

FCC Radio Test Report

FCC ID: XBG-AID240SBWMD

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

Project No. : 1603082
Equipment : 24 inch Touch Panel PC
Model Name : AID 240SBW
Applicant : Avalue Technology Inc.
Address : 7F, 228, Lian-cheng Road, Zhonghe Dist., New Taipei City 235, Taiwan

Date of Receipt : Mar. 18, 2016
Date of Test : Mar. 18, 2016 ~ Sep. 22, 2016
Issued Date : Sep. 23, 2016
Tested by : BTL Inc.

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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
BTL-FCCP-2-1603082	Original Issue.	Sep. 23, 2016

1 CERTIFICATION

Equipment : 24 inch Touch Panel PC
Brand Name : Avalue
Model Name : AID 240SBW
Applicant : Avalue Technology Inc.
Date of Test : Mar. 18, 2016 ~ Sep. 22, 2016
Test Sample : Engineering Sample
Standard(s) : FCC Part 15, Subpart C (15.225)
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-2-1603082) 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
15.215(c)	20 dB bandwidth	PASS
15.203	Antenna Requirement	PASS

NOTE:

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

2.1 TEST FACILITY

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

Conducted emission Test:

C05: (VCCI RN: C-4742; FCC RN:355421; FCC DN:TW1099)

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

Radiated emission Test:

CB11: (VCCI RN: R-4260; FCC RN:674415; FCC DN:TW0659; IC Assigned Code:20088-2)

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

2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty is not specified by FCC rules and for reference only.

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_{CISPR} requirement.

A. Conducted emission test:

Test Site	Method	Measurement Frequency Range	U,(dB)
C05	CISPR	150 kHz ~ 30MHz	3.06

B. Radiated emission test:

Test Site	Method	Measurement Frequency Range	U,(dB)
CB11 (3m)	CISPR	9kHz ~ 150kHz	2.66
		150kHz ~ 30MHz	2.42

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)
CB11 (3m)	CISPR	30MHz ~ 200MHz	V	4.04
		30MHz ~ 200MHz	H	3.76
		200MHz ~ 1,000MHz	V	4.24
		200MHz ~ 1,000MHz	H	3.84

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} .

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	24 inch Touch Panel PC	
Brand Name	Avalue	
Model Name	AID 240SBW	
Model Difference	N/A	
Product Description	Operation Frequency	13.56 MHz
	Antenna Designation	LOOP Antenna
Power Source	DC Voltage supplied from AC/DC adapter.	
Power Rating	I/P: AC 100-240V 2.0-1.0A 50-60Hz O/P: DC 19V 4.73A	
Products Covered	1 * CPU: Intel® Core™ i7-5650U 2.2 GHz 1 * Motherboard: EBM-BDW 2 * Memory: Transcend, TS9W9SES02844AV, 8 GB 1 * SSD: Transcend, SSD370S TS000ASTMM01AV 1 * IEEE 802.11 ac/b/g/n-BT Combo PCIe minicard: REALTEK, RTL8821AE (FCC ID: TX2-RTL8821AE; IC: 6317A-RTL8821AE) 1 * RFID Module: Sunion, MD-551L+ 1 * Panel: AU Optronics, G240HW01 1 * Power Supply: EDAC, EM11013C	

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	13.56MHz Transmit (MD-551L+)

Conducted emission test	
Final Test Mode	Description
Mode 1	13.56MHz Transmit (MD-551L+)

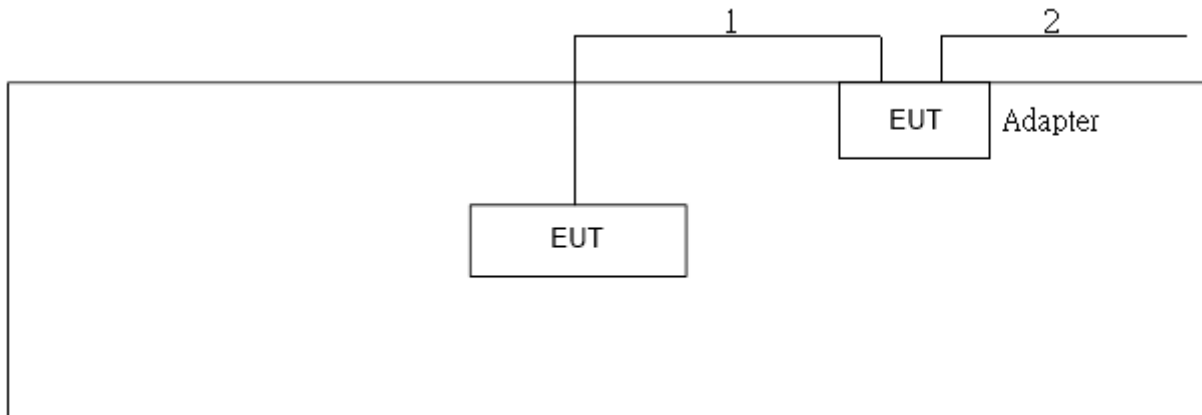
Radiated emission test	
Final Test Mode	Description
Mode 1	13.56MHz Transmit (MD-551L+)

Frequency Stability test	
Final Test Mode	Description
Mode 1	13.56MHz Transmit (MD-551L+)

20 dB Bandwidth test	
Final Test Mode	Description
Mode 1	13.56MHz Transmit (MD-551L+)

Antenna Requirement test	
Final Test Mode	Description
Mode 1	13.56MHz Transmit (MD-551L+)

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	YES	0.3m	Power Cable
2	NO	NO	1.8m	Power Cord

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

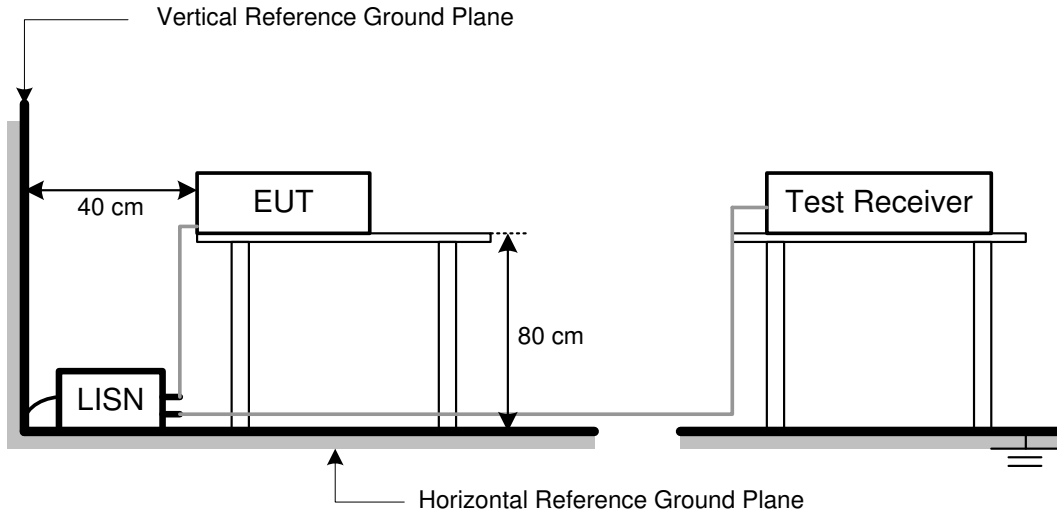
4.2 TEST PROCEDURES

- 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: 25°C
 Relative Humidity: 55%
 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 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: (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)

