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LP-009

Test report

Number:	**T251-0135/22**	Project file:	C20212375
		Date:	2022-07-05
		Pages:	94
Product:	**Wine climate cabinet**		
Type reference:	**VCS5197TPG**		
Ratings:	Uin: 120 V; 60 Hz Protection class: I		
Trademark:	**GORENJE, ASKO, ATAG, HISENSE**		
Applicant:	**Gorenje gospodinjski aparati d.o.o. Partizanska cesta 12, SI-3320 Velenje, Slovenia**		
Manufacturer:	Gorenje gospodinjski aparati d.o.o. Partizanska cesta 12, SI-3320 Velenje, Slovenia		
Place of manufacture:	Gorenje gospodinjski aparati d.o.o. Partizanska cesta 12, SI-3320 Velenje, Slovenia		
Summary of testing Testing method:	ANSI C63.10:2013 (Clause 6.3, 6.4, 6.5, 6.6, 6.9)		
Testing location:	SIQ Ljubljana, Mašera-Spasićeva ulica 10, SI-1000 Ljubljana, Slovenia		
Remarks:	Date of receipt of test items: 2021-11-16 Number of items tested: 1 Date of performance of tests: 2021-11-29 - 2022-06-24 The test results presented in this report relate only to the items tested. The product complies with the requirements of the testing methods. The product also complies with: 47 CFR Part 15, Subpart C (§15.203, §15.207 (a), §15.205; §15.209; §15.215; §15.249) RSS-210 Issue 10 with Amendment (Clause 7.2), RSS-Gen, Issue 5 with Amendment 1 & 2 (Clause 6.7, 8.8, 8.9, 8.10).		

Tested by: Luka Cvajnar

Approved by: Marjan Mak

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TN405E-02

SIQ Ljubljana, Mašera-Spasićeva ulica 10, SI-1000 Ljubljana, Slovenia
T +386 1 4778 100, F +386 1 4778 444, info@siq.si, www.siq.si

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1 GENERAL

History sheet			
Date	Report No.	Change	Revision
2022-07-05	T251-0135/22	Initial Test Report issued.	--

Environmental conditions:
Ambient temperature: 15 °C to 35 °C
Relative humidity: 30 % to 60 %
Atmospheric pressure: 860 mbar to 1060 mbar

1.1 Equipment under test

Wine climate cabinet
Type: **VCS5197TPG**
FCC ID: **2A4DNVCS5197TPG**
IC ID: **GORVCS5197**

General product information

Operating mode	Single antenna
Operating temperature range	10 °C to +43 °C
Operating frequency range	5785 - 5815 MHz
Number of channels	31
Antenna type and gain	Integral antenna, 0 dBi
Manufacturer	SHINKI
Product	Proximity sensor wc70
Type	819089(HXJ-RD58-A1)

Proximity sensor can detect movement and ignore the walking by situation. So you can just put your hands in front of the sensor to test. If you put your hands in front and swing back and forth, the sensor will not change the status of it's ST port (the status is maintained at 5V). But if you put your hands in front and hold for 1 second, or keep hands close to the sensor for more than 1 second, then the ST port of the sensor will change from 5V to 0V. And the change will be detected by the UI board.

The proximity sensor has the function of random frequency selection. Each time it is powered on, the frequency is selected randomly, and the frequency is between 5.785-5.815 Mhz.

Tested channels

Lowest	5785 MHz
Middle	5800 MHz
Highest	5815 MHz

Copy of marking plate:

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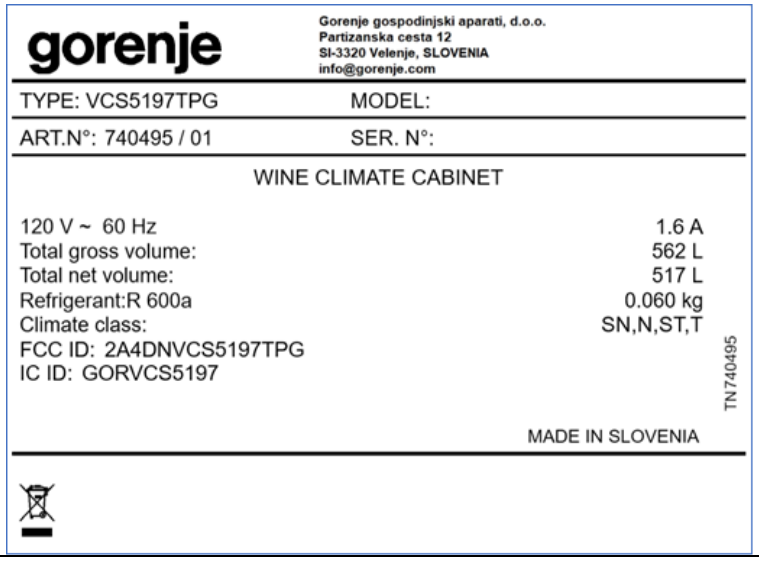


1.2 Occupied bandwidth measurement

Fundamental frequency	Minimum resolution bandwidth
9 kHz to 30 MHz	1 kHz
30 to 1000 MHz	10 kHz
1000 MHz to 40 GHz	100 kHz

1.3 Quasi-peak detector

Frequency range	Bandwidth (-6dB)
10 Hz to 20 kHz	Full range (wideband)
10 kHz to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz

1.4 Peak, rms, and average detectors

Frequency range	Bandwidth (-6dB)
10 Hz to 20 kHz	10, 100, 1000 Hz
10 kHz to 150 kHz	1 and 10 kHz
150 kHz to 30 MHz	1 and 10 kHz
30 MHz to 1 GHz	10 and 100 kHz
1 GHz to 40 GHz	0.1, 1.0 and 10 MHz

2 LIMITS

2.1 Subpart C: Intentional Radiators

2.1.1 Section 15.207; Conducted emission limits:

CLASS B limits:

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-peak	Average
0.15 to 0.5	66 – 56*	56 – 46*
0.5 to 5.0	56	46
5.0 to 30.0	60	50

* Decreases with the logarithm of the frequency.

The shown limits in table shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

- For carrier current systems containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

- For all other carrier current systems: 1000 µV within the frequency band 535-1705 kHz, as measured using a 50 µH/50 ohms LISN.

- Carrier current systems operating below 30 MHz are also subject to the radiated emission limits as appropriate.

2.1.2 Section 15.209; Radiated emission limits:

CLASS B limits:

Frequency Range (MHz)	Limits (dBµV/m)		Test distance (m)
0,009 to 0,490	20*log(2400/F(kHz))	Quasi Peak	300
0,490 to 1,705	20*log(24000/F(kHz))	Quasi Peak	30
1,705 to 30,0	29.5	Quasi Peak	30
30 to 88	40**	Quasi Peak	3
88 to 216	43.5**	Quasi Peak	3
216 to 960	46**	Quasi Peak	3
960 to 1000	54	Quasi Peak	3
above 1000	54	Average	3
above 1000	74	Peak	3

** Except as provided in paragraph below, 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.

Perimeter protection systems may operate in the 54-72 MHz and 76-88 MHz bands under the provisions of this section. The use of such perimeter protection systems is limited to industrial, business and commercial applications.

NOTE: For special limits refer to standard

3 ALL TEST EQUIPMENT AND THEIR DESCRIPTION

3.1 General information

Description	Model No.	SIQ No.	Last calibration	Calibrated until	Calibration period	Used
Rohde-Schwarz, Spectrum analyzer	FSV 40	/	2021-04	2022-10	18 months	X
Rohde-Schwarz, RFI receiver	ESU8	105187	2020-07	2022-07	24 months	
Rohde-Schwarz, RFI receiver	ESU26	106897	2021-01	2023-07	18 months	X
Comtest Engineering, Semi Anechoic Chamber SAC 1	SAC 3m	NPS001	2020-06	2022-06	24 months	X
Rohde & Schwarz, Ultra Broadband Antenna	HL562E (SN 109843)	109063	2020-07	2022-07	24 months	
Rohde & Schwarz, Horn Antenna	HF907 (SN 102494)	109064	2020-08	2022-08	24 months	
Comtest Engineering, Semi Anechoic Chamber SAC 2	SAC 3m	NPS002	2020-06	2022-06	24 months	X
Rohde & Schwarz, Ultra Broadband Antenna	HL562E (SN 100842)	109056	2020-07	2022-07	24 months	X
Rohde & Schwarz, Horn Antenna	HF907 (SN 102508)	109057	2020-08	2022-08	24 months	X
Horn Antenna, EMCO	3116	/	2021-10	2024-10	36 months	X
Maturo, Turn table (2 m diameter)	TT 2.0 SI	/	N/A	N/A	N/A	X
Maturo, Bore-sight antenna mast	BAM-4.0-P	/	N/A	N/A	N/A	X
Maturo, Multi-channel positioning equipment	Maturo NCD	/	N/A	N/A	N/A	X
Schwarzbeck Active loop antenna	FMZB 1519B	/	2021-04	2022-10	18 months	X
Rohde-Schwarz, AMN	ENV216	/	2021-08	2023-02	18 months	X

3.2 Other instrument information and auxiliary equipment

Description	Model No.	Bandwidth	Detector functions	Antenna factors	Cable loss	Range
Rohde-Schwarz, AMN	ENV216	/	/	/	/	9 kHz – 30 MHz
Rohde & Schwarz, Artificial main network	ESH 2-Z5	/	/	/	/	9 kHz – 30 MHz
Rohde-Schwarz, RFI receiver	ESU8	200Hz, 9kHz, 120kHz, 1MHz	Peak, Q-peak, Average	/	/	20 Hz – 8 GHz
Rohde-Schwarz, EMI receiver	ESW	200Hz, 9kHz, 120kHz, 1MHz	Peak, Q-peak, Average	/	/	20 Hz – 8 GHz
Rohde-Schwarz, RFI receiver	ESU26	200Hz, 9kHz, 120kHz, 1MHz	Peak, Q-peak, Average	/	/	20 Hz – 26.5 GHz
Comtest Engineering, Semi Anechoic Chamber SAC 1	SAC 3m	/	/	/	/	30 MHz – 18 GHz
Rohde & Schwarz, Ultra Broadband Antenna	HL562E (SN 109843)	/	/	See section 3.2.2	/	30 MHz – 6 GHz
Rohde & Schwarz, Horn Antenna	HF907 (SN 102494)	/	/	See section 3.2.2	/	0.8 GHz – 18 GHz
Comtest Engineering, Semi Anechoic Chamber SAC 2	SAC 3m	/	/	/	/	30 MHz – 18 GHz
Rohde & Schwarz, Ultra Broadband Antenna	HL562E (SN 100842)	/	/	See section 3.2.2	/	30 MHz – 6 GHz
Rohde & Schwarz, Horn Antenna	HF907 (SN 102508)	/	/	See section 3.2.2	/	0.8 GHz – 18 GHz
Horn Antenna, EMCO	3116	/	/	See section 3.2.2	/	18 GHz – 40 GHz
Schwarzbeck Active loop antenna	FMZB 1519B	/		See section 3.2.2	/	9 kHz – 30 MHz

