Prüfbericht-Nr.: *Test report no.*:	**CN24IPWU 003**	**Auftrags-Nr.:** *Order no.*:	**168477868**	Seite 1 von 22 *Page 1 of 22*
Kunden-Referenz-Nr.: *Client reference no.*:	N/A	**Auftragsdatum:** *Order date:*	2024-01-05	
Auftraggeber: *Client*:	**Xiamen Intretech Inc.** No. 100, Dongfu West Road, Haicang District, Xiamen, Fujian, China			
Prüfgegenstand: *Test item*:	M4GM			
Bezeichnung / Typ-Nr.: *Identification / Type no.*:	M4GM-GL-01 (Trademark: DATAWAY)			
Auftrags-Inhalt: *Order content*:	Test Report			
Prüfgrundlage: *Test specification*:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 2			

Wareneingangsdatum: *Date of sample receipt*:	2024-04-02	Please refer to Photo Document
Prüfmuster-Nr.: *Test sample no:*	A003680014-001~014	
Prüfzeitraum: *Testing period*:	2024-04-10 - 2024-05-13	
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 Jonathan Li Signed by: Jonathan Li	**genehmigt von:** *authorized by*:	x Bell Hu Signed by: Bell Hu
Datum: *Date:* 2024-06-10		**Ausstellungsdatum:** *Issue date:* 2024-06-10	
Stellung / Position:	Sachverständige(r)/Expert	**Stellung** / Position:	Sachverständige(r)/Expert

Sonstiges / *Other*: FCC ID: S96M4GMG

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

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*P(ass) = passed a.m. test specification(s)*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. *The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.* *Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.*
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4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.

TEST SUMMARY

5.1.1. RF POWER OUTPUT
RESULT: Pass

5.1.2. OCCUPIED BANDWIDTH AND 26DB BANDWIDTH
RESULT: Pass

5.1.3. SPURIOUS EMISSIONS AT ANTENNA TERMINALS
RESULT: Pass

5.1.4. SPURIOUS EMISSIONS AT ANTENNA TERMINALS – BAND EDGE
RESULT: Pass

5.1.5. FIELD STRENGTH OF SPURIOUS RADIATION
RESULT: Pass

5.1.6. FREQUENCY STABILITY
RESULT: Pass

5.1.7. 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 GPRS/EGPRS

Appendix B: Test Results of Field Strength of Spurious Radiation for GPRS/EGPRS operation

1.2. TEST STANDARD(S)

Applied Rules:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 2
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

2.2. TEST DATE

Date of test: 2024-04-10 - 2024-05-13

2.3. LIST OF TEST AND MEASUREMENT INSTRUMENTS

Table 1: List of Test and Measurement Equipment

Radio Spectrum Testing (CTE6000)					
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. Date**	**Cal. until**
Shielding Room 6#	Albatross	SR6	APC17151-SR6	2021-06-22	2024-06-22
Wideband Radio Communication Tester	R&S	CMW500	166305	2023-07-25	2024-07-25
Signal Analyzer	R&S	FSV 40	101475	2023-07-25	2024-07-25
Vector Signal Generator	R&S	SMBV100A	263466	2023-09-21	2024-09-21
Signal Generator	R&S	SMB100A	181041	2023-11-06	2024-11-05
High Speed Power Supply	KEITHLEY	2303	4080052	2023-11-06	2024-11-05
RF Control Unit	Tonscend	JS0806-1	19H8060192	N/A	N/A
Band Reject Filter Group	Tonscend	JS0806-F	19I8060194	2023-11-14	2025-11-13
Radio Spectrum Testing (LRD2)					
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. Date**	**Cal. until**
Shielding Room 6#	Albatross	SR6	APC17151-SR6	2021-06-22	2024-06-22
Signal Analyzer	R&S	FSV 40	101475	2023-07-25	2024-07-25
Signal and spectrum analyzer	Rohde & Schwarz	FSV3030	101576	2023-11-06	2024-11-05

