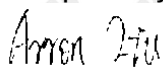


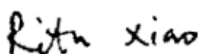
TEST REPORT

Product Name: Telematics Unit
FCC ID: S8UT-229LA
Trademark: N/A
Model Number: T-229LA-L, T-229LA
Prepared For: Sinocastel Co., Ltd.
Address: 501A, Building 11, Shenzhen Software Park (Phase 2), No. 1, Kejizhong Middle Road, High-tech Middle District, Maling Community, Yuehai Street, Nanshan District, Shenzhen
Manufacturer: Sinocastel Co., Ltd.
Address: 501A, Building 11, Shenzhen Software Park (Phase 2), No. 1, Kejizhong Middle Road, High-tech Middle District, Maling Community, Yuehai Street, Nanshan District, Shenzhen
Prepared By: Shenzhen CTB Testing Technology Co., Ltd.
Address: Floor 1&2, Building A, No. 26 of Xinghe Road, Xinqiao Street, Baoan District, Shenzhen China
Sample Received Date: Sep. 10, 2020
Sample tested Date: Sep. 10, 2020 to Sep. 24 2020
Issue Date: Sep. 24 2020
Report No.: CTB200929024RFX
Test Standards: FCC Part 22H & 24E
Test Results: PASS
Remark: This is WCDMA radio test report.

Compiled by:

Arron Liu

Reviewed by:

Rita Xiao

Approved by:

Sherwin Qian/ Director

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

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(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB200929024RFX	Sep. 24 2020	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

FCC Rules	Description of Test Item	Result
§1.1307, §2.1091	RF Exposure	Compliant
§22.913 (a), §24.232 (c)	RF Output Power	Compliant
§24.51	Peak-to-average Ratio(PAR) of Transmitter	Compliant
§22.917 (b), §24.238 (b)	Emission Bandwidth	Compliant
§22.917 (a), §24.238 (a)	Spurious Emissions at Antenna Terminal	Compliant
§22.917 (a), §24.238 (a)	Spurious Radiation Emissions	Compliant
§22.917 (a), §24.238 (a)	Out of Band Emissions	Compliant
§22.355, §24.235	Frequency Stability	Compliant

3. MEASUREMENT UNCERTAINTY

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

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m chamber Radiated spurious emission(30MHz-1GHz)	4.6dB
3m chamber Radiated spurious emission(1GHz-18GHz)	5.1dB
3m chamber Radiated spurious emission(18GHz-40GHz)	3.4dB
Receiver Reference Sensitivity level	1.9dB
humidity uncertainty	5.5%
Temperature uncertainty	0.63°C
frequency	1×10^{-7}

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model(s):	T-229LA-L, T-229LA
Model Description:	N/A
Hardware Version:	V2.0
Software Version:	V3.1.2
Operation Frequency:	WCDMA Band 2: 1850~1910MHz WCDMA Band 4: 1710-1755MHz WCDMA Band 5: 824~849MHz
Max. conducted output power:	WCDMA Band 2: 23.46dBm WCDMA Band 4: 23.34dBm, WCDMA Band 5: 23.21dBm
Type of Modulation:	GMSK, BPSK
Antenna installation:	Integral antenna
Antenna Gain:	2dBi
Ratings:	DC12V from battery

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Channel List

Testing Configure			
Support Band	Support Standard	Channel Frequency	Channel Number
WCDMA Band 5	WCDMA/HSDPA/HSUPA	826.4 MHz	4132
		836.6 MHz	4183
		846.6 MHz	4233
WCDMA Band 4	WCDMA/HSDPA/HSUPA	1712.4MHz	1312
		1732.6MHz	1413
		1752.6MHz	1513
WCDMA Band 2	WCDMA/HSDPA/HSUPA	1852.4 MHz	9262
		1880.0 MHz	9400
		1907.6 MHz	9538
Note: the transmitter has been tested on the communications mode of GSM, GPRS, EDGE, WCDMA, HSDPA, HSUPA compliance test and record the worst case.			

