EMC Test Report	
For:	**Airspan Communications Limited**
Product:	**Airspan ATG RU**
Model:	**ATG-402-00-922**
FCC ID:	**O2J-ATGRU**

Project Engineer:	**Malcolm Musgrave**
Approval Signatory:	**Dan Tiroke**

Document Reference:	**3200 FR**

Issue Number:	**Date:**	**Test Report Revisions History:**
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1.0 OVERVIEW

1.1 Introduction

The equipment under test (EUT) as described within this document was submitted for testing as agreed with the customer.

1.2 Objective

The purpose of the test was to measure and report the EUT against limits and methods of the requested standards as listed in section 2.0 Test Summary.

1.3 Product Modifications

None to sample submitted.

1.4 Conclusion

The EUT met the emission requirements of the tests defined in section 2.0 Test Summary.

This report relates to the sample tested and may not represent the entire population. It is valid only for the product identified, either in part or in full, to the standards and/or tests covered in this document.

1.5 EMC Test Lab Reference

Eurofins E&E Hursley Files: 3200 and 3192
Customer Test Plan: SC_AIR_TP14_A

1.6 Test Deviations

The latest editions of test standards were used in place of those listed on Eurofins E&E Hursley Limited's accreditation schedule.

2.0 TEST SUMMARY

2.1 Summary

The EUT, as described and reported within this document, complies with the applied sections of the standards listed below.

The EUT met the **emissions** test requirements of the following standards:			
Description	**General Standard**	**Referenced Standard**	**Status**
Radiated Emissions	FCC/CFR 47:Part 15 315.247, 15.209 and 15.207	ANSI C63.10:2013	Pass
Conducted Emissions			Pass

Note:

- The highest internal operating frequency declared by the manufacturer is 2476.56 MHz.

3.0 EQUIPMENT AND TEST DETAILS

3.1 General

Product (EUT):	Model:	Serial Number:
Airspan ATG RU	ATG-402-00-922	UKWK291HAPPY

Sample Build:	Production Sample
EUT Power:	48V DC
Alternate Models:	Not Applicable
EUT Manufacturer:	Airspan Communications Limited
Customer Name:	Airspan Communications Limited
Customer Address:	Capital Point
	33 Bath Road
	Slough
	Berkshire
	SL1 3UF
	United Kingdom
Test Commissioned By:	Charlie Blackham, Sulis Consultants Limited
Date EUT Received:	29th September 2021
Test Date(s):	29th September to the 1st October 2021
EMC Measurement Site:	Eurofins E&E Hursley Limited
	Trafalgar Close, Chandlers Ford, Hampshire, United Kingdom
Product Category:	IT and Multimedia Electrical Equipment

3.2 EUT Description

The EUT is an outdoor mounted Air-To-Ground Radio Unit (ATG RU). Provides 5GNR radio communications in the unlicensed 2.4 GHz band.

3.3 Support Equipment

Description	Manufacturer	Model	Serial Number
Not Applicable	Not Applicable	Not Applicable	Not Applicable

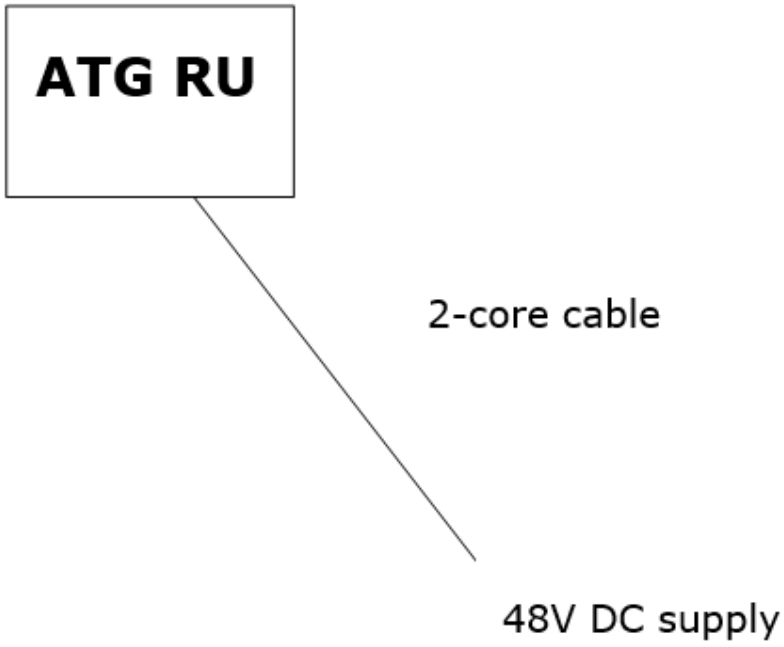
3.4 EUT Test Exerciser

Operating mode:

- All antenna ports set to transmit at their maximum transmit power.
- All antenna ports terminated with 50 Ω.

3.5 EUT Test Configuration #1

The ATG RU was configured as follows with all antenna ports terminated with 50 ohms.



3.6 Operating Modes

The EUT supports operation with the following modulation rates:

- QPSK
- 16QAM
- 64QAM

The EUT was tested in the following channel configurations:

- Single 2.88 MHz channel (0001)
- Single 50 MHz channel (50 MHz)
- Dual 2.88 MHz channels (0xnnnnn, where “nnnnn” denotes the power pooling combination as per Operational Description)

4.0 TEST RESULTS

4.1 Radiated Emissions (worst-case)

4.1.1 Test Parameters

A profile scan was taken using an EMI receiver at a distance of three metres on eight azimuths of the EUT in both the vertical and horizontal polarisation of the field in a semi-anechoic chamber.

Using the pre-scan results as a guide, each emission from the EUT was maximised. Measurements were carried out at a distance of three metres using the specified detector in a CISPR 16-1-4 compliant semi-anechoic chamber. Cable positions were then finally adjusted to produce the maximum emission levels. The worst-case results are reported below.

Test Equipment						
#ID	CP	Manufacturer	Type	Serial Number	Description	Calibration Due Date
750	1	Global	CISPR16	1	11 x 7 x 6.2m, chamber	11/11/2021
456	1	Rohde & Schwarz	ESCI7	1144573407		27/08/2022
877	1	Huber & Suhner	SUCOTEST_18A	602608/18A	ST_18A/Nm/Nm/3m	19/04/2022
762	3	Schwarzbeck	VULB9162	129	30-7000MHz	04/03/2024
778	1	IntelliConnect	0	I5071	Cable, long N-SMA 18GHz (yellow)	09/11/2021
651	1	Rohde & Schwarz	ESIB 40 no.2	100262	40GHz receiver	01/12/2021
676	3	Schwarzbeck	BBHA 9120 C	576	2-18GHz Horn	20/05/2024
399	3	Q-par Angus	WBH18-40k	10300	18 to 40GHz Horn	18/06/2022
073	3	Schwarzbeck	BBHA9120B	237	Horn antenna (1-10GHz)	20/05/2024
053	1	HP	8449B	3008A01394	Pre-amplifier (1.0-26.5GHz) (with #516)	15/10/2021
340	1	Sucoflex with #053 Pre-amplifier	104	0	26.5GHz	22/10/2021
Test Equipment Software						
#ID	CP	Manufacturer	Type		Description	Calibration Due Date
856	0	Rohde & Schwarz	Software	0	EMC32 v10.50.10	Not required

Environmental Test Conditions	
Temperature	22 to 22.4º Celsius
Relative Humidity	37 to 54%
Atmospheric Pressure	1010.3 to 1025.3 millibars
Test Dates:	28th, 29th July, 29th, 30th September and 1st October 2021
Test Engineer:	Malcolm Musgrave

Note: “Calibration due date” means the instrument is certified within UKAS or traceable calibration certificate. “Internal” means the instrument is calibrated using Eurofins Hursley procedures. “Not required” means the asset does not require calibration. “CP” is the interval period [year] prescribed for external calibration.