3.2.1 Cable loss and attenuation of radiated emission

3.2.1.1 Conducted emission cable (SIQ-K115)

Frequency (9kHz-30MHz)	Cable length (meters)	Loss (dB)
0.009000	4	0.0
0.010000	4	0.0
0.020000	4	0.0
0.030000	4	0.0
0.040000	4	0.0
0.050000	4	0.0
0.060000	4	0.0
0.070000	4	0.0
0.080000	4	0.0
0.090000	4	0.0
0.100000	4	0.0
0.200000	4	0.1
0.300000	4	0.0
0.400000	4	0.0
0.500000	4	0.0
0.600000	4	0.0
0.700000	4	0.0
0.800000	4	0.0
0.900000	4	0.0
1.000000	4	0.0
2.000000	4	0.1
3.000000	4	0.1
4.000000	4	0.1
5.000000	4	0.1
6.000000	4	0.1
7.000000	4	0.2
8.000000	4	0.2
9.000000	4	0.2
10.000000	4	0.2
20.000000	4	0.3
30.000000	4	0.3

3.2.1.2 Radiated emission attenuation

SAC1		SAC2	
Frequency (30 MHz – 6 GHz)	**Attenuation (dB)**	**Frequency (30 MHz – 6 GHz)**	**Attenuation (dB)**
30,00	0,40	30,00	0,41
35,00	0,43	35,00	0,44
40,00	0,46	40,00	0,47
45,00	0,49	45,00	0,50
50,00	0,52	50,00	0,53
55,00	0,55	55,00	0,55
60,00	0,57	60,00	0,58
65,00	0,59	65,00	0,60
70,00	0,62	70,00	0,63
75,00	0,64	75,00	0,65
80,00	0,66	80,00	0,67
85,00	0,68	85,00	0,70
90,00	0,71	90,00	0,72
95,00	0,73	95,00	0,73
100,00	0,75	100,00	0,76
125,00	0,84	125,00	0,85
150,00	0,93	150,00	0,94
175,00	1,00	175,00	1,01
200,00	1,07	200,00	1,09
225,00	1,14	225,00	1,18
250,00	1,20	250,00	1,23
275,00	1,27	275,00	1,31
300,00	1,33	300,00	1,38
325,00	1,37	325,00	1,48
350,00	1,43	350,00	1,51
375,00	1,49	375,00	1,58
400,00	1,54	400,00	1,62
425,00	1,59	425,00	1,69
450,00	1,65	450,00	1,74
475,00	1,68	475,00	1,82
500,00	1,72	500,00	1,85
525,00	1,79	525,00	1,93
550,00	1,85	550,00	1,98
575,00	1,85	575,00	2,03
600,00	1,95	600,00	2,05
625,00	1,97	625,00	2,16
650,00	2,00	650,00	2,15
675,00	2,05	675,00	2,33
700,00	2,10	700,00	2,25
725,00	2,13	725,00	2,30
750,00	2,19	750,00	2,34
775,00	2,21	775,00	2,44
800,00	2,27	800,00	2,50
825,00	2,31	825,00	2,56
850,00	2,34	850,00	2,55
875,00	2,36	875,00	2,56
900,00	2,41	900,00	2,63
925,00	2,43	925,00	2,70
950,00	2,54	950,00	2,76
975,00	2,52	975,00	2,78
1000,00	2,55	1000,00	2,84
1050,00	2,59	1050,00	2,87
1100,00	2,69	1100,00	2,96
1150,00	2,74	1150,00	3,14

1200,00	2,84	1200,00	3,08
1250,00	2,88	1250,00	3,16
1300,00	2,98	1300,00	3,33
1350,00	3,11	1350,00	3,38
1400,00	3,12	1400,00	3,33
1450,00	3,20	1450,00	3,56
1500,00	3,25	1500,00	3,57
1600,00	3,39	1600,00	3,71
1650,00	3,42	1650,00	3,70
1700,00	3,60	1700,00	3,78
1750,00	3,53	1750,00	3,81
1800,00	3,59	1800,00	3,93
1850,00	3,66	1850,00	4,07
1900,00	3,67	1900,00	4,00
1950,00	3,72	1950,00	4,18
2000,00	3,77	2000,00	4,08
2050,00	3,91	2050,00	4,16
2100,00	3,87	2100,00	4,26
2150,00	3,89	2150,00	4,27
2200,00	3,99	2200,00	4,31
2250,00	3,99	2250,00	4,39
2300,00	4,02	2300,00	4,49
2350,00	4,10	2350,00	4,55
2400,00	4,20	2400,00	4,57
2450,00	4,40	2450,00	4,62
2500,00	4,20	2500,00	4,74
2550,00	4,24	2550,00	4,72
2600,00	4,30	2600,00	4,84
2650,00	4,37	2650,00	4,77
2700,00	4,40	2700,00	4,81
2750,00	4,47	2750,00	4,90
2800,00	4,50	2800,00	5,00
2850,00	4,52	2850,00	4,98
2900,00	4,59	2900,00	5,06
2950,00	4,77	2950,00	5,07
3000,00	4,65	3000,00	5,15
3050,00	4,72	3050,00	5,23
3100,00	4,78	3100,00	5,34
3150,00	4,80	3150,00	5,25
3200,00	4,83	3200,00	5,33
3250,00	4,91	3250,00	5,38
3300,00	4,98	3300,00	5,48
3350,00	4,87	3350,00	5,48
3400,00	4,98	3400,00	5,52
3450,00	5,01	3450,00	5,76
3500,00	5,14	3500,00	5,55
3550,00	5,18	3550,00	5,60
3600,00	5,15	3600,00	5,64
3650,00	5,20	3650,00	5,78
3700,00	5,29	3700,00	5,74
3750,00	5,40	3750,00	5,86
3800,00	5,33	3800,00	5,82
3850,00	5,32	3850,00	5,88
3900,00	5,37	3900,00	5,89
3950,00	5,41	3950,00	5,95
4000,00	5,65	4000,00	6,02
4050,00	5,84	4050,00	6,07
4100,00	5,69	4100,00	6,01
4150,00	5,65	4150,00	6,10

4200,00	5,71	4200,00	6,17
4250,00	5,65	4250,00	6,19
4300,00	5,75	4300,00	6,27
4350,00	5,59	4350,00	6,32
4400,00	5,96	4400,00	6,41
4450,00	5,81	4450,00	6,53
4500,00	6,02	4500,00	6,51
4550,00	5,93	4550,00	6,46
4600,00	5,90	4600,00	6,61
4650,00	6,03	4650,00	6,82
4700,00	5,96	4700,00	6,60
4750,00	6,47	4750,00	6,63
4800,00	6,07	4800,00	6,78
4850,00	6,36	4850,00	6,69
4900,00	6,05	4900,00	6,77
4950,00	6,81	4950,00	6,95
5000,00	6,25	5000,00	6,96
5050,00	6,41	5050,00	6,88
5100,00	6,67	5100,00	6,92
5150,00	6,65	5150,00	6,99
5200,00	6,31	5200,00	6,98
5250,00	7,40	5250,00	7,05
5300,00	6,48	5300,00	7,26
5350,00	6,68	5350,00	7,22
5400,00	7,07	5400,00	7,44
5450,00	6,86	5450,00	7,19
5500,00	6,65	5500,00	7,29
5550,00	6,71	5550,00	7,32
5600,00	6,72	5600,00	7,48
5650,00	6,69	5650,00	7,37
5700,00	6,87	5700,00	7,43
5750,00	6,89	5750,00	7,35
5800,00	6,92	5800,00	7,52
5850,00	6,90	5850,00	7,48
5900,00	6,89	5900,00	7,53
5950,00	6,95	5950,00	7,58
6000,00	7,00	6000,00	7,69

Frequency (1 GHz – 40 GHz)	Attenuation (dB)
1006,354025	0,8
1056,671726	0,8
1109,505312	0,8
1164,980578	0,8
1223,229607	0,9
1284,391087	0,9
1348,610641	0,9
1416,041173	0,9
1486,843232	1,0
1561,185394	1,0
1639,244663	1,0
1721,206896	1,0
1807,267241	1,1
1897,630603	1,1
1992,512134	1,1
2092,137740	1,2
2196,744627	1,2
2306,581859	1,2
2421,910951	1,3
2543,006499	1,3
2670,156824	1,3
2803,664665	1,4
2943,847898	1,4
3091,040293	1,4
3245,592308	1,5
3407,871923	1,5
3578,265520	1,5
3757,178796	1,6
3945,037735	1,6
4142,289622	1,7
4349,404103	1,7
4566,874308	1,8
4795,218024	1,8
5034,978925	1,9
5286,727871	1,9
5551,064265	2,0
5828,617478	2,0
6120,048352	2,1
6426,050770	2,1
6747,353308	2,2
7084,720973	2,4
7438,957022	2,4
7810,904873	2,5
8201,450117	2,5
8611,522623	2,6
9042,098754	2,7
9494,203692	2,8
9968,913876	2,8
10467,359570	2,9
10990,727549	3,1
11540,263926	3,1
12117,277122	3,2
12723,140978	3,3
13359,298027	3,4
14027,262929	3,6
14728,626075	3,8
15465,057379	3,9

16238,310248	3,9
17050,225760	4,1
17902,737048	4,2
18797,873901	5,0
19737,767596	4,8
20724,655975	4,7
21760,888774	4,8
22848,933213	4,9
23991,379873	5,3
25190,948867	5,4
26450,496311	5,8
27773,021126	5,9
29161,672182	6,5
30619,755791	6,2
32150,743581	6,6
33758,280760	8,5
35446,194798	7,3
37218,504538	8,5
39079,429765	7,5
40000,000000	8,1

