TEST REPORT

of

FCC Part 15 Subpart C AND CANADA RSS-210

☒ New Application; ☐ Class I PC; ☐ Class II PC

Product :	**TIRE PRESSURE MONITOR SENSOR- C(433MHZ)**
Brand:	**Cub**
Model:	**UNI-SENSOR**
Model Difference:	**N/A**
FCC ID:	**ZPNUNI-SENSOR**
IC:	**9959A-UNISENSOR**
FCC Rule Part:	**§15.231 (e)**
IC Rule Part:	**RSS-210 issue 8:Dec. 2010, Annex 1.1**
Applicant:	**CUB ELECPARTS INC.**
Address:	**No.6, Lane 546, Sec.6, Changlu Road, Fuhsin Township Changhua County, Taiwan**

Test Performed by:

International Standards Laboratory
<Lung-Tan LAB>
*Site Registration No.
BSMI: SL2-IN-E-0013; MRA TW1036; TAF: 0997; IC: IC4067B-3;
*Address:
No. 120, Lane 180, Hsin Ho Rd.
Lung-Tan Dist., Tao Yuan City 325, Taiwan
*Tel : 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-15LR339FC**

Issue Date : **2015/12/23**

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.

This report MUST not be used to claim product endorsement by TAF, NVLAP or any agency of the Government.

VERIFICATION OF COMPLIANCE

Applicant:	CUB ELECPARTS INC.
Product Description:	TIRE PRESSURE MONITOR SENSOR- C(433MHZ)
Brand Name:	Cub
FCC ID:	ZPNUNI-SENSOR
IC:	9959A-UNISENSOR
FCC Rule Part:	§15.231 (e)
IC Rule Part:	RSS-210 issue 8:2010, Annex 1.1
Model No.:	UNI-SENSOR
Model Difference:	N/A
Date of test:	2015/12/09 ~ 2015/12/11
Date of EUT Received:	2015/12/09

We hereby certify that:

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Test By:	Dion Chen	***Date:***	2015/12/23
	Dion Chang / Engineer		
Prepared By:	Eva Kao	***Date:***	2015/12/23
	Eva Kao / Technical Supervisor		
Approved By:	Vincent Su	***Date:***	2015/12/23
	Vincent Su / Technical Manager		

Version

Version No.	Date	Description
00	2015/12/23	Initial creation of document

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1. GENERAL INFORMATION

1.1 Product Description

Product Name	TIRE PRESSURE MONITOR SENSOR- C(433MHZ)
Brand Name	Cub
Model Name	UNI-SENSOR
Model Difference	N/A
Power Supply	3.0V from battery
Device type	safety applications
Product & Radio Hardware version	10562U005010RA
Product & Radio Software version	80262U005010RA

TX:

Operating Frequency	433.92 MHz
Transmit Power	75.02dBuV/m at 3m
Modulation Technique	FSK & ASK
Number of Channels	1
Operating Mode	Point-to-Point
Periodic Transmission Time	Transmission period every 14s, Total Transmission Time <1 s per hour
Antenna Type	Wire Antenna

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **ZPNUNI-SENSOR** filing to comply with Section 15.231 (e) of the FCC Part 15, Subpart C Rules and **IC: 9959A-UNISENSOR** filing to comply with Industry Canada RSS-210 issue 8:2010 Annex 1.1.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in C63.10: 2013 and RSS-Gen Issue 4: 2014. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of **International Standards Laboratory** <Lung-Tan LAB> No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.10: 2013. FCC Registration Number is: 872200; Designation Number is: TW1036, Canada Registration Number: 4067B-3.

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT (Transmitter) was tested with a test program to fix the Tx frequency that was for the purpose of the measurements. For more information please see test data and APPENDIX 1 for set-up photographs.

2.3 Test Procedure

2.3.1 Conducted Emissions (Not apply in the report)

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10: 2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR 16-1-1 Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m/1.5m(Frequency above 1GHz) above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 6 and 11 of ANSI C63.10: 2013.

2.4 Limitation

(1) Conducted Emission

According to section RSS-Gen §8.8 Conducted Emission Limits is as following.

Frequency range MHz	Limits dB (uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

(2) Radiated Emission

According to (e) Intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) of this section and may be employed for any type of operation, including operation prohibited in paragraph (a) of this section, provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this section, except the field strength table in paragraph (b) of this section is replaced by the following:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emission (microvolts/meter)
40.66-40.70	1,000	100
70-130	500	50
130-174	500 to 1,500[1]	50 to 150[1]
174-260	1,500	150
260-470	1,500 to 5,000[1]	150 to 500[1]
Above 470	5,000	500

[1]Linear interpolations.

Remark:
1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205
4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of ξ15.205, then the general radiated emission limits in ξ 15.209 apply.
5. For the band 130-174MHz, uV/m at 3meters = 22.72727 * F(MHz) – 2454.545;
   For the band 260-470MHz uV/m at 3meters = 16.6667 * F(MHz) – 2833.333;
   Where F is the frequency in MHz.
6. 433.92MHz AV limit = 16.6667 * 433.92(MHz) – 2833.333= 4398.68 uV/m
   = 72.86dBuV/m
7. 433.92MHz Peak limit = AV Limit + 20dB = 92.86MHz

2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

TX

EUT

(Lithium manganese 3V)

Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	N/A					

3. SUMMARY OF TEST RESULTS

FCC /IC Rules	Description Of Test	Result
§15.207 RSS-Gen §7.2.2	Conducted Emission	N/A
§15.231(e) RSS-Gen § RSS-210 A1.1 Table B	Radiated Emission	Compliant
§15.231(c) RSS-Gen § RSS-210 A1.1	20dB Bandwidth	Compliant
RSS-Gen §4.6.1 RSS-210 A1.1.3(c)	99% Power Bandwidth	Compliant
	Duty Cycle Test (Pulse Modulation)	Compliant
§15.231(e) RSS-210 A1.1.5(2)	transmission time, silent period	Compliant
§15.203	Antenna Requirement	Compliant

4. Description of test modes

The EUT has been tested under engineering test mode condition. and the EUT staying in continuous transmitting mode. The Frequency 433.92 MHz is chosen for testing.

