

TEST REPORT

of

FCC Part 15 Subpart C §15.225
RSS-210 Issue 10, RSS-Gen Issue 5

FCC ID: 2ABFG-YRD622BLEV1
IC Certification: 11626A-YRD622BLEV1

1. Equipment Under Test : Digital Door Lock
2. Model Name : YRD622-ACC-619
3. Variant Model Name(s) : Refer to the page 3
4. Applicant : iRevo-ASSA ABLOY Korea
5. Manufacturer : iRevo-ASSA ABLOY Korea
6. Date of Receipt : 2020.07.07
7. Date of Test(s) : 2020.07.22 ~ 2020.08.26
8. Date of Issue : 2020.08.26

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

- 1) The results of this test report are effective only to the items tested.
- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.

Tested by:



Jinhyoung Cho

Technical
Manager:



Hyunchae You

SGS Korea Co., Ltd. Gunpo Laboratory

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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
 -10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
 -4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
 -Designation number: KR0150

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

Phone No. : +82 31 688 0901

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1.2. Details of Applicant

Applicant : iRevo-ASSA ABLOY Korea
 Address : 205-29, Gasan Digital 1-ro, Geumcheon-gu, Seoul, Korea, 08052
 Contact Person : Jang, Soo-kyung
 Phone No. : +82 2 2107 5741

1.3. Details of manufacturer

Applicant : Same as applicant
 Address : Same as applicant

1.4. Description of EUT

Kind of Product	Digital Door Lock
Model Name	YRD622-ACC-619
Variant Models	YRD622-ACC-605, YRD622-ACC-0BP, YRD622-ACC-0BE, YRD622-ACC-BSP, YRC622-ICK-15X, YRC622-ICK-3XX, YRC622-ICK-1BP, YRC622-ICK-1BE, YRC622-ICK-BSP
Serial Number	Radiated: BDNK600568(Basic Model), 4KNK8000009(Variant Model)
Power Supply	DC 6.0 V
Frequency Range	13.56 MHz (NFC)
Modulation Technique	ASK
Number of Channels	1 channel
Antenna Type	FPCB Antenna
Antenna Part Number	PC2K-D460B-F1
H/W Version	PV02
S/W Version	V0.4.0

1.5. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due
Signal Generator	R&S	SMBV100A	255834	Jun. 03, 2020	Annual	Jun. 03, 2021
Spectrum Analyzer	R&S	FSV30	103210	Dec. 05, 2019	Annual	Dec. 05, 2020
Spectrum Analyzer	Agilent	N9020A	MY53421758	Sep. 11, 2019	Annual	Sep. 11, 2020
High Pass Filter	Mini circuits	NHP-25+	V9741901107-1	Feb. 17, 2020	Annual	Feb. 17, 2021
DC Power Supply	Agilent	U8002A	MY50060028	Mar. 03, 2020	Annual	Mar. 03, 2021
Temperature Chamber	ESPEC CORP.	PL-1J	15000793	Jun. 02, 2020	Annual	Jun. 02, 2021
Preamplifier	H.P.	8447F	2944A03909	Aug. 06, 2020	Annual	Aug. 06, 2021
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB 1519	1519-039	Aug. 22, 2019	Biennial	Aug. 22, 2021
Bilog Antenna	Schwarzbeck Mess-Elektronik	VULB 9163	396	Mar. 21, 2019	Biennial	Mar. 21, 2021
Test Receiver	R&S	ESU26	100109	Feb. 18, 2020	Annual	Feb. 18, 2021
Turn Table	Innco systems GmbH	DS 1200 S	N/A	N.C.R.	N/A	N.C.R.
Controller	Innco systems GmbH	CONTROLLER CO3000-4P	CO3000/963/38 330516/L	N.C.R.	N/A	N.C.R.
Antenna Mast	Innco systems GmbH	MA4640-XP-ET	MA4640/536/38 330516/L	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L × W × H (9.6 m × 6.4 m × 6.6 m)	N/A	N.C.R.	N/A	N.C.R.
Coaxial Cable	RFONE	SFX086-NMNM-5M (5 m)	20200323001	Aug. 10, 2020	Semi-Annual	Feb. 10, 2021
Coaxial Cable	RFONE	PL520-NMNM-10M (10 m)	20200324001	Aug. 10, 2020	Semi-Annual	Feb. 10, 2021

1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

Applied standard : FCC Part15 subpart C, IC RSS-210 Issue 10, RSS-Gen Issue 5			
Standard section(s)		Test item(s)	Result
15.225(a)(b)(c)(d) 15.209	RSS-210 Annex B Section B.6 RSS-Gen Section 8.9	Radiated Emission, Spurious Emission and Field Strength of Fundamental	Complied
15.225(e)	RSS-210 Annex B Section B.6 RSS-Gen Section 6.11	Frequency Stability	Complied
15.215(c)	RSS-Gen Section 6.7	20 dB Bandwidth & 99 % Bandwidth	Complied
15.207	RSS-Gen Section 8.8	AC Power Line Conducted Emissions	N/A ¹⁾

Note;

- 1) The AC power line test was not performed because the EUT use battery power for operation.
2) Since there is a difference in appearance (The presence or absence of a lever) between "YRD622-ACC-XXX" and "YRC622-ICK-XXX" models, an additional radiated test was performed for "YRC622-ICK-XXX" models

1.7. Sample calculation

Where relevant, the following sample calculation is provided:

1.7.1. Radiation test

Field strength level (dB μ V/m) = Measured level (dB μ V) + Antenna factor (dB) + Cable loss (dB) - amplifier (dB)

1.8. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501-RF-RTL001103	2020.08.26	Initial

1.9. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Occupied Bandwidth	± 9.66 kHz
Radiated Disturbance, 9 kHz to 30 MHz	± 3.59 dB
Radiated Disturbance, below 1 GHz	± 5.88 dB

Uncertainty figures are valid to a confidence level of 95 %.

