

FCC ID TEST REPORT

for

Transmitter

Model: 8051-01

FCC ID: 2ABCY8051-01

Prepared for: Harvest Franco Ltd.
Rm. 204, Tower 1, Harbour Centre 1 Hok Cheung Street,
Hung Hom, Kowloon Hong Kong

Prepared by: Shenzhen TCT Testing Technology Co.,Ltd
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Report Number: TCT131111010F2-1
Date of Test: Nov. 20~Nov. 28, 2013
Date of Report: Nov. 28, 2013

The results detailed in this test report relate only to the specific sample(s) tested. It is the Application's responsibility to ensure that all production units are manufactured with equivalent EMC characteristics. This report is not to be reproduced except in full, without written approval from TCT Testing Technology.

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1.0 General Details

1.1 Test Lab Details

Name :	Shenzhen Tongce Testing Lab
Address:	1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China
Telephone:	13410377511
Fax:	--

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

FCC Registration Number: 572331

Shenzhen TCT Testing Technology Co., Ltd., Shenzhen EMC Laboratory: Shenzhen Tongce Testing Lab
The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.
Registration Number: 572331

Industry Canada (IC)

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing
Registration Number IC: 10668A-1

1.2 Applicant Details

Applicant:	Harvest Franco Ltd.
Address:	Rm. 204, Tower 1, Harbour Centre 1 Hok Cheung Street, Hung Hom, Kowloon Hong Kong
Telephone:	(852)2334-3806
Fax:	(852)2311-0553

Manufacturer:	Harvest Franco Ltd.
Address:	Rm. 204, Tower 1, Harbour Centre 1 Hok Cheung Street, Hung Hom, Kowloon Hong Kong
Telephone:	(852)2334-3806
Fax:	(852)2311-0553

1.3 Description of E.U.T.

Product:	Transmitter
Model No.:	8051-01
Additional Model No.:	N.A.
Brand Name:	N.A.
Additional Trade Name:	N.A.
Operation Frequency:	2406-2472MHz
Modulation Type:	GFSK
Channel spacing:	2 MHz
Channel number:	34
Antenna Designation:	A mental PIFA antenna, and the maximum antenna gain is 0dBi.
Rating:	DC 7.5V Via Adapter
	Adapter information Model: GPU280750150WD00 Input: 120VAC 60Hz 7W Output: 7.5VDC 150mA

1.4 Statement: --

1.5 Test Engineer

The sample tested by



Printed name: Jack Kang

2.0 Test equipments and Associated Equipment used during the test.

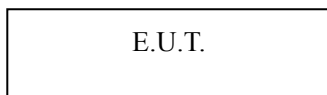
2.1 Test Equipments

Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	July 7, 2013	July 6, 2014
Spectrum Analyzer	ROHDE&SCHWARZ	FSEM	848597/001	July 7, 2013	July 6, 2014
Pre-amplifier	Teseq	LAN6900	--	July 8, 2013	July 7, 2014
Pre-amplifier	Agilent	8447D	83153007374	July 8, 2013	July 7, 2014
Pre-amplifier	Agilent	8449B	3008A01738	July 8, 2013	July 7, 2014
Loop antenna	A.R.A.	PLA-1030/B	1029	July 8, 2013	July 7, 2014
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	July 8, 2013	July 7, 2014
Horn Antenna	ETS LINDGREN	3117	--	July 8, 2013	July 7, 2014
Horn Antenna	ETS LINDGREN	3160	--	July 8, 2013	July 7, 2014
EMI Test Receiver	R&S	ESCS30	100139	July 7, 2013	July 6, 2014
LISN	AFJ	LS16C	16010222119	July 7, 2013	July 6, 2014

2.2 AE used during the test

Equipment type	Manufacturer	Model	Remark
N.A.			
N.A.			
N.A.			
N.A.			

2.3. Block Diagram of E.U.T. Configuration



3.0 Technical Details

3.1 Summary of test results

The E.U.T. has been tested according to the following specifications

Requirement	CFR 47 Section	Result
Conduction Emission, 0.15MHz to 30M Hz	Section 15.207	PASS
Radiated Emission Test	Section 15.209, 15.35 Section 15.249(a)(d)	PASS
Band Edge Test	15.249(d)	PASS
Occupied Bandwidth	Section 15.231(c)	PASS
Antenna Requirement	Section 15.203	PASS

3.2 Test Standards

FCC Rules and Regulations Part 15 Subpart C 15.249: 2012

4.0 E.U.T. Modification

No modification by Shenzhen TCT Testing Technology Co., Ltd

5.0 Measurement Uncertainty

(95% confidence levels, k=2)

No.	Item	MU
1.	Radio Frequency	$\pm 1 \times 10^{-9}$
2.	Temperature	$\pm 0.1^{\circ}\text{C}$
3.	Humidity	$\pm 1.0\%$
4.	RF power, conducted	$\pm 0.34\text{dB}$
5.	RF power density, conducted	$\pm 1.45\text{dB}$
6.	Spurious emissions, conducted	$\pm 3.70\text{dB}$
7.	All emissions, radiated	$\pm 4.50\text{dB}$

Note: 1) The E.U.T. is a Transmitter

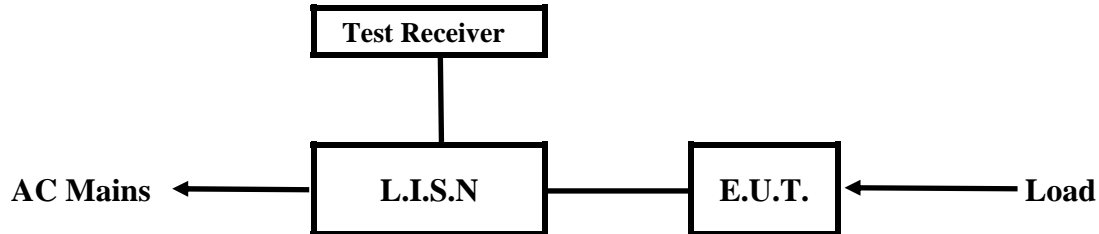
2) Working transmission frequency: 2406-2472MHz, Low channel: 2406MHz, Middle channel: 2442MHz, High channel: 2472MHz

3) In the report, E.U.T. means Equipment Under Test;

N.A. means Not Applicable

6.0 Power Line Conducted Emission Test

6.1 Schematics of the test



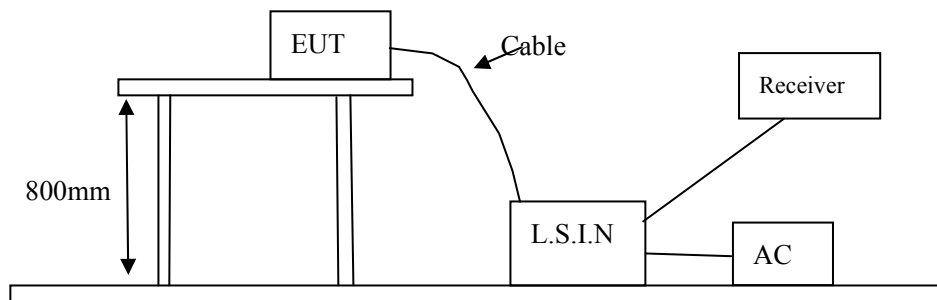
6.2 Test Method and test Procedure

The E.U.T. was tested according to ANSI C63.10-2009 and ANSI C63.4-2003

The Frequency spectrum From 0.15MHz to 30MHz was investigated.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



6.3 E.U.T. Operating Condition

Operating condition is according to ANSI C63.10-2009 and ANSI C63.4-2003

- 1) Setup the E.U.T. and simulators as shown on the following
- 2) Enable AF signal and confirm E.U.T. active to normal condition

6.4 Test Equipment

Please refer to the Section 2

6.5 Conducted Emission Limit

Frequency(MHz)	Class A Limits (dBμV)		Class B Limits (dBμV)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	73.0	60.0	56.0	46.0
5.00 ~ 30.00	73.0	60.0	60.0	50.0

Notes: 1) *Decreasing linearly with logarithm of frequency.
2) The tighter limit shall apply at the transition frequencies

6.6 Test specification

Environmental conditions: Temperature: 22° C Humidity: 52% Atmospheric pressure: 103kPa

Frequency range: 0.15 MHz – 30 MHz

The test was carried out in the following operation mode(s):

-- Hopping off Mode

6.7 Test result

Min. Margin: > 10 dB from 150 kHz to 30 MHz.

