

TEST REPORT

Applicant Name: TECNO MOBILE LIMITED
Address: FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Report Number: 2401U81808E-RF-00A
FCC ID: 2ADYY-KL8

Test Standard (s)

FCC PART 27; FCC PART 22H

Sample Description

Product Type: Mobile Phone
Model No.: KL8
Multiple Model(s) No.: N/A
Trade Mark: TECNO
Date Received: 2024/06/19
Issue Date: 2024/08/03

Test Result:

Pass▲

▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

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Andy Yu
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Approved By:

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Nancy Wang
RF Supervisor

Note: The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

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TABLE OF CONTENTS

DOCUMENT REVISION HISTORY	4
GENERAL INFORMATION.....	5
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
OBJECTIVE	6
TEST METHODOLOGY	6
MEASUREMENT UNCERTAINTY	6
TEST FACILITY	7
SYSTEM TEST CONFIGURATION	8
DESCRIPTION OF TEST CONFIGURATION	8
EQUIPMENT MODIFICATIONS	11
SUPPORT EQUIPMENT LIST AND DETAILS	11
SUPPORT CABLE DESCRIPTION	11
BLOCK DIAGRAM OF TEST SETUP	12
SUMMARY OF TEST RESULTS	13
TEST EQUIPMENT LIST	14
FCC §1.1307(B) & §2.1093 - RF EXPOSURE INFORMATION.....	16
APPLICABLE STANDARD	16
TEST RESULT	16
FCC§2.1047 - MODULATION CHARACTERISTIC	17
FCC § 2.1046, § 22.913 (A) (D) & §27.50(C)(D)(H)(J)(K) - RF OUTPUT POWER.....	18
APPLICABLE STANDARD	18
TEST PROCEDURE	18
TEST DATA	18
FCC §2.1049, §22.917, §22.905 & §27.53- OCCUPIED BANDWIDTH	19
APPLICABLE STANDARD	19
TEST PROCEDURE	19
TEST DATA	19
FCC §2.1051, §22.917(A) & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS.....	20
APPLICABLE STANDARD	20
TEST PROCEDURE	20
TEST DATA	20
FCC § 2.1053; § 22.917 (A); §27.53 - SPURIOUS RADIATED EMISSIONS	21
APPLICABLE STANDARD	21
TEST PROCEDURE	21
TEST DATA	21
FCC§ 22.917 (A); §27.53(G)(H)(L)(M)(N) - BAND EDGES.....	29
APPLICABLE STANDARD	29
TEST PROCEDURE	30
TEST DATA	30

FCC § 2.1055; § 22.355; §27.54 - FREQUENCY STABILITY31
 APPLICABLE STANDARD31
 TEST PROCEDURE31
 TEST DATA32
EUT PHOTOGRAPHS33
TEST SETUP PHOTOGRAPHS34

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	2401U81808E-RF-00A	Original Report	2024/08/03

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Mobile Phone
Tested Model	KL8
Multiple Model(s)	N/A
Frequency Range	5G NR Band 5: 824-849 MHz(TX); 869-894MHz(RX) 5G NR Band 7: 2500-2570 MHz(TX); 2620-2690MHz(RX) 5G NR Band 12: 699-716MHz(TX); 729-746MHz(RX) 5G NR Band 38: 2570-2620MHz(TX/RX) 5G NR Band 41: 2496-2690MHz(TX/RX) 5G NR Band 66: 1710-1780MHz(TX); 2110-2180MHz(RX) 5G NR Band 77_1: 3450-3550MHz (TX/RX) 5G NR Band 77_3: 3700-3980MHz(TX/RX) 5G NR Band 78_1: 3450-3550MHz (TX/RX) 5G NR Band 78_3: 3700-3800MHz(TX/RX)
EN-DC possible combinations	DC_2A_n7A, DC_4A_n7A, DC_5A_n7A, DC_7A_n7A, DC_66A_n7A, DC_4A_n38A, DC_5A_n38A, DC_66A_n38A, DC_4A_n41A, DC_5A_n41A, DC_41A_n41A, DC_66A_n41A, DC_2A_n66A, DC_5A_n66A, DC_7A_n66A, DC_66A_n66A, DC_2A_n78A, DC_4A_n78A, DC_5A_n78A, DC_7A_n78A, DC_38A_n78A, DC_41A_n78A, DC_66A_n78A, DC_5A_n77A, DC_7A_n77A, DC_41A_n77A, DC_66A_n77A DC_7A-7A_n78A, DC_2A-7A_n78, DC_2A-66A_n78, DC_2A-38A_n78, DC_5A-7A_n78A, DC_7A-66A_n78A
Carrier aggregation	None Carrier aggregation
Modulation Technique	DFT-s-OFDM: PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM
Antenna Specification [#]	Please refer to the Antenna Specifications [#] , which was provided by manufacturer.
Voltage Range	DC 3.87V from battery or DC 5V /7.5V from adapter
Sample serial number	2N77-2 for Radiated Emissions Test 2N77-1 for RF Conducted Test (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Normal/Extreme condition [#]	VL: Low Voltage 3.45V VN: Normal Voltage 3.87V VH: High Voltage 4.45V (provided by the applicant)
Adapter Information	Model: U180TSA Input: 100-240V,50/60Hz,0.6A Output: 5.0V,2.4A or 7.5V,2.4A,18.0W Max
Remark: 1. For NSA mode, we only show the combination of the maximum power among all NSA combinations in the report as below: DC_2A_n7A, DC_5A_n38A, DC_5A_n41A, DC_2A_n66A, DC_5A_n77A, DC_5A_n78A 2. The device has multiple antennas in each frequency band, all of which share the same transmit signal paths, and the transmit antenna is selected by the antenna switch. Only the worst case is recorded in this report.	