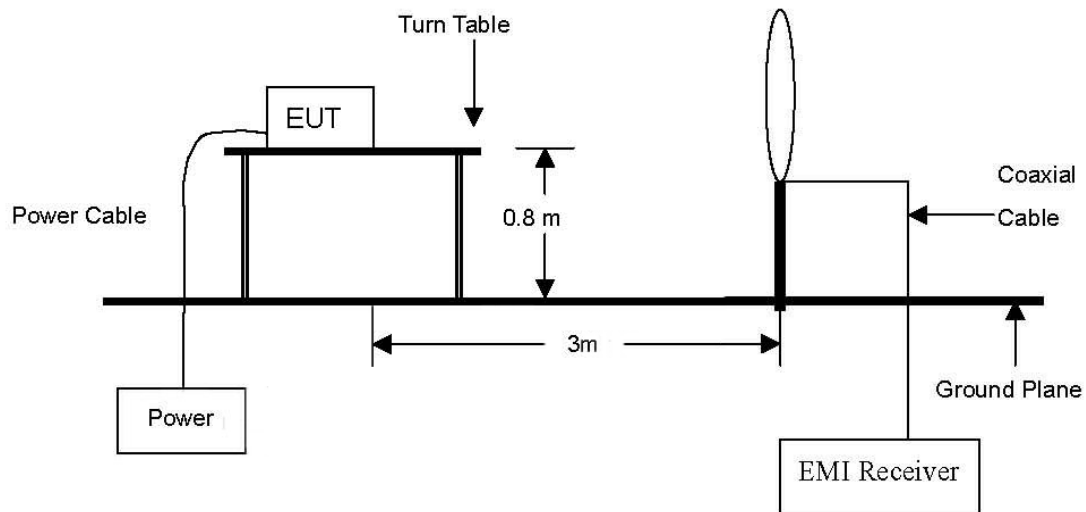
1.10. Information of Variant Models

Model Name	Description
YRD622-ACC-619	- Basic Model.
YRD622-ACC-605	- Same to basic model except for the exterior color. (GOLD)
YRD622-ACC-0BP	- Same to basic model except for the exterior color. (Oil Rubbed Bronze)
YRD622-ACC-0BE	- Same to basic model except for the exterior color. (Equivalent Bronze)
YRD622-ACC-BSP	- Same to basic model except for the exterior color. (BLACK)
YRC622-ICK-15X	- Added the lever to basic model.
YRC622-ICK-3XX	- Added the lever to basic model, Changed the exterior color. (GOLD)
YRC622-ICK-1BP	- Added the lever to basic model, Changed the exterior color. (Oil Rubbed Bronze)
YRC622-ICK-1BE	- Added the lever to basic model, Changed the exterior color. (Equivalent Bronze)
YRC622-ICK-BSP	- Added the lever to basic model, Changed the exterior color. (BLACK)

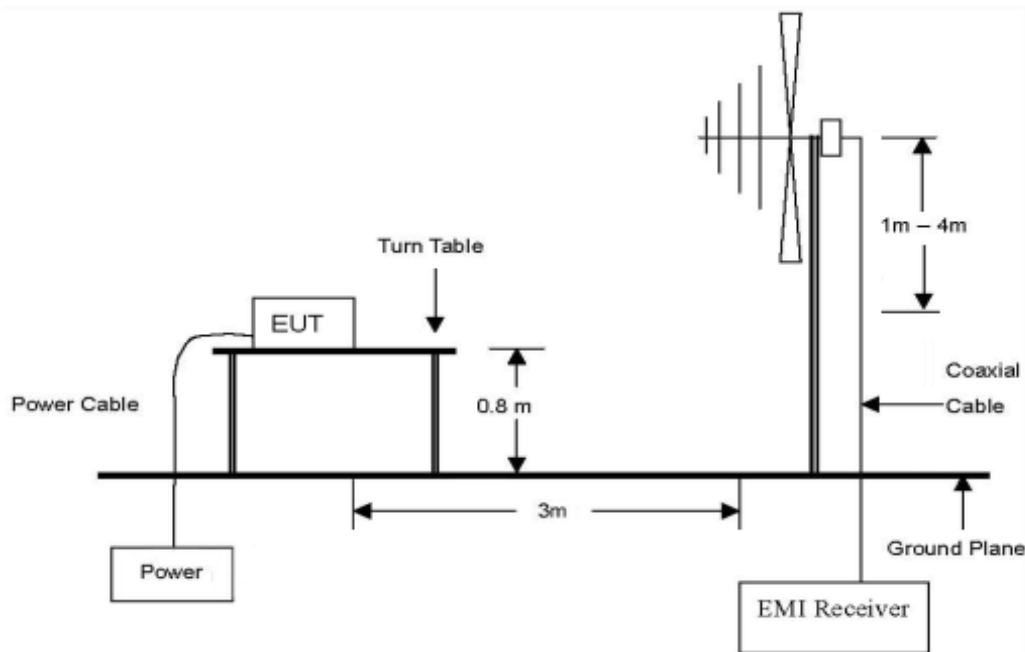
2. Radiated Emissions

2.1. Test Setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 000 MHz Emissions.



2.2. Limit

FCC

According to §15.225,

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15 848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

According to §15.209,

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

IC

According to RSS-210 Issue 10, B.6

The field strength of any emission shall not exceed the following limits:

- (a) 15.848 millivolts/m (84 dB μ V/m) at 30 m, within the band 13.553-13.567 MHz.
- (b) 334 microvolts/m (50.5 dB μ V/m) at 30 m, within the bands 13.410-13.553 MHz and 13.567-13.710 MHz.
- (c) 106 microvolts/m (40.5 dB μ V/m) at 30 m, within the bands 13.110-13.410 MHz and 13.710-14.010 MHz.
- (d) RSS-Gen general field strength limits for frequencies outside the band 13.110-14.010 MHz.

According to RSS-Gen Issue 5, 8.9

Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

Table 5 - General field strength limits at frequencies above 30 MHz

Frequency (MHz)	Field Strength (μ V/m at 3 m)
30-88	100
88-216	150
216-960	200
Above 960	500

Table 6 - General field strength limits at frequencies below 30 MHz

Frequency	Magnetic Field Strength (H-Field) (μ A/m)	Measurement Distance (m)
9-490 kHz ¹	6.37/F (F in kHz)	300
490-1 705 kHz	63.7/F (F in kHz)	30
1.705-30 MHz	0.08	30

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

2.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.10-2013.

