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FCC TEST REPORT

REPORT NO.: RF130710C01
MODEL NO.: ZIRC
FCC ID: D87-SG-ZIRC3502
RECEIVED: Jul. 10, 2013
TESTED: Jul. 19 ~ Aug. 17, 2013
ISSUED: Aug. 19, 2013

APPLICANT : Sigma Designs, Inc

ADDRESS : 1778 McCarthy Blvd., Milpitas, California, United States, 95035

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130710C01	Original release	Aug. 19, 2013



1. CERTIFICATION

PRODUCT: Z-Wave & Infra Red Remote Control

MODEL NO.: ZIRC

BRAND: Sigma Designs

APPLICANT: Sigma Designs, Inc

TESTED: Jul. 19 ~ Aug. 17, 2013

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: FCC Part 15, Subpart C (Section 15.249)

ANSI C63.10-2009

The above equipment (model: ZIRC) have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Ivy Lin , **DATE:** Aug. 19, 2013
Ivy Lin / Specialist

APPROVED BY : Ken Liu , **DATE:** Aug. 19, 2013
Ken Liu / Senior Manager



2. 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 PARAGRAPH	TEST TYPE	RESULT	REMARK
15.207	Conducted Emission Test	NA	Power from battery
15.209 15.249	Radiated Emission Test Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 908.42MHz.

2.1 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
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

EUT	Z-Wave & Infra Red Remote Control
MODEL NO.	ZIRC
POWER SUPPLY	3Vdc
MODULATION TYPE	2FSK (9.6kbps) / 2GFSK (40Kbps, 100Kbps)
DATA RATE	9.6Kbps, 40Kbps, 100Kbps
OPERATING FREQUENCY	908.42MHz, 908.4MHz, 916MHz
NUMBER OF CHANNEL	3
ANTENNA TYPE	PCB antenna
DATA CABLE	NA
I/O PORT	Refer to User's Manual
ACCESSORY DEVICES	NA

NOTE:

The above EUT information is declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.



3.2 DESCRIPTION OF TEST MODES

3 channels are provided to this EUT.

CHANNEL	FREQ. (MHz)	DATA RATE
1	908.42	9.6kbps
2	908.40	40kbps
3	916.00	100kbps

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO			DESCRIPTION
	RE \geq 1G	RE<1G	PLC	
-	√	√	NOTE 2	

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

NOTE:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. No need to concern of Conducted Emission due to the EUT is powered by battery.

RADIATED EMISSION TEST (ABOVE 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

TESTED CHANNEL	OPERATING FREQUENCY	MODULATION TYPE
1	908.42MHz	2FSK
2	908.40MHz	2GFSK
3	916.00MHz	2GFSK

RADIATED EMISSION TEST (BELOW 1 GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

TESTED CHANNEL	OPERATING FREQUENCY	MODULATION TYPE
1	908.42MHz	2FSK
2	908.40MHz	2GFSK
3	916.00MHz	2GFSK

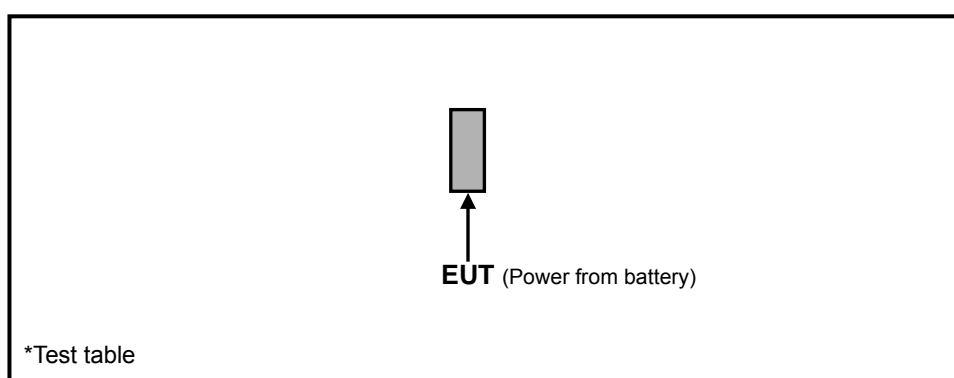
TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE \geq 1G	20deg. C, 68%RH	3Vdc	Brad Tung
RE<1G	20deg. C, 68%RH	3Vdc	Brad Tung

3.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST





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3.4 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: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. 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.

4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 ~ 928 MHz	50	500
2400 ~ 2483.5 MHz	50	500
5725 ~ 5875 MHz	50	500
24 ~ 24.25 GHz	250	2500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits as below table, whichever is the lesser attenuation

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

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.

