

<b>Prüfbericht-Nr.:</b> <i>Test report no.:</i>	<b>60443732 003</b>	<b>Auftrags-Nr.:</b> <i>Order no.:</i>	168266574	Seite 1 von 21 <i>Page 1 of 21</i>	
<b>Kunden-Referenz-Nr.:</b> <i>Client reference no.:</i>	N/A	<b>Auftragsdatum:</b> <i>Order date:</i>	2020-05-15		
<b>Auftraggeber:</b> <i>Client:</i>	<b>Sensitech Inc.</b> 800 Cummings Center Suite 258X, Beverly MA 01915-6197 USA				
<b>Prüfgegenstand:</b> <i>Test item:</i>	Quarterback Gateway				
<b>Bezeichnung / Typ-Nr.:</b> <i>Identification / Type no.:</i>	T11012860				
<b>Auftrags-Inhalt:</b> <i>Order content:</i>	FCC Test Report				
<b>Prüfgrundlage:</b> <i>Test specification:</i>	CFR47 FCC Part 22 CFR47 FCC Part 24 CFR47 FCC Part 27 CFR47 FCC Part 90 CFR47 FCC Part 2: Section 2.1091				
<b>Wareneingangsdatum:</b> <i>Date of sample receipt:</i>	2020-05-15	Please refer to photo documents			
<b>Prüfmuster-Nr.:</b> <i>Test sample no.:</i>	A002920612-001				
<b>Prüfzeitraum:</b> <i>Testing period:</i>	2020-11-02 - 2021-07-01				
<b>Ort der Prüfung:</b> <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd				
<b>Prüflaboratorium:</b> <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
<b>Prüfergebnis*:</b> <i>Test result*:</i>	Pass				
<b>geprüft von:</b> <i>tested by:</i>		<b>genehmigt von:</b> <i>authorized by:</i>			
<b>Datum:</b> <i>Date:</i>	2022-06-29	<b>Ausstellungsdatum:</b> <i>Issue date:</i>	2022-06-29		
<b>Stellung / Position</b>	Project Manager	<b>Stellung / Position</b>	Review er		
<b>Sonstiges / Other:</b>	FCC ID: SRMT11012860				
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged:</i>				
<b>Legend:</b>	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar	5 = mangelhaft N/T = nicht getestet
<b>Legend:</b>	1 = very good P(ass) = passed a.m. test specifications(s)	2 = good F(ail) = failed a.m. test specifications(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/A = not applicable	5 = poor N/T = not tested
<p><b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b></p> <p><i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p>					