5. AC CONDUCTED EMISSIONS TEST

5.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

5.2 Test SET-UP (Block Diagram of Configuration)

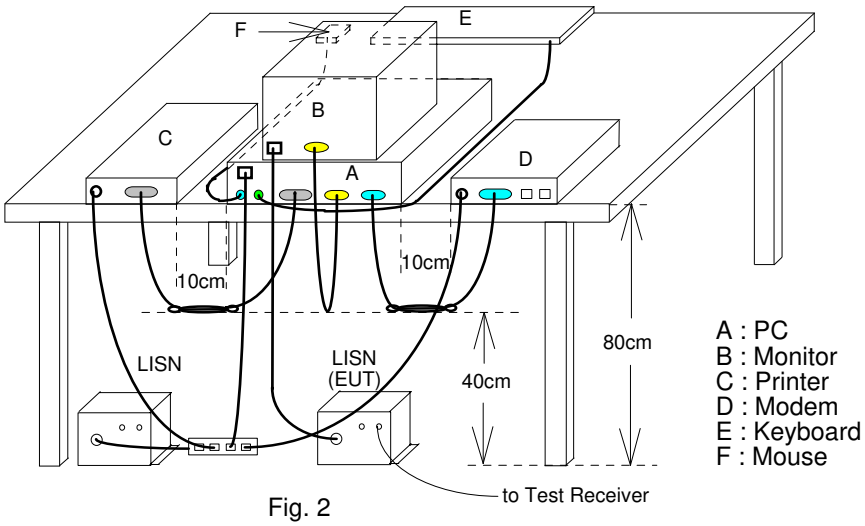


Fig. 2

5.3 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Conduction 04-3 Cable	WOKEN	CFD 300-NL	Conduction 04 -3	07/28/2015	07/27/2016
EMI Receiver 17	Rohde & Schwarz	ESCI 7	100887	09/08/2015	09/07/2016
LISN 18	ROHDE & SCHWARZ	ENV216	101424	02/11/2015	02/10/2016
LISN 19	ROHDE & SCHWARZ	ENV216	101425	03/12/2015	03/11/2016
Test Software	Farad	EZEMC Ver:ISL-03A2	N/A	N/A	N/A

5.4 Measurement Result:

N/A

6. RADIATED EMISSION TEST

15.231 (e) Intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) of this section and may be employed for any type of operation, including operation prohibited in paragraph (a) of this section, provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this section, except the field strength table in paragraph (b) of this section is replaced by the following:

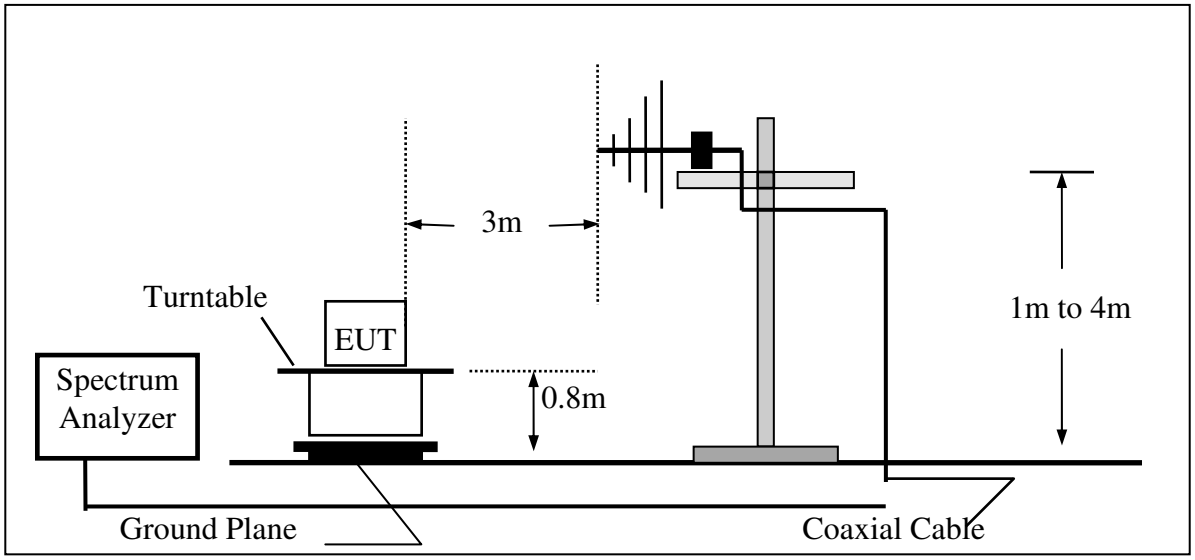
RSS 210 A1.1.5
(1) Devices may be employed for any type of operation, including operation prohibited in Section A1.1.1, provided that the device complies with the requirements of sections A1.1.2 through A1.1.4 and that the field strength meets the limits in Table B of this annex.

6.1 Measurement Procedure

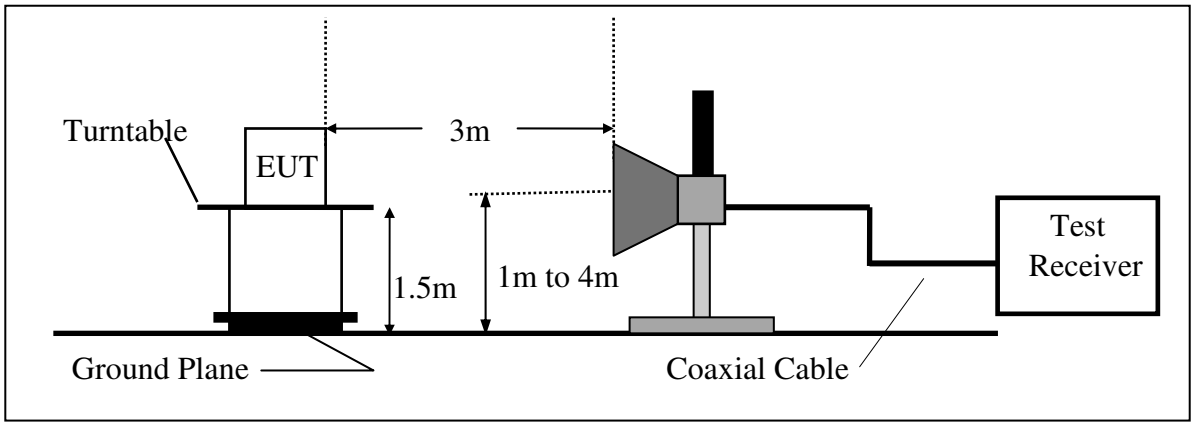
1. The EUT was placed on a turn table which is 0.8/1.5m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

