

TEST REPORT

Test Report Reference: F092137E2

Equipment under Test: cB-0925-01-1-02 with TwinGain-2400 mounted on cB-0924-01

FCC ID: PVH0925

IC: 5325A-0925

Serial Number: None

Applicant: connectBlue AB

Manufacturer: connectBlue AB

**Test Laboratory
(CAB)
accredited by
DATech in der TGA GmbH
in compliance with DIN EN ISO/IEC 17025
under the
Reg. No. DAT-P-105/99-21,
FCC Test site registration number 90877
and
Industry Canada Test site registration IC3469A-1 and
FCC Test site registration number 90877**

TEST REPORT REFERENCE: F092137E2

Contents:	Page
1 IDENTIFICATION	3
1.1 APPLICANT	3
1.2 MANUFACTURER	3
1.3 DATES	3
1.4 TEST LABORATORY	4
1.5 RESERVATION	4
1.6 NORMATIVE REFERENCES	4
1.7 TEST RESULTS	4
2 TECHNICAL DATA OF EQUIPMENT	5
2.1 PERIPHERY DEVICES	5
3 OPERATIONAL STATES AND PHYSICAL BOUNDARIES	6
4 LIST OF MEASUREMENTS	8
5 TEST RESULTS	9
5.1 BAND-EDGE COMPLIANCE	9
5.1.1 METHOD OF MEASUREMENT (BAND-EDGE COMPLIANCE (RADIATED))	9
5.1.2 TEST RESULT (BAND-EDGE COMPLIANCE (RADIATED)) WITH TwinGain-2400 ANTENNA ON cB-0924-01 PCB	10
5.2 RADIATED EMISSIONS	14
5.2.1 METHOD OF MEASUREMENT (RADIATED EMISSIONS)	14
5.2.2 TEST RESULTS (RADIATED EMISSIONS)	19
5.2.2.1 PRELIMINARY MEASUREMENT (9 kHz to 1 GHz) WITH TwinGain-2400 ANTENNA ON cB-0924-01 PCB	19
5.2.2.2 FINAL RADIATED EMISSION TEST (30 MHz to 1 GHz) WITH TwinGain-2400 ANTENNA ON cB-0924-01 PCB	22
5.2.2.3 PRELIMINARY MEASUREMENT (1 GHz to 25 GHz) WITH TwinGain-2400 ANTENNA ON cB-0924-01 PCB	24
5.2.2.4 FINAL MEASUREMENT (1 GHz to 25 GHz) WITH TwinGain-2400 ANTENNA ON cB-0924-01 PCB	31
5.3 CONDUCTED EMISSIONS ON POWER SUPPLY LINES (150 kHz to 30 MHz)	34
5.3.1 METHOD OF MEASUREMENT	34
5.3.2 TEST RESULTS (CONDUCTED EMISSIONS ON POWER SUPPLY LINES)	35
6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS	37
7 LIST OF ANNEXES	39

TEST REPORT REFERENCE: F092137E2

1 IDENTIFICATION

1.1 APPLICANT

Name:	connectBlue AB
Address:	Norra Vallgatan 64 3V
	Malmö SE-211 19
Country:	Sweden
Name for contact purposes:	Mr. Martin Engdahl
Tel:	+ 46 40 63 07 100
Fax:	+ 46 40 23 71 37
e-mail address:	martin.engdahl@connectblue.se

1.2 MANUFACTURER

Name:	connectBlue AB
Address:	Norra Vallgatan 64 3V
	Malmö SE-211 19
Country:	Sweden
Name for contact purposes:	Mr. Martin Engdahl
Tel:	+ 46 40 63 07 100
Fax:	+ 46 40 23 71 37
e-mail address:	martin.engdahl@connectblue.se

1.3 DATES

Date of receipt of test sample:	25 August 2009
Start of test:	25 August 2009
End of test:	02 September 2009

TEST REPORT REFERENCE: F092137E2

1.4 TEST LABORATORY

The tests were carried out at: **PHOENIX TESTLAB GmbH**
Königswinkel 10
D-32825 Blomberg Phone: **+49 (0) 52 35 / 95 00-0**
Germany Fax: **+49 (0) 52 35 / 95 00-10**

accredited by DATech in der TGA GmbH in compliance with DIN EN ISO/IEC 17025 under Reg. No. DAT-P-105/99, Industry Canada Test site registration IC3469A-1 and FCC Test site registration number 90877.

Test engineer: Thomas KÜHN
Name



Signature

09 September 2009

Date

Test report checked: Bernd STEINER
Name



Signature

09 September 2009

Date

PHOENIX TESTLAB GmbH
Königswinkel 10
32825 Blomberg
Tel. 0 52 35 / 95 00-0
Fax 0 52 35 / 95 00-10

Stamp

1.5 RESERVATION

This test report is only valid in its original form.

Any reproduction of its contents without written permission of the accredited test laboratory PHOENIX TESTLAB GmbH is prohibited.

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 REFERENCE.

1.6 NORMATIVE REFERENCES

- [1] **ANSI C63.4-2003** 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 (October 2008)** Radio Frequency Devices
- [3] **FCC Public Notice DA 00-705 (March 2000)**
- [4] **RSS-210 Issue 7 (June 2007)** Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment
- [5] **RSS-Gen Issue 2 (June 2007)** General Requirements and Information for the Certification of Radiocommunication Equipment
- [6] **Publication Number 913591 (March 2007)** Measurement of radiated emissions at the edge of the band for a Part 15 RF Device

1.7 TEST RESULTS

The requirements of this test document are fulfilled by the equipment under test. The complete test results are presented in the following.

TEST REPORT REFERENCE: F092137E2

2 TECHNICAL DATA OF EQUIPMENT

Type / model designation: *	cB-0925-01					
Type of equipment: *	Bluetooth module					
FCC ID: *	PVH0925					
IC: *	5325A-0925					
Fulfills Bluetooth specification: *	2.0 with EDR					
Antenna type: *	TwinGain-2400 mounted on cB-0924-01 PCB					
Antenna gain: *	+3 dBi					
Rated output power: *	Max. 4 dBm					
Antenna connector: *	Hirose U.FL connector (internal)					
Power supply: *	U _{nom} =	5.0 V DC	U _{min} =	3.0 V DC	U _{max} =	6.0 V DC
Type of modulation: *	FHSS: GFSK (1 Mbps), $\pi/4$ -DPQSK (2 Mbps) or 8DPSK (3 Mbps)					
Operating frequency range:*	2402 MHz to 2480 MHz					
Number of channels: *	79					
Temperature range: *	-40 °C to +85 °C					

*: declared by the applicant

Bluetooth operates in the unlicensed ISM band at 2.4 GHz. In North America (USA and Canada) a band with a width of 83.5 MHz is available. In this band 79 RF channels spaced 1 MHz apart are defined. The channel is represented by a pseudo random hopping sequence through the 79 channels. The normally occupancy time of one frequency will be 625 μ s. The ordinary hopping rate will be 1600 hops/s. All frequencies will be used equally.

The following external I/O cables were used:

Identification	Connector		Lenght
	EUT	Ancillary	
Power supply	Five pole M12 connector	-	2 m
-	-	-	-
-	-	-	-

*: Length during the test if no other specified.

2.1 PERIPHERY DEVICES

The following equipment was used as control unit and ancillary equipment:

- A personal computer with a terminal-software was used, connected temporary to the EUT, for setting the equipment into the necessary operation mode. During the measurements the personal computer was disconnected.
- For measurements on the power supply line an AC/DC adaptor type PHOENIX CONTACT MINI-PS-100-240AC/24DC/1 was used.

TEST REPORT REFERENCE: F092137E2

3 OPERATIONAL STATES AND PHYSICAL BOUNDARIES

The EUT is a module, which is intended to be used in several Bluetooth applications, in combination with the cB.0924-01 it is intended to transmit Ethernet signals via a Bluetooth radio link. The cB-0925-01 is already tested and documented under Phoenix Testlab test report reference F092137E1. Because the antenna TwinGain-2400 is mounted on a PCB cB-0924-01, which contains several digital circuits, the radiated measurements with the antenna and the conducted emission measurement on power supply lines were repeated and documented in this test report.

The tests were carried out with one unmodified sample mounted on the cB-0924 PCB.

During the tests the test sample was powered by an external power supply via the cB-0924 PCB with 5.0 V DC.

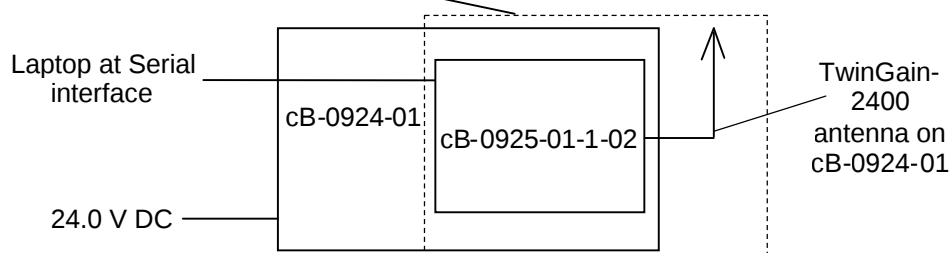
For selecting an operation mode, a personal computer with a software delivered by the applicant was connected to the EUT. After adjusting the operating mode, the personal computer was removed. To do this the test-engineer was instructed by the applicant.

The EUT was not labelled with an FCC / IC label during the tests.

The following operation modes were used during the tests:

Operation mode	Description of the operation mode	Modulation	Data rate / Mbps
1	Continuous transmitting on 2402 MHz	GFSK	1
1a		$\pi/4$ -DQPSK	2
1b		8DPSK	3
2	Continuous transmitting on 2441 MHz	GFSK	1
2a		$\pi/4$ -DQPSK	2
2b		8DPSK	3
3	Continuous transmitting on 2480 MHz	GFSK	1
3a		$\pi/4$ -DQPSK	2
3b		8DPSK	3
4	Transmitter hopping on all channels	GFSK	1
4a		$\pi/4$ -DQPSK	2
4b		8DPSK	3
5	Continuous receiving on 2441 MHz		

Physical boundary of the EUT



TEST REPORT REFERENCE: F092137E2

The following test modes were adjusted during the tests:

Preliminary tests were performed in different data rates and different orthogonal directions (if applicable), to find worst-case configuration and position. The data rate shown in the table below shows the found worst-case rate with respect to specific test item. The following table shows a list of the test modes used for the results, documented in this report. The radiated emission measurement was carried out in the orthogonal direction that emits the highest spurious emission levels.

