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LAB N° 0168

Independent Testing Laboratory
Accredited by ACCREDIA according to UNI CEI EN ISO/IEC 17025 cert. nr. 0168

TEST REPORT nr. R18277401

Federal Communication Commission (FCC)

Test item

Description .....: CARD READER
Trademark .....: SCHINDLER
Model/Type .....: PCR-TWN4LF
FCC ID .....: XFIPCRTWN4LF

Test Specification

Standard.....: FCC Rules & Regulations, Title 47:2017
Part 15 paragraph(s): 203, 204, 205, 207 and 209

Client's name .....: TECNOLAB del Lago Maggiore S.r.l.
Address .....: Via dell'Industria, 20 – 28924 Verbania (VB) – ITALY

Manufacturer's name : SCHINDLER ELEVATOR Ltd
Address .....: Via della Pace, 22 – 6600 Locarno (CH) – SWITZERLAND

Report

Tested by .....: A. Bertezzolo

Approved by .....: R. Beghetto – *Laboratory Manager*
Date of issue .....: 04.06.19
Contents.....: 30 pages

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1. Summary

Standard:

FCC Rules & Regulations, Title 47:2017
Part 15 paragraph(s): 203, 204, 205, 207 and 209

Test specifications	*Environmental Phenomena*	*Tests sequence*	*Result*
Part 15.207	Conducted emissions	1	Complies
Part 15.209	Radiated emissions	2	Complies

The Test Report was given to the Client representatives for necessary documentation of ratification of the tested equipment and it is valid for the FCC certification

2. Description of Equipment under test (EUT)

Power supply	:	5 Vdc
Serial Number	:	--
Type of equipment	:	☑ Transmitter Unit
		☑ Receiver Unit
Type of station	:	☑ Fixed station
		❑ Portable station
		❑ Mobile station
Nominal frequency	:	125 kHz

2.1 *Test Site*

Company	:	CMC Centro Misure Compatibilità S.r.l.
Address	:	Via dell'Elettronica, 12/C
		36016 Thiene (VI) – ITALY
Test site facility's FCC registration number	:	182474

3. Testing and sampling

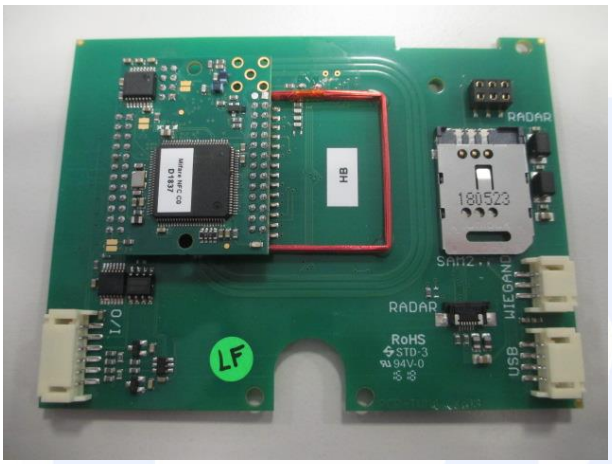
Date of receipt of test item	:	03.12.18
Testing start date	:	18.01.19
Testing end date	:	01.04.19
Samples tested nr.	:	1
Sampling procedure.	:	Equipment used for testing was picked up by the manufacturer, at the end of the production process with random criterion
Internal identification	:	adhesive label with the product number P181510

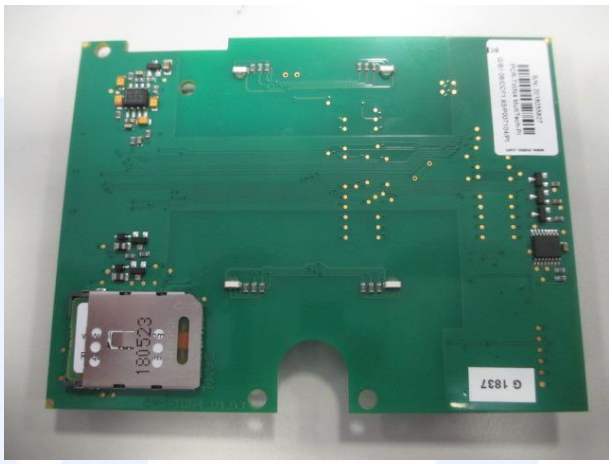
4. Operative conditions

EUT exercising	:	EUT supplied with USB signal floating, continuous transmission @125 kHz frequency

5. Photograph(s) of EUT

5.1 Photograph(s) of EUT





6. Equipment list

Id. number	*Manufacturer*	*Model*	*Description*	*Serial number*	*Last calibration*	*Due date calibration*
CMC S127	Schaffner	HLA6120	Loop Antenna	1191	March '17	March '20
CMC S164	Rohde & Schwarz	ESU26	EMC receiver	100052	January '19	January '20
CMC S010	Rohde & Schwarz	ESH3-Z2	Impulses Limiting Device	- - -	January '19	January '20
CMC S200	Schwarzbeck	NSLK 8128	V-LISN	8128-273	January '19	January '20
CMC S206	Rohde & Schwarz	ESCI 7	EMC Receiver 9KHz-7GHz	100781	January '19	January '20
CMC S271	Schwarzbeck	BBA 9106 + VHBB 9124	Biconical Antenna (30-300MHz)	831	June '16	June '19
CMC S287	Schwarzbeck	VUSLP 9111B	Broadband Antenna	9111B-203	June '16	June '19

