



FCC/IC Radio Test Report

FCC ID: O4GHRMBLE
IC: 7666A-HRMBLE

This report concerns (check one) : Original Grant Class II Change

Issued Date : Jan. 03, 2012
Project No. : 1112C176
Equipment : BLUE HR Bluetooth Smart
Model Name : HRMBLE
Applicant : Dayton Industrial Co. Ltd.
Address : 2-12 Kwai Fat Road, 11-A Kwai Chung, New Territories, Hong Kong
Manufacture : Kendy Electronics (Dongguan) Co. Ltd.
Address : Xingsi Huangtang Village, Hengli Town, Dongguan City, Guangdong Province, P.R. China

Tested by:
Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Dec. 19, 2011
Date of Test:
Dec. 19, 2011 ~ Dec. 30, 2011

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Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (NML) of **CHINA**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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1. CERTIFICATION

Equipment : BLUE HR Bluetooth Smart
Brand Name : N/A
Model Name : HRMBLE
Applicant : Dayton Industrial Co. Ltd.
Date of Test : Dec. 19, 2011 ~ Dec. 30, 2011
Test Item : ENGINEERING SAMPLE
Standards : FCC Part15, Subpart C(15.247) / ANSI C63.4 : 2003 / Canada RSS-210:2010

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FICP-1-1112C176) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).



2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

APPLIED STANDARD: 47 CFR Part 15, Subpart C; Canada RSS-210:2010				
Standard Section		Test Item	Judgment	Remark
RSS-210	47 CFR Part 15			
RSS-GEN 7.2.2	15.207	Conducted Emission	PASS	
RSS-210 Annex 8 (A8.1d)	15.247(d)	Antenna conducted Spurious Emission	PASS	
RSS-210 Annex 8 (A8.1d)	15.247 (a)(1)	Hopping Channel Separation	PASS	
RSS-210 Annex 8 (A8.1b)	15.247 (b)(1)	Peak Output Power	PASS	
RSS-210 Annex 8 (A8.1a)	15.247(d) 15.209	Radiated Spurious Emission	PASS	
RSS-210 Annex 8 (A8.4(2))	15.247 (a)(1)(iii)	Number of Hopping Frequency	PASS	
RSS-210 Annex 8 (A8.5)	15.247 (a)(1)(iii)	Dwell Time	PASS	
RSS-Gen 7.2.3	15.205	Restricted Bands	PASS	
RSS-210 Annex 8 (A8.5)	15.203	Antenna Requirement	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report



2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03** at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town, Dong Guan, China.523792

Neutron's test firm number for FCC 319330

Neutron's test firm number for IC 4428B-1

2.2 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:

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)	NOTE
DG-CB03	CISPR	30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	BLUE HR Bluetooth Smart
Brand Name	N/A
Model Name	HRMBLE
OEM Brand/Model Name	N/A
Model Difference	N/A
Product Description	The EUT is a BLUE HR Bluetooth Smart.
	Operation Frequency: 2402~2480 MHz
	Modulation Type: GFSK
	Bit Rate of Transmitter 1Mbps
	Number of Channel 40 CH
	Antenna Designation: Please see Note 3.
	Antenna Gain(Peak) Please see Note 3.
	Output Power: -9.83 dBm (1Mbps)
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Power Source	DC Voltage supplied from Lithium Battery.
Power Rating	DC 3V
Connecting I/O Port(s)	Please refer to the User's Manual
Products Covered	N/A
EUT Modification(s)	N/A

Note:

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



2.

Channel List			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	21	2442
02	2404	22	2444
03	2406	23	2446
04	2408	24	2448
05	2410	25	2450
06	2412	26	2452
07	2414	27	2454
08	2416	28	2456
09	2418	29	2458
10	2420	30	2460
11	2422	31	2462
12	2424	32	2464
13	2426	33	2466
14	2428	34	2468
15	2430	35	2470
16	2432	36	2472
17	2434	37	2474
18	2436	38	2476
19	2438	39	2478
20	2440	40	2480

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Printed Antenna	N/A	0.0



3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX Mode NOTE (1)
Mode 2	RX Mode NOTE (1)
Mode 3	Wireless

The EUT system operated these modes were found to be the worst case during the pre-scanning test as Following:

For Conducted Emission	
Final Test Mode	Description
Mode 3	Wireless

For Radiated Emission	
Final Test Mode	Description
Mode 1	TX Mode NOTE (1)
Mode 2	RX Mode NOTE (1)

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

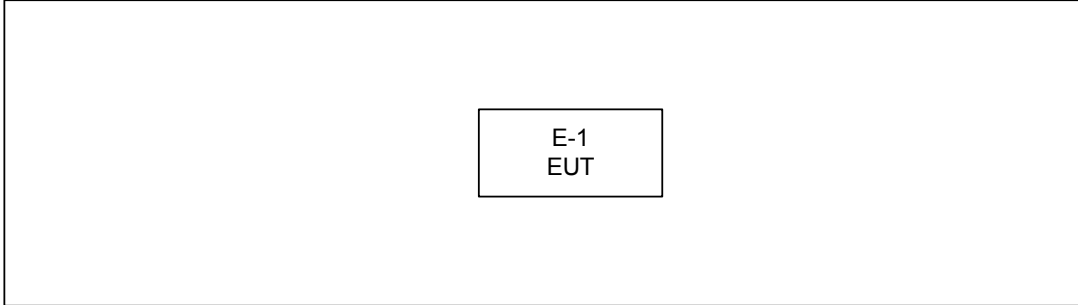
During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Test software Version	Test program: BLUE TOOL		
Frequency	2402 MHz	2440MHz	2480 MHz
Parameters-1Mbps	0	0	0



3.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiation TX Mode:





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.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID/IC	Series No.	Note
E-1	BLUE HR Bluetooth Smart	N/A	HRMBLE	O4GHRMBLE / 7666A-HRMBLE	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

4.1.2 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	May.26.2012
2	LISN	R&S	ENV216	100087	May.26.2012
3	Test Cable	N/A	C_17	N/A	Mar.30.2012
4	EMI TEST RECEIVER	R&S	ESCS30	826547/022	May.26.2012
5	50Ω Terminator	SHX	TF2-3G-A	08122902	May.26.2012

Remark: " N/A" denotes No Model No. , Serial No. or No Calibration specified.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

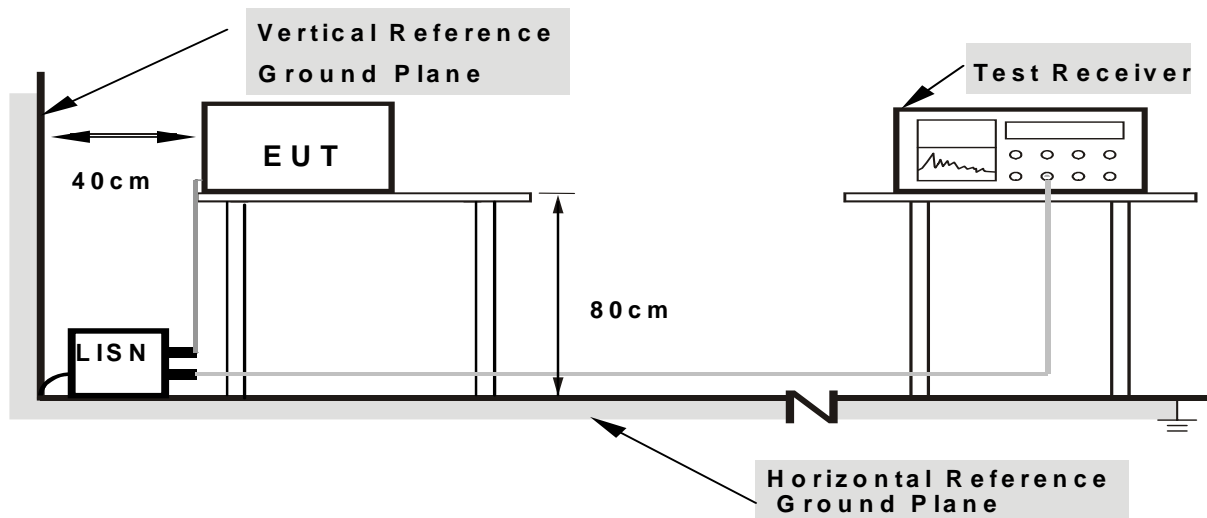
4.1.3 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

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 cm from other units and other metal planes

4.1.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT is continue Transmitter/Receive data or Hopping on mode.



4.1.7 TEST RESULTS

EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	--	Relative Humidity :	--
Pressure :	--	Test Power :	--
Test Mode :	" N/A" denotes test is not applicable in this Test Report.		

Remark

- (1) All readings are QP Mode value unless otherwise stated AVG in column of Note . If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform . In this case, a " * " marked in AVG Mode column of Interference Voltage Measured .
- (2) Measuring frequency range from 150KHz to 30MHz .

--



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower



4.2.2 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Jun .04.2012
2	Amplifier	HP	8447D	2944A09673	May.26.2012
3	Test Receiver	R&S	ESCI	100382	May.26.2012
4	Test Cable	N/A	C-01_CB03	N/A	Jul.01.2012
5	Controller	CT	SC100	N/A	N/A
6	Antenna	ETS	3115	00075789	May.26.2012
7	Amplifier	Agilent	8449B	3008A02274	May.26.2012
8	Spectrum	Agilent	E4408B	US39240143	Nov.25.2012
9	Test Cable	HUBER+SUHNER	C-45	N/A	May.04.2012
10	Controller	CT	SC100	N/A	N/A
11	Active Loop Antenna	R&S	HFH2-Z2	830749/020	May.26.2012
12	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Aug.15.2012

Remark: " N/A" denotes No Model Name / Serial No. and No Calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP/PK/AV
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP



4.2.3 TEST PROCEDURE

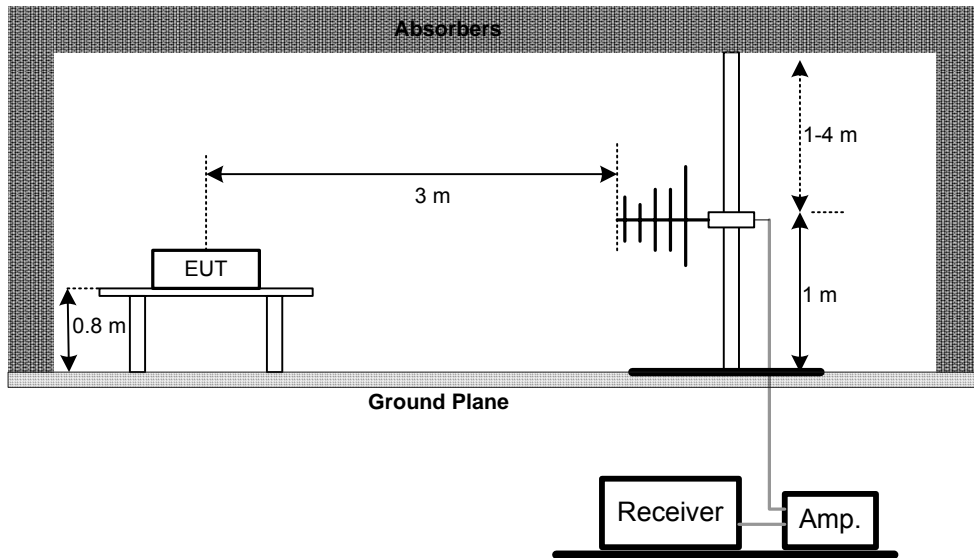
- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.4 DEVIATION FROM TEST STANDARD

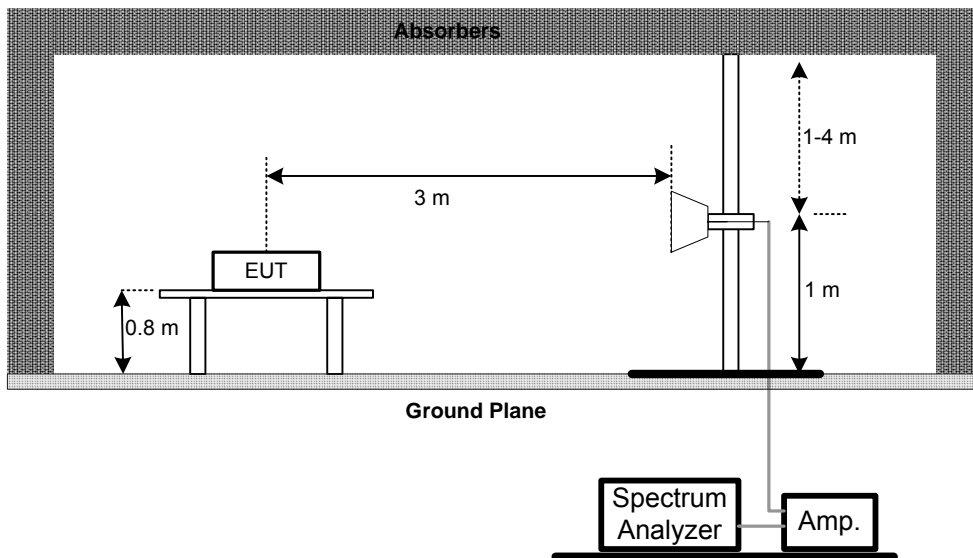
No deviation

4.2.5 TEST SETUP

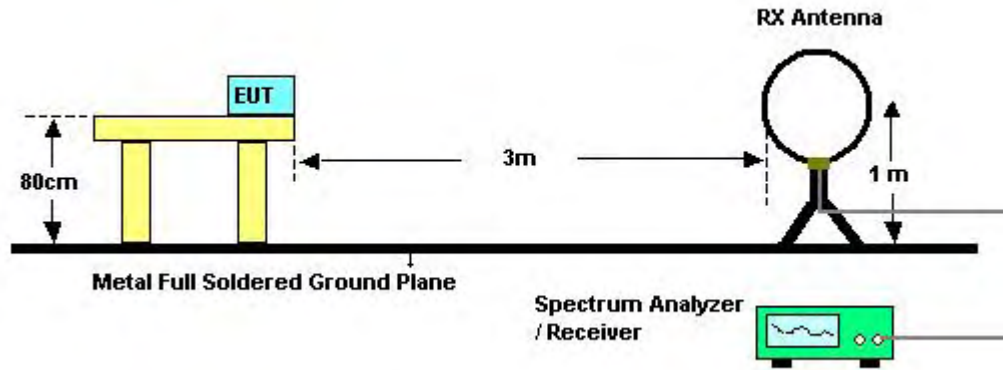
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



(C) For radiated emissions below 30MHz



4.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



4.2.7 TEST RESULTS (BELOW 30MHz)

EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	25°C	Relative Humidity :	53 %
Pressure :	1009 hPa	Test Power :	DC 3V
Test Mode :	TX Mode		

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Note
0.017	0°	42.35	24.30	18.05	123.10	-105.05	AVG
0.017	0°	45.35	24.30	21.05	143.10	-122.05	PK
0.025	0°	41.39	24.01	17.38	119.79	-102.40	AVG
0.025	0°	43.45	24.01	19.44	139.79	-120.35	PK
0.076	0°	43.52	21.88	21.64	110.00	-88.36	AVG
0.076	0°	44.31	21.88	22.43	130.00	-107.57	PK
0.160	0°	44.97	20.58	24.39	103.55	-79.16	AVG
0.160	0°	46.98	20.58	26.40	123.55	-97.15	PK
0.514	0°	43.65	19.84	23.81	73.39	-49.58	QP
0.573	0°	40.24	20.03	20.21	72.44	-52.23	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Note
0.014	90°	43.62	24.30	19.32	124.50	-105.18	AVG
0.014	90°	45.67	24.30	21.37	144.50	-123.13	PK
0.019	90°	41.85	24.30	17.55	122.26	-104.71	AVG
0.019	90°	43.81	24.30	19.51	142.26	-122.75	PK
0.099	90°	44.20	21.43	22.77	107.73	-84.95	QP
0.165	90°	45.28	20.57	24.71	103.24	-78.53	AVG
0.165	90°	46.32	20.57	25.75	123.24	-97.49	PK
0.504	90°	43.54	19.81	23.73	73.56	-49.83	QP
0.565	90°	44.39	20.01	24.38	72.56	-48.18	QP

Remark :

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported ◦
- (2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB); ◦
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor. ◦



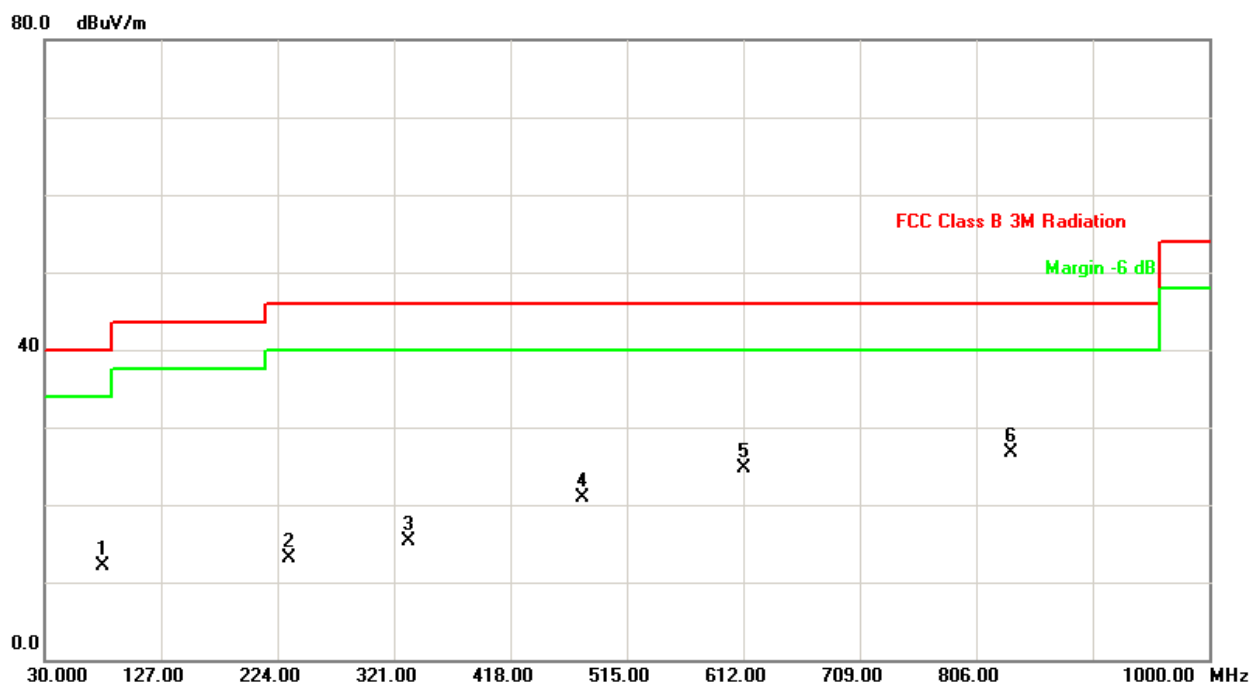
4.2.8 TEST RESULTS (BETWEEN 30 – 1000 MHZ)

EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX 2402MHz –CH01-1Mbps		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
78.50	V	31.15	-18.99	12.16	40.00	- 27.84	
233.70	V	28.53	-15.45	13.08	46.00	- 32.92	
333.13	V	26.57	-11.26	15.31	46.00	- 30.69	
478.63	V	28.50	-7.68	20.82	46.00	- 25.18	
612.00	V	28.72	-4.04	24.68	46.00	- 21.32	
835.10	V	27.93	-1.17	26.76	46.00	- 19.24	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz .
- (2) All readings are Peak unless otherwise stated QP in column of 『 Note 』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (3) Measuring frequency range from 30MHz to 1000MHz .
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table .