Test items	Operation mode
Band edge compliance (radiated)	1, 3, 4 (1 Mbps)
Radiated emissions (transmitter)	1, 2, 3 (1 Mbps)
Conducted emissions on supply line	4b (3 Mbps)
Radiated emissions (receiver)	5

TEST REPORT REFERENCE: F092137E2

4 LIST OF MEASUREMENTS

Application	Frequency range [MHz]	FCC 47 CFR Part 15 section [2]	RSS 210, Issue 7 [4] or RSS-Gen, Issue 2 [5]	Status	Refer page
20 dB bandwidth	General	15.247 (a) (1)	A8.1 (b) [4]	Passed	11 et seq. of test report F092137E1
Carrier frequency separation	General	15.247 (a) (1)	A8.1 (b) [4]	Passed	14 et seq. of test report F092137E1
Number of hopping channels	2400.0 - 2483.5	15.247 (a) (1) (iii)	A8.1 (d) [4]	Passed	17 et seq. of test report F092137E1
Dwell time	2400.0 - 2483.5	15.247 (a) (1) (iii)	A8.1 (d) [4]	Passed	19 et seq. of test report F092137E1
Maximum peak output power	2400.0 - 2483.5	15.247 (b) (1)	A8.4 (2) [4]	Passed	23 et seq. of test report F092137E1
Band edge compliance	2400.0 - 2483.5	15.247 (d)	A8.5 [4]	Passed	9 et seq.
Radiated emissions (transmitter)	0.009 - 25,000	15.205 (a) 15.209 (a)	A8.5 [4] 2.6 [4]	Passed	14 et seq.
Conducted emissions on supply line	0.15 - 30	15.207 (a)	7.2.2 [5]	Passed	34 et seq.
Radiated emissions (receiver)	0.009 - 25,000	15.109 (a)	6 [5] 2.6 [4]	Passed	Annex D

TEST REPORT REFERENCE: F092137E2

5 TEST RESULTS

5.1 BAND-EDGE COMPLIANCE

5.1.1 METHOD OF MEASUREMENT (BAND-EDGE COMPLIANCE (RADIATED))

The same test set-up as used for the final radiated emission measurement shall be used (refer also subclause 5.8.1 of this test report). The measurements shall be carried out with using a resolution bandwidth of 100 kHz.

The following spectrum analyser settings shall be used:

- Span: Wide enough to capture the peak level of the emission on the channel closest to the band-edge, as well as any modulation products, which fall outside the assigned frequency band.
- Resolution bandwidth: 100 kHz.
- Video bandwidth: $\geq$ the resolution bandwidth.
- Sweep: Auto.
- Detector function: Peak.
- Trace mode: Max hold.

After trace stabilisation the marker shall be set on the signal peak. The first display line has to be set on this value. The second display line has to be set 20 dB below the first line (or the peak marker). The frequency line shall be set on the edge of the assigned frequency band. Set the second marker on the emission at the band-edge, or on the highest modulation product outside of the band, if this level is higher than that at the band-edge. This frequency shall be measured with the EMI receiver as described in subclause 5.8.1 of this test report, but 100 kHz resolution bandwidth shall be used.

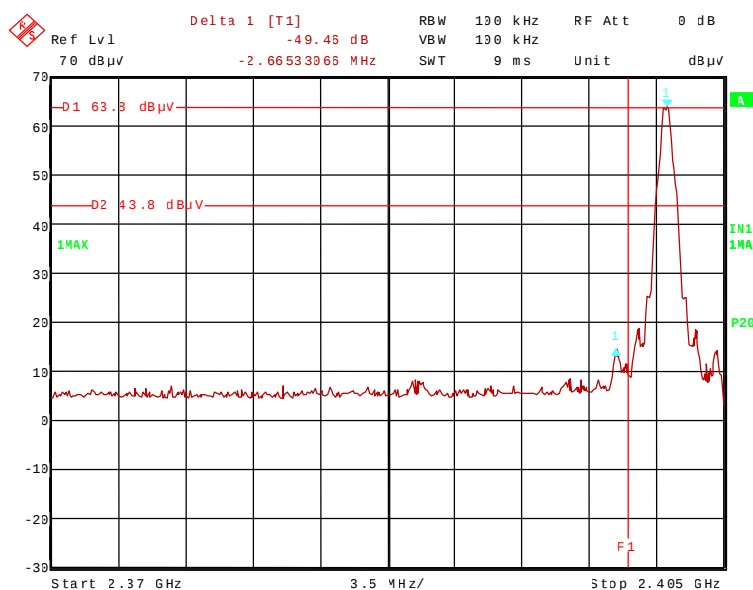
The measurement will be performed at the upper end of the assigned frequency band and with hopping on and off.

TEST REPORT REFERENCE: F092137E2

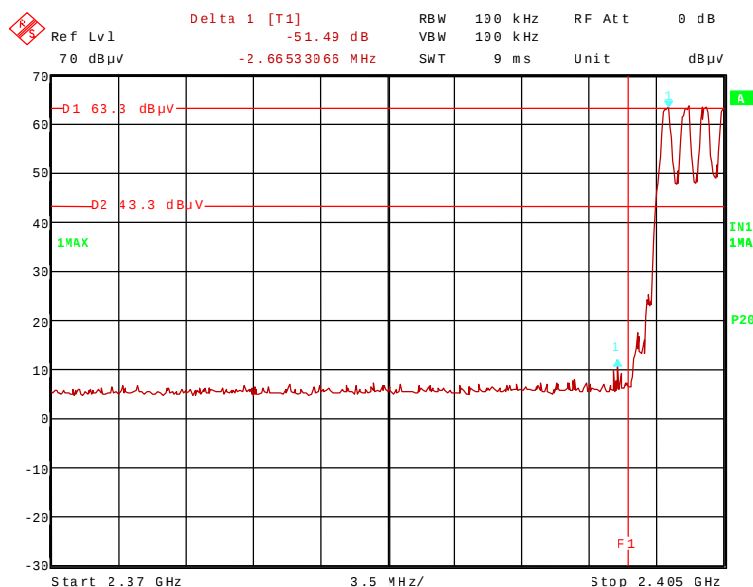
5.1.2 TEST RESULT (BAND-EDGE COMPLIANCE (RADIATED)) WITH TwinGain-2400 ANTENNA ON cB-0924-01 PCB

Ambient temperature	21 °C	Relative humidity	60 %
---------------------	-------	-------------------	------

92137_79.wmf. Radiated band-edge compliance, lower band edge, hopping off (operation mode 1):

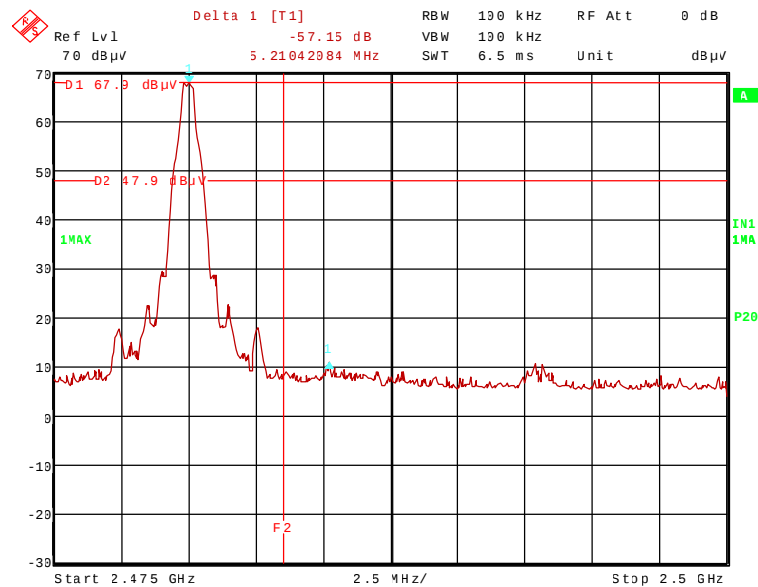


92137_82.wmf: Radiated band-edge compliance, lower band edge, hopping on (operation mode 4):

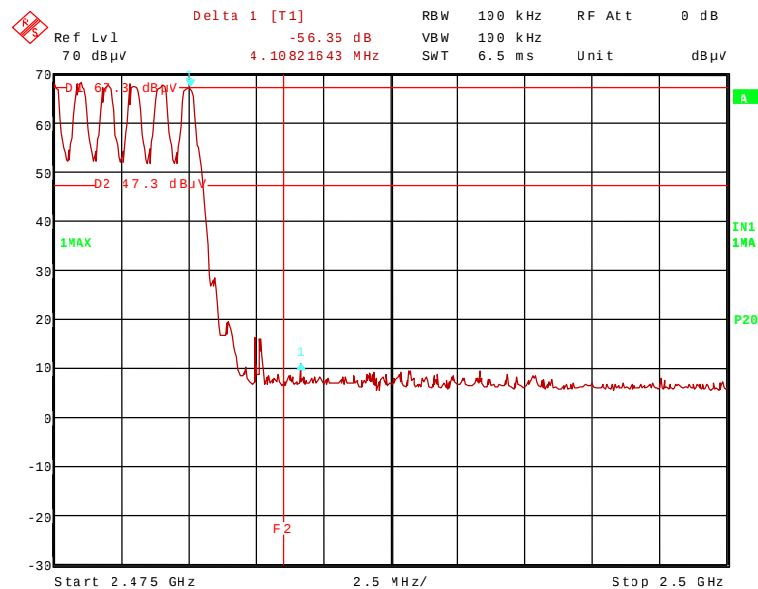


TEST REPORT REFERENCE: F092137E2

92137_80.wmf: Radiated band-edge compliance, upper band edge, hopping off (operation mode 3):



92137_81.wmf: Radiated band-edge compliance, upper band edge, hopping on (operation mode 4):



TEST REPORT REFERENCE: F092137E2

The plots on the page before are showing the radiated band-edge compliance for the upper band-edge, with and without hopping. The display line 1 (D1) in these plots represents the highest level within the assigned frequency band. The display line 2 (D2) represents the 20 dB offset to this highest level and shows the compliance with FCC 47 CFR Part 15.247 (d). The frequency line 1 (F1) shows the edge of the assigned frequency.

