



BUREAU
VERITAS

Test Report No.: RF141009N036-2



Test Lab
Cert 2951.01

TEST REPORT

Applicant:	Swann Communications Pty Ltd
Address:	Unit 13, 331 Ingles Street, Port Melbourne, Melbourne, 3207, Australia

Manufacturer or Supplier	LITE-ON NETWORK COMMUNICATION(DONGGUAN)LIMITED
Address	30# Keji Rd., Yin Hu Industrial Area, Qingxi Town, DongGuan City, Guangdong, China 523648
Product:	SmartHub
Brand Name:	N/A
Model:	SWO-HUB01K
Additional Model & Model Difference:	N/A
Date of tests:	Oct. 09 ~ Dec. 17, 2014

the tests have been carried out according to the requirements of the following standard:

☒ FCC Part 15, Subpart C (Section 15.249)

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Blue Zheng Project Engineer / EMC Department	Approved by Chris Chen Assistant Manager / EMC Department
	 Date: Dec. 26, 2014

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF141009N036-2	Original release	Dec. 26, 2014



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
§15.203	Antenna Requirement	PASS	No antenna connector is used
§15.207 (a)	Conducted Emission	PASS	Compliant
§15.205	Restricted Band of Operation	PASS	Compliant
§15.209 §15.249(a)	Radiated Emission	PASS	Compliant
§15.215(c)	20dB Bandwidth Test	PASS	Compliant

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:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.66dB
Radiated emissions	9KHz ~ 30MHz	2.74dB
	30MHz ~ 1GHz	3.55dB
	1GHz ~ 18GHz	4.84dB
	18GHz ~ 40GHz	4.84dB

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



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	SmartHub
MODEL NO.	SWO-HUB01K
FCC ID	VMISWO-HUB01K
NOMINAL VOLTAGE	DC 3.7V by Battery or DC 5V by Adapter
MODULATION TECHNOLOGY	Zigbee
OPERATING FREQUENCY	2405-2480MHz
ANTENNA TYPE	PCB Antenna, 0dBi Gain
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	RJ45 Cable: Shielded, Detachable, 2.1m

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.:RF141009N036) for detailed product photo.
4. The EUT can be powered by the adapter as listed below:

ADAPTER	
BRAND:	DVE
MODEL:	DSA-12PFA-05FUS050200
INPUT:	AC 100-240V, 50/60Hz, 0.5A
OUTPUT:	DC 5V/2A
DC LINE:	Unshielded, Non-detachable, 1.45m



3.2 DESCRIPTION OF TEST MODES

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE<1G	RE≥1G	PLC	BW	
A	√	√	√	-	Powered by Adapter
B	-	-	-	√	Powered by Battery

Where **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission

RE≥1G: Radiated Emission above 1GHz
BW: 20db bandwidth

Following channel(s) was (were) selected for the test as listed below.

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
11	2405 MHz	19	2445 MHz
12	2410 MHz	20	2450 MHz
13	2415 MHz	21	2455 MHz
14	2420 MHz	22	2460 MHz
15	2425 MHz	23	2465 MHz
16	2430 MHz	24	2470 MHz
17	2435 MHz	25	2475 MHz
18	2440 MHz	26	2480 MHz



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.249

ANSI C63.10-2009

All test items have been performed and recorded as per the above standards.

NOTE: It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Doc)
The test report has been issued separately.

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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	E6420	9H12FS1	N/A
2	slide rheostat	N/A	100Ω	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:** 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCS30	100340	May 17,14	May 16,15
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	May 13,14	May 12,15
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	May 13,14	May 12,15
Test software	ADT	ADT_Conc_V 7.3.7	N/A	N/A	N/A

- NOTE:** 1. The test was performed at Shielded Room 553.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