3.2.2 Antenna factors

3.2.2.1 Antenna FMZB 1519

Frequency (MHz)	Antenna factor FMZB 1519 B
0,01	20,66
0,01	20,38
0,02	19,31
0,03	19,05
0,04	18,93
0,05	18,87
0,06	18,82
0,07	18,79
0,08	18,76
0,09	18,74
0,10	18,72
0,11	18,71
0,12	18,69
0,13	18,68
0,14	18,67
0,15	18,66
0,20	18,63
0,30	18,59
0,40	18,56
0,50	18,54
0,60	18,53
0,70	18,51
0,80	18,50
0,90	18,50
1,00	18,49
2,00	18,43
3,00	18,40
4,00	18,37
5,00	18,35
6,00	18,26
7,00	18,21
8,00	18,14
9,00	18,07
10,00	17,99
11,00	17,91
12,00	17,84
13,00	17,77
14,00	17,71
15,00	17,66
16,00	17,61
17,00	17,57
18,00	17,53
19,00	17,51
20,00	17,49
21,00	17,49
22,00	17,50
23,00	17,53
24,00	17,56
25,00	17,59

26,00	17,64
27,00	17,70
28,00	17,77
29,00	17,85
30,00	17,94

3.2.2.2 Antenna HL562E

Frequency (MHz)	Antenna factor HL562E (SN 100843)	Antenna factor HL562E (SN 100842)
30,00	18,86	18,95
31,00	18,27	18,43
32,00	17,68	17,88
33,00	17,11	17,33
34,00	16,57	16,79
35,00	16,00	16,23
36,00	15,41	15,67
37,00	14,84	15,10
38,00	14,25	14,53
39,00	13,65	13,94
40,00	13,04	13,34
41,00	12,40	12,72
42,00	11,77	12,07
43,00	11,09	11,42
44,00	10,41	10,72
45,00	9,71	10,02
46,00	9,00	9,30
47,00	8,28	8,58
48,00	7,57	7,84
49,00	6,87	7,13
50,00	6,22	6,44
51,00	5,60	5,81
52,00	5,07	5,26
53,00	4,64	4,83
54,00	4,35	4,54
55,00	4,19	4,41
56,00	4,17	4,45
57,00	4,30	4,59
58,00	4,54	4,79
59,00	4,84	5,07
60,00	5,17	5,38
61,00	5,50	5,66
62,00	5,79	5,88
63,00	6,06	6,15
64,00	6,33	6,53
65,00	6,59	6,89
66,00	6,85	7,18
67,00	7,09	7,41
68,00	7,32	7,63
69,00	7,55	7,82
70,00	7,75	7,99
71,00	7,93	8,15
72,00	8,10	8,27
73,00	8,24	8,37
74,00	8,38	8,48
75,00	8,51	8,63
76,00	8,62	8,78
77,00	8,74	8,90
78,00	8,85	9,00
79,00	8,96	9,09
80,00	9,05	9,18
81,00	9,14	9,24
82,00	9,21	9,29
83,00	9,27	9,36
84,00	9,33	9,41
85,00	9,39	9,46

86,00	9,43	9,51
87,00	9,48	9,57
88,00	9,49	9,60
89,00	9,52	9,63
90,00	9,54	9,68
91,00	9,57	9,73
92,00	9,60	9,77
93,00	9,63	9,82
94,00	9,66	9,87
95,00	9,70	9,92
96,00	9,74	9,97
97,00	9,79	10,03
98,00	9,85	10,10
99,00	9,92	10,18
100,00	9,99	10,25
101,00	10,05	10,33
102,00	10,16	10,42
103,00	10,23	10,50
104,00	10,32	10,58
105,00	10,40	10,65
106,00	10,48	10,73
107,00	10,53	10,79
108,00	10,55	10,84
109,00	10,55	10,87
110,00	10,54	10,89
111,00	10,53	10,91
112,00	10,54	10,93
113,00	10,54	10,94
114,00	10,53	10,93
115,00	10,52	10,90
116,00	10,49	10,87
117,00	10,48	10,84
118,00	10,44	10,78
119,00	10,38	10,72
120,00	10,32	10,63
121,00	10,26	10,52
122,00	10,21	10,41
123,00	10,16	10,30
124,00	10,02	10,26
125,00	10,06	10,21
126,00	10,01	10,10
127,00	9,93	9,98
128,00	9,71	9,86
129,00	9,74	9,89
130,00	9,70	9,87
131,00	9,61	9,78
132,00	9,52	9,68
133,00	9,44	9,58
134,00	9,35	9,47
135,00	9,25	9,36
136,00	9,16	9,26
137,00	9,07	9,16
138,00	8,97	9,05
139,00	8,88	8,95
140,00	8,79	8,85
141,00	8,70	8,74
142,00	8,60	8,65
143,00	8,51	8,55
144,00	8,42	8,46
145,00	8,34	8,38
146,00	8,26	8,31

147,00	8,18	8,23
148,00	8,11	8,17
149,00	8,04	8,11
150,00	7,97	8,06
151,00	7,92	8,02
152,00	7,88	8,00
153,00	7,84	7,97
154,00	7,82	7,98
155,00	7,83	8,03
156,00	7,87	8,07
157,00	7,88	8,05
158,00	7,89	8,05
159,00	7,88	8,06
160,00	7,87	8,08
161,00	7,88	8,12
162,00	7,89	8,14
163,00	7,91	8,17
164,00	7,94	8,19
165,00	7,98	8,22
166,00	8,03	8,24
167,00	8,09	8,24
168,00	8,14	8,37
169,00	8,21	8,46
170,00	8,31	8,54
171,00	8,39	8,64
172,00	8,48	8,71
173,00	8,59	8,81
174,00	8,76	8,92
175,00	8,95	9,06
176,00	9,17	9,23
177,00	9,37	9,42
178,00	9,42	9,50
179,00	9,24	9,39
180,00	8,88	9,09
181,00	8,48	8,70
182,00	8,16	8,37
183,00	7,94	8,14
184,00	7,82	8,01
185,00	7,74	7,93
186,00	7,70	7,89
187,00	7,69	7,89
188,00	7,69	7,91
189,00	7,72	7,97
190,00	7,78	8,05
191,00	7,81	8,01
192,00	7,78	7,97
193,00	7,77	7,97
194,00	7,80	8,01
195,00	7,85	8,07
196,00	7,91	8,14
197,00	7,98	8,21
198,00	8,05	8,26
199,00	8,14	8,25
200,00	8,22	8,49
202,00	8,41	8,65
204,00	8,56	8,77
206,00	8,68	8,88
208,00	8,79	8,98
210,00	8,85	9,06
212,00	8,84	9,02
214,00	8,80	8,96

216,00	8,67	8,83
218,00	8,40	8,56
220,00	8,28	8,41
222,00	8,43	8,55
224,00	8,69	8,79
226,00	8,91	9,04
228,00	9,09	9,21
230,00	9,25	9,36
232,00	9,39	9,48
234,00	9,52	9,60
236,00	9,68	9,71
238,00	9,76	9,82
240,00	9,83	9,91
242,00	9,83	9,93
244,00	9,83	9,94
246,00	9,86	9,97
248,00	9,91	10,01
250,00	10,00	10,03
252,00	10,04	10,16
254,00	10,13	10,25
256,00	10,22	10,34
258,00	10,31	10,42
260,00	10,39	10,51
262,00	10,48	10,60
264,00	10,50	10,61
266,00	10,54	10,63
268,00	10,61	10,70
270,00	10,67	10,77
272,00	10,73	10,82
274,00	10,79	10,89
276,00	10,85	10,95
278,00	10,92	11,02
280,00	11,00	11,07
282,00	11,08	11,16
284,00	11,14	11,23
286,00	11,20	11,28
288,00	11,26	11,33
290,00	11,30	11,37
292,00	11,37	11,40
294,00	11,43	11,44
296,00	11,46	11,49
298,00	11,52	11,54
300,00	11,64	11,65
302,00	11,77	11,82
304,00	11,81	11,91
306,00	11,83	11,93
308,00	11,87	11,95
310,00	11,91	11,99
312,00	11,97	12,03
314,00	12,02	12,12
316,00	12,09	12,20
318,00	12,16	12,26
320,00	12,21	12,33
322,00	12,27	12,39
324,00	12,34	12,46
326,00	12,38	12,49
328,00	12,39	12,48
330,00	12,41	12,49
332,00	12,46	12,57
334,00	12,54	12,67
336,00	12,58	12,65

338,00	12,66	12,69
340,00	12,72	12,78
342,00	12,76	12,82
344,00	12,81	12,87
346,00	12,87	12,93
348,00	12,93	12,99
350,00	13,01	13,05
352,00	13,09	13,13
354,00	13,17	13,20
356,00	13,23	13,27
358,00	13,28	13,34
360,00	13,32	13,38
362,00	13,38	13,41
364,00	13,44	13,44
366,00	13,49	13,49
368,00	13,55	13,55
370,00	13,63	13,64
372,00	13,73	13,75
374,00	13,78	13,80
376,00	13,82	13,83
378,00	13,85	13,87
380,00	13,89	13,90
382,00	13,93	13,95
384,00	14,00	14,02
386,00	14,06	14,09
388,00	14,13	14,14
390,00	14,22	14,17
392,00	14,23	14,27
394,00	14,29	14,33
396,00	14,35	14,40
398,00	14,41	14,47
400,00	14,45	14,50
402,00	14,50	14,51
404,00	14,54	14,51
406,00	14,57	14,52
408,00	14,62	14,56
410,00	14,68	14,63
412,00	14,73	14,74
414,00	14,79	14,86
416,00	14,84	14,94
418,00	14,86	14,98
420,00	14,88	14,99
422,00	14,89	15,01
424,00	14,93	15,04
426,00	14,97	15,07
428,00	15,01	15,11
430,00	15,06	15,16
432,00	15,11	15,20
434,00	15,16	15,26
436,00	15,21	15,28
438,00	15,26	15,36
440,00	15,31	15,40
442,00	15,36	15,45
444,00	15,41	15,49
446,00	15,47	15,54
448,00	15,54	15,60
450,00	15,57	15,66
452,00	15,62	15,70
454,00	15,66	15,73
456,00	15,72	15,78
458,00	15,79	15,84