Band-edge compliance (lower band edge. hopping disenabled)										
Result measured with the peak detector:										
Frequency GHz	Corr. value dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.402	96.8	-	-	64.3	28.8	0.0	3.7	150	Vert.	-
2.3994	47.3	76.8	29.5	14.8	28.8	0.0	3.7	150	Vert.	No
Result measured with the average detector:										
Frequency GHz	Corr. value dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.402	94.2	-	-	61.7	28.8	0.0	3.7	150	Vert.	-
2.3994	44.7	74.2	29.5	12.2	28.8	0.0	3.7	150	Vert.	No
Measurement uncertainty							+2.2 dB / -3.6 dB			

Band-edge compliance (lower band edge. hopping enabled)										
Result measured with the peak detector:										
Frequency GHz	Corr. value dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.402	96.8	-	-	64.3	28.8	0.0	3.7	150	Vert.	-
2.3995	45.3	76.8	31.5	12.8	28.8	0.0	3.7	150	Vert.	No
Result measured with the average detector:										
Frequency GHz	Corr. value dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.402	94.2	-	-	61.7	28.8	0.0	3.7	150	Vert.	-
2.3995	42.7	74.2	31.5	10.2	28.8	0.0	3.7	150	Vert.	No
Measurement uncertainty							+2.2 dB / -3.6 dB			

TEST REPORT REFERENCE: F092137E2

Band-edge compliance (upper band edge. hopping disenabled)										
Result measured with the peak detector:										
Frequency GHz	Corr. value dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.480	100.7	-	-	67.9	29.0	0.0	3.8	150	Hor.	-
2.4853	43.5	74.0	30.5	10.7	29.0	0.0	3.8	150	Hor.	Yes
Result measured with the average detector:										
Frequency GHz	Corr. value dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.480	97.8	-	-	65.0	29.0	0.0	3.8	150	Hor.	-
2.4853	40.6	54.0	13.6	7.8	29.0	0.0	3.8	150	Hor.	Yes
Measurement uncertainty							+2.2 dB / -3.6 dB			

Band-edge compliance (upper band edge. hopping enabled)										
Result measured with the peak detector:										
Frequency GHz	Corr. value dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.480	100.7	-	-	67.9	29.0	0.0	3.8	150	Hor.	-
2.4842	44.3	74.0	29.7	11.5	29.0	0.0	3.8	150	Hor.	Yes
Result measured with the average detector:										
Frequency GHz	Corr. value dBµV/m	Limit dBµV/m	Margin dB	Readings dBµV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.480	97.8	-	-	65.0	29.0	0.0	3.8	150	Hor.	-
2.4842	41.4	54.0	12.6	8.6	29.0	0.0	3.8	150	Hor.	Yes
Measurement uncertainty							+2.2 dB / -3.6 dB			

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:
29, 31 – 34, 36, 44

TEST REPORT REFERENCE: F092137E2

5.2 RADIATED EMISSIONS

5.2.1 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 site 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.

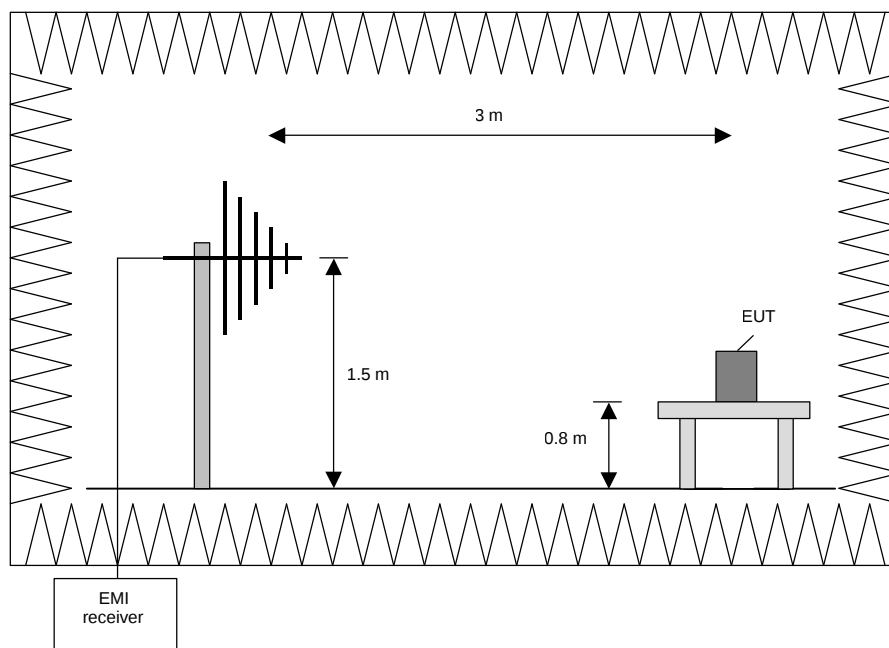
Preliminary measurement (30 MHz to 1 GHz)

In the first stage a preliminary measurement will be performed in a fully anechoic chamber with a measuring distance of 3 meter. 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 C63.4-2003 [1].

The frequency range 30 MHz to 1 GHz will be measured with an EMI Receiver 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 and while rotating the EUT in its vertical axis in the range of 0 ° to 360 °.

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

Frequency range	Resolution bandwidth
30 MHz to 230 MHz	100 kHz
230 MHz to 1 GHz	100 kHz



TEST REPORT REFERENCE: F092137E2

Procedure preliminary measurement:

Prescans were performed in the frequency range 30 MHz to 230 MHz and 230 MHz to 1 GHz.

The following procedure will be used:

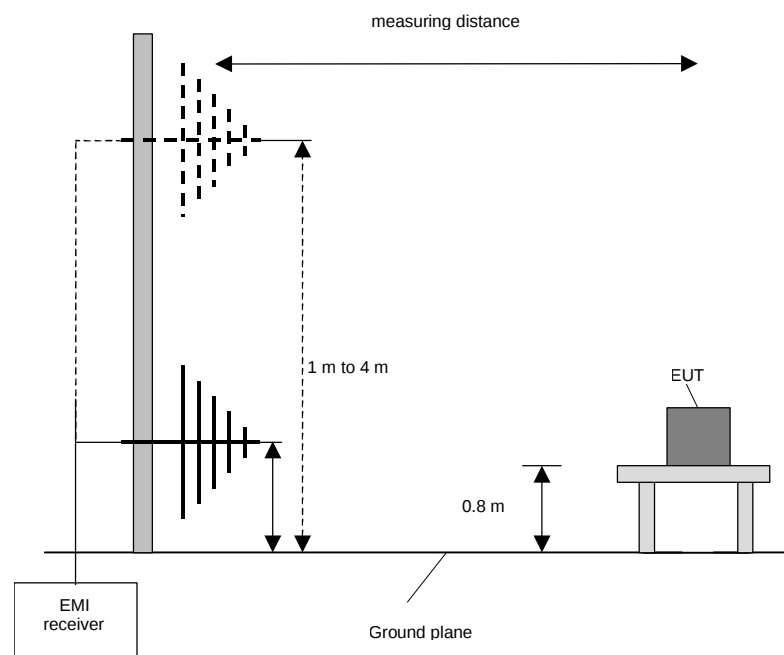
1. Monitor the frequency range at horizontal polarisation and a EUT azimuth of 0 °.
2. Manipulate the system cables within the range to produce the maximum level of emission.
3. Rotate the EUT by 360 ° to maximize the detected signals.
4. Make a hardcopy of the spectrum.
5. Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.
6. Repeat 1) to 4) with the other orthogonal axes of the EUT (because of EUT is a module and might be used in a handheld equipment application).
7. Repeat 1) to 5) with the vertical polarisation of the measuring antenna.

Final measurement (30 MHz to 1 GHz)

A final measurement on an open area test site will be performed on selected frequencies found in the preliminary measurement. During this test the EUT will be rotated in the range of 0 ° to 360 °, the measuring antenna will be set to horizontal and vertical polarisation and raised and lowered in the range from 1 m to 4 m to find the maximum level of emissions.

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

Frequency range	Resolution bandwidth
30 MHz to 1 GHz	120 kHz



TEST REPORT REFERENCE: F092137E2

Procedure final measurement:

The following procedure will be used:

- 1) Measure on the selected frequencies at an antenna height of 1 m and a EUT azimuth of 23 °.
- 2) Move the antenna from 1 m to 4 m and note the maximum value at each frequency.
- 3) Rotate the EUT by 45 ° and repeat 2) until an azimuth of 337 ° is reached.
- 4) Repeat 1) to 3) for the other orthogonal antenna polarization.
- 5) Move the antenna and the turntable to the position where the maximum value is detected.
- 6) Measure while moving the antenna slowly +/- 1 m.
- 7) Set the antenna to the position where the maximum value is found.
- 8) Measure while moving the turntable +/- 45 °.
- 9) Set the turntable to the azimuth where the maximum value is found.
- 10) Measure with Final detector (QP and AV) and note the value.
- 11) Repeat 5) to 10) for each frequency.
- 12) Repeat 1) to 11) for each orthogonal axes of the EUT (because of EUT is a module and might be used in a handheld equipment application).

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 C63.4-2003 [1].

