

Wireless Power Transfer
Test Report

for

Qisda Corporation

157, Shan-Ying Road, Gueishan,
Taoyuan 333, Taiwan, R.O.C.

Brand : DELL
Product Name : Flat Panel Monitor
Model Name : S2317HWib
FCC ID : VRSS2317HWIB
IC : 8729A-S2317HWIB

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APPENDIX A TEST PHOTOGRAPHS

TEST REPORT CERTIFICATION

Applicant : Qisda Corporation
Manufacture #1 : Qisda Corporation
Manufacture #2 : Qisda (Suzhou) Co., Ltd.
Model No. : S2317HWib
Serial No. : N/A
Brand : DELL
Power Supply : DC 19.5V

Applicable Standards:

FCC Rules and Regulations Part 15 Subpart C, Oct. 2014
RSS-Gen (Issue 4), November 2014
RSS-216 (Issue 1), November 2014
ANSI C63.10:2013

AUDIX Technology Corp. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report. *AUDIX Technology Corp.* does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens and samples.

Date of Test: 2015. 11. 12 ~ 25

Date of Report: 2015. 12. 02

Producer: Annie Yu
(Annie Yu/Administrator)

Signatory: Ben Cheng
(Ben Cheng/Manager)

1. REPORT HISTORY

Revision	Date	Revision Summary	Report Number
0	2015. 12. 02	Original Report.	EM-F150673

2. SUMMARY OF TEST RESULTS

Rule	Description	Results
15.207/RSS-Gen §8.8	Conducted Emission	PASS
15.209/RSS-Gen §8.9	Field strength Measurements.	PASS
RSS-Gen §8.1	Emission Bandwidth	PASS

3. GENERAL INFORMATION

3.1. Description of EUT

Product	Flat Panel Monitor
Model Number	S2317HWib
Serial Number	N/A
Brand Name	DELL
Serial Number	N/A
Applicant	Qisda Corporation 157, Shan-Ying Road, Gueishan, Taoyuan 333, Taiwan, R.O.C.
Manufacturer	#1 Qisda Corporation 157, Shan-Ying Road, Gueishan, Taoyuan 333, Taiwan, R.O.C. #2 Qisda (Suzhou) Co., Ltd. No. 169, Zhujiang Road, New District, Suzhou, Jiangsu Province, P.R. China
Power Supply Rating	Refer to AC adapter rating.
Date of Receipt of Sample	2015. 10. 27
AC Adapter	#1 DELL, M/N HA65NS5-00 I/P: 100-240V~ 50-60Hz 1.7A O/P: 19.5V 3.34A O/P Cable: Unshielded, Undetachable, 1.8m, Bonded a ferrite core #2 DELL, M/N DA65NM111-00 I/P: 100-240V~ 1.6A 50-60Hz O/P: 19.5V 3.34A O/P Cable: Unshielded, Undetachable, 1.8m
Antenna Type	Loop antenna
Interface Ports	Bottom Side: One Power-adapter Port One Line-Out Port One HDMI Port Two USB downstream Ports One Micro-B Port (For Service Only) Stand Side: One DC Adapter Port One DC Out Cable

3.2. EUT Specifications Assessed in Current Report

Mode	Fundamental Range	Channel Number	Modulation
WPC	110~205 kHz	95	-

3.3. Tested Supporting System List

3.3.1. Support Peripheral Unit

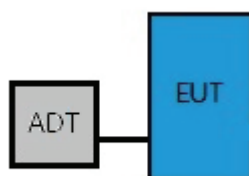
No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Qi-Wireless-Charger	Fusion	WTU-050	N/A	N/A

3.3.2. Cable Lists

No.	Cable Description Of The Above Support Units
1.	N/A

3.4. Setup Configuration

3.4.1. EUT Configuration for Power Line and Radiated Emission



3.5. Operating Condition of EUT

To Set EUT on RF function under continues transmitting.