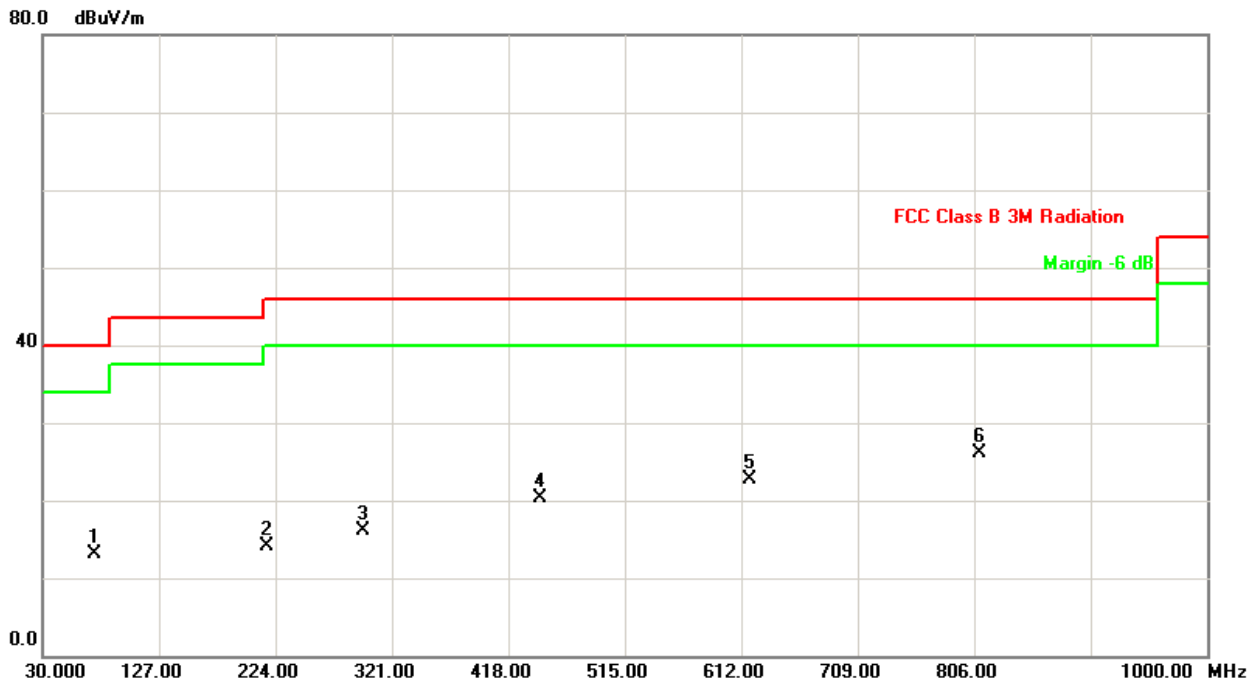


EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX 2402MHz -CH01-1Mbps		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
73.65	H	31.72	-18.69	13.03	40.00	- 26.97	
216.73	H	30.08	-16.00	14.08	46.00	- 31.92	
296.75	H	28.16	-12.07	16.09	46.00	- 29.91	
444.68	H	28.46	-8.21	20.25	46.00	- 25.75	
619.28	H	26.69	-3.90	22.79	46.00	- 23.21	
810.85	H	27.83	-1.66	26.17	46.00	- 19.83	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『 Note 』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦



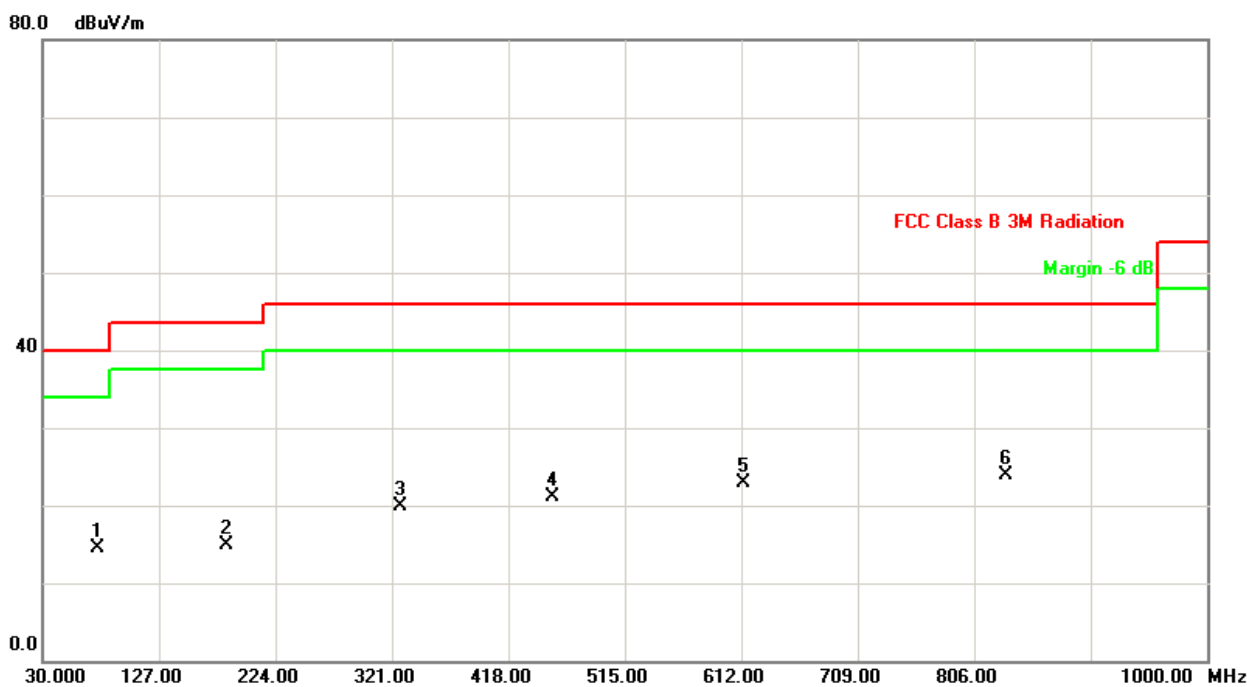


EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX 2440MHz -CH20-1Mbps		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
76.08	V	33.30	-18.86	14.44	40.00	- 25.56	
182.78	V	31.82	-16.84	14.98	43.50	- 28.52	
328.28	V	31.35	-11.37	19.98	46.00	- 26.02	
454.38	V	29.24	-8.05	21.19	46.00	- 24.81	
614.43	V	26.92	-4.00	22.92	46.00	- 23.08	
832.68	V	25.04	-1.22	23.82	46.00	- 22.18	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『 Note 』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦



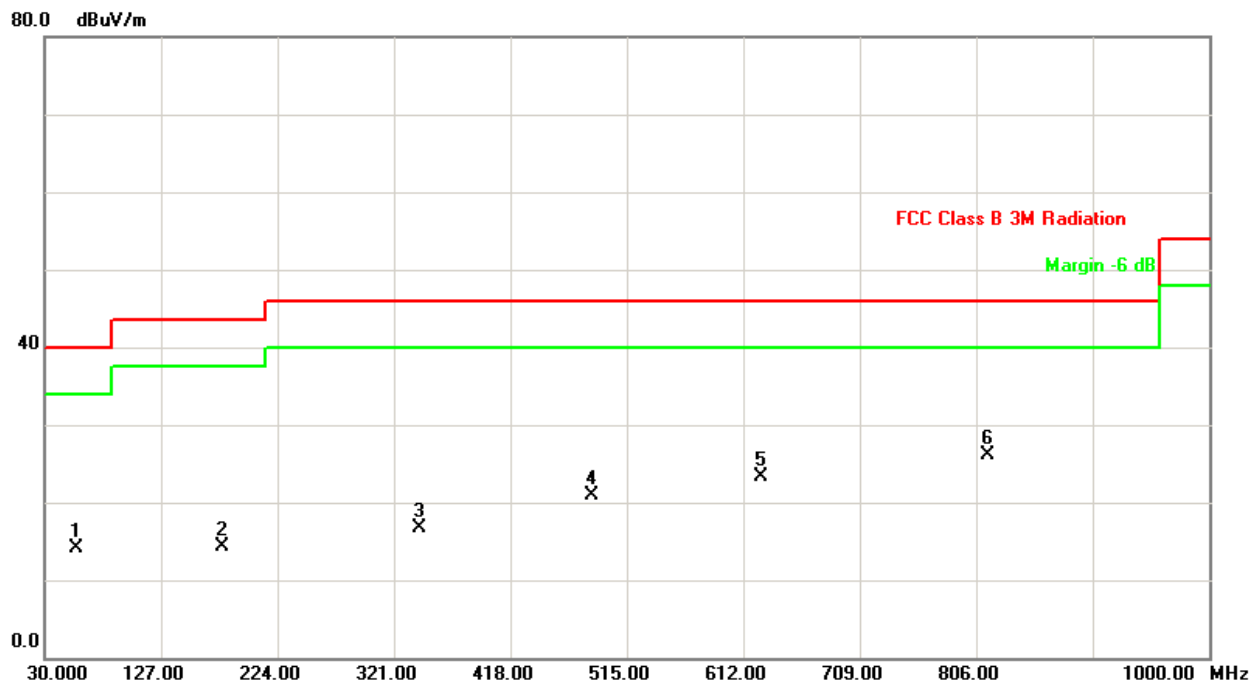


EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX 2440MHz -CH20-1Mbps		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
56.68	H	31.62	-17.59	14.03	40.00	- 25.97	
177.93	H	31.22	-16.97	14.25	43.50	- 29.25	
342.83	H	27.70	-11.01	16.69	46.00	- 29.31	
485.90	H	28.51	-7.57	20.94	46.00	- 25.06	
626.55	H	27.08	-3.77	23.31	46.00	- 22.69	
815.70	H	27.65	-1.56	26.09	46.00	- 19.91	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『 Note 』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦



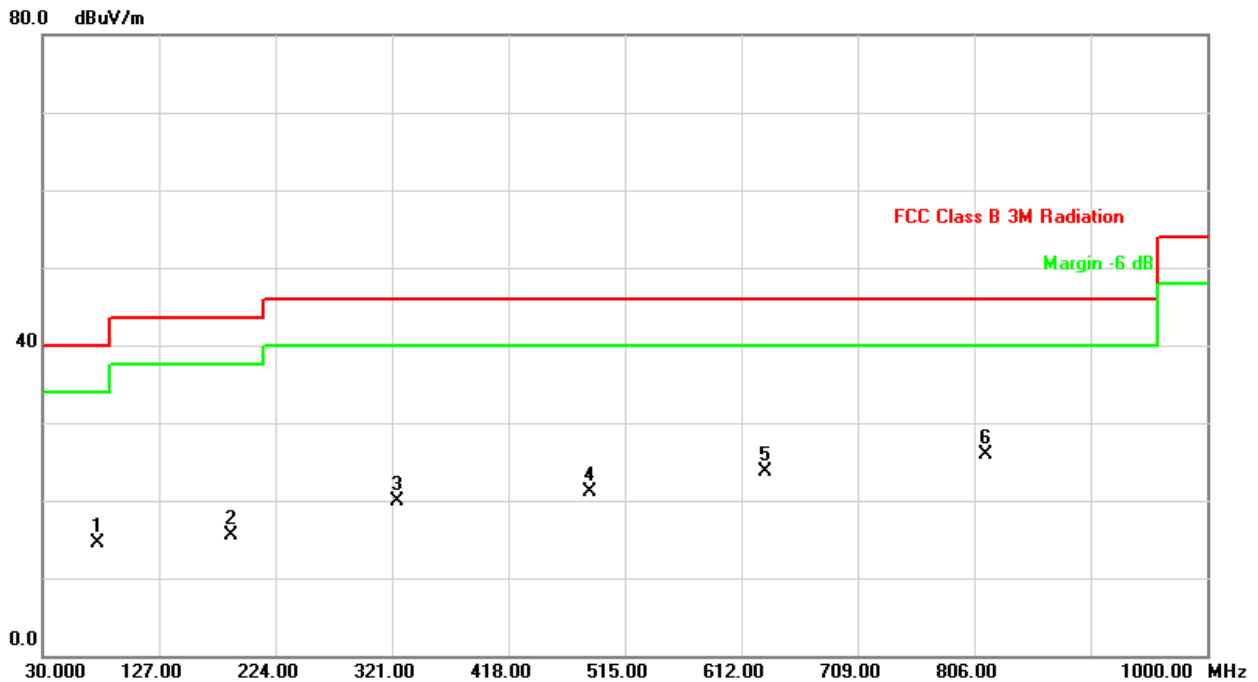


EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX 2480MHz -CH40-1Mbps		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
76.08	V	33.30	-18.86	14.44	40.00	- 25.56	
187.63	V	32.19	-16.76	15.43	43.50	- 28.07	
325.85	V	31.25	-11.43	19.82	46.00	- 26.18	
485.90	V	28.63	-7.57	21.06	46.00	- 24.94	
631.40	V	27.41	-3.68	23.73	46.00	- 22.27	
815.70	V	27.38	-1.56	25.82	46.00	- 20.18	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『 Note 』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦



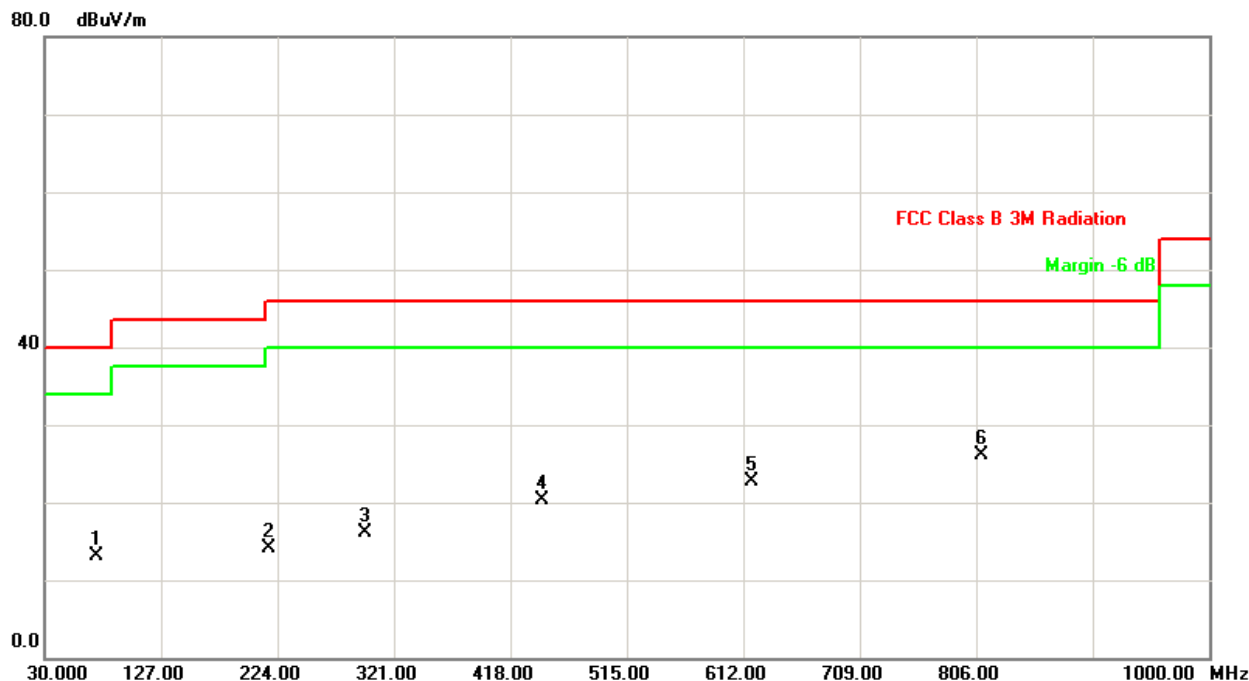


EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX 2480MHz -CH40-1Mbps		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
73.65	H	31.72	-18.69	13.03	40.00	- 26.97	
216.73	H	30.08	-16.00	14.08	46.00	- 31.92	
296.75	H	28.16	-12.07	16.09	46.00	- 29.91	
444.68	H	28.46	-8.21	20.25	46.00	- 25.75	
619.28	H	26.69	-3.90	22.79	46.00	- 23.21	
810.85	H	27.83	-1.66	26.17	46.00	- 19.83	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『 Note 』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦



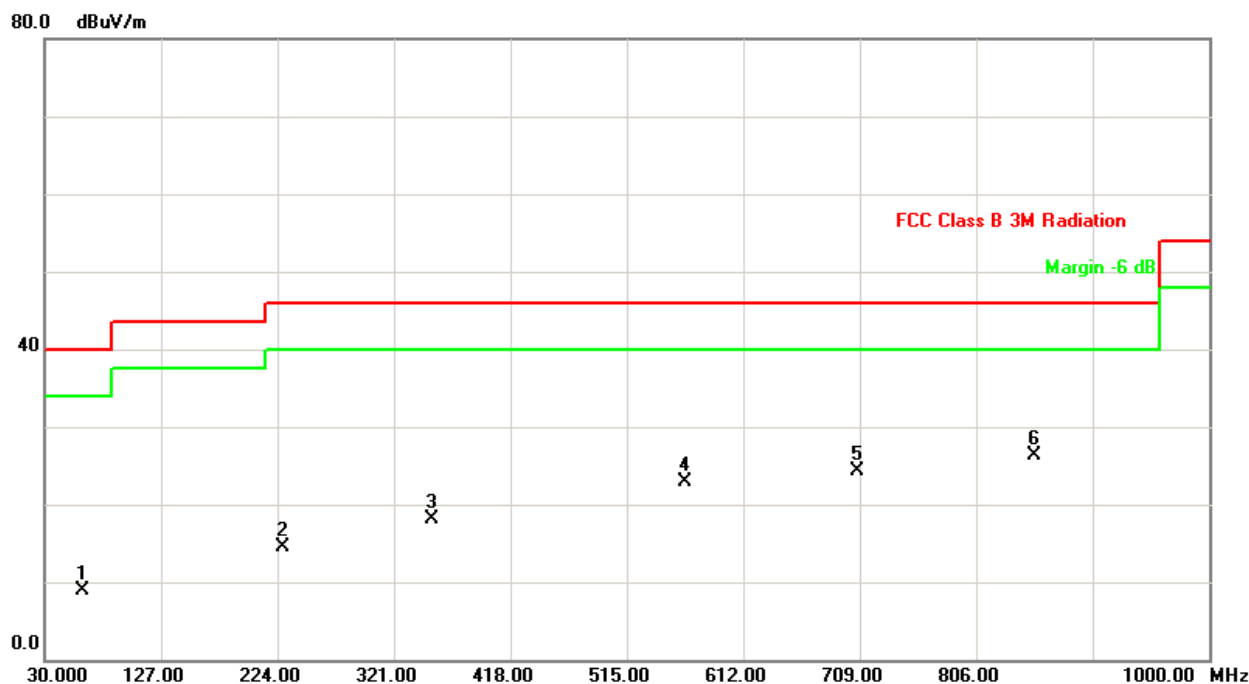


EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	RX Mode 2402MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
61.53	V	26.44	-17.51	8.93	40.00	- 31.07	
228.85	V	30.15	-15.63	14.52	46.00	- 31.48	
352.53	V	28.85	-10.75	18.10	46.00	- 27.90	
563.50	V	28.14	-5.16	22.98	46.00	- 23.02	
706.58	V	27.46	-3.09	24.37	46.00	- 21.63	
854.50	V	27.16	-0.80	26.36	46.00	- 19.64	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『 Note 』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦



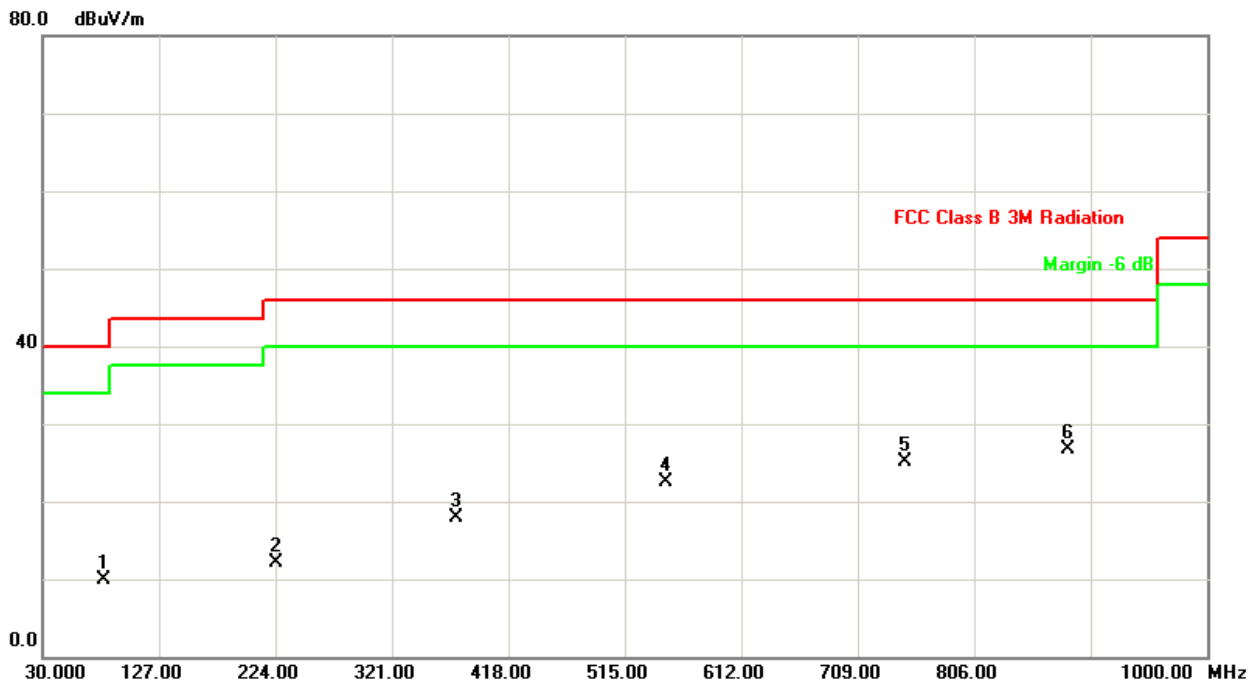


EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	RX Mode 2402MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
80.93	H	28.95	-19.07	9.88	40.00	- 30.12	
224.00	H	27.90	-15.76	12.14	46.00	- 33.86	
374.35	H	27.92	-9.95	17.97	46.00	- 28.03	
548.95	H	27.94	-5.53	22.41	46.00	- 23.59	
747.80	H	27.76	-2.59	25.17	46.00	- 20.83	
883.60	H	27.01	-0.34	26.67	46.00	- 19.33	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『 Note 』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦





4.2.9 TEST RESULTS (ABOVE 1000 MHZ)

EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX 2402MHz – CH01-1Mbps		

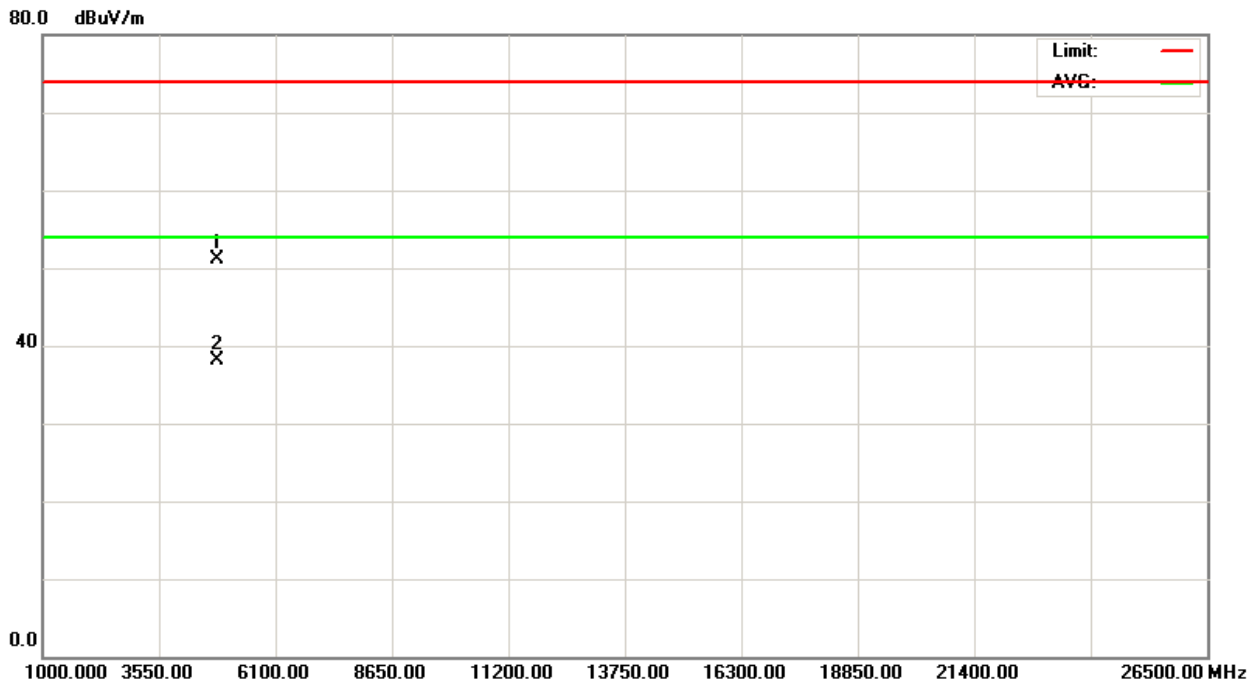
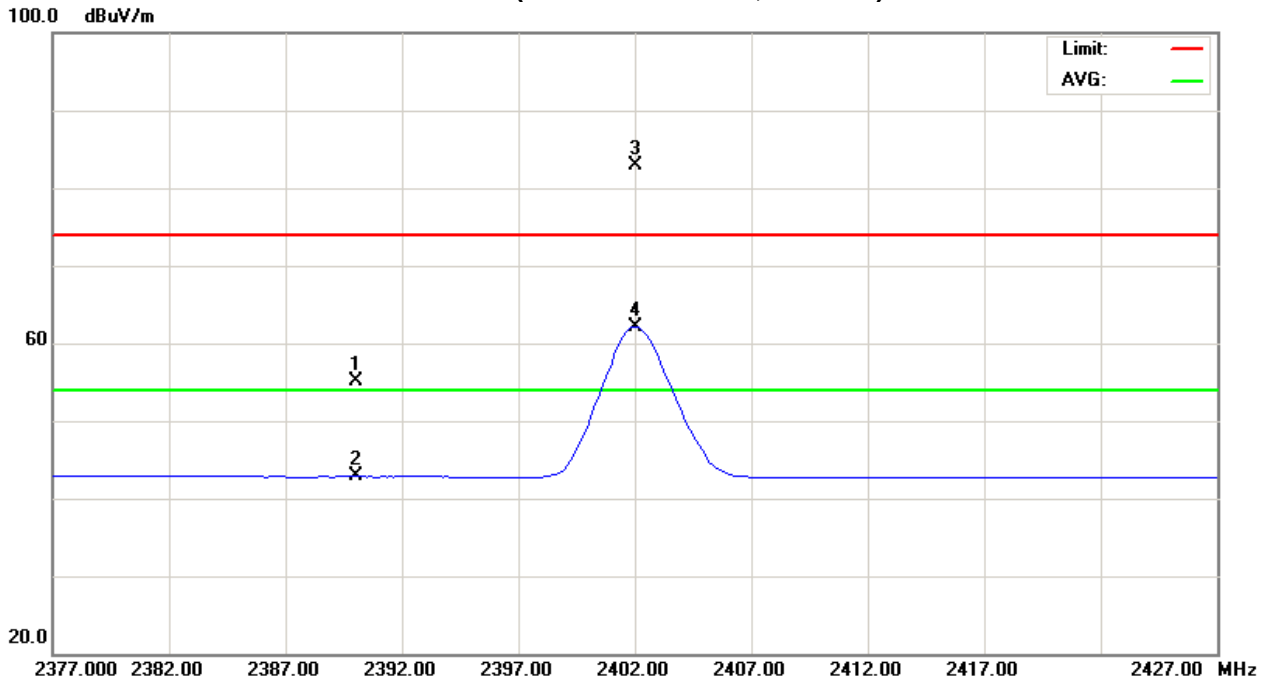
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	V	23.16	10.91	31.91	55.07	42.82	74.00	54.00	X/E
2402.00	V	50.95	30.23	31.90	82.85	62.13			X/F
4804.40	V	45.86	32.84	5.21	51.07	38.05	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency .“F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown “ * ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



TX CH01(Above 1000 MHz, Vertical)





EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010hPa	Test Voltage :	DC 3V
Test Mode :	TX 2402MHz – CH01-1Mbps		

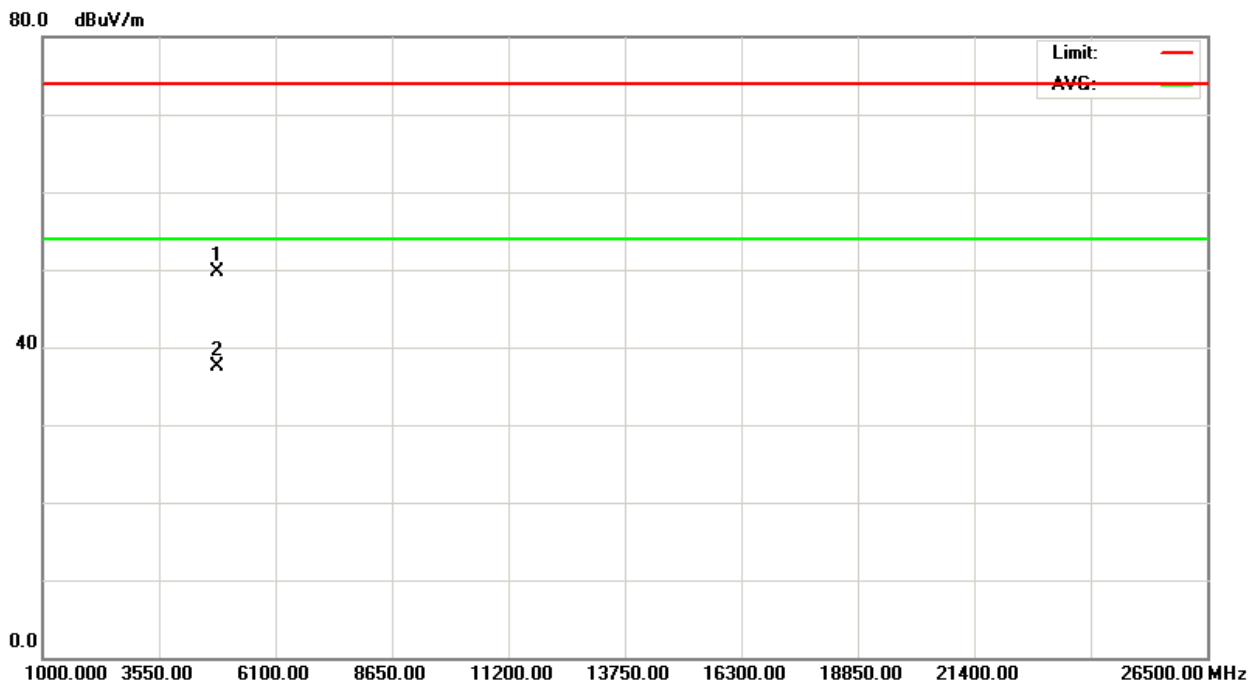
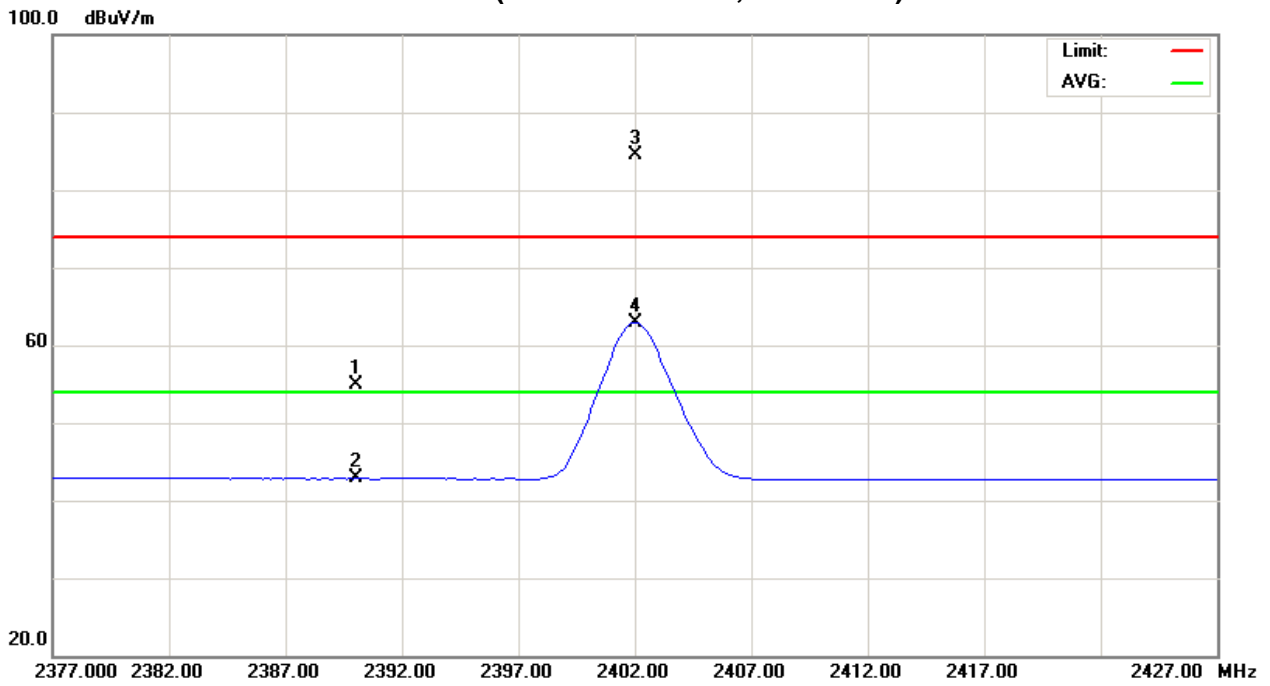
Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	H	22.93	10.91	31.91	54.84	42.82	74.00	54.00	X/E
2402.00	H	52.65	31.04	31.90	84.55	62.94			X/F
4804.15	H	44.54	32.20	5.21	49.75	37.41	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency .“F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown “ * ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



TX CH01(Above 1000 MHz, Horizontal)





EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX 2440MHz –CH20-1Mbps		

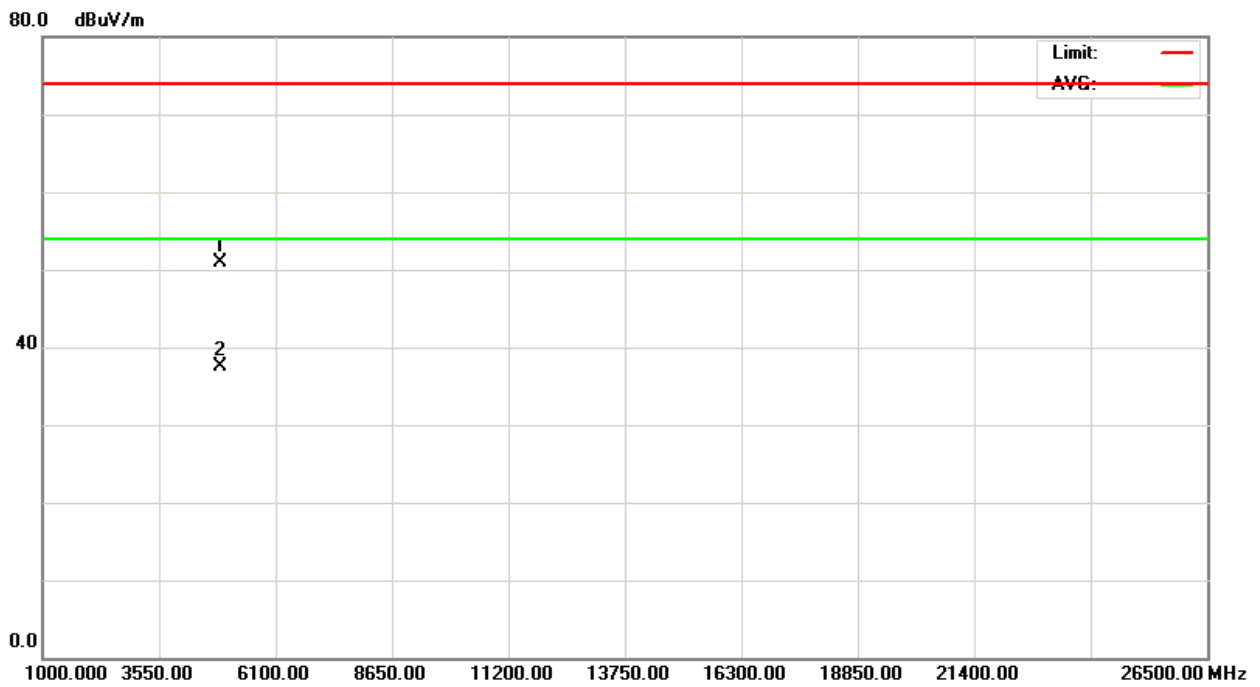
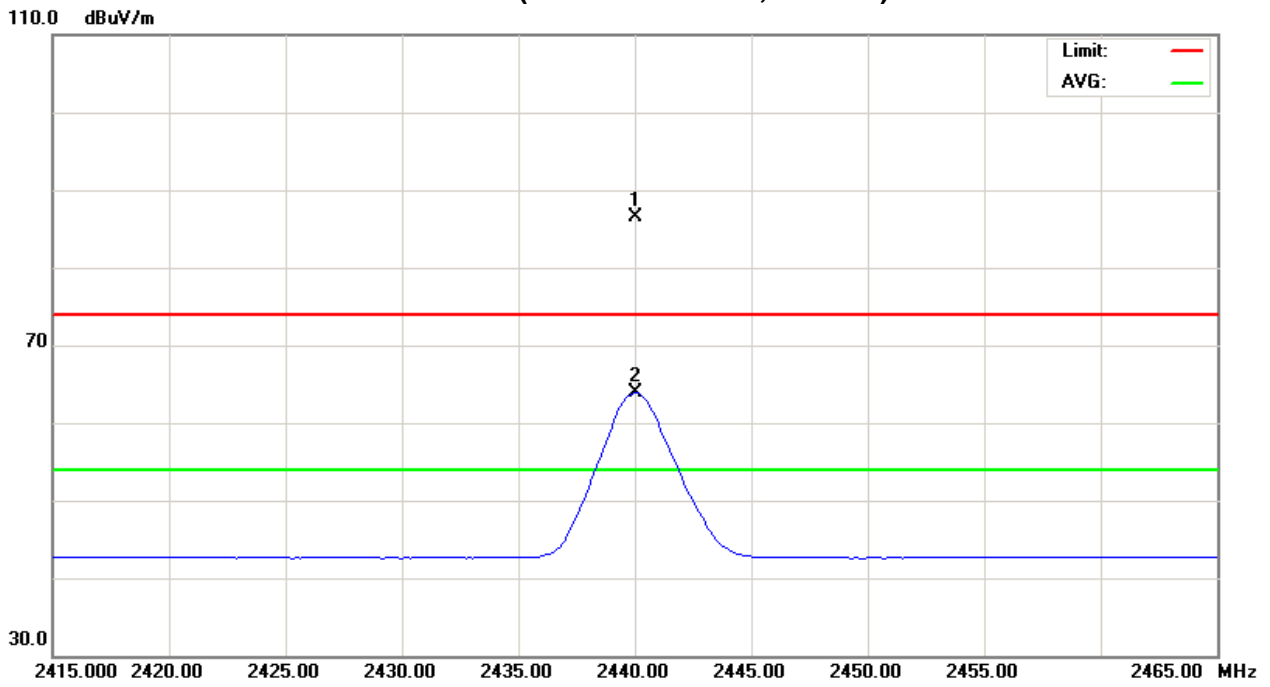
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2440.00	V	54.71	31.85	31.55	86.26	63.40			X/F
4880.84	V	45.37	32.05	5.50	50.87	37.55	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『 Note 』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency ◦ “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) Data of measurement within this frequency range shown “ * ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
 “X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



TX CH20 (Above 1000 MHz, Vertical)





EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX 2440MHz –CH20-1Mbps		

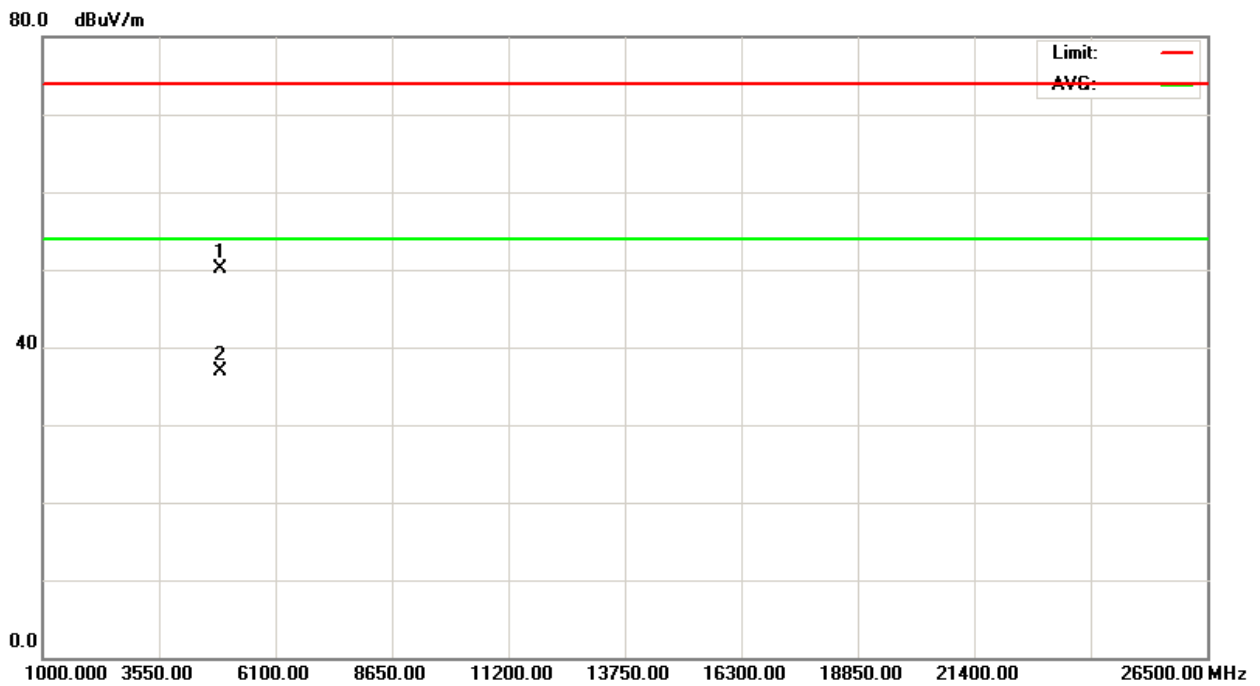
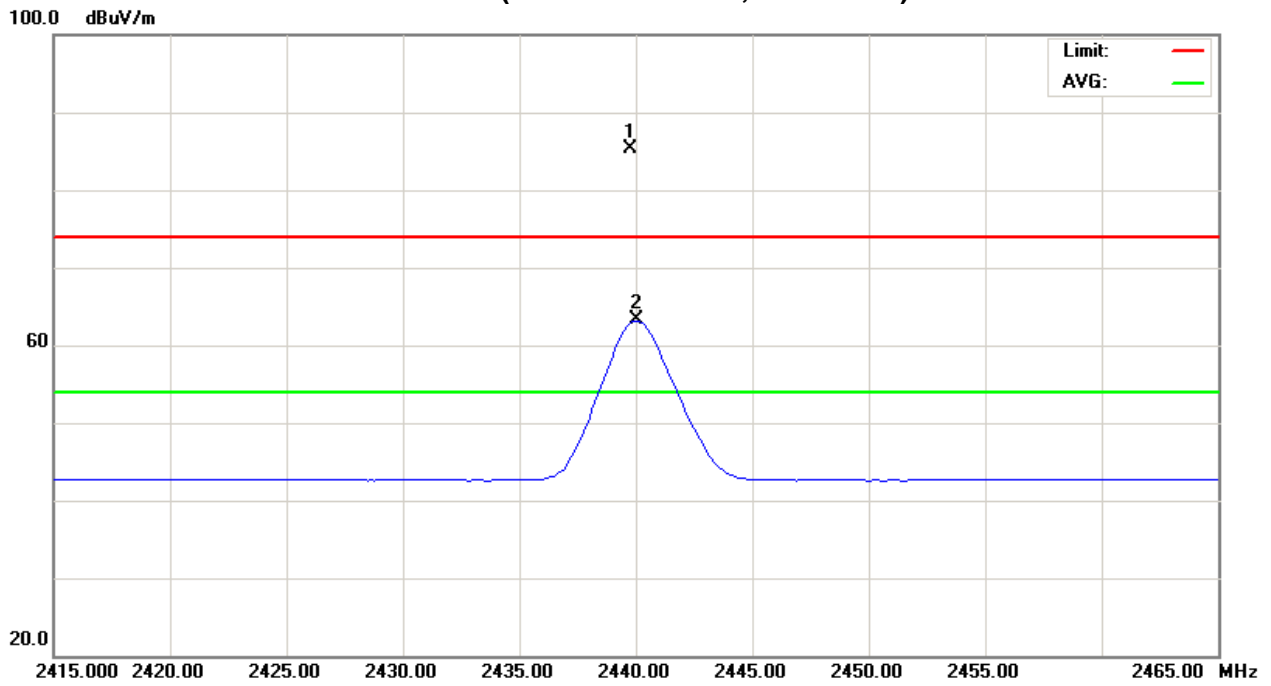
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2439.75	H	53.40	31.38	31.85	85.25	63.23			X/F
4880.24	H	44.65	31.42	5.50	50.15	36.92	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『 Note 』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency .“F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown “ * ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
 “X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