460,00	15,89	15,95
462,00	15,99	16,10
464,00	16,08	16,19
466,00	16,12	16,20
468,00	16,15	16,21
470,00	16,16	16,22
472,00	16,16	16,22
474,00	16,17	16,23
476,00	16,19	16,25
478,00	16,22	16,28
480,00	16,27	16,31
482,00	16,31	16,36
484,00	16,37	16,41
486,00	16,45	16,48
488,00	16,50	16,59
490,00	16,55	16,63
492,00	16,60	16,68
494,00	16,63	16,72
496,00	16,64	16,75
498,00	16,65	16,78
500,00	16,66	16,77
502,00	16,67	16,77
504,00	16,66	16,77
506,00	16,65	16,75
508,00	16,65	16,73
510,00	16,66	16,73
512,00	16,69	16,78
514,00	16,75	16,88
516,00	16,84	16,96
518,00	16,89	17,00
520,00	16,91	16,99
522,00	16,92	16,97
524,00	16,92	16,95
526,00	16,93	16,95
528,00	16,94	16,97
530,00	16,95	16,99
532,00	16,97	17,00
534,00	16,98	17,01
536,00	17,00	17,02
538,00	17,01	17,04
540,00	17,04	17,06
542,00	17,06	17,09
544,00	17,10	17,11
546,00	17,14	17,18
548,00	17,17	17,21
550,00	17,20	17,25
552,00	17,25	17,29
554,00	17,30	17,34
556,00	17,33	17,39
558,00	17,36	17,44
560,00	17,39	17,47
562,00	17,42	17,51
564,00	17,45	17,52
566,00	17,47	17,54
568,00	17,51	17,57
570,00	17,57	17,63
572,00	17,64	17,69
574,00	17,75	17,79
576,00	17,86	17,90
578,00	17,96	17,99
580,00	18,02	18,04

582,00	18,04	18,07
584,00	18,04	18,08
586,00	18,04	18,08
588,00	18,04	18,09
590,00	18,04	18,09
592,00	18,06	18,10
594,00	18,07	18,10
596,00	18,08	18,11
598,00	18,10	18,13
600,00	18,13	18,15
602,00	18,17	18,18
604,00	18,20	18,20
606,00	18,23	18,22
608,00	18,26	18,24
610,00	18,28	18,24
612,00	18,31	18,25
614,00	18,33	18,27
616,00	18,35	18,34
618,00	18,36	18,35
620,00	18,37	18,36
622,00	18,38	18,37
624,00	18,39	18,37
626,00	18,40	18,37
628,00	18,40	18,37
630,00	18,41	18,37
632,00	18,43	18,39
634,00	18,43	18,42
636,00	18,45	18,45
638,00	18,48	18,47
640,00	18,52	18,51
642,00	18,57	18,57
644,00	18,65	18,66
646,00	18,73	18,79
648,00	18,79	18,93
650,00	18,86	19,08
652,00	18,91	19,17
654,00	18,96	19,22
656,00	18,98	19,19
658,00	18,99	19,17
660,00	18,99	19,13
662,00	18,99	19,10
664,00	18,98	19,09
666,00	18,98	19,08
668,00	18,99	19,08
670,00	19,01	19,09
672,00	19,00	19,10
674,00	19,00	19,11
676,00	18,99	19,13
678,00	19,00	19,14
680,00	19,02	19,16
682,00	19,04	19,19
684,00	19,07	19,21
686,00	19,09	19,24
688,00	19,10	19,26
690,00	19,12	19,28
692,00	19,14	19,30
694,00	19,15	19,34
696,00	19,18	19,38
698,00	19,20	19,42
700,00	19,22	19,44
702,00	19,25	19,44

704,00	19,28	19,44
706,00	19,30	19,44
708,00	19,35	19,45
710,00	19,40	19,46
712,00	19,46	19,48
714,00	19,51	19,49
716,00	19,55	19,51
718,00	19,59	19,56
720,00	19,63	19,61
722,00	19,70	19,68
724,00	19,78	19,76
726,00	19,86	19,84
728,00	19,94	19,93
730,00	20,02	20,04
732,00	20,06	20,12
734,00	20,08	20,16
736,00	20,07	20,15
738,00	20,04	20,09
740,00	20,01	20,05
742,00	19,99	19,99
744,00	19,98	19,97
746,00	19,97	19,94
748,00	19,95	19,94
750,00	19,94	19,93
752,00	19,93	19,92
754,00	19,93	19,93
756,00	19,95	19,94
758,00	19,95	19,96
760,00	19,98	19,97
762,00	20,00	19,98
764,00	20,02	19,99
766,00	20,04	20,01
768,00	20,09	20,02
770,00	20,13	20,04
772,00	20,18	20,06
774,00	20,22	20,10
776,00	20,22	20,17
778,00	20,24	20,20
780,00	20,25	20,22
782,00	20,27	20,24
784,00	20,27	20,24
786,00	20,28	20,24
788,00	20,28	20,23
790,00	20,30	20,24
792,00	20,31	20,25
794,00	20,32	20,25
796,00	20,32	20,26
798,00	20,35	20,29
800,00	20,39	20,32
802,00	20,43	20,39
804,00	20,48	20,45
806,00	20,52	20,56
808,00	20,57	20,65
810,00	20,66	20,77
812,00	20,74	20,87
814,00	20,80	20,94
816,00	20,83	20,95
818,00	20,84	20,96
820,00	20,85	20,93
822,00	20,84	20,90
824,00	20,81	20,89

826,00	20,82	20,86
828,00	20,81	20,86
830,00	20,81	20,87
832,00	20,82	20,86
834,00	20,84	20,86
836,00	20,85	20,86
838,00	20,86	20,87
840,00	20,86	20,88
842,00	20,85	20,88
844,00	20,85	20,90
846,00	20,84	20,91
848,00	20,86	20,93
850,00	20,89	20,93
852,00	20,91	20,94
854,00	20,94	20,95
856,00	20,96	20,96
858,00	20,98	20,98
860,00	21,01	20,99
862,00	21,04	21,02
864,00	21,08	21,05
866,00	21,12	21,09
868,00	21,14	21,12
870,00	21,14	21,14
872,00	21,16	21,19
874,00	21,19	21,23
876,00	21,23	21,28
878,00	21,25	21,31
880,00	21,29	21,34
882,00	21,33	21,36
884,00	21,37	21,38
886,00	21,40	21,41
888,00	21,45	21,43
890,00	21,49	21,44
892,00	21,51	21,45
894,00	21,55	21,46
896,00	21,58	21,46
898,00	21,61	21,48
900,00	21,65	21,51
902,00	21,70	21,55
904,00	21,76	21,61
906,00	21,83	21,70
908,00	21,90	21,78
910,00	21,95	21,87
912,00	21,98	21,92
914,00	21,98	21,94
916,00	21,97	21,93
918,00	21,96	21,90
920,00	21,94	21,88
922,00	21,92	21,84
924,00	21,88	21,80
926,00	21,85	21,79
928,00	21,82	21,77
930,00	21,81	21,77
932,00	21,80	21,78
934,00	21,79	21,77
936,00	21,79	21,75
938,00	21,78	21,74
940,00	21,80	21,73
942,00	21,80	21,74
944,00	21,82	21,75
946,00	21,84	21,75

948,00	21,86	21,76
950,00	21,88	21,77
952,00	21,91	21,78
954,00	21,93	21,80
956,00	21,96	21,80
958,00	22,00	21,81
960,00	22,03	21,81
962,00	22,07	21,81
964,00	22,12	21,83
966,00	22,15	21,86
968,00	22,16	21,95
970,00	22,16	22,00
972,00	22,18	22,01
974,00	22,20	22,01
976,00	22,23	22,02
978,00	22,26	22,03
980,00	22,29	22,04
982,00	22,32	22,07
984,00	22,35	22,09
986,00	22,39	22,13
988,00	22,42	22,15
990,00	22,43	22,20
992,00	22,42	22,27
994,00	22,44	22,36
996,00	22,46	22,42
998,00	22,48	22,47
1000,00	22,52	22,54

3.2.2.3 Antenna HF907

Frequency (GHz)	Antenna factor HF907 (SN 102494)	Antenna factor HF907 (SN 102508)
1.00	24,3	24,26
1.01	24,4	24,28
1.02	24,4	24,30
1.03	24,4	24,31
1.04	24,4	24,33
1.05	24,4	24,34
1.06	24,4	24,33
1.07	24,4	24,34
1.08	24,4	24,35
1.09	24,4	24,36
1.10	24,4	24,35
1.11	24,4	24,37
1.12	24,4	24,39
1.13	24,4	24,39
1.14	24,4	24,39
1.15	24,4	24,38
1.16	24,4	24,38
1.17	24,3	24,35
1.18	24,3	24,33
1.19	24,3	24,33
1.20	24,3	24,30
1.21	24,2	24,29
1.22	24,2	24,29
1.23	24,2	24,29
1.24	24,3	24,32
1.25	24,3	24,35
1.26	24,4	24,40
1.27	24,5	24,48
1.28	24,5	24,53
1.29	24,6	24,60
1.30	24,7	24,68
1.31	24,8	24,73
1.32	24,8	24,78
1.33	24,9	24,84
1.34	24,9	24,87
1.35	24,9	24,88
1.36	24,9	24,90
1.37	24,9	24,92
1.38	24,9	24,93
1.39	24,9	24,94
1.40	25,0	24,96
1.41	25,0	25,01
1.42	25,1	25,06
1.43	25,1	25,12
1.44	25,2	25,21
1.45	25,3	25,32
1.46	25,4	25,44
1.47	25,5	25,55
1.48	25,6	25,65
1.49	25,7	25,76
1.50	25,8	25,85
1.51	25,9	25,93
1.52	26,0	25,99
1.53	26,1	26,06
1.54	26,1	26,11

