

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: 2401W26164E-RF-00A
FCC ID: 2ADYY-KL8HS

Test Standard (s)

FCC PART 96

Sample Description

Product Type: Mobile Phone
Model No.: KL8hs
Multiple Model(s) No.: N/A
Trade Mark: TECNO
Date Received: 2024-08-13
Issue Date: 2024-10-10

Test Result:	Pass▲
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▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Jim Cheng

Jim Cheng
RF Engineer

Approved By:

Nancy Wang

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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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	2401W26164E-RF-00A	Original Report	2024-10-10

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	5G NR Band 77: 3550-3700MHz (TX/RX) 5G NR Band 78: 3550-3700MHz (TX/RX)
EN-DC possible combinations	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_2A_38A_n78, DC_2A_7A_n78, DC_2A_66A_n78, DC_5A_7A_n78A, DC_7A_7A_n78A, DC_7A_66A_n78A DC_7C_n78A, DC_7C_n77A, DC_41C_n77A, DC_41C_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 from adapter
Sample serial number	2Q03-2 for Radiated Emissions Test 2Q03-1 for RF Conducted Test (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Normal/Extreme Condition[#]	VL: Low Voltage 3.45V _{DC} VN: Normal Voltage 3.87V _{DC} VH: High Voltage 4.45V _{DC} (provided by the applicant)
Adapter Information	Model: U100TSA Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5.0V, 2.0A 10.0W
Remark: 1. For NSA mode, we only show the combination of the maximum power among all NSA combinations in the report as below: DC_5A_n77A, DC_5A_n78A. Please refer to report 2401W26164E-RF-00B for worst case. 2. The device is an End User Device. 3. 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 96 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 96-Citizens Broadband Radio Service

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

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	Middle	High
N77	3550-3700	10	3555	3625	3695
		15	3557.5	3625	3692.5
		20	3560	3625	3690
		30	3565	3625	3685
		40	3570	3625	3680
		50	3575	3625	3675
		60	3580	3625	3670
		70	3585	3625	3665
		80	3590	3625	3660
		90	3595	3625	3655
N78	3550-3700	100	3600	3625	3650
		10	3555	3625	3695
		15	3557.5	3625	3692.5
		20	3560	3625	3690
		30	3565	3625	3685
		40	3570	3625	3680
		50	3575	3625	3675
		60	3580	3625	3670
		70	3585	3625	3665
		80	3590	3625	3660
		90	3595	3625	3655
		100	3600	3625	3650

Note:

- SCS 15kHz, 30kHz was supports by the device, they have same output power, so only SCS 30kHz tested for TDD band.
- 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

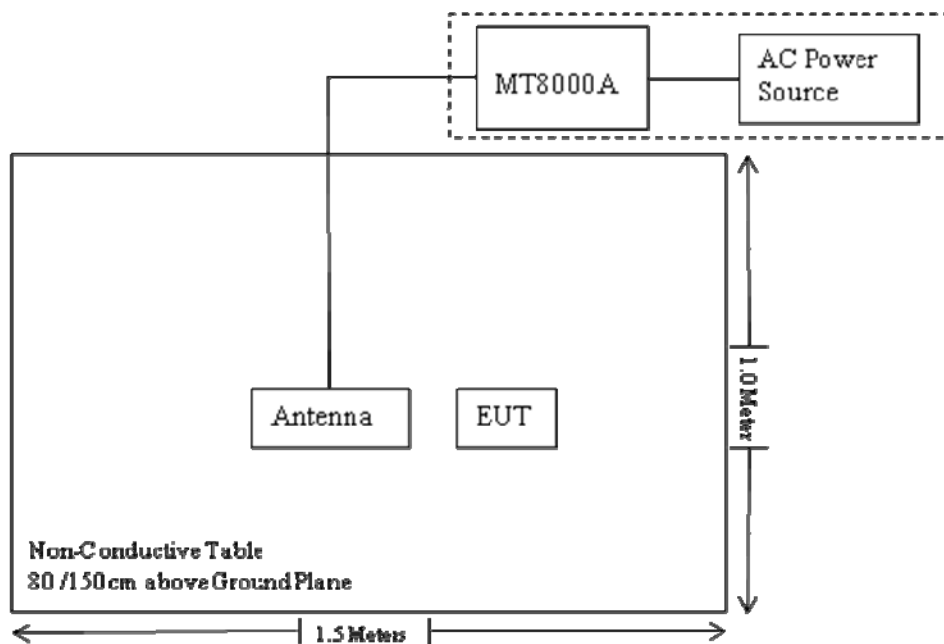
No modification was made to the EUT tested.

