

FCC Radio TEST Report

FCC ID: ZJC710RX

This report concerns (check one) : ☒ Original Grant ☐ Class II Change

Report No. : NTEK-2011NT0512386E
Product : Receiver
Model No. : 710/711/712/720/820/823/826/827/830/831/910/912/921/
230/231/232/270/277
Applicant : Yi zhi ying electronics co.,Ltd.
Address : 3Floor A2 Building Xifang , Shatou Area, Changan Town
Dongguan, guangdong ,China

Issued by : NTEK Testing Technology Co., Ltd
3/F,Block B, Hua feng Technology & Business Building,
Lab Location : Xin 'an 6 Road, Bao an Center District, Shenzhen,
China
Tel : (86)-0755-61156588 Fax: (86)-0755-61156599

Date of Test:

May. 6-11, 2011

Date of Issue:

May. 12, 2011

Test Result : Pass

Standards: FCC Part 15 subpart C(15.249)

Testing Engineer : Jake Wang
(Jake Wang)
Technical Manager : Ada Li
(Ada Li)
Authorized Signatory : Can Liu
(Can Liu)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C (15.249)			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	Note(1)
15.203	Antenna Requirement	Pass	
15.249	Radiated Spurious Emission	Pass	
15.249	Occupied Bandwidth	Pass	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report.

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd

Add. : 3/F,Block B, Hua feng Technology & Business Building, Xin 'an 6 Road, Bao an Center District, Shenzhen, China

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)
C01	ANSI C63.4-2003	150 KHz ~ 30MHz	1.94

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)
OS-01	ANSI C63.4-2003	30MHz ~ 200MHz	V	2.93
		30MHz ~ 200MHz	H	2.86
		200MHz ~ 1,000MHz	V	3.86
		200MHz ~ 1,000MHz	H	3.94

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Receiver	
Brand Name	N/A	
Model Name.	710/711/712/720/820/823/826/827/830/831/910/912/921/230/231/232/270/277	
OEM Brand/Model Name	N/A	
Model Difference	All the model are identical except the model name.	
Manufacturer	Yi zhi ying electronics co.,Ltd.	
Manufacturer Address	3Floor A2 Building Xifang , Shatou Area, Changan Town Dongguan, guangdong ,China	
Product Description	The EUT is Receiver	
	Product Type	Low Power Communication Device
	Operation Frequency:	2402~2479 MHz
	Modulation Type:	GFSK
	Number Of Channel	16CH .Please see below
	Antenna Designation:	Printed ANT
	Antenna Gain(Peak)	2.42dBi
	EIRP Power:	85.57 dBuV/m (AV Max.)
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.		
Channel List	Refer to below	
Power Source	DC Voltage supplied from PC	
Power Rating	DC 5.0V	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

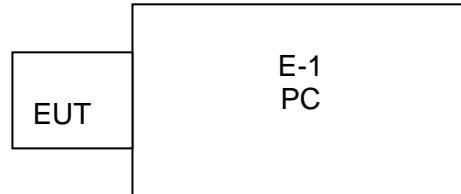
1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	05	2425	09	2447	13	2468
02	2405	06	2433	10	2450	14	2471
03	2408	07	2435	11	2462	15	2476
04	2411	08	2439	12	2465	16	2479

2.2 DESCRIPTION OF TEST CONDITIONS

(1) EUT was tested in normal configuration (Please See following Block diagram)

1. Block diagram of EUT configuration



(2) E.U.T. test conditions:

15.31(e) :For intentional radiators, measurements of the variation of the input power or the adiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% ofthe nominal rated supply voltage. For battery operated equipment, theequipment tests shall be performed using a new battery.

(3) Test frequencies:

According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. if required. reported for each band in which the device can be operated with the device operating at the number of fequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

(4) Frequency range of radiated measurements:

According to the 15.33,The test range will be upto the tenth harmonic of the highest fundamental frequency,

2.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	PC	Lenovo	G450	DOC	N/A	

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.4 EQUIPMENTS LIST FOR ALL TEST ITEMS

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Due Date
1	Spectrum Analyzer	ADVANTEST	R3182	150900201	2012.04.16
2	EMI Measuring Receiver	Schaffner	SCR3501	235	2012.04.06
3	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2011.09.06
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2012.04.07
5	TRILOG Super Broadband test Antenna	TESTQ	CBL611D	9160-3206	2012.05.01
6	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	451	2011.07.14
7	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2011.09.06
8	EMI Test Receiver	R&S	ESCI	100124	2011.12.27
9	LISN	Kyoritsu	KNW-242	8-837-4	2012.04.06
10	LISN	Kyoritsu	KNW-407	8-1789-3	2012.04.06
11	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2011.09.06
12	Loop Antenna	ARA	PLA-1030/B	1029	2012.03.19

3. TEST RESULT

3.1 ANTENNA REQUIREMENT

3.1.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

3.1.2 EUT ANTENNA

The EUT antenna is integral Antenna. It comply with the standard requirement.

3.2 CONDUCTED EMISSION MEASUREMENT

3.2.1 POWER LINE CONDUCTED EMISSION LIMITS (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

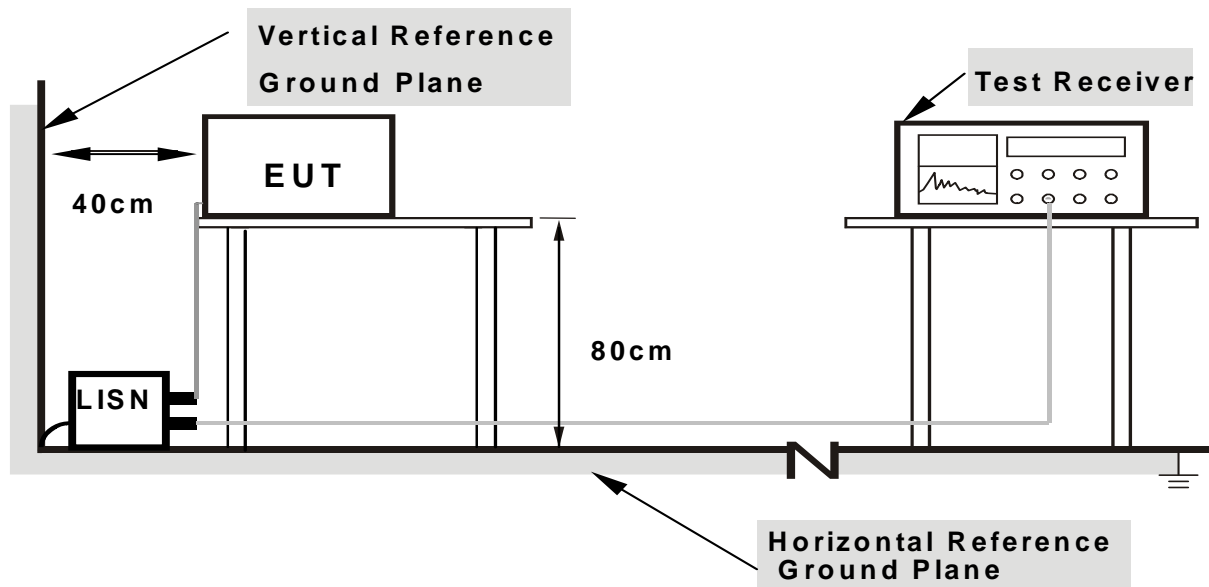
3.2.2 TEST PROCEDURE

- The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.3 DEVIATION FROM TEST STANDARD