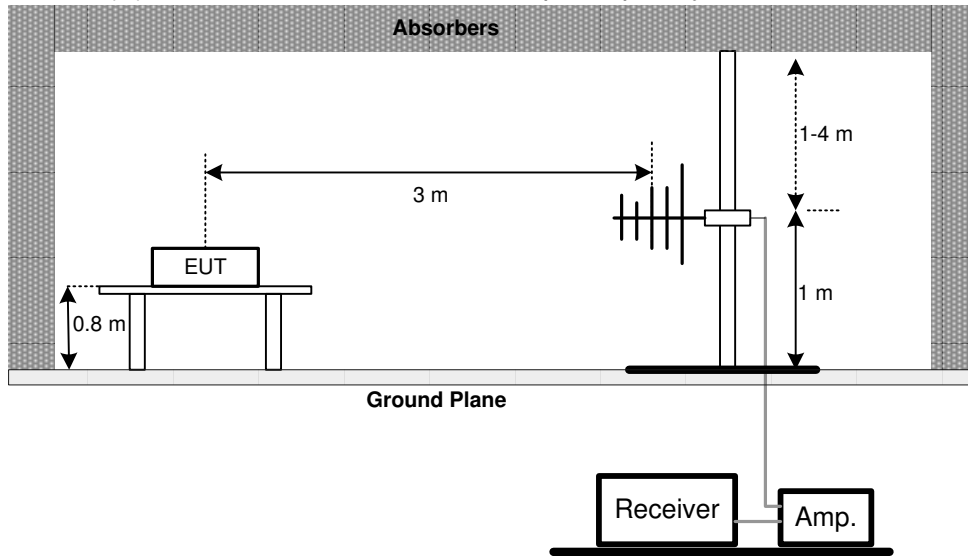
- a. Spectrum Setting:
 - 9 KHz – 150 KHz, RBW= 200Hz, VBW=200Hz, Sweep time = 200 ms.
 - 150 K Hz – 30 MHz, RBW= 10 KHz, VBW=10 KHz, Sweep time = 200 ms.
 - 30 MHz – 1000 MHz, RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.
- b. All readings are Peak unless otherwise stated QP in column of Note. Peak 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

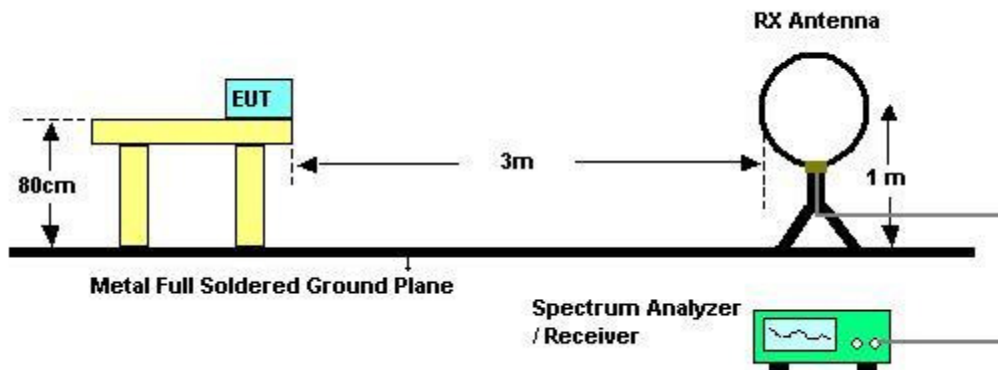
No deviation

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: 45%

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 supply voltage 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: 22°C

Relative Humidity: 66%

Test Voltage: AC 120V/60Hz

6.6 TEST RESULTS

Please refer to the Attachment E.

7 20 DB BANDWIDTH

7.1 LIMITS

FCC Part 15.215(c)		
Item	Frequency Range (MHz)	Result
20 dB Bandwidth	13.56	PASS

7.2 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.

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

7.3 DEVIATION FROM TEST STANDARD



7.4 TEST SETUP

No deviation

7.5 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.

7.6 EUT TEST CONDITIONS

Temperature: 22°C
 Relative Humidity: 66%
 Test Voltage: AC 120V/60Hz

7.7 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. 13, 2017
3	EMI Test Receiver	R&S	ESR7	101433	Dec. 09, 2016
4	Power Dividers	HP	11636A	8103	May 03, 2017
5	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	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jul. 29, 2017
2	Pre-Amplifier	Anritsu	MH648A	M92649	Jun. 15, 2017
3	Test Cable	LMR	LMR-400	01(10M)	May 11, 2017
4	Test Cable	LMR	LMR-400	01(3M)	May 11, 2017
5	Test Cable	Harbour industries	27478LL142	1M	May 12, 2017
6	Test Cable	Harbour industries	27478LL142	3M	May 12, 2017
7	Test Cable	AISI	S104-SMAP-1	8M	May 12, 2017
8	Spectrum Analyzer	Agilent	N9020A	MY51160196	Aug. 01, 2017
9	EMI Test Receiver	R&S	ESCI	100080	May 12, 2017
10	Measurement Software	Farad	EZ EMC (Version NB-03A)	N/A	N/A
11	Loop Ant	EMCO	6502	42960	Nov. 15, 2016

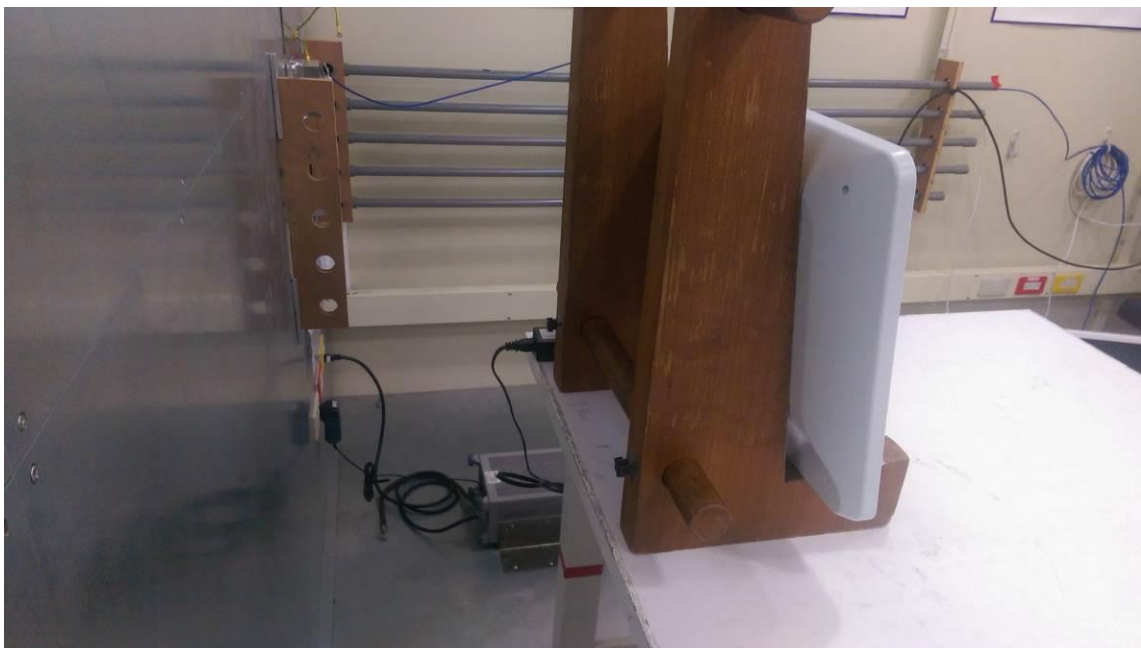
Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY51160196	Aug. 01, 2017

