

# Test report

**309365-4TRFWL**

Date of issue: June 30, 2016

Applicant:

**Digital Security Controls a div. of Tyco Safety Products Canada Ltd.**

Product:

**Self-Contained Wireless Security System**

Model:

**WS900-29**

FCC ID:

**F5316WS90029**

IC Registration number:

**160A-WS90029**

Specifications:

**FCC 47 CFR Part 15.249**

Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHz, and 24.0–24.25 GHz.


**RSS-210 Issue 8, December 2010, Annex 2.9**

Devices operating in 902–928, 2400–2483.5 and 5725–5875 MHz frequency band for any application

Test location

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Website	www.nemko.com
Site number	FCC test site registration number: 176392, IC: 2040A-4 (3 m semi anechoic chamber)

Tested by	Andrey Adelberg, Senior Wireless/EMC Specialist
Reviewed by	Kevin Rose, Wireless/EMC Specialist
Date	June 30, 2016
Signature	

Limits of responsibility

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Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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## Section 1. Report summary

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### 1.1 Applicant and manufacturer

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Company name	Digital Security Controls a div. of Tyco Safety Products Ltd.
Address	3301 Langstaff Road, Concord, ON, Canada, L4K 4L2

### 1.2 Test specifications

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FCC 47 CFR Part 15, Subpart C, Clause 15.249	Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHz, and 24.0–24.25 GHz.
RSS-210 Issue 8, December 2010, Annex 2.9	Devices operating in 902–928, 2400–2483.5 and 5725–5875 MHz

### 1.3 Test methods

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ANSI C63.10 v2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
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### 1.4 Statement of compliance

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In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

### 1.5 Exclusions

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None

### 1.6 Test report revision history

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Revision #	Details of changes made to test report
TRF	Original report issued

## Section 2. Summary of test results

### 2.1 FCC Part 15 Subpart C, general requirements test results

Part	Test description	Verdict
§15.207(a)	Conducted limits	Pass
§15.31(e)	Variation of power source	Pass <sup>1</sup>
§15.203	Antenna requirement	Pass <sup>2</sup>
§15.215(c)	20 dB bandwidth	Pass

Notes: <sup>1</sup> Measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, was performed with the supply voltage varied between 85 % and 115 % of the nominal rated supply voltage. No noticeable output power variation was observed

<sup>2</sup> The Antennas are located within the enclosure of EUT and not user accessible.

### 2.2 FCC Part 15 Subpart C, intentional radiators test results

Part	Test description	Verdict
§15.249(a)	Radiated emissions not in restricted bands	Pass
§15.249(b)	Fixed Point-to-Point operation in the 24.0–24.25 GHz band	Not applicable
§15.249(d)	Spurious emissions (except harmonics)	Pass

Notes: None

### 2.3 IC RSS-GEN, Issue 4, test results

Part	Test description	Verdict
6.6	Occupied bandwidth	Pass
7.1.2	Receiver radiated emission limits	Not applicable
7.1.3	Receiver conducted emission limits	Not applicable
8.8	Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus	Pass

Notes: <sup>1</sup> According to sections 5.2 and 5.3 of RSS-Gen, Issue 4 the EUT does not have a stand-alone receiver neither scanner receiver, therefore exempt from receiver requirements.

### 2.4 IC RSS-210, Issue 8, test results

Part	Test description	Verdict
§A2.9a	Radiated emissions not in restricted bands	Pass
§A2.9b	Spurious emissions (except harmonics)	Pass

Notes: None

## Section 3. Equipment under test (EUT) details

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### 3.1 Sample information

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Receipt date	May 24, 2016
Nemko sample ID number	133-002706 (Conducted sample) and 133-002700 (Radiated sample)

### 3.2 EUT information

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Product name	Self-Contained Wireless Security System
Model	WS900-29
Model variant	N/A
Serial number	None

### 3.3 Technical information

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All used IC test site(s) Reg. number	2040A-4
RSS number and Issue number	RSS-210 Annex 2.9 Issue 8, December 2010
Frequency band (MHz)	902–928
Frequency Min (MHz)	908.4
Frequency Max (MHz)	908.4
RF power Max (W), Conducted	N/A
Field strength, Units @ distance	89.375 dB $\mu$ V/m at 3 m
Measured BW (kHz) (99%)	407.05
Calculated BW (kHz), as per TRC-43	N/A
Type of modulation	2FSK
Emission classification	F1D
Transmitter spurious, Units @ distance	37.60 dB $\mu$ V/m Quasi-Peak @ 3 m at 33.92 MHz
Power requirements	12 V <sub>DC</sub> (Powered via external AC-DC adapter 90–264 V <sub>AC</sub> 47–63 Hz) and via 7.5 V <sub>DC</sub> battery
Hardware and software details	HW: UA707 Rev. 03 SW: Ver 1.0
Antenna information	The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator. Antenna gain is 1.0 dBi

### 3.4 Product description and theory of operation

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The EUT (WS900-29) is a Wireless Alarm System panel that contains three RF interfaces: Wi-Fi, PowerG and Z-wave. This report covers only the Home Automation Z-Wave Protocol interface.

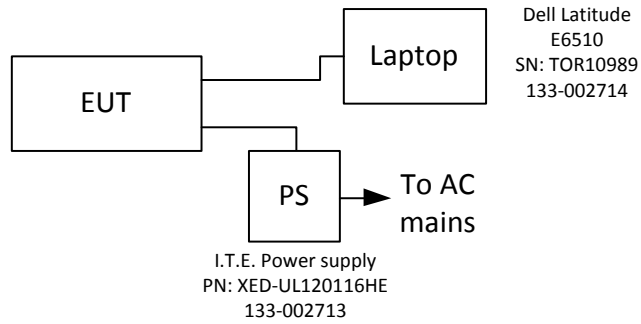
### 3.5 EUT exercise details

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The EUT was supplied in 8 different configurations: 1) Low channel - conducted, 2) Mid channel - conducted, 3) High channel - conducted, 4) Hopping – conducted and 5) Low channel - radiated, 6) Mid channel - radiated, 7) High channel - radiated, 8) Hopping – radiated. All variants were set to continuous transmit state.

