FCC Part 15

TEST REPORT

For

ZigBee Module

Model Name: IWTZ-M6-001

FCC ID: VWXIWTZ-M6-001

Report No.: SZAGC062071201E6

Date of Issue: Dec.21, 2007

Prepared For

INTELLENGENT WIRELESS TECHNOLOGY CO., LTD.

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Prepared By

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VERIFICATION OF COMPLIANCE

Applicant:	INTELLENGENT WIRELESS TECHNOLOGY CO., LTD.
Manufacturer	Rm804, Sino Centre, 582-592 Nathan Rd., Kln, Hongkong
Product Description:	ZigBee Module
Brand Name:	N/A
Model Number:	IWTZ-M6-001
FCC ID	VWXIWTZ-M6-001
Report Number:	SZAGC062071201E6
Date of Test:	Dec.10, 2007-Dec.20, 2007

WE HEREBY CERTIFY THAT:

The above equipment was tested by **Shenzhen Attestation of Global Compliance Science & Technology 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.

Tested By: Tony Tian

Tony Tian Dec.21, 2007

Checked By: Randy He

Randy He Dec.21, 2007

Authorized By King Zhang

King Zhang Dec.21, 2007

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

The EUT is an short range, lower power, **ZigBee Module** designed as an “Communication Device”. It is designed by way of utilizing the DSSS technology to achieve the system operation.

A major technical description of EUT is described as following:

Operation Frequency	2.405 GHz to 2.480 GHz
Modulation	DSSS
Number of channels	16
Antenna Designation	Dedicated Antenna with Maximum 2 dBi
Power Supply	DC 3.3V

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: **VWXIWTZ-M6-001** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

1.3 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.

1.4 TEST FACILITY

All measurement facilities used to collect the measurement data are located at
Shenzhen Electronic Product Quality Testing Centre
Electronic Testing Building, Wenguang Road, Xili Town Shenzhen, China
FCC test site Registration Number: 261302

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

1.5 SPECIAL ACCESSORIES

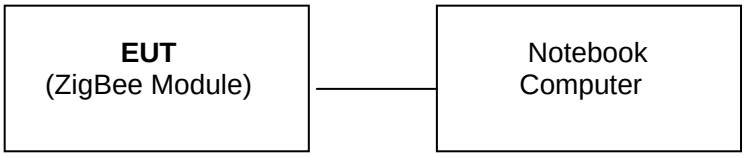
Not available for this EUT intended for grant.

1.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 CONFIGURATION OF TESTED SYSTEM



2.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
1	ZigBee	IWT	IWTZ-M6-001	VWXIWTZ-M6-001	--	--
2	Note	IBM	R74	--	--	--

3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.107	Conduction Emission	N/A
§15.247	Maximum Conducted Output Power	Compliant
§15.247	Maximum Power Density	Compliant
§15.247	Minimum 6 dB Bandwidth	Compliant
§15.247	Out of Band Conducted Output Power	Compliant
§15.247	Band Edge	Compliant

4. DESCRIPTION OF TEST MODES

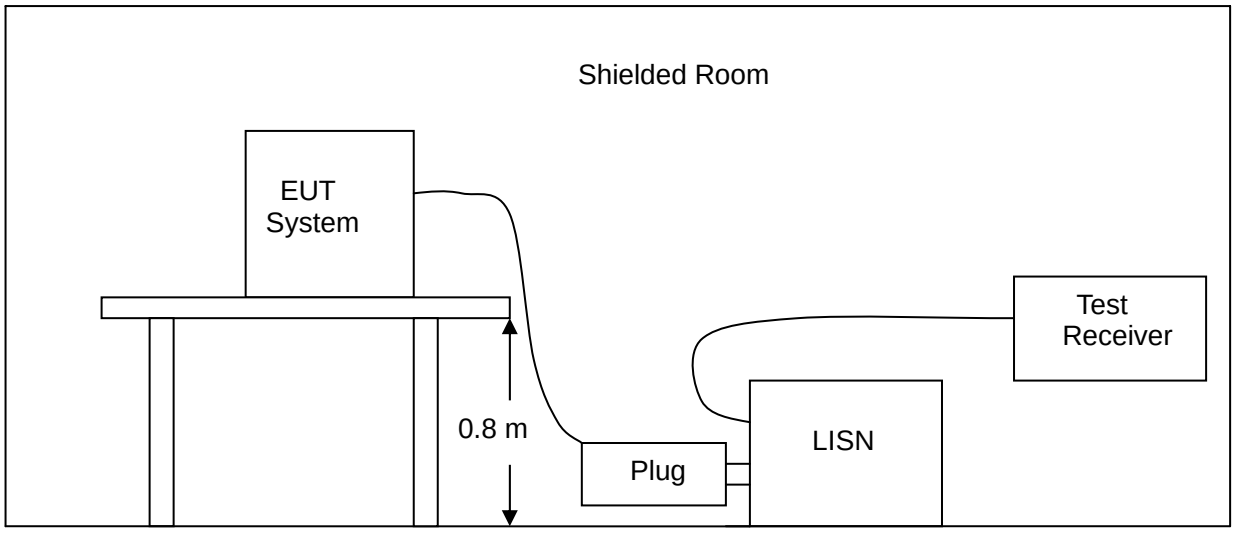
(1) The EUT has been set to operate continuously on the lowest, the middle and the highest operation frequency individually.
(2) The EUT stays in continuous transmitting mode on the operation frequency being set.

5. CONDUCTION EMISSIONS (NOT APPLICABLE)

5.1 MEASUREMENT PROCEDURE:

(1) The equipment was set up as per the test configuration to simulate typical actual usage per the users manual. 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.
(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)The EUT received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
(5) All support equipments received AC power from a second LISN, if any.
(6) The EUT 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.

5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



5.3 MEASUREMENT EQUIPMENT USED:

CONDUCTED EMISSION TEST SITE # 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS30	100038	2007/07	2008/07
ARTIFICIAL MAINS	ROHDE & SCHWARZ	ESH2-Z5	100028	2007/07	2008/07
PULSE LIMITER	ROHDE & SCHWARZ	ESHSZ2	100044	2007/07	2008/07

5.4 LIMITS AND MEASUREMENT RESULT:

(The chart below shows the highest readings taken from the final data)

FREQ MHz	PEAK RAW dBuV	Q.P. RAW dBuV	AVG RAW dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dB	AVG Margin dB	NOTE
---	---	---	---	---	---	---	---	L1
---	---	---	---	---	---	---	---	L1
---	---	---	---	---	---	---	---	L1
---	---	---	---	---	---	---	---	L1
---	---	---	---	---	---	---	---	L1
---	---	---	---	---	---	---	---	L1
---	---	---	---	---	---	---	---	L2
---	---	---	---	---	---	---	---	L2
---	---	---	---	---	---	---	---	L2
---	---	---	---	---	---	---	---	L2
---	---	---	---	---	---	---	---	L2
---	---	---	---	---	---	---	---	L2

L1 = Line One (Hot side) / L2 = Line Two (Neutral side)

****NOTE:**

"---" denotes the peak emission level was or more than 2dB below the Average limit, so no re-check anymore.

6. MAXIMUM OUTPUT POWER

6.1 MEASUREMENT PROCEDURE:

CONDUCTED METHOD

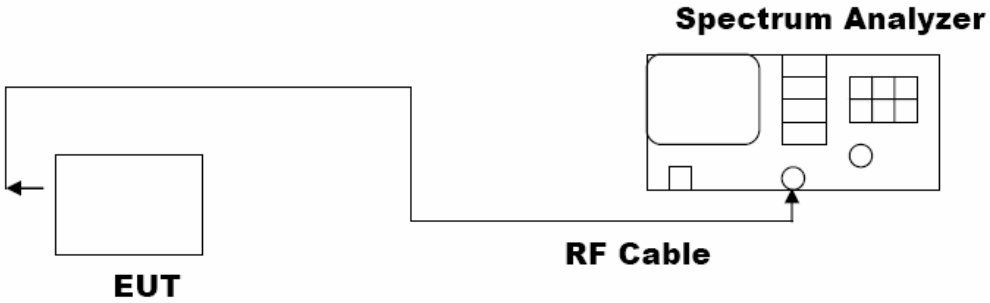
(1) The EUT was placed on a turn table which is 0.8m above ground plane.
(2) Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
(3) Set the EUT Work on the top, the middle and the bottom operation frequency individually.
(4) Set SPA Centre Frequency = Operation Frequency, RBW=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

RADIATED METHOD

According to ANSI C63.4:2003

6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

CONDUCTED METHOD



RADIATED METHOD

According to ANSI C63.4:2003

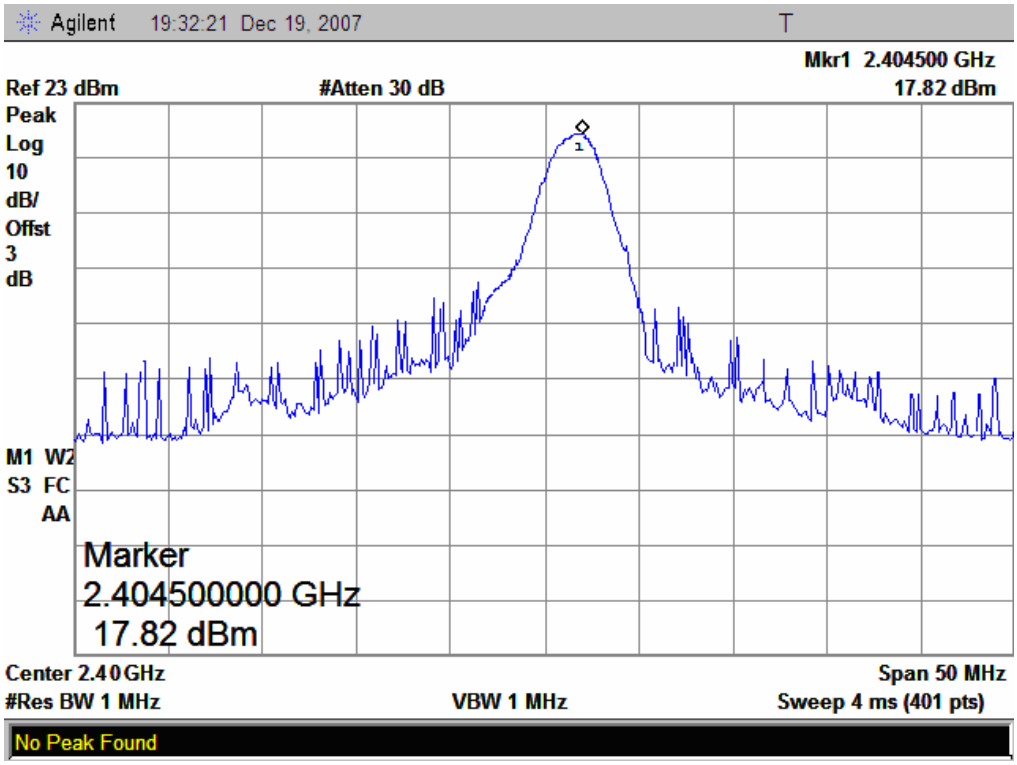
6.3 MEASUREMENT EQUIPMENT USED:

3/5 ANECHOIC CHAMBER RADIATION TEST SITE # 4					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
BROADBAND ANTENNA	R & S	HF562	10089	2007-06-09	2008-06-08
SPECTRUM ANALYZER	AGILENT	E4446A	US44300399	2007-02-06	2008-02-05