Objective

This test report is in accordance with Part 2-Subpart J, Part 22-Subpart H, Part 27 of the Federal Communication Commission's rules.

The objective is to determine the compliance of the EUT with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability and band edge.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2-Subpart J as well as the following parts:

Part 22 Subpart H - Public Mobile Services
Part 27 - Miscellaneous Wireless Communications Services

ANSI C63.26-2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF Frequency		213.55Hz(k=2, 95% level of confidence)
RF output power, conducted		0.72 dB(k=2, 95% level of confidence)
Unwanted Emission, conducted		1.75 dB(k=2, 95% level of confidence)
Emissions, Radiated	30MHz~200MHz (Horizontal)	4.48dB(k=2, 95% level of confidence)
	30MHz~200MHz (Vertical)	4.55dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Horizontal)	4.85dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Vertical)	5.05dB(k=2, 95% level of confidence)
	1GHz - 6GHz	5.35dB(k=2, 95% level of confidence)
	6GHz - 18GHz	5.44dB(k=2, 95% level of confidence)
	18GHz - 40GHz	5.16dB(k=2, 95% level of confidence)
Temperature		±1°C
Humidity		±1%
Supply voltages		±0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 715558, the FCC Designation No. : CN5045.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The final qualification test was performed with the EUT operating at normal mode.

The test items were performed with the EUT operating at testing mode. Test was performed with channels as below table:

Bands	Frequency Range (MHz)	Bandwidth (MHz)	Test Frequency (MHz)		
			Low Channel	Middle Channel	High Channel
N5	824-849	5	826.5	836.5	846.5
		10	829.0	836.5	844.0
		15	831.5	836.5	841.5
		20	834.0	836.5	839.0
N7	2500-2570	5	2502.5	2535	2567.5
		10	2505.0	2535	2565.0
		15	2507.5	2535	2562.5
		20	2510.0	2535	2560.0
N12	699-716	5	701.5	707.5	713.5
		10	704.0	707.5	711.0
		15	706.5	707.5	708.5
N38	2570-2620	5	2572.5	2595	2617.5
		10	2575	2595	2615
		15	2577.5	2595	2612.5
		20	2580	2595	2610
		25	2582.5	2595	2607.5
		30	2585	2595	2605
		40	2590	2595	2600

Bands	Frequency Range (MHz)	Bandwidth (MHz)	Test Frequency (MHz)		
			Low Channel	Middle Channel	High Channel
N41	2496-2690	10	2501	2593	2685
		15	2503.5	2593	2682.5
		20	2506	2593	2680
		30	2511	2593	2675
		40	2516	2593	2670
		50	2521	2593	2665
		60	2526	2593	2660
		80	2536	2593	2650
		90	2541	2593	2645
		100	2546	2593	2640
N66	1710-1780	5	1712.5	1745	1777.5
		10	1715	1745	1775
		15	1717.5	1745	1772.5
		20	1720	1745	1770
		25	1722.5	1745	1767.5
		30	1725	1745	1765
		40	1730	1745	1760
N77_1	3450-3550	10	3455.0	3500.0	3545.0
		15	3457.5	3500.0	3542.5
		20	3460.0	3500.0	3540.0
		30	3465.0	3500.0	3535.0
		40	3470.0	3500.0	3530.0
		50	3475.0	3500.0	3525.0
		60	3480.0	3500.0	3520.0
		70	3485.0	3500.0	3515.0
		80	3490.0	3500.0	3510.0
		90	3495.0	3500.0	3505.0
		100	/	3500.0	/

Bands	Frequency Range (MHz)	Bandwidth (MHz)	Test Frequency (MHz)		
			Low Channel	Middle Channel	High Channel
N77_3	3700-3980	10	3705.0	3840.0	3975.0
		15	3707.5	3840.0	3972.5
		20	3710.0	3840.0	3970.0
		30	3715.0	3840.0	3965.0
		40	3720.0	3840.0	3960.0
		50	3725.0	3840.0	3955.0
		60	3730.0	3840.0	3950.0
		70	3735.0	3840.0	3945.0
		80	3740.0	3840.0	3940.0
		90	3745.0	3840.0	3935.0
		100	3750.0	3840.0	3930.0
N78_1	3450-3550	10	3455.0	3500.0	3545.0
		15	3457.5	3500.0	3542.5
		20	3460.0	3500.0	3540.0
		30	3465.0	3500.0	3535.0
		40	3470.0	3500.0	3530.0
		50	3475.0	3500.0	3525.0
		60	3480.0	3500.0	3520.0
		70	3485.0	3500.0	3515.0
		80	3490.0	3500.0	3510.0
		90	3495.0	3500.0	3505.0
		100	/	3500.0	/

