

FCC Test Report

(TR-0908-015-02)

Applicant : GOLDEN REGENT ELECTRONICS INDUSTRIAL LTD

Address : SUN ON TOWN.KUNG LOK INDUSTRIAL VILLAGE..
SHENZHEN.GUANGDONG, CHINA

Manufacturer : GOLDEN REGENT ELECTRONICS INDUSTRIAL LTD

Address : SUN ON TOWN.KUNG LOK INDUSTRIAL VILLAGE..
SHENZHEN.GUANGDONG, CHINA

Product Name : Reader

Trademark : None

Model(s) : RDR 7(GNG-A741-02)

Standard(s) : FCC Part 15 Subpart C

Test Result : Pass

Date of Test : Nov 11, 2009 to Feb 04, 2010

Report issued Dated : Feb 04, 2010

The report shall not be reproduced except in full, without the written approval of the TDK EMC Center.

The results in this report apply only to the sample(s) tested. The production units are required to conform to the initial sample as received when the units are placed in the market.

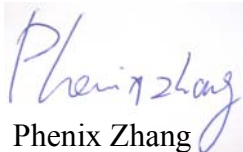

Responsible Engineer	:		Approved by	:	
		Phenix Zhang	Technical manager		CHAN king-chui
Date	:	2010.02.04	Date	:	2010.02.04

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1. Description of the Test Site

1.1 Test Site Location:

Laboratory	:	TDK South China EMC Center SAE Technologies Development (Dongguan) Co., Ltd. Changan Branch
Address	:	Zhenan Hi-tech Industrial Park, Dongguan City, Guangdong Province, China
Phone no.	:	(86)-769-8564-4678
Fax no.	:	(86)-769-8564-4499
Email	:	emc@cn.tdk.com

1.2 Site Registration

VCCI (September, 2008)	:	Reg. No. R-2205, C-2392
FCC site registration (July, 2008)	:	Reg. No. 732901
IC registration	:	Reg. No. 7993
EMCC (September, 2008)	:	Reg. No. NAR/tl-060330

1.3 Test Scope

EMC and RF testing according to national / international standards

2. Description of the Tested Samples

2.1 Customer Information

Customer : GOLDEN REGENT ELECTRONICS INDUSTRIAL LTD
Address : SUN ON TOWN.KUNG LOK INDUSTRIAL VILLAGE..
SHENZHEN.GUANGDONG, CHINA
Phone no. : 0086-755-29667713
Fax no. : 0086-755-29667044

2.2 Identification of EUT

Trademark : None
Model(s) No. : Reader
Serial No. : R-1098S50011A

2.3 Spec of EUT

Description of EUT : This product is a RFID reader, which has a 13.56MHz module to read a passive tag. It also has a 2.4GHz module to communicate with GSC(Gas Station Communicator). In this report, only 2.4GHz part was tested and recorded.

Description of Antenna : fixed permanent antenna, 3dBi gain for 13.56MHz
3dBi gain for 2.4GHz

Power Supply : Internal battery 3.6V DC

Operation Frequency : 13.56MHz and 2450 MHz

Number of Channels : 2

Bandwidth : 0.4MHz at 13.56MHz and 64MHz at 2450MHz

Type of Modulation : ASK for 13.56MHz
CSS for 2450MHz

2.4 Test Standards List

FCC Part 15 (2008)

American national standard for methods of measurement of radio noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40GHz.

3. Test Specifications

3.1 Standard(s) Used

FCC Rules	Description Of Test	Result
15.203/15.247(b)	Antenna Requirement	Pass
15.207	Conducted Emission	N/A
15.247(b)(3)	Maximum Peak Output Power	Pass
15.247(d)	Band Edges Emission	Pass
15.247(a)(2)	6 dB Bandwidth	Pass
15.247(e)	Power Spectral Density	Pass
15.247(d)	Spurious Radiated Emission	Pass

3.2 Deviations from the Test Specification

N/A

4. Test Result

4.1 Antenna Requirement

4.1.1 Standard Applicable

Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna James or electrical connector is prohibited.

Section 15.247(b):

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.1.2 Antenna Connected Construction

The antenna connector is designed with permanent attachment and no consideration of replacement.

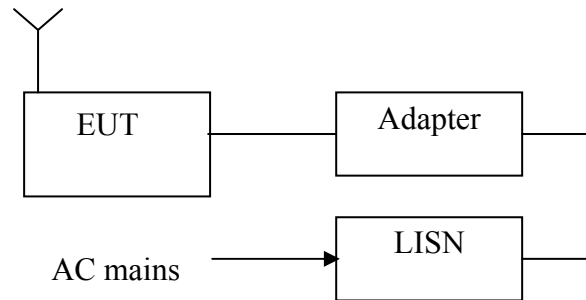
Transmitter antenna of directional gain is 3dBi.

4.2 Conducted Emission (mains)

4.2.1 Test Summary

Test Room	: Shielded Room
Power Source	: AC 120V / 60Hz
Standards:	: FCC Part15 B : 2008
EUT Type	: Table Top
EUT configuration	: EUT's highest possible emission level

4.2.2 Block diagram of test setup



4.2.3 Measurement method

The EUT along with its peripherals were placed on a 1.0m (W) x 1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4m space from a vertical reference plane. The EUT was connected to power mains through a Artificial Mains Network(AMN), which provided 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.

The excess power cable between the EUT and the AMN was bundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

4.2.4. Result

N/A

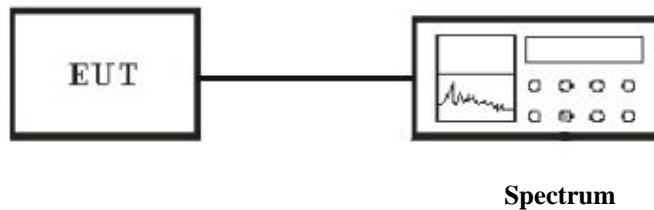
Because the power of EUT is internal battery, this test item is not applicable.

4.3 Maximum Peak Output Power

4.3.1 Applicable Standard

According to Section 15.247(b)(3), for systems using digital modulation in 2400-2483.5MHz: 1 Watt.

4.3.2 Block diagram of test setup



Connection method: The shield cable was connected with EUT and Spectrum which have $50\Omega Z_C$. The connector of EUT side is original by manufacturer. The connector of Spectrum side is N type.

4.3.3 Measurement method

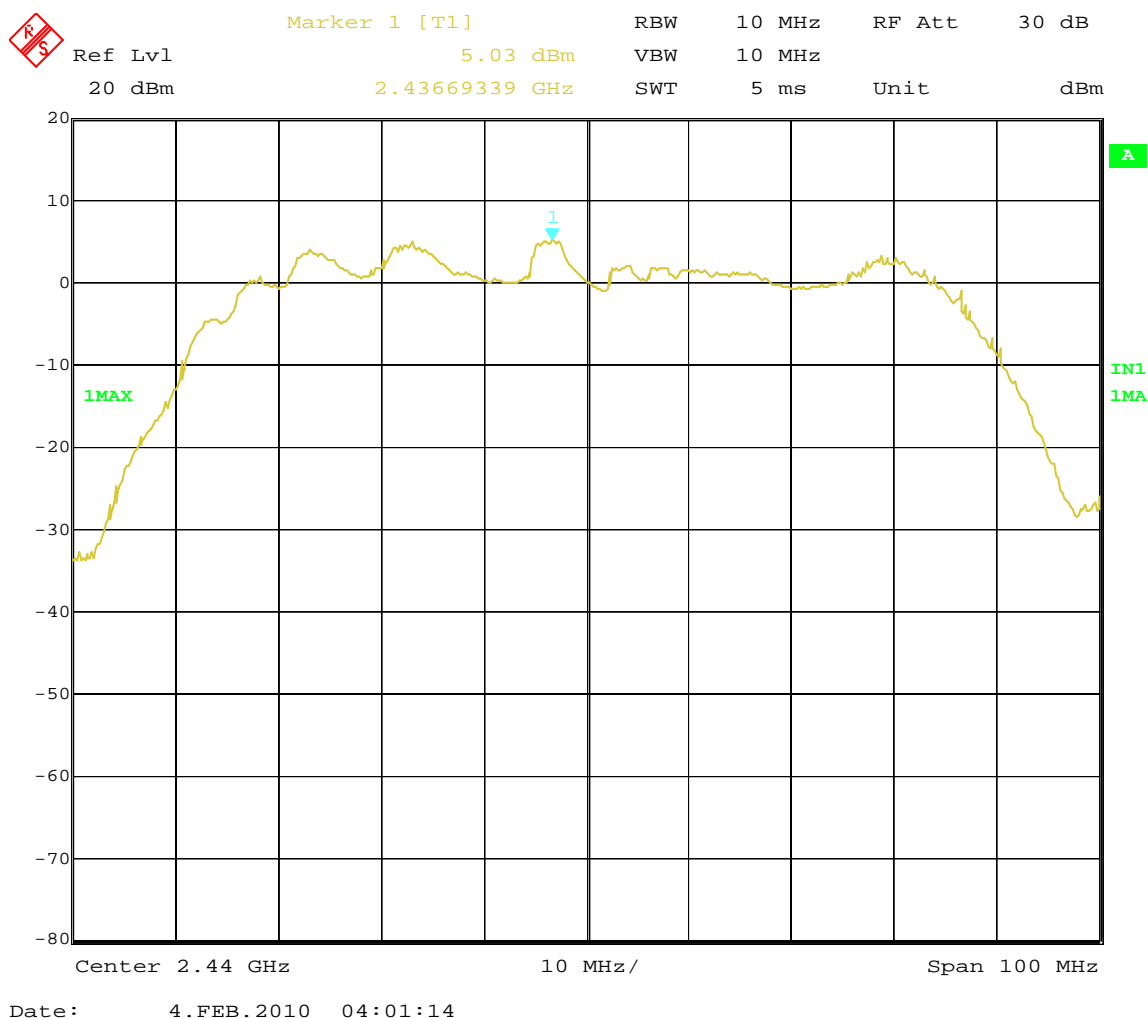
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in above figure without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set the spectrum analyzer as Center= 2.44 GHz, RBW=10 MHz, VBW=10 MHz, Span=100MHz.
4. Set Detector to Peak, Trace to Max Hold and Sweep Time is auto.
5. Hold on 30s, find out the max value on the screen of Spectrum.
6. Repeat above procedures until all frequencies measured were complete.

