FCC Radio Test Report

FCC ID: XHM-J680H92

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

Project No.	:	1407139A
Equipment	:	POS
Model Name	:	J2 680
Applicant	:	FLYTECH Technology Co., Ltd.
Address	:	1F, No. 168, Sing-Ai Rd., NeiHu District 11494, Taipei, Taiwan

Date of Receipt	:	Jan. 22, 2015
Date of Test	:	Jan. 22, 2015 ~ Dec. 01, 2016
Issued Date	:	Dec. 02, 2016
Tested by	:	BTL Inc.

Testing Engineer : Rush Kao
(Rush Kao)

Technical Manager : Jeff Yang
(Jeff Yang)

Authorized Signatory : Andy Chiu
(Andy Chiu)

BTL INC.

B1, No. 37, Lane 365, Yang-guang St.,
Nei-hu District, Taipei City 114, Taiwan.
TEL:+886-2-2657-3299 FAX: +886-2- 2657-3331

Testing Laboratory
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.

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 Guide17025** 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

REPORT ISSUED HISTORY 5
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 . BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 11
3.4 . DESCRIPTION OF SUPPORT UNITS 11
4 . CONDUCTED EMISSION 12
4.1 . LIMITS 12
4.2 . TEST PROCEDURES 12
4.3 . TEST SETUP LAYOUT 13
4.4 . DEVIATION FROM TEST STANDARD 13
4.5 . EUT OPERATING CONDITIONS 13
4.6 . EUT TEST CONDITIONS 13
4.7 . TEST RESULTS 13
5 . RADIATED EMISSION 14
5.1 . LIMITS 14
5.2 . TEST PROCEDURE 15
5.3 . DEVIATION FROM TEST STANDARD 16
5.4 . TEST SETUP 16
5.5 . EUT OPERATING CONDITIONS 16
5.6 . EUT TEST CONDITIONS 17
5.7 . TEST RESULTS (BELOW 30MHZ) - FCC PART 15.209 17
5.8 . TEST RESULTS -(30-1000MHZ) - FCC PART 15.209 17
5.9 . TEST RESULTS- FCC PART 15.225 17
6 . FREQUENCY STABILITY 18
6.1 . LIMITS 18
6.2 . TEST PROCEDURE 18
6.3 . DEVIATION FROM TEST STANDARD 18
6.4 . EUT OPERATING CONDITIONS 18
6.5 . EUT TEST CONDITIONS 18
6.6 . TEST RESULTS 18
7 . BANDWIDTH TEST 19
7.1 . EST PROCEDURE 19
7.2 . DEVIATION FROM STANDARD 19

Table of Contents

7.3 . TEST SETUP	19
7.4 . EUT OPERATION CONDITIONS	19
7.5 . EUT TEST CONDITIONS	19
7.6 . TEST RESULTS	19
8 . MEASUREMENT INSTRUMENTS LIST	20
9 . EUT TEST PHOTO	21
ATTACHMENT A - CONDUCTED EMISSION	24
ATTACHMENT B - RADIATED EMISSION (9KHZ-30MHZ)	27
ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)	32
ATTACHMENT D - RADIATED EMISSION (FCC PART 15.225)	35
ATTACHMENT E - FREQUENCY STABILITY MEASUREMENT	38
ATTACHMENT F - BANDWIDTH	40

REPORT ISSUED HISTORY

Issue No.	Description	Issued Date
BTL-FCCP-1-1407139A	Original Issue.	Dec. 02, 2016

1. CERTIFICATION

Equipment	:	POS
Brand Name	:	FLYTECH
Model Name	:	J2 680
Applicant	:	FLYTECH Technology Co., Ltd.
Manufacturer	:	FLYTECH TECHNOLOGY CO., LTD.
Address	:	1F, No. 168, Sing-Ai Rd., NeiHu District 11494, Taipei, Taiwan
Factory	:	FLYTECH TECHNOLOGY CO., LTD.
Address	:	No.36 Huaya 3rd Rd., Guishan Township, Taoyuan Country 33383,Taiwan
Date of Test	:	Jan. 22, 2015 ~ Dec. 01, 2016
Test Sample	:	Engineering Sample
Standards	:	FCC Part 15, Subpart C: 2014 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-1-1407139A) 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**
15.35/ 15.205 / 15.209 / 15.225	Radiated emission	**PASS**
15.225(e)	Frequency Stability	**PASS**
15.203	Antenna Requirement	**PASS**
15.215(c)	20dB Bandwidth Test	**PASS**

NOTE:

1. **N/A**: denotes test is not applicable in this Test Report

2.1. TEST FACILITY

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

Conducted emission Test:

C05: No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

Radiated emission Test:

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

2.2. MEASUREMENT UNCERTAINTY

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

The reported uncertainty of measurement y ± 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 emission test:

Test Site	Measurement Frequency Range	U, (dB)
C05	150 kHz~30 MHz	1.94

B. Radiated emission test:

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

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

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)
CB15 (3m)	CISPR	1GHz ~ 6GHz	V	4.48
		1GHz ~ 6GHz	H	4.50
		6GHz ~ 18GHz	V	4.30
		6GHz ~ 18GHz	H	4.14

Test Site	Method	Measurement Frequency Range	U,(dB)
CB15 (1m)	CISPR	18 ~ 26.5 GHz	4.72
		26.5 ~ 40 GHz	5.20

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

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

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

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

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

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

3. GENERAL INFORMATION

3.1. GENERAL DESCRIPTION OF EUT

Equipment	POS	
Brand Name	FLYTECH	
Model Name	J2 680	
OEM Brand/Model Name	N/A	
Model Difference	N/A	
Product Description	Operation Frequency	13.56 MHz
	Antenna Designation	LOOP Antenna
PowerSource	DC Voltage supplied from AC/DC adapter. Brand/ Model: FSP GROUP INC./FSP180-ABAN1	
Power Rating	I/P:AC 100-240V 2.5A 50-60Hz, O/P:DC 19V 9.47A	

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 Test Mode	Description
Mode 1	13.56MHz Transmit

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

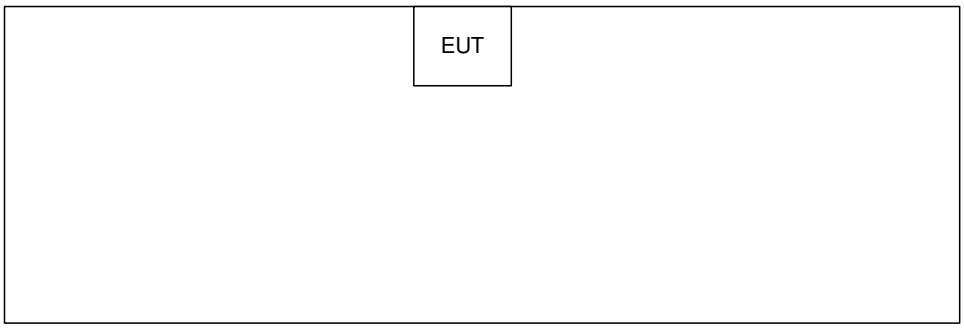
Radiated emission test	
Final Test Mode	Description
Mode 1	13.56MHz Transmit

Frequency Stability test	
Final Test Mode	Description
Mode 1	13.56MHz Transmit

Antenna Requirement test	
Final Test Mode	Description
Mode 1	13.56MHz Transmit

20dB Bandwidth test	
Final Test Mode	Description
Mode 1	13.56MHz 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.	Note
-	-	-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	-

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

4. CONDUCTED EMISSION

4.1. LIMITS

FREQUENCY (MHz)	(dBuV)	
	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.
3. 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

