TEST REPORT

N°: 174451-771725-A (FILE#2793206) **Version: 02**

Subject	**Electromagnetic compatibility tests according to the standards:** **FCC CFR 47 Part 15, Subpart B.** **ANSI C63.4 (2014)** **ICES-003 Ed7.0 (2020)**
Issued to	**SYCLOPE ELECTRONIQUE** Rue du Bruscos 64230 - SAUVAGNON
Apparatus under test	
↳ Product	Controller for public swimming pool
↳ Trade mark	SYCLOPE ELECTRONIQUE
↳ Manufacturer	SYCLOPE ELECTRONIQUE
↳ Model under test	ODT0000-V2
↳ Serial number	213916402
↳ FCCID	**2AS3B-ODITOUCH**
Conclusion	See Test Program chapter
Test date	October 12, 2021
Test location	LCIE Grenoble
FCC Test site	FR0008 - 197516
ISED Test site	FR0008 - 6500A
Sample receipt date	October 12, 2021
Composition of document	25 pages
Document issued on	March 30, 2022

Written by :
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Anthony MERLIN
Technical manager

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PUBLICATION HISTORY

Version	Date	Author	Modification
01	October 27,2021	Jonathan SARTO	Creation of the document
02	March 30, 2022	Majid MOURZAGH	Correction of applicant mailing

Each new edition of this test report replaces and cancels the previous edition. The control of the old editions of report is under responsibility of client.

SUMMARY

1. TEST PROGRAM

Standard:

- ✓ **FCC Part 15, Subpart B (Digital Devices)**
- ✓ **ANSI C63.4 (2014)**
- ✓ **ICES-003 Ed7.0 (2020)**

Requirements for disturbance emissions – Class B

EMISSION TEST	LIMITS			RESULTS (Comments)
Limits for conducted disturbance 150kHz-30MHz **FCC §15.107**	**Access: AC power**			**PASS**
	Frequency	**Quasi-peak**	**Average**	
	150-500kHz	66 to 56 dBµV	56 to 46 dBµV	
	0.5-5MHz	56 dBµV	46 dBµV	
	5-30MHz	60 dBµV	50 dBµV	
Radiated emissions 30MHz-1GHz **FCC §15.109**	**Access: Enclosure port of ancillary equipment**			**PASS**
	Frequency	**Quasi-peak @10m**		
	30MHz-88MHz	40.0 dBµV/m		
	88MHz-216MHz	43.5 dBµV/m		
	216MHz-960MHz	46.0 dBµV/m		
	Above 960MHz	54.0 dBµV/m		
Radiated emissions 1GHz- 6GHz* **FCC §15.109**	**Access: Enclosure port of ancillary equipment**			**PASS**
	Frequency	**Peak @3m**	**Average @3m**	
	1- 6GHz	74.0 dBµV/m	54.0 dBµV/m	

NA: Not Applicable / NP: Not Performed, not requested by the customer (It cannot be taken into account for the declaration of conformity)
[D]: Divergence, the last version is used to make it possible to test the product with the standard which describes the current state of the art and thus to answer as well as possible his environment of final use.
***§15.33:** The highest internal source of a testing device is defined like more the highest frequency generated or used in the testing device or on which the testing device works or agrees.
- If the highest frequency of the internal sources of the testing device is lower than 108 MHz, measurement must be only performed until 1GHz.
- If the highest frequency of the internal sources of the testing device ranges between 108 MHz and 500 MHz, measurement must be only performed until 2GHz.
- If the highest frequency of the internal sources of the testing device ranges between 500 MHz and 1 GHz, measurement must be only performed until 5GHz.
If the highest frequency of the internal sources of the testing device is above 1 GHz, measurement must be only performed until 5 times the highest frequency or 40 GHz, while taking smallest of both.
Special condition for intentional radiator:

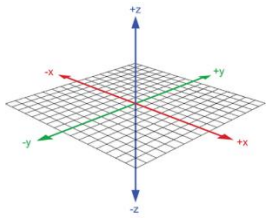
- For a composite system comprised of a digital device using a clock frequency of 1 GHz as the highest frequency for the digital logic and an intentional radiator operating at 2.4 GHz, the composite is required to be investigated to the upper frequency of 24 GHz (in this case, 10 times the intentional radiator frequency is the higher frequency).

- For a composite system comprised of a digital device using a clock frequency of 2 GHz as the highest frequency for the digital logic and an intentional radiator operating at 913 MHz, the composite is required to be investigated to the upper frequency of 10 GHz (in this case, 5 times the unintentional radiator clock frequency is the higher frequency).

2. EQUIPMENT UNDER TEST: CONFIGURATION (DECLARED BY PROVIDER)

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES)

Equipment under test (EUT):

Model under test :	ODT0000-V2
Serial Number:	213916402
	 
Dimensions:	28cm x 22cm x 16cm (Length x Width x Height)
Type :	Panel / Rack / Cabinet (considered like table-top)

Power supply:
During all the tests, EUT is supplied by V_{nom}: **230VAC**
For measurement with different voltage, it will be presented in test method.

Name	Type	Rating	Reference / Sn	Comments
Supply1	AC	90-240V 50/60Hz 6.5A	-	-

NC: Not communicated by provider

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
Supply1	3wires (L+N+PE)	2	No	No	Yes	-
Access1	RS485	5	No	Yes	Yes	-
Access2	RJ45 Ethernet	5	No	Yes	Yes	-
Access3	PI1	5	Yes	No	No	-
Access4	PO1	1	Yes	No	No	-
Access5	AI1	1	Yes	No	No	-
Access6	AI3	1	Yes	No	No	-
Access7	DI3	1	Yes	No	No	-
Access8	USB	-	Yes	Yes	No	Only for maintenance

NC: Not communicated by provider

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
None			

NC: Not communicated by provider

2.2. EUT CONFIGURATION

Hardware information			
Highest internal frequency (PLL, Quartz, Clock, Microprocessor…):	**$F_{Highest}$:**	**216**	**MHz**
Sensitive frequencies: (in addition to stepped frequencies for 61000-4-3 and 61000-4-6)	None declared by provider		
Firmware (if applicable):	**V. :**	2.0	
Software (Top board):	**V. :**	2.0.0	
Software (Bottom board):	**V. :**	1.0.0	

NC: Not communicated by provider

Running mode n°1:

Setup:
EUT is powered and functional without radio communication.

2.3. EQUIPMENT MODIFICATIONS DURING THE TESTS

None

2.4. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follow:

FS = RA + AF + CF – AG

Where *FS = Field Strength*
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Factor
AG = Amplifier Gain

2.5. CALIBRATION DATE

The calibration intervals are extended at 12+1 months. This extended interval is based on the fact that there is sufficient calibration data to statistically establish a trend or based on experience of use of the test equipment to assure good measurement results for a longer period

3. MEASUREMENT OF CONDUCTED EMISSION

3.1. ENVIRONMENTAL CONDITIONS

Date of test	:	October 12, 2021
Test performed by	:	Jonathan SARTO
Atmospheric pressure (hPa)	:	995
Relative humidity (%)	:	42
Ambient temperature (°C)	:	20

3.2. TEST SETUP

Mains terminals

The EUT and auxiliaries are set 80cm above the ground on the non-conducting table (Table-top equipment).
The EUT is powered by V_{nom}.
The EUT is powered through a LISN (measure). Auxiliaries are powered by another LISN.