4.3.4. Result

Temperature () : 22~23	EUT: Reader
Humidity (%RH) : 50~54	M/N: RDR 7(GNG-A741-02)
Barometric Pressure (mbar) : 950~1000	Operation Condition: 2.4GHz Tx Mode
Test data: Feb 04, 2010	Test engineer: Phenix

Frequency (MHz)	Output Power (dBm)	Limits (dBm)	Margin (dB)
2436.69	5.03	30	24.97

Test Plot:

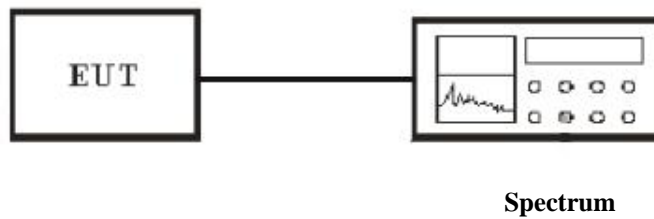


4.4 Band Edges Emission

4.4.1 Applicable Standard

Section 15.247(d): 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. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

4.4.2 Block diagram of test setup



Connection method: The shield cable was connected with EUT and Spectrum which have $50\Omega Z_C$. The connector of EUT side is original by manufacturer. The connector of Spectrum side is N type.

4.4.3 Measurement method

1. The transmitter is set to the lowest channel.
2. The transmitter output was connected to the spectrum analyzer via a cable and cable loss is used as the offset of the spectrum analyzer.
3. Set both RBW and VBW of spectrum analyzer to 100KHz with convenient frequency span including 50MHz bandwidth from lower band edge. Then detector set to peak and max hold this trace.
4. The lowest band edges emission was measured and recorded.
5. The transmitter set to the highest channel and repeated 2~4.

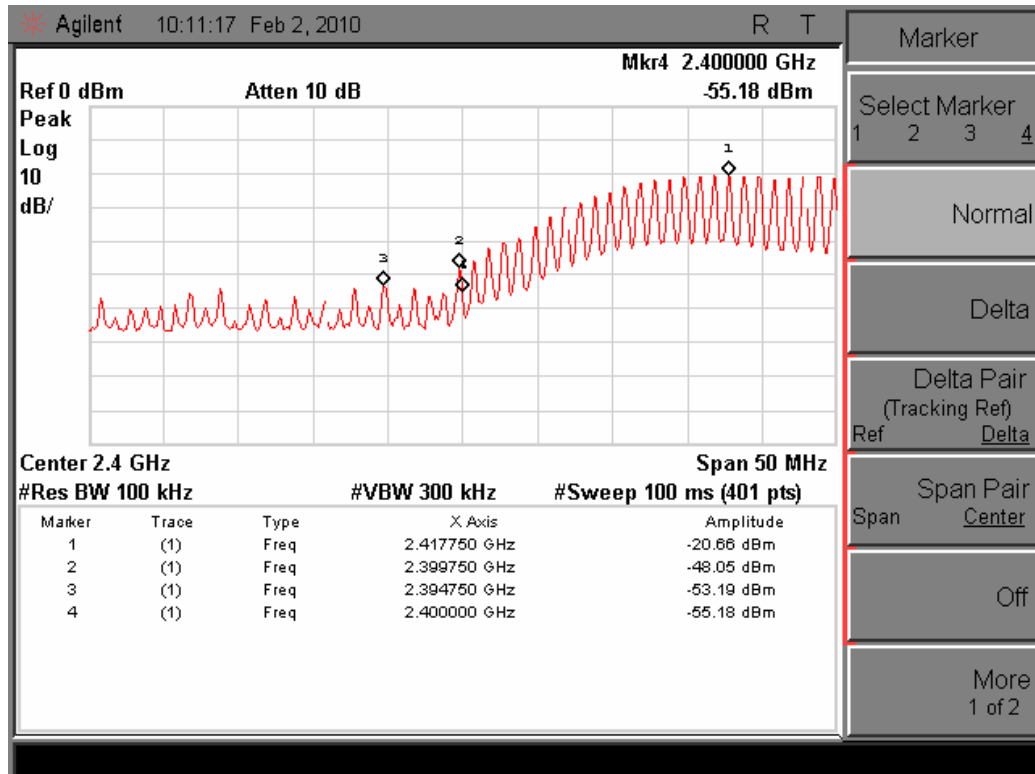
4.4.4. Result

Conducted:

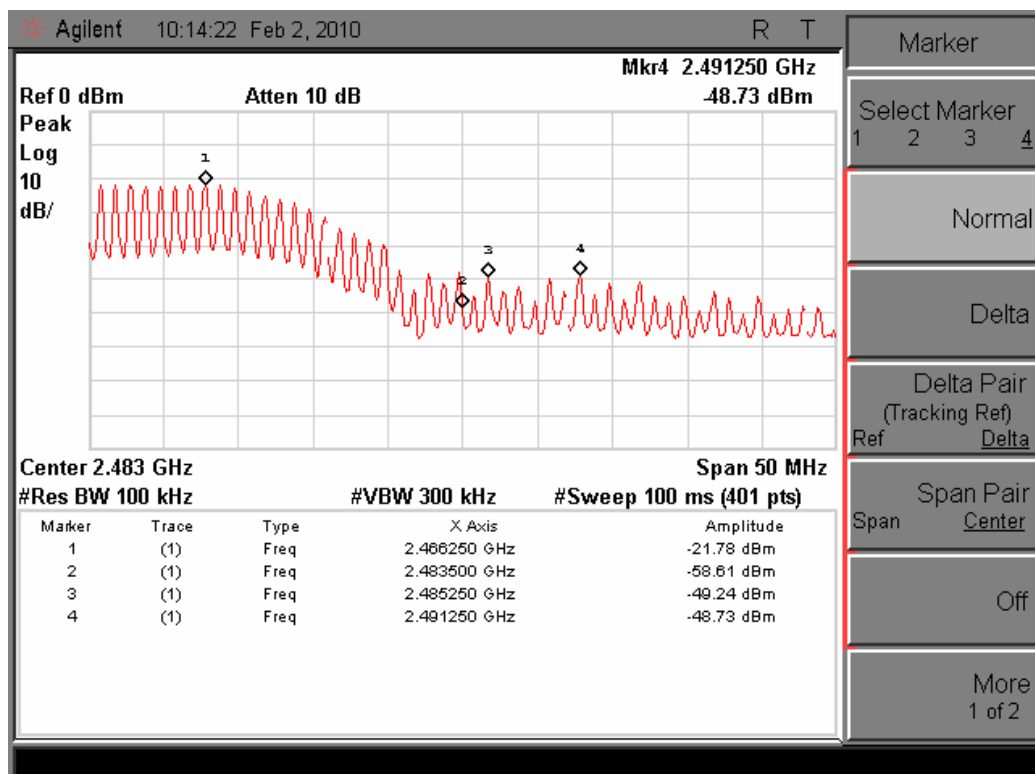
Temperature () : 22~23	EUT: Reader
Humidity (%RH) : 50~54	M/N: RDR 7(GNG-A741-02)
Barometric Pressure (mbar) : 950~1000	Operation Condition: 2.4G Tx Mode
Test data: Dec 02, 2009 & Feb 02, 2010	Test engineer: Phenix

Frequency (MHz)	Read Delta (dB)	Limits (dB)	Margin (dB)
2400	-34.52	-20	14.52
2399.75	-27.39	-20	7.39
2394.75	-32.53	-20	12.53
2483.5	-36.83	-20	16.83
2485.25	-27.46	-20	7.46
2491.25	-26.95	-20	6.95

Channel LOW :



Channel HIG :



Radiated:

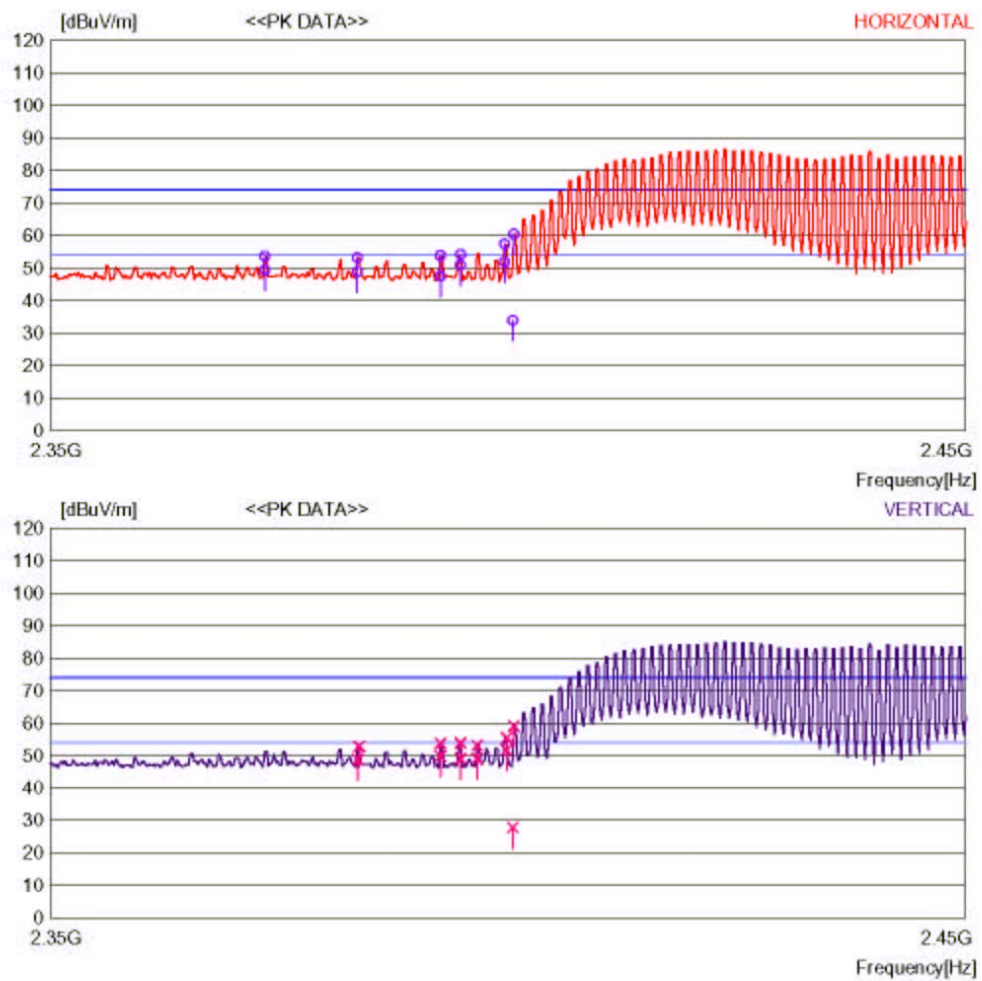
2009-12-02 17:44:06

RADIATED EMISSION

Date : 2009-12-02 17:43:21

Company Name	: Golden	Document No.	:
Model Name	: RDR 7(GNG-A741-02)	Power Supply	: internal battery
Product Name	: Reader	Temp/Humi	: 27/55RH%
Test Condition	: TX 2.4G testing	Operator	: Phenix

Memo :

LIMIT : FCC Part15 C transmitter spurious above1G(peak)
FCC Part15 C transmitter spurious above1G(average)


2009-12-02 17:44:06

RADIATED EMISSION

Date : 2009-12-02 17:43:21

Company Name : Golden	Document No. :
Model Name : RDR 7(GNG-A741-02)	Power Supply : internal battery
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Test Condition : TX 2.4G testing	Operator : Phenix

Memo :

LIMIT : FCC Part15 C transmitter spurious above1G(peak)
FCC Part15 C transmitter spurious above1G(average)

No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE	REMARK
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dB]	[dBuV/m][dBuV/m]	[dB]	[cm]	[deg]	
----- Horizontal -----											
1	2373.050	51.9	31.5	5.5	39.5	49.4	54.0	4.6	300	287	AV
2	2383.070	51.4	31.5	5.5	39.5	48.9	54.0	5.1	300	291	AV
3	2392.090	50.1	31.4	5.5	39.5	47.5	54.0	6.5	300	287	AV
4	2394.290	53.5	31.4	5.5	39.5	50.9	54.0	3.1	300	299	AV
5	2399.100	54.5	31.4	5.5	39.5	51.9	54.0	2.1	300	287	AV
6	2400.000	36.5	31.4	5.5	39.5	33.9	54.0	20.1	300	287	AV
7	2373.051	56.2	31.5	5.5	39.5	53.7	74.0	20.3	300	287	PK
8	2383.073	55.7	31.5	5.5	39.5	53.2	74.0	20.8	300	291	PK
9	2392.092	56.5	31.4	5.5	39.5	53.9	74.0	20.1	300	287	PK
10	2394.297	56.8	31.4	5.5	39.5	54.2	74.0	19.8	300	299	PK
11	2399.108	60.0	31.4	5.5	39.5	57.4	74.0	16.6	300	287	PK
12	2400.110	63.1	31.4	5.5	39.5	60.5	74.0	13.5	300	287	PK
----- Vertical -----											
13	2383.130	51.3	31.5	5.5	39.5	48.8	54.0	5.2	200	146	AV
14	2392.090	52.5	31.4	5.5	39.5	49.9	54.0	4.1	200	68	AV
15	2394.290	51.7	31.4	5.5	39.5	49.1	54.0	4.9	200	121	AV
16	2396.100	51.7	31.4	5.5	39.5	49.1	54.0	4.9	200	84	AV
17	2399.300	54.4	31.4	5.5	39.5	51.8	54.0	2.2	200	72	AV
18	2400.000	30.2	31.4	5.5	39.5	27.6	54.0	26.4	100	20	AV
19	2383.273	55.4	31.5	5.5	39.5	52.9	74.0	21.1	200	146	PK
20	2392.092	56.4	31.4	5.5	39.5	53.8	74.0	20.2	200	68	PK
21	2394.297	56.5	31.4	5.5	39.5	53.9	74.0	20.1	200	121	PK
22	2396.101	55.8	31.4	5.5	39.5	53.2	74.0	20.8	200	84	PK
23	2399.308	58.1	31.4	5.5	39.5	55.5	74.0	18.5	200	72	PK
24	2400.110	61.7	31.4	5.5	39.5	59.1	74.0	14.9	100	20	PK

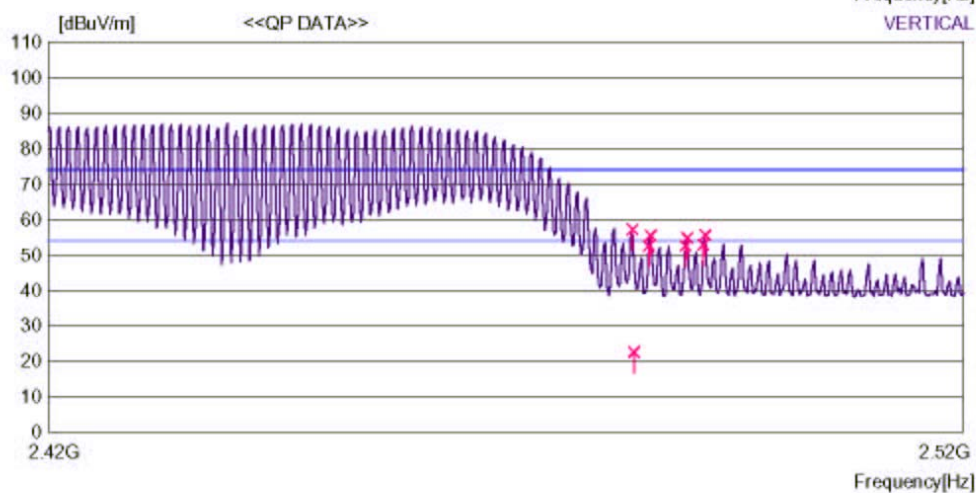
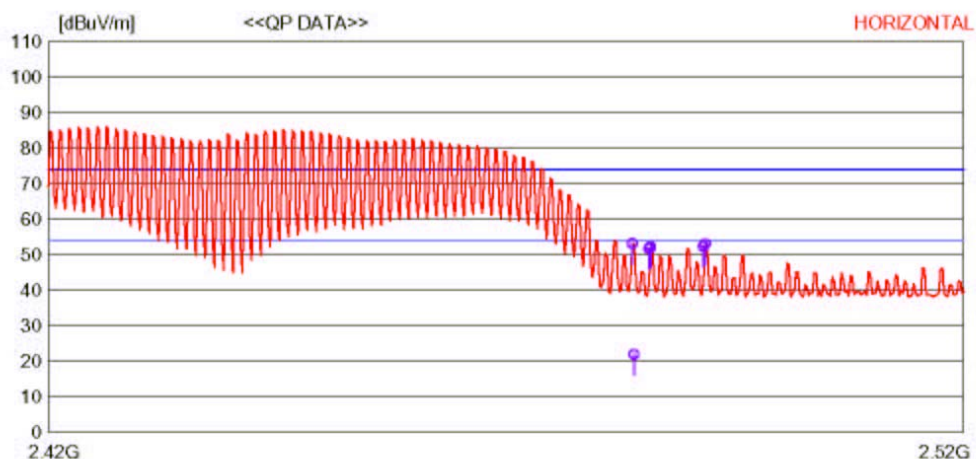
2009-12-08 19:06:45

