FCC TEST REPORT

Report No.: STS2006055W01

Issued for

Aeotec Limited

OFFICE 4 10/F KWAN CHART TOWER NO. 6 TONNOCHY ROADWANCHAI HK

Product Name:	Door / Window Sensor 7 Pro, Door Window Sensor 7
Brand Name:	Aeotec
Model Name:	ZWA012-A
Series Model:	ZWA011-A
FCC ID:	2AOGIZWA012
Test Standard:	FCC Part 15.249

Shenzhen STS Test Services Co., Ltd.
A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ
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TEST RESULT CERTIFICATION

Applicant's Name ..... :	Aeotec Limited
Address ..... :	OFFICE 4 10/F KWAN CHART TOWER NO. 6 TONNOCHY ROADWANCHAI HK
Manufacture's Name ..... :	A&R Technologies
Address ..... :	34B Zheng Feng Nan Lu, Bao'an District, Shenzhen, Guangdong Province, China

Product Description

Product Name ..... :	Door / Window Sensor 7 Pro, Door Window Sensor 7
Brand Name ..... :	Aeotec
Model Name ..... :	ZWA012-A
Series Model ..... :	ZWA011-A
Test Standards..... :	FCC Part15.249
Test Procedure ..... :	ANSI C63.10-2013

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Date of Test ..... :	
Date of receipt of test item ..... :	22 June 2020
Date of performance of tests .. :	22 June 2020 ~ 29 June 2020
Date of Issue ..... :	01 July 2020
Test Result..... :	**Pass**

Testing Engineer : Chris Chen
(Chris Chen)

Technical Manager : Sean She
(Sean she)

Authorized Signatory : Vita Li
(Vita Li)

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	01 July 2020	STS2006055W01	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part 15.249 , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	--
15.203	Antenna Requirement	Pass	--
15.249	Radiated Spurious Emission	Pass	--
15.249	Radiated Band Edge Emission	Pass	--
15.215	20dB Bandwidth	Pass	--

NOTE:

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

(2) All tests are according to ANSI C63.10-2013.

1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD
Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China
FCC test Firm Registration Number: 625569
IC test Firm Registration Number: 12108A
A2LA Certificate No.: 4338.01

1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	RF output power, conducted	±0.68dB
2	Unwanted Emissions, conducted	±2.988dB
3	All emissions, radiated 30-1GHz	±5.6dB
4	All emissions, radiated 1G-6GHz	±5.5dB
5	All emissions, radiated>6G	±5.8dB
6	Conducted Emission (9KHz-150KHz)	±3.37dB
7	Conducted Emission (150KHz-30MHz)	±3.83dB

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Door / Window Sensor 7 Pro, Door Window Sensor 7
Trade Name	Aeotec
Model Name	ZWA012-A
Series Model	ZWA011-A
Model Difference	ZWA011-A is a Door window sensor 7:the basic function is the door window sensor. ZWA012-A is a Door / Window Sensor 7 Pro:version has more accelerometers.
Product Description	The EUT is a Door / Window Sensor 7 Pro Operation Frequency: 908.4MHz/916MHz Modulation Type: FSK/GFSK Antenna Designation: Please refer to the Note 2. Antenna Gain(Peak): 4dBi Based on the application, features, or specification exhibited in User Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User Manual.
Battery	Rated Voltage: 3.6V Capacity: 1200mAh
Hardware version number	V1.0
Software version number	V1.0
Connecting I/O Port(s)	Please refer to the Note 1.

Note:

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

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	Aeotec	ZWA012-A	Monopole antenna	N/A	4dBi	Antenna

2.2 DESCRIPTION OF THE TEST MODES

For conducted test items and radiated spurious emissions
Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively.

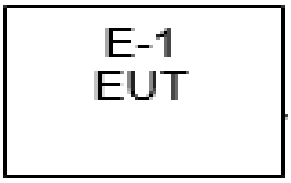
Pretest Mode	Description	Data/Modulation
Mode 1	TX(908.4MHz)	FSK
Mode 2	TX(916MHz)	GFSK

Note:
(1) All above mode have been measurement, only worst data was reported.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters.

Radiated Spurious Emission Test



2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND 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.

Necessary accessories

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
N/A	N/A	N/A	N/A	N/A	N/A

Support units

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
N/A	N/A	N/A	N/A	N/A	N/A

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.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2019.07.29	2020.07.28
Signal Analyzer	Agilent	N9020A	MY51110105	2020.03.05	2021.03.04
Active loop Antenna	ZHINAN	ZN30900C	16035	2018.03.11	2021.03.10
Bilog Antenna	TESEQ	CBL6111D	34678	2017.11.02	2020.11.01
Horn Antenna	SCHWARZBECK	BBHA 9120D(1201)	9120D-1343	2018.10.19	2021.10.18
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	J211020657	2018.03.11	2021.03.10
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2019.10.09	2020.10.08
Pre-Amplifier (1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2019.10.09	2020.10.08
Temperature & Humidity	HH660	Mieo	N/A	2019.10.09	2020.10.08
turn table	EM	SC100_1	60531	N/A	N/A
Antenna mast	EM	SC100	N/A	N/A	N/A
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 RE)			

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2019.07.29	2020.07.28
LISN	R&S	ENV216	101242	2019.10.09	2020.10.08
LISN	EMCO	3810/2NM	23625	2019.10.09	2020.10.08
Temperature & Humidity	HH660	Mieo	N/A	2019.10.12	2020.10.11
Test SW	FARAD	EZ-EMC(Ver.STSLAB-03A1 CE)			

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2019.10.09	2020.10.08
Signal Analyzer	Agilent	N9020A	MY49100060	2019.10.09	2020.10.08
Temperature & Humidity	HH660	Mieo	N/A	2019.10.12	2020.10.11
Test SW	FARAD	LZ-RF /LzRf-3A3			

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15.249 limit in the table below has to be followed.

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

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.

