# FCC TEST REPORT for NEO-TELECOM CORPORATION

#### **ECOXBT**

Model No.: GDI-EGBT500, GDI-EGBT501, GDI-EGBT502,

GDI-EGBT503, GDI-EGBT504, GDI-EGBT505, GDI-EGBT506, GDI-EGBT507, GDI-EGBT508,

GDI-EGBT509, GDI-EGBT510

Prepared for : NEO-TELECOM CORPORATION

Address : 7/F, 674-24, Anyang Dong, Manan Gu, Anyang City, Kyunggi

Do South Korea

Prepared By : Anbotek Compliance Laboratory Limited

Address : 1/F, 1 /Building, SEC Industrial Park, No. 4 Qianhai Road,

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Report Number : 201209848F

Date of Test : Sept. 28~Nov. 14, 2012

Date of Report : Nov. 01, 2012

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APPENDIX I (External Photos) (2 Pages) APPENDIX II (Internal Photos) (4 Pages)

#### TEST REPORT

: NEO-TELECOM CORPORATION **Applicant** Manufacturer : NEO-TELECOM CORPORATION

**EUT** : ECOXBT

: GDI-EGBT500, GDI-EGBT501, GDI-EGBT502, Model No.

> GDI-EGBT503, GDI-EGBT504, GDI-EGBT505, GDI-EGBT506, GDI-EGBT507, GDI-EGBT508,

GDI-EGBT509, GDI-EGBT510

: N/A Serial No

: DC 5V VIA ADAPTER Rating

Trade Mark : Ecoxgear

Measurement Procedure Used:

FCC Part15 Subpart C, Paragraph 15.207, 15.249 & 15.209

The device described above is tested by Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Anbotek Compliance Laboratory Limited

Date of Test:	Sept. 28~Nov. 14, 2012
Prepared by:	Zock reng
	(Tested Engineer / Rock Zeng )
	Andy chen
Reviewer:	
	(Project Manager / Andy Chen )
	Tom. Chen
Approved & Authorized Signer:	
	(Manager / Tom Chen)

## 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

EUT : ECOXBT

Model Number : GDI-EGBT500, GDI-EGBT501, GDI-EGBT502, GDI-EGBT503,

GDI-EGBT504, GDI-EGBT505, GDI-EGBT506, GDI-EGBT507,

GDI-EGBT508, GDI-EGBT509, GDI-EGBT510

(Note: All samples are the same except the model number & shape of appliances, so we prepare "GDI-EGBT500" for EMC test only.)

Test Power Supply: DC 5V Via Adapter

Parameter of Model: G

Model: GA050010 Input: 100-240Vac 50/60Hz, 0.40A

adapter Output: 5V, 1.0A

Frequency: 2402~2480MHz

Antenna : Printed Antenna:0dBi

Specification

Applicant : NEO-TELECOM CORPORATION Address : 7/F, 674-24, Anyang Dong, Manan Gu,

Anyang City, Kyunggi Do South Korea

Manufacturer : NEO-TELECOM CORPORATION

Address : 7/F, 674-24, Anyang Dong, Manan Gu,

Anyang City, Kyunggi Do South Korea

Date of receiver : Sept. 28, 2012

Date of Test : Sept. 28~Nov. 14, 2012

## 1.2. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### **CNAS - LAB Code: L3503**

Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

#### FCC-Registration No.: 752021

Anbotek Compliance Laboratory Limited, EMC Laboratory has been registed and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 752021, August 20, 2010.

#### IC-Registration No.: 8058A-1

Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A-1, August 30, 2010.

#### **Test Location**

All Emissions tests were performed at

Anbotek Compliance Laboratory Limited. at 1/F, 1 /Building, SEC Industrial Park, No. 4 Qianhai Road, Nanshan District, Shenzhen, 518054, China

#### 1.3. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.3dB

Conduction Uncertainty : Uc = 3.4dB

## 2. Test Procedure

**GENERAL**: This report shall NOT be reproduced except in full without the written approval of Anbotek Compliance Laboratory Limited. The EUT was transmitting a test signal during the testing.

**RADIATION INTERFERENCE**: The test procedure used was ANSI STANDARD C63.4-2009 using a spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz and the video bandwidth was 300KHz up to 1.0GHz and 1.0MHz with a video BW of 3.0MHz above 1.0GHz. The ambient temperature of the EUT was 74.3oF with a humidity of 69%.