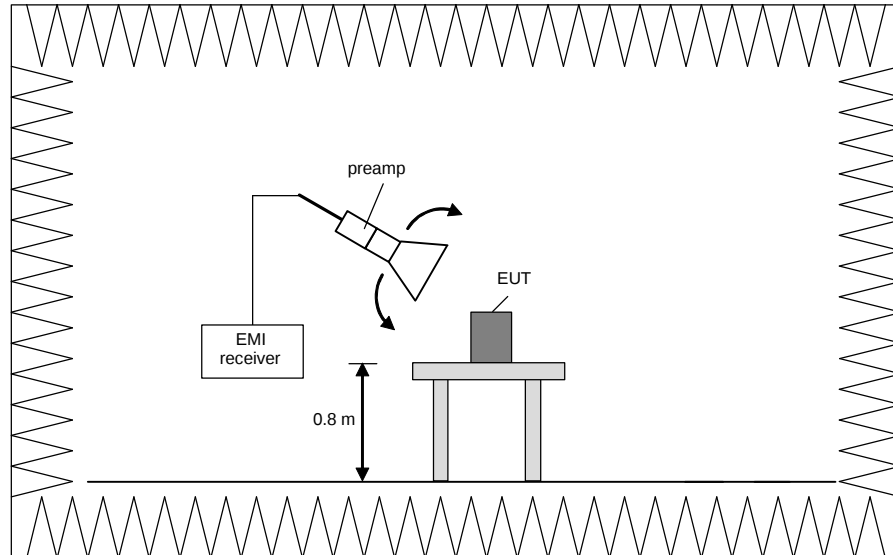
Preliminary measurement (1 GHz to 110 GHz)

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

TEST REPORT REFERENCE: F092137E2



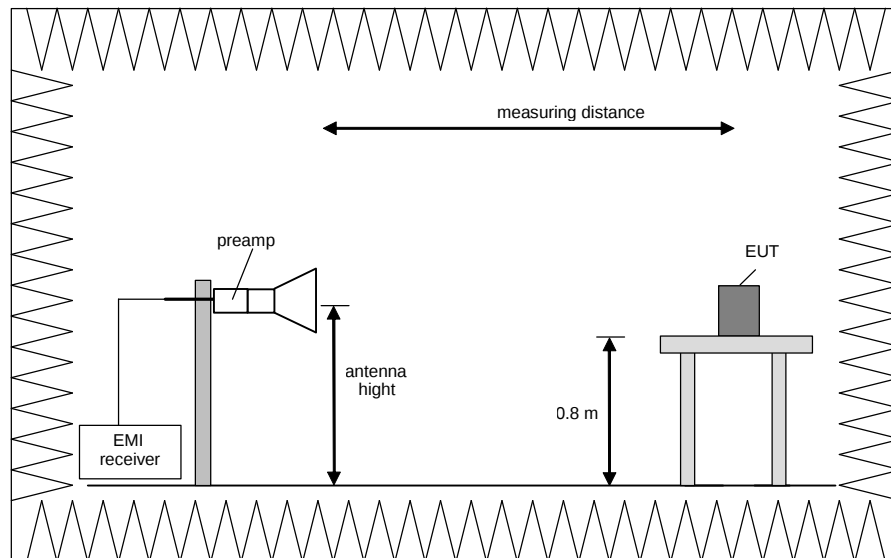
Final measurement (1 GHz to 110 GHz)

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

TEST REPORT REFERENCE: F092137E2



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.

TEST REPORT REFERENCE: F092137E2

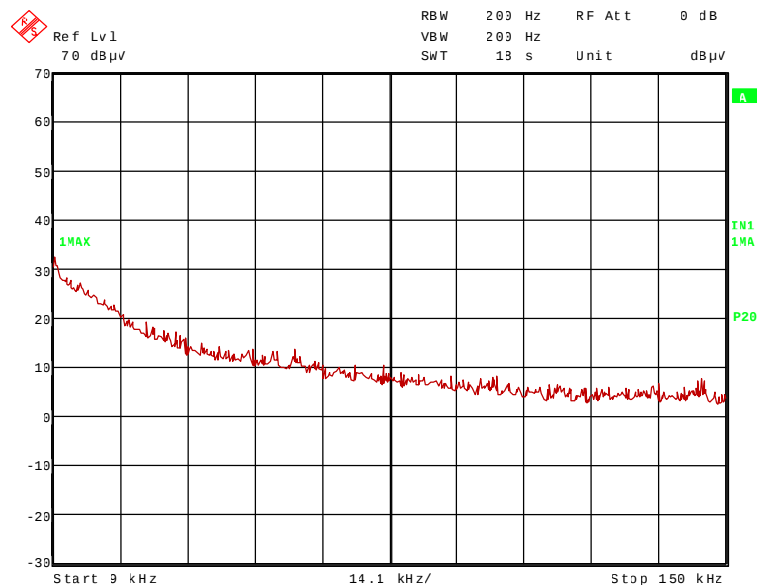
5.2.2 TEST RESULTS (RADIATED EMISSIONS)

5.2.2.1 PRELIMINARY MEASUREMENT (9 kHz to 1 GHz) WITH TwinGain-2400 ANTENNA ON cB-0924-01 PCB

Ambient temperature	21 °C	Relative humidity	55 %
---------------------	-------	-------------------	------

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:	The cable of the EUT is running vertically to the false floor. 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 EUT was supplied with 5.0 V DC via the cB-0924-01 PCB.
Remark:	As pre-tests have shown, the emissions in the frequency range 9 kHz to 1 GHz are not depending on the transmitter operation mode. Therefore the emissions in this frequency range were measured only with the transmitter operates in operation mode 2.

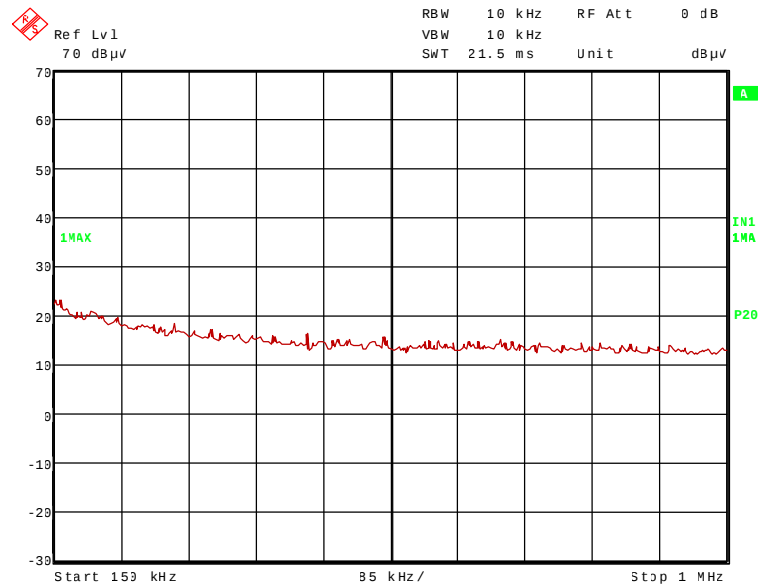
92137_90.wmf: Spurious emissions from 9 kHz to 150 kHz (operation mode 2):



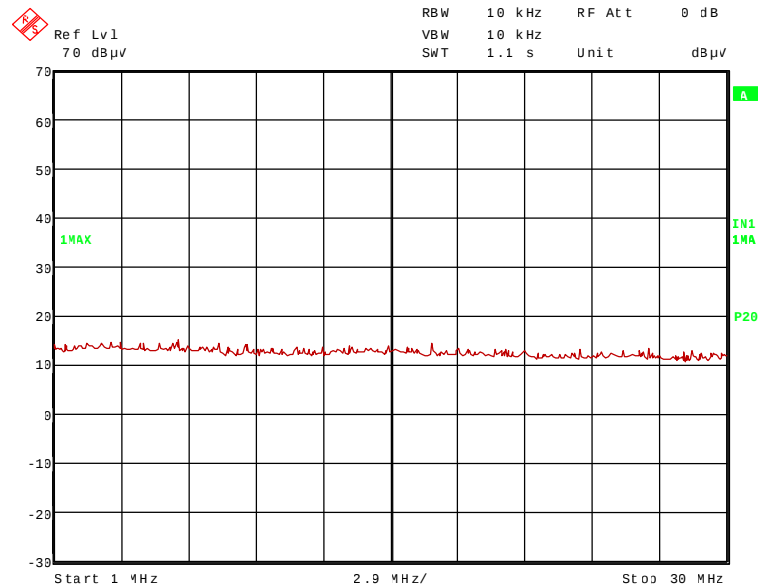
TEST EQUIPMENT USED FOR THE TEST:
29, 31 – 35, 43, 55

TEST REPORT REFERENCE: F092137E2

92137_91.wmf: Spurious emissions from 150 kHz to 1 MHz (operation mode 2):



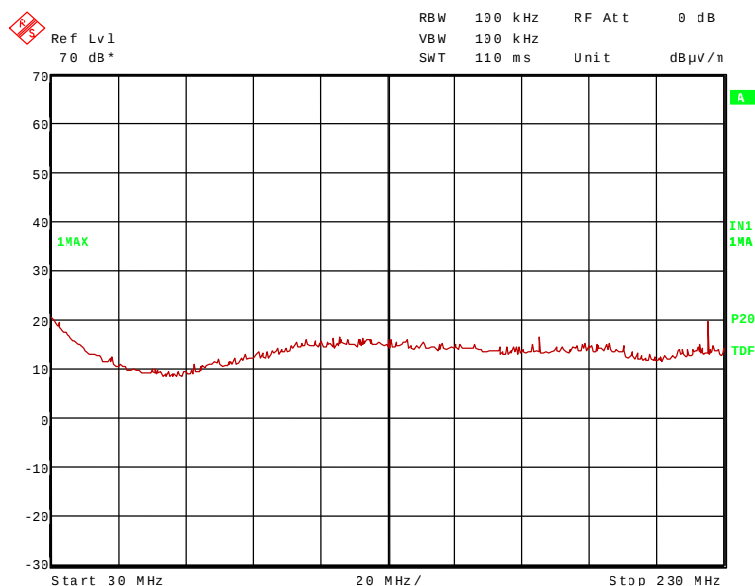
92137_92.wmf: Spurious emissions from 1 MHz to 30 MHz (operation mode 2):



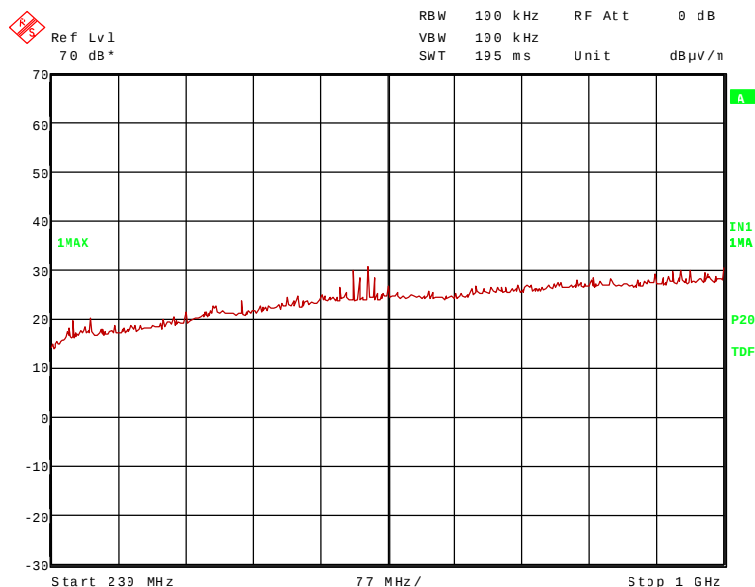
No significant frequencies above the noise floor of the system were found during the preliminary radiated emission test, so no measurements were carried out on the outdoor test site.