1.55	26,2	26,14
1.56	26,3	26,16
1.57	26,3	26,20
1.58	26,4	26,23
1.59	26,4	26,24
1.60	26,4	26,25
1.61	26,4	26,27
1.62	26,4	26,28
1.63	26,4	26,29
1.64	26,4	26,29
1.65	26,4	26,32
1.66	26,4	26,36
1.67	26,4	26,38
1.68	26,4	26,41
1.69	26,4	26,45
1.70	26,4	26,49
1.71	26,5	26,52
1.72	26,5	26,53
1.73	26,5	26,59
1.74	26,5	26,63
1.75	26,6	26,66
1.76	26,6	26,73
1.77	26,6	26,79
1.78	26,7	26,87
1.79	26,7	26,94
1.80	26,8	26,99
1.81	26,8	27,07
1.82	26,9	27,12
1.83	26,9	27,15
1.84	27,0	27,18
1.85	27,0	27,19
1.86	27,1	27,22
1.87	27,1	27,23
1.88	27,2	27,24
1.89	27,2	27,30
1.90	27,3	27,35
1.91	27,4	27,42
1.92	27,5	27,50
1.93	27,6	27,60
1.94	27,7	27,74
1.95	27,9	27,85
1.96	28,0	27,97
1.97	28,1	28,09
1.98	28,2	28,21
1.99	28,3	28,30
2.00	28,4	28,36
2.01	28,5	28,42
2.02	28,5	28,48
2.03	28,5	28,50
2.04	28,5	28,48
2.05	28,5	28,48
2.06	28,5	28,48
2.07	28,4	28,41
2.08	28,4	28,37
2.09	28,3	28,32
2.10	28,3	28,26
2.11	28,2	28,19
2.12	28,1	28,13
2.13	28,1	28,08
2.14	28,1	28,06
2.15	28,0	28,03

2.16	28,0	28,03
2.17	28,0	28,06
2.18	28,1	28,08
2.19	28,1	28,11
2.20	28,1	28,14
2.21	28,2	28,18
2.22	28,2	28,22
2.23	28,2	28,24
2.24	28,2	28,25
2.25	28,3	28,27
2.26	28,3	28,28
2.27	28,3	28,28
2.28	28,3	28,28
2.29	28,3	28,30
2.30	28,3	28,31
2.31	28,3	28,32
2.32	28,3	28,35
2.33	28,3	28,39
2.34	28,3	28,41
2.35	28,4	28,45
2.36	28,4	28,48
2.37	28,4	28,51
2.38	28,5	28,55
2.39	28,5	28,58
2.40	28,5	28,63
2.41	28,6	28,68
2.42	28,6	28,73
2.43	28,7	28,80
2.44	28,8	28,87
2.45	28,8	28,94
2.46	28,9	29,02
2.47	29,0	29,10
2.48	29,1	29,16
2.49	29,1	29,21
2.50	29,2	29,25
2.51	29,2	29,30
2.52	29,2	29,31
2.53	29,3	29,33
2.54	29,3	29,35
2.55	29,3	29,38
2.56	29,4	29,41
2.57	29,4	29,44
2.58	29,4	29,48
2.59	29,5	29,54
2.60	29,5	29,60
2.61	29,6	29,65
2.62	29,6	29,70
2.63	29,7	29,76
2.64	29,7	29,79
2.65	29,8	29,81
2.66	29,8	29,83
2.67	29,8	29,83
2.68	29,8	29,81
2.69	29,8	29,78
2.70	29,7	29,74
2.71	29,7	29,69
2.72	29,6	29,63
2.73	29,6	29,57
2.74	29,5	29,53
2.75	29,5	29,48
2.76	29,4	29,44

2.77	29,4	29,42
2.78	29,4	29,40
2.79	29,4	29,40
2.80	29,4	29,42
2.81	29,4	29,44
2.82	29,5	29,48
2.83	29,5	29,52
2.84	29,6	29,57
2.85	29,6	29,61
2.86	29,6	29,65
2.87	29,7	29,71
2.88	29,7	29,75
2.89	29,8	29,78
2.90	29,8	29,82
2.91	29,8	29,87
2.92	29,9	29,92
2.93	29,9	29,97
2.94	30,0	30,03
2.95	30,1	30,11
2.96	30,2	30,20
2.97	30,2	30,28
2.98	30,3	30,36
2.99	30,4	30,48
3.00	30,5	30,60
3.05	31,0	31,13
3.10	31,5	31,58
3.15	31,7	31,70
3.20	31,7	31,71
3.25	31,7	31,69
3.30	31,7	31,68
3.35	31,8	31,74
3.40	31,7	31,74
3.45	31,8	31,81
3.50	31,9	31,91
3.55	31,9	31,95
3.60	32,0	32,06
3.65	32,2	32,30
3.70	32,4	32,51
3.75	32,5	32,60
3.80	32,8	32,79
3.85	33,0	33,02
3.90	32,9	32,90
3.95	32,8	32,72
4.00	32,9	32,82
4.05	33,1	33,00
4.10	33,1	33,08
4.15	33,2	33,15
4.20	33,5	33,48
4.25	33,8	33,80
4.30	33,9	33,97
4.35	33,8	33,91
4.40	33,7	33,76
4.45	33,7	33,70
4.50	33,6	33,57
4.55	33,4	33,40
4.60	33,4	33,29
4.65	33,5	33,37
4.70	33,7	33,57
4.75	33,8	33,71
4.80	34,0	33,87
4.85	34,1	34,07

4.90	34,3	34,27
4.95	34,4	34,33
5.00	34,3	34,25
5.05	34,1	34,11
5.10	34,0	33,99
5.15	33,9	33,90
5.20	33,9	33,82
5.25	33,9	33,83
5.30	34,0	33,91
5.35	34,2	34,07
5.40	34,3	34,22
5.45	34,4	34,33
5.50	34,4	34,41
5.55	34,4	34,40
5.60	34,3	34,31
5.65	34,2	34,21
5.70	34,1	34,11
5.75	34,1	34,03
5.80	34,1	34,06
5.85	34,3	34,18
5.90	34,4	34,34
5.95	34,5	34,45
6.00	34,6	34,55
6.05	34,8	34,69
6.10	34,8	34,76
6.15	34,8	34,75
6.20	34,7	34,69
6.25	34,7	34,64
6.30	34,7	34,66
6.35	34,8	34,73
6.40	34,8	34,78
6.45	34,9	34,87
6.50	35,1	35,02
6.55	35,2	35,16
6.60	35,3	35,24
6.65	35,3	35,20
6.70	35,2	35,15
6.75	35,3	35,15
6.80	35,3	35,18
6.85	35,2	35,17
6.90	35,2	35,17
6.95	35,4	35,32
7.00	35,6	35,50
7.05	35,6	35,60
7.10	35,7	35,64
7.15	35,7	35,68
7.20	35,8	35,73
7.25	35,7	35,65
7.30	35,6	35,55
7.35	35,6	35,52
7.40	35,7	35,60
7.45	35,8	35,71
7.50	35,9	35,81
7.55	36,0	35,94
7.60	36,2	36,14
7.65	36,3	36,29
7.70	36,3	36,31
7.75	36,2	36,26
7.80	36,2	36,24
7.85	36,2	36,24
7.90	36,2	36,19

7.95	36,1	36,16
8.00	36,2	36,20
8.05	36,3	36,31
8.10	36,4	36,42
8.15	36,4	36,50
8.20	36,5	36,59
8.25	36,5	36,64
8.30	36,5	36,62
8.35	36,5	36,62
8.40	36,5	36,58
8.45	36,4	36,54
8.50	36,4	36,53
8.55	36,5	36,55
8.60	36,6	36,65
8.65	36,7	36,72
8.70	36,7	36,80
8.75	36,8	36,90
8.80	36,9	37,00
8.85	36,9	37,03
8.90	36,9	36,96
8.95	36,8	36,92
9.00	36,8	36,88
9.05	36,8	36,84
9.10	36,7	36,81
9.15	36,8	36,82
9.20	36,9	36,90
9.25	37,0	36,99
9.30	37,0	37,07
9.35	37,1	37,11
9.40	37,1	37,14
9.45	37,2	37,18
9.50	37,1	37,14
9.55	37,0	37,06
9.60	37,0	37,00
9.65	37,0	37,00
9.70	37,0	37,02
9.75	37,0	37,05
9.80	37,0	37,06
9.85	37,1	37,13
9.90	37,2	37,20
9.95	37,2	37,23
10.00	37,2	37,20
10.05	37,2	37,19
10.10	37,2	37,18
10.15	37,2	37,16
10.20	37,1	37,12
10.25	37,1	37,09
10.30	37,1	37,10
10.35	37,2	37,16
10.40	37,2	37,18
10.45	37,2	37,18
10.50	37,2	37,20
10.55	37,2	37,22
10.60	37,2	37,21
10.65	37,2	37,18
10.70	37,1	37,15
10.75	37,1	37,15
10.80	37,2	37,16
10.85	37,2	37,19
10.90	37,2	37,24
10.95	37,3	37,28

11.00	37,3	37,34
11.05	37,3	37,36
11.10	37,3	37,35
11.15	37,3	37,34
11.20	37,3	37,34
11.25	37,3	37,31
11.30	37,2	37,33
11.35	37,2	37,31
11.40	37,3	37,33
11.45	37,3	37,38
11.50	37,4	37,45
11.55	37,4	37,48
11.60	37,4	37,50
11.65	37,4	37,52
11.70	37,4	37,52
11.75	37,4	37,51
11.80	37,4	37,48
11.85	37,4	37,47
11.90	37,4	37,50
11.95	37,4	37,54
12.00	37,5	37,57
12.05	37,5	37,59
12.10	37,5	37,64
12.15	37,6	37,69
12.20	37,6	37,72
12.25	37,6	37,69
12.30	37,6	37,67
12.35	37,6	37,67
12.40	37,6	37,69
12.45	37,6	37,70
12.50	37,7	37,72
12.55	37,7	37,76
12.60	37,8	37,79
12.65	37,8	37,86
12.70	37,9	37,92
12.75	37,9	37,92
12.80	37,9	37,95
12.85	38,0	37,99
12.90	38,0	38,04
12.95	38,1	38,05
13.00	38,1	38,09
13.05	38,2	38,16
13.10	38,3	38,23
13.15	38,3	38,29
13.20	38,5	38,39
13.25	38,5	38,48
13.30	38,6	38,54
13.35	38,6	38,60
13.40	38,7	38,66
13.45	38,8	38,72
13.50	38,8	38,78
13.55	38,9	38,85
13.60	39,0	38,92
13.65	39,1	39,02
13.70	39,2	39,13
13.75	39,4	39,27
13.80	39,5	39,37
13.85	39,6	39,48
13.90	39,7	39,61
13.95	39,8	39,73
14.00	39,9	39,82