4.1.2 TEST INSTRUMENTS

Test date: Jul. 19, 2013

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 16, 2012	Nov. 15, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jan. 28, 2013	Jan. 27, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Mar. 22, 2013	Mar. 21, 2014
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-209	Sep. 03, 2012	Sep. 02, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 25, 2013	Dec. 24, 2014
Preamplifier Agilent	8449B	3008A01911	Oct. 25, 2012	Oct. 24, 2013
Preamplifier Agilent	8447D	2944A10638	Oct. 25, 2012	Oct. 24, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295013/4 283403/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Aug. 11, 2012	Aug. 10, 2013
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn Table Controller EMCO	2090	NA	NA	NA

- 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 test was performed in HwaYa Chamber 9.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 215374.
 5. The IC Site Registration No. is IC 7450F-9.

4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter 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.

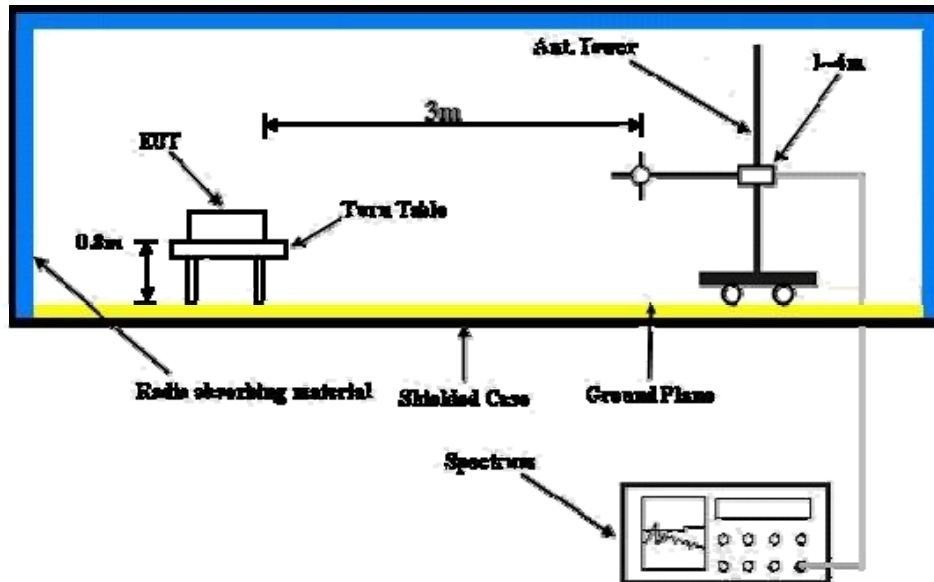
NOTE:

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 1kHz(Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. 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



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

4.1.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on a testing table.
- b. Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 TEST RESULTS

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1 (908.42MHz)	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	*908.42	93.6 PK	114.0	-20.4	1.53 H	147	66.70	26.90
2	*908.42	93.0 AV	94.0	-1.0	1.53 H	147	66.10	26.90
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	*908.42	90.4 PK	114.0	-23.6	1.55 V	180	63.50	26.90
2	*908.42	90.0 AV	94.0	-4.0	1.55 V	180	63.10	26.90

- 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) – Pre-Amplifier Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “ : Fundamental frequency

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2 (908.40MHz)	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	*908.40	92.9 PK	114.0	-21.1	1.56 H	152	66.00	26.90
2	*908.40	92.6 AV	94.0	-1.4	1.56 H	152	26.90	26.90
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	*908.40	89.6 PK	114.0	-24.4	1.60 V	182	62.70	26.90
2	*908.40	89.9 AV	94.0	-4.1	1.60 V	182	63.00	26.90

- 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) – Pre-Amplifier Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * ” : Fundamental frequency

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3 (916.00MHz)	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	*916.00	93.0 PK	114.0	-21.0	1.53 H	148	66.00	27.00
2	*916.00	92.8 AV	94.0	-1.2	1.53 H	148	65.80	27.00
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	*916.00	90.0 PK	114.0	-24.0	1.61 V	177	63.00	27.00
2	*916.00	89.8 AV	94.0	-4.2	1.61 V	177	62.80	27.00

- 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) – Pre-Amplifier Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “ : Fundamental frequency