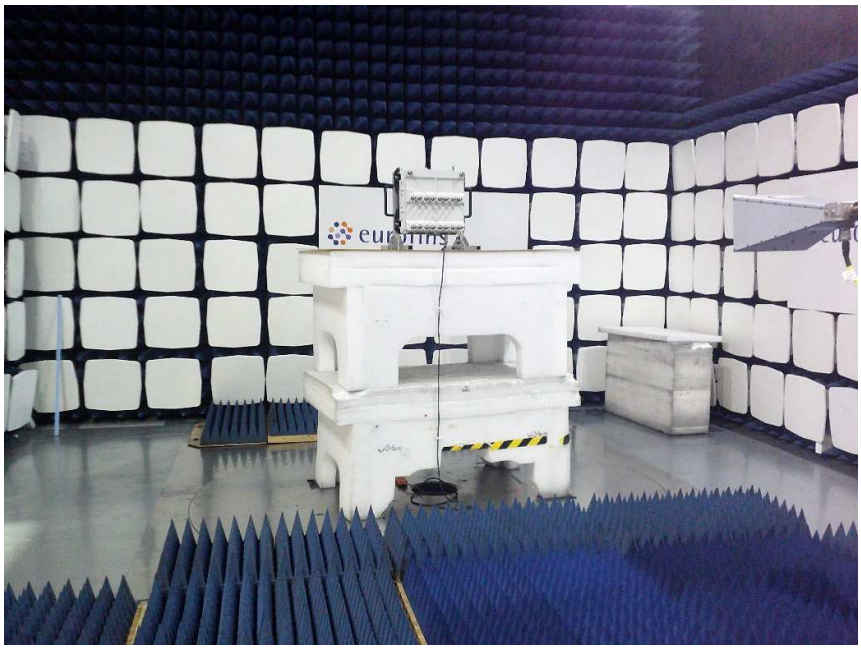
4.1.2 Test Configuration

Please refer to EUT Test Configuration #1.

4.1.3 Set-up Photos

Radiated Emissions; Below 1GHz

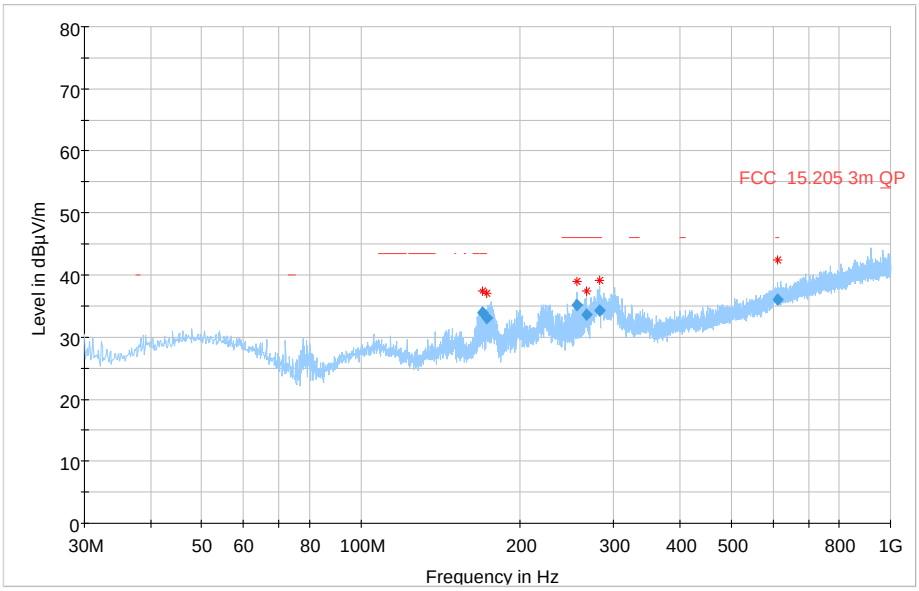
Radiated Emissions; Above 1GHz



4.1.4 Profile; 30MHz to 1GHz, 50MHz QPSK

Maximum peak hold trace with quasi-peak values (◆)
Peak measurements (✳)

30MHz to 1GHz, 50MHz QPSK



4.1.5 Data; 30MHz to 1GHz, 50MHz QPSK

Emission Frequency	Measured Quasi-Peak Value	Class A Specified Quasi-Peak Limit	Pass Margin	Antenna Polarisation	Antenna Height	Turntable Azimuth	
MHz	dBµV/m	dBµV/m	dB	H/V	cm	deg	Status
169.273545	33.92	43.50	9.58	V	109.0	276.0	Pass
172.434235	33.02	43.50	10.48	H	125.0	179.0	Pass
256.356890	35.21	46.00	10.79	H	105.0	207.0	Pass
266.978285	33.51	46.00	12.49	H	109.0	101.0	Pass
282.231800	34.24	46.00	11.77	H	115.0	226.0	Pass
612.565720	35.93	46.00	10.07	V	160.0	311.0	Pass

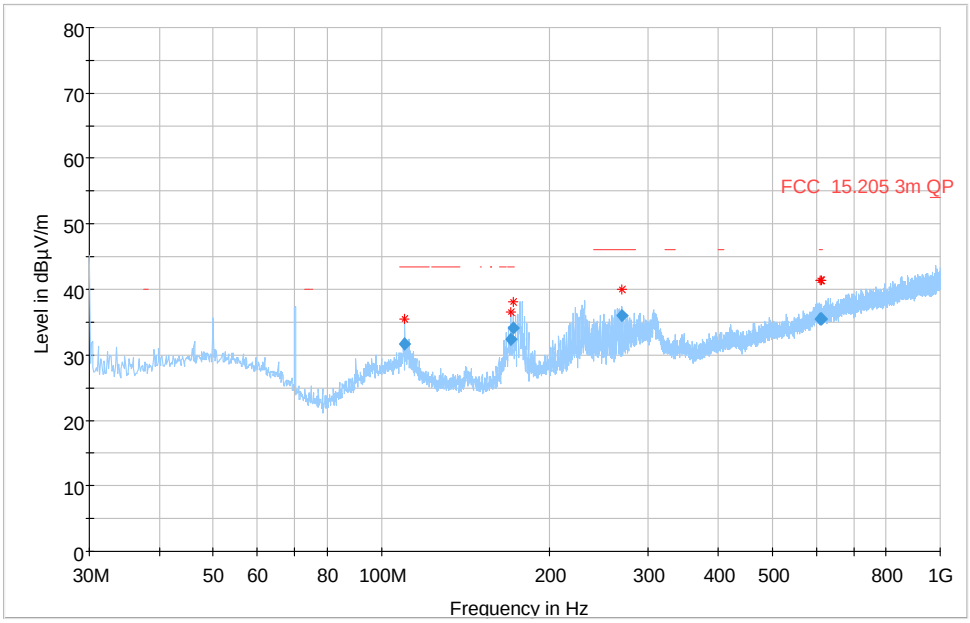
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the CISPR Class A limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: Path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.6 Profile; 30MHz to 1GHz, 50MHz QPSK Final

