TEST REPORT

Applicant	VOXLAND
Address	BP70119 – 13307 Marseille CEDEX 14

Manufacturer or Supplier	Zhongshan K-mate General Electronics Co.,Ltd
Address	B1 Building,Fuwan Ind.Zone,Fuwan Nan Road,East District, Zhongshan, China
Product	Bluetooth Stereo Headset
Brand Name	BeeWi
Model	BBH300
Additional Model & Model Difference	See section 3.1
Date of tests	Aug. 04 ~Oct. 8, 2012

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

☒ **FCC Part 15, Subpart C (Section 15.249)**

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

Prepared by Grace Ren Project Engineer / EMC Department	Approved by Sam Tung Manager / EMC Department
Grace	Date: Oct. 9, 2012

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	N/A	Oct. 9, 2012

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	Compliant
§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	2.44dB
Radiated emissions	30MHz ~ 200MHz	3.19dB
	200MHz ~1000MHz	3.21dB
	1GHz ~ 18GHz	2.26dB
	18GHz ~ 40GHz	1.94dB

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	Bluetooth Stereo Headset
MODEL NO.	BBH300
ADDITIONAL MODEL	BBH300-A00,BBH300-A10
FCC ID	ZKI-BBH300
NOMINAL VOLTAGE	DC 3.7V by battery or DC 5V by USB
MODULATION TECHNOLOGY	FHSS
OPERATING FREQUENCY	2402-2480MHz
ANTENNA TYPE	Integral PCB Antenna with gain 0dBi
I/O PORTS	USB port, Line in port
DATA CABLE SUPPLIED	USB cable: Unshielded, Detachable,1.2m Audio cable: Unshielded, Detachable,0.8m

NOTE:

1. The EUT was powered by the following adapter:

ADAPTER	
BRAND:	N/A
MODEL:	SKB0500500P
INPUT:	AC 100-240V 50-60Hz,0.3A
OUTPUT:	DC 5V/0.5A
USB LINE:	Unshielded,Detachable,1.2m

2. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

3. The two additional models of products are identical with the test model BBH300 except the model names and the colour of products.

4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3.2 DESCRIPTION OF TEST MODES

The EUT was tested under the following modes, and the final worst mode was marked in boldface and recorded in this report.

◆ **Conducted Emission Test**

Test Modes
Charging with PC+ Bluetooth
Charging with adapter+ Bluetooth HiFi System

◆ **Radiated Emission Test**

Test Modes
battery
Charging with PC+ Bluetooth
Charging with adapter+ Bluetooth HiFi System

Following channels were selected for the test as listed below.

TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE	PACKET TYPE
Low, Middle, High	FHSS	GFSK	1M	DH1/3/5
Low, Middle, High	FHSS	π/4 DPSK	2M	DH1/3/5
Low, Middle, High	FHSS	8DPSK	3M	DH1/3/5

CHANNEL NUMBER	TESTED CHANNEL	TESTED FREQUENCY
0	Low	2402 MHz
39	Middle	2441 MHz
78	High	2480 MHz

After estimating all the combination of every test mode, the result shown as below is the worst case

TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE	PACKET TYPE
Low, Middle, High	FHSS	GFSK	1M	DH5

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 (15.249)

ANSI C63.4-2003

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 (Verification). 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.

For Conducted Emission test:

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Iphone4	Apple	A1332	81124KCJA4S	N/A

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

For Radiated Emission test:

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Bluetooth Tester	R&S	CBT32	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC line:Shielded,Detachable,1.8m

4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
EMI Test Receiver Rohde&Schwarz	ESU 26	100005	May 15,12	May 14,13
Artificial Mains Network Rohde&Schwarz	ENV216	101173	May 15,12	May 14,13
Artificial Mains Network Rohde&Schwarz	ESH2-Z5	100071	May 15,12	May 14,13
Test software	ADT_Cond_V7.3.7	N/A	N/A	N/A

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA

2. The test was performed in Dongguan Shielded Room 553.

4.1.3 TEST PROCEDURES

a. 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.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

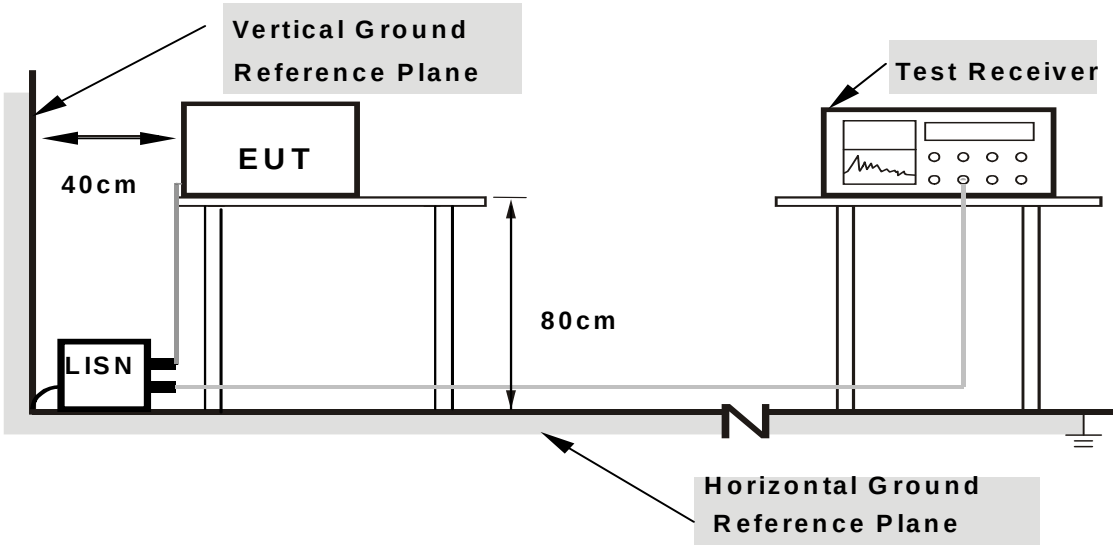
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