7. Measurement uncertainty

Test	Test Setup	Expanded uncertainty	Note
Conducted emission CISPR 16 LISN 50uH 0,009-0,0150MHz	PE001_01	3,4 dB	1
Conducted emission CISPR 16 LISN 50uH 0,150-30,0MHz	PE001_01	3,0 dB	1
Conducted emission CISPR 16 Voltage Probe 0,15-30MHz	PE001_02	2,9 dB	1
Conducted emission CISPR 16 Current Probe 0,15-30MHz	PE001_03	2,6 dB	1
Conducted emission CISPR 16 ISN 0,15-30MHz	PE001_04	4,7 dB	1
Clic CISPR 16 LISN 50uH 0,150-30,0MHz	PE001_05	3,1 dB	1
Disturbance Power 30-300 MHz	PE002_01	3,6 dB	1
Radiated Emission LAS 0,15-30MHz	PE003_01	2,0 dB	1
Radiated Emission CISPR 16 Loop Ant. 0,15-30MHz	PE004_01	4,0 dB	1
Radiated Emission CISPR 16 Bicon. Ant. 30-300MHz	PE004_02	3,9 dB	1
Radiated Emission CISPR 16 LogP. Ant. 300-1000MHz	PE004_03	3,8 dB	1
Radiated Emission CISPR 16 Horn Ant. 1-18GHz	PE004_04	4,2 dB	1
Human Exposure to electromagnetic fields	PE005_01	23,6 %	1
Harmonic current emissions test	PE006_01	10 mA + 2,6 %	1
Voltage fluctuation and flicker test	PE007_01	4,8 %	1
Radiated Immunity 80MHz-6GHz	PE102_XX	2,1 dB 0,82 V/m a 3V/m	1
Conducted Immunity 0,15-230MHz	PE105_XX	1,2 dB 0,44 V a 3V	1
AC Magnetic field	PE106_01	1,55 % 0,15 A/m a 10A/m	1
Pulse Magnetic field	PE107_01	6,25 % 18,7 A/m a 300A/m	1
Dumped Magnetic field	PE108_01	6,25 % 1,87 A/m a 30A/m	1
Common mode conducted immunity	PE112_01	2,21 % 0,22 V a 10V	1

Test	Test Setup	Expanded uncertainty	Note
Power/Spurious 9kHz-30MHz	PR001_01	4,0 dB	1
Power/Spurious ERP 30-1000MHz d=10m	PR001_02+03	4,7 dB	1
Misura della potenza EiRP 1-18GHz d=3m	PR001_04	4,7 dB	1
Misura della potenza EiRP 18-40GHz d=3m	PR001_05	5,4 dB	1
Frequency error	PR002_01+02	< 1x10-7	1
Timing zero span (1001pts.)	PR002_01+02	0,2 % SWT	1
Modulation bandwidth	PR002_01+02	< 1x10-7	1
Conducted RF power and spurious emission	PR002_01+02	1,1 dB	1
Adjacent channel power	PR002_01+02	1,1 dB	1
Blocking	PR002_01+02	1,1 dB	1

Test	Test Setup	Expanded uncertainty	Note
Electrostatic discharge immunity test	PE101_0X		2
Electrical fast transients / burst immunity test	PE103_0X		2
Surge immunity test	PE104_0X		2
Short interruption immunity test	PE109_01		2
Rev_19_01 date 14/01/2019			

Note 1:
The expanded uncertainty reported according to the document EA-4-02 is based on a standard uncertainty multiplied by a coverage factor of K=2, providing a level of confidence of p = 95%

Note 2:
It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95% confidence, covering factor k = 2

8. Reference documents

Reference no.	*Description*
FCC Rules and Regulation Title 47 part 15:2017	--
ANSI C63.4:2014	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz
ANSI C63.10:2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
Internal Procedure PM001 rev. 3.0 (Quality Manual)	Measure Procedure
Internal procedure INC_M rev. 9.1 (Quality Manual)	Measurement uncertainty calculation

9. Deviation from test specification

None

10. Test case verdicts

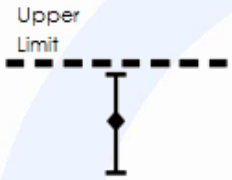
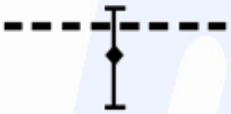
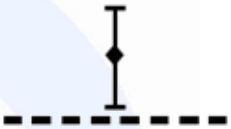
Test case does not apply to the test object	:	N.A.
Test item does meet the requirement	:	Complies
Test item does not meet the requirement	:	Does not comply
Test not performed	:	N.E.

11. Results

In this clause tests results are reported.

Measurement uncertainty is in accordance with document CMC INC_M rev. 9.1.

Judgement of compliance:

Case 1	Case 2	Case 3	Case 4
			
The sample complies with the requirement.	The sample complies with the requirement.	The sample does not comply with the requirement.	The sample does not comply with the requirement.
The measurement results is within the specification limit when the measurement uncertainty is taken into account.	It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty although the measurement result is below the limit.	It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty also the measurement result is upper the limit.	The measurement results is outside the specification limit when the measurement uncertainty is taken into account.

In agreement with ILAC-G8: 03/2009 Guidelines on the Reporting of Compliance with Specification.

11.1 Conducted emissions

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.207
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

Test site:
Shielded chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S010, CMC S200, CMC S206
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Main port
Frequency range: 150 kHz – 30 MHz

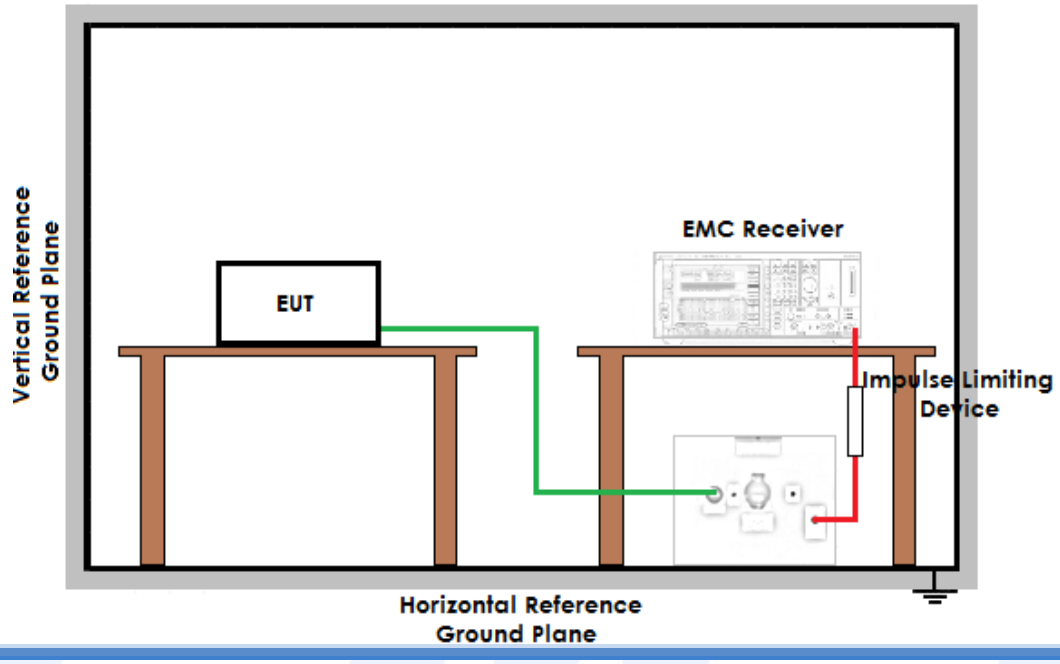
Environmental conditions

Temperature (°C)	*Atmospheric pressure (kPa)*	*Relative humidity (%)*
22	101	45

Acceptance limits

Frequency range (MHz)	*dB(µV) Quasi-peak*	*dB(µV) Average*
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

Setup

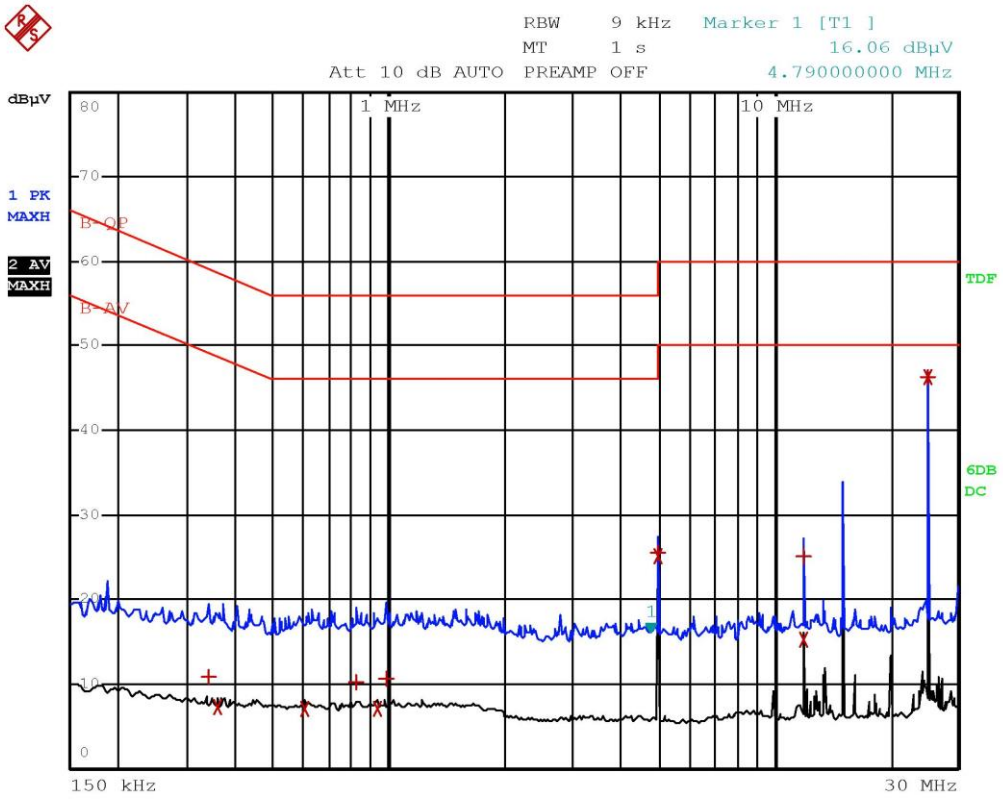


Result

Line	*Graphs*	*Remarks*	*Result*
N	G18277408	--	Complies
L1	G18277409	--	Complies
Remarks: Tests performed on 120 Vac side of PC			

Graphs Legend
PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +
AV: Average; AV [1s] (average at 1 second) values are marked with a X

Graphs



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EDIT PEAK LIST (Final Measurement Results)			
Trace1:	B-QP		
Trace2:	B-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	338 kHz	10.79	-48.45
2 Average	358 kHz	7.22	-41.55
2 Average	602 kHz	6.96	-39.03
1 Quasi Peak	822 kHz	10.09	-45.90
2 Average	934 kHz	6.93	-39.06
1 Quasi Peak	982 kHz	10.59	-45.40
1 Quasi Peak	4.998 MHz	25.56	-30.43
2 Average	4.998 MHz	25.01	-20.99
1 Quasi Peak	11.934 MHz	25.00	-35.00
2 Average	11.934 MHz	15.23	-34.76
1 Quasi Peak	24.998 MHz	46.26	-13.73
2 Average	24.998 MHz	46.39	-3.60

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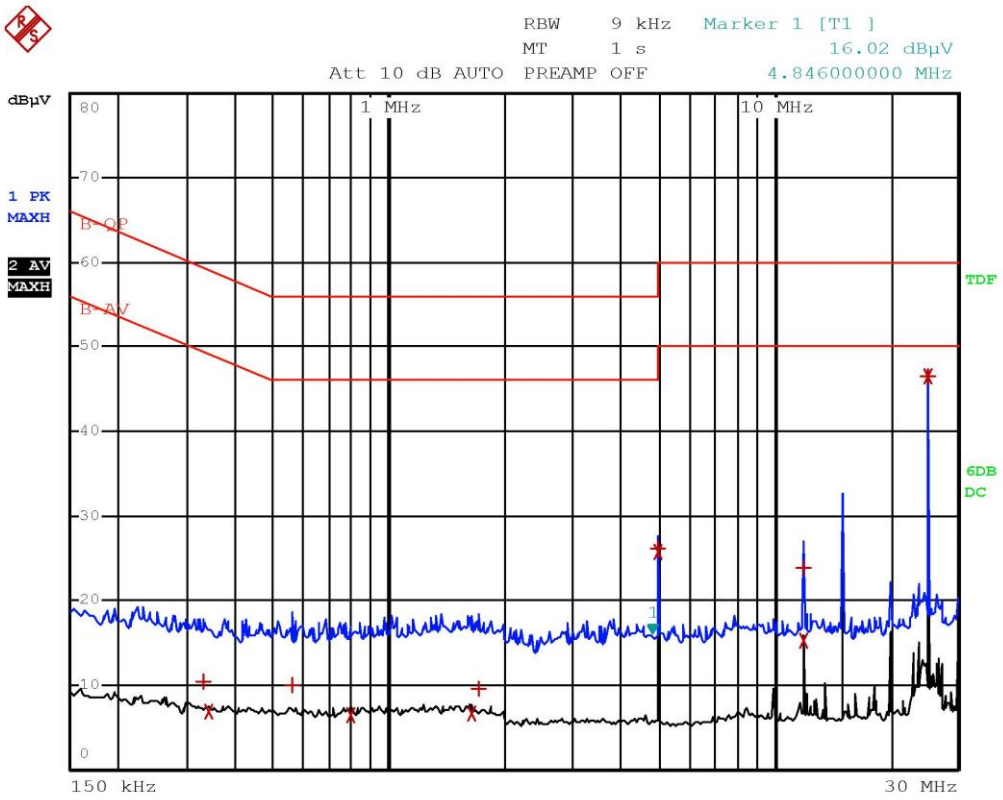

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EDIT PEAK LIST (Final Measurement Results)			
Trace1:	B-QP		
Trace2:	B-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	330 kHz	10.38	-49.06
2 Average	338 kHz	6.89	-42.35
1 Quasi Peak	562 kHz	9.87	-46.12
2 Average	798 kHz	6.48	-39.51
2 Average	1.634 MHz	6.62	-39.38
1 Quasi Peak	1.718 MHz	9.56	-46.43
1 Quasi Peak	4.998 MHz	26.22	-29.77
2 Average	4.998 MHz	25.64	-20.35
1 Quasi Peak	11.934 MHz	23.73	-36.26
2 Average	11.934 MHz	15.13	-34.86
1 Quasi Peak	24.998 MHz	46.46	-13.53
2 Average	24.998 MHz	46.60	-3.39

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Result: The requirements are met

11.2 Radiated emissions

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part. 15.209
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S127, CMC S164, CMC S271, CMC S287
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Enclosure
Frequency range: 0,009 MHz – 300 MHz
Antenna polarization: Horizontal (H) – Vertical (V)
EUT – Antenna distance: 10 m
EUT height about the floor: 80 cm

Environmental conditions

Temperature (°C)	*Atmospheric pressure (kPa)*	*Relative humidity (%)*
22	100	45

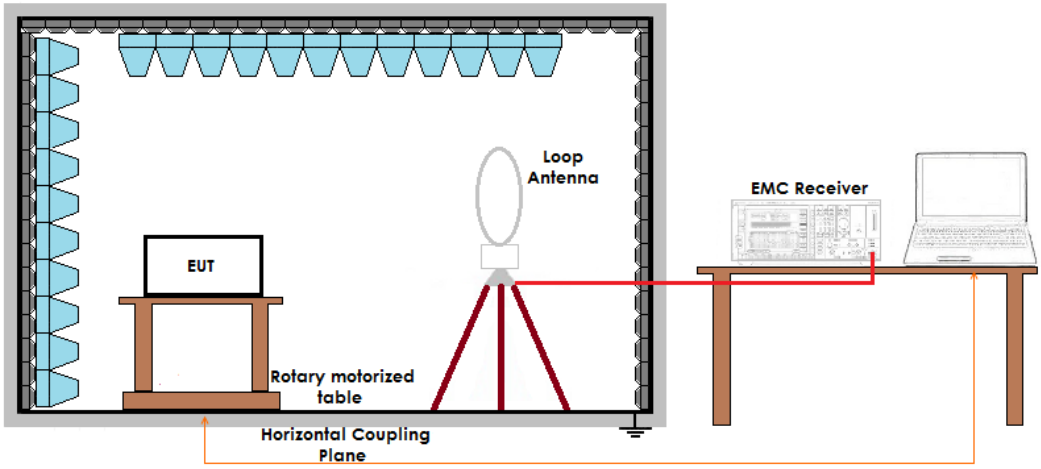
Acceptance limits

Frequency range (MHz)	*Test distance (m)*	*Limits [dB(µV/m)]*	
0,009 to 0,490	300	48,5 to 13,8	
0,490 to 1,705	30	33,8 to 22,9	
1,705 to 30	30	29,5	
30 to 88	3	40	
88 to 216	3	43,5	
216 to 960	3	46,0	
Above 960	3	53,9	
	Test distance (m)	*Linear average detector [dB(µV/m)]*	*Peak detector [dB(µV/m)]*
Above 1000	3	53,9	73,9

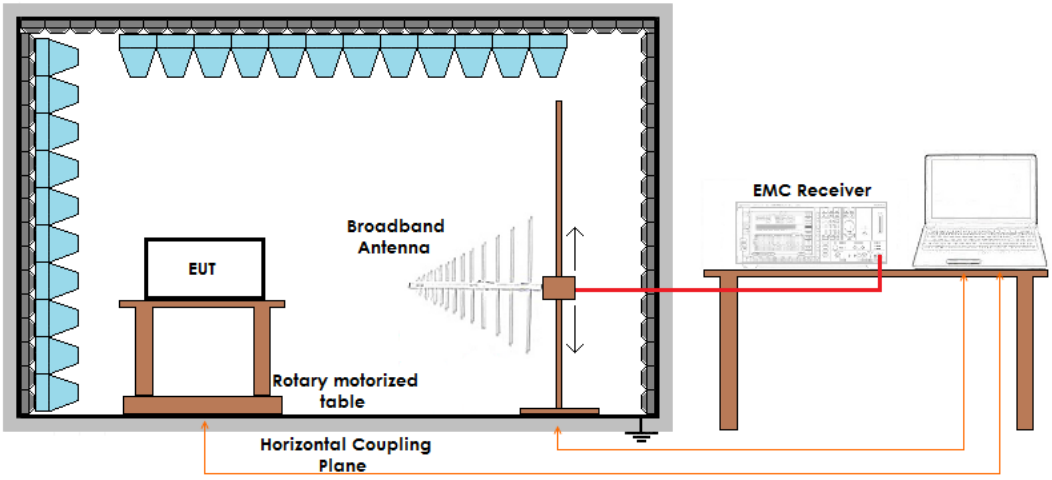
Remarks: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Setup

Frequency ≤ 30 MHz



Frequency ≤ 1 GHz

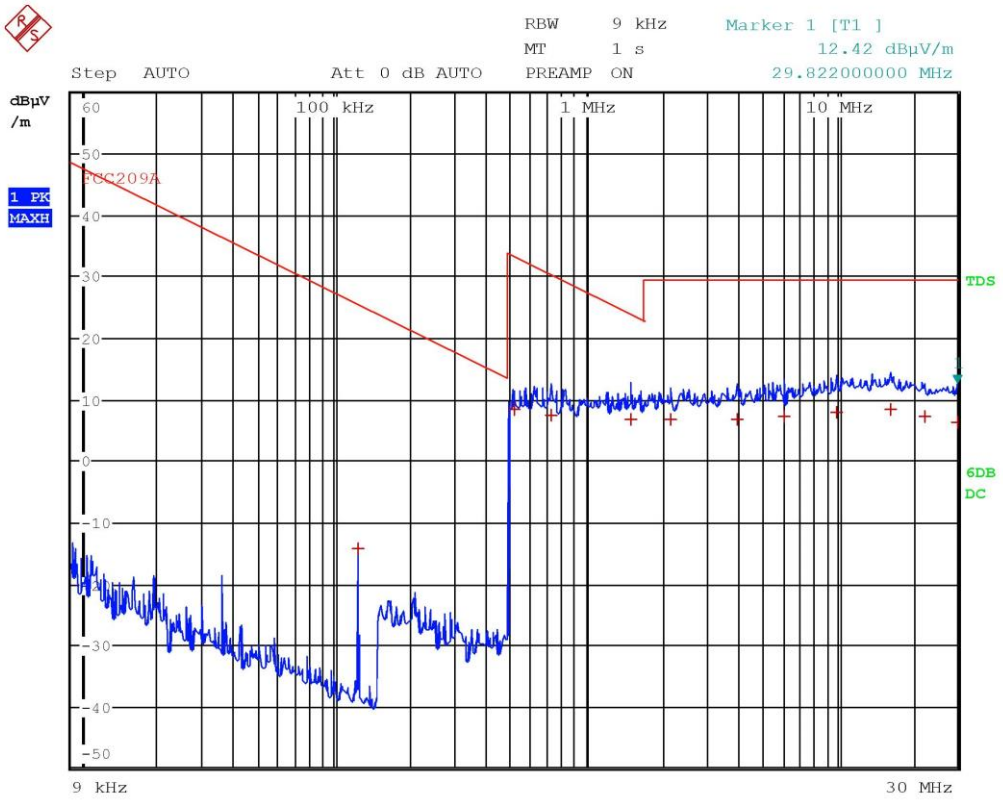


Result

Polarization	*Frequency Range (MHz)*	*Graphs*	*Remarks*	*Result*
Loop	0,009 – 30	G18277403	--	Complies
H	30 – 300	G18277404	--	Complies
V	30 – 300	G18277405	--	Complies
V	300 – 1000	G18277406	--	Complies
H	300 – 1000	G18277407	--	Complies
Remarks:	Measurements have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with different conversion factors, based on the measuring distance provided by the standard. Checks carried out in the open field area show that the values measured in the semi-anechoic chamber are worse in the frequency range 0,009 - 30 MHz			

Graphs Legend
PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +
AV: Average; AV [1s] (average at 1 second) values are marked with a x

Graphs



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EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC209A
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	125 kHz	-15.30	-40.97
1 Quasi Peak	514 kHz	8.43	-24.95
1 Quasi Peak	726 kHz	7.51	-22.86
1 Quasi Peak	1.51 MHz	6.68	-17.34
1 Quasi Peak	2.174 MHz	6.78	-22.75
1 Quasi Peak	4.01 MHz	6.65	-22.88
1 Quasi Peak	6.114 MHz	7.19	-22.34
1 Quasi Peak	9.898 MHz	7.90	-21.64
1 Quasi Peak	16.206 MHz	8.28	-21.25
1 Quasi Peak	22.234 MHz	7.11	-22.42
1 Quasi Peak	29.822 MHz	6.23	-23.30

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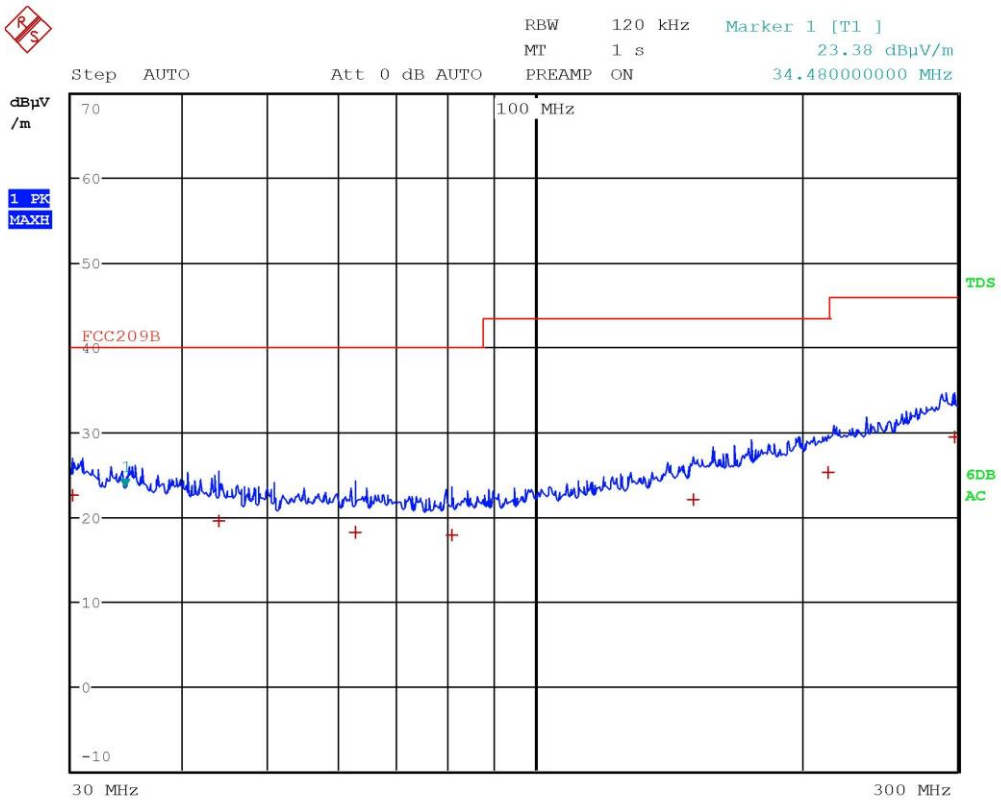

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EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC209B
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	30.08 MHz	22.56	-17.43
1 Quasi Peak	44.04 MHz	19.42	-20.57
1 Quasi Peak	62.64 MHz	18.16	-21.83
1 Quasi Peak	80.6 MHz	17.81	-22.18
1 Quasi Peak	151.04 MHz	22.10	-21.42
1 Quasi Peak	214.04 MHz	25.15	-18.37
1 Quasi Peak	297.28 MHz	29.48	-16.54