ABOVE 1GHz DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1 (908.42MHz)	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	1816.84	40.6 PK	74.0	-33.4	1.05 H	21	45.50	-4.90
2	1816.84	30.3 AV	54.0	-23.7	1.05 H	21	35.20	-4.90
3	2725.26	51.0 PK	74.0	-23.0	1.70 H	19	52.00	-1.00
4	2725.26	47.3 AV	54.0	-6.7	1.70 H	19	48.30	-1.00
5	3633.68	49.4 PK	74.0	-24.6	1.00 H	250	47.20	2.20
6	3633.68	36.1 AV	54.0	-17.9	1.00 H	250	33.90	2.20
7	4542.10	55.4 PK	74.0	-18.6	1.00 H	128	51.40	4.00
8	4542.10	44.9 AV	54.0	-9.1	1.00 H	128	40.90	4.00
9	5450.52	53.1 PK	74.0	-20.9	1.00 H	27	46.90	6.20
10	5450.52	39.7 AV	54.0	-14.3	1.00 H	27	33.50	6.20
11	6358.94	53.6 PK	74.0	-20.4	1.11 H	28	46.90	6.70
12	6358.94	43.6 AV	54.0	-10.4	1.11 H	28	36.90	6.70
13	7267.36	54.9 PK	74.0	-19.1	1.00 H	29	45.90	9.00
14	7267.36	41.9 AV	54.0	-12.1	1.00 H	29	32.90	9.00
15	8175.78	57.9 PK	74.0	-16.1	1.11 H	266	47.50	10.40
16	8175.78	45.3 AV	54.0	-8.7	1.11 H	266	34.90	10.40
17	9084.20	57.4 PK	74.0	-16.6	1.00 H	256	46.10	11.30
18	9084.20	44.4 AV	54.0	-9.6	1.00 H	256	33.10	11.30
19	9992.62	57.9 PK	74.0	-16.1	1.10 H	5	46.00	11.90
20	9992.62	47.1 AV	54.0	-6.9	1.10 H	5	35.20	11.90

- 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) – Pre-Amplifier Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1 (908.42MHz)	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	1816.84	41.0 PK	74.0	-33.0	1.00 V	244	45.90	-4.90
2	1816.84	28.3 AV	54.0	-25.7	1.00 V	244	33.20	-4.90
3	2725.26	51.4 PK	74.0	-22.6	1.05 V	108	52.40	-1.00
4	2725.26	47.5 AV	54.0	-6.5	1.05 V	108	48.50	-1.00
5	3633.68	48.8 PK	74.0	-25.2	1.00 V	21	46.60	2.20
6	3633.68	35.6 AV	54.0	-18.4	1.00 V	21	33.40	2.20
7	4542.10	50.9 PK	74.0	-23.1	1.19 V	64	46.90	4.00
8	4542.10	42.0 AV	54.0	-12.0	1.19 V	64	38.00	4.00
9	5450.52	52.4 PK	74.0	-21.6	1.00 V	66	46.20	6.20
10	5450.52	39.4 AV	54.0	-14.6	1.00 V	66	33.20	6.20
11	6358.94	55.4 PK	74.0	-18.6	1.00 V	109	48.70	6.70
12	6358.94	49.6 AV	54.0	-4.4	1.00 V	109	42.90	6.70
13	7267.36	54.9 PK	74.0	-19.1	1.00 V	225	45.90	9.00
14	7267.36	42.2 AV	54.0	-11.8	1.00 V	225	33.20	9.00
15	8175.78	57.3 PK	74.0	-16.7	1.22 V	328	46.90	10.40
16	8175.78	49.0 AV	54.0	-5.0	1.22 V	328	38.60	10.40
17	9084.20	56.8 PK	74.0	-17.2	1.00 V	150	45.50	11.30
18	9084.20	43.5 AV	54.0	-10.5	1.00 V	150	32.20	11.30
19	9992.62	62.3 PK	74.0	-11.7	1.00 V	6	50.40	11.90
20	9992.62	48.4 AV	54.0	-5.6	1.00 V	6	36.50	11.90