20 dB Bandwidth					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY51160196	Aug. 01, 2017

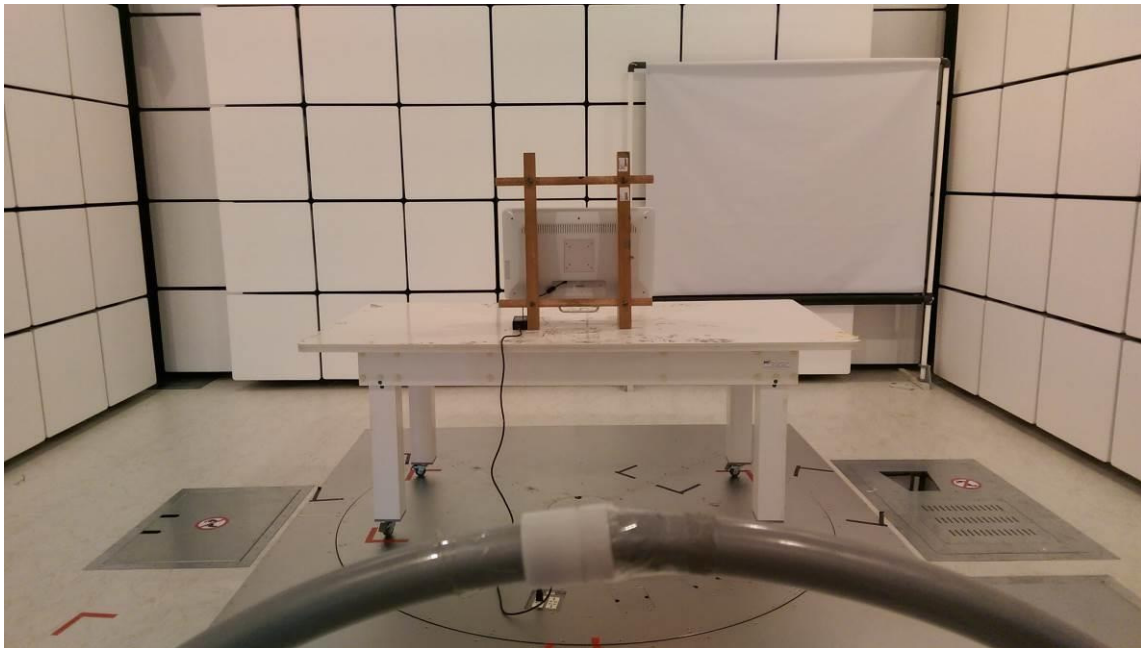
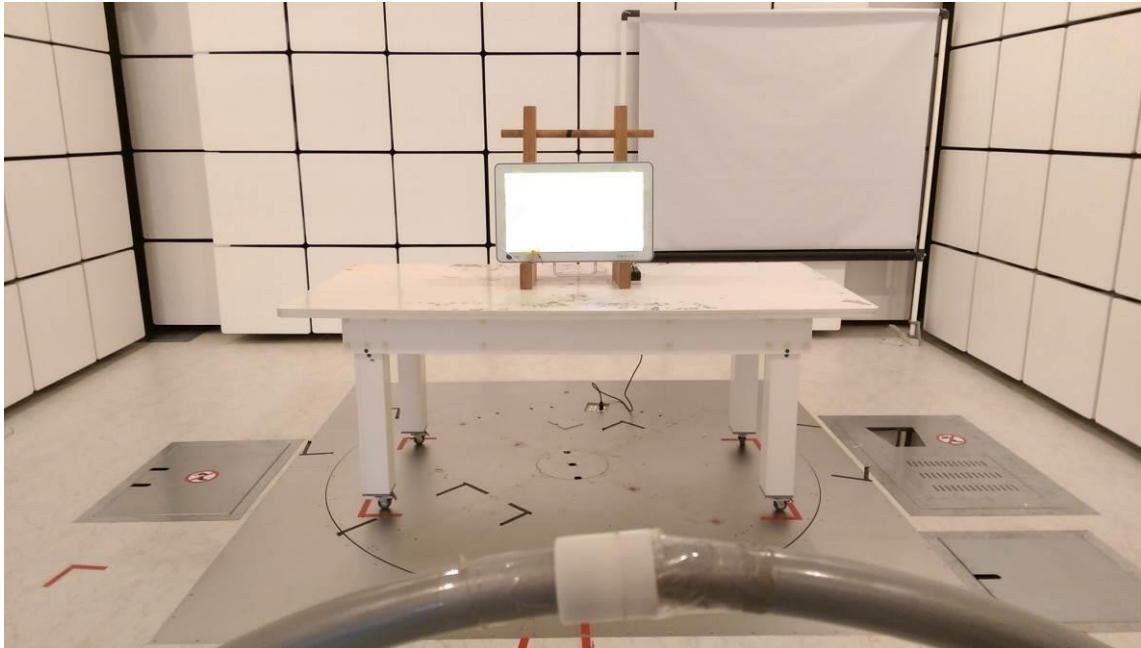
Remark: "N/A" denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

