



TEST REPORT

Reference No...... : WTX23X10217249W002
FCC ID..... : 2AOKB-T86P2
Applicant..... : Anker Innovations Limited
Address..... : Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon,
Hong Kong
Manufacturer..... : The same as Applicant
Address..... : The same as Applicant
Product Name..... : 4G LTE Cam S330
Model No...... : T86P2
Standards..... : 47 CFR Part 90
Date of Receipt sample.... : 2023-09-04
Date of Test..... : 2023-09-08 to 2023-10-12
Date of Issue..... : 2023-10-13
Test Report Form No...... : WTX_Part 90W
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.

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Report version

Version No.	Date of issue	Description
Rev.00	2023-10-13	Original
/	/	/

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT:	
Product Name:	4G LTE Cam S330
Trade Name:	eufy SECURITY
Model No.:	T86P2
Adding Model(s):	/
Rated Voltage:	Battery 3.69V
Battery Change Limit:	4.2V
Adapter Model:	/
Hardware Version:	V04
Software Version:	V1149
<i>Note: The test data is gathered from a production sample provided by the manufacturer.</i>	

Technical Characteristics of EUT:	
4G	
Support Networks:	FDD-LTE
Support Band:	FDD-LTE Band 14
Uplink Frequency:	FDD-LTE Band 14 Tx: 788-798MHz,
Downlink Frequency:	FDD-LTE Band 14 Rx: 758-768MHz,
Maximum E.R.P./E.I.R.P.(W)	FDD-LTE Band 14: 0.122W
Type of Modulation:	QPSK, 16QAM
Antenna Type:	FPC Antenna
Antenna Gain:	FDD-LTE Band 14: -0.9dBi,
<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:

47 CFR Part 2: Frequency Allocation and Radio Treaty Matters; General Rules and Regulations.

47 CFR Part 90: Private Land Mobile Radio 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

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commission's Declaration Of Conformity (DOC). 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 14	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	0.6	Unshielded	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
Adapter	TianYin	TPA-98B050100CU01	/



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 $\pm 3.92\text{dB}$

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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	2022-03-22	2023-03-21
WTXE1104 A1001	MXG Vector Signal Generator	Agilent	N5182A	MY474201 08	2023-02-25	2024-02-24
WTXE1104 A1002	DC Power Supply	Agilent	E3634A	MY400092 94	2023-02-25	2024-02-24
WTXE1104 A1003	EXG Analog Signal Generator	KEYSIGHT	N5173B	MY612528 92	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	23A806F0 658	2023-02-25	2024-02-24
<input type="checkbox"/> Chamber A: Below 1GHz						
WTXE1005 A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2023-02-25	2024-02-24
WTXE1007 A1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/00 5	2023-02-25	2024-02-24
WTXE1007 A1001	Amplifier	HP	8447F	2805A034 75	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
<input type="checkbox"/> Chamber A: Above 1GHz						
WTXE1005 A1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2023-02-25	2024-02-24
WTXE1007 A1001	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/00 5	2023-02-25	2024-02-24
WTXE1003 A1003	LISN	Rohde & Schwarz	ENV 216	100097	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 A1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
WTXE1004	Spectrum	Rohde &	FSP40	100612	2023-02-25	2024-02-24



A1-001	Analyzer	Schwarz				
<input type="checkbox"/> 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	2944A101 79	2023-02-25	2024-02-24
WTXE1001 A1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
<input checked="" type="checkbox"/> 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
<input checked="" type="checkbox"/> 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-11A	LP228060 221	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

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, §90.635(b), §90.542(a)(7)	Transmitter Conducted Output Power and E.R.P./E.I.R.P.	Pass
§2.1049, §90.209	Emission Bandwidth	Pass(Note1)
§2.1051, §90.691(a), §90.543(e)(f)	Spurious Emissions at Antenna Terminal	Pass(Note1)
§2.1053, §90.691(a), §90.543(e)(f)	Spurious Radiation Emissions	Pass
§2.1051, §90.691(a), §90.543(e)(f)	Out of Band Emissions	Pass(Note1)
§2.1055	Frequency Stability	Pass(Note1)

Note 1: The test results of all conducted test items please refer to the module FCC test report (Report No.: R2007A0434-R4), which issued on September 25, 2019 by TA Technology (Shanghai) Co., Ltd.

