

# **FCC Radio Test Report**

FCC ID: M82-AIM58W

Project No. : 1710T083D Equipment : Computer : AIM 10W Test Model

Series Model : AIM-58, AIM-58XXXXXXXXXXXXXXXX, AIM

10WXXXXXXXXXXXXXXX (where X may be any

alphanumeric character, blank or "-".)

Applicant : Advantech Co., Ltd.

Address : No.1, Alley 20, Lane 26, Rueiguang Road, Neihu

District, Taipei 11491, Taiwan, R.O.C.

**Date of Receipt** : 2017/11/13

2020/12/16

2017/11/13 ~ 2018/2/27 Date of Test

2020/12/16 ~ 2021/4/16

Issued Date : 2021/10/15 : BTL Inc. Tested by

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0659



#### **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.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

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

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

#### 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.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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# **REPORT ISSUED HISTORY**

Report No.	Version	Description	Issued Date
BTL-FCCP-1-1710T083D	R00	Original Report.	2021/4/27
BTL-FCCP-1-1710T083D		Revised report to address TCB's comments.	2021/9/8
BTL-FCCP-1-1710T083D	R02	Revised typo.	2021/10/15

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#### 1. CERTIFICATION

Equipment : Computer
Brand Name : ADVANTECH
Test Model : AIM 10W

(where X may be any alphanumeric character, blank or "-".)

Applicant : Advantech Co., Ltd. Manufacturer : Advantech Co., Ltd.

Address : No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 11491, Taiwan,

R.O.C.

Factory : N/A Address : N/A

Date of Test : 2017/11/13 ~ 2018/2/27

2020/12/16 ~ 2021/4/16

Test Sample: Production Unit

Standard(s): FCC Part15, Subpart C (15.247)

ANSI C63.10-2013

The above equipment has been tested and found in 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-1-1710T083D) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

Test results included in this report is only for the Bluetooth EDR part.

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# 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Applied Standard(s): FCC Part15, Subpart C (15.247)				
Standard(s) Section	Test Item	Judgment	Remark	
15.207	AC Power Line Conducted Emissions	PASS		
15.205 15.209 15.247(d)	Radiated Emissions	PASS		
15.247 (a)(1)(iii)	Number of Hopping Frequency	PASS		
15.247 (a)(1)(iii)	Average Time of Occupancy	PASS		
15.247 (a)(1)	Hopping Channel Separation	PASS		
15.247 (a)(1)	Bandwidth	PASS		
15.247 (b)(1)	Output Power	PASS		
15.247(d)	Antenna conducted Spurious Emission	PASS		
15.203	Antenna Requirement	PASS		

## Note:

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

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#### 2.1 TEST FACILITY

The test facilities used to collect the test data in this report:

No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan The test sites and facilities are covered under FCC RN: 674415 and DN: TW0659.

C05 ☐ CB08 □ CB11

□ CB16

**SR05**  $\boxtimes$ 

## 2.2 MEASUREMENT UNCERTAINTY

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 %.

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U<sub>cispr</sub> requirement.

A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U (dB)
C05	CISPR	150 kHz ~ 30MHz	3.44

#### B. Radiated emissions test:

Test Site	Measurement Frequency Range	U,(dB)
	0.03 GHz ~ 0.2 GHz	4.17
CB15	0.2 GHz ~ 1 GHz	4.72
	1 GHz ~ 6 GHz	5.21
	6 GHz ~ 18 GHz	5.51
	18 GHz ~ 26 GHz	3.69
	26 GHz ~ 40 GHz	4.23

#### C. Conducted test:

nou toot :	
Test Item	U,(dB)
Number of Hopping Frequency	0.00
Average Time of Occupancy	1.20
Hopping Channel Separation	1.20
Bandwidth	1.13
Peak Output Power	1.06
Antenna conducted Spurious Emission	1.14
Conducted Band edges	1.13

#### NOTE:

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

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## 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	Computer		
Brand Name	ADVANTECH		
Test Model	AIM 10W		
Series Model	AIM-58, AIM-58XXXXXXXXXXXXXXXXX, AIM 10WXXXXXXXXXXXXXXXXXX (where X may be any alphanumeric character, blank or "-".)		
Model Difference	The market distribution is	different only.	
	Operation Frequency	2402~2480 MHz	
Output Power (Max.)	Modulation Technology	GFSK(1Mbps) π /4-DQPSK(2Mbps)	
	Bit Rate of Transmitter	8-DPSK(3Mbps)	
	Output Power Max.	10.57 dBm(1Mbps) 9.57 dBm(3Mbps)	
	Output Power Max. Spot check test	9.97 dBm(1Mbps) 9.27 dBm(3Mbps)	
Power Source	DC Voltage supplied from	AC/DC adapter.	
Power Rating	I/P: AC 100-240V~, 1.5A, 50~60Hz, 1.5A O/P: DC 19V==3.42A		
	2* AC Adapter: (1) TAMURA / XEW1934N (2) FSP / FSP065-DBCM1		
Products Covered	2* Dock: (1) Desk Docking: ADVANTECH/AIM-OFD-0000 (2) VESA Docking: ADVANTECH/AIM-DOC-0001		

#### NOTE:

- (1) For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- (2) In this report, the test results of below items refer to BTL-FCCP-1-1710083 report due to the device is identical to the original device of the referencing report, except added series models and added an external power adapter.
  - a. Conducted Emission
  - b. Radiated Spurious Emission (30MHZ TO 1000MHZ & ABOVE 1000MHZ)
  - c. Number of Hopping Frequency
  - d. Average Time of Occupancy
  - e. Hopping Channel Separation
  - f. Bandwidth
  - g. Peak Output Power
  - h. Antenna conducted Spurious Emission

Spot checks are applied to below items:

- a. Peak Output Power
- b. Radiated Spurious Emission(ABOVE 1000MHZ)

After evaluated, the changes with respect to the original device below items are tested.

- a. Conducted Emission
- b. Radiated Spurious Emission (30MHZ TO 1000MHZ)

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# (3) Channel List:

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	(MHz)	07	(MHz)	T 4	(MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

# (4) Table for Filed Antenna

Ant.	Brand	Model	Antenna Type	Connector	Gain (dBi)
1	INPAQ	WA-F-LB-02-113	PIFA	I-pex	0.65

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#### 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 Mode Note (1)

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

For Conducted Emission			
Final Test Mode Description			
Mode 1	TX Mode		

For Radiated Emission			
Final Test Mode Description			
Mode 1	TX Mode Note (1)		

#### Note:

- (1) The measurements are performed at the high, middle, low available channels.
- (2) The measurements for Hopping Channel Separation, Bandwidth and Peak Output Power were tested during 1Mbps, 2Mbps and 3Mbps, the worst case are 1Mbps and 3Mbps, only worst case was documented.

#### 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 FHSS

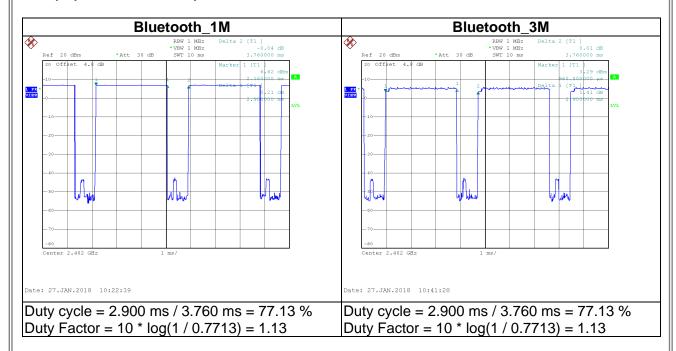
Test Software Version	DOC		
Frequency	2402 MHz	2441 MHz	2480 MHz
Parameters(1Mbps)	Default	Default	Default
Parameters(3Mbps)	Default	Default	Default

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## 3.4 DUTY CYCLE

If duty cycle is  $\geq$  98 %, duty factor is not required. If duty cycle is < 98 %, duty factor shall be considered.

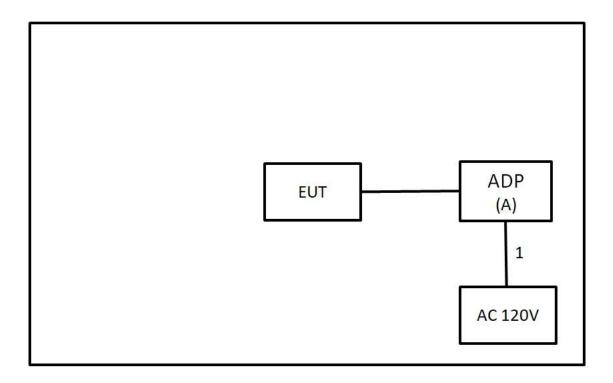


#### Note:

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1/3 MHz and the video bandwidth is 3 kHz (Duty cycle < 98%).



## 3.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



## 3.6 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	Brand	Model No.	Series No.	Remarks
Α	Adapter	FSP GROUP INC	FSP065-DBCM1	IN/A	Supplied by test requester

Item	Shielded	Ferrite Core	Length	Cable Type	Remarks
1	N/A	N/A	1.1m	PowerCoro	Supplied by test requester



#### 4. EMC EMISSION TEST

#### 4.1 CONDUCTED EMISSION MEASUREMENT

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

Frequency of Emission (MHz)	Conducted Limit (dBµV)		
	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.

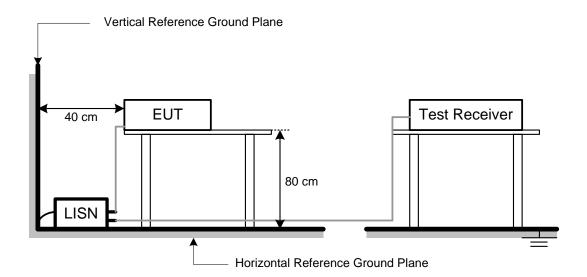
#### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation

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## 4.1.4 TEST SETUP



#### 4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical function (as a customer would normally use it), EUT was programmed to be in continuously transmitting/receiving data or hopping on mode.

#### 4.1.6 EUT TEST CONDITIONS

Temperature: 25°C, 19°C Relative Humidity: 55%, 61% Test Voltage: AC 120V/60Hz

#### 4.1.7 TEST RESULTS

Please refer to the Appendix A.

#### Remark:

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



## **4.2 RADIATED EMISSION MEASUREMENT**

## 4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9KHz -1000MHz)

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.

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)	
Frequency (Miriz)	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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

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Spectrum Parameter	Setting	
Attenuation	Auto	
Start Frequency	1000 MHz	
Stop Frequency	10th carrier harmonic	
RBW / VBW	4 Mile /4 Mile for Dools 4 Mile /401 le for Asserts	
(emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average	

Spectrum 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

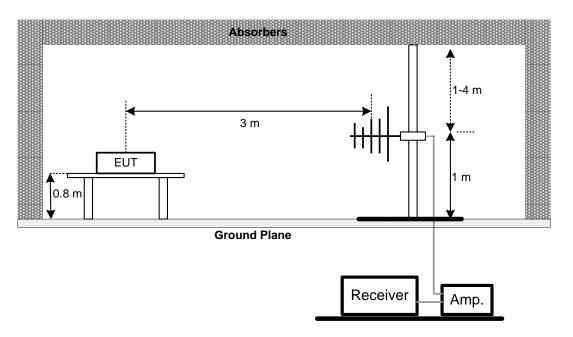
No deviation

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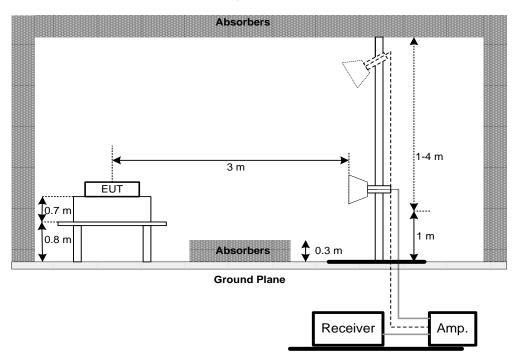


## 4.2.4 TEST SETUP

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

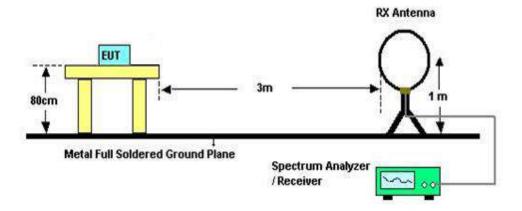


(B) Radiated Emission Test Set-Up Frequency Above 1 GHz





## (C) For Radiated Emissions Below 30MHz



#### 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, 21°C Relative Humidity: 55%, 70% 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 1000 MHZ)**

Please refer to the Appendix C.

## 4.2.9 TEST RESULTS (ABOVE 1000 MHZ)

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.

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## 5. NUMBER OF HOPPING CHANNEL

#### **5.1 APPLIED PROCEDURES**

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Frequency Range (MHz)	Result	
15.247(a)(1)(iii)	Number of Hopping Channel	2400-2483.5	PASS	

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RBW	100 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### **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=100KHz, Sweep time = Auto.

## **5.1.2 DEVIATION FROM STANDARD**

No deviation.

#### 5.1.3 TEST SETUP



## **5.1.4 EUT OPERATION CONDITIONS**

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

## **5.1.5 EUT TEST CONDITIONS**

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

## **5.1.6 TEST RESULTS**

Please refer to the Appendix E

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#### 6. AVERAGE TIME OF OCCUPANCY

## **6.1 APPLIED PROCEDURES / LIMIT**

VII 7 II EIED I ROOEDOREO / EIIIII I					
FCC Part15 (15.247) , Subpart C					
Section	Test Item	Limit	Frequency Range (MHz)	Result	
15.247(a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS	

#### 6.1.1 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- f. Measure the maximum time duration of one single pulse.
- g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
- h. Measure the maximum time duration of one single pulse.
- i. DH5 Packet permit maximum 1600/79/6 = 3.37 hops per second in each channel (5 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times  $3.37 \times 31.6 = 106.6$  within 31.6 seconds.
- j. DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times 5.06 x 31.6 = 160 within 31.6 seconds.
- k. DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times 10.12 x 31.6 = 320 within 31.6 seconds.

#### 6.1.2 DEVIATION FROM STANDARD

No deviation.

## 6.1.3 TEST SETUP

EUT	SPECTRUM	
	ANALYZER	

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## **6.1.4 EUT OPERATION CONDITIONS**

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

## **6.1.5 EUT TEST CONDITIONS**

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

## **6.1.6 TEST RESULTS**

Please refer to the Appendix F

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## 7. HOPPING CHANNEL SEPARATION MEASUREMENT

#### 7.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 KHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting	
Attenuation	Auto	
Span Frequency	> Measurement Bandwidth or Channel Separation	
RBW	30 KHz	
VBW	100 KHz	
Detector	Peak	
Trace	Max Hold	
Sweep Time	Auto	

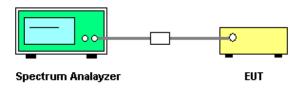
## 7.1.1 TEST PROCEDURE

- a. The EUT must have its hopping function enabled
- b. Span = wide enough to capture the peaks of two adjacent channels Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span Video (or Average) Bandwidth (VBW) ≥ RBW Sweep = Auto Detector function = Peak Trace = Max Hold

#### 7.1.2 DEVIATION FROM STANDARD

No deviation.

## 7.1.3 TEST SETUP



#### 7.1.4 EUT TEST CONDITIONS

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

#### 7.1.5 TEST RESULTS

Please refer to the Appendix G

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## 8. BANDWIDTH TEST

## **8.1 APPLIED PROCEDURES**

FCC Part15 (15.247) , Subpart C				
Section	Frequency Range (MHz)			
15.247(a)(2)	Bandwidth	2400-2483.5		

Spectrum Parameter	Setting			
Attenuation	Auto			
Span Frequency	> Measurement Bandwidth or Channel Separation			
RBW	30 KHz (20dB Bandwidth) / 30 KHz (Channel Separation)			
VBW	100 KHz (20dB Bandwidth) / 100 KHz (Channel Separation)			
Detector	Peak			
Trace	Max Hold			
Sweep Time	Auto			

#### **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= 30KHz, VBW=100KHz, 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 tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

## **8.1.5 EUT TEST CONDITIONS**

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

## 8.1.6 TEST RESULTS

Please refer to the Appendix H

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## 9. PEAK OUTPUT POWER TEST

## 9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C					
Section	Test Item	Limit	Frequency Range (MHz)	Result	
15.247(b)(1)	Peak Output Power	1 Watt or 30dBm (hopping channel >75) 0.125Watt or 21dBm (hopping channel <75	2400-2483.5	PASS	

## 9.1.1 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= 1MHz/3MHz, VBW= 1MHz/3MHz, Sweep time = Auto.

## 9.1.2 DEVIATION FROM STANDARD

No deviation.

## 9.1.3 TEST SETUP

EUT	SPECTRUM	
	ANALYZER	

#### 9.1.4 EUT OPERATION CONDITIONS

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

#### 9.1.5 EUT TEST CONDITIONS

Temperature: 25°C, 21.8°C Relative Humidity: 55%, 52% Test Voltage: AC 120V/60Hz

## 9.1.6 TEST RESULTS

Please refer to the Appendix I

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#### 10. ANTENNA CONDUCTED SPURIOUS EMISSION

#### 10.1 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.

#### **10.1.1 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=100KHz, Sweep time = Auto.
- c Offset=antenna gain+cable loss

#### 10.1.2 DEVIATION FROM STANDARD

No deviation.