Bands	Frequency Range (MHz)	Bandwidth (MHz)	Test Frequency (MHz)		
			Low Channel	Middle Channel	High Channel
N78_3	3700-3800	10	3705.0	3750.0	3795.0
		15	3707.5	3750.0	3792.5
		20	3710.0	3750.0	3790.0
		30	3715.0	3750.0	3785.0
		40	3720.0	3750.0	3780.0
		50	3725.0	3750.0	3775.0
		60	3730.0	3750.0	3770.0
		70	3735.0	3750.0	3765.0
		80	3740.0	3750.0	3760.0
		90	3745.0	3750.0	3755.0
		100	/	3750.0	/
Note: 1. SCS 15kHz, 30kHz was supports by the device, they have same output power, so only SCS 15kHz was tested for FDD band, and SCS 30kHz tested for TDD band except that the n38 5MHz Bandwidth only supports SCS 15kHz, so only N38 5MHz Bandwidth tests the SCS 15kHz. 2. For modulation of CP-OFDM and DFT-s-OFDM, the maximum power of CP-OFDM is lower than DFT-s-OFDM modulation, therefore, we chose higher power (DFT-s-OFDM modulation) to perform all tests and show in the report.					

Equipment Modifications

No modification was made to the EUT.

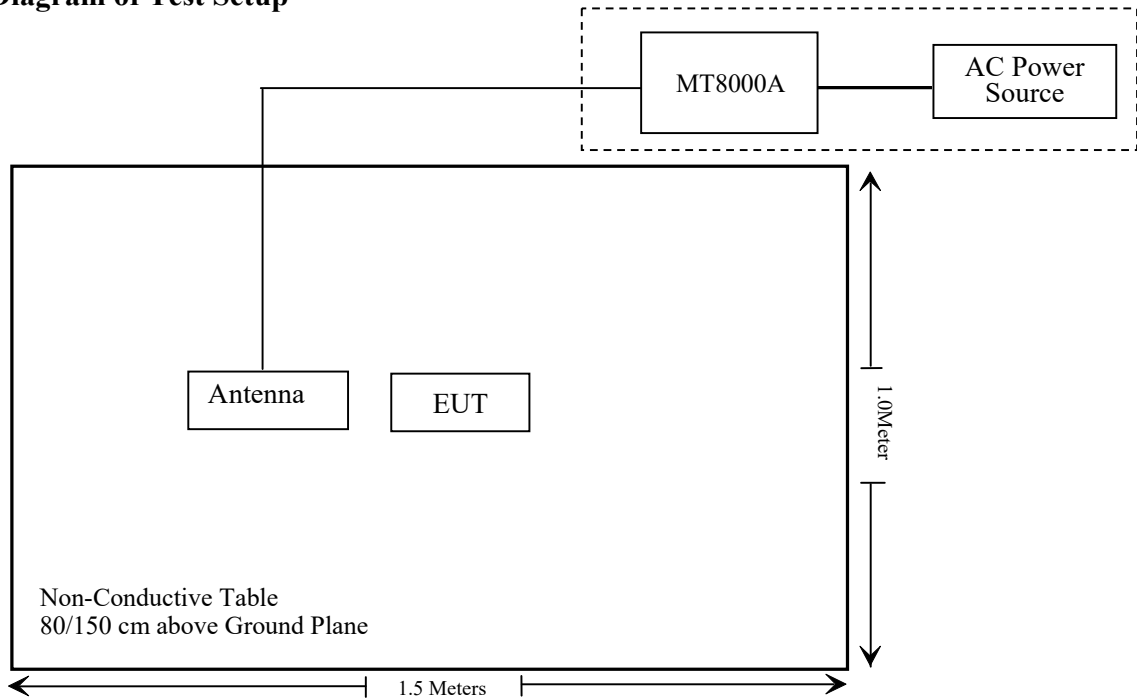
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Anritsu	Radio Communication Test Station	MT8000A	6262309799

Support Cable Description

Cable Description	Length (m)	From / Port	To
Un-shielded Un-detachable AC cable	1.2	AC Power	MT8000A