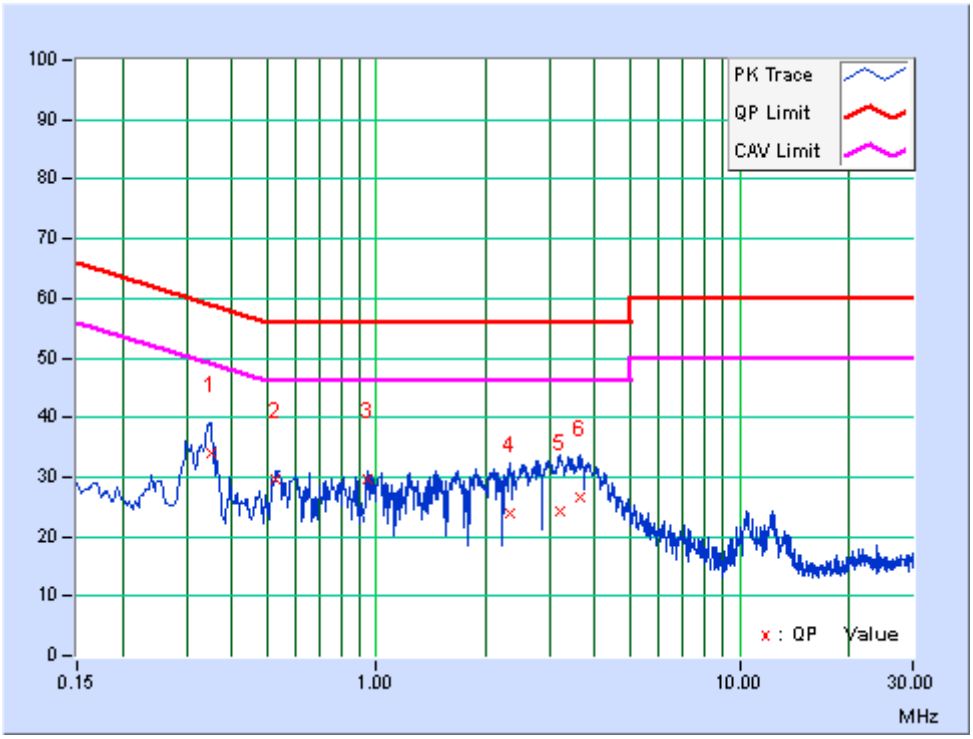
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA

PHASE	Line 1	6dB BANDWIDTH	9kHz

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	**0.34926**	**9.77**	**24.34**	**8.92**	**34.11**	**18.69**	**58.98**	**48.98**	**-24.87**	**-30.29**
2	0.52961	9.78	19.81	8.89	29.59	18.67	56	46	-26.41	-27.33
3	0.94764	9.83	19.79	4.56	29.62	14.39	56	46	-26.38	-31.61
4	2.32005	9.88	13.86	3.74	23.74	13.62	56	46	-32.26	-32.38
5	3.1998	9.92	14.35	2.4	24.27	12.32	56	46	-31.73	-33.68
6	3.64945	9.94	16.64	0.89	26.58	10.83	56	46	-29.42	-35.17

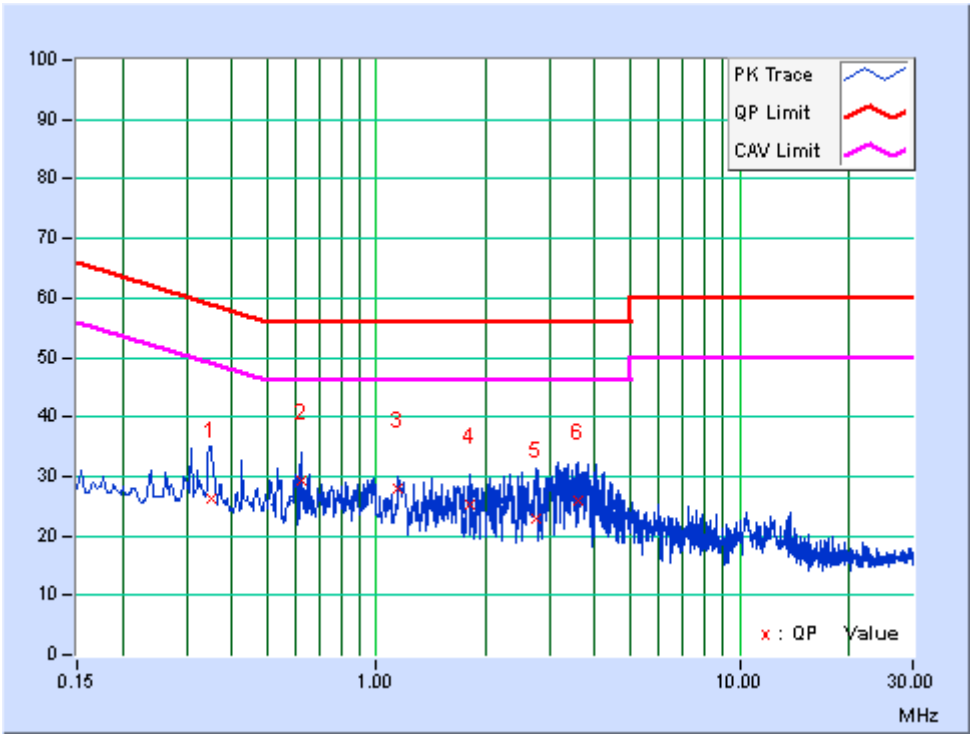
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