4.1.3 TEST PROCEDURES

- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

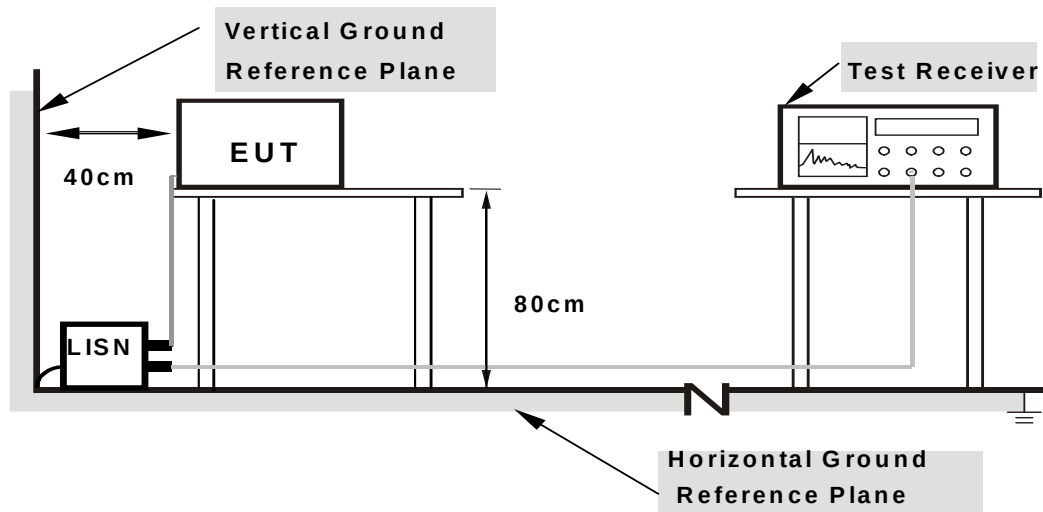
NOTE: All modes of operation were investigated and the worst-case emissions are reported.



4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80
from other units and other metal planes**

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

Set the EUT under transmission condition continuously at specific channel frequency.



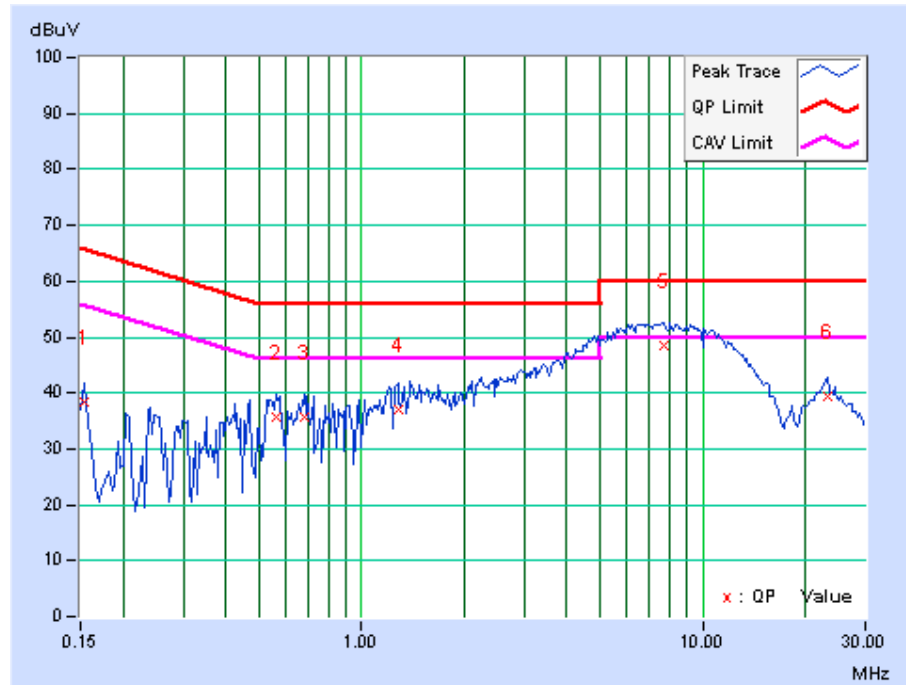
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA: Zigbee

PHASE	Line 1	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.84	27.60	15.66	38.44	26.50	65.79	55.79	-27.35	-29.29
2	0.56016	10.50	25.34	10.53	35.84	21.03	56.00	46.00	-20.16	-24.97
3	0.67734	10.43	25.38	11.47	35.81	21.90	56.00	46.00	-20.19	-24.10
4	1.28125	10.24	26.77	11.06	37.01	21.30	56.00	46.00	-18.99	-24.70
5	7.74219	10.17	38.20	26.19	48.37	36.36	60.00	50.00	-11.63	-13.64
6	23.12891	11.10	28.37	21.68	39.47	32.78	60.00	50.00	-20.53	-17.22

- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.