Maximum peak hold trace with quasi-peak values (◆)
Peak measurements (✳)

30MHz to 1GHz, 50MHz QPSK Final



4.1.7 Data; 30MHz to 1GHz, 50MHz QPSK Final

Emission Frequency	Measured Quasi-Peak Value	Class A Specified Quasi-Peak Limit	Pass Margin	Antenna Polarisation	Antenna Height	Turntable Azimuth	
MHz	dBµV/m	dBµV/m	dB	H/V	cm	deg	Status
109.993095	31.77	43.50	11.73	V	152.0	25.0	Pass
170.390535	32.39	43.50	11.11	H	169.0	71.0	Pass
172.040075	34.20	43.50	9.30	H	115.0	73.0	Pass
269.425340	36.08	46.00	9.92	H	105.0	285.0	Pass
608.381145	35.47	46.00	10.53	V	159.0	258.0	Pass
612.174740	35.44	46.00	10.56	H	295.0	129.0	Pass

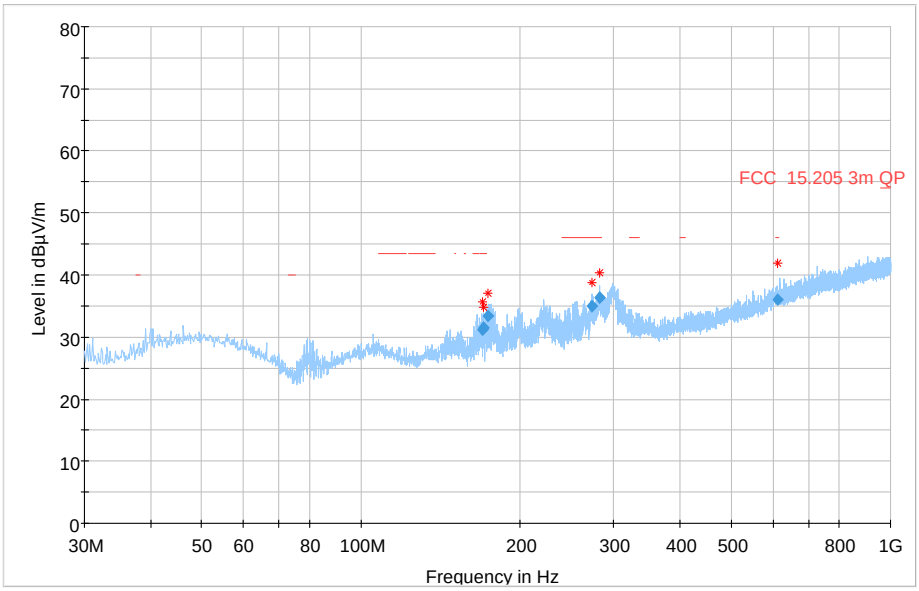
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the CISPR Class A limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: Path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.8 Profile; 30MHz to 1GHz, 10040 Dual CH QPSK

Maximum peak hold trace with quasi-peak values (◆)
Peak measurements (✳)

30MHz to 1GHz, 10040 Dual CH QPSK



4.1.9 Data; 30MHz to 1GHz, 10040 Dual CH QPSK

Emission Frequency	Measured Quasi-Peak Value	Class A Specified Quasi-Peak Limit	Pass Margin	Antenna Polarisation	Antenna Height	Turntable Azimuth	
MHz	dBµV/m	dBµV/m	dB	H/V	cm	deg	Status
169.236115	31.19	43.50	12.31	V	105.0	242.0	Pass
170.009625	31.52	43.50	11.98	V	105.0	281.0	Pass
173.229490	33.39	---	---	H	125.0	187.0	Pass
273.518285	34.95	46.00	11.05	H	108.0	211.0	Pass
282.412905	36.32	46.00	9.68	H	112.0	226.0	Pass
611.167465	35.95	46.00	10.05	V	195.0	210.0	Pass

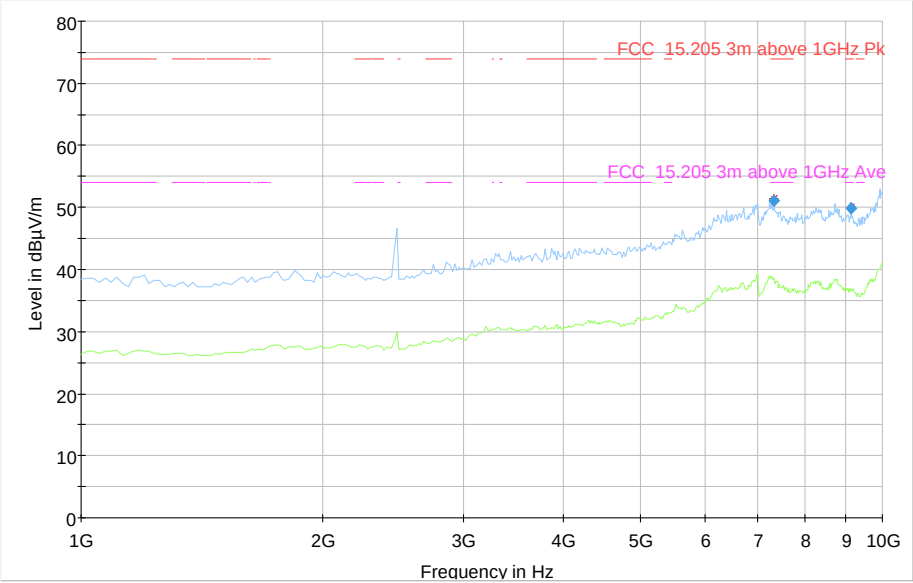
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the CISPR Class A limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: Path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.10 Profile; 1 to 10GHz, 0001 QPSK

Maximum peak hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

1 to 10GHz, 0001 QPSK



4.1.11 Data; 1 to 10GHz, 0001 QPSK

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
7330.661323	51.10	---	74.00	22.90	115.0	V	261.0	4.5	Pass
9134.268537	49.85	---	74.00	24.15	319.0	H	243.0	2.9	Pass

