

TEST REPORT

Reference No..... : WTX23X11234948W002
FCC ID : 2A96I-UA81
Applicant : Shanghai UniOne Science&Technology CO., Ltd.
Address..... : Building 4, No.651 Wanfang Road, Pujiang Town, Minhang District, Shanghai
Manufacturer : The same as Applicant
Address..... : The same as Applicant
Product Name : Rugged Android Tablet
Model No..... : UA81
Standards : FCC Part 22, FCC Part 24E, FCC Part 27
Date of Receipt sample : 2023-11-02
Date of Test..... : 2023-11-02 to 2023-11-22
Date of Issue : 2023-11-22
Test Report Form No. : WTX_Part 22_ Part 24_ 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:

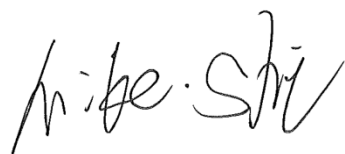
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TABLE OF CONTENTS

1. GENERAL INFORMATION.....4

1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....4

1.2 TEST STANDARDS.....7

1.3 TEST METHODOLOGY.....7

1.4 TEST FACILITY7

1.5 EUT SETUP AND TEST MODE.....8

1.6 MEASUREMENT UNCERTAINTY9

1.7 TEST EQUIPMENT LIST AND DETAILS10

2. SUMMARY OF TEST RESULTS13

3. SPURIOUS RADIATED EMISSIONS.....14

3.1 STANDARD APPLICABLE.....14

3.2 TEST PROCEDURE.....14

3.3 SUMMARY OF TEST RESULTS/PLOTS14

APPENDIX PHOTOGRAPHS.....20

Report version

Version No.	Date of issue	Description
Rev.00	2023-11-22	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT:	
Product Name:	Rugged Android Tablet
Trade Name:	/
Model No.:	UA81
Adding Model(s):	/
Rated Voltage:	DC3.8V
Battery:	8200mAh
Adapter Model:	/
IMEI:	/
Device Category:	Portable Device
<i>The test data is gathered from a production sample provided by the manufacturer.</i>	

Technical Characteristics of EUT:	
4G	
Support Networks:	FDD-LTE,TDD-LTE
Support Band:	FDD-LTE Band 2, 4, 5, 7,12, 13, 17, 25,66 ; TDD-LTE Band 38, 40, 41,
Uplink Frequency:	FDD-LTE Band 2: Tx: 1850-1910MHz, FDD-LTE Band 4: Tx: 1710-1755MHz, FDD-LTE Band 5: Tx: 824-849MHz, FDD-LTE Band 7: Tx: 2500-2570MHz, FDD-LTE Band 12: Tx: 699-716MHz, FDD-LTE Band 13: Tx: 777-787MHz, FDD-LTE Band 17: Tx: 704-716MHz FDD-LTE Band 25: Tx: 1850-1915MHz TDD-LTE Band 38: Tx: 2570-2620MHz TDD-LTE Band 40: Tx: 2305-2315MHz TDD-LTE Band 40: Tx: 2350-2360MHz TDD-LTE Band 41: Tx: 2496-2690MHz FDD-LTE Band 66: Tx: 1710-1780MHz
Downlink Frequency:	FDD-LTE Band 2: Rx: 1930-1990MHz, FDD-LTE Band 4: Rx: 2110-2155MHz, FDD-LTE Band 5: Rx: 869-894MHz, FDD-LTE Band 7: Rx: 2620-2690MHz, FDD-LTE Band 12: Rx: 729-746MHz, FDD-LTE Band 13: Rx: 746-756MHz, FDD-LTE Band 17: Rx: 734-746MHz FDD-LTE Band 25: Rx: 1930-1995MHz TDD-LTE Band 38: Rx: 2570-2620MHz TDD-LTE Band 40: Rx: 2305-2315MHz TDD-LTE Band 40: Rx: 2350-2360MHz TDD-LTE Band 41: Rx: 2496-2690MHz FDD-LTE Band 66: Rx: 2110-2200MHz
RF Output Power:	FDD-LTE Band 2: 22.75dBm, FDD-LTE Band 4: 23.44dBm, FDD-LTE Band 5: 22.47dBm, FDD-LTE Band 7: 23.42dBm, FDD-LTE Band 12: 22.87dBm, FDD-LTE Band 13: 22.63dBm, FDD-LTE Band 17: 23.01dBm FDD-LTE Band 25: 23.79dBm TDD-LTE Band 38: 23.71dBm TDD-LTE Band 40(2305-2315MHz): 23.31dBm TDD-LTE Band 40(2350-2360MHz): 23.32dBm