- 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)
– Pre-Amplifier Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2 (908.40MHz)	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	1816.80	40.2 PK	74.0	-33.8	1.00 H	33	45.10	-4.90
2	1816.80	30.0 AV	54.0	-24.0	1.00 H	33	34.90	-4.90
3	2725.20	50.6 PK	74.0	-23.4	1.65 H	20	51.60	-1.00
4	2725.20	47.0 AV	54.0	-7.0	1.65 H	20	48.00	-1.00
5	3633.60	49.0 PK	74.0	-25.0	1.00 H	300	46.80	2.20
6	3633.60	35.8 AV	54.0	-18.2	1.00 H	300	33.60	2.20
7	4542.00	55.0 PK	74.0	-19.0	1.00 H	255	51.00	4.00
8	4542.00	44.4 AV	54.0	-9.6	1.00 H	255	40.40	4.00
9	5450.40	52.8 PK	74.0	-21.2	1.00 H	53	46.60	6.20
10	5450.40	39.4 AV	54.0	-14.6	1.00 H	53	33.20	6.20
11	6358.80	53.1 PK	74.0	-20.9	1.11 H	63	46.40	6.70
12	6358.80	43.3 AV	54.0	-10.7	1.11 H	63	36.60	6.70
13	7267.20	54.1 PK	74.0	-19.9	1.00 H	100	45.10	9.00
14	7267.20	41.2 AV	54.0	-12.8	1.00 H	100	32.20	9.00
15	8175.60	57.3 PK	74.0	-16.7	1.08 H	30	46.90	10.40
16	8175.60	45.1 AV	54.0	-8.9	1.08 H	30	34.70	10.40
17	9084.00	57.2 PK	74.0	-16.8	1.00 H	240	45.90	11.30
18	9084.00	44.1 AV	54.0	-9.9	1.00 H	240	32.80	11.30
19	9992.40	57.5 PK	74.0	-16.5	1.10 H	0	45.60	11.90
20	9992.40	47.0 AV	54.0	-7.0	1.10 H	0	35.10	11.90

- 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) – Pre-Amplifier Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2 (908.40MHz)	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	1816.80	40.8 PK	74.0	-33.2	1.00 V	250	45.70	-4.90
2	1816.80	28.0 AV	54.0	-26.0	1.00 V	250	32.90	-4.90
3	2725.20	51.0 PK	74.0	-23.0	1.05 V	111	52.00	-1.00
4	2725.20	47.0 AV	54.0	-7.0	1.05 V	111	48.00	-1.00
5	3633.60	48.0 PK	74.0	-26.0	1.00 V	30	45.80	2.20
6	3633.60	35.1 AV	54.0	-18.9	1.00 V	30	32.90	2.20
7	4542.00	50.5 PK	74.0	-23.5	1.22 V	66	46.50	4.00
8	4542.00	41.6 AV	54.0	-12.4	1.22 V	66	37.60	4.00
9	5450.40	52.1 PK	74.0	-21.9	1.00 V	102	45.90	6.20
10	5450.40	39.2 AV	54.0	-14.8	1.00 V	102	33.00	6.20
11	6358.80	55.1 PK	74.0	-18.9	1.00 V	130	48.40	6.70
12	6358.80	49.3 AV	54.0	-4.7	1.00 V	130	42.60	6.70
13	7267.20	54.6 PK	74.0	-19.4	1.00 V	199	45.60	9.00
14	7267.20	42.0 AV	54.0	-12.0	1.00 V	199	33.00	9.00
15	8175.60	57.0 PK	74.0	-17.0	1.19 V	20	46.60	10.40
16	8175.60	48.8 AV	54.0	-5.2	1.19 V	20	38.40	10.40
17	9084.00	56.4 PK	74.0	-17.6	1.00 V	142	45.10	11.30
18	9084.00	43.3 AV	54.0	-10.7	1.00 V	142	32.00	11.30
19	9992.40	62.2 PK	74.0	-11.8	1.00 V	10	50.30	11.90
20	9992.40	48.2 AV	54.0	-5.8	1.00 V	10	36.30	11.90

- 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) – Pre-Amplifier Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3 (916.00MHz)	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	1832.00	40.2 PK	74.0	-33.8	1.00 H	42	44.90	-4.70
2	1832.00	30.0 AV	54.0	-24.0	1.00 H	42	34.70	-4.70
3	2748.00	50.6 PK	74.0	-23.4	1.70 H	40	51.70	-1.10
4	2748.00	47.0 AV	54.0	-7.0	1.70 H	40	48.10	-1.10
5	3664.00	49.0 PK	74.0	-25.0	1.00 H	312	46.60	2.40
6	3664.00	35.8 AV	54.0	-18.2	1.00 H	312	33.40	2.40
7	4580.00	55.0 PK	74.0	-19.0	1.00 H	263	50.90	4.10
8	4580.00	44.4 AV	54.0	-9.6	1.00 H	263	40.30	4.10
9	5496.00	52.8 PK	74.0	-21.2	1.00 H	64	46.50	6.30
10	5496.00	39.4 AV	54.0	-14.6	1.00 H	64	33.10	6.30
11	6412.00	53.1 PK	74.0	-20.9	1.14 H	70	46.30	6.80
12	6412.00	43.3 AV	54.0	-10.7	1.14 H	70	36.50	6.80
13	7328.00	54.1 PK	74.0	-19.9	1.00 H	203	44.90	9.20
14	7328.00	41.2 AV	54.0	-12.8	1.00 H	203	32.00	9.20
15	8244.00	57.3 PK	74.0	-16.7	1.06 H	32	46.90	10.40
16	8244.00	45.1 AV	54.0	-8.9	1.06 H	32	34.70	10.40
17	9160.00	57.2 PK	74.0	-16.8	1.00 H	300	46.00	11.20
18	9160.00	44.1 AV	54.0	-9.9	1.00 H	300	32.90	11.20
19	10076.00	57.5 PK	74.0	-16.5	1.10 H	215	45.60	11.90
20	10076.00	47.0 AV	54.0	-7.0	1.10 H	215	35.10	11.90