6.2 Test SET-UP (Block Diagram of Configuration)

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



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



6.3 Measurement Equipment Used:

Chamber 14					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer 21(26.5GHz)	Agilent	N9010A	MY49060537	07/30/2015	07/29/2016
Spectrum Analyzer 20(6.5GHz)	Agilent	E4443A	MY48250315	05/21/2015	05/20/2016
Loop Antenna9K-30M	A.H.SYSTEM	SAS-564	294	06/17/2015	06/16/2017
Bilog Antenna30-1G	Schaffner	CBL 6112D	37873	06/16/2015	06/15/2016
Horn antenna1-18G	ETS	3117	00066665	11/27/2015	11/26/2016
Horn antenna18-26G(04)	Com-power	AH-826	081001	07/24/2015	07/23/2017
PREAMPLIFIER9-1000M	HP	8447D	NA	03/12/2015	03/11/2016
Preamplifier1-18G	MITEQ	AFS44-00101800-25-10P-44	1329256	07/28/2015	07/27/2016
Preamplifier1-26G	EM	EM01M26G	NA	03/11/2015	03/10/2016
Cable1-18G	HUBER SUHNER	Sucoflex 106	NA	12/02/2015	12/01/2016
Cable UP to 1G	HUBER SUHNER	RG 214/U	NA	10/02/2015	10/01/2016
SUCOFLEX 1GHz-40GHz CABLE	HUBER SUHNER	SUCOFLEX 102	27963/2&37421/2	11/03/2015	11/02/2017

6.4 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:

FS = RA + AF + CL - AG

Average Value = Peak Value + 20 Log (Ton/Tp) ……Pulse Modulation Duty Cycle Correction Factor

Where FS = Field Strength		CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude		AG = Amplifier Gain
AF = Antenna Factor		

6.5 Measurement Result

Fundamental Measurement Result

Operation Mode:	Transmitting Mode	Test Date:	2015/12/11
Fundamental Frequency:	433.92MHz	Test By:	Dino
Temp:	25 ℃	Hum.:	60%

FSK Mode:

Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
433.92	77.02	-8.56	68.46	92.86	-24.40	Peak	VERTICAL
433.92	83.58	-8.56	75.02	92.86	-17.84	Peak	HORIZONTAL
433.92	72.74	-8.56	64.18	72.86	-8.68	AV	HORIZONTAL

ASK Mode:

Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
433.92	75.15	-8.26	66.89	92.86	-25.97	Peak	VERTICAL
433.92	79.09	-8.26	70.83	92.86	-22.03	Peak	HORIZONTAL

Remark:

1 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

2 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

3 Average Value = Peak Value + 20 Log (Ton/Tp) ……Pulse Modulation Duty Cycle Correction Factor

Radiated Spurious Emission Measurement Result (below 1GHz) (FSK Mode)

Operation Mode: Transmitting Mode
Test Date: 2015/12/11
Fundamental Frequency: 433.92MHz
Test By: Dino
Temperature : 25 ℃
Humidity : 60 %

No	Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	578.05	28.06	-6.24	21.82	46.00	-24.18	Peak	VERTICAL
2	666.32	27.28	-4.78	22.50	46.00	-23.50	Peak	VERTICAL
3	765.26	26.78	-2.82	23.96	46.00	-22.04	Peak	VERTICAL
4	838.98	27.87	-1.94	25.93	46.00	-20.07	Peak	VERTICAL
5	867.84	32.81	-1.44	31.37	52.86	-21.49	Peak	VERTICAL
6	908.82	31.36	-0.67	30.69	46.00	-15.31	Peak	VERTICAL
1	610.06	26.60	-5.55	21.05	46.00	-24.95	Peak	HORIZONTAL
2	674.08	26.19	-4.66	21.53	46.00	-24.47	Peak	HORIZONTAL
3	744.89	25.90	-3.07	22.83	46.00	-23.17	Peak	HORIZONTAL
4	825.40	26.34	-2.15	24.19	46.00	-21.81	Peak	HORIZONTAL
5	867.84	39.01	-1.44	37.57	52.86	-15.29	Peak	HORIZONTAL
6	951.50	26.41	0.15	26.56	46.00	-19.44	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
2 Measuring frequencies from the lowest internal frequency to the 1GHz.
3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.
4 Measurement result 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.
5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (above 1GHz) (FSK Mode)

Operation Mode: Transmitting Mode
Test Date: 2015/12/11
Fundamental Frequency: 433.92MHz
Test By: Dino
Temperature : 25 ℃
Humidity : 60 %

No	Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	3471.36	50.23	-7.25	42.98	74.00	-31.02	Peak	VERTICAL
2	3905.28	46.44	-5.36	41.08	74.00	-32.92	Peak	VERTICAL
1	3471.36	54.64	-7.25	47.39	74.00	-26.61	Peak	HORIZONTAL
2	3905.28	49.10	-5.36	43.74	74.00	-30.26	Peak	HORIZONTAL
3	4339.20	48.34	-3.68	44.66	74.00	-29.34	Peak	HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data 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.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (below 1GHz) (ASK Mode)

Operation Mode: Transmitting Mode
Test Date: 2015/12/11
Fundamental Frequency: 433.92MHz
Test By: Dino
Temperature : 25 ℃
Humidity : 60 %

No	Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	89.17	45.49	-18.52	26.97	43.50	-16.53	Peak	VERTICAL
2	106.63	45.06	-15.99	29.07	43.50	-14.43	Peak	VERTICAL
3	206.54	53.37	-14.69	38.68	43.50	-4.82	Peak	VERTICAL
4	389.87	34.65	-9.23	25.42	46.00	-20.58	Peak	VERTICAL
5	515.97	28.49	-7.10	21.39	46.00	-24.61	Peak	VERTICAL
6	867.84	26.68	-1.05	25.63	46.00	-20.37	Peak	VERTICAL
1	96.93	40.83	-17.59	23.24	43.50	-20.26	Peak	HORIZONTAL
2	106.63	43.85	-15.99	27.86	43.50	-15.64	Peak	HORIZONTAL
3	211.39	39.11	-14.58	24.53	43.50	-18.97	Peak	HORIZONTAL
4	293.84	31.66	-11.11	20.55	46.00	-25.45	Peak	HORIZONTAL
5	364.65	29.85	-9.75	20.10	46.00	-25.90	Peak	HORIZONTAL
6	867.84	31.73	-1.05	30.68	46.00	-15.32	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
2 Measuring frequencies from the lowest internal frequency to the 1GHz.
3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.
4 Measurement result 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.
5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (above 1GHz) (ASK Mode)

Operation Mode: Transmitting Mode
Test Date: 2015/12/11
Fundamental Frequency: 433.92MHz
Test By: Dino
Temperature : 25 ℃
Humidity : 60 %

