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# Wireless test report – 336973-2TRFWL

Applicant:

**Q-Free ASA**

Product name:

**UHF base station**

Model:

**ITS950**

FCC ID:

**2AO69-950A**

ISED Registration number:

**3610A-950A**

Specifications:

**FCC 47 CFR Part 15 Subpart C, §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 9, August 2016, Annex B10**

Bands 902-928 MHz, 2400-2483.5 MHz and 5725-5875 MHz

Date of issue: November 22, 2018

Test engineer(s): **Kevin Rose, Wireless/EMC Specialist**

Signature:

Reviewed by: **Andrey Adelberg, Senior Wireless/EMC Specialist**

Signature:



#### Test location(s)

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Province	Ontario
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Website	www.nemko.com
Site number	FCC: CA2040; IC: 2040A-4 (3 m SAC)

#### 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	Q-Free ASA
Address	Strindfjordveien 1
City	Ranheim
Province/State	–
Postal/Zip code	7053
Country	Norway

### 1.2 Test specifications

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FCC 47 CFR Part 15, Subpart C, §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 9, August 2016, Annex F.2	Speed Radar Meters operating in the Bands 10.5–10.55 GHz, 24.075–24.175 GHz and 33.4–36 GHz.

### 1.3 Test methods

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ANSI C63.10 v2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
RSS-Gen, Issue 5, April 2018	General Requirements for Compliance of Radio Apparatus

### 1.4 Statement of compliance

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In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard except as noted in section 1.5 below. 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 #	Date of issue	Details of changes made to test report
TRF	November 22, 2018	Original report issued

## Section 2. Summary of test results

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

**Table 2.1-1: FCC general requirements results**

Part	Test description	Verdict
§15.207(a)	Conducted limits	Pass
§15.31(e)	Variation of power source	Pass
§15.31(m)	Number of tested frequencies	Pass
§15.203	Antenna requirement	Pass

Notes: EUT is an AC powered device.

### 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	Pass
§15.249(d)	Spurious emissions (except harmonics)	Pass
§15.215(c)	20 dB bandwidth	Pass

Notes: None

### 2.3 IC RSS-GEN, Issue 5, test results

Part	Test description	Verdict
7.3	Receiver radiated emission limits	Not applicable
7.4	Receiver conducted emission limits	Not applicable
6.9	Operating bands and selection of test frequencies	Pass
8.8	AC power-line conducted emissions limits	Pass

Notes: <sup>1</sup> According to sections 5.2 and 5.3 of RSS-Gen, Issue 5 the EUT does not have a stand-alone receiver neither scanner receiver, therefore exempt from receiver requirements.

Choose an item.

### 2.4 ISSED RSS-210, Issue 9, test results

Section	Test description	Verdict
F.2.1	Radiated Emissions of fundamental and harmonics	Pass
F.2.1	Radiated Emissions except for harmonic	Pass
F.2.2	Frequency stability	Not applicable

Notes: None

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

### 3.1 Sample information

Receipt date	September 27, 2017
Nemko sample ID number	1 and 2

### 3.2 EUT information

Product name	UHF base station
Model	ITS950
Model variant	00000010
Serial number	A24BS001

### 3.3 Technical information

Applicant IC company number	3610A
IC UPN number	950A
All used IC test site(s) Reg. number	2040A-4
RSS number and Issue number	RSS-210 Issue 9
Frequency band	902–928 MHz
Frequency Min (MHz)	926.640
Frequency Max (MHz)	927.975
RF power Max (W)	N/A
Field strength, Units @ distance	93.72 dBμV/m @ 3 m
Measured BW (kHz) (20 dB)	104.17
Calculated BW (kHz), as per TRC-43	N/A
Type of modulation	FSK
Emission classification (F1D, G1D, D1D)	F1D
Transmitter spurious, Units @ distance	1855.9 MHz 34.5 dBμV/m @ 3 m peak (Noise Floor)
Power requirements	120 V <sub>AC</sub> 60 Hz
Antenna information	Laird FG9023 with 5.14 dBi gain omni, 3 dBi internal The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator.

### 3.4 Product description and theory of operation

UHF base station receives message and forwards message from a back-office system

### 3.5 EUT exercise details

EUT was connected to Laptop transmit settings were set using Tera Term.