### 3.6 EUT setup diagram

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**Figure 3.6-1:** Setup diagram

## Section 4. Engineering considerations

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### 4.1 Modifications incorporated in the EUT

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There were no modifications performed to the EUT during this assessment.

### 4.2 Technical judgment

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None

### 4.3 Deviations from laboratory tests procedures

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No deviations were made from laboratory procedures.



## Section 5. Test conditions

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### 5.1 Atmospheric conditions

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Temperature	15–30 °C
Relative humidity	20–75 %
Air pressure	860–1060 mbar

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

### 5.2 Power supply range

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The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages  $\pm 5\%$ , for which the equipment was designed.

## Section 6. Measurement uncertainty

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### 6.1 Uncertainty of measurement

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Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of  $K = 2$  with 95% certainty.

Test name	Measurement uncertainty, dB
All antenna port measurements	0.55
Conducted spurious emissions	1.13
Radiated spurious emissions	3.78
AC power line conducted emissions	3.55



## Section 7. Test equipment

### 7.1 Test equipment list

Table 7.1-1: Equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002047	1 year	Dec. 01/16
Flush mount turntable	Sunol	FM2022	FA002082	—	NCR
Controller	Sunol	SC104V	FA002060	—	NCR
Antenna mast	Sunol	TLT2	FA002061	—	NCR
AC Power source	Chenwa	2700M-10k	FA002716	—	VOU
Bilog antenna (20–3000 MHz)	Sunol	JB3	FA002108	1 year	Apr. 28/17
Horn antenna (1–18 GHz)	EMCO	3115	FA000825	1 year	Apr. 26/17
Pre-amplifier (1–18 GHz)	JCA	JCA118-503	FA002091	1 year	April 26/17
LISN	Rohde & Schwarz	ENV216	FA002023	1 year	Mar. 08/17

Note: NCR - no calibration required, VOU - verify on use

## Section 8. Testing data

### 8.1 FCC 15.207(a) and RSS-Gen 8.8 AC power line conducted emissions limits

### 8.2 FCC 15.207(a) and RSS-Gen 8.8 AC power line conducted emissions limits

#### 8.2.1 Definitions and limits

**FCC §15.207 (a):**

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50  $\Omega$  line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

**RSS-GEN, Clause 8.8:**

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz, shall not exceed the limits in table below.

Unless the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in table below. The more stringent limit applies at the frequency range boundaries.

*Table 8.2-1: AC power line conducted emissions limits*

Frequency of emission, MHz	Conducted limit, dB $\mu$ V	
	Quasi-peak	Average**
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

Notes: \* - The level decreases linearly with the logarithm of the frequency.  
 \*\* - A linear average detector is required.

#### 8.2.2 Test summary

Verdict	Pass				
Test date	May 25, 2016	Test engineer	David Duchesne		
Temperature	23.4 °C	Relative humidity	35.7 %	Air pressure	1001 mbar

#### 8.2.3 Notes

None

#### 8.2.4 Setup details

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Port under test	AC input (External adapter)
EUT setup configuration	Table top
Measurement details	A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver settings:

Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Detector mode	<ul style="list-style-type: none"><li>– Peak and Average (Preview measurement)</li><li>– Quasi-peak and CAverage (Final measurement)</li></ul>
Trace mode	Max Hold
Measurement time	<ul style="list-style-type: none"><li>– 100 ms (Peak and Average preview measurement)</li><li>– 1000 ms (Quasi-peak final measurement)</li><li>– 160 ms (CAverage final measurement)</li></ul>

8.2.5 Test data

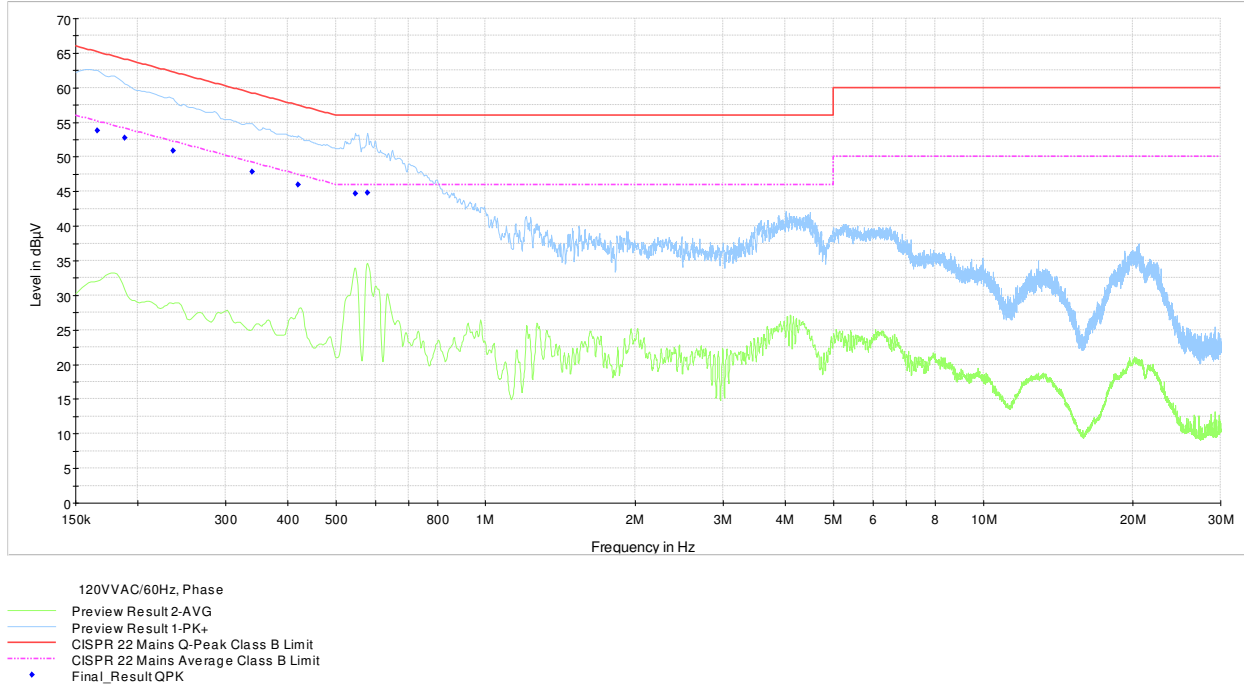


Figure 8.2-1: AC power line conducted emissions limits – phase line

Table 8.2-2: Quasi-Peak results AC power line conducted emissions limits – phase line

