





EMC TEST REPORT

Type of equipment: Computer workstation platform

Model: RM-M-CRPS

Marketing name: Comino Grando Server

Sub model: RM-M-CRPS

Serial number: 500.C.00405.03

Applicant: SIA IAS

Manufacturer: COMINO HOLDING LTD

Test standard: FCC Title 47, Part 15 Subpart B

Test report no.: LEITC-TR-23-164

Identification no.:ID_1423/2.2Testing laboratory:SIA LEITC

Result summary: Pass

The results applies only to the sample tested, according to the carried tests, which are included in this test report. This test report shall not be reproduced expect in full, without the written approval of EMC Laboratory SIA LEITC.

Test responsible: Andris Dzenis

Laboratory responsible: Uldis Stūre

Date of issue: 13.12.2023.

Page: 1 of 19







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1. REVISION HISTORY

Revision no.	Description	Date	Pages revised
00	First release.	13.12.2023.	N/A







2. LABORATORY INFORMATION



Latvian Electronic Equipment Testing Centre

Testing laboratory: SIA LEITC

Address: Azenes street 12, Riga, Latvia, LV-1048

Telephone number: +371 22001023 Contact Person: Uldis Stūre

E-mail: info@leitc.lv

uldis.sture@leitc.lv andris.dzenis@leitc.lv

Web site: http://www.leitc.lv



Accredited by: State agency Latvian National accreditation bureau (LATAK)

Address: Kr. Valdemara str. 157, Riga, LV-1013, Latvia

E-mail: latak@latak.gov.lv Web site: http://www.latak.gov.lv

Accreditation No: LATAK-T-397-11-2009







3. CLIENT INFORMATION

Applicant: SIA IAS

Address: Maskavas iela 164-27 Rīga, LV-1019

Telephone number: +371 27 069 716 Contact Person: Kaspars Frišfelds

E-mail: kaspars@iasolutions.lv

Web: -

Manufacturer: COMINO HOLDING LTD

Address: 30 Churchill Pl, London, England, E14 5RE

Manufacture address: Krimuldas iela 2A, LV-1039, Riga, Latvia

Telephone number: +44 2038855315

Contact Person: -

E-mail: info@comino.com Web: www.comino.com







4. SUMMARY OF TEST RESULTS

Sta	ndard: I	FCC Title 47,	Part 15 Subpart B							
Em	Emissions									
No.	Measu	rement type	Reference standard	Ref. Standard Clause	Result					
1.	Radiated emis	ssions	FCC Title 47, Part 15 Subpart B	15.109	Pass					
	(30MHz to 10	GHz)	(Class A)							
2.	Radiated emis	ssions	FCC Title 47, Part 15 Subpart B	15.109	Pass					
	(1GHz to 6GI	Hz)	(Class B)							
3.	Conducted en	nissions	FCC Title 47, Part 15 Subpart B	15.107	Pass					
	(AC power po	ort)	(Class B)							
Note	s: Y- applied; N/A	- not applicable.	·	•						
Devi	ations from stand	ard specification: no	deviations from the test standards.							
		•								