3.6 EUT setup diagram

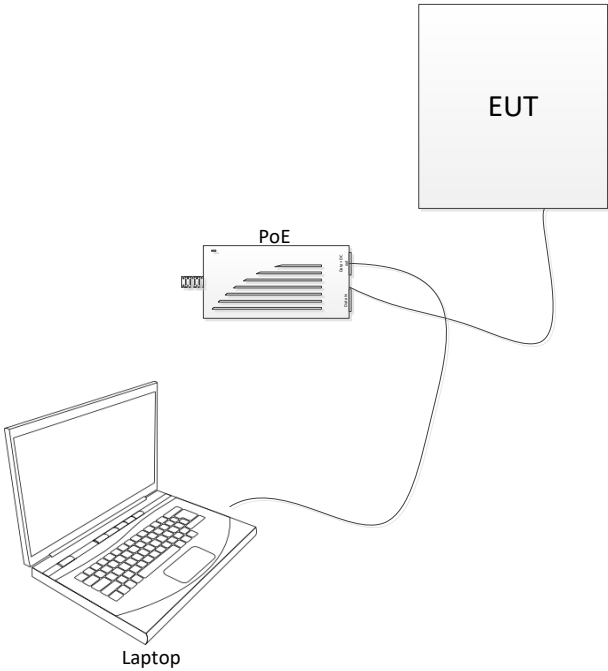


Figure 3.6-1: Setup diagram

3.7 EUT sub assemblies

Table 3.7-1: EUT sub assemblies

Description	Brand name	Model/Part number	Serial number
Laptop	Thinkpad	T550	NA
Power supply 48 Vdc POE	CINCON	TRG60A	000029

## 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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UKAS Lab 34 and TIA-603-B have been used as guidance for measurement uncertainty reasonable estimations with regards to previous experience and validation of data. Nemko Canada, Inc. follows these test methods in order to satisfy ISO/IEC 17025 requirements for estimation of uncertainty of measurement for wireless products.

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

**Table 6.1-1: Measurement uncertainty**

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. 9/18
Flush mount turntable	Sunol	FM2022	FA002082	—	NCR
Controller	Sunol	SC104V	FA002060	—	NCR
Antenna mast	Sunol	TLT2	FA002061	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 26	FA002043	1 year	Mar 26/19
Bilog antenna (20–3000 MHz)	Sunol	JB3	FA002108	1 year	June 27/18
Horn with Preamp	ETS-Lindgren	3117-PA	FA002840	1 year	Dec. 7/18
AC Power source	Chenwa	2700M-10k	FA002716	—	VOU
LISN	Rohde & Schwarz	ENV216	FA002514	1 year	Dec. 15/18

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

## Section 8. Testing data

### 8.1 FCC 15.31(e) Variation of power source

#### 8.1.1 Definitions and limits

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

#### 8.1.2 Test date

Start date February 21, 2018

#### 8.1.3 Observations, settings and special notes

None

#### 8.1.4 Test data

EUT Power requirements:	<input checked="" type="checkbox"/> AC	<input type="checkbox"/> DC	<input type="checkbox"/> Battery
If EUT is an AC or a DC powered, was the noticeable output power variation observed?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> N/A
If EUT is battery operated, was the testing performed using fresh batteries?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> N/A
If EUT is rechargeable battery operated, was the testing performed using fully charged batteries?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> N/A

## 8.2 FCC 15.31(m) and RSS-Gen 6.9 Number of frequencies

### 8.2.1 Definitions and limits

**FCC:**

Measurements on intentional radiators or receivers shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table.

**ISED:**

Except where otherwise specified, measurements shall be performed for each frequency band of operation for which the radio apparatus is to be certified, with the device operating at the frequencies in each band of operation shown in table below. The frequencies selected for measurements shall be reported in the test report.

**Table 8.2-1: Frequency Range of Operation**

Frequency range over which the device operates (in each band)	Number of test frequencies required	Location of measurement frequency inside the operating frequency range
1 MHz or less	1	Center (middle of the band)
1–10 MHz	2	1 near high end, 1 near low end
Greater than 10 MHz	3	1 near high end, 1 near center and 1 near low end

Note: “near” means as close as possible to or at the centre / low end / high end of the frequency range over which the device operates.

### 8.2.2 Test date

Start date February 21, 2018

### 8.2.3 Observations, settings and special notes

None

### 8.2.4 Test data

**Table 8.2-2: Test channels selection**

Start of Frequency range, MHz	End of Frequency range, MHz	Frequency range bandwidth, MHz	Low channel, MHz	Mid channel, MHz	High channel, MHz
902	928	1.335	926.640	N/A	927.975

## 8.3 FCC 15.203 and RSS-Gen, section 6.8 Antenna requirement

### 8.3.1 Definitions and limits

**FCC:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

**ISED:**

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report.

### 8.3.2 Test date

Start date	February 21, 2018
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### 8.3.3 Observations, settings and special notes

None

### 8.3.4 Test data

Must the EUT be professionally installed?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
Does the EUT have detachable antenna(s)?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
If detachable, is the antenna connector(s) non-standard?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO <input type="checkbox"/> N/A

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

### 8.4.1 Definitions and limits

**FCC:**

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.

**ISED:**

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 8.4-1: Conducted emissions limit**

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

Note: \* - The level decreases linearly with the logarithm of the frequency.

\*\* - A linear average detector is required.

