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RADIO TEST REPORT – 398418-5R3TRFWL

Type of assessment:

Final product testing

Applicant:

Laserglow Technologies

Product name (type):

Smart Proximity Detection System
Flashing Vehicle Beacon

Model:

Flashing Vehicle Beacon

FCC ID:

2AWBN-SPDFVB

Specifications:

- FCC 47 CFR Part 15, Subpart C, §15.250

Date of issue: December 3, 2020

Tarek Elkholy, EMC/RF Specialist	
Tested by	Signature
Kevin Rose, EMC/RF Lab Manager	
Reviewed by	Signature

Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada. The tests included in this report are within the scope of this accreditation

Company name	Nemko Canada Inc.	
Facilities	***Cambridge site:*** **1-130 Saltsman Drive** **Cambridge, Ontario** **Canada** **N3E 0B2** **Tel: +1 519 650 4811**	
Test site registration	**Organization**	**Recognition number and location**
	FCC/ISED	FCC: **CA0101 (Cambridge)**
Website	www.nemko.com	

Limits of responsibility

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 contained in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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Section 1. Report summary

1.1 Test specifications

FCC 47 CFR Part 15, Subpart C, Clause 15.250	Operation of wideband systems within the band 5925-7250 MHz.

1.2 Test methods

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

1.3 Exclusions

None

1.4 Statement of compliance

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 1.3 above. 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 Test report revision history

Table 1.5-1: Test report revision history

Revision #	Date of issue	Details of changes made to test report
TRF	October 28, 2020	Original report issued
R1TRF	November 11, 2020	Frequency stability data is added to **section 8.6**
R2TRF	November 24, 2020	Add note to **section 8.5 & 8.7**
R3TRF	December 3, 2020	All pages - Remove references to UWB

Section 2. Engineering considerations

2.1 Modifications incorporated in the EUT for compliance

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

2.2 Technical judgment

None

2.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 3. Test conditions

3.1 Atmospheric conditions

Temperature	15 °C – 35 °C
Relative humidity	20 % – 75 %
Air pressure	86 kPa (860 mbar) – 106 kPa (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.

3.2 Power supply range

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 ±5 %, for which the equipment was designed.

Section 4. Measurement uncertainty

4.1 Uncertainty of measurement

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 4.1-1: Measurement uncertainty calculations for Radio

Test name	Measurement uncertainty, ±dB
All antenna port measurements	0.55
Occupied bandwidth	4.45
Conducted spurious emissions	1.13
Radiated spurious emissions	3.78
AC power line conducted emissions	3.55

Section 5. Information provided by the applicant

5.1 Disclaimer

This section contains information provided by the applicant and has been utilized to support the test plan. Inaccurate information provided by the applicant can affect the validity of the results contained within this test report. Nemko accepts no responsibility for the information contained within this section and the impact it may have on the test plan and resulting measurements.

5.2 Applicant

Company name	Laserglow Technologies
Address	99 Ingram Drive #B, North York, ON, M6M 2L7, Canada

5.3 Manufacturer

Company name	Kyungwoo Systech, Inc.
Address	401 Daeryung Post Tower 5, 68, Digital-ro 9-gil, Geumchun-gu, 08512, South Korea

5.4 EUT information

Product name	Smart Proximity Detection System Flashing Vehicle Beacon
Model	Flashing Vehicle Beacon
Serial number	None
Part number	SPDFVBAXX
Operating conditions	The Vehicle Tag transmits a message every 250 ms to detect other devices in range. The Flashing Vehicle Beacon does not transmit anything until it receives a message from the Vehicle Tag. Digital communication begins between the Vehicle Tag and the Flashing Vehicle Beacon after the Flashing Vehicle Beacon receives the first message from the Vehicle Tag.
Product description and theory of operation	Pedestrian arm or helmet mounted device listens for radio pulses transmitted by Vehicle Tags within range. If detected, devices use time-of-flight to determine distance and both devices sound an alarm if distance between devices is below a threshold value. Alarm alerts pedestrian and vehicle driver of possible collision.
Software details	V 6.0.0.0

5.5 Technical information

Operation type	☐ Periodic ☒ Non-periodic
Frequency band	5925-7250 MHz
Frequency Min (MHz)	6489.6
Frequency Max (MHz)	6489.6
Channel numbers	1
RF power Max (W), EIRP	$2.6 * 10^{-4}$ W (-5.8 dBm)
Field strength, dBµV/m @ 3 m	89.43 dBµV/m
Measured 99% OBW (MHz),	743.5 MHz
Measured BW (MHz), 10 dB BW	609.6 MHz
Type of modulation	BPM, BPSK
Emission classification	743MG2DN
Transmitter spurious, dBµV/m @ 3 m	34.0 dBµV/m , QPK @ 230.62 MHz
Power supply requirements	12/24 V_{DC} (via external 100–240 V_{AC}, 50/60 Hz power adapter)
Antenna information	Chip antenna Manufacturer – Parton Part number: ACS5200HFAUWB Peak Gain 4.16 dBi

5.6 EUT setup details

5.6.1 EUT Exercise and monitoring

Methods used to exercise the EUT and all relevant ports:

- The EUT was powered ON and triggered using an associate device to transmit as in practical operation.

