Prüfbericht-Nr.: *Test report no.:*	**CN21N817 001**	**Auftrags-Nr.:** *Order no.:*	168335486	**Seite 1 von 25** *Page 1 of 25*
Kunden-Referenz-Nr.: *Client reference no.:*	**N/A**	**Auftragsdatum:** *Order date:*	2021.09.22	
Auftraggeber: *Client:*	Telit Communications S.p.A. Viale Stazione di Prosecco 5/b, 34010, Trieste, Italy			
Prüfgegenstand: *Test item:*	Data Terminal Module			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	ME310G1-W3			
Auftrags-Inhalt: *Order content*:	Test Report			
Prüfgrundlage: *Test specification:*	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		RSS-132 Issue 3 RSS-133 Issue 6 RSS-130 Issue 2 RSS-139 Issue 3 RSS-140 Issue 1 RSS-Gen Issue 5	

Wareneingangsdatum: *Date of sample receipt:*	2021.10.15	Refer to Photo Documentation
Prüfmuster-Nr.: *Test sample no:*	A003146834-001/008~011/012~014	
Prüfzeitraum: *Testing period:*	2021.10.15~2021.11.09	
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüfergebnis*: *Test result*:*	Pass	

geprüft von: *tested by:*	X Bell Hu Signed by: Bell Hu	**genehmigt von:** *authorized by:*	X Lin Lin Signed by: Lin Lin
Datum: *Date:* 2021-11-26		**Ausstellungsdatum:** *Issue date:* 2021-11-26	
Stellung */ Position:*	Project Manager	**Stellung** */ Position:*	Reviewer
Sonstiges */ Other:*	**Sonstiges** */ Other*: FCC ID: RI7ME310G1W3; IC: 5131A-ME310G1W3 This report is for eMTC operation.		

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

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.
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.
V05

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

CONTENTS

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 Band 2 for eMTC operation

Appendix B: Test Results of Band 4 for eMTC operation

Appendix C: Test Results of Band 5 for eMTC operation

Appendix D: Test Results of Band 12 for eMTC operation

Appendix E: Test Results of Band 13 for eMTC operation

Appendix F: Test Results of Band 14 for eMTC operation

Appendix G: Test Results of Band 25 for eMTC operation

Appendix H: Test Results of Band 26 Lower for eMTC operation

Appendix I: Test Results of Band 26 upper for eMTC operation

Appendix J: Test Results of Band 66 for eMTC operation

Appendix K: Test Results of Band 85 for eMTC operation

Appendix L: Test Results of Band 8_39d for eMTC operation

Appendix M: Test Results of Field Strength of Spurious Radiation for eMTC operation

1.2 TEST STANDARD(S)

Applied Rules:	47 CFR FCC Part 22	RSS-130 Issue 2
	47 CFR FCC Part 24	RSS-132 Issue 3
	47 CFR FCC Part 27	RSS-133 Issue 6
	47 CFR FCC Part 90	RSS-139 Issue 3
	47 CFR FCC Part 2	RSS-140 Issue 1
		RSS-Gen Issue 5
Test Method:	KDB 971168 D01	
	ANSI C63.26	

2. TEST SITES

2.1 TEST FACILITIES

TÜV Rheinland (Shenzhen) Co., Ltd.
(FCC Registration No.: 694916 & IC Registration Number: 25069)
Address: No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, P.R. China
A2LA accredited certificate number: 5162.01

2.2 TEST DATE

Date of test: 2021.10.15~2021.11.09

2.3 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Table 1: List of Test and Measurement Equipment

Description	Manufacturer	Model	Serial No.	Calibrated until (DD.MM.YYYY)
Radio Spectrum Testing				
Wireless Connectivity Tester	R&S	CMW270	101375	09.08.2022
Signal Analyzer	R&S	FSV 40	101441	09.08.2022
Vector Signal Generator	R&S	SMBV100A	263301	09.08.2022
Signal Generator	R&S	SMB100A	115186	09.08.2022
OSP	R&S	OSP 150	101017	10.12.2021
Control PC	DELL	OptiPlex 7050	FTJZ9P2	N/A
Test Software	R&S	WMS32 (V11.00.00)	N/A	N/A
Power Meter	R&S	NRP2	107105	10.12.2021
Power Sensor	R&S	NRP-Z81	105677	09.08.2022
Humid & Temp Programmable Tester	BOST	NTH090-60	19040801	02.04.2022
Shielding Room 8#	Albatross	SR8	APC17151-SR8	22.06.2024
Unwanted Emission Testing				
Signal Generator	R&S	SMB100A	180840	09.08.2022
Wideband Radio Communication Tester	R&S	CMW500	165339	09.08.2022
Signal Analyzer	R&S	FSV 40	101440	09.08.2022
System Controller	R&S	SCI-100	S10010036	N/A