3.6. Description of Test Facility

Test Firm Name : AUDIX Technology Corporation
EMC Department
No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan

Test Location & Facility : No. 8 Shielded Room
No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan

Semi-Anechoic Chamber
No. 53-11, Dingfu, Linkou Dist.,
New Taipei City 244, Taiwan
Renewal on May 06, 2015
Federal Communication Commission
Registration Number: 90993

NVLAP Lab. Code : 200077-0

TAF Accreditation No : 1724

3.7. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty
Conduction Test	150kHz~30MHz	± 3.5dB
Radiation Test (Distance: 3m)	30MHz~1000MHz	± 3.64dB
	Above 1GHz	± 4.70dB

Remark : Uncertainty = $k_{uc}(y)$

4. MEASUREMENT EQUIPMENT LIST

4.1. Conducted Emission Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Test Receiver	R&S	ESR3	101774	2015. 02. 06	2016. 02. 06
2.	A.M.N.	R&S	ENV4200	825358/003	2015. 04. 07	2016. 04. 06
3.	Pulse Limiter	R&S	ESH3-Z2	100354	2015. 01. 17	2016. 01. 16

4.2. Radiated Emission Measurement

4.2.1. Frequency Range 9kHz~30MHz

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2015. 09. 14	2016. 09. 13
2.	Test Receiver	R & S	ESCS30	100338	2015. 06. 24	2016. 06. 23
3.	Loop Antenna	R&S	HFH2-Z2	891847/27	2014. 12. 26	2015. 12. 25

4.2.2. Frequency Range 30MHz~1000MHz

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
1.	Spectrum Analyzer	Agilent	N9010A-526	MY53400071	2015. 09. 14	2016. 09. 13
2.	Test Receiver	R & S	ESCS30	100338	2015. 06. 24	2016. 06. 23
3.	Amplifier	HP	8447D	2944A06305	2015. 02. 12	2016. 02. 11
4.	Bilog Antenna	CHASE	CBL6112D	33821	2015. 02. 27	2016. 02. 26

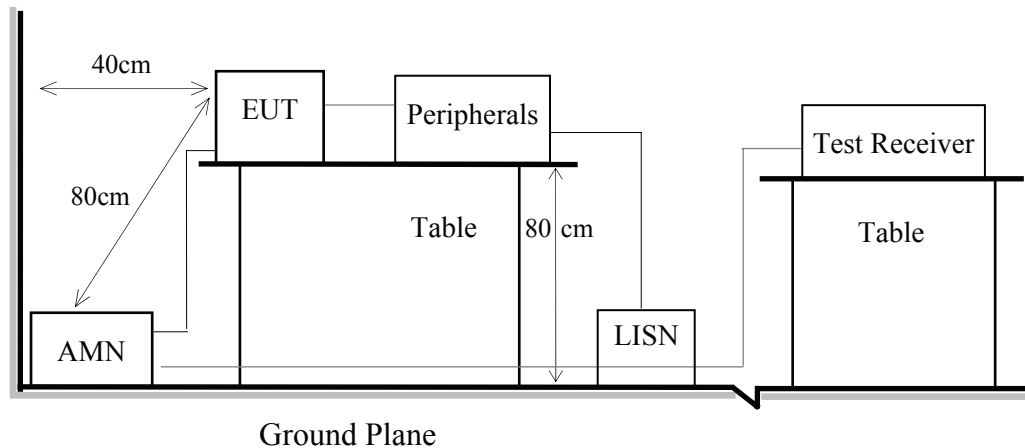
4.3. RF Conducted Measurement

Item	Type	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9030A-526	MY53310269	2015. 11. 28	1 Year
2.	Loop Antenna	ETS	7405	N/A	N.C.R	N.C.R

5. CONDUCTED EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup

Shielded Room Setup Diagram



5.2. Power Line Conducted Emission Limit

Frequency	Conducted Limit	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 dB μ V	56 ~ 46 dB μ V
500kHz ~ 5MHz	56 dB μ V	46 dB μ V
5MHz ~ 30MHz	60 dB μ V	50 dB μ V

Remark 1.: If the average limit is met when using a Quasi-Peak detector, the measurement using the average detector is not required.

2.: The lower limit applies to the band edges.

5.3. Test Procedure

- 5.3.1. To set up the EUT as indicated in ANSI C 63.10. The EUT was placed on the table which has 80 cm height to the ground and 40 cm distance to the conducting wall.
- 5.3.2. Power supplier of the EUT was connected to the AC mains through an Artificial Mains Network (A.M.N.).
- 5.3.3. The AC power supplies to all peripheral devices must be provided through line impedance stabilization network (L.I.S.N.)
- 5.3.4. Checking frequency range from 150 kHz to 30 MHz and record the emission which does not have 20 dB below limit.