TX CH20 (Above 1000 MHz, Horizontal)





EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010hPa	Test Voltage :	DC 3V
Test Mode :	TX 2480MHz –CH40-1Mbps		

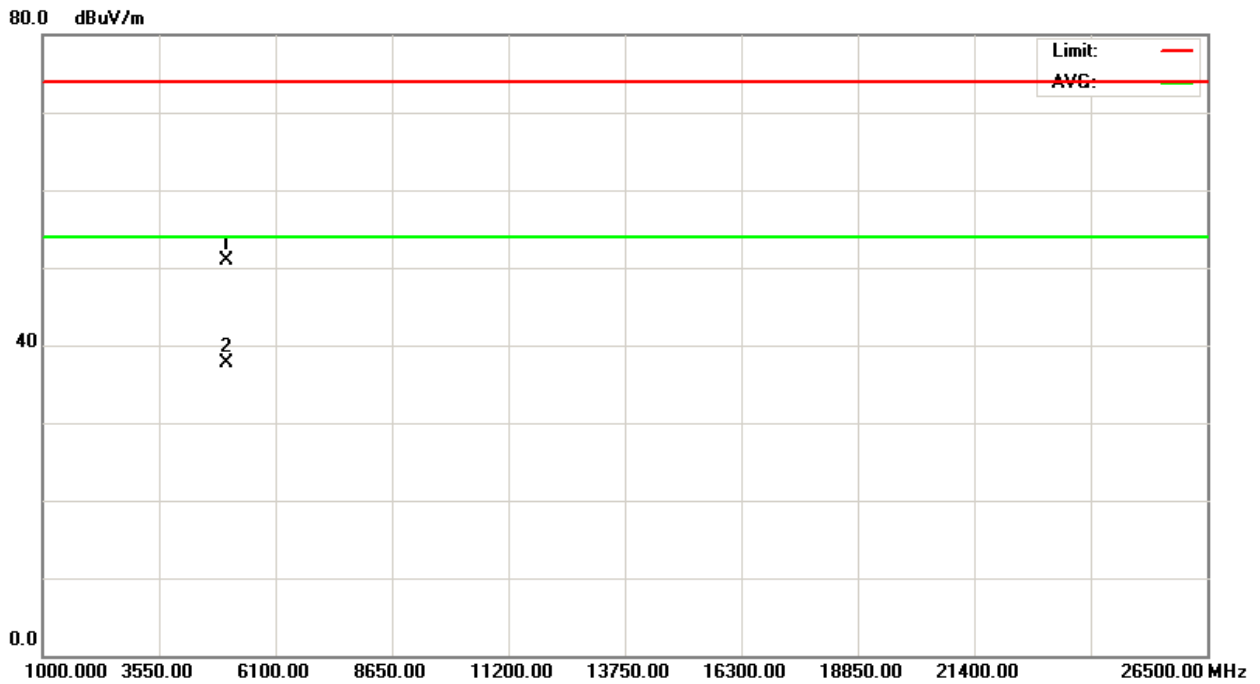
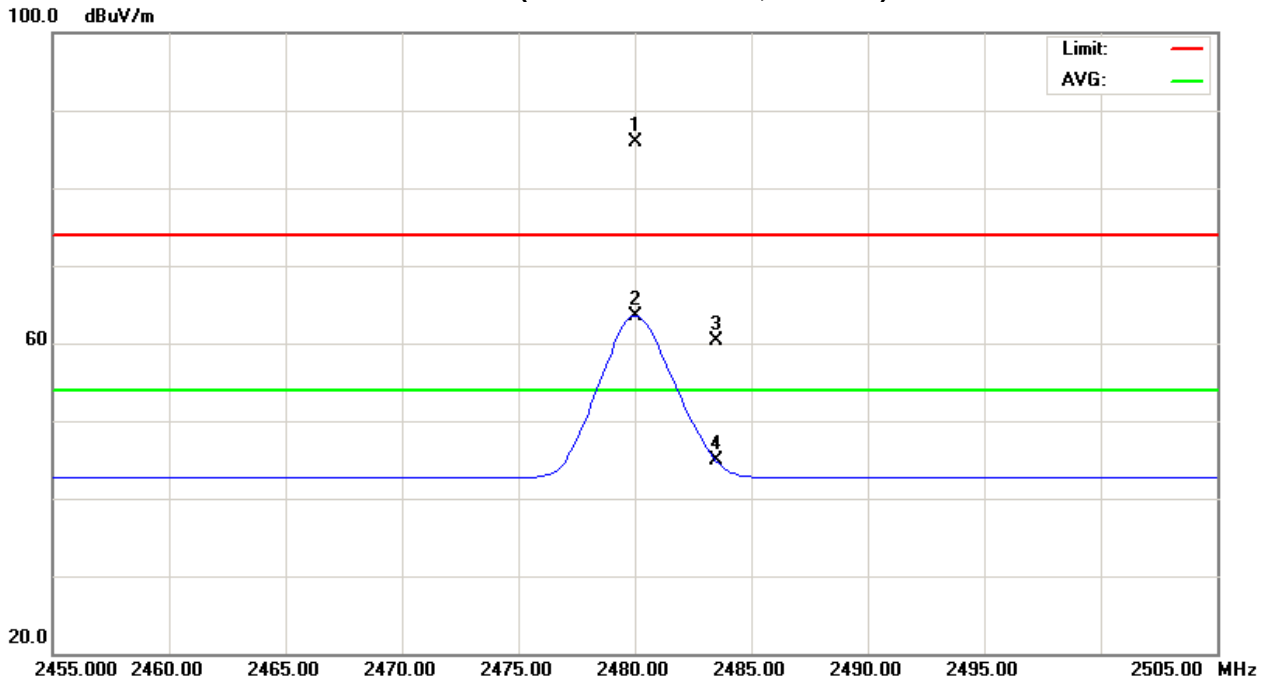
Freq.	Ant. Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2480.00	V	54.08	31.74	31.80	85.88	63.54			X/F
2483.50	V	28.55	13.07	31.80	60.35	44.87	74.00	54.00	X/E
4960.02	V	45.08	31.99	5.78	50.86	37.77	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
 "X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



TX CH40 (Above 1000 MHz, Vertical)





EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX 2480MHz –CH40-1Mbps		

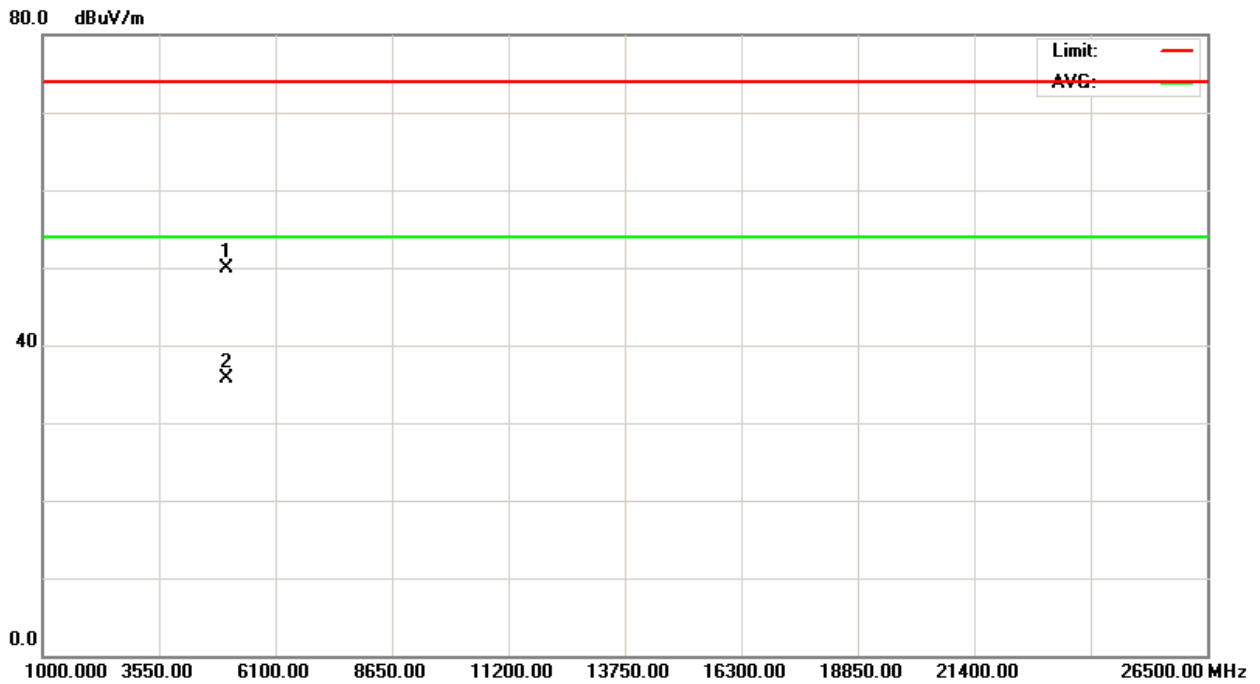
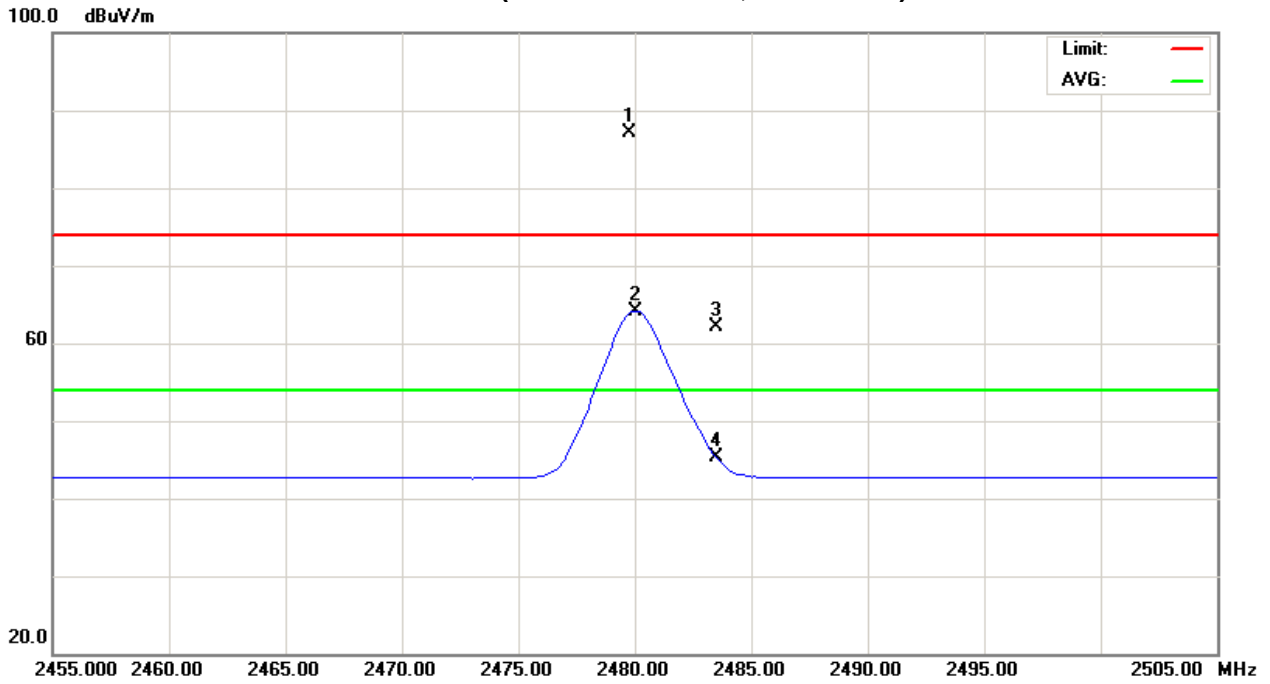
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2480.00	H	55.33	32.30	31.80	87.13	64.10			X/F
2483.50	H	30.26	13.47	31.80	62.06	45.27	74.00	54.00	X/E
4960.25	H	44.10	30.01	5.78	49.88	35.79	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency .“F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown “ * ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



TX CH40 (Above 1000 MHz, Horizontal)



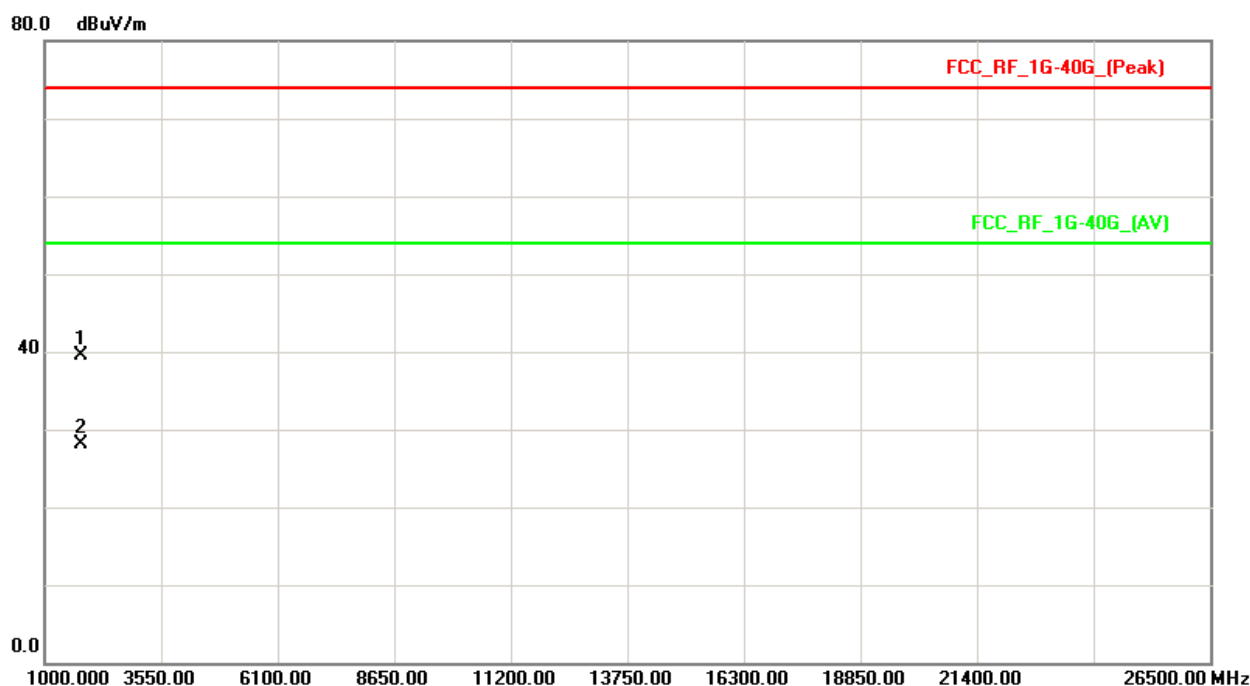


EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	RX Mode 2402MHz - 1Mbps		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
1784.20	V	42.75	31.42	-3.29	39.46	28.13	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『 Note 』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
 "X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



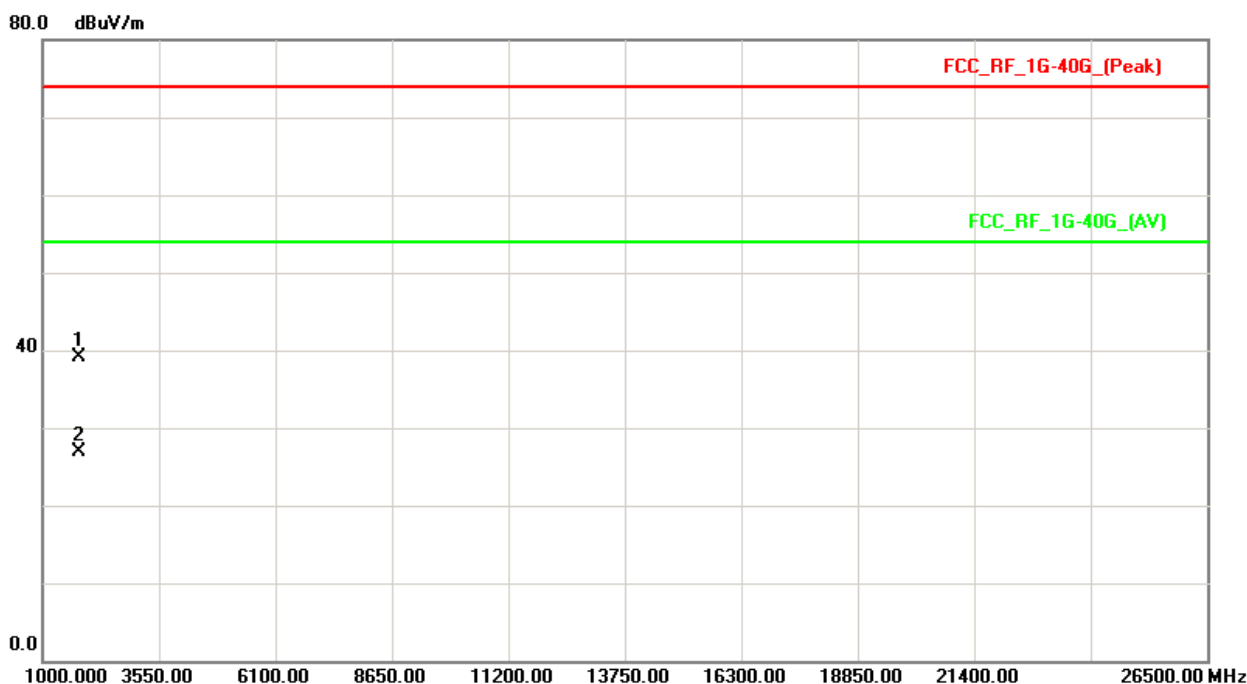


EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1010 hPa	Test Voltage :	DC 3V
Test Mode :	RX Mode 2402MHz - 1Mbps		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
1784.20	H	42.37	30.24	-3.29	39.08	26.95	74.00	54.00	X/H

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency ◦ "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) Data of measurement within this frequency range shown " * " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :
 "X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand





5. NUMBER OF HOPPING CHANNEL

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Number of Hopping Channel	2400-2483.5	PASS

5.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2012

Remark: " N/A" denotes No Model Name , Serial No. or No Calibration specified.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

5.1.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

5.1.3 DEVIATION FROM STANDARD

No deviation.

5.1.4 TEST SETUP



5.1.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



6. AVERAGE TIME OF OCCUPANCY

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

6.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2012

Remark: " N/A" denotes No Model Name , Serial No. or No Calibration specified.

6.1.2 TEST PROCEDURE

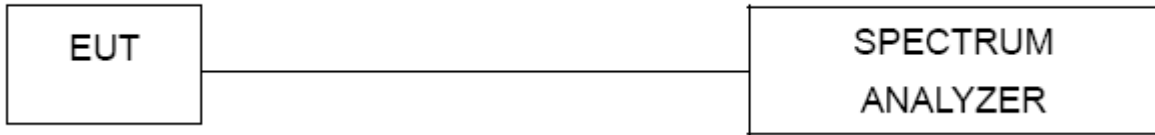
- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- f. Measure the maximum time duration of one single pulse.
- g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
- h. Measure the maximum time duration of one single pulse.
- i. DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel (5 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times $3.37 \times 31.6 = 106.6$ within 31.6 seconds.
- j. DH3 Packet permit maximum $1600 / 79 / 4 = 5.06$ hops per second in each channel (3 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times $5.06 \times 31.6 = 160$ within 31.6 seconds.
- k. DH1 Packet permit maximum $1600 / 79 / 2 = 10.12$ hops per second in each channel (1 time slot RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times $10.12 \times 31.6 = 320$ within 31.6 seconds.

6.1.3 DEVIATION FROM STANDARD

No deviation.



