

# FCC Part 22H, Part 24E, FCC Part 27 Class II Permissive Change Test Report

For

**AIOTO Tech Inc.**

No. 1, Yumen St., Zhongshan Dist., Taipei City 10452, Taiwan (R.O.C.)

**FCC ID: 2A33I-AIOTOGO**

<b>Report Type:</b> Class II Permissive Change Report	<b>Product Type:</b> 4G-LTE Mobile Security Camera
<b>Report Producer :</b> <u>Jane Chen</u>	
<b>Report Number :</b> <u>RXZ210923002</u>	
<b>Report Date :</b> <u>2022-02-11</u>	
<b>Reviewed By:</b> <u>Andy Shih</u> <i>Andy Shih</i>	
<b>Prepared By:</b> Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) 70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C. Tel: +886 (2) 2647 6898 Fax: +886 (2) 2647 6895 <a href="http://www.bacl.com.tw">www.bacl.com.tw</a>	

## Revision History

Revision	No.	Report Number	Issue Date	Description	Author/ Revised by
0.0	RXZ210923002	RXZ210923002RF01	2022.02.11	Original Report	Jane Chen

## TABLE OF CONTENTS

**General Information ..... 4**

Product Description for Equipment under Test (EUT) ..... 4

Objective ..... 5

Related Submittal(s)/Grant(s)..... 5

Test Methodology ..... 5

Statement of Compliance ..... 6

Measurement Uncertainty ..... 6

Test Facility..... 6

**System Test Configuration ..... 7**

Description of Test Configuration..... 7

Equipment Modifications ..... 9

EUT Exercise Software ..... 9

Support Equipment List and Details ..... 9

External Cable List and Details..... 9

Block Diagram of Test Setup ..... 10

**Summary of Test Results ..... 11**

**Test Equipment List and Details..... 12**

**FCC §1.1310, §2.1091 – Maximum Permissible Exposure (MPE)..... 14**

Applicable Standard ..... 14

**FCC §2.1046, §22.913(A), §24.232(C), §27.50 – RF Output Power ..... 15**

Applicable Standard ..... 15


**FCC§2.1053, §22.917 & §24.238 & §27.53 – Spurious Radiated Emissions ..... 27**

Applicable Standard ..... 27

Test Procedure..... 27

## General Information

### Product Description for Equipment under Test (EUT)

Applicant	AIOTO Tech Inc.		
	No. 1, Yumen St., Zhongshan Dist., Taipei City 10452, Taiwan (R.O.C.)		
Manufacturer	AIOTO Tech Inc.		
	No. 1, Yumen St., Zhongshan Dist., Taipei City 10452, Taiwan (R.O.C.)		
Brand(Trade) Name			
Product (Equipment)	4G-LTE Mobile Security Camera		
Main Model Name	AIOTO Go		
Series Model Name	N/A		
Model Discrepancy	N/A		
Frequency Range	LTE Band 2: 1850-1910 MHz(TX), 1930-1990MHz(RX) LTE Band 4: 1710-1755 MHz(TX), 2110-2155MHz(RX) LTE Band 5: 824-849 MHz(TX), 869-894 MHz(RX) LTE Band 12: 699-716 MHz(TX), 729-746 MHz(RX)		
Modulation Technique	QPSK, 16QAM		
Antenna Specification	Mode	Type	Gain(dBi)
	LTE Band 2	PIFA	-0.1
	LTE Band 4	PIFA	1.4
	LTE Band 5	PIFA	-2.5
	LTE Band 12	PIFA	-3.5
Output Voltage	<input checked="" type="checkbox"/> AC Type <input checked="" type="checkbox"/> Adapter Brand Name: DEE VAN ENTERPRISE Model: DSA-10PFL-05 FUS I/P: 100~240Vac, 0.3A O/P: 100~240Vac, 0.3A <input type="checkbox"/> By AC Power Cord <input type="checkbox"/> PoE		
	<input checked="" type="checkbox"/> DC Type <input checked="" type="checkbox"/> Battery Brand Name: acell Model: 11B-200-0005R Power Rating: 3.7Vdc, 6400mAh <input type="checkbox"/> DC Power Supply <input type="checkbox"/> External from USB Cable <input type="checkbox"/> External DC Adapter		
Received Date	Sep. 23, 2021		
Date of Test	Dec. 13, 2021 ~ Feb. 9, 2022		

\* All measurement and test data in this report was gathered from production sample serial number: RXZ210923002-01(Assigned by BACL, New Taipei Laboratory)

**Objective**

This report is prepared on behalf of *AIOTO Tech Inc.* in accordance with Part 2, Part 22-Subpart H and Part 24-Subpart E, Part 27 of the Federal Communication Commission’s rules.

This is the Class II Permissive Change report. The purpose is to build this Module into the host. The Module FCC ID: 2A33I-AIOTOGO, and the changes are as follows:

Added an antenna type to use with the host.

Conducted output power is evaluated and compliant with FCC rules.

The changes made to the device affected radiation spurious emissions test. Therefore, only the data of these two items are recorded in this report.

**Related Submittal(s)/Grant(s)**

N/A

**Test Methodology**

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2-Subpart J as well as the following parts:

Part 22 Subpart H –Public Mobile Services

Part 24 Subpart E – Personal Communications Services

Part 27 – Miscellaneous wireless communications services

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

**Statement of Compliance**

Decision Rule: No, (The test results do not include MU judgment)

It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (New Taipei Laboratory)

Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

The determination of the test results does not require consideration of the uncertainty of the measurement, unless the assessment is required by customer agreement, regulation or standard document specification.

Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) is not responsible for the authenticity of the information provided by the applicant that affects the test results.

**Measurement Uncertainty**

Parameter		Uncertainty
RF output power, conducted		+/- 0.98 dBm
Emissions, radiated	30 MHz~1GHz	+/- 5.22 dB
	1 GHz~18 GHz	+/- 6.12 dB
	18 GHz~40 GHz	+/- 4.99 dB
Temperature		+/- 1.27 °C
Humidity		+/- 3 %

**Environmental Conditions**

Test Site	Test Data	Temperature (°C)	Relative Humidity (%)	ATM Pressure (hPa)	Test Engineer
Radiation Spurious Emissions	2021/12/13 ~ 2021/12/17	20.9 ~ 22.9	66~72	1010	Boris Kao
Maximum Output Power	2022/2/9	22	57	1010	Boris Kao

**Test Facility**

The Test site used by Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) to collect test data is located on

70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

Bay Area Compliance Laboratories Corp.(New Taipei Laboratory) is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3732) and the FCC designation No.TW3732 under the Mutual Recognition Agreement (MRA) in FCC Test.

