
FCC Test Report

Report No.: AGC01612220501FE04

FCC ID : WRAWPM-300TX

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION : Wireless Monitoring System

BRAND NAME : TAKSTAR

MODEL NAME : WPM-300

APPLICANT : GUANGDONG TAKSTAR ELECTRONIC CO., LTD.

DATE OF ISSUE : Jun. 09, 2022

STANDARD(S) : FCC Part 15.236

REPORT VERSION : V1.0

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Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: <http://www.agccert.com/>



Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun. 09, 2022	Valid	Initial Release

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TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY	5
2. GENERAL INFORMATION	6
2.1. PRODUCT DESCRIPTION	6
2.2. TEST METHODOLOGY	7
2.3. SPECIAL ACCESSORIES	8
2.4. EQUIPMENT MODIFICATIONS	8
2.5. ANTENNA REQUIREMENT	8
3. MEASUREMENT UNCERTAINTY	9
4. DESCRIPTION OF TEST MODES	10
5. SYSTEM TEST CONFIGURATION	11
5.1. CONFIGURATION OF EUT SYSTEM	11
5.2 EQUIPMENT USED IN TESTED SYSTEM	11
5.3. SUMMARY OF TEST RESULTS	11
6. TEST FACILITY	12
7. OUPUT POWER	13
7.1. TEST LIMIT	13
7.2. MEASUREMENT PROCEDURE	13
7.3. TEST SETUP	14
7.4. TEST RESULT	15
8. OCCUPIED BANDWIDTH	16
8.1. TEST LIMIT	16
8.2. MEASUREMENT PROCEDURE	16
8.3. TEST SET-UP	16
8.4. MEASUREMENT RESULTS	17
9. FREQUENCY STABILITY	19
9.1. TEST LIMIT	19
9.2. MEASUREMENT PROCEDURE	19
9.3. TEST SET-UP	20
9.4. TEST RESULT	20
10. EMISSIONS WITHIN THE BAND AND OUTSIDE THE BAND	22

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10.1. TEST LIMIT	22
10.2. MEASUREMENT PROCEDURE	22
10.3. TEST SETUP	23
10.4. TEST RESULT.....	25
11. LINE CONDUCTED EMISSION TEST	35
11.1. LIMITS OF LINE CONDUCTED EMISSION TEST.....	35
11.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST	35
11.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	36
11.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST.....	36
11.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST	37
APPENDIX A: PHOTOGRAPHS OF TEST SETUP	43
APPENDIX B: PHOTOGRAPHS OF EUT	43

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1. VERIFICATION OF CONFORMITY

Applicant	GUANGDONG TAKSTAR ELECTRONIC CO., LTD.
Address	DINGGANG, NO.5 TEAM, XIALIAO VILLAGE, LONGXI TOWN, BOLUO COUNTY, HUIZHOU CITY, GUANGDONG, CHINA
Manufacturer	GUANGDONG TAKSTAR ELECTRONIC CO., LTD.
Address	DINGGANG, NO.5 TEAM, XIALIAO VILLAGE, LONGXI TOWN, BOLUO COUNTY, HUIZHOU CITY, GUANGDONG, CHINA
Factory	GUANGDONG TAKSTAR ELECTRONIC CO., LTD.
Address	DINGGANG, NO.5 TEAM, XIALIAO VILLAGE, LONGXI TOWN, BOLUO COUNTY, HUIZHOU CITY, GUANGDONG, CHINA
Product Designation	Wireless Monitoring System
Brand Name	TAKSTAR
Test Model	WPM-300
Date of test	May 10, 2022 to Jun. 07, 2022
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-LPAS/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Part 15.236.

Prepared By



Eder Zhan
(Project Engineer)

Jun. 08, 2022

Reviewed By



Calvin Liu
(Reviewer)

Jun. 09, 2022

Approved By



Max Zhang
(Authorized Officer)

Jun. 09, 2022

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

Operation Frequency	533.3MHz -591MHz
Maximum Conducted Power	12.765dBm
Modulation	FM
Number of channels	10
Antenna Gain	5dBi
Antenna Designation	Wire Antenna (Met 15.203 Antenna requirement)
Hardware Version	WPM300RX_V1
Software Version	WPM300RX_V1_104
Power Supply	DC 12V by adapter

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Channel list:

Channel Number	Frequency (MHz)
1	533.30
2	533.80
3	536.50
4	542.80
5	550.40
6	556.90
7	574.50
8	576.10
9	583.0
10	591.0

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2.2. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

2.3. SPECIAL ACCESSORIES

Refer to section 5.2.

2.4. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.5. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.

3. MEASUREMENT UNCERTAINTY

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

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 3.1 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 4.0 \text{ dB}$
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.8 \text{ dB}$
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$
Uncertainty of spurious emissions, conducted	$U_c = \pm 2 \%$
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2 \%$

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4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	TX mode at Low channel (533.3MHz)
2	TX mode at Middle channel (550.4MHz)
3	TX mode at High channel (591MHz)

Note:

1. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
2. For Conducted Test method, a temporary antenna connector is provided by the manufacture.
3. All the requirements have been tested by modulating the transmitter with a 1khz tone at a fixed level which set to the manufacturer's maximum rated input to the modulator.

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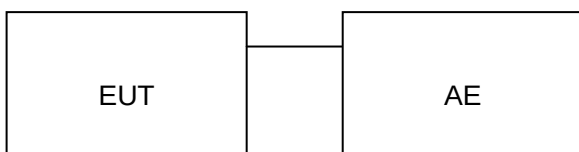
5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Radiated Emission Configure:



Conducted Emission Configure:



5.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Wireless Monitoring System	WPM-300	WRAWPM-300TX	EUT
2	Adapter	FD00SC-120-0800	--	AE

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna requirement	Compliant
§15.236(d)(1)	Maximum radiated power	Compliant
§15.236(f)(2)	Occupied bandwidth	Compliant
§15.236(f)(3)	Frequency stability	Compliant
§15.236(g)	Emissions within the band	Compliant
§15.236(g)	Emissions outside of this band	Compliant
15.207	Line Conducted Emission	Compliant

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6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance (Shenzhen) Co., Ltd is accredited by A2LA

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Mar. 28, 2022	Mar. 27, 2023
LISN	R&S	ESH2-Z5	100086	Jun. 09, 2021	Jun. 08, 2022
Test software	R&S	ES-K1(Ver.V1.71)	N/A	N/A	N/A

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Mar. 28, 2022	Mar. 27, 2023
EXA Signal Analyzer	Aglient	N9020A	MY52090123	Nov. 17, 2021	Nov. 16, 2022
Attenuator	Warriors	W13	11324	Sep. 03, 2020	Sep. 02, 2022
Horn antenna	ETS-LINDGREN	3117	00154520	Oct. 31, 2021	Oct. 30, 2023
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 21, 2024
Double-Ridged Waveguide Horn	ETS-LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
Broadband Preamplifier	ETS-LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2020	Jan. 07, 2023
Wireless communication tester	HP	8920B	US35010161	Sep. 06, 2021	Sep. 05, 2022
Test software	Tonscend	JS32-RE (Ver. 2.5)	N/A	N/A	N/A

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7. OUTPUT POWER

7.1. TEST LIMIT

The power may not exceed the following values.

470-608 MHz bands: 50 mW EIRP

7.2. MEASUREMENT PROCEDURE

☐ EIRP Test Method

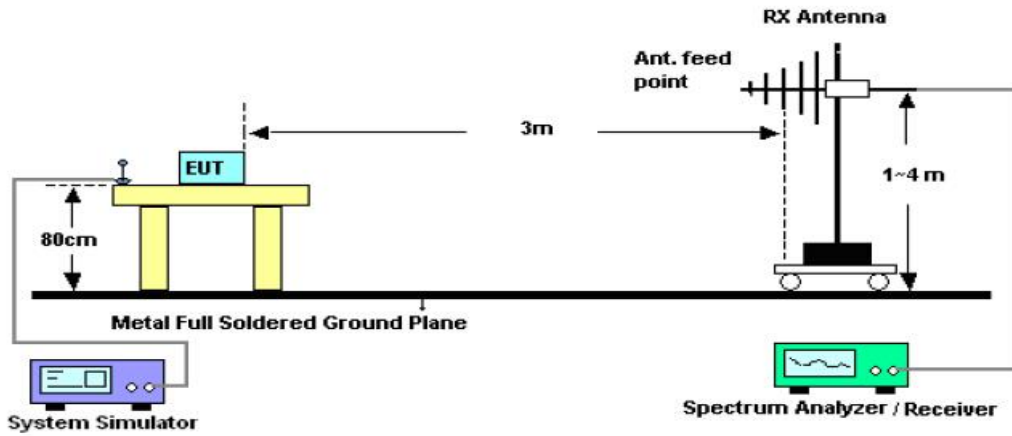
1. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
 4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
 6. $EIRP [dBm] = E[dB(\mu V)/m] - 95.3$
- 4.7dB shall be added as an upper bound on the field strength that would be observed on a test range with a ground plane for frequencies between 30MHz and 1000MHz, or an additional 6dB shall be added for frequencies below 30 MHz.

