FCC TEST REPORT
for
Low Power Radio Solutions Ltd

Radio Transceiver Module
Model No.: eRIC9

Prepared for	:	Low Power Radio Solutions Ltd
Address	:	Two Rivers Ind Est, Station Lane, Witney, OX28 4BH, United Kingdom

Prepared By	:	Shenzhen Anbotek Compliance Laboratory Limited
Address	:	1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China Tel: (86) 755-26066544 Fax: (86) 755-26014772

Report Number	:	R011505565I
Date of Test	:	Jun. 01~ Jul. 02, 2015
Date of Report	:	Jul. 03, 2015

TABLE OF CONTENT

Description

Page

Test Report

1. GENERAL INFORMATION....4
1.1. Description of Device (EUT)....4
1.2. Auxiliary Equipment Used during Test....5
1.3. Description of Test Facility....6
1.4. Measurement Uncertainty....6
2. TEST METHODOLOGY....7
2.1. Summary of Test Results....7
2.2. Description of Antennas Specification....7
2.3. Description of Test Modes....7
3. CONDUCTED EMISSION TEST....8
3.1. Block Diagram of Test Setup....8
3.2. Power Line Conducted Emission Measurement Limits (15.207)....8
3.3. Configuration of EUT on Measurement....8
3.4. Operating Condition of EUT....8
3.5. Test Procedure....9
3.6. Test equipment....9
3.7. Power Line Conducted Emission Measurement Results....9
4. FCC PART 15.247 REQUIREMENTS FOR DSSS & OFDM MODULATION....12
4.1. Test Setup....12
4.2. 6dB Bandwidth....12
4.3. Maximum Output Power Test....18
4.4. Band Edges Measurement....21
4.5. Peak Power Spectral Density....32
4.6. Radiated Emissions....35
5. PHOTOGRAPH....46
5.1. Photo of Conducted Emission Measurement....46
5.2. Photo of Radiation Emission Test....46
APPENDIX I (EXTERNAL PHOTOS)....48
APPENDIX Ⅱ(INTERNAL PHOTOS)....52

TEST REPORT

Applicant	:	Low Power Radio Solutions Ltd
Manufacturer	:	Low Power Radio Solutions Ltd
EUT	:	Radio Transceiver Module
Model No.	:	eRIC9
Serial No.	:	N.A.
Trade Mark	:	N.A.
Rating	:	DC 5V Via USB Port

Measurement Procedure Used:
FCC Part15 Subpart C 2014, Paragraph 15.247

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

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

Date of Test : Jun. 01~ Jul. 02, 2015

Prepared by : (Tested Engineer / Kebo Zhang)

Reviewer : (Project Manager / Amy Ding)

Approved & Authorized Signer : (Manager / Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	Radio Transceiver Module
Model Number	:	eRIC9
Test Power Supply	:	DC 5V Via USB Port
RF Transmission Frequency	:	908-922MHz
Channels	:	15
Channel Space	:	1MHz
Modulation		ASK
Antenna Gain:	:	3dBi Max. for mor details, refer to clause 2.2.
Applicant	:	Low Power Radio Solutions Ltd
Address	:	Two Rivers Ind Est, Station Lane, Witney, OX28 4BH, United Kingdom
Manufacturer	:	Low Power Radio Solutions Ltd
Address	:	Two Rivers Ind Est, Station Lane, Witney, OX28 4BH, United Kingdom
Factory	:	Low Power Radio Solutions Ltd
Address	:	Two Rivers Ind Est, Station Lane, Witney, OX28 4BH, United Kingdom
Date of receipt	:	Jun. 01, 2015
Date of Test	:	Jun. 01~ Jul. 02, 2015

1.2. Auxiliary Equipment Used during Test

PC	:	Manufacturer: DELL M/N: OPTIPLEX 380 S/N: 1J63X2X CE , FCC: DOC
MONITOR	:	Manufacturer: DELL M/N: E170Sc S/N: CN-00V539-64180-055-0UPS CE , FCC: DOC
KEYBOARD	:	Manufacturer: DELL M/N: SK-8115 S/N: CN-0DJ313-71616-06C-02XN CE , FCC: DOC Cable: 1m, unshielded
MOUSE	:	Manufacturer: DELL M/N: M-UARDEL7 S/N: N/A CE , FCC: DOC Cable: 1m, unshielded
Printer	:	Manufacturer:Brother M/N: MFC-3360C S/N: N/A CE, FCC:DOC
Power Line	:	Non-Shielded, 1.5m
VGA Cable	:	Non-Shielded, 1.5m

1.3. Description of Test Facility

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

CNAS - LAB Code: L3503
Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 752021
Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registed and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 752021, July 10, 2013.

IC-Registration No.: 8058A-1
Shenzhen Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A, February 22, 2013.

Test Location
All Emissions tests were performed at
Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

1.4. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 4.1 dB (Horizontal) Ur = 4.3 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4dB

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC Part 15, Paragraph 15.247.

2.1. Summary of Test Results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107, 15.207	Conducted Emission Test	PASS	Complies
FCC Part 15, Paragraph 15.247(b)(1)	Maximum Output Power	PASS	Complies
FCC Part 15, Paragraph 15.247(a)(2)	6dB Bandwidth	PASS	Complies
FCC Part 15, Paragraph 15.247(c)	100kHz Bandwidth of Frequency Band Edges	PASS	Complies
FCC Part 15, Paragraph 15.209(a)(f)	Spurious Emission	PASS	Complies
FCC Part 15, Paragraph 15.247(a)(1)	Frequency Separation	-	N/A
FCC Part 15, Paragraph 15.247(a)(1)(iii)	Number of Hopping Frequency	-	N/A
FCC Part 15, Paragraph 15.247(a)(1)(iii)	Time of Occupancy	-	N/A
FCC Part 15, Paragraph 15.247(c)	Peak Power Density	PASS	Complies

2.2. Description of Antennas Specification

Antenna Type	Model Number	Max. Antenna Gain
Antenna 1	ANT-900MS/MR	3.0dBi
Antenna 2	ANT-WP915SMA-Y	2.5dBi
Antenna 3	ANT-SS/SR900	2.1dBi
Antenna 4	ANT-RP915SMA-Y	2.0dBi

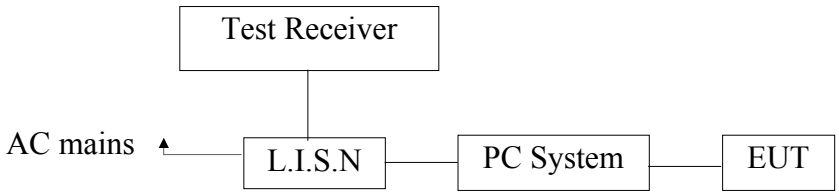
2.3. Description of Test Modes

The EUT has been tested under operating condition.
Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
Tests with all the four antennas have been evaludated, found that tests with Antenna 1 were the worst case.
Channel 1(908MHz), Channel 8(915MHz) and Channel 15(922MHz) with Antenna 1 are chosen for the final testing.

3. Conducted Emission Test

3.1. Block Diagram of Test Setup

3.1.1. Block diagram of connection between the EUT and simulators



3.2. Power Line Conducted Emission Measurement Limits (15.207)

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

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

3.3. Configuration of EUT on Measurement

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

3.4. Operating Condition of EUT

3.4.1. Setup the EUT and simulator as shown as Section 3.1.

3.4.2. Turn on the power of all equipment.

3.4.3. Let the EUT work in test mode (On) and measure it.

3.5. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2013 on Conducted Emission Measurement.

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

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

The test results are reported on Section 3.6.

3.6. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Two-Line V-network	Rohde & Schwarz	ENV216	100055	Apr. 17, 2015	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Apr. 17, 2015	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Apr. 17, 2015	1 Year

3.7. Power Line Conducted Emission Measurement Results

PASS.

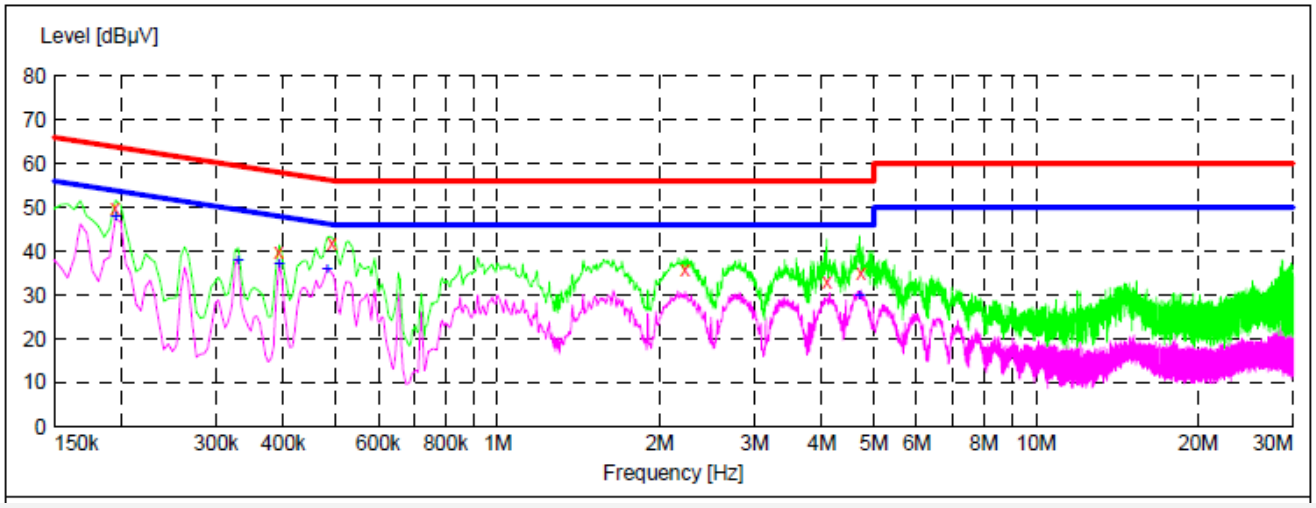
The frequency range from 150KHz to 30 MHz is investigated.

Please refer the following pages.

CONDUCTED EMISSION TEST DATA

Test Site:	1# Shielded Room
Operating Condition:	On
Test Specification:	DC 5V Via USB Port
Comment:	Live Line
	Tem.:25℃ Hum.:50%

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



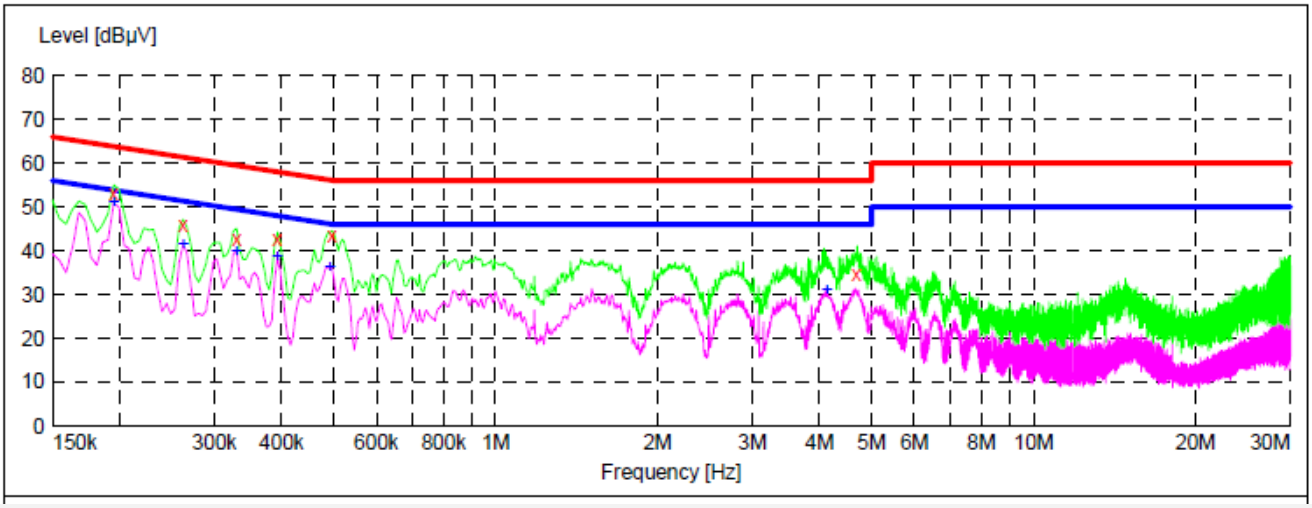
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	49.90	20.1	64	13.9	QP	L1	GND
0.393000	40.00	20.1	58	18.0	QP	L1	GND
0.492000	41.80	20.1	56	14.3	QP	L1	GND
2.228500	35.80	20.3	56	20.2	QP	L1	GND
4.091500	33.20	20.5	56	22.8	QP	L1	GND
4.721500	35.10	20.5	56	20.9	QP	L1	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	47.80	20.1	54	6.0	AV	L1	GND
0.330000	38.00	20.1	50	11.5	AV	L1	GND
0.393000	37.30	20.1	48	10.7	AV	L1	GND
0.483000	35.80	20.1	46	10.5	AV	L1	GND
4.699000	30.00	20.5	46	16.0	AV	L1	GND

CONDUCTED EMISSION TEST DATA

Test Site:	1# Shielded Room
Operating Condition:	On
Test Specification:	DC 5V Via USB Port
Comment:	Neutral Line
	Tem.:25℃ Hum.:50%

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

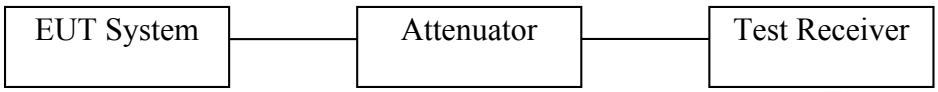


Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	53.00	20.1	64	10.8	QP	N	GND
0.262500	46.10	20.1	61	15.3	QP	N	GND
0.330000	42.60	20.1	60	16.9	QP	N	GND
0.393000	42.70	20.1	58	15.3	QP	N	GND
0.496500	43.50	20.1	56	12.6	QP	N	GND
4.681000	34.90	20.5	56	21.1	QP	N	GND

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	50.50	20.1	54	3.4	AV	N	GND
0.262500	41.30	20.1	51	10.1	AV	N	GND
0.330000	39.70	20.1	50	9.8	AV	N	GND
0.393000	38.60	20.1	48	9.4	AV	N	GND
0.492000	36.30	20.1	46	9.8	AV	N	GND
4.127500	31.10	20.5	46	14.9	AV	N	GND

4. FCC Part 15.247 Requirements for DSSS & OFDM Modulation

4.1. Test Setup



4.2. 6dB Bandwidth

a. Limit

For the direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

b.Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:
   RBW = 100kHz, VBW⩾3*RBW =300kHz,
   Detector= Peak
   Trace mode= Max hold.
   Sweep- auto couple.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