Configuration details:

- The EUT setup in a configuration that was expected to produce the highest amplitude emissions relative to the limit and that satisfy normal operation/installation practice by the end user.
- The type and construction of cables used in the measurement set-up were consistent with normal or typical use. Cables with mitigation features (for example, screening, tighter/more twists per length, ferrite beads) have been noted below:
  - None
- The EUT was setup in a manner that was consistent with its typical arrangement and use. The measurement arrangement of the EUT, local AE and associated cabling was representative of normal practice. Any deviations from typical arrangements have been noted below:
  - None

Monitoring details:

- EUT flashing beacon is ON and LCD display is ON

5.6 EUT setup details, continued

5.6.2 EUT test configuration

Table 5.6-1: EUT interface ports

Description	Qty.
DC Power	1

Table 5.6-2: Inter-connection cables

Cable description	From	To	Length (m)
DC power cable	Power supply	EUT	2

Table 5.6-3: EUT support equipment

Description	Brand name	Model/Part number	Serial number
DC power supply	GWInstek	GPR-3060D	None

5.6 EUT setup details, continued

5.6.2 EUT test configuration, continued

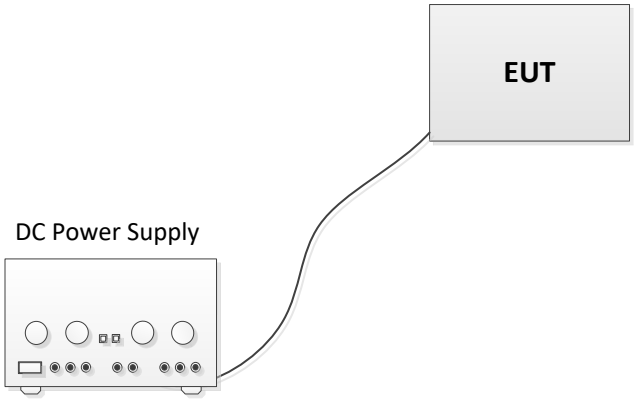


Figure 5.6-1: Radiated testing block diagram

Section 6. Summary of test results

6.1 Testing location

Test location (s)	Cambridge

6.2 Testing period

Test start date	April 28, 2020	Test end date	April 29, 2020

6.3 Sample information

Receipt date	April 27, 2020	Nemko sample ID number(s)	1

6.4 FCC Part 15 Subpart F, general requirements test results

Table 6.4-1: FCC general requirements results

Part	Test description	Verdict
§15.207(a)	Conducted limits	Not applicable
§15.31I	Variation of power source	Pass
§15.31(m)	Number of tested frequencies	Pass
§15.203	Antenna requirement	Pass

Notes: EUT is a battery-operated device, the testing was performed using fully charged batteries.

6.5 FCC Part 15 Subpart C, intentional radiators test results

Table 6.5-1: FCC 15.250 requirements results

Part	Test description	Verdict
§15.250(d)(1)	Field strength of emissions	Pass
§15.250(a), (b)	Emission bandwidth	Pass
§15.250(d)(2)	Field Strength of emissions within 1164-1240 and 1559-1610 MHz	Pass
§15.250(d)(3)	Peak Emissions within 50 MHz band	Pass
§15.250(d)(4)	Emissions at or below 960 MHz	Pass

Notes: None

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	FA003012	1 year	April 10, 2021
Flush mount turntable	SUNAR	FM2022	FA003006	—	NCR
Controller	SUNAR	SC110V	FA002976	—	NCR
Antenna mast	SUNAR	TLT2	FA003007	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESR26	FA002969	1 year	December 4, 2020
Spectrum analyzer	Rohde & Schwarz	FSW43	FA002971	1 year	December 21, 2020
Victor Signal Generator	Rohde & Schwarz	SMW200A	FA002970	1 year	January 16, 2021
Bilog antenna (30–2000 MHz)	SUNAR	JB1	FA003010	1 year	March 17, 2021
Horn antenna (1–18 GHz)	ETS Lindgren	3117	FA002911	1 year	March 11, 2021
Preamp (1–18 GHz)	ETS Lindgren	124334	FA002956	1 year	March 18, 2021
50 Ω coax cable	Huber + Suhner	None	FA003047	1 year	March 30, 2021
50 Ω coax cable	Huber + Suhner	None	FA003044	1 year	April 7, 2021
Filter 2.4 – 2.4835 GHz	Microwave Circuits	N0324413	FA003027	1 year	April 1, 2021
Temperature Chamber	Espec	EPX-4H	FA0003033	—	VOU
Horn antenna (18–40 GHz)	EMCO	3116B	FA002948	1 year	January 9, 2021
Thermal power sensor	Rohde & Schwarz	NRP40T	FA002960	1 year	January 26, 2021

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 References, 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 summary

Verdict	Pass		
Tested by	Tarek Elkholy	Test date	April 29, 2020

8.1.3 Observations, settings and special notes

None

8.1.4 Test data

EUT Power requirements:	☐ AC	☒ DC	☐ Battery
If EUT is an AC or a DC powered, was the noticeable output power variation observed?	☐ YES	☒ NO	☐ N/A
If EUT is battery operated, was the testing performed using fresh batteries?	☐ YES	☐ NO	☒ N/A
If EUT is rechargeable battery operated, was the testing performed using fully charged batteries?	☐ YES	☐ NO	☒ N/A

8.2 FCC 15.31(m) Number of frequencies

8.2.1 References, 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.

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 summary

Verdict	Pass		
Tested by	Tarek Elkholy	Test date	April 28, 2020

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	Center Frequency, MHz
5925	7250	631.71	6489.6

Note: EUT only utilizes a single channel for transmission

8.3 FCC 15.203 Antenna requirement

8.3.1 References, 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.

8.3.2 Test summary

Verdict	Pass		
Tested by	Tarek Elkholy	Test date	April 28, 2020

8.3.3 Observations, settings and special notes

None

8.3.4 Test data

Must the EUT be professionally installed?	☐ YES	☒ NO	
Does the EUT have detachable antenna(s)?	☐ YES	☒ NO	
If detachable, is the antenna connector(s) non-standard?	☐ YES	☐ NO	☒ N/A

8.4 FCC 15.250 (d)(3) Peak emissions within 50 MHz band

8.4.1 References, definitions and limits

FCC:

There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs and this 50 MHz bandwidth must be contained within the 5925-7250 MHz band.