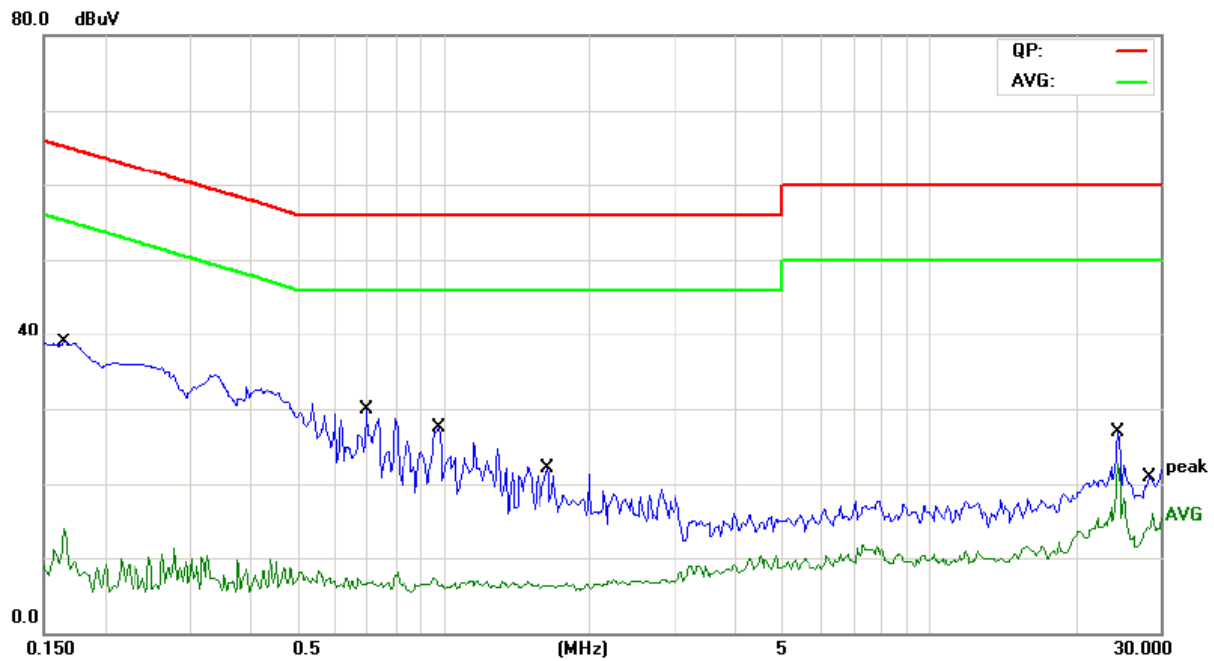
The requirements are FULFILLED

Remarks: According to FCC part 15.207

A Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)

E.U.T. Description: Transmitter
Operation Mode: Hopping off Mode
Tested By: Sevin li
Test Date: Nov. 25, 2013

Start Frequency	Stop Frequency	Step	IF BW	Detector	Final M-Time
0.15MHz	30MHz	4.5KHz	10KHz	QP+AV	1s

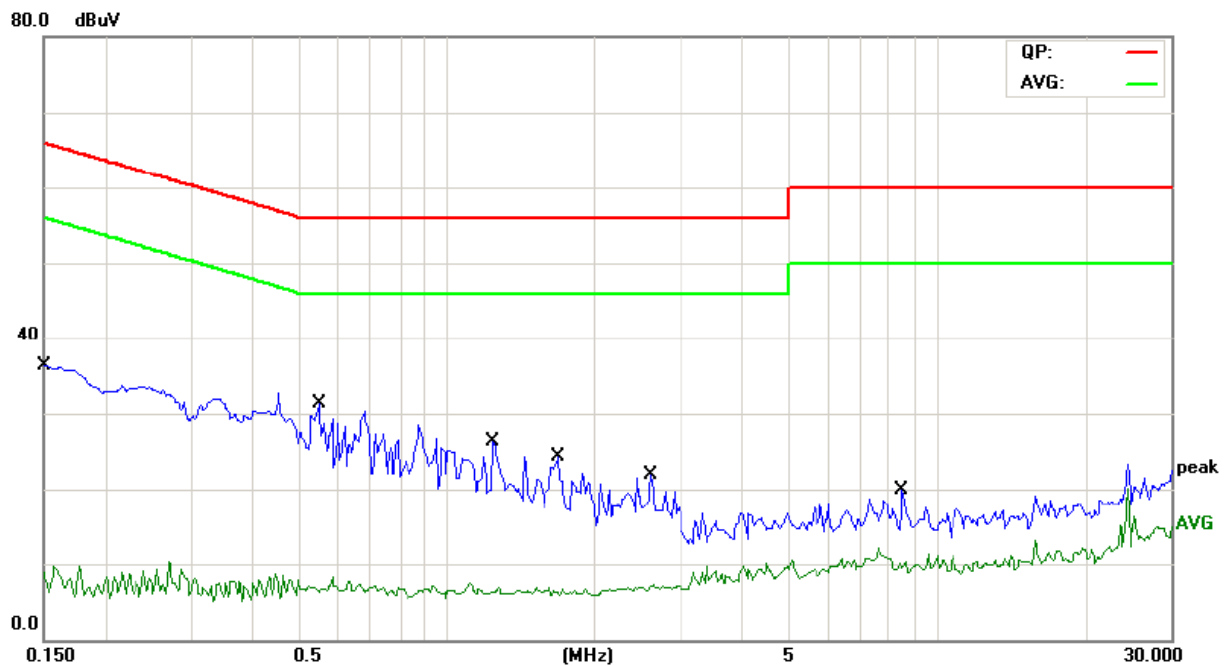


Frequency (MHz)	Reading(dBμV)				Limit (dBμV)	
	Live		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.1655	30.99	10.14	--	--	65.18	55.18
0.6930	16.66	7.95	--	--	56.00	46.00
0.9820	13.21	7.39	--	--	56.00	46.00
1.6422	8.82	7.38	--	--	56.00	46.00
24.5780	24.54	21.70	--	--	60.00	50.00
28.5820	14.89	11.24	--	--	60.00	50.00

B Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)

E.U.T. Description: Transmitter
Operation Mode: Hopping off Mode
Tested By: Sevin li
Test Date: Nov. 25, 2013

Start Frequency	Stop Frequency	Step	IF BW	Detector	Final M-Time
0.15MHz	30MHz	4.5KHz	10KHz	QP+AV	1s



Frequency (MHz)	Reading(dBμV)				Limit (dBμV)	
	Live		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.1500	--	--	28.18	9.50	65.99	55.99
0.5484	--	--	19.02	7.88	56.00	46.00
1.2398	--	--	9.92	7.41	56.00	46.00
1.6930	--	--	9.33	7.30	56.00	46.00
2.5953	--	--	8.84	7.52	56.00	46.00
8.4688	--	--	9.44	8.16	60.00	50.00