20dB Bandwidth:
C63.10
Occupied Bandwidth (OBW=20dB Bandwidth

1. Set RBW=1%~5% OBW
2. Set the VBW⩾3*RBW
3. Set the span range between 2 times and 5 times of the OBW
4. Sweep Time= Auto
   Detector= Peak
   Trace= Max hold
5. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce the worst case (i.e. the widest) bandwidth. Unless otherwise specified for an unlicensed wireless device, measure the bandwidth at the -20dB levels with respect to the reference level.

c. Test Setup See 4.1

d. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 20, 2015	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

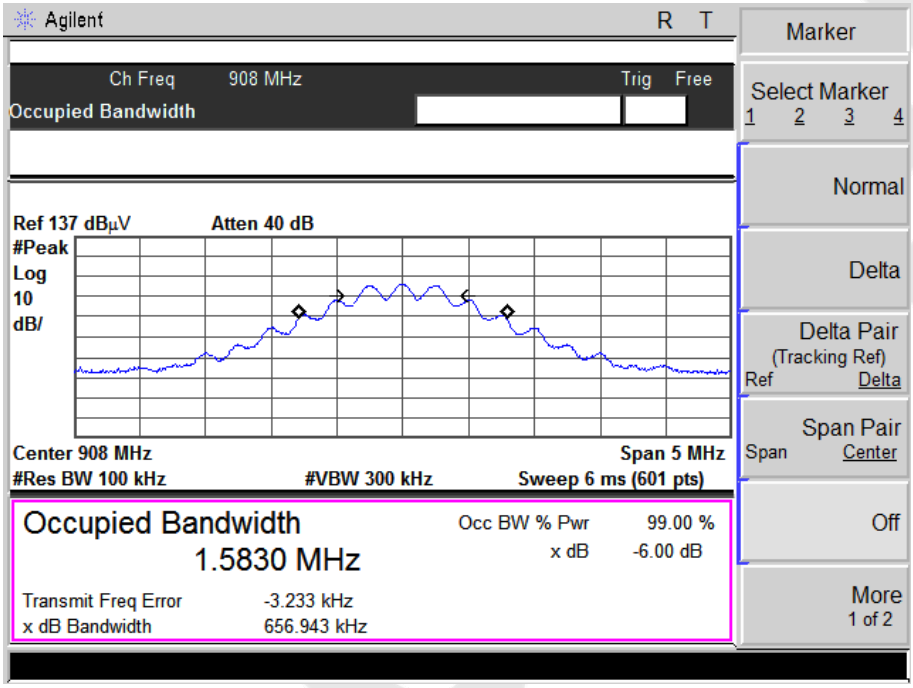
e. Test Results

Pass.

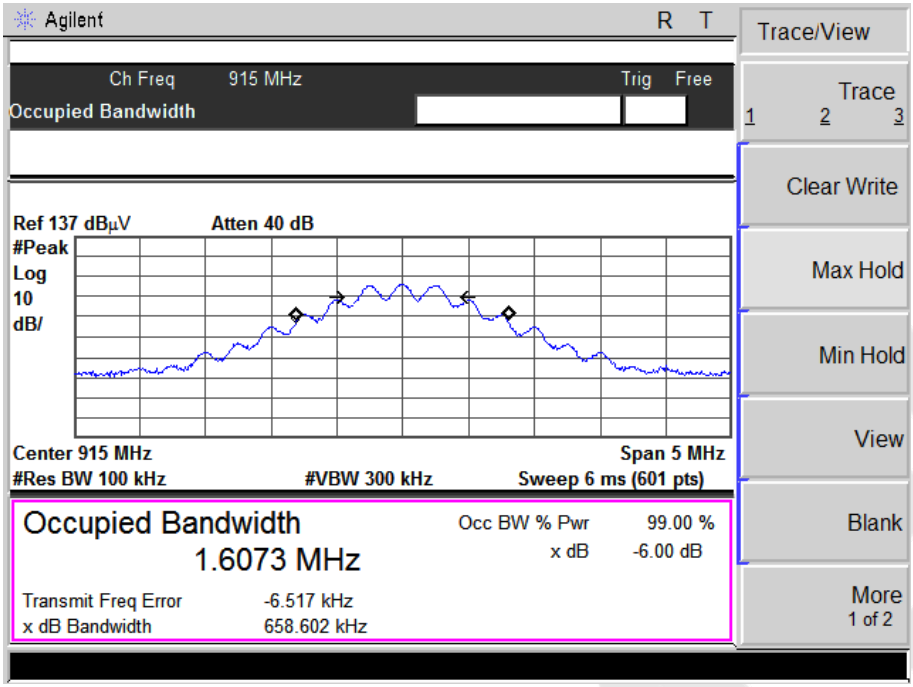
f. Test Data
6dB Bandwidth

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Results
Low	908	656.943		Pass
Mid	915	658.602	>500	Pass
High	922	658.514		Pass

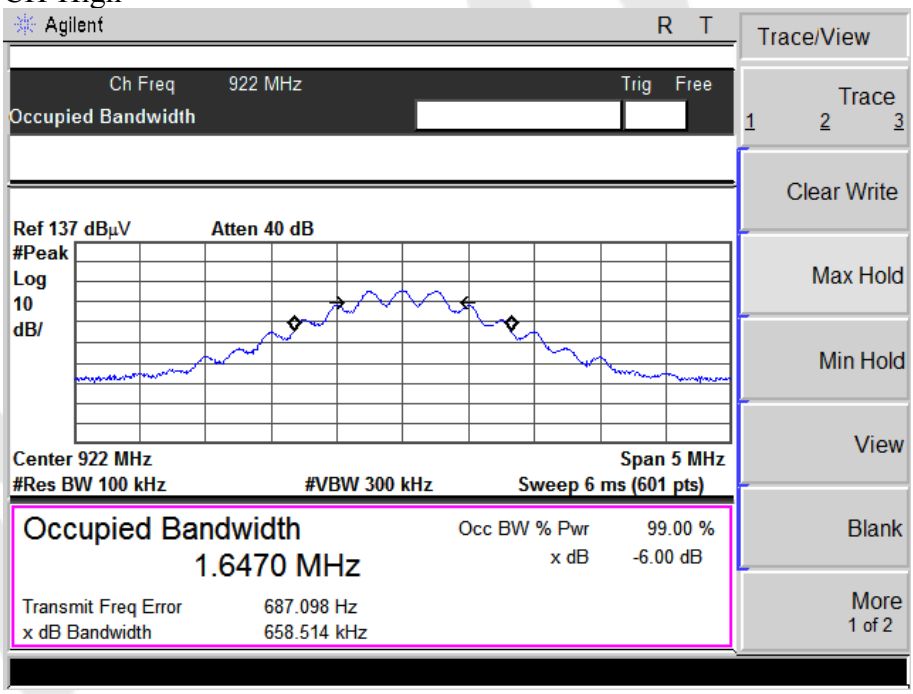
CH Low



CH Mid



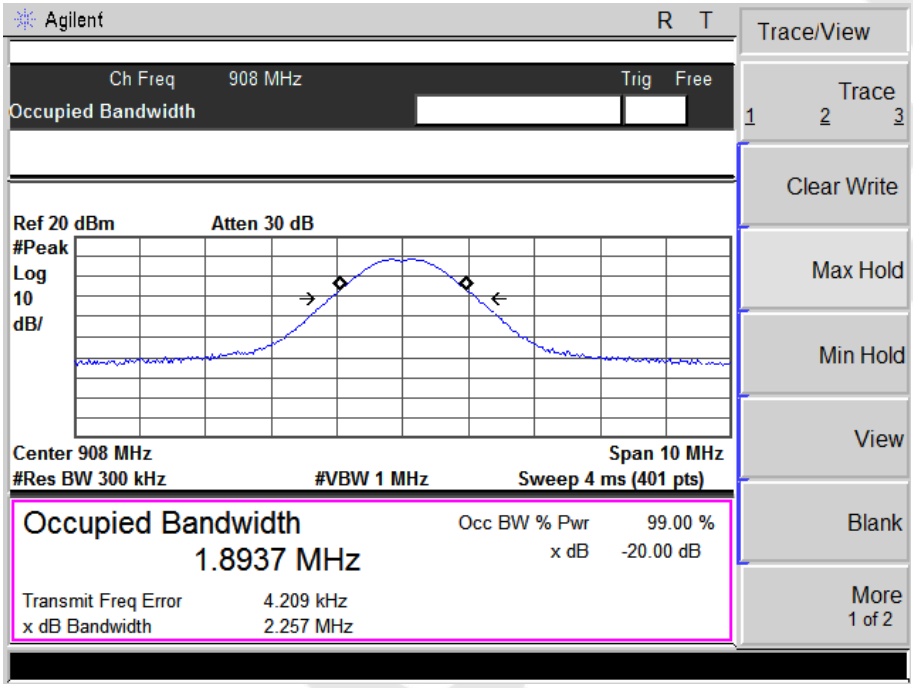
CH-High



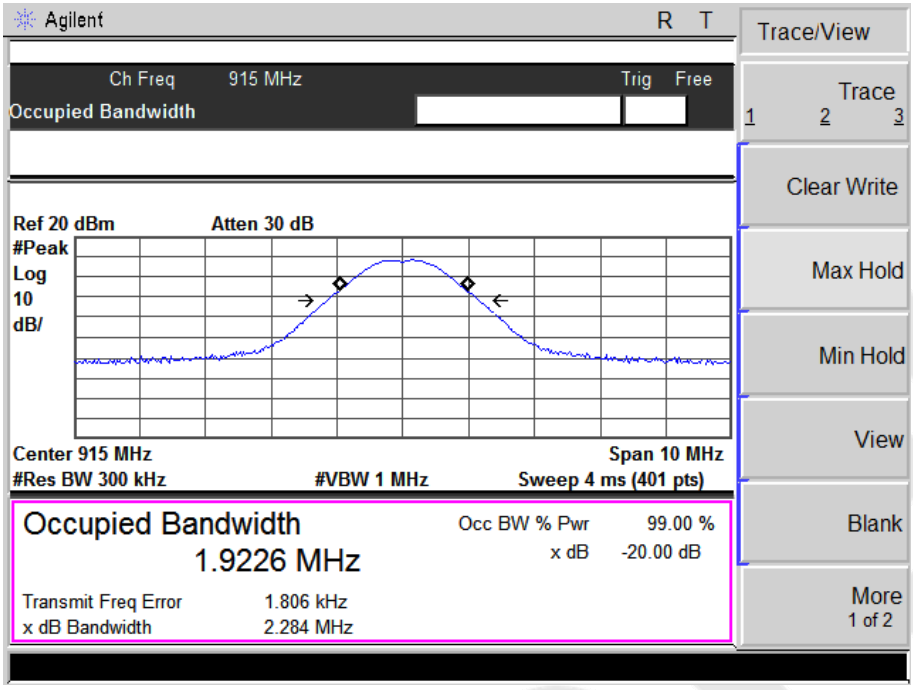
20dB Bandwidth

Channel	Frequency (MHz)	Bandwidth (MHz)	Results
Low	908	2.257	Pass
Mid	915	2.284	Pass
High	922	2.323	Pass

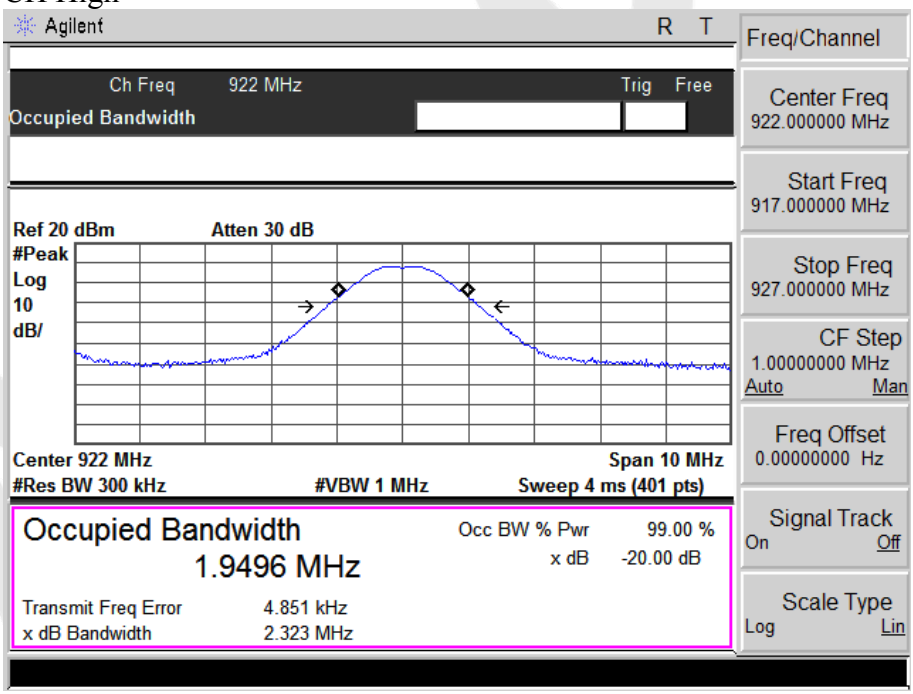
CH Low



CH Mid



CH High

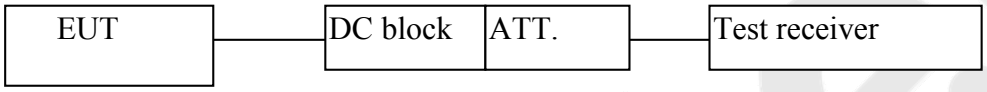


4.3. Maximum Output Power Test

a. Limit

The maximum output power of the intentional radiator shall not exceed the following:
1. For systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 watt (30dBm).
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antenna of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

b. Configuration of Measurement



c. Test Procedure

This test was according the kDB 558074 9.2.2:
1. Set span to at least 1.5 times the OBW.
2. Set the RBW =1~5% of the OBW, not to exceed 1MHz.
3. Set VBW⩾3*RBW.
4. Detector = Average.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

d. Test Equipment

Same as the equipment listed in 4.2.

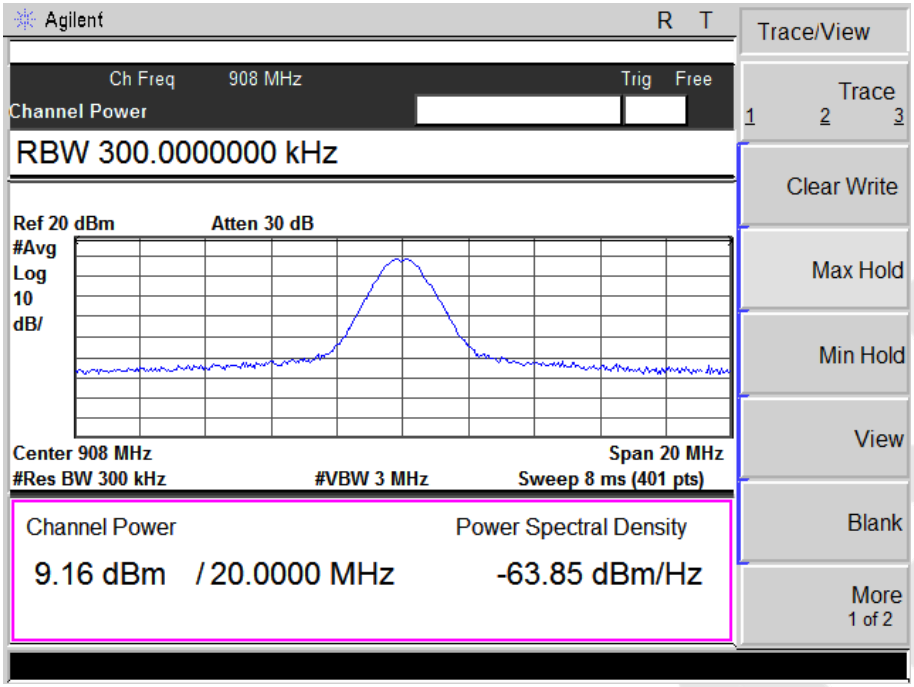
e. Test Results

Pass.