RADIATED EMISSION

Date : 2009-12-08 19:06:33

Company Name	: Golden	Document No.	:
Model Name	: RDR 7(GNG-A741-02)	Power Supply	: internal battery
Product Name	: Reader	Temp/Humi	: 27/55RH%
Test Condition	: TX 2.4G testing	Operator	: Phenix

Memo

LIMIT : FCC Part15 C transmitter spurious above1G(peak)
FCC Part15 C transmitter spurious above1G(average)


2009-12-08 19:06:45

RADIATED EMISSION

Date : 2009-12-08 19:06:33

Company Name : Golden	Document No. :
Model Name : RDR 7(GNG-A741-02)	Power Supply : internal battery
Product Name : Reader	Temp/Humi : 27/55RH%
Test Condition : TX 2.4G testing	Operator : Phenix

Memo :

LIMIT : FCC Part15 C transmitter spurious above1G(peak)
FCC Part15 C transmitter spurious above1G(average)

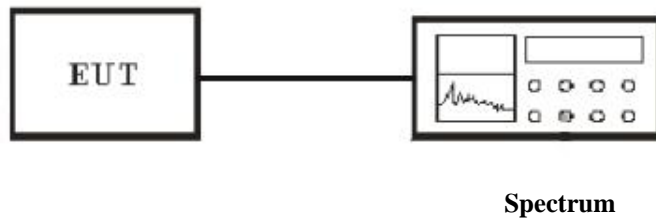
No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE	REMARK
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[deg]
----- Horizontal -----											
1	2483.500	24.6	31.2	5.6	39.4	22.0	54.0	32.0	100	105	AV
2	2485.142	54.4	31.2	5.6	39.4	51.8	54.0	2.2	100	101	AV
3	2491.138	55.0	31.2	5.6	39.4	52.4	54.0	1.6	100	101	AV
4	2483.339	55.8	31.2	5.6	39.4	53.2	74.0	20.8	100	105	QP
5	2485.343	54.9	31.2	5.6	39.4	52.3	74.0	21.7	100	101	QP
6	2491.356	55.7	31.2	5.6	39.4	53.1	74.0	20.9	100	101	QP
----- Vertical -----											
7	2483.500	25.0	31.2	5.6	39.4	22.4	54.0	31.6	100	39	AV
8	2485.127	55.1	31.2	5.6	39.4	52.5	54.0	1.5	100	39	AV
9	2489.144	55.2	31.2	5.6	39.4	52.6	54.0	1.4	100	39	AV
10	2491.137	55.5	31.2	5.6	39.4	52.9	54.0	1.1	100	43	AV
11	2483.339	59.8	31.2	5.6	39.4	57.2	74.0	16.8	100	39	QP
12	2485.343	58.1	31.2	5.6	39.4	55.5	74.0	18.5	100	39	QP
13	2489.352	57.4	31.2	5.6	39.4	54.8	74.0	19.2	100	39	QP
14	2491.356	58.2	31.2	5.6	39.4	55.6	74.0	18.4	100	43	QP

4.5 6dB BANDWIDTH

4.5.1 Applicable Standard

According to section 15.247(a)(2), for digital modulation technique, the minimum 6dB bandwidth shall be at least 500kHz.

4.5.2 Block diagram of test setup



Connection method: The shield cable was connected with EUT and Spectrum which have 50Ω Z_C . The connector of EUT side is original by manufacturer. The connector of Spectrum side is N type.

4.5.3 Measurement method

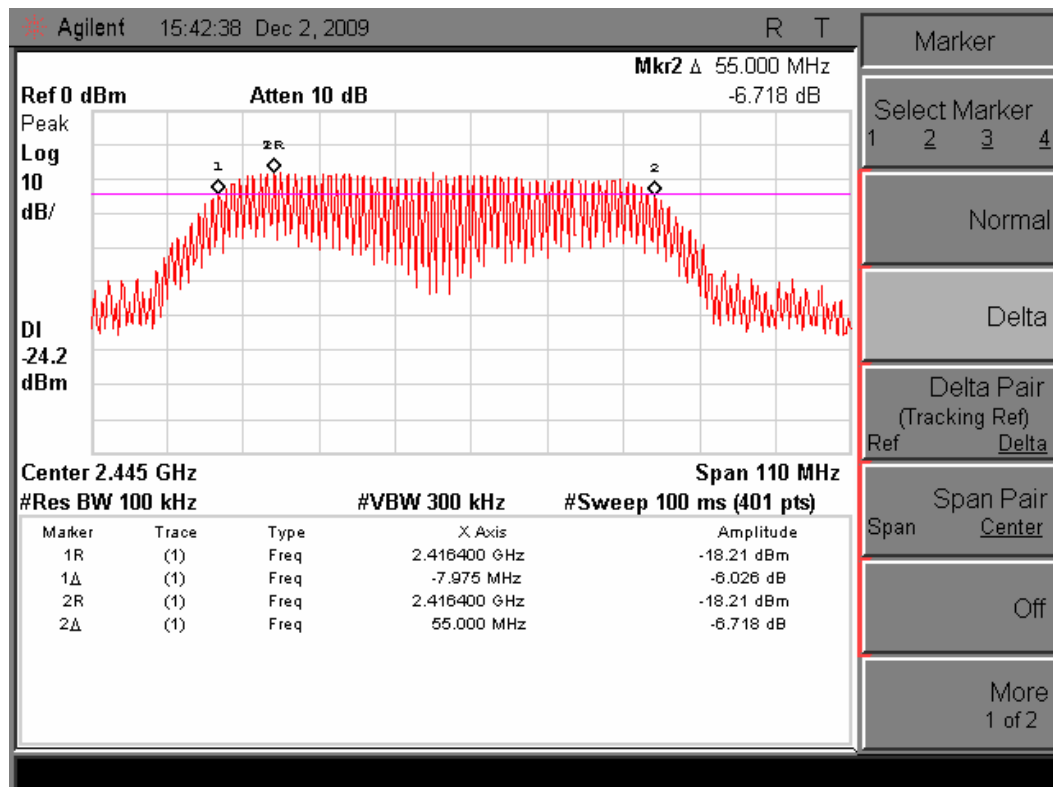
1. The transmitter output was connected to the spectrum analyzer through a shielded cable.
2. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Span=110MHz, Sweep=auto.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is auto.
4. Mark the peak frequency and -6dB(upper and lower) frequency.
5. Repeat above 1-4 points for the middle and highest channel of the EUT.

4.5.4. Result

Temperature () : 22~23	EUT: Reader
Humidity (%RH) : 50~54	M/N: RDR 7(GNG-A741-02)
Barometric Pressure (mbar) : 950~1000	Operation Condition: 2.4G Tx Mode
Test data: Dec 02, 2009	Test engineer: Phenix

Frequency (MHz)	6dB Bandwidth (MHz)	Limits (MHz)
2445	62.975	> 0.5

Test Plot:

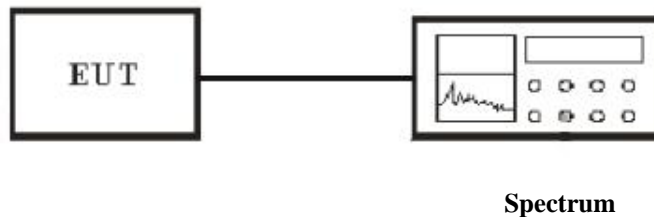


4.6 Power Spectral Density

4.6.1 Applicable Standard

According to section 15.247(d), for digital modulation technique, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

4.6.2 Block diagram of test setup



Connection method: The shield cable was connected with EUT and Spectrum which have $50\Omega Z_C$. The connector of EUT side is original by manufacturer. The connector of Spectrum side is N type.