The peak EIRP limit is 20 log (RBW/50) dBm where RBW is the resolution bandwidth in megahertz that is employed by the measurement instrument. RBW shall not be lower than 1 MHz or greater than 50 MHz. The video bandwidth of the measurement instrument shall not be less than RBW.

If RBW is greater than 3 MHz, the application for certification filed with the Commission shall contain a detailed description of the test procedure, calibration of the test setup, and the instrumentation employed in the testing.

8.4.2 Test summary

Verdict	Pass		
Tested by	Tarek Elkholy	Test date	April 29, 2020

8.4.3 Observations, settings and special notes

The EUT was set up as indicted in radiated procedures of ANSI C.63.10 v2.0.1

The limit is 95.2+20 Log (RBW/50); Limit =61.22

Peak fundamental signal Field strength (dBµV/m) = 55.43 (dBµV/m) + 34 dB (20 Log (50/RBW)) = 89.43 (dBµV/m)

Peak EIRP (dBm) @ 50 MHz Bw = 89.43 (dBµV/m) - 95.23 (dB) = -5.8 dBm

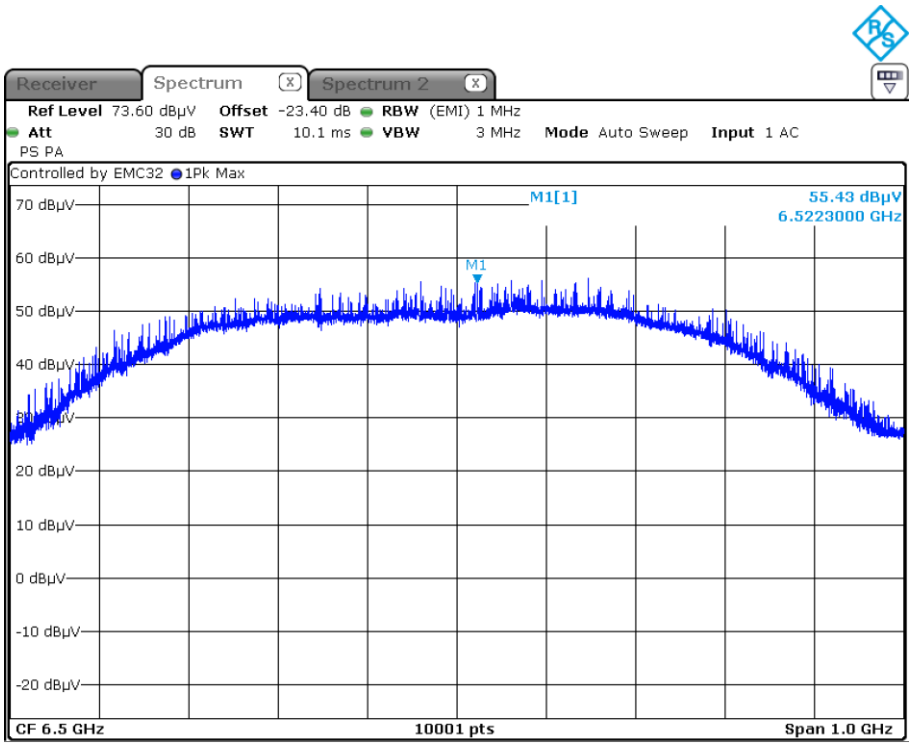
Receiver settings for preview measurements:

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

8.4.4 Test data

Table 8.4-1: Peak emissions within 50 MHz band results

Frequency, MHz	Peak result, dBµV	Limit, dBµV	Margin, dB
6522.3	55.43	61.22	5.79



Date: 29.APR.2020 14:00:20

Plot 8.4-1: Peak emissions plot

8.5 FCC 15.250(d)(1) Field strength of emissions

8.5.1 References, definitions and limits

FCC:

(d) Emissions from a transmitter operating under this section shall not exceed the following equivalent isotropically radiated power (EIRP) density levels:
(1) The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following RMS average limits based on measurements using a 1 MHz resolution bandwidth:

Table 8.5-1: FCC 15.250 (d) Field strength limits

Fundamental frequency (MHz)	EIRP in RBW of 1MHz (dBm)	Field strength @ 3 m
960 - 1610	-75.3	19.93
1610 – 1990	-63.3	31.93
1990 – 3100	-61.3	33.93
3100 – 5925	-51.3	43.93
5925 - 7250	-41.3	53.93
7250 - 10600	-51.3	43.93
Above 10600	-61.3	33.93

Notes: In the emission table above, the tighter limit applies at the band edges

Table 8.5-3: FCC §15.209– Radiated emission limits

Frequency, MHz	Field strength of emissions µV/m	dBµV/m	Measurement distance, 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.
The limit above 960 MHz is not applicable

Table 8.5-5: 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

Verdict	Pass		
Tested by	Tarek Elkholy	Test date	April 29, 2020

8.5.3 Observations, settings and special notes

The spectrum was searched from 30 MHz to 40 GHz
Whenever a limit line is found in a plot along with 15.250 limit line, it shall has the same exact value as the 15.250
Field Strength = Measured raw value (dBµV/m) + Path loses (dB) + Distance Correction Factor (dB)
All emissions exceeding the limit are emissions from digital circuitry which comply with the limits in §15.209