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3. Transmitter E.R.P./E.I.R.P.

3.1 Standard Applicable

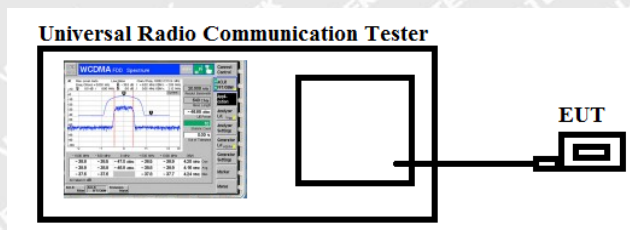
According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

According to FCC section 90.542(a)(7) for LTE Band 14, portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

According to FCC section 90.635(b) for LTE Band 26, the maximum output power of the transmitter for mobile stations is 100 watts.

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

E.R.P/E.I.R.P Radiated Power:

LTE Band 14				E.I.R.P					
BW [MHz]	Modulation	RB Size	RB Offset	Low Channel /Freq.		Middle Channel /Freq.		High Channel /Freq.	
Channel						23330			
Frequency (MHz)						793			
				dBm	W	dBm	W	dBm	W
10	QPSK	1	0	/	/	20.68	0.117	/	/
10	QPSK	1	25	/	/	20.80	0.120	/	/
10	QPSK	1	49	/	/	20.48	0.112	/	/
10	QPSK	25	0	/	/	19.79	0.095	/	/
10	QPSK	25	13	/	/	19.73	0.094	/	/
10	QPSK	25	25	/	/	19.77	0.095	/	/
10	QPSK	50	0	/	/	19.78	0.095	/	/
10	16QAM	1	0	/	/	19.65	0.092	/	/
10	16QAM	1	25	/	/	20.33	0.108	/	/
10	16QAM	1	49	/	/	19.80	0.095	/	/
10	16QAM	25	0	/	/	18.59	0.072	/	/
10	16QAM	25	13	/	/	18.75	0.075	/	/
10	16QAM	25	25	/	/	18.71	0.074	/	/
10	16QAM	50	0	/	/	18.72	0.074	/	/



LTE Band 14				E.I.R.P					
BW [MHz]	Modulation	RB Size	RB Offset	Low Channel /Freq.		Middle Channel /Freq.		High Channel /Freq.	
Channel				23305		23330		23355	
Frequency (MHz)				790.5		793		795.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	20.76	0.119	20.54	0.113	20.54	0.113
5	QPSK	1	13	20.59	0.115	20.79	0.120	20.70	0.117
5	QPSK	1	24	20.63	0.116	20.83	0.121	20.85	0.122
5	QPSK	12	0	19.78	0.095	19.78	0.095	19.70	0.093
5	QPSK	12	6	19.72	0.094	19.75	0.094	19.66	0.092
5	QPSK	12	13	19.77	0.095	19.80	0.095	19.72	0.094
5	QPSK	25	0	19.84	0.096	19.71	0.094	19.68	0.093
5	16QAM	1	0	19.45	0.088	19.42	0.087	19.37	0.086
5	16QAM	1	13	19.33	0.086	19.56	0.090	19.49	0.089
5	16QAM	1	24	19.16	0.082	19.52	0.090	19.17	0.083
5	16QAM	12	0	18.60	0.072	18.63	0.073	18.69	0.074
5	16QAM	12	6	18.79	0.076	18.54	0.071	18.80	0.076
5	16QAM	12	13	18.62	0.073	18.45	0.070	18.60	0.072

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4. Radiated Spurious Emissions

4.1 Standard Applicable

According to FCC section 2.1051, 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. This calculated to be -13dBm.

