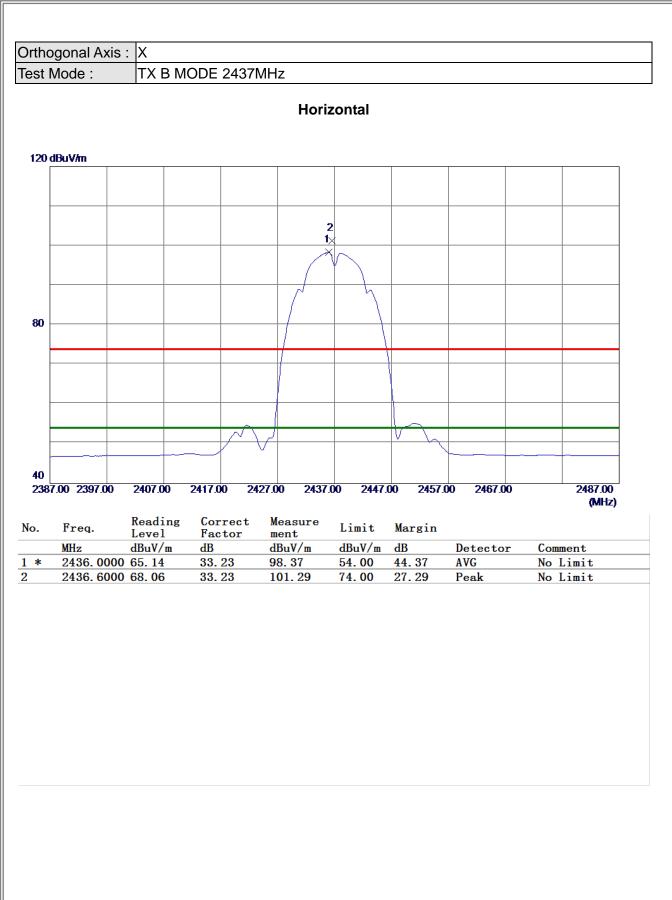












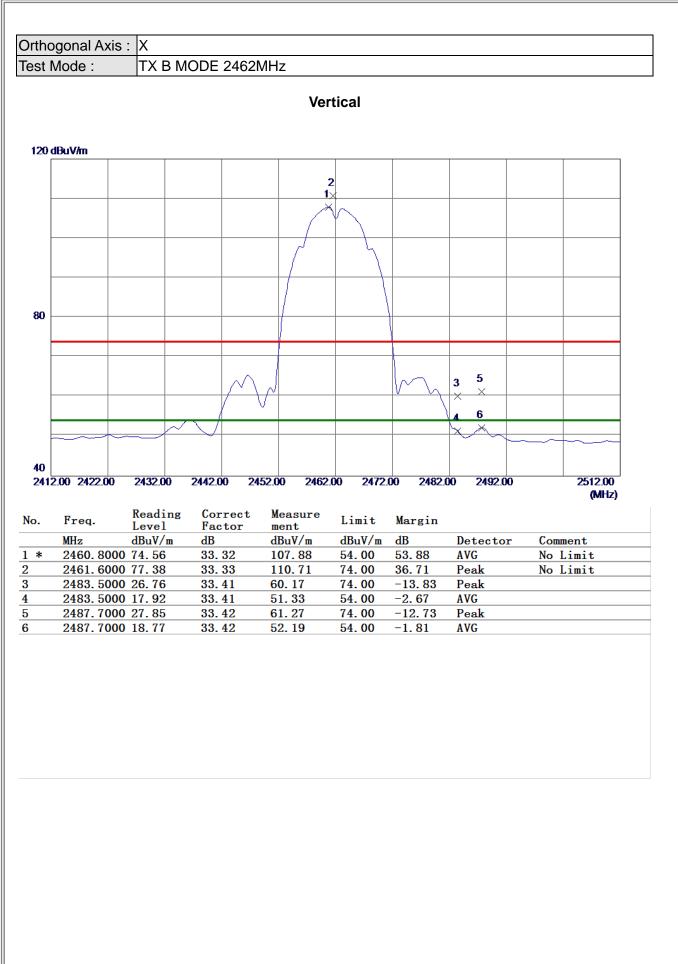






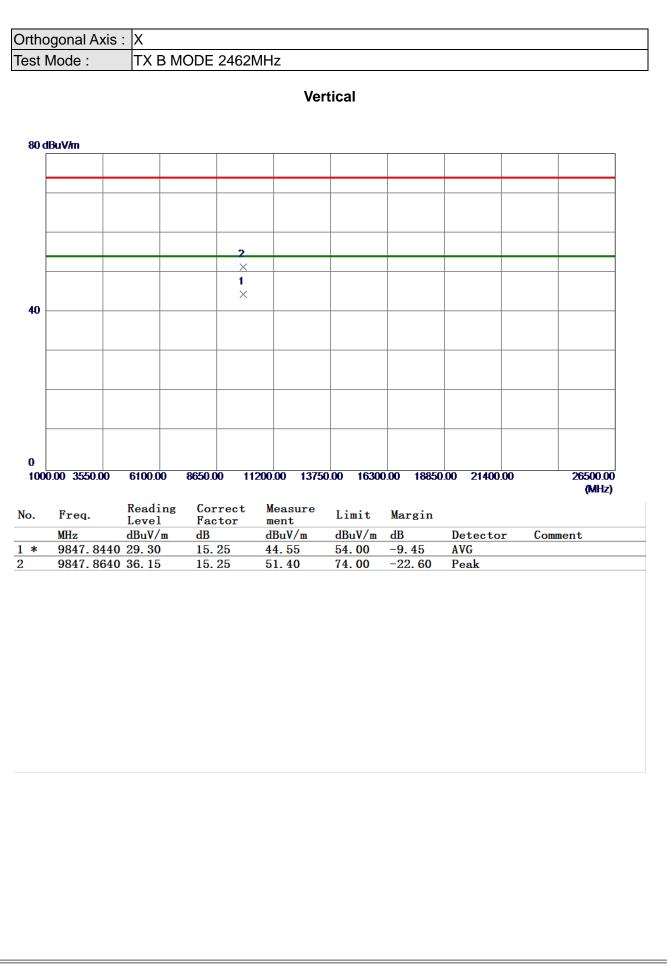






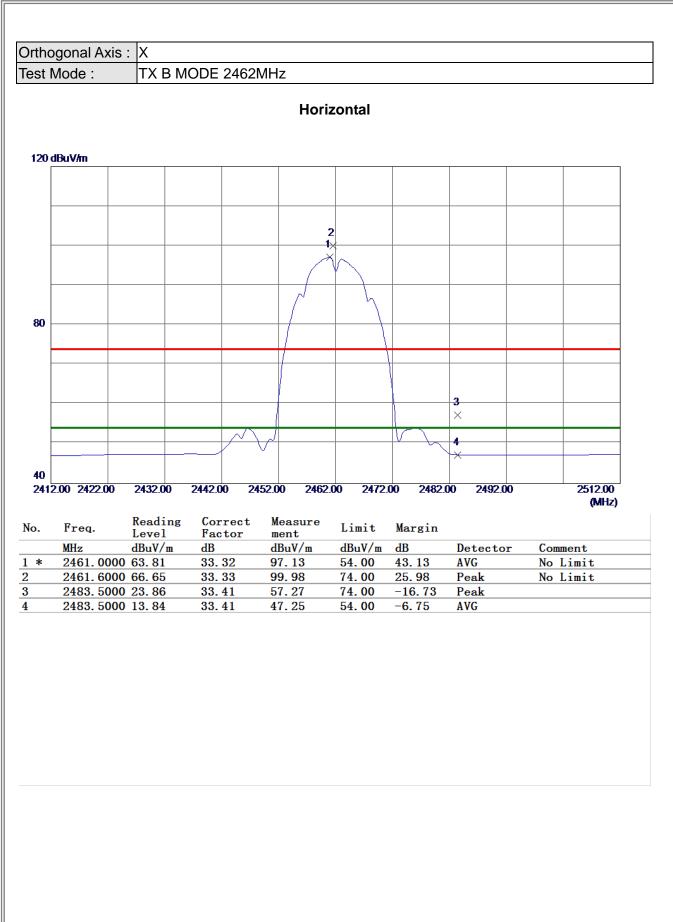












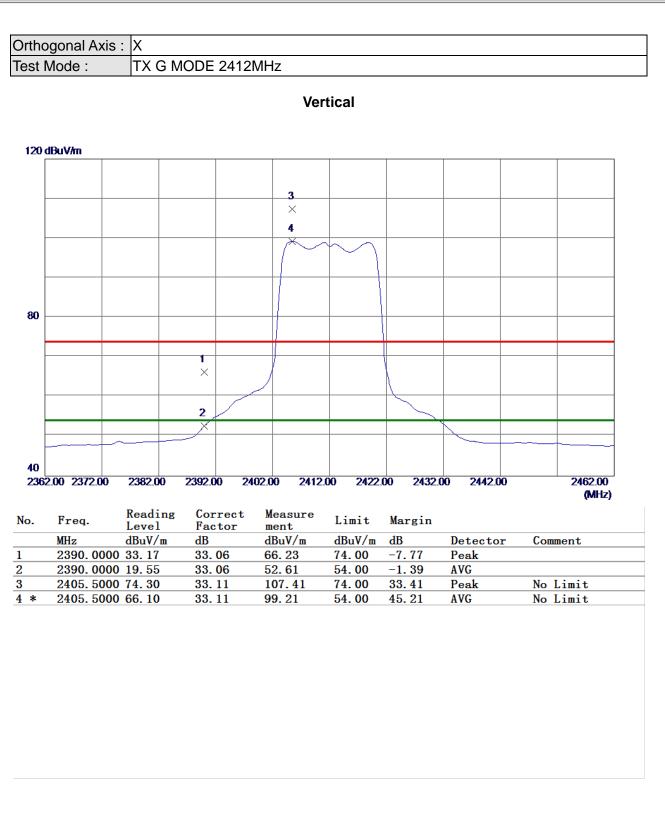






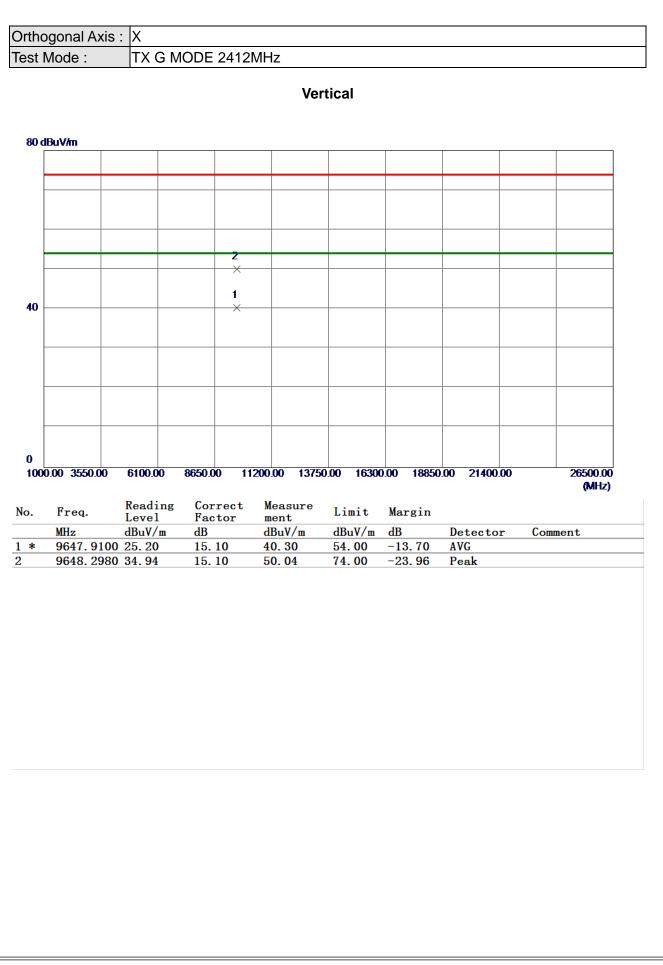






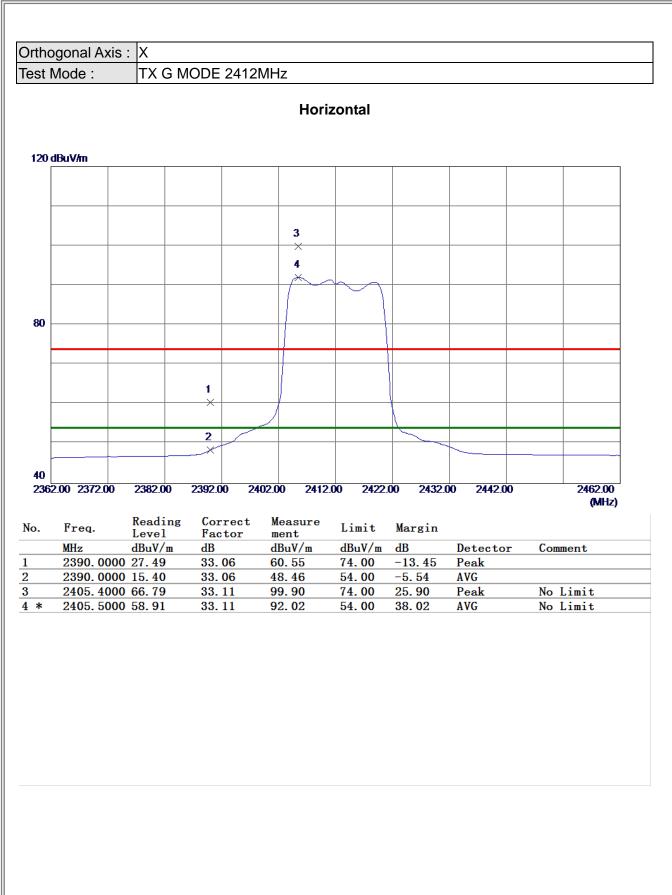






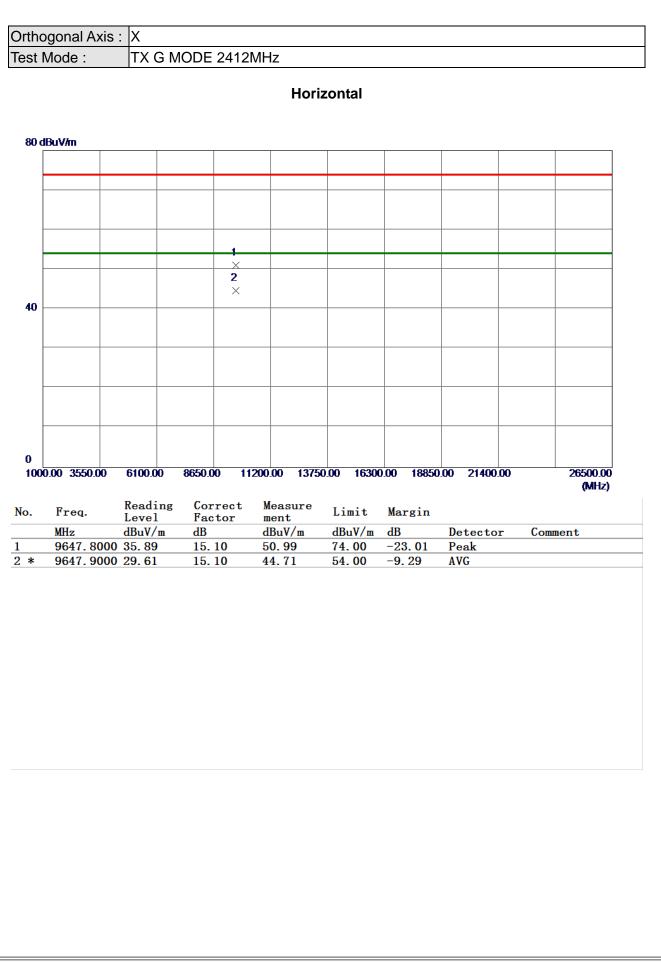






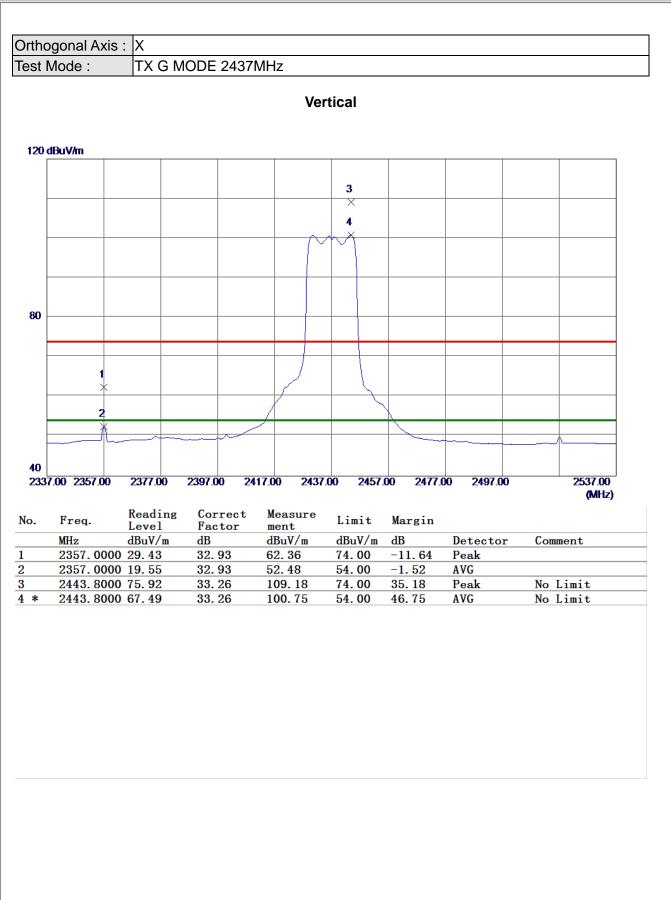






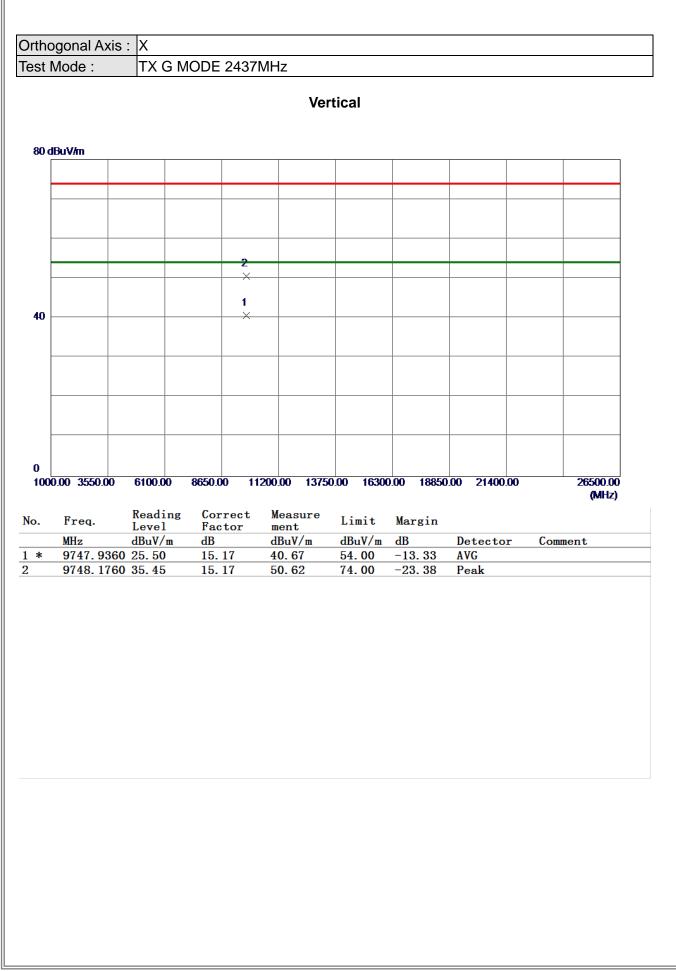






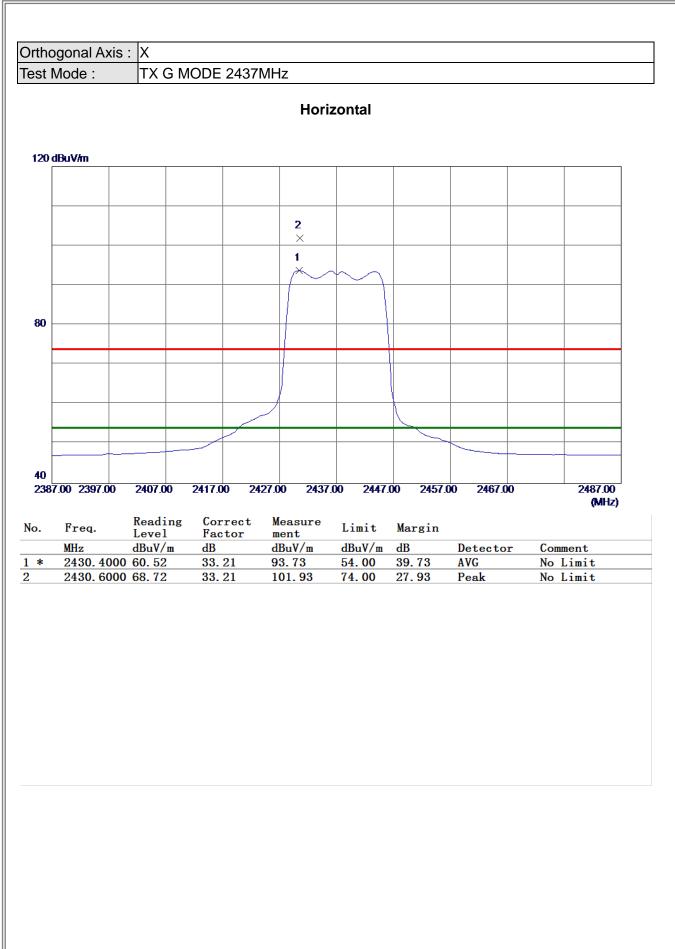






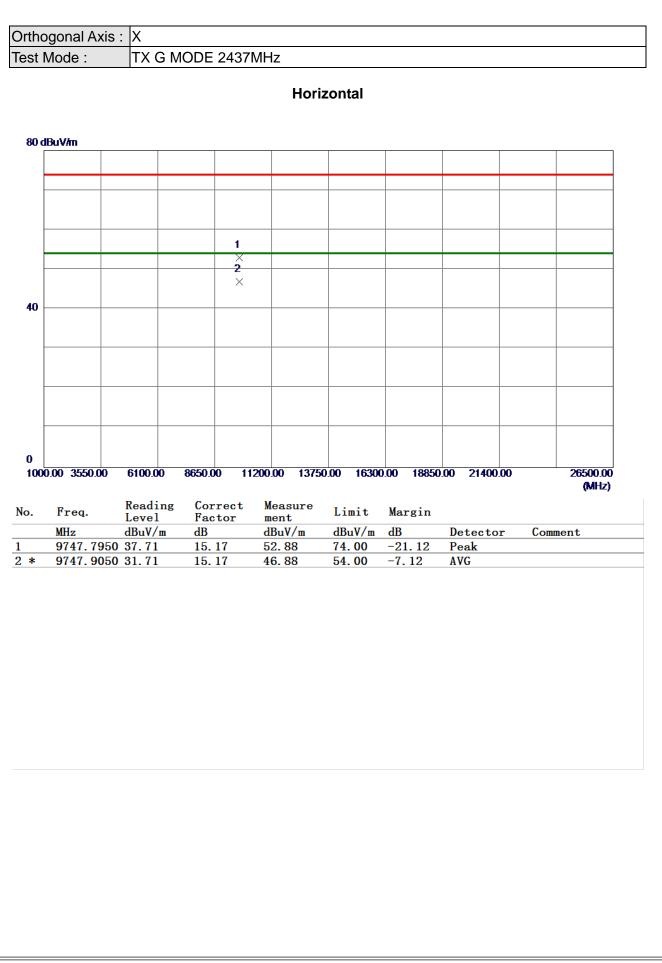






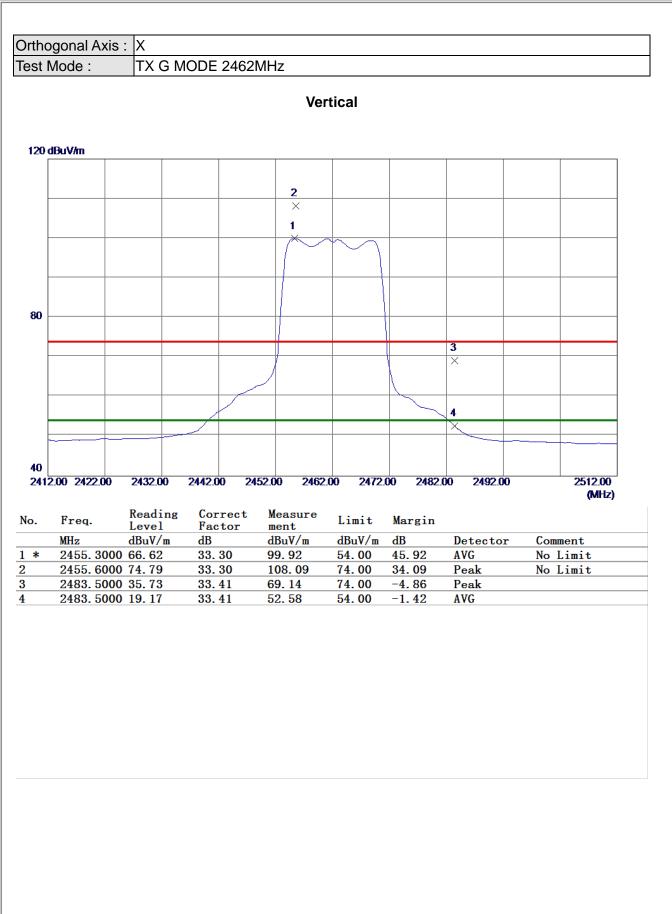