PHASE	Neutral	6dB BANDWIDTH	9kHz

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	0.34941	9.79	16.44	7.88	26.23	17.67	58.98	48.98	-32.75	-31.31
2	0.6192	9.81	19.57	8.05	29.38	17.86	56	46	-26.62	-28.14
3	1.15096	9.79	18.05	8.05	27.84	17.84	56	46	-28.16	-28.16
4	1.80002	9.84	15.33	1.18	25.17	11.02	56	46	-30.83	-34.98
5	2.76188	9.88	13	3.08	22.88	12.96	56	46	-33.12	-33.04
6	3.59471	9.91	16.1	4.57	26.01	14.48	56	46	-29.99	-31.52

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.



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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Spectrum Analyzer ROHDE & SCHWARZ	E4446A	MY46180622	May 02, 12	May 01, 13
Test Receiver ROHDE & SCHWARZ	ESVD	847398/003	May 15,12	May 14,13
Bilog Antenna TESEQ	CBL 6111D	25758	Nov.07,11	Nov.07,12
Horn Antenna EMCO	3117	00062558	Nov.07,11	Nov.07,12
10m Semi-anechoic Chamber ETS-LINDGREN	21.4m*12.1m*8.8m	NSEMC006	Mar 24,12	Mar 23,13
RF Cable IMRO	IMRO-400	10m Cable 1#10m	May 16,12	May 15,13
RF Cable IMRO	IMRO-400	10m Cable 2#3m	May 16,12	May 15,13
Signal Amplifier EMCI	EMC330	980095	Nov 07,11	Nov 07,12
Signal Amplifier EMCI	EMC 012645	980077	Nov 07,11	Nov 07,12
RF Cable DRAKA	M06/25-RG102	10m Cable 2#	May 16,12	May 15,13
Test software ADT	ADT_Radiated_V7.6.15	N/A	N/A	N/A

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA.

2. The test was performed in Dongguan 10m Chamber.

3. The horn antenna are used only for the measurement of emission frequency above 1GHz if tested.

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 10 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.

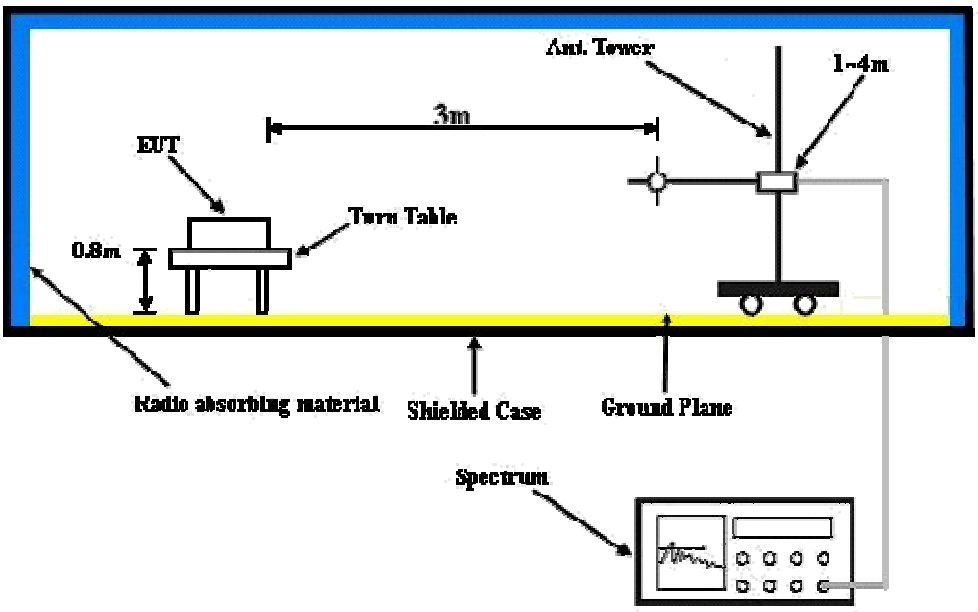
NOTE:

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

Same as item 4.1.6

4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA: GFSK DH5

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 39	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak

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	135.08	23.9 QP	43.5	-19.6	1.50 H	334	11.18	12.73
2	183.58	24.2 QP	43.5	-19.3	1.50 H	315	13.94	10.22
3	316.15	24.6 QP	46.0	-21.4	1.50 H	238	9.28	15.35
4	403.45	29.2 QP	46.0	-16.8	1.50 H	220	11.20	18.04
5	626.55	32.3 QP	46.0	-13.7	1.50 H	359	9.18	23.08
6	666.97	32.6 QP	46.0	-13.4	1.50 H	0	9.20	23.36
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	**36.47**	**28.5 QP**	**40.0**	**-11.5**	**1.50 V**	**0**	**12.29**	**16.24**
2	68.80	23.2 QP	40.0	-16.8	1.50 V	0	15.77	7.45
3	139.93	25.2 QP	43.5	-18.3	1.50 V	0	12.52	12.66
4	312.92	29.6 QP	46.0	-16.4	1.50 V	0	14.31	15.29
5	403.45	31.9 QP	46.0	-14.1	1.50 V	0	13.86	18.04
6	447.10	26.8 QP	46.0	-19.2	1.50 V	0	7.82	18.95