☒ Conducted Power Test Method

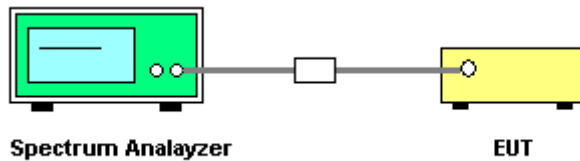
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. $RBW \geq OBW$.
3. $VBW \geq 3 \times RBW$.
4. $Span \geq 2 \times OBW$.
5. $Sweep\ time \geq 10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})$
6. Detector function: Peak.
7. Trace: Max hold.
8. Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

7.3. TEST SETUP

☐ EIRP Test Method



☒ Conducted Power Test Method



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7.4. TEST RESULT

Test Channel	Peak Power	Limit
(MHz)	(dBm)	(dBm)
533.3	11.900	17
550.4	12.765	17
591.0	11.824	17

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8. OCCUPIED BANDWIDTH

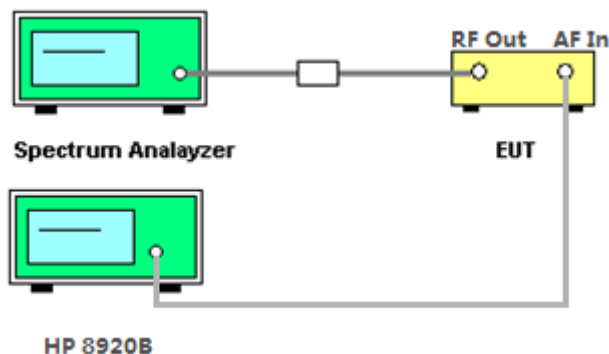
8.1. TEST LIMIT

The operating bandwidth shall not exceed 200 kHz.

8.2. MEASUREMENT PROCEDURE

1. For the occupied bandwidth measurements, the input signal shall be a 1 kHz tone. The level of the tone shall be set to the manufacturer's maximum rated input to the modulator.
2. Set the EUT Work on operation frequency.
3. Set Span = approximately 1.5 times the occupied bandwidth, centered on a channel
The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

8.3. TEST SET-UP

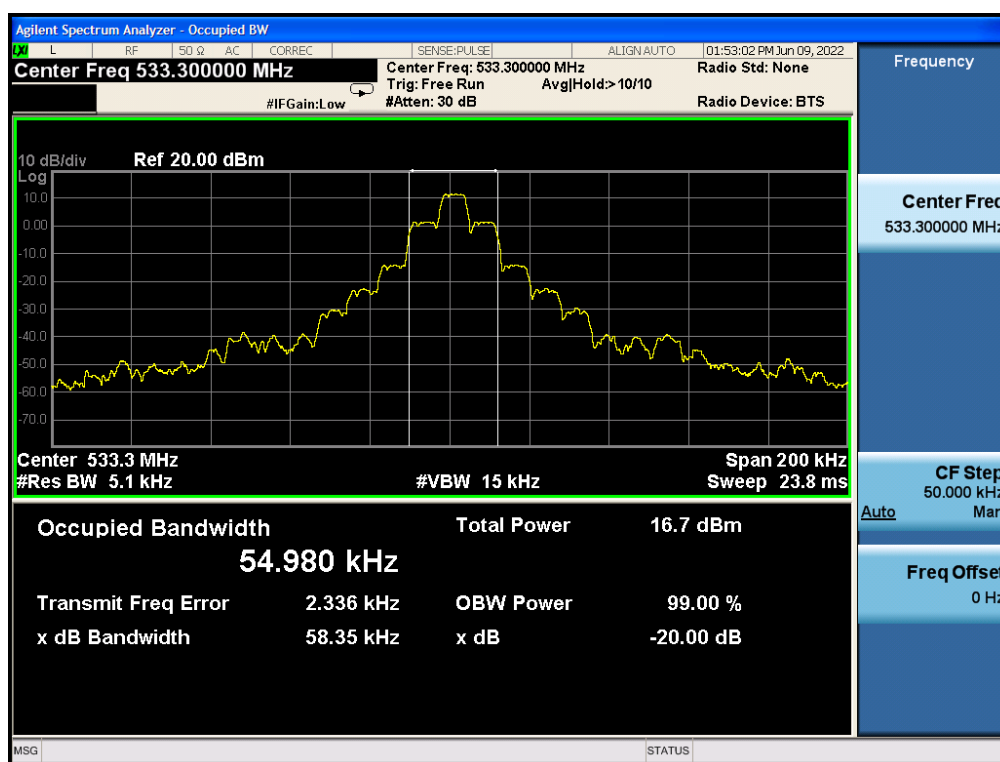


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8.4. MEASUREMENT RESULTS

Test Channel	-20dBc EBW (kHz)	99% OBW (kHz)	Limit (kHz)
533.3	58.35	54.980	200
550.4	58.08	54.543	200
591.0	84.16	77.826	200

TEST PLOT OF BANDWIDTH FOR 533.3MHz



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TEST PLOT OF BANDWIDTH FOR 550.4MHz



TEST PLOT OF BANDWIDTH FOR 591MHz



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9. FREQUENCY STABILITY

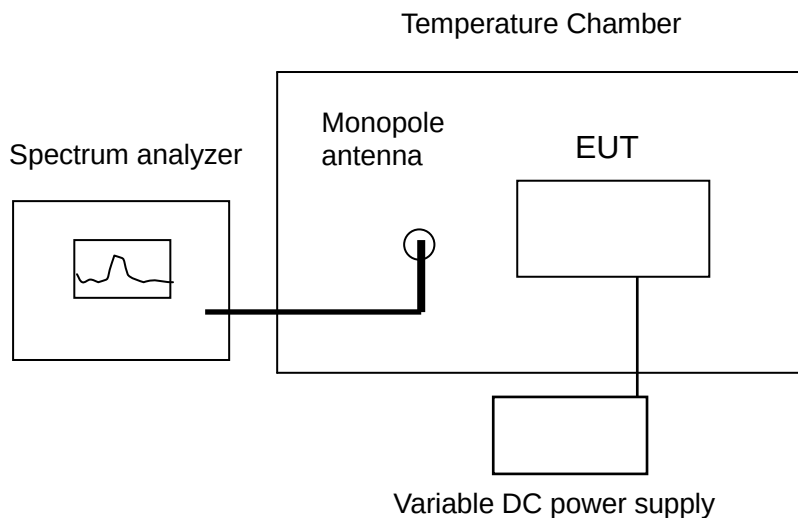
9.1. TEST LIMIT

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.005\%$ of the operating frequency over a temperature variation of -30 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.

9.2. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the operation frequency.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 1 KHz, VBW $\geq 3 \times$ RBW.
4. Set SPA Trace 1 Max hold, then View.
5. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
6. Extreme temperature rule is $-30^{\circ}\text{C} \sim 50^{\circ}\text{C}$.

9.3. TEST SET-UP



9.4. TEST RESULT

Test frequency: 533.3MHz

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
10.2	533.312	0.017	0.03	PASS
12.0	533.316			
13.8	533.317			

Temperature vs. Frequency Stability (Test Voltage: 12V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	533.311	0.018	0.03	PASS
-20°C	533.315			
-10°C	533.316			
0°C	533.318			
10°C	533.314			
20°C	533.315			
30°C	533.315			
40°C	533.313			
50°C	533.318			

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Test frequency: 550.4MHz

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
10.2	550.402	0.005	0.03	PASS
12.0	550.405			
13.8	550.401			

Temperature vs. Frequency Stability (Test Voltage: 12V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	550.407	0.008	0.03	PASS
-20°C	550.405			
-10°C	550.406			
0°C	550.402			
10°C	550.408			
20°C	550.404			
30°C	550.405			
40°C	550.401			
50°C	550.406			

Test frequency: 591MHz

Voltage vs. Frequency Stability (Test Temperature: 20°C)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
10.2	591.002	0.006	0.03	PASS
12.0	591.003			
13.8	591.006			

Temperature vs. Frequency Stability (Test Voltage: 12V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit (MHz)	Conclusion
-30°C	591.001	0.009	0.03	PASS
-20°C	591.005			
-10°C	591.006			
0°C	591.004			
10°C	591.002			
20°C	591.008			
30°C	591.004			
40°C	591.009			
50°C	591.005			

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10. EMISSIONS WITHIN THE BAND AND OUTSIDE THE BAND

10.1. TEST LIMIT

Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in §8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08).