#### **10.1.3 TEST SETUP**

EUT	SPECTRUM	
	ANALYZER	

#### 10.1.4 EUT OPERATION CONDITIONS

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

## **10.1.5 EUT TEST CONDITIONS**

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

## 10.1.6 TEST RESULTS

Please refer to the Appendix J

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# 11. MEASUREMENT INSTRUMENTS LIST

	Conducted Emission Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	TWO-LINE V-NETWORK	R&S	ENV216	101050	Jan. 24, 2019		
2	Test Cable	TIMES	CFD300-NL	C02	Jun. 13, 2019		
3	EMI Test Receiver	R&S	ESR7	101433	Dec. 07, 2019		
4	Measurement Software	EZ	EZ_EMC (Version NB-03A)	N/A	N/A		

	Conducted Emission Measurement (For Adapter: FSP / FSP065-DBCM1)						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	TWO-LINE V-NETWORK	R&S	ENV216	101050	2021/6/10		
2	Test Cable	EMCI	EMC400-BM-BM- 5000	170501	2021/6/7		
3	EMI Test Receiver	R&S	ESCI	100080	2021/6/14		
4	Measurement Software	EZ	EZ_EMC (Version NB-03A1-01)	N/A	N/A		

	Radiated Emission Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Preamplifier	EMCI	012645B	980267	Feb. 28, 2018		
2	Preamplifier	EMCI	EMC02325	980217	Dec. 27, 2019		
3	Preamplifier	EMCI	EMC2654045	980030	Feb. 13, 2019		
4	Test Cable	EMCI	EMC104-SM-S M-8000	8m	Jan. 03, 2019		
5	Test Cable	EMCI	EMC104-SM-S M-800	150207	Jan. 03, 2019		
6	Test Cable	EMCI	EEMC104-SM-S M-3000	151205	Jan. 03, 2019		
7	MXE EMI Receiver	Agilent	N9038A	MY55420127	Jan. 08, 2019		
8	Signal Analyzer	Agilent	N9010A	MY52220990	Feb. 21, 2019		
9	Loop Ant	EMCO	6502	42960	Nov. 23, 2018		
10	Horm Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	Feb. 28, 2018		
11	Horm Ant	Schwarzbeck	BBHA 9170	187	Dec. 05, 2019		
12	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-548	Jan. 15, 2019		
13	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0623	Jan. 15, 2019		

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	Radiated Emission Measurement (For Spot check test)						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Preamplifier	EMCI	EMC001340	980555	2021/4/9		
2	Preamplifier	EMCI	EMC02325B	980217	2021/4/9		
3	Preamplifier	EMCI	EMC012645B	980267	2021/4/9		
4	Preamplifier	EMCI	EMC184045SE	980512	2021/5/31		
5	Test Cable	EMCI	EMC-SM-SM-10 00	180809	2021/4/9		
6	Test Cable	EMCI	EMC104-SM-S M-3000	151205	2021/4/9		
7	Test Cable	EMCI	EMC-SM-SM-70 00	180408	2021/4/9		
8	MXE EMI Receiver	Agilent	N9038A	MY554200087	2021/6/9		
9	Signal Analyzer	Agilent	N9010A	MY56480554	2021/8/24		
10	Loop Ant	Electro-Metrics	EMCI-LPA600	274	2021/6/15		
11	Horn Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	2021/6/11		
12	Horn Ant	Schwarzbeck	BBHA 9170	BBHA 9170340	2021/7/8		
13	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	VULB 9168-352	2021/7/23		
14	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0625	2021/7/23		
15	Measurement Software	EZ	EZ_EMC (Version NB-03A1-01)	N/A	N/A		

	Number of Hopping Channel						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018		

	Average Time of Occupancy						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018		

	Hopping Channel Separation Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018		

	Bandwidth						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until		
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018		

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	Peak Output Power							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until			
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018			
2	Power Meter	Anritsu	ML2495A	1128008	Aug. 16, 2018			
3	Power Sensor	Anritsu	MA2411B	1126001	Aug. 16, 2018			

	Peak Output Power (For Spot check test)							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until			
1	Power Meter	Anritsu	ML2495A	1128008	2021/6/10			
2	Power Sensor	Anritsu	MA2411B	1126001	2021/6/10			

Antenna Conducted Spurious Emission						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until	
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018	

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

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# **12. EUT TEST PHOTO**









# Conducted Measurement Photos Desk Docking







# Conducted Measurement Photos VESA Docking







# Conducted Measurement Photos Adapter: FSP / FSP065-DBCM1







Conducted Measurement Photos Adapter: FSP / FSP065-DBCM1+ VESA Docking







# Radiated Measurement Photos 9KHz to 30MHz

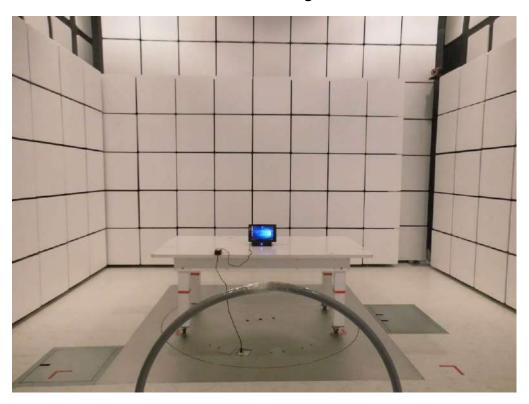






# Radiated Measurement Photos 9KHz to 30MHz

# **Desk Docking**

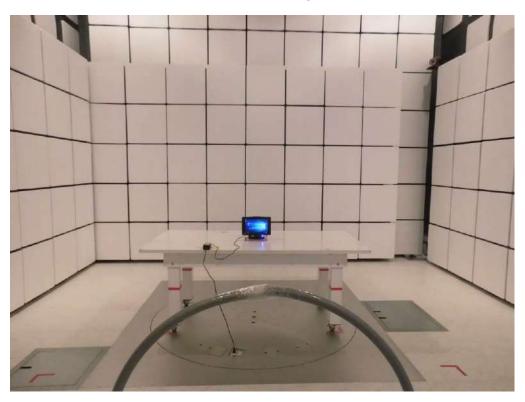


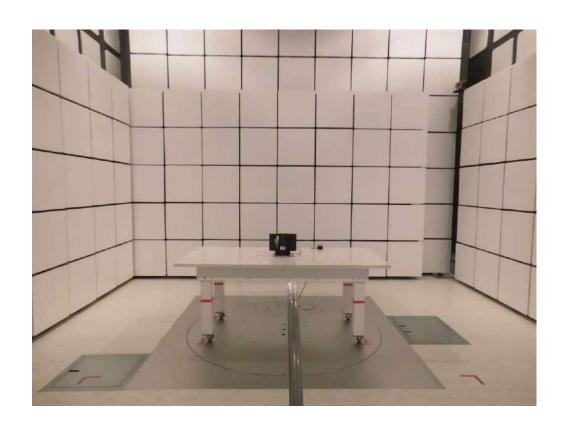




# Radiated Measurement Photos 9KHz to 30MHz

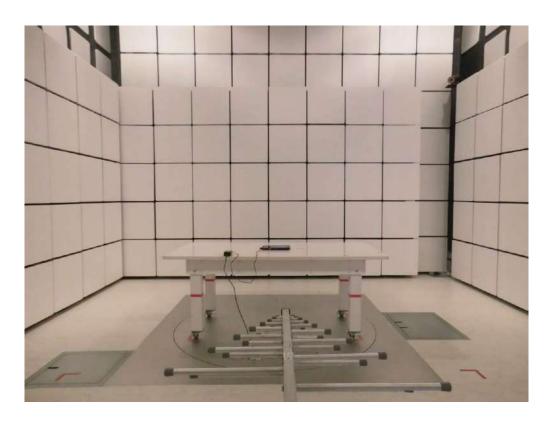
# **VESA Docking**









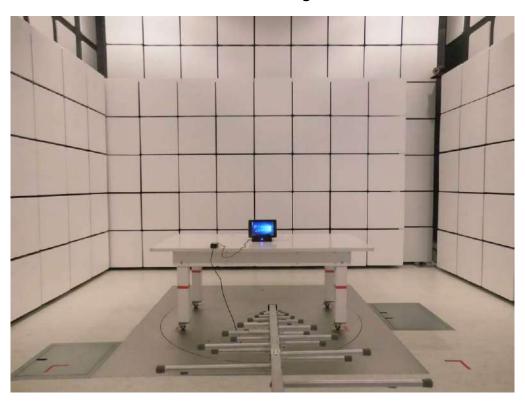


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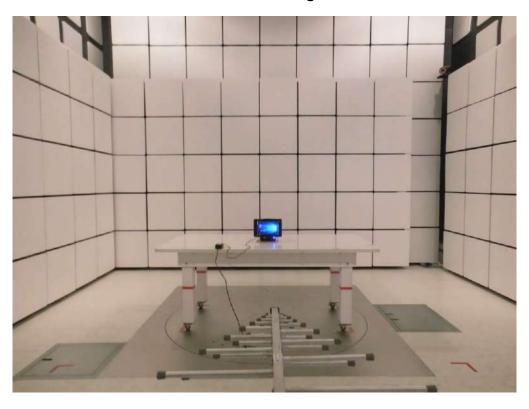
# **Desk Docking**

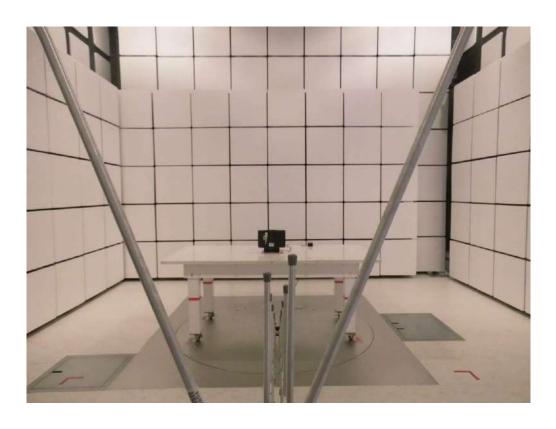






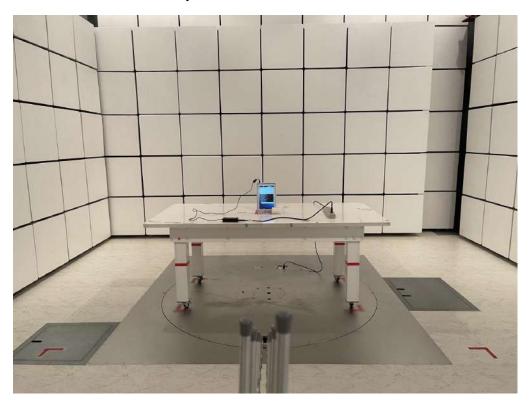
# **VESA Docking**

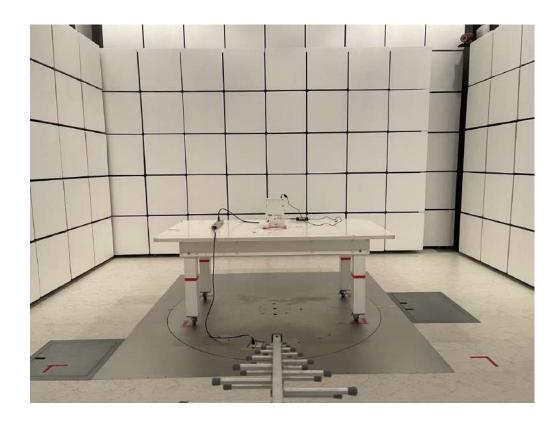






Adapter: FSP / FSP065-DBCM1

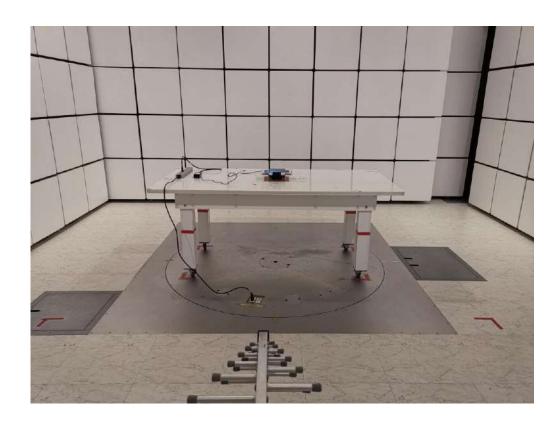






Adapter: FSP / FSP065-DBCM1+ VESA Docking

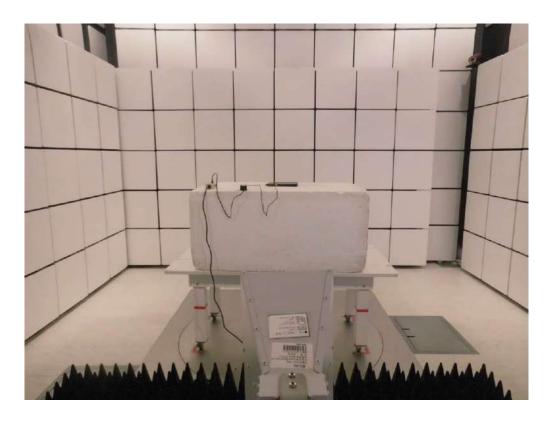






## Radiated Measurement Photos Above 1GHz





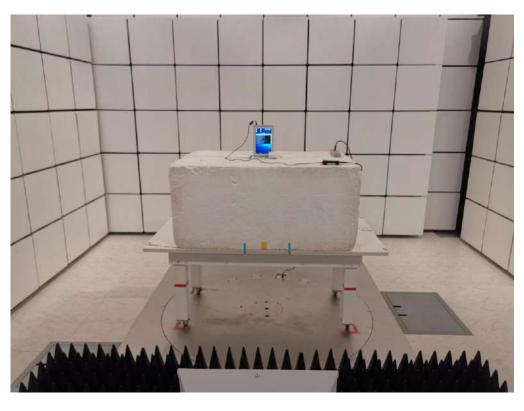
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## Radiated Measurement Photos Above 1GHz

# Spot check test





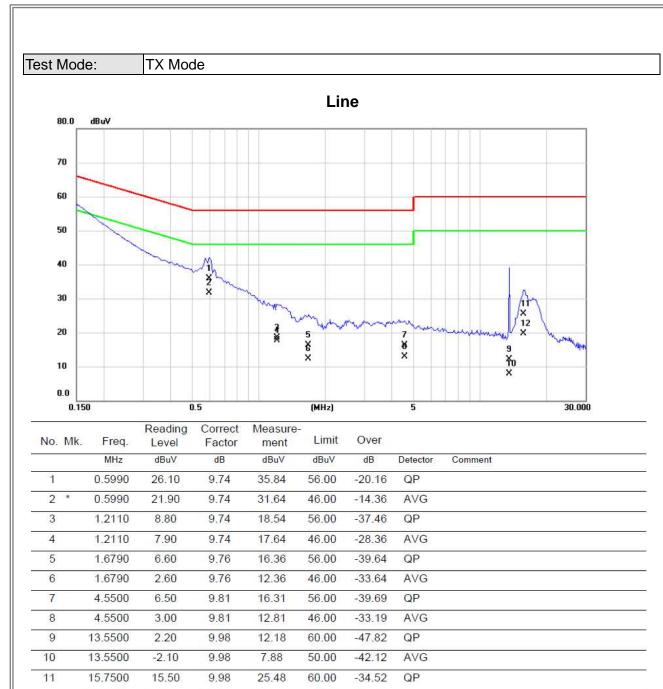
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APPENDIX A - CONDUCTED EMISSION