Frequency (MHz)	Quasi-Peak result <sup>1 and 3</sup> (dBµV)	Quasi-Peak limit (dBµV)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Conductor	Filter	Correction factor <sup>2</sup> (dB)
0.165750	53.77	65.17	11.40	1000	9	L1	ON	10.1
0.188250	52.76	64.11	11.35	1000	9	L1	ON	10.0
0.235500	50.85	62.25	11.40	1000	9	L1	ON	9.7
0.339000	47.88	59.23	11.35	1000	9	L1	ON	9.9
0.420000	45.97	57.45	11.48	1000	9	L1	ON	10.0
0.548250	44.72	56.00	11.28	1000	9	L1	ON	10.0
0.579750	44.78	56.00	11.22	1000	9	L1	ON	10.0

Notes: <sup>1</sup> Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

<sup>2</sup> Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)

<sup>3</sup> The maximum measured value observed over a period of 15 seconds was recorded.

Sample calculation: 44.78 dBµV (result) = 34.78 dBµV (receiver reading) + 10.00 dB (Correction factor)

8.2.5 Test data, continued

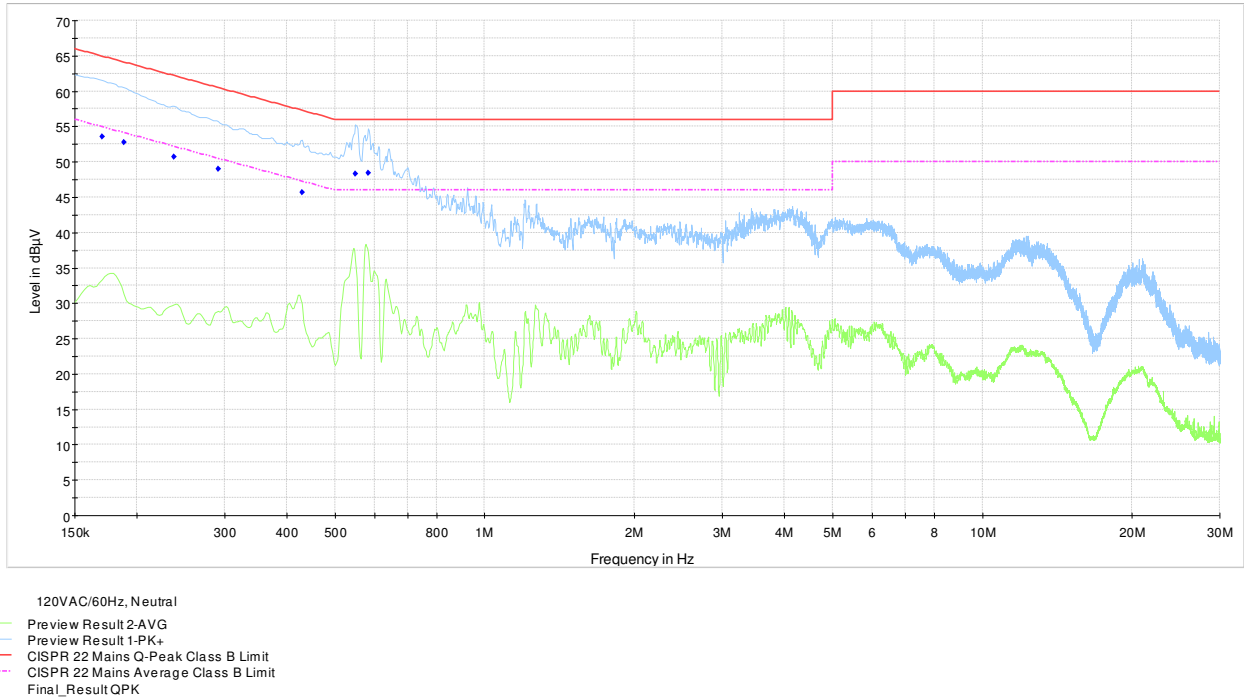


Figure 8.2-2: AC power line conducted emissions limits – neutral line

Table 8.2-3: Quasi-Peak results AC power line conducted emissions limits – neutral line

Frequency (MHz)	Quasi-Peak result <sup>1 and 3</sup> (dBµV)	Quasi-Peak limit (dBµV)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Conductor	Filter	Correction factor <sup>2</sup> (dB)
0.170250	53.57	64.95	11.38	1000	9	N	ON	10.1
0.188250	52.70	64.11	11.41	1000	9	N	ON	10.0
0.237750	50.67	62.17	11.50	1000	9	N	ON	9.7
0.291750	49.01	60.47	11.46	1000	9	N	ON	9.8
0.429000	45.73	57.27	11.54	1000	9	N	ON	10.0
0.550500	48.25	56.00	7.75	1000	9	N	ON	10.0
0.584250	48.38	56.00	7.62	1000	9	N	ON	10.0

Notes: <sup>1</sup> Result (dBµV) = receiver/spectrum analyzer value (dBµV) + correction factor (dB)

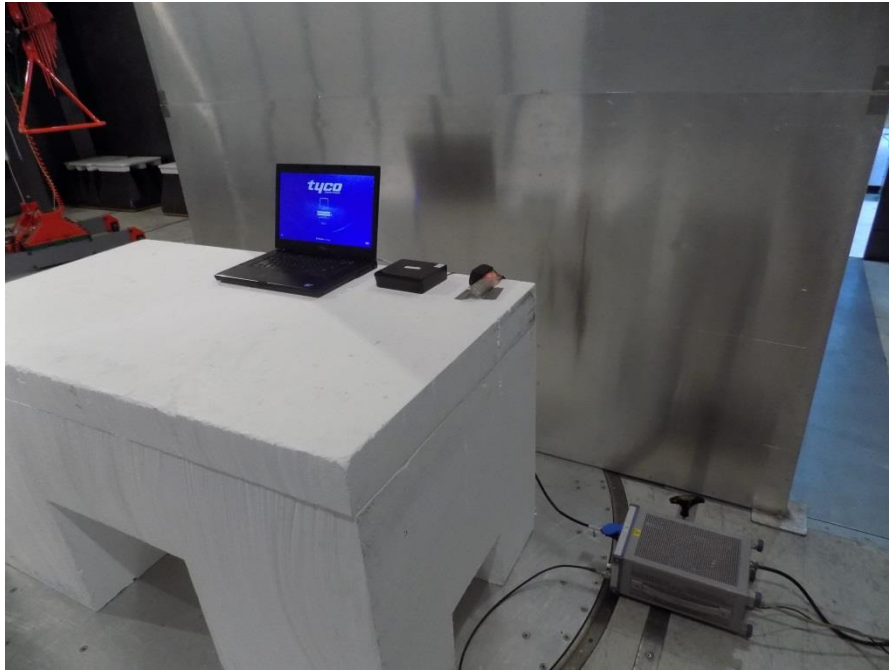
<sup>2</sup> Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)

<sup>3</sup> The maximum measured value observed over a period of 15 seconds was recorded.

