
FCC Test Report

Report No.: AGC11581012SZ03-4F2

FCC ID : OQB-SG01

PRODUCT DESIGNATION : Bluetooth Sunglasses

BRAND NAME : Temco

TEST MODEL : SG01

CLIENT : Temco Japan Co.,Ltd

DATE OF ISSUE : Mar. 10, 2011

STANDARD(S) : FCC Part 15 Rules

Attestation of Global Compliance Co., Ltd.

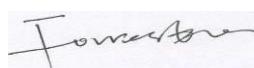
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VERIFICATION OF COMPLIANCE

Applicant	Temco Japan Co.,Ltd 2-21-4,Honan,Suginami-ku Tokyo 168-0062,Japan
Manufacturer	Temco Japan Co.,Ltd 2-21-4,Honan,Suginami-ku Tokyo 168-0062,Japan
Product Designation	Bluetooth Sunglasses
Brand Name	Temco
Model Name	SG01,GL43A-TBK,GL43A-TRSM
Model Difference	The models have same PCB and components layout, but their shells is different
FCC ID	OQB-SG01
Report Number	AGC11581012SZ03-4F2
Date of Test	Mar.3, 2011 to Mar.8, 2011

WE HEREBY CERTIFY THAT:

The above equipment was tested by Attestation of Global Compliance Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.247.

Checked By: 
Forrest Lei Mar.10, 2011

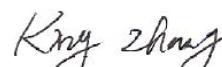
Authorized By 
King Zhang Mar.10, 2011

TABLE OF CONTENTS

1. GENERAL INFORMATION.....	4
1.1 PRODUCT DESCRIPTION.....	4
1.2 TABLE OF CARRIER FREQUENCIES.....	4
1.3 RECEIVER INPUT BANDWIDTH.....	4
1.4 EXAMPLE OF A HOPPING SEQUENCE IN DATA MODE	5
1.5 EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR.....	5
1.6 RELATED SUBMITTAL(S) / GRANT (S).....	5
1.7 TEST METHODOLOGY	5
1.8 TEST FACILITY	6
1.9 SPECIAL ACCESSORIES	6
1.10 EQUIPMENT MODIFICATIONS	6
2. SYSTEM TEST CONFIGURATION.....	7
2.1 CONFIGURATION OF TESTED SYSTEM	7
2.2 EQUIPMENT USED IN TESTED SYSTEM	7
3. SUMMARY OF TEST RESULTS	8
4. DESCRIPTION OF TEST MODES	8
5. MAXIMUM OUTPUT POWER	9
5.1 MEASUREMENT PROCEDURE.....	9
5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	9
5.3 MEASUREMENT EQUIPMENT USED	10
5.4 LIMITS AND MEASUREMENT RESULT.....	11
6. 20 DB BANDWIDTH.....	12
6.1 MEASUREMENT PROCEDURE.....	12
6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	12
6.3 MEASUREMENT EQUIPMENT USED	12
6.4 LIMITS AND MEASUREMENT RESULTS	12
7. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY (N/A)	14
7.1 MEASUREMENT PROCEDURE.....	14
7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	14
7.3 MEASUREMENT EQUIPMENT USED	14
7.4 LIMITS AND MEASUREMENT RESULT	14
8. CONDUCTED SPURIOUS EMISSION.....	15
8.1 MEASUREMENT PROCEDURE.....	15
8.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	15
8.3 MEASUREMENT EQUIPMENT USED	15
8.4 LIMITS AND MEASUREMENT RESULT	15
9. RADIATED SPURIOUS EMISSION.....	19
9.1 MEASUREMENT PROCEDURE.....	19
9.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	19
9.3 MEASUREMENT EQUIPMENT USED	20
9.4 TEST RESULT	21
10. BAND EDGE EMISSION.....	25
10.1 MEASUREMENT PROCEDURE	25

10.2 TEST SET-UP	25
10.3 TEST RESULT	25
11 NUMBER OF HOPPING FREQUENCY.....	31
11.1 MEASUREMENT PROCEDURE	31
11.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION).....	31
11.3 MEASUREMENT EQUIPMENT USED.....	31
11.4 LIMITS AND MEASUREMENT RESULT	31
12 TIME OF OCCUPANCY (DWELL TIME).....	33
12.1 MEASUREMENT PROCEDURE	33
12.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION).....	33
12.3 MEASUREMENT EQUIPMENT USED.....	33
12.4 LIMITS AND MEASUREMENT RESULT	33
13. FREQUENCY SEPARATION.....	36
13.1 MEASUREMENT PROCEDURE	36
13.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION).....	36
13.3 MEASUREMENT EQUIPMENT USED.....	36
13.4 LIMITS AND MEASUREMENT RESULT	36
14 FCC LINE CONDUCTED EMISSION TEST	37
14.1 LIMITS OF LINE CONDUCTED EMISSION TEST	37
14.2 BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST	37
14.3 PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	38
14.4 FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST	38
14.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST.....	39
APPENDIX I	40
PHOTOGRAPHS OF THE EUT.....	40
APPENDIX II	45
PHOTOGRAPHS OF THE TEST SETUP	45

1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

The EUT is a **Bluetooth Sunglasses** designed as an “Communication Device”. It is designed by way of utilizing the FHSS technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	2.402 GHz to 2.480GHz
Rated Output Power	2.11dBm
Modulation	GFSK
Number of channels	79
Antenna Designation	Integrated Antenna
Antenna Type	Chip Antenna
Antenna Model	AT 5020-B2R8HAA
Antenna Manufacture	Advanced Ceramic X corp
Antenna Gain	1.02dBi
Power Supply	DC3.3V by battery

1.2 TABLE OF CARRIER FREQUENCIES

Frequency Band	Channel Number	Frequency
2400~2483.5MHZ	0	2402MHZ
	1	2403MHZ
	:	:
	38	2440 MHZ
	39	2441 MHZ
	40	2442 MHZ
	:	:
	77	2479 MHZ
	78	2480 MHZ

1.3 RECEIVER INPUT BANDWIDTH

The input bandwidth of the receiver is 1MHZ,In every connection one Bluetooth device is the master and the other one is slave.The master determines the hopping sequence.The slave follows this sequence.Both devices shift between RX and TX time slot according to the clock of the master.Additionally the type of connection(e.g. single or multislots packet) is set up at the beginning of the connection.The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection.Also the slave of the connection will use these settings.

Repeating of a packet has no influence on the hopping sequence.The hopping sequence generated by the master of the connection will be followed in any case.That means,a repeated packet will not be send on the same frequency,it is send on the next frequency of the hopping sequence.

1.4 EXAMPLE OF A HOPPING SEQUENCE IN DATA MODE

Example of a 79 hopping sequence in data mode:
40,21,44,23,42,53,46,55,48,33,52,35,50,65,54,67
56,37,60,39,58,69,62,71,64,25,68,27,66,57,70,59
72,29,76,31,74,61,78,63,01,41,05,43,03,73,07,75
09,45,13,47,11,77,15,00,64,49,66,53,68,02,70,06
01,51,03,55,05,04

1.5 EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR

The generation of the hopping sequence in connection mode depends essentially on two input values:

1 LAP/UAP of the master of the connection

2 Internal master clock

The LAP(lower address part) are the 24 LSB's of the 48 BD_ADDRESS. The BD_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP(upper address part) are the 24MSB's of the 48BD_ADDRESS

The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For synchronisation with other units only offset are used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5us. The clock has a cycle of about One day(23h30). In most case it is implemented as 28 bit counter. For the deriving of the hopping sequence the entire.

LAP(24 bits),4LSB's(4bits)(Input 1) and the 27MSB's of the clock(Input 2) are used. With this input values different mathematical procedures(permuations,additions,XOR-operations)are performed to generate the Sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following behaviour:

The first connection between the two devices is established,a hopping sequence was generated. For Transmitting the wanted data the complete hopping sequence was not used. The connection ended.

The second connection will be established. A new hopping sequence is generated. Due to the fact the Bluetooth clock has a different value,because the period between the two transmission is longer(and it cannot be shorter)than the minimum resolution of the clock(312.5us). The hopping sequence will always Differ from the first one.

1.6 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: OQB-SG01** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

1.7 TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.8 TEST FACILITY

All measurement facilities used to collect the measurement data are located at
Attestation of Global Compliance Co., Ltd.
1F., No.2 Building, Huafeng No.1 Technical Industrial Park, Sanwei, Xixiang, Baoan District, Shenzhen
The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003.
FCC register No.: 259865

1.9 SPECIAL ACCESSORIES

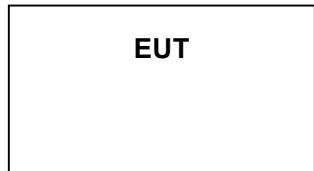
Not available for this EUT intended for grant.

1.10 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 CONFIGURATION OF TESTED SYSTEM



Note: The EUT no other connection device in normal use.

2.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID
1	Bluetooth Sunglasses	Temco	SG01	OQB-SG01

3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247	Maximum Output Power	Compliant
§15.247	20 dB Bandwidth	Compliant
§15.209	Radiated Emission	Compliant
§15.247	Spurious Emission	Compliant
§15.247	Band Edges	Compliant
§15.247	Number of Hopping Frequency	Compliant
§15.247	Frequency Separation	Compliant
§15.247	Time of Occupancy	Compliant
§15.207	Conduction Emission	Not applicable

4. DESCRIPTION OF TEST MODES

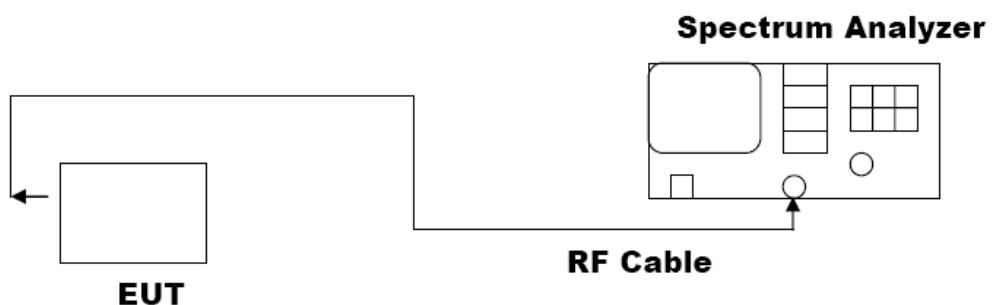
1. The EUT has been set to operate continuously on the lowest, middle and highest operation frequency individually. The EUT stays in continuous transmitting mode on the operation frequency being set.
2. The EUT stays in hopping mode.

5MAXIMUM OUTPUT POWER

5.1 MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set SPA Centre Frequency = Operation Frequency, RBW= 3 MHz,
VBW= 3 MHz.
5. Set SPA Trace 1 Max hold, then View.