No	Freq MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1301.76	50.11	-15.49	34.62	74.00	-39.38	Peak	VERTICAL
2	1735.68	48.15	-13.56	34.59	74.00	-39.41	Peak	VERTICAL
3	2169.60	48.49	-11.55	36.94	74.00	-37.06	Peak	VERTICAL
4	2603.52	49.26	-10.12	39.14	74.00	-34.86	Peak	VERTICAL
5	3037.44	47.71	-9.15	38.56	74.00	-35.44	Peak	VERTICAL
6	3471.36	54.48	-7.98	46.50	74.00	-27.50	Peak	VERTICAL
7	3905.28	46.55	-6.14	40.41	74.00	-33.59	Peak	VERTICAL
8	4339.20	48.76	-4.53	44.23	74.00	-29.77	Peak	VERTICAL
1	1301.76	49.87	-15.49	34.38	74.00	-39.62	Peak	HORIZONTAL
2	1735.68	48.22	-13.56	34.66	74.00	-39.34	Peak	HORIZONTAL
3	2169.60	50.23	-11.55	38.68	74.00	-35.32	Peak	HORIZONTAL
4	2603.52	48.78	-10.12	38.66	74.00	-35.34	Peak	HORIZONTAL
5	3037.44	48.15	-9.15	39.00	74.00	-35.00	Peak	HORIZONTAL
6	3471.36	54.84	-7.98	46.86	74.00	-27.14	Peak	HORIZONTAL
7	3905.28	47.33	-6.14	41.19	74.00	-32.81	Peak	HORIZONTAL
8	4339.20	50.31	-4.53	45.78	74.00	-28.22	Peak	HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data 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.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

7. 20DB / 99% OCCUPIED BANDWIDTH

RSS 210 A1.1.3 Bandwidth of Momentary Signals
For the purpose of Section A1.1, the 99% bandwidth shall be no wider than 0.25% of the centre frequency for devices operating between 70 MHz and 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the centre frequency.

7.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Set SPA Center Frequency = fundamental frequency, RBW= 10KHz, VBW= 30KHz, Span =3MHz.
4. Set SPA Max hold. Mark peak, -20dB. 99% Bandwidth

7.2 Test SET-UP (Block Diagram of Configuration)

Same as 6.2 Radiated Emission Measurement.

7.3 Measurement Equipment Used:

Same as 6.3 Radiated Emission Measurement.

7.4 Measurement Results

Refer to attached data chart.

The center frequency **f_c is 433.92MHz,** according to the Rules, section 15.231(C), the Bandwidth of Center Frequency at-20dB should be calculated as following:

433.92 X 0.0025 = 1.0848(MHz)

So, the Uper/Lower frequencies limit should be specified as:

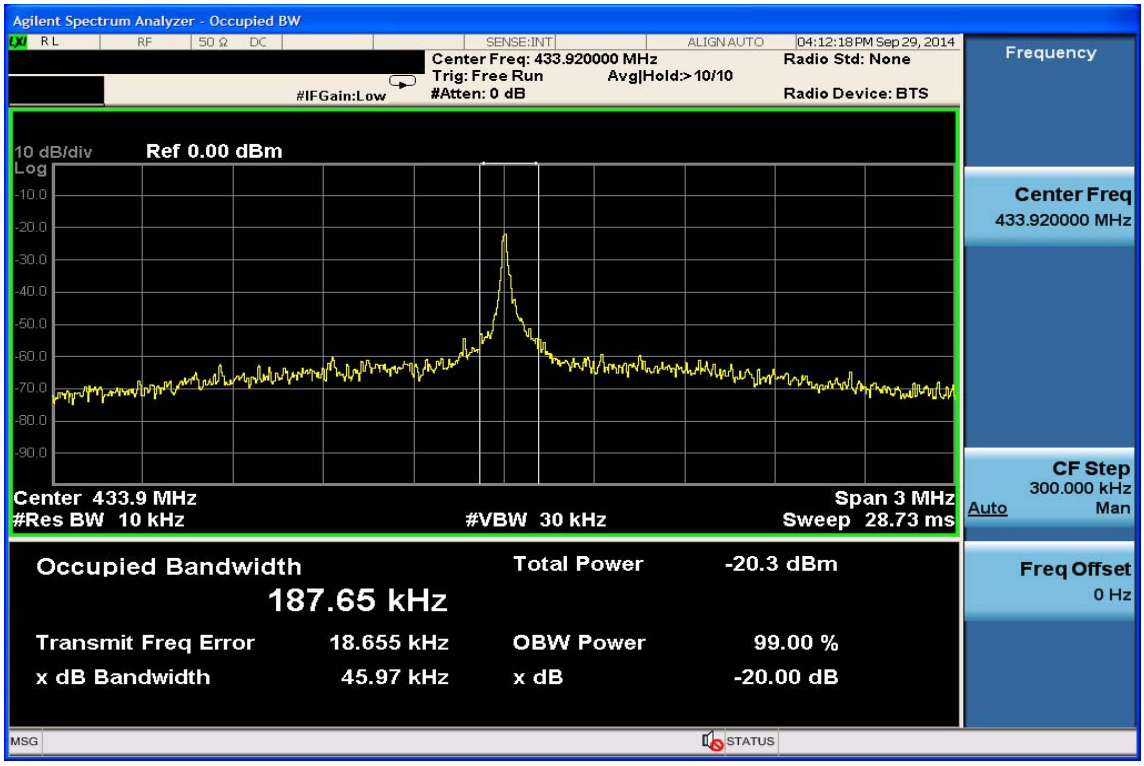
$f_{(U)} = f_c + \Delta f/2 = 433.92 + 0.5424 = 434.46$(MHz)
$f_{(L)} = f_c - \Delta f/2 = 433.92 - 0.5424 = 433.377$ (MHz)

7.5 Measurement Result:

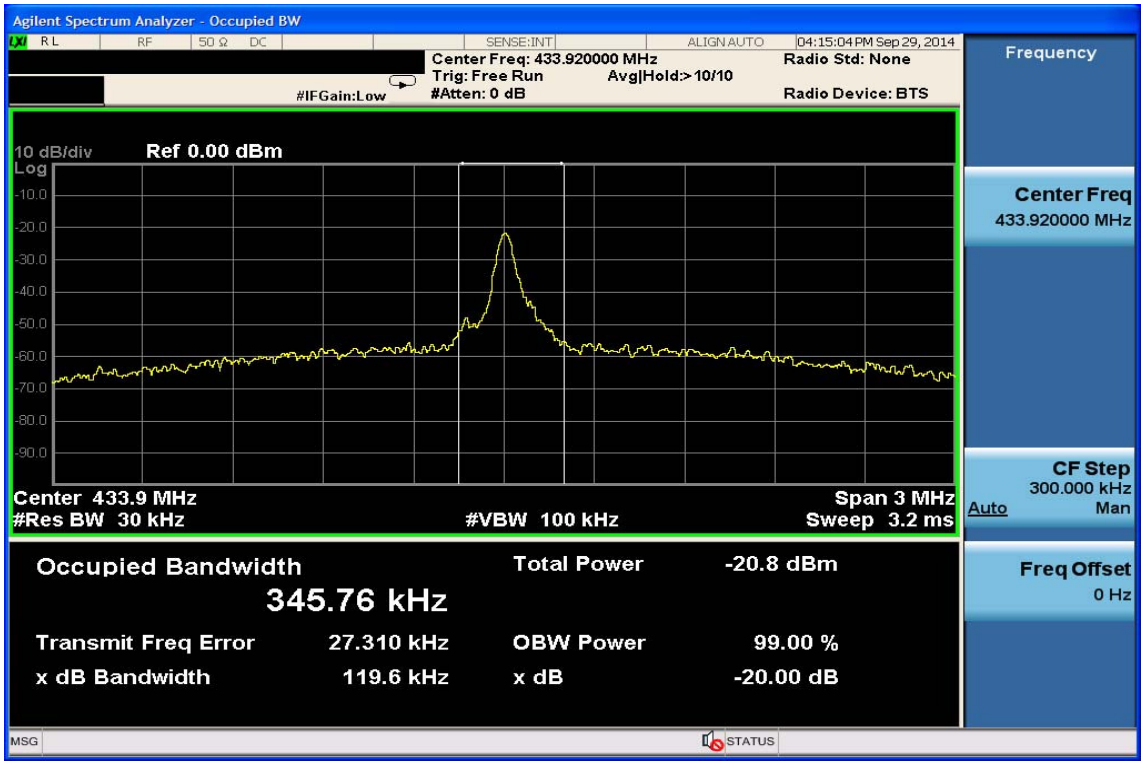
	FSK Mode	ASK Mode	limit (MHz)	rulust
-20dB Bandwidth (kHz)	45.97	56.98	within allowed frequency range	PASS
99% Bandwidth (kHz)	345.76	86.228	<1.0848	PASS