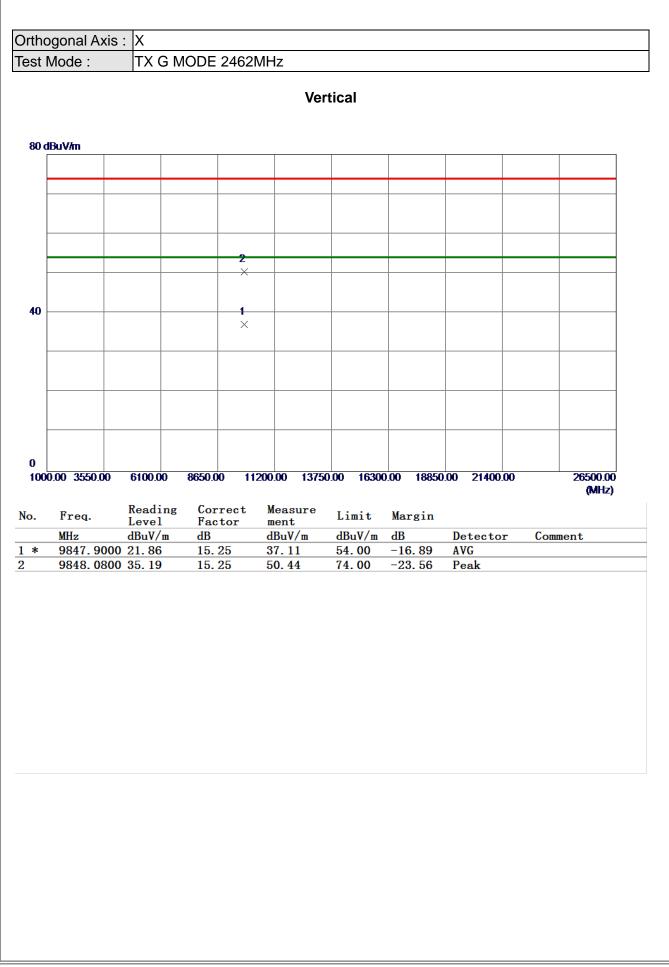






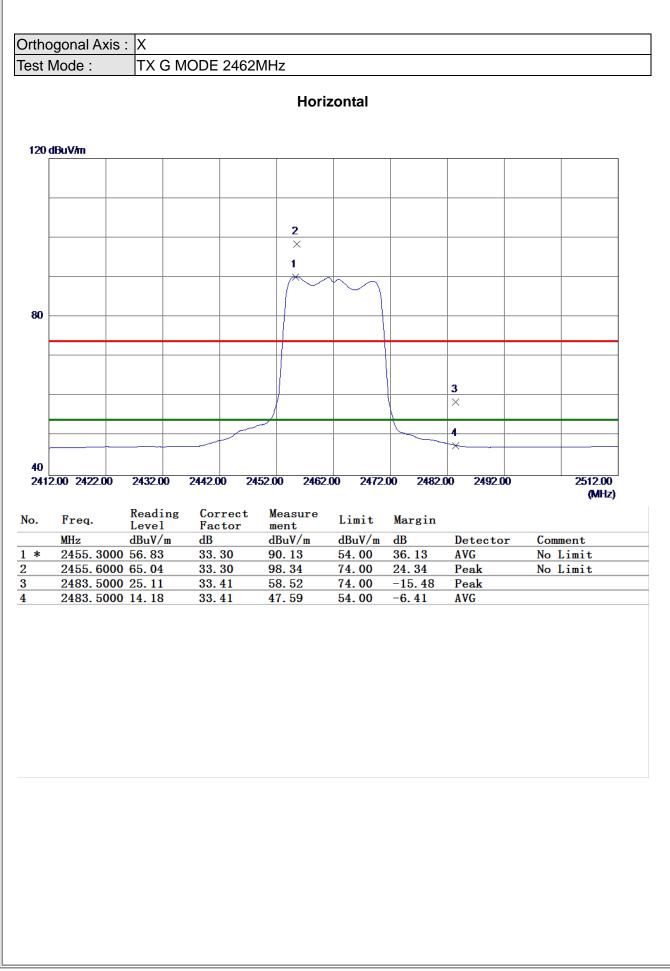












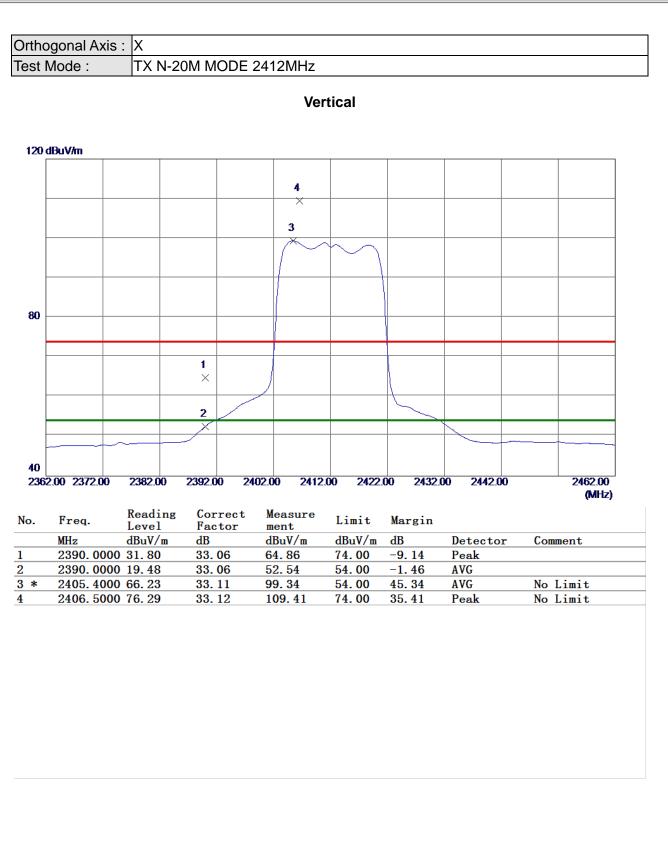












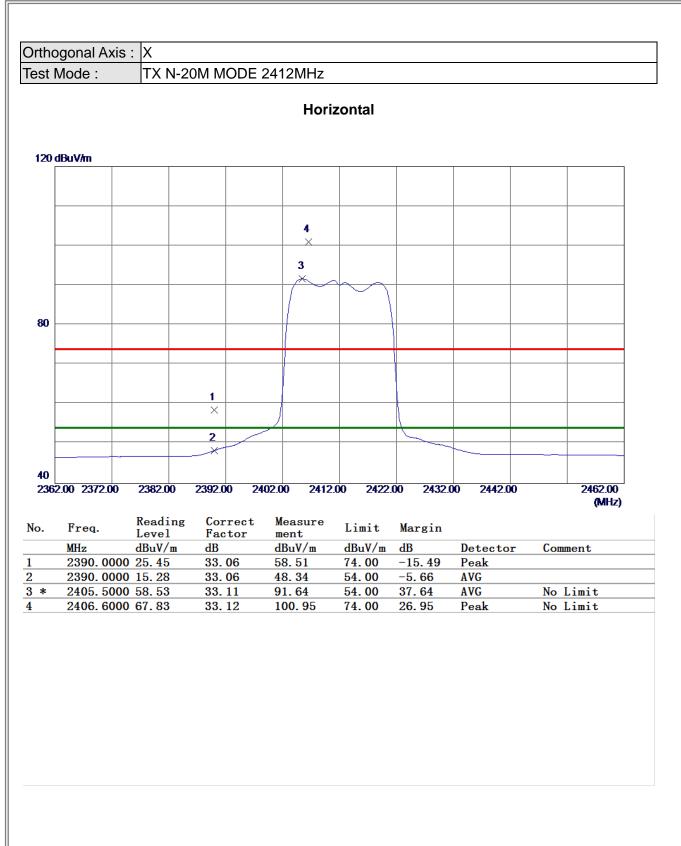






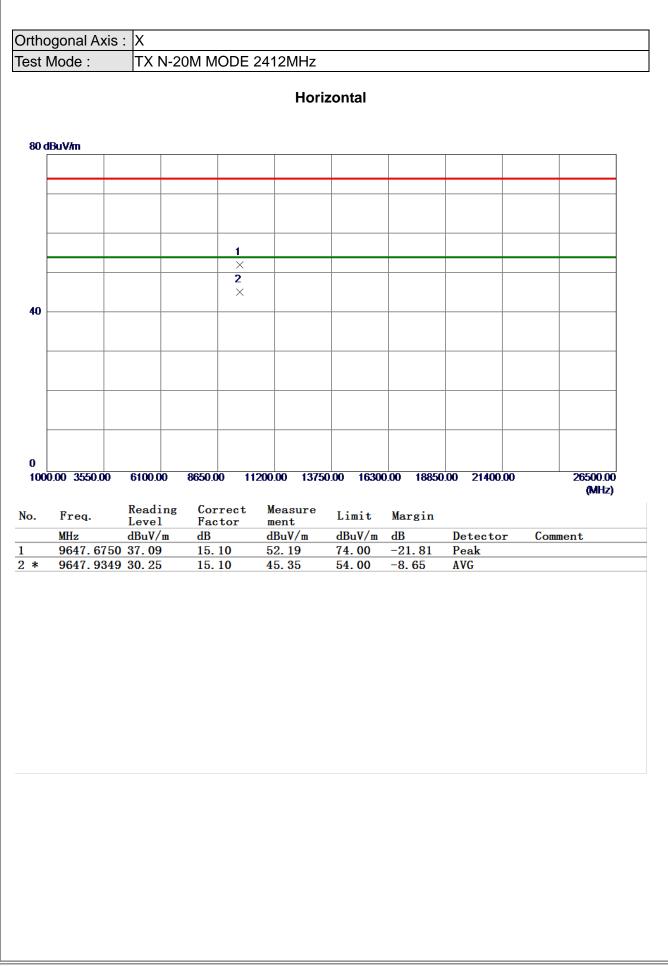


















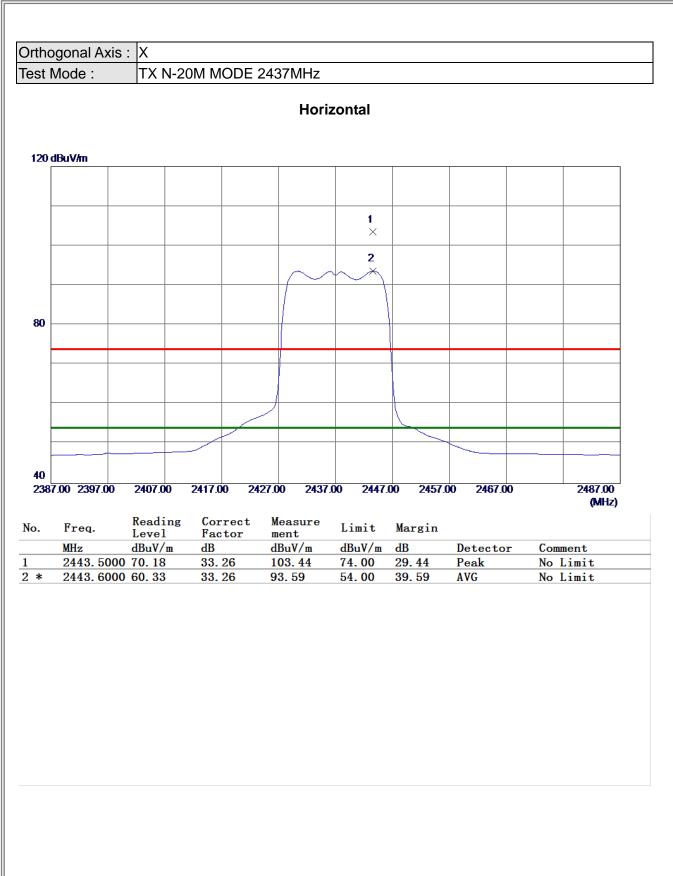






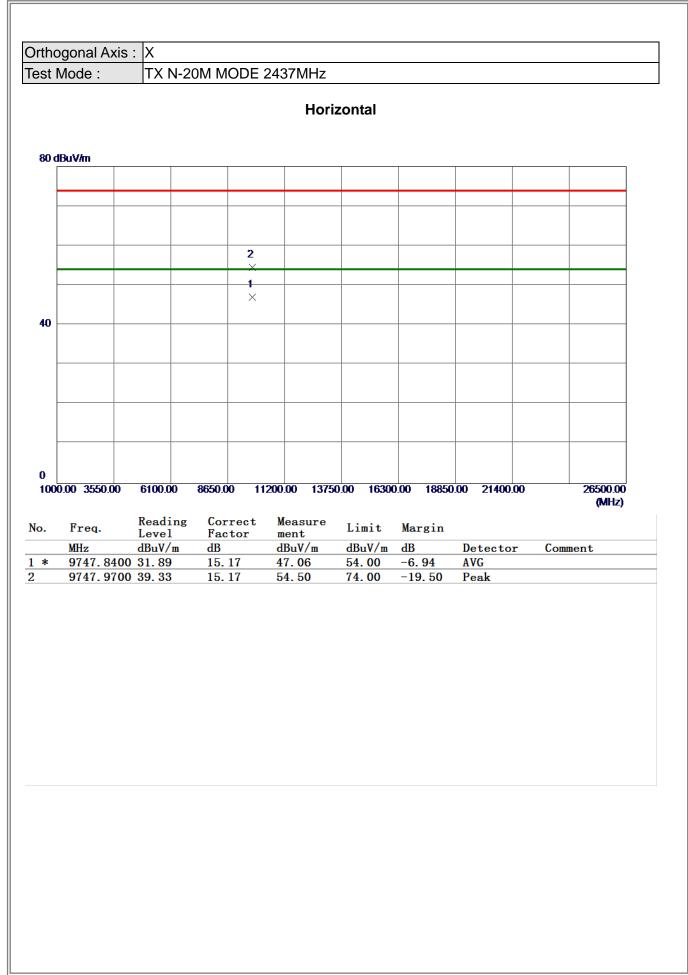






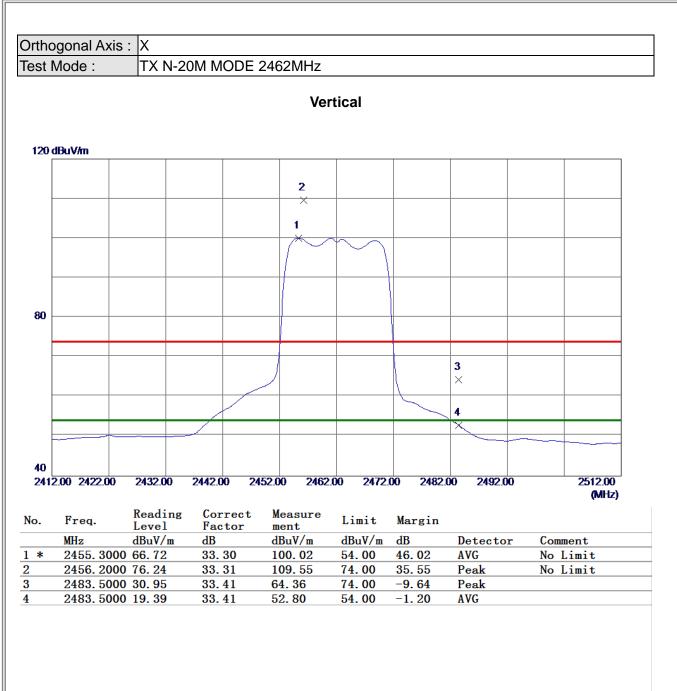






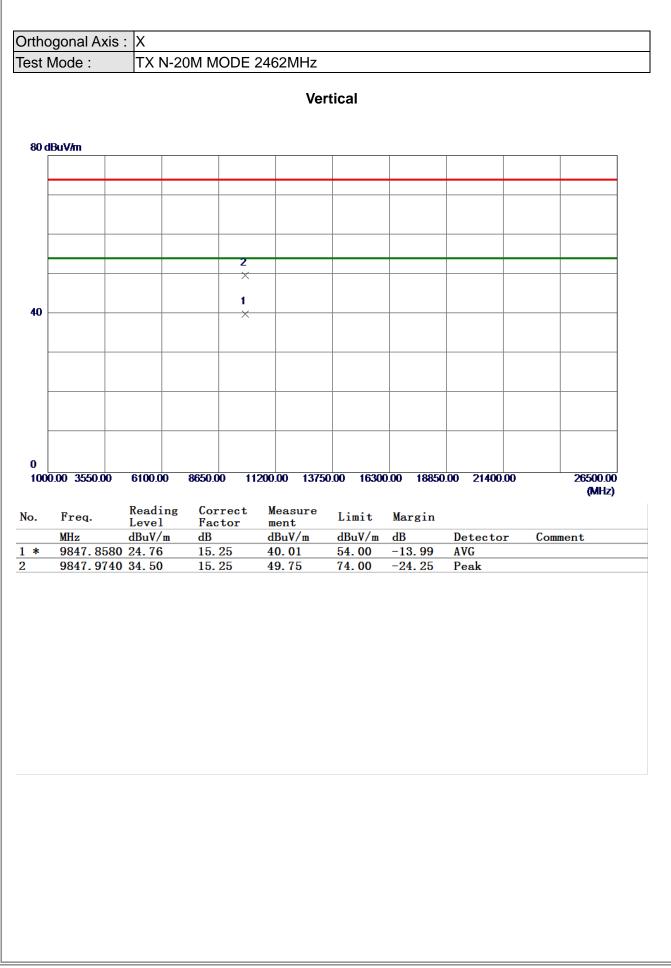






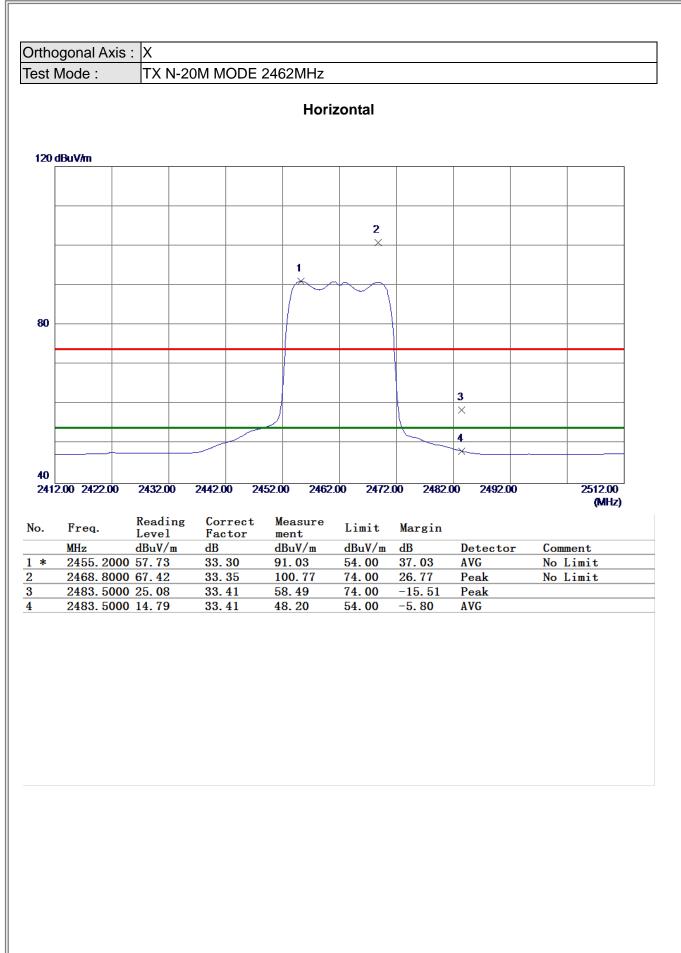












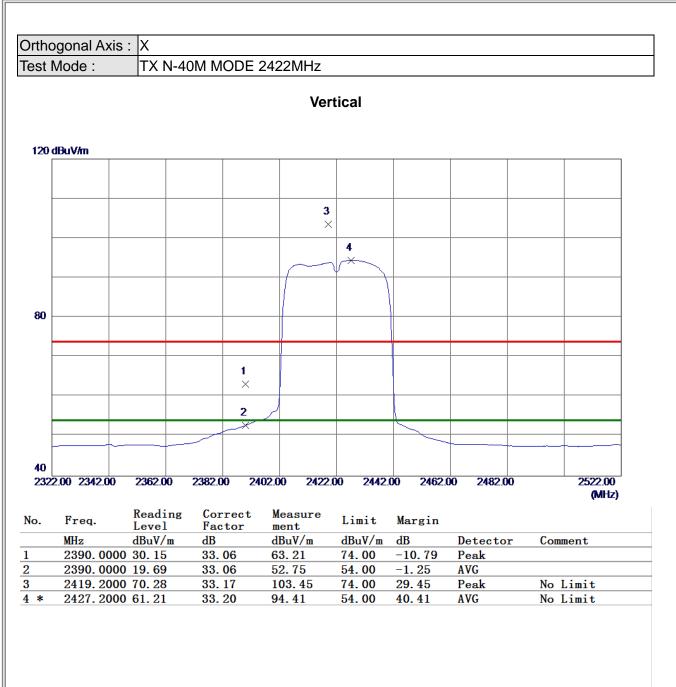






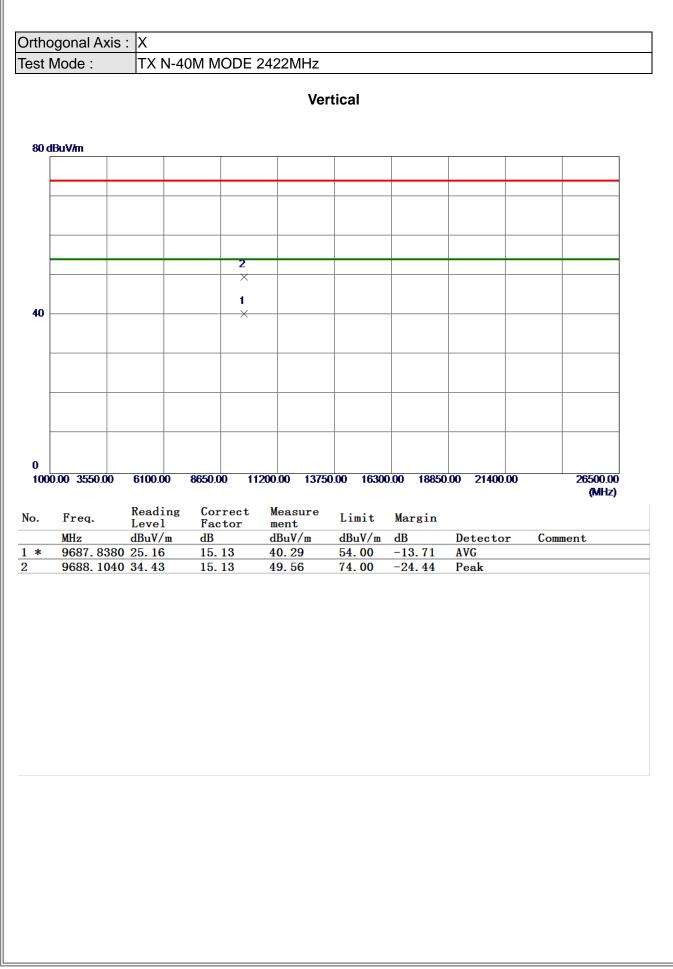






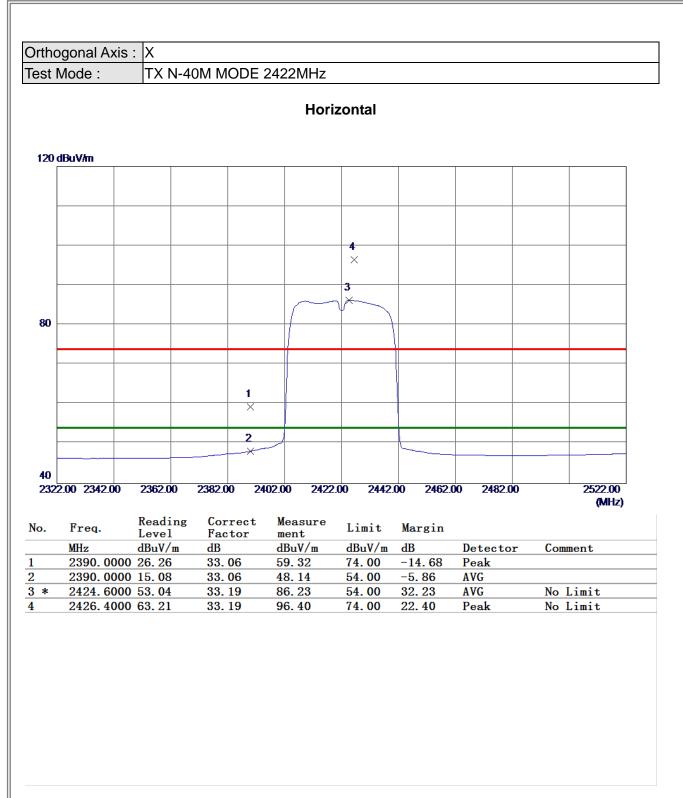