Test setup

3.3. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
BAT EMC	NEXIO	v3.19.1.23	L1000115		
Cable + self	_	_	A5329578	04/21	04/22
EMC comb generator	LCIE SUD EST	_	A3169098		
LISN	ROHDE & SCHWARZ	ENV216	C2320291	08/21	08/22
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
Transient limiter	ROHDE & SCHWARZ	ESH3-Z2	A7122204	08/20	08/22
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	11/20	11/22

3.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

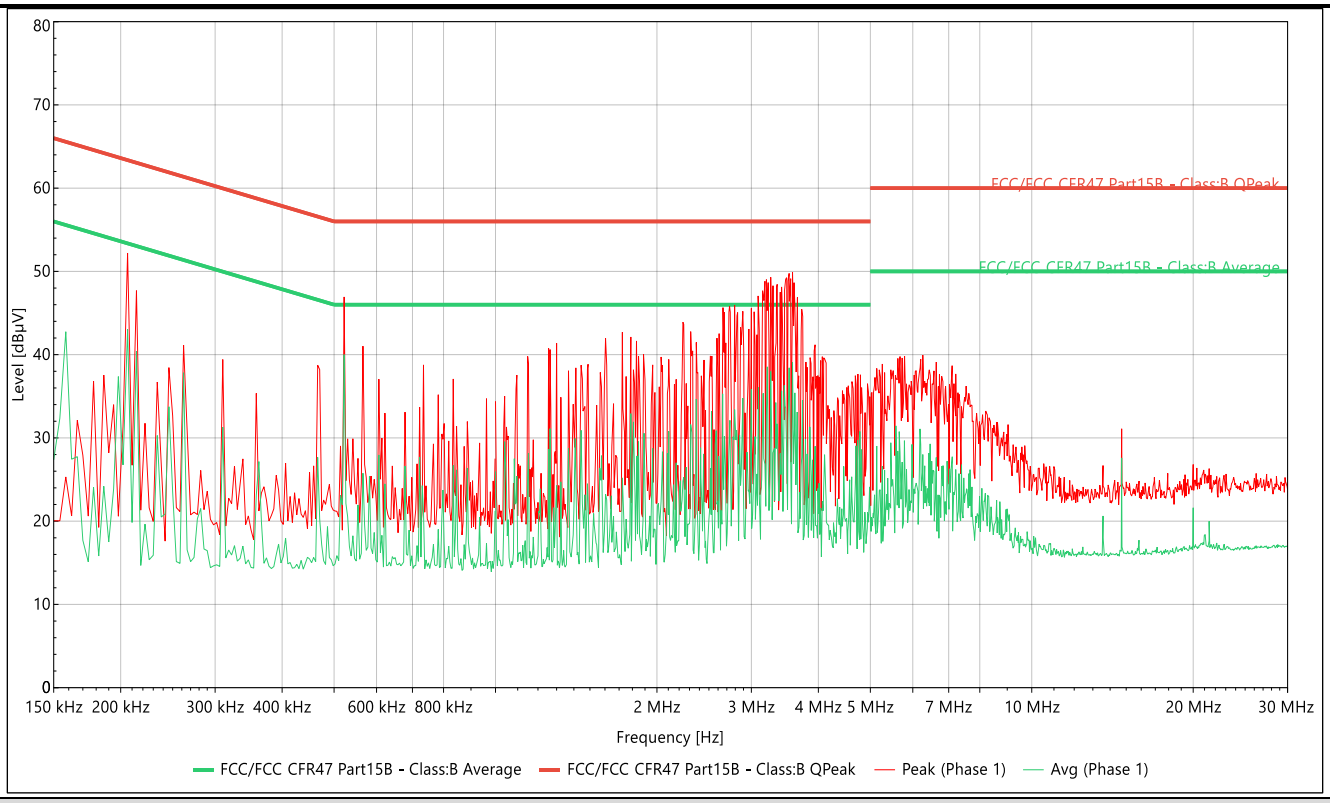
3.5. TEST RESULTS – RUNNING MODE N°1

Mains terminals:

Supply1
Measurements are performed on the phase (L1) and neutral (N) of the power line.
Results: (PEAK detection)

Graph identifier		Line	Comments	
Emc#	1	Phase	120VAC/60Hz	See below
Emc#	2	Neutral	120VAC/60Hz	See below
Emc#	3	Phase	240VAC/50Hz	See below
Emc#	4	Neutral	240VAC/50Hz	See below

CONDUCTED EMISSIONS			
Graph name:	Emc#1	**Test configuration:**	
Limit:	FCC CFR47 Part15B	Running mode 1	
Class:	B		
Frequency range: 150 kHz-30 MHz			
Voltage / Frequency:	120V/60Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



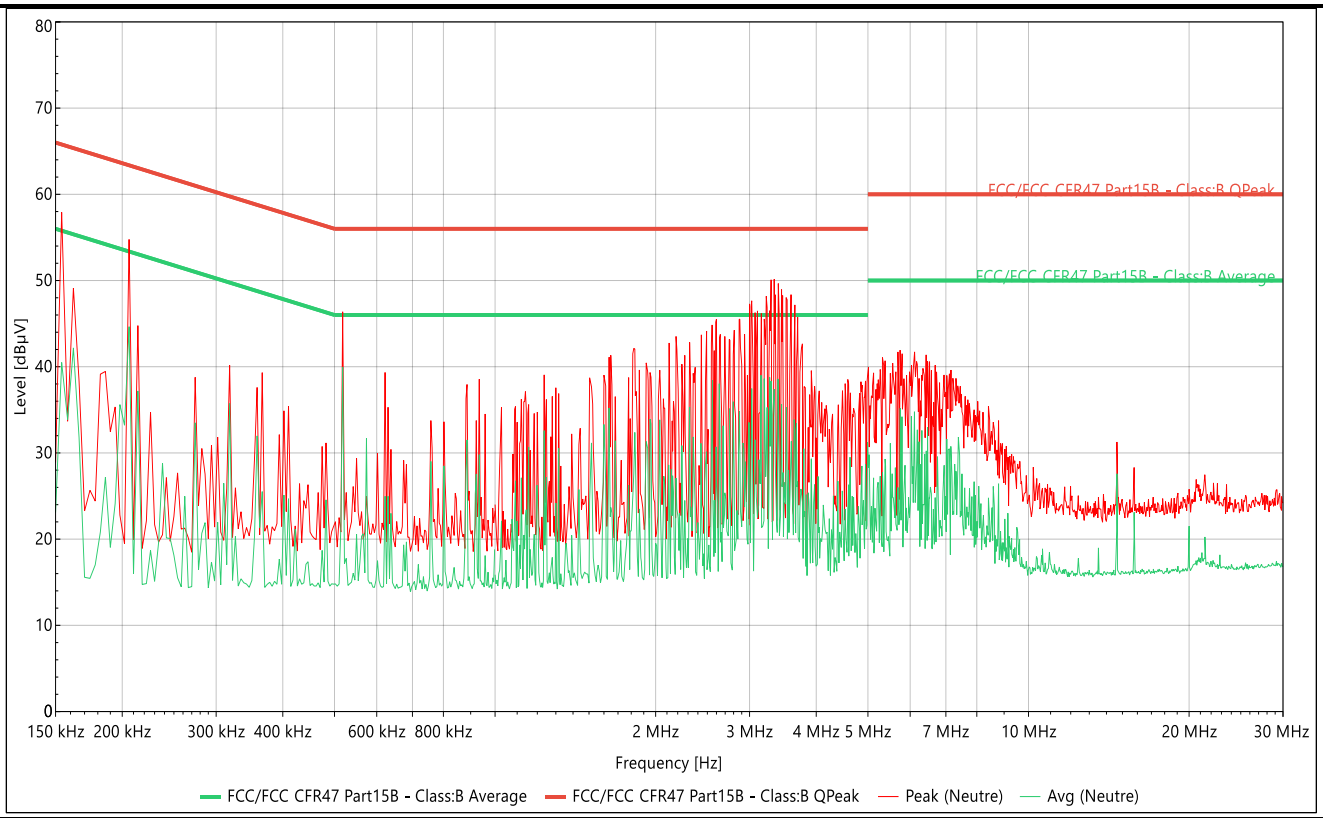
Spurious emissions

Frequency	Level (dBµV)	Limit QPeak (dBµV)	Margin (dB)	Correction (dB)
158 kHz	52,795	65,568	-12,773	19,415
206 kHz	45,572	63,365	-17,793	19,532
262 kHz	41,472	61,368	-19,896	19,452
522 kHz	42,134	56	-13,866	19,534
734 kHz	33,671	56	-22,329	19,491
2,656 MHz	36,073	56	-19,927	19,673
3,26 MHz	39,965	56	-16,035	19,725
3,528 MHz	39,506	56	-16,494	19,746
5,68 MHz	26,178	60	-33,822	19,918
14,712 MHz	17,938	60	-42,062	20,598