5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



5.3 MEASUREMENT EQUIPMENT USED

Description	Manufacturer	Model	SERIAL NUMBER	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E4440A	N/A	06/29/2010	06/28/2011
Amplifier	EM	EM30180	0607030	06/29/2010	06/28/2011
Horn Antenna	EM	EM-AH-10180	N/A	06/29/2010	06/28/2011
EMI Test Receiver	Rohde & Schwarz	ESCI	N/A	06/29/2010	06/28/2011
Amplifier	EM	EM30180	N/A	06/29/2010	06/28/2011
Biological Antenna	A.H. Systems Inc.	SAS-521-4	N/A	06/29/2010	06/28/2011
Loop Antenna	Daze	ZN30900N	SEL0097	06/29/2010	06/28/2011
Isolation Transformer	LETEAC	LTBK	--	06/08/2010	06/07/2011

5.4 LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT			
Frequency (GHz)	Result (dBm)	Applicable Limits (dBm)	Pass or Fail
2.402	2.11	30	Pass
2.441	2.05	30	Pass
2.480	2.09	30	Pass

6 20 DB BANDWIDTH

6.1 MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 30 KHz,
VBW= 300 KHz.
4. Set SPA Trace 1 Max hold, then View.

6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The Same as described in Section 5.2

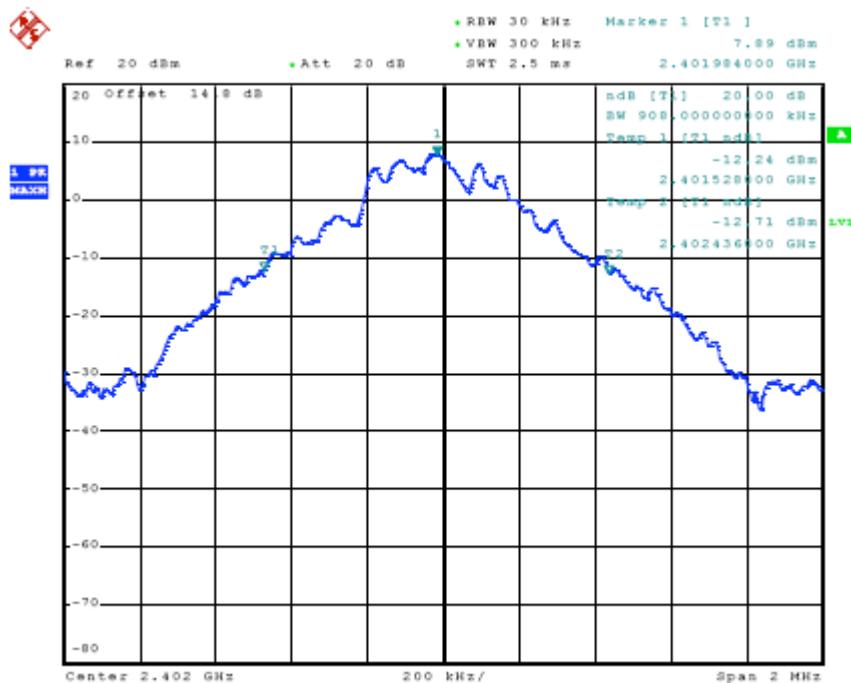
6.3 MEASUREMENT EQUIPMENT USED

The same as described in Section 5.3

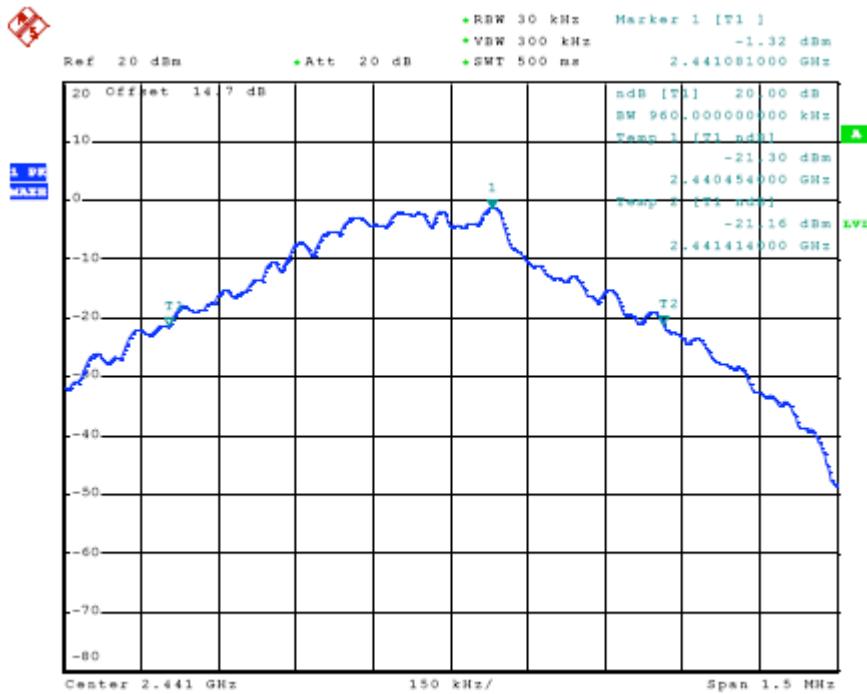
6.4 | LIMITS AND MEASUREMENT RESULTS

Limits and Measurement Result			
Applicable Limits	Measurement Result		
	Test Data (MHz)		Criteria
--	Low Channel	0.908	PASS
	Middle Channel	0.960	PASS
	High Channel	0.963	PASS

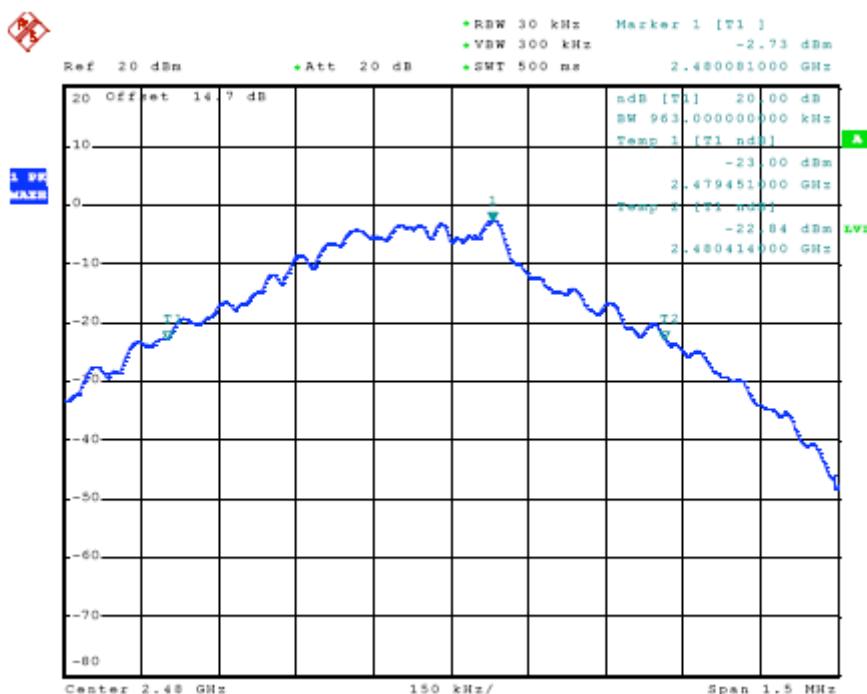
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

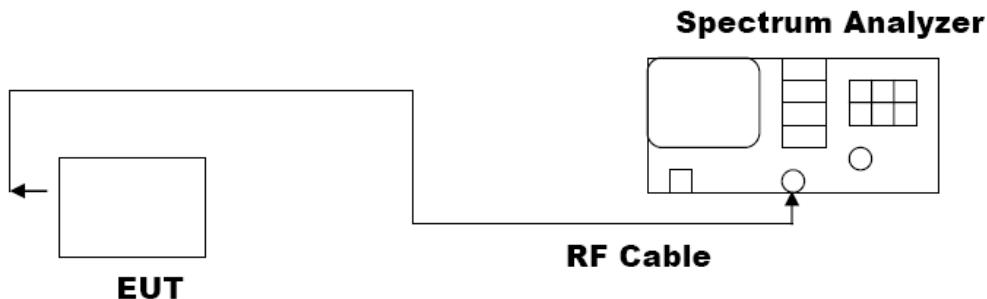


7. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY (N/A)

7.1 MEASUREMENT PROCEDURE

- (1). The EUT was placed on a turn table which is 0.8m above ground plane.
- (2). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (3). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (4). Set SPA Centre Frequency = Operation Frequency, RBW= 3 KHz,
VBW= 10 KHz., Sweep time= Auto
- (5). Set SPA Trace 1 Max hold, then View.

7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



7.3 MEASUREMENT EQUIPMENT USED

SHIELDING ROOM					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	N/A	06/29/2010	06/28/2011

7.4 LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT			
Applicable Limits	Measurement Result		
	Test Data (dBm/3KHz)		Criteria
8 dBm / 3KHz	Low Channel	--	--
	Middle Channel	--	--
	High Channel	--	--

8. CONDUCTED SPURIOUS EMISSION

8.1 MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz,
VBW= 100 KHz.
4. Set SPA Trace 1 Max hold, then View.

8.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The Same as described in section 5.2