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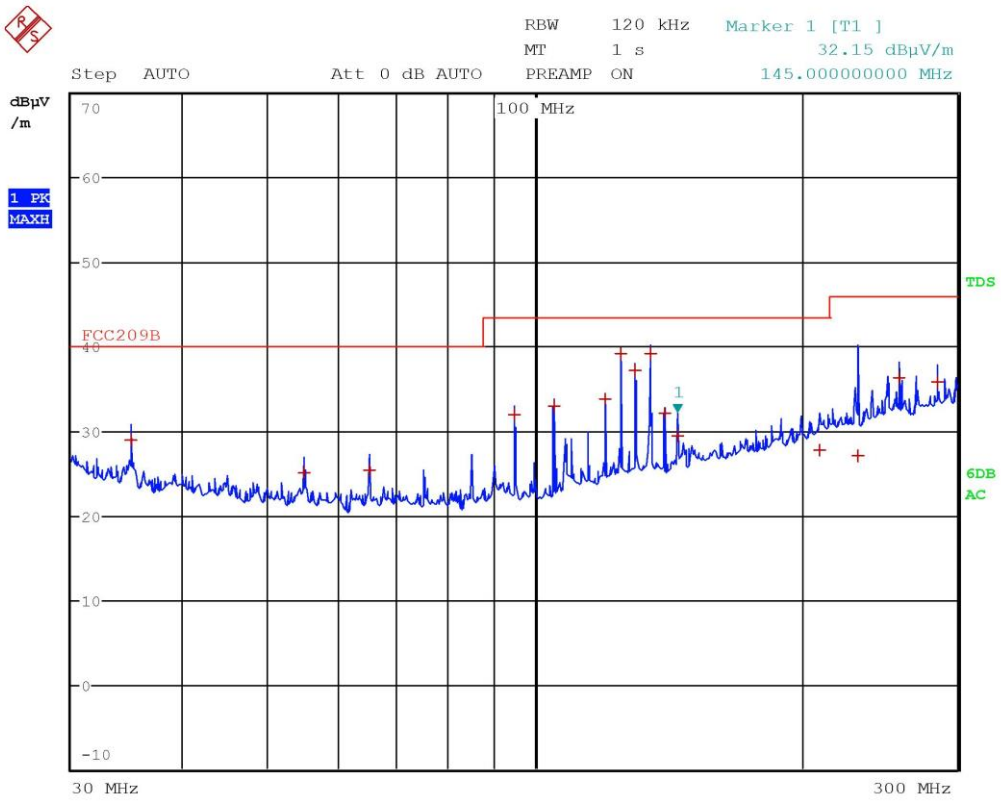

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EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC209B
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	35 MHz	28.96	-11.03
1 Quasi Peak	55 MHz	24.97	-15.02
1 Quasi Peak	65 MHz	25.38	-14.61
1 Quasi Peak	95 MHz	31.86	-11.65
1 Quasi Peak	105 MHz	32.98	-10.53
1 Quasi Peak	120 MHz	33.76	-9.75
1 Quasi Peak	125 MHz	39.09	-4.43
1 Quasi Peak	130 MHz	37.21	-6.30
1 Quasi Peak	135 MHz	39.19	-4.32
1 Quasi Peak	140 MHz	32.04	-11.47
1 Quasi Peak	145 MHz	29.47	-14.04
1 Quasi Peak	209.96 MHz	27.79	-15.72
1 Quasi Peak	231.68 MHz	27.00	-19.02
1 Quasi Peak	257.64 MHz	36.28	-9.73
1 Quasi Peak	284.76 MHz	35.78	-10.23

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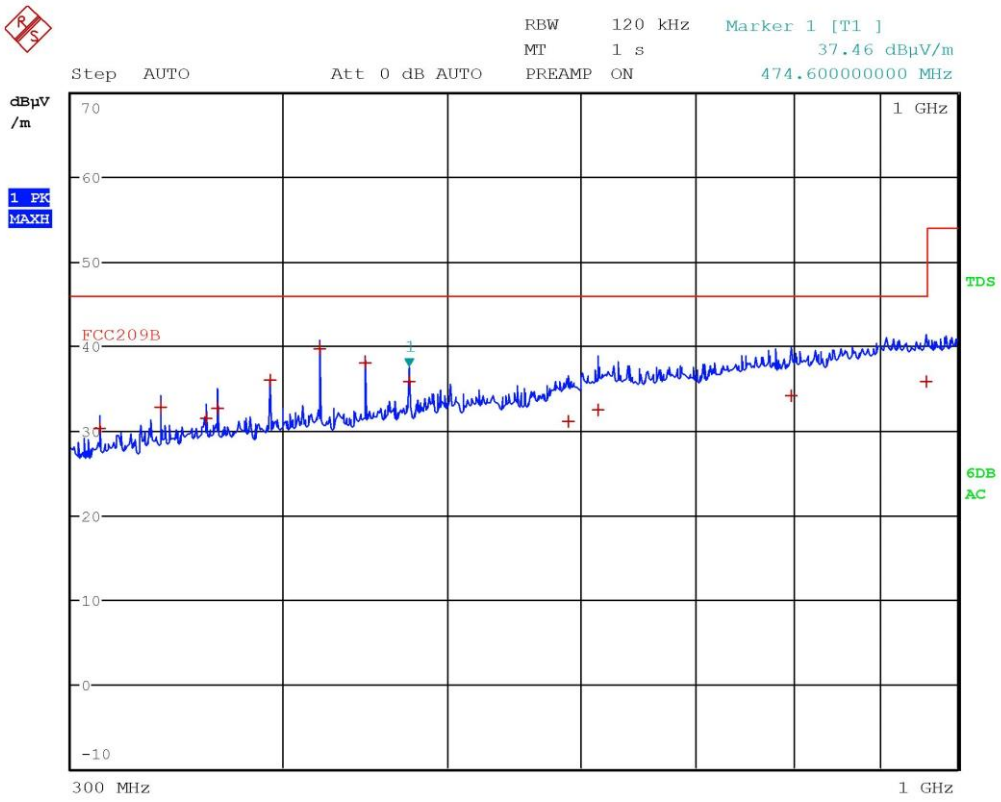

