

Abridged report

Test report no.: 1-8203/19-02-03

Report information

Kind of test item: RFID Card Reader
Model name: IDE-ZG-L-MFB-USB (10117-810, 10115-610)
Customer: Baltech AG
Standard: FCC - Title 47 CFR Part 15
RSS - 247 Issue 2
Frequency: Band or fixed frequency
Technology tested: Bluetooth® LE
Antenna: Integrated antenna
Verdict: ☒ Compliant ☐ Not compliant
Additional comments: -/-

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signature, the public key can be requested at the testing laboratory.

Test performed:


cn=Andreas Luckenbill, o=CTC
advanced GmbH, ou=LUC-180217,
email=andreas.luckenbill@ctcadvanc
ed.com, c=DE
2019.05.02 07:55:54 +02'00'

Andreas Luckenbill
Lab Manager
Radio Communications & EMC

1 Table of contents

1	Table of contents	2
2	Notes and disclaimer	3
3	Additional comments	4
4	Test standard/s and references	5
5	Measurement results.....	6
5.1	Radiated output power.....	6
5.2	Radiated spurious emissions.....	7
6	Glossary	14
7	Document history	15
Annex A	Accreditation Certificate – D-PL-12076-01-04	15
Annex B	Accreditation Certificate – D-PL-12076-01-05	16

2 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CTC advanced GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CTC advanced GmbH.

The testing service provided by CTC advanced GmbH has been rendered under the current "General Terms and Conditions for CTC advanced GmbH".

CTC advanced GmbH will not be liable for any loss or damage resulting from false, inaccurate, inappropriate or incomplete product information provided by the customer.

Under no circumstances does the CTC advanced GmbH test report include any endorsement or warranty regarding the functionality, quality or performance of any other product or service provided.

Under no circumstances does the CTC advanced GmbH test report include or imply any product or service warranties from CTC advanced GmbH, including, without limitation, any implied warranties of merchantability, fitness for purpose, or non-infringement, all of which are expressly disclaimed by CTC advanced GmbH.

All rights and remedies regarding vendor's products and services for which CTC advanced GmbH has prepared this test report shall be provided by the party offering such products or services and not by CTC advanced GmbH. In no case this test report can be considered as a Letter of Approval.

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

3 Additional comments

Reference documents: BALTECH Bluetooth Test Tool description V3.00
CTC advanced GmbH – External Photos of the EUT – 1-8203/19-02-01_AnnexA
CTC advanced GmbH – Internal Photos of the EUT – 1-8203/19-02-01_AnnexB
CTC advanced GmbH – Test setup Photos – 1-8203/19-02-01_AnnexD

Special test descriptions: None

Configuration descriptions: None

Test mode: ☐ No test mode available.
Iperf was used to ping another device with the largest support packet size

☒ Special software is used.
EUT is transmitting pseudo random data by itself

Antennas and transmit operating modes:

☒ Operating mode 1 (single antenna)

- *Equipment with 1 antenna,*
- *Equipment with 2 diversity antennas operating in switched diversity mode by which at any moment in time only 1 antenna is used,*
- *Smart antenna system with 2 or more transmit/receive chains, but operating in a mode where only 1 transmit/receive chain is used)*

☐ Operating mode 2 (multiple antennas, no beamforming)

- *Equipment operating in this mode contains a smart antenna system using two or more transmit/receive chains simultaneously but without beamforming.*

☐ Operating mode 3 (multiple antennas, with beamforming)

- *Equipment operating in this mode contains a smart antenna system using two or more transmit/receive chains simultaneously with beamforming.
In addition to the antenna assembly gain (G), the beamforming gain (Y) may have to be taken into account when performing the measurements.*

4 Test standard/s and references

Test standard	Date	Description
FCC - Title 47 CFR Part 15		FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
RSS - 247 Issue 2	February 2017	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence - Exempt Local Area Network (LE-LAN) Devices

Guidance	Version	Description
DTS: KDB 558074 D01	v05r01	GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES
ANSI C63.4-2014	-/-	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10-2013	-/-	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

5 Measurement results

5.1 Radiated output power

Measurement parameters:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	3 MHz
Video bandwidth:	10 MHz
Trace mode:	Max hold

Limits:

30 dBm conducted + 6dBi

Results:

	Lowest channel	Middle channel	Highest channel
conducted: EUT 1: 10115-610	-2.7 dBm	-1.4 dBm	-1.2 dBm
conducted: EUT 2: 10117-810	-2.8 dBm	-1.5 dBm	-0.7 dBm
radiated: EUT 1: 10115-610	-25.4 dBm	-27.5 dBm	-28.8 dBm
radiated: EUT 2: 10117-810	-25.2 dBm	-26.9 dBm	-28.3 dBm

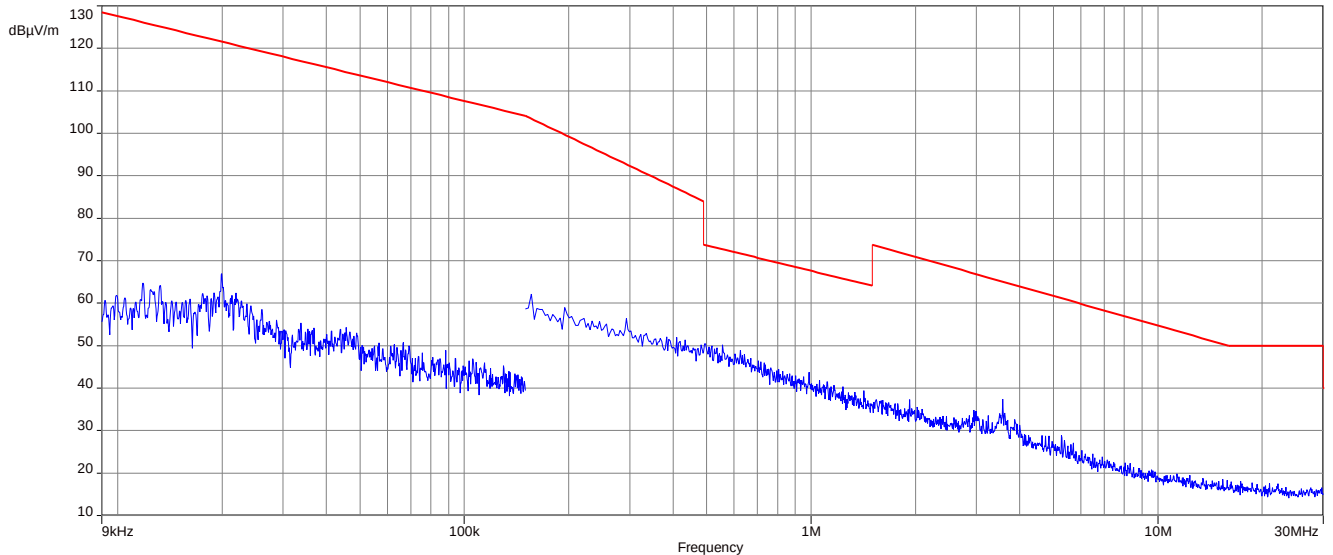
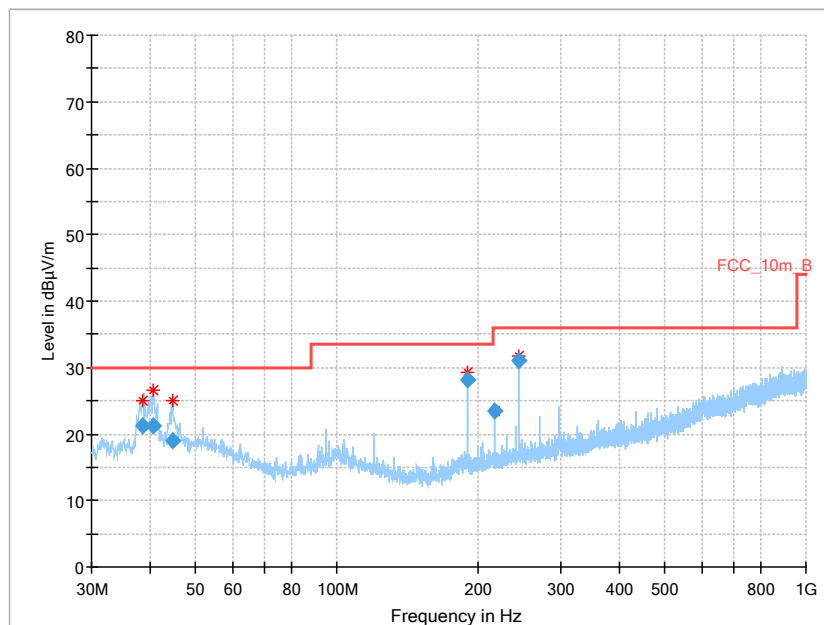
5.2 Radiated spurious emissions

Measurement:

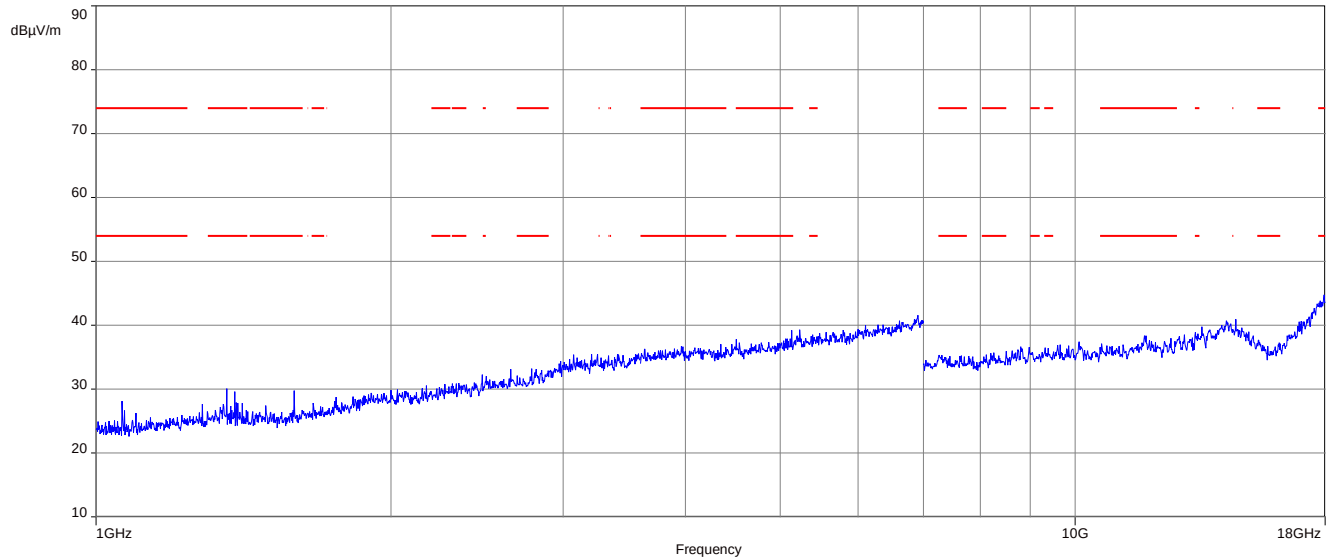
Measurement parameter	
Detector:	Peak / Quasi Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	F > 1 GHz: 1 MHz F < 1 GHz: 200 Hz, 9 kHz, 120 kHz
Video bandwidth:	3 x RBW
Span:	9 kHz to 18 GHz
Trace mode:	Max Hold

Limits:

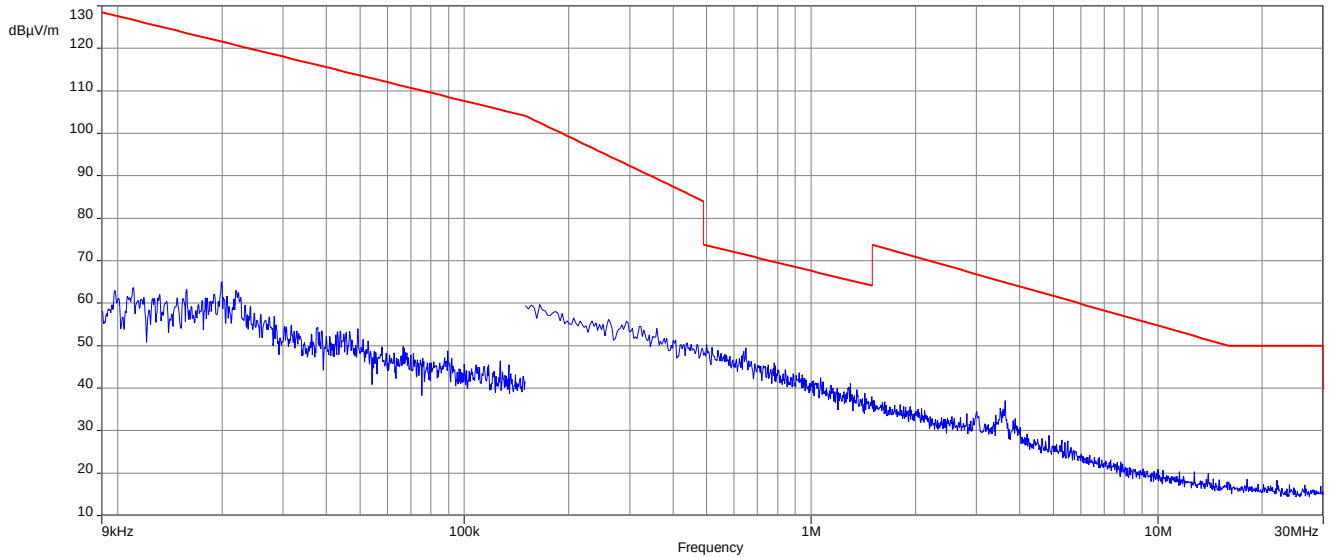
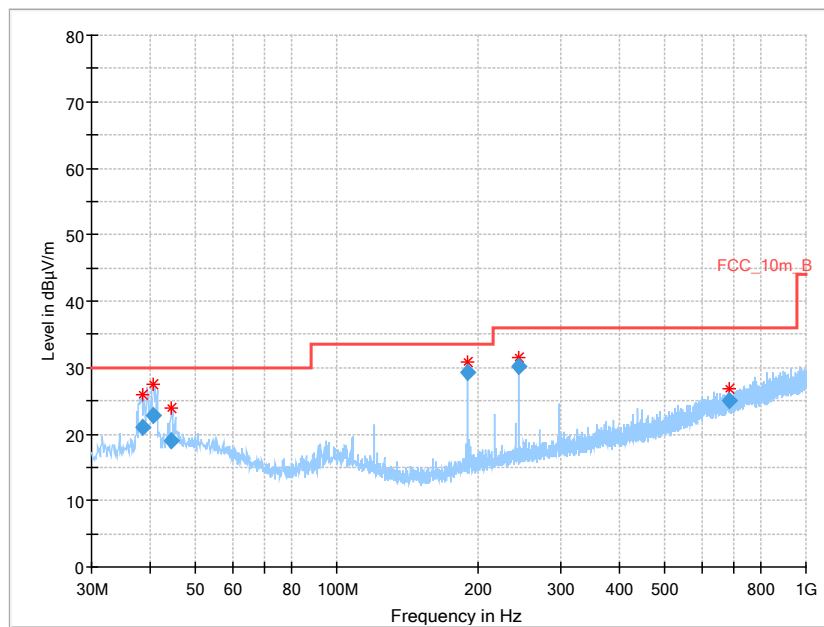
Part 15.209/RSS-Gen: Restricted bands 54 dB μ V/m @ 3 m

Plots:**Plot 1:** lowest channel, 9 kHz to 30 MHz**Plot 2:** lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

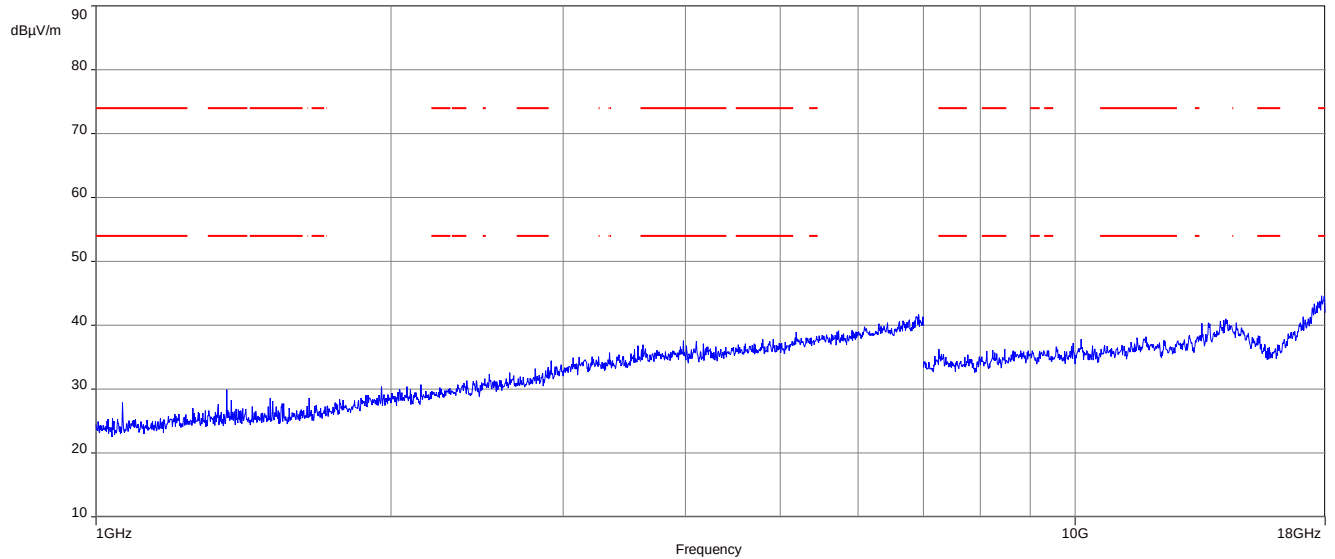
Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Po l	Azimuth (deg)	Corr. (dB/m)
38.448	21.19	---	30.0	8.81	1000	120	98.0	V	92.0	14
40.658	21.29	---	30.0	8.71	1000	120	98.0	V	167.0	14
44.852	19.01	---	30.0	10.99	1000	120	101.0	V	310.0	15
189.856	28.16	---	33.5	5.34	1000	120	101.0	V	257.0	12
216.979	23.47	---	36.0	12.53	1000	120	98.0	V	206.0	13
244.093	31.06	---	36.0	4.94	1000	120	160.0	V	62.0	14

Plot 3: lowest channel, 1 GHz to 18 GHz, vertical & horizontal polarization

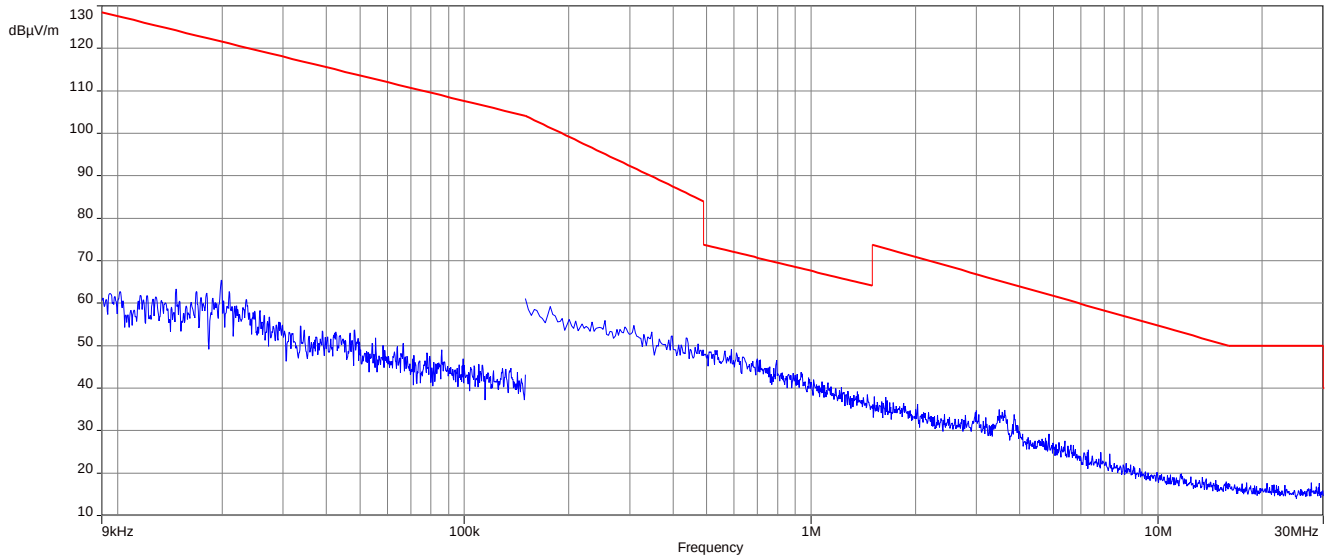
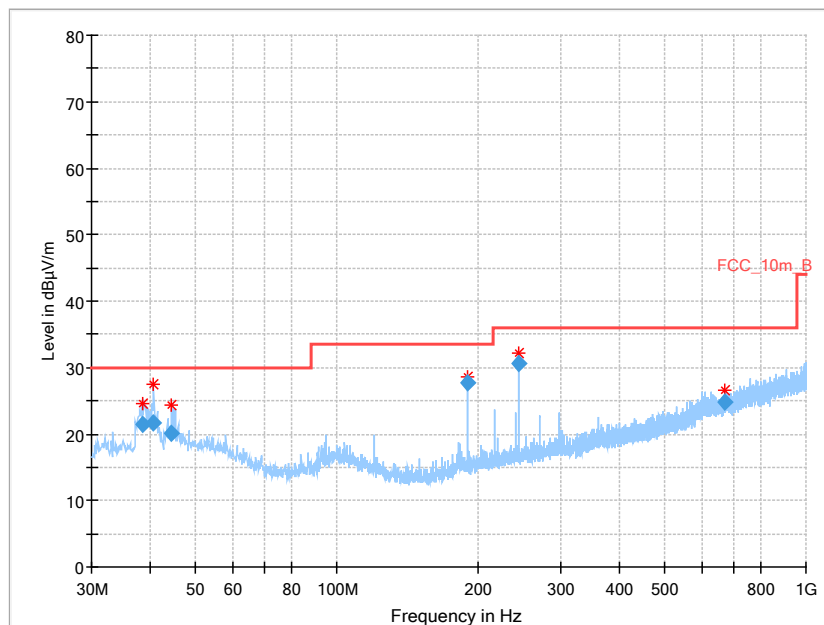
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 4: mid channel, 9 kHz to 30 MHz**Plot 5:** mid channel, 30 MHz to 1 GHz, vertical & horizontal polarization

Frequency (MHz)	QuasiPeak (dBμV/m)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Po l	Azimuth (deg)	Corr. (dB/m)
38.678	21.04	---	30.0	8.96	1000	120	101.0	V	87.0	14
40.656	22.86	---	30.0	7.14	1000	120	98.0	V	228.0	14
44.458	18.94	---	30.0	11.06	1000	120	100.0	V	236.0	15
189.846	29.37	---	33.5	4.13	1000	120	98.0	V	291.0	12
244.088	30.14	---	36.0	5.86	1000	120	101.0	V	8.0	14
685.610	24.93	---	36.0	11.07	1000	120	160.0	V	341.0	21

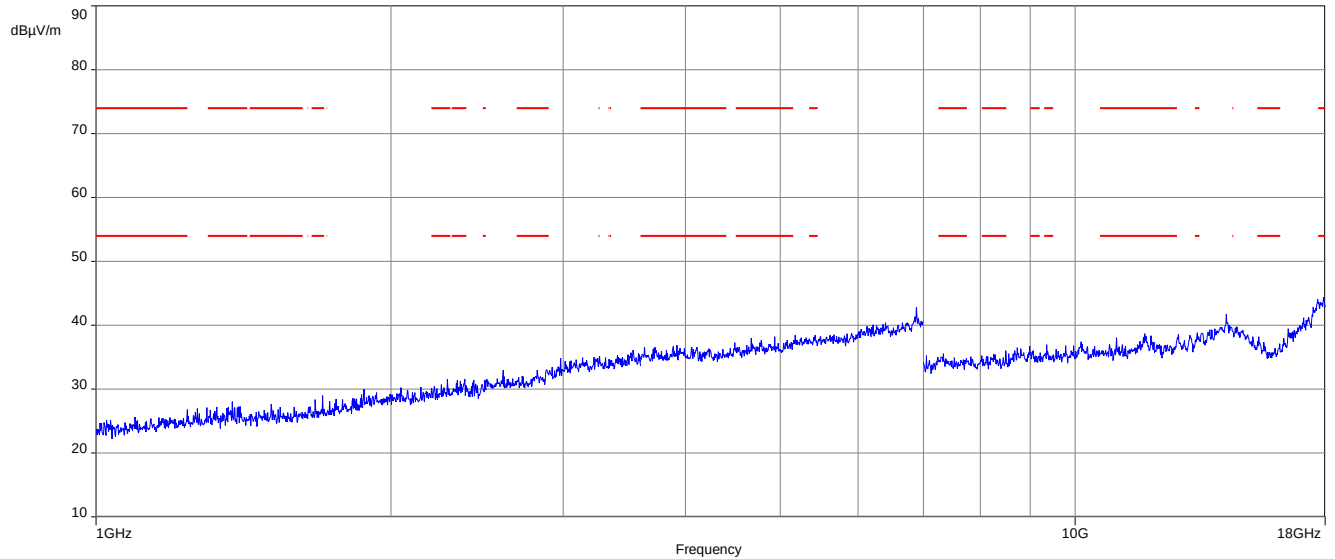
Plot 6: mid channel, 1 GHz to 18 GHz, vertical & horizontal polarization

The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 7: highest channel, 9 kHz to 30 MHz**Plot 8:** highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Po l	Azimuth (deg)	Corr. (dB/m)
38.482	21.54	---	30.0	8.46	1000	120	98.0	V	328.0	14
40.684	21.61	---	30.0	8.39	1000	120	98.0	V	353.0	14
44.480	20.15	---	30.0	9.85	1000	120	101.0	V	61.0	15
189.839	27.77	---	33.5	5.73	1000	120	98.0	V	303.0	12
244.092	30.68	---	36.0	5.32	1000	120	98.0	V	15.0	14
673.277	24.79	---	36.0	11.21	1000	120	160.0	H	136.0	21

Plot 9: highest channel, 1 GHz to 18 GHz, vertical & horizontal polarization



The carrier signal is notched with a 2.4 GHz band rejection filter.

6 Glossary

EUT	Equipment under test
DUT	Device under test
UUT	Unit under test
GUE	GNSS User Equipment
ETSI	European Telecommunications Standards Institute
EN	European Standard
FCC	Federal Communications Commission
FCC ID	Company Identifier at FCC
IC	Industry Canada
PMN	Product marketing name
HMN	Host marketing name
HVIN	Hardware version identification number
FVIN	Firmware version identification number
EMC	Electromagnetic Compatibility
HW	Hardware
SW	Software
Inv. No.	Inventory number
S/N or SN	Serial number
C	Compliant
NC	Not compliant
NA	Not applicable
NP	Not performed
PP	Positive peak
QP	Quasi peak
AVG	Average
OC	Operating channel
OCW	Operating channel bandwidth
OBW	Occupied bandwidth
OOB	Out of band
DFS	Dynamic frequency selection
CAC	Channel availability check
OP	Occupancy period
NOP	Non occupancy period
DC	Duty cycle
PER	Packet error rate
CW	Clean wave
MC	Modulated carrier
WLAN	Wireless local area network
RLAN	Radio local area network
DSSS	Dynamic sequence spread spectrum
OFDM	Orthogonal frequency division multiplexing
FHSS	Frequency hopping spread spectrum
GNSS	Global Navigation Satellite System
C/N₀	Carrier to noise-density ratio, expressed in dB-Hz

7 Document history

Version	Applied changes	Date of release
-/-	Initial release	2019-05-02

Annex A Accreditation Certificate – D-PL-12076-01-04

first page	last page
 Deutsche Akkreditierungsstelle GmbH Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition Accreditation  The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory CTC advanced GmbH Untertürkheimer Straße 6-10, 66117 Saarbrücken is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields: Telecommunication (TC) and Electromagnetic Compatibility (EMC) for Canadian Standards The accreditation certificate shall only apply in connection with the notice of accreditation of 11.01.2019 with the accreditation number D-PL-12076-01 and is valid until 21.04.2021. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 7 pages. Registration number of the certificate: D-PL-12076-01-04 Frankfurt am Main, 11.01.2019  Dipl.-Biol. Uwe Zimmermann Head of Division	Deutsche Akkreditierungsstelle GmbH Office Berlin Spittelmarkt 10 10117 Berlin Office Frankfurt am Main Europa-Allee 52 60327 Frankfurt am Main Office Braunschweig Bundesallee 100 38116 Braunschweig The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkkS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf. No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS. The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkkS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations. The up-to-date state of membership can be retrieved from the following websites: EA: www.european-accreditation.org ILAC: www.ilac.org IAF: www.iaf.eu

Note: The current certificate annex is published on the website (link see below) of the Accreditation Body DAkkS or may be received by CTC advanced GmbH on request

<https://www.dakks.de/as/ast/d/D-PL-12076-01-04.pdf>

Annex B Accreditation Certificate – D-PL-12076-01-05

first page	last page
 Deutsche Akkreditierungsstelle GmbH Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition Accreditation  The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory CTC advanced GmbH Untertürkheimer Straße 6-10, 66117 Saarbrücken is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields: Telecommunication (FCC Requirements) The accreditation certificate shall only apply in connection with the notice of accreditation of 11.01.2019 with the accreditation number D-PL-12076-01 and is valid until 21.04.2021. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 5 pages. Registration number of the certificate: D-PL-12076-01-05 Frankfurt am Main, 11.01.2019  Uwe Zimmermann Head of Division DAKKS-Logo (2019-2021)	Deutsche Akkreditierungsstelle GmbH Office Berlin Spittelmarkt 10 10117 Berlin Office Frankfurt am Main Europa-Allee 52 60327 Frankfurt am Main Office Braunschweig Bundesallee 100 38116 Braunschweig The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkKS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf. No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkKS. The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products [Official Journal of the European Union L 218 of 9 July 2008, p. 30]. DAkKS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations. The up-to-date state of membership can be retrieved from the following websites: EA: www.european-accreditation.org ILAC: www.ilac.org IAF: www.iaf.nu

Note: The current certificate annex is published on the website (link see below) of the Accreditation Body DAkKS or may be received by CTC advanced GmbH on request

<https://www.dakks.de/as/ast/d/D-PL-12076-01-05.pdf>

END OF TEST REPORT