14.05	39,9	39,85
14.10	40,0	39,92
14.15	40,0	40,00
14.20	40,1	40,10
14.25	40,2	40,18
14.30	40,3	40,26
14.35	40,3	40,38
14.40	40,4	40,51
14.45	40,5	40,62
14.50	40,5	40,70
14.55	40,6	40,77
14.60	40,6	40,82
14.65	40,7	40,89
14.70	40,7	40,93
14.75	40,7	40,94
14.80	40,7	40,91
14.85	40,7	40,96
14.90	40,8	40,97
14.95	40,7	40,97
15.00	40,8	40,97
15.05	40,8	40,98
15.10	40,8	41,00
15.15	40,9	41,08
15.20	40,9	41,11
15.25	40,9	41,13
15.30	40,9	41,16
15.35	40,9	41,18
15.40	40,9	41,19
15.45	40,9	41,18
15.50	40,9	41,16
15.55	40,9	41,15
15.60	40,8	41,14
15.65	40,9	41,14
15.70	40,9	41,14
15.75	40,9	41,16
15.80	40,9	41,18
15.85	41,0	41,21
15.90	41,1	41,26
15.95	41,1	41,29
16.00	41,1	41,31
16.05	41,2	41,33
16.10	41,2	41,37
16.15	41,2	41,40
16.20	41,2	41,43
16.25	41,3	41,46
16.30	41,3	41,48
16.35	41,4	41,52
16.40	41,5	41,58
16.45	41,5	41,64
16.50	41,6	41,70
16.55	41,7	41,77
16.60	41,8	41,86
16.65	41,9	41,92
16.70	42,0	42,03
16.75	42,1	42,15
16.80	42,2	42,26
16.85	42,3	42,33
16.90	42,4	42,45
16.95	42,5	42,55
17.00	42,5	42,63
17.05	42,5	42,74

17.10	42,5	42,81
17.15	42,6	42,89
17.20	42,6	42,96
17.25	42,7	43,04
17.30	42,8	43,13
17.35	42,8	43,18
17.40	42,9	43,27
17.45	43,0	43,35
17.50	43,1	43,43
17.55	43,1	43,49
17.60	43,2	43,57
17.65	43,3	43,66
17.70	43,3	43,72
17.75	43,4	43,80
17.80	43,5	43,88
17.85	43,5	43,96
17.90	43,7	44,06
17.95	43,8	44,14
18.00	43,9	44,26

3.2.2.4 Horn Antenna EMCO 3116

Frequency (GHz)	Antenna factor EMCO 3116
18.000	44.86
18.100	44.88
18.200	44.94
18.300	44.97
18.400	44.95
18.500	44.86
18.600	44.90
18.700	45.04
18.800	45.11
18.900	45.20
19.000	45.23
19.100	45.24
19.200	45.07
19.300	45.01
19.400	45.02
19.500	45.07
19.600	44.96
19.700	44.94
19.800	45.00
19.900	44.83
20.000	44.72
20.100	44.70
20.200	44.68
20.300	44.53
20.400	44.44
20.500	44.48
20.600	44.54
20.700	44.37
20.800	44.25
20.900	44.36
21.000	44.42
21.100	44.35
21.200	44.38
21.300	44.34
21.400	44.30
21.500	44.20
21.600	44.22
21.700	44.25
21.800	44.31
21.900	44.31
22.000	44.44
22.100	44.67
22.200	44.68
22.300	44.68
22.400	44.87
22.500	44.79
22.600	44.68
22.700	44.84
22.800	44.91
22.900	44.84
23.000	44.95
23.100	44.97
23.200	45.14
23.300	45.20
23.400	45.35
23.500	45.45

23.600	45.55
23.700	45.70
23.800	45.75
23.900	45.77
24.000	45.83
24.100	45.85
24.200	45.73
24.300	45.92
24.400	45.83
24.500	45.81
24.600	45.98
24.700	46.12
24.800	46.23
24.900	46.34
25.000	46.36
25.100	46.43
25.200	46.53
25.300	46.49
25.400	46.33
25.500	46.40
25.600	46.34
25.700	46.12
25.800	46.27
25.900	46.19
26.000	46.16
26.100	46.33
26.200	46.32
26.300	46.55
26.400	46.70
26.500	46.68
26.600	46.76
26.700	46.70
26.800	46.57
26.900	46.74
27.000	46.56
27.100	46.40
27.200	46.60
27.300	46.61
27.400	46.69
27.500	46.71
27.600	46.82
27.700	46.84
27.800	46.85
27.900	47.02
28.000	47.07
28.100	47.02
28.200	46.99
28.300	47.02
28.400	47.06
28.500	46.94
28.600	46.88
28.700	47.06
28.800	47.00
28.900	46.96
29.000	47.03
29.100	46.94
29.200	46.95
29.300	46.86
29.400	46.90
29.500	47.05
29.600	46.90

29.700	46.80
29.800	46.95
29.900	46.79
30.000	46.78
30.100	46.76
30.200	46.78
30.300	46.76
30.400	46.80
30.500	46.90
30.600	46.99
30.700	46.97
30.800	46.99
30.900	47.06
31.000	47.18
31.100	47.26
31.200	47.28
31.300	47.32
31.400	47.35
31.500	47.47
31.600	47.54
31.700	47.64
31.800	47.69
31.900	47.74
32.000	47.93
32.100	48.23
32.200	48.17
32.300	48.32
32.400	48.51
32.500	48.50
32.600	48.56
32.700	48.80
32.800	48.90
32.900	49.28
33.000	49.46
33.100	49.76
33.200	49.83
33.300	50.07
33.400	50.49
33.500	50.68
33.600	50.81
33.700	50.89
33.800	51.11
33.900	51.15
34.000	51.22
34.100	51.46
34.200	51.56
34.300	51.79
34.400	51.81
34.500	51.93
34.600	52.17
34.700	52.19
34.800	52.45
34.900	52.66
35.000	52.59
35.100	52.55
35.200	52.41
35.300	52.30
35.400	52.27
35.500	52.05
35.600	52.00
35.700	51.94

35.800	51.94
35.900	51.68
36.000	51.64
36.100	51.51
36.200	51.28
36.300	51.18
36.400	51.29
36.500	51.19
36.600	51.05
36.700	50.78
36.800	50.80
36.900	50.68
37.000	50.57
37.100	50.65
37.200	50.76
37.300	50.73
37.400	50.86
37.500	50.98
37.600	51.16
37.700	51.29
37.800	51.57
37.900	51.58
38.000	51.98
38.100	52.34
38.200	52.34
38.300	52.66
38.400	52.86
38.500	52.96
38.600	53.24
38.700	53.66
38.800	53.81
38.900	53.92
39.000	54.09
39.100	54.02
39.200	53.93
39.300	53.75
39.400	53.75
39.500	53.62
39.600	53.36
39.700	53.54
39.800	53.28
39.900	53.27
40.000	53.34

4 CONVERSION FACTORS AND ALL OTHER FORMULAS

Unit	Conversion unit	Formula of conversion
dBμV	dBμV/m	dBμV/m = dBμV + AF
μV/m	dBμV/m	dBμV/m = 20log(X(μV/m)/1μV)

	Test distance stated in standard	Test distance of measurement	Conversion factor
Class B	3 m	3 m	/
Class A	10 m	3 m	20dB/decade

5 GENERAL AND SPECIAL CONDITIONS DESCRIPTION

5.1 General condition description

Interconnect and power cabling (or wiring)

5.1.1 Test arrangement for conducted emissions

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.

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.

EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground-plane.
All other equipment powered from additional LISN(s).
Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
LISN at least 80 cm from nearest part of EUT chassis.

Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.

Non-EUT components of EUT system being tested.

Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground-plane.

5.1.2 Test arrangement for conducted emissions- floor-standing equipment

Excess I/O cables shall be bundled in the center. If bundling is not possible, the cables shall be arranged in serpentine fashion. Bundling shall not exceed 40 cm in length.

Excess power cords shall be bundled in the center or shortened to appropriate length.

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. If bundling is not possible, the cable shall be arranged in serpentine fashion.

EUT and all cables shall be insulated, if required, from the ground-plane by up to 12 mm of insulating material.

EUT connected to one LISN. LISN can be placed on top of, or immediately beneath, the ground-plane.
All other equipment powered from a second LISN or additional LISN(s).
Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

5.1.3 Test arrangement for radiated emissions tabletop equipment

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.

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 total length shall not exceed 1 m.

If LISNs are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground-plane with the receptacle flush with the ground-plane.

Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.

Non-EUT components of EUT system being tested.

Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

No vertical conducting plane used.

Power cords drape to the floor and are routed over to receptacle.

5.1.4 Test arrangement for radiated emissions floor-standing equipment

Excess I/O cables shall be bundled in center. If bundling is not possible, the cables shall be arranged in serpentine fashion. Bundling not to exceed 40 cm in length.

Excess power cords shall be bundled in the center or shortened to appropriate length.

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. If bundling is not possible, the cable shall be arranged in a serpentine fashion.

EUT and all cables shall be insulated, if required, from the ground-plane by up to 12 mm of insulating material.

If LISNs are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground-plane with the receptacle flush with the ground plane.

Overhead cable trays and suspended ceilings

5.1.5 Test arrangement for floor-standing equipment

Only one vertical riser may be used where typical of system under test.

Excess power cord shall be bundled in the center or shortened to appropriate length.

EUT and cables shall be insulated from ground-plane by up to 12 mm. Where the manual has specified or there exists a code of practice for installation of the EUT, the test arrangement shall allow the use of this practice for the tests.

Power cords being measured connected to one LISN. All other system power cords powered through other LISN(s). A multiple receptacle strip may be used for other power cords.

For *conducted* tests, the LISNs may be placed on top of or immediately beneath and bonded directly to the ground-plane. For *radiated* tests, the LISN(s), if used, should be installed under, with the receptacle flush with the ground-plane.

5.1.6 Placement and manipulation of interconnect cabling (or wiring) of tabletop equipment

LISN(s) may have to be positioned to the side of the table to meet the criterion that the LISN receptacle shall be 80 cm away from the EUT. LISN(s) may be above ground-plane only for conducted emission measurements.

Accessories, such as ac power adapter, if typically table-mounted, shall occupy peripheral positions as is applicable.

Accessories, which are typically floor-mounted, shall occupy a floor position directly below the portion of the EUT to which they are typically connected. T

Table length may be extended beyond 1.5 m with peripherals aligned with the back edge. The table depth may be extended beyond 1 m. The 40 cm distance to the vertical conducting plane shall be maintained for conducted emission testing.

