

Test report

23-0121RP11-007-C

Product / EUT: *Exoskeleton*
 Type designation: *EXOACTIVE EXO 18*
 Tested type: *EXOACTIVE EXO 18*

EUT authorization: ☒ Certification
☐ Suppliers Declaration of Conformity

Production level: *EUT 23-0121PR05-015* *2023-04*
EUT 23-0121PR05-016 *2023-04*

S/N: *EUT 23-0121PR05-015* *40023038*
EUT 23-0121PR05-016 *40025445*

FCC ID: *2BE7T-EXO18*
 IC certification number: *32110-EXO18*
 PMN *ExoActive*
 HVIN *10715513*
 FVIN *10499807*

Manufacturer: *exoIQ GmbH*
Jaffestraße 12
21109 Hamburg / Germany

Test remit: 47 CFR Part 15 – Subpart C – Intentional radiators
 RSS-247, Issue 3 (2023-08)
 RSS-Gen, Issue 5 (2018-04)
 - Amendment 1:2019-03 and Amendment 2:2021-02
 in accordance with the procedures given in
 ANSI C63.10-2013 and ANSI C63.4a-2017

The standards were: ☒ kept
☐ kept, for the limited scope of testing
☐ not kept

Remark: ☒ Validation covered by the accredited scope
☐ Validation not covered by the accredited scope
 according: _____
☐ Validation of the EMC-requirements partly proceeded

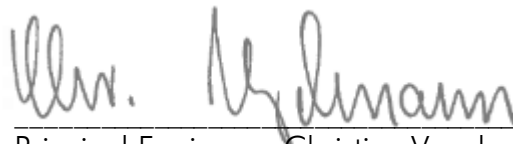


Applicant: exolQ GmbH
Jaffestraße 12
21109 Hamburg / Germany

EUT-
Date of arrival: 02/02/2024 02/02/2024
Test ID: 23-0121PR05-015 23-0121PR05-016
Date(s) of test: 02/14/2024 – 03/01/2024

Burgrieden, 08/26/2024

Released by:



Principal Engineer - Christian Vogelmann

Test laboratory: EMCE GmbH
Ingenieurbüro für EMV-Prüfungen und
Schaltungsentwicklung
Untere Wiesen 1 / 88483 Burgrieden / Germany

DAkkS-Registration No: D-PL-12122-01-00
USA / CAB-Registration No.: BNetzA-CAB-02/21-01
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Designated by:
Bundesnetzagentur



BNetzA-CAB-02/21-01

Accredited by:
Deutsche Akkreditierungsstelle GmbH



Deutsche
Akkreditierungsstelle
D-PL-12122-01-00



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1 General information

Project manager: Mr. S. Vogelmann
Inspector: Mr. S. Vogelmann

EMCE GmbH
Ingenieurbüro für EMV-Prüfungen und Schaltungsentwicklung

Contact person: Mr. Kosub / exolQ GmbH

Remarks: n/a

State of revision:

Source document	New Document	Date / Reviser	Modifications
23-0121RP11-007	23-0121RP11-007-A	08/16/2024 Chr. Vogelmann	CAB Identifier DE-0019 added.
23-0121RP11-007-A	23-0121RP11-007-B	08/24/2024 Chr. Vogelmann	PMN, HVIN and FVIN added. The output power was also documented using the measured radiated power.
23-0121RP11-007-B	23-0121RP11-007-C	08/26/2024 S. Vogelmann	Presentation of the results in terms of output power expressed in watts instead of dBm.

2 EUT information

Sampling: The device was selected and provided by the customer.

23-0121PR05-015 EUT with antenna and firmware for transmit mode only on channel 37, 17 and 39.

23-0121PR05-016 EUT with U.FL jack and firmware for transmit mode only on channel 37, 17 and 39.

EUT description

Description: *EUT is an exoskeleton for supporting the arms and has a Bluetooth interface.*

Voltage supply: *Internal battery, 18 V*

Frequency list: *n/a*

Max. clock frequency: *2480 MHz*

Temperature range: *0 °C – 40 °C*

Dimension: *(LxWxH) / mm³ - Corpus 580 x 200 x 200*

RF technology: ☐ 802.11b ☐ 802.11g
☐ 802.11n ☒ Bluetooth - low energy

Wide band modulation ☐ FHSS ☒ other than FHSS

Modulation type: ☐ BPSK ☐ GFSK
☐ 16QAM ☐ 64QAM
☐ 256QAM ☐ QPSK
☒ BLE 2M PHY

Transfer rate: ☐ 1 Mbit/s ☒ 2 Mbit/s
☐ 3 Mbit/s ☐ ____

Channel bandwidth: ☐ 1 MHz ☒ 2 MHz
☐ 10 MHz ☐ 20 MHz
☐ 40 MHz ☐ ____

Channel number: ☐ 0 – 11 ☐ 0 – 13
☒ 0 – 39 ☐ 0 – 79
☐ ____

Channel plan – Bluetooth low energy:

Channel #	Frequency (MHz)	Channel #	Frequency (MHz)	Channel #	Frequency (MHz)	Channel #	Frequency (MHz)
37	2402	9	2422	18	2442	28	2462
0	2404	10	2424	19	2444	29	2464
1	2406	38	2426	20	2446	30	2466
2	2408	11	2428	21	2448	31	2468
3	2410	12	2430	22	2450	32	2470
4	2412	13	2432	23	2452	33	2472
5	2414	14	2434	24	2454	34	2474
6	2416	15	2436	25	2456	35	2476
7	2418	16	2438	26	2458	36	2478
8	2420	17	2440	27	2460	39	2480

Used antennas:

Antenna designation	Manufacturer	Connector / cable length	Gain (dBi) @ f / GHz
<i>Internal antenna</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>

Supplied / used equipment:

Designation	Type	Manufacturer	S/N
<i>1 x Battery</i>	<i>BP 18 Li 4,0 HPC-ASI</i>	<i>Festool</i>	<i>n/a</i>

Configuration: ☒ As-delivered condition
☐ Modified
 * _____

Cable designation	Type	Length	Remarks
<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>



Pictures of the EUT





Type plate of EUT 23-0121PR05-015



Type plate of EUT 23-0121PR05-016



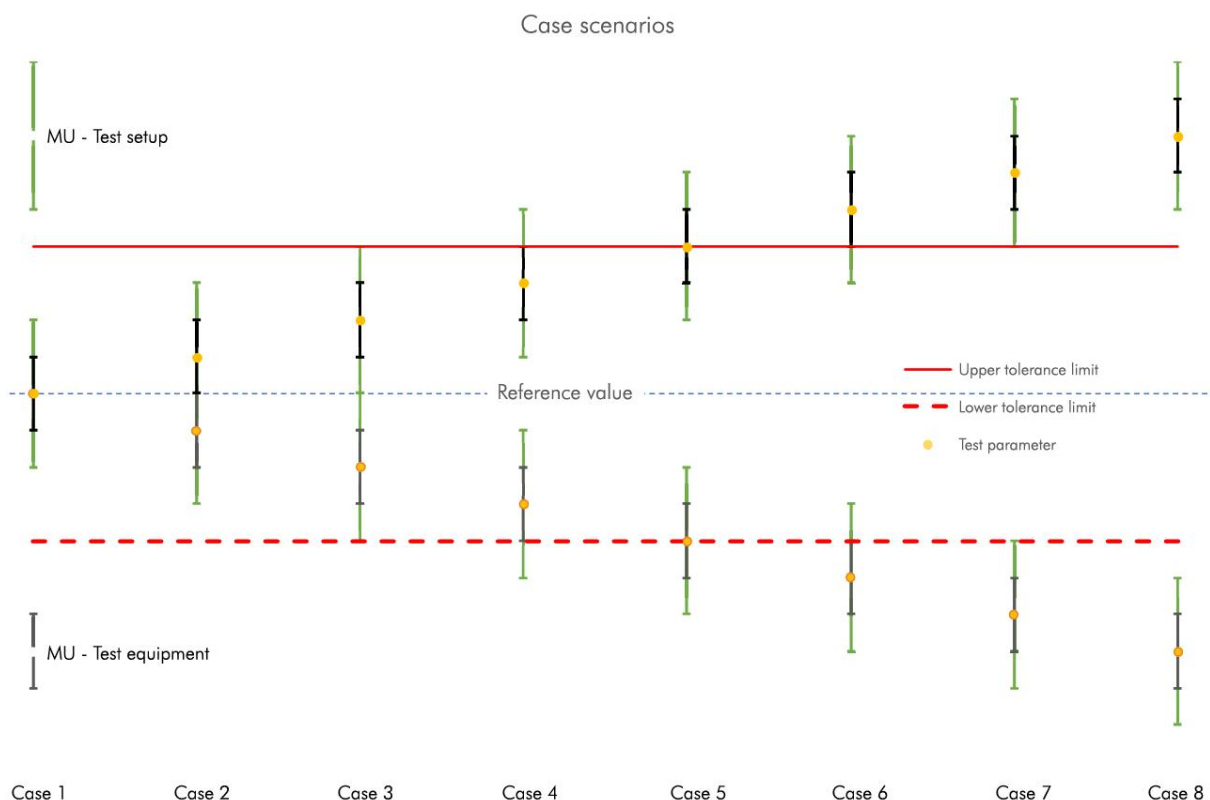
3 Decision rules for conformity assessment

"Binary" decision rule - pass / fail

Unless otherwise stated in the test module, the following specifications apply:

Interference immunity

No measurement uncertainties are taken into account for the statement of conformity. The test requirement is fulfilled if the value of the test parameter is less than or equal to the tolerance limit. Here, the specification from the standard is used as decision threshold. The test equipment used in the laboratory for testing is within the specifications with a confidence level of 95 % and thus allows a reliable statement of conformity. On the basis of the selected decision rule, the risk (such as a wrong assumption, a wrong rejection and wrong statistical assumptions) is limited to the remaining uncertainty of measurement. The statement applies separately for each relevant parameter from the test standard.



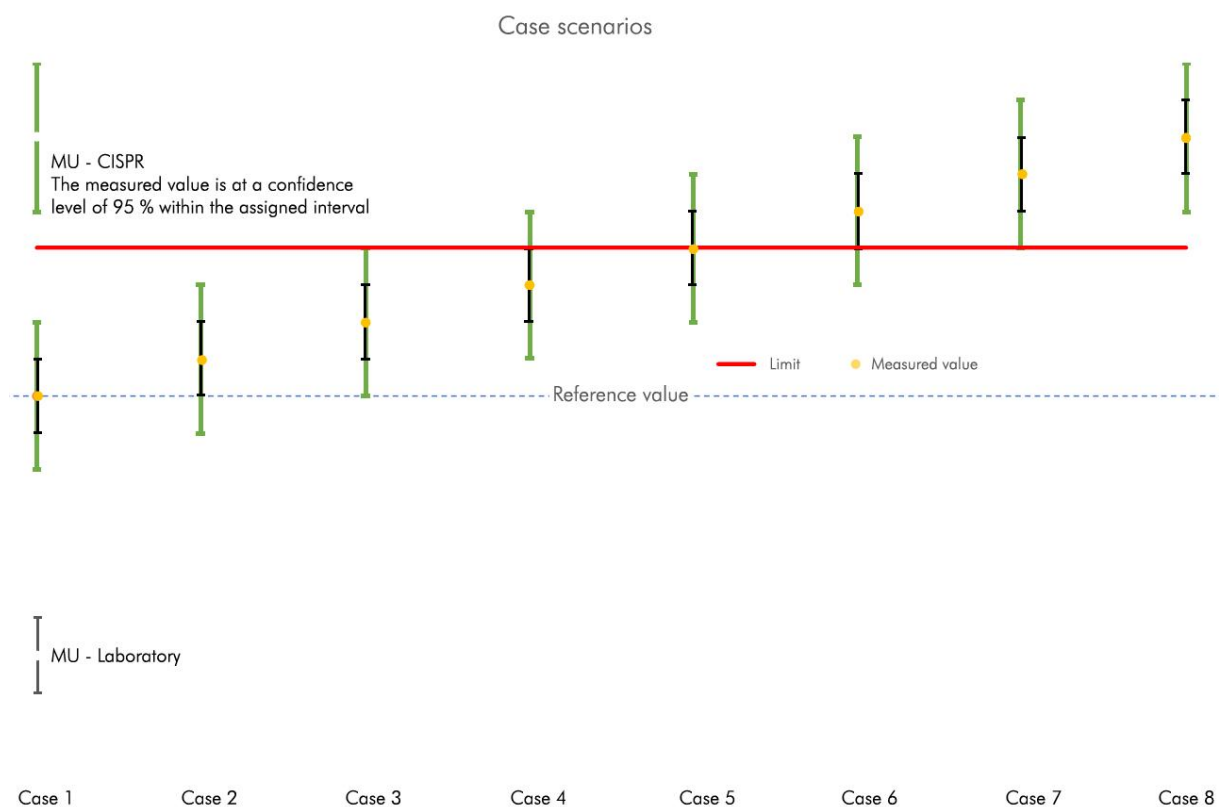
Since the statement of conformity does not take into account any measurement uncertainties, the requirement is fulfilled if the value of the test parameter is less than or equal to the tolerance limit.

This is valid for cases 1 - 5.

Test equipment outside the tolerance limits, case 6 - 8, is not used.

Interference emission

No measurement uncertainties are taken into account for the statement of conformity. In the case of conducted and radiated interference emission, the measurement is considered passed if the measurement result is below the permitted limit value. The accepted measurement uncertainties for a direct statement of conformity, determined for the U_{Lab} laboratory, must be less than the U_{CISPR} values determined in the CISPR16-4-2 standard. The measurement uncertainties are stated with a confidence level of 95 %. In this case the uncertainty of measurement is not taken into account for the conformity statement.



The test is passed for case 1 - 5. A rejection is made in case 6 - 8.

The test is considered as passed if the evaluation criteria for immunity to interference and the limits of emitted interference of the specified standard are met. Measurement uncertainties are not considered.



Grid supply distortion through: Harmonics

The test is considered passed if the limits for harmonics of the specified standard are met. Measurement uncertainties are not taken into account; this also applies to the variability of the repeatability and the reproducibility of the measurements.

Voltage changes, voltage fluctuations and flicker

No measurement uncertainties are taken into account for the statement of conformity. The measurement is considered passed if the measurement result is below the permitted limit value. The accepted measurement uncertainties for a direct statement of conformity, determined for the U_{Lab} laboratory, must be less than the value for the total measurement uncertainty specified in the standard. The total impedance of the measuring system used corresponds to the reference impedance. The measurement uncertainties are specified with a confidence level of 95 %. In this case, the measurement uncertainty is not taken into account in the conformity statement.

4 Test equipment list of EMCE GmbH

Inv.-No.	Designation	Type	Manufacturer	S/N	Calibration: Interval /valid until
002	Passive probe	ESH2-Z3	Rohde & Schwarz		1 Year(s)/ 2024-12-31
006	LISN	NNBM 8125	Schwarzbeck	8125371	1 Year(s)/ 2024-03-31
007	Absorbing clamp	MDS 21	Schwarzbeck	942436	1 Year(s)/ 2025-01-31
008	Loop antenna 9kHz-30MHz	HFH2-Z2	Rohde & Schwarz	835776/0002	3 Year(s)/ 2026-02-28
009	Antenna 30-300MHz	VHBA9123 / BBA9106	Schwarzbeck	435	3 Year(s)/ 2024-12-22
010	Antenna 250-1200MHz	UHALP 9108A	Schwarzbeck	108	3 Year(s)/ 2025-12-20
013	Antenna 9 kHz-30 MHz	Ø 1.5 m	EMCE GmbH		1 Year(s)/ 2024-12-31
014	OATS	Test site 3 m referred to ANSI C63.4a-2017	EMCE GmbH		3 Year(s)/ 2024-04-23
015	OATS	Test site 10 m referred to ANSI C63.4a-2017	EMCE GmbH		3 Year(s)/ 2024-04-26
020	Coupling clamp	IP4A	Haefely	082672-13	1 Year(s)/ 2024-12-31
022	ESD-Gun	NSG 435	Schaffner	577	1 Year(s)/ 2024-08-24
024	RF-Generator	SMY01	Rohde & Schwarz	844146/046	2 Year(s)/ 2024-09-09
025	Current clamp BCI	F-120-2	FCC	47	1 Year(s)/ 2025-01-31
026	Coupling-/ Decoupling Network M3	CDN 801-M3-25	FCC	92	1 Year(s)/ 2025-01-31
032	RF Power Amplifier	75A250	Amplifier Research	22789	2 Year(s)/ 2026-08-31
038	Helmholtz coil	1 m x 1 m	EMCE GmbH		1 Year(s)/ 2024-10-31
039	Helmholtz coil	1 m x 1 m	EMCE GmbH		1 Year(s)/ 2024-10-31
040	Current transformer		EMCE GmbH		1 Year(s)/ 2024-10-31
041	Loop antenna shielded	HZ-10 0816.2511.02	Rohde & Schwarz	849788/0020	3 Year(s)/ 2026-01-10

Inv.-No.	Designation	Type	Manufacturer	S/N	Calibration: Interval /valid until
042-2	AC-Source	EMV D 5000/PAS/SyCore	Spitzenberger & Spies	A274700 / 00501	3 Year(s)/ 2026-02-10
042-1	Analyser Reference System	ARS 16/3	Spitzenberger & Spies	A274707 / 00501	3 Year(s)/ 2024-12-28
043	Receiver	3DH/E Fieldmeter ESM-100	Maschek	971521	3 Year(s)/ 2026-09-11
044	CDN	CN-U	EMC-Partner	86	1 Year(s)/ 2024-12-31
045	CDN	DN-HF	EMC-Partner	86	1 Year(s)/ 2024-12-31
046	CDN	DN-LF2	EMC-Partner	86	1 Year(s)/ 2024-12-31
047	CDN	DN-LF1	EMC-Partner	86	1 Year(s)/ 2024-12-31
050	Data Acquisition/ Switch Unit	Agilent 34970A	Agilent Technologies	MY41019453	3 Year(s)/ 2026-07-18
051	20 Channel Multiplexer	Agilent 34901A	Agilent Technologies	MY41013531	3 Year(s)/ 2026-07-18
054	Helmholtz coil	1.25 m x 1.25 m	EMCE GmbH		1 Year(s)/ 2024-08-31
055	Helmholtz coil	1.25 m x 1.25 m	EMCE GmbH		1 Year(s)/ 2024-08-31
058	Receiver	ESIB 40	Rohde & Schwarz	100200/ Firmware 4.35	1 Year(s)/ 2024-08-18
059	Log.-per. antenna	HL050	Rohde & Schwarz	100006	3 Year(s)/ 2025-10-21
068	LISN	ESH2-Z5	Rohde & Schwarz	872460/042	1 Year(s)/ 2024-03-14
070	Pulse limiter + 10 dB Attenuator	ESH3-Z2	Rohde & Schwarz	n/a	1 Year(s)/ 2024-08-31
115	Strip line 50 Ohm		EMCE GmbH		1 Year(s)/ 2024-03-31
116	Vertical rod antenna	VAMP 9243	Schwarzbeck	9243-205	3 Year(s)/ 2026-05-19
117	LISN	ESH3-Z6	Rohde & Schwarz	100521	1 Year(s)/ 2024-03-31
118	Current Probe	F-52	Fischer Customs Communication, Inc.	08398	1 Year(s)/ 2025-01-31
119	10V Insertion Unit 50 Ohm	URV5-Z2	Rohde & Schwarz	100911	2 Year(s)/ 2025-09-12

Inv.-No.	Designation	Type	Manufacturer	S/N	Calibration: Interval /valid until
122	Power Meter	NRVS	Rohde & Schwarz	833430 / 0017	2 Year(s)/ 2025-09-12
123	Directional coupler	BDC 0100-50/500	BONN Elektronik	087261	1 Year(s)/ 2024-08-31
127	Function/ Arbitrary Waveform Generator	Agilent 33220A	Agilent Technologies	MY44026679	3 Year(s)/ 2025-03-08
128	Signal Generator	SMF100A	Rohde & Schwarz	100137	2 Year(s)/ 2025-02-22
129	ESD-Gun	ESD30N	EM TEST GmbH	V1012106114	3 Year(s)/ 2026-01-30
131	Coupling network	M3/AC	Dr. Hubert GmbH	A3052006	1 Year(s)/ 2024-07-31
132	LF-Amplifier	A1110-05	Dr. Hubert GmbH	111A1110	2 Year(s)/ 2025-12-31
134	10 V Insertion Unit 50 Ohm	URV5-Z2	Rohde & Schwarz	101025	2 Year(s)/ 2025-12-13
136	Directional coupler	BDC 0842-40/200	Bonn Elektronik	108082	1 Year(s)/ 2024-08-31
140	Burst/Surge-Generator	Transient 3000	EMC-Partner	TRA3000 104033	2 Year(s)/ 2024-05-31
142	Coupling / Decoupling Network for Burst and Surge	CNI 503 B7.4	EM TEST GmbH	V1125109869	2 Year(s)/ 2024-05-31
143	Ultra-Compact Simulator	UCS 500 N7	EM TEST AG	V1125109868	2 Year(s)/ 2024-05-31
151	DSO Infiniium 2500 MHz	DSO9254A	Agilent Technologies	MY52090137	2 Year(s)/ 2024-05-18
154	Capacitive voltage clamp	CDN 500	Teseq GmbH	656	3 Year(s)/ 2024-08-31
155	Impedance stabilisation network	ISN T400A	Teseq GmbH	26541	3 Year(s)/ 2025-01-31
157	Power Amplifier	CBA1G-1000	Teseq GmbH	T44166	1 Year(s)/ 2024-08-31
159	Function/Arbitrary Waveform Generator	Agilent 33220A	Agilent Technologies	MY44058563	3 Year(s)/ 2024-05-19
163	Power Sensor	NRV-Z4	Rohde & Schwarz	100575	2 Year(s)/ 2024-04-21
164	Burst Generator	EFT 500 N8	EM Test GmbH	P1251107058	2 Year(s)/ 2024-05-31
174	LISN	ESH3-Z6	Rohde & Schwarz	101003	1 Year(s)/ 2024-03-31

Inv.-No.	Designation	Type	Manufacturer	S/N	Calibration: Interval /valid until
175	EMI Test receiver	ESR7	Rohde & Schwarz	101108 Firmware: FW V3.46 SP3	1 Year(s)/ 2024-11-15
186	Signal Generator 9kHz - 3.3GHz	SML03	Rohde & Schwarz	836927/005	2 Year(s)/ 2024-11-23
187	Arbitrary Generator	AutoWave	EM Test GmbH	P1450145409	3 Year(s)/ 2026-02-07
190	Coupling-/ Decoupling Network M1	CDN M132	Ametek	40493	1 Year(s)/ 2025-01-31
191	Coupling-/ Decoupling Network M2	CDN M232S	Ametek	37701	1 Year(s)/ 2025-01-31
192	Coupling-/ Decoupling Network M3	CDN M332	Ametek	37749	1 Year(s)/ 2025-01-31
193	Coupling-/ Decoupling Network M3	CDN M332	Ametek	37750	1 Year(s)/ 2025-01-31
194	Coupling-/ Decoupling Network M4	CDN M432	Ametek	39127	1 Year(s)/ 2025-01-31
195	Coupling-/ Decoupling Network M5	CDN M532	Ametek	40558	1 Year(s)/ 2025-01-31
196	Coupling-/ Decoupling Network AF2	CDN A201A	Ametek	40613	1 Year(s)/ 2025-01-31
197	Coupling-/ Decoupling Network AF2	CDN A201A	Ametek	40614	1 Year(s)/ 2025-01-31
198	Coupling-/ Decoupling Network S1 - 9-pol. D-Sub	CDN S900	Ametek	40033	1 Year(s)/ 2025-01-31
199	Coupling-/ Decoupling Network S1 - RJ45	CDN ST08A	Ametek	39792	1 Year(s)/ 2025-01-31
200	Coupling-/ Decoupling Network S1 - RJ45	CDN ST08A	Ametek	39794	1 Year(s)/ 2025-01-31
201	Coupling-/ Decoupling Network S1 - USB	CDN USB/p	Ametek	40162	1 Year(s)/ 2025-01-31