5.4. Conducted Emission Measurement Results

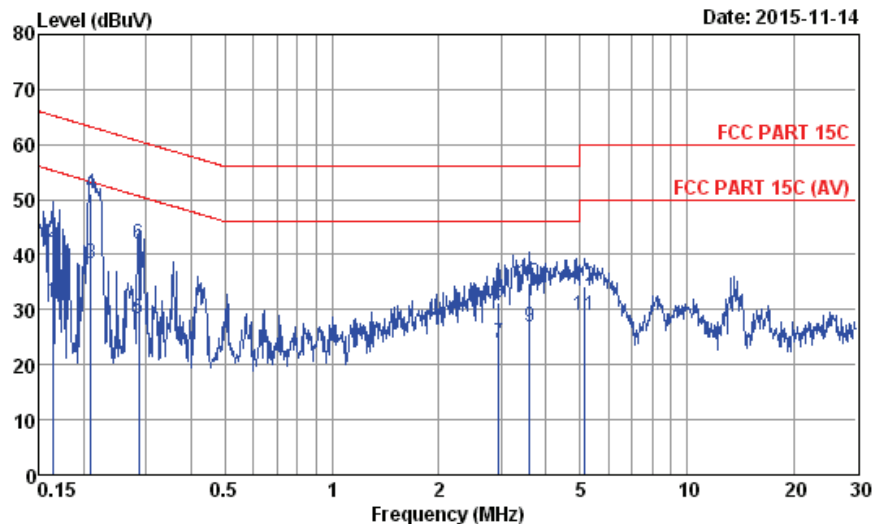
PASSED.

Test Date	2015/11/14	Temp./Hum.	26°C/57%
Test Voltage	DC 19.5V (Via AC Adaptor, M/N HA65NS5-00)		



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Data: 2 File: D:\test data\REPORT\2015\1M1510XXX\1M1510238-C-D-RF-EM6 (8) Date: 2015-11-14



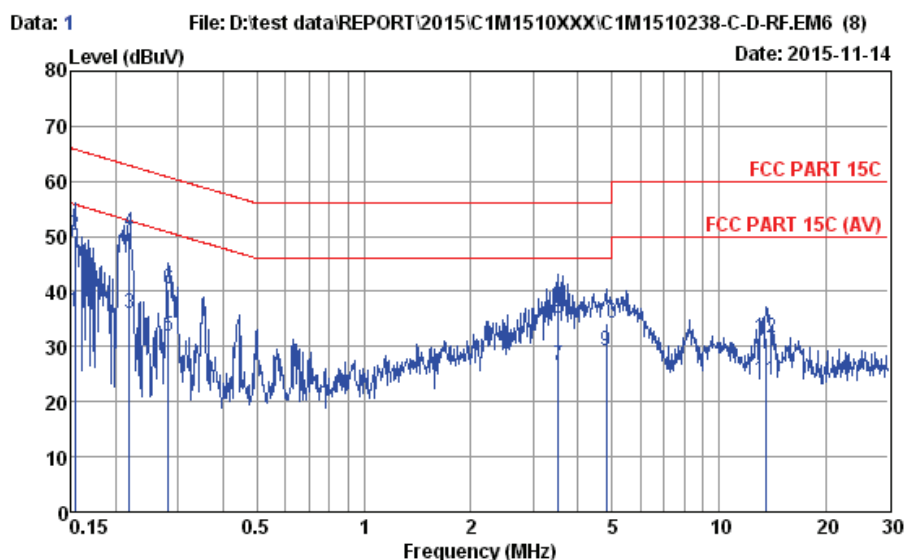
Site no. : No.8 Shielded Room Data no. : 2
Condition : ENV4200 358 (H) Phase : NEUTRAL
Limit : FCC PART 15C
Env. / Ins. : 26°C / 57% ESR3 (1774) Engineer : Tim
EUT : S2317HWib
Power Rating : 120Vac/60Hz
Test Mode : Operating
ADP: HA65NS5-00

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.163	10.26	0.03	9.87	11.05	31.21	55.30	24.09	Average
2	0.163	10.26	0.03	9.87	21.92	42.08	65.30	23.22	QP
3	0.209	10.27	0.03	9.87	18.17	38.34	53.23	14.89	Average
4	0.209	10.27	0.03	9.87	31.04	51.21	63.23	12.02	QP
5	0.286	10.24	0.03	9.87	8.13	28.27	50.63	22.36	Average
6	0.286	10.24	0.03	9.87	21.88	42.02	60.63	18.61	QP
7	2.946	10.20	0.11	9.88	3.75	23.94	46.00	22.06	Average
8	2.946	10.20	0.11	9.88	11.08	31.27	56.00	24.73	QP
9	3.603	10.20	0.12	9.88	6.65	26.85	46.00	19.15	Average
10	3.603	10.20	0.12	9.88	14.66	34.86	56.00	21.14	QP
11	5.139	10.19	0.15	9.90	8.74	28.98	50.00	21.02	Average
12	5.139	10.19	0.15	9.90	13.92	34.16	60.00	25.84	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.



