

TEST REPORT

Reference No..... : WTX25X04091864W001
FCC ID : 2BAK2-F110PRO
Applicant : Shenzhen Qichang Intelligent Technology Co., Ltd
Address : Room 510, Building 7, Yunli Intelligent Park, No. 7, Bantian Street,
Longgang , Shenzhen
Manufacturer : The same as Applicant
Address : The same as Applicant
Product Name : Smart Phone
Model No..... : F110 Pro
Standards : FCC Part 2, FCC Part 27
Date of Receipt sample : 2025-04-14
Date of Test..... : 2025-04-14 to 2025-05-07
Date of Issue : 2025-05-07
Test Report Form No. : WTX_Part 27W
Test Result..... : Pass

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:

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Approved by:



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TABLE OF CONTENTS

1. GENERAL INFORMATION.....	4
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	4
1.2 TEST STANDARDS.....	5
1.3 TEST METHODOLOGY.....	5
1.4 TEST FACILITY	5
1.5 EUT SETUP AND TEST MODE	6
1.6 MEASUREMENT UNCERTAINTY	7
1.7 TEST EQUIPMENT LIST AND DETAILS	8
2. SUMMARY OF TEST RESULTS	12
3. RF OUTPUT POWER	13
3.1 STANDARD APPLICABLE.....	13
3.2 TEST PROCEDURE.....	13
3.3 SUMMARY OF TEST RESULTS/PLOTS	13
4. PEAK-TO-AVERAGE RATIO (PAR) OF TRANSMITTER.....	20
4.1 STANDARD APPLICABLE.....	20
4.2 TEST PROCEDURE.....	20
4.3 SUMMARY OF TEST RESULTS	20
5. EMISSION BANDWIDTH.....	21
5.1 STANDARD APPLICABLE.....	21
5.2 TEST PROCEDURE.....	21
5.3 SUMMARY OF TEST RESULTS/PLOTS	21
6. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL.....	22
6.1 STANDARD APPLICABLE.....	22
6.2 TEST PROCEDURE.....	22
6.3 SUMMARY OF TEST RESULTS/PLOTS	23
7. SPURIOUS RADIATED EMISSIONS.....	24
7.1 STANDARD APPLICABLE.....	24
7.2 TEST PROCEDURE.....	24
7.3 SUMMARY OF TEST RESULTS/PLOTS	24
8. FREQUENCY STABILITY	31
8.1 STANDARD APPLICABLE.....	31
8.2 TEST PROCEDURE.....	31
8.3 SUMMARY OF TEST RESULTS/PLOTS	31
APPENDIX PHOTOGRAPHS.....	32

Report version

Version No.	Date of issue	Description
Rev.00	2025-05-07	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT:	
Product Name:	Smart Phone
Trade Name:	
Model No.:	F110 Pro
Adding Model(s):	F110 Plus, F110 Ultra, F110 P, iHunt Titan Music P11001 ULTRA, iHunt Titan Music P11001 ULTRA 5G
Rated Voltage:	DC 3.87V
Battery:	10000mAh
Adapter Model:	QZ-0180AE2H Input: AC100-240V 50/60Hz 0.5A Output: DC5V3A 15W; OR 9V2.22A 20W; OR 12V1.67A 20W
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model F110 Pro, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT:	
5G	
Support Networks:	5G NR
Support Band:	n78
EN-DC Mode	/
Uplink Frequency:	5G NR n78: 3450-3550MHz 5G NR n78: 3700-3800MHz
Downlink Frequency:	5G NR n78: 3450-3550MHz 5G NR n78: 3700-3800MHz
RF Output Power:	5G NR n78(3450-3550MHz): 27.84dBm 5G NR n78(3700-3800MHz): 27.79dBm
Type of Emission:	5G NR n78(3450-3550MHz): 96M4G7D, 96M0W7D 5G NR n78(3700-3800MHz): 96M3G7D, 96M6W7D
Type of Modulation:	DFT-s-OFDM: PI/2 BPSK QPSK / 16QAM / 64QAM / 256QAM CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM
Antenna Type:	FPC Antenna
Antenna Gain:	N78_3450-3550MHz: 1.2dBi N78_3700-3800MHz: 1.2dBi
<i>Note The Antenna Gain is provided by the customer and can affect the validity of results.</i>	

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 2: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations.

FCC Rules Part 27: Miscellaneous Wireless Communications Services.

TIA/EIA 603 E March 2016: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

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

KDB 971168 D01 Power Measurement License Digital Systems v03r01: Measurement Guidance for Certification of Licensed Digital Transmitters.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with TIA/EIA 603 E/ KDB 971168/ ANSI C63.26. The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A and the CAB identifier is CN0057.

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	5G NR n78 (SCS:30 kHz)	Low, Middle, High Channels

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	45~75 %
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	0.57dB
Occupied Bandwidth	Conducted	0.015MHz
Frequency Stability	Conducted	2.3%
Transmitter Spurious Emissions	Conducted	0.42dB
Transmitter Spurious Emissions	Radiated	30-200MHz, 4.52dB
		0.2-1GHz 5.56dB
		1-6GHz, 3.84dB
		6-18GHz, 3.92dB

1.7 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1041A 1001	Communication Tester	Rohde & Schwarz	CMW500	148650	2025-02-23	2026-02-22
WTXE1022A 1002	GSM Tester	Rohde & Schwarz	CMU200	114403	2025-02-23	2026-02-22
WTXE1091A 1001	UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY574505 25	2025-02-23	2026-02-22
WTXE1005A 1005	Spectrum Analyzer	Agilent	N9020A	US471401 02	2025-02-23	2026-02-22
WTXE1084A 1001	Spectrum Analyzer	Agilent	N9020A	MY543205 48	2025-02-23	2026-02-22
WTXE1044A 1001	Signal Generator	Agilent	83752A	3610A014 53	2025-02-23	2026-02-22
WTXE1045A 1001	Vector Signal Generator	Agilent	N5182A	MY470702 02	2025-02-23	2026-02-22
WTXE1018A 1001	Power Divider	Weinschel	1506A	PM204	2025-02-23	2026-02-22
WTXE1088A 1001-2	EXA Signal Analyzer	KEYSIGHT	N9010B	MY590704 94	2025-02-23	2026-02-22
WTXE1092A 1001-2	Band Reject Filter Group	Tonscend	JS0806-F	20180603 19	2025-02-23	2026-02-22
WTXE1103A 1003	Attenuator	Pasternack	PE4007-4	/	2025-02-23	2026-02-22
WTXE1003A 1-005	Coaxial Cable	/	0M4RFC	/	2025-02-23	2026-02-22
☐ Chamber A: Below 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2025-02-23	2026-02-22
WTXE1001A 1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2025-02-23	2026-02-22
WTXE1007A 1001	Amplifier	HP	8447F	2805A034 75	2025-02-23	2026-02-22
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2026-02-25
WTXE1010A 1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2025-02-23	2026-02-22
WTXE1104A 1032-1	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22

WTXE1104A 1032-2	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1032-3	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
☐ Chamber A: Above 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2025-02-23	2026-02-22
WTXE1001A 1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2025-02-23	2026-02-22
WTXE1065A 1001	Amplifier	C&D	PAP-1G18	2002	2025-02-23	2026-02-22
WTXE1010A 1005	Horn Antenna	ETS	3117	00086197	2025-02-23	2026-02-22
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2026-03-16
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2025-02-23	2026-02-22
WTXE1004A 1-001	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2025-02-23	2026-02-22
WTXE1104A 1033-1	Coaxial Cable	/	C16-07-07	/	2025-02-23	2026-02-22
WTXE1104A 1033-2	Coaxial Cable	/	C16-07-07	/	2025-02-23	2026-02-22
WTXE1104A 1033-3	Coaxial Cable	/	C16-07-07	/	2025-02-23	2026-02-22
☐ Chamber B:Below 1GHz						
WTXE1010A 1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2024-03-17	2027-03-16
WTXE1038A 1001	Amplifier	Agilent	8447D	2944A104 57	2025-02-23	2026-02-22
WTXE1001A 1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2025-02-23	2026-02-22
WTXE1104A 1031-1	Coaxial Cable	/	1.5MRFC-LWB 3	/	2025-02-23	2026-02-22
WTXE1104A 1031-2	Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22
WTXE1104A 1031-3	Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22
☒ Chamber C:Below 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2025-02-23	2026-02-22

WTXE1010A 1013-1	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2024-04-18	2027-04-17
WTXE1007A 1002	Amplifier	HP	8447F	2944A038 69	2025-02-23	2026-02-22
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2026-02-25
WTXE1104A 1034-1	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1034-2	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1034-3	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
☒ Chamber C: Above 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2025-02-23	2026-02-22
WTXE1103A 1005	Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
WTXE1103A 1006	Amplifier	Tonscend	TAP01018050	AP22E806 235	2025-02-23	2026-02-22
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2026-03-16
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2025-02-23	2026-02-22
WTXE1104A 1035-1	Coaxial Cable	/	RC-18G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1035-2	Coaxial Cable	/	RC-18G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1035-3	Coaxial Cable	/	RC-18G-N-M	/	2025-02-23	2026-02-22

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission A)	Farad	EZ-EMC	RA-03A1 (1.1.4.2)
EMI Test Software (Radiated Emission B)	Farad	EZ-EMC	RA-03A1 (1.1.4.2)
EMI Test Software (Radiated Emission C)	Farad	EZ-EMC	RA-03A1-2 (1.1.4.2)
5G NR Test Ssystem	Tonscend	TS-1120	V2.4.0

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§27.50(j)(3), §27.50(k)(3), §2.1046	RF Output Power	Compliant
§27.50(j)(4), §27.50(k)(4)	Peak-to-average Ratio (PAR) of Transmitter	Compliant
§27.53(l)(2), §27.53(n)(2) , §2.1049	Emission Bandwidth	Compliant
§27.53(l)(2), §27.53(n)(2) , §2.1051	Spurious Emissions at Antenna Terminal	Compliant
§27.53(l)(2), §27.53(n)(2) , §2.1053	Spurious Radiation Emissions	Compliant
§27.53(h)(1) , §2.1051	Out of Band Emissions	Compliant
§27.54 , §2.1055	Frequency Stability	Compliant

3. RF Output Power

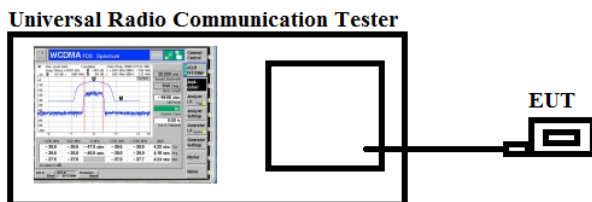
3.1 Standard Applicable

According to §27.50(j)(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)(3), Mobile devices are limited to 1Watt (30 dBm) EIRP. Mobile devices operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

3.2 Test Procedure

- Conducted output power test method:



- Radiated power test method:

1. The setup of EUT is according with per ANSI/TIA Standard 603E and ANSI C63.26 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the 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.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

3.3 Summary of Test Results/Plots

Max. Radiated Power:**5G NR N78_3450-3550MHz**

Channel Bandwidth: 10MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	25.29	PASS
	MCH	25.64	PASS
	HCH	25.30	PASS
DFT-16QAM	LCH	25.17	PASS
	MCH	25.24	PASS
	HCH	25.38	PASS
Channel Bandwidth: 15MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	24.29	PASS
	MCH	24.30	PASS
	HCH	24.75	PASS
DFT-16QAM	LCH	24.12	PASS
	MCH	24.93	PASS
	HCH	24.19	PASS
Channel Bandwidth: 20MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	25.53	PASS
	MCH	25.24	PASS
	HCH	25.32	PASS
DFT-16QAM	LCH	25.10	PASS
	MCH	25.57	PASS
	HCH	25.29	PASS
Channel Bandwidth: 40MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	25.36	PASS
	MCH	25.14	PASS
	HCH	25.57	PASS
DFT-16QAM	LCH	25.32	PASS
	MCH	25.62	PASS
	HCH	25.19	PASS

Channel Bandwidth: 50MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	24.31	PASS
	MCH	24.59	PASS
	HCH	24.27	PASS
DFT-16QAM	LCH	24.53	PASS
	MCH	24.41	PASS
	HCH	24.28	PASS
Channel Bandwidth: 60MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	24.37	PASS
	MCH	24.15	PASS
	HCH	24.30	PASS
DFT-16QAM	LCH	24.51	PASS
	MCH	24.54	PASS
	HCH	24.63	PASS
Channel Bandwidth: 70MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	25.86	PASS
	MCH	25.27	PASS
	HCH	25.21	PASS
DFT-16QAM	LCH	25.16	PASS
	MCH	25.28	PASS
	HCH	25.32	PASS
Channel Bandwidth: 80MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	24.14	PASS
	MCH	24.29	PASS
	HCH	24.21	PASS
DFT-16QAM	LCH	24.45	PASS
	MCH	24.23	PASS
	HCH	24.67	PASS

Channel Bandwidth: 90MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	LCH	24.29	PASS
	MCH	24.45	PASS
	HCH	24.30	PASS
DFT-16QAM	LCH	24.12	PASS
	MCH	24.46	PASS
	HCH	24.53	PASS
Channel Bandwidth: 100MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-QPSK	MCH	24.12	PASS
DFT-16QAM	MCH	24.51	PASS

5G NR N78_3700-3800MHz

Channel Bandwidth: 10MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-16QAM	LCH	24.16	PASS
	MCH	24.38	PASS
	HCH	24.57	PASS
DFT-16QAM	LCH	24.13	PASS
	MCH	24.40	PASS
	HCH	24.56	PASS
Channel Bandwidth: 15MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-16QAM	LCH	24.29	PASS
	MCH	24.34	PASS
	HCH	24.15	PASS
DFT-16QAM	LCH	24.51	PASS
	MCH	24.28	PASS
	HCH	24.60	PASS
Channel Bandwidth: 20MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-16QAM	LCH	24.48	PASS
	MCH	24.31	PASS
	HCH	24.29	PASS
DFT-16QAM	LCH	24.33	PASS
	MCH	24.41	PASS
	HCH	24.12	PASS
Channel Bandwidth: 40MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-16QAM	LCH	24.43	PASS
	MCH	24.31	PASS
	HCH	24.22	PASS
DFT-16QAM	LCH	24.59	PASS
	MCH	24.42	PASS
	HCH	24.55	PASS

Channel Bandwidth: 50MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-16QAM	LCH	24.62	PASS
	MCH	24.34	PASS
	HCH	24.45	PASS
DFT-16QAM	LCH	24.51	PASS
	MCH	24.32	PASS
	HCH	24.13	PASS
Channel Bandwidth: 60MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-16QAM	LCH	24.14	PASS
	MCH	24.09	PASS
	HCH	24.41	PASS
DFT-16QAM	LCH	24.32	PASS
	MCH	24.26	PASS
	HCH	24.23	PASS
Channel Bandwidth: 70MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-16QAM	LCH	23.85	PASS
	MCH	23.56	PASS
	HCH	24.23	PASS
DFT-16QAM	LCH	23.97	PASS
	MCH	23.42	PASS
	HCH	24.10	PASS
Channel Bandwidth: 80MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-16QAM	LCH	24.09	PASS
	MCH	24.23	PASS
	HCH	24.34	PASS
DFT-16QAM	LCH	23.19	PASS
	MCH	24.16	PASS
	HCH	24.30	PASS

Channel Bandwidth: 90MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-16QAM	LCH	24.45	PASS
	MCH	24.18	PASS
	HCH	24.13	PASS
DFT-16QAM	LCH	24.24	PASS
	MCH	24.39	PASS
	HCH	24.12	PASS
Channel Bandwidth: 100MHz			
Modulation	Channel	E.i.r.p [dBm]	Verdict
DFT-16QAM	MCH	25.29	PASS
DFT-16QAM	MCH	25.30	PASS

Max. Conducted Output Power

Please refer to Appendix A: Average Power Output Data

Test result: Pass

4. Peak-to-average Ratio (PAR) of Transmitter

4.1 Standard Applicable

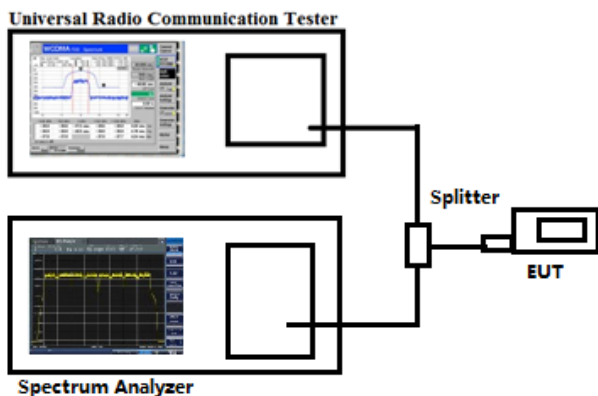
According to §27.50(j)(4) and §27.50(k)(4), Equipment employed must be authorized in accordance with the provisions of § 27.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (j)(5) and (k)(5) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.2 Test Procedure

According with KDB 971168

1. The signal analyzer's CCDF measurement profile is enabled.
2. Frequency = carrier center frequency.
3. Measurement BW > Emission bandwidth of signal.
4. The signal analyzer was set to collect one million samples to generate the CCDF curve.
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power.

Test Configuration for the emission bandwidth testing:



4.3 Summary of Test Results

Please refer to Appendix B: Peak-to-Average Ratio

Test result: Pass

5. Emission Bandwidth

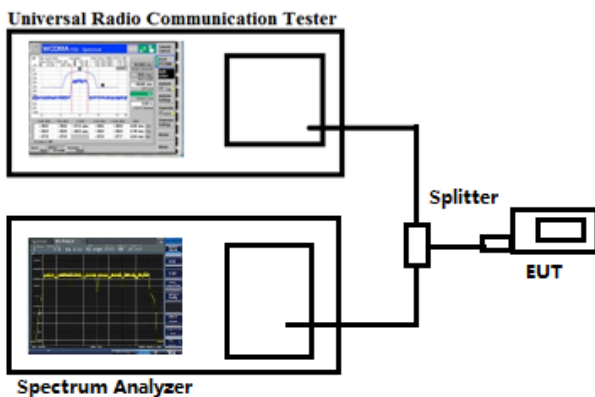
5.1 Standard Applicable

According to §27.53(l)(2) and §27.53(n)(2), 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 26dB below the transmitter power.

5.2 Test Procedure

According to §22.917(b), 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 26dB below the transmitter power.

Test Configuration for the emission bandwidth testing:



5.3 Summary of Test Results/Plots

Please refer to Appendix C: 26dB Bandwidth and Occupied Bandwidth

Test result: Pass

6. Out of Band Emissions at Antenna Terminal

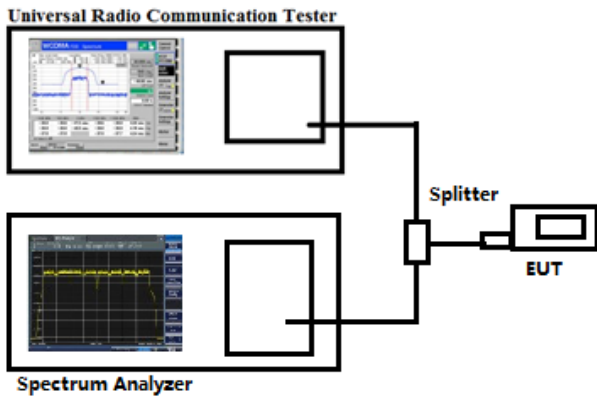
6.1 Standard Applicable

According to §27.53(h)(1), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43+10 \log_{10}(P)$ dB.

6.2 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 100kHz and 1MHz for the scan frequency from 30MHz to 1GHz and the scan frequency from 1GHz to up to 10th harmonic.

Test Configuration for the out of band emissions testing:



6.3 Summary of Test Results/Plots

Please refer to Appendix D & E: Band Edge & Conducted Spurious Emission

Test result: Pass

7. Spurious Radiated Emissions

7.1 Standard Applicable

According to §27.53(l)(2) and §27.53(n)(2), For mobile operations in the 3450-3550 MHz and 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) and (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, 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.

7.2 Test Procedure

1. The setup of EUT is according with per ANSI/TIA-603-E and ANSIC63.10(2020)+Cor1(2023) measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the 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.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious attenuation limit in dB = $43 + 10 \log_{10}(\text{power out in Watts})$

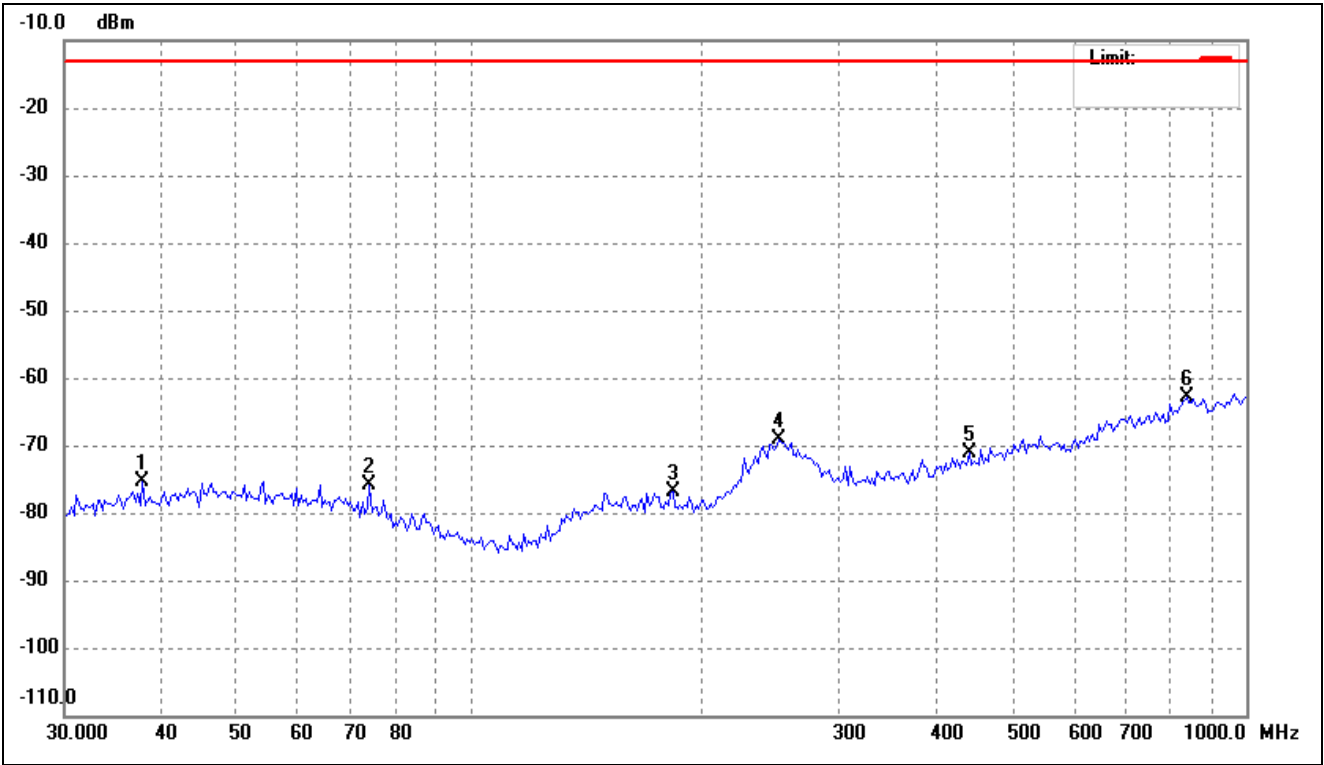
7.3 Summary of Test Results/Plots

Note: 1. this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

- 2. All test modes (different bandwidth and different modulation) are performed, but the report records that 10MHz bandwidth DFT-QPSK modulation is the worst mode*

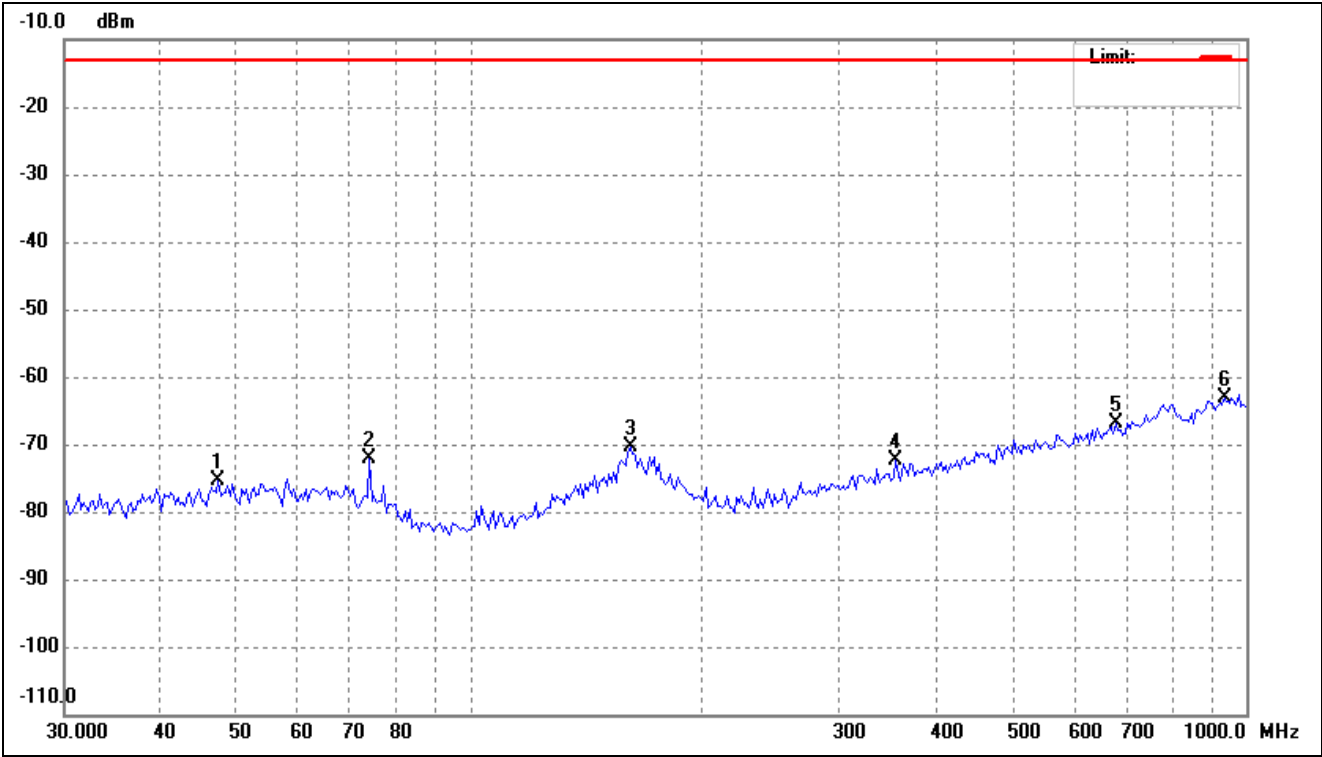
➤ Spurious Emissions Below 1GHz
Worst case: 10MHz bandwidth; DFT-QPSK modulation

Test Mode	5G NR n78(3450-3550MHz)	Polarity:	Horizontal
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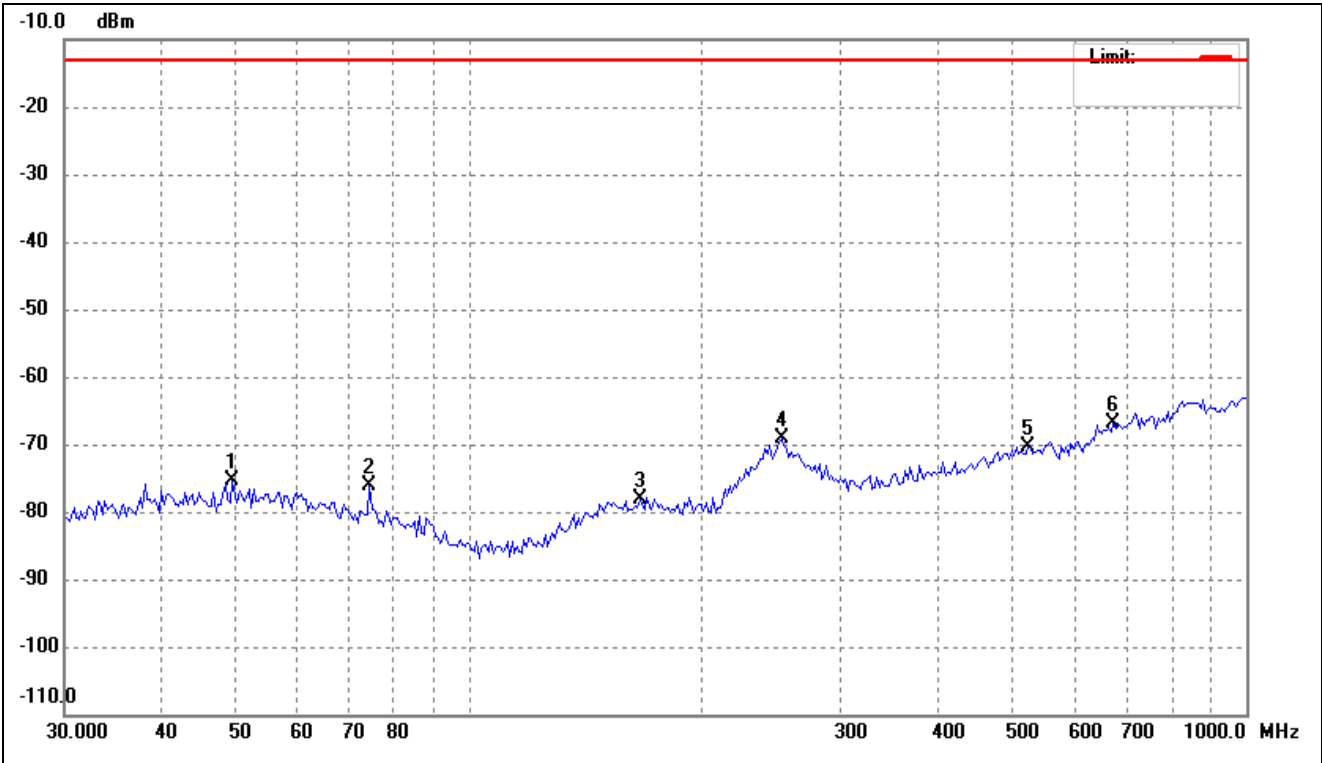
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	37.8296	-77.83	2.34	-75.49	-13.00	-62.49	ERP
2	74.2696	-76.10	0.32	-75.78	-13.00	-62.78	ERP
3	182.5784	-77.75	0.85	-76.90	-13.00	-63.90	ERP
4	250.4859	-77.58	8.51	-69.07	-13.00	-56.07	ERP
5	439.4730	-76.72	5.69	-71.03	-13.00	-58.03	ERP
6	838.8870	-76.33	13.50	-62.83	-13.00	-49.83	ERP

Test Mode	5G NR n78(3450-3550MHz)	Polarity:	Vertical
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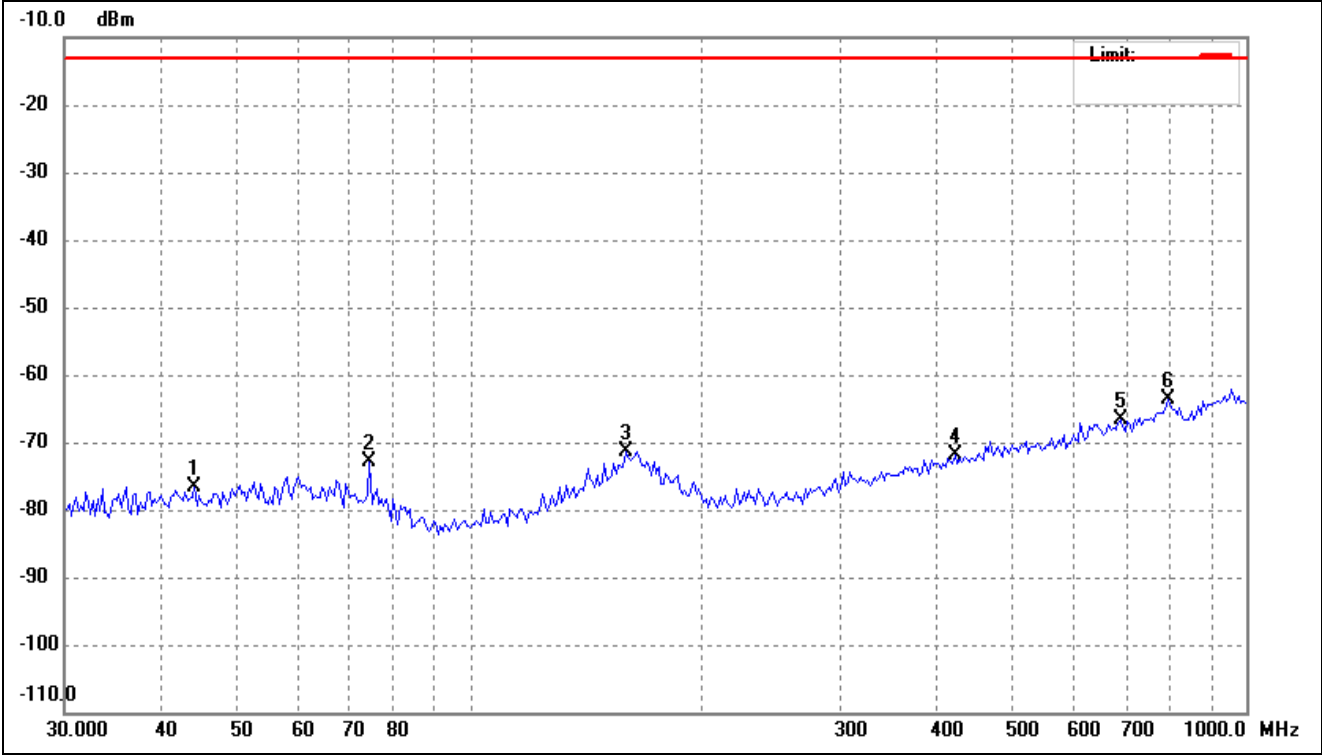
No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	47.3687	-78.62	3.25	-75.37	-13.00	-62.37	ERP
2	74.2696	-74.09	1.94	-72.15	-13.00	-59.15	ERP
3	160.8851	-78.20	7.77	-70.43	-13.00	-57.43	ERP
4	353.4471	-76.72	4.41	-72.31	-13.00	-59.31	ERP
5	679.4345	-76.68	9.83	-66.85	-13.00	-53.85	ERP
6	938.7139	-75.59	12.54	-63.05	-13.00	-50.05	ERP

Test Mode	5G NR n78(3700-3800MHz)	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	49.4086	-78.84	3.44	-75.40	-13.00	-62.40	ERP
2	74.2696	-76.53	0.32	-76.21	-13.00	-63.21	ERP
3	165.4716	-79.09	0.98	-78.11	-13.00	-65.11	ERP
4	252.2523	-77.45	8.36	-69.09	-13.00	-56.09	ERP
5	523.8763	-77.96	7.50	-70.46	-13.00	-57.46	ERP
6	674.6767	-77.07	10.28	-66.79	-13.00	-53.79	ERP

Test Mode	5G NR n78(3700-3800MHz)	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	44.1543	-79.61	2.94	-76.67	-13.00	-63.67	ERP
2	74.2696	-74.77	1.94	-72.83	-13.00	-59.83	ERP
3	158.6398	-78.76	7.39	-71.37	-13.00	-58.37	ERP
4	421.3287	-77.61	5.75	-71.86	-13.00	-58.86	ERP
5	689.0509	-76.63	9.95	-66.68	-13.00	-53.68	ERP
6	793.0281	-76.20	12.48	-63.72	-13.00	-50.72	ERP

Note: Margin= (Reading+ Correct)- Limit

➤ Spurious Emissions Above 1GHz

For TDD_SA N78_3450-3550MHz Mode

Frequency	Result	Limit	Margin	Polar
(MHz)	(dBm)	(dBm)	(dB)	H/V
Low Channel (3459.99MHz)				
6919.98	-25.97	-13	-12.97	H
10379.97	-23.51	-13	-10.51	H
6919.98	-23.26	-13	-10.26	V
10379.97	-25.76	-13	-12.76	V
Middle Channel (3500.01MHz)				
7000.02	-25.94	-13	-12.94	H
10500.03	-26.09	-13	-13.09	H
7000.02	-21.69	-13	-8.69	V
10500.03	-25.48	-13	-12.48	V
High Channel (3540.00MHz)				
7080.00	-24.72	-13	-11.72	H
10620.00	-24.09	-13	-11.09	H
7080.00	-23.12	-13	-10.12	V
10620.00	-24.98	-13	-11.98	V

For TDD_SA N78_3700-3800MHz Mode

Frequency	Result	Limit	Margin	Polar
(MHz)	(dBm)	(dBm)	(dB)	H/V
Low Channel (3710.01MHz)				
7420.02	-25.65	-13	-12.65	H
11130.03	-25.95	-13	-12.95	H
7420.02	-23.85	-13	-10.85	V
11130.03	-26.32	-13	-13.32	V
Middle Channel (3750.00MHz)				
7500.00	-25.88	-13	-12.88	H
11250.00	-24.03	-13	-11.03	H
7500.00	-22.45	-13	-9.45	V
11250.00	-24.11	-13	-11.11	V
High Channel (3789.99MHz)				
7579.98	-23.71	-13	-10.71	H
11369.97	-24.63	-13	-11.63	H
7579.98	-23.67	-13	-10.67	V
11369.97	-24.82	-13	-11.82	V

Note: Result=Reading+ Correct, Margin= Result- Limit

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

8. Frequency Stability

8.1 Standard Applicable

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

8.2 Test Procedure

According to §2.1055, the following test procedure was performed.

The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

8.3 Summary of Test Results/Plots

Please refer to Appendix F: Frequency Stability

Test result: Pass

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

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