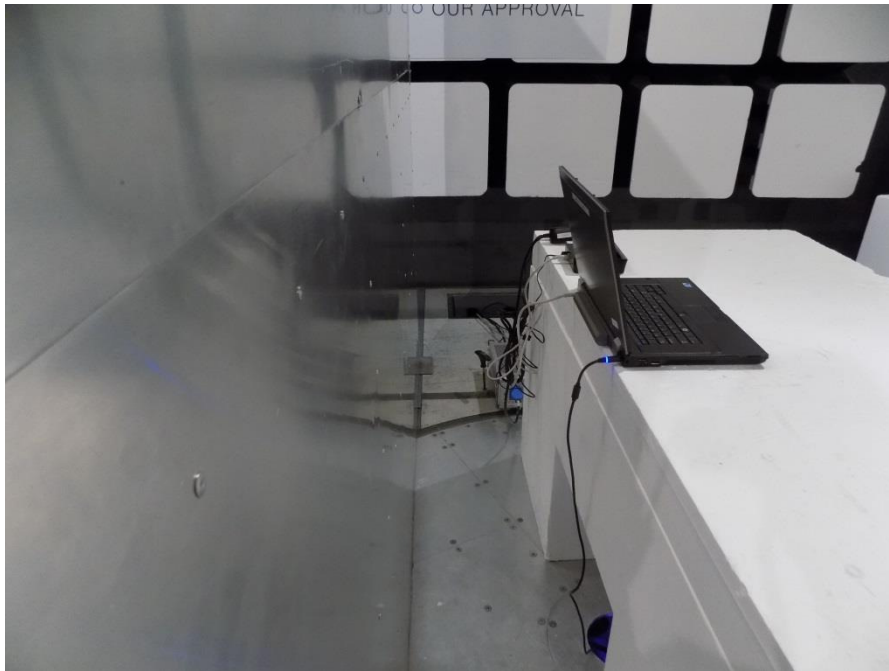
Sample calculation: 48.38 dBµV (result) = 38.38 dBµV (receiver reading) + 10.00 dB (Correction factor)

8.2.6 Setup photos

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*Figure 8.2-3: AC power line conducted emissions limits setup photo*



*Figure 8.2-4: AC power line conducted emissions limits setup photo*



### 8.3 FCC 15.215(c) and RSS-Gen 6.6 Occupied (Emission) bandwidth

#### 8.3.1 Definitions and limits

**FCC**  
 Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80 % of the permitted band in order to minimize the possibility of out-of-band operation.

**IC**  
 When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

#### 8.3.2 Test summary

Test date	June 15, 2016	Temperature	21 °C
Test engineer	Andrey Adelberg	Air pressure	1005 mbar
Verdict	Pass	Relative humidity	32 %

#### 8.3.3 Observations, settings and special notes

Spectrum analyzer settings:

Detector mode	Peak
Resolution bandwidth	≥1 % of span
Video bandwidth	RBW × 3
Trace mode	Max Hold

#### 8.3.4 Test data

*Table 8.3-1: 20 dB bandwidth result*

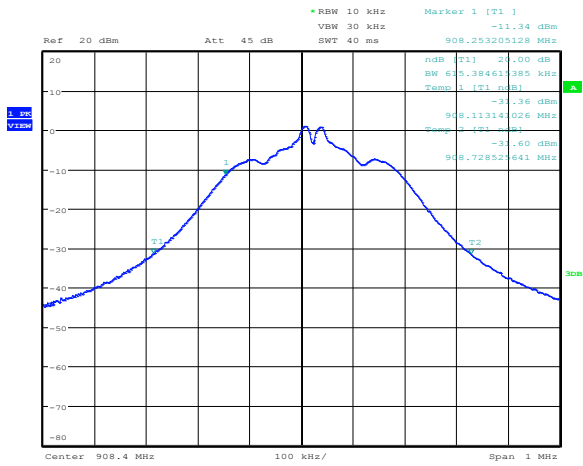
Fundamental frequency, MHz	20 dB bandwidth, kHz
908.4	615.38

*Table 8.3-2: 99% occupied bandwidth results*

Fundamental frequency, MHz	99% occupied bandwidth, kHz
908.4	407.05

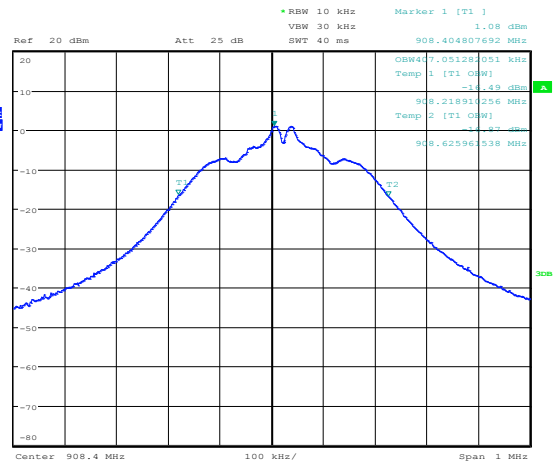
**Section 8**  
**Test name**  
**Specification**

Testing data  
 FCC 15.215(c) and RSS-Gen 6.6 Occupied (Emission) bandwidth  
 FCC 15 Subpart C and RSS-Gen



Date: 22.JUN.2016 10:45:29

**Figure 8.3-1: 20 dB bandwidth**



Date: 22.JUN.2016 10:46:18

**Figure 8.3-2: 99% occupied bandwidth**



## 8.4 FCC 15.249(a) RSS 210 A2.9(a) Field strength of fundamental and harmonics outside restricted bands

### 8.4.1 Definitions and limits

**FCC:**  
 The field strength of emissions from intentional radiators shall comply with the following table. Field strength limits are specified at a distance of 3 meters.  
**IC:**  
 The field strength measured at 3 metres shall not exceed the limits in the following table.