12

15.7500

9.70

9.98

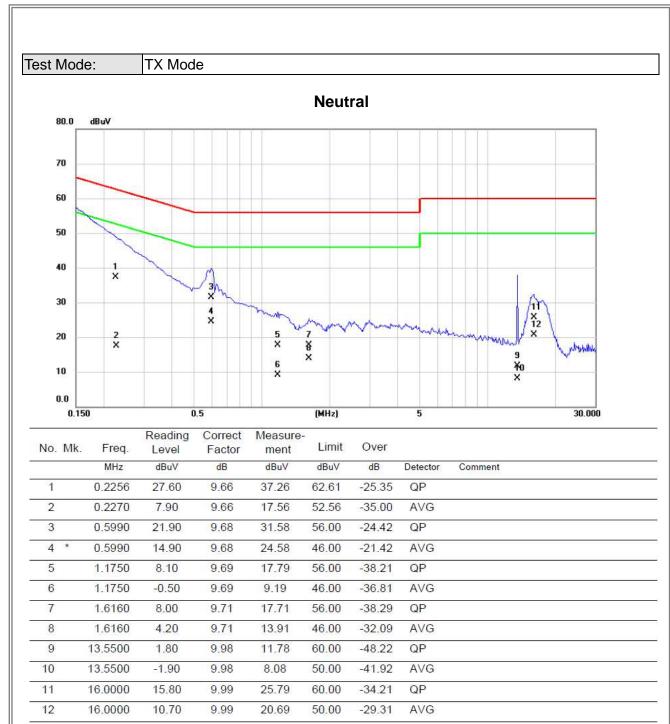
19.68

50.00

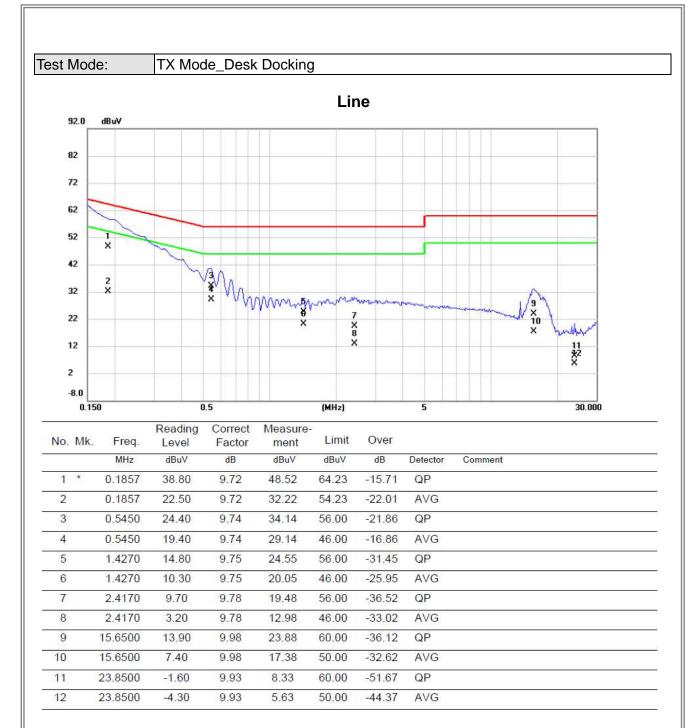
-30.32

AVG

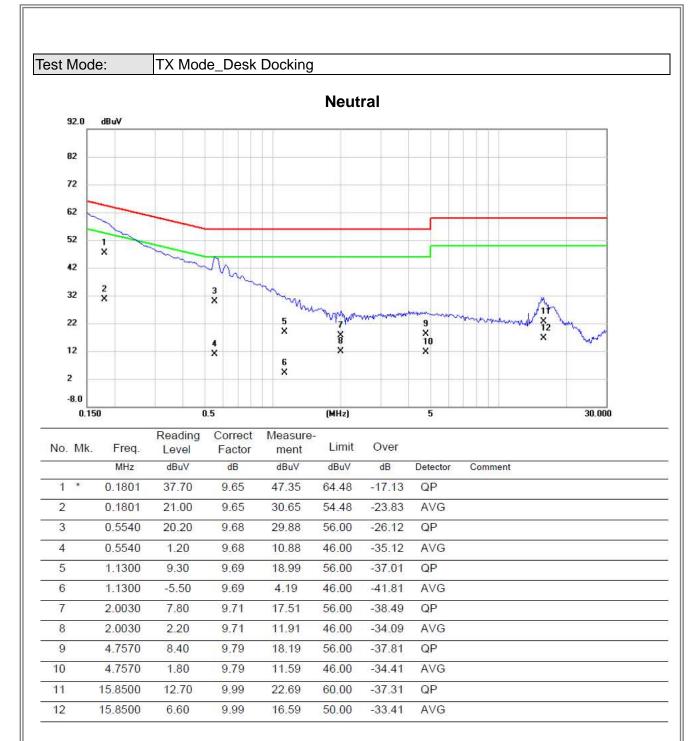




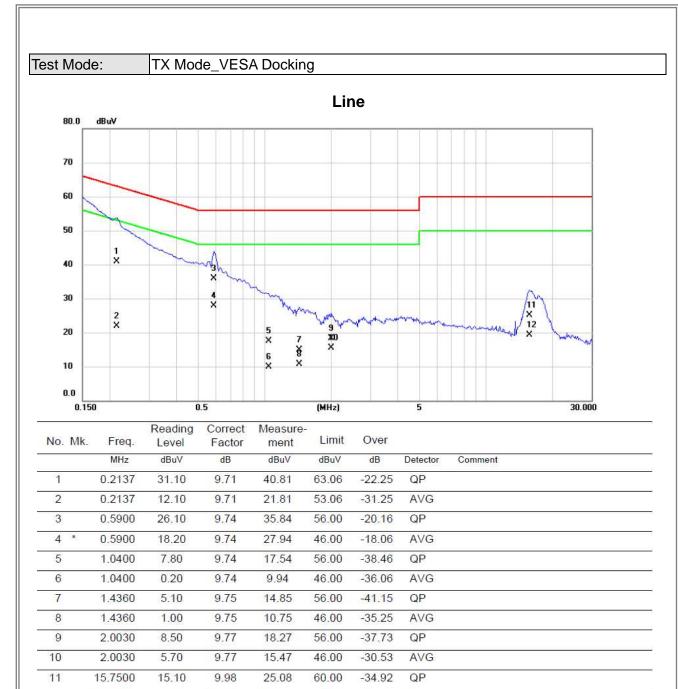












12

15.7500

9.40

9.98

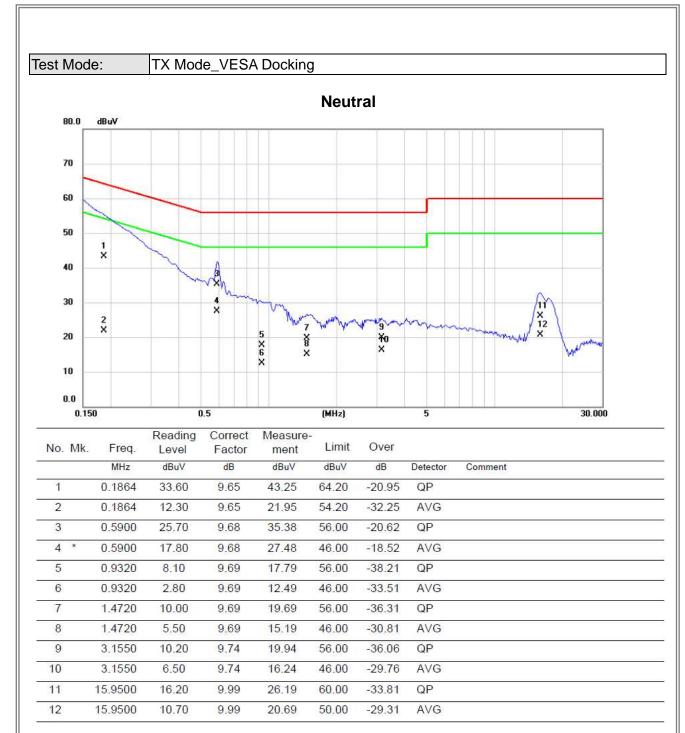
19.38

50.00

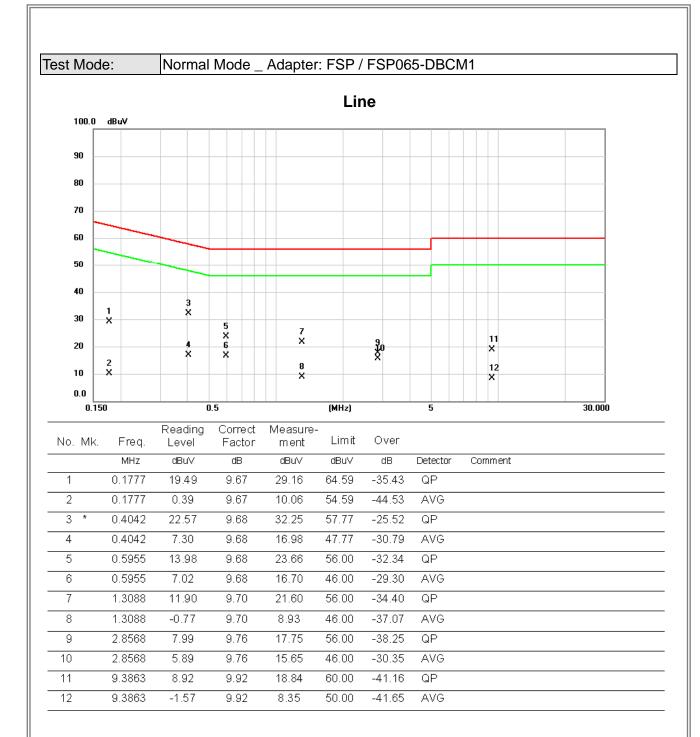
-30.62

AVG

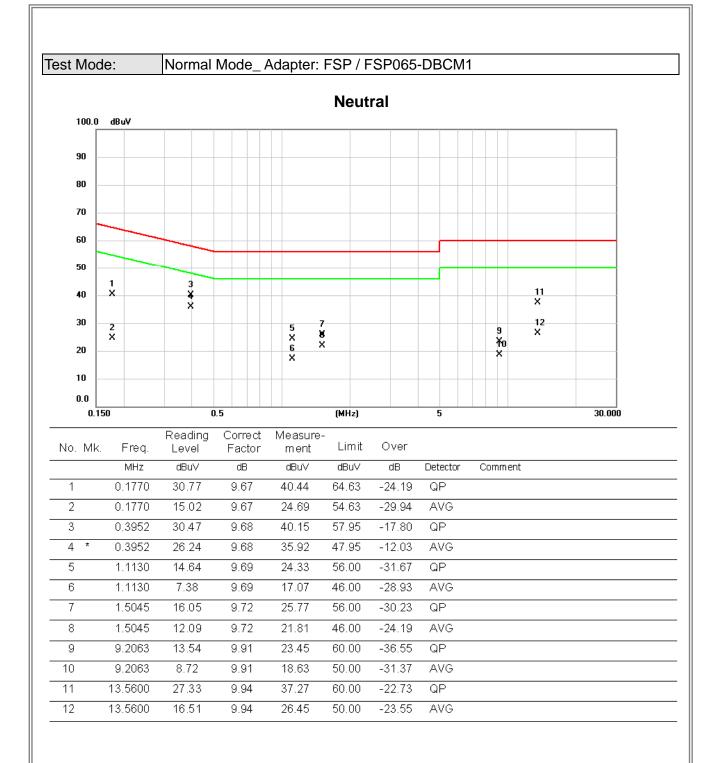




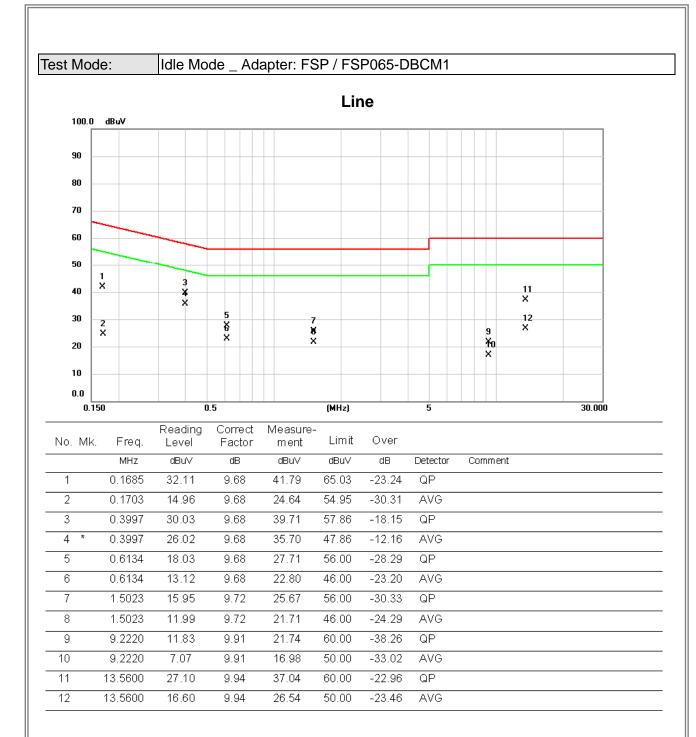




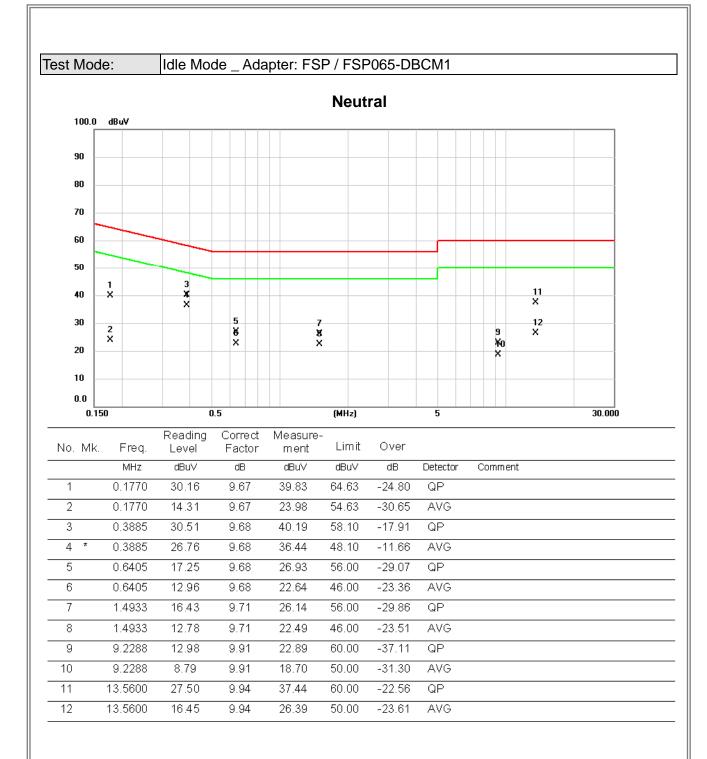




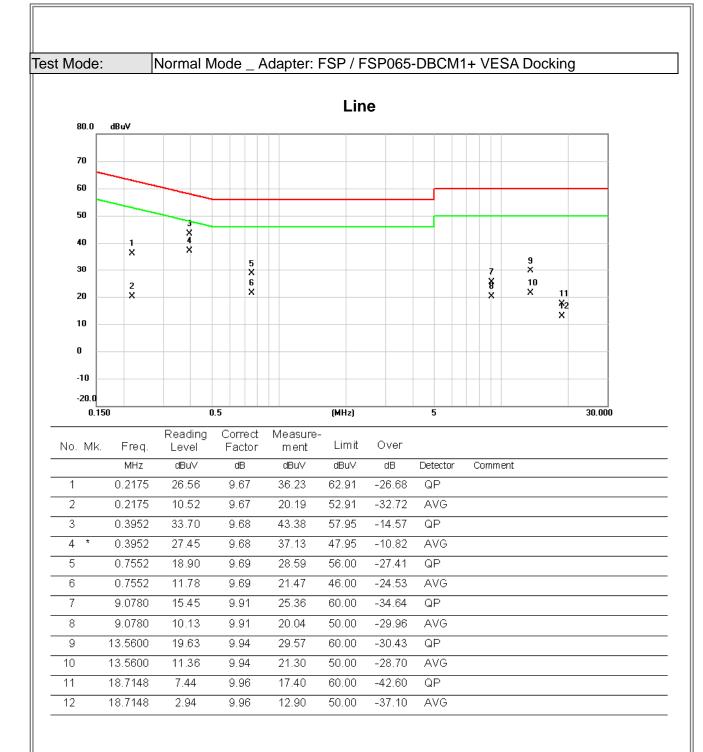














Test Mode: Normal Mode\_ Adapter: FSP / FSP065-DBCM1+ VESA Docking **Neutral** 80.0 dBuV 70 60 50 40 30 7 8 X 2 X 12 X Ϋ́ο 20 10 0 -10 -20.0 0.150 5 30.000 (MHz) Reading Correct Measure-Freq. Limit Over No. Mk. Factor ment MHz dBu∀ dΒ dBu∀ dBu∀ dΒ Detector Comment 1 0.1864 32.00 9.67 41.67 64.20 -22.53 QΡ 2 0.1864 14.42 9.67 24.09 54.20 -30.11 AVG 3 0.3997 33.27 9.68 42.95 57.86 -14.91 QΡ 4 0.3997 26.16 9.68 35.84 47.86 -12.02 AVG 0.7012 -29.94 QΡ 5 16.38 9.68 26.06 56.00 6 0.7012 6.16 9.68 15.84 46.00 -30.16 AVG 7 1.7655 16.02 9.73 25.75 56.00 -30.25 QΡ 1.7655 9.25 9.73 18.98 46.00 -27.02 AVG 8 9 9.0218 14.88 9.91 24.79 60.00 -35.21 QΡ 9.0218 9.93 9.91 19.84 50.00 -30.16 AVG 10 11 13.5600 19.59 9.94 29.53 60.00 -30.47 QΡ 13.5600 50.00 -28.33 AVG 12 11.73 9.94 21.67



Test Mode: Idle Mode Adapter: FSP / FSP065-DBCM1+ VESA Docking Line 80.0 dBuV 70 60 50 40 5 X 7 8 X 30 6 X ۴o 12 20 10 0 -10 -20.0 0.150 (MHz) 30.000 Reading Correct Measure-Freq. Limit Over No. Mk. Level Factor ment MHz dBu∨ dΒ dBu∀ dBu∀ dB Detector Comment 0.2030 28.65 9.67 38.32 63.49 -25.17 QΡ 1 AVG 2 0.2030 11.95 9.67 21.62 53.49 -31.87 33.60 0.3952 9.68 43.28 57.95 -14.67 QΡ 3 27.73 4 0.3952 9.68 37.41 47.95 -10.54 AVG 5 0.5280 20.85 9.68 30.53 56.00 -25.47 QΡ 0.5280 12.71 46.00 9.68 22.39 -23.61 6 AVG 1.0455 20.58 30.27 56.00 -25.73 QΡ 7 9.69 1.0455 13.31 23.00 46.00 8 9.69 -23.00 AVG 9.0375 15.70 9.91 25.61 60.00 -34.39 QΡ 9 9.0375 10.12 20.03 50.00 -29.97 10 9.91 AVG 11 13.5600 19.65 9.94 29.59 60.00 -30.41 QΡ 12 13.5600 11.41 9.94 21.35 50.00 -28.65 AVG

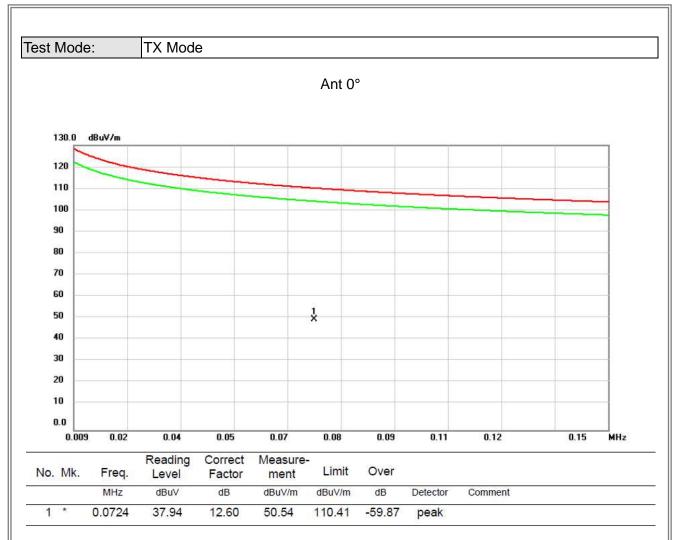


Test Mode: Idle Mode Adapter: FSP / FSP065-DBCM1+ VESA Docking **Neutral** 80.0 dBuV 70 60 50 40 1 X 30 5 X 7 8 X X 10 X 20 ¥2 X 10 0 -10 -20.0 0.150 5 30.000 (MHz) Reading Correct Measure-Freq. Limit Over No. Mk. Factor ment MHz dBu∀ dΒ dBu∀ dBu∀ dΒ Detector Comment 1 0.2490 23.07 9.68 32.75 61.79 -29.04 QΡ 2 0.2490 6.94 9.68 16.62 51.79 -35.17 AVG 3 0.3930 33.08 9.68 42.76 58.00 -15.24 QΡ 4 0.3930 26.62 9.68 36.30 48.00 -11.70 AVG 25.48 -30.52 QΡ 5 0.7147 15.80 9.68 56.00 6 0.7147 7.43 9.68 17.11 46.00 -28.89 AVG 7 9.0262 14.86 9.91 24.77 60.00 -35.23 QΡ 9.0262 9.58 9.91 19.49 50.00 -30.51 AVG 8 9 13.5600 15.83 9.94 25.77 60.00 -34.23 QΡ 13.5600 9.62 9.94 19.56 50.00 -30.44 AVG 10 18.6743 -43.54 11 6.50 9.96 16.46 60.00 QΡ 18.6743 2.52 12.48 50.00 -37.52 AVG 12 9.96

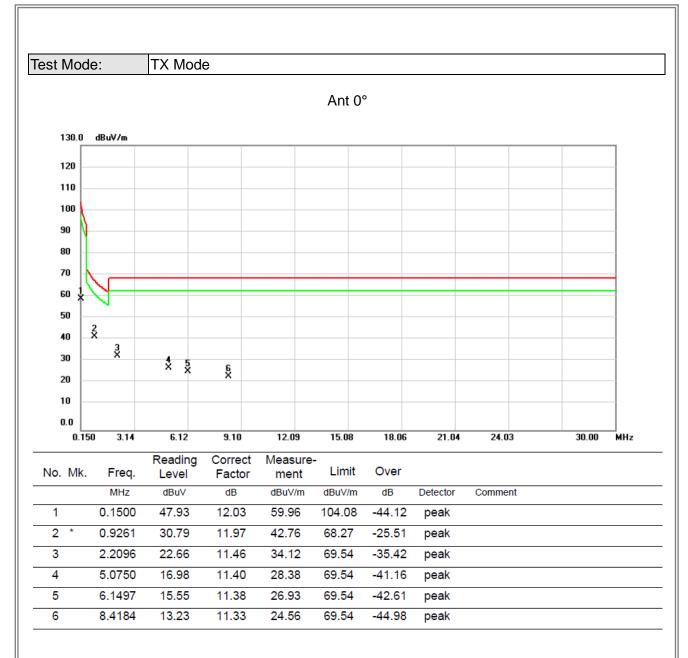


APPENDIX B - RADIATED EMISSION (9KHZ-30MHZ)