Emissions outside of this band shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 V1.4.2 (2011-08).

10.2. MEASUREMENT PROCEDURE

Emission outside the band:

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. $EIRP [dBm] = E[dB(\mu V)/m] - 95.2$

The following table is the setting of spectrum analyzer and receiver.

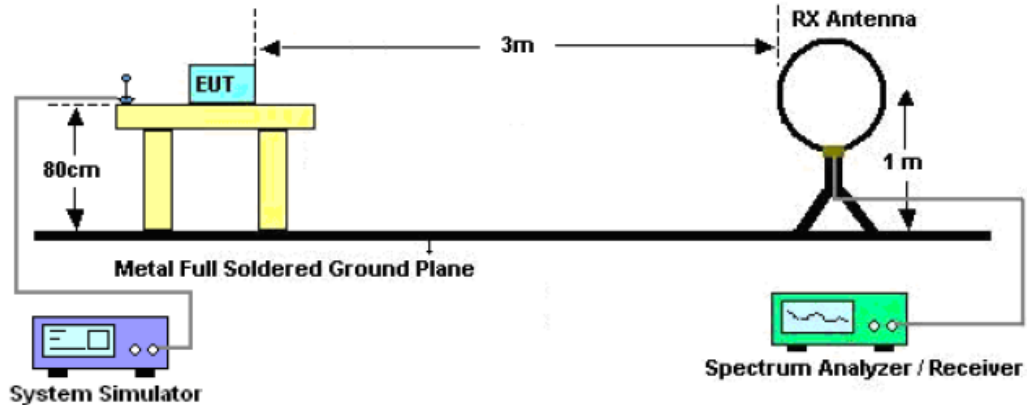
Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1000MHz~6000MHz/RB 1MHz for QP

Emission within the band:

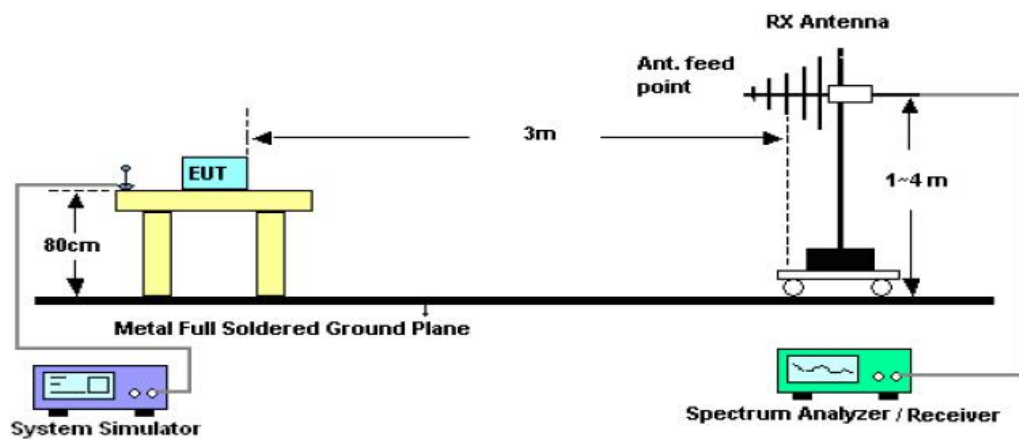
- ☒ Method of Measurement for Analogue Systems in ETSI EN 300 422-1 Subclass 8.3.1
☐ Method of Measurement for Digital Systems in ETSI EN 300 422-1 Subclass 8.3.2

10.3. TEST SETUP

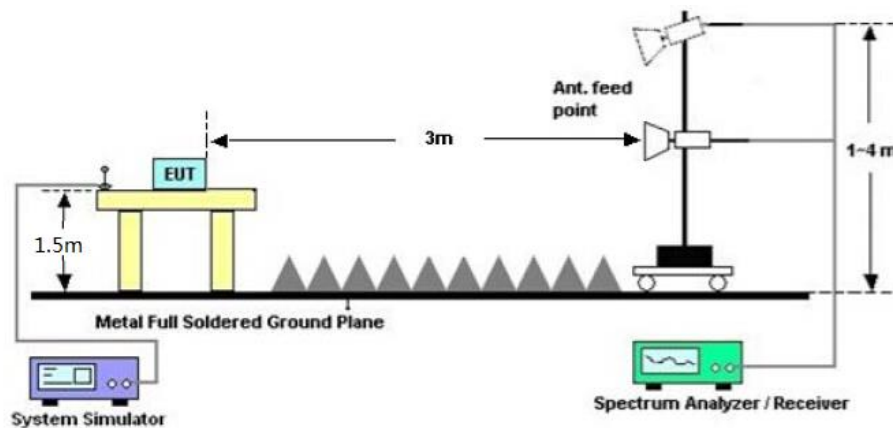
Emission outside the band Radiated Emission Test-Setup Frequency Below 30MHz



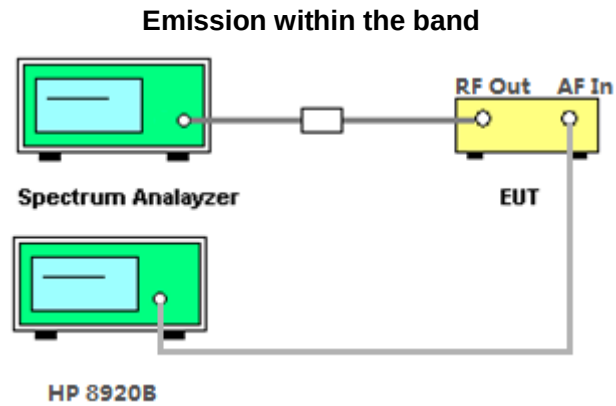
RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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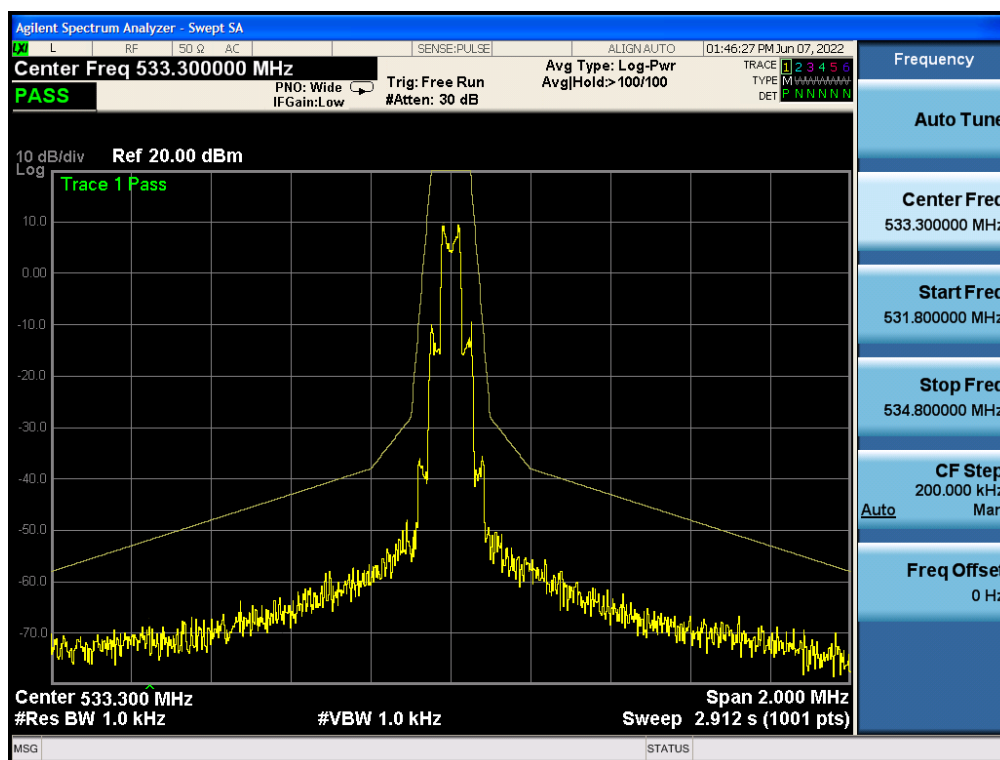