5. DESCRIPTION OF EQUIPMENT UNDER TEST

				PINICIAI OND		-		
	Description of E		2.2	_				
	TC identification n				1 1 .			
		latform in a 4	U form-facto	or equipped with the re	dundant pow	er supply, lie	quid-cooling and	
mon No.	itoring system. EUT	Model		Carial Na	Mos			
1.	Comino Grando							
1.	Server	KWI-WI-CK	P3	300.C.00403.03	CON	VIINO HOLI	DING LID	
<i>5</i> 2		Laggagiata						
	Peripherals and		ı equipme		34	C4		
No.	•	Model		Serial No.		nufacturer		
1.	N/A	N/A	4	N/A	N/A	·		
	Cables used dur						T a	
No.	v I	Shielded	Ferrite	Length used durin		nection 1	Connection2	
1.	AC power (2 pcs)			1.8m	AC	main	EUT	
<u>5.4</u>	EUT configurat	ion						
instr	ructions. 1 Operating mo	des/load		ulate a typical user inst	anation according	ruing to the l	manuracturer	
1.	Operating mode: sy		work enable	d.				
	Monitoring parame	eters:						
	Air IN/OUT							
	CLNT IN/OUT							
	PUMPS RPM							
	FANS RPM							
	Flow R.							
- 4	Block diagram 1.							
	2 Modification s							
1.	No modification m						_	
		<u>icy transm</u>		orporated in EUT		T		
No.	Description			requency		Modulatio	n	
1.	N/A		N	J/A		N/A		
D1.	.11							
B 10	ck diagram 1:							
		SAC			AC1 120	OVAC		
				1.8m	60H L/N/F	Z		
			EUT	1.8m	AC2 120			
					L/N/			
							•	







6. INSTRUMENTATION AND CALIBRATION

Equipment and EUT during the tests are operated in temperature range of 21° to 25°C, humidity range of 40% to 60%, if not mentioned more precisely next to measurement data.

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with manufacturer's recommendations or quality manager deliverance and it is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

The following list contains measurement equipment used for testing. The equipment conforms to the requirements of CISPR 16-1 and other standard requirements.

	Radiated emissions										
Device	Manufacturer	Model	S/N	Calibrated	Next calibration	Notes					
Antenna	Rohde & Schwarz	HL562E	102093	15.04.2021	15.04.2027	Certificate of calibration No. 200583 D-K-15195-01-00					
Antenna	Rohde & Schwarz	HF906	100448	14.02.2022	14.02.2028	Certificate of calibration No. 202200066.00					
Preamplifier	BONN Elektronik GmbH	BLMA 0118- 1M	066396D	10.02.2023	10.02.2024	Test report No. LEITC-M-04/2023					
Receiver	Rohde & Schwarz	ESIB26	1088.7490K26	26.01.2023	26.01.2025	Certificate of calibration No. 202204692.00					
Receiver	Gauss Instruments	TDEMI X6	1605023	10.02.2022	10.02.2024	Certificate of calibration No. 202100907.00					
Antenna mast	FRANKONIA	FBM 1-4 Rev.1	-	-	-	Not applicable.					
Turntable	FRANKONIA	FCTAM01	-	-	-	Not applicable.					
Test site	FRANKONIA	SAC3	-	18.05.2023	18.05.2025	Interlaboratory comparison No. LEITC-TR-23-066					
Software for EMC measurements EMC32	Rohde & Schwarz	Version 8.53.0	-	-	-	Not applicable.					
Software for EMC measurements (Gauss Instruments)	Gauss Instruments	Version 6.12	-	-	-	Not applicable.					

	Conducted emissions										
Device	Manufacturer	Model	S/N	Calibrated	Next calibration	Notes					
LISN	Rohde & Schwarz	ENV432	100266	13.01.2023	13.01.2025	Certificate of calibration No. 0001A300679985					
AMN	Rohde & Schwarz	ENV216	100266	12.01.2023	12.01.2025	Certificate of calibration No. 300679983 D-K-15195-01-00					
ISN	Rohde & Schwarz	ENY81	100066	10.02.2022	10.02.2024	Certificate of calibration No. 202100909.00					
CDN	Teseq	ISN-ST08	55183	10.02.2022	10.02.2024	Certificate of calibration No. 202200075.00					
Receiver	Rohde & Schwarz	ESIB26	1088.7490K26	26.01.2023	26.01.2025	Certificate of calibration No. 202204692.00					
Receiver	Gauss Instruments	TDEMI X6	1605023	10.02.2022	10.02.2024	Certificate of calibration No. 202100907.00					
Test site	FRANKONIA	SAC3	-	-	-	Not applicable.					
Software for EMC measurements EMC32	Rohde & Schwarz	Version 8.53.0	-	-	-	Not applicable.					
Software for EMC measurements (Gauss Instruments)	Gauss Instruments	Version 6.12	-	-	-	Not applicable.					