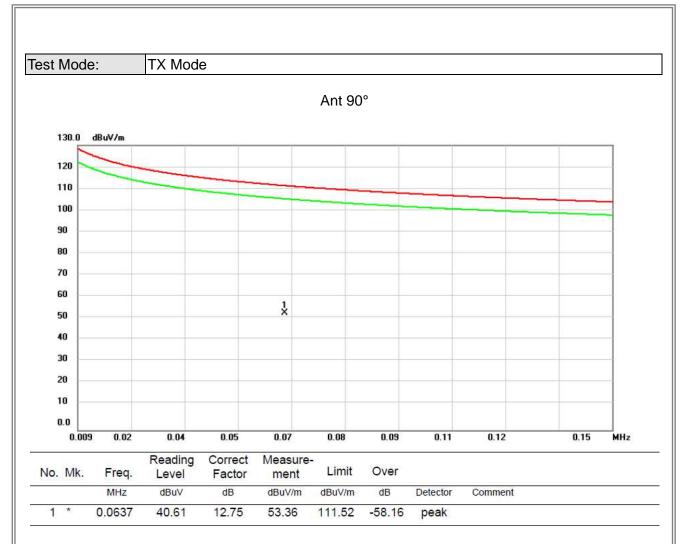




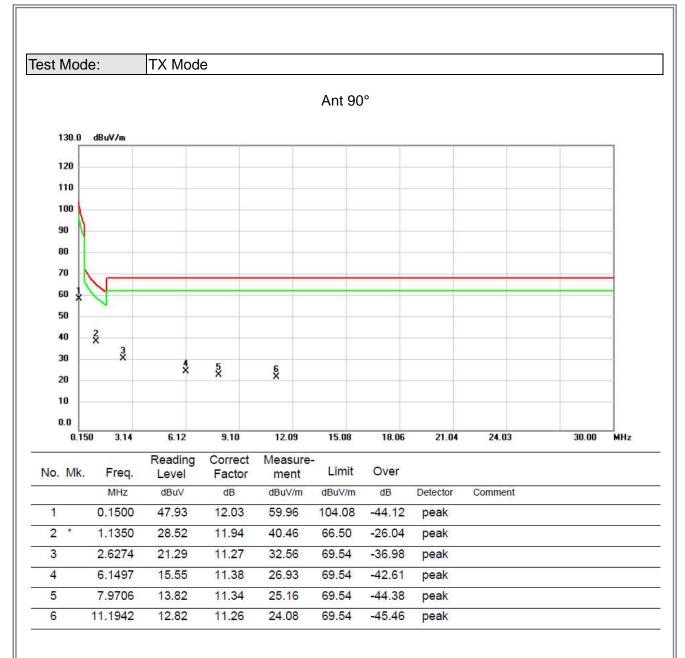










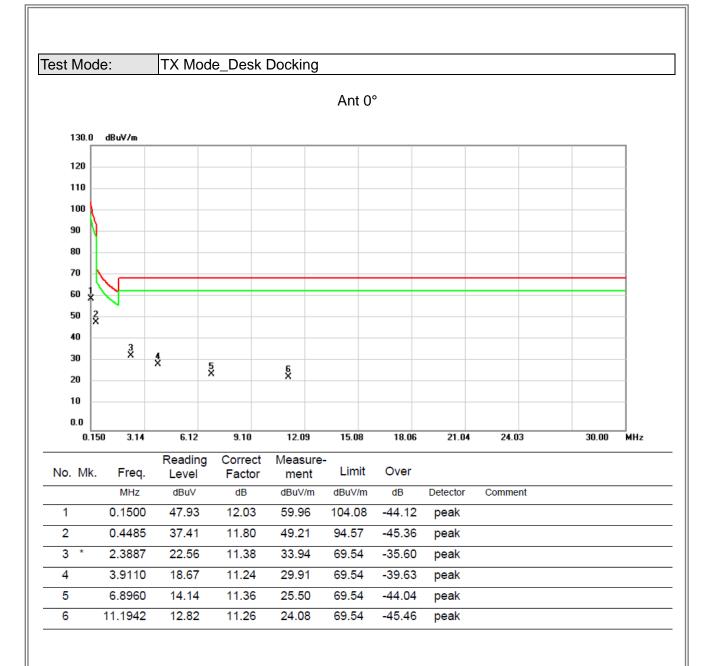




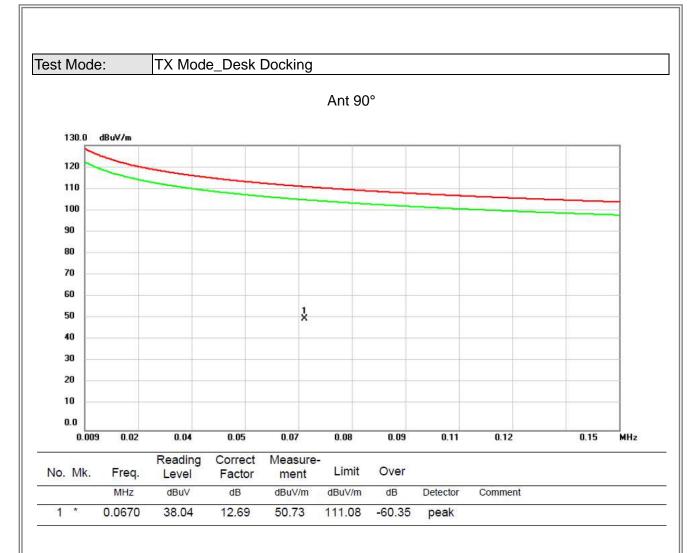
Test Mode: TX Mode\_Desk Docking Ant 0° 130.0 dBuV/m 120 110 100 90 80 70 60 50 40 30 20 10 0.0 0.009 0.02 0.04 0.05 0.07 0.08 0.09 0.11 0.12 0.15 MHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over				
		MHz	dBu∀	dB	dBuV/m	dBuV/m	dB	Detector	Comment		_
1	*	0.0670	38.25	12.69	50.94	111.08	-60.14	peak			_

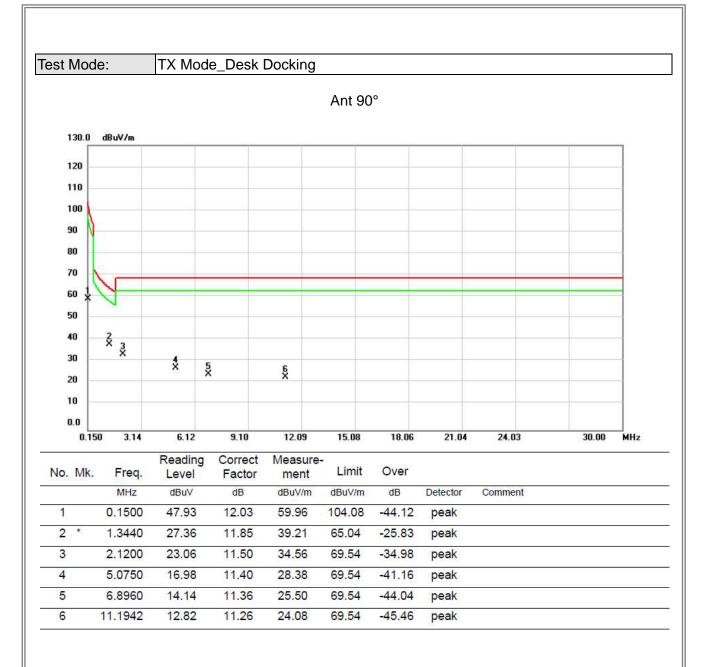










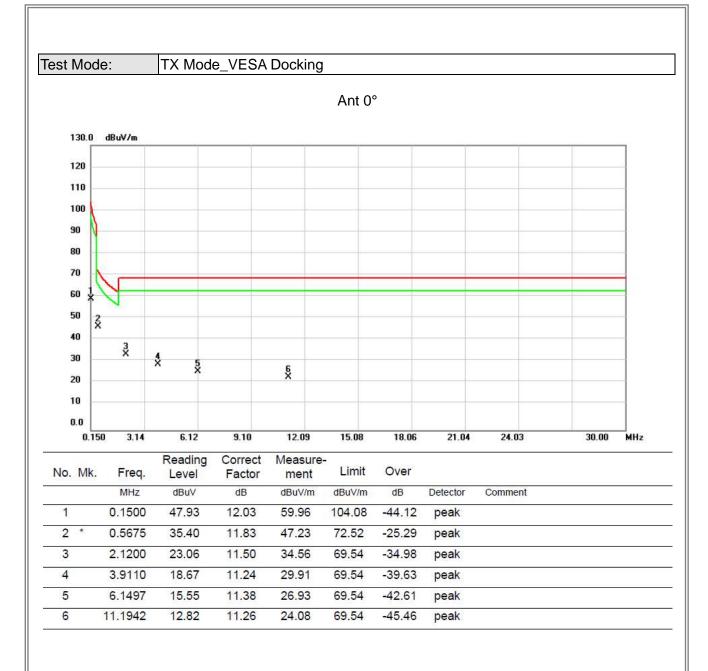




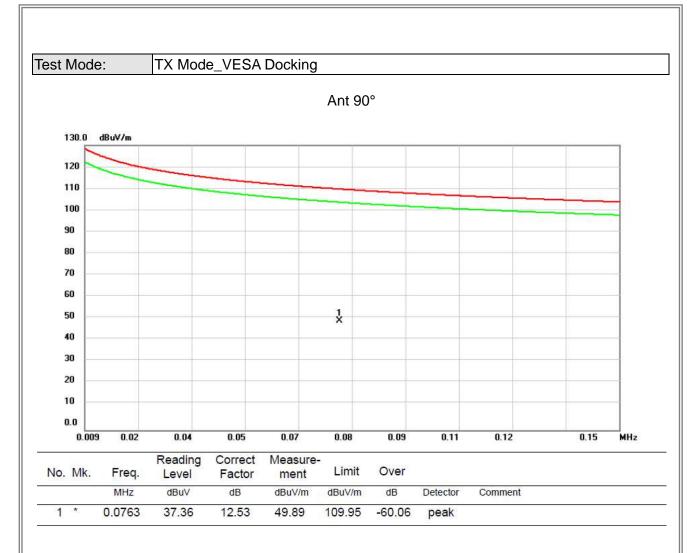
Test Mode: TX Mode\_VESA Docking Ant 0° 130.0 dBuV/m 120 110 100 90 80 70 60 1 X 50 40 30 20 10 0.0 0.009 0.02 0.04 0.05 0.07 0.08 0.09 0.11 0.12 0.15 MHz

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over				
		MHz	dBu∨	dB	dBuV/m	dBuV/m	dB	Detector	Comment		_
1	*	0.0630	39.39	12.77	52.16	111.62	-59.46	peak			

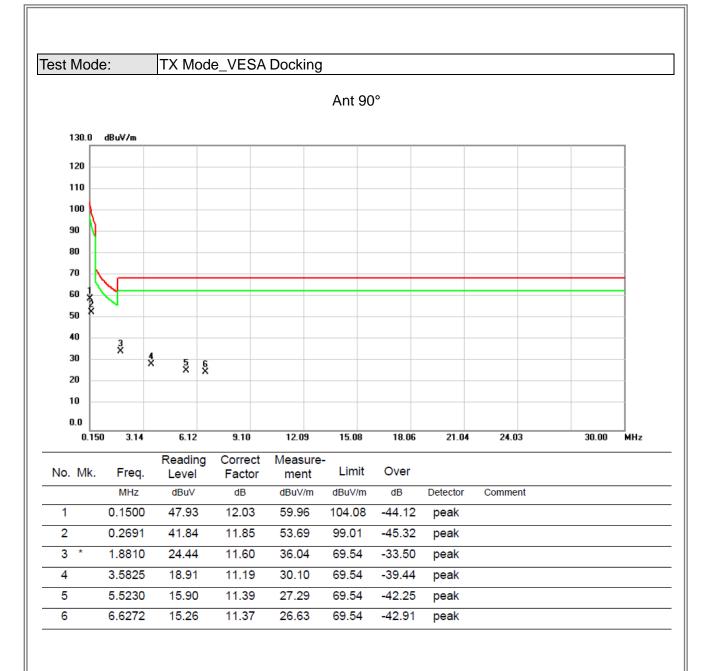










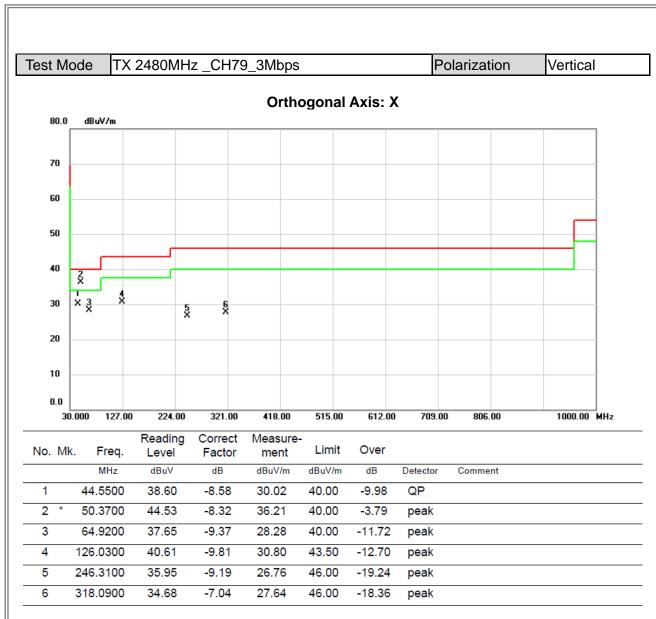




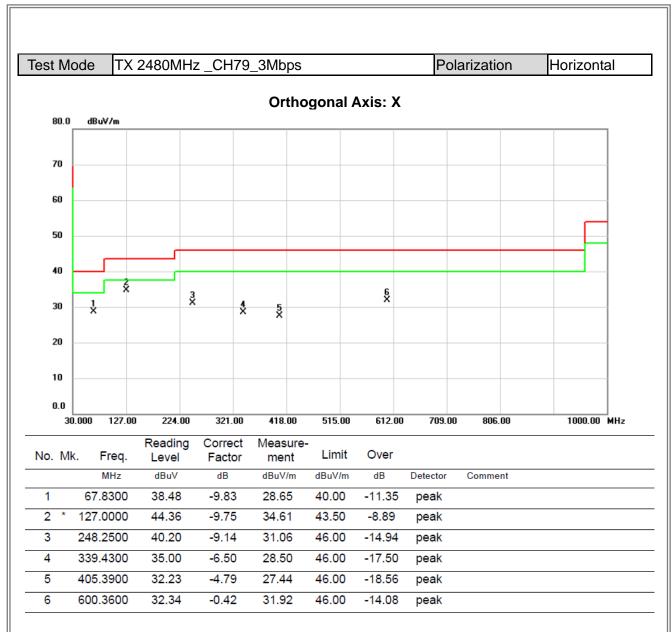
APPENDIX C - RADIATED EMISSION (30MHZ TO 1000MHZ)

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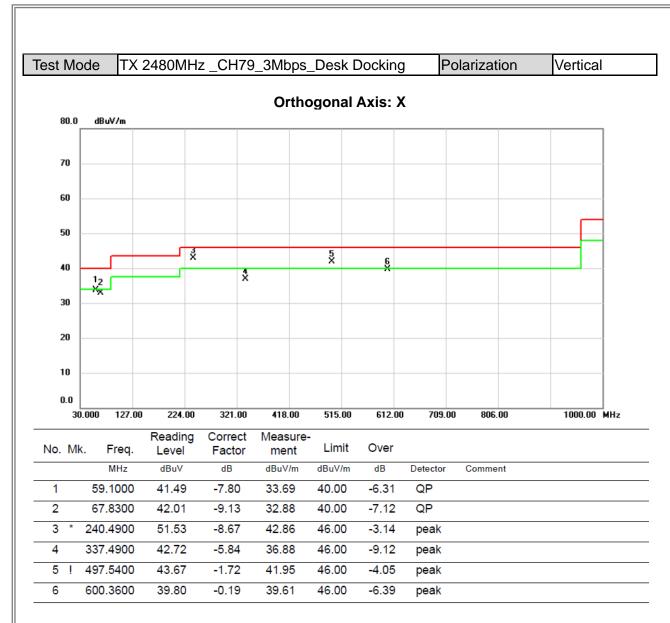