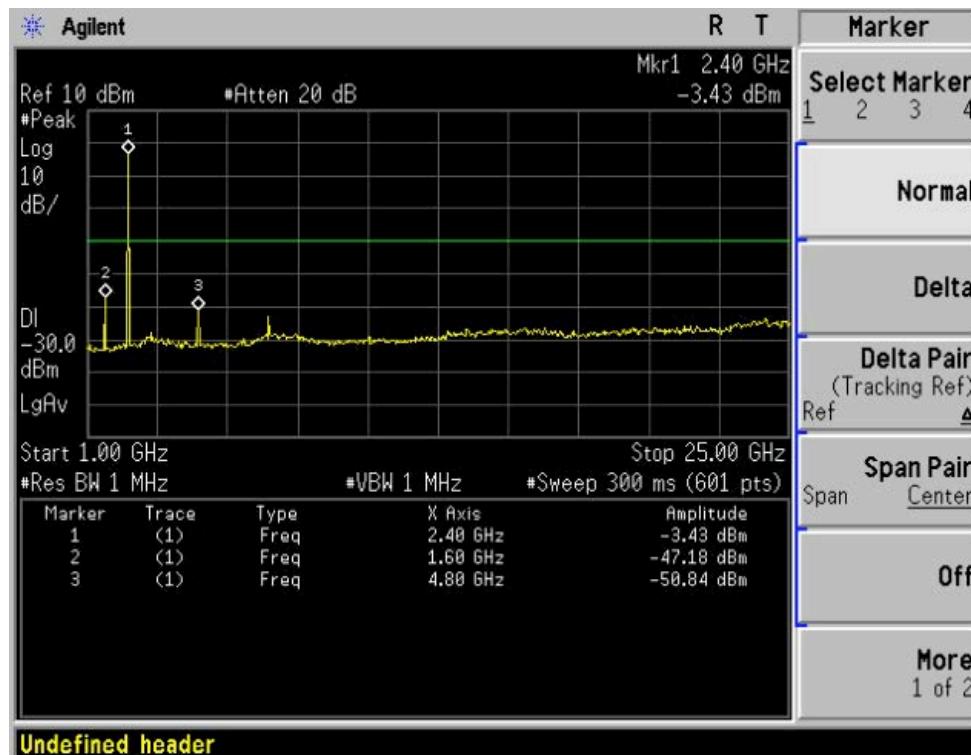
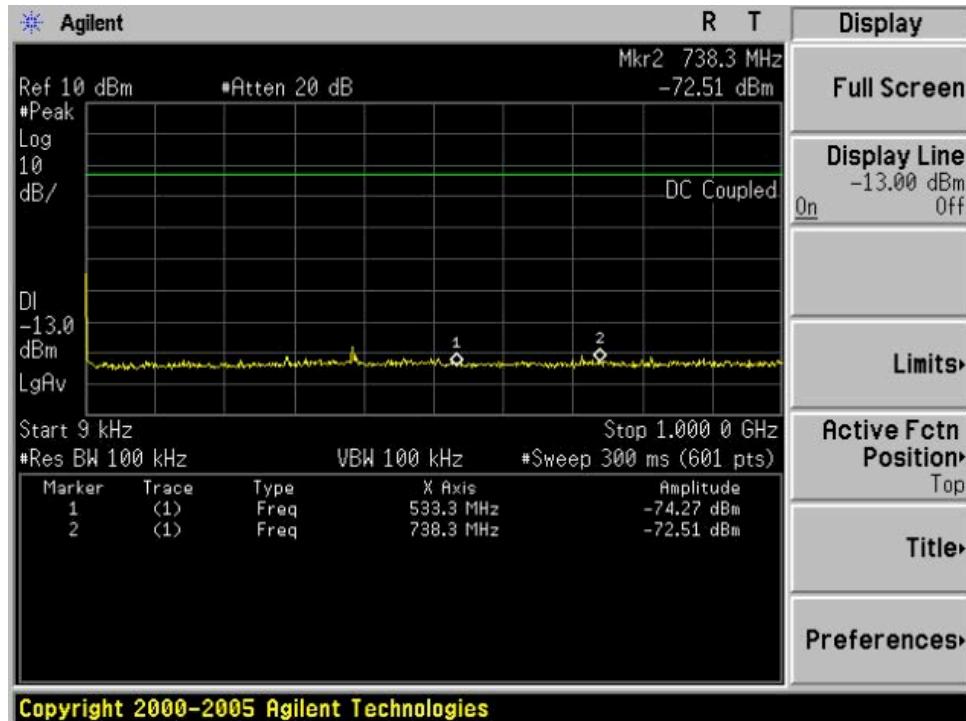
8.3 MEASUREMENT EQUIPMENT USED

The Same as described in section 5.3

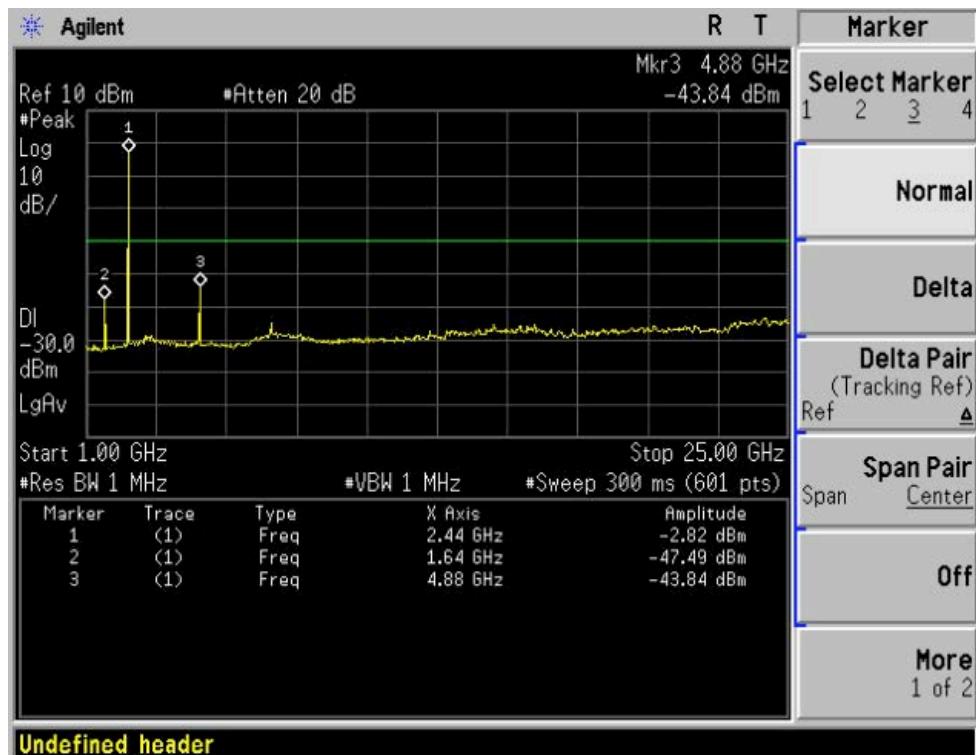
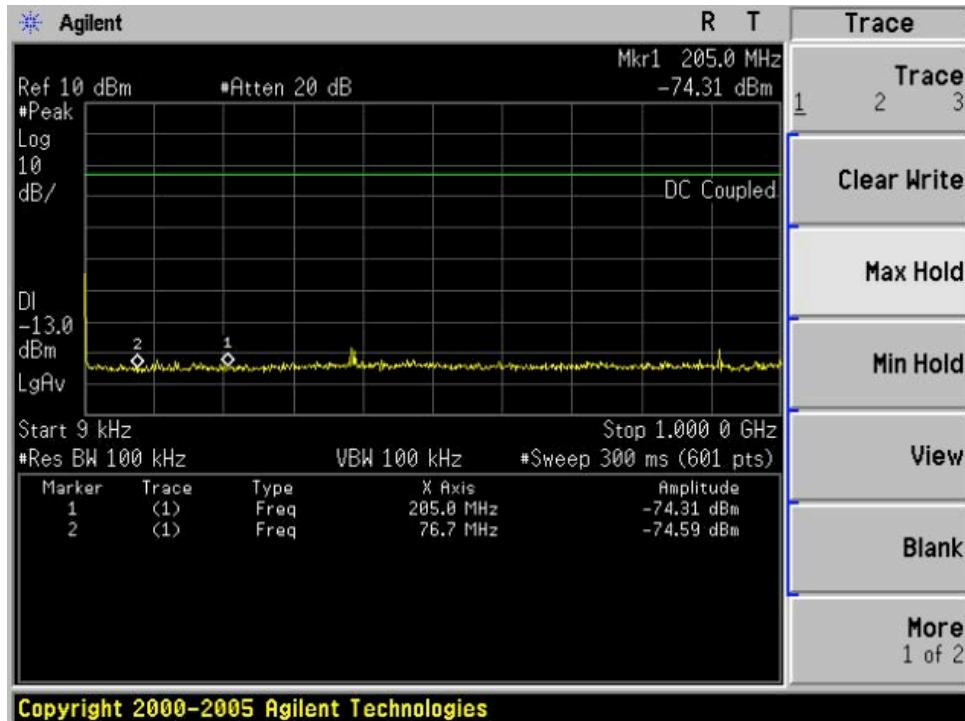
8.4 LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT		
Applicable Limits	Measurement Result	
	Test Data	Criteria
<p>In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power.</p> <p>In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a))</p>	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS
	At least -20dBc than the limit Specified on the TOP Channel	PASS

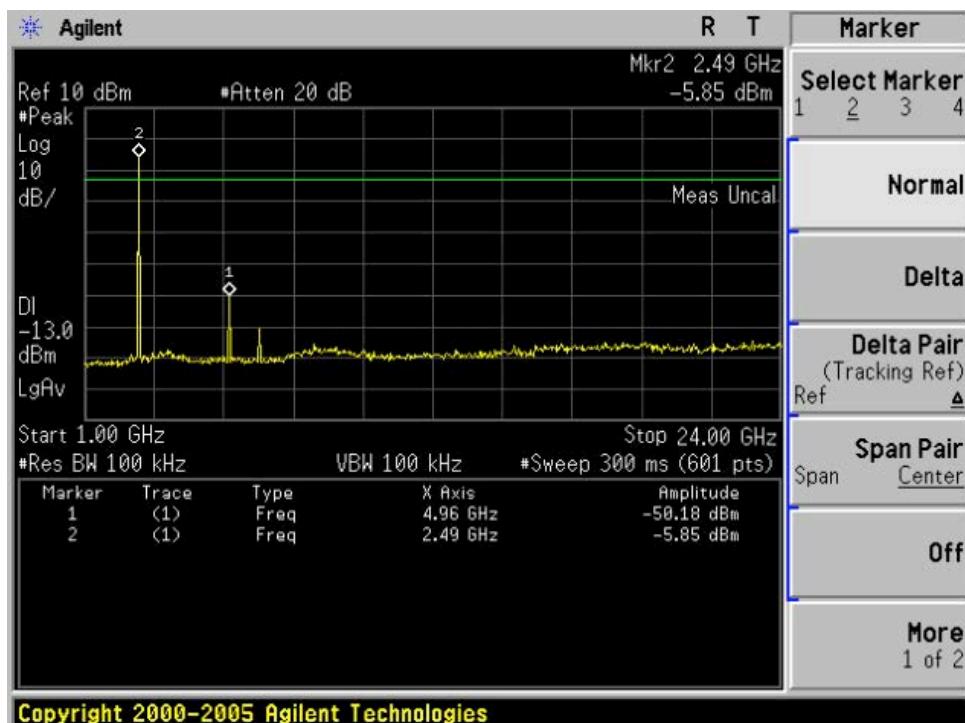
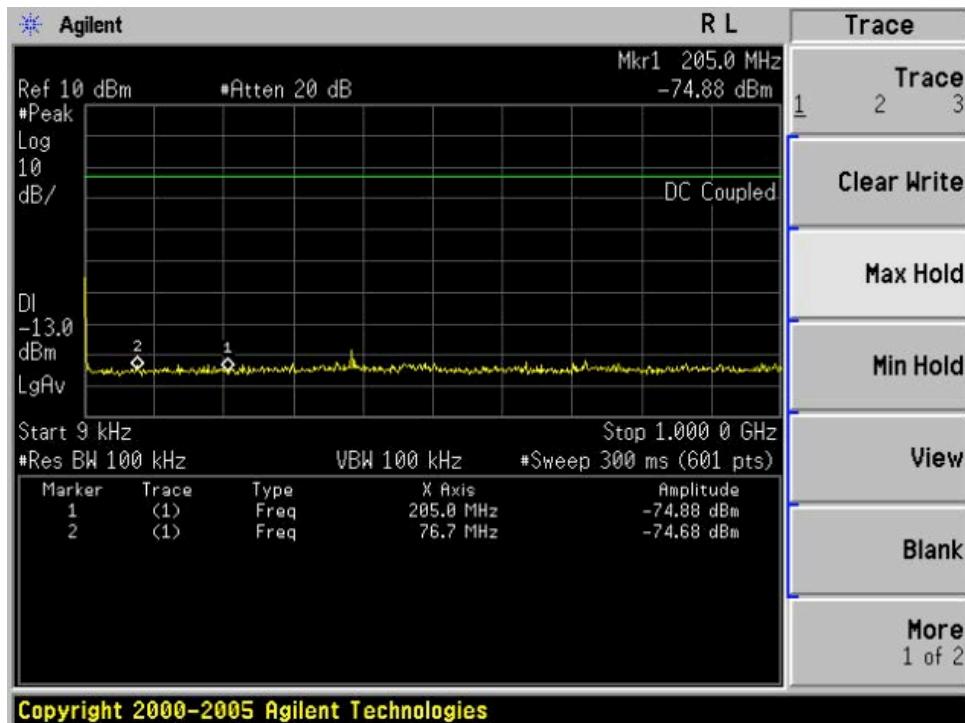
TEST PLOT OF OUT OF BAND EMISSIONS FOR LOW CHANNEL