Spectrum analyser settings for radiated measurements within restricted bands below 1 GHz:

Resolution bandwidth	100 kHz
Video bandwidth	300 kHz
Detector mode	RMS
Trace mode	Max Hold

Spectrum analyser settings for peak radiated measurements within restricted bands above 1 GHz:

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

8.5.4 Test data

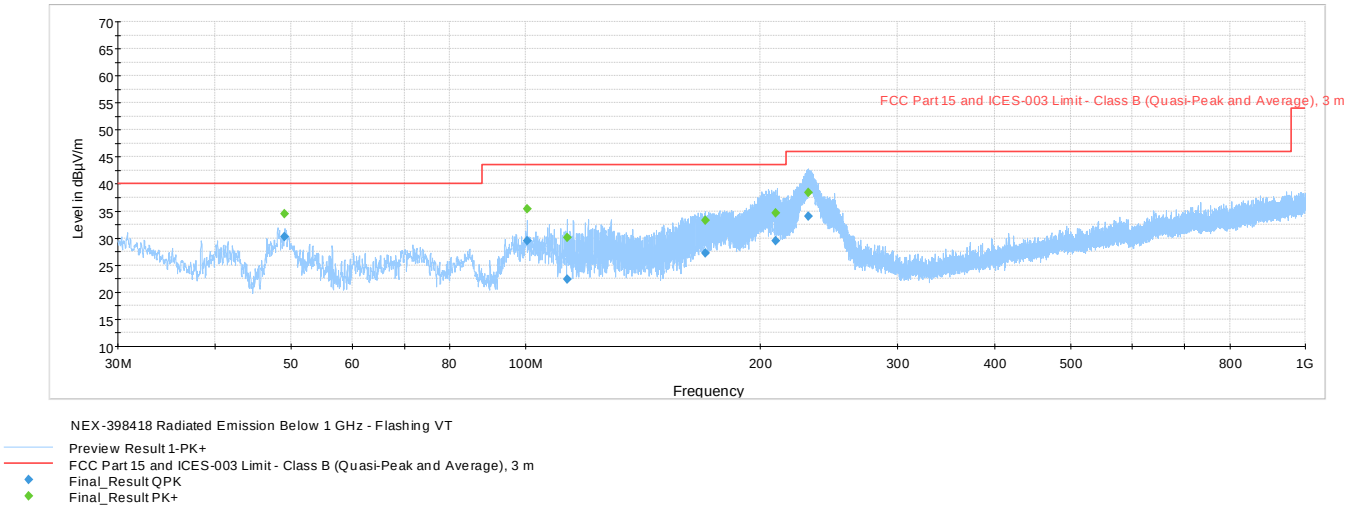


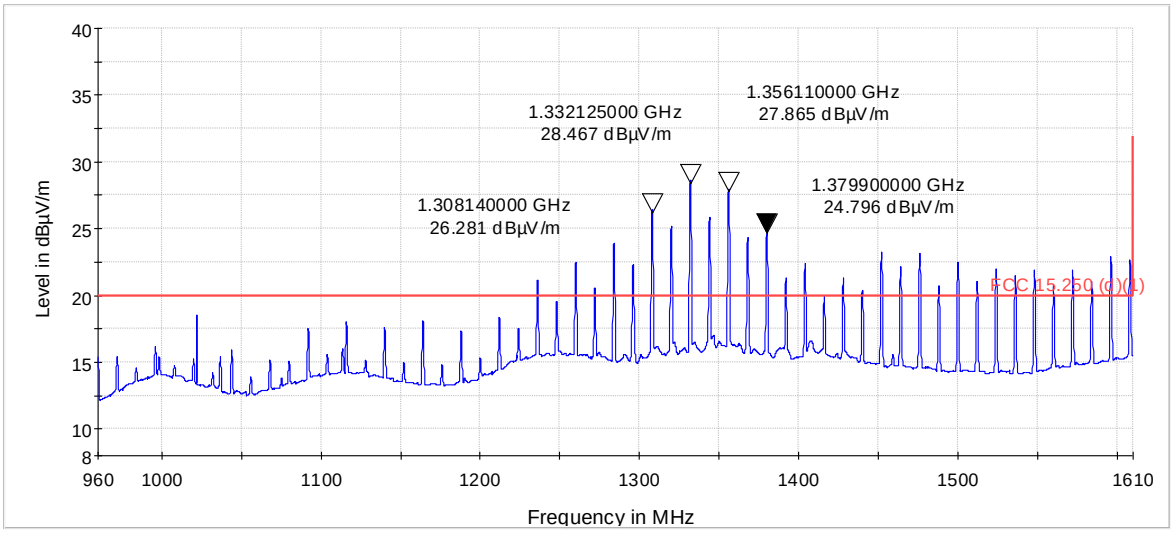
Figure 8.5-1: Spurious emissions below 1 GHz

Table 8.5-6: Radiated field strength measurement results

Frequency, MHz	Q-Peak field strength, dBµV/m	Q-peak limit, dBµV/m	Margin, dB
49.13	30.3	40.0	9.7
100.39	29.5	43.5	14.0
113.04	22.4	43.5	21.1
170.02	27.2	43.5	16.3
209.35	29.5	43.5	14.0
230.62	34.0	46.0	12.0