Frequency	Level (dBµV)	Limit Average (dBµV)	Margin (dB)	Correction (dB)
158 kHz	43,875	55,568	-11,693	19,415

Frequency	Level (dBµV)	Limit Average (dBµV)	Margin (dB)	Correction (dB)
206 kHz	37,182	53,365	-16,183	19,532
262 kHz	29,162	51,368	-22,206	19,452
522 kHz	32,514	46	-13,486	19,534
734 kHz	21,261	46	-24,739	19,491
2,656 MHz	24,483	46	-21,517	19,673
3,26 MHz	29,175	46	-16,825	19,725
3,528 MHz	26,476	46	-19,524	19,746
5,68 MHz	16,868	50	-33,132	19,918
14,712 MHz	15,068	50	-34,932	20,598

CONDUCTED EMISSIONS			
Graph name:	Emc#2	**Test configuration:**	
Limit:	FCC CFR47 Part15B	Running mode 1	
Class:	B		
Frequency range: 150 kHz-30 MHz			
Voltage / Frequency:	120V/60Hz	**RBW :**	10kHz
Line:	Neutral	**VBW :**	30kHz



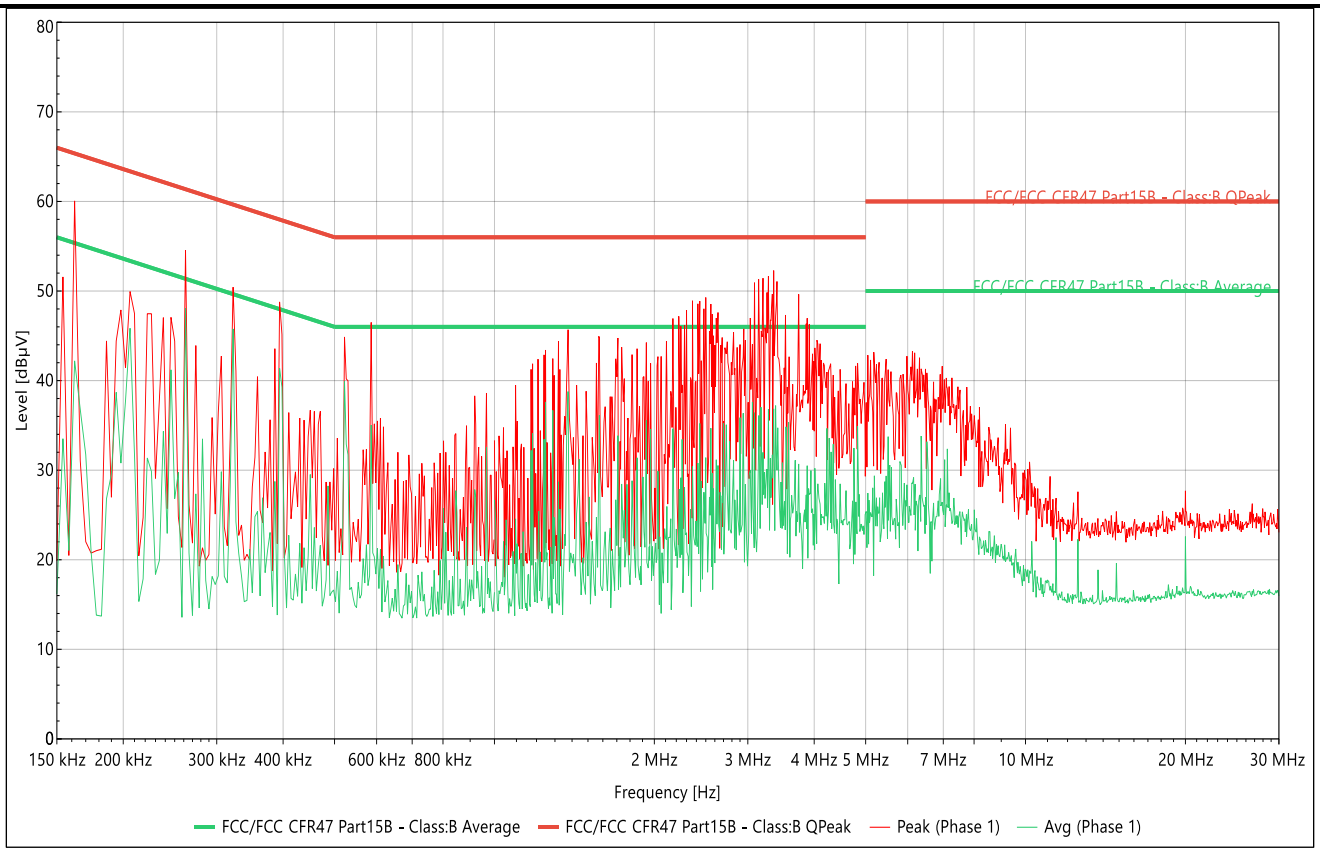
Spurious emissions

Finals

Frequency	Level (dBµV)	Limit QPeak (dBµV)	Margin (dB)	Correction (dB)
154 kHz	53,017	65,781	-12,764	19,397
206 kHz	48,632	63,365	-14,733	19,532
518 kHz	38,415	56	-17,585	19,535
886 kHz	27,928	56	-28,072	19,528
1,82 MHz	27,345	56	-28,655	19,605
2,6 MHz	26,75	56	-29,25	19,67
3,292 MHz	41,307	56	-14,693	19,727
5,744 MHz	31,405	60	-28,595	19,925
14,648 MHz	6,753	60	-53,247	20,593

Frequency	Level (dBµV)	Limit Average (dBµV)	Margin (dB)	Correction (dB)
154 kHz	42,357	55,781	-13,424	19,397
206 kHz	38,432	53,365	-14,933	19,532
518 kHz	28,175	46	-17,825	19,535
886 kHz	19,158	46	-26,842	19,528
1,82 MHz	15,615	46	-30,385	19,605
2,6 MHz	15,57	46	-30,43	19,67
3,292 MHz	29,417	46	-16,583	19,727
5,744 MHz	21,365	50	-28,635	19,925
14,648 MHz	5,423	50	-44,577	20,593

CONDUCTED EMISSIONS			
Graph name:	Emc#3	**Test configuration:**	
Limit:	FCC CFR47 Part15B	Running mode 1	
Class:	B		
Frequency range: 150 kHz-30 MHz			
Voltage / Frequency:	240V/50Hz	**RBW :**	10kHz
Line:	Phase	**VBW :**	30kHz