FSK Mode

20dB Band Width Test Data

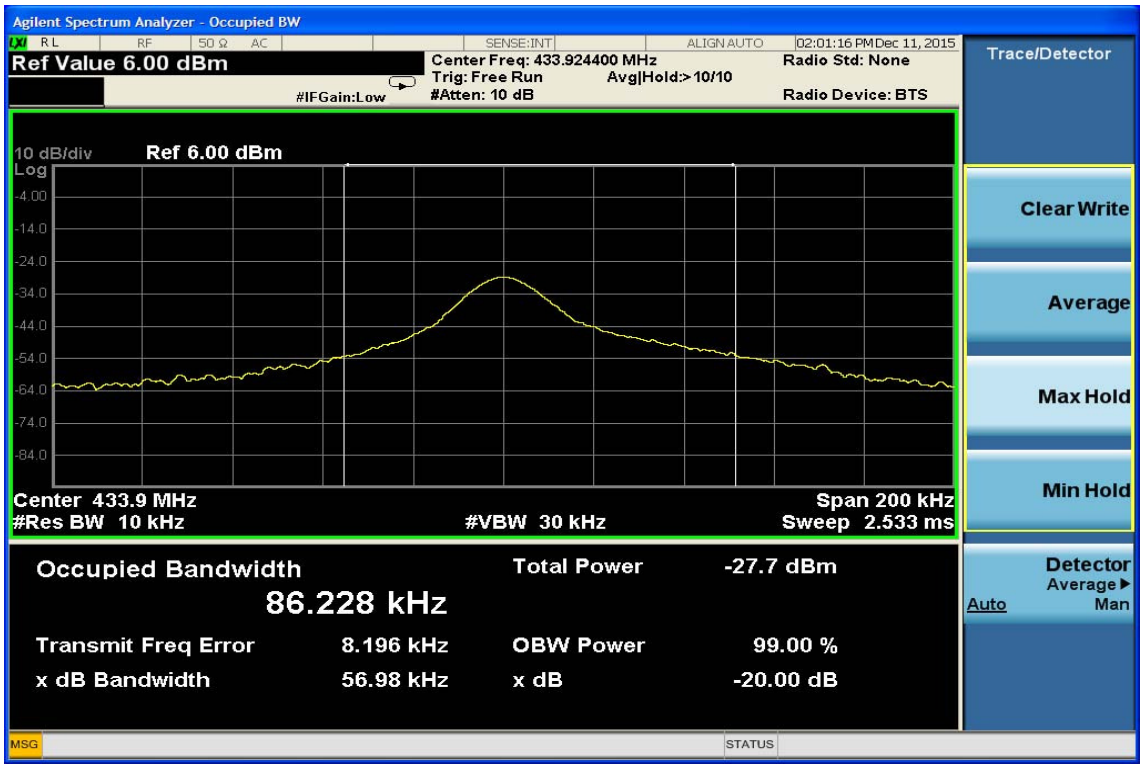


99% Band Width Test Data



ASK Mode

20dB & 99% Band Width Test Data



8. DUTY CYCLE (AVERAGE CORRECTION FACTOR) MEASUREMENT

8.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set ETU normal operating mode.
3. Set SPA Center Frequency = fundamental frequency, RBW, VBW= 1.0MHz, Span =0 Hz. Adjacent sweep.
4. Set SPA View. Mark delta.

8.2 Test SET-UP (Block Diagram of Configuration)

Same as 6.2 Radiated Emission Measurement.

8.3 Measurement Equipment Used:

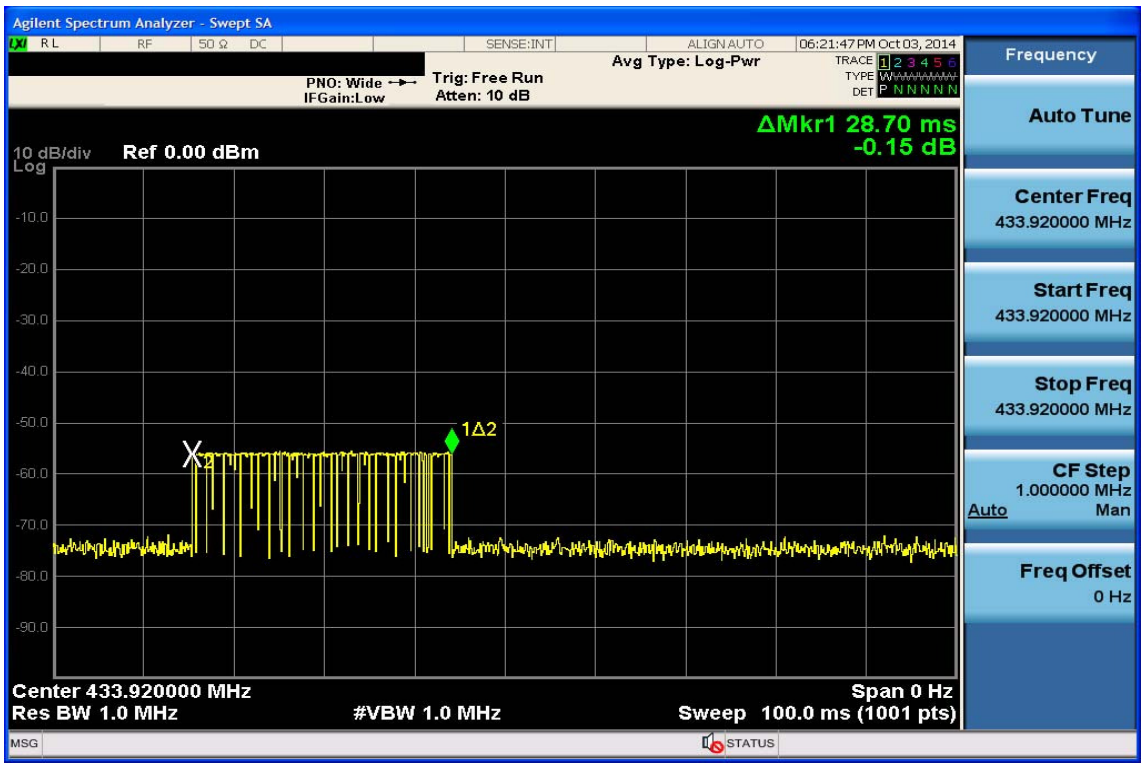
Same as 6.3 Radiated Emission Measurement.