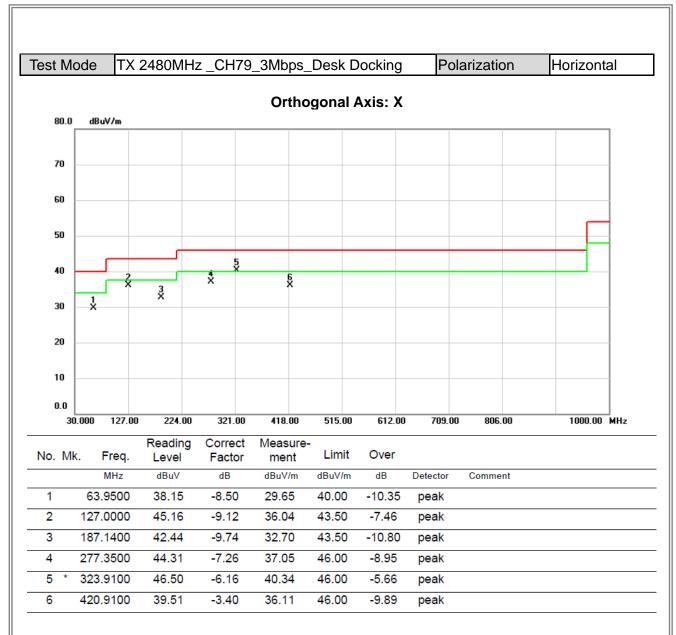




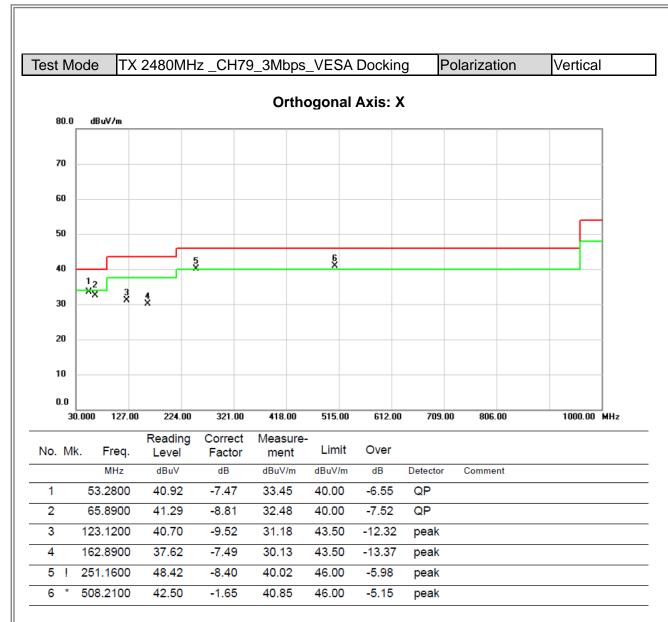




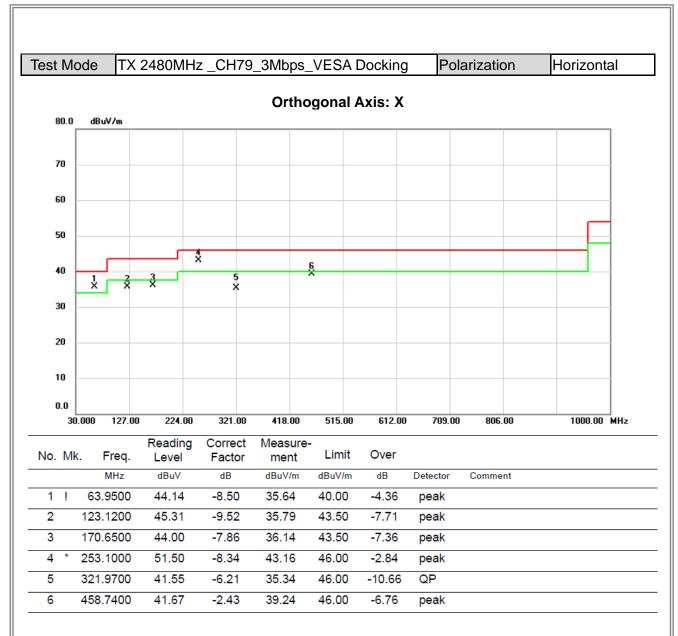














5

6

600.0043

766.1977

41.33

29.54

-0.63

2.14

40.70

31.68

46.00

46.00

-5.30

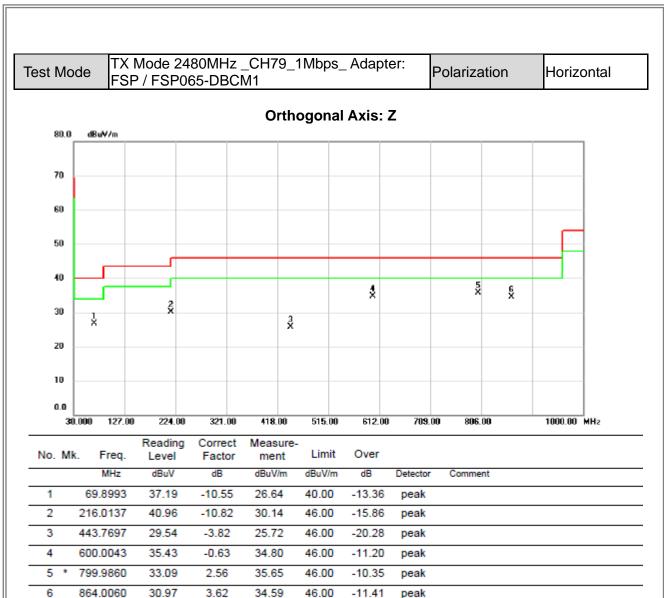
-14.32

QP

peak

TX Mode 2480MHz \_CH79\_1Mbps\_ Adapter: Test Mode Polarization Vertical FSP / FSP065-DBCM1 **Orthogonal Axis: Z** 80.0 dBu∀/m 70 605040 Š 30 š 20 10 30.000 127.00 224.00 321.00 418.00 515.00 612.00 709.00 806.00 1000.00 MHz Reading Correct Measure-No. Mk. Freq. Limit Over Level Factor ment MHz dBuV dΒ dBuV/m dBuV/m dΒ Detector Comment 68.7030 -10.32 30.86 40.00 41.18 1 -9.14 peak 2 127.1617 36.82 -9.73 27.09 43.50 -16.41 peak 3 363.4537 30.23 -5.79 24.44 46.00 -21.56 peak 4 512.6073 29.71 -2.51 27.20 46.00 -18.80 peak







TX Mode 2480MHz \_CH79\_1Mbps\_ Adapter: FSP / FSP065-DBCM1+ VESA Docking Test Mode Polarization Vertical **Orthogonal Axis: X** 80.0 dBuV/m 70 60 50 40 X 8 Š 4 X 30 20 10 0.0 30.000 127.00 224.00 321.00 418.00 515.00 612.00 1000.00 MHz 709.00 806.00 Reading Correct Measure-Freq. Limit Over No. Mk. Level Factor ment dBuV dBuV/m MHz dΒ dBuV/m dΒ Detector Comment 71.5160 42.67 -10.90 31.77 40.00 -8.23 1 peak 2 146.0767 42.00 -8.55 33.45 43.50 -10.05 peak 3 230.3697 40.14 -10.33 29.81 46.00 -16.19 peak 391.7130 34.34 -5.05 46.00 4 29.29 -16.71 peak 600.0043 38.07 -0.63 37.44 46.00 5 -8.56 peak 6 974.8770 29.40 5.39 34.79 54.00 -19.21 peak

Report No.: BTL-FCCP-1-1710T083D

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6

953.6986

29.32

5.12

34.44

46.00

-11.56

peak

TX Mode 2480MHz \_CH79\_1Mbps\_ Adapter: FSP / FSP065-DBCM1+ VESA Docking Test Mode Polarization Horizontal **Orthogonal Axis: X** 80.0 dBuV/m 70 60 50 40 **4** × 5 X 8 30 20 10 0.0 30.000 127.00 224.00 321.00 418.00 515.00 612.00 709.00 1000.00 MHz 806.00 Reading Correct Measure-Freq. Limit Over No. Mk. Level Factor ment MHz dBu∀ dΒ dBuV/m dBuV/m dΒ Detector Comment 146.8526 46.31 -8.54 37.77 43.50 -5.73 QΡ 1 2 228.8176 43.84 -10.42 33.42 46.00 -12.58 peak 3 412.6650 31.93 -4.54 27.39 46.00 -18.61 peak 600.0043 35.40 -0.63 46.00 4 34.77 -11.23 peak 799.9860 31.25 2.56 33.81 46.00 5 -12.19 peak

Report No.: BTL-FCCP-1-1710T083D

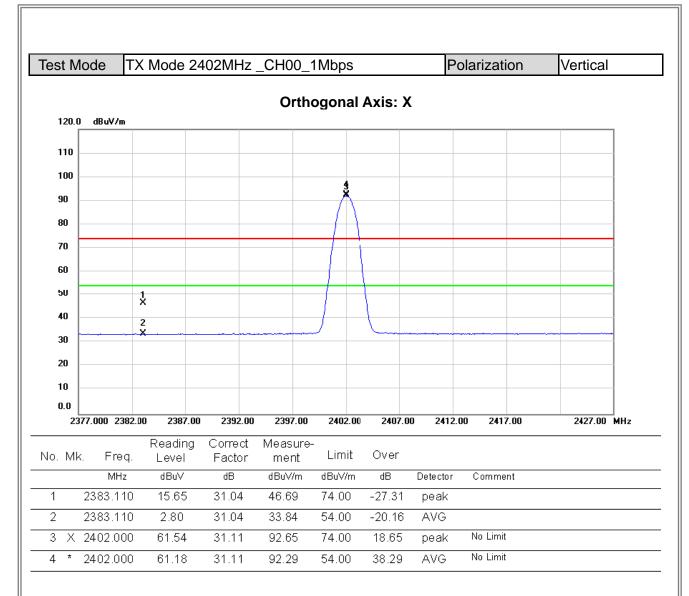
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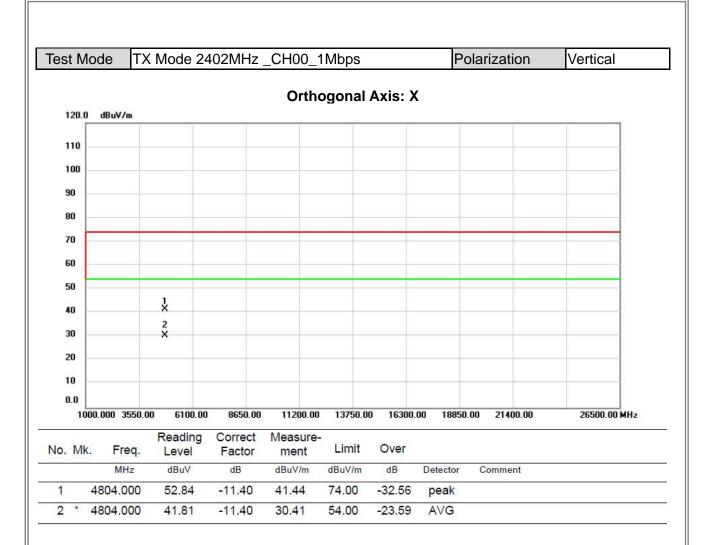
APPENDIX D - RADIATED EMISSION (ABOVE 1000MHZ)

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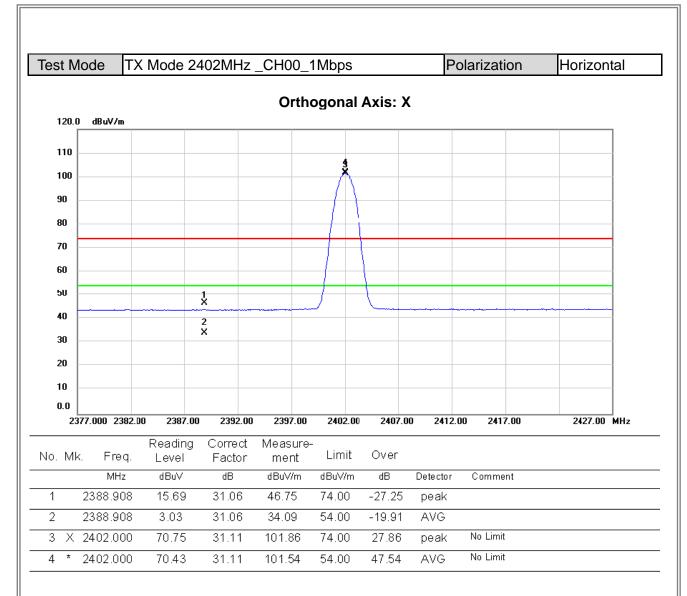