9 EUT TEST PHOTO

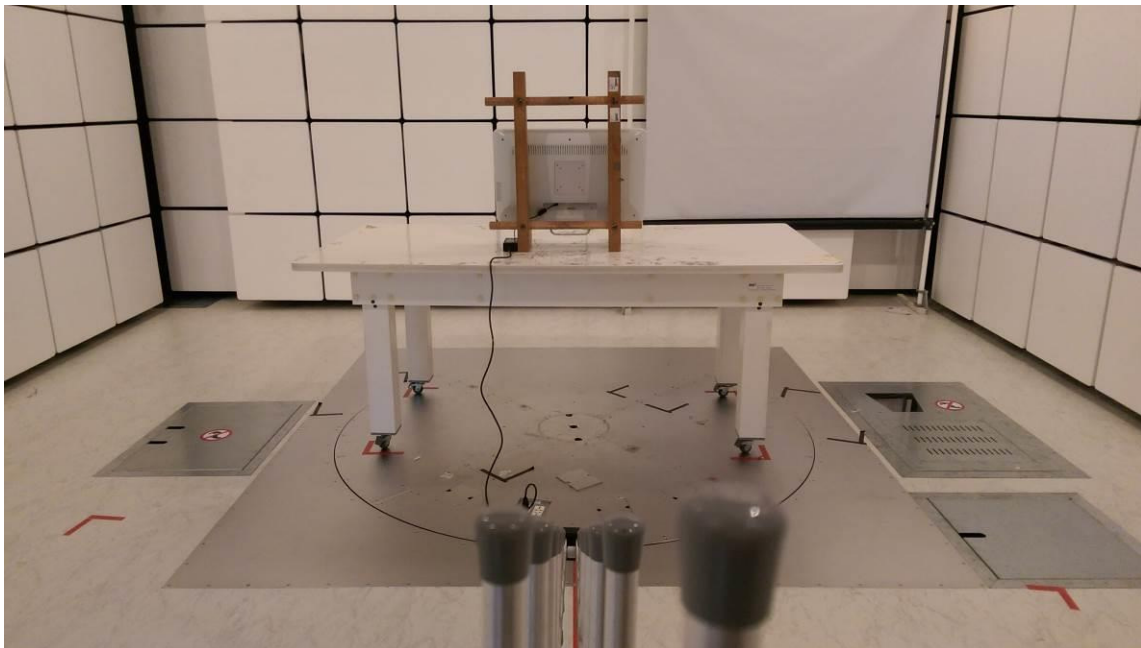
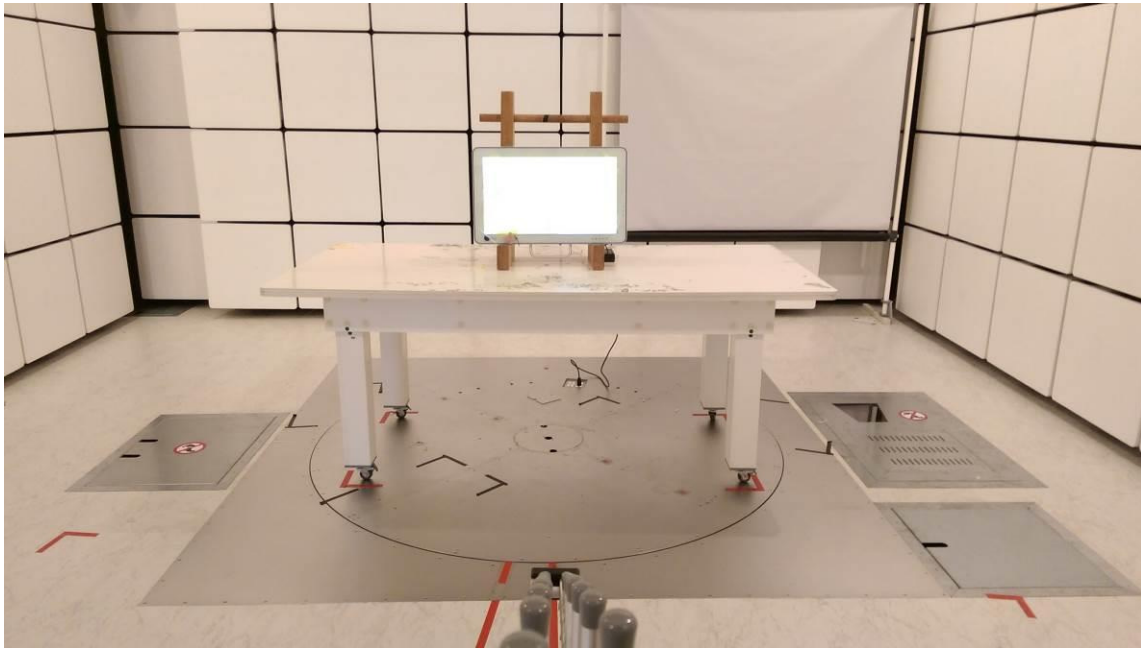
Conducted emission test photos



**Radiated emission test photos
9KHz to 30MHz**



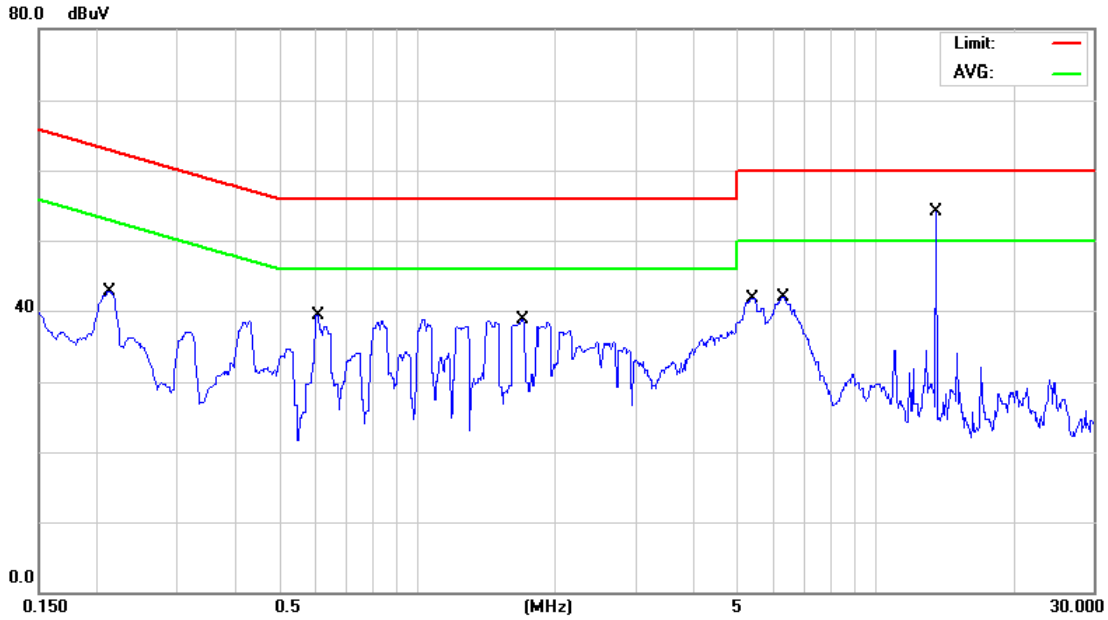
**Radiated emission test photos
30MHz to 1000MHz**



ATTACHMENT A - CONDUCTED EMISSION

Test Mode : 13.56MHz Transmit (MD-551L+)

