# FCC Radio Test Report

# FCC ID: XHM-J240222

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

Project No. Equipment Model Name Applicant Address

1508080
POS
Aures 240, J2 240
FLYTECH Technology Co., Ltd.
1F, No. 168, Sing-Ai Rd., NeiHu District 11494, Taipei, Taiwan

Date of Receipt	: Aug. 06, 2015
Date of Test	: Aug. 06, 2015 ~ Feb. 26, 2016
Issued Date	: Mar. 01, 2016
Tested by	: BTL Inc.

**Testing Engineer** 

**Technical Manager** 

Authorized Signatory

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# BTL INC.

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#### 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.

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### **REPORT ISSUED HISTORY**

Issue No.	Description	Issued Date
Issue No. BTL-FCCP-2-1508080	Description Original Issue.	Issued Date Mar. 01, 2016

#### **1 CERTIFICATION**

Equipment :	POS
Brand Name :	FLYTECH
Model Name :	Aures 240, J2 240
Applicant :	FLYTECH Technology Co., Ltd.
Manufacturer :	FLYTECH Technology Co., Ltd.
Address :	1F, No. 168, Sing-Ai Rd., NeiHu District 11494, Taipei, Taiwan
	FLYTECH TECHNOLOGY CO., LTD.
	No.36 Huaya 3 <sup>rd</sup> Rd., Guishan Township, Taoyuan Country 33383, Taiwan
Date of Test :	Aug. 06, 2015 ~ Feb. 26, 2016
Test Sample :	Engineering Sample
Standards :	FCC Part 15, Subpart C(15.209)
	ANSI C63. 10-2013

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

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-2-1508080) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

## **2 SUMMARY OF TEST RESULTS**

Test procedures according to the technical standards:

Standard Section	Test Item	Result
15.207	Conducted emission	PASS
15.209	Radiated Emission	PASS

NOTE:

1.  $\ensuremath{\text{N/A}}\xspace$ : denotes test is not applicable in this Test Report

#### 2.1 TEST FACILITY

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

#### Conducted emission Test:

C05: (VCCI RN: C-4742; FCC RN:965108; FCC DN:TW1082)

No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan Radiated emission Test:

**CB08:** (FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)

1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

#### 2.2 MEASUREMENT UNCERTAINTY

# The measurement uncertainty is not specified by FCC/Industry Canada rules and for reference only.

The reported uncertainty of measurement  $\mathbf{y} \pm \mathbf{U}$ , where expanded uncertainty  $\mathbf{U}$  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. Conducted emission test:

Test Site	Method	Measurement Frequency Range	U,(dB)
C05	CISPR	150 kHz ~ 30MHz	2.04

#### B. Radiated emission test:

Test Site	Method	Measurement Frequency Range	U,(dB)
CB08 CISPR	9kHz ~ 150kHz	4.00	
	USPR	150kHz ~ 30MHz	4.00

٦	Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
			30MHz ~ 200MHz	V	3.06
	CB08	CISPR	30MHz ~ 200MHz	Н	2.58
		CIOPR	200MHz ~ 1,000MHz	V	3.50
			200MHz ~ 1,000MHz	Н	3.10

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

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

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

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

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

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	POS	
Brand Name	FLYTECH	
Model Name	Aures 240, J2 240	
Model Difference	For marketing purpose.	
Due due t De se vistis e	Operation Frequency	125 kHz
Product Description	Antenna Designation	LOOP Antenna
Power Source	DC voltage supplied from External Power Supply.	
Power Rating	I/P: 100-240V~ 1.5A 50-60Hz O/P: 19V 3.42A	
Products Covered	1 * Mother Board: D36 1 * CPU: Intel, J1900 2.0G 1 * RFID: SUNION, A02278-S 1 * Panel: 14" 1 * 2nd Display: 10.1" 1 * HDD: 2.5" 1 * External Power Supply: Delta, ADP-65JH HB	

Note:

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

#### 3.2 DESCRIPTION OF TEST MODES

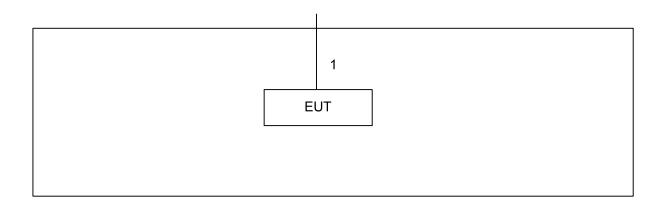
To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration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

Pretest Mode	Description	
Mode 1	125 KHz Transmit	

Conducted emission test		
Final Test Mode	Test Mode Description	
Mode 1	13.56MHz Transmit	

Radiated emission test	
Final Test Mode Description	
Mode 1	125 KHz Transmit

#### 3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



#### 3.4 DESCRIPTION OF SUPPORT UNITS

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

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.
-	-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.5m	Power Line

Note:

(1) The support equipment was authorized by Declaration of Conformity (DOC).

## **4 CONDUCTED EMISSION**

#### 4.1 LIMITS

FREQUENCY	(dBuV)				
(MHz)	Quasi-peak	Average			
0.15 - 0.5	66 - 56 *	56 - 46 *			
0.50 - 5.0	56.00	46.00			
5.0 - 30.0	60.00	50.00			

#### NOTE:

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

#### 4.2 TEST PROCEDURES

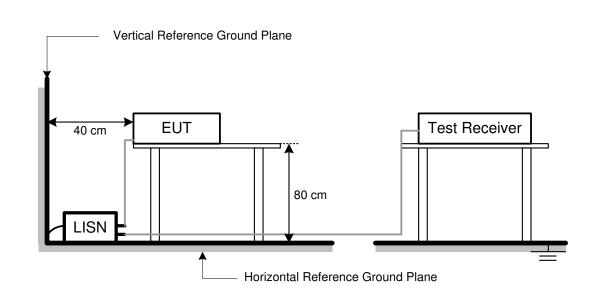
- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.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

e. For the actual test configuration, please refer to the related Item –EUT Test Photos. **NOTE:** 

- a. Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).
- b. All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or 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 Peak or QP Mode was measured, but AVG Mode didn't perform.



#### 4.3 TEST SETUP LAYOUT



#### 4.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.5 EUT OPERATING CONDITIONS

The EUT used during radiated and/or conducted emission measurement was designed to exercise in a manner similar to a typical use.

Temperature: 25°C Relative Humidity: 54%

#### 4.6 TEST RESULTS

Please refer to the Attachment A.

### **5 RADIATED EMISSION**

#### 5.1 LIMITS

FCC Part 15.209									
Frequency	Field Streng Limitation		Field Strength Limitation at 3m Measurement Dist						
(MHz)	(uV/m) Dis		(uV/m)	(dBuV/m)					
0.009 - 0.490	2400 / F(KHz)	300m	10000 * 2400/F(KHz)	20log 2400/F(KHz) + 80					
0.490 – 1.705	24000 / F(KHz)	30m	100 * 24000/F(KHz)	20log 24000/F(KHz) + 40					
1.705 – 30.00	30	30m	100* 30	20log 30 + 40					
30.0 - 88.0	100	3m	100	20log 100					
88.0 – 216.0	150	3m	150	20log 150					
216.0 - 960.0	200	3m	200	20log 200					
Above 960.0	500	3m	500	20log 500					

#### NOTE:

- (1) The tighter limit shall apply at the boundary between two frequency range.
- (2) Limitation expressed in dBuV/m is calculated by 20log Emission Level (uV/m).
- (3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of  $L_{d1} = L_{d2} * (d_2/d_1)^2$ .
  - Example:

F.S Limit at 30m distance is 30uV/m , then F.S Limitation at 3m distance is adjusted as  $L_{d1}$  =  $L_1$  = 30uV/m  $^*$  (10)  $^2$  = 100  $^*$  30 uV/m