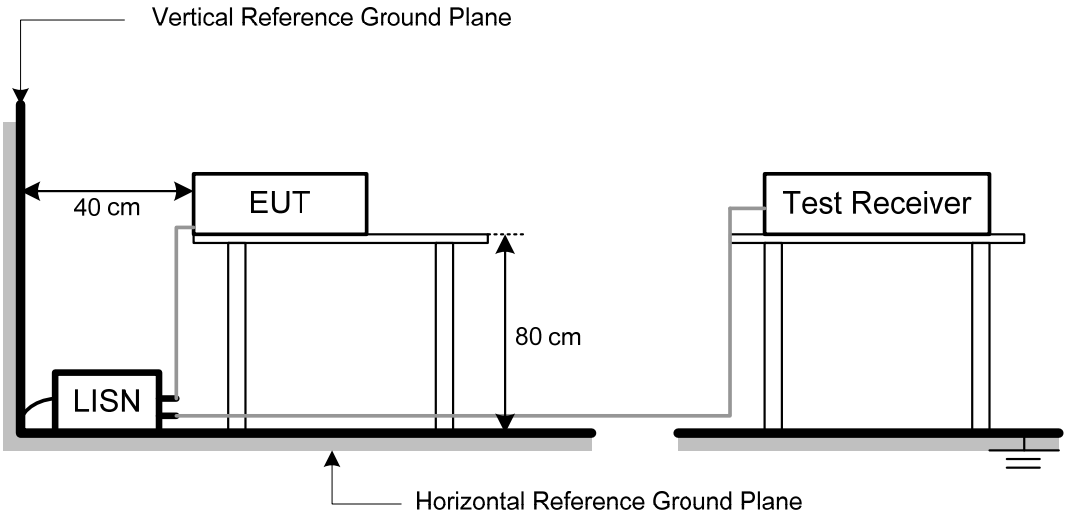
4.2. TEST PROCEDURES

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.

4.6. EUT TEST CONDITIONS

Temperature: 24°C
Relative Humidity: 60%
Test Voltage: AC 120V/60Hz

4.7. TEST RESULTS

Please refer to the Attachment 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.

5. RADIATED EMISSION

5.1. LIMITS

FCC Part 15.209				
Frequency (MHz)	Field Strength Limitation		Field Strength Limitation at 3m Measurement Dist	
	(uV/m)	Dist	(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
FCC Part 15.225(a)/(b)/(c)				
Frequency (MHz)	Field Strength Limitation		Field Strength Limitation at 3m Measurement Dist	
	(uV/m)	Dist	(uV/m)	(dBuV/m)
13.553 – 13.567	15,848	30 m	15,848*100	124
13.567 – 13.710	334	30 m	334*100	90.5
13.110 – 13.410 13.710 – 14.010	106	30 m	106*100	80.5

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; 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 spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
d. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE: (FCC PART 15.209)

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.

NOTE: (FCC PART 15.225)

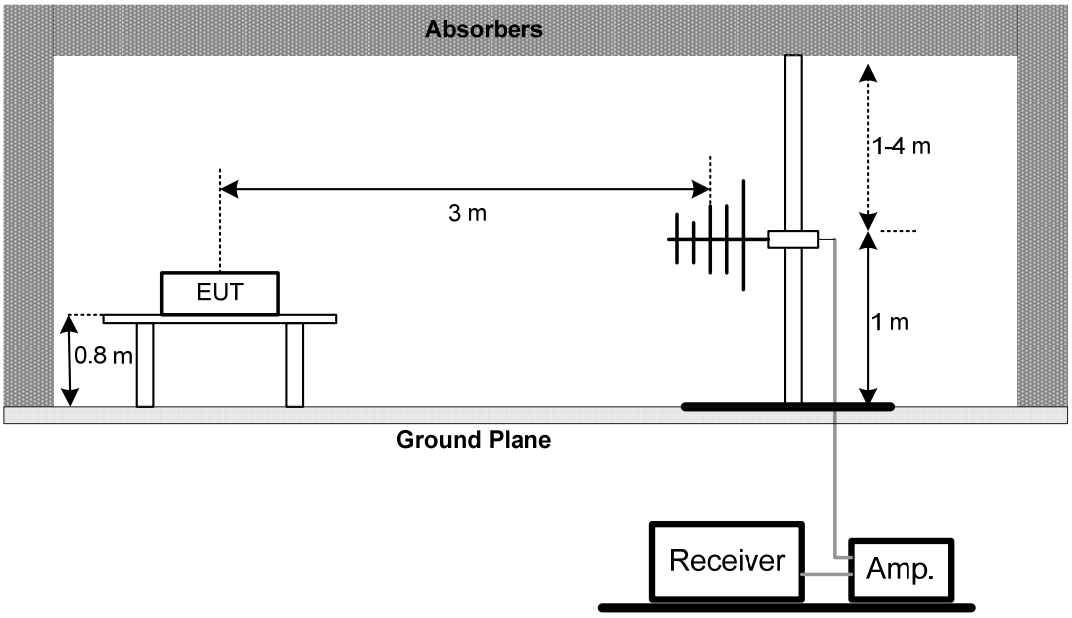
a. Spectrum Setting:
9 KHz – 150 KHz, RBW= 200Hz, VBW=200Hz, Sweep time = 200 ms.
150 K Hz – 30 MHz, RBW= 10 KHz, VBW=10 KHz, Sweep time = 200 ms.
30 MHz – 1000 MHz, RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.
b. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform.
c. The Log-Bicon Antenna will use to test frequency range from 30MHz to 1000MHz and the Loop Antenna will use to test frequency below 30MHz.

5.3. DEVIATION FROM TEST STANDARD

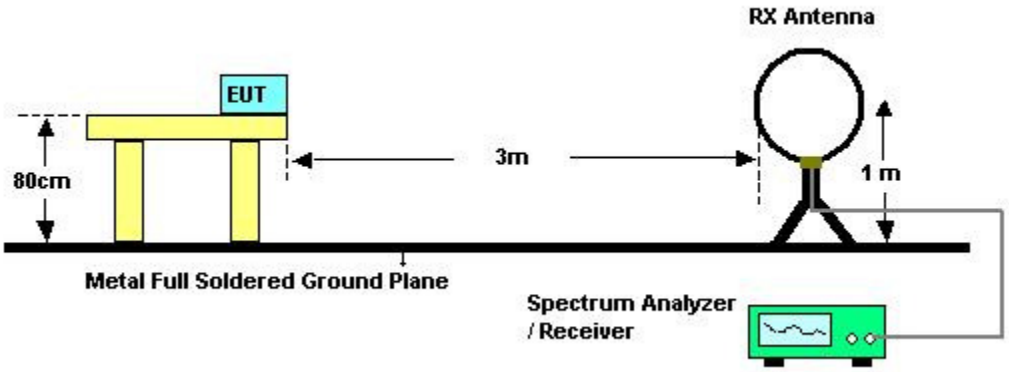
No deviation

5.4. TEST SETUP

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



(B) For radiated emissions below 30MHz



5.5. EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **4.5** Unless otherwise a special operating condition is specified in the follows during the testing.

5.6. EUT TEST CONDITIONS

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

5.7. TEST RESULTS (BELOW 30MHZ) - FCC PART 15.209

Please refer to the Attachment B.

5.8. TEST RESULTS -(30-1000MHZ) - FCC PART 15.209

Please refer to the Attachment C.

5.9. TEST RESULTS- FCC PART 15.225

Please refer to the Attachment D.

6. FREQUENCY STABILITY

6.1. LIMITS

FCC Part 15.225(e)
The frequency tolerance of the carrier signal shall be maintained within +/-0.01% of the operating frequency over a temperature variation of - 20 degrees to + 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supplyvoltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

6.2. TEST PROCEDURE

a. The equipment under test was connected to an external AC power supply and the RF output was connected to a frequency counter via feed through attenuators. The EUT was placed inside the temperature chamber.
After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.
b. At room temperature (25±5°C), an external variable AC power supply was connected to the EUT. The frequency of the transmitter was measured for 115%, 100% and 85% of the nominal operating input voltage.

6.3. DEVIATION FROM TEST STANDARD

No deviation

6.4. EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **4.5** Unless otherwise a special operating condition is specified in the follows during the testing.