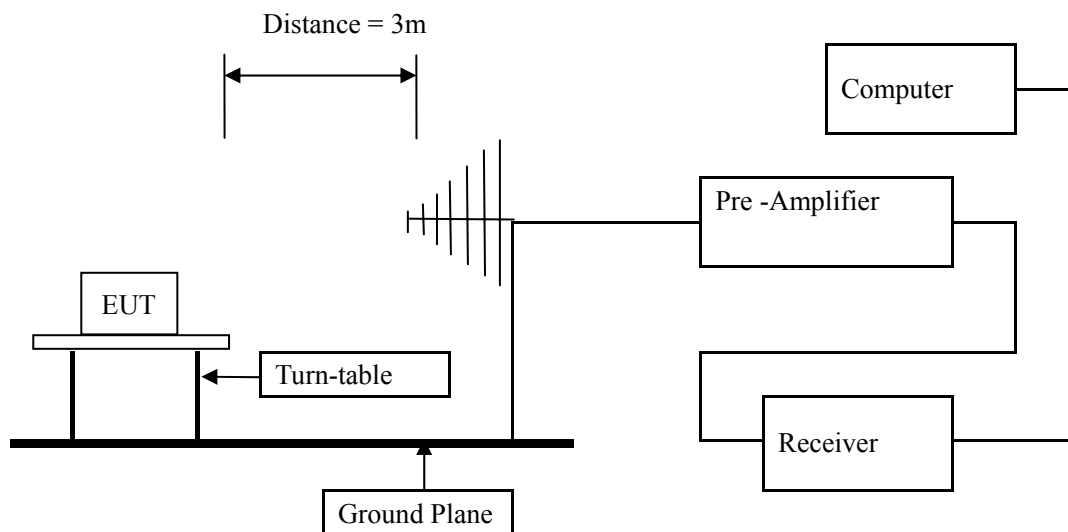
7.0 Radiated Emission Test

7.1 Test Method and test Procedure:

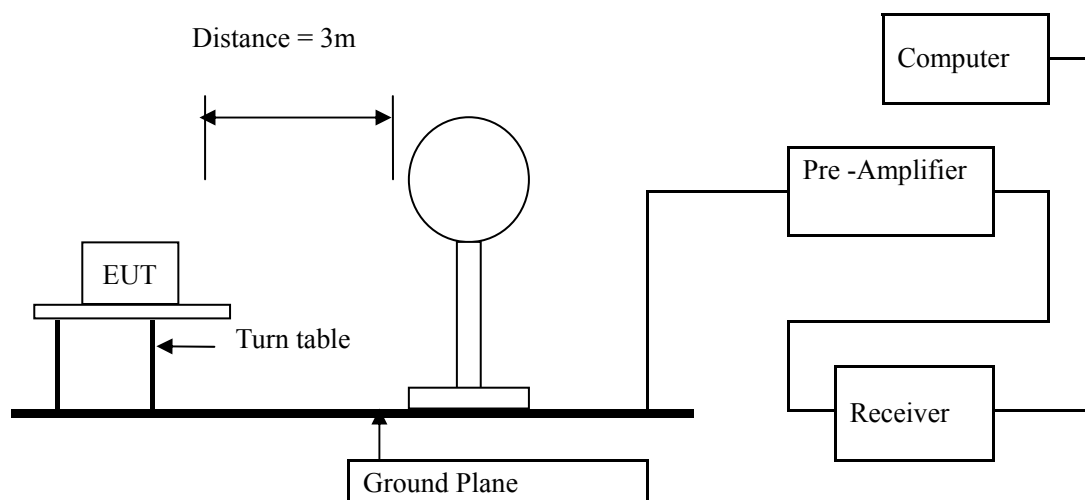
- 1) The E.U.T. was tested according to ANSI C63.10-2009 and ANSI C63.4-2003
- 2) The E.U.T., peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2009 and ANSI C63.4-2003
- 3) The frequency spectrum from 9kHz to 5GHz was investigated. All readings from 9kHz to 30MHz are quasi-peak values with a resolution bandwidth of 10 kHz, measured with loop antenna. All readings from 30MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz, measured with Bi-log antenna. All readings are above 1 GHz are peak values with a resolution bandwidth of 1 MHz, measured with horn antenna.
- 4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for above 30MHz each frequency. The antenna high is 1 m to find the maximum emission for each frequency below 30MHz
- 5) Tested distance: 3 meters
- 6) The antenna polarization: Vertical polarization and Horizontal polarization.
- 7) Each azimuth of E.U.T will be tested.

7.2 Block diagram of Test setup

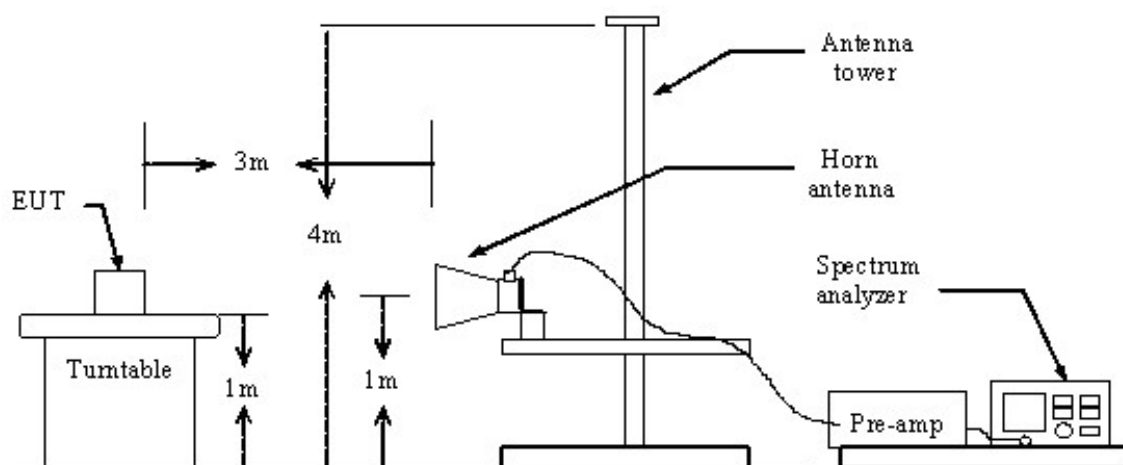
Block diagram of Test setup for frequency 30-1000MHz



Block diagram of Test setup for frequency below 30MHz



Block diagram of Test setup for frequency above 1GHz



7.3 Limit

According to 15.249(a) requirements:

Fundamental Frequency (MHz)	Filed Strength of(mil livolts/meter)	
	Fundamental	Harmonics
902-928	50	0.5
2400-2483.5	50	0.5
5725-5875	50	0.5
24000-24250	250	2.5

For this E.U.T.

Fundamental Frequency (MHz)	Field Strength of Fundamental (3m)		Field Strength of Harmonics (3m)		
	mV/m	dBuV/m	mV/m	dBuV/m	
2400-2483.5	50	94 (Average) 114 (Peak)	0.5	54 (Average) 74 (Peak)	

- Note:
- 1) RF Field Strength (dBuV) = 20 log RF Voltage (uV)
 - 2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
 - 3) The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

According to 15.249(d) requirements: 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.

Frequencies in restricted band are complied to limit

Frequency Range (MHz)	Distance (m)	Field strength (dBμV/m)
0.009-0.490	3	20log 2400/F (kHz) + 80
0.490-1.705	3	20log 24000/F (kHz) + 40
1.705-30	3	20log 30 + 40
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

- Note:
- 1) RF Voltage (dBuV) = 20 log RF Voltage (uV)
 - 2) In the Above Table, the tighter limit applies at the band edges.
 - 3) Distance refers to the distance in meters between the measuring instrument antenna and the E.U.T.
 - 4) The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.
 - 5) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula $Ld1 = Ld2 * (d2/d1)$

7.4 Test Equipment

Please refer to the Section 2

7.5 Test specification:

Environmental conditions: Temperature 23° C Humidity: 50% Atmospheric pressure: 103kPa

7.6 Test result

Result: Pass

A Radiated Emission (9 kHz----30 MHz)

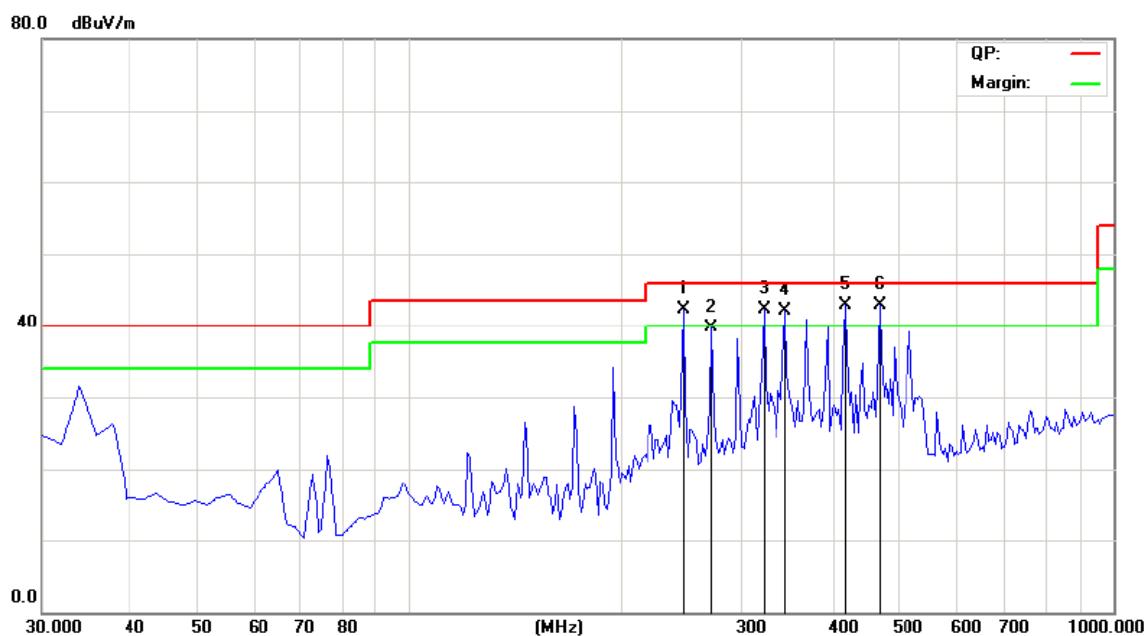
Note: 1) Emission Level=Reading+ Cable loss-Antenna factor-Amp factor
2) The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement

Result: Pass

Frequency (MHz)	Level@3m (dBμV/m)	Limit@3m (dBμV/m)
--	--	--

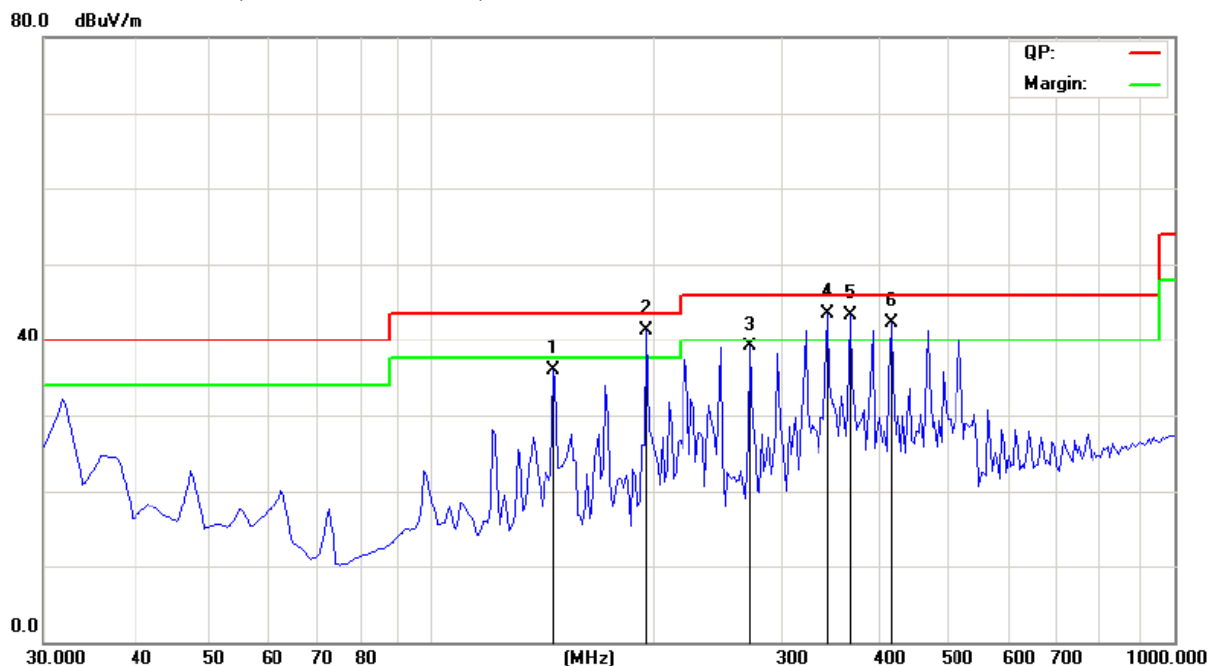
B General Radiated Emissions Data

Please refer to following diagram for individual
Radiated Emission (30MHz----1000MHz) In Horizontal



Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
245.7715	42.32	H	46.00
269.0982	39.71	H	46.00
319.6392	42.30	H	46.00
342.9658	42.19	H	46.00
416.8337	42.99	H	46.00
467.3747	42.81	H	46.00

Radiated Emission (30MHz----1000MHz) In Vertical



Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
146.6332	35.99	V	43.50
195.2305	41.32	V	43.50
269.0982	39.01	V	46.00
342.9658	43.49	V	46.00
368.2364	43.26	V	46.00
416.8337	42.22	V	46.00

Note: Measurements were conducted in all channels (high, middle, low), and the worst case (low channel) was submitted only.

C Fundamental & Harmonics and Spurious Radiated Emission Data (1000MHz-25000MHz)

Low channel: 2406 MHz				
Frequency (MHz)	Emission PK/AV (dBuV/m)	Horizontal / Vertical	Limits PK/AV (dBuV/m)	Margin (dB)
2406	83.16(PK)	H	114/94	-10.84
2406	80.16 (PK)	V	114/94	-13.84
4812	47.29 (PK)	H	74/54	-6.71
4812	49.79PK)	V	74/54	-4.21
7218	45.23(PK)	H	74/54	-8.77
7218	42.71(PK)	V	74/54	-11.29

Middle channel: 2442 MHz				
Frequency (MHz)	Emission PK/AV (dBuV/m)	Horizontal / Vertical	Limits PK/AV (dBuV/m)	Margin (dB)
2442	84.31(PK)	H	114/94	-9.69
2442	85.16(PK)	V	114/94	-8.84
4884	49.08(PK)	H	74/54	-4.92
4884	47.92(PK)	V	74/54	-6.08
7326	45.29(PK)	H	74/54	-8.71
7326	49.73 (PK)	V	74/54	-4.27

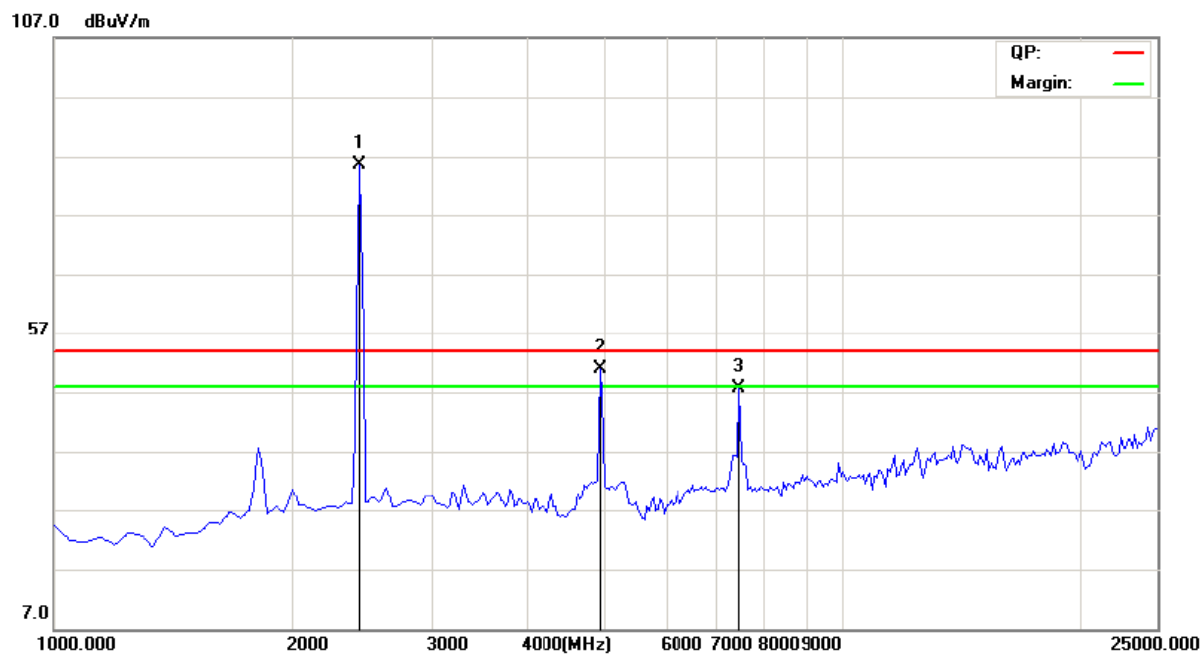
High channel: 2472 MHz				
Frequency (MHz)	Emission PK/AV (dBuV/m)	Horizontal/ Vertical	Limits PK/AV (dBuV/m)	Margin (dB)
2472	86.17(PK)	H	114/94	-7.83
2472	85.67(PK)	V	114/94	-8.33
4944	45.31 (PK)	H	74/54	-8.69
4944	50.81(PK)	V	74/54	-3.19
7416	44.54(PK)	H	74/54	-9.46
7416	47.54(PK)	V	74/54	-6.46

- Note:
- 1) Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.
 - 2) Radiated emissions measured in frequencies above 1GHz were made
(Peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector).
 - 3) Average test would be performed if the peak readings were greater than the average limit.
 - 4) Data of measurement shown “---“in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.
 - 5) Emission Level=Peak (AV) Reading + Correction Factor;
Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
 - 6) Margin (dB) = Emission Level (Peak) (dBuV/m)-Average limit (dBuV/m)

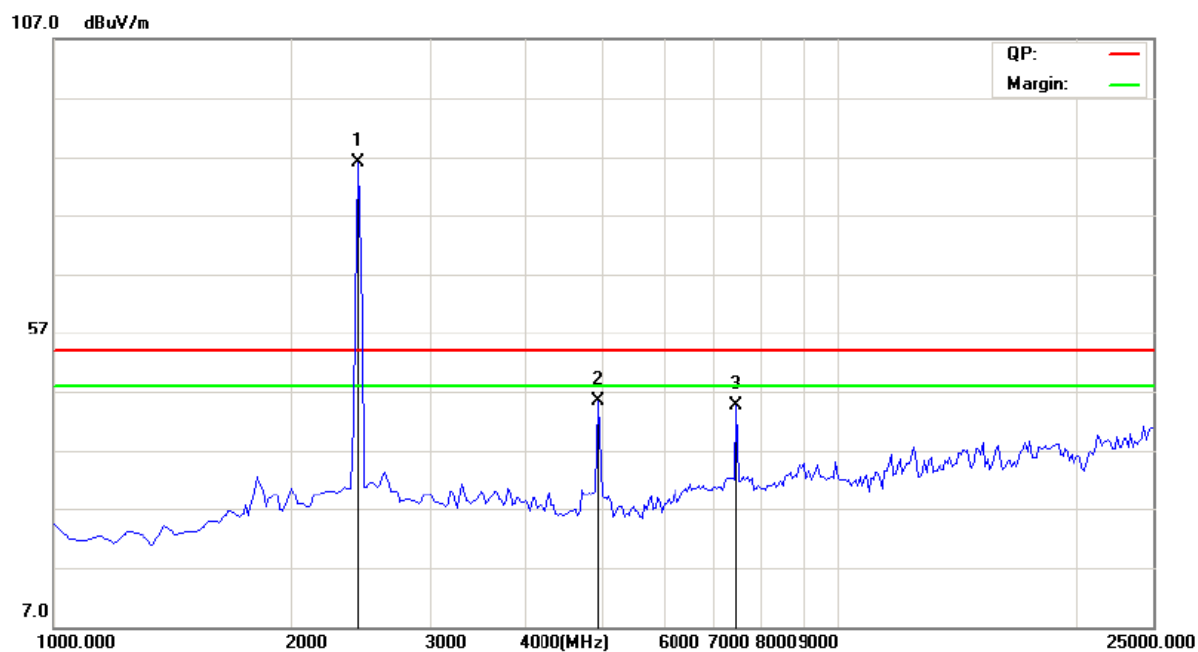
Please refer to the following diagram for individual