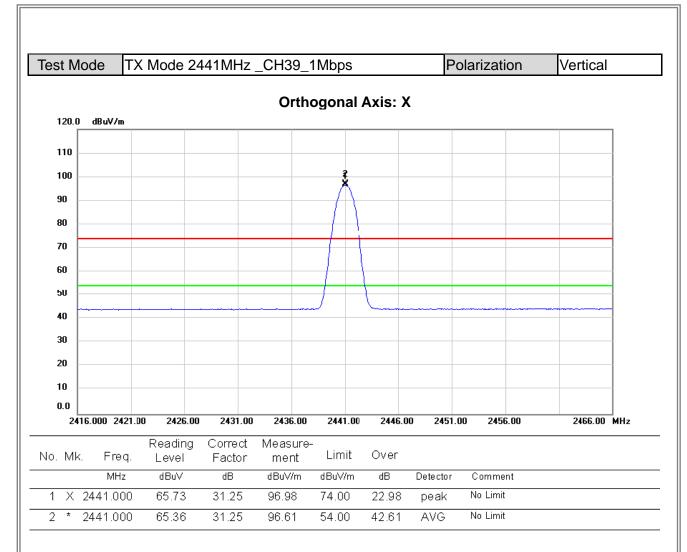




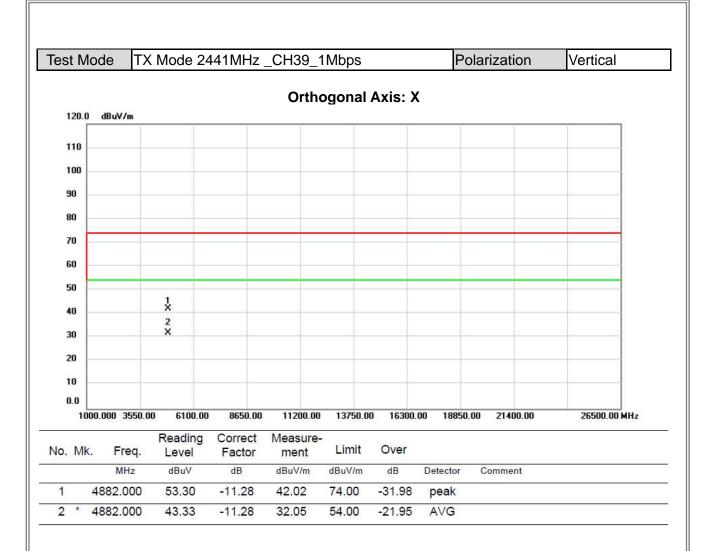




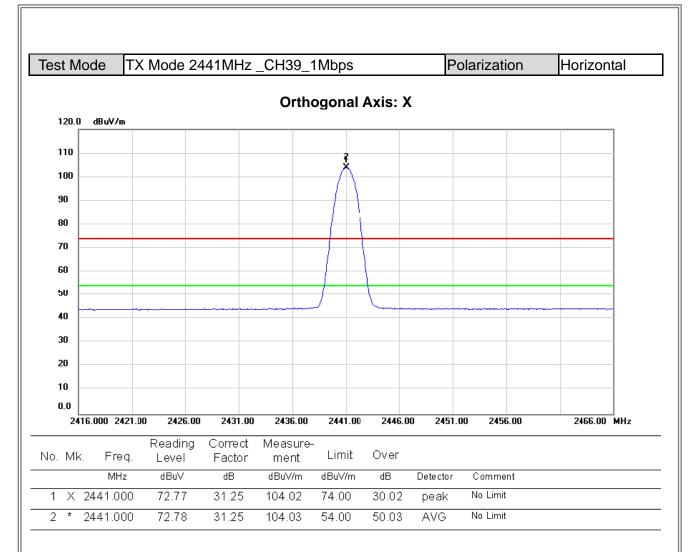




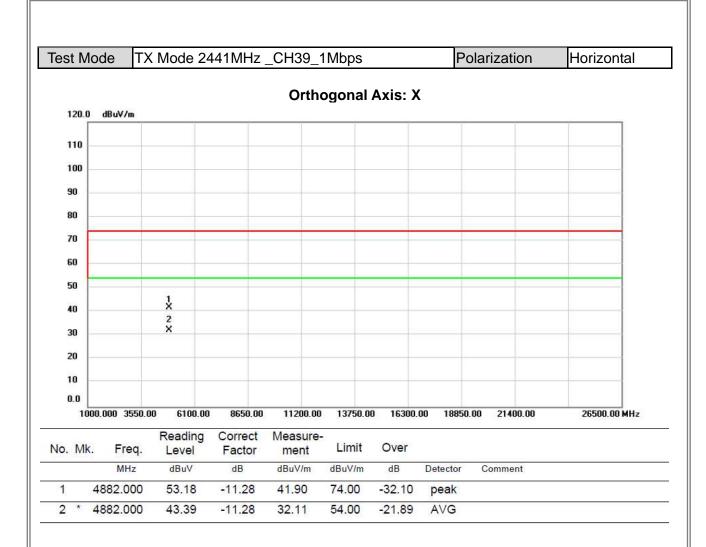




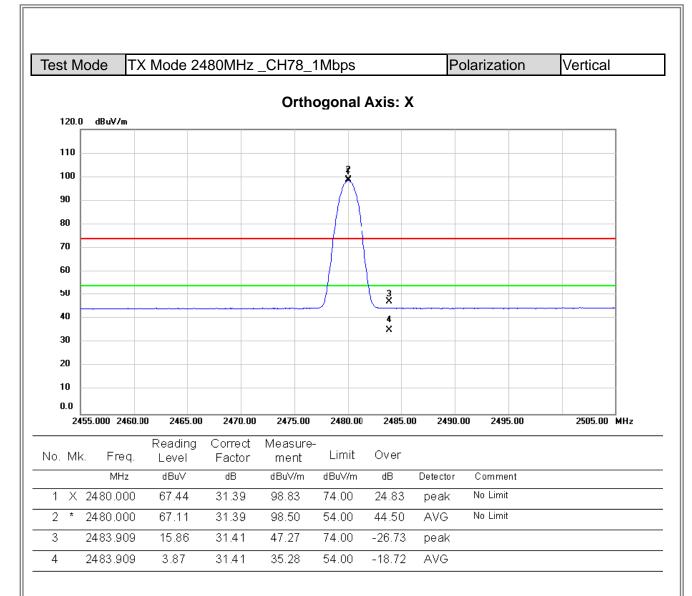




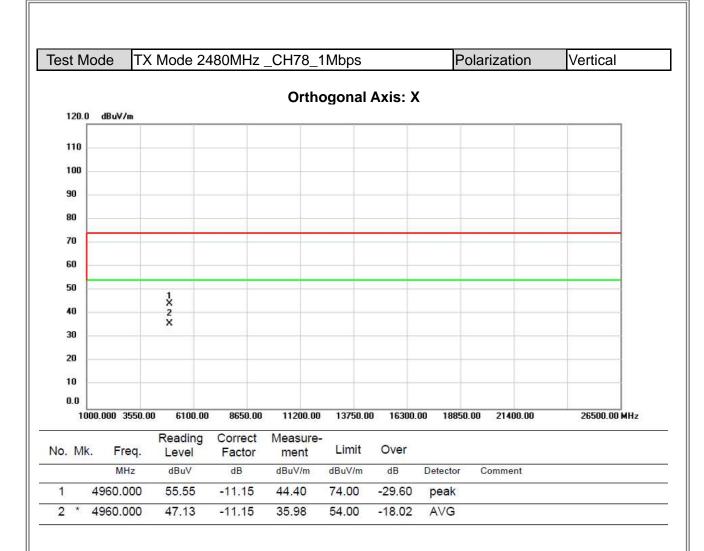




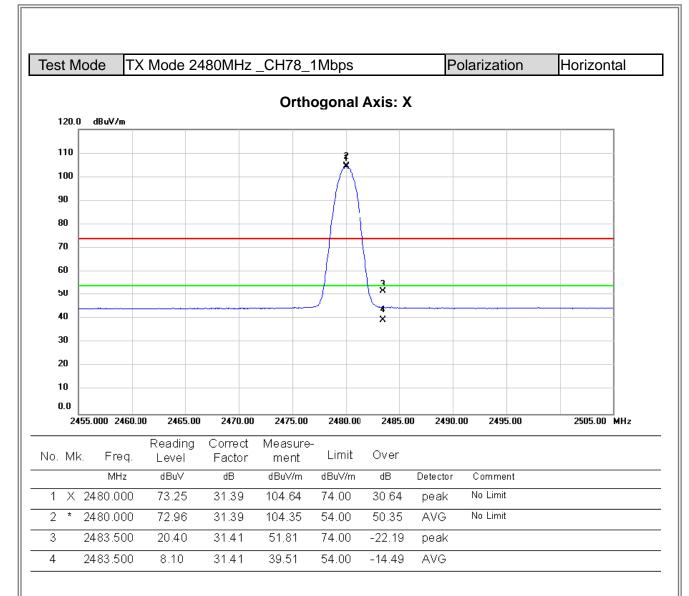




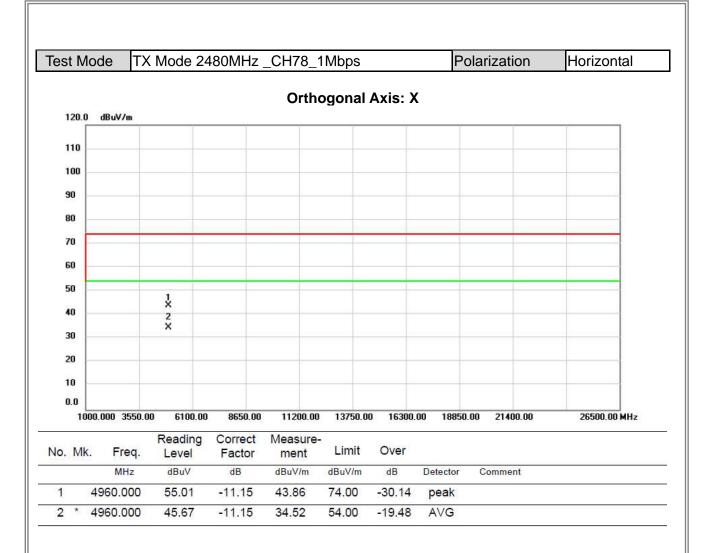




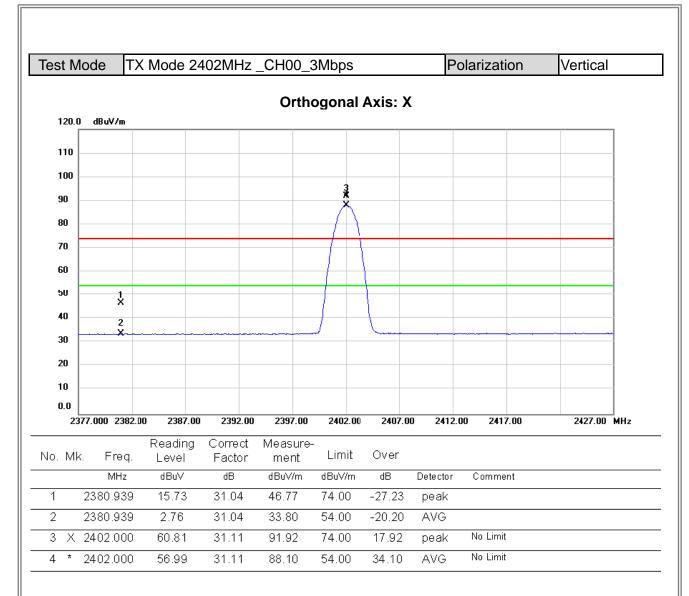




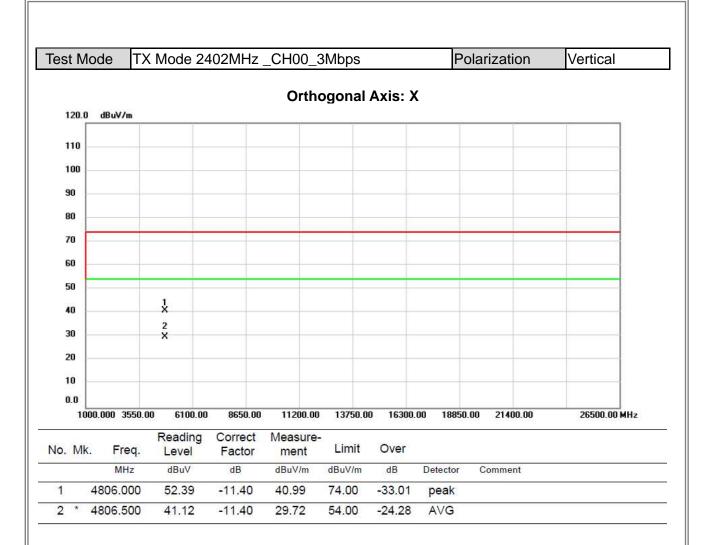




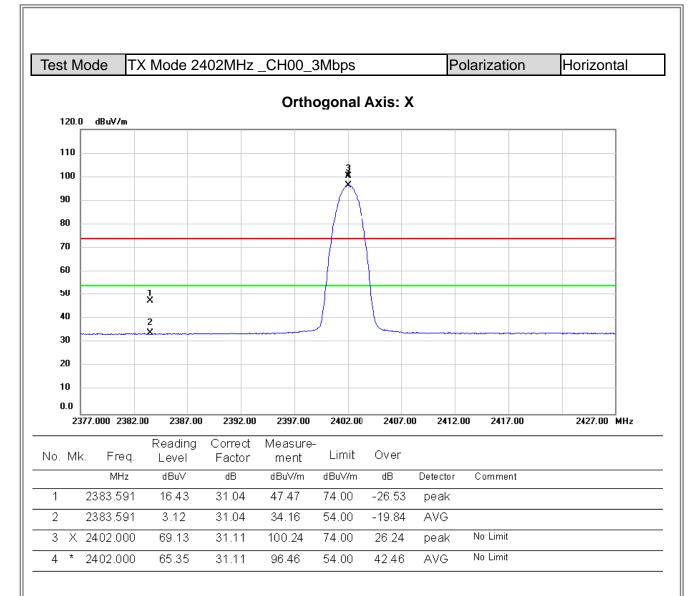




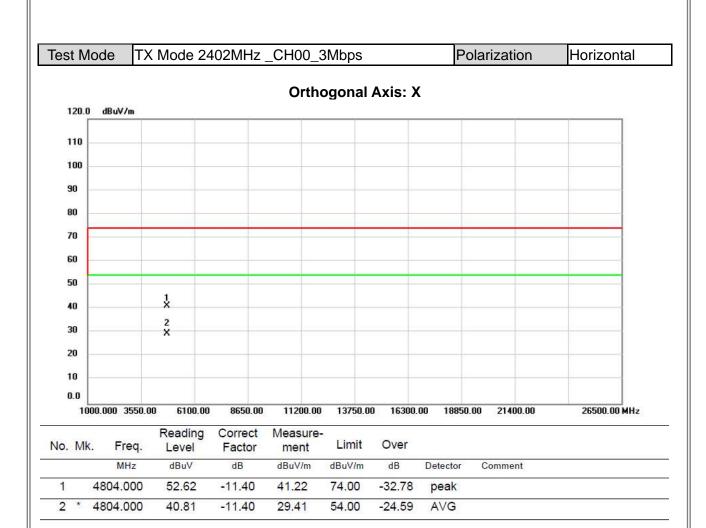




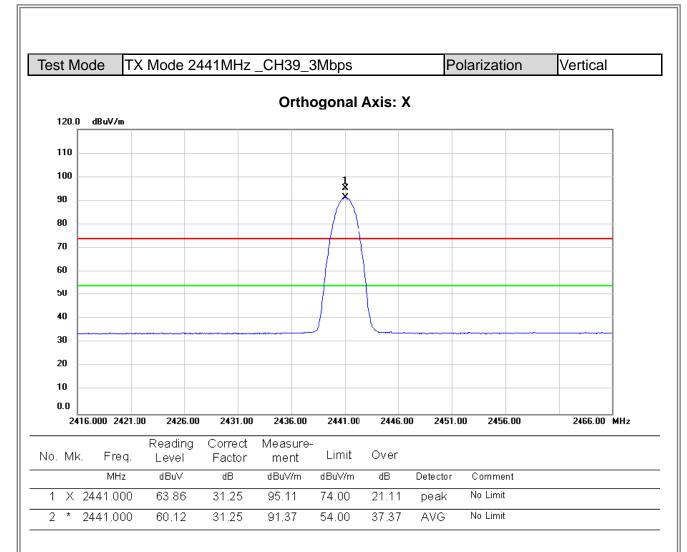




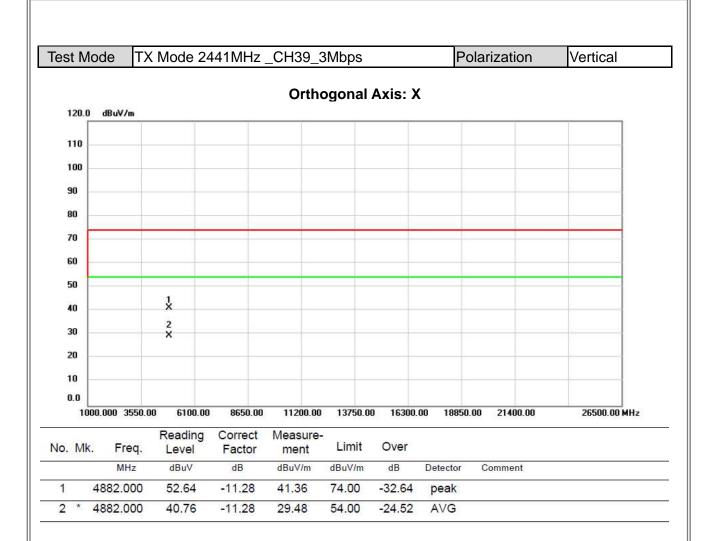




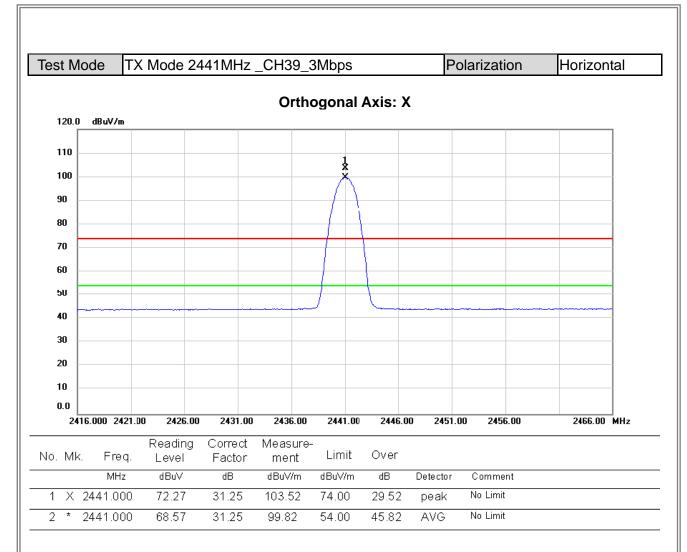






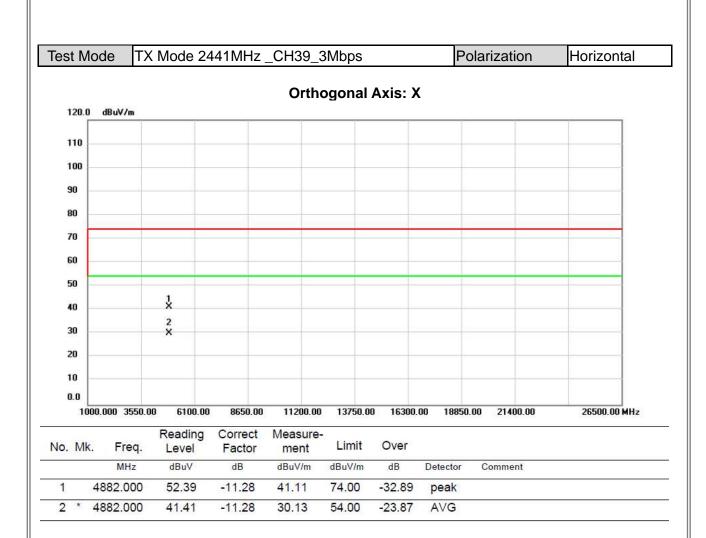




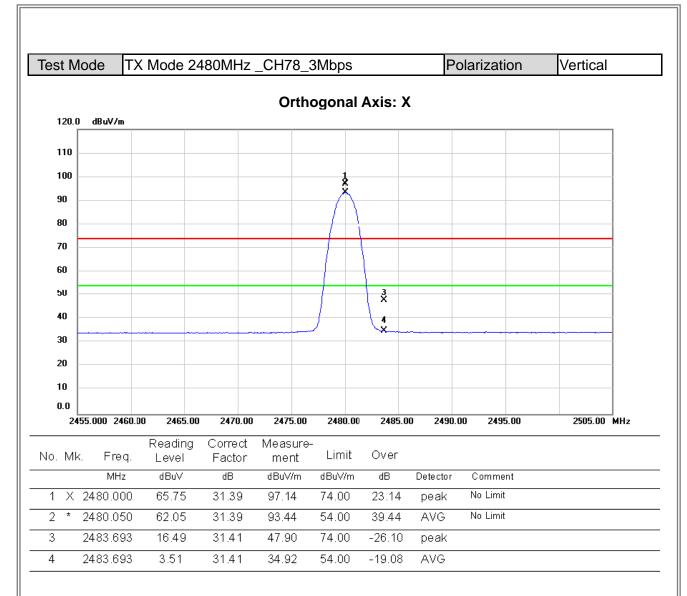


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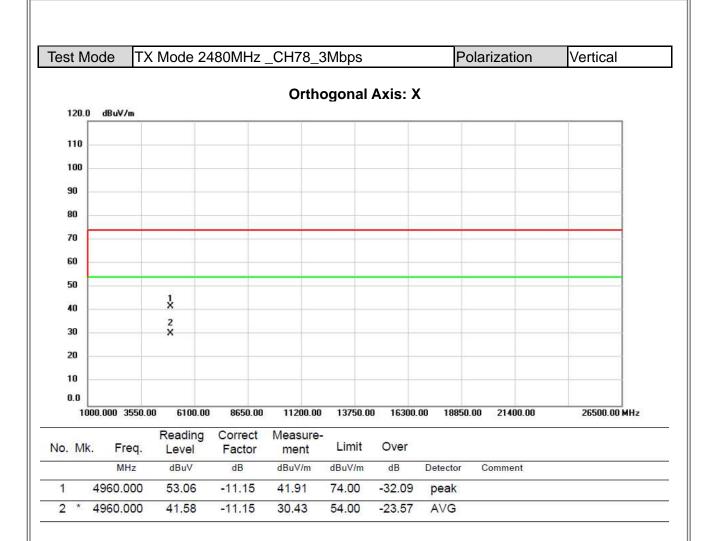




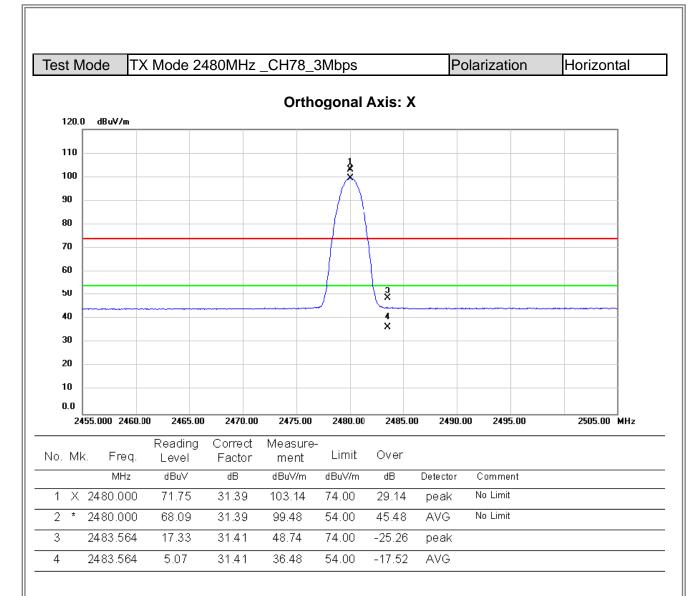




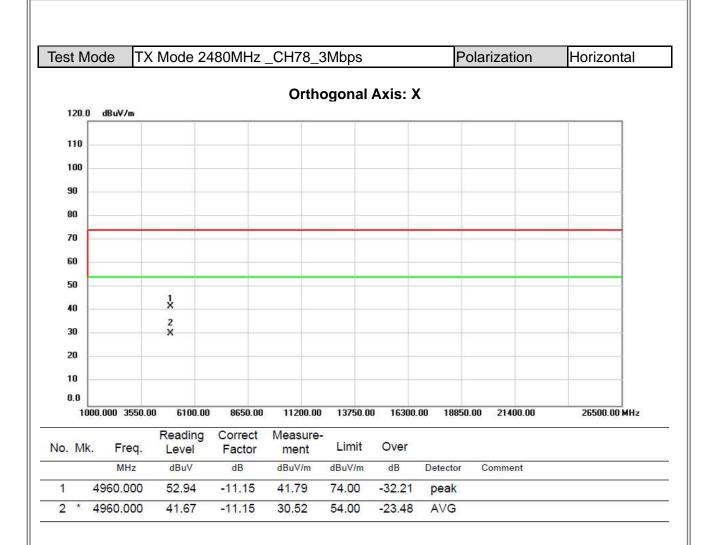










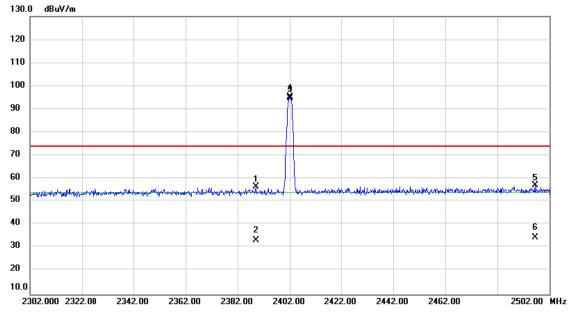




### Spot check test:

Test Mode TX Mode 2402MHz \_CH00\_1Mbps Polarization Horizontal

### **Orthogonal Axis: Z**



No	. MI	k. F	req.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		١	MHz	dBu∀	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2389	.093	26.01	30.78	56.79	74.00	-17.21	peak	
		2389	.093	2.50	30.78	33.28	54.00	-20.72	AVG	
3	X	2402	.000	64.46	30.84	95.30	74.00	21.30	peak	No Limit
4	. *	2402	.000	63.87	30.84	94.71	54.00	40.71	AVG	No Limit
- 5	i	2496	.513	26.02	31.22	57.24	74.00	-16.76	peak	
- 6		2496	.513	3.37	31.22	34.59	54.00	-19.41	AVG	

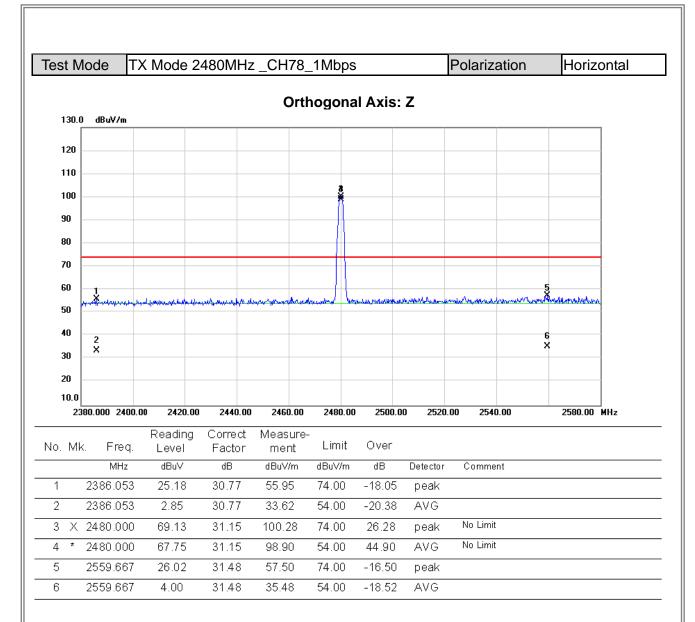
### **REMARKS:**

(1) Both Vertical and Horizontal are evaluated, but only the worst case (Horizontal) is recorded.