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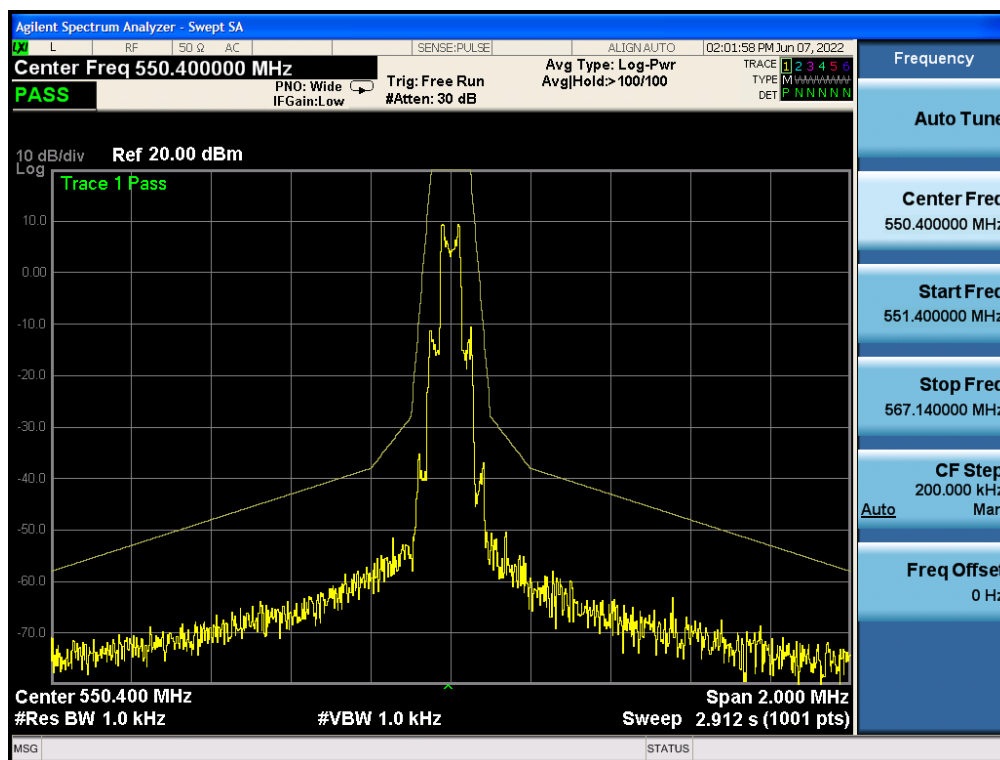
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10.4. TEST RESULT

Emission within the band for 533.3MHz



Emission within the band for 550.4MHz



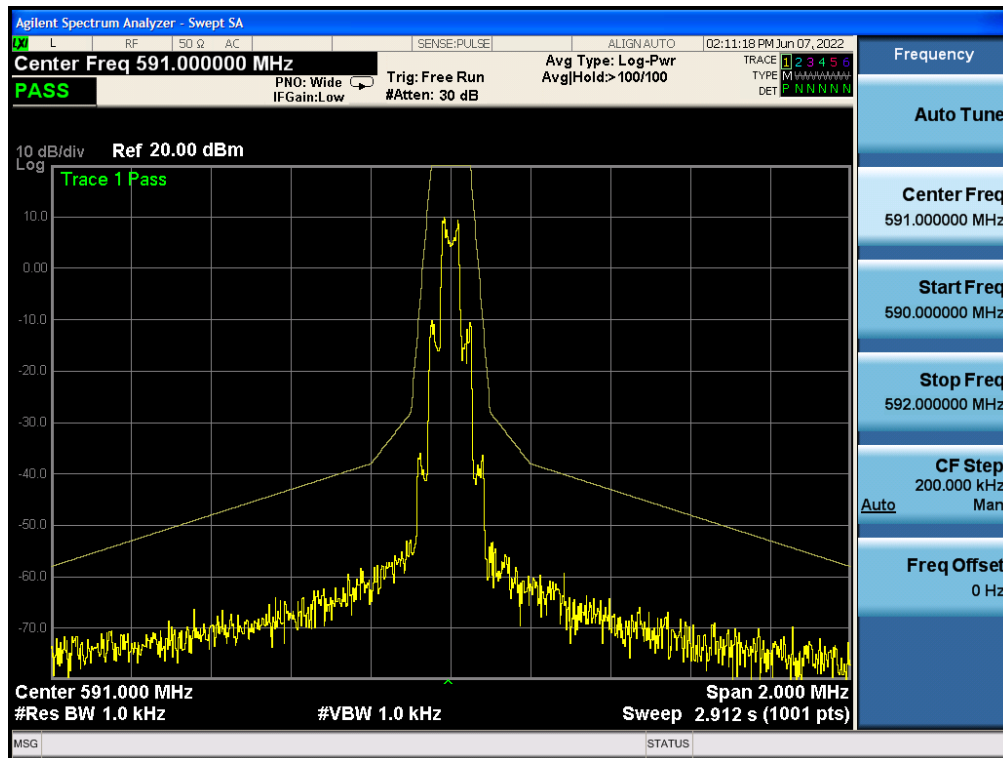
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Emission within the band for 591MHz



Note:

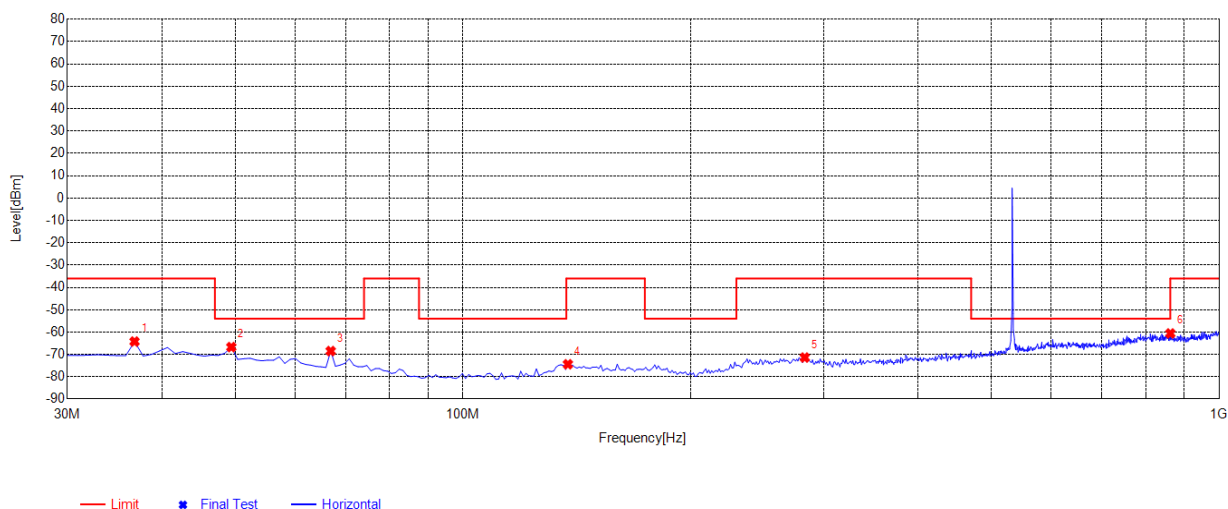
1. The manufacturer declared that the channel bandwidth is 200KHz.
2. The carrier power is the ref level, and the factor had been edited in the "Input Correction" of the Spectrum Analyzer.

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Emission outside the band 30-1000MHz

EUT:	Wireless Monitoring System	Model Name:	WPM-300
Temperature:	25℃	Relative Humidity:	60%
Pressure:	986 Pa	Test Voltage:	Normal
Test Mode:	Mode 1	Polarization:	Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	36.79	-96.07	-64.22	-36.00	28.22	31.85	300	Horizontal
2	49.4	-97.45	-66.71	-54.00	12.71	30.74	40	Horizontal
3	66.86	-94.76	-68.49	-54.00	14.49	26.27	250	Horizontal
4	137.67	-100.33	-74.40	-36.00	38.40	25.93	140	Horizontal
5	283.17	-101.68	-71.38	-36.00	35.38	30.30	30	Horizontal
6	862.26	-100.72	-60.60	-36.00	24.60	40.12	100	Horizontal