Additional requirement for Band 14

According to FCC section 90.543(f), for operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. This calculated to be -40dBm

4.2 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 = $43+10 \text{ Log}_{10}$ (power out in Watts)

4.3 Summary of Test Results/Plots

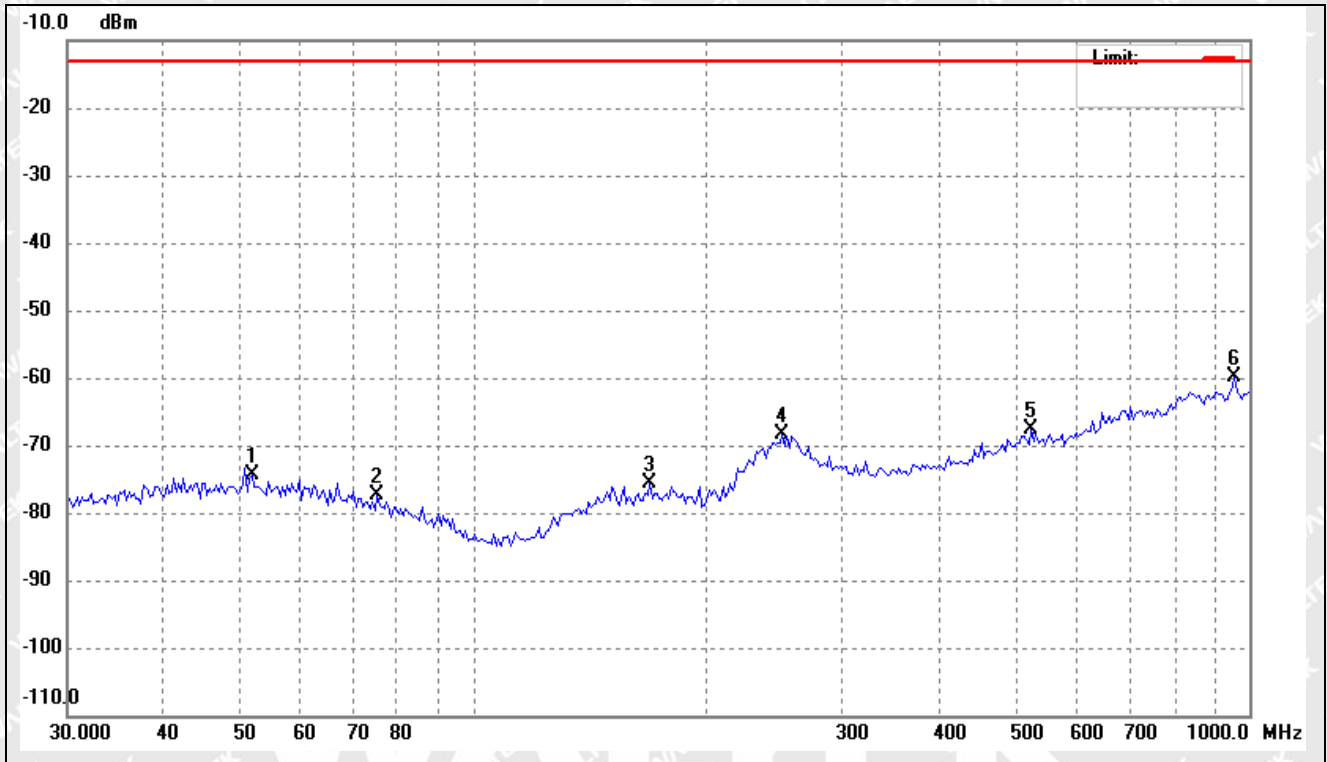
Note: 1. this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