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Site no. : No.8 Shielded Room Data no. : 1
Condition : ENV4200 358 (H) Phase : LINE
Limit : FCC PART 15C
Env. / Ins. : 26°C / 57% ESR3 (1774) Engineer : Tim
EUT : S2317HWib
Power Rating : 120Vac/60Hz
Test Mode : Operating
ADP: HA65NS5-00

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.153	10.25	0.03	9.87	16.20	36.35	55.82	19.47	Average
2	0.153	10.25	0.03	9.87	30.12	50.27	65.82	15.55	QP
3	0.219	10.28	0.03	9.87	15.70	35.88	52.88	17.00	Average
4	0.219	10.28	0.03	9.87	30.74	50.92	62.88	11.96	QP
5	0.282	10.26	0.03	9.87	11.61	31.77	50.76	18.99	Average
6	0.282	10.26	0.03	9.87	20.21	40.37	60.76	20.39	QP
7	3.528	10.21	0.12	9.88	6.40	26.61	46.00	19.39	Average
8	3.528	10.21	0.12	9.88	14.81	35.02	56.00	20.98	QP
9	4.822	10.20	0.14	9.90	8.94	29.18	46.00	16.82	Average
10	4.822	10.20	0.14	9.90	14.04	34.28	56.00	21.72	QP
11	13.551	10.13	0.24	9.91	3.72	24.00	50.00	26.00	Average
12	13.551	10.13	0.24	9.91	11.45	31.73	60.00	28.27	QP

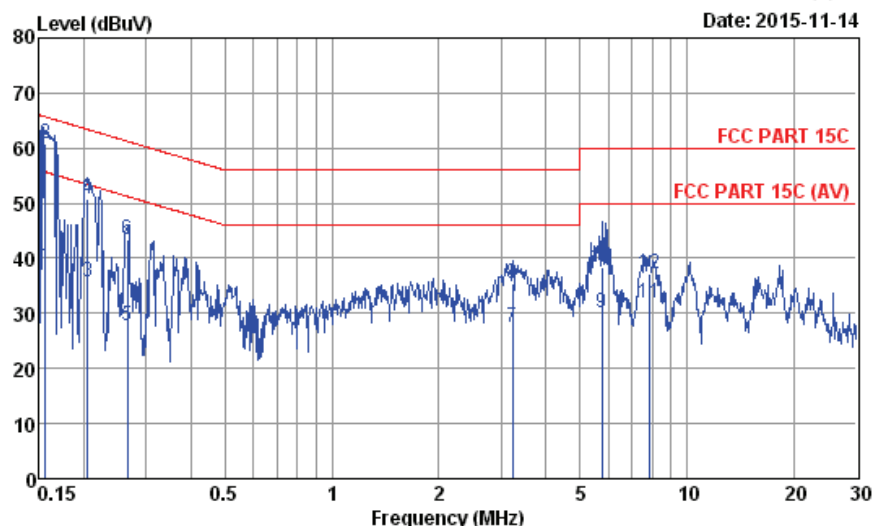
Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.

Test Date	2015/11/14	Temp./Hum.	26°C/57%
Test Voltage	DC 19.5V (Via AC Adaptor, M/N DA65NM111-00)		



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Data: 4 File: D:\test data\REPORT\2015\1M1510XXX\1M1510238-C-D-RF-EM6 (8)



Site no. : No.8 Shielded Room Data no. : 4
Condition : ENV4200 358 (H) Phase : NEUTRAL
Limit : FCC PART 15C
Env. / Ins. : 26°C / 57% ESR3 (1774) Engineer : Tim
EUT : S2317HWib
Power Rating : 120Vac/60Hz
Test Mode : Operating
ADP: DA65NM111-00