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: GFSK DH5

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK)

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**	**56.4 PK**	**74**	**-17.6**	**1.00 H**	**360**	**41.47**	**14.95**
2	2400	26.3 AV	54	-27.7	1.00 H	360	11.37	14.95
3	* 2402.00	79.7 PK	114	-34.3	1.20 H	340	64.72	14.96
4	* 2402.00	49.6 AV	94	-44.4	1.20 H	340	34.62	14.96
5	4804	54.6 PK	74	-19.4	1.12 H	34	31.13	23.5
6	4804	24.5 AV	54	-29.5	1.12 H	34	1.03	23.5
7	7206	53.2 PK	74	-20.8	1.15 H	200	23.81	29.43
8	7206	23.1 AV	54	-30.9	1.15 H	200	-6.29	29.43
9	9608	52.5 PK	74	-21.5	1.20 H	280	18.76	33.71
10	9608	22.4 AV	54	-31.6	1.20 H	280	-11.34	33.71
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	54.6 PK	74	-19.4	1.00 V	0	35.58	19.05
2	2400	24.5 AV	54	-29.5	1.00 V	0	5.48	19.05
3	* 2402.00	81.2 PK	114	-32.8	1.45 V	164	62.14	19.07
4	* 2402.00	51.1 AV	94	-42.9	1.50 V	163	32.04	19.07
5	4804	55.7 PK	74	-18.3	1.90 V	74	29.45	26.23
6	4804	25.6 AV	54	-28.4	1.89 V	74	-0.65	26.23
7	7206	50.7 PK	74	-23.3	1.10 V	100	21.11	29.58
8	7206	20.6 AV	54	-33.4	1.10 V	100	-8.99	29.58
9	9608	53.7 PK	74	-20.3	1.20 V	360	19.9	33.75
10	9608	23.6 AV	54	-30.4	1.20 V	360	-10.2	33.75

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.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1dB.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 39	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) 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	*2441.00	80.2 PK	114	-33.8	1.20 H	350	65.1	15.1
2	*2441.00	50.1 AV	94	-43.9	1.20 H	350	35	15.1
3	4882	53.5 PK	74	-20.5	1.70 H	75	29.69	23.78
4	4882	23.4 AV	54	-30.6	1.70 H	75	-0.41	23.78
5	7323	54.4 PK	74	-19.6	1.20 H	240	24.68	29.68
6	7323	24.3 AV	54	-29.7	1.20 H	240	-5.42	29.68
7	9764	52.6 PK	74	-21.4	1.20 H	300	18.45	34.18
8	9764	22.5 AV	54	-31.5	1.20 H	300	-11.65	34.18
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	*2441.00	81.0 PK	114	-33	1.60 V	335	61.56	19.46
2	*2441.00	50.9 AV	94	-43.1	1.60 V	335	31.46	19.46
3	4882	52.4 PK	74	-21.6	1.04 V	40	26.1	26.32
4	4882	22.3 AV	54	-31.7	1.04 V	40	-4	26.32
5	7323	53.2 PK	74	-20.8	1.20 V	138	23.3	29.94
6	7323	23.1 AV	54	-30.9	1.20 V	138	-6.8	29.94
7	9764	51.2 PK	74	-22.8	1.25 V	35	17.11	34.09
8	9764	21.1 AV	54	-32.9	1.25 V	35	-12.99	34.09

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.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) 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	78.4 PK	114	-35.6	1.20 H	350	63.14	15.28
2	*2480.00	48.3 AV	94	-45.7	1.20 H	350	33.04	15.28
3	2483.5	54.3 PK	74	-19.7	N/A H	N/A	38.96	15.29
4	2483.5	24.2 AV	54	-29.8	N/A H	N/A	8.86	15.29
5	4960	53.3 PK	74	-20.7	1.60 H	45	29.21	24.05
6	4960	23.2 AV	54	-30.8	1.60 H	45	-0.89	24.05
7	7440	54.2PK	74	-19.7	1.50 H	230	24.31	29.94
8	7440	24.2 AV	54	-29.8	1.50 H	230	-5.79	29.94
9	9920	53.4 PK	74	-20.6	1.00 H	360	18.78	34.64
10	9920	23.3 AV	54	-30.7	1.00 H	360	-11.32	34.64
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	78.7 PK	114	-35.3	1.60 V	80	58.83	19.86
2	*2480.00	48.6 AV	94	-45.4	1.60 V	80	28.73	19.86
3	2483.5	55.2 PK	74	-18.8	1.00 V	0	35.31	19.89
4	2483.5	25.1 AV	54	-28.9	1.00 V	0	5.21	19.89
5	4960	53.6 PK	74	-20.4	1.05 V	50	27.22	26.41
6	4960	23.5 AV	54	-30.5	1.05 V	50	-2.88	26.41
7	7440	54.2 PK	74	-19.8	1.35 V	340	23.94	30.29
8	7440	24.1 AV	54	-29.9	1.35 V	340	-6.16	30.29
9	9920	53.2 PK	74	-20.8	1.20 V	50	18.78	34.43
10	9920	23.1 AV	54	-30.9	1.20 V	50	-11.32	34.43