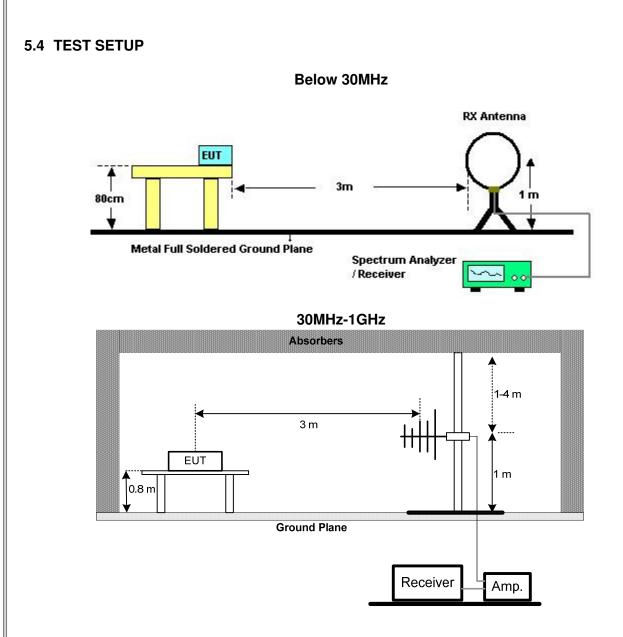
 (4) The test result calculated as following: Measurement Value = Reading Level + Correct Factor Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use) Margin Level = Measurement Value – Limit Value

#### 5.2 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 height of the equipment or of the substitution antenna shall be 0.8 m 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.
- c. 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.
- d. 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)
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos. **NOTE:**
- a. Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode with Detector BW=120 kHz.
- b. 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.

#### 5.3 DEVIATION FROM TEST STANDARD

No deviation



#### 5.5 EUT OPERATING 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.

Below 30MHz: Temperature: 25°C Relative Humidity: 45% 30MHz-1GHz: Temperature: 25°C Relative Humidity: 45%

#### 5.6 TEST RESULTS (BELOW 30MHz)

Please refer to the Attachment B.

#### 5.7 TEST RESULTS (30MHz-1GHz)

Please refer to the Attachment C.

## 6. 20dB SPECTRUM BANDWIDTH MEASUREMENT

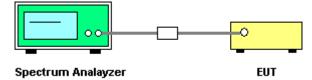
#### 6.1. LIMIT OF 20DB BANDWIDTH MEASUREMENT

The 20dB bandwidth shall be specified in operating frequency band.

#### 6.2.TEST PROCEDURES

The bandwidth of the fundamental frequency was measured by spectrum analyzer with 10kHz RBW and 10kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

#### 6.3. TEST SETUP LAYOUT



#### 6.4. TEST DEVIATION

There is no deviation with the original standard.

#### 6.5. EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

#### 6.6. TEST RESULT

Please refer to the Attachment D.

## 7 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	Jun. 01, 2017						
2	Test Cable	TIMES	CFD300-NL	C05	Jun. 14, 2016						
3	EMI Test Receiver	R&S	ESR3	101854	Dec. 10, 2016						
4	Measurement Software	EZ	EZ_EMC (Version NB-03A)	N/A	N/A						

	Radiated Emission Measurement Instruments List									
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until					
1	Spectrum Analyzer	Agilent	N9038A	MY51210215	Jun. 07, 2016					
2	Microwave Pre_amplifier	HP	8447D	2944A08891	Mar. 08, 2016					
3	Test Cable	EMCI	EMC8D-NM-N M-8000	150301	Mar. 08, 2016					
4	Test Cable	EMCI	EMC8D-NM-N M-2500	150303	Mar. 08, 2016					
5	Test Cable	Test Cable EMCI		150304	Mar. 08, 2016					
6	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	9168-364	Feb. 03, 2017					
7	Loop Antenna EMCO		6502	00042960	Nov. 15. 2016					