	TDD-LTE Band 41: 22.59dBm FDD-LTE Band 66: 23.79dBm
Type of Emission:	FDD-LTE Band 2: 18M1G7D, 18M0W7D FDD-LTE Band 4: 18M0G7D, 18M0W7D FDD-LTE Band 5: 9M00G7D, 9M00W7D FDD-LTE Band 7: 18M0G7D, 18M0W7D FDD-LTE Band 12: 9M00G7D, 9M00W7D FDD-LTE Band13: 9M00G7D, 9M00W7D FDD-LTE Band 17: 9M00G7D, 9M00W7D FDD-LTE Band 25: 18M0G7D, 18M0W7D TDD-LTE Band 38: 18M0G7D, 18M0W7D TDD-LTE Band 40(2305-2315MHz): 9M00G7D, 9M00W7D TDD-LTE Band 40(2350-2360MHz): 9M00G7D, 9M00W7D TDD-LTE Band 41: 18M0G7D, 18M0W7D FDD-LTE Band 66: 18M0G7D, 18M0W7D
Type of Modulation:	QPSK, 16QAM
Antenna Type:	FPC Antenna
Antenna Gain:	FDD-LTE Band 2: 2.74dBi, FDD-LTE Band 4:3.44dBi, FDD-LTE Band 5: 1.69dBi, FDD-LTE Band 7: 3.21dBi, FDD-LTE Band 12: 0.06dBi, FDD-LTE Band 13: 0.99dBi, FDD-LTE Band 17: 0.06dBi FDD-LTE Band 25: 2.74dBi TDD-LTE Band 38: 3.12dBi TDD-LTE Band 40: 2.92dBi TDD-LTE Band 41: 3.21dBi FDD-LTE Band 66: 3.67dBi

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 22: Private Land Mobile Radio Services.

FCC Rules Part 24: Public Mobile Services.

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	FDD-LTE Band 2	Low, Middle, High Channels
TM2	FDD-LTE Band 4	Low, Middle, High Channels
TM3	FDD-LTE Band 5	Low, Middle, High Channels
TM4	FDD-LTE Band 7	Low, Middle, High Channels
TM5	FDD-LTE Band 12	Low, Middle, High Channels
TM6	FDD-LTE Band 13	Low, Middle, High Channels
TM7	FDD-LTE Band 17	Low, Middle, High Channels
TM8	FDD-LTE Band 25	Low, Middle, High Channels
TM9	TDD-LTE Band 38	Low, Middle, High Channels
TM10	TDD-LTE Band 40(2305-2315MHz)	Low, Middle, High Channels
TM11	TDD-LTE Band 40(2350-2360MHz)	Low, Middle, High Channels
TM12	TDD-LTE Band 41	Low, Middle, High Channels
TM13	FDD-LTE Band 66	Low, Middle, High Channels

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	50~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Type-C Cable	1.0	Shielded	With 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
Computer	Lenovo	L13 Yoga	/
Adapter	AQUIL	ASUC71w-050912300	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	$\pm 0.42\text{dB}$
Occupied Bandwidth	Conducted	$\pm 1.5\%$
Frequency Stability	Conducted	2.3%
Transmitter Spurious Emissions	Conducted	$\pm 0.42\text{dB}$
Transmitter Spurious Emissions	Radiated	30-200MHz $\pm 4.52\text{dB}$
		0.2-1GHz $\pm 5.56\text{dB}$
		1-6GHz $\pm 3.84\text{dB}$
		6-18GHz $\pm 3.92\text{dB}$