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.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle)

BT_8DPSK DH5

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) 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	54.3 PK	74	-19.7	1.20 H	32	39.35	14.95
2	2400	24.2 AV	54	-29.8	1.20 H	32	9.25	14.95
3	*2402.00	78.5 PK	114	-35.5	1.10 H	0	63.54	14.96
4	*2402.00	48.4 AV	94	-45.6	1.10 H	0	33.44	14.96
5	4804	53.6 PK	74	-20.4	1.10 H	20	30.1	23.5
6	4804	23.5 AV	54	-30.5	1.10 H	20	0	23.5
7	7206	50.5 PK	74	-23.5	1.25 H	190	21.04	29.43
8	7206	20.4 AV	54	-33.6	1.25 H	190	-9.06	29.43
9	9608	49.7 PK	74	-24.3	1.05 H	35	15.97	33.71
10	9608	19.6 AV	54	-34.4	1.05 H	35	-14.13	33.71
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	53.6 PK	74	-20.4	1.23 V	112	34.55	19.05
2	2400	23.5 AV	54	-30.5	1.23 V	112	4.45	19.05
3	*2402.00	79.5 PK	114	-34.5	1.07 V	260	60.43	19.07
4	*2402.00	49.4 AV	94	-44.6	1.07 V	260	30.33	19.07
5	4804	53.6 PK	74	-20.4	1.94 V	360	27.37	26.23
6	4804	23.5 AV	54	-30.5	1.94 V	360	-2.73	26.23
7	7206	52.4 PK	74	-21.6	1.30 V	250	22.82	29.58
8	7206	22.3 AV	54	-31.7	1.30 V	250	-7.28	29.58
9	9608	53.5 PK	74	-20.5	1.25 V	80	19.75	33.75
10	9608	23.4 AV	54	-30.6	1.25 V	80	-10.35	33.75

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.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 39	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) 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	*2441.00	80.4 PK	114	-33.6	1.20 H	345	65.23	15.12
2	*2441.00	50.3 AV	94	-43.7	1.20 H	345	35.13	15.12
3	4882	54.2 PK	74	-19.8	1.65 H	65	30.42	23.78
4	4882	24.1 AV	54	-29.9	1.65 H	65	0.32	23.78
5	7323	52.3 PK	74	-21.7	1.30 H	50	22.62	29.68
6	7323	22.2 AV	54	-31.8	1.30 H	50	-7.48	29.68
7	9764	51.8 PK	74	-22.2	1.20 H	80	17.62	34.18
8	9764	21.7 AV	54	-32.3	1.20 H	80	-12.48	34.18
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	*2441.00	78.5 PK	114	-35.5	1.28 V	260	59.04	19.46
2	*2441.00	48.4 AV	94	-45.6	1.28 V	260	28.94	19.46
3	4882	52.6 PK	74	-21.4	1.10 V	20	26.28	26.32
4	4882	22.5 AV	54	-31.5	1.10 V	20	-3.82	26.32
5	7323	53.2 PK	74	-20.8	1.25 V	360	23.26	29.94
6	7323	23.1 AV	54	-30.9	1.25 V	360	-6.84	29.94
7	9764	53.4 PK	74	-20.6	1.00 V	230	19.31	34.09
8	9764	23.3 AV	54	-30.7	1.00 V	230	-10.79	34.09

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.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 78	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) 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	79.7 PK	114	-34.3	1.20 H	350	64.41	15.28
2	*2480.00	49.6 AV	94	-44.4	1.20 H	350	34.31	15.28
3	2483.5	54.6 PK	74	-19.4	1.36 H	125	39.31	15.29
4	2483.5	24.5 AV	54	-29.5	1.36H	125	9.21	15.29
5	4960	54.8 PK	74	-19.2	1.74 H	330	30.75	24.05
6	4960	24.7 AV	54	-29.3	1.74 H	330	0.65	24.05
7	7440	51.7 PK	74	-22.3	1.10 H	260	21.76	29.94
8	7440	21.6 AV	54	-32.4	1.10 H	260	-8.34	29.94
9	9920	50.6 PK	74	-23.4	1.35 H	60	15.96	34.64
10	9920	20.5 AV	54	-33.5	1.35 H	60	-14.14	34.64
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	77.9 PK	114	-36.1	1.15 V	230	58.03	19.86
2	*2480.00	47.8 AV	94	-46.2	1.15 V	230	27.93	19.86
3	2483.5	53.6 PK	74	-20.4	1.26 V	53	33.71	19.89
4	2483.5	23.5 AV	54	-30.5	1.26 V	53	3.61	19.89
5	4960	53.4 PK	74	-20.6	1.70 V	60	26.99	26.41
6	4960	23.3 AV	54	-30.7	1.70 V	60	-3.11	26.41
7	7440	51.3 PK	74	-22.7	1.50 V	330	21.01	30.29
8	7440	21.2 AV	54	-32.8	1.50 V	330	-9.09	30.29
9	9920	49.8 PK	74	-24.2	1.20 V	60	15.37	34.43
10	9920	19.7 AV	54	-34.3	1.20 V	60	-14.73	34.43

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.
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625 * 5 per 296.25 ms per channel. Therefore, the duty cycle correlation factor be equal to: 20log(3.125 / 100)= -30.1 dB.
7. Average value = peak reading + 20log(duty cycle).