Low Channel: 2406 MHz

H

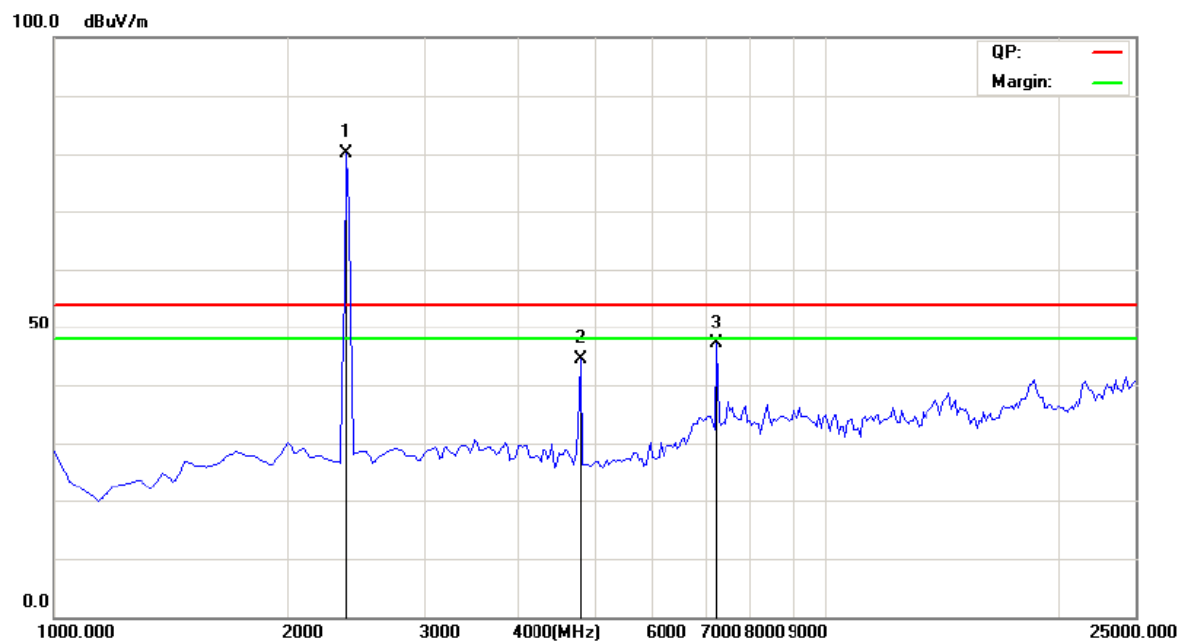


V

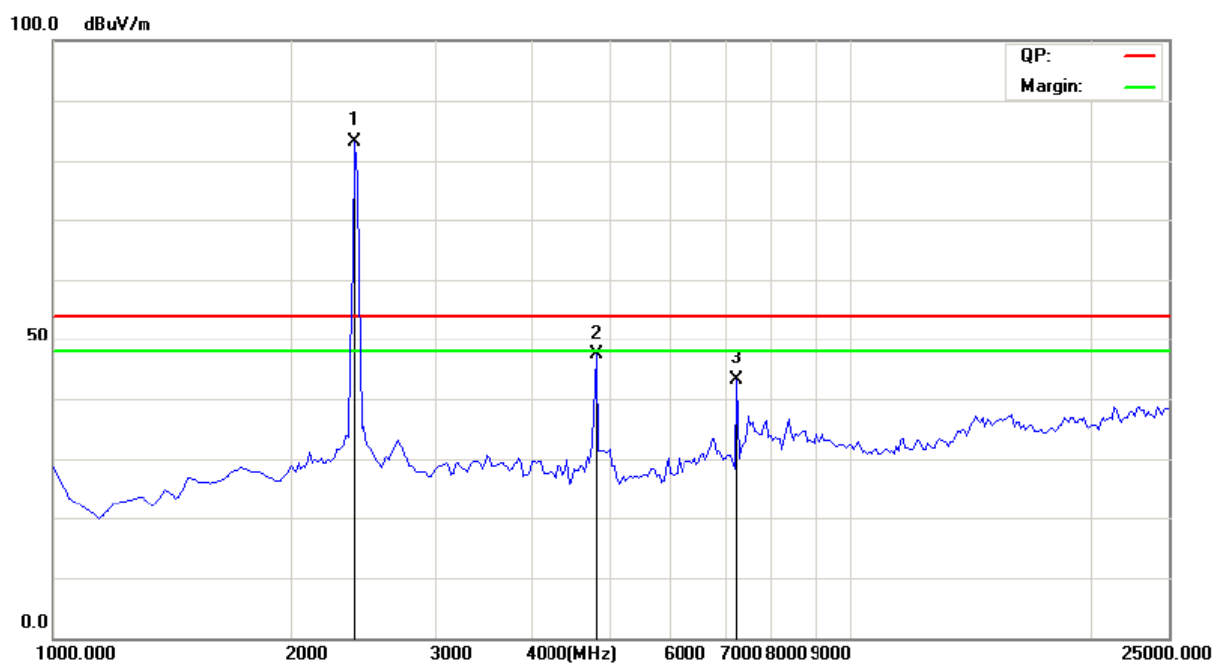


Middle Channel: 2442 MHz

H

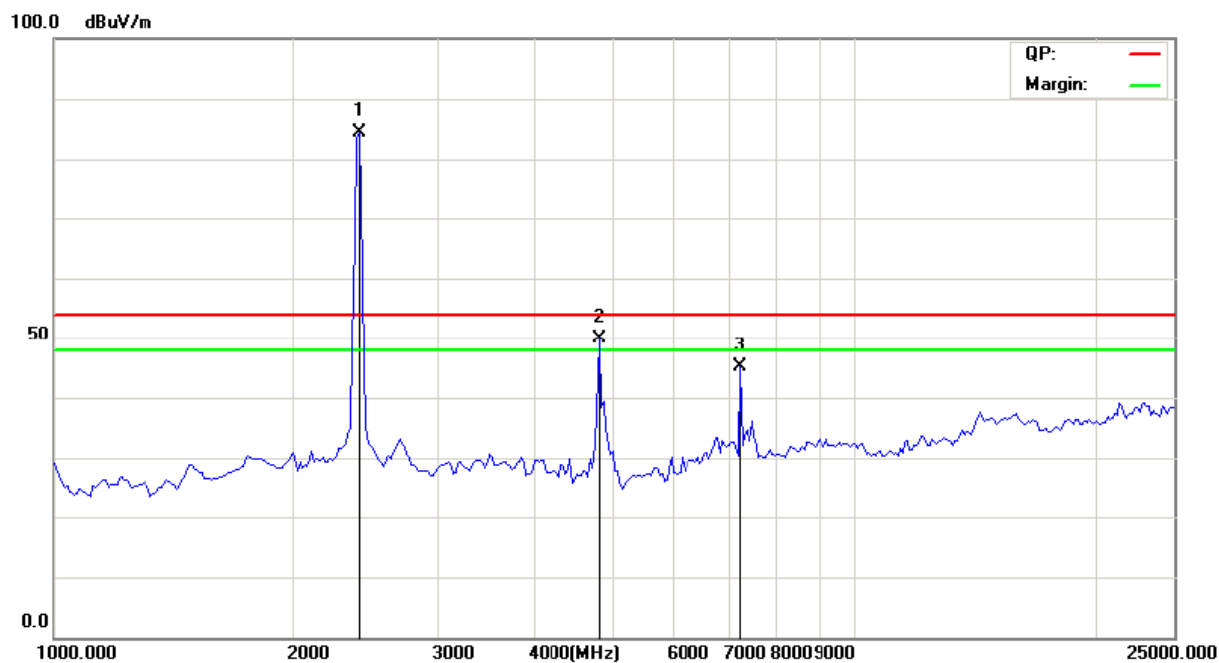


V

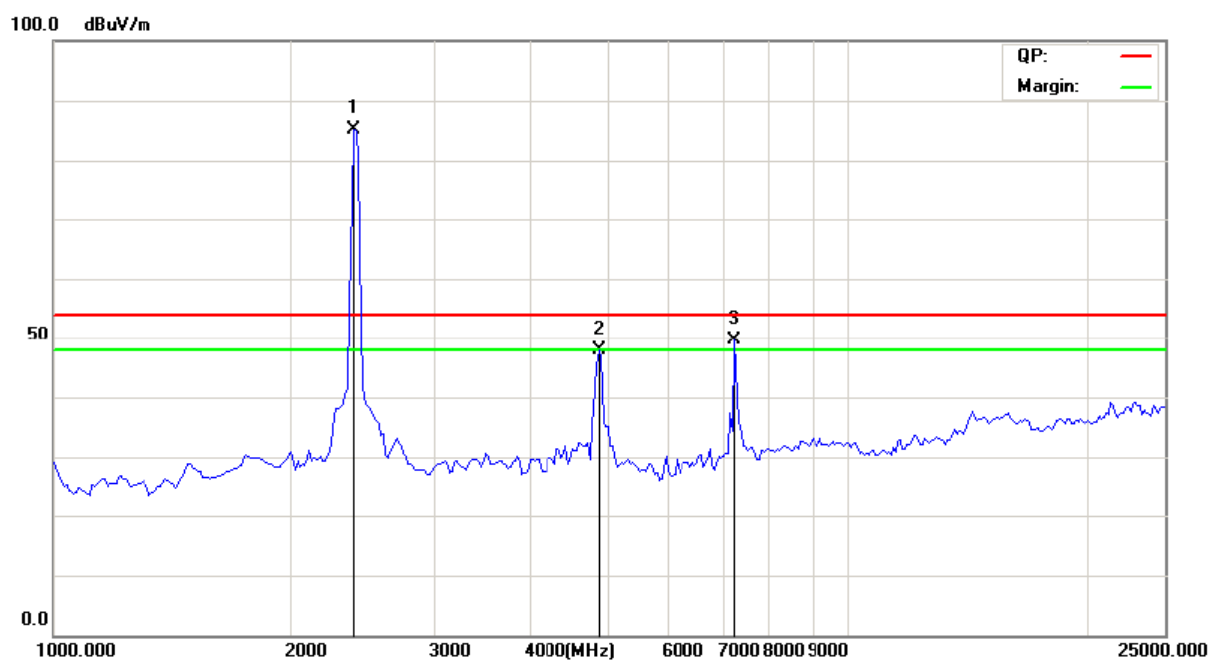


High Channel: 2472 MHz

H



V



8.0 Band Edge

8.1 Band Edge Limit

1) According to 15.249(d) requirements: 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.

2) For Emissions in Restricted band, the limit is below the general radiated emission limits in 15.209

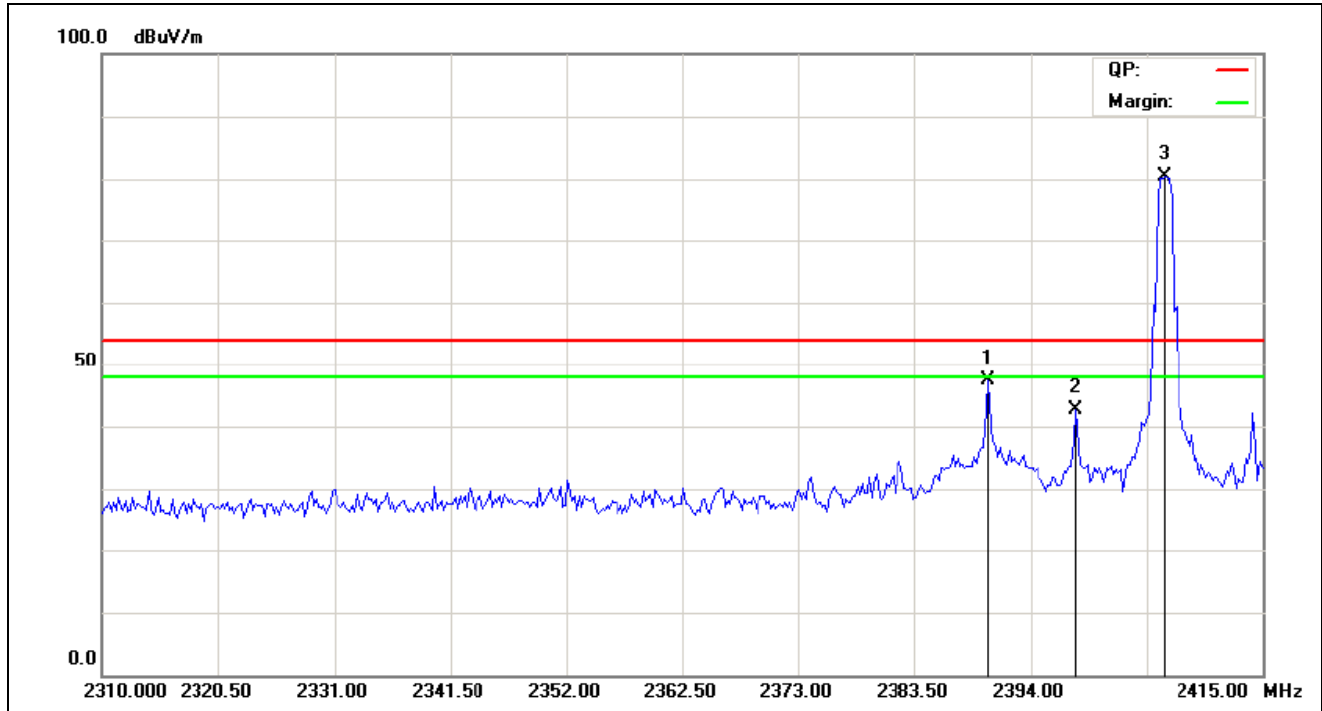