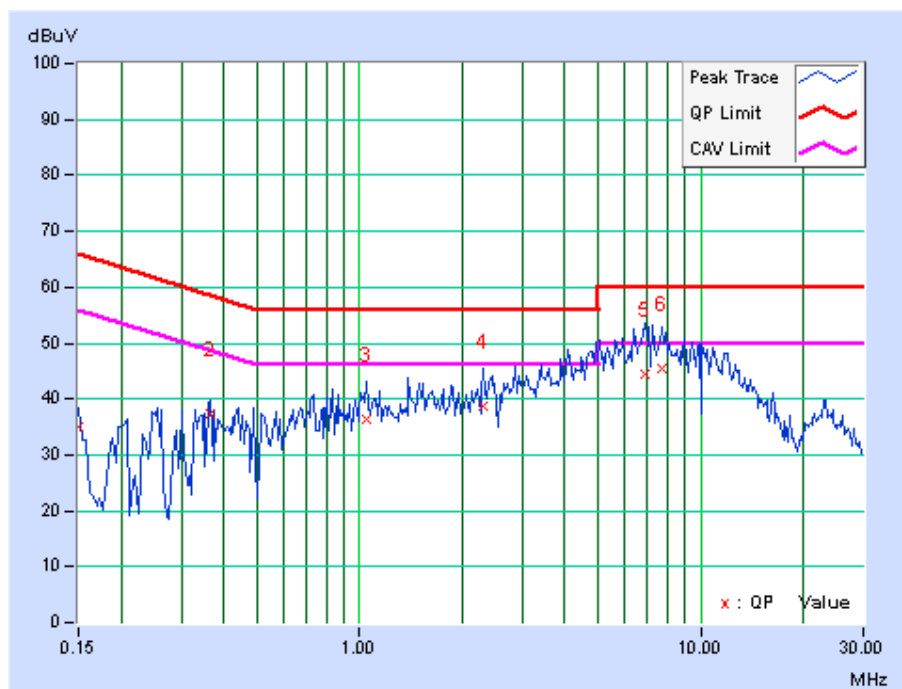
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Test Report No.: RF141009N036-2

PHASE	Neutral	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.65	24.51	16.31	35.16	26.96	66.00	56.00	-30.84	-29.04
2	0.36484	10.60	26.66	13.97	37.26	24.57	58.62	48.62	-21.35	-24.04
3	1.04297	10.16	26.26	13.35	36.42	23.51	56.00	46.00	-19.58	-22.49
4	2.30859	9.87	28.70	14.57	38.57	24.44	56.00	46.00	-17.43	-21.56
5	6.85156	10.09	34.49	24.03	44.58	34.12	60.00	50.00	-15.42	-15.88
6	7.73438	10.11	35.26	25.69	45.37	35.80	60.00	50.00	-14.63	-14.20

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



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4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
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

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	Agilent	E4446A	MY46180622	Apr. 29,14	Apr. 28,15
EMI Test Receiver	Rohde&Schwarz	ESVS10	841431/004	May 17,14	May 16,15
Loop antenna (9kHz~30MHz)	Daze	ZN30900A	0708	Dec. 05,14	Dec. 04,15
Bilog Antenna	Teseq	CBL 6111D	27089	Jun. 27, 14	Jun. 26, 15
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 30,14	May 29,16
Horn Antenna (15GHz-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170242	Feb. 13,14	Feb. 12,15
Pre-Amplifier (9kHz~1GHz)	SONOMA	310D	186955	Mar. 05,14	Mar. 04,15
Signal Amplifier	Agilent	8447D	2944A10488	Jun. 25,14	Jun. 24,15
Pre-Amplifier (100MHz-26.5GHz)	Agilent	8449B	3008A00409	May 13,14	May 12,15
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,14	Nov. 03,15
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Apr. 19,14	Apr. 18,15
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 30, 14	Oct. 29, 15
Test Software	ADT	ADT_Radiated V7.6.15.9.2	N/A	N/A	N/A

NOTE:

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GREGT/CHINA and NIM/CHINA.
3. The horn antenna are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 494399.