6.5. EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 62%
Test Voltage: AC 120V/60Hz

6.6. TEST RESULTS

Please refer to the Attachment E.

7. BANDWIDTH TEST

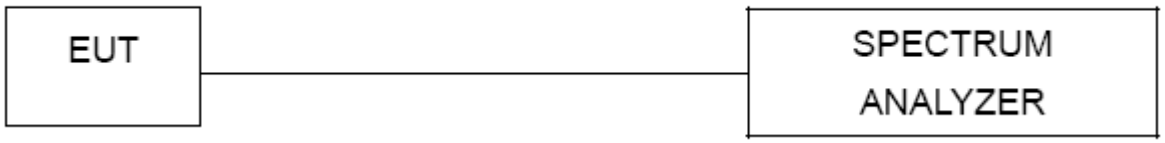
7.1. EST PROCEDURE

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.

7.2. DEVIATION FROM STANDARD

No deviation.

7.3. TEST SETUP



7.4. EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

7.5. EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 62%
Test Voltage: AC 120V/60Hz

7.6. TEST RESULTS

Please refer to the Attachment F.

8. 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. 26, 2017
2	Test Cable	TIMES	CFD300-NL	C02	Jun. 15, 2017
3	EMI Test Receiver	R&S	ESR7	101433	Dec. 10, 2016
4	Measurement Software	EZ	EZ_EMC (Version NB-03A)	N/A	N/A

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB9168-352	9168-352	Feb. 04, 2017
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-546	Nov. 05, 2017
3	Pre-Amplifier	HP	8447D	2944A08891	Mar. 09 2017
4	Pre-Amplifier	Agilent	8449B	3008A02331	Jan. 24, 2017
5	Test Cable	EMCI	EMC8D-NM-NM -8000	150301	Mar. 09, 2017
6	Test Cable	EMCI	EMC104-SM-S M-2500	150303	Mar. 09, 2017
7	Test Cable	EMCI	EMC104-NM-S M-1000	150304	Mar. 09, 2017
8	Test Cable	EMCI	EMC104-SM-S M-5000	150302	Mar. 29, 2017
9	Test Cable	EMCI	EMC104-SM-S M-800	150305	Mar. 29, 2017
10	EXA Spectrum Analyzer	Agilent	N9010A	MY52220990	Feb. 24, 2017
11	EMI Test Receiver	Agilent	N9038A	MY51210215	Jan. 08, 2017
12	Loop Antenna	EMCO	6502	00042960	Nov. 05. 2017
13	Horn Antenna	Schwarzbeck	BBHA-9170	187	May 12, 2017

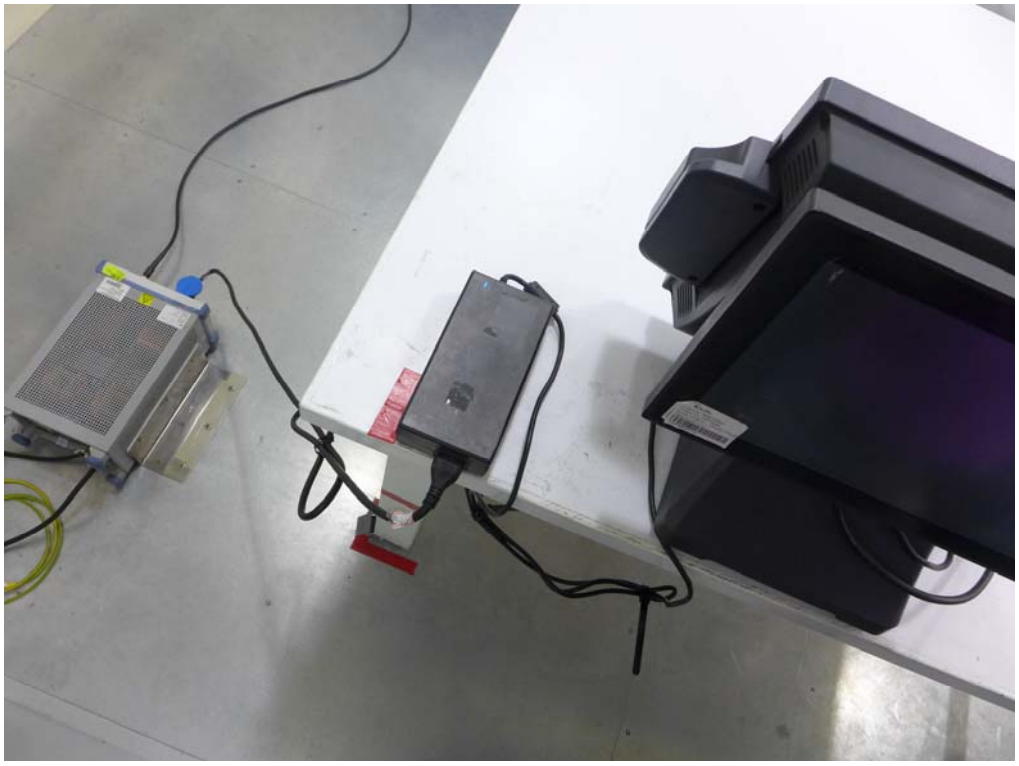
Frequency StabilityMeasurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 18, 2017