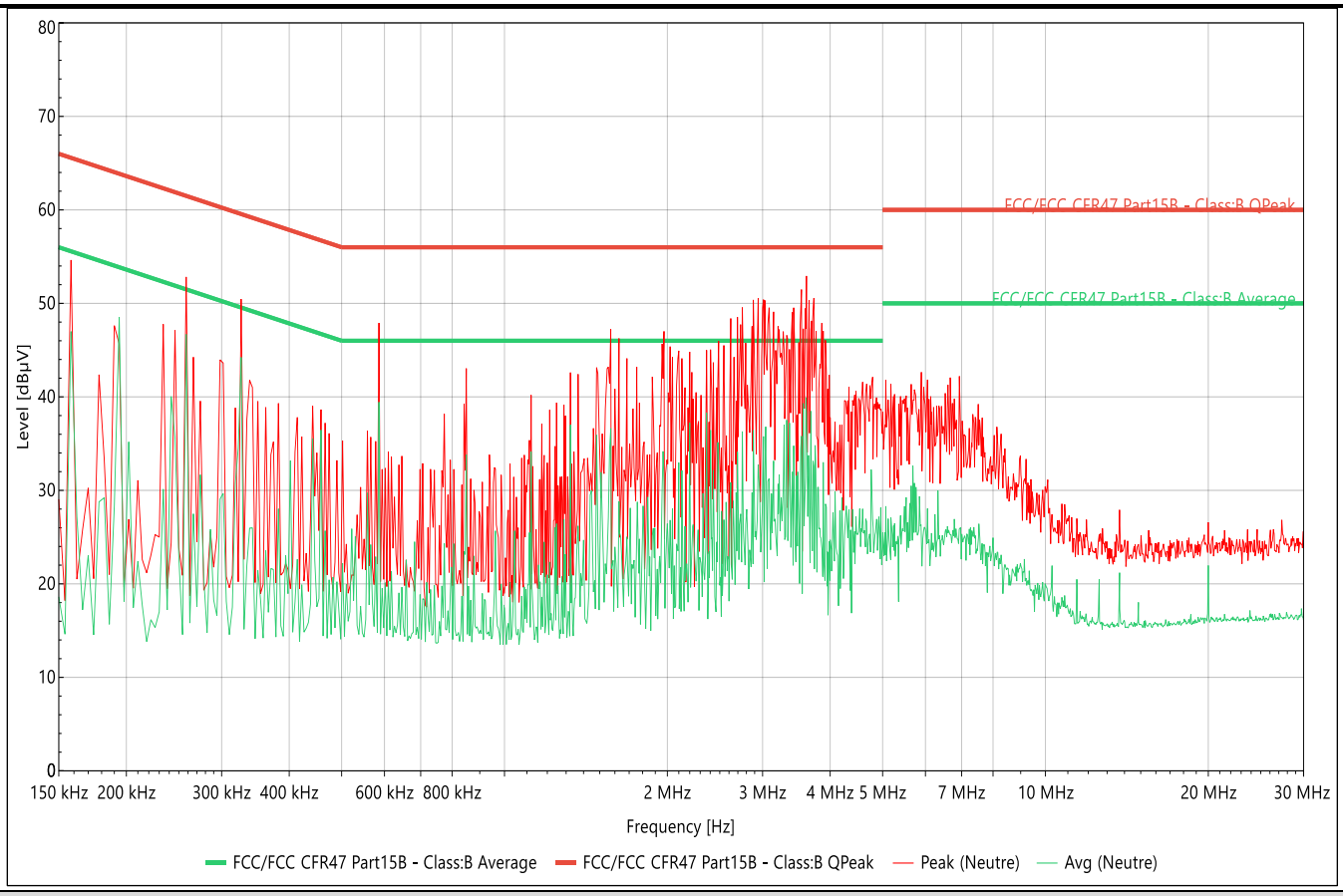
Spurious emissions

Frequency	Level (dBµV)	Limit QPeak (dBµV)	Margin (dB)	Correction (dB)
162 kHz	51,904	65,361	-13,457	19,424
206 kHz	39,212	63,365	-24,153	19,532
262 kHz	47,952	61,368	-13,416	19,452
322 kHz	42,555	59,655	-17,1	19,475
394 kHz	38,908	57,979	-19,071	19,468
522 kHz	41,434	56	-14,566	19,534
586 kHz	36,663	56	-19,337	19,503
1,376 MHz	33,467	56	-22,533	19,567
2,36 MHz	36,055	56	-19,945	19,655
2,5 MHz	33,245	56	-22,755	19,665
3,356 MHz	35,65	56	-20,35	19,73

Frequency	Level (dBµV)	Limit QPeak (dBµV)	Margin (dB)	Correction (dB)
3,74 MHz	37,456	56	-18,544	19,756
5,18 MHz	26,214	60	-33,786	19,874
20 MHz	22,472	60	-37,528	20,972

Frequency	Level (dBµV)	Limit Average (dBµV)	Margin (dB)	Correction (dB)
162 kHz	39,064	55,361	-16,297	19,424
206 kHz	29,262	53,365	-24,103	19,532
262 kHz	34,472	51,368	-16,896	19,452
322 kHz	33,085	49,655	-16,57	19,475
394 kHz	27,738	47,979	-20,241	19,468
522 kHz	30,394	46	-15,606	19,534
586 kHz	24,493	46	-21,507	19,503
1,376 MHz	21,637	46	-24,363	19,567
2,36 MHz	24,885	46	-21,115	19,655
2,5 MHz	21,185	46	-24,815	19,665
3,356 MHz	23,77	46	-22,23	19,73
3,74 MHz	24,616	46	-21,384	19,756
5,18 MHz	17,744	50	-32,256	19,874
20 MHz	21,622	50	-28,378	20,972

CONDUCTED EMISSIONS			
Graph name:	Emc#4	**Test configuration:**	
Limit:	FCC CFR47 Part15B	Running mode 1	
Class:	B		
Frequency range: 150 kHz-30 MHz			
Voltage / Frequency:	240V/50Hz	**RBW :**	10kHz
Line:	Neutral	**VBW :**	30kHz



Spurious emissions

Frequency	Level (dBµV)	Limit QPeak (dBµV)	Margin (dB)	Correction (dB)
158 kHz	48,455	65,568	-17,113	19,415
194 kHz	51,835	63,864	-12,028	19,515
258 kHz	47,148	61,496	-14,347	19,448
325,999 kHz	43,496	59,552	-16,057	19,476
586 kHz	37,823	56	-18,177	19,503
850 kHz	35,123	56	-20,877	19,523
1,572 MHz	37,271	56	-18,729	19,591
1,972 MHz	34,755	56	-21,245	19,615
2,752 MHz	37,179	56	-18,821	19,679
3,028 MHz	31,91	56	-24,09	19,71

Frequency	Level (dBµV)	Limit QPeak (dBµV)	Margin (dB)	Correction (dB)
3,616 MHz	39,111	56	-16,889	19,751
5,648 MHz	27,815	60	-32,185	19,915
19,996 MHz	20,252	60	-39,748	20,972

Frequency	Level (dBµV)	Limit Average (dBµV)	Margin (dB)	Correction (dB)
158 kHz	35,445	55,568	-20,123	19,415
194 kHz	40,635	53,864	-13,228	19,515
258 kHz	34,638	51,496	-16,857	19,448
325,999 kHz	32,046	49,552	-17,507	19,476
586 kHz	24,543	46	-21,457	19,503
850 kHz	22,013	46	-23,987	19,523
1,572 MHz	24,401	46	-21,599	19,591
1,972 MHz	22,035	46	-23,965	19,615
2,752 MHz	24,729	46	-21,271	19,679
3,028 MHz	20,84	46	-25,16	19,71
3,616 MHz	25,931	46	-20,069	19,751
5,648 MHz	19,885	50	-30,115	19,915
19,996 MHz	18,832	50	-31,168	20,972

3.6. CONCLUSION

The sample of the equipment ODT0000-V2, Sn : 213916402, tested in the configuration presented in this test report **satisfies** to requirements of the product family standard applied (See §Test Program) for conducted emissions.