No deviation

3.2.4 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

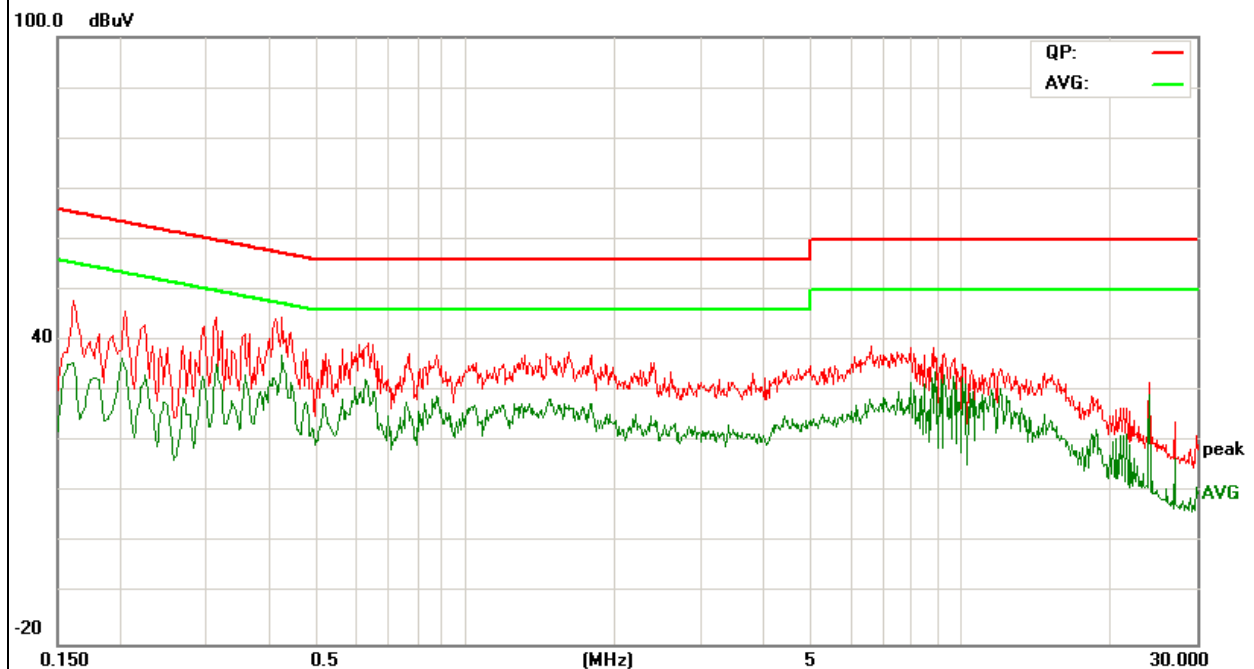
3.2.5 TEST RESULTS

EUT :	Receiver	Model Name. :	710
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2011-5-7
Test Mode :	Running	Phase :	Line
Test Voltage :	DC 5V from PC AC 120V/60Hz		

Frequency (MHz)	Factor (dB)	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
		QP	Average	QP	Average	QP	Average	QP	Average
0.1620	11.68	36.19	23.95	47.87	35.63	65.36	55.36	-17.49	-19.73
0.2060	11.10	34.90	25.51	46.00	36.61	63.37	53.53	-17.37	-16.92
0.3140	10.71	33.97	24.55	44.68	35.26	59.86	49.86	-15.18	-14.60
*0.4260	10.49	34.10	26.61	44.59	37.10	57.33	47.33	-12.74	-10.23
0.6380	10.28	29.35	22.10	39.63	32.38	56.00	46.00	-16.37	-13.62
8.8220	10.26	28.43	23.53	38.69	33.79	60.00	50.00	-21.31	-16.21

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. '*' means the worst case

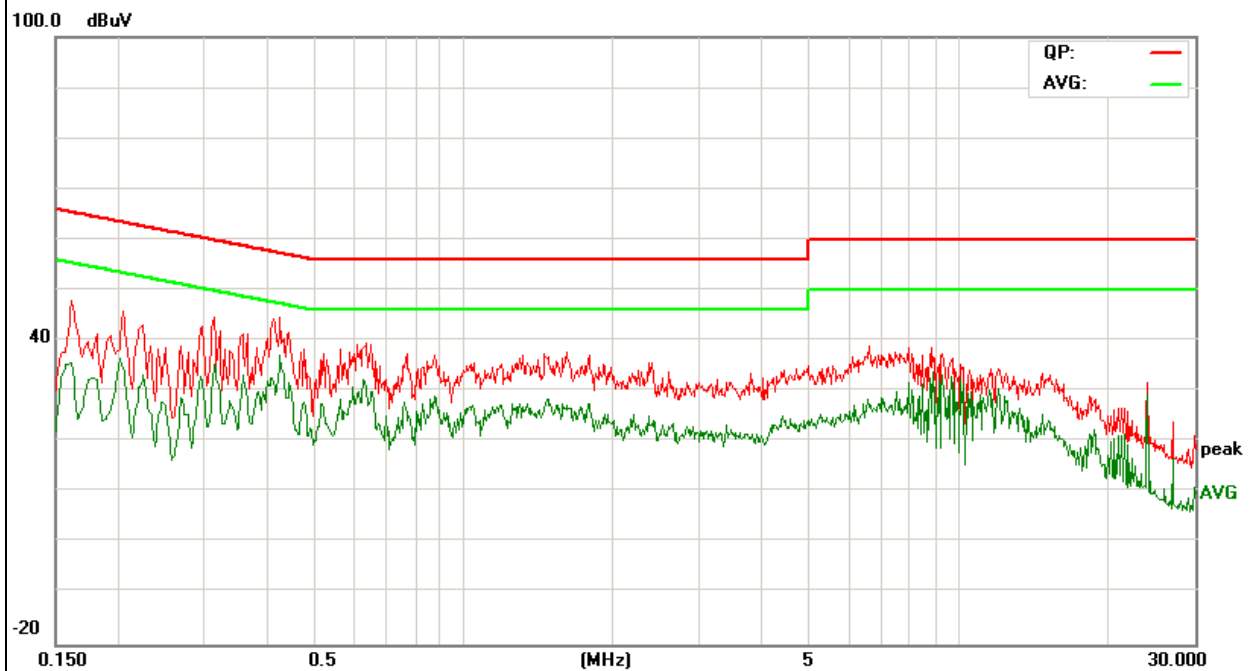


EUT :	Receiver	Model Name. :	710
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2011-5-7
Test Mode :	Running	Phase :	Neutral
Test Voltage :	DC 5V from PC AC 120V/60Hz		