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

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

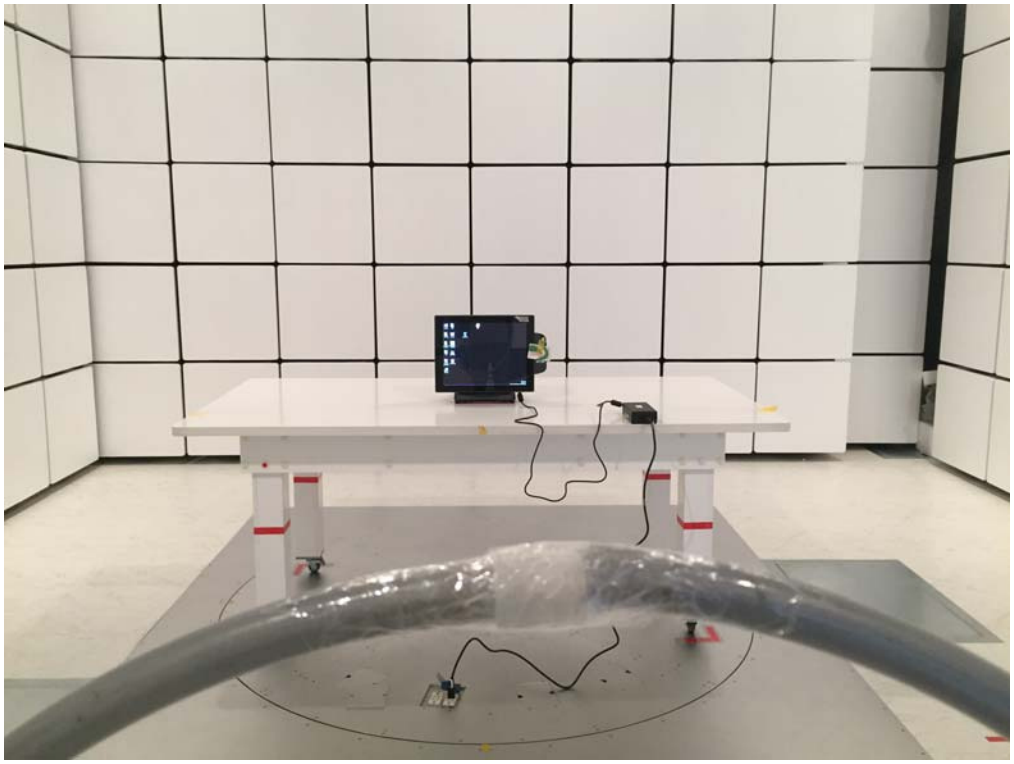
9. EUT TEST PHOTO

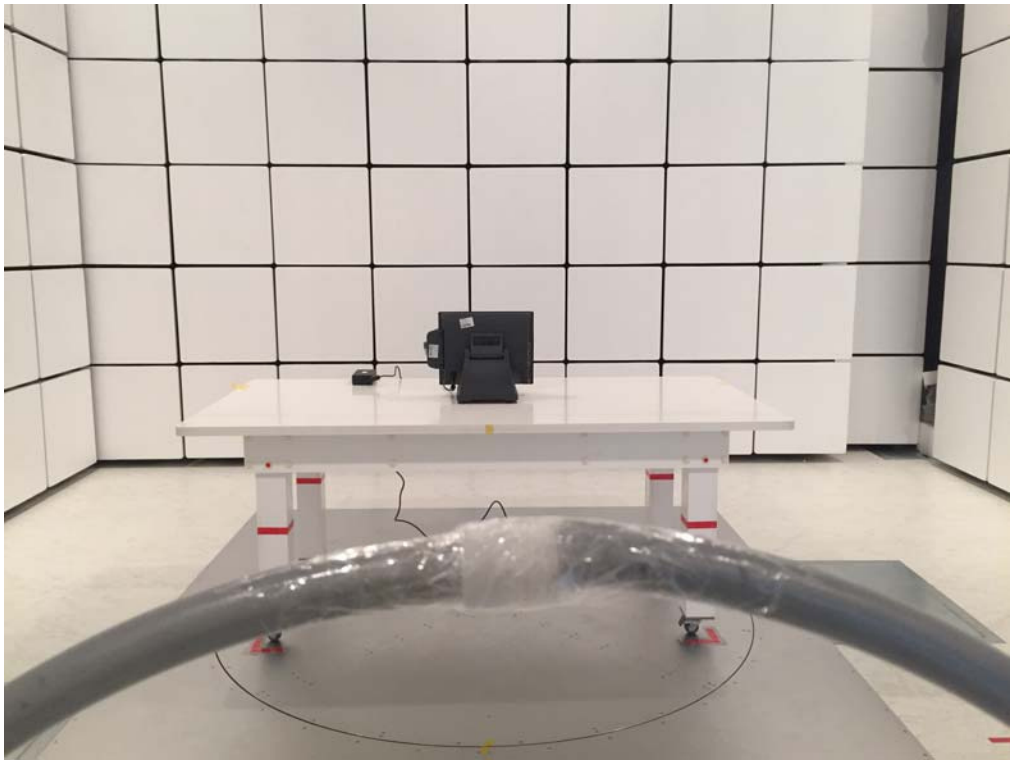
Conducted emission test photos



Radiated emission test photos

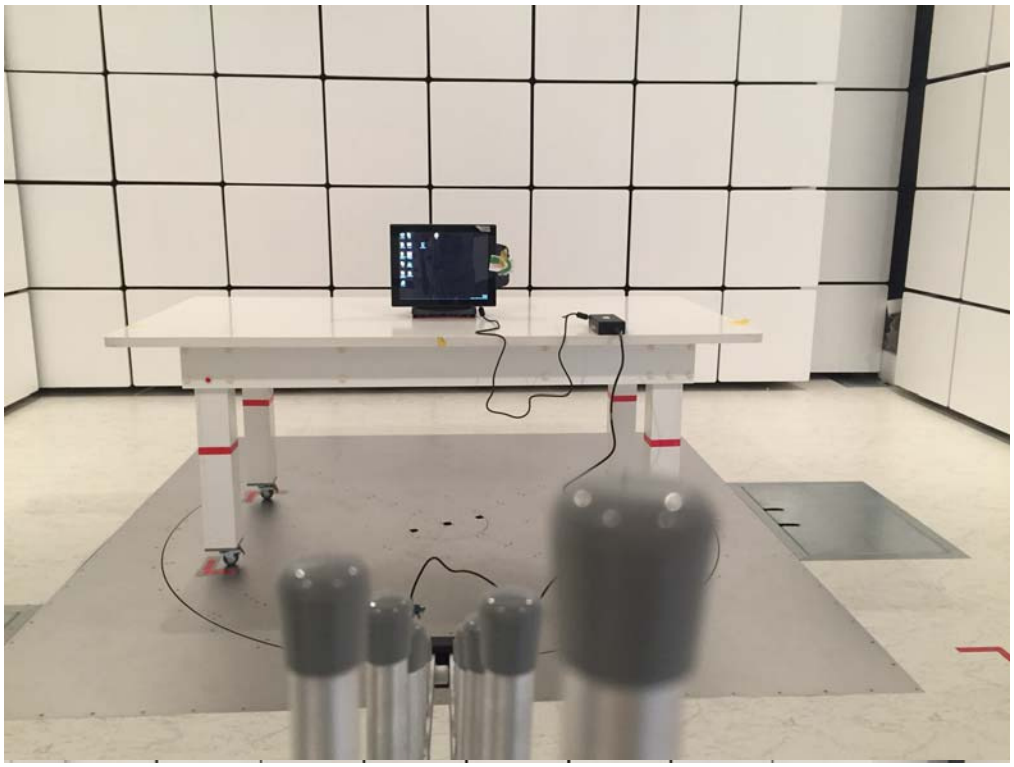
9KHz to 30MHz

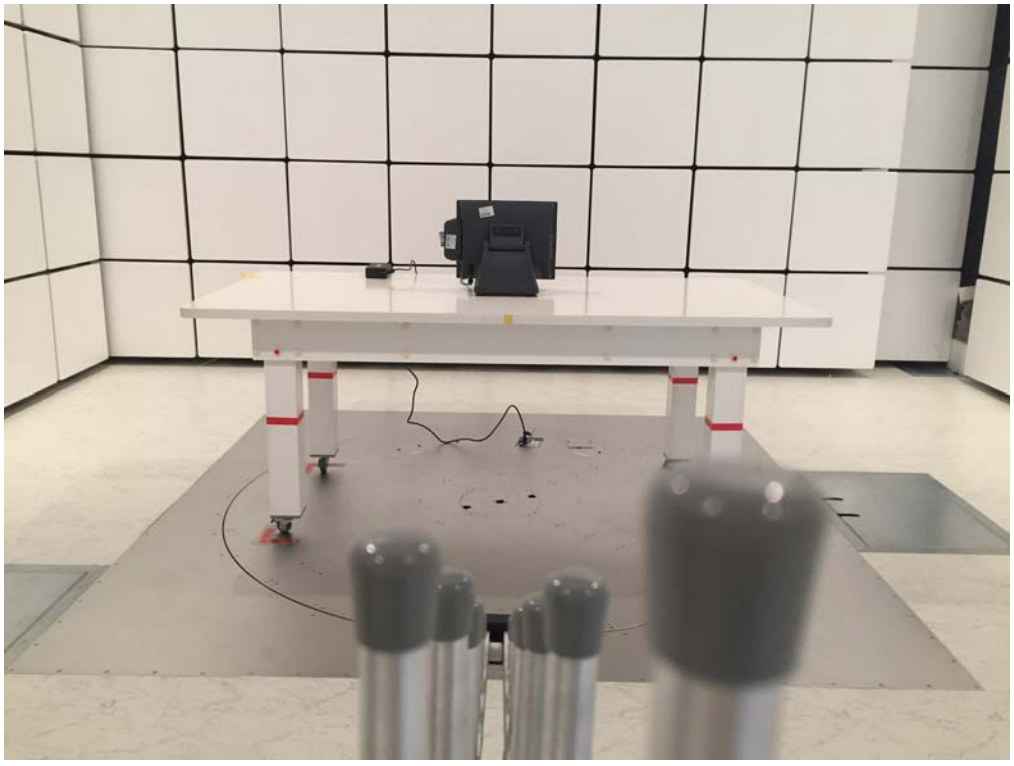




Radiated emission test photos

30MHz to 1000MHz

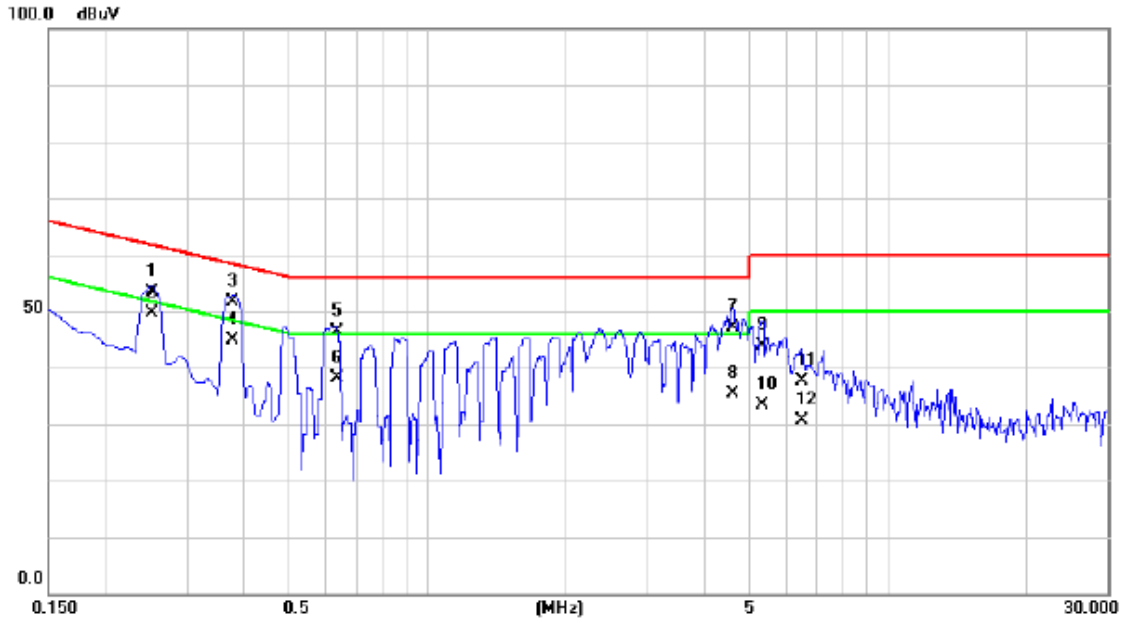




ATTACHMENT A - CONDUCTED EMISSION

Test Mode :	13.56MHz Transmit

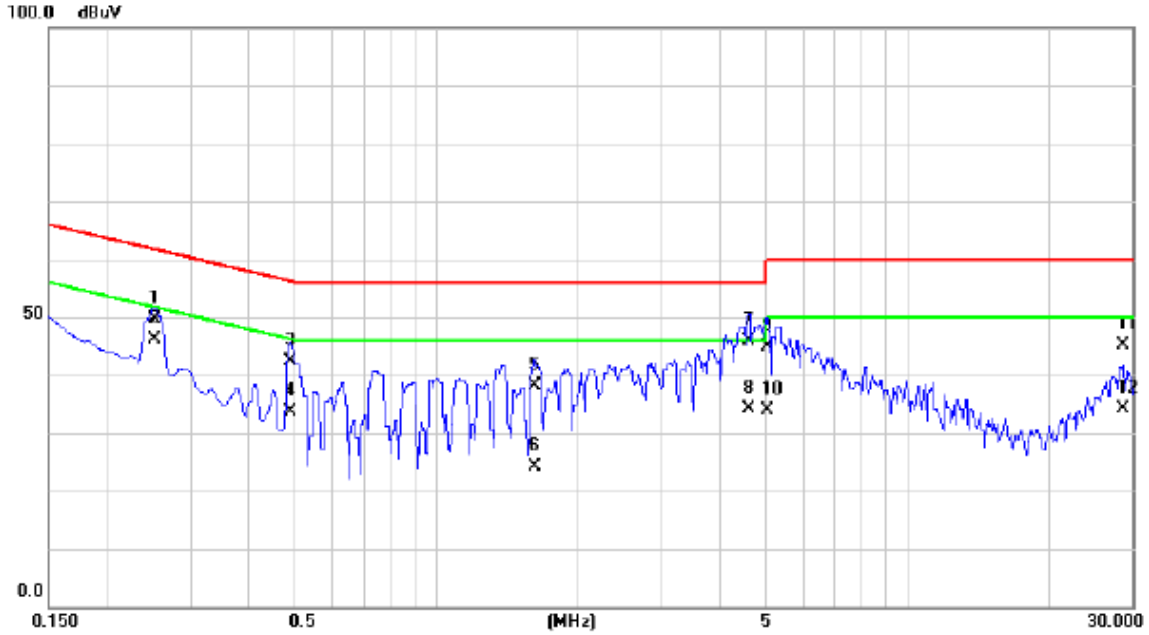
Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2515	43.70	9.63	53.33	61.71	-8.38	QP	
2	*	0.2515	40.00	9.63	49.63	51.71	-2.08	AVG	
3		0.3768	42.00	9.63	51.63	58.35	-6.72	QP	
4		0.3768	35.30	9.63	44.93	48.35	-3.42	AVG	
5		0.6350	36.70	9.65	46.35	56.00	-9.65	QP	
6		0.6350	28.40	9.65	38.05	46.00	-7.95	AVG	