## System Test Configuration

### Description of Test Configuration

The EUT was configured for testing according to ANSI C63.26-2015.

The final qualification test was performed with the EUT operating at normal mode.

### Channel List

Mode	Bandwidth (MHz)	Test Frequency (MHz)	
		Low	High
LTE Band 2	1.4	Low	1850.7
		Middle	1880.0
		High	1909.3
	3	Low	1851.5
		Middle	1880.0
		High	1908.5
	5	Low	1852.5
		Middle	1880.0
		High	1907.5
	10	Low	1855.0
		Middle	1880.0
		High	1905.0
	15	Low	1857.5
		Middle	1880.0
		High	1902.5
20	Low	1860.0	
	Middle	1880.0	
	High	1900.0	

Mode	Bandwidth (MHz)	Test Frequency (MHz)	
		Low	High
LTE Band 4	1.4	Low	1710.7
		Middle	1732.5
		High	1754.3
	3	Low	1711.5
		Middle	1732.5
		High	1753.5
	5	Low	1712.5
		Middle	1732.5
		High	1752.5
	10	Low	1715.0
		Middle	1732.5
		High	1750.0
	15	Low	1717.5
		Middle	1732.5
		High	1747.5
20	Low	1720.0	
	Middle	1732.5	
	High	1745.0	
LTE Band 5	1.4	Low	824.7
		Middle	836.5
		High	848.3
	3	Low	825.5
		Middle	836.5
		High	847.5
	5	Low	826.5
		Middle	836.5
		High	846.5
10	Low	829.0	
	Middle	836.5	
	High	844.0	



Mode	Bandwidth (MHz)	Test Frequency (MHz)	
LTE Band 12	1.4	Low	699.7
		Middle	707.5
		High	715.3
	3	Low	700.5
		Middle	707.5
		High	714.5
	5	Low	701.5
		Middle	707.5
		High	713.5
	10	Low	704.0
		Middle	707.5
		High	711.0

**Equipment Modifications**

No modification was made to the EUT.

**EUT Exercise Software**

N/A.

**Test Mode**

Full System (model: AIOTO Go) for all test item.

**Support Equipment List and Details**

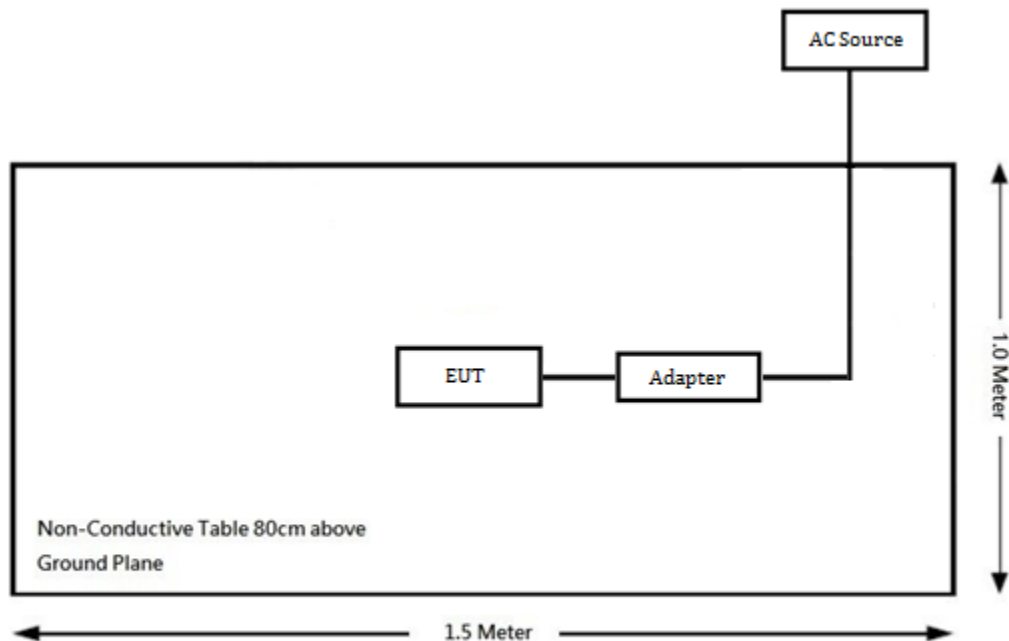
Description	Manufacturer	Model Number	S/N
Switching Adapter	DEE VAN ENTERPRISE CO.LTD	DSA-10PFL-05 FUS 050200	N/A

**External Cable List and Details**

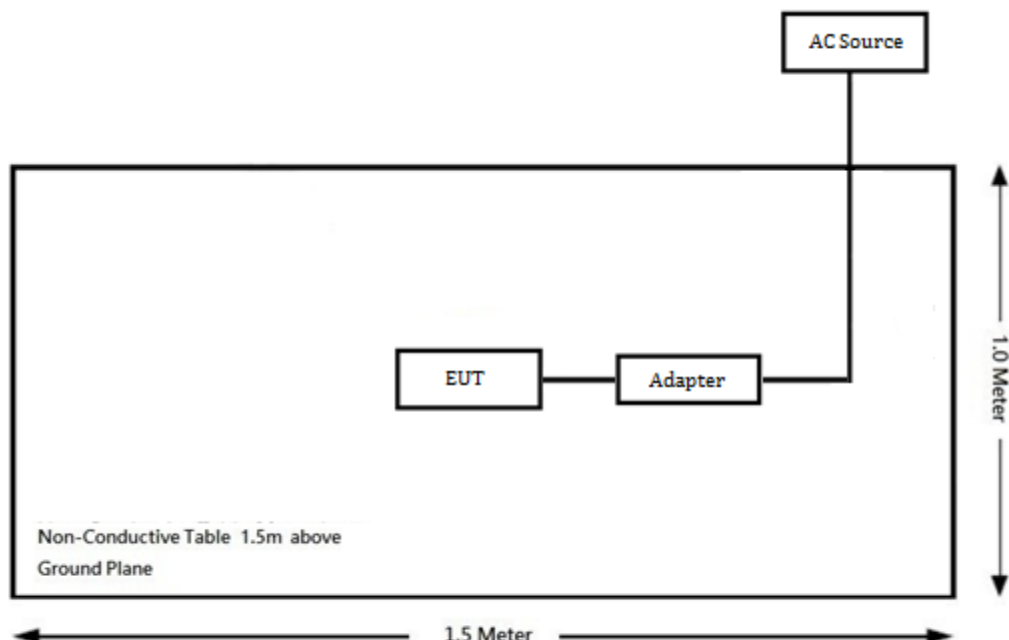
Cable Description	Length (m)	From	To
Micro USB Cable	1.5	Adapter	EUT

### Block Diagram of Test Setup

For Radiated Emissions (Below 1GHz).