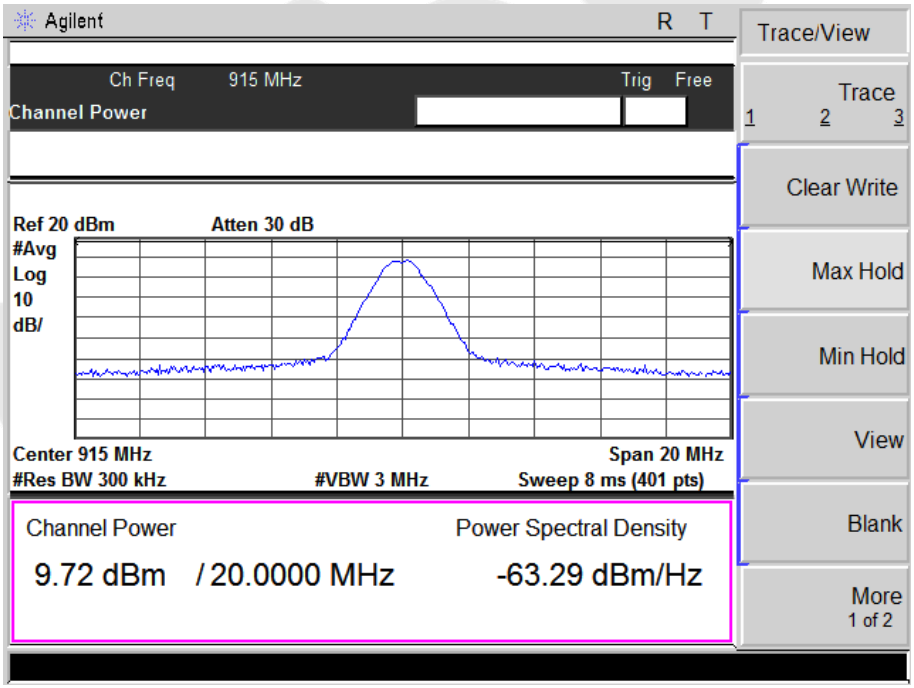
g. Test Data

Channel	Frequency (MHz)	Maximum transmit power (dBm)	Limit (dBm)	Limit (watts)	Result
Low	908	9.16	30	1	Pass
Mid	915	9.72			Pass
High	922	9.32			Pass

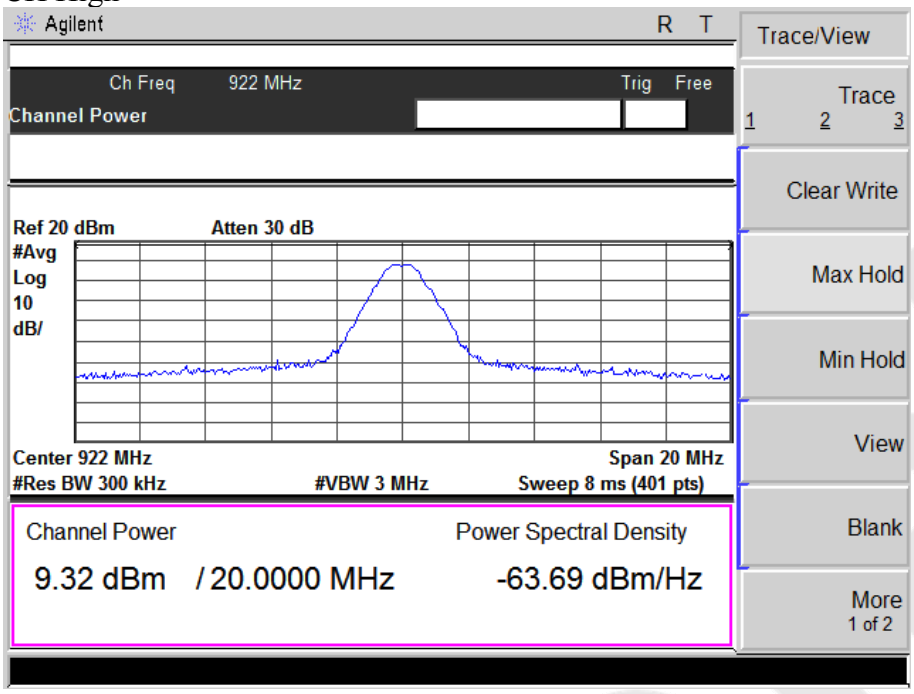
CH Low


Agilent
R T
Trace/View
Ch Freq 908 MHz
Trig Free
Channel Power
Trace
1 2 3
RBW 300.0000000 kHz
Clear Write
Ref 20 dBm
Atten 30 dB
#Avg
Log
10
dB/
Max Hold
Min Hold
View
Center 908 MHz
Span 20 MHz
#Res BW 300 kHz
#VBW 3 MHz
Sweep 8 ms (401 pts)
Blank
Channel Power
Power Spectral Density
9.16 dBm / 20.0000 MHz
-63.85 dBm/Hz
More
1 of 2

CH Mid


Agilent
R T
Trace/View
Ch Freq 915 MHz
Trig Free
Channel Power
Trace
1 2 3
Clear Write
Ref 20 dBm
Atten 30 dB
#Avg
Log
10
dB/
Max Hold
Min Hold
View
Center 915 MHz
Span 20 MHz
#Res BW 300 kHz
#VBW 3 MHz
Sweep 8 ms (401 pts)
Blank
Channel Power
Power Spectral Density
9.72 dBm / 20.0000 MHz
-63.29 dBm/Hz
More
1 of 2

CH High


Agilent
R T
Trace/View
Ch Freq 922 MHz
Trig Free
Channel Power
Trace
1 2 3
Clear Write
Ref 20 dBm
Atten 30 dB
#Avg
Log
10
dB/
Max Hold
Min Hold
View
Center 922 MHz
Span 20 MHz
#Res BW 300 kHz
#VBW 3 MHz
Sweep 8 ms (401 pts)
Blank
Channel Power
Power Spectral Density
9.32 dBm / 20.0000 MHz
-63.69 dBm/Hz
More
1 of 2

4.4. Band Edges Measurement

a. Limit

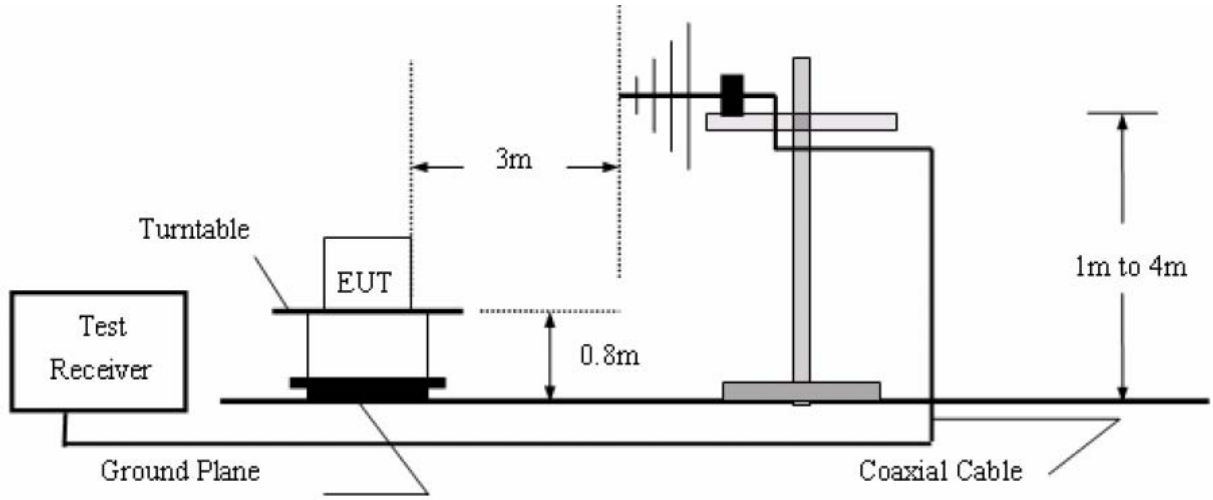
According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

b. Test Procedure

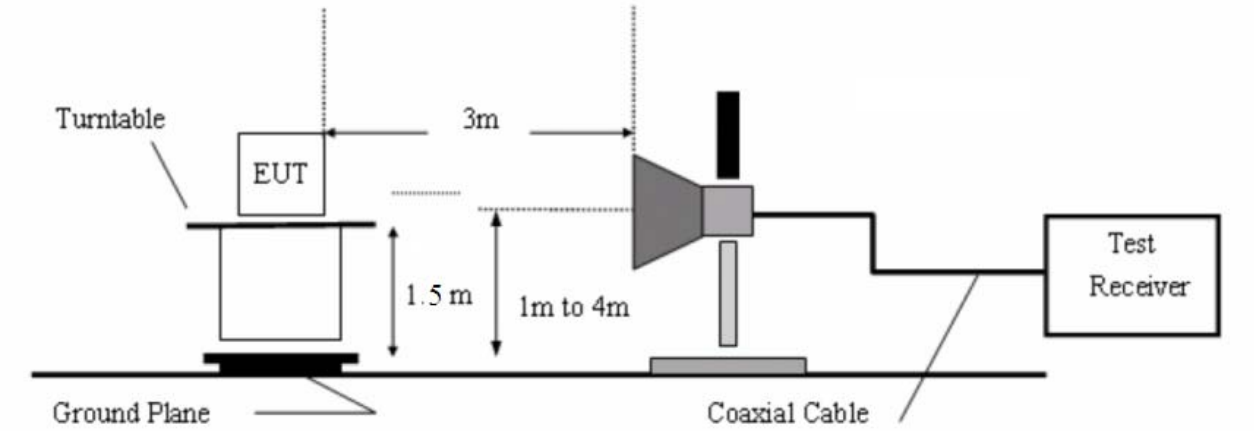
1. Conducted Method:
1) Set RBW=100KHz, VBW=300KHz
2) Detector=peak
3) Sweep time= auto
4) Trace mode=max hold.

2. Radiated Method:
1) For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane. The EUT is tested in 9*6*6 Chamber.
For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane. The EUT is tested in 9*6*6 Chamber.
2) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4) Peak detector: RBW=1MHz, VBW=3MHz, SWT=AUTO
Average detector: RBW=1MHz, VBW=10Hz, SWT=AUTO
The EUT is tested in 9*6*6 Chamber.
5) Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

30M to 1G emissions:



1G to 40G emissions:



c. Test Equipment

Same as the equipment listed in 4.2.

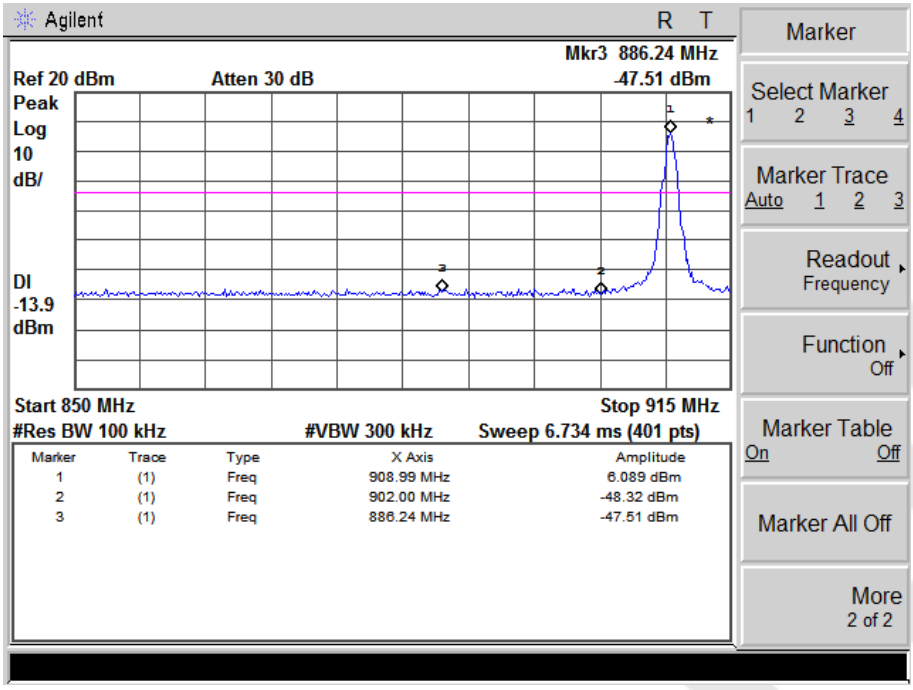
d. Test Results

Pass.

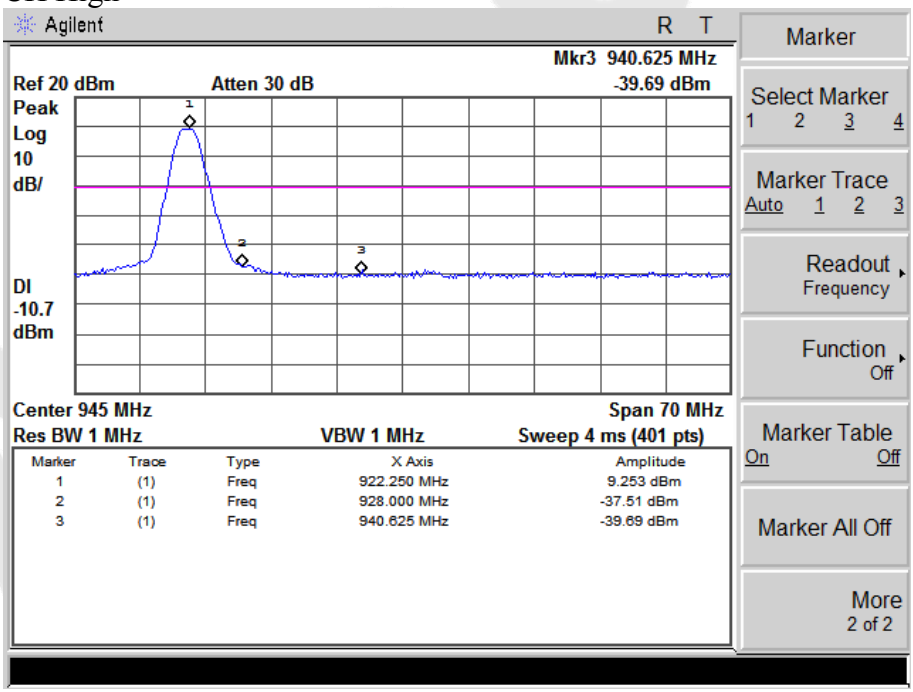
e. Test Plots

See the following page.

