


CFR 47 FCC Part 15.247

TEST REPORT

Product : **Local Control Node Module**

Trade Name : 

Model Number : LCNM-001

Prepared for

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Remark :

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The test results in the report only to the tested sample.

Statement of Compliance

Applicant: GRT Technology Co., Ltd.

Manufacturer: GRT Technology Co., Ltd.

Product: Local Control Node Module

Model No.: LCNM-001

Tested Power Supply: 120Vac, 60Hz

Date of Final Test: Mar. 02, 2011

Configuration of Measurements and Standards Used :

FCC Rules and Regulations Part 15 Subpart C

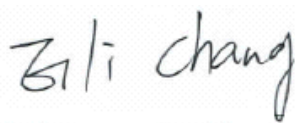
I HEREBY CERTIFY THAT: The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Note: 1. The result of the testing report relate only to the item tested.

2. The testing report shall not be reproduced expect in full, without the written approval of IETC

Report Issued : 2011/03/02

Project Engineer :



Elli Chang

Approved :



Jerry Liu

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1 General Information

1.1 Description of Equipment Under Test

Product	: Local Control Node Module
Model Number	: LCNM-001
Applicant	: GRT Technology Co., Ltd. 18F.-1, NO. 150, Jian 1st Rd., Jhonghe District, New Taipei City 235, Taiwan (R.O. C.)
Manufacturer	: GRT Technology Co., Ltd. 18F.-1, NO. 150, Jian 1st Rd., Jhonghe District, New Taipei City 235, Taiwan (R.O. C.)
Power Supply	: Manufacture: Powertron Electronics Corp. Model No.: PA1010-120DUB Input: 100~240Vac, 50-60Hz, 0.4A Output: 12Vdc, 1.0A, 12W max. Power Cord: Non-shielded, Un-detachable, 1.9m, without core
Operating Frequency	: 2405 ~ 2475MHz
Channel Number	: 15 Channels
Freq. of each channel	: 2405+5kMHz, k=0 ~14
Type of Modulation	: OQPSK
Antenna description	: Antenna type : Dipole Antenna Gain : 2.0dBi Connector type : SMA PLUG REVERSE Antenna Part No. : U0110A6010
Sample Receive date	: Feb. 14, 2011
Date of Test	: Feb. 14~Mar. 02, 2011

1.2 Technical Specifications

- ISM band 2.405~2.475 GHz operation
- IEEE 802.15.4-2006 specification compliance
- -95 dBm sensitivity and 3 dBm max. input level
- Differential RF input/output and integrated TX/RX switch
- Integrated low phase noise VCO, frequency synthesizer and PLL loop filter
- Integrated 32 MHz and 32.768 KHz oscillator drive.
- Integrated internal oscillator circuit
- 32 MHz reference clock output
- Digital VCO and filter calibration
- Integrated RSSI ADC and I/Q DACs
- Integrated DC-DC converter
- High receiver and RSSI dynamic range
- 1M/2M bps turbo mode supported
- Low current consumption, 16 mA in RX and 17.5 mA in TX mode

1.3 Test Facility

- Site Description** : ☑RF Test Room ☑Conduction 2 ☑OATS 2
- Name of Firm** : Interocean EMC Technology Corp.
- Company web** : <http://www.ietc.com.tw>
- Site 1, 2, 3 Location** : No. 5-2, Lin 1, Tin-Fu, Lin-Kou Dist., New Taipei City, Taiwan 244, R.O.C.
- Site Filing** :
- Federal Communication Commissions – USA
Registration No.: 96399 (OATS 1 & 2)
Registration No.: 518958 (OATS 3)
Designation No.: TW1020
 - Voluntary Control Council for Interference by Information Technology Equipment (VCCI) – Japan
Member No.: 1349
Registration No. (Conducted Room): C-1094
Registration No. (Conducted Room): T-1562
Registration No. (OATS 1): R-1040; G-274
Registration No. (OATS 2): R-1041
 - Industry Canada (IC)
OUR FILE: 46405-4437 Submission: 145171
Registration No. (OATS 1): Site# 4437A-1
Registration No. (OATS 2): Site# 4437A-2
Registration No. (OATS 3): Site# 4437A-3
- Site Accreditation** :
- Bureau of Standards and Metrology and Inspection (BSMI) – Taiwan, R.O.C.
Accreditation No.:
SL2-IN-E-0026 for CNS13438 / CISPR22
SL2-R1-E-0026 for CNS13439 / CISPR13
SL2-R2-E-0026 for CNS13439 / CISPR13
SL2-A1-E-0026 for CNS13783-1 / CISPR14-1
SL2-L1-E-0026 for CNS 14115 / CISPR 15
 - Taiwan Accreditation Foundation (TAF)
Accrditation No.: 1113
 - TÜV NORD
Certificate No: TNTW0801R-03



1.4 Test Equipment

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100836	2011/06/09
Spectrum Analyzer	R&S	FSP30	100002	2012/01/03
Spectrum Analyzer	R&S	FSP40	100478	2011/04/20
Pre-Amplifier	SCHAFFNER	CPA9231A	3349	2011/08/03
Pre-Amplifier	Agilent	8449B	3008A01434	2011/04/20
Pre-Amplifier	Agilent	83050A	3950A00225	2012/09/07
Pre-Amplifier	SCHAFFNER	CA30100	2	2011/10/28
Pre-Amplifier	Mini-Circuits	ZVA-213-ST	H627800732	2012/01/03
Biconical Antenna	Schwarzbeck	VHA 9103	2484	2011/10/08
Log Antenna	Schwarzbeck	UHALP 9108	A 0765	2011/10/08
Horn Antenna	Schwarzbeck	BBHA 9170	213	2012/07/19
Wide Bandwidth Sensor	Anritsu	MA2491A	728133	2011/11/13
Power Meter	Anritsu	ML2495A	736010	2011/11/13
Temp & Humidity chamber	GIAN FORCE	GTH-150-40-2P-U	MAA0305-012	2011/05/07
RF Cable	IETC	8DFB	CBL14	2011/07/14
Cable	HARBOUR	27478LL142	CBL22	2011/09/28
Cable	HARBOUR	27478LL142	CBL23	2011/09/28

Note: The above equipments are within the valid calibration period.

1.5 Summary of Measurement

Report Clause	Test Parameter	Reference Document CFR47 Part15	Results
2	RF Radiated spurious emission test	§15.205, 15.209	Pass
3	RF Conducted spurious emission	§15.247	Pass
4	Maximum Peak output power test	§15.247(b)	Pass
5	6dB Bandwidth	§15.247(a)(2)	Pass
6	Power spectral density	§15.247(e)	Pass
7	Emission on the Band Edge	§15.247(d)	Pass
8	AC Power Line Conducted Emission test	§15.247(b)	Pass

1.6 Justification

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of the frequency band were all arrive limit requirement, thus we evaluate the EUT pass the specified test.

2 RF Radiated spurious emission test

2.1 Limits

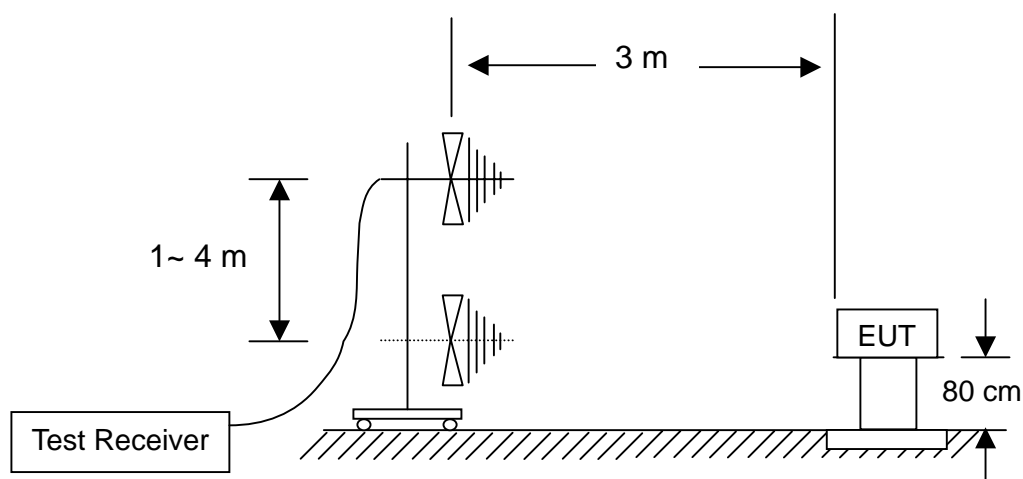
For intentional radiator, the radiated emission shall comply with §15.209(a).

For intentional radiators, according to §15.247 (a), operation under this provision is limited to frequency hopping and direct sequence spread spectrum, and the out band emission shall be comply with §15.247 (c)

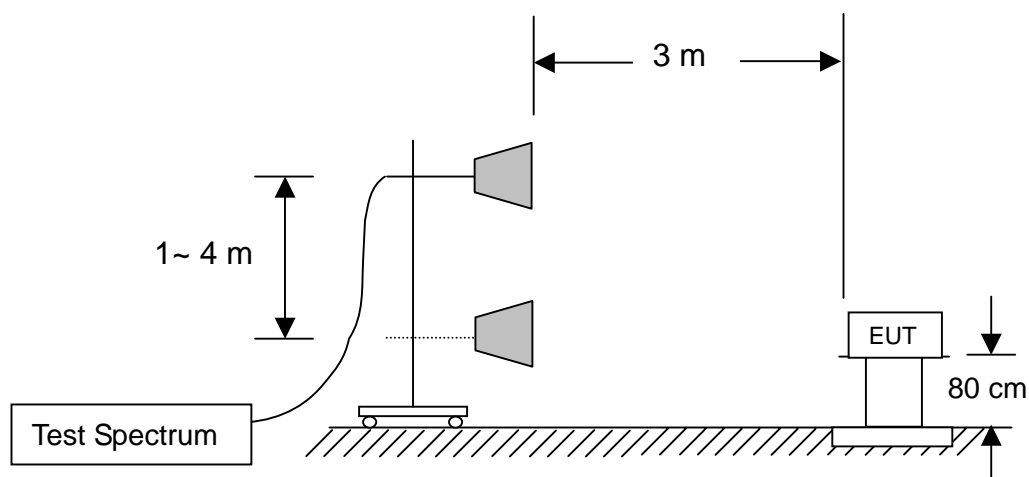
Frequency (MHz)	Field strength dB(μ V/m)	Measurement distance (meters)
1.705~30.0	29.5	30
30 ~ 88	40	3
88~216	43.5	3
216~960	46	3
Above 960	54	3

2.2 Configuration of Measurement

Measurement Frequency under 1GHz



Measurement Frequency above 1GHz



2.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Radiated emission measurements were performed from 30MHz to 25GHz. Spectrum Analyzer Resolution Bandwidth is 100kHz or greater for frequencies 30MHz to 1GHz, and set 1MHz – for frequencies above 1GHz.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meter and down to 1 meter.

2.4 Test Result

PASS.

The final test data is shown as following pages.

Radiated spurious emission

Test Environment

Ambient temperature : 16.2°C

Relative humidity : 60%

Radiated Emission below 1GHz

Worse Case: CH11

Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamplifier (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
133.560	H	46.32	33.10	15.26	28.48	43.50	-15.02	QP
169.860	H	45.89	33.40	16.88	29.37	43.50	-14.13	QP
208.630	H	43.76	33.30	19.05	29.51	43.50	-13.99	QP
246.600	H	46.70	33.40	19.83	33.13	46.00	-12.87	QP
325.000	H	46.63	33.50	17.11	30.24	46.00	-15.76	QP
435.350	H	46.58	34.20	20.21	32.59	46.00	-13.41	QP
68.960	V	54.36	33.30	7.04	28.10	40.00	-11.90	QP
126.300	V	49.85	33.06	15.06	31.85	43.50	-11.65	QP
168.250	V	49.23	33.38	17.80	33.65	43.50	-9.85	QP
301.360	V	48.95	33.60	16.87	32.22	46.00	-13.78	QP
368.340	V	47.11	33.68	18.36	31.79	46.00	-14.21	QP
435.240	V	45.03	34.20	19.95	30.78	46.00	-15.22	QP

Remark : Corrected Level = Reading + Correction Factor – Preamplifier

Correction Factor = Antenna Factor + Cable Loss

The present spurious only show those points are above noise level and the frequency range test from 30MHz to 1GHz.

Radiated spurious emission

Radiated Emission above 1GHz

CH11								
Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamplifier (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
4810.00	H	40.96	26.01	36.95	51.90	54	-2.10	PK
7215.00	H	36.05	25.70	42.83	53.18	54	-0.82	PK
9620.00	H	31.25	25.16	46.04	52.13	54	-1.87	PK
4810.00	V	46.53	26.01	36.95	57.47	74	-16.53	PK
4810.00	V	32.96	26.01	36.95	43.90	54	-10.10	AV
7215.00	V	38.26	25.70	42.83	55.39	74	-18.61	PK
7215.00	V	24.01	25.70	42.83	41.14	54	-12.86	AV
9620.00	V	32.85	25.16	46.04	53.73	54	-0.27	PK

CH18								
Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamplifier (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
4880.00	H	40.56	25.99	37.11	51.68	54	-2.32	PK
7320.00	H	35.85	25.71	43.09	53.23	54	-0.77	PK
9760.00	H	31.45	25.34	46.19	52.30	54	-1.70	PK
4880.00	V	44.32	25.99	37.11	55.44	74	-18.56	PK
4880.00	V	29.46	25.99	37.11	40.58	54	-13.42	AV
7320.00	V	36.53	25.71	43.09	53.91	54	-0.09	PK
9760.00	V	32.00	25.34	46.19	52.85	54	-1.15	PK

CH25								
Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Preamplifier (dB)	Correction Factor (dB/m)	Corrected Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Det. Mode
4950.00	H	39.66	25.97	37.27	50.96	54	-3.04	PK
7425.00	H	35.25	25.72	43.34	52.87	54	-1.13	PK
9900.00	H	31.21	25.52	46.35	52.04	54	-1.96	PK
4950.00	V	39.86	25.97	37.27	51.16	54	-2.84	PK
7425.00	V	35.75	25.72	43.34	53.37	54	-0.63	PK
9900.00	V	32.09	25.52	46.35	52.92	54	-1.08	PK

Remark : Corrected Level = Reading + Correction Factor – Preamp
Correction Factor = Antenna Factor + Cable Loss

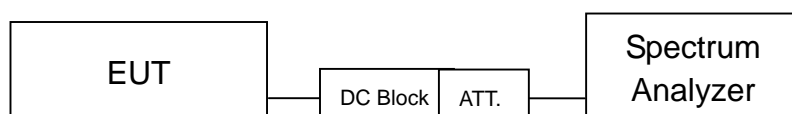
3 RF Conducted spurious emission

3.1 Limits

According to 15.247(d) requirement :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

3.2 Configuration of Measurement



3.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The measurements were performed from 30MHz to 40GHz RF antenna conducted per FCC 15.247 (c) was measured from the EUT antenna port using a 50ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 100 kHz.