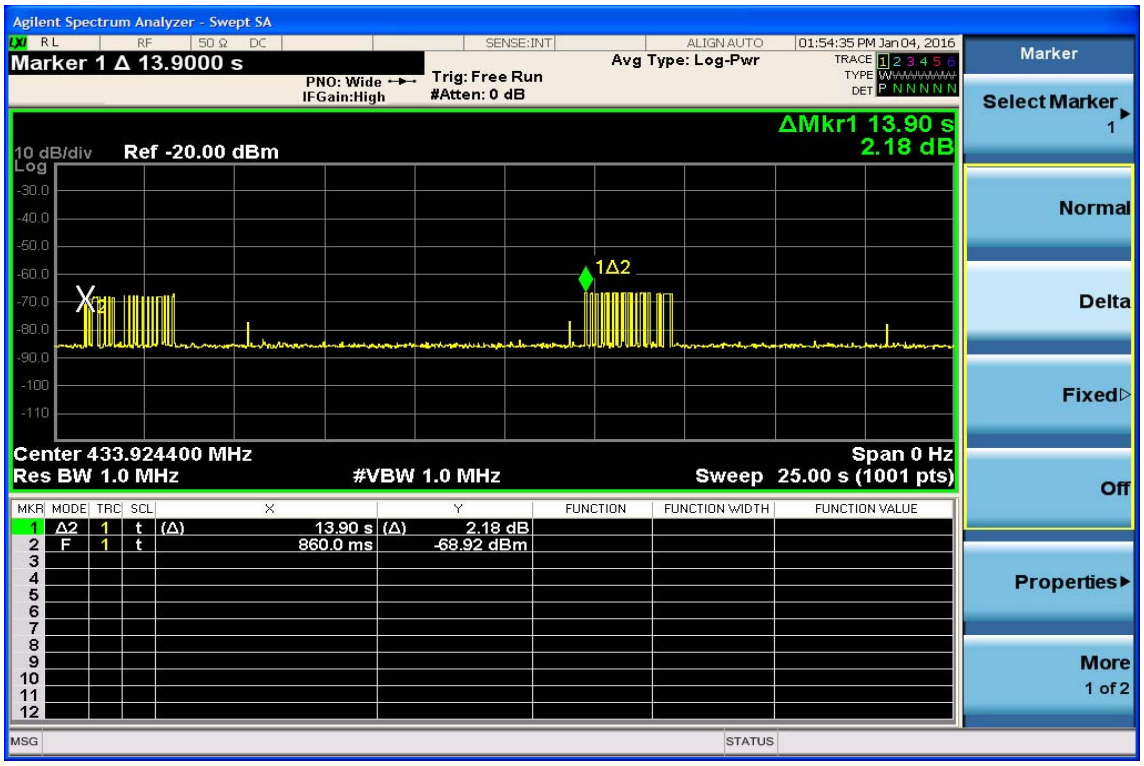
8.4 Measurement Results:

FSK Mode:
Ton = 28.70(ms)
Tp> 100 (ms),
Average Correction Factory = 20log (Ton/Tp) =20log (28.70/100) = -10.84 dB

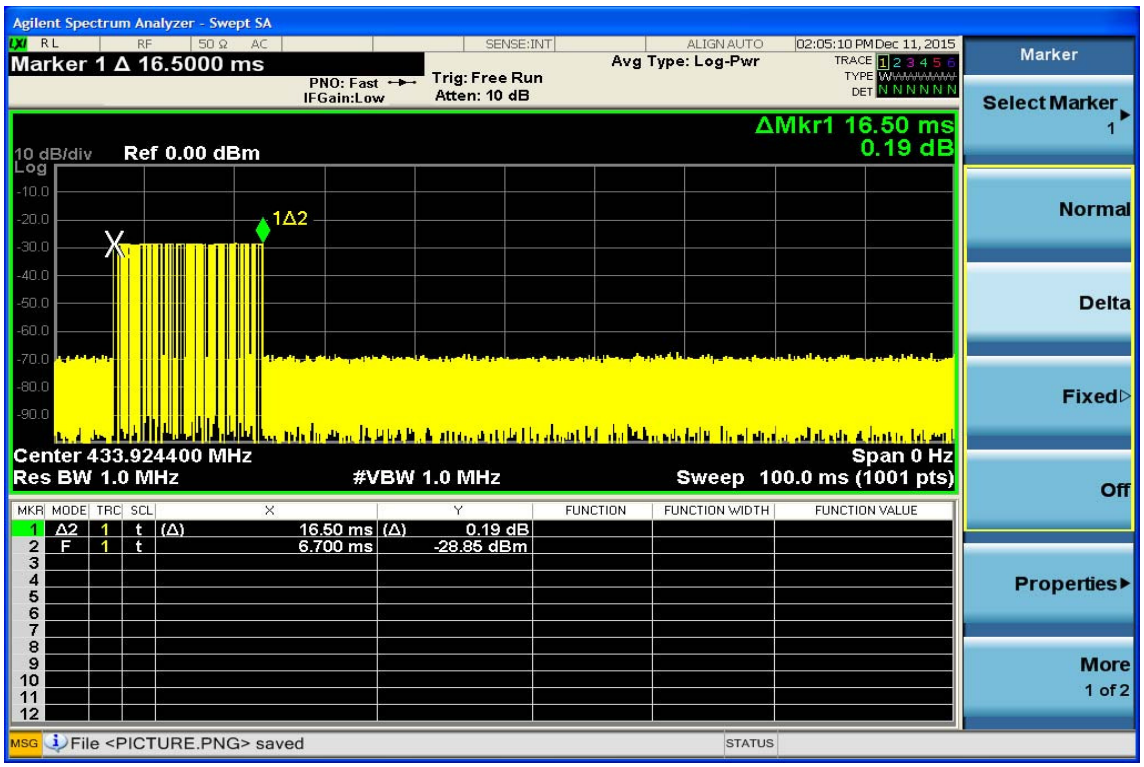
ASK Mode:
Ton = 16.5(ms)
Tp> 100 (ms),
Average Correction Factory = 20log (Ton/Tp) =20log (16.5/100) = -15.65 dB