TEST REPORT REFERENCE: F092137E2

92137_68.wmf: Spurious emissions from 30 MHz to 230 MHz (operation mode 2):



92137_67.wmf: Spurious emissions from 230 MHz to 1 GHz (operation mode 2):



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

225.000 MHz, 576.000 MHz and 592.000 MHz.

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

960.000 MHz.

These frequencies have to be measured on the open area test site. The result is presented in the following.

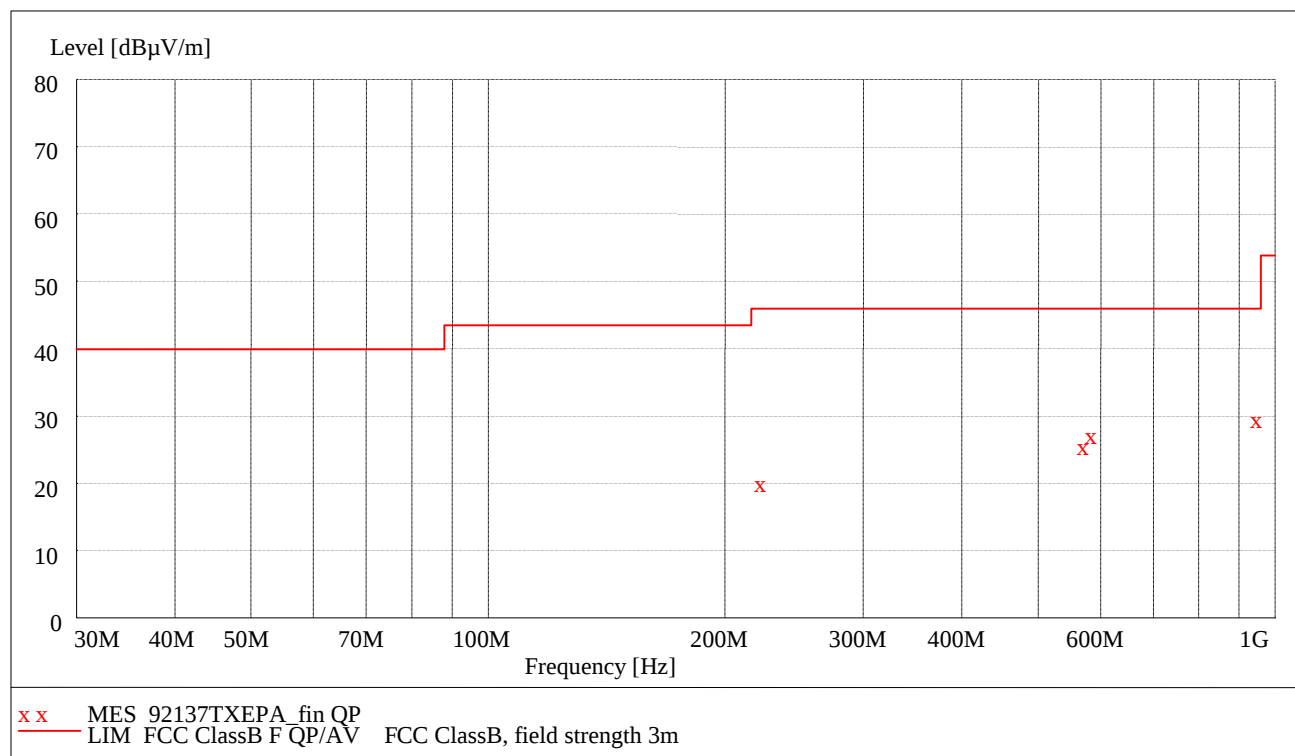
TEST REPORT REFERENCE: F092137E2

5.2.2.2 FINAL RADIATED EMISSION TEST (30 MHz to 1 GHz) WITH TwinGain-2400 ANTENNA ON cB-0924-01 PCB

Ambient temperature	21 °C	Relative humidity	55 %
---------------------	-------	-------------------	------

- 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:** The cable of the EUT is running vertically to the false floor. 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 EUT was supplied with 5.0 V DC via the cB-0924-01 PCB.
- Test results:** The test results were calculated with the following formula:
- $$\text{Result [dB}\mu\text{V/m]} = \text{reading [dB}\mu\text{V]} + \text{cable loss [dB]} + \text{antenna factor [dB/m]}$$

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 an x are the measured results of the standard final measurement on the open area test site.



Data record name: 92137TXEPA

TEST REPORT REFERENCE: F092137E2

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 3 m measuring distance.

The measurement time with the quasi-peak measuring detector is 1 second.

Result measured with the quasipeak detector:

(This value is marked in the diagram by an x)

Spurious emissions outside restricted bands									
Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Readings dBμV	Antenna factor dB/m	Cable loss dB	Height cm	Azimuth deg	Pol.
225.000	20.6	46.0	25.4	8.9	10.1	1.6	162.0	341.0	Vert.
576.000	26	46.0	20.0	4.0	19.2	2.8	100.0	203.0	Vert.
592.000	27.7	46.0	18.3	5.8	19.1	2.8	100.0	55.0	Vert.
Spurious emissions in restricted bands									
Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Readings dBμV	Antenna factor dB/m	Cable loss dB	Height cm	Azimuth deg	Pol.
960.000	30.1	54.0	23.9	2.8	23.8	3.5	102.0	250.0	Vert.
Measurement uncertainty				+2.2 dB / -3.6 dB					

The test results were calculated with the following formula:

Result [dBμV/m] = reading [dBμV] + cable loss [dB] + antenna factor [dB/m]

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:
14 – 20

TEST REPORT REFERENCE: F092137E2

5.2.2.3 PRELIMINARY MEASUREMENT (1 GHz to 25 GHz) WITH TwinGain-2400 ANTENNA ON cB-0924-01 PCB

Ambient temperature	21 °C	Relative humidity	60 %
---------------------	-------	-------------------	------

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.

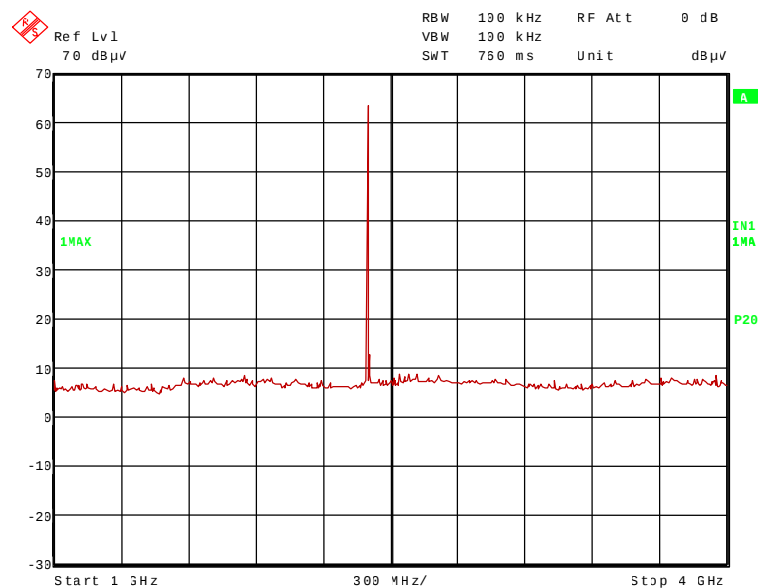
Cable guide: The cable of the EUT is running vertically to the false floor. For detail information of test set-up and the cable guide refer to the pictures in annex A of this test report.

Test record: All results are shown in the following.

Supply voltage: During all measurements the EUT was supplied with 5.0 V DC via the cB-0924-01 PCB.

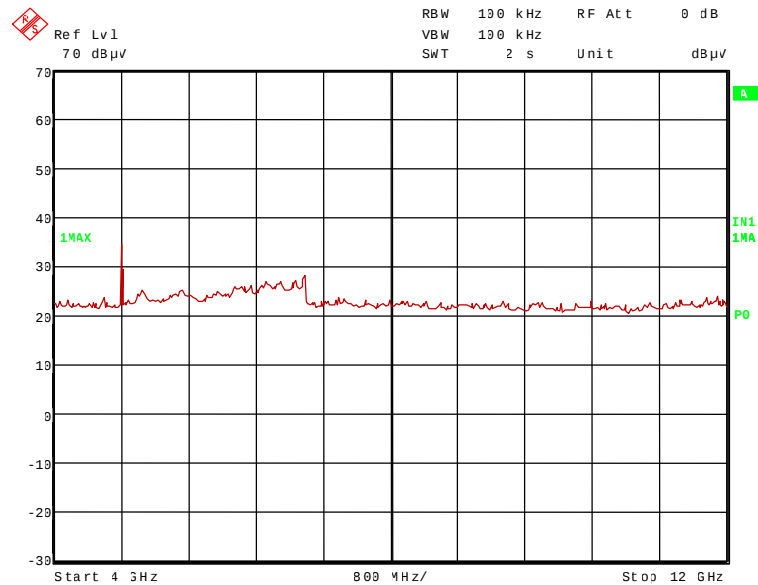
Transmitter operates at the lower end of the assigned frequency band

92137_69.wmf: Spurious emissions from 1 GHz to 4 GHz (operation mode 1):