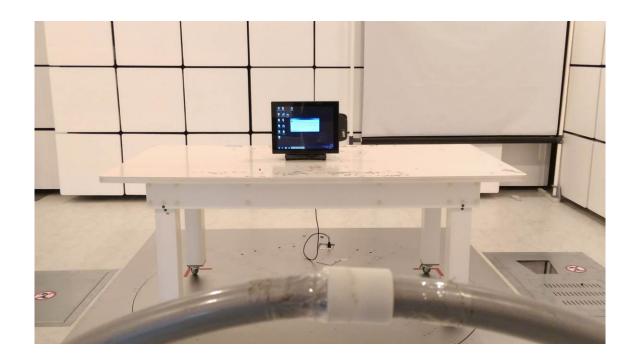
	20dB Bandwidth Measurement									
Iter	n Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until					
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 17, 2017					

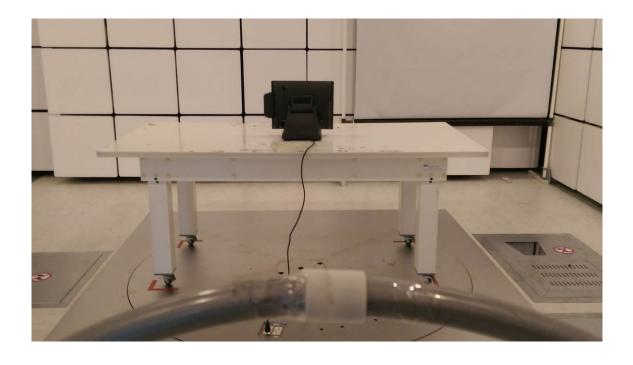


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## Radiated emission test photos

9KHz to 30MHz

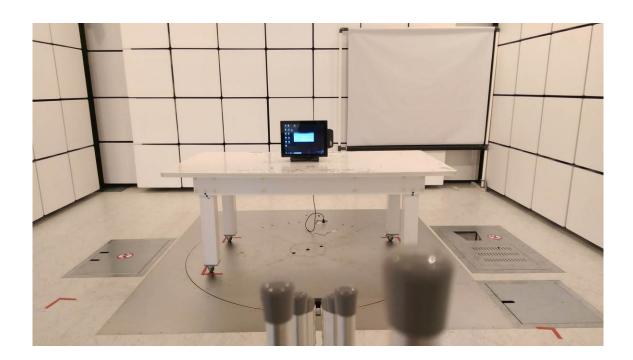


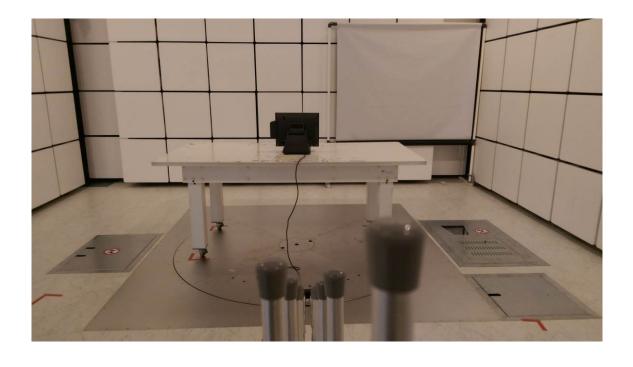


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## Radiated emission test photos

30MHz to 1000MHz





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## **ATTACHMENT A - CONDUCTED EMISSION**