**Table 8.4-1: Field strength limits**

Fundamental frequencies, MHz	Field strength of fundamental		Field strength of harmonics	
	mV/m	dBµV/m	µV/m	dBµV/m
902–928	50	94	500	54
2400–2483.5	50	94	500	54
5725–5875	50	94	500	54
24000–24250	250	108	2500	68

Notes: In the emission table above, the tighter limit applies at the band edges. For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. The limits shown in the above table are based on measurements using an average detector, except for the fundamental emission in the frequency band 902–928 MHz, which is based on measurements using a CISPR quasi-peak detector.

### 8.4.2 Test summary

Test date	June 15, 2016	Temperature	21 °C
Test engineer	Andrey Adelberg	Air pressure	1005 mbar
Verdict	Pass	Relative humidity	32 %

### 8.4.3 Observations, settings and special notes

The spectrum was searched from 30 MHz to 10<sup>th</sup> harmonic of fundamental frequency. Radiated measurements were performed at a distance of 3 m. Spectrum analyzer settings for frequencies below 1000 MHz:

Detector mode	Quasi-Peak
Resolution bandwidth	100 kHz
Video bandwidth	300 kHz
Trace mode	Max Hold

Spectrum analyzer settings for peak measurements at the frequencies above 1000 MHz:

Detector mode	Peak
Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Trace mode	Max Hold

Spectrum analyzer settings for average measurements at the frequencies above 1000 MHz:

Detector mode	Peak
Resolution bandwidth	1 MHz
Video bandwidth	10 Hz
Trace mode	Max Hold

8.4.4 Test data

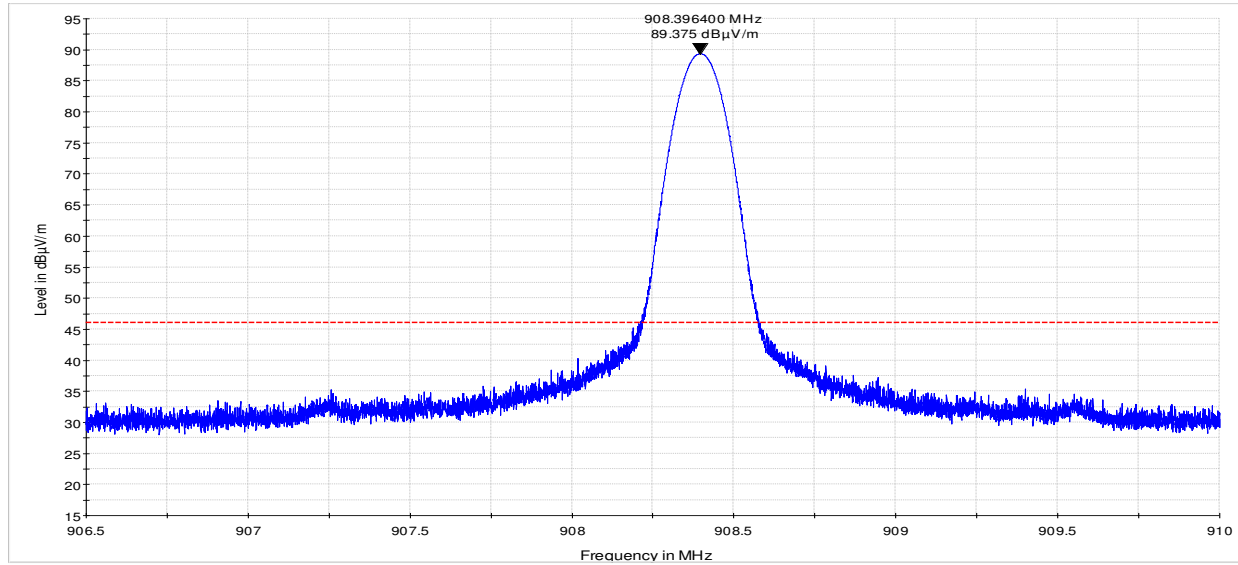


Figure 8.4-1: Field strength of fundamental

Table 8.4-2: Radiated field strength of fundamental and harmonics measurement results

Frequency, MHz	Quasi-peak field strength <sup>1</sup> , dBµV/m	Quasi-peak field strength limit, dBµV/m	Margin, dB
908.4	89.38	94.00	4.62

Table 8.4-3: Radiated field strength of harmonics measurement results

Frequency, MHz	Peak field strength <sup>1</sup> , dBµV/m	Average field strength limit, dBµV/m	Margin, dB	Average field strength, dBµV/m	Average field strength limit, dBµV/m	Average margin, dB
1810.0	37.81	74.00	36.19	37.81	54.00	16.19
2725.5	40.27	74.00	33.73	40.27	54.00	13.73
4542.5	41.23	74.00	32.77	41.23	54.00	12.77
6358.8	44.43	74.00	29.57	44.43	54.00	9.57

Notes: <sup>1</sup> Peak field strength (dBµV/m) = Spectrum analyzer value (dBµV) + transducer factors (dB)  
 Transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

## 8.5 FCC 15.249(d) Spurious emissions (except for harmonics)

### 8.5.1 Definitions and limits

#### FCC

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

#### IC

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general field strength limits listed in RSS-Gen, whichever is less stringent.