Frequency (MHz)	Factor (dB)	Meter Reading (dBμV)		Emission Level (dBμV)		Limits (dBμV)		Margin (dB)	
		QP	Average	QP	Average	QP	Average	QP	Average
0.1620	11.68	36.19	23.95	47.87	35.63	65.36	55.36	-17.49	-19.73
0.2060	11.10	34.90	25.51	46.00	36.61	63.37	53.53	-17.37	-16.92
0.3140	10.71	33.97	24.55	44.68	35.26	59.86	49.86	-15.18	-14.60
*0.4260	10.49	34.10	26.61	44.59	37.10	57.33	47.33	-12.74	-10.23
0.6380	10.28	29.35	22.10	39.63	32.38	56.00	46.00	-16.37	-13.62
8.8220	10.26	28.43	23.53	38.69	33.79	60.00	50.00	-21.31	-16.21

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. '*' means the worst case



3.3 RADIATED EMISSION MEASUREMENT

3.3.1 RADIATED EMISSION LIMITS (FCC 15.209)

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.249)

Frequency of Emission (MHz)	Field Strength of fundamental (microvolts/meter)	Field Strength of Harmonics (microvolts/meter)
2400 - 2483.5	50	500

Notes:

- (1) 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 Section 15.209, whichever is the lesser attenuation.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1MHz / 1MHz for Peak

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.3.2 TEST PROCEDURE

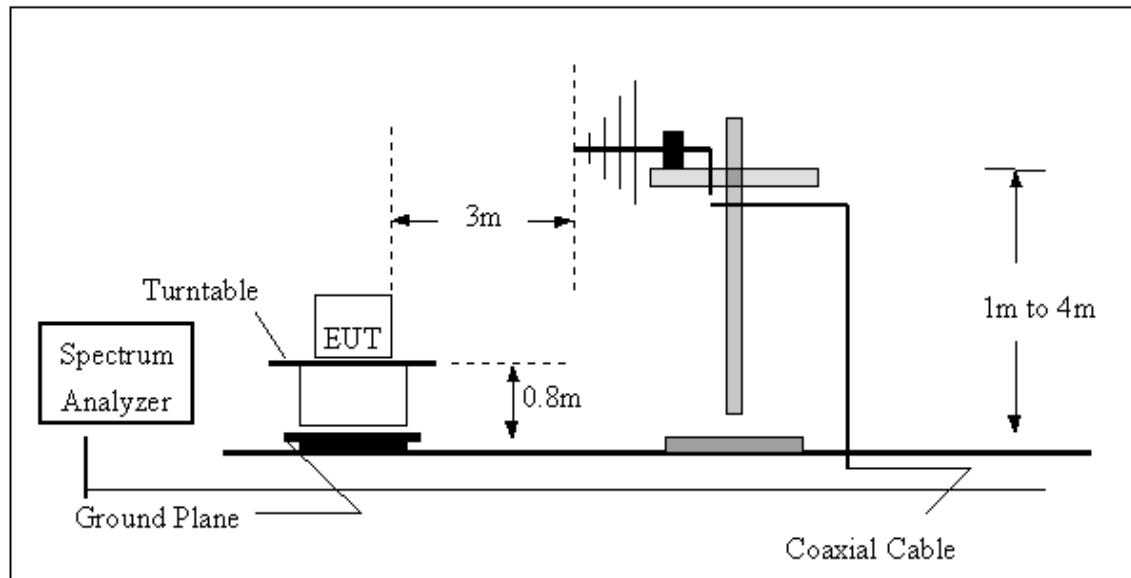
- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement. performed pretest to three orthogonal axis.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3.3 DEVIATION FROM TEST STANDARD