2.3.1. Test Procedures for emission below 30 MHz

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
2. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
3. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
4. The test-receiver system was set to Quasi peak Detect Function with Maximum Hold Mode.

2.3.2. Test Procedures for emission above 30 MHz

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna is a Trilog Broadband antenna and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note;

Definition of the test orthogonal plan for EUT was described in the test setup photo.
The test orthogonal plan of EUT is X – axis during radiation test.

2.4. Test Result

Ambient temperature : (23 ± 1) °C
Relative humidity : 47 % R.H.

The following table shows the highest levels of radiated emissions.

Original Model

- Fundamental within the band 13.553 MHz - 13.567 MHz

Radiated Emissions			Ant.	Correction Factors		Total		Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m) at 3 m	Actual (dB μ V/m) at 30 m	Limit (dB μ V/m) at 30 m	Margin (dB)
13.559	25.47	Peak	H	18.66	0.58	44.71	4.71	84.00	79.29

- Spurious emission within the bands 13.410 MHz - 13.553 MHz and 13.567 MHz - 13.710 MHz

Radiated Emissions			Ant.	Correction Factors		Total		Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m) at 3 m	Actual (dB μ V/m) at 30 m	Limit (dB μ V/m) at 30 m	Margin (dB)
13.553	26.20	Peak	H	18.66	0.58	45.44	5.44	50.47	45.03
13.567	24.70	Peak	H	18.66	0.58	43.94	3.94	50.47	46.53

- Spurious emission within the bands 13.110 MHz - 13.410 MHz and 13.710 MHz - 14.010 MHz

Radiated Emissions			Ant.	Correction Factors		Total		Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m) at 3 m	Actual (dB μ V/m) at 30 m	Limit (dB μ V/m) at 30 m	Margin (dB)
13.297	7.85	Peak	H	18.67	0.57	27.09	-12.91	40.51	53.42
*13.408	7.71	Peak	H	18.66	0.58	26.95	-13.05	30.00	43.05
14.006	8.72	Peak	H	18.64	0.60	27.96	-12.04	40.51	52.55

- Spurious emission within the bands 9 MHz - 13.110 MHz

Radiated Emissions			Ant.	Correction Factors		Total		Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m) at 3 m	Actual (dB μ V/m) at 30 m	Limit (dB μ V/m) at 30 m	Margin (dB)
Below 13.110	Not detected	-	-	-	-	-	-	-	-

- Spurious emission within the bands 14.010 MHz - 30 MHz

Radiated Emissions			Ant.	Correction Factors		Total		Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m) at 3 m	Actual (dB μ V/m) at 30 m	Limit (dB μ V/m) at 30 m	Margin (dB)
Above 14.010	Not detected	-	-	-	-	-	-	-	-

Remark;

1. Fundamental limit (μ V/m) = $20 \log(15\ 848) = 84.00$ dB μ V/m.
2. 30 m distance compensation = $40 \log(3/30) = -40$ dB μ V/m.
3. “*” means the restricted band.
4. If the spurious emissions are in the restricted band, the limit complied with §15.209.
5. All data were recorded using a spectrum analyzer employing a peak detector.
If PK results were meet Quasi-peak limit, Quasi-peak measurements were omitted.

- Spurious emission above 30 MHz

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Freq. (MHz)	Reading (dB μ V)	Detect Mode	Pol.	Ant. Factor (dB/m)	AMP + CL (dB)	Actual (dB μ V/m) at 3 m	Limit (dB μ V/m) at 3 m	Margin (dB)
40.71	38.10	Peak	V	20.11	-27.48	30.73	40.00	9.27
67.79	34.40	Peak	V	15.38	-27.23	22.55	40.00	17.45
271.21	34.80	Peak	V	18.62	-25.53	27.89	46.00	18.11
Above 300.00	Not detected	-	-	-	-	-	-	-

Remark;

1. Radiated spurious emission measurement as below.
(Actual = Reading + Antenna Factor + Amp + CL)
2. According to §15.31(o), emission levels are not report much lower than the limits by over 20 dB.

Variant Model

- Fundamental within the band 13.553 MHz - 13.567 MHz

Radiated Emissions			Ant.	Correction Factors		Total		Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m) at 3 m	Actual (dB μ V/m) at 30 m	Limit (dB μ V/m) at 30 m	Margin (dB)
13.560	32.42	Peak	H	18.66	0.58	51.66	11.66	84.00	72.34

- Spurious emission within the bands 13.410 MHz - 13.553 MHz and 13.567 MHz - 13.710 MHz

Radiated Emissions			Ant.	Correction Factors		Total		Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m) at 3 m	Actual (dB μ V/m) at 30 m	Limit (dB μ V/m) at 30 m	Margin (dB)
13.553	26.10	Peak	H	18.66	0.58	45.34	5.34	50.47	45.13
13.567	26.61	Peak	H	18.66	0.58	45.85	5.85	50.47	44.62

- Spurious emission within the bands 13.110 MHz - 13.410 MHz and 13.710 MHz - 14.010 MHz

Radiated Emissions			Ant.	Correction Factors		Total		Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m) at 3 m	Actual (dB μ V/m) at 30 m	Limit (dB μ V/m) at 30 m	Margin (dB)
13.154	9.14	Peak	H	18.67	0.57	28.38	-11.62	40.51	52.13
*13.386	7.57	Peak	H	18.66	0.58	26.81	-13.19	30.00	43.19
13.938	9.19	Peak	H	18.64	0.60	28.43	-11.57	40.51	52.08

- Spurious emission within the bands 9 MHz - 13.110 MHz

Radiated Emissions			Ant.	Correction Factors		Total		Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dBμV/m) at 3 m	Actual (dBμV/m) at 30 m	Limit (dBμV/m) at 30 m	Margin (dB)
Below 13.110	Not detected	-	-	-	-	-	-	-	-

- Spurious emission within the bands 14.010 MHz - 30 MHz

Radiated Emissions			Ant.	Correction Factors		Total		Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	Ant. Factor (dB/m)	Cable loss (dB)	Actual (dBμV/m) at 3 m	Actual (dBμV/m) at 30 m	Limit (dBμV/m) at 30 m	Margin (dB)
Above 14.010	Not detected	-	-	-	-	-	-	-	-

Remark;

1. Fundamental limit ($\mu V/m$) = $20 \log(15\ 848) = 84.00\ dB\mu V/m$.
2. 30 m distance compensation = $40 \log(3/30) = -40\ dB\mu V/m$.
3. “*” means the restricted band.
4. If the spurious emissions are in the restricted band, the limit complied with §15.209.
5. All data were recorded using a spectrum analyzer employing a peak detector.
If PK results were meet Quasi-peak limit, Quasi-peak measurements were omitted.