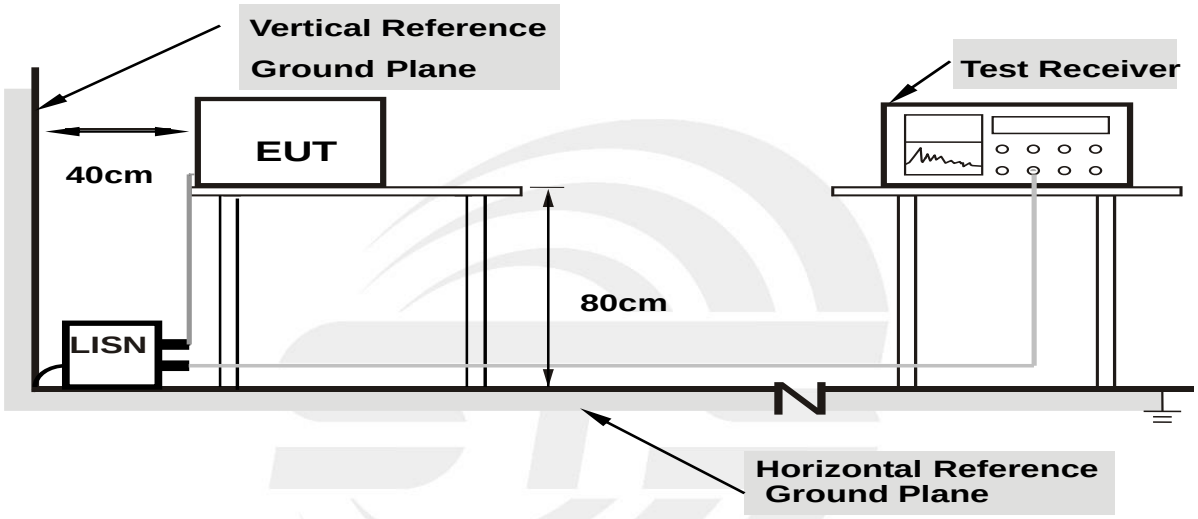
The following table is the setting of the receiver

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

3.1.2 TEST PROCEDURE

a. The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical 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.
b. 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.
c. 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.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 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

3.1.4 EUT OPERATING CONDITIONS

Temperature:	22.8(C)	Relative Humidity:	66%RH
Test Voltage:	N/A	Phase:	L/N
Test Mode:	N/A		

Note: EUT is only power by battery, So it is not applicable for this test.

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15.249 and the Part 15.209(a) limit in the table below has to be followed.

Standard FCC 15.209

Frequencies (MHz)	Field Strength (micorvolts/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
960~1000	500	3
Above 1000	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	3

Standard FCC 15.249

Frequency of Emission (MHz)	**Field Strength of fundamental (millivolts /meter)**	**Field Strength of Harmonics (microvolts/meter)**
900~928	50	500
2400~2483.5	50	500
5725~5875	50	500
24000~242500	250	2500

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
Detector	Peak/AV
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB (emission in restricted band)	1MHz
VB (emission in restricted band)	=3xRB

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
	90kHz~110kHz / RB 200Hz for QP
	110kHz~490kHz / RB 200Hz for PK & AV
	490kHz~30MHz / RB 9kHz for QP
	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

a. The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of arotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Below 1GHz)

b. The measuring distance of 3m shall used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Above 1GHz)

c. The height of the test antenna shall vary between 1m to 4m.Both horizontal and vertical polarization Of the antenna are set to make the measurement.

d. The initial step in collecting radiated emission data is a receive peak detector mode. Pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

e. All readings are peak unless otherwise stated QP in column of Note. Peak denoted that the Peak reading compliance with the QP limits and then QP Mode measurement didn't perform (Below 1GHz)

f. All readings are Peak mode value unless otherwise stated AVG in column of Note. If the Peak mode measured value compliance with the Peak limits and lower than AVG Limits, the EUT shall be deemed to meet Peak & AVG limits and then only Peak mode was measured, but AVG mode didn't perform.(Above 1GHz)

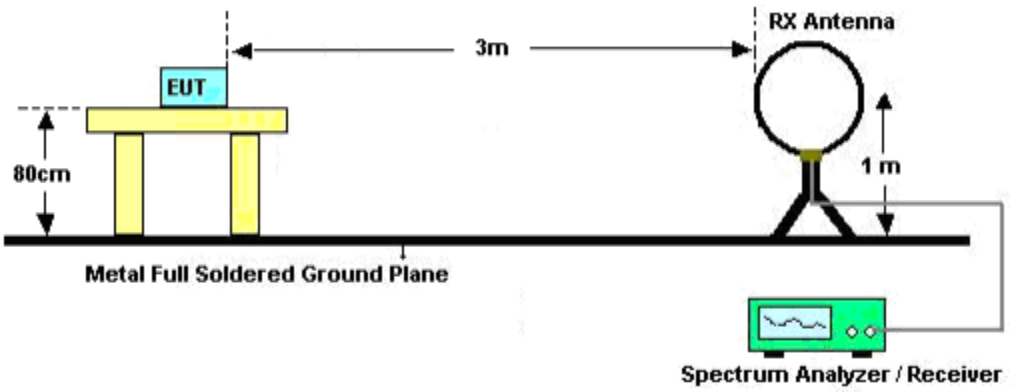
g. For the actual test configuration, please refer to the related Item –EUT Test Photos. Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