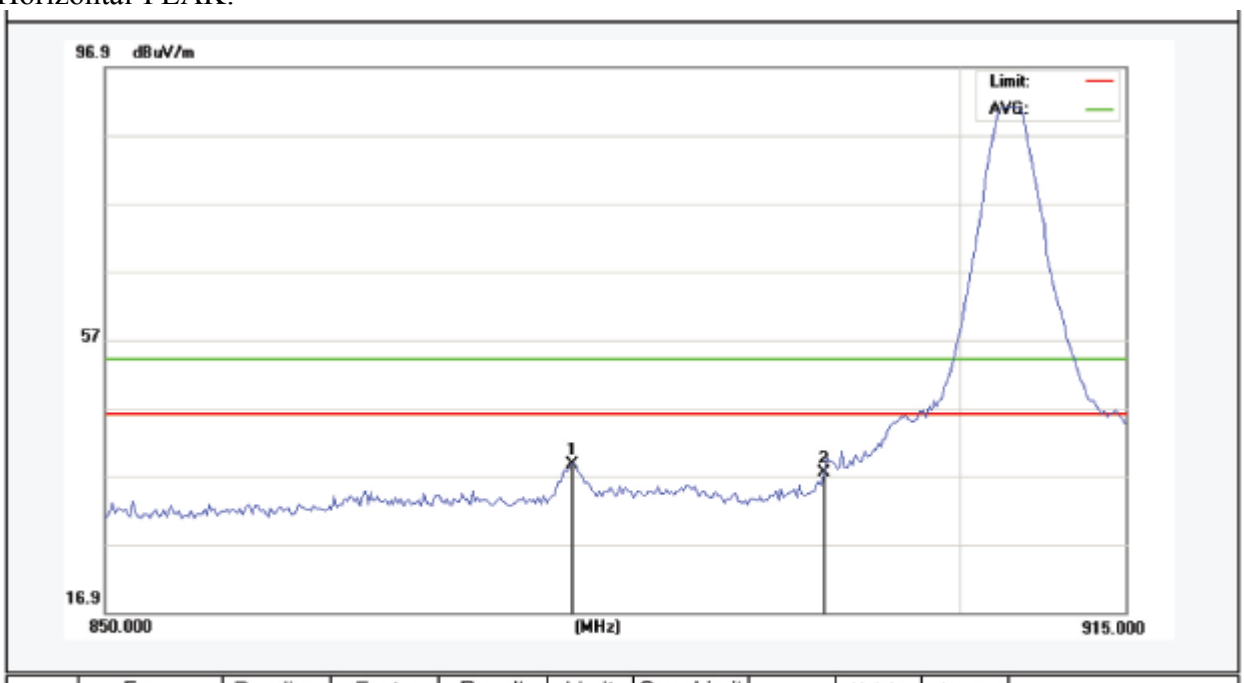
CH Low



CH High



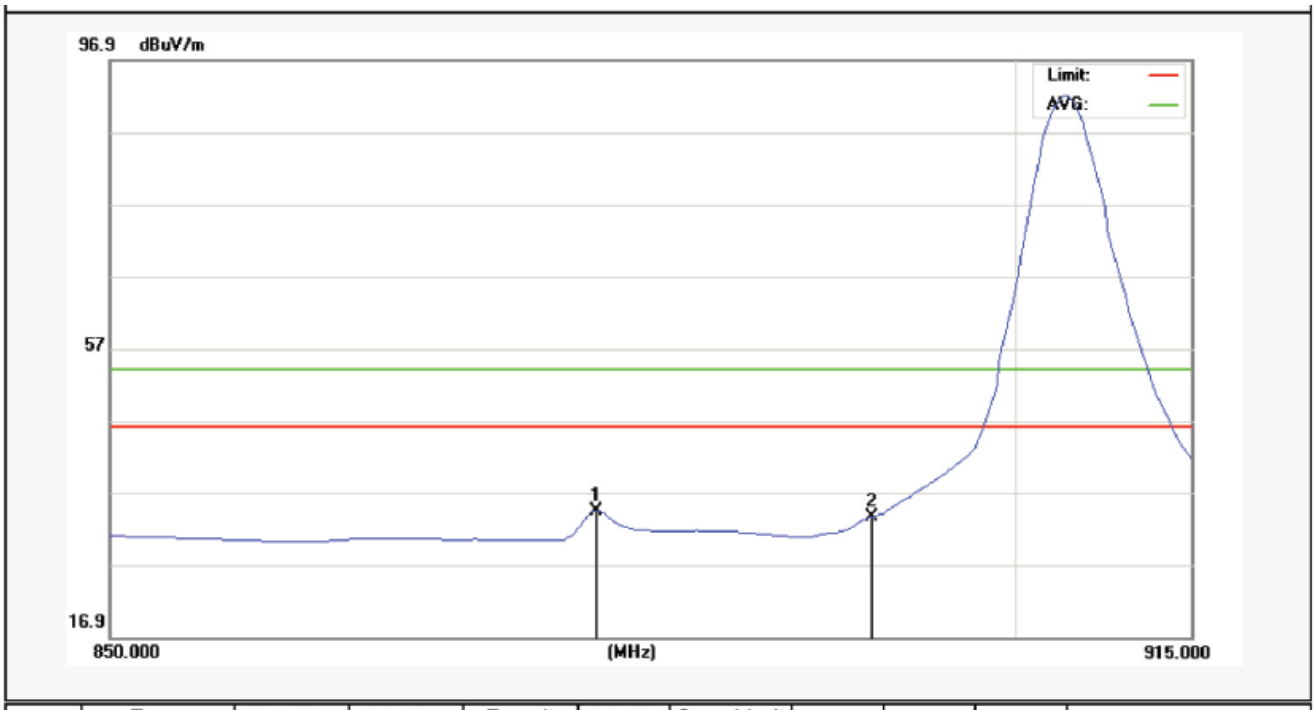
908MHz:
Horizontal-PEAK:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	877.0000	38.70	0.00	38.70	46.00	-7.30	peak			
2	902.0000	37.42	0.00	37.42	46.00	-8.58	peak			

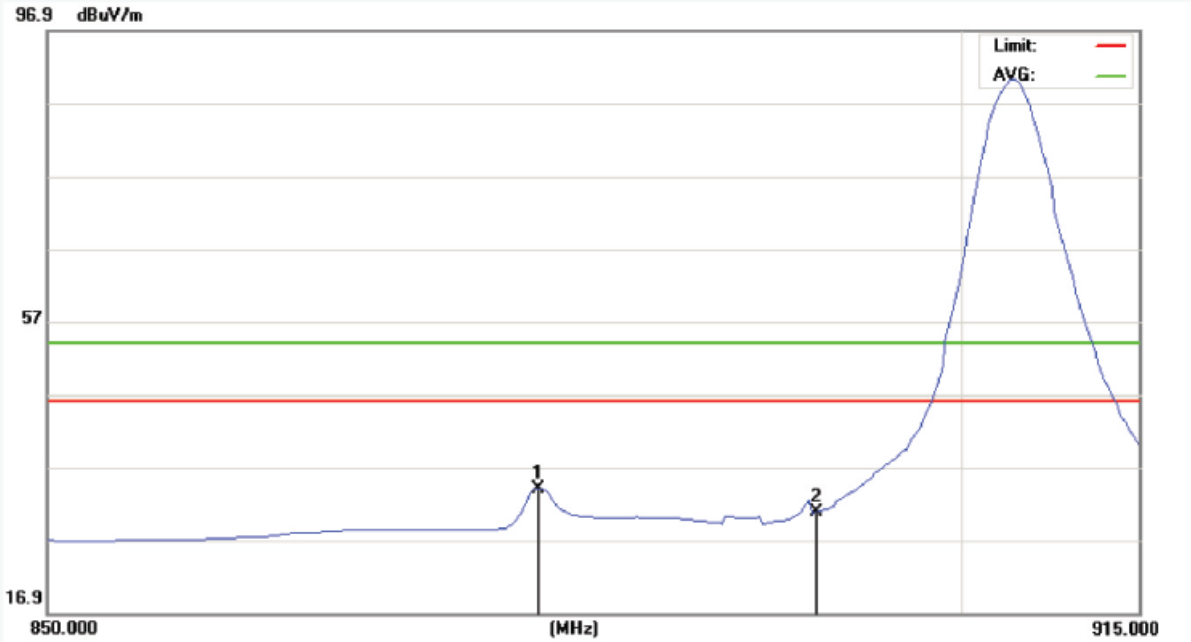
908MHz

Horizontal-AV:



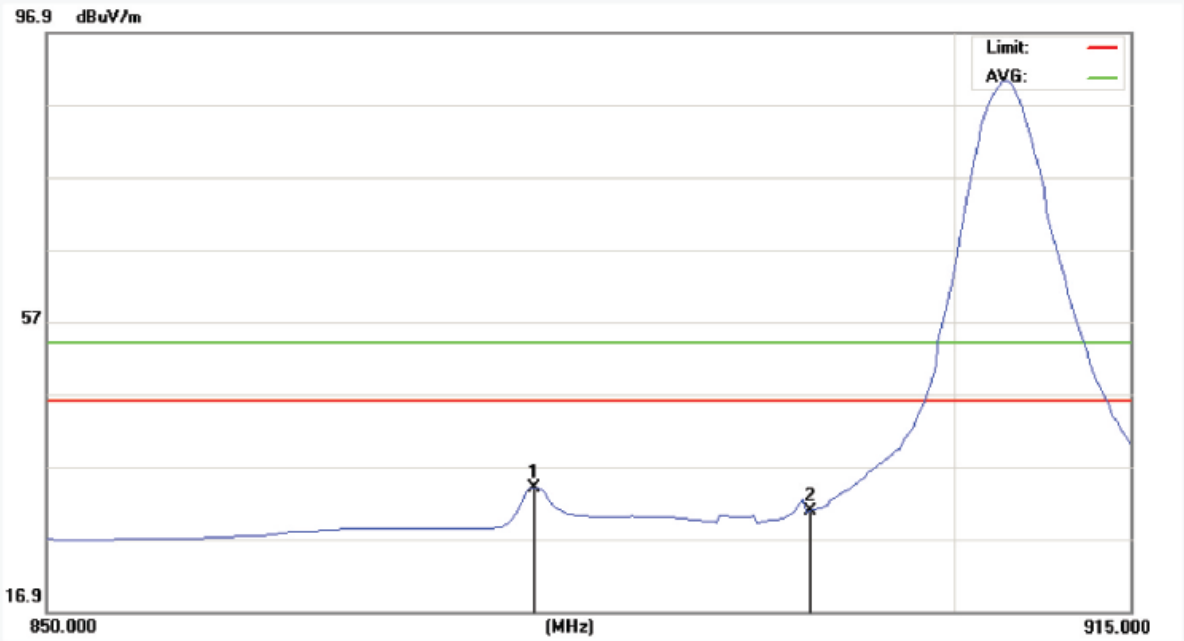
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	876.5500	34.37	0.00	34.37	54.00	-19.63	AVG			
2	902.0000	33.59	0.00	33.59	54.00	-20.41	AVG			

908MHz:
Vertical-PEAK:



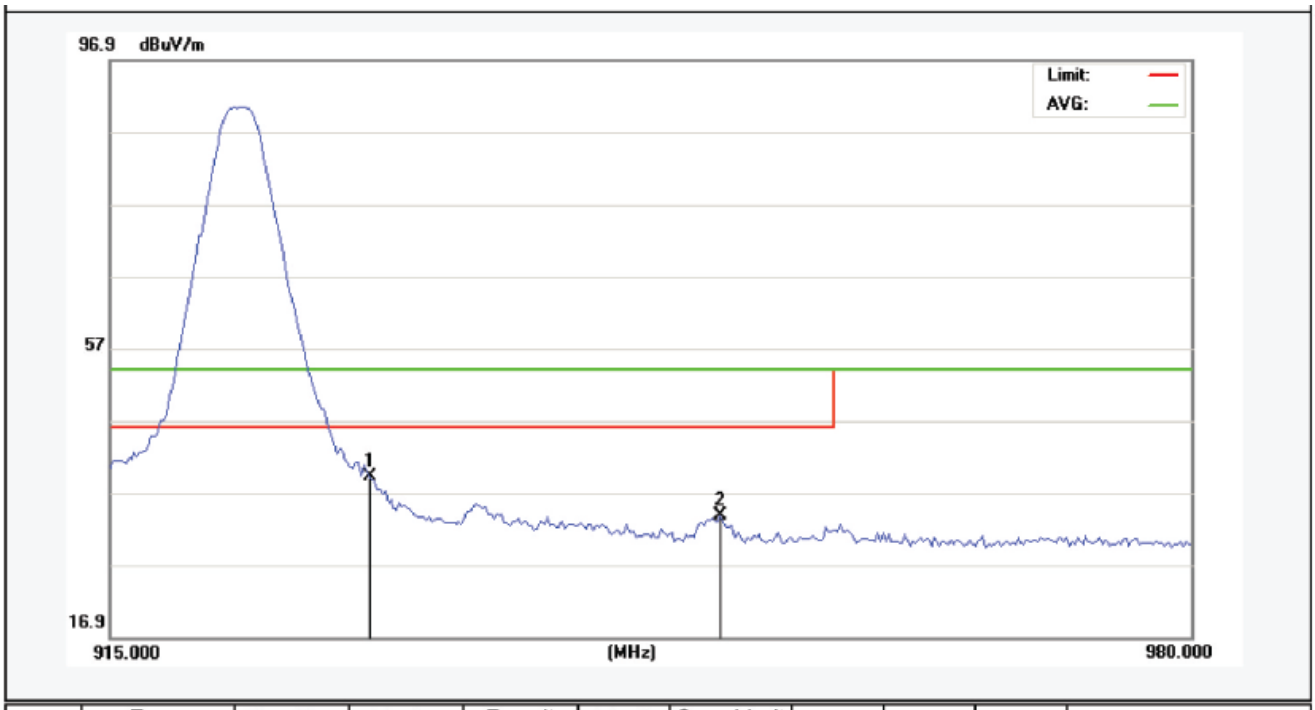
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	876.5500	34.05	0.00	34.05	54.00	-19.95	AVG			
2	902.0000	30.84	0.00	30.84	54.00	-23.16	AVG			

908MHz:
Vertical-AV:908MHz:



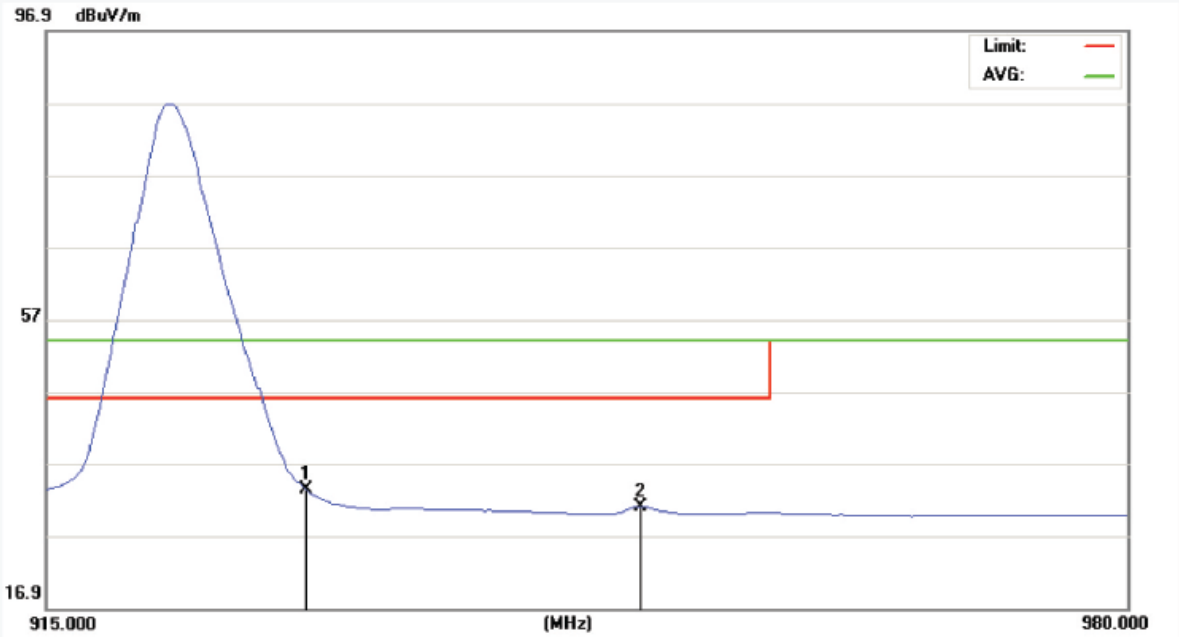
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	876.5500	34.05	0.00	34.05	54.00	-19.95	AVG			
2	902.0000	30.84	0.00	30.84	54.00	-23.16	AVG			

922MHz:
Horizontal-PEAK:



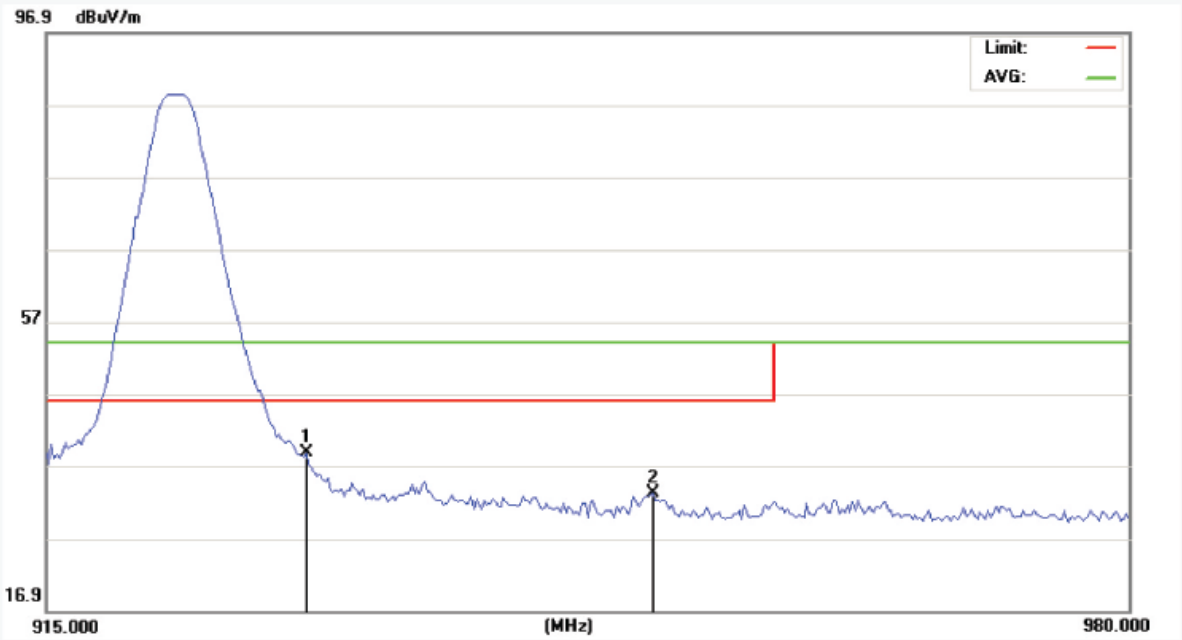
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	928.0000	39.21	0.00	39.21	46.00	-6.79	peak			
2	953.4500	33.77	0.00	33.77	46.00	-12.23	peak			

922MHz:
Horizontal-AV:



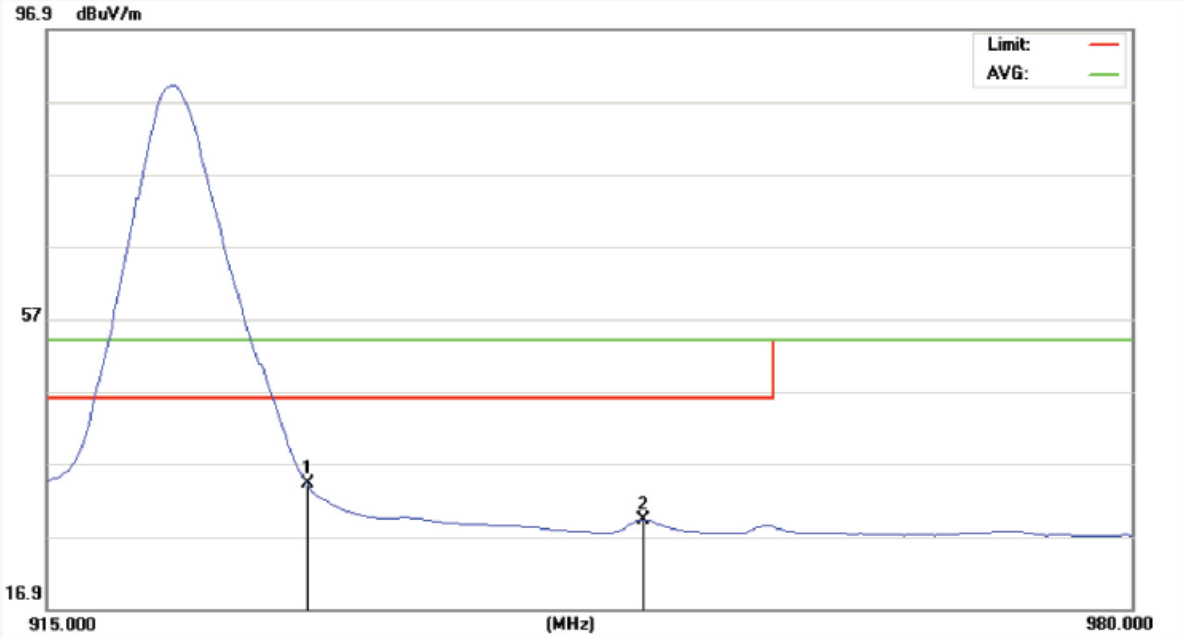
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	928.0000	33.45	0.00	33.45	54.00	-20.55	AVG			
2	952.5499	31.02	0.00	31.02	54.00	-22.98	AVG			

922MHz:
Vertical-PEAK:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	928.0000	38.73	0.00	38.73	46.00	-7.27	peak			
2	953.1499	33.11	0.00	33.11	46.00	-12.89	peak			

922MHz:
Vertical-AV:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	928.0000	34.30	0.00	34.30	54.00	-19.70	AVG			
2	952.5499	29.27	0.00	29.27	54.00	-24.73	AVG			

4.5. Peak Power Spectral Density

a. Limit

1. For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
2. The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

b. Test Procedure

1. Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 1.5 times DTS BW, Sweep=500s
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

c. Test Equipment

Same as the equipment listed in 4.2.

d. Test Setup

See 4.1

e. Test Results

Pass

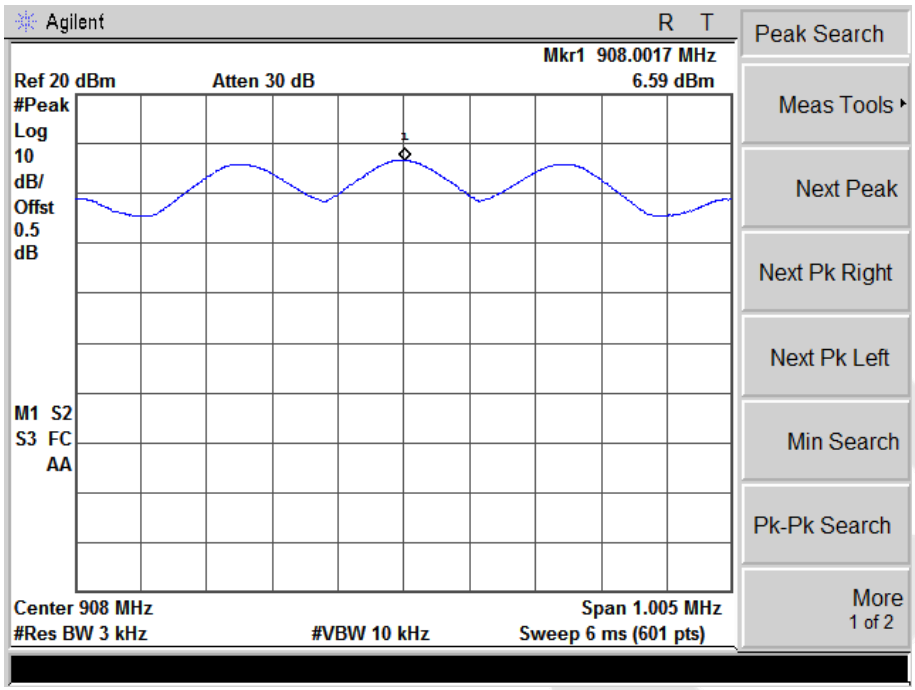
f. Test Data

Please refer to the following data.

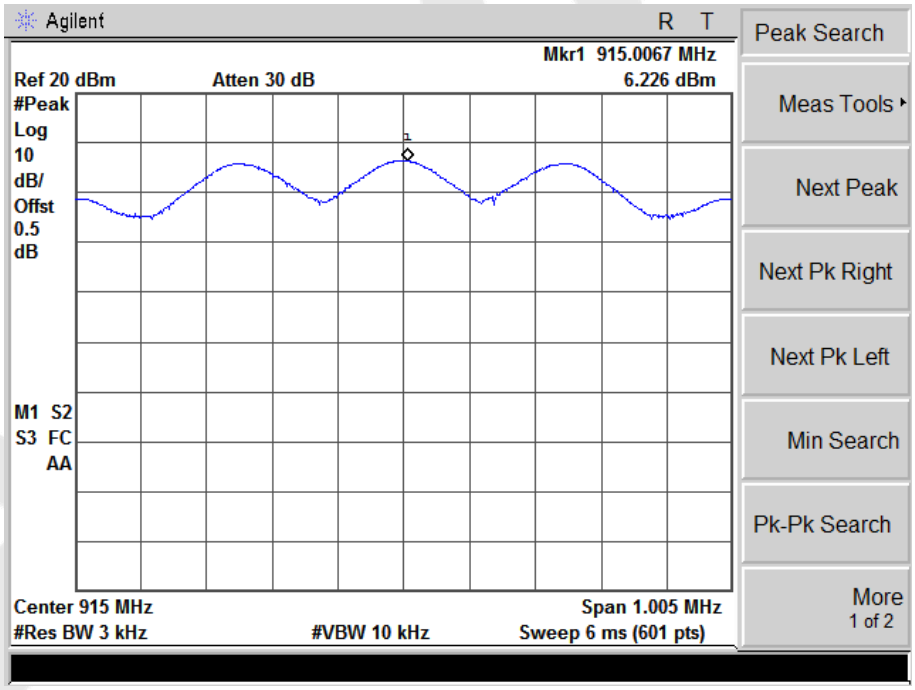
g. Test Plot See the following pages

Channel	Frequency (MHz)	PPSD (dBm/3KHz)	∑PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	908	6.590	-		Pass
Mid	915	6.226	-	8.00	Pass
High	922	6.076	-		Pass

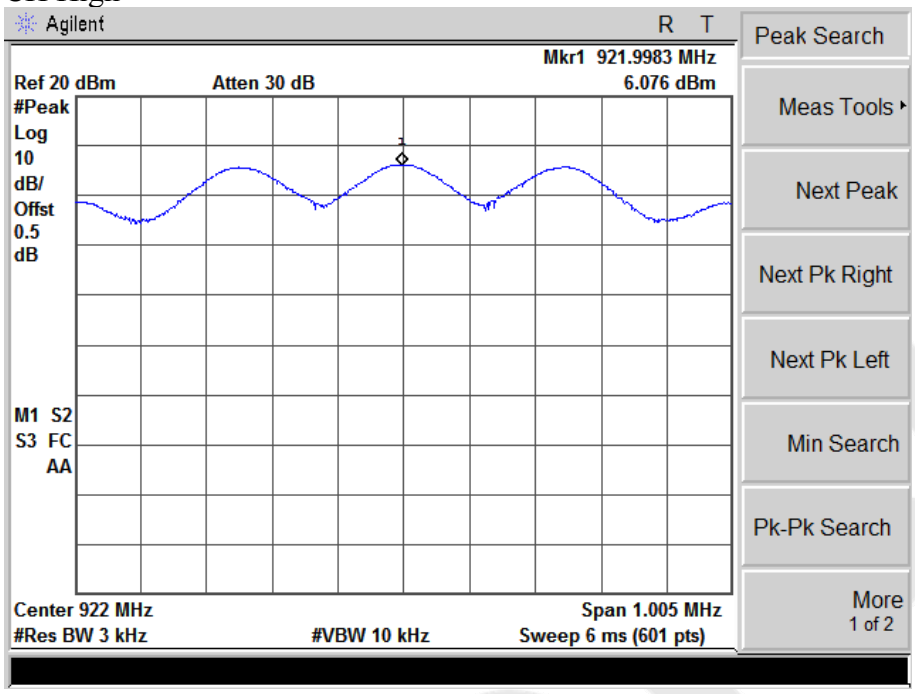
CH Low


Agilent
R T
Mkr1 908.0017 MHz
Ref 20 dBm
Atten 30 dB
6.59 dBm
#Peak
Log
10
dB/
Offst
0.5
dB
M1 S2
S3 FC
AA
Center 908 MHz
#Res BW 3 kHz
#VBW 10 kHz
Span 1.005 MHz
Sweep 6 ms (601 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