### 8.4.2 Test date

Start date July 25, 2018

### 8.4.3 Observations, settings and special notes

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The EUT was set up as tabletop configuration.

The spectral scan has been corrected with transducer factors (i.e. cable loss, LISN factors, and attenuators) for determination of compliance.

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.

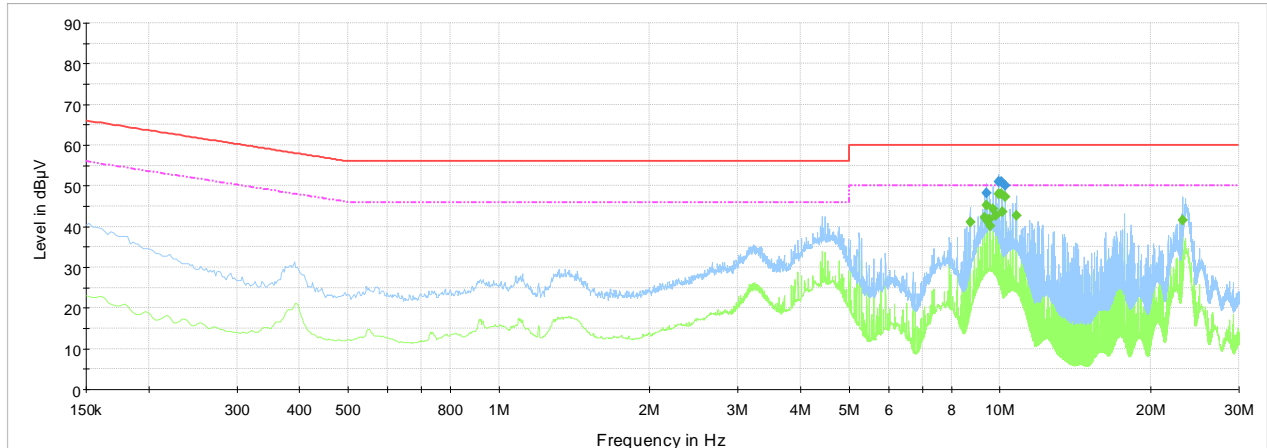
Receiver settings for preview measurements:

Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Detector mode	Peak and Average
Trace mode	Max Hold
Measurement time	1000 ms

Receiver settings for final measurements:

Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Detector mode	Quasi-Peak and Average
Trace mode	Max Hold
Measurement time	1000 ms

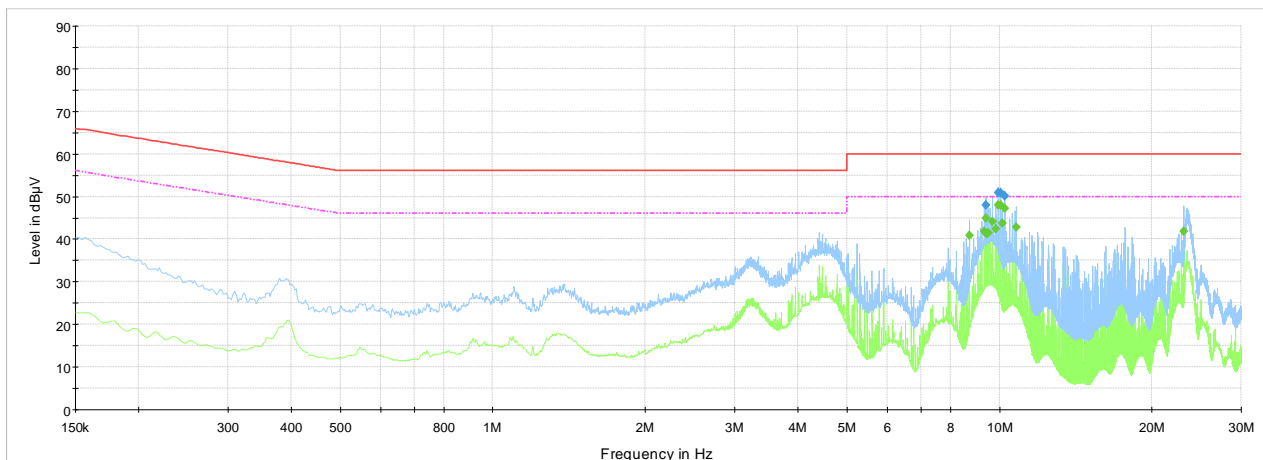
#### 8.4.1 Test data



NEX-336973 CE scan Phase 120 Vac 60 Hz

- Preview Result 2-AVG
- Preview Result 1-PK+
- CISPR 22 Mains Q-Peak Class B Limit
- CISPR 22 Mains Average Class B Limit
- Final\_Result QPK
- Final\_Result CAV