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
§1.1307, §2.1093	RF Exposure Information	Compliant
§2.1046; § 22.913(a)(d); §27.50(c)(d)(h)(j)(k);	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; §27.53	Occupied Bandwidth	Compliant
§ 2.1051; §22.917(a); §27.53;	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; § 22.917(a); §27.53	Field Strength of Spurious Radiation	Compliant
§ 22.917(a); §27.53(g)(h)(l)(m)(n)	Band Edge	Compliant
§ 2.1055; § 22.355; §27.54	Frequency stability	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR3	102455	2024/01/16	2025/01/15
Sonoma instrument	Pre-amplifier	310 N	186238	2024/05/21	2025/05/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2023/07/20	2026/07/19
Unknown	Cable	Chamber A Cable 1	N/A	2024/05/21	2025/05/20
Unknown	Cable	XH500C	J-10M-A	2024/05/21	2025/05/20
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40	101605	2024/03/27	2025/03/26
COM-POWER	Pre-amplifier	PA-122	181919	2024/06/18	2025/06/17
Schwarzbeck	Horn Antenna	BBHA9120D (1201)	1143	2023/07/26	2026/07/25
A.H.System	Horn Antenna	SAS-200/571	135	2024/06/18	2025/06/17
Unknown	RF Cable	KMSE	0735	2023/10/08	2024/10/07
Unknown	RF Cable	UFA147	219661	2023/10/08	2024/10/07
Agilent	Signal Generator	N5183A	MY50140588	2023/12/18	2024/12/17
JD	Filter Switch Unit	DT7210FSU	DQ77930	NCR	NCR
JD	Multiplex Switch Test Control Set	DT7220FSU	DQ77926	NCR	NCR
A.H.System	Pre-amplifier	PAM-1840VH	190	2023/08/02	2024/08/01
Electro-Mechanics Co	Horn Antenna	3116	9510-2270	2023/09/18	2026/09/17
Electro-Mechanics Co	Horn Antenna	3116	2026	2023/09/18	2026/09/17
UTIFLEX	RF Cable	NO. 13	232308-001	2023/08/03	2024/08/02

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSV40	101942	2023/12/18	2024/12/17
BACL	Temperature & Humidity Chamber	BTH-150-40	30144	2024/01/16	2025/01/15
Anritsu	Radio Communication Analyzer	MT8821C	6262287697	2024/05/17	2025/05/16
Anritsu	Radio Communication Test Station	MT8000A	6262309799	2024/05/17	2025/05/16
Keysight	UXM 5G Wireless Test Platform	E7515B	MY58120284	2024/05/17	2025/05/16
JD	Filter Switch Unit	DT7210FSU	DQ77930	NCR	NCR
JD	Multiplex Switch Test Control Set	DT7210SCU	DQ77929	NCR	NCR
instek	DC Power Supply	GPS-3030DD	EM832096	NCR	NCR
Fluke	Digital Multimeter	287	19000011	2024/05/21	2025/05/20
WEINSCHTEL	3dB Attenuator	Unknown	F-03-EM220	2024/06/27	2025/06/26
narda	Power divider	SN5	100005	2024/06/27	2025/06/26
Unknown	RF Cable	65475	01670515	2024/06/27	2025/06/26

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: 2401U81808E-SA.

FCC§2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d) , Part 22H and Part 27, there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046, § 22.913 (a) (d) & §27.50(c)(d)(h)(j)(k) - RF OUTPUT POWER**Applicable Standard**

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to §27.50(c), Control and mobile stations in the 698-746 MHz band are limited to 30 watts ERP. And Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

According to §27.50(d), Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

According to §27.50 (h) The following power limits shall apply in the BRS and EBS:
(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

According to §27.50 (j) The following power requirements apply to stations transmitting in the 3700–3980 MHz band:

(3) Mobile and portable stations are limited to 1 Watt EIRP. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

According to §27.50 (k) The following power requirements apply to stations transmitting in the 3450–3550 MHz band:

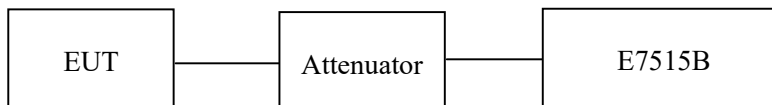
(3) Mobile devices are limited to 1 Watt (30 dBm) EIRP. Mobile devices operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

Test Procedure

Conducted method: ANSI C63.26-2015 Section 5.2

The RF output of the transmitter was connected to the E7515B through sufficient attenuation.

**Test Data****Environmental Conditions**

Temperature:	24~26°C
Relative Humidity:	45~60%
ATM Pressure:	101kPa

The testing was performed by Jim Cheng from 2024-07-13 to 2024-08-02.

EUT operation mode: Transmitting (Worst case record in the reports)

Please refer to the Appendix D1& Appendix D2 for Conducted Power

Please refer to the Appendix E1 for Peak-to-average ratio (PAR)

FCC §2.1049, §22.917, §22.905 & §27.53- OCCUPIED BANDWIDTH**Applicable Standard**

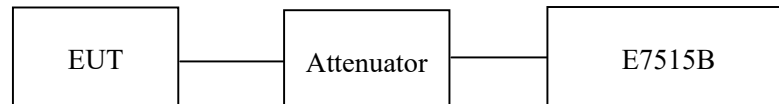
FCC 47 §2.1049, §27.53, §22.917, §22.905,

Test Procedure

ANSI C63.26-2015 Section 5.4.4

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 1% to 5% of the anticipated emission bandwidth and the 26 dB & 99% bandwidth was recorded.