Harmonics and spurious noise must be at least 20dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. The table below is the results from the highest emission for each channel within the authorized band. This table was used to determine the spurious limits for each channel.

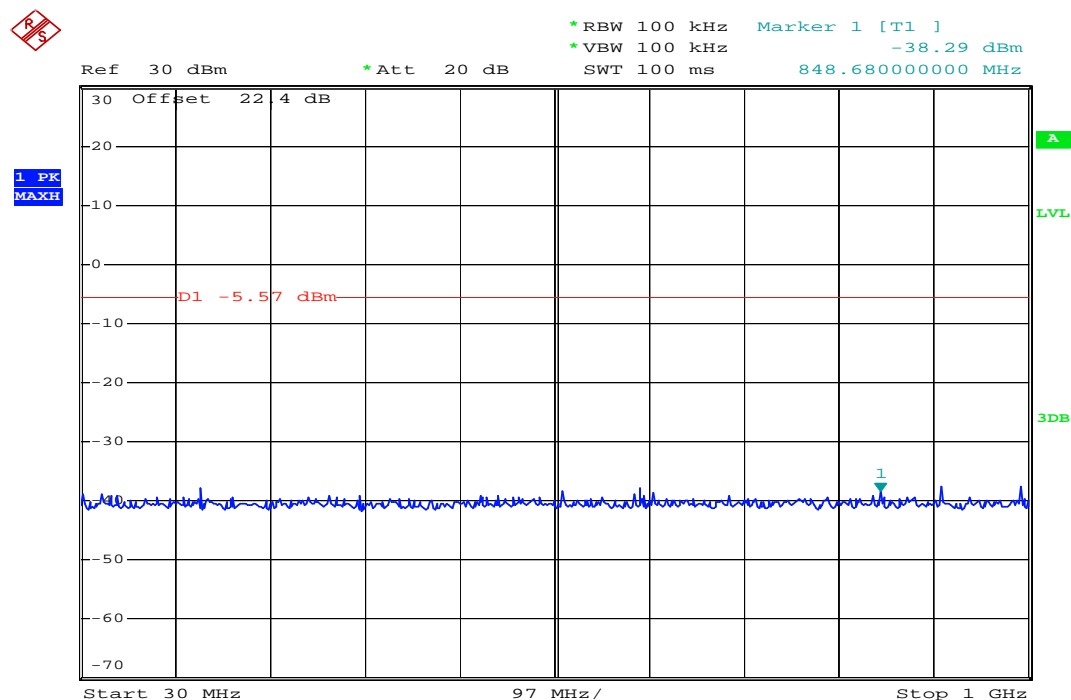
3.4 Test Result

PASS.

The final test data is shown as following pages.

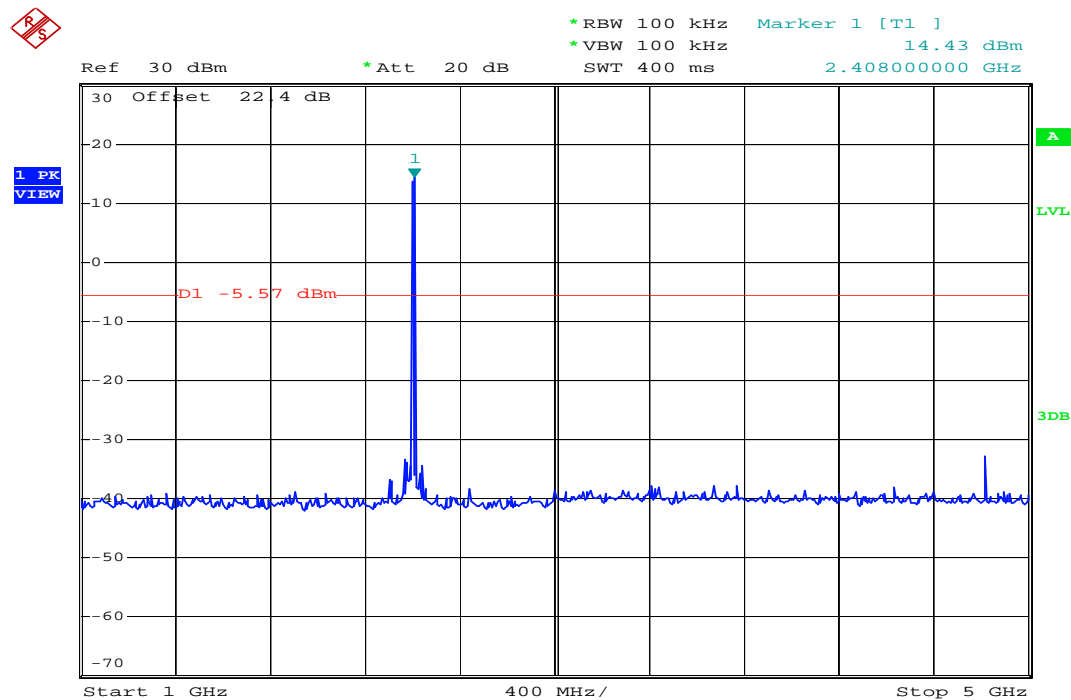
Conducted spurious emission

2405MHz (30MHz~1GHz)



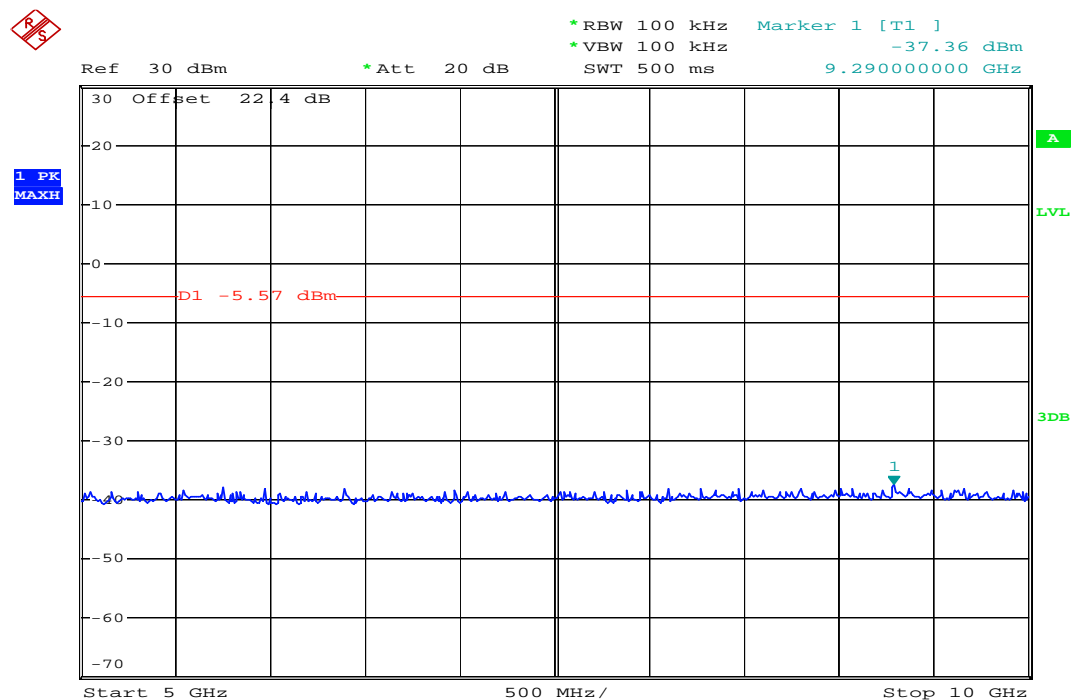
Date: 2.MAR.2011 10:11:48

2405MHz (1GHz~5GHz)



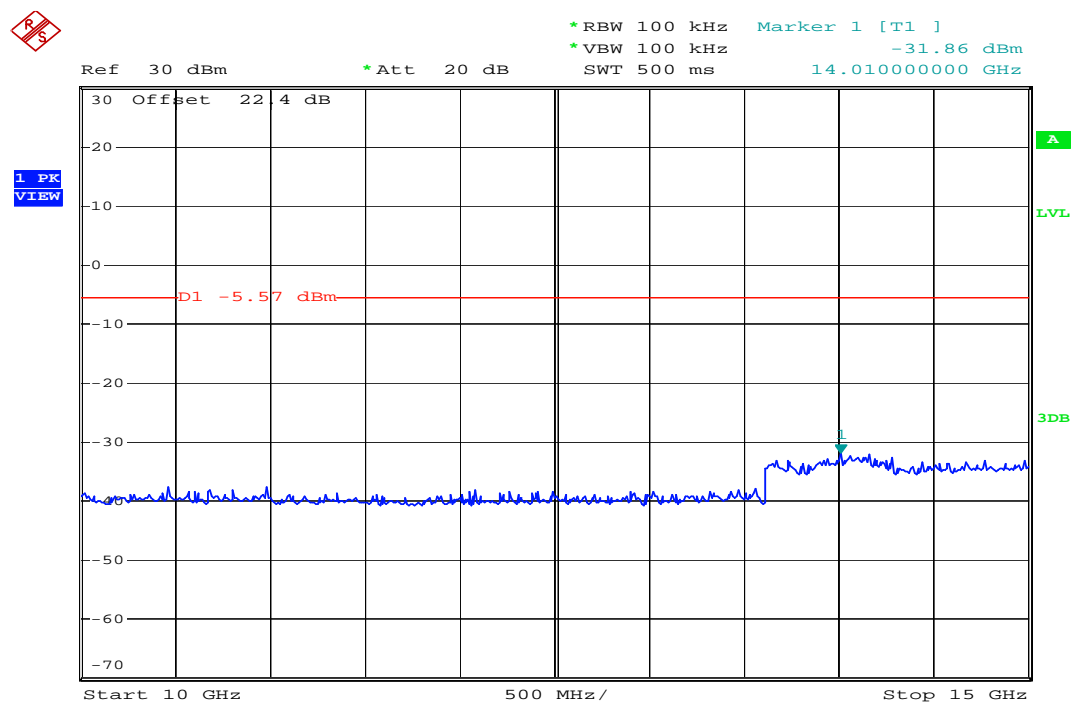
Date: 2.MAR.2011 10:09:56

2405MHz (5GHz~10GHz)



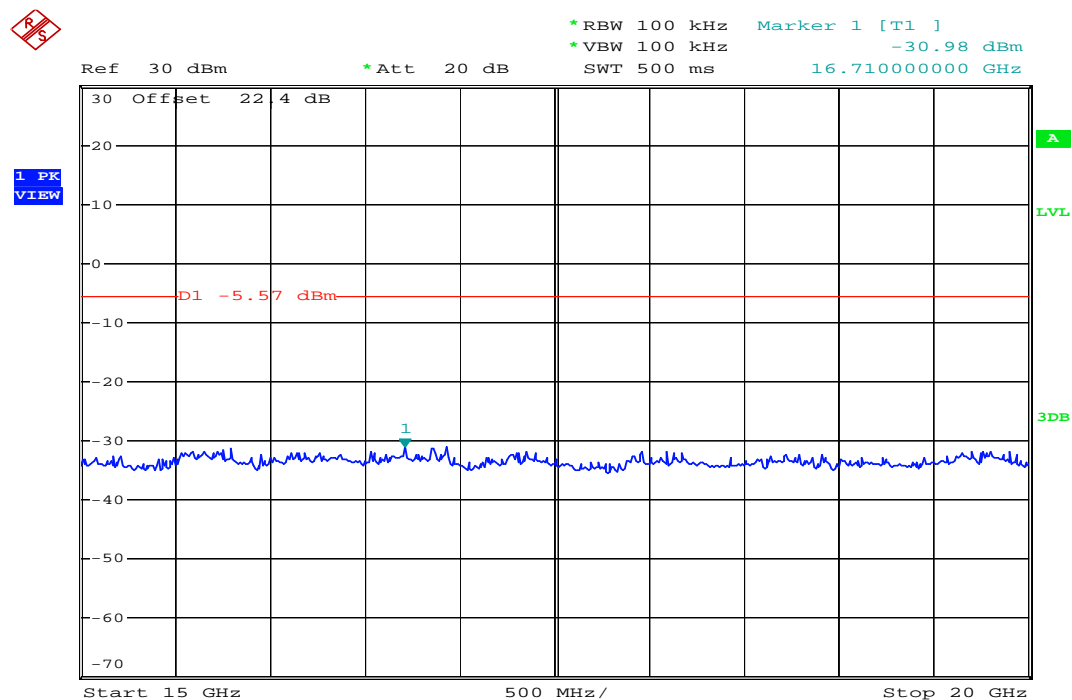
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2405MHz (10GHz~15GHz)



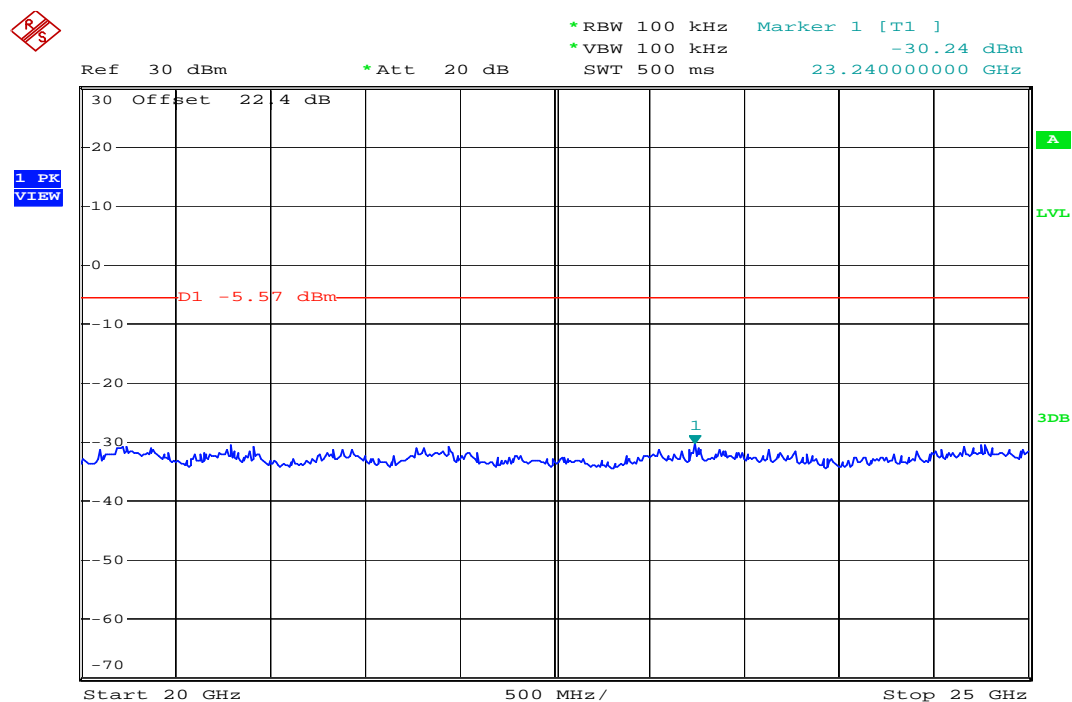
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2405MHz (15GHz~20GHz)