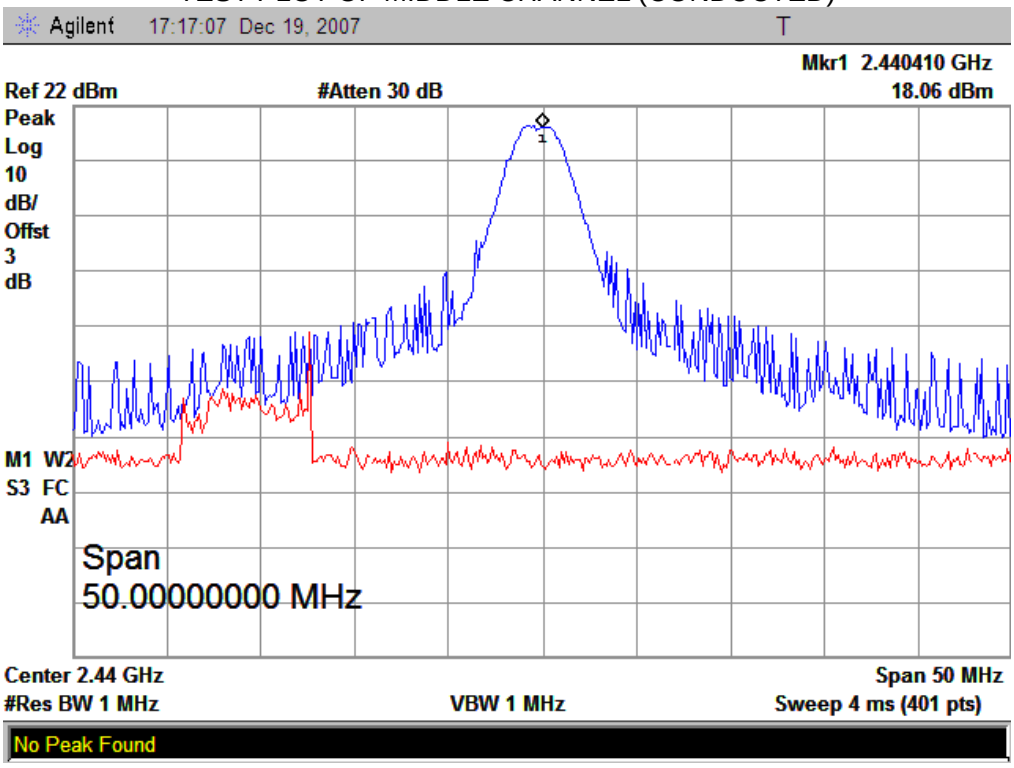
6.4 LIMITS AND MEASUREMENT RESULT:

LIMITS AND MEASUREMENT RESULT				
Applicable Limits	Frequency	Measurement Result		
		EIRP (dBm)	Conducted (dBm)	Criteria
30 dBm	2.405GHz	Hor: 19.81	17.87	PASS
		Ver: 11.52		
30 dBm	2.440GHz	Hor: 19.85	18.06	PASS
		Ver: 11.64		
30 dBm	2.480GHz	Hor: 19.83	17.91	PASS
		Ver: 11.60		

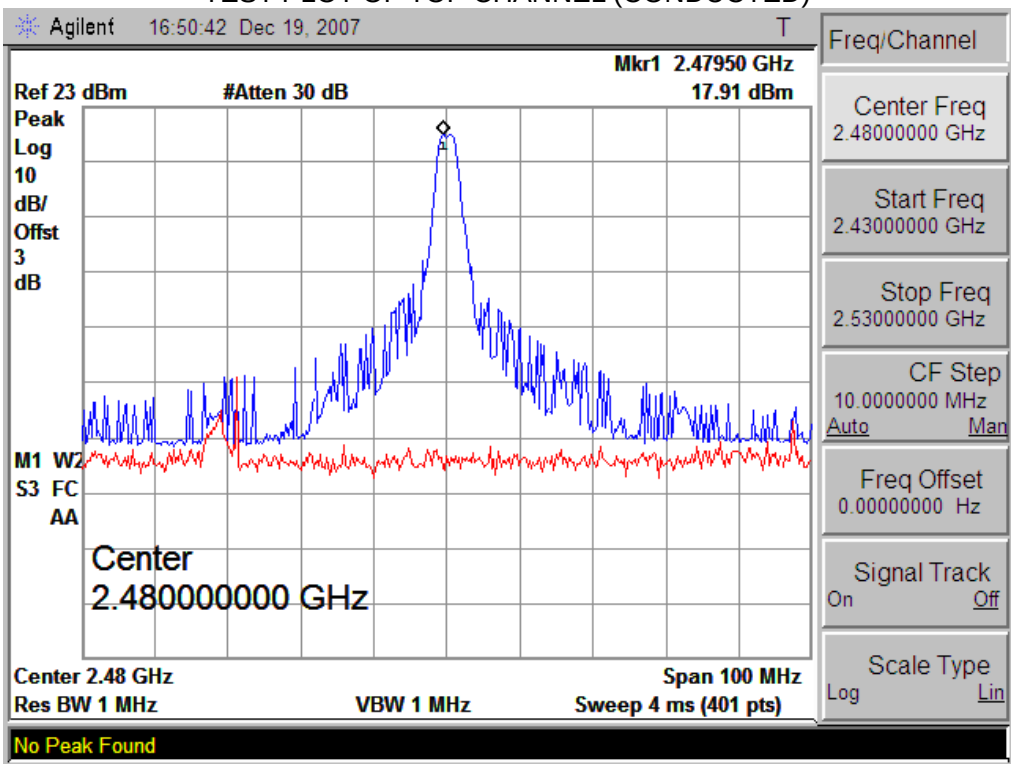
TEST PLOT OF BOTTOM CHANNEL (CONDUCTED)



TEST PLOT OF MIDDLE CHANNEL (CONDUCTED)



TEST PLOT OF TOP CHANNEL (CONDUCTED)

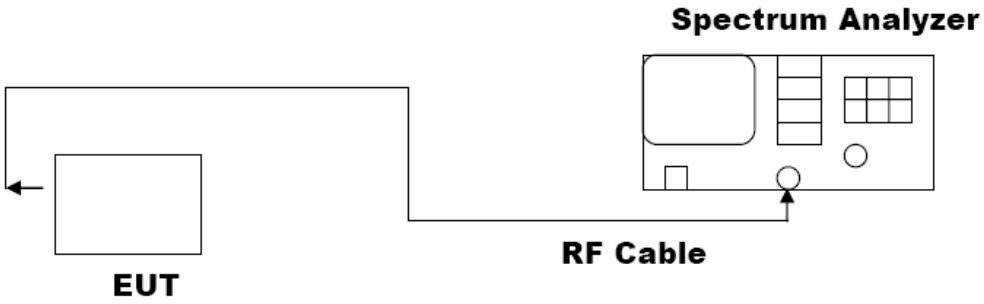


7. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY

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)



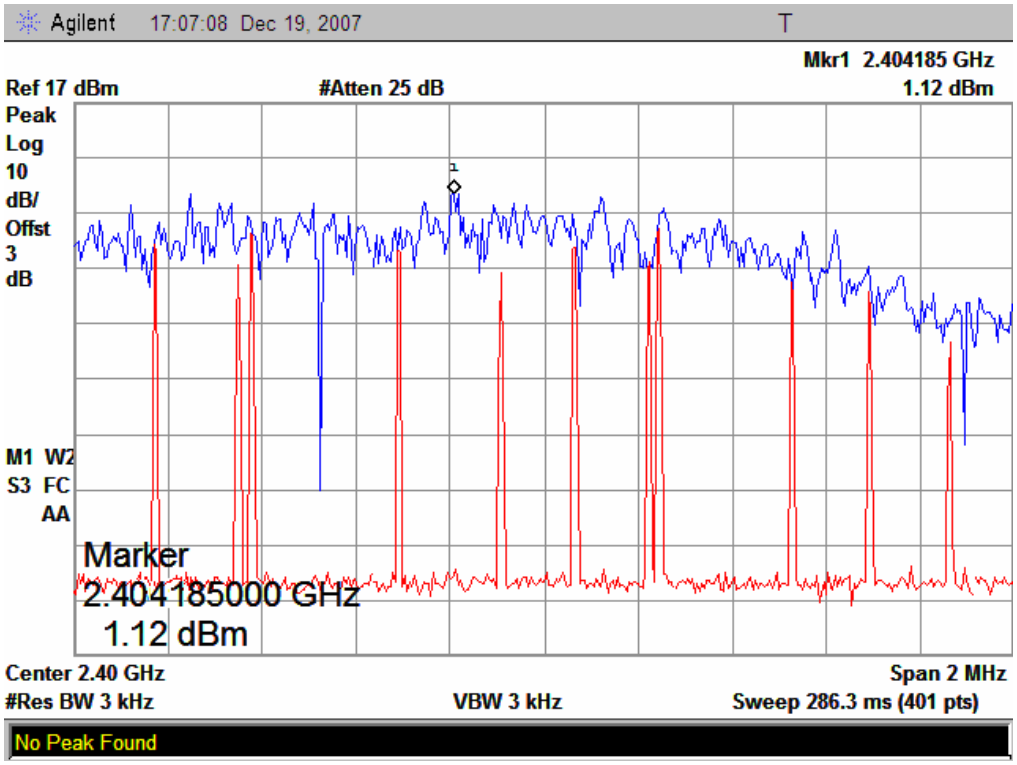
7.3 MEASUREMENT EQUIPMENT USED:

SHIELDING ROOM					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
SPECTRUM ANALYZER	AGILENT	E4446A	US44300399	2007-02-06	2008-02-05

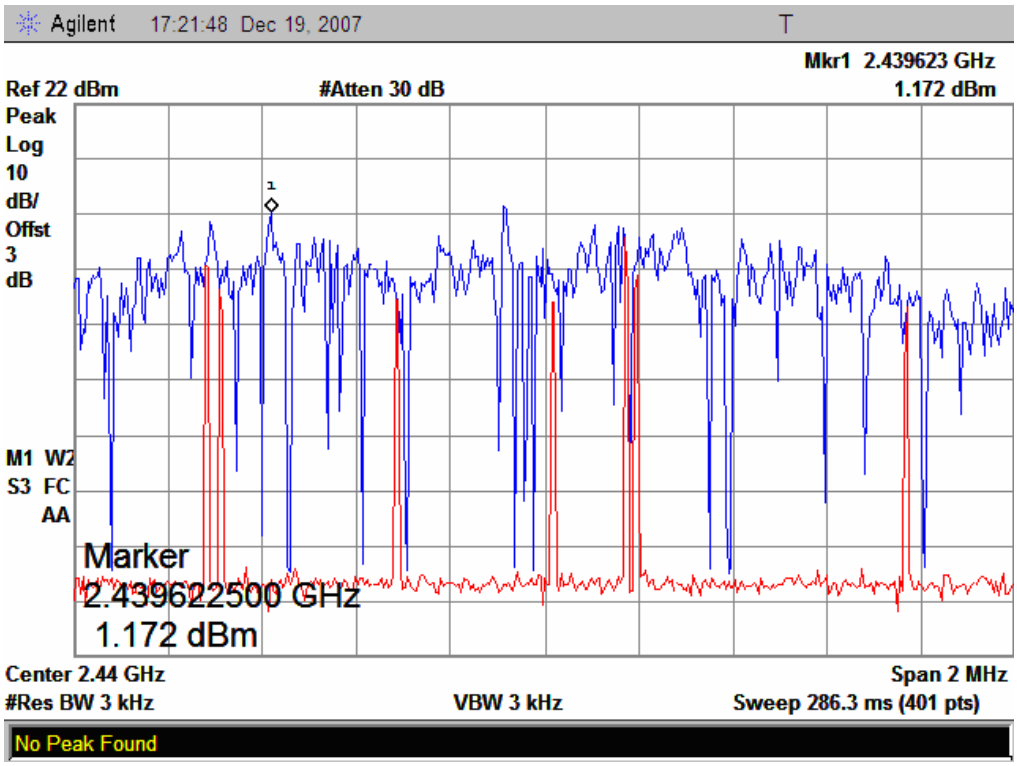
7.4 LIMITS AND MEASUREMENT RESULT:

LIMITS AND MEASUREMENT RESULT			
Applicable Limits	Measurement Result		
	Test Data (dBm/3KHz)		Criteria
8 dBm / 3KHz	Bottom Channel	1.12	PASS
	Middle Channel	1.17	PASS
	Top Channel	1.15	PASS

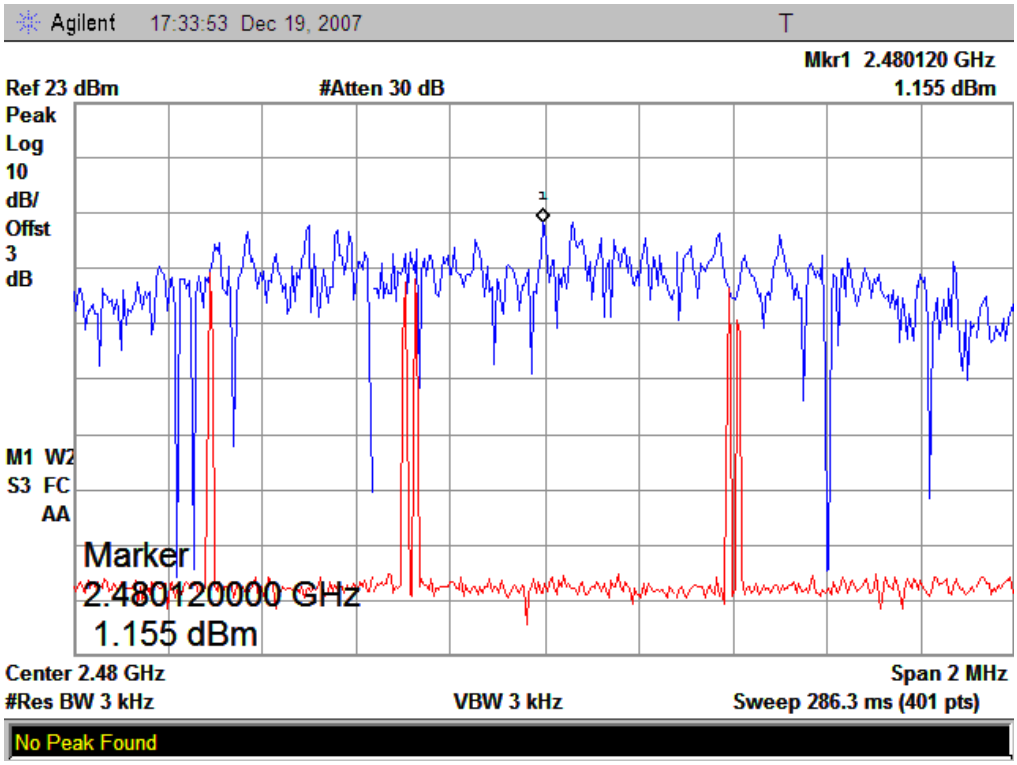
TEST PLOT OF SPECTRAL DENSITY – BOTTOM CHANNEL



TEST PLOT OF SPECTRAL DENSITY – MIDDLE CHANNEL



TEST PLOT OF SPECTRAL DENSITY – TOP CHANNEL



8. MINIMUM 6 DB BANDWIDTH

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= 1 MHz,
   VBW= 3 MHz.
4. Set SPA Trace 1 Max hold, then View.

8.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The Same as described in Section 7.2

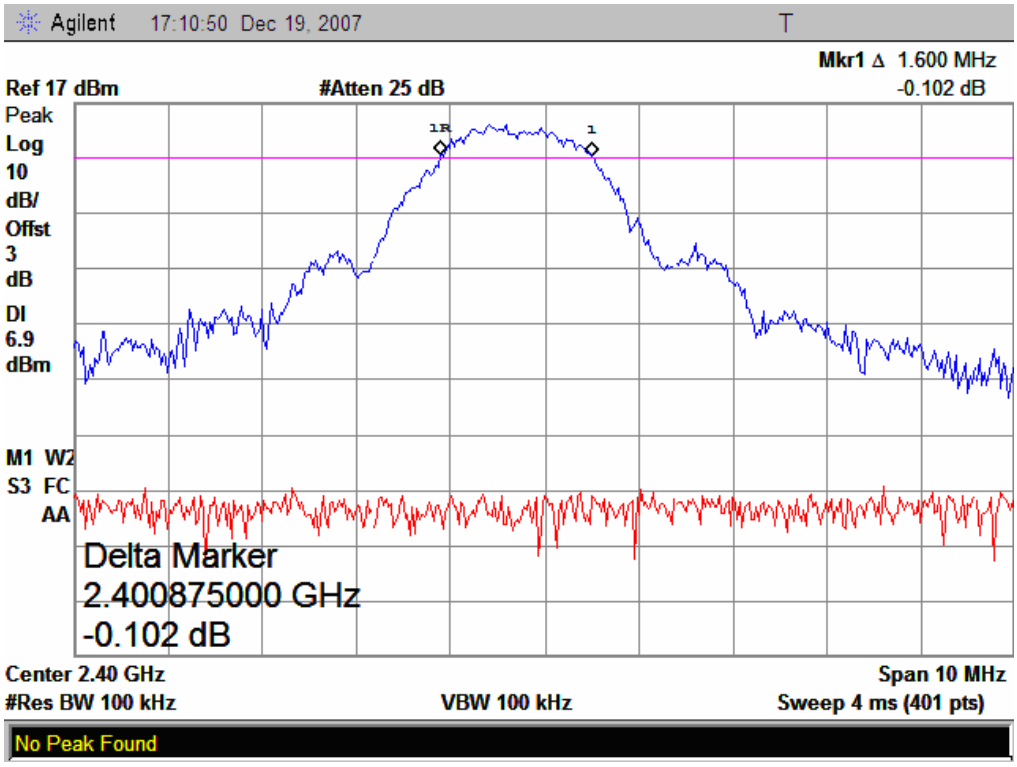
8.3 MEASUREMENT EQUIPMENT USED:

The same as described in Section 7.3

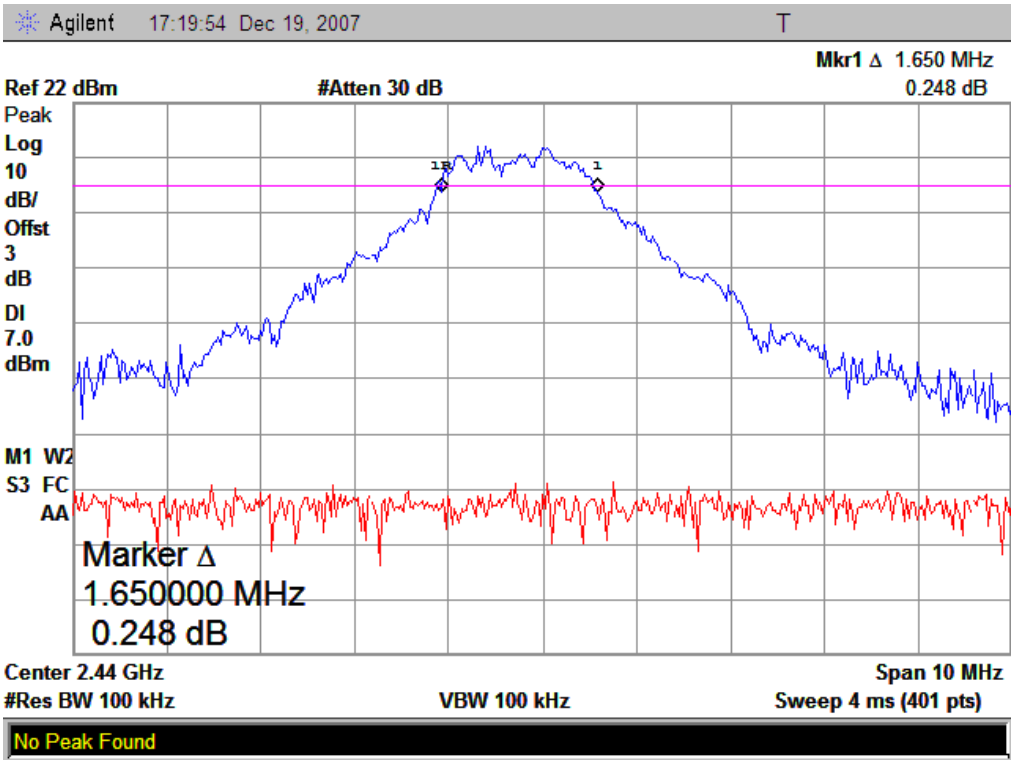
8.4 LIMITS AND MEASUREMENT RESULTS:

LIMITS AND MEASUREMENT RESULT			
Applicable Limits	Measurement Result		
	Test Data (MHz)		Criteria
> 500 KHz	Bottom Channel	1.600	PASS
	Middle Channel	1.650	PASS
	Top Channel	1.475	PASS

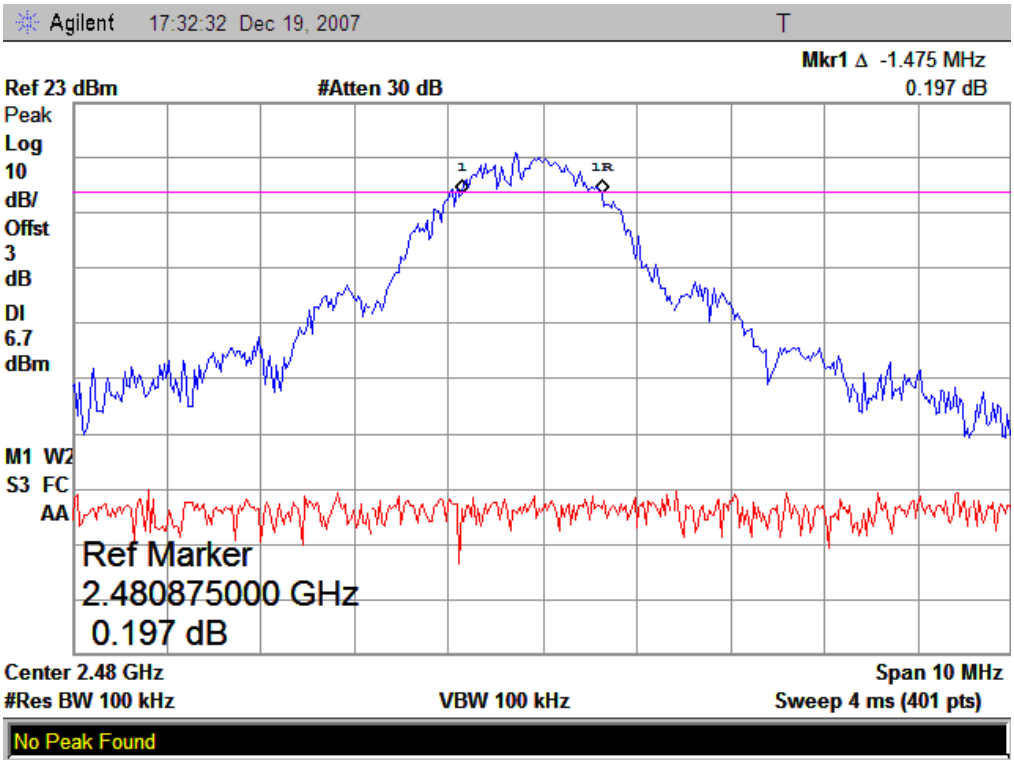
TEST PLOT OF BANDWIDTH FOR BOTTOM CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR TOP CHANNEL



9. OUT OF BAND EMISSION

9.1 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.