**Test Data****Environmental Conditions**

Temperature:	25~26.5°C
Relative Humidity:	45~55%
ATM Pressure:	101kPa

The testing was performed by Jim Cheng from 2024-07-18 to 2024-08-03.

EUT operation mode: Transmitting (Worst case record in the reports)

Test Result: Pass

Please refer to the Appendix F1 for occupied bandwidth

FCC §2.1051, §22.917(a) & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

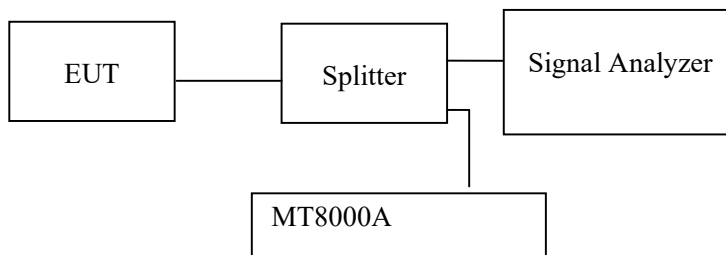
FCC §2.1051, §22.917(a) & §27.53

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

ANSI C63.26-2015 Section 5.7

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Note: the worst case path loss (cable loss and splitter inset loss) among the test frequency range has included in plots.

Test Data

Environmental Conditions

Temperature:	24.5~26°C
Relative Humidity:	40~55%
ATM Pressure:	101kPa

The testing was performed by Jim Cheng from 2024-07-08 to 2024-08-02.

EUT operation mode: Transmitting (Worst case record in the reports)

Test result: Pass

Please refer to the Appendix G1 for spurious emissions at antenna terminals.

FCC § 2.1053; § 22.917 (a); §27.53 - SPURIOUS RADIATED EMISSIONS**Applicable Standard**

FCC § 2.1053, §22.917(a) & § 27.53

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

ANSI/TIA-603-E-2016 Section 2.2.12
KDB 671168 D01 v03r01 Section 6.2

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the receiving antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Test Data**Environmental Conditions**

Temperature:	25~25.6°C
Relative Humidity:	50%
ATM Pressure:	101 kPa

The testing was performed by Anson Su on 2024-07-23 for Below 1GHz and Dylan Yang on 2024-07-24 for above 1GHz.

EUT operation mode: Transmitting (Scan with X-axis, Y-axis, Z-axis, the worst case Y-axis was recorded)

The worst case is as below:

Test Mode Description: (*worst case*)

Mode	NR Band	Channel	SCS(kHz)	Condition
SA	n5	Low/Middle/High	15	5MHz DFT-s-OFDM (QPSK)
	n7	Low/Middle/High	15	5MHz DFT-s-OFDM (QPSK)
	n12	Low/Middle/High	15	5MHz DFT-s-OFDM (QPSK)
	n38	Low/Middle/High	30	10MHz DFT-s-OFDM (QPSK)
	n41	Low/Middle/High	30	10MHz DFT-s-OFDM (QPSK)
	n66	Low/Middle/High	15	5MHz DFT-s-OFDM (QPSK)
	n77	Low/Middle/High	30	10MHz DFT-s-OFDM (QPSK)
NSA	n78	Low/Middle/High	30	10MHz DFT-s-OFDM (QPSK)
	DC 2A n7A	Low/Middle/High	15	10MHz 5MHz QPSK DFT-s-OFDM (QPSK)
	DC 5A n38A	Low/Middle/High	30	10MHz 10MHz QPSK DFT-s-OFDM (QPSK)
	DC 5A n41A	Low/Middle/High	30	10MHz 10MHz QPSK DFT-s-OFDM (QPSK)
	DC 2A n66A	Low/Middle/High	15	10MHz 5MHz QPSK DFT-s-OFDM (QPSK)
	DC 5A n77A	Low/Middle/High	30	10MHz 10MHz QPSK DFT-s-OFDM (QPSK)
	DC 5A n78A	Low/Middle/High	30	10MHz 10MHz QPSK DFT-s-OFDM (QPSK)

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
N5_ ANT 7								
Low Channel								
1653.00	48.97	H	-58.6	0.90	8.60	-50.90	-13	37.90
1653.00	51.99	V	-56.2	0.90	8.60	-48.50	-13	35.50
2479.50	49.82	H	-57.5	1.10	8.80	-49.80	-13	36.80
2479.50	49.43	V	-57.7	1.10	8.80	-50.00	-13	37.00
Middle Channel								
1673.00	47.02	H	-60.5	0.90	8.60	-52.80	-13	39.80
1673.00	50.07	V	-58.1	0.90	8.60	-50.40	-13	37.40
2509.50	48.43	H	-58.9	1.10	8.80	-51.20	-13	38.20
2509.50	53.61	V	-53.5	1.10	8.80	-45.80	-13	32.80
High Channel								
1693.00	47.44	H	-60.1	0.90	8.60	-52.40	-13	39.40
1693.00	48.62	V	-59.5	0.90	8.60	-51.80	-13	38.80
2539.50	48.20	H	-59.2	1.10	8.80	-51.50	-13	38.50
2539.50	50.89	V	-56.2	1.10	8.80	-48.50	-13	35.50
N7_ ANT 7								
Low Channel								
5005.00	49.74	H	-53.6	1.50	9.80	-45.30	-25	20.30
5005.00	49.22	V	-53.4	1.50	9.80	-45.10	-25	20.10
7507.50	46.02	H	-49.9	1.90	10.80	-41.00	-25	16.00
7507.50	46.08	V	-50.2	1.90	10.80	-41.30	-25	16.30
Middle Channel								
5070.00	54.30	H	-48.9	1.50	9.60	-40.80	-25	15.80
5070.00	54.12	V	-48.5	1.50	9.60	-40.40	-25	15.40
7605.00	51.91	H	-44.0	1.90	11.00	-34.90	-25	9.90
7605.00	51.20	V	-45.0	1.90	11.00	-35.90	-25	10.90
High Channel								
5135.00	45.77	H	-57.4	1.50	9.60	-49.30	-25	24.30
5135.00	45.49	V	-57.1	1.50	9.60	-49.00	-25	24.00
7702.50	47.65	H	-52.55	1.9	10.9	-43.55	-25	18.55
7702.50	48.18	V	-52.52	1.9	10.9	-43.52	-25	18.52

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
N12_ ANT 7								
Low Channel								
1403.00	45.98	H	-61.7	0.80	7.90	-54.60	-13	41.60
1403.00	46.85	V	-61.6	0.80	7.90	-54.50	-13	41.50
2104.50	53.25	H	-54.1	1.00	8.30	-46.80	-13	33.80
2104.50	54.12	V	-53.7	1.00	8.30	-46.40	-13	33.40
Middle Channel								
1415.00	46.35	H	-61.4	0.80	7.90	-54.30	-13	41.30
1415.00	46.28	V	-62.1	0.80	7.90	-55.00	-13	42.00
2122.50	49.71	H	-57.6	1.00	8.30	-50.30	-13	37.30
2122.50	50.01	V	-57.8	1.00	8.30	-50.50	-13	37.50
High Channel								
1427.00	45.67	H	-62.0	0.80	7.90	-54.90	-13	41.90
1427.00	46.56	V	-61.8	0.80	7.90	-54.70	-13	41.70
2140.50	48.08	H	-59.2	1.00	8.30	-51.90	-13	38.90
2140.50	49.06	V	-58.8	1.00	8.30	-51.50	-13	38.50
N38_ ANT 7								
Low Channel								
5150.00	46.35	H	-56.8	1.50	9.60	-48.70	-25	23.70
5150.00	46.03	V	-56.6	1.50	9.60	-48.50	-25	23.50
Middle Channel								
5190.00	51.32	H	-51.7	1.60	9.70	-43.60	-25	18.60
5190.00	47.86	V	-54.8	1.60	9.70	-46.70	-25	21.70
High Channel								
5230.00	45.49	H	-57.6	1.60	9.70	-49.50	-25	24.50
5230.00	45.15	V	-57.5	1.60	9.70	-49.40	-25	24.40
N41_ ANT 7								
Low Channel								
5002.00	64.00	H	-39.3	1.50	9.80	-31.00	-25	6.00
5002.00	59.27	V	-43.3	1.50	9.80	-35.00	-25	10.00
Middle Channel								
5186.00	64.87	H	-38.2	1.60	9.70	-30.10	-25	5.10
5186.00	60.12	V	-42.5	1.60	9.70	-34.40	-25	9.40
High Channel								
5370.00	64.41	H	-38.4	1.70	10.50	-29.60	-25	4.60
5370.00	60.31	V	-42.4	1.70	10.50	-33.60	-25	8.60