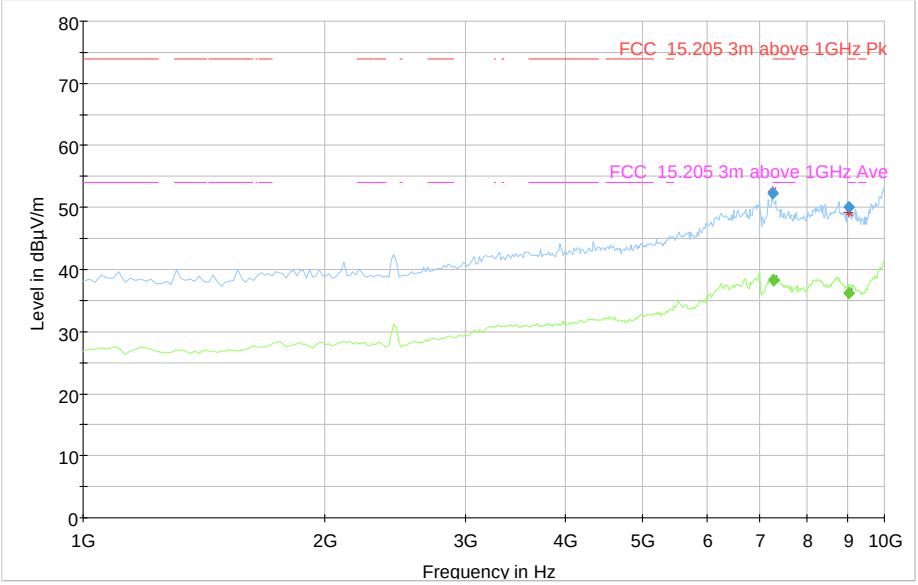
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the CISPR Class A limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.12 Profile; 1 to 10GHz, 50MHz QPSK

Maximum peak hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

1 to 10GHz, 50MHz QPSK



4.1.13 Data; 1 to 10GHz, 50MHz QPSK

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
7258.517034	52.22	---	74.00	21.78	363.0	H	260.0	5.0	Pass
7276.553106	---	38.35	54.00	15.65	264.0	V	136.0	4.9	Pass
9026.052104	50.05	---	74.00	23.95	330.0	V	102.0	3.1	Pass
9044.088176	---	36.28	54.00	17.72	181.0	V	239.0	3.0	Pass

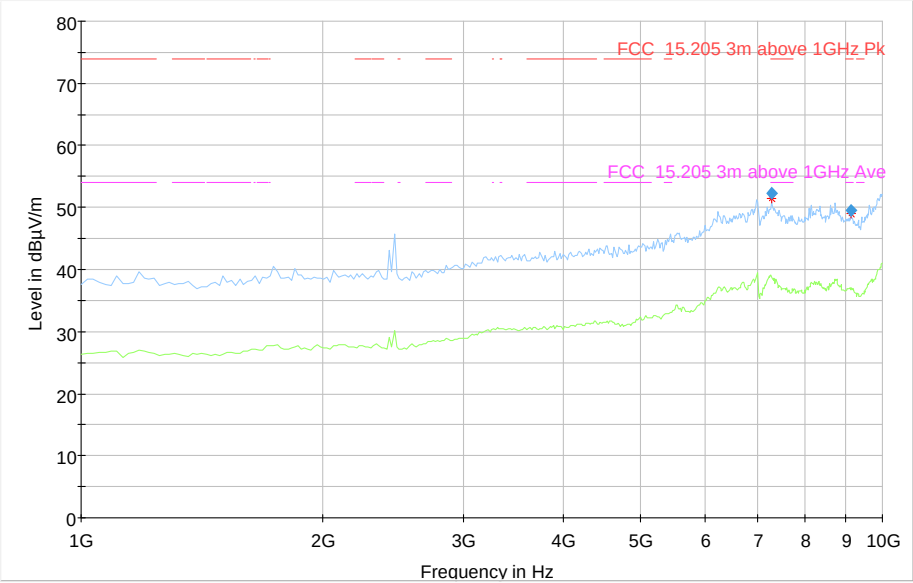
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the CISPR Class A limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.14 Profile; 1 to 10GHz, 10040 Dual CH 64QAM

Maximum peak hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

1 to 10GHz, 10040 Dual CH 64QAM



4.1.15 Data; 1 to 10GHz, 10040 Dual CH 64QAM

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
7276.553106	52.31	---	74.00	21.69	266.0	V	167.0	4.9	Pass
9134.268537	49.49	---	74.00	24.51	284.0	H	177.0	2.9	Pass

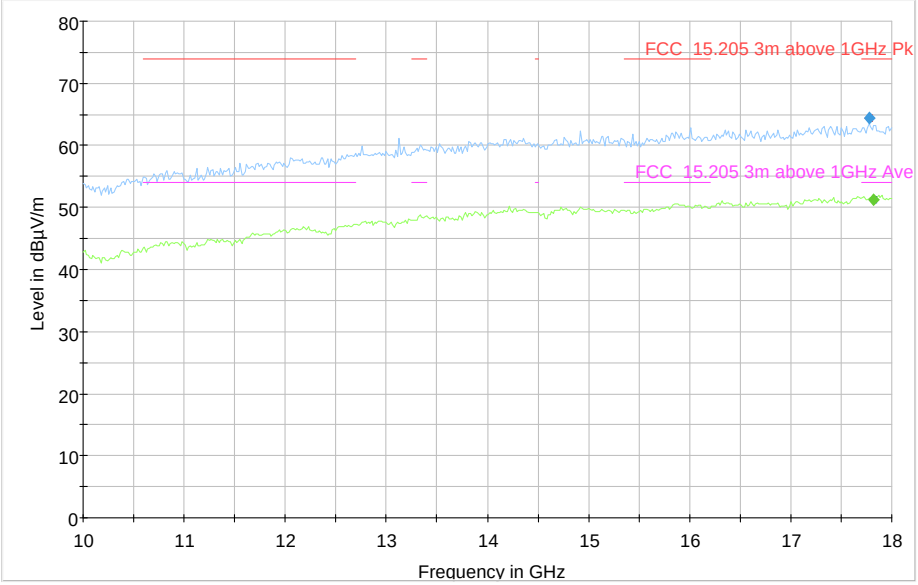
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the CISPR Class A limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.16 Profile; 10 to 18GHz, 0001 QPSK

Maximum peak hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

10 to 18GHz, 0001 QPSK



4.1.17 Data; 10 to 18GHz, 0001 QPSK

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
17775.55110	64.45	---	74.00	9.55	100.0	V	164.0	19.2	Pass
17823.64729	---	51.19	54.00	2.81	132.0	V	36.0	19.3	Pass