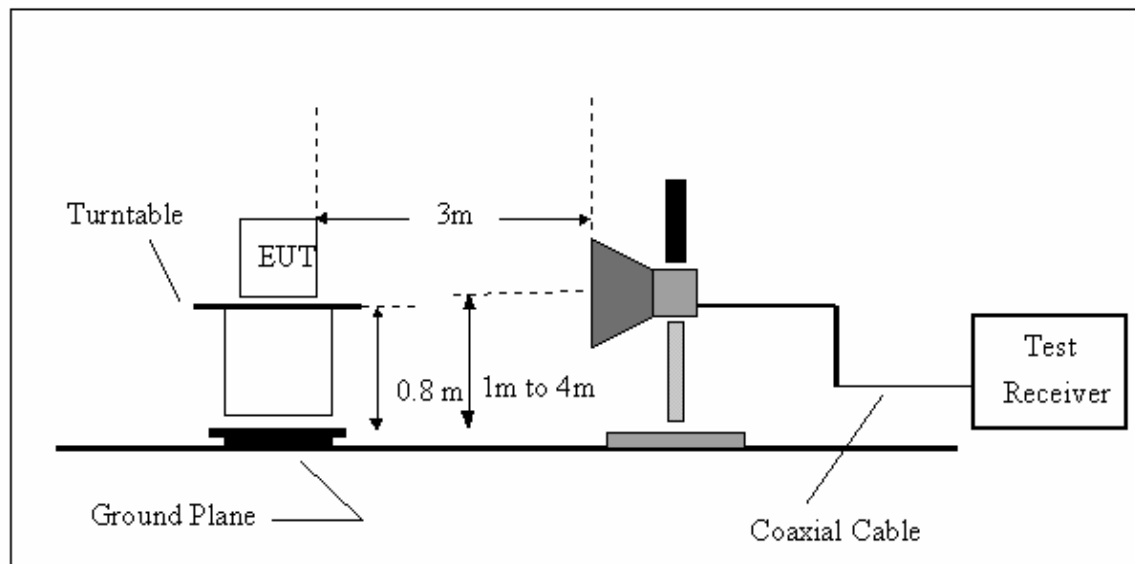
No deviation

3.3.4 TEST SETUP

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



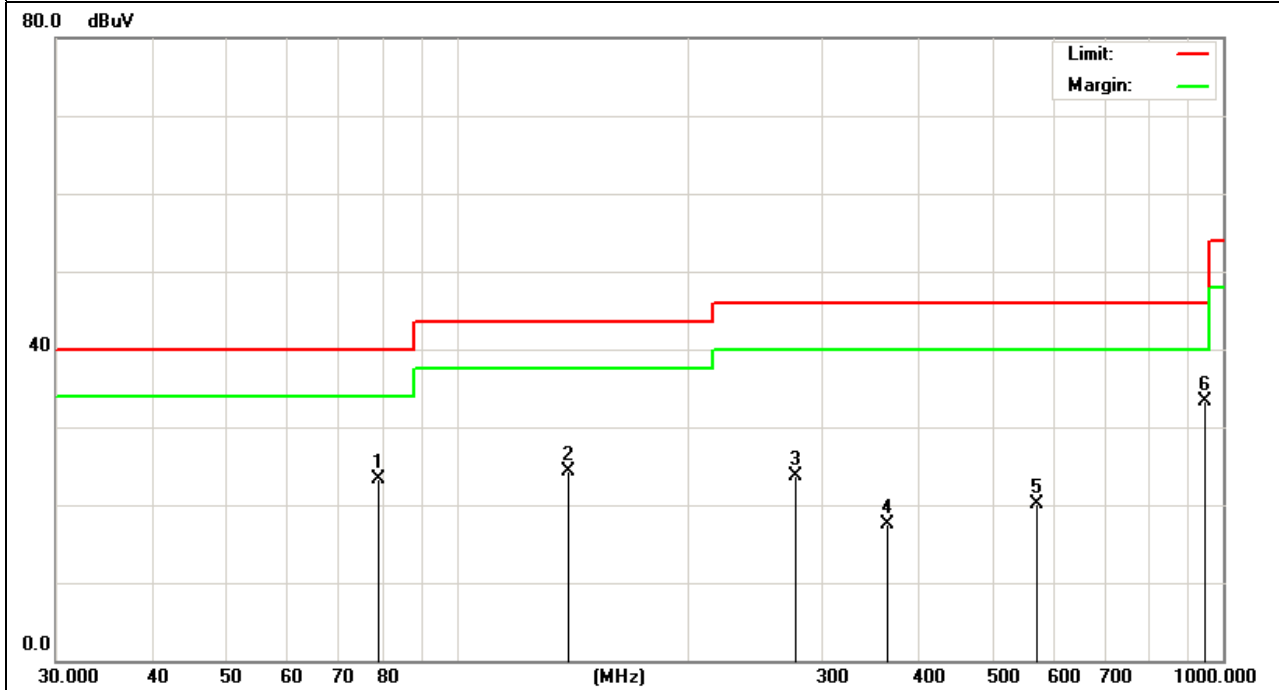
(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



3.3.5 TEST RESULTS (BETWEEN 9KHz – 1000 MHz)

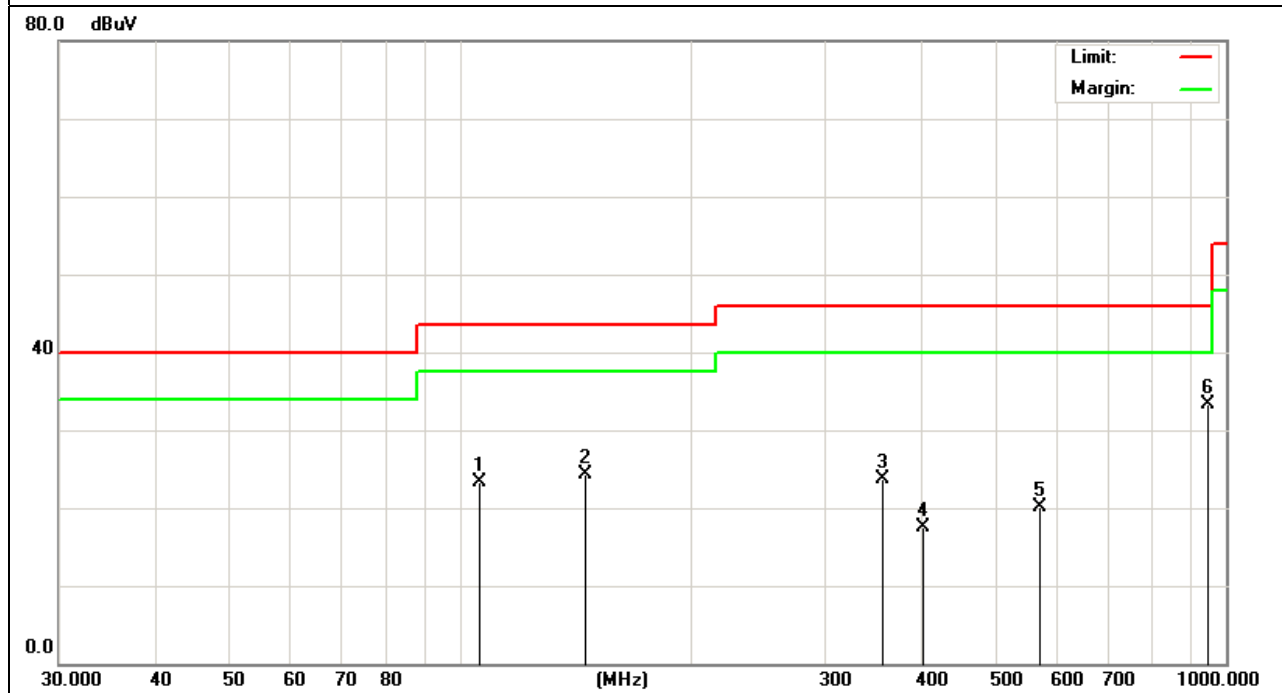
EUT :	Receiver	Model Name :	710
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2011-5-10
Test Mode :	TX	Polarization :	Horizontal
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
78.97	40.13	-16.75	23.38	40.00	-16.62	Quasi-Peak
139.36	35.96	-11.69	24.27	43.50	-19.23	Quasi-Peak
277.09	34.65	-10.95	23.70	46.00	-22.30	Quasi-Peak
364.26	25.95	-8.45	17.50	46.00	-28.50	Quasi-Peak
572.61	23.51	-3.31	20.20	46.00	-25.80	Quasi-Peak
945.44	30.98	2.30	33.28	46.00	-12.72	Quasi-Peak



EUT :	Receiver	Model Name :	710
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2011-5-10
Test Mode :	TX	Polarization :	Vertical
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
105.68	38.06	-14.68	23.38	43.50	-20.12	Quasi-Peak
145.78	35.52	-11.25	24.27	43.50	-19.23	Quasi-Peak
355.88	32.41	-8.71	23.70	46.00	-22.30	Quasi-Peak
400.59	24.85	-7.35	17.50	46.00	-28.50	Quasi-Peak
572.61	23.51	-3.31	20.20	46.00	-25.80	Quasi-Peak
945.44	30.98	2.30	33.28	46.00	-12.72	Quasi-Peak



Remark :

- (1) '*' means the worst case
Measurement Level = Reading Level + Factor
Factor=Ant Factor + Cable Loss
- (2) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission .
- (3) Data of measurement within this frequency range shown " - " 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.