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.156	10.25	0.03	9.87	18.18	38.33	55.69	17.36	Average
2	0.156	10.25	0.03	9.87	40.55	60.70	65.69	4.99	QP
3	0.205	10.27	0.03	9.87	15.61	35.78	53.40	17.62	Average
4	0.205	10.27	0.03	9.87	30.60	50.77	63.40	12.63	QP
5	0.266	10.25	0.03	9.87	7.55	27.70	51.25	23.55	Average
6	0.266	10.25	0.03	9.87	23.38	43.53	61.25	17.72	QP
7	3.224	10.20	0.11	9.88	7.30	27.49	46.00	18.51	Average
8	3.224	10.20	0.11	9.88	15.26	35.45	56.00	20.55	QP
9	5.744	10.19	0.16	9.90	9.74	29.99	50.00	20.01	Average
10	5.744	10.19	0.16	9.90	18.27	38.52	60.00	21.48	QP
11	7.810	10.19	0.19	9.90	11.71	31.99	50.00	18.01	Average
12	7.810	10.19	0.19	9.90	17.01	37.29	60.00	22.71	QP

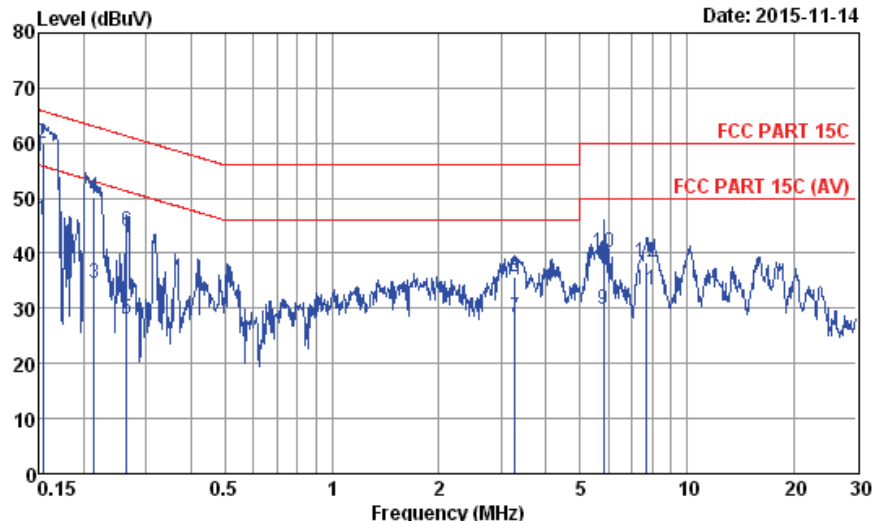
Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.



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Data: 3 File: D:\test data\REPORT\2015\C1M1510XXX\C1M1510238-C-D-RF-EM6 (8)

Date: 2015-11-14



Site no. : No.8 Shielded Room Data no. : 3
Condition : ENV4200 358 (H) Phase : LINE
Limit : FCC PART 15C
Env. / Ins. : 26°C / 57% ESR3 (1774) Engineer : Tim
EUT : S2317HWib
Power Rating : 120Vac/60Hz
Test Mode : Operating
ADP: DA65NM111-00

	Freq. (MHz)	AMN Factor (dB)	Cable Loss (dB)	Pulse Att. (dB)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Remark
1	0.153	10.25	0.03	9.87	25.78	45.93	55.82	9.89	Average
2	0.153	10.25	0.03	9.87	39.65	59.80	65.82	6.02	QP
3	0.214	10.28	0.03	9.87	14.39	34.57	53.05	18.48	Average
4	0.214	10.28	0.03	9.87	30.01	50.19	63.05	12.86	QP
5	0.264	10.27	0.03	9.87	8.01	28.18	51.29	23.11	Average
6	0.264	10.27	0.03	9.87	23.91	44.08	61.29	17.21	QP
7	3.276	10.21	0.12	9.88	8.25	28.46	46.00	17.54	Average
8	3.276	10.21	0.12	9.88	15.40	35.61	56.00	20.39	QP
9	5.805	10.19	0.16	9.90	9.59	29.84	50.00	20.16	Average
10	5.805	10.19	0.16	9.90	19.78	40.03	60.00	19.97	QP
11	7.687	10.18	0.19	9.90	13.13	33.40	50.00	16.60	Average
12	7.687	10.18	0.19	9.90	18.25	38.52	60.00	21.48	QP

Remarks: 1. Emission Level= AMN Factor + Cable Loss + Pulse Att. + Reading.