The test results relate only to the sample tested. This test report shall not be reproduced except in full, without the written approval of SIA LEITC.







7. STATEMENT OF THE MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainties were calculated according to guidelines given in EN 55016-4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4 Uncertainly in EMC Measurements" and is documented in the SIA "LEITC" quality system according to ISO/IEC 17025. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective manuals.

Measurement uncertainty								
Procedure Designation Uncertainty Device								
Conducted emissions 9kHz to 30MHz	U _{lab}	2.75dB	LISN: ENV216					
Radiated emissions 30MHz to 1GHz	U _{lab}	4.97dB	Antenna: HL562E					
Radiated emissions 1GHz to 6GHz	U _{lab}	4.96dB	Antenna: HF906					







8. TEST PROCEDURES

Radiated emissions

The equipment was set up as per the test configuration to simulate typical usage per user's manual. When the EUT is a table top equipment, a non-conductive table with a height of 0,8m is used which is placed on the ground plane. When EUT is floor standing equipment, it is placed on the 0,1m insulation support.

Auxiliary equipment and/or support equipment, if needed was placed as per FCC Title 47, Part 15 Subpart B recommendations.

All input/output cables were positioned to simulate typical usage as per FCC Title 47, Part 15 Subpart B.

The EUT was connected to AC mains 230V/50Hz under the turntable shucko type socket, all other equipment was connected to the other shucko type socket under the turntable.

The antenna was placed at 3m away from EUT. Antenna height was changed in range 1-4m and EUT rotation angle in range of -180° to 180° maximize measured emissions.

Conducted emissions

The equipment was set up as per the test configuration to simulate typical usage per user's manual. When the EUT is a table top equipment, a non-conductive table with a height of 0,8m is used which is placed in a distance of 0,4m from vertical conductive plane. When EUT is floor standing equipment, it is placed on the 0,1m insulation support in a distance of 0,4m from vertical conductive plane.

Auxiliary equipment and/or support equipment, if needed was placed as per FCC Title 47, Part 15 Subpart B recommendations.

All input/output cables were positioned to simulate typical usage as per FCC Title 47, Part 15 Subpart B.

EUT mains power port was connected to LISN/AMN which is placed in a distance of 0,8m. Each EUT power lead, except ground (safety), was connected through a LISN/AMN to power source. All lines and neutral of power cord where measured.

All telecommunication and signal cables are connected through ISN which is located in distance of 0,8m. Each cable lead is measured according to used connection type.



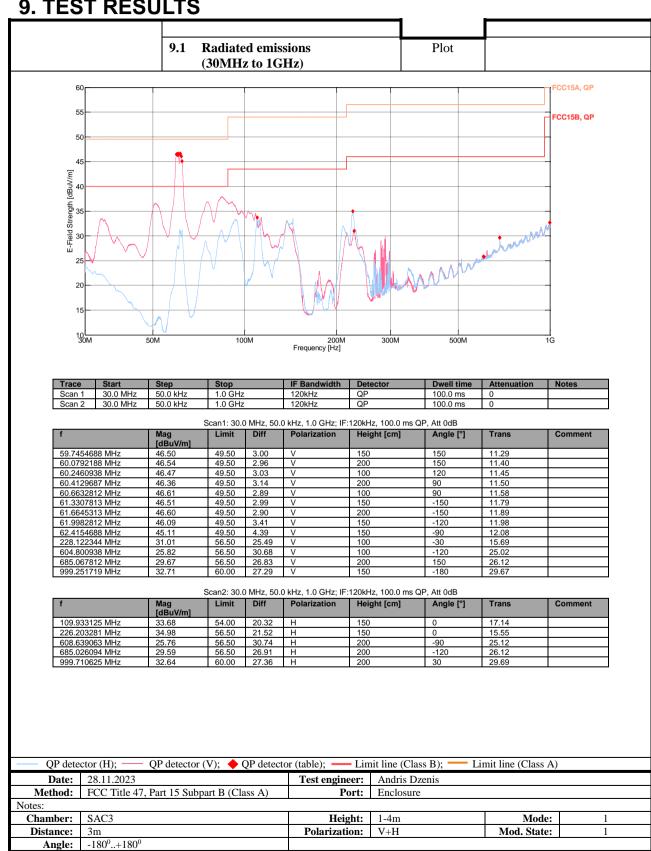




9. TEST RESULTS

File:

2023.11.28_HL562E_#02_IAS_FCC







-0.44

-0.06

-90

-150



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4.89920125 GHz

5.94717625 GHz

41.01

41.98

74.00

74.00 32.02

32.99



Scan2: 1.0 GHz.	400.0 kHz.	6.0 GHz: IF:1MHz.	100.0 ms	Average, Att AutodB

150

150

f	Mag [dBuV/m]	Limit	Diff	Polarization	Height [cm]	Angle [°]	Trans	Comment
1.90412875 GHz	19.43	54.00	34.57	V	150	-180	-9.73	
2.99983 GHz	23.00	54.00	31.00	V	150	-150	-5.89	
3.81317875 GHz	26.01	54.00	27.99	V	150	-150	-2.52	
4.89185875 GHz	27.45	54.00	26.55	V	150	-180	-0.08	
6 GHz	28.27	54.00	25.73	V	150	-180	0.28	

Scan3: 1.0 GHz, 400.0 kHz, 6.0 GHz; IF:1MHz, 100.0 ms MaxPeak, Att AutodB

f	Mag [dBuV/m]	Limit	Diff	Polarization	Height [cm]	Angle [°]	Trans	Comment
1.93683625 GHz	33.59	74.00	40.41	Н	100	30	-9.94	
2.99081875 GHz	36.57	74.00	37.43	Н	150	-60	-6.01	
3.75811 GHz	39.62	74.00	34.38	Н	150	-120	-2.55	
4.89586375 GHz	40.92	74.00	33.08	Н	150	120	-0.28	
5.93916625 GHz	42.25	74.00	31.75	Н	150	150	-0.02	

Scan4: 1.0 GHz, 400.0 kHz, 6.0 GHz; IF:1MHz, 100.0 ms Average, Att AutodB

f	Mag [dBuV/m]	Limit	Diff	Polarization	Height [cm]	Angle [°]	Trans	Comment
1.8964525 GHz	19.43	54.00	34.57	Н	150	-150	-9.76	
2.99983 GHz	22.98	54.00	31.02	Н	150	-150	-5.89	
3.8121775 GHz	26.02	54.00	27.98	Н	150	-150	-2.53	
4.89119125 GHz	27.44	54.00	26.56	Н	150	-150	-0.07	
6 GHz	28.23	54.00	25.77	Н	150	-90	0.28	

MaxPeak detector (H);-MaxPeak detector (V); — AV detector (H); — AV detector (V); MaxPeak Limit line; AV Limit line

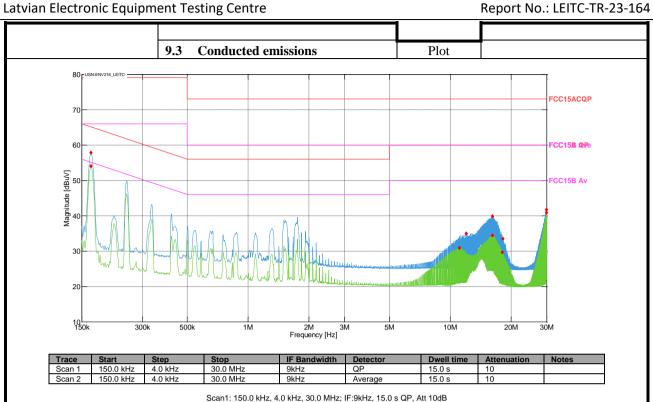
TIV EIIIII					
Date:	24.11.2023	Test engineer:	Andris Dzenis		
Method:	FCC Title 47, Part 15 Subpart B (Class B)	Port:	Enclosure		
Notes:					
Chamber:	SAC3	Height:	1-4m	Mode:	1
Distance:	3m	Polarization:	V+H	Mod. State:	1
Angle:	-180°+180°				
File:	2023.11.24_HF906_#02_IAS_FCC				