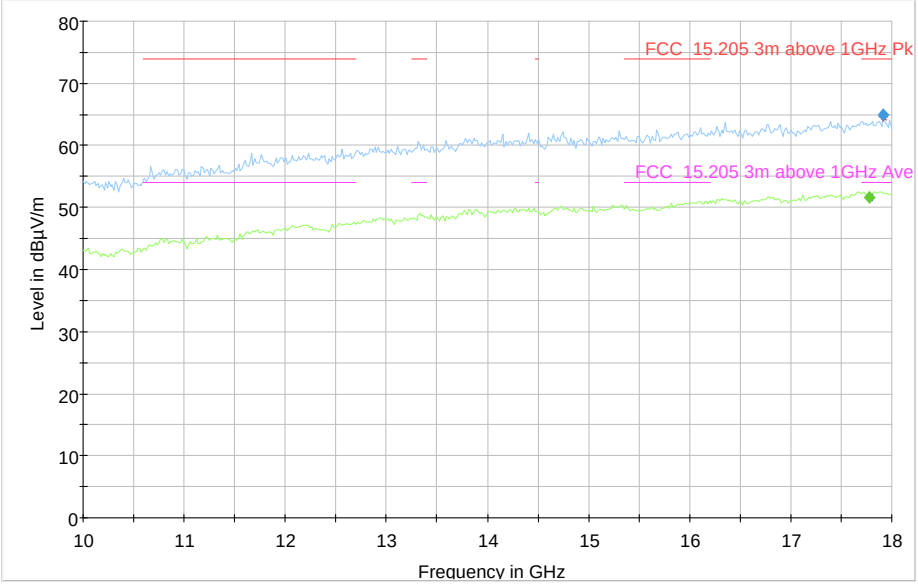
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the CISPR Class A limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.18 Profile; 10 to 18GHz, 50MHz QPSK

Maximum peak hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

10 to 18GHz, 50MHz QPSK



4.1.19 Data; 10 to 18GHz, 50MHz QPSK

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
17775.55110	---	51.61	54.00	2.39	239.0	V	0.0	19.2	Pass
17919.83967	64.95	---	74.00	9.05	180.0	H	354.0	19.3	Pass

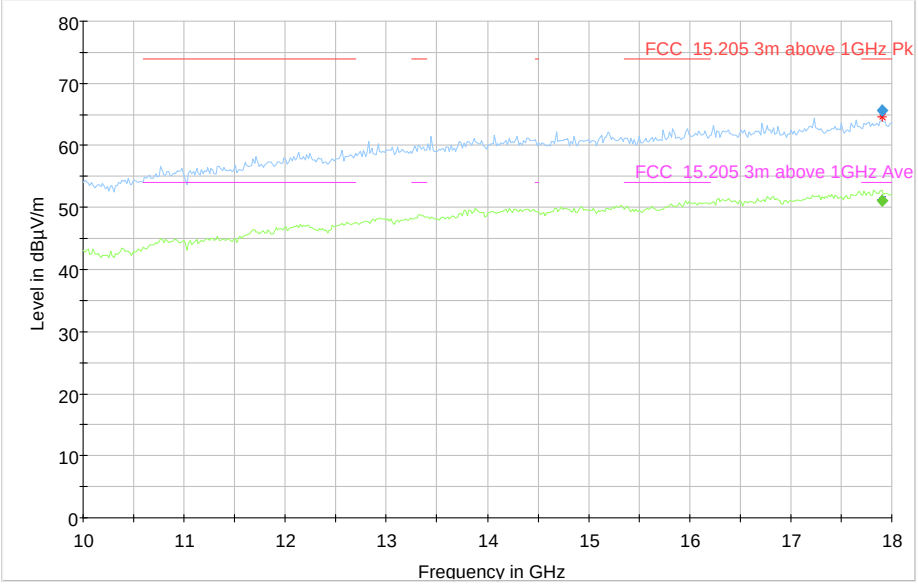
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the CISPR Class A limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.20 Profile; 10 to 18GHz, 10040 Dual CH QPSK

Maximum peak hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

10 to 18GHz, 10040 Dual CH QPSK



4.1.21 Data; 10 to 18GHz, 10040 Dual CH QPSK

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
17903.80761	---	51.14	54.00	2.86	242.0	H	194.0	19.3	Pass
17903.80761	65.70	---	74.00	8.30	208.0	V	245.0	19.3	Pass

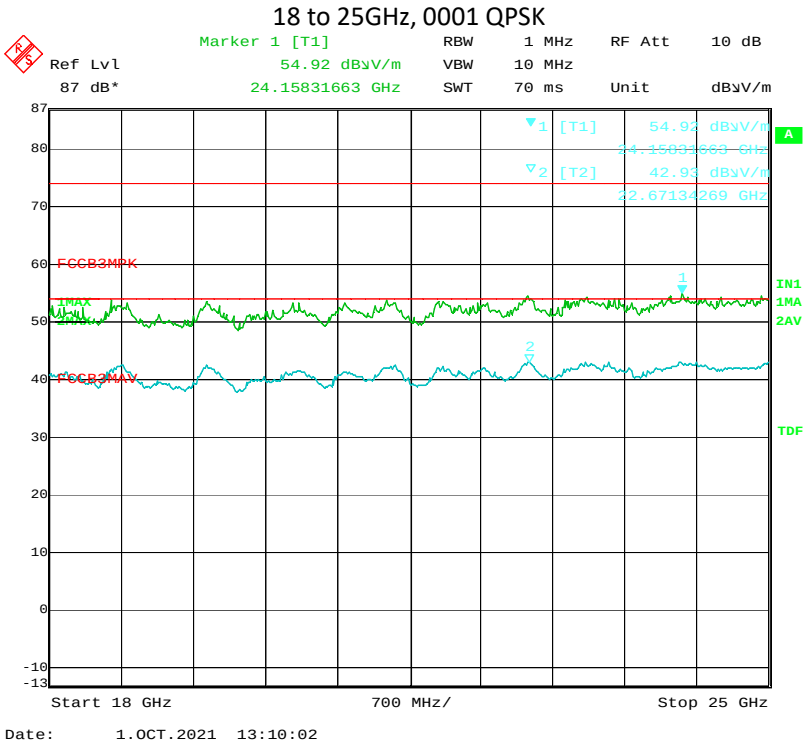
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the CISPR Class A limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.22 Profile; 18 to 25GHz, 0001 QPSK

Maximum hold trace with peak values (▽)

Maximum hold trace with average values (▼)



4.1.23 Data; 18 to 25GHz, 0001 QPSK

No measurements were taken based on the max peak data values high margins relative to the limit lines.