**Plot 8.4-1: Conducted emissions on phase line**



NEX-336973 CE scan Neutral 120 Vac 60 Hz

- Preview Result 2-AVG
- Preview Result 1-PK+
- CISPR 22 Mains Q-Peak Class B Limit
- CISPR 22 Mains Average Class B Limit
- Final\_Result QPK
- Final\_Result CAV

**Plot 8.4-2: Conducted emissions on neutral line**

## 8.5 FCC 15.215(c) and RSS-Gen 6.7 Occupied (Emission) bandwidth

### 8.5.1 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.

#### ISED

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

### 8.5.2 Test summary

Test date February 21, 2018

### 8.5.3 Observations, settings and special notes

Spectrum analyzer settings:

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

### 8.5.4 Test data

**Table 8.5-1: Lower 20 dBc frequency cross result**

Fundamental frequency, MHz	Lower 20 dBc frequency cross, MHz	Lower limit, MHz	Margin, MHz
926.640	926.598	902	24.598

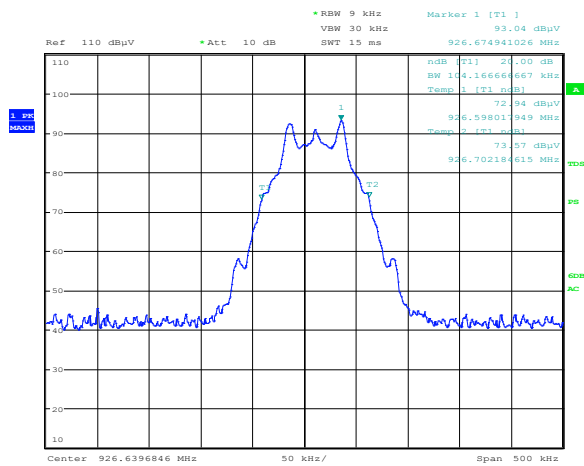
**Table 8.5-2: Upper 20 dBc frequency cross result**

Fundamental frequency, MHz	Upper 20 dBc frequency cross, MHz	Upper limit, MHz	Margin, MHz
927.950	927.994	928	0.006

**Table 8.5-3: 99% occupied bandwidth results**

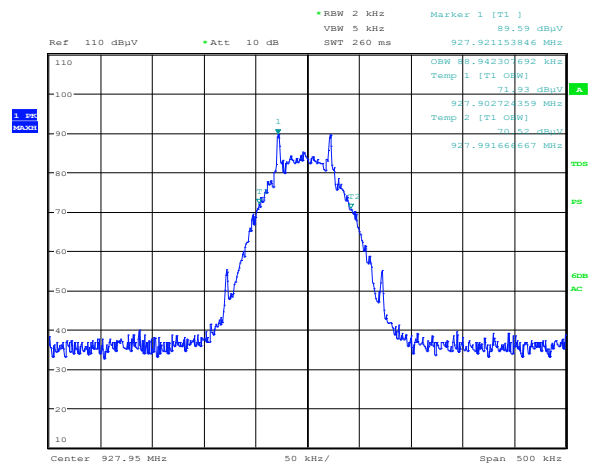
Frequency, MHz	99% occupied bandwidth, kHz
926.640	90.54
927.950	88.94

Note: there is no 99% occupied bandwidth limit in the standard's requirements, the measurement results provided for information purposes only.



Date: 21.FEB.2018 22:35:17

**Figure 8.5-1: 20 dB bandwidth**



Date: 21.FEB.2018 22:40:15

**Figure 8.5-2: 99% dB bandwidth**

## 8.6 FCC 15.249(a) RSS 210 Annex B (a) Field strength of fundamental and harmonics emissions

### 8.6.1 Definitions and limits

**FCC:**

The field strength of emissions from intentional radiators shall comply with the following FCC table. Field strength limits are specified at a distance of 3 meters.

**ISED:**

The field strength of fundamental and harmonic emissions, measured at 3 m, shall not exceed 50 mV/m and 0.5 mV/m respectively.

*Table 8.6-1: FCC field strength limits*

Fundamental frequencies, MHz	Field strength of fundamental		Field strength of harmonics	
	mV/m	dB $\mu$ V/m	$\mu$ V/m	dB $\mu$ V/m
902–928	50	94	500	54
2400–2483.5	50	94	500	54
5725–5875	50	94	500	54
24.0–24.25	250	108	2500	68

Note: The field strength limits shall be measured using an average detector, except for the fundamental emission in the frequency band 902–928 MHz, which is based on measurements using an International Special Committee on Radio Interference (CISPR) quasi-peak detector.