**FORMULA OF CONVERSION FACTORS**: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

#### Example:

**ANSI STANDARD C63.4-2009 10.1.7 MEASUREMENT PROCEDURES**: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

## 3. Conducted Limits

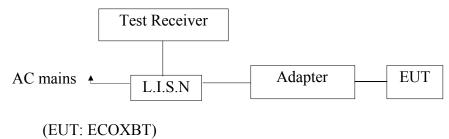
**Test Equipment** 

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Nov. 12, 2012	1 Year
2.	LISN	SchwarzBeck	NSLK 8126	8126377	May 19, 2012	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 19, 2012	1 Year
4.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A

Conduction Uncertainty : Uc = 3.4dB

## 3.1. Block Diagram of Test Setup

#### 3.1.1. Block diagram of connection between the EUT and simulators



## 3.2. Power Line Conducted Emission Measurement Limits (15.207)

Frequency	Limits	$dB(\mu V)$
MHz	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. \*Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

## 3.3. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

EUT	:	ECOXBT
Model Number	:	GDI-EGBT500
Applicant	:	NEO-TELECOM CORPORATION

## 3.4. Operating Condition of EUT

- 3.4.1. Setup the EUT and simulator as shown as Section 3.1.
- 3.4.2. Turn on the power of all equipment.
- 3.4.3. Let the EUT work in test mode (Charging) and measure it.

#### 3.5. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.4-2003 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

The test results are reported on Section 3.6.

Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
5.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Nov. 12, 2012	1 Year
6.	LISN	SchwarzBeck	NSLK 8126	8126377	May 19, 2012	1 Year
7.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 19, 2012	1 Year
8.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A

Conduction Uncertainty

Uc = 3.4dB

## 3.6. Power Line Conducted Emission Measurement Results **PASS.**

The frequency range from 150KHz to 30 MHz is investigated.

Please refer the following pages.

#### CONDUCTED EMISSION TEST DATA

EUT: ECOXBT M/N: GDI-EGBT500

Operating Condition: Charging

Test Site: 1# Shielded Room

Operator: Andy Chen

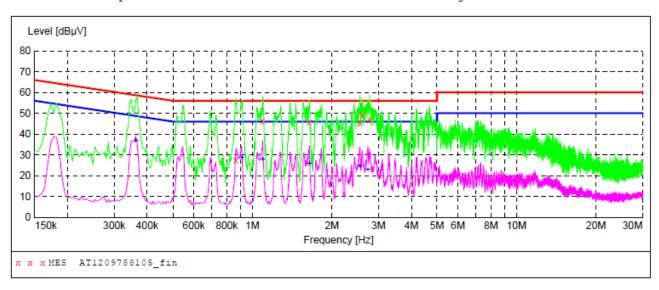
Test Specification: DC 5V Via Adapter

Comment: Live Line

Tem:25℃ Hum:50%

#### SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



#### MEASUREMENT RESULT: "AT1209788105 fin"

9/29/2012 11	:22AM						
Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
MHz	dΒμV	dB	dΒμV	dB			
0.865500	27.60	20.1	56	28.4	QP	L1	GND
1.094500	46.30	20.2	56	9.7	QP	L1	GND
1.643500	45.80	20.3	56	10.2	QP	L1	GND
2.557000	45.60	20.4	56	10.4	QP	L1	GND
2.606500	49.10	20.4	56	6.9	QP	L1	GND
2.777500	46.90	20.4	56	9.1	QP	L1	GND

#### MEASUREMENT RESULT: "AT1209788105\_fin2"

9/29/2012 11 Frequency MHz		Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.361500	37.00	20.1	49	11.7	AV	L1	GND
0.910500	28.50	20.1	46	17.5	AV	L1	GND
1.094500	27.80	20.2	46	18.2	AV	L1	GND
1.643500	25.60	20.3	46	20.4	AV	L1	GND
2.552500	24.40	20.4	46	21.6	AV	L1	GND
2.737000	22.90	20.4	46	23.1	AV	L1	GND