Inv.-No.	Designation	Type	Manufacturer	S/N	Calibration: Interval /valid until
202	Coupling-/Decoupling Network S1 - USB 3.0	CDN USB3.0	Ametek	40536	1 Year(s)/ 2025-01-31
204	Coupling-/Decoupling Network S1 -D-Sub 9-pol.	CDN S900	Ametek	40034	1 Year(s)/ 2025-01-31
207	Power sensor	NRV-Z4	Rohde & Schwarz	845674/006	2 Year(s)/ 2024-08-11
208	RF Power Meter	NRVD	Rohde & Schwarz	832378/056	2 Year(s)/ 2024-05-06
211	Broadband Amplifier	BBA150 800 - 3000 MHz	Rohde & Schwarz	102104	1 Year(s)/ 2024-08-31
212	Broadband Amplifier	BBA150 2500 - 6000 MHz	Rohde & Schwarz	102105	1 Year(s)/ 2024-08-31
214	Load Dump Simulator	LD 200N	EM TEST	P1551169024	3 Year(s)/ 2026-02-07
215	Ultra-Compact Simulator for automotive transients	UCS200N100	EM TEST	P1607171950	3 Year(s)/ 2026-02-07
216	Voltage Drop Simulator	VDS 200Q100.1	EM TEST	P1612177896	3 Year(s)/ 2026-02-09
217	Automotive Power Fail Module	PFM 200N100.1	EM TEST	P1606171835	3 Year(s)/ 2026-02-08
222	Broadband Preamplifier 0.5-18 GHz	BBV 9718	Schwarzbeck	9718-316	1 Year(s)/ 2024-07-31
223	Broadband Preamplifier 12-28 GHz	BBV 9719	Schwarzbeck	9719-024	1 Year(s)/ 2024-07-31
224	SMB100A Signal Generator	SMB100A	Rohde & Schwarz	108055	3 Year(s)/ 2026-01-25
225	Electric and Magnetic Field Probe-Analyzer	EHP-200A	Narda S.T.S. / PMM	170WX70205	3 Year(s)/ 2025-07-22
226	HL050 Log.-Per. Antenna 850 MHz to 26.5 GHz	HL050 4062.4063.02	Rohde & Schwarz	100829	3 Year(s)/ 2026-07-27
227	Field Probe HI-6006	HI-6006	ETS-Lindgren	00213536	1 Year(s)/ 2025-02-28
228	Coupling device network AF4	CDN AF4-32	EMCE GmbH		1 Year(s)/ 2025-01-31
229	Test receiver	ESS 5 Hz - 1000 MHz	Rohde & Schwarz	845420/0005	1 Year(s)/ 2025-01-19

Inv.-No.	Designation	Type	Manufacturer	S/N	Calibration: Interval /valid until
230	FSV40 Signal Analyzer 40 GHz	FSV40	Rohde & Schwarz	101717	2 Year(s)/ 2026-02-06
231	Vector Signal Generator SMBV100A	SMBV100A	Rohde & Schwarz	262891	3 Year(s)/ 2026-11-13
233	OSP-B157W 8 PORT	OSP-B157W8	Rohde & Schwarz	100925	2 Year(s)/ 2026-01-31
235	ESD-Gun	NSG 435	Teseq	7275	2 Year(s)/ 2024-10-26
236	Broad-Band Horn Antenna 0.5-6 GHz	BBHA 9120 E	Schwarzbeck	00831	5 Year(s)/ 2024-05-13
237	Exposure Level Tester	ELT-400	Narda Safety Test Solutions	O-0028	3 Year(s)/ 2026-03-03
239	Broadband Horn Antenna 15-40 GHz	BBHA 9170	Schwarzbeck	00932	5 Year(s)/ 2024-05-23
240	Broadband Preamplifier 18-40 GHz	BBV 9721	Schwarzbeck	54	1 Year(s)/ 2024-07-31
241	Coupling Network M2	CN M232-300- DC	Teseq	52495	1 Year(s)/ 2024-07-31
242	Coupling Network M4	CN M432-AC	Teseq	53779	1 Year(s)/ 2024-07-31
243	Coupling Network M2	CN M232-AC	Teseq	50442	1 Year(s)/ 2024-07-31
244	Coupling Network M3	CN M332-AC	Teseq	53480	1 Year(s)/ 2024-07-31
245	Coupling Network M4	CN A401-M	Teseq	53736	1 Year(s)/ 2024-07-31
246	Coupling Network T8	CN T8-AC	Teseq	53835	1 Year(s)/ 2024-07-31
247	Coupling Network T8	CN T8-DC	Teseq	53849	1 Year(s)/ 2024-07-31
248	Coupling Network T4	CN T444-AC	Teseq	53832	1 Year(s)/ 2024-07-31
249	Coupling Network T4	CN T444-DC	Teseq	51260	1 Year(s)/ 2024-07-31
250	Coupling Network M5	CN M532-AC	Teseq	540086	1 Year(s)/ 2024-07-31
252	Coupling Network	CN AF3-AC	EMCE GmbH	n/a	1 Year(s)/ 2024-07-31
253	Broadband Preamplifier 20-1000 MHz	ESV-Z3	Rohde & Schwarz	881 909/030	1 Year(s)/ 2024-08-31

Inv.-No.	Designation	Type	Manufacturer	S/N	Calibration: Interval /valid until
254	Power Sensor	NRP6AN	Rohde & Schwarz	101326	2 Year(s)/ 2025-06-28
255	Coupling Network AF2	CN A201-M	Teseq	52135	1 Year(s)/ 2024-07-31
257	Pulse limiter + 10 dB Attenuator	ESH3-Z2	Rohde & Schwarz	102769	1 Year(s)/ 2024-08-31
258	SMB100A Signal Generator	SMB100A 100 kHz - 40 GHz	Rohde & Schwarz	181667	3 Year(s)/ 2027-01-17
259	SMB100B Signal Generator	SMB100B 8 kHz - 6 GHz	Rohde & Schwarz	101679	2 Year(s)/ 2024-12-09
260	Coupling Network	CDN HF Chirurgic	EMCE GmbH	n/a	2 Year(s)/ 2024-12-31
262	EM Clamp	KEMZ 801A	Teseq	78033	1 Year(s)/ 2025-01-31
718	EMC-Software	BAT-EMC Vers. 3.18.0.19	Nexio	n/a	
997	EMC Software	EMC32 Vers. 10.60.20	Rohde & Schwarz	n/a	
1046	Environmental Simulation Chamber	MKF 115 (E3.1)	Binder GmbH	12-02215	3 Year(s)/ 2026-03-24
1212	EMC Software	WMS32 Vers. 10.60.20	Rohde & Schwarz	n/a	
1341	Multimeter	8845A	Fluke	5905001	3 Year(s)/ 2025-11-30
8004	Broadband Preamplifier 18-40 GHz	BLMA 1840-5G	BONN Elektronik GmbH	2113300	1 Year(s)/ 2024-07-31
8007	LPDA Broadband Antenna 180 - 1500 MHz	VULP 9118A	Schwarzbeck	899	3 Year(s)/ 2024-10-27
8008	LPDA Broadband Antenna 180 - 1500 MHz	VULP 9118A	Schwarzbeck	900	3 Year(s)/ 2024-10-27
8009	Field Monitoring Loop	FESP 5134-1	Schwarzbeck	00078	3 Year(s)/ 2024-12-20
8011	Compact Generator	compact NX5 bsp- 1-400-32	Ametek CTS	P2145257429	2 Year(s)/ 2024-05-31
8012	Capacitive Coupling Clamp	CCI	Ametek CTS	P2132255475	1 Year(s)/ 2024-12-31
8013	Antenna 9 - 150 kHz	Ø 120 mm, 20 Turns	EMCE GmbH	n/a	
8015	Amplifier 2.5 - 6 GHz	BBA150-E100	Rohde & Schwarz	105302	1 Year(s)/ 2024-08-31

Inv.-No.	Designation	Type	Manufacturer	S/N	Calibration: Interval /valid until
8016	Circular Loop Antenna 0.01 - 120 MHz	HFRA 5164	Schwarzbeck	00152	
8017	Compensation network for 13.56 MHz	NFCN 1356	Schwarzbeck	00122	
8018	Field Probe	EP-601	Narda	811ZX20438	1 Year(s)/ 2024-09-26
8020	Switch and Control Platform	OSP 230	Rohde & Schwarz	101967	1 Year(s)/ 2025-01-31
8021	CDN / EN 61000-4-6	CDN A401A	Ametek	64801	1 Year(s)/ 2025-01-31
8022	CDN / EN 61000-4-6	CDN A501A	Ametek	64789	1 Year(s)/ 2025-01-31
8023	Power Sensor	NRP6AN	Rohde & Schwarz	102076	2 Year(s)/ 2025-01-24
8024	Power Sensor	NRP6AN	Rohde & Schwarz	102077	2 Year(s)/ 2025-01-24
8025	Monopole Antenna 144 - 148 MHz	HLC 146	Schwarzbeck	00057	3 Year(s)/ 2026-02-28
8028	EMI Test Receiver	ESW26	Rohde & Schwarz	103119	1 Year(s)/ 2024-04-09
8029	CDN / EN 61000-4-6	CDN10 AF3	Schwarzbeck	3	1 Year(s)/ 2025-01-31
8030	CDN / EN 61000-4-6	CDN10 AF3	Schwarzbeck	4	1 Year(s)/ 2025-01-31
8031	CDN / EN 61000-4-6	CDN S24 USB-C	Schwarzbeck	10	1 Year(s)/ 2025-01-31
8032	CDN / EN 61000-4-6	CDN S19 HDMI	Schwarzbeck	9	1 Year(s)/ 2025-01-31
8033	Antenna 30-300 MHz	VHBB9124 / BBA9106	Schwarzbeck	1808	3 Year(s)/ 2026-04-21
8034	Antenna 30-300 MHz	VHBB9124 / BBA9106	Schwarzbeck	1812	3 Year(s)/ 2026-04-21
8035	CDN / EN 61000-4-6	CDN T2 16A	Schwarzbeck	23	1 Year(s)/ 2025-01-31
8036	CDN / EN 61000-4-6	CDN CAN-4	Schwarzbeck	1	1 Year(s)/ 2025-01-31
8037	CDN / EN 61000-4-6	CDN T8 RJ45	Schwarzbeck	56	1 Year(s)/ 2025-01-31
8038	CDN / EN 61000-4-6	CDN T8 RJ45	Schwarzbeck	55	1 Year(s)/ 2025-01-31
8039	Impedance Stabilisation Network	Pilot ISN	Schwarzbeck	82	1 Year(s)/ 2024-08-31



Inv.- No.	Designation	Type	Manufacturer	S/N	Calibration: Interval /valid until
8041	Power Amplifier 80 - 1000 MHz	CBA1G-1200D	Ametek	1101147	1 Year(s)/ 2024-10-31
8042	Manual Attenuator	8494B+8495B	Keysight	TH61358076+ TH61354943	1 Year(s)/ 2025-02-28



5 Testplan provided by customer

n/a

6 Test(s) according 47 CFR Part 15 Subpart C - 01/16/2024 and RSS-247, Issue 3 (2023-08)

6.1 Requirements and conformance test specifications

Standard

47 CFR Part 15 Subpart C
 RSS-247, Issue 3 (2023-08)
 RSS-Gen, Issue 5 (2018-04)
 KDB 558074 D01 15.247 Meas Guidance v05r02

Requirement		Regulation section	
		47 CFR Part 15 Subpart C	RSS-247 / RSS-Gen
☒	Antenna requirements	§ 15.203	RSS-Gen 6.8
☐	Terminal voltage on powerline	§ 15.207 (a)	RSS-Gen 8.8
☐	Radiated emissions H-Field of intentional radiators	§ 15.209 (a) (b) (c) (d) (e) (f)	RSS-Gen 8.9
☒	Radiated emissions E-Field of intentional radiators	§ 15.209 (a) (b) (c) (d) (e) (f)	RSS-Gen 8.9
☒	Emissions in restricted frequency bands	§ 15.205 (a) (b) (c)	RSS-Gen 8.10
☒	Occupied Bandwidth	§ 15.215 (c)	n/a
☒	DTS Bandwidth	§ 15.247 (a) (2)	RSS-247 5.2 (a)
☒	Output Power	§ 15.247 (b) (3) (4)	RSS-247 5.4 (d)
☒	Emissions in non-restricted frequency bands	§ 15.247 (d)	RSS-247 5.5
☒	Power Spectral Density	§ 15.247 (e)	RSS-247 5.2 (b)

6.2 Antenna requirements

- ☒ No deviation from the standard
☐ Deviation from the standard*
☐ Test not requested*
☐ Test not carried out*

*

Measurement procedure:
Rules and specification
Guide

47 CFR Part 15 Section 15.203
n/a

Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficiently to comply with the provisions of this section.

Antenna:

- ☐ Print antenna
☒ Internal antenna
☐ External antenna
- ☒ Single Antenna ☐ Antenna array
☐ MIMO ☐ __-

Antenna connector:

- ☒ Permanent attached
☐ Unique coupling to the intentional radiator
- ☐ SMA ☐ UFL
☐ __

Test result

Requirement:

- ☒ kept
☐ not kept

| Remarks: n/a



6.3 Terminal voltage on powerline

- ☐ No deviation from the standard
- ☐ Deviation from the standard
- ☒ Test not requested*
- ☐ Test not carried out

* EUT is powered by an internal battery and has no external leads.

6.4 Radiated emissions H-Field of intentional radiators

- ☐ No deviation from the standard
- ☐ Deviation from the standard
- ☒ Test not requested*
- ☐ Test not carried out

* No intentional emissions in the frequency range < 30 MHz.

6.5 Radiated emissions E-Field of intentional radiators

- ☒ No deviation from the standard*
☐ Deviation from the standard
☐ Test not requested
☐ Test not carried out
 * Valid only for EUT 23-0121PR05-015

Measurement procedure:

Rules and specification 47 CFR Part 15 Section 15.209 (a)(b)(c)(d)(e)(f)
 RSS-Gen, Issue 5 (2018-04) Section 8.9

Guide ANSI C63.10-2013 Section 6.3

The radiated interference emission is measured on an alternative open area test site OATS in the frequency range 30 - 1000 MHz. The measurement distance is 3 m or 10 m, depending on the standard. Above 1 GHz, the measurement is performed in a 3 m semi-anechoic chamber with floor absorber to reduce ground reflections. For the measurement of the field strength a biconical antenna up to 200 MHz, a logperiodic antenna from 200 MHz to 1 GHz and horn antennas or double stacked logperiodic antenna above 1 GHz are used. All antennas are linearly polarized. External low-noise preamplifiers are used in the range above 1 GHz to improve measurement sensitivity. Special measures, such as filters or attenuators, are taken to avoid overloading the amplifiers. The antenna height is varied between 1 m and 4 m as required. The elevation angle of the antenna can be corrected via the antenna mast to ensure that the main lobe of the antenna is always directed at the EUT. A turntable allows the alignment of the EUT towards the antenna to maximize the radiated emission. The test sites are located above a metallic ground plane. Table-top devices are placed on a non-conductive wooden table. Hand-held, body-worn, or ceiling-mounted devices are examined in 3 orthogonal axis orientations to determine the maximum emission level. Floor-standing devices are placed directly on the grounded metal turntable/reference insulated from ground plane by an insulating material <12 mm.

During an initial automated pre-test run in a semi-anechoic chamber, the desired frequency range is measured. The receiver is operated as an analyzer and the frequency ranges are run sequentially depending on the antenna. For the measurement, the turntable is continuously rotated from 0° - 360° and back, and the antenna height is changed in 0.5 m increments after each complete turntable cycle. The antenna position is then changed from 1.0 m to 4.0 m in 0.5 m steps for vertical polarization and back for horizontal polarization. During a cycle, the frequency range is continuously swept with peak detector and max hold function. Depending on the test specification, an average detector is also used if required.



For each discrete antenna polarization over all positions, the maximum peak values are recorded with frequency, level, turntable position, antenna height and antenna polarization. Significant peaks or clock frequencies are marked and re-measured with increased frequency accuracy. The recordings are used to determine the exact frequency and to optimize the interference level. At the predefined position, the turntable position is fine-adjusted in the range of $\pm 20^\circ$ and then the antenna height is varied by ± 0.3 m. At the maximized position, the emission is measured with quasi-peak or average detector and listed. The six highest emissions are selected for final measurement in the OATS.

In a final test run, an open area test site measurement is made at selected frequencies determined by the previous test procedure. For each selected frequency, the frequency setting is optimized again in the OATS and the field strength value is maximized, rotating the EUT 360° at an antenna height of 1.0 m for vertical antenna polarization and 2.0 m for horizontal antenna polarization. At the azimuth position of the EUT for the highest radiation, the antenna height is varied within 1.0 m and 4.0 m until the highest interference level is reached. To maximize the interference level at the determined position, the turntable azimuth is fine-adjusted by $\pm 45^\circ$ and the antenna height is fine-adjusted by ± 0.3 m. The setup of the instrument and the cables are manipulated within the range to produce the highest emission.

Final measurement is made using a receiver conforming to CISPR 16 guidelines with a quasi-peak and average detector.

The identified frequency and amplitude of the six highest radiated emissions relative to the limit lines are listed. If fewer than six emission frequencies are within 20 dB of the limit, the noise level of the instrument at representative frequencies is reported. For documentation of final testing below 1 GHz on the OATS the plots recorded in den SAC are indicated as pre-compliance.

In case the regulation requires testing at different distances, the result is extrapolated by an extrapolation factor 20 dB / decade to the required distance.

The reported test results are calculated using the following formula to normalize the results to the requested test distance:

$$\text{Result (dB}\mu\text{V/m)} = \text{Reading (dB}\mu\text{V)} + \text{AF (dB/m)} + \text{CF (dB)} + 20 \cdot (\text{D}_\text{T}/\text{D}_\text{R}) \text{ (dB)}$$

AF = Correction factor for the antenna

CF = Correction factor for the cable loss

D_T = Test distance

D_R = Reference distance for the limit defined in the standard

Example:

Test frequency 500.00 MHz

Reading 12.3 dBμV

AF_(500.00 MHz) 17.1 dB/m

CF_(500.00 MHz) 1.4 dB

DT = 3 m

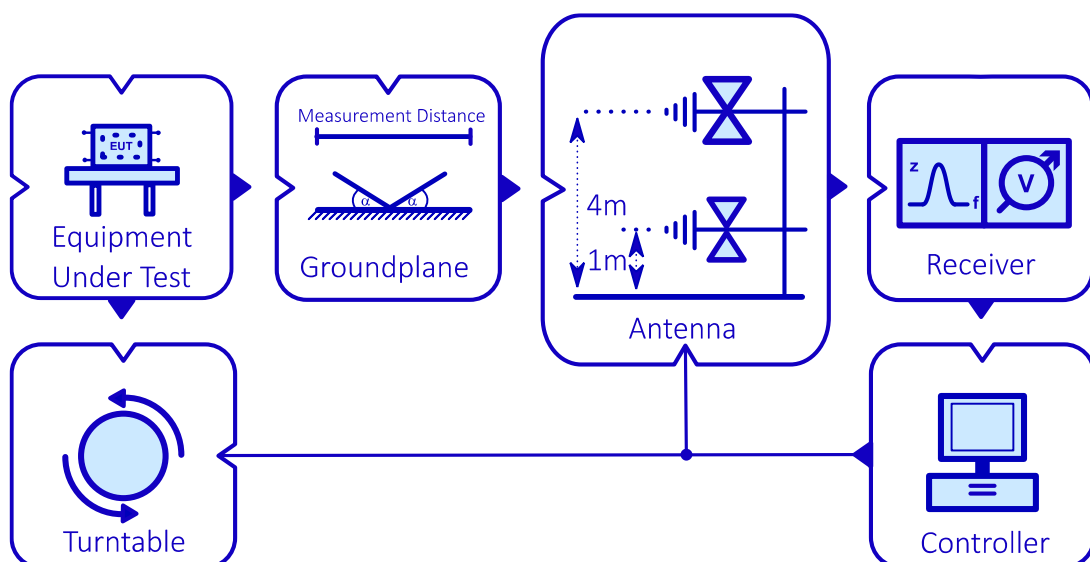
DR = 3 m

Calculated final result for the electrical field strength E(f):

$$E_{(500.00 \text{ MHz})} = 12.3 \text{ dB}\mu\text{V} + 17.1 \text{ dB/m} + 1.4 \text{ dB} + 0 \text{ dB} = 30.8 \text{ dB}\mu\text{V/m}$$