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

8.5.4 Test data, continued

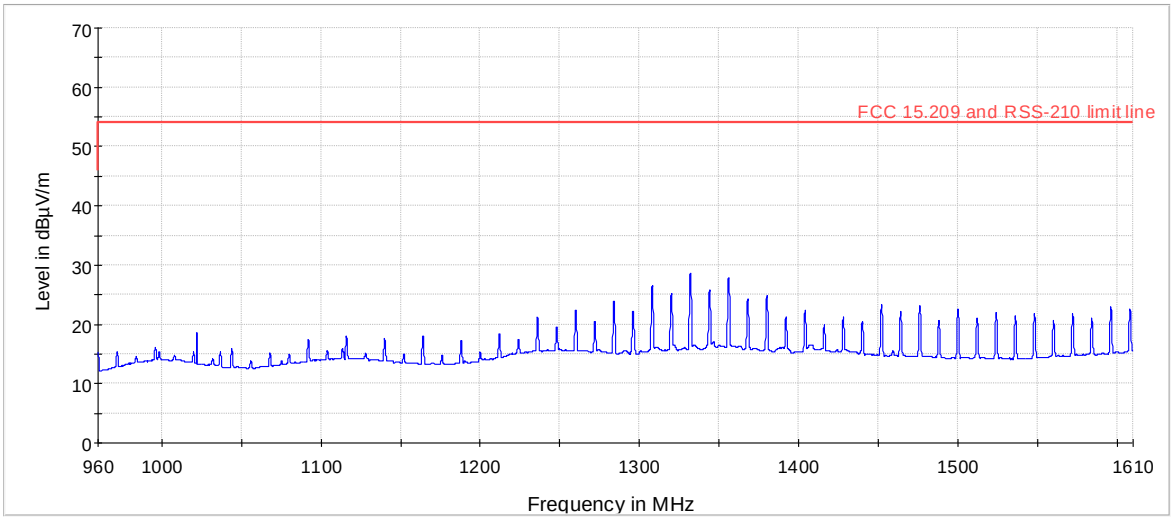


NEX-398418-5 Radiated Emissions 960 - 1610 MHz - Flashing VT

RMS_MAXH
FCC 15.250 (d)(1)

Figure 8.5-2: Spurious emissions 960 – 1610 MHz

Note: Emissions exceeding the limit are emissions from digital circuitry which comply with the limits in §15.209 & RSS-Gen, ***Figure 8.5-3***