3.2.3 DEVIATION FROM TEST STANDARD

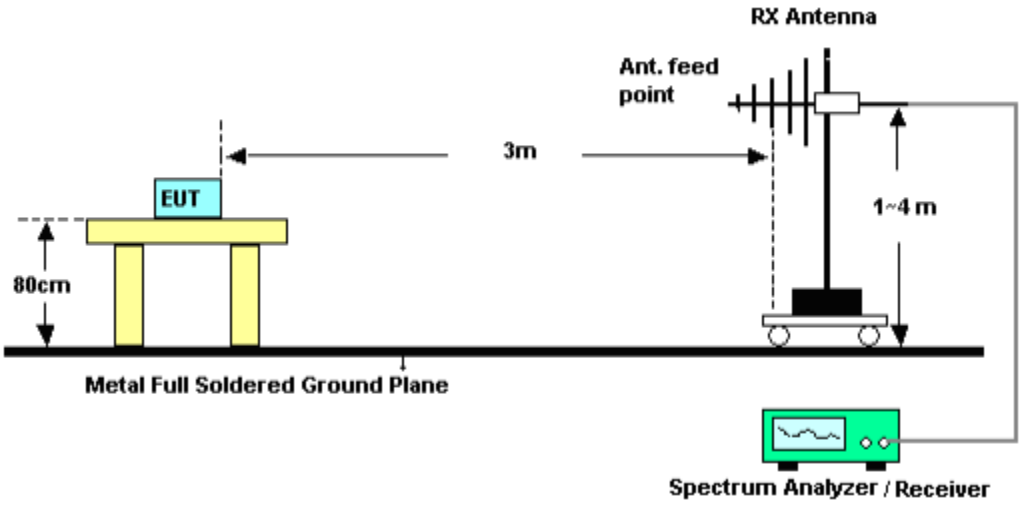
No deviation

3.2.4 TEST SETUP

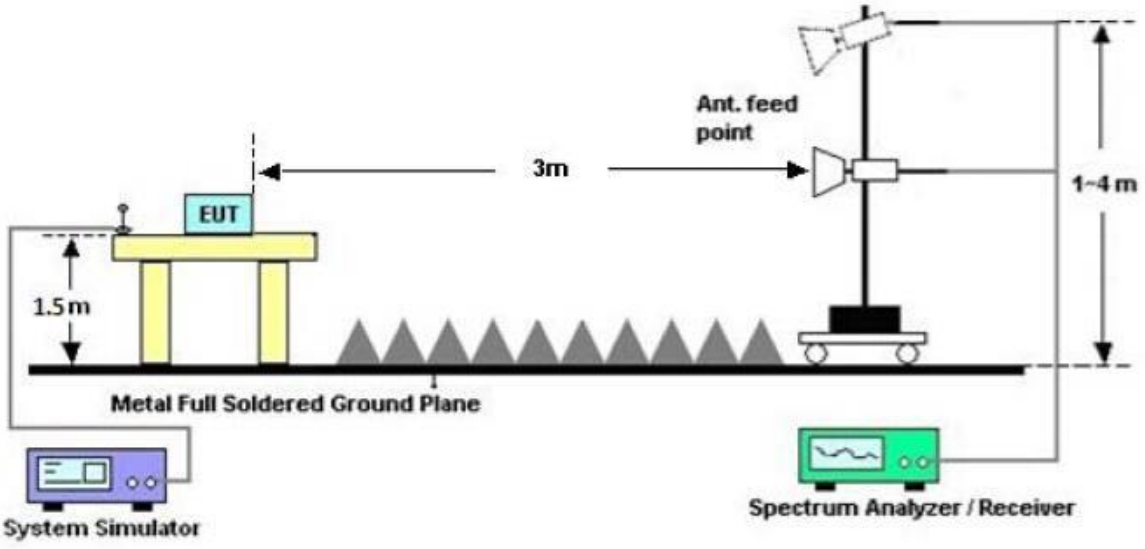
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:
Margin=PL-PK L or AL- AV L; Margin only shown the worst case.
Where
PR = Peak Reading
AR = Average Reading
PL = Peak Level
AL = Average Level
AF = Antenna Factor
PK L = Peak Limit
AV L = AV Limit
For example

Frequency	PR	AR	AF	PL	AL	PK L	AV L	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV/m)	(dBμV/m)	(dBμV/m)	(dB)
2178	40.23	30.31	9.83	50.06	40.14	74.00	54.00	-13.86

3.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

Below 30 MHz

Temperature:	23.5(C)	Relative Humidity:	54%RH
Test Voltage:	3V	Polarization:	---
Test Mode:	TX Mode		

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

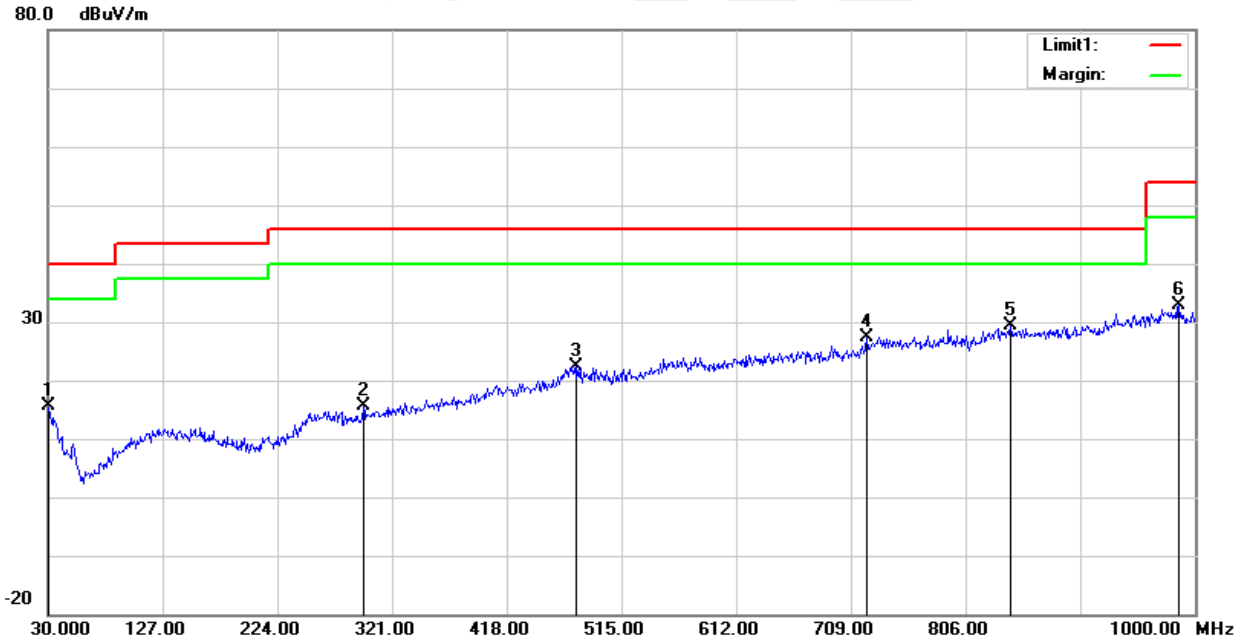
Between 30MHz – 1000 MHz Radiation Spurious