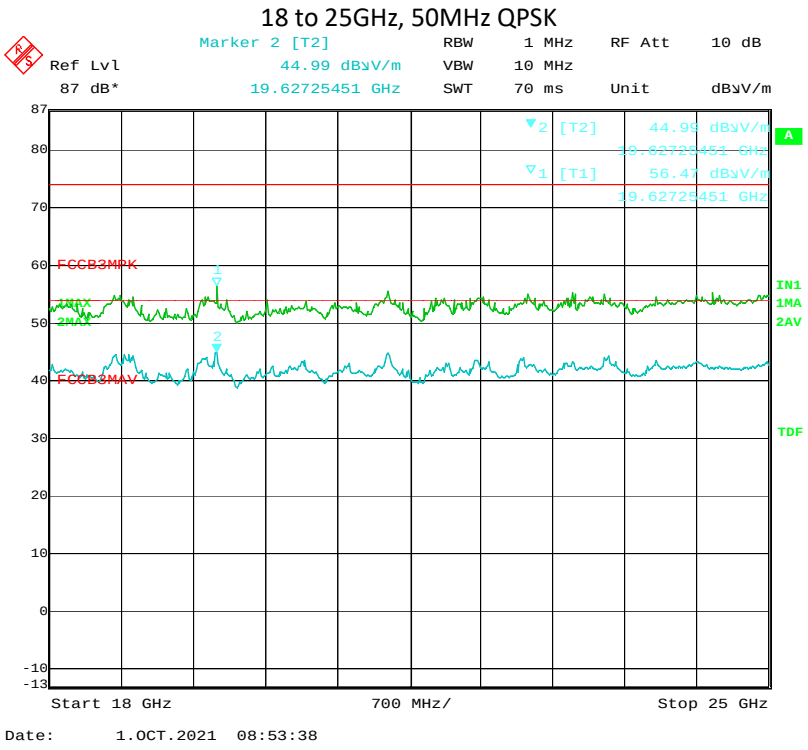
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the CISPR Class A limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.24 Profile; 18 to 25GHz, 50MHz QPSK

Maximum hold trace with peak values (▽)

Maximum hold trace with average values (▼)



4.1.25 Data; 18 to 25GHz, 50MHz QPSK

No measurements were taken based on the max peak data values high margins relative to the limit lines.

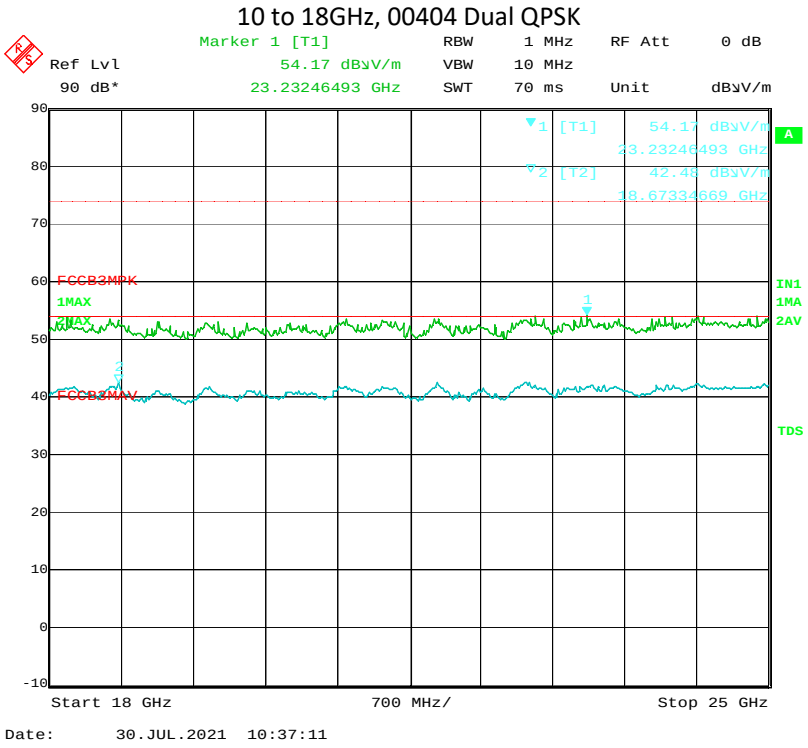
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the CISPR Class A limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.26 Profile; 10 to 18GHz, 00404 Dual QPSK

Maximum hold trace with peak values (▽)

Maximum hold trace with average values (▼)



4.1.27 Data; 18 to 25GHz, 00404 Dual QPSK

No measurements were taken based on the max peak data values high margins relative to the limit lines.

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the CISPR Class A limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.2 Conducted Emissions

4.2.1 Test Parameters

A filtered supply was fed to the EUT via a 50Ω/50µH Artificial Mains Network (AMN). The AMN was bonded to a conductive ground plane. Line and neutral phases were measured separately.

An EMI receiver was set to scan between 0.15MHz and 30.0MHz with a 20s measurement time. A CISPR Average and Quasi-Peak trace was generated and compared to the limits and take into account the correction factor. Measurements made according to the test standard and Eurofins Hursley test procedure CON-02.

Test Equipment						
#ID	CP	Manufacturer	Type	Serial Number	Description	Calibration Due Date
679	2	Gauss	TDEIM30M	1510003	30MHz TD receiver	16/04/2023
787	0	0	Ground plane	0	Ground plane work area	Not required
252	1	Rohde & Schwarz	ESH 3 Z2	08970	10dB pulse limiter	28/05/2022
162	1	Rohde & Schwarz	ESH3 Z5	829996/003	Single phase LISN / AMN ANSI&CISPR	02/12/2021
126	0	Schaffner	NSG1007	55090	Power source (5kW)	Not required
Test Equipment Software						
#ID	CP	Manufacturer	Type		Description	Calibration Due Date
857	0	Gauss	Software	0	TDMI 30 v5.00	Not required

Environmental Test Conditions	
Temperature	24º Celsius
Relative Humidity	48%
Atmospheric Pressure	1006.6millibars
Test Date:	30th July 2021
Test Engineer:	Malcolm Musgrave

Note: “Calibration due date” means the instrument is certified within UKAS or traceable calibration certificate. “Internal” means the instrument is calibrated using Eurofins Hursley procedures. “Not required” means the asset does not require calibration. “CP” is the interval period [year] prescribed for external calibration.

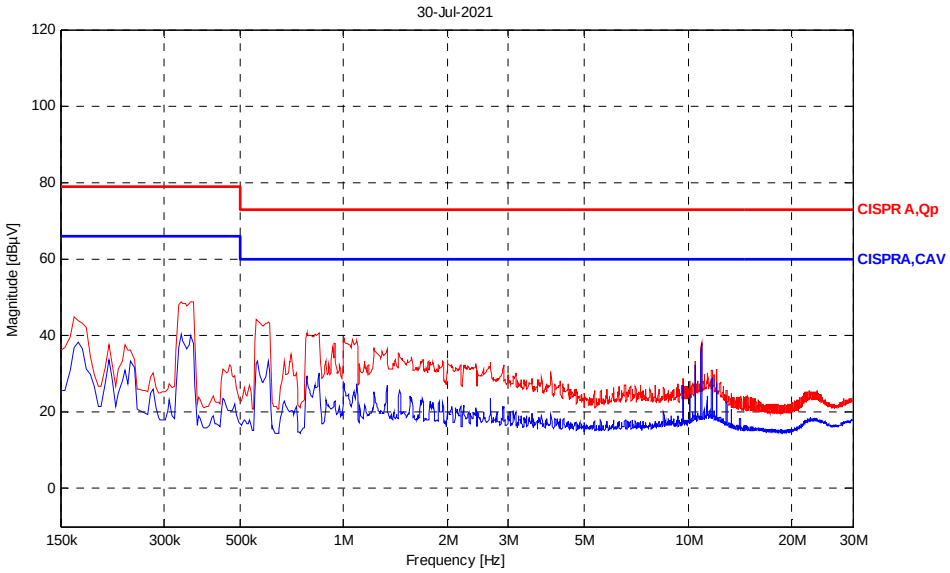
4.2.2 Test Configuration

Please refer to EUT Test Configuration #1.