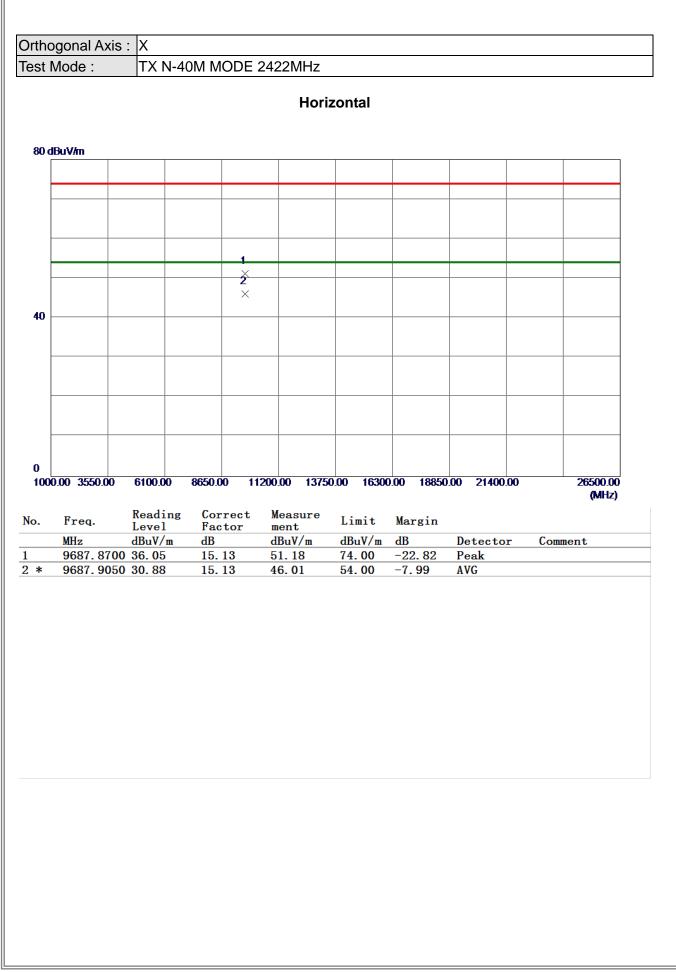






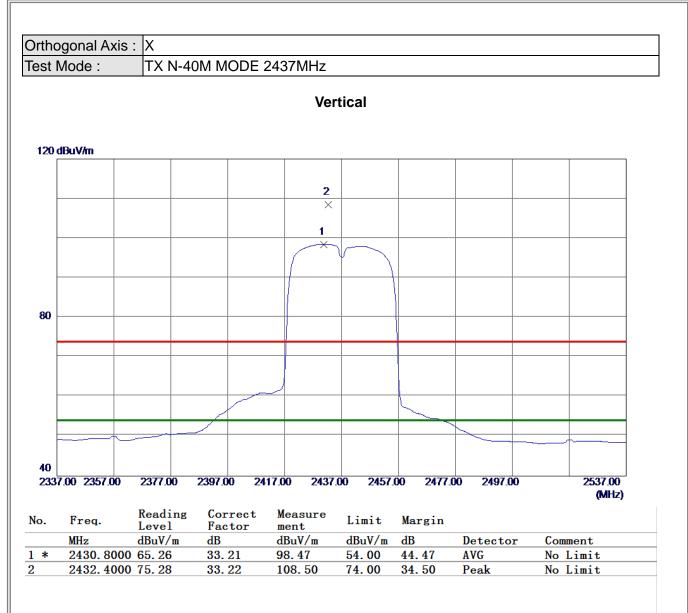












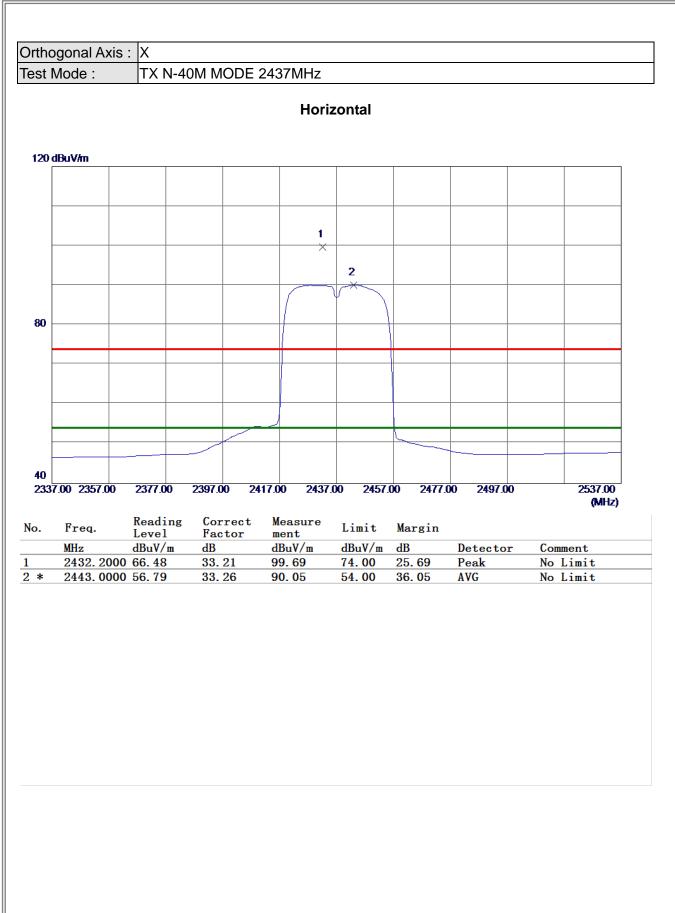






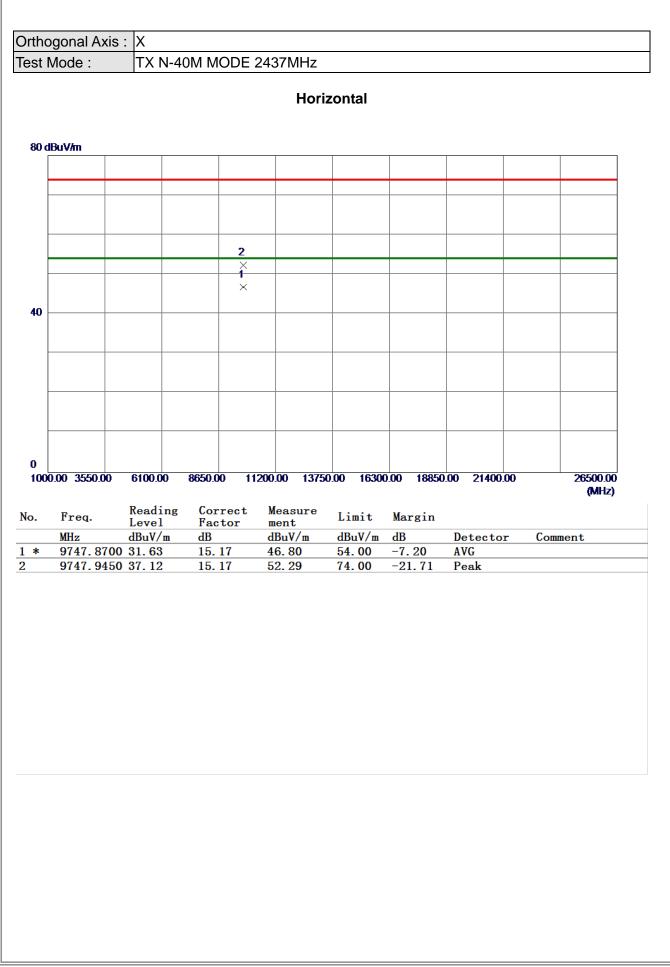






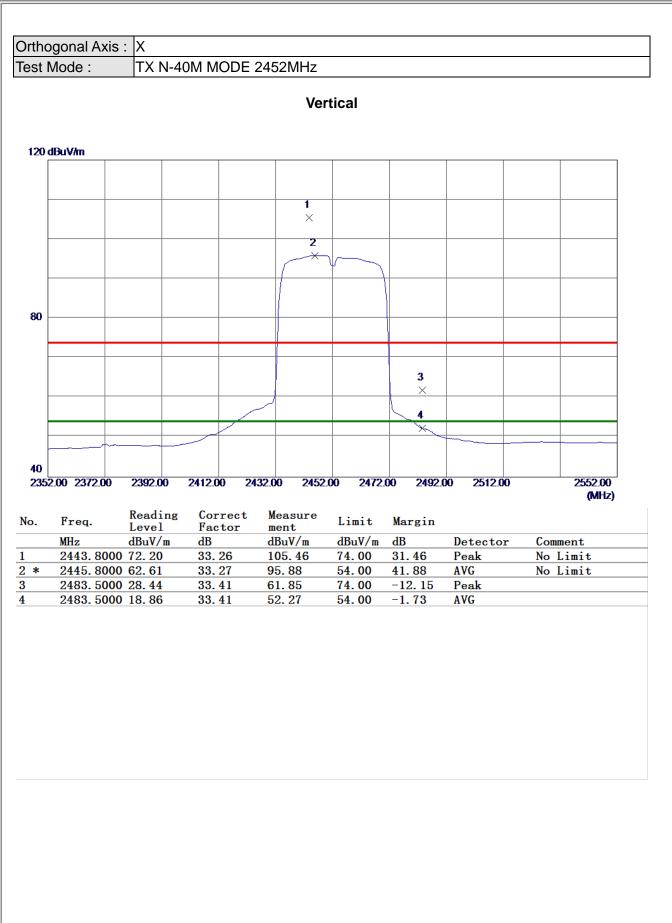






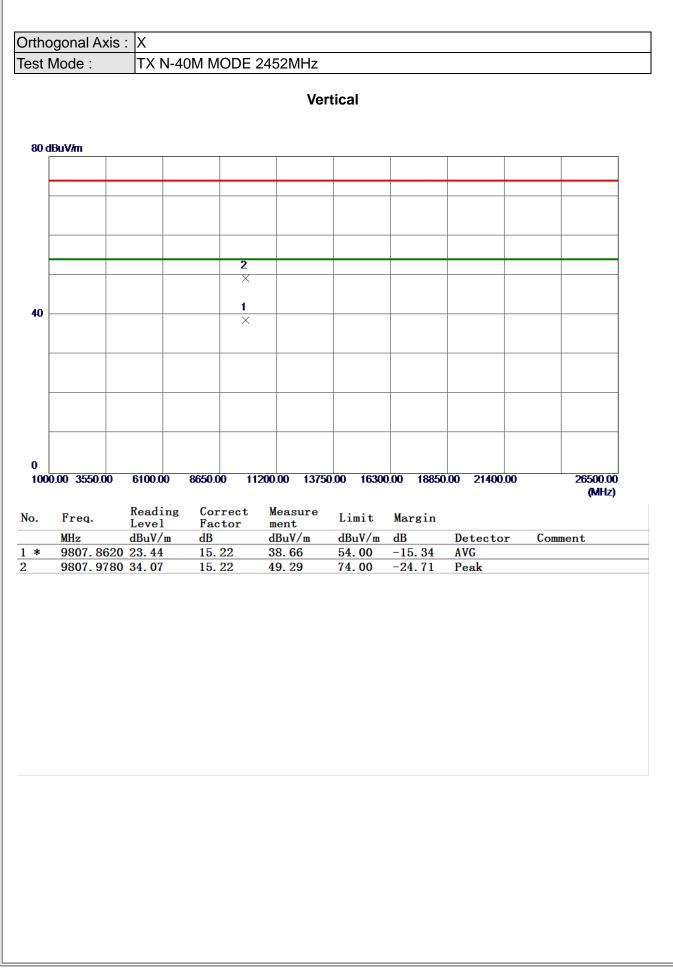






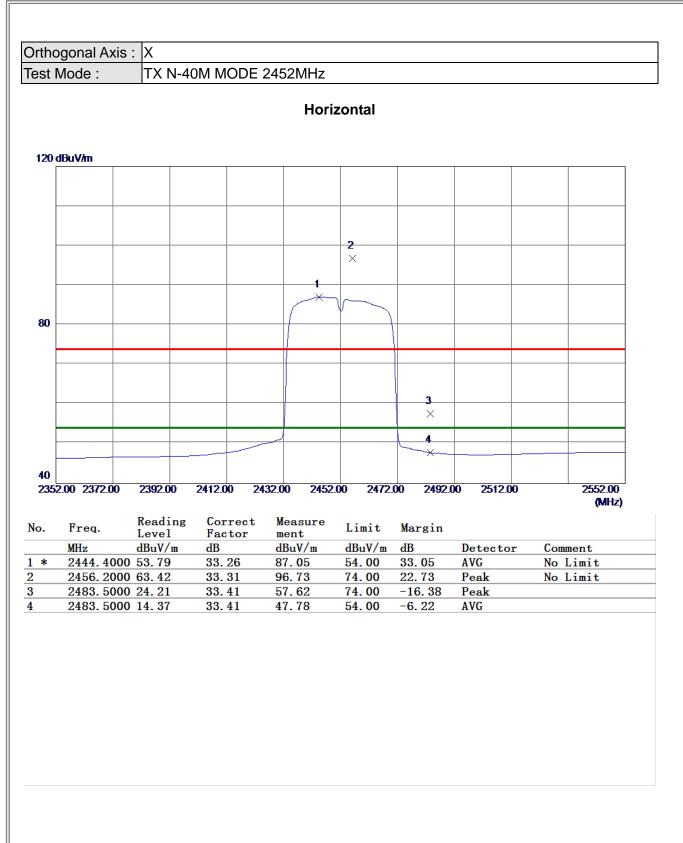






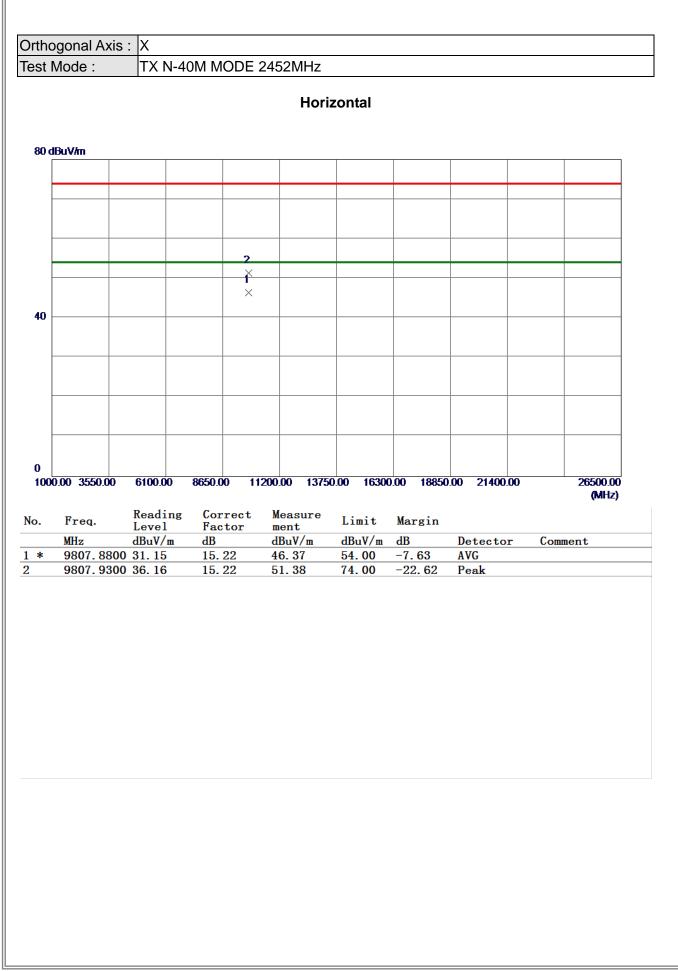
















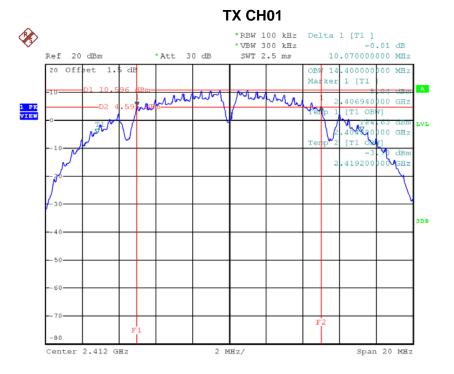
#### **APPENDIX E - BANDWIDTH**





# Test Mode : TX B Mode\_CH01/06/11

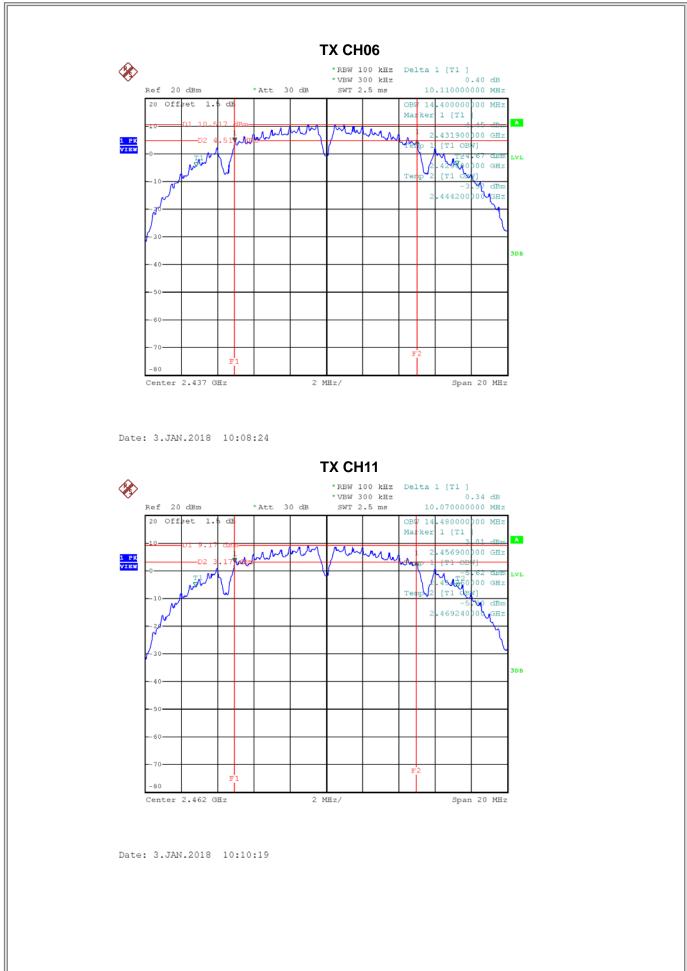
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	10.07	14.4	500	Complies
2437	10.11	14.4	500	Complies