4.5 Test Mode

Test Mode List		
Test Mode	Description	Remark
TM1	WCDMA Band 5	Low, Middle, High Channels
TM2	HSDPA Band 5	Low, Middle, High Channels
TM3	HSUPA Band 5	Low, Middle, High Channels
TM4	WCDMA Band 4	Low, Middle, High Channels
TM5	HSDPA Band 4	Low, Middle, High Channels
TM6	HSUPA Band 4	Low, Middle, High Channels
TM7	WCDMA Band 2	Low, Middle, High Channels
TM8	HSDPA Band 2	Low, Middle, High Channels
TM9	HSUPA Band 2	Low, Middle, High Channels

4.6 Test Environment

Humidity(%):	55
Atmospheric Pressure(kPa):	101.1
Normal Voltage(AC):	230V
Normal Temperature(°C)	25
Low Temperature(°C)	0
High Temperature(°C)	40

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Floor 1&2, Building A, No. 26 of Xinh Road, Xinqiao Street, Baoan District, Shenzhen China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	Oct. 17, 2019	Oct. 16, 2020
2	Power Sensor	Agilent	U2021XA	MY56120032	Nov. 02, 2019	Nov. 01, 2020
3	Power Sensor	Agilent	U2021XA	MY56120034	Nov. 02, 2019	Nov. 01, 2020
4	Communication test set	R&S	CMW500	118735	Nov. 02, 2019	Nov. 01, 2020
5	Spectrum Analyzer	R&S	FSP40	100550	Nov. 02, 2019	Nov. 01, 2020
6	Signal Generator	Agilent	N5181A	MY49060920	Nov. 03, 2019	Nov. 02, 2020
7	Signal Generator	Agilent	N5182A	MY47420195	Nov. 03, 2019	Nov. 02, 2020
8	Communication test set	R&S	CMU200	119978	Nov. 02, 2019	Nov. 01, 2020
9	band rejection filter	Shenxiang	MSF2400-24 83.5MS-1154	20181015001	Nov. 02, 2019	Nov. 01, 2020
10	band rejection filter	Shenxiang	MSF5150-58 50MS-1155	20181015001	Nov. 02, 2019	Nov. 01, 2020
11	band rejection filter	Xingbo	XBLBQ-DZA 120	190821-1-1	Nov. 02, 2019	Nov. 01, 2020
12	BT&WI-FI Automatic test software	Microwave	MTS8310	Ver. 2.0.0.0	\	\
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	Nov. 02, 2019	Nov. 01, 2020
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	Nov. 02, 2019	Nov. 01, 2020
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	\	\
16	966 chamber	C.R.T.	966 Room	966	Nov. 10, 2019	Nov. 09, 2020
17	Receiver	R&S	ESPI	100362	Nov. 02, 2019	Nov. 01, 2020

18	Amplifier	HP	8447E	2945A02747	Nov. 03, 2019	Nov. 02, 2020
19	Amplifier	Agilent	8449B	3008A01838	Nov. 03, 2019	Nov. 02, 2020
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	869	Nov. 02, 2019	Nov. 01, 2020
21	Horn Antenna	Schwarzbeck	BBHA9120D	1911	Nov. 02, 2019	Nov. 01, 2020
22	Software	Fala	EZ-EMC	FA-03A2 RE	\	\
23	3-Loop Antenna	Daze	ZN30401	17014	Nov. 02, 2019	Nov. 01, 2020
24	loop antenna	ZHINAN	ZN30900A	/	Nov. 02, 2019	Nov. 01, 2020
25	Horn antenna	A/H/System	SAS-574	588	Nov. 02, 2019	Nov. 01, 2020
26	Amplifier	AEROFLEX	/	S/N/ 097	Nov. 02, 2019	Nov. 01, 2020

6. RF OUTPUT POWER

6.1 Standard Applicable

According to §22.913(a)(2), The ERP of mobile and portable stations transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to §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.

6.2 Test Procedure

Conducted output power test method:



Radiated power test method:

1. The setup of EUT is according with per ANSI/TIA Standard 603D 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.

6.3 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

6.4 Summary of Test Results/Plots

Max. Radiated Power

ERP For WCDMA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	22.86	1.5	0	H	1.5	0	21.36	38.45
826.4	22.97	1.5	0	V	1.5	0	21.47	38.45
Middle Channel								
836.6	22.72	1.5	0	H	1.5	0	21.22	38.45
836.6	22.93	1.5	0	V	1.5	0	21.43	38.45
High Channel								
846.6	22.69	1.5	0	H	1.5	0	21.19	38.45
846.6	22.88	1.5	0	V	1.5	0	21.38	38.45

ERP For HSDPA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	22.01	1.5	0	H	1.5	0	20.51	38.45
826.4	21.84	1.5	0	V	1.5	0	20.34	38.45
Middle Channel								
836.6	21.79	1.5	0	H	1.5	0	20.29	38.45
836.6	21.68	1.5	0	V	1.5	0	20.18	38.45
High Channel								
846.6	20.82	1.5	0	H	1.5	0	19.32	38.45
846.6	20.81	1.5	0	V	1.5	0	19.31	38.45