908.4MHz

Temperature:	23.5(C)	Relative Humidity:	54%RH
Test Voltage:	3V	Phase:	Horizontal
Test Mode:	Mode 1		

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	28.43	-12.85	15.58	40.00	-24.42	QP
2	296.7500	30.64	-14.92	15.72	46.00	-30.28	QP
3	477.1700	31.03	-8.75	22.28	46.00	-23.72	QP
4	722.5800	30.47	-3.04	27.43	46.00	-18.57	QP
5	843.8300	29.86	-0.49	29.37	46.00	-16.63	QP
6	986.4200	30.54	2.27	32.81	54.00	-21.19	QP

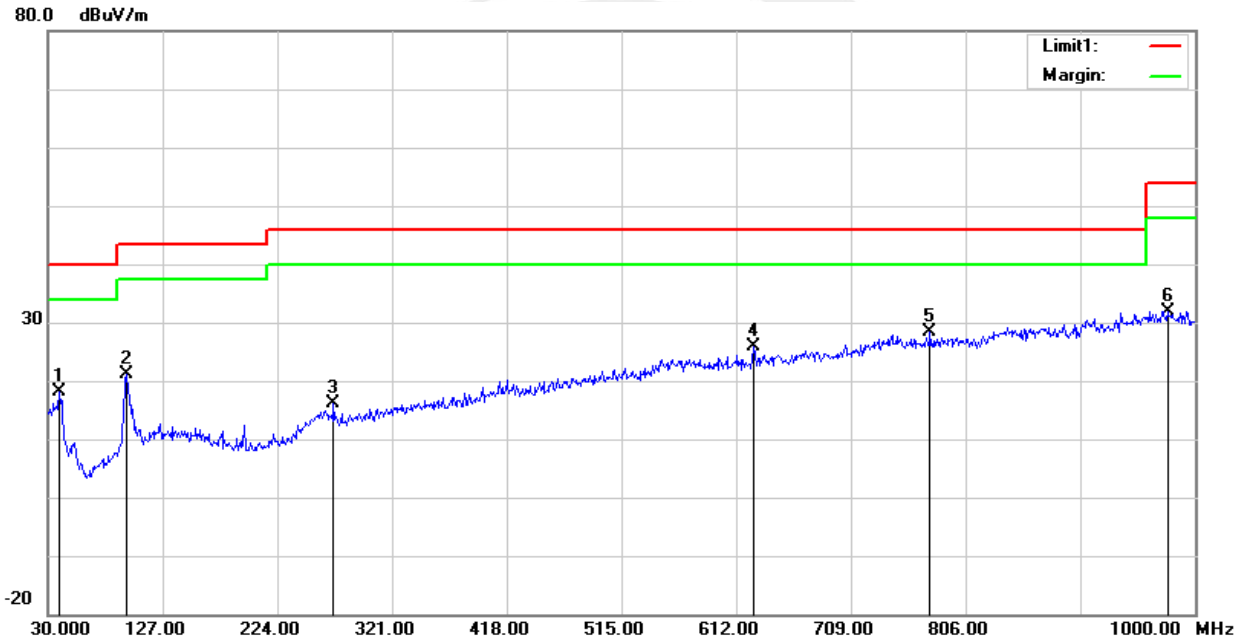
Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Temperature:	23.5(C)	Relative Humidity:	54%RH
Test Voltage:	3V	Phase:	Vertical
Test Mode:	Mode 1		

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	39.7000	36.02	-17.88	18.14	40.00	-21.86	QP
2	95.9600	41.90	-20.67	21.23	43.50	-22.27	QP
3	271.5300	31.47	-15.37	16.10	46.00	-29.90	QP
4	626.5500	31.17	-5.19	25.98	46.00	-20.02	QP
5	775.9300	30.69	-2.26	28.43	46.00	-17.57	QP
6	976.7200	29.51	2.45	31.96	54.00	-22.04	QP

Remark:
1. Margin = Result (Result =Reading + Factor)–Limit
2. Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain



Note: 908.4MHz, 916MHz all has been tested, only shown the worst case in this report.

Above 1G Radiation Spurious

908.4MHz
Horizontal
PK

Frequency	Meter Reading	Detector	Amplifier	Loss	Antenna Factor	Orrected Factor	Corrected Amplitude	FCC Part 15.249/15.209/205		RX Antenna
								Limit	Margin	Polar
(MHz)	(dBμV/m)	(PK/QP/AV)	（dB）	（dB）	（dB/m）	（dB）	(dBμV/m)	(dBμV/m)	(dB)	(H/V)
1816.68	51.63	PK	45.10	4.91	25.00	-15.19	36.44	74	-37.56	H
1816.68	52.13	PK	45.10	4.91	25.00	-15.19	36.94	74	-37.06	V
2725.40	49.71	PK	44.10	5.03	25.80	-13.27	36.44	74	-37.56	H
2725.40	48.34	PK	44.10	5.03	25.80	-13.27	35.07	74	-38.93	V
3633.63	48.57	PK	43.80	6.72	27.20	-9.88	38.69	74	-35.31	H
3633.63	48.00	PK	43.80	6.72	27.20	-9.88	38.12	74	-35.88	V

AV

Frequency	PK Reading	Duty cycle factor	AV Reading	Orrected Factor	Corrected Amplitude	FCC Part 15.249/15.209/205		RX Antenna
						Limit	Margin	Polar
(MHz)	(dBμV/m)	(dB)	(dBμV/m)	（dB）	(dBμV/m)	(dBμV/m)	(dB)	(H/V)
1816.68	51.63	0	51.63	-15.19	36.44	54.00	-17.56	H
1816.68	52.13	0	52.13	-15.19	36.94	54.00	-17.06	V
2725.40	49.71	0	49.71	-13.27	36.44	54.00	-17.56	H
2725.40	48.34	0	48.34	-13.27	35.07	54.00	-18.93	V
3633.63	48.57	0	48.57	-9.88	38.69	54.00	-15.31	H
3633.63	48.00	0	48.00	-9.88	38.12	54.00	-15.88	V