### 8.6.2 Test summary

Test date February 21, 2018

### 8.6.3 Observations, settings and special notes

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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	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:

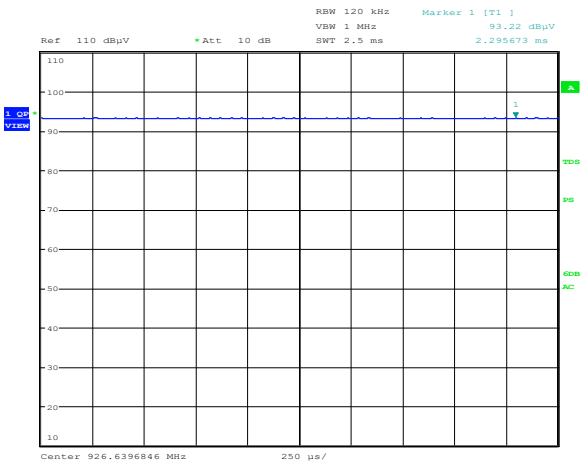
Detector mode	Peak
Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Trace mode	Max Hold

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

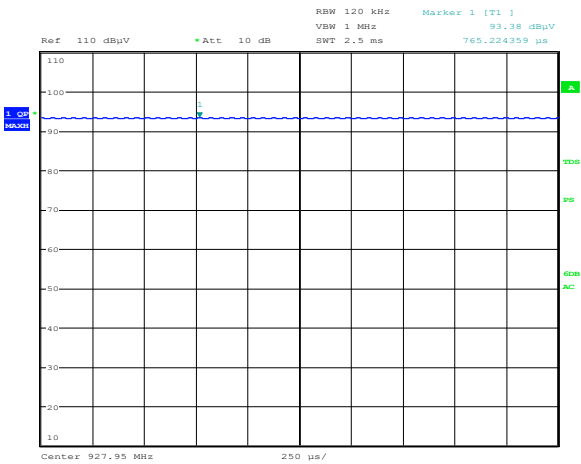


8.6.4 Test data



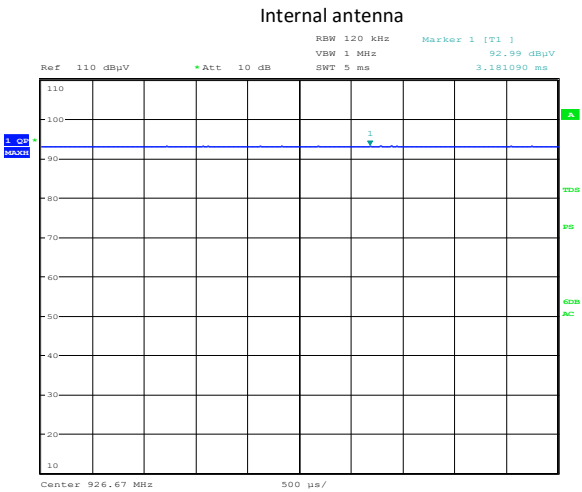
Date: 21.FEB.2018 22:33:19

Figure 8.6-1: Field strength of fundamental emission at low channel



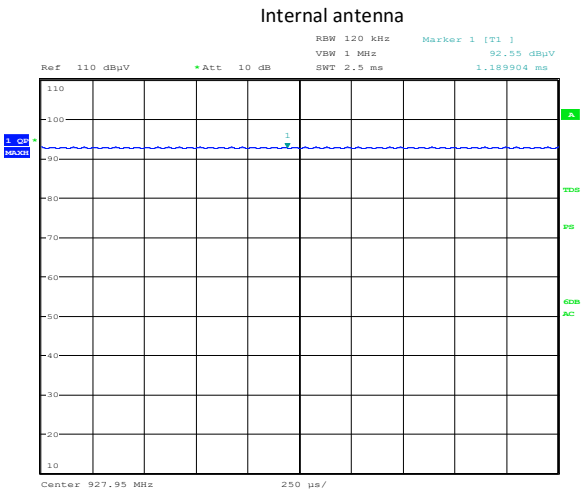
Date: 21.FEB.2018 22:42:08

Figure 8.6-2: Field strength of fundamental emission at high channel



Date: 22.FEB.2018 01:10:05

Figure 8.6-3: Field strength of fundamental emission at low channel



Date: 22.FEB.2018 01:11:12

Figure 8.6-4: Field strength of fundamental emission at high channel

Omni antenna

Omni antenna

**Table 8.6-2: Field Strength results**

Antenna	Frequency	Field Strength, dB $\mu$ V/m	Field Strength Limit, dB $\mu$ V/m	Margin, dB
Omni	Low channel	92.99	94	1.01
Omni	High channel	92.55	94	1.45
Internal	Low channel	93.72	94	0.28
Internal	High channel	92.60	94	1.40