4.2.3 Set-up Photos

Conducted Emissions

4.2.4 Profile; Mains Neutral, 50MHz CH QPSK



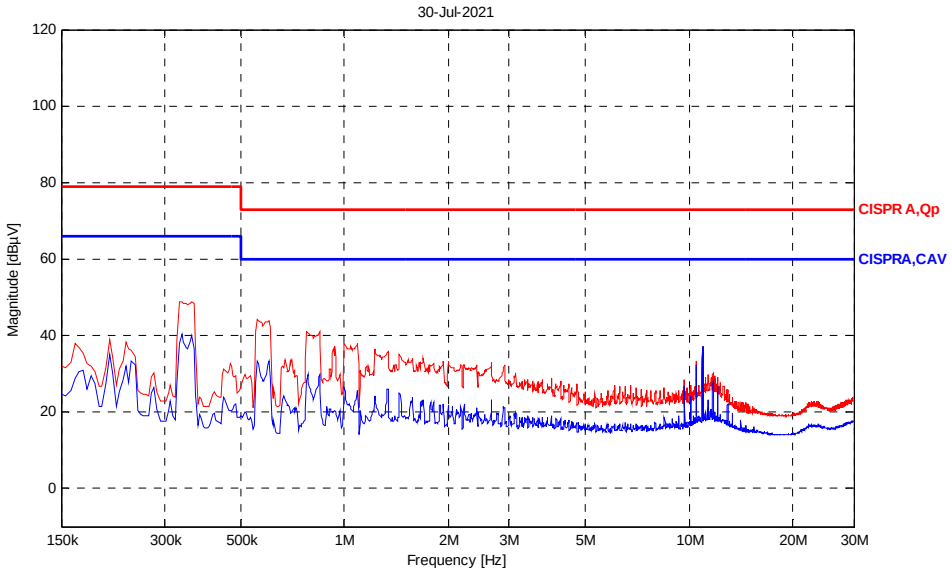
4.2.5 Data; Mains Neutral, 50MHz CH QPSK

Quasi-peak value (dBµV)				
Frequency	**Measured**	**Limit**	**Margin**	**Status**
555.515 kHz	44.17	73.00	28.83	Pass
9.701 MHz	28.67	73.00	44.33	Pass
10.912 MHz	38.12	73.00	34.88	Pass
15.090 MHz	23.98	73.00	49.02	Pass
23.658 MHz	25.61	73.00	47.39	Pass
29.595 MHz	23.58	73.00	49.42	Pass

CISPR Average value (dBµV)				
Frequency	**Measured**	**Limit**	**Margin**	**Status**
336.170 kHz	40.29	66.00	25.71	Pass
9.701 MHz	26.81	60.00	33.19	Pass
10.912 MHz	37.79	60.00	22.21	Pass
15.361 MHz	16.27	60.00	43.73	Pass
22.552 MHz	18.43	60.00	41.57	Pass
29.857 MHz	17.85	60.00	42.15	Pass

The measured value takes into account the correction factor.
Correction factor (dB) = cable, AMN, and pulse limiter losses as summed positive values (dB)
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).

4.2.6 Profile; Mains Line, 50MHz CH QPSK



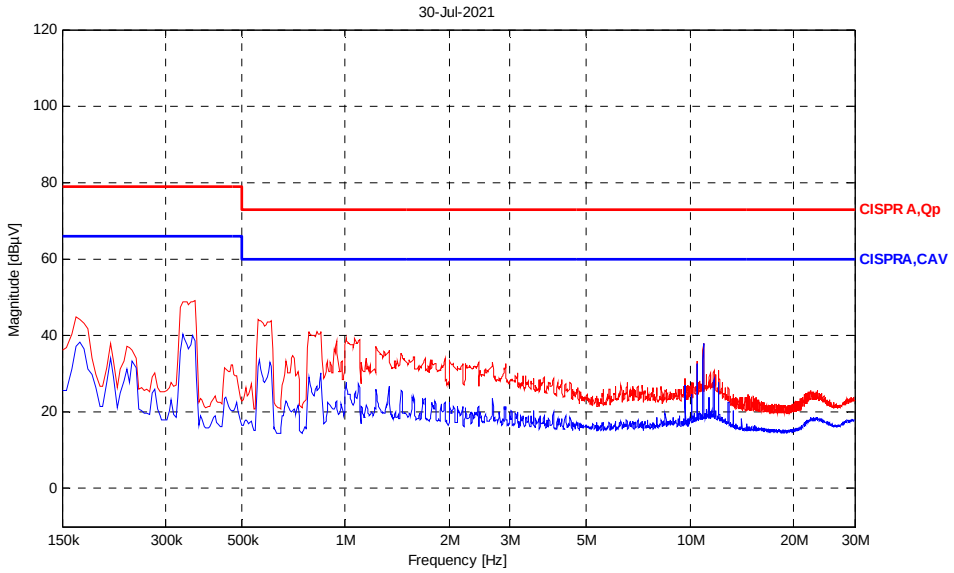
4.2.7 Data; Mains Line, 50MHz CH QPSK

Quasi-peak value (dBµV)				
Frequency	**Measured**	**Limit**	**Margin**	**Status**
555.515 kHz	44.07	73.00	28.93	Pass
9.701 MHz	28.46	73.00	44.54	Pass
10.917 MHz	36.96	73.00	36.04	Pass
15.218 MHz	21.41	73.00	51.59	Pass
23.611 MHz	22.88	73.00	50.12	Pass
29.933 MHz	23.82	73.00	49.18	Pass

CISPR Average value (dBµV)				
Frequency	**Measured**	**Limit**	**Margin**	**Status**
336.170 kHz	40.39	66.00	25.61	Pass
9.706 MHz	26.59	60.00	33.41	Pass
10.917 MHz	37.02	60.00	22.98	Pass
15.366 MHz	15.99	60.00	44.01	Pass
22.624 MHz	16.69	60.00	43.31	Pass
29.933 MHz	17.63	60.00	42.37	Pass

The measured value takes into account the correction factor.
Correction factor (dB) = cable, AMN, and pulse limiter losses as summed positive values (dB)
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).