AV = Peak +20Log10(duty cycle factor) =PK+(0)

Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain

Corrected Amplitude= Reading+ Orrected Factor

Margin= Corrected Amplitude-Limit

Vertical

PK

Frequency	Meter Reading	Detector	Amplifier	Loss	Antenna Factor	Orrected Factor	Corrected Amplitude	FCC Part 15.249/15.209/205		RX Antenna
								Limit	Margin	Polar
(MHz)	(dBμV/m)	(PK/QP/AV)	（dB）	（dB）	（dB/m）	（dB）	(dBμV/m)	(dBμV/m)	(dB)	(H/V)
1816.88	51.43	PK	45.10	4.91	25.00	-15.19	36.24	74	-37.76	H
1816.88	52.22	PK	45.10	4.91	25.00	-15.19	37.03	74	-36.97	V
2725.15	49.36	PK	44.10	5.03	25.80	-13.27	36.09	74	-37.91	H
2725.15	48.39	PK	44.10	5.03	25.80	-13.27	35.12	74	-38.88	V
3633.86	48.23	PK	43.80	6.72	27.20	-9.88	38.35	74	-35.65	H
3633.86	48.29	PK	43.80	6.72	27.20	-9.88	38.41	74	-35.59	V

AV

Frequency	PK Reading	Duty cycle factor	AV Reading	Orrected Factor	Corrected Amplitude	FCC Part 15.249/15.209/205		RX Antenna
						Limit	Margin	Polar
(MHz)	(dBμV/m)	(dB)	(dBμV/m)	（dB）	(dBμV/m)	(dBμV/m)	(dB)	(H/V)
1816.88	51.43	0	51.43	-15.19	36.24	54.00	-17.76	H
1816.88	52.22	0	52.22	-15.19	37.03	54.00	-16.97	V
2725.15	49.36	0	49.36	-13.27	36.09	54.00	-17.91	H
2725.15	48.39	0	48.39	-13.27	35.12	54.00	-18.88	V
3633.86	48.23	0	48.23	-9.88	38.35	54.00	-15.65	H
3633.86	48.29	0	48.29	-9.88	38.41	54.00	-15.59	V

AV = Peak +20Log10(duty cycle factor) =PK+(0)

Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain

Corrected Amplitude= Reading+ Orrected Factor

Margin= Corrected Amplitude-Limit

916MHz
Horizontal
PK

Frequency	Meter Reading	Detector	Amplifier	Loss	Antenna Factor	Orrected Factor	Corrected Amplitude	FCC Part 15.249/15.209/205		RX Antenna
								Limit	Margin	Polar
(MHz)	(dBμV/m)	(PK/QP/AV)	（dB）	（dB）	（dB/m）	（dB）	(dBμV/m)	(dBμV/m)	(dB)	(H/V)
1832.18	51.53	PK	45.10	4.91	25.00	-15.19	36.34	74	-37.66	H
1832.18	52.13	PK	45.10	4.91	25.00	-15.19	36.94	74	-37.06	V
2747.88	49.75	PK	44.10	5.03	25.80	-13.27	36.48	74	-37.52	H
2747.88	48.70	PK	44.10	5.03	25.80	-13.27	35.43	74	-38.57	V
3663.99	48.35	PK	43.80	6.72	27.20	-9.88	38.47	74	-35.53	H
3663.99	48.18	PK	43.80	6.72	27.20	-9.88	38.30	74	-35.70	V

AV

Frequency	PK Reading	Duty cycle factor	AV Reading	Orrected Factor	Corrected Amplitude	FCC Part 15.249/15.209/205		RX Antenna
						Limit	Margin	Polar
(MHz)	(dBμV/m)	(dB)	(dBμV/m)	（dB）	(dBμV/m)	(dBμV/m)	(dB)	(H/V)
1832.18	51.53	0	51.53	-15.19	36.34	54.00	-17.66	H
1832.18	52.13	0	52.13	-15.19	36.94	54.00	-17.06	V
2747.88	49.75	0	49.75	-13.27	36.48	54.00	-17.52	H
2747.88	48.70	0	48.70	-13.27	35.43	54.00	-18.57	V
3663.99	48.35	0	48.35	-9.88	38.47	54.00	-15.53	H
3663.99	48.18	0	48.18	-9.88	38.30	54.00	-15.70	V

AV = Peak +20Log10(duty cycle factor) =PK+(0)

Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain

Corrected Amplitude= Reading+ Orrected Factor

Margin= Corrected Amplitude-Limit

Vertical

PK

Frequency	Meter Reading	Detector	Amplifier	Loss	Antenna Factor	Orrected Factor	Corrected Amplitude	FCC Part 15.249/15.209/205		RX Antenna
								Limit	Margin	Polar
(MHz)	(dBμV/m)	(PK/QP/AV)	（dB）	（dB）	（dB/m）	（dB）	(dBμV/m)	(dBμV/m)	(dB)	(H/V)
1832.16	51.74	PK	45.10	4.91	25.00	-15.19	36.55	74	-37.45	H
1832.16	52.35	PK	45.10	4.91	25.00	-15.19	37.16	74	-36.84	V
2748.00	49.43	PK	44.10	5.03	25.80	-13.27	36.16	74	-37.84	H
2748.00	48.25	PK	44.10	5.03	25.80	-13.27	34.98	74	-39.02	V
3664.17	48.38	PK	43.80	6.72	27.20	-9.88	38.50	74	-35.50	H
3664.17	48.22	PK	43.80	6.72	27.20	-9.88	38.34	74	-35.66	V