4.6.3 Measurement method

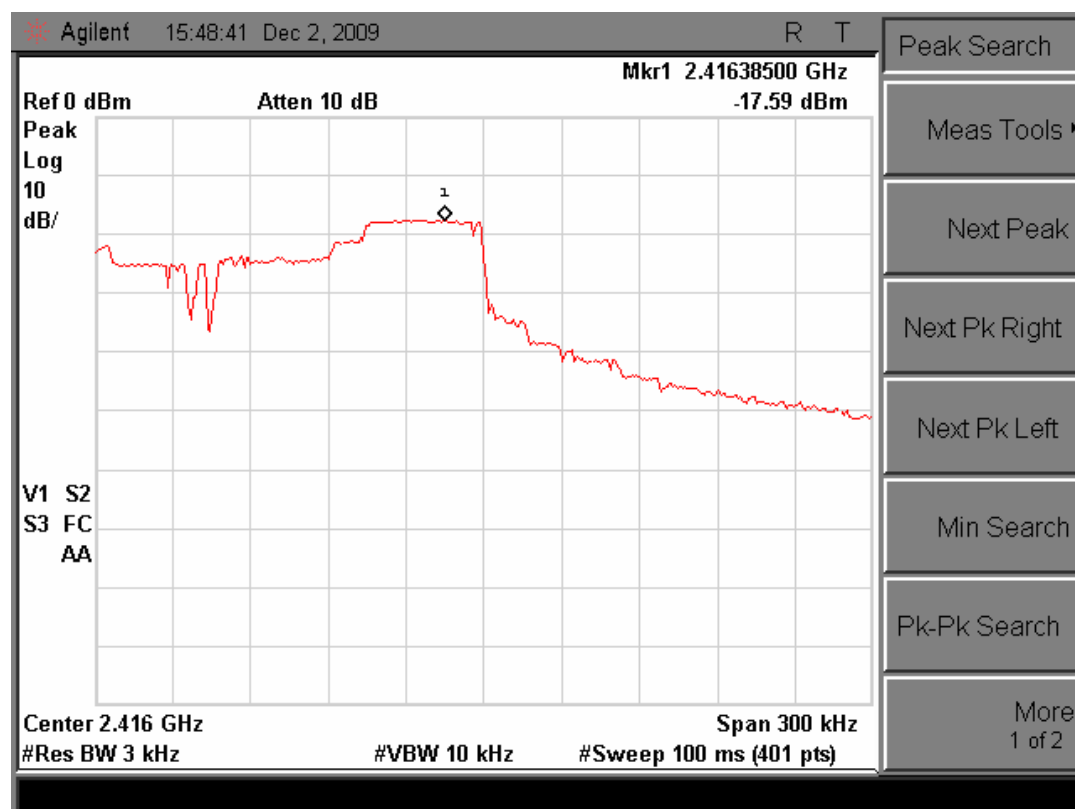
1. The transmitter output was connected to the spectrum analyzer through a shielded cable.
2. Set the spectrum analyzer as RBW=3 kHz, VBW=10 kHz, Span=300 kHz, Sweep=100s.
3. Set Detector to Peak, Trace to Max Hold.
4. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The plot of result is show on the screen of spectrum analyzer.
5. Repeat above 1-4 points for the middle and highest channel of the EUT.

4.6.4. Result

Temperature () : 22~23	EUT: Reader
Humidity (%RH) : 50~54	M/N: RDR 7(GNG-A741-02)
Barometric Pressure (mbar) : 950~1000	Operation Condition: 2.4G Tx Mode
Test data: Dec 02, 2009	Test engineer: Phenix

Frequency (MHz)	Power Spectral Density (MHz)	Limits (dBm)	Margin (dB)
2416	-17.59	8	25.59

Test Plot:



4.7 Spurious Radiated Emission

4.7.1 Applicable Standard

Section 15.247(d): 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. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

4.7.2 Block diagram of test setup

Radiated Measurement Setup:

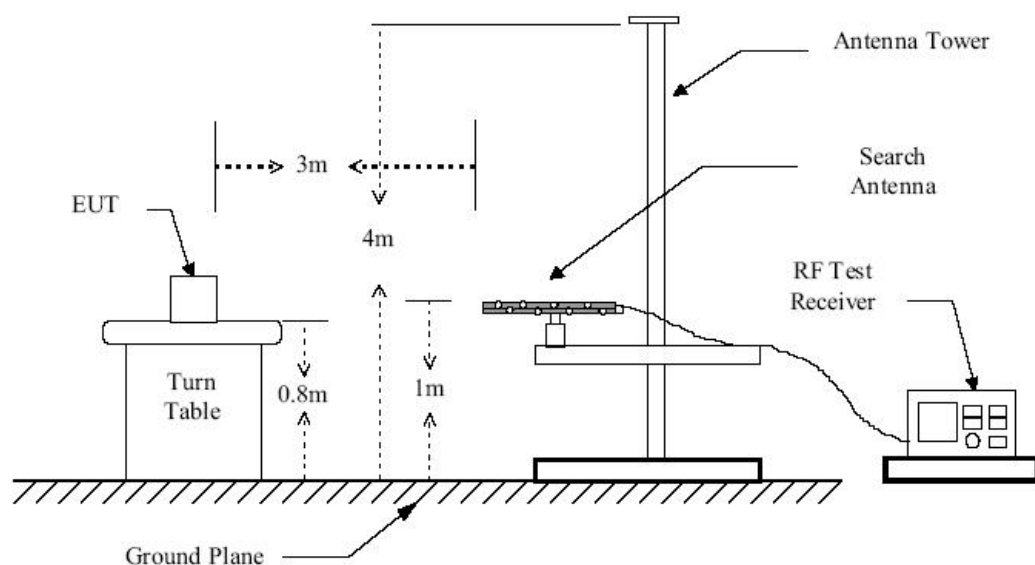


Figure 1 : Frequencies measured below 1 GHz configuration

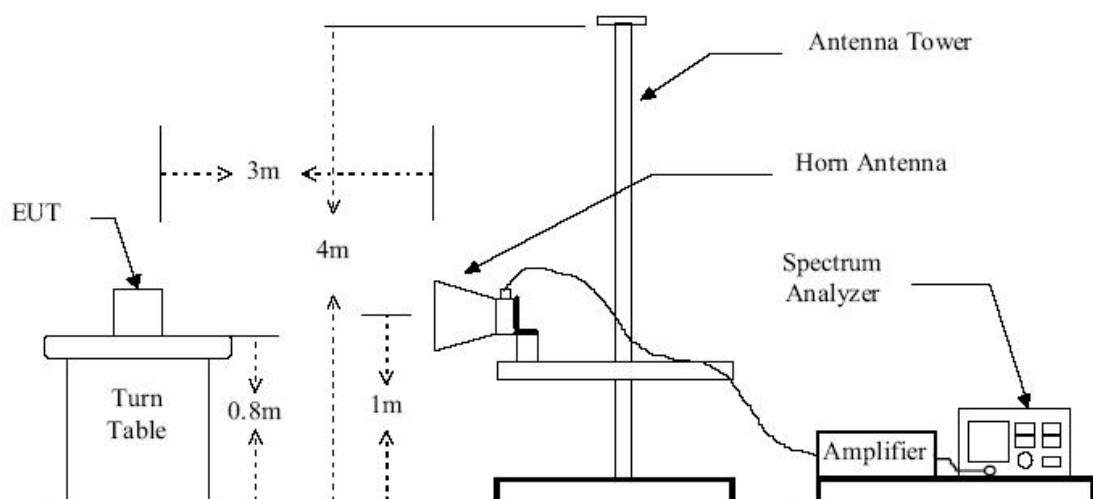
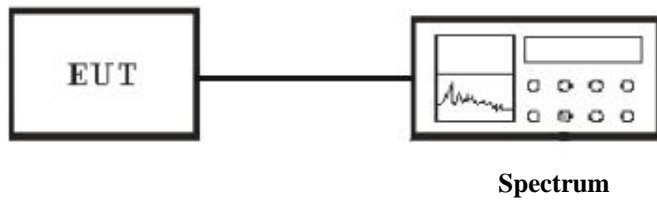


Figure 2 : Frequencies measured above 1 GHz configuration

Conducted Measurement Setup:



Connection method: The shield cable was connected with EUT and Spectrum which have $50\Omega Z_C$. The connector of EUT side is original by manufacturer. The connector of Spectrum side is N type.

4.7.3 Measurement method

Radiated Measurement

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turntable 0.8 meter above ground.
3. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
4. Power on the EUT and all the supporting units.
5. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
6. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
7. For each suspected emission, the antenna tower was scanned (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.

Conducted Measurement

1. For emission above 1GHz, conducted measurement method is used.
2. The transmitter is set to the lowest channel.
3. The transmitter output was connected to the spectrum analyzer via a cable and cable loss is used as the offset of the spectrum analyzer.
4. Set RBW to 100 KHz and VBW to 300 KHz, Then detector set to peak and max hold this trace.
5. The lowest band edges emission was measured and recorded.
6. The transmitter set to the highest channel and repeated 2~4.

4.7.4. Result

PASS

Radiated:

Below 30MHz:

No further spurious emissions found between lowest internal used or generated frequency and 30 MHz.