For Radiated Emissions (Above 1GHz).



### Summary of Test Results

FCC Rules	Description of Test	Result
§1.1310 ,§ 2.1091	Maximum Permissible Exposure (MPE)	Compliance
§2.1046; §22.913 (a); §24.232(c) ;§27.50	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; §22.905; §22.917; §24.238 ;§27.53	Occupied Bandwidth	Compliance*
§ 2.1051; §22.917(a); §24.238(a) ;§27.53	Spurious Emissions at Antenna Terminal	Compliance*
§ 2.1053; §22.917(a); §24.238(a) ;§27.53	Field Strength of Spurious Radiation	Compliance
§22.917(a); §24.238(a) ;§27.53	Band Edge	Compliance*
§ 2.1055; §22.355; §24.235 ;§27.54	Frequency stability	Compliance*

**Note:**

Compliance\*: please refer to original module FCC ID: 2A33I-AIOTOGO which granted on 01/26/2022. The Original module (FCC ID: 2A33I-AIOTOGO) is exactly identical with FCC ID: XMR201903EG25G issued on 03/29/2019 with corresponding report HR/2019/1001601 issued by SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch Lab on 02/28/2019.

## Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Room (966-A)					
Bilog Antenna with 6 dB Attenuator	Sunol Sciences & EMEC	JB3 &EM-ATT18-6-NN	A061204 /ATT-09-003	2021/1/25	2022/1/24
Bilog Antenna with 6 dB Attenuator	SUNOL SCIENCES & MINI-CIRCUITS	JB6/UNAT-6+	A050115/15542_01	2021/1/19	2022/1/18
Horn Antenna	EMCO	SAS-571	1983	2021/5/6	2022/5/5
Horn Antenna	EMCO	SAS-571	1020	2021/4/23	2022/4/22
Horn Antenna	ETS-Lindgren	3116	62638	2021/8/11	2022/8/10
Preamplifier	Sonoma	310N	130602	2021/6/8	2022/6/7
Preamplifier	A.H. system Inc.	PAM-0118P	470	2021/03/15	2022/03/14
Microwave Preamplifier	EM Electronics Corporation	EM18G40G	60656	2020/12/30	2021/12/29
Spectrum Analyzer	Rohde & Schwarz	FSV40	101435	2021/1/7	2022/1/6
EMI Test Receiver	Rohde & Schwarz	ESR7	101419	2021/11/9	2022/11/8
Sweep Signal Generator	Agilent	MXG N5183A	MY50140407	2020/12/30	2021/12/29
Micro flex Cable	UTIFLEX	UFB197C-1-2362-70U-70U	225757-001	2021/2/1	2022/1/31
Coaxial Cable	COMMATE	PEWC	8Dr	2020/12/25	2021/12/24
Coaxial Cable	UTIFLEX	UFB311A-Q-1440-300300	220490-006	2021/2/1	2022/1/31
Coaxial Cable	JUNFLON	J12J102248-00-B-5	AUG-07-15-044	2020/12/25	2021/12/24
Cable	EMC	EMC105-SM-SM-10000	201003	2021/2/3	2022/2/2
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	149170	2021/5/5	2022/5/4
Software	Farad	EZ EMC	BACL-03A1	N.C.R	N.C.R
Conducted Room					
Cable	UTIFLEX	UFA210A	9435	2021/10/05	2022/10/04

Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	149170	2021/5/5	2022/5/4
---	-----------------	--------	--------	----------	----------

*\*Statement of Traceability: BACL Corp. attests that all of the calibrations on the equipment items listed above were traceable to the SI System of Units via the R.O.C. Center for Measurement Standards of the Electronics Testing Center, Taiwan (ETC) or to another internationally recognized National Metrology Institute (NMI), and were compliant with the current Taiwan Accreditation Foundation (TAF) requirements.*

## FCC §1.1310, §2.1091 – Maximum Permissible Exposure (MPE)

### Applicable Standard

According to subpart 1.1310, 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

#### Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; \* = Plane-wave equivalent power density;

### Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$  = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

### Calculated Data:

Mode	Frequency Range (MHz)	Antenna Gain		Tune-up Output Power		Evaluation Distance (cm)	Power Density (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
		(dBi)	(numeric)	(dBm)	(mW)			
LTE Band 2	1850-1910	-0.1	0.977	25	316.228	20	0.061	1
LTE Band 4	1710-1755	1.4	1.380	25	316.228	20	0.086	1
LTE Band 5	824-849	-2.5	0.562	25	316.228	20	0.035	0.55
LTE Band 12	699-716	-3.5	0.447	25	316.228	20	0.028	0.47

**Result:** The device meets MPE at distance **20cm**.

## **FCC §2.1046, §22.913(A), §24.232(C), §27.50 – RF Output Power**

### **Applicable Standard**

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to §24.232 (d) 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 (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. 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.

According to FCC §2.1046 and §27.50 (d), (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. 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

(b)(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

(c) (10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

(d), (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

(h),(2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

## Test Procedure

*For Conducted method:*

The RF output of the transmitter was connected to the CMW500 through sufficient attenuation

*For ERP measurement:*

ERP can be calculated by below formula from KDB 412172 D01.

$$EIRP = P_T + G_T - L_C$$

$P_T$  = transmitter output power, in dBm.

$G_T$  = gain of the transmitting antenna, in dBi (EIRP).

$L_C$  = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

$$ERP = EIRP - 2.15 \text{ dB.}$$



**Test Results**

**LTE Band 2**

<b>Antenna Gain (dBi):</b>	<b>-0.1</b>	<b>Cable Loss (dB):</b>	<b>0.5</b>
----------------------------	-------------	-------------------------	------------

Test Bandwidth (MHz)	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
1.4	QPSK	RB1#0	22.97	22.99	22.93	22.42	33
		RB1#2	23.00	23.02	22.97		
		RB1#5	22.98	22.96	22.99		
		RB3#0	22.86	22.90	22.89		
		RB3#1	22.98	23.00	22.95		
		RB3#3	22.95	22.93	22.88		
	RB6#0	22.16	22.29	22.29			
	16-QAM	RB1#0	21.96	21.98	21.93	21.44	33
		RB1#2	21.96	22.04	22.02		
		RB1#5	21.96	21.95	22.00		
		RB3#0	21.93	21.90	21.92		
		RB3#1	21.97	21.98	21.91		
RB3#3		21.92	21.95	21.86			
RB6#0	21.30	21.18	21.34				
3	QPSK	RB1#0	23.26	23.26	23.21	22.75	33
		RB1#8	23.32	23.35	23.29		
		RB1#14	23.24	23.26	23.24		
		RB8#0	23.25	23.25	23.16		
		RB8#4	23.24	23.29	23.27		
		RB8#7	23.17	23.22	23.22		
	RB15#0	22.58	22.59	22.52			
	16-QAM	RB1#0	22.30	22.26	22.24	21.75	33
		RB1#8	22.35	22.35	22.29		
		RB1#14	22.23	22.25	22.28		
		RB8#0	22.25	22.21	22.19		
		RB8#4	22.24	22.26	22.21		
RB8#7		22.20	22.20	22.17			
RB15#0	21.53	21.60	21.46				