6.1.4 TEST SETUP



6.1.5 EUT OPERATION CONDITIONS

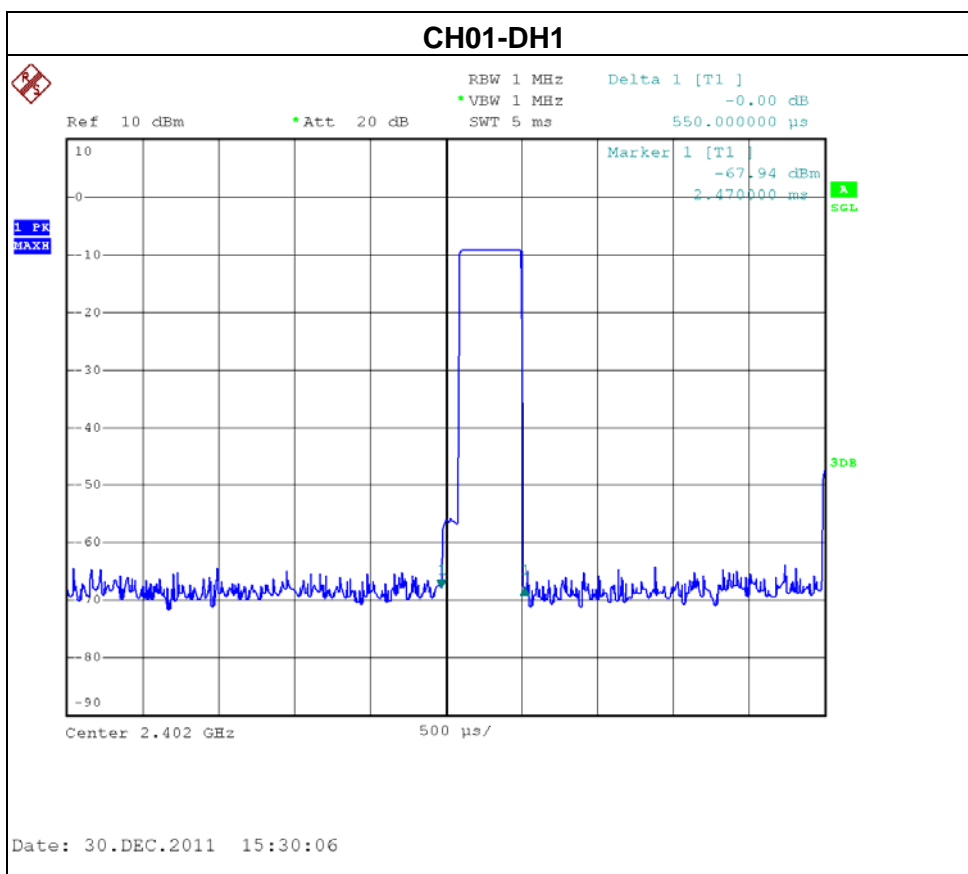
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

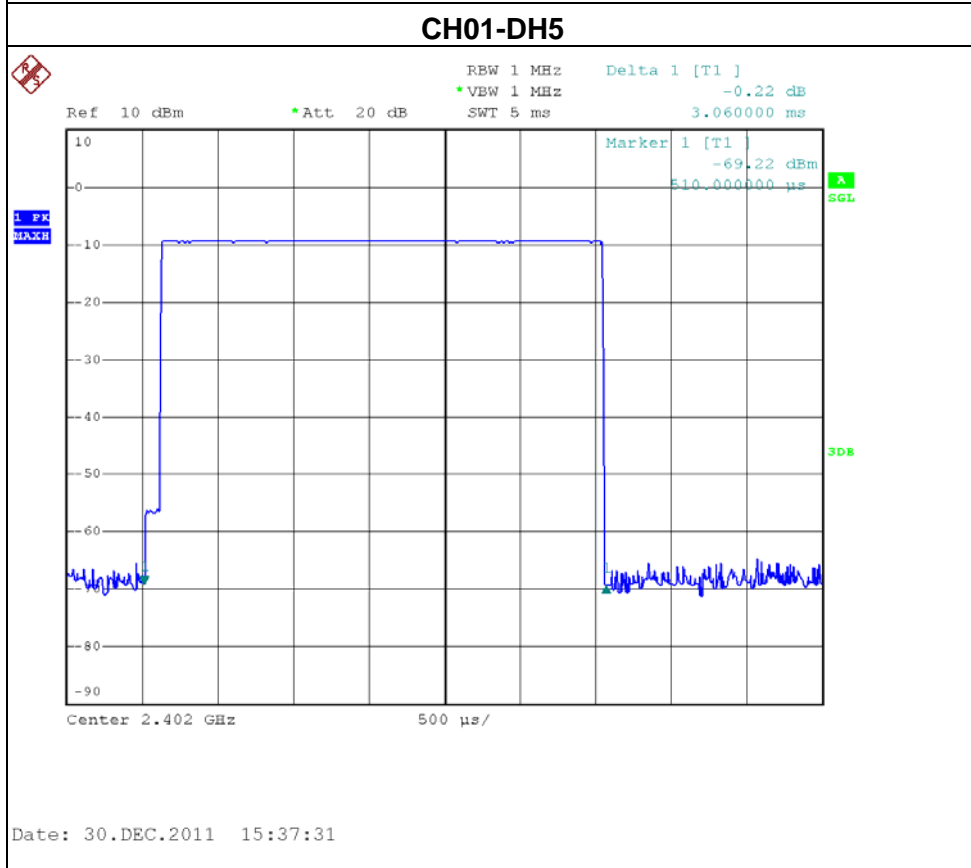
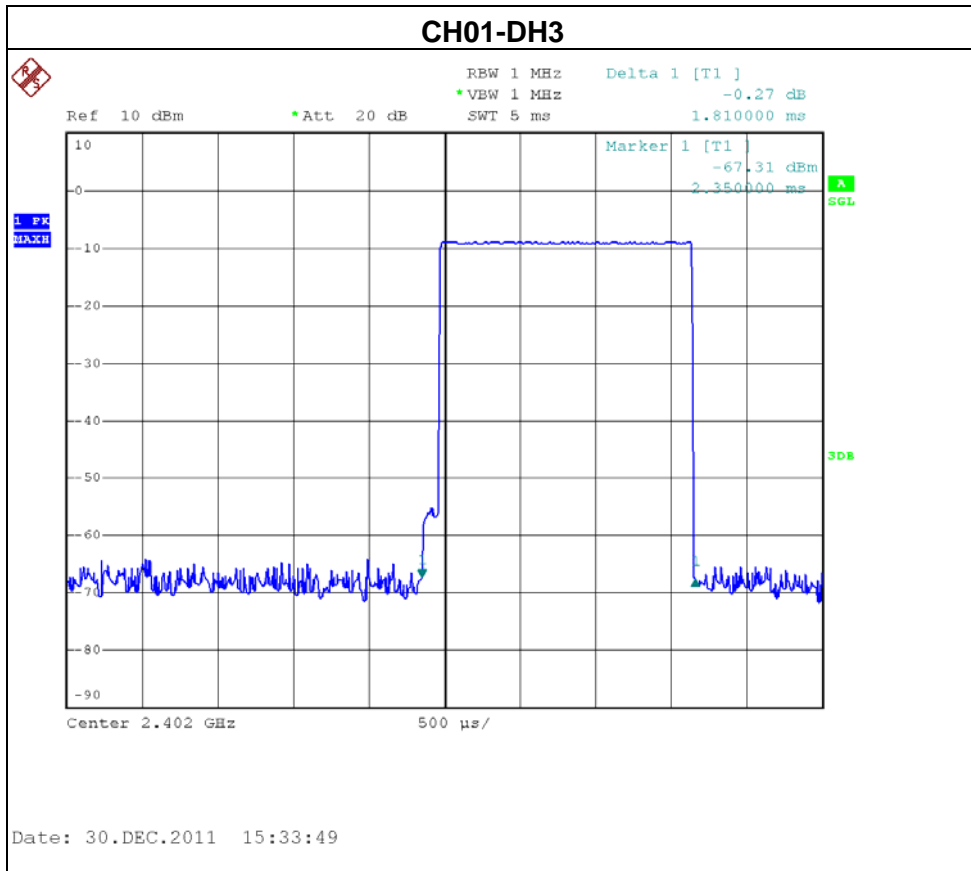


6.1.6 TEST RESULTS

EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1009 hPa	Test Voltage :	DC 3V
Test Mode :	CH01-DH1/DH3/DH5 -1Mbps		

Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
DH5	2402 MHz	3.0600	0.3264	0.4000
DH3	2402 MHz	1.8100	0.2896	0.4000
DH1	2402 MHz	0.5500	0.1760	0.4000

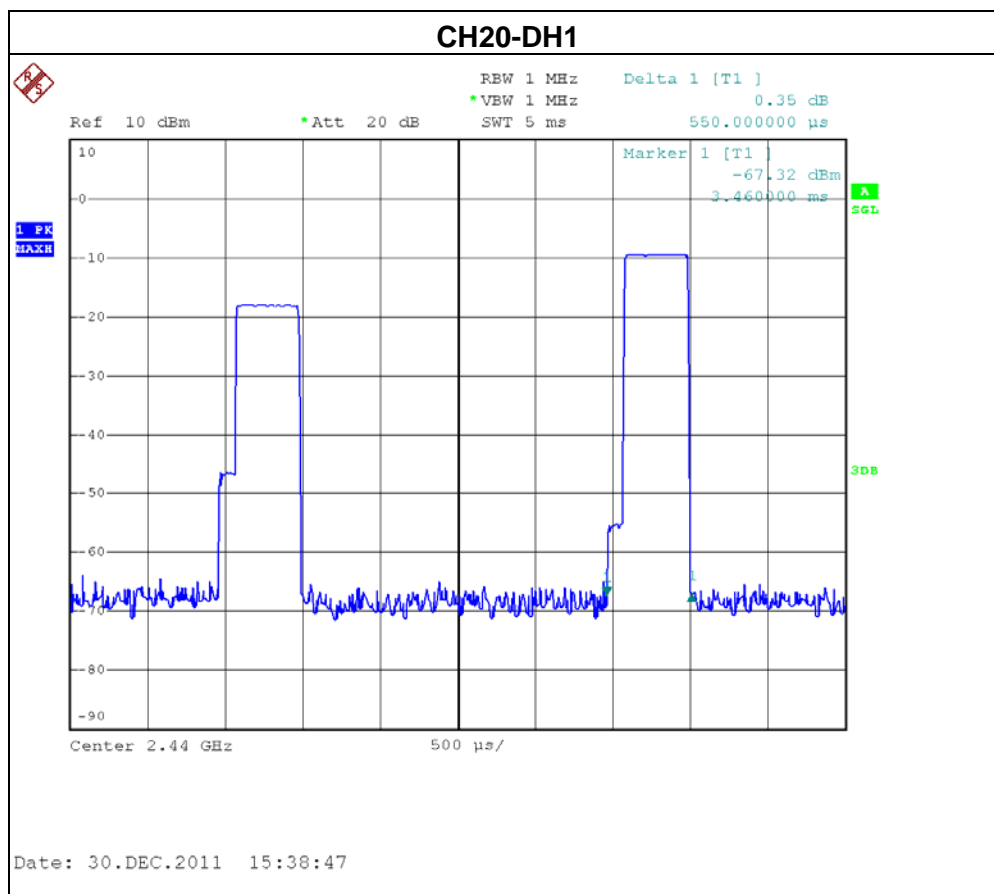


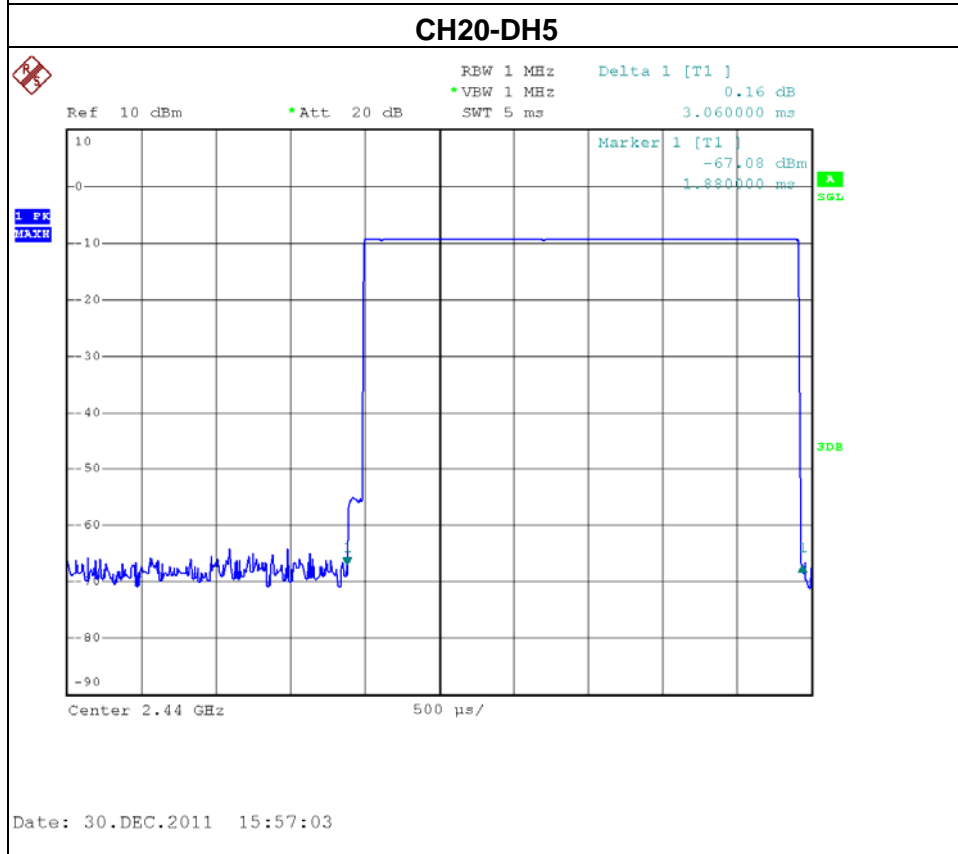
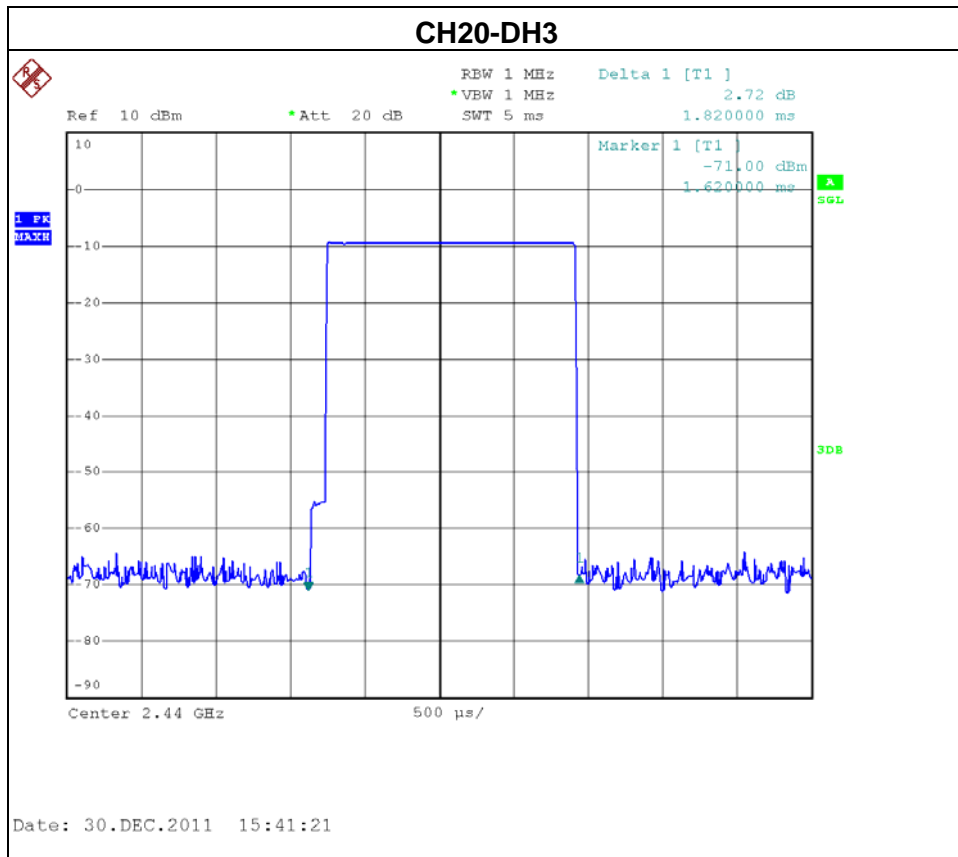




EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	60%
Pressure :	1009 hPa	Test Voltage :	DC 3V
Test Mode :	CH20 -DH1/DH3/DH5 -1Mbps		

Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
DH5	2440 MHz	3.0600	0.3264	0.4000
DH3	2440 MHz	1.8200	0.2912	0.4000
DH1	2440 MHz	0.5500	0.1760	0.4000

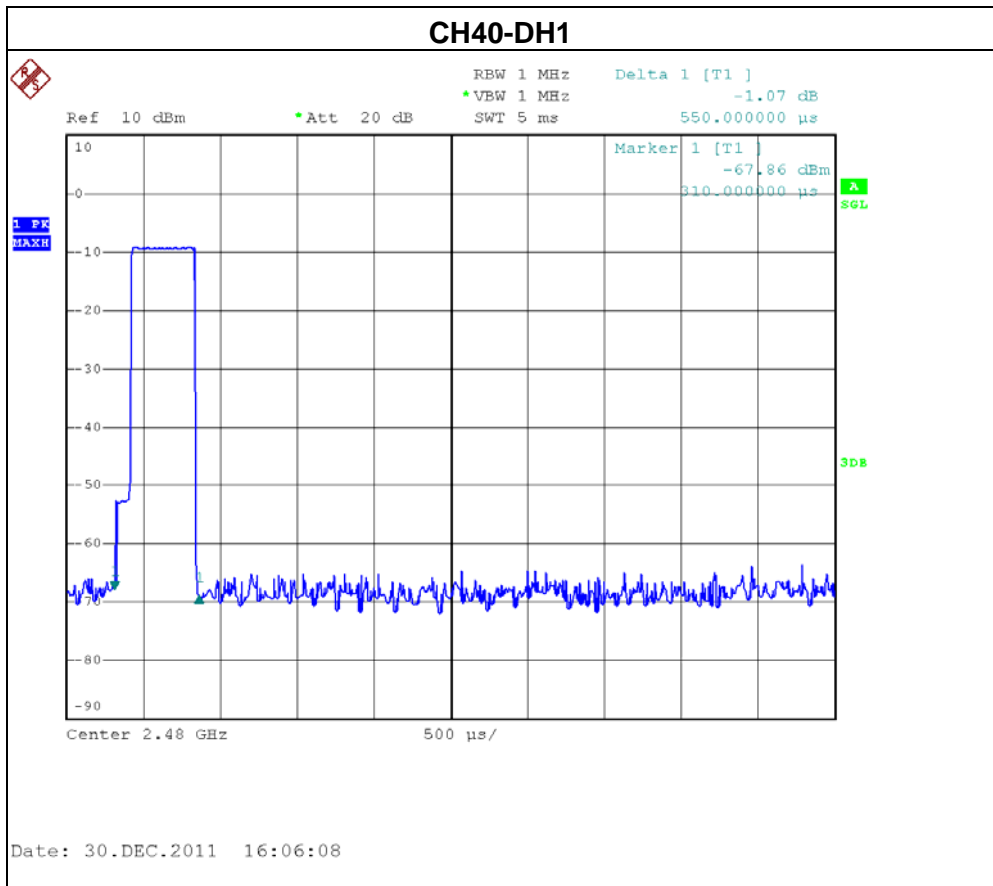


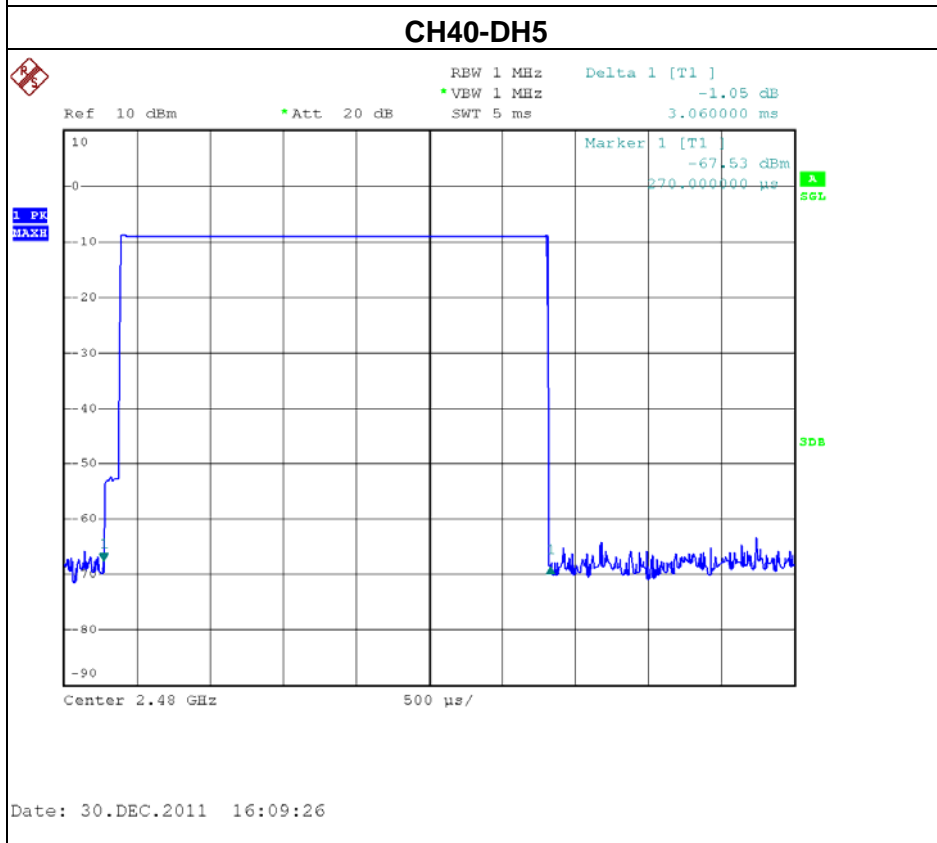
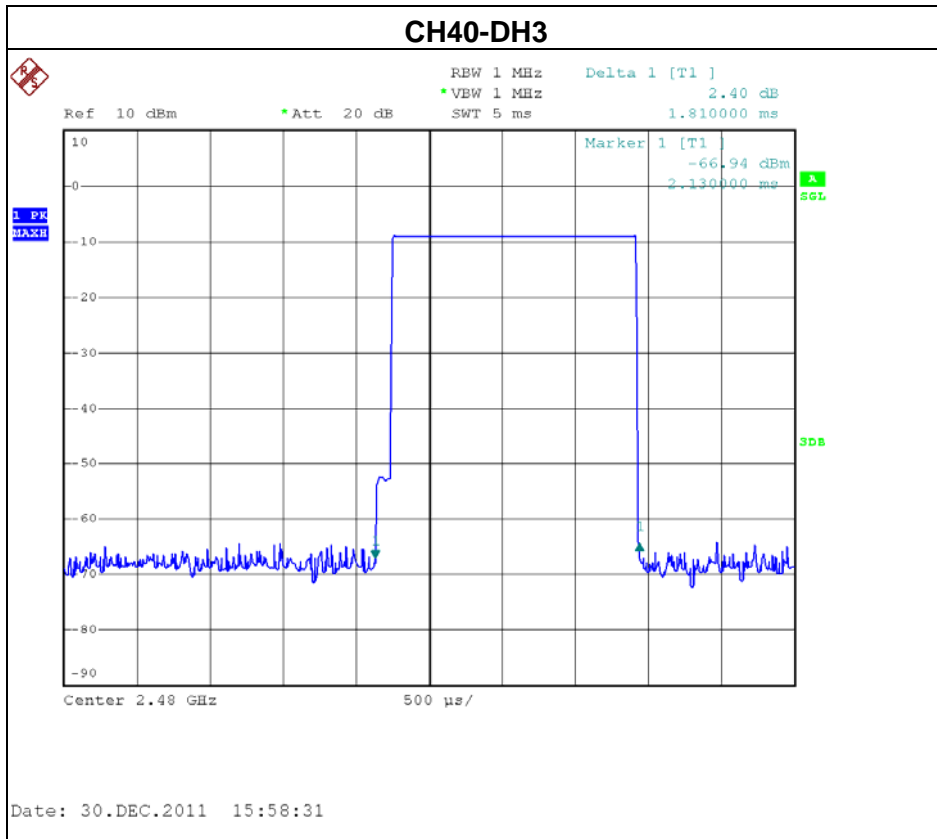




EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	60 %
Pressure :	1009 hPa	Test Voltage :	DC 3V
Test Mode :	CH40 -DH1/DH3/DH5-1Mbps		

Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits (s)
DH5	2480 MHz	3.0600	0.3264	0.4000
DH3	2480 MHz	1.8100	0.2896	0.4000
DH1	2480 MHz	0.5500	0.1760	0.4000





7. HOPPING CHANNEL SEPARATION MEASUREMENT

7.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

7.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2012

Remark: " N/A" denotes No Model Name , Serial No. or No Calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

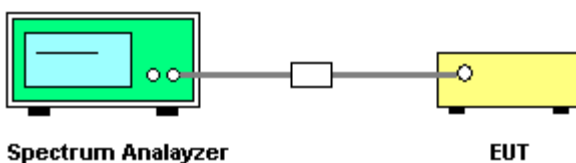
7.1.2 TEST PROCEDURE

- a. The EUT must have its hopping function enabled
- b. Span = wide enough to capture the peaks of two adjacent channels
 - Resolution (or IF) Bandwidth (RBW) \geq 1% of the span
 - Video (or Average) Bandwidth (VBW) \geq RBW
 - Sweep = auto
 - Detector function = peak
 - Trace = max hold

7.1.3 DEVIATION FROM STANDARD

No deviation.

7.1.4 TEST SETUP



7.1.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in hopping mode.

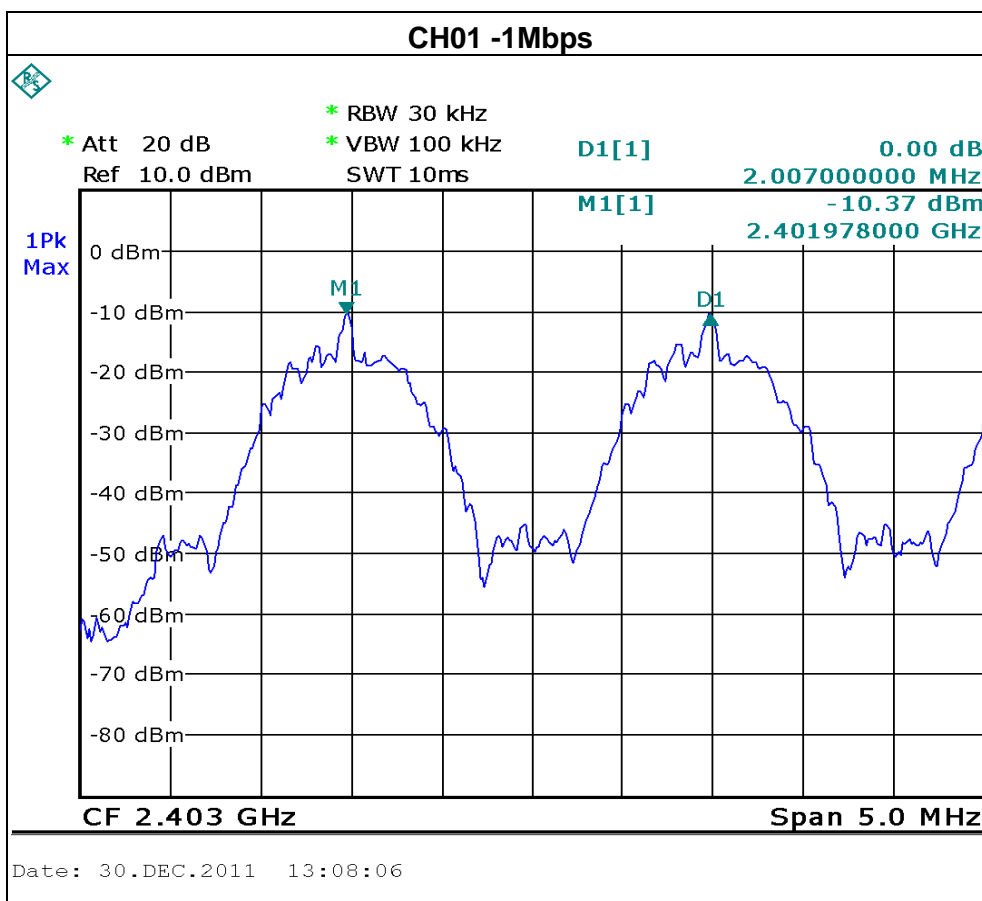


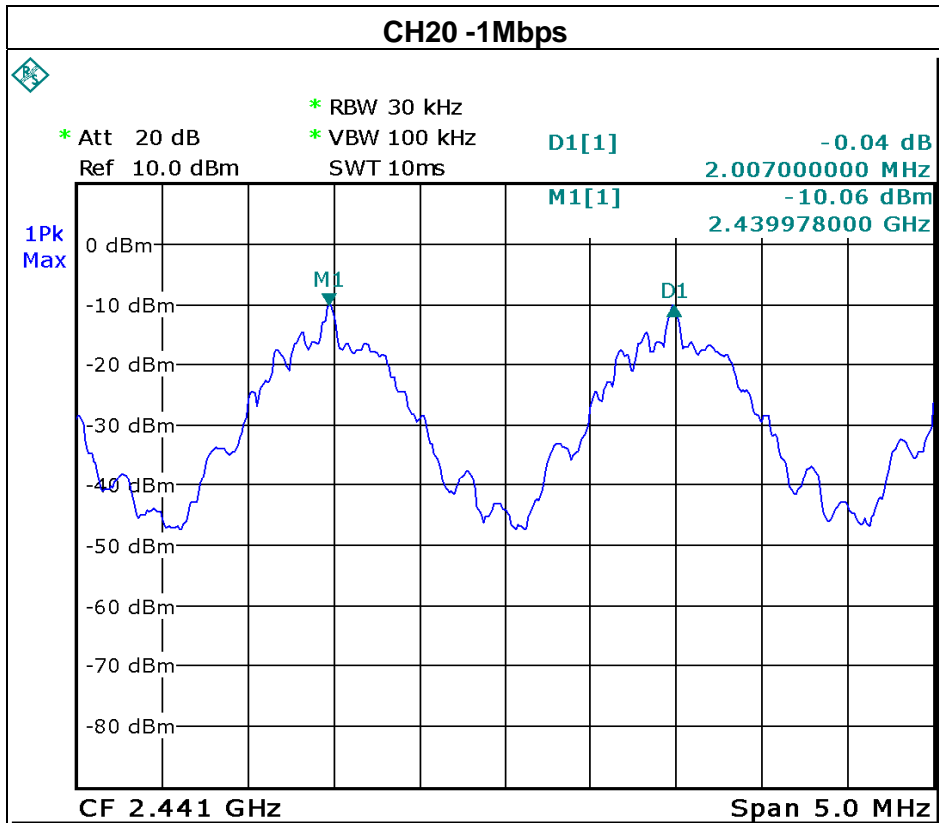
7.1.6 TEST RESULTS

EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1009 hPa	Test Voltage :	DC 3V
Test Mode :	CH01 / CH20 /CH40-1Mbps		

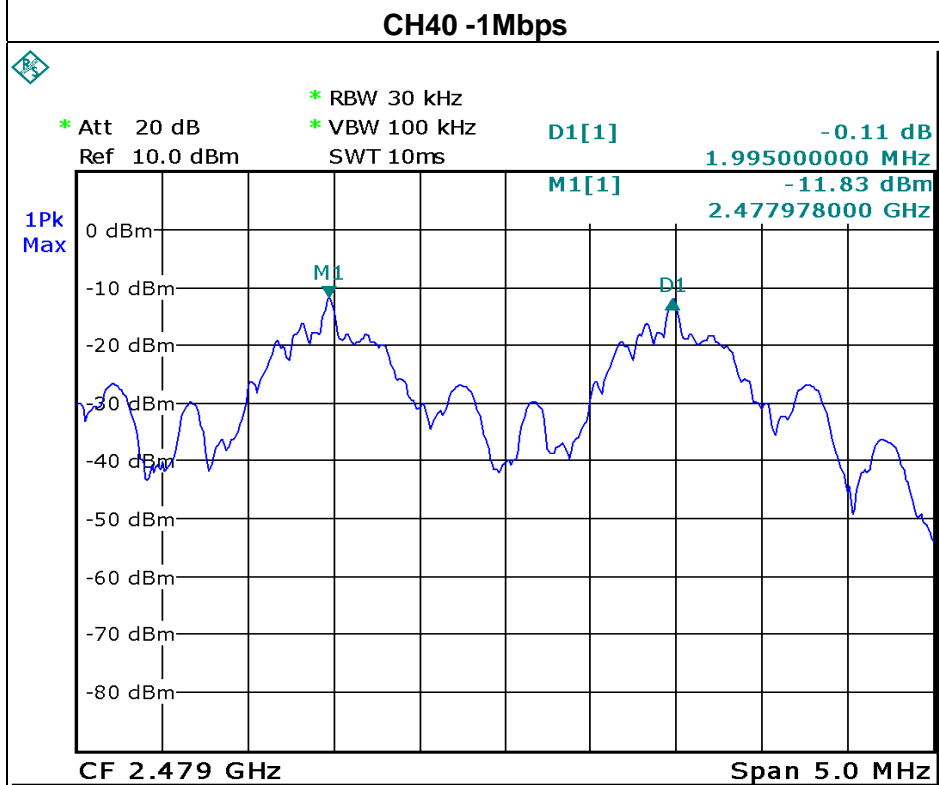
Frequency	Ch. Separation (KHz)	20dB Bandwidth (KHz)	Result
2402 MHz	2007	1028.00	Complies
2440 MHz	2007	1048.00	Complies
2480 MHz	1995	1737.00	Complies

Ch. Separation Limits: >20dB bandwidth or >2/3 of 20dB bandwidth





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8. BANDWIDTH TEST

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Frequency Range (MHz)	Result
15.247 (a)(2)	Bandwidth	2400-2483.5	PASS

8.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2012

Remark: " N/A" denotes No Model Name , Serial No. or No Calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

8.1.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 30KHz, VBW=100KHz, Sweep time = Auto.

8.1.3 DEVIATION FROM STANDARD

No deviation.

8.1.4 TEST SETUP



8.1.5 EUT OPERATION CONDITIONS

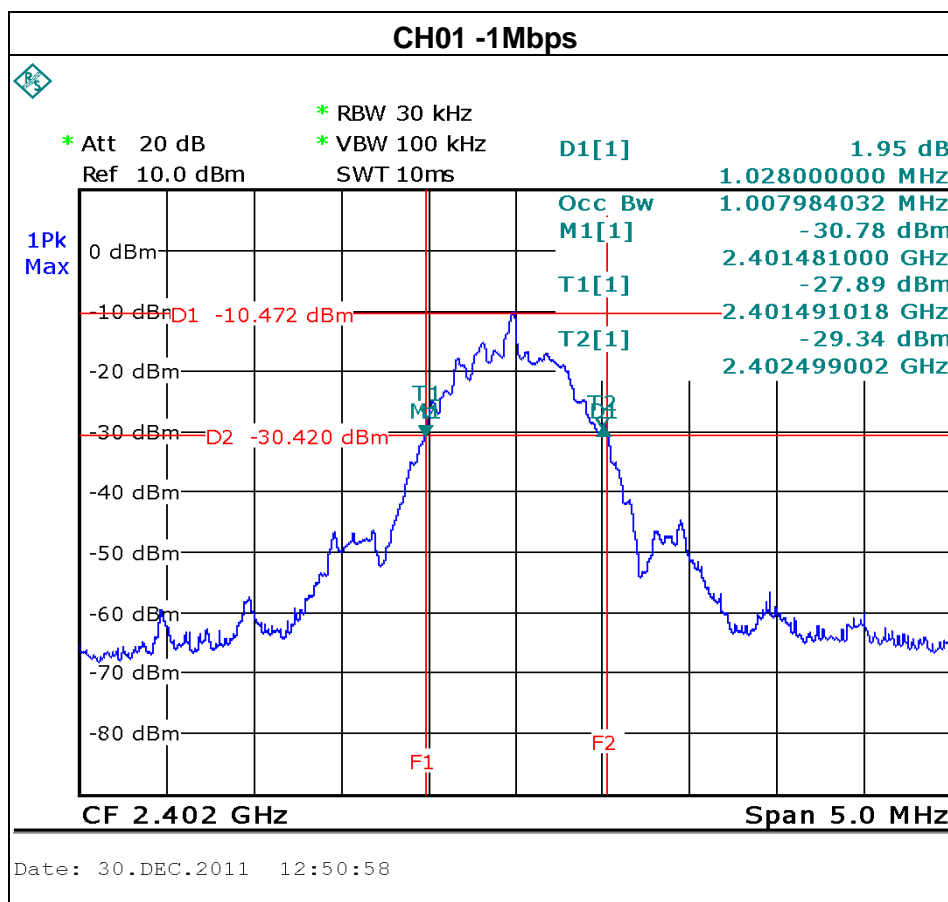
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

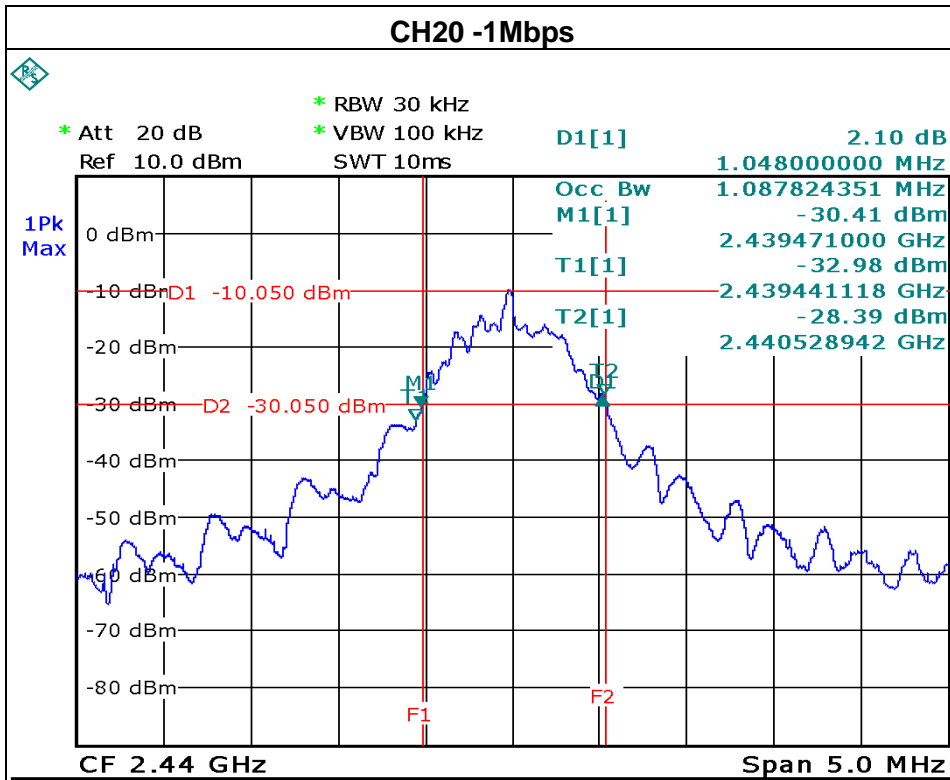


8.1.6 TEST RESULTS

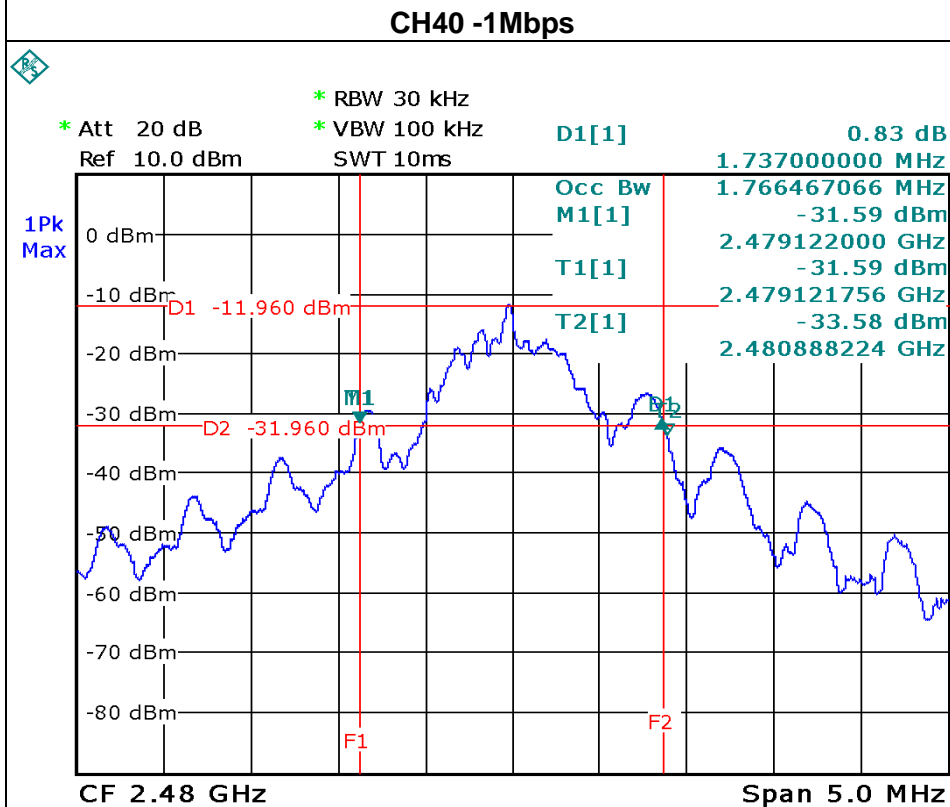
EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1009 hPa	Test Voltage :	DC 3V
Test Mode :	CH01 / CH20 /CH40-1Mbps		

Frequency	20dB Bandwidth (KHz)	99% Occupied Bandwidth (KHz)	Result
2402 MHz	1028.00	1007.98	PASS
2440 MHz	1048.00	1087.82	PASS
2480 MHz	1737.00	1766.47	PASS





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9. PEAK OUTPUT POWER TEST

9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (b)(1)	Peak Output Power	0.125 watt or 21dBm	2400-2483.5	PASS

9.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2012

Remark: " N/A" denotes No Model Name , Serial No. or No Calibration specified.

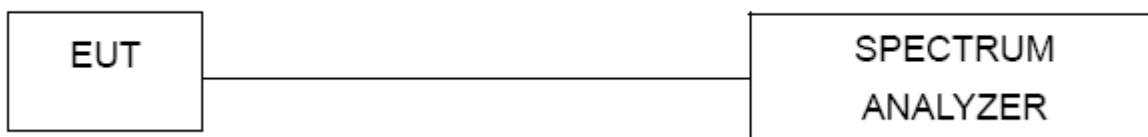
9.1.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 3MHz, VBW= 3MHz, Sweep time = Auto.