**Table 8.5-1: 15.209 and RSS-Gen emissions field strength limits**

Frequency, MHz	Field strength of emissions		Measurement distance, m
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	
0.009–0.490	2400/F	$67.6 - 20 \times \log_{10}(F)$	300
0.490–1.705	24000/F	$87.6 - 20 \times \log_{10}(F)$	30
1.705–30.0	30	29.5	30
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
above 960	500	54.0	3

Notes: In the emission table above, the tighter limit applies at the band edges. For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test

**Table 8.5-2: IC restricted frequency bands**

MHz	MHz	MHz	GHz
0.090–0.110	12.51975–12.52025	399.9–410	5.35–5.46
2.1735–2.1905	12.57675–12.57725	608–614	7.25–7.75
3.020–3.026	13.36–13.41	960–1427	8.025–8.5
4.125–4.128	16.42–16.423	1435–1626.5	9.0–9.2
4.17725–4.17775	16.69475–16.69525	1645.5–1646.5	9.3–9.5
4.20725–4.20775	16.80425–16.80475	1660–1710	10.6–12.7
5.677–5.683	25.5–25.67	1718.8–1722.2	13.25–13.4
6.215–6.218	37.5–38.25	2200–2300	14.47–14.5
6.26775–6.26825	73–74.6	2310–2390	15.35–16.2
6.31175–6.31225	74.8–75.2	2655–2900	17.7–21.4
8.291–8.294	108–138	3260–3267	22.01–23.12
8.362–8.366	156.52475–156.52525	3332–3339	23.6–24.0
8.37625–8.38675	156.7–156.9	3345.8–3358	31.2–31.8
8.41425–8.41475	240–285	3500–4400	36.43–36.5
12.29–12.293	322–335.4	4500–5150	Above 38.6

Note: Certain frequency bands listed in table above and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard

**Table 8.5-3: FCC restricted frequency bands**

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	Above 38.6
13.36–13.41			

### 8.5.2 Test summary

Test date	June 15, 2016	Temperature	21 °C
Test engineer	Andrey Adelberg	Air pressure	1005 mbar
Verdict	Pass	Relative humidity	32 %

### 8.5.3 Observations, settings and special notes

The spectrum was searched from 30 kHz to 10<sup>th</sup> harmonic of the fundamental frequency. Radiated measurements were performed at a distance of 3 m.

Spectrum analyzer settings for frequencies below 1000 MHz:

Detector mode	Peak or Quasi-Peak
Resolution bandwidth	100 kHz
Video bandwidth	300 kHz
Trace mode	Max Hold

Spectrum analyzer settings for peak measurements at the frequencies above 1000 MHz:

Detector mode	Peak
Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Trace mode	Max Hold

Spectrum analyzer settings for average measurements at the frequencies above 1000 MHz:

Detector mode	Peak
Resolution bandwidth	1 MHz
Video bandwidth	10 Hz
Trace mode	Max Hold