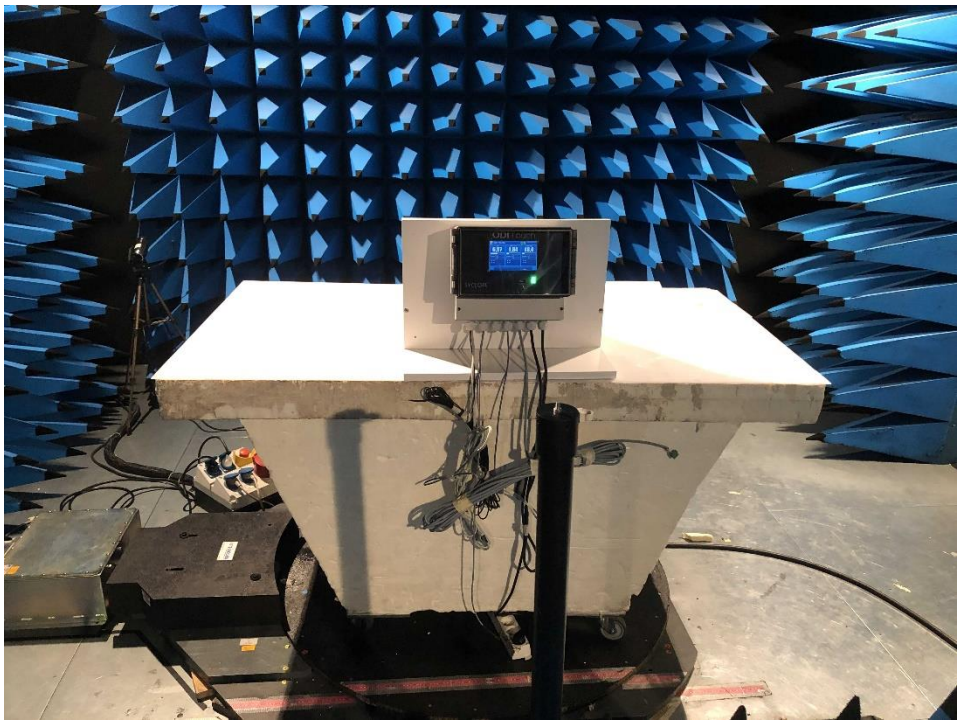
4. MEASUREMENT OF RADIATED EMISSION

4.1. ENVIRONMENTAL CONDITIONS

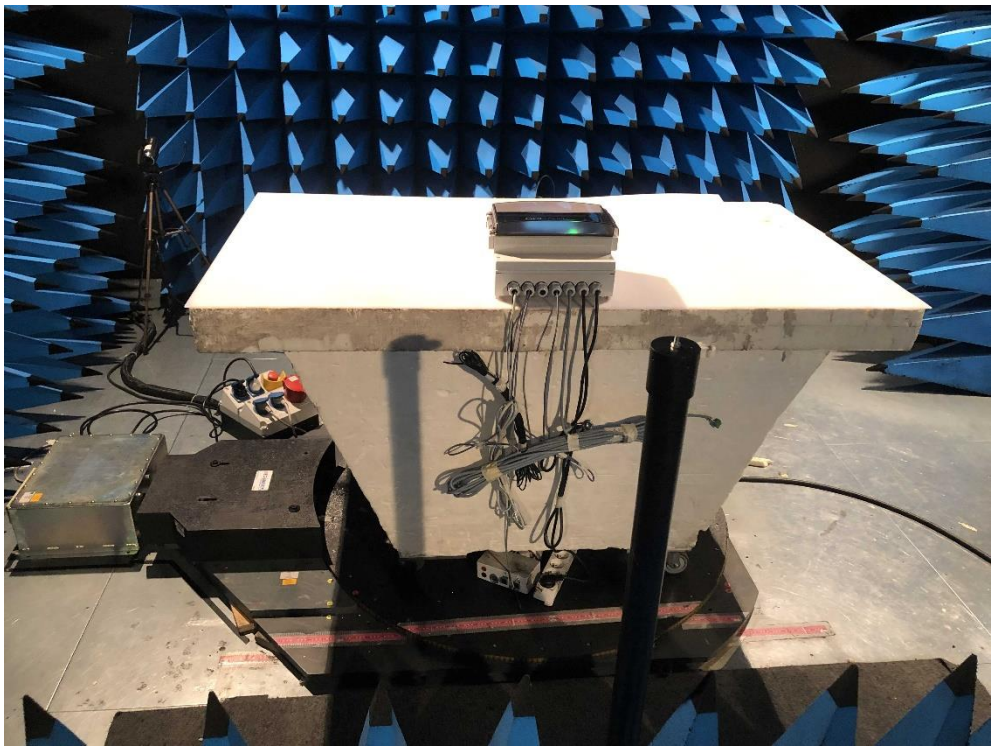
Date of test	:	October 12, 2021
Test performed by	:	Jonathan SARTO
Atmospheric pressure (hPa)	:	995
Relative humidity (%)	:	42
Ambient temperature (°C)	:	20

4.2. TEST SETUP

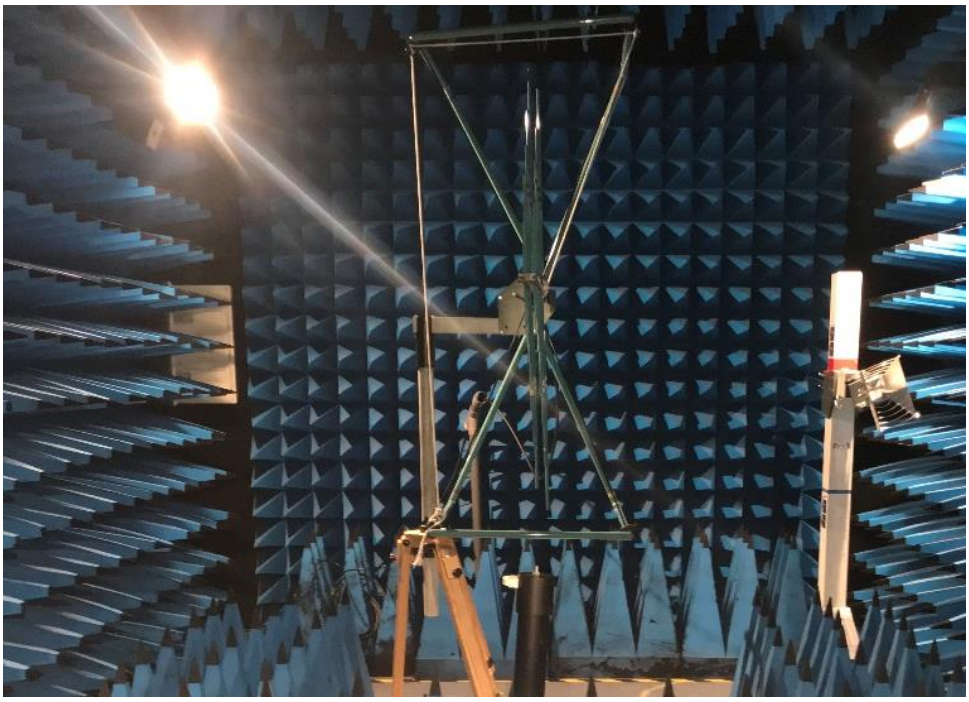
The EUT and auxiliaries are set 80cm above the ground on the non-conducting table (Table-top equipment).
The EUT is powered by V_{nom}.