30M- 1GHz:

2009-11-11 15:18:34

RADIATED EMISSION

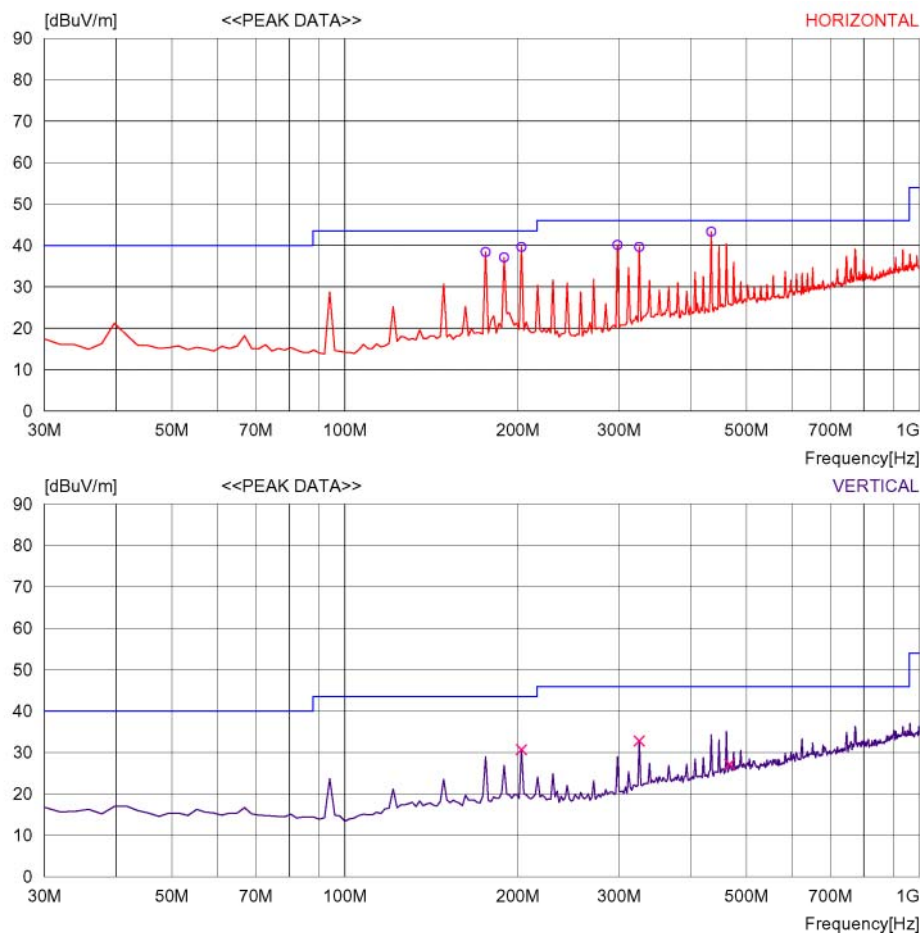
Date : 2009-11-11 15:18:25

Trade Name : GOLDEN
Model Name : RDR 7(GNG-A741-02)
Product Name : Reader
Test Condition : TX ON 2.4GHz

Document No. :
Power Supply : Internal Battery
Temp/Humi : 27/55RH%
Operator : Phenix

Memo :

LIMIT : FCC Part15 Class B(3m)/USA



2009-11-11 15:18:34

RADIATED EMISSION

Date : 2009-11-11 15:18:25

Trade Name	: GOLDEN	Document No.	:
Model Name	: RDR 7(GNG-A741-02)	Power Supply	: Internal Battery
Product Name	: Reader	Temp/Humi	: 27/55RH%
Test Condition	: TX ON 2.4GHz	Operator	: Phenix

Memo :

LIMIT : FCC Part15 Class B(3m)/USA

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	175.792	49.7	12.3	7.9	31.5	38.4	43.5	5.1	200	191
2	189.399	47.8	12.9	7.9	31.5	37.1	43.5	6.4	200	191
3	203.006	49.8	13.3	8.0	31.5	39.6	43.5	3.9	200	12
4	298.257	49.3	13.5	8.6	31.3	40.1	46	5.9	100	199
5	325.471	47.3	14.9	8.7	31.3	39.6	46	6.4	100	335
6	434.328	48.2	17.2	9.2	31.3	43.3	46	2.7	100	150
----- Vertical -----										
7	203.006	40.9	13.3	8.0	31.5	30.7	43.5	12.8	200	278
8	325.471	40.5	14.9	8.7	31.3	32.8	46	13.2	200	357
9	467.374	30.9	18.1	9.5	31.3	27.2	46	18.8	300	172

Above 1GHz:

2009-12-02 18:19:52

RADIATED EMISSION

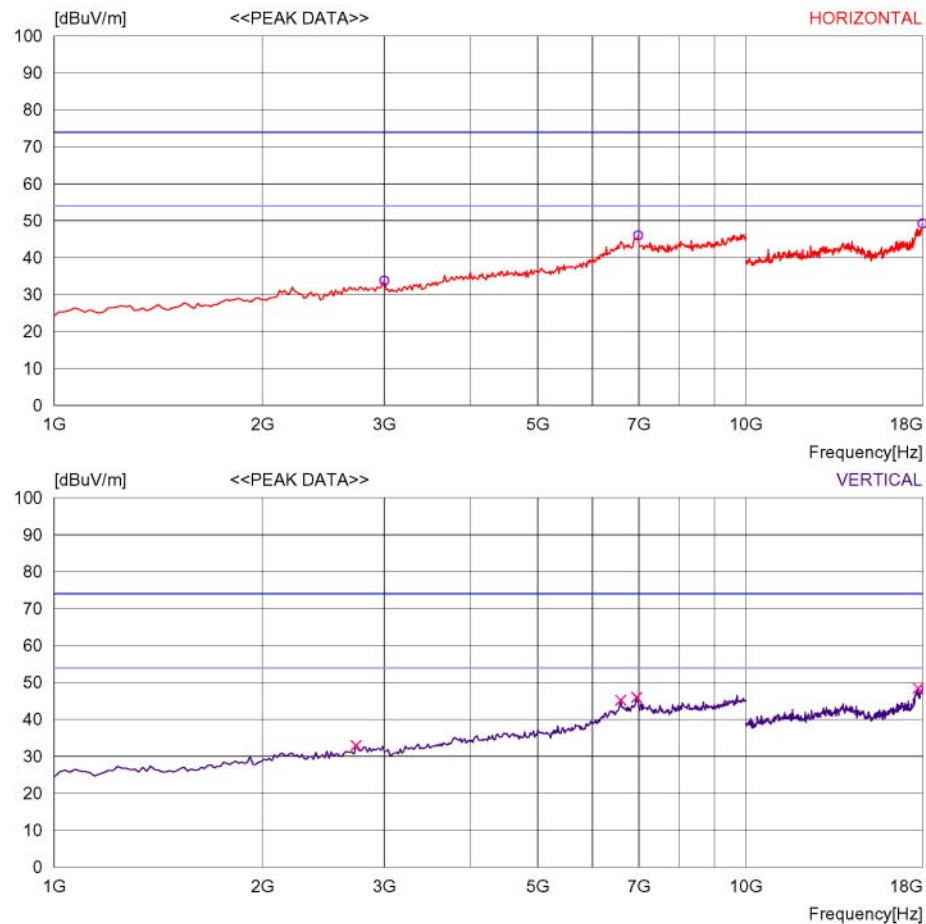
Date : 2009-12-02 18:19:35

Company Name : Golden
Model Name : RDR 7(GNG-A741-02)
Product Name : Reader
Test Condition : TX 2.4G testing

Document No. :
Power Supply : internal battery
Temp/Humi : 27/55RH%
Operator : Phenix

Memo :

LIMIT : FCC Part15 C transmitter spurious above1G(peak)
FCC Part15 C transmitter spurious above1G(average)



2009-12-02 18:19:52

RADIATED EMISSION

Date : 2009-12-02 18:19:35

Company Name : Golden
Model Name : RDR 7(GNG-A741-02)
Product Name : Reader
Test Condition : TX 2.4G testing

Document No. :
Power Supply : internal battery
Temp/Humi : 27/55RH%
Operator : Phenix