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EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC209B
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	311.88 MHz	30.20	-15.82
1 Quasi Peak	339 MHz	32.74	-13.27
1 Quasi Peak	360 MHz	31.41	-14.60
1 Quasi Peak	366.16 MHz	32.53	-13.48
1 Quasi Peak	393.24 MHz	35.98	-10.03
1 Quasi Peak	420.36 MHz	39.59	-6.42
1 Quasi Peak	447.48 MHz	38.04	-7.97
1 Quasi Peak	474.6 MHz	35.78	-10.23
1 Quasi Peak	589.08 MHz	31.15	-14.86
1 Quasi Peak	614.04 MHz	32.41	-13.61
1 Quasi Peak	798.4 MHz	34.05	-11.96
1 Quasi Peak	957.76 MHz	35.81	-10.20

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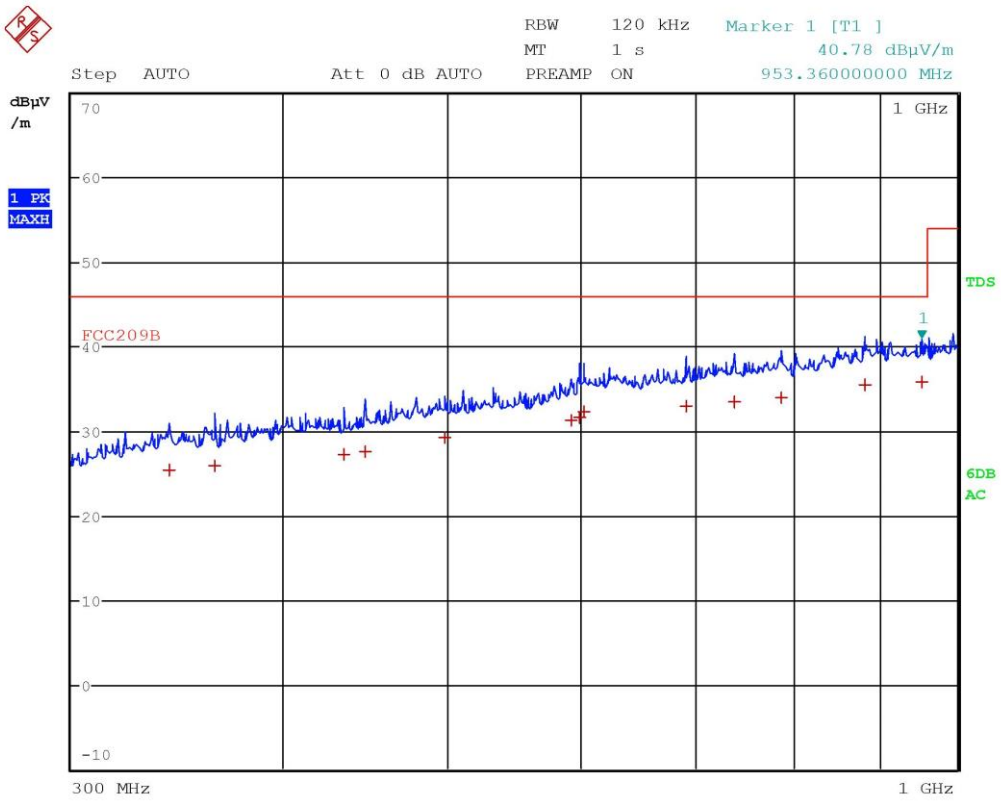

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EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC209B
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	342.88 MHz	25.42	-20.59
1 Quasi Peak	364.28 MHz	25.86	-20.15
1 Quasi Peak	434.44 MHz	27.23	-18.78
1 Quasi Peak	447.6 MHz	27.61	-18.40
1 Quasi Peak	498.44 MHz	29.31	-16.70
1 Quasi Peak	591.56 MHz	31.32	-14.69
1 Quasi Peak	599 MHz	31.59	-14.42
1 Quasi Peak	602 MHz	32.21	-13.80
1 Quasi Peak	691.6 MHz	32.88	-13.14
1 Quasi Peak	738.16 MHz	33.38	-12.63
1 Quasi Peak	786.48 MHz	33.92	-12.09
1 Quasi Peak	882.24 MHz	35.49	-10.52
1 Quasi Peak	953.36 MHz	35.75	-10.26

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Result: The requirements are met