RESULT: PASS

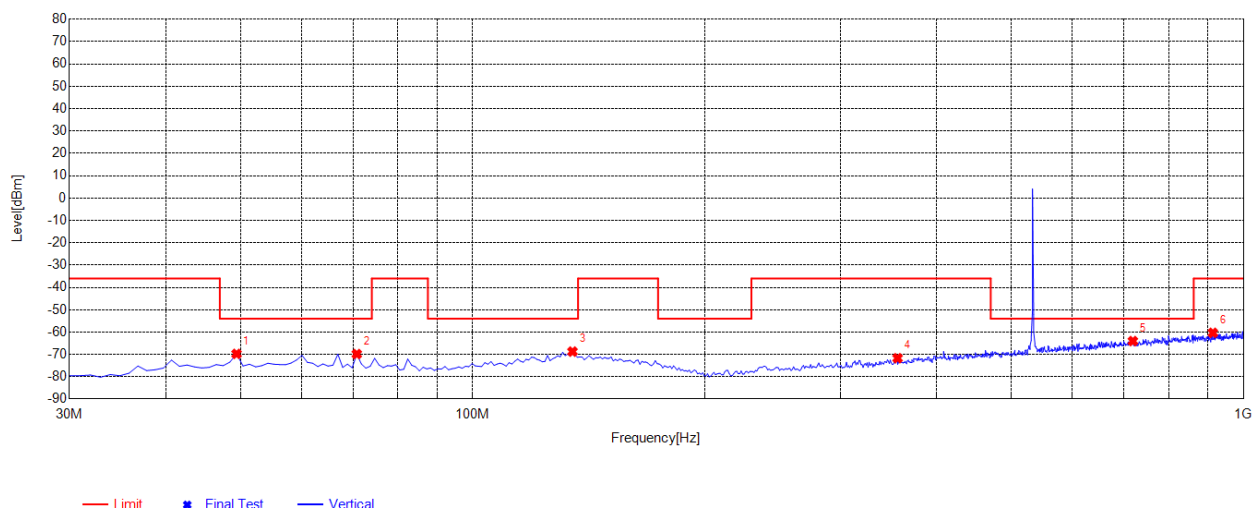
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EUT:	Wireless Monitoring System	Model Name:	WPM-300
Temperature:	25°C	Relative Humidity:	60%
Pressure:	986 Pa	Test Voltage:	Normal
Test Mode:	Mode 1	Polarization:	Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	49.4	-96.45	-69.74	-54.00	15.74	26.71	80	Vertical
2	70.74	-94.77	-69.82	-54.00	15.82	24.95	70	Vertical
3	134.76	-99.76	-68.72	-54.00	14.72	31.04	290	Vertical
4	355.92	-101.88	-71.68	-36.00	35.68	30.20	200	Vertical
5	718.7	-101.85	-64.02	-54.00	10.02	37.83	310	Vertical
6	912.7	-100.77	-60.33	-36.00	24.33	40.44	310	Vertical

RESULT: PASS

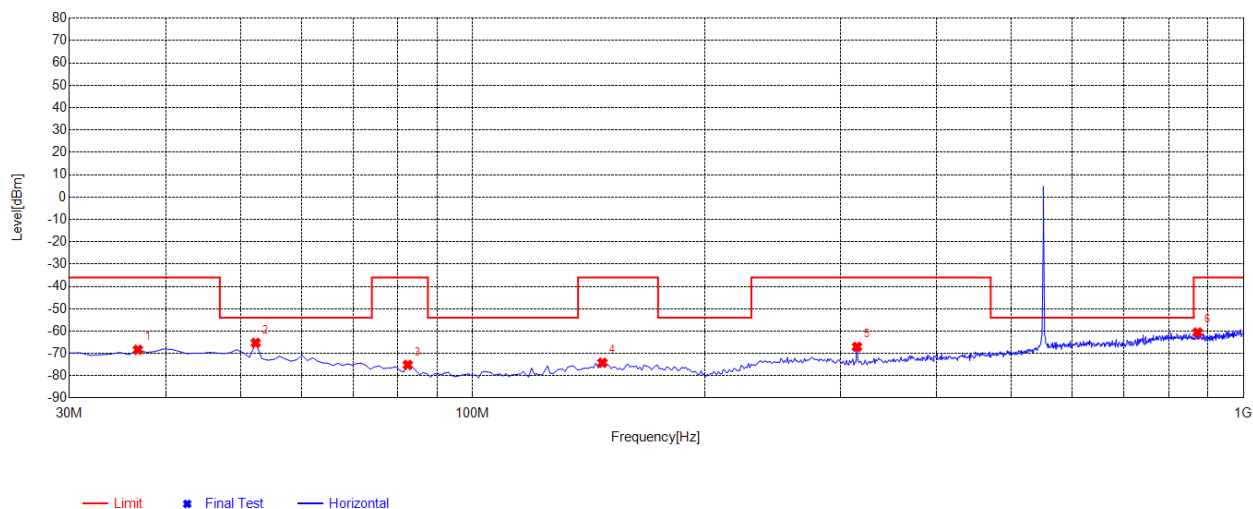
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EUT:	Wireless Monitoring System	Model Name:	WPM-300
Temperature:	25°C	Relative Humidity:	60%
Pressure:	986 Pa	Test Voltage:	Normal
Test Mode:	Mode 2	Polarization:	Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	36.79	-100.23	-68.38	-36.00	32.38	31.85	40	Horizontal
2	52.31	-95.27	-65.28	-54.00	11.28	29.99	120	Horizontal
3	82.38	-98.42	-75.13	-36.00	39.13	23.29	220	Horizontal
4	147.37	-100.52	-74.17	-36.00	38.17	26.35	340	Horizontal
5	315.18	-96.36	-67.03	-36.00	31.03	29.33	20	Horizontal
6	871.96	-100.69	-60.62	-36.00	24.62	40.07	330	Horizontal

RESULT: PASS

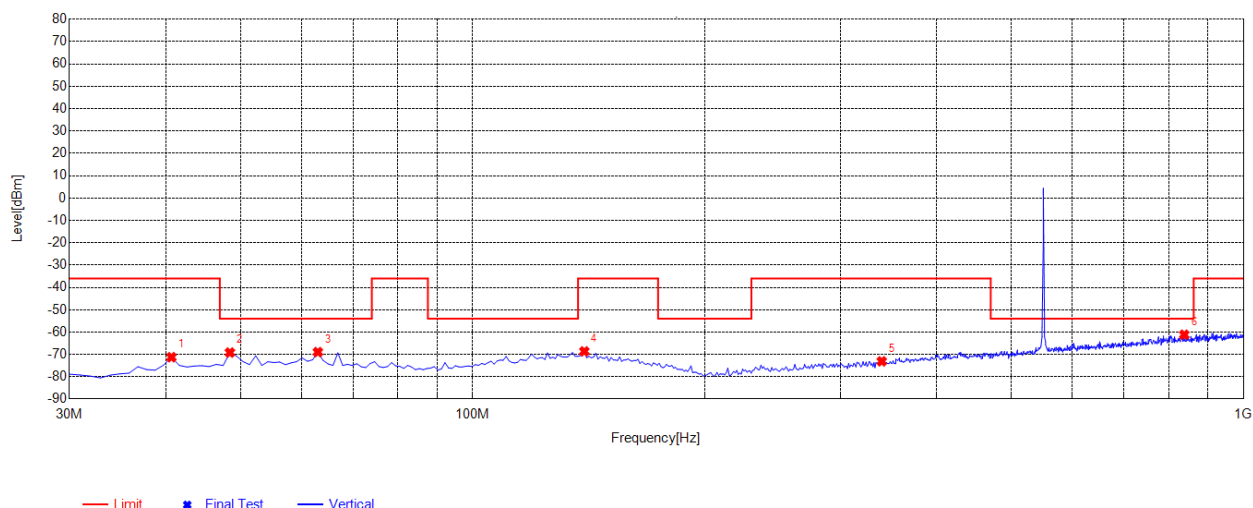
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Temperature:	25°C	Relative Humidity:	60%
Pressure:	986 Pa	Test Voltage:	Normal
Test Mode:	Mode 2	Polarization:	Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	40.67	-96.49	-71.24	-36.00	35.24	25.25	170	Vertical
2	48.43	-95.71	-69.16	-54.00	15.16	26.55	70	Vertical
3	62.98	-96.29	-68.95	-54.00	14.95	27.34	170	Vertical
4	139.61	-99.99	-68.63	-36.00	32.63	31.36	40	Vertical
5	339.43	-102.61	-73.08	-36.00	37.08	29.53	180	Vertical
6	838.01	-100.90	-61.17	-54.00	7.17	39.73	280	Vertical