CH Mid


Agilent
R T
Mkr1 915.0067 MHz
Ref 20 dBm
Atten 30 dB
6.226 dBm
#Peak
Log
10
dB/
Offst
0.5
dB
M1 S2
S3 FC
AA
Center 915 MHz
#Res BW 3 kHz
#VBW 10 kHz
Span 1.005 MHz
Sweep 6 ms (601 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

CH High


Agilent
R T
Mkr1 921.9983 MHz
Ref 20 dBm
Atten 30 dB
6.076 dBm
#Peak
Log
10
dB/
Offst
0.5
dB
M1 S2
S3 FC
AA
Center 922 MHz
#Res BW 3 kHz
#VBW 10 kHz
Span 1.005 MHz
Sweep 6 ms (601 pts)
Peak Search
Meas Tools
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
More
1 of 2

4.6. Radiated Emissions

4.6.1.1. Test Limits (< 30 MHZ)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

4.6.1.2. Test Limits (≥ 30 MHZ)

FIELD STRENGTH of Fundamental: @3M	FIELD STRENGTH of Harmonics	S15.209	
902-928 MHZ		30 - 88 MHz	40 dBuV/m
2.4-2.4835 GHz		88 - 216 MHz	43.5
94 dBμV/m @3m	54 dBμV/m @3m	216 - 960 MHz	46
		ABOVE 960 MHz	54dBuV/m

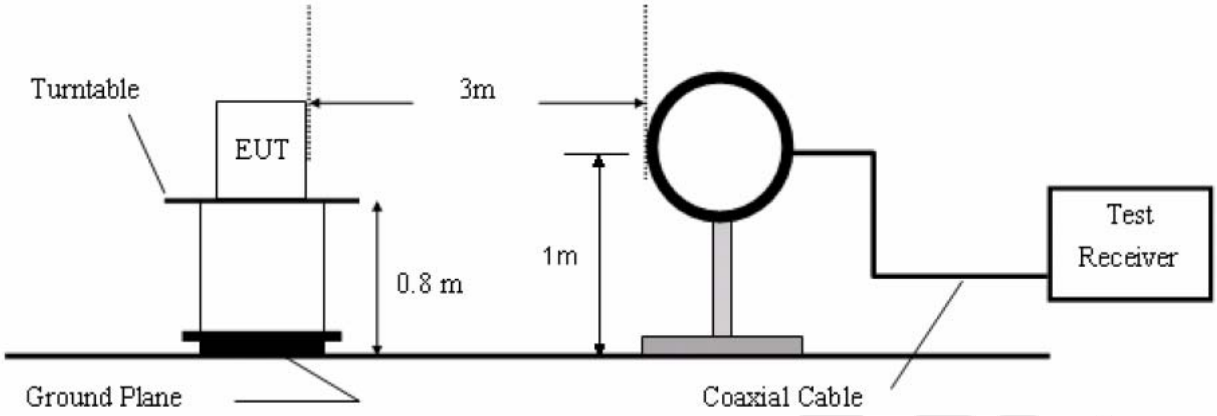
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Test Equipment

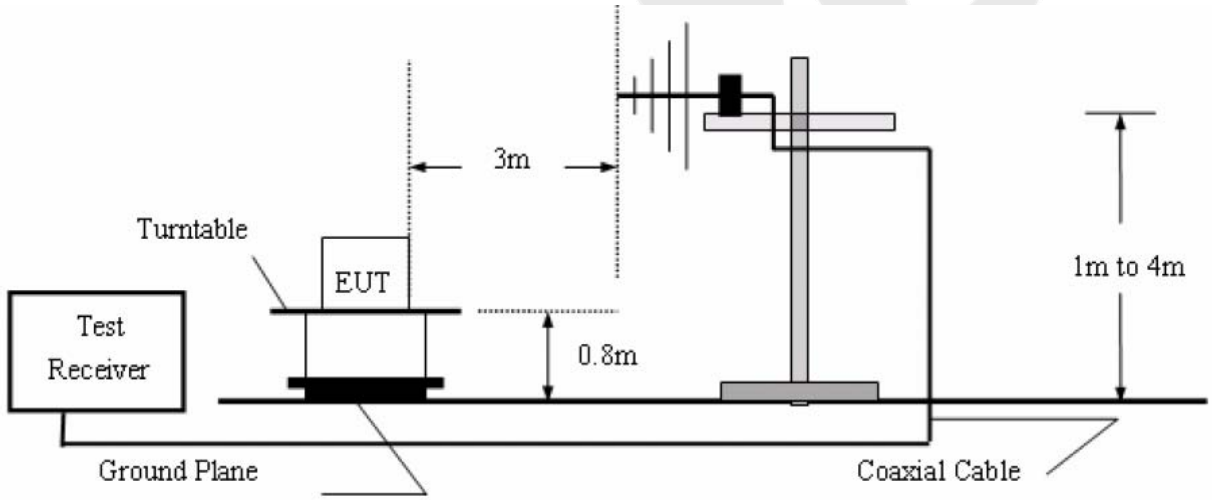
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 20, 2015	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

4.6.2. Test Configuration:

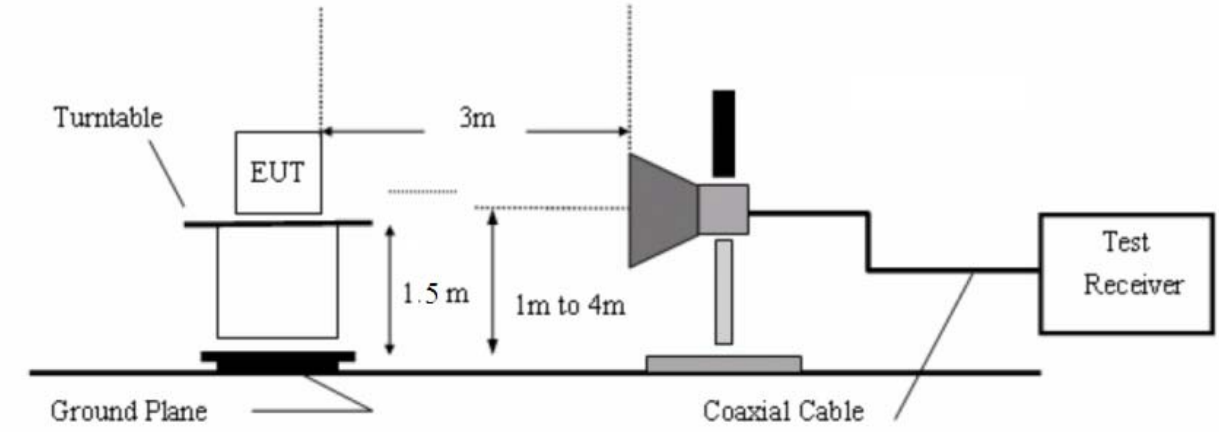
4.6.2.1. 9k to 30MHz emissions:



4.6.2.2. 30M to 1G emissions:



4.6.2.3. 1G to 40G emissions:



4.6.3. Test Procedure

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

Measurements are made on 9KHz to 30MHz and 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

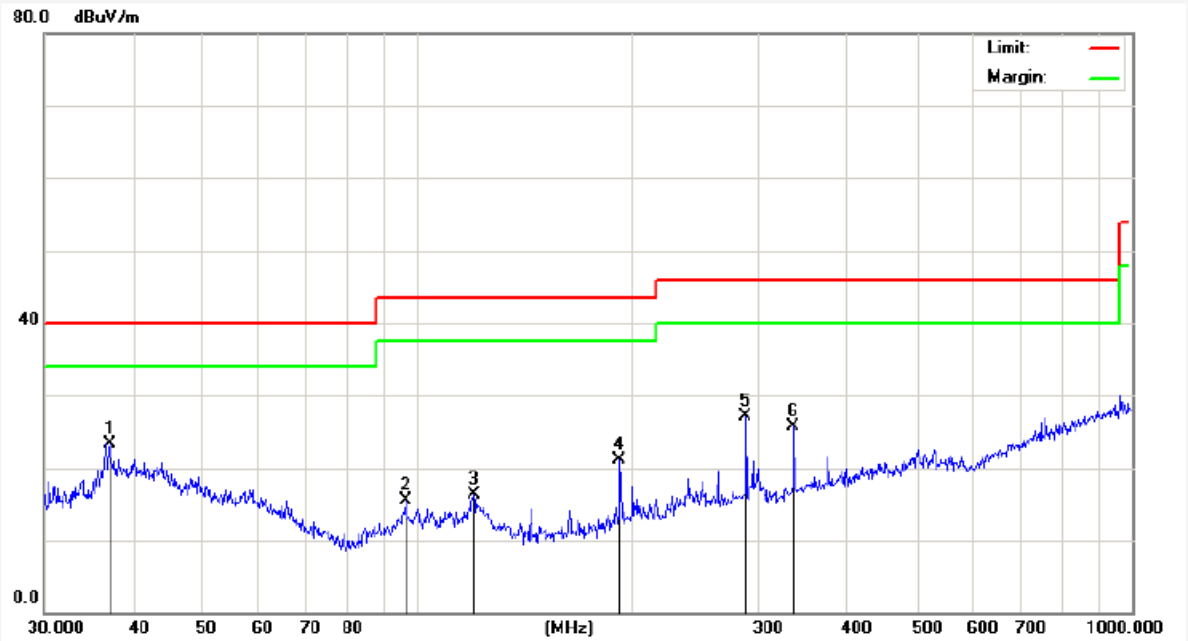
All readings from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. All reading are above 1GHz, peak & average values with a resolution bandwidth of 1MHz.
The EUT is tested in 9*6*6 Chamber.

The test results are listed in Section 4.6.4.

4.6.4. Test Results

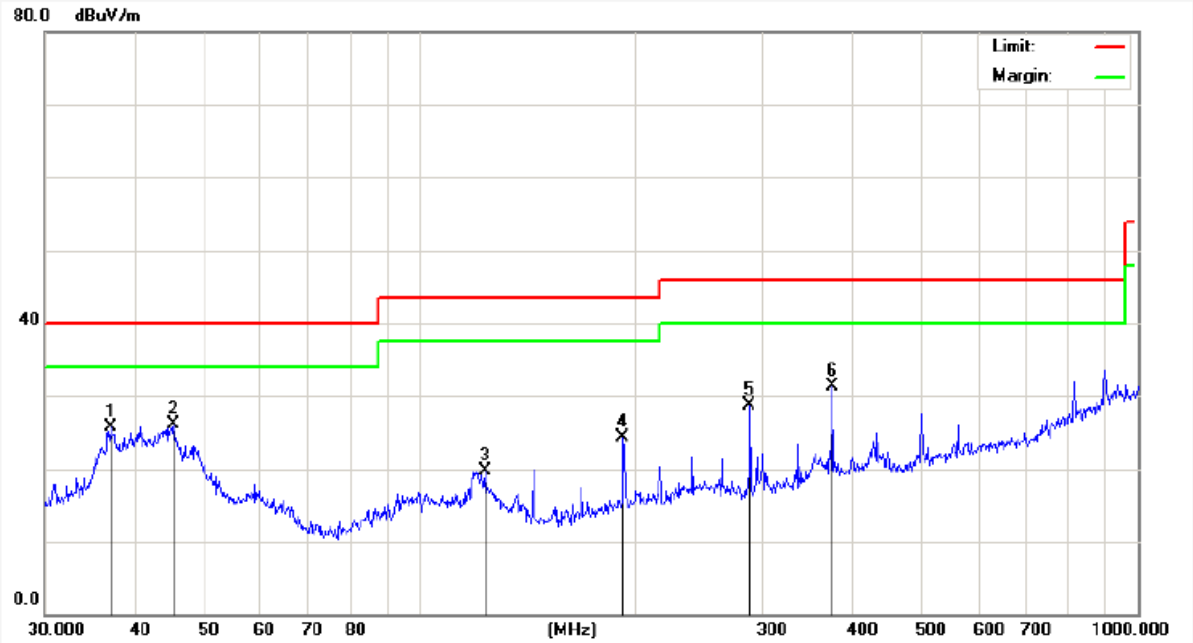
Please refer to the following pages.

Job No.:	**011505565I**	**Polarization:**	**Horizontal**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via USB Port**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Test Mode:	**On**	**Distance:**	**3m**



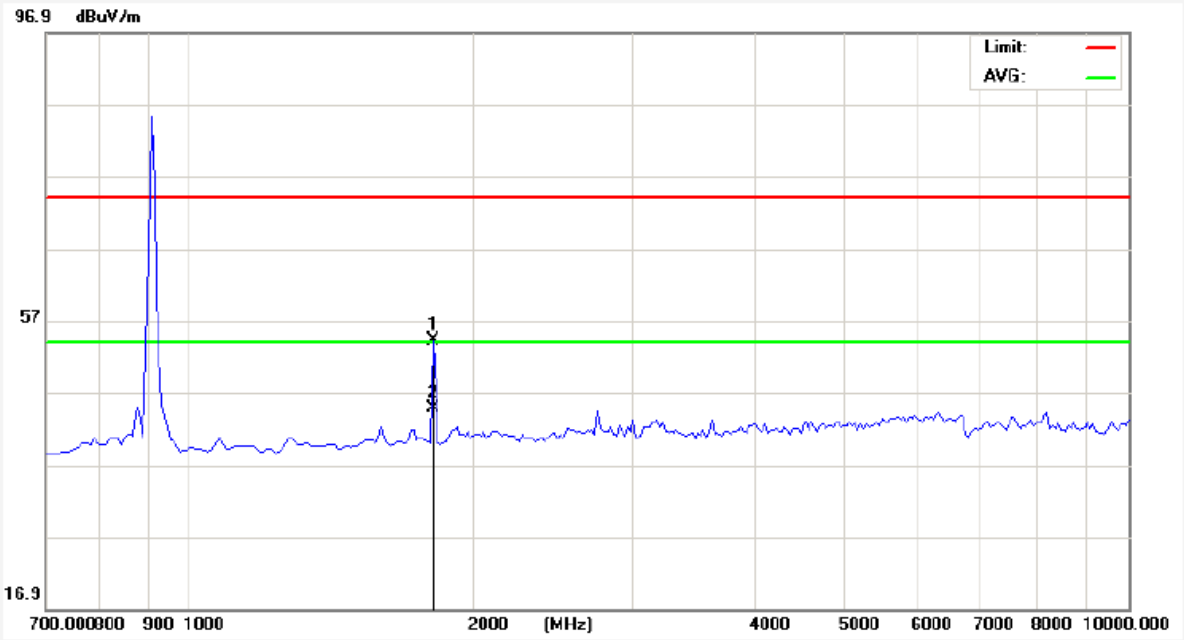
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	37.0248	36.03	-12.70	23.33	40.00	-16.67	peak			
2	96.0986	33.39	-17.97	15.42	43.50	-28.08	peak			
3	119.8556	34.62	-18.32	16.30	43.50	-27.20	peak			
4	191.7450	39.10	-17.92	21.18	43.50	-22.32	peak			
5	287.9904	42.10	-15.01	27.09	46.00	-18.91	peak			
6	336.0352	40.19	-14.49	25.70	46.00	-20.30	peak			