TEST PLOT OF OUT OF BAND EMISSIONS FOR MIDDLE CHANNEL



TEST PLOT OF OUT OF BAND EMISSIONS FOR HIGH CHANNEL



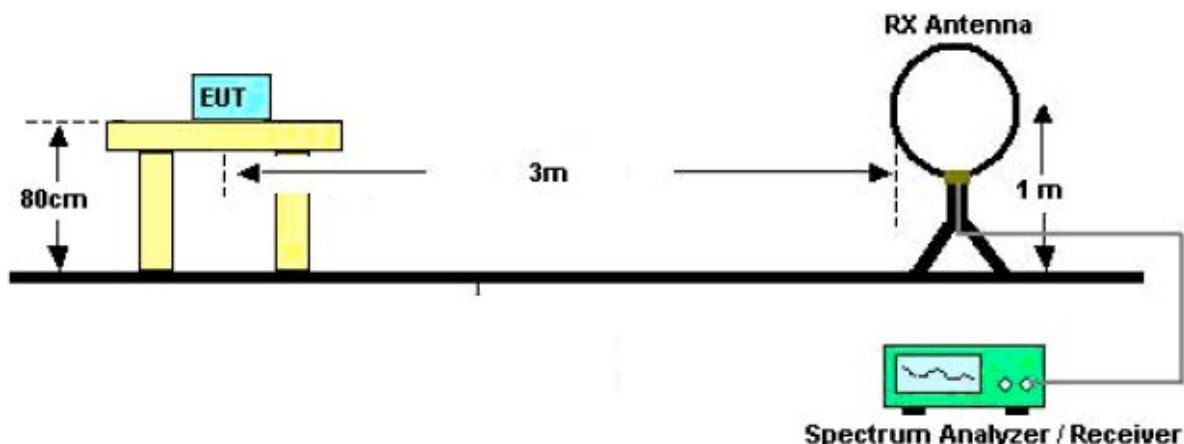
9. RADIATED SPURIOUS EMISSION

9.1 MEASUREMENT PROCEDURE

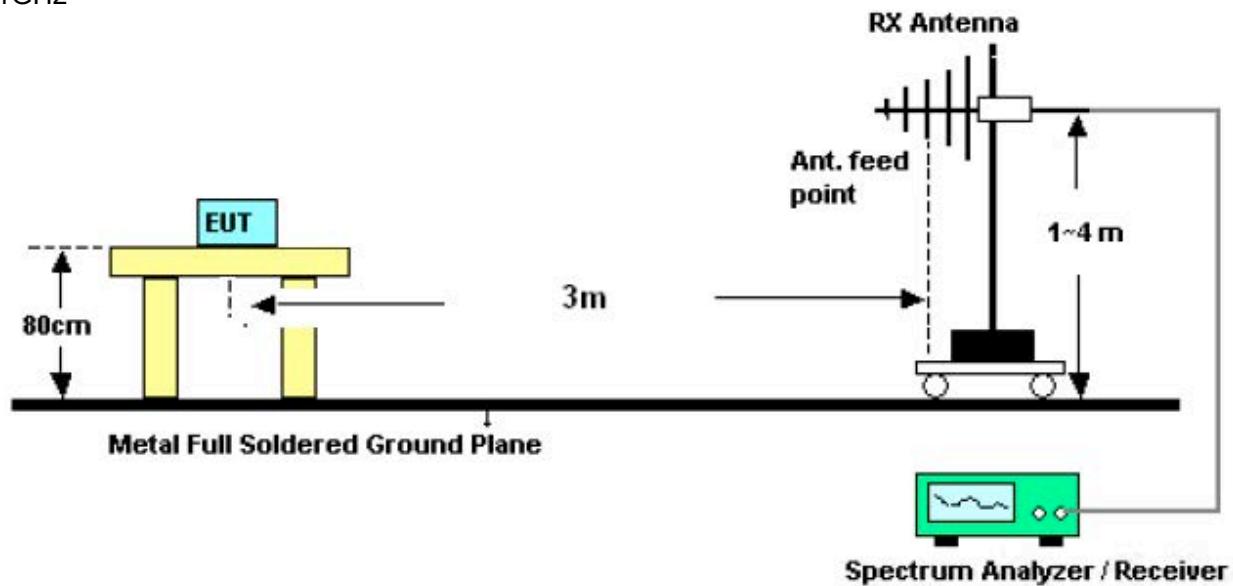
- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used).
- 2) The EUT received DC 3.3V power.
- 3) The antenna was placed at 3 meter away from the EUT as stated in FCC Part 15. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- 4) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 5) Repeat above step then test above 1GHZ

9.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

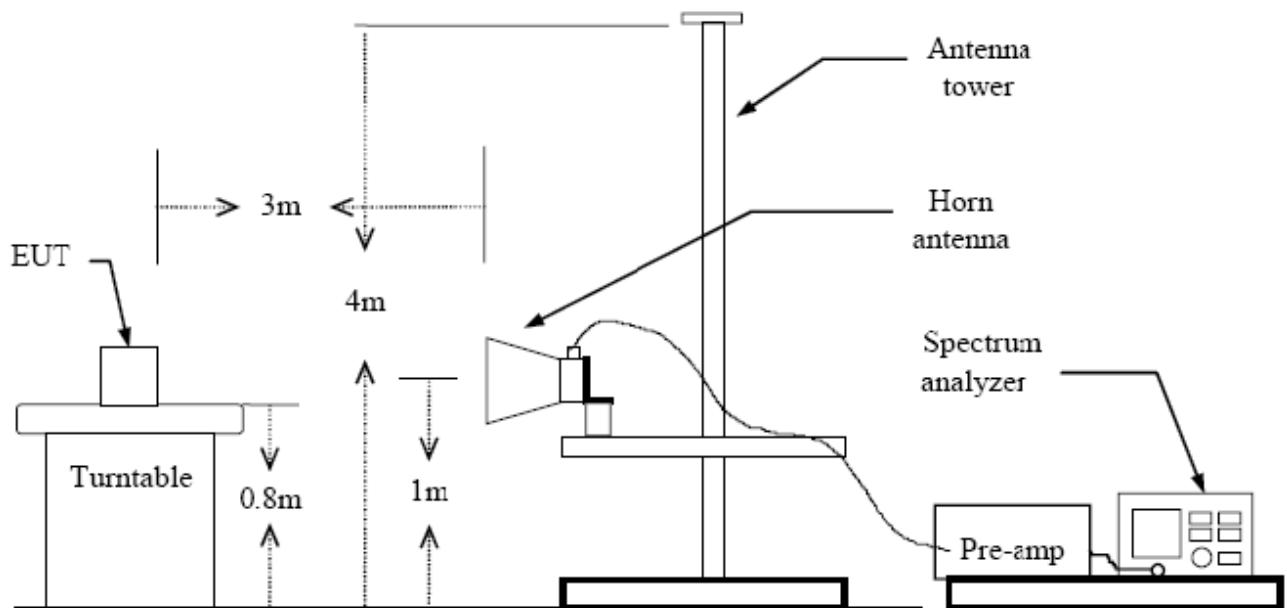
Below 30MHz



Below 1GHz



Above 1GHz



9.3 MEASUREMENT EQUIPMENT USED

Same as section 5.3

9.4 TEST RESULT

RADIATED EMISSION BELOW 30MHZ

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

RADIATED EMISSION BELOW 1GHZ

EUT	Bluetooth Sunglasses	Model Name	SG01
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC3.3V
Test Mode	BT2402MHZ		

Freq. (MHZ)	Ant.Pol. H/V	Detector (PK/QP)	Reading (dBuV)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
40.33	H	Peak	14.22	15.45	29.67	40	-10.33
137.44	H	Peak	17.34	14.21	31.55	43.5	-12
165.33	H	Peak	12.78	16.45	29.23	43.5	-14.27
423.57	H	Peak	17.21	18.85	36.06	46	-9.94
627.03	H	Peak	10.54	23.29	33.83	46	-12.17
923	H	Peak	8.34	25.42	33.67	46	-12.24
59.23	V	Peak	17.34	10.34	27.38	40	-12.62
84.2	V	Peak	18.20	9.45	27.65	40	-12.35
139.4	V	Peak	9.97	13.65	23.62	43.5	-19.88
174.25	V	Peak	12.33	19.25	31.58	43.5	-11.92
713.47	V	Peak	8.65	24.16	32.81	46	-13.19
941.55	V	Peak	7.44	27.24	34.68	46	-11.32

EUT	Bluetooth Sunglasses	Model Name	SG01
	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC3.3V
Test Mode	BT2441MHZ		

Freq. (MHZ)	Ant.Pol. H/V	Detector (PK/QP)	Reading (dBuV)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
--	H	Peak	--	--	--	--	--
--	H	Peak	--	--	--	--	--
--	V	Peak	--	--	--	--	--
--	V	Peak	--	--	--	--	--

EUT	Bluetooth Sunglasses	Model Name	SG01
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC3.3V
Test Mode	BT2480MHZ		

Freq. (MHZ)	Ant.Pol. H/V	Detector (PK/QP)	Reading (dBuV)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
--	H	Peak	--	--	--	--	--
--	H	Peak	--	--	--	--	--
--	V	Peak	--	--	--	--	--
--	V	Peak	--	--	--	--	--

Note: "--"means the mode and other modes at least have 20dB margin.