1.7 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1041 A1001	Communication Tester	Rohde & Schwarz	CMW500	148650	2023-02-25	2024-02-24
WTXE1022 A1002	GSM Tester	Rohde & Schwarz	CMU200	114403	2023-02-25	2024-02-24
WTXE1104 A1001	MXG Vector Signal Generator	Agilent	N5182A	MY47420108	2023-02-25	2024-02-24
WTXE1104 A1002	DC Power Supply	Agilent	E3634A	MY40009294	2023-02-25	2024-02-24
WTXE1104 A1003	EXG Analog Signal Generator	KEYSIGHT	N5173B	MY61252892	2023-02-25	2024-02-24
WTXE1104 A1004	Spectrum Analyzer	Rohde&Schwarz	FSV40-N	101559	2023-02-25	2024-02-24
WTXE1104 A1005-2	Band Reject Filter Group	Tonscend	JS0806-F	23A806F0658	2023-02-25	2024-02-24
☐ Chamber A: Below 1GHz						
WTXE1005 A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
WTXE1007 A1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
WTXE1007 A1001	Amplifier	HP	8447F	2805A03475	2023-02-25	2024-02-24
WTXE1010 A1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1010 A1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2023-03-20	2026-03-19
☐ Chamber A: Above 1GHz						
WTXE1005 A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
WTXE1007 A1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
WTXE1065 A1001	Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
WTXE1010 A1005	Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
WTXE1010 A1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
WTXE1003	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24

A1001						
WTXE1004 A1-001	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2023-02-25	2024-02-24
☐ Chamber B:Below 1GHz						
WTXE1010 A1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
WTXE1038 A1001	Amplifier	Agilent	8447D	2944A104 57	2023-02-25	2024-02-24
WTXE1001 A1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
☒ Chamber C:Below 1GHz						
WTXE1093 A1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1010 A1013-1	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2021-05-28	2024-05-27
WTXE1010 A1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
WTXE1007 A1002	Amplifier	HP	8447F	2944A038 69	2023-02-25	2024-02-24
☒ Chamber C: Above 1GHz						
WTXE1093 A1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
WTXE1103 A1005	Horn Antenna	POAM	RTF-118A	1820	2023-03-10	2026-03-09
WTXE1103 A1006	Amplifier	Tonscend	TAP01018050	AP22E806 235	2023-02-25	2024-02-24
WTXE1010 A1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
WTXE1003 A1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
☒ Conducted Room 1#						
WTXE1001 A1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2023-02-25	2024-02-24
WTXE1002 A1001	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2023-02-25	2024-02-24
WTXE1003 A1001	AC LISN	Schwarz beck	NSLK8126	8126-279	2023-02-25	2024-02-24
☐ Conducted Room 2#						
WTXE1001 A1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2023-02-25	2024-02-24

Reference No.: WTX23X11234948W002

WTXE1003 A1003	LISN	Rohde & Schwarz	ENV 216	100097	2023-02-25	2024-02-24
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Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
LTE Test System*	Tonscend	JS1120-1	V2.5

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

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§2.1046, §22.913(a)(2), §24.232(c), §27.50(b)(10), §27.50(c)(10), §27.50(d)(4), §27.50(h)(2)	RF Output Power	N/A
§24.232(d), §27.50(d)(5)	Peak-to-average Ratio (PAR) of Transmitter	N/A
§2.1049	Emission Bandwidth	N/A
§2.1053, §22.917(a), §24.238(a), §27.53(c)(2), §27.53(g), §27.53(h), §27.53(m)(4)	Spurious Emissions at Antenna Terminal	N/A
§2.1053, §22.917(a), §24.238(a), §27.53(c)(2), §27.53(g), §27.53(h), §27.53(m)(4)	Spurious Radiation Emissions	Compliant
§2.1051, §22.917(a), §24.238(a), §27.53(c)(2), §27.53(g), §27.53(h), §27.53(m)(4)	Out of Band Emissions	N/A
§2.1055, §22.355, §24.235, §27.54	Frequency Stability	N/A

Class II Permissive Change: The device updates the surrounding soft glue and removes the pogo pin.