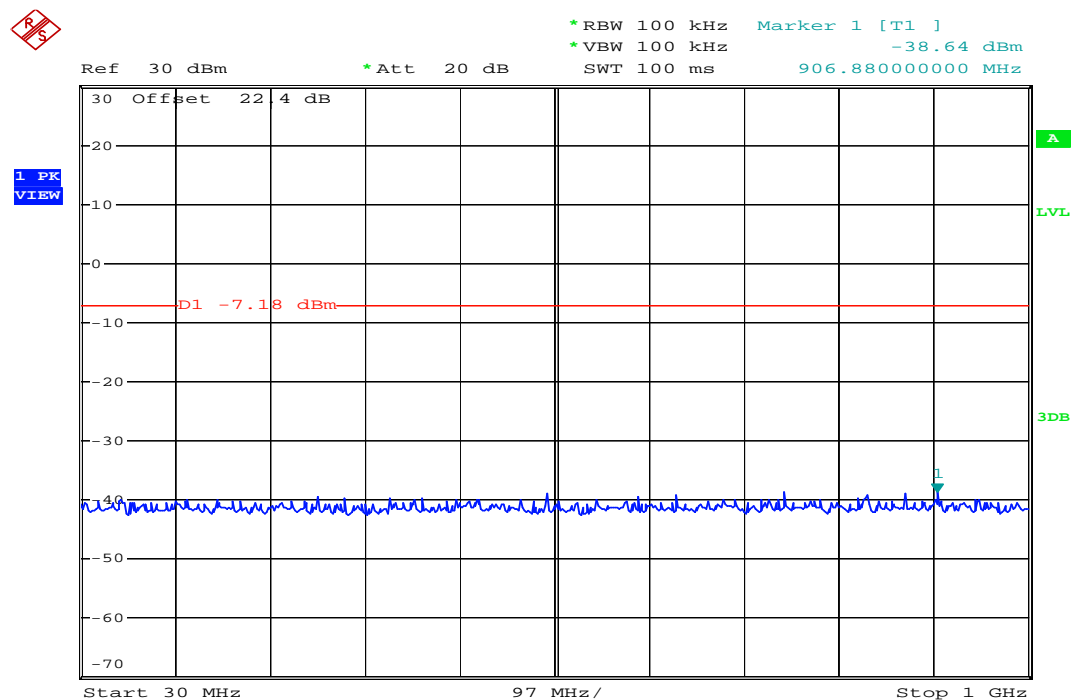
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2405MHz (20GHz~25GHz)



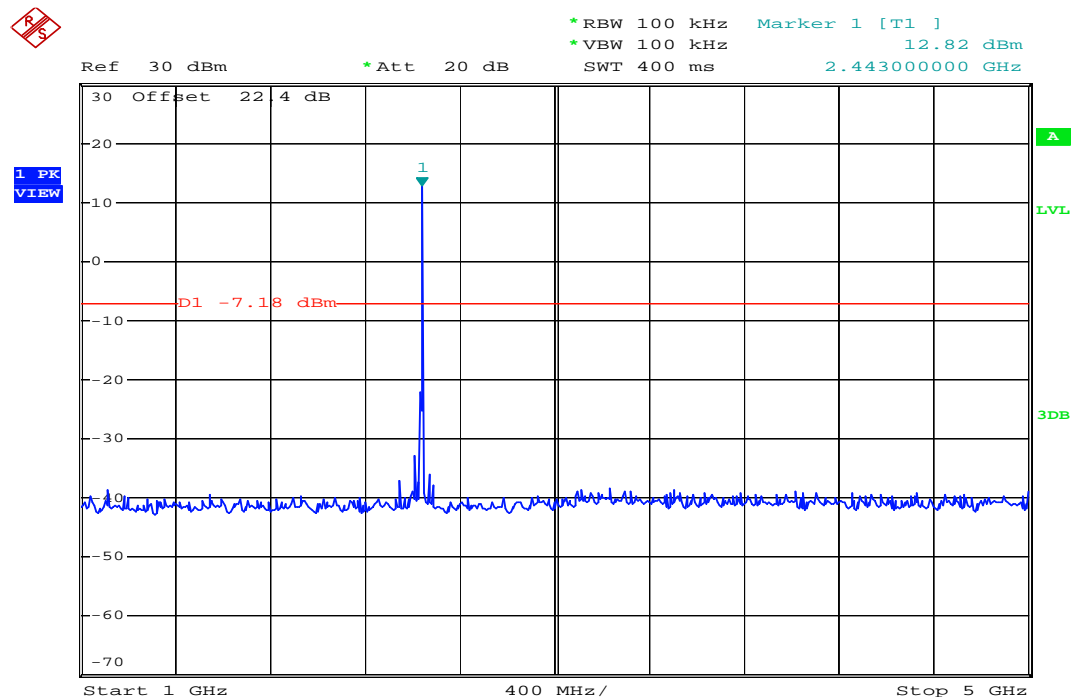
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2440MHz (30MHz~1GHz)



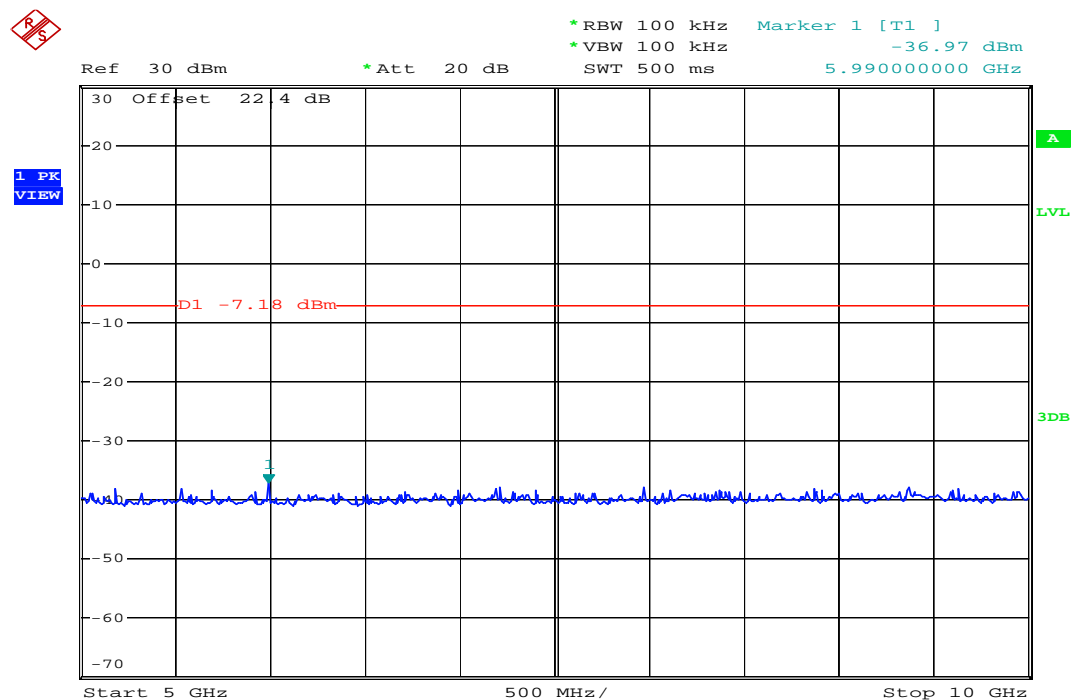
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2440MHz (1GHz~5GHz)



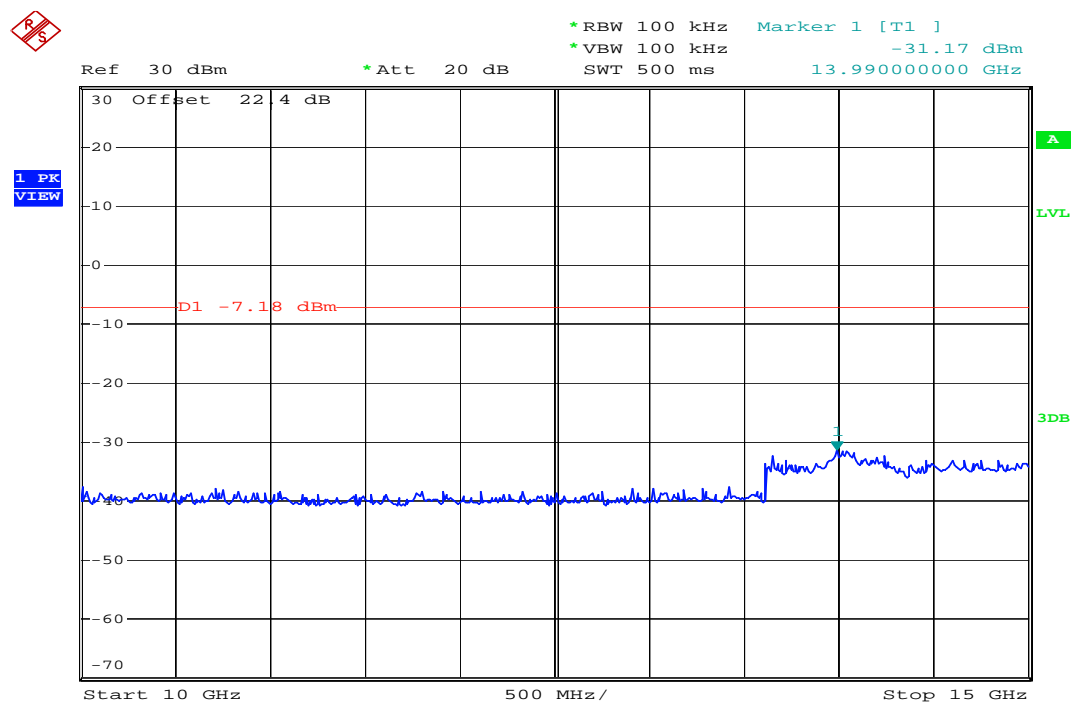
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2440MHz (5GHz~10GHz)



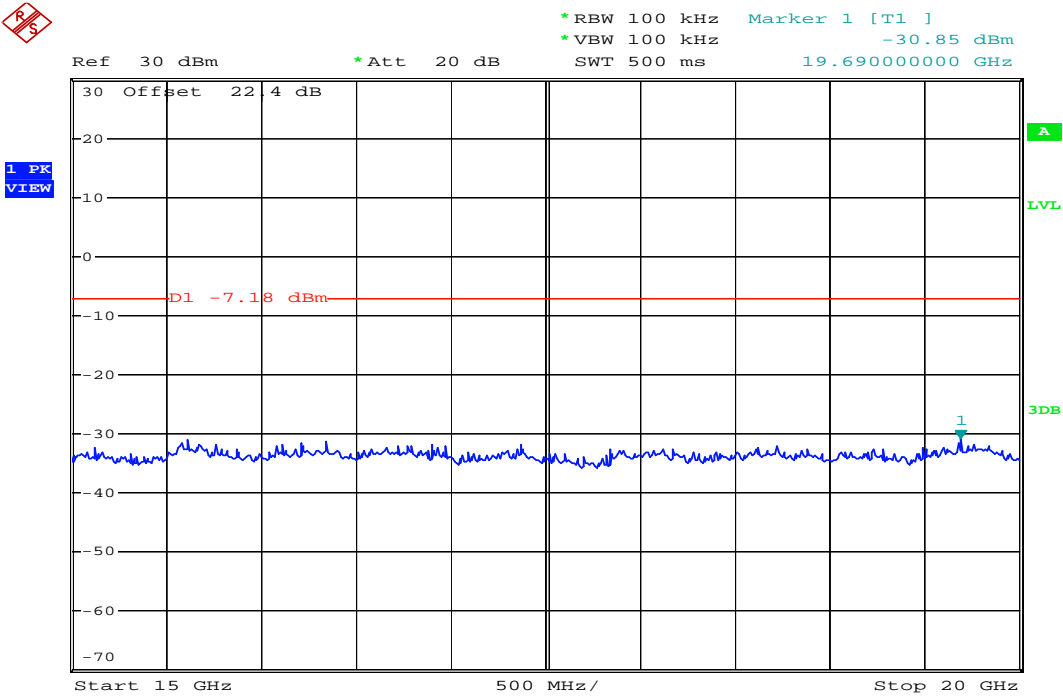
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2440MHz (10GHz~15GHz)



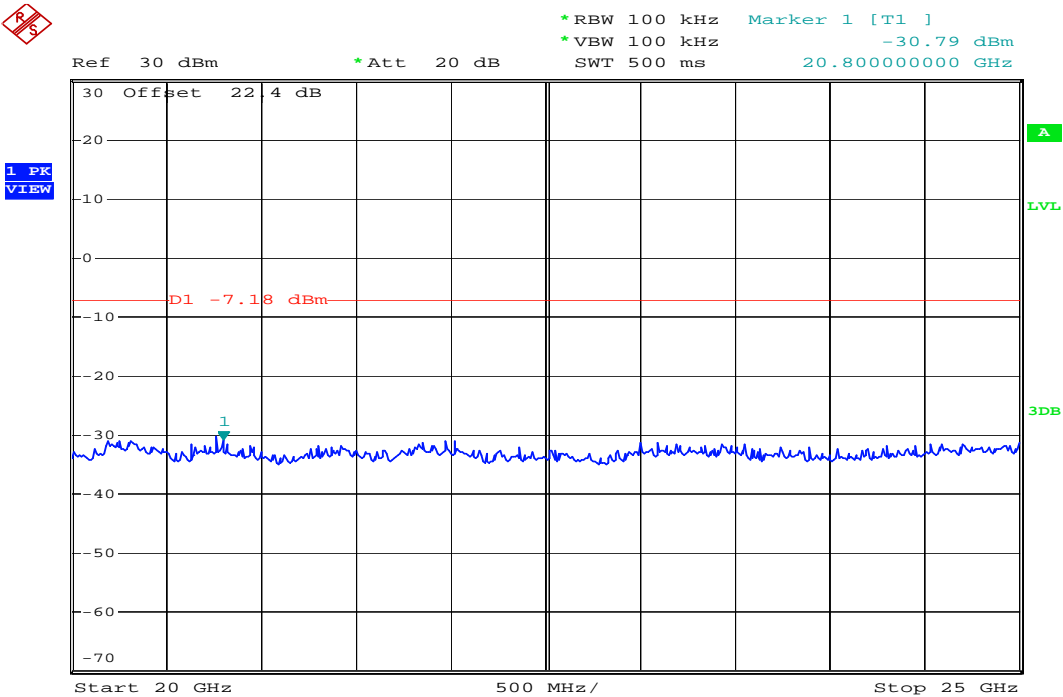
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2440MHz (15GHz~20GHz)