## 8.7 FCC 15.249(d) and RSS-210 Annex B(b) Spurious emissions (except for harmonics)

### 8.7.1 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.

#### ISED

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

**Table 8.7-1: 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 8.7-2: ISED restricted frequency bands**

MHz	MHz	MHz	GHz
0.090–0.110	12.57675–12.57725	399.9–410	7.25–7.75
0.495–0.505	13.36–13.41	608–614	8.025–8.5
2.1735–2.1905	16.42–16.423	960–1427	9.0–9.2
3.020–3.026	16.69475–16.69525	1435–1626.5	9.3–9.5
4.125–4.128	16.80425–16.80475	1645.5–1646.5	10.6–12.7
4.17725–4.17775	25.5–25.67	1660–1710	13.25–13.4
4.20725–4.20775	37.5–38.25	1718.8–1722.2	14.47–14.5
5.677–5.683	73–74.6	2200–2300	15.35–16.2
6.215–6.218	74.8–75.2	2310–2390	17.7–21.4
6.26775–6.26825	108–138	2483.5–2500	22.01–23.12
6.31175–6.31225	149.9–150.05	2655–2900	23.6–24.0
8.291–8.294	156.52475–156.52525	3260–3267	31.2–31.8
8.362–8.366	156.7–156.9	3332–3339	36.43–36.5
8.37625–8.38675	162.0125–167.17	3345.8–3358	
8.41425–8.41475	167.72–173.2	3500–4400	
12.29–12.293	240–285	4500–5150	Above 38.6
12.51975–12.52025	322–335.4	5350–5460	

Note: Certain frequency bands listed in this table and above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

**Table 8.7-3: 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			

## 8.7.2 Test summary

Test date February 21, 2018

## 8.7.3 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

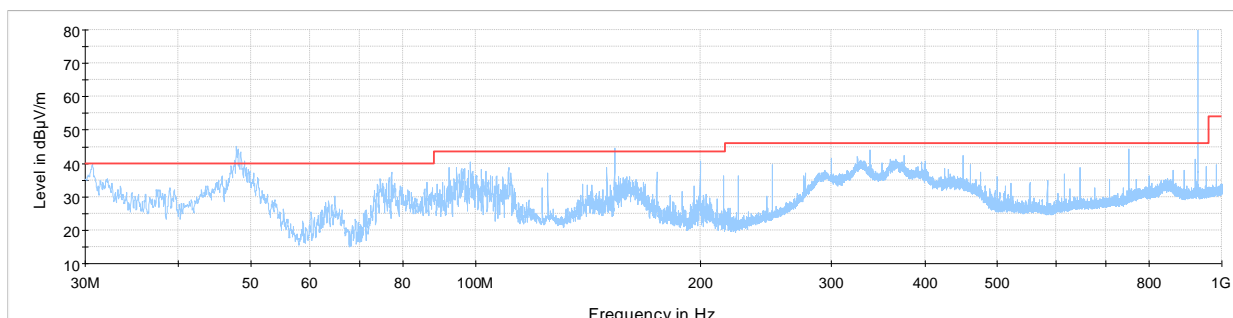
Spectrum analyzer settings for peak measurements at the frequencies above 1000 MHz:

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

## 8.7.4 Test data

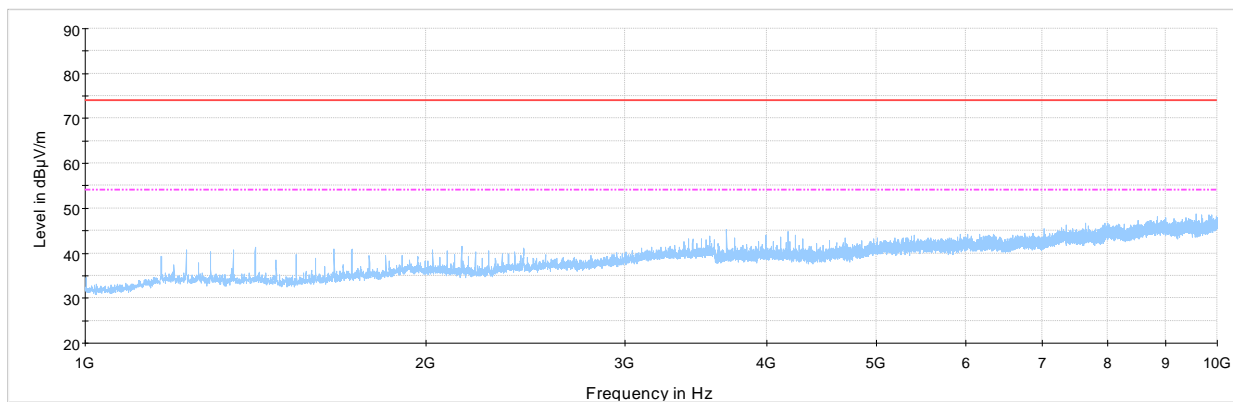


NEX 336973 (ITS 950) high channel RE scan 30-1 GHz Omni antenna 15.249

Preview Result 1-PK+  
FCC Part 15 and ICES - Class B 3m Q-Peak Limit  
Final\_Result QPK