8.2 Test Equipment

Please refer to the Section 2

8.3 Test Result

Pass

Low channel in Horizontal polarization



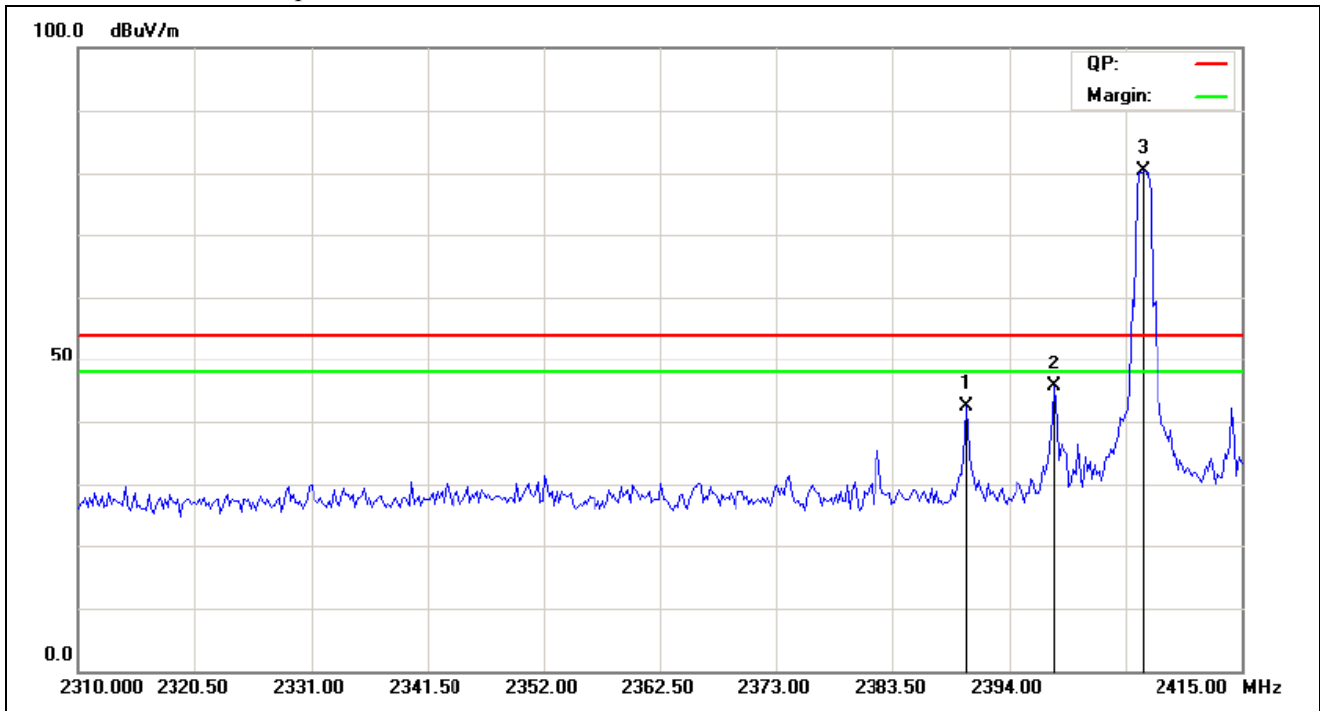
Frequency (MHz)	Level@3m (dBμV/m)	Detector	Limit@3m (dBμV/m)
2389	47.26	Peak	74.00
2398	42.58	Peak	74.00
2406	80.44	Peak	114.00

Note: 1) As the table shown above, emissions radiated outside of the specified frequency bands are met the requirements in 15.209

2) The maximum PK emission of restriction band 2310 to 2390 MHz was 47.26 dBuV/m@3m at 2389 MHz, which is less than the Average limit.