9.1.3 DEVIATION FROM STANDARD

No deviation.

9.1.4 TEST SETUP



9.1.5 EUT OPERATION CONDITIONS

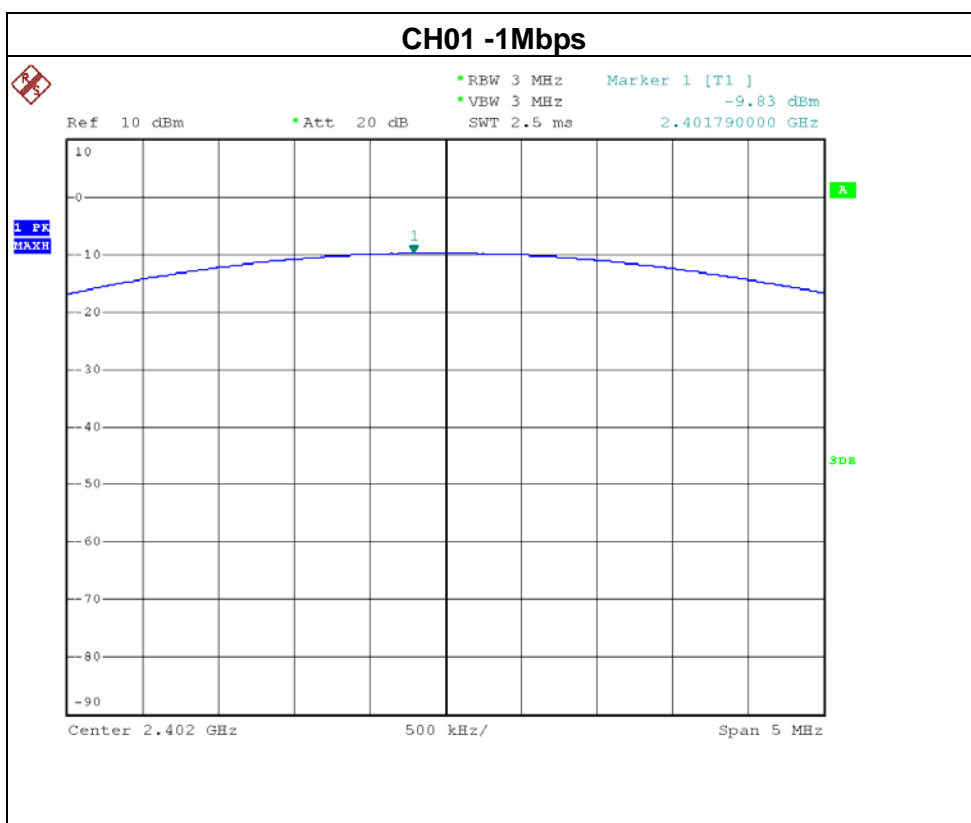
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

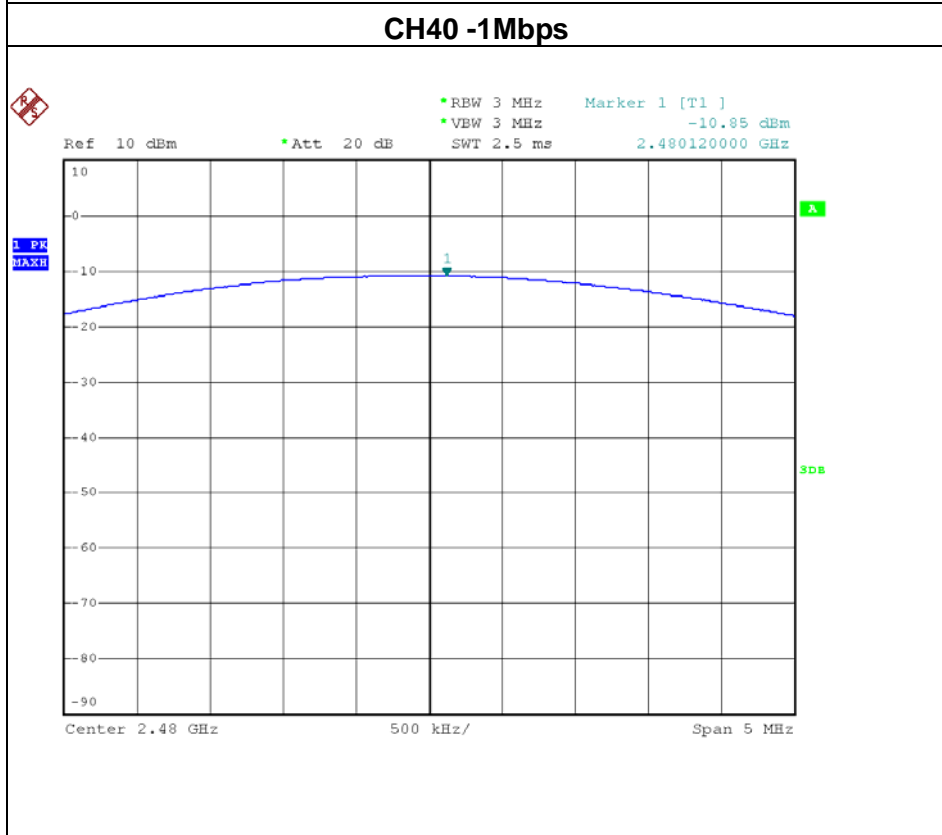
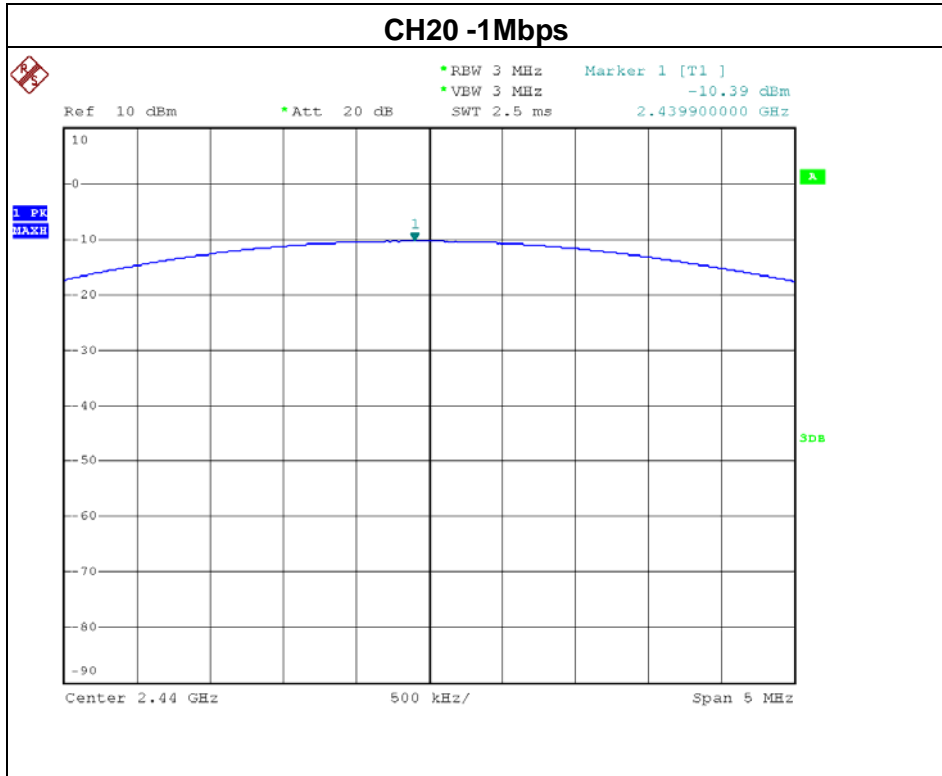


9.1.6 TEST RESULTS

EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1009 hPa	Test Voltage :	DC 3V
Test Mode :	CH01/ CH20 /CH40 -1Mbps		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH01	2402	-9.83	21	0.125
CH20	2441	-10.39	21	0.125
CH40	2480	-10.85	21	0.125







10. ANTENNA CONDUCTED SPURIOUS EMISSION

10.1 APPLIED PROCEDURES / LIMIT

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (microrvolts/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

10.1.1 MEASUREMENT INSTRUMENTS LIST AND SETTING

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.25.2012

Remark: " N/A" denotes No Model Name , Serial No. or No Calibration specified.

10.1.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

10.1.3 DEVIATION FROM STANDARD

No deviation.

10.1.4 TEST SETUP



10.1.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



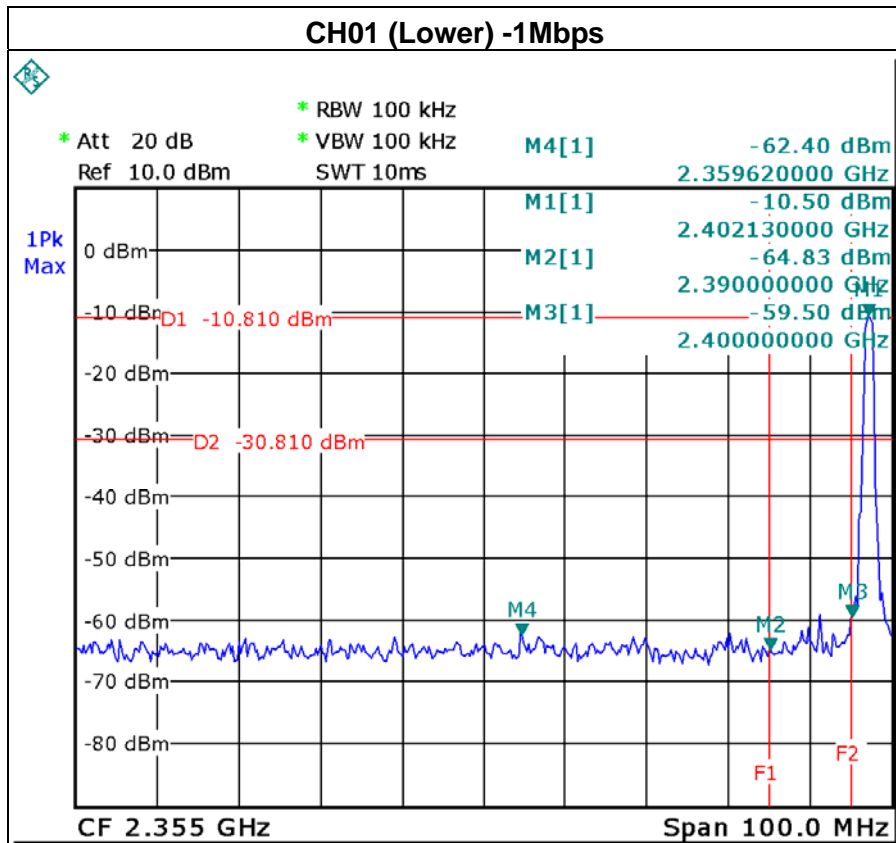
10.1.6 TEST RESULTS

EUT :	BLUE HR Bluetooth Smart	Model Name :	HRMBLE
Temperature :	21 °C	Relative Humidity :	45 %
Pressure :	1009 hPa	Test Voltage :	DC 3V
Test Mode :	CH01 / CH20/ CH40-1Mbps & Hopping on mode (1Mbps)		

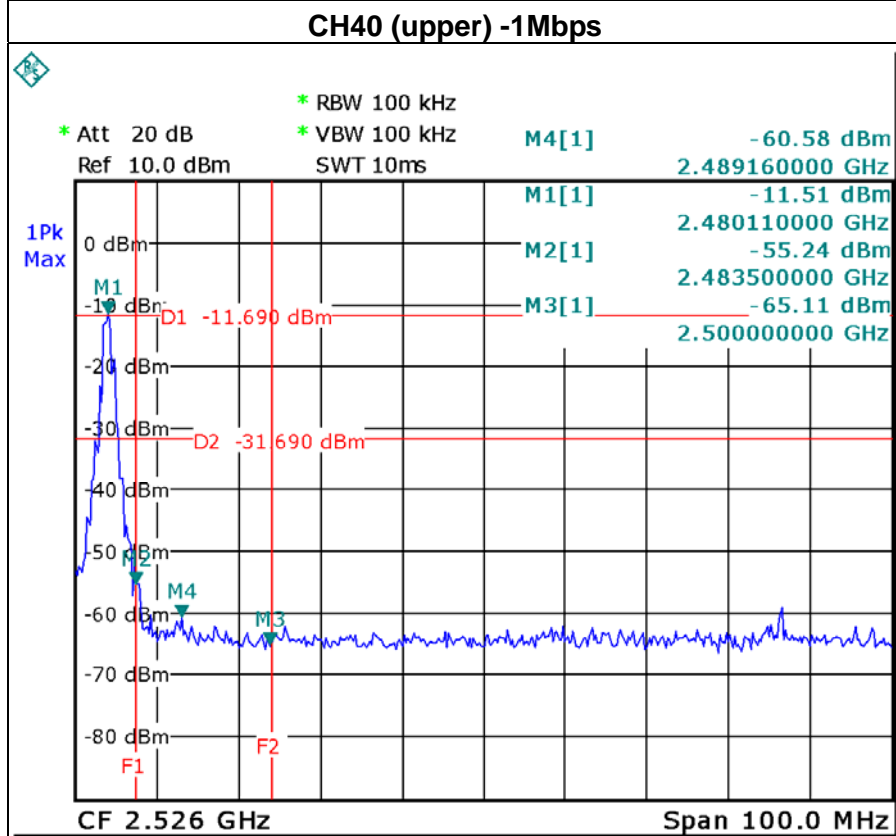
CH01 (Lower)		CH40(Upper)	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2400.00	-59.50	2483.50	-55.24

Result

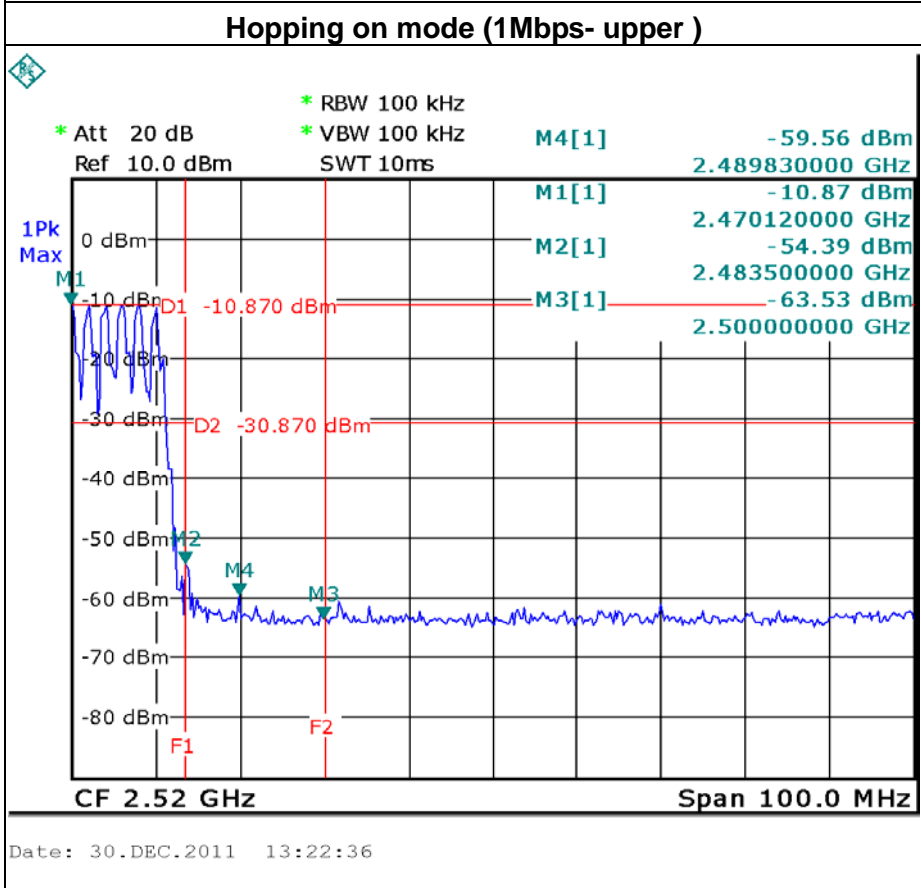
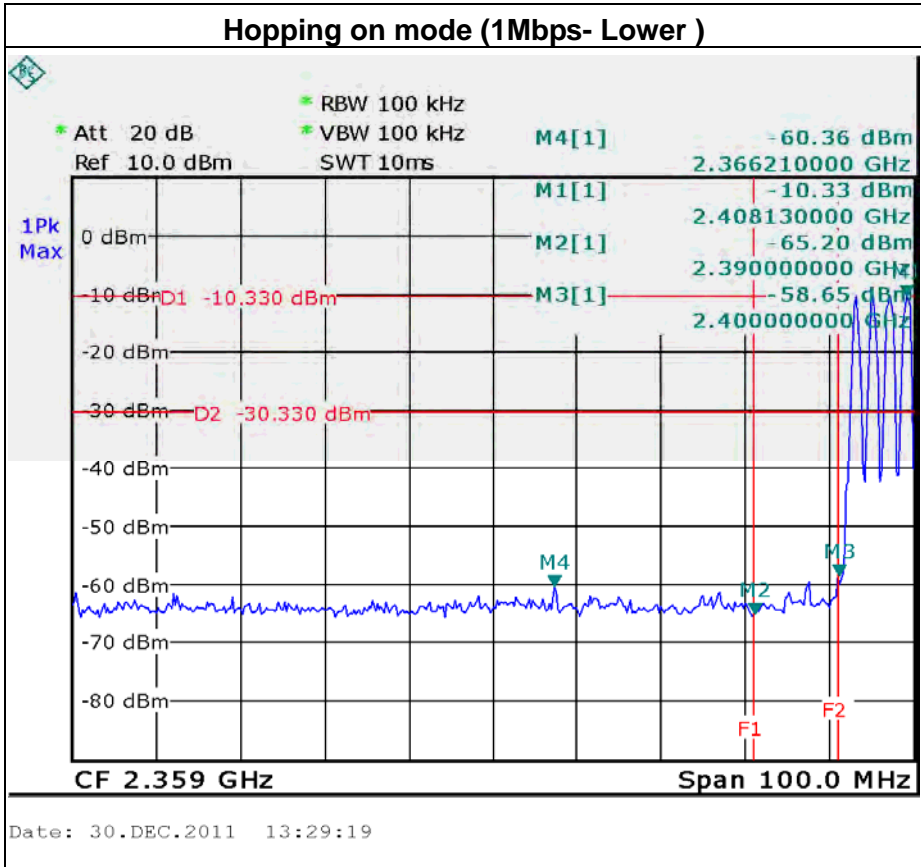
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

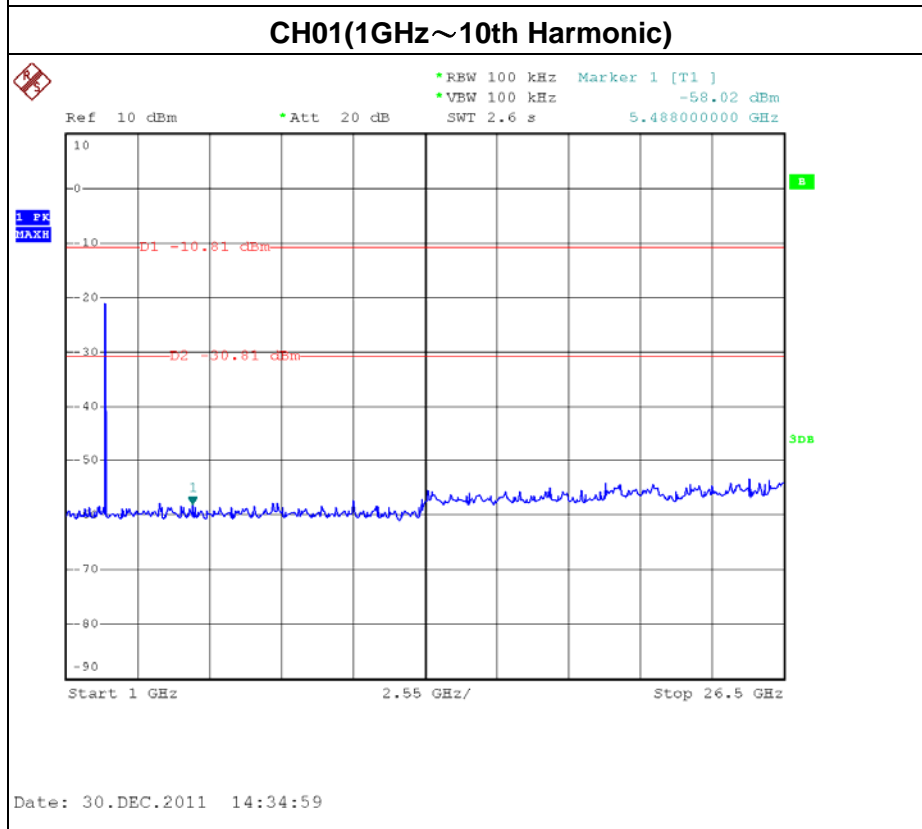
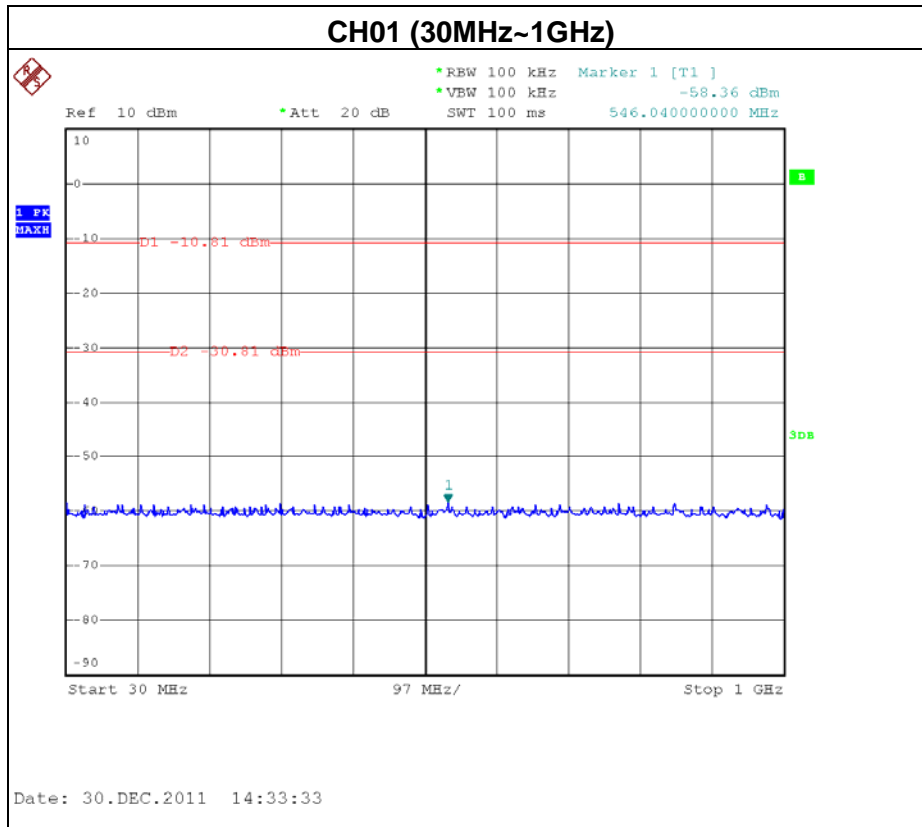