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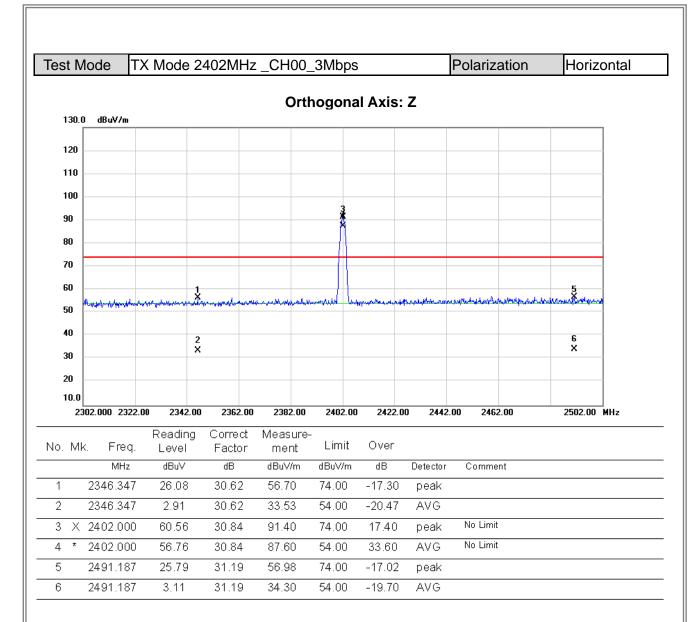
### **REMARKS:**

(1) Both Vertical and Horizontal are evaluated, but only the worst case (Horizontal) is recorded.

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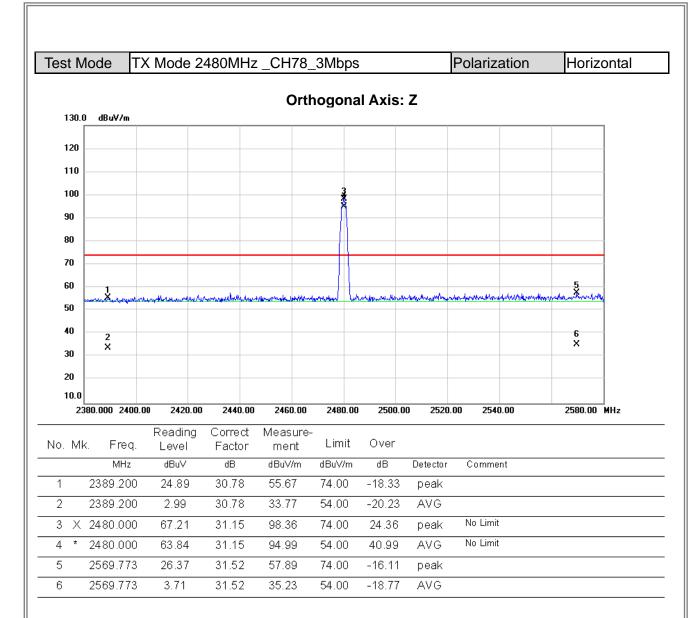
### **REMARKS:**

(1) Both Vertical and Horizontal are evaluated, but only the worst case (Horizontal) is recorded.

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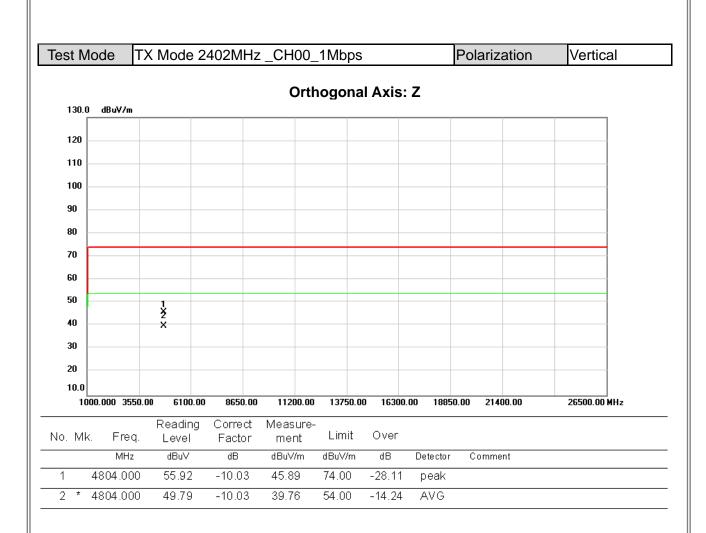
### **REMARKS:**

(1) Both Vertical and Horizontal are evaluated, but only the worst case (Horizontal) is recorded.

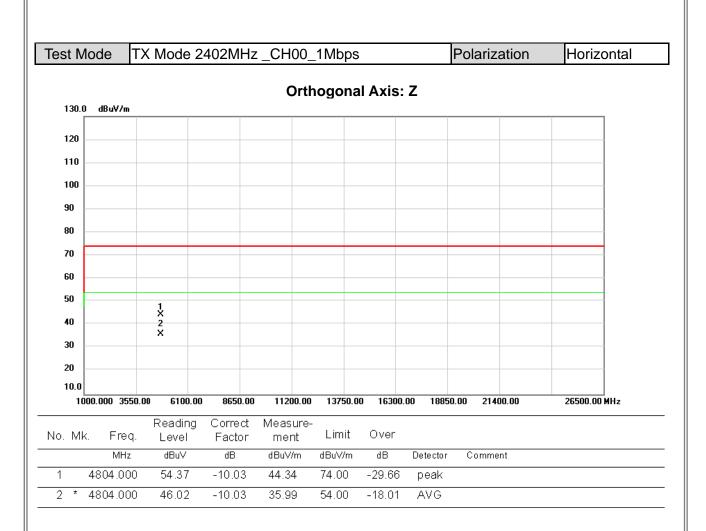
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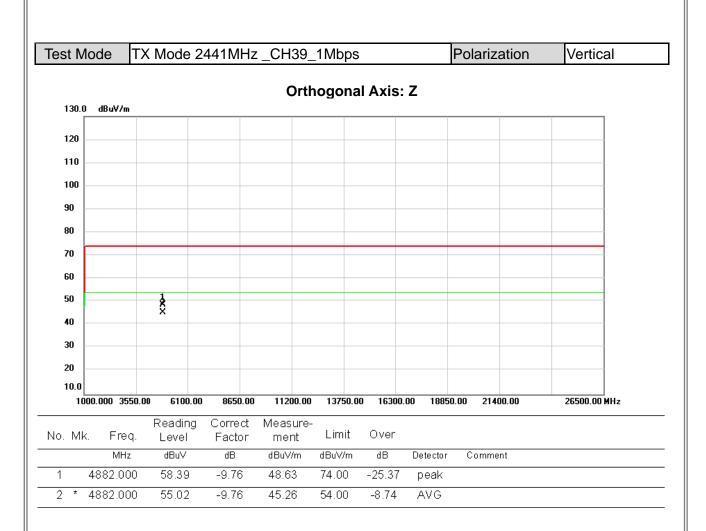