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Spectrum Analyzer ROHDE & SCHWARZ	E4446A	MY46180622	May 02, 12	May 01, 13
Horn Antenna EMCO	3117	00062558	Nov.07,11	Nov.07,12
10m Semi-anechoic Chamber ETS-LINDGREN	21.4m*12.1m*8.8m	NSEMC006	Mar 24,12	Mar 23,13
RF Cable IMRO	IMRO-400	10m Cable 2#3m	May 16,12	May 15,13
Signal Amplifier EMCI	EMC 012645	980077	Nov 07,11	Nov 07,12
RF Cable DRAKA	M06/25-RG102	10m Cable 2#	May 16,12	May 15,13
Test software ADT	ADT_Radiated_V7.6.15	N/A	N/A	N/A

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA

2. The test was performed in Dongguan Chamber 10m.

4.3.3 TEST PROCEDURE

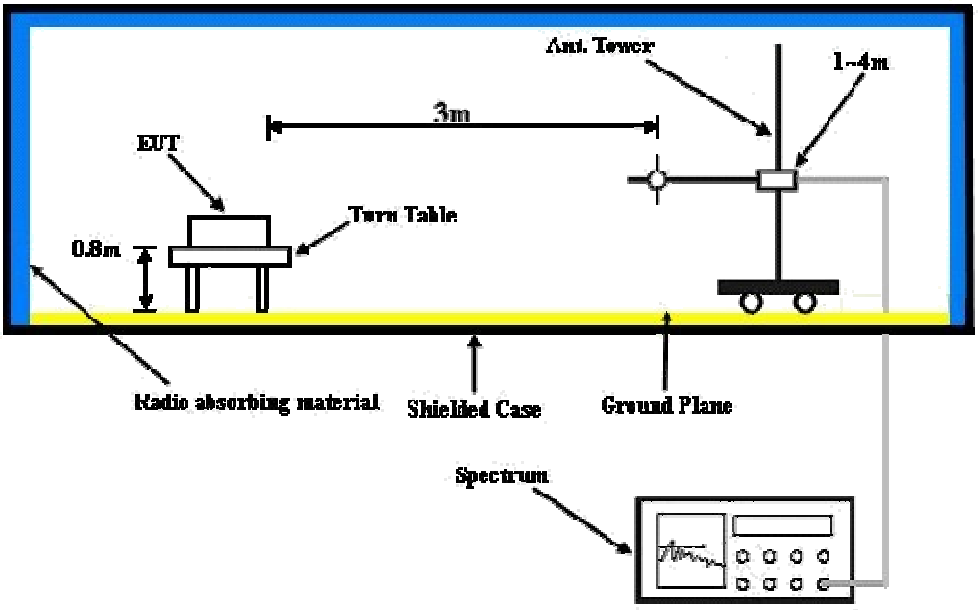
The EUT was placed on a turn table which was 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. At the frequency band of 30MHz to 1GHz, The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 to 4 m for horizontal and vertical polarizations.

The spectrum analyzer was receiving the maximum emission level. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

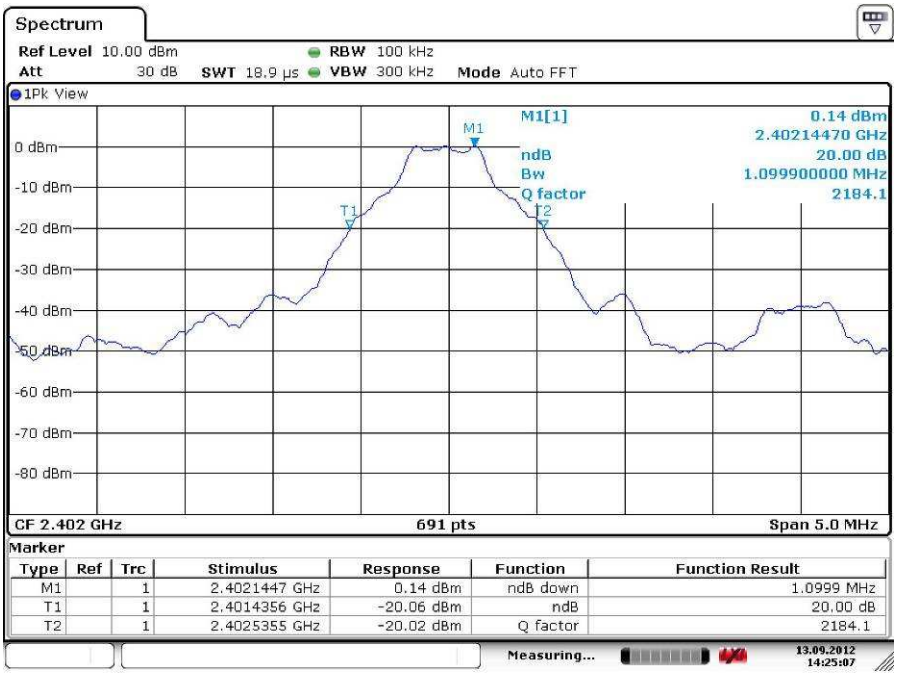
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