7		4.5950	37.30	9.84	47.14	56.00	-8.86	QP	
8		4.5950	25.50	9.84	35.34	46.00	-10.66	AVG	
9		5.3500	33.90	9.86	43.76	60.00	-16.24	QP	
10		5.3500	23.40	9.86	33.26	50.00	-16.74	AVG	
11		6.5000	27.80	9.88	37.68	60.00	-22.32	QP	
12		6.5000	20.70	9.88	30.58	50.00	-19.42	AVG	

Test Mode :	13.56MHz Transmit

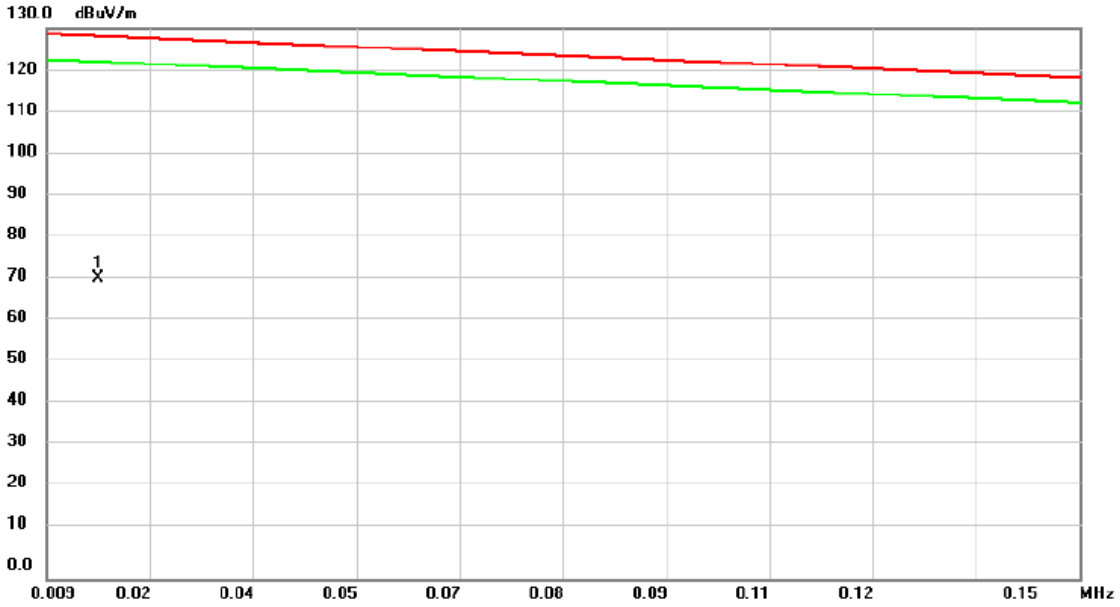
Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2515	40.10	9.63	49.73	61.71	-11.98	QP	
2	*	0.2515	36.40	9.63	46.03	51.71	-5.68	AVG	
3		0.4895	32.80	9.65	42.45	56.18	-13.73	QP	
4		0.4895	23.90	9.65	33.55	46.18	-12.63	AVG	
5		1.6160	28.50	9.70	38.20	56.00	-17.80	QP	
6		1.6160	14.40	9.70	24.10	46.00	-21.90	AVG	
7		4.6040	36.10	9.84	45.94	56.00	-10.06	QP	
8		4.6040	24.30	9.84	34.14	46.00	-11.86	AVG	
9		5.0500	35.10	9.85	44.95	60.00	-15.05	QP	
10		5.0500	24.00	9.85	33.85	50.00	-16.15	AVG	
11		28.6500	35.10	9.91	45.01	60.00	-14.99	QP	
12		28.6500	24.20	9.91	34.11	50.00	-15.89	AVG	