#### CONDUCTED EMISSION TEST DATA

EUT: ECOXBT M/N: GDI-EGBT500

Operating Condition: Charging

Test Site: 1# Shielded Room

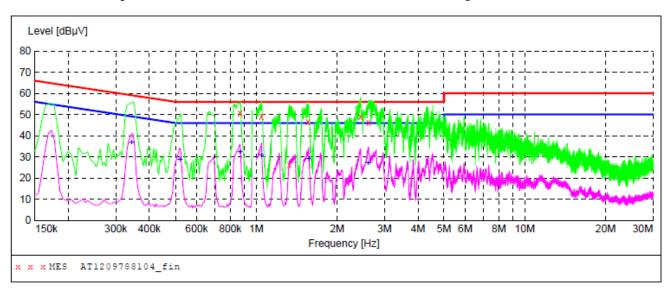
Operator: Andy Chen

Test Specification: DC 5V Via Adapter

Comment: **Neutral Line** 

Tem:25°C Hum:50%

SCAN TABLE: "Voltage(150K~30M)FIN"
Short Description: 150K-30M Disturbance Voltages



#### MEASUREMENT RESULT: "AT1209788104 fin"

9/	29/2012 11:	19AM						
	Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
	0.870000	50.90	20.1	56	5.1	QP	N	GND
	1.045000	49.20	20.2	56	6.8	QP	N	GND
	1.328500	26.30	20.2	56	29.7	QP	N	GND
	1.558000	46.80	20.3	56	9.2	QP	N	GND
	2.444500	49.10	20.3	56	6.9	QP	N	GND
	2.620000	46.30	20.4	56	9.7	QP	N	GND

#### MEASUREMENT RESULT: "AT1209788104 fin2"

9/29/2012 Frequen M			Limit dBµV	Margin dB	Detector	Line	PE
0.3435	00 36.80	20.1	49	12.3	AV	N	GND
0.5190	00 28.80	20.1	46	17.2	AV	N	GND
0.8700	00 32.30	20.1	46	13.7	AV	N	GND
1.0450	00 30.70	20.2	46	15.3	AV	N	GND
1.5670	00 29.00	20.3	46	17.0	AV	N	GND
2.6110	00 27.20	20.4	46	18.8	AV	N	GND

#### 4. Radiation Interference

#### 4.1. Requirements (15.249, 15.209):

FIELD STRENGTH FIELD STRENGTH S15.209

of Fundamental: of Harmonics 30 - 88 MHz 40 dBuV/m @3M

902-928 MHZ 88 - 216 MHz 43.5 2.4-2.4835 GHz 216 - 960 MHz 46

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation.

#### 4.2 Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

All readings from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. All reading are above 1GHz, peak & average values with a resolution bandwidth of 1MHz. The EUT is tested in 9\*6\*6 Chamber.

The test results are listed in Section 4.3.

Test Equipment

	est Equipment					
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 12, 2011	1 Year
2.	Trilog Broadband	Schwarzbeck	VULB9163	VULB	May 17, 2012	1 Year
	Antenna			9163-289	Way 17, 2012	
3.	Pre-amplifier	Compliance	PAP-0203	22008	May 19, 2012	1 Year
		Direction			Way 19, 2012	1 1 6 6 1
4.	EMI Test					
	Software	SHURPLE	N/A	N/A	N/A	N/A
	EZ-EMC					

Radiation Uncertainty : Ur = 4.3 dB

#### 4.3 Test Results

PASS.

Please refer the following pages.

## Data:

Horizontal CH Low(2402MHz)

Frequency MHz	Cable Loss dB	Ant Factor dB/m	Preamp Factor dB	Read Level dBµV	Level dBμV/m	Limit dBμV/m	Over Limit dB	Remark
239.98	1.58	13.50	38.90	57.45	33.65	46.00	-12.35	QP
2402.00	2.17	31.21	35.30	98.56	102.64	114.0	-11.36	Peak
2402.00	2.17	31.21	35.30	95.71	89.79	94.0	-4.21	AV
4804.10	2.56	34.01	34.71	41.15	43.01	74.0	-30.99	Peak
4804.10	2.56	34.01	34.71	38.26	40.12	54.0	-13.88	AV
7207.97	2.98	36.16	35.15	38.33	42.32	74.0	-31.68	Peak
7207.97	2.98	36.16	35.15	35.50	39.49	54.0	-14.51	AV
9608.00								
12010.00								
14412.00								
16814.00								
19216.00								
21618.00								
24020.00								