9.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The Same as described in section 7.2

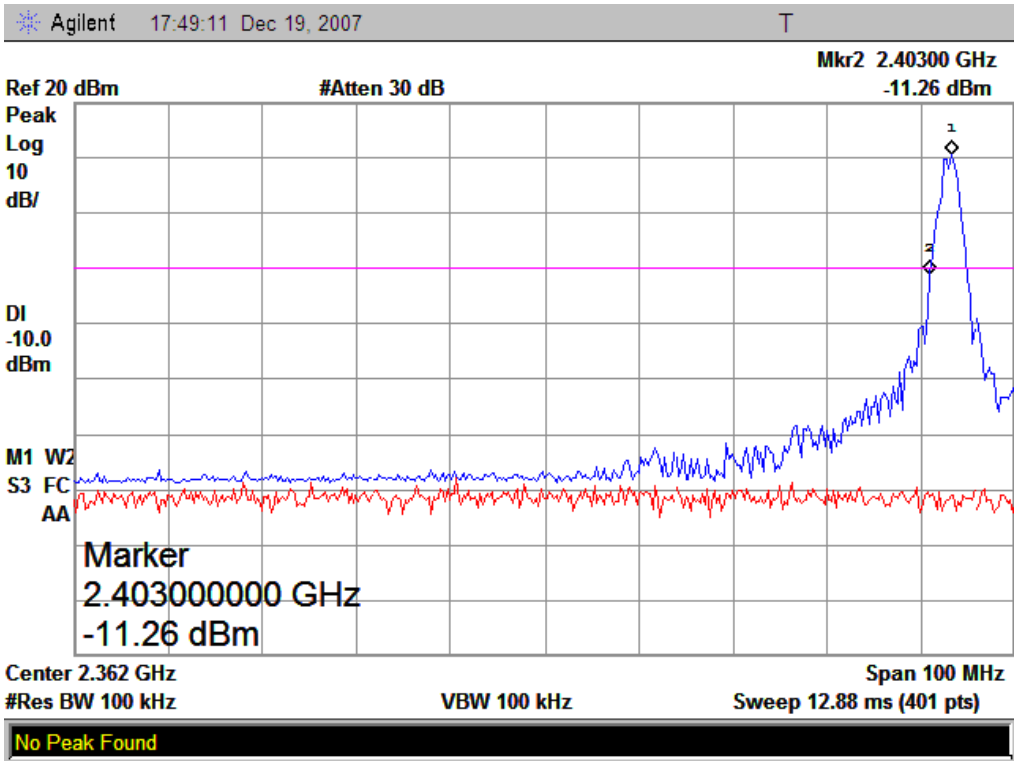
9.3 MEASUREMENT EQUIPMENT USED:

The Same as described in section 6.3

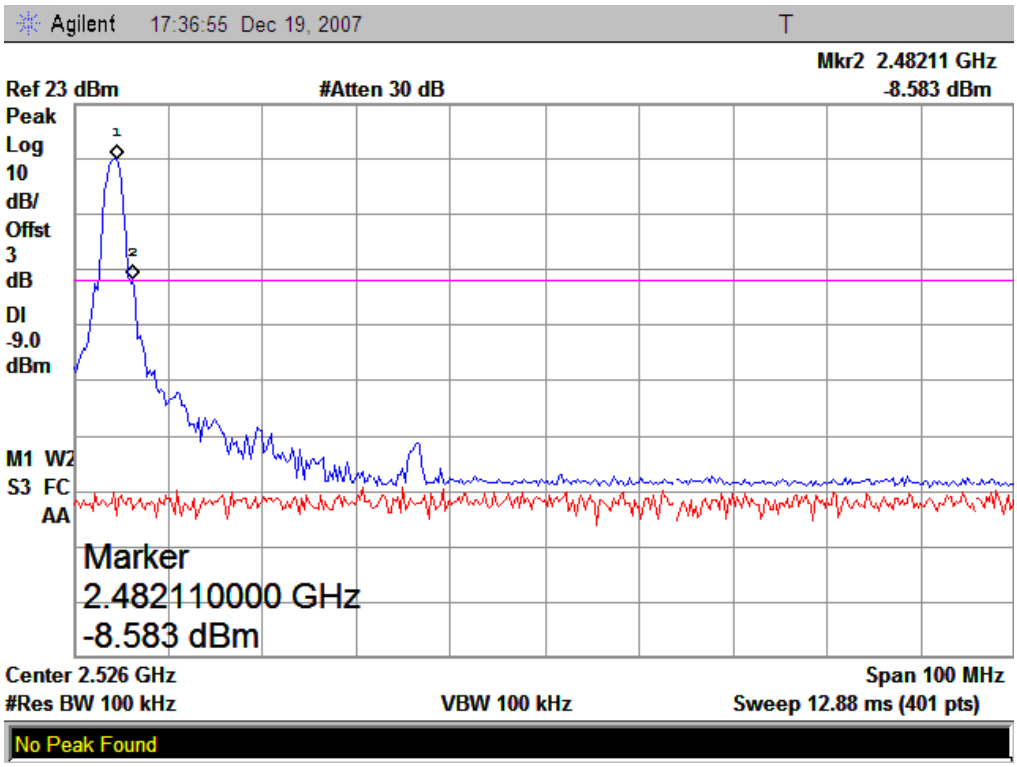
9.4 LIMITS AND MEASUREMENT RESULT:

LIMITS AND MEASUREMENT RESULT		
Applicable Limits	Measurement Result	
	Test Data	Criteria
In any 100 KHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce 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.	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS
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))	At least -20dBc than the limit Specified on the TOP Channel	PASS

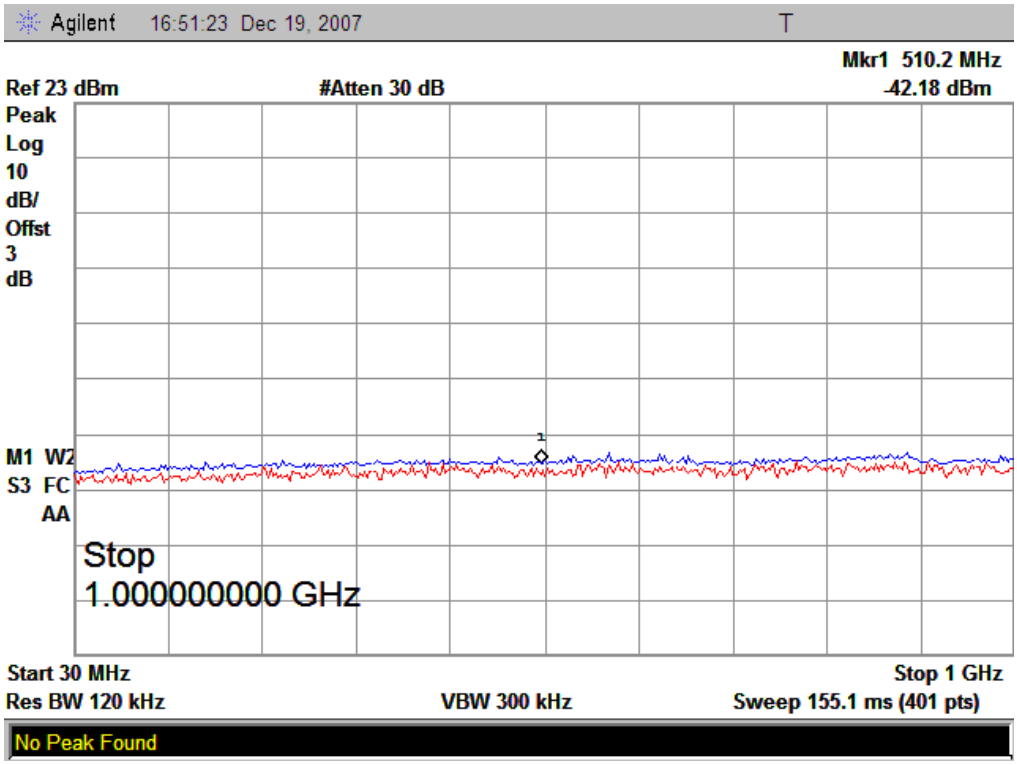
TEST PLOT OF BAND ELDG FOR BOTTOM CHANNEL



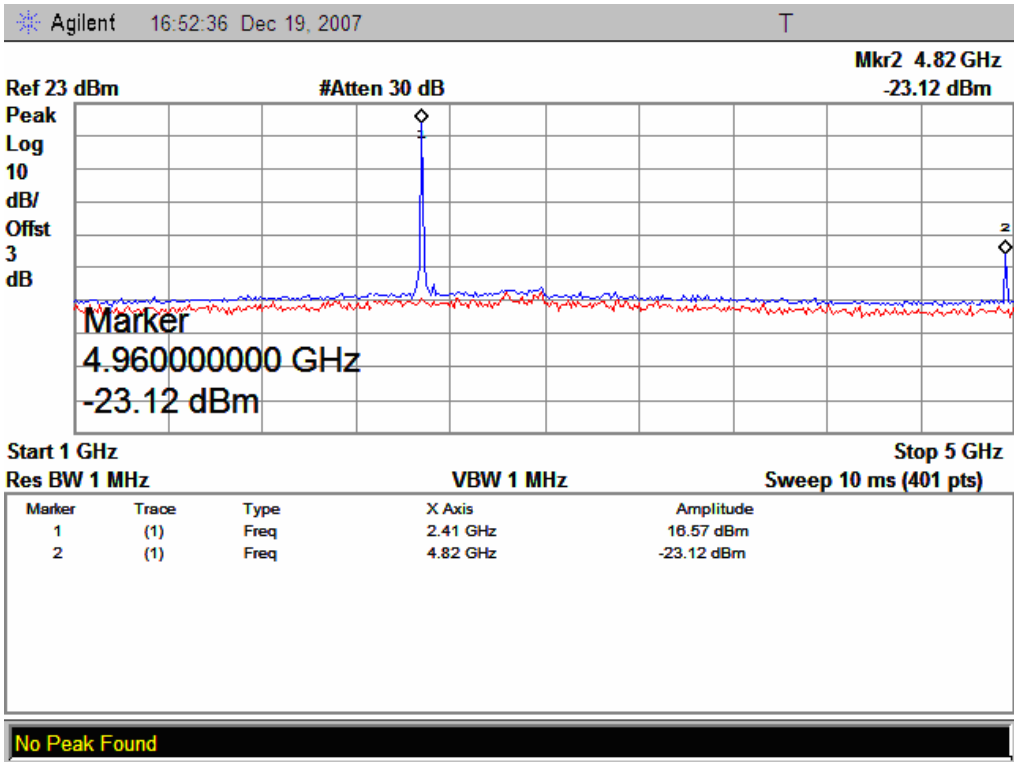
TEST PLOT OF BAND ELDG FOR TOP CHANNEL



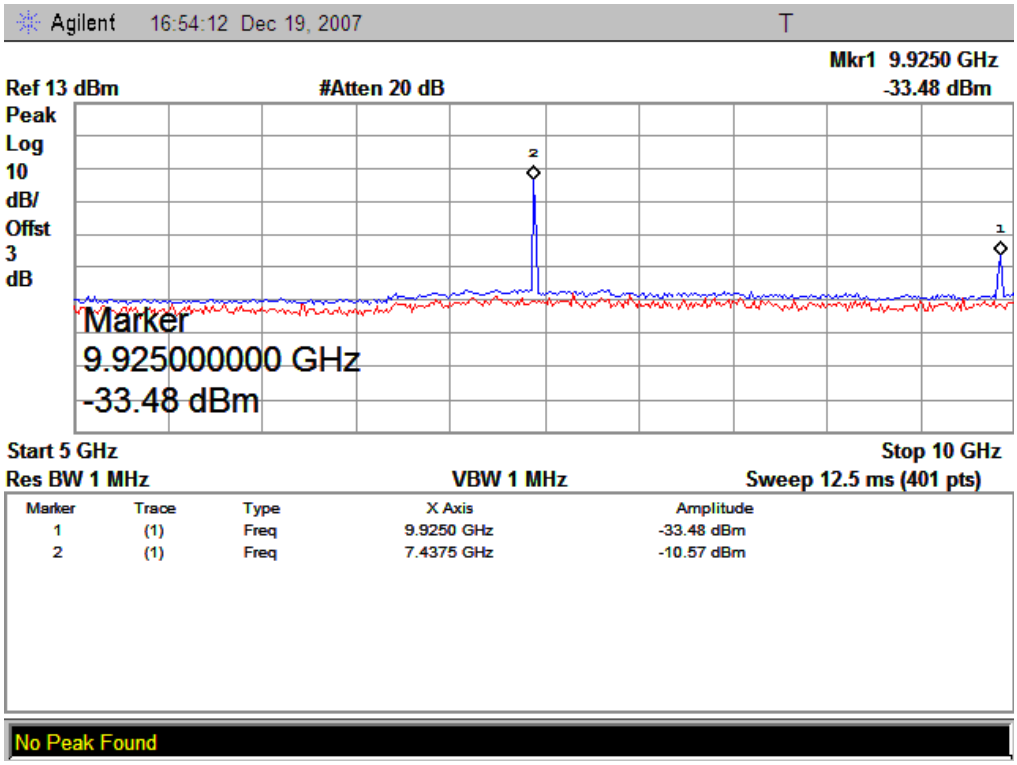
TEST PLOT OF OUT OF BAND EMISSIONS FOR BOTTOM CHANNEL - 1