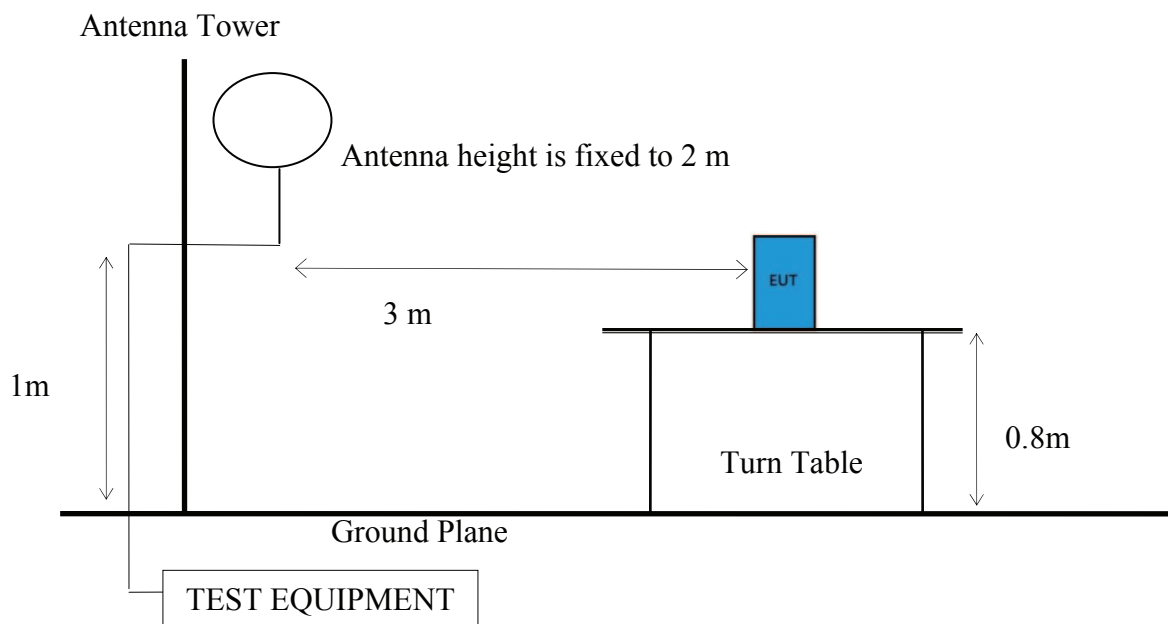
6. RADIATED SPURIOUS EMISSION MEASUREMENT

6.1. Block Diagram of Test Setup

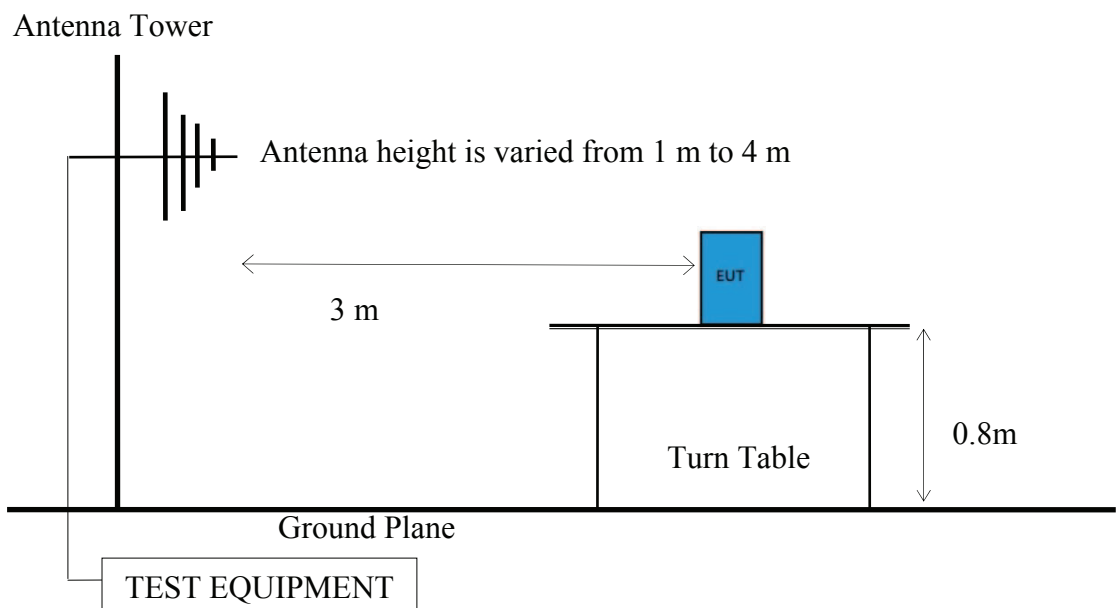
6.1.1. Block Diagram of EUT

Indicated as section 3.5

6.1.2. Setup Diagram for 9kHz-30MHz



6.1.3. Setup Diagram for 30MHz-1000MHz



6.2. Radiated Spurious Emission Limits

Frequency (MHz)	Distance (m)	Limits	
		dB μ V/m	μ V/m
0.009 - 0.490	300	67.6	2400/kHz
0.490 - 1.705	30	87.6	24000/kHz
1.705 - 30	30	29.5	30
30 - 88	3	40.0	100
88- 216	3	43.5	150
216- 960	3	46.0	200
Above 960	3	54.0	500