4.2.8 Profile; Mains Neutral, Dual CH 64QAM 10040



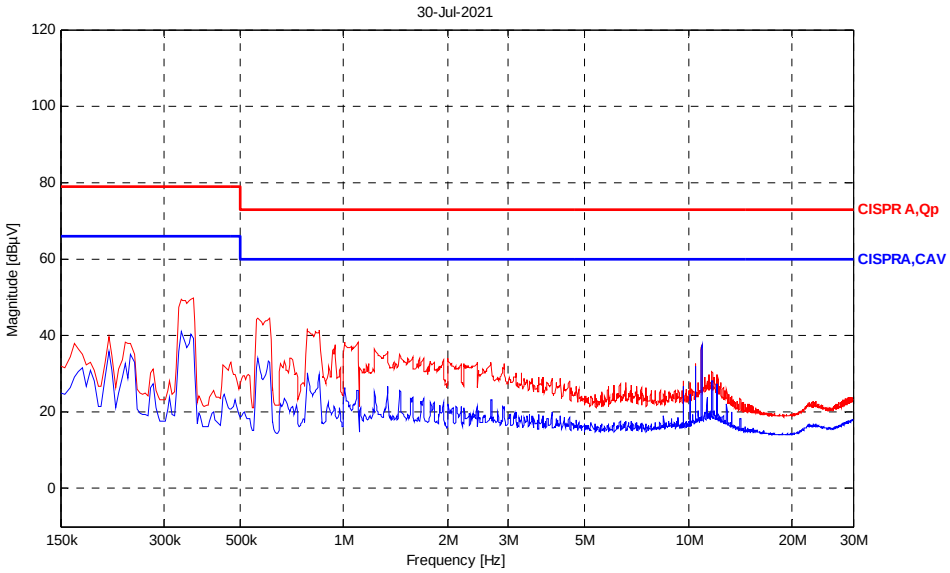
4.2.9 Data; Mains Neutral, Dual CH 64QAM 10040

Quasi-peak value (dBµV)				
Frequency	**Measured**	**Limit**	**Margin**	**Status**
555.515 kHz	44.04	73.00	28.96	Pass
9.701 MHz	28.69	73.00	44.31	Pass
10.912 MHz	37.99	73.00	35.01	Pass
15.228 MHz	24.07	73.00	48.93	Pass
23.448 MHz	25.58	73.00	47.42	Pass
29.399 MHz	23.79	73.00	49.21	Pass

CISPR Average value (dBµV)				
Frequency	**Measured**	**Limit**	**Margin**	**Status**
336.170 kHz	40.43	66.00	25.57	Pass
9.701 MHz	26.83	60.00	33.17	Pass
10.912 MHz	37.81	60.00	22.19	Pass
15.361 MHz	16.62	60.00	43.38	Pass
22.357 MHz	18.56	60.00	41.44	Pass
29.924 MHz	17.98	60.00	42.02	Pass

The measured value takes into account the correction factor.
Correction factor (dB) = cable, AMN, and pulse limiter losses as summed positive values (dB)
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).

4.2.10 Profile; Mains Line, Dual CH 64QAM 10040



4.2.11 Data; Mains Line, Dual CH 64QAM 10040

Quasi-peak value (dBµV)				
Frequency	**Measured**	**Limit**	**Margin**	**Status**
607.967 kHz	44.55	73.00	28.45	Pass
9.701 MHz	28.07	73.00	44.93	Pass
10.912 MHz	37.59	73.00	35.41	Pass
15.132 MHz	21.55	73.00	51.45	Pass
22.986 MHz	22.65	73.00	50.35	Pass
29.933 MHz	23.95	73.00	49.05	Pass

CISPR Average value (dBµV)				
Frequency	**Measured**	**Limit**	**Margin**	**Status**
336.170 kHz	40.82	66.00	25.18	Pass
9.701 MHz	26.45	60.00	33.55	Pass
10.912 MHz	37.54	60.00	22.46	Pass
15.357 MHz	15.76	60.00	44.24	Pass
23.472 MHz	16.71	60.00	43.29	Pass
29.933 MHz	17.90	60.00	42.10	Pass

The measured value takes into account the correction factor.
Correction factor (dB) = cable, AMN, and pulse limiter losses as summed positive values (dB)
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).

5.0 MEASUREMENT UNCERTAINTIES

Emissions tests

For all emissions tests, measurement uncertainties have been calculated in line with the requirements of CISPR 16-4-2 to give a confidence level of greater than 95%. In all cases the laboratories calculated uncertainty values (known as Ulab) are equal to or are less than the expected uncertainty values contained in CISPR 16-4-2 (known as Ucispr). Below is a list of the laboratories calculated measurement uncertainties:

Conducted emissions:

Via AMN/LISN:	±3.27dB (9kHz – 150kHz), ±3.27dB (150kHz – 30MHz)
Via AAN/ISN:	±5.00dB (150kHz – 30MHz)
Via CVP:	±3.47dB (150kHz – 30MHz)
Via CP:	±2.69dB (150kHz – 30MHz)
Via 100 Ω:	±2.68dB (150kHz – 30MHz)
Clicks:	±2.83dB (150kHz – 30MHz)
Harmonics:	±1.42% (100Hz – 2kHz)
Flicker:	±1.76% (worst case for all parameters)

Radiated emissions:

H-Field:	±2.84dB (9kHz – 3MHz), ±2.92dB (3MHz – 30MHz)
D = 3.0 m (Horizontal):	±3.91dB (30MHz – 1GHz SAC), ±3.82dB (30MHz – 1GHz FAC)
D = 3.0 m (Vertical):	±5.22dB (30MHz – 1GHz SAC), ±3.82dB (30MHz – 1GHz FAC)
D = 3.0 m:	±5.13dB (1GHz – 6GHz SAC), ±5.15dB (1GHz – 10GHz SAC), ±3.64dB (10GHz – 18GHz SAC), ±3.10dB (18GHz – 40GHz SAC). ±3.05dB (1GHz – 6GHz FAC)

Immunity tests

For IEC 61000-4-2, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-8, IEC 61000-4-9, IEC 61000-4-11 tests, the following applies:

Measurement uncertainty has been calculated or calibrated for the various required parameters to provide a confidence level of 95% (k=2). These parameters have been compared to the basic standard tolerance requirements for each of the various parameters.
In all cases the calculated or calibrated uncertainty meets the basic standard requirements.

For IEC 61000-4-3, IEC 61000-4-6 tests, the following applies:

Measurement uncertainty has been calculated to provide a confidence level of 95%, or k=2, but this has not been applied to the applied test level, therefore the applied test level has an uncertainty of ±50%. This is in accordance with Cenelec and other international guidance.

Test Results - Decision Rules

As the decision is generally inherent in the standard for Commercial EMC a simple acceptance rule can be applied. The following statement will be added to EMC quotes and reports. "The Decision Rule is applied on the basis of CISPR16-4-2 and/or EN61000-4-x (TR61000-1-6) These standards provide guidance on how to calculate and apply measurement uncertainty whilst providing maximum uncertainties allowance. Due consideration will also be given to JCGM 106:2012, ILAC-G8:09/2019 and LAB 48. This laboratory has demonstrated by calibrating its equipment and facilities, and calculating its own uncertainties, that it complies with the above requirements and therefore no allowance of uncertainties has been given to the tolerances." Where a result is considered marginal in respect of its proximity to the limit line, for example, the customer would be made aware of situation so that they can make an informed decision on how to proceed.

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