Basic structure - Setup

OATS / SAC





6.5.1 Test set up

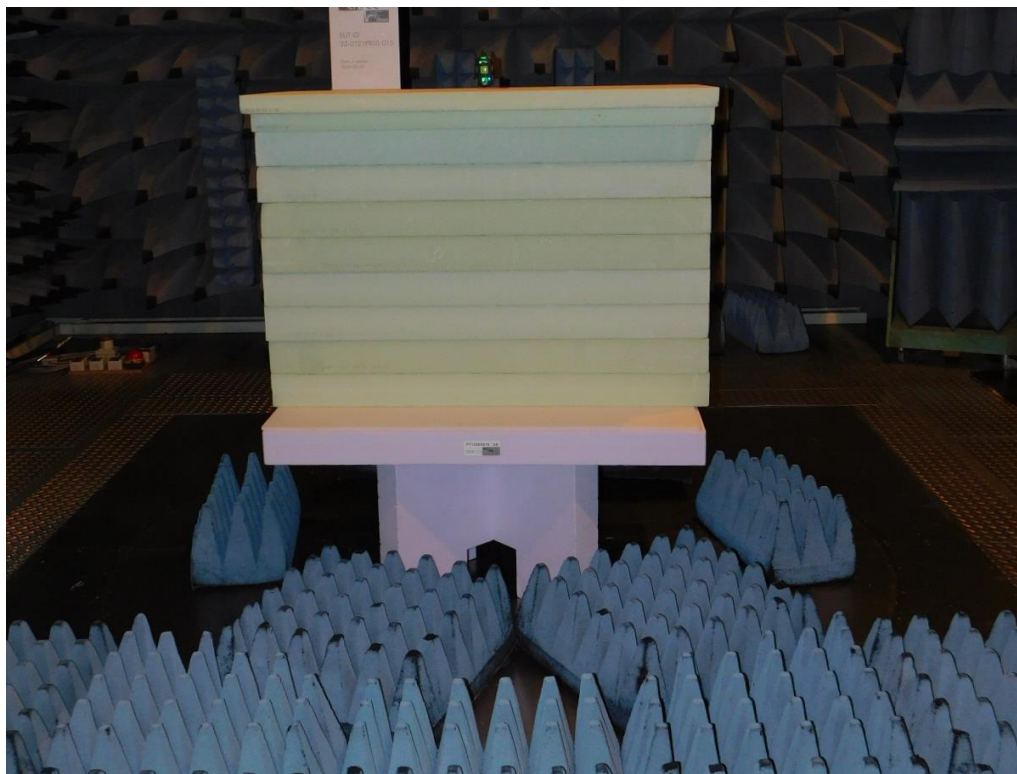
According ANSI C63.10-2013

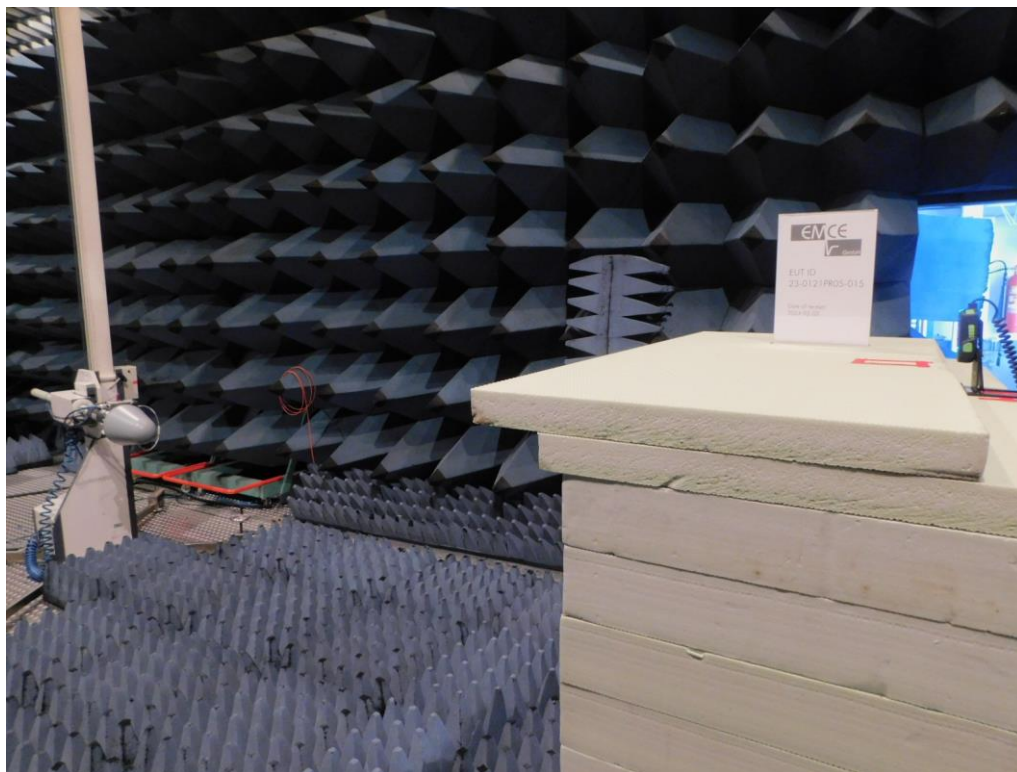
Photo(s) showing the interconnection of the major function units

Final test setup









Test location

Pre-compliance test					
☒	Inv.-No.	Designation	Type (L x W x H)	Manufacturer	Location
☒	062	Semi anechoic chamber # 2	13.5 x 6.1 x 5.5 m	EMC-Technik & Consulting GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden

Final test					
☒	Inv.-No.	Designation	Type (L x W x H)	Manufacturer	Location
☒	062	Semi anechoic chamber # 2	13.5 x 6.1 x 5.5 m	EMC-Technik & Consulting GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	014	Open area test site	10 m	EMCE GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
☒	015	Open area test site	3 m	EMCE GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden

Used test equipment

Pre-compliance test					
☒	Inv.-No.	Designation	Type	Manufacturer	S/N
☒	058	Test receiver	ESIB 40	Rohde & Schwarz	100200
☒	997	Software	EMC32	Rohde & Schwarz	n/a
☒	8008	Logarithmic Periodic Broadband Antenna	VULP 9118A 180 - 1500 MHz	Schwarzbeck	900
☒	8034	Antenna 30-300 MHz	VHBB9124 / BBA9106	Schwarzbeck	1812

Final test					
☒	Inv.-No.	Designation	Type	Manufacturer	S/N
☒	058	Test receiver	ESIB 40	Rohde & Schwarz	100200
☒	059	Logper. Antenna	HL050	Rohde & Schwarz	100006
☒	222	Broadband Preamplifier	BBV 9718 0.5-18GHz	Schwarzbeck	9718-316
☒	223	Broadband Preamplifier	BBV 9719 12-28 GHz	Schwarzbeck	9719-024
☒	226	Log.-per. antenna	HL050	Rohde & Schwarz	100829
☒	229	Test receiver	ESS 5 Hz – 1000 MHz	Rohde & Schwarz	845420/0005
☒	230	Signal Analyzer 40 GHz	FSV40	Rohde & Schwarz	101717
☒	239	Broadband Horn Antenna	BBHA 9170 15-40 GHz	Schwarzbeck	00932
☒	997	Software	EMC32	Rohde & Schwarz	n/a
☒	8004	Broadband Preamplifier	BLMA 1840-5G 18-40 GHz	BONN Elektronik GmbH	2113300
☒	8007	Logarithmic Periodic Broadband Antenna	VULP 9118A 180 - 1500 MHz	Schwarzbeck	899
☒	8033	Antenna 30-300 MHz	VHBB9124 / BBA9106	Schwarzbeck	1808

All used test equipment are checked resp. calibrated periodically.

☒ Test equipment was checked and complied to the requirements



Test-/Measurement uncertainty

The measurement uncertainty in the test met the guideline of CISPR16-4-2 or better.

Measurement uncertainty of the radiated emission with an extended coverage factor of $k = 2$:

Frequency	Measurement uncertainty
30 MHz – 225 MHz	4.8 dB (valid for 10 m-OATS)
225 MHz – 1 GHz	4.9 dB (valid for 10 m-OATS)
30 MHz – 225 MHz	4.8 dB (valid for 3 m-OATS)
225 MHz – 1 GHz	6.2 dB (valid for 3 m-OATS)

6.5.2 Test

Highest frequency generated or used in the device or on which the device operates or tunes:

☒ <10 GHz

☐ 10 GHz – 30 GHz

☐ 30 GHz – 95 GHz

☐ ≥95 GHz

Upper frequency of measurement:

☒ 10th harmonic of the highest frequency or 40 GHz, whichever is lower

☐ 5th harmonic of the highest frequency or 100 GHz, whichever is lower

☐ 5th harmonic of the highest frequency or 200 GHz, whichever is lower

☐ 3rd harmonic of the highest frequency or 750 GHz, whichever is lower

Frequency range:

☐ 9 kHz – 30 MHz

☒ 1 – 5 GHz

☒ 12.75 – 26.5 GHz

☒ 30 MHz – 1000 MHz

☒ 5 – 12.75 GHz

☐ 26.5 – 40 GHz

Limits for radiated emissions

Technical requirements			
Detector	Frequency / MHz	Limit / dBμV/m	Measurement distance / m
QP	30.0 – 88.0	40.0	3
QP	88.0 – 216.0	43.5	3
QP	216.0 – 960.0	46.0	3
QP	960.0 – 1000.0	54.0	3
AV	> 1000	54.0	3
PK	> 1000	74.0	3
The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other sections within this part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.			

Rationale for selecting the EUT test set up

Equipment units:

EUT as a stand-alone device with a cable-mounted control unit.

EUT Orientation

☒ X-Direction ☒ Y-Direction ☒ Z-Direction

Test frequencies

- ☐ Nominal Channel Bandwidth 20 MHz
- | | |
|-----------------|---------------|
| Lowest channel | ___ / ___ MHz |
| Middle channel | ___ / ___ MHz |
| Highest channel | ___ / ___ MHz |
- ☐ Nominal Channel Bandwidth 40 MHz
- | | |
|-----------------|---------------|
| Lowest channel | ___ / ___ MHz |
| Middle channel | ___ / ___ MHz |
| Highest channel | ___ / ___ MHz |
- ☒ Nominal Channel Bandwidth 2 MHz
- | | |
|-----------------|---------------|
| Lowest channel | 37 / 2402 MHz |
| Middle channel | 17 / 2440 MHz |
| Highest channel | 39 / 2480 MHz |

Operation mode

EUT arrangement: ☒ Tabletop ☐ Floor standing
 Power supply: ☐ 120 V/60 Hz ☒ Internal battery

Continuous operation in transmitter mode with a maximum power level and duty cycle of 57.72 %. The pump motor was deactivated.

Environmental conditions - OATS

Temperature [10 – 40 °C]: 14 °C

Relative humidity [10 – 90 %]: 43 %

Environmental conditions during the test: ☒ kept
☐ not kept

Environmental conditions - SAC

Temperature [10 – 40 °C]: 24 °C

Relative humidity [10 – 90 %]: 35 %

Environmental conditions during the test: ☒ kept
☐ not kept

Test result

Limits for unwanted radiated emissions: ☒ kept
☐ not kept

| Remarks: n/a

Records

Pre-compliance measurement

☒ Readings - Worst case channel/direction (lowest margin)

☒ Diagram - Worst case channel/direction (lowest margin)

Final measurement

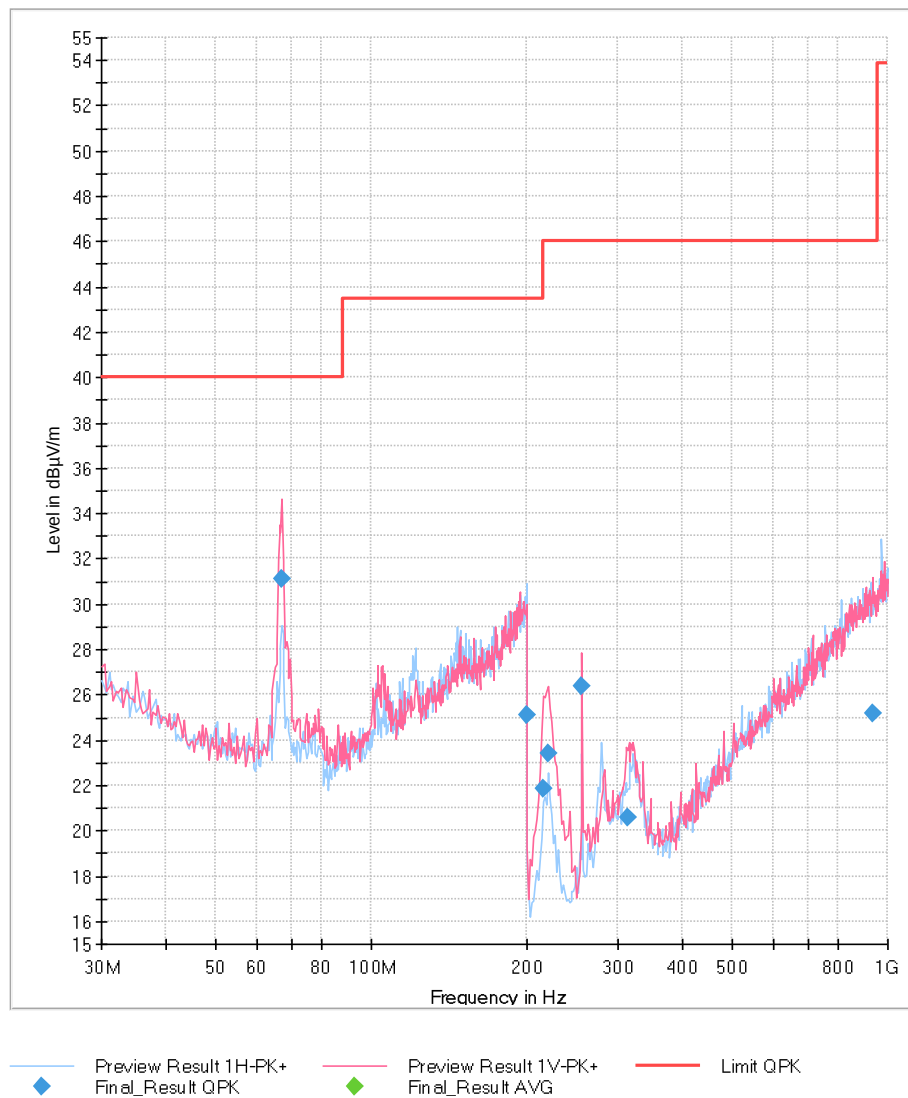
☒ Readings - Worst case channel/direction (lowest margin)

☒ Diagram - Worst case channel/direction (lowest margin)

Pre-compliance measurement

EUT Information

EUT Name:	Exo 18
Test_ID: / SN:	23-0121PR05-015
Customer:	exo IQ GmbH
Operational condition:	Continuous transmission on CH39, pump motor deactivated
Test specification:	47 CFR Part 15 Subpart C §15.209 general limits SAC @3 m RSS-Gen, Issue 5 (2018-04) 8.9 general limits SAC @3 m
Antenna information:	Distance EUT-Ant.: 3.0 m / Polarisation: H/V / Ant.Height: 1.0-4.0 m.
Operator:	S. Vogelmann
File #:	23-0121PR07-015-003
Comment#1:	EUT in Z-Direction
Comment#2:	





Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
67.134268	31.08	40.00	8.92	5000.0	120.000	235.0	V	149.0	9.8
199.899319	25.10	43.50	18.40	5000.0	120.000	130.0	H	338.0	15.7
215.588858	21.89	43.50	21.61	5000.0	120.000	285.0	V	4.0	12.3
219.641684	23.43	46.00	22.57	5000.0	120.000	273.0	V	20.0	12.1
255.792225	26.36	46.00	19.64	5000.0	120.000	181.0	V	145.0	13.0
314.790862	20.55	46.00	25.45	5000.0	120.000	166.0	V	106.0	14.9
935.711744	25.16	46.00	20.84	5000.0	120.000	206.0	V	117.0	25.1



Final measurement

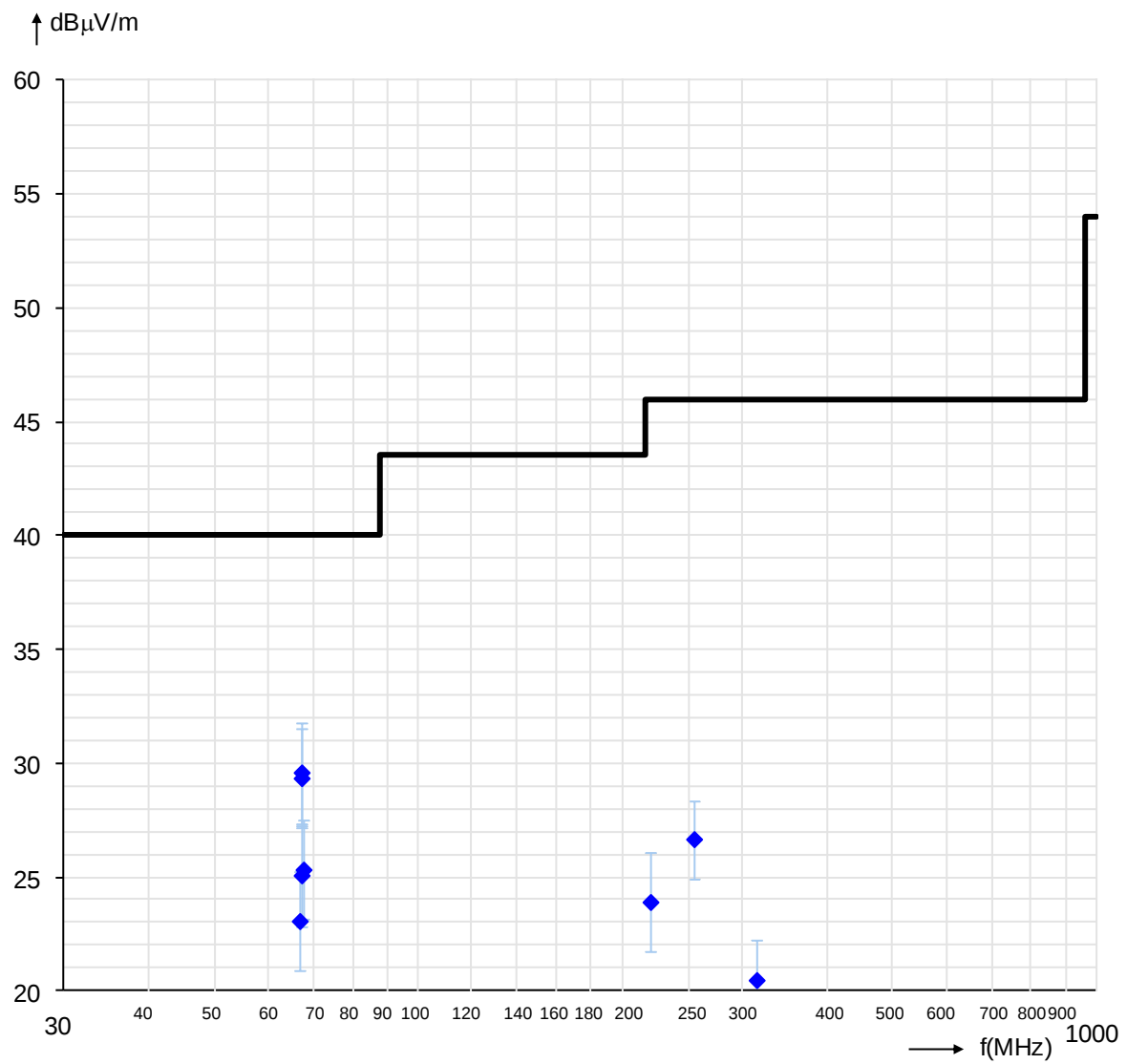
Readings – Antenna horizontal / vertical polarized
EUT in Z-Direction

Frequency	Readings	+ AF Antenna correction factor	+ KF Cable correction factor	Field strength	Limit	Margin	Antenna- Height	Antenna- Polarization	Turn Table- Position
MHz	dBµV	dB/m	dB	dBµV/m	dBµV/m	dB	m	hor./ver.	Degree
67.126	13.0	9.1	1.0	23.0	40.0	17.0	V	1.00	90
67.262	19.3	9.1	1.0	29.3	40.0	10.7	H	2.61	180
67.416	15.0	9.1	1.0	25.0	40.0	15.0	V	1.00	90
67.570	19.5	9.1	1.0	29.5	40.0	10.5	H	2.61	180
68.030	15.3	9.0	1.0	25.3	40.0	14.7	V	1.00	90
220.000	11.2	10.9	1.8	23.9	46.5	22.6	V	1.00	180
255.800	13.1	11.6	1.9	26.6	46.5	19.9	V	1.00	145
315.000	5.0	13.3	2.2	20.5	46.5	26.0	V	1.00	90



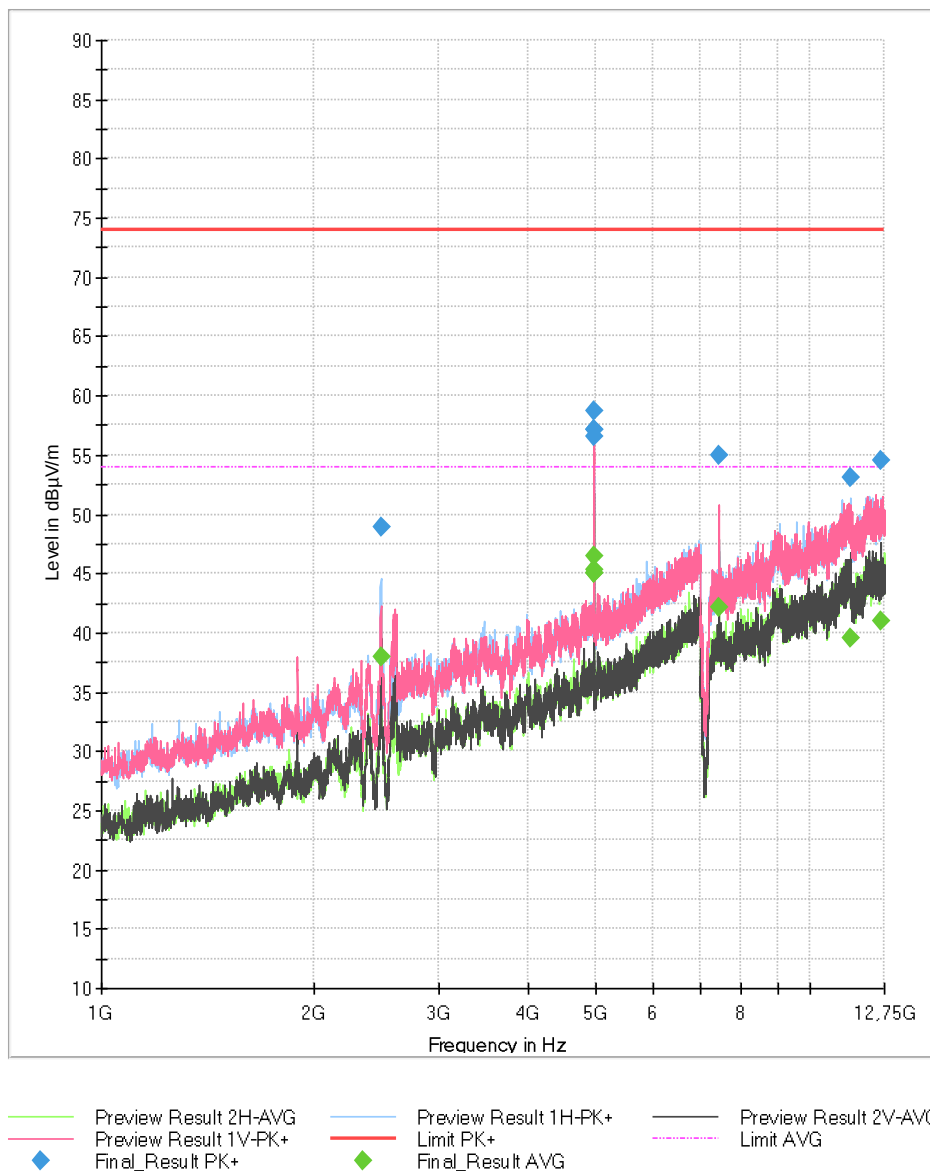
Diagram radio disturbances – Antenna horizontal / vertical polarized
EUT in Z-Direction

Limit: 47 CFR Part 15 Section 15.209 and
RSS-Gen, Issue 5 (2018-04) Section 8.9



EUT Information

EUT Name:	Exo 18
Test_ID: / SN:	23-0121PR05-015
Customer:	Festool GmbH
Operational condition:	Continuous transmission on CH39, pump motor deactivated
Test specification:	47 CFR Part 15 Subpart C §15.209 general limits SAC @3 m RSS-Gen, Issue 5 (2018-04) 8.9 general limits SAC @3 m
Antenna information:	Distance EUT-Ant.: 3.0 m / Polarisation: H/V/ Ant.Height: 1.0-4.0 m.
Operator:	S. Vogelmann
File #:	23-0121RC07-015-006
Comment #1:	A notch filter for the frequency band 2400 - 2483.5 MHz was used.
Comment #2:	EUT in Z-Direction