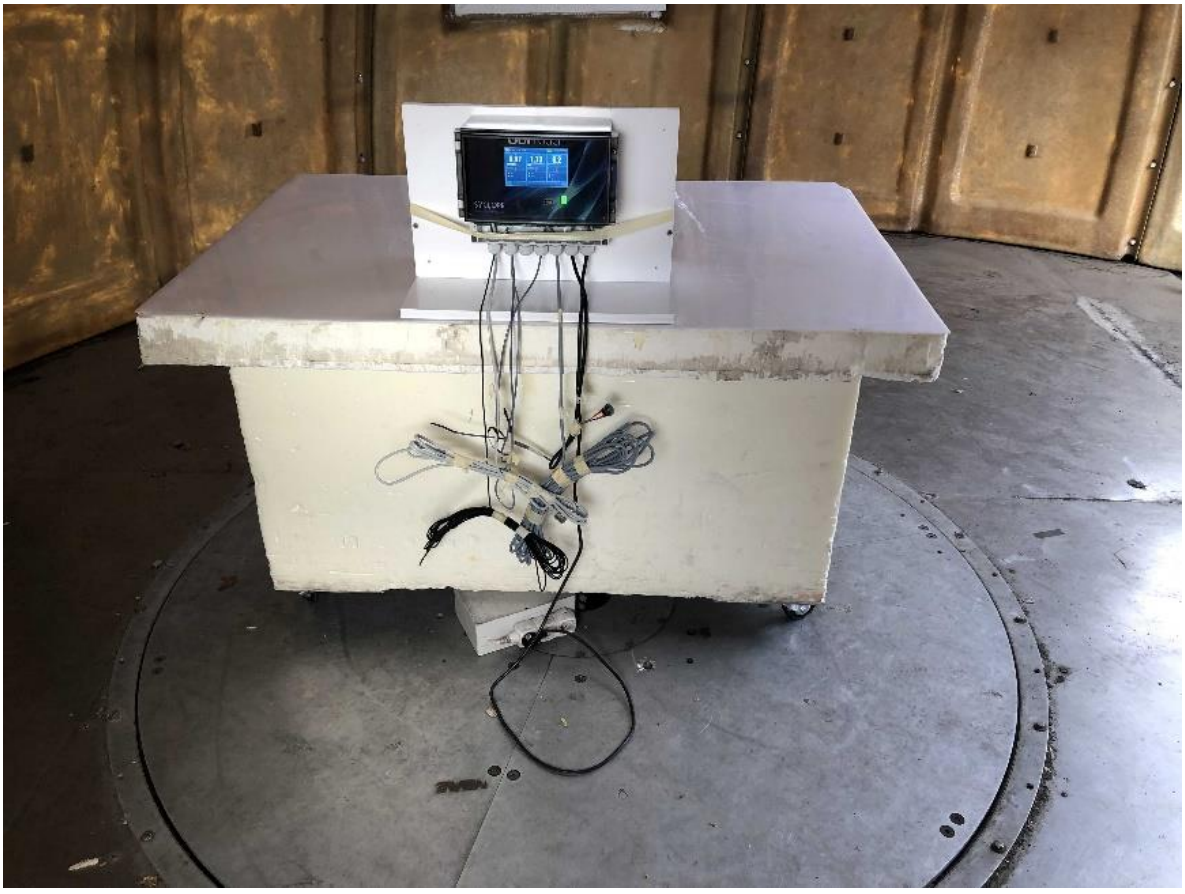


Test setup in anechoic chamber –Axis X



Test setup in anechoic chamber –Axis YZ





Test setup on OATS (worth case)

4.3. TEST METHOD

4.3.1. 30MHz –1GHz

Pre-qualification measurement

A pre-scan of all the setup has been performed in a 3 meters semi-anechoic chamber. Test is performed with antenna centered on EUT in horizontal (H) and vertical (V) polarization, continuous linear turntable azimuth search was performed with 360 degrees range. Measurements are performed on all axis of EUT used in normal configuration. The pre-characterization graphs are obtained in PEAK detection.

Qualification

The installation of EUT is identical than for pre-qualification measurements on an Open Area Test Site with a 10 meters distance between EUT and antenna. In this case, it corrected according to requirements of 15.209.e), M@3m = M@10m+10.5dB. Test is performed in horizontal (H) and vertical (V) polarization and the height antenna is varied from 1m to 4m. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurements are performed on all axis of EUT used in normal configuration. A summary of the worst case emissions found in all test configurations and modes is shown.

4.3.2. 1GHz – 6GHz:

Pre-qualification measurement

A pre-scan of all the setup has been performed in a 3 meters full anechoic chamber. Test is performed with antenna centered on EUT in horizontal (H) and vertical (V) polarization, continuous linear turntable azimuth search was performed with 360 degrees range. Measurements are performed on all axis of EUT used in normal configuration. The pre-characterization graphs are obtained in PEAK and AVERAGE detection.

Qualification

The installation of EUT is identical for pre-characterization measurements. Test is performed in horizontal (H) and vertical (V) polarization and the height antenna is fixed and centered on the EUT, EUT smaller than the beamwidth of the measurement antenna.

Minimal beamwidth of the measurement antenna used: AINFO 10180 / w@3m=1.4m<14GHz / w@3m=0.8m<18GHz

Continuous linear turntable azimuth search was performed with 360 degrees range. Measurements are performed on all axis of EUT used in normal configuration. A summary of the worst case emissions found in all test configurations and modes is shown.

4.4. TEST EQUIPMENT LIST

TEST EQUIPMENT USED					
Description	**Manufacturer**	**Model**	**Identifier**	**Cal_Date**	**Cal_Due**
Amplifier 100kHz - 18GHz	LCIE SUD EST	_	A7085027	11/20	11/21
Antenna Bi-Log XWing	TESEQ	CBL6144	C2040146	03/17	03/22
Antenna horn 18GHz	AINFO	LB	C2042078	04/21	04/23
BAT EMC	NEXIO	v3.19.1.23	L1000115		
Cable 0.75m	SUCOFLEX	18GHz	A5329919	11/20	11/21
Cable 2.2m N	SUCOFLEX	SF118A/2x11N/2.2M	A5329990	11/20	11/21
Cable 5m	SUCOFLEX	18GHz	A5329918	11/20	11/21
CALCUL_FACTEURS	LCIE SUD EST	V4	L2000035		
Diameter 1.2m / Height 2.25m	LCIE	VSWR 1GHz - 18GHz	D3044015_VSWR	06/19	06/22
HF Radiated emission comb generator	LCIE SUD EST	_	A3169088		
Radiated emission comb generator	BARDET	_	A3169050		
Semi-Anechoic chamber #2	SIEPEL	_	D3044015	06/19	06/22
Spectrum Analyzer 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A4060049	04/20	04/22
Table C2/OATS	LCIE	_	F2000438		
Thermo-hygrometer (PM1/2/3)	KIMO	HQ 210	B4206022	01/21	01/23
Turntable chamber (Cage#2)	ETS Lingren	Model 2165	F2000404		
Turntable controller (Cage#2)	ETS Lingren	Model 2066	F2000393		
Antenna Bi-log	CHASE	CBL6111A	C2040051	07/20	07/22
Antenna Mat (OATS)	ETS Lingren	2071-2	F2000392		
Biconic Antenna	EATON	94455-1	C2040234	03/21	03/23
Cable (OATS)	_	1GHz	A5329623	05/20	05/22
Emission Cable	MICRO-COAX	1GHz	A5329656	08/20	08/22
Emission Cable	SUCOFLEX	6GHz	A5329061	08/21	08/22
OATS	_	_	F2000409	04/21	04/22
Receiver 20-1000MHz	ROHDE & SCHWARZ	ESVS30	A2642006	03/20	03/22
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019	11/20	11/22
Table C1/OATS	LCIE	_	F2000445		
Turntable (OATS)	ETS Lingren	Model 2187	F2000403		
Turntable / Mast controller (OATS)	ETS Lingren	Model 2066	F2000372		