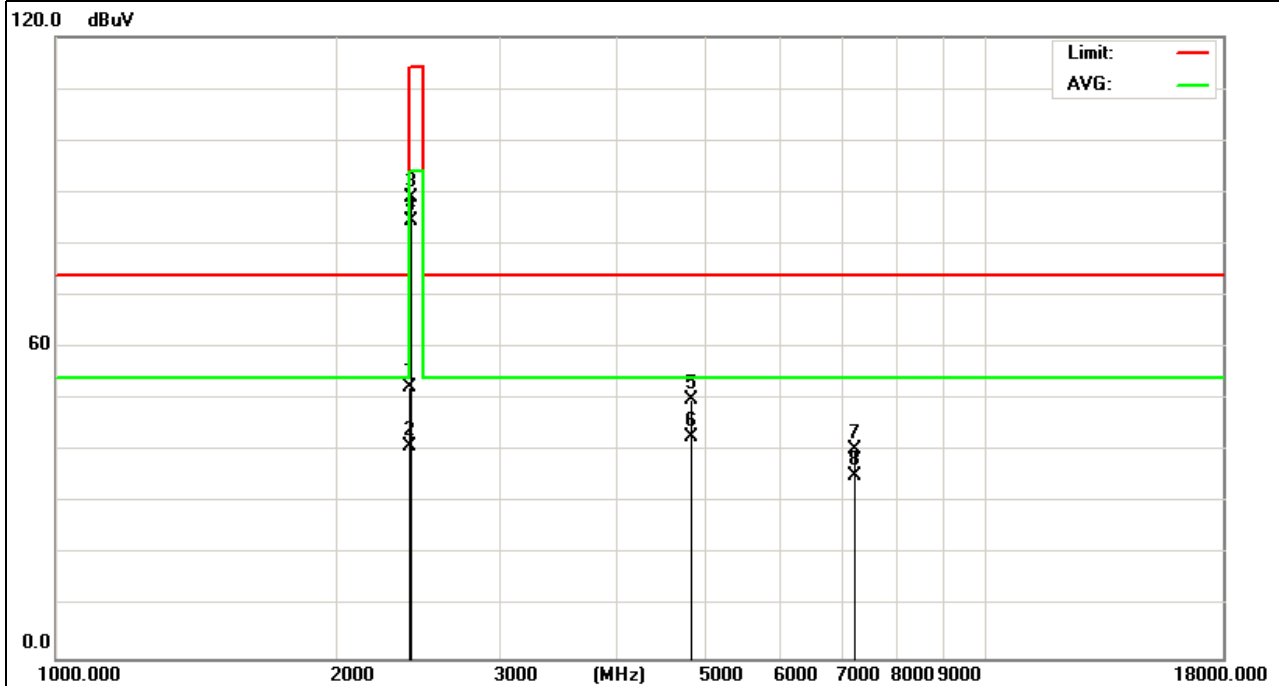
3.3.6 TEST RESULTS (Above 1000 MHz)

EUT :	Receiver	Model Name :	710
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2011-5-10
Test Mode :	TX 2402MHz	Polarization :	Horizontal
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2400.00	54.12	-1.79	52.33	74.00	-21.67	peak
2400.00	42.87	-1.79	41.08	54.00	-12.92	AVG
2402.00	90.63	-1.77	88.86	114.00	-25.14	peak
2402.00	86.31	-1.77	84.54	94.00	-9.46	AVG
4804.00	45.86	4.12	49.98	74.00	-24.02	peak
4804.00	38.62	4.12	42.74	54.00	-11.26	AVG
7206.00	28.59	11.64	40.23	74.00	-33.77	peak
7206.00	23.51	11.64	35.15	54.00	-18.85	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

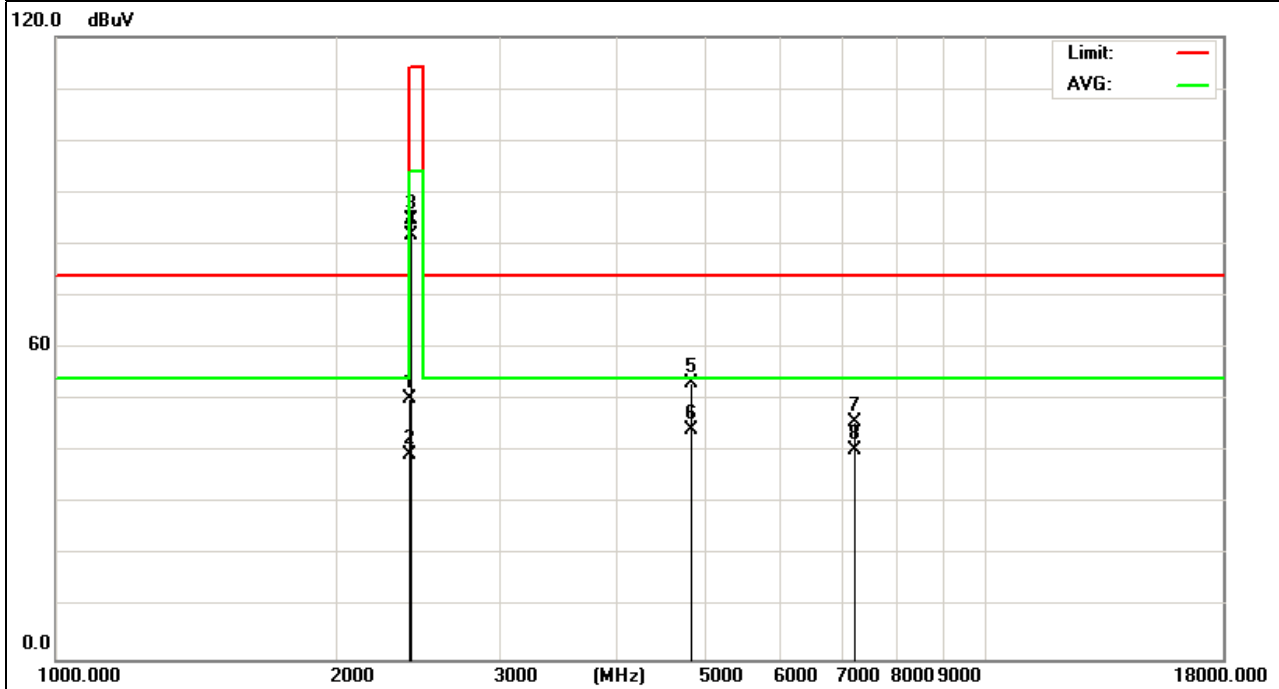


EUT :	Receiver	Model Name :	710
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2011-5-10
Test Mode :	TX 2402MHz	Polarization :	Vertical
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2400.00	51.93	-1.79	50.14	74.00	-23.86	peak
2400.00	41.18	-1.79	39.39	54.00	-14.61	AVG
2402.00	86.41	-1.77	84.64	114.00	-29.36	peak
2402.00	83.54	-1.77	81.77	94.00	-12.23	AVG
4804.00	49.08	4.12	53.20	74.00	-20.80	peak
4804.00	39.99	4.12	44.11	54.00	-9.89	AVG
7206.00	34.10	11.64	45.74	74.00	-28.26	peak
7206.00	28.59	11.64	40.23	54.00	-13.77	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