**Figure 8.7-1:** Field strength of spurious emissions below 1000 MHz Omni antenna

Note: No transmitter related Emission exceed the General Emission limits. The EUT is a Class A digital device



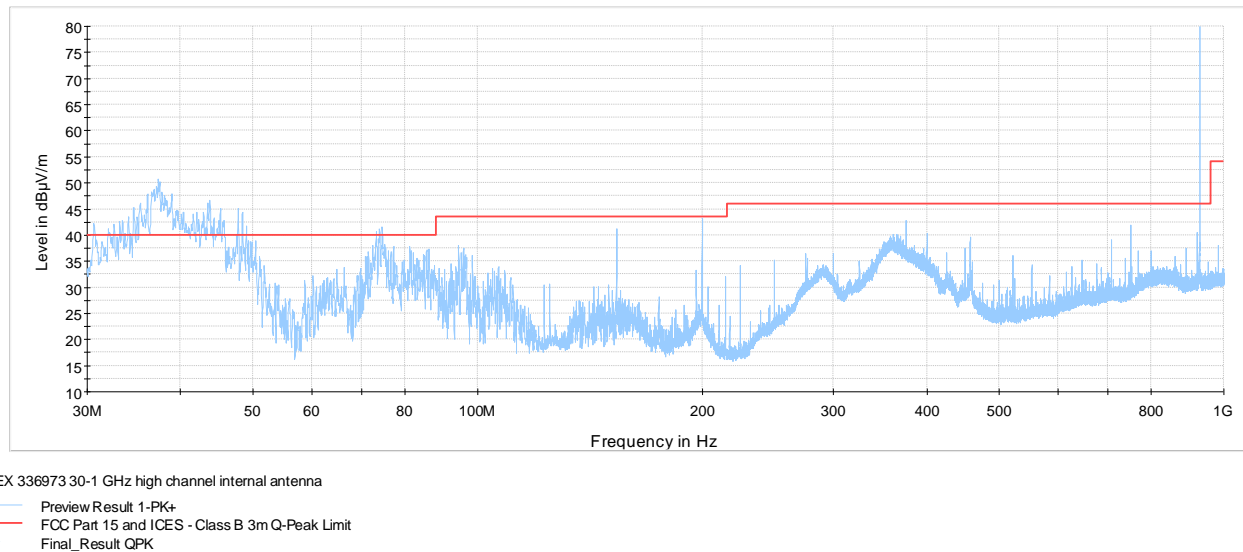
NEX 336973 1-10 GHz High channel

Preview Result 1-PK+  
FCC Part 15 and ICES - Class B 3m Peak Limit  
FCC Part 15 and ICES - Class B 3m Average Limit  
Final\_Result PK+  
Final\_Result CAV

**Figure 8.7-2:** Field strength of spurious emissions above 1000 MHz Omni antenna

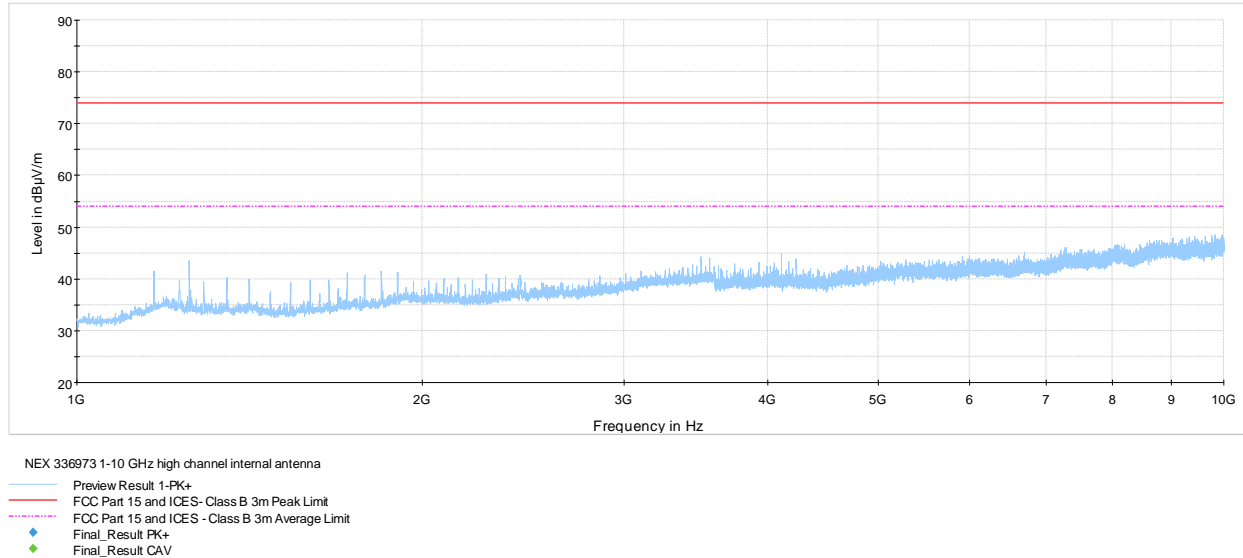
Note: all measurement results indicated in the plot were taken with a peak detector, which is more stringent measurement, and still comply with average limit.