4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

NOTE:

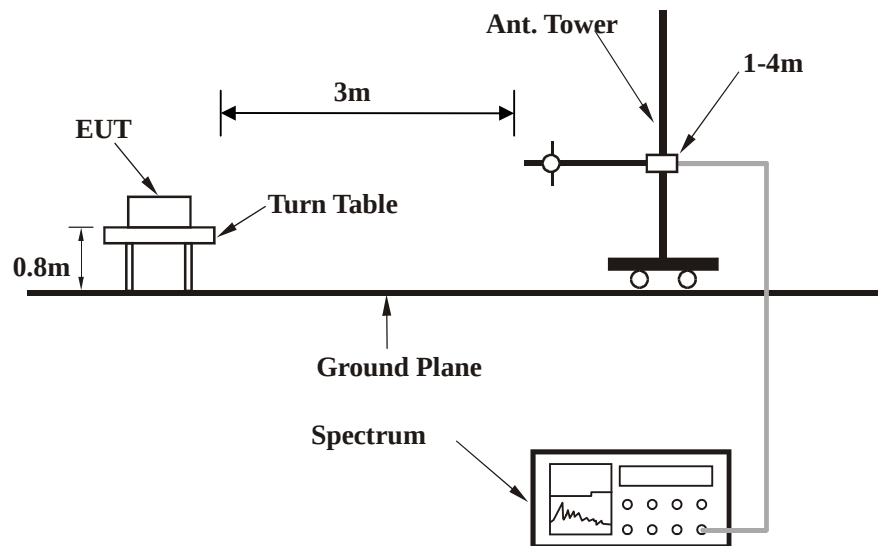
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.



4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

- Turned on the power of all equipment.
- EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.



4.2.7 TEST RESULTS

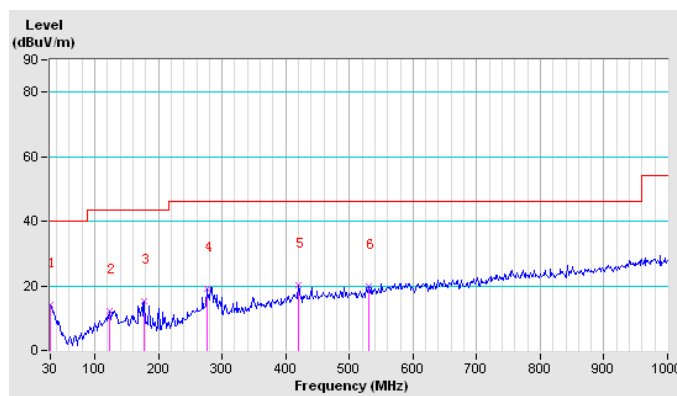
BELOW 1GHz WORST-CASE DATA

CHANNEL	18 Channel	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	30.00	14.2 QP	40.0	-25.8	1.00 H	0	-5.45	19.65
2	123.27	12.3 QP	43.5	-31.3	1.00 H	0	-1.40	13.65
3	177.68	15.4 QP	43.5	-28.1	1.00 H	0	3.84	11.54
4	275.61	19.0 QP	46.0	-27.0	1.00 H	0	3.36	15.62
5	420.18	20.4 QP	46.0	-25.6	1.00 H	0	-0.19	20.55
6	530.54	20.0 QP	46.0	-26.1	1.00 H	0	-2.19	22.14