Note: EIRP=Conducted Power (dBm) - Cable loss (dB) + Antenna Gain (dBi)

Test Bandwidth (MHz)	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
5	QPSK	RB1#0	23.36	23.36	23.31	22.85	33
		RB1#12	23.43	23.45	23.42		
		RB1#24	23.40	23.33	23.33		
		RB12#0	23.27	23.30	23.29		
		RB12#6	23.31	23.34	23.40		
		RB12#13	23.34	23.27	23.29		
		RB25#0	22.67	22.70	22.60		
	16-QAM	RB1#0	22.36	22.34	22.33	21.84	33
		RB1#12	22.42	22.44	22.43		
		RB1#24	22.36	22.39	22.38		
		RB12#0	22.31	22.34	22.29		
		RB12#6	22.40	22.35	22.32		
		RB12#13	22.31	22.26	22.32		
RB25#0	21.71	21.57	21.62				
10	QPSK	RB1#0	23.61	23.65	23.68	23.15	33
		RB1#24	23.71	23.75	23.74		
		RB1#49	23.67	23.64	23.61		
		RB25#0	23.63	23.63	23.60		
		RB25#12	23.69	23.66	23.62		
		RB25#25	23.65	23.56	23.65		
		RB50#0	22.87	22.98	22.86		
	16-QAM	RB1#0	22.61	22.63	22.66	22.09	33
		RB1#24	22.66	22.67	22.66		
		RB1#49	22.61	22.68	22.69		
		RB25#0	22.56	22.57	22.56		
		RB25#12	22.68	22.65	22.66		
		RB25#25	22.65	22.59	22.65		
RB50#0	21.88	22.00	21.88				

Note: EIRP=Conducted Power (dBm) - Cable loss (dB) + Antenna Gain (dBi)

Test Bandwidth (MHz)	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
15	QPSK	RB1#0	23.99	23.96	23.91	23.41	33
		RB1#38	23.98	24.00	24.01		
		RB1#74	23.93	23.91	23.97		
		RB36#0	23.89	23.94	23.93		
		RB36#18	23.98	23.95	23.92		
		RB36#39	23.92	23.88	23.87		
		RB75#0	23.22	23.18	23.30		
	16-QAM	RB1#0	22.97	22.95	22.96	22.44	33
		RB1#38	23.04	23.02	23.01		
		RB1#74	22.93	22.92	22.99		
		RB36#0	22.95	22.87	22.90		
		RB36#18	22.92	22.93	22.94		
		RB36#39	22.88	22.90	22.87		
		RB75#0	22.26	22.22	22.18		
20	QPSK	RB1#0	24.42	24.50	24.50	23.92	33
		RB1#49	24.49	24.52	24.46		
		RB1#99	24.44	24.42	24.47		
		RB50#0	24.38	24.40	24.45		
		RB50#25	24.42	24.46	24.45		
		RB50#50	24.36	24.36	24.36		
		RB100#0	23.75	23.69	23.74		
	16-QAM	RB1#0	23.48	23.43	23.49	22.94	33
		RB1#49	23.53	23.49	23.54		
		RB1#99	23.46	23.49	23.47		
		RB50#0	23.38	23.40	23.40		
		RB50#25	23.46	23.41	23.43		
		RB50#50	23.42	23.37	23.44		
		RB100#0	22.76	22.67	22.69		

Note: EIRP=Conducted Power (dBm) - Cable loss (dB) + Antenna Gain (dBi)

**LTE Band 4**

<b>Antenna Gain (dBi):</b>	<b>1.4</b>	<b>Cable Loss (dB):</b>	<b>0.5</b>
----------------------------	------------	-------------------------	------------

Test Bandwidth (MHz)	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
1.4	QPSK	RB1#0	23.03	23.08	23.04	24.02	30
		RB1#2	23.12	23.11	23.07		
		RB1#5	23.06	23.03	23.04		
		RB3#0	23.03	22.98	22.96		
		RB3#1	23.08	23.07	23.01		
		RB3#3	23.05	22.96	23.02		
		RB6#0	22.27	22.29	22.45		
	16-QAM	RB1#0	22.09	22.06	22.10	23.05	30
		RB1#2	22.13	22.15	22.15		
		RB1#5	22.09	22.04	22.08		
		RB3#0	22.01	22.03	22.01		
		RB3#1	22.07	22.06	22.08		
		RB3#3	22.05	21.97	21.98		
3	QPSK	RB1#0	23.32	23.36	23.38	24.35	30
		RB1#8	23.45	23.43	23.40		
		RB1#14	23.32	23.40	23.33		
		RB8#0	23.29	23.32	23.28		
		RB8#4	23.39	23.34	23.35		
		RB8#7	23.28	23.29	23.31		
		RB15#0	22.60	22.56	22.67		
	16-QAM	RB1#0	22.38	22.38	22.34	23.33	30
		RB1#8	22.37	22.36	22.43		
		RB1#14	22.39	22.31	22.36		
		RB8#0	22.33	22.34	22.34		
		RB8#4	22.37	22.32	22.37		
		RB8#7	22.30	22.33	22.35		
RB15#0	21.65	21.65	21.60				

Note: EIRP=Conducted Power (dBm) - Cable loss (dB) + Antenna Gain (dBi)