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

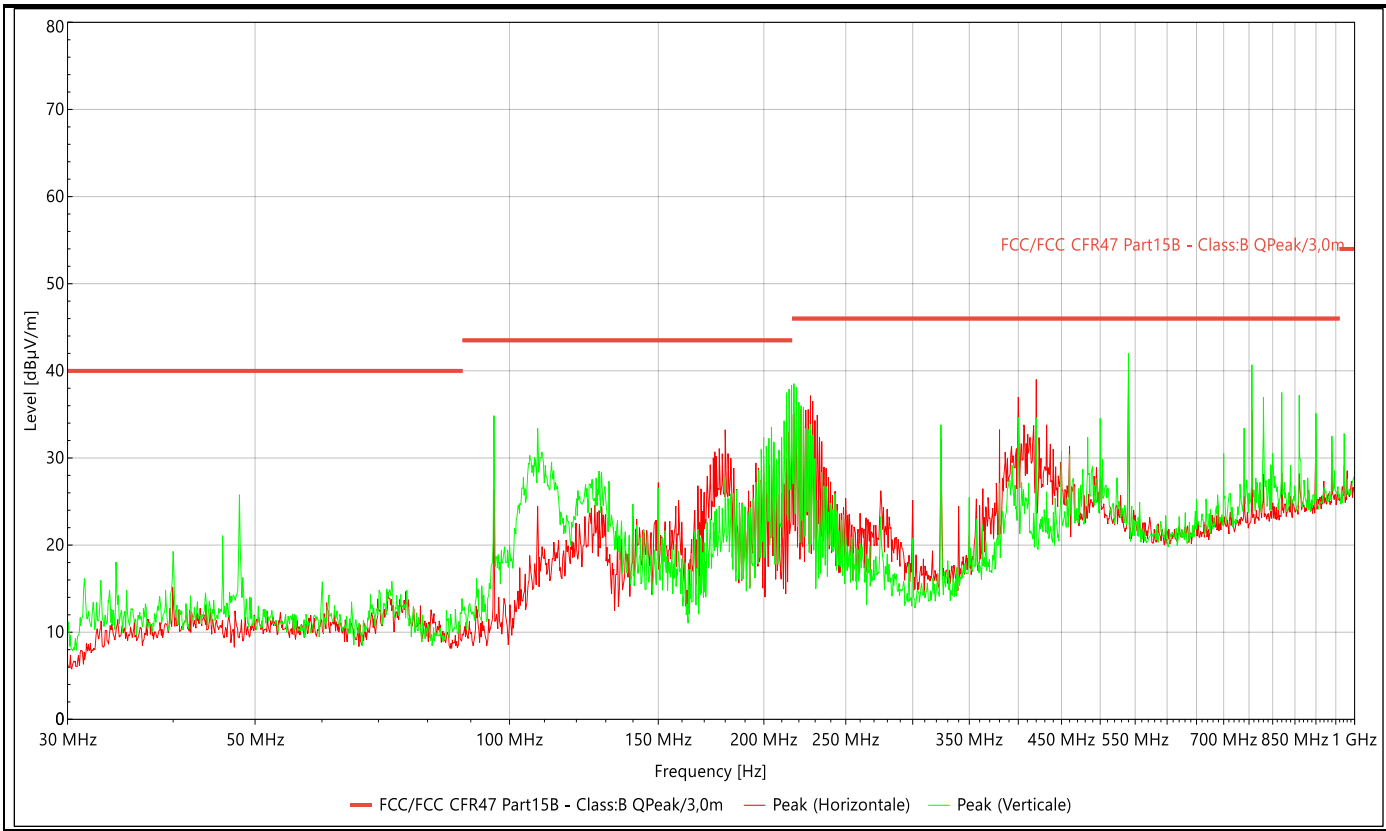
4.6. TEST RESULTS – RUNNING MODE N°1

4.6.1. 30MHz –1GHz

Pre-qualification measurement

Graph identifier		Polarization	EUT position	Comments	
Emr#	1	Horizontal & Vertical	Axis X	-	See below
Emr#	2	Horizontal & Vertical	Axis YZ	-	See below

RADIATED EMISSIONS			
Graph name:	Emr#1	**Test configuration:**	
Limit:	FCC CFR47 Part15B	Running mode 1 axis X	
Class:	B		
Frequency range: 30 MHz-1 GHz			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz

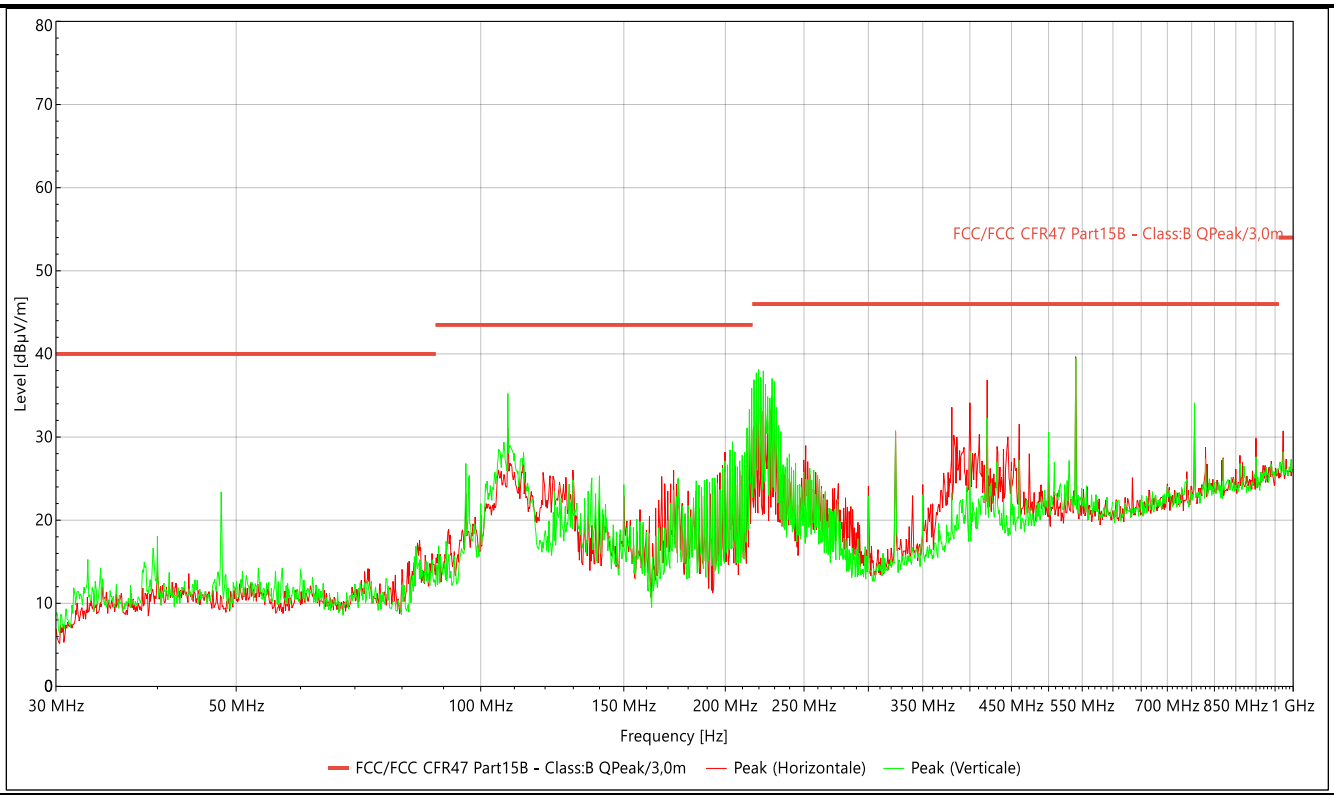


Spurious emissions

Frequency	Peak (dBµV/m)	Lim.Q-Peak (dBµV/m)	Angle(°)	Polarisation	Correction (dB)
179,991 MHz	33,238	43,5	334	Horizontale	-16,631
399,96 MHz	36,991	46	323	Horizontale	-8,821
420,08 MHz	39,009	46	0	Horizontale	-8,276

Frequency	Peak (dBµV/m)	Lim.Q-Peak (dBµV/m)	Angle(°)	Polarisation	Correction (dB)
47,918 MHz	25,781	40	101	Verticale	-16,563
95,875 MHz	34,871	43,5	334	Verticale	-18,204
108,03 MHz	33,389	43,5	28	Verticale	-18,238
127,648 MHz	28,502	43,5	40	Verticale	-18,019
150,003 MHz	26,556	43,5	51	Verticale	-17,349
217,08 MHz	38,545	46	292	Verticale	-14,78
324 MHz	33,814	46	0	Verticale	-11,397
540,079999 MHz	42,024	46	0	Verticale	-5,986
755,92 MHz	40,698	46	0	Verticale	-3,842
859,92 MHz	37,204	46	6	Verticale	-2,798

RADIATED EMISSIONS			
Graph name:	Emr#2	**Test configuration:**	
Limit:	FCC CFR47 Part15B	Running mode 1 axis YZ	
Class:	B		
Frequency range: 30 MHz-1 GHz			
Antenna polarization:	Horizontal & Vertical	**RBW :**	100kHz
Azimuth:	0° - 360°	**VBW :**	300kHz



Spurious emissions

Frequency	Peak (dBµV/m)	Lim.Q-Peak (dBµV/m)	Angle (°)	Polarisation	Correction (dB)
119,318 MHz	25,752	43,5	61	Horizontale	-18,523
420,08 MHz	36,88	46	55	Horizontale	-8,276
539,92 MHz	39,671	46	79	Horizontale	-5,987
95,875 MHz	26,827	43,5	1	Verticale	-18,204
107,979 MHz	35,243	43,5	17	Verticale	-18,237
219,8 MHz	38,155	46	138	Verticale	-14,645
229,8 MHz	36,73	46	338	Verticale	-14,168

Qualification

The frequency list is created from the results obtained during the pre-qualification.
Measurements are performed using a QUASI-PEAK detection.
Only worst case was performed on OATS (worst case = Axis X)