RADIATED EMISSION ABOVE 1GHZ

EUT	Bluetooth Sunglasses	Model Name	SG01
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC3.3V
Test Mode	BT2402MHZ		

EUT	Bluetooth Sunglasses	Model Name	SG01
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC3.3V
Test Mode	BT2441MHZ		

EUT	Bluetooth Sunglasses	Model Name	SG01
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC3.3V
Test Mode	BT2480MHZ		

Freq. (MHZ)	Ant.Pol. H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Factor (dB)	Result		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin
					Peak (dBuV/m)	AV (dBuV/m)			
--	H	--	--	--	--	--	--	--	--
--	H	--	--	--	--	--	--	--	--
--	V	--	--	--	--	--	--	--	--
--	V	--	--	--	--	--	--	--	--

Note: This Handheld EUT was tested in 3 orthogonal positions and the worst-case data was presented.

Note: "--" means the mode and other modes at least have 20dB margin.

10 BAND EDGE EMISSION

10.1 MEASUREMENT PROCEDURE

1. Set the EUT Work on the top, the bottom operation frequency individually.
2. Set SPA Start or Stop Frequency = Operation Frequency, RBW= 1MHz, VBW= 1MHz.
3. The band edges was measured and receorded.

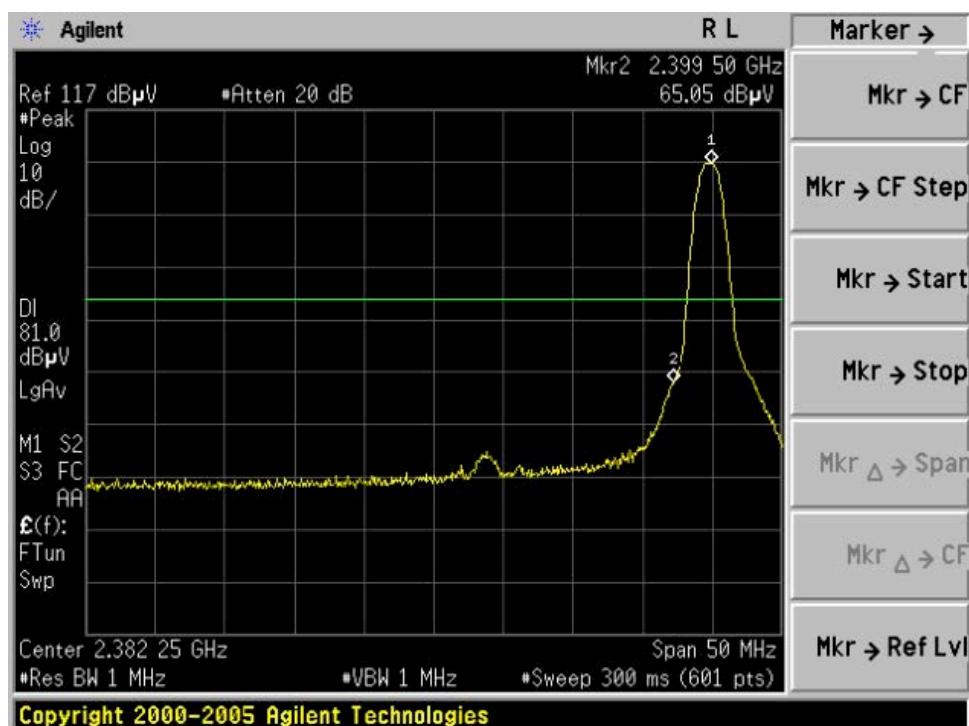
10.2 TEST SET-UP

The Same as described in section 5.2&9.2

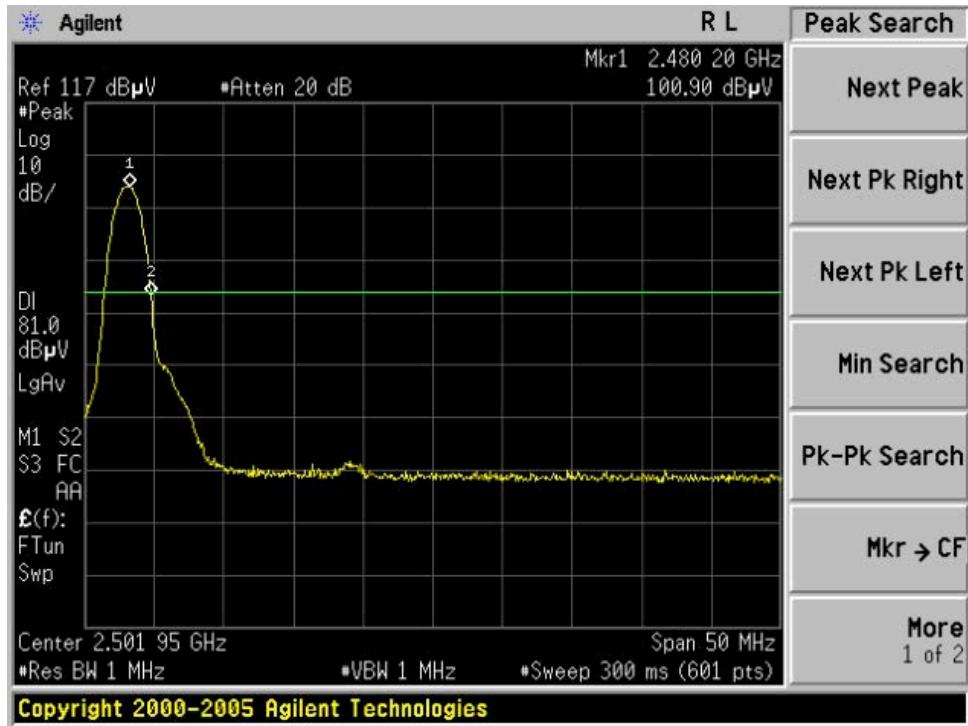
10.3 TEST RESULT

CONDUCTION TEST RESULT

TEST PLOT OF BAND ELDG FOR LOW CHANNEL



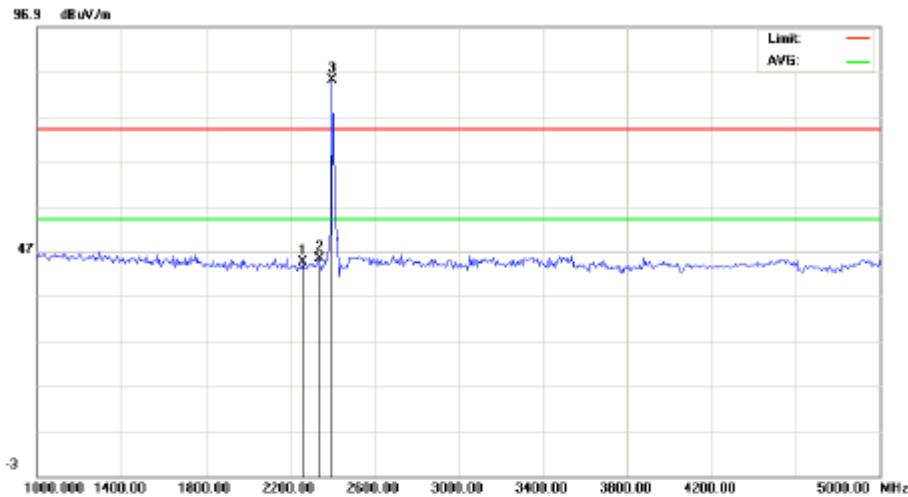
TEST PLOT OF BAND ELDG FOR HIGH CHANNEL



RADIATION TEST RESULT

TEST RESULT OF 2402MHZ

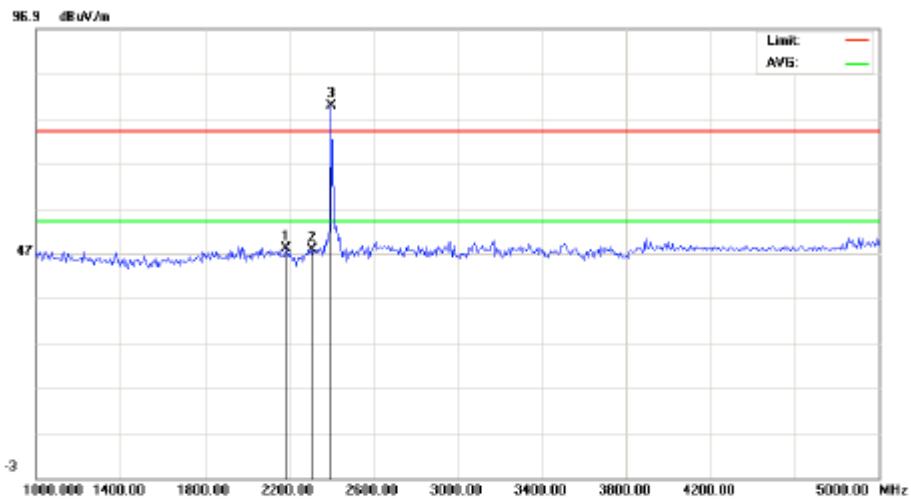
Radiated Emission Measurement



Site: site #1 Polarization: **Horizontal** Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %
EUT: Bluetooth Sunglasses Distance: 3m
M/N: SG01
Mode: 2402MHZ TX
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna	Table	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		Height	Degree	
1		2260.000	43.06	1.57	44.63	74.00	-29.37	peak			
2		2340.000	43.81	1.56	45.37	74.00	-28.63	peak			
3	*	2400.000	83.49	1.53	85.02	74.00	11.02	peak			