RESULT: PASS

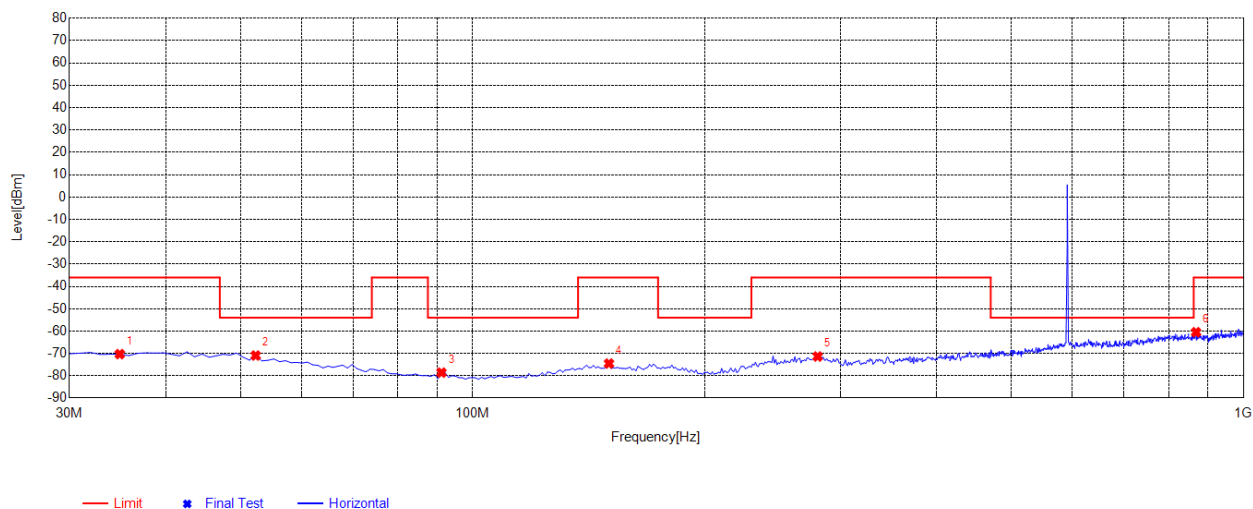
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EUT:	Wireless Monitoring System	Model Name:	WPM-300
Temperature:	25°C	Relative Humidity:	60%
Pressure:	986 Pa	Test Voltage:	Normal
Test Mode:	Mode 3	Polarization:	Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	34.85	-102.06	-70.30	-36.00	34.30	31.76	200	Horizontal
2	52.31	-100.92	-70.93	-54.00	16.93	29.99	140	Horizontal
3	91.11	-100.45	-78.58	-54.00	24.58	21.87	40	Horizontal
4	150.28	-100.85	-74.51	-36.00	38.51	26.34	180	Horizontal
5	280.26	-101.90	-71.37	-36.00	35.37	30.53	130	Horizontal
6	868.08	-100.60	-60.51	-36.00	24.51	40.09	120	Horizontal

RESULT: PASS

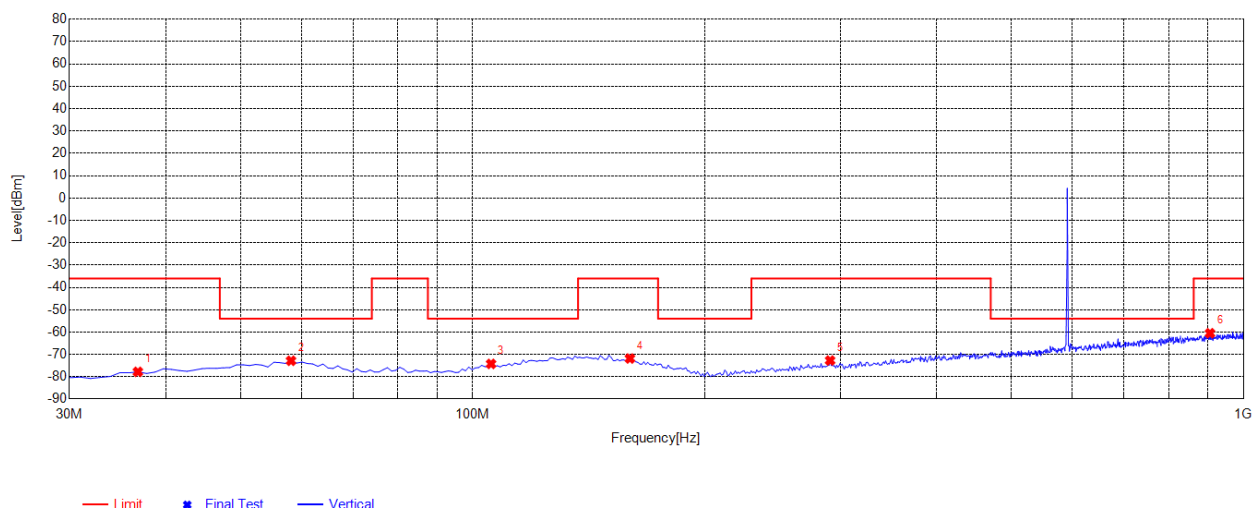
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EUT:	Wireless Monitoring System	Model Name:	WPM-300
Temperature:	25°C	Relative Humidity:	60%
Pressure:	986 Pa	Test Voltage:	Normal
Test Mode:	Mode 3	Polarization:	Vertical



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	36.79	-101.72	-77.78	-36.00	41.78	23.94	10	Vertical
2	58.13	-100.92	-72.83	-54.00	18.83	28.09	210	Vertical
3	105.66	-101.57	-74.23	-54.00	20.23	27.34	300	Vertical
4	159.98	-101.83	-71.82	-36.00	35.82	30.01	30	Vertical
5	290.93	-100.55	-72.71	-36.00	36.71	27.84	220	Vertical
6	904.94	-100.87	-60.51	-36.00	24.51	40.36	280	Vertical

RESULT: PASS

Note:

Factor=Antenna Factor + Cable loss, Margin=Limit–Level.

The “Factor” value can be calculated automatically by software of measurement system.

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Emission outside the band above 1000MHz

EUT:	Wireless Monitoring System	Model Name:	WPM-300
Temperature:	25 °C	Relative Humidity:	60%
Pressure:	986 Pa	Test Voltage:	Normal
Test Mode:	Mode 1	Polarization:	Horizontal/Vertical

Frequency (MHz)	Meter Reading (dBm)	Factor (dB)	Emission Level (dBm)	Limits (dBm)	Margin (dB)	Value Type
1066.600	-36.25	-4.02	-40.27	-30	-10.27	Horizontal
1066.600	-41.45	-4.02	-45.47	-30	-15.47	Vertical
1599.900	-39.67	-1.95	-41.62	-30	-11.62	Horizontal
1599.900	-40.25	-1.95	-42.2	-30	-12.2	Vertical
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT:	Wireless Monitoring System	Model Name:	WPM-300
Temperature:	25 °C	Relative Humidity:	60%
Pressure:	986 Pa	Test Voltage:	Normal
Test Mode:	Mode 2	Polarization:	Horizontal/Vertical

Frequency (MHz)	Meter Reading (dBm)	Factor (dB)	Emission Level (dBm)	Limits (dBm)	Margin (dB)	Value Type
1100.800	-36.57	-4.02	-40.59	-30	-10.59	Horizontal
1100.800	-40.48	-4.02	-44.5	-30	-14.5	Vertical
1651.200	-39.57	-1.95	-41.52	-30	-11.52	Horizontal
1651.200	-41.36	-1.95	-43.31	-30	-13.31	Vertical
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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EUT:	Wireless Monitoring System	Model Name:	WPM-300
Temperature:	25℃	Relative Humidity:	60%
Pressure:	986 Pa	Test Voltage:	Normal
Test Mode:	Mode 3	Polarization:	Horizontal/Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
1182.000	-35.98	-4.02	-40	-30	-10	Horizontal
1182.000	-41.52	-4.02	-45.54	-30	-15.54	Vertical
1773.000	-38.54	-1.95	-40.49	-30	-10.49	Horizontal
1773.000	-42.75	-1.95	-44.7	-30	-14.7	Vertical
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RESULT: PASS

Note:

Other emissions from 1G to 6 GHz are considered as ambient noise. No recording in the test report.

The “Factor” value can be calculated automatically by software of measurement system.

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11. LINE CONDUCTED EMISSION TEST

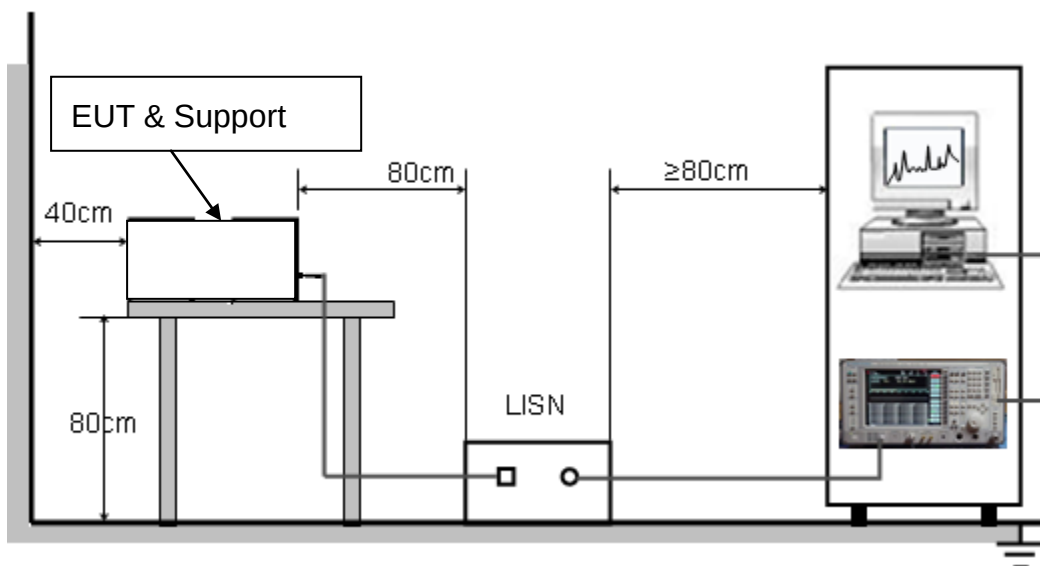
11.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P. (dB μ V)	Average (dB μ V)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