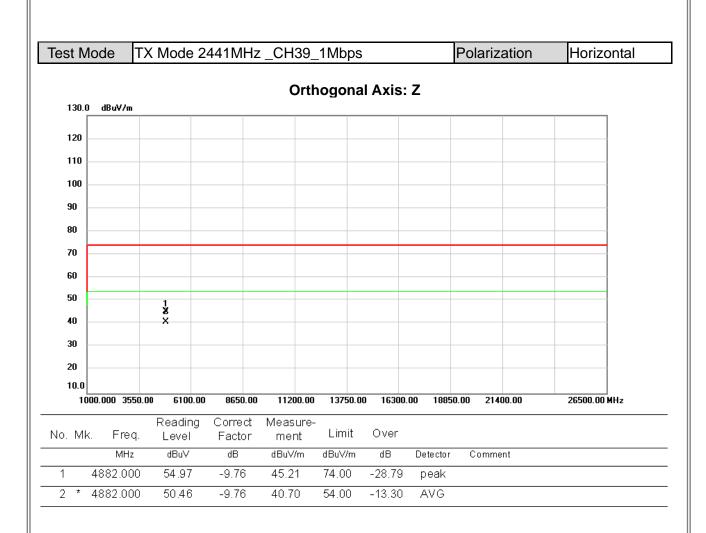




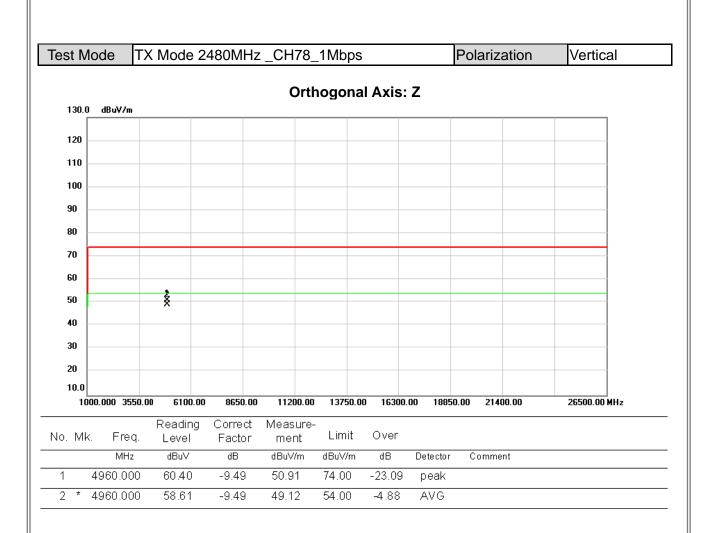




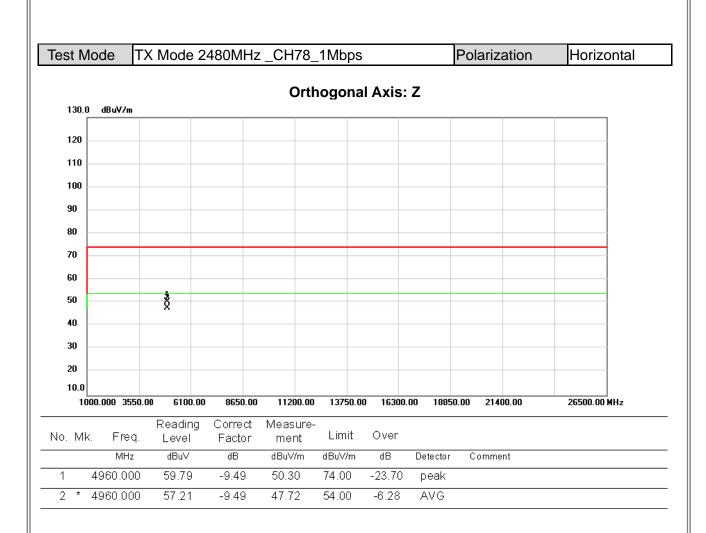




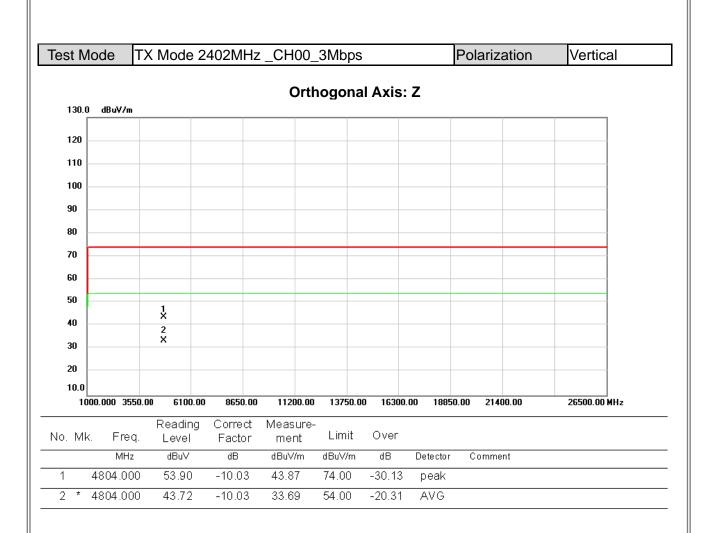




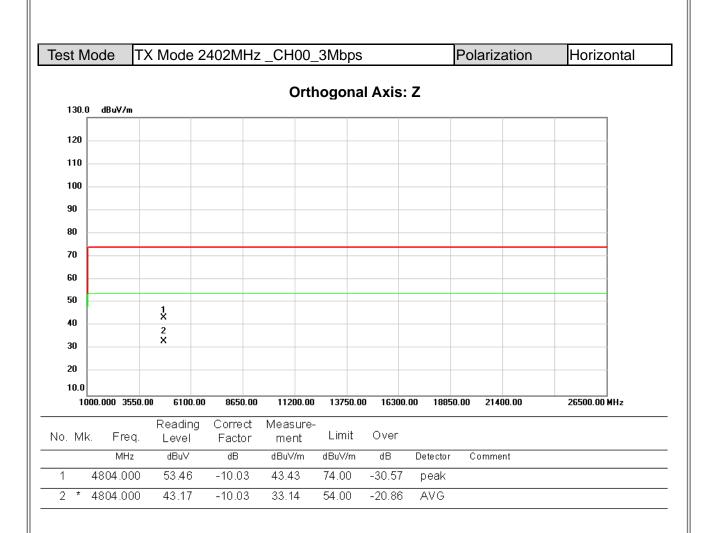




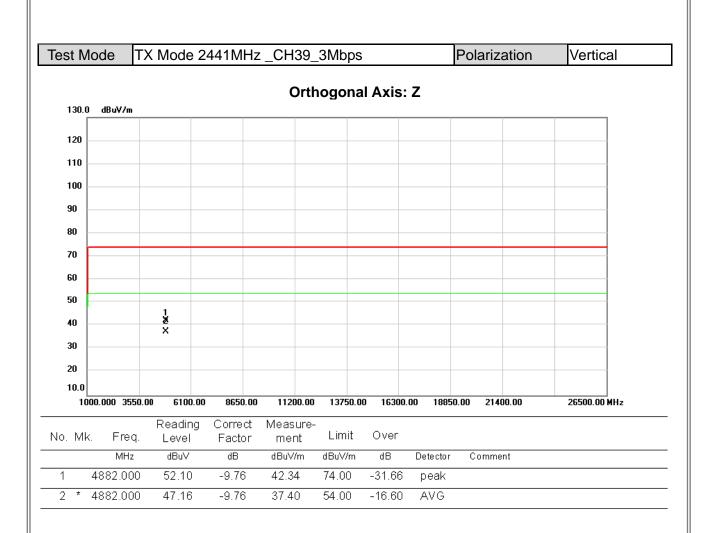




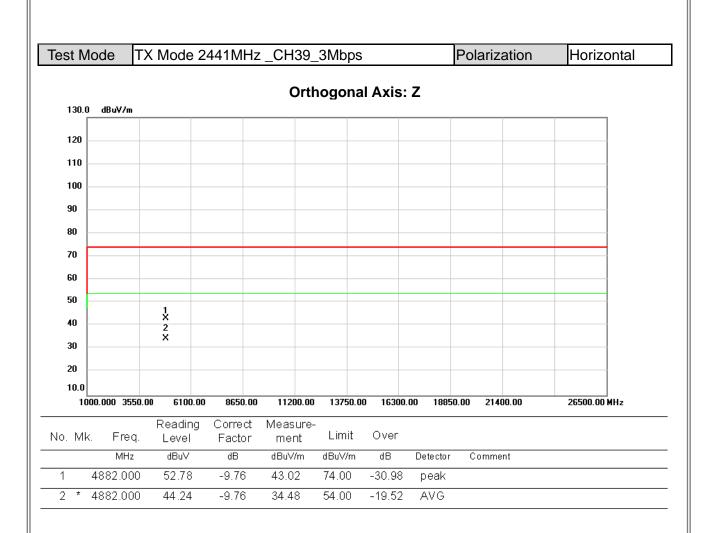




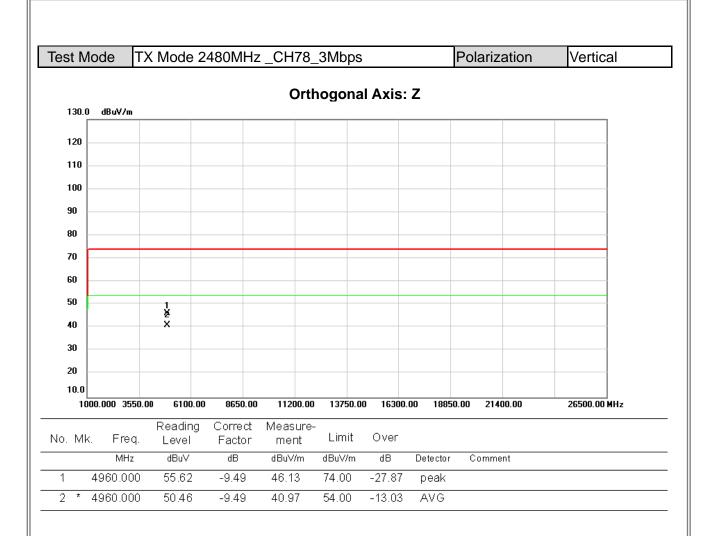




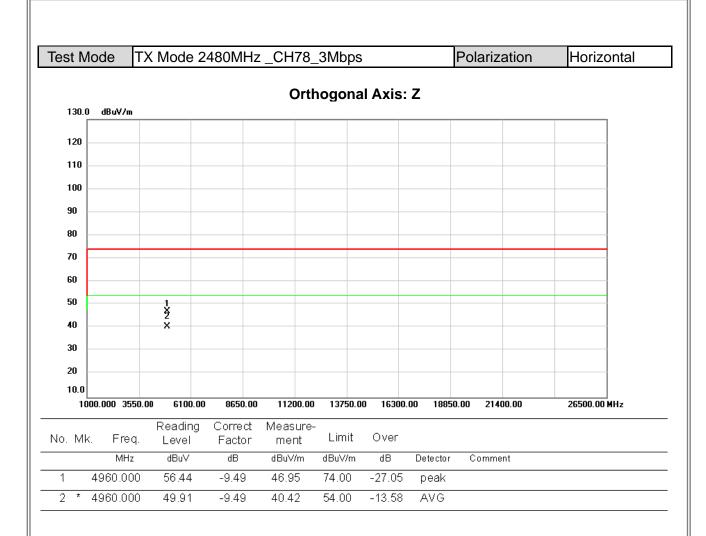














APPENDIX E - NUMBER OF HOPPING CHANNEL				

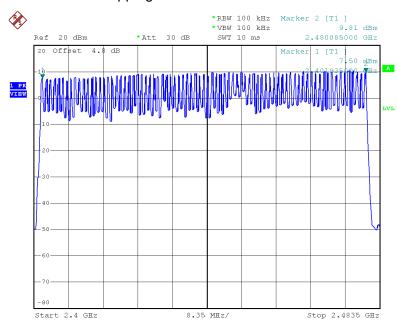




# **Hopping Mode\_1Mbps**

### Number of Hopping Channel

79



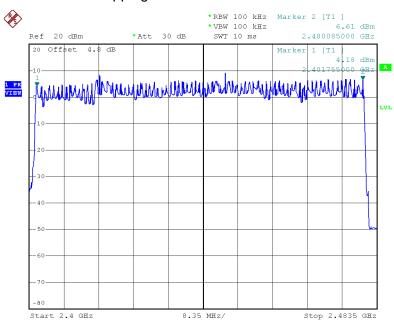
Date: 26.JAN.2018 15:39:53

# **Test Mode**

# **Hopping Mode\_3Mbps**

# Number of Hopping Channel

79



Date: 26.JAN.2018 16:23:16

Report No.: BTL-FCCP-1-1710T083D

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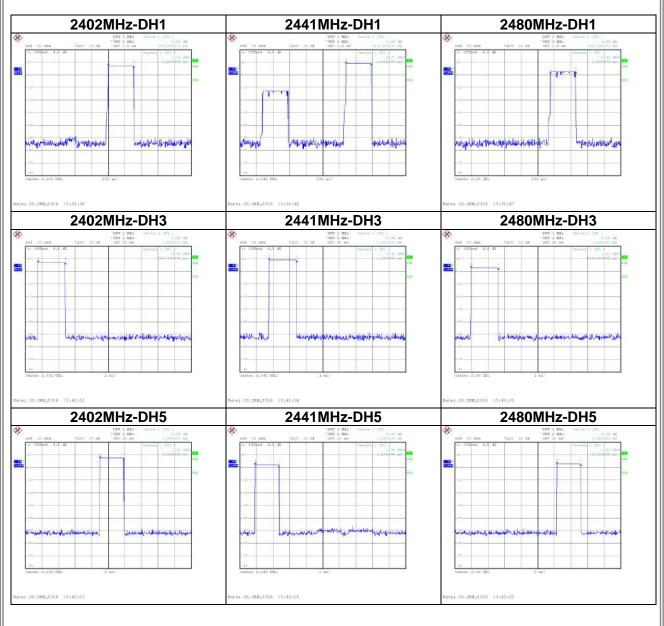
# **APPENDIX F - AVERAGE TIME OF OCCUPANCY**

Report No.: BTL-FCCP-1-1710T083D

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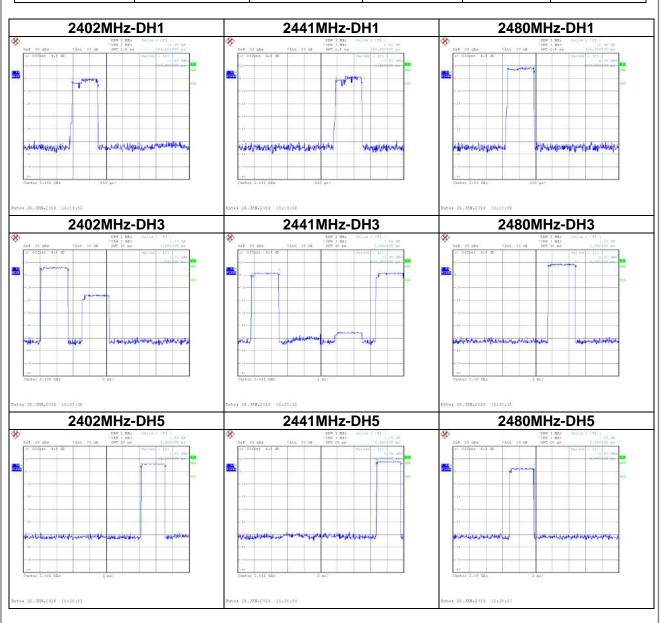


Test Mode :	TX Mode_1Mbps				
Data Daglest	Frequency	Pulse Duration	Dwell Time	Limits	Toot Dooult
Data Packet	(MHz)	(ms)	(s)	(s)	Test Result
DH5	2402	2.8800	0.3072	0.4000	Pass
DH3	2402	1.6400	0.2624	0.4000	Pass
DH1	2402	0.3850	0.1232	0.4000	Pass
DH5	2441	2.8800	0.3072	0.4000	Pass
DH3	2441	1.6600	0.2656	0.4000	Pass
DH1	2441	0.3850	0.1232	0.4000	Pass
DH5	2480	2.8800	0.3072	0.4000	Pass
DH3	2480	1.6400	0.2624	0.4000	Pass
DH1	2480	0.3850	0.1232	0.4000	Pass





Test Mode :	TX Mode_3Mbps				
Data Packet	Frequency	Pulse Duration(ms)	Dwell Time(s)	Limits(s)	Test Result
DH5	2402	2.9200	0.3115	0.4000	Pass
DH3	2402	1.6600	0.2656	0.4000	Pass
DH1	2402	0.3850	0.1232	0.4000	Pass
DH5	2441	2.9200	0.3115	0.4000	Pass
DH3	2441	1.6400	0.2624	0.4000	Pass
DH1	2441	0.3900	0.1248	0.4000	Pass
DH5	2480	2.8800	0.3072	0.4000	Pass
DH3	2480	1.6400	0.2624	0.4000	Pass
DH1	2480	0.3950	0.1264	0.4000	Pass



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# **APPENDIX G - HOPPING CHANNEL SEPARATION MEASUREMENT**

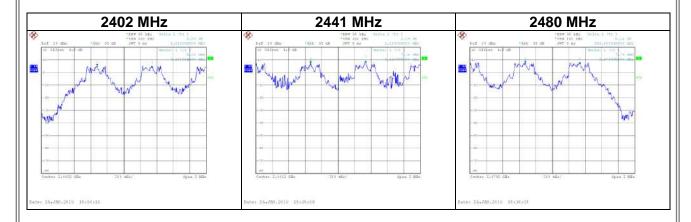
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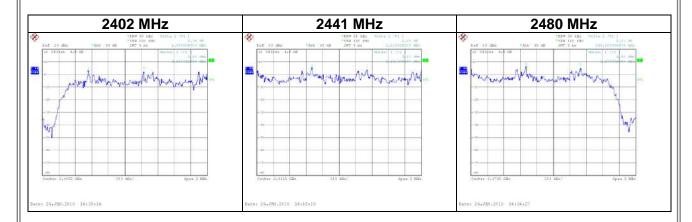
Test Mode : Hopping on \_1Mbps

Frequency	Channel Separation	2/3 of 20dB Bandwidth	Toot Dooult	
(MHz)	(MHz)	(MHz)	Test Result	
2402	1.002	0.669	Pass	
2441	1.009	0.651	Pass	
2480	0.993	0.664	Pass	





Frequency	Channel Separation	2/3 of 20dB Bandwidth	Toot Dooult
(MHz)	(MHz)	(MHz)	Test Result
2402	1.010	0.889	Pass
2441	1.010	0.889	Pass
2480	0.996	0.887	Pass





APPENDIX H - BANDWIDTH



Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	1.003	0.908	Pass
2441	0.976	0.908	Pass
2480	0.996	0.900	Pass





Test Mode:	TX Mode	3Mbps
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Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	1.334	1.220	Pass
2441	1.333	1.212	Pass
2480	1.330	1.216	Pass





APPENDIX I - PEAK OUTPUT POWER			



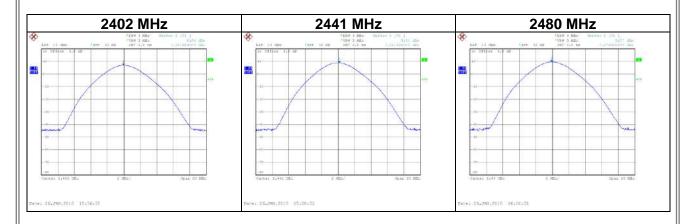
Test Mode:	TX Mode	_1Mbps

Frequency	Conducted Power	Conducted Power	Max. Limit	Max. Limit	Toot Dooult
(MHz)	(dBm)	(W)	(dBm)	(W)	Test Result
2402	7.69	0.0059	21.00	0.1250	Pass
2441	9.68	0.0093	21.00	0.1250	Pass
2480	10.57	0.0114	21.00	0.1250	Pass



Test Mode :	TX Mode _3Mbps	
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Frequency	Conducted Power	Conducted Power	Max. Limit	Max. Limit	Toot Dooult
(MHz)	(dBm)	(W)	(dBm)	(W)	Test Result
2402	6.86	0.0049	21.00	0.1250	Pass
2441	8.93	0.0078	21.00	0.1250	Pass
2480	9.57	0.0091	21.00	0.1250	Pass





# Spot check test:

Test Mode : TX Mode \_1Mbps

Frequency	Conducted Power	Conducted Power	Max. Limit	Max. Limit	Toot Dooult
(MHz)	(dBm)	(W)	(dBm)	(W)	Test Result
2402	6.08	0.0041	21.00	0.1250	Pass
2441	8.39	0.0069	21.00	0.1250	Pass
2480	9.97	0.0099	21.00	0.1250	Pass

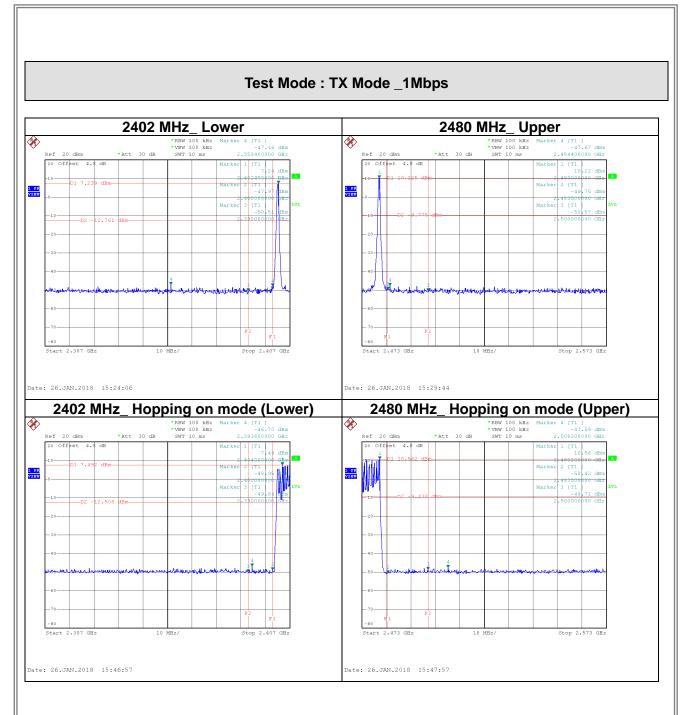
Test Mode : TX Mode \_3Mbps

Frequency	Conducted Power	Conducted Power	Max. Limit	Max. Limit	Toot Dooult
(MHz)	(dBm)	(W)	(dBm)	(W)	Test Result
2402	5.65	0.0037	21.00	0.1250	Pass
2441	7.40	0.0055	21.00	0.1250	Pass
2480	9.27	0.0085	21.00	0.1250	Pass

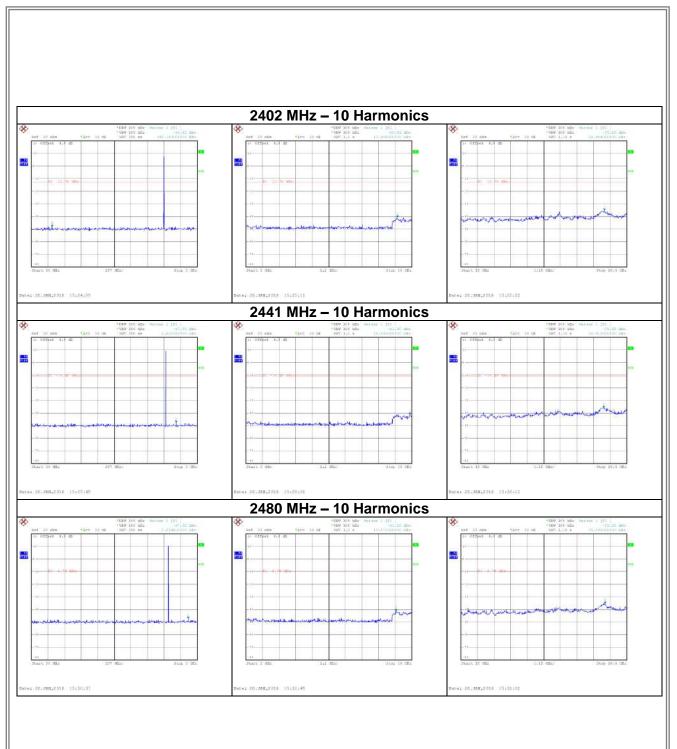


APPENDIX J - ANTENNA CONDUCTED SPURIOUS EMISSION

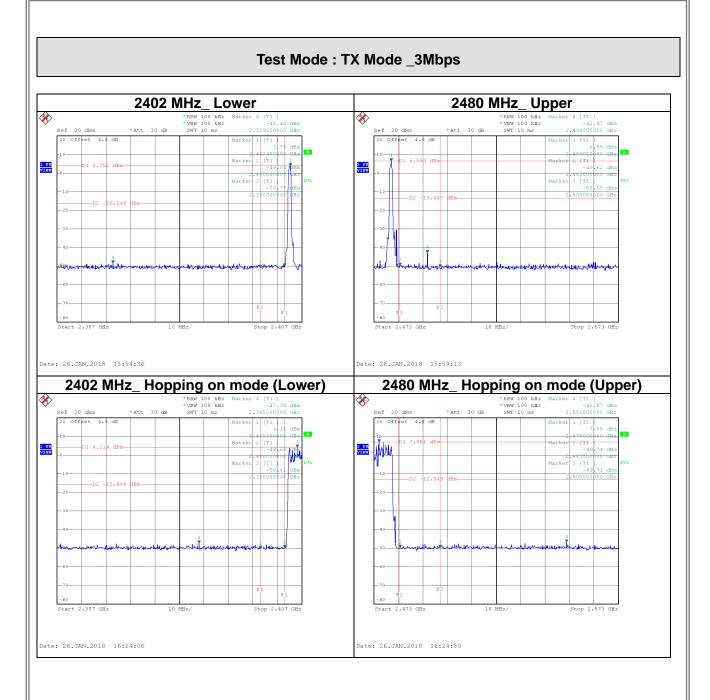




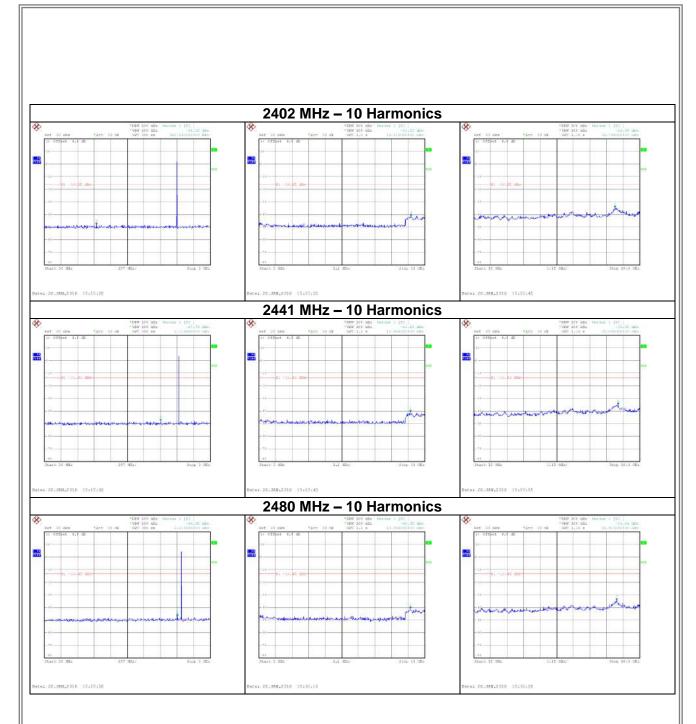












**End of Test Report** 

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