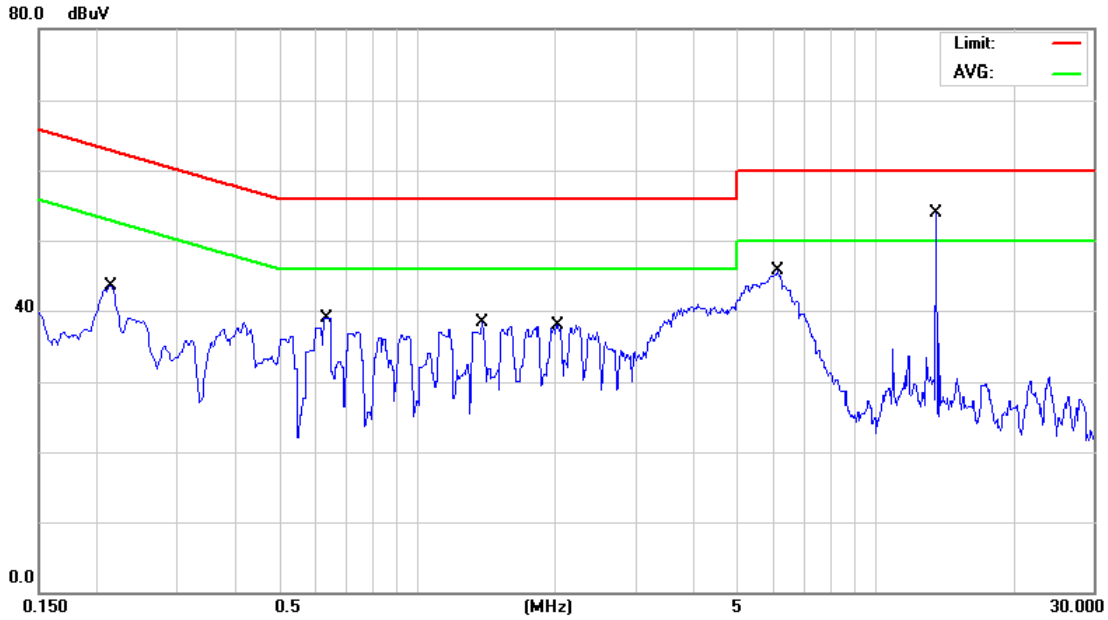
Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.2137	28.50	9.68	38.18	63.06	-24.88	QP	
2		0.2137	20.70	9.68	30.38	53.06	-22.68	AVG	
3		0.6080	25.20	9.69	34.89	56.00	-21.11	QP	
4		0.6080	16.10	9.69	25.79	46.00	-20.21	AVG	
5		1.7060	26.70	9.76	36.46	56.00	-19.54	QP	
6		1.7060	13.20	9.76	22.96	46.00	-23.04	AVG	
7		5.4000	28.10	9.90	38.00	60.00	-22.00	QP	
8		5.4000	14.90	9.90	24.80	50.00	-25.20	AVG	
9		6.3000	28.00	9.92	37.92	60.00	-22.08	QP	
10		6.3000	15.00	9.92	24.92	50.00	-25.08	AVG	
11	*	13.5500	40.90	9.89	50.79	60.00	-9.21	QP	
12		13.5500	29.20	9.89	39.09	50.00	-10.91	AVG	

Test Mode : 13.56MHz Transmit (MD-551L+)

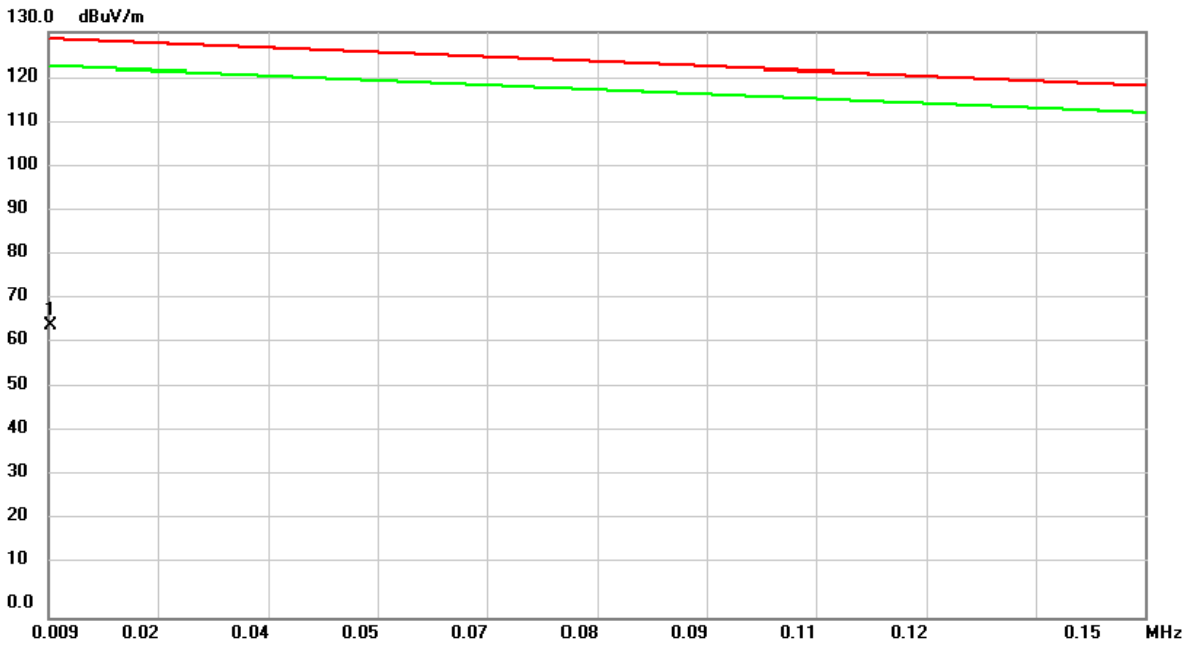
Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.2151	29.80	9.68	39.48	63.00	-23.52	QP	
2		0.2151	22.70	9.68	32.38	53.00	-20.62	AVG	
3		0.6350	23.10	9.70	32.80	56.00	-23.20	QP	
4		0.6350	14.80	9.70	24.50	46.00	-21.50	AVG	
5		1.3910	25.00	9.74	34.74	56.00	-21.26	QP	
6		1.3910	11.00	9.74	20.74	46.00	-25.26	AVG	
7		2.0120	25.70	9.78	35.48	56.00	-20.52	QP	
8		2.0120	12.60	9.78	22.38	46.00	-23.62	AVG	
9		6.1500	32.90	9.92	42.82	60.00	-17.18	QP	
10		6.1500	19.10	9.92	29.02	50.00	-20.98	AVG	
11	*	13.5500	40.70	9.89	50.59	60.00	-9.41	QP	
12		13.5500	29.00	9.89	38.89	50.00	-11.11	AVG	