AV

Frequency	PK Reading	Duty cycle factor	AV Reading	Orrected Factor	Corrected Amplitude	FCC Part 15.249/15.209/205		RX Antenna
						Limit	Margin	Polar
(MHz)	(dBμV/m)	(dB)	(dBμV/m)	（dB）	(dBμV/m)	(dBμV/m)	(dB)	(H/V)
1832.16	51.74	0	51.74	-15.19	36.55	54.00	-17.45	H
1832.16	52.35	0	52.35	-15.19	37.16	54.00	-16.84	V
2748.00	49.43	0	49.43	-13.27	36.16	54.00	-17.84	H
2748.00	48.25	0	48.25	-13.27	34.98	54.00	-19.02	V
3664.17	48.38	0	48.38	-9.88	38.50	54.00	-15.50	H
3664.17	48.22	0	48.22	-9.88	38.34	54.00	-15.66	V

AV = Peak +20Log10(duty cycle factor) =PK+(0)

Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain

Corrected Amplitude= Reading+ Orrected Factor

Margin= Corrected Amplitude-Limit

908.4MHz

Duty cycle

	Tp (μs)	Duty Factor
1.000	1.000	0.00

Note: Duty Factor=20*LOG10(1/(Ton/Tp))

916MHz

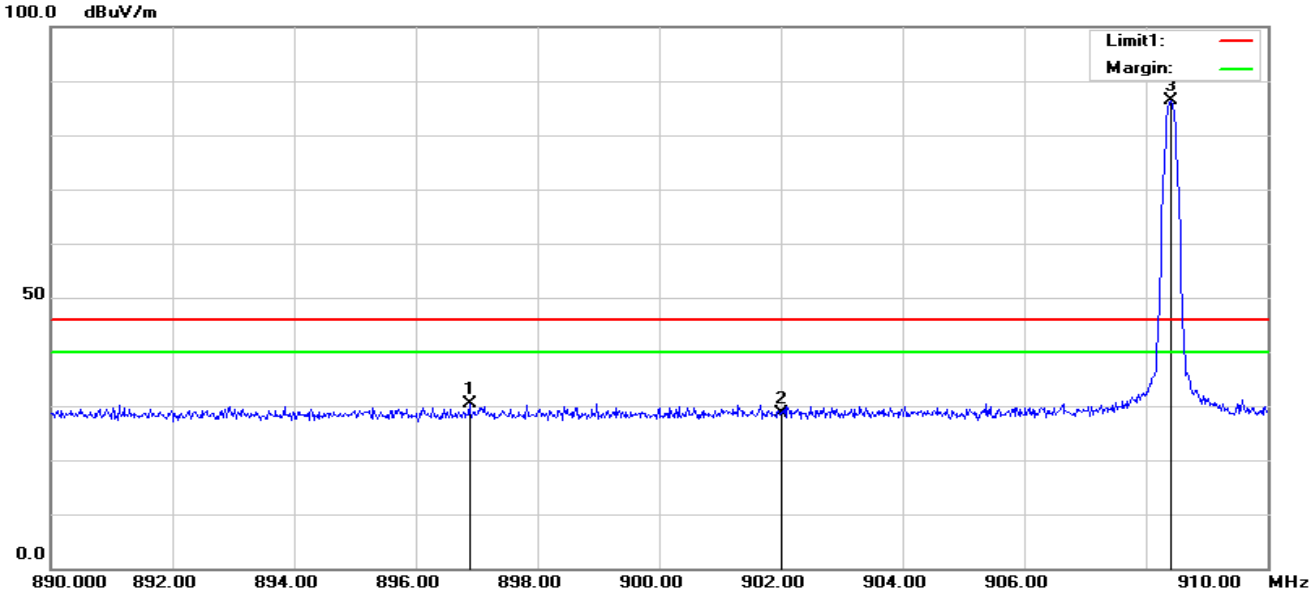
Duty cycle

Ton (μs)	Tp (μs)	Duty Factor
1.000	1.000	0.00

Note: Duty Factor=20*LOG10(1/(Ton/Tp))

(Radiation Band edge)

908.4MHz
Horizontal

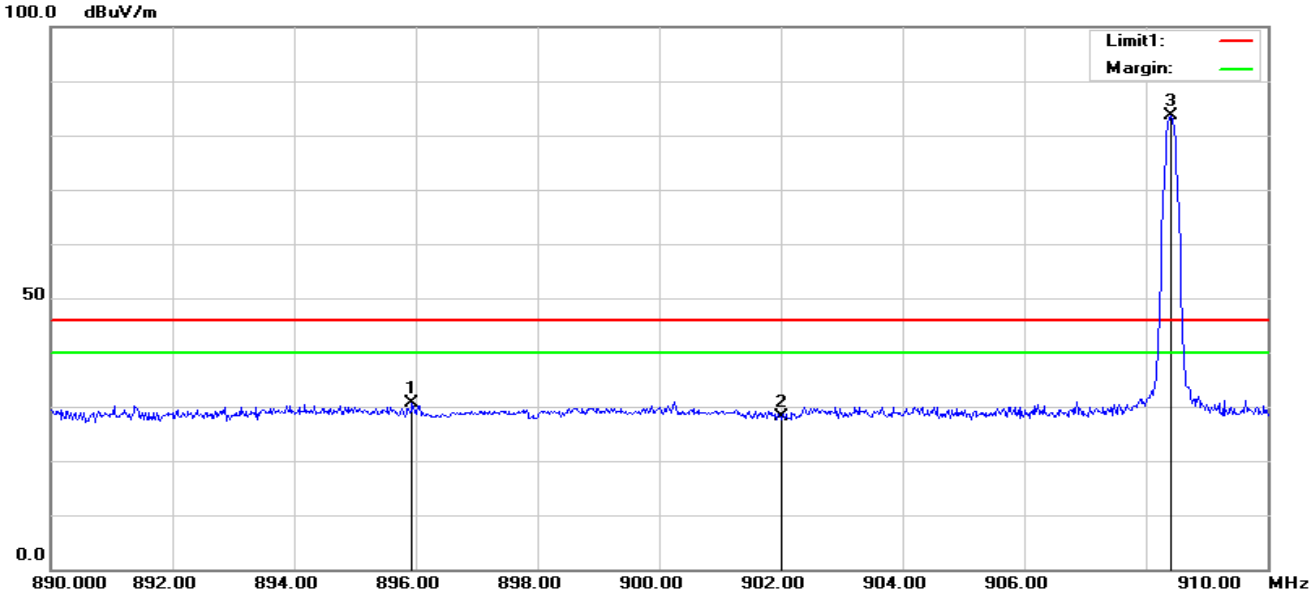


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	896.8800	30.83	-0.52	30.31	46.00	-15.69	peak
2	902.0000	29.10	-0.40	28.70	46.00	-17.30	peak

