

FCC TEST REPORT

Product Name: Hybrid Full-Touch Handheld computer

Trade Mark: 

Model No.: X40

Report Number: 26051324500RFM-4

Test Standards: FCC 47 CFR Part 96

FCC ID: VTVX40

Test Result: PASS

Date of Issue: September 12, 2026

Prepared for:

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UTTR-RF-FCC4G-V1.1

Version

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V1.0	September 12, 2026	Original



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CONTENTS

1. GENERAL INFORMATION	4
1.1 CLIENT INFORMATION	4
1.2 EUT INFORMATION	4
1.2.1 GENERAL DESCRIPTION OF EUT	4
1.2.2 DESCRIPTION OF ACCESSORIES	4
1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD	5
1.4 DESCRIPTION OF SUPPORT UNITS	5
1.5 TEST LOCATION	6
1.6 TEST FACILITY	6
1.7 DEVIATION FROM STANDARDS	6
1.8 ABNORMALITIES FROM STANDARD CONDITIONS	6
1.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER	6
1.10 MEASUREMENT UNCERTAINTY	7
2. TEST SUMMARY	8
3. EQUIPMENT LIST	9
4. TEST CONFIGURATION	10
4.1 ENVIRONMENTAL CONDITIONS FOR TESTING	10
4.2 TEST SETUP	11
4.2.1 FOR RADIATED EMISSIONS TEST SETUP	11
4.2.2 FOR CONDUCTED RF TEST SETUP	12
4.3 SYSTEM TEST CONFIGURATION	13
4.4 PRE-SCAN	14
5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION	15
5.1 REFERENCE DOCUMENTS FOR TESTING	15
5.2 CONDUCTED POWER SPECTRAL DENSITY (PSD)	15
5.3 EIRP	18
5.4 PEAK-TO-AVERAGE RATIO	19
5.5 99%&26DB BANDWIDTH	20
5.6 BAND EDGE AT ANTENNA TERMINALS	21
5.7 SPURIOUS EMISSIONS AT ANTENNA TERMINALS	23
5.8 FIELD STRENGTH OF SPURIOUS RADIATION	25
5.9 FREQUENCY STABILITY	29
5.10 END USER DEVICE ADDITIONAL REQUIREMENT	30
APPENDIX 1 PHOTOS OF TEST SETUP	33
APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS	33

1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	TSC Auto ID Technology Co., Ltd.
Address of Applicant:	9F., No. 95, Minquan Rd. Xindian Dist., New Taipei City, Taiwan
Manufacturer:	TSC Auto ID Technology Co., Ltd.
Address of Manufacturer:	9F., No. 95, Minquan Rd. Xindian Dist., New Taipei City, Taiwan

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	Hybrid Full-Touch Handheld computer		
Model No.:	X40		
Trade Mark:			
DUT Stage:	Identical Prototype		
EUT Supports Function: (Provided by the customer)	GSM Bands:	GSM 850/ PCS 1900	
	UTRA Bands:	Band II/ Band IV/ Band V	
	E-UTRA Bands:	FDD Band 2/ 4/ 5/ 7/ 12/ 13/ 14/ 17/ 25/ 26/ 66/ 71 TDD Band 38/ 41 / 48	
	5G NR Bands:	FDD n2/ 5/ 7/ 12/ 13/ 14/ 25/ 26/ 66/ 71 TDD n38/ 41/ 48/ 77/ 78	
	2.4 GHz ISM Band:	IEEE 802.11b/g/n/ax	
		Bluetooth V5.3	
		2 nd BLE	
	U-NII 5 GHz Bands:	5 150 - 5 250 MHz	IEEE 802.11a/n/ac/ax
		5 250 - 5 350 MHz	IEEE 802.11a/n/ac/ax
		5 470 - 5 725 MHz	IEEE 802.11a/n/ac/ax
		5 725 - 5 850 MHz	IEEE 802.11a/n/ac/ax
	U-NII 6 GHz Bands:	5 925 - 6 425 MHz	IEEE 802.11ax
		6 425 - 6 525 MHz	IEEE 802.11ax
		6 525 - 6 875 MHz	IEEE 802.11ax
		6 875 - 7 125 MHz	IEEE 802.11ax
RNSS Bands:	1559 - 1610 MHz	GPS/ Galileo/ GLONASS/ BDS	
	1164 - 1300 MHz	GPS/ Galileo	
RFID:	902 - 928 MHz		
UWB:	6.0-8.5GHz		
NFC:	13.553 MHz to 13.567 MHz		
Software Version:	R2.00 (Provided by the customer)		
Hardware Version:	REV0.3 (Provided by the customer)		
Sample Received Date:	May 13, 2026		
Sample Tested Date:	May 14, 2026 to September 1, 2026		
Remark:	The above EUT's information was provided by customer. Please refer to the specifications or user's manual for more detailed description.		

1.2.2 Description of Accessories

Refer to Report 26051324500EMC-1 for accessories.

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Support Networks:	LTE	TDD Band 48
	5G NR	n48
Type of Modulation:	LTE	QPSK, 16QAM, 64QAM, 256QAM
	5G NR	DFT-s-OFDM: $\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM; CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM
5G NR UE Channel Bandwidth:	5G NR n48:	10/20/40 MHz
5G NR SCS:	5G NR n48:	30 kHz
Antenna Type: (Provided by the customer)	LDS Antenna	
Antenna Gain (dBi): (Provided by the customer)	-7.29 dBi	
Sample No.:	Radiated: S202605138612-ZJA03/26	
	Conducted: S202605138612-ZJA20/26, S202605138612-ZJA11/26	
Device Category:	End User Device	
Normal Test Voltage:	3.87 Vdc	
Extreme Test Voltage:	3.4 Vdc to 4.38 Vdc	
Extreme Test Temperature:	-30 °C to +50 °C	

Summary of Results:							
Bands	BW	Modulation	Frequency Range	Max. Tune Up EIRP		99% BW	Emission Designator
	(MHz)		(MHz)	(dBm)	(W)	(MHz)	
LTE Band 48	5	QPSK	3552.5 - 3697.5	15.71	0.0372	4.502	4M50G7D
		16QAM/64QAM/256QAM		15.71	0.0372	4.498	4M50W7D
	10	QPSK	3555 - 3695	15.71	0.0372	8.992	8M99G7D
		16QAM/64QAM/256QAM		15.71	0.0372	8.987	8M99W7D
	15	QPSK	3557.5 - 3692.5	15.71	0.0372	13.450	13M5G7D
		16QAM/64QAM/256QAM		15.71	0.0372	13.504	13M5W7D
	20	QPSK	3560 - 3690	15.71	0.0372	17.953	18M0G7D
		16QAM/64QAM/256QAM		15.71	0.0372	17.949	17M9W7D
5G NR n48	10	PI/2 BPSK / QPSK	3555 - 3694.98	15.21	0.0332	8.603	8M60G7D
		16QAM / 64QAM / 256QAM		15.21	0.0332	8.587	8M59W7D
	20	PI/2 BPSK / QPSK	3560.01 - 3690	15.21	0.0332	17.855	17M9G7D
		16QAM / 64QAM / 256QAM		15.21	0.0332	17.862	17M9W7D
	40	PI/2 BPSK / QPSK	3570 - 3679.98	15.21	0.0332	35.679	35M7G7D
		16QAM / 64QAM / 256QAM		15.21	0.0332	35.687	35M7W7D

1.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
Dummy battery	Bluebird	N/A	S202605138612-PJA02	Bluebird

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.3 Meter	UnionTrust

1.5 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F., Block A, Building 6, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, Guangdong, China

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1.6 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories

CAB identifier: CN0032

FCC Accredited Lab.

Designation Number: CN1194

Test Firm Registration Number: 259480

1.7 DEVIATION FROM STANDARDS

None.

1.8 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.10 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted Output Power	±0.7 dB
2	99%&26dB Bandwidth	±1.86 %
3	Emission Mask	±2.7 dBm
4	Spurious emissions at antenna terminals	±2.7 dBm
5	Field strength of spurious radiation	30 MHz-1 GHz: ±4.9 dB 1 GHz-18 GHz: ±4.8 dB 18 GHz-40 GHz: ±5.1 dB
6	Frequency stability	±6.5 x 10 ⁻⁸
7	Humidity	±3.9 %
8	Temperature	±0.62 °C
9	DC Voltages	±0.68 %

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2. TEST SUMMARY

FCC 47 CFR Part 96 Test Cases			
Test Item	Test Requirement	Test Method	Result
Equivalent Isotropic Radiated Power (EIRP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 96.41(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 96.41(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	FCC 47 CFR Part 96.41(g)	KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 96.41(e)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 96.41(e)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 96.41(e)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
End User Device additional requirement	FCC 47 CFR Part 96.47	KDB 940660 D01v03	PASS

Disclaimer and Explanations:

The declared of product specification and data (e.g. antenna gain, RF specification, etc) for EUT presented in the report are provided by the customer, and the customer takes all the responsibilities for the accuracy of product specification.

3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	3 m SAC	ETS-Lindgren	3 m	Euroshiedpn-CT001270-1317	11-Nov-2023	10-Nov-2026
☒	Loop Antenna	ETS-Lindgren	6502	00202525	26-Jan-2026	25-Jan-2027
☒	Broadband Antenna	ETS-Lindgren	3142E	00201566	26-Oct-2025	25-Oct-2026
☒	6dB Attenuator	Talent	RA6A5-N-18	18103001	26-Oct-2025	25-Oct-2026
☒	Double-Ridged Waveguide Horn Antenna(Pre-amplifier)	ETS-Lindgren	3117-PA	00201541	21-Mar-2026	20-Mar-2027
☒	Pre-amplifier	ETS-Lindgren	00118385	00201874	21-Mar-2026	20-Mar-2027
☒	Double-Ridged Waveguide Horn Antenna(Pre-amplifier)	ETS-Lindgren	3116C-PA	00202652	30-Oct-2025	29-Oct-2026
☒	Pre-amplifier	ETS-Lindgren	00118384	00202652	24-Oct-2025	23-Oct-2026
☒	Receiver	ROHDE & SCHWARZ	ESIB26	100114	24-Oct-2025	23-Oct-2026
☒	Spectrum analyzer	ROHDE & SCHWARZ	FSV40-N	101653	20-Mar-2026	19-Mar-2027
☒	Pre-amplifier	HP	8447F	2805A02960	24-Oct-2025	23-Oct-2026
☒	Multi device Controller	ETS-Lindgren	7006-001	160105.00	N/A	N/A
☒	Test Software	Audix	e3	Software Version: 9.160323		

RF Conducted Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	Wideband Radio Communication Tester	ROHDE & SCHWARZ	CMW500	120932	20-Mar-2026	19-Mar-2027
☒	EXA Spectrum Analyzer	KEYSIGHT	N9020A	MY51286807	24-Oct-2025	23-Oct-2026
☒	EXA Signal Analyzer	KEYSIGHT	N9010B	MY62060155	20-Mar-2026	19-Mar-2027
☒	UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY59020226	20-Mar-2026	19-Mar-2027
☒	Shielding Room	SAEMC	4(L)*3(W)*3(H)	N/A	25-Oct-2024	24-Oct-2027
☒	Temp Humidity chamber	Votisch	VT4002	58566133290020	20-Mar-2026	19-Mar-2027
☒	Automatic control switch	Tonscend	JS0806-1	24E80610780	N/A	N/A
☒	Notch filter control unit	Tonscend	JS0806-F	24G806F0807	N/A	N/A
☒	DC Source	Agilent	66319B	MY43000795	24-Oct-2025	23-Oct-2026
☒	Test Software	Tonscend	TS1120-5	Software Version: 2.4.1 (5g)		
☒	Test Software	Tonscend	JS1120-1	Software Version: 3.1.46(234G)		

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UTTR-RF-FCC4G-V1.1

4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

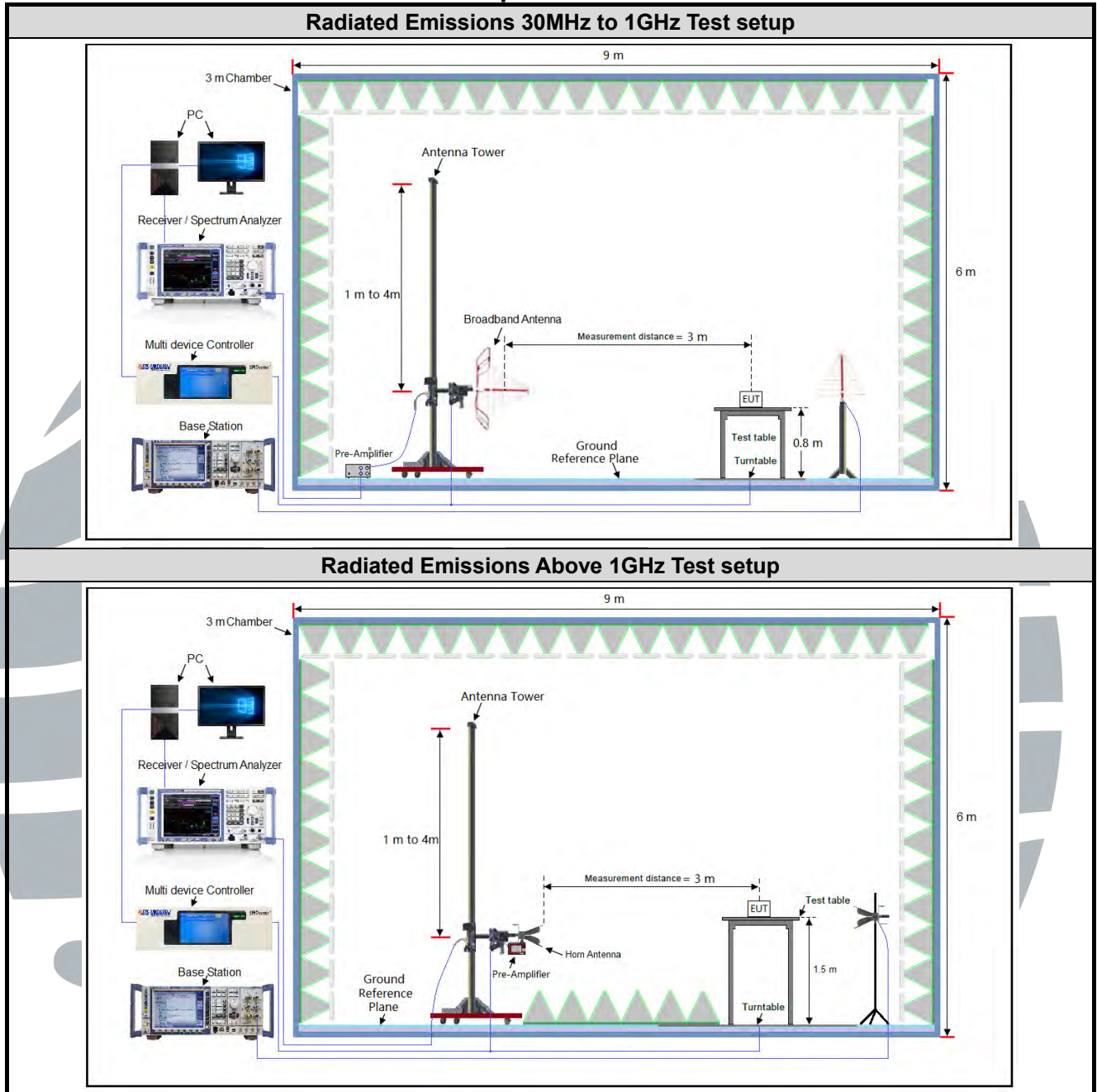
Test Environment	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
TN/VN	+15 to +35	3.87	20 to 75
TL/VL	-30	3.4	20 to 75
TH/VL	+50	3.4	20 to 75
TL/VH	-30	4.38	20 to 75
TH/VH	+50	4.38	20 to 75

Remark:

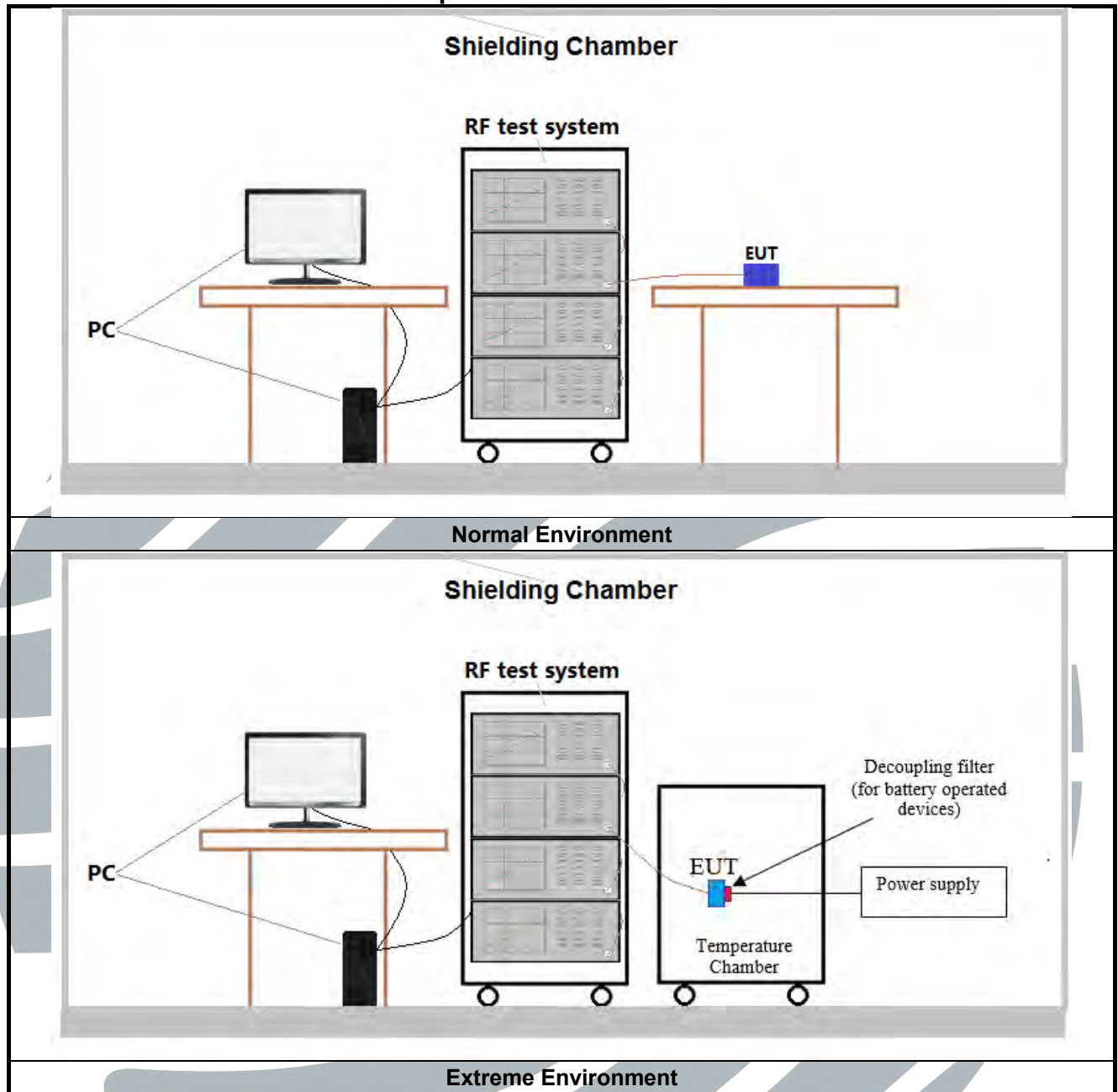
- 1) The EUT just work in such extreme temperature of -30 °C to +50 °C and the extreme voltage of 3.4 V to 4.38 V, so here the EUT is tested in the temperature of -30 °C to +50 °C and the voltage of 3.4 V to 4.38 V.
- 2) VN: Normal Voltage; TN: Normal Temperature;
TL: Low Extreme Test Temperature; TH: High Extreme Test Temperature;
VL: Low Extreme Test Voltage; VH: High Extreme Test Voltage.

4.2 TEST SETUP

4.2.1 For Radiated Emissions test setup



4.2.2 For Conducted RF test setup



4.3 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 3.87V battery. Only the worst case data were recorded in this test report.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X/Y/Z axis, and antenna ports.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

4.4 PRE-SCAN

Pre-scan all bandwidth, Configuration and Mode, find worse case mode are chosen to the report, the LTE and 5G NR worse case mode applicability and tested channel detail as below:

Item	Worst case Configuration and Mode
EIRP	The maximum Tune-up was adopted for the calculation.
Conducted output power ^{Note 1)}	All bandwidth, All modulation, All RB configuration and Low/middle/high channel
99%&26dB Bandwidth	All bandwidth, 5G NR DFT-s-OFDM_QPSK/16QAM modulation, Full RB configuration and Low/middle/high channel
peak-to-average ratio	Max. bandwidth, 5G NR DFT-s-OFDM modulation, Full RB configuration and Low/middle/high channel
Band Edge at antenna terminals	All bandwidth, 5G NR DFT-s-OFDM_QPSK modulation, Full&1 RB configuration and Low/ high channel
Spurious emissions at antenna terminals	For 5G NR, Conducted spurious emission tests were conducted on wider bandwidth with inner 5G NR DFT-s-OFDM_QPSK_1RB and since this is the worst bandwidth and the highest output power.
Field strength of spurious radiation	For 5G NR, Conducted spurious emission tests were conducted on wider bandwidth with inner 5G NR DFT-s-OFDM_QPSK_1RB and since this is the worst bandwidth and the highest output power.
Frequency stability	Max. bandwidth, 5G NR_CP_QPSK modulation, Full RB configuration and middle channel

Note:

- 1) The EUT supports SA and NSA mode, according to the maximum power between SA and NSA mode, NSA covered SA mode.
- 2) The EN-DC combinations declared by the manufacturer are as follows:

EN-DC Combinations		
DC_B2A+N78A	DC_B66A+n5A	DC_B2A+B7A+n78A
DC_B4A+N78A	DC_B5A+n66A	DC_B2A+B66A+n78A
DC_B2A+N12A	DC_B2A+n71AA	DC_B2A+B5A+n78A
DC_B12A+N77A	DC_B66A+n71AA	DC_B2A+B12A+n78A
DC_B13A+N77A	DC_B66A+N12A	DC_B13A+B66A+n77A
DC_B38A+N78A	DC_B12A+N66A	DC_B2A+B13A+n77A
DC_B12A+N78A	DC_B71A+N66A	DC_B2A+B5A+n77A
DC_B25A+N78A	DC_B2A+N71A	DC_B2A+B66A+n77A
DC_B25A+N77A	DC_B66A+N71A	DC_B5A+B66A+n77A
DC_B2A+N5A	DC_12A+n41A	DC_B2A+B66A+n12A
DC_B13A+N66A	DC_B26A+N41A	DC_B7A+B66A+n5A
DC_B5A+N2A	DC_B13A+N2A	DC_B2A+B7A+n71A
DC_B66A+n78A	DC_B48A+N5A	DC_B2A+B66A+n71A
DC_B66A+n77A	DC_B48A+N66A	DC_B2A+B66A+n71AA
		DC_B2A+B66A+n5A

5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

5.1 REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 96	Citizens Broadband Radio Service
3	ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
4	KDB 971168 D01	MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS
5	KDB 412172 D01 Determining ERP and EIRP v01r01	Guidelines for determining the effective radiated power (ERP) and isotropically radiated power (EIRP) of an RF transmitting system
6	FCC KDB 940660 D01 Part 96 CBRS Eqpt v03	CERTIFICATION AND TEST PROCEDURES FOR CITIZENS BROADBAND RADIO SERVICE DEVICES AUTHORIZED UNDER PART 96
7	WINNF-TS-0122-V1.0.1	WINNF-TS-0122-V1.0.1 CBRS CBSD Test Specification

5.2 CONDUCTED POWER SPECTRAL DENSITY (PSD)

Test Requirement: FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 96.41(b)

Test Method: KDB 971168 D01v03r01 & ANSI C63.26-2015

Limit:

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:

The EUT was set up for the maximum power with CMW500, and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.2.2 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Conducted Power Spectral Density (PSD) (dBm/10MHz)														
Modulation			QPSK			16QAM			64QAM			256QAM		
Band	Bandwidth	RB	55265 3552.5 MHz	55990 3625 MHz	56715 3697.5 MHz	55265 3552.5 MHz	55990 3625 MHz	56715 3697.5 MHz	55265 3552.5 MHz	55990 3625 MHz	56715 3697.5 MHz	55265 3552.5 MHz	55990 3625 MHz	55265 3552.5 MHz
48	5	1RB#0	22.33	22.24	22.29	21.63	21.33	21.45	20.34	20.13	20.59	18.22	17.91	22.33
		1RB#12	19.63	20.17	20.78	19.65	20.21	20.74	19.65	20.27	20.75	17.97	17.52	19.63
		1RB#24	19.63	19.24	19.42	19.64	19.40	19.33	19.63	19.44	19.41	18.33	17.91	19.63
		12RB#0	19.64	19.38	19.30	19.62	19.26	19.30	19.62	19.34	19.30	17.72	17.46	19.64
		12RB#6	19.74	19.44	19.30	19.73	19.40	19.29	19.75	19.59	19.33	17.76	17.59	19.74
		12RB#13	19.64	19.45	19.40	19.63	19.30	19.40	19.62	19.47	19.41	17.69	17.49	19.64
		25RB#0	19.66	19.26	19.30	19.66	19.34	19.31	19.67	19.50	19.29	17.68	17.35	19.66
48	10	55290	55990	56690	55290	55990	56690	55290	55990	56690	55290	55990	55290	55290
		3555 MHz	3625 MHz	3695 MHz	3555 MHz	3625 MHz	3695 MHz	3555 MHz	3625 MHz	3695 MHz	3555 MHz	3625 MHz	3555 MHz	3555 MHz
		1RB#0	22.37	22.13	22.30	21.82	21.26	21.06	20.54	19.88	20.50	18.02	17.31	22.37
		1RB#24	18.63	20.12	20.61	18.60	20.15	20.60	18.58	20.22	20.61	17.42	17.04	18.63
		1RB#49	18.56	18.03	18.15	18.56	18.04	18.07	18.55	18.16	18.06	17.90	17.30	18.56
		25RB#0	18.53	18.00	18.09	18.53	18.06	18.14	18.52	18.10	18.13	17.56	17.28	18.53
		25RB#12	19.63	19.10	19.15	19.62	19.12	19.17	19.61	19.12	19.09	17.65	17.28	19.63
48	15	25RB#25	18.52	18.07	18.10	18.53	18.18	18.14	18.52	18.16	18.14	17.65	17.07	18.52
		50RB#0	18.52	18.00	18.12	18.52	18.08	18.14	18.52	18.04	18.16	16.60	16.23	18.52
		55315	55990	56665	55315	55990	56665	55315	55990	56665	55315	55990	55315	55315
		3557.5 MHz	3625 MHz	3692.5 MHz	3557.5 MHz	3625 MHz	3692.5 MHz	3557.5 MHz	3625 MHz	3692.5 MHz	3557.5 MHz	3625 MHz	3557.5 MHz	3557.5 MHz
		1RB#0	22.30	21.80	22.06	21.46	21.15	21.35	20.18	20.01	19.95	17.61	17.01	22.30
		1RB#38	16.89	20.01	20.13	16.90	20.16	20.09	16.90	20.06	20.07	17.45	17.08	16.89
		1RB#74	16.87	16.23	16.56	16.91	16.40	16.55	16.90	16.37	16.50	17.88	17.04	16.87
48	20	38RB#0	16.89	16.32	16.50	16.91	16.32	16.50	16.87	16.45	16.50	16.88	16.41	16.89
		38RB#18	19.29	18.60	18.93	19.22	18.77	18.94	19.32	18.70	18.95	17.25	16.75	19.29
		38RB#37	19.20	18.62	18.84	19.19	18.73	18.84	19.30	18.74	18.81	19.27	18.77	19.20
		75RB#0	19.26	18.63	18.78	19.24	18.85	18.81	19.24	18.75	18.84	14.83	14.51	19.26
		55340	55990	56640	55340	55990	56640	55340	55990	56640	55340	55990	55340	55340
		3560 MHz	3625 MHz	3690 MHz	3560 MHz	3625 MHz	3690 MHz	3560 MHz	3625 MHz	3690 MHz	3560 MHz	3625 MHz	3560 MHz	3560 MHz
		1RB#0	22.35	21.95	22.41	21.39	21.17	21.42	20.56	20.47	20.44	17.84	17.44	22.35
48	25	1RB#49	20.41	20.65	18.76	15.74	20.79	20.40	15.74	20.75	20.37	17.76	17.19	20.41
		1RB#99	18.30	18.20	18.72	15.72	15.31	15.30	15.71	15.27	15.31	18.11	17.37	18.30
		50RB#0	18.37	18.17	18.70	15.72	15.40	15.28	15.70	15.30	15.34	16.49	16.13	18.37
		50RB#25	18.23	18.02	18.65	18.66	18.13	18.23	18.65	18.11	18.21	16.48	16.07	18.23
		50RB#50	18.31	18.23	18.68	15.69	15.32	15.30	15.67	15.32	15.30	16.63	16.00	18.31
		100RB#0	18.26	18.25	18.29	15.68	15.27	15.23	15.67	15.28	15.17	13.67	13.28	18.26

Conducted Power Spectral Density (PSD) (dBm/10MHz)												
5G NR n48		RB Size	RB Offset	10MHz BW SCS = 30kHz			20MHz BW SCS = 30kHz			40MHz BW SCS = 30kHz		
Channel				637000	641666	646332	637334	641666	646000	638000	641666	645332
Frequency (MHz)				3555	3624.99	3694.98	3560.01	3624.99	3690	3570	3624.99	3679.98
DFT-s-OFDM	$\pi/2$ BPSK	1	Left	21.86	21.58	21.85	21.81	21.61	21.48	22.03	21.81	21.52
	$\pi/2$ BPSK	1	Right	21.98	21.58	21.91	21.97	21.22	21.81	22.09	21.55	21.87
	$\pi/2$ BPSK	Innter_Full	Mid	22.05	21.66	22.00	21.98	21.56	21.68	22.09	21.58	21.70
	QPSK	1	Left	21.89	21.64	21.85	21.89	21.59	21.60	22.06	21.73	21.56
	QPSK	1	Right	22.03	21.51	21.97	21.86	21.38	21.82	22.03	21.60	22.02
	QPSK	Innter_Full	Mid	22.07	21.68	21.94	22.01	21.77	21.73	22.10	21.87	21.85
	16QAM	1	Left	20.93	20.80	21.04	20.89	20.67	20.46	20.80	21.07	20.80
	16QAM	1	Right	20.99	20.68	21.12	21.11	20.42	20.85	21.13	20.80	21.16
	16QAM	Innter_Full	Mid	21.13	20.77	21.07	20.82	20.53	20.79	21.03	20.76	20.76
	64QAM	1	Left	19.51	19.38	19.61	19.60	19.12	19.06	19.69	19.44	18.93
	64QAM	1	Right	19.52	19.26	19.68	19.72	18.88	19.27	19.81	19.18	19.54
	64QAM	Innter_Full	Mid	19.51	19.17	19.49	19.39	18.99	19.18	19.55	19.04	19.29
	256QAM	1	Left	17.40	17.05	17.37	17.16	16.98	16.98	17.19	17.10	16.58
	256QAM	1	Right	17.43	16.94	17.32	17.31	16.73	17.25	17.45	16.81	17.06
	256QAM	Innter_Full	Mid	17.49	17.07	17.40	17.34	16.96	17.16	17.48	17.05	17.18
CP-OFDM	QPSK	1	Left	20.39	20.08	20.48	20.40	19.93	19.90	20.44	20.18	20.02
	QPSK	1	Right	20.43	20.06	20.53	20.59	19.72	20.22	20.57	19.91	20.62
	QPSK	Innter_Full	Mid	20.51	20.17	20.50	20.39	20.06	20.12	20.60	20.16	20.30
	16QAM	1	Left	20.29	19.87	20.03	19.83	19.93	19.99	19.84	20.26	19.37
	16QAM	1	Right	20.17	19.90	20.20	20.32	19.91	20.37	20.15	19.84	19.85
	16QAM	Innter_Full	Mid	19.97	19.54	19.95	19.92	19.57	19.83	20.11	19.62	19.56
	64QAM	1	Left	18.57	18.23	18.57	18.50	18.31	18.19	18.37	18.04	17.42
	64QAM	1	Right	18.75	18.30	18.58	18.70	18.08	18.50	18.54	17.96	17.97
	64QAM	Innter_Full	Mid	18.67	18.23	18.56	18.50	18.05	18.30	18.58	18.26	18.28
	256QAM	1	Left	15.74	15.37	15.62	15.51	15.43	15.34	15.27	15.66	15.29
	256QAM	1	Right	15.80	15.28	15.76	15.63	15.16	15.60	15.43	15.34	15.91
	256QAM	Innter_Full	Mid	15.56	15.17	15.49	15.40	15.04	15.19	15.49	15.14	15.21

5.3 EIRP

Test Requirement: FCC 47 CFR Part 2.1046(a) &
FCC 47 CFR Part 96.41(b)

Test Method: KDB 971168 D01v03r01 Section 5.6 & ANSI C63.26-2015

Limit:

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:

According to KDB 412172 D01 Power Approach,

- $ERP \text{ or } EIRP = P_T + G_T - L_c$
- $ERP = EIRP - 2.15$

where

- P_T = transmitter output power, expressed in dBW, dBm, or PSD;
- G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
- L_c = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

Test Setup: Refer to section 4.2.1 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Band	TX Frequency (MHz)	Antenna Gain (dBi)	Max. Conducted PSD (dBm/10MHz)	Max. Tune Up (dBm/10MHz)	EIRP PSD (dBm/10MHz)	EIRP (W/10MHz)
LTE Band 48	3550-3700	-7.29	22.41	23.0	15.71	0.0372
5G NR n 48	3550-3700	-7.29	22.10	22.5	15.21	0.0332

Note:

- The maximum EIRP is calculated from max output power and antenna gain, the antenna gain provided by the customer, and the customer takes all the responsibilities for the accuracy of antenna gain.
- $EIRP = \text{Tune Up (dBm)} + \text{Antenna Gain (dBi)}$

5.4 PEAK-TO-AVERAGE RATIO

Test Requirement: FCC 47 CFR Part 96.41(g)

Test Method: KDB 971168 D01v03r01 Section 5.7

Limit: The peak-to-average power ratio (PAPR) of any CBSD transmitter output power must not exceed 13 dB. PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities or another Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

Test Procedure:

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer.

- a) Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth
- b) Set the number of counts to a value that stabilizes the measured CCDF curve
- c) Record the maximum PAPR level associated with a probability of 0.1 %

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.2.2 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Test Data: Please refer to Appendix A to B

5.5 99%&26DB BANDWIDTH

Test Requirement: FCC 47 CFR Part 2.1049(h)

Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01 Section 4

Limit: No Limit, for reporting purposes only.

Test Procedure:

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.2.2 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Test Data: Please refer to Appendix A to B

5.6 BAND EDGE AT ANTENNA TERMINALS

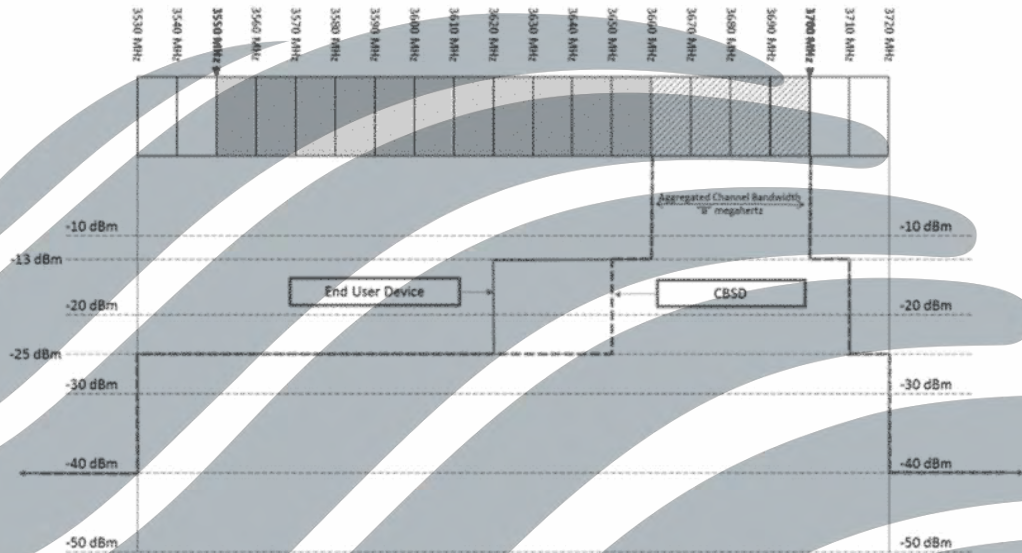
Test Requirement: FCC 47 CFR Part 2.1051,
FCC 47 CFR Part 96.41(e)
Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01

Limit:

3.5 GHz Emissions and Interference Limits —

(1) Click to open paragraph tools 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.

(3) Measurement procedure.

(i) Compliance with this provision 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 authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full reference bandwidth (i.e., 1 MHz or 1 percent of emission bandwidth, as specified). The fundamental 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.

(ii) When measuring unwanted emissions to demonstrate compliance with the limits, the CBSD and End User Device nominal carrier frequency/channel shall be adjusted as close to the licensee's authorized frequency block edges, both upper and lower, as the design permits.

(iii) Compliance with emission limits shall be demonstrated using either average (RMS)-detected or peak-detected power measurement techniques.

Test Procedure:

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer.

For each band edge measurement:

- 1) Set the spectrum analyzer span to include the block edge frequency.
- 2) Set a marker to point the corresponding band edge frequency in each test case.
- 3) Set display line at -40 dBm
- 4) Set resolution bandwidth to at least 1% of emission bandwidth.
- 5) Set spectrum analyzer with RMS detector.
- 6) Record the max trace plot into the test report

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.2.2 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Test Data: Please refer to Appendix A to B

5.7 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Test Requirement: FCC 47 CFR Part 2.1051,
FCC 47 CFR Part 96.41(e)

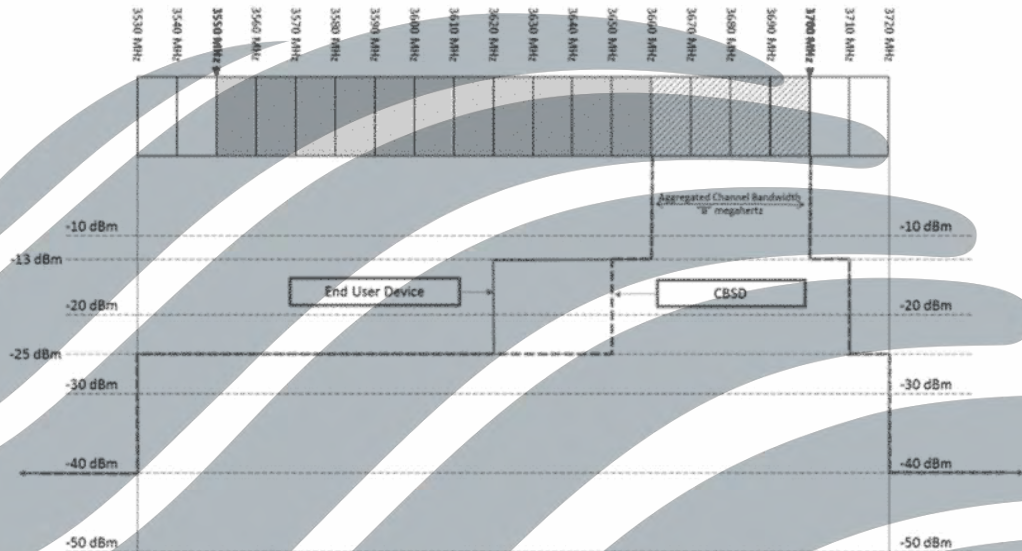
Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01

Limit:

3.5 GHz Emissions and Interference Limits —

(1) Click to open paragraph tools 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.

(3) Measurement procedure.

(i) Compliance with this provision 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 authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full reference bandwidth (i.e., 1 MHz or 1 percent of emission bandwidth, as specified). The fundamental 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.

(ii) When measuring unwanted emissions to demonstrate compliance with the limits, the CBSD and End User Device nominal carrier frequency/channel shall be adjusted as close to the licensee's authorized frequency block edges, both upper and lower, as the design permits.

(iii) Compliance with emission limits shall be demonstrated using either average (RMS)-detected or peak-detected power measurement techniques.

Test Procedure:

The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range. b. Measuring frequency range is from 30 MHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.2.2 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Test Data: Please refer to Appendix A to B

5.8 FIELD STRENGTH OF SPURIOUS RADIATION

Test Requirement: FCC 47 CFR Part 2.1051,
FCC 47 CFR Part 96.41(e)

Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01

Receiver Setup:

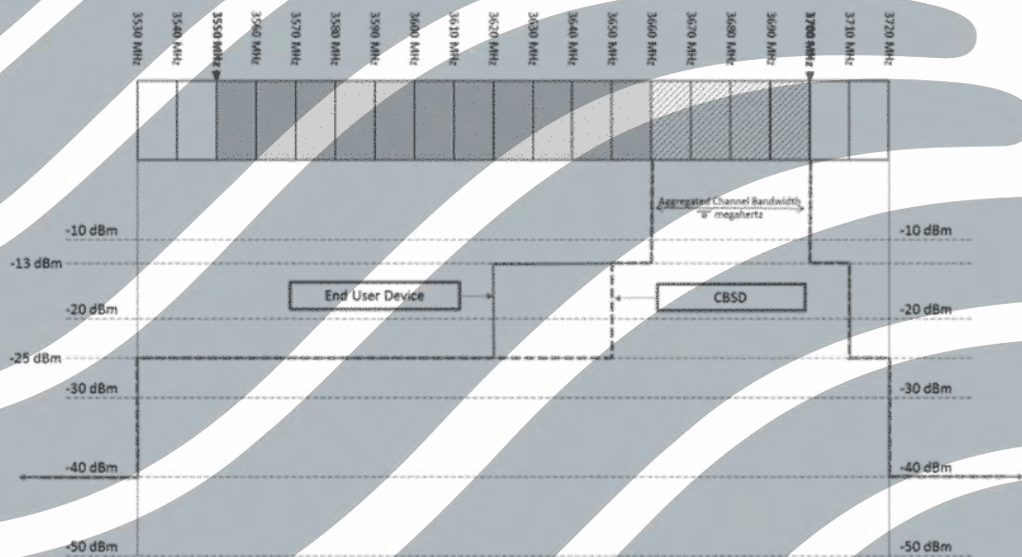
Frequency	Detector	RBW	VBW	Remark
0.009 MHz-30 MHz	Peak	10 kHz	30 KHz	Peak
30 MHz-1 GHz	Quasi-peak	100 kHz	300 KHz	Peak
Above 1 GHz	Peak	1 MHz	3 MHz	Peak

Limits:

3.5 GHz Emissions and Interference Limits —

(1) Click to open paragraph tools 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

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<http://www.uttlab.com>

UTTR-RF-FCC4G-V1.1

-40dBm/MHz.

(3) Measurement procedure.

(i) Compliance with this provision 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 authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full reference bandwidth (i.e., 1 MHz or 1 percent of emission bandwidth, as specified). The fundamental 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.

(ii) When measuring unwanted emissions to demonstrate compliance with the limits, the CBSD and End User Device nominal carrier frequency/channel shall be adjusted as close to the licensee's authorized frequency block edges, both upper and lower, as the design permits.

(iii) Compliance with emission limits shall be demonstrated using either average (RMS)-detected or peak-detected power measurement techniques.

Test Setup: Refer to section 4.2.1 for details.

Test Procedures: KDB 971168 D01v03r01 Section 7

Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:

LTE Band 48_ 20 MHz_ QPSK							
No.	Frequency (MHz)	SA Reading (dBm)	Correction factor (dB/m)	EIRP Result (dBm)	Limit (dBm)	Margin (dB)	Ant. Pol.
Lowest Channel							
1	42.931	-70.77	-2.10	-72.87	-40.00	-32.87	Horizontal
2	906.304	-80.83	16.24	-64.59	-40.00	-24.59	Horizontal
3	958.714	-80.81	16.27	-64.54	-40.00	-24.54	Horizontal
4	7120.000	-59.81	14.22	-45.59	-40.00	-5.59	Horizontal
5	10680.000	-62.44	16.60	-45.84	-40.00	-5.84	Horizontal
6	17800.000	-64.58	21.73	-42.85	-40.00	-2.85	Horizontal
7	44.154	-64.82	-3.98	-68.80	-40.00	-28.80	Vertical
8	844.803	-79.55	15.03	-64.52	-40.00	-24.52	Vertical
9	958.714	-80.09	16.27	-63.82	-40.00	-23.82	Vertical
10	7120.000	-58.68	14.22	-44.46	-40.00	-4.46	Vertical
11	10680.000	-65.23	16.60	-48.63	-40.00	-8.63	Vertical
12	17800.000	-73.75	21.73	-52.02	-40.00	-12.02	Vertical
Middle Channel							
1	56.466	-64.00	-8.54	-72.54	-40.00	-32.54	Horizontal
2	925.613	-80.81	16.24	-64.57	-40.00	-24.57	Horizontal
3	986.044	-81.04	16.74	-64.30	-40.00	-24.30	Horizontal
4	7250.000	-58.95	14.22	-44.73	-40.00	-4.73	Horizontal
5	10875.000	-62.46	16.44	-46.02	-40.00	-6.02	Horizontal
6	14500.000	-71.42	20.83	-50.59	-40.00	-10.59	Horizontal
7	44.154	-58.82	-3.98	-62.80	-40.00	-22.80	Vertical
8	887.398	-80.69	15.78	-64.91	-40.00	-24.91	Vertical
9	945.334	-80.24	16.22	-64.02	-40.00	-24.02	Vertical
10	7250.000	-59.77	14.22	-45.55	-40.00	-5.55	Vertical
11	10875.000	-65.11	16.44	-48.67	-40.00	-8.67	Vertical
12	14500.000	-71.15	20.83	-50.32	-40.00	-10.32	Vertical
Highest Channel							
1	57.265	-64.34	-8.83	-73.17	-40.00	-33.17	Horizontal
2	925.613	-80.51	16.24	-64.27	-40.00	-24.27	Horizontal
3	986.044	-81.26	16.74	-64.52	-40.00	-24.52	Horizontal
4	7380.000	-57.81	14.23	-43.58	-40.00	-3.58	Horizontal
5	11070.000	-62.94	16.39	-46.55	-40.00	-6.55	Horizontal
6	14760.000	-68.48	21.02	-47.46	-40.00	-7.46	Horizontal
7	44.154	-64.37	-3.98	-68.35	-40.00	-28.35	Vertical
8	919.132	-80.94	16.17	-64.77	-40.00	-24.77	Vertical
9	979.139	-81.29	16.52	-64.77	-40.00	-24.77	Vertical
10	7380.000	-58.44	14.23	-44.21	-40.00	-4.21	Vertical
11	11080.000	-62.25	16.39	-45.86	-40.00	-5.86	Vertical
12	14760.000	-70.87	21.02	-49.85	-40.00	-9.85	Vertical

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

5G NR n48_40 MHz_QPSK							
No.	Frequency (MHz)	SA Reading (dBm)	Correction factor (dB/m)	EIRP Result (dBm)	Limit (dBm)	Margin (dB)	Ant. Pol.
Lowest Channel							
1	56.466	-63.75	-8.54	-72.29	-40.00	-32.29	Horizontal
2	844.803	-80.15	15.03	-65.12	-40.00	-25.12	Horizontal
3	1000.000	-81.35	17.07	-64.28	-40.00	-24.28	Horizontal
4	7200.000	-59.96	14.22	-45.74	-40.00	-5.74	Horizontal
5	10800.000	-62.77	16.50	-46.27	-40.00	-6.27	Horizontal
6	18000.000	-64.77	22.37	-42.40	-40.00	-2.40	Horizontal
7	44.466	-63.92	-3.99	-67.91	-40.00	-27.91	Vertical
8	906.304	-80.65	16.24	-64.41	-40.00	-24.41	Vertical
9	992.997	-80.99	16.81	-64.18	-40.00	-24.18	Vertical
10	7200.000	-60.32	14.22	-46.10	-40.00	-6.10	Vertical
11	10800.000	-62.26	16.50	-45.76	-40.00	-5.76	Vertical
12	18000.000	-65.04	22.37	-42.67	-40.00	-2.67	Vertical
Middle Channel							
1	42.931	-69.45	-2.10	-71.55	-40.00	-31.55	Horizontal
2	952.000	-80.01	16.19	-63.82	-40.00	-23.82	Horizontal
3	1000.000	-79.96	17.07	-62.89	-40.00	-22.89	Horizontal
4	7249.980	-61.33	14.23	-47.10	-40.00	-7.10	Horizontal
5	14499.960	-65.00	20.83	-44.17	-40.00	-4.17	Horizontal
6	44.466	-61.74	-3.99	-65.73	-40.00	-25.73	Vertical
7	856.760	-78.80	14.89	-63.91	-40.00	-23.91	Vertical
8	1000.000	-81.43	17.07	-64.36	-40.00	-24.36	Vertical
9	7249.980	-60.94	14.23	-46.71	-40.00	-6.71	Vertical
10	10874.970	-60.71	16.44	-44.27	-40.00	-4.27	Vertical
11	14499.960	-64.86	20.83	-44.03	-40.00	-4.03	Vertical
Highest Channel							
1	56.071	-63.42	-8.43	-71.85	-40.00	-31.85	Horizontal
2	925.613	-80.91	16.24	-64.67	-40.00	-24.67	Horizontal
3	958.714	-80.79	16.27	-64.52	-40.00	-24.52	Horizontal
4	7299.960	-60.91	14.23	-46.68	-40.00	-6.68	Horizontal
5	10949.940	-60.51	16.38	-44.13	-40.00	-4.13	Horizontal
6	14599.920	-65.44	20.90	-44.54	-40.00	-4.54	Horizontal
7	44.154	-65.14	-3.98	-69.12	-40.00	-29.12	Vertical
8	925.613	-80.22	16.24	-63.98	-40.00	-23.98	Vertical
9	958.714	-80.95	16.27	-64.68	-40.00	-24.68	Vertical
10	7299.960	-61.27	14.23	-47.04	-40.00	-7.04	Vertical
11	10949.940	-61.82	16.38	-45.44	-40.00	-5.44	Vertical
12	14599.920	-65.67	20.90	-44.77	-40.00	-4.77	Vertical

5.9 FREQUENCY STABILITY

Test Requirement: FCC 47 CFR Part 2.1055

Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01

Limits: N/A

Test Setup: Refer to section 4.2.2 for details.

Test Procedures:

- 1) Use CMW 500 or E7515B with Frequency Error measurement capability.
 - a) Temp. = -30° to $+50^{\circ}\text{C}$
 - b) Voltage = low voltage, 3.4 Vdc, Normal, 3.87 Vdc and High voltage, 4.38 Vdc.

- 2) Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to 20°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until $+50^{\circ}\text{C}$ is reached.

- 3) Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

Equipment Used: Refer to section 3 for details.

Test Result: Please refer to Appendix A to B

Note 1: The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

5.10 END USER DEVICE ADDITIONAL REQUIREMENT

Test Requirement: FCC 47 CFR Part 96.47

Test Method: KDB 940660 D01v03

WINNF-TS-0122-V1.0.1 CBRS CBSD Test Specification

(a) End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation.

Limits:

(1) An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.

Test Setup: Refer to section 4.2.2 for details.

Test Procedures:

Following procedure can be done by applying WINNF-TS-0122-V1.0.1 CBRS CBSD Test Specification, use the certified Ruckus CBSD as companion device to show compliance with Part 96.47 requirement for End User Device (EUD):

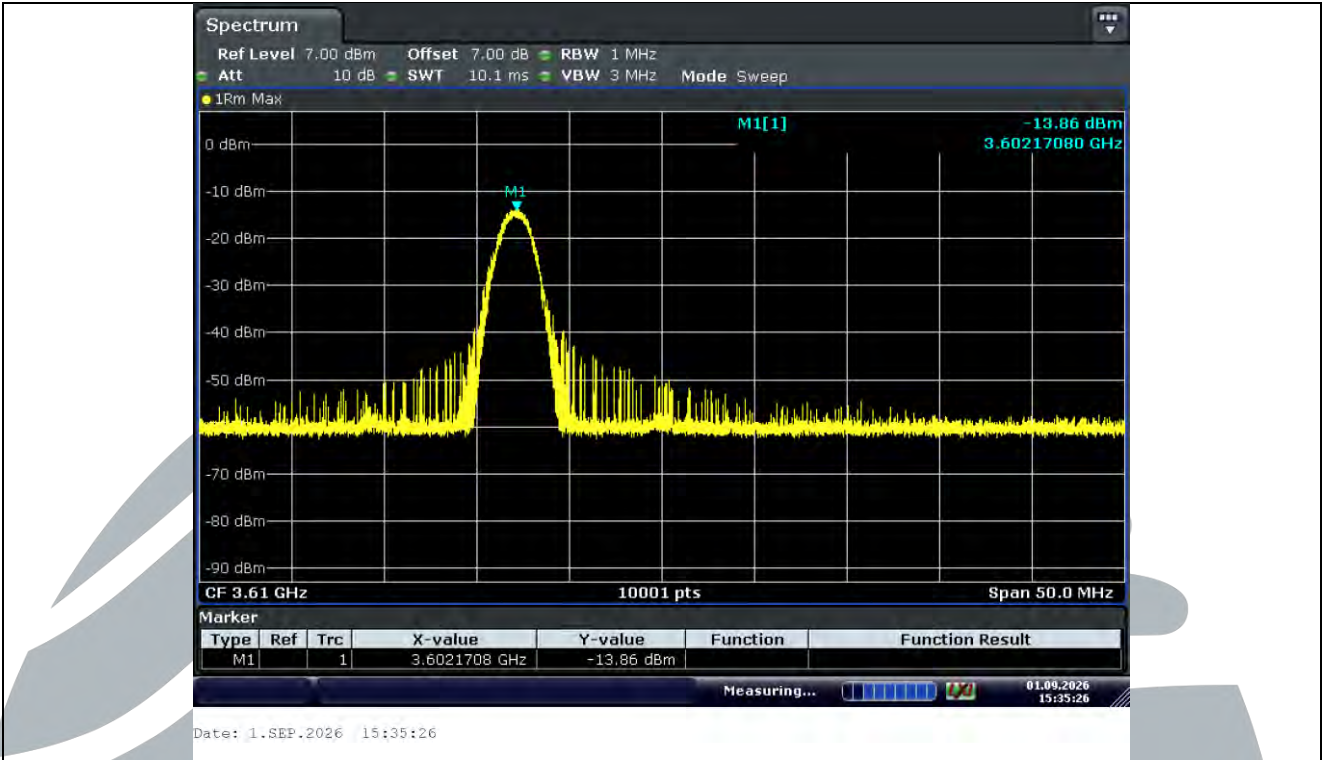
- 1) Setup with frequency 3600-3620MHz and power level 17dBm/MHz
- 2) Enable AP service from Ruckus Cloud management
- 3) Check EUD Tx Frequency and power
- 4) Disable AP service from Ruckus Cloud management
 - a. Check EUD stops transmission within 10seconds.
- 5) Setup with 3670-3690MHz & power level 7dBm/MHz
- 6) Enable AP service from Ruckus Cloud management
- 7) Check EUD Tx Frequency and power
- 8) Disable AP service from Ruckus Cloud management
 - a. Check EUD stops transmission within 10seconds.

Equipment Used: Refer to section 3 for details.

Test Result: PASS

[Step 1] Setup with frequency 3600-3620MHz and power level 17dBm/MHz
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[Step 3] Check EUD Tx Frequency and power

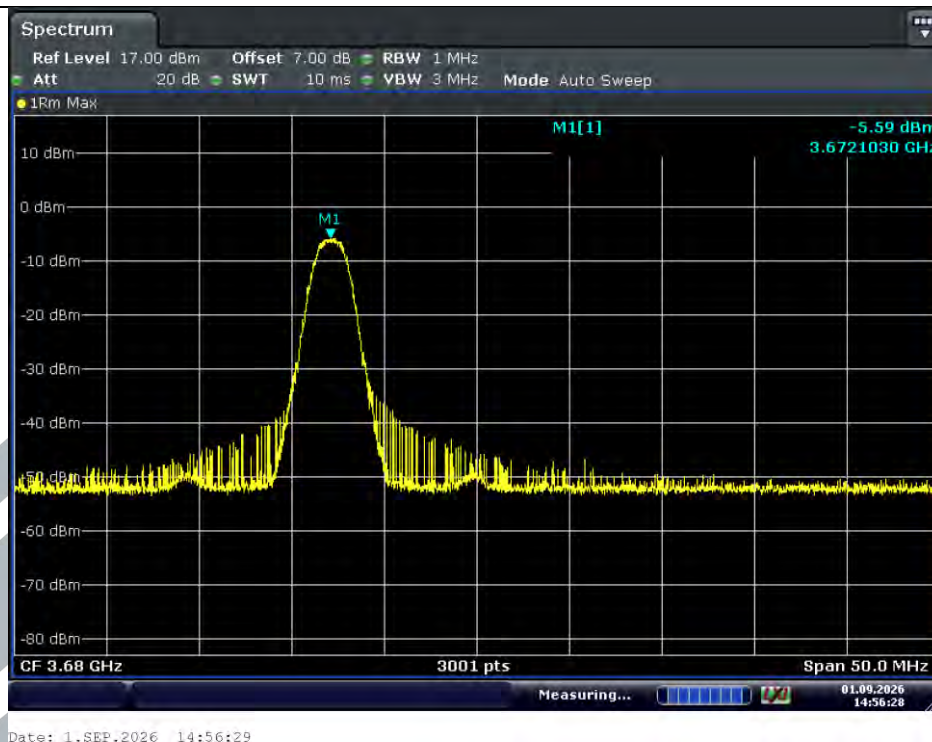


[Step 4.a.] EUD stops transmission within 10 seconds of receiving instructions from its associated CBSD.



[Step 5] Setup with 3670-3690MHz & power level 7dBm/MHz

[Step 7] Check EUD Tx Frequency and power



[Step 8.a.] After changing the frequency and power level, The module (EUT) discontinues operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD. Test result is PASS.



APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of UnionTrust, this report can't be reproduced except in full.