Support Equipment List and Details

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

External I/O Cable

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

FCC Rules	Description of Test	Result
§1.1307, §2.1093	RF Exposure Information	Compliant
§2.1046; §96.41(b)	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; §96.41	Occupied Bandwidth	Compliant
§ 2.1051; §96.41(e)	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; §96.41(e)	Field Strength of Spurious Radiation	Compliant
§96.41(e)	Band Edge	Compliant
§ 2.1055	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
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2023/07/20	2026/07/19
Sonoma instrument	Pre-amplifier	310N	186238	2024/05/21	2025/05/20
Unknown	Cable	XH500C	J-10M-A	2024/06/18	2025/06/17
Agilent	Signal Generator	N5183A	MY50140588	2023/12/18	2024/12/17
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
Rohde&Schwarz	Spectrum Analyzer	FSV40	101605	2024/03/27	2025/03/26
Schwarzbeck	Horn Antenna	BBHA9120D(1201)	1143	2023/07/26	2026/07/25
COM-POWER	Pre-amplifier	PA-122	181919	2024/06/18	2025/06/17
Unknown	RF Cable	KMSE	0735	2024/06/18	2025/06/17
Unknown	RF Cable	UFA147	219661	2024/06/18	2025/06/17
Unknown	RF Cable	XH750A-N	J-10M	2024/06/18	2025/06/17
A.H.System	Pre-amplifier	PAM-1840VH	190	2024/06/18	2025/06/17
Electro-Mechanics Co	Horn Antenna	3116	2026	2023/09/18	2026/09/17
UTIFLEX	RF Cable	NO. 13	232308-001	2024/06/18	2025/06/17
The Electro-Mechanics Co.	Horn Antenna	3115	9107-3694	2024/06/06	2027/06/05
Electro-Mechanics Co	Horn Antenna	3116	9510-2270	2023/09/18	2026/09/17
Anritsu	Radio Communication Analyzer	MT8821C	6262287697	2024/05/17	2025/05/16
JD	Multiplex Switch Test Control Set	DT7220FSU	DQ77926	2024/06/18	2025/06/17
Anritsu	Radio Communication Test Station	MT8000A	6262309799	2024/05/17	2025/05/16

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
BACL	Temperature & Humidity Chamber	BTH-150-40	30145	2024/01/16	2025/01/15
Anritsu	Radio Communication Analyzer	MT8821C	6262287697	2024/05/17	2025/05/16
Unknown	RF Cable	65475	01670515	2024/06/27	2025/06/26
R&S	spectrum analyzer	FSV40	101942	2023/12/18	2024/12/17
Fluke	Digital Multimeter	287	19000011	2024/05/21	2025/05/20
Agilent	Signal Generator	N5183A	MY50140588	2023/12/18	2024/12/17
WEINSCHL	Power Splitter	1515	RH476	2024/06/27	2025/06/26
instek	DC Power Supply	GPS-3030DD	EM832096	NCR	NCR
WEINSCHL	3dB Attenuator	Unknown	F-03-EM220	2024/06/27	2025/06/26
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

* 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).

REQUIREMENTS AND TEST PROCEDURES

Modulation Characteristic

According to FCC § 2.1047(d) and Part 96, there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

RF Output Power

Applicable Standard

According to §96.41(b) The following power requirements apply to stations transmitting in the 3550-3700MHz band:

Unless otherwise specified in this section, the maximum effective isotropic radiated power (EIRP) and maximum Power Spectral Density (PSD) of any CBSD and End User Device must comply with the limits shown in the table in this paragraph (b):

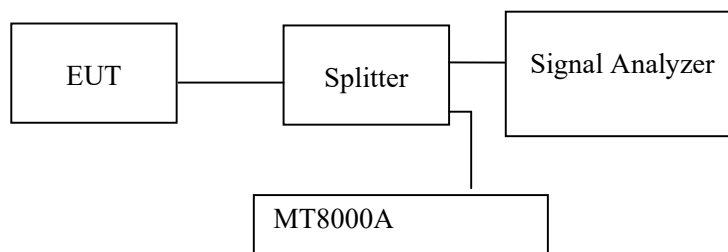
Device	Maximum EIRP (dBm/10 megahertz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a
Category A CBSD	30	20
Category B CBSD ¹	47	37

¹ Category B CBSDs will only be authorized for use after an ESC is approved and commercially deployed consistent with §§ 96.15 and 96.67.

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.



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

Occupied Bandwidth**Applicable Standard**

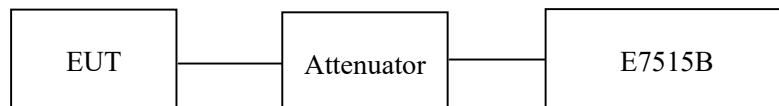
FCC 47 §2.1049, § 96.41

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.



