EMC TEST REPORT

No. 2104082STO-101

Electromagnetic disturbances

EQUIPMENT UNDER TEST

Equipment:	Radio Unit
Type/Model:	AIR 6449 B77D
Product number:	KRD 901 206/2
Additional product number*:	KRD 901 206/1, KRD 901 206/11, KRD 901 206/21
Product configuration:	NR
Manufacturer:	Ericsson AB
Tested by request of:	Ericsson AB

*See opinions and interpretations clause 2.6

SUMMARY

Referring to the emission limit, 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: May 27, 2021

Issued by: Anna Karin Cedergren

Per Larsson
Per Larsson

Approved by: Matti Virkki

Revision History

Test report number	Date	Description	Changes
2104082STO-101	May 27, 2021	First release	

CONTENTS

1. CLIENT INFORMATION

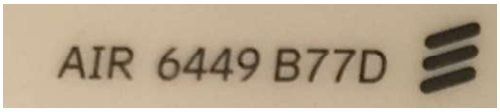
The EUT has been tested by request of

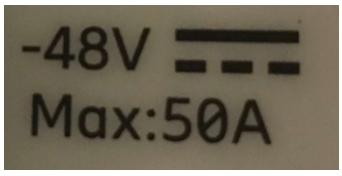
Company:	Ericsson AB 164 80 Stockholm Sweden
Name of contact:	Anders Karlsson BNEW DNEW RA RPSE1 IVC Phone +46 10 714 27 06
Client observer:	Per Sjöberg & Tomas Johansson

2. EQUIPMENT UNDER TEST (EUT)

2.1 Identification of the EUT

Equipment	Radio Unit
Type/Model	AIR 6449 B77D
Product number:	KRD 901 206/2
Additional product number:	KRD 901 206/1, KRD 901 206/11, KRD 901 206/21
Product configuration:	NR
Brand name	Ericsson
Manufacturer	Ericsson
Rating	-48VDC max: 50A
Class	III



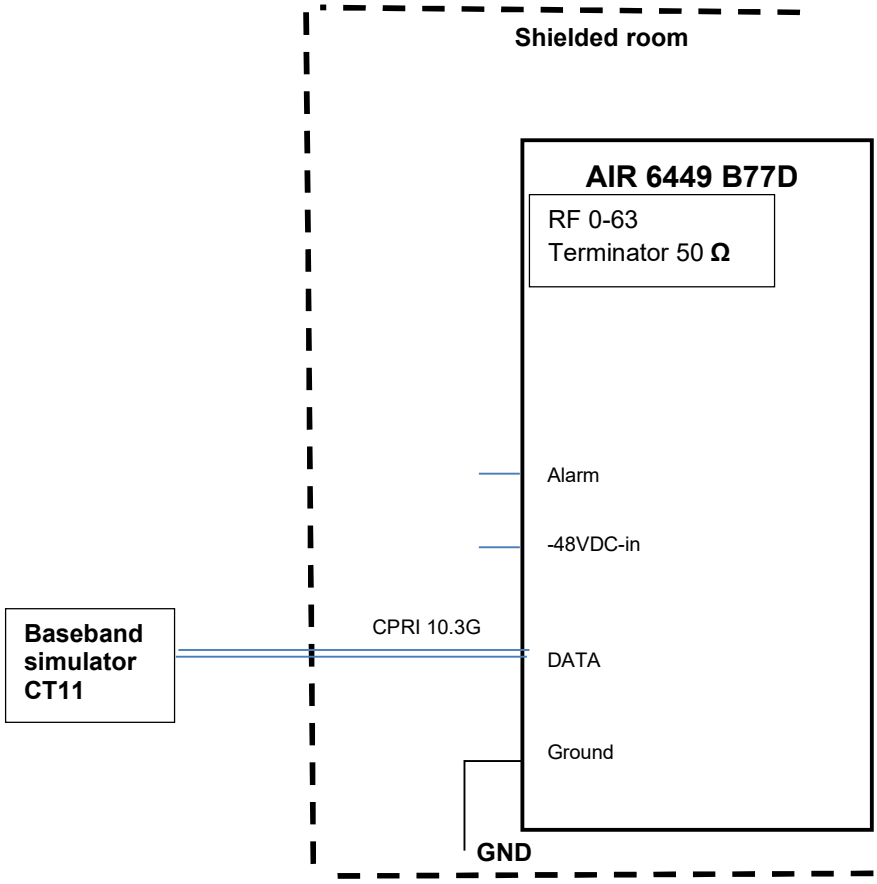


Markings and EUT

2.2 Description of the EUT

The test object is an Antenna Integrated Radio (AIR 6449) for a base station with NR. 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	Type	Length [m]	Specifications
DC in	DC power	3.0	Two-core
Earth	Ground	3.0	Single wire, 35mm^2
External alarm	Signal cable	5.0	RPM 513 2350/1

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	EliteBook	HP	BAMS-1001233323
Baseband simulator CT11	LPC 102 494/1	Ericsson	BAMS-1001971074
SFP module	RDH 102 65/3	Oclaro Japan Inc.	T14B65442
SFP module	RDH 102 65/3	Source Photonics	J4F2010951
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
AIR 6449 B77D	KRD 901 206/1	With un-security software and antenna
	KRD 901 206/11	With security software and antenna
	KRD 901 206/2 *	With un-security software and RDNB board for testing
	KRD 901 206/21	With security software and RDNB board for testing

* Tested model. The tests were performed on KRD 901 206/2 (AIR 6449 B77D with un-security software and RDNB board for testing purpose).

The hardware and software (except for the security software) are identical for all types above. The difference is considered not to imply different EMC-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 (2019)
FCC 47 CFR Part 27 Subpart C (2019) + amendment published on April 23, 2020, covering 3700 – 3980 MHz frequency band

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.

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 SAC chamber	Semi-anechoic 5 m	2042G-3

3.4 Mode of operation during the test

The EUT was tested with – 53.5 V DC, 26 A.

Radio Configuration

NR: The test object was transmitting test model FR1-TM3.1 as defined in ETSI TS 138 141/ 3GPP TS 38.141-1.

Transmission band B77D: 3700 – 3980 MHz.

The following configurations were tested:

1. 1 carrier with 80 MHz bandwidth, 4 W/MHz, with bottom, middle or top within the channel
2. 1 carrier with 40 MHz bandwidth, 8 W/MHz, with bottom, middle or top within the channel
3. 2 carriers with 80 MHz bandwidth, 4 W/MHz with middle channel
4. 2 carriers with 40 MHz bandwidth, 8 W/MHz, with middle channel

The radio was activated for maximum transmit power of 320 W. See below table for detailed radio configurations of the radio unit.

Configura-tion No.	Carrier No.	Channel BW (MHz)	RF power (W/MHz)	Test Model	Carrier Frequency (DL)	
					MHz	NR ARFCN
1	1	80	4	NR-FR1-TM3.1	3740.01	649334
	1	80	4	NR-FR1-TM3.1	3840.00	656000
	1	80	4	NR-FR1-TM3.1	3939.99	662666
2	1	40	8	NR-FR1-TM3.1	3720.00	648000
	1	40	8	NR-FR1-TM3.1	3840.00	656000
	1	40	8	NR-FR1-TM3.1	3960.00	664000
3	2	80	4	NR-FR1-TM3.1	3800.01 3879.99	653334 658666
4	2	40	8	NR-FR1-TM3.1	3819.99 3860.01	654666 657334

3.5 Compliance

The EUT shall comply with the emission limit as listed below

Field strength of spurious emissions

CFR47 §2.1053 and §27.53(l)(1)

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

4. TEST SUMMARY

The results in this report apply only to sample tested:

Standard	Description	Result
	Emission	
ANSI C63.26 5.5	**Field strength of spurious radiation**	**PASS**
	The EUT complies with the limit.	

5. RADIATED RF EMISSION IN THE FREQUENCY-RANGE 30 MHZ – 1 – 18 – 26.5 – 40 GHZ

Date of test	Temperature [°C]	Relative Humidity [%]
May 10, 2021	20	49
May 11, 2021	22	40
May 12, 2021	21	37
May 17, 2021	20	45
May 18, 2021	21	42

5.1 Test set-up and test procedure

The test method is in accordance with ANSI C63.26 clause 5.5.

The EUT was set up 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.
> 1000 MHz: The EUT was placed on a pole 1.5 m above the turntable which is part of the reference ground plane. 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 360º.

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[dBµV/m] = Analyser reading [dBµV] + Antenna factor [1/m] - Amplifier gain [dB] + Cable loss [dB]

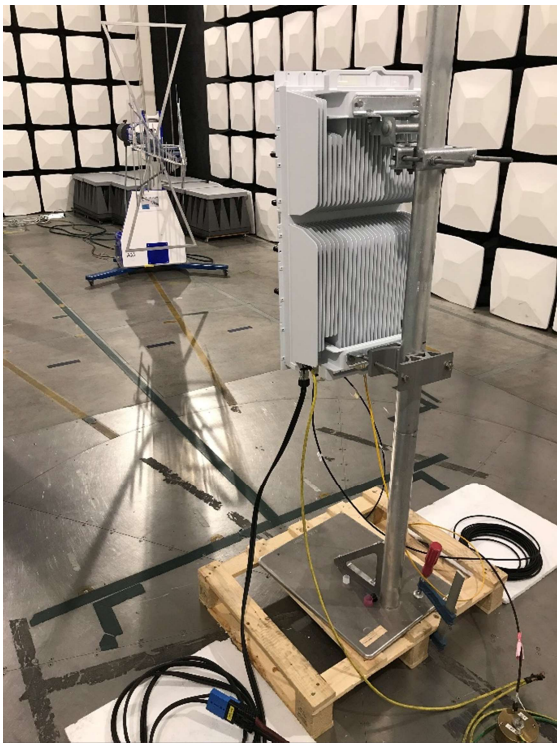
EIRP [dBm] = E[dBµV/m] +20log[3] – 104.8

5.2 Measurement uncertainty

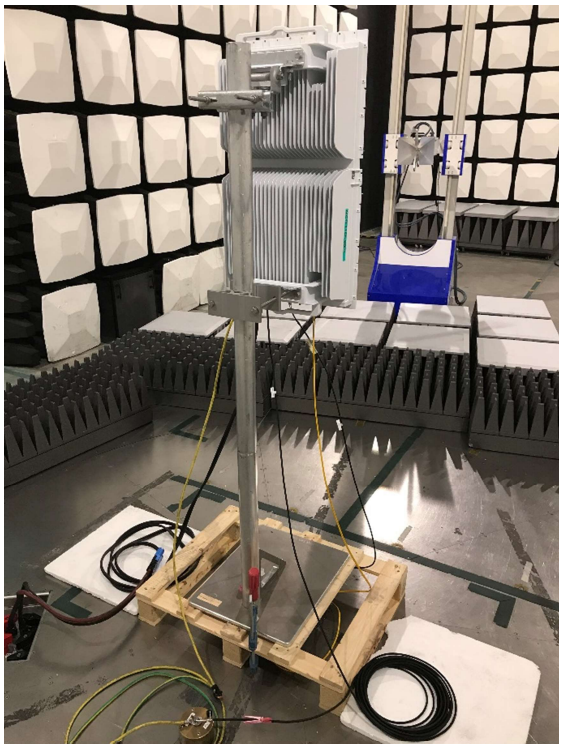
Measurement uncertainty for radiated disturbance

Uncertainty for the frequency range 30 to 1000 MHz at 3 m	± 5.1 dB
Uncertainty for the frequency range 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

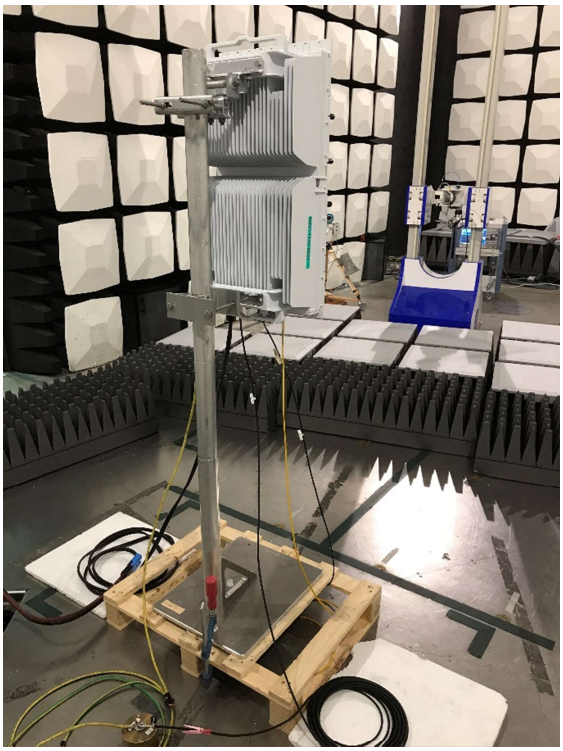
Measurement uncertainty is calculated in accordance with CISPR 16-4-2: 2011.
The measurement uncertainty is given with a confidence of 95 %.



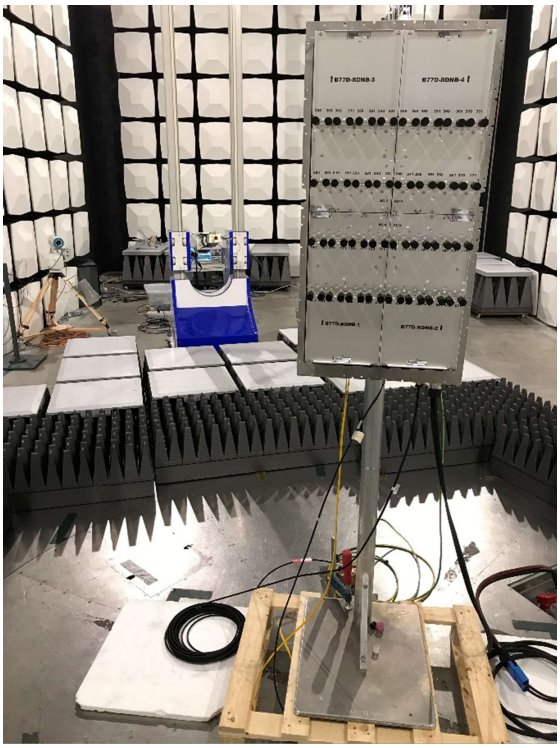
30 – 1000 MHz



1 – 18 GHz



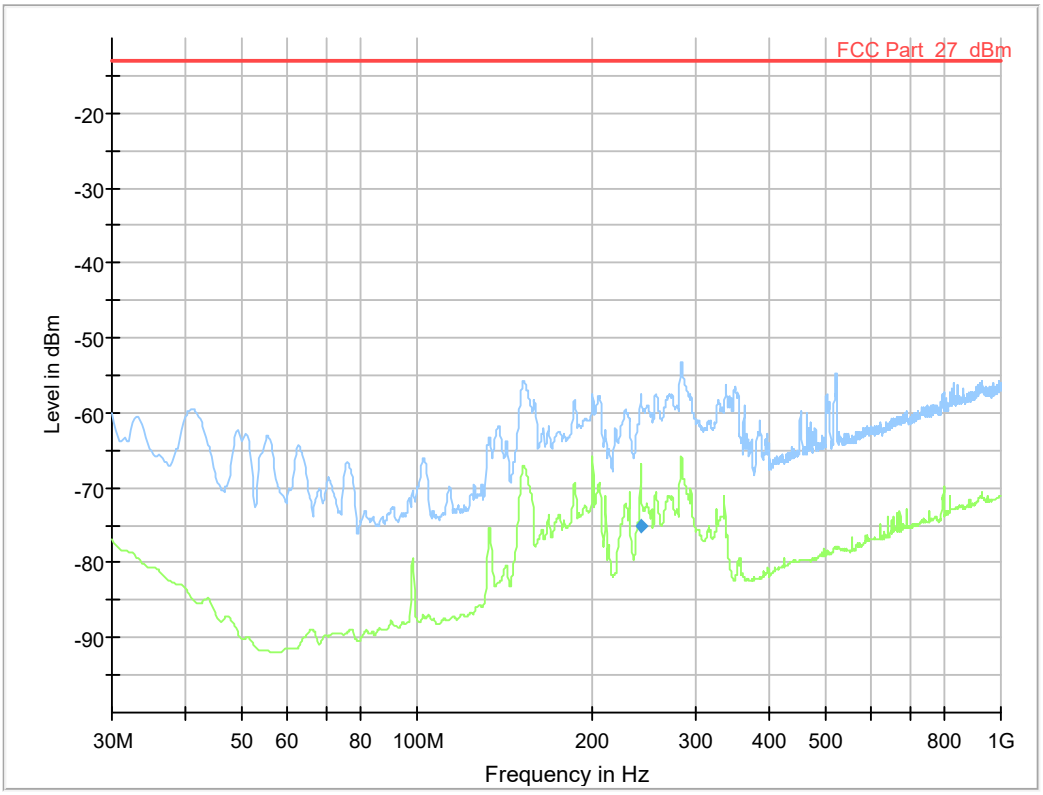
18 – 26,5 GHz



26,5 – 40 GHz

Photos of the test set up

5.3 Test results, 30 – 1000 MHz, Configuration 1

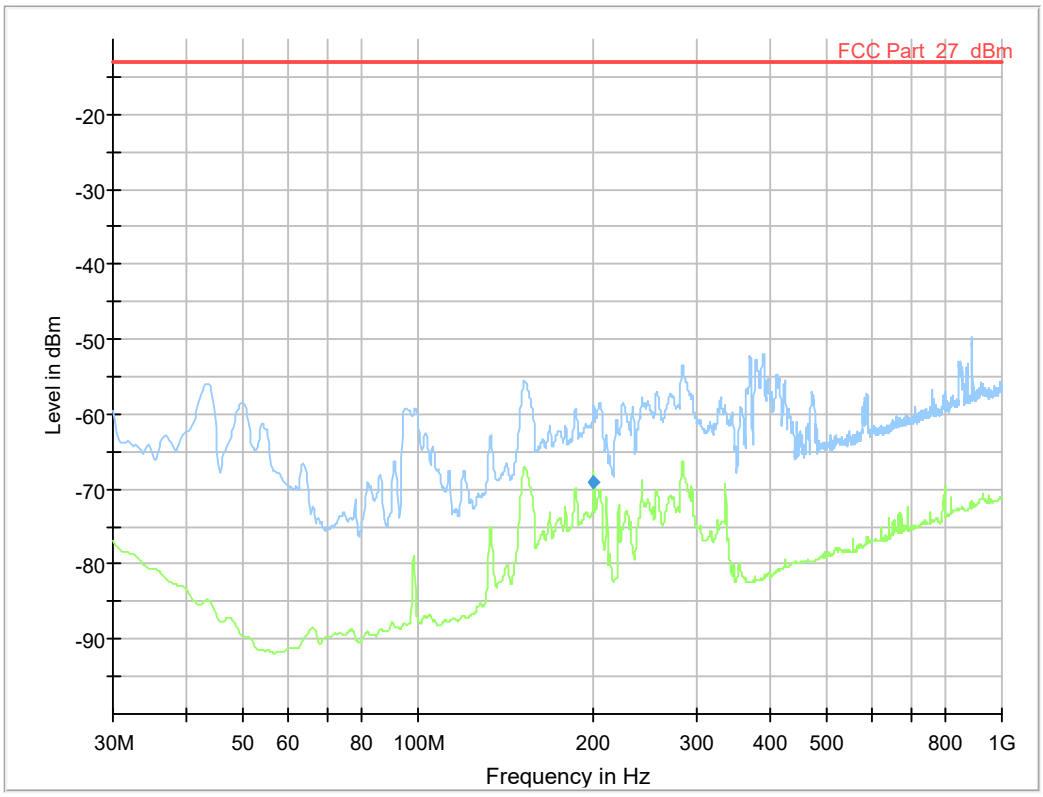


Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance.

Bottom Channel

Measurement results

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

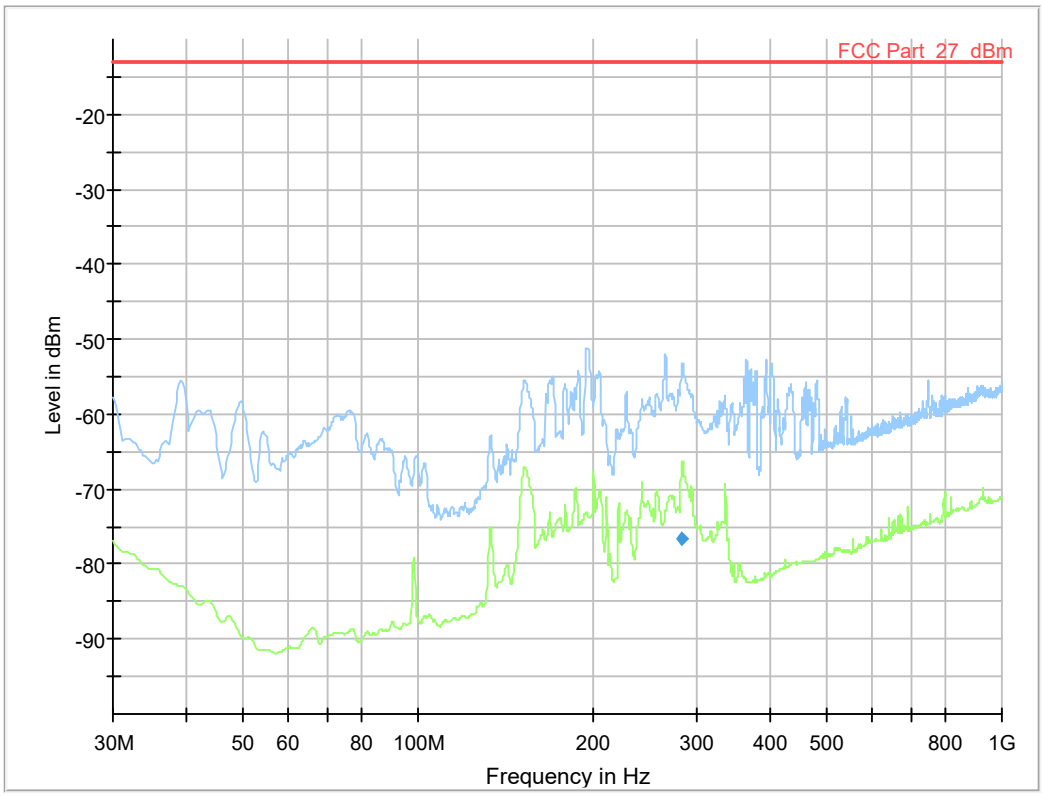


Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance.

Middle Channel

Measurement results

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



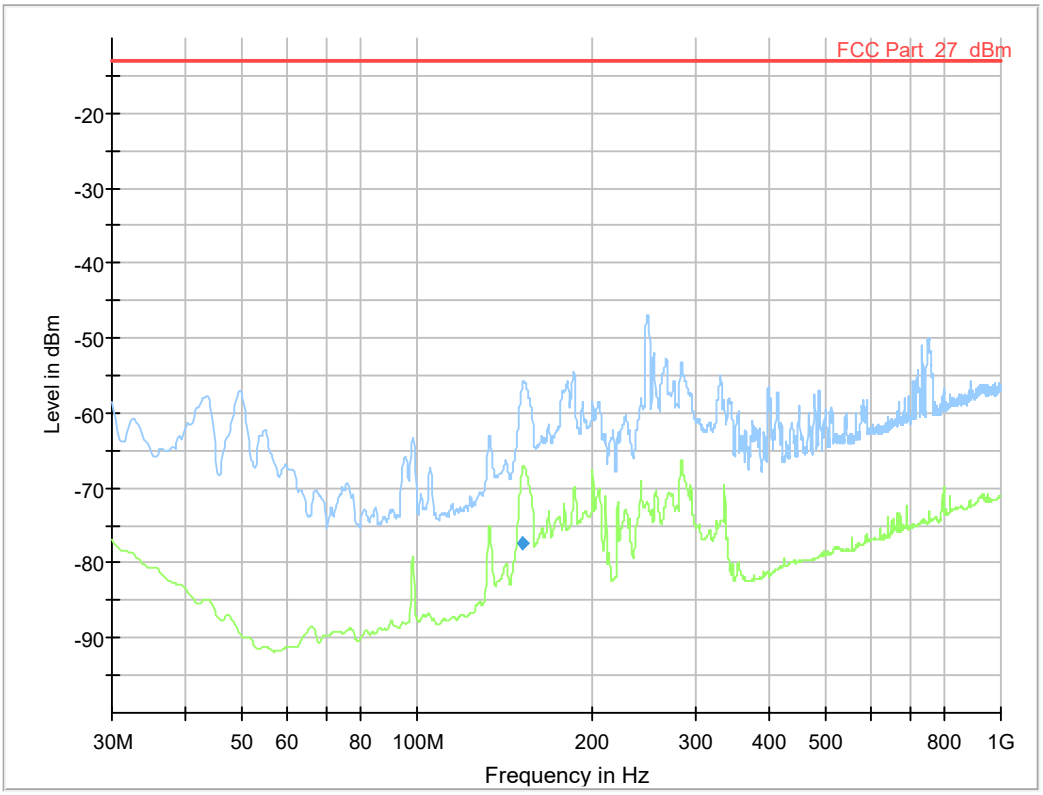
Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance.

Top channel

Measurement results

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

5.4 Test results, 30 – 1000 MHz, Configuration 2

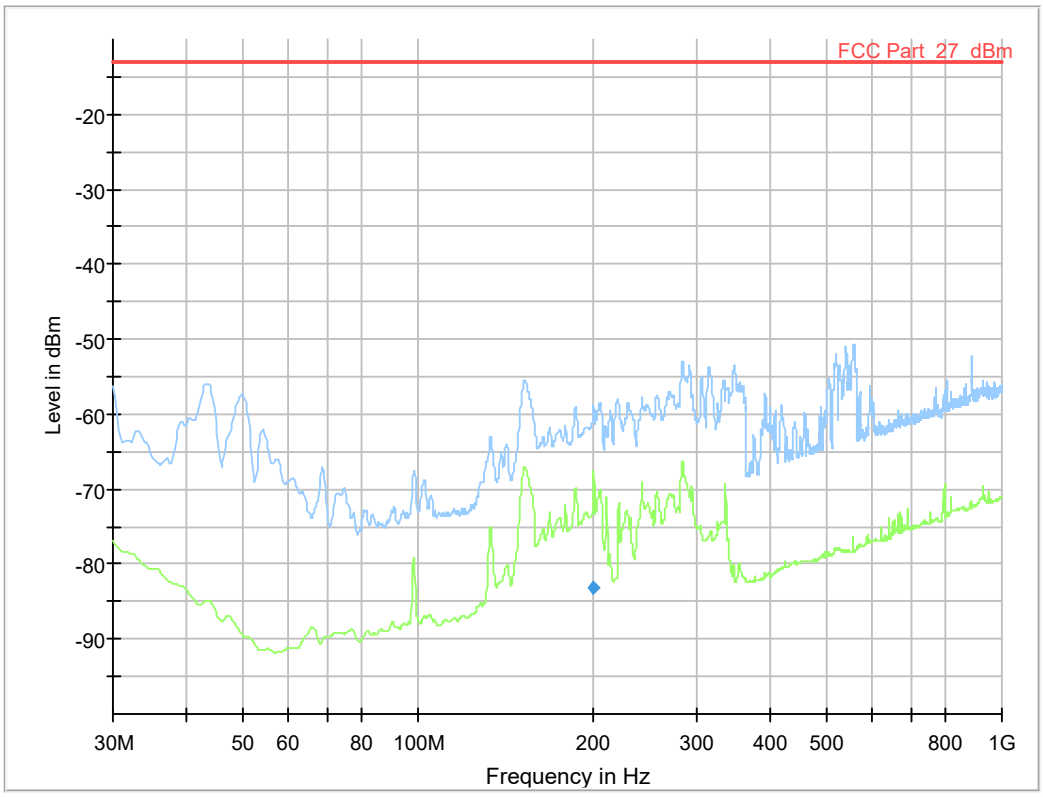


Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance

Bottom channel

Measurement results

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

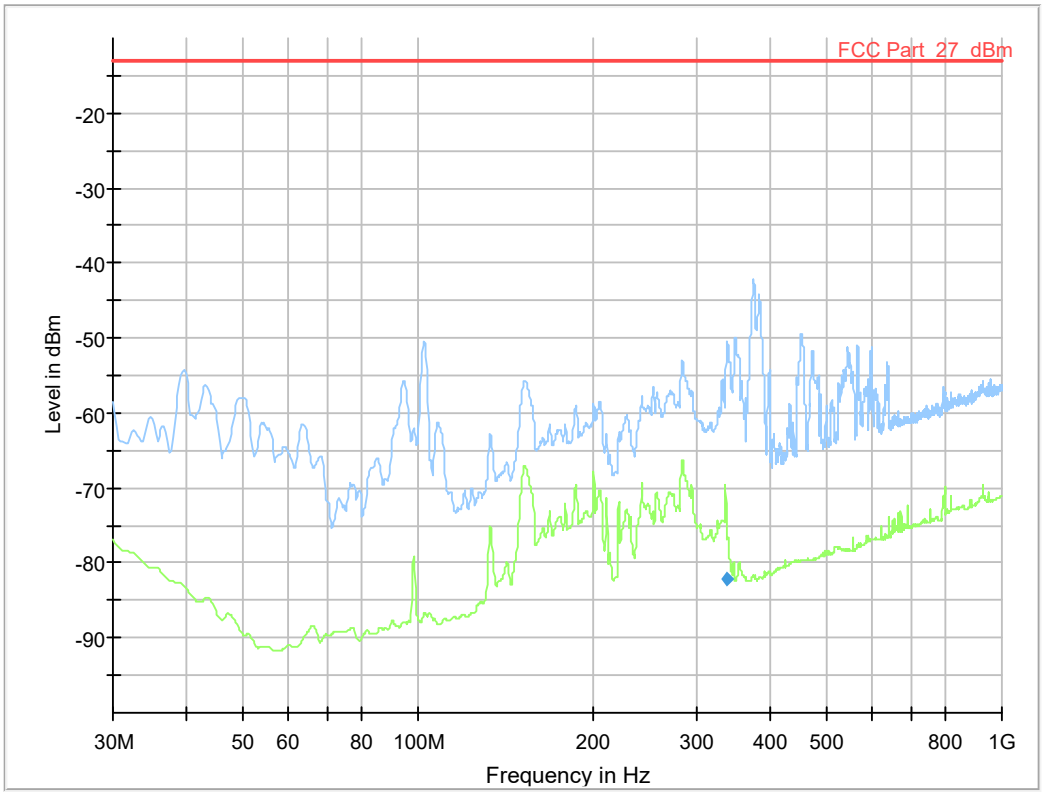


Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance

Middle Channel

Measurement results

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



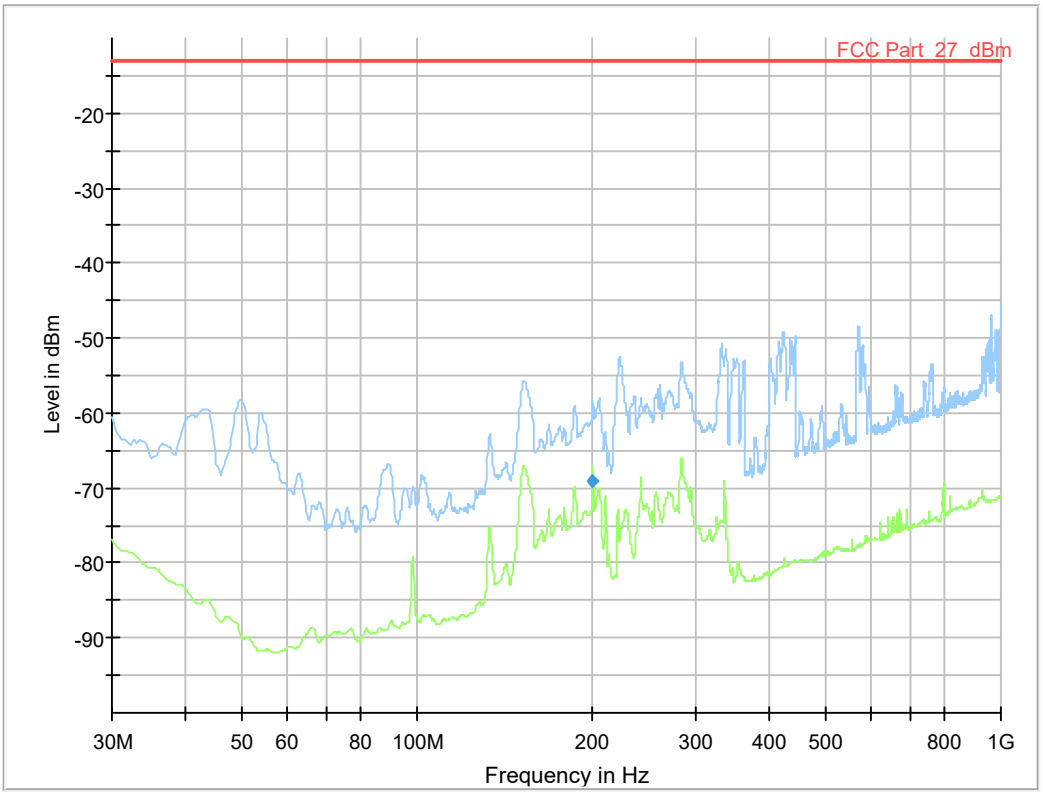
Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance

Top channel

Measurement results

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

5.5 Test results, 30 – 1000 MHz, Configuration 3



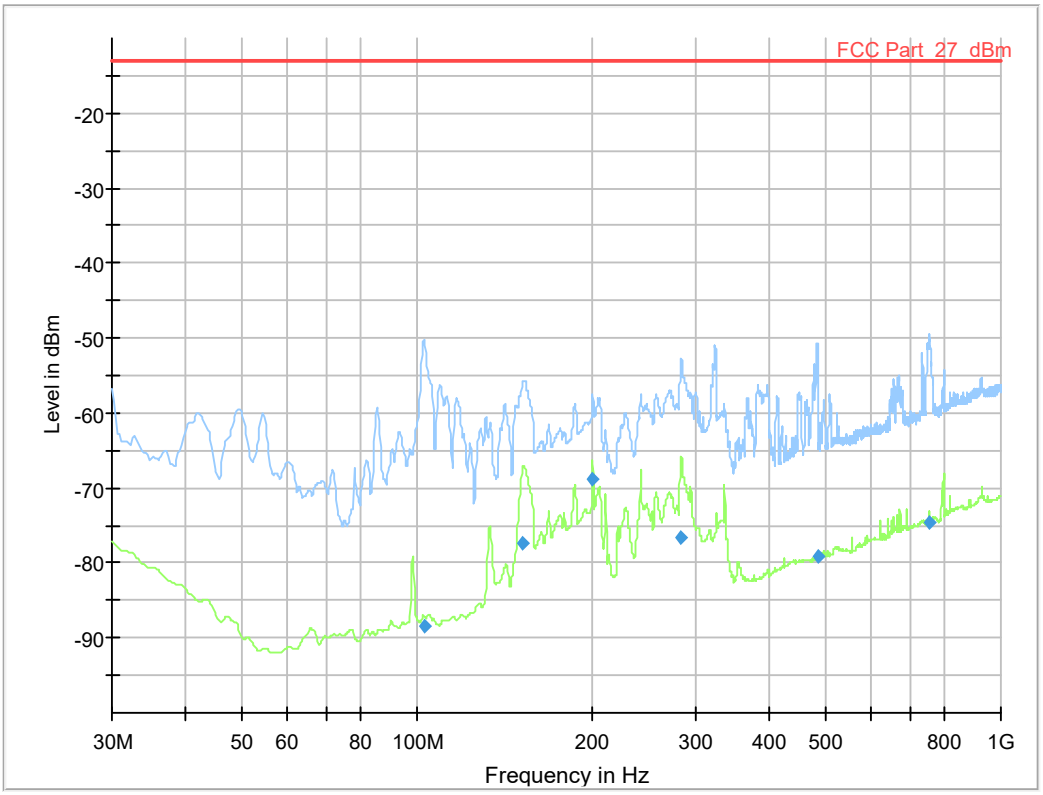
Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance

Middle Channel

Measurement results

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

5.6 Test results, 30 – 1000 MHz, Configuration 4



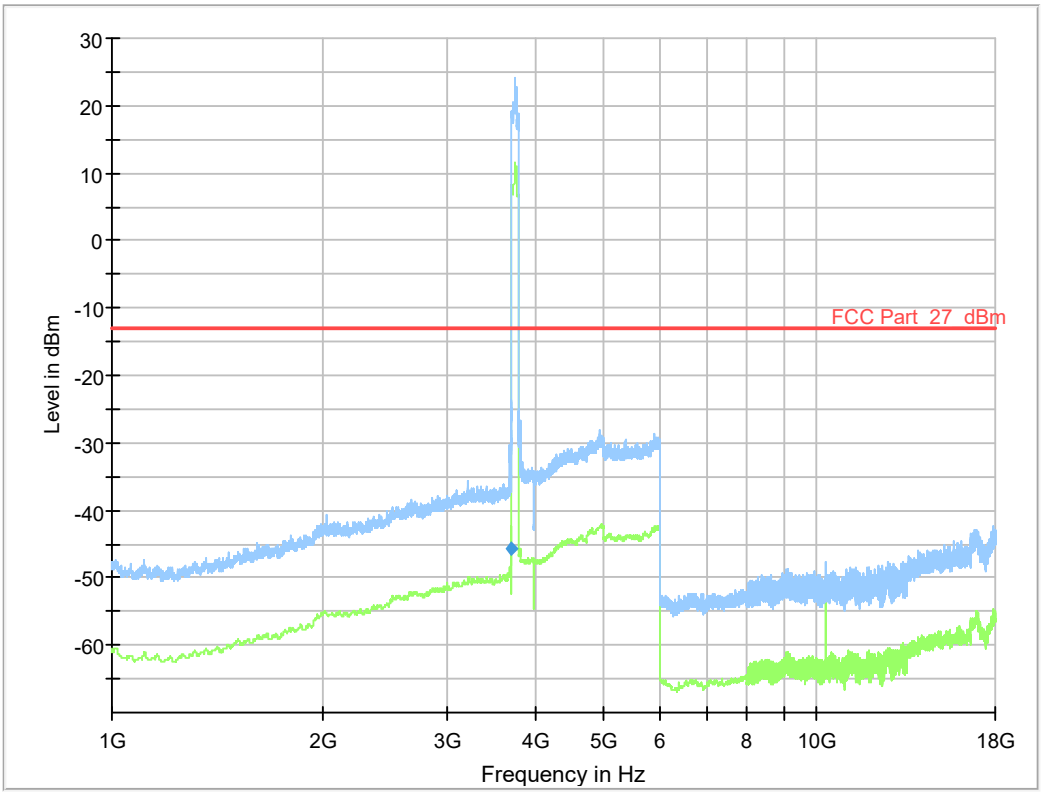
Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance

Middle Channel

Measurement results

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

5.7 Test results, 1 – 18 GHz Configuration 1



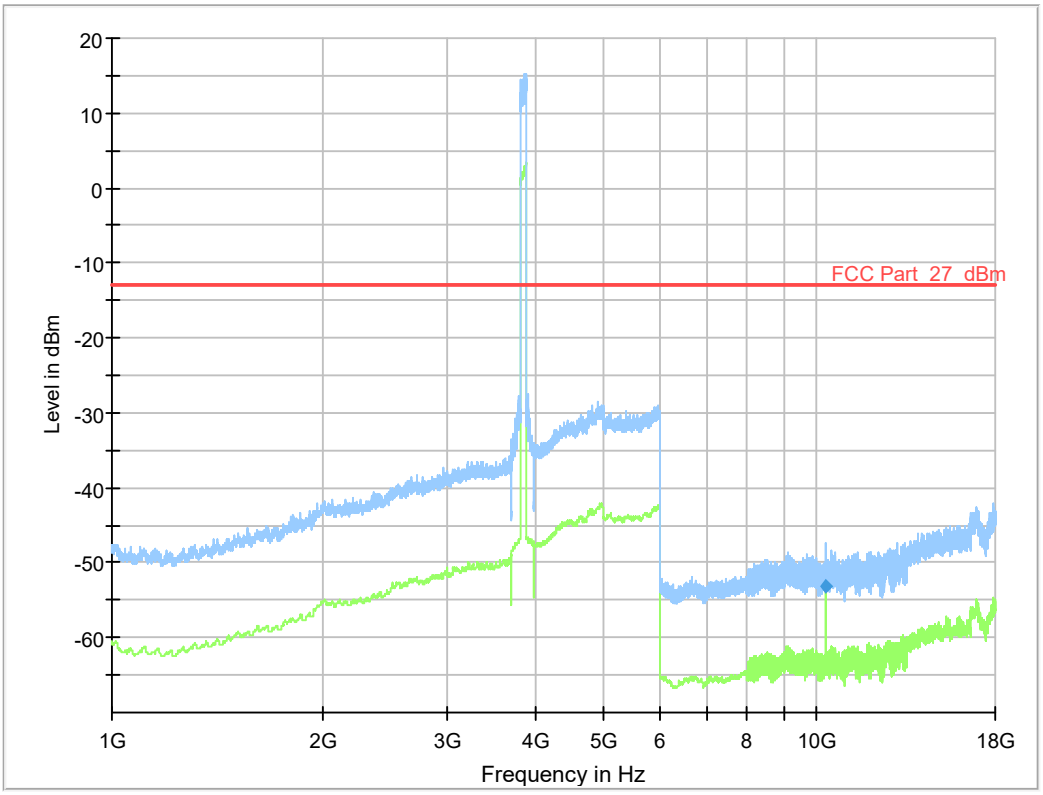
Diagram, Peak and RMS overview sweep, 1 – 18 GHz at 3 m distance.

Bottom channel

Measurement results, RMS

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

No disturbances outside the transmission band B77D down link 3700 – 3980 MHz.



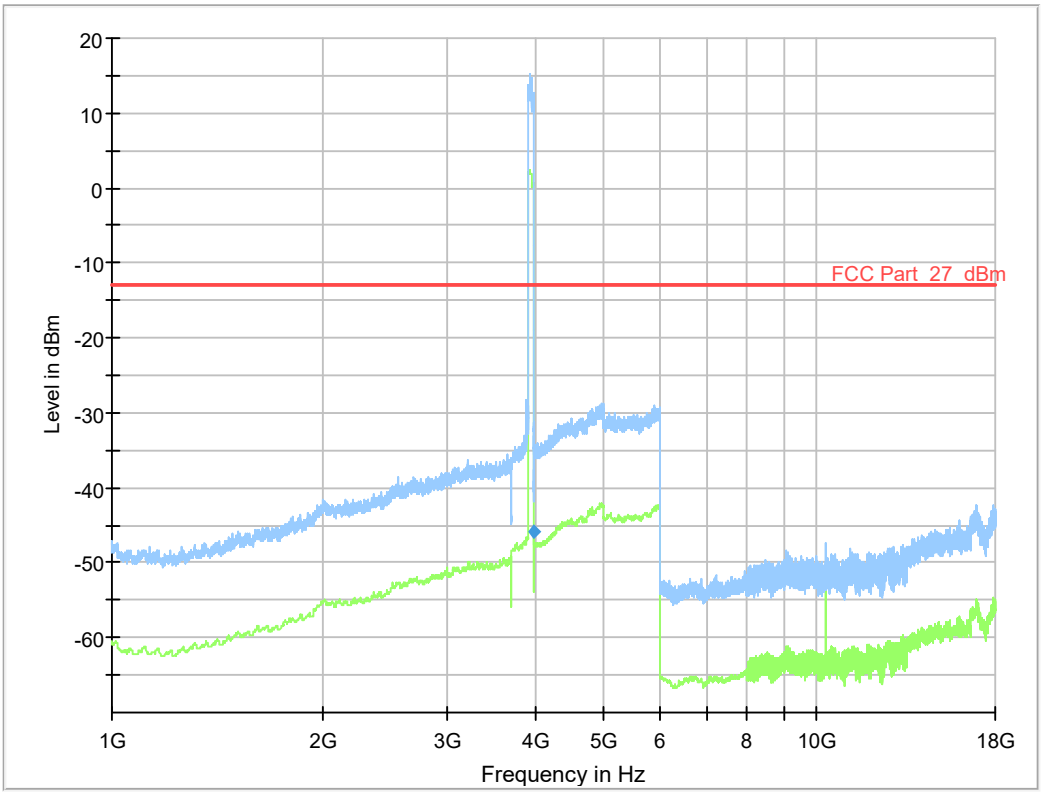
Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance.

Middle Channel

Measurement results, RMS

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

No disturbances outside the transmission band B77D down link 3700 – 3980 MHz.



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

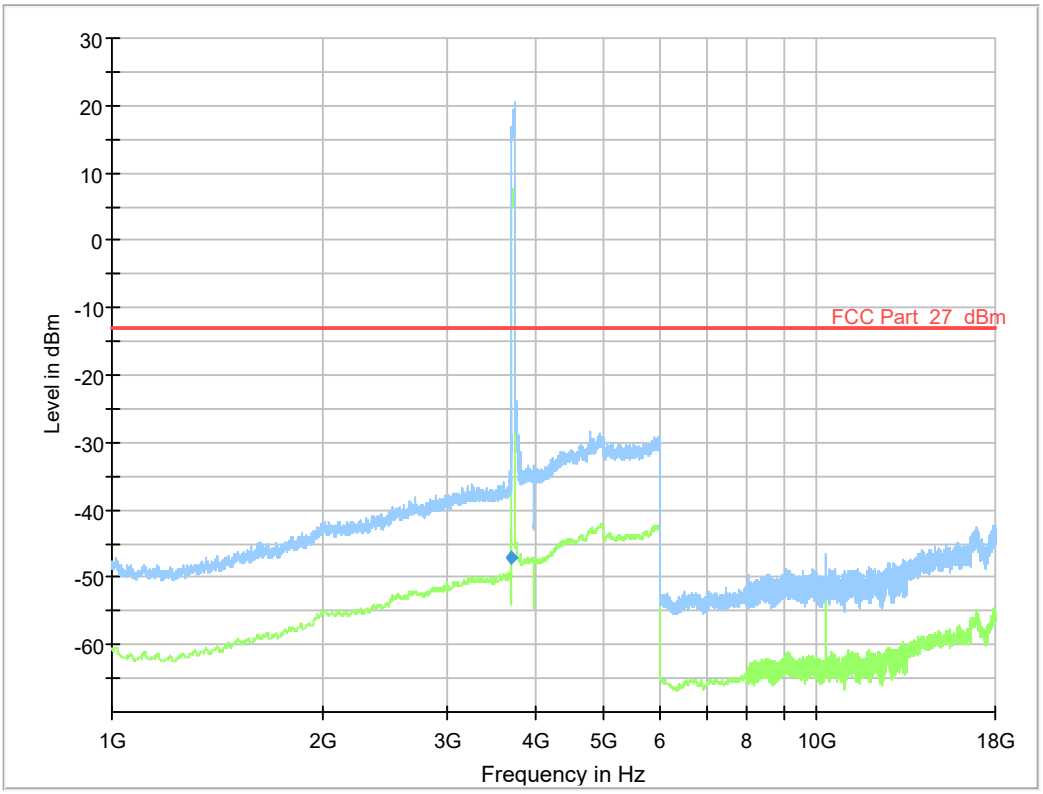
Top channel

Measurement results, RMS

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

No disturbances outside the transmission band B77D down link 3700 – 3980 MHz.

5.9 Test results, 1 – 18 GHz Configuration 2



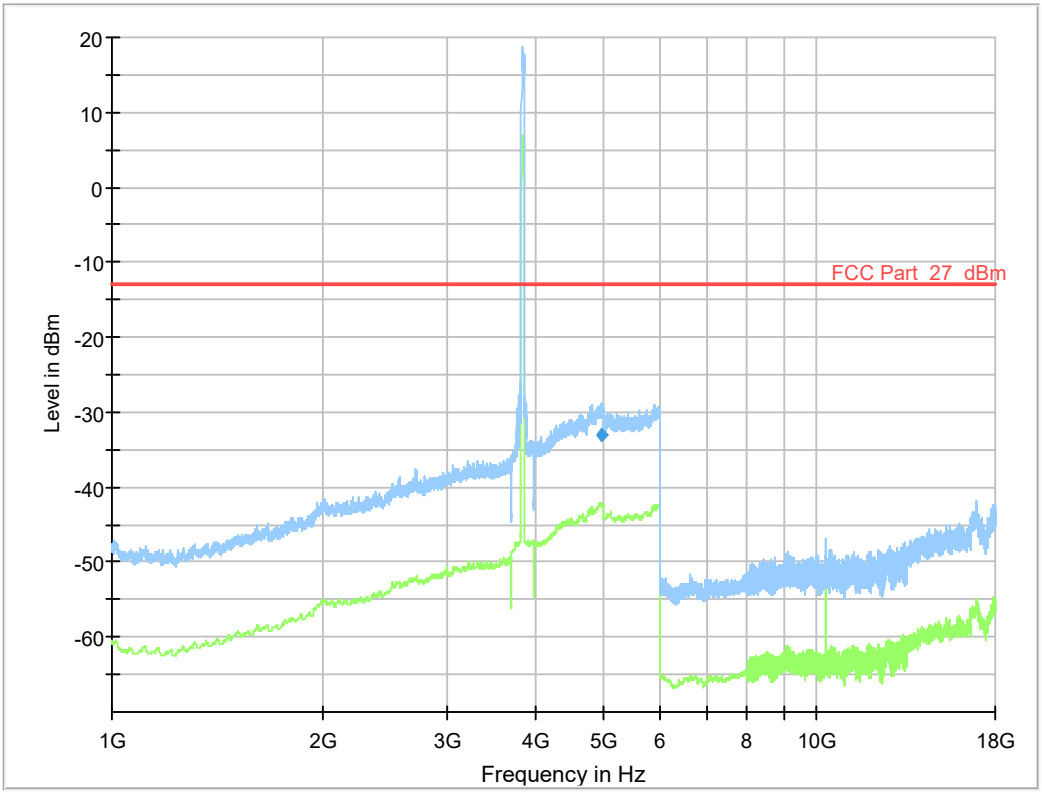
Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance.

Bottom channel

Measurement results, RMS

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

No disturbances outside the transmission band B77D down link 3700 – 3980 MHz.



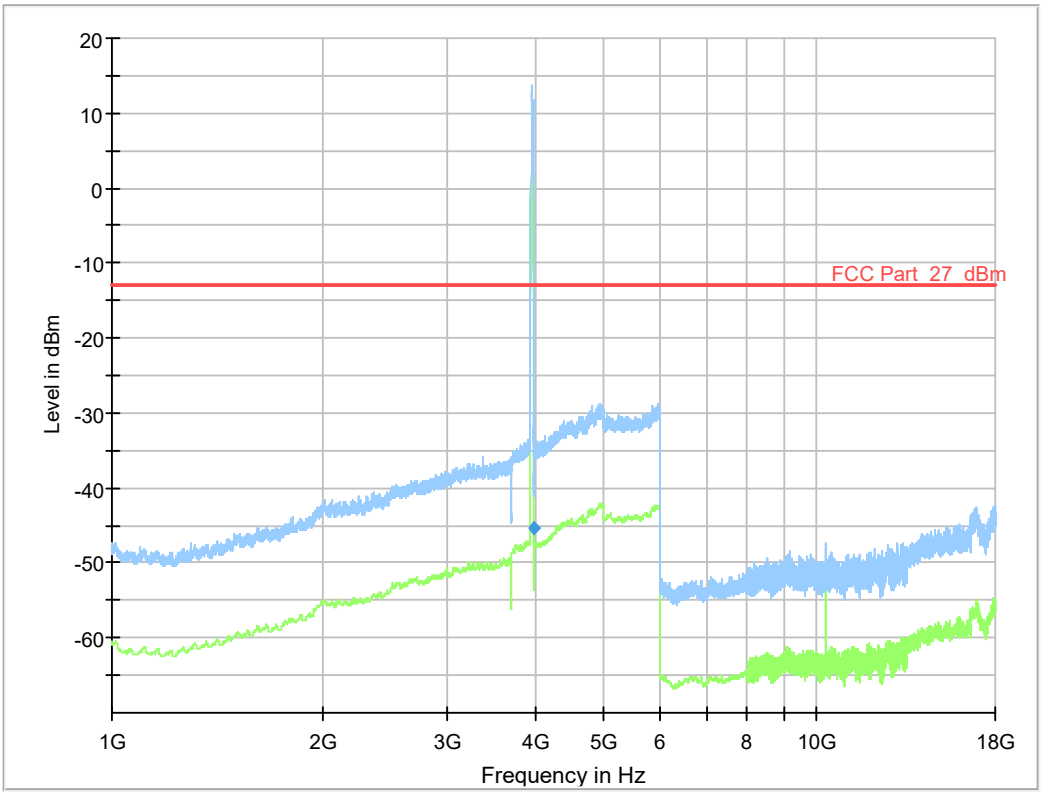
Diagram, Peak and average overview sweep, 1 – 18 GHz at 3 m distance.

Middle channel

Measurement results, RMS

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

No disturbances outside the transmission band B77D down link 3700 – 3980 MHz.



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

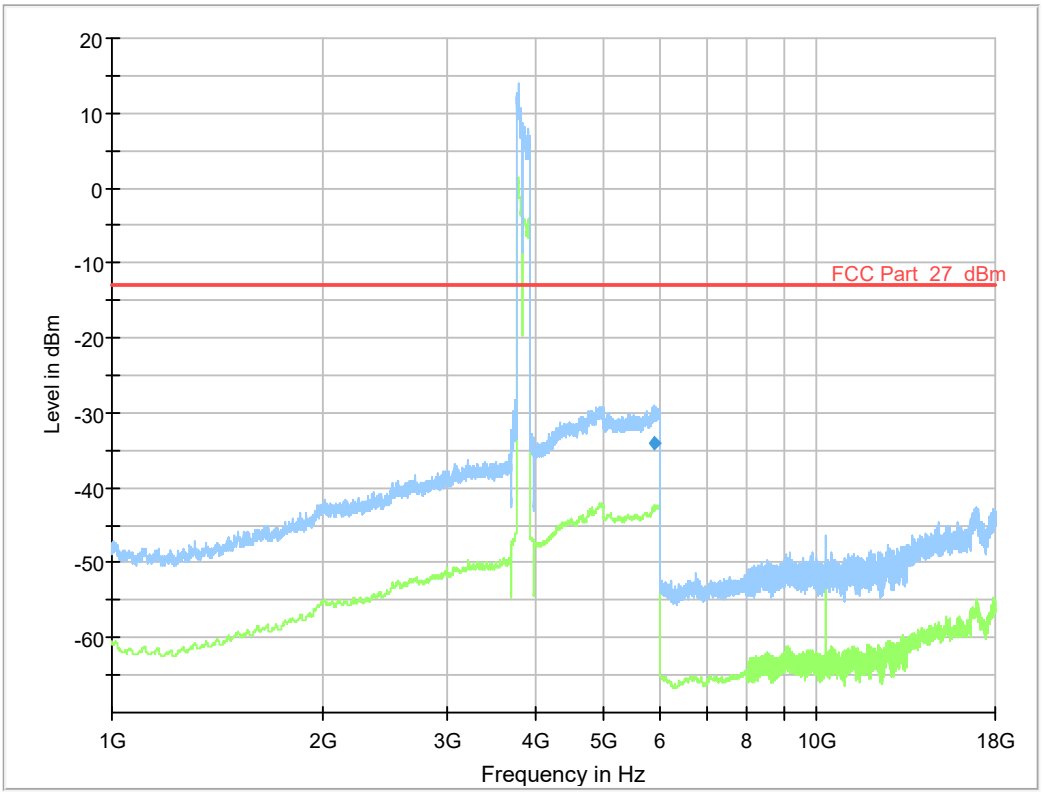
Top channel

Measurement results, RMS

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

No disturbances outside the transmission band B77D down link 3700 – 3980 MHz.

5.10 Test results, 1 – 18 GHz Configuration 3



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

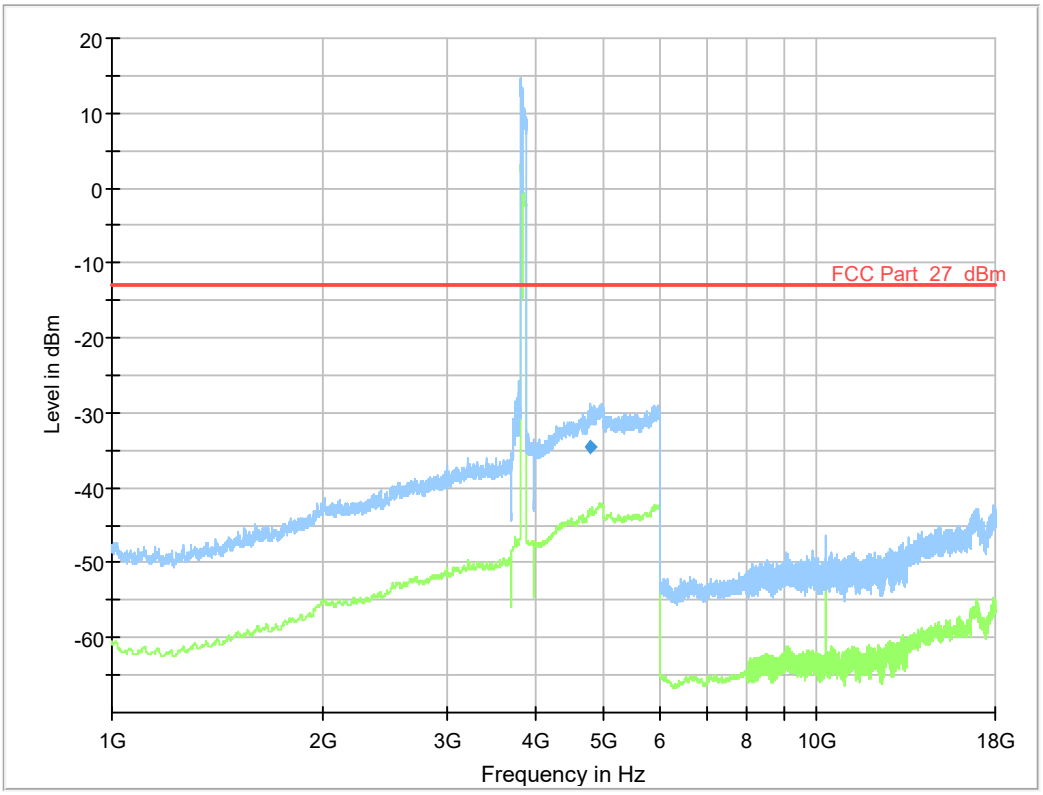
Middle channel

Measurement results, RMS

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

No disturbances outside the transmission band B77D down link 3700 – 3980 MHz.

5.11 Test results, 1 – 18 GHz Configuration 4



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

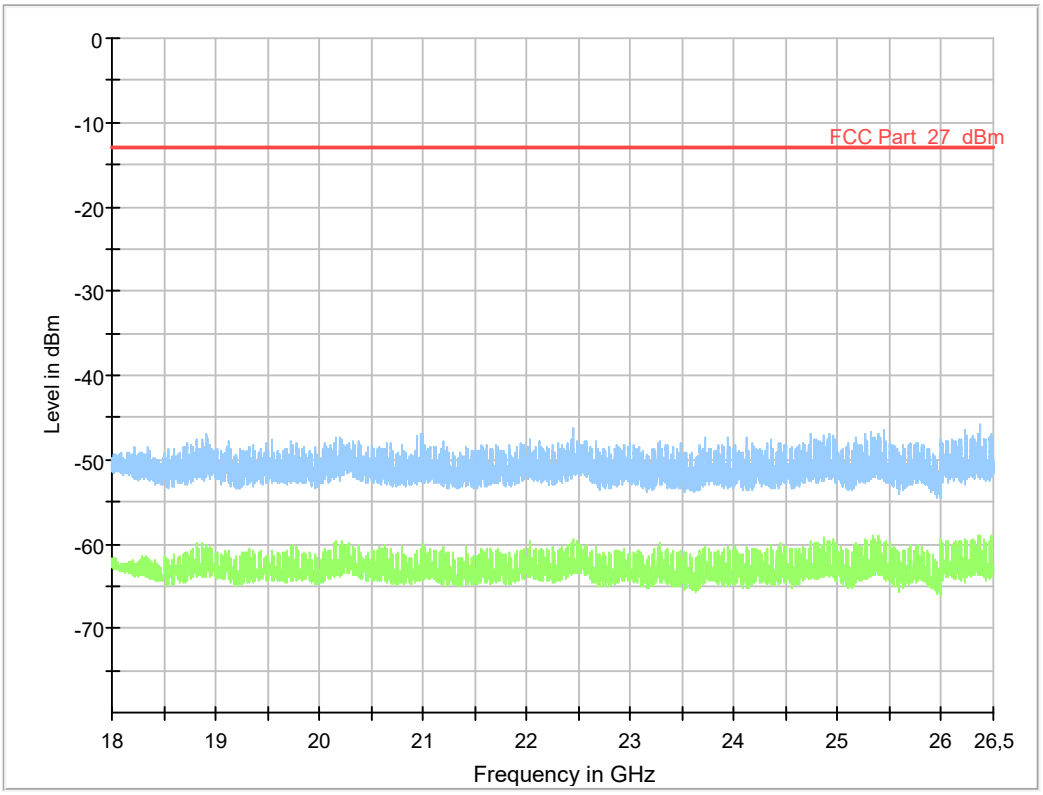
Middle channel

Measurement results, RMS

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

No disturbances outside the transmission band B77D down link 3700 – 3980 MHz.

5.12 Test results, 18 – 26.5 GHz, Configuration 1

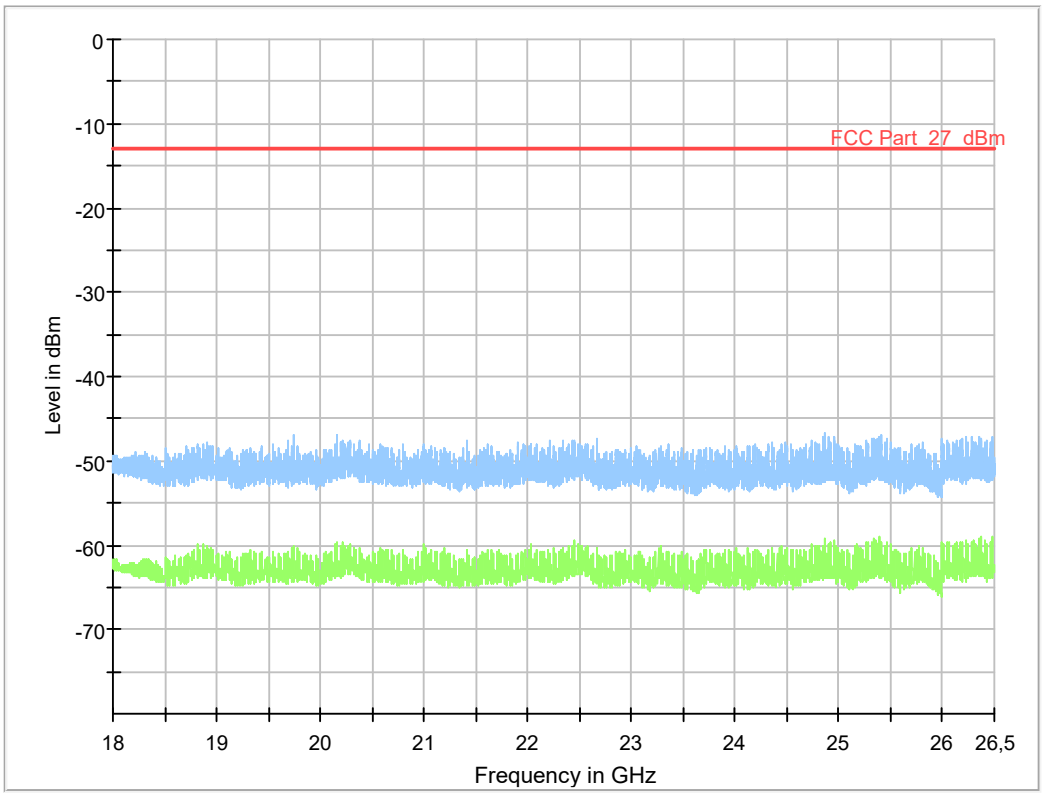


Diagram, Peak and average overview sweep, 18 – 26.5 GHz at 3 m distance.

Bottom channel

Measurement results, RMS

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

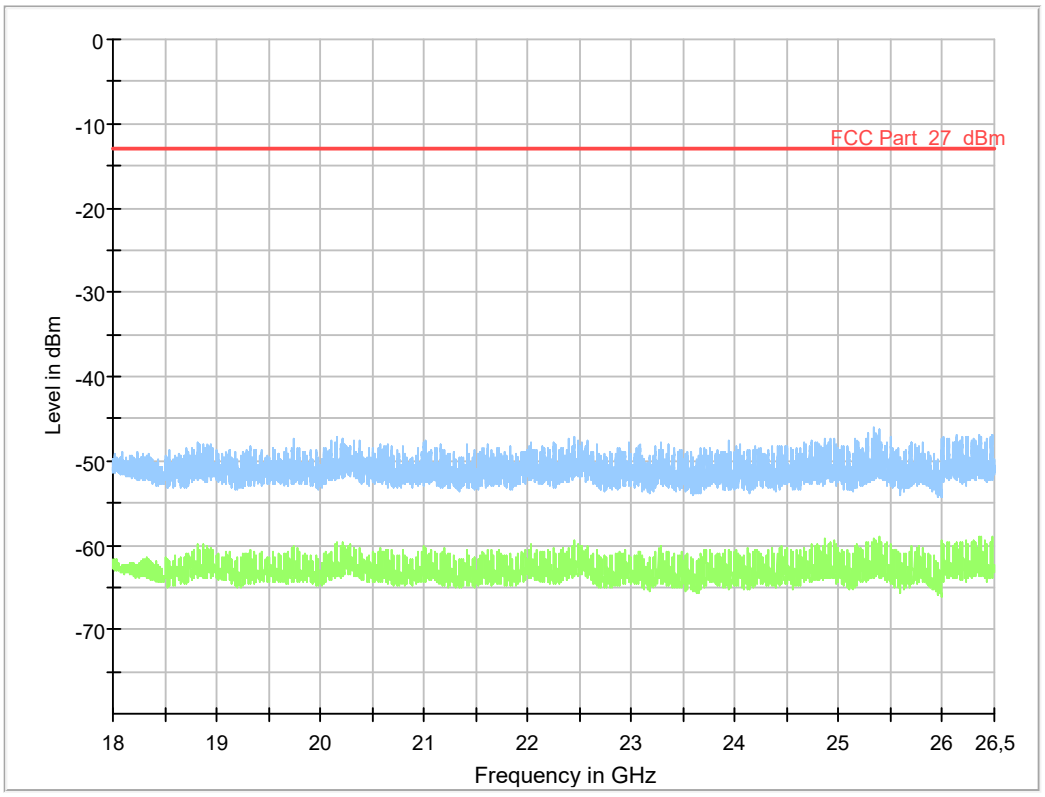


Diagram, Peak and average overview sweep, 18 – 26.5 GHz at 3 m distance.

Middle channel

Measurement results, RMS

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



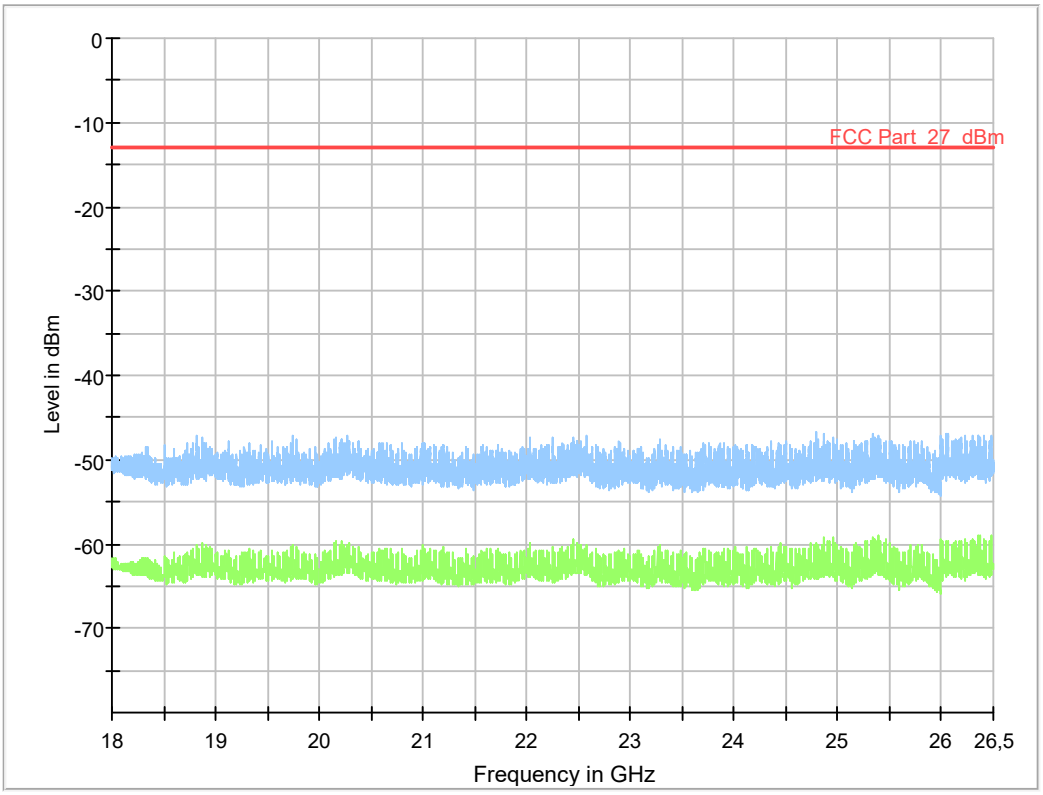
Diagram, Peak and average overview sweep, 18 – 26.5 GHz at 3 m distance.

Top channel

Measurement results, RMS

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

5.14 Test results, 18 – 26.5 GHz, Configuration 2

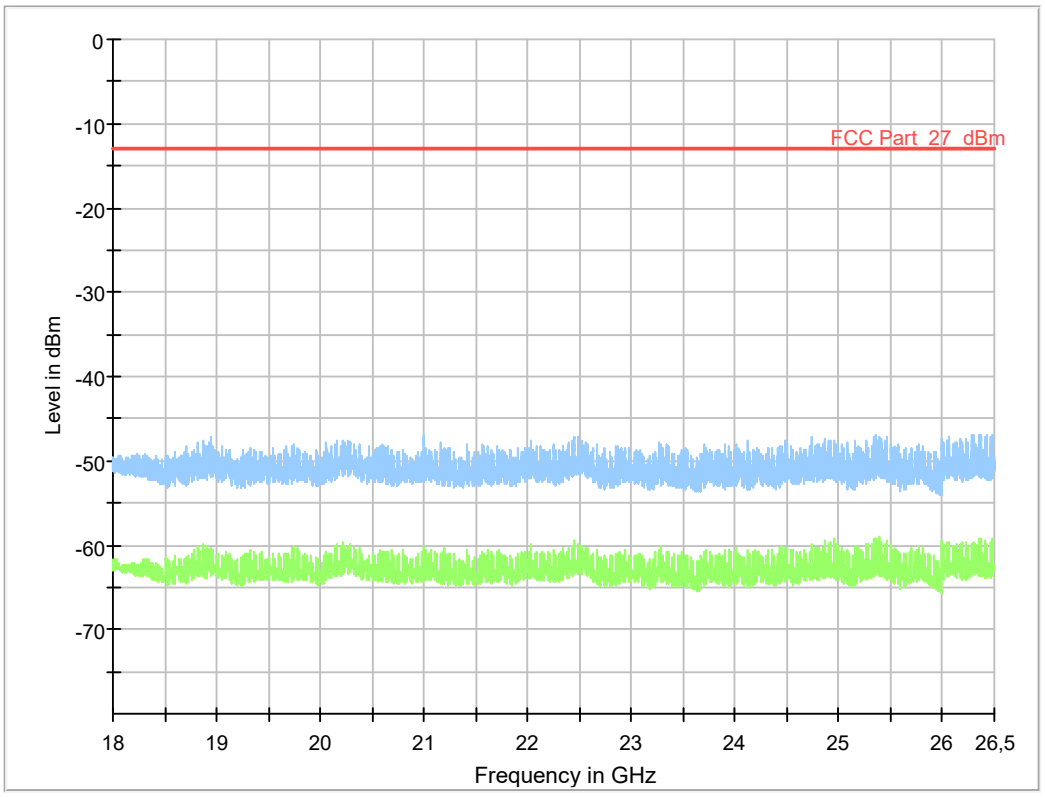


Diagram, Peak and average overview sweep, 18 – 26.5 GHz at 3 m distance.

Bottom channel

Measurement results, RMS

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

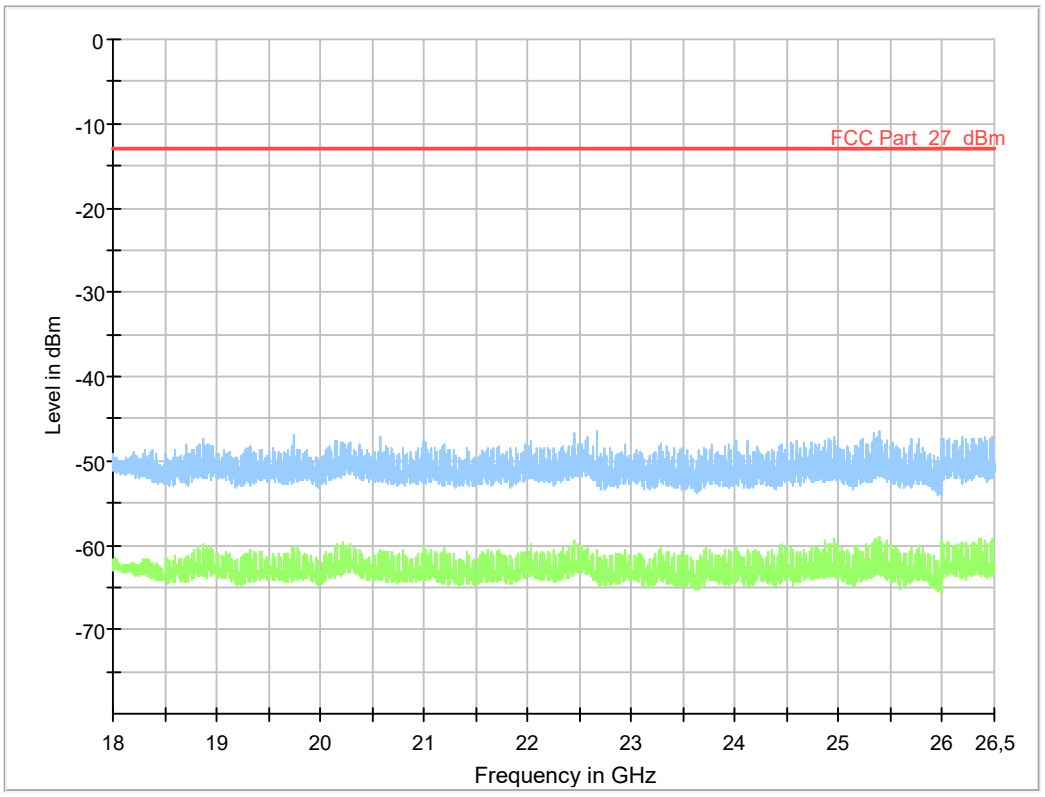


Diagram, Peak and average overview sweep, 18 – 26.5 GHz at 3 m distance.

Middle channel

Measurement results, RMS

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



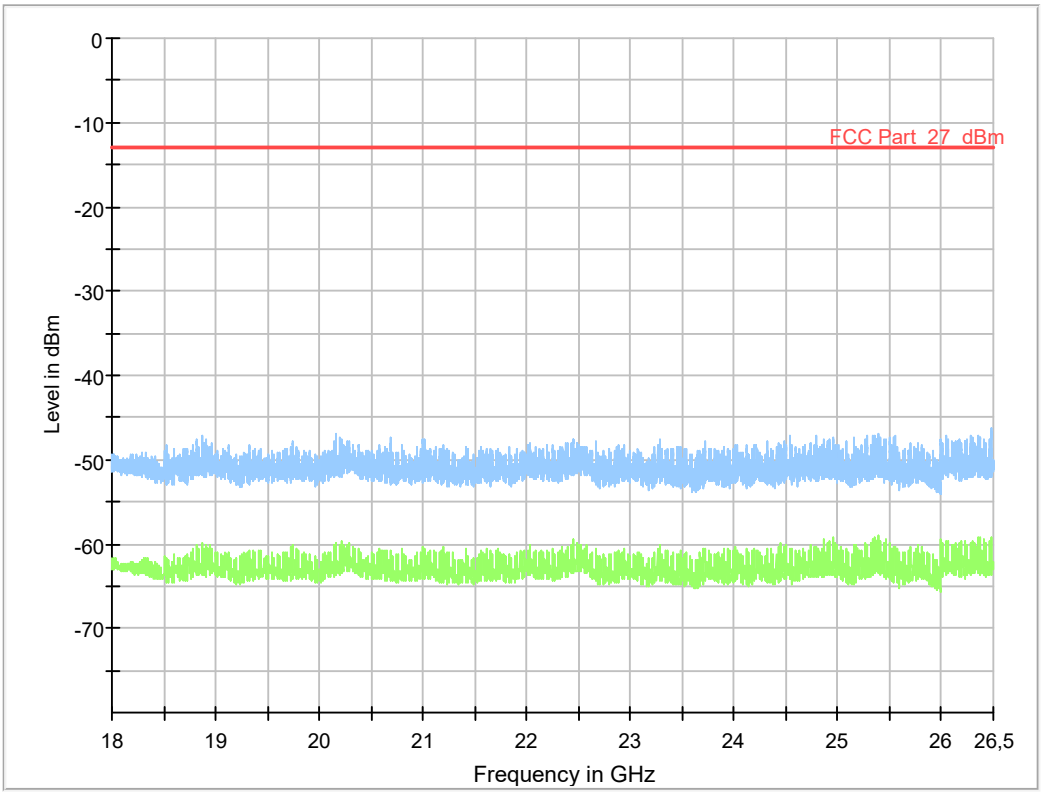
Diagram, Peak and average overview sweep, 18 – 26.5 GHz at 3 m distance.

Top channel

Measurement results, RMS

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

5.15 Test results, 18 – 26.5 GHz, Configuration 3



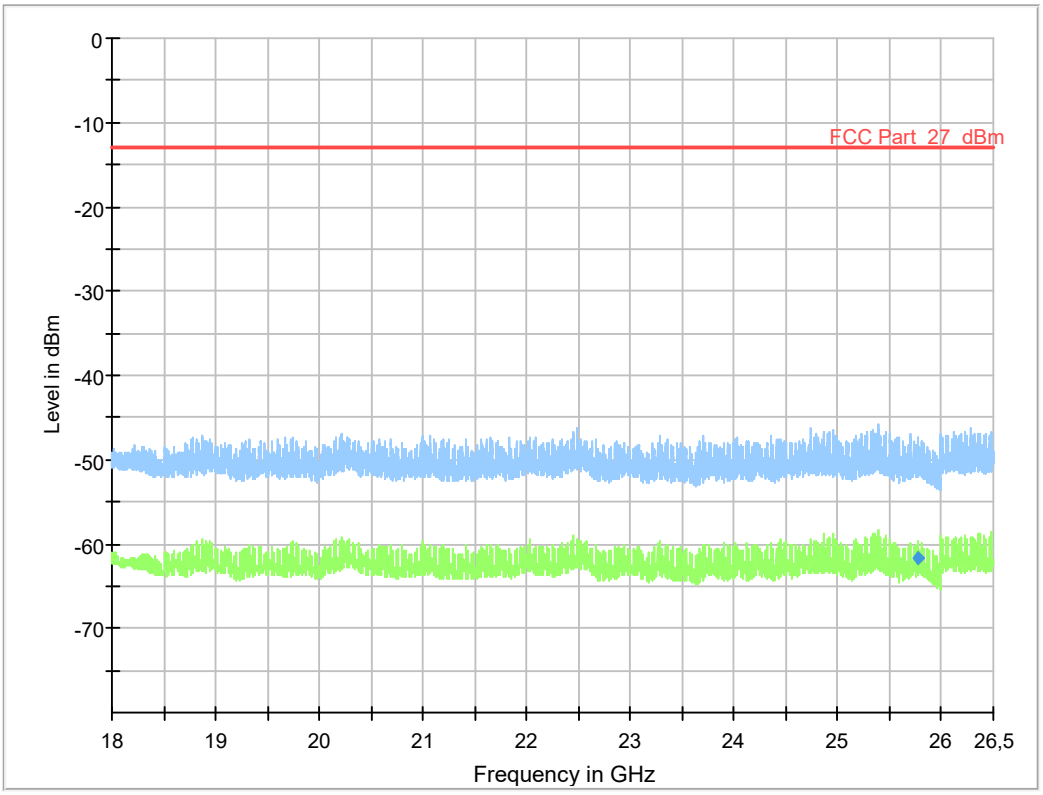
Diagram, Peak and average overview sweep, 18 – 26.5 GHz at 3 m distance

Middle channel

Measurement results, RMS

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

5.16 Test results, 18 – 26.5 GHz, Configuration 4



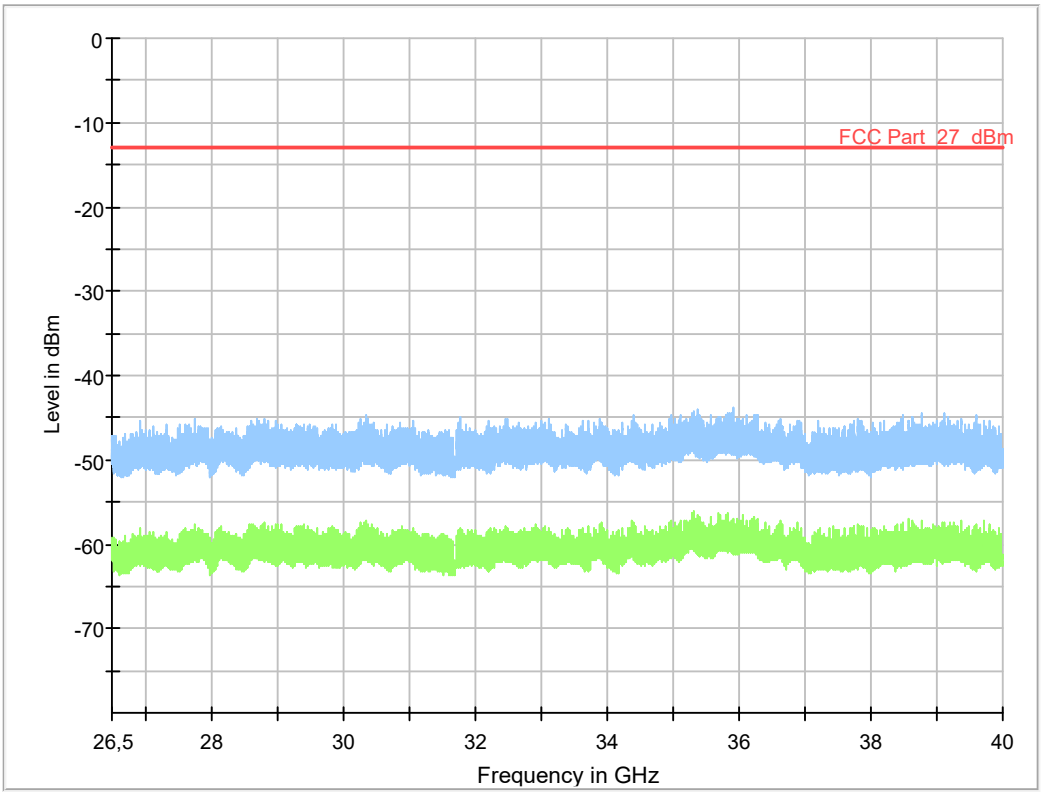
Diagram, Peak and average overview sweep, 18 – 26.5 GHz at 3 m distance.

Middle Channel

Measurement results, RMS

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

5.17 Test results, 26.5 – 40 GHz, Configuration 1

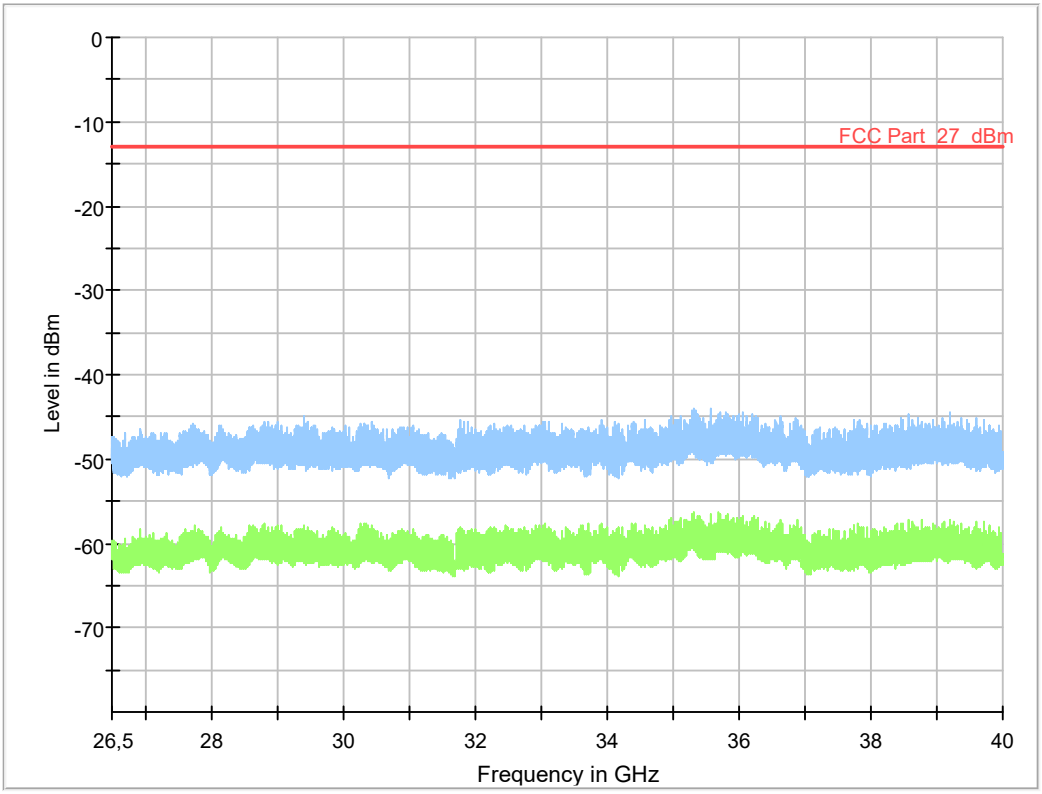


Diagram, Peak and average overview sweep, 26.5 – 40 GHz at 3 m distance.

Bottom Channel

Measurement results, RMS

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

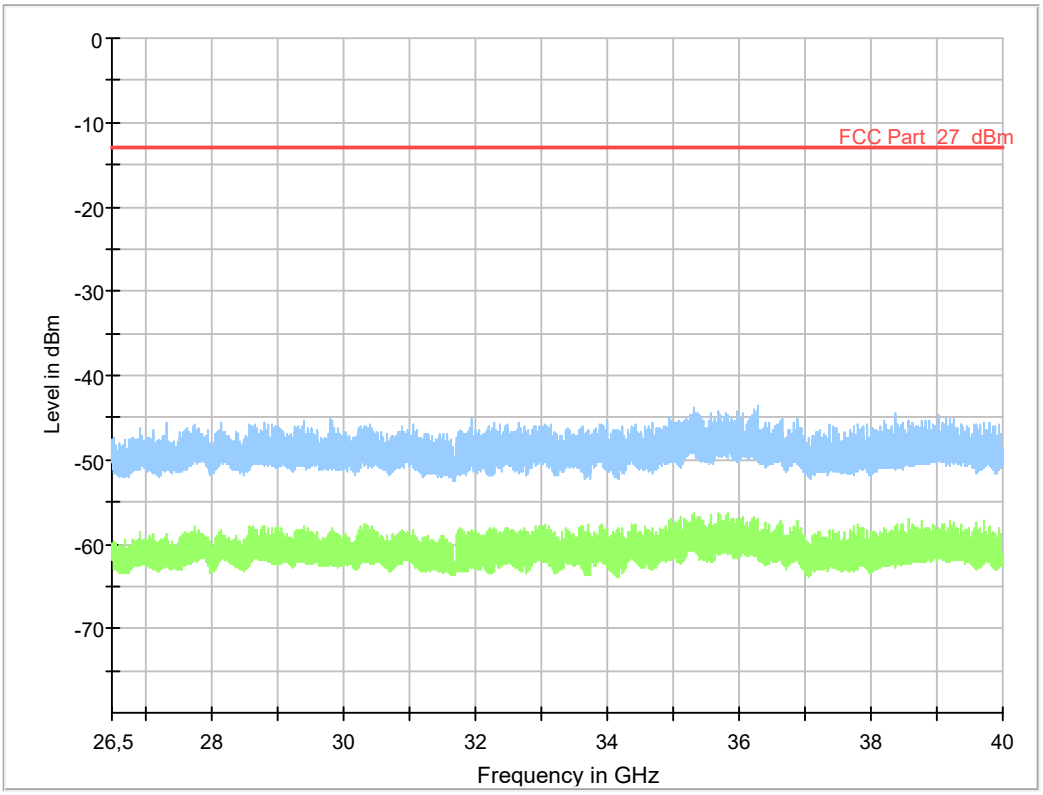


Diagram, Peak and average overview sweep, 26.5 – 40 GHz at 3 m distance.

Middle Channel

Measurement results, RMS

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



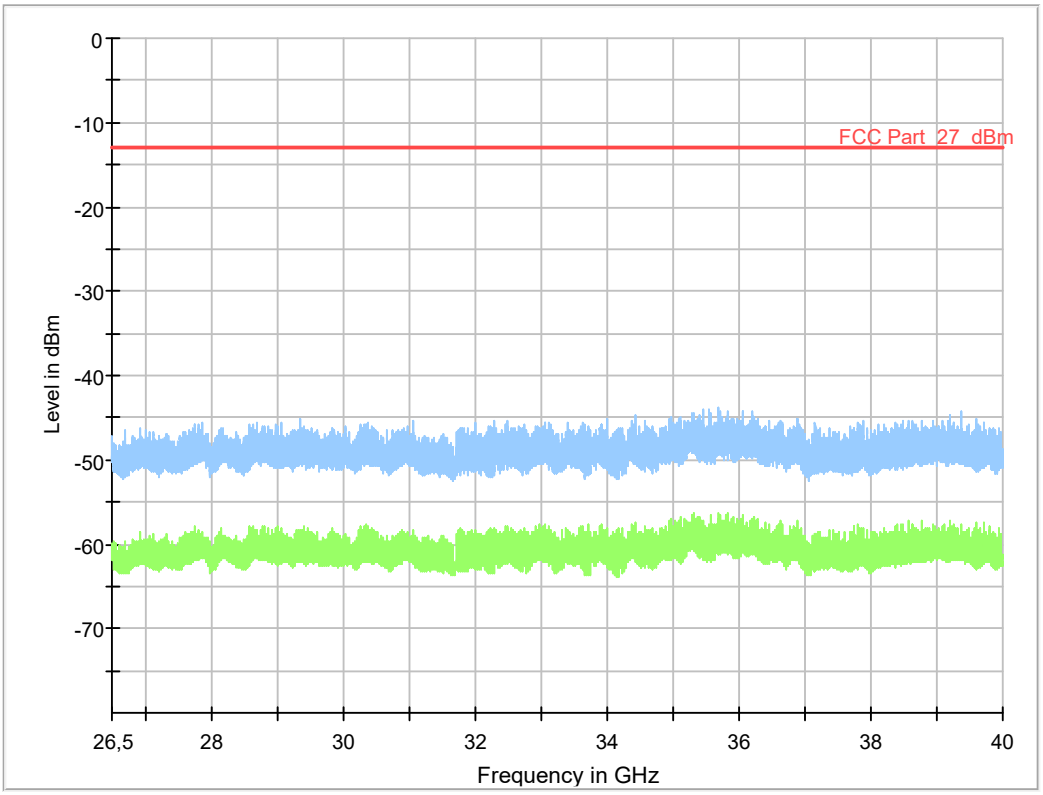
Diagram, Peak and average overview sweep, 26.5 – 40 GHz at 3 m distance.

Top channel

Measurement results, RMS

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

5.19 Test results, 26.5 – 40 GHz, Configuration 2

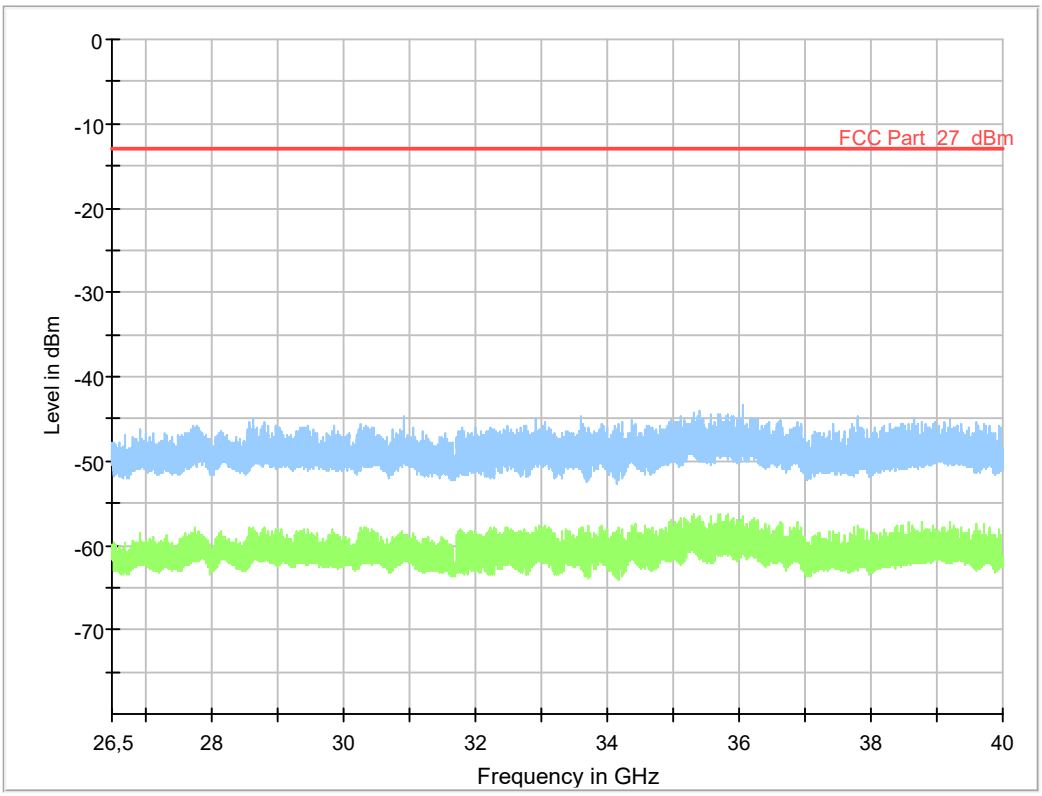


Diagram, Peak and average overview sweep, 26.5 – 40 GHz at 3 m distance.

Bottom Channel

Measurement results, RMS

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

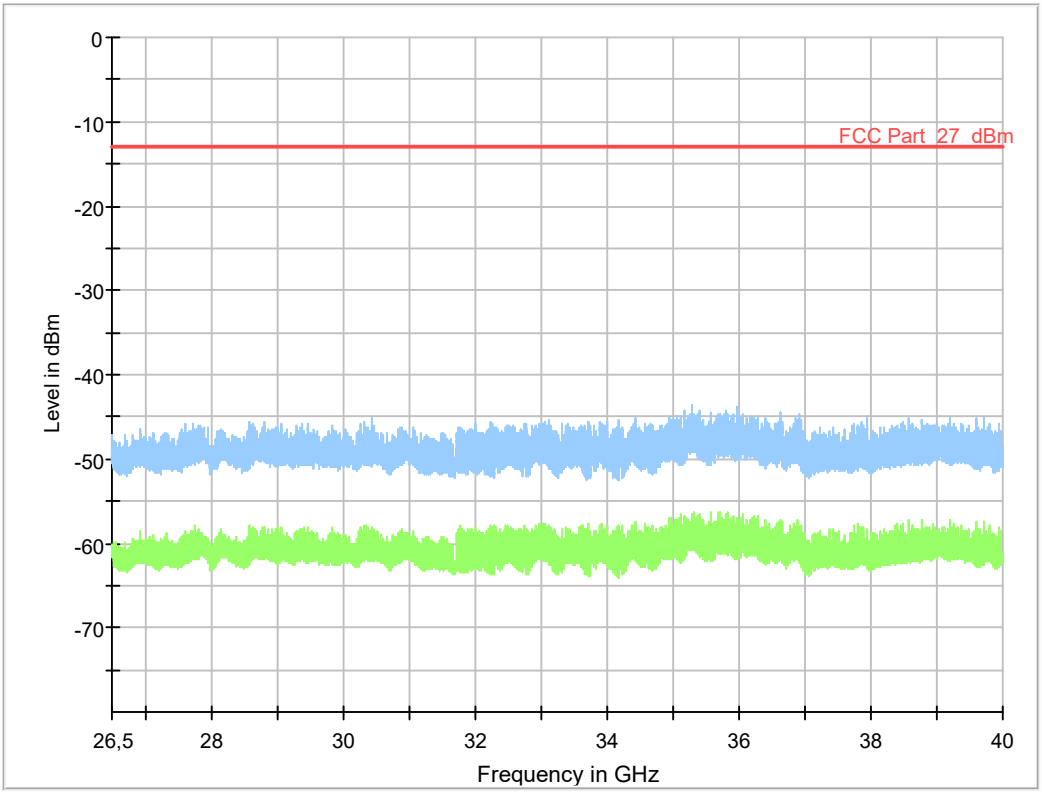


Diagram, Peak and average overview sweep, 26.5 – 40 GHz at 3 m distance.

Middle Channel

Measurement results, RMS

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



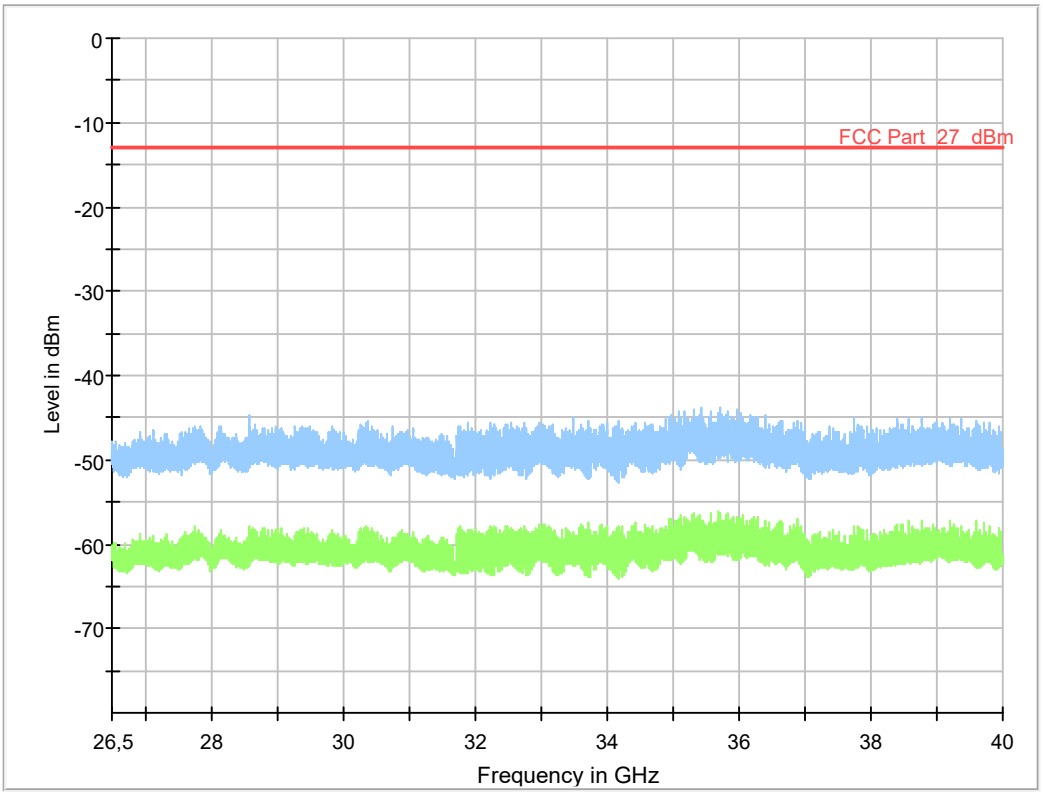
Diagram, Peak and average overview sweep, 26.5 – 40 GHz at 3 m distance.

Top Channel

Measurement results, RMS

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

5.21 Test results, 26.5 – 40 GHz, Configuration 3



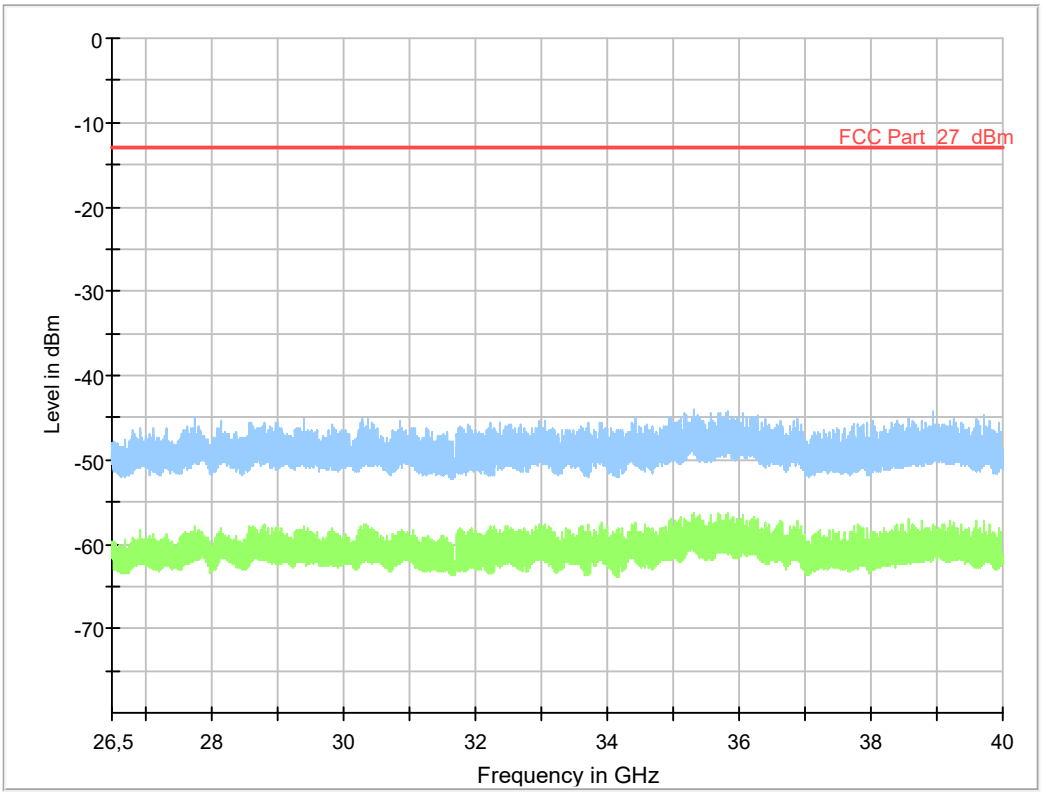
Diagram, Peak and average overview sweep, 26.5 – 40 GHz at 3 m distance.

Middle channel

Measurement results, RMS

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

5.23 Test results, 26.5 – 40 GHz, Configuration 4



Diagram, Peak and average overview sweep, 26.5 – 40 GHz at 3 m distance.

Middle channel

Measurement results, RMS

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

5.25 Test equipment

Equipment type	Manufacturer	Model	Inv. No.	Last Cal. date	Next Cal. date
Measurement software	Rohde & Schwarz	EMC32 – 10.50.40	--	--	--
Measurement Receiver	Rohde & Schwarz	ESW44	33950	2020-07-02	1 year
Antenna	Rohde & Schwarz	HL562	32310	2019-05-06	3 years
Measurement cable	Schuner	SUCOFLEX 104	39003	2020-09-22	1 year
Preamplifier	Rohde & Schwarz	TS-PRE1	39150	2020-09-22	1 year
Measurement cable	Rosenberger	JFB293C	39141 & 39142	2020-12-15	1 year
Horn antenna	Rohde & Schwarz	HF907	32296	2019-04-01	3 years
Horn antenna with Preamplifier	Bonn	BLMA 1826-5A	31247	2020-08-26	3 years
Horn antenna with Preamplifier	Bonn	BLMA 2640-5A	31248	2020-08-27	3 years
Measurement cable	Megaphase	GC12-K1K1-315	39128	2020-08-06	1 year

7. EUT SOFTWARE

Software Radio: CXP 203 0039/1 R50C22

8. EUT HARDWARE LIST

Product	Product No	R-State	Manufacturer	Serial Number
AIR 6449 B77D	KRD 901 206/2	R1F	Ericsson	E23C810761
SFP module	RDH 102 65/3	-	Source Photonics	J4M2006891
SFP module	RDH 102 65/3	-	WTD Crtuaeplaa	EB174200190002