Vector signal generator	Rohde & Schwarz	SMBV100B	102642	2023-11-06	2024-11-05
Vector signal generator	Rohde & Schwarz	SMB100A	182690	2023-11-06	2024-11-05
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	170345	2023-11-06	2024-11-05
1 channel power supply	Rohde & Schwarz	HMC8041	101712	2023-11-06	2024-11-05
Band Reject Filter Group	Tonscend	JS0806-F	21I8060483	2023-11-14	2025-11-13
RF Control Unit	Tonscend	JS0806-1	21H8060472	N/A	N/A
Test Software	Tonscend	JS1120	N/A	N/A	N/A
Control PC	Lenovo	TianYi510S-07IMB	2018AP3073	N/A	N/A
Unwanted Emission Testing (TS8996)					
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. Date**	**Cal. until**
EMI Test Receiver	R&S	ESR 7	102021	2023-07-26	2024-07-25
Signal Analyzer	R&S	FSV 40	101439	2023-07-26	2024-07-25
System Controller Interface	R&S	SCI-100	S10010038	N/A	N/A
Filterbank	R&S	Wlan	100759	2023-07-26	2024-07-25
OSP	R&S	OSP 120	102040	N/A	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2023-07-26	2024-07-25
Amplifier	R&S	SCU-18F	180070	2023-07-26	2024-07-25
Amplifier	R&S	SCU40A	100475	2023-07-26	2024-07-25
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-07	2024-08-06
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-07	2024-08-06
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-28	2024-08-27
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2022-08-07	2024-08-06
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2021-06-22	2024-06-22

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 Appendix A 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 GPRS/EGPRS, LTE-CAT1 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	Value
Product Name:	M4GM
Test Model No.:	M4GM-GL-01
Trademark:	SDATAWAY
FCC ID:	S96M4GMG
Operating Voltage:	DC 8V~30V
Testing Voltage:	DC 24V
Operation Temperature:	0°C to +60°C

Table 3: Technical Specification of EUT

Characteristic	Description
Operated Modes:	GPRS, EGPRS
Operational Frequency Band(s):	GSM 850, PCS 1900
Nominal RF Output Power:	GSM 850: 33 dBm ± 2dB PCS 1900: 30 dBm ± 2dB
Power Class:	GSM 850: Class 4 PCS 1900: Class 1
Modulation Type:	GMSK(GPRS/EGPRS), 8PSK(EGPRS)
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
Max Antenna Gain:	3.4 dBi for 1900 band 5.4 dBi for 850 band

Table 4: Operating Frequency Range and Channel Bandwidth of EUT

Frequency Band(s)	Frequency Range					
	Transmitting f_{UL} (MHz)			Receiving f_{DL} (MHz)		
GSM 850	824	~	849	869	~	894
PCS 1900	1850	~	1910	1930	~	1990

3.3. INDEPENDENT OPERATION MODES

The basic operation modes are:

A. On, communication link established, Transmitting
   1) GPRS/EGPRS GMSK operating
      i. Low channel
      ii. Middle channel
      iii. High channel
   2) EGPRS 8PSK operating
      i. Low channel
      ii. Middle channel
      iii. High channel

B. On, communication link established, Receiving
   1) GPRS/EGPRS 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
☒ 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	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

Table 6: Test Environments

Environment Parameter	Values During Tests			
	Temperature	Voltage (Radio Module)	Voltage (EUT)	Relative Humidity
NTNV	25°C±2°C	3.3Vdc	24Vdc	Ambient
LTLV	0 °C	3.0Vdc	---	---
LTHV	0 °C	3.6Vdc	---	---
HTLV	+60 °C	3.0Vdc	---	---
HTHV	+60 °C	3.6Vdc	---	---