- Spurious emission above 30 MHz

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Freq. (MHz)	Reading (dBμV)	Detect Mode	Pol.	Ant. Factor (dB/m)	AMP + CL (dB)	Actual (dBμV/m) at 3 m	Limit (dBμV/m) at 3 m	Margin (dB)
40.67	37.60	Peak	V	20.10	-27.48	30.22	40.00	9.78
122.03	36.10	Peak	V	15.19	-26.78	24.51	43.50	18.99
203.39	34.60	Peak	V	16.73	-25.70	25.63	43.50	17.87
271.21	35.50	Peak	V	18.62	-25.53	28.59	46.00	17.41
352.57	34.70	Peak	H	20.95	-25.46	30.19	46.00	15.81
Above 400.00	Not detected	-	-	-	-	-	-	-

Remark;

1. Radiated spurious emission measurement as below.
(Actual = Reading + Antenna Factor + Amp + CL)
2. According to §15.31(o), emission levels are not report much lower than the limits by over 20 dB.

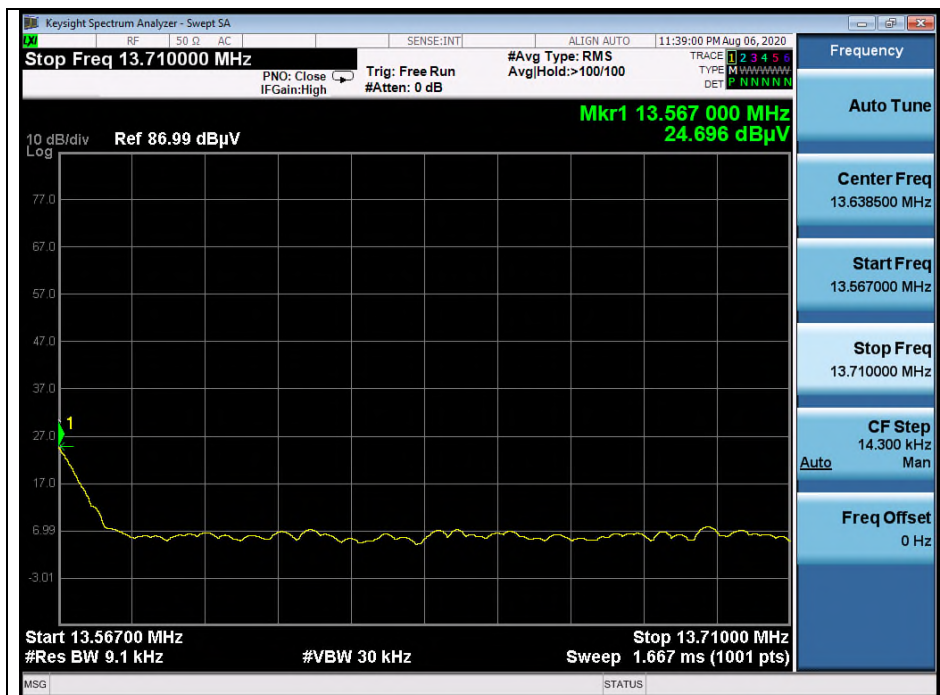
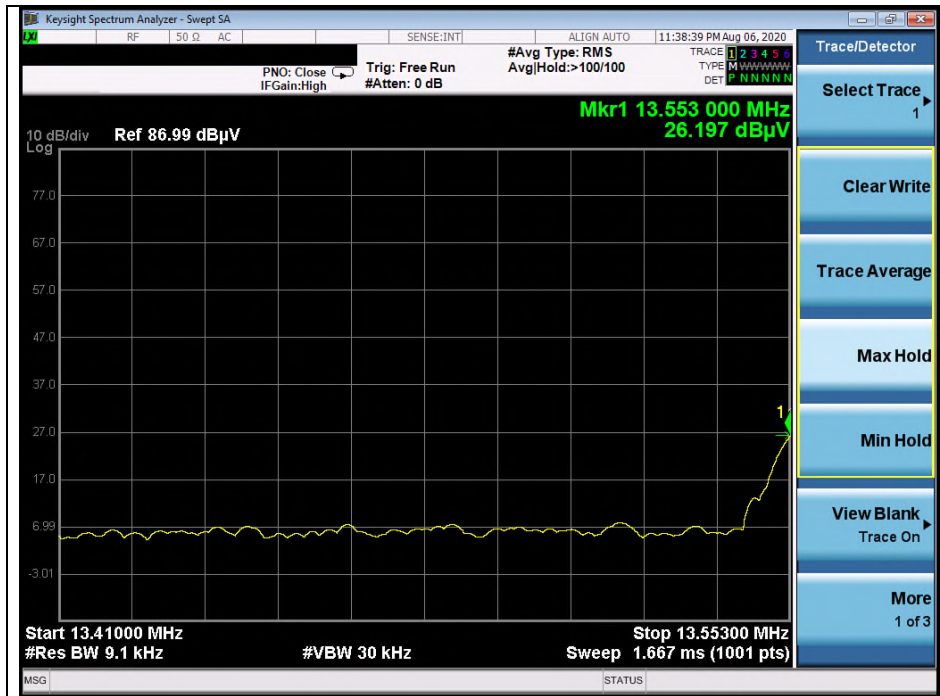
Test plots