Test Bandwidth (MHz)	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
5	QPSK	RB1#0	23.48	23.49	23.46	24.42	30
		RB1#12	23.52	23.48	23.46		
		RB1#24	23.42	23.44	23.50		
		RB12#0	23.41	23.45	23.39		
		RB12#6	23.47	23.43	23.43		
		RB12#13	23.41	23.36	23.42		
		RB25#0	22.81	22.80	22.74		
	16-QAM	RB1#0	22.48	22.50	22.44	23.43	30
		RB1#12	22.47	22.47	22.53		
		RB1#24	22.44	22.42	22.45		
		RB12#0	22.40	22.37	22.37		
		RB12#6	22.45	22.50	22.50		
		RB12#13	22.37	22.41	22.43		
10	QPSK	RB1#0	23.73	23.78	23.76	24.75	30
		RB1#24	23.77	23.85	23.79		
		RB1#49	23.75	23.79	23.75		
		RB25#0	23.68	23.71	23.72		
		RB25#12	23.76	23.77	23.73		
		RB25#25	23.74	23.68	23.73		
		RB50#0	23.15	23.03	23.11		
	16-QAM	RB1#0	22.80	22.80	22.76	23.72	30
		RB1#24	22.82	22.79	22.82		
		RB1#49	22.72	22.71	22.78		
		RB25#0	22.70	22.73	22.71		
		RB25#12	22.78	22.80	22.73		
		RB25#25	22.72	22.75	22.70		
RB50#0	22.10	22.04	22.02				

Note: EIRP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(dBi)

Test Bandwidth (MHz)	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Maximum EIRP (dBm)	EIRP Limit (dBm)
15	QPSK	RB1#0	24.02	24.04	24.03	25.04	30
		RB1#38	24.07	24.09	24.14		
		RB1#74	24.02	24.01	24.04		
		RB36#0	24.03	23.97	24.01		
		RB36#18	24.05	24.05	24.01		
		RB36#39	23.98	23.98	23.96		
		RB75#0	23.41	23.40	23.45		
	16-QAM	RB1#0	23.01	23.09	23.02	24.02	30
		RB1#38	23.06	23.12	23.06		
		RB1#74	23.04	23.04	23.08		
		RB36#0	23.02	23.03	22.96		
		RB36#18	23.08	23.06	23.05		
		RB36#39	22.97	23.02	22.96		
		RB75#0	22.41	22.34	22.44		
20	QPSK	RB1#0	24.58	24.55	24.57	25.52	30
		RB1#49	24.57	24.62	24.59		
		RB1#99	24.57	24.56	24.54		
		RB50#0	24.50	24.50	24.46		
		RB50#25	24.54	24.57	24.55		
		RB50#50	24.51	24.50	24.51		
		RB100#0	23.81	23.85	23.80		
	16-QAM	RB1#0	23.53	23.51	23.59	24.51	30
		RB1#49	23.61	23.57	23.56		
		RB1#99	23.59	23.60	23.56		
		RB50#0	23.48	23.46	23.53		
		RB50#25	23.55	23.52	23.58		
		RB50#50	23.51	23.48	23.46		
		RB100#0	22.79	22.87	22.78		

Note: EIRP=Conducted Power (dBm) - Cable loss (dB) + Antenna Gain (dBi)

**LTE Band 5**

<b>Antenna Gain (dBi):</b>	<b>-2.5</b>	<b>Antenna Gain (dBd):</b>	<b>-4.65</b>	<b>Cable Loss (dB):</b>	<b>0.3</b>
----------------------------	-------------	----------------------------	--------------	-------------------------	------------

Test Bandwidth (MHz)	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Maximum ERP (dBm)	ERP Limit (dBm)
1.4	QPSK	RB1#0	23.95	24.00	23.95	19.07	38.45
		RB1#2	23.97	23.99	23.96		
		RB1#5	23.90	23.97	23.97		
		RB3#0	23.91	23.98	23.88		
		RB3#1	24.02	24.00	23.91		
		RB3#3	23.83	23.94	23.87		
		RB6#0	23.19	23.30	23.36		
	16-QAM	RB1#0	23.02	22.94	22.99	18.08	38.45
		RB1#2	23.03	22.92	23.02		
		RB1#5	22.95	22.90	22.92		
		RB3#0	22.92	22.93	22.97		
		RB3#1	22.91	22.98	22.88		
		RB3#3	22.87	22.85	22.97		
3	QPSK	RB1#0	24.33	24.24	24.24	19.38	38.45
		RB1#8	24.30	24.29	24.32		
		RB1#14	24.31	24.18	24.24		
		RB8#0	24.21	24.18	24.27		
		RB8#4	24.31	24.19	24.24		
		RB8#7	24.21	24.18	24.21		
		RB15#0	23.65	23.51	23.47		
	16-QAM	RB1#0	23.18	23.25	23.25	18.42	38.45
		RB1#8	23.36	23.32	23.37		
		RB1#14	23.30	23.29	23.21		
		RB8#0	23.14	23.20	23.18		
		RB8#4	23.27	23.21	23.24		
		RB8#7	23.22	23.25	23.16		
RB15#0	22.59	22.56	22.66				

Note: ERP=Conducted Power (dBm) - Cable loss (dB) + Antenna Gain (dBd)

Test Bandwidth (MHz)	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Maximum ERP (dBm)	ERP Limit (dBm)
5	QPSK	RB1#0	24.33	24.24	24.24	19.38	38.45
		RB1#12	24.30	24.29	24.32		
		RB1#24	24.31	24.18	24.24		
		RB12#0	24.21	24.18	24.27		
		RB12#6	24.31	24.19	24.24		
		RB12#13	24.21	24.18	24.21		
		RB25#0	23.65	23.51	23.47		
	16-QAM	RB1#0	23.18	23.25	23.25	18.42	38.45
		RB1#12	23.36	23.32	23.37		
		RB1#24	23.30	23.29	23.21		
		RB12#0	23.14	23.20	23.18		
		RB12#6	23.27	23.21	23.24		
		RB12#13	23.22	23.25	23.16		
		RB25#0	22.59	22.56	22.66		
10	QPSK	RB1#0	24.73	24.66	24.64	19.80	38.45
		RB1#24	24.75	24.71	24.74		
		RB1#49	24.67	24.64	24.71		
		RB25#0	24.61	24.59	24.60		
		RB25#12	24.69	24.69	24.69		
		RB25#25	24.68	24.60	24.51		
		RB50#0	23.91	23.93	24.10		
	16-QAM	RB1#0	23.70	23.60	23.69	18.80	38.45
		RB1#24	23.69	23.66	23.70		
		RB1#49	23.57	23.60	23.75		
		RB25#0	23.60	23.68	23.69		
		RB25#12	23.57	23.69	23.69		
		RB25#25	23.62	23.68	23.57		
		RB50#0	23.02	23.00	22.91		

Note: ERP=Conducted Power (dBm) - Cable loss (dB) + Antenna Gain (dBd)



**LTE Band 12**

<b>Antenna Gain (dBi):</b>	<b>-3.5</b>	<b>Antenna Gain (dBd):</b>	<b>-5.65</b>	<b>Cable Loss (dB):</b>	<b>0.3</b>
----------------------------	-------------	----------------------------	--------------	-------------------------	------------