- 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) – Pre-Amplifier Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3 (916.00MHz)	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	1832.00	40.5 PK	74.0	-33.5	1.00 V	260	45.20	-4.70
2	1832.00	28.1 AV	54.0	-25.9	1.00 V	260	32.80	-4.70
3	2748.00	51.1 PK	74.0	-22.9	1.05 V	130	52.20	-1.10
4	2748.00	47.1 AV	54.0	-6.9	1.05 V	130	48.20	-1.10
5	3664.00	48.1 PK	74.0	-25.9	1.00 V	54	45.70	2.40
6	3664.00	35.0 AV	54.0	-19.0	1.00 V	54	32.60	2.40
7	4580.00	50.4 PK	74.0	-23.6	1.18 V	100	46.30	4.10
8	4580.00	41.4 AV	54.0	-12.6	1.18 V	100	37.30	4.10
9	5496.00	51.6 PK	74.0	-22.4	1.00 V	86	45.30	6.30
10	5496.00	39.1 AV	54.0	-14.9	1.00 V	86	32.80	6.30
11	6412.00	55.0 PK	74.0	-19.0	1.00 V	214	48.20	6.80
12	6412.00	49.5 AV	54.0	-4.5	1.00 V	214	42.70	6.80
13	7328.00	54.8 PK	74.0	-19.2	1.00 V	203	45.60	9.20
14	7328.00	42.2 AV	54.0	-11.8	1.00 V	203	33.00	9.20
15	8244.00	57.1 PK	74.0	-16.9	1.20 V	16	46.70	10.40
16	8244.00	48.5 AV	54.0	-5.5	1.20 V	16	38.10	10.40
17	9160.00	56.3 PK	74.0	-17.7	1.00 V	150	45.10	11.20
18	9160.00	48.3 AV	54.0	-5.7	1.00 V	150	37.10	11.20
19	10076.00	62.7 PK	74.0	-11.3	1.00 V	30	50.80	11.90
20	10076.00	43.5 AV	54.0	-10.5	1.00 V	30	31.60	11.90

- 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) – Pre-Amplifier Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.

BELOW 1GHz WORST-CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1 (908.42MHz)	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	142.52	31.8 QP	43.5	-11.7	1.50 H	266	46.10	-14.30
2	198.78	31.3 QP	43.5	-12.2	1.50 H	258	48.00	-16.70
3	266.68	36.9 QP	46.0	-9.1	2.00 H	274	50.60	-13.70
4	379.20	28.2 QP	46.0	-17.8	1.25 H	209	39.20	-11.00
5	450.98	29.8 QP	46.0	-16.2	1.00 H	8	39.00	-9.20
6	528.58	31.6 QP	46.0	-14.4	1.50 H	201	39.60	-8.00
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	99.84	24.6 QP	43.5	-18.9	1.00 V	172	43.40	-18.80
2	198.78	23.5 QP	43.5	-20.0	1.00 V	10	40.20	-16.70
3	266.68	27.0 QP	46.0	-19.0	2.00 V	193	40.70	-13.70
4	371.44	27.6 QP	46.0	-18.4	1.25 V	226	38.60	-11.00
5	450.98	30.1 QP	46.0	-15.9	1.25 V	33	39.30	-9.20
6	528.58	29.1 QP	46.0	-16.9	1.50 V	226	37.10	-8.00