Note: Report is for Class II Permissive Change only. Updated test data include Spurious Radiation Emissions. Other test data refer to the original report WTX23X05115369W002, The original FCC ID: 2A96I-UA80, issue date: 09/12/2023.

3. Spurious Radiated Emissions

3.1 Standard Applicable

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

According to §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §27.53(h), 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.

According to §27.53(g) the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB.

3.2 Test Procedure

1. The setup of EUT is according with per ANSI/TIA-603-E and ANSI C63.4-2014 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 = $43 + 10 \log_{10}(\text{power out in Watts})$

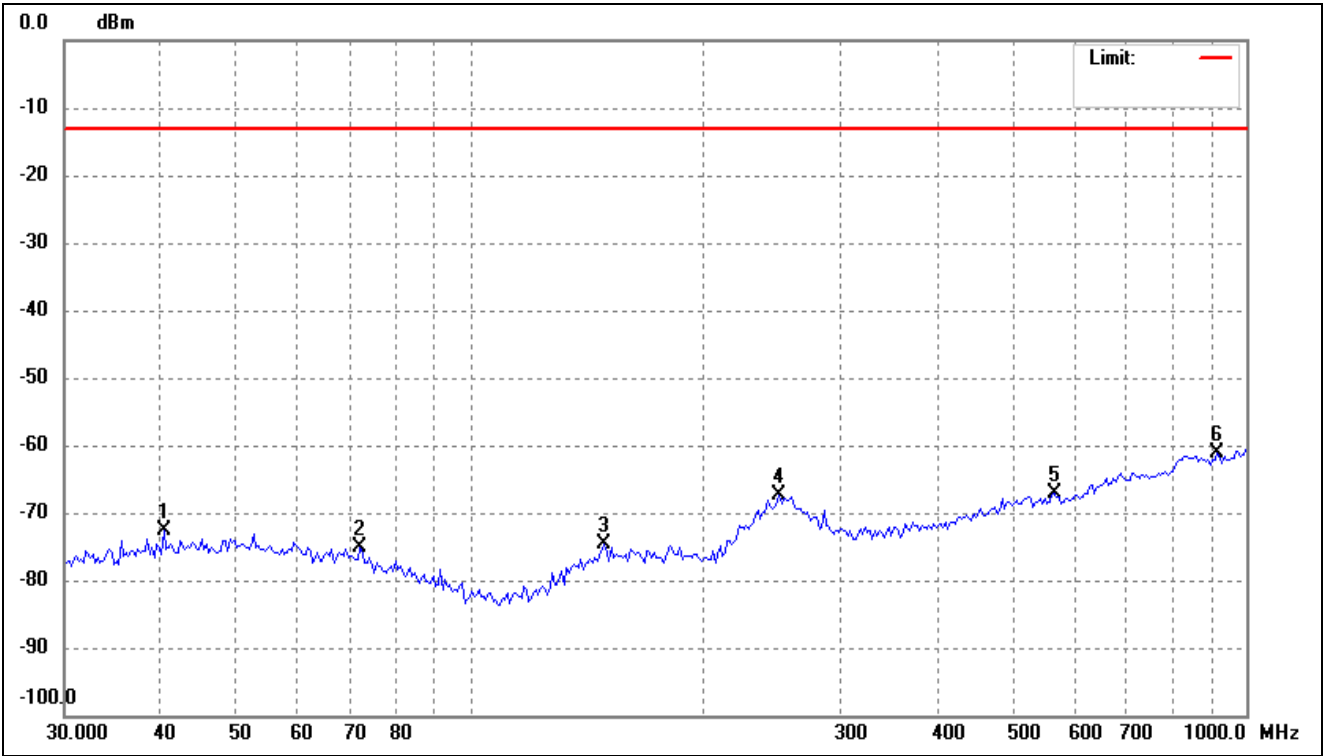
3.3 Summary of Test Results/Plots

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 only the worst case is recorded in this report.