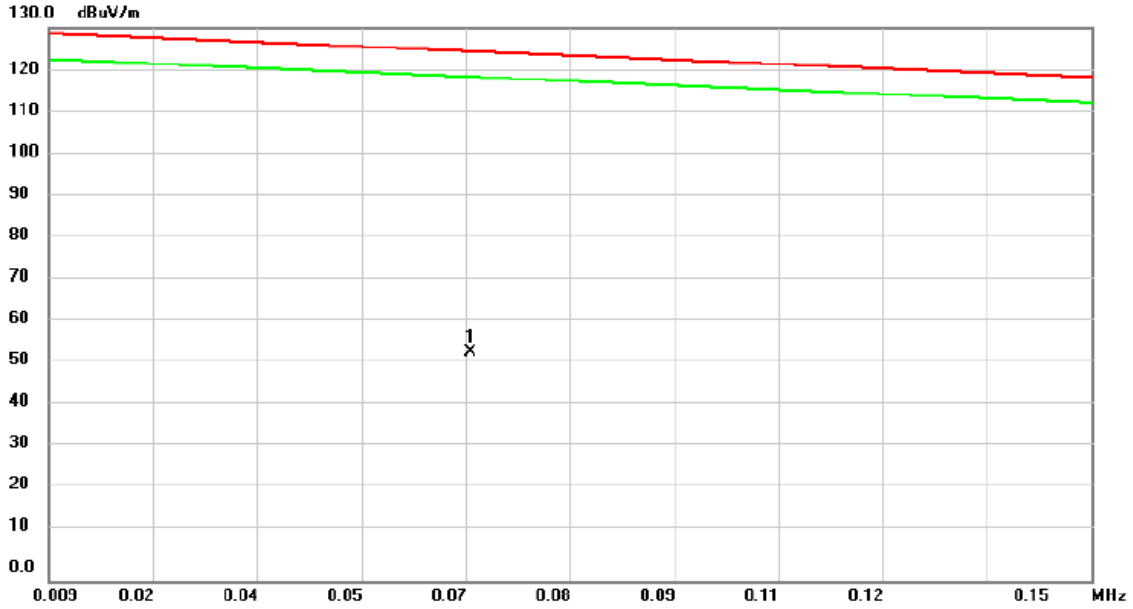
ATTACHMENT B - RADIATED EMISSION (9KHZ-30MHZ)

Test Mode:	13.56MHz Transmit _Open



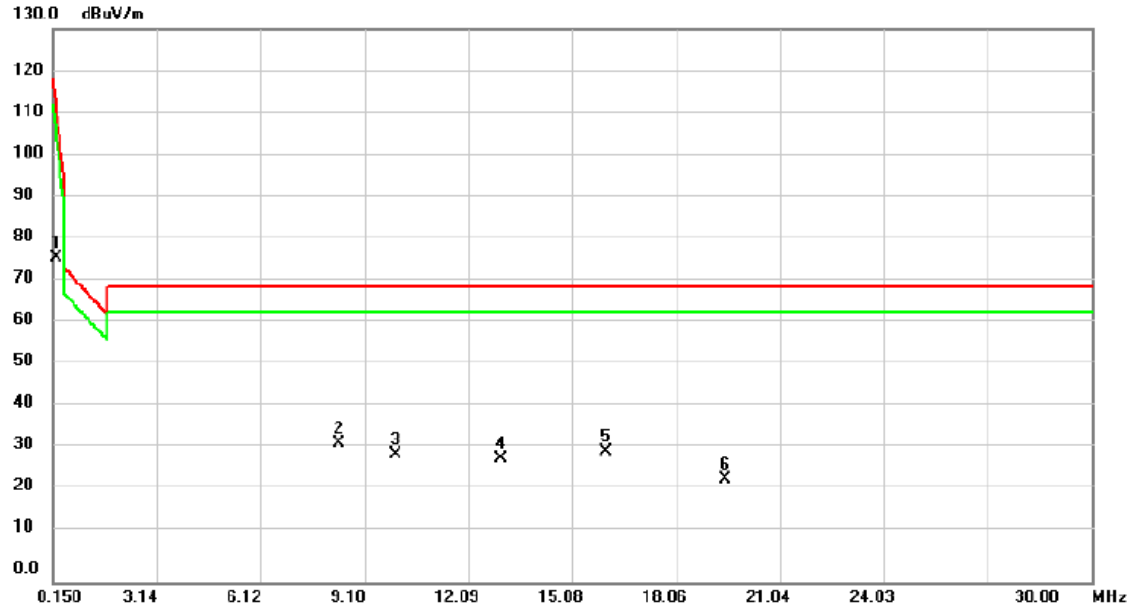
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0160	52.19	18.85	71.04	128.01	-56.97	peak	

Test Mode:	13.56MHz Transmit _Close



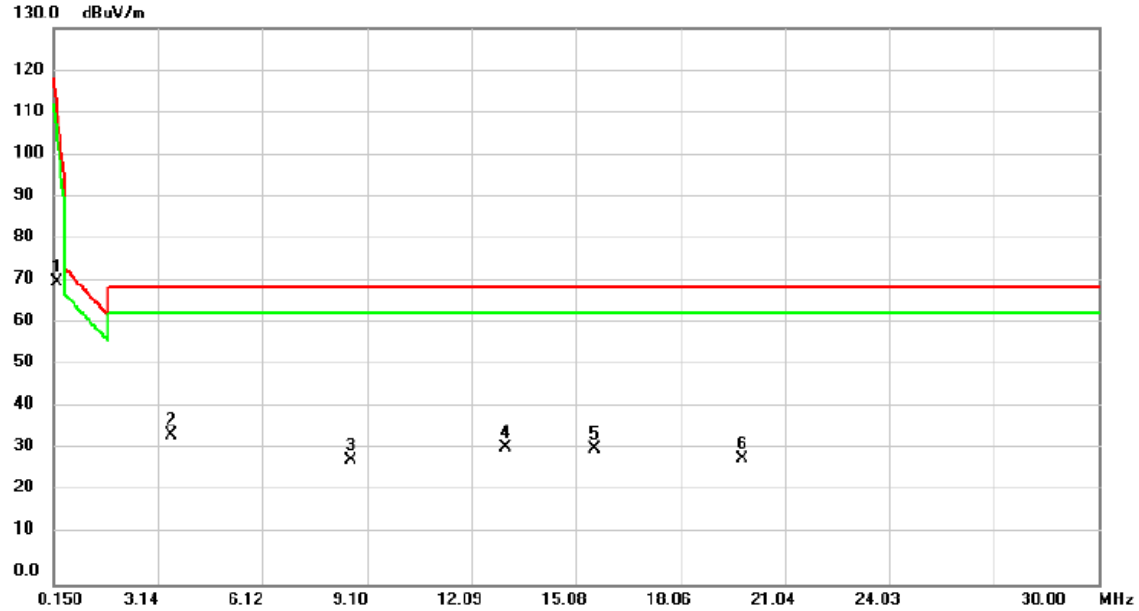
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0661	40.92	12.71	53.63	124.40	-70.77	peak	