- 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) – Pre-Amplifier Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2 (908.40MHz)	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	142.52	31.5 QP	43.5	-12.0	1.00 H	252	45.80	-14.30
2	198.78	31.8 QP	43.5	-11.7	1.49 H	257	48.50	-16.70
3	231.76	32.8 QP	46.0	-13.2	1.00 H	260	48.60	-15.80
4	264.74	37.7 QP	46.0	-8.3	1.00 H	271	51.50	-13.80
5	371.44	27.3 QP	46.0	-18.7	1.00 H	230	38.30	-11.00
6	528.58	31.3 QP	46.0	-14.7	1.49 H	197	39.30	-8.00
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	99.84	23.8 QP	43.5	-19.7	1.25 V	161	42.60	-18.80
2	198.78	23.6 QP	43.5	-19.9	1.00 V	16	40.30	-16.70
3	266.68	27.4 QP	46.0	-18.6	1.50 V	209	41.10	-13.70
4	377.26	27.1 QP	46.0	-18.9	2.00 V	233	38.20	-11.10
5	450.98	31.7 QP	46.0	-14.3	1.00 V	60	40.90	-9.20
6	528.58	29.7 QP	46.0	-16.3	1.50 V	220	37.70	-8.00

- 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)
– Pre-Amplifier Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3 (916.00MHz)	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	142.52	30.7 QP	43.5	-12.8	1.00 H	275	45.00	-14.30
2	198.78	32.8 QP	43.5	-10.7	1.50 H	272	49.50	-16.70
3	231.76	33.6 QP	46.0	-12.4	2.00 H	262	49.40	-15.80
4	264.74	38.8 QP	46.0	-7.2	1.01 H	268	52.60	-13.80
5	371.44	28.2 QP	46.0	-17.8	1.25 H	214	39.20	-11.00
6	528.58	31.5 QP	46.0	-14.5	1.50 H	192	39.50	-8.00
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	99.84	24.4 QP	43.5	-19.1	1.25 V	36	43.20	-18.80
2	142.52	22.7 QP	43.5	-20.8	1.00 V	49	37.00	-14.30
3	198.78	24.5 QP	43.5	-19.0	1.50 V	4	41.20	-16.70
4	266.68	27.7 QP	46.0	-18.3	1.00 V	195	41.40	-13.70
5	369.50	28.0 QP	46.0	-18.0	2.00 V	226	39.10	-11.10
6	528.58	28.6 QP	46.0	-17.4	1.25 V	225	36.60	-8.00

- 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)
– Pre-Amplifier Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.

4.2 BAND EDGE MEASUREMENT

4.2.1 LIMITS OF BAND EDGE MEASUREMENT

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 ~ 928 MHz	50	500
2400 ~ 2483.5 MHz	50	500
5725 ~ 5875 MHz	50	500
24 ~ 24.25 GHz	250	2500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits as below table, whichever is the lesser attenuation

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. 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

Test date: Aug. 17, 2013

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 16, 2012	Nov. 15, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jan. 28, 2013	Jan. 27, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Mar. 22, 2013	Mar. 21, 2014
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-209	Sep. 03, 2012	Sep. 02, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8449B	3008A01911	Oct. 25, 2012	Oct. 24, 2013
Preamplifier Agilent	8447D	2944A10638	Oct. 25, 2012	Oct. 24, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295013/4 283403/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Aug. 11, 2013	Aug. 10, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn Table Controller EMCO	2090	NA	NA	NA

- 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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
 3. The test was performed in HwaYa Chamber 9.
 4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 5. The FCC Site Registration No. is 215374.
 6. The IC Site Registration No. is IC 7450F-9.

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 meter 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.

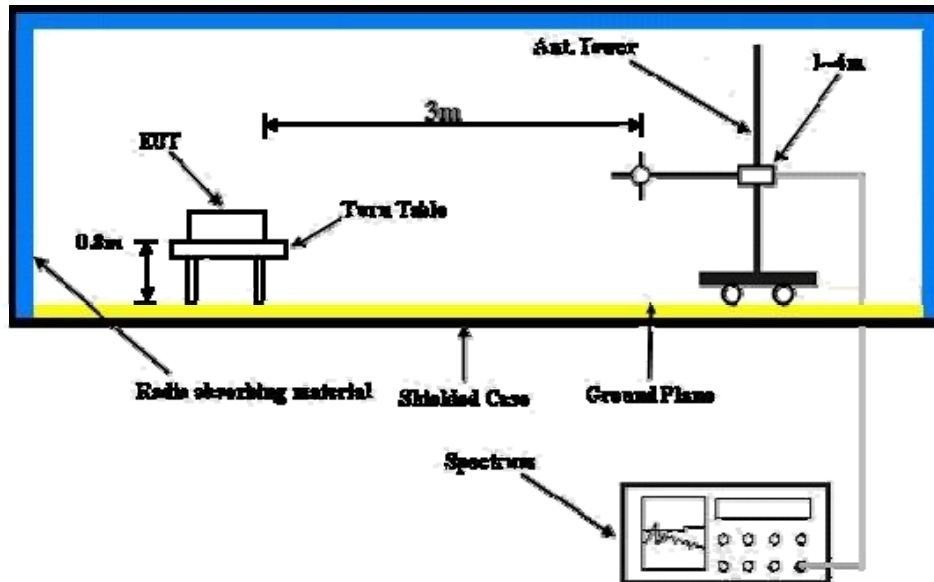
NOTE:

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 1kHz(Duty cycle < 98%) or 10Hz(Duty cycle > 98%) 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

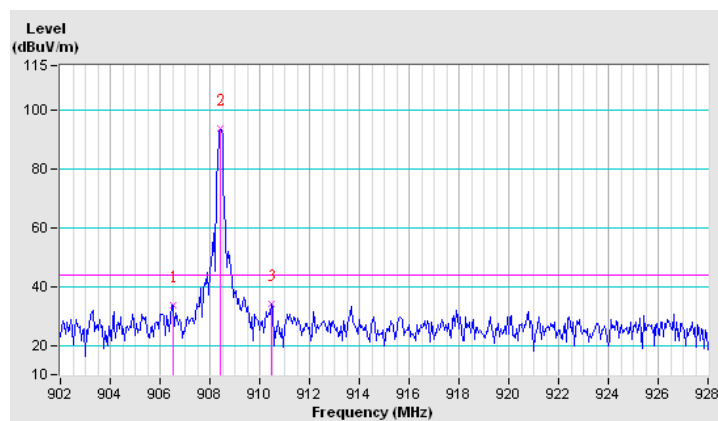
- a. Placed the EUT on a testing table.
- b. Set the EUT under transmission condition continuously at specific channel frequency.

4.2.7 TEST RESULTS

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1 (908.42MHz)	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	906.52	33.8 PK	43.6	-9.8	1.05 H	75	7.00	26.80
2	*908.42	93.6 PK			-	-	66.70	26.90
3	910.48	34.2 PK	43.6	-9.4	1.00 H	244	7.30	26.90

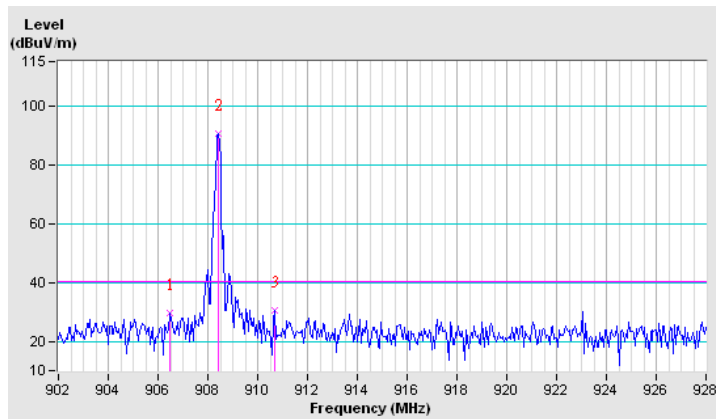
- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1 (908.42MHz)	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	906.47	29.4 PK	40.4	-11.0	1.02 V	245	2.60	26.80
2	*908.42	90.4 PK			-	-	63.50	26.90
3	910.68	30.3 PK	40.4	-10.1	1.00 V	44	3.40	26.90

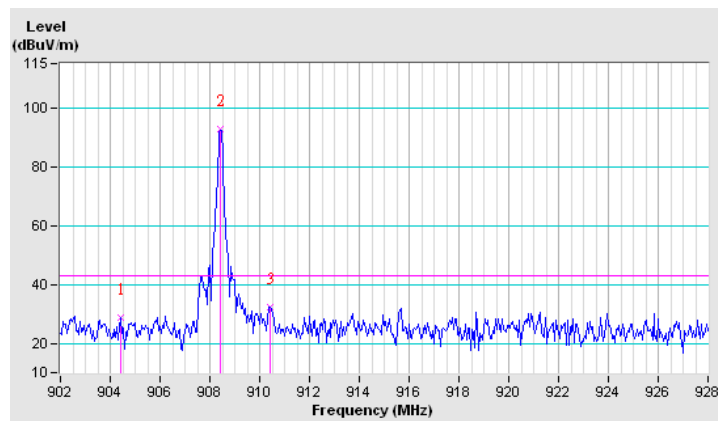
- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2 (908.40MHz)	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	904.44	28.7 PK	42.9	-14.2	1.10 H	32	2.00	26.70
2	*908.40	92.9 PK			-	-	66.00	26.90
3	910.42	32.3 PK	42.9	-10.6	1.08 H	50	5.40	26.90