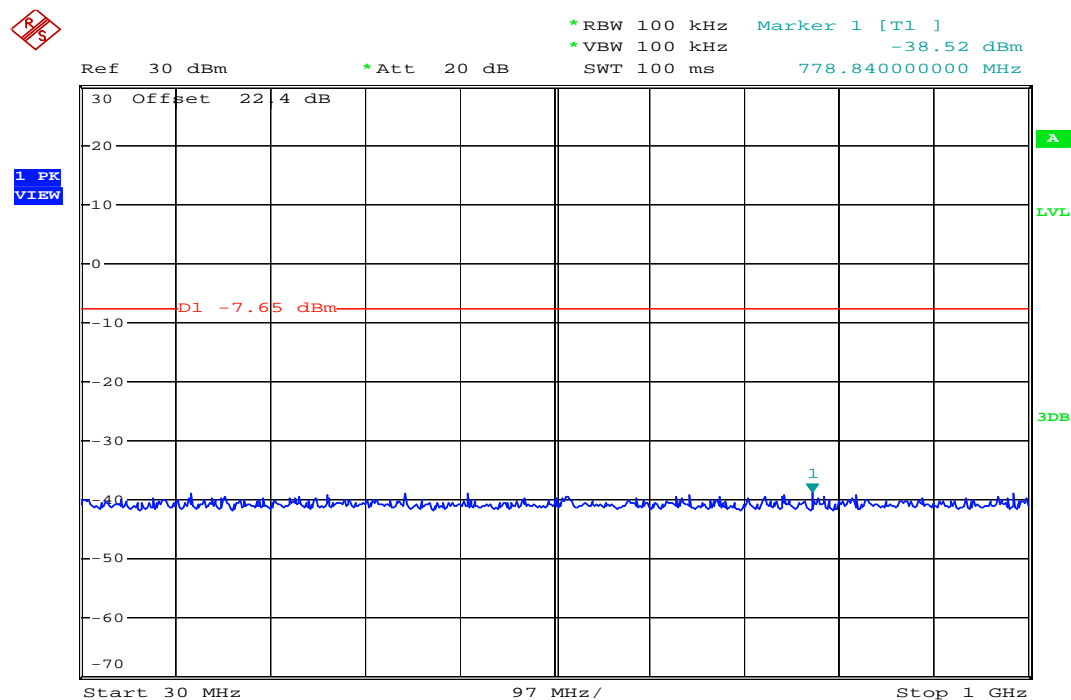
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2440MHz (20GHz~25GHz)



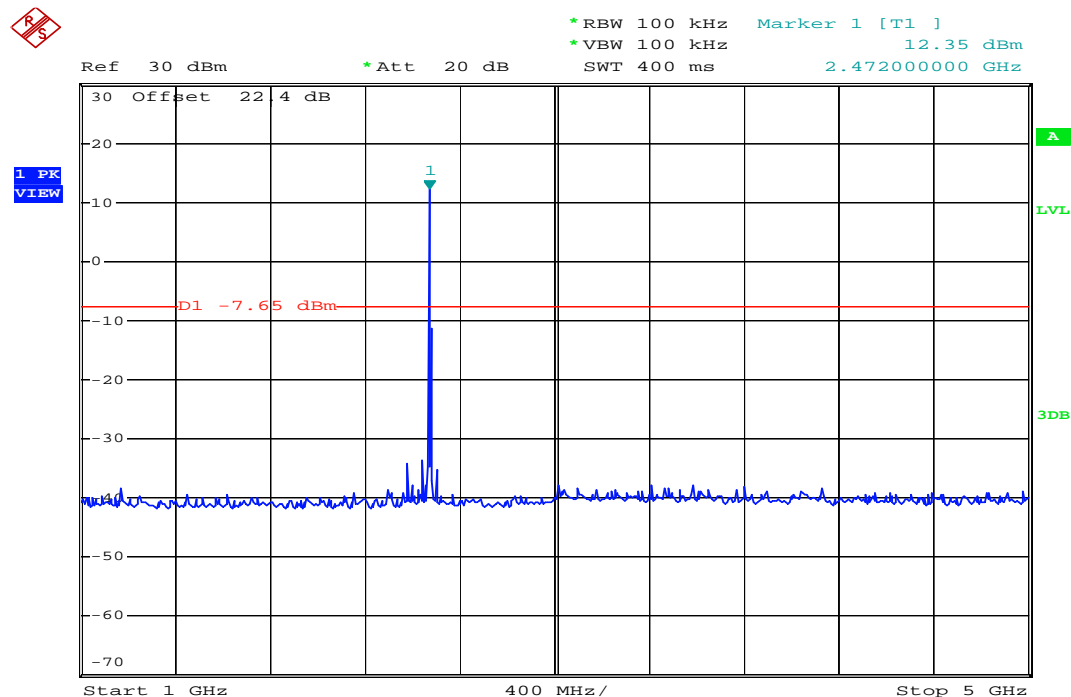
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2475MHz (30MHz~1GHz)



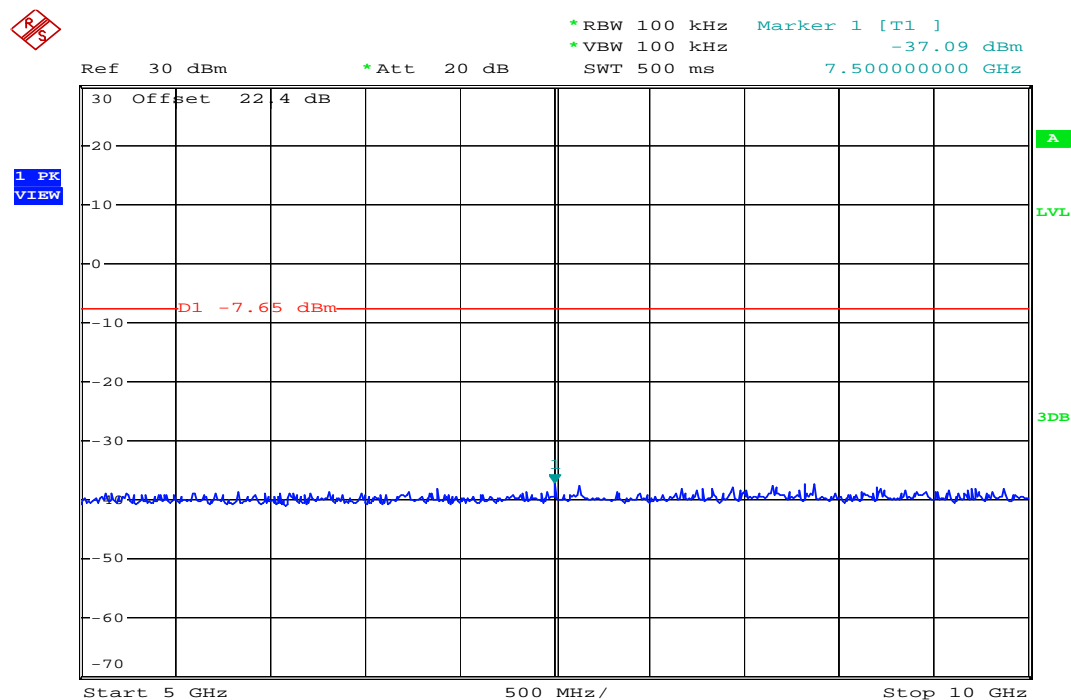
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2475MHz (1GHz~5GHz)



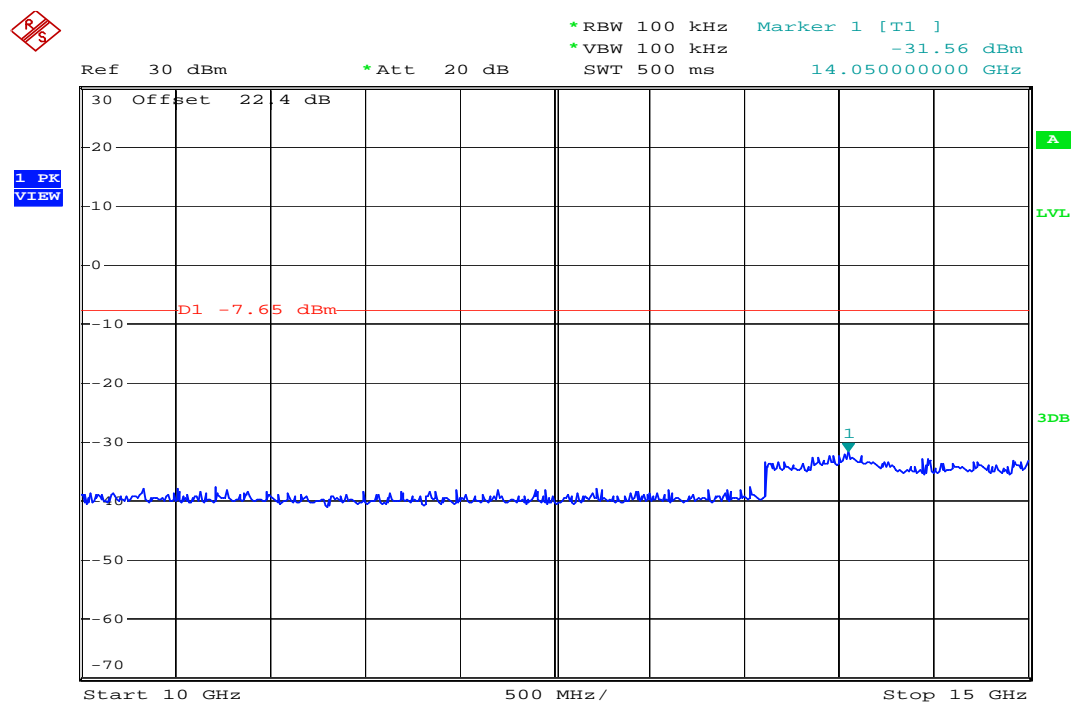
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2475MHz (5GHz~10GHz)



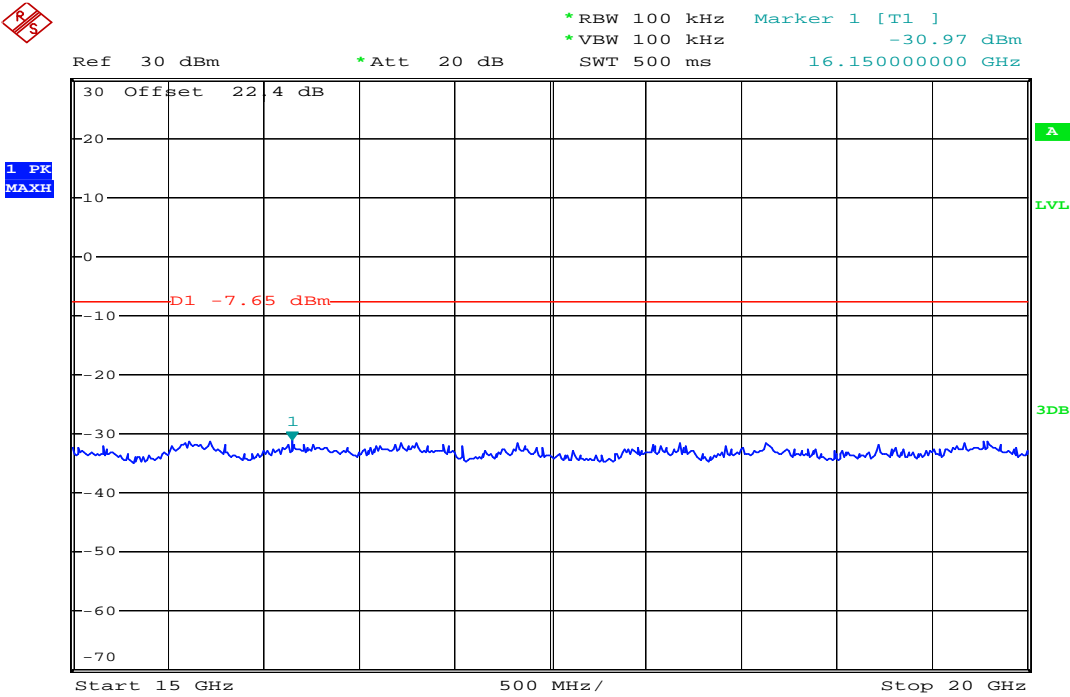
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2475MHz (10GHz~15GHz)



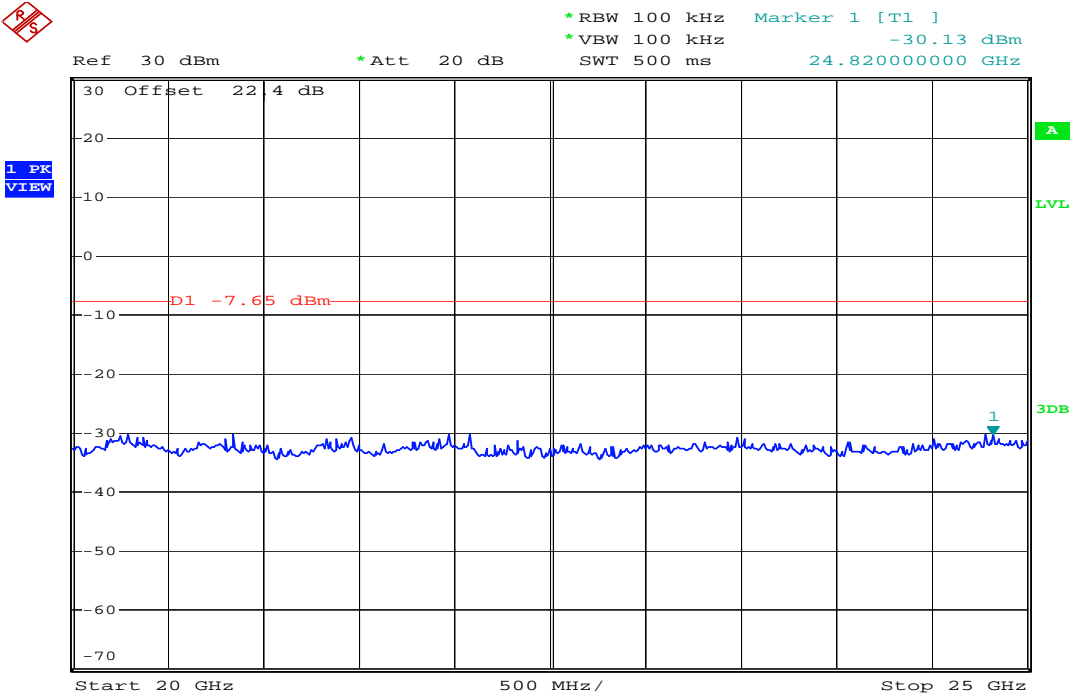
Date: 2.MAR.2011 10:28:09

2475MHz (15GHz~20GHz)



Date: 2.MAR.2011 10:30:04

2475MHz (20GHz~25GHz)



Date: 2.MAR.2011 10:31:30

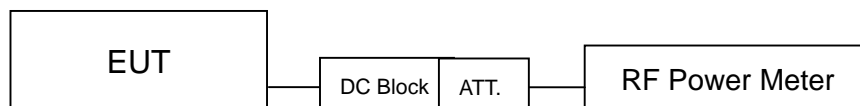
4 Maximum Peak output power test

4.1 Limits

According to FCC Part15.247 (b)(3) requirement :

For systems using digital modulation in the 2400–2483.5 MHz bands: The maximum conducted output power shall be less than 1Watt.