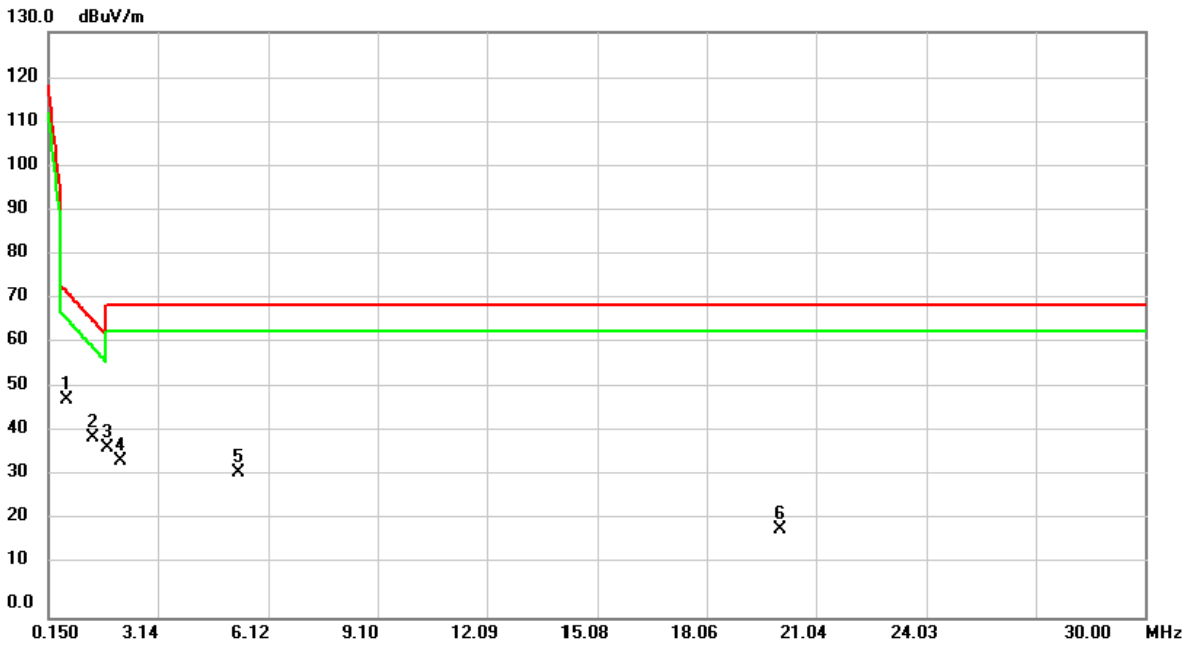
ATTACHMENT B - RADIATED EMISSION (9KHZ-30MHZ)

Test Mode: 13.56MHz Transmit (MD-551L+) - Open



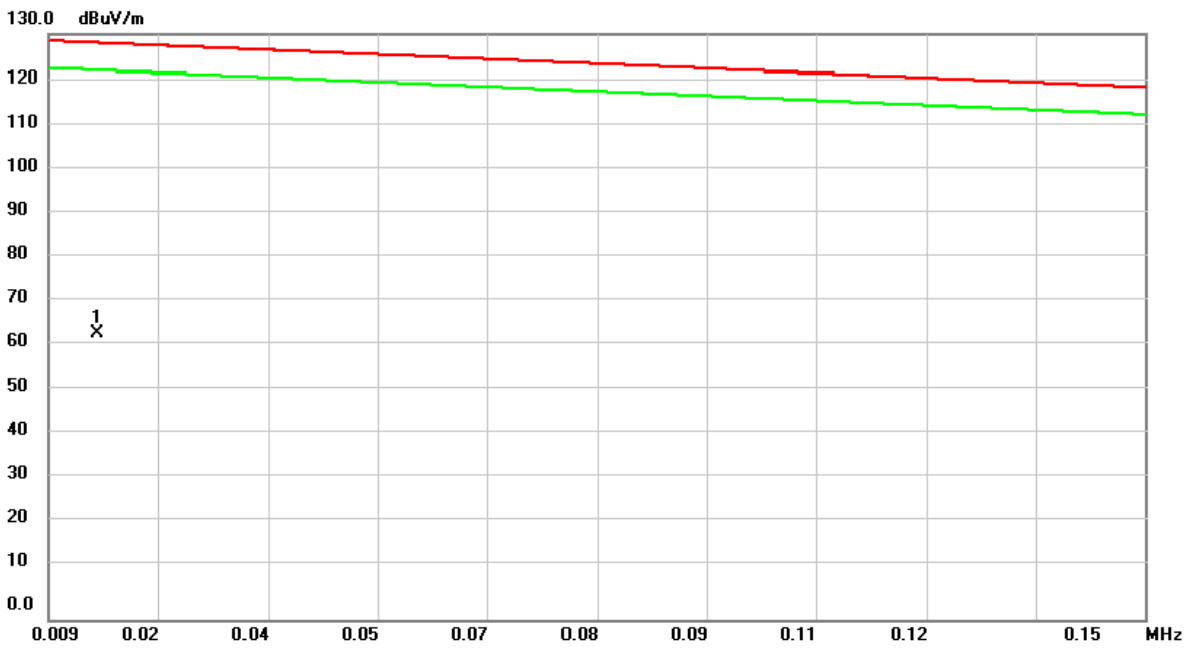
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	0.0093	44.38	20.50	64.88	128.50	-63.62	peak	

Test Mode: 13.56MHz Transmit (MD-551L+) - Open



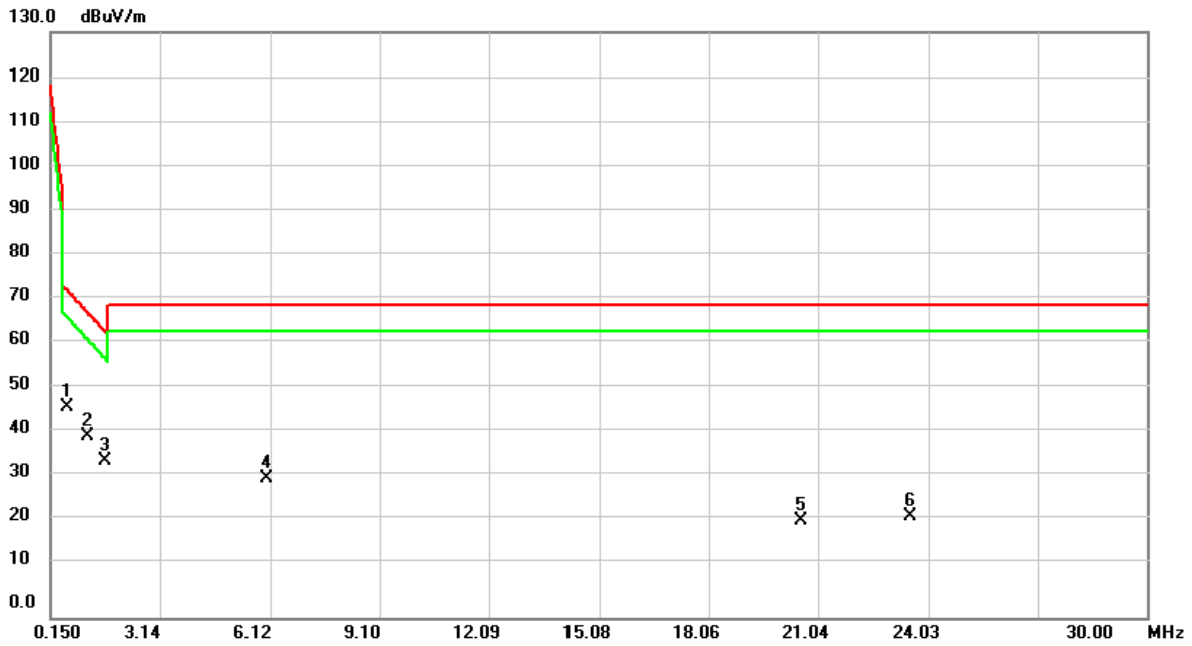
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	0.6574	36.72	11.86	48.58	72.31	-23.73	peak	
2		1.3740	28.25	11.83	40.08	65.92	-25.84	peak	
3		1.7620	26.13	11.66	37.79	69.54	-31.75	peak	
4		2.1201	23.35	11.50	34.85	69.54	-34.69	peak	
5		5.3437	20.80	11.39	32.19	69.54	-37.35	peak	
6		20.0600	8.58	10.99	19.57	69.54	-49.97	peak	

