



FCC 47 CFR PART 15 SUBPART C & RSSINDUSTRY CANADA RSS-247

for

WiFi & Bluetooth Enabled Smart Plug

Model: IDEV0004

Brand: iDevices Outdoor Switch

Issued Date: June 28, 2016

Issued for

iDevices, LLC

136 Simsbury Rd Building 12 Avon, Connecticut 06001, United States

Issued by:

Compliance Certification Services (Shenzhen) Inc.

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TESTING CERT #2861.01

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Revision History of Report

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	June 28, 2016	Initial Issue	ALL	Sabrina Wang



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1 TEST CERTIFICATION

Product	WiFi & Bluetooth Enabled Smart Plug
Model	IDEV0004
Brand	iDevices Outdoor Switch
Test Date	June 20~28, 2016
Applicant	iDevices, LLC 136 Simsbury Rd Building 12 Avon, Connecticut 06001, United States
Manufacturer	iDevices, LLC 136 Simsbury Rd Building 12 Avon, Connecticut 06001, United States

APPLICABLE STANDARDS

Standard	Test Type
15.247(a)	Spurious Emissions Measurement

* Partial testing to verify product compliance after modifications have been made to the originally certified design.

We hereby certify that:

The above equipment was tested by Compliance Certification Services (Shenzhen) Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in **ANSI C63.10: 2013** and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247 and IC RSS-247.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Sunday Hu
Supervisor of EMC Dept.
Compliance Certification Services (Shenzhen)
Inc.

Reviewed by:

Ruby Zhang
Supervisor of Report Dept.
Compliance Certification Services (Shenzhen)
Inc.



2 FACILITIES AND ACCREDITATIONS

2.1. FACILITIES

All measurement facilities used to collect the measurement data are located at **No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China**

The sites are constructed in conformance with the requirements of ANSI C63.10, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

2.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	A2LA
China	CNAS

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

USA	FCC
Japan	VCCI(C-4815,R-4320,T-2317, G-10624)
Canada	INDUSTRY CANADA

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccssz.com>

2.3. 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:

Parameter	Uncertainty
Radiated Emission, 30 to 200 MHz Test Site : 966(2)	+/-3.6880dB
Radiated Emission, 200 to 1000 MHz Test Site : 966(2)	+/-3.6695dB
Radiated Emission, 1 to 8 GHz	+/-5.1782dB
Radiated Emission, 8 to 18 GHz	+/-5.2173dB
Conducted Emissions	+/-3.6836dB
Band Width	178kHz
Peak Output Power MU	+/-1.906dB
Band Edge MU	+/-0.182dB
Channel Separation MU	416.178Hz
Duty Cycle MU	0.054ms
Frequency Stability MU	226Hz

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

The measured result is above (below) the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance (non-compliance) is more probable than non-compliance) with the specification limit.



3 SPURIOUS EMISSIONS MEASUREMENT

3.1. RADIATED EMISSIONS MEASUREMENT

3.1.1. LIMITS OF RADIATED EMISSIONS MEASUREMENT

According to §15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

1. In the emission table above, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength ($\text{dB}\mu\text{V/m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) Emission level ($\text{dB}\mu\text{V/m}$) = $20 \log$ Emission level ($\mu\text{V/m}$).

**3.1.2. TEST INSTRUMENTS**

Radiated Emission Test Site 966 (2)					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	02/21/2016	02/20/2017
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	02/21/2016	02/20/2017
Amplifier	EMEC	EM330	060661	03/18/2016	03/17/2017
High Noise Amplifier	Agilent	8449B	3008A01838	02/21/2016	02/20/2017
Loop Antenna	COM-POWER	AL-130	121044	09/25/2016	09/24/2017
Bilog Antenna	SCHAFFNER	CBL6143	5082	02/21/2016	02/20/2017
Horn Antenna	SCHWARZBECK	BBHA9120	D286	02/28/2016	02/27/2017
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	02/28/2016	02/27/2017
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/21/2016	02/20/2017
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The FCC Site Registration number is 101879.
3. N.C.R = No Calibration Required.



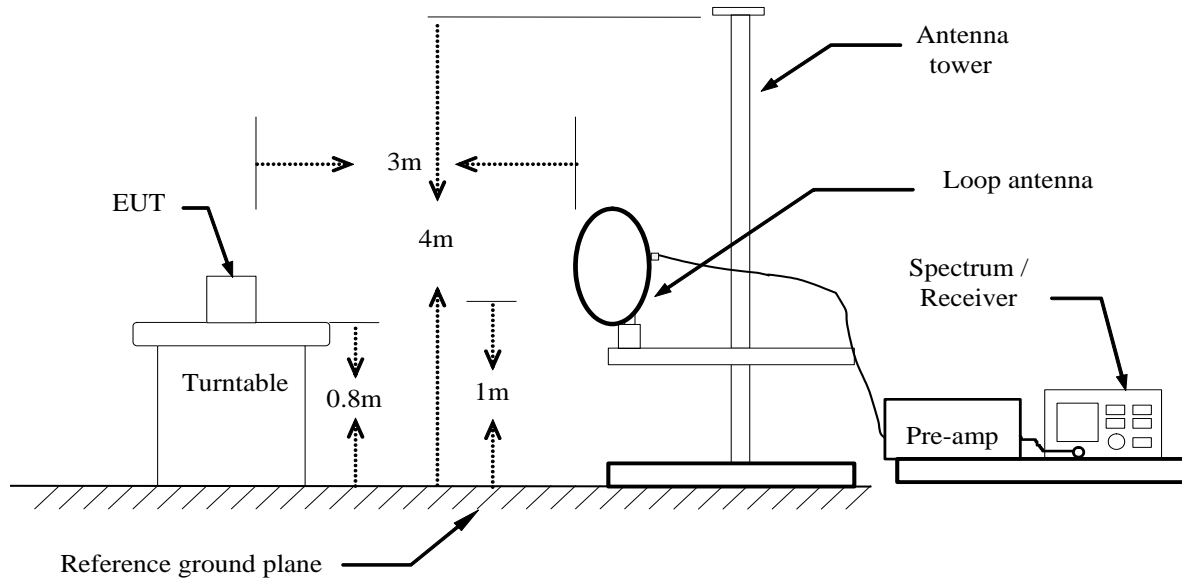
3.1.3. TEST PROCEDURE (please refer to measurement standard)

1. The EUT is placed on a turntable, which is 0.8m or 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:
Below 1GHz:
RBW=100kHz / VBW=300kHz / Sweep=AUTO
Above 1GHz:
(a) PEAK: RBW=1MHz,VBW=3MHz / Sweep=AUTO
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies
8. are complete.