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$(\Box H)$	งเาตต	let /44	(MHz)

CII WIIUU	110(24411)	/	_				_	
Frequency	Cable	Ant	Preamp	Read	Level	Limit	Over	Remark
1 2	Loss	Factor	Factor	Level			Limit	1101114111
MHz	dB	dB/m	dB	$dB\mu V$	$dB\mu V/m$	$dB\mu V/m$	dB	
312.18	1.60	13.52	38.82	56.40	32.70	46.00	-13.30	QP
2441.00	2.19	31.22	34.60	85.32	100.13	114.0	-13.87	Peak
2441.00	2.19	31.22	34.60	83.55	88.36	94.0	-5.64	AV
4882.08	2.57	35.00	34.58	39.61	42.62	74.0	-31.38	Peak
4882.08	2.57	35.00	34.58	37.47	40.46	54.0	-13.54	AV
7323.05	3.00	36.17	35.14	38.80	42.83	74.0	-31.17	Peak
7323.05	3.00	36.17	35.14	36.08	40.11	54.0	-13.89	AV
9764.00								
12205.00								
14646.00								
17087.00								
19528.00								
21969.00								
24410.00								

CH High(2480MHz)

Frequency	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBμV	$dB\mu V/m$	$dB\mu V/m$	dB	
312.18	1.60	13.52	38.82	53.20	29.50	46.00	-16.50	QP
2480.00	2.20	31.65	36.00	92.78	99.63	114.0	-14.37	Peak
2480.00	2.20	31.65	36.00	89.51	87.36	94.0	-6.64	AV
4960.05	2.58	35.06	34.79	41.76	44.61	74.0	-29.39	Peak
4960.05	2.58	35.06	34.79	39.28	42.13	54.0	-11.87	AV
7439.97	3.02	36.19	34.90	39.53	43.84	74.0	-30.16	Peak
7439.97	3.02	36.20	35.20	37.40	41.42	54.0	-12.58	AV
9920.00								
12400.00								
14880.00								
17360.00								
19840.00								
22320.00								
24800.00								

Vertical CH Low(2402MHz)

CH Low(2402MHz)								
Frequency	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	$dB\mu V$	$dB\mu V/m$	$dB\mu V/m$	dB	
30.42	1.43	12.13	38.45	53.52	28.63	40.00	-11.37	QP
2402.00	2.17	31.21	35.30	84.23	101.31	114.0	-12.69	Peak
2402.00	2.17	31.21	35.30	81.84	89.92	94.0	-4.08	AV
4804.10	2.56	34.01	34.71	41.05	42.91	74.0	-31.09	Peak
4804.10	2.56	34.01	34.71	38.61	40.47	54.0	-13.53	AV
7207.93	2.98	36.16	35.15	37.46	41.45	74.0	-32.55	Peak
7207.93	2.98	36.16	35.15	34.50	38.49	54.0	-15.51	AV
9608.00								
12010.00								
14412.00								
16814.00								
19216.00								
21618.00								
24020.00								

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CH Midd	lle(2441M	IHz)						
Frequency	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dB <sub>µ</sub> V	dBμV/m	dBμV/m	dB	
	-	<b>4</b> ,,			pr	Pr	<del></del>	
143.82	1.50	13.40	38.89	53.90	29.91	43.50	-13.59	QP
2441.01	2.19	31.22	34.60	82.34	100.15	114.0	-13.85	Peak
2441.01	2.19	31.22	34.60	81.01	89.82	94.0	-4.18	AV
4882.11	2.57	35.00	34.58	40.15	43.14	74.0	-30.86	Peak
4882.11	2.57	35.00	34.58	37.86	40.85	54.0	-13.15	AV
7323.05	3.00	36.17	35.14	38.70	42.73	74.0	-31.27	Peak
7323.05	3.00	36.17	35.14	36.00	40.03	54.0	-13.97	AV
9764.00								
12205.00								
14646.00								
17087.00								
19528.00								
21969.00								
24410.00								