Test Bandwidth (MHz)	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Maximum ERP (dBm)	ERP Limit (dBm)
1.4	QPSK	RB1#0	24.20	24.21	24.14	18.28	34.77
		RB1#2	24.23	24.21	24.22		
		RB1#5	24.21	24.13	24.12		
		RB3#0	24.02	24.11	24.08		
		RB3#1	24.11	24.14	24.10		
		RB3#3	24.05	24.17	24.07		
		RB6#0	23.41	23.48	23.44		
	16-QAM	RB1#0	23.16	23.15	23.23	17.28	34.77
		RB1#2	23.23	23.16	23.21		
		RB1#5	23.21	23.17	23.15		
		RB3#0	23.08	23.08	23.13		
		RB3#1	23.11	23.19	23.22		
		RB3#3	23.12	23.10	23.17		
		RB6#0	22.40	22.45	22.43		
3	QPSK	RB1#0	24.49	24.51	24.43	18.56	34.77
		RB1#8	24.46	24.43	24.41		
		RB1#14	24.50	24.42	24.38		
		RB8#0	24.37	24.39	24.31		
		RB8#4	24.41	24.44	24.46		
		RB8#7	24.42	24.37	24.36		
		RB15#0	23.81	23.74	23.75		
	16-QAM	RB1#0	23.41	23.50	23.43	17.55	34.77
		RB1#8	23.45	23.49	23.50		
		RB1#14	23.46	23.45	23.46		
		RB8#0	23.38	23.33	23.33		
		RB8#4	23.46	23.48	23.44		
		RB8#7	23.45	23.41	23.43		
		RB15#0	22.77	22.83	22.68		

Note: ERP=Conducted Power (dBm) - Cable loss (dB) + Antenna Gain (dBd)

Test Bandwidth (MHz)	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)	Maximum ERP (dBm)	ERP Limit (dBm)
5	QPSK	RB1#0	24.50	24.48	24.44	18.62	34.77
		RB1#12	24.57	24.54	24.46		
		RB1#24	24.49	24.39	24.50		
		RB12#0	24.40	24.36	24.36		
		RB12#6	24.45	24.53	24.39		
		RB12#13	24.41	24.49	24.34		
		RB25#0	23.82	23.69	23.71		
	16-QAM	RB1#0	23.37	23.45	23.53	17.62	34.77
		RB1#12	23.57	23.50	23.49		
		RB1#24	23.54	23.40	23.46		
		RB12#0	23.34	23.47	23.39		
		RB12#6	23.48	23.45	23.39		
		RB12#13	23.41	23.39	23.42		
		RB25#0	22.72	22.77	22.65		
10	QPSK	RB1#0	24.49	24.57	24.59	18.70	34.77
		RB1#24	24.60	24.61	24.59		
		RB1#49	24.53	24.65	24.55		
		RB25#0	24.47	24.55	24.48		
		RB25#12	24.58	24.56	24.51		
		RB25#25	24.55	24.56	24.46		
		RB50#0	23.94	23.74	23.81		
	16-QAM	RB1#0	23.58	23.48	23.51	17.72	34.77
		RB1#24	23.65	23.67	23.61		
		RB1#49	23.58	23.57	23.49		
		RB25#0	23.51	23.47	23.42		
		RB25#12	23.54	23.56	23.53		
		RB25#25	23.53	23.42	23.58		
		RB50#0	22.85	22.74	22.81		

Note: ERP=Conducted Power (dBm) - Cable loss (dB) + Antenna Gain (dBd)

**FCC§2.1053, §22.917 & §24.238 & §27.53 – Spurious Radiated Emissions****Applicable Standard**

FCC § 2.1053, §22.917, § 24.238 and § 27.53

**Test Procedure**

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

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 emissions in dB =  $10 \lg(\text{TX pwr in Watts}/0.001)$  – the absolute level

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

ANSI C63.26-2015 the defined surrogate measurement reproduces the EUT's emission in a two-stage measurement using a well-characterized transmission path. The EUT's transmissions are replicated using alternate antenna settings and the transmit power is calculated using the known characteristics of each transmit's transmit path.

This alternative method uses the same well-characterized transmit path to establish a reference radiated power chosen by the tester to characterize the path loss from the transmit antenna to the measurement receiver. This allows calculation of correction factors that can be used to directly determine EUT emissions without having to perform two-stage measurements for each emissions.

EUT emissions correction = S.G.

S.G = Result + Cable loss - Antenna gain

Spurious emissions in dB =  $10 \lg(\text{TX pwr in Watts}/0.001)$  – the absolute level

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

**LTE Band:**

Pre-scan with Low, Middle and High channel and the worst case as below:

Pre-scan with all the bandwidth, worse case as below:

(Worst case is Resource Block & RB offset : RB1#0)

**Horizontal**

Frequency (MHz)	S.G. (dBm)	Cable loss(dB)	Ant.Gain (dBd/dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Heigh ( cm )	Degree ( ° )
LTE Band 2, QPSK 20MHz Bandwidth, Middle channel (30MHz-20GHz)								
97.9000	-57.81	0.97	-5.91	-64.69	-13.00	-51.69	150	214
209.4500	-65.36	1.43	-0.04	-66.83	-13.00	-53.83	150	121
256.0100	-61.45	1.58	0.31	-62.72	-13.00	-49.72	150	65
321.9700	-54.66	1.78	0.21	-56.23	-13.00	-43.23	150	210
430.6100	-61.04	2.06	0.14	-62.96	-13.00	-49.96	150	111
729.3700	-56.42	2.7	0.93	-58.19	-13.00	-45.19	150	32
3760.000	-61.57	6.33	10.6	-57.30	-13.00	-44.30	155	349
5640.000	-58.36	7.49	11.4	-54.45	-13.00	-41.45	149	237
LTE Band 4, QPSK 20MHz Bandwidth, Middle channel (30MHz-20GHz)								
93.0500	-59.2	0.95	-5.14	-65.29	-13.00	-52.29	150	46
259.8900	-61.04	1.59	0.11	-62.52	-13.00	-49.52	150	130
326.8200	-56.37	1.8	0.34	-57.83	-13.00	-44.83	150	126
429.6400	-62.1	2.06	0.13	-64.03	-13.00	-51.03	150	122
549.9200	-62.81	2.33	0.66	-64.48	-13.00	-51.48	150	158
729.3700	-55.56	2.7	0.93	-57.33	-13.00	-44.33	150	32
3465.000	-56.52	6.12	10.49	-52.15	-13.00	-39.15	125	67
5197.500	-57.52	7.18	10.59	-54.11	-13.00	-41.11	152	337
LTE Band 5, QPSK 10MHz Bandwidth, Middle channel, (30MHz-10GHz)								
88.2000	-60.02	0.92	-4.87	-65.81	-13.00	-52.81	150	96
211.3900	-67.25	1.44	0.13	-68.56	-13.00	-55.56	150	137
258.9200	-63.8	1.59	0.16	-65.23	-13.00	-52.23	150	232
319.0600	-56.93	1.77	0.16	-58.54	-13.00	-45.54	150	20
686.6900	-60.12	2.6	0.92	-61.80	-13.00	-48.80	150	126
729.3700	-56.97	2.7	0.93	-58.74	-13.00	-45.74	150	133
1673.000	-68.37	4.02	9.55	-62.84	-13.00	-49.84	148	252
2509.500	-65.22	5.01	9.11	-61.12	-13.00	-48.12	155	129
LTE Band 12, QPSK 10MHz Bandwidth, Middle channel, (30MHz-10GHz)								
49.4000	-52.93	0.69	-10.48	-64.10	-13.00	-51.10	150	85
97.9000	-59.58	0.97	-5.91	-66.46	-13.00	-53.46	150	120
213.3300	-69.28	1.44	0.17	-70.55	-13.00	-57.55	150	98
327.7900	-58.37	1.8	0.37	-59.80	-13.00	-46.80	150	110
427.7000	-62.32	2.06	0.13	-64.25	-13.00	-51.25	150	118
547.9800	-65.54	2.33	0.66	-67.21	-13.00	-54.21	150	14
1415.000	-69.41	2.78	8.22	-63.97	-13.00	-50.97	148	207
2122.500	-67.27	3.65	8.6	-62.32	-13.00	-49.32	155	118