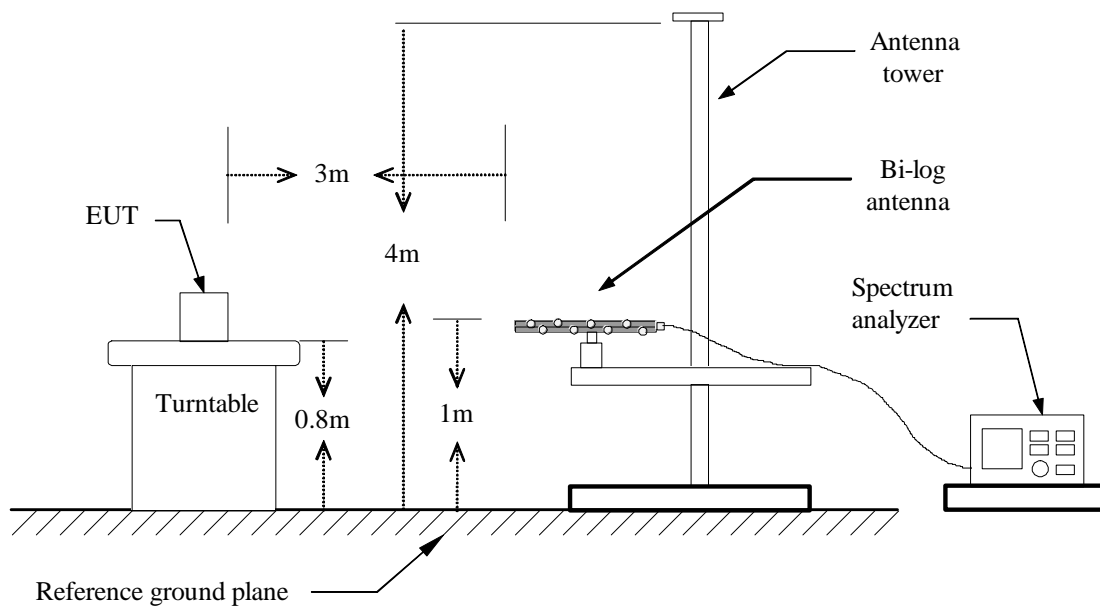


3.1.4. TEST SETUP

Below 30MHz

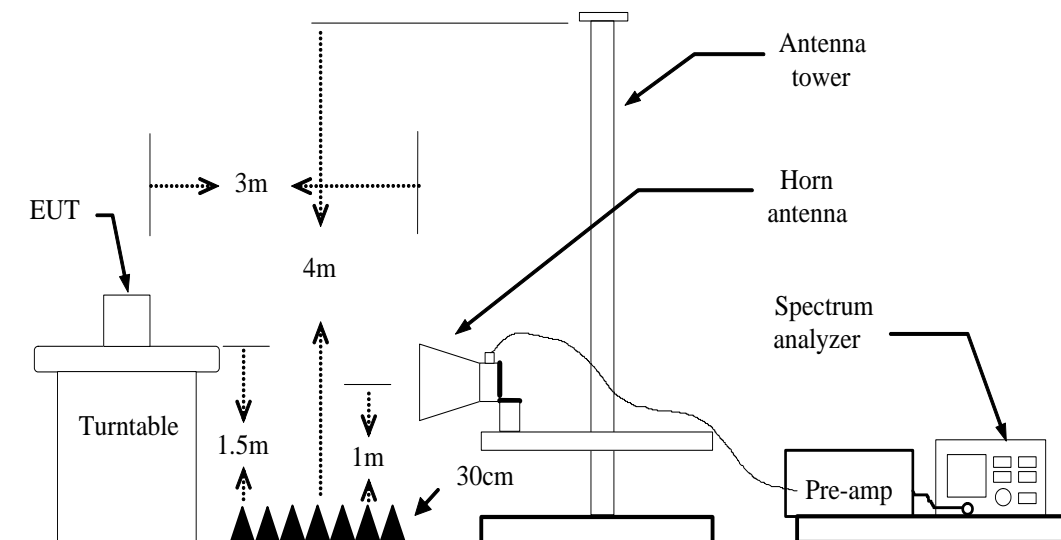


Below 1 GHz





Above 1 GHz



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

**3.1.5. DATA SAPLE****Below 1GHz**

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXX.XXXX	36.37	-12.20	24.17	40.00	-15.83	V	QP

Frequency (MHz) = Emission frequency in MHz
 Reading (dBuV) = Uncorrected Analyzer / Receiver reading
 Correct Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
 Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
 Limit (dBuV/m) = Limit stated in standard
 Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
 Q.P. = Quasi-peak Reading

Above 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXXX.XXXX	62.09	-11.42	50.67	74.00	-23.33	V	Peak
XXXX.XXXX	49.78	-11.42	38.36	54.00	-15.64	V	AVG

Frequency (MHz) = Emission frequency in MHz
 Reading (dBuV) = Uncorrected Analyzer / Receiver reading
 Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
 Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
 Limit (dBuV/m) = Limit stated in standard
 Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
 Peak = Peak Reading
 AVG = Average Reading

Calculation Formula

Margin (dB) = Result (dBuV/m) – Limits (dBuV/m)
 Result (dBuV/m) = Reading (dBuV) + Correction Factor

**3.1.6. TEST RESULTS****Below 1 GHz****Test Mode:** TX**Tested by:** Jack Chen**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** June 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
37.7600	49.65	-15.48	34.17	40.00	-5.83	V	QP
61.0400	44.03	-24.15	19.88	40.00	-20.12	V	QP
144.4600	38.25	-21.48	16.77	43.50	-26.73	V	QP
433.5200	48.00	-15.62	32.38	46.00	-13.62	V	QP
623.6400	35.31	-12.77	22.54	46.00	-23.46	V	QP
815.7000	35.50	-10.55	24.95	46.00	-21.05	V	QP
37.7600	49.06	-15.48	33.58	40.00	-6.42	H	QP
61.0400	46.95	-24.15	22.80	40.00	-17.20	H	QP
433.5200	38.35	-15.62	22.73	46.00	-23.27	H	QP
672.1400	36.52	-12.19	24.33	46.00	-21.67	H	QP
719.6700	37.81	-11.86	25.95	46.00	-20.05	H	QP
768.1700	37.81	-11.11	26.70	46.00	-19.30	H	QP

****Remark:** 1. No emission found between lowest internal used/generated frequency to 30MHz.

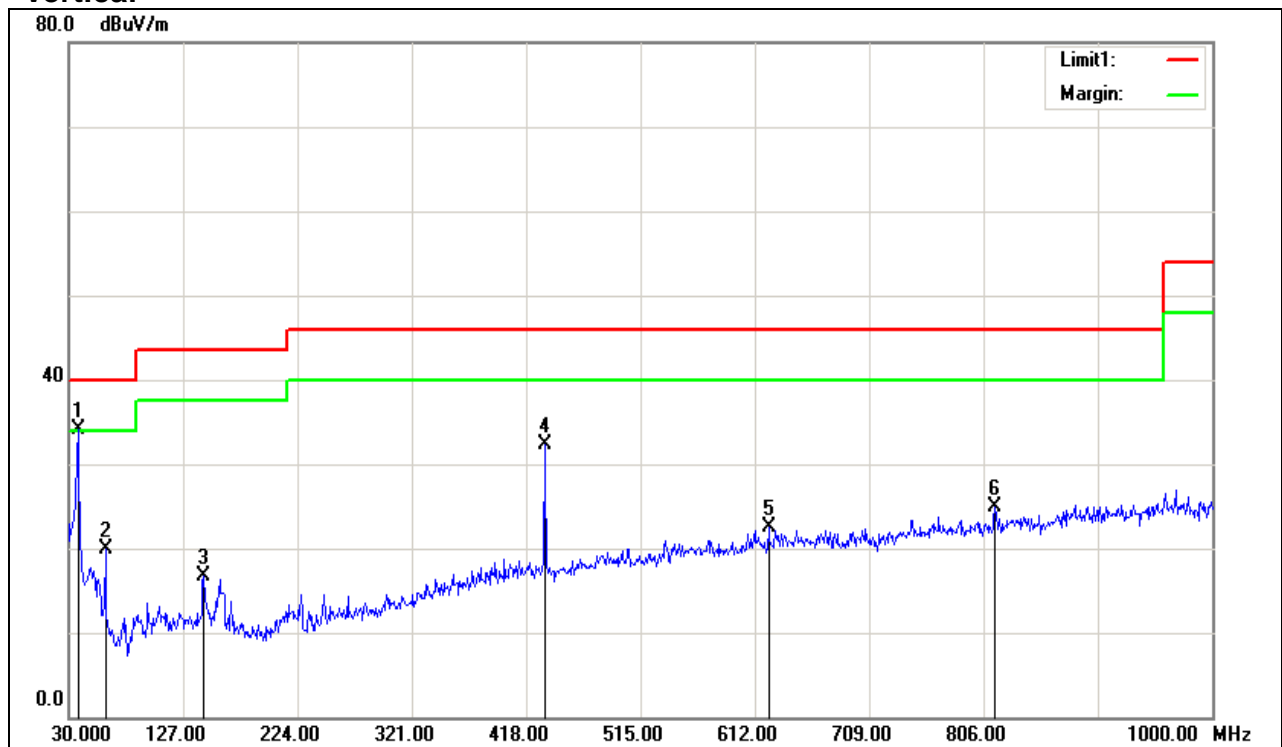
2. Only worst case recorded for radiated emissions below 1GHz.

Notes:

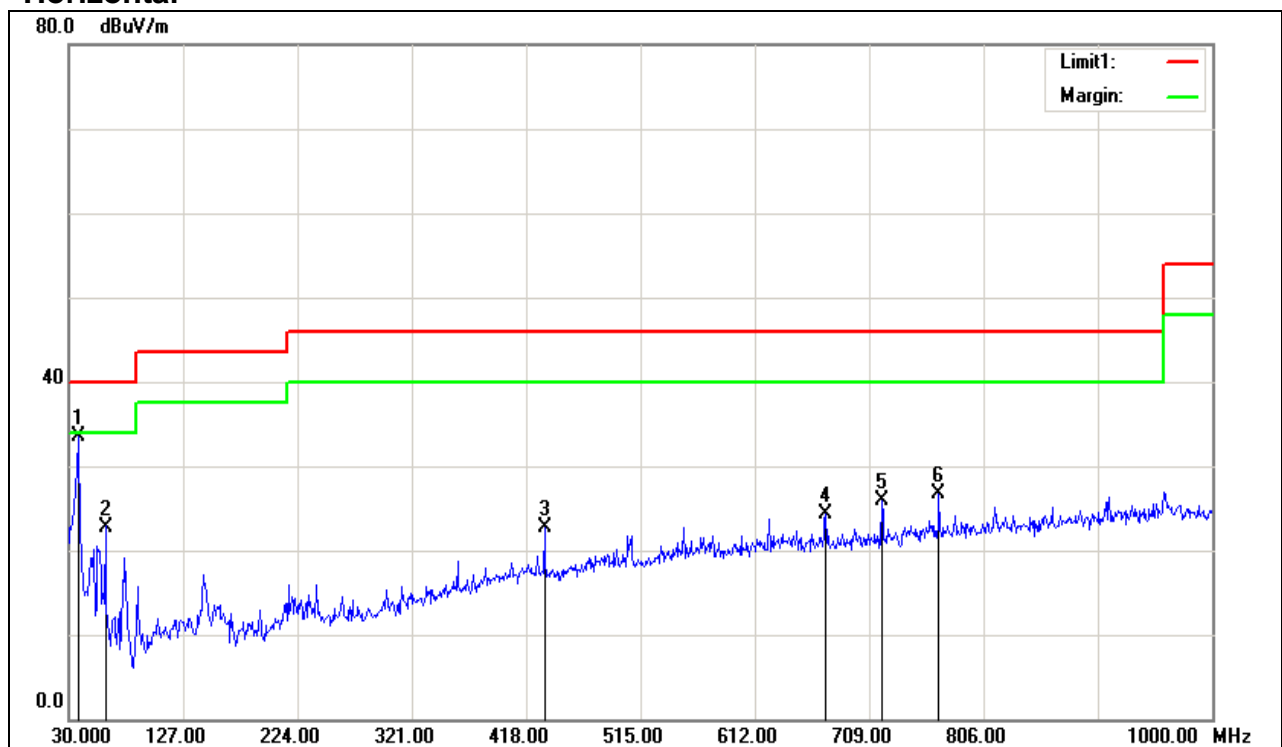
1. Radiated emissions measured in frequency range from 9kHz to 1GHz were made with an instrument using Quasi-peak detector mode.
2. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. The IF bandwidth of Receiver between 30MHz to 1GHz was 120kHz.
4. Frequency (MHz). = Emission frequency in MHz
 Reading (dBμV/m) = Receiver reading
 Correction Factor (dB) = Antenna factor + Cable loss – Amplifier gain
 Limit (dBμV/m) = Limit stated in standard
 Margin (dB) = Measured (dBμV/m) – Limits (dBμV/m)
 Antenna Pol e(H/V) = Current carrying line of reading



Vertical



Horizontal



**Above 1 GHz****Test Mode:** TX / IEEE 802.11b(CH Mid)**Tested by:** Jack Chen**Ambient temperature:** 24°C **Relative humidity:** 52% RH**Date:** June 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1711.0000	47.32	-6.46	40.86	74.00	-33.14	V	peak
2584.0000	45.49	-2.11	43.38	74.00	-30.62	V	peak
3934.0000	43.09	1.31	44.40	74.00	-29.60	V	peak
5014.0000	41.98	5.00	46.98	74.00	-27.02	V	peak
5563.0000	41.33	5.90	47.23	74.00	-26.77	V	peak
6949.0000	40.49	7.62	48.11	74.00	-25.89	V	peak
1333.0000	47.77	-7.30	40.47	74.00	-33.53	H	Peak
2557.0000	45.11	-2.16	42.95	74.00	-31.05	H	peak
3898.0000	42.94	1.16	44.10	74.00	-29.90	H	peak
4699.0000	41.49	4.00	45.49	74.00	-28.51	H	peak
5581.0000	41.27	5.90	47.17	74.00	-26.83	H	peak
6931.0000	40.98	7.59	48.57	74.00	-25.43	H	peak

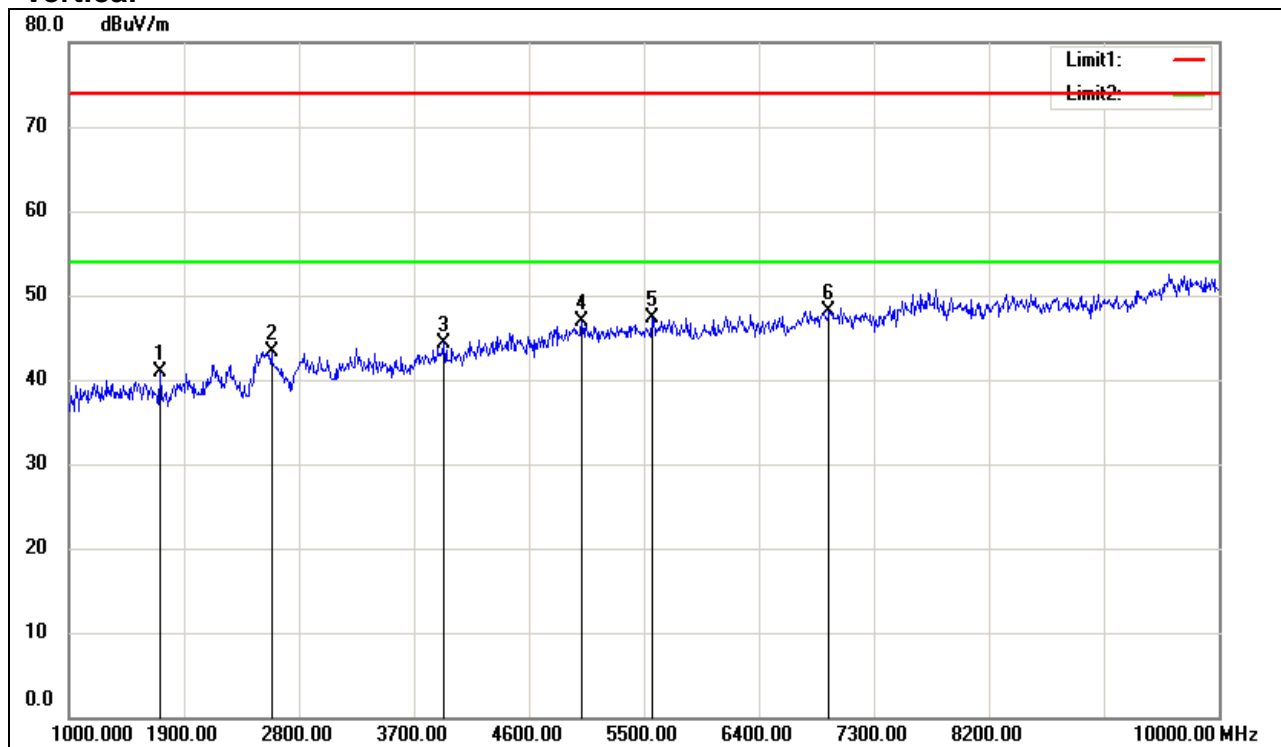
Note: Only worst case recorded for radiated emissions above 1GHz.

REMARKS:

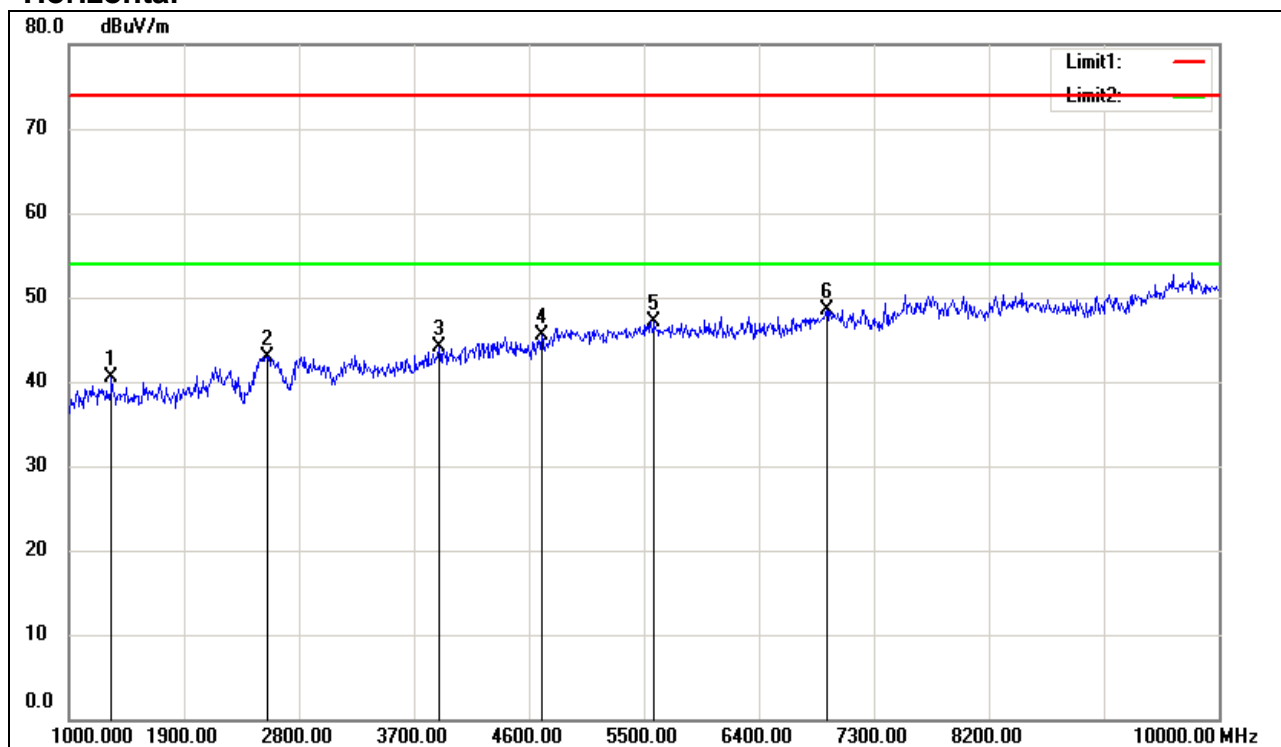
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Vertical



Horizontal



**Test Mode:** TX / IEEE 802.11g (CH Mid)**Tested by:** Jack Chen**Ambient temperature:** 24°C**Relative humidity:** 52% RH**Date:** June 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1594.0000	49.25	-6.71	42.54	74.00	-31.46	V	Peak
2503.0000	44.88	-2.25	42.63	74.00	-31.37	V	Peak
3700.0000	44.09	0.32	44.41	74.00	-29.59	V	Peak
4960.0000	42.32	4.85	47.17	74.00	-26.83	V	Peak
5833.0000	41.69	6.01	47.70	74.00	-26.30	V	Peak
6823.0000	40.64	7.41	48.05	74.00	-25.95	V	Peak
1216.0000	47.58	-7.73	39.85	74.00	-34.15	H	Peak
2521.0000	45.83	-2.22	43.61	74.00	-30.39	H	Peak
3250.0000	45.22	-0.94	44.28	74.00	-29.72	H	Peak
4051.0000	43.19	1.77	44.96	74.00	-29.04	H	Peak
4816.0000	42.40	4.38	46.78	74.00	-27.22	H	Peak
6976.0000	41.33	7.66	48.99	74.00	-25.01	H	Peak

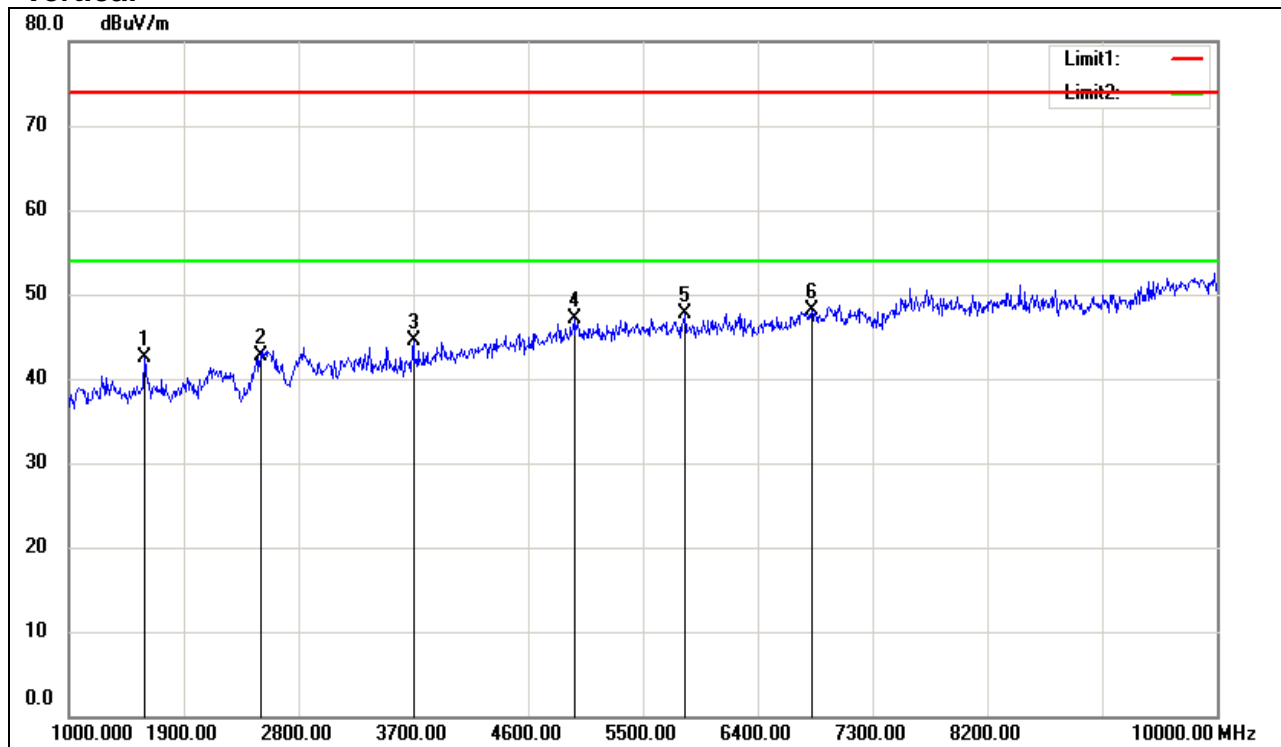
Note: Only worst case recorded for radiated emissions above 1GHz.

REMARKS:

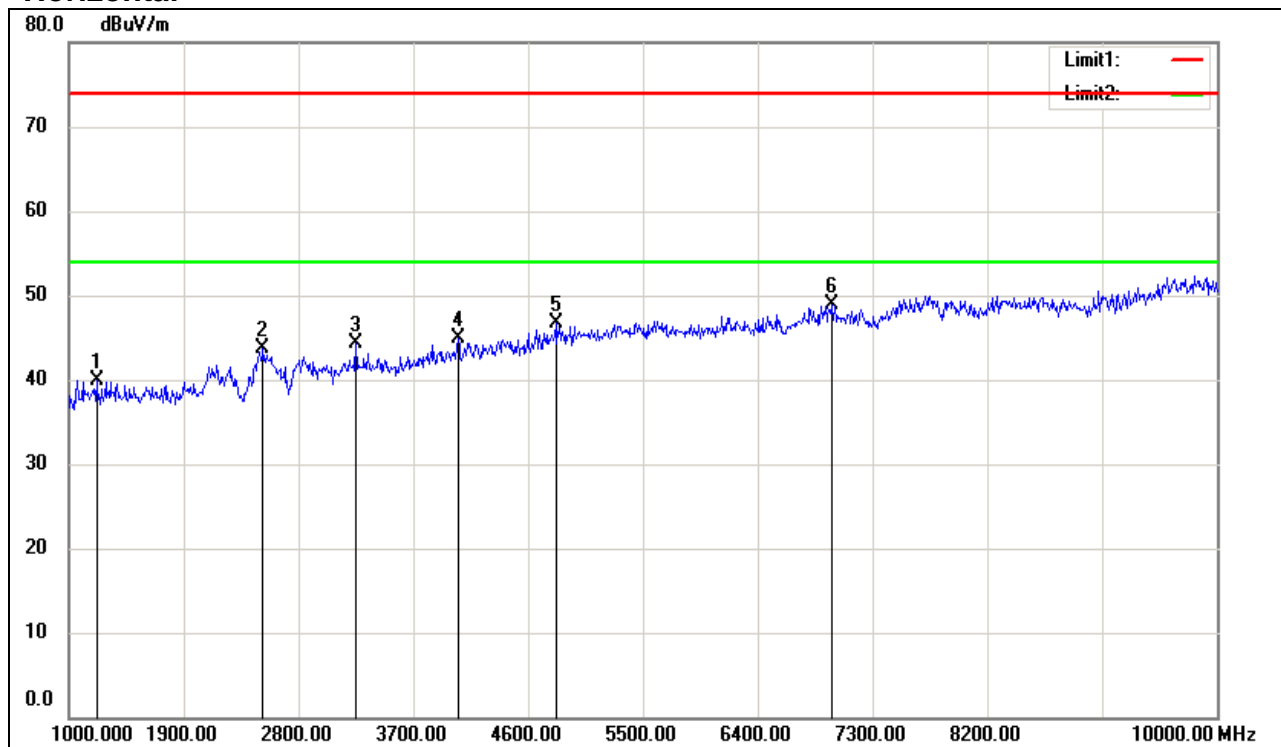
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Vertical



Horizontal



**Test Mode:** TX / IEEE 802.11n HT 20 Hz (CH Mid)**Tested by:** Jack Chen**Ambient temperature:** 24°C**Relative humidity:** 52% RH**Date:** June 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2557.0000	46.47	-2.16	44.31	74.00	-29.69	V	Peak
4051.0000	41.91	1.77	43.68	74.00	-30.32	V	Peak
4771.0000	41.63	4.23	45.86	74.00	-28.14	V	Peak
5608.0000	41.53	5.92	47.45	74.00	-26.55	V	Peak
6580.0000	41.48	7.02	48.50	74.00	-25.50	V	Peak
6958.0000	41.41	7.63	49.04	74.00	-24.96	V	Peak
2512.0000	46.38	-2.24	44.14	74.00	-29.86	H	Peak
3718.0000	42.71	0.40	43.11	74.00	-30.89	H	Peak
4465.0000	42.48	3.23	45.71	74.00	-28.29	H	Peak
5356.0000	41.74	5.61	47.35	74.00	-26.65	H	Peak
6409.0000	41.04	6.74	47.78	74.00	-26.22	H	Peak
7534.0000	41.08	8.74	49.82	74.00	-24.18	H	Peak

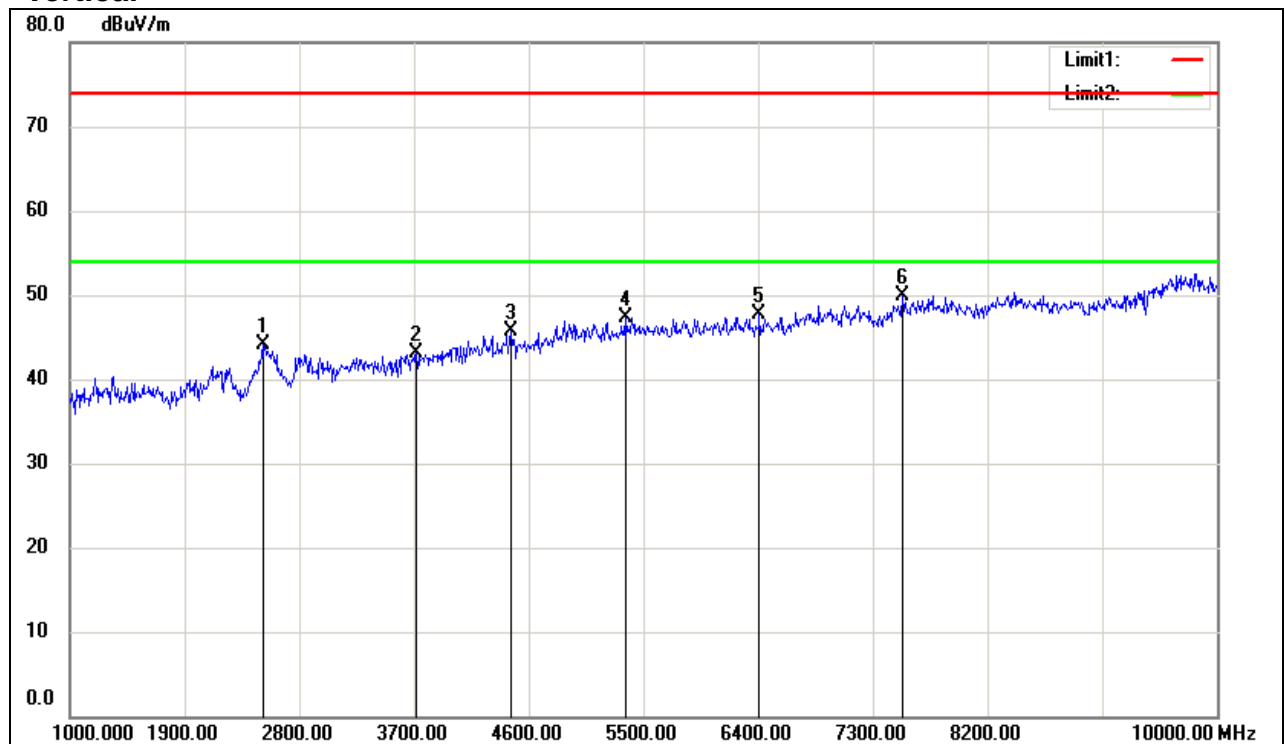
Note: Only worst case recorded for radiated emissions above 1GHz.

REMARKS:

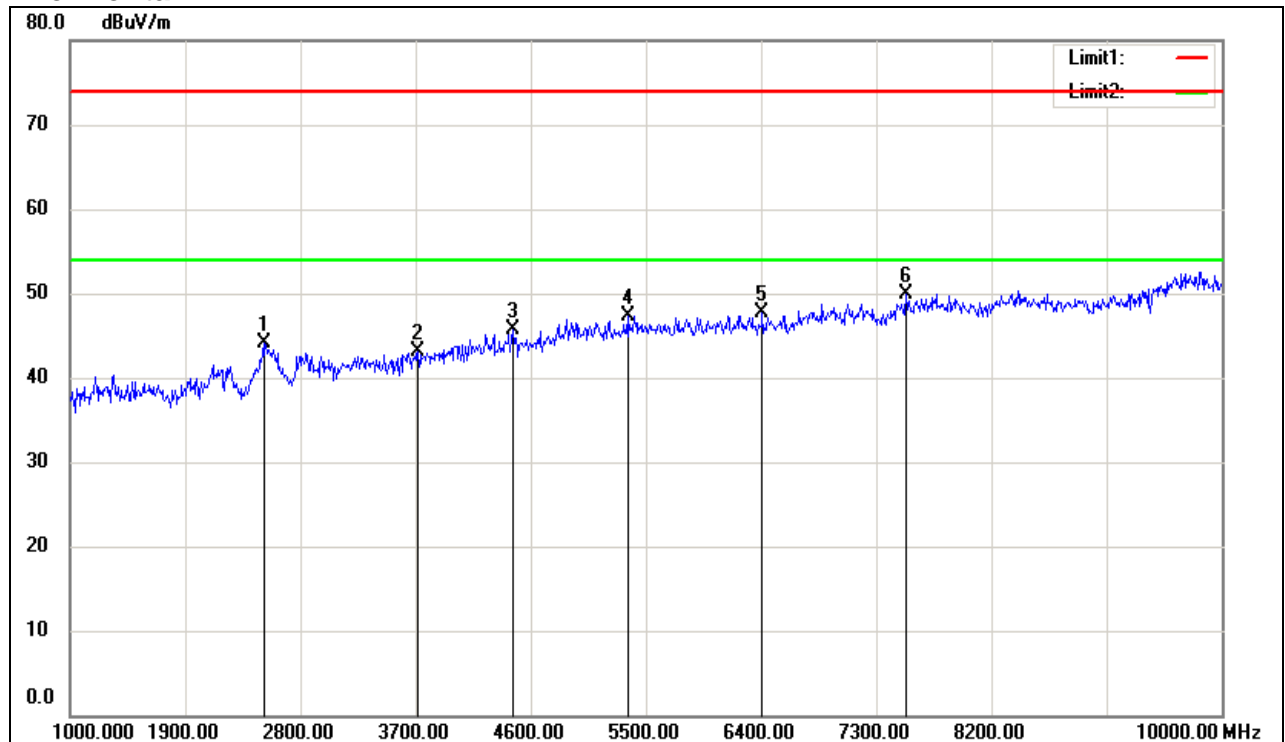
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Vertical



Horizontal



**Below 1 GHz****Test Mode:** RX**Tested by:** Jack Chen**Ambient temperature:** 24°C**Relative humidity:** 52% RH**Date:** June 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
37.7600	50.35	-15.48	34.87	40.00	-5.13	V	QP
55.2200	53.70	-22.75	30.95	40.00	-9.05	V	QP
151.2500	46.37	-21.86	24.51	43.50	-18.99	V	QP
433.5200	38.64	-15.62	23.02	46.00	-22.98	V	QP
768.1700	37.74	-11.11	26.63	46.00	-19.37	V	QP
960.2300	37.27	-8.69	28.58	54.00	-25.42	V	QP
37.7600	47.23	-15.48	31.75	40.00	-8.25	H	QP
61.0400	44.15	-24.15	20.00	40.00	-20.00	H	QP
144.4600	39.89	-21.48	18.41	43.50	-25.09	H	QP
433.5200	45.14	-15.62	29.52	46.00	-16.48	H	QP
816.6700	35.31	-10.52	24.79	46.00	-21.21	H	QP
960.2300	34.91	-8.69	26.22	54.00	-27.78	H	QP

Note: 1. Only worst case recorded for radiated emissions below 1GHz.

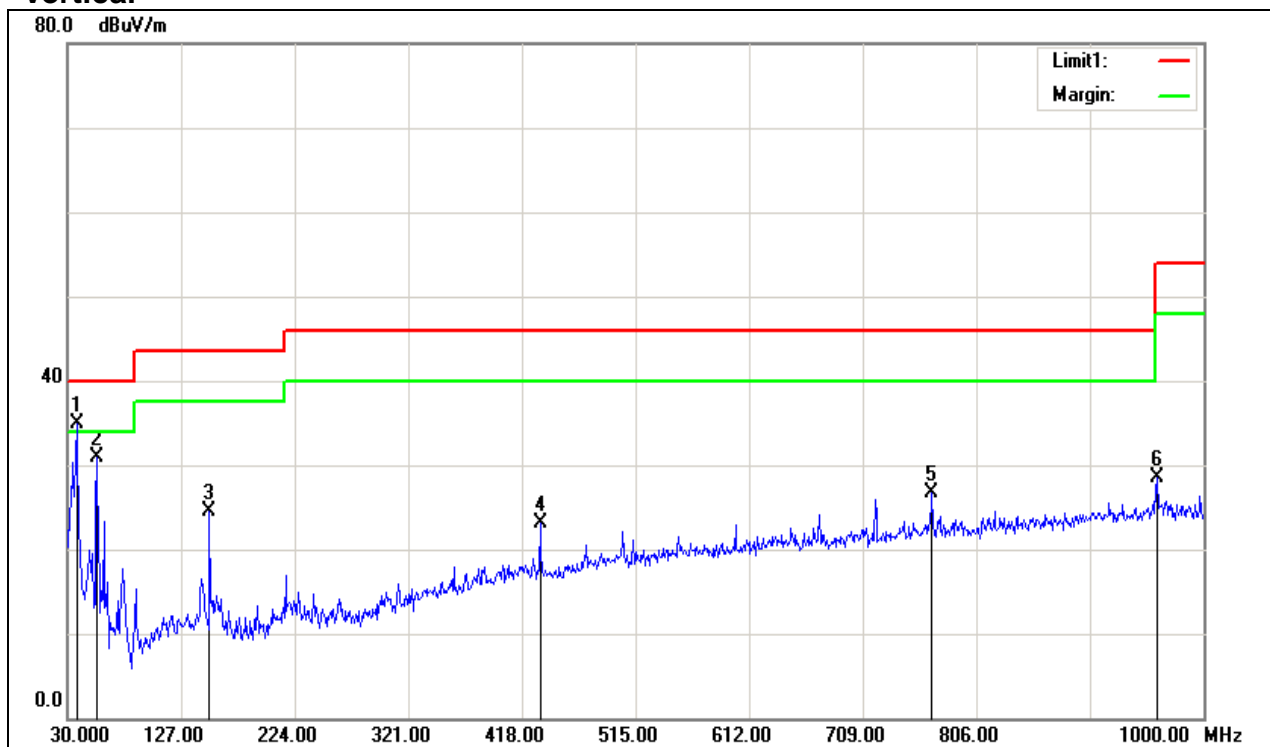
2. No emission found between lowest internal used/generated frequency to 30 MHz.

REMARKS:

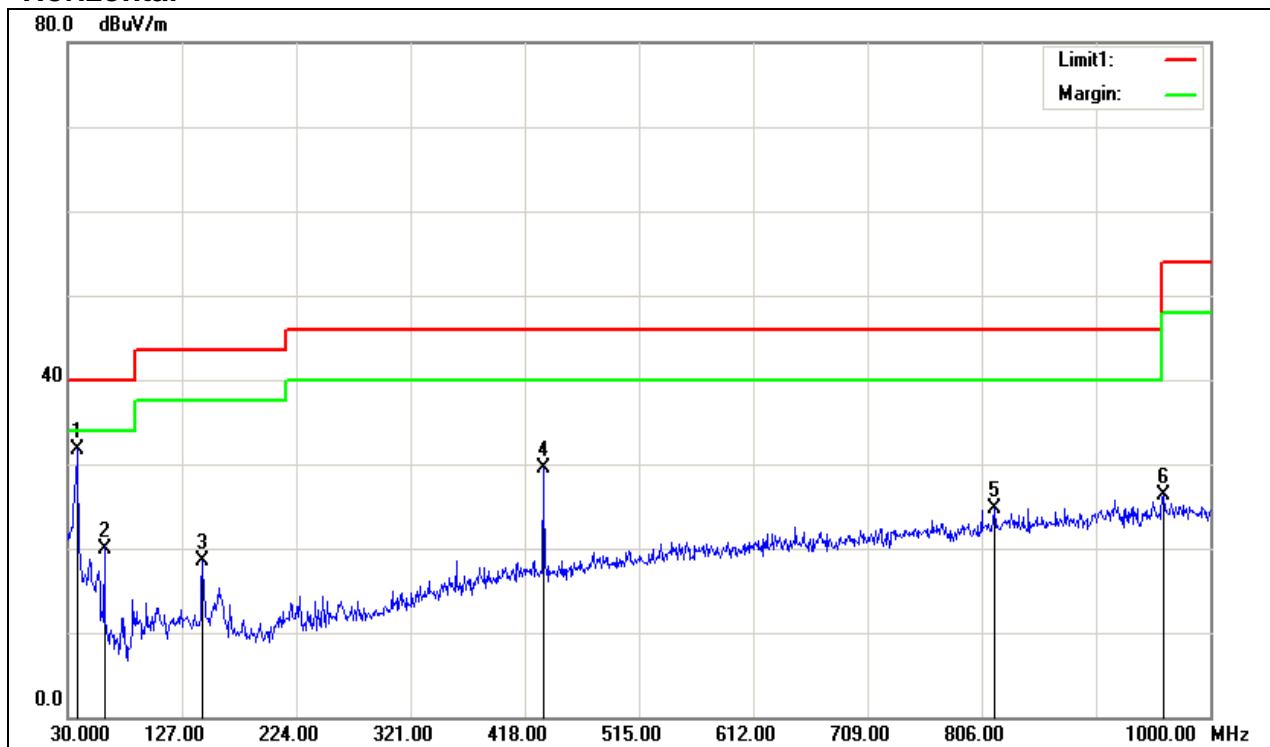
1. Measuring frequencies from 9kHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using quasi-peak detector mode.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV)



Vertical



Horizontal



**Above 1 GHz****Test Mode:** RX**Tested by:** Jack Chen**Ambient temperature:** 24°C**Relative humidity:** 52% RH**Date:** June 22, 2016

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
2062.0000	46.73	-4.66	42.07	74.00	-31.93	V	Peak
2665.0000	44.96	-1.96	43.00	74.00	-31.00	V	Peak
3907.0000	42.50	1.20	43.70	74.00	-30.30	V	Peak
4861.0000	42.01	4.53	46.54	74.00	-27.46	V	Peak
6058.0000	41.04	6.17	47.21	74.00	-26.79	V	Peak
6877.0000	40.74	7.50	48.24	74.00	-25.76	V	Peak
2656.0000	46.30	-1.98	44.32	74.00	-29.68	H	Peak
4231.0000	42.19	2.40	44.59	74.00	-29.41	H	Peak
5662.0000	41.29	5.94	47.23	74.00	-26.77	H	Peak
6760.0000	41.01	7.31	48.32	74.00	-25.68	H	Peak
7174.0000	41.73	8.04	49.77	74.00	-24.23	H	Peak
7795.0000	40.58	9.25	49.83	74.00	-24.17	H	Peak

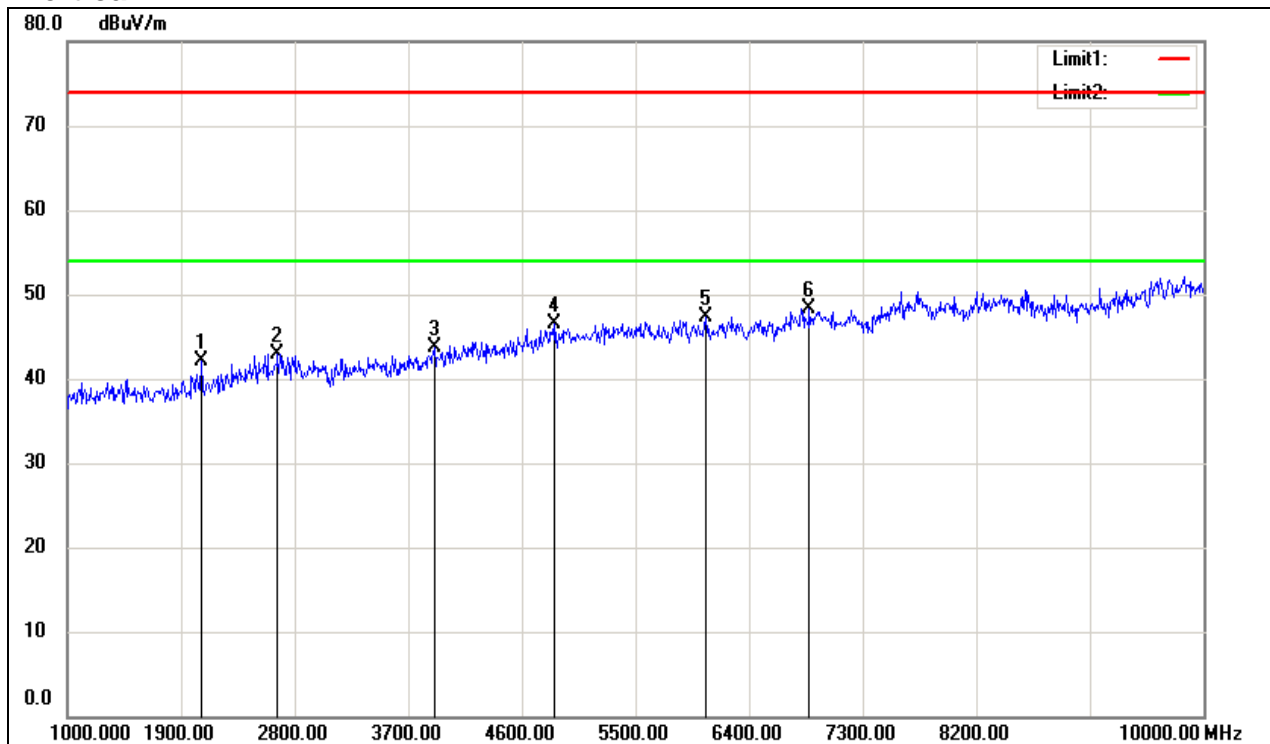
Note: Only worst case recorded for radiated emissions above 1GHz.

REMARKS:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Vertical



Horizontal