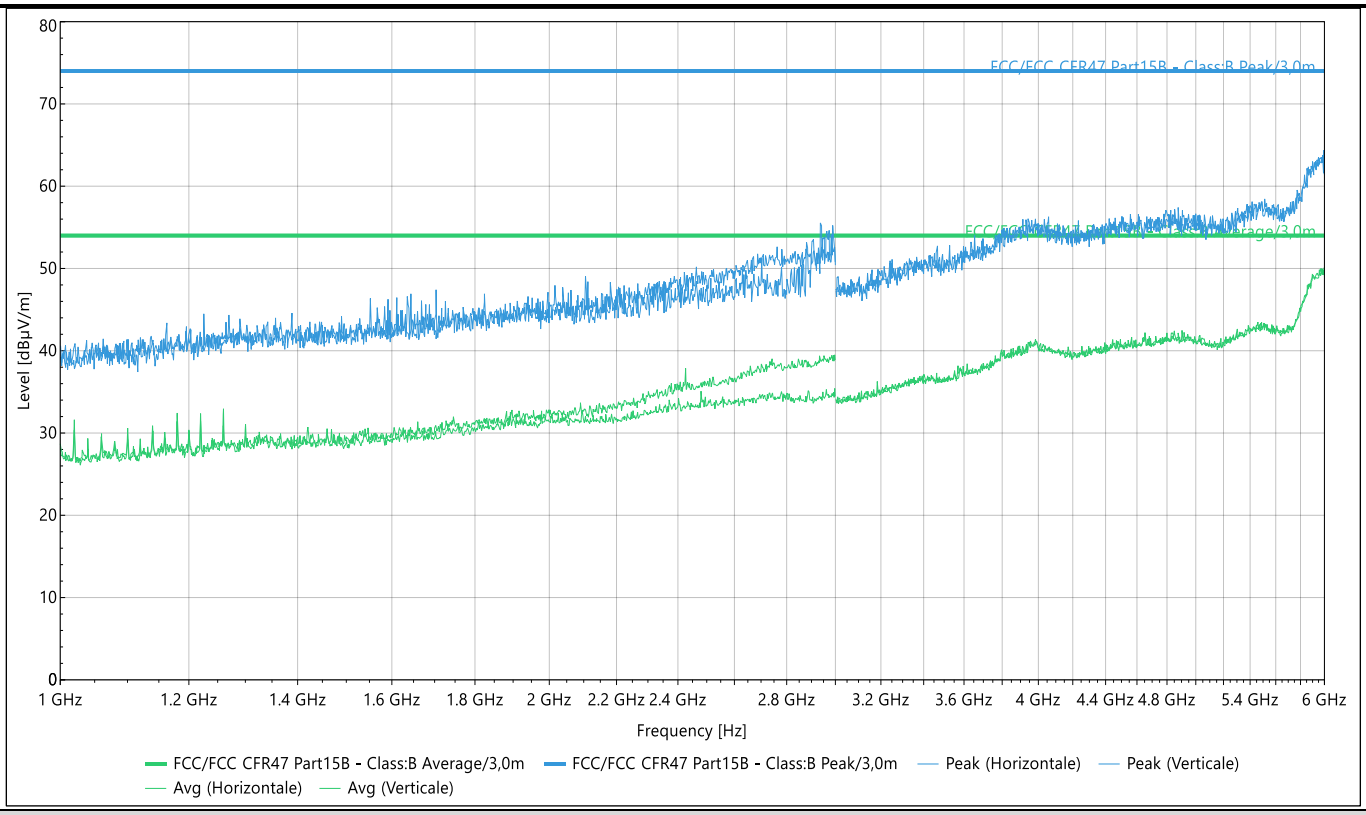
Test Frequency (MHz)	Meter Reading dB(µV)	Detector (Pk/QP/Av)	Polarity (V/H)	Azimuth (Degrees)	Antenna Height (cm)	Transducer Factor (dB)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
95.8	16.1	QP	V	14	150	13.1	29.2	43.5	**-14.3**	Measure performed at 3m
108	14.8	QP	V	67	150	13.1	27.9	43.5	**-15.6**	Measure performed at 3m
128.7	18.7	QP	V	360	100	14.8	33.5	43.5	**-10.0**	
136.3	16.8	QP	V	0	100	16.7	33.5	43.5	**-10.0**	
180.1	16.8	QP	V	130	100	17.1	33.9	43.5	**-9.6**	
216	26.3	QP	V	360	100	12.3	38.6	43.5	**-4.9**	
225.8	26.5	QP	V	0	100	13.0	39.5	46.0	**-6.5**	
324	22.5	QP	V	360	100	17.8	40.3	46.0	**-5.7**	
400	21.1	QP	V	0	100	20.7	41.8	46.0	**-4.2**	
432	17.8	QP	H	360	172	21.5	39.3	46.0	**-6.7**	
540	20.8	QP	V	0	224	24.6	45.4	46.0	**-0.6**	
756	11.6	QP	V	358	150	29.3	40.9	46.0	**-5.1**	Measure performed at 3m
820.2	11.8	QP	V	0	150	30.2	42.0	46.0	**-4.0**	Measure performed at 3m
860.1	10.2	QP	V	0	150	30.9	41.1	46.0	**-4.9**	Measure performed at 3m
900	8.1	QP	V	17	150	31.2	39.3	46.0	**-6.7**	Measure performed at 3m

4.6.2. 1GHz - 6GHz

Pre-qualification measurement

Graph identifier	Polarization	EUT position	Comments	
Emr# 3	Horizontal & Vertical	Axis X	-	See below

RADIATED EMISSIONS			
Graph name:	Emr#3	**Test configuration:**	
Limit:	FCC CFR47 Part15B	Running mode 1 axis X	
Class:	B		
Frequency range: 1 GHz-6 GHz			
Antenna polarization:	Horizontal & Vertical	**RBW :**	1MHz
Azimuth:	0° - 360°	**VBW :**	3MHz



Spurious emissions

Qualification

The frequency list is created from the results obtained during the pre-qualification.
Measurements are performed using a PEAK and AVERAGE detection.

No significative frequency observed

4.7. CONCLUSION

The sample of the equipment ODT0000-V2, Sn : 213916402, tested in the configuration presented in this test report **satisfies** to requirements of the product family standard applied (See §Test Program) for radiated emissions.

5. UNCERTAINTIES CHART

Type de mesure / Kind of measurement	Incertitude élargie laboratoire / Wide uncertainty laboratory (k=2) ±x	Incertitude limite du CISPR / CISPR uncertainty limit ±y
Mesure des perturbations conduites en tension sur le réseau d'énergie (monophasé /triphasé) 150kHz-30MHz *Measurement of conducted disturbances in voltage on the power port (single & three phases)150kHz-30MHz*	3.29dB	3.4dB
Mesure du champ électrique rayonné en cage de Faraday semi-anéchoïque de 30MHz à 1GHz *Measurement of radiated electric field in half-anechoic Faraday room From 30MHz to 1GHz*	5.06dB	5.3dB
Mesure du champ électrique rayonné en cage de Faraday semi-anéchoïque de 1GHz à 6GHz *Measurement of radiated electric field in half-anechoic Faraday room From 1GHz à 6GHz*	5.18dB	5.2dB
Mesure du champ électrique rayonné sur le site en espace libre de Moirans 30MHz – 1GHz. *Measurement of radiated electric field on the Moirans open area test site 30MHz – 1GHz.*	5.2dB	6.3dB

Les valeurs d'incertitudes calculées du laboratoire étant inférieures aux valeurs d'incertitudes limites établies par le CISPR, la conformité de l'échantillon est établie directement par les niveaux limites applicables. Ce tableau regroupe l'ensemble des incertitudes maximales pour les essais réalisables dans le laboratoire, qu'ils aient été ou non réalisés dans le cadre du présent rapport / *The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the CISPR. The conformity of the sample is directly established by the applicable limits values. This table includes all uncertainties maximum feasible for testing in the laboratory, whether or not made in this report*

Note - L'incertitude de mesure instrumentale est déterminée selon la CISPR 16-4-2. / *The instrumentation measurement uncertainty is determined according to CISPR16-4-2*