NEX-398418-5 Radiated Emissions 960 - 1610 MHz - Flashing VT

RMS_MAXH
FCC 15.209 and RSS-210 limit line

Figure 8.5-3: Digital circuitry Spurious emissions 960 MHz – 1.61 GHz

8.5.4 Test data, continued

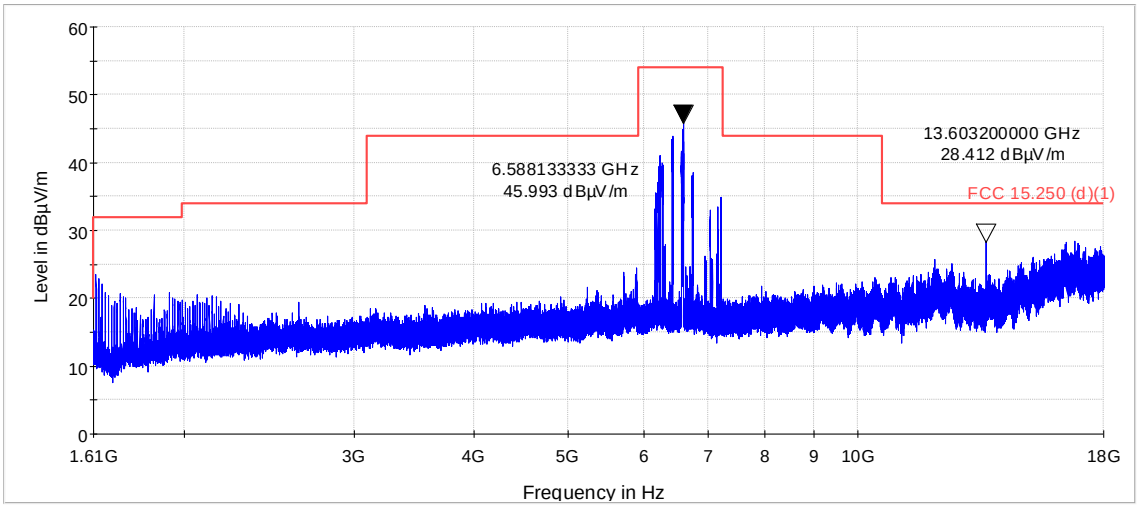


Figure 8.5-4: Spurious emissions 1610 MHz – 18 GHz

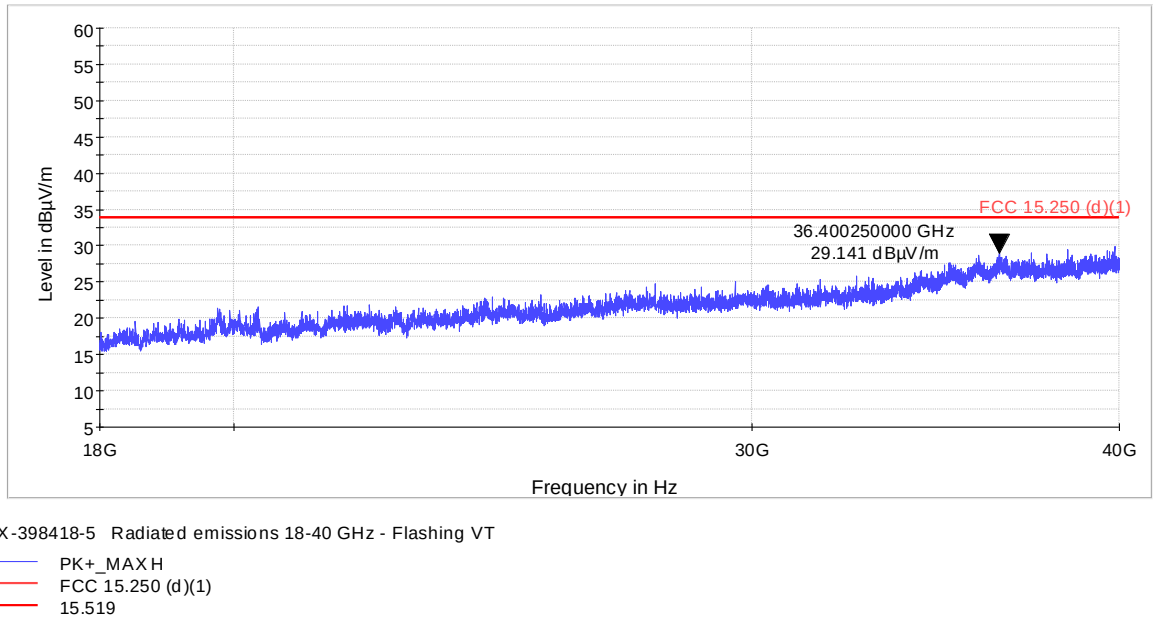


Figure 8.5-5: Spurious emissions 18 - 40 GHz

8.6 FCC 15.250(a), (b) Emission bandwidth and Frequency Stability

8.6.1 References, definitions and limits

FCC:

(a) The −10 dB bandwidth of a device operating under the provisions of this section must be contained within the 5925-7250 MHz band under all conditions of operation including the effects from stepped frequency, frequency hopping or other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage.

(b) The −10 dB bandwidth of the fundamental emission shall be at least 50 MHz. For transmitters that employ frequency hopping, stepped frequency or similar modulation types, measurement of the −10 dB minimum bandwidth specified in this paragraph shall be made with the frequency hop or step function disabled and with the transmitter operating continuously at a fundamental frequency following the provisions of §15.31(m).

8.6.2 Test summary

Verdict	Pass		
Tested by	Tarek Elkholy	Test date	April 28, 2020

8.6.3 Observations, settings and special notes

Spectrum analyser settings:

Resolution bandwidth	≥ 1 % of emission bandwidth
Video bandwidth	≥ 3 × RBW
Frequency span	Wider than emission bandwidth
Detector mode	Peak

8.6.4 Test data

Table 8.6-1: 10 dB bandwidth measurement result

10 dB bandwidth, MHz	Limit, MHz	Margin, MHz
609.6	> 50	**559.6**

Table 8.6-2: bandwidth within frequency band measurement result

Lower Frequency f_L, MHz	Limit, MHz	Margin, MHz
6177.0	5925	**252**

Upper Frequency f_H, MHz	Limit, MHz	Margin, MHz
6786.5	7250	**463.5**

11:07:02 17.08.2020

Figure 8.6-1: 10 dB occupied bandwidth

8.6.4 Test data, continued

Table 8.6-3: 99% bandwidth measurement result

99% occupied bandwidth, MHz
743.52

Table 8.6-4: bandwidth within frequency band measurement result

Lower Frequency f_L, MHz	Limit, MHz	Margin, MHz
6064.83	5925	**139.83**

Upper Frequency f_H, MHz	Limit, MHz	Margin, MHz
6808.35	7250	**441.65**

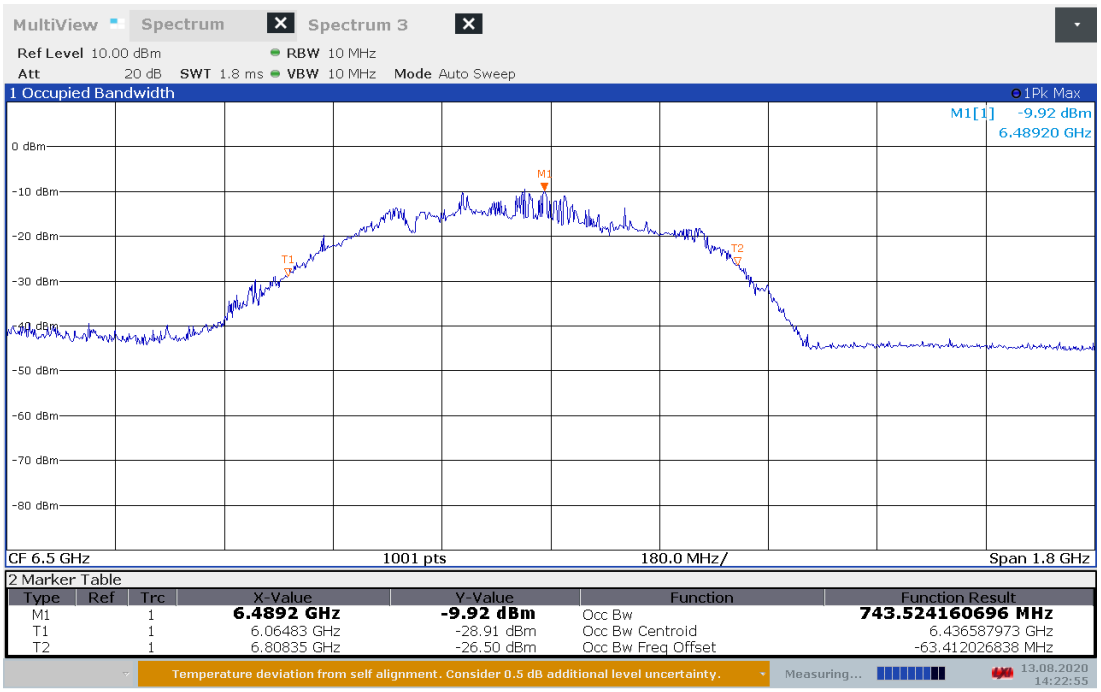


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Figure 8.6-2: 99% occupied bandwidth