➤ Spurious Emissions Below 1GHz

Test Mode	TDD_LTE Band 40(worst case)	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	40.2995	-75.27	2.58	-72.69	-13.00	-59.69	ERP
2	72.2111	-75.68	0.68	-75.00	-13.00	-62.00	ERP
3	148.9175	-75.43	0.75	-74.68	-13.00	-61.68	ERP
4	250.4859	-75.81	8.51	-67.30	-13.00	-54.30	ERP
5	565.9776	-75.02	7.88	-67.14	-13.00	-54.14	ERP
6	919.1315	-74.52	13.43	-61.09	-13.00	-48.09	ERP

Test Mode	TDD_LTE Band 40(worst case)	Polarity:	Vertical
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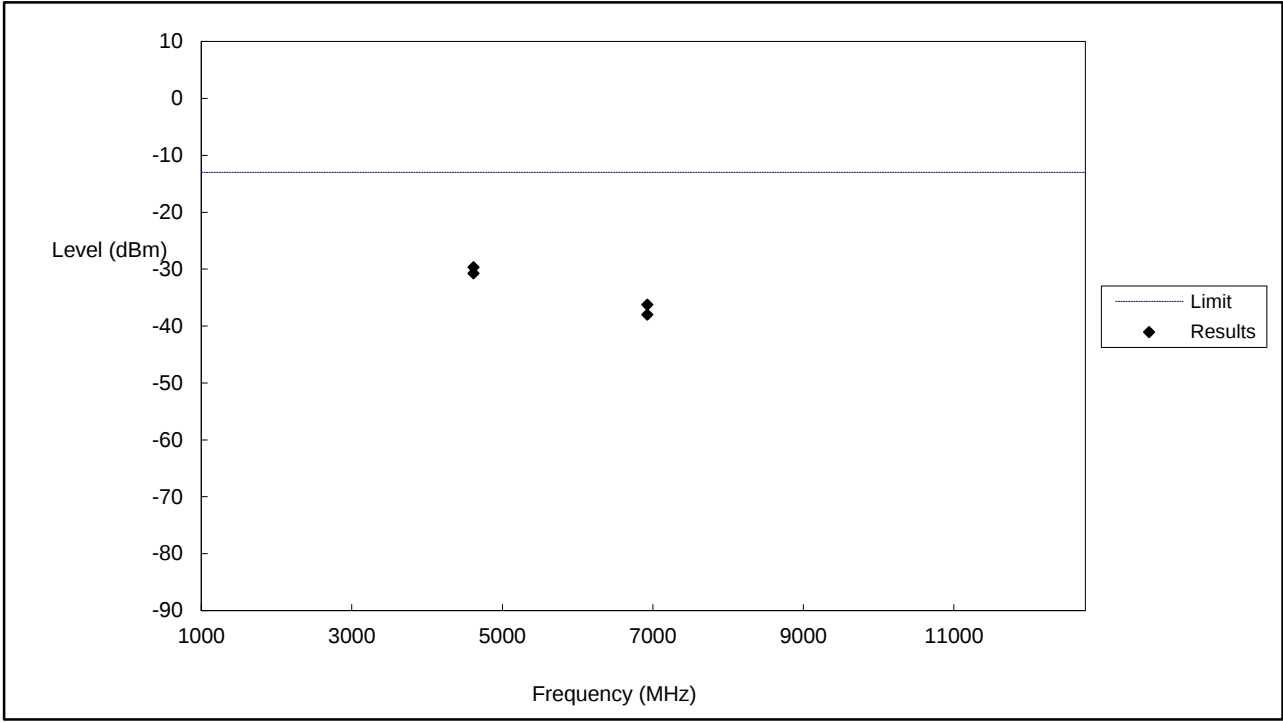