Placement of wall-mounted equipment

5.1.7 Test configuration/arrangement for combination floor-standing and tabletop equipment

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.

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.

If LISNs are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground-plane with the receptacle flush with the ground-plane.

Cables of hand-operated devices, such as keyboards, mice, etc., have to be placed as for normal use.

Non-EUT components of EUT system being tested.

I/O cable to floor-standing unit drapes to the ground-plane and shortened or excess bundled. Cables not reaching the metal ground-plane are draped to the height of the connector or 40 cm, whichever is lower.

Power cords and signal cables shall drape to the floor. No extension cords shall be used to the power receptacles.

The floor-standing unit can be placed under the table if its height permits.

5.2 Special condition description

If for some reason the above measurement conditions can’t be met, the description below should be used as an appropriate measurement condition and placement.

(Description is written additionally as the measurements differ – all is within test procedure)

6 MEASUREMENT UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the product, as specified in ETSI TR 100 028-2 and C63.23. This represents an expanded uncertainty expressed at 95% confidence level using a coverage factor k=2.

Measurements	U_{LAB}	$U_{ETSI\ TR\ 100\ 028\text{-}2}$	$U_{C63.23}$
AC Line Conducted Emission	3.2 dB	/	±4,13
Spurious emission 30 – 300 MHz	4.2 dB	±6	/
Spurious emission 300 – 1000 MHz	4.4 dB	±6	/
Spurious emission 1 GHz – 40 GHz	5.1 dB	±6	
Occupied bandwidth (99% emission bandwidth)	< 2%	±5%	/

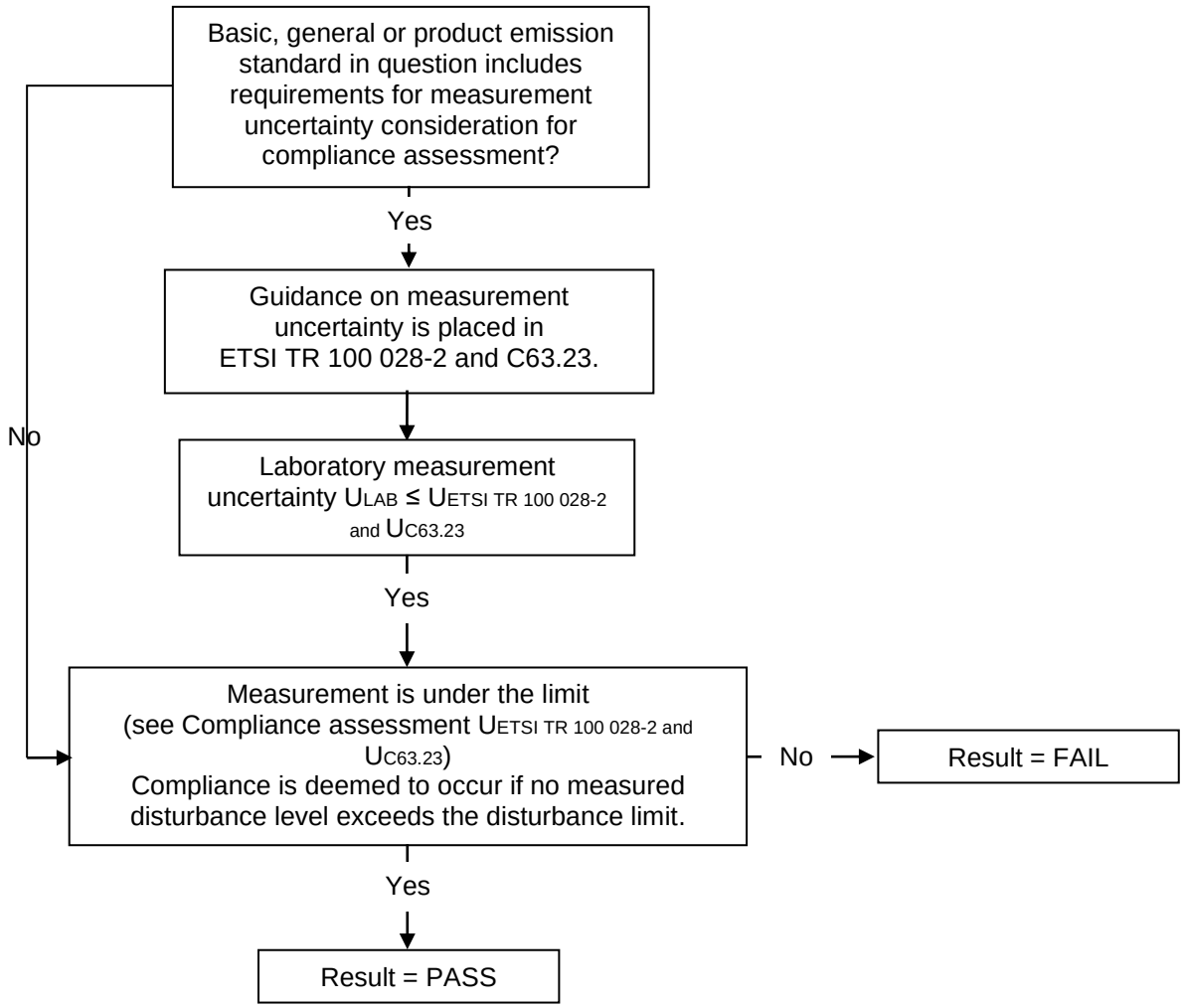
Note: Measurement uncertainty calculated in accordance with ETSI TR 100 028-2 and C63.23.

6.1 Application of decision rule

Application of decision rule and statement of conformity is defined in document TN023 Decision rule and measurement uncertainty.

As a general rule Pass/Fail decisions are based on simple acceptance rule and acceptance limits chosen based on simple acceptance (w = 0, AL = TL) except if a decision rule is governed by particular standard or guidance document.

Decision rule:



7 TEST SUMMARY

STANDARDS (details on first page)	Tested yes	Tested no	Sample pass	Sample not pass
ANSI C63.10-2013 (Clause 6.3, 6.4, 6.5, 6.6, 6.9); The product also complies with: 47 CFR Part 15, Subpart C: (§15.203, §15.207 (a), §15.205; §15.209; §15.215; §15.249;) RSS-210 Issue 10 (Clause 7.2), RSS-Gen, Issue 5 (Clause 6.7, 8.8, 8.9)	☑	☐	☑	☐

Test	Section within the report	47 CFR Part 15	RSS 210, Issue 10 (*1) or RSS-Gen, Issue 5 (*2)	Conclusion
Antenna requirement	8.1	15.203	-	PASS
Conducted emission	8.2	15.207	8.8 (*2)	N/A
Radiated emission	8.3	15.205, 15.209, 15.249(a)	8.9 (*2), 8.10(*2), 7.2 (*1)	PASS
99% Bandwidth	8.4	-	6.7 (*2)	PASS
20 dB Bandwidth	8.5	15.215(c)	-	PASS
*Note: Radiated measurements performed in laboratory recognized by ISED Canada: – CAB identifier: SI0001 – ISED#: 21434				

7.1 Operating voltages/frequencies used for testing

Section	Test	Operating conditions
8.2	Conducted emission	120 V; 60 Hz
8.3	Radiated emission	120 V; 60 Hz
8.4	99% Bandwidth	120 V; 60 Hz
8.5	20 dB Bandwidth	120 V; 60 Hz

8 EMISSION TESTS

8.1 47 CFR § 15.203 Antenna requirements

Requirement
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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Conclusion:
PASS

Note: Device has integrated internal antenna.

8.2 47 CFR § 15.207 Conducted emission measurement (intentional radiator)

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

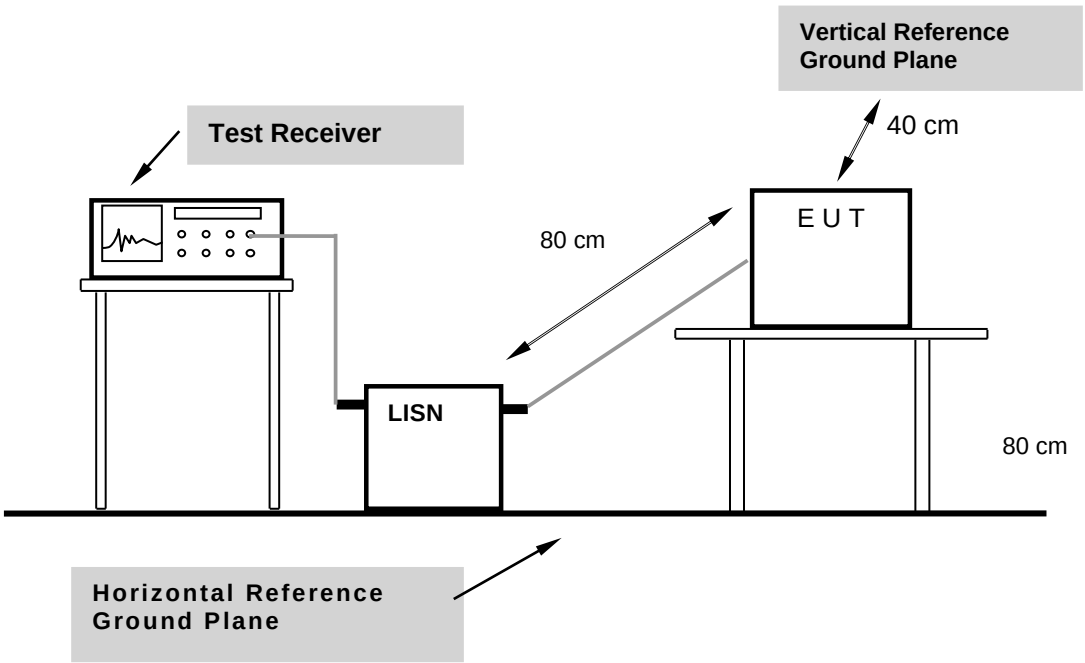
Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15–0.5	66 to 56*	56 to 46
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

8.2.1 Test procedure

EMI test receiver was set to investigate from 150 kHz to 30 MHz with the 9 kHz RBW.
During conducted emission EUT was connected to a LISN and maximum emissions was recorded in the QP and average detection mode.