Original Model

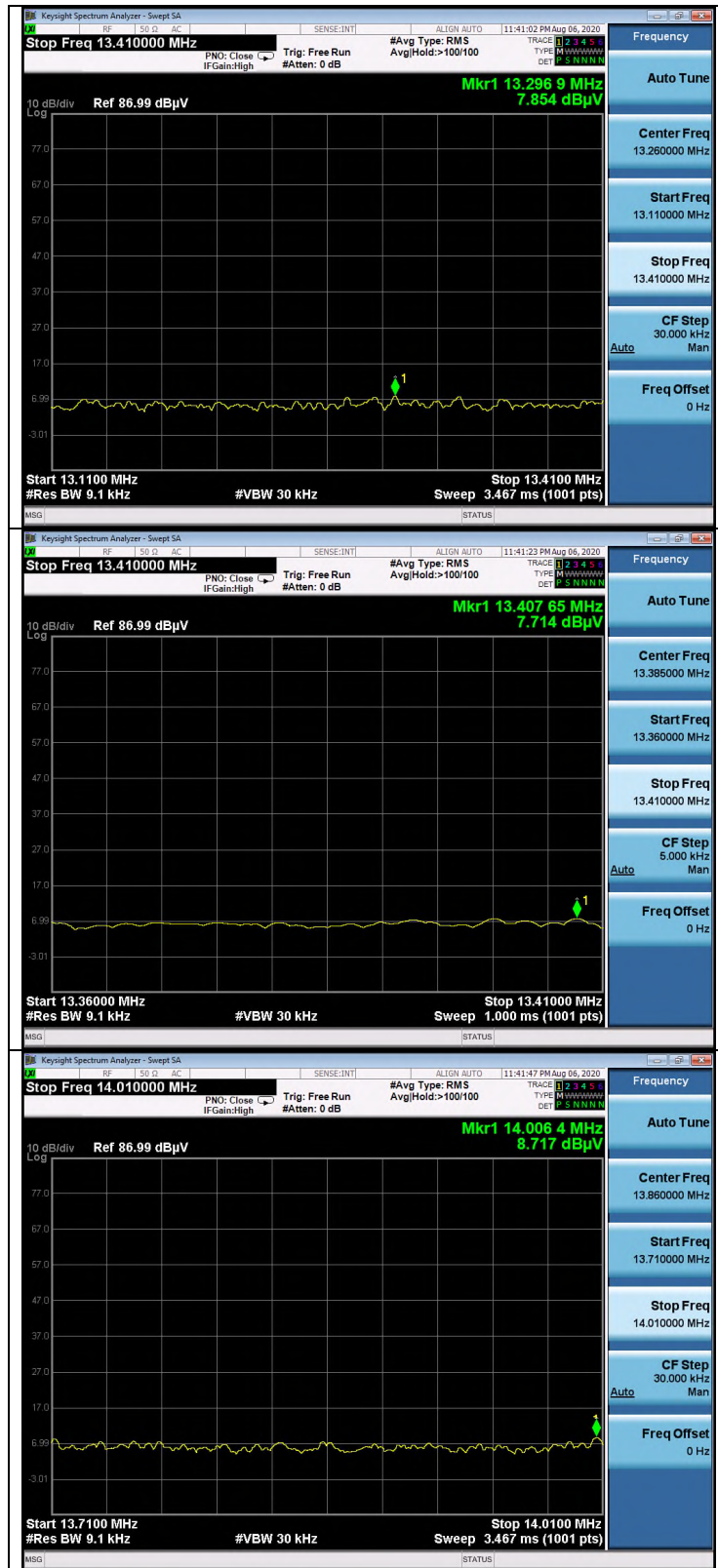
- Fundamental within the band 13.553 MHz - 13.567 MHz



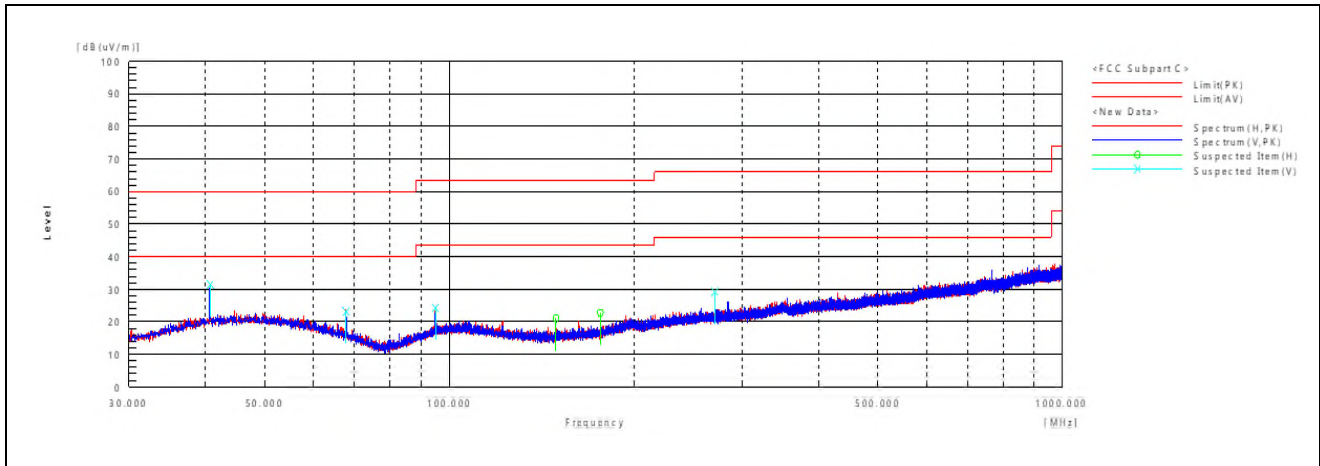
- Spurious emission within the bands 13.410 MHz - 13.553 MHz and 13.567 MHz - 13.710 MHz



- Spurious emission within the bands 13.110 MHz - 13.410 MHz and 13.710 MHz - 14.010 MHz



