

Global EMC Inc. Labs

EMC & RF Test Report

As per
RSS 210 Issue 8:2010
&
FCC Part 15 Subpart C:2010
Unlicensed Intentional Radiators
on the

Wireless Locator & Alert for Safety, Security and Rescue
Models LSS-DA42-TR8, LSS-DA42-RX8,
& LSS-DA42-TX8



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Testing produced for



See Appendix A for full customer & EUT details.




| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

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Report Scope

This report addresses the EMC verification testing and test results of the Wireless Locator & Alert for Safety, Security and Rescue, models LSS-DA42-TR8, LSS-DA42-RX8, and LSS-DA42-TX8, from Lu Technologies, performed at Global EMC Labs. These units are herein referred to as EUT (Equipment Under Test). The LSS-DA42-TR8 is the transceiver in full mode. The LSS-DA42-RX8 is the transceiver in receiver mode only, and the LSS-DA42-TX8 is the transceiver in transmitter mode only.

The EUT was tested for compliance against the following standards:


RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010

Test procedures, results, justifications, and engineering considerations, if any, follow later in this report.

The results contained in this report relate only to the item(s) tested.

This report does not imply product endorsement by A2LA or any other accreditation agency, any government, or Global EMC Inc.


Opinions/interpretations expressed in this report, if any, are outside the scope of Global EMC Inc accreditation. Any opinions expressed do not necessarily reflect the opinions of Global EMC Inc, unless otherwise stated.

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Summary

The results contained in this report relate only to the item(s) tested.


| | |
|--|--------------------------------|
| EUT FCC Certification #, FCC ID: | AYO-LSSDA428 |
| EUT Industry Canada Certification #, IC: | 10275A-LSSDA428 |
| EUT Passed all tests performed. | Yes (see test results summary) |
| Tests conducted by | Raymond Lee Au |

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Test Results Summary

Table 1 – Manual operation or periodic transmission for safety/security applications
For EUT which complies with 15.231(a)

| Standard/Method | Description | Class/Limit | Result |
|---|--|--|---------------------------|
| FCC 15.203 | Antenna Requirement | Unique | Pass See Justification |
| FCC 15.205 RSS 210 (Table 1) | Restricted Bands for intentional operation | Quasi Peak Average | Pass |
| FCC 15.207 | Power line conducted emissions | Quasi Peak Average | N/A See Justification |
| FCC 15.209 RSS-210 (Table 2) FCC 15.231(b) RSS-210 (Table 4) | Intentional / Spurious Radiated emissions | Quasi Peak Average | Pass |
| FCC 15.231(a) RSS-210 A1.1 | Type of transmission | Not a continuous transmissions, voice, video or radio control of toys. | N/A See Justification |
| FCC 15.231 (a)(1) RSS-210 A1.1.1(a) | Manual transmission Release holdover | < 5 seconds | N/A See Justification |
| FCC 15.231 (a)(2) RSS-210 A1.1.1(b) | Automatic transmission Transmission time | < 5 seconds | Pass See Justification |
| FCC 15.231 (a)(3) RSS-210 A1.1.1(c) | Predetermined intervals Transmission Security/Safety | < 2 seconds per hour | Pass See Justification |
| FCC 15.231 (c) RSS-210 A1.1.3 | 20 dB Bandwidth | < 0.25% of carrier | Pass |
| Overall Result | | | PASS |

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All tests were performed by Raymond Lee Au.

If the product as tested or otherwise complies with the specification, the EUT is deemed to comply with the requirement and is deemed a 'PASS' grade. If not 'FAIL' grade will be issued. Note that 'PASS' / 'FAIL' grade is independent of any measurement uncertainties. A 'PASS' / 'FAIL' grade within measurement uncertainty is marked with a '*'.

Justifications, Descriptions, or Deviations

The following justifications for tests, or deviations from the above listed specifications, apply:

For the antenna requirement specified in FCC 15.203 (RSS 210 section 5.5), this device is designed with an integral antenna or proprietary antenna connector which meets the requirements of FCC 15.203. It uses a PCB trace antenna.

For the Restricted Bands of operation as specified in FCC 15.205, the EUT is designed to operate at 415MHz (minimum) – 440MHz (maximum). This does not fall within the restricted bands as listed.


For the power line conducted emissions requirements, the EUT is powered by one standard 1.5Vdc AAA battery. This test does not apply.

15.231(a)(1) is not applicable. The EUT is not a manually operated transmitter activated by a switch.

The type of transmission is a data signal sent with a control signal, which complies with the requirements of 15.231(a).

Each automatic transmission lasts for 1.7milliseconds. This is less than the maximum requirement of 5 seconds which complies with the requirement of FCC 15.231(a)(2).


This device complies with 15.231(a)(3). It transmits at predetermined intervals, however this section permits "polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications ... if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour." This device is used to alert parents when a child carrying a paired device is not within an allowed detectable distance for an allowed period of time. It transmits one 1.7ms-long pulse modulated packet every

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3.3 to 10.8 seconds. Therefore it transmits for a maximum total duration of 1.85 seconds per hour and meets the requirements of 15.231(a)(3). As this device may be handheld, it was scanned in the three orthogonal axes for the applicable radiated emissions and worst case results are presented in this test report.

Applicable Standards, Specifications and Methods

| | |
|-----------------|---|
| ANSI C63.4:2003 | - Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |
| CFR 47 FCC 15 | - Code of Federal Regulations – Radio Frequency Devices |
| CISPR 22:1997 | - Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement |
| ICES-003:2004 | - Digital Apparatus - Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard |
| ISO 17025:2005 | - General Requirements for the competence of testing and calibration laboratories |
| RSS 210:2010 | - Issue 8: Spectrum Management and Telecommunications Radio Standards Specification. Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment |

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Sample calculation(s)


Margin = limit – (received signal + antenna factor + cable loss – pre-amp gain)

Margin = 50.5dBuV/m – (50dBuV + 10dB + 2.5dB – 20dB)

Margin = 8.0 dB

Document Revision Status

Revision 1 - May 24, 2012

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Definitions and Acronyms

The following definitions and acronyms are applicable in this report.
See also ANSI C63.14.

AE – Auxiliary Equipment.

BW – Bandwidth. Unless otherwise stated, this refers to the 6 dB bandwidth.

EMC – Electro-Magnetic Compatibility

EMI – Electro-Magnetic Immunity

EUT – Equipment Under Test

ITE – Information Technology Equipment with a primary function(s) of entry, storage, display, retrieval, transmission, processing, switching, or control, of data.

LISN – Line impedance stabilization network

NCR – No Calibration Required

RF – Radio Frequency


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Testing Facility

Testing for EMC on the EUT was carried out at Global EMC labs in Toronto, Ontario, Canada. The testing lab consists of a 3m semi-anechoic chamber calibrated to be able to allow measurements on an EUT with a maximum width or length of up to 2m and height up to 3m. The chamber is equipped with a turn table that is capable of testing devices up to 3300lb in weight. This facility is capable of testing products that are rated for 120 Vac and 240Vac single phase, or 208 Vac 3 phase input. DC capability is also available. The chamber is equipped with an antenna mast that controls polarization and height from the control room adjoining the shielded chamber. Radiated emissions measurements are performed using a Bilog, and Horn antenna where applicable. Conducted emissions, unless otherwise stated, are performed using a LISN.

Calibrations and Accreditations


The measurement site used is registered with Federal Communications Commission (FCC) and Industry Canada (IC). This site is calibrated for Normalized Site Attenuation (NSA) using test procedures outlined in ANSI C63.4 “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz”. The semi-anechoic chamber is lined with ferrite tiles and absorption cones to minimize any undesired reflections. All measuring equipment is calibrated on an annual or bi-annual basis as listed for each respective test.

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Testing Environmental Conditions and Dates

Following were the environmental conditions in the facility during time of testing –

| Date | Test | Init. | Temperature (°C) | Humidity (%) | Pressure (kPa) |
|----------------|------|-------|---------------------|--------------|-------------------|
| April 16, 2012 | All | RA | 20-25°C | 30-45% | 100 -103kPa |

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Detailed Test Results Section

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Radiated Emissions of Fundamental

Purpose

The purpose of this test is to ensure that the RF energy intentionally emitted from the EUT does not exceed the limit listed below as defined in the applicable test standard, as measured from a receiving antenna. This helps protect periodic operation services, licensed broadcast services, and so on, from unwanted interference.

Limit(s) and Method

The method is as defined in ANSI C63.4:2003.

The fundamental emission limits for periodic operation are defined in FCC Part 15, Section 15.231(b):

40.66 - 40.70 MHz, 2250 uV/m (67.0 dBuV/m¹) at 3 m

70 - 130 MHz, 1250 uV/m (61.9 dBuV/m¹) at 3 m

130 - 174 MHz, 1250 to 3750 uV/m (linear interpolations) (61.9 to 71.4 dBuV/m¹) at 3 m

174 - 260 MHz, 3750 uV/m (71.4 dBuV/m¹) at 3 m


260 - 470 MHz, 3750 to 12500 uV/m (linear interpolations) (71.4 to 81.9 dBuV/m¹) at 3 m

Above 470 MHz, 12500 uV/m (81.9 dBuV/m¹) at 3 m

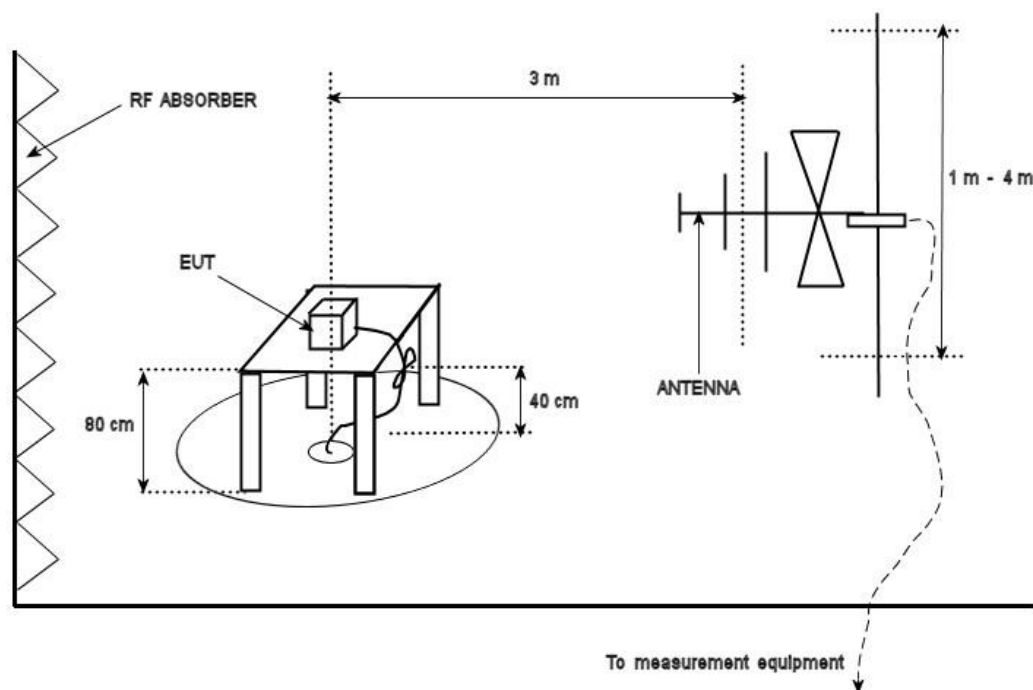
Lowest fundamental limit occurs at the lowest channel: 415MHz

Fundamental limit: 100.1 dBuV/m¹.

¹Based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector.

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Typical Radiated Emissions Setup



Measurement Uncertainty


The expanded measurement uncertainty is calculated in accordance with CISPR 16-4-2 and is ± 4.4 dB with a 'k=2' coverage factor and a 95% confidence level.

Final Measurements

The device complies with the requirement. All sides of the EUT were scanned at low, middle, and high frequencies. The highest fundamental field strength is presented in the table below. A worst case measurement of 85.6 dBuV/m at 3 meters was obtained using a peak detector at a fundamental frequency of 427.16 MHz (middle frequency) in the horizontal polarity. See spurious emissions section for related graphs. This is passing with 14.5 dB of margin to the requirement.

The averaging factor for this pulse modulated device was calculated as per specifications in section 15.35 from an ON time of 1.7ms per pulse using $20\log(1.7\text{ms}/100\text{ms}) = -35.3\text{dB}$.

The maximum calculated average field strength is $85.6 \text{ dBuV/m} - 35.3\text{dB} = 50.3\text{dBuV/m}$. This passes with 29.8dB of margin.

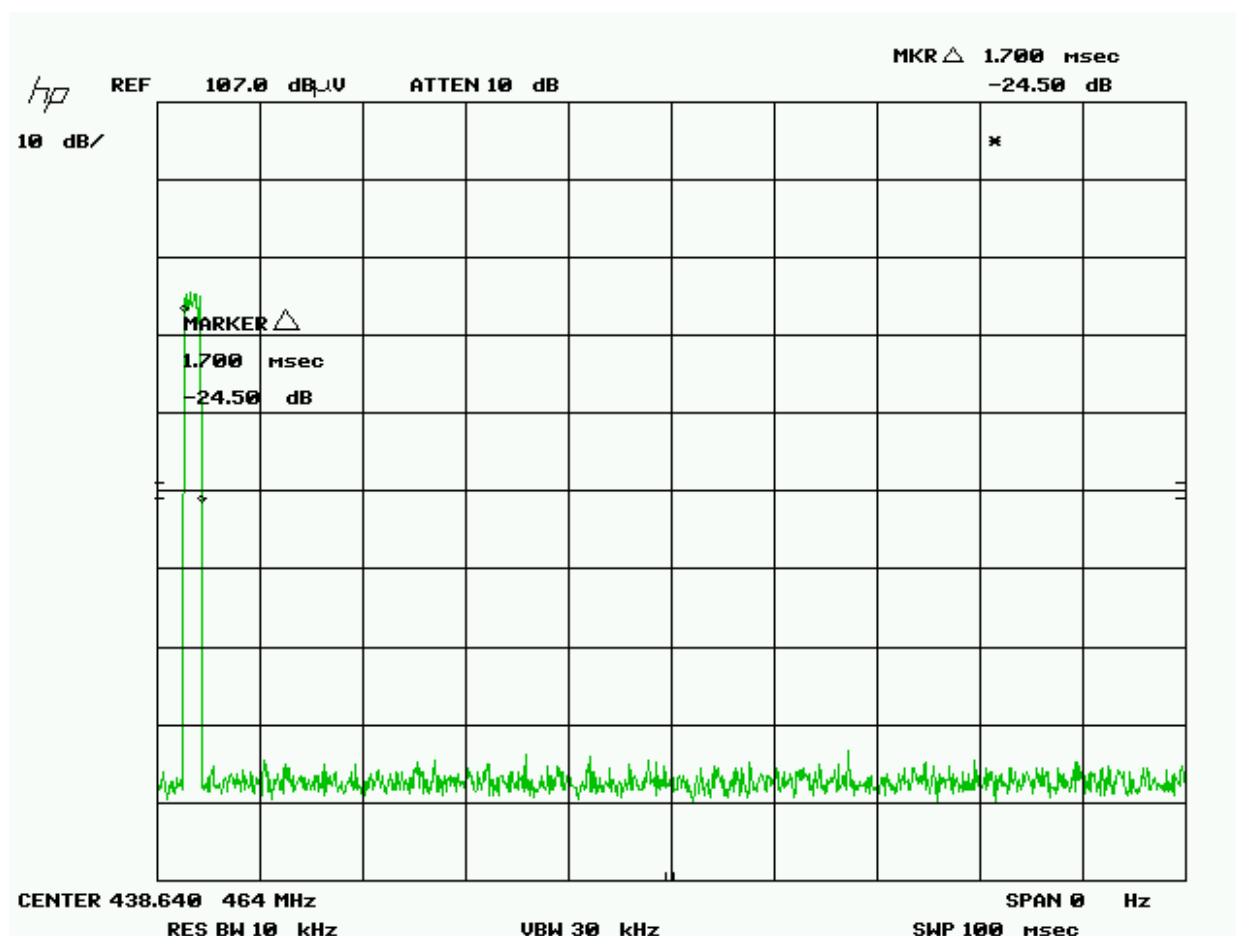
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Maximum Fundamental Field Strength Table

| Test Freq. (MHz) | Detection mode (Q-Peak) | Antenna polarity (Horz/Vert) | Raw signal dB(μV) | Antenna factor dB | Cable loss dB + Preselector | Atten. dB | Pre-Amp Gain dB | Received signal dB(μV/m) | Emission limit dB(μV/m) Part 15.231(b) | Margin dB(μV) | Result |
|------------------|-------------------------|------------------------------|-------------------|-------------------|-----------------------------|-----------|-----------------|--------------------------|--|---------------|--------|
| 427.16 | Peak | Horz | 98.8 | 17.3 | 0.7 | 0.0 | 31.2 | 85.6 | 100.1 | 14.5 | PASS |
| 427.16 | Avg | Horz | 63.5 | 17.3 | 0.7 | 0.0 | 31.2 | 50.3 | 80.1 | 29.8 | PASS |
| 427.16 | Peak | Vert | 88.7 | 16.2 | 0.7 | 0.0 | 31.2 | 74.4 | 100.1 | 25.7 | PASS |
| 427.16 | Avg | Vert | 53.4 | 16.2 | 0.7 | 0.0 | 31.2 | 39.1 | 80.1 | 41.0 | PASS |