Job No.:	**011505565I**	**Polarization:**	**Vertical**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via USB Port**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Test Mode:	**On**	**Distance:**	**3m**



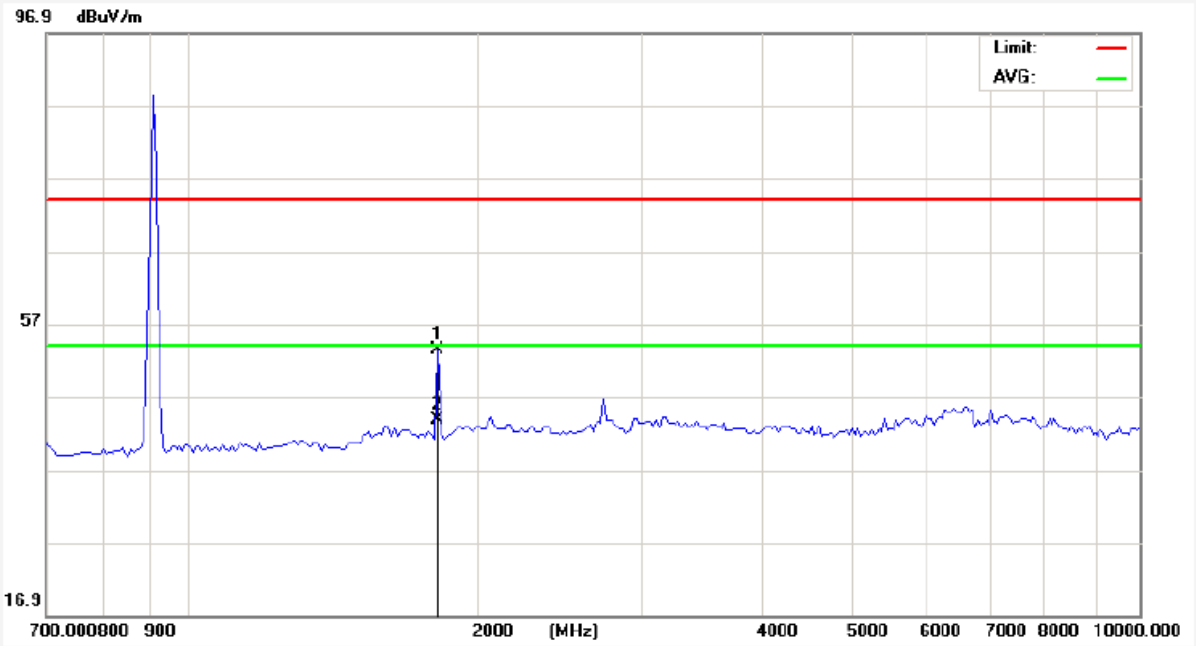
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	37.0248	38.45	-12.70	25.75	40.00	-14.25	peak			
2	45.3755	38.54	-12.50	26.04	40.00	-13.96	peak			
3	123.2655	36.45	-16.82	19.63	43.50	-23.87	peak			
4	191.7450	40.19	-15.92	24.27	43.50	-19.23	peak			
5	287.9904	43.66	-15.01	28.65	46.00	-17.35	peak			
6	375.9385	43.56	-12.35	31.21	46.00	-14.79	peak			

Job No.:	**011505565I**	**Polarization:**	**Horizontal**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via USB Port**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**908MHz**	**Distance:**	**3m**



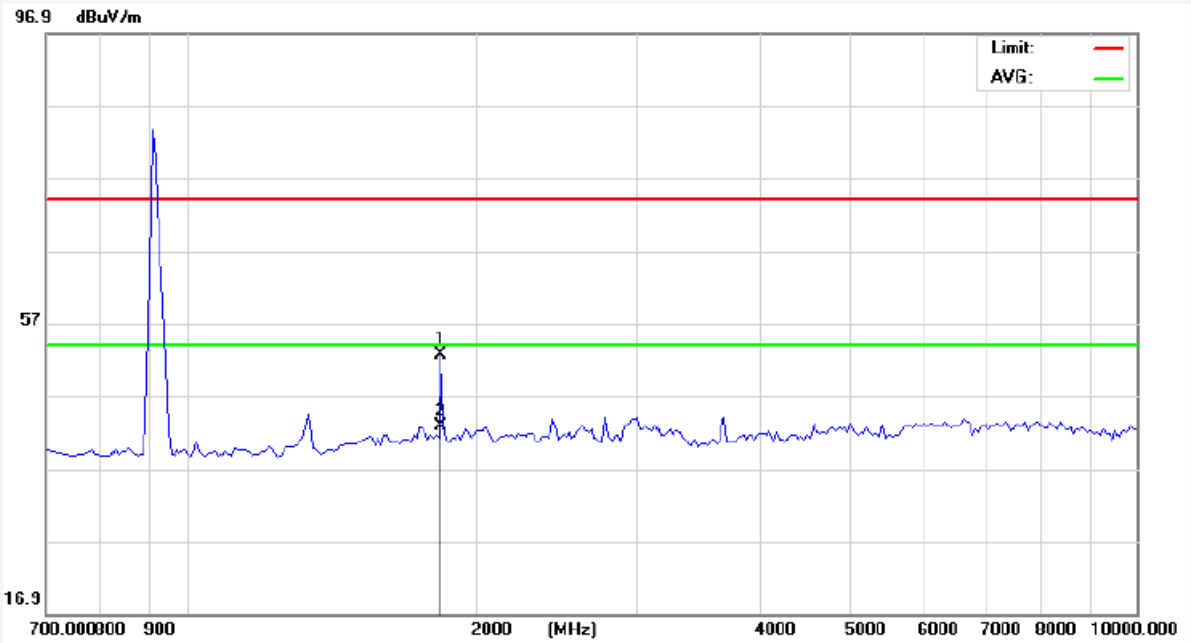
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	1816.000	58.63	-4.44	54.19	74.00	-19.81	peak			
2	1816.000	49.28	-4.44	44.84	54.00	-9.16	AVG			

Job No.:	**011505565I**	**Polarization:**	**Vertical**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via USB Port**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**908MHz**	**Distance:**	**3m**



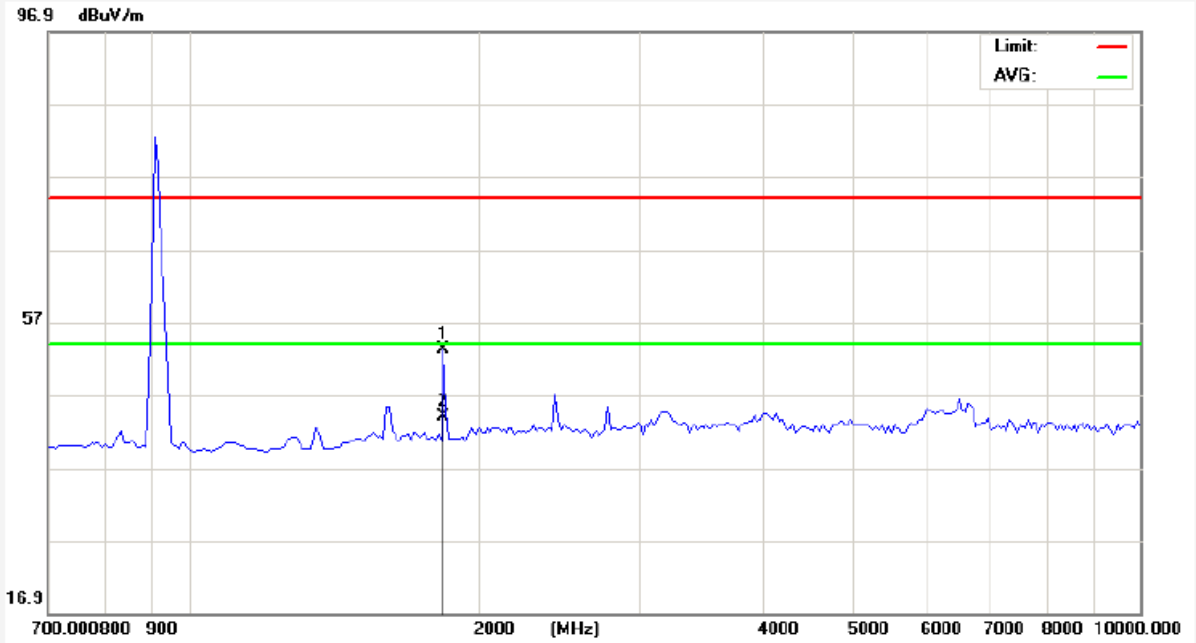
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	1816.000	57.90	-4.44	53.46	74.00	-20.54	peak			
2	1816.000	48.31	-4.44	43.87	54.00	-10.13	AVG			

Job No.:	**011505565I**	**Polarization:**	**Horizontal**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via USB Port**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**915MHz**	**Distance:**	**3m**



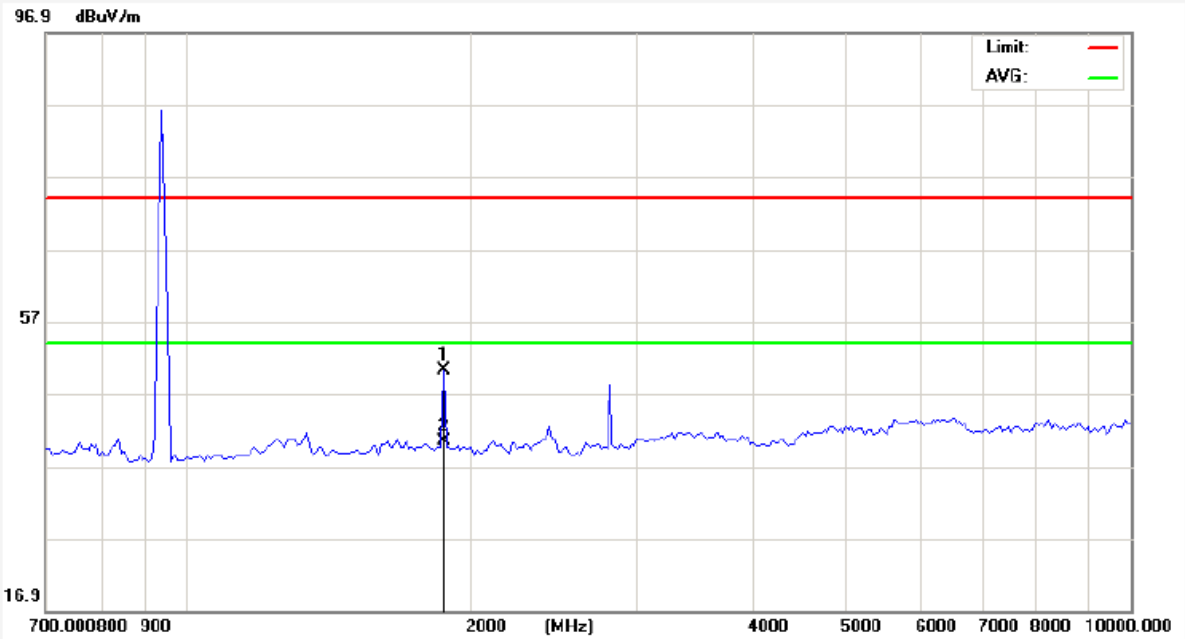
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	1839.250	56.99	-4.31	52.68	74.00	-21.32	peak			
2	1839.250	47.15	-4.31	42.84	54.00	-11.16	AVG			

Job No.:	**011505565I**	**Polarization:**	**Vertical**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via USB Port**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**915MHz**	**Distance:**	**3m**



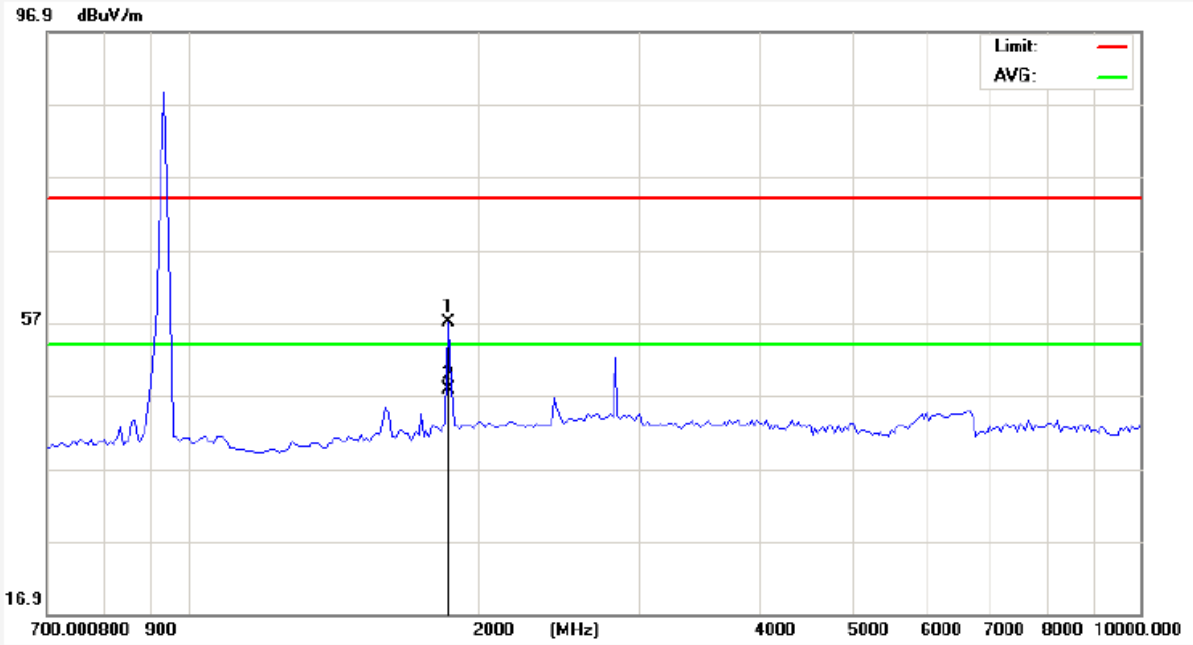
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	1839.250	57.48	-4.31	53.17	74.00	-20.83	peak			
2	1839.250	48.25	-4.31	43.94	54.00	-10.06	AVG			

Job No.:	**011505565I**	**Polarization:**	**Horizontal**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via USB Port**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**922MHz**	**Distance:**	**3m**



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	1862.500	54.45	-4.17	50.28	74.00	-23.72	peak			
2	1862.500	44.54	-4.17	40.37	54.00	-13.63	AVG			

Job No.:	**011505565I**	**Polarization:**	**Vertical**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via USB Port**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**922MHz**	**Distance:**	**3m**