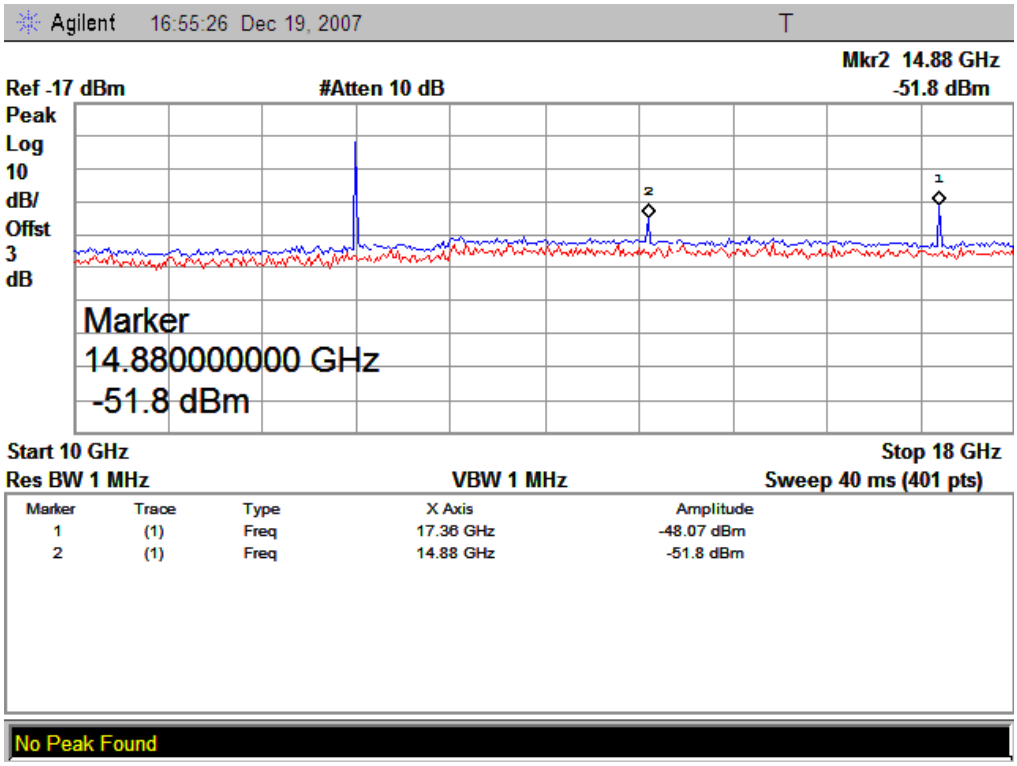
TEST PLOT OF OUT OF BAND EMISSIONS FOR BOTTOM CHANNEL – 2



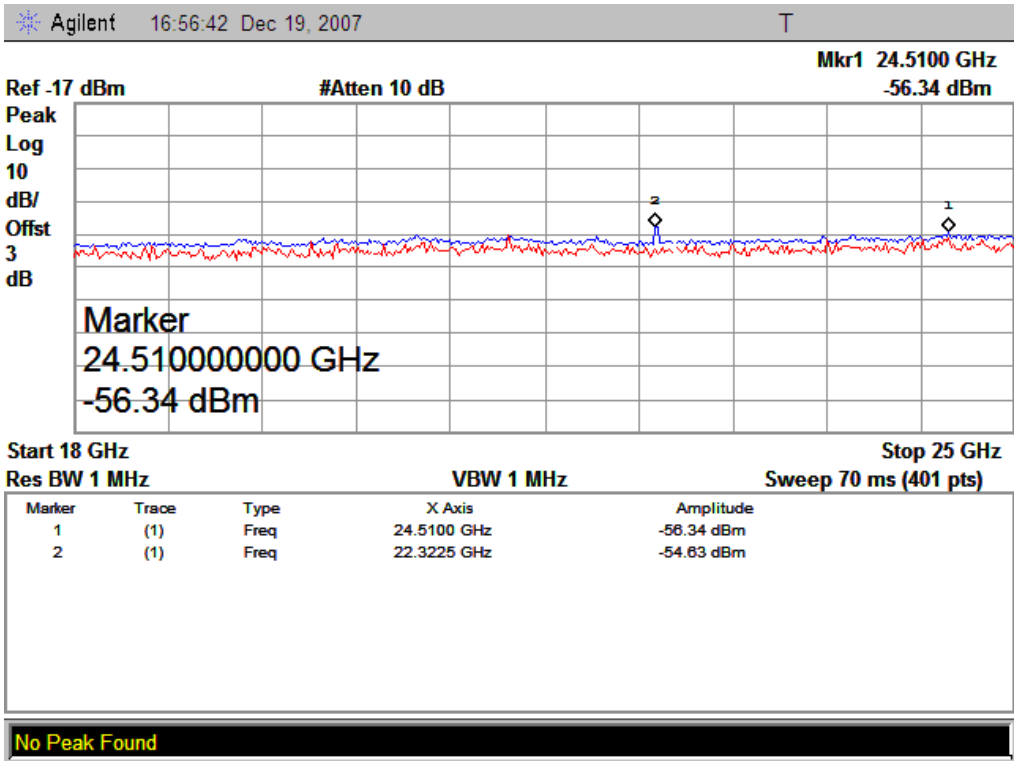
TEST PLOT OF OUT OF BAND EMISSIONS FOR BOTTOM CHANNEL – 3



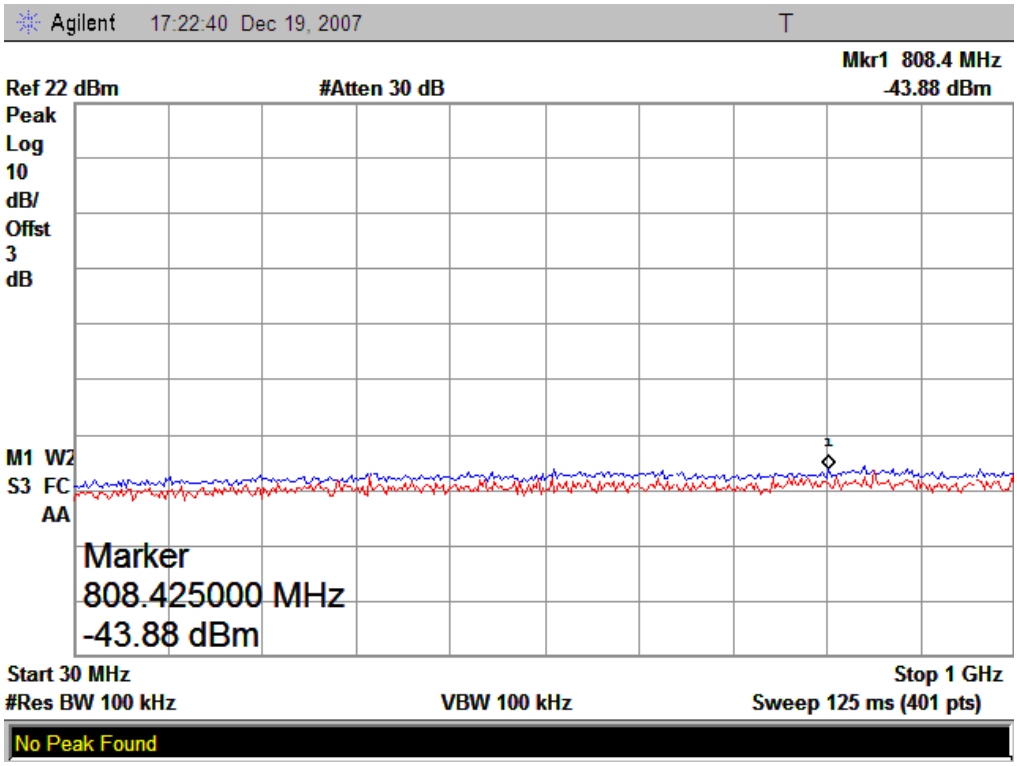
TEST PLOT OF OUT OF BAND EMISSIONS FOR BOTTOM CHANNEL – 4



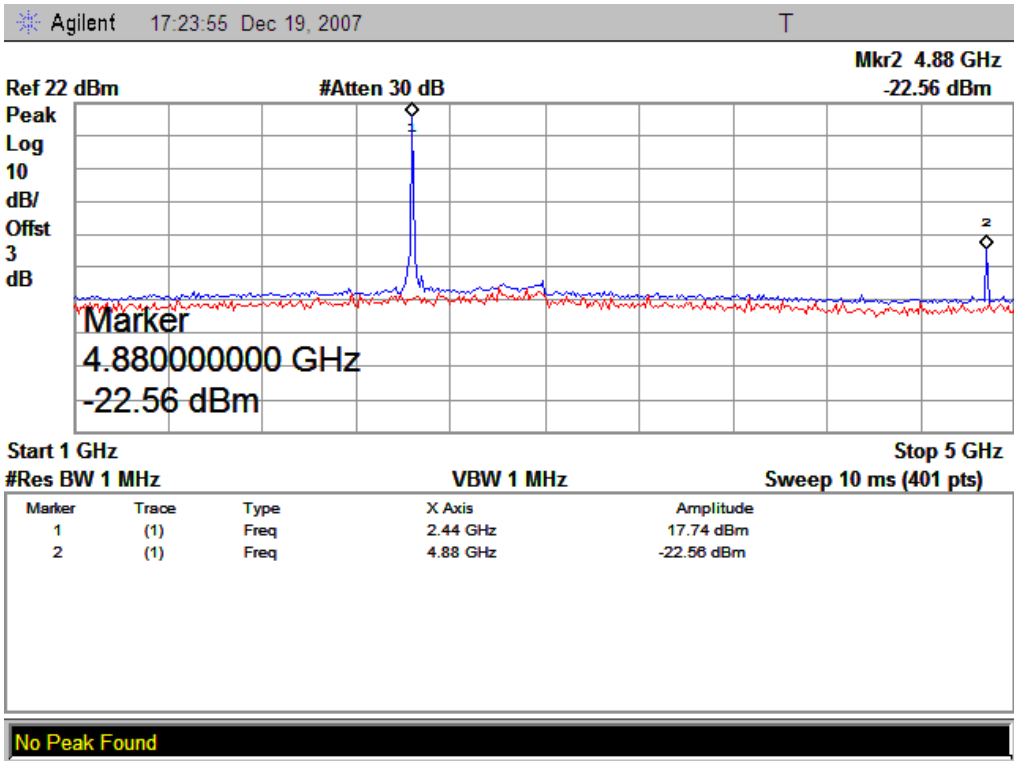
TEST PLOT OF OUT OF BAND EMISSIONS FOR BOTTOM CHANNEL – 5