ERP For HSUPA Mode Band 5

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 22H Limit
MHz	dBm	Meter	Degree	H / V	dB	dBd	dBm	dBm
Low Channel								
826.4	21.05	1.5	0	H	1.5	0	19.55	38.45
826.4	20.87	1.5	0	V	1.5	0	19.37	38.45
Middle Channel								
836.6	19.65	1.5	0	H	1.5	0	18.15	38.45
836.6	19.73	1.5	0	V	1.5	0	18.23	38.45
High Channel								
846.6	21.85	1.5	0	H	1.5	0	20.35	38.45
846.6	21.91	1.5	0	V	1.5	0	20.41	38.45

EIRP For WCDMA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	15.54	1.5	0	H	1.9	7.7	21.34	33
1852.4	15.75	1.5	0	V	1.9	7.7	21.55	33
Middle Channel								
1880.0	15.62	1.5	0	H	1.9	7.7	21.42	33
1880.0	15.36	1.5	0	V	1.9	7.7	21.16	33
High Channel								
1907.6	15.23	1.5	0	H	1.9	7.7	21.03	33
1907.6	15.47	1.5	0	V	1.9	7.7	21.27	33

EIRP For HSDPA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	14.56	1.5	0	H	1.9	7.7	20.36	33
1852.4	14.62	1.5	0	V	1.9	7.7	20.42	33
Middle Channel								
1880.0	14.75	1.5	0	H	1.9	7.7	20.55	33
1880.0	14.57	1.5	0	V	1.9	7.7	20.37	33
High Channel								
1907.6	14.34	1.5	0	H	1.9	7.7	20.14	33
1907.6	14.62	1.5	0	V	1.9	7.7	20.42	33

EIRP For HSUPA Mode Band 2

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	13.62	1.5	0	H	1.9	7.7	19.42	33
1852.4	13.61	1.5	0	V	1.9	7.7	19.41	33
Middle Channel								
1880.0	14.56	1.5	0	H	1.9	7.7	20.36	33
1880.0	14.61	1.5	0	V	1.9	7.7	20.41	33
High Channel								
1907.6	14.51	1.5	0	H	1.9	7.7	20.31	33
1907.6	14.47	1.5	0	V	1.9	7.7	20.27	33

EIRP For WCDMA Mode Band 4

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1712.4	16.36	1.5	0	H	1.8	7.3	21.86	33
1712.4	16.59	1.5	0	V	1.8	7.3	22.09	33
Middle Channel								
1732.6	16.75	1.5	0	H	1.8	7.3	22.25	33
1732.6	16.35	1.5	0	V	1.8	7.3	21.85	33
High Channel								
1752.6	16.22	1.5	0	H	1.8	7.3	21.72	33
1752.6	16.37	1.5	0	V	1.8	7.3	21.87	33

EIRP For HSDPA Mode Band 4

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	15.22	1.5	0	H	1.8	7.3	20.72	33
1852.4	15.36	1.5	0	V	1.8	7.3	20.86	33
Middle Channel								
1880.0	15.68	1.5	0	H	1.8	7.3	21.18	33
1880.0	15.54	1.5	0	V	1.8	7.3	21.04	33
High Channel								
1907.6	15.33	1.5	0	H	1.8	7.3	20.83	33
1907.6	15.39	1.5	0	V	1.8	7.3	20.89	33

EIRP For HSUPA Mode Band 4

Frequency	Substitute SG	Height	Table	Polar	Cable loss	Antenna Gain	Result	FCC Part 24E Limit
MHz	dBm	Meter	Degree	H / V	dB	dB	dBm	dBm
Low Channel								
1852.4	15.26	1.5	0	H	1.8	7.3	20.76	33
1852.4	15.26	1.5	0	V	1.8	7.3	20.76	33
Middle Channel								
1880.0	15.36	1.5	0	H	1.8	7.3	20.86	33
1880.0	15.69	1.5	0	V	1.8	7.3	21.19	33
High Channel								
1907.6	15.54	1.5	0	H	1.8	7.3	21.04	33
1907.6	15.62	1.5	0	V	1.8	7.3	21.12	33