- Spurious emission above 30 MHz

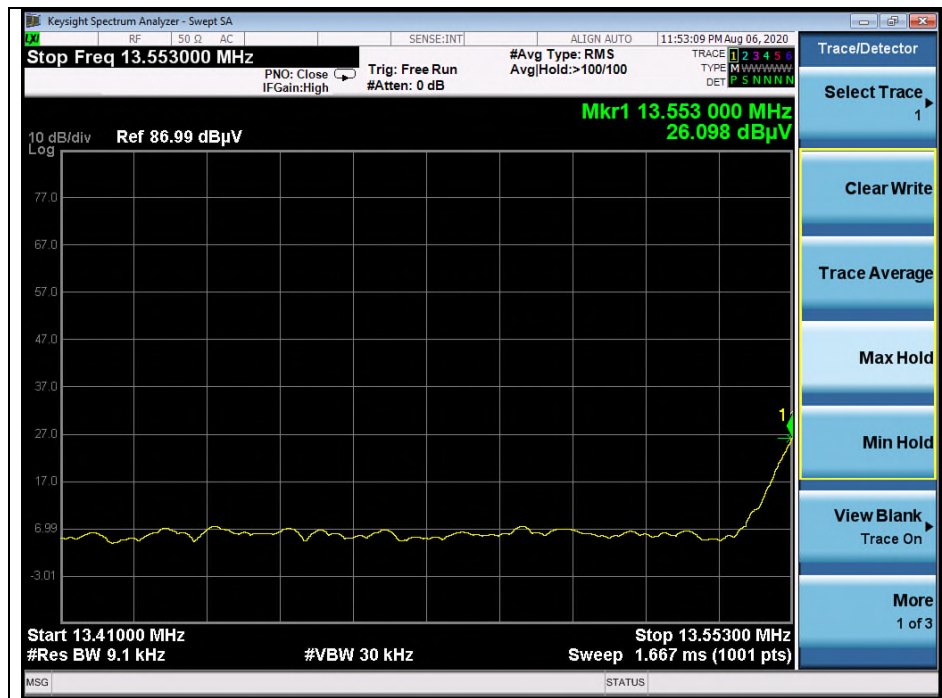


Variant Model

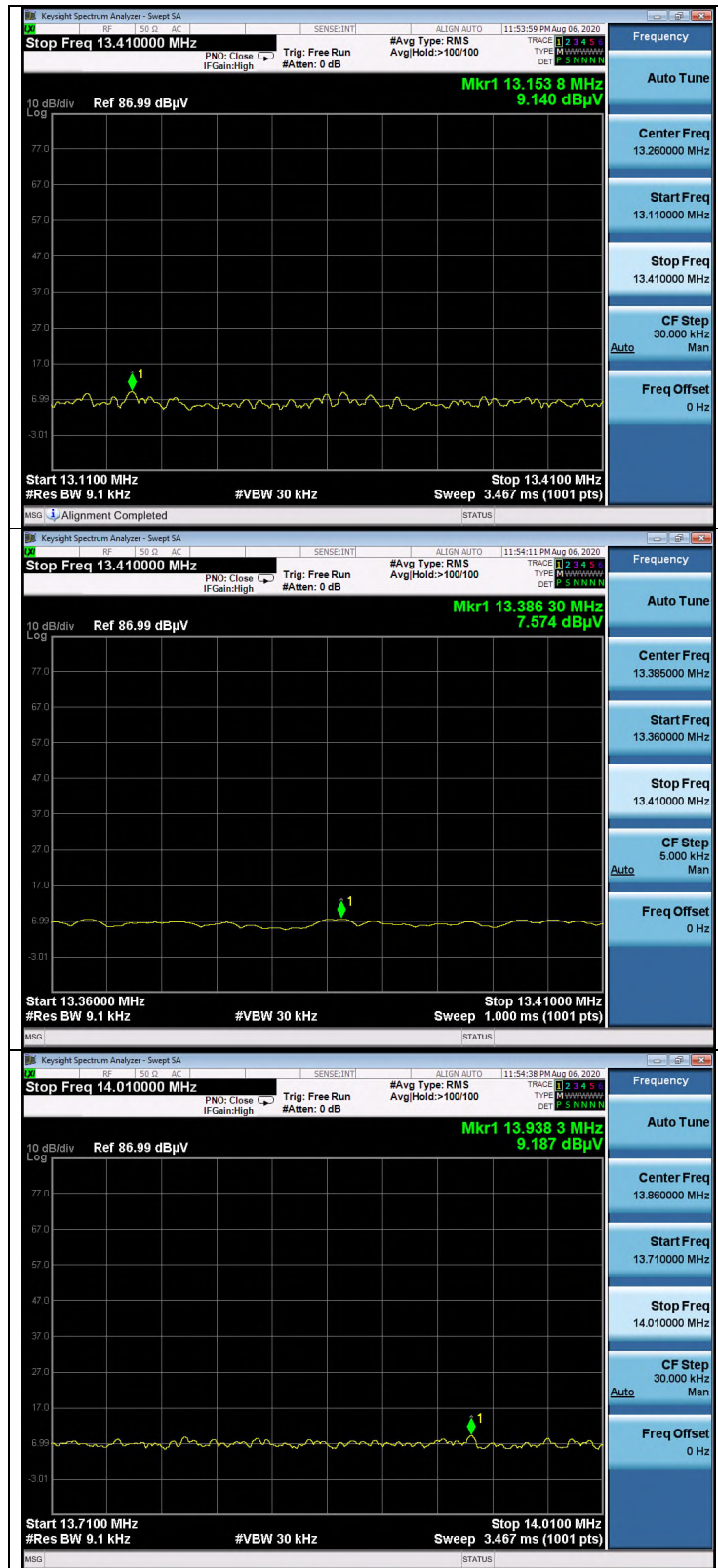
- Fundamental within the band 13.553 MHz - 13.567 MHz