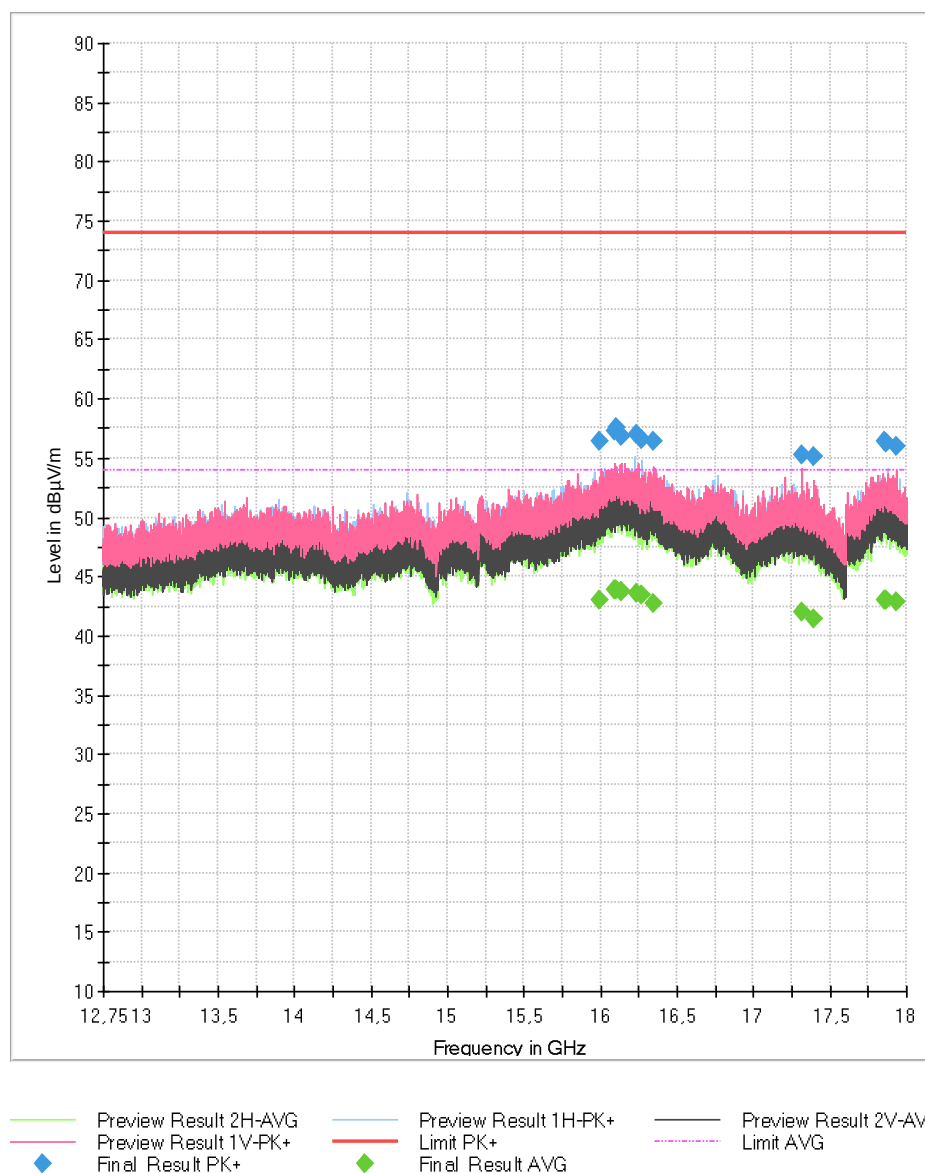


Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2480.544285	---	37.91	54.00	16.09	5000.0	1000.000	130.0	H	214.0	0.1
2480.544285	48.94	---	74.00	25.06	5000.0	1000.000	130.0	H	214.0	0.1
4959.154285	---	45.03	54.00	8.97	5000.0	1000.000	100.0	H	151.0	7.8
4959.154285	56.59	---	74.00	17.41	5000.0	1000.000	100.0	H	151.0	7.8
4960.179285	58.77	---	74.00	15.23	5000.0	1000.000	304.0	V	108.0	7.8
4960.179285	---	46.48	54.00	7.52	5000.0	1000.000	304.0	V	108.0	7.8
4960.992143	---	45.32	54.00	8.68	5000.0	1000.000	155.0	H	135.0	7.8
4960.992143	57.11	---	74.00	16.89	5000.0	1000.000	155.0	H	135.0	7.8
4961.098571	---	45.01	54.00	8.99	5000.0	1000.000	318.0	V	111.0	7.8
4961.098571	57.12	---	74.00	16.88	5000.0	1000.000	318.0	V	111.0	7.8
7438.522857	55.04	---	74.00	18.96	5000.0	1000.000	326.0	V	68.0	15.0
7438.522857	---	42.20	54.00	11.80	5000.0	1000.000	326.0	V	68.0	15.0
11426.296428	---	39.56	54.00	14.44	5000.0	1000.000	130.0	V	283.0	23.1
11426.296428	53.04	---	74.00	20.96	5000.0	1000.000	130.0	V	283.0	23.1
12592.025000	---	41.00	54.00	13.00	5000.0	1000.000	130.0	V	1.0	24.2
12592.025000	54.56	---	74.00	19.44	5000.0	1000.000	130.0	V	1.0	24.2

EUT Information

EUT Name:	Exo 18
Test_ID:/ SN:	23-0121PR02-015
Customer:	exo IQ GmbH
Operational condition:	Continuous transmission on CH37, pump motor deactivated
Test specification:	47 CFR Part 15 Subpart C §15.209 general limits SAC @3 m RSS-Gen, Issue 5 (2018-04) 8.9 general limits SAC @3 m
Antenna information:	Distance EUT-Ant.: 3.0 m / Polarisation: H/V/ Ant.Height: 1.0-4.0 m.
Operator:	S. Vogelmann
File #:	23-0121RC03-015-010
Comment#1:	EUT in Z-Direction
Comment#2:	

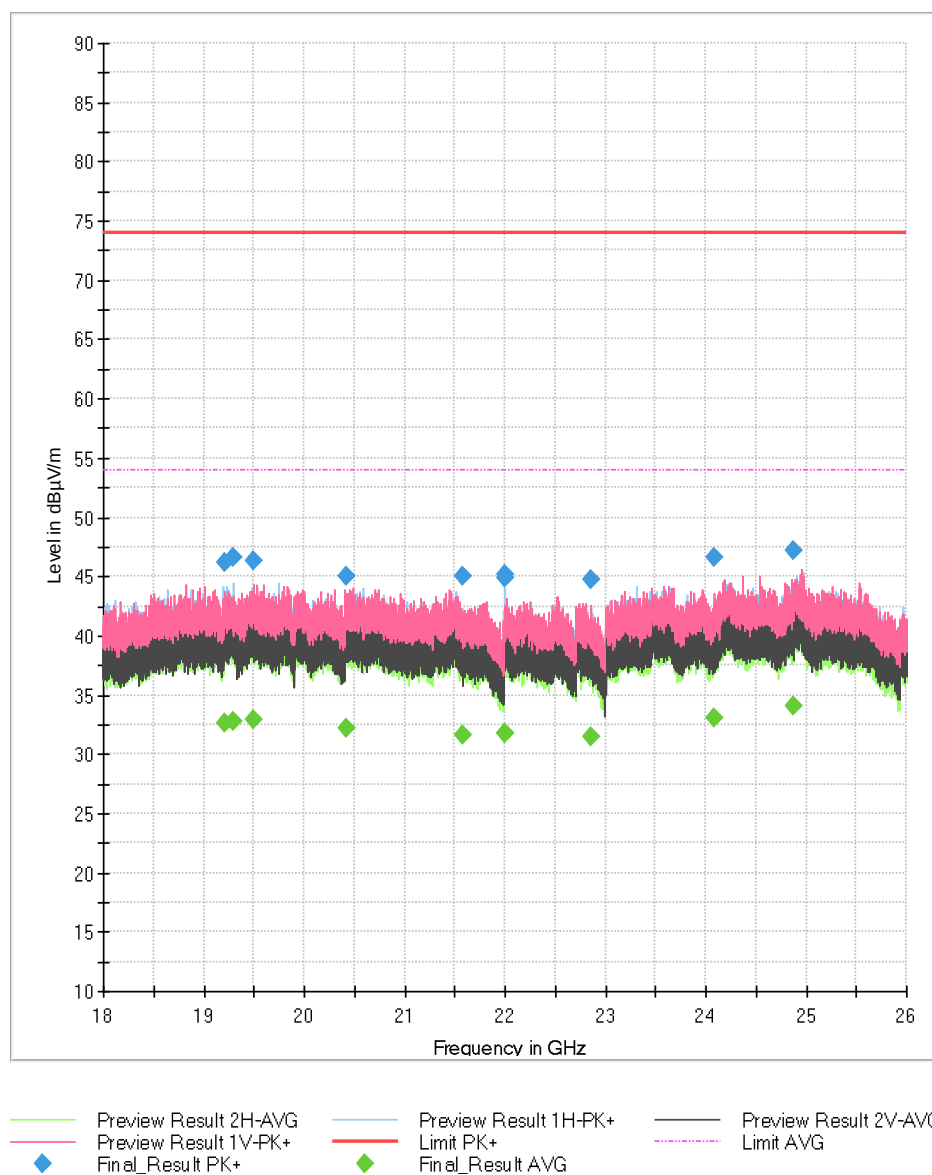


Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
15996.541111	---	42.95	54.00	11.05	5000.0	1000.000	173.0	V	-2.0	24.3
15996.541111	56.47	---	74.00	17.53	5000.0	1000.000	173.0	V	-2.0	24.3
16096.873889	57.34	---	74.00	16.66	5000.0	1000.000	253.0	V	186.0	25.2
16096.873889	---	43.91	54.00	10.09	5000.0	1000.000	253.0	V	186.0	25.2
16098.848334	---	43.91	54.00	10.09	5000.0	1000.000	130.0	V	10.0	25.2
16098.848334	57.50	---	74.00	16.50	5000.0	1000.000	130.0	V	10.0	25.2
16131.289444	56.79	---	74.00	17.21	5000.0	1000.000	159.0	V	140.0	25.4
16131.289444	---	43.66	54.00	10.34	5000.0	1000.000	159.0	V	140.0	25.4
16140.451667	---	43.69	54.00	10.31	5000.0	1000.000	130.0	V	30.0	25.4
16140.451667	56.85	---	74.00	17.15	5000.0	1000.000	130.0	V	30.0	25.4
16230.449444	56.93	---	74.00	17.07	5000.0	1000.000	235.0	H	285.0	25.3
16230.449444	---	43.62	54.00	10.38	5000.0	1000.000	235.0	H	285.0	25.3
16270.818333	56.56	---	74.00	17.44	5000.0	1000.000	130.0	H	268.0	25.2
16270.818333	---	43.38	54.00	10.62	5000.0	1000.000	130.0	H	268.0	25.2
16349.786667	---	42.79	54.00	11.21	5000.0	1000.000	335.0	V	198.0	25.0
16349.786667	56.38	---	74.00	17.62	5000.0	1000.000	335.0	V	198.0	25.0
17316.667223	---	42.06	54.00	11.94	5000.0	1000.000	170.0	V	110.0	25.3
17316.667223	55.30	---	74.00	18.70	5000.0	1000.000	170.0	V	110.0	25.3
17397.837222	55.07	---	74.00	18.93	5000.0	1000.000	235.0	V	269.0	25.0
17397.837222	---	41.41	54.00	12.59	5000.0	1000.000	235.0	V	269.0	25.0
17852.807222	56.38	---	74.00	17.62	5000.0	1000.000	258.0	H	289.0	27.1
17852.807222	---	42.98	54.00	11.02	5000.0	1000.000	258.0	H	289.0	27.1
17871.828334	56.24	---	74.00	17.76	5000.0	1000.000	185.0	H	116.0	27.0
17871.828334	---	42.99	54.00	11.01	5000.0	1000.000	185.0	H	116.0	27.0
17934.961667	55.97	---	74.00	18.03	5000.0	1000.000	130.0	V	62.0	26.9
17934.961667	---	42.89	54.00	11.11	5000.0	1000.000	130.0	V	62.0	26.9

EUT Information

EUT Name:	Exo 18
Test_ID:/ SN:	23-0121PR02-015
Customer:	exo IQ GmbH
Operational condition:	Continuous transmission on CH37, pump motor deactivated
Test specification:	47 CFR Part 15 Subpart C §15.209 general limits SAC @3 m RSS-Gen, Issue 5 (2018-04) 8.9 general limits SAC @3 m
Antenna information:	Distance EUT-Ant.: 3.0 m / Polarisation: H/V/ Ant.Height: 1.0-4.0 m.
Operator:	S. Vogelmann
File #:	23-0121RC03-015-013
Comment#1:	EUT in Z-Direction
Comment#2:	



Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
19203.481666	---	32.67	54.00	21.33	5000.0	1000.000	263.0	H	37.0	-2.6
19203.481666	46.22	---	74.00	27.78	5000.0	1000.000	263.0	H	37.0	-2.6
19301.557917	---	32.79	54.00	21.21	5000.0	1000.000	279.0	H	162.0	-2.6
19301.557917	46.68	---	74.00	27.32	5000.0	1000.000	279.0	H	162.0	-2.6
19497.197500	46.38	---	74.00	27.62	5000.0	1000.000	285.0	V	192.0	-2.3
19497.197500	---	32.92	54.00	21.08	5000.0	1000.000	285.0	V	192.0	-2.3
20411.815000	---	32.19	54.00	21.81	5000.0	1000.000	204.0	V	95.0	-1.5
20411.815000	45.08	---	74.00	28.92	5000.0	1000.000	204.0	V	95.0	-1.5
21587.797500	44.98	---	74.00	29.02	5000.0	1000.000	130.0	H	67.0	-1.0
21587.797500	---	31.58	54.00	22.42	5000.0	1000.000	130.0	H	67.0	-1.0
21992.386667	---	31.80	54.00	22.20	5000.0	1000.000	179.0	H	353.0	-0.9
21992.386667	44.92	---	74.00	29.08	5000.0	1000.000	179.0	H	353.0	-0.9
21997.472500	45.10	---	74.00	28.90	5000.0	1000.000	162.0	H	5.0	-0.9
21997.472500	---	31.70	54.00	22.30	5000.0	1000.000	162.0	H	5.0	-0.9
22863.990833	---	31.46	54.00	22.54	5000.0	1000.000	235.0	V	67.0	0.0
22863.990833	44.79	---	74.00	29.21	5000.0	1000.000	235.0	V	67.0	0.0
24082.375000	46.61	---	74.00	27.39	5000.0	1000.000	235.0	V	216.0	2.3
24082.375000	---	33.06	54.00	20.94	5000.0	1000.000	235.0	V	216.0	2.3
24868.892500	---	34.07	54.00	19.93	5000.0	1000.000	285.0	V	250.0	3.4
24868.892500	47.26	---	74.00	26.74	5000.0	1000.000	285.0	V	250.0	3.4

6.6 Emissions in restricted frequency bands

- ☒ No deviation from the standard*
☐ Deviation from the standard
☐ Test not requested
☐ Test not carried out
 * Valid only for EUT 23-0121PR05-015

Measurement procedure:

Requirement: 47 CFR Part 15 Section 15.205 (a)(b)(c)

Guide ANSI C63.10-2013 Section 5.9 and 6.10.5/6

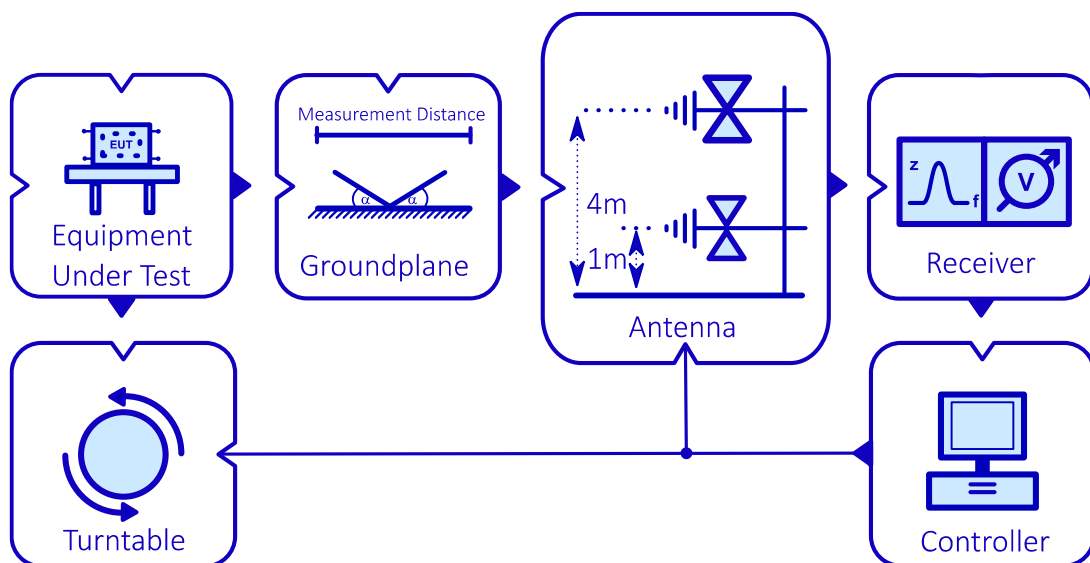
Restricted bands

f / MHz	f / MHz	f / MHz	f / GHz
0.090-0.110	12.57675-12.57725	322-335.4	4.500-5.150
0.495-0.505	13.36-13.41	399.9-410	5.350-5.460
2.1735-2.1905	16.42-16.423	608-614	7.250-7.750
4.125-4.128	16.69475-16.69525	960-1427	8.025-8.500
4.17725-4.17775	16.80425-16.80475	1435-1626.5	9.0-9.2
4.20725-4.20775	25.5-25.67	1645.5-1646.5	9.3-9.5
5.677-5.683	37.5-38.25	1660-1710	10.6-12.7
6.215-6.218	73-74.6	1718.8-1722.2	13.25-13.4
6.26775-6.26825	74.8-75.2	2200-2300	14.47-14.5
6.31175-6.31225	108-138	2310-2390	15.35-16.2
8.291-8.294	149.9-150.05	2483.5-2500	17.7-21.4
8.362-8.366	156.52475-156.52525	2655-2900	22.01-23.12
8.37625-8.38675	156.7-156.9	3260-3267	23.6-24.0
8.41425-8.41475	162.0125-167.17	3332-3339	31.2-31.8
12.29-12.293	167.72-173.2	3345.8-3358	36.43-36.5
12.51975-12.52025	240-285	3500-4400	above 38.6

Only spurious emissions are permitted in any of the frequency bands listed before. The field strength of emissions appearing within these frequency bands shall not exceed the radiated emission limits; general requirements. At frequencies equal to or less than 1000 MHz, compliance with the radiated emission limits; general requirements shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions.

Basic structure - Setup

OATS / SAC



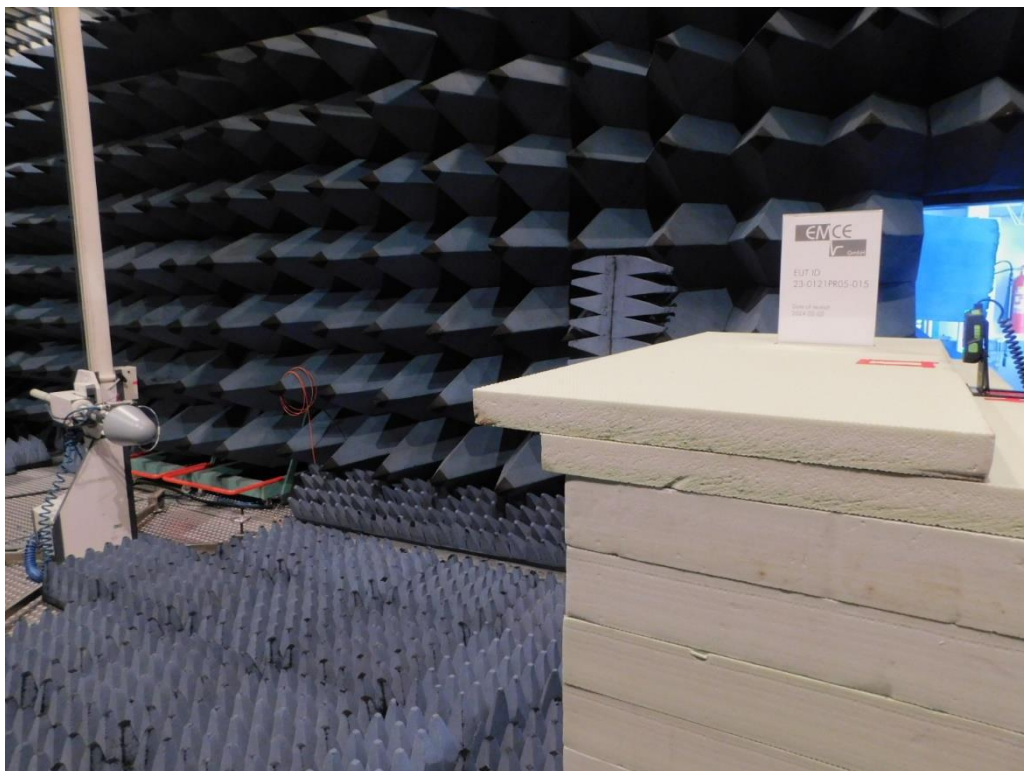
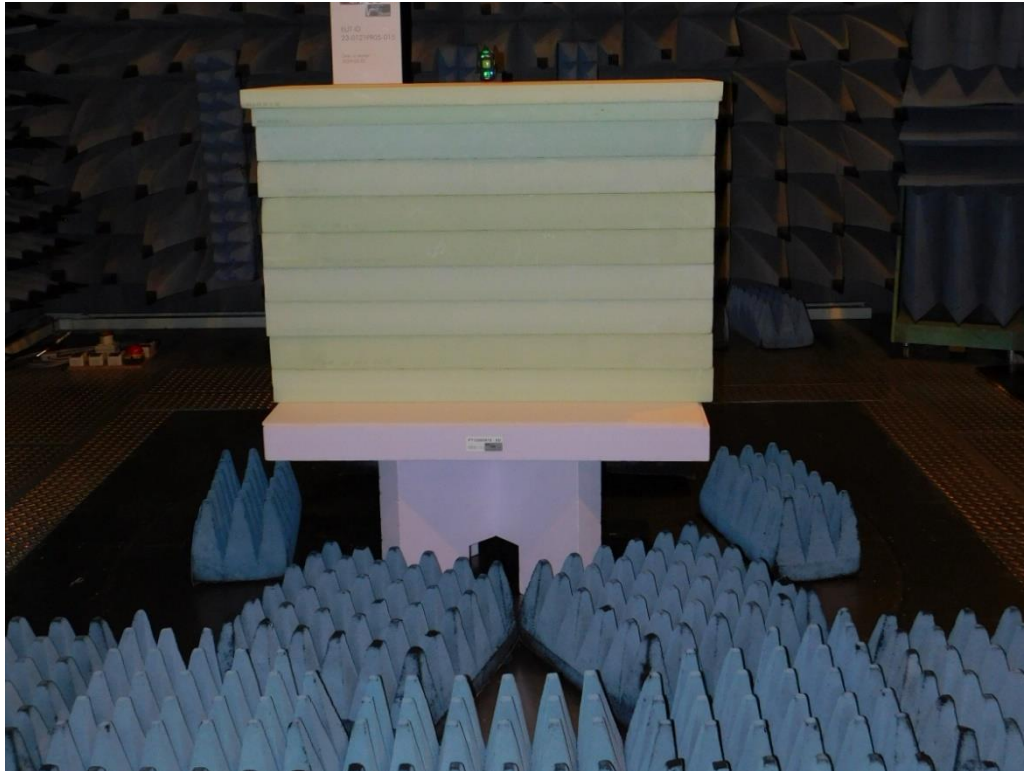


6.6.1 Test set up

According ANSI C63.10-2013

Photo(s) showing the interconnection of the major function units





Test location

Pre-compliance test					
☒	Inv.-No.	Designation	Type (L x W x H)	Manufacturer	Location
	062	Semi anechoic chamber # 2	13.5 x 6.1 x 5.5 m	EMC-Technik & Consulting GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden

Final test					
☒	Inv.-No.	Designation	Type (L x W x H)	Manufacturer	Location
☒	062	Semi anechoic chamber # 2	13.5 x 6.1 x 5.5 m	EMC-Technik & Consulting GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	014	Open area test site	10 m	EMCE GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden
	015	Open area test site	3 m	EMCE GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden

Used test equipment

Pre-compliance test					
☒	Inv.-No.	Designation	Type	Manufacturer	S/N
	058	Test receiver	ESIB 40	Rohde & Schwarz	100200
	997	Software	EMC32	Rohde & Schwarz	n/a
	8008	Logarithmic Periodic Broadband Antenna	VULP 9118A 180 - 1500 MHz	Schwarzbeck	900
	8034	Antenna	VHBB9124 / BBA9106 30-300 MHz	Schwarzbeck	1812

Final test					
☒	Inv.-No.	Designation	Type	Manufacturer	S/N
	058	Test receiver	ESIB 40	Rohde & Schwarz	100200
	059	Log.-per. antenna	HL050	Rohde & Schwarz	100006
☒	222	Broadband Preamplifier	BBV 9718 0.5-18GHz	Schwarzbeck	9718-316
	223	Broadband Preamplifier	BBV 9719 12-28 GHz	Schwarzbeck	9719-024
☒	226	Log.-per. antenna	HL050	Rohde & Schwarz	100829
	229	Test receiver	ESS 5 Hz – 1000 MHz	Rohde & Schwarz	845420/0005
☒	230	Signal Analyzer 40 GHz	FSV40	Rohde & Schwarz	101717
	239	Broadband Horn Antenna	BBHA 9170 15-40 GHz	Schwarzbeck	00932
☒	997	Software	EMC32	Rohde & Schwarz	n/a
	8004	Broadband Preamplifier	BLMA 1840-5G 18-40 GHz	BONN Elektronik GmbH	2113300
	8007	Logarithmic Periodic Broadband Antenna	VULP 9118A 180 - 1500 MHz	Schwarzbeck	899
	8033	Antenna	VHBB9124 / BBA9106 30-300 MHz	Schwarzbeck	1808

All used test equipment are checked resp. calibrated periodically.

☒ Test equipment was checked and complied to the requirements

6.6.2 Test

Used frequency band: ☒ 2400 – 2438.5 MHz
☐ _____

Nearest restricted band(s): ☒ 2310 - 2390 MHz
☒ 2483.5 – 2500 MHz
☐ _____

Limits for radiated emissions in the restricted bands

Technical requirements			
Detector	Frequency / MHz	Limit / $\mu\text{V/m}$	Measurement distance / m
AV	0.009 – 0.09	2400/F(kHz)	300
QP	0.09 – 0.110	2400/F(kHz)	300
AV	0.110 – 0.49	2400/F(kHz)	300
QP	0.49 – 1.705	24000/F(kHz)	30
QP	1.705 – 30.0	30	30
Detector	Frequency / MHz	Limit / dB $\mu\text{V/m}$	Measurement distance / m
QP	30.0 – 88.0	40.0	3
QP	88.0 – 216.0	43.5	3
QP	216.0 – 960.0	46.0	3
QP	960.0 – 1000.0	54.0	3
AV	> 1000	54.0	3
PK	> 1000	74.0	3
The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other sections within this part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency. Devices operated pursuant to § 15.225 [13.110-14.010 MHz] are exempt from complying with this section for the 13.36-13.41 MHz band only.			

Rationale for selecting the EUT test set up

Equipment units:

EUT as a stand-alone device with a cable-mounted control unit.

EUT Orientation

☐ X-Direction
 ☐ Y-Direction
 ☒ Z-Direction

Test frequencies

☐ Nominal Channel Bandwidth 20 MHz
 Lowest channel ___ / ___ MHz
 Middle channel ___ / ___ MHz
 Highest channel ___ / ___ MHz
☐ Nominal Channel Bandwidth 40 MHz
 Lowest channel ___ / ___ MHz
 Middle channel ___ / ___ MHz
 Highest channel ___ / ___ MHz
☒ Nominal Channel Bandwidth 2 MHz
 Lowest channel 37 / 2402 MHz
 Middle channel 17 / 2440 MHz
 Highest channel 39 / 2480 MHz

Operation mode

EUT arrangement: ☒ Tabletop ☐ Floor standing
 Power supply: ☐ 120 V/60 Hz ☒ Internal battery

Continuous operation in transmitter mode with a maximum power level and duty cycle of 57.72 %. The pump motor was deactivated.

Environmental conditions

Temperature [10 – 40 °C]: 24 °C
 Relative humidity [10 – 90 %]: 34 %

Environmental conditions during the test: ☒ kept ☐ not kept



Test result

Limits for restricted-band band-edge:

☒ kept
☐ not kept

General emission limits for restricted frequency bands based on measurements from radiated emissions of intentional radiators:

☒ kept
☐ not kept

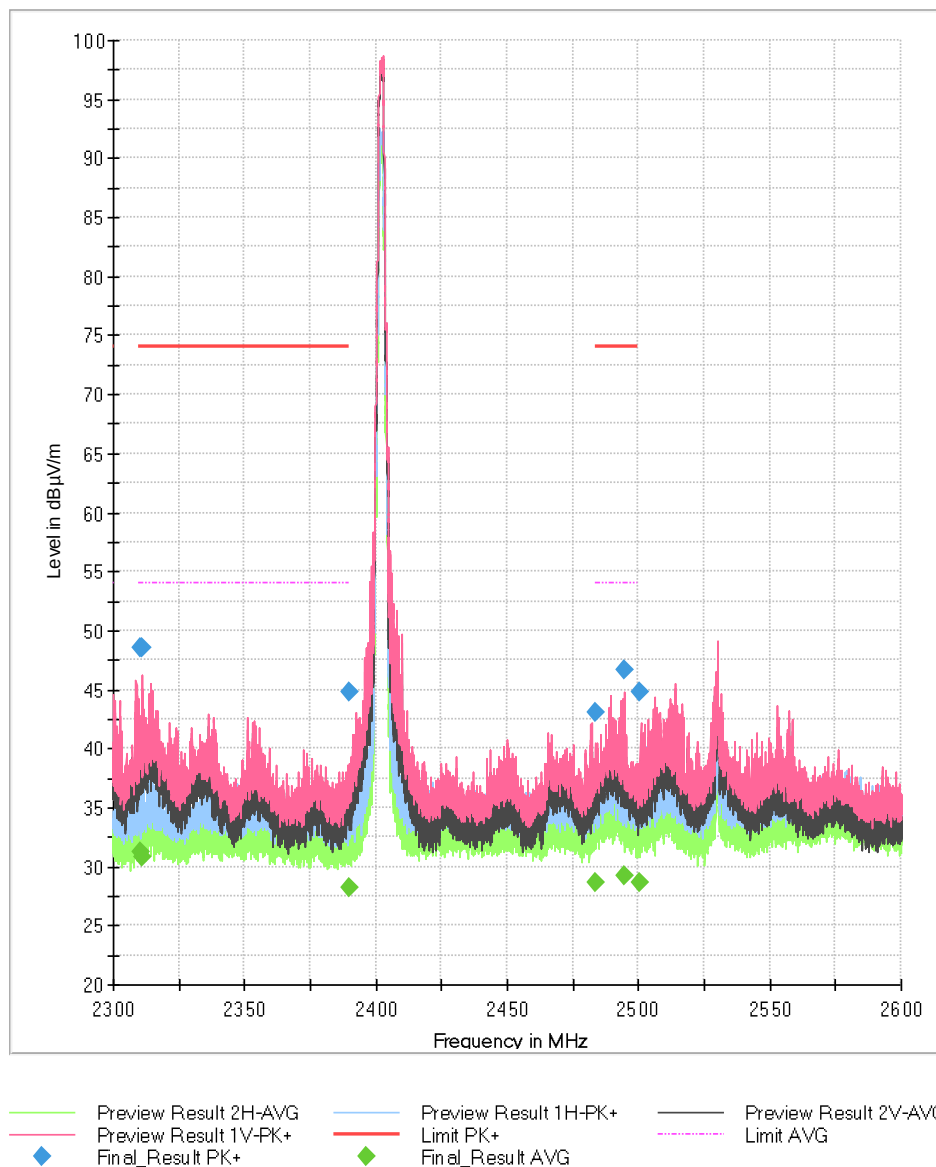
| Remarks: n/a

Records

- ☒ Readings - Restricted-band band-edge
- ☒ Diagrams - Restricted-band band-edge

EUT Information

EUT Name:	Exo 18
Test_ID: / SN:	23-0121PR05-015
Customer:	Festool GmbH
Operational condition:	Continuous transmission on CH37, pump motor deactivated
Test specification:	47 CFR Part 15 Subpart C §15.205 restricted bands SAC @3 m RSS-Gen, Issue 5 (2018-04) 8.10 restricted frequency bands SAC
Antenna information:	Distance EUT-Ant.: 3.0 m / Polarisation: H/V / Ant.Height: 1.0-4.0 m.
Operator:	S. Vogelmann
File #:	23-0121RC07-015-007
Comment#1:	EUT in Z-Direction
Comment#2:	



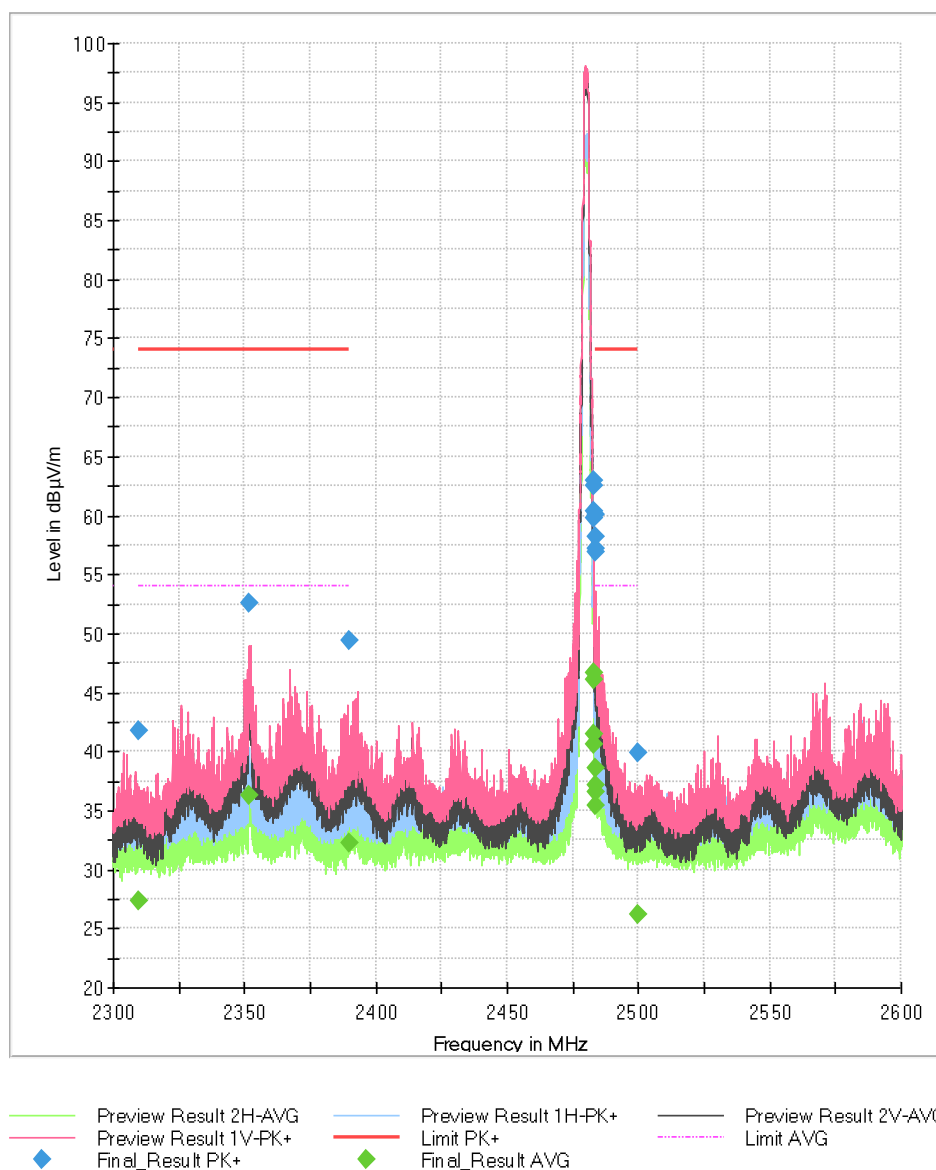


Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2310.130857	---	31.31	54.00	22.69	5000.0	1000.000	119.0	V	10.0	-0.2
2310.130857	48.47	---	74.00	25.53	5000.0	1000.000	119.0	V	10.0	-0.2
2311.006072	48.49	---	74.00	25.51	5000.0	1000.000	266.0	V	178.0	-0.2
2311.006072	---	30.87	54.00	23.13	5000.0	1000.000	266.0	V	178.0	-0.2
2390.068714	---	28.17	Excluded		5000.0	1000.000	235.0	V	166.0	-0.1
2390.068714	44.82	---			5000.0	1000.000	235.0	V	166.0	-0.1
2483.494286	43.02	---			5000.0	1000.000	321.0	V	31.0	0.1
2483.494286	---	28.64			5000.0	1000.000	321.0	V	31.0	0.1
2494.494143	---	29.20	54.00	24.80	5000.0	1000.000	158.0	V	137.0	0.0
2494.494143	46.71	---	74.00	27.29	5000.0	1000.000	158.0	V	137.0	0.0
2500.392000	---	28.67	Excluded		5000.0	1000.000	308.0	V	354.0	0.0
2500.392000	44.80	---			5000.0	1000.000	308.0	V	354.0	0.0

EUT Information

EUT Name:	Exo 18
Test_ID: / SN:	23-0121PR05-015
Customer:	Festool GmbH
Operational condition:	Continuous transmission on CH39, pump motor deactivated
Test specification:	47 CFR Part 15 Subpart C §15.205 restricted bands SAC @3 m RSS-Gen, Issue 5 (2018-04) 8.10 restricted frequency bands SAC
Antenna information:	Distance EUT-Ant.: 3.0 m / Polarisation: H/V / Ant.Height: 1.0-4.0 m.
Operator:	S. Vogelmann
File #:	23-0121RC07-015-007
Comment #1:	EUT in Z-Direction
Comment #2:	



Final Result

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2310.001428	---	27.42	Excluded		5000.0	1000.000	170.0	V	156.0	-0.2
2310.001428	41.71	---			5000.0	1000.000	170.0	V	156.0	-0.2
2351.875214	52.63	---	74.00	21.37	5000.0	1000.000	108.0	V	6.0	-0.1
2351.875214	---	36.34	54.00	17.66	5000.0	1000.000	108.0	V	6.0	-0.1
2389.714286	49.42	---	74.00	24.58	5000.0	1000.000	203.0	V	161.0	-0.1
2389.714286	---	32.31	54.00	21.69	5000.0	1000.000	203.0	V	161.0	-0.1
2483.011072	62.96	---	Excluded		5000.0	1000.000	155.0	V	157.0	0.1
2483.011072	---	46.69			5000.0	1000.000	155.0	V	157.0	0.1
2483.020572	62.53	---			5000.0	1000.000	154.0	V	348.0	0.1
2483.020572	---	46.05			5000.0	1000.000	154.0	V	348.0	0.1
2483.234714	---	41.41			5000.0	1000.000	265.0	V	21.0	0.1
2483.234714	60.36	---			5000.0	1000.000	265.0	V	21.0	0.1
2483.253571	---	40.63			5000.0	1000.000	264.0	V	21.0	0.1
2483.253571	59.75	---			5000.0	1000.000	264.0	V	21.0	0.1
2483.316571	---	37.20			5000.0	1000.000	322.0	H	283.0	0.1
2483.316571	56.97	---			5000.0	1000.000	322.0	H	283.0	0.1
2483.514286	60.12	---	74.00	13.88	5000.0	1000.000	153.0	V	341.0	0.1
2483.514286	---	38.60	54.00	15.40	5000.0	1000.000	153.0	V	341.0	0.1
2483.872072	---	35.41	54.00	18.59	5000.0	1000.000	203.0	V	37.0	0.1
2483.872072	57.19	---	74.00	16.81	5000.0	1000.000	203.0	V	37.0	0.1
2483.900000	58.23	---	74.00	15.77	5000.0	1000.000	154.0	V	343.0	0.1
2483.900000	---	36.56	54.00	17.44	5000.0	1000.000	154.0	V	343.0	0.1
2499.740715	---	26.20	54.00	27.80	5000.0	1000.000	228.0	V	351.0	0.0
2499.740715	39.82	---	74.00	34.18	5000.0	1000.000	228.0	V	351.0	0.0

6.1 Occupied Bandwidth

- ☒ No deviation from the standard*
 - ☐ Deviation from the standard
 - ☐ Test not requested
 - ☐ Test not carried out
- * Valid only for EUT 23-0121PR05-016

Measurement procedure:

Rules and specification

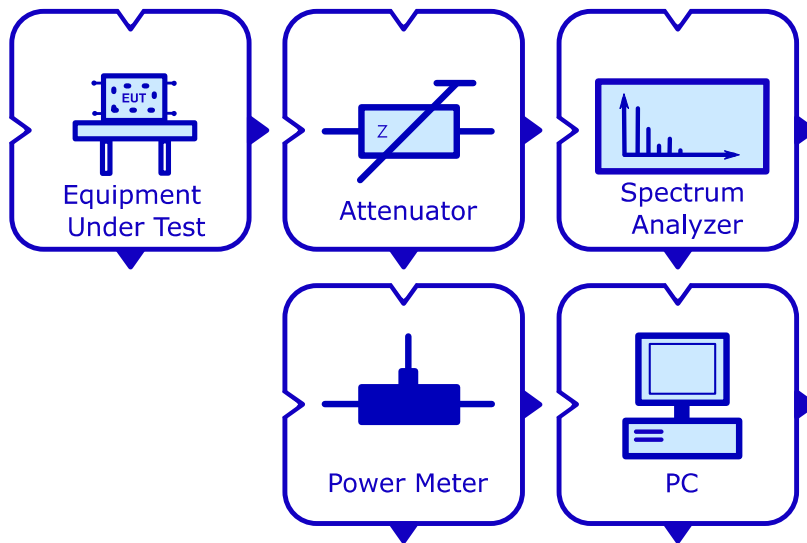
47 CFR Part 15 Section 15.215 (c)

Guide

- ☐ ANSI C63.10-2013 Section 6.9.2 – 20dB Bandwidth
- ☒ ANSI C63.10-2013 Section 6.9.3 - 99% Bandwidth

Basic structure - Setup

Conducted RF Measurement





6.1.1 Test set up

According ANSI C63.10-2013

Photo(s) showing the interconnection of the major function units



Test location

Final test					
☒	Inv.-No.	Designation	Type (L x W x H)	Manufacturer	Location
☒	234	Regulatory Test System for Wireless Devices	TS8997	Rohde & Schwarz	EMCE GmbH Untere Wiesen 1 88483 Burgrieden

Used test equipment

Final test					
☒	Inv.-No.	Designation	Type	Manufacturer	S/N
☒	230	Signal Analyzer 40 GHz	FSV40	Rohde & Schwarz	101717
☐	231	Vector Signal Generator	SMBV100A	Rohde & Schwarz	262891
☒	233	OSP-B157W 8 PORT	OSP-B157W8	Rohde & Schwarz	100925
☒	1212	Software	WMS32	Rohde & Schwarz	n/a

All used test equipment are checked resp. calibrated periodically.

☒ Test equipment was checked and complied to the requirements

Test / Measurement uncertainty

For the test method the measurement uncertainty is equal to or lower than the listed values and correspond to an expansion factor $k = 2$

Occupied Channel Bandwidth	$\pm 5 \%$
RF output power, conducted	$\pm 1.5 \text{ dB}$
Power Spectral Density, conducted	$\pm 3 \text{ dB}$
Unwanted Emissions, conducted	$\pm 3 \text{ dB}$
All emissions, radiated	$\pm 6 \text{ dB}$
Temperature	$\pm 3 \text{ degree}$
Humidity	$\pm 5 \%$
Supply voltages	$\pm 3 \%$
Time	$\pm 5 \%$

6.1.2 Test

Test frequencies

- ☐ Nominal Channel Bandwidth 20 MHz
- | | |
|-----------------|---------------|
| Lowest channel | ___ / ___ MHz |
| Middle channel | ___ / ___ MHz |
| Highest channel | ___ / ___ MHz |
- ☐ Nominal Channel Bandwidth 40 MHz
- | | |
|-----------------|---------------|
| Lowest channel | ___ / ___ MHz |
| Middle channel | ___ / ___ MHz |
| Highest channel | ___ / ___ MHz |
- ☒ Nominal Channel Bandwidth 2 MHz
- | | |
|-----------------|---------------|
| Lowest channel | 37 / 2402 MHz |
| Middle channel | 17 / 2440 MHz |
| Highest channel | 39 / 2480 MHz |

Test Requirements

- ☒ Bandwidth contained within the used frequency band
- | | |
|-------------|------------|
| Lower limit | 2400.0 MHz |
| Upper limit | 2483.5 MHz |

Operation mode

- | | | |
|------------------|--|--|
| EUT arrangement: | ☒ Tabletop | ☐ Floor standing |
| Power supply: | ☐ 120 V/60 Hz | ☒ Internal battery |

Continuous operation in transmitter mode with a maximum power level and duty cycle of 57.72 %. The pump motor was active.

Environmental conditions

Temperature [10 – 40 °C]:	23 °C
Relative humidity [10 – 90 %]:	30 %

Environmental conditions during the test:	☒ kept
	☐ not kept



Test result

Channel	Lower edge / MHz	Lower limit / MHz	Upper edge / MHz	Upper limit / MHz	OCBw / MHz
37	2400.975	2400.000	2403.025	2483.500	2.050
17	2438.975	2400.000	2441.025	2483.500	2.050
39	2478.965	2400.000	2481.025	2483.500	2.060

Limits for 20 dB Bandwidth:

- ☐ kept
- ☐ not kept
- ☒ not relevant

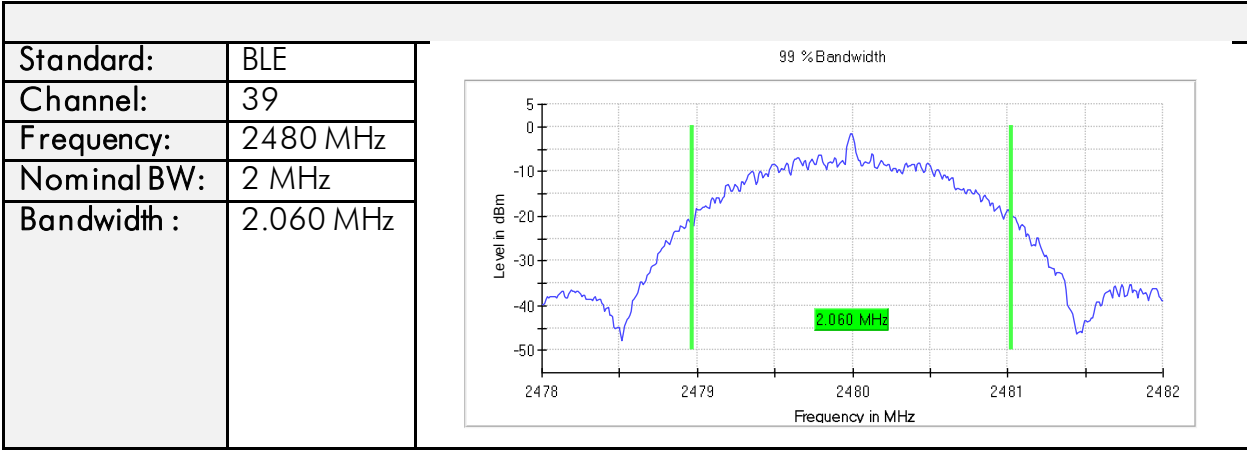
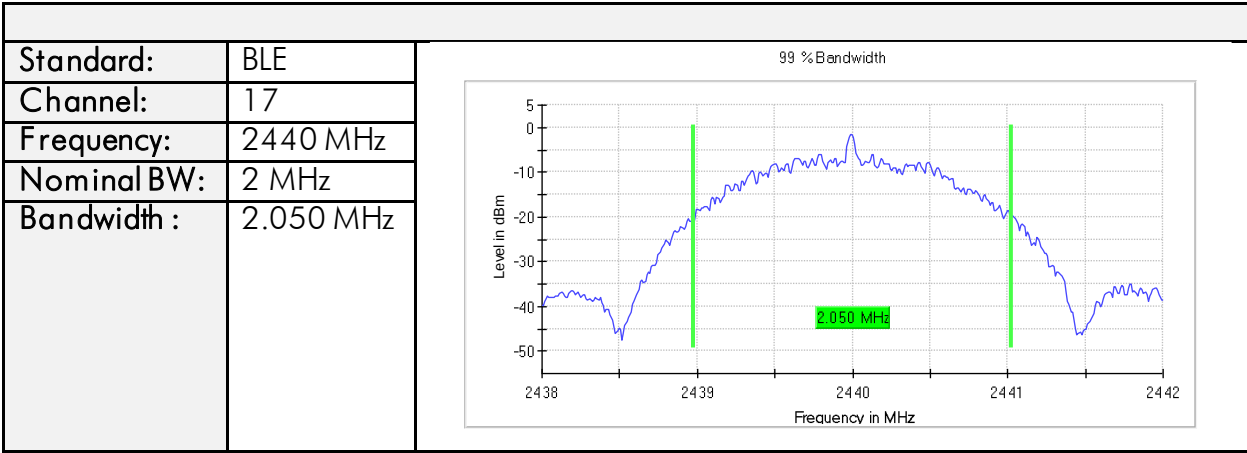
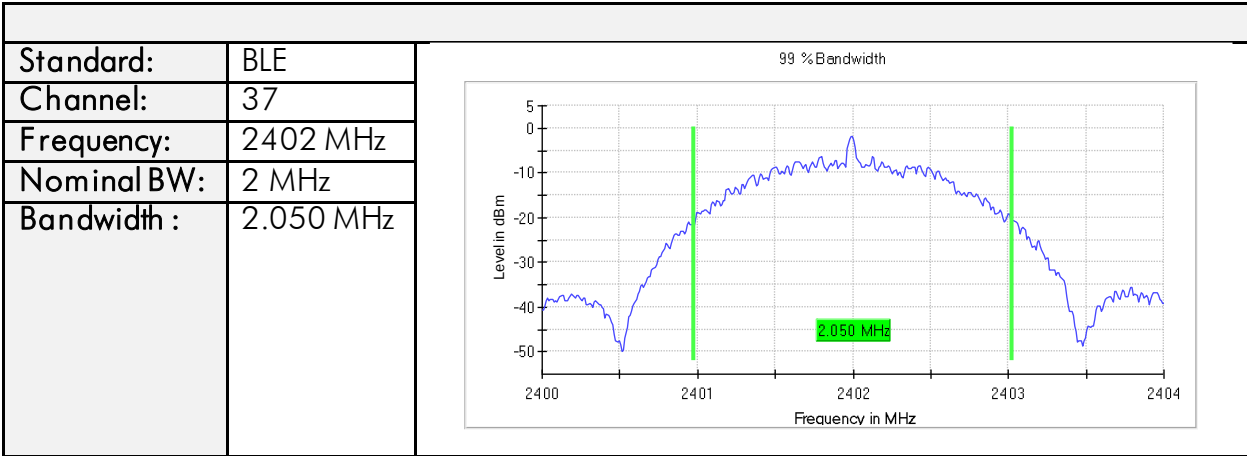
Limits for 99% Bandwidth:

- ☒ kept
- ☐ not kept
- ☐ not relevant

Remarks: n/a

Records

- ☒ Diagrams
- ☒ Readings



6.2 DTS Bandwidth

- ☒ No deviation from the standard*
 - ☐ Deviation from the standard
 - ☐ Test not requested
 - ☐ Test not carried out
- * Valid only for EUT 23-0121PR05-016

Measurement procedure:

Rules and specification

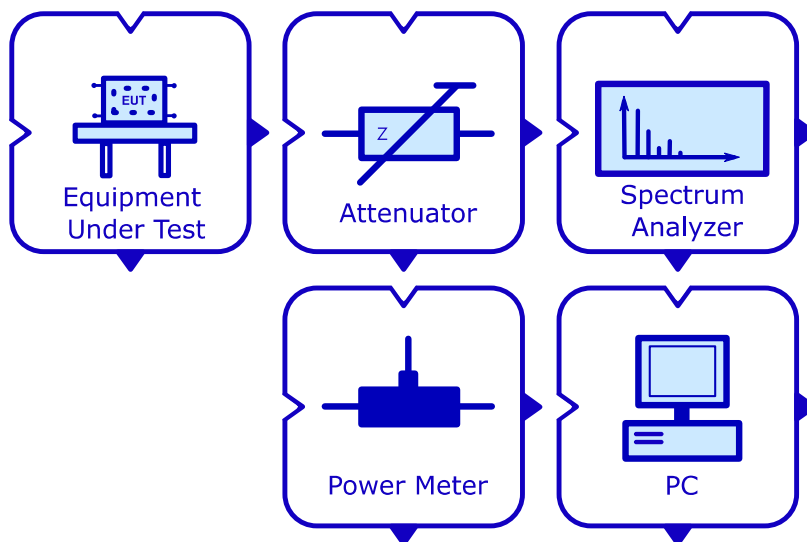
47 CFR Part 15 Section 15.247 (a)(2) and
RSS-247, Issue 3 (2023-08) Section 5.2 (a)

Guide

- ☒ ANSI C63.10-2013 Section 11.8.1 – Option 1
- ☐ ANSI C63.10-2013 Section 11.8.2 – Option 2

Basic structure - Setup

Conducted RF Measurement





6.2.1 Test set up

According ANSI C63.10-2013

Photo(s) showing the interconnection of the major function units



Test location

Final test					
☒	Inv.-No.	Designation	Type (L x W x H)	Manufacturer	Location
☒	234	Regulatory Test System for Wireless Devices	TS8997	Rohde & Schwarz	EMCE GmbH Untere Wiesen 1 88483 Burgrieden

Used test equipment

Final test					
☒	Inv.-No.	Designation	Type	Manufacturer	S/N
☒	230	Signal Analyzer 40 GHz	FSV40	Rohde & Schwarz	101717
☐	231	Vector Signal Generator	SMBV100A	Rohde & Schwarz	262891
☒	233	OSP-B157W 8 PORT	OSP-B157W8	Rohde & Schwarz	100925
☒	1212	Software	WMS32	Rohde & Schwarz	n/a

All used test equipment are checked resp. calibrated periodically.

☒ Test equipment was checked and complied to the requirements

Test / Measurement uncertainty

For the test method the measurement uncertainty is equal to or lower than the listed values and correspond to an expansion factor $k = 2$

Occupied Channel Bandwidth	$\pm 5 \%$
RF output power, conducted	$\pm 1.5 \text{ dB}$
Power Spectral Density, conducted	$\pm 3 \text{ dB}$
Unwanted Emissions, conducted	$\pm 3 \text{ dB}$
All emissions, radiated	$\pm 6 \text{ dB}$
Temperature	$\pm 3 \text{ degree}$
Humidity	$\pm 5 \%$
Supply voltages	$\pm 3 \%$
Time	$\pm 5 \%$

6.2.2 Test

Test frequencies

- ☐ Nominal Channel Bandwidth 20 MHz
- | | |
|-----------------|---------------|
| Lowest channel | ___ / ___ MHz |
| Middle channel | ___ / ___ MHz |
| Highest channel | ___ / ___ MHz |
- ☐ Nominal Channel Bandwidth 40 MHz
- | | |
|-----------------|---------------|
| Lowest channel | ___ / ___ MHz |
| Middle channel | ___ / ___ MHz |
| Highest channel | ___ / ___ MHz |
- ☒ Nominal Channel Bandwidth 2 MHz
- | | |
|-----------------|---------------|
| Lowest channel | 37 / 2402 MHz |
| Middle channel | 17 / 2440 MHz |
| Highest channel | 39 / 2480 MHz |

Test Requirements

- ☒ Minimum 6 dB bandwidth $\geq$ 500 kHz

Operation mode

- | | | |
|------------------|--|--|
| EUT arrangement: | ☒ Tabletop | ☐ Floor standing |
| Power supply: | ☐ 120 V/60 Hz | ☒ Internal battery |

Continuous operation in transmitter mode with a maximum power level and duty cycle of 57.72 %. The pump motor was active.

Environmental conditions

Temperature [10 – 40 °C]:	23 °C
Relative humidity [10 – 90 %]:	30 %

Environmental conditions during the test:	☒ kept
	☐ not kept



Test result

Channel	Lower edge / MHz	Upper edge / MHz	6 dB BW / MHz	Minimum limit / MHz
37	2401.405941	2402.594059	1.188118	0.500000
17	2439.405941	2440.594059	1.188118	0.500000
39	2479.405941	2480.594059	1.188118	0.500000

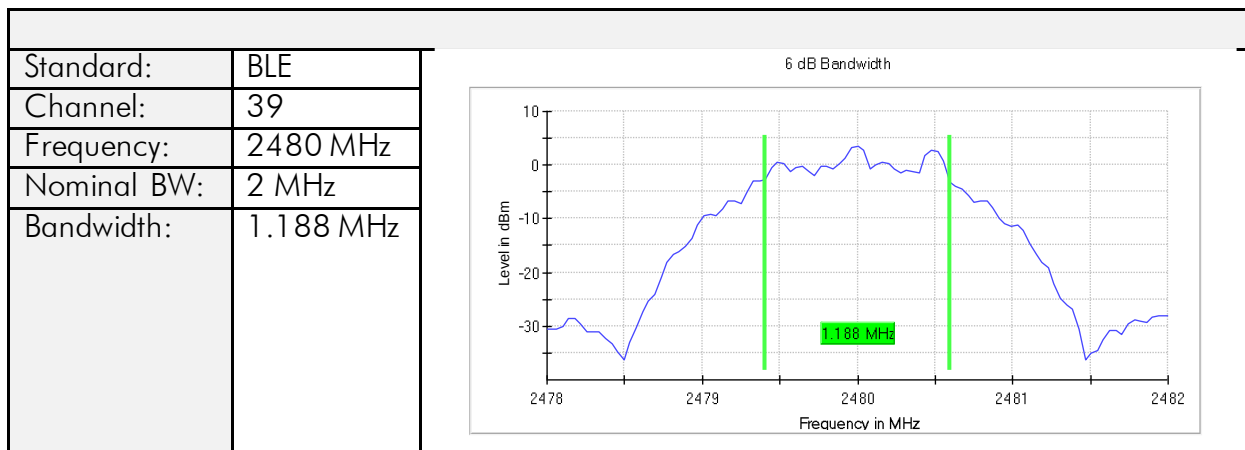
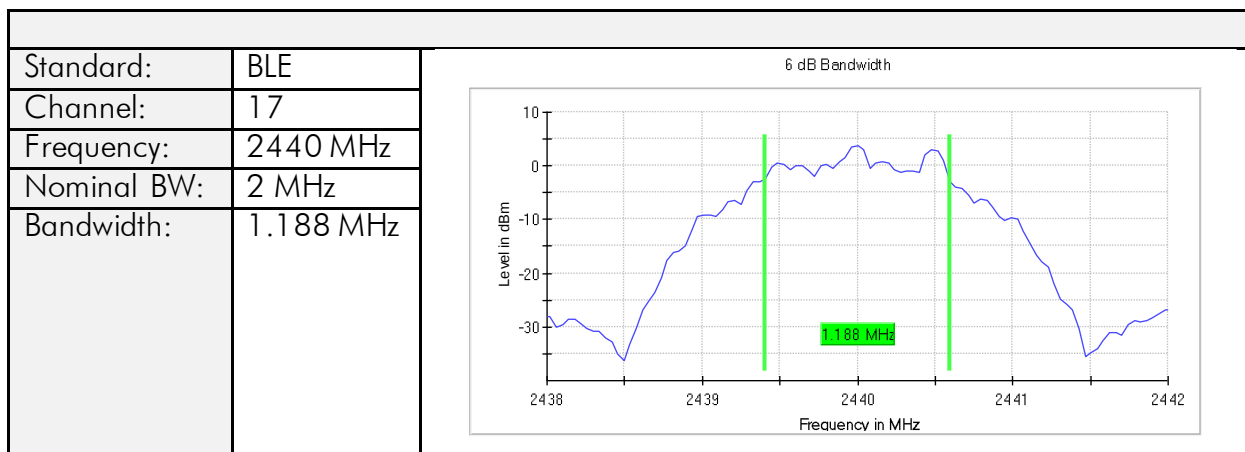
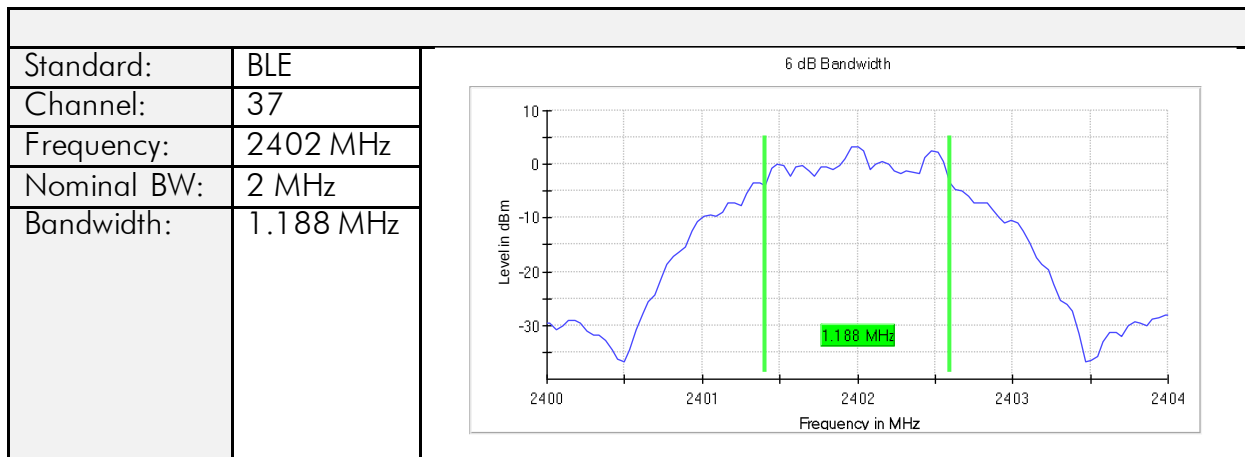
Limits for DTS (6 dB) Bandwidth:

- ☒ kept
- ☐ not kept
- ☐ not relevant

Remarks: n/a

Records

- ☒ Diagrams
- ☒ Readings



6.3 Output Power

- ☒ No deviation from the standard*
- ☐ Deviation from the standard
- ☐ Test not requested
- ☐ Test not carried out

* Valid only for EUT 23-0121PR05-016,
the radiated test was performed with EUT 23-0121PR05-015.

Measurement procedure:

Rules and specification

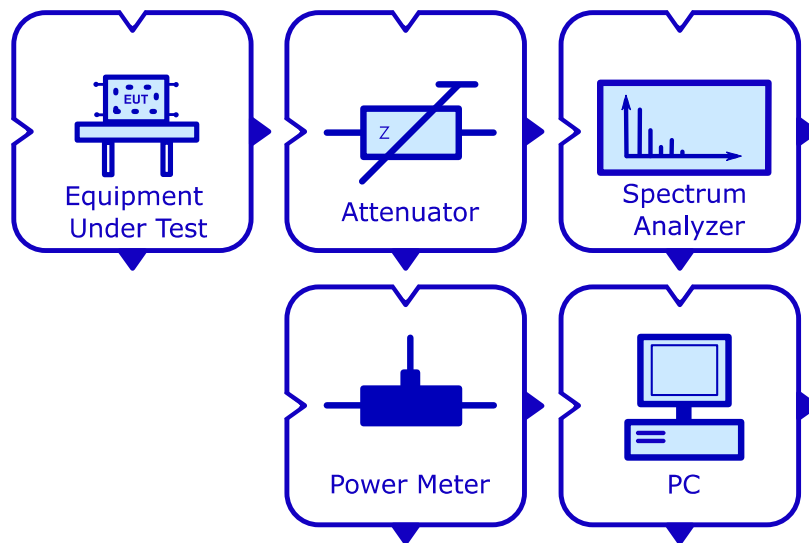
47 CFR Part 15 Section 15.247 (b)(3)(4)) and
RSS-247, Issue 3 (2023-08) Section 5.4 (d)

Guide

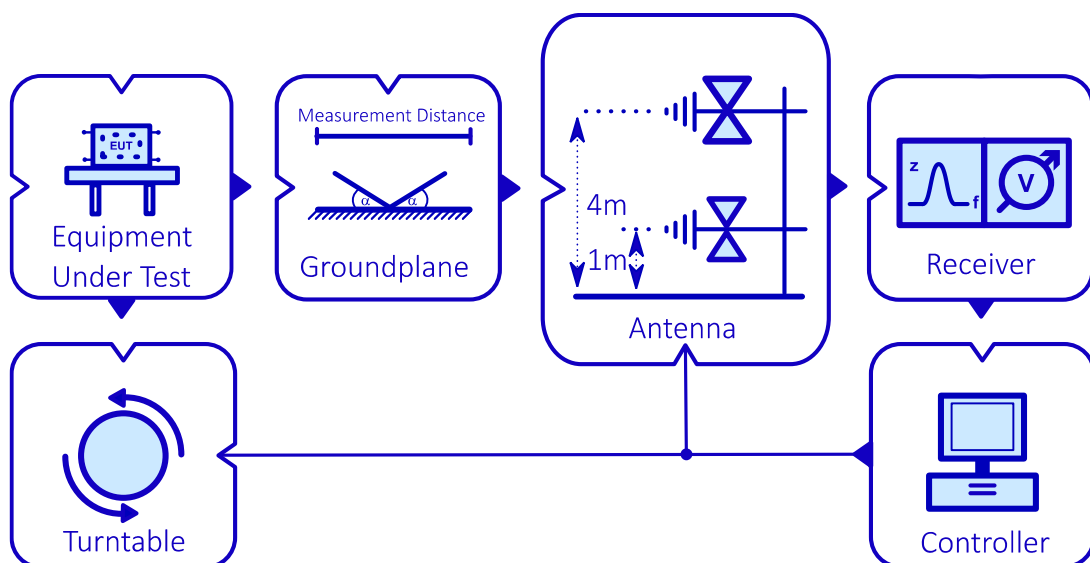
- ☒ ANSI C63.10-2013 Section 11.9.1.1 – RBW $\geq$ DTS bandwidth
- ☐ ANSI C63.10-2013 Section 11.9.1.2 – Integrated band power method
- ☐ ANSI C63.10-2013 Section 11.9.1.3 – Peak power meter method
- ☐ ANSI C63.10-2013 Section 11.9.2.2.2 – Method AVGSA-1
- ☐ ANSI C63.10-2013 Section 11.9.2.2.3 – Method AVGSA-1A
- ☐ ANSI C63.10-2013 Section 11.9.2.2.4 – Method AVGSA-2
- ☐ ANSI C63.10-2013 Section 11.9.2.2.5 – Method AVGSA-2A
- ☐ ANSI C63.10-2013 Section 11.9.2.2.6 – Method AVGSA-3
- ☐ ANSI C63.10-2013 Section 11.9.2.2.7 – Method AVGSA-3A
- ☐ ANSI C63.10-2013 Section 11.9.2.3.1 - Method AVGPM
- ☒ ANSI C63.10-2013 Section 11.9.2.3.2 - Method AVGPM-G

Basic structure - Setup

Conducted RF Measurement



SAC





6.3.1 Test set up

According ANSI C63.10-2013

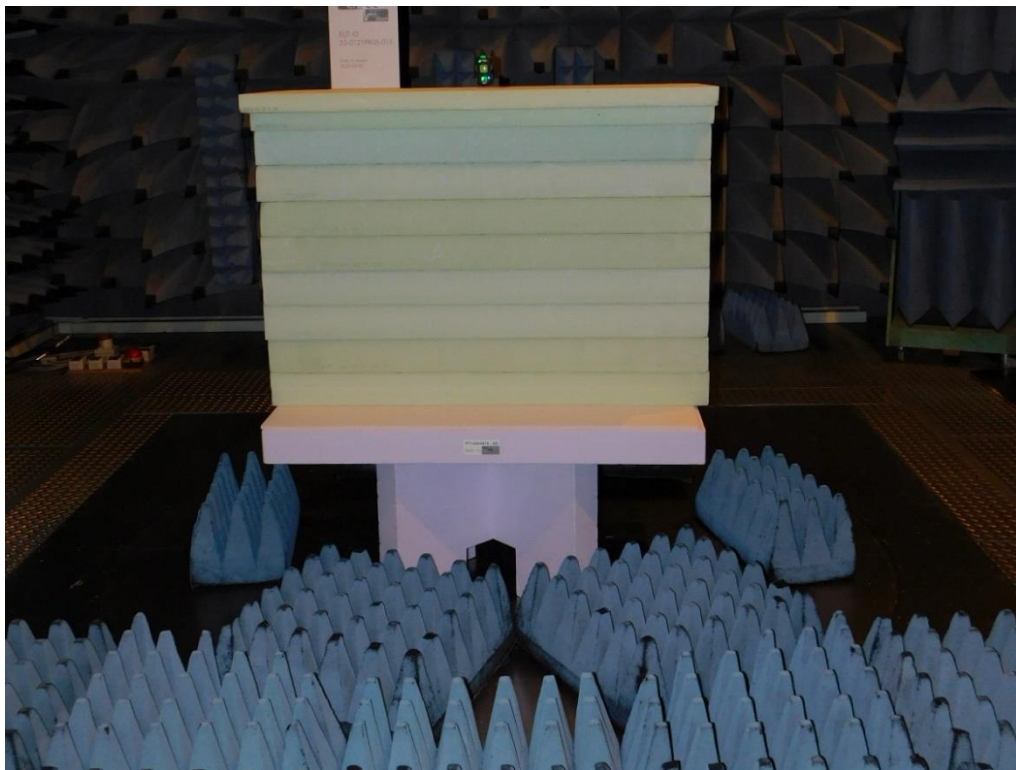
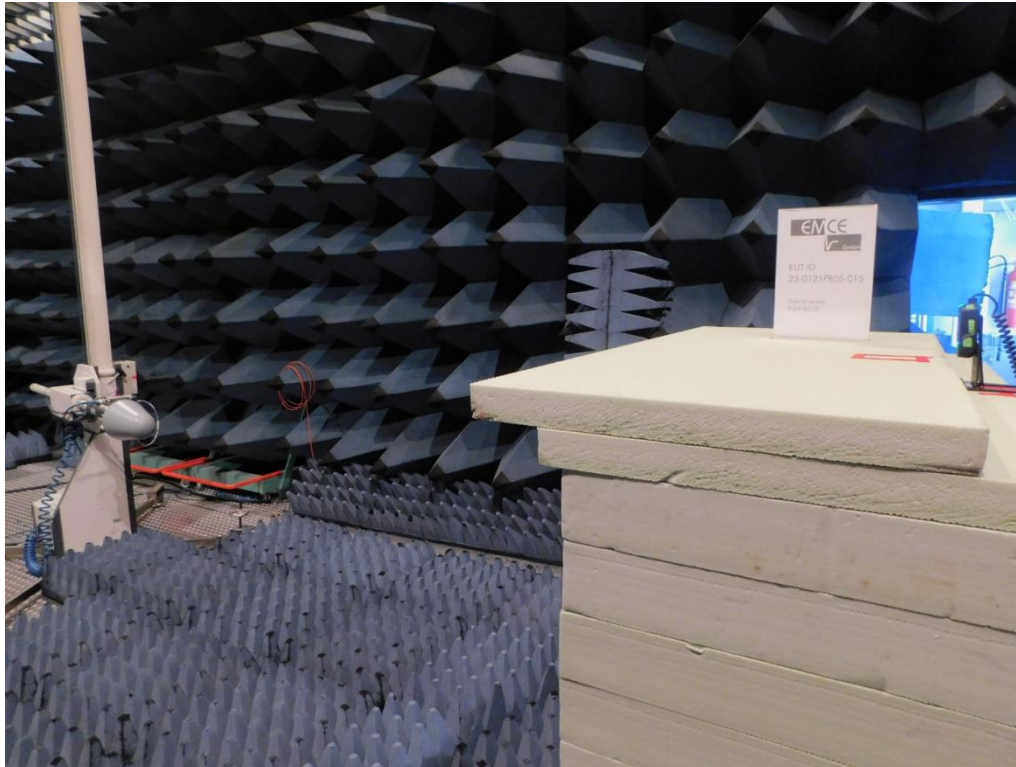
Photo(s) showing the interconnection of the major function units

Conducted set up





Radiated set up



Test location – Conducted test

Final test					
☒	Inv.-No.	Designation	Type (L x W x H)	Manufacturer	Location
☒	234	Regulatory Test System for Wireless Devices	TS8997	Rohde & Schwarz	EMCE GmbH Untere Wiesen 1 88483 Burgrieden

Used test equipment

Final test					
☒	Inv.-No.	Designation	Type	Manufacturer	S/N
☒	230	Signal Analyzer 40 GHz	FSV40	Rohde & Schwarz	101717
☐	231	Vector Signal Generator	SMBV100A	Rohde & Schwarz	262891
☒	233	OSP-B157W 8 PORT	OSP-B157W8	Rohde & Schwarz	100925
☒	1212	Software	WMS32	Rohde & Schwarz	n/a

All used test equipment are checked resp. calibrated periodically.

☒ Test equipment was checked and complied to the requirements

Test / Measurement uncertainty

For the test method the measurement uncertainty is equal to or lower than the listed values and correspond to an expansion factor $k = 2$

Occupied Channel Bandwidth	$\pm 5 \%$
RF output power, conducted	$\pm 1.5 \text{ dB}$
Power Spectral Density, conducted	$\pm 3 \text{ dB}$
Unwanted Emissions, conducted	$\pm 3 \text{ dB}$
All emissions, radiated	$\pm 6 \text{ dB}$
Temperature	$\pm 3 \text{ degree}$
Humidity	$\pm 5 \%$
Supply voltages	$\pm 3 \%$
Time	$\pm 5 \%$

Test location – Radiated test

Final test					
☒	Inv.-No.	Designation	Type (L x W x H)	Manufacturer	Location
☒	062	Semi anechoic chamber # 2	13.5 x 6.1 x 5.5 m	EMC-Technik & Consulting GmbH	EMCE GmbH Untere Wiesen 1 88483 Burgrieden

Used test equipment

Final test					
☒	Inv.-No.	Designation	Type	Manufacturer	S/N
☒	059	Logper. Antenna	HL050	Rohde & Schwarz	100006
☒	230	Signal Analyzer 40 GHz	FSV40	Rohde & Schwarz	101717
☒	997	Software	EMC32	Rohde & Schwarz	n/a

All used test equipment are checked resp. calibrated periodically.

☒ Test equipment was checked and complied to the requirements

Test-/Measurement uncertainty

The measurement uncertainty in the test met the guideline of CISPR16-4-2 or better.

Measurement uncertainty of the radiated emission with an extended coverage factor of $k = 2$:

RF output power, radiated ± 6.0 dB

6.3.2 Test

Test frequencies

- ☐ Nominal Channel Bandwidth 20 MHz
- | | |
|-----------------|---------------|
| Lowest channel | ___ / ___ MHz |
| Middle channel | ___ / ___ MHz |
| Highest channel | ___ / ___ MHz |
- ☐ Nominal Channel Bandwidth 40 MHz
- | | |
|-----------------|---------------|
| Lowest channel | ___ / ___ MHz |
| Middle channel | ___ / ___ MHz |
| Highest channel | ___ / ___ MHz |
- ☒ Nominal Channel Bandwidth 2 MHz
- | | |
|-----------------|---------------|
| Lowest channel | 37 / 2402 MHz |
| Middle channel | 17 / 2440 MHz |
| Highest channel | 39 / 2480 MHz |

Test Requirements

- ☒ Transmitting antenna(s) directional gain $G_{Tx} \leq 6$ dBi
Maximum conducted output power ≤ 1.0 W
- ☐ Transmitting antenna(s) directional gain $G_{Tx} > 6$ dBi
Maximum conducted output power ≤ 1.0 W reduced by $G_{Tx} - 6$ dB

Operation mode

- | | | |
|------------------|---|--|
| EUT arrangement: | ☒ Tabletop | ☐ Floor standing |
| Power supply: | ☐ 120 V/60 Hz | ☒ Internal battery |
| Duty Cycle: | ☐ Continuous (D=1) | ☐ ≥ 0.98 |
| | ☒ Constant (D $\pm$ 0.02) | ☐ ___ |

Continuous operation in transmitter mode with a maximum power level and duty cycle of 57.72 %. The pump motor was active.

Environmental conditions

Temperature [10 – 40 °C]: 24 °C

Relative humidity [10 – 90 %]: 30 %

Environmental conditions during the test: ☒ kept
☐ not kept

Test result

Conducted test

Channel #	Duty Cycle / %	Output power / dBm	Output power / W	Limit / W	Margin / W
37	57.72	3.897	0.002	1.000	0.998
17	57.72	4.054	0.003	1.000	0.997
39	57.72	4.197	0.003	1.000	0.997

Radiated test

Channel #	Duty Cycle / %	Output power / dBm	Output power / W	Limit / W	Margin / W
37	57.72	3.240	0.002	1.000	0.998
17	57.72	3.600	0.002	1.000	0.998
39	57.72	2.810	0.002	1.000	0.998

Limits for Output Power (peak): ☐ kept
☐ not kept
☒ not relevant

Limits for Output Power (average): ☒ kept
☐ not kept
☐ not relevant

Remarks: n/a

6.5 Emissions in non-restricted frequency bands

- ☒ No deviation from the standard*
 - ☐ Deviation from the standard
 - ☐ Test not requested
 - ☐ Test not carried out
- * Valid only for EUT 23-0121PR05-016

Measurement procedure:

Rules and specification

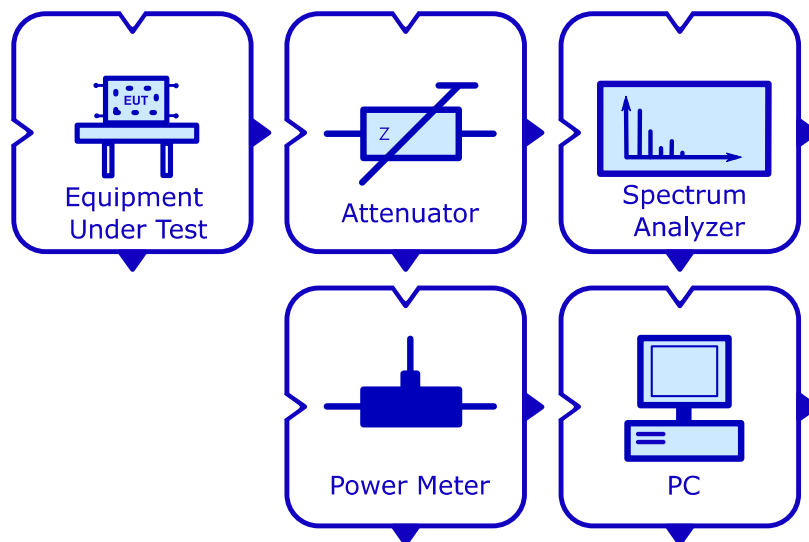
47 CFR Part 15 Section 15.247 (d) and
RSS-247, Issue 3 (2023-08) Section 5.5

Guide

- ☐ ANSI C63.10-2013 Section 11.11.1 a) – 20dBc (Peak)
- ☒ ANSI C63.10-2013 Section 11.11.1 b) – 30dBc (Average)

Basic structure - Setup

Conducted RF Measurement





6.5.1 Test set up

According ANSI C63.10-2013

Photo(s) showing the interconnection of the major function units



Test location

Final test					
☒	Inv.-No.	Designation	Type (L x W x H)	Manufacturer	Location
☒	234	Regulatory Test System for Wireless Devices	TS8997	Rohde & Schwarz	EMCE GmbH Untere Wiesen 1 88483 Burgrieden

Used test equipment

Final test					
☒	Inv.-No.	Designation	Type	Manufacturer	S/N
☒	230	Signal Analyzer 40 GHz	FSV40	Rohde & Schwarz	101717
	231	Vector Signal Generator	SMBV100A	Rohde & Schwarz	262891
	233	OSP-B157W 8 PORT	OSP-B157W8	Rohde & Schwarz	100925
☒	1212	Software	WMS32	Rohde & Schwarz	n/a

All used test equipment are checked resp. calibrated periodically.

☒ Test equipment was checked and complied to the requirements

Test / Measurement uncertainty

For the test method the measurement uncertainty is equal to or lower than the listed values and correspond to an expansion factor $k = 2$

Occupied Channel Bandwidth	$\pm 5 \%$
RF output power, conducted	$\pm 1.5 \text{ dB}$
Power Spectral Density, conducted	$\pm 3 \text{ dB}$
Unwanted Emissions, conducted	$\pm 3 \text{ dB}$
All emissions, radiated	$\pm 6 \text{ dB}$
Temperature	$\pm 3 \text{ degree}$
Humidity	$\pm 5 \%$
Supply voltages	$\pm 3 \%$
Time	$\pm 5 \%$

6.5.2 Test

Test frequencies

- ☐ Nominal Channel Bandwidth 20 MHz
- | | |
|-----------------|---------------|
| Lowest channel | ___ / ___ MHz |
| Middle channel | ___ / ___ MHz |
| Highest channel | ___ / ___ MHz |
- ☐ Nominal Channel Bandwidth 40 MHz
- | | |
|-----------------|---------------|
| Lowest channel | ___ / ___ MHz |
| Middle channel | ___ / ___ MHz |
| Highest channel | ___ / ___ MHz |
- ☒ Nominal Channel Bandwidth 2 MHz
- | | |
|-----------------|---------------|
| Lowest channel | 37 / 2402 MHz |
| Middle channel | 17 / 2440 MHz |
| Highest channel | 39 / 2480 MHz |

Test Requirements

According to the method for determining compliance for the output power, the measured power in each 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by a certain value relative to the maximum in-band peak PSD level. For the peak method, the power must be attenuated by at least 20 dB, and for the average method, the power must be attenuated by at least 30 dB.

Operation mode

- | | | |
|------------------|--|--|
| EUT arrangement: | ☒ Tabletop | ☐ Floor standing |
| Power supply: | ☐ 120 V/60 Hz | ☒ Internal battery |

Continuous operation in transmitter mode with a maximum power level and duty cycle of 57.72 %. The pump motor was active.



Environmental conditions

Temperature [10 – 40 °C]: 25 °C
Relative humidity [10 – 90 %]: 29 %

Environmental conditions during the test: ☒ kept
☐ not kept

Test result

Limits for Band Edges according
peak measurement ☐ kept
☐ not kept
☒ not relevant

Limits for Band Edges according
average measurement ☒ kept
☐ not kept
☐ not relevant

Remarks: n/a

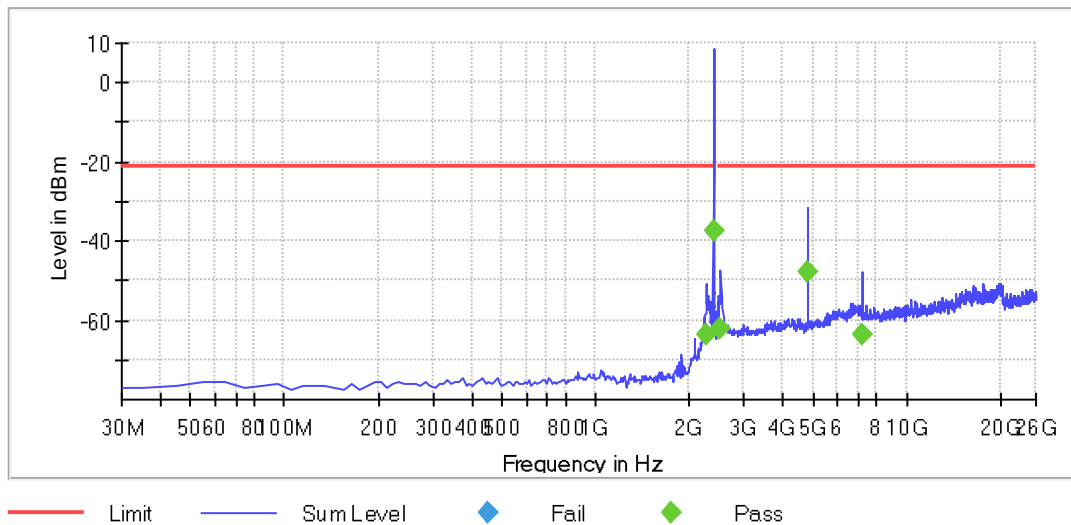
Records

- ☒ Diagrams – Non-Restricted-band emissions
- ☒ Readings - Non-Restricted-band emissions

EUT Information

EUT Name: Exo 18
 Test_ID: / SN: 23-0121PR02-016
 Customer: exo IQ GmbH
 Operational condition: Continuous transmission on CH37, motor pump active
 Test specification: 47 CFR Part 15 Subpart C §15.247 (d)
 RSS-247, Issue 3 (2023-08) Section 5.5 unwanted emissions
 Operator: S. Vogelmann
 File #: 23-0121RC03-016-005
 Comment #1: Limit relative to the maximum power with -30 dBc

Spurious

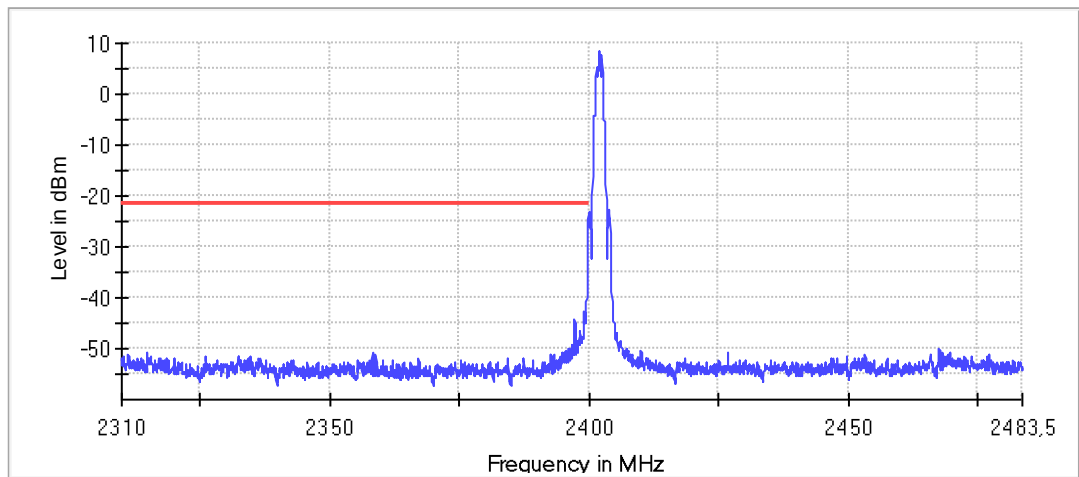


Final Result

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	RBW (kHz)
2273.829449	-63.9	-21.3	42.5	100.000
2399.958664	-37.5	-21.3	16.1	100.000
2529.920566	-62.3	-21.3	41.0	100.000
4802.976539	-47.9	-21.3	26.6	100.000
7204.791593	-63.9	-21.3	42.6	100.000

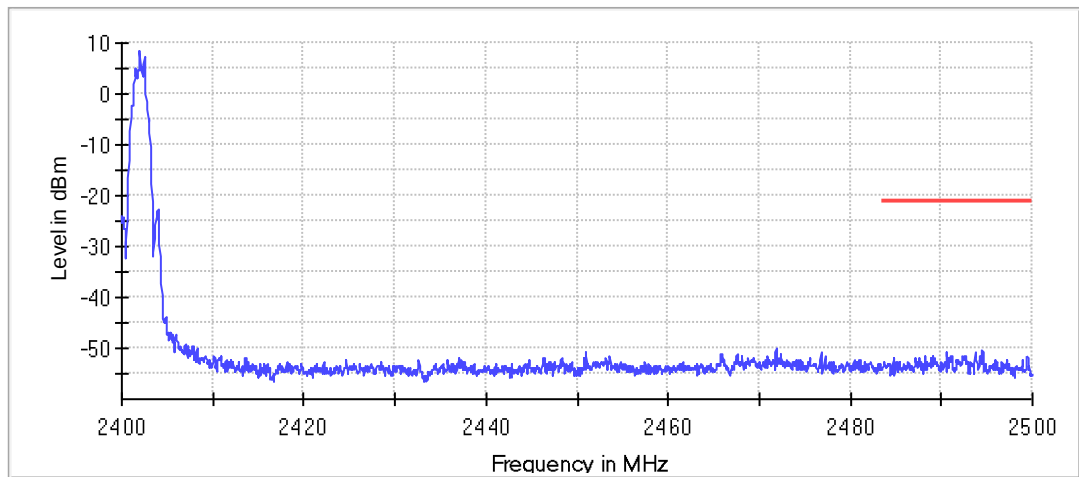


Band Edge



— Limit — Sum Level × Fail

Band Edge



— Limit — Sum Level × Fail

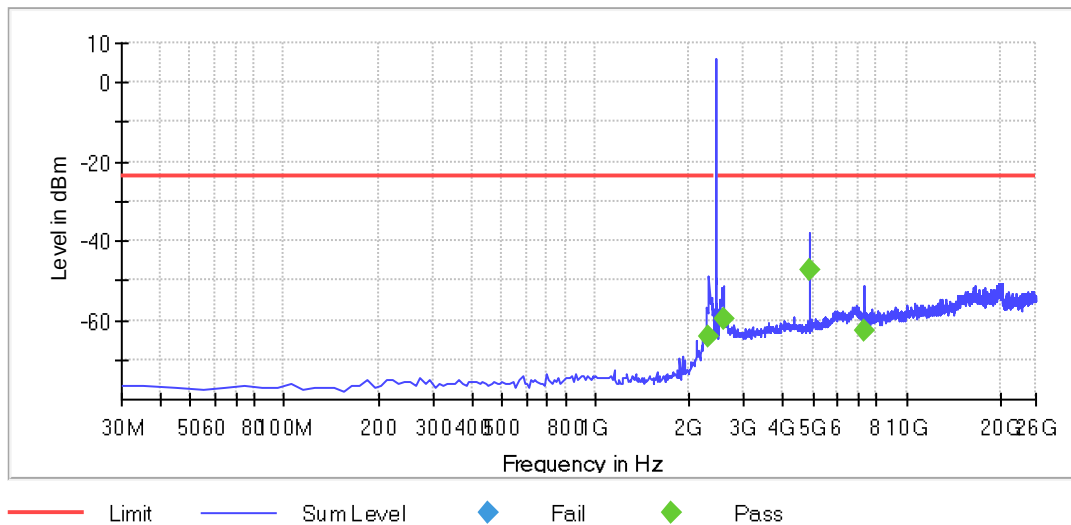
Final Result

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	RBW (kHz)
2399.975000	-23.1	1.5	-21.6	100.000
2399.925000	-24.6	2.9	-21.6	100.000
2399.875000	-28.0	6.3	-21.6	100.000
2399.825000	-30.3	8.6	-21.6	100.000
2399.775000	-30.9	9.2	-21.6	100.000

EUT Information

EUT Name: Exo 18
 Test_ID: / SN: 23-0121PR02-016
 Customer: exo IQ GmbH
 Operational condition: Continuous transmission on CH17, motor pump active
 Test specification: 47 CFR Part 15 Subpart C §15.247 (d)
 RSS-247, Issue 3 (2023-08) Section 5.5 unwanted emissions
 Operator: S. Vogelmann
 File #: 23-0121RC03-016-005
 Comment #1: Limit relative to the maximum power with -30 dBc

Spurious

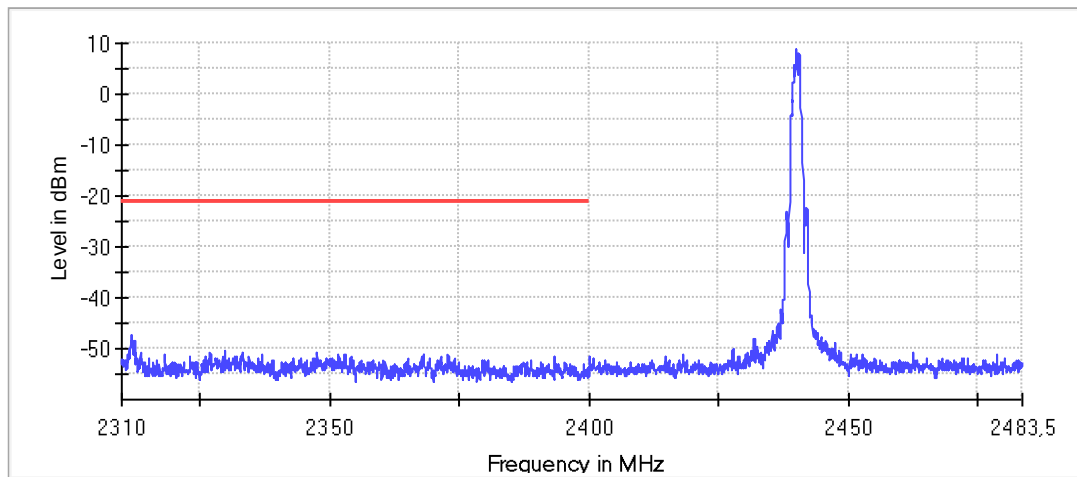


Final Result

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	RBW (kHz)
2311.965622	-64.1	-23.8	40.4	100.000
2568.052230	-59.7	-23.8	35.9	100.000
4878.971290	-47.1	-23.8	23.4	100.000
7321.162397	-62.9	-23.8	39.2	100.000
15369.187216	-84.0	-23.8	60.2	100.000

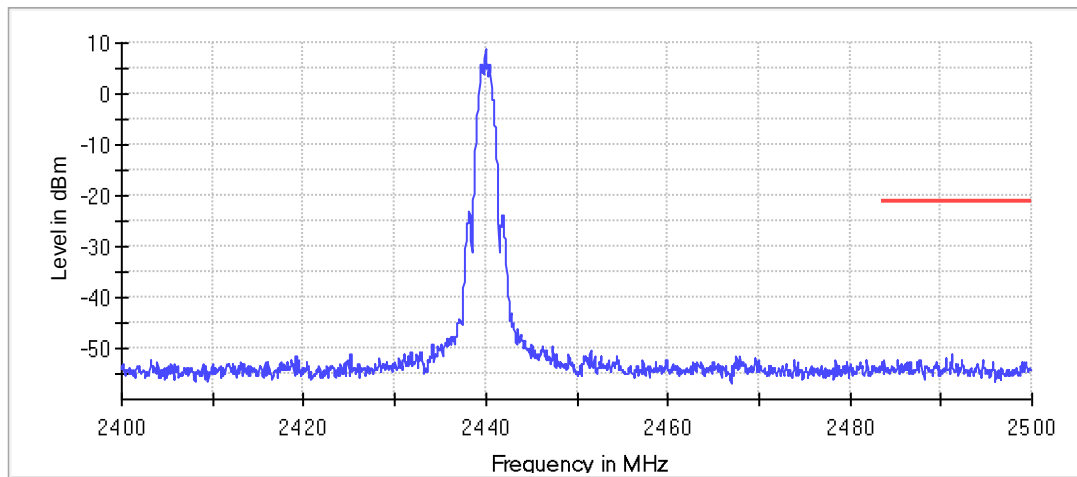


Band Edge



— Limit — Sum Level × Fail

Band Edge



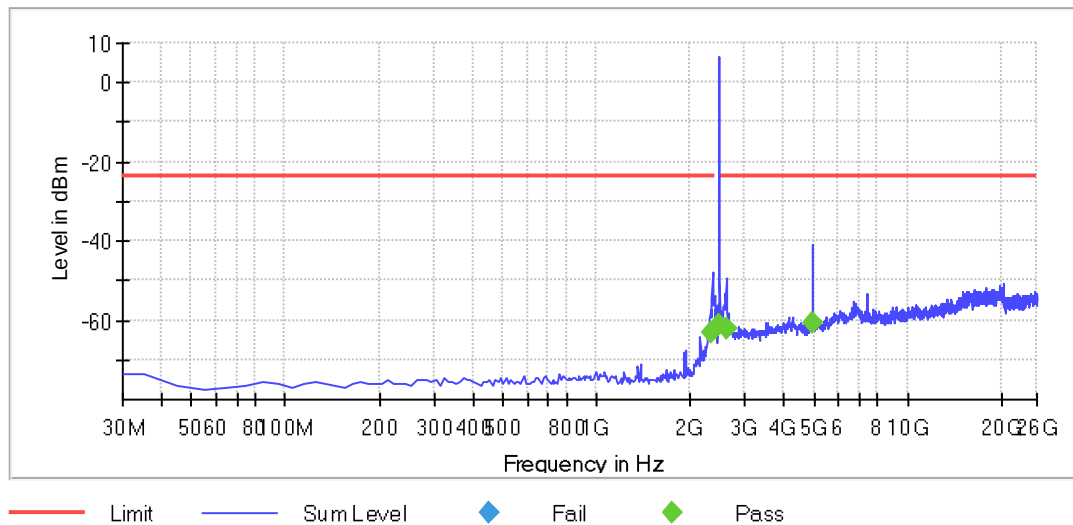
— Limit — Sum Level × Fail

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	RBW (kHz)
2311.775000	-47.5	25.5	-22.0	100.000
2311.825000	-47.6	25.7	-22.0	100.000
2311.725000	-48.3	26.3	-22.0	100.000
2312.425000	-48.4	26.4	-22.0	100.000
2312.475000	-48.4	26.5	-22.0	100.000

EUT Information

EUT Name: Exo 18
 Test_ID: / SN: 23-0121PR02-016
 Customer: exo IQ GmbH
 Operational condition: Continuous transmission on CH39, motor pump active
 Test specification: 47 CFR Part 15 Subpart C §15.247 (d)
 RSS-247, Issue 3 (2023-08) Section 5.5 unwanted emissions
 Operator: S. Vogelmann
 File #: 23-0121RC03-016-005
 Comment #1: Limit relative to the maximum power with -30 dBc

Spurious

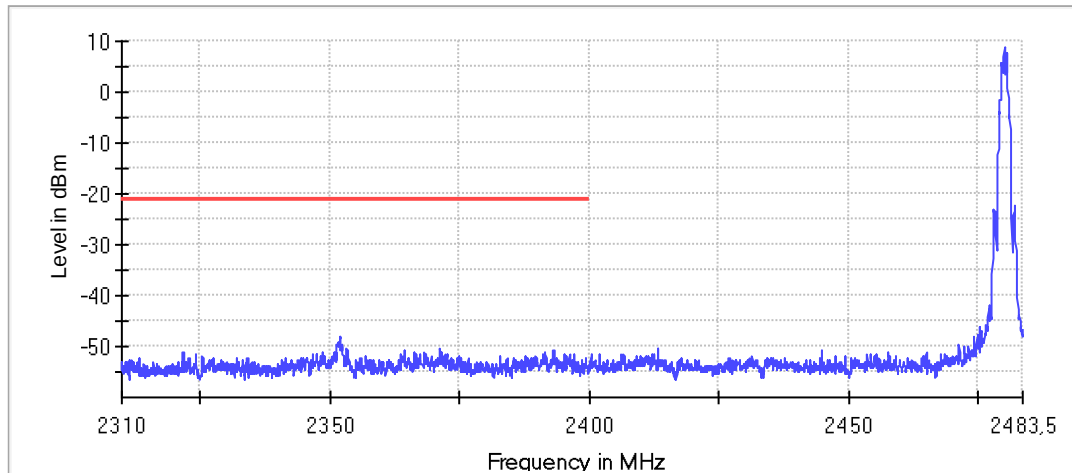


Final Result

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	RBW (kHz)
2352.096807	-63.2	-23.6	39.6	100.000
2483.659226	-61.2	-23.6	37.5	100.000
2608.079156	-62.0	-23.6	38.4	100.000
4960.970278	-60.5	-23.6	36.9	100.000
20223.375667	-81.6	-23.6	58.0	100.000

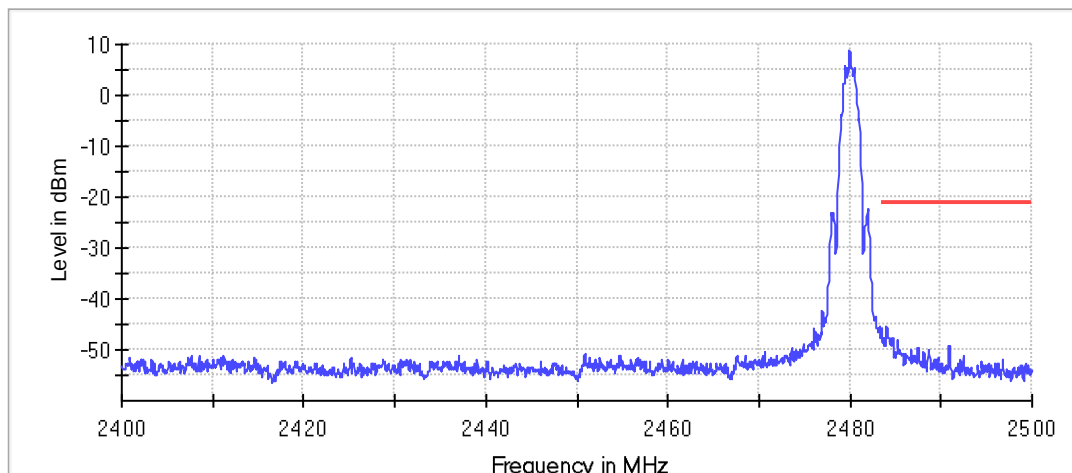


Band Edge



— Limit — Sum Level × Fail

Band Edge



— Limit — Sum Level × Fail

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	RBW (kHz)
2484.025000	-45.4	23.2	-22.2	100.000
2483.975000	-45.5	23.4	-22.2	100.000
2484.075000	-45.7	23.6	-22.2	100.000
2483.525000	-45.8	23.6	-22.2	100.000
2484.125000	-46.4	24.3	-22.2	100.000

6.6 Power Spectral Density

- ☒ No deviation from the standard*
 - ☐ Deviation from the standard
 - ☐ Test not requested
 - ☐ Test not carried out
- * Valid only for EUT 23-0121PR05-016

Measurement procedure:

Rules and specification

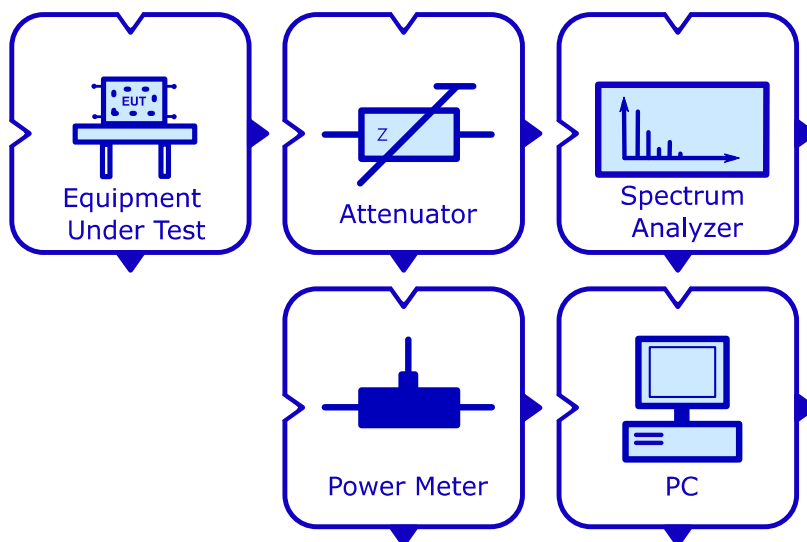
47 CFR Part 15 Section 15.247 (e) and
RSS-247, Issue 3 (2023-08) Section 5.2 (b)

Guide

- ☒ ANSI C63.10-2013 Section 11.10.2 – Method PKPSD
- ☐ ANSI C63.10-2013 Section 11.10.3 – Method AVGPSD-1
- ☐ ANSI C63.10-2013 Section 11.10.4 – Method AVGPSD-1A
- ☐ ANSI C63.10-2013 Section 11.10.5 - Method AVGPSD-2
- ☐ ANSI C63.10-2013 Section 11.10.6 – Method AVGPSD-2A
- ☐ ANSI C63.10-2013 Section 11.10.7 – Method AVGPSD-3
- ☐ ANSI C63.10-2013 Section 11.10.8 – Method AVGPSD-3-A

Basic structure - Setup

Conducted RF Measurement





6.6.1 Test set up

According ANSI C63.10-2013

Photo(s) showing the interconnection of the major function units



Test location

Final test					
☒	Inv.-No.	Designation	Type (L x W x H)	Manufacturer	Location
☒	234	Regulatory Test System for Wireless Devices	TS8997	Rohde & Schwarz	EMCE GmbH Untere Wiesen 1 88483 Burgrieden

Used test equipment

Final test					
☒	Inv.-No.	Designation	Type	Manufacturer	S/N
☒	230	Signal Analyzer 40 GHz	FSV40	Rohde & Schwarz	101717
☐	231	Vector Signal Generator	SMBV100A	Rohde & Schwarz	262891
☒	233	OSP-B157W 8 PORT	OSP-B157W8	Rohde & Schwarz	100925
☒	1212	Software	WMS32	Rohde & Schwarz	n/a

All used test equipment are checked resp. calibrated periodically.

☒ Test equipment was checked and complied to the requirements

Test / Measurement uncertainty

For the test method the measurement uncertainty is equal to or lower than the listed values and correspond to an expansion factor $k = 2$

Occupied Channel Bandwidth	$\pm 5 \%$
RF output power, conducted	$\pm 1.5 \text{ dB}$
Power Spectral Density, conducted	$\pm 3 \text{ dB}$
Unwanted Emissions, conducted	$\pm 3 \text{ dB}$
All emissions, radiated	$\pm 6 \text{ dB}$
Temperature	$\pm 3 \text{ degree}$
Humidity	$\pm 5 \%$
Supply voltages	$\pm 3 \%$
Time	$\pm 5 \%$

6.6.2 Test

Test frequencies

- ☐ Nominal Channel Bandwidth 20 MHz
- | | |
|-----------------|---------------|
| Lowest channel | ___ / ___ MHz |
| Middle channel | ___ / ___ MHz |
| Highest channel | ___ / ___ MHz |
- ☐ Nominal Channel Bandwidth 40 MHz
- | | |
|-----------------|---------------|
| Lowest channel | ___ / ___ MHz |
| Middle channel | ___ / ___ MHz |
| Highest channel | ___ / ___ MHz |
- ☒ Nominal Channel Bandwidth 2 MHz
- | | |
|-----------------|---------------|
| Lowest channel | 37 / 2402 MHz |
| Middle channel | 17 / 2440 MHz |
| Highest channel | 39 / 2480 MHz |

Test Requirements

- ☒ Power spectral density (PSD) ≤ 8 dBm

Operation mode

- | | | |
|------------------|--|--|
| EUT arrangement: | ☒ Tabletop | ☐ Floor standing |
| Power supply: | ☐ 120 V/60 Hz | ☒ Internal battery |

Continuous operation in transmitter mode with a maximum power level and duty cycle of 57.72 %. The pump motor was active.

Environmental conditions

- | | |
|--------------------------------|-------|
| Temperature [10 – 40 °C]: | 24 °C |
| Relative humidity [10 – 90 %]: | 30 % |

- Environmental conditions during the test:
- ☒ kept
☐ not kept



Test result

Channel	RBW / kHz	PSD / dBm	Limit / dBm	Margin / dB
37	10.000	-6.582	8.000	14.582
17	10.000	-6.330	8.000	14.33
39	10.000	-6.459	8.000	14.459

Limits for Peak Power Spectral Density:

- ☒ kept
- ☐ not kept
- ☐ not relevant

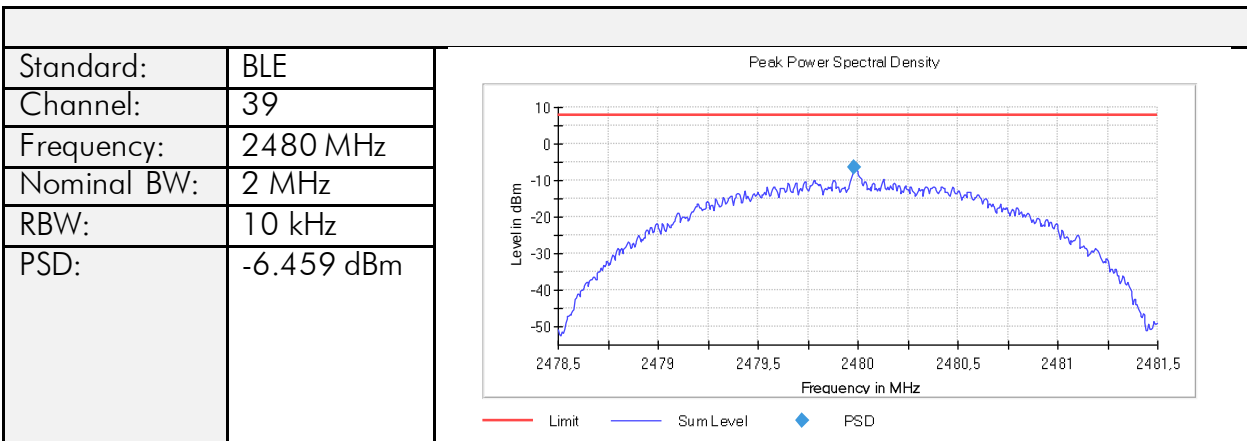
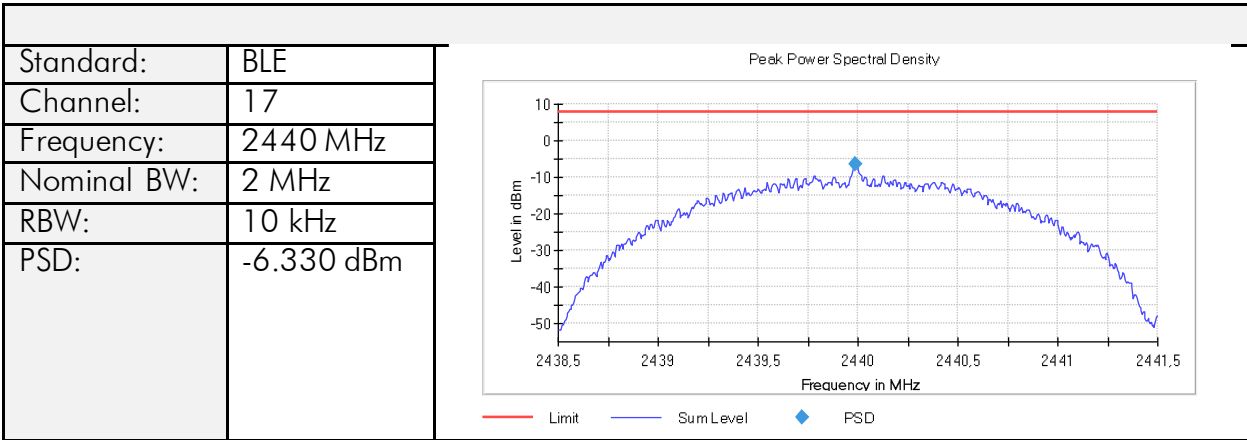
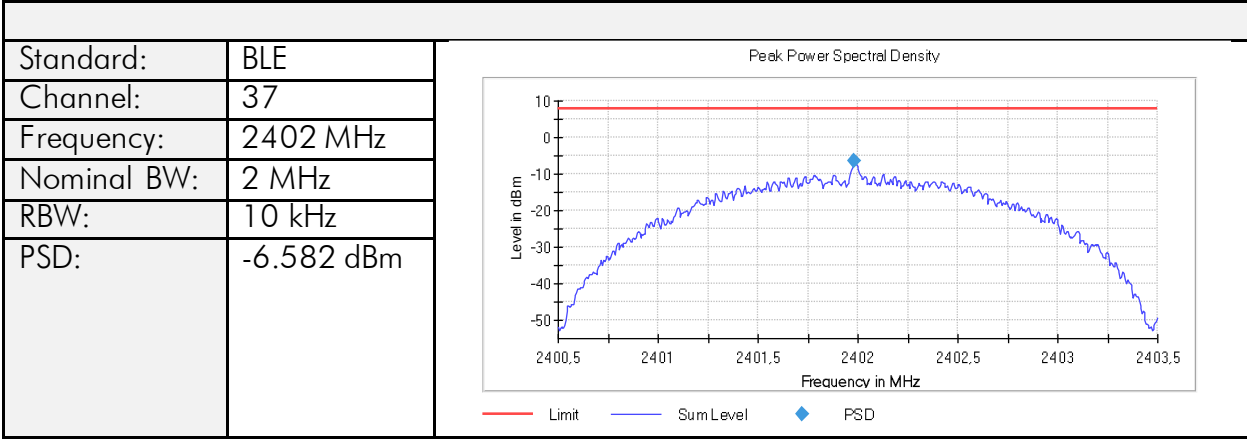
Limits for Average Power Spectral Density:

- ☐ kept
- ☐ not kept
- ☒ not relevant

Remarks: n/a

Records

- ☒ Diagrams
- ☒ Readings



7 Summary

47 CFR Part 15 Subpart C
 RSS-247, Issue 3 (2023-08)
 RSS-Gen, Issue 5 (2018-04)
 KDB 558074 D01 15.247 Meas Guidance v05r02

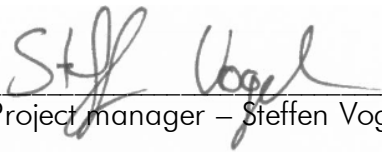
Requirement	Regulation section		Result	Remark
	47 CFR Part 15 Subpart C	RSS-247 / RSS-Gen		
Antenna requirements	§ 15.203	RSS-Gen 6.8	Pass	n/a
Terminal voltage on powerline	§ 15.207 (a)	RSS-Gen 8.8	n. r.	n/a
Radiated emissions H-Field of intentional radiators	§ 15.209 (a) (b) (c) (d) (e) (f)	RSS-Gen 8.9	n. r.	n/a
Radiated emissions E-Field of intentional radiators	§ 15.209 (a) (b) (c) (d) (e) (f)	RSS-Gen 8.9	Pass	n/a
Emissions in restricted frequency bands	§ 15.205 (a) (b) (c)	RSS-Gen 8.10	Pass	n/a
Occupied Bandwidth	§ 15.215 (c)	n/a	Pass	n/a
DTS Bandwidth	§ 15.247 (a) (2)	RSS-247 5.2 (a)	Pass	n/a
Output Power	§ 15.247 (b) (3) (4)	RSS-247 5.4 (d)	Pass	n/a
Emissions in non-restricted frequency bands	§ 15.247 (d)	RSS-247 5.5	Pass	n/a
Power Spectral Density	§ 15.247 (e)	RSS-247 5.2 (b)	Pass	n/a

n. r. – not relevant



Burgrieden, 08/26/2024

Responsible inspector:


Project manager – Steffen Vogelmann

- End of Test Report -