Spurious Emissions at Antenna Terminals

Applicable Standard

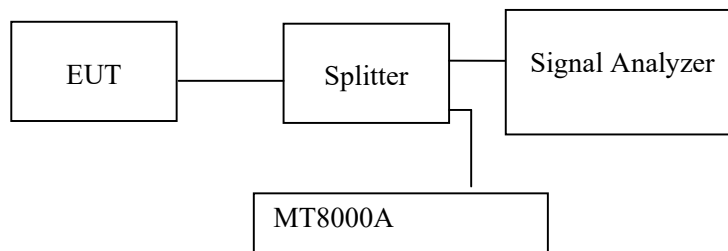
FCC §2.1051, § 96.41(e)

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.

Spurious Radiated Emissions

Applicable Standard

FCC § 2.1053, § 96.41(e)

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 5.5

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.

Band Edges

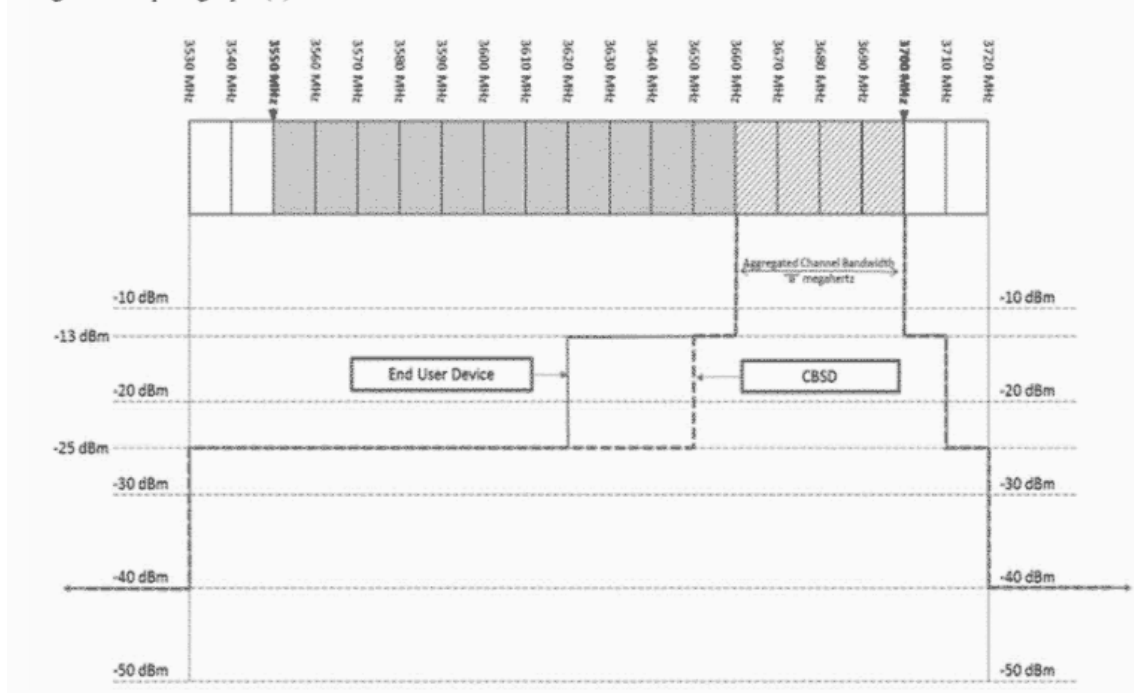
Applicable Standard

According to FCC§96.41(e)

3.5 GHz Emissions and Interference Limits —

(1) General protection levels.

Figure 1 to paragraph (e) – Protection levels



(i) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any CBSD emission shall not exceed -25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25

dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.

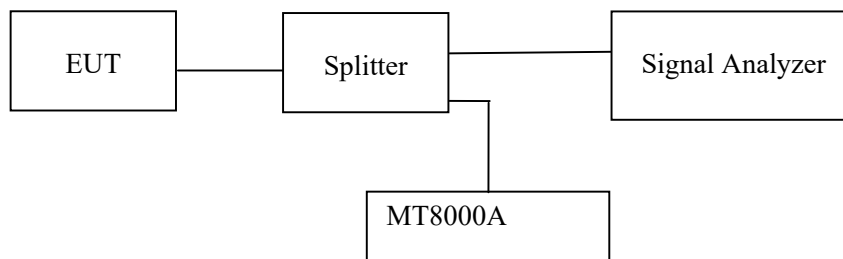
Test Procedure

ANSI C63.26-2015 Section 5.7

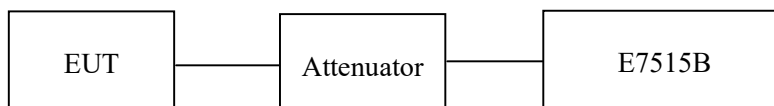
The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

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

For Band Edges:



For ACLR:



Frequency Stability

Applicable Standard

FCC § 2.1055

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

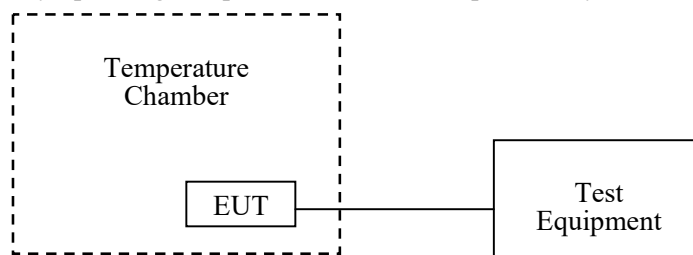
Test Procedure

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 AND RESULTS

Spurious Radiated Emissions

Environmental Conditions

Temperature (°C)	24.5-25.5	Relative Humidity (%)	50-55
ATM Pressure (kPa):	101	Test engineer:	Anson Su & Dylan Yang
Test date:	2024/09/22&2024/09/23		
EUT operation mode:	Transmitting		
Note:	After pre-scan in the X, Y and Z axes of orientation, the worst case z-axis of orientation were recorded.		

Test Mode Description: (worst case)

Mode	NR Band	Channel	SCS(kHz)	Condition
SA	n77	Low/Middle/High	30	10MHz DFT-s-OFDM (QPSK)
	n78	Low/Middle/High	30	10MHz 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)			
N77_2 (3550MHz-3700MHz) _ ANT0								
QPSK 10MHz Bandwidth, Low channel								
952.6	32.94	H	-63.6	1.36	0.0	-64.96	-40	24.96
952.6	33.15	V	-60.9	1.36	0.0	-62.26	-40	22.26
7110	45.16	H	-52.2	1.90	10.2	-43.90	-40	3.90
7110	44.94	V	-52.6	1.90	10.2	-44.30	-40	4.30
QPSK 10MHz Bandwidth, Middle channel								
954.8	33.14	H	-63.4	1.36	0.0	-64.76	-40	24.76
954.8	33.23	V	-60.8	1.36	0.0	-62.16	-40	22.16
7250	45.89	H	-50.8	1.90	10.4	-42.30	-40	2.30
7250	45.47	V	-51.4	1.90	10.4	-42.90	-40	2.90
QPSK 10MHz Bandwidth, High channel								
954.9	33.35	H	-63.2	1.36	0.0	-64.56	-40	24.56
954.9	33.39	V	-60.7	1.36	0.0	-62.06	-40	22.06
7390	45.09	H	-51.2	1.90	10.6	-42.50	-40	2.50
7390	44.86	V	-51.8	1.90	10.6	-43.10	-40	3.10
N78_2 (3550MHz-3700MHz) _ ANT0								
QPSK 10MHz Bandwidth, Low channel								
956.4	33.56	H	-62.9	1.36	0.0	-64.26	-40	24.26
956.4	33.51	V	-60.5	1.36	0.0	-61.86	-40	21.86
7110	45.45	H	-51.9	1.90	10.2	-43.60	-40	3.60
7110	44.56	V	-53.0	1.90	10.2	-44.70	-40	4.70
QPSK 10MHz Bandwidth, Middle channel								
959.9	33.75	H	-62.8	1.36	0.0	-64.16	-40	24.16
959.9	33.62	V	-60.4	1.36	0.0	-61.76	-40	21.76
7250	45.43	H	-51.2	1.90	10.4	-42.70	-40	2.70
7250	44.99	V	-51.9	1.90	10.4	-43.40	-40	3.40
QPSK 10MHz Bandwidth, High channel								
952.7	33.97	H	-62.5	1.36	0.0	-63.86	-40	23.86
952.7	33.83	V	-60.2	1.36	0.0	-61.56	-40	21.56
7390	45.91	H	-50.4	1.90	10.6	-41.70	-40	1.70
7390	45.35	V	-51.3	1.90	10.6	-42.60	-40	2.60

Note:

Absolute Level = Reading Level + Substituted Factor

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

Margin = Limit-Absolute Level

RF Conducted data

The test data please refer to the Appendix.

Test Items	Test Data
RF Output Power	Appendix A
Peak-to-average Ratio(PAR)	Appendix C
Occupied Bandwidth	Appendix B
Spurious Emissions at Antenna Terminal	Appendix D
Adjacent Channel Leakage Ratio	Appendix E
Band Edge	Appendix F
Frequency Stability_ Range	Appendix G1-G11

RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: 2401W26164E-SA.

EUT PHOTOGRAPHS

Please refer to the attachment 2403W26164E-RF-EXP External photo and 2403W26164E-RF-INP Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2401W26164E-RF-00A Test Setup photo.

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