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EMC TEST REPORT

No. 2310415STO-101

Electromagnetic disturbances

EQUIPMENT UNDER TEST

Equipment:

AIR Antenna Integrated Radio AAS

Type/Model:

AIR 6472 B77G B77M

Product number:

KRD 901 259/2

Product configuration:

NR

Manufacturer:

Ericsson AB

Tested by request of:

Ericsson AB

SUMMARY

Referring to the emission limits, and the operating mode during the tests specified in this report, the equipment complies with the radiated spurious emission requirements according to the following standards:

47 CFR Part 2 Subpart J 47 CFR Part 27 Subpart C

For details, see clause 2 - 4.

Date of issue: Maj 22, 2024

Issued by:

Approved by:

Per Larsson

Tşégereda Gebrehiwet

Per Larsson

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^{*}See opinions and interpretations clause 2.6





Revision History

Test report number	Date	Description	Changes
2310415STO-101	Maj 22, 2024	First release	



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1. CLIENT INFORMATION

The EUT has been tested by request of

Company: Ericsson AB

164 80 Stockholm

Sweden

Name of contact: Lennart Blixt

BNEW DNEW RA RPSE1 IVC EMC

Phone +46 70 673 1973

Client observer: Per Sjöberg & Tomas Johansson

2. EQUIPMENT UNDER TEST (EUT)

2.1 Identification of the EUT

Equipment AIR Antenna Integrated Radio AAS

Type/Model AIR 6472 B77G B77M

Product number KRD 901 259/2

Product configuration NR

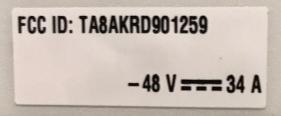
Brand name Ericsson
Manufacturer Ericsson

Rating -48VDC max: 34A

Class

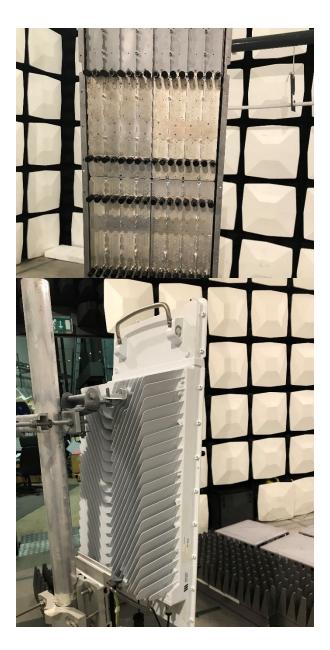
Highest clock frequency CPRI 25,78 GHz





Photos of marking and EUT





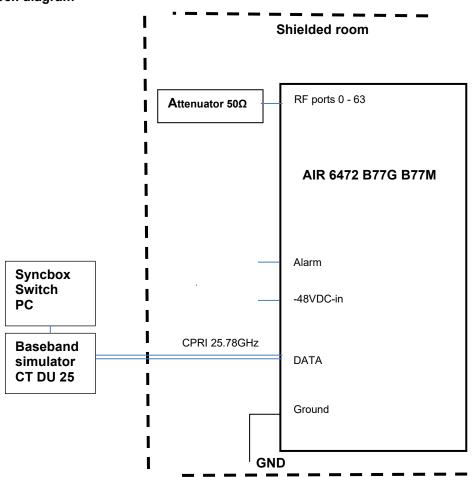
Photos of EUT

2.2 Description of the EUT

The test object AIR 6472 B77G B77M is antenna integrated radio AAS with NR support. It is designed to provide mobile users with a connection to a mobile network.



2.3 Test setup- block diagram



Block diagram of EUT during the tests

2.4 External cables connected to the EUT

Port	Туре	Length [m]	Specifications
DC input power	RPM 150 54/10M R1A	10,0	DC power Two-wire
Earth	Ground	2,0	Single wire, 35mm ²
External Alarm	RPM 513 2350/15000 R1A	10,0	Shielded signal cable
Data_1 & 2	RPM2531610/20M	20,0	Optical fibre cable
Antenna port	RF cable		



2.5 Auxiliary equipment (AE)

Auxiliary equipment is equipment needed for correct operation of the EUT, but not included as part of the testing and evaluation of the EUT.

Equipment	Type / Model	Manufacturer	Serial no.
Computer	MacBook Pro	Apple	BAMS-1001997578
			ASSET: 4137535
PSU	LP2 x 700W		BAMS-1056778582
Baseband simulator	LPC 102 500/1	Ericsson	T01G522083
CT-DU25			
SFP module	RDH 102 75/2 R1A	Ericsson	CT72247996
SFP module	RDH 102 75/2 R1A	Ericsson	CT72194126
Sync Box	LPC 107 043/1 R2B	Ericsson	BAMS-1002156826
			ASSET: 4157127
Power supply (for EUT)	SGA 60/250	Sorensen	BAMS-1000234866

2.6 Opinions and interpretations

The following types are also included as additional types in this test report:

The differences between the models are (according to the manufacturer):

Type/Model	Product numbers	Comment
	KRD 901 259/1	Radio including AFU (Antenna Filter Unit), with un- security software
AIR 6472 B77G B77M	KRD 901 259/2*	Radio including VFU (Verification Filter Unit, excluding antenna) with un- security software
	KRD 901 259/11	Radio including AFU (Antenna Filter Unit) with security software
	KRD 901 259/21	Radio including VFU (Verification Filter Unit, excluding antenna) with security software

^{*}Tested unit. The tests were performed on KRD 901 259/2 (AIR 6472 B77G B77M with un- security software for testing purposes).

The hardware and software (except for the security software) are identical for all types above. The difference is considered not to imply different FCC part 2 Radio characteristics when compared to the tested type.

2.7 Decision rule

The statements of conformity are reported as:

Passed – When the measured values are within the specified limits.

Failed – When one or more measures values are outside the specified limits.



3. TEST SPECIFICATIONS

3.1 Standards

Requirements:

FCC 47 CFR Part 2 Subpart J FCC 47 CFR Part 27 Subpart C (2019) + amendment published on April 23, 2020

Test methods:

KDB971168 D01 Power Meas License Digital Systems v03r01
ANSI C63.26: 2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

3.2 Additions, deviations and exclusions from standards and accreditation

The following deviation from standards and accreditation was made: only the radiated spurious emission performed according to manufacturer's request.

No other additions, deviations or exclusions have been made from standards and accreditation.

3.3 Test site

Measurements were performed at:

Intertek Semko AB. Torshamnsgatan 43, P.O. Box 1103 SE-164 22 Kista

Intertek Semko AB is a FCC listed test site with site registration number 90913
Intertek Semko AB is a FCC accredited conformity assessment body with designation number SE0002
Intertek Semko AB is an Industry Canada listed test facility with IC assigned code 2042G
Intertek Semko AB is an Innovation, Science and Economic Development Canada recognized wireless device testing laboratory with CAB identifier SE0003

Measurement chambers

Measurement Chamber	Type of chamber	IC Site filing #
5 m CHAMBER	Semi-anechoic 5 m	2042G-3



3.4 Mode of operation during the test

The EUT was tested with -48 V DC, up to 34 A. Max total output power is 400W for both bands.

	Both bands	B77G	B77M
Maximum Total Power	400W	320W	400W

Radio Configuration

The AIR 6472 B77M & B77G were configured to operate with NR technology.

Transmission bands:

B77G: UL/DL 3450 - 3550 MHz B77M: UL/DL 3840 - 3980 MHz

The EUT was tested with eleven different radio transmitting configurations. See table on next page for detailed radio configurations of the EUT.

NR

The test object was transmitting test model FR1-TM1.1 as defined in ETSI TS 138 141/3GPP TS 38.141-1.



Radio configuration for radiated emission

Configuration		No of Carriers	Carrier Frequeny MHz	BW MHz	RF power (W)/ Carrier	Total Power (W) (G+M)
MC-1(2 Carriers)*						
C1	NR MIMO 1C 60M Band 77M	1	3870	60	240	280
Ci	NR MIMO 1C 10M Band 77G	1	3455	10	40	200
C2	NR MIMO 1C 60M Band 77M	1	3910	60	240	280
02	NR MIMO 1C 10M Band 77G	1	3500	10	40	200
C3	NR MIMO 1C 60M Band 77M	1	3950	60	240	280
- 03	NR MIMO 1C 10M Band 77G	1	3545	10	40	200
	NR MIMO 1C 20M Band 77M	1	3910	20	80	400
C4	NR MIMO 1C 100M Band 77G	Band 77M	400			
		MC-1(3 Cari	riers)*			
	NR MIMO 1C 60M Band 77M	1	3910		240	
C5	NR MIMO 1C 10M Band 77G	•				320
	NR MIMO 1C 10M Band 77G	·	l .	10	40	
			1		T	
C6	NR MIMO 1C 20M Band 77M	1	3850	20	80	NA
C7	NR MIMO 1C 20M Band 77M	1	3910	20	80	NA
C8	NR MIMO 1C 20M Band 77M	1	3970	20	80	NA
C9	NR MIMO 1C 100M Band 77M	1	3890	100	400	NA
C10	NR MIMO 1C 100M Band 77M	1	3910	100	400	NA
C11	NR MIMO 1C 100M Band 77M	1	3930	100	400	NA

^{*}Max Operational BW/per multiband 200 MHz

3.5 Compliance

The EUT shall comply with the emission limits as listed below

Spurious emission at antenna terminals

CFR47 §2.1051, §27.53(I)(1), §22.917

The conducted power of any emission outside the licensee's authorized bandwidth shall not exceed –13 dBm/MHz.

Granted Petition's for Waiver of Rules Sections 27.53(n) and 2.947(f) according to FCC DA23-142.

^{**}Max Operational BW/per multiband 140 MHz Modulation QPSK



4. TEST SUMMARY

The results in this report apply only to sample tested:

Standard Description		Result
	Emission	
ANSI C63.26	Field strength of spurious radiation	PASS
	The EUT complies with the limits.	
	The margin to the limit was more than 20 dB to the limit at 30– 1000 MHz.	
	The margin to the limit was more than 20 dB to the limit at 1–40 GHz.	
	See clause 5.3-5.7.	



5. RADIATED RF EMISSION IN THE FREQUENCY-RANGE 30 MHZ- 40 GHZ

Date of test	Temperature [°C]	Relative Humidity [%]	Tested by
April 24, 2024	20	19	Thomas Petersson & Tsegereda Gebrehiwet
April 25, 2024	20	27	Thomas Petersson & Tsegereda Gebrehiwet
April 26, 2024	20	27	Thomas Petersson & Tsegereda Gebrehiwet
April 29, 2024	20	36	Thomas Petersson & Tsegereda Gebrehiwet
April 30, 2024	21	35	Thomas Petersson
Maj 2, 2024	21	29	Thomas Petersson
Maj 3, 2024	22	28	Thomas Petersson

5.1 Test set-up and test procedure

The test method is in accordance with ANSI C63.26.

The EUT was set up in order to emit maximum disturbances.

30 – 1000 MHz: The EUT was placed on a pole 0.8 m above the turntable which is part of the reference ground plane (RGP). The pole was insulated from RGP with 15 cm thick support. > 1000 MHz: The EUT was placed on a pole 1.5 m above the turntable which is part of the reference ground plane (RGP). The pole was insulated from RGP with 15 cm thick support. Absorbers were placed on the floor between the EUT and measurement antenna.

Overview sweeps were performed with the measurement receiver in max-hold mode and the peak and average detectors activated in the frequency-range

The EUT is continuously rotated 360°

Test set-up: 30 MHz - 40 GHz

Test receiver set-up:

Preview test: Peak RBW 1 MHz, VBW 3 MHz

Average RBW 1 MHz, VBW 3 MHz

Final test: RMS RBW 1 MHz, VBW 3 MHz

Measuring distance: 3 m Measuring angle: 0 – 359°

EUT height above ground plane: 0.8 m 1.5 m

Antenna 30 – 1000 MHz 1 – 40 GHz

Type: Bilog Horn

Antenna tilt: Not Activated Activated

Height above ground plane: 1 – 4 m

Polarisation: Vertical and Horizontal

 $E[dB\mu V/m]$ = Analyser reading [dB μV] + Antenna factor [1/m] - Amplifier gain [dB] + Cable loss [dB]

 $EIRP [dBm] = E[dB\mu V/m] + 20log[3] - 104.8$



5.2 Measurement uncertainty

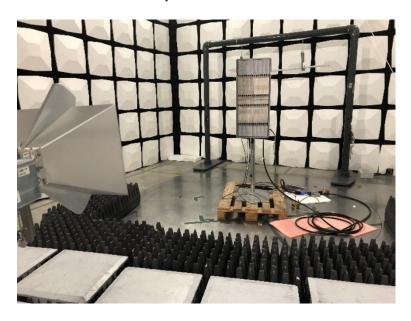
Measurement uncertainty for radiated disturbance

Uncertainty for the frequency range 30 to 1000 MHz at 3 m	± 5.1 dB
Uncertainty for the frequency range 30 to 1000 MHz at 10 m	± 5.0 dB
Uncertainty for the frequency range 1.0 to 18 GHz at 3 m	± 4.5 dB
Uncertainty for the frequency range 18 to 26 GHz at 3 m	± 4.8 dB
Uncertainty for the frequency range 26 to 40 GHz at 3 m	± 5.7 dB

Measurement uncertainty is calculated in accordance with CISPR 16-4-2: 2011. The measurement uncertainty is given with a confidence of 95 %.



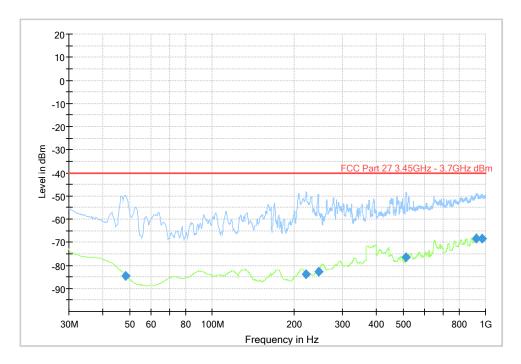
Photos of the test set up 30 - 1000 MHz



Photos of the test set up above 1 GHz



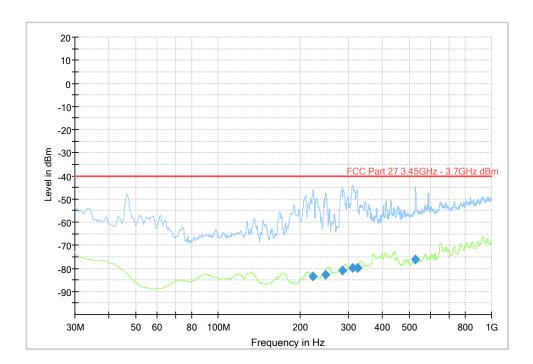
5.3 Test results, 30 – 1000 MHz



Diagram, Peak and average overview sweep, 30 - 1000 MHz, at 3 m distance, configuration C1.

Measurement results, RMS

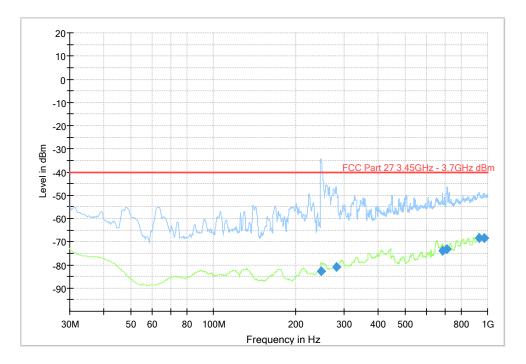
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 30 - 1000 MHz at 3 m distance, configuration C2.

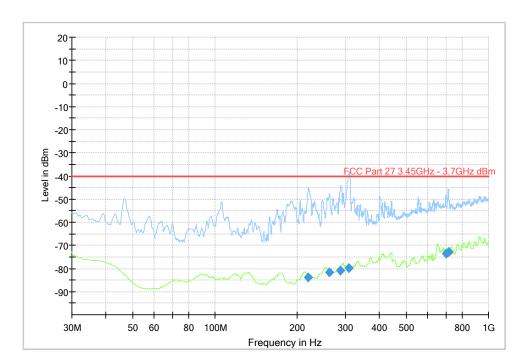
Measurement results, RMS





Diagram, Peak and average overview sweep, 30 – 1000 MHz at 3 m distance, configuration C3.

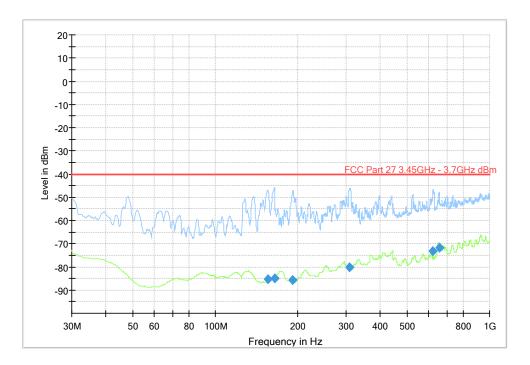
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 30 - 1000 MHz at 3 m distance, configuration C4.

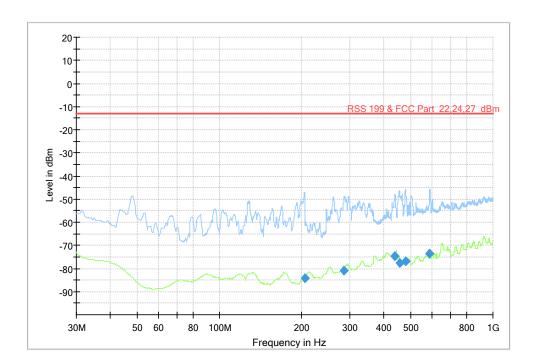
Measurement results, RMS





Diagram, Peak and average overview sweep, 30 – 1000 MHz at 3 m distance, configuration C5.

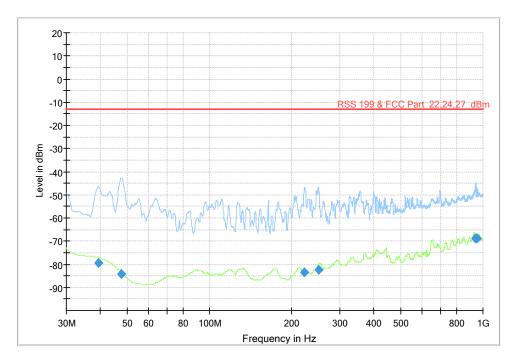
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 30 - 1000 MHz at 3 m distance, configuration C6.

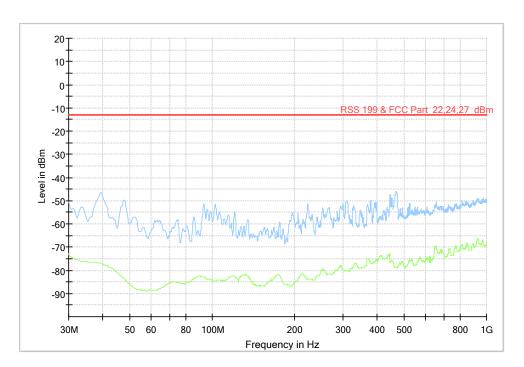
Measurement results, RMS





Diagram, Peak and average overview sweep, 30 – 1000 MHz at 3 m distance, configuration C7.

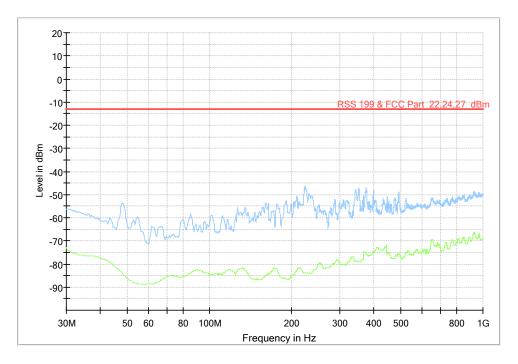
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 30 - 1000 MHz at 3 m distance, configuration C8.

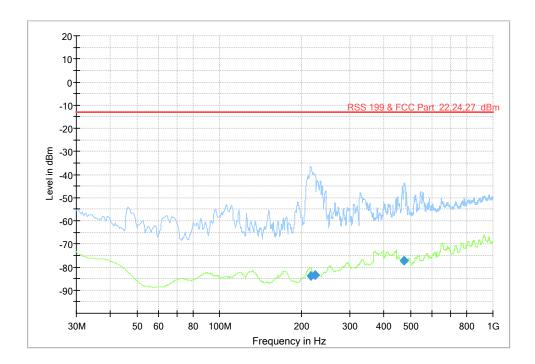
Measurement results, RMS





Diagram, Peak and average overview sweep, 30 – 1000 MHz at 3 m distance, configuration C9.

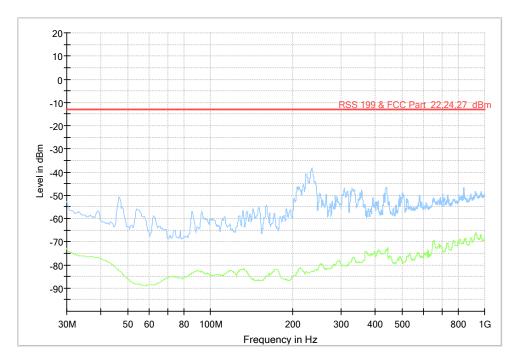
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 30 - 1000 MHz at 3 m distance, configuration C10.

Measurement results, RMS

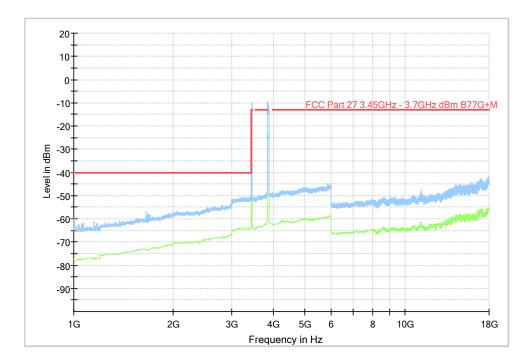




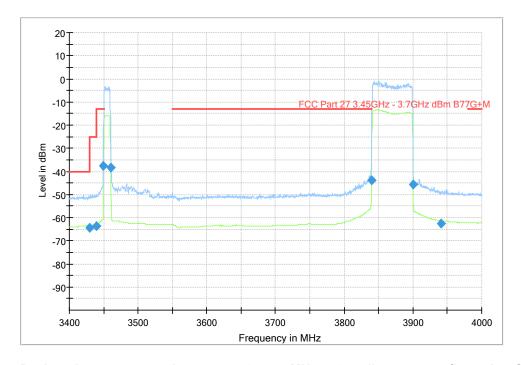
Diagram, Peak and average overview sweep, 30 – 1000 MHz at 3 m distance, configuration C11.



5.4 Test results, 1 – 18 GHz

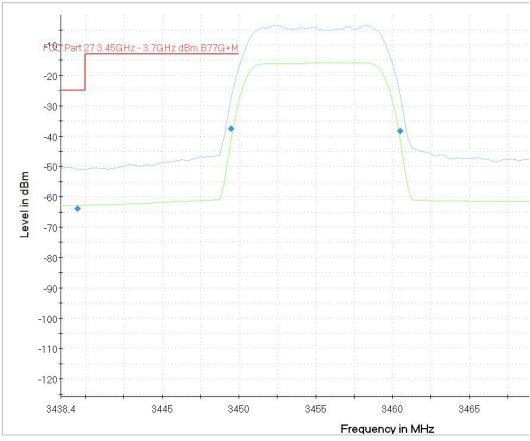


Diagram, Peak and average overview sweep, 1 - 18 GHz at 3 m distance, configuration C1

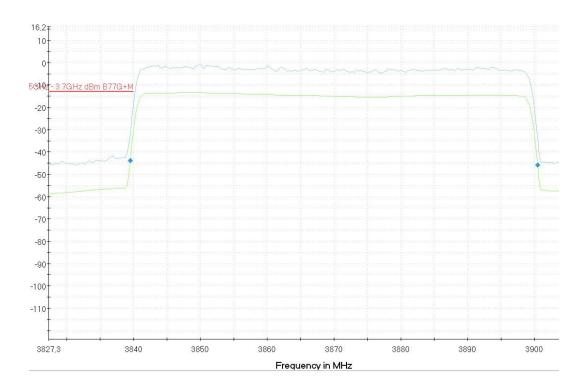


Diagram, Peak and average overview sweep, 3.4 - 4 MHz at 3 m distance, configuration C1





Diagram, Zoom in bottom channel 77G from the measurement graph 3.4 – 4 GHz for configuration C1



Diagram, Zoom in bottom channel for 77M from the measurement graph 3.4 – 4 GHz for configuration C1 $\,$

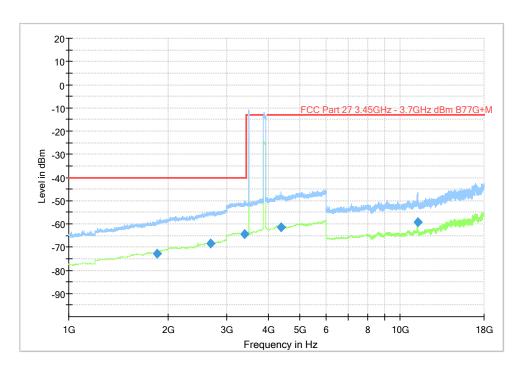


Measurement results, RMS	Meas	uremei	nt results	, RMS
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Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarization H/V	Result	Comment
3429.50	-64.41	-40.00	24.41	Н	Pass	
3439.50	-63.81	-25.00	38.81	Н	Pass	
3449.50	-37.45	-13.00	24.45	Н	Pass	
3460.50*	-38.34					
3839.50	-43.93	-13.00	30.93	Н	Pass	
3900.50*	-45.76					
3940.50*	-62.72					

All measured disturbances have a margin of more than 20 dB to the limit.

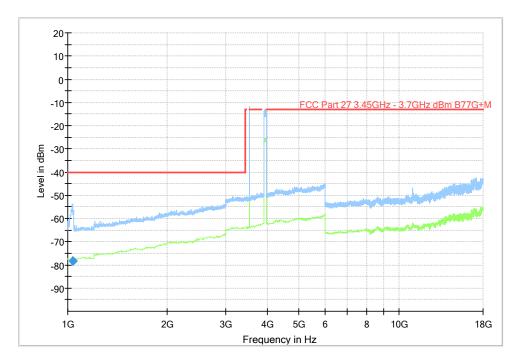
^{*}Should be ignored, the frequency belongs to the operating band.



Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance, configuration C2.

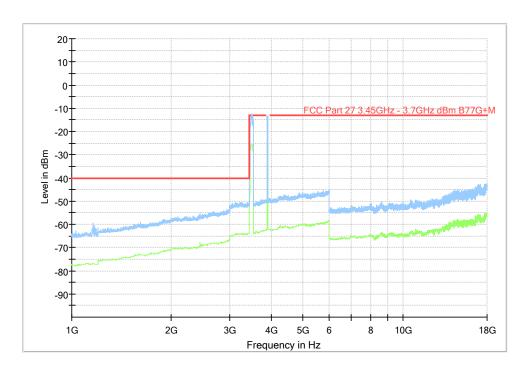
Measurement results, RMS





Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance, configuration C3.

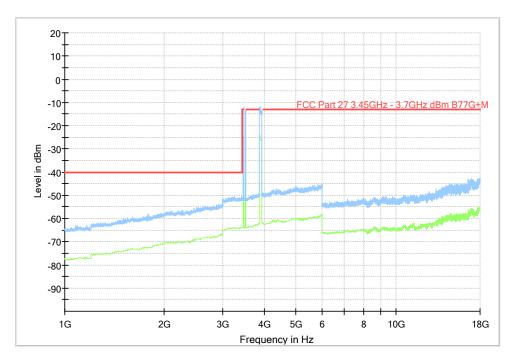
All measured disturbances have a margin of more than 20 dB to the limit.



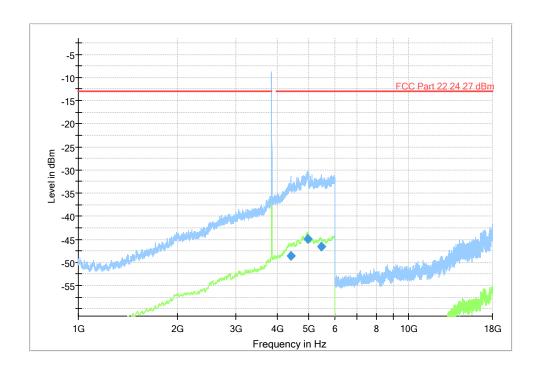
Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance, configuration C4.

Measurement results, RMS



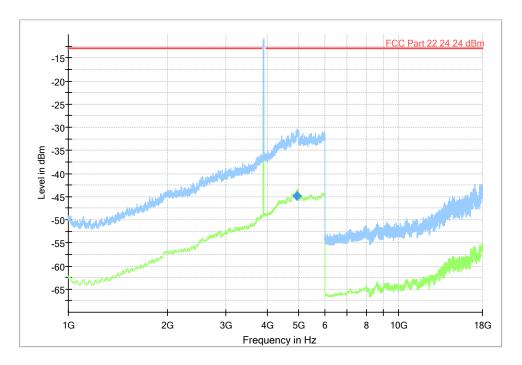


Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance, configuration C5.



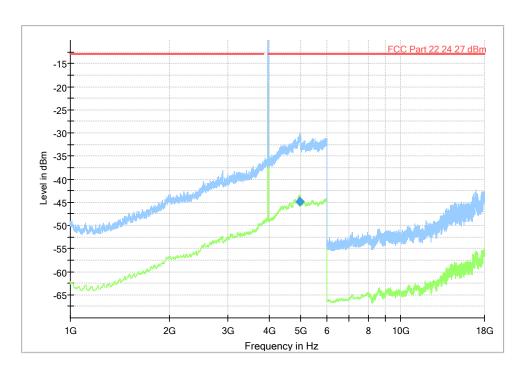
Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance, configuration C6.





Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance, configuration C7.

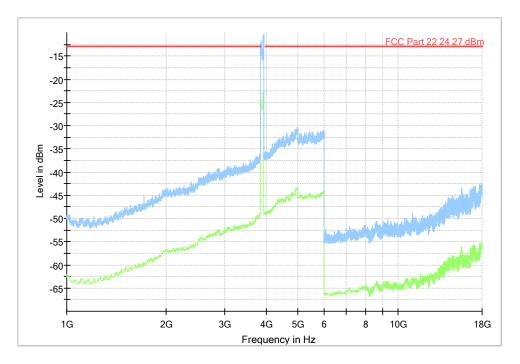
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance, configuration C8.

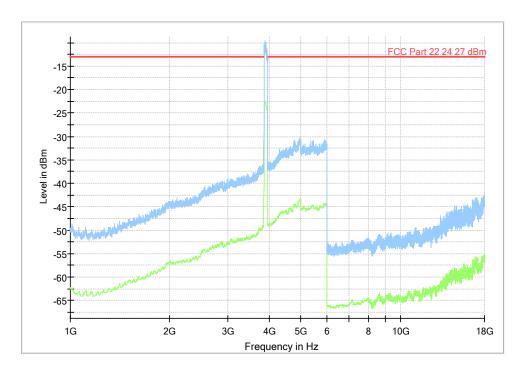
Measurement results, RMS





Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance, configuration C9.

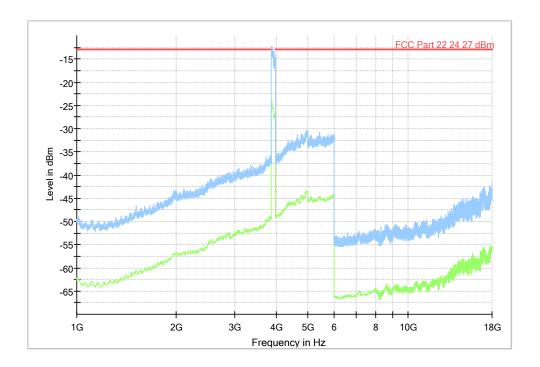
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance, configuration C10.

Measurement results, RMS

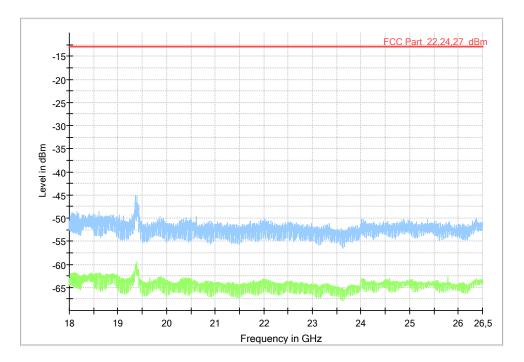




Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance, configuration C11.



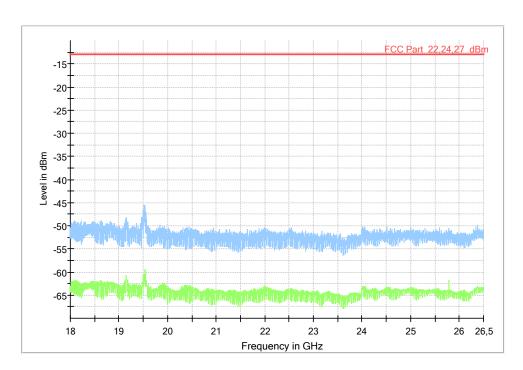
5.5 Test results, 18 - 26,5 GHz



Diagram, Peak and average overview sweep, 18 - 26,5 GHz at 3 m distance, configuration C1.

Measurement results, RMS

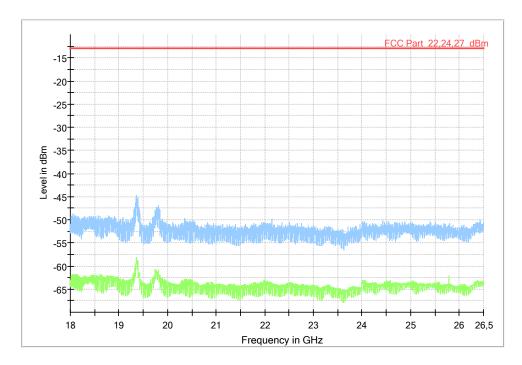
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 18 - 26,5 GHz at 3 m distance, configuration C2.

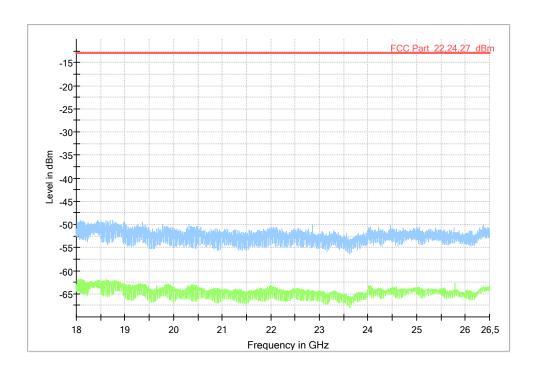
Measurement results, RMS





Diagram, Peak and average overview sweep, 18 – 26,5 GHz at 3 m distance, configuration C3.

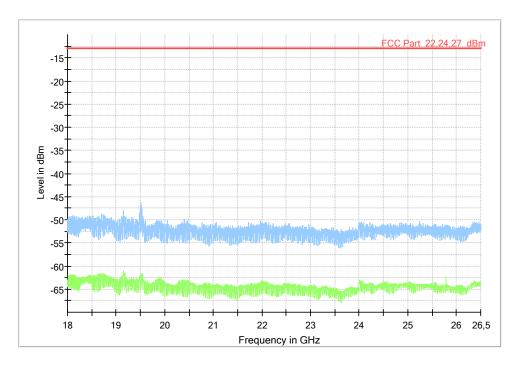
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 18 – 26,5 GHz at 3 m distance, configuration C4.

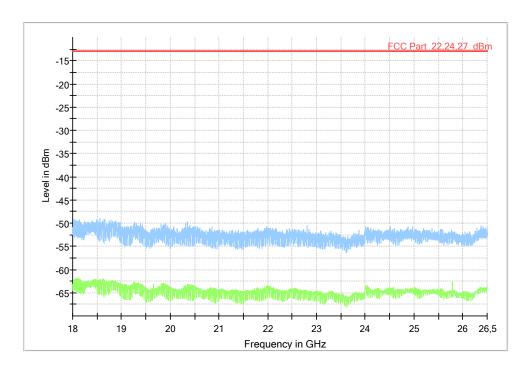
Measurement results, RMS





Diagram, Peak and average overview sweep, 18 – 26,5 GHz at 3 m distance, configuration C5.

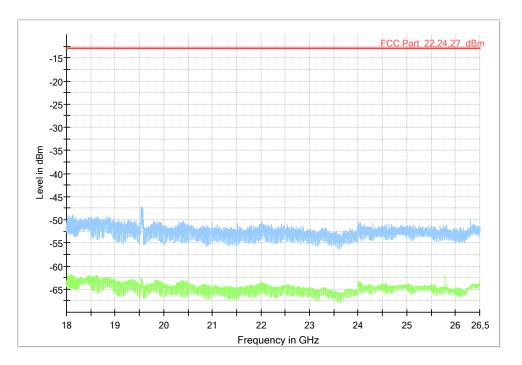
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 18 – 26,5 GHz at 3 m distance, configuration C6.

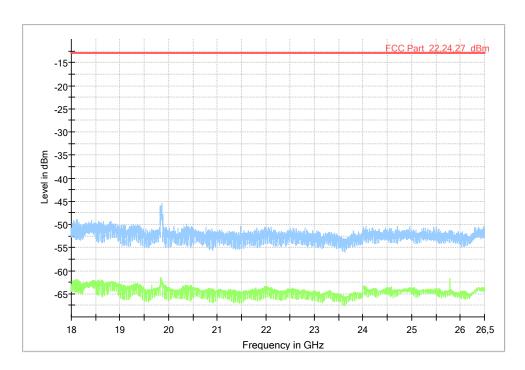
Measurement results, RMS





Diagram, Peak and average overview sweep, 18 – 26,5 GHz at 3 m distance, configuration C7.

All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 18 – 26,5 GHz at 3 m distance, configuration C8.

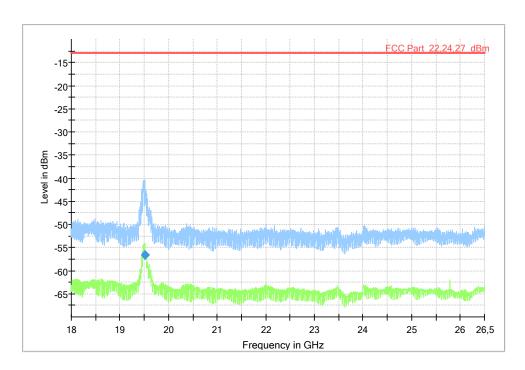
Measurement results, RMS





Diagram, Peak and average overview sweep, 18 – 26,5 GHz at 3 m distance, configuration C9.

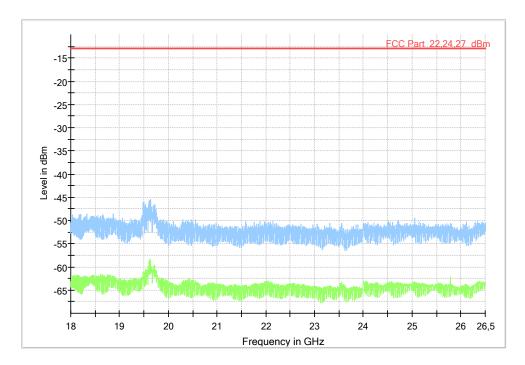
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 18 – 26,5 GHz at 3 m distance, configuration C10.

Measurement results, RMS

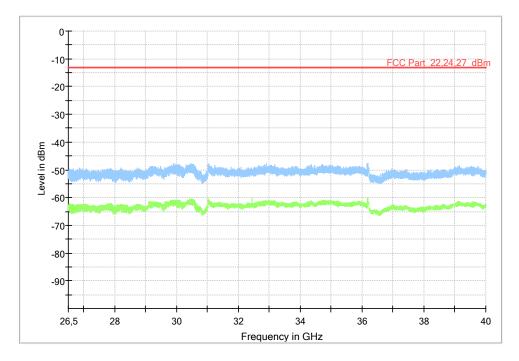




Diagram, Peak and average overview sweep, 18 – 26,5 GHz at 3 m distance, configuration C11.



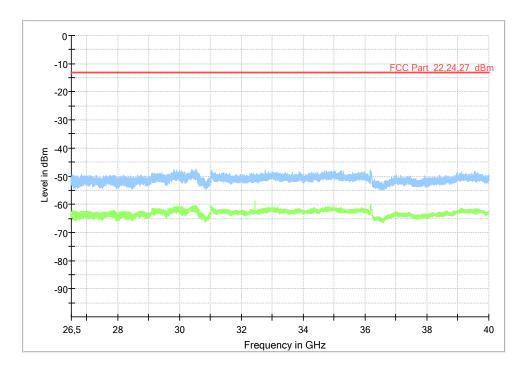
5.6 Test results, 26,5 - 40 GHz



Diagram, Peak and average overview sweep, 26,5 - 40 GHz at 3 m distance, configuration C1.

Measurement results, RMS

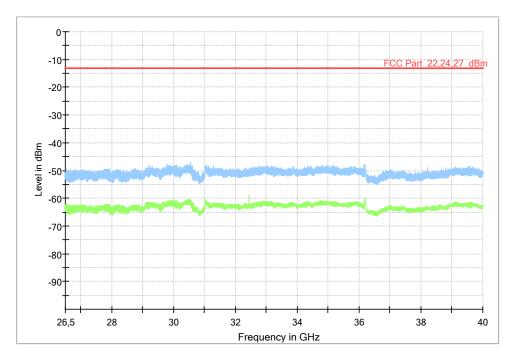
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 26,5 – 40 GHz at 3 m distance, configuration C2.

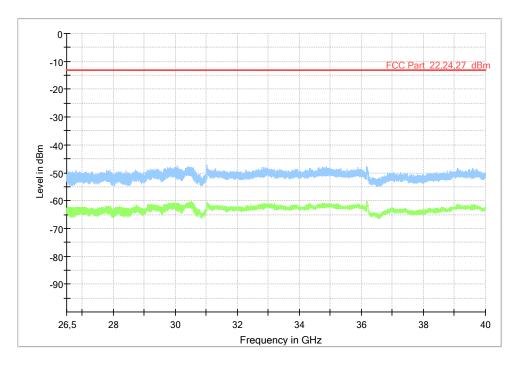
Measurement results, RMS





Diagram, Peak and average overview sweep, 26,5 – 40 GHz at 3 m distance, configuration C3. Measurement results, RMS

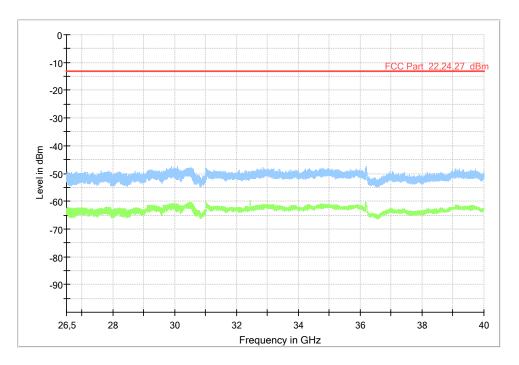
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 26,5 – 40 GHz at 3 m distance, configuration C4.

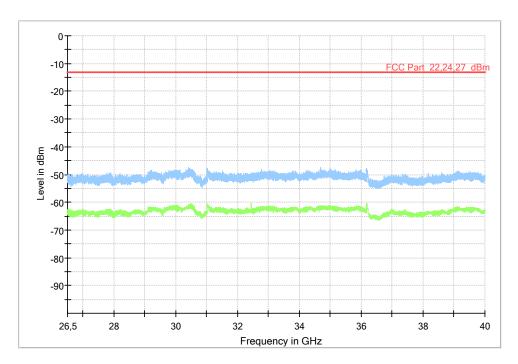
Measurement results, RMS





Diagram, Peak and average overview sweep, 26,5 – 40 GHz at 3 m distance, configuration C5.

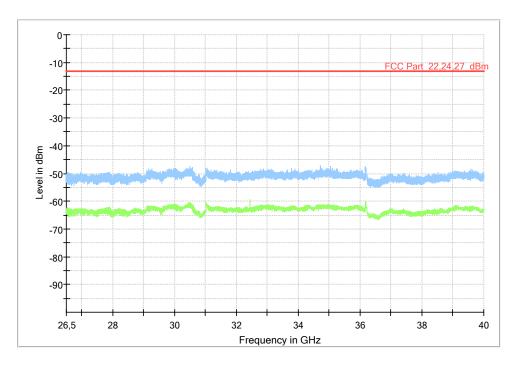
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 26,5 – 40 GHz at 3 m distance, configuration C6.

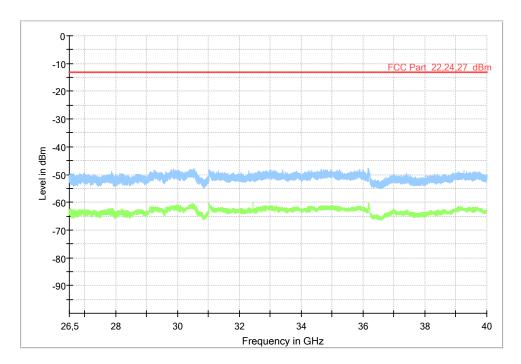
Measurement results, RMS





Diagram, Peak and average overview sweep, 26,5 – 40 GHz at 3 m distance, configuration C7.

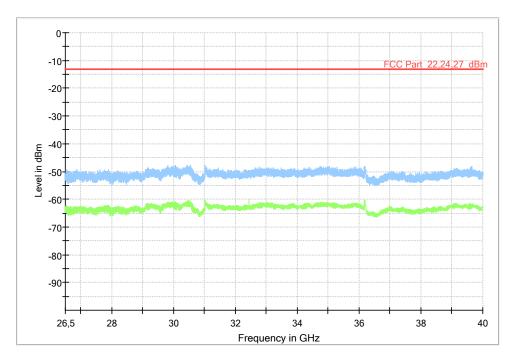
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 26,5 – 40 GHz at 3 m distance, configuration C8.

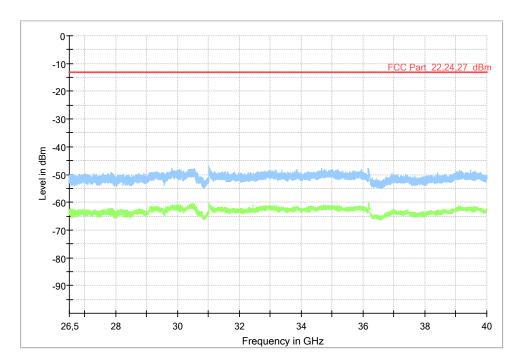
Measurement results, RMS





Diagram, Peak and average overview sweep, 26,5 – 40 GHz at 3 m distance, configuration C9.

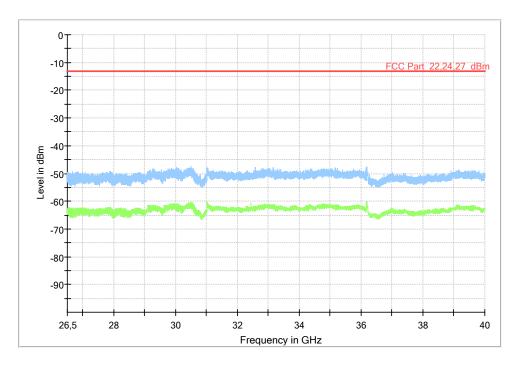
All measured disturbances have a margin of more than 20 dB to the limit.



Diagram, Peak and average overview sweep, 26,5 – 40 GHz at 3 m distance, configuration C10.

Measurement results, RMS





Diagram, Peak and average overview sweep, 26,5 – 40 GHz at 3 m distance, configuration C11.



5.7 Test equipment

Equipment type	Manufacturer	Model	Inv. No.	Last Cal. date	Next Cal. date
Measurement software	Rohde & Schwarz	EMC32 - 11.30.00			
Measurement Receiver	Rohde & Schwarz	ESW44	33950	July 5, 2023	1 year
Open switch and control platform	Rohde & Schwarz	OSP130	32298	December 13, 2023	1 year
Open switch and control platform	Rohde & Schwarz	OSP-F7-B	32299	December 13, 2023	1 year
Coaxial cable	Schuner	SUCOFLEX 104	39003	October 25, 2023	1 year
Antenna	Rohde & Schwarz	HL562	32310	June 13, 2022	3 years
Rotary join	Spinner	BN835027	31807	October 25, 2023	1 year
Coaxial cable	Rosenberger	JFB293C	39141	June 14, 2023	1 year
Coaxial cable	Rosenberger	JFB293C	39142	June 14, 2023	1 year
Horn antenna	Rohde & Schwarz	HF907	32550	July 25, 2022	3 years
Preamplifier Signal path	Rohde & Schwarz	TS-PRE1 EMI	32297	July 11, 2023	1 year
Signal path	Rohde & Schwarz	ЕМІ	39150	December 13 2023	1 year
Horn antenna	Bonn	BLMA 1826- 5A	31247	September 13, 2023	3 years
Horn antenna	Bonn	BLMA 2640- 5A	31248	September 14, 2023	3 years
Coaxial cable (blue)	MEGAPHASE	GC12-K1K1- 315	39128	July 10,2023	1 year



6. EUT SOFTWARE

Software radio: CXP2021151/1_P20B30604

7. EUT HARDWARE LIST

Product	Product No,	R-State	Serial Number
AIR 6472 B77G B77M	KRD 901 259/2	R1C	C82A5951Z5
SFP module Ericsson	RDH 102 75/3	R1A	EA61XL0995
SFP module Ericsson	RDH 102 75/3	R1A	EA61XL0330



8. TEST SET UP AND EUT PHOTOS

Test set up photos are in separate document 2310415STO-102 Annex 1.