Result = S.G - Cable loss + Antenna gain  
 Margin = Result – Limit  
 S.G. = Result + Cable loss - Antenna gain  
 Spurious emissions more than 20 dB below the limit were not reported.

**Vertical**

Frequency (MHz)	S.G. (dBm)	Cable loss(dB)	Ant.Gain (dBd/dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Heigh ( cm )	Degree ( ° )
LTE Band 2, QPSK 20MHz Bandwidth, Middle channel, (30MHz-20GHz)								
88.2000	-56.81	0.92	-4.87	-62.60	-13.00	-49.60	150	162
125.0600	-59.72	1.11	-8.01	-68.84	-13.00	-55.84	150	125
213.3300	-66.17	1.44	0.17	-67.44	-13.00	-54.44	150	132
258.9200	-63.84	1.59	0.16	-65.27	-13.00	-52.27	150	65
325.8500	-57.9	1.79	0.32	-59.37	-13.00	-46.37	150	95
721.6100	-58.58	2.67	0.99	-60.26	-13.00	-47.26	150	124
3760.000	-61.59	6.33	10.6	-57.32	-13.00	-44.32	153	42
5640.000	-58.68	7.49	11.4	-54.77	-13.00	-41.77	156	314
LTE Band 4, QPSK 20MHz Bandwidth, Middle channel, (30MHz-20GHz)								
88.2000	-55.73	0.92	-4.87	-61.52	-13.00	-48.52	150	247
210.4200	-67.25	1.43	0.11	-68.57	-13.00	-55.57	150	126
259.8900	-61.69	1.59	0.11	-63.17	-13.00	-50.17	150	12
319.0600	-61.78	1.77	0.16	-63.39	-13.00	-50.39	150	62
418.9700	-67.2	2.04	0.14	-69.10	-13.00	-56.10	150	166
729.3700	-63.93	2.7	0.93	-65.70	-13.00	-52.70	150	85
3465.000	-58.81	6.12	10.49	-54.44	-13.00	-41.44	100	77
5197.500	-57.19	7.18	10.59	-53.78	-13.00	-40.78	150	298
LTE Band 5, QPSK 10MHz Bandwidth, Middle channel, (30MHz-10GHz)								
35.8200	-41.91	0.58	-22.32	-64.81	-13.00	-51.81	150	352
90.1400	-55.9	0.93	-4.68	-61.51	-13.00	-48.51	150	123
127.9700	-63.17	1.12	-7.8	-72.09	-13.00	-59.09	150	130
208.4800	-65.99	1.43	-0.3	-67.72	-13.00	-54.72	150	100
258.9200	-63.35	1.59	0.16	-64.78	-13.00	-51.78	150	15
321.9700	-61.99	1.78	0.21	-63.56	-13.00	-50.56	150	159
1673.000	-61.91	4.02	9.55	-56.38	-13.00	-43.38	126	268
2509.500	-64.43	5.01	9.11	-60.33	-13.00	-47.33	151	329
LTE Band 12, QPSK 10MHz Bandwidth, Middle channel, (30MHz-10GHz)								
88.2000	-56.11	0.92	-4.87	-61.90	-13.00	-48.90	150	96
127.9700	-60.92	1.12	-7.8	-69.84	-13.00	-56.84	150	120
208.4800	-66.18	1.43	-0.3	-67.91	-13.00	-54.91	150	187
258.9200	-65.3	1.59	0.16	-66.73	-13.00	-53.73	150	185
318.0900	-60.39	1.77	0.16	-62.00	-13.00	-49.00	150	109
441.2800	-66.8	2.08	0.24	-68.64	-13.00	-55.64	150	55
1415.000	-65.9	3.69	8.22	-61.37	-13.00	-48.37	155	337
2122.500	-65.27	4.57	8.6	-61.24	-13.00	-48.24	142	258

Result = S.G - Cable loss + Antenna gain  
 Margin = Result – Limit  
 S.G. = Result + Cable loss - Antenna gain  
 Spurious emissions more than 20 dB below the limit were not reported.

**Horizontal**

Frequency (MHz)	S.G. (dBm)	Cable loss(dB)	Ant.Gain (dBd/dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Heigh ( cm )	Degree ( ° )
LTE Band 2, 16-QAM 20MHz Bandwidth, Middle channel (30MHz-20GHz)								
97.9000	-57.76	0.97	-5.91	-64.64	-13.00	-51.64	150	207
213.3300	-65.77	1.44	0.17	-67.04	-13.00	-54.04	150	339
259.8900	-64.23	1.59	0.11	-65.71	-13.00	-52.71	150	117
321.9700	-56.45	1.78	0.21	-58.02	-13.00	-45.02	150	256
716.7600	-52.72	2.66	0.93	-54.45	-13.00	-41.45	150	148
729.3700	-54.67	2.7	0.93	-56.44	-13.00	-43.44	150	223
3760.000	-62.67	4.74	10.6	-56.81	-13.00	-43.81	153	360
5640.000	-59.98	5.9	11.4	-54.48	-13.00	-41.48	144	159
LTE Band 4, 16-QAM 20MHz Bandwidth, Middle channel (30MHz-20GHz)								
91.1100	-59.75	0.94	-4.84	-65.53	-13.00	-52.53	150	128
321.9700	-60.02	1.78	0.21	-61.59	-13.00	-48.59	150	166
418.9700	-64.11	2.04	0.14	-66.01	-13.00	-53.01	150	213
459.7100	-64.55	2.13	0.26	-66.42	-13.00	-53.42	150	22
711.9100	-63.5	2.65	0.82	-65.33	-13.00	-52.33	150	247
729.3700	-59.1	2.7	0.93	-60.87	-13.00	-47.87	150	23
3465.000	-64.41	4.67	10.49	-58.59	-13.00	-45.59	155	233
5197.500	-58.82	5.6	10.59	-53.83	-13.00	-40.83	142	149
LTE Band 5, 16-QAM 10MHz Bandwidth, Middle channel, (30MHz-10GHz)								
35.8200	-34.96	0.58	-22.32	-57.86	-13.00	-44.86	150	296
91.1100	-60.86	0.94	-4.84	-66.64	-13.00	-53.64	150	165
321.0000	-56.4	1.77	0.19	-57.98	-13.00	-44.98	150	100
428.6700	-62.89	2.06	0.13	-64.82	-13.00	-51.82	150	132
562.5300	-64.74	2.36	0.67	-66.43	-13.00	-53.43	150	28
729.3700	-55.13	2.7	0.93	-56.90	-13.00	-43.90	150	136
1673.000	-69.04	4.02	9.55	-63.51	-13.00	-50.51	152	337
2509.500	-65.15	5.01	9.11	-61.05	-13.00	-48.05	144	211
LTE Band 12, 16-QAM 10MHz Bandwidth, Middle channel, (30MHz-10GHz)								
49.4000	-54.33	0.69	-10.48	-65.50	-13.00	-52.50	150	190
90.1400	-59.2	0.93	-4.68	-64.81	-13.00	-51.81	150	110
212.3600	-69.27	1.44	0.15	-70.56	-13.00	-57.56	150	97
327.7900	-57.06	1.8	0.37	-58.49	-13.00	-45.49	150	185
432.5500	-62.8	2.07	0.15	-64.72	-13.00	-51.72	150	24
552.8300	-64.3	2.34	0.66	-65.98	-13.00	-52.98	150	96
1415.000	-67.84	3.69	8.22	-63.31	-13.00	-50.31	152	341
2122.500	-65.92	4.57	8.6	-61.89	-13.00	-48.89	144	228

Result = S.G - Cable loss + Antenna gain

Margin = Result – Limit

S.G. = Result + Cable loss - Antenna gain

Spurious emissions more than 20 dB below the limit were not reported.

**Vertical**

Frequency (MHz)	S.G. (dBm)	Cable loss(dB)	Ant.Gain (dBd/dBi)	Result (dBm)	Limit (dBm)	Margin (dB)	Heigh ( cm )	Degree ( ° )
LTE Band 2, 16-QAM 20MHz Bandwidth, Middle channel, (30MHz-20GHz)								
88.2000	-57.44	0.92	-4.87	-63.23	-13.00	-50.23	150	51
125.0600	-62.03	1.11	-8.01	-71.15	-13.00	-58.15	150	82
211.3900	-66.03	1.44	0.13	-67.34	-13.00	-54.34	150	117
265.7100	-62.43	1.61	-0.2	-64.24	-13.00	-51.24	150	349
318.0900	-60.05	1.77	0.16	-61.66	-13.00	-48.66	150	148
729.3700	-62.19	2.7	0.93	-63.96	-13.00	-50.96	150	222
3760.000	-62.75	4.74	10.6	-56.89	-13.00	-43.89	148	248
5640.000	-59.41	5.9	11.4	-53.91	-13.00	-40.91	153	66
LTE Band 4, 16-QAM 20MHz Bandwidth, Middle channel, (30MHz-20GHz)								
88.2000	-55.92	0.92	-4.87	-61.71	-13.00	-48.71	150	38
205.5700	-66.34	1.42	-1.06	-68.82	-13.00	-55.82	150	195
260.8600	-62.49	1.59	0.06	-64.02	-13.00	-51.02	150	65
330.7000	-61.13	1.81	0.43	-62.51	-13.00	-49.51	150	75
713.8500	-62.22	2.66	0.86	-64.02	-13.00	-51.02	150	136
729.3700	-61.67	2.7	0.93	-63.44	-13.00	-50.44	150	139
3465.000	-63.72	4.67	10.49	-57.90	-13.00	-44.90	153	109
5197.500	-59.33	5.6	10.59	-54.34	-13.00	-41.34	149	227
LTE Band 5, 16-QAM 10MHz Bandwidth, Middle channel, (30MHz-10GHz)								
35.8200	-41.31	0.58	-22.32	-64.21	-13.00	-51.21	150	110
89.1700	-56.35	0.93	-4.75	-62.03	-13.00	-49.03	150	112
259.8900	-62.67	1.59	0.11	-64.15	-13.00	-51.15	150	185
332.6400	-62.57	1.82	0.44	-63.95	-13.00	-50.95	150	130
457.7700	-67.57	2.12	0.27	-69.42	-13.00	-56.42	150	123
729.3700	-64.81	2.7	0.93	-66.58	-13.00	-53.58	150	13
1673.000	-59.25	4.02	9.55	-53.72	-13.00	-40.72	148	226
2509.500	-63.28	5.01	9.11	-59.18	-13.00	-46.18	149	142
LTE Band 12, 16-QAM 10MHz Bandwidth, Middle channel, (30MHz-10GHz)								
90.1400	-56.33	0.93	-4.68	-61.94	-13.00	-48.94	150	54
143.4900	-60.32	1.18	-5.68	-67.18	-13.00	-54.18	150	120
256.9800	-65.29	1.58	0.26	-66.61	-13.00	-53.61	150	158
322.9400	-60.38	1.78	0.24	-61.92	-13.00	-48.92	150	147
433.5200	-66.42	2.07	0.16	-68.33	-13.00	-55.33	150	95
589.6900	-67.64	2.41	1.16	-68.89	-13.00	-55.89	150	98
1415.000	-68.95	3.69	8.22	-64.42	-13.00	-51.42	128	331
2122.500	-65.34	4.57	8.6	-61.31	-13.00	-48.31	149	107

Result = S.G - Cable loss + Antenna gain  
 Margin = Result – Limit  
 S.G. = Result + Cable loss - Antenna gain  
 Spurious emissions more than 20 dB below the limit were not reported.

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