11.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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11.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipment received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC 5V power from adapter which received AC120V/60Hz power from a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

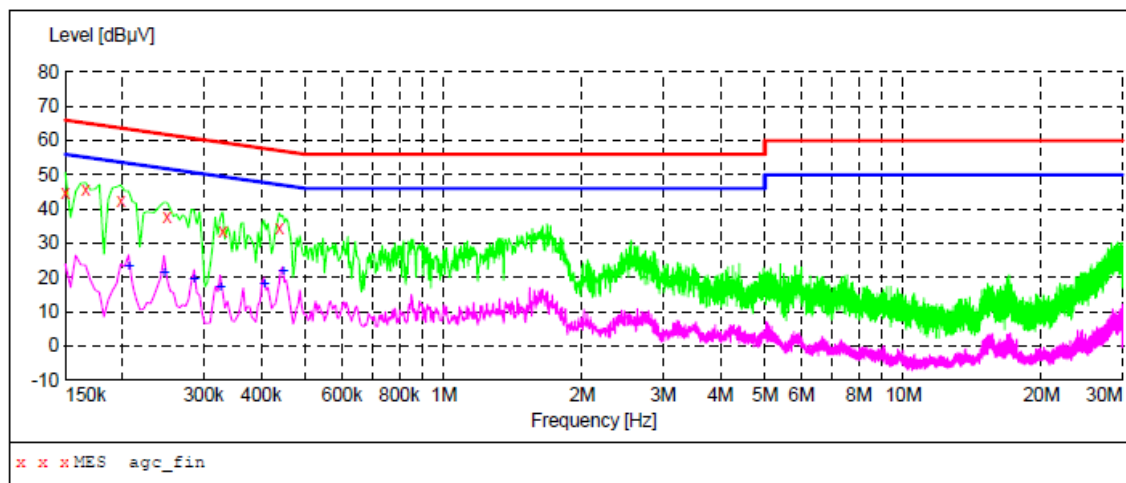
11.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

11.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

Mode 1

Line Conducted Emission Test Line 1-L



MEASUREMENT RESULT: "agc_fin"

2022/5/22 11:09

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.150000	44.70	6.9	66	21.3	QP	L1
0.166000	45.60	6.8	65	19.6	QP	L1
0.198000	42.50	6.6	64	21.2	QP	L1
0.250000	37.80	6.3	62	24.0	QP	L1
0.330000	33.50	5.9	60	26.0	QP	L1
0.438000	34.50	5.6	57	22.6	QP	L1

MEASUREMENT RESULT: "agc_fin2"

2022/5/22 11:09

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.206000	22.90	6.5	53	30.5	AV	L1
0.246000	21.40	6.3	52	30.5	AV	L1
0.286000	19.60	6.1	51	31.0	AV	L1
0.326000	16.80	5.9	50	32.8	AV	L1
0.406000	18.10	5.7	48	29.6	AV	L1
0.446000	21.60	5.5	47	25.3	AV	L1

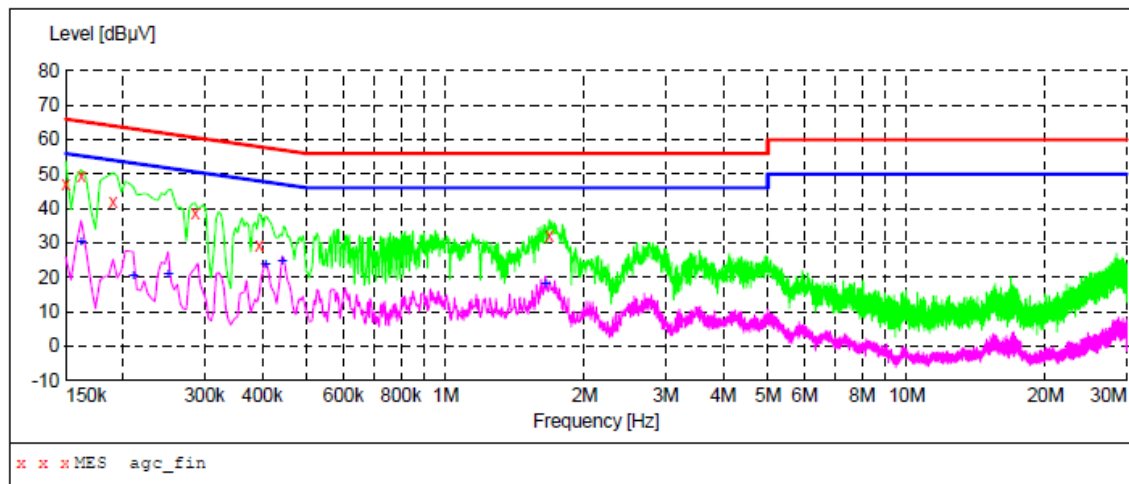
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Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT: "agc_fin"

2022/5/22 10:55

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.150000	47.00	6.9	66	19.0	QP	N
0.162000	49.20	6.8	65	16.2	QP	N
0.190000	42.00	6.6	64	22.0	QP	N
0.286000	38.40	6.1	61	22.2	QP	N
0.394000	29.00	5.7	58	29.0	QP	N
1.678000	31.90	6.2	56	24.1	QP	N

MEASUREMENT RESULT: "agc_fin2"

2022/5/22 10:55

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.162000	30.20	6.8	55	25.2	AV	N
0.210000	20.50	6.5	53	32.7	AV	N
0.250000	20.60	6.3	52	31.2	AV	N
0.406000	23.50	5.7	48	24.2	AV	N
0.442000	24.60	5.6	47	22.4	AV	N
1.646000	17.80	6.2	46	28.2	AV	N

RESULT: PASS

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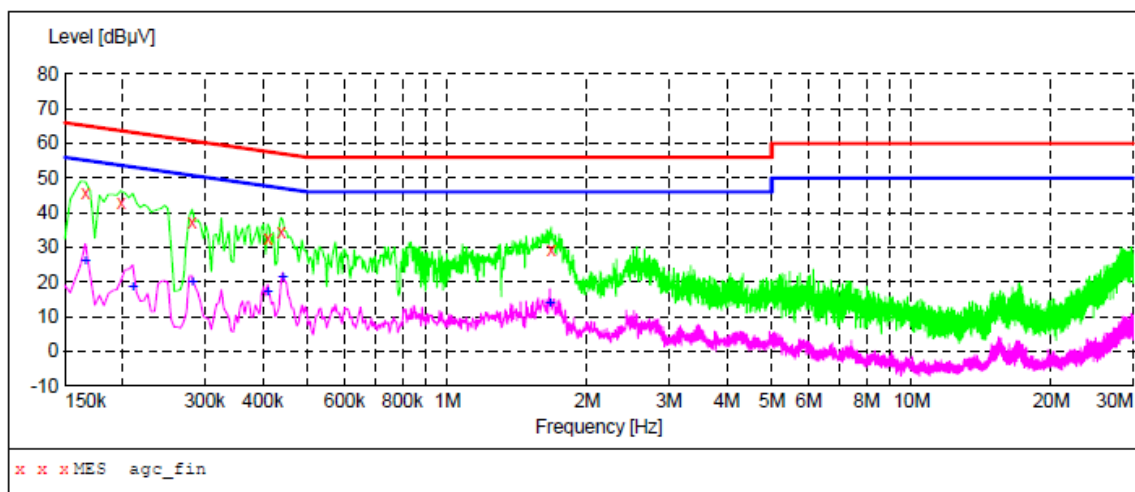
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Mode 2

Line Conducted Emission Test Line 1-L



MEASUREMENT RESULT: "agc_fin"

2022/5/22 11:06

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.166000	45.90	6.8	65	19.3	QP	L1
0.198000	42.70	6.6	64	21.0	QP	L1
0.282000	37.30	6.1	61	23.5	QP	L1
0.410000	32.30	5.7	58	25.3	QP	L1
0.438000	34.20	5.6	57	22.9	QP	L1
1.674000	29.10	6.2	56	26.9	QP	L1

MEASUREMENT RESULT: "agc_fin2"