Interface				
Filterbank	R&S	GSM	100811	09.08.2022
OSP	R&S	OSP 120	102041	N/A
OSP	R&S	OSP 150	101385	10.12.2021
Pre-amplifier	R&S	SCU08F1	08320030	09.08.2022
Amplifier	R&S	SCU-18F	180079	09.08.2022
Amplifier	R&S	SCU40A	100450	09.08.2022
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	192	08.08.2022
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218719	08.08.2022
Wideband Ridged Horn Antenna (12-18 GHz)	Steatite	QMS-00208	18312	08.08.2022
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19066	08.08.2022
Biconical Broadband Antenna (30 MHz - 1 GHz)	Schwarzbeck	VUBA 9117	357	02.08.2024
Double Ridged Broadband Horn Antenna (1 – 18 GHz)	Schwarzbeck	BBHA 9120 D	01760	30.07.2024
Broadband Horn Antenna (15 – 40 GHz)	Schwarzbeck	BBHA 9170	00862	02.08.2024
Test software	R&S	EMC32 (V10.50.40)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NW9P2	N/A
3m Fully Anechoic Chamber	Albatross	FAC-3m	APC17151-FAC	22.06.2024

2.4 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.5 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 basics using in house standards or comparisons.

2.6 Location of Original Data

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

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. facility located at No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, P.R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3. GENERAL PRODUCT INFORMATION

3.1 GENERAL DESCRIPTION

The EUT is wireless module which supports EMTC wireless technology.

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

3.2 RATING AND SYSTEM DETAILS

Table 2: Rating of EUT

General Information of EUT	Description
Kind of Equipment:	Data Terminal Module
Type Designation:	ME310G1-W3
FCC ID:	RI7ME310G1W3
IC:	5131A-ME310G1W3
HVIN:	ME310G1-W3
FVIN:	M0C.900004
Type of Equipment:	Single Module
Antenna Type:	External Antenna
Operating Voltage:	DC 3.8V
Operating Temperature Range:	-40°C ~ +85°C

Table 3: Technical Specification of EUT

Characteristic	Description
Operated Modes:	eMTC
Operational Frequency Band(s):	Band 2, Band 4, Band 5, Band 8, Band 12, Band 13, Band 14,Band 25, Band 26, Band 66, Band 85
Nominal RF Output Power:	23 dBm ± 2dB
Modulation Type:	16QAM, QPSK
Antenna Type:	External Antenna The EUT doesn't have antenna, The adapter and antenna used for testing in this report is the after-market accessory
Antenna Gain:	2.14 dBi
Device Category:	CAT-M1

Table 4: Operating Frequency Range of EUT

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 8	897.5	~	900.5	936.5	~	939.5	1.4, 3
Band 12	699	~	716	729	~	746	1.4, 3, 5, 10
Band 13	777	~	787	746	~	756	5, 10
Band 14	788	~	798	758	~	768	5, 10
Band 25	1850	~	1915	1930	~	1995	1.4, 3, 5, 10, 15, 20
Band 26	814	~	849	859	~	894	1.4, 3, 5, 10, 15
Band 66	1710	~	1780	2110	~	2200	1.4, 3, 5, 10, 15, 20
Band 85	698	~	716	728	~	746	5, 10

3.3 INDEPENDENT OPERATION MODES

The basic operation modes are:

A. On, communication link established, Transmitting
    1) eMTC operating
        i. Low channel
        ii. Middle channel
        iii. High channel
B. On, communication link established, Receiving
    1) eMTC operating
C. Idle
D. Off

3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS

Refer to the Circuit Diagram.

3.5 SUBMITTED DOCUMENTS

☒ User Manual
☒ Circuit Diagram
☒ Block Diagram
☒ Schematics
☐ Model Difference Letter
☒ Rating Label
☒ PCB Layout
☒ Photo Document
☒ 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.

4.2 TEST OPERATION AND TEST SOFTWARE

Test operation refers to test setup in chapter 5. All testing were performed according to the procedure in KDB 971168 D01 and ANSI C63.26.