8.6.4 Test data, continued

Table 8.6-5: Frequency tolerance measurement result – nominal voltage

Test conditions	Low, GHz	High, GHz
-30 °C	6.126	6.8432
-20 °C	6.1479	6.8432
-10 °C	6.138	6.8113
0 °C	6.124	6.8273
+10 °C	6.2079	6.8073
+30 °C	6.2199	6.7913
+40 °C	6.1679	6.8133
+50 °C	6.1459	6.8253
+60 °C	6.2219	6.7034
+700 °C	6.2219	6.7374
+80 °C	6.1619	6.8093
+85 °C	6.2758	6.7713

Note: all measured BWs are within the designated bandwidth

Table 8.6-6: Frequency tolerance measurement result – 85% voltage

Test conditions	Low, GHz	High, GHz
-30 °C	6.138	6.8612
-20 °C	6.138	6.8432
-10 °C	6.118	6.8093
0 °C	6.1539	6.8273
+10 °C	6.1999	6.8033
+30 °C	6.1839	6.8173
+40 °C	6.1499	6.8093
+50 °C	6.1479	6.8093
+60 °C	6.2458	6.7034
+70 °C	6.2219	6.7513
+80 °C	6.1519	6.8492
+85 °C	6.2319	6.7054

Note: all measured BWs are within the designated bandwidth

Table 8.6-7: Frequency tolerance measurement result – 115 % voltage

Test conditions	Low, GHz	High, GHz
-30 °C	6.1699	6.8592
-20 °C	6.1719	6.8293
-10 °C	6.1519	6.8113
0 °C	6.1559	6.8373
+10 °C	6.2079	6.7893
+30 °C	6.1999	6.7953
+40 °C	6.1599	6.8153
+50 °C	6.1699	6.8073
+60 °C	6.2219	6.7513
+700 °C	6.2259	6.7194
+80 °C	6.1759	6.8113
+85 °C	6.1639	6.7733

Note: all measured BWs are within the designated bandwidth

8.7 FCC 15.250(d)(2) Field strength of emissions within 1164-1240 and 1559-1610 MHz band

8.7.1 References, definitions and limits

FCC:.

(2) In addition to the radiated emission limits specified in the table in paragraph (d)(1) of this section, transmitters operating under the provisions of this section shall not exceed the following RMS average limits when measured using a resolution bandwidth of no less than 1 kHz:

Table 8.7-1: Field strength limits

Fundamental frequency (MHz)	EIRP in RBW no less than 1 kHz dBm	(dBµV/m)
1164-1240	-85.3	9.93
1559-1610	-85.3	9.93

Notes: In the emission table above, the tighter limit applies at the band edges

8.7.2 Test summary

Verdict	Pass		
Tested by	Tarek Elkholy	Test date	April 29, 2020

8.7.3 Observations, settings and special notes

- Limit line 15.519 in the plots is the exact same limit line of 15.250 (d)(2)

Spectrum analyser settings:

Resolution bandwidth	1 kHz
Video bandwidth	3 kHz
Detector mode	RMS
Trace Mode	Max Hold

8.7.4 Test data

Table 8.7-2: Radiated field strength measurement results

Frequency, MHz	Average field strength, dBµV/m	Average limit, dBµV/m	Margin, dB
1187.99	0.885	9.93	9.05
1211.99	0.580	9.93	9.35
1235.98	2.868	9.93	7.06
1560.00	3.538	9.93	6.39
1572.00	4.790	9.93	5.14
1584.04	3.243	9.93	6.69
1596.04	4.782	9.93	5.15
1608.04	4.301	9.93	5.63