6.3. Test Procedure

Frequency Range 9kHz~30MHz:

The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 2 m to find the maximum emission level. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

- (1) RBW = 9kHz with peak and average detector.
- (2) Detector: average and peak (9kHz-490kHz)
Q.P. (490kHz-30MHz)

Frequency Range 30MHz ~ 1000MHz:

The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna varied from 1 m to 4 m to find the maximum emission level. Both horizontal and vertical polarization are required. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 regulation.

Spectrum Analyzer is used for pre-testing with following setting:

- (1) RBW = 120KHz
- (2) VBW $\geq$ 3 x RBW.
- (3) Detector = Peak.
- (4) Sweep time = auto.
- (5) Trace mode = max hold.
- (6) Allow sweeps to continue until the trace stabilizes.
- (7) When peak-detected value is lower than limit that the measurement using the Q.P. detector is not required. Otherwise using Q.P. for finally measurement.

6.4. Measurement Result Explanation

■ Emission Level = Antenna Factor + Cable Loss + Meter Reading

6.5. Test Results

PASSED.

Test Date	2015/11/12	Temp./Hum.	24°C/56%
Test Voltage	DC 19.5V (Via AC Adaptor)		

6.5.1. Frequency Range 9kHz~30MHz

Antenna at 0 Degree

Test Frequency (MHz)	Test Result (dBμV/m at 3m)	Limits (dBμV/m at 3m)	Margin (dB)	Detector
0.132910	76.00	105.13	29.130	Peak
0.265820	42.40	99.11	56.710	Peak
0.398730	53.80	95.59	41.790	Peak
0.664550	42.30	111.15	68.850	Peak
0.930370	30.60	108.23	77.630	Peak

Antenna at 90 Degree

Test Frequency (MHz)	Test Result (dBμV/m at 3m)	Limits (dBμV/m at 3m)	Margin (dB)	Detector
0.132910	67.80	105.13	37.330	Peak
0.265820	42.50	99.11	56.610	Peak
0.398730	46.40	95.59	49.190	Peak
0.664550	42.80	111.15	68.350	Peak
0.930370	34.20	108.23	74.030	Peak

Note: All emissions are lower than the ambient level cannot be measured.

6.5.2. Frequency Range 30MHz ~ 1000MHz

Antenna at Horizontal Polarization

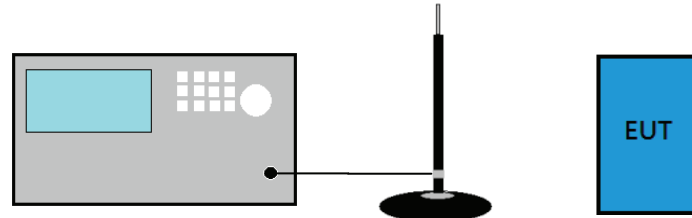
Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
244.37	12.06	4.29	24.10	40.45	46.00	5.55	Peak
396.66	15.47	5.62	19.84	40.93	46.00	5.07	Peak
679.90	18.66	6.68	14.00	39.34	46.00	6.66	Peak

Antenna at Vertical Polarization

Emission Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector
145.43	10.86	3.57	23.94	38.37	43.50	5.13	Peak
445.16	16.22	6.03	16.79	39.04	46.00	6.96	Peak
594.54	18.27	6.50	18.70	43.47	46.00	2.53	Peak
891.36	20.53	7.51	16.13	44.17	46.00	1.83	Peak

7. EMISSION BANDWIDTH MEASUREMENT

7.1. Block Diagram of Test Setup



7.2. Specification Limits

The 99% bandwidth shall be no wider than 0.25% of the center frequency for device operating between 70MHz and 900MHz. For devices operating above 900MHz, the emission shall be no wider than 0.5% of the centre frequency.

7.3. Test Procedure

- (1) Set RBW close to 1-5 % of OBW.
- (2) Set $VBW \geq RBW$.
- (3) Detector = Peak.
- (4) Trace mode = max hold.
- (5) Sweep = auto couple.
- (6) Allow the trace to stabilize.
- (7) Setting channel bandwidth function x % to 99% to record the final bandwidth.