2022/5/22 11:06

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.166000	26.00	6.8	55	29.2	AV	L1
0.210000	18.60	6.5	53	34.6	AV	L1
0.282000	20.00	6.1	51	30.8	AV	L1
0.410000	17.00	5.7	48	30.6	AV	L1
0.442000	21.40	5.6	47	25.6	AV	L1
1.662000	13.90	6.2	46	32.1	AV	L1

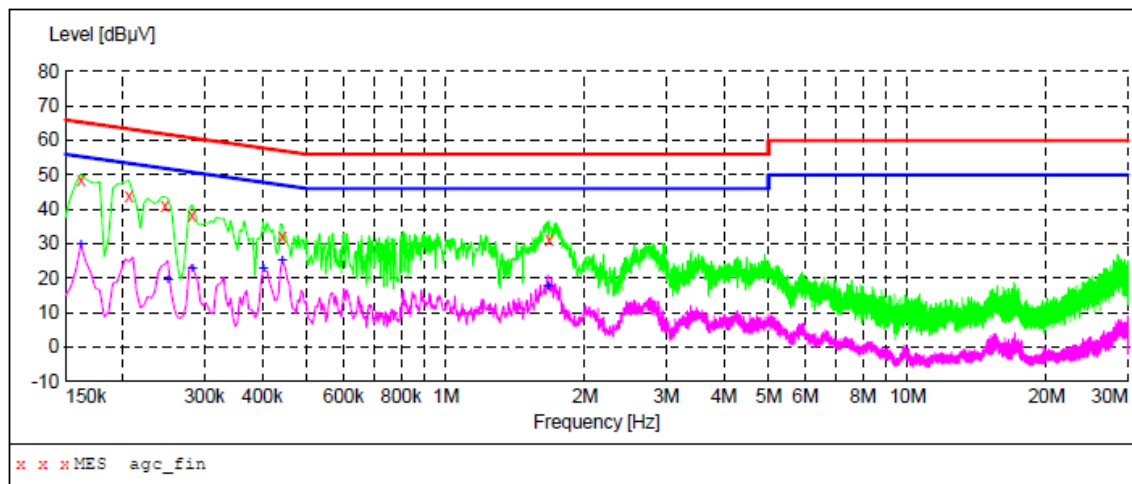
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Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT: "agc_fin"

2022/5/22 10:58

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.162000	48.50	6.8	65	16.9	QP	N
0.206000	43.70	6.5	63	19.7	QP	N
0.246000	40.80	6.3	62	21.1	QP	N
0.282000	38.20	6.1	61	22.6	QP	N
0.442000	31.80	5.6	57	25.2	QP	N
1.674000	31.20	6.2	56	24.8	QP	N

MEASUREMENT RESULT: "agc_fin2"

2022/5/22 10:58

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.162000	29.50	6.8	55	25.9	AV	N
0.250000	19.50	6.3	52	32.3	AV	N
0.282000	22.40	6.1	51	28.4	AV	N
0.402000	22.70	5.7	48	25.1	AV	N
0.442000	24.80	5.6	47	22.2	AV	N
1.662000	17.40	6.2	46	28.6	AV	N

RESULT: PASS

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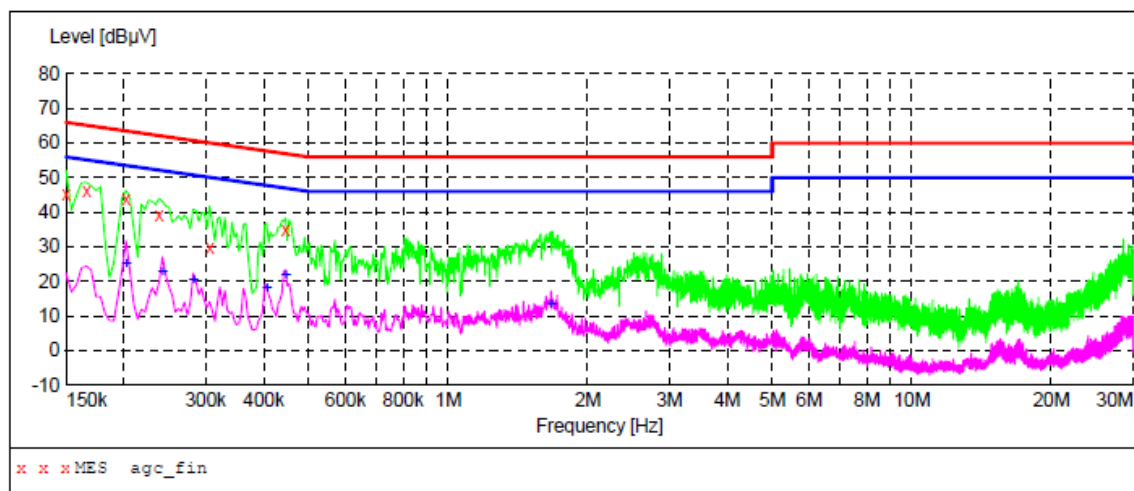
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Mode 3

Line Conducted Emission Test Line 1-L



MEASUREMENT RESULT: "agc_fin"

2022/5/22 11:04

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.150000	45.20	6.9	66	20.8	QP	L1
0.166000	46.10	6.8	65	19.1	QP	L1
0.202000	44.00	6.5	64	19.5	QP	L1
0.238000	39.30	6.3	62	22.9	QP	L1
0.306000	29.50	6.0	60	30.6	QP	L1
0.446000	34.70	5.5	57	22.2	QP	L1

MEASUREMENT RESULT: "agc_fin2"

2022/5/22 11:04

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.202000	25.00	6.5	54	28.5	AV	L1
0.242000	22.60	6.3	52	29.4	AV	L1
0.282000	20.40	6.1	51	30.4	AV	L1
0.406000	18.20	5.7	48	29.5	AV	L1
0.446000	21.60	5.5	47	25.3	AV	L1
1.666000	13.40	6.2	46	32.6	AV	L1

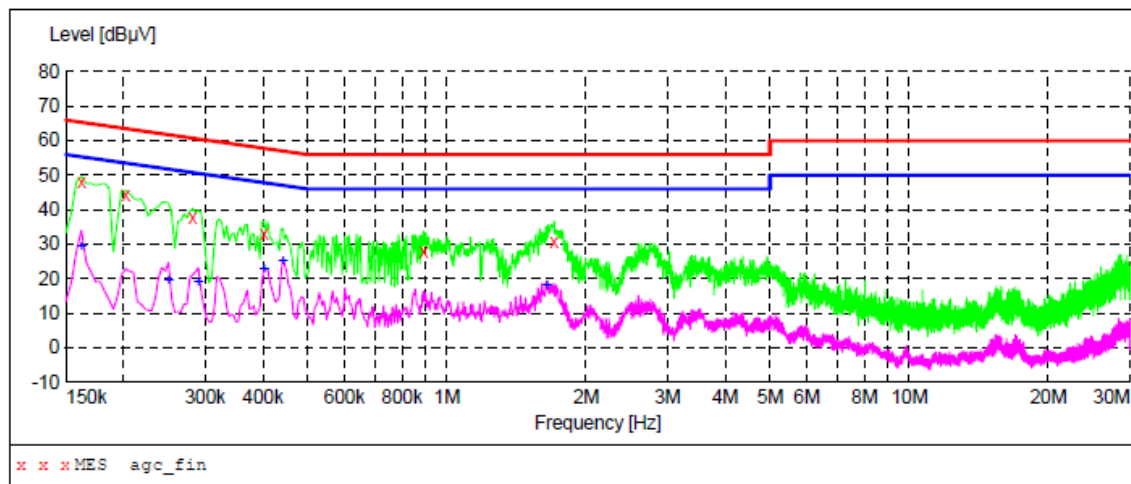
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Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT: "agc_fin"

2022/5/22 11:00

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.162000	48.00	6.8	65	17.4	QP	N
0.202000	44.30	6.5	64	19.2	QP	N
0.282000	37.70	6.1	61	23.1	QP	N
0.402000	33.20	5.7	58	24.6	QP	N
0.890000	27.60	5.4	56	28.4	QP	N
1.706000	30.40	6.2	56	25.6	QP	N

MEASUREMENT RESULT: "agc_fin2"

2022/5/22 11:00

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line
0.162000	29.30	6.8	55	26.1	AV	N
0.250000	19.40	6.3	52	32.4	AV	N
0.290000	18.80	6.1	51	31.7	AV	N
0.402000	22.70	5.7	48	25.1	AV	N
0.442000	24.80	5.6	47	22.2	AV	N
1.646000	17.90	6.2	46	28.1	AV	N

RESULT: PASS

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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC01612220501AP02

APPENDIX B: PHOTOGRAPHS OF EUT

Refer to the Report No.: AGC01612220501AP03

-----END OF REPORT-----

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