Test Mode: 13.56MHz Transmit (MD-551L+) - Close



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	0.0153	44.41	19.04	63.45	128.07	-64.62	peak	

Test Mode: 13.56MHz Transmit (MD-551L+) - Close

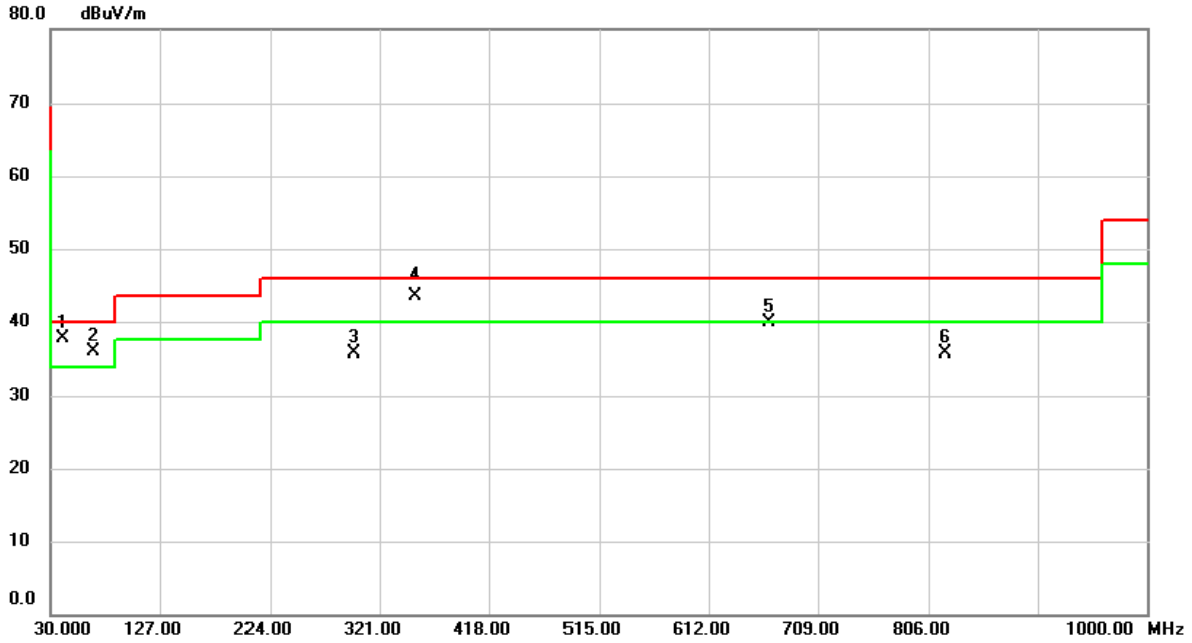


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	0.5978	34.99	11.84	46.83	72.84	-26.01	peak	
2		1.1650	28.40	11.93	40.33	67.78	-27.45	peak	
3		1.6425	23.37	11.71	35.08	63.53	-28.45	peak	
4		6.0006	19.57	11.38	30.95	69.54	-38.59	peak	
5		20.5972	10.87	10.89	21.76	69.54	-47.78	peak	
6		23.5224	12.36	10.37	22.73	69.54	-46.81	peak	

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

Test Mode: 13.56MHz Transmit (MD-551L+)

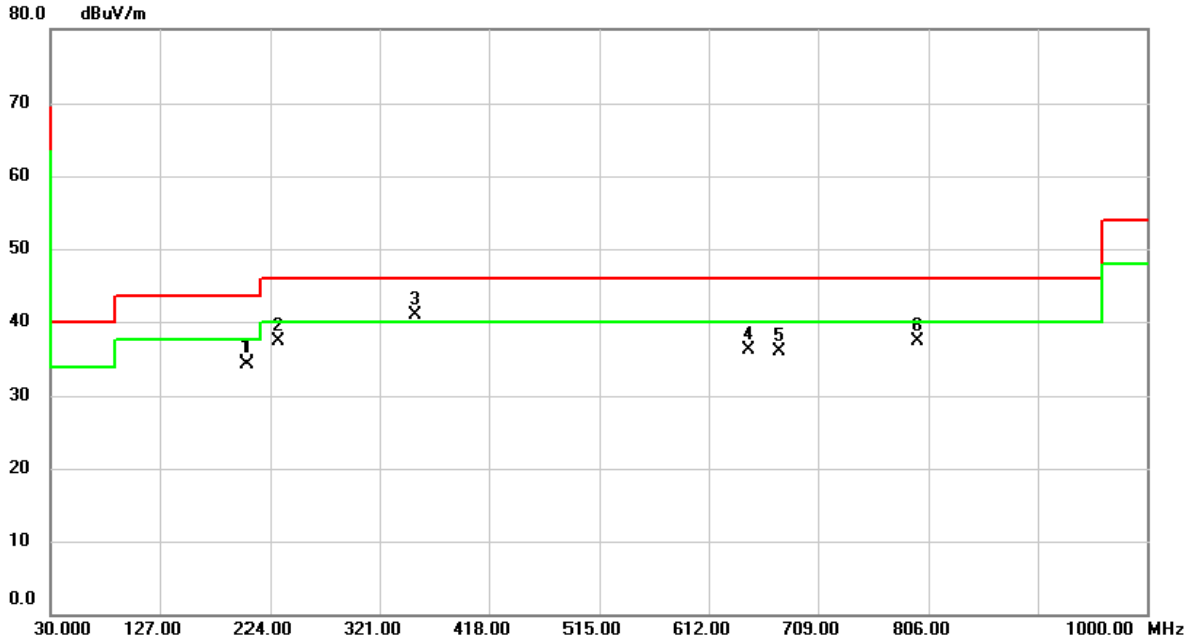
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	40.6700	46.35	-8.61	37.74	40.00	-2.26	peak	
2	!	67.8300	46.11	-10.13	35.98	40.00	-4.02	peak	
3		298.6900	43.27	-7.51	35.76	46.00	-10.24	peak	
4	!	353.0100	49.51	-5.92	43.59	46.00	-2.41	QP	
5		665.3500	39.46	0.53	39.99	46.00	-6.01	peak	
6		820.5500	32.50	3.17	35.67	46.00	-10.33	peak	

Test Mode: 13.56MHz Transmit (MD-551L+)