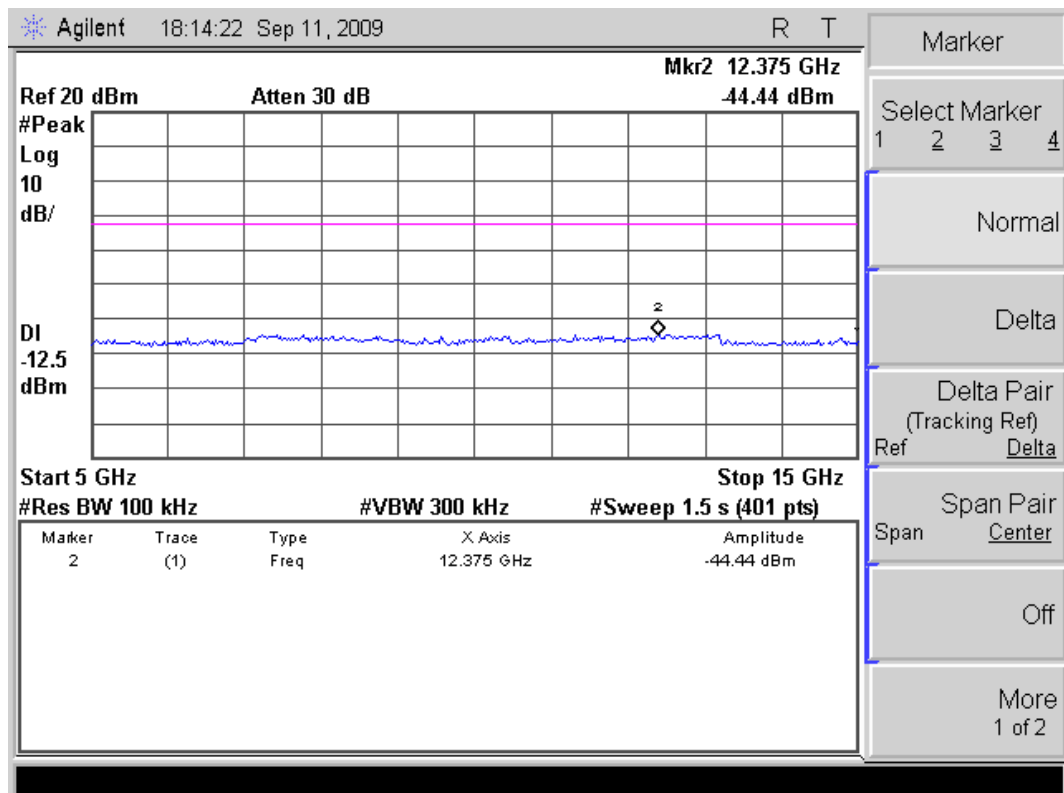
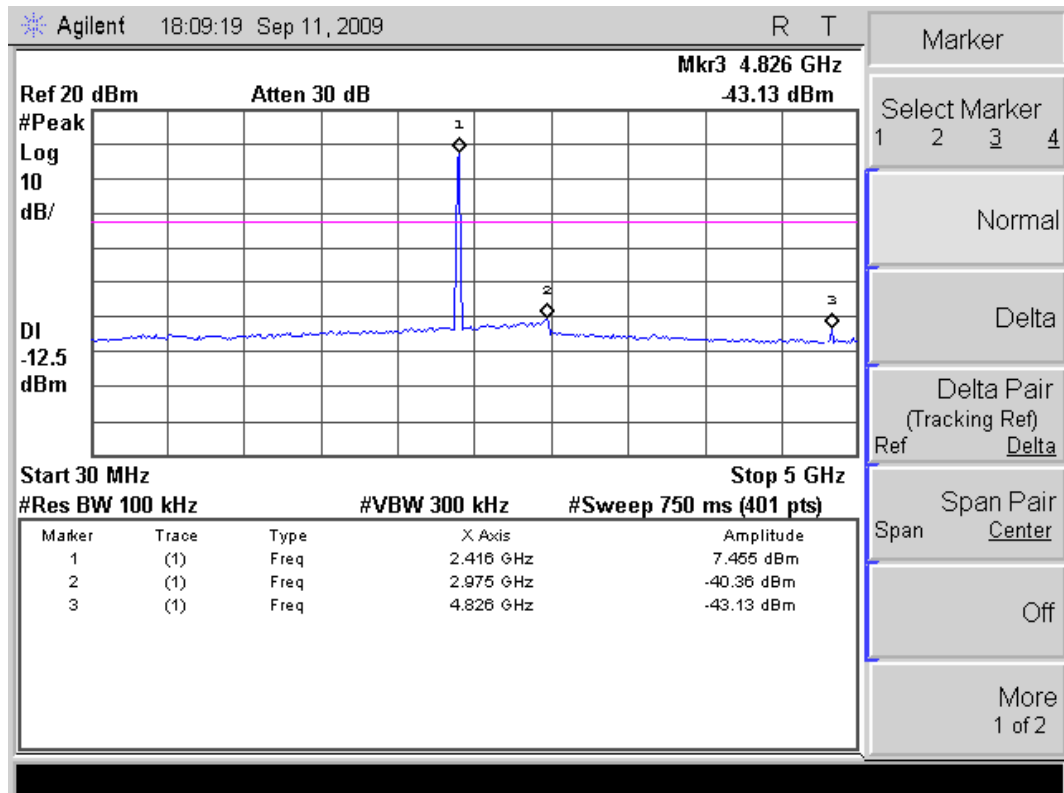
Memo :

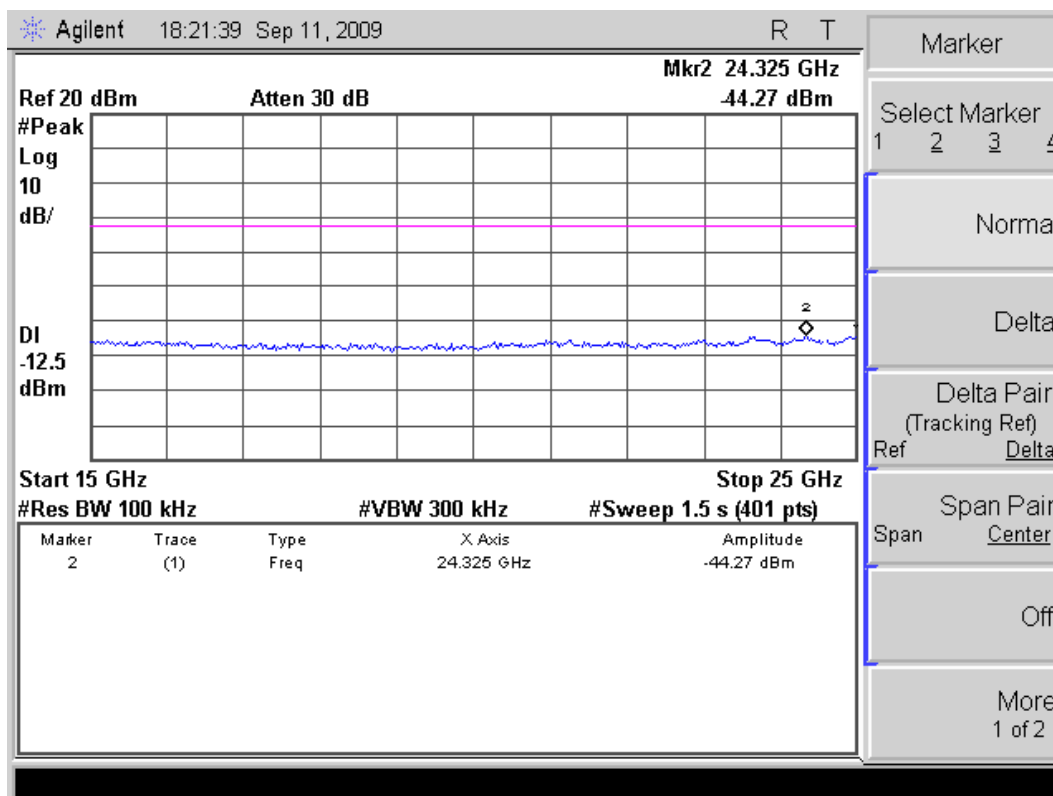
LIMIT : FCC Part15 C transmitter spurious above1G(peak)
FCC Part15 C transmitter spurious above1G(average)

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
---- Horizontal ----										
1	3002.010	34.5	32.3	6.2	39.2	33.8	74	40.2	400	31
2	6987.996	34.6	41.0	9.6	39.2	46.0	74	28.0	100	358
3	18000.000	24.0	49.8	15.6	40.2	49.2	74	24.8	200	150
4	18000.000	24.0	49.8	15.6	40.2	49.2	74	24.8	200	150
---- Vertical ----										
5	2731.469	34.5	31.7	6.0	39.3	32.9	74	41.1	300	59
6	6591.201	35.3	40.2	9.3	39.6	45.2	74	28.8	200	126
7	6951.923	34.8	40.9	9.6	39.3	46.0	74	28.0	300	2
8	17743.480	25.6	47.5	15.6	40.3	48.4	74	25.6	100	14

No further spurious emissions found between 18GHz and 25GHz.

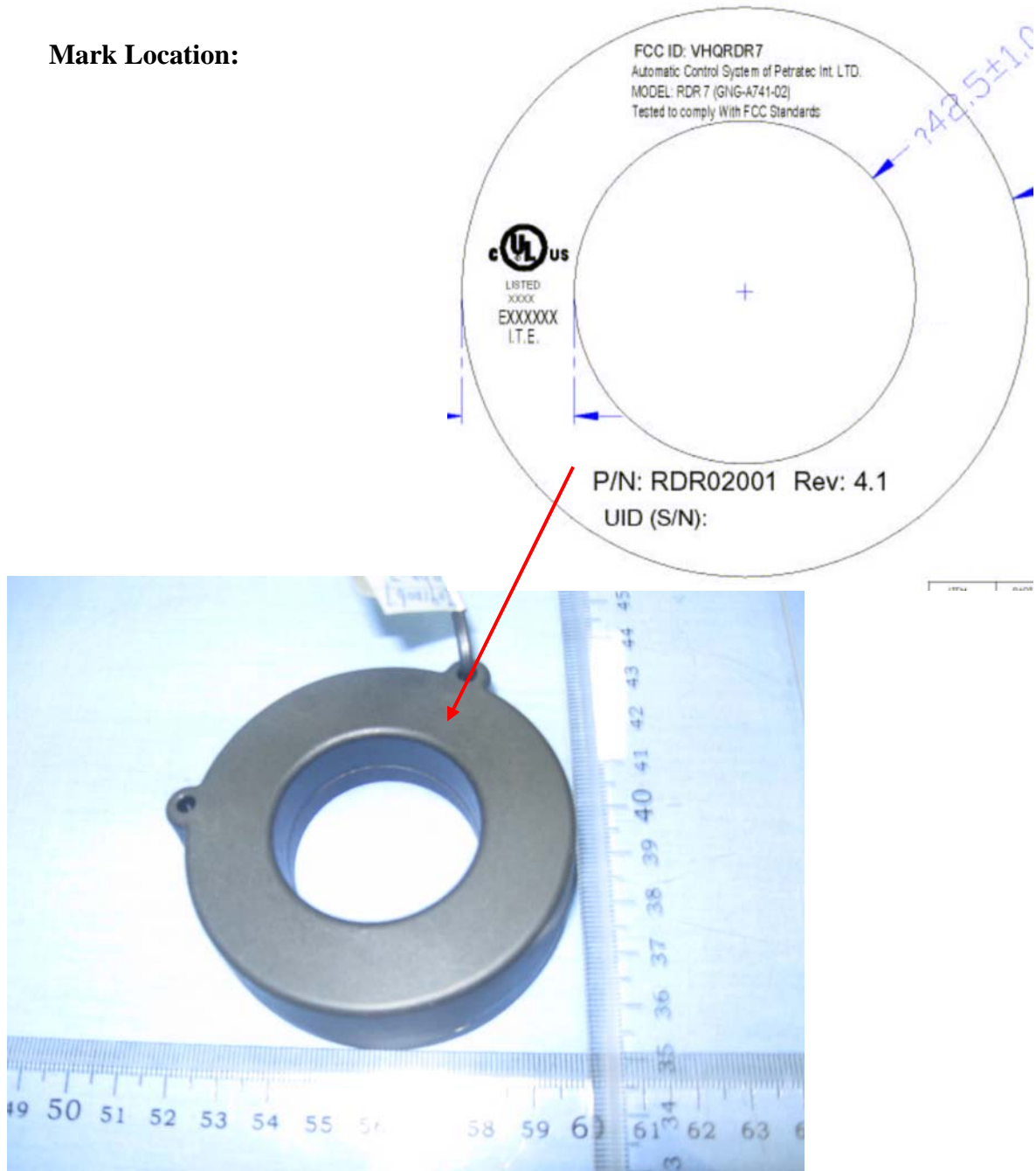
Conducted:





5. FCC ID Label

Mark Location:



5. Test Setup

5.1 Ancillary and Accessory Equipment Used

Connect to GSC, for control EUT:

No.	Description	Specification	Quantity
1.	PC	DELL, M/N:540, S/N: 124XK2X	1
2.	Monitor	DELL, M/N:E157FPc, S/N:CN-OFJ061-64180-69A-06CS	1
3.	Keyboard	DELL, M/N:L100, S/N: CN0RH6566589006860007J	1
4.	Mouse	HP, M/N:M-SBF96	1

5.2 Photographs of the Test Configuration

5.2.1 Radiated emission

Below 1GHz:



Above 1GHz:



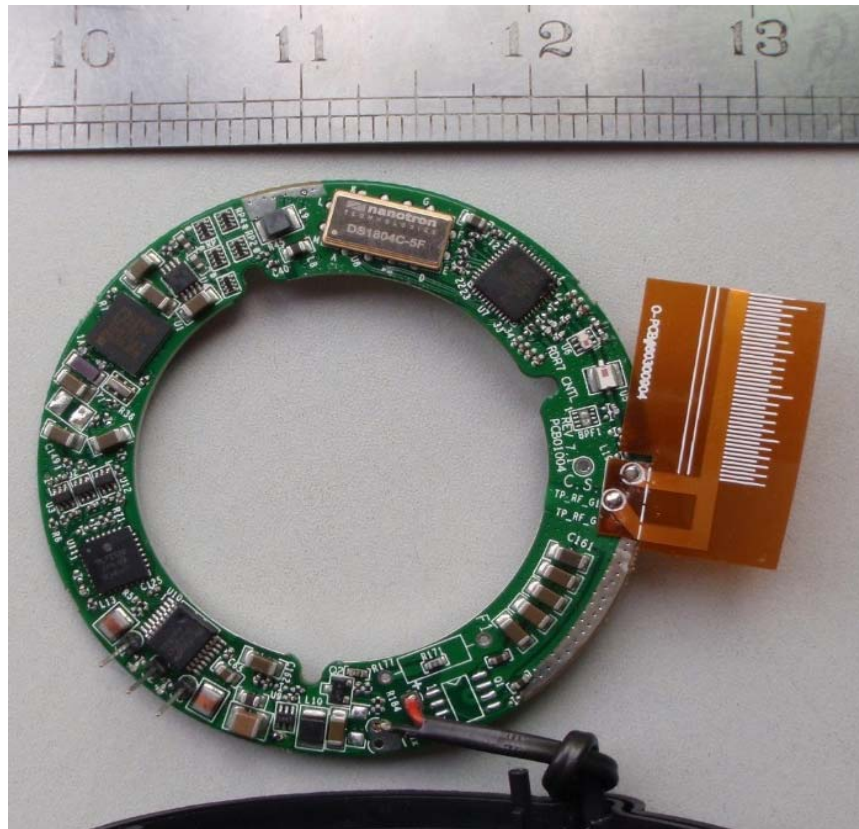
5.3 Photographs of the EUT



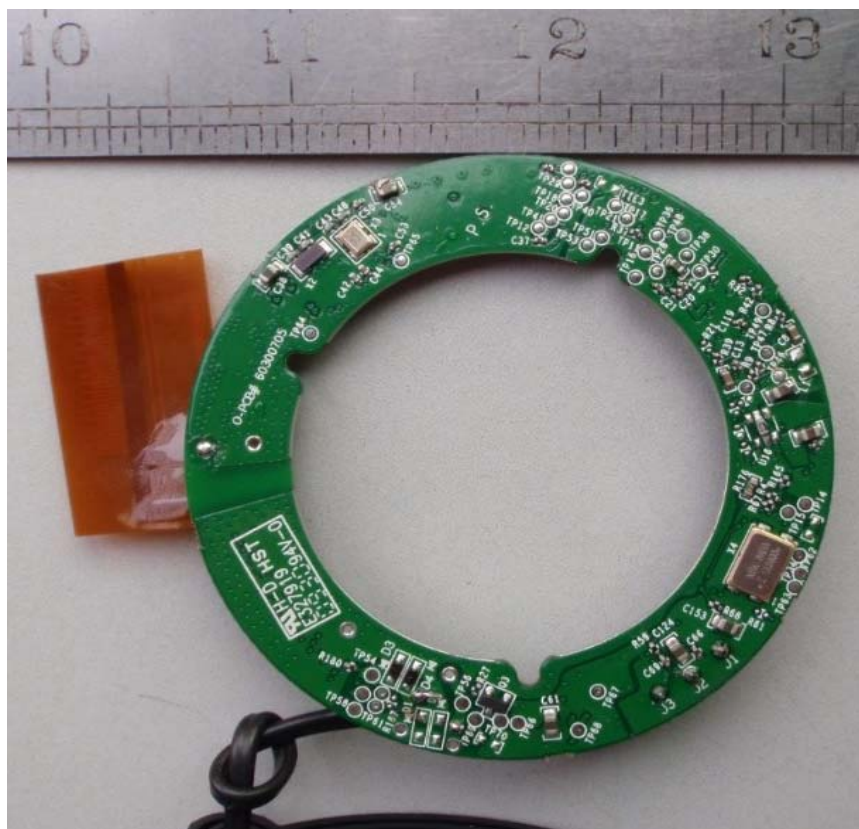
Enclosure of EUT



Enclosure of EUT



PCB of EUT



PCB of EUT



Photo of Battery



Photo of Battery



Connectors

6. Equipment List

No.	Equipment	Manufacturer	Model	Serial No.	Calibration Date
1	Precision Biconical Antenna	TDK Co.	PBA-2030	090500	2009-09-18
2	Precision Log Periodic Antenna	TDK Co.	PLP-3003	061001	2009-09-18
3	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130174	2009-09-18
4	Horn antenna	TDK	HRN-0118	130186	2009-04-07
5	Attenuator 6 dB	Agilent	8491B	MY39260147	2009-09-18
6	Preamplifier	TDK Sonoma	310	242803	2009-04-07
7	Preamplifier	ELENA	EAU-3718 GXA	A070701	2009-04-07
8	EMI Receiver	Rohde & Schwarz	ESIB26	100234	2009-04-07
9	EMI Receiver	Rohde & Schwarz	ESCS30	100350	2009-04-07
10	Spectrum Analyzer	Agilent	E4403B	MY44210199	2009-04-07
11	Art. Mains Network	EMCO	3816/2	00044921	2009-04-07
12	Transient Limiter(10 dB)	Agilent	11947A	3107A03736	2009-04-07
13	Personal Computer	HP	DX2000MT	MXD4250FZM	N/A
14	Personal Computer	HP	DX2000MT	MXD4130B2N	N/A
15	Semi-Anechoic Chamber	TDK Co.	N/A	N/A	2009-04-07
16	Shielded Room	TDK Co.	N/A	N/A	N/A
17	Loop Antenna	EMCO	6502	9107-2440	2009-04-07

7. Test Uncertainty

Test	Range	Confidence Level	Calculated Uncertainty
Radiated emission(3m)	30-1000MHz	95%	4.3dB
Conducted emission	0.15-30MHz	95%	3.3dB

8. Appendix

8.1 Confirmation of Compliance within the Limits

8.1.1 Method of calculating measurement result

Radiated Emission

For example the point of 203.006MHz, vertical, Page 25.

$$\begin{array}{ccccccccccccc}
 & \text{Reading} & + & \text{Antenna} & + & \text{Cable} & - & \text{Gain} & = & \text{Result} \\
 & & & \text{factor} & & \text{loss} & & & & & \\
 \text{Example} & 40.9 & + & 13.3 & + & 8.0 & - & 31.5 & = & 30.7
 \end{array}$$