- 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

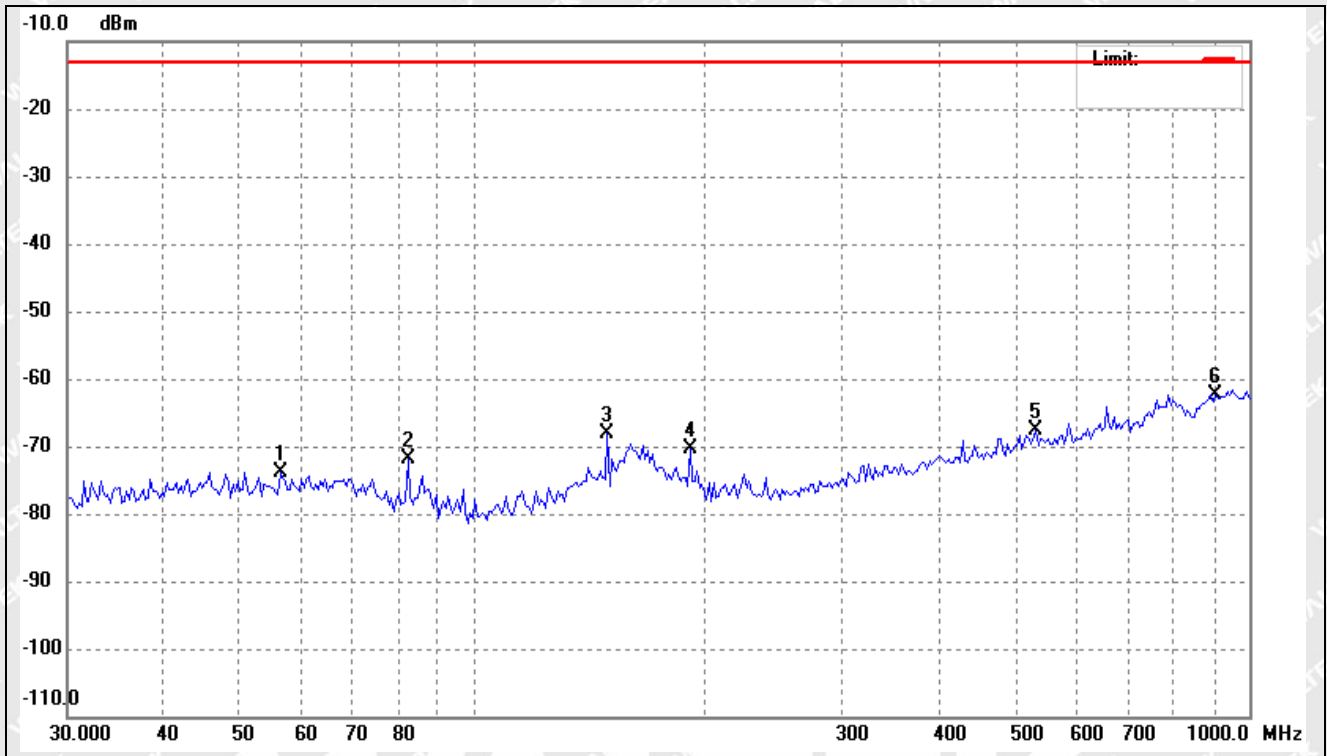
Test Mode	FDD_LTE Band 14	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	51.8999	-77.75	3.27	-74.48	-13.00	-61.48	ERP
2	75.3208	-77.61	0.14	-77.47	-13.00	-64.47	ERP
3	168.9970	-76.58	0.98	-75.60	-13.00	-62.60	ERP
4	250.4859	-76.92	8.51	-68.41	-13.00	-55.41	ERP
5	523.8763	-75.00	7.50	-67.50	-13.00	-54.50	ERP
6	958.7135	-73.59	13.71	-59.88	-13.00	-46.88	ERP



Test Mode	FDD_LTE Band 14	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBm)	Correct (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	56.4662	-77.25	3.37	-73.88	-13.00	-60.88	ERP
2	82.5257	-71.60	-0.27	-71.87	-13.00	-58.87	ERP
3	148.9175	-71.97	3.95	-68.02	-13.00	-55.02	ERP
4	190.4411	-73.20	2.76	-70.44	-13.00	-57.44	ERP
5	531.2910	-75.24	7.69	-67.55	-13.00	-54.55	ERP
6	906.3041	-74.66	12.29	-62.37	-13.00	-49.37	ERP

Note: Margin= (Reading+ Correct)- Limit



➤ Spurious Emissions Above 1GHz
For FDD_LTE Band 14 Mode

Frequency (MHz)	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (790.5MHz)				
1441.4805	-60.25	-13	47.25	H
2028.3428	-61.57	-13	48.57	H
1444.8149	-59.63	-13	46.63	V
1976.3254	-62.20	-13	49.20	V
Middle Channel (793MHz)				
1440.1467	-59.86	-13	46.86	H
2363.7879	-57.20	-13	44.20	H
1444.1480	-60.62	-13	47.62	V
2525.1751	-61.54	-13	48.54	V
High Channel (795.5MHz)				
1355.4518	-59.54	-13	46.54	H
2335.7786	-57.16	-13	44.16	H
1442.8143	-60.49	-13	47.49	V
2329.7766	-62.19	-13	49.19	V

Note: 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.



TEST SETUP PHOTOGRAPHS

Please refer to "ANNEX"

**** END OF REPORT ****

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