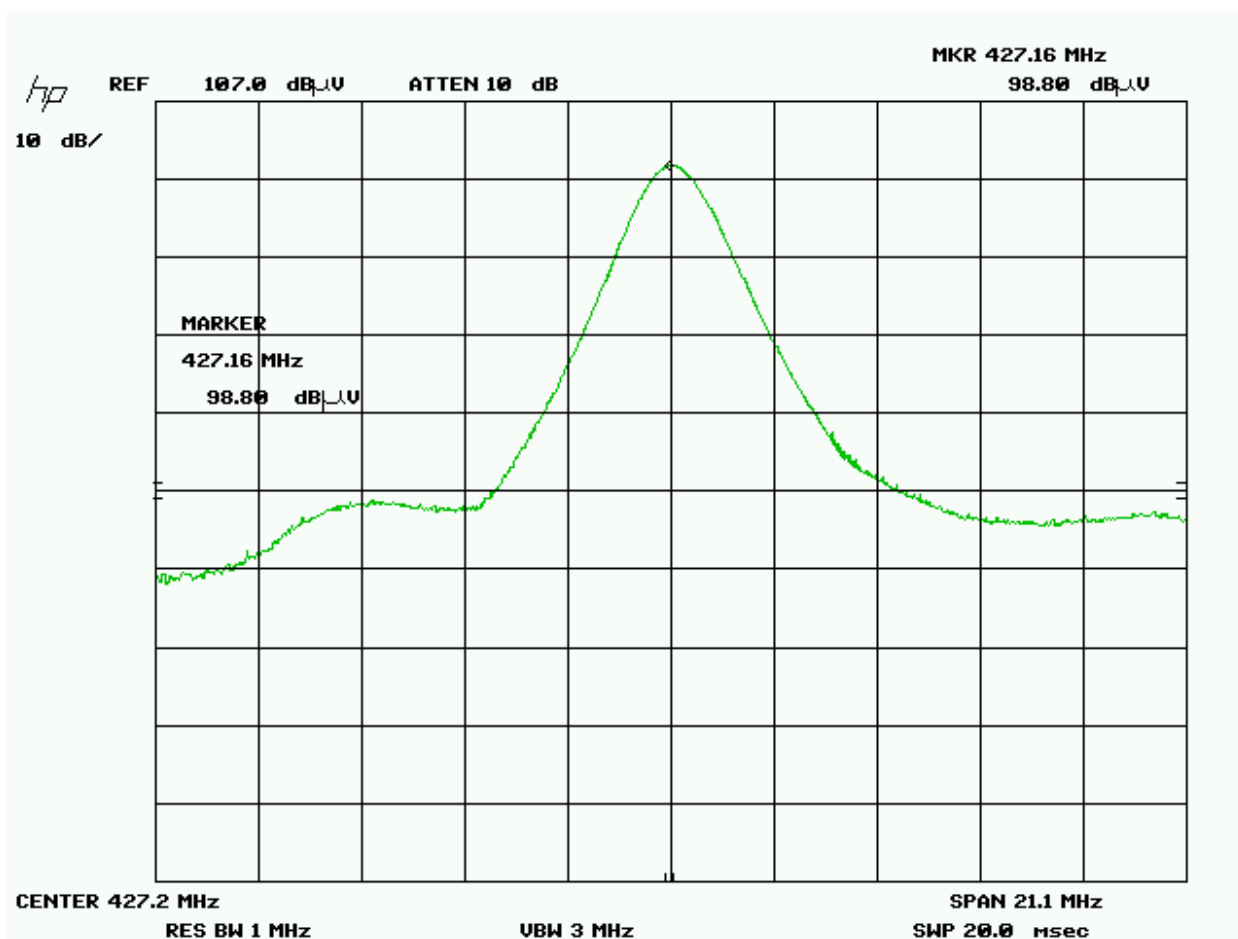
Note: The more severe limits for low channel emissions are applied to the maximum emission out of low, medium and high channels.


Pulse width



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Peak fundamental
(Raw signal, no factors applied)




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Test Equipment List

| Equipment | Model No. | Manufacturer | Last calibration date | Next calibration due date | Asset # |
|---------------------------|--------------------------|-----------------|-----------------------|---------------------------|-----------|
| Spectrum Analyzer | ESL 6 | Rohde & Schwarz | Oct-06, 2011 | Oct-06, 2013 | GEMC 160 |
| BiLog Antenna | 3142-C | ETS | Jan. 17, 2011 | Jan. 17, 2013 | GEMC 137 |
| Chase Preamp 9kHz - 2 GHz | CPA9231A | Chase | Aug. 25, 2010 | Aug. 25, 2012 | GEMC 6403 |
| RF Cable 7m | LMR-400-7M-50OHM-MN-MN | LexTec | NCR | NCR | GEMC 28 |
| RF Cable 1m | LMR-400-1M-50OHM-MN-MN | LexTec | NCR | NCR | GEMC 29 |
| RF Cable 0.5M | LMR-400-0.5M-50OHM-MN-MN | LexTec | NCR | NCR | GEMC 31 |

This report module is based on GEMC template "FCC - 15.209 - Radiated Emissions_Rev1.doc"

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Radiated Emissions of Spurious Emissions

Purpose

The purpose of this test is to ensure that the RF energy unintentionally emitted from the EUT does not exceed the limits listed below as defined in the applicable test standard, as measured from a receiving antenna. This helps protect broadcast radio services such as television, FM radio, pagers, cellular telephones, emergency services, and so on, from unwanted interference.

Limit(s) and Method

The method is as defined in ANSI C63.4:2003. The limits are as defined in FCC Part 15, Section 15.209 and 15.231 (b). Whichever limit permits the higher field strength is allowed.

The following are radiated emission limits for general requirements as defined in FCC Part 15, Section 15.209. All scans are performed at a 3m test distance. Where limits are specified for a farther distance, limits are extrapolated as specified in FCC Part 15 Section 15.31(f)(2). Note that F = frequency in kHz:

0.009 – 0.090 MHz¹, (2400/ F) uV/m at 300m (128.5-108.5 dBuV/m at 3m)
 0.090 – 0.110 MHz², (2400/ F) uV/m at 300m (108.5-106.7 dBuV/m at 3m)
 0.110 – 0.150 MHz³, (2400/ F) uV/m at 300m (106.7-104.0 dBuV/m at 3m)
 0.150 – 0.490 MHz⁴, (2400/ F) uV/m at 300m (104.0-93.8 dBuV/m at 3m)
 0.490 – 1.705 MHz⁵, (24000/ F) uV/m at 30m (73.8-62.9 dBuV/m at 3m)
 1.705 – 30 MHz⁵, 30 uV/m (29.5 dBuV/m) at 30m (69.5 dBuV/m at 3m)
 30 - 88 MHz⁶, 100 uV/m (40.0 dBuV/m) at 3 m
 88 - 216 MHz⁶, 150 uV/m (43.5 dBuV/m) at 3 m
 216 - 960 MHz⁶, 200 uV/m (46.0 dBuV/m) at 3 m
 Above 960 MHz⁶, 500 uV/m (53.9 dBuV/m) at 3 m
 Above 1000 MHz⁷, 500 uV/m (53.9 dBuV/m) at 3m

¹Limit is with 100 Hz measurement bandwidth and using an Average detector

²Limit is with 200 Hz measurement bandwidth and using a Quasi Peak detector


³Limit is with 100 Hz measurement bandwidth and using an Average detector

⁴Limit is with 9 kHz measurement bandwidth and using an Average detector

⁵Limit is with 9 kHz measurement bandwidth and using a Quasi Peak detector

⁶Limit is with 120 kHz measurement bandwidth and using a Quasi Peak detector.

⁷Limit is with 1 MHz measurement bandwidth and using an Average detector

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| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

The following are spurious emission limits for the EUT as defined in FCC Part 15, Section 15.231(b). The value is calculated for the tightest limit at low channel operation (415MHz):

For all spurious emissions, the limit is 1020.8 uV/m (60.1 dBuV/m) at 3m using an Average detector. However, if the values of the measured emissions based on the use of measurement instrumentation with a CISPR quasi-peak detector meets those limits, that is permissible as well. Measurement bandwidths are as listed above in the corresponding frequency ranges.

The spurious emission limit defined in FCC 15.231(b) is applied for the second harmonic at 854.5MHz. The radiated emission limits for general requirements defined in FCC 15.209, which are tighter than those of FCC 15.231(b) for the EUT, is applied for subsequent measurements. When the emission meets the requirements in FCC 15.209, it automatically meets the requirements in 15.231(b).

For reference, the tables below show the limits of FCC 15.231(b), FCC 15.209, and FCC 15.205(a) Restricted Frequency Bands:

FCC 15.231 (b) Emission Limits:


| Fundamental frequency (MHz) | Field strength of fundamental (microvolts/meter) | Field strength of spurious emissions (microvolts/meter) |
|-----------------------------|--|---|
| 40.66–40.70 | 2,250 | 225 |
| 70–130 | 1,250 | 125 |
| 130–174 | ¹ 1,250 to 3,750 | ¹ 125 to 375 |
| 174–260 | 3,750 | 375 |
| 260–470 | ¹ 3,750 to 12,500 | ¹ 375 to 1,250 |
| Above 470 | 12,500 | 1,250 |

¹Linear interpolations.

(1) The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.

FCC 15.209 Emission Limits

| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 0.009–0.490 | 2400/F(kHz) | 300 |
| 0.490–1.705 | 24000/F(kHz) | 30 |
| 1.705–30.0 | 30 | 30 |
| 30–88 | 100** | 3 |
| 88–216 | 150** | 3 |
| 216–960 | 200** | 3 |
| Above 960 | 500 | 3 |

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FCC 15.205 (a) Restricted Frequency Bands:

| MHz | MHz | MHz | GHz |
|--------------------------|---------------------|---------------|------------------|
| 0.090–0.110 | 16.42–16.423 | 399.9–410 | 4.5–5.15 |
| ¹ 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 | (²) |
| 13.36–13.41 | | | |

¹Until February 1, 1999, this restricted band shall be 0.490–0.510 MHz.

²Above 38.6


Notes:

As specified in 15.231(b)(3), spurious emissions may meet the higher limit permitted by 15.209 or 15.231(b), in addition to the requirements of 15.205. The provisions in Section 15.35 apply to these measurements. The method used is noted in the *Final Measurements* table in this report.

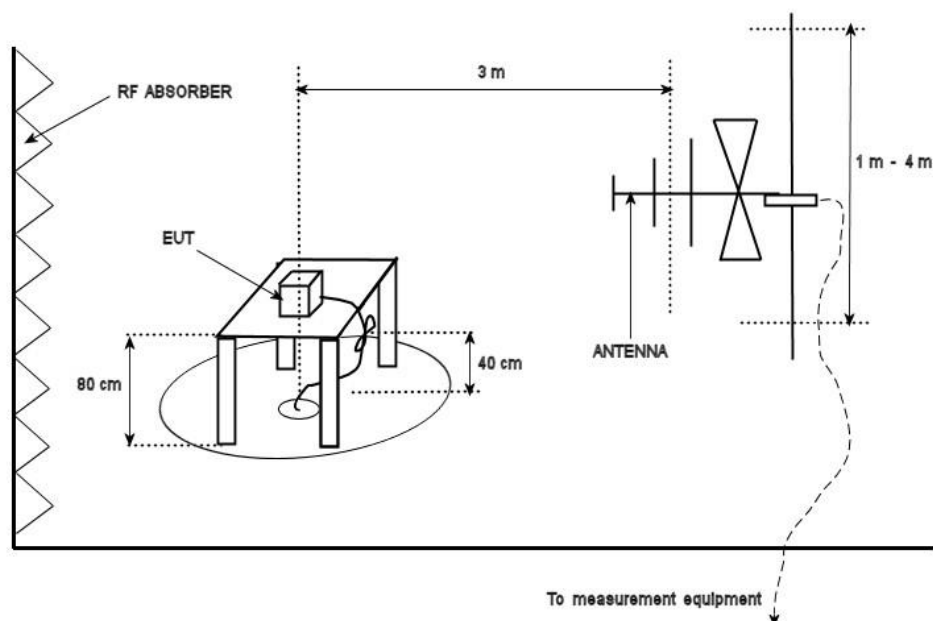
Where average limits are specified, a peak limit that is 20 dB higher than the average limit applies.

Where peak measurements are under the quasi-peak and/or average limits, the emission is considered a pass, since peak measurements are always greater than or equal to readings with these detectors.

Frequency range is scanned in accordance with 15.33.

| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

Typical Radiated Emissions Setup




Measurement Uncertainty

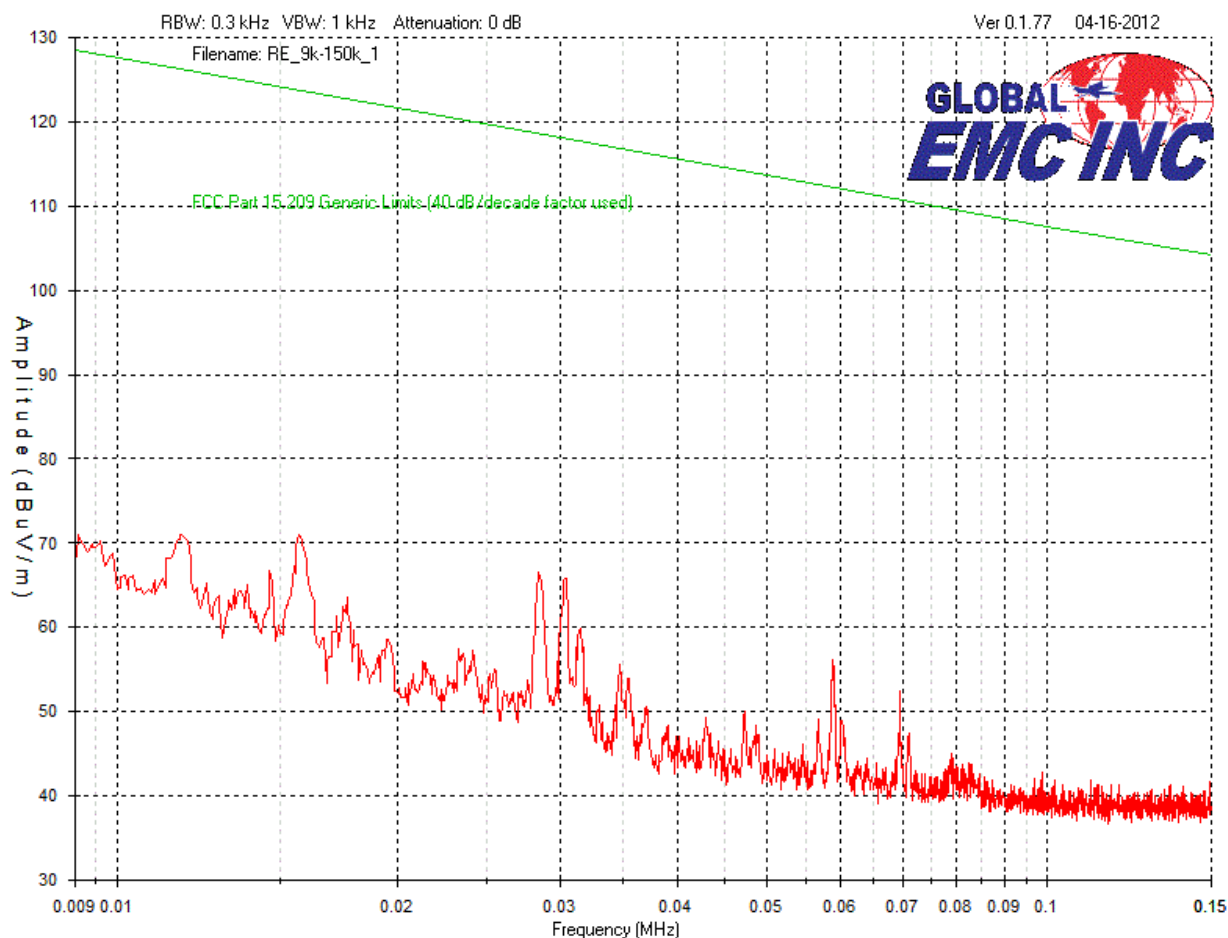
The expanded measurement uncertainty is calculated in accordance with CISPR 16-4-2 and is ± 4.4 dB with a 'k=2' coverage factor and a 95% confidence level.