2462	10.07	14.48	500	Complies



Date: 3.JAN.2018 10:04:46

## **3**TL





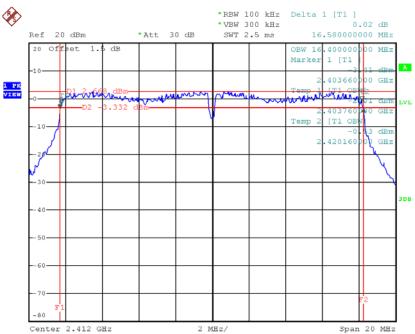




Test Mode: TX G Mode_CH01/06/11							
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result			
2412	16.58	16.40	500	Complies			
2437	16.54	16.40	500	Complies			
2462	16.53	16.40	500	Complies			

 $\bigotimes$ 

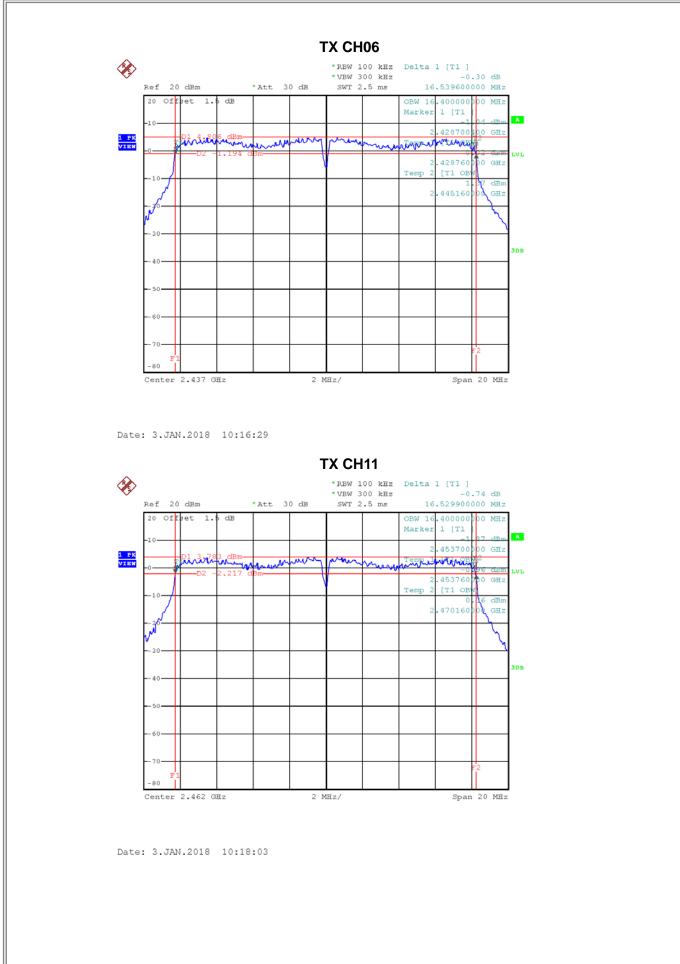




Date: 3.JAN.2018 10:12:21

## **3**TL

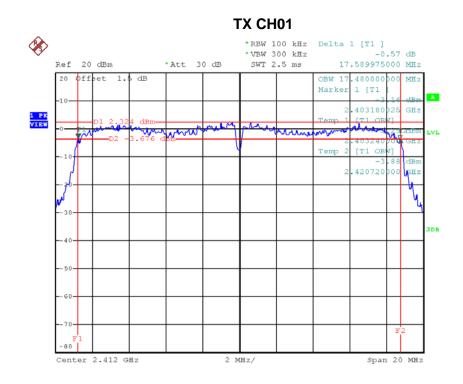




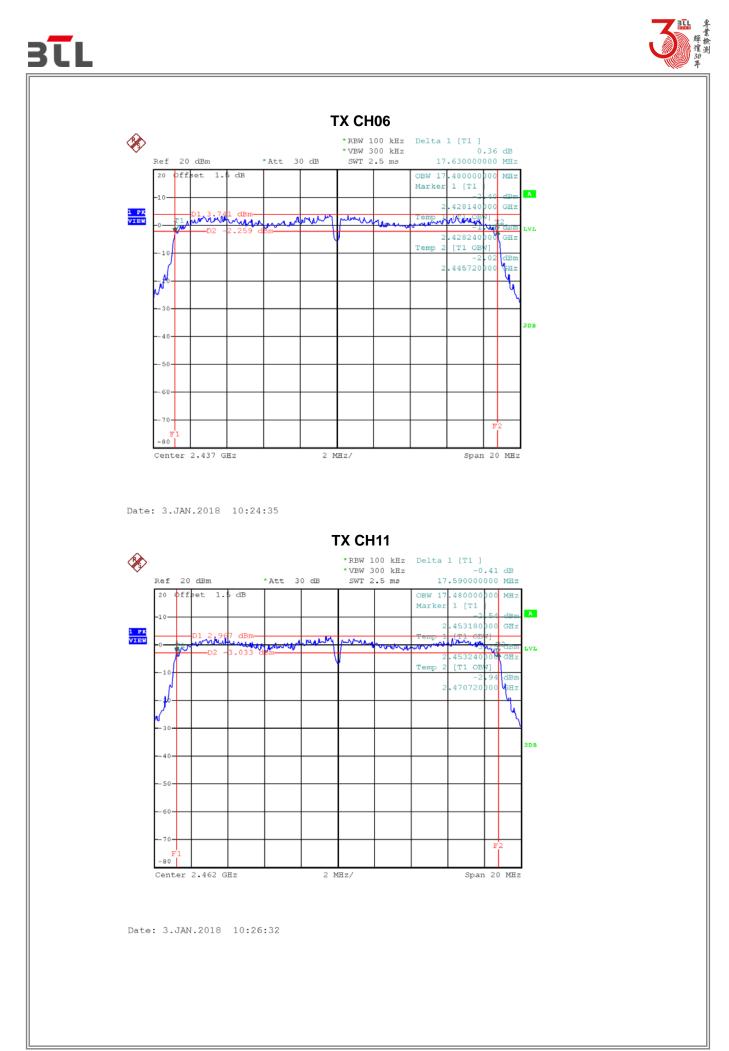




Test Mode : TX N-20MHz Mode_CH01/06/11						
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result		
2412	17.59	17.48	500	Complies		
2437	17.63	17.48	500	Complies		
2462	17.59	17.48	500	Complies		



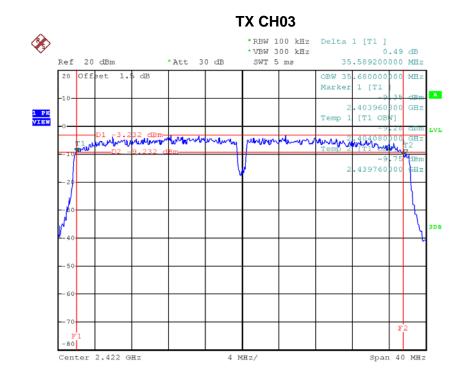
Date: 3.JAN.2018 10:22:38





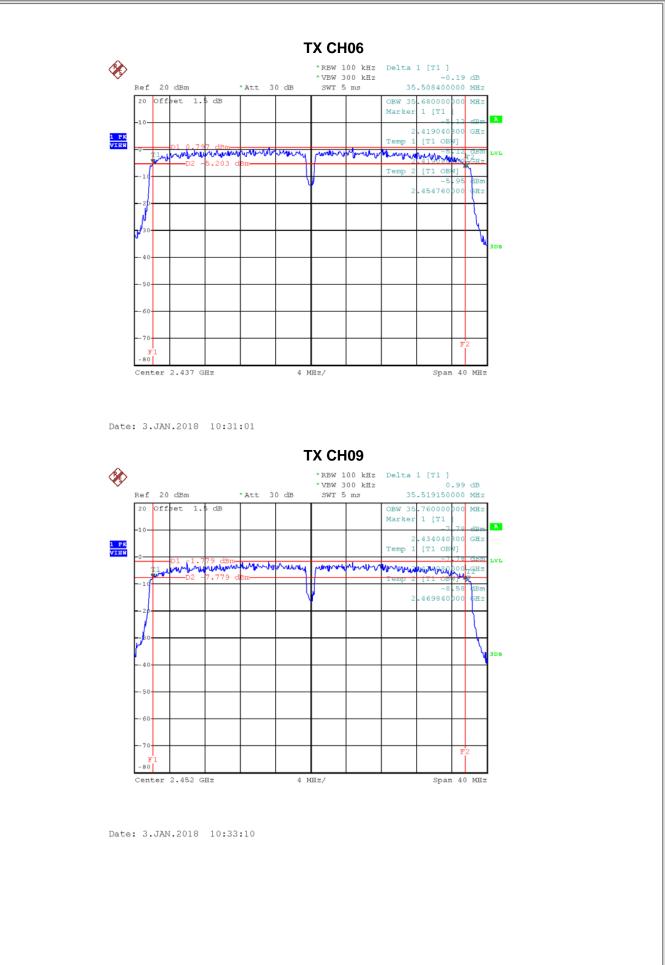


Test Mode : TX N-40MHz Mode_CH03/06/09						
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result		
2422	35.59	35.68	500	Complies		
2437	35.51	35.68	500	Complies		
2452	35.52	35.76	500	Complies		



Date: 3.JAN.2018 10:29:12









### **APPENDIX F - MAXIMUM PEAK CONDUCTED OUTPUT POWER**





Test Mode :TX B Mode_CH01/06/11_ANT 1						
Frequency	Conducted	Conducted	Max. Limit	Max. Limit	Result	
(MHz)	Power (dBm)	Power (W)	(dBm)	(W)	Result	
2412	23.94	0.25	30.00	1.00	Complies	
2437	23.71	0.23	30.00	1.00	Complies	
2462	22.85	0.19	30.00	1.00	Complies	

Test Mode :TX G Mode_CH01/06/11_ANT 1						
Frequency	Conducted	Conducted	Max. Limit	Max. Limit	Result	
(MHz)	Power (dBm)	Power (W)	(dBm)	(W)	Result	
2412	27.65	0.58	30.00	1.00	Complies	
2437	27.45	0.56	30.00	1.00	Complies	
2462	27.90	0.62	30.00	1.00	Complies	





Test Mode :TX N20 Mode_CH01/06/11_ANT 1						
Frequency	Conducted	Conducted	Max. Limit	Max. Limit	Result	
(MHz)	Power (dBm)	Power (W)	(dBm)	(W)	Result	
2412	26.62	0.46	30.00	1.00	Complies	
2437	26.69	0.47	30.00	1.00	Complies	
2462	26.98	0.50	30.00	1.00	Complies	