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f	Mag [dBuV]	Limit	Diff	Phase	Trans	Comment
166.6875 kHz	57.81	65.12	7.31	N	19.64	
12.0273281 MHz	34.92	60.00	25.08	L1	20.34	
16.2054609 MHz	39.83	60.00	20.17	N	20.34	
18.2100469 MHz	33.49	60.00	26.51	N	20.18	
29.98725 MHz	41.72	60.00	18.28	Ν	20.51	

Scan2: 150.0 kHz, 4.0 kHz, 30.0 MHz; IF:9kHz, 15.0 s Average, Att 10dB

f	Mag [dBuV]	Limit	Diff	Phase	Trans	Comment
166.6875 kHz	54.04	55.12	1.08	L1	19.63	
11.1095156 MHz	30.89	50.00	19.11	L1	20.28	
16.2054609 MHz	34.36	50.00	15.64	N	20.34	
18.1245234 MHz	29.68	50.00	20.32	L1	20.14	
29.98725 MHz	40.84	50.00	9.16	N	20.51	

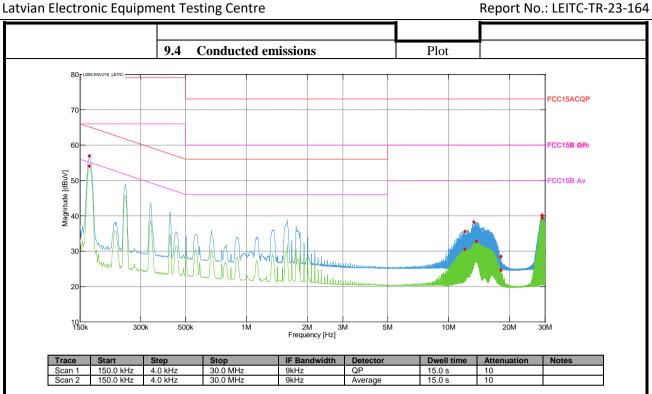
——QP detect	——QP detector; ♦ QP detector (table); ——AV detector; ♦ AV detector (table); —— QP Limit line; ——AV Limit line; L- Live, N-Neutral							
Date:	28.11.2023	Test engineer:	Andris Dzenis					
Method:	FCC Title 47, Part 15 Subpart B (Class B)	Port:	AC1 power					
Notes:								
Chamber:	SAC3	Attenuator:	10dB	Mode:	1			
LISN:	ENV216			Mod. State:	1			
File:	2023.11.28_2-Line_ENV216_#02_IAS_FCC							







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Scan1: 150.0 kHz, 4.0 kHz, 30.0 MHz; IF:9kHz, 15.0 s QP, Att 10dB

f	Mag [dBuV]	Limit	Diff	Phase	Trans	Comment
166.6875 kHz	56.89	65.12	8.24	L1	19.63	
12.064875 MHz	35.52	60.00	24.48	N	20.35	
13.3206094 MHz	38.18	60.00	21.82	N	20.41	
18.1766719 MHz	28.44	60.00	31.56	L1	20.14	
29.0694375 MHz	40.12	60.00	19.88	L1	20.38	

Scan2: 150.0 kHz, 4.0 kHz, 30.0 MHz; IF:9kHz, 15.0 s Average, Att 10dB

f	Mag [dBuV]	Limit	Diff	Phase	Trans	Comment
166.6875 kHz	54.06	55.12	1.06	N	19.64	
12.0627891 MHz	30.50	50.00	19.50	N	20.35	
13.7377969 MHz	32.78	50.00	17.22	N	20.42	
18.1766719 MHz	24.54	50.00	25.46	L1	20.14	
29.0673516 MHz	39.36	50.00	10.64	L1	20.38	