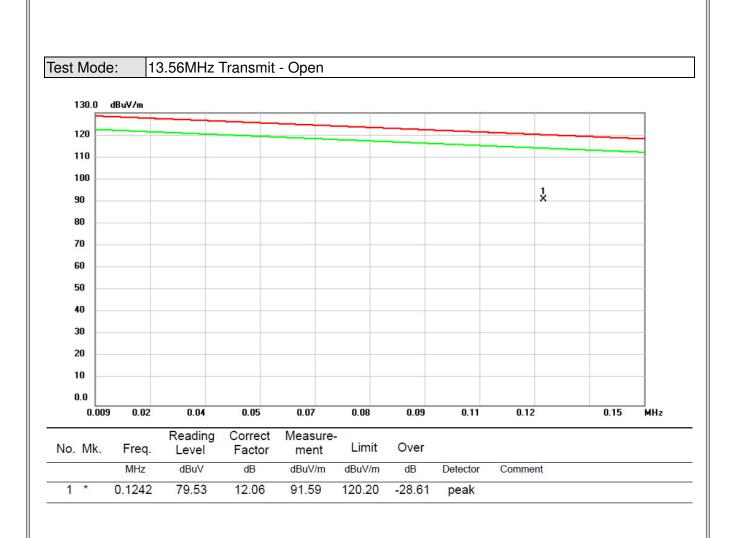


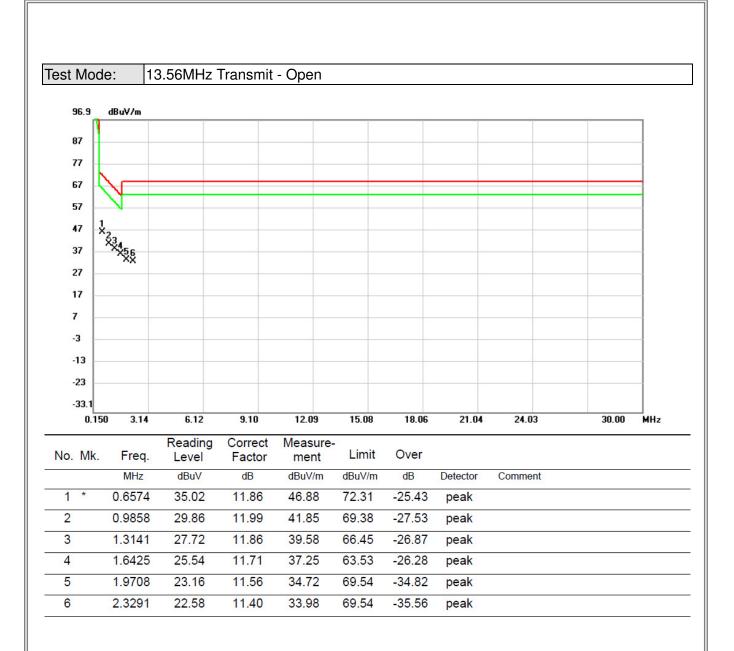
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	I	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1604	47.70	9.67	57.37	65.44	-8.07	QP	
2		0.1604	25.30	9.67	34.97	55.44	-20.47	AVG	
3		0.2151	39.10	9.66	48.76	63.00	-14.24	QP	
4		0.2151	15.80	9.66	25.46	53.00	-27.54	AVG	
5		0.4377	25.10	9.67	34.77	57.10	-22.33	QP	
6		0.4377	12.60	9.67	22.27	47.10	-24.83	AVG	
7		5.0000	22.70	9.89	32.59	56.00	-23.41	QP	
8		5.0000	11.20	9.89	21.09	46.00	-24.91	AVG	
9		10.6000	22.40	9.94	32.34	60.00	-27.66	QP	
10		10.6000	13.60	9.94	23.54	50.00	-26.46	AVG	
11		16.9500	22.40	9.85	32.25	60.00	-27.75	QP	
12		16.9500	17.30	9.85	27.15	50.00	-22.85	AVG	



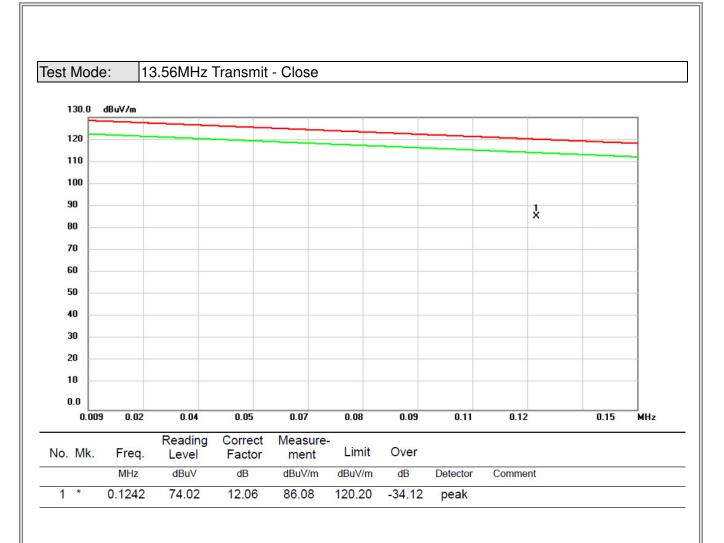
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1577	45.30	9.66	54.96	65.58	-10.62	QP	
2		0.1577	25.00	9.66	34.66	55.58	-20.92	AVG	
3		0.2158	37.70	9.66	47.36	62.98	-15.62	QP	
4		0.2158	13.50	9.66	23.16	52.98	-29.82	AVG	
5		0.2662	36.40	9.66	46.06	61.23	-15.17	QP	
6		0.2662	12.90	9.66	22.56	51.23	-28.67	AVG	
7		0.4398	25.30	9.68	34.98	57.06	-22.08	QP	
8		0.4398	10.00	9.68	19.68	47.06	-27.38	AVG	
9		5.0500	21.70	9.88	31.58	60.00	-28.42	QP	
10		5.0500	11.00	9.88	20.88	50.00	-29.12	AVG	
11		10.5000	22.30	9.94	32.24	60.00	-27.76	QP	
12		10.5000	13.30	9.94	23.24	50.00	-26.76	AVG	

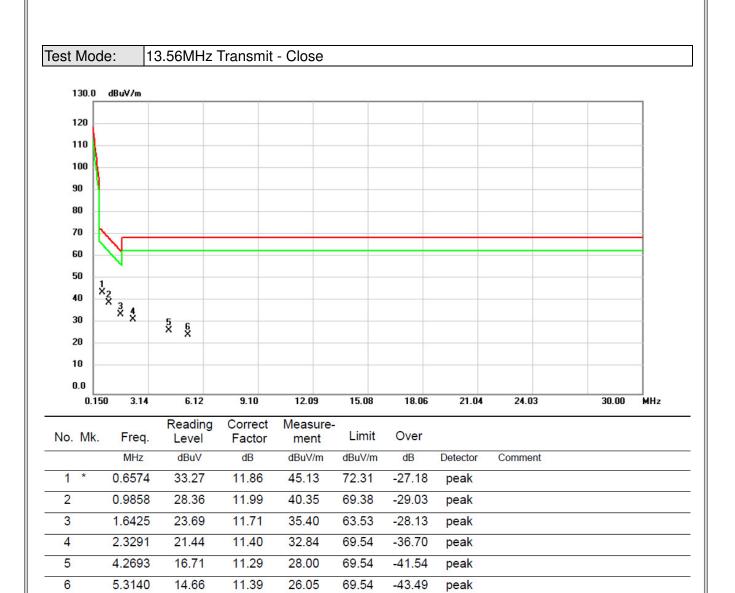
## ATTACHMENT B - RADIATED EMISSION (9KHZ-30MHZ)



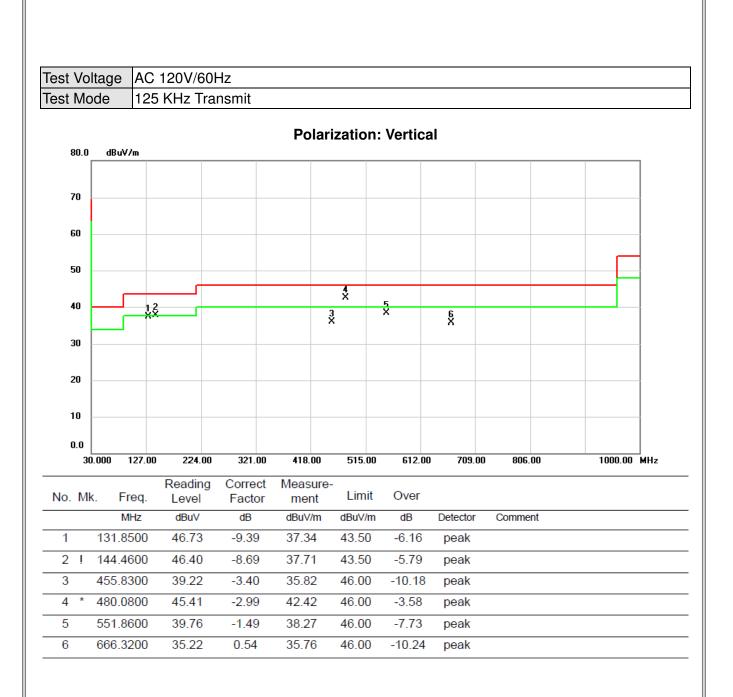


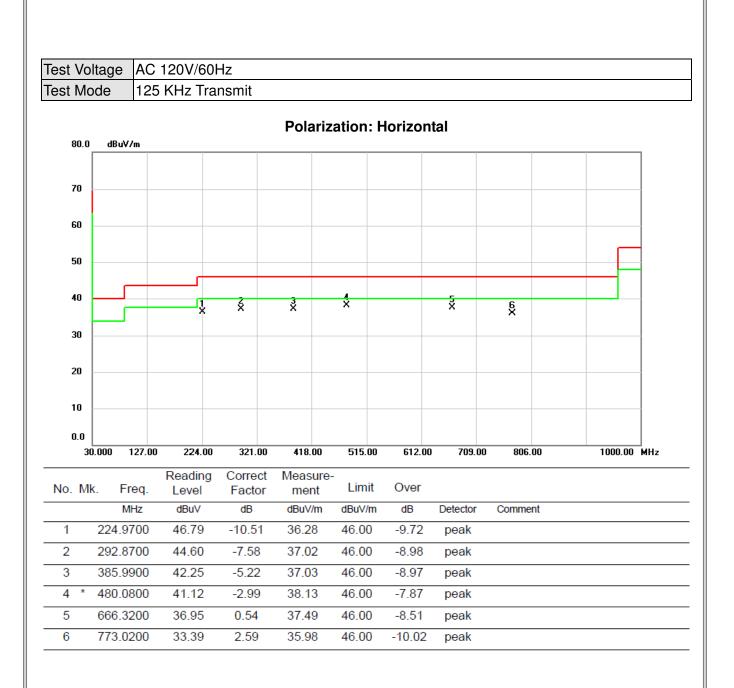






## ATTACHMENT C - RADIATED EMISSION (30 MHz TO 1 GHz)

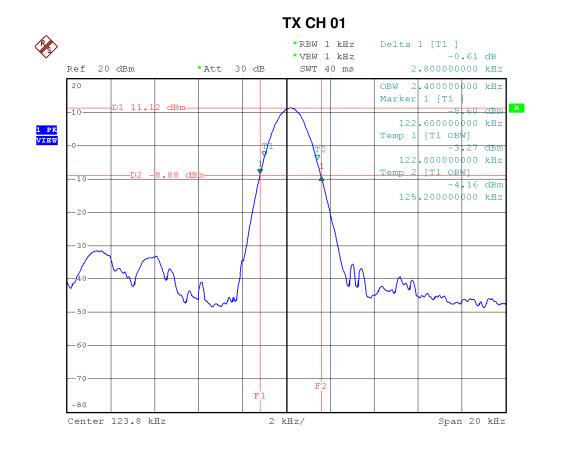




## ATTACHMENT D - 20dB SPECTRUM BANDWIDTH MEASUREMENT

Test Mode : TX Mode

Frequency (kHz)	20dB Bandwidth (kHz)	99% OBW (kHz)	Test Result
124.2000	2.80	2.40	Complies



Date: 24.FEB.2016 19:11:38