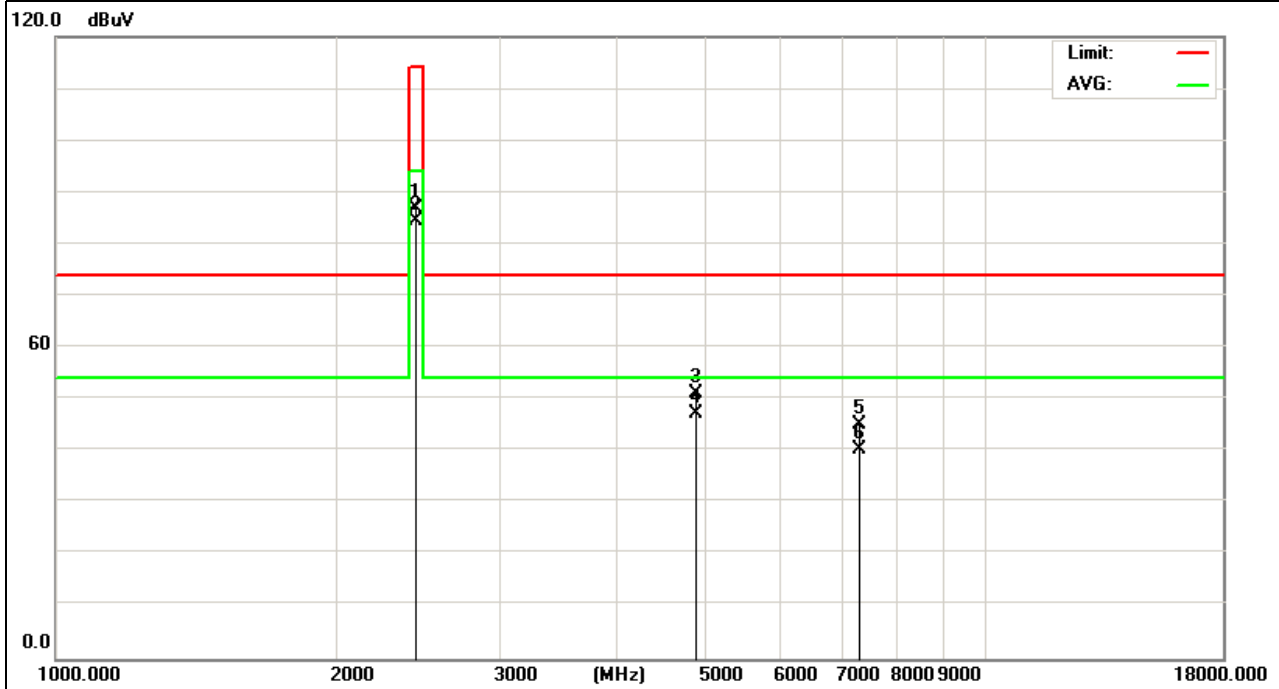


EUT :	Receiver	Model Name :	710
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2011-5-10
Test Mode :	TX 2439MHz	Polarization :	Horizontal
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2439.00	88.50	-1.70	86.80	114.0 0	-27.20	peak
2439.00	86.12	-1.70	84.42	94.00	-9.58	AVG
4878.00	47.03	4.25	51.28	74.00	-22.72	peak
4878.00	42.97	4.25	47.22	54.00	-6.78	AVG
7317.00	33.26	11.95	45.21	74.00	-28.79	peak
7317.00	28.29	11.95	40.24	54.00	-13.76	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

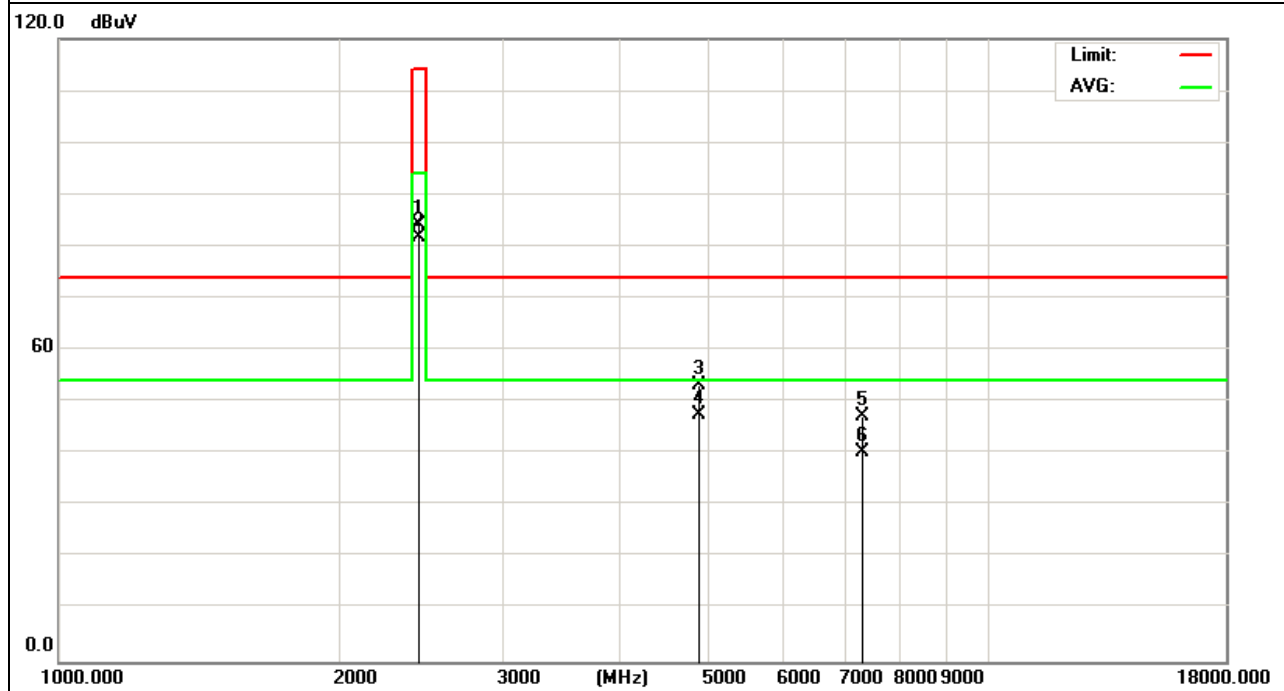


EUT :	Receiver	Model Name :	710
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2011-5-10
Test Mode :	TX 2439MHz	Polarization :	Vertical
Test Power :	DC 5V		

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2439.00	85.92	-1.70	84.22	114.0 0	-29.78	peak
2439.00	83.44	-1.70	81.74	94.00	-12.26	AVG
4878.00	48.95	4.25	53.20	74.00	-20.80	peak
4878.00	43.23	4.25	47.48	54.00	-6.52	AVG
7317.00	35.17	11.95	47.12	74.00	-26.88	peak
7317.00	28.50	11.95	40.45	54.00	-13.55	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