4.2 Configuration of Measurement



4.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

For FCC §15.247(b) the power output was measured on the EUT using a 50 ohm SMA cable connected to peak power meter via power sensor. Peak output power was read directly from power meter. The test was performed at 3 channels (lowest, middle and highest).

4.4 Test Result

PASS.

The final test data is shown as following pages.

Maximum transmit power

CH	Temp. (°C)	Test Voltage (Vac)	Maximum transmit power (dBm)	Limit (dBm)	Margin (dB)
11	18.2	120	20.42	30	-9.58
18	18.2	120	19.45	30	-10.55
25	18.2	120	18.12	30	-11.88

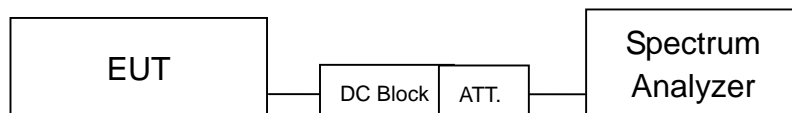
5 6dB Bandwidth

5.1 Limits

According to FCC Part15.247 (a)(2) requirement :

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

5.2 Configuration of Measurement



5.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The minimum 6dB bandwidth was measured using a 50 ohm spectrum analyzer with resolutions bandwidth set at 100kHz, video bandwidth set \geq RBW, and SPAN>>RBW. The test was performed at 3 channels (lowest, middle and highest).

5.4 Test Result

PASS.

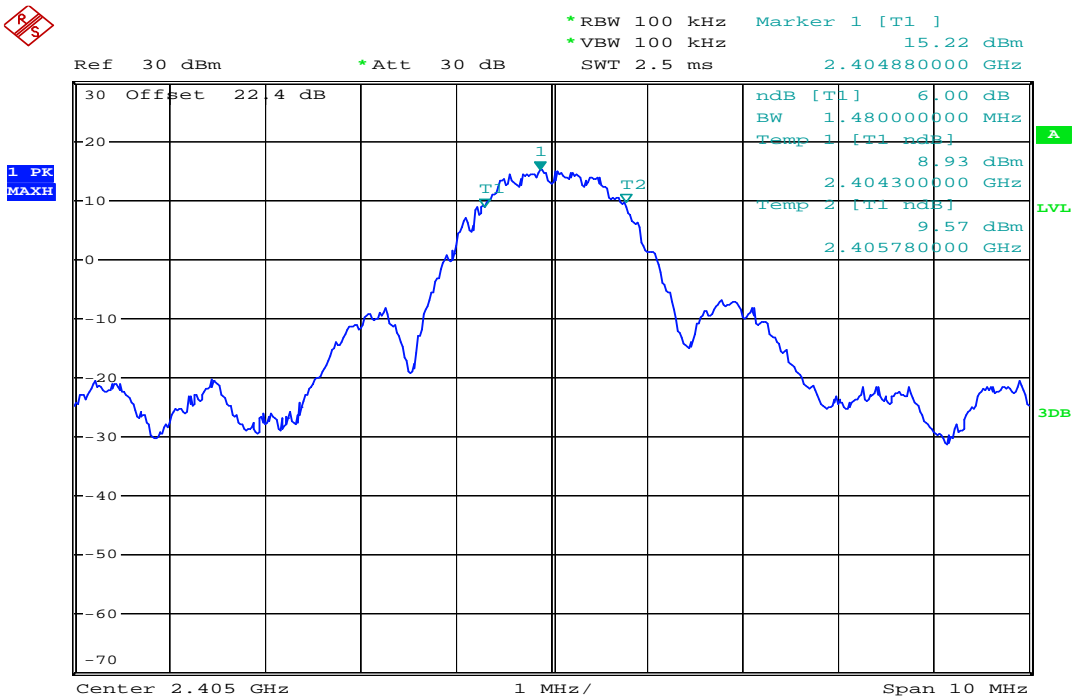
The final test data is shown as following pages.

6dB Bandwidth

Test CH		6dB Bandwidth (MHz)	Limit (kHz)
CH No.	Freq. (MHz)		
11	2405	1.48	>500
18	2440	1.48	>500
25	2475	1.32	>500

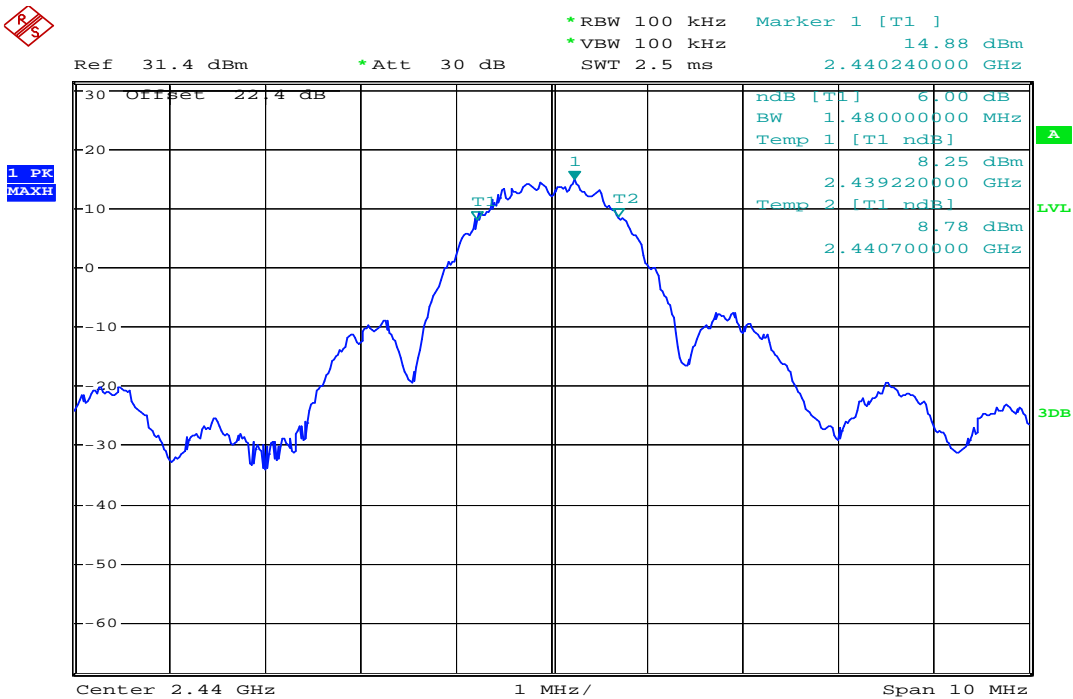
6dB Bandwidth

2405MHz



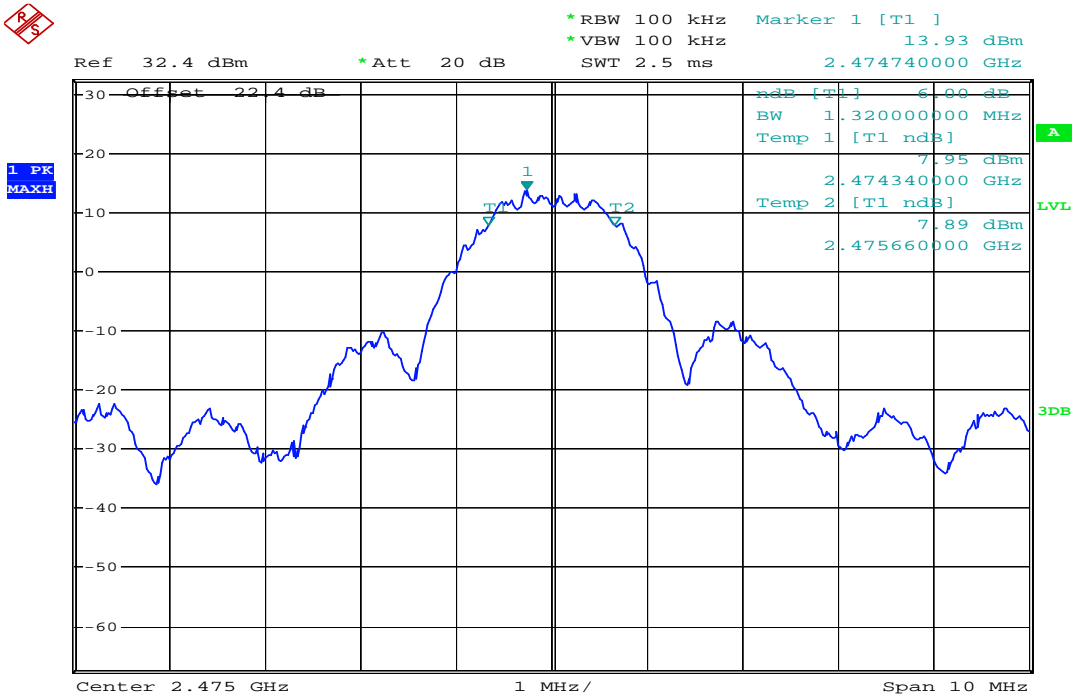
Date: 14.FEB.2011 16:47:36

2440MHz



Date: 14.FEB.2011 16:17:01

2475MHz



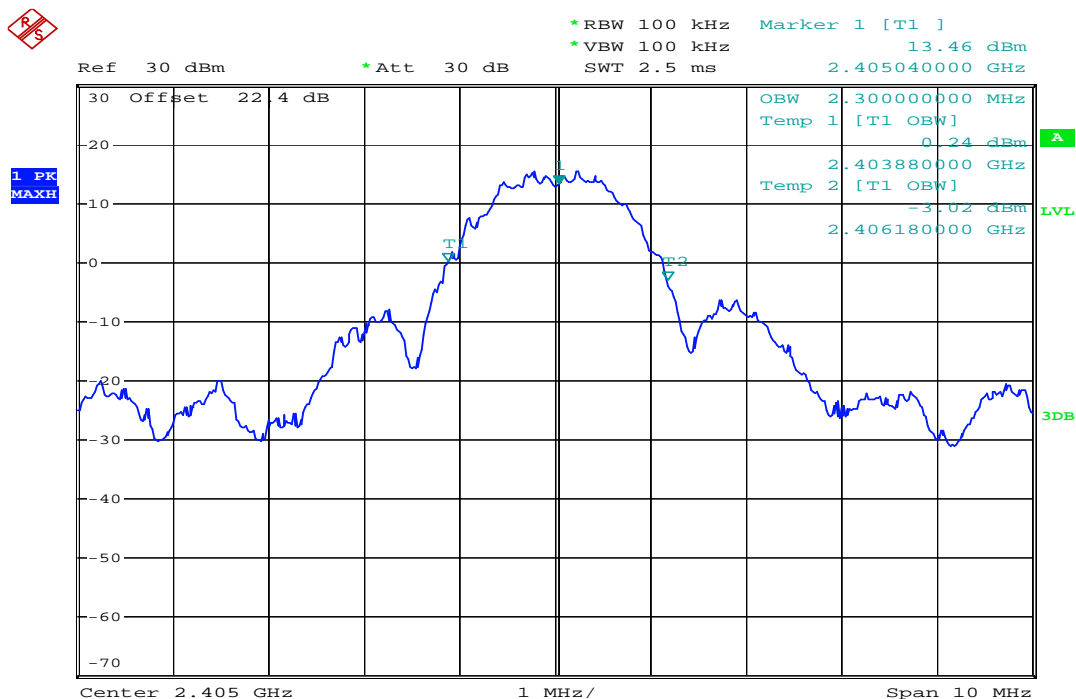
Date: 14.FEB.2011 17:03:46

99%Occupied bandwidth

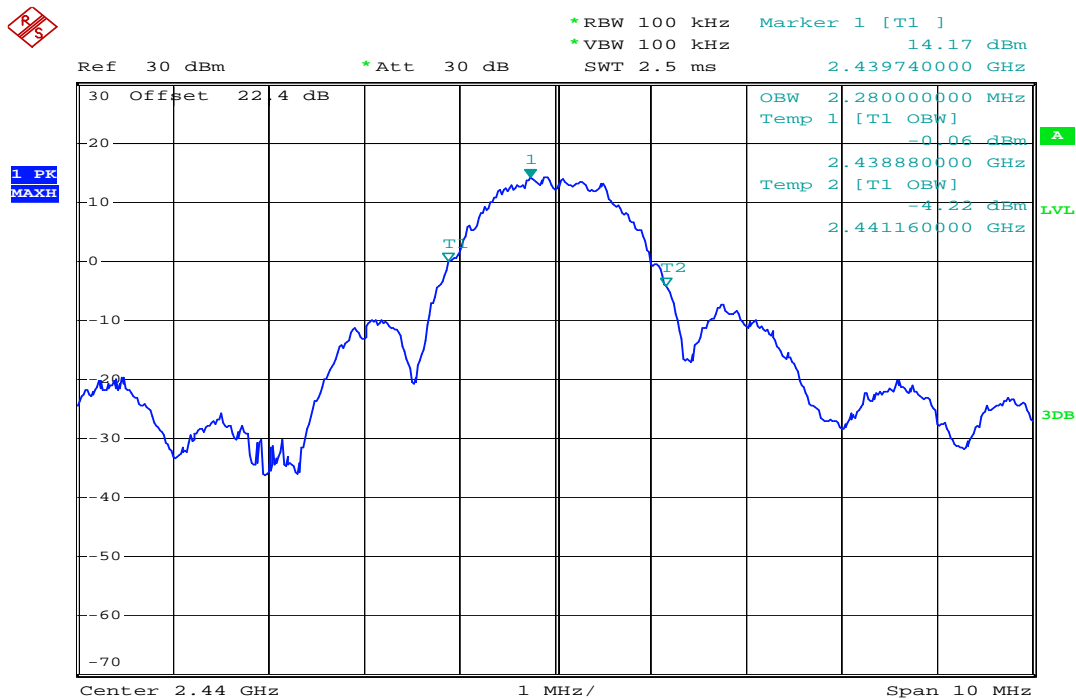
Test CH		Occupied Bandwidth (MHz)
CH No.	Freq. (MHz)	
11	2405	2.30
18	2440	2.28
25	2475	2.28