Table 5: List of Frequencies under Test

Operation bands	Mode	Channel Bandwidth (MHz)	Frequencies under Test					
			EARFCN	CH_{Low} (MHz)	EARFCN	CH_{Mid} (MHz)	EARFCN	CH_{High} (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

8	TX	1.4	21632	898.2	21640	899	21648	899.8
		3	21640	899	21640	899	21640	899
	RX	1.4	21632	898.2	21640	899	21648	899.8
		3	21640	899	21640	899	21640	899
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
14	TX	5	23305	790.5	23330	793	23355	795.5
		10	23330	793	23330	793	23330	793
	RX	5	5305	760.5	5330	763	5355	765.5
		10	5330	763	5330	763	5330	763
25	TX	1.4	26047	1850.7	26365	1882.5	26683	1914.3
		3	26055	1851.5	26365	1882.5	26675	1913.5
		5	26065	1852.5	26365	1882.5	26665	1912.5
		10	26090	1855	26365	1882.5	26640	1910
		15	26115	1857.5	26365	1882.5	26615	1907.5
		20	26140	1860	26365	1882.5	26590	1905
	RX	1.4	8047	1930.7	8365	1962.5	8683	1994.3
		3	8055	1931.5	8365	1962.5	8675	1993.5
		5	8065	1932.5	8365	1962.5	8665	1992.5
		10	8090	1935	8365	1962.5	8640	1990
		15	8115	1937.5	8365	1962.5	8615	1987.5
		20	8140	1940	8365	1962.5	8590	1985
26_Lower 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
66	TX	1.4	131979	1710.7	132322	1745	132665	1779.3
		3	131987	1711.5	132322	1745	132657	1778.5
		5	131997	1712.5	132322	1745	132647	1777.5
		10	132022	1715	132322	1745	132622	1775
		15	132047	1717.5	132322	1745	132597	1772.5
		20	132047	1717.5	132322	1745	132572	1770
	RX	1.4	66443	2110.7	66786	2145	67129	2179.3
		3	66451	2111.5	66786	2145	67121	2178.5
		5	66461	2112.5	66786	2145	67111	2177.5
		10	66486	2115	66786	2145	67086	2175
		15	66511	2117.5	66786	2145	67061	2172.5
		20	66536	2120	66786	2145	67036	2170
85	TX	5	134027	700.5	134092	707	134157	713.5
		10	134052	703	134092	707	134132	711
	RX	5	70391	730.5	70456	737	70521	743.5
		10	70416	733	70456	737	70496	741

Table 6: Test Environments

Environment Parameter	Selected Values During Tests		
	Temperature (°C)	Voltage (V) DC	Relative Humidity
Normal (NTNV)	24	3.8	51%
HTHV	85 °C	4.5	---
LTHV	-40 °C	4.5	---
HTLV	85 °C	3.2	---
LTLV	-40 °C	3.2	---

Table 7: Test Configurations

Frequency Bands	Bandwidths (MHz)						Modulation	
	1.4	3	5	10	15	20	QPSK	16QAM
2	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ
4	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ
5	Δ	Δ	Δ	Δ	-	-	Δ	Δ
8_39d	Δ	Δ	-	-			Δ	Δ
12	Δ	Δ	Δ	Δ	-	-	Δ	Δ
13	-	-	Δ	Δ	-	-	Δ	Δ
14	-	-	Δ	Δ	-	-	Δ	Δ
25	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ
26	Δ	Δ	Δ	Δ	Δ	-	Δ	Δ
66	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ
85	-	-	Δ	Δ	-	-	Δ	Δ

4.3 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT

Table 8: Cables used during test

Port	Quantity	Length (m)	Connector	Type of Cable
USB	1	1.2	USB	USB cable, shielding

Table 9: Auxiliary Equipment used during test

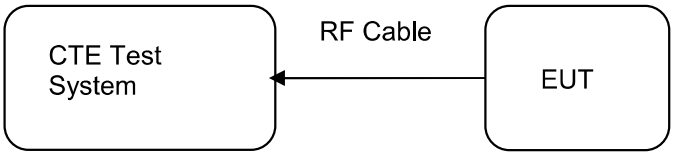
Name	Model	Manufacturer	S/N
Evaluation Kit	EVK2	Telit	N/A
LTE Magnetic Antenna	T-AT305 Frequency Range: 700-960 MHz / 1710-2700 MHz Omnidirectional antenna Gain: 2.14 dBi (Max.) Cable: RG 174mm 2500	ATEL-CAB	N/A