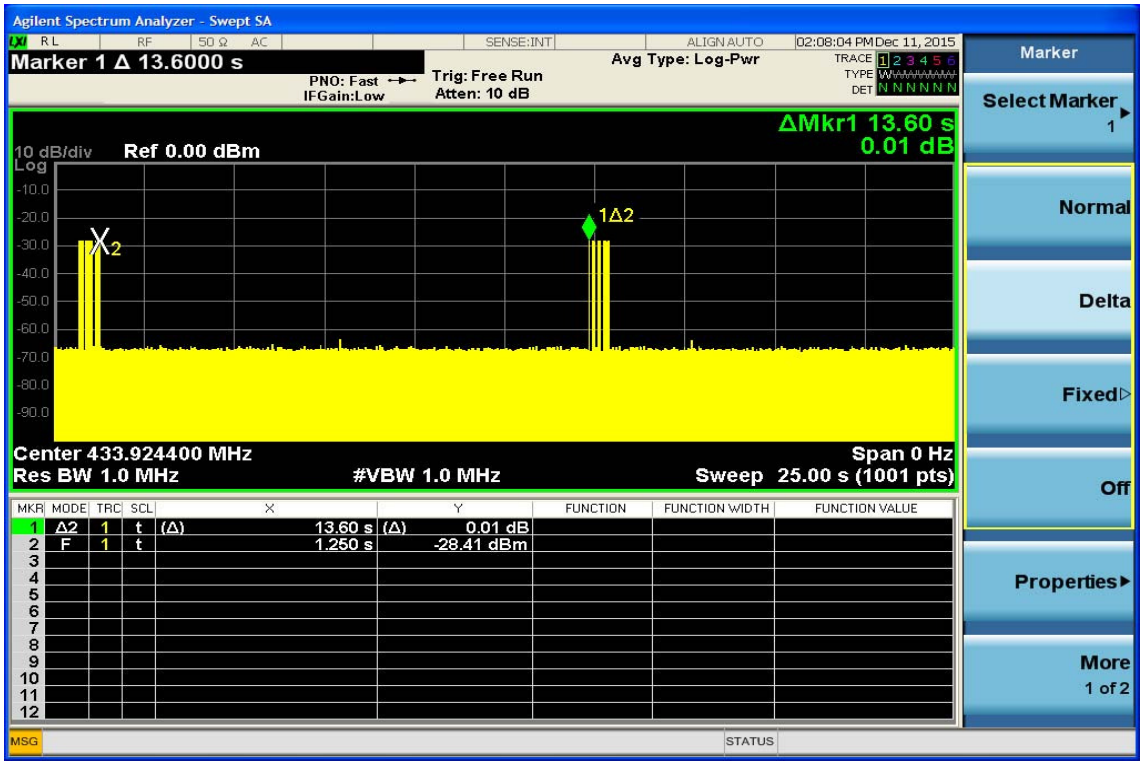
FSK Mode
Ton Measurement: Tp >100ms





ASK Mode
Ton Measurement: Tp >100ms





9. SILENT PERIOD TIME MEASUREMENT:

15.231 (e)

devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

RSS 210 A1.1.5
(2) In addition, devices operated under the provisions of this section (A1.1.5) shall be capable of automatically limiting their operation so that the duration of each transmission shall not be greater than 1 second and the silent period between transmissions shall be at least 30 times the duration of the transmission, but in no case less than 10 seconds. However, devices that are designed for limited
use for the purpose of initial programming, reprogramming or installation, and not for regular operations, may operate up to 5 seconds provided that such devices are used only occasionally in connection with each unit being programmed or installed.

9.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set SPA Center Frequency = fundamental frequency, RBW, VBW= 1MHz, Span =0Hz
3. Set EUT Power on as normal operation
4. Set SPA Max hold. Delta Mark.

9.2 Test SET-UP (Block Diagram of Configuration)

Same as 6.2 Radiated Emission Measurement.

9.3 Measurement Equipment Used:

Same as 6.3 Radiated Emission Measurement.

9.4 Measurement Results

Total transmission time of transmissions calculation:

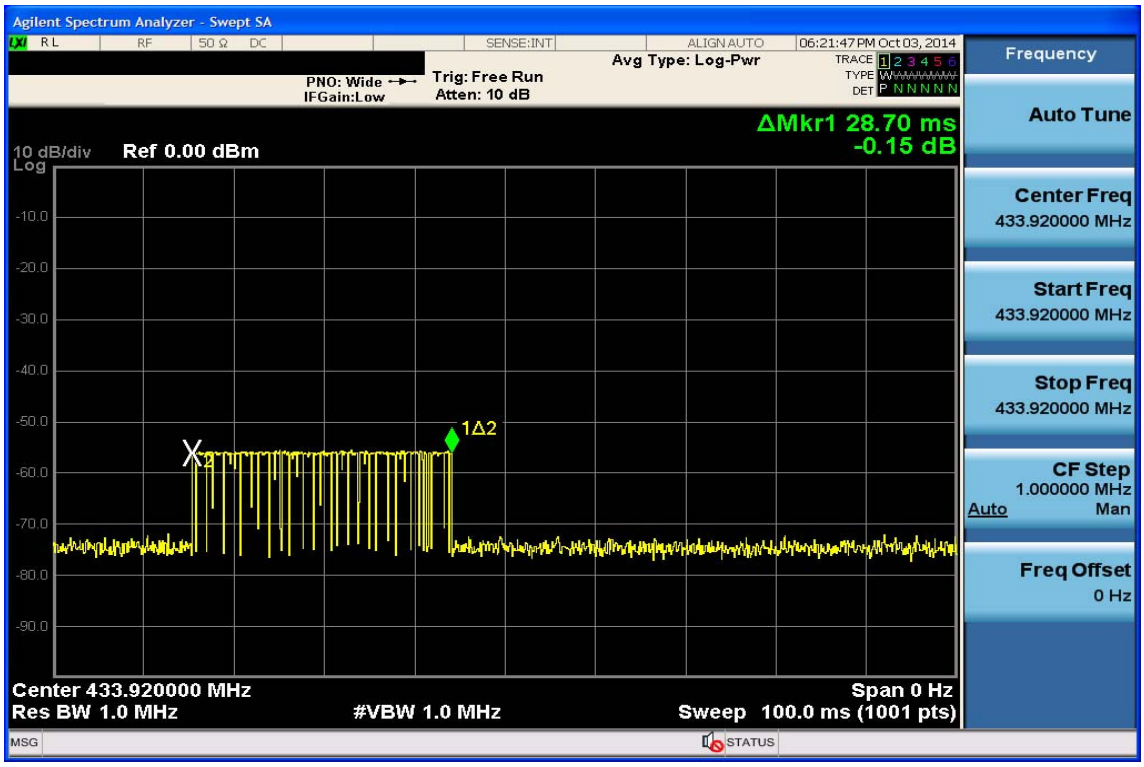
FSK Mode:
Ton: 28.70 ms,
Tp: 13.9s
silent period limit(which one is lower): 10s or 28.7(ms) *30 =861(mS),
T silent period = 13.9s -28.70ms = 13.613s > 10s