99%Occupied bandwidth

2405MHz



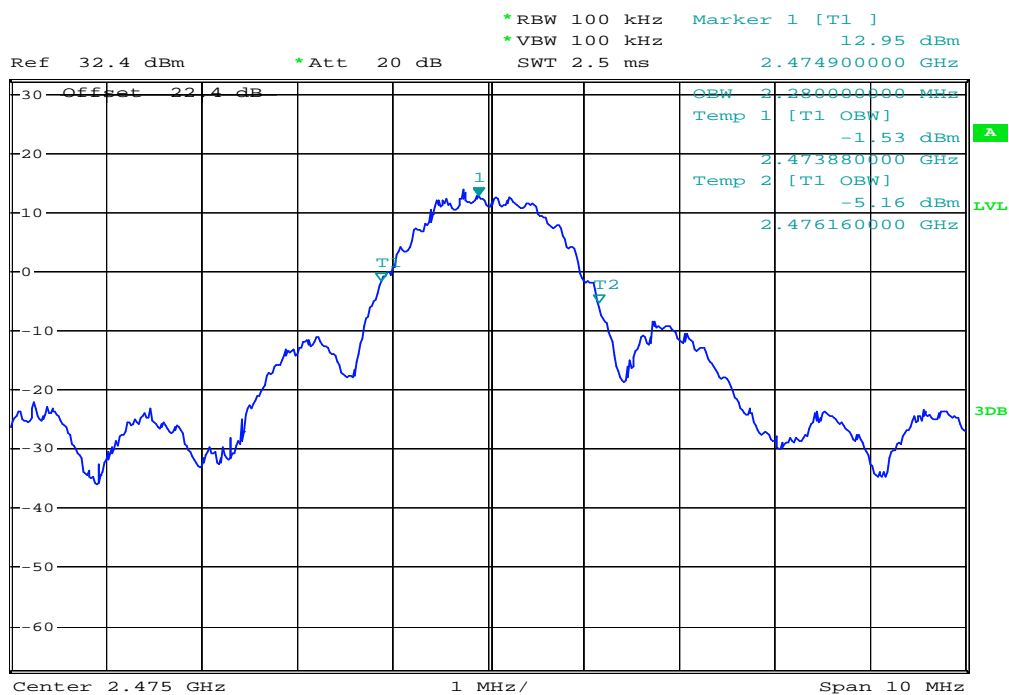
2440MHz



2475MHz



1 PK
MAXH



Date: 14.FEB.2011 17:04:07

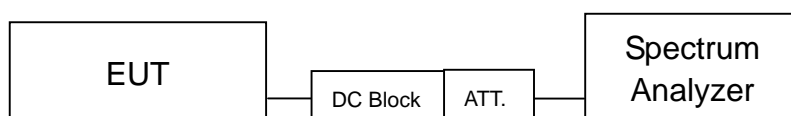
6 Power spectral density

6.1 Limits

According to FCC Part15.247 (e) requirement :

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

6.2 Configuration of Measurement



6.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The power spectrum density was measured from the antenna port of the EUT using a 50ohm spectrum analyzer with the resolution bandwidth set at 3kHz, video bandwidth set at 10kHz, span of 1.5MHz, and sweep time set at 500 seconds. Power Density was read directly correction was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest).

6.4 Test Result

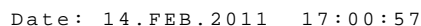
PASS.

The final test data is shown as following pages.

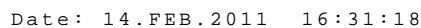
Power spectral density

CH	Freq. (MHz)	Temp. (°C)	Test Voltage (Vac)	Power Spectral Density (dBm)	Limit (dBm)	Margin (dB)
11	2405	18.2	120	6.85	8	-1.15
18	2440	18.2	120	6.19	8	-1.81
25	2475	18.2	120	4.98	8	-3.02

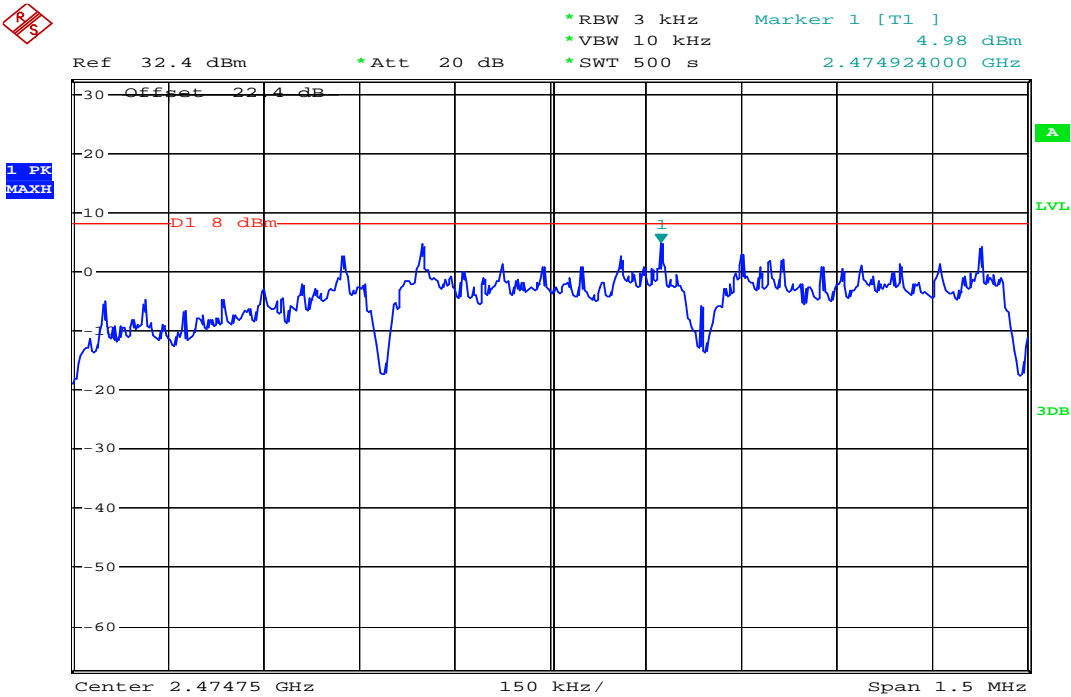
2405MHz



2440MHz



2475MHz



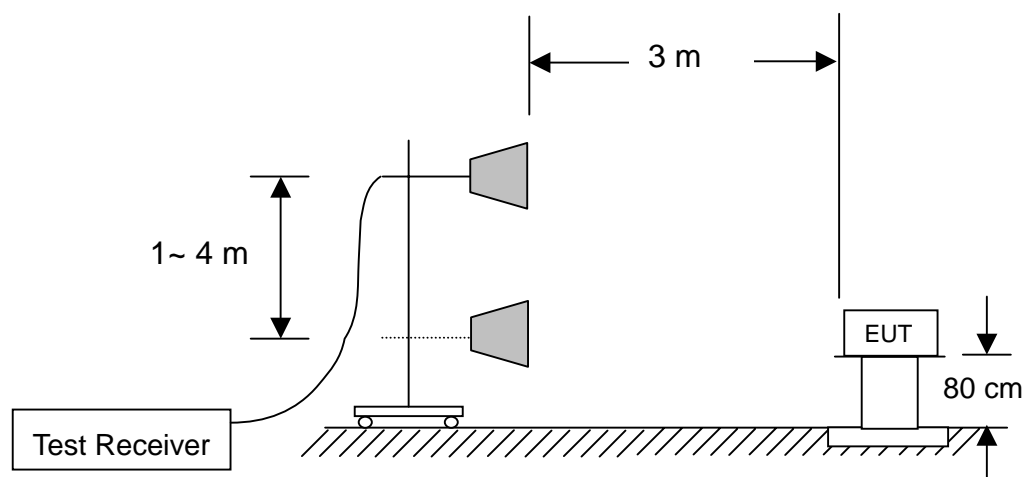
Date: 14.FEB.2011 17:27:34

7 Emission on the Band Edge test

7.1 Limits

In any 100kHz 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 the 100 KHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

7.2 Configuration of Measurement



7.3 Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW =1M, VBW= RBW for peak, and VBW=10Hz for average.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meter and down to 1 meter.

7.4 Test Result

PASS.

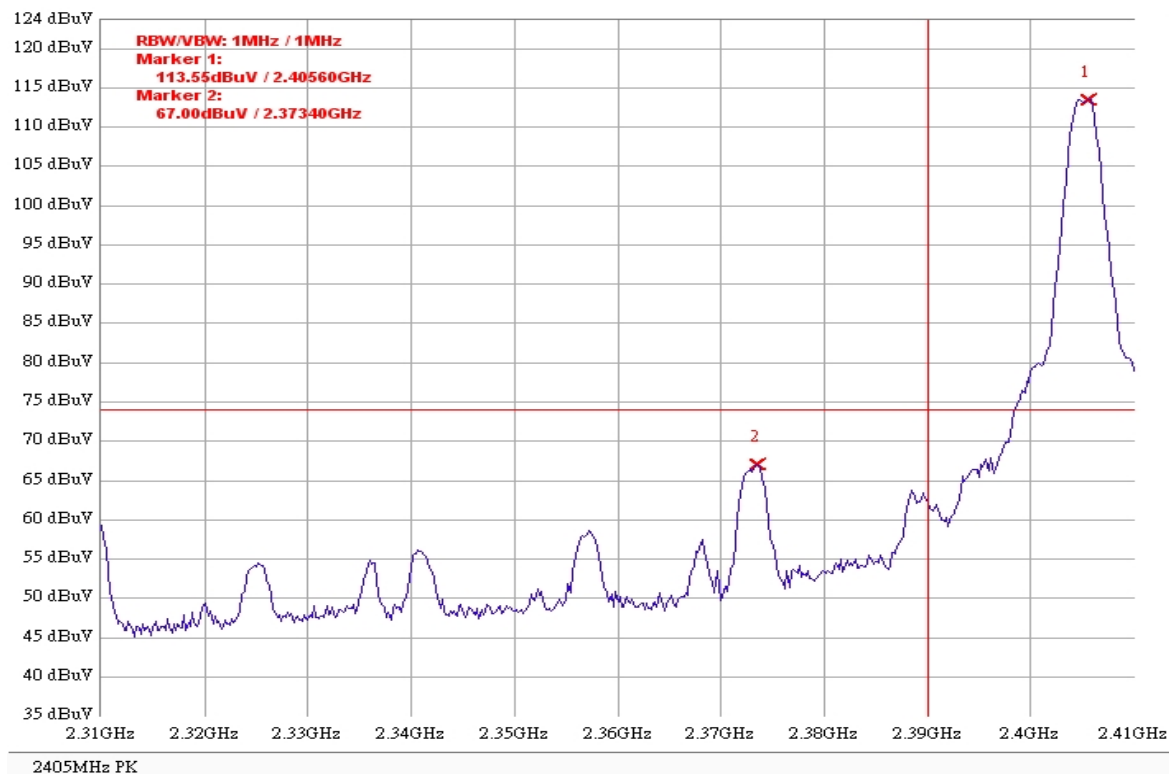
The final test data is shown as following pages.

Band edge

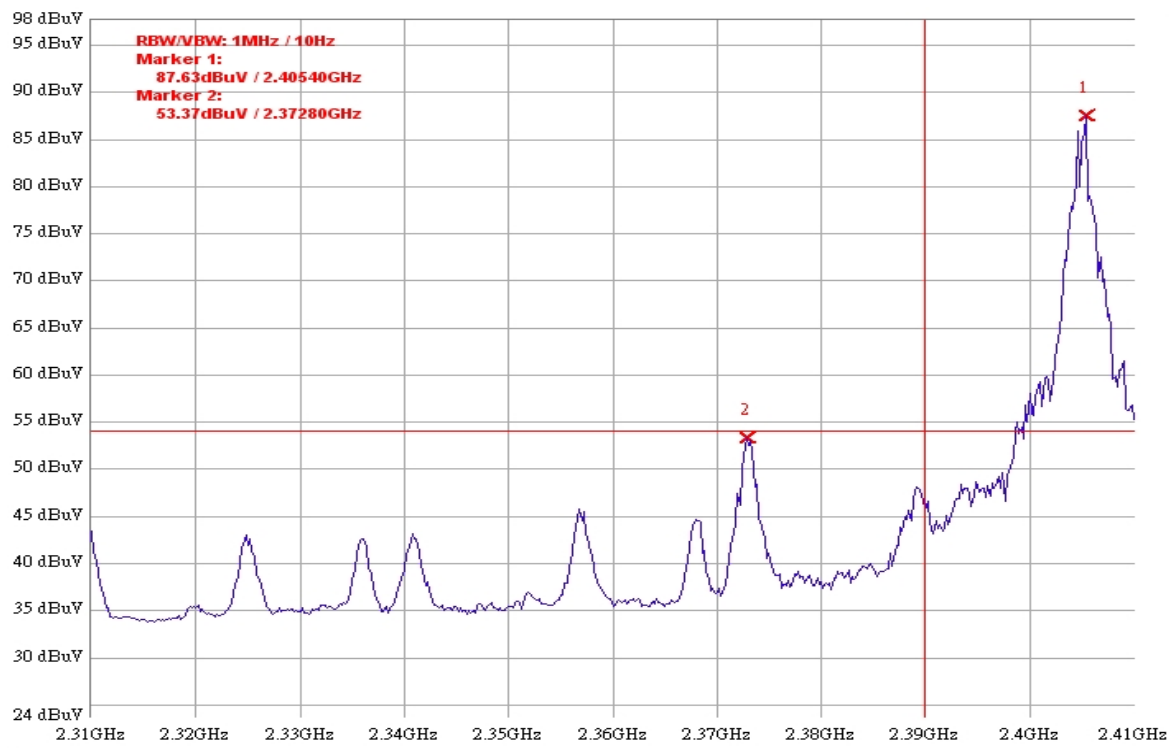
CH	Freq. (MHz)	Restrict Freq. Band (MHz)	Detector Mode	Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)
11	2405	2310~2390	PK	67.00	74	-7.00
			AV	53.37	54	-0.63
25	2475	2483.5~2500	PK	61.25	74	-12.75
			AV	45.66	54	-8.34