Test Mode :TX N20 Mode_CH01/06/11_ANT 2						
Frequency	Conducted	Conducted	Max. Limit	Max. Limit	Result	
(MHz)	Power (dBm)	Power (W)	(dBm)	(W)	Result	
2412	25.08	0.32	30.00	1.00	Complies	
2437	26.37	0.43	30.00	1.00	Complies	
2462	25.72	0.37	30.00	1.00	Complies	

Test Mode :TX N20 Mode_CH01/06/11_Total						
Frequency	Conducted	Conducted	Max. Limit	Max. Limit	Result	
(MHz)	Power (dBm)	Power (W)	(dBm)	(W)	Result	
2412	28.93	0.78	30.00	1.00	Complies	
2437	29.54	0.90	30.00	1.00	Complies	
2462	29.41	0.87	30.00	1.00	Complies	





Test Mode :TX N40 Mode_CH03/06/09_ANT 1						
Frequency	Conducted	Conducted	Max. Limit	Max. Limit	Result	
(MHz)	Power (dBm)	Power (W)	(dBm)	(W)	Result	
2422	23.45	0.22	30.00	1.00	Complies	
2437	26.67	0.46	30.00	1.00	Complies	
2452	24.09	0.26	30.00	1.00	Complies	

Test Mode :TX N40 Mode_CH03/06/09_ANT 2						
Frequency	Conducted	Conducted	Max. Limit	Max. Limit	Result	
(MHz)	Power (dBm)	Power (W)	(dBm)	(W)	Result	
2422	22.70	0.19	30.00	1.00	Complies	
2437	26.85	0.48	30.00	1.00	Complies	
2452	23.89	0.24	30.00	1.00	Complies	

Test Mode :TX N40 Mode_CH03/06/09_Total						
Frequency	Conducted	Conducted	Max. Limit	Max. Limit	Popult	
(MHz)	Power (dBm)	Power (W)	(dBm)	(W)	Result	
2422	26.10	0.41	30.00	1.00	Complies	
2437	29.77	0.95	30.00	1.00	Complies	
2452	27.00	0.50	30.00	1.00	Complies	

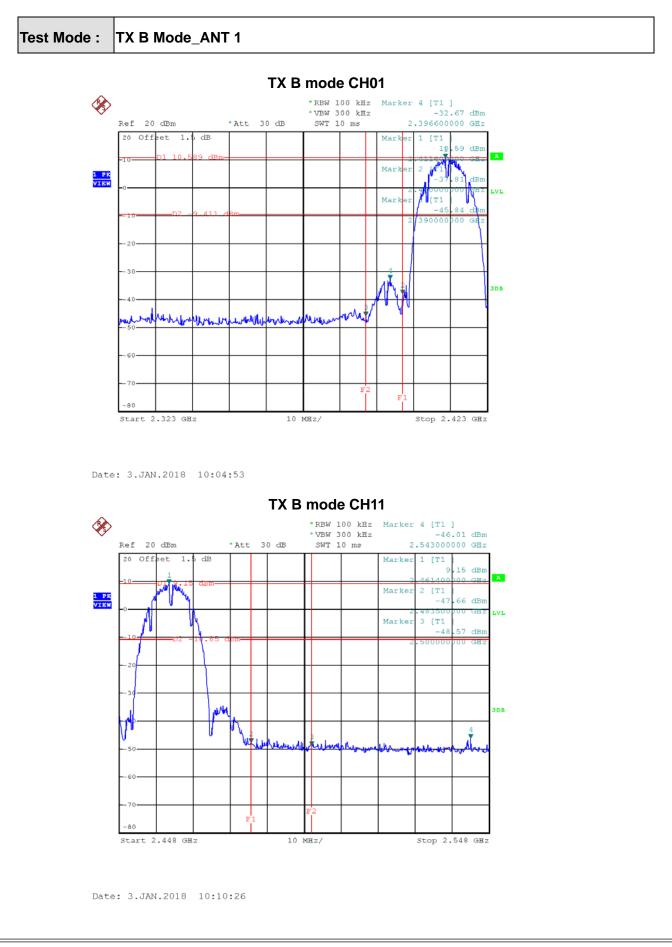




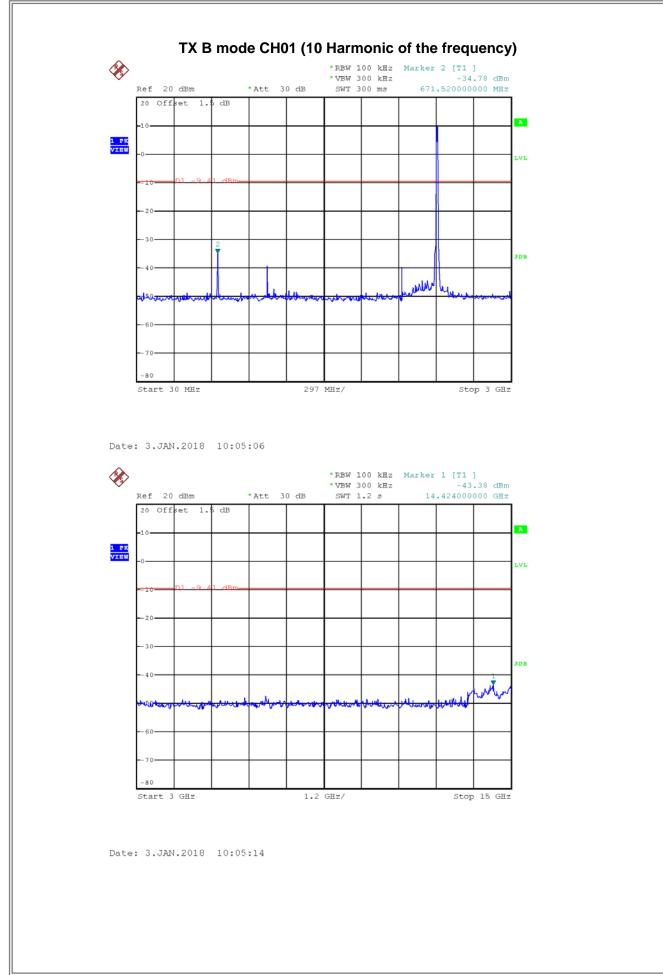
### **APPENDIX G - ANTENNA CONDUCTED SPURIOUS EMISSION**

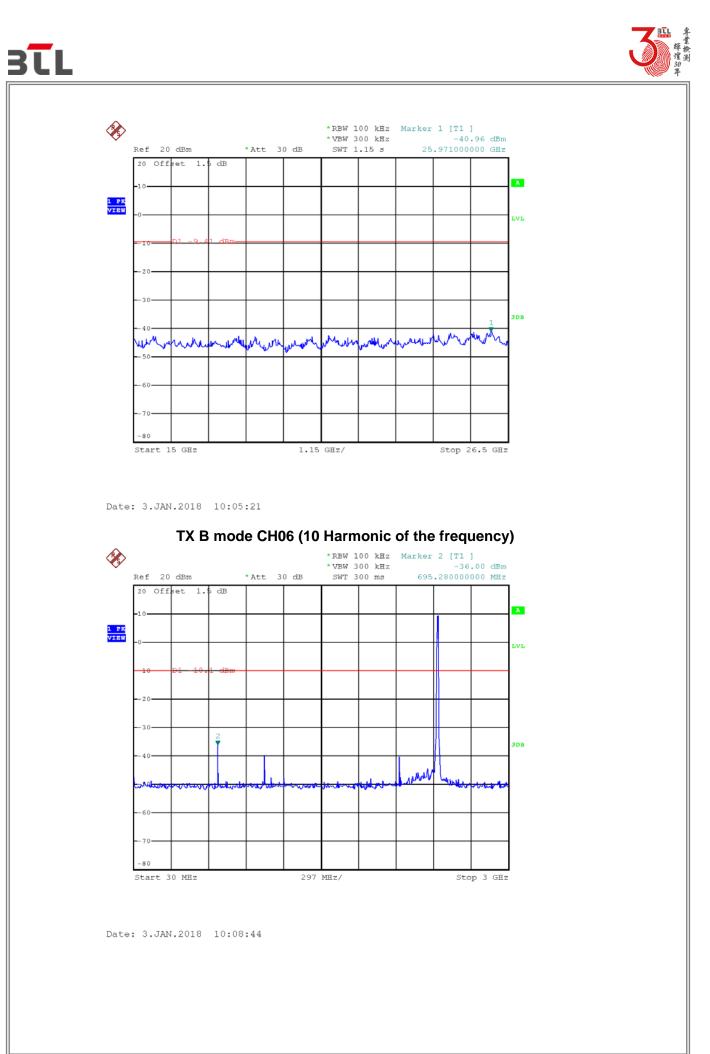


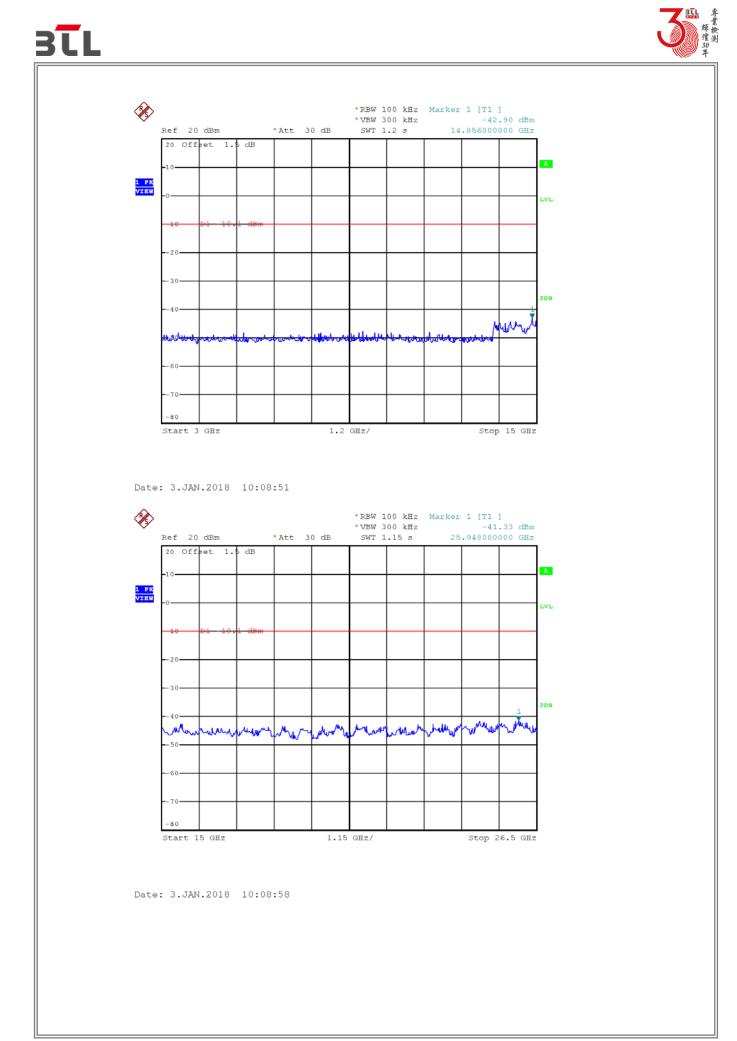




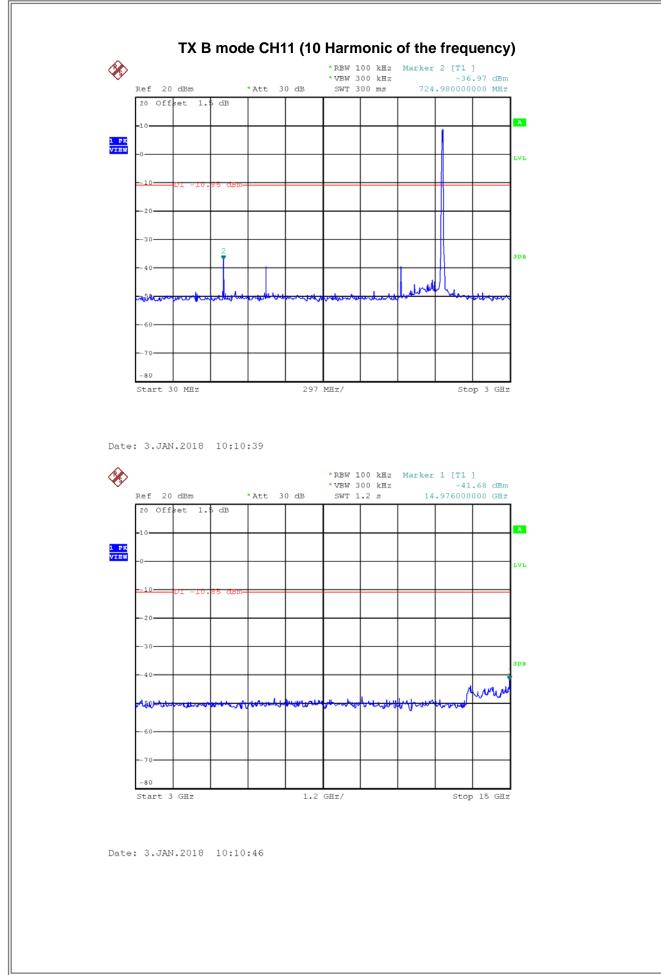


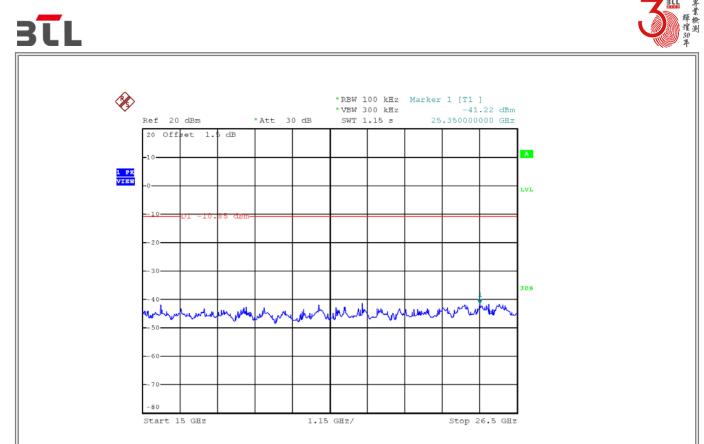








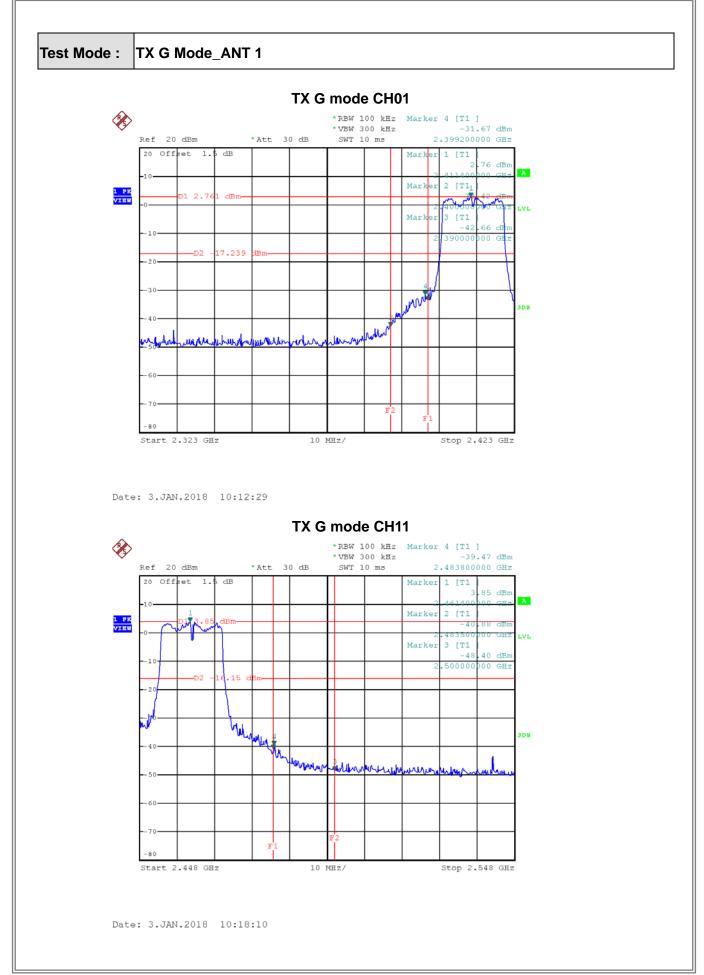




Date: 3.JAN.2018 10:10:53

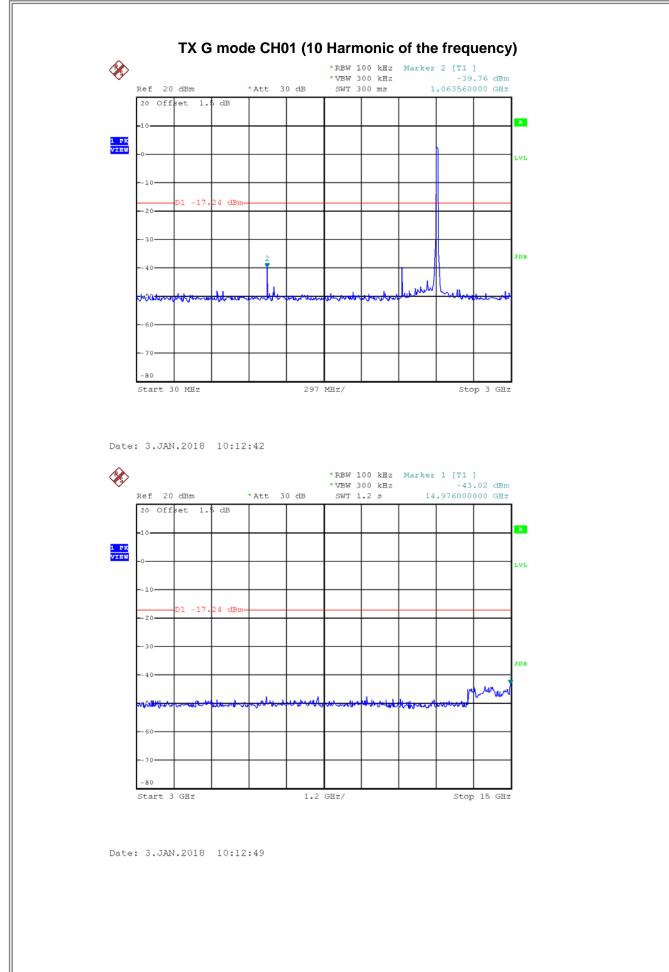


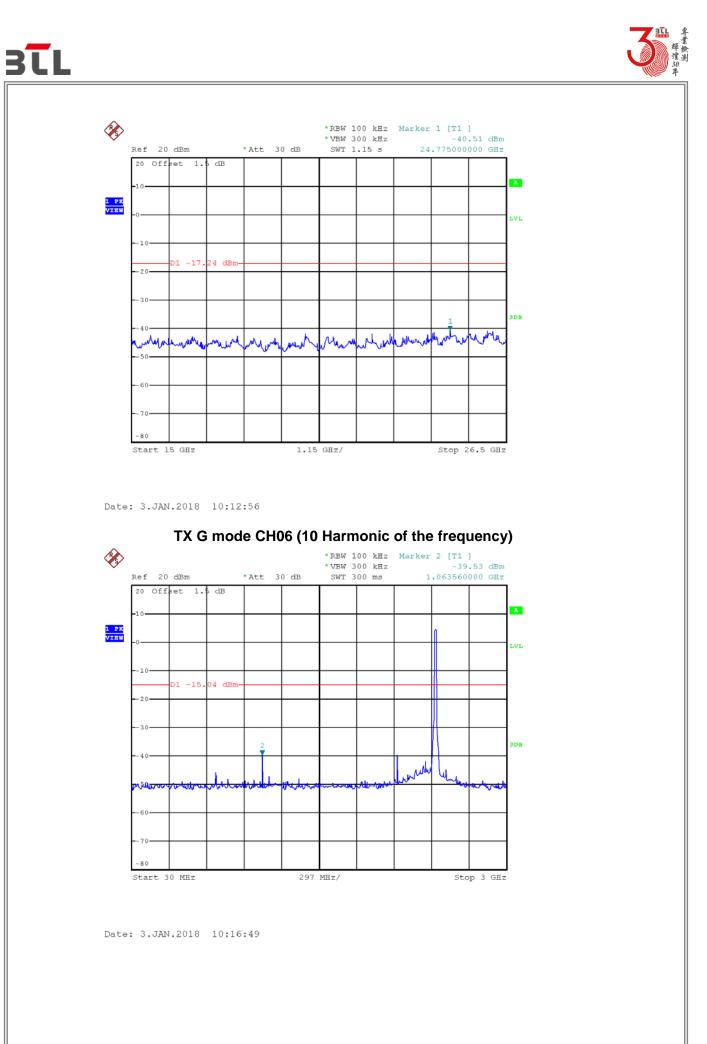


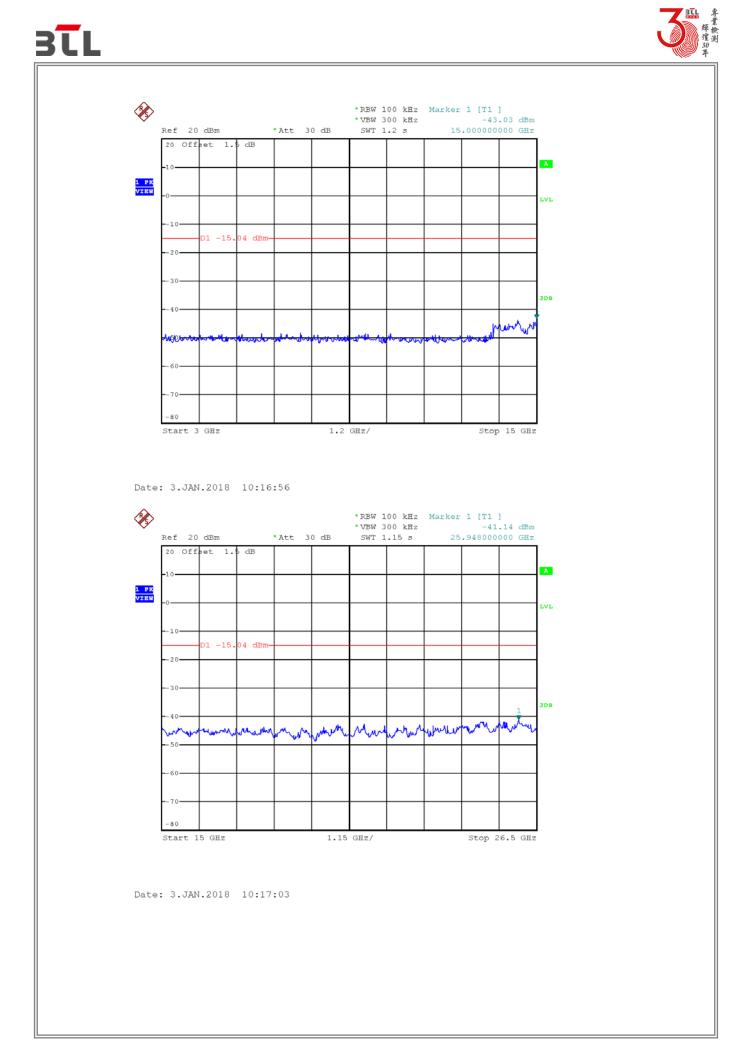


Report No.: BTL-FCCP-1-1712C162

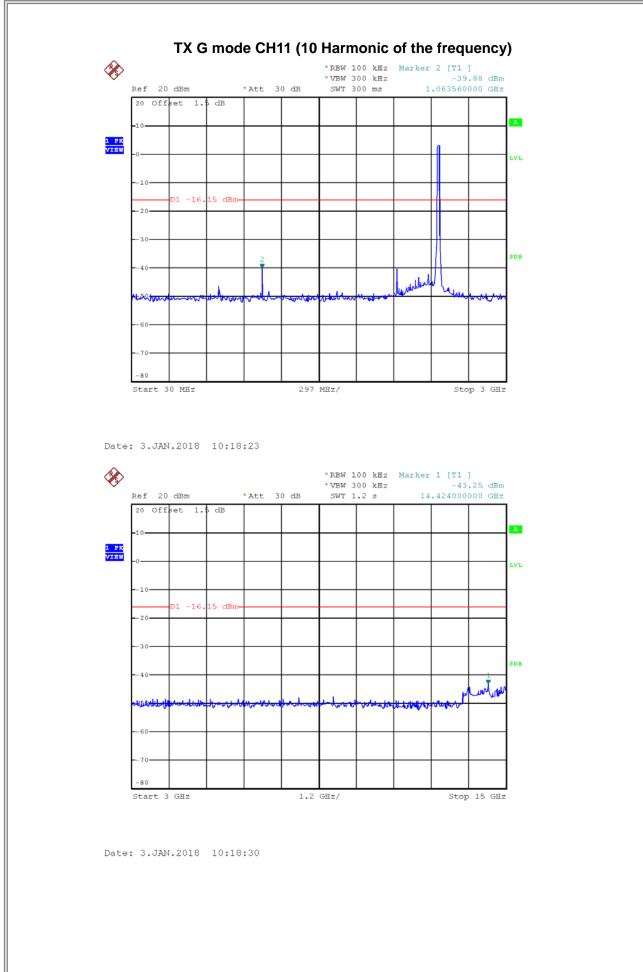


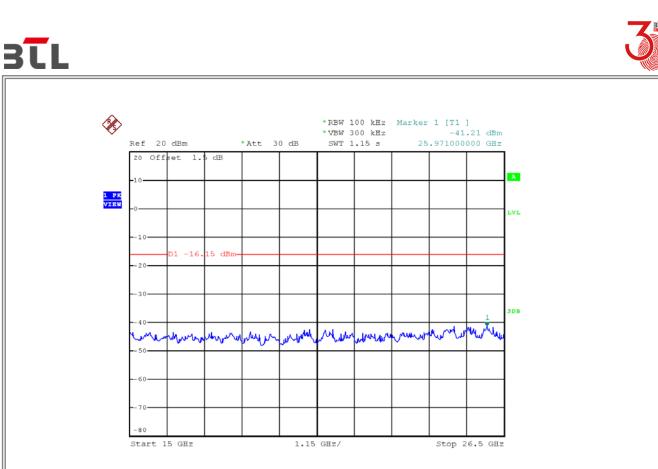












Date: 3.JAN.2018 10:18:37

·檢測 30 平