## 8.7.1 Test data



**Figure 8.7-3:** Field strength of spurious emissions below 1000 MHz internal antenna

Note: No transmitter related Emission exceed the General Emission limits. The EUT is a Class A digital device

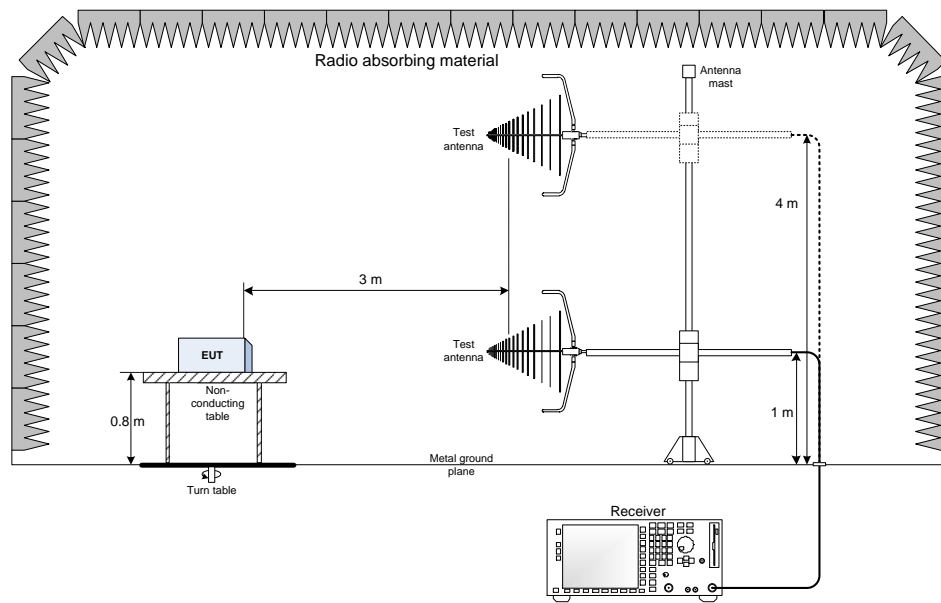


**Figure 8.7-4:** Field strength of spurious emissions above 1000 MHz internal antenna

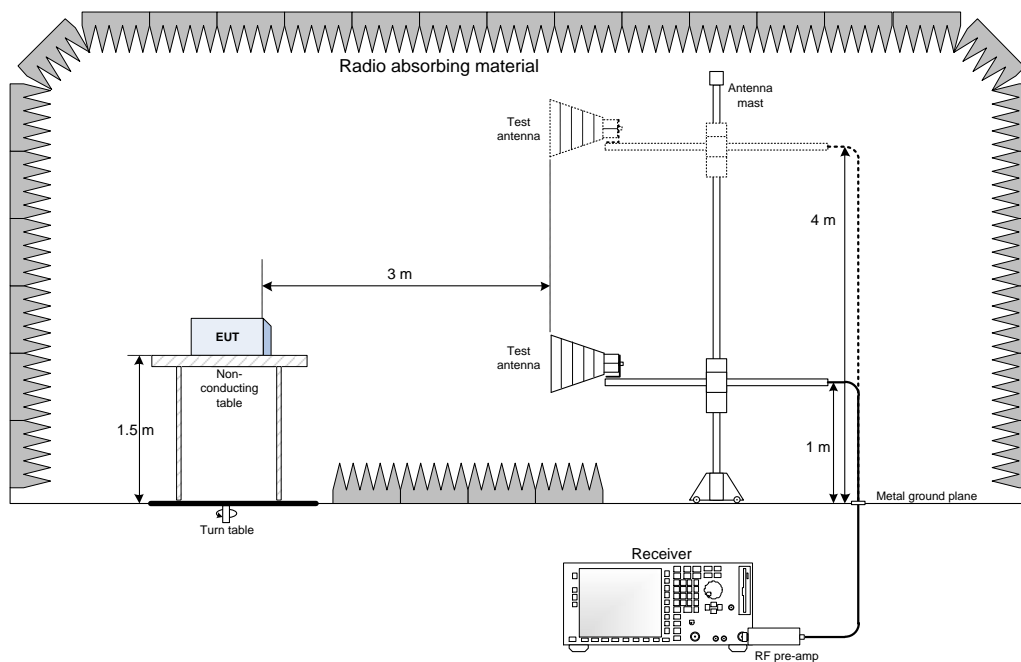
Note: all measurement results indicated in the plot were taken with a peak detector, which is more stringent measurement, and still comply with average limit

## 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