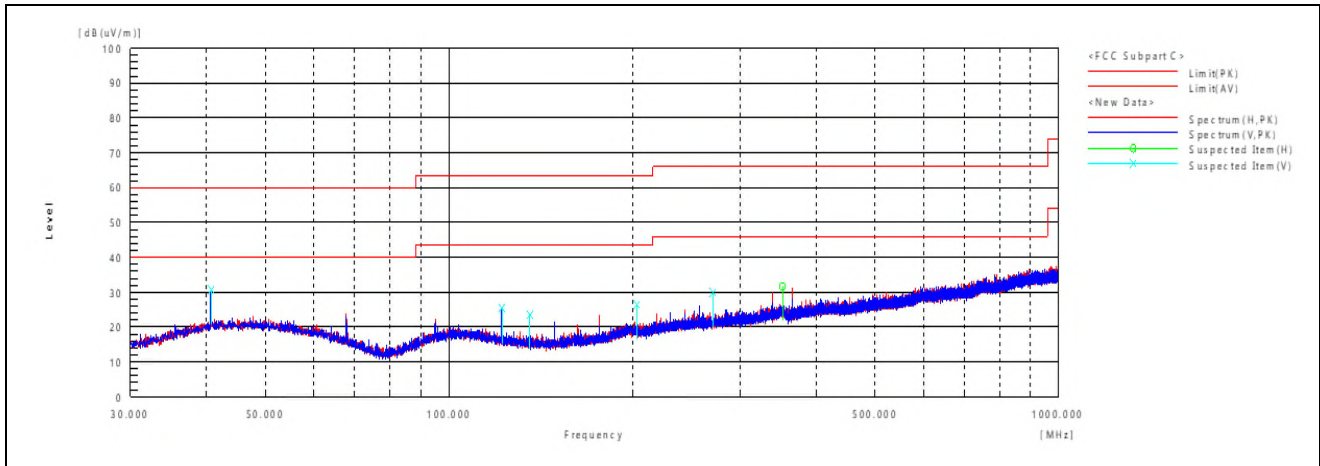
- Spurious emission within the bands 13.410 MHz - 13.553 MHz and 13.567 MHz - 13.710 MHz



- Spurious emission within the bands 13.110 MHz - 13.410 MHz and 13.710 MHz - 14.010 MHz

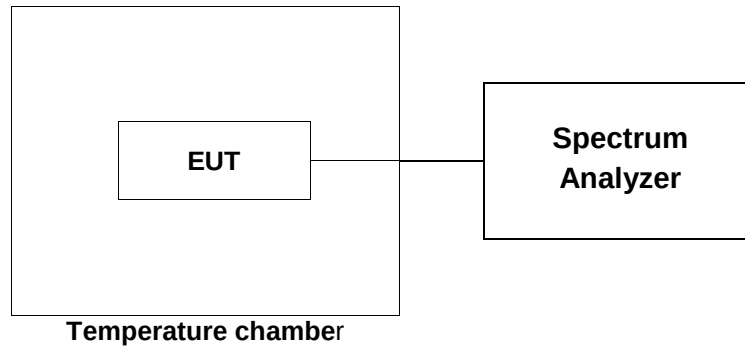


- Spurious emission above 30 MHz



3. Frequency Stability

3.1. Test Setup



3.2. Limit

FCC

According to §15.225(e), the frequency tolerance of the carrier signal shall be maintained within ± 0.01 % of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85 % to 115 % of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

IC

According to RSS-210, Annex B, Section B.6

Carrier frequency stability shall be maintained to ± 0.01 % (± 100 ppm).

3.3. Test Procedures

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 environment into appropriate environment.
4. Set the spectrum analyzer as RBW = 100 Hz, VBW = 100 Hz, Span = 10 kHz, Sweep time = auto.
5. Mark the peak frequency and measure the frequency tolerance using frequency counter function.
6. Repeat until all the results are investigated.

3.4. Test Result

Ambient temperature : (23 ± 1) °C
 Relative humidity : 47 % R.H.

Operating Frequency : 13 560 000 Hz
 Deviation Limit : ± 0.01 % = ± 1 356 Hz

Startup

Temperature Variations

Power (V _{d.c.})	Temperature (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
6	-20	13 560 580	580	0.004 277
	-10	13 560 430	430	0.003 171
	0	13 560 072	72	0.000 531
	+10	13 560 072	72	0.000 531
	+20	13 560 072	72	0.000 531
	+30	13 560 430	430	0.003 171
	+40	13 560 290	290	0.002 139
	+50	13 560 140	140	0.001 032

Voltage Variations

Power (V _{d.c.})	Temperature (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
115 % (6.90)	+20	13 560 720	720	0.005 310
85 % (5.10)	+20	13 560 720	720	0.005 310

2 minutes

Temperature Variations

Power (V _{d.c.})	Temperature (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
6	-20	13 560 430	430	0.003 171
	-10	13 560 430	430	0.003 171
	0	13 560 072	72	0.000 531
	+10	13 560 072	72	0.000 531
	+20	13 560 430	430	0.003 171
	+30	13 560 430	430	0.003 171
	+40	13 560 290	290	0.002 139
	+50	13 560 140	140	0.001 032

Voltage Variations

Power (V _{d.c.})	Temperature (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
115 % (6.90)	+20	13 560 720	720	0.005 310
85 % (5.10)	+20	13 560 720	720	0.005 310

5 minutes

Temperature Variations

Power (V _{d.c.})	Temperature (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
6	-20	13 560 430	430	0.003 171
	-10	13 560 580	580	0.004 277
	0	13 560 072	72	0.000 531
	+10	13 560 072	72	0.000 531
	+20	13 560 430	430	0.003 171
	+30	13 560 430	430	0.003 171
	+40	13 560 290	290	0.002 139
	+50	13 560 140	140	0.001 032

Voltage Variations

Power (V _{d.c.})	Temperature (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
115 % (6.90)	+20	13 560 720	720	0.005 310
85 % (5.10)	+20	13 560 720	720	0.005 310

10 minutes

Temperature Variations

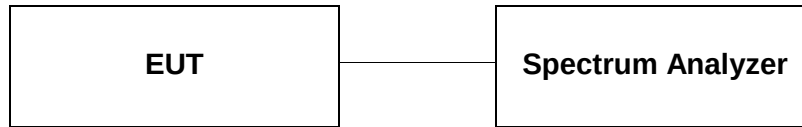
Power (V _{d.c.})	Temperature (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
6	-20	13 560 430	430	0.003 171
	-10	13 560 580	580	0.004 277
	0	13 560 072	72	0.000 531
	+10	13 560 072	72	0.000 531
	+20	13 560 430	430	0.003 171
	+30	13 560 430	430	0.003 171
	+40	13 560 140	140	0.001 032
	+50	13 560 140	140	0.001 032

Voltage Variations

Power (V _{d.c.})	Temperature (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
115 % (6.90)	+20	13 560 720	720	0.005 310
85 % (5.10)	+20	13 560 720	720	0.005 310

4. 20 dB Bandwidth & 99 % Bandwidth

4.1. Test Setup



4.2. Limit

None; for reporting purposes only.