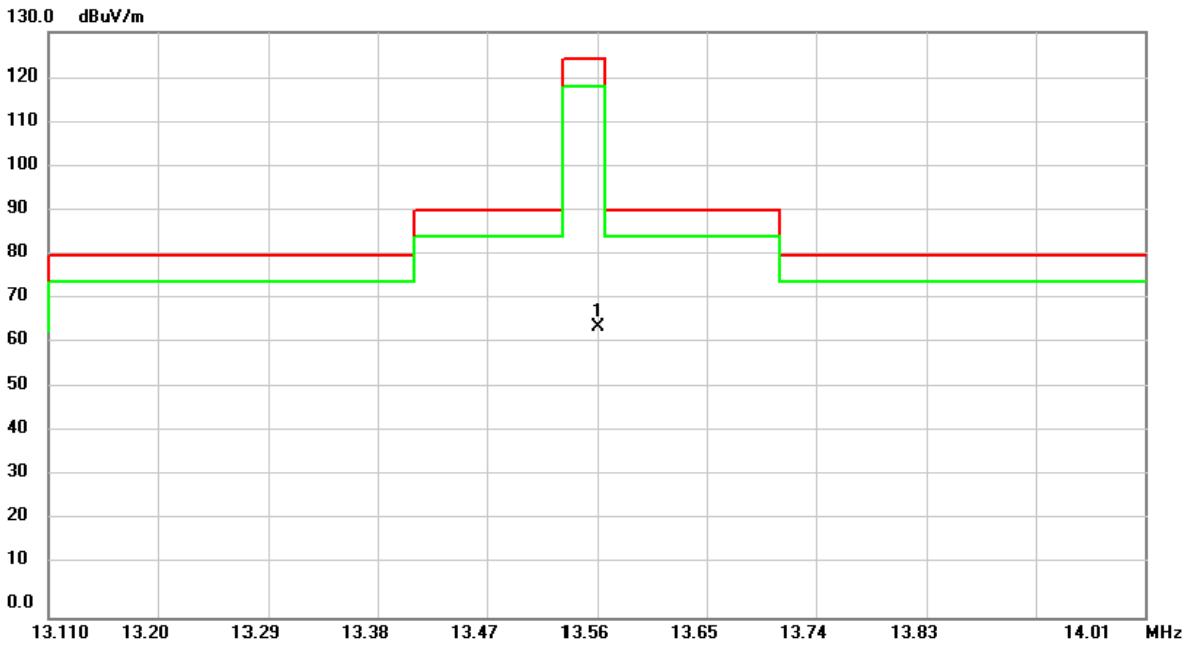
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		203.6300	45.18	-10.85	34.33	43.50	-9.17	peak	
2		230.7900	47.40	-10.09	37.31	46.00	-8.69	peak	
3	*	353.0100	46.89	-5.92	40.97	46.00	-5.03	peak	
4		647.8900	35.94	0.17	36.11	46.00	-9.89	peak	
5		675.0500	35.24	0.74	35.98	46.00	-10.02	peak	
6		796.3000	34.49	2.84	37.33	46.00	-8.67	peak	

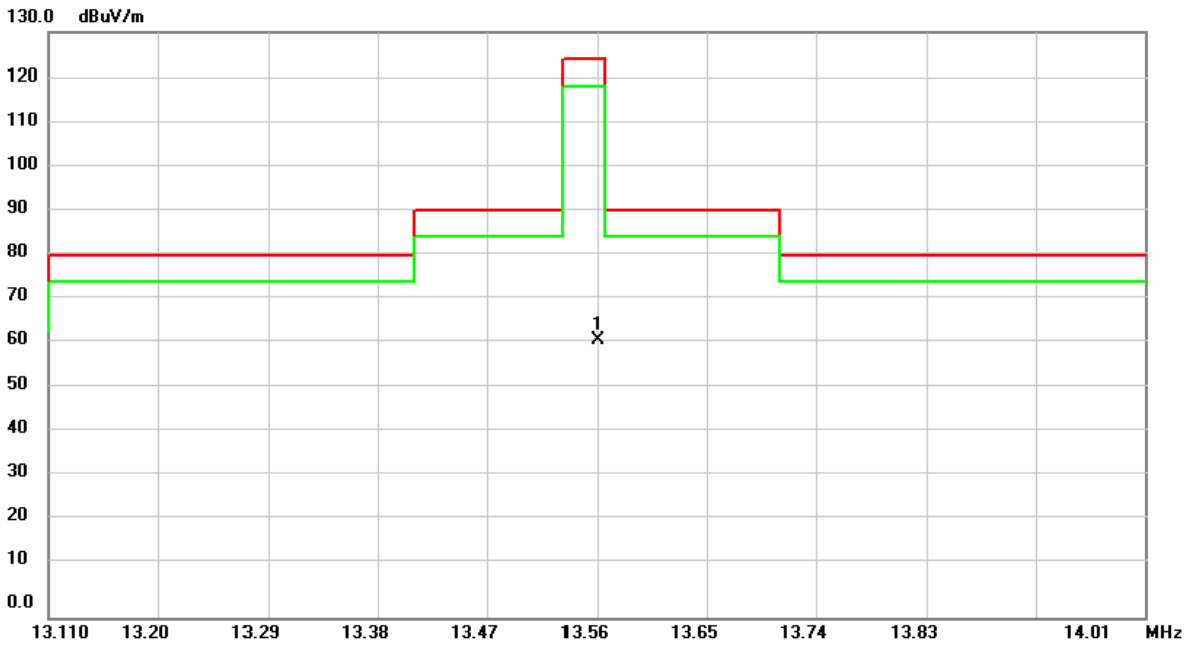
ATTACHMENT D - RADIATED EMISSION (FCC PART 15.225)

Test Mode: 13.56MHz Transmit (MD-551L+) - Open



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	13.5610	53.45	11.19	64.64	124.00	-59.36	peak	

Test Mode: 13.56MHz Transmit (MD-551L+) - Close



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	13.5610	50.55	11.19	61.74	124.00	-62.26	peak	

ATTACHMENT E - FREQUENCY STABILITY MEASUREMENT

Test Mode:	13.56MHz Transmit (MD-551L+)
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Frequency Stability Versus Environmental Temperature						
	Temperature (°C)	Voltage (AC)	Frequency (MHz)	Frequency Error (kHz)	Limit (kHz)	Result
	20	120V	13.5610	-	-	-
0 min	55	120V	13.5615	0.0015	+/- 1.356	PASS
	-20	120V	13.5612	0.0012	+/- 1.356	PASS
2 min	55	120V	13.5611	0.0011	+/- 1.356	PASS
	-20	120V	13.5621	0.0021	+/- 1.356	PASS
5 min	55	120V	13.5614	0.0014	+/- 1.356	PASS
	-20	120V	13.5612	0.0012	+/- 1.356	PASS
10 min	55	120V	13.5632	0.0032	+/- 1.356	PASS
	-20	120V	13.5613	0.0013	+/- 1.356	PASS

Frequency Stability Versus Input Voltage						
Temperature (°C)	Voltage (AC)		Frequency (MHz)	Frequency Error (kHz)	Limit (kHz)	Result
20	V-nom	120	13.5632	0.0032	+/- 1.356	PASS
20	V-min	102	13.5614	0.0014	+/- 1.356	PASS
20	V-max	138	13.5632	0.0032	+/- 1.356	PASS

ATTACHMENT F - 20 DB BANDWIDTH

Test Mode: 13.56MHz Transmit (MD-551L+)

Frequency (MHz)	20 dB Bandwidth (kHz)	99% Occupied Bandwidth (kHz)	Test Result
13.56	5.010	9.215	Pass