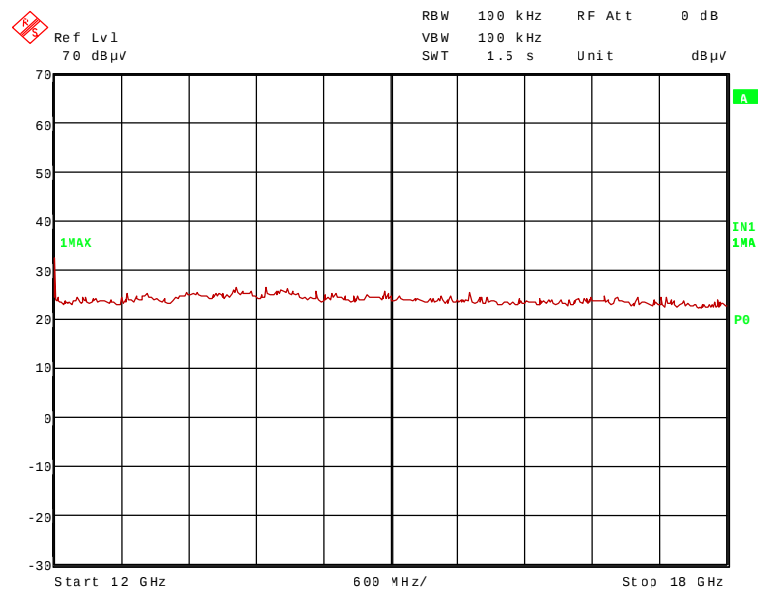


TEST REPORT REFERENCE: F092137E2

92137_74.wmf: Spurious emissions from 4 GHz to 12 GHz (operation mode 1):

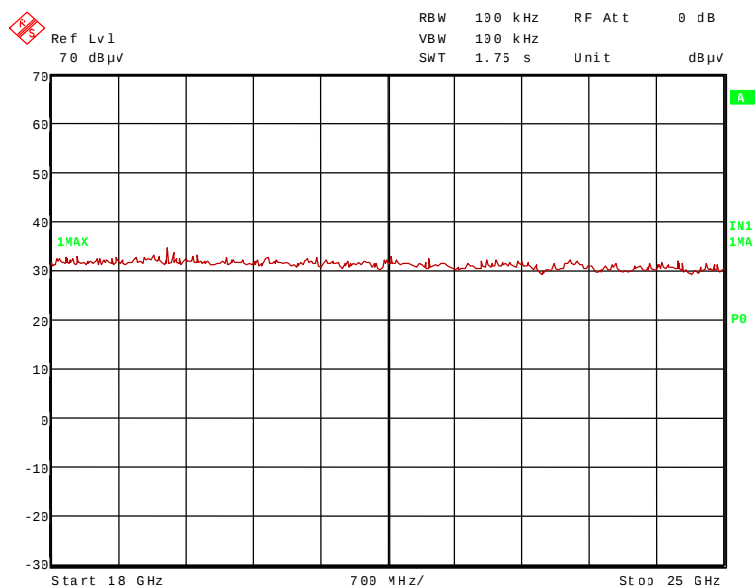


92137_93.wmf: Spurious emissions from 12 GHz to 18 GHz (operation mode 1):



TEST REPORT REFERENCE: F092137E2

92137_98.wmf: Spurious emissions from 18 GHz to 25 GHz (operation mode 1):



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

- 2.389 GHz, 4.804 GHz, 4.822 GHz, 12.010 GHz and 19.216 GHz.

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

- 2.402 GHz.

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

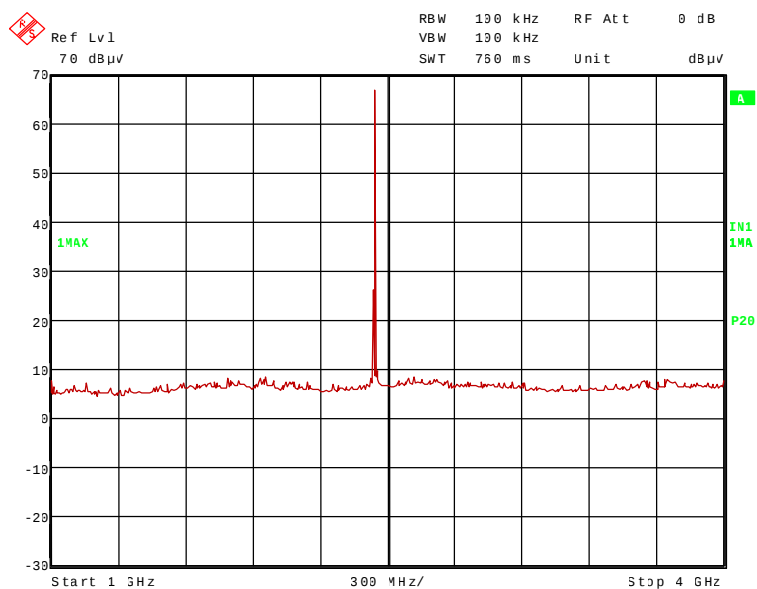
TEST EQUIPMENT USED FOR THE TEST:

29, 31 –34, 36, 37, 39, 44, 46, 49 - 51, 72

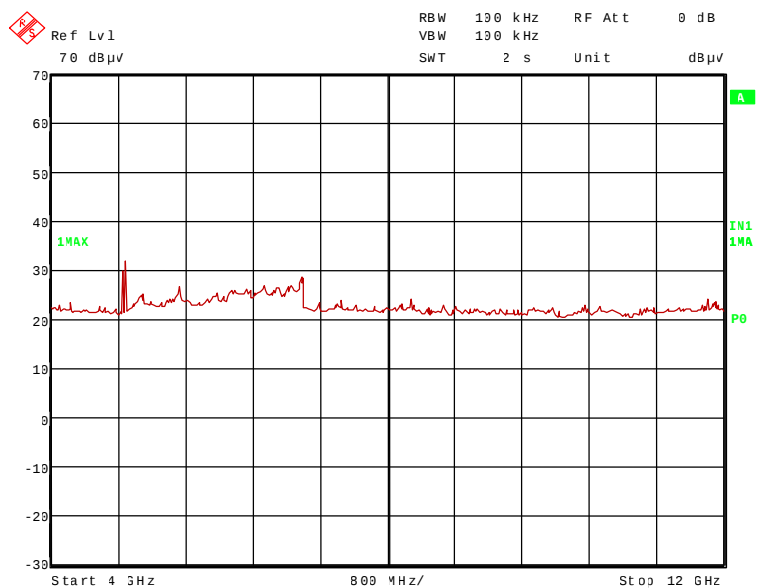
TEST REPORT REFERENCE: F092137E2

Transmitter operates on the middle of the assigned frequency band

92137_70.wmf: Spurious emissions from 1 GHz to 4 GHz (operation mode 2):

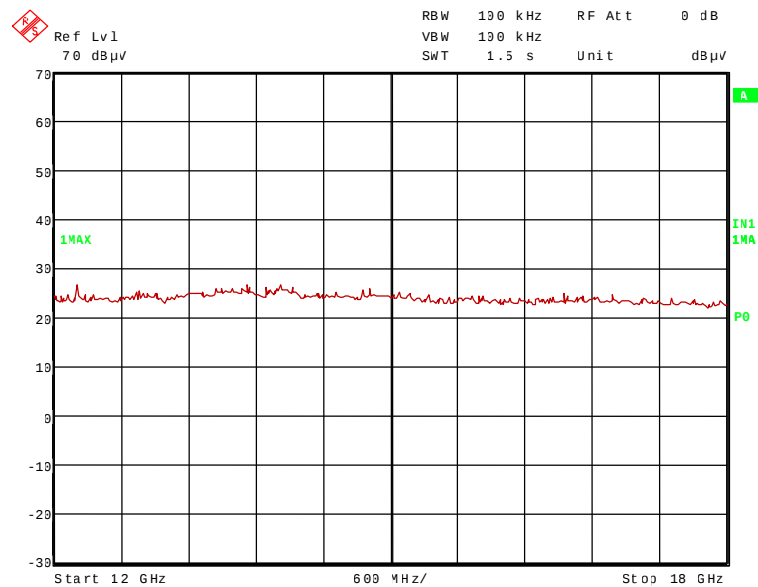


92137_73.wmf: Spurious emissions from 4 GHz to 12 GHz (operation mode 2):

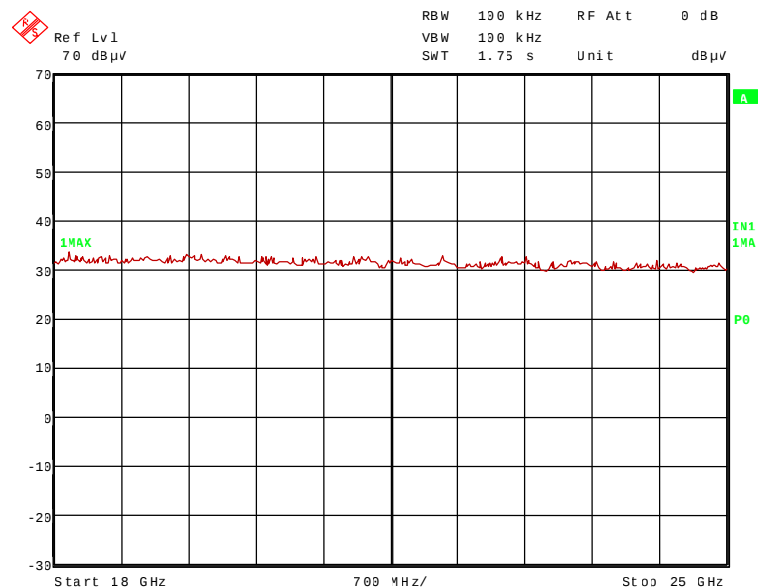


TEST REPORT REFERENCE: F092137E2

92137_94.wmf: Spurious emissions from 12 GHz to 18 GHz (operation mode 2):



92137_97.wmf: Spurious emissions from 18 GHz to 25 GHz (operation mode 2):



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

- 4.860 GHz, 4.882 GHz and 12.205 GHz

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

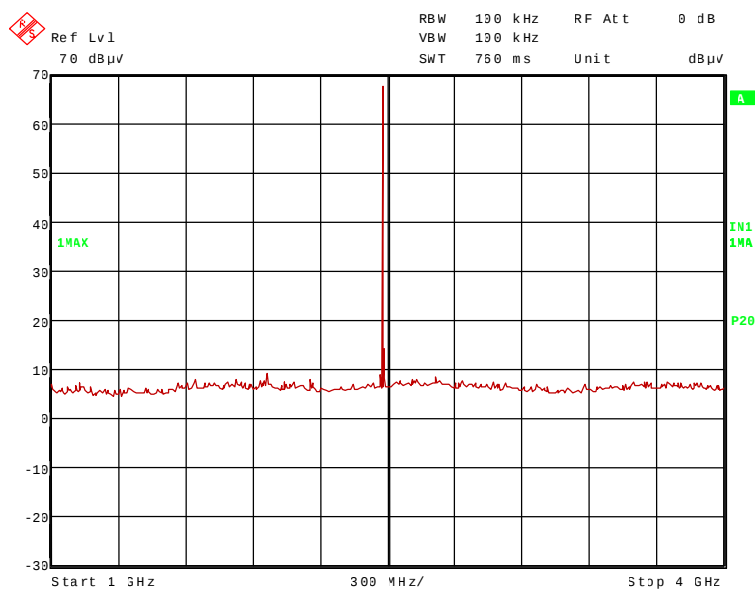
- 2.441 GHz.