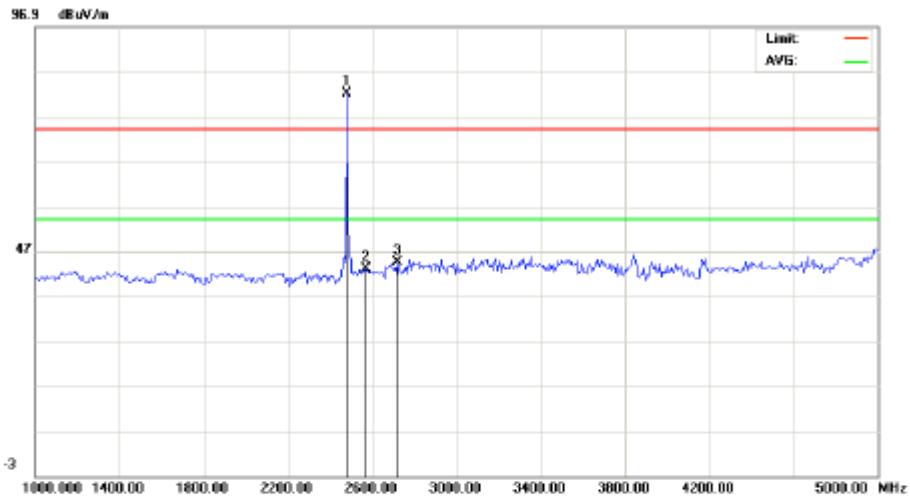
Radiated Emission Measurement



Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %
EUT: Bluetooth Sunglasses Distance: 3m
MN: SG01
Mode: 2402MHZ TX
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2186.667	46.45	1.58	48.03	74.00	-25.97	peak			
2		2306.667	46.25	1.56	47.81	74.00	-26.19	peak			
3	*	2400.000	78.21	1.53	79.74	74.00	5.74	peak			

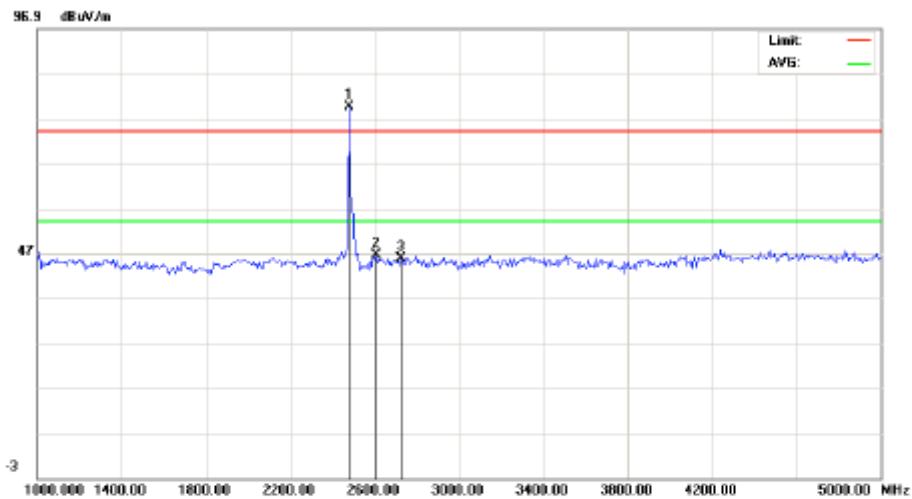
TEST RESULT OF 2480MHZ
Radiated Emission Measurement



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %
EUT: Bluetooth Sunglasses Distance: 3m
MN: SG01
Mode:2480MHZ TX
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBm	dBuV/m	dBuV/m	dB		cm	degree	
1	"	2480.000	80.73	1.40	82.13	74.00	8.13	peak			
2		2573.333	41.68	1.43	43.11	74.00	-30.89	peak			
3		2720.000	42.99	1.48	44.47	74.00	-29.53	peak			

Radiated Emission Measurement



Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %
EUT: Bluetooth Sunglasses Distance: 3m
MN: SG01
Mode: 2480MHZ TX
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna	Table	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		Height	Degree	
1	*	2480.000	78.25	1.40	79.65	74.00	5.65	peak			
2		2606.667	44.98	1.44	46.42	74.00	-27.58	peak			
3		2726.667	44.23	1.49	45.72	74.00	-28.28	peak			

11 NUMBER OF HOPPING FREQUENCY

11.1 MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer Start = 2.4GHz Stop = 2.4835GHz
4. Set the Spectrum Analyzer as RBW = 100KHZ

11.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 5.2

1. Conducted Method.

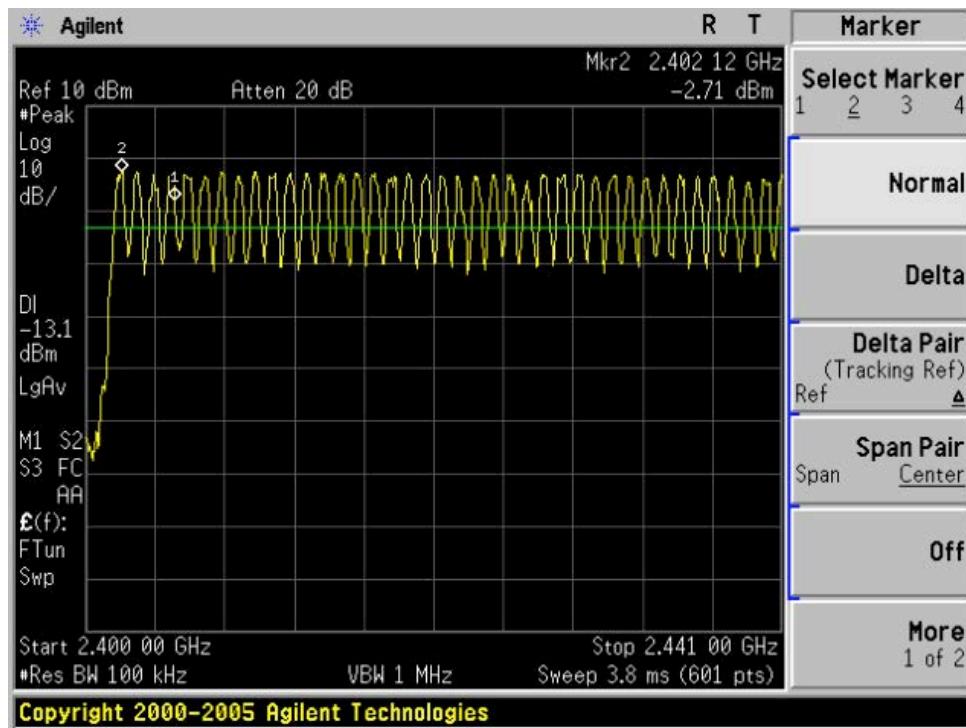
11.3 MEASUREMENT EQUIPMENT USED

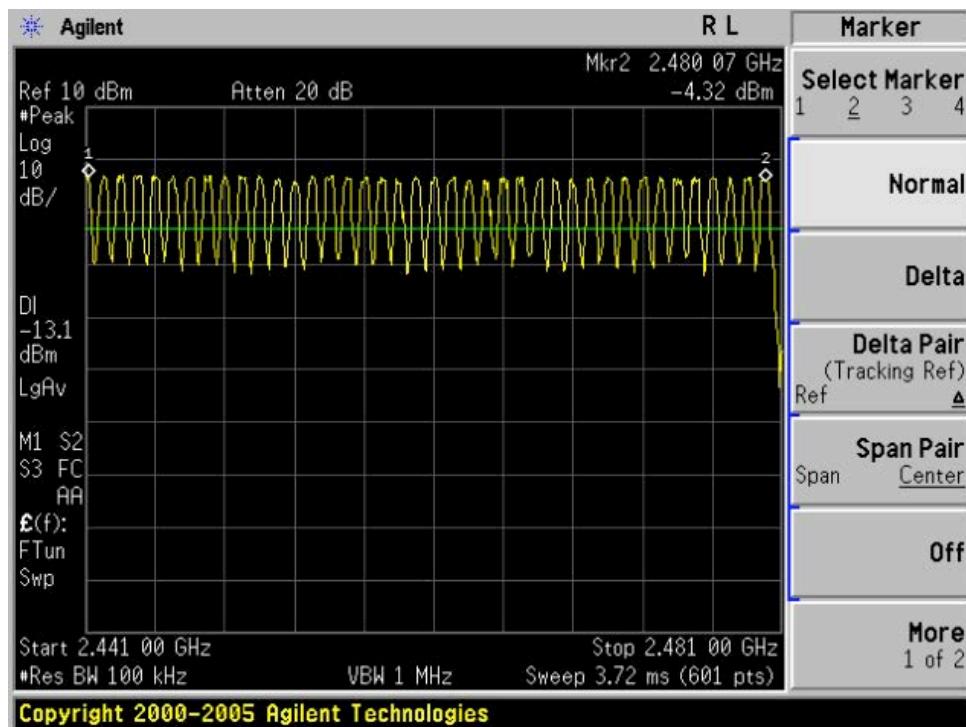
The Same as described in section 5.3

11.4 LIMITS AND MEASUREMENT RESULT

TOTAL NO. OF HOPPING CHANNEL	LIMIT (NO. OF CH)	MEASUREMENT (NO. OF CH)	RESULT
	>=15	79	PASS

TEST PLOT FOR NO. OF TOTAL CHANNELS





12 TIME OF OCCUPANCY (DWELL TIME)

12.1 MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer
3. Set center frequency of spectrum analyzer = Operating frequency
4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0 Hz,

12.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 5.2
Conducted Method

12.3 MEASUREMENT EQUIPMENT USED

The same as described in section 5.3

12.4 LIMITS AND MEASUREMENT RESULT

Low Channel Time

$2.9 * (1600/6) / 79 * 31.6 = 309.33\text{ms}$

Middle Channel Time

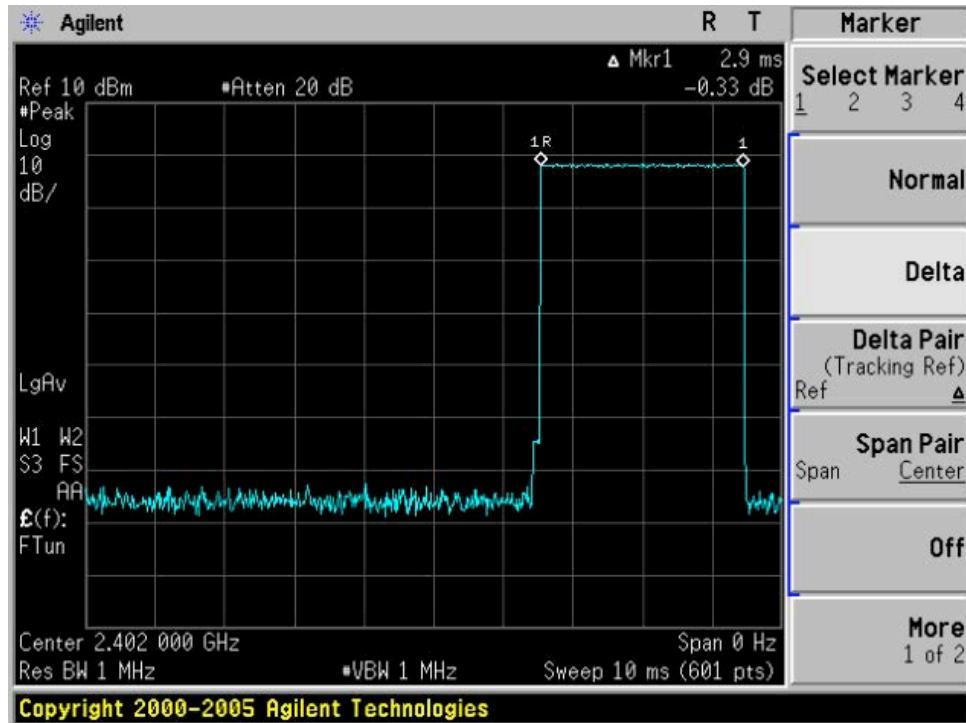
$2.883 * (1600/6) / 79 * 31.6 = 307.52\text{ms}$