## **Test Summary**

**5.1.1 RF POWER OUTPUT**

*RESULT: Pass*

**5.1.2 MODULATION CHARACTERISTICS**

*RESULT: Pass*

**5.1.3 OCCUPIED BANDWIDTH AND 26dB BANDWIDTH**

*RESULT: Pass*

**5.1.4 SPURIOUS EMISSIONS AT ANTENNA TERMINALS**

*RESULT: Pass*

**5.1.5 SPURIOUS EMISSIONS AT ANTENNA TERMINALS – BAND EDGE**

*RESULT: Pass*

**5.1.6 FIELD STRENGTH OF SPURIOUS RADIATION**

*RESULT: Pass*

**5.1.7 FREQUENCY STABILITY**

*RESULT: Pass*

**5.1.8 PEAK TO AVERAGE RATIO**

*RESULT: Pass*

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# 1 General Remarks

## 1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test Results of Output Power

Appendix B: Test Results of Radiated Spurious Emissions and Co-Located Emissions

# 2 Test Sites

## 2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China

FCC Registration No.: 694916

## 2.2 List of Test and Measurement Instruments

**Table 1: List of Test and Measurement Equipment**

<b>Radio Spectrum Testing (CTE6000)</b>				
<b>Equip. No.</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Calibrated until (DD.MM.YYYY)</b>
Shielding Room 6#	Albatross	SR6	APC17151-SR6	23.07.2021
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	166305	10.09.2021
Signal Analyzer	Rohde & Schwarz	FSV 40	101475	10.09.2021
Vector Signal Generator	Rohde & Schwarz	SMBV100A	263466	10.09.2021
Signal Generator	Rohde & Schwarz	SMB100A	181041	10.12.2021
High Speed Power Supply	KEITHLEY	2303	4080052	12.12.2021
RF Control Unit	Tonscend	JS0806-1	19H8060192	N/A
Band Reject Filter Group	Tonscend	JS0806-F	19I8060194	10.12.2021
<b>Unwanted Emission Testing (TS9975)</b>				
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Cal. until</b>
EMI Test Receiver	R&S	ESR 7	102021	11.08.2021
Signal Analyzer	R&S	FSV 40	101439	10.08.2021
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	10.08.2021
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	10.08.2021
Amplifier	R&S	SCU-18F	180070	10.08.2021
Amplifier	R&S	SCU40A	100475	10.09.2021
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	08.08.2022
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	08.08.2022
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	08.08.2022
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	13.09.2022
Wideband Ridged Horn Antenna (12-18 GHz)	Steatite	QMS-00208	18313	02.09.2021
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A

3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	06.07.2021
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## 2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

## 2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

## 2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-7}$
RF Power (conducted)	$\pm 2.5$ dB
Radiated Emission of Transmitter, valid up to 26.5 GHz	$\pm 6$ dB
Temperature	$\pm 1$ °C
Humidity	$\pm 5$ %
Voltage (DC)	$\pm 1$ %
Voltage (AC, <10kHz)	$\pm 2$ %

## 2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

## 2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at 362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

## 3 General Product Information

### 3.1 Product Function and Intended Use

The T11012860 is a tracking device supporting LTE-M/NB-IoT/2G, WiFi and 915MHz wireless technology.

This product including a Quectel BG96 license module with FCC ID: XMR201707BG96 with report no.: RXA1706-0199RF01R1, RXA1706-0199RF02R1, RXA1706-0199RF03R1, RXA1706-0199RF04R1, RXA1706-0199RF05, RXA1706-0199RF06, RXA1706-0199RF07, RXA1706-0199RF08 issued by TA Technology (Shanghai) Co., Ltd. Since the BG96 license module has no any change from the granted one except the antenna, only recheck the output power and radiated spurious emission. All the other data can refer to report RXA1706-0199RF01R1, RXA1706-0199RF02R1, RXA1706-0199RF03R1, RXA1706-0199RF04R1, RXA1706-0199RF05, RXA1706-0199RF06, RXA1706-0199RF07, RXA1706-0199RF08.

This report is for LTE-M/NB-IoT/2G functions.

For details refer to the User Manual, Technical Description and Circuit Diagram.

### 3.2 Ratings and System Details

**Table 2: Technical Specification of EUT**

General Information of EUT	Value
Kind of Equipment	Quarterback Gateway
Type Designation	T11012860
FCC ID	SRMT11012860
Operating Voltage	12 / 24V DC Charger AC/DC Adapter Rechargeable Battery (4.2V)
Testing Voltage	AC/DC Adapter Rechargeable Battery (4.2V)
<b>Technical Specification</b>	
Operational Frequency Band(s):	LTE-Cat M1: Band 2, Band 4, Band 5, Band 12, Band 13, Band 26 NB-IoT: Band 2, Band 5, Band 12, Band 13, Band 26 GPRS/EDGE 850/1900
Power Class:	GPRS 900: Class 4 GPRS1800: Class 1 EGPRS 900/1800: E2 LTE Cat M1 and NB-IoT: Class 3
Modulation Type:	GMSK, 8PSK, BPSK, QPSK, 16QAM
Antenna Type:	Integral Antenna
Antenna Gain:	Max. 2.0 dBi