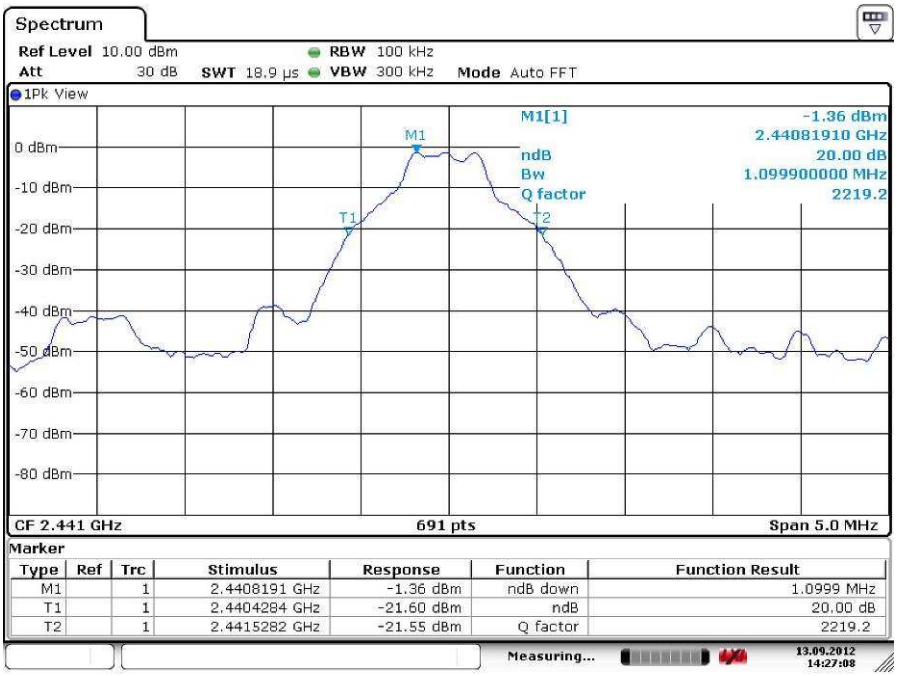
GFSK DH5

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2402	1.0999
Middle	2441	1.0999
High	2480	1.0926