Fundamental Frequency

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
3	908.4000	86.57	-0.23	86.34	94.00	-7.66	QP

Vertical



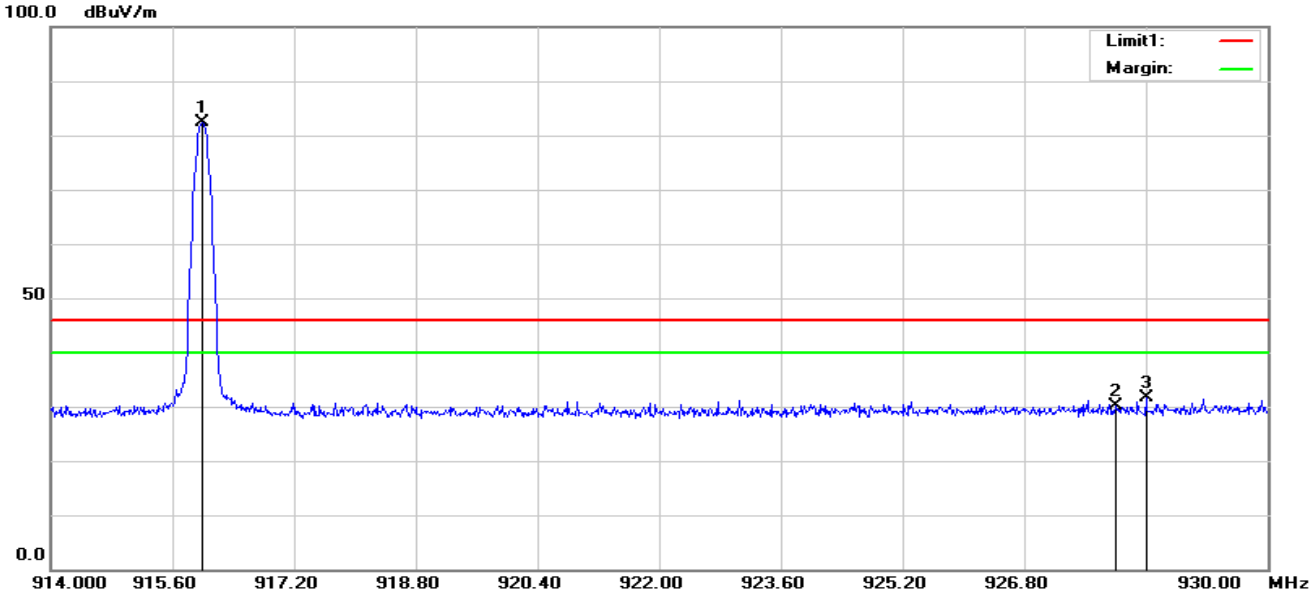
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	895.9400	31.26	-0.55	30.71	46.00	-15.29	peak
2	902.0000	28.60	-0.40	28.20	46.00	-17.80	peak

Fundamental Frequency

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
3	908.4000	83.82	-0.23	83.59	94.00	-10.41	QP

916MHz

Horizontal

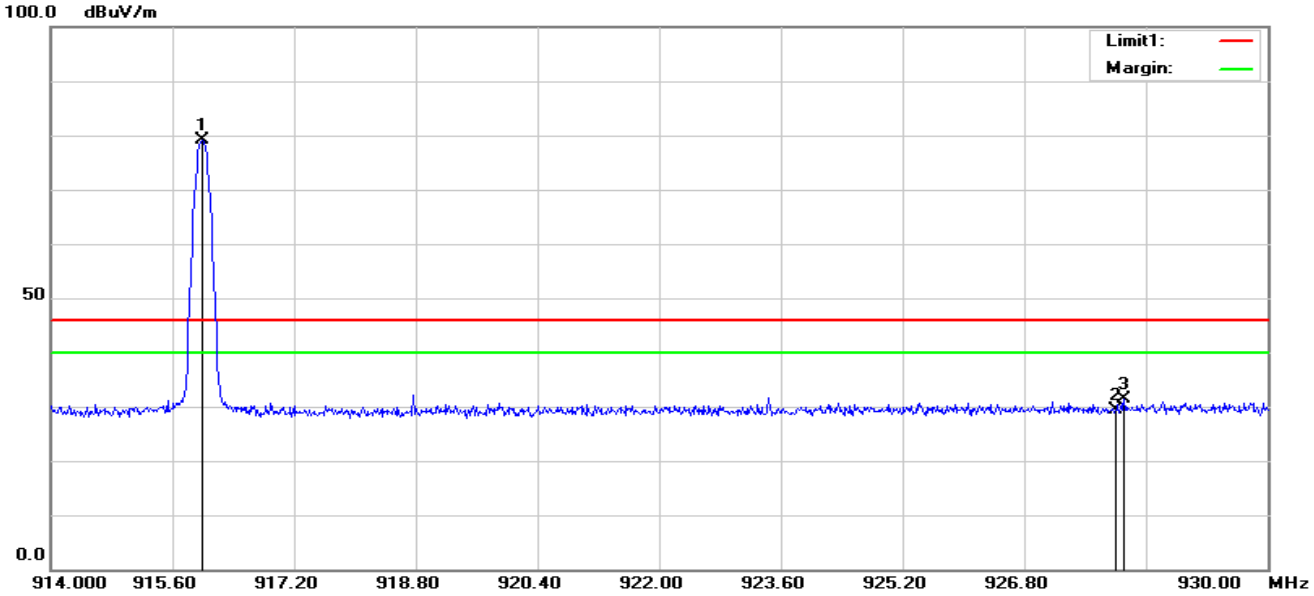


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
2	928.0000	29.65	0.43	30.08	46.00	-15.92	peak
3	928.4000	31.15	0.45	31.60	46.00	-14.40	peak