Band edge

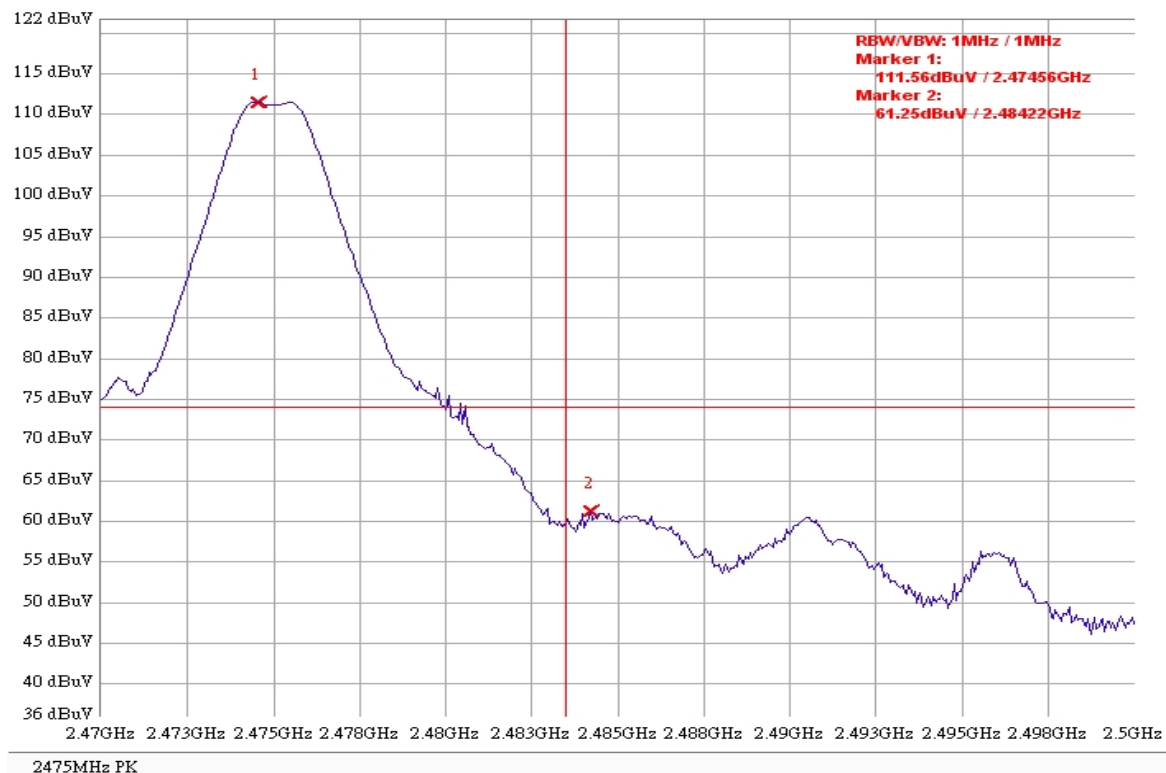
CH11 PK



CH11 AV



CH25 PK



CH25 AV



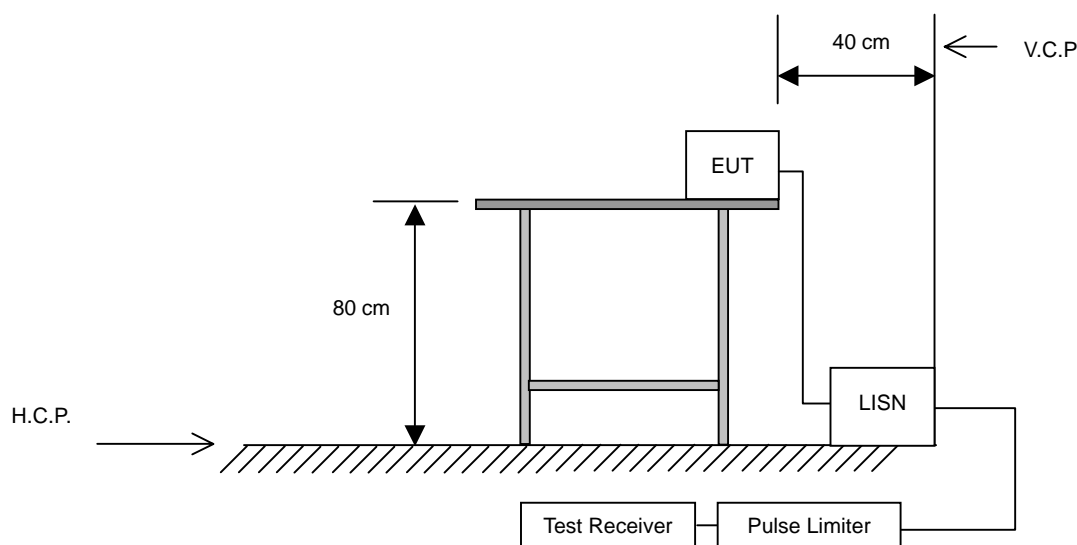
8 AC Power Line Conducted Emission test

8.1 Limits

Frequency (MHz)	Quasi-Peak (dB μ V)	Average (dB μ V)
0.15 to 0.5	66 to 56	56 to 46
> 0.5 to 5	56	46
> 5 to 30	60	50

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

8.2 Configuration of Measurement



8.3 Test Procedures

- 8.3.1 The EUT was placed 80cm height above ground on a non-conductive table and vertical conducting plane located 40cm to the rear of the EUT.
- 8.3.2 The EUT was connected to the main power through Line Impedance Stabilization Networks (LISN). This setup provided a 50ohm/50mH coupling impedance for the measuring equipment. The auxiliary equipment will place in secondary LISN.
- 8.3.3 Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/2003 on conducted measurement.
- 8.3.4 The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

8.4 Test Result

PASS.

The final test data is shown as following pages.

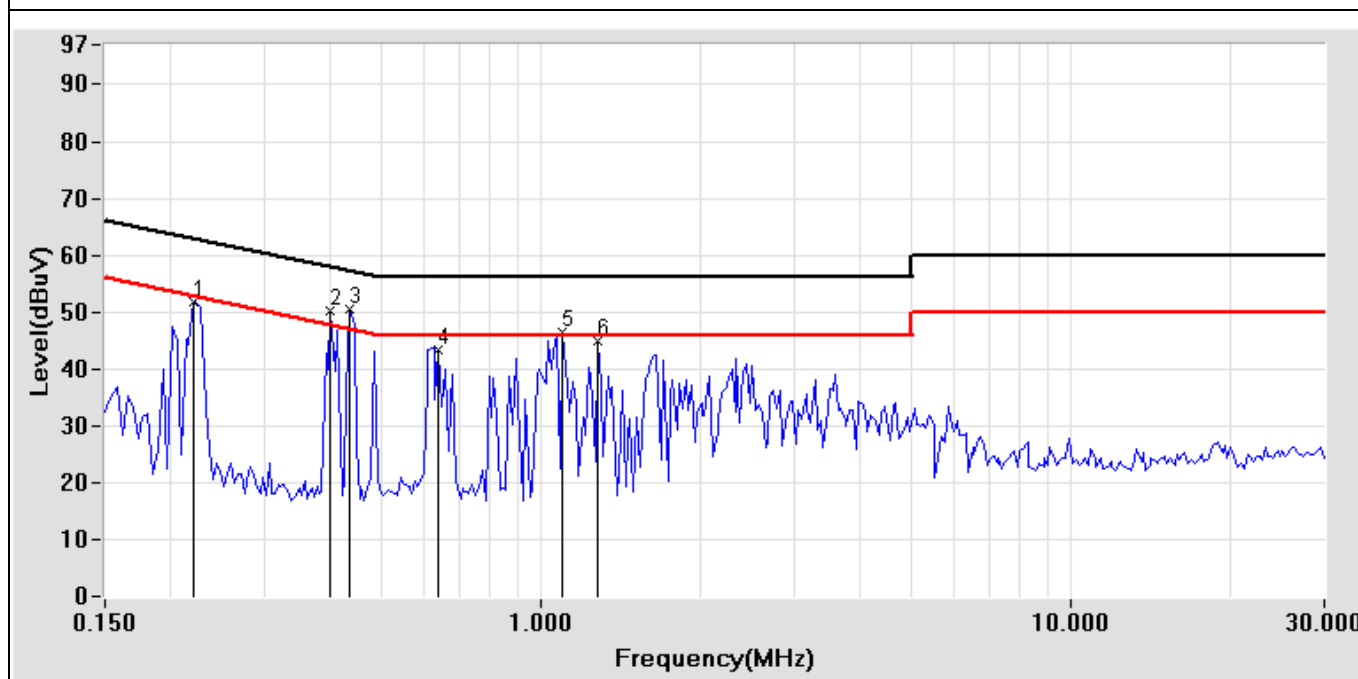
Power Line Conducted Test Data

EUT: Local Control Node Module	POLARITY: Line
CLIENT: GRT Technology Co., Ltd.	DISTANCE:
MODEL: LCNM-001	Serial No.:
RATING: 120V/60Hz	FILE/DATA#: GRT.emi/2
Temperature: 21.9 °C	OPERATOR: Elli
Humidity: 53 %	TEST SITE: Conduction 2

Frequency (MHz)	Factor (dB)	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.220	0.19	49.47	35.30	49.66	35.49	62.82	52.82	-13.16	-17.33
0.400	0.18	48.93	34.99	49.11	35.17	57.85	47.85	-8.74	-12.68
0.435	0.18	46.84	27.06	47.02	27.24	57.16	47.16	-10.14	-19.92
0.638	0.18	39.97	21.38	40.15	21.56	56.00	46.00	-15.85	-24.44
1.095	0.19	40.79	19.61	40.98	19.80	56.00	46.00	-15.02	-26.20
1.279	0.19	37.91	17.09	38.10	17.28	56.00	46.00	-17.90	-28.72

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



Test Mode: Mode 1: Working Mode (Operating frequency: 2405MHz)

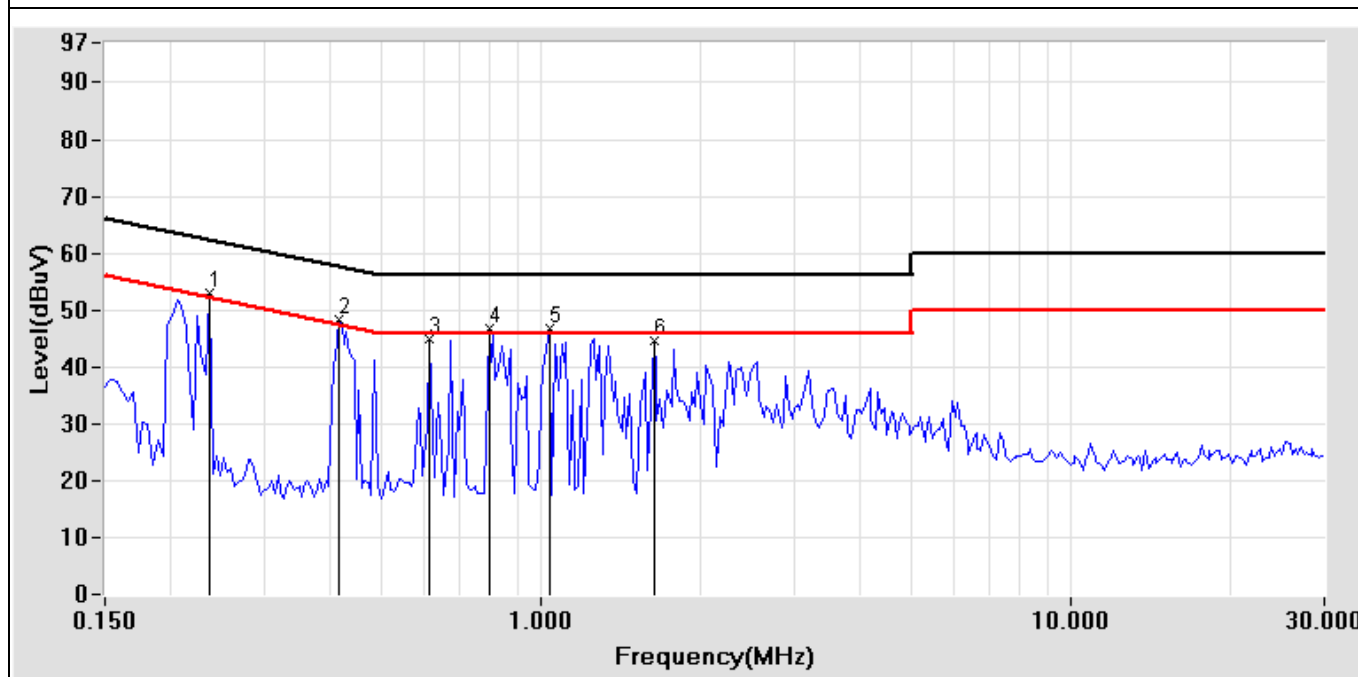
Power Line Conducted Test Data

EUT: Local Control Node Module	POLARITY: Neutral
CLIENT: GRT Technology Co., Ltd.	DISTANCE:
MODEL: LCNM-001	Serial No.:
RATING: 120V/60Hz	FILE/DATA#: GRT.emi/3
Temperature: 21.9 °C	OPERATOR: Elli
Humidity: 53 %	TEST SITE: Conduction 2

Frequency (MHz)	Factor (dB)	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.236	0.19	50.28	36.24	50.47	36.43	62.24	52.24	-11.77	-15.81
0.416	0.18	48.55	35.17	48.73	35.35	57.53	47.53	-8.80	-12.18
0.615	0.18	41.86	25.87	42.04	26.05	56.00	46.00	-13.96	-19.95
0.795	0.19	42.10	23.71	42.29	23.90	56.00	46.00	-13.71	-22.10
1.037	0.19	43.99	23.80	44.18	23.99	56.00	46.00	-11.82	-22.01
1.627	0.17	39.13	18.80	39.30	18.97	56.00	46.00	-16.70	-27.03

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



Test Mode: Mode 1: Working Mode (Operating frequency: 2405MHz)

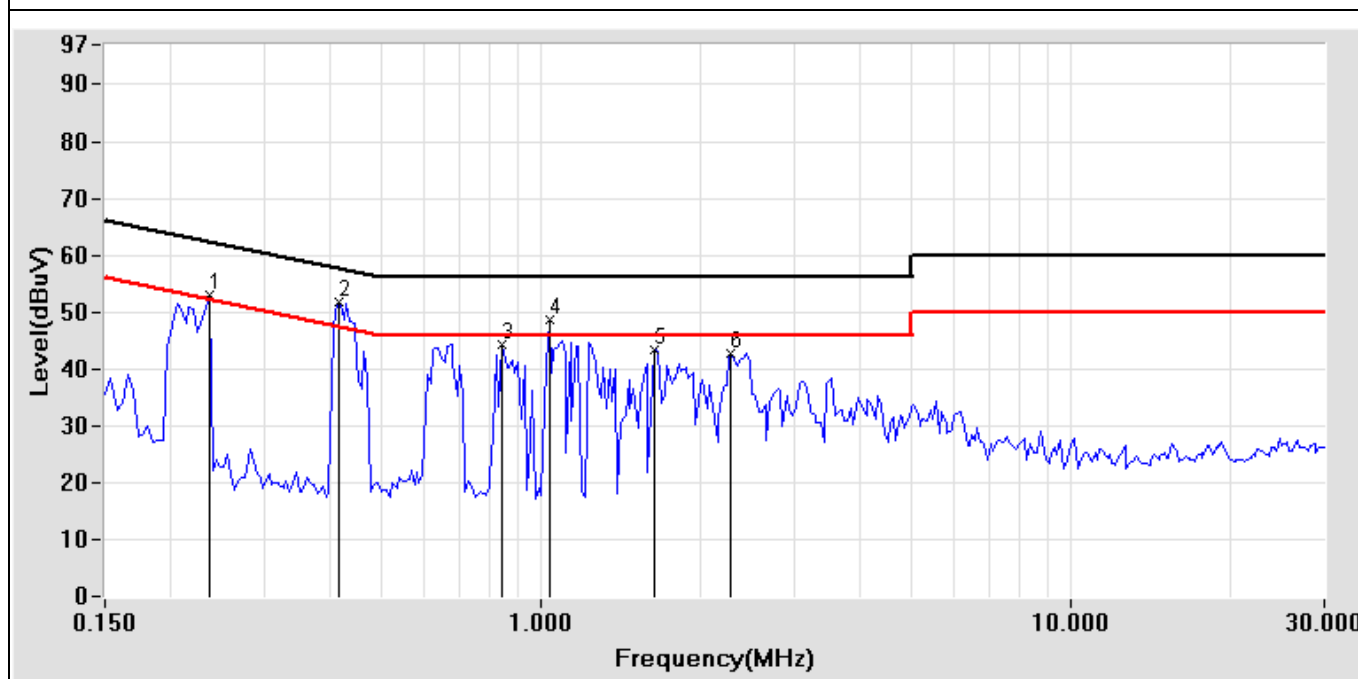
Power Line Conducted Test Data

EUT: Local Control Node Module	POLARITY: Line
CLIENT: GRT Technology Co., Ltd.	DISTANCE:
MODEL: LCNM-001	Serial No.:
RATING: 120V/60Hz	FILE/DATA#: GRT.emi/5
Temperature: 21.9 °C	OPERATOR: Elli
Humidity: 53 %	TEST SITE: Conduction 2