High Channel Time

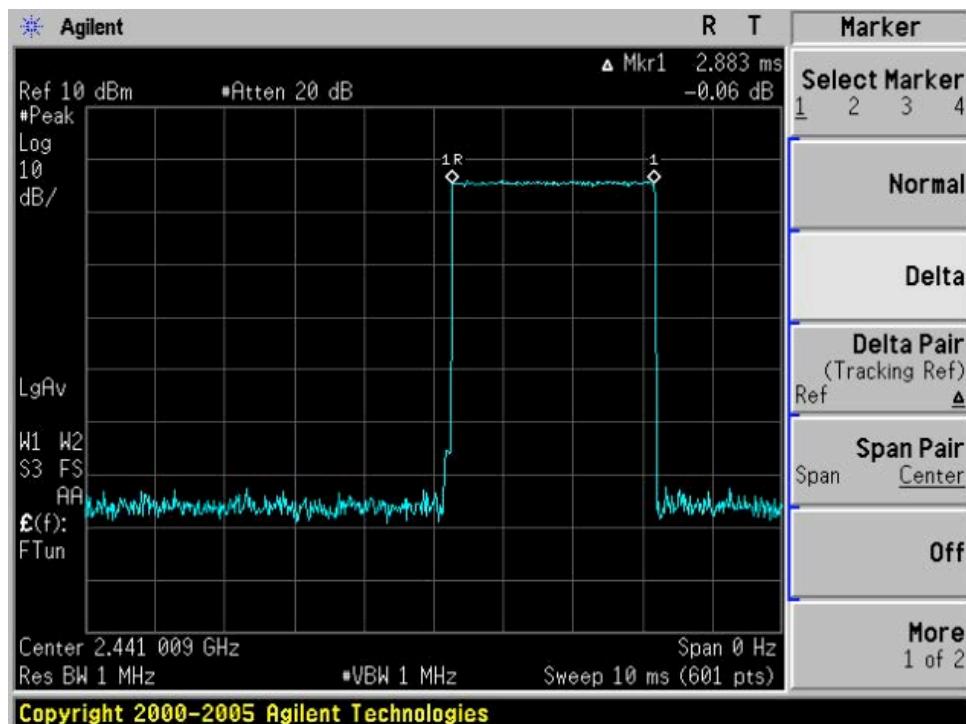
$2.9 * (1600/6) / 79 * 31.6 = 309.33\text{ms}$

Channel	Time of Pulse for DH5 (ms)	Period Time (s)	Sweep Time (ms)	Limit (ms)
Low	2.9	31.6	309.33	400
Middle	2.883	31.6	307.52	400
High	2.9	31.6	309.33	400

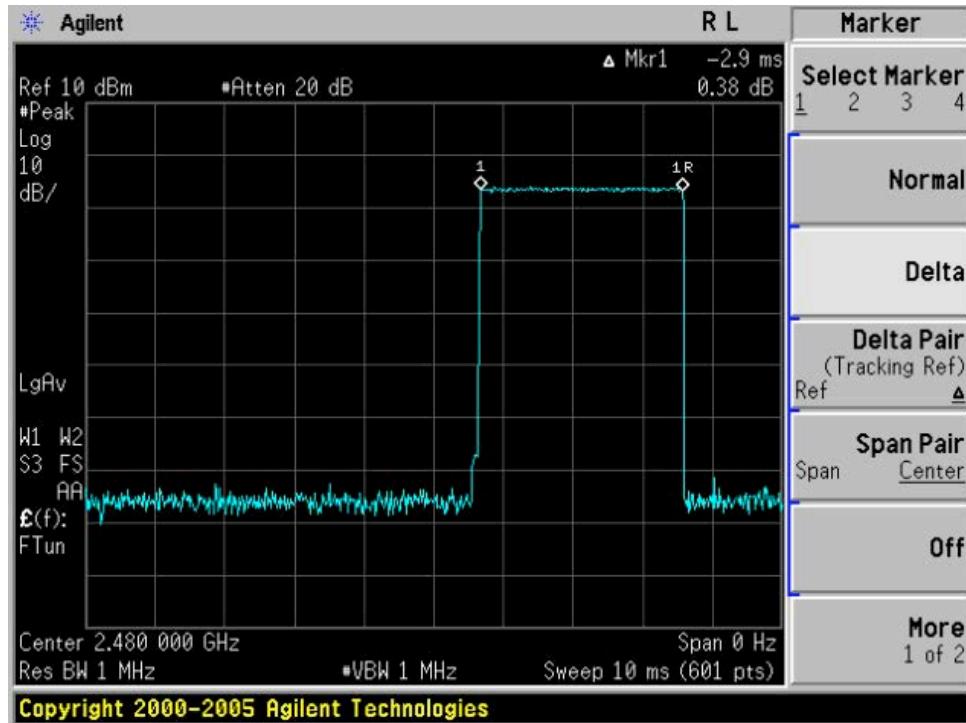
TEST PLOT OF LOW CHANNEL



TEST PLOT OF MIDDLE CHANNEL



TEST PLOT OF HIGH CHANNEL



13. FREQUENCY SEPARATION

13.1 MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer
3. Set center frequency of spectrum analyzer = Middle of Operating frequency
4. Set the spectrum analyzer as RBW, VBW=100KHz, Span = 5 MHz,

13.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 5.2

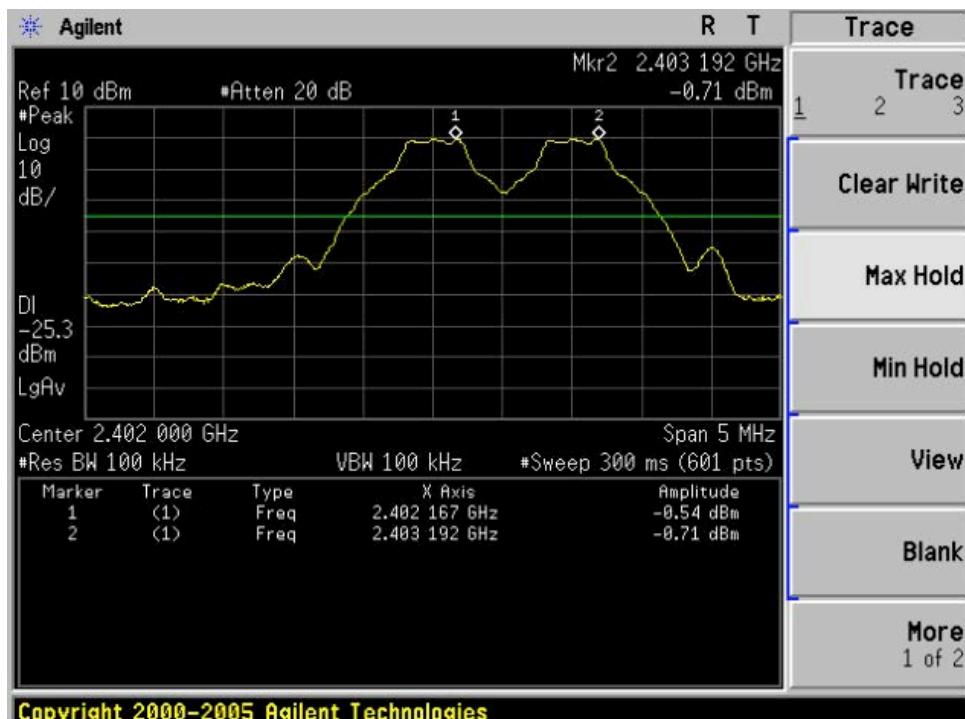
13.3 MEASUREMENT EQUIPMENT USED

The same as described in section 5.3

13.4 LIMITS AND MEASUREMENT RESULT

CHANNEL	CHANNEL SEPARATION	LIMIT	RESULT
	KHz	KHz	
CH00-CH01	1025	>=25 KHz or 2/3 20 dB BW	Pass

TEST PLOT FOR FREQUENCY SEPARATION



14 FCC LINE CONDUCTED EMISSION TEST

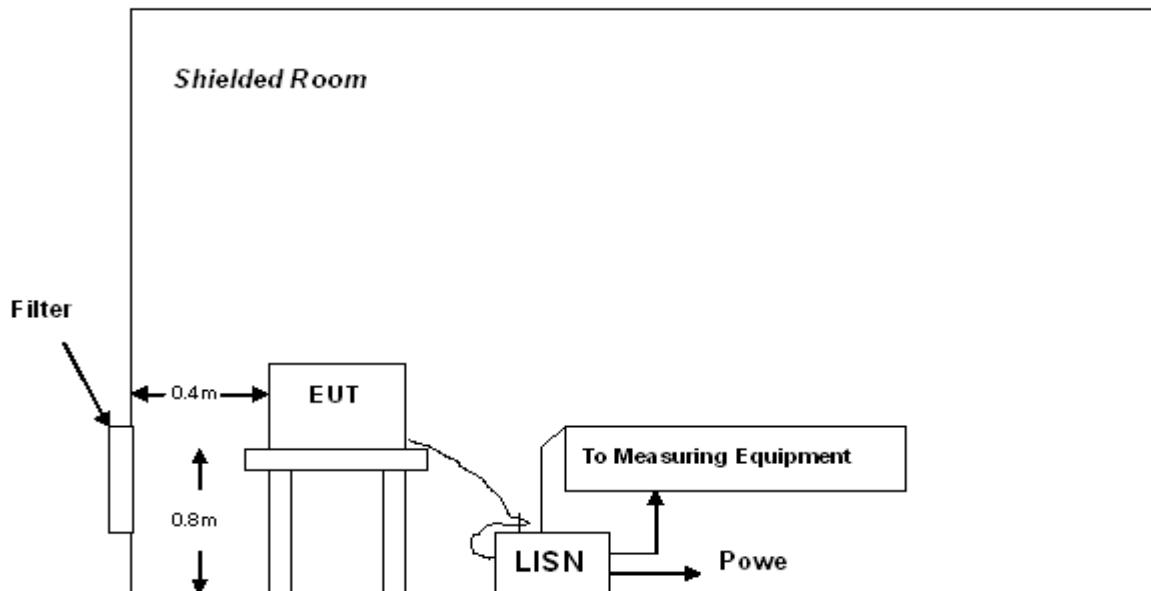
14.1 LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P. (dBuV)	Average (dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

**Note: 1. The lower limit shall apply at the transition frequency.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

14.2 BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



A: Powered through filter

14.3 PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4) All support equipments received AC120V power from a LISN, if any.
- 5) The EUT received power from support PC
- 6) The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8) During the above scans, the emissions were maximized by cable manipulation.
- 9) The following test mode(s) were scanned during the preliminary test:

Preliminary Line Conducted Emission Test				
Frequency Range Investigated		150 KHz TO 30 MHz		
Mode of operation	Date	Report No.	Data#	Worst Mode
--	--	--	--	<input type="checkbox"/>

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

14.4 FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1) EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3) The test data of the worst case condition(s) was reported on the Summary Data page.