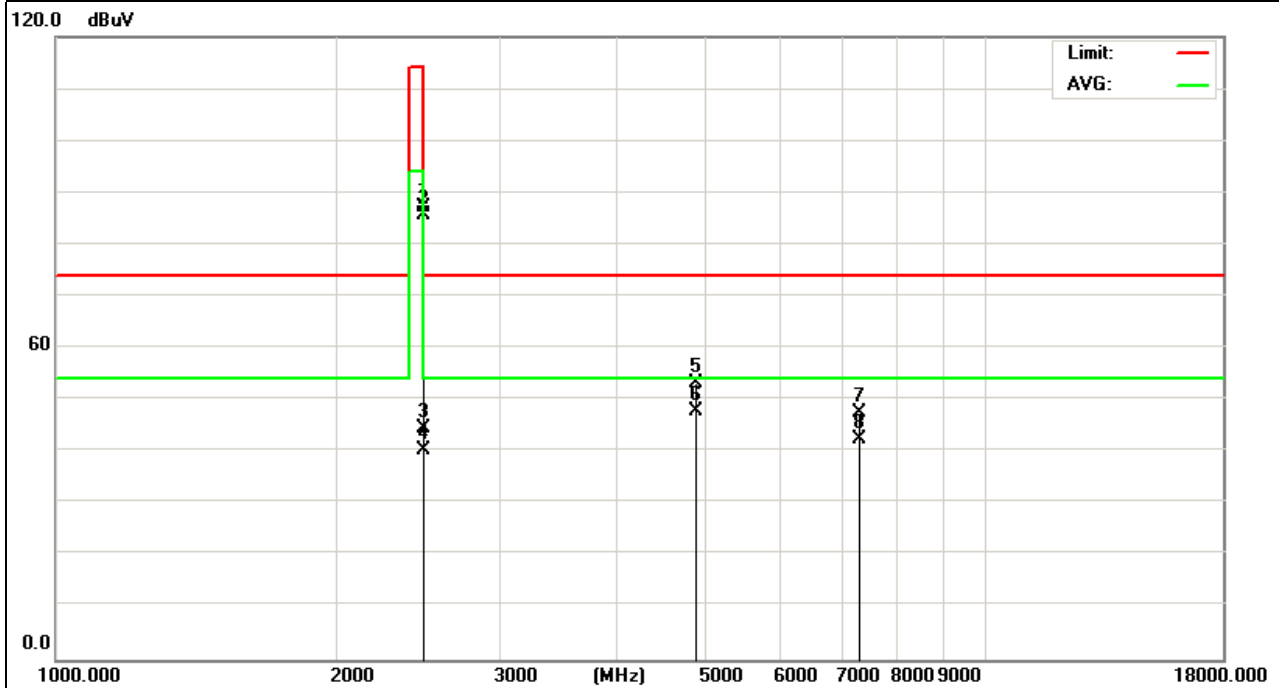


EUT :	Receiver	Model Name :	710
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2011-5-10
Test Mode :	TX 2479MHz	Polarization :	Horizontal
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2479.00	88.70	-1.59	87.11	114.0 0	-26.89	peak
2479.00	87.16	-1.59	85.57	94.00	-8.43	AVG
2483.50	46.15	-1.58	44.57	74.00	-29.43	peak
2483.50	41.79	-1.58	40.21	54.00	-13.79	AVG
4958.00	48.95	4.25	53.20	74.00	-20.80	peak
4958.00	43.62	4.25	47.87	54.00	-6.13	AVG
7437.00	35.60	11.95	47.55	74.00	-26.45	peak
7437.00	30.62	11.95	42.57	54.00	-11.43	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

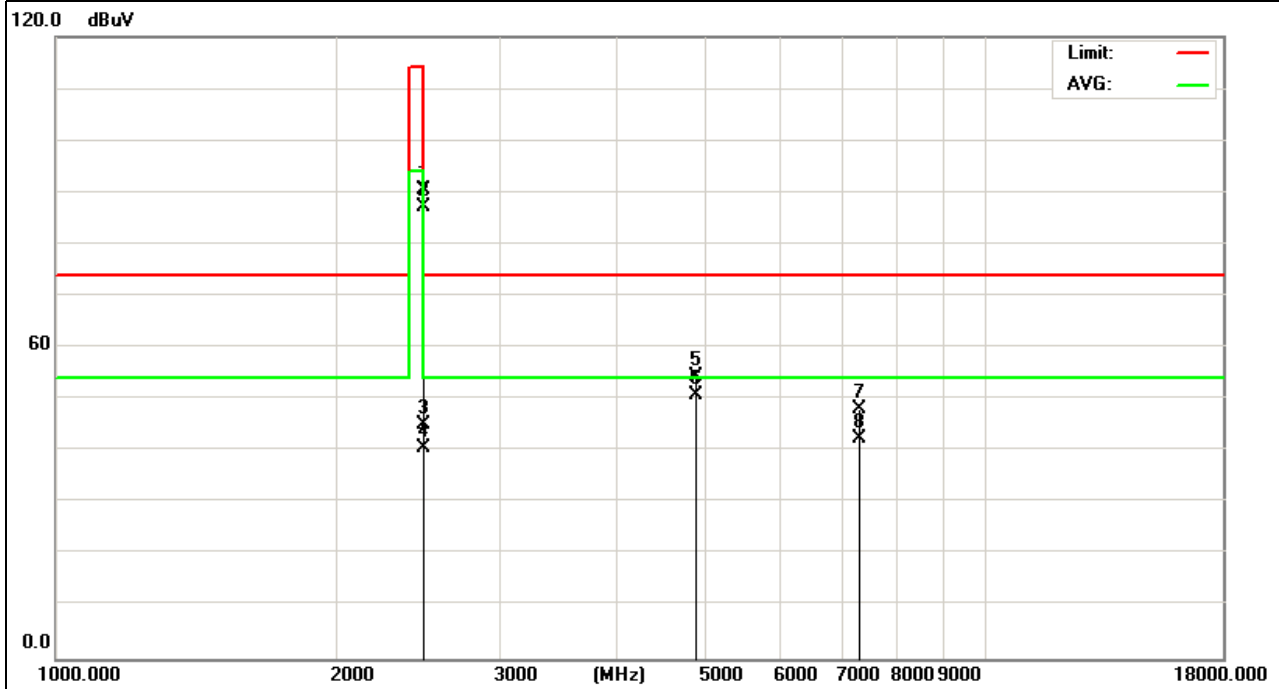


EUT :	Receiver	Model Name :	710
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2011-5-10
Test Mode :	TX 2479MHz	Polarization :	Vertical
Test Power :	DC 5V		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2479.00	92.05	-1.59	90.46	114.0 0	-23.54	peak
2479.00	88.72	-1.59	87.13	94.00	-6.87	AVG
2483.50	46.81	-1.58	45.23	74.00	-28.77	peak
2483.50	42.32	-1.58	40.74	54.00	-13.26	AVG
4958.00	50.11	4.25	54.36	74.00	-19.64	peak
4958.00	46.49	4.25	50.74	54.00	-3.26	AVG

Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



4. BANDWIDTH TEST

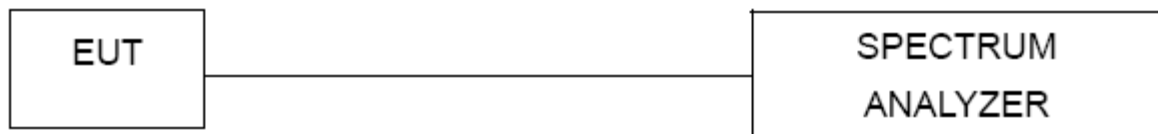
4.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW \geq RBW, Sweep time = Auto.

4.2 DEVIATION FROM STANDARD

No deviation.