3) Radiated emissions which fall in the restricted band, as defined in 15.205(a), comply with the radiated emission limits specified in 15.209(a).

Low channel in Vertical polarization



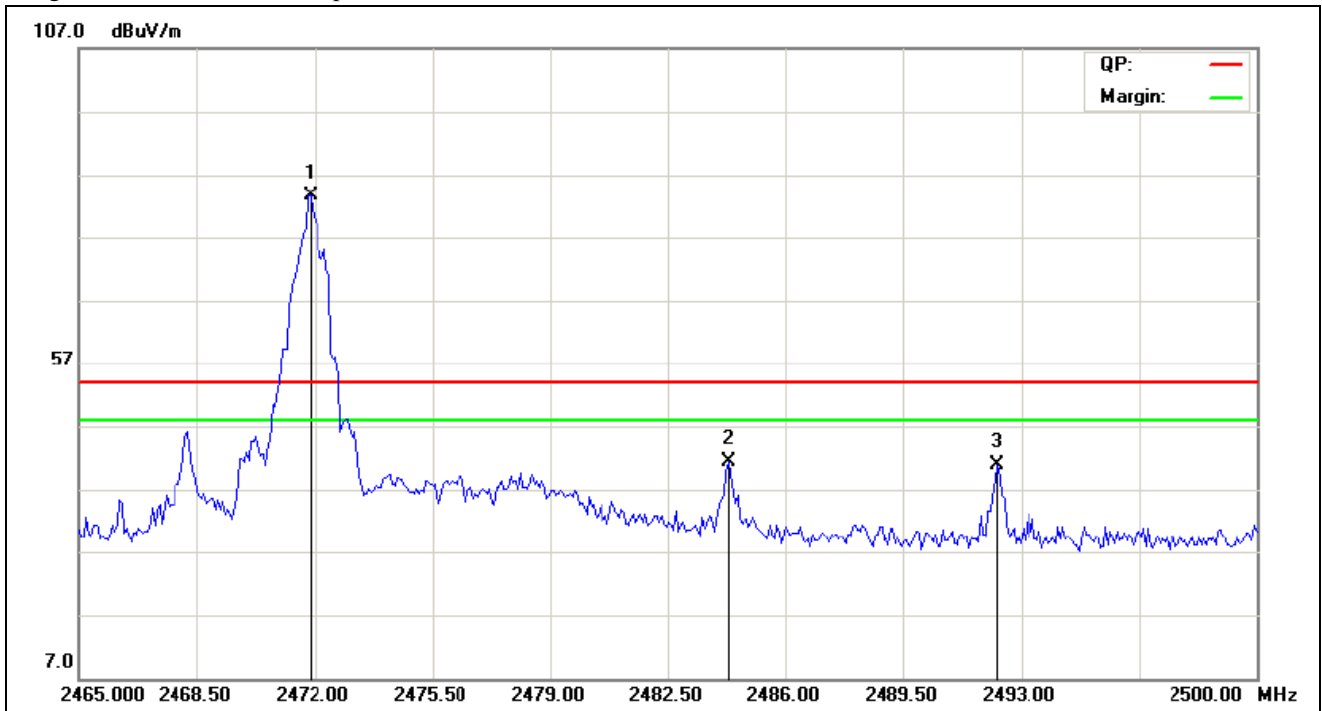
Frequency (MHz)	Level@3m (dBμV/m)	Detector	Limit@3m (dBμV/m)
2389	42.26	Peak	74.00
2398	45.58	Peak	74.00
2406	80.44	Peak	114.00

Note: 1) As the table shown above, emissions radiated outside of the specified frequency bands are met the requirements in 15.209

2) The maximum PK emission of restriction band 2310 to 2390 MHz was 42.26 dBuV/m@3m at 2389 MHz, which is less than the Average limit.

3) Radiated emissions which fall in the restricted band, as defined in 15.205(a), comply with the radiated emission limits specified in 15.209(a).

High channel in Horizontal polarization



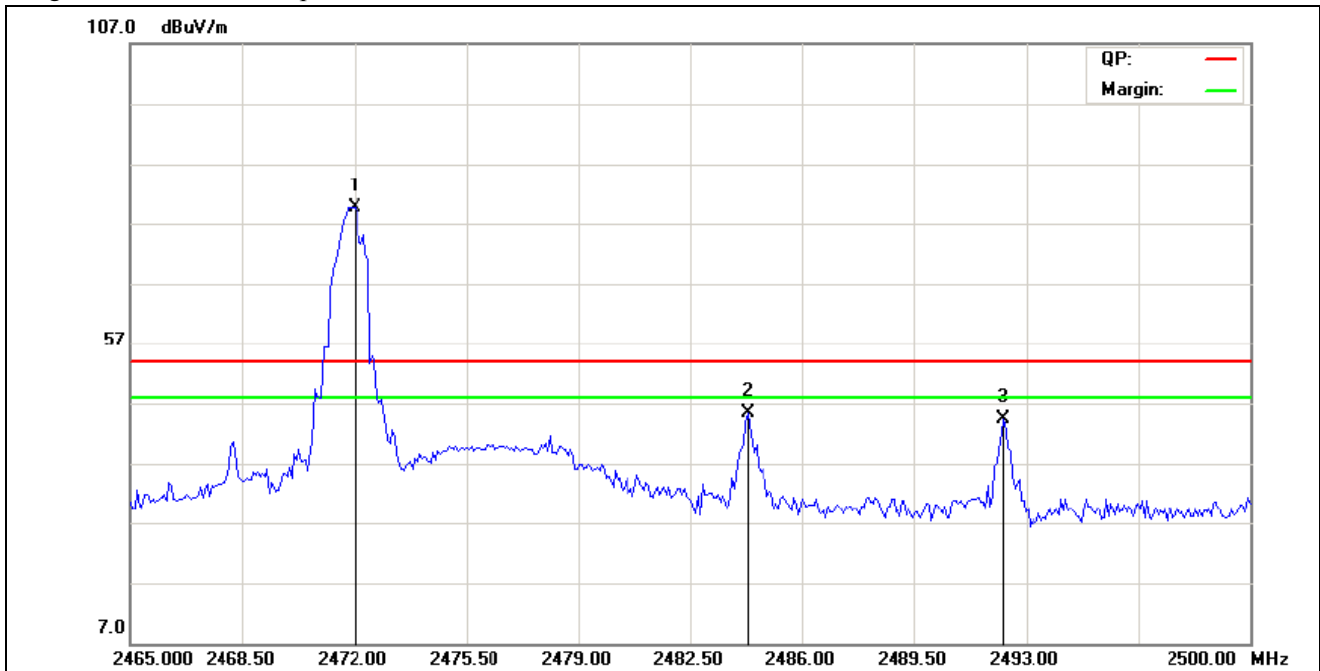
Frequency (MHz)	Level@3m (dB μ V/m)	Detector	Limit@3m (dB μ V/m)
2472	83.60	Peak	114.00
2484	41.40	Peak	74.00
2492	40.91	Peak	74.00

Note: 1) As the table shown above, emissions radiated outside of the specified frequency bands are met the requirements in 15.209

2) The maximum PK emission of restriction band 2483.5 to 2500 MHz was 41.40dBuV/m@3m at 2484 MHz, which is less than the Average limit.

3) Radiated emissions which fall in the restricted band, as defined in 15.205(a), comply with the radiated emission limits specified in 15.209(a).

High channel in Vertical polarization



Frequency (MHz)	Level@3m (dBμV/m)	Detector	Limit@3m (dBμV/m)
2472	79.64	Peak	114.00
2484	45.40	Peak	74.00
2492	44.41	Peak	74.00

Note: 1) As the table shown above, emissions radiated outside of the specified frequency bands are met the requirements in 15.209

2) The maximum PK emission of restriction band 2483.5 to 2500 MHz was 45.40 dBuV/m@3m at 2484 MHz, which is less than the Average limit.

3) Radiated emissions which fall in the restricted band, as defined in 15.205(a), comply with the radiated emission limits specified in 15.209(a).