No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	45.0950	-76.60	3.03	-73.57	-13.00	-60.57	ERP
2	68.2635	-76.30	3.13	-73.17	-13.00	-60.17	ERP
3	165.4716	-75.44	6.96	-68.48	-13.00	-55.48	ERP
4	290.3169	-76.54	2.84	-73.70	-13.00	-60.70	ERP
5	461.6313	-74.58	6.48	-68.10	-13.00	-55.10	ERP
6	925.6131	-73.16	12.44	-60.72	-13.00	-47.72	ERP

Note: Margin= (Reading+ Correct)- Limit

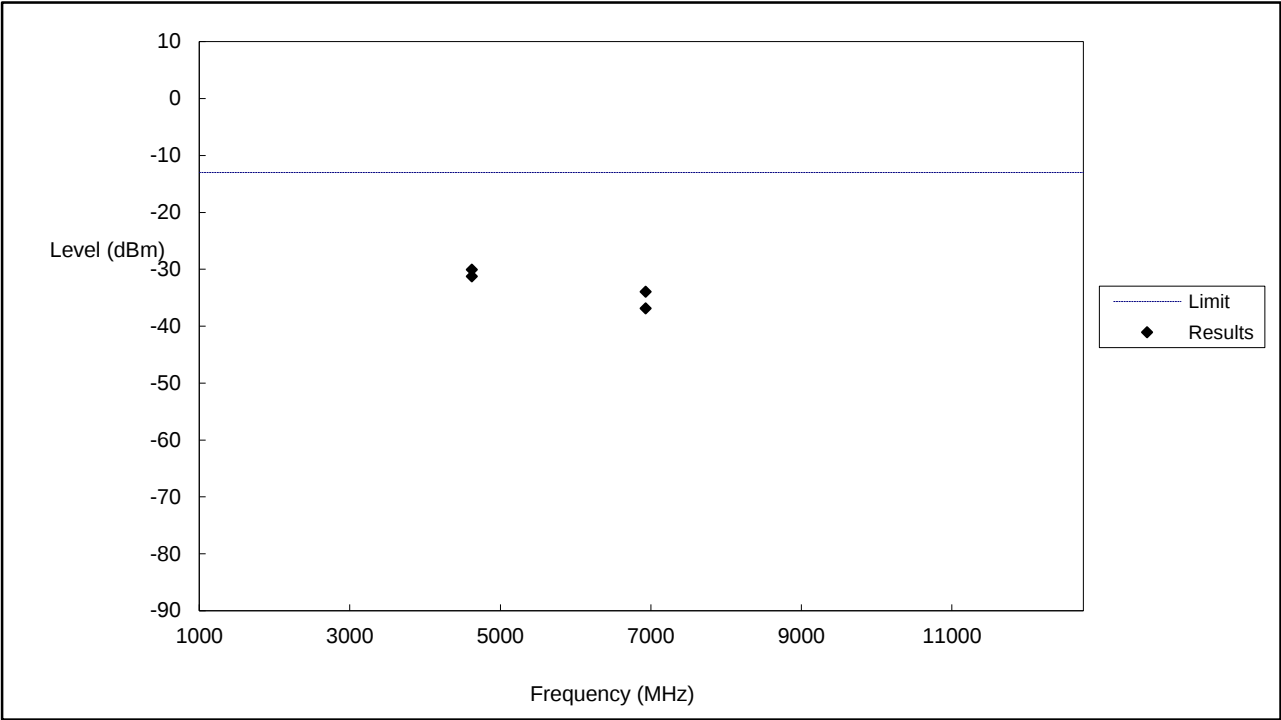
➤ Spurious Emissions Above 1GHz
For TDD_LTE Band 40 Mode(worst case)