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

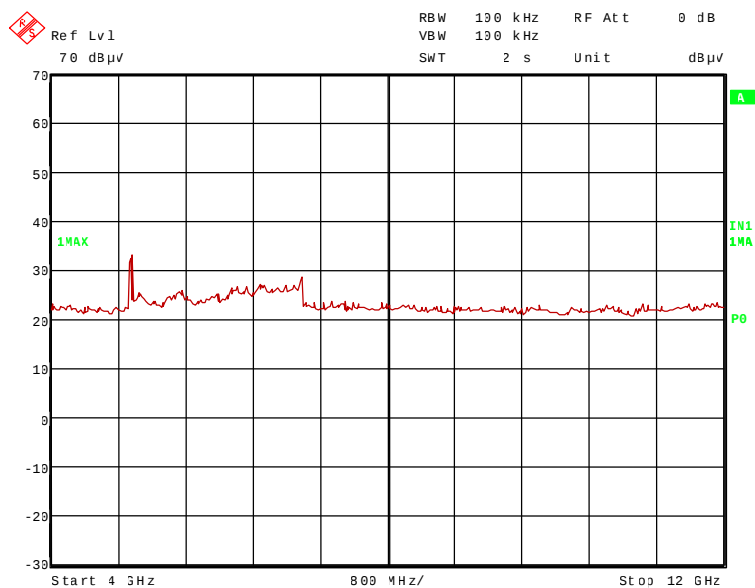
TEST REPORT REFERENCE: F092137E2

Transmitter operates on the upper end of the assigned frequency

92137_71.wmf: Spurious emissions from 1 GHz to 4 GHz (operation mode 3):

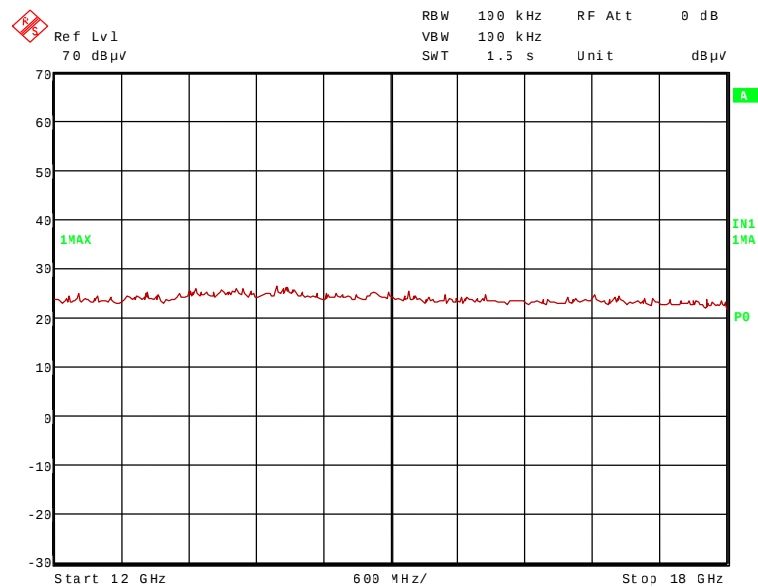


92137_72.wmf: Spurious emissions from 4 GHz to 12 GHz (operation mode 3):

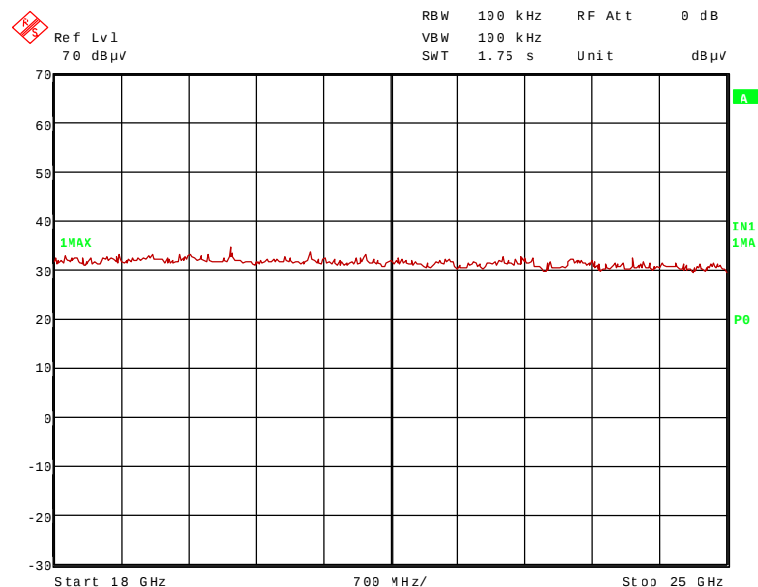


TEST REPORT REFERENCE: F092137E2

92137_95.wmf: Spurious emissions from 12 GHz to 18 GHz (operation mode 3):



92137_96.wmf: Spurious emissions from 18 GHz to 25 GHz (operation mode 3):



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

- 2.493 GHz, 4.938 GHz, 4.960 GHz and 19.840 GHz.

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

- 2.480 GHz.

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

TEST REPORT REFERENCE: F092137E2

5.2.2.4 FINAL MEASUREMENT (1 GHz to 25 GHz) WITH TwinGain-2400 ANTENNA ON cB-0924-01 PCB

Ambient temperature	21 °C	Relative humidity	60 %
---------------------	-------	-------------------	------

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: The cable of the EUT is running vertically to the false floor. 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 EUT was supplied with 5.0 V DC via the cB-0924-01 PCB.

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

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

Result measured with the peak detector:

Frequency GHz	Corr. value dBμV/m	Limit dBμV/m	Margin dB	Readings dBμV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.389	49.9	74.0	24.1	17.5	28.7	0.0	3.7	150	Vert.	Yes
2.402	96.8	-	-	64.3	28.8	0.0	3.7	150	Vert.	-
4.804	52.8	74.0	21.2	39.5	33.7	25.7	5.3	150	Hor.	Yes
4.822	47.6	74.0	26.4	34.3	33.7	25.7	5.3	150	Hor.	Yes
12.010	50.9	74.0	23.1	40.7	33.6	25.9	2.5	150	Vert.	Yes
19.216	45.3	74.0	28.7	43.9	37.1	38.2	2.5	150	Vert.	Yes
Measurement uncertainty						+2.2 dB / -3.6 dB				

Result measured with the average detector:

Frequency GHz	Corr. value dBμV/m	Limit dBμV/m	Margin dB	Readings dBμV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.389	36.2	54.0	17.8	3.8	28.7	0.0	3.7	150	Vert.	Yes
2.402	94.2	-	-	61.7	28.8	0.0	3.7	150	Vert.	-
4.804	44.2	54.0	9.8	30.9	33.7	25.7	5.3	150	Hor.	Yes
4.822	30.4	54.0	23.6	17.1	33.7	25.7	5.3	150	Hor.	Yes
12.010	39.3	54.0	14.7	29.1	33.6	25.9	2.5	150	Vert.	Yes
19.216	33.5	54.0	20.5	32.1	37.1	38.2	2.5	150	Vert.	Yes
Measurement uncertainty						+2.2 dB / -3.6 dB				

TEST REPORT REFERENCE: F092137E2

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

Result measured with the peak detector:

Frequency GHz	Corr. value dBμV/m	Limit dBμV/m	Margin dB	Readings dBμV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height Cm	Pol.	Restr. Band
2.441	100.1	-	-	67.5	28.9	0.0	3.7	150	Hor.	-
4.860	47.8	74.0	26.2	34.5	33.8	25.7	5.2	150	Hor.	Yes
4.882	51.2	74.0	22.8	37.8	33.8	25.7	5.3	150	Hor.	Yes
12.205	46.9	74.0	27.1	36.7	33.6	25.9	2.5	150	Vert.	Yes
Measurement uncertainty						+2.2 dB / -3.6 dB				

Result measured with the average detector:

Frequency GHz	Corr. value dBμV/m	Limit dBμV/m	Margin dB	Readings dBμV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.441	97.2	-	-	64.6	28.9	0.0	3.7	150	Hor.	-
4.860	30.5	54.0	23.5	17.2	33.8	25.7	5.2	150	Hor.	Yes
4.882	42.7	54.0	11.3	29.3	33.8	25.7	5.3	150	Hor.	Yes
12.205	33.4	54.0	20.6	23.2	33.6	25.9	2.5	150	Vert.	Yes
Measurement uncertainty						+2.2 dB / -3.6 dB				

TEST REPORT REFERENCE: F092137E2

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

Result measured with the peak detector:

Frequency GHz	Corr. value dBμV/m	Limit dBμV/m	Margin dB	Readings dBμV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.480	100.7	-	-	67.9	29.0	0.0	3.8	150	Hor.	-
2.493	52.1	74.0	21.9	19.3	29.0	0.0	3.8	150	Hor.	Yes
4.938	49.7	74.0	24.3	36.0	34.0	25.6	5.3	150	Vert.	Yes
4.960	51.7	74.0	22.3	38	34.0	25.6	5.3	150	Vert.	Yes
19.840	45.5	74.0	28.5	44.3	37.0	38.3	2.5	150	Vert.	Yes
Measurement uncertainty						+2.2 dB / -3.6 dB				

Result measured with the average detector:

Frequency GHz	Corr. value dBμV/m	Limit dBμV/m	Margin dB	Readings dBμV	Antenna factor 1/m	Preamp dB	Cable loss dB	Height cm	Pol.	Restr. Band
2.480	97.8	-	-	65.0	29.0	0.0	3.8	150	Hor.	-
2.493	37.8	54.0	16.2	5.0	29.0	0.0	3.8	150	Hor.	Yes
4.960	44.2	54.0	9.8	30.5	34.0	25.6	5.3	150	Vert.	Yes
4.938	31.8	54.0	22.2	18.1	34.0	25.6	5.3	150	Vert.	Yes
19.840	33.6	54.0	20.4	32.4	37.0	38.3	2.5	150	Vert.	Yes
Measurement uncertainty						+2.2 dB / -3.6 dB				