9.0 Occupied Bandwidth

9.1 Test Equipment

Please refer to the Section 2

9.2 Test Specification:

Environmental conditions: Temperature 22° C Humidity: 50% Atmospheric pressure: 103kPa

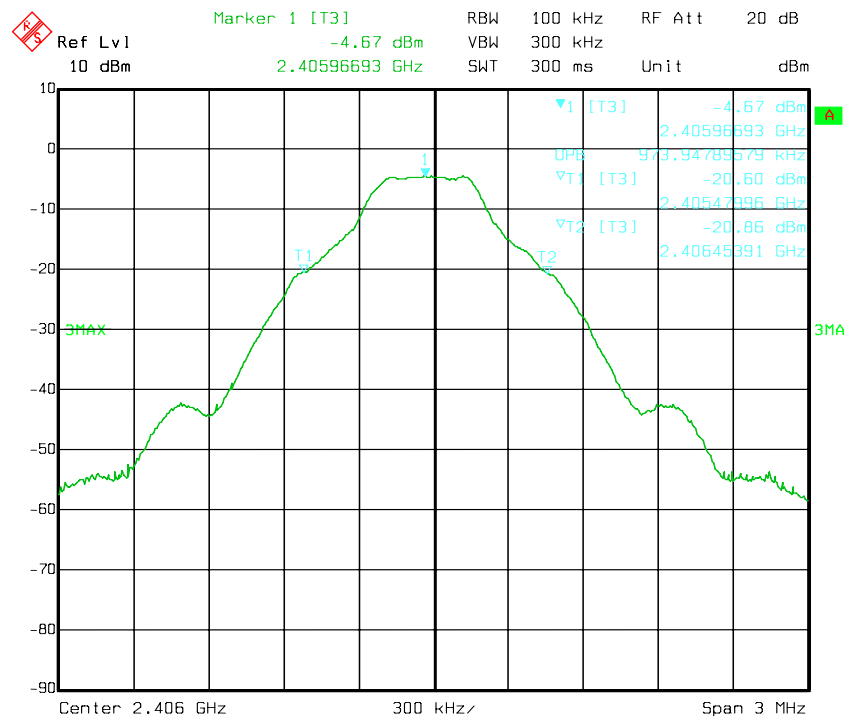
9.3 Limit

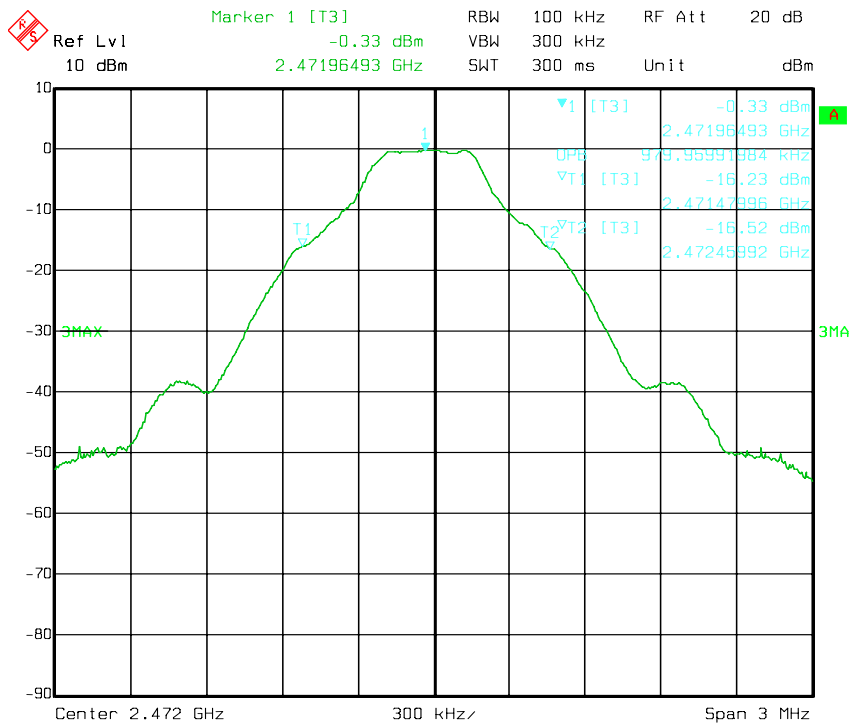
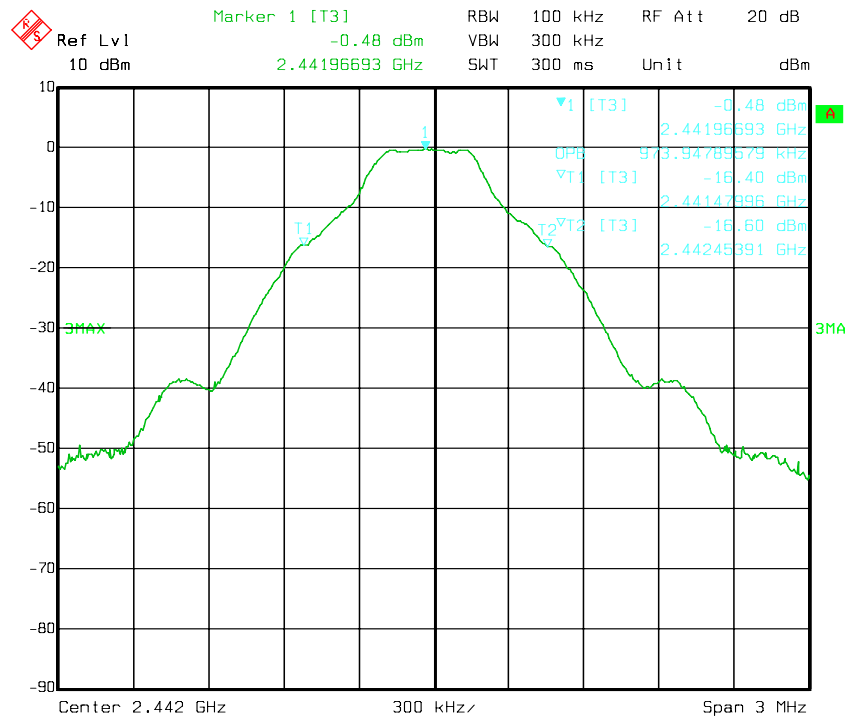
According to 15.231(c), 20dB Bandwidth should be test

9.4 Test Result:

Channel	99% Bandwidth (kHz)	Limit (kHz)	Conclusion
Low	973.95	--	PASS
Middle	973.95	--	PASS
High	979.96	--	PASS

Test Data as follows:





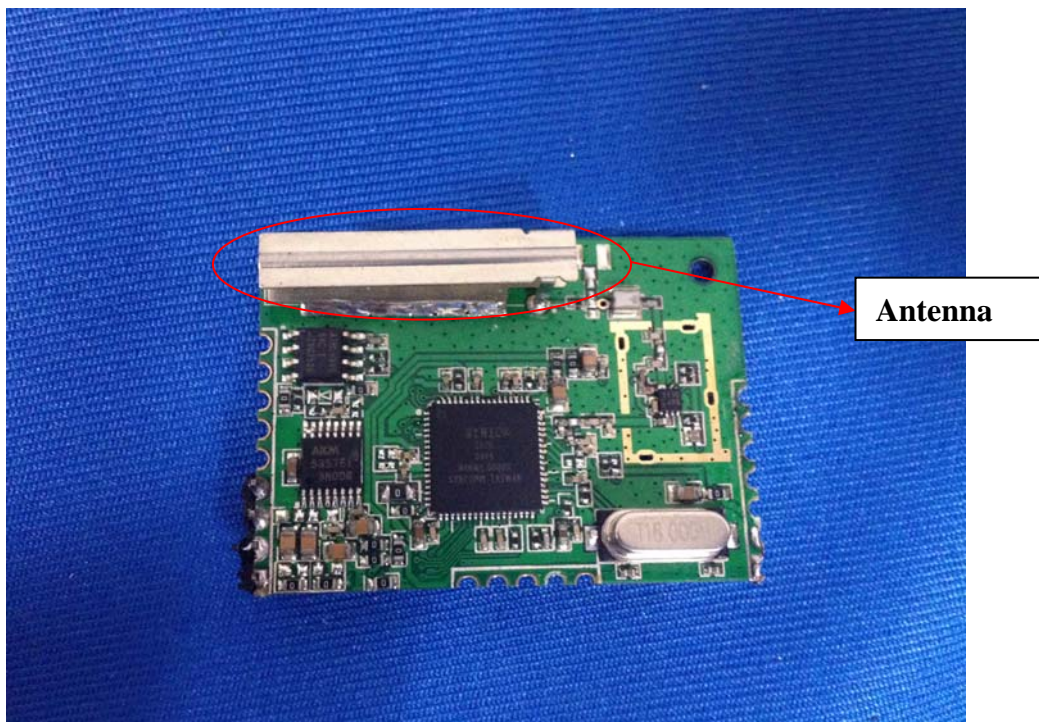
10.0 Antenna Requirement

10.1 Standard Applicable

For intentional device, according to FCC 47 CFR 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.

10.2 Antenna Specification

According to the manufacturer declared, a mental PIFA antennas; the maximum gain of antennas is 0 dBi. and no consideration of replacement. Therefore the E.U.T. is considered sufficient to comply with the provision.



11.0 FCC ID Label

FCC ID: 2ABCY8051-01

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



*****END OF THE REPORT*****