Preliminary Graphs

Note the graphs shown below are for graphical illustration only. For final measurements with the appropriate detector, please refer to the final measurements table where applicable. The graphs shown below are maximized peak measurement graphs, measured with a resolution bandwidth greater than the final required detector and over a full 0-360° rotation. This peaking process is done as a worst case measurement. This process enables the detection of frequencies of concern for final measurement, and provides considerable time savings. In accordance with FCC Part 15, Subpart A, Section 15.33, the device was scanned to a minimum of a 4.5 GHz in Transmitter mode, and to a minimum of 2 GHz in Receiver mode.

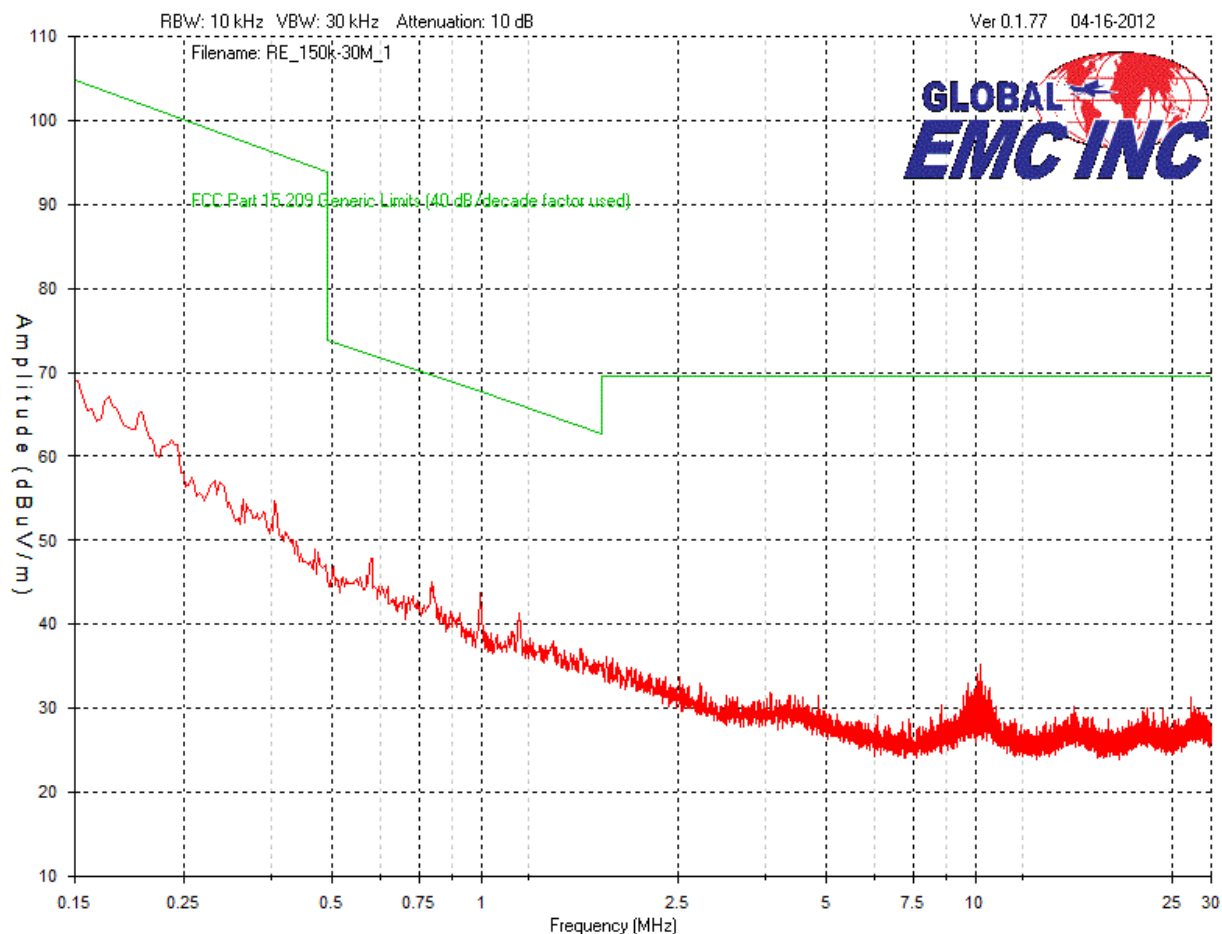
| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Peak Emissions Graph 9kHz – 150kHz



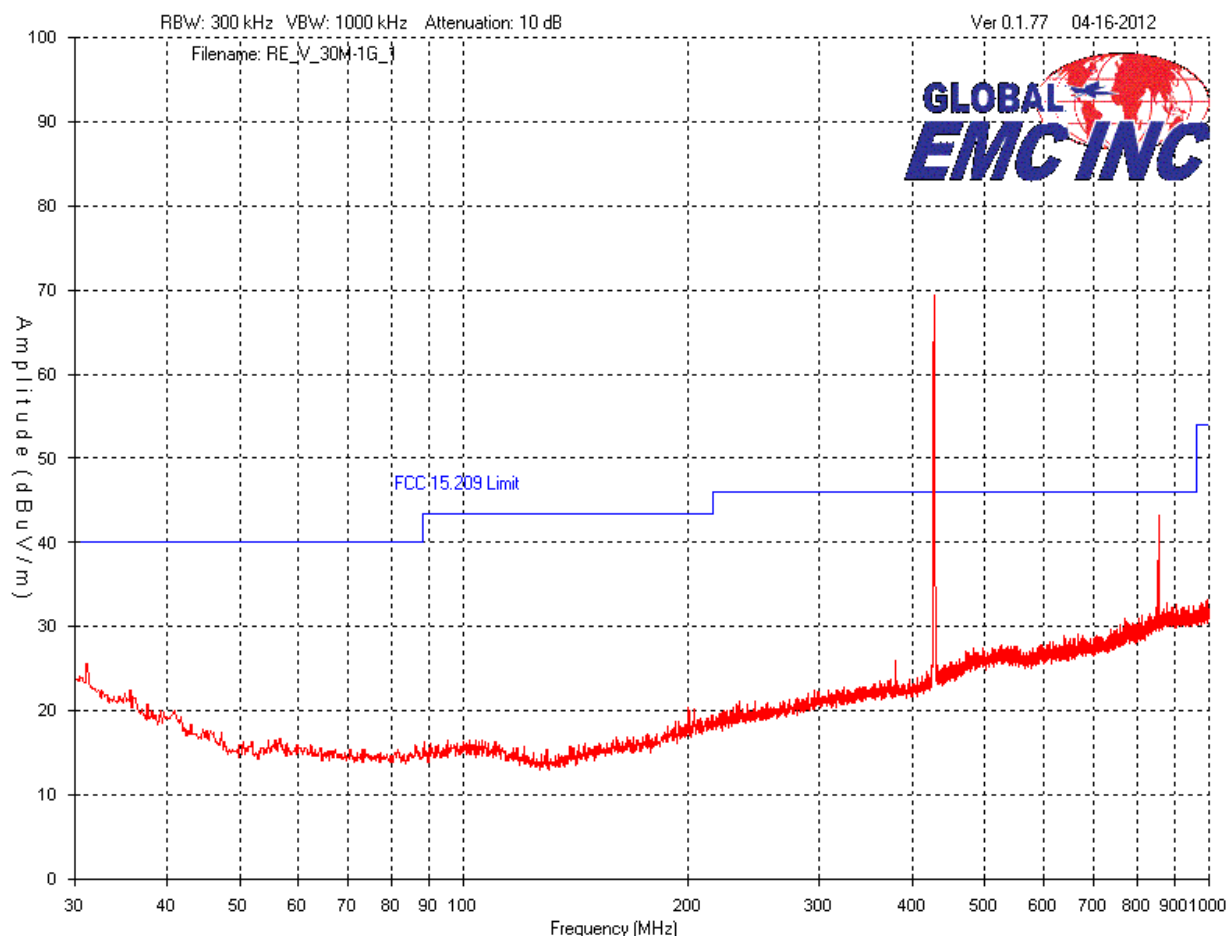
| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Peak Emissions Graph 150kHz – 30MHz



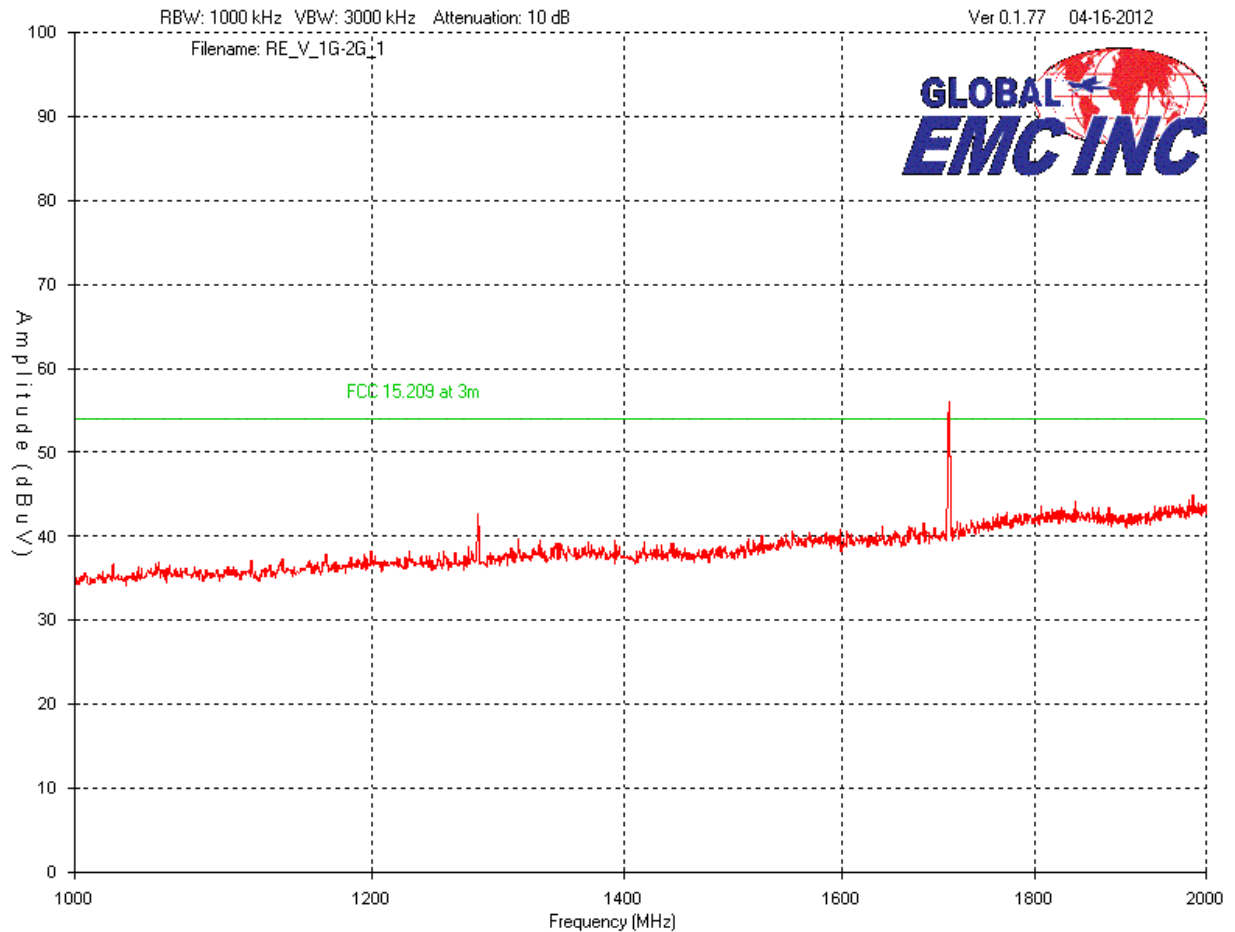
| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Vertical – Peak Emissions Graph 30MHz – 1GHz



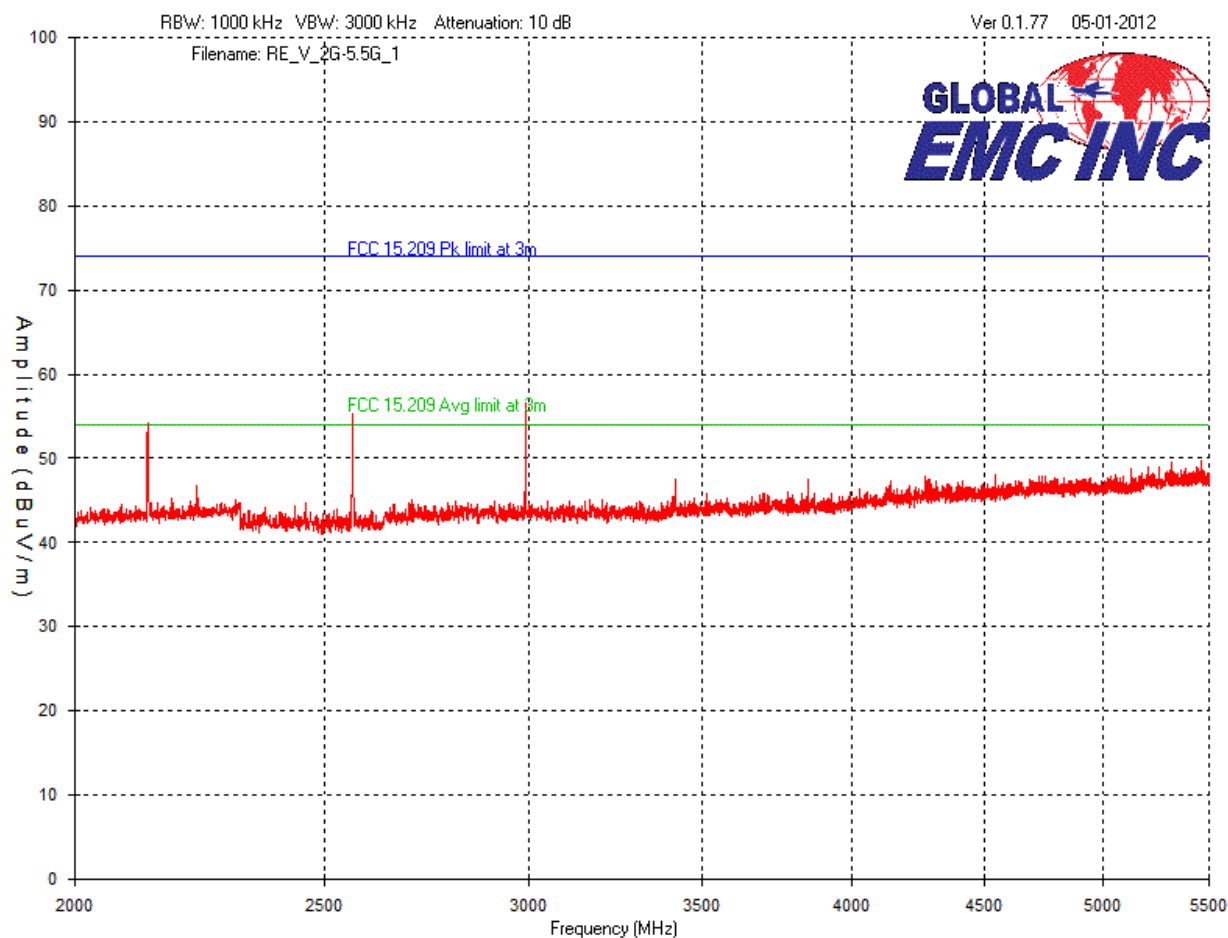
| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Vertical – Peak Emissions Graph
1GHz – 2GHz



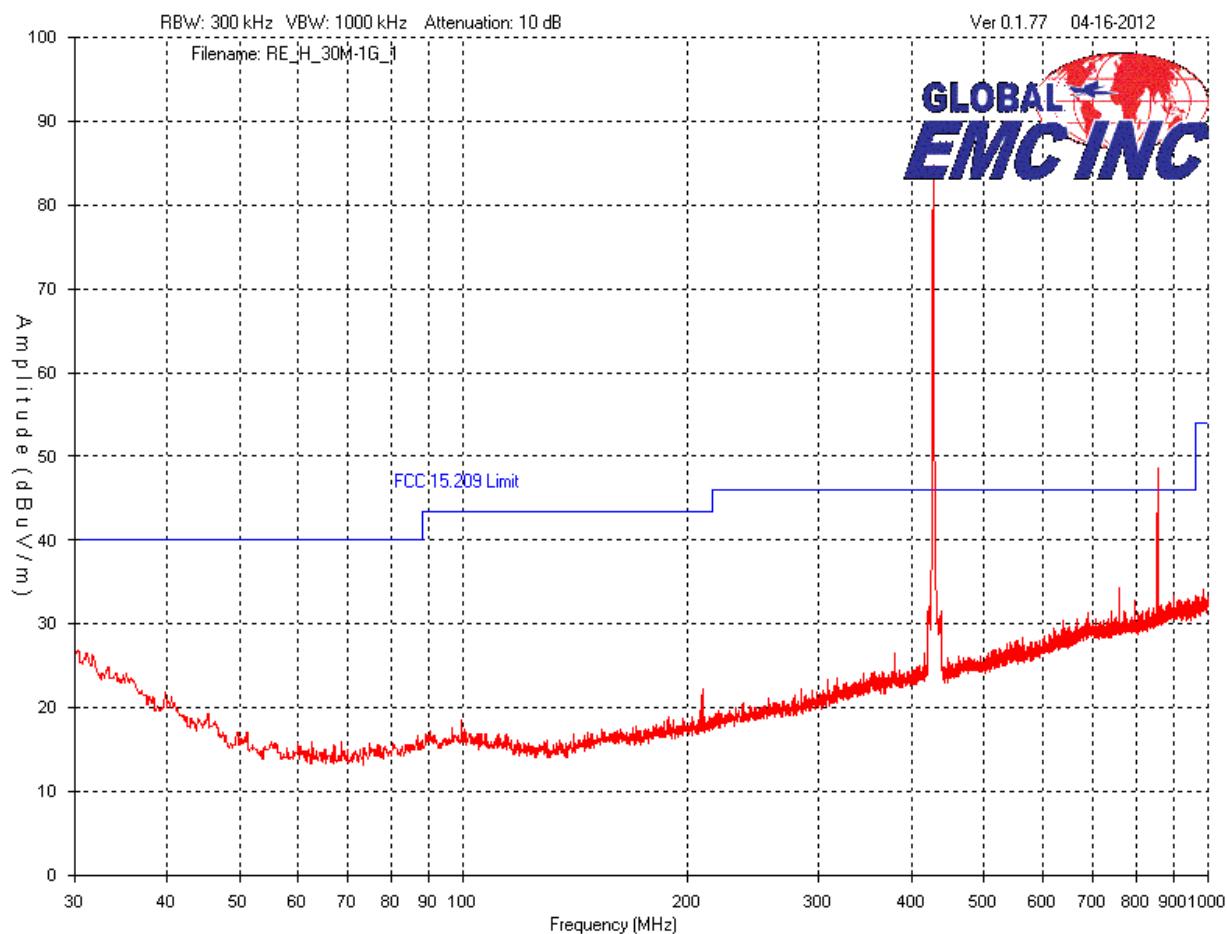
| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Vertical – Peak Emissions Graph
2GHz – 5.5GHz



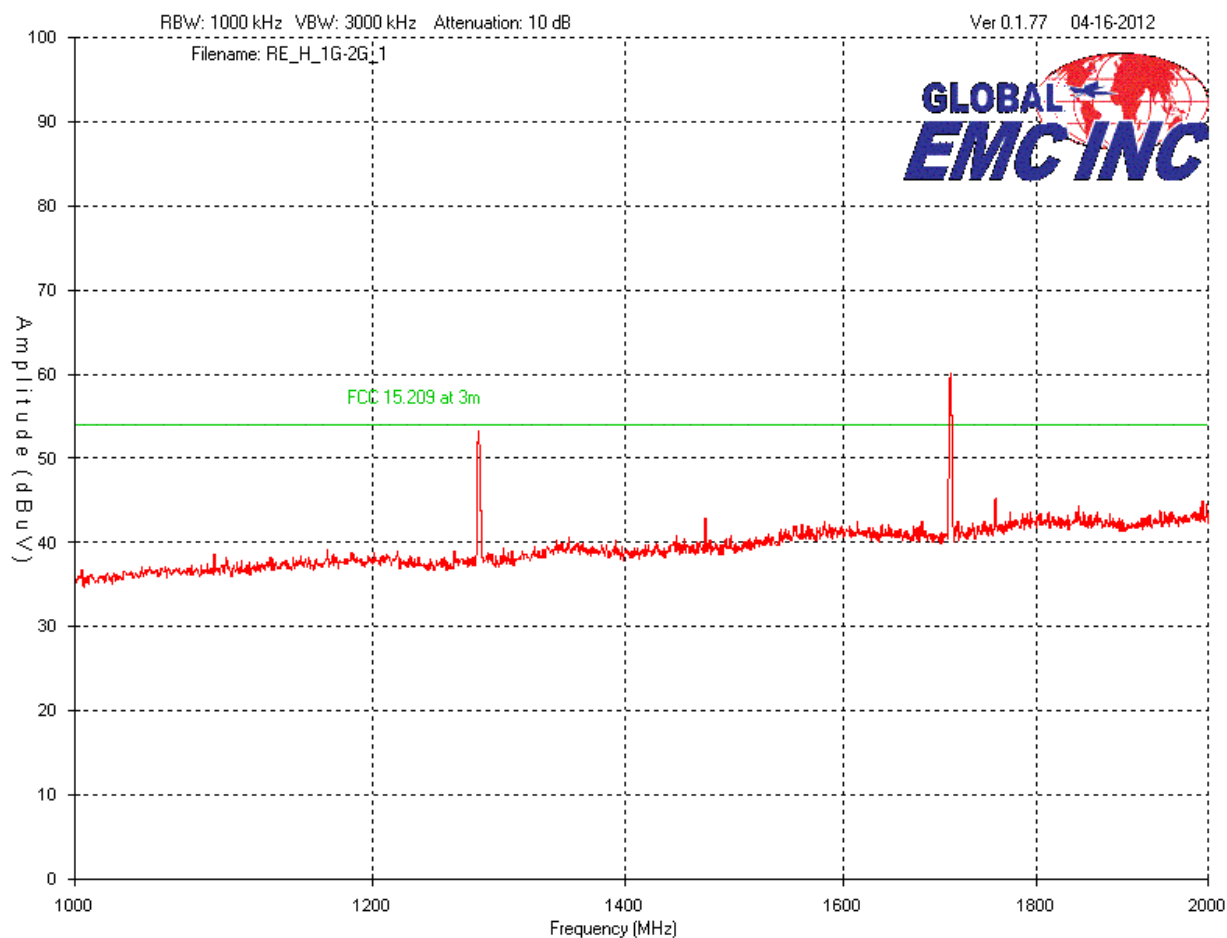
| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Horizontal – Peak Emissions Graph 30MHz – 1GHz



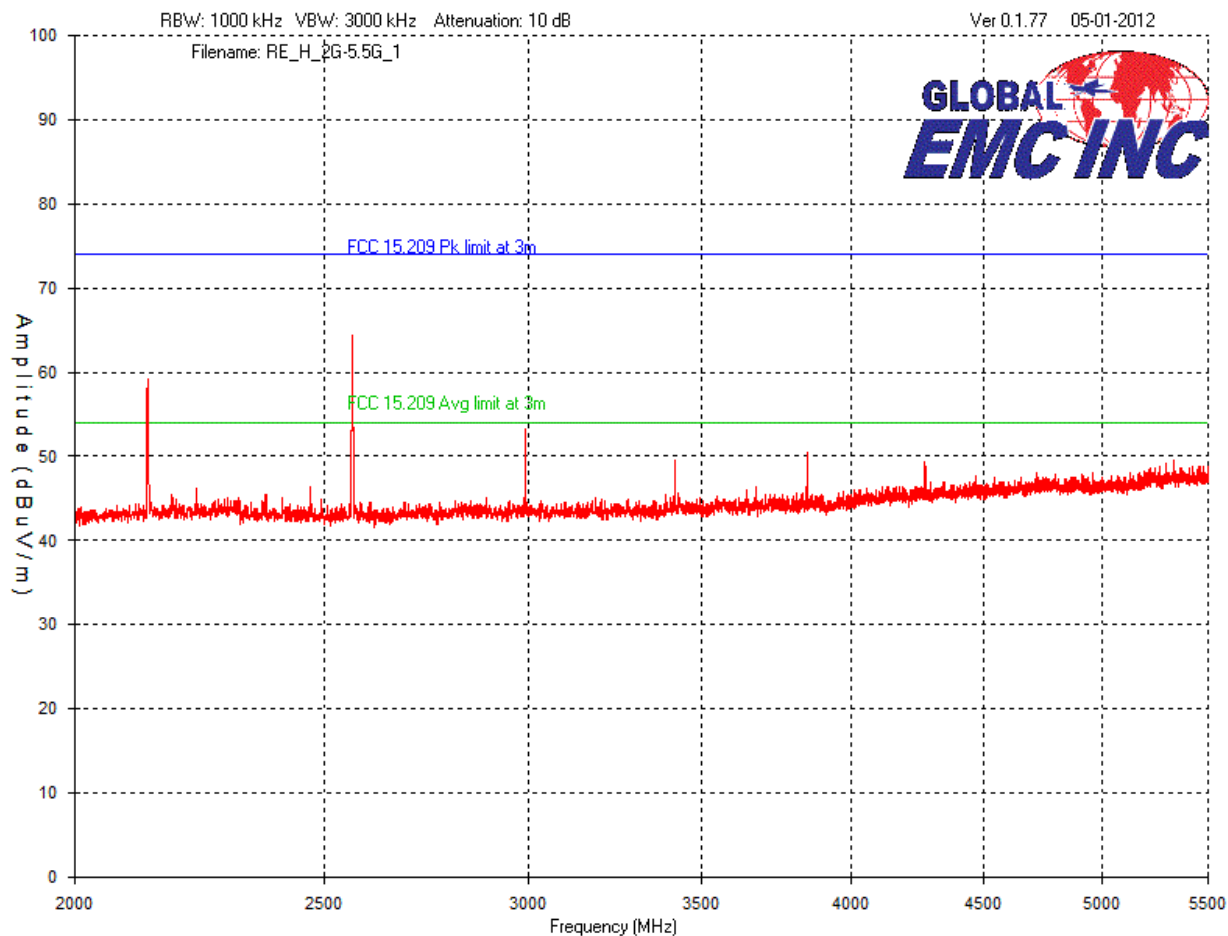
| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Horizontal – Peak Emissions Graph 1GHz – 2GHz



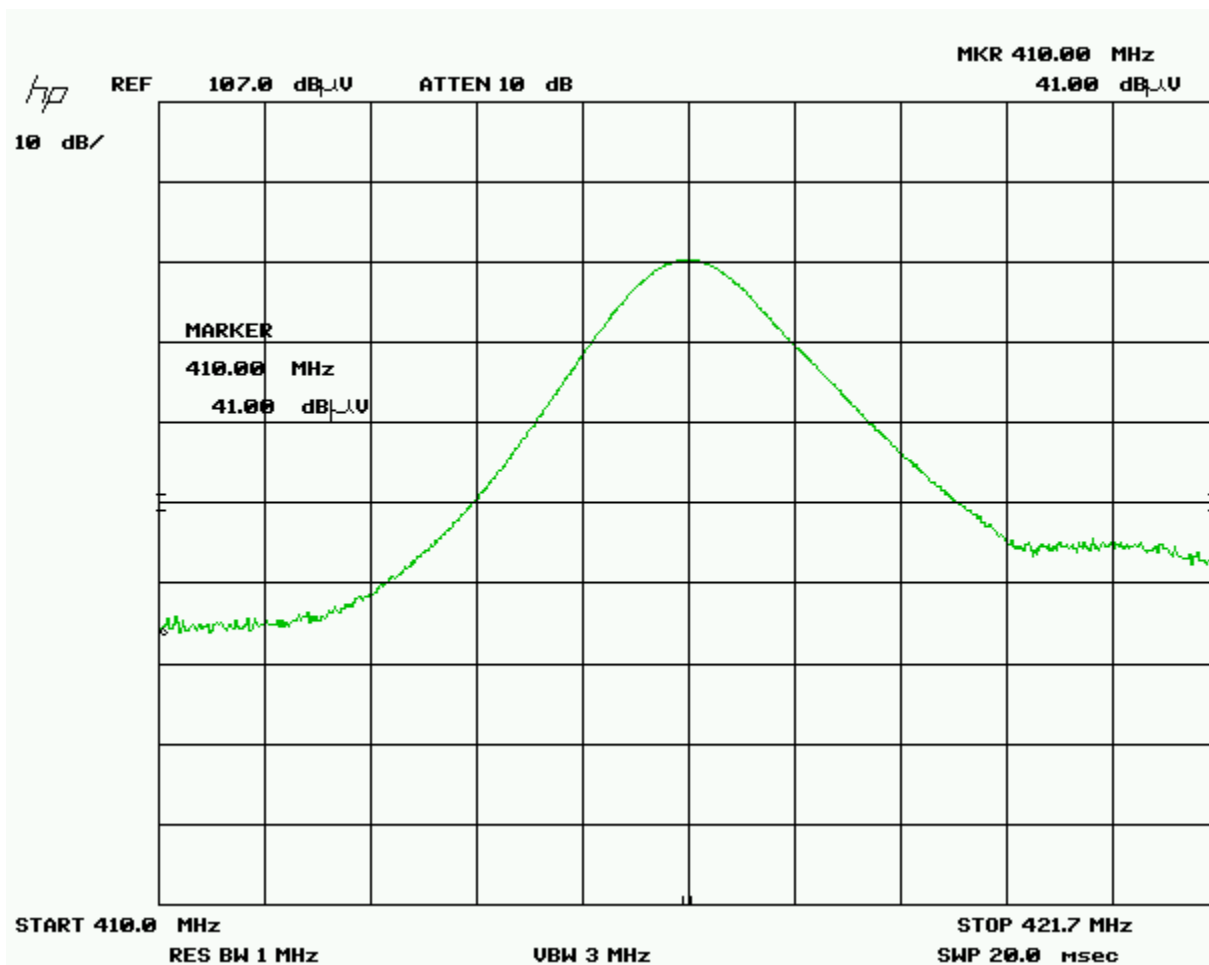
| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Horizontal – Peak Emissions Graph 2GHz – 5.5GHz



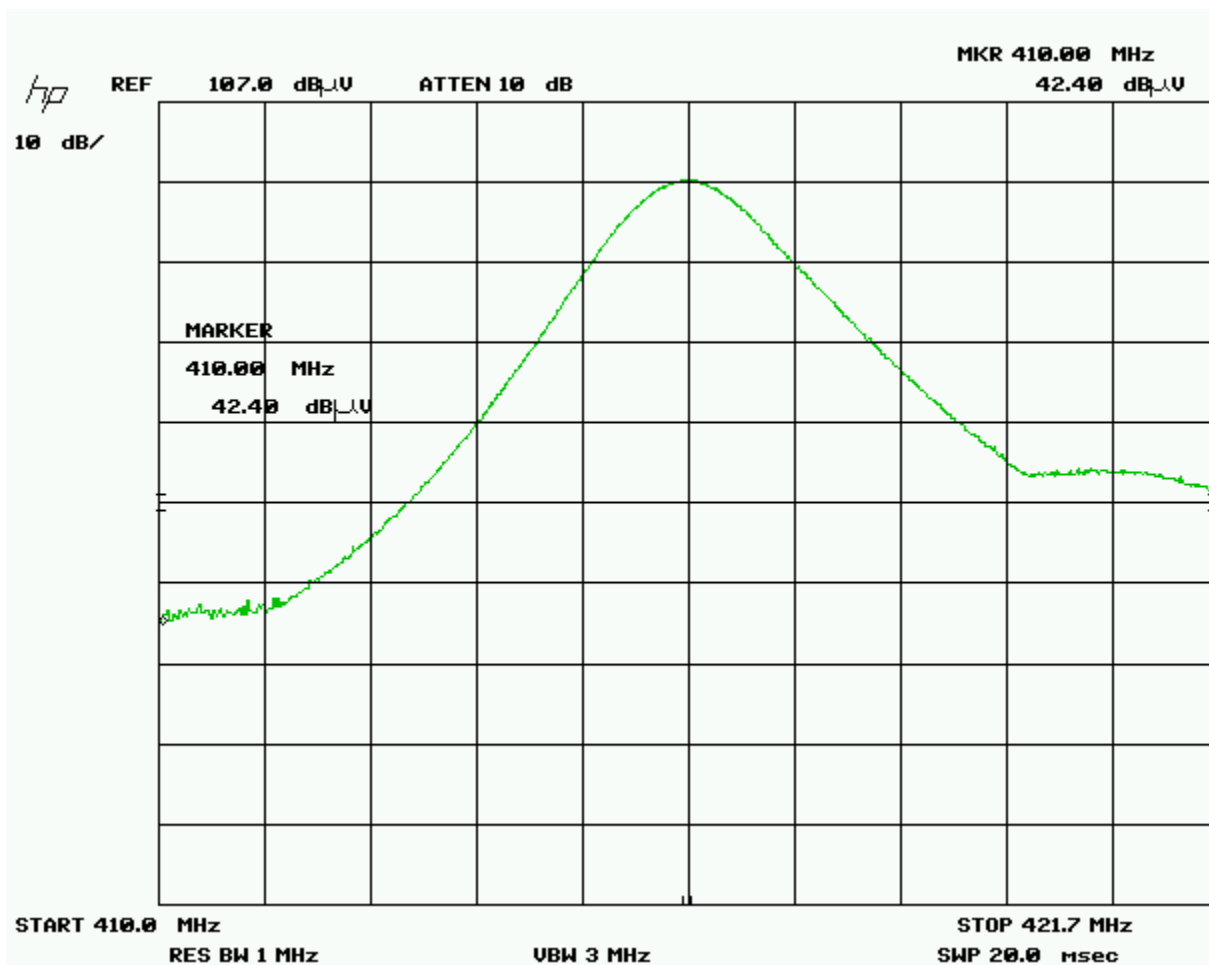
| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Vertical – Peak Emissions Graph
Restricted Band edge at 410 MHz, Low channel



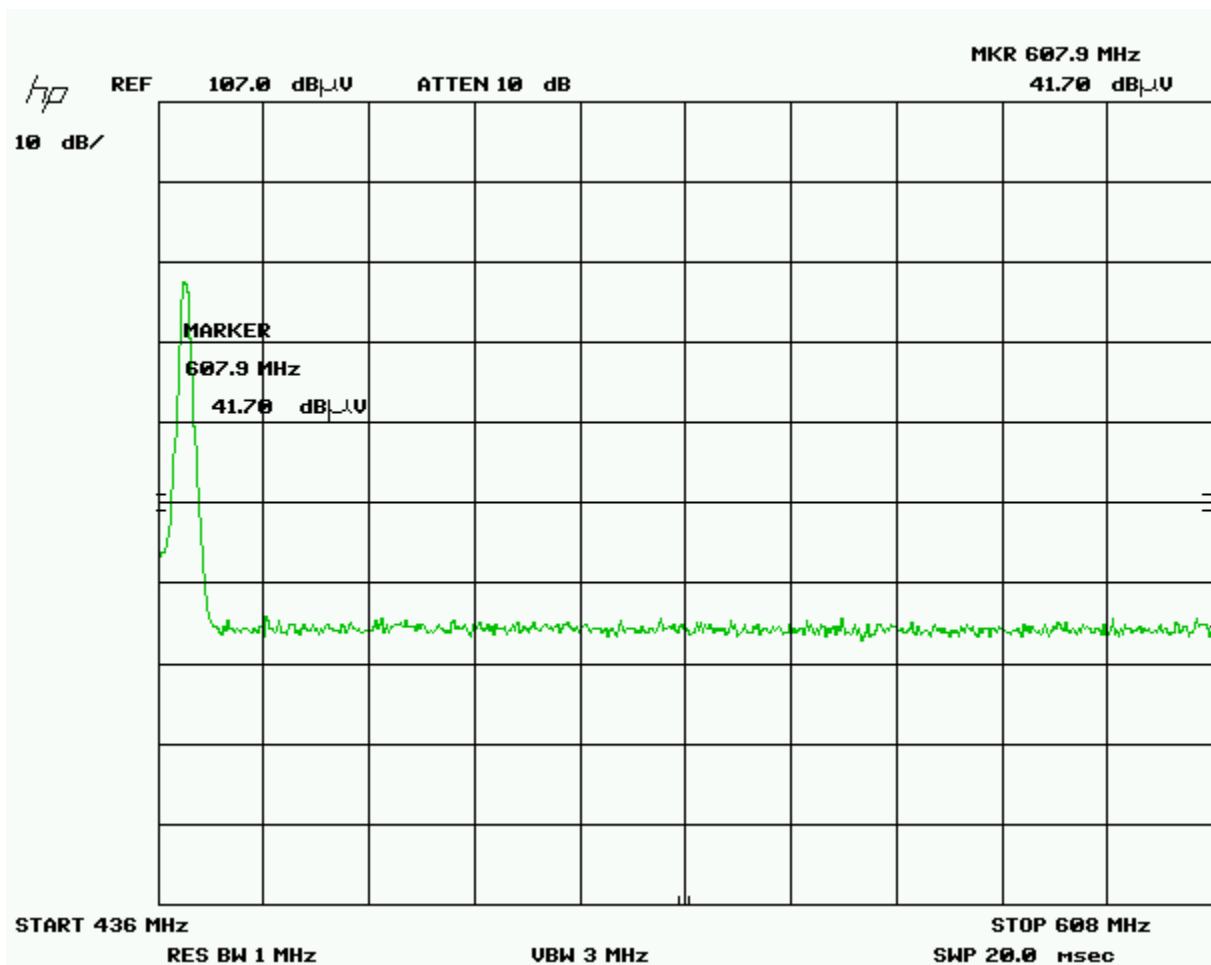
| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

Horizontal – Peak Emissions Graph
Restricted Band edge at 410 MHz, Low channel



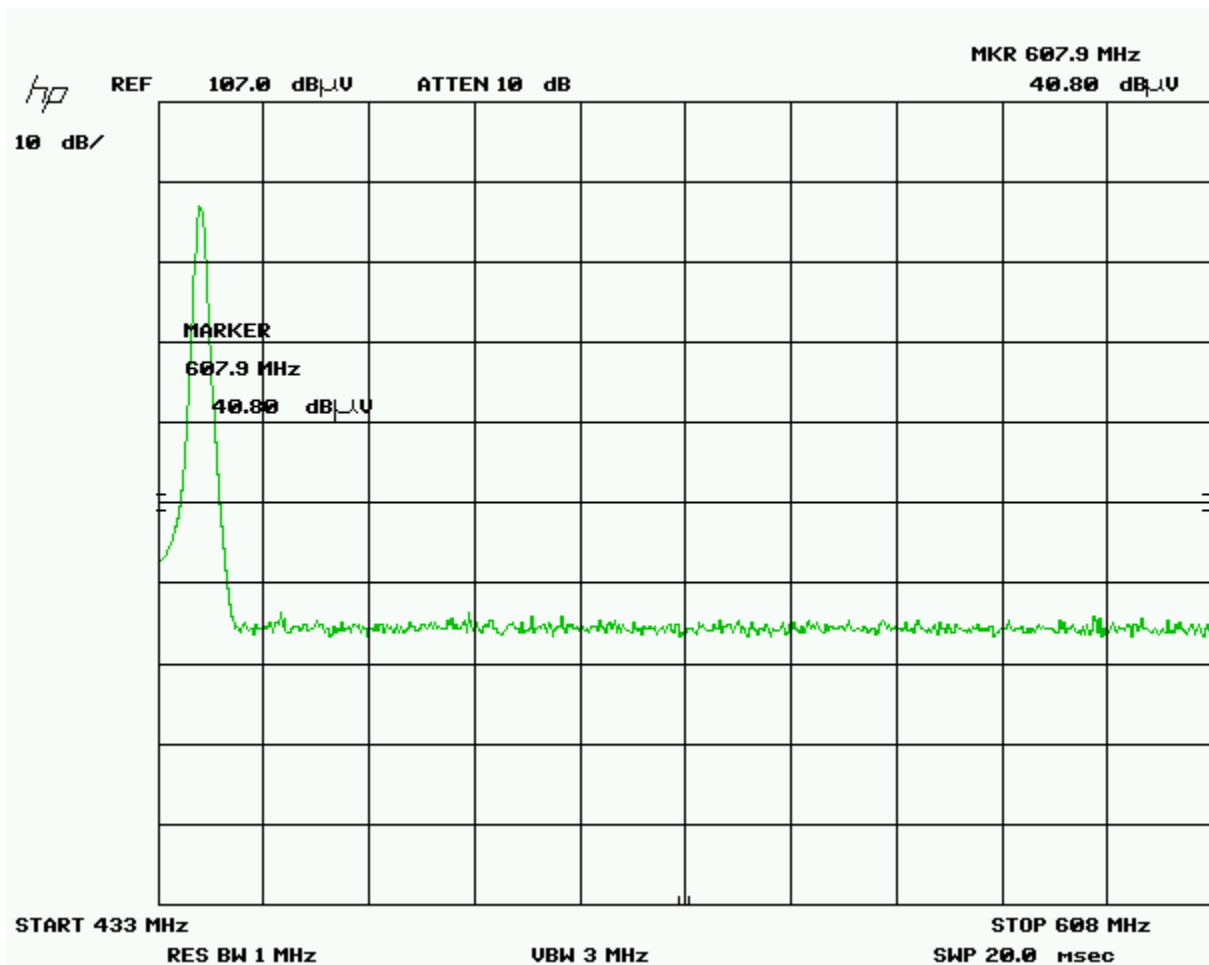
| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Vertical – Peak Emissions Graph
Restricted Band edge at 608 MHz, High channel



| | | |
|-------------|---|--|
| Client | Lu Technologies | |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

Horizontal – Peak Emissions Graph
Restricted Band edge at 608 MHz, High channel




| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

Final Measurements

Spurious Emissions Table

| Test Frequency (MHz) | Detection mode (Q-Peak) | Antenna polarity (Horz/Vert) | Raw signal dB(μV) | Antenna factor dB | Cable loss dB + Pre-selector | Attenuator dB | Pre-Amp Gain dB | Received signal dB(μV/m) | Emission limit dB(μV/m) | Margin dB(μV) | Result |
|----------------------|-------------------------|------------------------------|-------------------|-------------------|------------------------------|---------------|-----------------|--------------------------|-------------------------|---------------|--------|
| 854.5 | Peak | Horz | 56.6 | 23.2 | 1.3 | 0.0 | 30.3 | 50.8 | 80.1 | 29.3 | PASS |
| 854.5 | Avg | Horz | 21.3 | 23.2 | 1.3 | 0.0 | 30.3 | 15.5 | 60.1 | 44.6 | PASS |
| 854.5 | Peak | Vert | 53.3 | 22.2 | 1.3 | 0.0 | 30.3 | 46.5 | 80.1 | 33.6 | PASS |
| 854.5 | Avg | Vert | 18.0 | 22.2 | 1.3 | 0.0 | 30.3 | 11.2 | 60.1 | 48.9 | PASS |
| 1281.8 | Peak | Horz | 65.2 | 25.8 | 2.5 | 0.0 | 37.0 | 56.5 | 73.9 | 17.4 | PASS |
| 1281.8 | Avg | Horz | 29.9 | 25.8 | 2.5 | 0.0 | 37.0 | 21.2 | 53.9 | 32.7 | PASS |
| 1281.8 | Peak | Vert | 57.2 | 25.7 | 2.5 | 0.0 | 37.0 | 48.4 | 73.9 | 25.5 | PASS |
| 1281.8 | Avg | Vert | 21.9 | 25.7 | 2.5 | 0.0 | 37.0 | 13.1 | 53.9 | 40.8 | PASS |
| 1709.1 | Peak | Vert | 62.1 | 28.0 | 2.9 | 0.0 | 36.5 | 56.5 | 73.9 | 17.4 | PASS |
| 1709.1 | Avg | Vert | 26.8 | 28.0 | 2.9 | 0.0 | 36.5 | 21.2 | 53.9 | 32.7 | PASS |
| 1709.1 | Peak | Horz | 66.3 | 29.5 | 2.9 | 0.0 | 36.5 | 62.2 | 73.9 | 11.7 | PASS |
| 1709.1 | Avg | Horz | 31.0 | 29.5 | 2.9 | 0.0 | 36.5 | 26.9 | 53.9 | 27.0 | PASS |
| 2136.4 | Peak | Horz | 62.5 | 30.4 | 3.2 | 0.0 | 36.2 | 59.9 | 73.9 | 14.0 | PASS |
| 2136.4 | Avg | Horz | 27.2 | 30.4 | 3.2 | 0.0 | 36.2 | 24.6 | 53.9 | 29.3 | PASS |
| 2136.4 | Peak | Vert | 61.2 | 30.4 | 3.2 | 0.0 | 36.2 | 58.6 | 73.9 | 15.3 | PASS |
| 2136.4 | Avg | Vert | 25.9 | 30.4 | 3.2 | 0.0 | 36.2 | 23.3 | 53.9 | 30.6 | PASS |
| 2563.6 | Peak | Horz | 71.0 | 30.4 | 3.2 | 0.0 | 36.2 | 68.4 | 73.9 | 5.5 | PASS |
| 2563.6 | Avg | Horz | 35.7 | 30.4 | 3.2 | 0.0 | 36.2 | 33.1 | 53.9 | 20.8 | PASS |
| 2563.6 | Peak | Vert | 68.6 | 30.4 | 3.2 | 0.0 | 36.2 | 66.0 | 73.9 | 7.9 | PASS |
| 2563.6 | Avg | Vert | 33.3 | 30.4 | 3.2 | 0.0 | 36.2 | 30.7 | 53.9 | 23.2 | PASS |
| 2990.9 | Peak | Horz | 58.2 | 30.4 | 3.2 | 0.0 | 36.2 | 55.6 | 73.9 | 18.3 | PASS |
| 2990.9 | Avg | Horz | 22.9 | 30.4 | 3.2 | 0.0 | 36.2 | 20.3 | 53.9 | 33.6 | PASS |
| 2990.9 | Peak | Vert | 59.0 | 30.4 | 3.2 | 0.0 | 36.2 | 56.4 | 73.9 | 17.5 | PASS |
| 2990.9 | Avg | Vert | 23.7 | 30.4 | 3.2 | 0.0 | 36.2 | 21.1 | 53.9 | 32.8 | PASS |
| 3418.2 | Peak | Horz | 52.0 | 30.4 | 3.2 | 0.0 | 36.2 | 49.4 | 73.9 | 24.5 | PASS |
| 3418.2 | Avg | Horz | 16.7 | 30.4 | 3.2 | 0.0 | 36.2 | 14.1 | 53.9 | 39.8 | PASS |
| 3418.2 | Peak | Vert | 49.3 | 30.4 | 3.2 | 0.0 | 36.2 | 46.7 | 73.9 | 27.2 | PASS |
| 3418.2 | Avg | Vert | 14.0 | 30.4 | 3.2 | 0.0 | 36.2 | 11.4 | 53.9 | 42.5 | PASS |

| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Restricted Band Edge Emissions Table

| Test Frequency (MHz) | Detection mode (Q-Peak) | Antenna polarity (Horz/Vert) | Raw signal dB(μV) | Antenna factor dB | Cable loss dB + Pre-selector | Attenuator dB | Pre-Amp Gain dB | Received signal dB(μV/m) | Emission limit dB(μV/m) | Margin dB(μV) | Result |
|----------------------|-------------------------|------------------------------|-------------------|-------------------|------------------------------|---------------|-----------------|--------------------------|-------------------------|---------------|--------|
| 410 | Peak | Horz | 42.4 | 17.3 | 0.7 | 0.0 | 31.2 | 29.2 | 46.0 | 16.8 | PASS |
| 410 | Peak | Vert | 41.0 | 16.2 | 0.7 | 0.0 | 31.2 | 26.7 | 46.0 | 19.3 | PASS |
| 608 | Peak | Horz | 40.8 | 17.3 | 0.7 | 0.0 | 31.2 | 27.6 | 46.0 | 18.4 | PASS |
| 608 | Peak | Vert | 41.7 | 16.2 | 0.7 | 0.0 | 31.2 | 27.4 | 46.0 | 18.6 | PASS |

Notes:

Average measurements shown are obtained by applying a duty cycle correction factor, as reported previously in this test report, in the *Radiated Emissions of Fundamental* section.


Peak readings at the band edges are under the tighter quasi-peak limits of 15.209 as required by 15.231(b)(1). The EUT passes requirements at the band edges.

| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

Test Equipment List

| Equipment | Model No. | Manufacturer | Last calibration date | Next calibration due date | Asset # |
|---------------------------|--------------------------|-----------------|-----------------------|---------------------------|-----------|
| Spectrum Analyzer | ESL 6 | Rohde & Schwarz | Oct-06, 2011 | Oct-06, 2013 | GEMC 160 |
| BiLog Antenna | 3142-C | ETS | Jan 17, 2011 | Jan 17, 2013 | GEMC 8 |
| Q-Par 1.5-18 GHz Horn | 6878/24 | Q-par | Aug 25, 2010 | Aug 25, 2012 | GEMC 6365 |
| Attenuator 3 dB | FP-50-3 | Trilithic | NCR | NCR | GEMC 40 |
| Chase Preamp 9kHz - 2 GHz | CPA9231A | Chase | Aug 25, 2010 | Aug 25, 2012 | GEMC 6403 |
| 1-26G pre-amp | HP 8449B | HP | Aug 25, 2010 | Aug 25, 2012 | GEMC 6351 |
| RF Cable 7m | LMR-400-7M-50OHM-MN-MN | LexTec | NCR | NCR | GEMC 28 |
| RF Cable 1m | LMR-400-1M-50OHM-MN-MN | LexTec | NCR | NCR | GEMC 29 |
| RF Cable 0.5M | LMR-400-0.5M-50OHM-MN-MN | LexTec | NCR | NCR | GEMC 31 |

This report module is based on GEMC template "FCC - 15.209 - Radiated Emissions_Rev1.doc"

| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

20 dB Bandwidth of Periodically Operated Transmitters

Purpose

The purpose of this test is to ensure that the bandwidth occupied does not exceed a stated minimum. This helps ensure the utilization of the frequency allocation is sufficiently narrow and not occupying excessive spectrum. This also helps prevent accidental interference of data by ensuring adequate data separation to distinguish the reception of the intended information by enabling the receiver to have a relatively narrow band response tuned to the transmitter's frequency.


Limits

The Limit is as specified in FCC Part 15 and RSS 210.

For periodic transmitters below 900 MHz, this should not exceed 0.25% of the fundamental frequency. For periodic transmitters above 900 MHz, this should not exceed 0.5 % of the fundamental frequency. This should be measured with a RBW equal to approximately 1% of the 20 dB BW of the signal and a VBW more than the RBW.

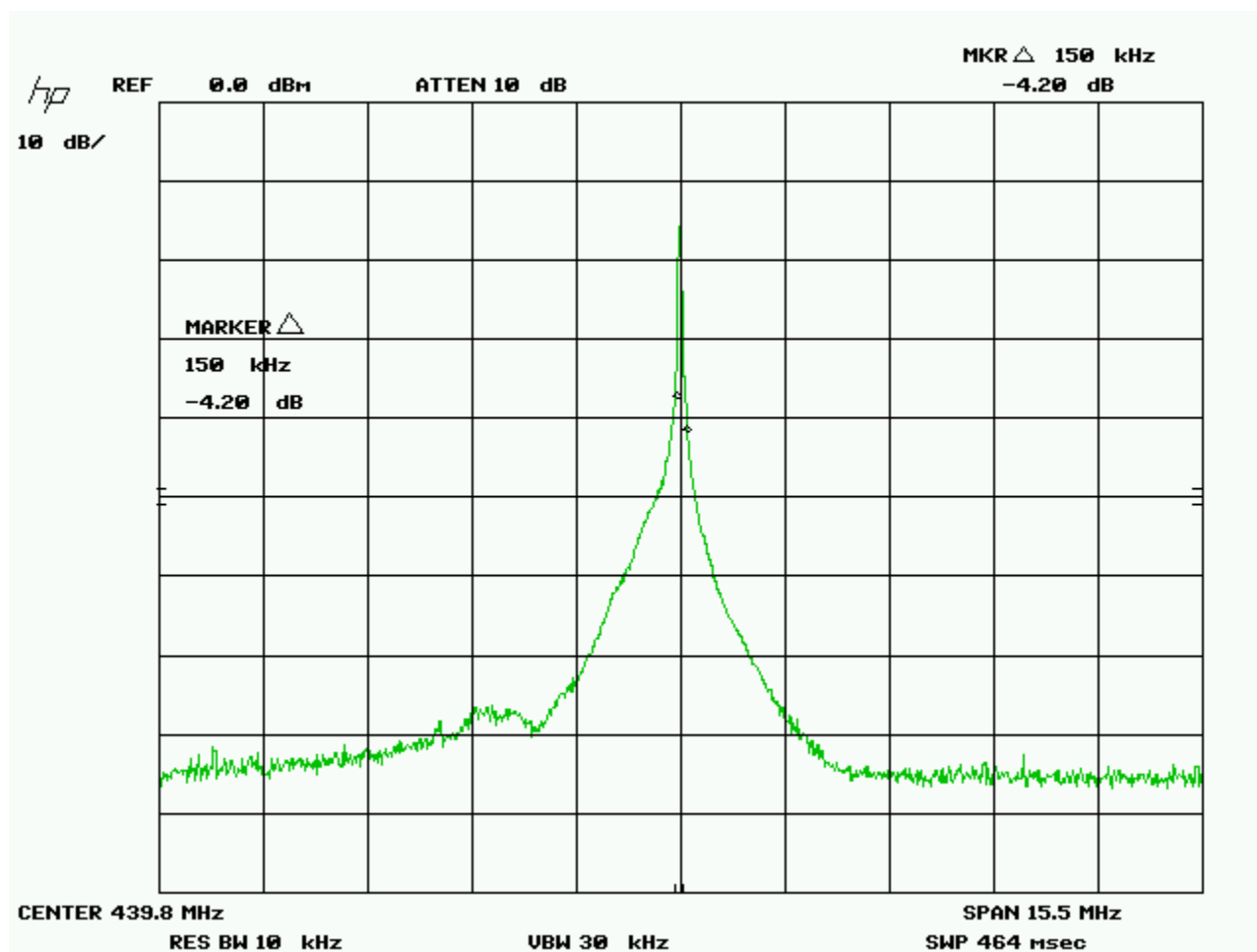
Results

The EUT passed. The 20 dB bandwidth measured was 150 kHz and the requirement was that this be less than 1.03 MHz.


| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

Graph(s)

The graph shown below shows the channel spacing during the operation of the device. This is measured by a max hold on the spectrum analyzer and the highest resolution bandwidth that is approximately 1% of the 20 dB BW during operation of the EUT. This measurement is a peak measurement. Max hold is performed for a duration of not less than 1 minute. The markers are set at approximately 20dB below the peak.




Note: See 'Appendix B – EUT & Test Setup Photographs' for photos showing the test set-up.

| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

Test Equipment List

| Equipment | Model No. | Manufacturer | Last calibration date | Next calibration due date | Asset # |
|---------------------------|------------------------|-----------------|-----------------------|---------------------------|-----------|
| Spectrum Analyzer | ESL 6 | Rohde & Schwarz | Oct-06, 2011 | Oct-06, 2013 | GEMC 160 |
| BiLog Antenna | 3142-C | ETS | Jan 17, 2011 | Jan 17, 2013 | GEMC 8 |
| Chase Preamp 9kHz - 2 GHz | CPA9231A | Chase | Aug 25, 2010 | Aug 25, 2012 | GEMC 6403 |
| RF Cable 7m | LMR-400-7M-50OHM-MN-MN | LexTec | NCR | NCR | GEMC 28 |
| RF Cable 1m | LMR-400-1M-50OHM-MN-MN | LexTec | NCR | NCR | GEMC 29 |
| Attenuator 10 dB | FP-50-10 | Trilithic | NCR | NCR | GEMC 42 |
| Power Attenuator 20 dB | 25-A-FFN-20 | Bird / Hutton | NCR | NCR | GEMC 49 |

This report module is based on GEMC template "FCC – Power Line Conducted Emissions Class B_Rev1"

| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

Radiated Emissions of Receiver

Purpose

The purpose of this test is to ensure that the RF energy unintentionally emitted from the EUT does not exceed the limits listed below as defined in the applicable test standard, as measured from a receiving antenna. This helps protect broadcast radio services such as television, FM radio, pagers, cellular telephones, emergency services, and so on, from unwanted interference.

Limit(s) and Method

The method is as defined in ANSI C63.4:2003.

The limits are as defined in FCC Part 15, Section 15.209:

30 MHz – 88 MHz, 100 uV/m (40.0 dBuV/m¹) at 3 m

88 MHz – 216 MHz, 150 uV/m (43.5 dBuV/m¹) at 3 m


216 MHz – 960 MHz, 200 uV/m (46.0 dBuV/m¹) at 3 m

Above 960 MHz, 500 uV/m (54.0 dBuV/m¹) at 3 m

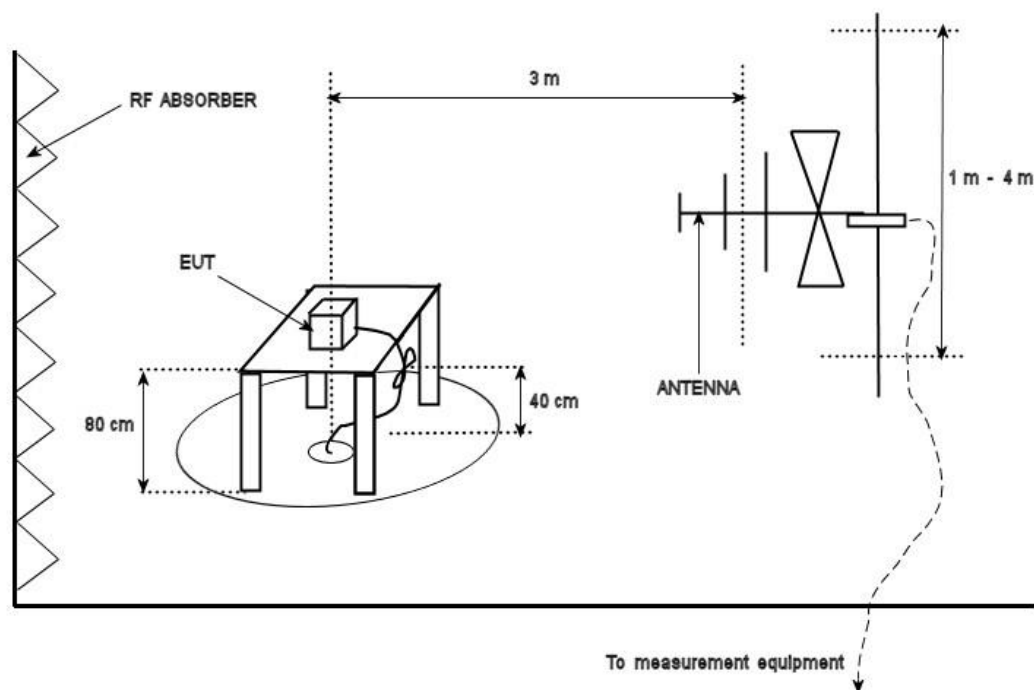
Above 1000 MHz², 500 uV/m (54 dBuV/m) at 3m

¹Limit is with 120 kHz measurement bandwidth and a using a Quasi Peak detector.

²Limit is with 1 MHz measurement bandwidth and using an Average detector


| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

Typical Radiated Emissions Setup



Measurement Uncertainty

The expanded measurement uncertainty is calculated in accordance with CISPR 16-4-2 and is ± 4.4 dB with a 'k=2' coverage factor and a 95% confidence level.

| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Preliminary Graphs

Note the graphs shown below are for graphical illustration only. For final measurements with the appropriate detector, please refer to the final measurement table where applicable. The graphs shown below are maximized peak measurement graphs, measured with a resolution bandwidth greater than the final required detector and over a full 0-360° rotation. This peaking process is done as a worst case measurement. This process enables the detection of frequencies of concern for final measurement, and provides considerable time savings.

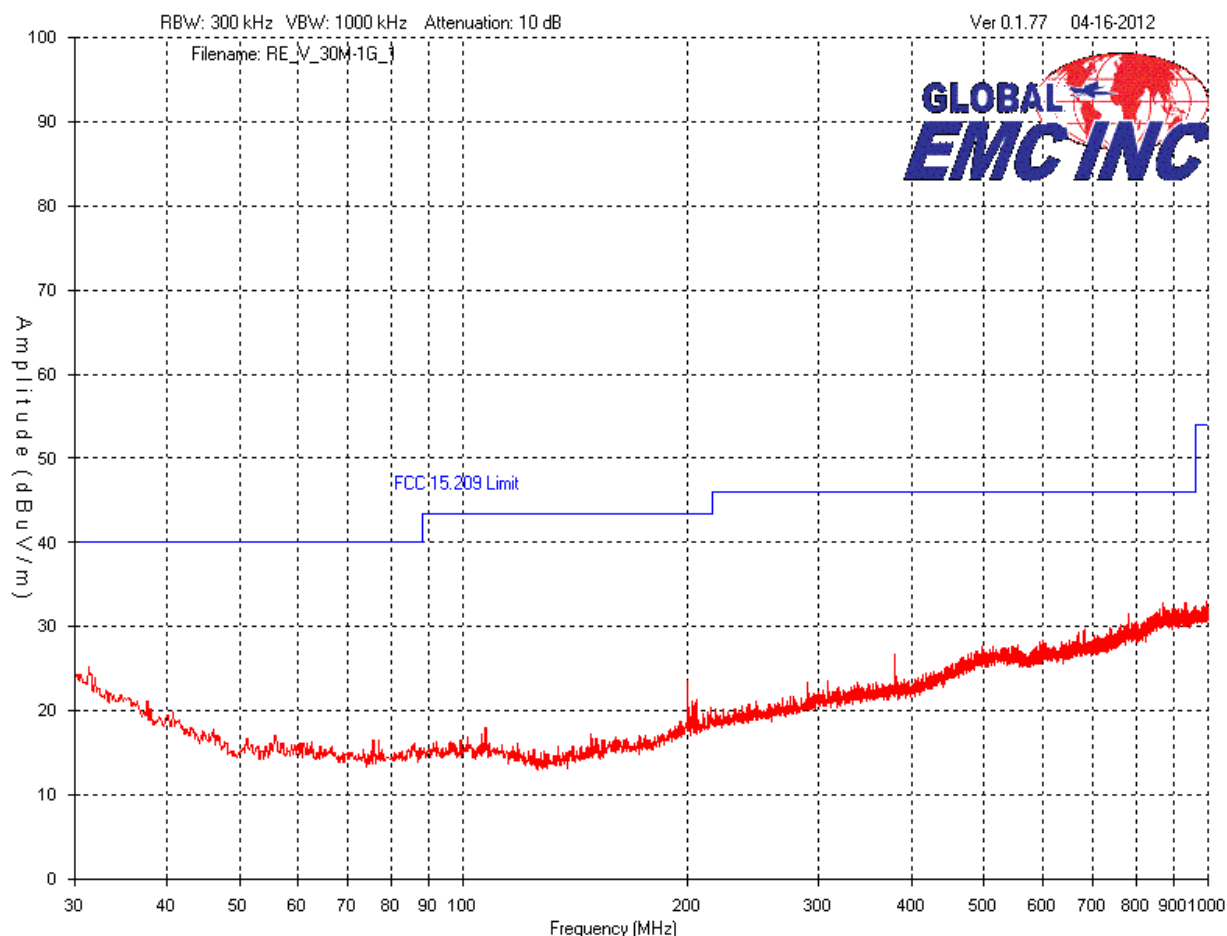
In accordance with FCC Part 15, Subpart A, Section 15.33, the device was scanned to a minimum of 1 GHz.


Devices scanned above 1GHz may be scanned at a 1 meter test distance. In accordance with FCC Part 15, Subpart A, Section 15.31, an extrapolation factor of 20 dB/decade will be used in such cases. For example for 1 meter measurements, an extrapolation factor of 9.5 dB from $20\text{Log}(1\text{m} / 3\text{m})$ will be applied.

All scans are performed at 3m test distance.

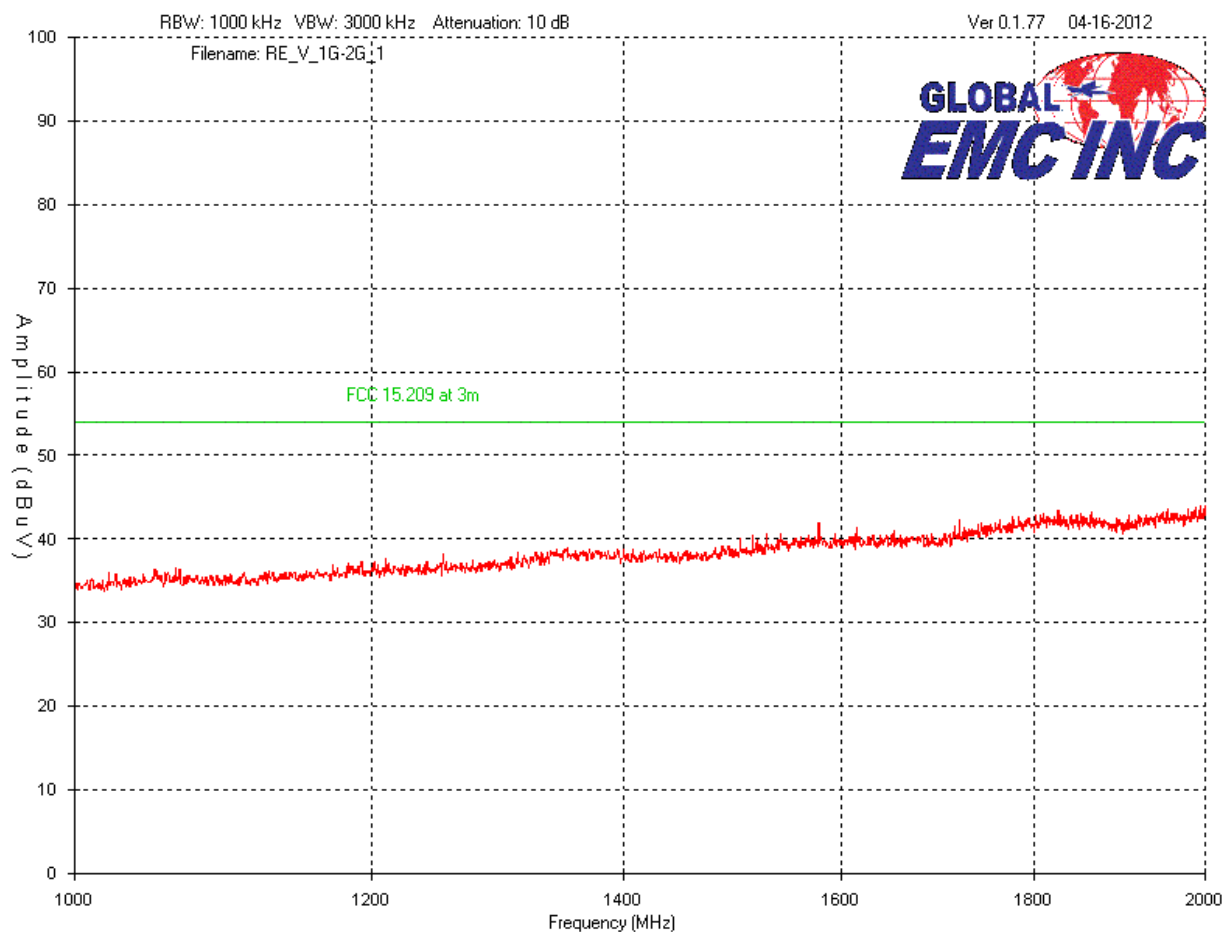
| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Vertical – Peak Emissions Graph
30MHz – 1GHz, Receiver mode



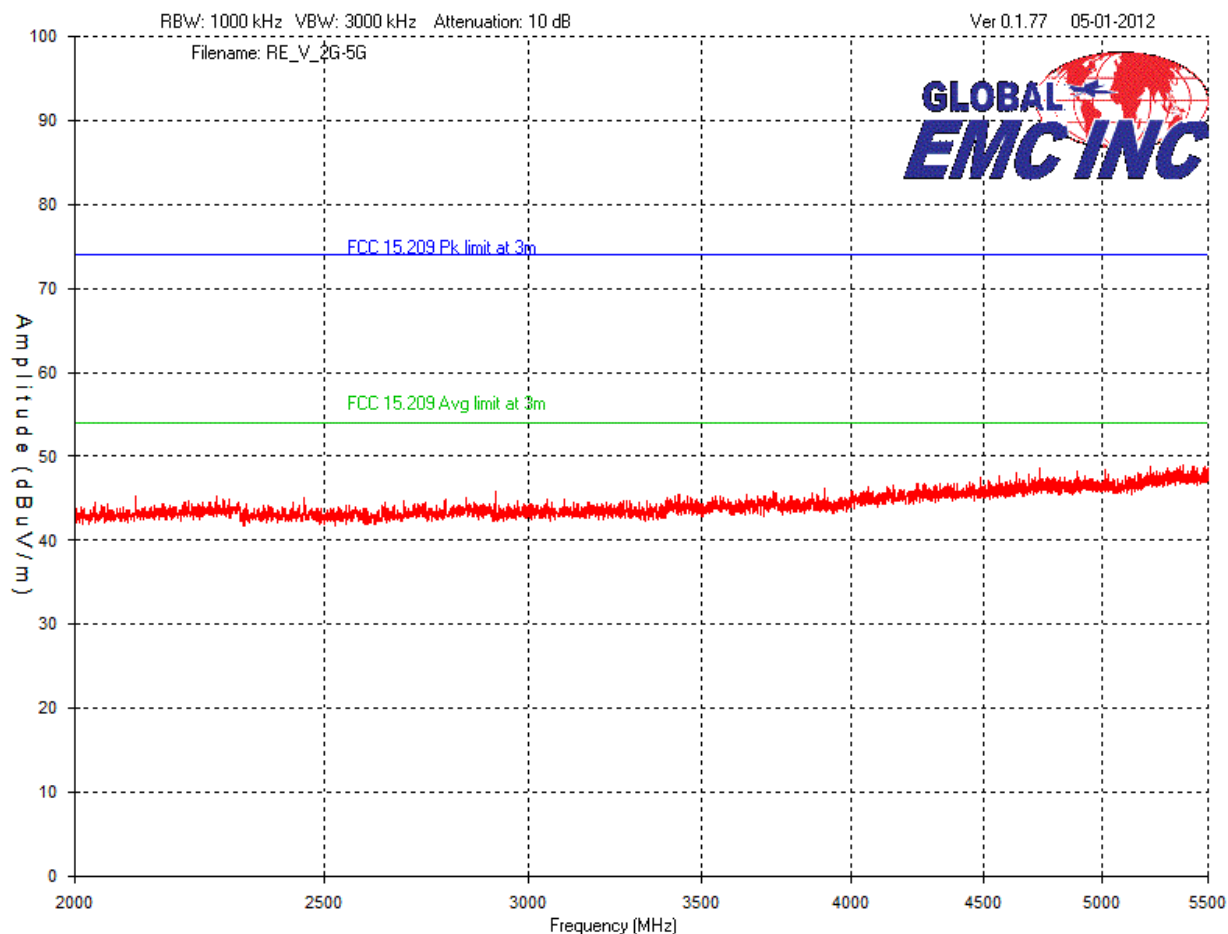
| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Vertical – Peak Emissions Graph
1GHz – 2GHz, Receiver mode



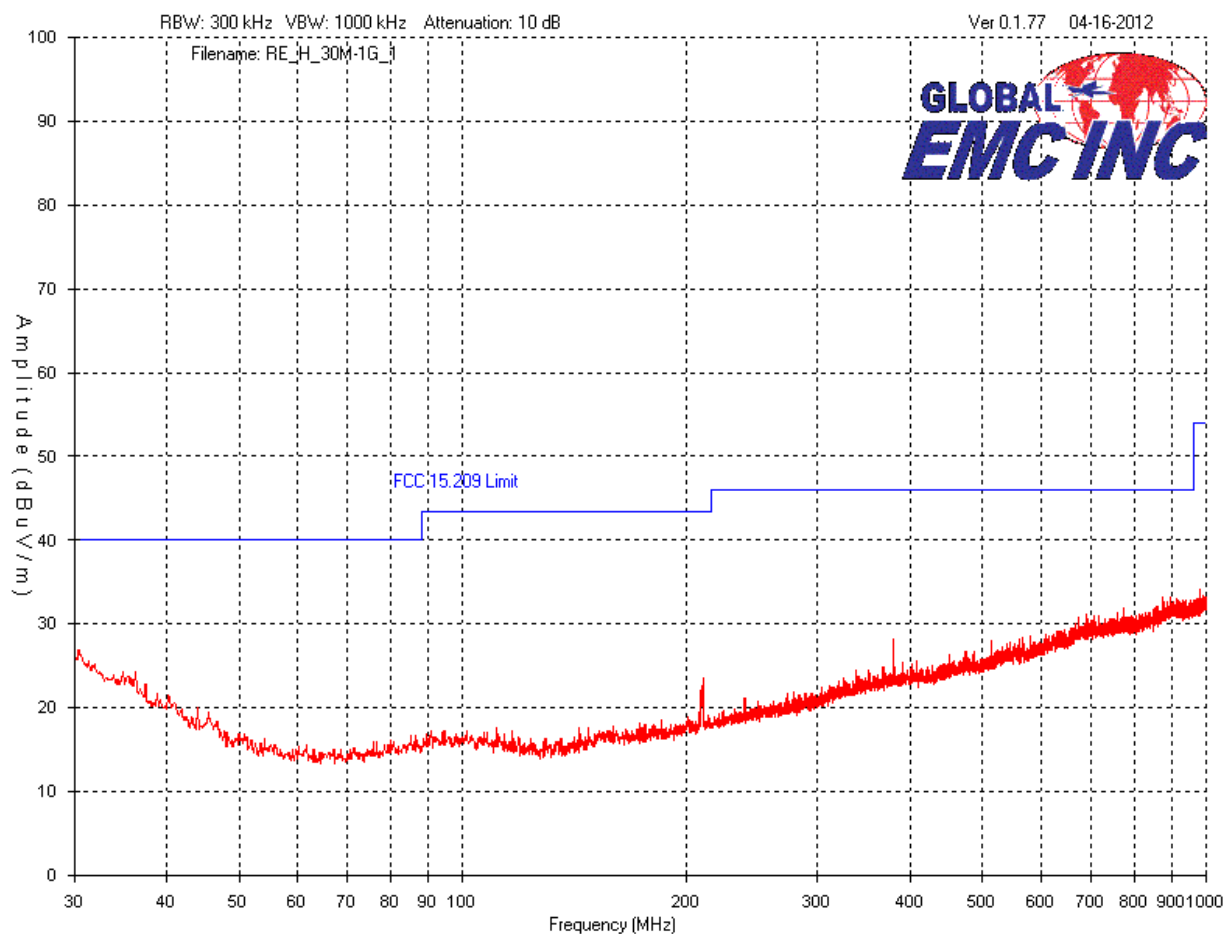
| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Vertical – Peak Emissions Graph
2GHz – 5GHz, Receiver mode



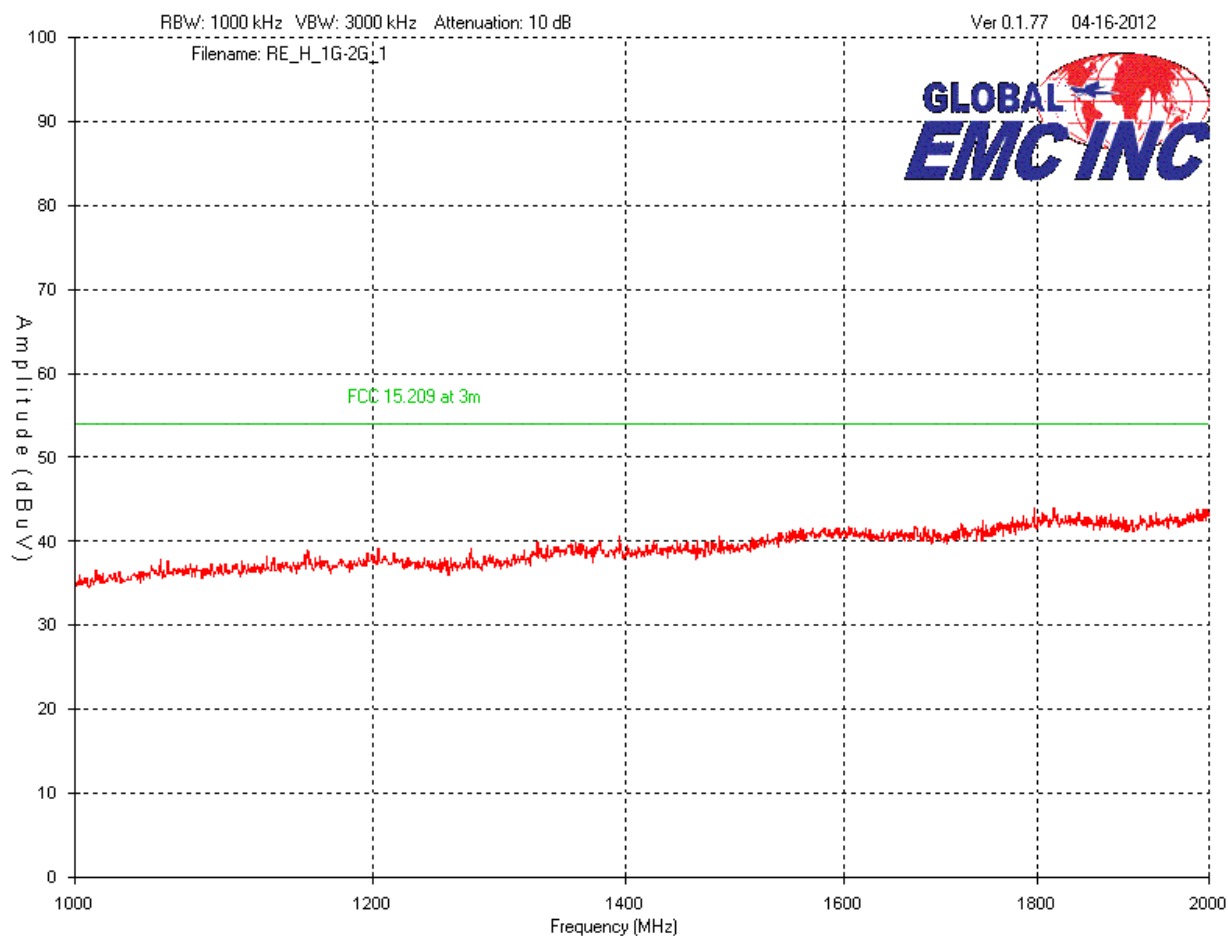
| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Horizontal – Peak Emissions Graph
30MHz – 1GHz, Receiver mode



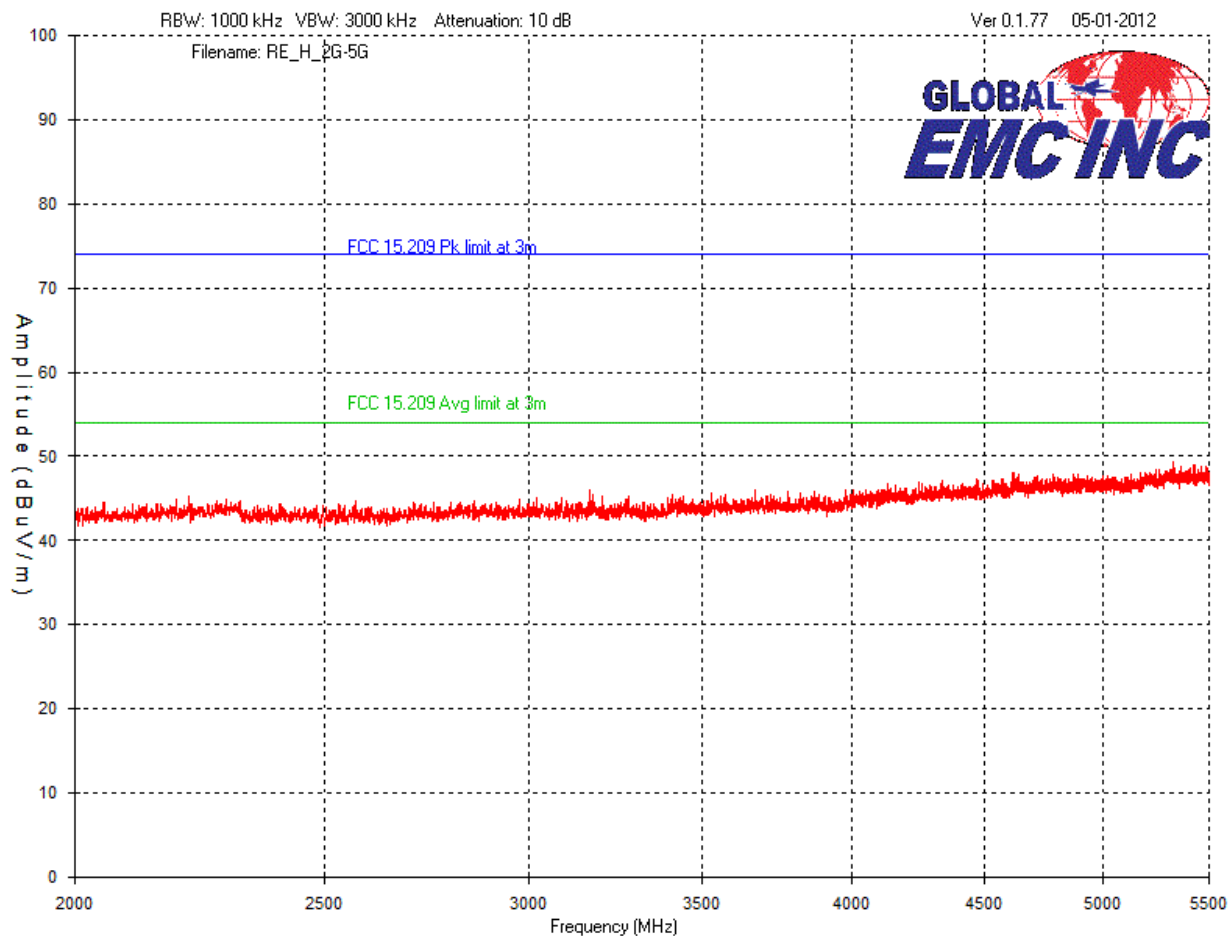
| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Horizontal – Peak Emissions Graph
1GHz – 2GHz, Receiver mode



| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

Horizontal – Peak Emissions Graph
2GHz – 5.5GHz, Receiver mode



| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Final Measurements

This section shows the emissions from the EUT in receiver mode. The worst case of the EUT's emissions happens in the Transmitter mode, and both the Receiver and Transmitter modes meet the limits of spurious emissions as described in 15.231(b) and 15.209. See *Radiated Emissions of Spurious Emissions* section for more details.

No peak emissions were over the limits.

Receiver Mode Emissions Table


| Test Frequency (MHz) | Antenna polarity | Detector | Received signal (dBμV) | Antenna factor (dB) | Cable loss (dB) | Pre-Amp (dB) | Emission Level (dBuV/m) | Emission limit dB(μV/m) | Margin (dB) | Result |
|----------------------|------------------|----------|------------------------|---------------------|-----------------|--------------|-------------------------|-------------------------|-------------|--------|
| 31.4 | Vertical | Peak | 38.8 | 16.2 | 0.3 | -30.1 | 25.2 | 40 | 14.8 | Pass |
| 199.8 | Vertical | Peak | 42.9 | 10.5 | 0.5 | -30.3 | 23.6 | 43.5 | 19.9 | Pass |
| 993.1 | Vertical | Peak | 38.4 | 22.8 | 1.5 | -29.7 | 33 | 54 | 21 | Pass |
| 30.4 | Horizontal | Peak | 38 | 18.8 | 0.3 | -30.1 | 27 | 40 | 13 | Pass |
| 979.9 | Horizontal | Peak | 38.9 | 23.5 | 1.5 | -29.7 | 34.2 | 54 | 19.8 | Pass |
| 210.3 | Horizontal | Peak | 42.7 | 10.7 | 0.6 | -30.4 | 23.6 | 43.5 | 19.9 | Pass |

| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

Test Equipment List

| Equipment | Model No. | Manufacturer | Last calibration date | Next calibration due date | Asset # |
|---------------------------|--------------------------|-----------------|-----------------------|---------------------------|-----------|
| Spectrum Analyzer | ESL 6 | Rohde & Schwarz | Oct-06, 2011 | Oct-06, 2013 | GEMC 160 |
| BiLog Antenna | 3142-C | ETS | Jan. 17, 2011 | Jan. 17, 2013 | GEMC 137 |
| Chase Preamp 9kHz - 2 GHz | CPA9231A | Chase | Aug. 25, 2010 | Aug. 25, 2012 | GEMC 6403 |
| RF Cable 7m | LMR-400-7M-50OHM-MN-MN | LexTec | NCR | NCR | GEMC 28 |
| RF Cable 1m | LMR-400-1M-50OHM-MN-MN | LexTec | NCR | NCR | GEMC 29 |
| RF Cable 0.5M | LMR-400-0.5M-50OHM-MN-MN | LexTec | NCR | NCR | GEMC 31 |

This report module is based on GEMC template "FCC - 15.209 - Radiated Emissions_Rev1.doc"


| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

Appendix A – EUT Summary

For further details for filing purposes, refer to filing package.


General EUT Description

| Client/Manufacturer Details | |
|---|---|
| Organization / Address | Lu Technologies 1711 Stackhouse Ave London, ON Canada, N5X 4H9 |
| Contact | Daniel Lu |
| Phone | (519) 266-6467 |
| Email | dlu@lutechs.com |
| EUT (Equipment Under Test) Details | |
| EUT Name | Wireless Locator & Alert for Safety, Security and Rescue |
| EUT Model / SN | LSS-DA42-TR8 LSS-DA42-RX8 LSS-DA42-TX8 |
| EUT revision | New product |
| Software version | 2012030404F00-2011021400C05-000 |
| Equipment category | RF Transceiver |
| EUT is powered using | 1 standard AAA battery |
| Input voltage range(s) (V) | 1.5VDC |
| Rated input current (A) | < 0.35 |
| Nominal power consumption (W) | < 0.39 |
| Number of power supplies in EUT | 1 |
| Transmits RF energy? | Yes. Transceiver in transmit mode to report its proximity |
| Basic EUT functionality description | The EUT is a monitoring device which alerts parents when a child carrying a paired device is not within an allowed detectable distance for an allowed period of time. It transmits one RF packet every 3.3 to 10.8 seconds. It switches between Sleep, Transmitter, and/or Receiver modes automatically, depending on the model number. |
| Modes of operation | Sleep, Transmitter, and/or Receiver modes |
| Step by step instructions for setup and operation | By pushing the button, the EUT switches the modes in the following order: Sleep, Tx@Low Freq, Tx@Middle Freq, Tx@High Freq, Rx@Low Freq, Rx@Middle Freq, Rx@High Freq, and then starts over again. |

| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


| | |
|--|-------------------------------------|
| Frequency of all clocks present in EUT | 12.8MHz, 8MHz, 2MHz, 125kHz |
| I/O cable description Specify length and type | None |
| Available connectors on EUT | None |
| Dimensions of product | L 78.0 mm W 21.1 mm H 20.4 mm |

Note: The EUT is considered to have been received the date of the commencement of the first test, unless otherwise stated. For a close-up picture of the EUT, see ‘Appendix B – EUT & Test Setup Photographs’.

| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |


Appendix B – EUT and Test Setup Photographs

Note: These photos are for information purposes only.
Also refer to PDF files separate from this test report.

| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |




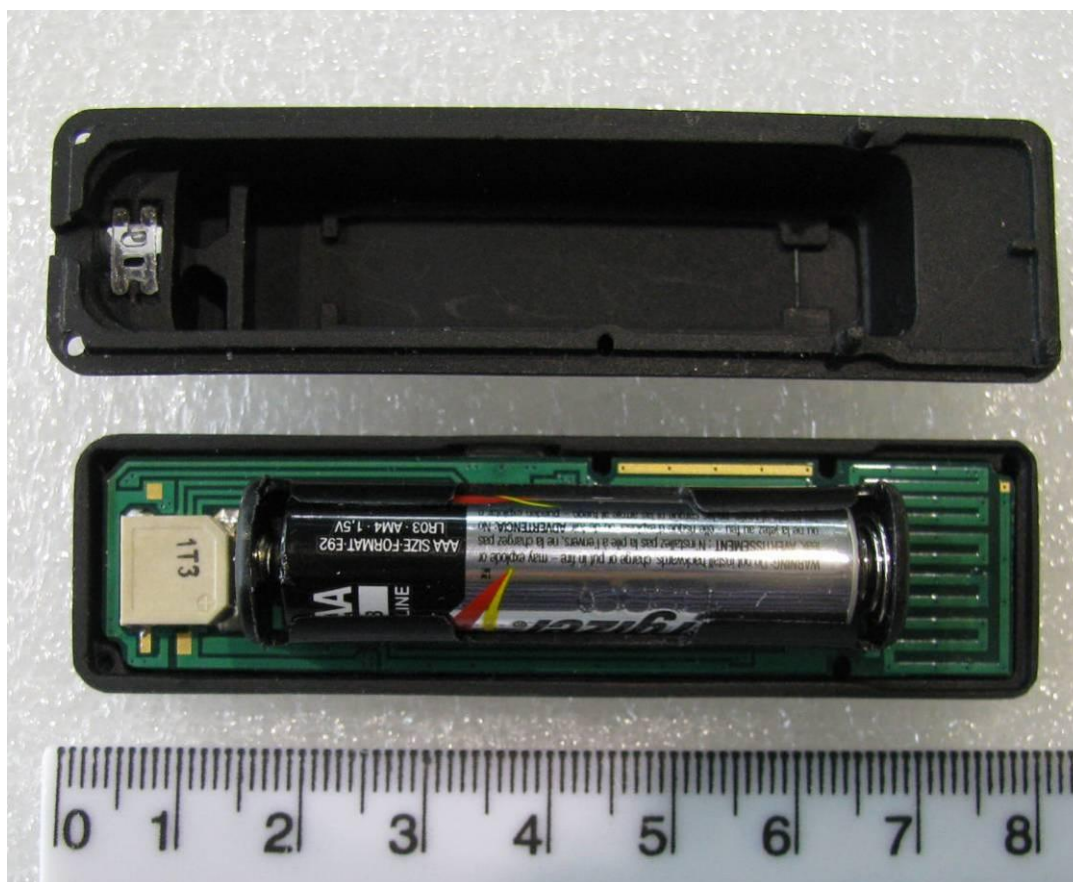
EUT exterior: View 1

| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |




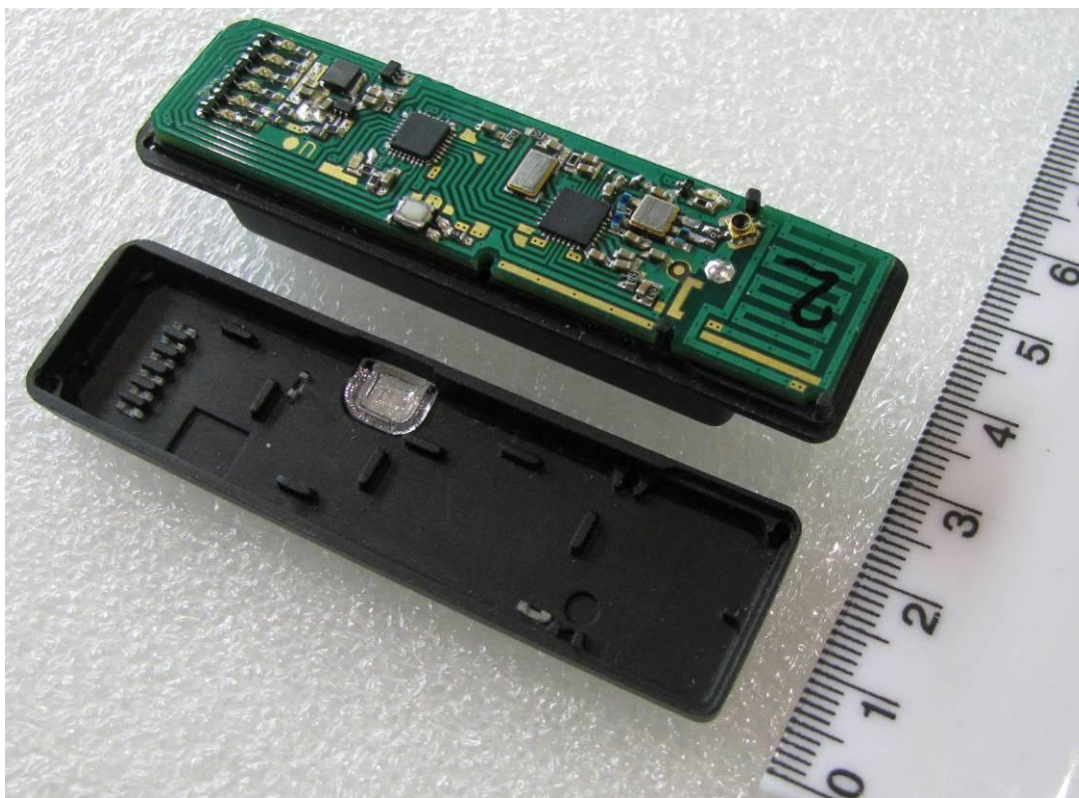
EUT exterior: View 2

| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |




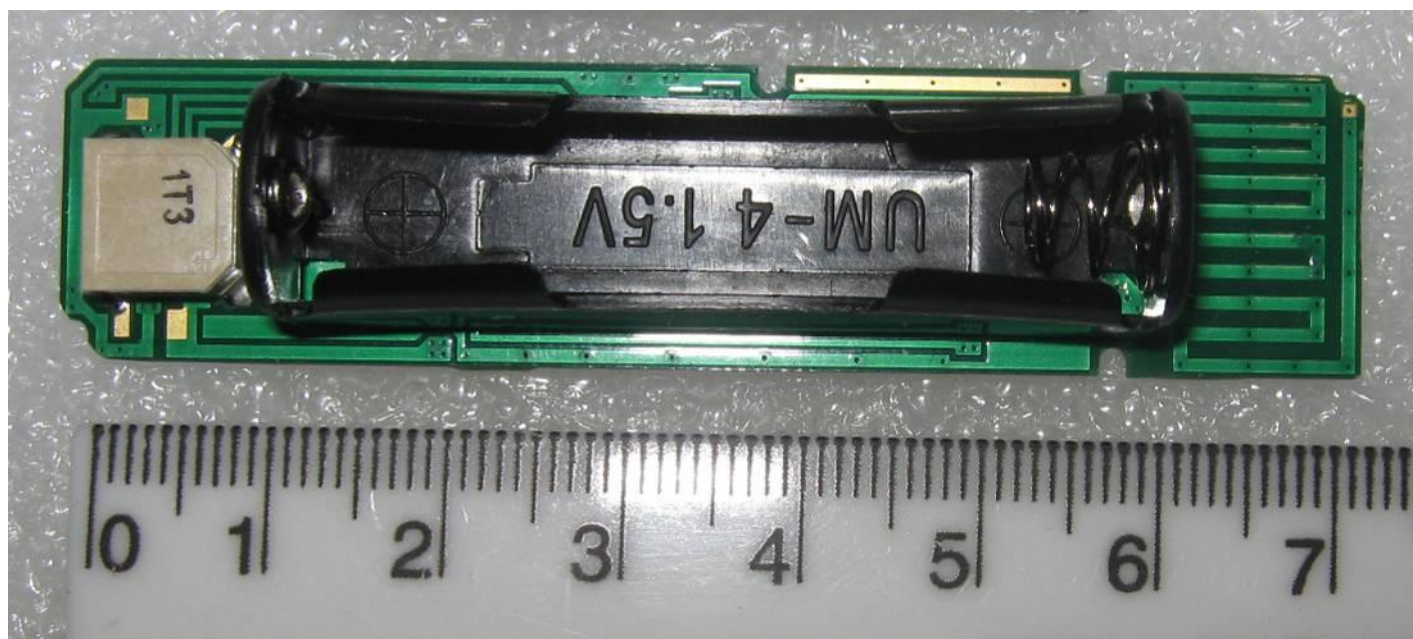
EUT interior: Enclosure opened, view 1

| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |

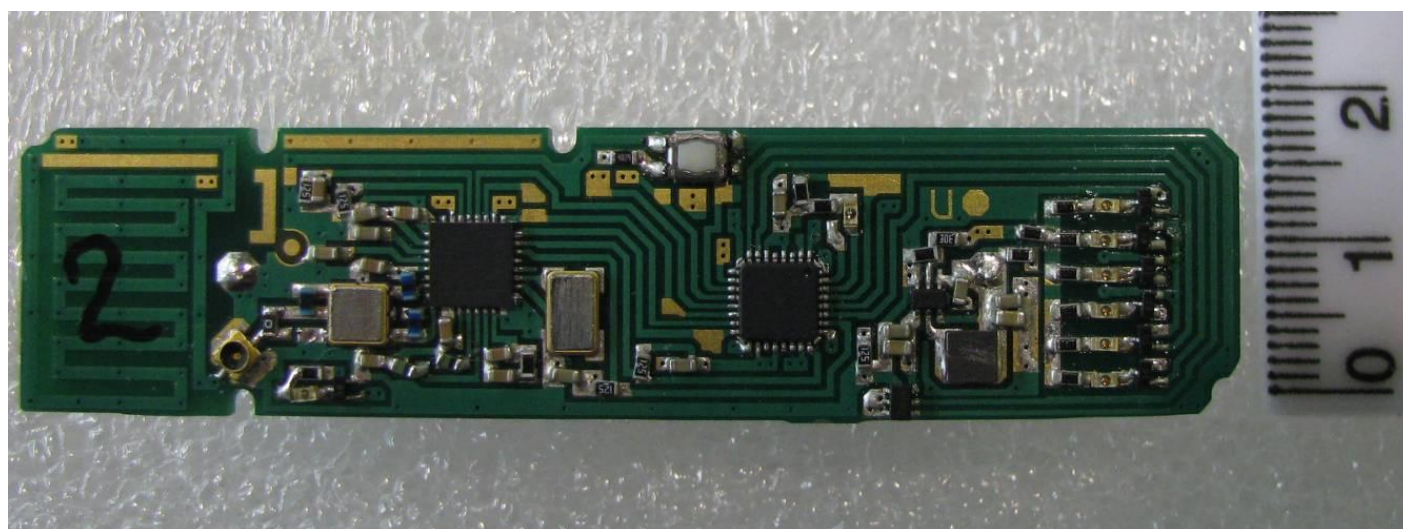


EUT interior: Enclosure opened, view 2

| | | |
|-------------|--|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |



EUT interior: PCB close-up side 1




EUT interior: PCB close-up side 2

| | | |
|-------------|---|--|
| Client | Lu Technologies | |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |



Radiated emissions testing (less than 30MHz)

| | | |
|-------------|---|---|
| Client | Lu Technologies |  |
| Product | Wireless Locator & Alert for Safety, Security and Rescue (LSS-DA42-TR8, LSS-DA42-RX8, LSS-DA42-TX8) | |
| Standard(s) | RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010 | |



Radiated emissions testing (greater than 30MHz)