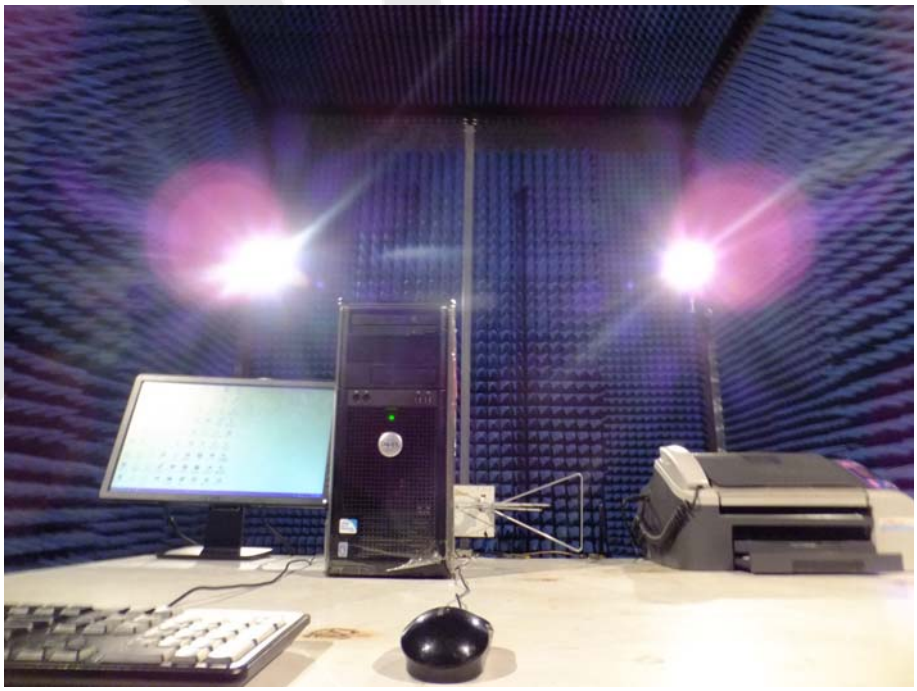


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	1862.500	61.21	-4.17	57.04	74.00	-16.96	peak			
2	1862.500	52.02	-4.17	47.85	54.00	-6.15	AVG			

5. PHOTOGRAPH

5.1. Photo of Conducted Emission Measurement

5.2. Photo of Radiation Emission Test



APPENDIX I (EXTERNAL PHOTOS)

Figure 1
The EUT-Overall View

Figure 2
The Overall View of Antenna 1 (Model No.: ANT-900MS/MR)

Figure 3
The Overall View of Antenna 2 (Model No.: ANT-WP915SMA-Y)

Figure 4
The Overall View of Antenna 3 (Model No.: ANT-SS/SR900)

Figure 5
The Overall View of Antenna 4 (Model No.: ANT-RP915SMA-Y)

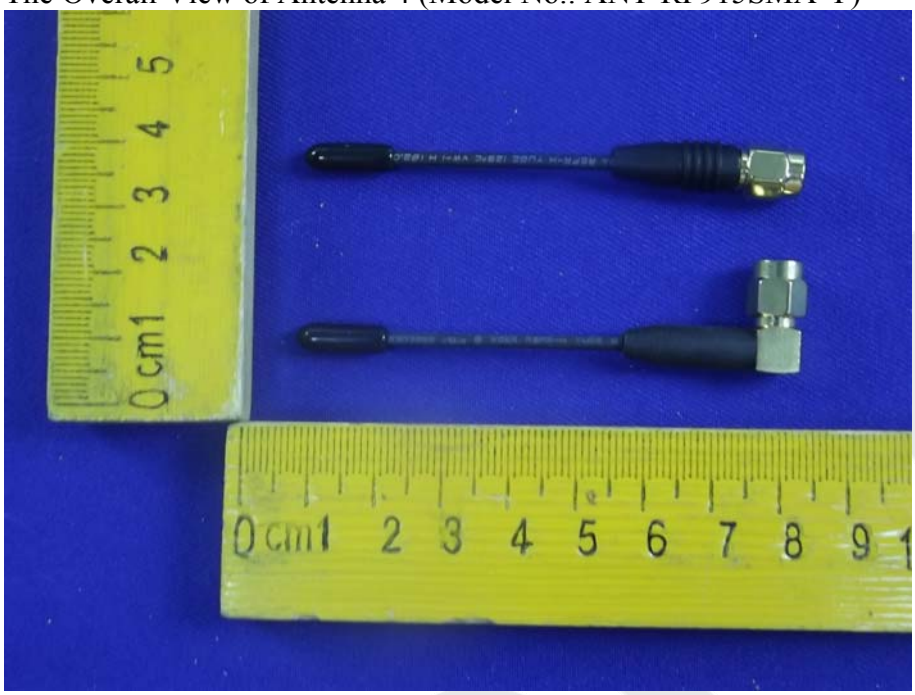


Figure 6
The EUT-Front View

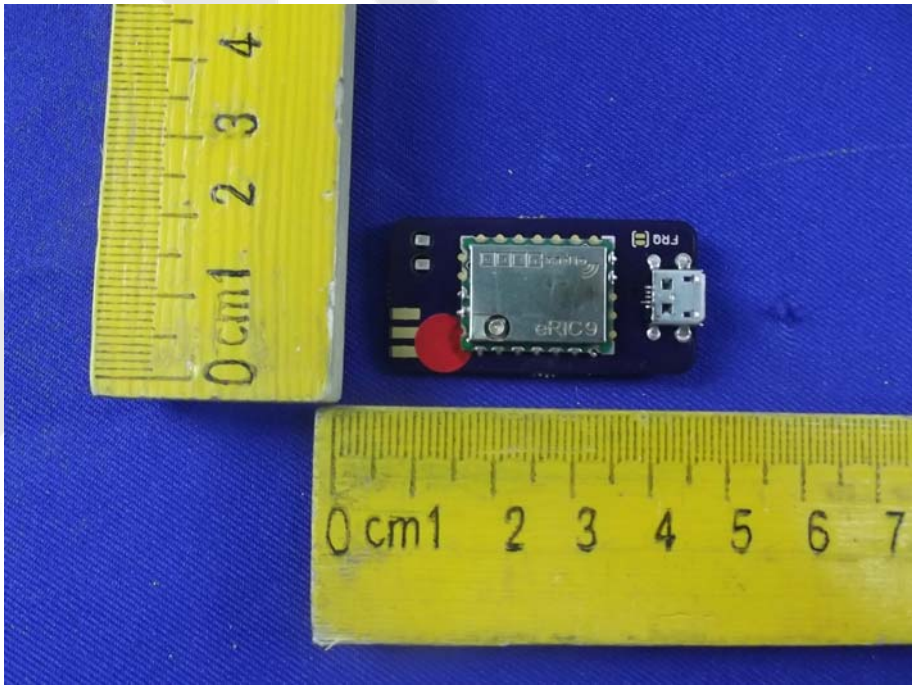
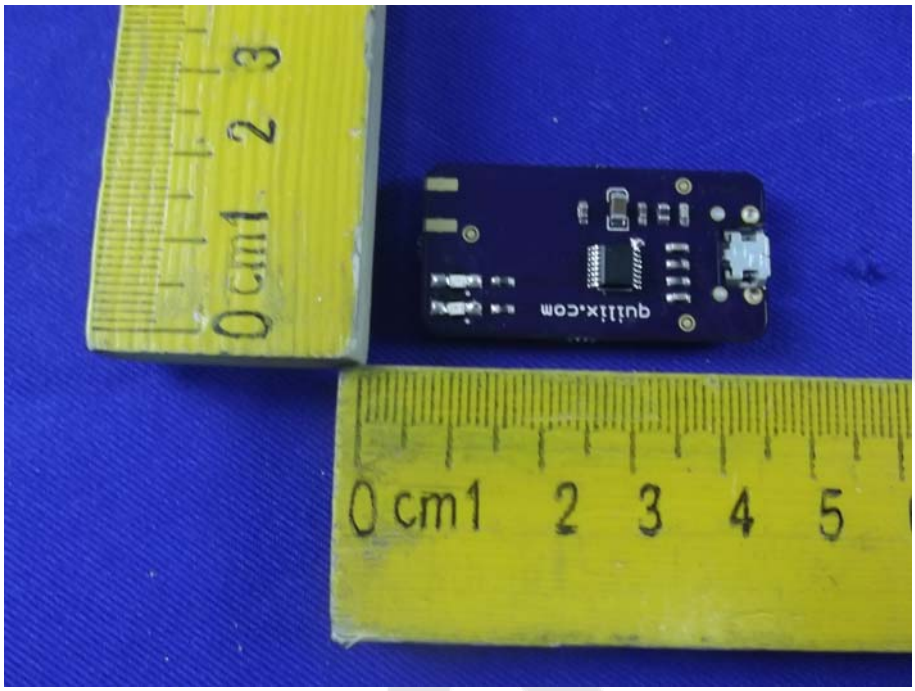


Figure 7
The EUT-Back View



APPENDIX Ⅱ(INTERNAL PHOTOS)

Figure 8
The EUT-Inside View

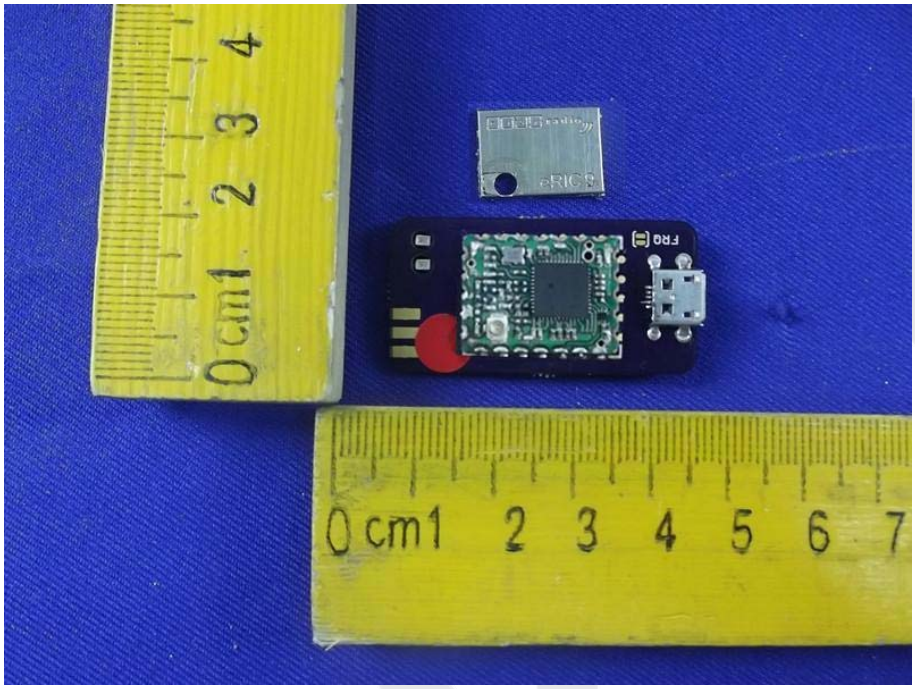


Figure 10
PCB of the EUT-Front View

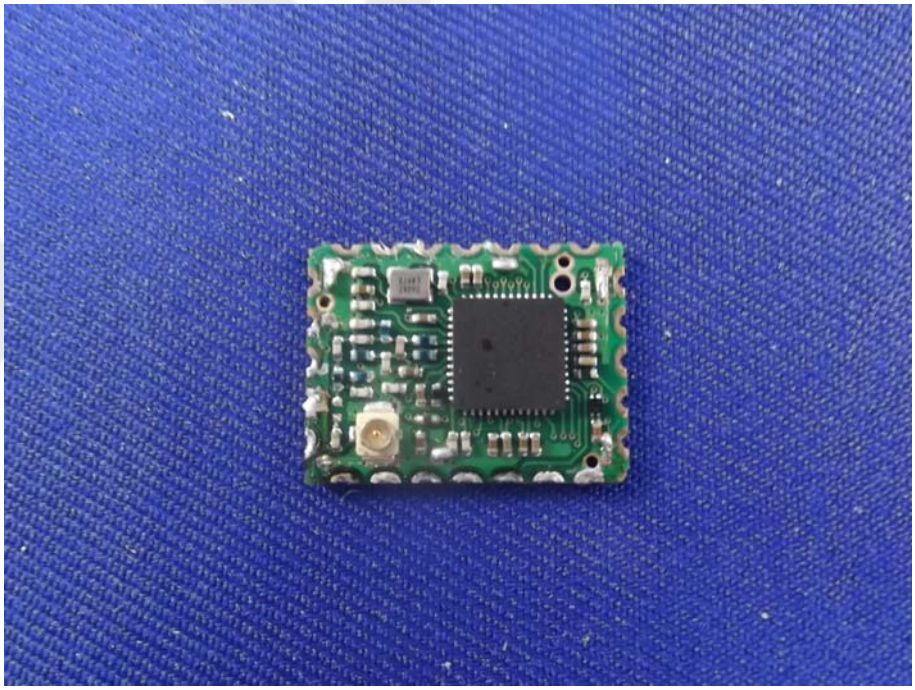
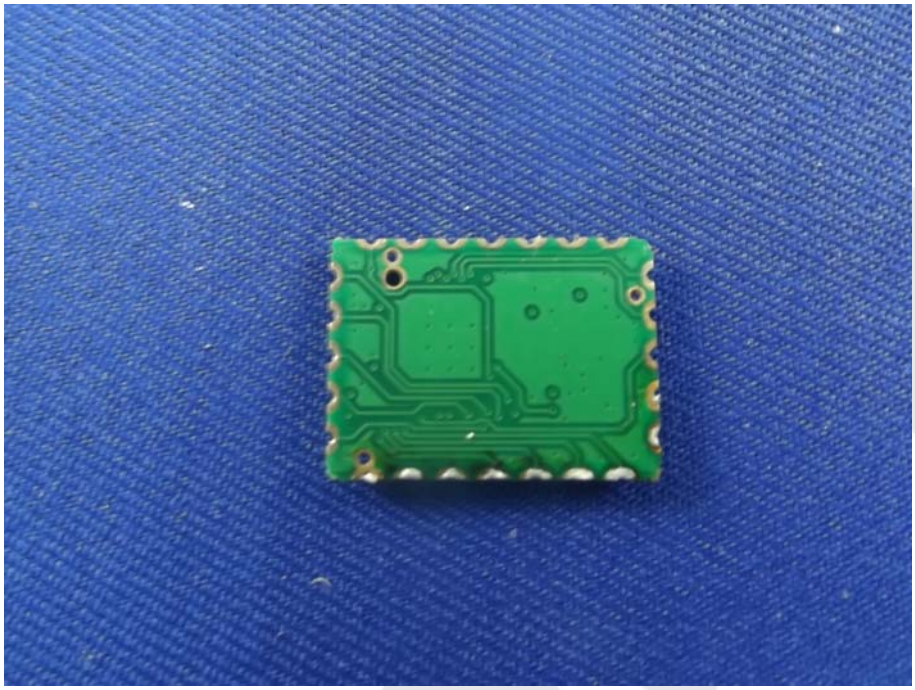



Figure 11
PCB of the EUT-Front View