4.3 TEST SETUP

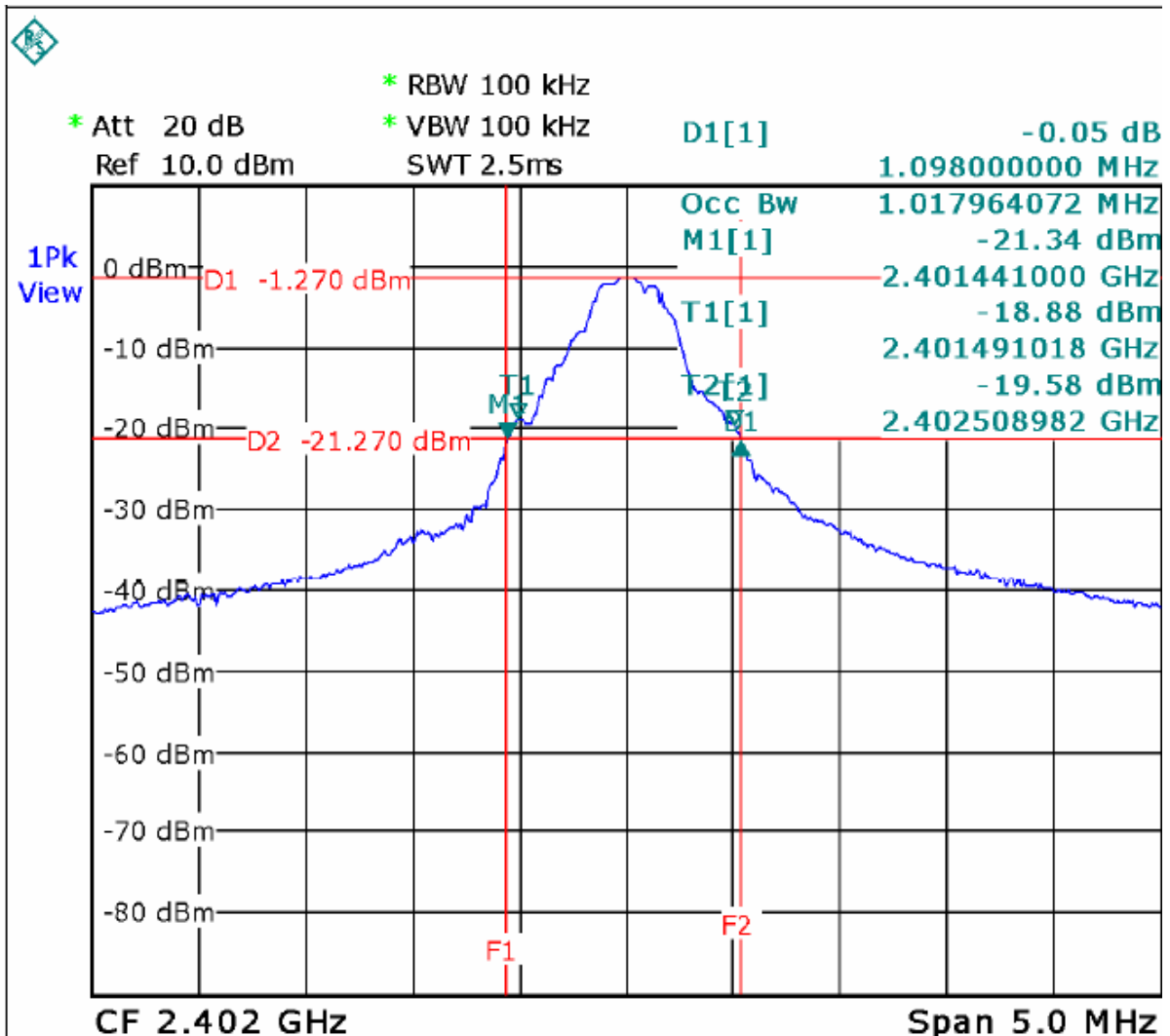


4.4 TEST RESULTS

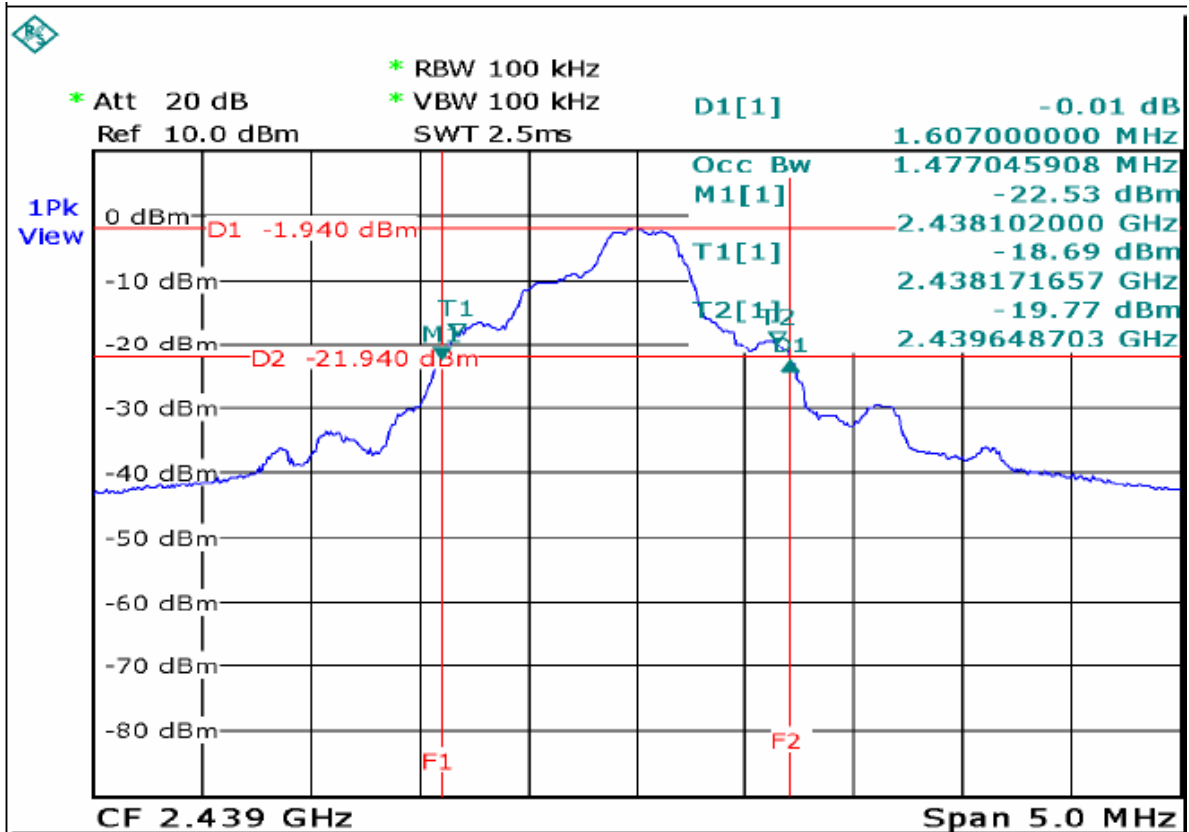
EUT :	Receiver	Model Name :	710
Temperature :	26 °C	Relative Humidity :	53%
Pressure :	1020 hPa	Test Power :	DC 5V
Test Mode :	TX CH 01/08/16		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)	99% Bandwidth (MHz)
CH01	2402	1.098	1.02
CH08	2439	1.607	1.477
CH16	2479	2.006	1.886

The Lowest Channel:2402MHz



The Middle Channel:2439MHz



The Highest Channel:2479MHz