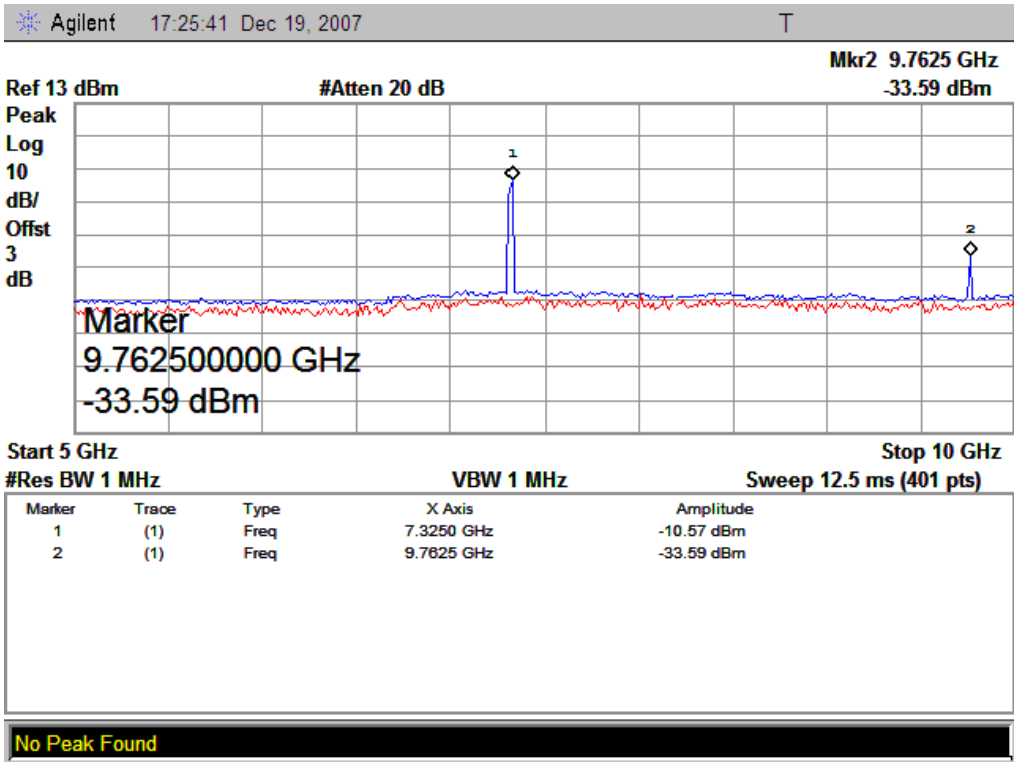
TEST PLOT OF OUT OF BAND EMISSIONS FOR MIDDLE CHANNEL – 1



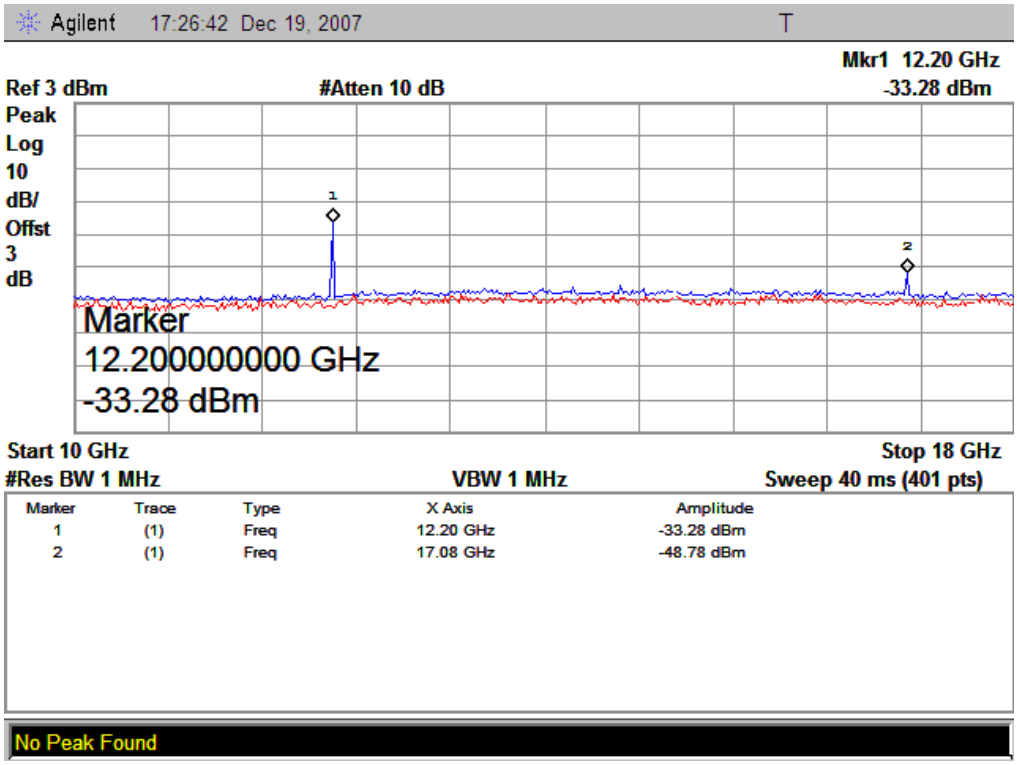
TEST PLOT OF OUT OF BAND EMISSIONS FOR MIDDLE CHANNEL – 2



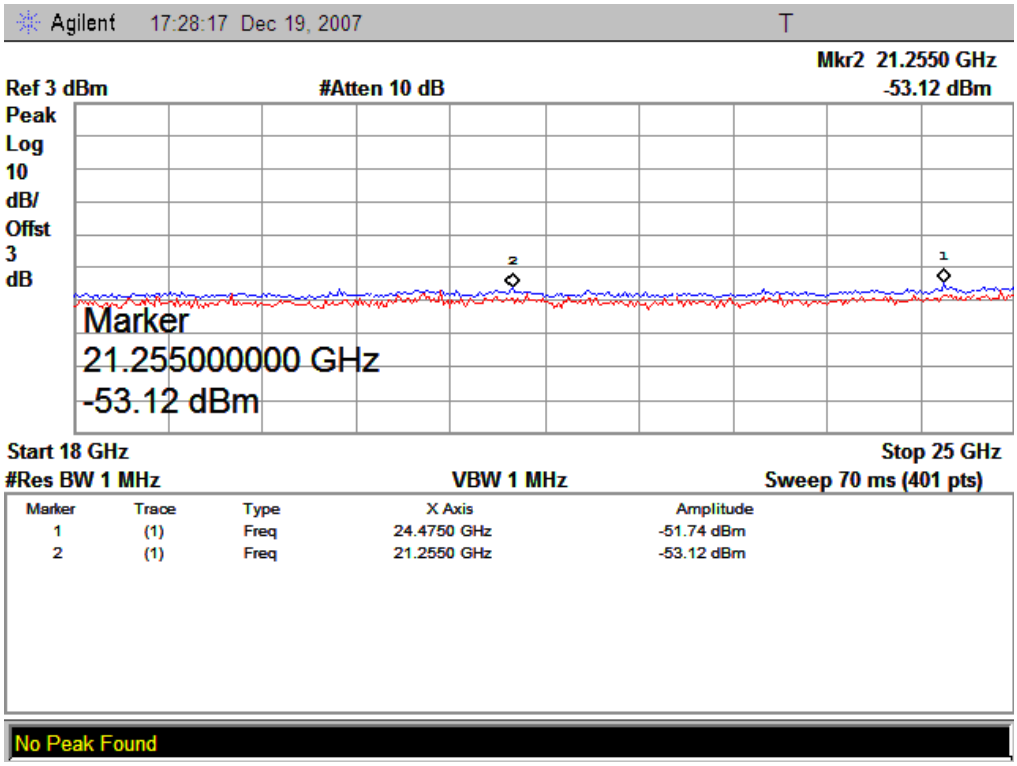
TEST PLOT OF OUT OF BAND EMISSIONS FOR MIDDLE CHANNEL – 3



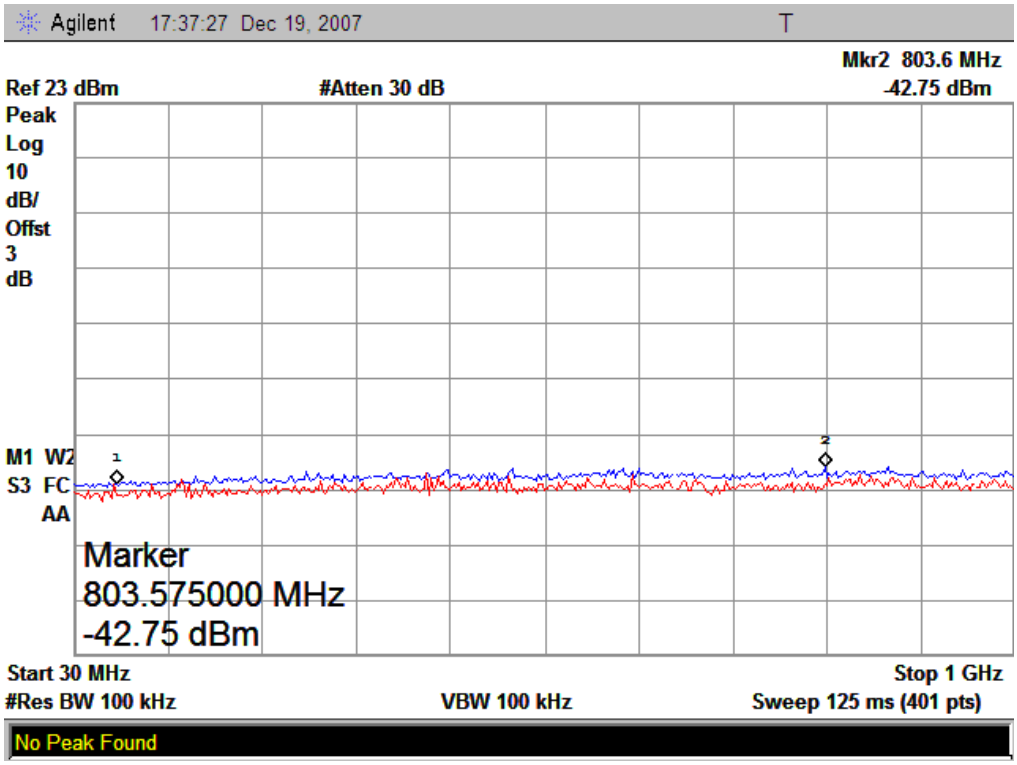
TEST PLOT OF OUT OF BAND EMISSIONS FOR MIDDLE CHANNEL – 4