Test Mode:	13.56MHz Transmit _Open



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.2396	64.26	11.89	76.15	111.87	-35.72	peak	
2		8.3588	21.25	11.33	32.58	69.54	-36.96	peak	
3		10.0004	18.80	11.30	30.10	69.54	-39.44	peak	
4		13.0451	17.87	11.21	29.08	69.54	-40.46	peak	
5		16.0302	19.60	11.12	30.72	69.54	-38.82	peak	
6		19.4630	13.08	11.02	24.10	69.54	-45.44	peak	

Test Mode:	13.56MHz Transmit _Close

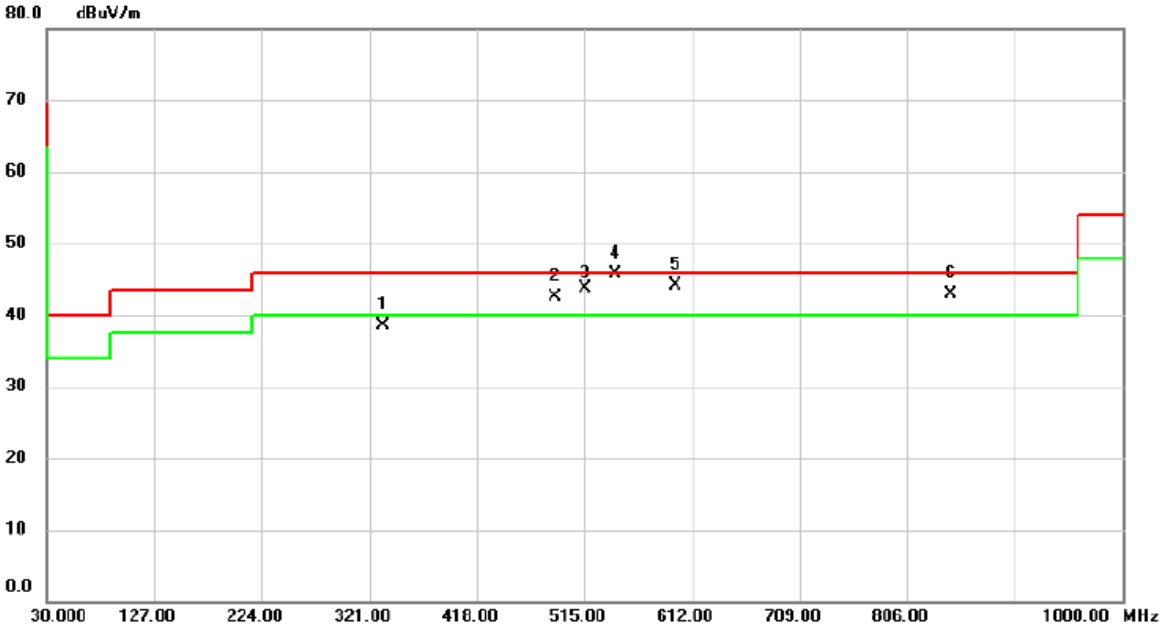


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.2396	58.89	11.89	70.78	111.87	-41.09	peak	
2	*	3.4932	23.92	11.17	35.09	69.54	-34.45	peak	
3		8.6274	17.83	11.33	29.16	69.54	-40.38	peak	
4		13.0750	20.65	11.21	31.86	69.54	-37.68	peak	
5		15.6123	20.60	11.13	31.73	69.54	-37.81	peak	
6		19.8211	18.49	11.01	29.50	69.54	-40.04	peak	

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

Test Mode:	13.56MHz Transmit

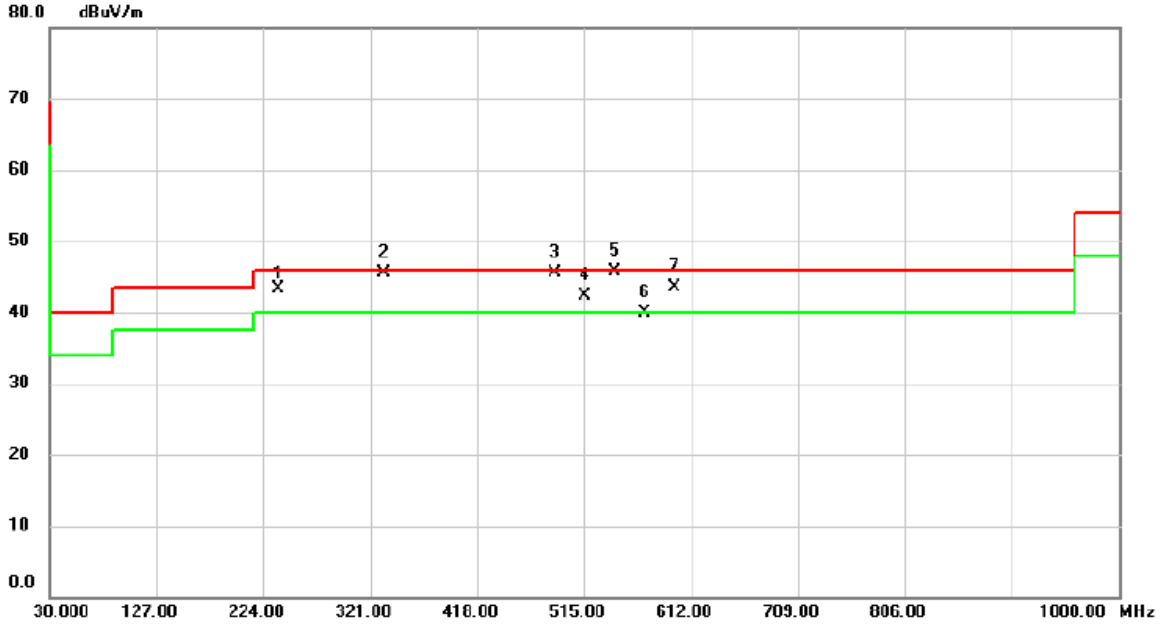
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		333.6100	45.33	-6.81	38.52	46.00	-7.48	QP	
2	!	487.8400	45.65	-3.23	42.42	46.00	-3.58	QP	
3	!	515.0000	46.49	-2.70	43.79	46.00	-2.21	peak	
4	*	542.1600	47.80	-2.11	45.69	46.00	-0.31	QP	
5	!	596.4800	44.72	-0.71	44.01	46.00	-1.99	QP	
6	!	844.8000	39.92	3.05	42.97	46.00	-3.03	QP	