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



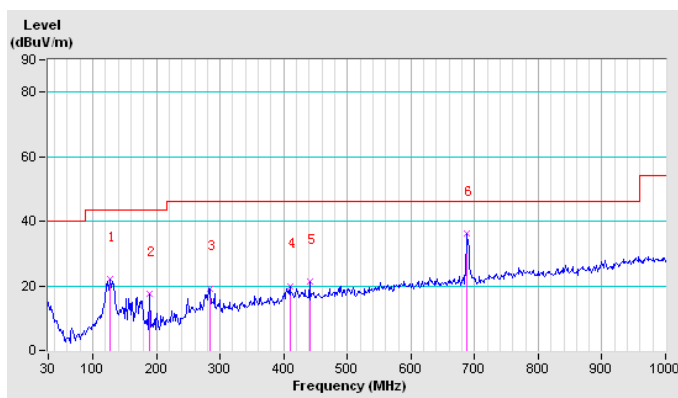


CHANNEL	18 Channel	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	127.93	22.0 QP	43.5	-21.5	1.00 V	0	8.12	13.87
2	188.56	17.7 QP	43.5	-25.8	1.00 V	0	7.21	10.46
3	283.38	19.2 QP	46.0	-26.8	1.00 V	0	3.58	15.66
4	409.29	20.0 QP	46.0	-26.0	1.00 V	0	-0.18	20.16
5	440.38	21.4 QP	46.0	-24.6	1.00 V	0	1.35	20.09
6	687.55	36.3 QP	46.0	-9.7	1.00 V	0	11.11	25.19

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.





ABOVE 1GHz WORST-CASE DATA:

CHANNEL	11 Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	62.2 PK	74.0	-11.8	1.21 H	121	25.99	36.21
2	2400.00	50.4 AV	54.0	-3.6	1.21 H	121	14.19	36.21
3	*2405.00	99.6 PK	114.0	-14.4	1.21 H	121	63.38	36.22
4	*2405.00	90.3 AV	94.0	-3.7	1.21 H	121	54.08	36.22
5	4810.00	55.3 PK	74.0	-18.7	1.00 H	42	15.61	39.69
6	4810.00	45.9 AV	54.0	-8.1	1.00 H	42	6.21	39.69
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	53.4 PK	74.0	-20.6	1.00 V	80	17.19	36.21
2	2400.00	41.5 AV	54.0	-12.5	1.00 V	80	5.29	36.21
3	*2405.00	94.3 PK	114.0	-19.7	1.00 V	80	58.08	36.22
4	*2405.00	89.7 AV	94.0	-4.3	1.00 V	80	53.48	36.22
5	4810.00	57.2 PK	74.0	-16.8	1.00 V	90	17.51	39.69
6	4810.00	48.2 AV	54.0	-5.8	1.00 V	90	8.51	39.69

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



CHANNEL	18 Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	98.5 PK	114.0	-15.5	1.20 H	116	62.23	36.27
2	*2440.00	90.4 AV	94.0	-3.6	1.20 H	116	54.13	36.27
3	4880.00	50.6 PK	74.0	-23.4	1.00 H	39	10.90	39.70
4	4880.00	40.0 AV	54.0	-14.0	1.00 H	39	0.30	39.70
5	7320.00	53.6 PK	74.0	-20.4	1.01 H	112	10.44	43.16
6	7320.00	43.0 AV	54.0	-11.0	1.01 H	112	-0.16	43.16
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	93.9 PK	114.0	-20.1	1.00 V	80	57.63	36.27
2	*2440.00	89.7 AV	94.0	-4.3	1.00 V	80	53.43	36.27
3	4880.00	52.7 PK	74.0	-21.3	1.02 V	175	13.00	39.70
4	4880.00	43.4 AV	54.0	-10.6	1.02 V	175	3.70	39.70
5	7320.00	56.4 PK	74.0	-17.6	1.00 V	26	13.24	43.16
6	7320.00	46.0 AV	54.0	-8.0	1.00 V	26	2.84	43.16