4.4 COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE

The test sample, which has been tested, contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Equipment Configuration for Transmitter Measurement



5. TEST RESULTS

5.1 ESSENTIAL REQUIREMENTS OF STANDARD

5.1.1 RF POWER OUTPUT

RESULT: **Pass**

Test standard	:	47 CFR FCC Part 22		RSS-130 Issue 2
		47 CFR FCC Part 24		RSS-132 Issue 3
		47 CFR FCC Part 27		RSS-133 Issue 6
		47 CFR FCC Part 90		RSS-139 Issue 3
		47 CFR FCC Part 2		RSS-140 Issue 1
				RSS-Gen Issue 5
Limits	:	Operating band	FCC Limit	ISED Limit
		Band 2	EIRP 2 watts	EIRP 2 watts
		Band 4	EIRP 1 watts	EIRP 1 watts
		Band 5	ERP 7 watts	EIRP 11.5 watts
		Band 8_39d	ERP 10 watts	N/A
		Band 12	ERP 3 watts	ERP 3 watts
		Band 13	ERP 3 watts	ERP 3 watts
		Band 14	ERP 30 watts	ERP 30 watts
		Band 25	EIRP 2 watts	EIRP 2 watts
		Band 26 Lower Band	< 100 watts	N/A
		Band 26 Upper Band	ERP 7 watts	EIRP 11.5 watts
		Band 66	EIRP 1 watts	EIRP 1 watts
		Band 85	ERP 3 watts	ERP 3 watts
Test procedure	:	Clause 5.2.4.2 of ANSI C63.26		
Kind of test site	:	Shielding Room		

Test Setup

Date of testing	:	2021.10.20-2021.11.06
Input voltage	:	DC 3.8V
Test environment	:	☒ Normal test conditions
		☐ Extreme test conditions
Operation mode	:	A.1
Ambient temperature	:	23 ºC
Relative humidity	:	50%
Atmospheric pressure	:	101.0 kPa

ERP or EIRP = P_{Meas} + G_T

where

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

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

G_T: gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

Refer to attached Appendix A to Appendix L for details of test results.

5.1.2 MODULATION CHARACTERISTICS

RESULT: **Pass**

Test standard	:	47 CFR FCC Part 22	RSS-130 Issue 2
		47 CFR FCC Part 24	RSS-132 Issue 3
		47 CFR FCC Part 27	RSS-133 Issue 6
		47 CFR FCC Part 90	RSS-139 Issue 3
		47 CFR FCC Part 2	RSS-140 Issue 1
			RSS-Gen Issue 5
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	
		2021.10.20-2021.11.06	
		DC 3.8V	

Note:
The device implement digital modulation such as 16QAM and QPSK, hence the EUT is deemed to comply with this requirement without additional testing.

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	RSS-130 Issue 2 RSS-132 Issue 3 RSS-133 Issue 6 RSS-139 Issue 3 RSS-140 Issue 1 RSS-Gen Issue 5
Test requirement	:	Section 2.1049	
Limits	:	No limit	
Test procedure	:	Section 5.4.3 of ANSI C63.26 ☒ Conducted measurements ☐ Radiated measurements	
Kind of test site	:	Shielding Room	

Test Setup

Date of testing	:	2021.10.20-2021.11.06
Input voltage	:	DC 3.8V
Test environment	:	☒ Normal test conditions ☐ Extreme test conditions
Operation mode	:	A.1
Ambient temperature	:	24 ºC
Relative humidity	:	50%
Atmospheric pressure	:	101.0 kPa

Refer to attached Appendix A to Appendix L for details of test results.

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	RSS-130 Issue 2 RSS-132 Issue 3 RSS-133 Issue 6 RSS-139 Issue 3 RSS-140 Issue 1 RSS-Gen Issue 5

Limits	:	Operating band	FCC Limit	ISED Limit
		Band 2	< - 13 dBm /1MHz	< - 13 dBm /1MHz
		Band 4	< - 13 dBm /1MHz	< - 13 dBm /1MHz
		Band 5	< - 13 dBm /100kHz @ < 1GHz < - 13 dBm /1MHz @ > 1GHz	< - 13 dBm / 100 kHz
		Band 8_39d	< - 13 dBm /100kHz	N/A
		Band 12	< - 13 dBm /100kHz	< - 13 dBm /100kHz
		Band 13	< - 13 dBm /100kHz	< - 13 dBm /100kHz
		Band 14	< - 13 dBm /100kHz	< - 13 dBm /100kHz
		Band 25	< - 13 dBm /1MHz	< - 13 dBm /1MHz
		Band 26 Lower Band	< - 13 dBm /100kHz	N/A
		Band 26 Upper Band	< - 13 dBm /100kHz @ < 1GHz < - 13 dBm /1MHz @ > 1GHz	< - 13 dBm / 100 kHz
		Band 66	< - 13 dBm /1MHz	< - 13 dBm /1MHz
		Band 85	< - 13 dBm /100kHz	< - 13 dBm /100kHz
Test procedure	:	Clause 5.7.4 of ANSI C63.26		
Kind of test site	:	Shielding Room		

Test Setup

Date of testing	:	2021.10.20-2021.11.06
Input voltage	:	DC 3.8V
Test environment	:	☒ Normal test conditions ☐ Extreme test conditions
Operation mode	:	A.1
Ambient temperature	:	24 ºC
Relative humidity	:	51%
Atmospheric pressure	:	101.0 kPa

The limit calculation:
Limit = P_{Meas} (dBm) – [43+10log(P_{Meas})] = −13 dBm

Refer to attached Appendix A to Appendix L for details of test results.

5.1.5 SPURIOUS EMISSIONS AT ANTENNA TERMINALS – BAND EDGE

RESULT: **Pass**

Test standard	:	47 CFR FCC Part 22	RSS-130 Issue 2
		47 CFR FCC Part 24	RSS-132 Issue 3
		47 CFR FCC Part 27	RSS-133 Issue 6
		47 CFR FCC Part 90	RSS-139 Issue 3
		47 CFR FCC Part 2	RSS-140 Issue 1
			RSS-Gen Issue 5

Limits	:	Operating band	FCC Limit	ISED Limit
		Band 2	< - 13 dBm /1%EBW	< - 13 dBm / 1%OBW
		Band 4	< - 13 dBm /1%EBW	< - 13 dBm / 1%OBW
		Band 5	< - 13 dBm /1%EBW	< - 13 dBm / 1%OBW
		Band 8_39d	< - 13 dBm /1%EBW	N/A
		Band 12	< - 13 dBm /30kHz	< - 13 dBm /30kHz
		Band 13	< - 13 dBm /30kHz	< - 13 dBm /30kHz
		Band 14	< - 13 dBm /30kHz	< - 13 dBm /30kHz
		Band 25	< - 13 dBm /1%EBW	< - 13 dBm / 1%OBW
		Band 26 Lower Band	< - 20 dBm /1%EBW	N/A
		Band 26 Upper Band	< - 13 dBm /1%EBW	< - 13 dBm / 1%OBW
		Band 66	< - 13 dBm /1%EBW	< - 13 dBm / 1%OBW
		Band 85	< - 13 dBm /30kHz	< - 13 dBm /30kHz
Test procedure	:	Clause 5.7.3 of ANSI C63.26		
Kind of test site	:	Shielding Room		

Test Setup

Date of testing	:	2021.10.20-2021.11.06
Input voltage	:	DC 3.8V
Test environment	:	☒ Normal test conditions
		☐ Extreme test conditions
Operation mode	:	A.1
Ambient temperature	:	24 ºC
Relative humidity	:	51%
Atmospheric pressure	:	101.0 kPa

The limit calculation:
Limit = P_{Meas} (dBm) – [43+10log(P_{Meas})] = −13 dBm

Refer to attached Appendix A to Appendix L for details of test results.

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	RSS-130 Issue 2 RSS-132 Issue 3 RSS-133 Issue 6 RSS-139 Issue 3 RSS-140 Issue 1 RSS-Gen Issue 5

Limits	:	Operating band	FCC Limit	ISED Limit
		Band 2	< - 13 dBm /1MHz	< - 13 dBm /1MHz
		Band 4	< - 13 dBm /1MHz	< - 13 dBm /1MHz
		Band 5	< - 13 dBm /100kHz @ < 1GHz < - 13 dBm /1MHz @ > 1GHz	< - 13 dBm / 100 kHz
		Band 8_39d	< - 13 dBm /100kHz	N/A
		Band 12	< - 13 dBm /100kHz	< - 13 dBm /100kHz
		Band 13	< - 13 dBm /100kHz	< - 13 dBm /100kHz
		Band 14	< - 13 dBm /100kHz	< - 13 dBm /100kHz
		Band 25	< - 13 dBm /1MHz	< - 13 dBm /1MHz
		Band 26 Lower Band	< - 13 dBm /100kHz	N/A
		Band 26 Upper Band	< - 13 dBm /100kHz @ < 1GHz < - 13 dBm /1MHz @ > 1GHz	< - 13 dBm / 100 kHz
		Band 66	< - 13 dBm /1MHz	< - 13 dBm /1MHz
		Band 85	< - 13 dBm /100kHz	< - 13 dBm /100kHz
Test procedure	:	Clause 5.5 of ANSI C63.26		
Kind of test site	:	3m Semi Anechoic Room		