CH High(24 Frequency MHz	480MHz) Cable Loss dB	Ant Factor dB/m	Preamp Factor dB	Read Level dBµV	Level dBµV/m	Limit dBµV/m	Over Limit dB	Remark
408.80	1.62	13.54	38.45	51.18	27.83	46.00	-18.17	QP
2480.00	2.20	31.65	36.00	83.52	102.37	114.0	-11.63	Peak
2480.00	2.20	31.65	36.00	82.03	89.88	94.0	-4.12	AV
4960.10	2.58	35.06	34.79	40.08	42.93	74.0	-31.07	Peak
4960.10	2.58	35.06	34.79	38.10	40.95	54.0	-13.05	AV
7439.97	3.02	36.19	34.90	38.58	42.89	74.0	-31.11	Peak
7439.97	3.02	36.20	35.20	36.34	40.36	54.0	-13.64	AV
9920.00								
12400.00								
14880.00								
17360.00								
19840.00								
22320.00								
24800.00								

NOTE: " --- " 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. Occupied Bandwidth

## 5.1. Requirements (15.249):

The field strength of any emissions appearing outside the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.249.

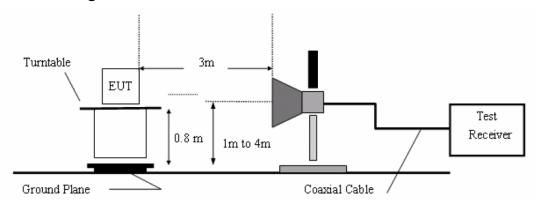
#### 5.2. Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

**Test Equipment** 

	cst Equipment					
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Nov. 12, 2012	1 Year
2.	Preamplifier	Instruments corporation	EMC01183 0	980100	July 03, 2012	1 Year
3.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 07, 2012	1 Year
4.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

#### 5.3. Test Configuration:

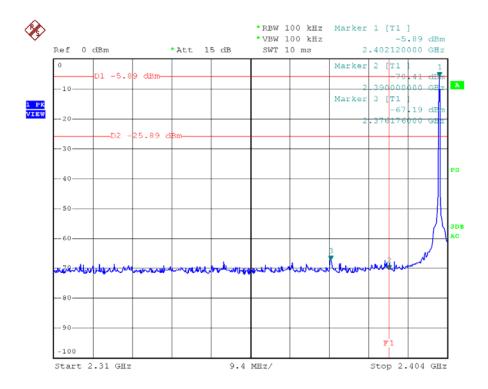


#### 5.4. Test Results

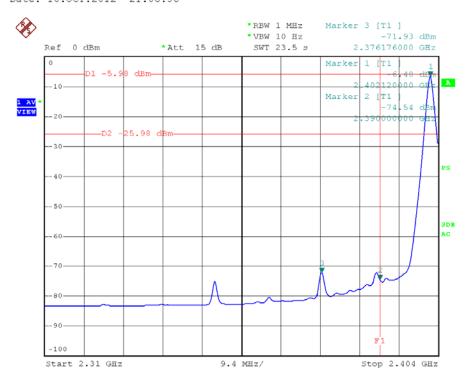
Pass.

Please refer the following plot.

(Note: Marker 3 means the highest value in 2.39GHz~2.4GHz or 2.4835~2.5GHz)

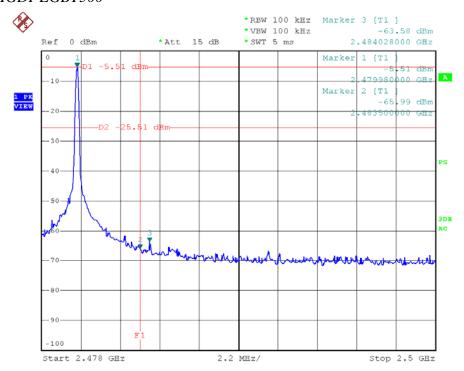




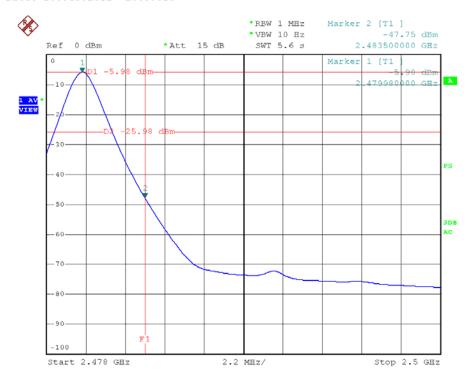


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Date: 10.0CT.2012 21:07:48



H Date: 10.0CT.2012 20:55:19



Η

Date: 10.0CT.2012 21:06:08