Fundamental Frequency

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	916.0000	82.50	-0.09	82.41	94.00	-11.59	QP

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
2	928.0000	29.02	0.43	29.45	46.00	-16.55	peak
3	928.1120	30.94	0.44	31.38	46.00	-14.62	peak

Fundamental Frequency

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	916.0000	79.30	-0.09	79.21	94.00	-14.79	QP

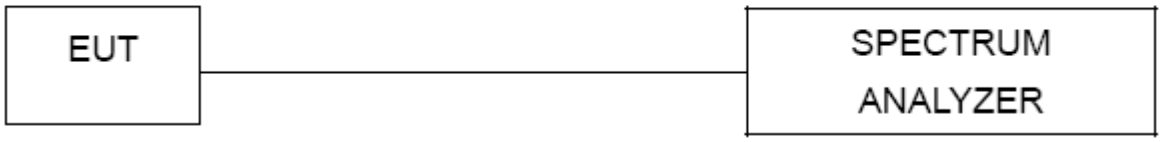
4. BANDWIDTH TEST

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= 1~5% of the OBW, VBW≧RBW, Sweep time = Auto.

4.2 TEST SETUP



4.3 EUT OPERATION CONDITIONS

TX mode.

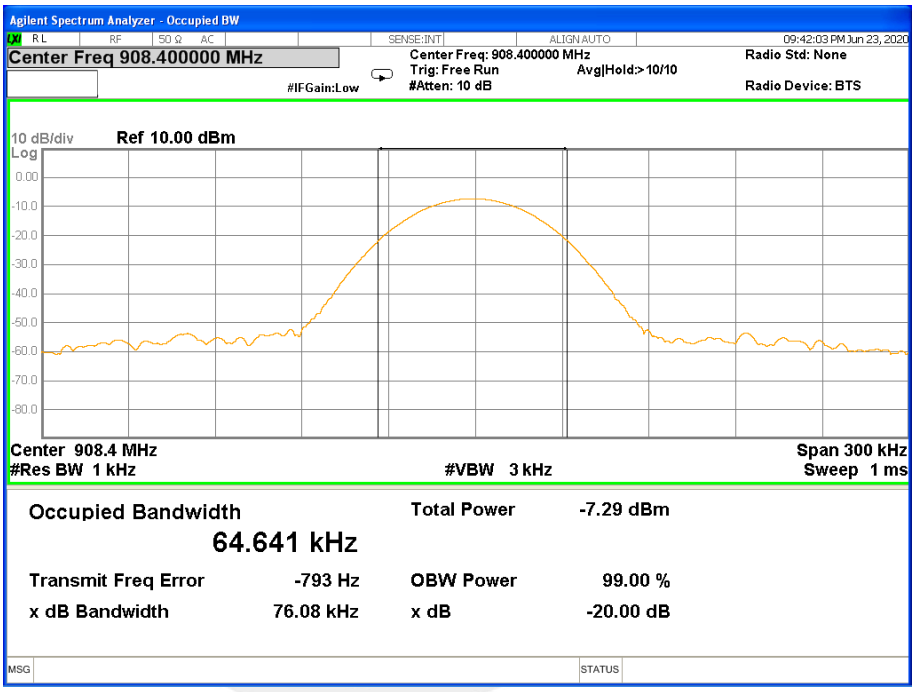
4.4 TEST RESULTS

Temperature:	25 ℃	Relative Humidity:	50%
Test Voltage:	3V		

908MHz

Test Channel	Frequency(MHz)	20 dB Bandwidth(KHz)	99% Bandwidth(KHz)
CH01	908.4	76.08	64.641

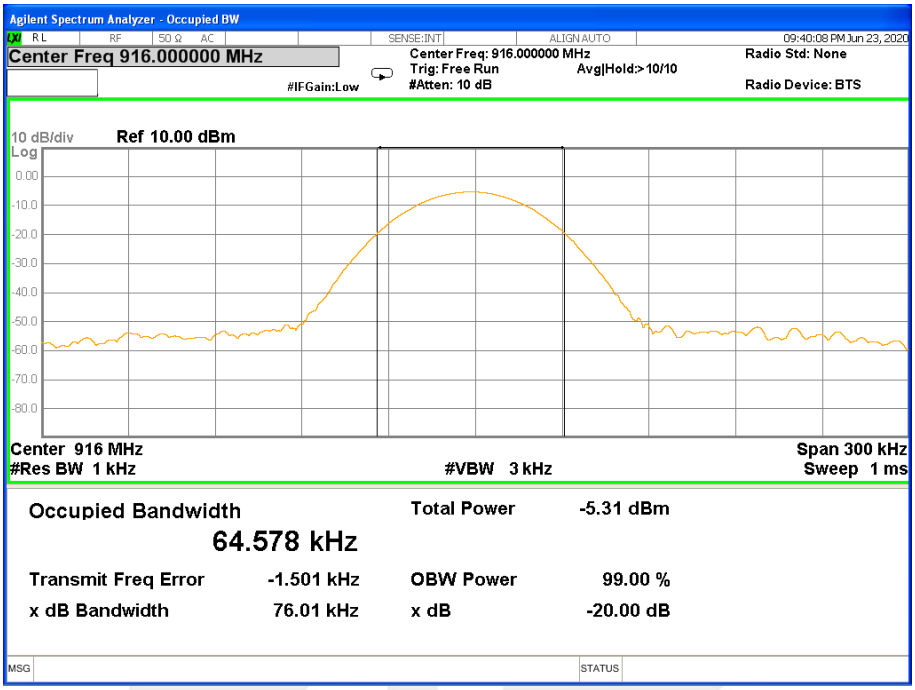
Mid Channel



916MHz

Test Channel	Frequency(MHz)	20 dB Bandwidth(KHz)	99% Bandwidth(KHz)
CH01	916	76.01	64.578

Mid Channel



5. ANTENNA REQUIREMENT

5.1 STANDARD REQUIREMENT

According to the FCC Part 15 Paragraph 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.

5.2 EUT ANTENNA

The EUT antenna is Monopole antenna Antenna.It conforms to the standard requirements.

APPENDIX- PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※