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
N66_ ANT 7								
Low Channel								
3425.00	46.53	H	-59.4	1.30	9.90	-50.80	-13	37.80
3425.00	46.45	V	-59.2	1.30	9.90	-50.60	-13	37.60
Middle Channel								
3490.00	46.27	H	-59.7	1.30	10.50	-50.50	-13	37.50
3490.00	46.10	V	-59.5	1.30	10.50	-50.30	-13	37.30
High Channel								
3555.00	46.53	H	-59.1	1.30	10.90	-49.50	-13	36.50
3555.00	46.66	V	-58.8	1.30	10.90	-49.20	-13	36.20
N77_1(3450MHz-3550MHz)_ ANT 0								
Low Channel								
6910.00	44.68	H	-53.6	1.90	10.30	-45.20	-13	32.20
6910.00	44.75	V	-53.6	1.90	10.30	-45.20	-13	32.20
Middle Channel								
7000.00	44.87	H	-52.9	1.90	10.20	-44.60	-13	31.60
7000.00	44.59	V	-53.2	1.90	10.20	-44.90	-13	31.90
High Channel								
7090.00	45.21	H	-52.2	1.90	10.20	-43.90	-13	30.90
7090.00	45.09	V	-52.4	1.90	10.20	-44.10	-13	31.10
N77_3(3700MHz-3980MHz)_ ANT 0								
Low Channel								
7410.00	46.18	H	-50.1	1.90	10.60	-41.40	-13	28.40
7410.00	47.49	V	-49.1	1.90	10.60	-40.40	-13	27.40
Middle Channel								
7680.00	46.72	H	-49.1	1.90	10.90	-40.10	-13	27.10
7680.00	47.65	V	-48.5	1.90	10.90	-39.50	-13	26.50
High Channel								
7950.00	47.14	H	-48.4	1.90	11.10	-39.20	-13	26.20
7950.00	47.59	V	-48.4	1.90	11.10	-39.20	-13	26.20

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
N78_1 (3450MHz-3550MHz)_ANT0								
Low Channel								
6910.00	44.66	H	-53.6	1.90	10.30	-45.20	-13	32.20
6910.00	44.33	V	-54.0	1.90	10.30	-45.60	-13	32.60
Middle Channel								
7000.00	45.28	H	-52.5	1.90	10.20	-44.20	-13	31.20
7000.00	45.32	V	-52.5	1.90	10.20	-44.20	-13	31.20
High Channel								
7090.00	45.60	H	-51.8	1.90	10.20	-43.50	-13	30.50
7090.00	45.10	V	-52.4	1.90	10.20	-44.10	-13	31.10
N78_3 (3700MHz-3800MHz)_ANT0								
Low Channel								
7410.00	50.71	H	-45.6	1.90	10.60	-36.90	-13	23.90
7410.00	51.01	V	-45.6	1.90	10.60	-36.90	-13	23.90
Middle Channel								
7500.00	51.17	H	-44.8	1.90	10.80	-35.90	-13	22.90
7500.00	51.13	V	-45.2	1.90	10.80	-36.30	-13	23.30
High Channel								
7590.00	51.96	H	-43.9	1.90	11.00	-34.80	-13	21.80
7590.00	51.38	V	-44.9	1.90	11.00	-35.80	-13	22.80

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
DC_2A_n7A (LTE ANT3+NR ANT7)								
Low Channel								
5005.00	51.03	H	-52.3	1.50	9.80	-44.00	-25	19.00
5005.00	50.33	V	-52.2	1.50	9.80	-43.90	-25	18.90
Middle Channel								
5070.00	51.12	H	-52.1	1.50	9.60	-44.00	-25	19.00
5070.00	50.38	V	-52.2	1.50	9.60	-44.10	-25	19.10
High Channel								
5135.00	51.32	H	-51.9	1.50	9.60	-43.80	-25	18.80
5135.00	50.72	V	-51.9	1.50	9.60	-43.80	-25	18.80
DC_5A_n38A (LTE ANT7+NR ANT7)								
Low Channel								
5150.00	45.26	H	-57.9	1.50	9.60	-49.80	-25	24.80
5150.00	46.04	V	-56.6	1.50	9.60	-48.50	-25	23.50
Middle Channel								
5190.00	46.02	H	-57.0	1.60	9.70	-48.90	-25	23.90
5190.00	46.32	V	-56.3	1.60	9.70	-48.20	-25	23.20
High Channel								
5230.00	46.49	H	-56.5	1.60	9.70	-48.40	-25	23.40
5230.00	46.34	V	-56.3	1.60	9.70	-48.20	-25	23.20
DC_5A_n41A (LTE ANT7+NR ANT7)								
Low Channel								
5002.00	45.45	H	-57.9	1.50	9.80	-49.60	-25	24.60
5002.00	44.80	V	-57.8	1.50	9.80	-49.50	-25	24.50
Middle Channel								
5186.00	45.66	H	-57.4	1.60	9.70	-49.30	-25	24.30
5186.00	45.61	V	-57.0	1.60	9.70	-48.90	-25	23.90
High Channel								
5370.00	46.26	H	-56.5	1.70	10.50	-47.70	-25	22.70
5370.00	46.13	V	-56.6	1.70	10.50	-47.80	-25	22.80
DC_2A_n66A (LTE ANT3+NR ANT7)								
Low Channel								
3425.00	46.09	H	-59.9	1.30	9.90	-51.30	-13	38.30
3425.00	45.57	V	-60.1	1.30	9.90	-51.50	-13	38.50
Middle Channel								
3490.00	46.49	H	-59.5	1.30	10.50	-50.30	-13	37.30
3490.00	45.87	V	-59.8	1.30	10.50	-50.60	-13	37.60
High Channel								
3555.00	46.43	H	-59.2	1.30	10.90	-49.60	-13	36.60
3555.00	45.82	V	-59.6	1.30	10.90	-50.00	-13	37.00

Frequency (MHz)	Receiver Reading (dBμV)	Polar (H / V)	Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi/dBd)			
DC_5A_n77A (LTE ANT7+NR ANT0)								
Low Channel								
7410.00	44.21	H	-54.20	1.9	10.4	-45.70	-13	32.70
7410.00	44.45	V	-54.00	1.9	10.4	-45.50	-13	32.50
Middle Channel								
7680.00	45.17	H	-53.00	1.9	10.6	-44.30	-13	31.30
7680.00	44.93	V	-53.30	1.9	10.6	-44.60	-13	31.60
High Channel								
7950.00	45.72	H	-52.30	1.9	10.8	-43.40	-13	30.40
7090.00	45.23	V	-52.3	1.90	10.20	-44.00	-13	31.00
DC_5A_n78A (LTE ANT7+NR ANT0)								
Low Channel								
7410.00	44.07	H	-54.30	1.9	10.4	-45.80	-13	32.80
7410.00	43.95	V	-54.50	1.9	10.4	-46.00	-13	33.00
Middle Channel								
7500.00	44.56	H	-53.40	1.9	10.4	-44.90	-13	31.90
7500.00	44.61	V	-53.40	1.9	10.4	-44.90	-13	31.90
High Channel								
7590.00	44.29	H	-53.40	1.9	10.5	-44.80	-13	31.80
7590.00	44.78	V	-53.00	1.9	10.5	-44.40	-13	31.40

Note:

Absolute Level = Reading Level + Substituted Factor

Substituted Factor contains: Substituted Level - Cable loss+ Antenna Gain

Margin = Limit -Absolute Level

The radiated spurious emission data of below 1GHz and other spurious emission is 20dB below the limit which was not recorded.

FCC§ 22.917 (a); §27.53(g)(h)(l)(m)(n) - BAND EDGES**Applicable Standard**

According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to FCC §27.53 (g) , For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a 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, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

According to FCC §27.53 (h), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to FCC §27.53(l)(2), For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (l)(2) 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, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. 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.

According to FCC §27.53 (m), For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5MHz.

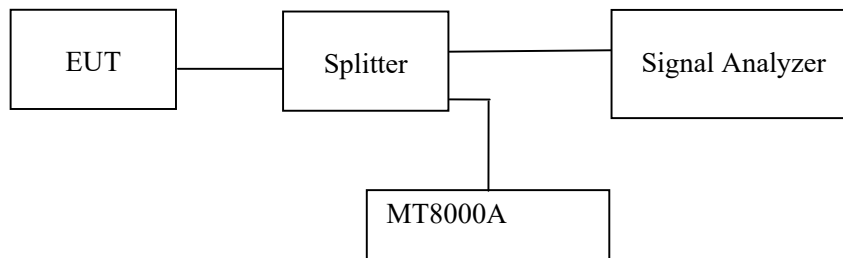
According to FCC §27.53(n)(2), For mobile operations in the 3450 – 3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution 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, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. 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.

Test Procedure

ANSI C63.26-2015 Section 5.7

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency



Test Data

Environmental Conditions

Temperature:	25~26°C
Relative Humidity:	40~50%
ATM Pressure:	101kPa

The testing was performed by Jim Cheng from 2024-07-08 to 2024-08-02.

EUT operation mode: Transmitting (Worst case record in the reports)

Test Result: Pass

Please refer to the Appendix H1 for band edges.

FCC § 2.1055; § 22.355; §27.54 - FREQUENCY STABILITY**Applicable Standard**

FCC § 2.1055, § 22.355; §27.54

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile > 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

According to §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

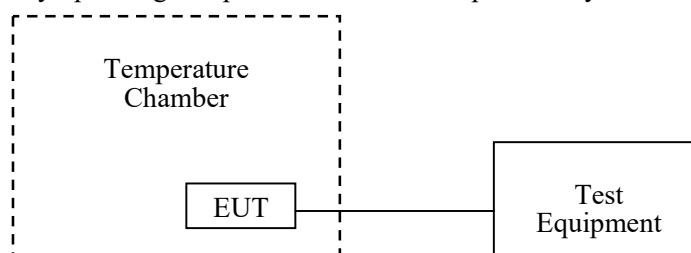
Test Procedure

ANSI C63.26-2015 Section 5.6

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Data**Environmental Conditions**

Temperature:	24.5~25.5°C
Relative Humidity:	45~55%
ATM Pressure:	101kPa

The testing was performed by Jim Cheng from 2024-07-08 to 2024-07-13.

EUT operation mode: Transmitting (Worst case record in the reports)

Test Result: Pass

Please refer to the Appendix I1~I13 for frequency stability.

EUT PHOTOGRAPHS

Please refer to the attachment 2403U81808E-RF-EXP External photo and 2403U81808E-RF-INP Internal photo

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2401U81808E-RF Test Setup photo.

******* END OF REPORT *******