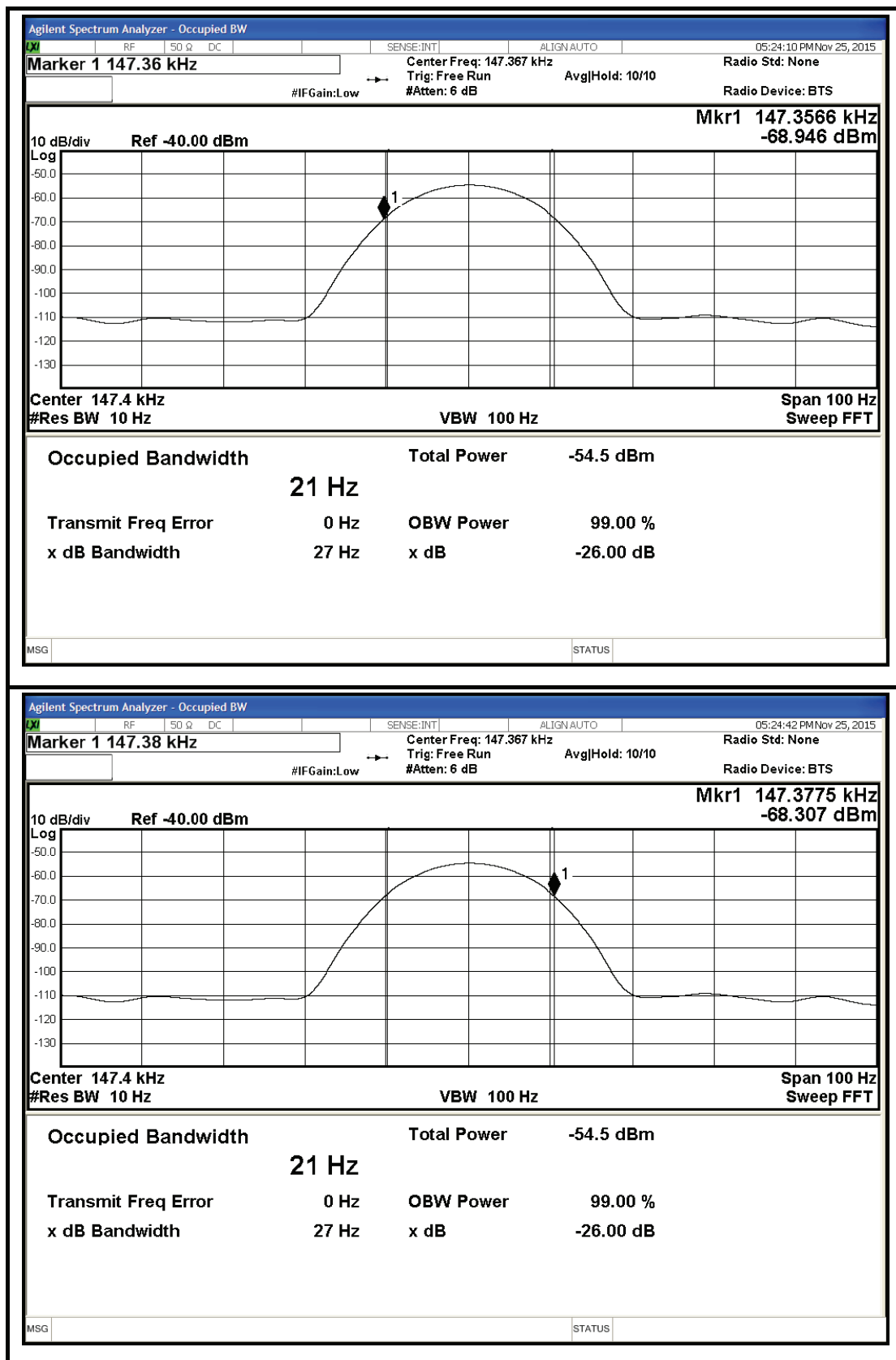
7.4. Test Results

Test Date	2015/11/25	Temp./Hum.	25°C/45%
Test Voltage	DC 19.5V (Via AC Adaptor)	Frequency	147.4MHz

7.4.1. Emission Bandwidth Measurement Results

Center Frequency (MHz)	Occupied Bandwidth (MHz)	Tolerance (%)	Limit (%)
147.4	0.000021	0.000	0.25

7.4.2. Graph of Bandwidth Measurement



8. DEVIATION TO TEST SPECIFICATIONS

【NONE】