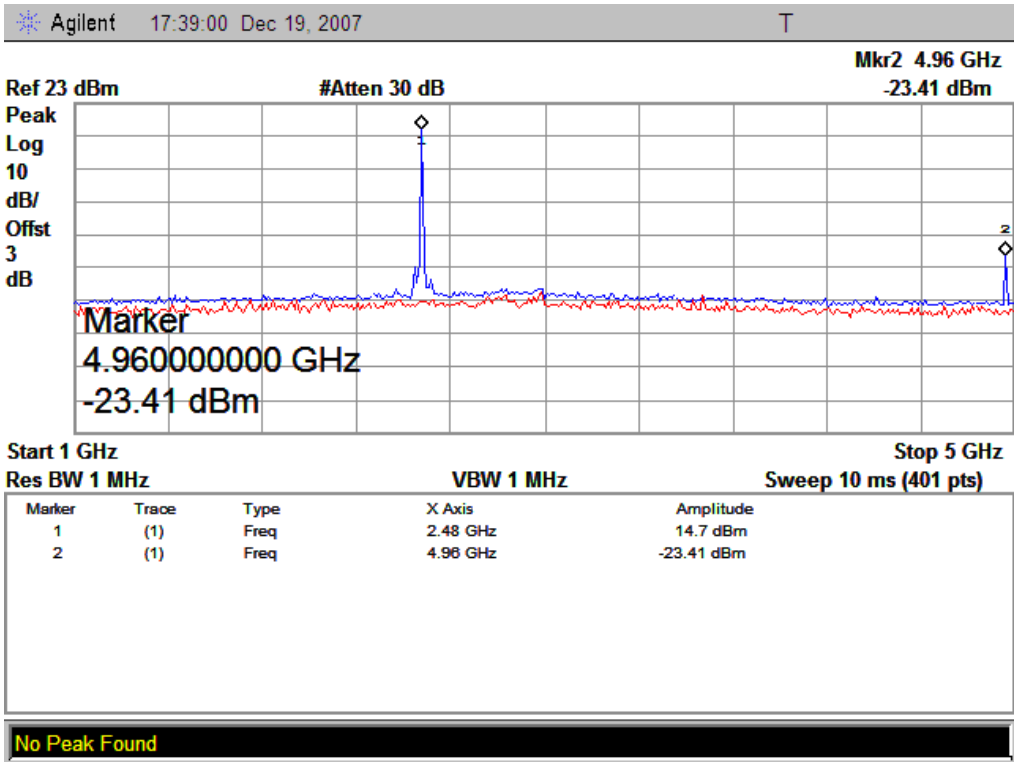
TEST PLOT OF OUT OF BAND EMISSIONS FOR MIDDLE CHANNEL – 5



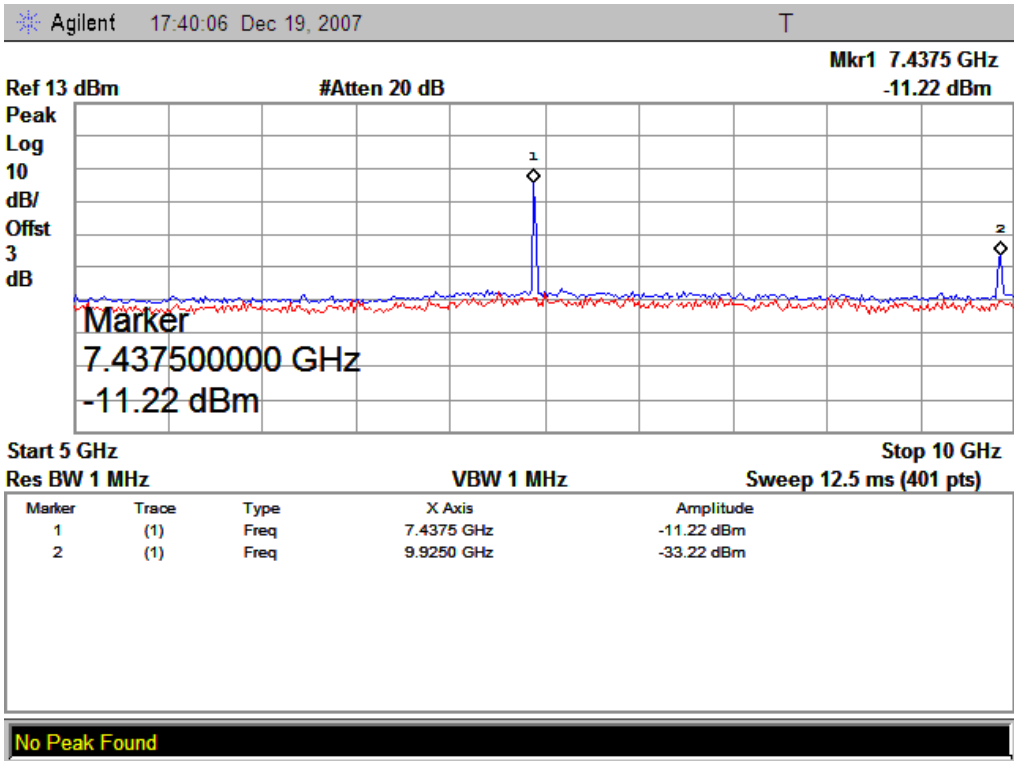
TEST PLOT OF OUT OF BAND EMISSIONS FOR TOP CHANNEL – 1



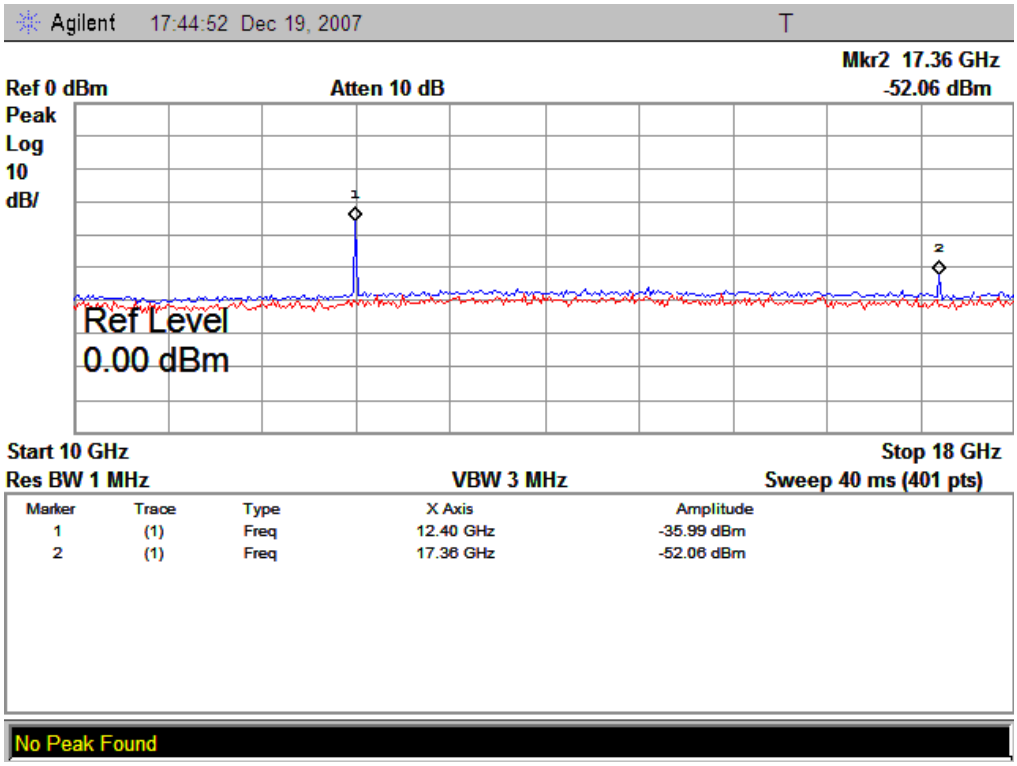
TEST PLOT OF OUT OF BAND EMISSIONS FOR TOP CHANNEL – 2



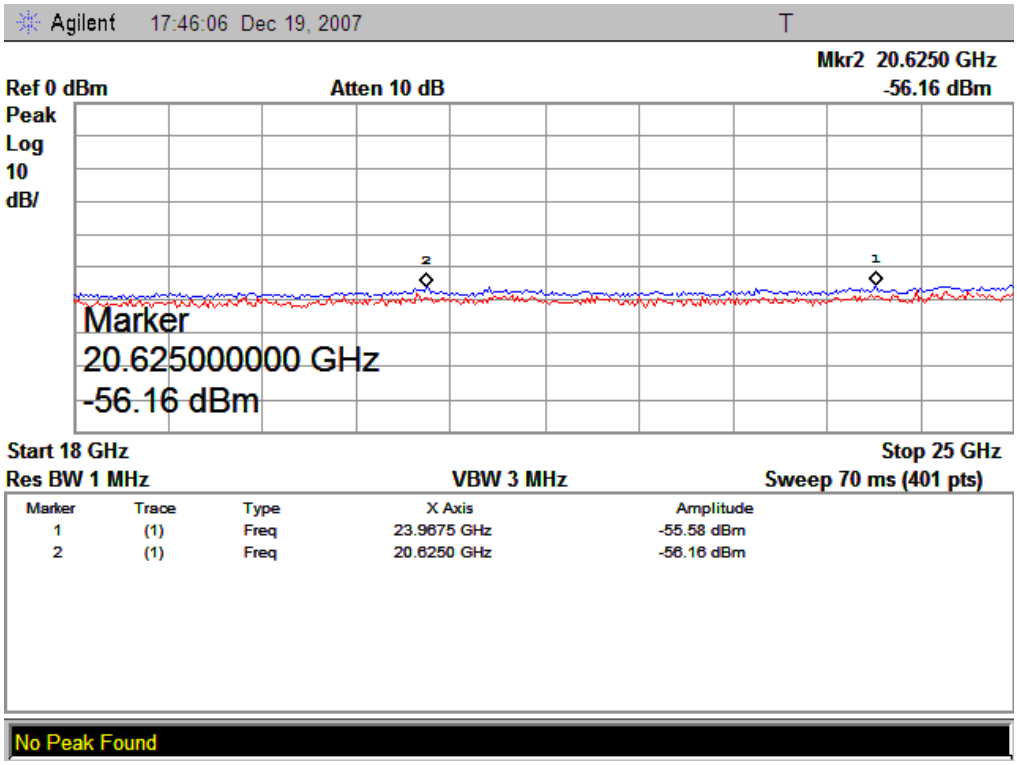
TEST PLOT OF OUT OF BAND EMISSIONS FOR TOP CHANNEL – 3



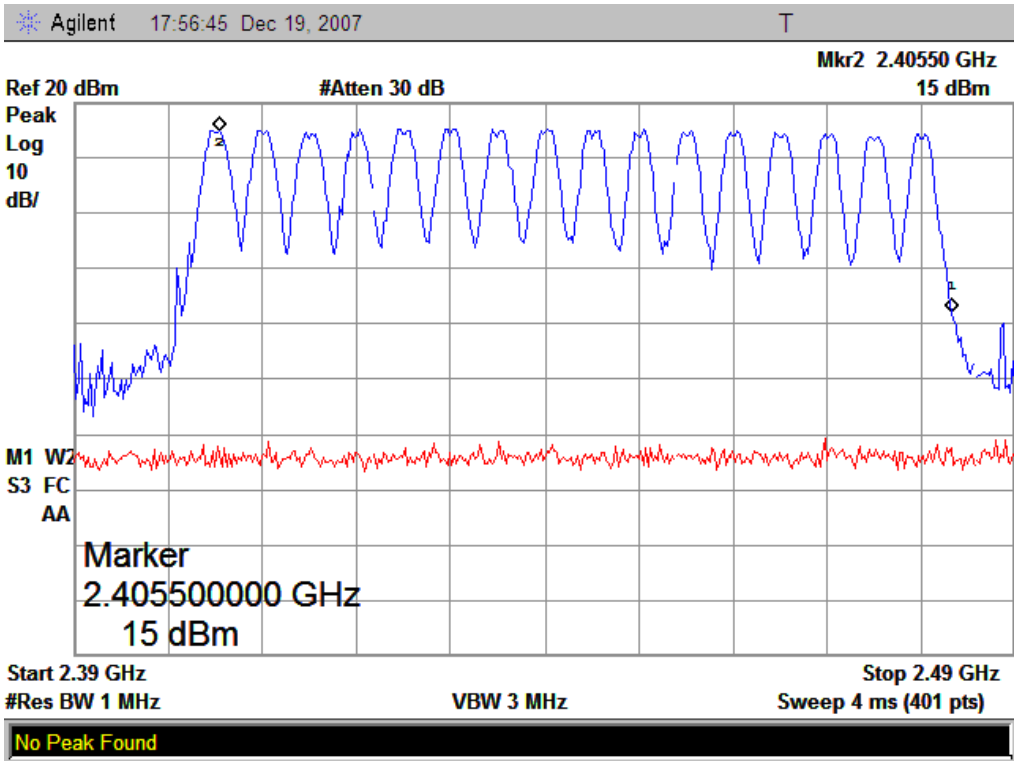
TEST PLOT OF OUT OF BAND EMISSIONS FOR TOP CHANNEL – 4



TEST PLOT OF OUT OF BAND EMISSIONS FOR TOP CHANNEL – 5



TEST PLOT OF NUMBER OF CHANNELS



ZigBee Module Channels Frequency

Channels No.	Frequency
CH 00	2.405
CH 01	2.410
CH 02	2.415
CH 03	2.420
CH 04	2.425
CH 05	2.430
CH 06	2.435
CH 07	2.440
CH 08	2.445
CH 09	2.450
CH 10	2.455
CH 11	2.460
CH 12	2.465
CH 13	2.470
CH 14	2.475
CH 15	2.480

RADIATED EMISSION TEST RESULT:

Emission for Bottom/Middle/Top Channel Below 1GHz						
Frequency	Antenna Pol.	Field Strength	Field Strength	Limit (PK)	Limit (AV)	Memo
MHz	H/V	dBuV/m (PK)	dBuV/m (AV)	dBuV/m	dBuV/m	
--	H/V	--	--	--	--	*
--	H/V	--	--	--	--	*
--	H/V	--	--	--	--	*
--	H/V	--	--	--	--	*

Band Edge Emission for Bottom Channel						
Frequency	Antenna Pol.	Field Strength	Field Strength	Limit (PK)	Limit (AV)	Memo
GHz	H/V	dBuV/m (PK)	dBuV/m (AV)	dBuV/m	dBuV/m	
2.40	H	57.42	37.55	74	54	*
2.40	V	50.08	34.19	74	54	*

Band Edge Emission for Top Channel						
Frequency	Antenna Pol.	Field Strength	Field Strength	Limit (PK)	Limit (AV)	Memo
GHz	H/V	dBuV/m (PK)	dBuV/m (AV)	dBuV/m	dBuV/m	
2.48	H	53.17	35.29	74	54	*
2.48	V	48.33	32.77	74	54	*

Restricted Band Emission for Bottom Channel						
Frequency	Antenna Pol.	Field Strength	Field Strength	Limit (PK)	Limit (AV)	Memo
GHz	H/V	dBuV/m (PK)	dBuV/m (AV)	dBuV/m	dBuV/m	
4.81	H	61.80	41.48	74	54	*
4.81	V	54.93	38.56	74	54	*

Restricted Band Emission for Middle Channel						
Frequency	Antenna Pol.	Field Strength	Field Strength	Limit (PK)	Limit (AV)	Memo
GHz	H/V	dBuV/m (PK)	dBuV/m (AV)	dBuV/m	dBuV/m	
4.88	H	55.29	37.89	74	54	*
4.88	V	60.37	40.85	74	54	*
7.32	H	68.02	46.22	74	54	*
7.32	V	60.29	41.57	74	54	*

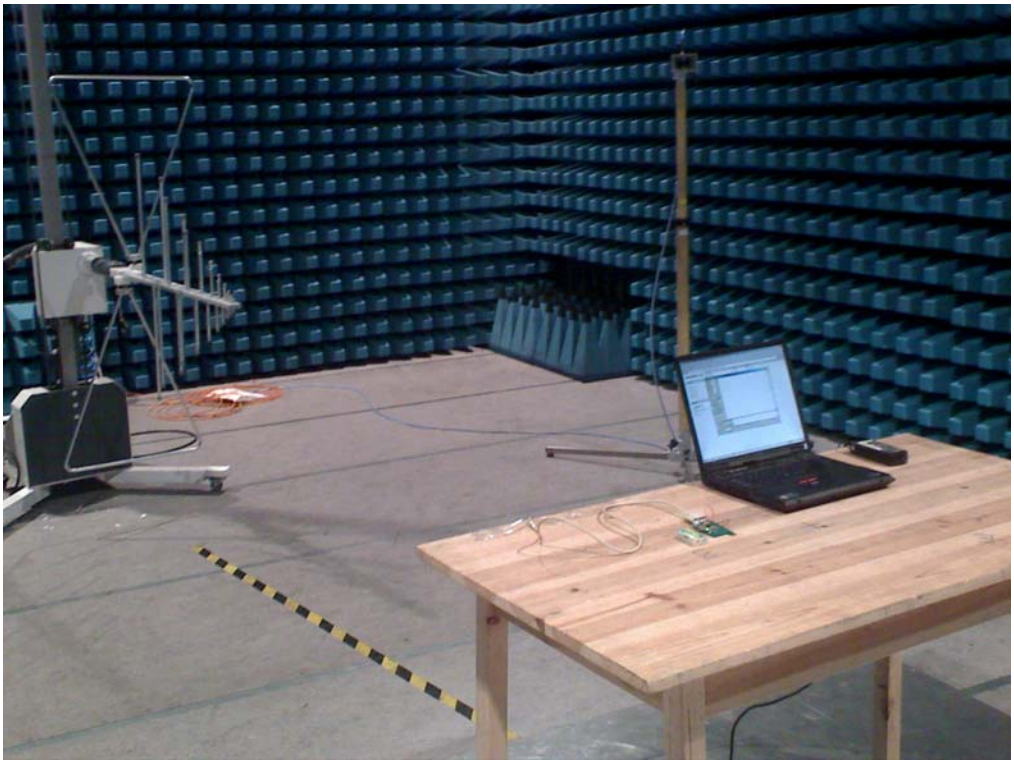
Restricted Band Emission for Top Channel						
Frequency	Antenna Pol.	Field Strength	Field Strength	Limit (PK)	Limit (AV)	Memo
GHz	H/V	dBuV/m (PK)	dBuV/m (AV)	dBuV/m	dBuV/m	
4.95	H	55.69	39.21	74	54	*
4.95	V	58.57	41.22	74	54	*
7.43	H	61.44	50.13	74	54	*
7.43	V	56.13	47.92	74	54	*

Note: "--" Indicated the test value is much lower to limit.

APPENDIX 1

PHOTOGRAPHS OF SET UP

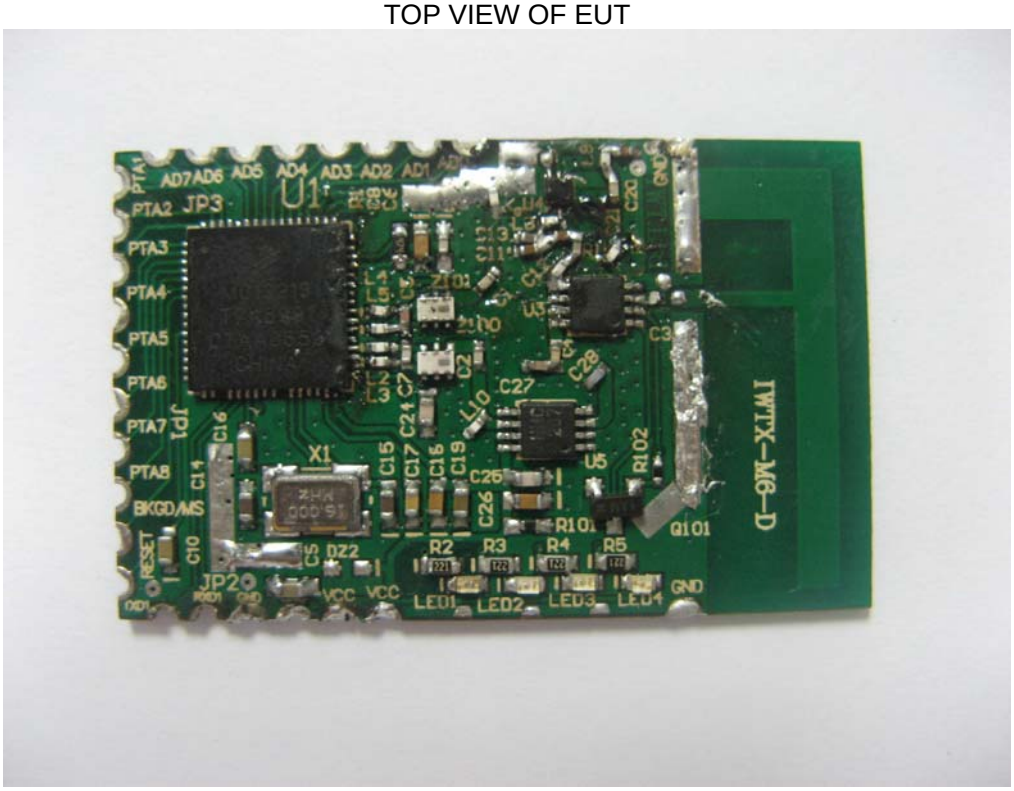
RADIATED EMISSION TEST SETUP



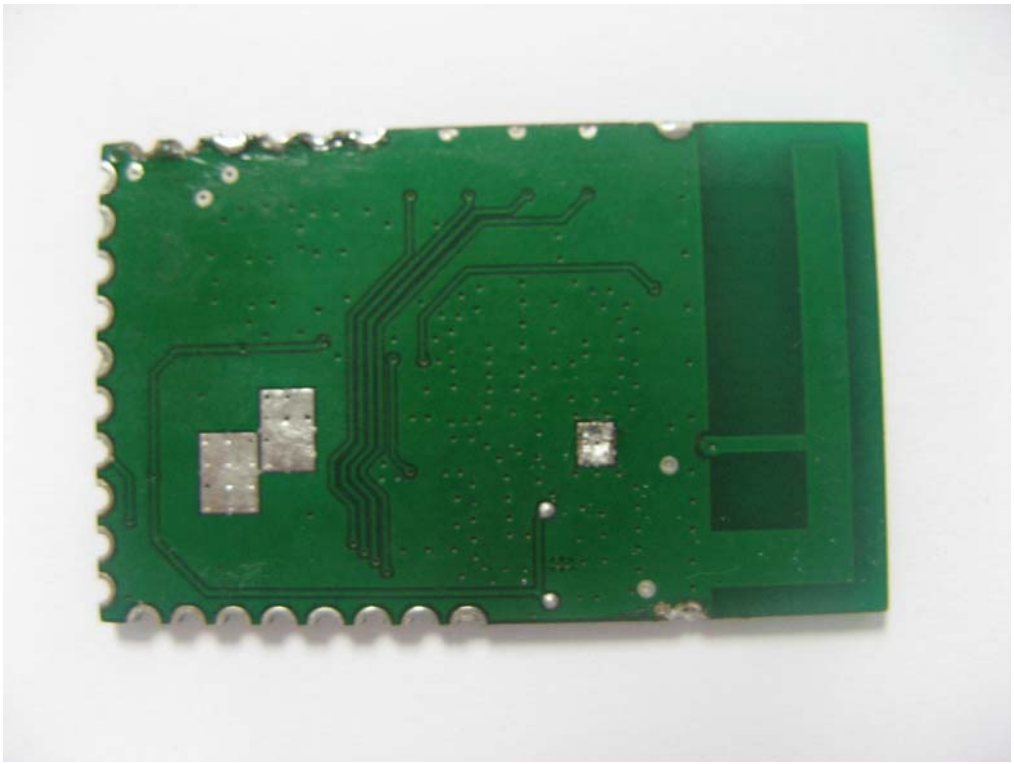
APPENDIX 2

PHOTOGRAPHS OF EUT

TOP VIEW OF EUT



BOTTOM VIEW OF EUT



SAMPLE WITH SHIELDING

----END OF REPORT----