ASK Mode:
Ton: 16.5 ms,
Tp: 13.6s
silent period limit(which one is lower): 10s or 16.5(ms) *30 =495(mS),
T silent period = 13.6s > 10s

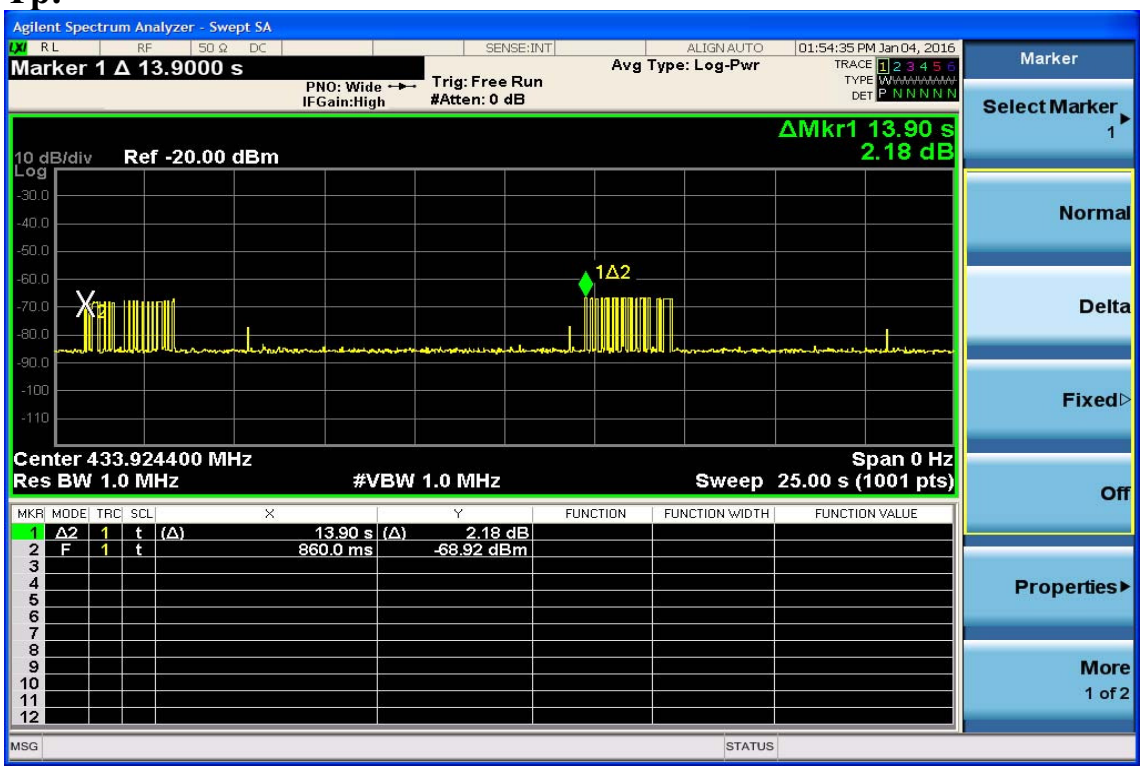
The result : PASS.

FSK Mode

Ton:

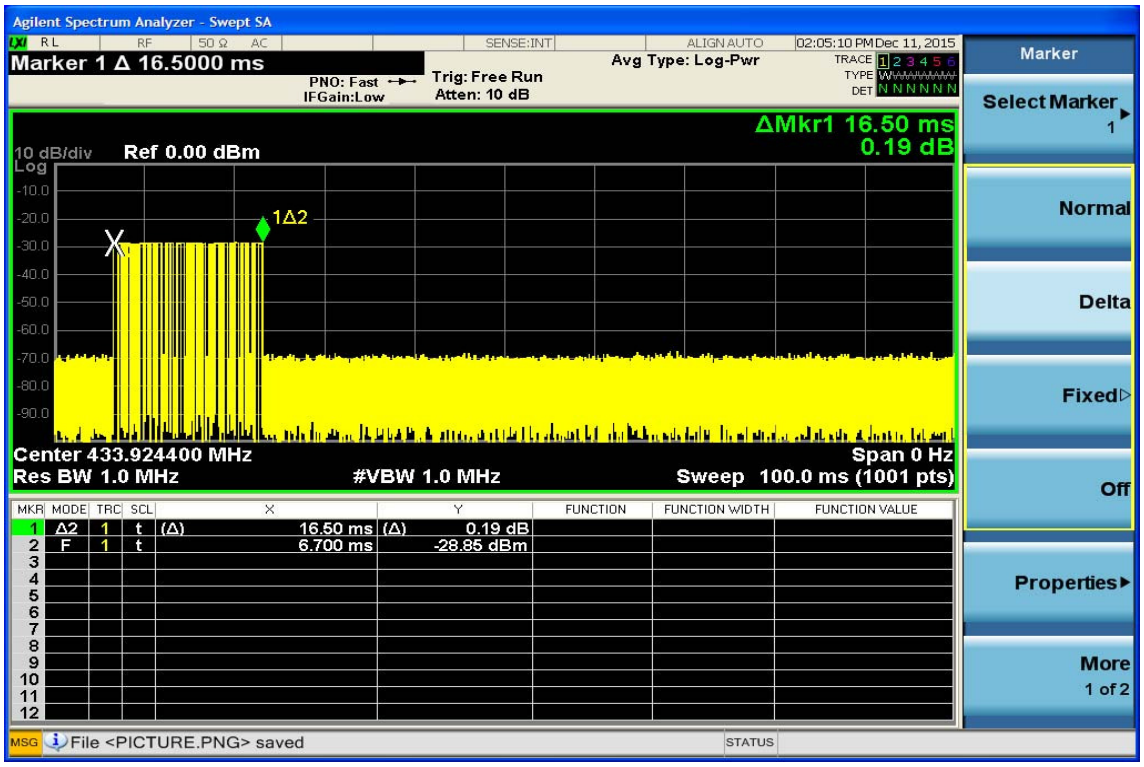


Tp:



ASK Mode

Ton:



Tp: