PHOENIX TESTLAB
Königswinkel 10
32825 Blomberg
Germany
Phone: +49 (0) 52 35 95 00-0
Fax: +49 (0) 52 35 95 00-10

Test Report

Report Number: F133448E2

Applicant:

Hirschmann Automation and Control GmbH

Manufacturer:

Hirschmann Automation and Control GmbH

Equipment under Test (EUT):

EWLAN1

Laboratory accredited by
Deutsche Akkreditierungsstelle GmbH (DAkkS)
in compliance with DIN EN ISO/IEC 17025
under the Reg. No. D-PL-17186-01-02,
FCC Test site registration number 90877 and
Industry Canada Test site registration IC3469A-1

REFERENCES

[1] **ANSI C63.4-2009** American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

[2] **FCC CFR 47 Part 15 (September 2013)** Radio Frequency Devices

[3] **Publication Number 558074 (April 2013)** DTS Meas Guidance v03r01

[4] **RSS-210 Issue 8 (December 2010)** Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

[5] **RSS-Gen Issue 3 (December 2010)** General Requirements and Information for the Certification of Radiocommunication Equipment

[6] **Publication Number 662911 (May 2013)** Emission Testing of Transmitters with Multiple Outputs in the Same Band v02

TEST RESULT

The requirements of the tests performed as shown in the overview (clause 4) were fulfilled by the equipment under test.
The complete test results are presented in the following.

Test engineer:	Paul NEUFELD	P. Neufeld	17 September 2013
	Name	Signature	Date
Authorized reviewer:	Bernd STEINER	B. Steiner	17 September 2013
	Name	Signature	Date

RESERVATION

This test report is only valid in its original form.

The test results herein refer only to the tested sample. PHOENIX TESTLAB GmbH is not responsible for any generalisations or conclusions drawn from these test results concerning further samples. Any modification of the tested samples is prohibited and leads to the invalidity of this test report. Each page necessarily contains the PHOENIX TESTLAB Logo and the TEST REPORT NUMBER.

Contents: Page

1 IDENTIFICATION

1.1 Applicant

Name:	Hirschmann Automation and Control GmbH
Address:	Stuttgarter Straße 45-51, 72654 Neckartenzlingen
Country:	Germany
Name for contact purposes:	Robert BINDER
Phone:	+49 7127 14 1750
Fax:	+49 7127 14 1600
eMail Address:	robert.binder@belden.com
Applicant represented during the test by the following person:	-

1.2 Manufacturer

Name:	Hirschmann Automation and Control GmbH
Address:	Stuttgarter Straße 45-51, 72654 Neckartenzlingen
Country:	Germany
Name for contact purposes:	Robert BINDER
Phone:	+49 7127 14 1750
Fax:	+49 7127 14 1600
eMail Address:	robert.binder@belden.com
Applicant represented during the test by the following person:	-

1.3 Test laboratory

The tests were carried out at: **PHOENIX TESTLAB GmbH**
Königswinkel 10
32825 Blomberg
Germany

accredited by Deutsche Akkreditierungsstelle GmbH (DAkkS) in compliance with DIN EN ISO/IEC 17025 under the Reg. No. D-PL-17186-01-02, FCC Test site registration number 90877 and Industry Canada Test site registration IC3469A-1.

1.4 EUT (Equipment Under Test)

Test object: *	Wireless LAN Module
Type: *	EWLAN1
FCC ID: *	U99EWLAN1
IC: *	4019A-EWLAN1
Serial number: *	837599005030501094
PCB identifier: *	742386001 G03
Hardware version: *	Z03S06
Software version: *	HiLCOS 8.60.024

Channel 01	RX:	2412 MHz	TX:	2412 MHz
Channel 02	RX:	2417 MHz	TX:	2417 MHz
Channel 03	RX:	2422 MHz	TX:	2422 MHz
Channel 04	RX:	2427 MHz	TX:	2427 MHz
Channel 05	RX:	2432 MHz	TX:	2432 MHz
Channel 06	RX:	2437 MHz	TX:	2437 MHz
Channel 07	RX:	2442 MHz	TX:	2442 MHz
Channel 08	RX:	2447 MHz	TX:	2447 MHz
Channel 09	RX:	2452 MHz	TX:	2452 MHz
Channel 10	RX:	2457 MHz	TX:	2457 MHz
Channel 11	RX:	2462 MHz	TX:	2462 MHz
3	RX:	2422 MHz	TX:	2422 MHz
4	RX:	2427 MHz	TX:	2427 MHz
5	RX:	2432 MHz	TX:	2432 MHz
6	RX:	2437 MHz	TX:	2437 MHz
7	RX:	2442 MHz	TX:	2442 MHz
8	RX:	2447 MHz	TX:	2447 MHz
9	RX:	2452 MHz	TX:	2452 MHz

Channel 36	RX:	5180 MHz	TX:	5180 MHz
Channel 40	RX:	5200 MHz	TX:	5200 MHz
Channel 44	RX:	5220 MHz	TX:	5220 MHz
Channel 48	RX:	5240 MHz	TX:	5240 MHz
Channel 38	RX:	5190 MHz	TX:	5190 MHz
Channel 46	RX:	5230 MHz	TX:	5230 MHz

Channel 149	RX:	5745 MHz	TX:	5745 MHz
Channel 153	RX:	5765 MHz	TX:	5765 MHz
Channel 157	RX:	5785 MHz	TX:	5785 MHz
Channel 161	RX:	5805 MHz	TX:	5805 MHz
Channel 165	RX:	5825 MHz	TX:	5825 MHz
Channel 151	RX:	5755 MHz	TX:	5755 MHz
Channel 159	RX:	5795 MHz	TX:	5795 MHz

Fulfills WLAN specification: *	IEEE, 802.11b, 802.11g, 802.11n, 802.11a					
Antenna type: *	See Table 1					
Antenna gain: *	See Table 1					
Antenna connector: *	See Table 1					
Power supply - EUT	3.3 V & 1.18 V					
Power supply Host (type W)	U_{nom}=	24 V DC	U_{min}=	18 V DC	U_{max}=	36 V DC
Power supply Host (type C)	U_{nom}=	24 - 48 V DC	U_{min}=	18 V DC	U_{max}=	60 V DC
Power supply Host (type K)	U_{nom}=	60 - 250 V DC	U_{min}=	48 V DC	U_{max}=	320 V DC
	U_{nom}=	110 - 230 V AC 50 – 60 Hz	U_{min}=	88 V AC 47 – 63 Hz	U_{max}=	265 V AC 47 – 63 Hz
Type of modulation: *	802.11a:OFDM 802.11b: CCK, DQPSK, DBPSK 802.11g: OFDM 802.11n: OFDM					
Operating frequency range:*	2412 MHz to 2462 MHz, 5180 MHz to 5240 MHz, 5745 to 5825 MHz					
Number of channels: *	7					
Temperature range: *	-40 °C to +80 °C					
Lowest / highest Internal clock frequency: *	40 MHz					

* declared by the applicant.

Table 1 Antenna specifications

Antenna name	**Manufacturer**	**Type**	**Comment**	**Gain** [dBi]
BAT-ANT-N-3AGN-IP67	Joymax Electronics Co., Ltd.	Monopole	Connector: N male	2 @ 2,4 GHz 2 @ 5 GHz
BAT-ANT-RSMA-2AGN-R	Joymax Europe GbmH	Monopole	Connector: SMA Reverse male ,	3 @ 2,4 GHz 5 @ 5 GHz
BAT-ANT-N-MiMoDB-5N-IP65	Huber+Suhner	Patch Array	Connector: N male,	3.5 @ 2,4 GHz 5.5 @ 5 GHz
BAT-ANT-N-MiMo5-9N-IP65	Huber+Suhner	Patch	Connector: N male,	9 @ 5 GHz

The following external I/O cables were used:

Identification	Connector		Length
	EUT	Ancillary	
AC/DC Adapter	DC plug	-	2 m *
Ethernet cable	Ethernet plug	-	-
PCI Express cable	PCI Express plug	PCI Express plug	30 cm*[2]

*: Length during the test if no other specified.
*[2] Cable connects EUT and host device.

1.5 Dates

Date of receipt of test sample:	08 July 2013
Start of test:	08 July 2013
End of test:	31 July 2013

2 OPERATIONAL STATES

The equipment under test (EUT) is a WLAN module with a PCI express interface and 3 antenna ports. To set this module into operation it was connected to a Hirschmann Belden BAT-R Access Point via ribbon cable with a length of 30 cm.

The tests were carried out with an unmodified sample of the EUT. Parts of the tests were carried out conducted at the antenna ports. If these tests did not pass, the measurements were repeated as radiated tests, with the dedicated antennas attached.
Additionally a radiated measurement of the housing emission was performed while the antenna ports are terminated symmetrically by 50 Ω resistors.

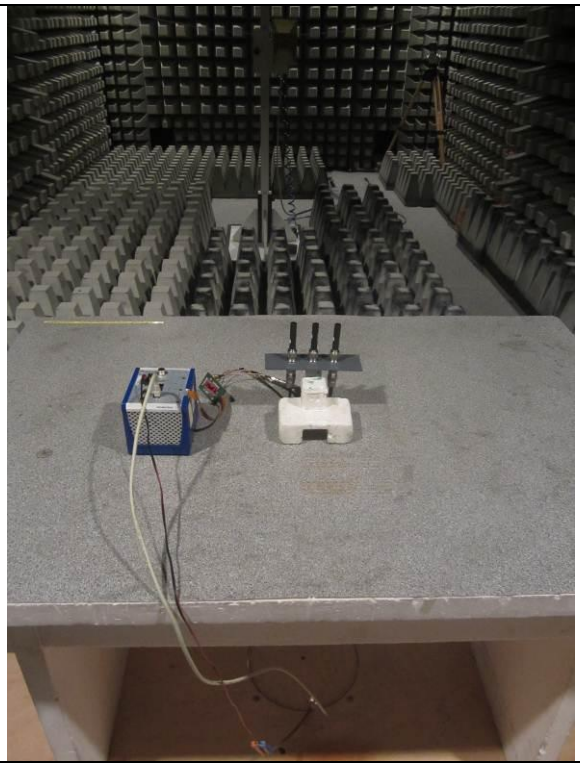
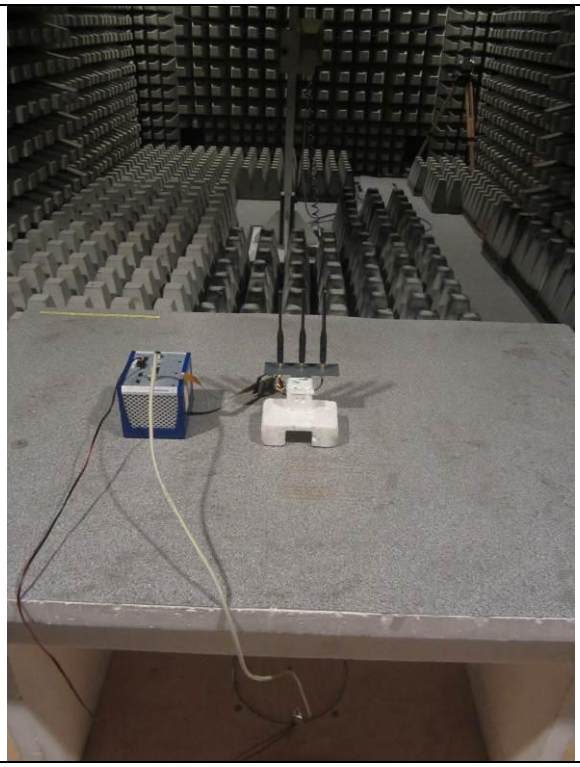
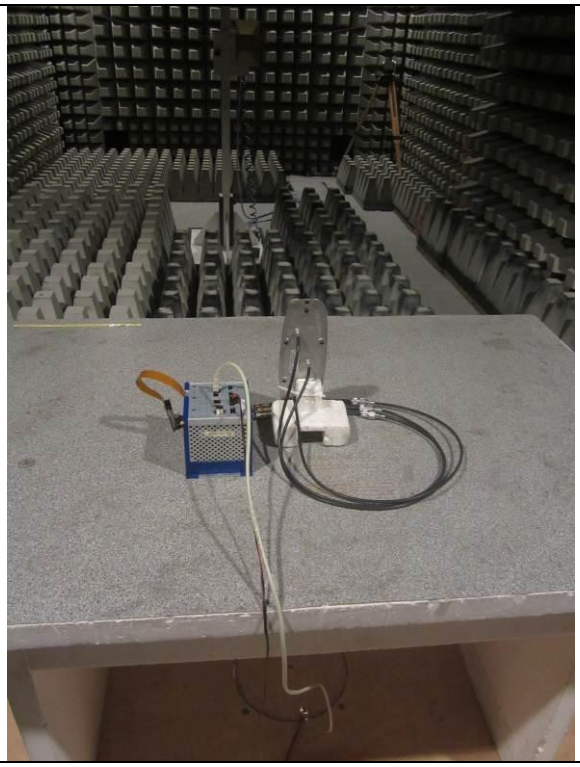
The BAT-R Access Point was connected via an Ethernet connection to a laptop computer. With a testsoftware running on the laptop the operation mode as seen in the table below could be chosen.

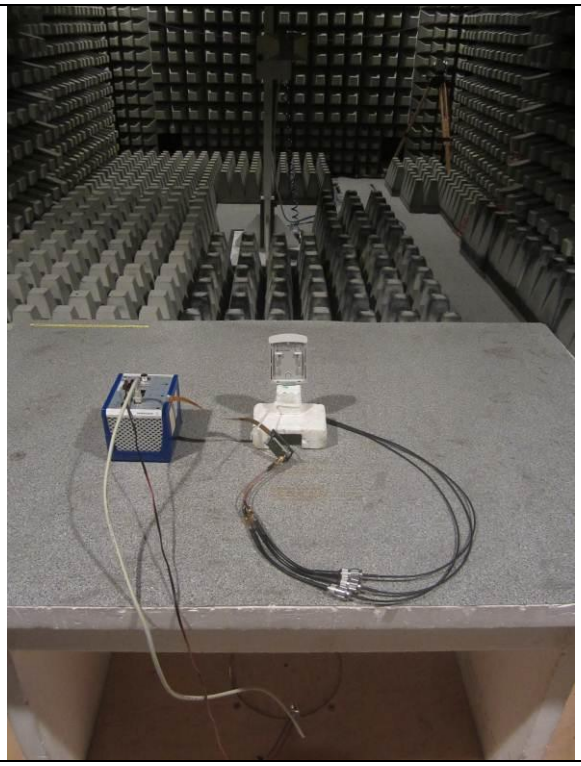
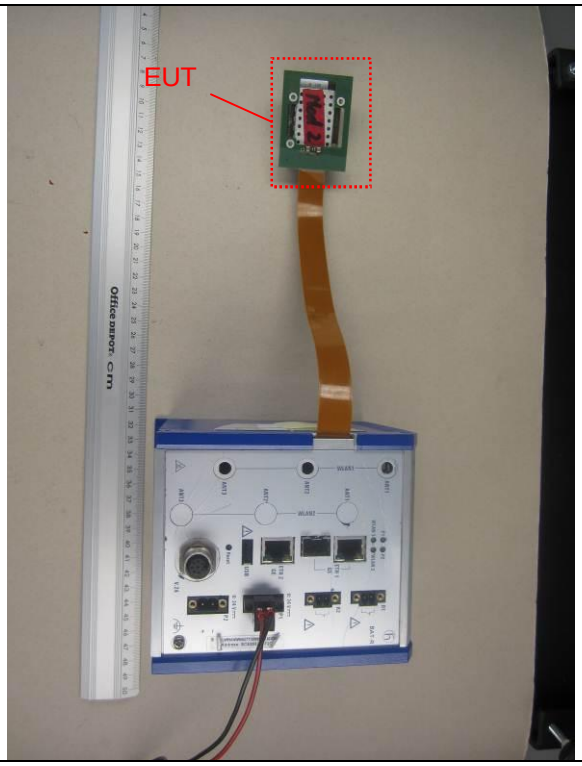
During the tests, the test samples were powered with 3.3 V and 1.28 V via PCI Express interface from the BAT-R Accesspoint. This Accesspoint was powered with 24 VDC from a laboratory power supply.

The following operation modes were identified as worst case condition and used during the tests:

Operation mode	Description of the operation mode	WLAN mode	WLAN channel	Modulation	Data rate / Mbps
1	Continuous transmitting on 5745 MHz	a	149	OFDM	6 MBit/s
2	Continuous transmitting on 5785 MHz	a	157	OFDM	6 MBit/s
3	Continuous transmitting on 5825 MHz	a	165	OFDM	6 MBit/s
4	Continuous transmitting on 5745 MHz	n 20 MHz	149	OFDM	6.5 MBit/s
5	Continuous transmitting on 5785 MHz	n 20 MHz	157	OFDM	6.5 MBit/s
6	Continuous transmitting on 5825 MHz	n 20 MHz	165	OFDM	6.5 MBit/s
7	Continuous transmitting on 5755 MHz	n 40 MHz	151	OFDM	13.5 MBit/s
8	Continuous transmitting on 5795 MHz	n 40 MHz	159	OFDM	13.5 MBit/s

Table 2 Worst case test setup

Pos. 1: Worst case Position for housing emission	Pos. 2: Worst case Position for Antenna BAT-ANT-N-3AGN-F
	
Pos. 3: Worst case Position for BAT-ANT-RSMA-2AGN-R	Pos. 4: Worst case Position for BAT-ANT-N-MiMoDB-5N-IP65
	

Pos. 5: Worst case Position for BAT-ANT-N-9A-DS-IP65	Figure 1: Identification of the EUT
	

Preliminary tests were performed to find worst-case configuration and position. The radiated emission measurements were carried out in the orthogonal direction that emits the highest spurious emission levels.

The orthogonal directions with the highest emissions are shown in Table 2.

The following test modes were adjusted during the tests:

Test items	Operation mode
Maximum Peak Output Power	1 - 8
DTS Bandwidth	1 - 8
Peak Power Spectral Density	1 - 8
Band Edge Compliance	1, 3, 4, 6, 7, 8
Maximum Unwanted Emissions	1 - 8

3 ADDITIONAL INFORMATION

The country profile, used for the measurement, was “FCC-United-States”. No power reductions were set for the tests.

The setting for antenna gain was set to 0 in all tests.

4 Overview

Application	Frequency range [MHz]	FCC 47 CFR Part 15 section [2]	RSS 210, Issue 8 [4] or RSS-Gen, Issue 3 [5]	Status	Refer page
Maximum Peak Output Power	5725 - 5825	15.247 (b) (3), (4)	A8.4 (4) [4]	Passed	12 et seq
DTS Bandwidth	5725 – 5825	15.247 (a) (2)	A8.2 (a) [4]	Passed	14 et seq
Peak Power Spectral Density	5725 – 5825	15.247 (e)	A8.2 (b) [4]	Passed	18 et seq
Band-Edge compliance	5725 - 5825	15.247 (d)	A8.5 [4]	Passed	22 et seq.
Radiated emissions (transmitter)	0.009 - 40,000	15.247 (d) 15.205 (a) 15.209 (a)	7.2.2 [5], 2.5 [4]	Passed	26 et seq.
Conducted emissions on supply line	0.15 - 30	15.207 (a)	7.2.4 [5]	Passed	88 et seq.

5 TEST RESULTS

5.1 Maximum Peak Output Power

5.1.1 Method of measurement

The EUT has to be connected to the power meter via a low loss cable.

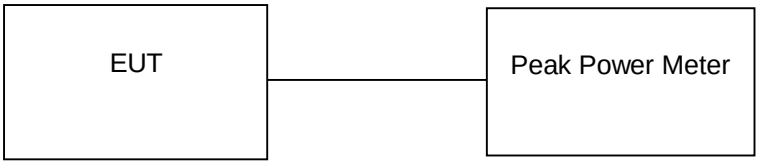
Acceptable measurement configurations

The measurement procedures described herein are based on the use of an antenna-port conducted test configuration.

PKPM1 – Peak power meter method was used for this test. The procedure is described in chapter 9.1.3 of document [3].

The measurement was performed at the upper and lower end and the middle of the assigned frequency band.

Test set-up:



5.1.2 Test results

Ambient temperature	22 °C

Relative humidity	62 %

The highest array gain is given for the BAT-ANT-N-MiMoDB-5N-IP65 antenna, which has a gain of 5.5. dBi, which results in an array gain of 10.3 dBi. Therefore the Peak power limit is reduced by 4.3 dB.

Operation Mode	Antenna gain combined [dBi]	Maximum peak output power – port1 [dBm]	Maximum peak output power – port2 [dBm]]	Maximum peak output power – port3 [dBm]	Maximum peak output power – sum (all ports) [dBm]	Margin [dB]	Peak power limit [dBm]
1	10.3	9.8	8.0	8.3	13.5	12.2	25.7
2	10.3	8.1	6.9	6.6	12.0	13.7	25.7
3	10.3	10.0	8.4	8.8	13.9	11.8	25.7
4	10.3	14.2	12.9	13.0	18.2	7.5	25.7
5	10.3	14.9	13.6	13.8	18.9	6.8	25.7
6	10.3	13.4	12.2	12.4	17.5	8.2	25.7
7	10.3	14.3	12.2	12.4	17.9	7.8	25.7
8	10.3	14.6	12.9	13.3	18.5	7.2	25.7
Measurement uncertainty			+0.66 dB / -0.72 dB				

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:

60, 61

5.2 DTS Bandwidth

5.2.1 Method of measurement

The relating measurements were carried out in a conducting manner. Therefore, the antenna connector was directly connected to a spectrum analyser. The measurement procedure refers to part 8.1 of document [3].

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) ≥ 3 x RBW.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

The measurements were carried out at each antenna port separately.

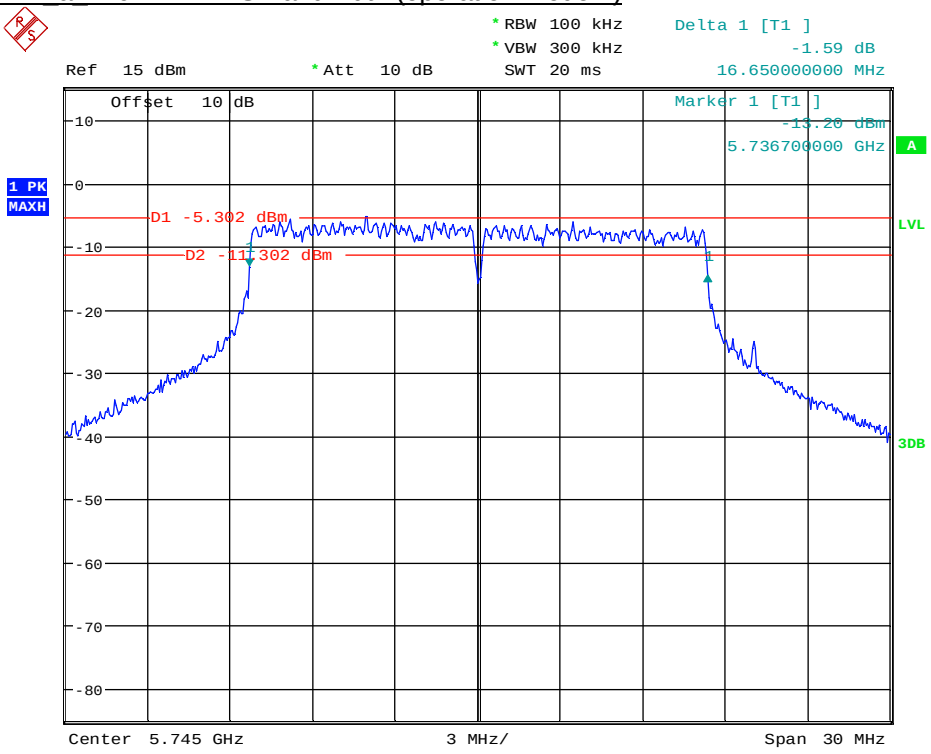
5.2.2 Test result

5.2.2.1 Antenna Port 1

Ambient temperature	22 °C	Relative humidity	61 %

The following results were measured at antenna port 1 of the EUT. The plot shows an exemplary measurement result for the worst documented case. The other results are listed in the following table.

130254_6dB-BW_a_149.wmf: DTS Bandwidth (operation mode 1)



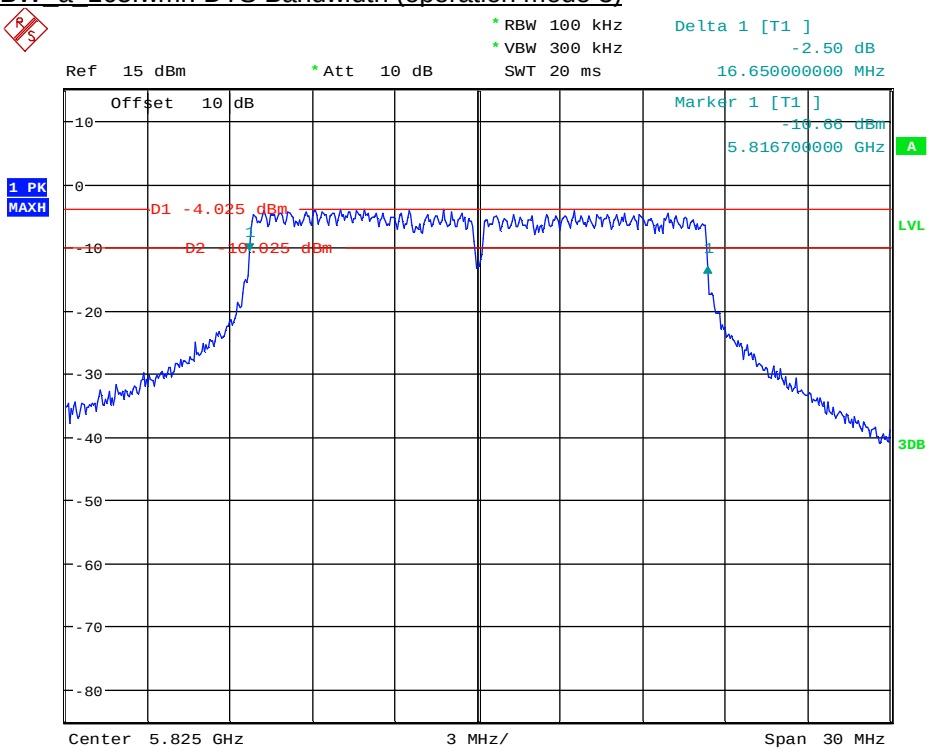
Operation Mode	Center Frequency [MHz]	Minimum 6-dB Bandwidth Limit [MHz]	6 dB Bandwidth [MHz]	Result
1	5745	0.5	16.650	Passed
2	5785	0.5	16.700	Passed
3	5825	0.5	16.650	Passed
4	5745	0.5	17.900	Passed
5	5785	0.5	17.850	Passed
6	5825	0.5	17.900	Passed
7	5755	0.5	36.550	Passed
8	5795	0.5	36.700	Passed
Measurement uncertainty		+0.66 dB / -0.72 dB		

5.2.2.2 Antenna Port 2

Ambient temperature	22 °C	Relative humidity	59 %

The following results were measured at antenna port 2 of the EUT. The plot shows an exemplary measurement result for the worst documented case. The other results are listed in the following table.

130254_6dB-BW_a_165.wmf: DTS Bandwidth (operation mode 3)



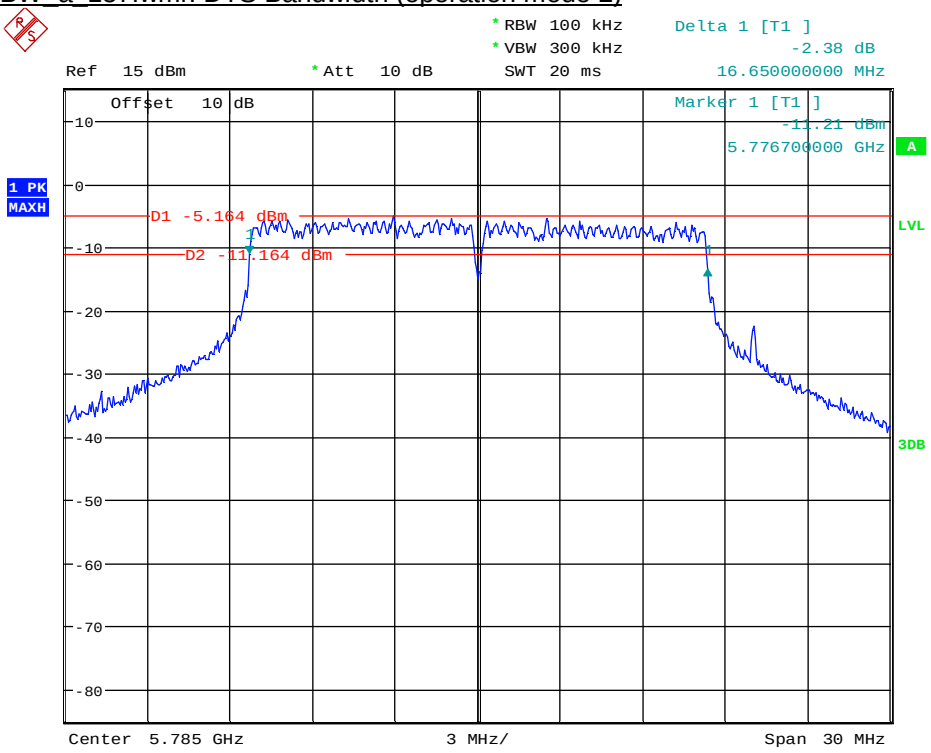
Operation Mode	Center Frequency [MHz]	Minimum 6-dB Bandwidth Limit [MHz]	6 dB Bandwidth [MHz]	Result
1	5745	0.5	16.650	Passed
2	5785	0.5	16.650	Passed
3	5825	0.5	16.650	Passed
4	5745	0.5	17.950	Passed
5	5785	0.5	17.950	Passed
6	5825	0.5	16.650	Passed
7	5755	0.5	36.600	Passed
8	5795	0.5	36.600	Passed
Measurement uncertainty		+0.66 dB / -0.72 dB		

5.2.2.3 Antenna Port 3

Ambient temperature	21 °C	Relative humidity	63 %

The following results were measured at antenna port 3 of the EUT. The plot shows an exemplary measurement result for the worst documented case. The other results are listed in the following table.

130254_6dB-BW_a_157.wmf: DTS Bandwidth (operation mode 2)



Operation Mode	Center Frequency [MHz]	Minimum 6-dB Bandwidth Limit [MHz]	6 dB Bandwidth [MHz]	Result
1	5745	0.5	16.600	Passed
2	5785	0.5	16.650	Passed
3	5825	0.5	16.650	Passed
4	5745	0.5	17.950	Passed
5	5785	0.5	17.900	Passed
6	5825	0.5	17.900	Passed
7	5755	0.5	36.700	Passed
8	5795	0.5	36.700	Passed
Measurement uncertainty		+0.66 dB / -0.72 dB		

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:

30

5.3 Peak Power Spectral Density

5.3.1 Method of measurement

The relating measurements were carried out in a conducting manner. Therefore, the antenna connector was directly connected to a spectrum analyser. The measurement procedure refers to part 10.2 of document [3].

- Set analyzer center frequency to DTS channel center frequency
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
- Set the VBW ≥ 3 x RBW.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

The measurements were carried out at each antenna port separately.

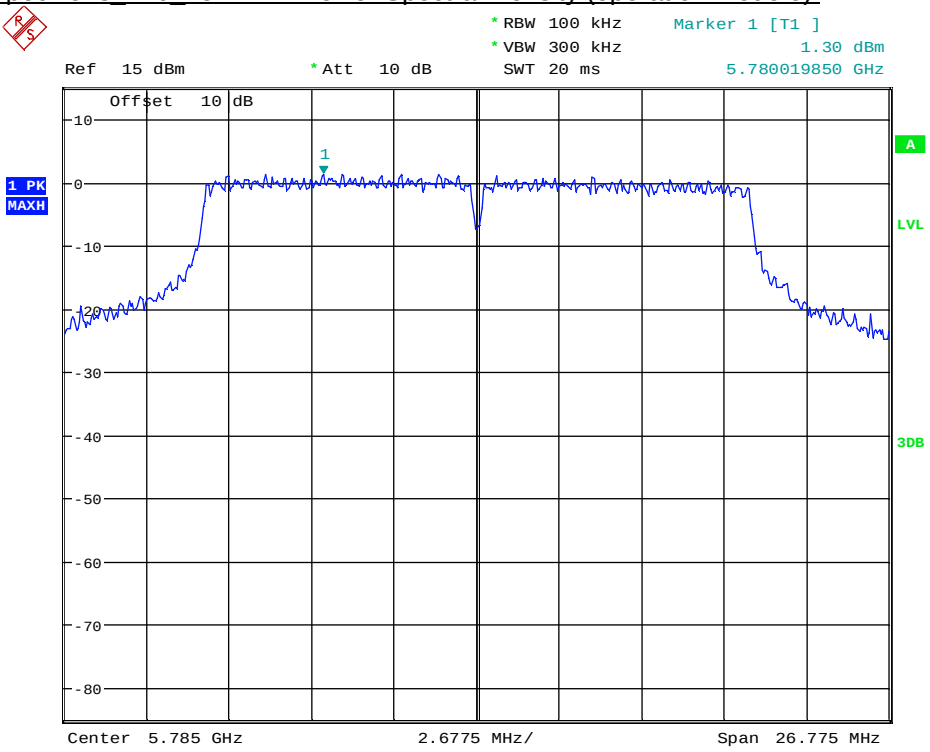
5.3.2 Test result

5.3.2.1 Antenna Port 1

Ambient temperature	22 °C	Relative humidity	61 %

The following results were measured at antenna port 1 of the EUT. The plot shows an exemplary measurement result for the worst documented case. The other results are listed in the following table. The array sum for 3 antenna ports is an addition of 4.8 dB.

130254_PwrSpecDens_n20_157.wmf: Power Spectral Density (operation mode 5):



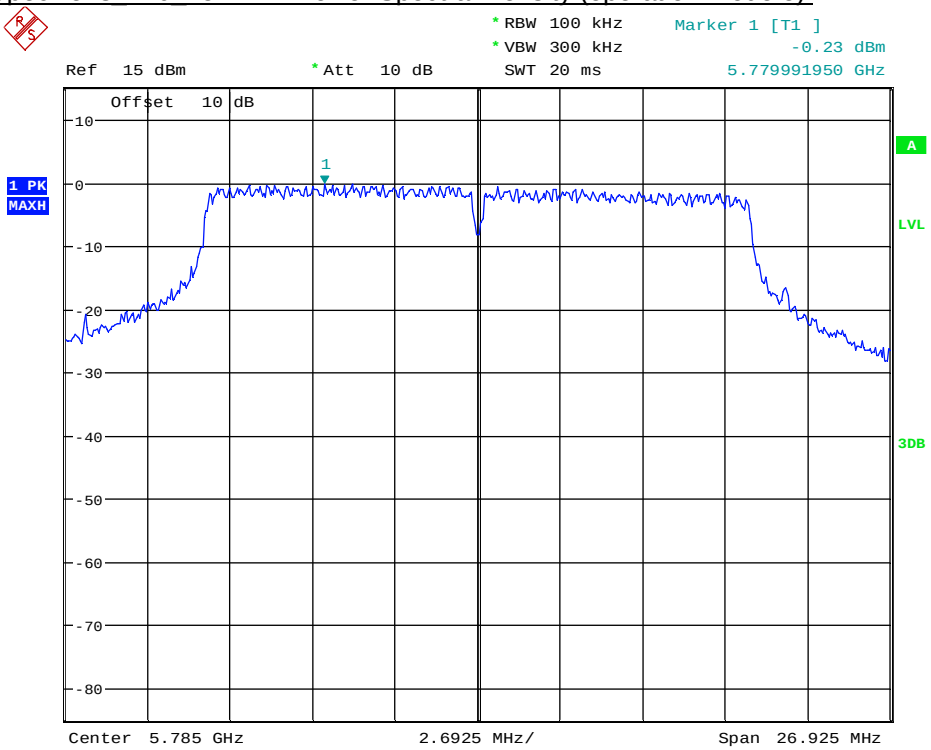
Operation Mode	Peak Frequency [MHz]	Power Spectral Density Limit [dBm]	Power Spectral Density Reading [dBm]	Array Gain [dB]	Power Spectral Density Level [dBm]	Margin [dB]	Result
1	5740.305	8	-6.8	4.8	-2.0	10.0	Passed
2	5777.836	8	-3.1	4.8	1.7	6.3	Passed
3	5824.051	8	-3.0	4.8	1.8	6.2	Passed
4	5740.006	8	-0.3	4.8	4.5	3.5	Passed
5	5780.020	8	1.3	4.8	6.1	1.9	Passed
6	5820.006	8	-0.6	4.8	4.2	3.8	Passed
7	5741.892	8	-4.7	4.8	0.1	7.9	Passed
8	5787.493	8	-1.3	4.8	3.5	4.5	Passed
Measurement uncertainty			+0.66 dB / -0.72 dB				

5.3.2.2 Antenna Port 2

Ambient temperature	22 °C	Relative humidity	59 %

The following results were measured at antenna port 2 of the EUT. The plot shows an exemplary measurement result for the worst documented case. The other results are listed in the following table. The array sum for 3 antenna ports is an addition of 4.8 dB.

130254_PwrSpecDens_n20_157.wmf:Power Spectral Density (operation mode 5):



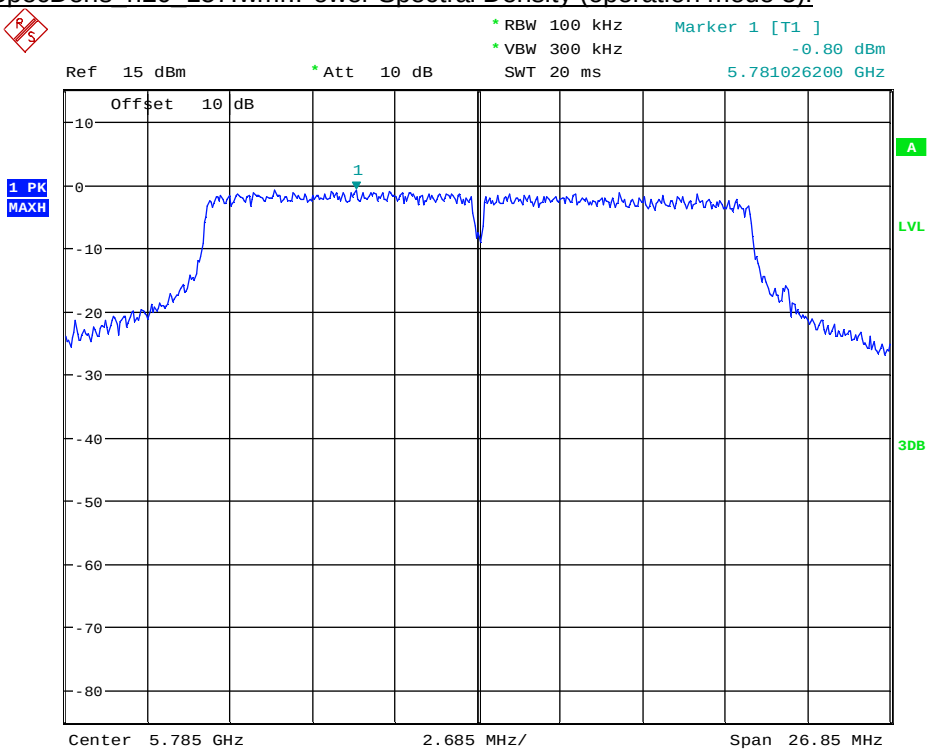
Operation Mode	Peak Frequency [MHz]	Power Spectral Density Limit [dBm]	Power Spectral Density Reading [dBm]	Array Gain [dB]	Power Spectral Density Level [dBm]	Margin [dB]	Result
1	5739.705	8	-4.8	4.8	0.0	8.0	Passed
2	5778.107	8	-5.7	4.8	-0.9	8.9	Passed
3	5817.857	8	-4.2	4.8	0.6	7.4	Passed
4	5739.992	8	-3.3	4.8	1.5	6.5	Passed
5	5779.992	8	-0.2	4.8	4.6	3.4	Passed
6	5820.405	8	-4.3	4.8	0.5	7.5	Passed
7	5740.027	8	-3.8	4.8	1.0	7.0	Passed
8	5780.277	8	-4.0	4.8	0.8	7.2	Passed
Measurement uncertainty			+0.66 dB / -0.72 dB				

5.3.2.3 Antenna Port 3

Ambient temperature	21 °C	Relative humidity	63 %

The following results were measured at antenna port 3 of the EUT. The plot shows an exemplary measurement result for the worst documented case. The other results are listed in the following table. The array sum for 3 antenna ports is an addition of 4.8 dB.

130254_PwrSpecDens_n20_157.wmf:Power Spectral Density (operation mode 5):



Operation Mode	Peak Frequency [MHz]	Power Spectral Density Limit [dBm]	Power Spectral Density Reading [dBm]	Array Gain [dB]	Power Spectral Density Level [dBm]	Margin [dB]	Result
1	5740.618	8	-4.6	4.8	0.2	7.8	Passed
2	5779.056	8	-5.0	4.8	-0.2	8.2	Passed
3	5816.908	8	-4.1	4.8	0.7	7.3	Passed
4	5741.554	8	-0.9	4.8	3.9	4.1	Passed
5	5781.026	8	-0.8	4.8	4.0	4.0	Passed
6	5818.502	8	-3.0	4.8	1.8	6.3	Passed
7	5742.138	8	-4.8	4.8	0.0	8.0	Passed
8	5780.237	8	-3.4	4.8	1.4	6.6	Passed
Measurement uncertainty			+0.66 dB / -0.72 dB				

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:

30

5.4 Band-Edge compliance

5.4.1 Method of measurement (band edges next to unrestricted bands (conducted))

The relating measurements were carried out in a conducting manner. Therefore, the antenna connector was directly connected to a spectrum analyser. The measurement procedure refers to part 11.2 and 11.3 of the 558074 D01 DTS Meas Guidance v.03r01.

Measurement Procedure Reference – Reference Level:

- RBW = 100 kHz.
- VBW ≥ 300 kHz.
- Set the span to ≥ 1.5 times the DTS Bandwidth.
- Detector = Peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the the maximum PSD level.

Measurement Procedure – Unwanted Emissions

- Set the center frequency and span to encompass the frequency range to be measured.
- RBW = 100 kHz.
- VBW ≥ 300 kHz.
- Detector = Peak.
- Ensure that the number of measurement points ≥ span/RBW.
- Sweep time = auto couple.
- Trace Mode = max hold.
- Allow the trace to stabilize.
- Use the peak marker function to determine the maximum amplitude level.

The measurement procedure at the band edges was simplified by performing the measurement in just one plot. Both, the in-band-emission and the unwanted emission were be encompassed by the span. After trace stabilization, the maximum peak was be determined by a peak detector and the value was marked by an appropriate limit line. The second limit line, which is 20 dB below the first, marks the limit for the emissions in the unrestricted band. A maximum-peak-detector marks the highest emission in the unrestricted band next to the band edge.

The measurements were performed at the lower end of the 2.4 GHz band.

The measurements were carried out at each antenna port separately.

5.4.2 Test result (band edges next to unrestricted bands (conducted))

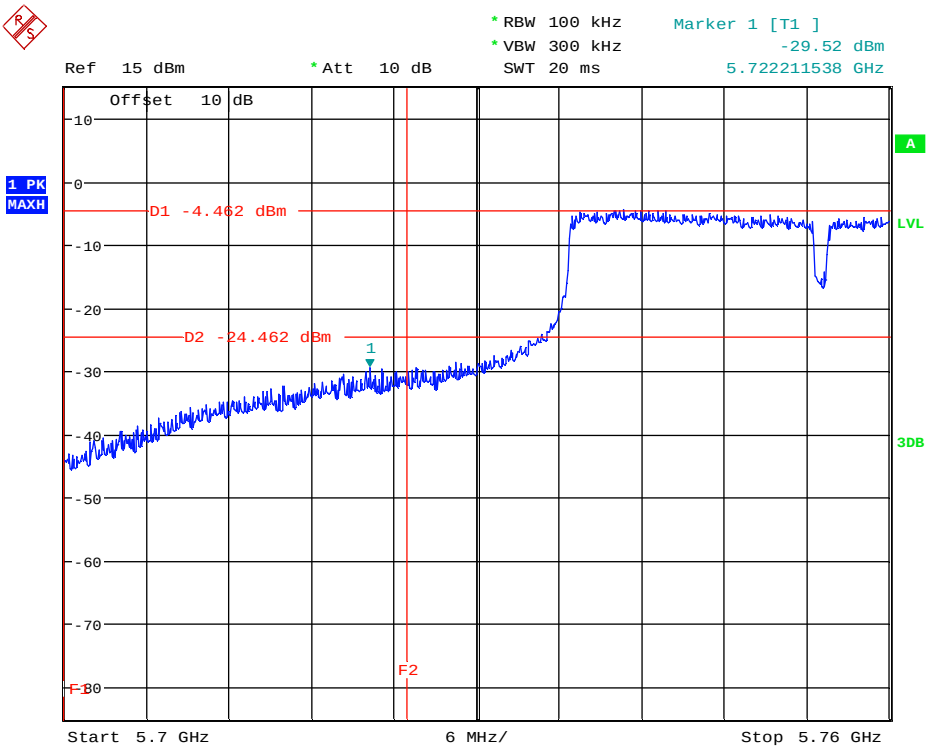
5.4.2.1 Antenna port 1

Ambient temperature	22 °C

Relative humidity	61 %

The following results were measured at antenna port 1 of the EUT. The plot shows an exemplary measurement result for the worst documented case. The other results are listed in the following table.

130254_BandEdgeUnrestr_n40_149.wmf: conducted band-edge compliance (operation mode 7):



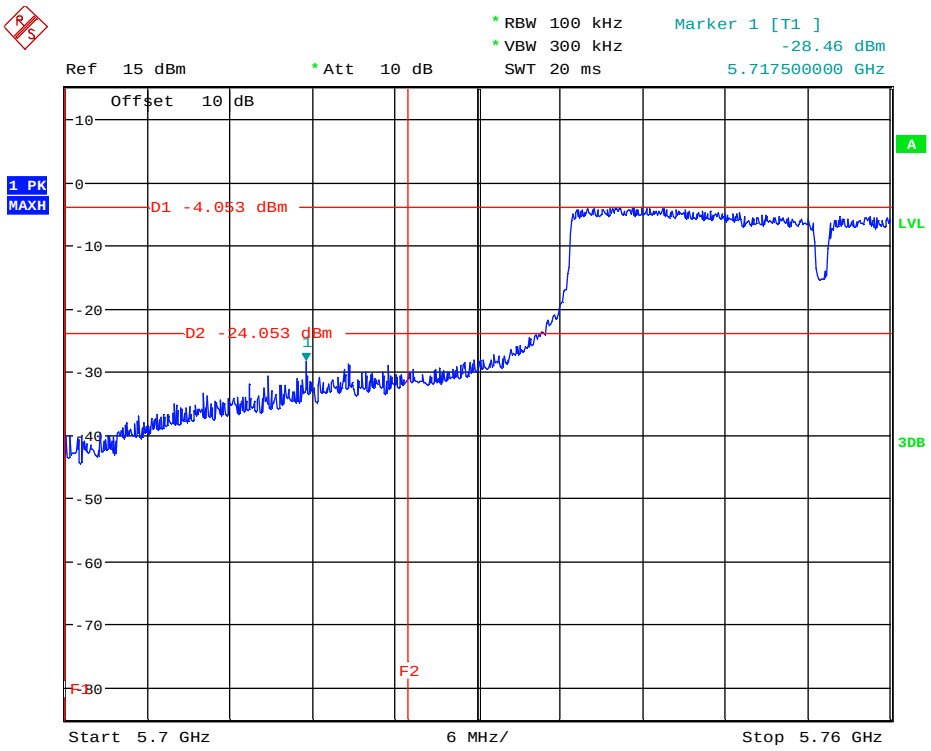
Operation mode	WLAN channel	WLAN mode	Band-Edge	Reference Level dBm	Limit dBm	Unwanted Emission Frequency MHz	Unwanted Emission Value dBm	Margin dB
1	149	a	low	-6.21	-26.21	5725.000	-47.17	20.96
3	165	a	up	-3.23	-23.23	5854.087	-54.92	31.69
4	149	n20	low	-0.86	-20.86	5725.000	-27.85	7.00
6	165	n20	up	-0.76	-20.76	5853.189	-40.75	20.00
7	151	n40	low	-4.46	-24.46	5722.212	-29.52	5.06
8	159	n40	up	-3.72	-23.72	5851.058	-45.73	22

5.4.2.2 Antenna port 2

Ambient temperature	22 °C	Relative humidity	59 %

The following results were measured at antenna port 2 of the EUT. The plot shows an exemplary measurement result for the worst documented case. The other results are listed in the following table.

130254_BandEdgeUnrestr_n40_149.wmf: conducted band-edge compliance (operation mode 7):



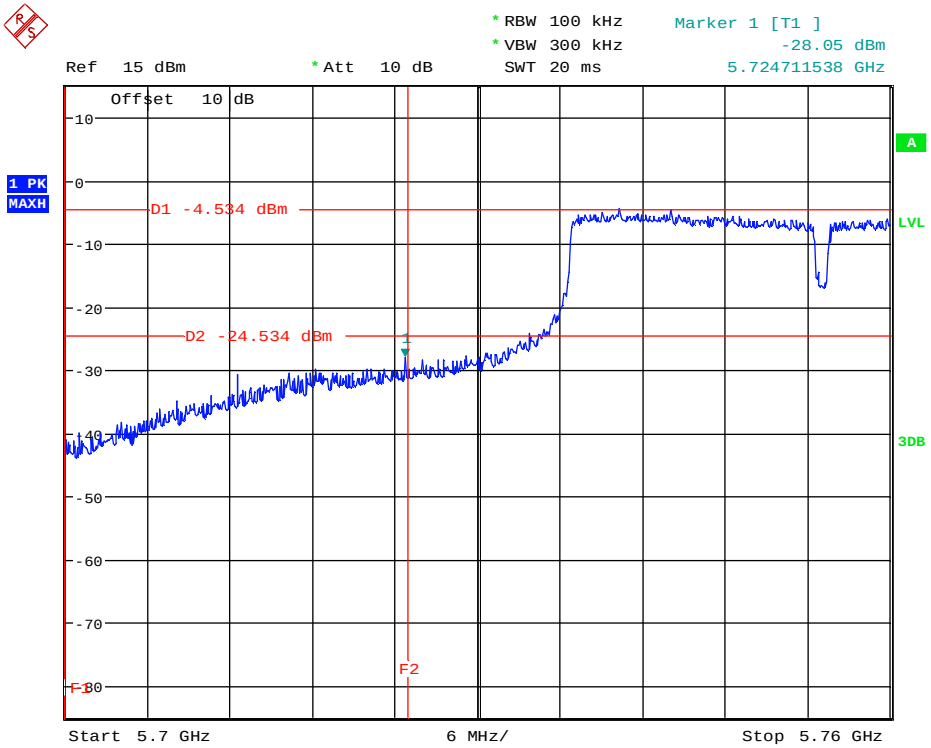
Operation mode	WLAN channel	WLAN mode	Band-Edge	Reference Level dBm	Limit dBm	Unwanted Emission Frequency MHz	Unwanted Emission Value dBm	Margin dB
1	149	a	low	-5.17	-25.17	5725.000	-48.97	23.80
3	165	a	up	-4.14	-24.14	5851.282	-47.30	23.17
4	149	n20	low	-3.89	-23.89	5725.000	-38.02	14.12
6	165	n20	up	-3.36	-23.36	5850.048	-42.39	19.03
7	149	n40	low	-4.05	-24.05	5717.500	-28.46	4.41
8	159	n40	up	-6.30	-26.30	5857.564	-49.62	23.32

5.4.2.3 Antenna port 3

Ambient temperature	21 °C	Relative humidity	63 %

The following results were measured at antenna port 2 of the EUT. The plot shows an exemplary measurement result for the worst documented case. The other results are listed in the following table.

130254_BandEdgeUnrestr_n40_149.wmf: conducted band-edge compliance (operation mode 7):



Operation mode	WLAN channel	WLAN mode	Band-Edge	Reference Level dBm	Limit dBm	Unwanted Emission Frequency MHz	Unwanted Emission Value dBm	Margin dB
1	149	a	low	-5.0	-25.0	5725.000	-40.8	15.8
3	165	a	up	-4.5	-24.5	5850.721	-47.9	23.3
4	149	n20	low	-1.6	-21.6	5725.000	-29.4	7.9
6	165	n20	up	-2.6	-22.6	5850.272	-39.9	17.3
7	149	n40	low	-4.5	-24.5	5724.712	-28.1	3.5
8	159	n40	up	-1.24	-21.24	5857.564	-45.15	23.91

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:
30

5.5 Maximum unwanted emissions

5.5.1 Method of measurement (conducted emissions in the restricted bands)

The relating measurements were carried out in a conducting manner. Therefore, the antenna connector was directly mounted to a spectrum analyser. The measurement procedure refers to part 12.2 D01 DTS Meas Guidance v03r01.

If emissions were detected during the preliminary measurements, they were measured using the following measurement procedures:

Procedure for average measurement: 12.2.5.1 – Trace averaging with continuous EUT transmission at full power:

The following method is valid if the EUT transmits continuously (duty cycle ≥ 98%)

- Set the RBW = 1 MHz.
- Set the VBW ≥ 3 x RBW.
- Detector = power average (RMS).
- Ensure that the number of measurement points in the sweep to ≥ 2 x (span/RBW).
- Averaging type = power
- Sweep time = auto
- Perform a trace average of at least 100 traces

Peak measurement procedure: 12.2.4

- Set the analyzer span to encompass the entire unwanted emission bandwidth.
- Set the RBW = specified in Table 3.
- Set the VBW ≥ RBW.
- Set sweep time = auto.
- Detector = peak.
- Trace mode = max hold.
- Allow the trace to stabilize.
- Use the peak marker function to determine the peak power over the emission bandwidth.

Table 3 RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

The measurements were carried out at each antenna port.

5.5.1.1 Limit calculations

The following general procedure is described in chapter 12.2.2 of the D01 DTS Meas Guidance v03r01.

a) Measure the conducted output power (in dBm) using the procedures described in 5.5.1.
b) Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level
c) Add the appropriate maximum ground reflections factor to the EIRP level (6 dB for frequencies ≤, 30 MHz, 4.7 for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz)
d) For devices with multiple antenna ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW)
e) Convert the resultant level to an equivalent electric field strength using the following relationships:

$$E. = EIRP - 20\log(d) + 104.8 \qquad (1)$$

Where:

E. = electric field strength, in dBμV/m
EIRP = equivalent isotropic radiated power, in dBm
d = specified measurement distance, in meters

f) Compare the resultant electric field strength to the applicable limit

Document [6] states, that for transmitters with multiple outputs in the same band, summing of emissions and accounting for array gain have to be considered.

For combining emissions from multiple outputs, the spurious emissions at each output have to be measured and 10log(N) has to be added to the resulting value, whereby N refers to the number of outputs.

To account for directional gain which might occur in case of N transmit antennas, the directional has to be calculated as

$$G_{Dir} = G_{Ant} + 10\log(N)dBi\,,$$

whereby N is the number of antennas.

For the actual EUT the highest combination of antenna gain and used number of ports results in an additional value, added to the conducted spurious emission level, of 15 dB. Whereby the antenna has a gain of 5.5 dBi and the number of used ports is 3.

5.5.2 Method of measurement (conducted emissions in the unrestricted bands)

In any 100 kHz outside the authorized frequency band, the power shall be attenuated by 20 dB, compared to the highest in band power in any 100 kHz. This shall be demonstrated by using the peak power procedure. The reference level shall be measured using the procedure described in 5.5.2.1 and the emission level according to procedure 5.5.2.2.

5.5.2.1 Reference level measurement

a) Set instrument center frequency to DTS channel center frequency.
b) Set the span to ≥ 1.5 times the DTS bandwidth.
c) Set the RBW = 100 kHz.
d) Set the VBW ≥ 3 x RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.+
i) Use the peak marker function to determine the maximum PSD level.

5.5.2.2 Emission level measurement

a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ 3 x RBW.
d) Detector = peak.
e) Ensure that the number of measurement points ≥ span/RBW
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level.

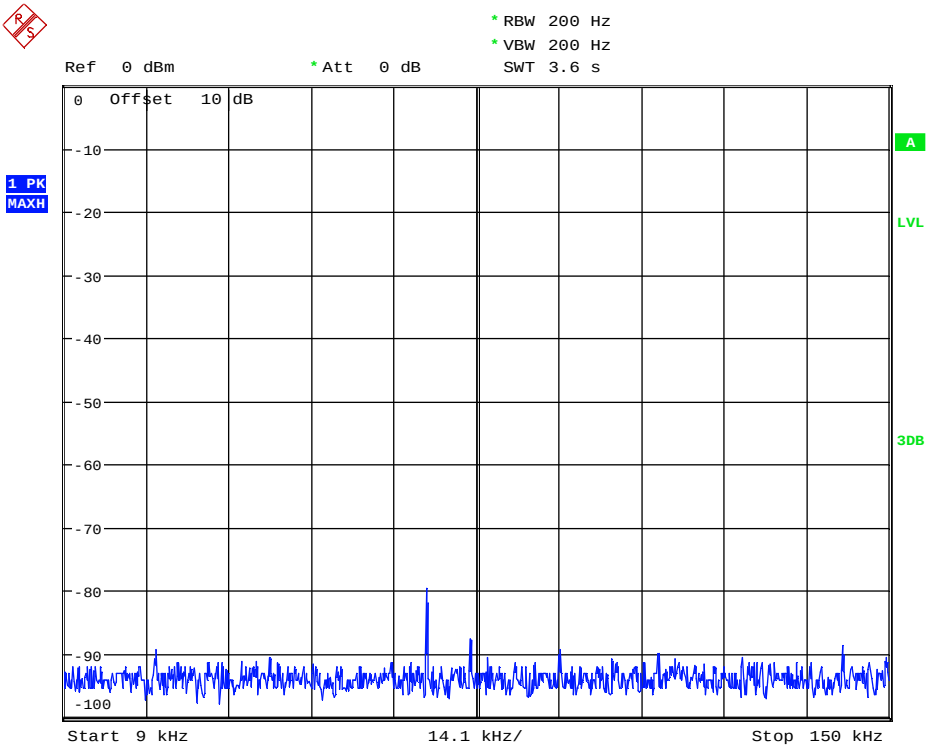
5.5.3 Test results (conducted emissions)

5.5.3.1 Emissions below 1 GHz

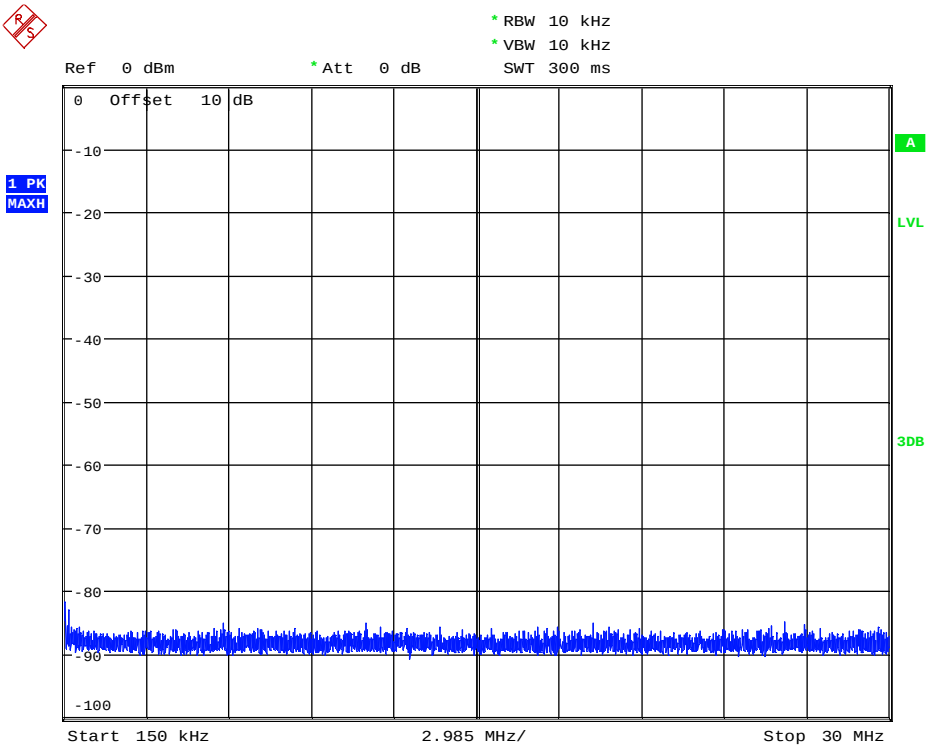
Ambient temperature	22 °C	Relative humidity	59 %

The Emissions below 1 GHz were equal for all antenna ports, modulations and data rates. Therefore only the results of an exemplary test case are submitted below.

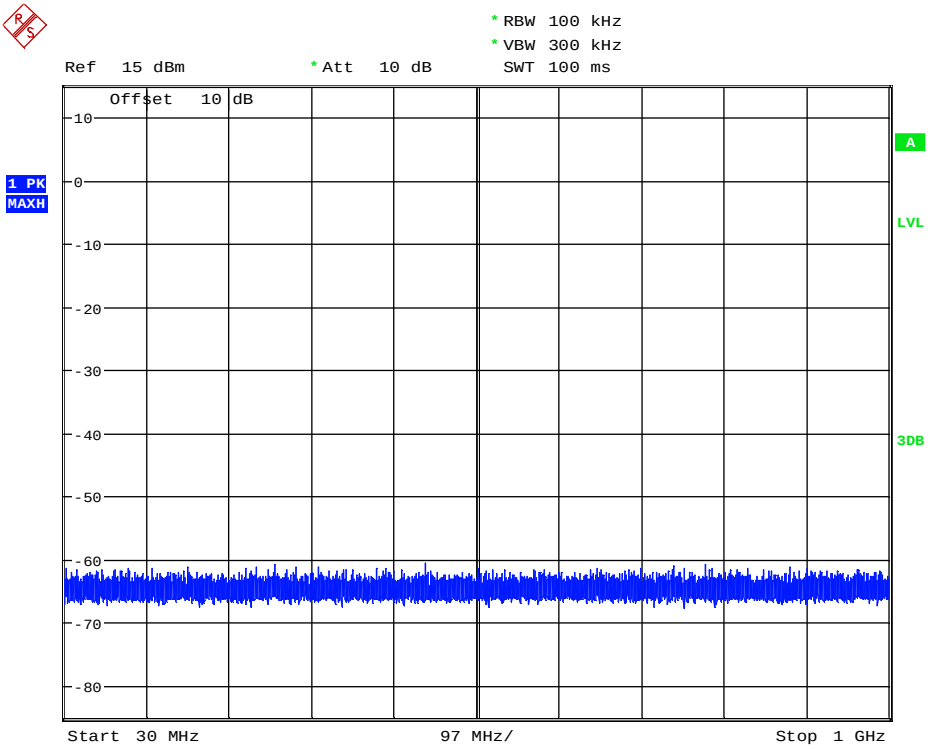
130254_SpurEmiss9-150k_b_1.wmf: conducted spurious emissions (operation mode 1):



130254_SpurEmiss150k-30M_b_1.wmf: conducted spurious emissions (operation mode 1):



130254_SpurEmiss0.03-1G_b_1.wmf: conducted spurious emissions (operation mode 1):



Spurious Emissions f < 1 GHz						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
0.071	6.52	30.59	24.07	-69.74	15.0	Passed
0.078	0.44	29.72	29.28	-75.82	15.0	Passed
0.142	-0.87	24.56	25.43	-77.13	15.0	Passed

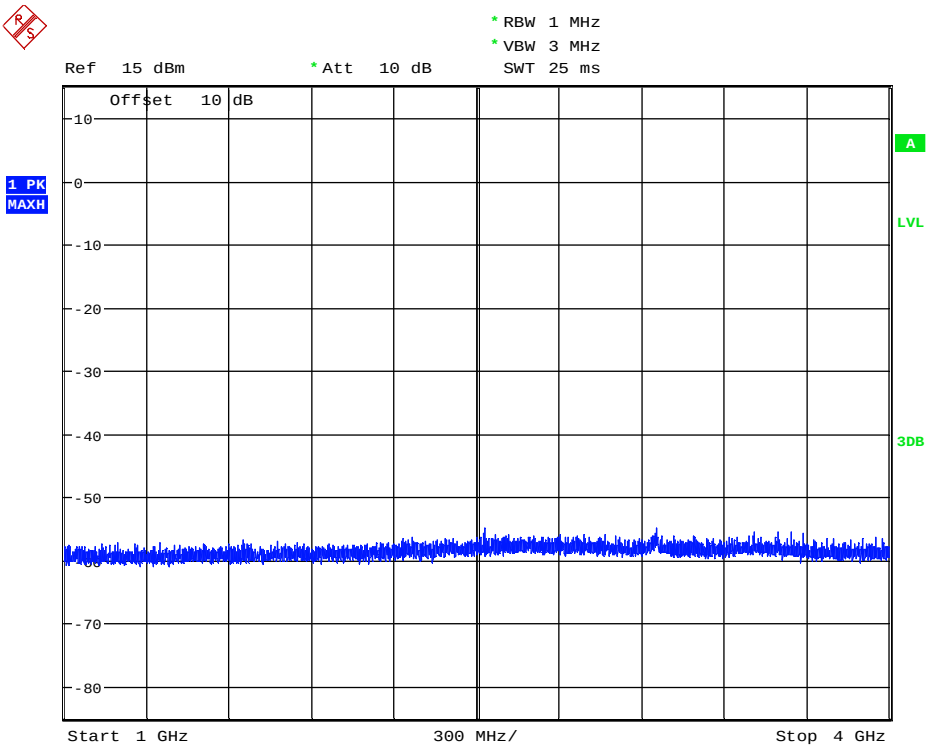
5.5.3.2 Antenna port 1

Ambient temperature	22 °C

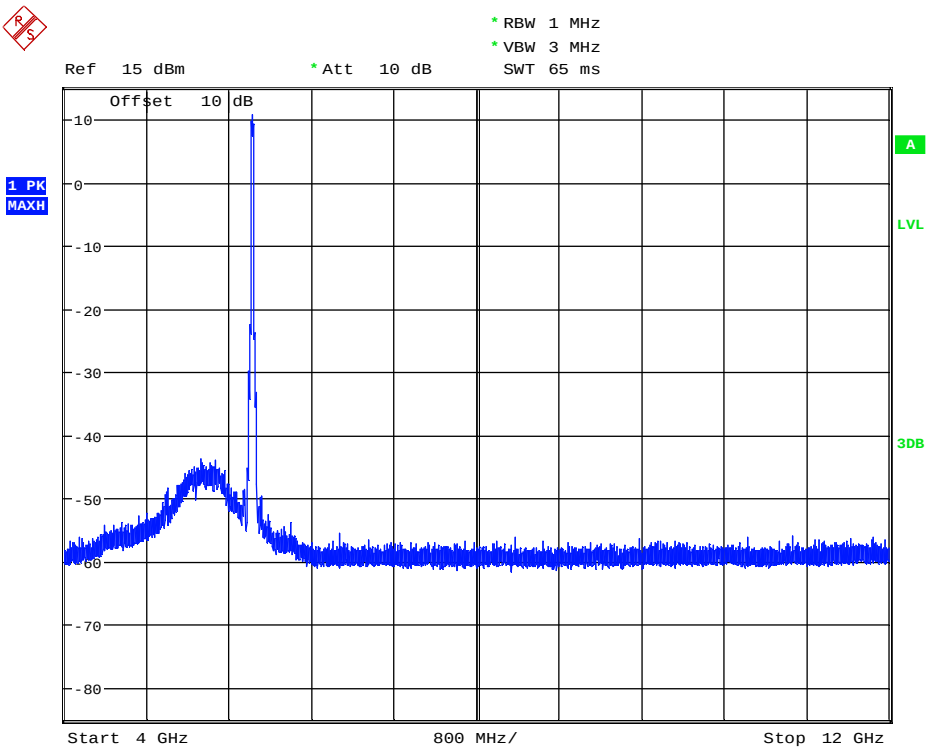
Relative humidity	59 %

The following results were measured at antenna port 1 of the EUT. The plots shows exemplary measurement results for the worst documented case. The other results are listed in the following tables.

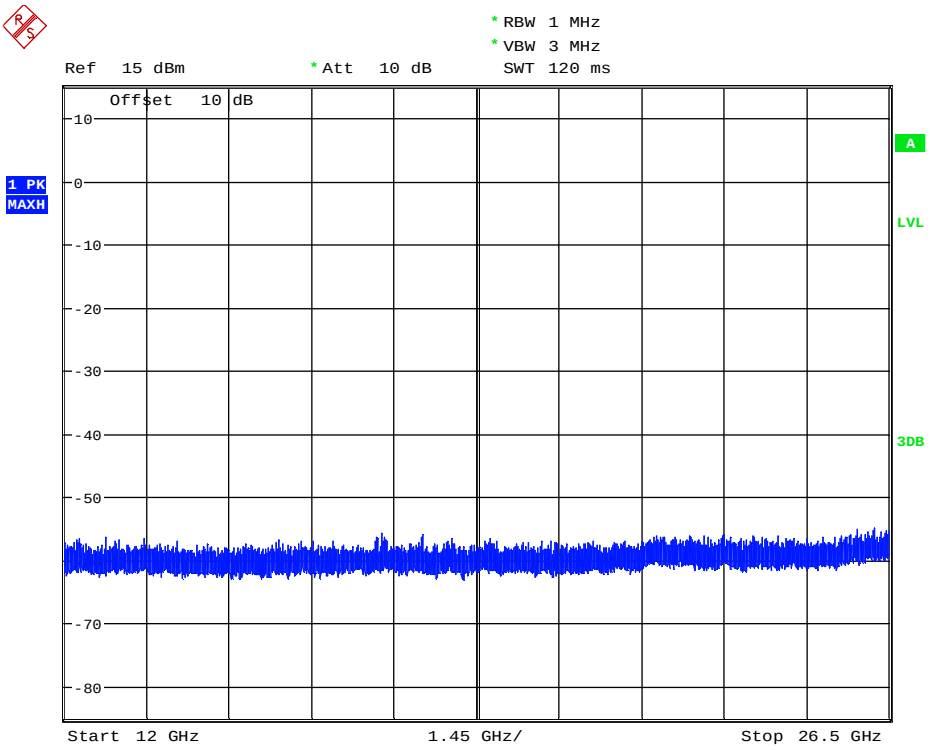
130254_SpurEmiss1-4G_n20_165.wmf: conducted spurious emissions (operation mode 6):



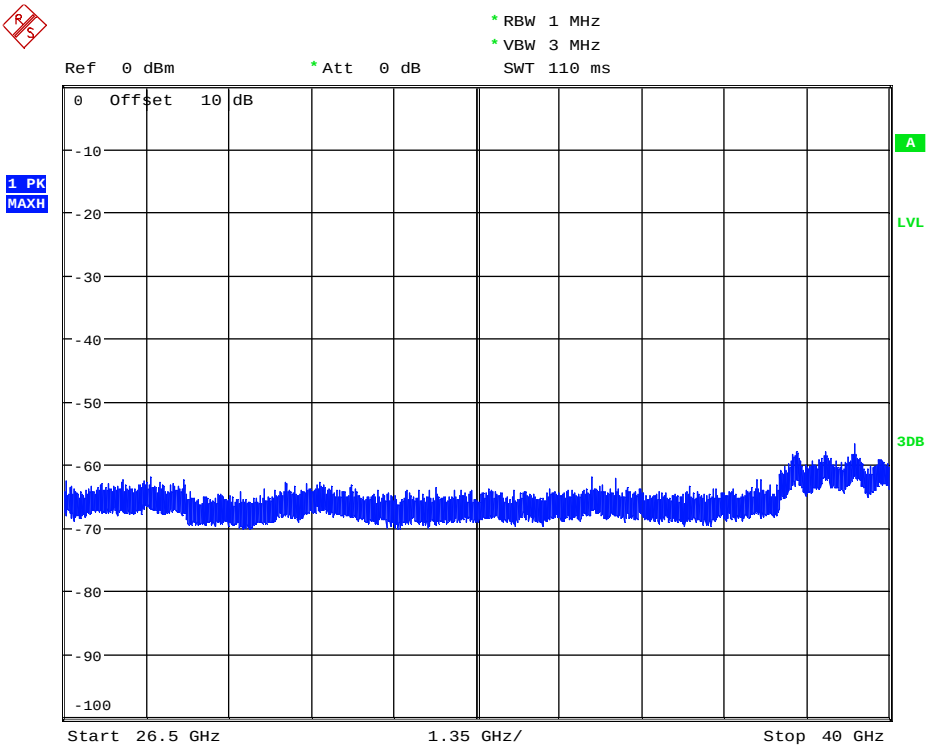
130254_SpurEmiss4-12G_n20_165.wmf: conducted spurious emissions (operation mode 6):



130254_SpurEmiss12-26,5G_n20_165.wmf: conducted spurious emissions (operation mode 6):



130254_SpurEmiss26,5-40G_n20_165: conducted spurious emissions (operation mode 6):



Spurious Emissions, a-mode, channel 149 (Operation mode 1)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
5359.775	63.72	74.00	10.28	-46.54	15.0	Passed
5392.725	63.80	74.00	10.20	-46.46	15.0	Passed
5400.150	64.29	74.00	9.71	-45.96	15.0	Passed
5439.775	63.57	74.00	10.43	-46.68	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
5360.000	52.90	54.00	1.10	-57.36	15.0	Passed
5400.000	52.54	54.00	1.46	-57.72	15.0	Passed
5400.000	52.47	54.00	1.53	-57.78	15.0	Passed
5440.000	51.89	54.00	2.11	-58.37	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5743.500	-6.90	-	-	-		
5200.050	-56.48	-26.90	29.58	Passed		
5240.000	-50.06	-26.90	23.16	Passed		
5320.000	-49.73	-26.90	22.83	Passed		

Spurious Emissions, a-mode, channel 157 (Operation mode 2)				
Emissions in the non-restricted Bands				
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result
5777.500	-3.70	-	-	-
5200.025	-53.14	16.30	69.45	Passed
5240.000	-55.10	16.30	71.40	Passed
5280.025	-51.47	16.30	67.78	Passed
5520.000	-52.98	16.30	69.28	Passed
5560.000	-55.49	16.30	71.79	Passed

Spurious Emissions, a-mode, channel 165 (Operation mode 3)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4960.225	59.32	74.00	14.68	-50.94	15.0	Passed
5039.900	59.47	74.00	14.53	-50.79	15.0	Passed
5120.200	61.50	74.00	12.50	-48.76	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4959.925	50.43	54.00	3.57	-59.83	15.0	Passed
5039.975	49.27	54.00	4.73	-60.98	15.0	Passed
5120.000	50.88	54.00	3.12	-59.37	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5820.300	-3.64	-	-	-		
5200.000	-53.48	-23.64	29.84	Passed		
5240.025	-53.87	-23.64	30.23	Passed		
5280.000	-52.25	-23.64	28.61	Passed		
5520.000	-53.18	-23.64	29.54	Passed		
5560.000	-53.91	-23.64	30.27	Passed		

Spurious Emissions, n20-mode, channel 149 (Operation mode 4)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
5040.375	61.28	74.00	12.72	-48.97	15.0	Passed
5119.625	62.71	74.00	11.29	-47.55	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
5040.000	51.71	54.00	2.29	-58.55	15.0	Passed
5119.925	52.39	54.00	1.61	-57.87	15.0	Passed

Emissions in the non-restricted Bands				
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result
5740.400	-0.71	-	-	-
5200.050	-53.03	-20.71	32.32	Passed
5280.000	-47.78	-20.71	27.07	Passed
5480.050	-52.17	-20.71	31.46	Passed
5707.550	-42.07	-20.71	21.36	Passed

Spurious Emissions, n20-mode, channel 157 (Operation mode 5)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4999.550	63.30	74.00	10.70	-46.95	15.0	Passed
5119.950	64.39	74.00	9.61	-45.86	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4999.925	53.18	54.00	0.82	-57.08	15.0	Passed
5120.025	52.72	54.00	1.28	-57.54	15.0	Passed

Emissions in the non-restricted Bands				
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result
5781.850	0.96	-	-	-
3521.875	-59.42	-19.04	40.38	Passed
5159.975	-52.13	-19.04	33.09	Passed
5239.975	-51.20	-19.04	32.16	Passed
5280.000	-49.53	-19.04	30.49	Passed
5319.975	-49.91	-19.04	30.87	Passed
5520.025	-50.22	-19.04	31.18	Passed

Spurious Emissions, n20-mode, channel 165 (Operation mode 6)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4719.500	58.83	74.00	15.17	-51.42	15.0	Passed
4919.975	61.27	74.00	12.73	-48.98	15.0	Passed
4999.950	64.44	74.00	9.56	-45.82	15.0	Passed
5079.200	63.28	74.00	10.72	-46.98	15.0	Passed
5119.900	65.08	74.00	8.92	-45.18	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4719.975	49.48	54.00	4.52	-60.78	15.0	Passed
4919.950	50.38	54.00	3.62	-59.87	15.0	Passed
4999.975	53.74	54.00	0.26	-56.52	15.0	Passed
5079.950	52.29	54.00	1.71	-57.97	15.0	Passed
5120.000	53.84	54.00	0.16	-56.42	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5819.375	-1.22	-	-	-		
4479.975	-57.99	-21.22	36.77	Passed		
5200.000	-52.32	-21.22	31.10	Passed		
5240.000	-49.73	-21.22	28.51	Passed		
5320.025	-48.33	-21.22	27.11	Passed		
5480.000	-51.34	-21.22	30.12	Passed		
5520.000	-50.55	-21.22	29.33	Passed		
5559.975	-50.10	-21.22	28.88	Passed		

Spurious Emissions, n40-mode, channel 149 (Operation mode 7)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
5000.000	62.01	74.00	11.99	-48.25	15.0	Passed
5119.925	62.74	74.00	11.26	-47.51	15.0	Passed
5039.775	61.36	74.00	12.64	-48.90	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4999.925	51.95	54.00	2.05	-58.31	15.0	Passed
5120.000	52.60	54.00	1.40	-57.66	15.0	Passed
5040.000	50.46	54.00	3.54	-59.80	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5743.500	-6.90	-	-	-		
5200.050	-56.48	-26.90	29.58	Passed		
5240.000	-50.06	-26.90	23.16	Passed		
5320.000	-49.73	-26.90	22.83	Passed		

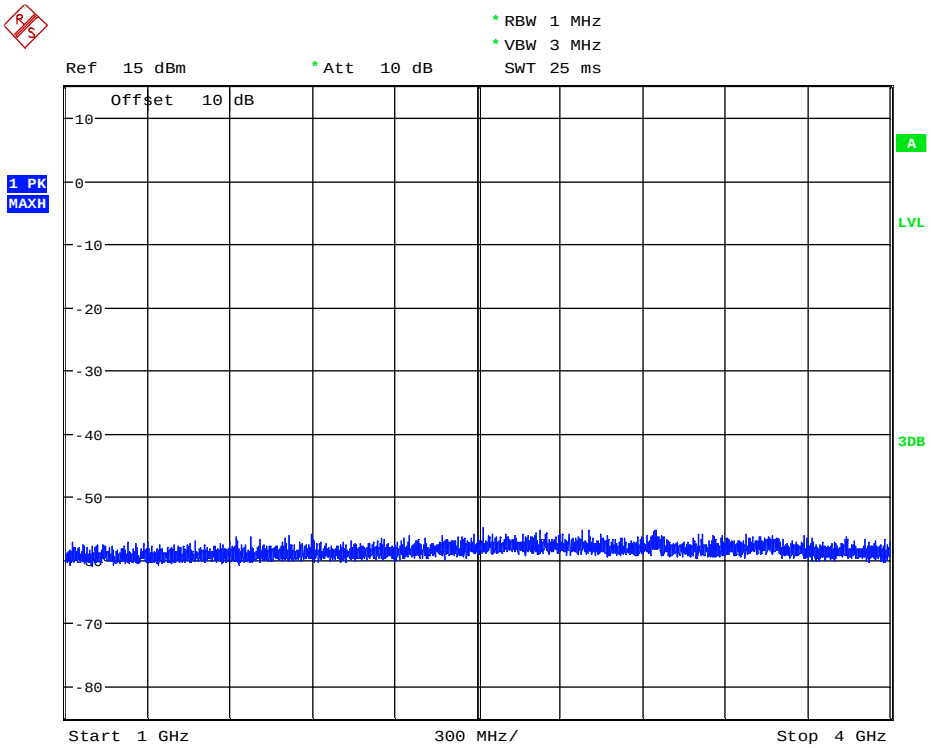
Spurious Emissions, n40-mode, channel 157 (Operation mode 8)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4959.700	62.77	74.00	11.23	-47.49	15.0	Passed
4920.025	62.60	74.00	11.40	-47.65	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4959.925	53.08	54.00	0.92	-57.18	15.0	Passed
4920.050	53.27	54.00	0.73	-56.99	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5782.250	-1.58	-	-	-		
3522.500	-59.68	-21.58	38.1	Passed		
5200.000	-48.35	-21.58	26.77	Passed		
5280.000	-44.77	-21.58	23.19	Passed		
5520.000	-46.08	-21.58	24.5	Passed		
5600.000	-48.54	-21.58	26.96	Passed		

5.5.3.3 Antenna port 2

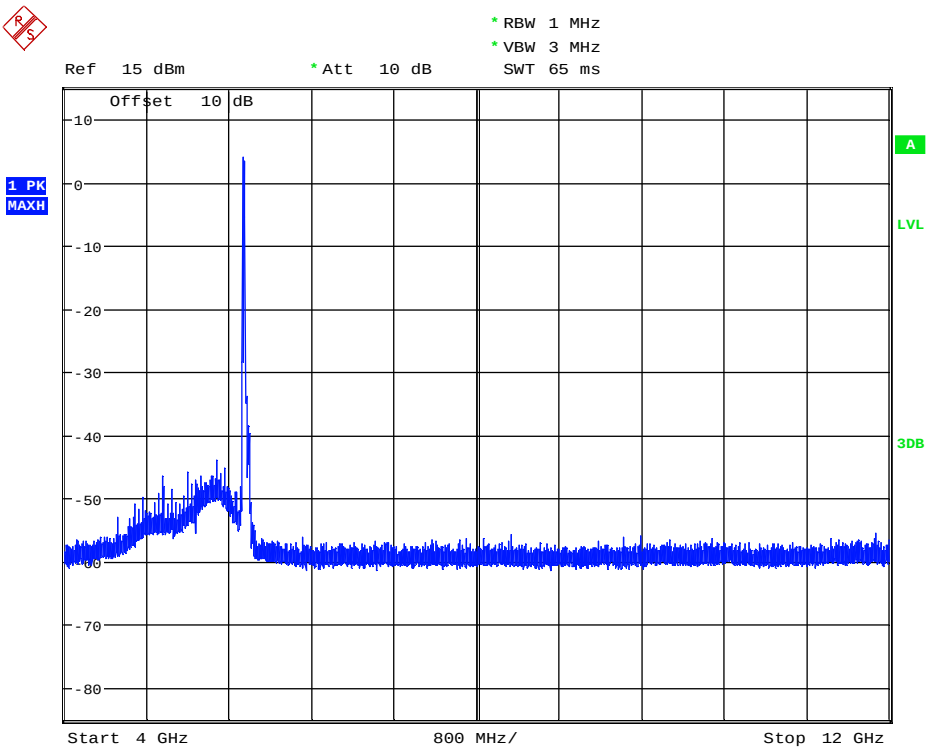
Ambient temperature	22 °C	Relative humidity	59 %

The following results were measured at antenna port 2 of the EUT. The plots shows exemplary measurement results for the worst documented case. The other results are listed in the following tables.

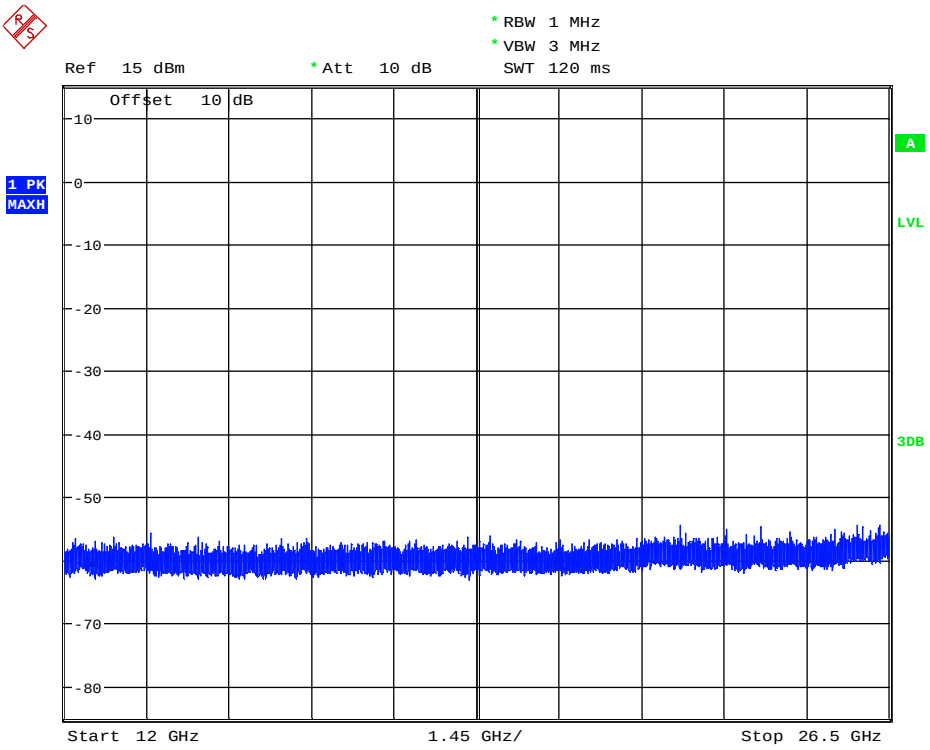
130254_SpurEmiss1-4G_a_149.wmf: conducted spurious emissions (operation mode 1):



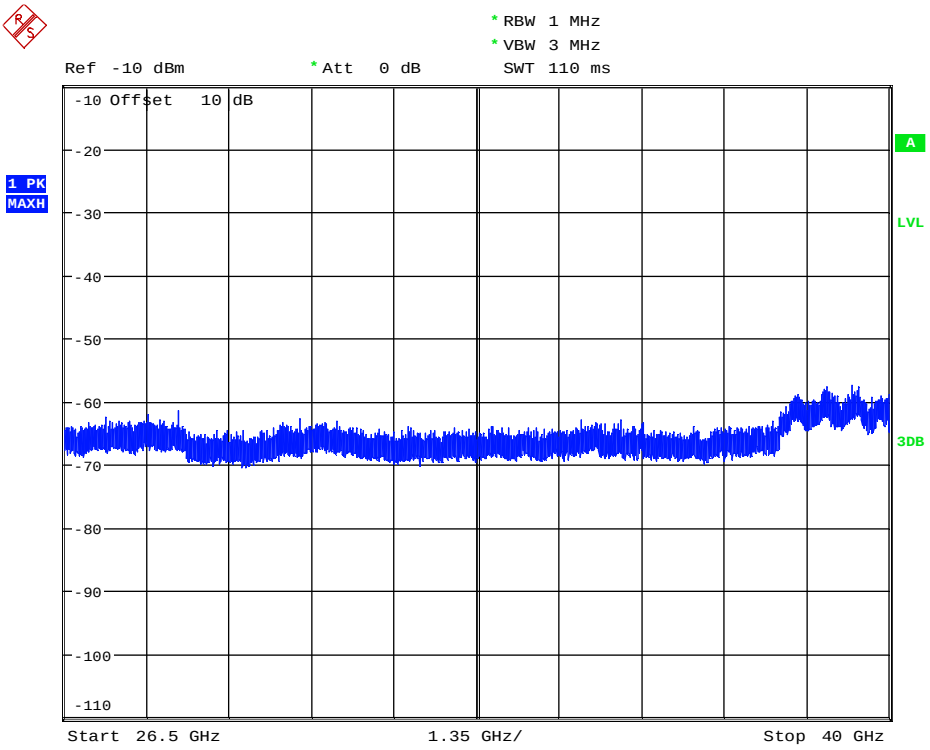
130254_SpurEmiss4-12G_a_149.wmf: conducted spurious emissions (operation mode 1):



130254_SpurEmiss26,5-40G_a_149.wmf: conducted spurious emissions (operation mode 1):



130254_SpurEmiss26,5-40G_a_149.wmf: conducted spurious emissions (operation mode 1):



Spurious Emissions, a-mode, channel 149 (Operation mode 1)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4301.150	55.76	74.00	18.24	-54.50	15.0	Passed
4759.650	59.83	74.00	14.17	-50.43	15.0	Passed
4879.950	61.93	74.00	12.07	-48.32	15.0	Passed
5360.525	64.98	74.00	9.02	-45.28	15.0	Passed
5399.300	64.37	74.00	9.63	-45.88	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4304.300	43.81	54.00	10.19	-66.44	15.0	Passed
4760.000	49.39	54.00	4.61	-60.87	15.0	Passed
4880.000	53.96	54.00	0.04	-56.29	15.0	Passed
5359.975	53.11	54.00	0.89	-57.15	15.0	Passed
5400.050	53.63	54.00	0.37	-56.63	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5740.350	-5.10	-	-	-		
5160.025	-53.47	-25.10	28.37	Passed		
5200.000	-50.94	-25.10	25.84	Passed		
5240.025	-47.24	-25.10	22.14	Passed		
5320.025	-49.41	-25.10	24.31	Passed		
5480.025	-47.40	-25.10	22.30	Passed		
5560.025	-48.80	-25.10	23.7	Passed		

Spurious Emissions, a-mode, channel 157 (Operation mode 2)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4799.675	61.50	74.00	12.50	-48.76	15.0	Passed
4880.050	61.55	74.00	12.45	-48.71	15.0	Passed
5120.400	62.24	74.00	11.76	-48.02	15.0	Passed
5404.100	64.78	74.00	9.22	-45.47	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4800.025	53.36	54.00	0.64	-56.90	15.0	Passed
4880.025	53.93	54.00	0.07	-56.33	15.0	Passed
5119.975	53.24	54.00	0.76	-57.01	15.0	Passed
5400.000	52.96	54.00	1.04	-57.30	15.0	Passed

Emissions in the non-restricted Bands				
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result
5778.100	-5.72	-	-	-
5160.025	-52.79	-25.72	27.07	Passed
5200.025	-52.39	-25.72	26.67	Passed
5240.000	-46.98	-25.72	21.26	Passed
5320.025	-49.43	-25.72	23.71	Passed
5480.025	-47.99	-25.72	22.27	Passed
5560.000	-49.45	-25.72	23.73	Passed
5960.225	-60.07	-25.72	34.35	Passed

Spurious Emissions, a-mode, channel 165 (Operation mode 3)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
3883.400	56.72	74.00	17.28	-53.54	15.0	Passed
4879.825	61.75	74.00	12.25	-48.51	15.0	Passed
5079.875	62.21	74.00	11.79	-48.05	15.0	Passed
5442.875	64.81	74.00	9.19	-45.45	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
3883.300	48.46	54.00	5.54	-61.80	15.0	Passed
4879.950	53.80	54.00	0.20	-56.46	15.0	Passed
5079.975	53.99	54.00	0.01	-56.27	15.0	Passed
5439.950	53.70	54.00	0.30	-56.56	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5817.525	-3.48	-	-	-		
4400.000	-58.40	-23.48	34.92	Passed		
5160.000	-53.51	-23.48	30.03	Passed		
5200.000	-51.44	-23.48	27.96	Passed		
5240.000	-47.40	-23.48	23.92	Passed		
5319.975	-49.01	-23.48	25.53	Passed		
5480.000	-47.21	-23.48	23.73	Passed		
5560.000	-48.22	-23.48	24.74	Passed		
5720.025	-55.54	-23.48	32.06	Passed		

Spurious Emissions, n20-mode, channel 149 (Operation mode 4)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
3836.575	55.97	74.00	18.03	-54.29	15.0	Passed
4799.650	60.86	74.00	13.14	-49.40	15.0	Passed
4879.975	61.21	74.00	12.79	-49.05	15.0	Passed
5079.925	61.50	74.00	12.50	-48.76	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
3836.675	46.26	54.00	7.74	-64.00	15.0	Passed
4800.000	52.84	54.00	1.16	-57.41	15.0	Passed
4879.975	53.40	54.00	0.60	-56.85	15.0	Passed
5080.000	53.11	54.00	0.89	-57.15	15.0	Passed

Emissions in the non-restricted Bands				
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result
5739.625	-4.32	-	-	-
5160.000	-51.85	-24.32	27.53	Passed
5200.000	-53.91	-24.32	29.59	Passed
5240.025	-48.20	-24.32	23.88	Passed
5280.000	-51.54	-24.32	27.22	Passed
5320.000	-50.02	-24.32	25.70	Passed
5480.000	-50.48	-24.32	26.16	Passed
5520.025	-49.27	-24.32	24.95	Passed
5560.000	-50.81	-24.32	26.49	Passed

Spurious Emissions, n20-mode, channel 157 (Operation mode 5)				
Emissions in the non-restricted Bands				
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result
5778.750	-0.17	-	-	-
3521.350	-60.18	-20.17	40.01	Passed
4480.025	-57.45	-20.17	37.28	Passed
5160.000	-50.39	-20.17	30.22	Passed
5200.000	-46.26	-20.17	26.09	Passed
5280.000	-44.18	-20.17	24.01	Passed
5480.000	-46.71	-20.17	26.54	Passed
5520.000	-44.52	-20.17	24.35	Passed
5600.000	-48.05	-20.17	27.88	Passed

Spurious Emissions, n20-mode, channel 165 (Operation mode 6)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
3882.925	44.27	74.00	29.73	-53.98	15.0	Passed
4719.775	49.13	74.00	24.87	-49.13	15.0	Passed
4880.000	47.98	74.00	26.02	-50.28	15.0	Passed
4960.000	51.52	74.00	22.48	-46.74	15.0	Passed
5039.925	50.00	74.00	24.00	-48.26	15.0	Passed
5079.850	50.83	74.00	23.17	-47.43	15.0	Passed
5359.325	53.78	74.00	20.22	-44.48	15.0	Passed
5408.475	53.85	74.00	20.15	-44.41	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
3883.300	36.85	54.00	17.15	-61.41	15.0	Passed
4720.000	42.25	54.00	11.75	-56.01	15.0	Passed
4880.000	38.92	54.00	15.08	-59.34	15.0	Passed
4960.000	45.09	54.00	8.91	-53.16	15.0	Passed
5040.000	41.94	54.00	12.06	-56.31	15.0	Passed
5080.000	44.37	54.00	9.63	-53.89	15.0	Passed
5360.000	44.77	54.00	9.23	-53.49	15.0	Passed
5400.000	43.98	54.00	10.02	-54.28	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5817.750	-4.73	-	-	-		
5200.000	-52.16	-24.73	27.43	Passed		
5240.000	-44.42	-24.73	19.69	Passed		
5320.000	-45.15	-24.73	20.42	Passed		
5480.050	-45.47	-24.73	20.74	Passed		
5520.000	-44.64	-24.73	19.91	Passed		
5560.050	-49.54	-24.73	24.81	Passed		
5600.000	-50.59	-24.73	25.86	Passed		

Spurious Emissions, n40-mode, channel 149 (Operation mode 7)				
Emissions in the non-restricted Bands				
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result
5740.025	-3.56	-	-	-
5160.000	-53.75	-23.56	30.19	Passed
5200.025	-48.10	-23.56	24.54	Passed
5280.000	-46.75	-23.56	23.19	Passed
5480.025	-47.56	-23.56	24.00	Passed
5520.025	-47.98	-23.56	24.42	Passed
5600.025	-50.41	-23.56	26.85	Passed

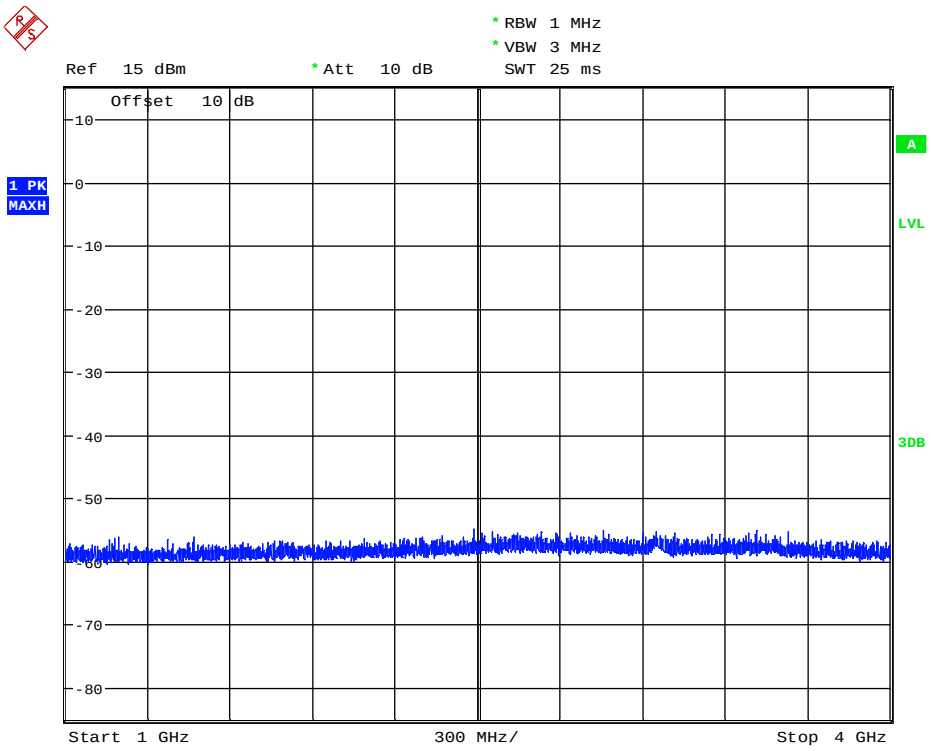
Spurious Emissions, n40-mode, channel 157 (Operation mode 8)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
3863.550	56.14	74.00	17.86	-54.12	15.0	Passed
4880.225	63.03	74.00	10.97	-47.23	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
3863.350	46.74	54.00	7.26	-63.51	15.0	Passed
4879.975	53.90	54.00	0.10	-56.35	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5778.125	-4.58	-	-	-		
4480.000	-56.85	-24.58	32.27	Passed		
5160.000	-48.19	-24.58	23.61	Passed		
5200.000	-47.45	-24.58	22.87	Passed		
5240.025	-47.22	-24.58	22.64	Passed		
5280.000	-44.61	-24.58	20.03	Passed		
5520.025	-43.92	-24.58	19.34	Passed		
5600.000	-48.09	-24.58	23.51	Passed		

5.5.3.4 Antenna port 3

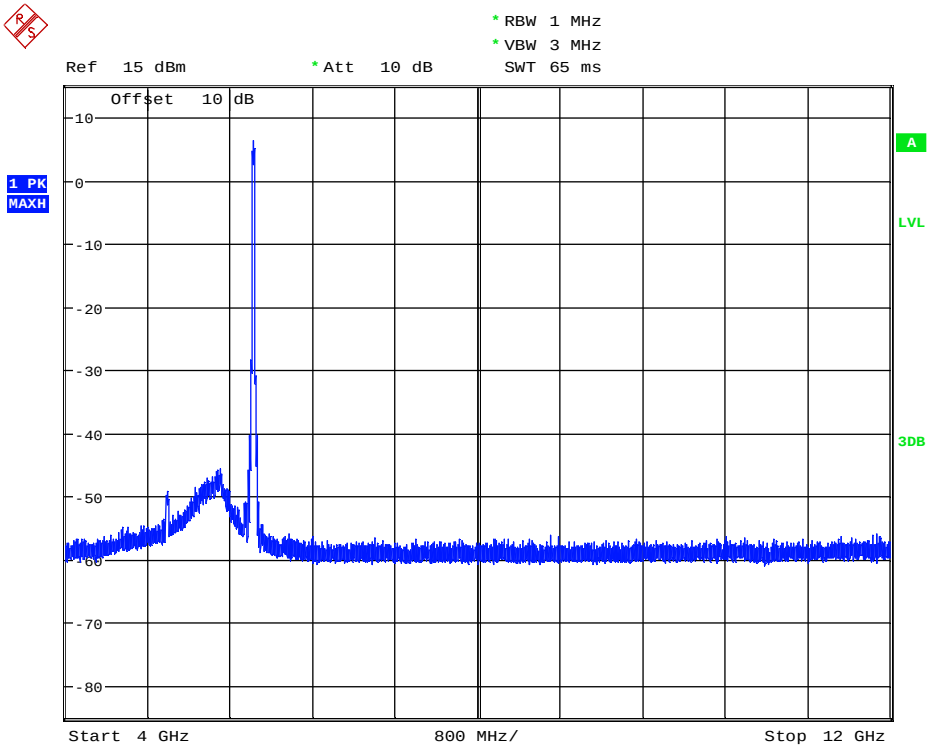
Ambient temperature	21 °C	Relative humidity	63 %

The following results were measured at antenna port 2 of the EUT. The plots shows exemplary measurement results for the worst documented case. The other results are listed in the following tables.

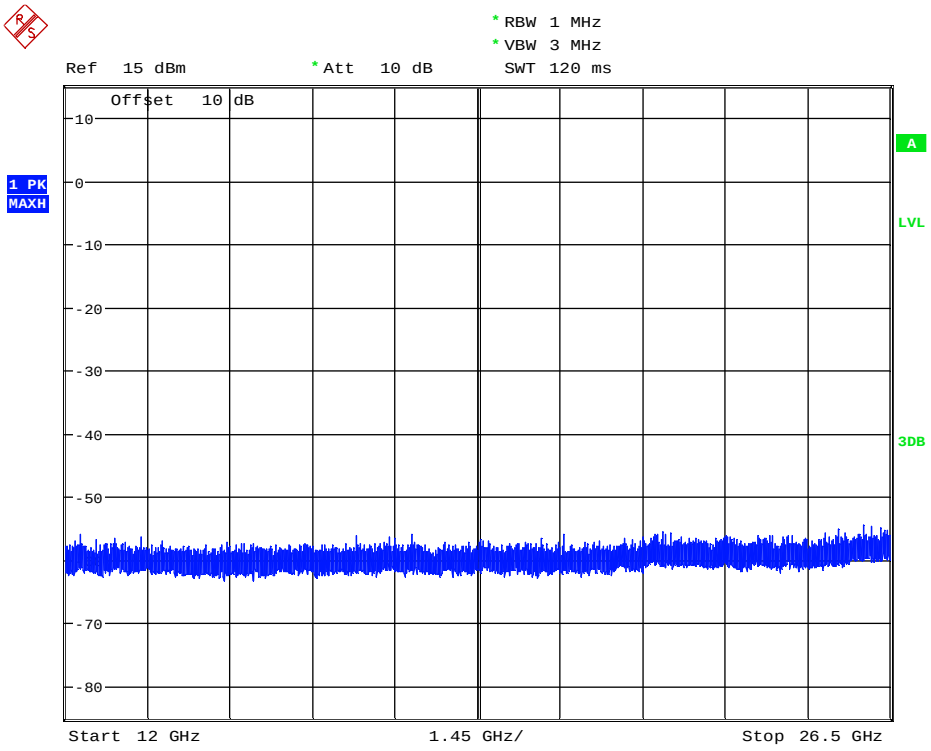
130254_SpurEmiss1-4G_a_165.wmf: conducted spurious emissions (operation mode 3):



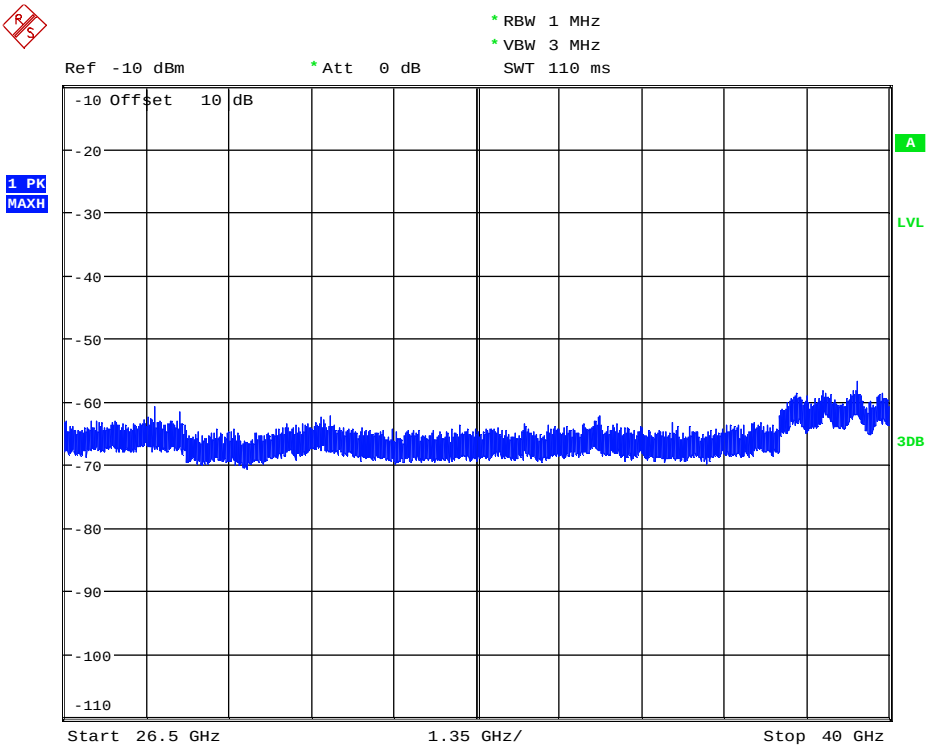
130254_SpurEmiss4-12G_a_165.wmf: conducted spurious emissions (operation mode 3):



130254_SpurEmiss12-26,5G_a_165.wmf: conducted spurious emissions (operation mode 3):



130254_SpurEmiss26,5-40G_a_165.wmf: conducted spurious emissions (operation mode 3):



Spurious Emissions, a-mode, channel 149 (Operation mode 1)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4986.825	62.2	74.0	11.8	-48.1	15.0	Passed
5124.275	59.8	74.0	14.2	-50.4	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4988.200	48.3	54.0	5.7	-61.9	15.0	Passed
5116.875	47.8	54.0	6.2	-62.5	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5738.150	-2.7	-	-	-		
3393.475	-60.0	-22.7	37.3	Passed		
5187.700	-58.3	-22.7	35.6	Passed		
5339.150	-56.0	-22.7	33.3	Passed		
5500.075	-54.7	-22.7	32.0	Passed		
5899.975	-59.5	-22.7	36.8	Passed		

Spurious Emissions, a-mode, channel 157 (Operation mode 2)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
3601.000	54.4	74.0	19.6	-55.8	15.0	Passed
4998.675	62.5	74.0	11.5	-47.8	15.0	Passed
5421.625	65.5	74.0	8.5	-44.7	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
3605.725	43.8	54.0	10.2	-66.5	15.0	Passed
4995.500	48.6	54.0	5.4	-61.6	15.0	Passed
5426.100	52.9	54.0	1.1	-57.3	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5777.775	-5.5	-	-	-		
5321.825	-56.2	-25.5	30.7	Passed		
5332.625	-55.8	-25.5	30.3	Passed		
5492.500	-55.5	-25.5	30.0	Passed		
5923.500	-60.6	-25.5	35.1	Passed		

Spurious Emissions, a-mode, channel 165 (Operation mode 3)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4960.225	59.32	74.00	14.68	-50.94	15.0	Passed
5039.900	59.47	74.00	14.53	-50.79	15.0	Passed
5120.200	61.50	74.00	12.50	-48.76	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4959.925	50.43	54.00	3.57	-59.83	15.0	Passed
5039.975	49.27	54.00	4.73	-60.98	15.0	Passed
5120.000	50.88	54.00	3.12	-59.37	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5820.300	-3.64	-	-	-		
5200.000	-53.48	-23.6	29.8	Passed		
5240.025	-53.87	-23.6	30.2	Passed		
5280.000	-52.25	-23.6	28.6	Passed		
5520.000	-53.18	-23.6	29.5	Passed		
5560.000	-53.91	-23.6	30.3	Passed		

Spurious Emissions, n20-mode, channel 149 (Operation mode 4)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4980.100	63.7	74.0	10.3	-46.6	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4987.825	49.7	54.0	4.3	-60.6	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5740.250	-1.2	-	-	-		
3397.850	-60.4	-21.2	39.2	Passed		
5342.625	-53.8	-21.2	32.6	Passed		
5466.300	-53.4	-21.2	32.2	Passed		
6114.475	-59.2	-21.2	38.0	Passed		

Spurious Emissions, n20-mode, channel 157 (Operation mode 5)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
3649.600	55.0	74.0	19.0	-55.3	15.0	Passed
4980.725	64.9	74.0	9.1	-45.4	15.0	Passed
5123.125	63.8	74.0	10.2	-46.5	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
3647.300	43.8	54.0	10.2	-66.5	15.0	Passed
4981.075	51.0	54.0	3.0	-59.3	15.0	Passed
5116.325	50.7	54.0	3.3	-59.6	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5782.150	-0.8	-	-	-		
5348.875	-52.1	-20.8	31.3	Passed		
5470.275	-50.5	-20.8	29.7	Passed		
5498.650	-52.3	-20.8	31.5	Passed		
5688.075	-50.0	-20.8	29.2	Passed		
5853.475	-47.1	-20.8	26.3	Passed		

Spurious Emissions, n20-mode, channel 165 (Operation mode 6)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4999.825	64.1	74.0	9.9	-46.1	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4995.200	50.1	54.0	3.9	-60.1	15.0	Passed

Emissions in the non-restricted Bands				
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result
5740.250	-1.2	-	-	-
3397.850	-60.4	-21.2	39.2	Passed
5342.625	-53.8	-21.2	32.6	Passed
5466.300	-53.4	-21.2	32.2	Passed

Spurious Emissions, n40-mode, channel 151 (Operation mode 7)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4998.200	64.0	74.0	10.0	-46.3	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4998.175	50.0	54.0	4.0	-60.2	15.0	Passed

Emissions in the non-restricted Bands				
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result
5738.375	-4.6	-	-	-
3221.600	-59.9	-24.6	35.3	Passed
5299.875	-54.4	-24.6	29.8	Passed
5472.800	-53.7	-24.6	29.1	Passed
5649.450	-54.7	-24.6	30.1	Passed
6063.800	-59.3	-24.6	34.7	Passed

Spurious Emissions, n40-mode, channel 159 (Operation mode 8)						
Peak Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Max Peak Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4718.450	57.9	74.0	16.1	-52.3	15.0	Passed
4979.125	64.8	74.0	9.2	-45.5	15.0	Passed
Average Emission – Restricted Band						
Frequency [MHz]	Meas. Result [dBµV/m]	Average Limit [dBµV/m/m]	Margin [dB]	Reading [dBm]	Antenna Gain + Array Gain [dBi]	Result
4721.700	46.0	54.0	8.0	-64.3	15.0	Passed
4981.975	50.7	54.0	3.3	-59.5	15.0	Passed
Emissions in the non-restricted Bands						
Frequency [MHz]	Meas. Result [dBm]	Limit [dBm]	Margin [dB]	Result		
5779.750	-3.2	-	-	-		
4446.125	-60.0	-23.2	36.8	Passed		
5345.275	-53.2	-23.2	30.0	Passed		
5346.475	-52.9	-23.2	29.7	Passed		
5728.775	-39.2	-23.2	16.0	Passed		
5849.425	-42.2	-23.2	19.0	Passed		

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:
30, 80

5.5.4 Method of measurement (radiated emissions)

The radiated emission measurement is subdivided into four stages.

- A preliminary measurement carried out in a fully anechoic chamber with a fixed antenna height in the frequency range 30 MHz to 1 GHz.
- A final measurement carried out on an open area test side with reflecting ground plane and various antenna height in the frequency range 30 MHz to 1 GHz.
- A preliminary measurement carried out in a fully anechoic chamber with a variable antenna distance and height in the frequency range 1 GHz to 110 GHz.
- A final measurement carried out in a fully anechoic chamber with a fixed antenna height in the frequency range 1 GHz to 110 GHz.

All measurements will be carried out with the EUT working on the middle of the assigned frequency band.

Preliminary and final measurement (1 GHz to 110 GHz)

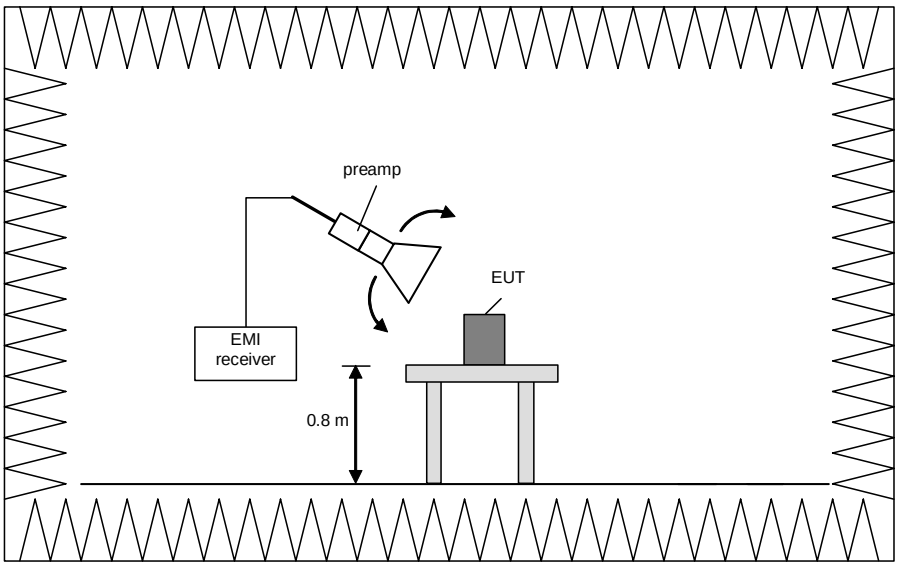
This measurement will be performed in a fully anechoic chamber. Tabletop devices will set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm. Floor-standing devices will be placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2009 [1].

Preliminary measurement (1 GHz to 110 GHz)

The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The spectrum analyser set to MAX Hold mode and a resolution bandwidth of 100 kHz. The measurement will be performed in horizontal and vertical polarisation of the measuring antenna, the antenna close to the EUT and while moving the antenna over all sides of the EUT. With the spectrum analyser in CLEAR / WRITE mode the cone of the emission should be found and than the measuring distance will be set to 3 m with the receiving antenna moving in this cone of emission. At this position the final measurement will be carried out.

The resolution bandwidth of the EMI Receiver will be set to the following values:

Frequency range	Resolution bandwidth
1 GHz to 4 GHz	100 kHz
4 GHz to 12 GHz	100 kHz
12 GHz to 18 GHz	100 kHz
18 GHz to 26.5 GHz	100 kHz
26.5 GHz to 40 GHz	100 kHz
40 GHz to 60 GHz	100 kHz
50 GHz to 75 GHz	100 kHz
75 GHz to 110 GHz	100 kHz

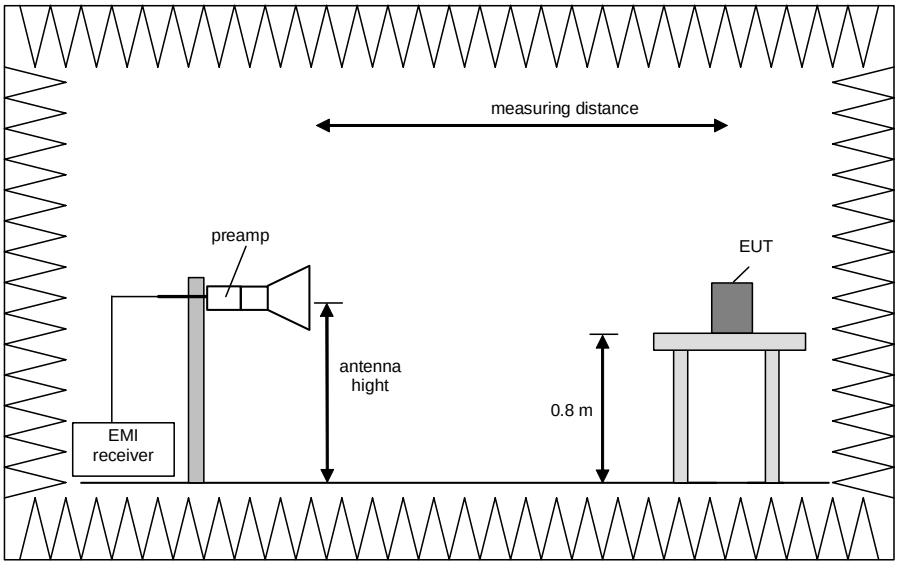


Final measurement (1 GHz to 110 GHz)

The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1 MHz. The measurement will be performed in horizontal and vertical polarisation of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 ° to 360 ° in order to have the antenna inside the cone of radiation.

The resolution bandwidth of the EMI Receiver will be set to the following values:

Frequency range	Resolution bandwidth
1 GHz to 4 GHz	1 MHz
4 GHz to 12 GHz	1 MHz
12 GHz to 18 GHz	1 MHz
18 GHz to 26.5 GHz	1 MHz
26.5 GHz to 40 GHz	1 MHz
40 GHz to 60 GHz	1 MHz
50 GHz to 75 GHz	1 MHz
75 GHz to 110 GHz	1 MHz



Procedure of measurement:

The measurements were performed in the frequency range 1 GHz to 4 GHz, 4 GHz to 12 GHz, 12 GHz to 18 GHz, 18 GHz to 26.5 GHz, 26.5 GHz to 40 GHz, 40 GHz to 60 GHz, 60 GHz to 75 GHz and 75 GHz to 110 GHz.
The following procedure will be used:

1) Monitor the frequency range at horizontal polarisation and move the antenna over all sides of the EUT (if necessary move the EUT to another orthogonal axis).
2) Change the antenna polarisation and repeat 1) with vertical polarisation.
3) Make a hardcopy of the spectrum.
4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
5) Change the analyser mode to Clear / Write and found the cone of emission.
6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3 m and the antenna will be still inside the cone of emission.
7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarisation and azimuth and the peak and average detector, which causes the maximum emission.
8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.

Step 1) to 6) are defined as preliminary measurement.

5.5.5 Test results (radiated emissions) – Antenna Emissions

5.5.5.1 Preliminary radiated emission measurement

The preliminary measurements were already performed during the conducted measurements, therefore only the failed measurements were repeated at the given frequencies.

5.5.5.2 Final radiated emission measurement (1 GHz to 40 GHz)

Ambient temperature	22 °C	Relative humidity	59 %

Position of EUT: The EUT was set-up on a non-conducting table of a height of 0.8 m. The distance between EUT and antenna was 3 m.

Cable guide: For detail information of test set-up and the cable guide refer to the pictures in Table 2.

Test record: All results are shown in the following.

Supply voltage: During all measurements the host of the EUT was powered with 24 V via an AC/DC Adapter.

Resolution bandwidth: For all measurements a resolution bandwidth of 1 MHz was used.

Remark: Only the frequencies that failed the conducted spurious emissions tests are repeated in the following radiated antenna measurements.

5.5.5.2.1 BAT-ANT-RSMA-2AGNR

Transmitter operates at the lower end of the assigned frequency band (operation mode 1)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	55.48	74.00	18.52	17.75	32.53	0.00	5.20	150	Vert.	26	1
4960.0	57.82	74.00	16.18	19.63	32.89	0.00	5.30	150	Vert.	4	1
5040.0	57.80	74.00	16.20	19.29	33.11	0.00	5.40	150	Vert.	349	1
5080.0	58.84	74.00	15.16	19.75	33.49	0.00	5.60	150	Vert.	0	1
5430.0	59.80	74.00	14.20	20.10	33.80	0.00	5.90	150	Vert.	355	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	44.61	54.00	9.39	6.88	32.53	0.00	5.20	150	Vert.	42	1
4960.0	48.01	54.00	5.99	9.82	32.89	0.00	5.30	150	Vert.	1	1
5040.0	45.08	54.00	8.92	6.57	33.11	0.00	5.40	150	Vert.	359	1
5080.0	47.12	54.00	6.88	8.03	33.49	0.00	5.60	150	Vert.	0	1
5430.0	46.51	54.00	7.49	6.81	33.80	0.00	5.90	150	Vert.	354	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 2)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	55.61	74.00	18.39	17.88	32.53	0.00	5.20	150	Vert.	226	1
5000.0	58.89	74.00	15.11	20.48	33.11	0.00	5.30	150	Vert.	359	1
5080.0	59.07	74.00	14.93	19.98	33.49	0.00	5.60	150	Vert.	249	1
5340.0	59.06	74.00	14.94	19.75	33.61	0.00	5.70	150	Vert.	360	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	44.13	54.00	9.87	6.40	32.53	0.00	5.20	150	Vert.	46	1
5000.0	47.58	54.00	6.42	9.17	33.11	0.00	5.30	150	Vert.	356	1
5080.0	46.69	54.00	7.31	7.60	33.49	0.00	5.60	150	Vert.	0	1
5340.0	45.26	54.00	8.74	5.95	33.61	0.00	5.70	150	Vert.	284	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the upper end of the assigned frequency band (operation mode 3)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	55.72	74.00	18.28	17.99	32.53	0.00	5.20	150	Vert.	360	1
4960.0	57.37	74.00	16.63	19.18	32.89	0.00	5.30	150	Vert.	358	1
5000.0	58.64	74.00	15.36	20.23	33.11	0.00	5.30	150	Vert.	257	1
5040.0	58.03	74.00	15.97	19.52	33.11	0.00	5.40	150	Vert.	360	1
5340.0	58.60	74.00	15.40	19.29	33.61	0.00	5.70	150	Vert.	352	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	44.76	54.00	9.24	7.03	32.53	0.00	5.20	150	Vert.	46	1
4960.0	44.36	54.00	9.64	6.17	32.89	0.00	5.30	150	Vert.	1	1
5000.0	49.36	54.00	4.64	10.95	33.11	0.00	5.30	150	Vert.	358	1
5040.0	45.61	54.00	8.39	7.10	33.11	0.00	5.40	150	Vert.	356	1
5340.0	45.54	54.00	8.46	6.23	33.61	0.00	5.70	150	Vert.	288	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the lower end of the assigned frequency band (operation mode 4)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	54.75	74.00	19.25	17.02	32.53	0.00	5.20	150	Hor.	3	1
4960.0	57.01	74.00	16.99	18.82	32.89	0.00	5.30	150	Vert.	360	1
5000.0	58.39	74.00	15.61	19.98	33.11	0.00	5.30	150	Vert.	359	1
5360.0	60.22	74.00	13.78	20.72	33.80	0.00	5.70	150	Vert.	354	1
5421.7	62.13	74.00	11.87	22.63	33.80	0.00	5.70	150	Vert.	356	1
5440.0	61.57	74.00	12.43	21.87	33.80	0.00	5.90	150	Vert.	357	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	41.75	54.00	12.25	4.02	32.53	0.00	5.20	150	Vert.	38	1
4960.0	43.84	54.00	10.16	5.65	32.89	0.00	5.30	150	Vert.	6	1
5000.0	48.03	54.00	5.97	9.62	33.11	0.00	5.30	150	Vert.	357	1
5360.0	48.39	54.00	5.61	8.89	33.80	0.00	5.70	150	Vert.	289	1
5421.7	48.21	54.00	5.79	8.71	33.80	0.00	5.70	150	Vert.	292	1
5440.0	49.94	54.00	4.06	10.24	33.80	0.00	5.90	150	Vert.	356	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 5)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	56.48	74.00	17.52	18.59	32.59	0.00	5.30	150	Vert.	9	1
4920.0	57.99	74.00	16.01	19.87	32.82	0.00	5.30	150	Vert.	354	1
5000.0	59.51	74.00	14.49	21.10	33.11	0.00	5.30	150	Vert.	14	1
5040.0	60.12	74.00	13.88	21.61	33.11	0.00	5.40	150	Vert.	357	1
5440.0	62.33	74.00	11.67	22.63	33.80	0.00	5.90	150	Vert.	260	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4920.0	47.60	54.00	6.40	9.48	32.82	0.00	5.30	150	Vert.	0	1
5000.0	47.97	54.00	6.03	9.56	33.11	0.00	5.30	150	Vert.	358	1
5040.0	50.15	54.00	3.85	11.64	33.11	0.00	5.40	150	Vert.	357	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the upper end of the assigned frequency band (operation mode 6)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5400.0	60.85	74.00	13.15	21.35	33.80	0.00	5.70	150	Vert.	356	1
5451.1	62.02	74.00	11.98	22.12	34.00	0.00	5.90	150	Vert.	276	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5400.0	48.02	54.00	5.98	8.52	33.80	0.00	5.70	150	Vert.	292	1
5451.1	48.91	54.00	5.09	9.01	34.00	0.00	5.90	150	Vert.	308	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the lower end of the assigned frequency band (operation mode 7)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	56.48	74.00	17.52	18.59	32.59	0.00	5.30	150	Vert.	289	1
4920.0	57.30	74.00	16.70	19.18	32.82	0.00	5.30	150	Vert.	352	1
5000.0	58.39	74.00	15.61	19.98	33.11	0.00	5.30	150	Vert.	257	1
5040.0	58.74	74.00	15.26	20.23	33.11	0.00	5.40	150	Vert.	250	1
5360.0	60.22	74.00	13.78	20.72	33.80	0.00	5.70	150	Vert.	360	1
5440.0	61.57	74.00	12.43	21.87	33.80	0.00	5.90	150	Vert.	360	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	45.17	54.00	8.83	7.28	32.59	0.00	5.30	150	Vert.	27	1
4920.0	45.90	54.00	8.10	7.78	32.82	0.00	5.30	150	Vert.	0	1
5000.0	46.46	54.00	7.54	8.05	33.11	0.00	5.30	150	Vert.	359	1
5040.0	48.96	54.00	5.04	10.45	33.11	0.00	5.40	150	Vert.	357	1
5360.0	48.00	54.00	6.00	8.50	33.80	0.00	5.70	150	Vert.	284	1
5440.0	49.52	54.00	4.48	9.82	33.80	0.00	5.90	150	Vert.	358	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 8)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4920.0	58.60	74.00	15.40	20.48	32.82	0.00	5.30	150	Vert.	360	1
5000.0	61.69	74.00	12.31	23.28	33.11	0.00	5.30	150	Vert.	266	1
5040.0	60.63	74.00	13.37	22.12	33.11	0.00	5.40	150	Vert.	357	1
5360.0	62.78	74.00	11.22	23.28	33.80	0.00	5.70	150	Vert.	350	1
5440.0	64.50	74.00	9.50	24.80	33.80	0.00	5.90	150	Vert.	300	1
5460.0	64.02	74.00	9.98	24.12	34.00	0.00	5.90	150	Vert.	358	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4920.0	48.17	54.00	5.83	10.05	32.82	0.00	5.30	150	Vert.	356	1
5000.0	47.95	54.00	6.05	9.54	33.11	0.00	5.30	150	Vert.	358	1
5040.0	52.48	54.00	1.52	13.97	33.11	0.00	5.40	150	Vert.	357	1
5360.0	51.01	54.00	2.99	11.51	33.80	0.00	5.70	150	Vert.	284	1
5440.0	52.27	54.00	1.73	12.57	33.80	0.00	5.90	150	Vert.	356	1
5460.0	51.40	54.00	2.60	11.50	34.00	0.00	5.90	150	Vert.	307	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

5.5.5.2.2 BAT-ANT-N-MiMoDB-5N-IP65

Transmitter operates at the lower end of the assigned frequency band (operation mode 1)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	54.99	74.00	19.01	17.26	32.53	0.00	5.20	150	Hor.	22	1
4960.0	58.91	74.00	15.09	20.72	32.89	0.00	5.30	150	Hor.	58	1
5040.0	58.99	74.00	15.01	20.48	33.11	0.00	5.40	150	Hor.	60	1
5080.0	59.32	74.00	14.68	20.23	33.49	0.00	5.60	150	Hor.	42	1
5430.0	61.05	74.00	12.95	21.35	33.80	0.00	5.90	150	Hor.	53	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	42.14	54.00	11.86	4.41	32.53	0.00	5.20	150	Hor.	46	1
4960.0	49.29	54.00	4.71	11.10	32.89	0.00	5.30	150	Hor.	45	1
5040.0	47.94	54.00	6.06	9.43	33.11	0.00	5.40	150	Hor.	42	1
5080.0	47.26	54.00	6.74	8.17	33.49	0.00	5.60	150	Hor.	42	1
5430.0	48.55	54.00	5.45	8.85	33.80	0.00	5.90	150	Hor.	66	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 2)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	55.36	74.00	18.64	17.63	32.53	0.00	5.20	150	Hor.	38	1
5000.0	59.38	74.00	14.62	20.97	33.11	0.00	5.30	150	Hor.	45	1
5080.0	58.84	74.00	15.16	19.75	33.49	0.00	5.60	150	Hor.	29	1
5340.0	59.79	74.00	14.21	20.48	33.61	0.00	5.70	150	Hor.	66	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	42.56	54.00	11.44	4.83	32.53	0.00	5.20	150	Hor.	38	1
5000.0	47.72	54.00	6.28	9.31	33.11	0.00	5.30	150	Hor.	45	1
5080.0	47.18	54.00	6.82	8.09	33.49	0.00	5.60	150	Hor.	45	1
5340.0	47.33	54.00	6.67	8.02	33.61	0.00	5.70	150	Hor.	66	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the upper end of the assigned frequency band (operation mode 3)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	55.25	74.00	18.75	17.52	32.53	0.00	5.20	150	Hor.	31	1
4960.0	57.59	74.00	16.41	19.40	32.89	0.00	5.30	150	Hor.	46	1
5000.0	60.28	74.00	13.72	21.87	33.11	0.00	5.30	150	Hor.	45	1
5040.0	58.86	74.00	15.14	20.35	33.11	0.00	5.40	150	Hor.	73	1
5340.0	60.66	74.00	13.34	21.35	33.61	0.00	5.70	150	Hor.	45	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	41.82	54.00	12.18	4.09	32.53	0.00	5.20	150	Hor.	38	1
4960.0	45.68	54.00	8.32	7.49	32.89	0.00	5.30	150	Hor.	41	1
5000.0	50.04	54.00	3.96	11.63	33.11	0.00	5.30	150	Hor.	38	1
5040.0	47.62	54.00	6.38	9.11	33.11	0.00	5.40	150	Hor.	45	1
5340.0	47.53	54.00	6.47	8.22	33.61	0.00	5.70	150	Hor.	61	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the lower end of the assigned frequency band (operation mode 4)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4960.0	57.94	74.00	16.06	19.75	32.89	0.00	5.30	150	Hor.	30	1
5000.0	59.63	74.00	14.37	21.22	33.11	0.00	5.30	150	Hor.	53	1
5360.0	61.11	74.00	12.89	21.61	33.80	0.00	5.70	150	Hor.	45	1
5421.7	62.39	74.00	11.61	22.89	33.80	0.00	5.70	150	Hor.	48	1
5440.0	62.08	74.00	11.92	22.38	33.80	0.00	5.90	150	Hor.	66	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4960.0	48.34	54.00	5.66	10.15	32.89	0.00	5.30	150	Hor.	38	1
5000.0	48.64	54.00	5.36	10.23	33.11	0.00	5.30	150	Hor.	45	1
5360.0	49.15	54.00	4.85	9.65	33.80	0.00	5.70	150	Hor.	45	1
5421.7	49.58	54.00	4.42	10.08	33.80	0.00	5.70	150	Hor.	60	1
5440.0	49.95	54.00	4.05	10.25	33.80	0.00	5.90	150	Hor.	54	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 5)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	56.11	74.00	17.89	18.22	32.59	0.00	5.30	150	Hor.	42	1
4920.0	58.22	74.00	15.78	20.10	32.82	0.00	5.30	150	Hor.	41	1
5000.0	62.53	74.00	11.47	24.12	33.11	0.00	5.30	150	Hor.	45	1
5040.0	59.11	74.00	14.89	20.60	33.11	0.00	5.40	150	Hor.	49	1
5360.0	62.92	74.00	11.08	23.42	33.80	0.00	5.70	150	Hor.	77	1
5440.0	65.16	74.00	8.84	25.46	33.80	0.00	5.90	150	Hor.	60	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	44.35	54.00	9.65	6.46	32.59	0.00	5.30	150	Hor.	42	1
4920.0	47.65	54.00	6.35	9.53	32.82	0.00	5.30	150	Hor.	41	1
5000.0	52.57	54.00	1.43	14.16	33.11	0.00	5.30	150	Hor.	38	1
5040.0	47.10	54.00	6.90	8.59	33.11	0.00	5.40	150	Hor.	45	1
5360.0	50.97	54.00	3.03	11.47	33.80	0.00	5.70	150	Hor.	53	1
5440.0	52.05	54.00	1.95	12.35	33.80	0.00	5.90	150	Hor.	60	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the upper end of the assigned frequency band (operation mode 6)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5400.0	62.64	74.00	11.36	23.14	33.80	0.00	5.70	150	Hor.	46	1
5451.1	62.79	74.00	11.21	22.89	34.00	0.00	5.90	150	Hor.	49	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5400.0	49.83	54.00	4.17	10.33	33.80	0.00	5.70	150	Hor.	54	1
5451.1	50.25	54.00	3.75	10.35	34.00	0.00	5.90	150	Hor.	60	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the lower end of the assigned frequency band (operation mode 7)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	56.48	74.00	17.52	18.59	32.59	0.00	5.30	150	Hor.	58	1
4920.0	58.60	74.00	15.40	20.48	32.82	0.00	5.30	150	Hor.	38	1
5000.0	61.55	74.00	12.45	23.14	33.11	0.00	5.30	150	Hor.	48	1
5040.0	59.23	74.00	14.77	20.72	33.11	0.00	5.40	150	Hor.	50	1
5360.0	62.64	74.00	11.36	23.14	33.80	0.00	5.70	150	Hor.	73	1
5440.0	64.50	74.00	9.50	24.80	33.80	0.00	5.90	150	Hor.	45	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	45.21	54.00	8.79	7.32	32.59	0.00	5.30	150	Hor.	42	1
4920.0	48.72	54.00	5.28	10.60	32.82	0.00	5.30	150	Hor.	38	1
5000.0	51.61	54.00	2.39	13.20	33.11	0.00	5.30	150	Hor.	38	1
5040.0	49.98	54.00	4.02	11.47	33.11	0.00	5.40	150	Hor.	46	1
5360.0	50.80	54.00	3.20	11.30	33.80	0.00	5.70	150	Hor.	90	1
5440.0	50.21	54.00	3.79	10.51	33.80	0.00	5.90	150	Hor.	48	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 8)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4920.0	58.97	74.00	15.03	20.85	32.82	0.00	5.30	150	Hor.	42	1
5000.0	60.15	74.00	13.85	21.74	33.11	0.00	5.30	150	Hor.	34	1
5040.0	59.23	74.00	14.77	20.72	33.11	0.00	5.40	150	Hor.	50	1
5360.0	62.39	74.00	11.61	22.89	33.80	0.00	5.70	150	Hor.	66	1
5440.0	64.09	74.00	9.91	24.39	33.80	0.00	5.90	150	Hor.	52	1
5460.0	63.74	74.00	10.26	23.84	34.00	0.00	5.90	150	Hor.	49	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4920.0	49.17	54.00	4.83	11.05	32.82	0.00	5.30	150	Hor.	45	1
5000.0	46.46	54.00	7.54	8.05	33.11	0.00	5.30	150	Hor.	41	1
5040.0	48.95	54.00	5.05	10.44	33.11	0.00	5.40	150	Hor.	45	1
5360.0	50.52	54.00	3.48	11.02	33.80	0.00	5.70	150	Hor.	46	1
5440.0	51.23	54.00	2.77	11.53	33.80	0.00	5.90	150	Hor.	61	1
5460.0	51.23	54.00	2.77	11.33	34.00	0.00	5.90	150	Hor.	61	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

5.5.5.2.3 BAT-ANT-N-9A-DS-IP65

Transmitter operates at the lower end of the assigned frequency band (operation mode 1)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	55.36	74.00	18.64	17.63	32.53	0.00	5.20	150	Hor.	1	1
4960.0	58.79	74.00	15.21	20.60	32.89	0.00	5.30	150	Vert.	358	1
5040.0	58.99	74.00	15.01	20.48	33.11	0.00	5.40	150	Vert.	357	1
5080.0	60.19	74.00	13.81	21.10	33.49	0.00	5.60	150	Vert.	0	1
5430.0	60.55	74.00	13.45	20.85	33.80	0.00	5.90	150	Vert.	0	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	43.07	54.00	10.93	5.34	32.53	0.00	5.20	150	Hor.	0	1
4960.0	49.41	54.00	4.59	11.22	32.89	0.00	5.30	150	Vert.	14	1
5040.0	49.06	54.00	4.94	10.55	33.11	0.00	5.40	150	Vert.	3.00	1
5080.0	49.90	54.00	4.10	10.81	33.49	0.00	5.60	150	Vert.	360	1
5430.0	46.74	54.00	7.26	7.04	33.80	0.00	5.90	150	Vert.	9	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 2)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	54.75	74.00	19.25	17.02	32.53	0.00	5.20	150	Vert.	352	1
5000.0	58.64	74.00	15.36	20.23	33.11	0.00	5.30	150	Vert.	0	1
5080.0	58.96	74.00	15.04	19.87	33.49	0.00	5.60	150	Vert.	360	1
5340.0	59.79	74.00	14.21	20.48	33.61	0.00	5.70	150	Vert.	0	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	41.79	54.00	12.21	4.06	32.53	0.00	5.20	150	Vert.	360	1
5000.0	49.89	54.00	4.11	11.48	33.11	0.00	5.30	150	Vert.	1	1
5080.0	45.33	54.00	8.67	6.24	33.49	0.00	5.60	150	Vert.	4	1
5340.0	46.46	54.00	7.54	7.15	33.61	0.00	5.70	150	Vert.	354	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the upper end of the assigned frequency band (operation mode 3)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	55.72	74.00	18.28	17.99	32.53	0.00	5.20	150	Vert.	352	1
4960.0	59.16	74.00	14.84	20.97	32.89	0.00	5.30	150	Vert.	12	1
5000.0	58.51	74.00	15.49	20.10	33.11	0.00	5.30	150	Vert.	0	1
5040.0	59.11	74.00	14.89	20.60	33.11	0.00	5.40	150	Vert.	19	1
5340.0	60.03	74.00	13.97	20.72	33.61	0.00	5.70	150	Vert.	1	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	42.07	54.00	11.93	4.34	32.53	0.00	5.20	150	Hor.	0	1
4960.0	50.42	54.00	3.58	12.23	32.89	0.00	5.30	150	Vert.	360	1
5000.0	45.83	54.00	8.17	7.42	33.11	0.00	5.30	150	Vert.	2	1
5040.0	49.17	54.00	4.83	10.66	33.11	0.00	5.40	150	Vert.	3	1
5340.0	46.68	54.00	7.32	7.37	33.61	0.00	5.70	150	Vert.	1	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the lower end of the assigned frequency band (operation mode 4)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	55.72	74.00	18.28	17.99	32.53	0.00	5.20	150	Hor.	360	1
4960.0	58.17	74.00	15.83	19.98	32.89	0.00	5.30	150	Vert.	359	1
5000.0	60.15	74.00	13.85	21.74	33.11	0.00	5.30	150	Vert.	3	1
5360.0	61.74	74.00	12.26	22.24	33.80	0.00	5.70	150	Vert.	357	1
5421.7	61.62	74.00	12.38	22.12	33.80	0.00	5.70	150	Vert.	342	1
5440.0	63.26	74.00	10.74	23.56	33.80	0.00	5.90	150	Vert.	359	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	44.01	54.00	9.99	6.28	32.53	0.00	5.20	150	Hor.	360	1
4960.0	45.50	54.00	8.50	7.31	32.89	0.00	5.30	150	Vert.	12	1
5000.0	51.76	54.00	2.24	13.35	33.11	0.00	5.30	150	Vert.	16	1
5360.0	49.82	54.00	4.18	10.32	33.80	0.00	5.70	150	Vert.	354	1
5421.7	48.54	54.00	5.46	9.04	33.80	0.00	5.70	150	Vert.	0	1
5440.0	52.58	54.00	1.42	12.88	33.80	0.00	5.90	150	Vert.	360	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 5)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	55.41	74.00	18.59	17.52	32.59	0.00	5.30	150	Hor.	159	1
4920.0	57.87	74.00	16.13	19.75	32.82	0.00	5.30	150	Vert.	0	1
5000.0	61.16	74.00	12.84	22.75	33.11	0.00	5.30	150	Vert.	9	1
5040.0	58.86	74.00	15.14	20.35	33.11	0.00	5.40	150	Vert.	350	1
5360.0	62.78	74.00	11.22	23.28	33.80	0.00	5.70	150	Vert.	360	1
5440.0	64.23	74.00	9.77	24.53	33.80	0.00	5.90	150	Vert.	6	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	42.13	54.00	11.87	4.24	32.59	0.00	5.30	150	Vert.	360	1
4920.0	45.37	54.00	8.63	7.25	32.82	0.00	5.30	150	Vert.	360	1
5000.0	53.31	54.00	0.69	14.90	33.11	0.00	5.30	150	Vert.	11	1
5040.0	47.28	54.00	6.72	8.77	33.11	0.00	5.40	150	Vert.	3	1
5360.0	50.61	54.00	3.39	11.11	33.80	0.00	5.70	150	Vert.	360	1
5440.0	53.58	54.00	0.42	13.88	33.80	0.00	5.90	150	Vert.	7	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the upper end of the assigned frequency band (operation mode 6)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5400.0	63.06	74.00	10.94	23.56	33.80	0.00	5.70	150	Vert.	359	1
5451.1	63.04	74.00	10.96	23.14	34.00	0.00	5.90	150	Vert.	360	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5400.0	49.28	54.00	4.72	9.78	33.80	0.00	5.70	150	Vert.	0	1
5451.1	49.23	54.00	4.77	9.33	34.00	0.00	5.90	150	Vert.	5	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the lower end of the assigned frequency band (operation mode 7)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	55.52	74.00	18.48	17.63	32.59	0.00	5.30	150	Vert.	360	1
4920.0	58.35	74.00	15.65	20.23	32.82	0.00	5.30	150	Vert.	358	1
5000.0	60.28	74.00	13.72	21.87	33.11	0.00	5.30	150	Vert.	2	1
5040.0	59.36	74.00	14.64	20.85	33.11	0.00	5.40	150	Vert.	354	1
5360.0	62.01	74.00	11.99	22.51	33.80	0.00	5.70	150	Vert.	360	1
5440.0	62.21	74.00	11.79	22.51	33.80	0.00	5.90	150	Vert.	1	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	42.67	54.00	11.33	4.78	32.59	0.00	5.30	150	Vert.	360	1
4920.0	47.47	54.00	6.53	9.35	32.82	0.00	5.30	150	Vert.	6	1
5000.0	51.77	54.00	2.23	13.36	33.11	0.00	5.30	150	Vert.	16	1
5040.0	48.72	54.00	5.28	10.21	33.11	0.00	5.40	150	Vert.	3	1
5360.0	51.66	54.00	2.34	12.16	33.80	0.00	5.70	150	Vert.	355	1
5440.0	48.63	54.00	5.37	8.93	33.80	0.00	5.90	150	Vert.	4	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 8)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4920.0	57.75	74.00	16.25	19.63	32.82	0.00	5.30	150	Vert.	359	1
5000.0	61.16	74.00	12.84	22.75	33.11	0.00	5.30	150	Vert.	3	1
5040.0	58.61	74.00	15.39	20.10	33.11	0.00	5.40	150	Vert.	360	1
5360.0	63.06	74.00	10.94	23.56	33.80	0.00	5.70	150	Vert.	357	1
5440.0	64.64	74.00	9.36	24.94	33.80	0.00	5.90	150	Vert.	1	1
5460.0	63.60	74.00	10.40	23.70	34.00	0.00	5.90	150	Vert.	3	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4920.0	45.56	54.00	8.44	7.44	32.82	0.00	5.30	150	Vert.	358	1
5000.0	52.76	54.00	1.24	14.35	33.11	0.00	5.30	150	Vert.	11	1
5040.0	46.80	54.00	7.20	8.29	33.11	0.00	5.40	150	Vert.	353	1
5360.0	50.43	54.00	3.57	10.93	33.80	0.00	5.70	150	Vert.	358	1
5440.0	53.56	54.00	0.44	13.86	33.80	0.00	5.90	150	Vert.	7	1
5460.0	50.30	54.00	3.70	10.40	34.00	0.00	5.90	150	Vert.	7	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

5.5.5.2.4 BAT-ANT-N-3AGN-F

Transmitter operates at the lower end of the assigned frequency band (operation mode 1)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	54.99	74.00	19.01	17.26	32.53	0.00	5.20	150	Hor.	186	1
4960.0	57.37	74.00	16.63	19.18	32.89	0.00	5.30	150	Vert.	0	1
5040.0	57.45	74.00	16.55	18.94	33.11	0.00	5.40	150	Vert.	270	1
5080.0	59.44	74.00	14.56	20.35	33.49	0.00	5.60	150	Vert.	357	1
5430.0	59.10	74.00	14.90	19.40	33.80	0.00	5.90	150	Vert.	19	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	42.98	54.00	11.02	5.25	32.53	0.00	5.20	150	Vert.	280	1
4960.0	46.19	54.00	7.81	8.00	32.89	0.00	5.30	150	Vert.	304	1
5040.0	44.73	54.00	9.27	6.22	33.11	0.00	5.40	150	Vert.	357	1
5080.0	47.86	54.00	6.14	8.77	33.49	0.00	5.60	150	Vert.	357	1
5430.0	46.06	54.00	7.94	6.36	33.80	0.00	5.90	150	Vert.	1	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 2)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	54.63	74.00	19.37	16.90	32.53	0.00	5.20	150	Vert.	7	1
5000.0	56.75	74.00	17.25	18.34	33.11	0.00	5.30	150	Vert.	360	1
5080.0	59.19	74.00	14.81	20.10	33.49	0.00	5.60	150	Vert.	356	1
5340.0	58.36	74.00	15.64	19.05	33.61	0.00	5.70	150	Vert.	356	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	41.87	54.00	12.13	4.14	32.53	0.00	5.20	150	Vert.	277	1
5000.0	43.63	54.00	10.37	5.22	33.11	0.00	5.30	150	Vert.	359	1
5080.0	47.11	54.00	6.89	8.02	33.49	0.00	5.60	150	Vert.	357	1
5340.0	45.15	54.00	8.85	5.84	33.61	0.00	5.70	150	Vert.	359	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the upper end of the assigned frequency band (operation mode 3)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	54.99	74.00	19.01	17.26	32.53	0.00	5.20	150	Hor.	315	1
4960.0	57.59	74.00	16.41	19.40	32.89	0.00	5.30	150	Vert.	355	1
5000.0	57.11	74.00	16.89	18.70	33.11	0.00	5.30	150	Vert.	360	1
5040.0	59.23	74.00	14.77	20.72	33.11	0.00	5.40	150	Vert.	358	1
5340.0	58.36	74.00	15.64	19.05	33.61	0.00	5.70	150	Vert.	359	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	41.58	54.00	12.42	3.85	32.53	0.00	5.20	150	Vert.	281	1
4960.0	46.76	54.00	7.24	8.57	32.89	0.00	5.30	150	Vert.	297	1
5000.0	43.99	54.00	10.01	5.58	33.11	0.00	5.30	150	Vert.	359	1
5040.0	46.64	54.00	7.36	8.13	33.11	0.00	5.40	150	Vert.	349	1
5340.0	45.25	54.00	8.75	5.94	33.61	0.00	5.70	150	Vert.	360	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the lower end of the assigned frequency band (operation mode 4)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	54.63	74.00	19.37	16.90	32.53	0.00	5.20	150	Hor.	190	1
4960.0	56.07	74.00	17.93	17.88	32.89	0.00	5.30	150	Vert.	30	1
5000.0	58.51	74.00	15.49	20.10	33.11	0.00	5.30	150	Vert.	300	1
5360.0	61.24	74.00	12.76	21.74	33.80	0.00	5.70	150	Vert.	0	1
5421.7	60.35	74.00	13.65	20.85	33.80	0.00	5.70	150	Vert.	355	1
5440.0	62.84	74.00	11.16	23.14	33.80	0.00	5.90	150	Vert.	359	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4720.0	41.47	54.00	12.53	3.74	32.53	0.00	5.20	150	Vert.	285	1
4960.0	42.92	54.00	11.08	4.73	32.89	0.00	5.30	150	Vert.	296	1
5000.0	47.37	54.00	6.63	8.96	33.11	0.00	5.30	150	Vert.	359	1
5360.0	51.09	54.00	2.91	11.59	33.80	0.00	5.70	150	Vert.	347	1
5421.7	47.42	54.00	6.58	7.92	33.80	0.00	5.70	150	Vert.	1	1
5440.0	52.85	54.00	1.15	13.15	33.80	0.00	5.90	150	Vert.	354	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 5)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	56.00	74.00	18.00	18.11	32.59	0.00	5.30	150	Vert.	293	1
4920.0	56.94	74.00	17.06	18.82	32.82	0.00	5.30	150	Vert.	360	1
5000.0	58.76	74.00	15.24	20.35	33.11	0.00	5.30	150	Vert.	0	1
5040.0	58.26	74.00	15.74	19.75	33.11	0.00	5.40	150	Vert.	359	1
5360.0	62.13	74.00	11.87	22.63	33.80	0.00	5.70	150	Vert.	356	1
5440.0	62.71	74.00	11.29	23.01	33.80	0.00	5.90	150	Vert.	360	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	42.96	54.00	11.04	5.07	32.59	0.00	5.30	150	Vert.	285	1
4920.0	44.92	54.00	9.08	6.80	32.82	0.00	5.30	150	Vert.	271	1
5000.0	49.56	54.00	4.44	11.15	33.11	0.00	5.30	150	Vert.	357	1
5040.0	46.66	54.00	7.34	8.15	33.11	0.00	5.40	150	Vert.	358	1
5360.0	52.58	54.00	1.42	13.08	33.80	0.00	5.70	150	Vert.	352	1
5440.0	52.49	54.00	1.51	12.79	33.80	0.00	5.90	150	Vert.	354	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the upper end of the assigned frequency band (operation mode 6)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5400.0	61.62	74.00	12.38	22.12	33.80	0.00	5.70	150	Vert.	349	1
5451.1	62.53	74.00	11.47	22.63	34.00	0.00	5.90	150	Vert.	360	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5400.0	48.94	54.00	5.06	9.44	33.80	0.00	5.70	150	Vert.	359	1
5451.1	49.66	54.00	4.34	9.76	34.00	0.00	5.90	150	Vert	360	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the lower end of the assigned frequency band (operation mode 7)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	55.03	74.00	18.97	17.14	32.59	0.00	5.30	150	Vert.	49	1
4920.0	56.11	74.00	17.89	17.99	32.82	0.00	5.30	150	Hor.	238	1
5000.0	57.00	74.00	17.00	18.59	33.11	0.00	5.30	150	Vert.	296	1
5040.0	58.14	74.00	15.86	19.63	33.11	0.00	5.40	150	Vert.	0	1
5360.0	59.73	74.00	14.27	20.23	33.80	0.00	5.70	150	Vert.	2	1
5440.0	59.57	74.00	14.43	19.87	33.80	0.00	5.90	150	Vert.	360	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4760.0	41.90	54.00	12.10	4.01	32.59	0.00	5.30	150	Vert.	284	1
4920.0	43.61	54.00	10.39	5.49	32.82	0.00	5.30	150	Vert.	22	1
5000.0	44.11	54.00	9.89	5.70	33.11	0.00	5.30	150	Vert.	357	1
5040.0	47.08	54.00	6.92	8.57	33.11	0.00	5.40	150	Vert.	358	1
5360.0	46.60	54.00	7.40	7.10	33.80	0.00	5.70	150	Vert.	1	1
5440.0	46.72	54.00	7.28	7.02	33.80	0.00	5.90	150	Vert.	0	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 8)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4920.0	56.23	74.00	17.77	18.11	32.82	0.00	5.30	150	Vert.	238	1
5000.0	58.39	74.00	15.61	19.98	33.11	0.00	5.30	150	Vert.	3	1
5040.0	57.45	74.00	16.55	18.94	33.11	0.00	5.40	150	Vert.	360	1
5360.0	60.98	74.00	13.02	21.48	33.80	0.00	5.70	150	Vert.	360	1
5440.0	62.98	74.00	11.02	23.28	33.80	0.00	5.90	150	Vert.	359	1
5460.0	61.89	74.00	12.11	21.99	34.00	0.00	5.90	150	Vert.	0	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
4920.0	43.59	54.00	10.41	5.47	32.82	0.00	5.30	150	Vert.	272	1
5000.0	47.86	54.00	6.14	9.45	33.11	0.00	5.30	150	Vert.	0	1
5040.0	44.71	54.00	9.29	6.20	33.11	0.00	5.40	150	Vert.	357	1
5360.0	48.05	54.00	5.95	8.55	33.80	0.00	5.70	150	Vert.	354	1
5440.0	51.35	54.00	2.65	11.65	33.80	0.00	5.90	150	Vert.	0	1
5460.0	48.87	54.00	5.13	8.97	34.00	0.00	5.90	150	Vert.	2	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:
29, 31 – 37, 39 - 44, 46, 49 – 51, 55, 72, 73

5.5.6 Test results (radiated emissions) – cabinet emissions

5.5.6.1 Preliminary radiated emission measurement

Ambient temperature	22 °C	Relative humidity	59 %

Position of EUT: The EUT was set-up on a non-conducting table of a height of 0.8 m. The distance between EUT and antenna was 3 m.

Cable guide: For detail information of test set-up and the cable guide refer to the pictures in Table 2.

Test record: All results are shown in the following.

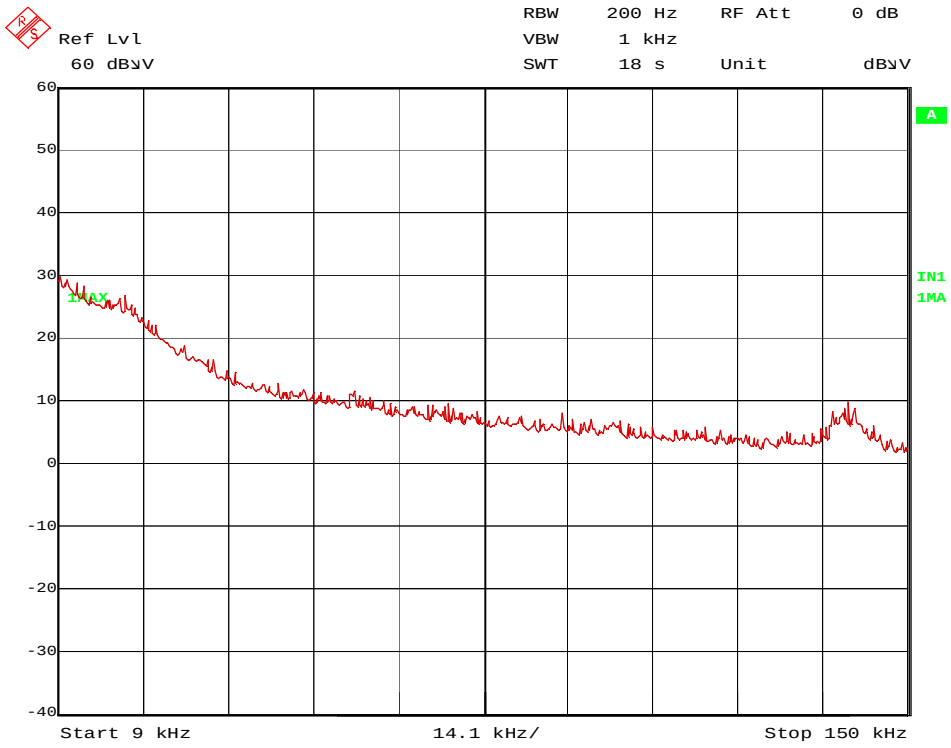
Supply voltage: During all measurements the host of the EUT was powered with 24 V via an AC/DC Adapter.

Remark: Document [3] states in 12.2.1, that in case of conducted measurements, additional radiated cabinet emission measurements must be performed. The measurements were performed at the worst case modulation, namely 802.11b mode with at channel 149, 157 and 165.

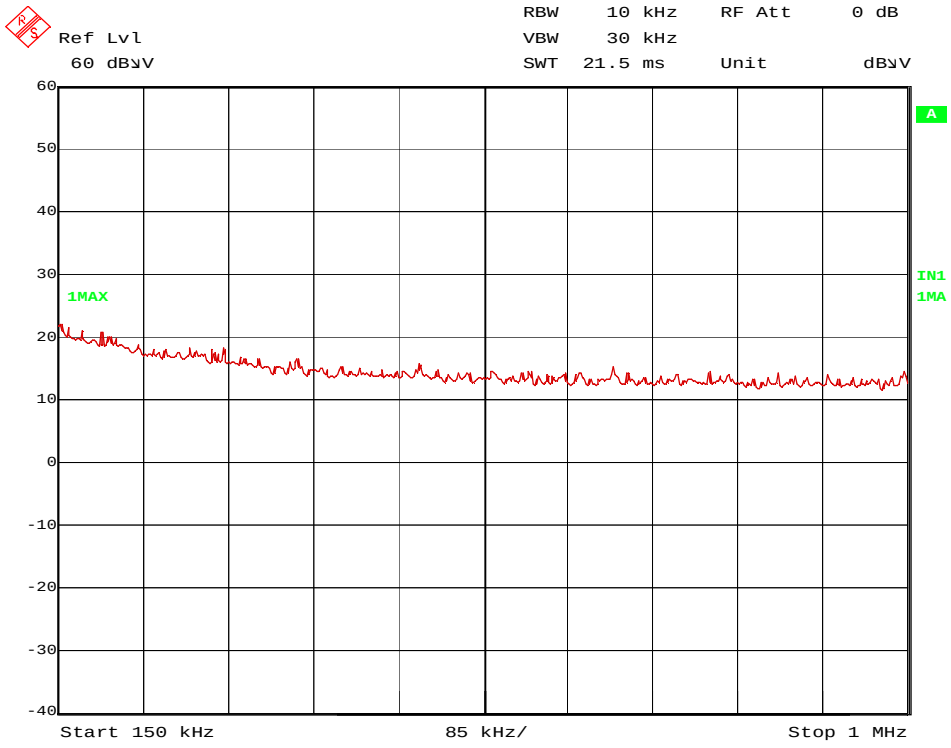
Only the plots of the worst case emissions are submitted for every frequency range above 1 GHz in the preliminary results.

The Emissions below 1 GHz were equal for all antenna ports, transmit frequencies, modulation schemes and data rates. Therefore only the results of an exemplary test case are submitted below.

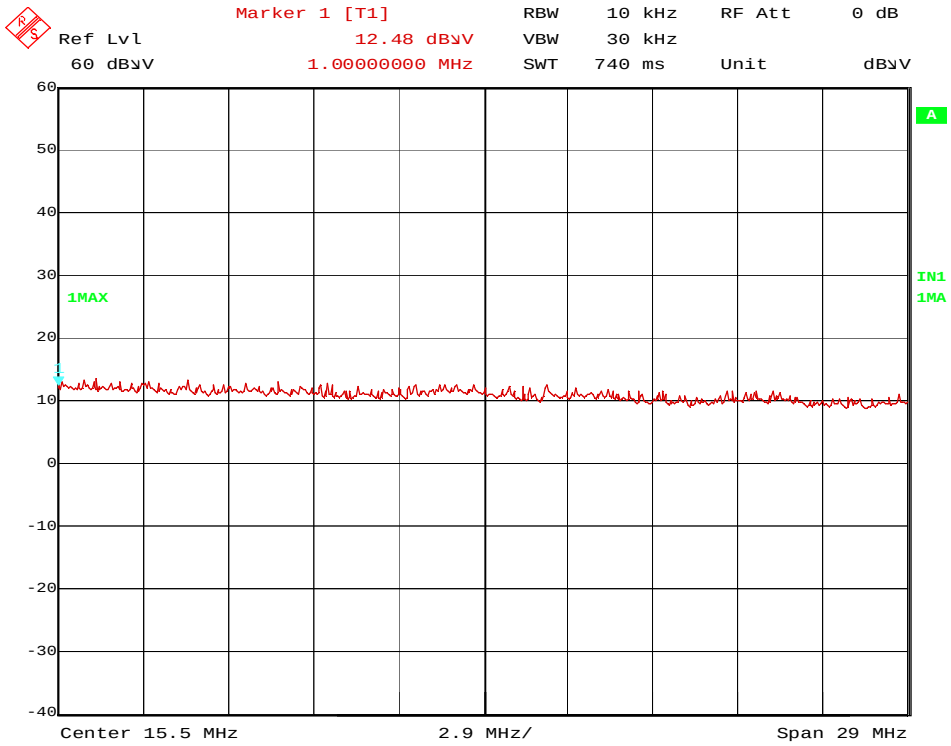
130254_9-150k_bMode_ch6.wmf: Spurious emissions from 9 kHz to 150 kHz:



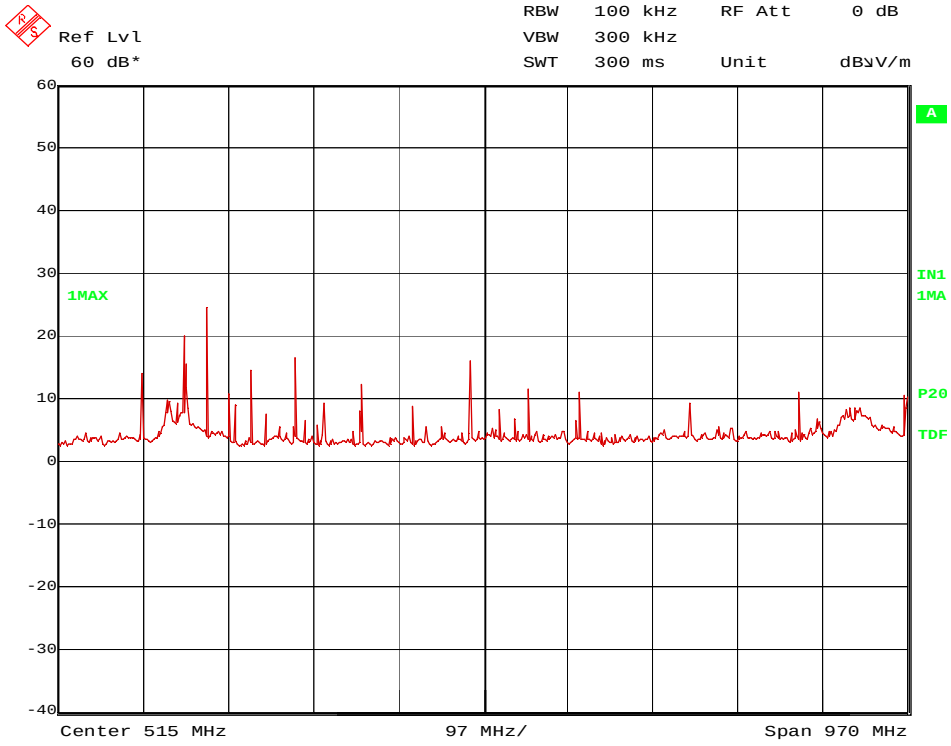
130254_150k-1M_bMode_ch6.wmf: Spurious emissions from 150 kHz to 1 MHz:



130254_1M-30M_bMode_ch6.wmf: Spurious emissions from 1 MHz to 30 MHz:

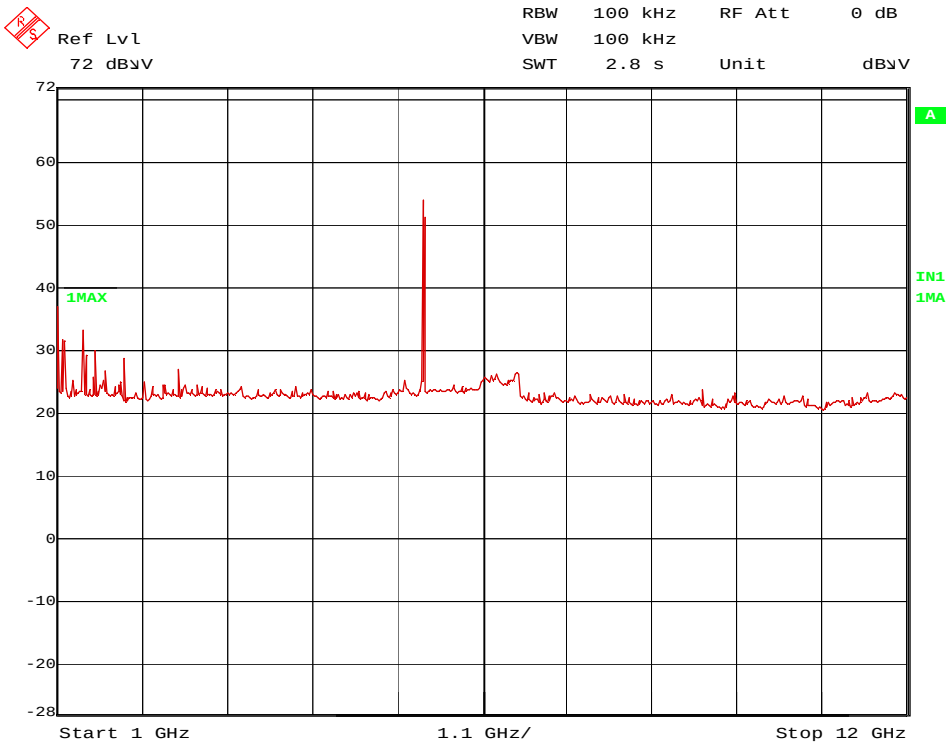


130254_30M-1G_bMode_ch6.wmf: Spurious emissions from 30 MHz to 1 GHz:

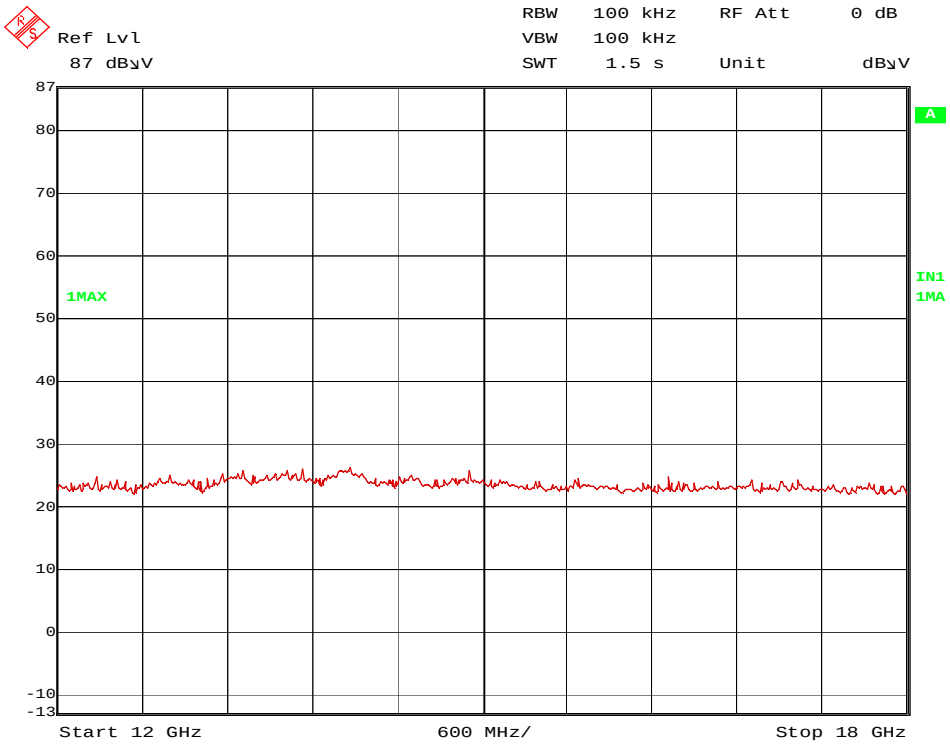


Transmitter operates at the upper end of the assigned frequency band (operation mode 4)

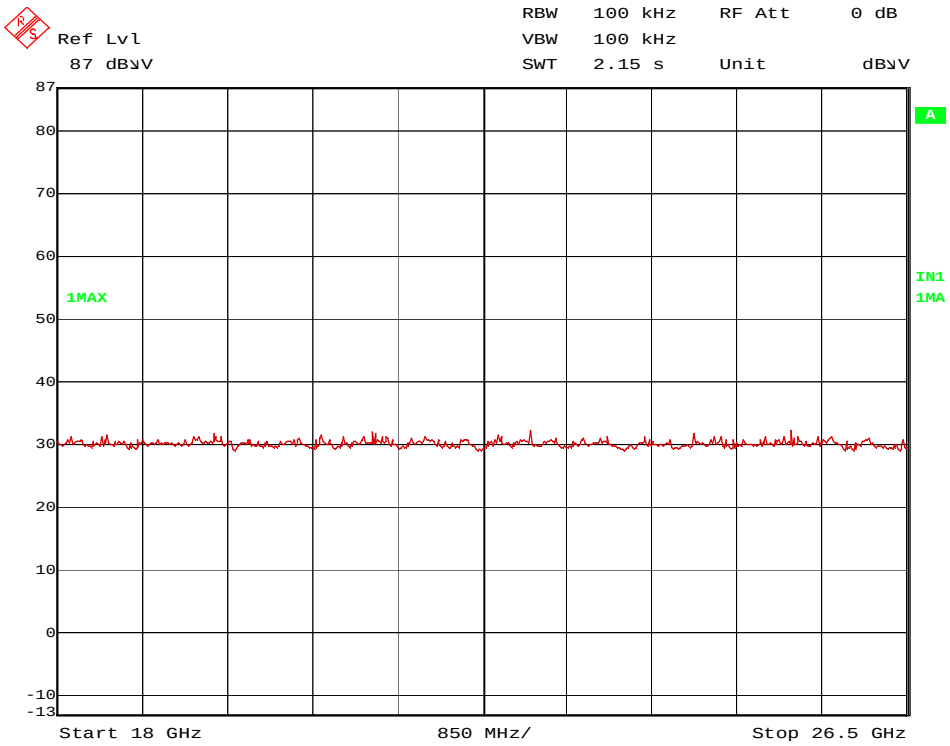
130254_SpurEmiss_1-12G_149_n20-mode.wmf: Spurious emissions from 1 GHz to 12 GHz (operation mode 4):



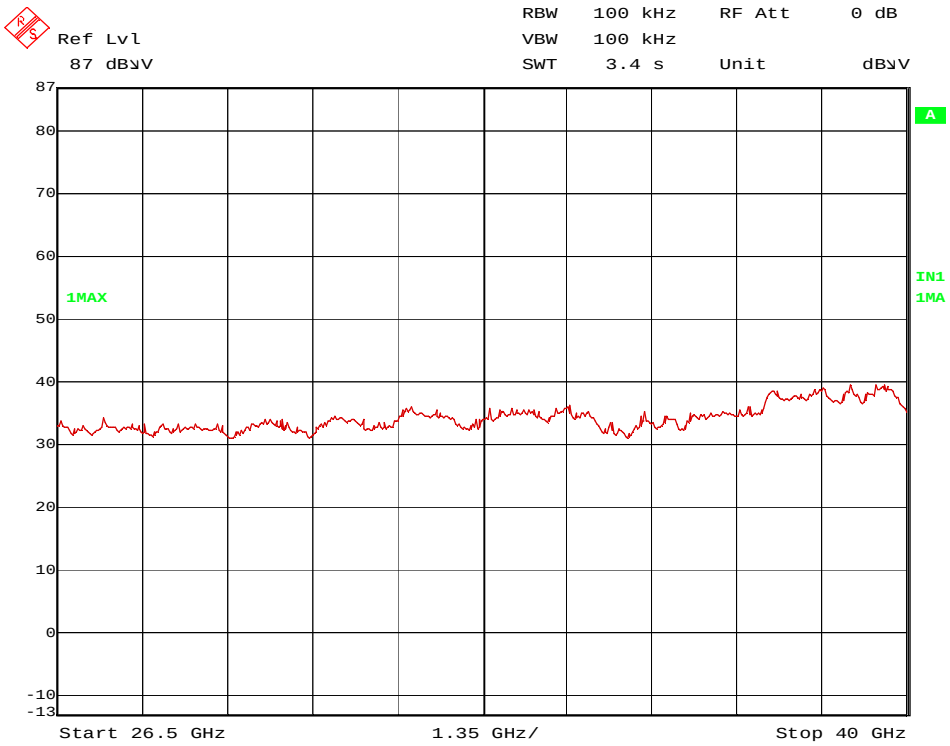
254_07.wmf: Spurious emissions from 12 GHz – 18 GHz (operation mode 4):



254_16.wmf: Spurious emissions from 18 GHz – 26.5 GHz (operation mode 4):



254_22.wmf: Spurious emissions from 26.5 GHz – 40 GHz (operation mode 4):



The following frequency was found inside the restricted bands during the preliminary radiated emission test:

- 125 MHz, 250 MHz, 1000 MHz, 1010 MHz, 1066 MHz, 1333 MHz and 1498 MHz.

The following frequencies were found outside the restricted bands during the preliminary radiated emission test:

- 175 MHz, 200 MHz, 225 MHz, 233.33 MHz, 300 MHz, 375 MHz, 433 MHz, 500 MHz, 566 MHz and 5740 MHz.

These frequencies have to be measured in a final measurement. The results are presented in the following.

TEST EQUIPMENT USED FOR THE TEST:
29, 31 – 37, 39 - 44, 46, 49 – 51, 55, 72, 73

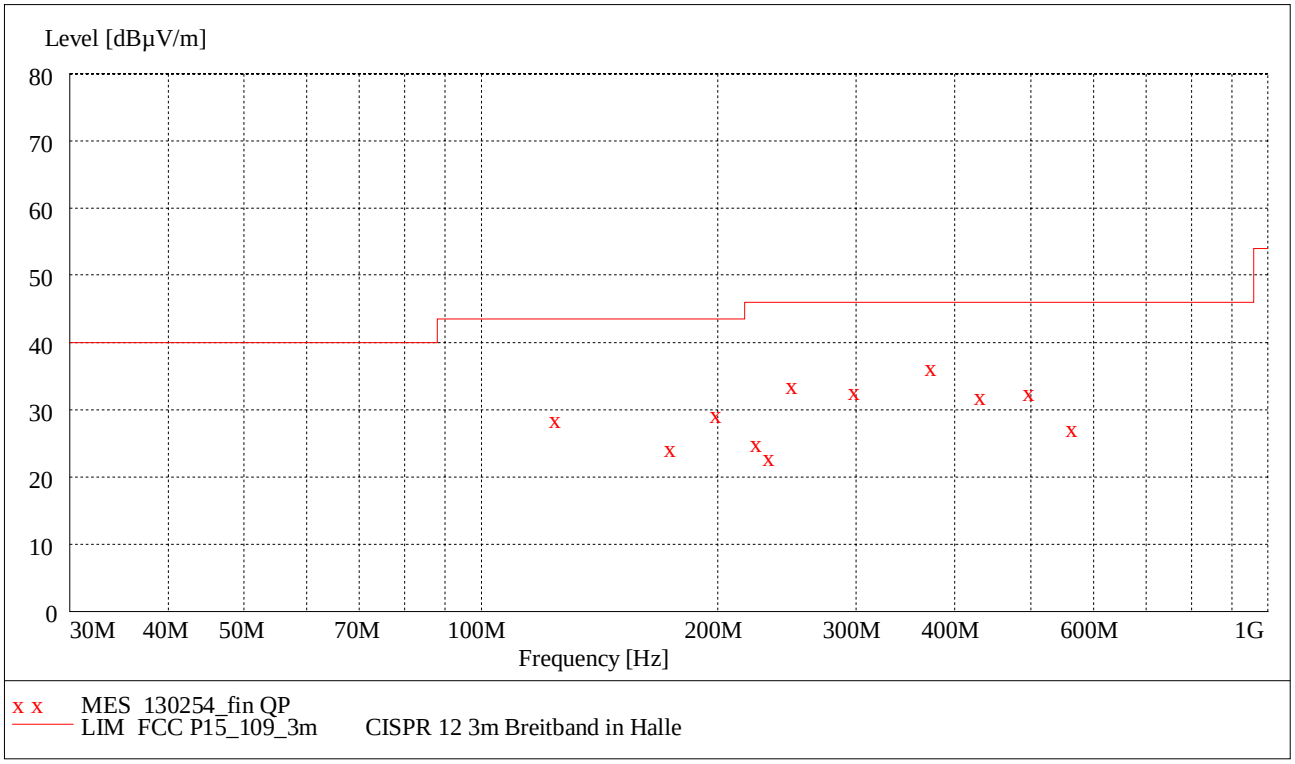
5.5.6.1 Final radiated emission measurement (9 kHz to 1 GHz)

Ambient temperature	22 °C	Relative humidity	55 %

Title: final measurement on 3 m open area test site

EUT: EWLAN1
Manufacturer: Hirschmann Automation and Control GmbH
Operating Condition: Continous Transmission
Test site: PHOENIX TESTLAB GmbH, BLOMBERG; open area test site M6
Operator: P. Neufeld
Test Specification: Transmitting on channel 6, b-mode, 2dB Power Reduction
Comment: Profile: Egalistan
15.07.2013 / 15:42:57

The measured points and the limit line in the following diagram refer to the standard measurement of the emitted interference in compliance with the above mentioned standard. The measured points marked with “x” are the measured results of the standard subsequent measurement on the open area test site.



Data record name: 130254 of 15.07.2013

The results of the standard subsequent measurement on the open area test site are indicated in the table below. The limits as well as the measured results (levels) refer to the above mentioned standard while taking account of the specified requirements for a 10 m measuring distance.

Result measured with the quasipeak detector (marked by an x):

Frequency MHz	Level dBµV/m	Transducer dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
125.000000	28.90	14.1	43.5	14.6	125.0	25.00	VERTICAL
175.000000	24.60	12.4	43.5	18.9	100.0	91.00	VERTICAL
200.000000	29.70	11.7	43.5	13.8	101.0	206.00	HORIZONTAL
225.000000	25.30	12.9	46.0	20.7	113.0	204.00	HORIZONTAL
233.330000	23.30	13.5	46.0	22.7	118.0	201.00	HORIZONTAL
250.000000	34.00	15.1	46.0	12.0	100.0	340.00	HORIZONTAL
300.000000	33.10	16.4	46.0	12.9	100.0	213.00	HORIZONTAL
375.000000	36.70	18.5	46.0	9.3	100.0	200.00	HORIZONTAL
433.330000	32.40	20.4	46.0	13.6	198.0	189.00	HORIZONTAL
500.000000	32.90	21.9	46.0	13.1	154.0	328.00	HORIZONTAL
566.660000	28.50	24.1	46.0	17.5	375.0	232.00	VERTICAL

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:
14 - 20

5.5.6.2 Final radiated emission measurement (1 GHz to 40 GHz)

Ambient temperature	20 °C	Relative humidity	30 %

Position of EUT: The EUT was set-up on a non-conducting table of a height of 0.8 m. The distance between EUT and antenna was 3 m.

Cable guide: For detail information of test set-up and the cable guide refer to the pictures in annex A of this test report.

Test record: All results are shown in the following.

Supply voltage: During all measurements the host of the EUT was powered with 24 V via an AC/DC Adapter.

Resolution bandwidth: For all measurements a resolution bandwidth of 1 MHz was used.

Comment: For simplification, all emissions were tested using the restricted band limits. Chapter 11.1 c) in document [3] states, that attenuation below 15.209 limits is not required.

Transmitter operates at the lower end of the assigned frequency band (operation mode 4)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5740.0	79.50	-	-	65.02	33.78	25.20	5.90	150	Hor.	26	1
1000.0	47.48	74.00	26.52	47.54	24.04	26.50	2.40	150	Vert.	11	1
1010.0	35.21	74.00	38.79	35.27	24.04	26.50	2.40	150	Vert.	6	1
1066.0	33.22	74.00	40.78	33.22	24.20	26.50	2.30	150	Hor.	77	1
1333.0	37.94	74.00	36.06	36.65	24.99	26.50	2.80	150	Vert.	171	1
1498.0	35.08	74.00	38.92	33.47	25.31	26.50	2.80	150	Hor.	1	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5740.0	69.92	-	-	55.44	33.78	25.20	5.90	150	Hor.	26	1
1000.0	33.75	54.00	20.25	33.81	24.04	26.50	2.40	150	Vert.	16	1
1010.0	22.22	54.00	31.78	22.28	24.04	26.50	2.40	150	Vert.	187	1
1066.0	22.03	54.00	31.97	22.03	24.20	26.50	2.30	150	Vert.	164	1
1333.0	30.95	54.00	23.05	29.66	24.99	26.50	2.80	150	Vert.	175	1
1498.0	20.80	54.00	33.20	19.19	25.31	26.50	2.80	150	Vert.	215	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the middle of the assigned frequency band (operation mode 5)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5777.9	78.61	-	-	63.97	33.84	25.20	6.00	150	Hor.	22	1
1000.0	47.48	74.00	26.52	47.54	24.04	26.50	2.40	150	Vert.	3	1
1010.0	41.04	74.00	32.96	41.10	24.04	26.50	2.40	150	Vert.	278	1
1064.0	33.22	74.00	40.78	33.22	24.20	26.50	2.30	150	Vert.	1	1
1240.0	34.28	74.00	39.72	33.22	24.86	26.50	2.70	150	Hor.	0	1
1332.0	37.07	74.00	36.93	35.78	24.99	26.50	2.80	150	Hor.	23	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5777.9	69.22	-	-	54.58	33.84	25.20	6.00	150	Hor.	22	1
1000.0	33.68	54.00	20.32	33.74	24.04	26.50	2.40	150	Vert.	12	1
1010.0	22.27	54.00	31.73	22.33	24.04	26.50	2.40	150	Vert.	180	1
1064.0	19.10	54.00	34.90	19.10	24.20	26.50	2.30	150	Vert.	182	1
1240.0	20.23	54.00	33.77	19.17	24.86	26.50	2.70	150	Vert.	172	1
1332.0	20.36	54.00	33.64	19.07	24.99	26.50	2.80	150	Vert.	178	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Transmitter operates at the upper end of the assigned frequency band (operation mode 6)

Result measured with the peak detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5818.0	79.00	-	-	64.36	33.84	25.20	6.00	150	Hor.	162	1
1000.0	47.61	74.00	26.39	47.67	24.04	26.50	2.40	150	Vert.	19	1
1066.0	35.89	74.00	38.11	35.89	24.20	26.50	2.30	150	Vert.	53	1
1099.0	36.25	74.00	37.75	35.78	24.47	26.50	2.50	150	Vert.	198	1
1333.0	38.92	74.00	35.08	37.63	24.99	26.50	2.80	150	Vert.	172	1
1498.0	37.89	74.00	36.11	36.28	25.31	26.50	2.80	150	Hor.	94	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Result measured with the average detector:

Frequency MHz	Meas. Result dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Turntable Angle	Pos.
5818.0	69.41	-	-	54.77	33.84	25.20	6.00	150	Hor.	162	1
1000.0	33.73	54.00	20.27	33.79	24.04	26.50	2.40	150	Vert.	16	1
1066.0	22.00	54.00	32.00	22.00	24.20	26.50	2.30	150	Vert.	165	1
1099.0	22.47	54.00	31.53	22.00	24.47	26.50	2.50	150	Vert.	190	1
1333.0	31.70	54.00	22.30	30.41	24.99	26.50	2.80	150	Vert.	176	1
1498.0	20.81	54.00	33.19	19.20	25.31	26.50	2.80	150	Vert.	210	1
Measurement uncertainty						+2.2 dB / -3.6 dB					

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:
29, 31 – 37, 39 - 44, 46, 49 – 51, 55, 72, 73

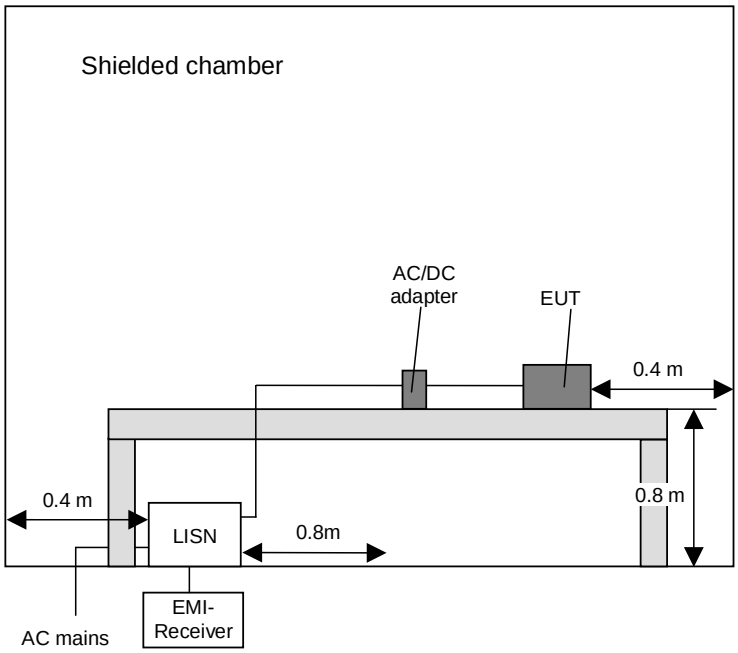
5.6 Conducted emissions on power supply lines (150 kHz to 30 MHz)

5.6.1 Method of measurement

This test will be carried out in a shielded chamber. Tabletop devices will set up on a non-conducting support with a size of 1 m by 1.5 m and a height of 80 cm above the ground plane. Floor-standing devices will be placed directly on the ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2009 [1].

The frequency range 150 kHz to 30 MHz will be measured with an EMI Receiver set to MAX Hold mode with peak and average detector and a resolution bandwidth of 9 kHz. A scan will be carried out on the phase (or plus pole in case of DC powered devices) of the AC mains network. If levels detected 10 dB below the appropriable limit, this emission will be measured with the average and quasi-peak detector on all lines.

Frequency range	Resolution bandwidth
150 kHz to 30 MHz	9 kHz



5.6.2 Test results (conducted emissions on power supply lines)

Ambient temperature	20 °C	Relative humidity	52 %

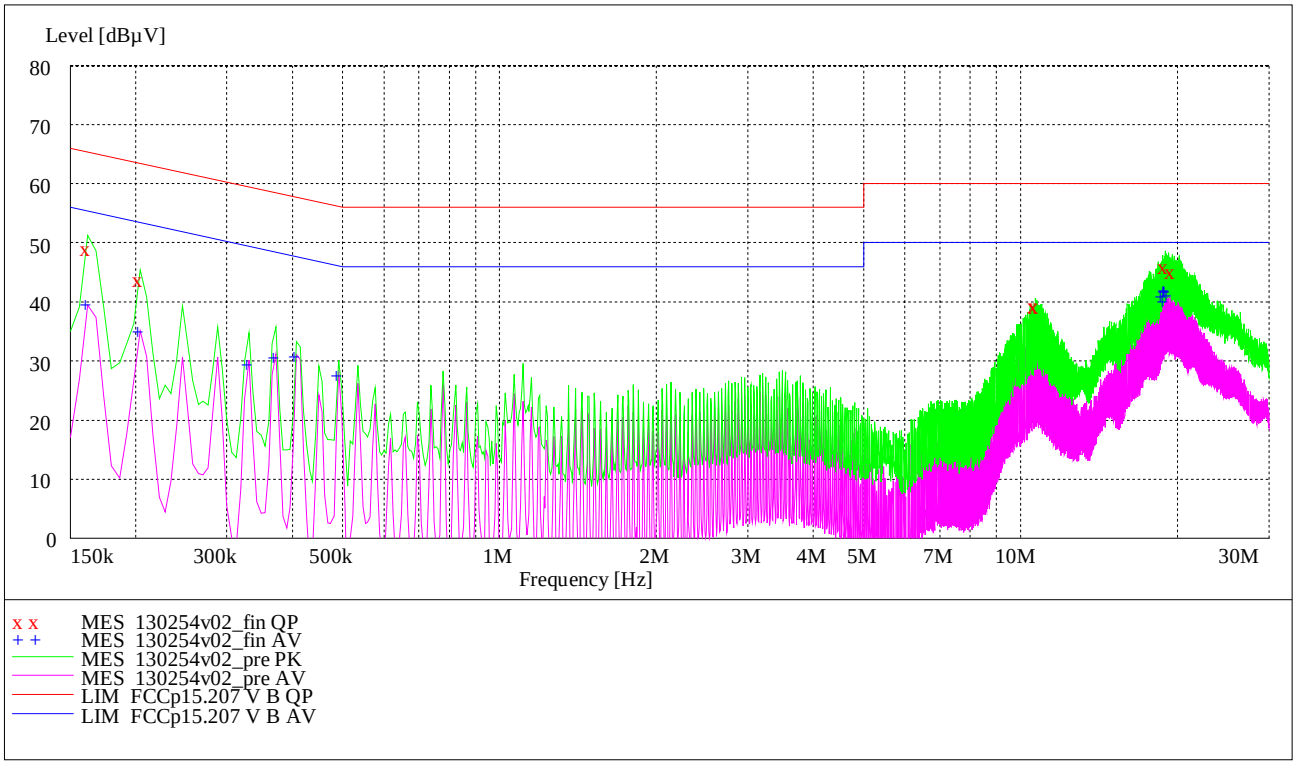
Position of EUT: For the test the EUT together with the basic unit were plugged into a laptop PC via an Ethernet cable. To emulate a real use case, a connection between the laptop PC connected by Ethernet and another laptop PC connected wirelessly to the Access Point was established. To emulate real traffic, an iperf stream was send from one laptop PC to the other. The laptop PC with the inserted EUT was set-up on a non-conducting table of a height of 0.8 m. The distance between EUT and antenna was 3 m.

Cable guide: For detail information of test set-up and the cable guide refer to the pictures in annex A of this test report.

Test record: All results are shown in the following.

Supply voltage: During all measurements the host of the EUT was supplied by a 100 – 240 V AC to 24 V DC converter. Measurement performed with US 120V/60Hz. For the test a MINI-PS-100-240AC/24DC/1 from Phoenix Contact was used.

The curves in the diagram only represent for each frequency point the maximum measured value of all preliminary measurements, which were made for each power supply line. The top-measured curve represents the peak measurement and the bottom-measured curve the average measurement. The quasi-peak measured points are marked by an x and the average measured points by an +.



Data record name: 130254v02

Result measured with the quasipeak detector (marked by an x):

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.162000	49.30	1.5	65.4	16.1	N	FLO
0.204000	44.00	1.0	63.4	19.4	L1	FLO
10.680000	39.80	1.4	60.0	20.2	N	GND
10.722000	39.60	1.4	60.0	20.4	N	GND
18.978000	46.30	2.3	60.0	13.7	L1	GND
19.554000	45.60	2.4	60.0	14.4	L1	FLO

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:
1 – 4, 20

6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No.	Test equipment	Type	Manufacturer	Serial No.	PM. No.	Cal. Date	Cal. Due
1	Shielded chamber M47	-	Albatross Projects	B83117-C6439-T262 -	480662	Weekly verification (system cal.)	
2	EMI Receiver	ESIB 26	Rohde & Schwarz	1088.7490	481182	03/09/2012	03/2014
4	High pass filter	HR 0.13-5ENN	FSY Microwave Inc.	DC 0109 SN 002	480340	Weekly verification (system cal.)	
14	Open area test site	-	Phoenix Test-Lab	-	480085	Weekly verification (system cal.)	
15	Measuring receiver	ESIB7	Rohde & Schwarz	100304	480521	02/15/2012	02/2014
16	Controller	HD100	Deisel	100/670	480139	-	-
17	Turntable	DS420HE	Deisel	420/620/80	480087	-	-
18	Antenna support	MA240-0	Inn-Co GmbH	MA240-0/030/6600603	480086	-	-
19	Antenna	CBL6111 D	Chase	25761	480894	09/28/2011	09/2014
20	EMI Software	ES-K1	Rohde & Schwarz	-	480111	-	-
29	Fully anechoic chamber M20	-	Albatross Projects	B83107-E2439-T232	480303	Weekly verification (system cal.)	
30	Spectrum analyser	FSU	Rohde & Schwarz	200125	480956	02/15/2012	02/2014
31	Measuring receiver	ESI 40	Rohde & Schwarz	100064	480355	02/13/2012	02/2014
32	Controller	MCU	Maturo	MCU/043/971107	480832	-	-
33	Turntable	DS420HE	Deisel	420/620/80	480315	-	-
34	Antenna support	AS615P	Deisel	615/310	480187	-	-
35	Antenna	CBL6112 B	Chase	2688	480328	04/21/2011	04/2014
36	Antenna	3115 A	EMCO	9609-4918	480183	11/09/2011	11/2014
37	Standard Gain Horn 11.9 GHz – 18 GHz	18240-20	Flann Microwave	483	480294	Six month verification (system cal.)	
39	Standard Gain Horn 17.9 GHz – 26.7 GHz	20240-20	Flann Microwave	411	480297	Six month verification (system cal.)	
40	Standard Gain Horn Antenne 26.4 – 40.1 GHz	22240-20	Flann Microwave	469	480229	Six month verification (system cal.)	
41	RF-cable No. 3	Sucoflex 106B	Huber&Suhner	0563/6B / Kabel 3	480670	Weekly verification (system cal.)	
42	RF-cable No. 40	Sucoflex 106B	Huber&Suhner	0708/6B / Kabel 40	481330	Weekly verification (system cal.)	
43	RF-cable No. 30	RTK 081	Rosenberger	-	410141	Weekly verification (system cal.)	
44	RF-cable No. 31	RTK 081	Rosenberger	-	410142	Weekly verification (system cal.)	
46	RF-cable 1 m	KPS-1533-400-KPS	Insulated Wire	-	480301	Six month verification (system cal.)	
49	Preamplifier	JS3-00101200-23-5A	Miteq	681851	480337	Six month verification (system cal.)	
50	Preamplifier	JS3-12001800-16-5A	Miteq	571667	480343	Six month verification (system cal.)	

51	Preamplifier	JS3-18002600-20-5A	Miteq	658697	480342	Six month verification (system cal.)	
55	Loop antenna	HFH2-Z2	Rohde & Schwarz	832609/014	480059	02/16/2012	02/2014
60	Power Meter	NRVD	Rohde & Schwarz	833697/030	480589	02/15/2012	02/2014
61	Peak Power Sensor	NRV-Z32	Rohde & Schwarz	849745/016	480551	07/2013	07/2015
72	4 GHz High Pass Filter	WHKX4.0/18G-8SS	Wainwright Instruments	1	480587	Weekly verification (system cal.)	
73	Single Control Unit	SCU	Maturo GmbH	SCU/006/971107	480831	Calibration not necessary	
80	High-pass Filter	H26G40G1	Microwave Circuits, Inc.	33471	480593	Six month verification (system cal.)	

7 REPORT HISTORY

Report Number	Date	Comment
F122165E3	17 September 2013	Document created

8 LIST OF ANNEXES

ANNEX A TEST SET-UP PHOTOS 7 pages

133448_01: Test setup - Radiated emission, Antennas terminated (open area test site)
133448_02: Test setup - Radiated emission, Antennas terminated (fully anechoic chamber)
133448_03: Test setup - Radiated emission, Antenna BAT-ANT-N-3AGN-F (fully anechoic chamber)
133448_04: Test setup - Radiated emission, Antenna BAT-ANT-RSMA-2AGN-R (fully anechoic chamber)
133448_05: Test setup - Radiated emission, Antenna BAT-ANT-N-MiMoDB-5N-IP65 (fully anechoic chamber)
133448_06: Test setup - Radiated emission, Antenna BAT-ANT-N-9A-DS-IP65 (fully anechoic chamber)
133448_07: Test setup – conducted measurements at the antenna port
133448_18: Test setup – conducted emissions on power supply lines

ANNEX B EXTERNAL PHOTOGRAPHS 3 pages

133448_08.JPG: EUT + Ancillary Device, 3D view 1
133448_09.JPG: EUT + Ancillary Device, 3D view 1
133448_10.JPG: Adapter board for test purposes

ANNEX C INTERNAL PHOTOGRAPHS 3 pages

133448_13.JPG: EUT - top view, with shielding
133448_16.JPG: EUT - top view, shielding removed
133448_14.JPG: EUT – bottom view