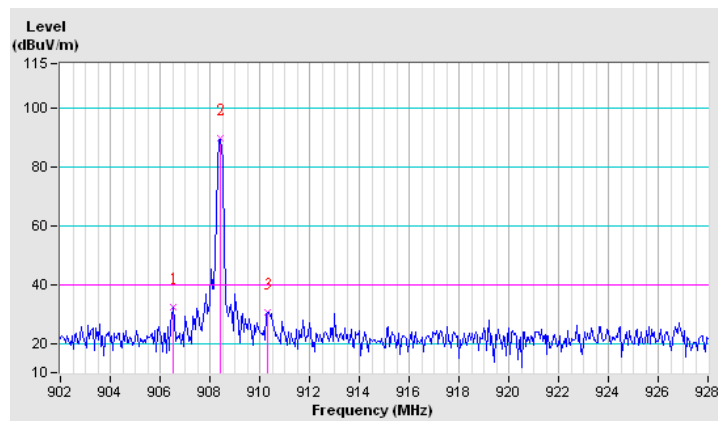
- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2 (908.40MHz)	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	906.52	32.2 PK	39.6	-7.4	1.23 V	80	5.40	26.80
2	*908.40	89.6 PK			-	-	62.70	26.90
3	910.32	30.5 PK	39.6	-9.1	1.09 V	17	3.60	26.90

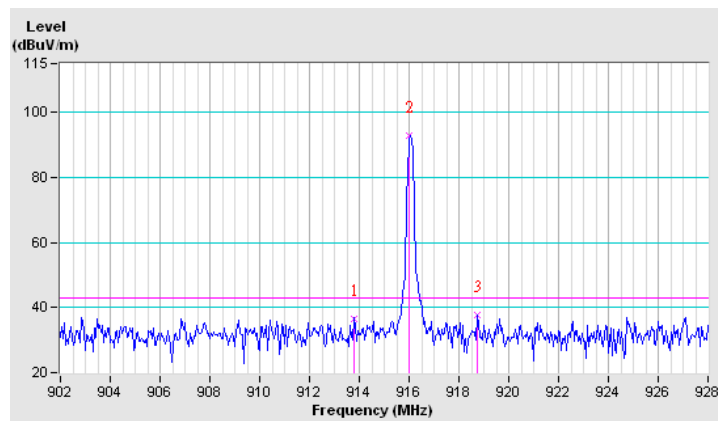
- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3 (916.00MHz)	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	913.80	36.7 PK	43.0	-6.3	1.00 H	2	9.80	26.90
2	*916.00	93.0 PK			-	-	66.00	27.00
3	918.74	37.6 PK	43.0	-5.4	1.00 H	31	10.50	27.10

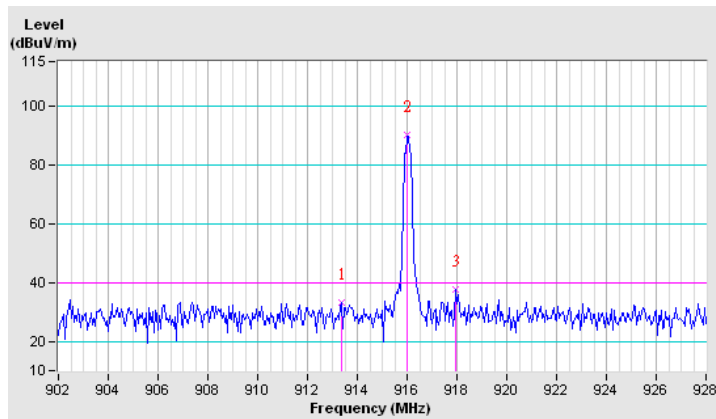
- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3 (916.00MHz)	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3Vdc	DETECTOR FUNCTION	Peak (PK)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH	TESTED BY	Brad Tung

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	913.39	33.0 PK	40.0	-7.0	1.00 V	126	6.10	26.90
2	*916.00	90.0 PK			-	-	63.00	27.00
3	917.96	37.7 PK	40.0	-2.3	1.07 V	86	10.70	27.00

- 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) – Pre-Amplifier Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “ : Fundamental frequency





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5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

7. 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.

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