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Bundesnetzagentur

BNetzA-CAB-02/21-102

## TEST REPORT

Test report no.: 1-4759\_22-02-02

### Testing laboratory

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#### Accredited Testing Laboratory:

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2018-03) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)  
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate starting with the registration number: D-PL-12076-01.

### Applicant

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### Manufacturer

**Aquis Systems GmbH**  
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### Test standard/s

FCC - Title 47 CFR Part 27   FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 27 -  
Miscellaneous wireless communications services

For further applied test standards please refer to section 3 of this test report.

### Test Item

**Kind of test item:** IoT Tracking and Monitoring Srew Module and Compact Module  
**Model name:** TM1XXX / TM2XXX  
**FCC ID:** 2A9CE-TM  
**Frequency:** LTE bands 4 and 13  
**Technology tested:** LTE CAT M1  
**Antenna:** Integrated antenna  
**Power supply:** 12.0 V DC by external power supply  
**Temperature range:** -20°C to +55°C

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.

### Test report authorized:

Marco Bertolino  
Lab Manager  
Radio Communications

### Test performed:

Michael Dorongovski  
Lab Manager  
Radio Communications

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## 2 General information

### 2.1 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.

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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.

### 2.2 Application details

Date of receipt of order: 2022-08-10

Date of receipt of test item: 2022-08-29

Start of test: 2022-11-11

End of test: 2022-11-14

Person(s) present during the test: -/-

\*Date of each measurement, if not shown in the plot, can be requested. Dates are stored in the measurement software.

### 2.3 Test laboratories sub-contracted

None

### 3 Test standard/s, references and accreditations

Test standard	Date	Description
FCC - Title 47 CFR Part 27		FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 27 - Miscellaneous wireless communications services

Guidance	Version	Description
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 C63.26-2015	-/-	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
KDB 996369 D04	v02	MODULAR TRANSMITTERINTEGRATION GUIDEGUIDANCE FOR HOSTPRODUCTMANUFACTURERS

Accreditation	Description	
D-PL-12076-01-04	Telecommunication and EMC Canada <a href="https://www.dakks.de/as/ast/d/D-PL-12076-01-04e.pdf">https://www.dakks.de/as/ast/d/D-PL-12076-01-04e.pdf</a>	 <b>DAkkS</b> Deutsche Akreditierungsstelle D-PL-12076-01-04
D-PL-12076-01-05	Telecommunication FCC requirements <a href="https://www.dakks.de/as/ast/d/D-PL-12076-01-05e.pdf">https://www.dakks.de/as/ast/d/D-PL-12076-01-05e.pdf</a>	 <b>DAkkS</b> Deutsche Akreditierungsstelle D-PL-12076-01-05

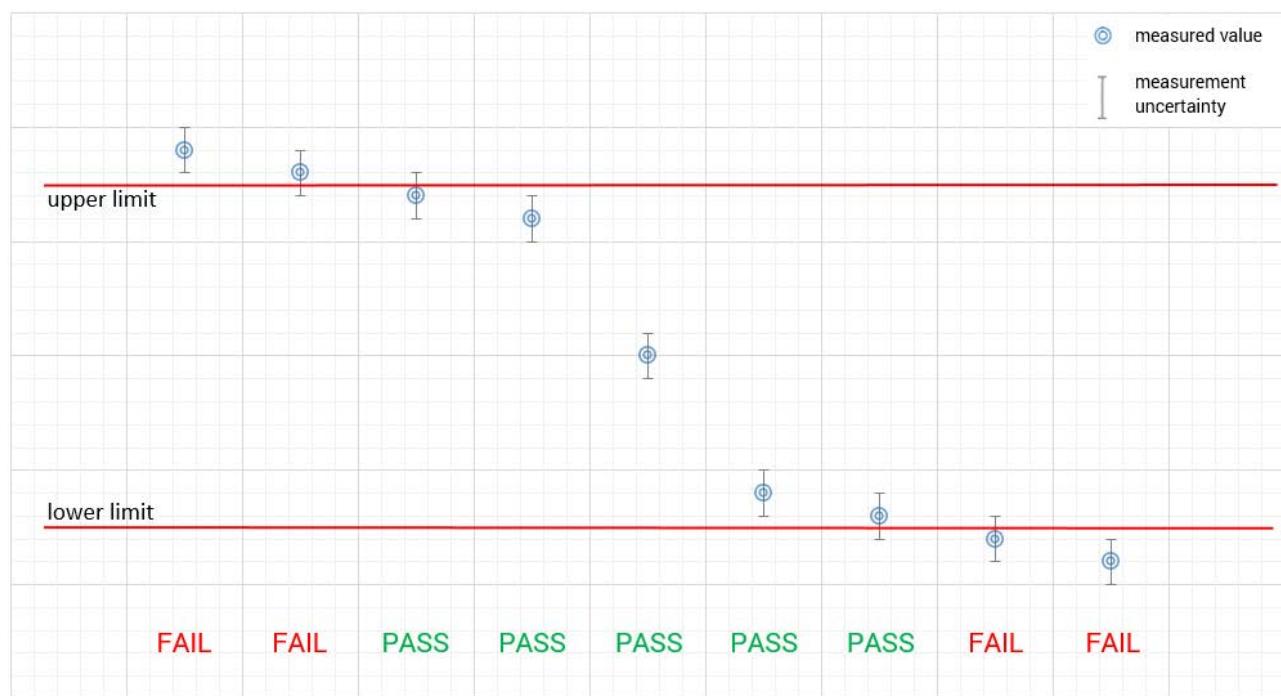
ISED Testing Laboratory Recognized Listing Number: DE0001  
 FCC designation number: DE0002

## 4 Reporting statements of conformity – decision rule

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3.

The measurement uncertainty is mentioned in this test report, see chapter 9, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong."

### measured value, measurement uncertainty, verdict



## 5 Test environment

Temperature	: $T_{\text{nom}}$ $T_{\text{max}}$ $T_{\text{min}}$	+22 °C during room temperature tests No tests under extreme environmental conditions performed. No tests under extreme environmental conditions performed.
Relative humidity content	:	55 %
Barometric pressure	:	1021 hpa
Power supply	: $V_{\text{nom}}$ $V_{\text{max}}$ $V_{\text{min}}$	12.0 V DC by external power supply No tests under extreme environmental conditions performed. No tests under extreme environmental conditions performed.

## 6 Test item

### 6.1 General description

Kind of test item	: IoT Tracking and Monitoring Srew Module and Compact Module
Model name	: TM1XXX / TM2XXX
S/N serial number	: Rad. 210407000996
Hardware status	: V3.1.0
Software status	: N/A
Firmware status	: V3.24
Frequency band	: LTE bands 4 and 13
Type of radio transmission	: Modulated carrier
Use of frequency spectrum	: Integrated antenna
Antenna	: 12.0 V DC by external power supply
Power supply	: -20°C to +55°C

### 6.2 Additional information

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup and EUT photos are included in test report: 1-4759\_22-02-01\_AnnexA  
 1-4759\_22-02-01\_AnnexB  
 1-4759\_22-02-01\_AnnexD

## 7 Description of the test setup

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, RF generating and signaling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

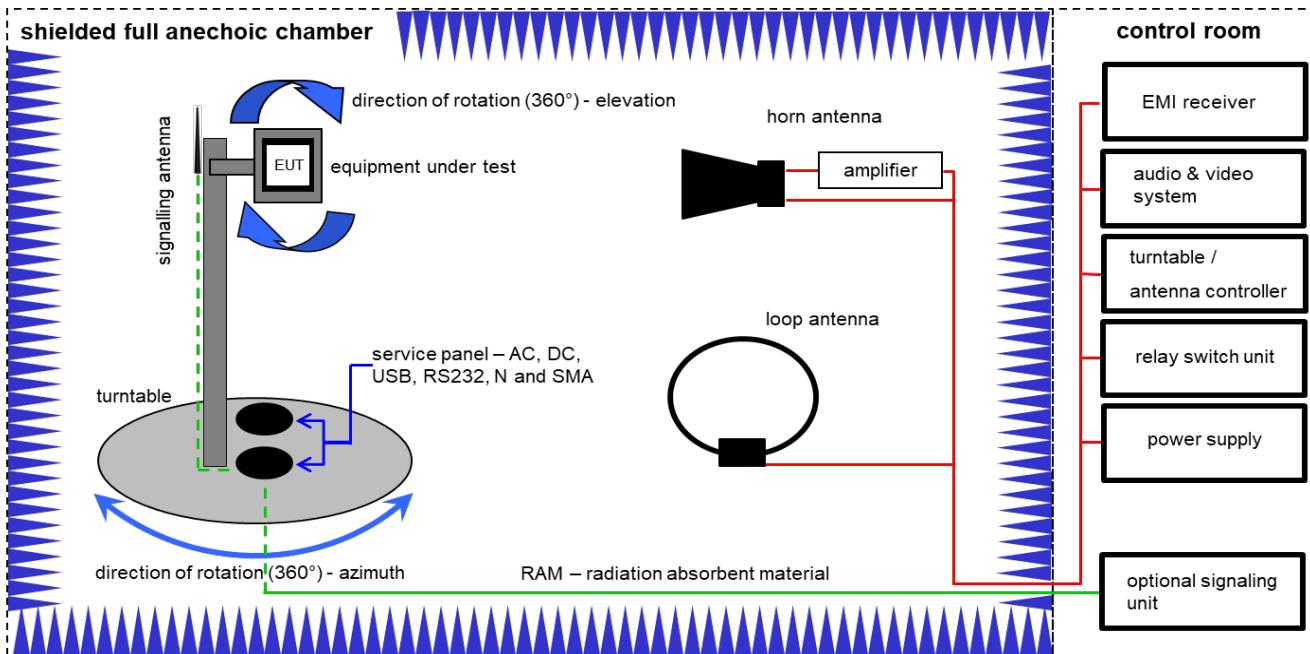
In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

Each block diagram listed can contain several test setup configurations. All devices belonging to a test setup are identified with the same letter syntax. For example: Column Setup and all devices with an A.

### Agenda: Kind of Calibration

k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
vlk!	Attention: extended calibration interval	*	next calibration ordered / currently in progress
NK!	Attention: not calibrated		

## 7.1 Shielded fully anechoic chamber



Measurement distance: horn antenna 3 meter; loop antenna 3 meter

OP = AV + D - G + CA

(OP-radiated output power; AV-analyzer value; D-free field attenuation of measurement distance; G-antenna gain+amplifier gain; CA-loss signal path)

Example calculation:

$$OP [dBm] = -39.0 [dBm] + 57.0 [dB] - 12.0 [dBi] + (-36.0) [dB] = -30 [dBm] (1 \mu W)$$

### Equipment table:

No.	Setup	Equipment	Type	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	A	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	9107-3696	300001604	vIKI!	12.03.2021	11.03.2023
2	A	Highpass Filter	WHK1.1/15G-10SS	Wainwright	37	400000148	ne	-/-	-/-
3	A	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne	-/-	-/-
4	A	Broadband Amplifier 0.5-18 GHz	CBLU5184540	CERNEX	22051	300004483	ev	-/-	-/-
5	A	4U RF Switch Platform	L4491A	Agilent Technologies	MY50000032	300004510	ne	-/-	-/-
6	A	Computer	Intel Core i3 3220/3,3 GHz, Prozessor	-/-	2V2403033A 5421	300004591	ne	-/-	-/-
7	A	NEXIO EMV-Software	BAT EMC V3.21.0.27	EMCO	-/-	300004682	ne	-/-	-/-
8	A	Anechoic chamber	-/-	TDK	-/-	300003726	ne	-/-	-/-
9	A	EMI Test Receiver 9kHz-26,5GHz	ESR26	Rohde & Schwarz	101376	300005063	k	15.12.2021	14.12.2022
10	A	RF-Amplifier	AMF-6F06001800-30-10P-R	NARDA-MITEQ Inc	2011571	300005240	ev	-/-	-/-
11	A	Wideband radio communication tester	CMW500	Rohde & Schwarz	170616	300006655	k	16.09.2021	30.09.2023

## 8 Sequence of testing

### 8.1 Sequence of testing radiated spurious 1 GHz to 18 GHz

#### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a 2-axis positioner with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

#### Premereasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height is 1.5 m.
- At each turntable position and antenna polarization the analyzer sweeps with positive peak detector to find the maximum of all emissions.

#### Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximizes the peaks by rotating the turntable from 0° to 360°. This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps) and for both antenna polarizations.
- The final measurement is done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

## 9 Measurement uncertainty

Measurement uncertainty		
Test case	Uncertainty	
Antenna gain	± 3 dB	
99 % bandwidth	± RBW	
-26 dB bandwidth	± RBW	
Frequency stability	10 <sup>-6</sup>	
Maximum output power conducted	± 1.56 dB	
Block edge compliance	± 1.56 dB	
Spurious emissions conducted	> 3.6 GHz	± 1.56 dB
	> 7 GHz	± 1.56 dB
	> 18 GHz	± 2.31 dB
	≥ 40 GHz	± 2.97 dB
Spurious emissions radiated below 30 MHz	± 3 dB	
Spurious emissions radiated 30 MHz to 1 GHz	± 3 dB	
Spurious emissions radiated 1 GHz to 12.75 GHz	± 3.7 dB	
Spurious emissions radiated above 12.75 GHz	± 4.5 dB	

## 10 Additional information and comments

Reference documents:      None

Special test descriptions:      Module integration tests according to KDB 996369 D04. Only LTE CAT M1 was tested.

Configuration descriptions:      None

EUT selection:

- Only one device available
- Devices selected by the customer
- Devices selected by the laboratory (Randomly)

## 11 RF measurements

## 12 Summary of measurement results

<input type="checkbox"/>	No deviations from the technical specifications were ascertained
<input type="checkbox"/>	There were deviations from the technical specifications ascertained
<input checked="" type="checkbox"/>	This test report is only a partial test report. The content and verdict of the performed test cases are listed below.

TC identifier	Description	verdict	date	Remark
RF-Testing	FCC: CFR Part 2 & Part 27	See table!	2022-11-28	-/-

### 12.1 Part 27: LTE band 4 LTE CAT M1

Test Case	temperature conditions	power source voltages	C	NC	NA	NP	Remark
RF Output Power	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
Frequency Stability	Extreme	Extreme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
Spurious Emissions Radiated	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Only one configuration tested
Spurious Emissions Conducted	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
Block Edge Compliance	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
Occupied Bandwidth	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-

**Notes:**

C	Compliant	NC	Not compliant	NA	Not applicable	NP	Not performed
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## 12.2 Part 27: LTE band 13 LTE CAT M1

Test Case	temperature conditions	power source voltages	C	NC	NA	NP	Remark
RF Output Power	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
Frequency Stability	Extreme	Extreme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
Spurious Emissions Radiated	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Only one configuration tested
Spurious Emissions Conducted	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
Block Edge Compliance	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-
Occupied Bandwidth	Nominal	Nominal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-/-

**Notes:**

<b>C</b>	Compliant	<b>NC</b>	Not compliant	<b>NA</b>	Not applicable	<b>NP</b>	Not performed
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## 13 RF measurements

### 13.1 Description of test setup

For the spurious measurements we use the substitution method according TIA/EIA 603.

### 13.2 Results LTE band 4 LTE CAT M1

The EUT was set to transmit the maximum power.

#### 13.2.1 Spurious emissions radiated

##### Description:

The following steps outline the procedure used to measure the radiated emissions from the mobile station. The site is constructed in accordance with ANSI C63.4:2014 requirements and is recognized by the FCC to be in compliance for a 3 and a 10 meter site. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1750 MHz. Measurement made up to 18 GHz. The resolution bandwidth is set as outlined in Part 27.53. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE band 4.

##### Measurement:

Measurement parameters	
Detector:	Peak
Sweep time:	2 sec.
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Span:	100 MHz Steps
Trace mode:	Max Hold
Used equipment:	See chapter 7.2 setup A
Measurement uncertainty:	See chapter 9
Measurement procedure	FCC: § 2.1053

**Limits:**

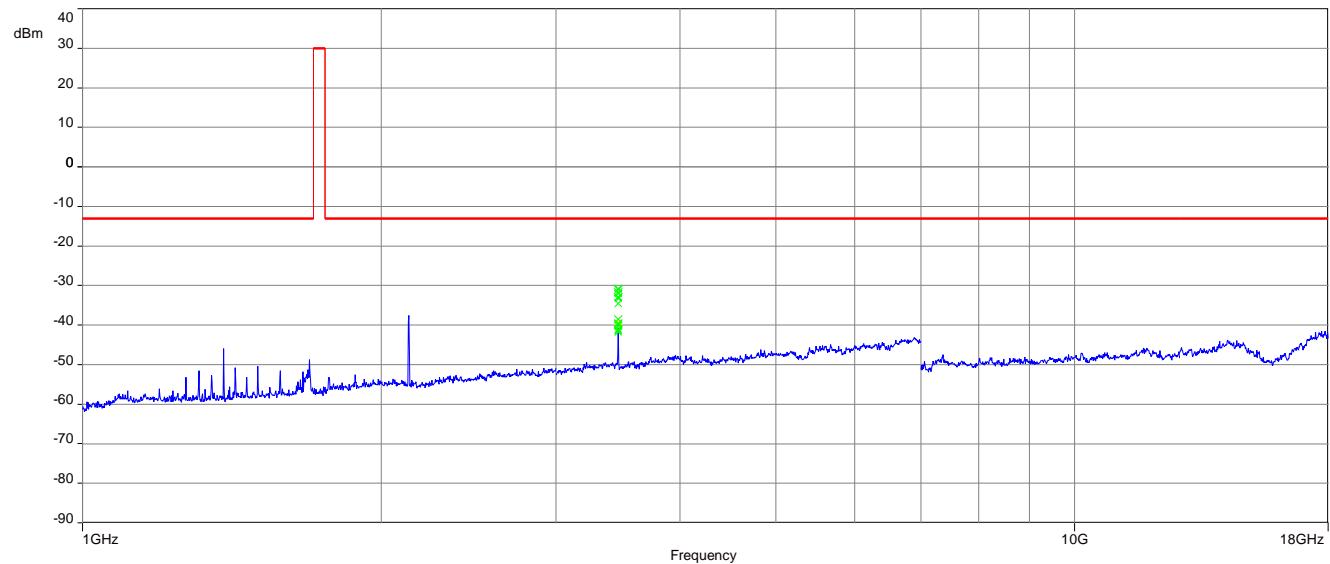
FCC	ISED
§ 27.53(h)(1) & (3)	RSS-139, 6.6
<p>(1) Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least <math>43 + 10 \log_{10} (P)</math> dB.</p> <p>(3) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.</p>	<p>i. In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least <math>43 + 10 \log_{10} (P)</math> (watts) dB.</p> <p>ii. After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least <math>43 + 10 \log_{10} (P)</math> (watts) dB.</p>
<b>-13 dBm</b>	

**Results:****QPSK**

SPURIOUS EMISSION LEVEL					
LOWEST CHANNEL		MIDDLE CHANNEL		HIGHEST CHANNEL	
Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]
		3465 MHz	-38.5		

**QPSK**

Plot 1: 1 GHz to 18GHz, Channel 1732.5 MHz, 5 MHz BW, 1 RB



## 13.3 Results LTE band 13 LTE CAT M1

The EUT was set to transmit the maximum power.

### 13.3.1 Spurious emissions radiated

#### Description:

The following steps outline the procedure used to measure the radiated emissions from the mobile station. The site is constructed in accordance with ANSI C63.4:2014 requirements and is recognized by the FCC to be in compliance for a 3 and a 10 meter site. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 782 MHz. Measured up to 8 GHz. The resolution bandwidth is set as outlined in Part 27.53. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE band 13.

#### Measurement:

Measurement parameters	
Detector:	Peak / RMS
Sweep time:	2 sec.
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Span:	100 MHz Steps
Trace mode:	Max Hold
Used equipment:	See chapter 7.2 setup A
Measurement uncertainty:	See chapter 9
Measurement procedure	FCC: § 2.1053

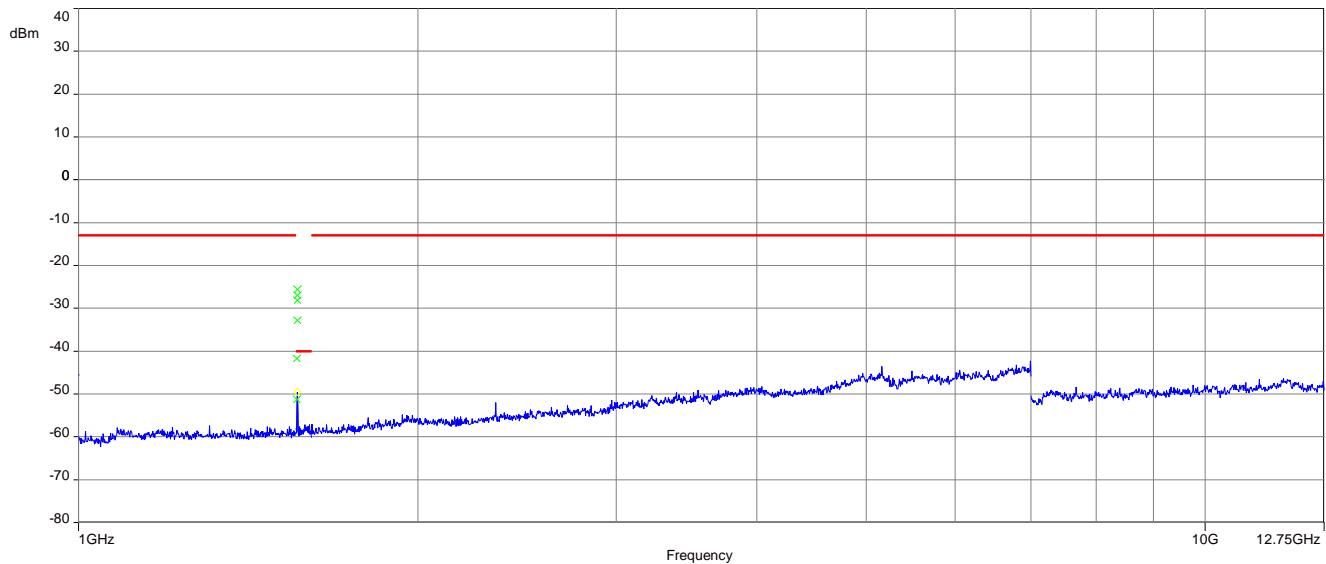
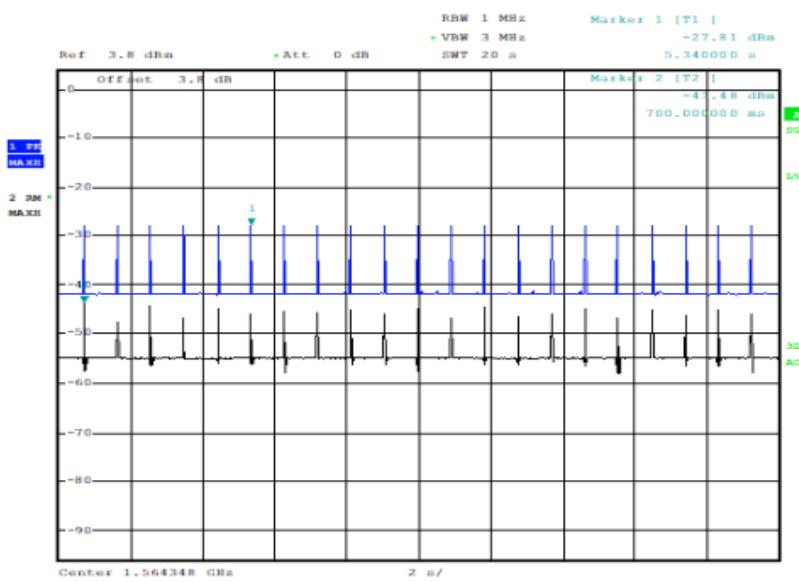
**Limits:**

FCC	ISED
\$ 27.53(c)	RSS-130, 4.7.1
<p>(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:</p> <p>(c)(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least <math>43 + 10 \log (P)</math> dB.</p> <p>For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.</p>	<p>The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least <math>43 + 10 \log_{10} p</math> (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.</p>
<b>-13 dBm / -40 dBm</b>	

**Results:****QPSK**

SPURIOUS EMISSION LEVEL					
LOWEST CHANNEL		MIDDLE CHANNEL		HIGHEST CHANNEL	
Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]	Spurious emissions	Level [dBm]
-/-	-/-	1564 MHz	-27.8	-/-	-/-
	-/-		-42.5		-/-

**NOTE:** The average value of the harmonic is nearly the same as in the module test report of the Quectel BG77 module.

**QPSK**
**Plot 1: 1 MHz to 12.75 GHz, Channel 782 MHz, 5 MHz BW, 1 RB**

**Plot 2: Harmonic measurement**


Date: 14.NOV.2022 11:24:59

## 14 Glossary

<b>EUT</b>	Equipment under test
<b>DUT</b>	Device under test
<b>UUT</b>	Unit under test
<b>GUE</b>	GNSS User Equipment
<b>ETSI</b>	European Telecommunications Standards Institute
<b>EN</b>	European Standard
<b>FCC</b>	Federal Communications Commission
<b>FCC ID</b>	Company Identifier at FCC
<b>IC</b>	Industry Canada
<b>PMN</b>	Product marketing name
<b>HMN</b>	Host marketing name
<b>HVIN</b>	Hardware version identification number
<b>FVIN</b>	Firmware version identification number
<b>EMC</b>	Electromagnetic Compatibility
<b>HW</b>	Hardware
<b>SW</b>	Software
<b>Inv. No.</b>	Inventory number
<b>S/N or SN</b>	Serial number
<b>C</b>	Compliant
<b>NC</b>	Not compliant
<b>NA</b>	Not applicable
<b>NP</b>	Not performed
<b>PP</b>	Positive peak
<b>QP</b>	Quasi peak
<b>AVG</b>	Average
<b>OC</b>	Operating channel
<b>OCW</b>	Operating channel bandwidth
<b>OBW</b>	Occupied bandwidth
<b>OOB</b>	Out of band
<b>DFS</b>	Dynamic frequency selection
<b>CAC</b>	Channel availability check
<b>OP</b>	Occupancy period
<b>NOP</b>	Non occupancy period
<b>DC</b>	Duty cycle
<b>PER</b>	Packet error rate
<b>CW</b>	Clean wave
<b>MC</b>	Modulated carrier
<b>WLAN</b>	Wireless local area network
<b>RLAN</b>	Radio local area network
<b>DSSS</b>	Dynamic sequence spread spectrum
<b>OFDM</b>	Orthogonal frequency division multiplexing
<b>FHSS</b>	Frequency hopping spread spectrum
<b>GNSS</b>	Global Navigation Satellite System
<b>C/N<sub>0</sub></b>	Carrier to noise-density ratio, expressed in dB-Hz

## 15 Document history

Version	Applied changes	Date of release
-/-	Initial release	2022-11-28

## 16 Accreditation Certificate – D-PL-12076-01-05

first page	last page
 <p>Deutsche Akkreditierungsstelle GmbH</p> <p>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</p> <p><b>Accreditation</b> </p> <p>The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory <b>CTC advanced GmbH</b> <b>Untertürkheimer Straße 6-10, 66117 Saarbrücken</b></p> <p>is competent under the terms of DIN EN ISO/IEC 17025:2018 to carry out tests in the following fields: Telecommunication (FCC Requirements)</p> <p>The accreditation certificate shall only apply in connection with the notice of accreditation of 09.06.2020 with the accreditation number D-PL-12076-01. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 05 pages.</p> <p>Registration number of the certificate: <b>D-PL-12076-01-05</b></p> <p>Frankfurt am Main, 09.06.2020  by order Digi-Ing. (Dr.) Ingrid Egner Head of Division</p> <p><small>The certificate together with its annex reflects the status at the time of the date of issue. The current status of the scope of accreditation can be found in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH. <a href="https://www.dakks.de/en/content/accredited-bodies-dokks">https://www.dakks.de/en/content/accredited-bodies-dokks</a> See notes overleaf.</small></p>	<p>Deutsche Akkreditierungsstelle GmbH</p> <p>Office Berlin Spittelmarkt 10 10117 Berlin</p> <p>Office Frankfurt am Main Europa-Allee 52 60327 Frankfurt am Main</p> <p>Office Braunschweig Bundesallee 100 38116 Braunschweig</p> <p>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.</p> <p>No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS.</p> <p>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.</p> <p>The up-to-date state of membership can be retrieved from the following websites: EA: <a href="http://www.european-accreditation.org">www.european-accreditation.org</a> ILAC: <a href="http://www.ilac.org">www.ilac.org</a> IAF: <a href="http://www.iaf.nu">www.iaf.nu</a></p>

**Note: The current certificate annex is published on the websites (link see below).**

<https://www.dakks.de/files/data/as/pdf/D-PL-12076-01-05e.pdf>

or

[https://ctcadvanced.com/app/uploads/2020/06/D-PL-12076-01-05\\_TCB\\_USA.pdf](https://ctcadvanced.com/app/uploads/2020/06/D-PL-12076-01-05_TCB_USA.pdf)

##### END OF TEST REPORT #####