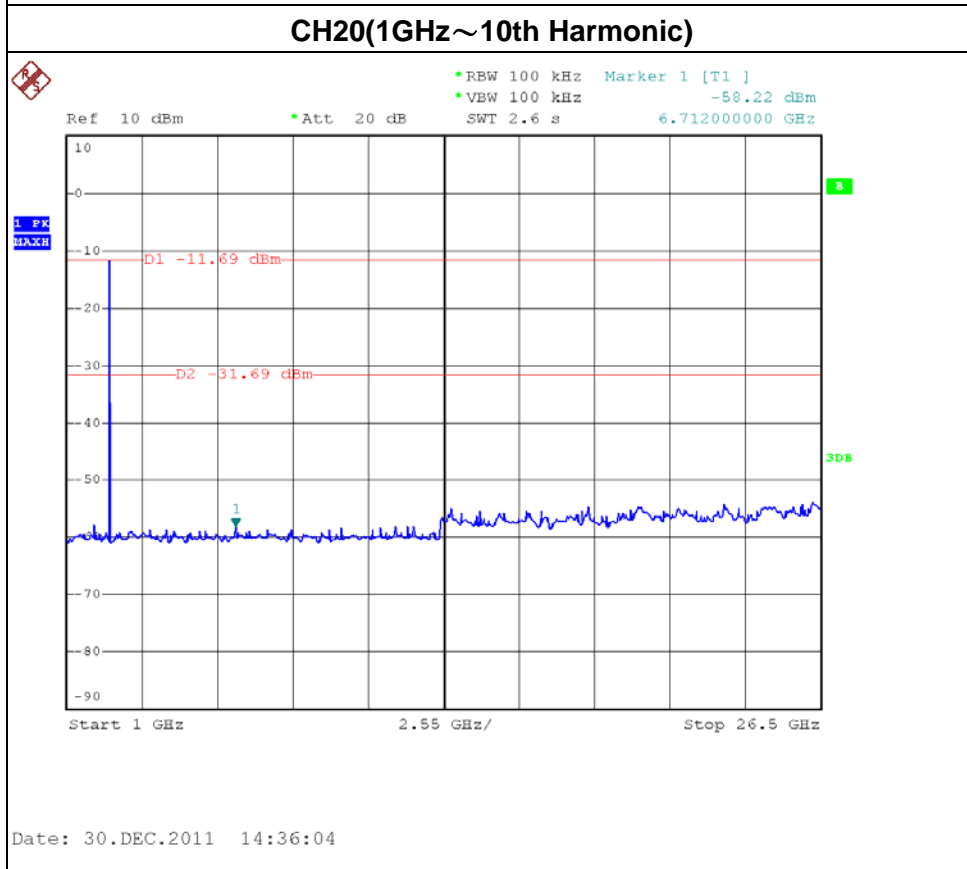
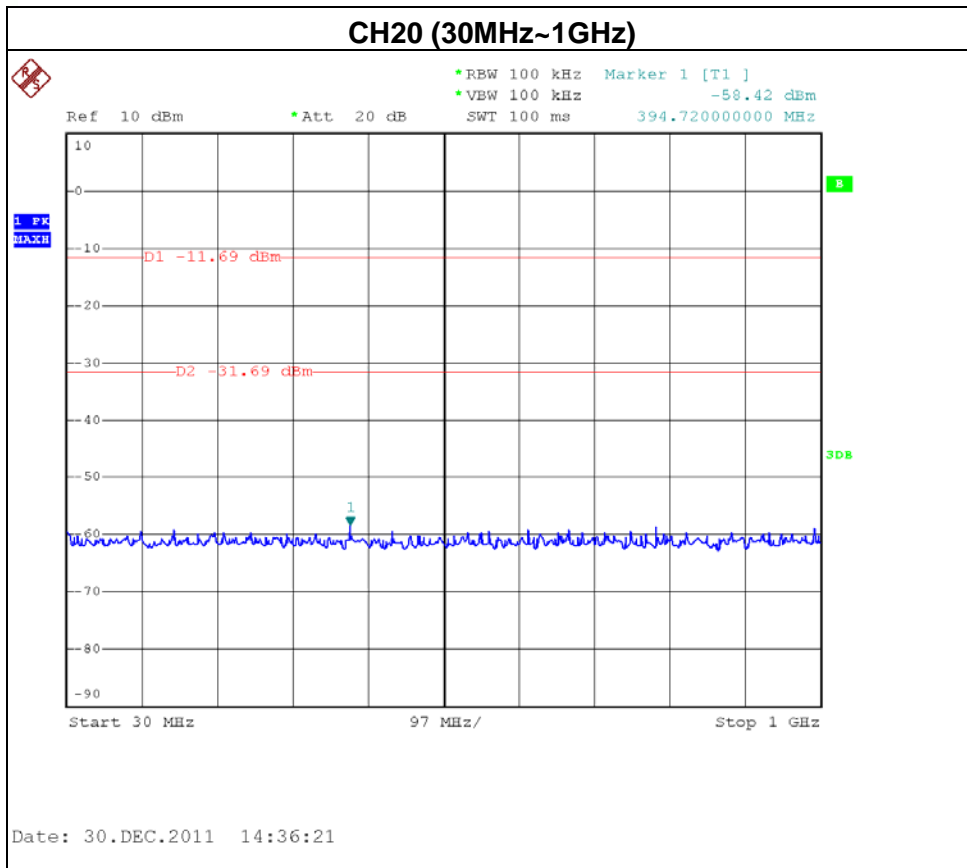
Date: 30.DEC.2011 12:52:36

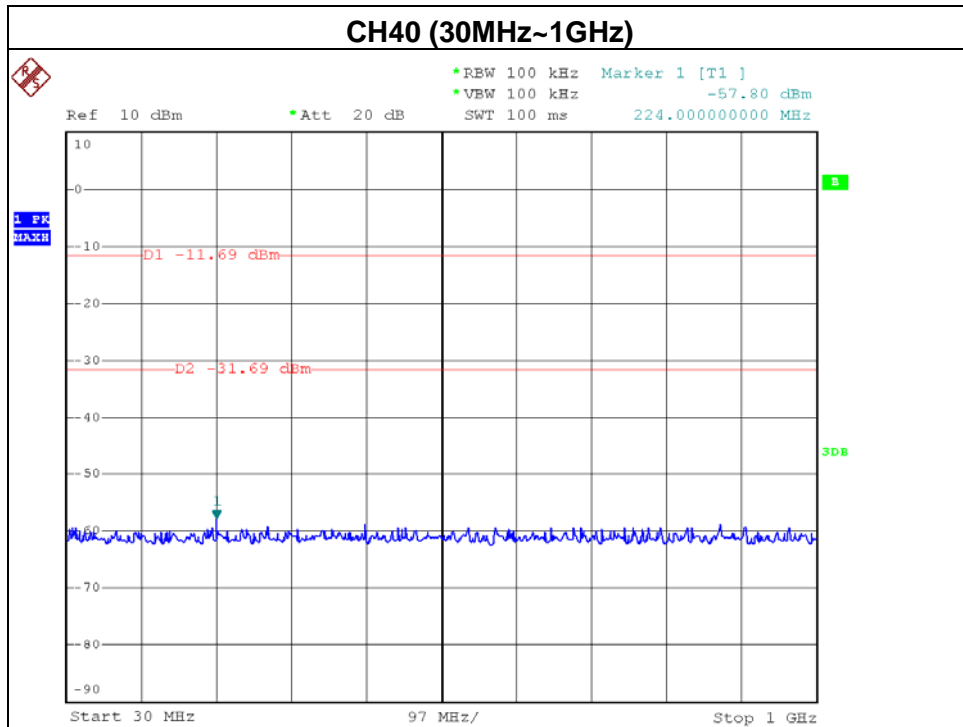


Date: 30.DEC.2011 13:00:49

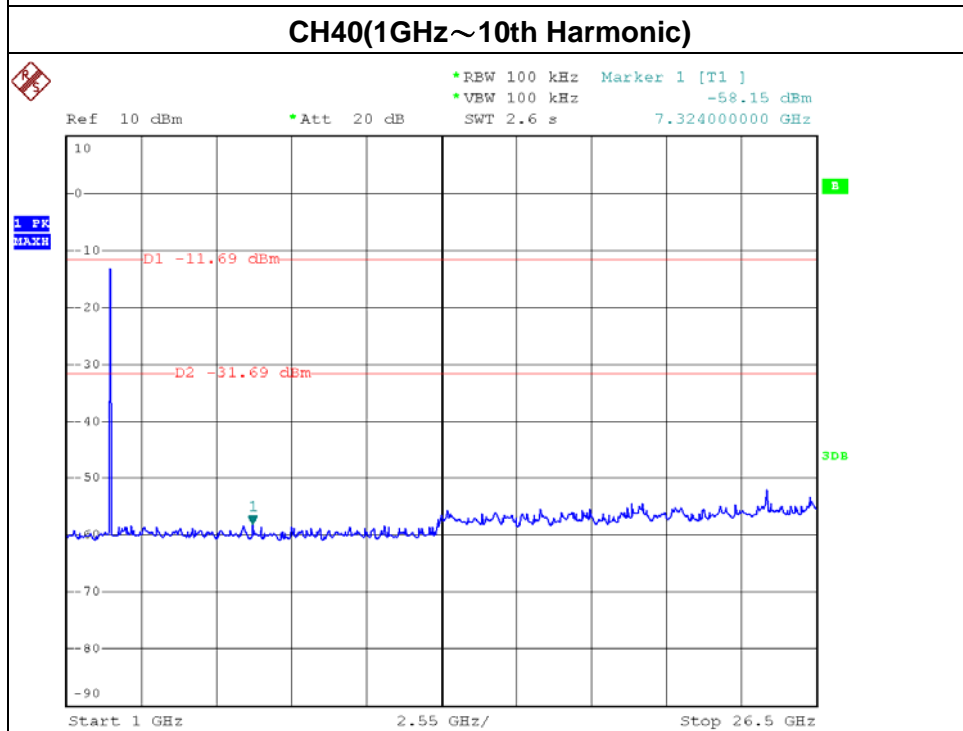








Date: 30.DEC.2011 14:36:39

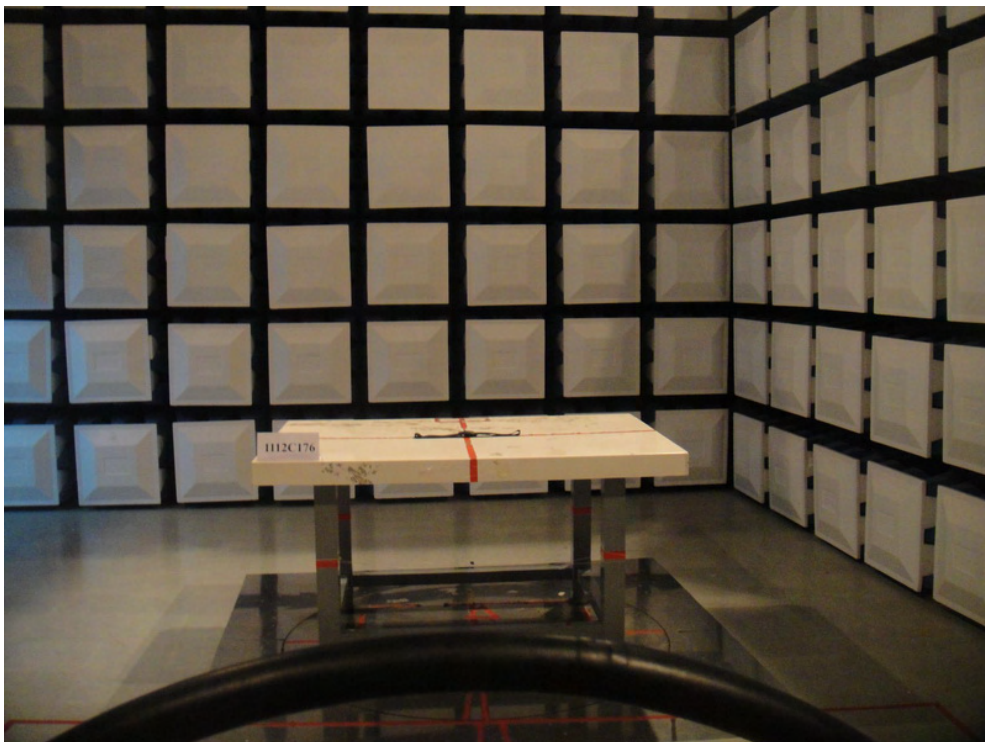
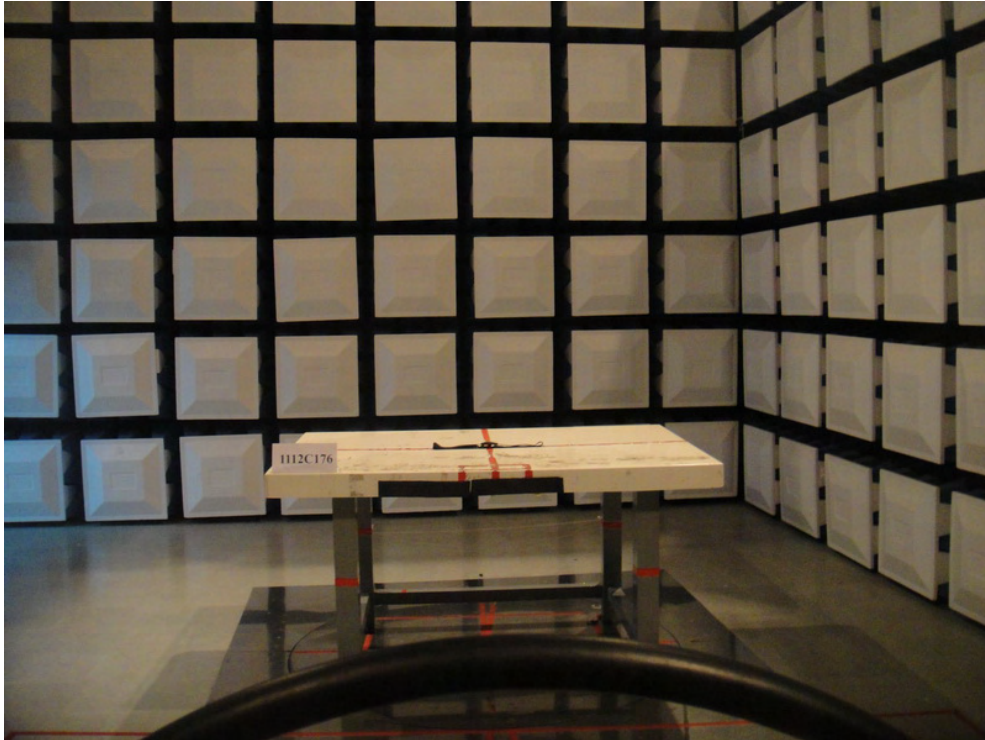


Date: 30.DEC.2011 14:37:24



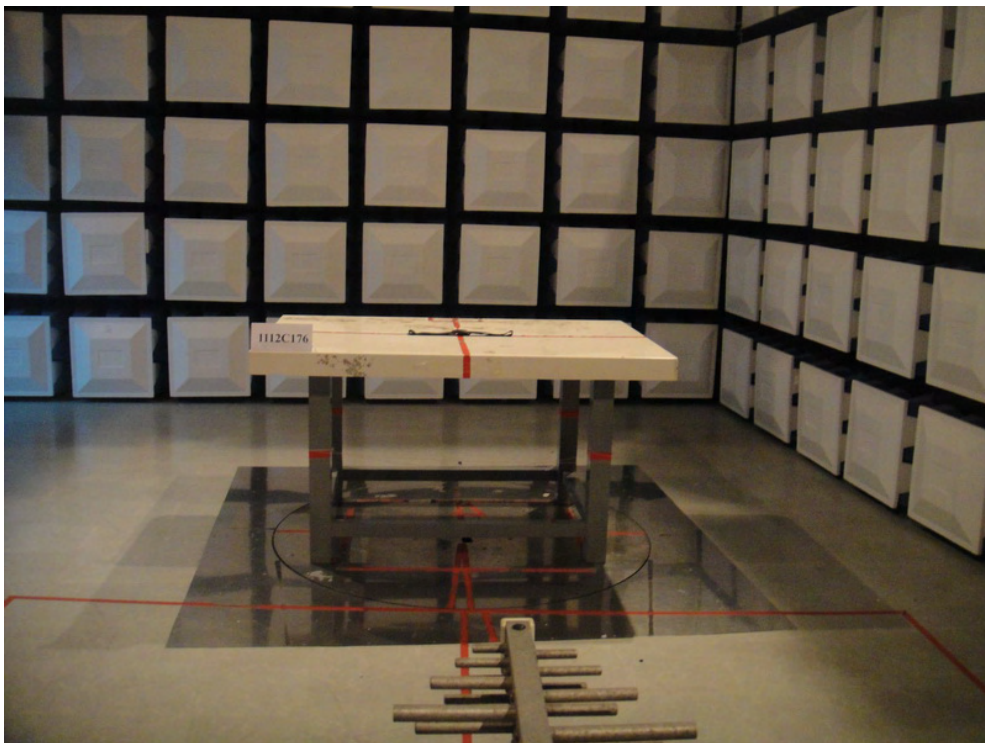
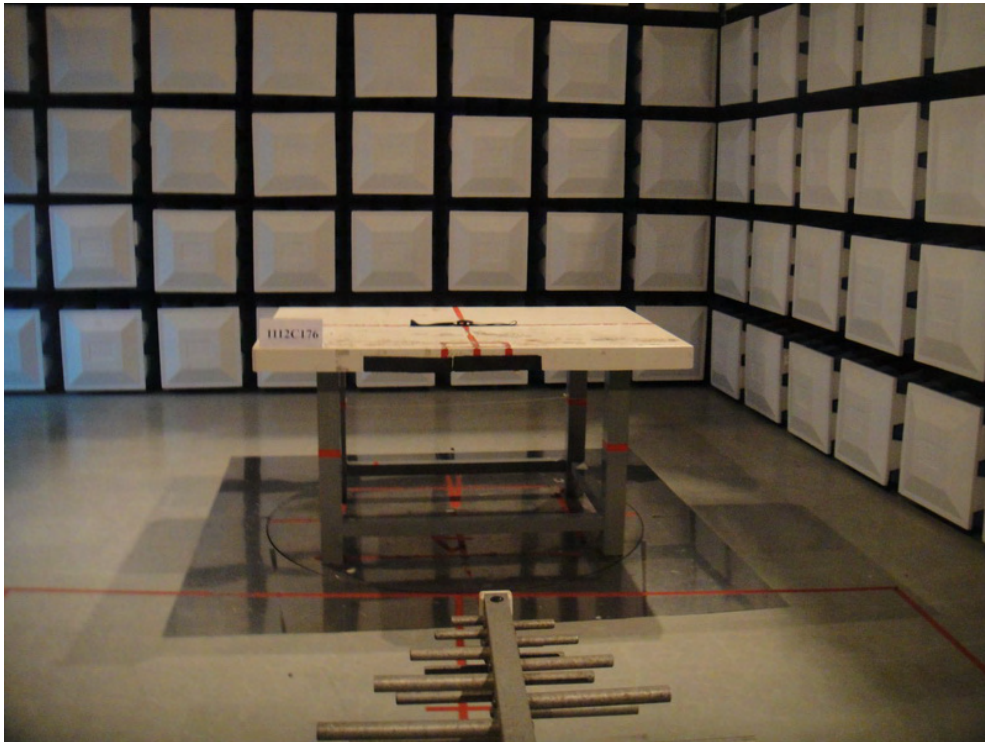
11. EUT TEST PHOTO

**Radiated Measurement Photos
9K~30MHz**





**Radiated Measurement Photos
30MHz~1000MHz**





**Radiated Measurement Photos
Above 1000MHz**