Test Mode:	13.56MHz Transmit

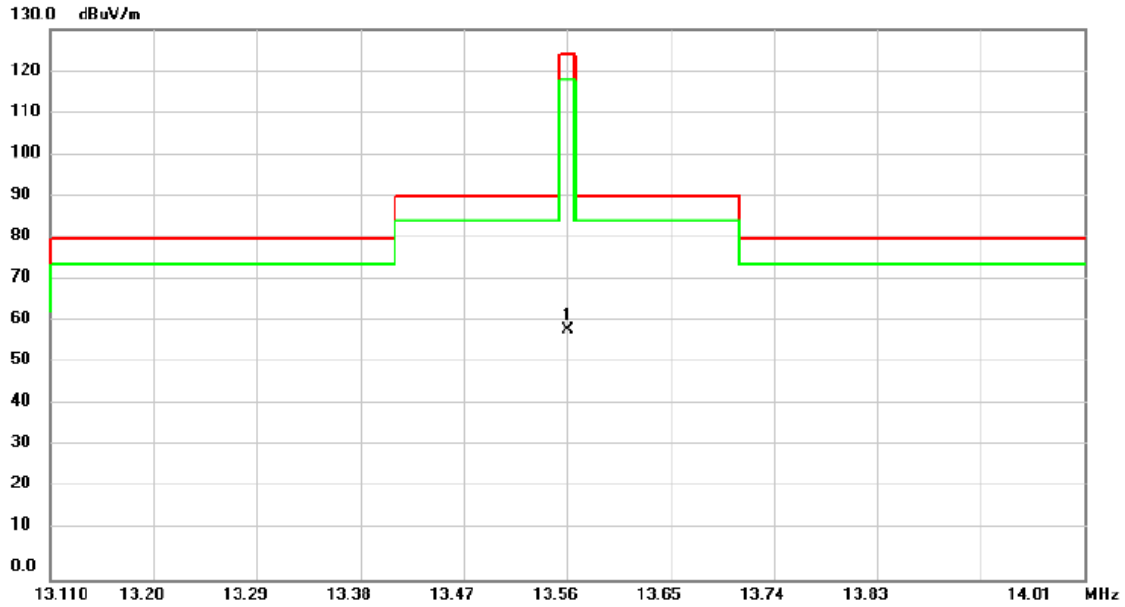
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	!	237.5800	53.17	-9.87	43.30	46.00	-2.70	peak	
2	!	333.6100	52.29	-6.81	45.48	46.00	-0.52	QP	
3	!	487.8400	48.67	-3.23	45.44	46.00	-0.56	QP	
4	!	515.0000	45.07	-2.70	42.37	46.00	-3.63	QP	
5	*	542.1600	47.82	-2.11	45.71	46.00	-0.29	QP	
6		569.3200	41.29	-1.42	39.87	46.00	-6.13	QP	
7	!	596.4800	44.13	-0.71	43.42	46.00	-2.58	QP	

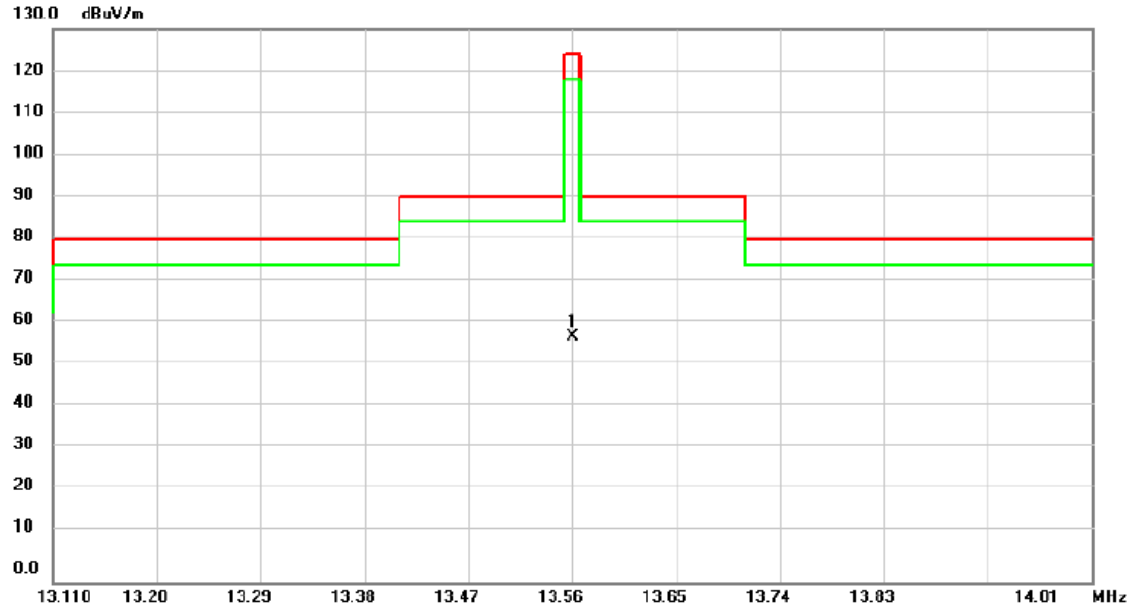
ATTACHMENT D - RADIATED EMISSION (FCC PART 15.225)

Test Mode:	13.56MHz Transmit _Open



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	13.5600	47.84	11.19	59.03	124.00	-64.97	peak	

Test Mode:	13.56MHz Transmit _Close



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	13.5600	46.40	11.19	57.59	124.00	-66.41	peak	

ATTACHMENT E - FREQUENCY STABILITY MEASUREMENT

Test Mode:	13.56MHz Transmit

Frequency Stability Versus Environmental Temperature						
	Temperature (°C)	**Voltage (AC)**	**Frequency (MHz)**	**Frequency Error (kHz)**	**Limit (kHz)**	**Result**
	20	120V	13.5599	-	-	-
0 min	50	120V	13.5597	-0.0003	+/- 1.356	PASS
	-20	120V	13.5601	0.0001	+/- 1.356	PASS
2 min	50	120V	13.5602	0.0002	+/- 1.356	PASS
	-20	120V	13.5598	-0.0002	+/- 1.356	PASS
5 min	50	120V	13.5599	-0.0001	+/- 1.356	PASS
	-20	120V	13.5601	0.0001	+/- 1.356	PASS
10 min	50	120V	13.5598	-0.0002	+/- 1.356	PASS
	-20	120V	13.5599	-0.0001	+/- 1.356	PASS

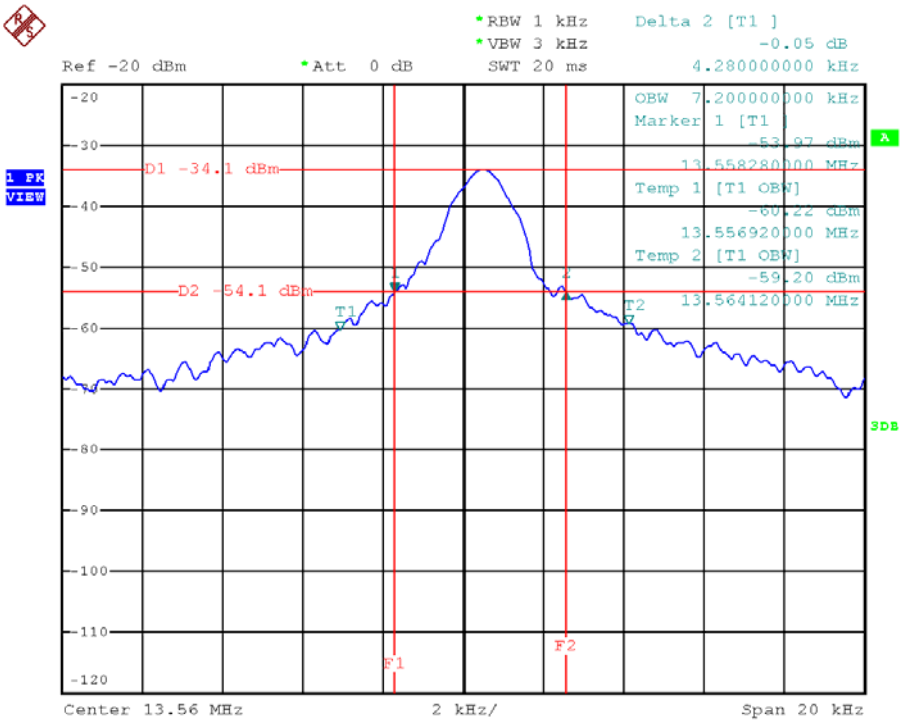
Fuequency Stability Versus Input Voltage						
Temperature (°C)	**Voltage (AC)**		**Frequency (MHz)**	**Frequency Error (kHz)**	**Limit (kHz)**	**Result**
20	**V-nom**	120	13.5598	-0.0002	-	-
-35	**V-min**	102	13.5601	0.0001	+/- 1.356	PASS
85	**V-max**	138	13.5599	-0.0001	+/- 1.356	PASS

ATTACHMENT F - BANDWIDTH

Test Mode:	13.56MHz Transmit

Frequency (MHz)	20dB Bandwidth (kHz)	99% Occupied BW (MHz)
13.56	4.28	7.20

TX Mode_2466 MHz



Date: 5.DEC.2016 16:55:17