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

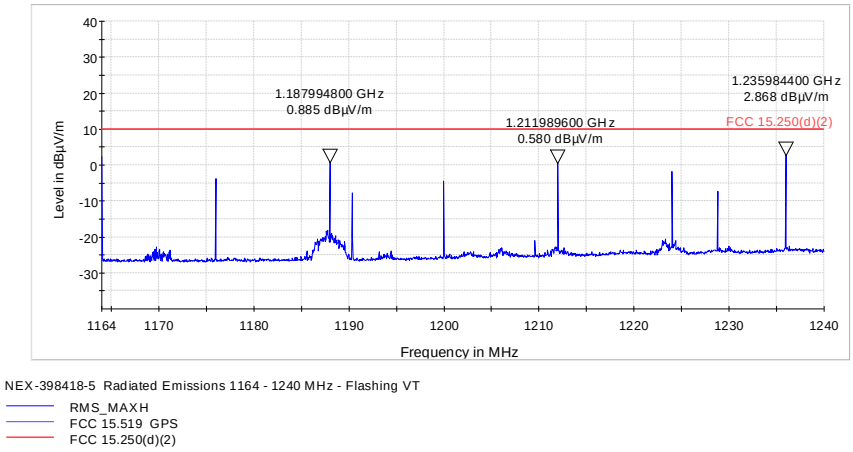


Figure 8.7-1: **Spurious emissions within 1164-1240 MHz**

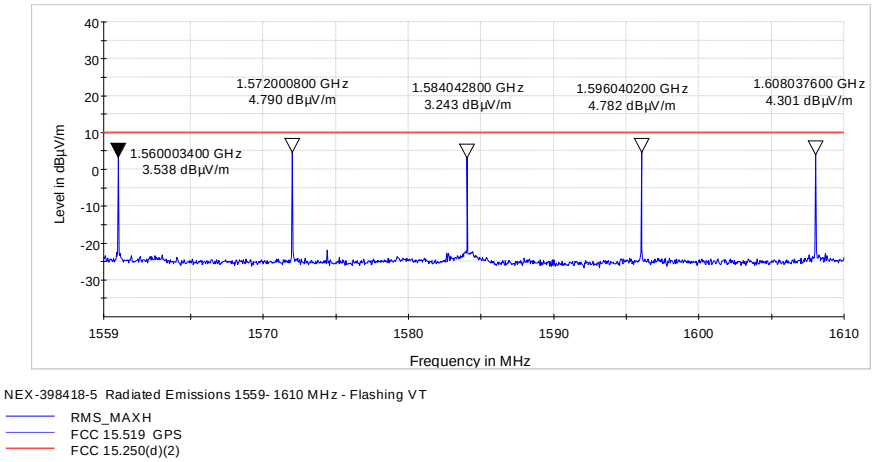
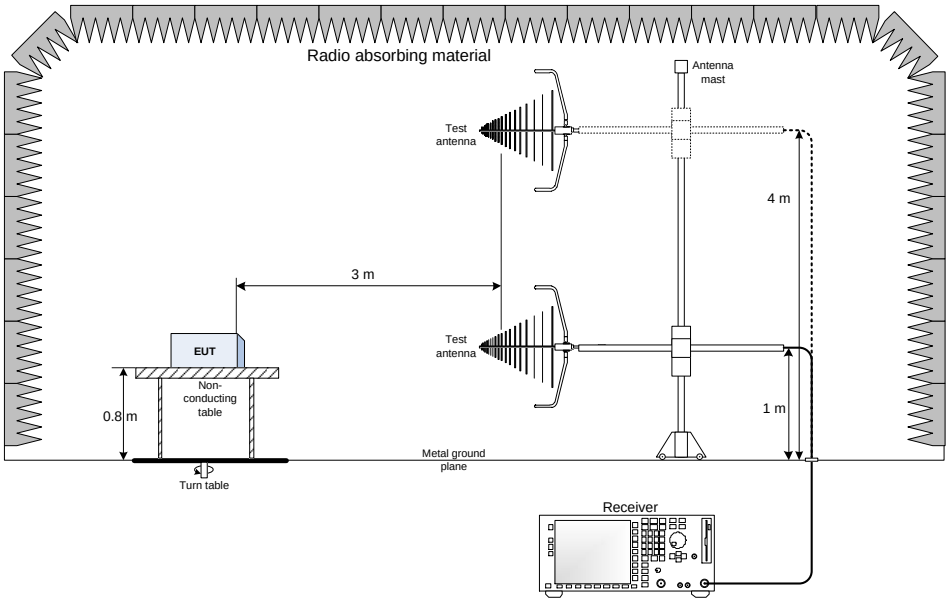
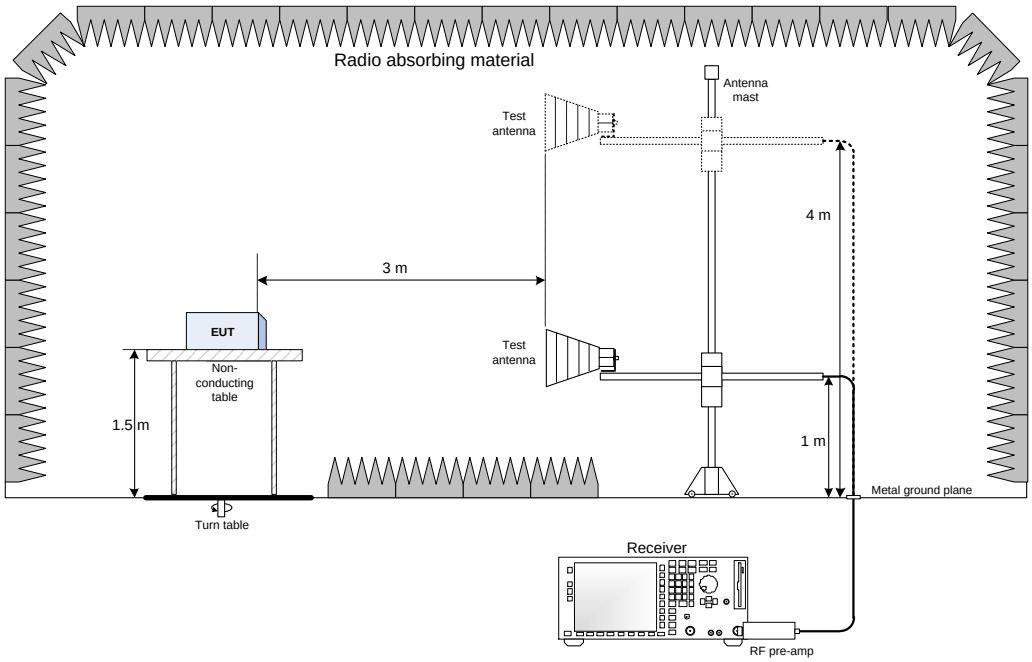


Figure 8.7-2: Spurious emissions within 1559-1610 MHz

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