Test Setup

Date of testing	:	2021.10.20-2021.11.06
Input voltage	:	DC 3.8V
Test environment	:	☒ Normal test conditions ☐ Extreme test conditions
Operation mode	:	A.1
Ambient temperature	:	23 ºC
Relative humidity	:	47%
Atmospheric pressure	:	101.0 kPa

The limit calculation:
Limit = P_{Meas} (dBm) – [43+10log(P_{Meas})] = −13 dBm

Sweep the whole frequency band through the range from 9 kHz to the 10th 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 M for details of test results.

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; RSS-130 Issue 2, RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3, RSS-140 Issue 1, RSS-Gen Issue 5

Limits :

Operating band	FCC Limit	ISED Limit
Band 2	Within authorized bands	2.5 ppm
Band 4	Within authorized bands	Within authorized bands
Band 5	2.5 ppm	2.5 ppm
Band 8_39d	Within authorized bands	N/A
Band 12	Within authorized bands	Within authorized bands
Band 13	Within authorized bands	Within authorized bands
Band 14	Within authorized bands	Within authorized bands
Band 25	Within authorized bands	2.5 ppm
Band 26 Lower Band	2.5 ppm	N/A
Band 26 Upper Band	2.5 ppm	2.5 ppm
Band 66	Within authorized bands	Within authorized bands
Band 85	Within authorized bands	Within authorized bands

Test procedure : Clause 5.6.3 of ANSI C63.26

Kind of test site : Shielding Room

Test Setup

Date of testing	:	2021.10.20-2021.11.06
Input voltage	:	DC 3.8V
Test environment	:	☒ Normal test conditions
		☒ Extreme test conditions
Operation mode	:	A.1
Ambient temperature	:	24 ºC
Relative humidity	:	51%
Atmospheric pressure	:	101.0 kPa

Refer to attached Appendix A to Appendix L for details of test results.

5.1.8 PEAK TO AVERAGE RATIO

RESULT: **Pass**

Test standard	:	47 CFR FCC Part 22		RSS-130 Issue 2
		47 CFR FCC Part 24		RSS-132 Issue 3
		47 CFR FCC Part 27		RSS-133 Issue 6
		47 CFR FCC Part 90		RSS-139 Issue 3
		47 CFR FCC Part 2		RSS-140 Issue 1
				RSS-Gen Issue 5
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 8_39d	PAR ≤ 13 dB	N/A
		Band 12	PAR ≤ 13 dB	PAR ≤ 13 dB
		Band 13	PAR ≤ 13 dB	PAR ≤ 13 dB
		Band 14	PAR ≤ 13 dB	PAR ≤ 13 dB
		Band 25	PAR ≤ 13 dB	PAR ≤ 13 dB
		Band 26 Lower Band	N/A	N/A
		Band 26 Upper Band	PAR ≤ 13 dB	PAR ≤ 13 dB
		Band 66	PAR ≤ 13 dB	PAR ≤ 13 dB
		Band 85	PAR ≤ 13 dB	PAR ≤ 13 dB
Test procedure	:	Clause 5.2.6 of ANSI C63.26		
Kind of test site	:	Shielding Room		

Test Setup

Date of testing	:	2021.10.20-2021.11.06
Input voltage	:	DC 3.8V
Test environment	:	☒ Normal test conditions
		☐ Extreme test conditions
Operation mode	:	A.1
Ambient temperature	:	24 ºC
Relative humidity	:	51%
Atmospheric pressure	:	101.0 kPa

Refer to attached Appendix A to Appendix K for details of test results.

6. SYSTEM MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

Table 10: System Measurement Uncertainty

Items		Extended Uncertainty
RE	Radiated emission 9 kHz - 30 MHz	±3.97 dB
	Radiated emission 30 MHz - 1 GHz	±4.30 dB
Remark: 95% Confidence Levels, K=2.		

7. LIST OF TABLES