4.3. Test Procedures

20 dB Bandwidth

1. Span = set to capture all products of the modulation process, including the emission skirts. RBW = 200 Hz, VBW = 200 Hz, Sweep = auto, Detector = peak, Trace = max hold.
2. The marker-to-peak function to set the mark to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is 20 dB bandwidth of the emission.

99 % Bandwidth

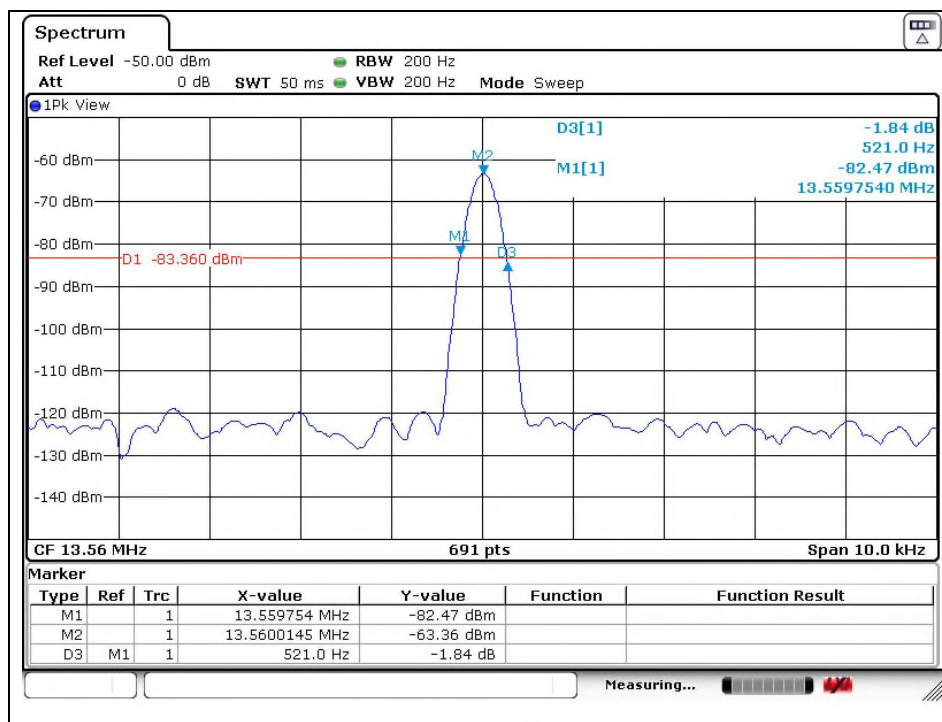
1. Set the spectrum analyzer as Span = set to capture all products of the modulation process, including the emission skirts, RBW = 200 Hz, VBW = 200 Hz, Detector = sampling, Trace mode = max hold.
2. Measure lowest and highest frequencies are placed in a running sum until 0.5 % and 99.5 % of the total is reached.
3. The difference between the two recorded frequencies is the occupied bandwidth.

4.3. Test Result

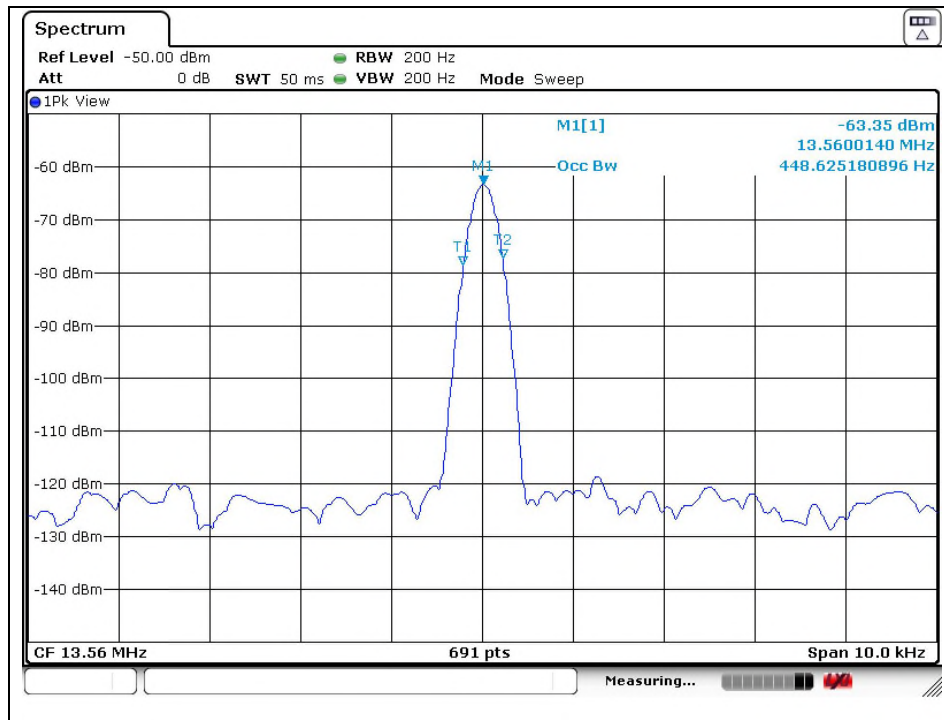
Ambient temperature : (23 ± 1) °C
 Relative humidity : 47 % R.H.

Frequency (MHz)	20 dB Bandwidth (kHz)	99 % Bandwidth (kHz)
13.560	0.521	0.449

- 20 dB Bandwidth



- 99 % Bandwidth



-End of the Test report-