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



CHANNEL	26 Channel	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	95.7 PK	114.0	-18.3	1.21 H	114	59.38	36.32
2	*2480.00	90.9 AV	94.0	-3.1	1.21 H	114	54.58	36.32
3	2483.50	59.8 PK	74.0	-14.2	1.21 H	114	23.47	36.33
4	2483.50	50.8 AV	54.0	-3.2	1.21 H	114	14.47	36.33
5	4960.00	43.7 PK	74.0	-30.3	1.00 H	337	3.99	39.71
6	4960.00	30.9 AV	54.0	-23.1	1.00 H	337	-8.81	39.71
7	7440.00	47.1 PK	74.0	-26.9	1.00 H	0	4.04	43.06
8	7440.00	32.0 AV	54.0	-22.0	1.00 H	0	-11.06	43.06
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	87.0 PK	114.0	-27.0	1.00 V	133	50.68	36.32
2	*2480.00	84.1 AV	94.0	-9.9	1.00 V	133	47.78	36.32
3	2483.50	54.2 PK	74.0	-19.8	1.00 V	133	17.87	36.33
4	2483.50	43.1 AV	54.0	-10.9	1.00 V	133	6.77	36.33
5	4960.00	45.2 PK	74.0	-28.8	1.00 V	89	5.49	39.71
6	4960.00	34.8 AV	54.0	-19.2	1.00 V	89	-4.91	39.71
7	7440.00	47.6 PK	74.0	-26.4	1.00 V	360	4.54	43.06
8	7440.00	32.0 AV	54.0	-22.0	1.00 V	360	-11.06	43.06

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.



4.3 20dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer (10Hz–40GHz)	Rohde&Schwarz	FSV40	101003	Apr. 09,14	Apr. 08,15
Power Meter	Anritsu	ML2495A	1139001	Feb. 21,14	Feb. 20,15
Power Sensor	Anritsu	MA2411B	1126068	Feb. 21,14	Feb. 20,15
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 27,14	Oct. 26,15
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.04,14	Sep. 03,15
Oscilloscope	Agilent	DSO9254A	MY51260160	Oct. 17, 14	Oct. 16, 15
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 05,14	Nov. 04,15

NOTE:

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

4.3.3 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

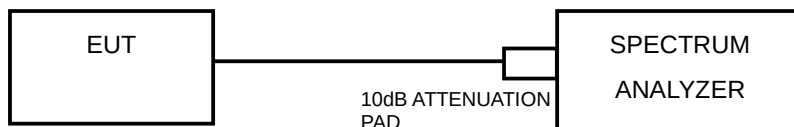


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4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

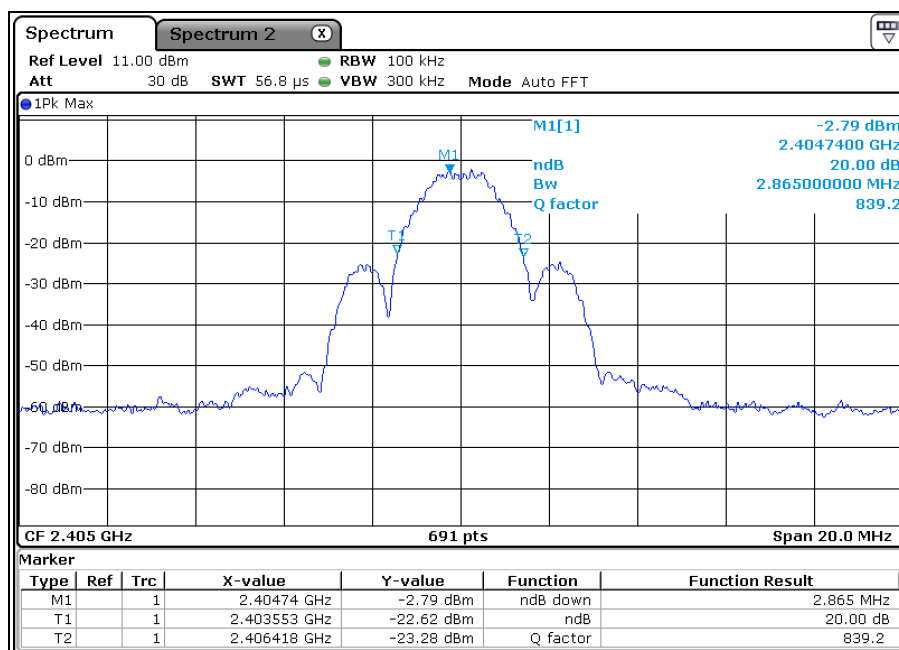
- a) Turned on the power of all equipment.
- b) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