Table 7: Test Configurations

Frequency Bands	Modulation	
	GMSK	8PSK
GSM 850/PCS1900 GPRS	Δ	-
GSM 850/PCS1900 EGPRS	Δ	Δ

4.3. Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Adapter	N/A	IVP0330-2000	N/A	DC 3.3V, 2.0A
Adapter	N/A	IVP2400-2000	N/A	DC 24V, 2.0A

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 Configuration for Radiation Test (Below 1GHz)

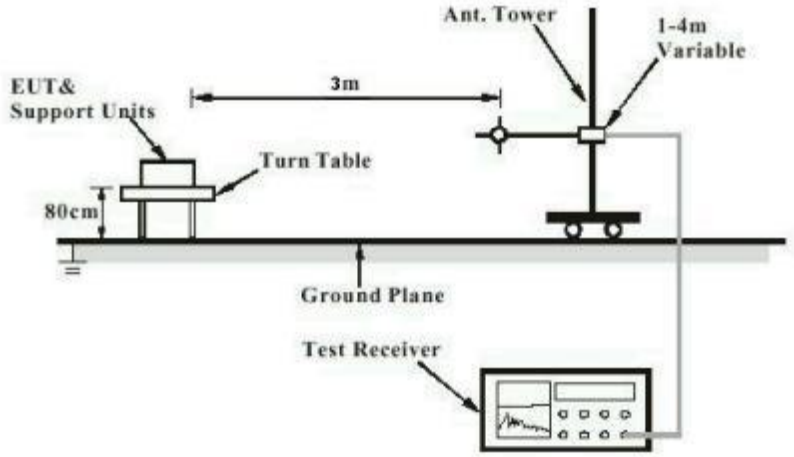


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

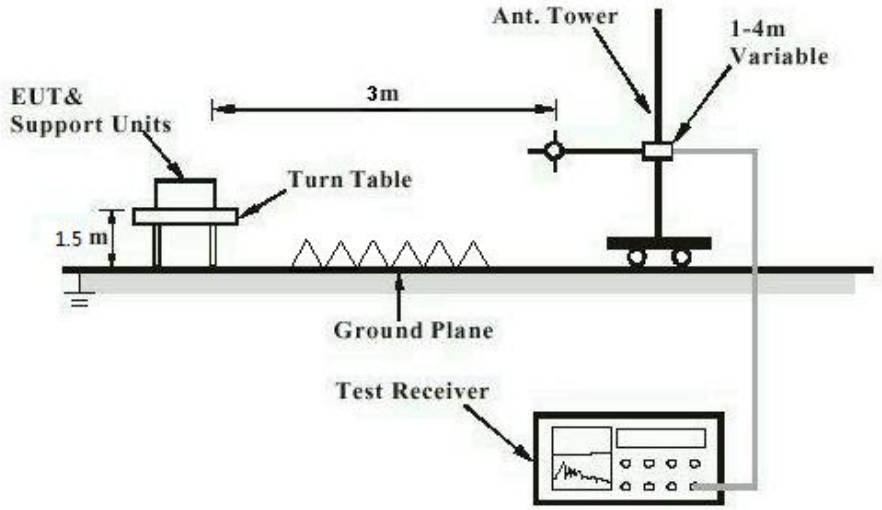
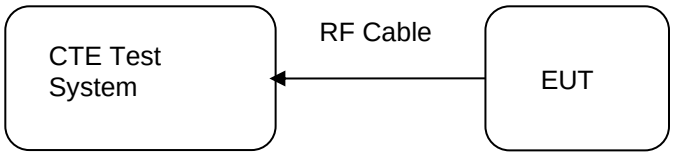


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5. TEST RESULTS

5.1. ESSENTIAL REQUIREMENTS

5.1.1. RF POWER OUTPUT

RESULT: **Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 2	
Limits	:	Operating band	FCC Limit
		GSM 850	ERP 7 watts
		PCS 1900	EIRP 2 watts
Test procedure	:	Clause 5.2.4.2 of ANSI C63.26	
Kind of test site	:	Shielding Room	

TEST SETUP

Date of testing	:	2024-04-10 - 2024-05-13
Input voltage	:	DC 3.3V
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 for details of test results.

5.1.2. OCCUPIED BANDWIDTH AND 26DB BANDWIDTH

RESULT: **Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 2
Test requirement	:	Section 2.1049 of 47 CFR FCC Part 2 Clause 6.7 of RSS-Gen Issue 5
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	:	2024-04-10 - 2024-05-13
Input voltage	:	DC 3.3V
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 for details of test results.

5.1.3. SPURIOUS EMISSIONS AT ANTENNA TERMINALS

RESULT: **Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 2	
Limits	:	Operating band	FCC Limit
		PCS 1900	< - 13 dBm /1MHz
		GSM 850	< - 13 dBm /100kHz @ < 1GHz < - 13 dBm /1MHz @ > 1GHz
Test procedure	:	Clause 5.7.4 of ANSI C63.26	
Kind of test site	:	Shielding Room	

TEST SETUP

Date of testing	:	2024-04-10 - 2024-05-13
Input voltage	:	DC 3.3V
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 for details of test results.

5.1.4. 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 2	
Limits	:	Operating band	FCC Limit
		PCS 1900	< - 13 dBm /1%EBW
		GSM 850	< - 13 dBm /1%EBW
Test procedure	:	Clause 5.7.3 of ANSI C63.26	
Kind of test site	:	Shielding Room	

TEST SETUP

Date of testing	:	2024-04-10 - 2024-05-13
Input voltage	:	DC 3.3V
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
Limit = P_{Meas} (dBm) – [50+10log(P_{Meas})] = -20 dBm

Refer to attached Appendix A for details of test results.

5.1.5. FIELD STRENGTH OF SPURIOUS RADIATION

RESULT: **Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 2
Limits	:	Operating band / FCC Limit PCS 1900: < - 13 dBm /1MHz GSM 850: < - 13 dBm /100kHz @ < 1GHz; < - 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	:	2024-04-10 - 2024-05-13
Input voltage	:	DC 3.3V
Test environment	:	☒ Normal test conditions ☐ Extreme test conditions
Operation mode	:	A.1
Ambient temperature	:	23 ºC
Relative humidity	:	48%
Atmospheric pressure	:	101.0 kPa

The limit calculation:

Limit = PMeas (dBm) – [43+10log(PMeas)] = -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 B for details of test results.

5.1.6. FREQUENCY STABILITY

RESULT: **Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 2	
Limits	:	Operating band	FCC Limit
		PCS 1900	Within authorized bands
		GSM 850	2.5 ppm
Test procedure	:	Clause 5.6.3 of ANSI C63.26	
Kind of test site	:	Shielding Room	

TEST SETUP

Date of testing	:	2024-04-10 - 2024-05-13
Input voltage	:	DC 3.3V
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 for details of test results.

5.1.7. PEAK TO AVERAGE RATIO

RESULT: **Pass**

Test standard	:	47 CFR FCC Part 22 47 CFR FCC Part 24 47 CFR FCC Part 2	
Limits	:	Operating band	FCC Limit
		PCS 1900	PAR ≤ 13 dB
		GSM 850	PAR ≤ 13 dB
Test procedure	:	Clause 5.2.6 of ANSI C63.26	
Kind of test site	:	Shielding Room	

TEST SETUP

Date of testing	:	2024-04-10 - 2024-05-13
Input voltage	:	DC 3.3V
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 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 8: System Measurement Uncertainty

Parameter	Uncertainty (k=2)
RF output power, conducted	± 0.99 dB
Occupied Channel Bandwidth	± 2.08 %
RF power density, conducted	± 0.99 dB
Unwanted Emissions, conducted	± 0.89 dB
All emissions, radiated	±4.17 dB

7. LIST OF TABLES