8.5.4 Test data

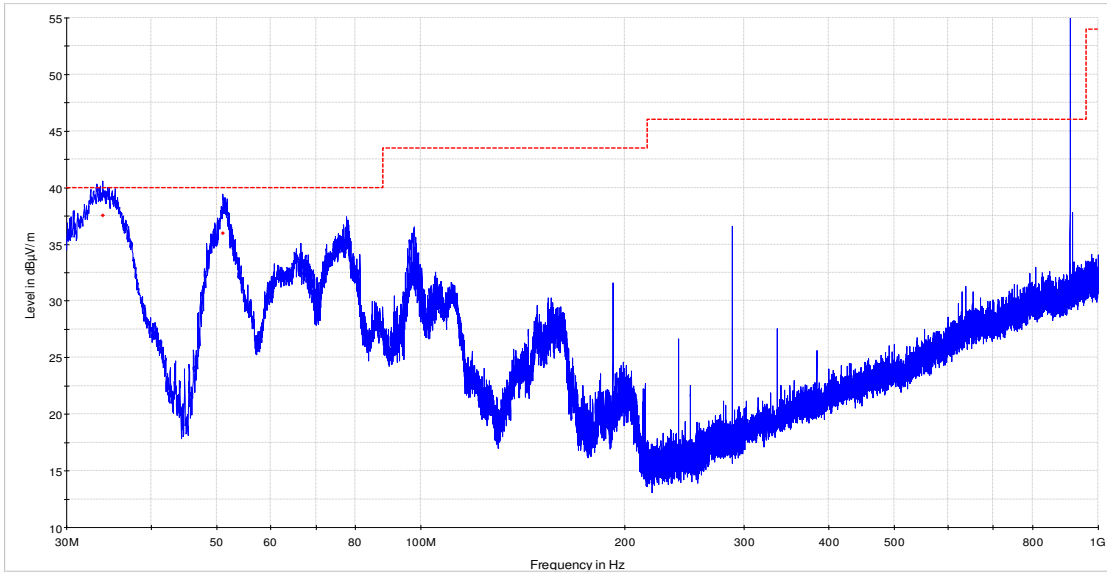


Figure 8.5-1: Field strength of spurious emissions below 1000 MHz

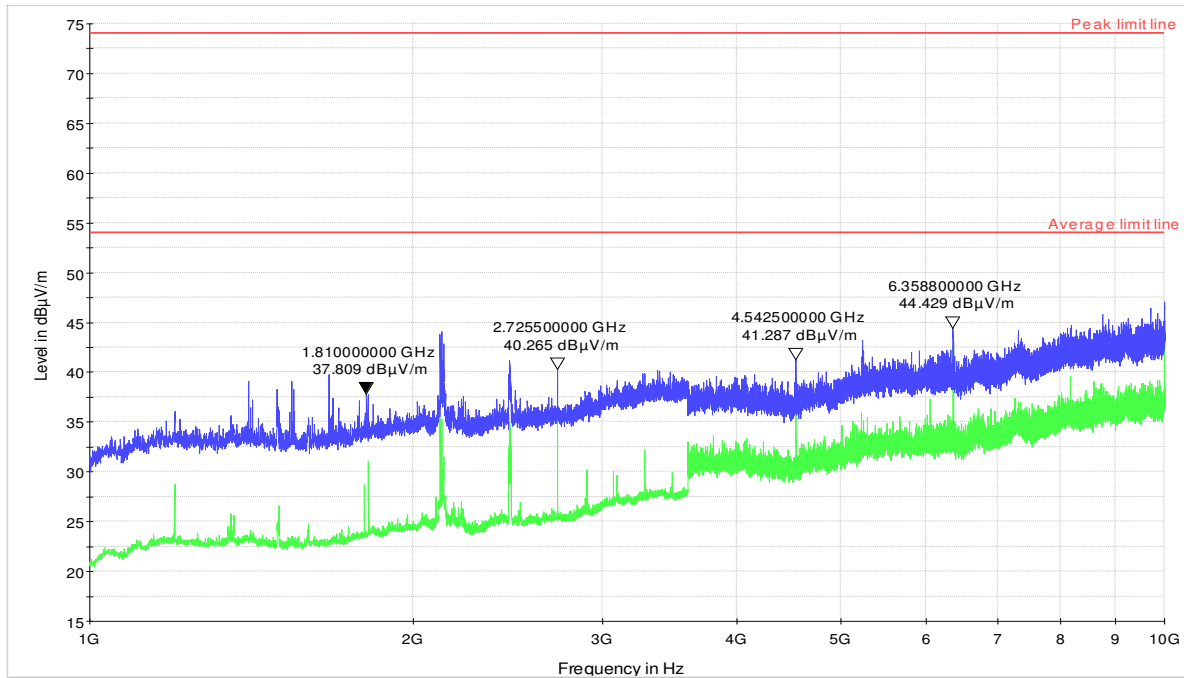


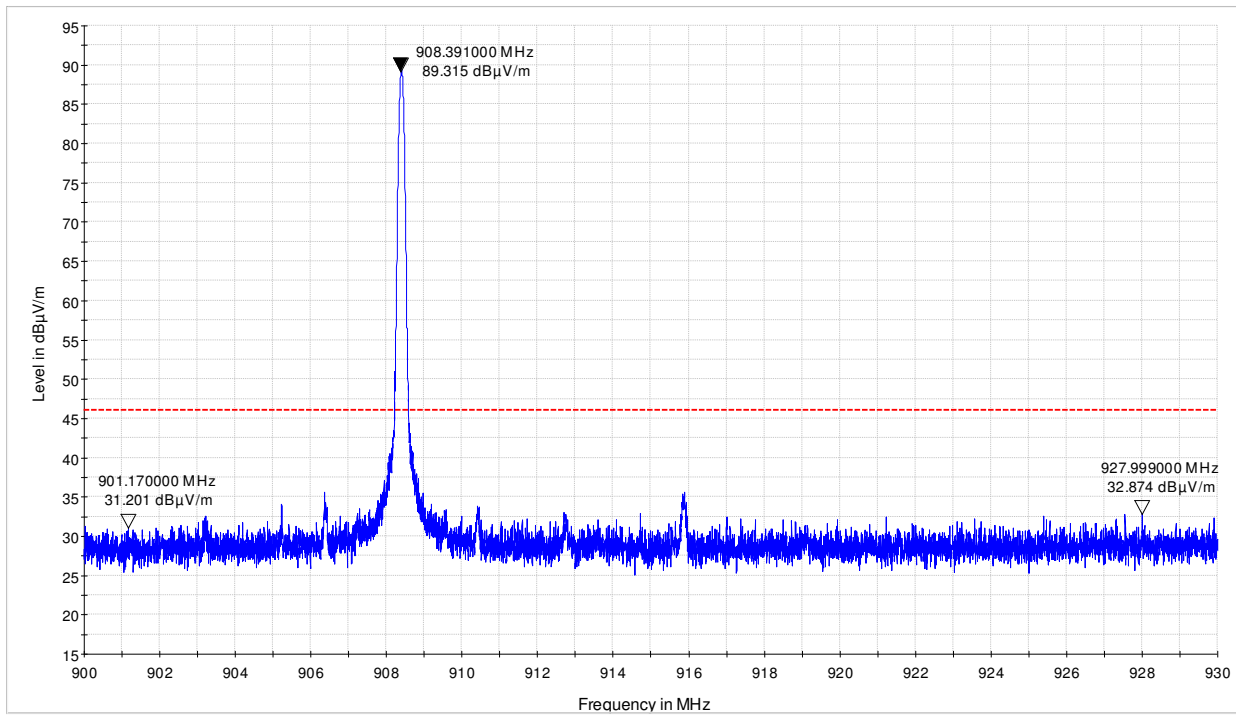
Figure 8.5-2: Field strength of spurious emissions above 1000 MHz

**Table 8.5-4:** Radiated field strength of spurious emissions measurement results

Frequency, MHz	Quasi-peak field strength <sup>1</sup> , dB $\mu$ V/m	Quasi Peak field strength limit, dB $\mu$ V/m	Margin, dB
33.92	37.60	40.00	2.40
51.04	36.00	40.00	4.00

**Table 8.5-5:** Radiated band edge emissions measurement results

Frequency, MHz	Attenuation below carrier, dBc	Minimum limit, dBc	Margin, dB
902	58.114	50.000	8.114
928	56.441	50.000	6.441