Test setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

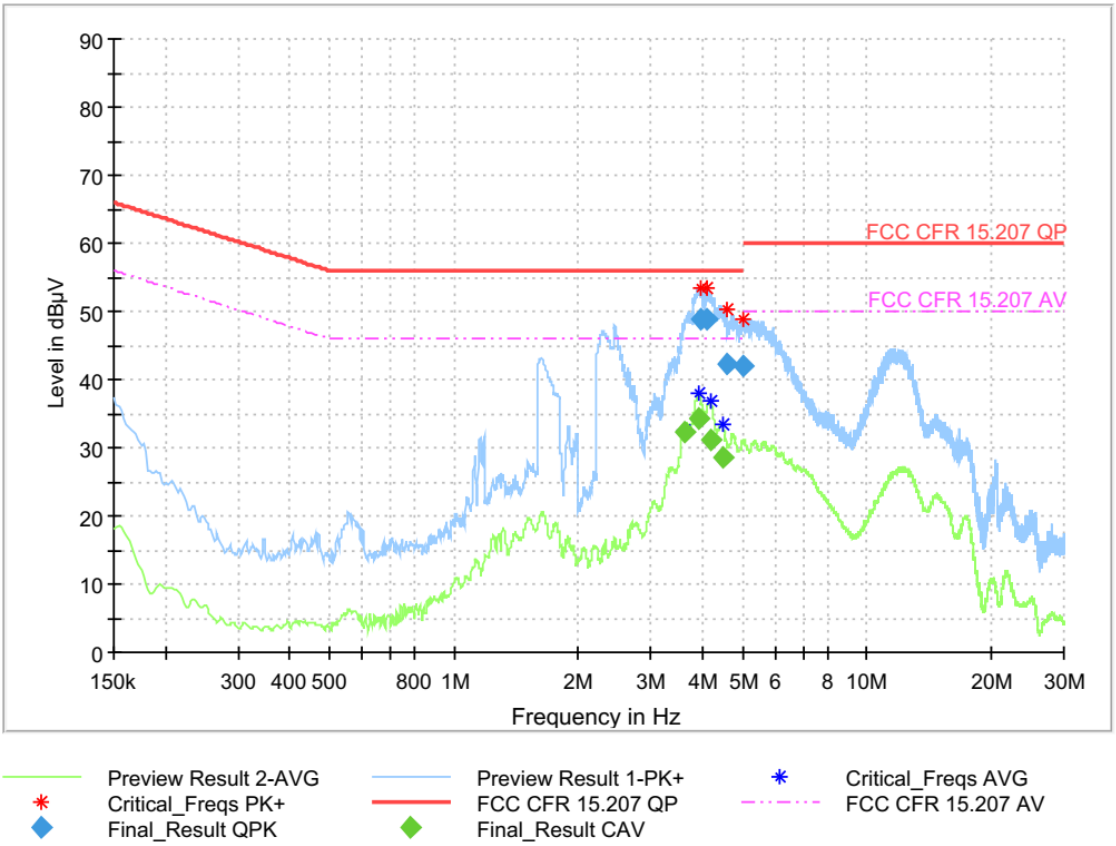
8.2.2 Test equipment

Description	Model No.	SIQ No.	Last calibration	Calibrated until	Calibration period	Used
Rohde-Schwarz, RFI receiver	ESU8	105187	2020-07	2022-07	24 months	
Rohde-Schwarz, AMN	ENV216	/	2021-08	2023-02	18 months	X

8.2.3 Test results

EUT Information

EUT:	Wine climate cabinet
Operating mode:	Uin: 120 V / 60 Hz, proximity sensor turned on
Lines:	Line L and N



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
3.941250	48.79	---	56.00	7.21	2000.0	9.000	L1	ON	9.8
4.114500	48.77	---	56.00	7.23	2000.0	9.000	N	ON	9.8
3.896250	---	34.36	46.00	11.64	2000.0	9.000	N	ON	9.8
4.564500	42.32	---	56.00	13.68	2000.0	9.000	N	ON	9.8
3.601500	---	32.19	46.00	13.81	2000.0	9.000	N	ON	9.8
4.994250	42.10	---	56.00	13.90	2000.0	9.000	N	ON	9.8
4.173000	---	31.02	46.00	14.98	2000.0	9.000	N	ON	9.8
4.463250	---	28.65	46.00	17.35	2000.0	9.000	N	ON	9.8

8.3 47 CFR § 15.205, § 15.209, § 15.249 Radiated emission measurement (intentional radiator)

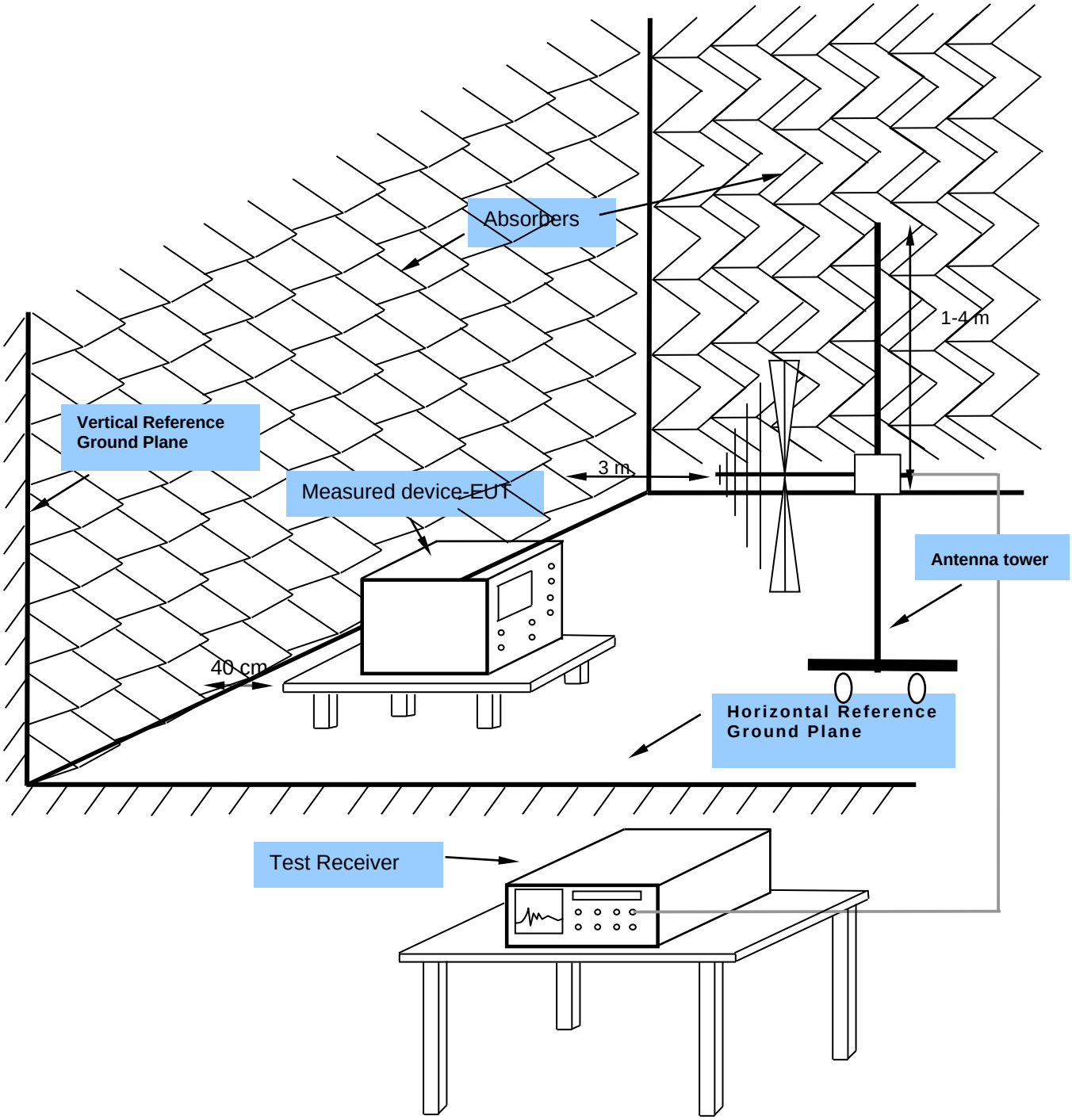
8.3.1 Test instruments

Description	Model No.	SIQ No.	Last calibration	Calibrated until	Calibration period	Used
Rohde-Schwarz, Spectrum analyzer	FSV 40	/	2021-04	2022-10	18 months	X
Rohde-Schwarz, RFI receiver	ESU8	105187	2020-07	2022-07	24 months	
Rohde-Schwarz, RFI receiver	ESU26	106897	2021-01	2023-07	18 months	X
Comtest Engineering, Semi Anechoic Chamber SAC 1	SAC 3m	NPS001	2020-06	2022-06	24 months	X
Rohde & Schwarz, Ultra Broadband Antenna	HL562E (SN 109843)	109063	2020-07	2022-07	24 months	
Rohde & Schwarz, Horn Antenna	HF907 (SN 102494)	109064	2020-08	2022-08	24 months	
Comtest Engineering, Semi Anechoic Chamber SAC 2	SAC 3m	NPS002	2020-06	2022-06	24 months	X
Rohde & Schwarz, Ultra Broadband Antenna	HL562E (SN 100842)	109056	2020-07	2022-07	24 months	X
Rohde & Schwarz, Horn Antenna	HF907 (SN 102508)	109057	2020-08	2022-08	24 months	X
Horn Antenna, EMCO	3116	/	2021-10	2024-10	36 months	X
Maturo, Turn table (2 m diameter)	TT 2.0 SI	/	N/A	N/A	N/A	X
Maturo, Bore-sight antenna mast	BAM-4.0-P	/	N/A	N/A	N/A	X
Maturo, Multi-channel positioning equipment	Maturo NCD	/	N/A	N/A	N/A	X
Schwarzbeck Active loop antenna	FMZB 1519B	/	2021-04	2022-10	18 months	X
Rohde-Schwarz, AMN	ENV216	/	2021-08	2023-02	18 months	X

8.3.2 Test procedure

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground in an Anechoic Chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 m away from the interference-receiving antenna, which was mounted on the top of variable-height antenna tower.
3. The antenna is a 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 turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to PEAK and QUASI-PEAK Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The highest points would be re-tested one by one using the quasi-peak method.

8.3.3 Test setup



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.