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:

29, 31 –34, 36, 37, 39, 44, 46, 49 - 51, 72

TEST REPORT REFERENCE: F092137E2

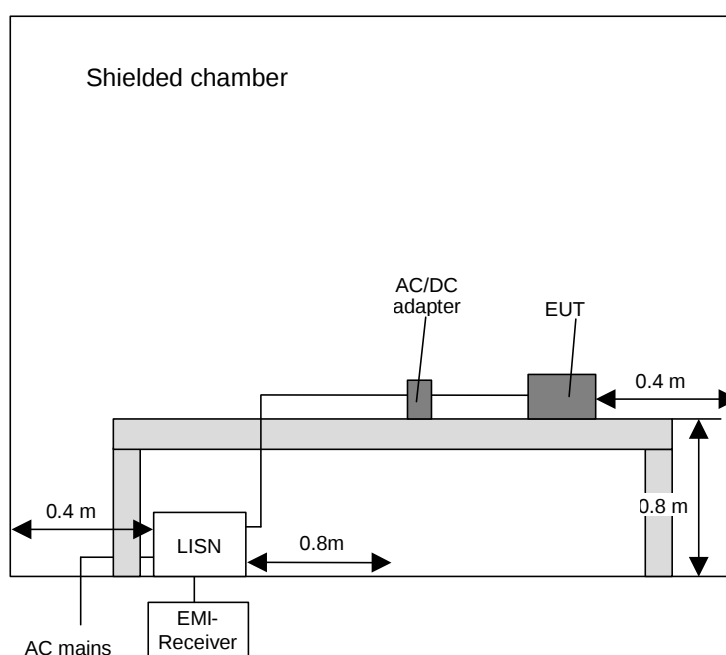
5.3 CONDUCTED EMISSIONS ON POWER SUPPLY LINES (150 kHz to 30 MHz)

5.3.1 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 C63.4-2003 [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 appropriate 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



TEST REPORT REFERENCE: F092137E2

5.3.2 TEST RESULTS (CONDUCTED EMISSIONS ON POWER SUPPLY LINES)

Ambient temperature	20 °C	Relative humidity	50 %
---------------------	-------	-------------------	------

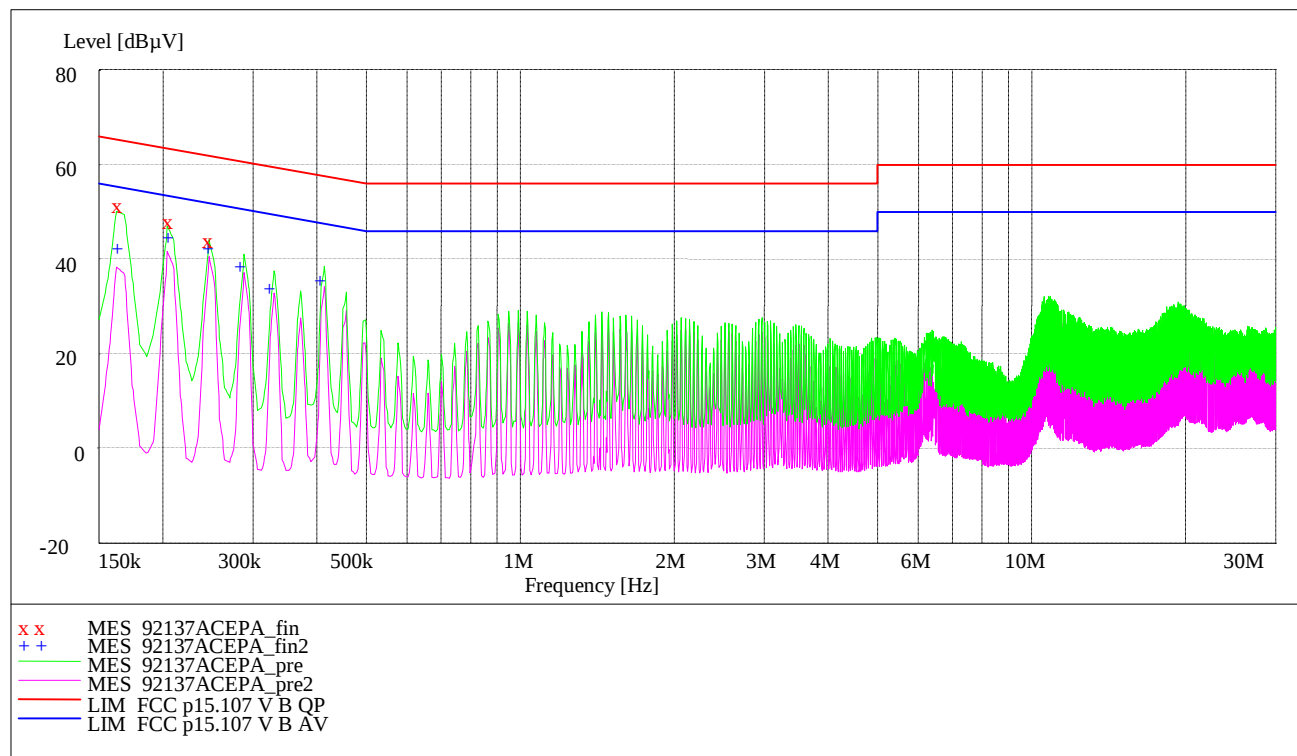
Position of EUT: The EUT was set-up on a non-conducting table of a height of 0.8 m.

Cable guide: The cable of the EUT was fixed on the non-conducting table. For further information of the cable guide refer to the pictures in annex A of this test report.

Test record: The EUT operates in operation mode 4. All results are shown in the following.

Supply voltage: During the measurement the EUT was supplied 5.0 V DC by an AC / DC adaptor type PHOENIX CONTACT MINI-PS-100-244AC/24DC/1, which was supplied by 120 V AC / 60 Hz.

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: 92137ACEPA

TEST REPORT REFERENCE: F092137E2

Result measured with the quasipeak detector:

(These values are marked in the diagram by an x)

Frequency MHz	Level dBμV	Transducer dB	Limit dBμV	Margin dB	Line	PE
0.165300	52.4	0.7	65.0	12.8	N	FLO
0.206700	49.0	0.5	63.0	14.3	N	FLO
0.248100	44.9	0.3	62.0	16.9	N	FLO
Measurement uncertainty				+3.6 dB / -4.5 dB		

Data record name: 92137ACEPA_fin

Result measured with the average detector:

(These values are marked in the diagram by an +)

Frequency MHz	Level dBμV	Transducer dB	Limit dBμV	Margin dB	Line	PE
0.165300	43.2	0.7	55.0	12.0	N	FLO
0.206700	45.3	0.5	53.0	8.0	N	FLO
0.248100	43.4	0.3	52.0	8.4	N	FLO
0.288600	39.5	0.3	51.0	11.1	N	FLO
0.330000	35.0	0.2	50.0	14.5	N	FLO
0.412800	36.4	0.2	48.0	11.2	N	FLO
Measurement uncertainty				+3.6 dB / -4.5 dB		

Data record name: 92137ACEPA_fin2

Test: Passed

TEST EQUIPMENT USED FOR THE TEST:

1 – 4, 20

TEST REPORT REFERENCE: F092137E2

6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

TEST REPORT REFERENCE: F092137E2

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	ESCS 30	Rohde & Schwarz	834489/011	580007	02/27/2008	02/2010
3	LISN	ESH2-Z5	Rohde & Schwarz	879675/037	580006	06/14/2009	06/2010
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	02/26/2008	02/2010
16	Controller	HD100	Deisel	100/670	480139	-	-
17	Turntable	DS420HE	Deisel	420/620/80	480087	-	-
18	Antenna support	AS615P	Deisel	615/310	480086	-	-
19	Antenna	CBL6111 A	Chase	1643	480147	08/01/2007	08/2012
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	02/04/2009	02/2011
31	Measuring receiver	ESI 40	Rohde & Schwarz	100064	480355	02/25/2008	02/2010
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	10/11/2005	10/2010
36	Antenna	3115 A	EMCO	9609-4918	480183	04/11/2008	11/2013
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.)	
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 1m	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	02/19/2008	02/2013
72	4 GHz High Pass Filter	WHKX4.0/18 G-8SS	Wainwright Instruments	1	480587	Weekly verification (system cal.)	

TEST REPORT REFERENCE: F092137E2

7 LIST OF ANNEXES

ANNEX A	PHOTOGRAPHS OF THE TEST SET-UPS:	6 pages
	cB-0925-01-1-02 with TwinGain-2400 on cB-0924-01, test set-up fully anechoic chamber	92137_15.jpg
	cB-0925-01-1-02 with TwinGain-2400 on cB-0924-01, test set-up fully anechoic chamber	92137_17.jpg
	cB-0925-01-1-02 with TwinGain-2400 on cB-0924-01, test set-up fully anechoic chamber	92137_16.jpg
	cB-0925-01-1-02 with TwinGain-2400 on cB-0924-01, test set-up fully anechoic chamber	92137_14.jpg
	cB-0925-01-1-02 with TwinGain-2400 on cB-0924-01, test set-up open area test site	92137_26.jpg
	cB-0925-01-1-02 with TwinGain-2400 on cB-0924-01, test set-up shielded chamber	92137_35.jpg
ANNEX B	INTERNAL PHOTOGRAPHS OF THE TEST SAMPLE:	8 pages
	cB-0925-01-1-02 mounted on cB-0924-01, internal view	92137_j.jpg
	cb-0925-01-1-02, top view	92137_d.jpg
	cB-0925-01-1-01, shielding removed, top view	92137_g.jpg
	cB-0925-01-1-0x, bottom view	92137_g.jpg
	cB-0925-01-1-02 mounted on cB-0924-01	92137_k.jpg
	cB-0924-01, top view	92137_m.jpg
	cB-0924-01, bottom view	92137_l.jpg
	cB-0924-01, bottom view, antenna removed	92137_n.jpg
ANNEX C	EXTERNAL PHOTOGRAPHS OF THE TEST SAMPLE:	2 pages
	Bluetooth EPA, 3-D-view 1	92137_h.jpg
	Bluetooth EPA, 3-D-view 2	92137_i.jpg
ANNEX D	ADDITIONAL RESULTS FOR INDUSTRY CANADA:	8 pages