Frequency (MHz)	Factor (dB)	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.236	0.19	50.72	39.12	50.91	39.31	62.24	52.24	-11.33	-12.93
0.416	0.18	48.92	37.04	49.10	37.22	57.53	47.53	-8.43	-10.31
0.845	0.19	41.63	25.59	41.82	25.78	56.00	46.00	-14.18	-20.22
1.037	0.19	44.51	27.82	44.70	28.01	56.00	46.00	-11.30	-17.99
1.630	0.17	39.75	18.03	39.92	18.20	56.00	46.00	-16.08	-27.80
2.279	0.16	38.77	21.08	38.93	21.24	56.00	46.00	-17.07	-24.76

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



Test Mode: Mode 2: Working Mode (Operating frequency: 2440MHz)

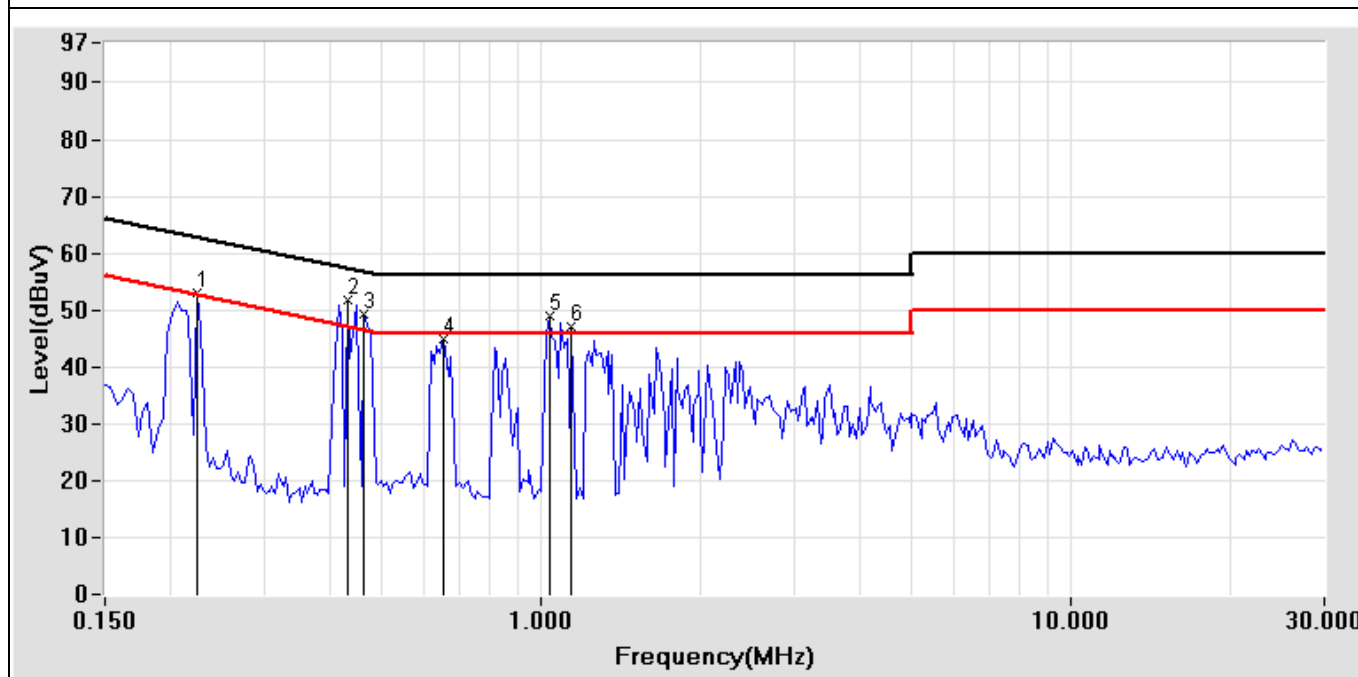
Power Line Conducted Test Data

EUT: Local Control Node Module	POLARITY: Neutral
CLIENT: GRT Technology Co., Ltd.	DISTANCE:
MODEL: LCNM-001	Serial No.:
RATING: 120V/60Hz	FILE/DATA#: GRT.emi/4
Temperature: 21.9 °C	OPERATOR: Elli
Humidity: 53 %	TEST SITE: Conduction 2

Frequency (MHz)	Factor (dB)	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.224	0.19	50.25	38.90	50.44	39.09	62.67	52.67	-12.23	-13.58
0.431	0.18	48.97	32.57	49.15	32.75	57.23	47.23	-8.08	-14.48
0.463	0.18	47.73	28.38	47.91	28.56	56.64	46.64	-8.73	-18.08
0.654	0.18	41.40	24.46	41.58	24.64	56.00	46.00	-14.42	-21.36
1.033	0.19	44.90	27.65	45.09	27.84	56.00	46.00	-10.91	-18.16
1.138	0.18	41.15	18.82	41.33	19.00	56.00	46.00	-14.67	-27.00

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



Test Mode: Mode 2: Working Mode (Operating frequency: 2440MHz)

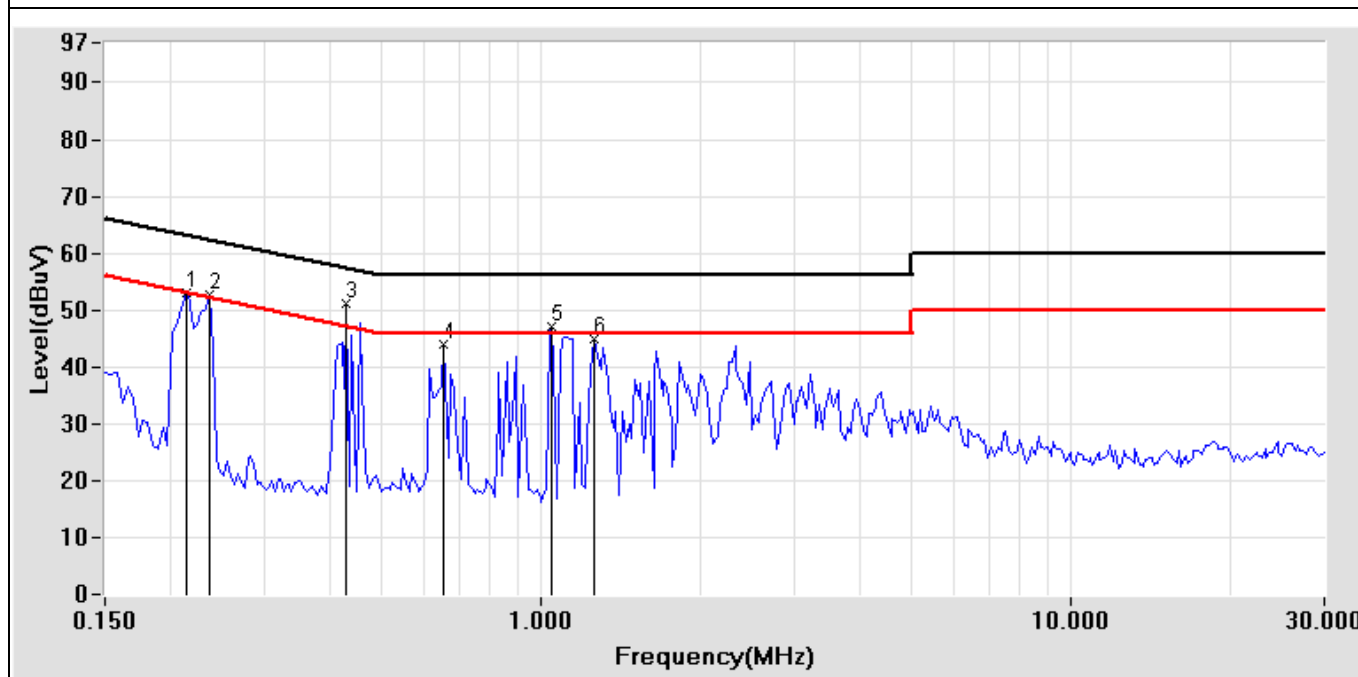
Power Line Conducted Test Data

EUT: Local Control Node Module	POLARITY: Line
CLIENT: GRT Technology Co., Ltd.	DISTANCE:
MODEL: LCNM-001	Serial No.:
RATING: 120V/60Hz	FILE/DATA#: GRT.emi/6
Temperature: 21.9 °C	OPERATOR: Elli
Humidity: 53 %	TEST SITE: Conduction 2

Frequency (MHz)	Factor (dB)	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.213	0.19	50.52	41.86	50.71	42.05	63.09	53.09	-12.38	-11.04
0.236	0.19	49.96	35.64	50.15	35.83	62.24	52.24	-12.09	-16.41
0.427	0.18	47.59	29.31	47.77	29.49	57.31	47.31	-9.54	-17.82
0.654	0.18	40.41	22.76	40.59	22.94	56.00	46.00	-15.41	-23.06
1.045	0.19	44.70	26.20	44.89	26.39	56.00	46.00	-11.11	-19.61
1.259	0.19	39.79	19.44	39.98	19.63	56.00	46.00	-16.02	-26.37

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



Test Mode: Mode 3: Working Mode (Operating frequency: 2475MHz)

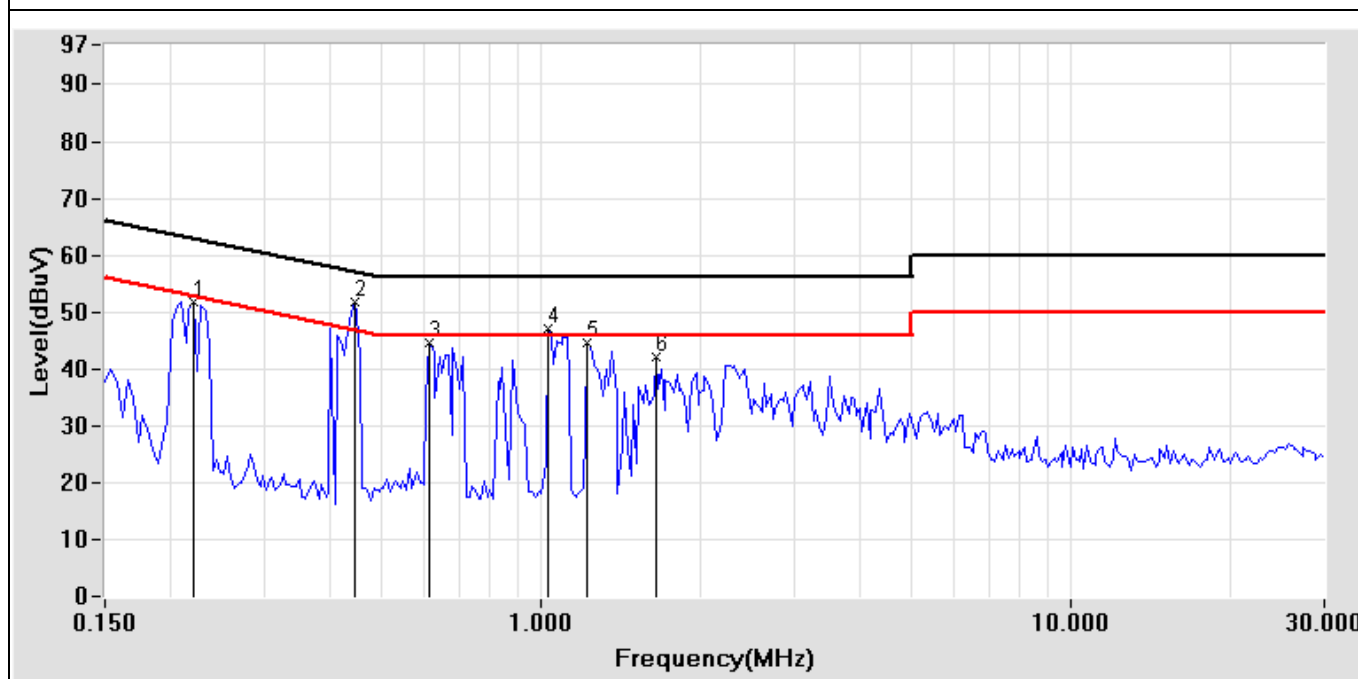
Power Line Conducted Test Data

EUT: Local Control Node Module	POLARITY: Neutral
CLIENT: GRT Technology Co., Ltd.	DISTANCE:
MODEL: LCNM-001	Serial No.:
RATING: 120V/60Hz	FILE/DATA#: GRT.emi/7
Temperature: 21.9 °C	OPERATOR: Elli
Humidity: 53 %	TEST SITE: Conduction 2

Frequency (MHz)	Factor (dB)	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.220	0.19	50.15	38.78	50.34	38.97	62.82	52.82	-12.48	-13.85
0.443	0.18	48.84	32.09	49.02	32.27	57.01	47.01	-7.99	-14.74
0.615	0.18	41.92	25.55	42.10	25.73	56.00	46.00	-13.90	-20.27
1.025	0.19	44.90	25.49	45.09	25.68	56.00	46.00	-10.91	-20.32
1.220	0.18	41.60	22.28	41.78	22.46	56.00	46.00	-14.22	-23.54
1.646	0.17	40.51	21.34	40.68	21.51	56.00	46.00	-15.32	-24.49

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



Test Mode: Mode 3: Working Mode (Operating frequency: 2475MHz)