14.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST

Owing to the EUT power supply by battery. So is not applicable!

APPENDIX I
PHOTOGRAPHS OF THE EUT

FRONT VIEW OF EUT



BACK VIEW OF EUT



BOTTOM VIEW OF EUT



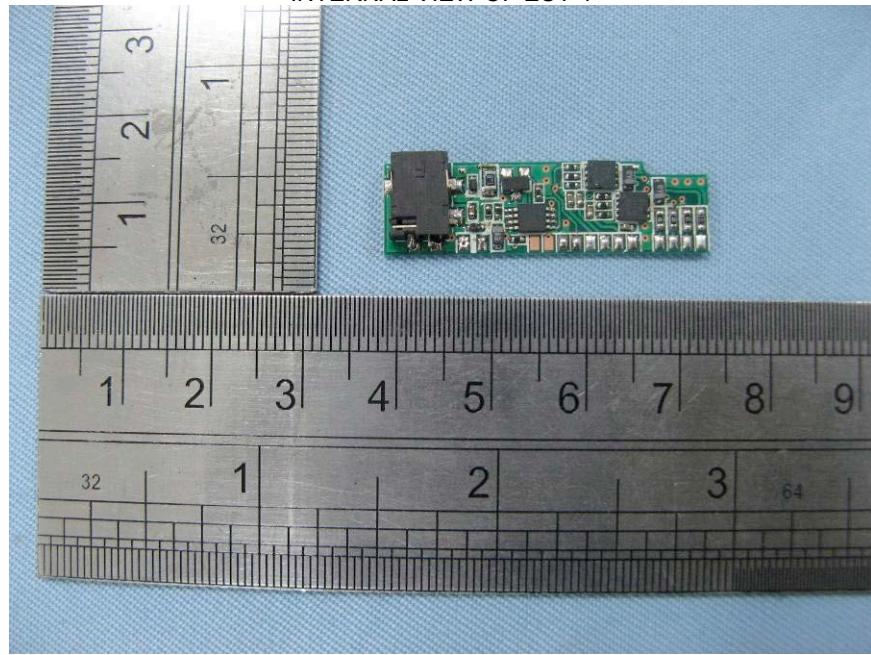
TOM VIEW OF EUT



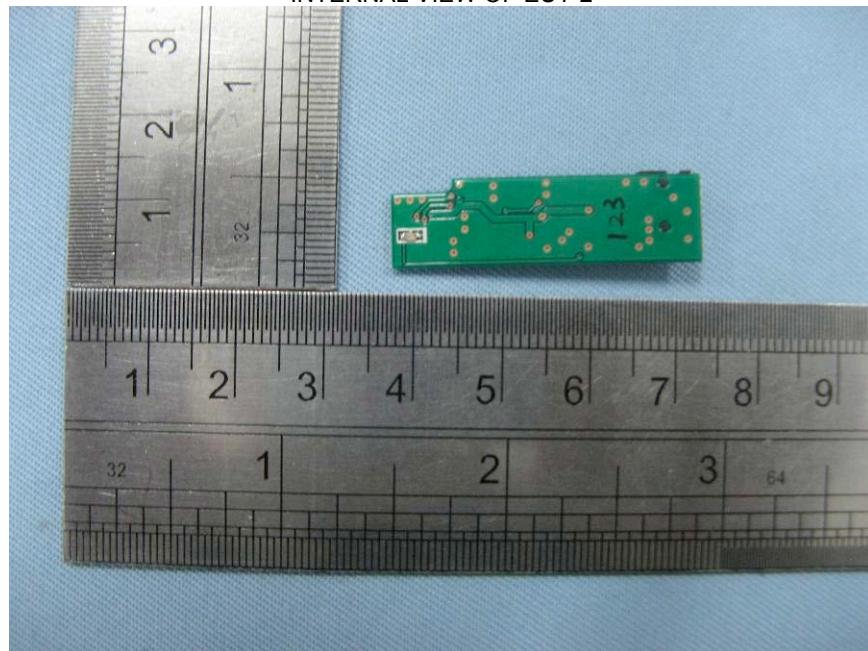
PART VIEW OF EUT



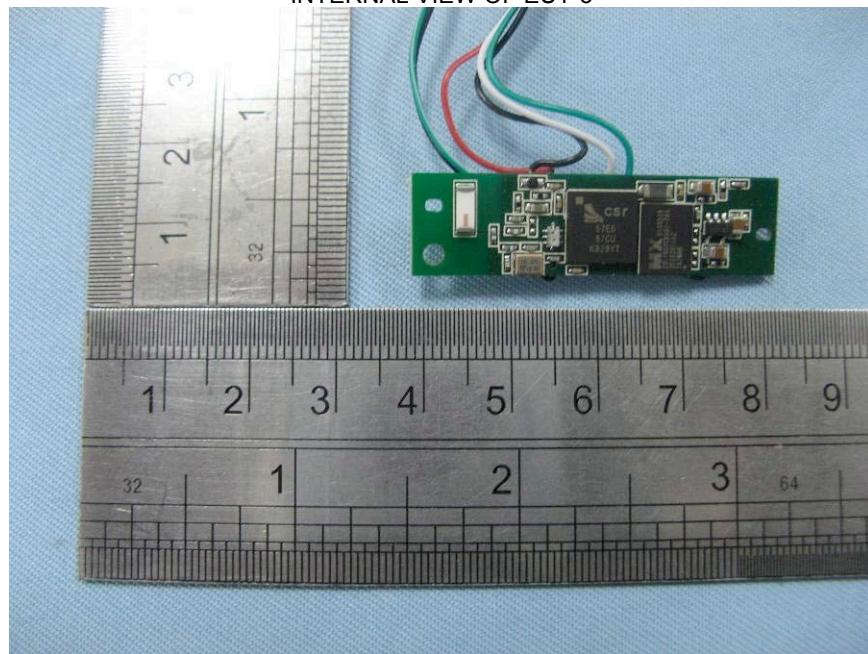
INTERNAL VIEW OF EUT-1



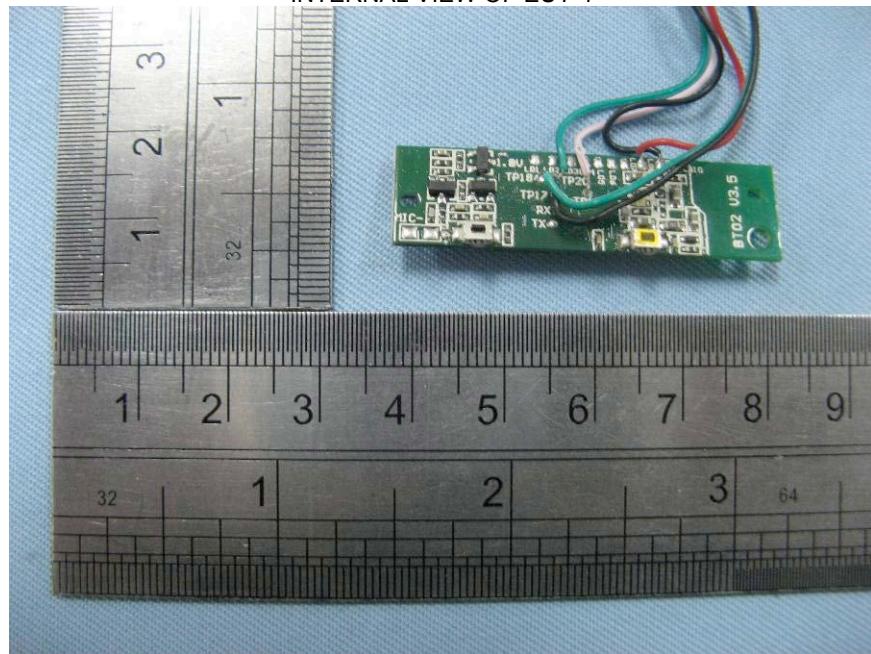
INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3

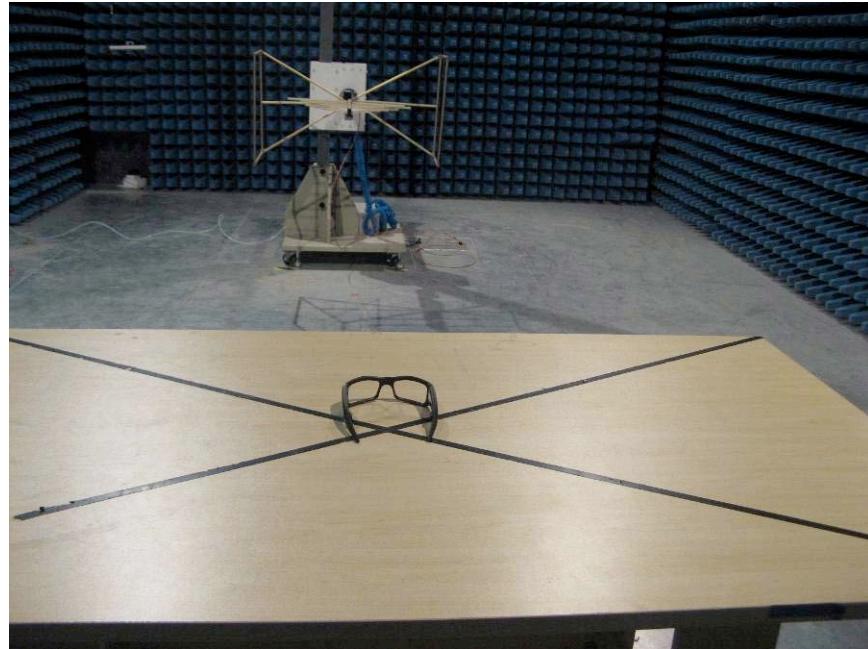


INTERNAL VIEW OF EUT-4



PPENDIX II
PHOTOGRAPHS OF THE TEST SETUP

RADIATED EMISSION TEST SETUP



----END OF REPORT----