**Table 3: RF Channel and Frequency**

LTE Cat-M1

Frequency Band(s)	Frequency Range		Channel Bandwidth (MHz)
	Transmitting $f_{UL}$ (MHz)	Receiving $f_{DL}$ (MHz)	
Band 2	1850 ~ 1910	1930 ~ 1990	1.4, 3, 5, 10, 15, 20
Band 4	1710 ~ 1755	2110 ~ 2155	1.4, 3, 5, 10, 15, 20
Band 5	824 ~ 849	869 ~ 894	1.4, 3, 5, 10
Band 12	699 ~ 716	729 ~ 746	1.4, 3, 5, 10
Band 13	777 ~ 787	746 ~ 756	5, 10
Band 26	814 ~ 849	859 ~ 894	1.4, 3, 5, 10, 15
NB-IoT Frequency Band(s)	Frequency Range		Subcarrier Spacing (kHz)
	Transmitting $f_{UL}$ (MHz)	Receiving $f_{DL}$ (MHz)	
Band 2	1850 ~ 1910	1930 ~ 1990	3.75, 15
Band 5	824 ~ 849	869 ~ 894	3.75, 15
Band 12	699 ~ 716	729 ~ 746	3.75, 15
Band 13	777 ~ 787	746 ~ 756	3.75, 15
Band 26	814 ~ 849	859 ~ 894	3.75, 15
GPRS/EGPRS Frequency Band(s)	Frequency Range		Channel Bandwidth (KHz)
	Transmitting $f_{UL}$ (MHz)	Receiving $f_{DL}$ (MHz)	
GSM 850	824 ~ 849	869 ~ 894	200
PCS 1900	1850 ~ 1910	1930 ~ 1990	200

### 3.3 Independent Operation Modes

The basic operation modes are:

- A. On, transmitting mode
- 1) Low Channel
  - 2) Middle Channel
  - 3) High Channel

### 3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

### 3.5 Submitted Documents

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> User Manual     | <input checked="" type="checkbox"/> Rating Label   |
| <input checked="" type="checkbox"/> Circuit Diagram | <input checked="" type="checkbox"/> PCB Layout     |
| <input checked="" type="checkbox"/> Block Diagram   | <input checked="" type="checkbox"/> Photo Document |
| <input checked="" type="checkbox"/> Schematics      | <input checked="" type="checkbox"/> Parts List     |



## 4 Test Set-up and Operation Modes

### 4.1 Principle of Configuration Selection

**Radio Spectrum:** The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

### 4.2 Test Operation and Test Software

NB-IoT Operation bands	Frequencies under Test					
	Uplink			Downlink		
	Range	EARFCN	Frequencies (MHz)	Range	EARFCN	Frequencies (MHz)
2	Low	18601	1850.1000	Low	601	1930.1000
	Mid	18900	1880.0000	Mid	900	1960.0000
	High	19199	1909.9000	High	1199	1989.9000
5	Low	20401	824.1000	Low	2401	869.1000
	Mid	20525	836.5000	Mid	2525	881.5000
	High	20649	848.9000	High	2649	893.9000
12	Low	23011	699.1000	Low	5011	729.1000
	Mid	23095	707.5000	Mid	5095	737.5000
	High	23179	715.9000	High	5179	745.9000
13	Low	23181	777.1000	Low	5181	746.1000
	Mid	23230	782.0000	Mid	5230	751.0000
	High	23279	786.9000	High	5279	755.9000
26_Lower Band (814-824 MHz)	Low	26691	814.1000	Low	8691	859.1000
	Mid	26740	819.0000	Mid	8740	864.0000
	High	26789	823.9000	High	8789	868.9000
26_Upper Band (824-849 MHz)	Low	26791	824.1000	Low	8791	869.1000
	Mid	26915	836.5000	Mid	8915	881.5000
	High	27039	848.9000	High	9039	893.9000
	High	134181	715.9000	High	70545	745.9000

LTE CAT-M Operation bands	Mo de	Channel Bandwidth (MHz)	Frequencies under Test					
			EARFCN	CH <sub>Low</sub> (MHz)	EARFCN	CH <sub>Mid</sub> (MHz)	EARFCN	CH <sub>High</sub> (MHz)
2	TX	1.4	18607	1850.7	18900	1880	19193	1909.3
		3	18615	1851.5	18900	1880	19185	1908.5
		5	18625	1852.5	18900	1880	19175	1907.5
		10	18650	1855	18900	1880	19150	1905
		15	18675	1857.5	18900	1880	19125	1902.5
		20	18700	1860	18900	1880	19100	1900
	RX	1.4	607	1930.7	900	1960	1193	1989.3
		3	615	1931.5	900	1960	1185	1988.5
		5	625	1932.5	900	1960	1175	1987.5
		10	650	1935	900	1960	1150	1985
		15	675	1937.5	900	1960	1125	1982.5
		20	700	1940	900	1960	1100	1980
4	TX	1.4	19957	1710.7	20175	1732.5	20393	1754.3
		3	19965	1711.5	20175	1732.5	20385	1753.5
		5	19975	1712.5	20175	1732.5	20375	1752.5
		10	20000	1715	20175	1732.5	20350	1750
		15	20025	1717.5	20175	1732.5	20325	1747.5
		20	20050	1720	20175	1732.5	20300	1745
	RX	1.4	1957	2110.7	2175	2132.5	2393	2154.3
		3	1965	2111.5	2175	2132.5	2385	2153.5
		5	1975	2112.5	2175	2132.5	2375	2152.5
		10	2000	2115	2175	2132.5	2350	2150
		15	2025	2117.5	2175	2132.5	2325	2147.5
		20	2050	2120	2175	2132.5	2300	2145
5	TX	1.4	20407	824.7	20525	836.5	20643	848.3
		3	20415	825.5	20525	836.5	20635	847.5
		5	20425	826.5	20525	836.5	20625	846.5
		10	20450	829	20525	836.5	20600	844
	RX	1.4	2407	869.7	2525	881.5	2643	893.3
		3	2415	870.5	2525	881.5	2635	892.5
		5	2425	871.5	2525	881.5	2625	891.5
		10	2450	874	2525	881.5	2600	889
12	TX	1.4	23017	699.7	23095	707.5	23173	715.3
		3	23025	700.5	23095	707.5	23165	714.5
		5	23035	701.5	23095	707.5	23155	713.5
		10	23060	704	23095	707.5	23130	711
	RX	1.4	5017	729.7	5095	737.5	5173	745.3
		3	5025	730.5	5095	737.5	5165	744.5
		5	5035	731.5	5095	737.5	5155	743.5
		10	5060	734	5095	737.5	5130	741
13	TX	5	23205	779.5	23230	782	23255	784.5
		10	23230	782	23230	782	23230	782
	RX	5	5205	748.5	5230	751	5255	753.5
		10	5230	751	5230	751	5230	751
26_Low er Band (814-824 MHz)	TX	1.4	26697	814.7	26740	819	26783	823.3
		3	26705	815.5	26740	819	26775	822.5
		5	26715	816.5	26740	819	26765	821.5
		10	26740	819	26740	819	26740	819
	RX	1.4	8697	859.7	8740	864	8783	868.3
		3	8705	860.5	8740	864	8775	867.5
		5	8715	861.5	8740	864	8765	866.5

		10	8740	864	8740	864	8740	864
26_Upper Band (824-849 MHz)	TX	1.4	26797	824.7	26915	836.5	27033	848.3
		3	26805	825.5	26915	836.5	27025	847.5
		5	26815	826.5	26915	836.5	27015	846.5
		10	26840	829	26915	836.5	26990	844
		15	26865	831.5	26915	836.5	26965	841.5
	RX	1.4	8797	869.7	8915	881.5	9033	893.3
		3	8805	870.5	8915	881.5	9025	892.5
		5	8815	871.5	8915	881.5	9015	891.5
		10	8840	874	8915	881.5	8990	889
		15	8865	876.5	8915	881.5	8965	886.5

GSM Operation bands	TX/RX	RF Channel		
		Low (L)	Middle (M)	High (H)
GSM 850	TX	Channel 128	Channel 190	Channel 251
		824.2MHz	836.6MHz	848.8MHz
	RX	Channel 128	Channel 190	Channel 251
		869.2MHz	881.6MHz	893.8MHz
PCS 1900	TX	Channel 512	Channel 661	Channel 810
		1850.2MHz	1880.0MHz	1909.8MHz
	RX	Channel 512	Channel 661	Channel 810
		1930.2MHz	1960.0MHz	1989.8MHz

### 4.3 Special Accessories and Auxiliary Equipment

**Table 4: Auxiliary Equipment Used during Test**

Description	Manufacturer	Model	S/N	Rating
--	--	--	--	--

### 4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

## 4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

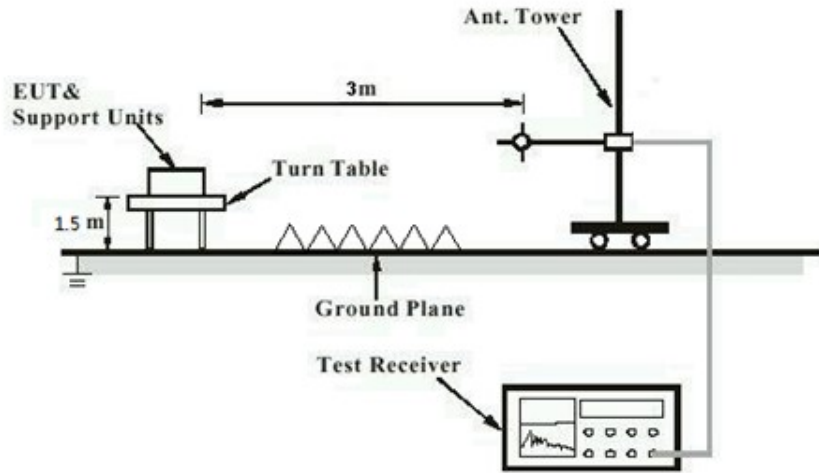
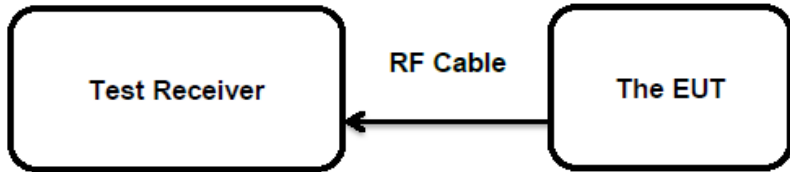


Diagram of Measurement Configuration for Conducted Transmitter Measurement



## 5 Test Results

### 5.1 Transmitter Requirement & Test Suites

#### 5.1.1 RF POWER OUTPUT

**RESULT:**
**Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 27 47 CFR FCC Part 90 47 CFR FCC Part 2
Limits	:	Operating band      FCC Limit Band 2/PCS1900      EIRP 2 watts Band 4                      EIRP 1 watts Band 5/GSM 850      ERP 7 watts Band 12                    ERP 3 watts Band 13                    ERP 3 watts Band 26 Lower Band   < 100 watts Band 26 Upper Band   ERP 7 watts
Test procedure	:	Clause 5.2.4.2 of ANSI C63.26
Kind of test site	:	Shielding Room

**Test Setup**

Date of testing	:	
Input voltage	:	Fully charged battery
Test environment	:	<input checked="" type="checkbox"/> Normal test conditions <input type="checkbox"/> Extreme test conditions
Operation mode	:	A.1
Ambient temperature	:	26 °C
Relative humidity	:	55%
Atmospheric pressure	:	101.0 kPa

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_{\text{T}}$$

where

 ERP or EIRP: effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as  $P_{\text{Meas}}$ , e.g. dBm)

 $P_{\text{Meas}}$ : measured transmitter output power, in dBm

 $G_{\text{T}}$ : gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

Refer to attached Appendix A for details of test results.

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## 5.1.2 MODULATION CHARACTERISTICS

**RESULT:****Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 27 47 CFR FCC Part 90 47 CFR FCC Part 2
Limits	:	“Other types of equipment”, the use of higher order modulations such as OFDM or LTE or other modulation are acceptable for use
Test procedure	:	Clause 5.2.3 of ANSI C63.26
Kind of test site	:	Shielding Room

**Note:**

The device implement digital modulation such as BPSK and QPSK, hence the EUT is deemed to comply with this requirement without additional testing.

Refer attached report RXA1706-0199RF01R1, RXA1706-0199RF02R1, RXA1706-0199RF03R1, RXA1706-0199RF04R1, RXA1706-0199RF05, RXA1706-0199RF06, RXA1706-0199RF07, RXA1706-0199RF08.

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Page 15 of 21**5.1.3 OCCUPIED BANDWIDTH AND 26dB BANDWIDTH****RESULT:****Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 27 47 CFR FCC Part 90 47 CFR FCC Part 2
Test requirement	:	Section 2.1049 of 47 CFR FCC Part 2
Limits	:	No limit
Test procedure	:	Section 5.4.3 of ANSI C63.26 <input checked="" type="checkbox"/> Conducted measurements <input type="checkbox"/> Radiated measurements
Kind of test site	:	Shielding Room

Refer attached report RXA1706-0199RF01R1, RXA1706-0199RF02R1, RXA1706-0199RF03R1, RXA1706-0199RF04R1, RXA1706-0199RF05, RXA1706-0199RF06, RXA1706-0199RF07, RXA1706-0199RF08.

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### 5.1.4 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

**RESULT:**
**Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 27 47 CFR FCC Part 90 47 CFR FCC Part 2																												
Limits	:	<table border="0"> <tr> <td>Operating band</td> <td>FCC Limit</td> </tr> <tr> <td>Band 2/PCS1900</td> <td>&lt; - 13 dBm /1MHz</td> </tr> <tr> <td>Band 4</td> <td>&lt; - 13 dBm /1MHz</td> </tr> <tr> <td></td> <td>&lt; - 13 dBm /100kHz</td> </tr> <tr> <td>Band 5/GSM850</td> <td>@ &lt; 1GHz</td> </tr> <tr> <td></td> <td>&lt; - 13 dBm /1MHz</td> </tr> <tr> <td></td> <td>@ &gt; 1GHz</td> </tr> <tr> <td>Band 12</td> <td>&lt; - 13 dBm /100kHz</td> </tr> <tr> <td>Band 13</td> <td>&lt; - 13 dBm /100kHz</td> </tr> <tr> <td>Band 26 Lower Band</td> <td>&lt; - 13 dBm /100kHz</td> </tr> <tr> <td></td> <td>&lt; - 13 dBm /100kHz</td> </tr> <tr> <td>Band 26 Upper Band</td> <td>@ &lt; 1GHz</td> </tr> <tr> <td></td> <td>&lt; - 13 dBm /1MHz</td> </tr> <tr> <td></td> <td>@ &gt; 1GHz</td> </tr> </table>	Operating band	FCC Limit	Band 2/PCS1900	< - 13 dBm /1MHz	Band 4	< - 13 dBm /1MHz		< - 13 dBm /100kHz	Band 5/GSM850	@ < 1GHz		< - 13 dBm /1MHz		@ > 1GHz	Band 12	< - 13 dBm /100kHz	Band 13	< - 13 dBm /100kHz	Band 26 Lower Band	< - 13 dBm /100kHz		< - 13 dBm /100kHz	Band 26 Upper Band	@ < 1GHz		< - 13 dBm /1MHz		@ > 1GHz
Operating band	FCC Limit																													
Band 2/PCS1900	< - 13 dBm /1MHz																													
Band 4	< - 13 dBm /1MHz																													
	< - 13 dBm /100kHz																													
Band 5/GSM850	@ < 1GHz																													
	< - 13 dBm /1MHz																													
	@ > 1GHz																													
Band 12	< - 13 dBm /100kHz																													
Band 13	< - 13 dBm /100kHz																													
Band 26 Lower Band	< - 13 dBm /100kHz																													
	< - 13 dBm /100kHz																													
Band 26 Upper Band	@ < 1GHz																													
	< - 13 dBm /1MHz																													
	@ > 1GHz																													
Test procedure	:	Clause 5.7.4 of ANSI C63.26																												
Kind of test site	:	Shielding Room																												

Refer attached report RXA1706-0199RF01R1, RXA1706-0199RF02R1, RXA1706-0199RF03R1, RXA1706-0199RF04R1, RXA1706-0199RF05, RXA1706-0199RF06, RXA1706-0199RF07, RXA1706-0199RF08.



**Prüfbericht - Nr.: 60443732 003**  
Test Report No.Seite 17 von 21  
Page 17 of 21**5.1.5 SPURIOUS EMISSIONS AT ANTENNA TERMINALS – BAND EDGE****RESULT:****Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 27 47 CFR FCC Part 90 47 CFR FCC Part 2
Limits	:	Operating band      FCC Limit Band 2/PCS1900      < - 13 dBm /1%EBW Band 4                      < - 13 dBm /1%EBW Band 5/GSM850        < - 13 dBm /1%EBW Band 12                   < - 13 dBm /30kHz Band 13                   < - 13 dBm /30kHz Band 26 Lower Band   < - 20 dBm /1%EBW Band 26 Upper Band   < - 13 dBm /1%EBW
Test procedure	:	Clause 5.7.3 of ANSI C63.26
Kind of test site	:	Shielding Room

Refer attached report RXA1706-0199RF01R1, RXA1706-0199RF02R1, RXA1706-0199RF03R1, RXA1706-0199RF04R1, RXA1706-0199RF05, RXA1706-0199RF06, RXA1706-0199RF07, RXA1706-0199RF08.

### 5.1.6 FIELD STRENGTH OF SPURIOUS RADIATION

**RESULT:**
**Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 27 47 CFR FCC Part 90 47 CFR FCC Part 2
Limits	:	Operating FCC Limit band Band 2 < - 13 dBm /1MHz Band 4 < - 13 dBm /1MHz Band 5 < - 13 dBm /100kHz @ < 1GHz < - 13 dBm /1MHz @ > 1GHz Band 12 < - 13 dBm /100kHz Band 13 < - 13 dBm /100kHz Band 26 < - 13 dBm /100kHz Lower Band Band 26 < - 13 dBm /100kHz @ < 1GHz Upper Band < - 13 dBm /1MHz @ > 1GHz
Test procedure	:	Clause 5.5 of ANSI C63.26
Kind of test site	:	3m Semi Anechoic Room

**Test Setup**

Date of testing	:	2020-11-02 – 2021-07-01
Input voltage	:	Fully charged battery
Test environment	:	<input checked="" type="checkbox"/> Normal test conditions <input type="checkbox"/> Extreme test conditions
Operation mode	:	A
Ambient temperature	:	26 °C
Relative humidity	:	56%
Atmospheric pressure	:	101.0 kPa

The limit calculation:

$$\text{Limit} = P_{\text{Meas}} \text{ (dBm)} - [43 + 10 \log(P_{\text{Meas}})] = -13 \text{ dBm}$$

Sweep the whole frequency band through the range from 9 kHz to the 10<sup>th</sup> harmonic of the carrier, the emissions below the noise floor will not be recorded in this report. The measurement is performed for all operational modes and both antenna polarization, only the data of the worst mode is recorded in this report.

Refer to attached Appendix B for details of test results.

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### 5.1.7 FREQUENCY STABILITY

**RESULT:****Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 27 47 CFR FCC Part 90 47 CFR FCC Part 2
Limits	:	Operating band      FCC Limit
		Band 2                      Within authorized bands
		Band 4                      Within authorized bands
		Band 5                      2.5 ppm
		Band 12                     Within authorized bands
		Band 13                     Within authorized bands
		Band 26 Lower Band      2.5 ppm
		Band 26 Upper Band      2.5 ppm
Test procedure	:	Clause 5.6.3 of ANSI C63.26
Kind of test site	:	Shielding Room

Refer attached report RXA1706-0199RF01R1, RXA1706-0199RF02R1, RXA1706-0199RF03R1, RXA1706-0199RF04R1, RXA1706-0199RF05, RXA1706-0199RF06, RXA1706-0199RF07, RXA1706-0199RF08.

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### 5.1.8 PEAK TO AVERAGE RATIO

**RESULT:**
**Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 27 47 CFR FCC Part 90 47 CFR FCC Part 2		
Limits	:	Operating band	FCC Limit	ISED Limit
		Band 2	PAR ≤ 13 dB	PAR ≤ 13 dB
		Band 4	PAR ≤ 13 dB	PAR ≤ 13 dB
		Band 5	PAR ≤ 13 dB	PAR ≤ 13 dB
		Band 12	PAR ≤ 13 dB	PAR ≤ 13 dB
		Band 13	PAR ≤ 13 dB	PAR ≤ 13 dB
		Band 26 Lower Band	N/A	N/A
		Band 26 Upper Band	PAR ≤ 13 dB	PAR ≤ 13 dB
Test procedure	:	Clause 5.2.6 of ANSI C63.26		
Kind of test site	:	Shielding Room		

Refer attached report RXA1706-0199RF01R1, RXA1706-0199RF02R1, RXA1706-0199RF03R1, RXA1706-0199RF04R1, RXA1706-0199RF05, RXA1706-0199RF06, RXA1706-0199RF07, RXA1706-0199RF08.

## 6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

## 7 List of Tables

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