Test Data: Low channel

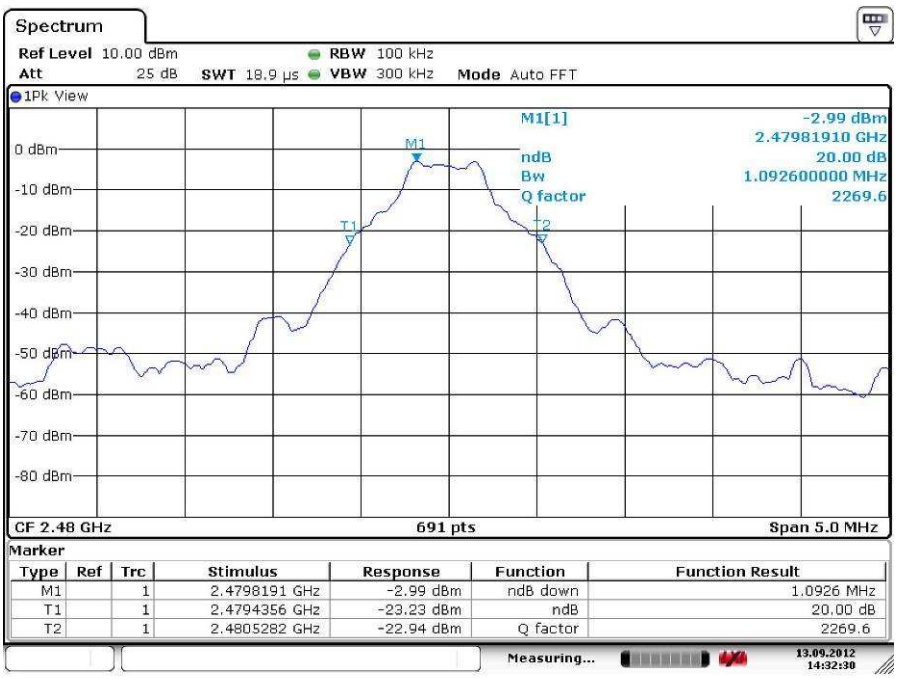


Test Data: Middle channel



Date: 13.SEP.2012 14:27:09

Test Data: High channel

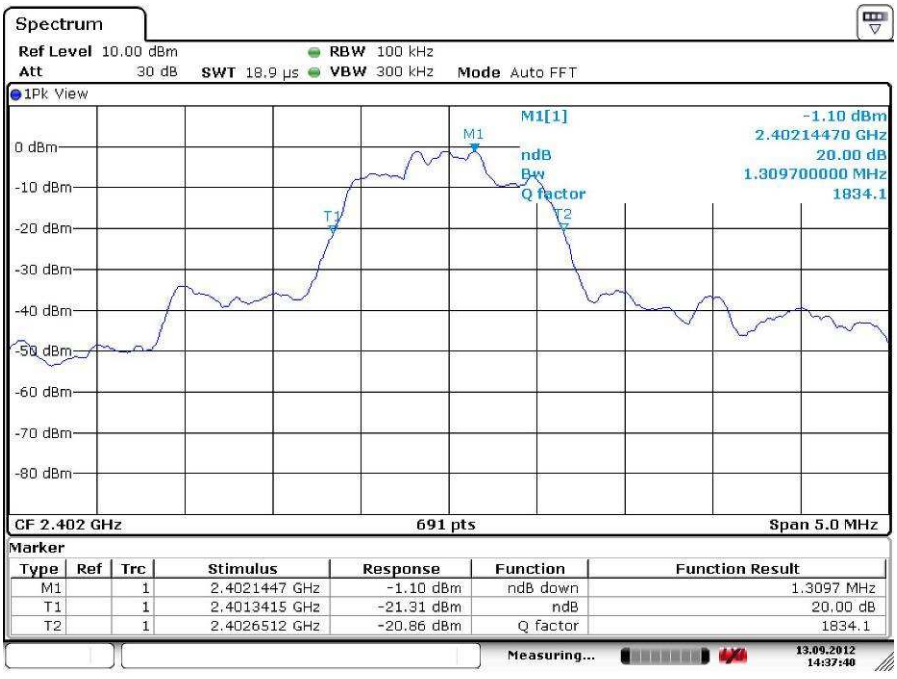


Date: 13.SEP.2012 14:32:30

8DPSK DH5

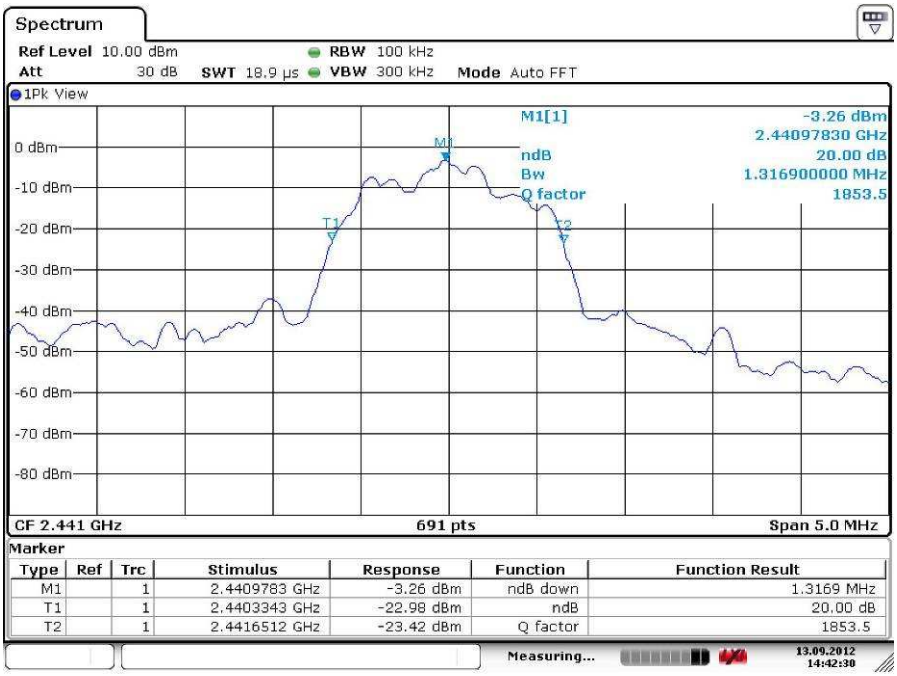
CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2402	1.3097
Middle	2441	1.3169
Hight	2480	1.3097

Test Data: Low channel



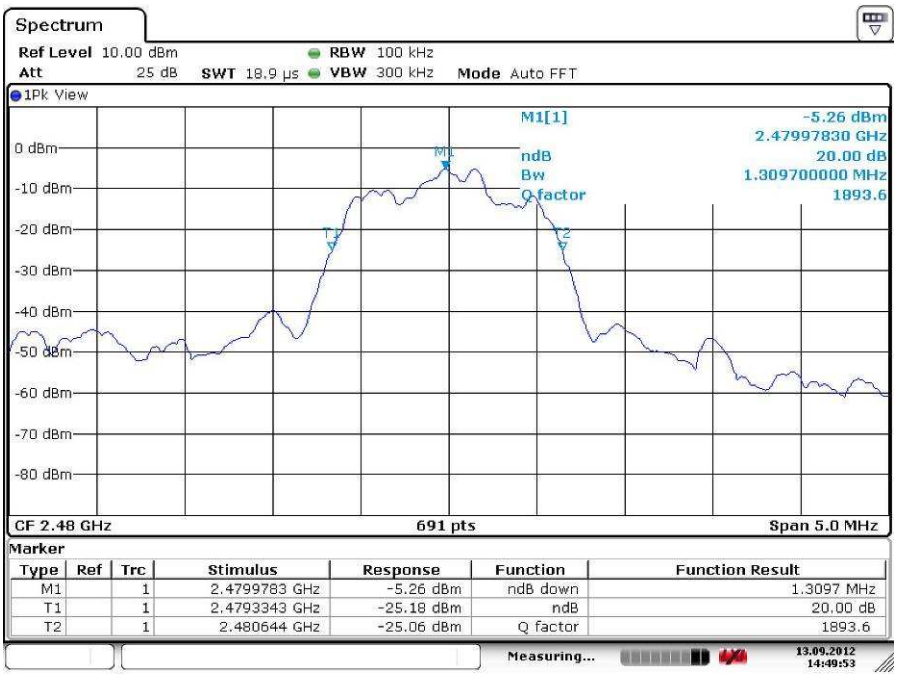
Date: 13.SEP.2012 14:37:40

Test Data: Middle channel



Date: 13.SEP.2012 14:42:31

Test Data: High channel



Date: 13.SEP.2012 14:49:53

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

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---