Low Channel



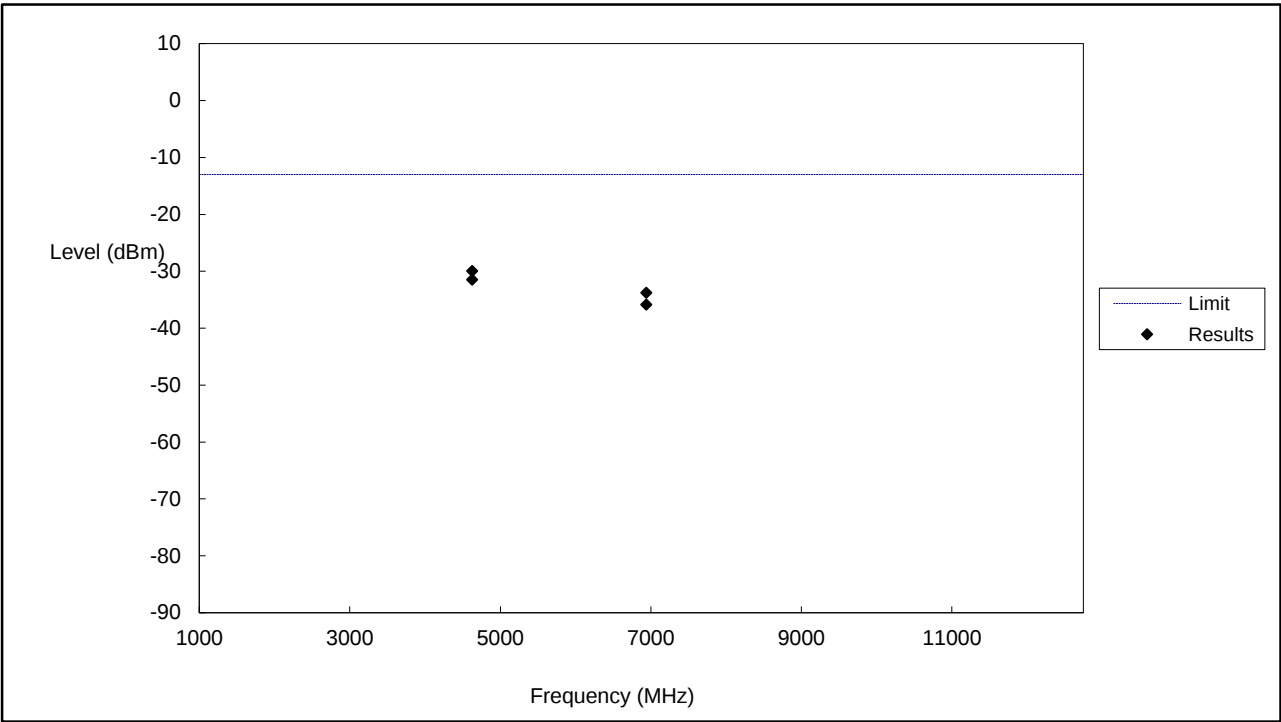
No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	4615.00	-30.72	-13	-17.72	H	RMS
2	6922.50	-36.21	-13	-23.21	H	RMS
1	4615.00	-29.67	-13	-16.67	V	RMS
2	6922.50	-37.98	-13	-24.98	V	RMS

Middle Channel



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	4620.00	-30.04	-13	-17.04	H	RMS
2	6930.00	-33.93	-13	-20.93	H	RMS
1	4620.00	-31.21	-13	-18.21	V	RMS
2	6930.00	-36.86	-13	-23.86	V	RMS

High Channel



No.	Frequency	Result	Limit	Margin	Polarity	Remark
	(MHz)	(dBm)	(dBm)	(dB)		
1	4625.00	-29.92	-13	-29.92	H	RMS
2	6937.50	-33.75	-13	-33.75	H	RMS
1	4625.00	-31.42	-13	-31.42	V	RMS
2	6937.50	-35.83	-13	-35.83	V	RMS

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.

APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

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