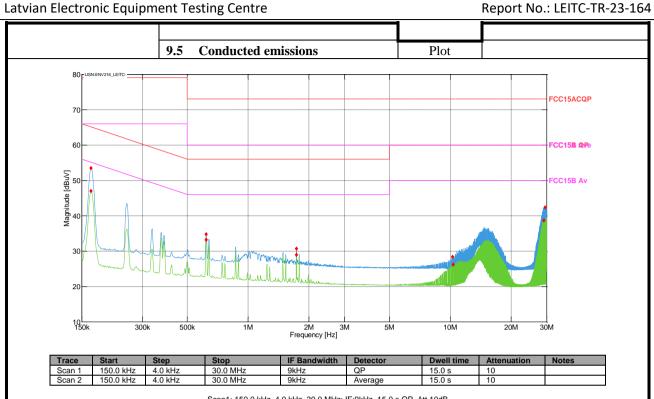
——QP detector; ♦ QP detector (table); ——AV detector; ♦ AV detector (table); —— QP Limit line; ——AV Limit line; L- Live, N-Neutral							
Date:	28.11.2023	Test engineer:	Andris Dzenis				
Method:	FCC Title 47, Part 15 Subpart B (Class B)	Port:	AC2 power				
Notes:							
Chamber:	SAC3	Attenuator:	10dB	Mode:	1		
LISN:	ENV216			Mod. State:	1		
File:	2023.11.28_2-Line_ENV216_#03_IAS_FCC						







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Scan1: 150.0 kHz, 4.0 kHz, 30.0 MHz; IF:9kHz, 15.0 s QP, Att 10dB

f	Mag [dBuV]	Limit	Diff	Phase	Trans	Comment
166.6875 kHz	53.49	65.12	11.63	N	19.64	
619.335938 kHz	34.77	56.00	21.23	L1	19.68	
1.7353125 MHz	30.69	56.00	25.31	L1	19.78	
10.2730547 MHz	28.34	60.00	31.66	L1	20.24	
29.4887109 MHz	42.35	60.00	17.65	N	20.51	

Scan2: 150.0 kHz, 4.0 kHz, 30.0 MHz; IF:9kHz, 15.0 s Average, Att 10dB

f	Mag [dBuV]	Limit	Diff	Phase	Trans	Comment
166.6875 kHz	46.95	55.12	8.17	L1	19.63	
619.335938 kHz	33.21	46.00	12.79	L1	19.68	
1.7353125 MHz	28.89	46.00	17.11	L1	19.78	
10.3564922 MHz	26.17	50.00	23.83	L1	20.24	
29.0694375 MHz	38.69	50.00	11.31	N	20.50	

——QP detector; ♦ QP detector (table); ——AV detector; ♦ AV detector (table); —— QP Limit line; —— AV Limit line; L- Live, N-Neutral							
Date:	28.11.2023	Test engineer:	Andris Dzenis				
Method:	FCC Title 47, Part 15 Subpart B (Class B)	Port:	AC1+AC2 power				
Notes:							
Chamber:	SAC3	Attenuator:	10dB	Mode:	1		
LISN:	ENV216			Mod. State:	1		
File:	2023.11.28_2-Line_ENV216_#04_IAS_FCC						







10. TEST PHOTOGRAPHS

EUT-equipment under test:































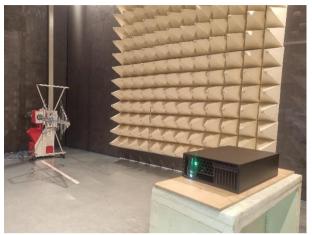








Radiated emissions (30MHz-1GHz):





Radiated emissions (1GHz-6GHz):





Conducted emissions:



