

FCC ID: DO4EVOLVE

EMI -- TEST REPORT

Test Report No. :	T31884-04-00HU	17. December 2007
		Date of issue

Type / Model Name : Emerald Family

Family Variations : Evolve G10, Evolve G20, Evolve P10, Evolve P20, PX

Product Description : Electronic Article Surveillance Detection System

Applicant : Checkpoint Systems, Inc.

Address : 101 Wolf Drive, Thorofare

New Jersey, USA 08086

Manufacturer : Pikatron Feinwerktechnik GmbH & Co. KG

Address : Raiffeisenstrasse 10

D-61250 Usingen

Licence holder : Checkpoint Systems, Inc.

Address : 101 Wolf Drive, Thorofare

New Jersey, USA 08086

Test Result according to the standards listed in clause 1 test standards:	POSITIVE
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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

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1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15 Subpart C - Intentional Radiators (September 20, 2007)

Part 15, Subpart C, Section 15.223	Operation in the band 1.705-10 MHz §15.223(a) Radiated emissions, Fundamental & Harmonics
Part 15, Subpart C, Section 15.207(a)	AC Line conducted emissions
Part 15, Subpart C, Section 15.209(a)	Radiated emissions, general requirements
Part 15, Subpart C, Section 15.215(c)	Additional Provisions to the general radiated emission limitations

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2 SUMMARY

GENERAL REMARKS:

None

FINAL ASSESSMENT:

The equipment under test **fulfills** the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 20. November 2007

Testing concluded on : 30. November 2007

Checked by:



Thomas Weise
Ich bestätige die Richtigkeit
und Integrität dieses
Dokuments
2007.12.17 16:10:50 +01'00'

Thomas Weise
Dipl.-Ing.(FH)
Laboratory Manager

Tested by:



Huber Markus
Ich bin der Verfasser
dieses Dokuments
2007.12.17 10:52:46
+01'00'

Huber Markus

Ferrite Locations:

1. Chang Sung Corp P/N FS155090 (Order No 7235629) – Add one ferrite on the Tx1 and Tx2 cables with two turns.
2. Fair Rite P/N 5943000601 (Order No 7225873) – Add one ferrite on the Tx1 and Tx2 cables with four turns.
3. Fair Rite P/N 7118986 (Order No B6429-L618-X35) – Add a ferrite on each end of the Badge Board Cable with three turns through the ferrite.
4. Würth Ferrite Pearl (74270020) – Add a ferrite with 2 turns through the ferrite in LED INHIBIT cable.
5. Fair Rite P/N (Order No 2865-000-202) – Add one ferrite with 2 turns through the ferrite in LED PSU cable.
6. Fair Rite P/N (Order No 2865-000-202) – Add one ferrite with 2 turns through the ferrite in lamp cable.
7. Fair Rite P/N (Order No 2865-000-202) – Add one ferrite with 2 turns through the ferrite in buzzer cable.
8. Fair Rite P/N 284760 (Order No 0443806406) – Add one ferrite in each people counter cable with three turns through the ferrite.
9. Fair Rite P/N 284760 (Order No 0443806406) – Add one ferrite in WLAN modem cable with three turns through the ferrite.
10. Fair Rite P/N 284760 (Order No 0443806406) – Add one ferrite in DC/DC Converter cable with three turns through the ferrite.
11. Fair Rite P/N 284760 (Order No 0443806406) – Add a ferrite on each end of the DC Cable with four turns through the ferrite.
12. Fair Rite P/N 7118986 (Order No B6429-L618-X35) – Add a ferrite on each end of the DC Cable with four turns through the ferrite.

Instead of ferrite 1 and ferrite 2 follow types can also be used:

13. Micrometals BLN3961-263/BU – Add one ferrite on the Tx1 and Tx2 cables with two turns.
14. Fair Rite P/N 5943000601 (Order No 7225873) – Add one ferrite on the Tx1 and Tx2 cables with four turns

3.3 Power supply system utilised

Power supply voltage : 115 V / 60 Hz / 1 ϕ
24 V / DC

3.4 Short description of the Equipment under Test (EuT)

The Evolve Antenna's with Emerald Electronic are Electronic Article Surveillance System (EAS). The system detects target tags attached to merchandise. The targets resonate in the region of 8.2 MHz or 9.5 MHz. When an article of merchandise is purchased, the target is deactivated which causes it to no longer resonate. The Evolve Antenna's with Emerald Electronic monitors an area 3-feet on either side of the antenna in the 7.4 to 10.0 MHz range and triggers an alarm when a non-deactivated target is detected.

Number of tested samples: 1
Serial number: see Photo documentation of the EuT under Point 3 / Equipment Under Test

EuT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- Continuous sweep mode at 8.2 MHz Band

- Continuous sweep mode at 9.0 MHz Dual Band

-

EuT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurements:

- PSU (Power Supply Unit) GlobTek Model : GT-2S5024D-R, S/N RoHS00984803/06
- PSU (Power Supply Unit) GlobTek Model : GT-2S5024D-R-ES,
- Standard AC mains cable Model :
- Model :
- Model :
- Model :
- customer specific cables

- For detailed information about the connected cables during the test and other technical details, see attached CDF (Subclause 7) which was filled out from the manufacturer and Photo documentation of the EuT under Point 3 / Equipment Under Test.

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

mikes-testingpartners gmbh
Ohmstrasse 2-4
94342 Strasskirchen
Germany

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 /11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.4 Measurement Protocol for FCC, VCCI and AUSTEL

4.4.1 GENERAL INFORMATION

4.4.1.1 Test Methodology

Conducted and radiated disturbance testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

In compliance with 47 CFR Part 15 Subpart A Section 15.38 testing for FCC compliance may be done following the ANSI C63.4-2003 procedures and using the CISPR 22 Limits.

4.4.1.2 Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each other thus obtaining maximum disturbances from the unit.

4.4.2 DETAILS OF TEST PROCEDURES

General Standard Information

The test methods used comply with CISPR Publication 22, EN 55022 - "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with 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."

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Summarizing:

- | | |
|---|--|
| ⇒ maximum conducted emission:
with PSU GT-2S5024D-R-ES | Evolve P20 |
| ⇒ maximum conducted emission:
with PSU GT-2S5024D-R | Evolve G10 |
| ⇒ maximum field strength: | Evolve G20 |
| ⇒ maximum spurious emission: | Evolve G20 |
| ⇒ bandwidth plots: | no essential differences on the 5 versions |

This test results are documented in the following sections of this test report.

For detailed information about the connected cables during the test and other technical details, see attached CDF (Subclause 7) which was filled out from the manufacturer and Photo documentation of the EuT under Point 3 / Equipment Under Test.

4.6 Deviations or Exclusions from the Requirements and Standards

Measurement of the fundamental – 7.4 to 10.0 MHz – was performed by setting a spectrum analyzer to “max-hold”, peak detector, a 300 kHz bandwidth and a span from 6.5 MHz to 10 MHz. A resolution bandwidth of 300 kHz was used in performing the “true peak” measurements, because increasing the bandwidth above 300 kHz did not increase the detected peak of the fundamental.

4.7 Operation in Restricted Bands

The EUT is a digital swept frequency hopping transmitter. The EUT hops on discrete frequencies. The discrete frequencies that can be transmitted by the EUT are as follows:

Original Emerald frequency tables Vers. 2.79:

/* Center frequency 8.2MHz +/- 410KHz */
8610, 8555, 8500, 8446, 8391, 8337, 8282, 8227, 8173, 8118, 8063, 8009, 7954, 7899, 7845, 7790

/* Center frequency 8.6MHz +/- 430KHz */
9030, 8973, 8915, 8858, 8801, 8743, 8686, 8629, 8571, 8514, 8457, 8399, 8342, 8285, 8227, 8170

/* Center frequency 9.0MHz +/- 450KHz */
9450, 9390, 9330, 9270, 9210, 9150, 9090, 9030, 8970, 8910, 8850, 8790, 8730, 8670, 8610, 8550

/* Center frequency 9.2MHz +/- 460KHz */
9660, 9599, 9537, 9476, 9415, 9353, 9292, 9231, 9169, 9108, 9047, 8985, 8924, 8863, 8801, 8740

/* Center frequency 9.5MHz +/- 480KHz */
9980, 9916, 9852, 9788, 9724, 9660, 9596, 9532, 9468, 9404, 9340, 9276, 9212, 9148, 9084, 9020

/* This table is used for multi band (8.2/9.2) skinny pulse, using PW of 4us JRG_SP */
9325, 9325, 9325, 9325, 9075, 9075, 9075, 9075, 8325, 8325, 8325, 8325, 8075, 8075, 8075, 8075

The restricted frequency bands (per FCC Part 15 Clause 15.205) in the operating frequency band of the EUT are as follows:

8.291 – 8.294 MHz
8.362 – 8.366 MHz
8.37625 – 8.38675 MHz
8.41425 – 8.41475 MHz

The transmitter is not capable of hopping into, or operating, in the restricted frequency bands and therefore complies with the restriction.

5 TEST CONDITIONS AND RESULTS

5.1 Conducted emissions

For test instruments and accessories used see section 6 Part A 4.

5.1.1 Description of the test location

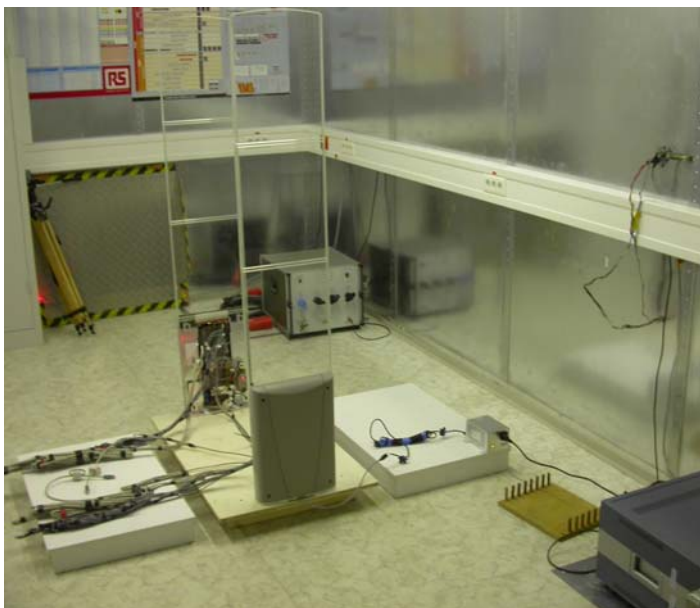
Test location: Shielded Room S2

5.1.2 Photo documentation of the test set-up

Evolve G10:



Evolve G20:



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Evolve P10:



Evolve P20:



PX:



5.1.3 Description of Measurement

The final level, expressed in dB μ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC Limit or to the CISPR limit.

To convert between dB μ V and μ V, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EuT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection and a Line Impedance Stabilization Network (LISN) with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

5.1.4 Test result

Frequency range:	0.15 MHz - 30 MHz
With PSU GT-2S5024D-R: Min. limit margin	9.0 MHz Dual Band Evolve G10: 0.4 dB at 9.295 MHz Evolve G20: 13.9 dB at 9.295 MHz
With PSU GT-2S5024D-R-ES: Min. limit margin	9.0 MHz Dual Band Evolve P10: 8.6 dB at 9.295 MHz Evolve P20: 0.6 dB at 9.295 MHz PX: 1.3 dB at 9.295 MHz

The requirements are **FULFILLED**.

Remarks:

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5.1.5 Test protocol

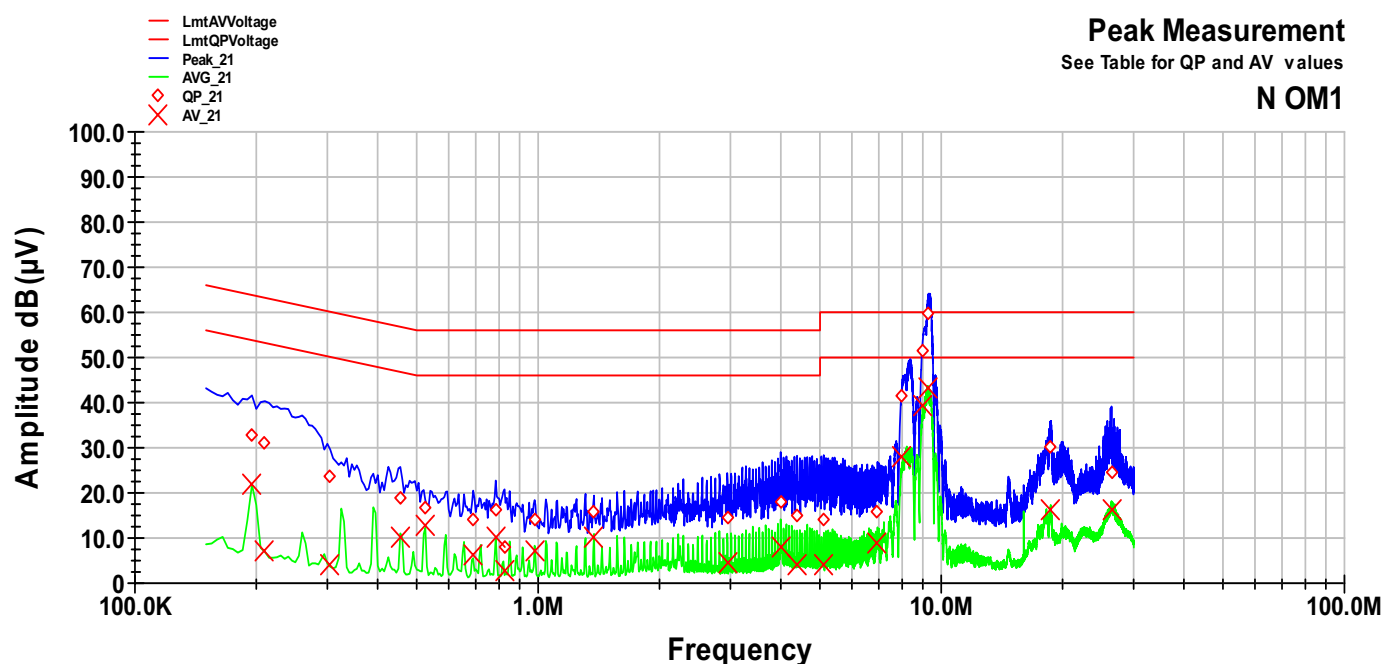
Test point L1
Operation mode: Evolve G10 / Continuous sweep mode
Remarks: FCC/IC Requirements
With standard PSU Cable and Ferrite on DC line
9.0MHz Band, Tx1 & Tx2: 31
Tested by: Huber Markus

Result: passed

Peak Measurement

See Table for QP and AV values

N OM1



Frequency MHz	QP Level dB(μV)	QP Margin dB	QP Limit dB	AV Level dB(μV)	AV Margin dB	AV Limit dB
0.195	32.9	-30.9	63.8	22.0	-31.8	53.8
0.21	30.9	-32.3	63.2	7.2	-46.0	53.2
0.305	23.7	-36.4	60.1	4.2	-45.9	50.1
0.455	18.8	-38.0	56.8	10.1	-36.7	46.8
0.525	16.9	-39.1	56.0	12.8	-33.2	46.0
0.69	14.0	-42.0	56.0	6.3	-39.8	46.0
0.785	16.0	-40.0	56.0	10.2	-35.8	46.0
0.825	8.0	-48.0	56.0	2.7	-43.3	46.0
0.98	14.1	-41.9	56.0	7.3	-38.7	46.0
1.375	15.8	-40.2	56.0	10.1	-35.9	46.0
2.945	14.4	-41.6	56.0	4.4	-41.6	46.0
3.995	17.9	-38.1	56.0	7.9	-38.1	46.0
4.385	14.8	-41.2	56.0	4.2	-41.8	46.0
5.105	13.9	-46.1	60.0	4.1	-46.0	50.0
6.945	15.9	-44.1	60.0	8.8	-41.2	50.0
8	41.5	-18.5	60.0	28.0	-22.0	50.0
9	51.4	-8.6	60.0	39.2	-10.8	50.0
9.295	59.6	-0.4	60.0	43.2	-6.8	50.0
18.685	30.4	-29.6	60.0	16.1	-33.9	50.0
26.42	24.6	-35.4	60.0	16.1	-33.9	50.0

FCC ID: DO4EVOLVE

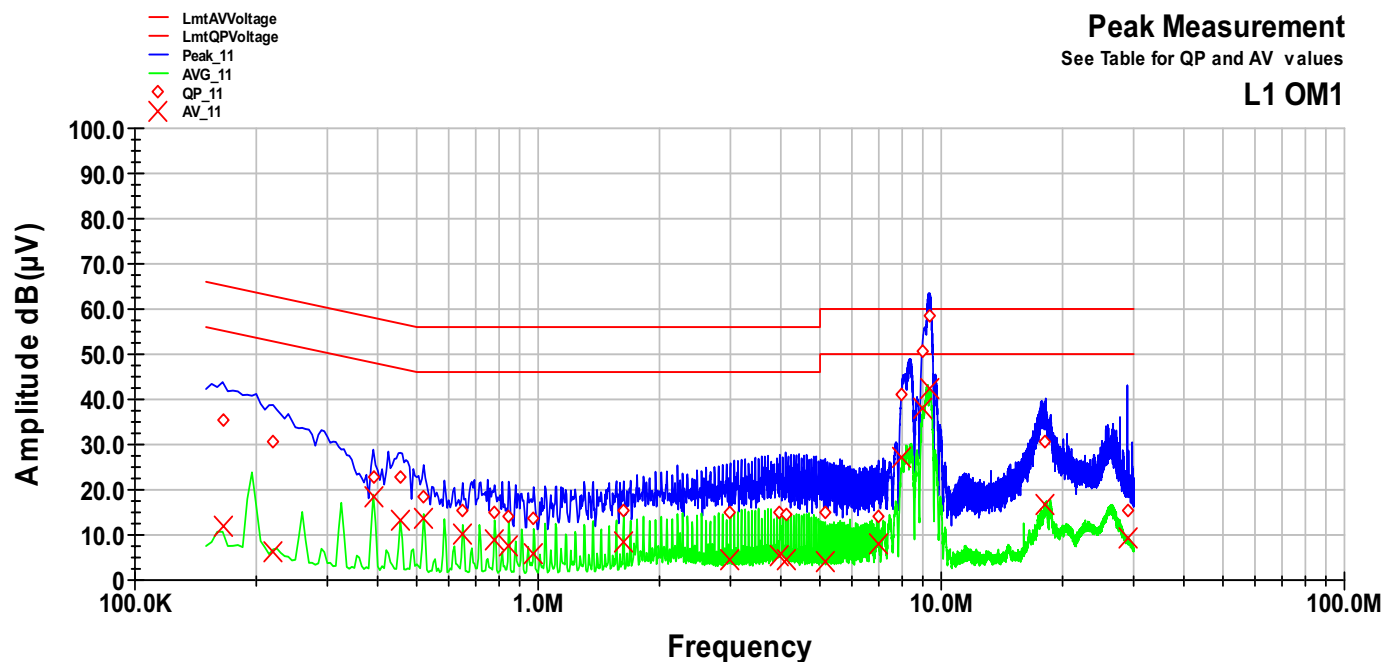
Test point N
Operation mode: Evolve G10 / Continuous sweep mode
Remarks: FCC/IC Requirements
With standard PSU Cable and Ferrite on DC line
9.0MHz Band, Tx1 & Tx2: 31
Tested by: Huber Markus

Result: passed

Peak Measurement

See Table for QP and AV values

L1 OM1



Frequency MHz	QP Level dB(μV)	QP Margin dB	QP Limit dB	AV Level dB(μV)	AV Margin dB	AV Limit dB
0.165	35.3	-29.9	65.2	12.1	-43.1	55.2
0.22	30.4	-32.4	62.8	6.4	-46.4	52.8
0.39	22.6	-35.4	58.1	18.4	-29.7	48.1
0.455	22.8	-34.0	56.8	13.1	-33.7	46.8
0.52	18.3	-37.7	56.0	13.7	-32.3	46.0
0.65	15.6	-40.4	56.0	10.0	-36.0	46.0
0.78	15.0	-41.0	56.0	9.1	-36.9	46.0
0.845	14.0	-42.0	56.0	7.7	-38.3	46.0
0.975	13.8	-42.2	56.0	5.8	-40.2	46.0
1.63	15.4	-40.6	56.0	8.5	-37.5	46.0
3	14.9	-41.1	56.0	4.7	-41.3	46.0
3.975	14.8	-41.2	56.0	5.2	-40.8	46.0
4.11	14.5	-41.5	56.0	4.5	-41.5	46.0
5.15	14.9	-45.1	60.0	4.2	-45.8	50.0
6.985	14.3	-45.7	60.0	7.9	-42.0	50.0
8	40.9	-19.1	60.0	27.2	-22.8	50.0
9	50.7	-9.3	60.0	38.3	-11.8	50.0
9.36	58.5	-1.5	60.0	42.6	-7.4	50.0
18.15	30.7	-29.3	60.0	16.9	-33.1	50.0
28.925	15.5	-44.5	60.0	9.2	-40.8	50.0

FCC ID: DO4EVOLVE

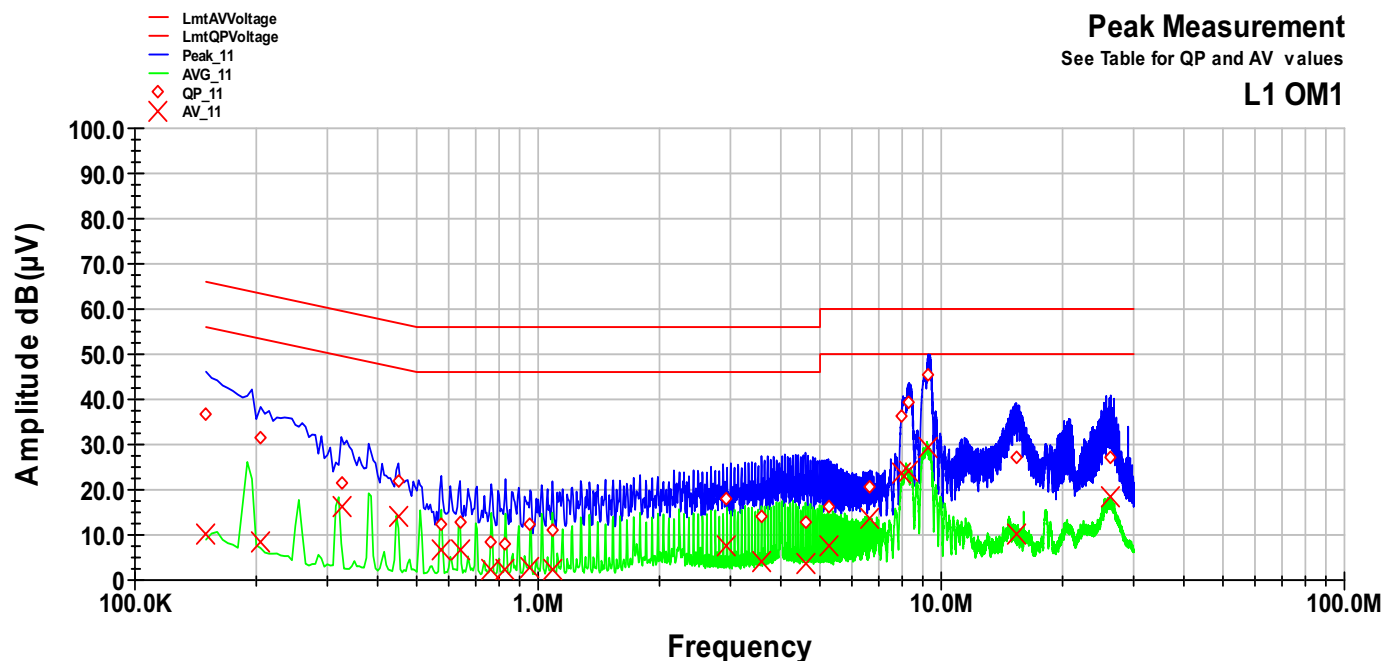
Test point L1
Operation mode: Evolve G20 / Continuous sweep mode
Remarks: FCC/IC Requirements
With standard PSU Cable and Ferrite on DC line
9.0MHz Band, Tx1 & Tx2: 31
Tested by: Huber Markus

Result: passed

Peak Measurement

See Table for QP and AV values

L1 OM1



Frequency MHz	QP Level dB(μV)	QP Margin dB	QP Limit dB	AV Level dB(μV)	AV Margin dB	AV Limit dB
0.15	36.6	-29.4	66.0	10.3	-45.7	56.0
0.205	31.4	-32.0	63.4	8.3	-45.1	53.4
0.325	21.3	-38.2	59.6	16.2	-33.3	49.6
0.45	21.9	-35.0	56.9	13.9	-33.0	46.9
0.575	12.5	-43.5	56.0	6.9	-39.1	46.0
0.64	12.9	-43.1	56.0	6.9	-39.1	46.0
0.765	8.4	-47.6	56.0	2.2	-43.8	46.0
0.83	8.0	-48.0	56.0	2.1	-43.9	46.0
0.955	12.2	-43.8	56.0	2.7	-43.3	46.0
1.085	10.9	-45.1	56.0	2.4	-43.6	46.0
2.94	18.1	-37.9	56.0	7.7	-38.3	46.0
3.58	14.3	-41.7	56.0	4.3	-41.7	46.0
4.605	12.6	-43.4	56.0	3.8	-42.2	46.0
5.245	16.2	-43.8	60.0	7.5	-42.5	50.0
6.66	20.8	-39.2	60.0	13.5	-36.5	50.0
8	36.4	-23.6	60.0	23.7	-26.3	50.0
8.315	39.4	-20.6	60.0	24.0	-26.0	50.0
9.31	45.3	-14.7	60.0	29.4	-20.6	50.0
15.34	27.2	-32.8	60.0	10.2	-39.8	50.0
26.31	27.2	-32.8	60.0	18.5	-31.5	50.0

FCC ID: DO4EVOLVE

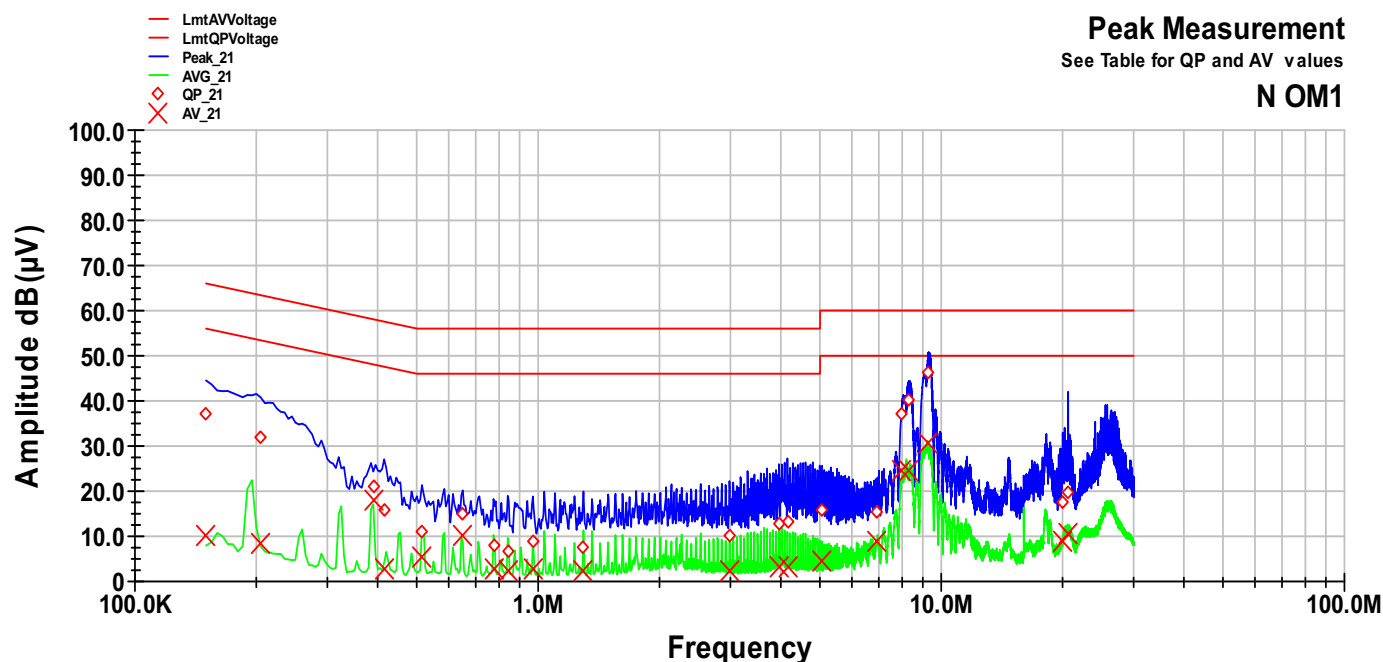
Test point: N
Operation mode: Evolve G20 / Continuous sweep mode
Remarks: FCC/IC Requirements
With standard PSU Cable and Ferrite on DC line
9.0MHz Band, Tx1 & Tx2: 31
Tested by: Huber Markus

Result: passed

Peak Measurement

See Table for QP and AV values

N OM1



Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.15	37.0	-29.0	66.0	10.1	-45.9	56.0
0.205	31.9	-31.5	63.4	8.6	-44.8	53.4
0.39	21.2	-36.8	58.1	17.9	-30.1	48.1
0.415	15.8	-41.7	57.5	2.9	-44.6	47.5
0.515	11.0	-45.0	56.0	5.5	-40.5	46.0
0.65	15.0	-41.0	56.0	9.9	-36.0	46.0
0.775	8.2	-47.8	56.0	2.9	-43.1	46.0
0.84	6.5	-49.5	56.0	2.4	-43.6	46.0
0.97	8.7	-47.3	56.0	2.6	-43.4	46.0
1.295	7.5	-48.5	56.0	2.1	-43.9	46.0
2.98	10.1	-45.9	56.0	2.3	-43.7	46.0
3.955	12.9	-43.2	56.0	3.0	-43.0	46.0
4.15	13.4	-42.6	56.0	3.4	-42.6	46.0
5.06	15.8	-44.2	60.0	4.4	-45.6	50.0
6.945	15.4	-44.7	60.0	8.9	-41.0	50.0
8	37.1	-22.9	60.0	24.3	-25.7	50.0
8.315	40.2	-19.8	60.0	24.6	-25.4	50.0
9.295	46.1	-13.9	60.0	30.4	-19.6	50.0
19.995	17.4	-42.6	60.0	8.7	-41.3	50.0
20.635	19.5	-40.5	60.0	10.7	-39.3	50.0

FCC ID: DO4EVOLVE

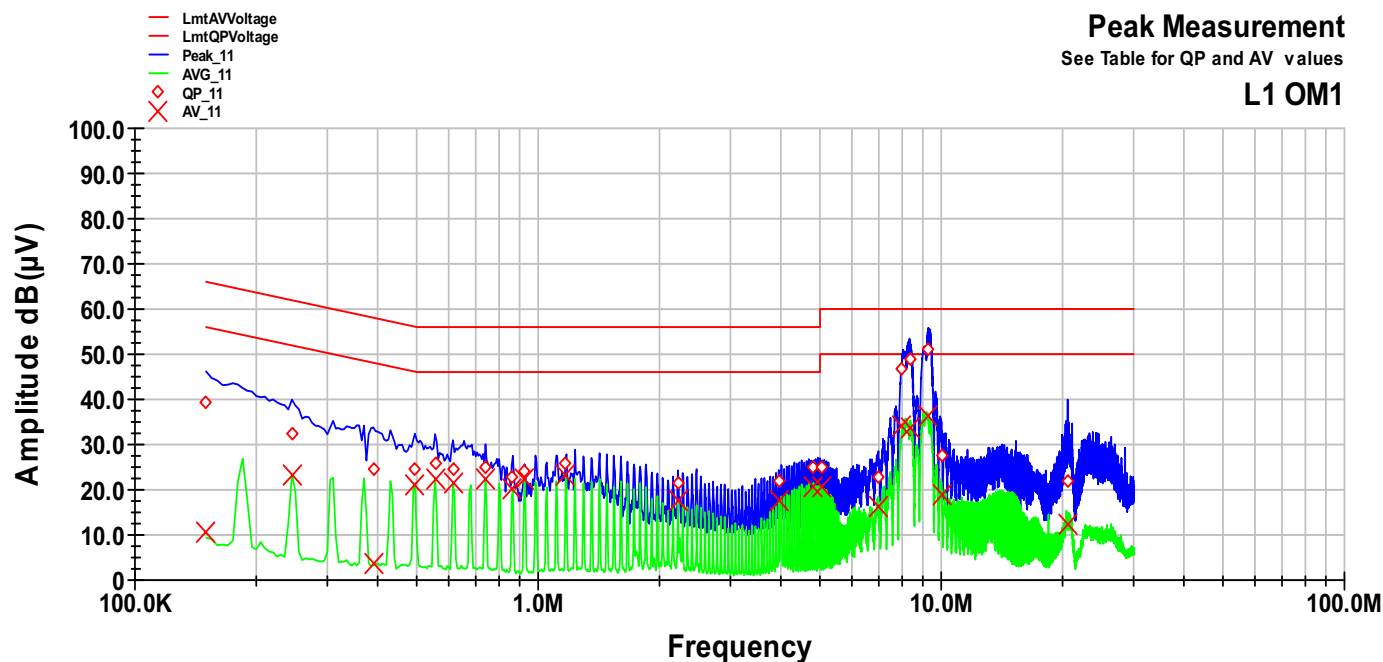
Test point L1
Operation mode: Evolve P10 / Continuous sweep mode
Remarks: FCC/IC Requirements
With standard PSU Cable and Ferrite on DC line
9.0MHz Band, Tx1 & Tx2: 31
Tested by: Huber Markus

Result: passed

Peak Measurement

See Table for QP and AV values

L1 OM1



Frequency MHz	QP Level dB(μV)	QP Margin dB	QP Limit dB	AV Level dB(μV)	AV Margin dB	AV Limit dB
0.15	39.3	-26.7	66.0	10.6	-45.4	56.0
0.245	32.6	-29.4	61.9	23.4	-28.5	51.9
0.39	24.6	-33.5	58.1	3.8	-44.3	48.1
0.495	24.5	-31.6	56.1	21.1	-24.9	46.1
0.555	25.7	-30.3	56.0	22.4	-23.6	46.0
0.615	24.6	-31.4	56.0	21.6	-24.4	46.0
0.74	25.0	-31.0	56.0	22.5	-23.5	46.0
0.865	22.6	-33.4	56.0	20.1	-25.9	46.0
0.925	24.2	-31.8	56.0	22.3	-23.7	46.0
1.17	25.6	-30.4	56.0	23.3	-22.7	46.0
2.22	21.4	-34.6	56.0	17.5	-28.5	46.0
3.95	22.1	-33.9	56.0	17.6	-28.4	46.0
4.815	24.9	-31.1	56.0	20.7	-25.3	46.0
5.06	24.9	-35.1	60.0	20.5	-29.5	50.0
6.98	22.7	-37.3	60.0	16.4	-33.6	50.0
8	46.8	-13.2	60.0	34.2	-15.8	50.0
8.335	48.8	-11.2	60.0	33.6	-16.4	50.0
9.28	51.0	-9.0	60.0	36.2	-13.8	50.0
10.015	27.8	-32.2	60.0	18.8	-31.2	50.0
20.555	22.0	-38.0	60.0	12.5	-37.5	50.0

FCC ID: DO4EVOLVE

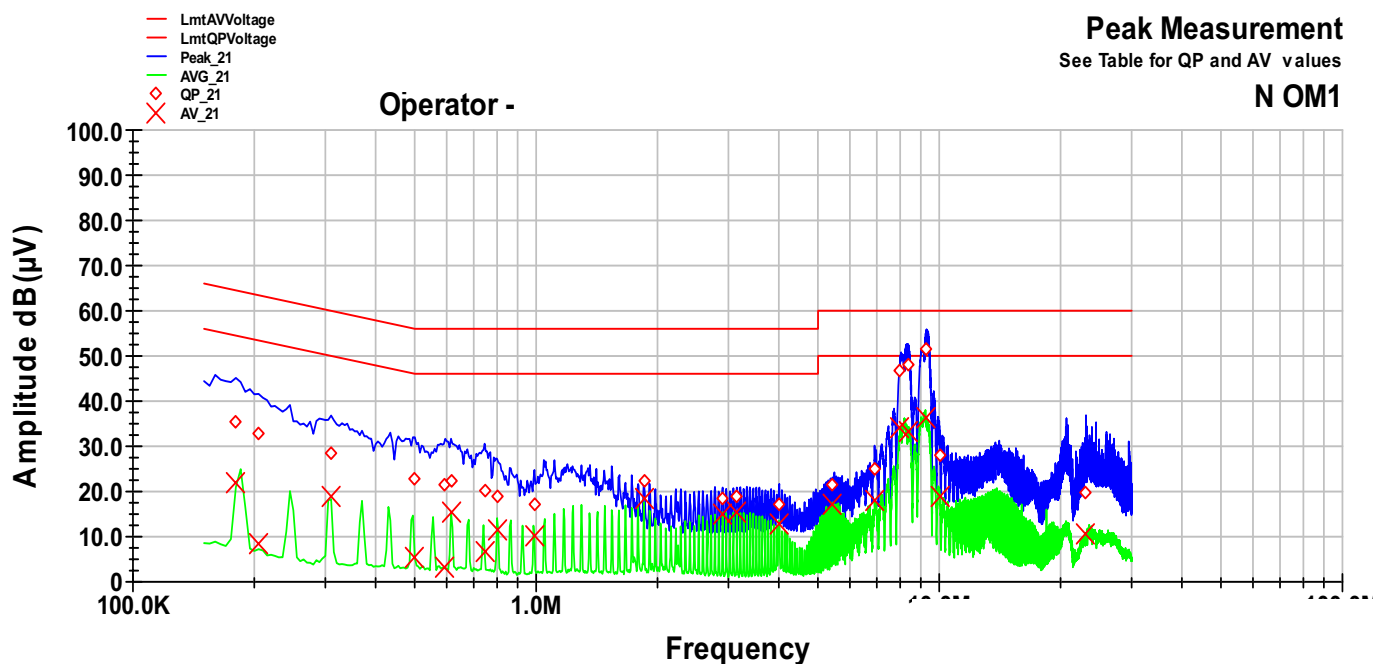
Test point: N
Operation mode: Evolve P10 / Continuous sweep mode
Remarks: FCC/IC Requirements
With standard PSU Cable and Ferrite on DC line
9.0MHz Band, Tx1 & Tx2: 31
Tested by: Huber Markus

Result: passed

Peak Measurement

See Table for QP and AV values

N OM1



Frequency MHz	QP Level dB(μV)	QP Margin dB	QP Limit dB	AV Level dB(μV)	AV Margin dB	AV Limit dB
0.18	35.5	-29.0	64.5	22.0	-32.5	54.5
0.205	32.8	-30.6	63.4	8.3	-45.1	53.4
0.31	28.3	-31.7	60.0	18.7	-31.2	50.0
0.5	23.0	-33.0	56.0	5.3	-40.7	46.0
0.595	21.7	-34.3	56.0	3.2	-42.8	46.0
0.615	22.4	-33.7	56.0	15.3	-30.7	46.0
0.745	20.4	-35.6	56.0	6.8	-39.2	46.0
0.805	18.9	-37.1	56.0	11.5	-34.5	46.0
0.99	17.3	-38.8	56.0	10.3	-35.7	46.0
1.85	22.6	-33.4	56.0	18.6	-27.4	46.0
2.9	18.5	-37.5	56.0	15.1	-30.9	46.0
3.145	19.1	-36.9	56.0	15.6	-30.4	46.0
4.01	17.3	-38.7	56.0	12.6	-33.4	46.0
5.43	21.3	-38.7	60.0	17.3	-32.7	50.0
6.91	24.8	-35.2	60.0	18.2	-31.8	50.0
8	46.9	-13.1	60.0	34.3	-15.7	50.0
8.35	48.2	-11.8	60.0	33.4	-16.6	50.0
9.295	51.4	-8.6	60.0	36.1	-13.9	50.0
10.015	27.9	-32.1	60.0	19.0	-31.0	50.0
23.09	19.7	-40.3	60.0	10.6	-39.4	50.0

FCC ID: DO4EVOLVE

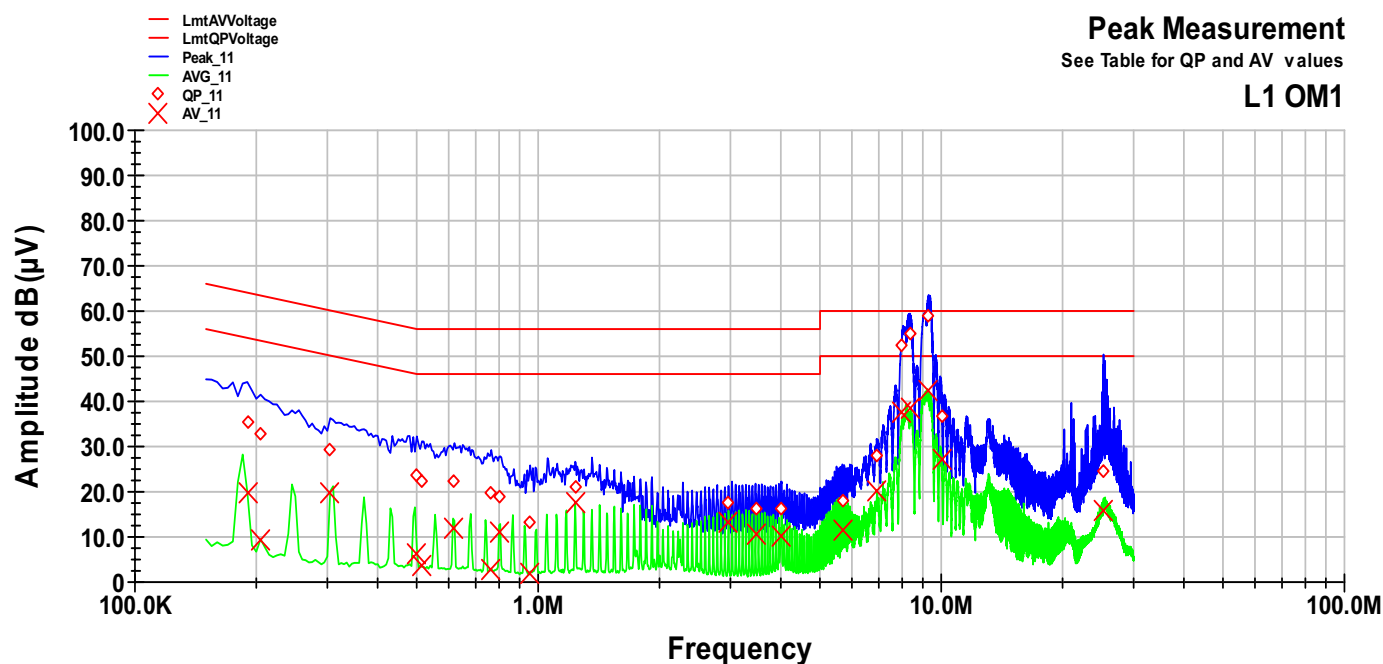
Test point L1
Operation mode: Evolve P20 / Continuous sweep mode
Remarks: FCC/IC Requirements
With standard PSU Cable and Ferrite on DC line
9.0MHz Band, Tx1 & Tx2: 31
Tested by: Huber Markus

Result: passed

Peak Measurement

See Table for QP and AV values

L1 OM1



Frequency MHz	QP Level dB(μV)	QP Margin dB	QP Limit dB	AV Level dB(μV)	AV Margin dB	AV Limit dB
0.19	35.5	-28.6	64.0	19.7	-34.3	54.0
0.205	32.8	-30.6	63.4	9.2	-44.2	53.4
0.305	29.3	-30.8	60.1	20.0	-30.2	50.1
0.5	23.5	-32.5	56.0	6.1	-39.9	46.0
0.515	22.6	-33.4	56.0	3.5	-42.5	46.0
0.62	22.5	-33.5	56.0	11.8	-34.3	46.0
0.765	19.9	-36.1	56.0	2.8	-43.2	46.0
0.805	18.8	-37.3	56.0	11.1	-34.9	46.0
0.955	13.3	-42.7	56.0	2.0	-44.0	46.0
1.235	20.9	-35.1	56.0	17.5	-28.5	46.0
2.965	17.7	-38.3	56.0	13.3	-32.8	46.0
3.46	16.3	-39.7	56.0	10.6	-35.4	46.0
4.015	16.1	-39.9	56.0	10.3	-35.7	46.0
5.685	18.1	-41.9	60.0	11.3	-38.7	50.0
6.91	27.9	-32.1	60.0	20.1	-29.9	50.0
8	52.4	-7.6	60.0	37.4	-12.6	50.0
8.365	55.1	-4.9	60.0	38.6	-11.4	50.0
9.295	58.7	-1.3	60.0	42.2	-7.8	50.0
10.015	36.7	-23.3	60.0	27.2	-22.8	50.0
25.245	24.6	-35.4	60.0	15.7	-34.3	50.0

FCC ID: DO4EVOLVE

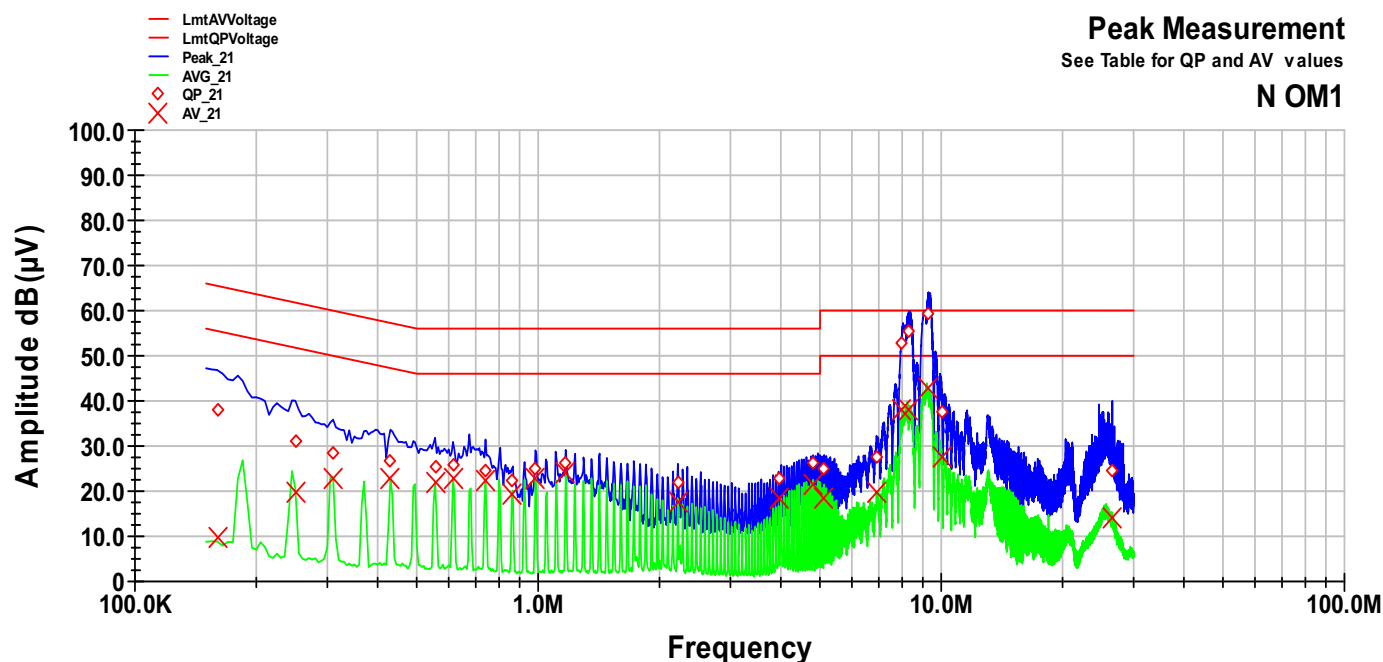
Test point: N
Operation mode: Evolve P20 / Continuous sweep mode
Remarks: FCC/IC Requirements
With standard PSU Cable and Ferrite on DC line
9.0MHz Band, Tx1 & Tx2: 31
Tested by: Huber Markus

Result: passed

Peak Measurement

See Table for QP and AV values

N OM1



Frequency MHz	QP Level dB(μV)	QP Margin dB	QP Limit dB	AV Level dB(μV)	AV Margin dB	AV Limit dB
0.16	38.0	-27.5	65.5	9.9	-45.5	55.5
0.25	30.9	-30.8	61.8	19.6	-32.2	51.8
0.31	28.6	-31.4	60.0	22.7	-27.3	50.0
0.43	26.7	-30.5	57.3	22.8	-24.4	47.3
0.555	25.5	-30.5	56.0	21.9	-24.1	46.0
0.615	25.7	-30.3	56.0	22.8	-23.2	46.0
0.74	24.7	-31.3	56.0	22.2	-23.8	46.0
0.865	22.4	-33.6	56.0	19.5	-26.5	46.0
0.985	25.2	-30.8	56.0	22.9	-23.1	46.0
1.17	26.3	-29.7	56.0	24.2	-21.8	46.0
2.22	21.7	-34.3	56.0	17.6	-28.4	46.0
3.945	22.8	-33.2	56.0	18.4	-27.6	46.0
4.81	26.4	-29.6	56.0	21.6	-24.4	46.0
5.12	25.0	-35.0	60.0	18.6	-31.4	50.0
6.91	27.4	-32.6	60.0	19.7	-30.3	50.0
8	52.8	-7.2	60.0	37.9	-12.1	50.0
8.315	55.4	-4.6	60.0	37.8	-12.2	50.0
9.295	59.4	-0.6	60.0	42.8	-7.2	50.0
10.015	37.4	-22.6	60.0	27.7	-22.3	50.0
26.545	24.7	-35.3	60.0	14.0	-36.0	50.0

5.2 Field strength of the fundamental wave

For test instruments and accessories used see section 6 Part CPR 1.

5.2.1 Description of the test location

Test location: OATS1

Test distance: 10 metres

5.2.2 Photo documentation of the test set-up

Evolve G10:



Evolve G20:



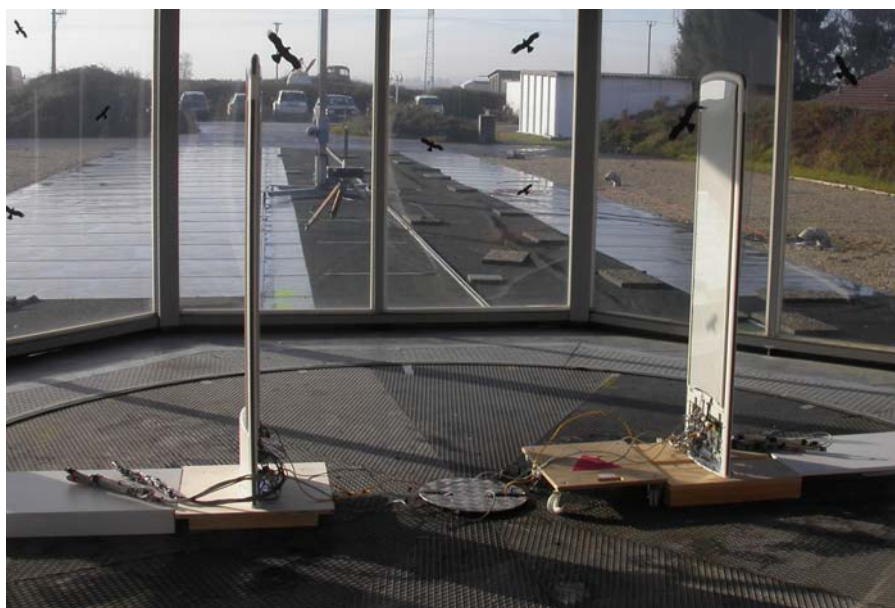
Evolve P10:



Evolve P20:



PX:



5.2.3 Description of Measurement

The magnetic field strength from the EuT will be measured on an open area test site in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions. In the case where larger measuring distances are required the results will extrapolated based on the values measured on the closer distances according to Section 15.31 (f) (2) [2]. The final measurement will be performed with an EMI Receiver set to an average and a peak detector.

The final level, expressed in $\text{dB}\mu\text{V}/\text{m}$, is arrived at by taking the reading from the EMI receiver (Level $\text{dB}\mu\text{V}$) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.

The resolution bandwidth during the measurement was 300 kHz.

5.2.4 Test result

Evolve G10:

10m Distance measured:

Frequency [MHz]	L: PK [dBµV]	Correct. [dB]	L: PK [dBµV/m]	Limit [dBµV/m]	Delta [dB]	Tx1 & Tx2:
8.2	59.6	20	79.6	80.0	0.4	30
9.0	59.7	20	79.7	80.0	0.3	26

30m Distance calculated:

Frequency [MHz]	L: PK [dBµV]	Correct. [dB]	L: PK [dBµV/m]	Limit [dBµV/m]	Delta [dB]
8.2	39.6	20	59.6	60.0	0.4
9.0	39.7	20	59.7	60.0	0.3

Evolve G20:

10m Distance measured:

Frequency [MHz]	L: PK [dBµV]	Correct. [dB]	L: PK [dBµV/m]	Limit [dBµV/m]	Delta [dB]	Tx1 & Tx2:
8.2	59.8	20	79.8	80.0	0.2	29
9.0	59.9	20	79.9	80.0	0.1	25

30m Distance calculated:

Frequency [MHz]	L: PK [dBµV]	Correct. [dB]	L: PK [dBµV/m]	Limit [dBµV/m]	Delta [dB]
8.2	39.8	20	59.8	60.0	0.5
9.0	39.9	20	59.9	60.0	0.1

Evolve P10:

10m Distance measured

Frequency [MHz]	L: PK [dBµV]	Correct. [dB]	L: PK [dBµV/m]	Limit [dBµV/m]	Delta [dB]	Tx1 & Tx2:
8.2	59.9	20	79.9	80.0	0.1	31
9.0	59.7	20	79.7	80.0	0.3	28

30m Distance calculated:

Frequency [MHz]	L: PK [dBµV]	Correct. [dB]	L: PK [dBµV/m]	Limit [dBµV/m]	Delta [dB]
8.2	39.9	20	59.9	60.0	0.1
9.0	39.7	20	59.7	60.0	0.3

Evolve P20:

10m Distance measured:

Frequency [MHz]	L: PK [dBµV]	Correct. [dB]	L: PK [dBµV/m]	Limit [dBµV/m]	Delta [dB]	Tx1 & Tx2:
8.2	58.5	20	78.5	80.0	1.5	31
9.0	59.4	20	79.4	80.0	0.6	28

30m Distance calculated:

Frequency [MHz]	L: PK [dBµV]	Correct. [dB]	L: PK [dBµV/m]	Limit [dBµV/m]	Delta [dB]
8.2	38.5	20	58.5	60.0	1.5
9.0	39.4	20	59.4	60.0	0.6

FCC ID: DO4EVOLVE

PX:

10m Distance measured:

Frequency [MHz]	L: PK [dBµV]	Correct. [dB]	L: PK [dBµV/m]	Limit [dBµV/m]	Delta [dB]	Tx1 & Tx2:
8.2	59.7	20	79.7	80.0	0.3	31
9.0	59.9	20	79.9	80.0	0.1	28

30m Distance calculated:

Frequency [MHz]	L: PK [dBµV]	Correct. [dB]	L: PK [dBµV/m]	Limit [dBµV/m]	Delta [dB]
8.2	39.7	20	59.7	60.0	0.3
9.0	39.9	20	59.9	60.0	0.1

Limit according to FCC Part 15 Subpart 15.223, 15.35(b)

Frequency (MHz)	Field strength of fundamental – Average Detector	
	(µV/m)	dB (µV/m)
1.705-10.0	100*	40*

Frequency (MHz)	Field strength of fundamental – Peak Detector	
	(µV/m)	dB (µV/m)
1.705-10.0	1000*	60*

* At a test distance of 30 metres

The requirements are **FULFILLED**.

Remarks:

5.3 Spurious emissions (Magnetic field) 9 kHz – 30 MHz

For test instruments and accessories used see section 6 Part SER 1.

5.3.1 Description of the test location

Test location: OATS1

Test distance: 10 metres

5.3.2 Photo documentation of the test set-up

Evolve G10:



Evolve G20:



FCC ID: DO4EVOLVE

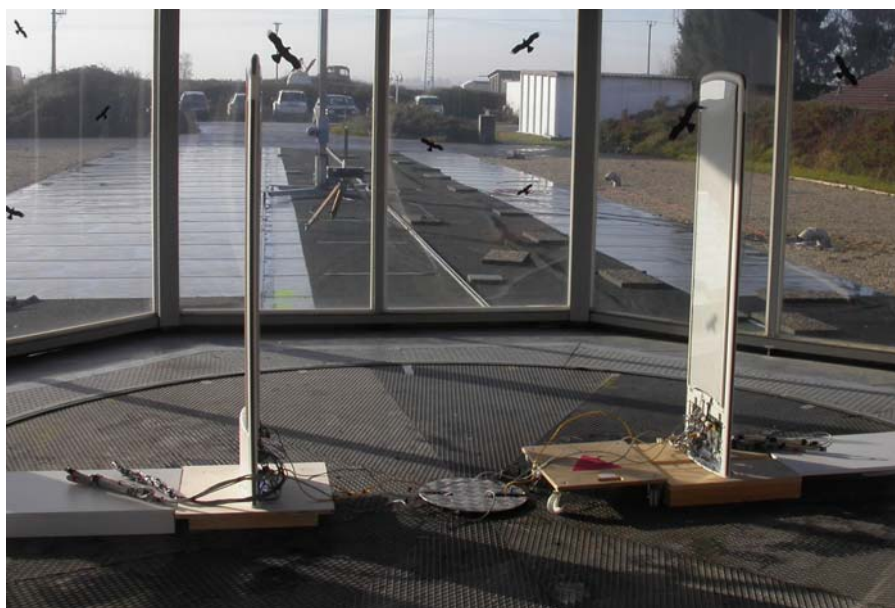
Evolve P10:



Evolve P20:



PX:



5.3.3 Description of Measurement

The spurious emissions from the EuT will be measured on an open area test site in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions. In the case where larger measuring distances are required the results will extrapolated based on the values measured on the closer distances according to Section 15.31 (f) (2) [2]. The final measurement will be performed with an EMI Receiver set to Quasi Peak detector except for the frequency bands 9 kHz to 90 kHz and 110 to 490 kHz where an average detector will be used according to Section 15.209 (d) [2].

The final level, expressed in $\text{dB}\mu\text{V}/\text{m}$, is arrived at by taking the reading from the EMI receiver (Level $\text{dB}\mu\text{V}$) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.

The resolution bandwidth during the measurement is as follows:

9 kHz – 150 kHz: ResBW: 200 Hz

150 kHz – 30 MHz: ResBW: 300 kHz

Example:

Frequency (MHz)	Level ($\text{dB}\mu\text{V}$)	+	Factor (dB)	=	Level ($\text{dB}\mu\text{V}/\text{m}$)	Limit ($\text{dB}\mu\text{V}/\text{m}$)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

5.3.4 Test result

Evolve G10

Tx Frequency: 8.2 MHz Band, 9.0 MHz Dual Band

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
0.009 – 30.0				20				40.0	> 20

Evolve G20

Tx Frequency: 8.2 MHz Band, 9.0 MHz Dual Band

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
0.009 – 30.0				20				40.0	> 20

Evolve P10

Tx Frequency: 8.2 MHz Band, 9.0 MHz Dual Band

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
0.009 – 30.0				20				40.0	> 20

Evolve P20

Tx Frequency: 8.2 MHz Band, 9.0 MHz Dual Band

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
0.009 – 30.0				20				40.0	> 20

PX

Tx Frequency: 8.2 MHz Band, 9.0 MHz Dual Band

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
0.009 – 30.0				20				40.0	> 20

Limit according to FCC Part 15 Subpart 15.209(a), Subpart 15.223(a)

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
0.009-0.490	2400/F(kHz)	--	300
0.490-1.705	24000/F (kHz)	--	30
1.705-30.0	100	40	30

The requirements are **FULFILLED**.

Remarks:

5.4 Radiated emissions (electric field) 30 MHz – 1 GHz

For test instruments and accessories used see section 6 Part SER 2.

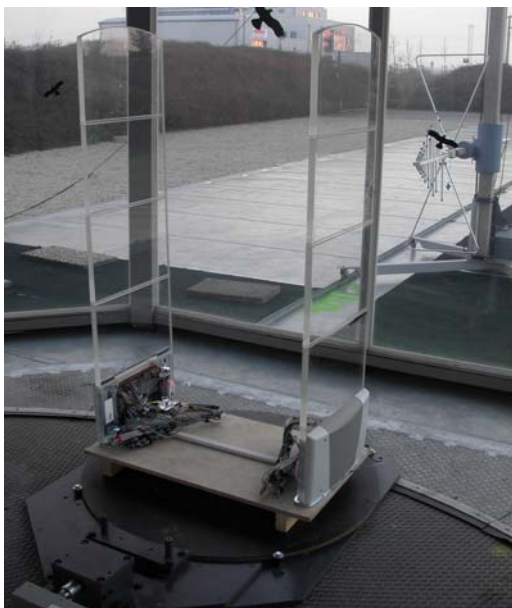
5.4.1 Description of the test location

Test location: OATS1

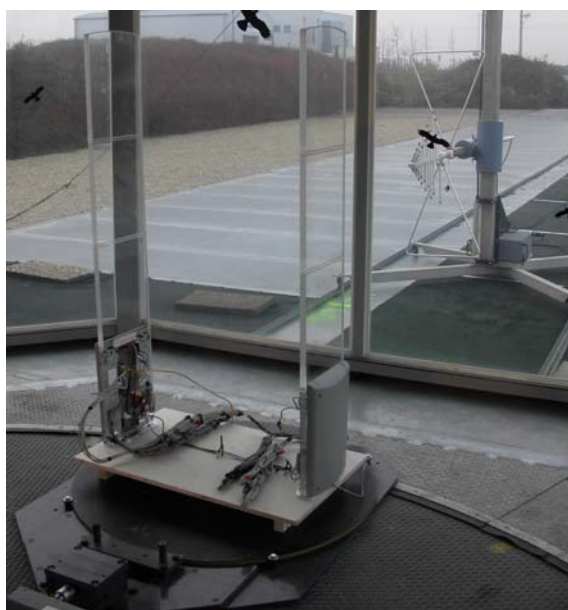
Test distance: 3 metres

5.4.2 Photo documentation of the test set-up

Evolve G10:



Evolve G20:



FCC ID: DO4EVOLVE

Evolve P10:



Evolve P20:



PX:



5.4.3 Description of Measurement

Spurious emissions from the EuT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003. The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization's and the EuT are rotated 360 degrees.

The final level, expressed in dB μ V/m, is arrived by taking the reading from the EMI receiver (Level dB μ V) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

The resolution bandwidth during the measurement is as follows:
30 MHz – 1000 MHz: ResBW: 120 kHz

Example:

Frequency (MHz)	Level (dB μ V)	+	Factor (dB)	=	Level (dB μ V/m)	Limit (dB μ V/m)	=	Delta (dB)
719	75	+	32.6	=	107.6	110	=	-2.4

5.4.4 Test result

Extract of the critical values:

Evolve G10, Tx Frequency: 9.0 MHz Dual Band, Tx1&Tx2:31

Frequency [MHz]	L: QP [dB μ V]	Correct. [dB]	L: QP [dB μ V/m]	Limit [dB μ V/m]	Delta [dB]
32.29	15.2	14.2	29.4	40.0	10.6
40.35	24.5	15.1	39.6	40.0	0.4
72.59	24.9	11.8	36.7	40.0	3.3
74.55	22.4	11.5	33.9	40.0	6.1
83.31	27.5	11.5	38.3	40.0	1.7
121.09	22.7	14.1	36.8	43.5	6.7

Evolve G20, Tx Frequency: 9.0 MHz Dual Band, Tx1&Tx2:31

Frequency [MHz]	L: QP [dB μ V]	Correct. [dB]	L: QP [dB μ V/m]	Limit [dB μ V/m]	Delta [dB]
45.37	25.1	14.7	39.8	40.0	0.2
46.61	24.0	14.7	38.7	40.0	1.3
58.29	19.1	14.1	33.2	40.0	6.8
72.73	25.6	11.8	37.4	40.0	2.6
80.76	28.0	10.7	38.7	40.0	1.3
83.92	24.3	10.8	35.1	40.0	4.9

Extract of the critical values:

Evolve P10, Tx Frequency: 9.0 MHz Dual Band, Tx1&Tx2:31

Frequency [MHz]	L: QP [dBµV]	Correct. [dB]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
41.68	22.3	15.0	37.3	40.0	2.7
58.30	24.5	14.1	38.6	40.0	1.4
66.60	23.4	12.8	36.2	40.0	3.8
83.23	23.4	10.8	34.2	40.0	5.8
108.90	18.2	12.8	31.0	43.5	12.5
116.57	14.9	13.6	28.5	43.5	15.0

Evolve P20, Tx Frequency: 9.0 MHz Dual Band, Tx1&Tx2:31

Frequency [MHz]	L: QP [dBµV]	Correct. [dB]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
45.39	21.7	14.7	36.4	40.0	3.6
56.14	25.2	14.3	39.5	40.0	0.5
59.90	22.2	14.0	36.2	40.0	3.8
108.25	20.0	12.7	32.7	43.5	10.8
111.92	20.1	13.1	33.2	43.5	10.3
121.28	20.9	14.1	35.0	43.5	8.5

PX, Tx Frequency: 9.0 MHz Dual Band, Tx1&Tx2:31

Frequency [MHz]	L: QP [dBµV]	Correct. [dB]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
33.36	21.0	14.2	35.2	40.0	4.8
41.64	20.9	15.0	35.9	40.0	4.1
46.65	19.4	14.7	34.1	40.0	5.9
56.52	21.0	14.2	35.2	40.0	4.8
108.88	25.0	12.8	37.8	43.5	5.7
165.21	22.4	15.6	38.0	43.5	5.5

Limit according to FCC Part 15 Subpart 15.209(a)

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
960-1000	500	54	3

The requirements are **FULFILLED**.

Remarks:

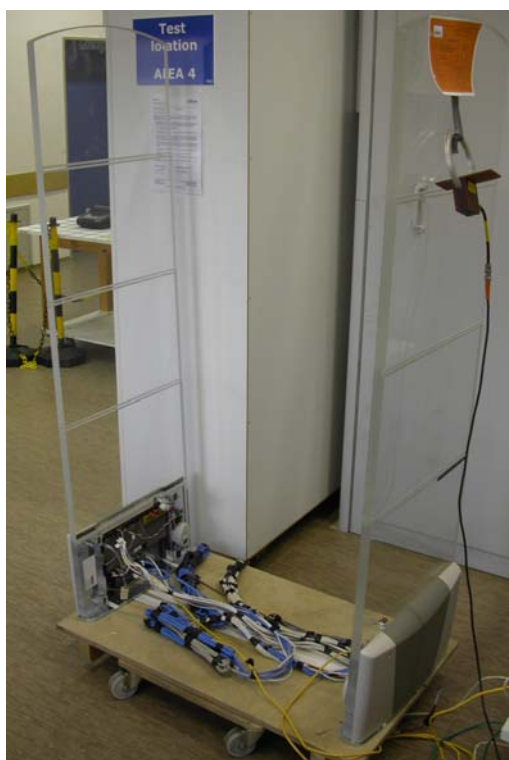
5.5 Emission Bandwidth

For test instruments and accessories used see section 6 Part MB.

5.5.1 Description of the test location

Test location: AREA4

5.5.2 Photo documentation of the test set-up



5.5.3 Test result

Tx Frequency: 8.2 MHz Dual Band

Fundamental [MHz] See Plot 1	6dB Bandwidth F1 [MHz]	6dB Bandwidth F2 [MHz]	Measured Bandwidth [MHz]
8.2	7.690	8.662	0.972

Tx Frequency: 9.0 MHz Dual Band

Fundamental [MHz] See Plot 2	6dB Bandwidth F1 [MHz]	6dB Bandwidth F2 [MHz]	Measured Bandwidth [MHz]
8.2 & 9.2	7.816	9.536	1.72

Tx Frequency: 9.0 MHz Dual Band

Fundamental [MHz] See Plot 3	6dB Bandwidth F1 [MHz]	6dB Bandwidth F2 [MHz]	Measured Bandwidth [MHz]
8.2 & 9.2	7.752	9.584	1.832

FCC ID: DO4EVOLVE

5.5.4 Test protocol

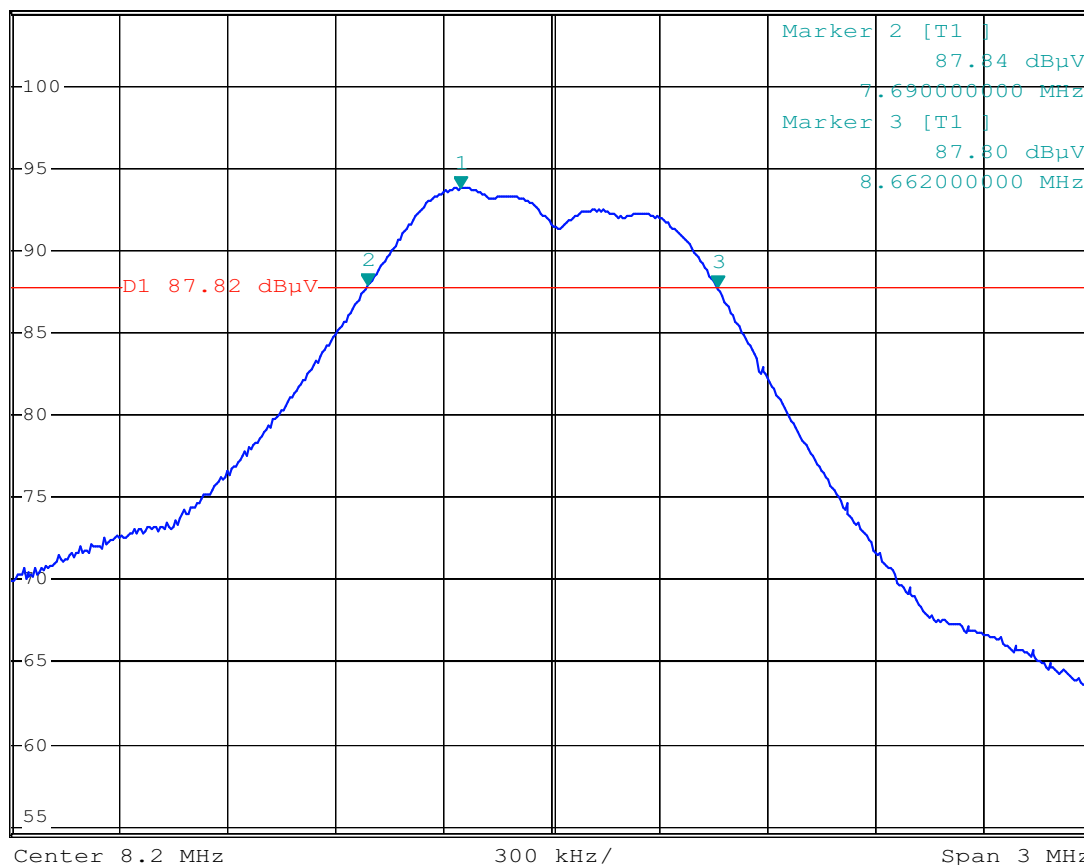
Emission Bandwidth FCC Part 15 Subpart 15.223(a)

Plot 1:



*RBW 300 kHz Marker 1 [T1]
*VBW 300 kHz 93.82 dBμV
Ref 104.5 dBμV Att 30 dB SWT 2.5 ms 7.948000000 MHz

1 PK
VIEW



FCC ID: DO4EVOLVE

Emission Bandwidth
FCC Part 15 Subpart 15.223(a)

Plot 2:



SELECT TRACE
1

Ref 99 dBμV

Att 30 dB

*RBW 300 kHz

*VBW 300 kHz

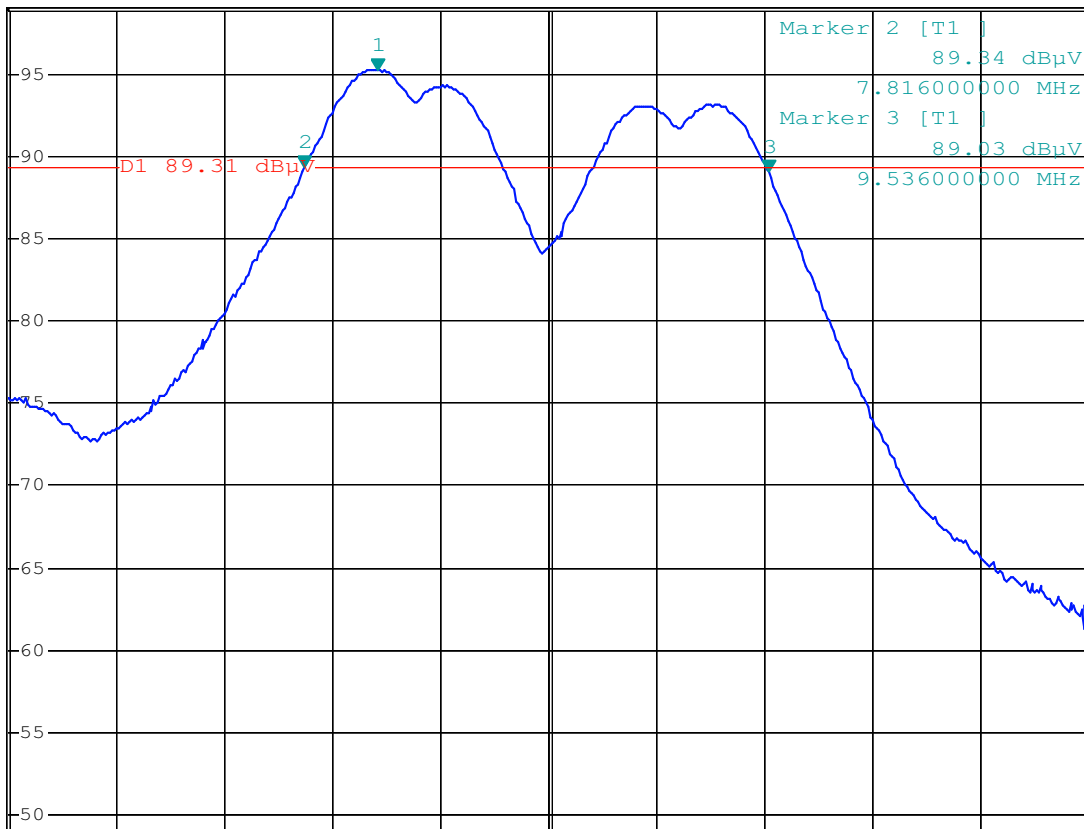
SWT 2.5 ms

Marker 1 [T1]

95.31 dBμV

8.088000000 MHz

1 PK
VIEW



A

Center 8.72 MHz

400 kHz/

Span 4 MHz

FCC ID: DO4EVOLVE

Emission Bandwidth
FCC Part 15 Subpart 15.223(a)

Plot 3:



MARKER 1

9.32 MHz

Ref 99 dBµV

Att 30 dB

* RBW 300 kHz

* VBW 300 kHz

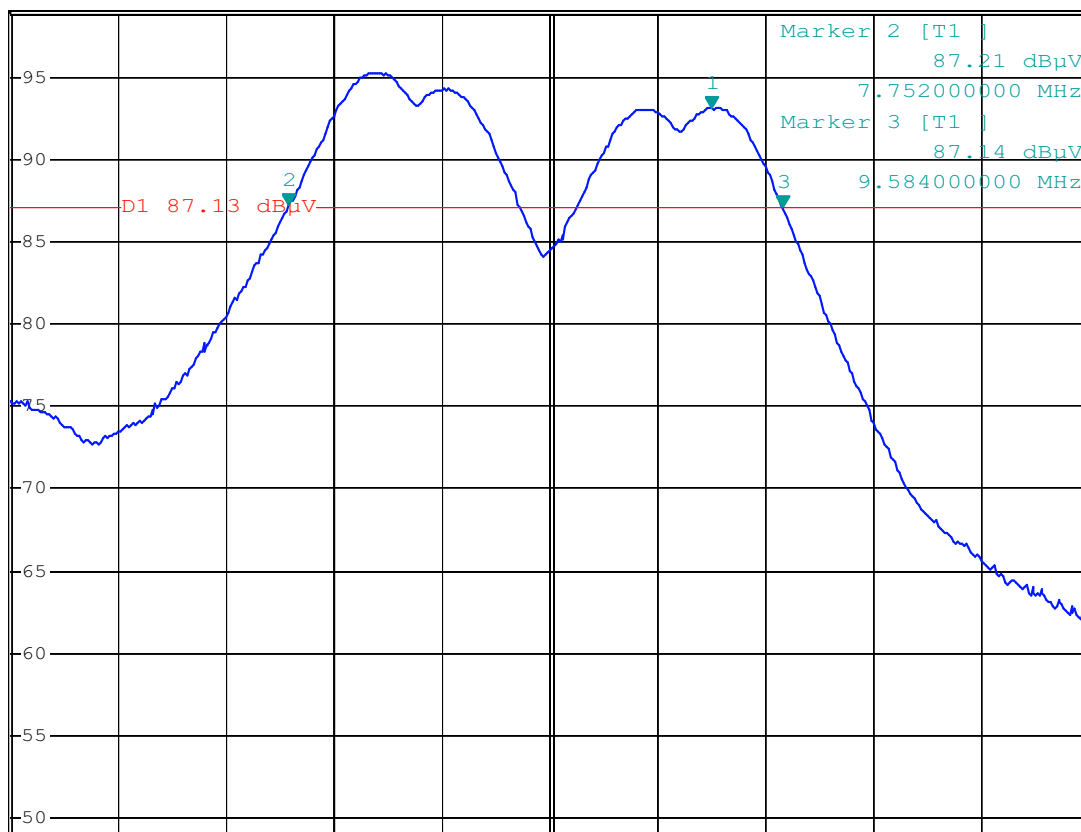
SWT 2.5 ms

Marker 1 [T1]

93.13 dBµV

9.32000000 MHz

1 PK
VIEW



A

Center 8.72 MHz

400 kHz/

Span 4 MHz

6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

The calibration intervals and the calibration history will be given out on request.

Test Report No: T31884-04-00HU
Beginning of Testing: 20 November 2007
End of Testing: 30 November 2007

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.
A 4	ESHS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-002
	NNLK 8129	LISN	Schwarzbeck Mess-Elektron	02-02/20-05-001
	ESH 2 - Z 5	LISN	Rohde & Schwarz München	02-02/20-05-004
	N-4000-BNC	RF Cable	mikes-testingpartners gmbh	02-02/50-05-138
	N-1500-N	RF Cable	mikes-testingpartners gmbh	02-02/50-05-140
	ESH 3 - Z 2	Pulse Limiter	Rohde & Schwarz München	02-02/50-05-155
	SP 103 /3.5-60	Convertor 220V / 110V	mikes-testingpartners gmbh	02-02/50-05-182
CPR 1	FMZB 1516	Magnetic Field Antenna	Schwarzbeck Mess-Elektron	01-02/24-01-018
	ESCI	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-005
	S10162-B	RF Cable 33m	Huber + Suhner	02-02/50-05-031
	KK-EF393-21N-16	RF Cable 20m	Huber + Suhner	02-02/50-05-033
	NW-2000-NB	RF Cable	Huber + Suhner	02-02/50-05-113
MB	FSP 30	Spectrum Analyzer	Rohde & Schwarz München	02-02/11-05-001
	HZ-10	Magnetic Field Antenna	Rohde & Schwarz München	02-02/24-05-012
SER 1	FMZB 1516	Magnetic Field Antenna	Schwarzbeck Mess-Elektron	01-02/24-01-018
	ESCI	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-005
	S10162-B	RF Cable 33m	Huber + Suhner	02-02/50-05-031
	KK-EF393-21N-16	RF Cable 20m	Huber + Suhner	02-02/50-05-033
	NW-2000-NB	RF Cable	Huber + Suhner	02-02/50-05-113
SER 2	ESVS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-006
	VULB 9168	Trilog-Broadband Anten	Schwarzbeck Mess-Elektron	02-02/24-05-005
	S10162-B	RF Cable 33m	Huber + Suhner	02-02/50-05-031
	KK-EF393-21N-16	RF Cable 20m	Huber + Suhner	02-02/50-05-033
	NW-2000-NB	RF Cable	Huber + Suhner	02-02/50-05-113

FCC ID: DO4EVOLVE

Test Report No: T31884-04-00HU
Beginning of Testing: 20 November 2007
End of Testing: 30 November 2007

Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A4				
02-02/03-05-002	04/20/2008	04/20/2007		
02-02/20-05-001	05/13/2008	11/13/2007		
02-02/20-05-004	03/11/2008	04/11/2005	05/13/2008	11/13/2007
02-02/50-05-155	03/25/2008	09/25/2007		
CPR1				
01-02/24-01-018	12/04/2008	12/04/2007		
02-02/03-05-005	06/11/2008	06/11/2007		
MB				
02-02/11-05-001	12/06/2008	12/06/2006		
SER 1				
01-02/24-01-018	12/04/2008	12/04/2007		
02-02/03-05-005	06/11/2008	06/11/2007		
SER 2				
02-02/03-05-006	07/24/2008	07/24/2007		
02-02/24-05-005	04/15/2008	04/15/2005	09/21/2008	09/21/2007

7 Constructional dataform for testing

Licence holder:	Checkpoint Systems, Inc.				
Address:	101 Wolf Drive, Thorofare, New Jersey, USA 08086				
Manufacturer:	Pikatron Feinwerktechnik GmbH & Co. KG				
Address:	Raiffeisenstrasse 10, 61250 Usingen				
Type:	Electronic Article Surveillance Detection Systems				
Model Names:	EVOLVE (EMERALD ELECTRONIC) Models: EVOLVE P10, EVOLVE P20, EVOLVE G10, EVOLVE G20, LIBERTY PX w/EMERALD				
Serial-No.:	EVOLVE P10 PAB S/N: 7411639C0U01857001 7411639C0U01857002	EVOLVE P20 PAB S/N: 7172727C0U01857001 7172727C0U01857002	EVOLVE G10 PAB S/N: 7410859C0U01857001 7410859C0U01857002	EVOLVE G20 PAB S/N: 7283991C0U01857001 7283991C0U01857002	LIBERTY PX w/EMERALD S/N: 736121603D11996098 736121603D11996117

Additional information to the above named model:

Antenna: transmitter-receiver	Type: Loop Antennas				
Antenna	EVOLVE P10	EVOLVE P20	EVOLVE G10	EVOLVE G20	LIBERTY PX
Width	460 mm	270 mm	500 mm	300 mm	430 mm
Height	1430 mm	1550 mm	1390 mm	1640 mm	1450 mm
Power supply of the transmitter: Type:	nominal voltage: 24.0 V				
	lowest voltage: 18.0 V				
	highest voltage: 25.0 V				
	current consumption 0.5 A				
Power supply of the receiver: Type:	Same as transmitter				
	nominal voltage: V				
	lowest voltage: V				
	highest voltage: V				
	current consumption A				

Ancillary equipment:

Description:	PSU	Type:	GT-2S5024D-R	Serial-no.:	RoHS00983803/06
Description:	PSU	Type:	ES-R ES(R)	Serial-no.:	
Description:		Type:		Serial-no.:	
Description:		Type:		Serial-no.:	

Extreme temperature range in which the approval test should be performed:

- ☒ Category I: General (-20°C to +55°C)
☐ Category II: Portable (-10°C to +55°C)
☐ Category III: Equipment for normal indoor use (0°C to +55°C)

Connectable cables:

Name of the cable	Digital	Length/m	shielded
DC cable from PSU	O yes ☒ no	5.0	O yes ☒ no
Additional cables listed in the attachment	O yes O no		O yes O no
	O yes O no		O yes O no

FCC ID: DO4EVOLVE

Type designation:

EVOLVE (EMERALD ELECTRONIC) Antenna Models:
G10, G20, P10, P20 and LIBERTY PX w/EMERALD

Name and type designation of individual units comprising the radio equipment:

PSU, GT-2S5024D-R
PSU, GS 599ES(R)

Type of equipment:

- | | | | |
|---|---|---|-------------------------------|
| ☐ Radiotelephone equipment | ☐ Remote-control equipment | ☐ Radiomaritime equipment | ☐ LPD |
| ☐ One-way radiotelephone equipment | ☒ Inductive loop system | ☐ Inland waterways equipment | ☐ RLAN |
| ☐ Personal paging system | ☐ Radio-relay system | ☐ Radionavigation equipm. | ☐ |
| ☐ Satellite earth station | ☐ CB radiotelephone equipment | ☐ Antenna | ☐ |
| ☐ Data transmission equipment | ☐ Movement detector | ☐ Aeronautical equipment | ☐ |

Technical characteristics:

	Transmitter-receiver	Transmitter	Receiver
Frequency range	7.4 – 10.0 MHz		
Maximum no. of channels	1		
Channel spacing			
Class of emission (type of modulation)	P0N		
Maximum RF output power			
Maximum effective radiated power (ERP)	60 dB uV/m at 30 m		
Output power variable	Yes		
Channel switching frequency range			
Method of frequency generation	☒ Synthesizer	☐ Crystal	☐ Other
Frequency generation TX			
Frequency generation RX			
IF	1st IF	2nd IF	3rd IF
Integral selective calling			
Audio-frequency interface level at external data socket			
Modes of operation	☐ Duplex mode	☐ Semi-duplex mode	☒ Simplex mode
Power source	☒ Mains	☐ Vehicle-regulated	☐ Integral
Antenna socket	☐ BNC ☐ M ☒ None	☐ TNC ☐ UHF ☐	☐ N ☐ Adapter ☐

Test specifications:

Part 15 SubPart C (September 20, 2007)
RSS 210 Issue 7 (June 2007)

FCC ID: DO4EVOLVE

Declarations:

- We declare that the above information are correct and the named model was supplied with the maximum configuration to the accredited test laboratory.

THOROFARE, NJ, date DEC 10, 2007
place of issue



Seal and signature of applicant

mikes

FCC ID: DO4EVOLVE

FCC/IC System Setup				
Antennae Aisles, 200 cm hor. Center to hor. Center	Serial Number	PSU	Max Tx Pwr Setting In DMS (Ant1, Ant2)	Frequency Band in DMS
EVOLVE G10 (ver 2.79 firmware installed)	7410859C0U01857001	GT-2S5024D-R	30	8.2
	7410859C0U01857002	GS 599ES(R)	26	9.0(dual band)
EVOLVE G20 (ver 2.79 firmware installed)	7283991C0U01857001	GT-2S5024D-R	29	8.2
	7283991C0U01857002	GS 599ES(R)	25	9.0(dual band)
EVOLVE P10 (ver 2.79 firmware installed)	7411639C0U01857001	GT-2S5024D-R	31	8.2
	7411639C0U01857003	GS 599ES(R)	28	9.0(dual band)
EVOLVE P20 (ver 2.79 firmware installed)	7172727C0U01857001	GT-2S5024D-R	31	8.2
	7172727C0U01857002	GS 599ES(R)	29	9.0(dual band)
LIBERTY PX w/EMERALD (ver 2.79 firmware installed)	736121603D11996098	GT-2S5024D-R	31	8.2
	736121603D11996117	GS 599ES(R)	28	9.0(dual band)

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Connected Cables							
Connector	Pin #	Wire Color	Termination Resistors	Function	Cable Length	Supplier Part #	Termination Resistor
J72 (MAIN)	1 2 3 4	Green Black White Red	R1/1 R1/2	People Counter Sensor	2.4 m	Belden - 82723 plenum rated	100Ohm
J13	1 2	Black Red	R1/1 R1/2	Metal Point		Belden - 82723 plenum rated	10KOhm
J6/J7/J54	1 2 3 4	Green White Black Red	R1/1 R1/2 R2/1 R2/2	Deactivator Interlock 4/3/2 Ext. Sounder 4	2.4 m	Belden - 82723 plenum rated	10KOhm 10KOhm
J20/J22	1 2 3	Red Black Ground	R1/1 R1/2	Pedestal Synchronization	2.4 m	Belden - 82723 plenum rated	100Ohm
J48				BADGE	0.5 m	Pedestal Integrated	
J18 or J31				Pedestal Main Power	0.3 m	from filter pcb	
J41	1 2 3 4 5	white-blue blue ground white-orange orange	R1/1 R1/2 R2/1 R2/2	External Counter External Alarm Lights	4.2 m	Olympic - 3804M5-6 plenum rated	10KOhm 10KOhm
J9	1 2 3 4 5 6	white-blue blue white-green green+ground white-orange orange	R1/1 R1/2 R2/1 R2/2	Alarm Group External Alarm Group	4.2 m	Olympic - 3804M5-6 plenum rated	10KOhm 10KOhm
J44/J45	1 2 3 4 5 6	white-blue blue white-green white-orange orange green+ground	R1/1 R1/2 R2/1 R2/2	External Relay 0/1	4.2 m	Olympic - 3804M5-6 plenum rated	10KOhm 10KOhm
J10/J14	1 2 3 4 5	red white ground black green	R1/1 R2/1 R1/2 R2/2	Inter-Pedestal Network Com.	2.4 m	Belden - 82723 plenum rated	100Ohm 100Ohm
J7				Ethernet / I AN	5 m	Cat5e	