4.3.7 TEST RESULTS

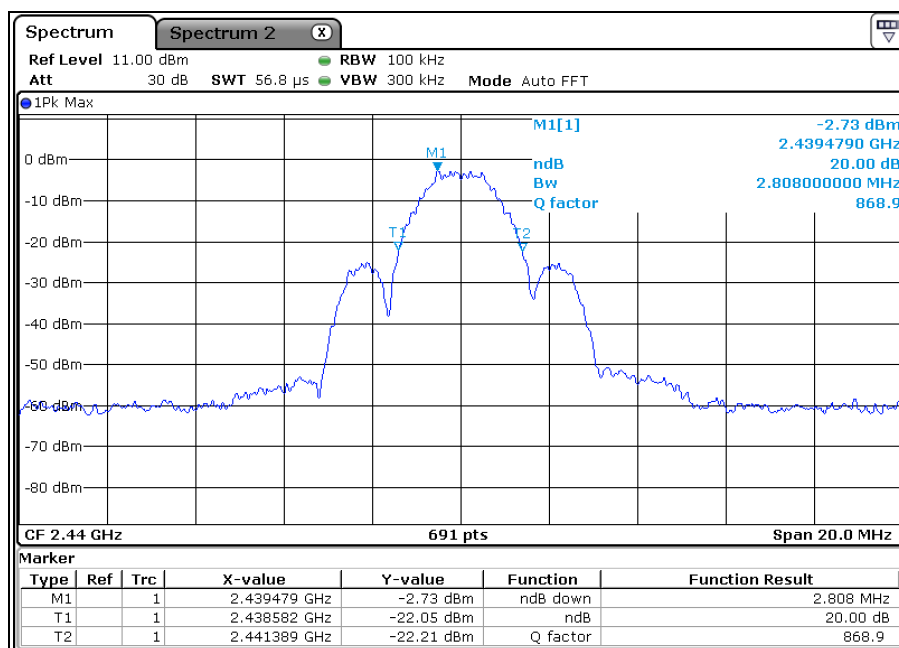
CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
11	2405	2.865
18	2440	2.808
26	2480	2.808



Test Data: 11 channel

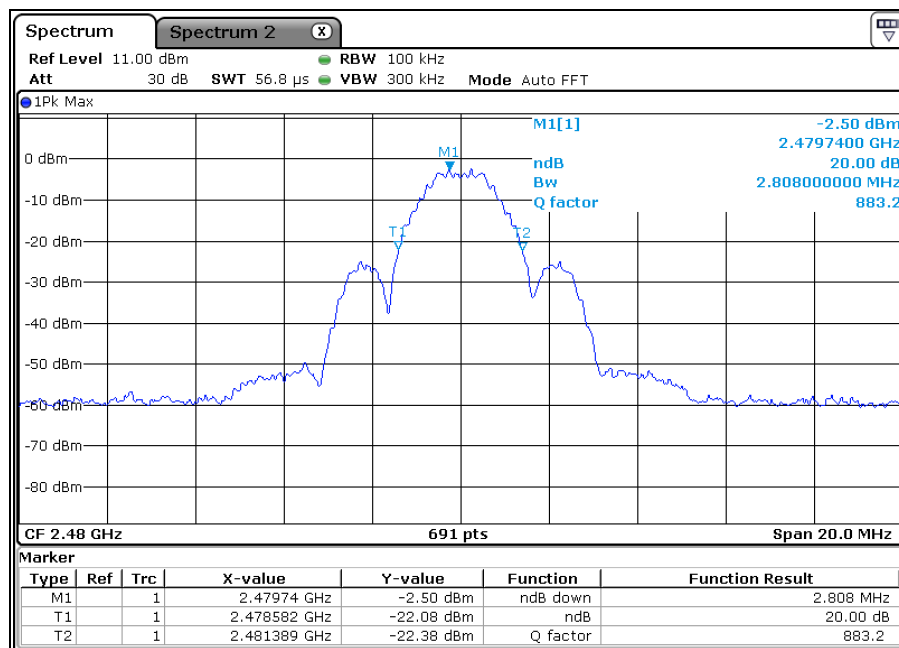


Test Data: 18 channel





Test Data: 26 channel





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5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



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6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---