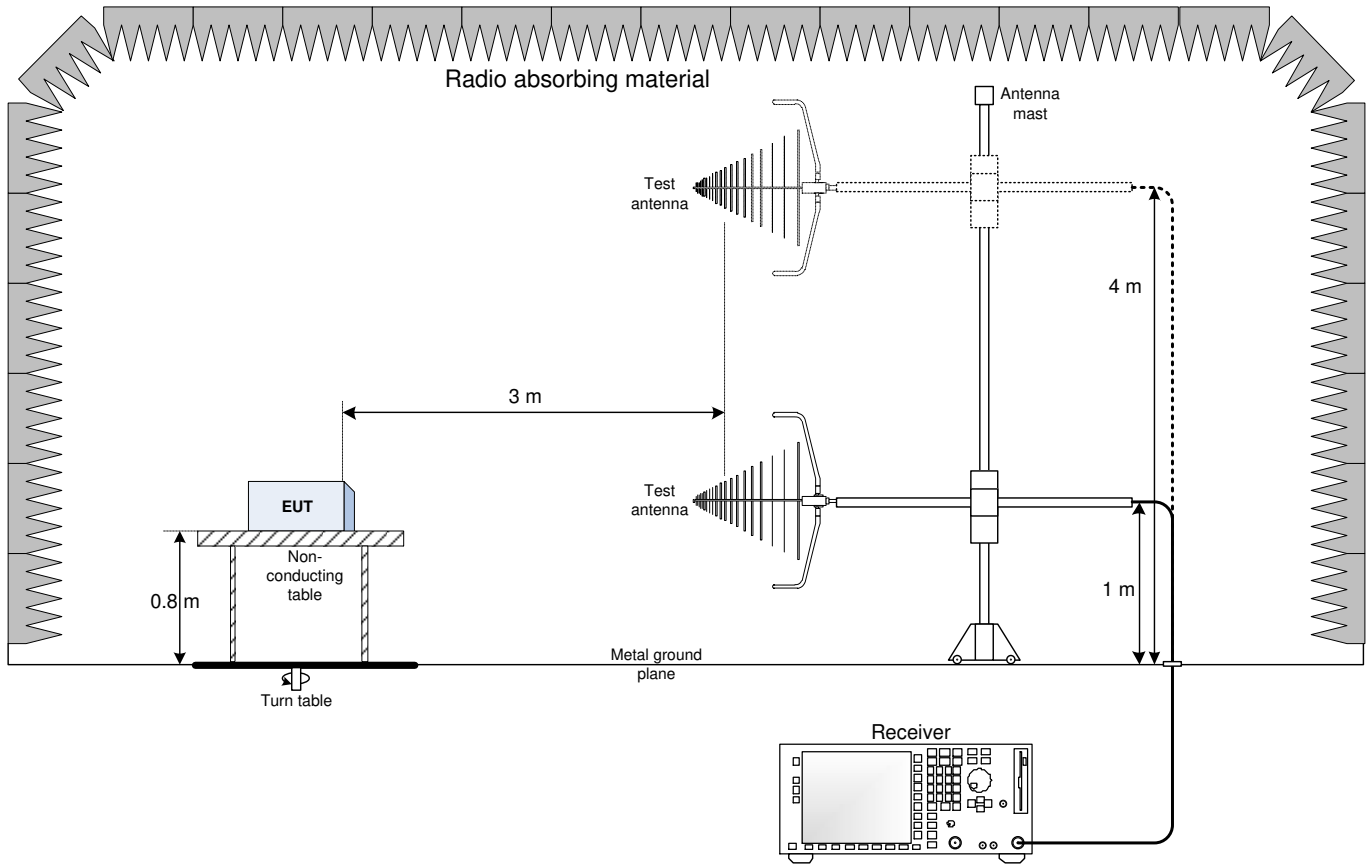


**Figure 8.5-3:** Radiated band edge emissions

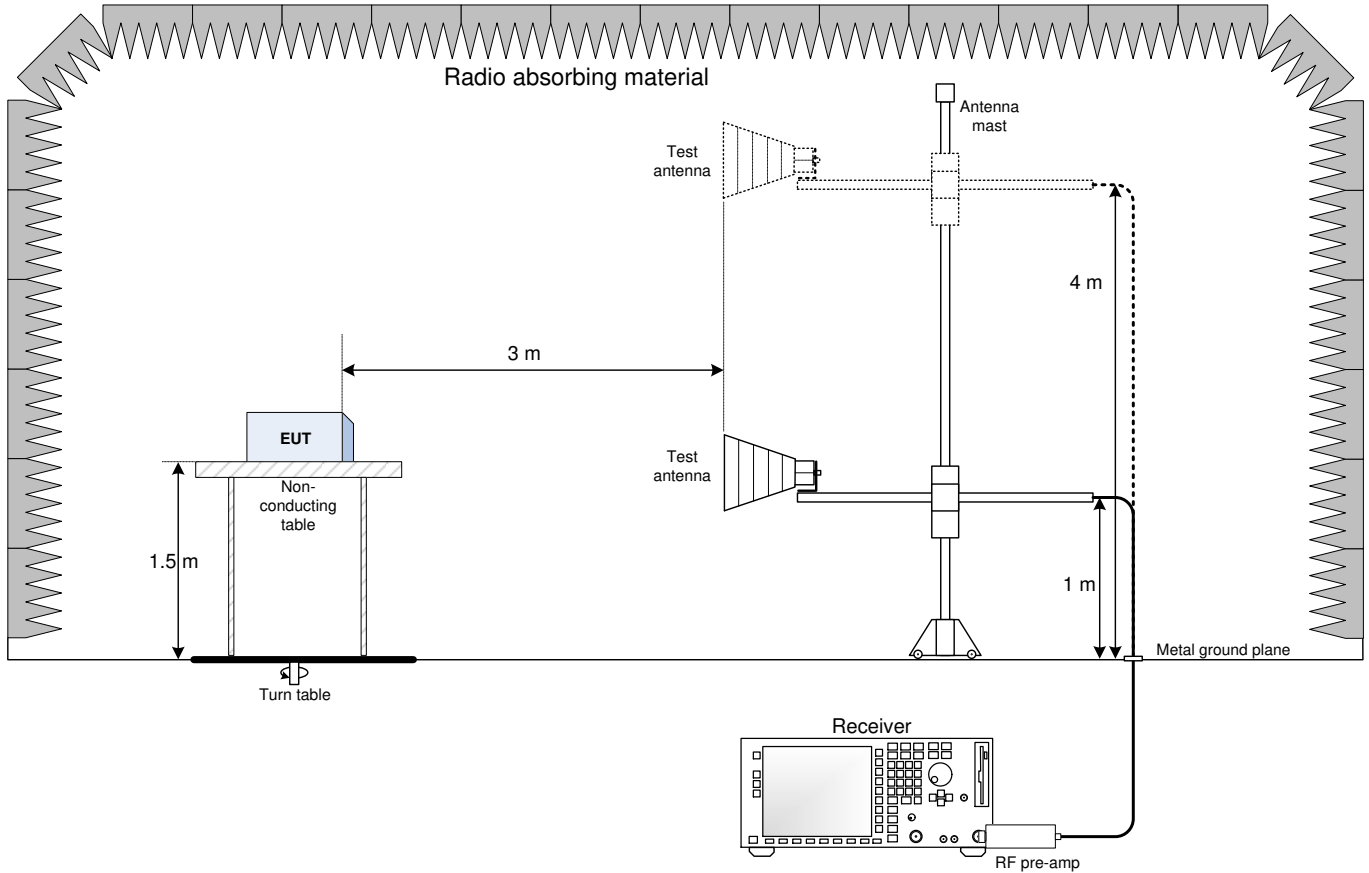


## Section 9. Block diagrams of test set-ups

### 9.1 Radiated emissions set-up for frequencies below 1 GHz



9.2 Radiated emissions set-up for frequencies above 1 GHz



9.3 Conducted emissions set-up