Note: Result = Substitute - Cable loss + Antenna Gain

Max. Conducted Output Power

Please refer to report of FCC ID :XMR201605EC25A

7. PEAK-TO-AVERAGE RATIO(PAR) OF TRANSMITTER

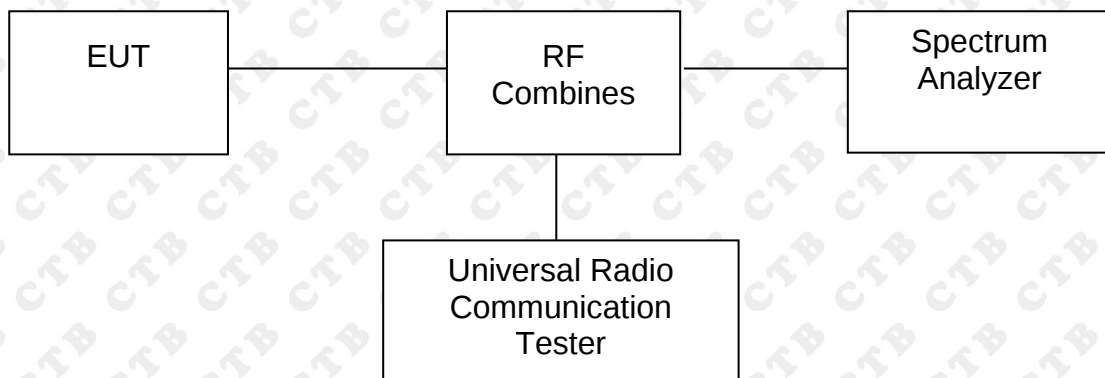
7.1 Standard Applicable

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.

7.2 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 30kHz and the peak-to-average ratio (PAR) of the transmission was recorded. Record the maximum PAPR level associated with a probability of 0.1%.

Test Configuration for the emission bandwidth testing:



7.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

7.4 Summary of Test Results

Please refer to report of FCC ID : XMR201605EC25A

8. EMISSION BANDWIDTH

8.1 Standard Applicable

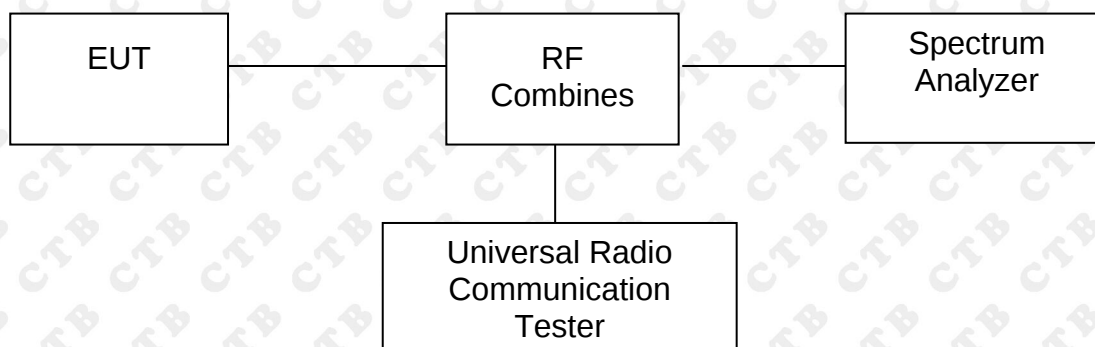
According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

According to §24.238(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 26 dB below the transmitter power.

8.2 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 10kHz for GSM mode and 100kHz for WCDMA mode, VBW shall be at least 3 times the RBW, and the 26dB bandwidth was recorded.

Test Configuration for the emission bandwidth testing:



8.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

8.4 Summary of Test Results/Plots

Please refer to report of FCC ID :XMR201605EC25A

9. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

9.1 Standard Applicable

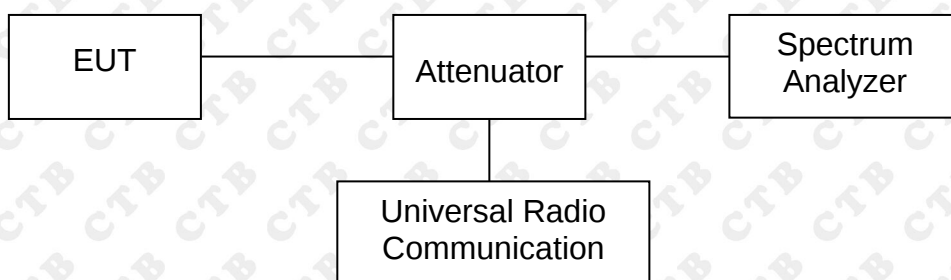
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §24.238(a), the power of any 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.

9.2 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:



9.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

9.4 Summary of Test Results/Plots

Please refer to report of FCC ID : XMR201605EC25A

10. SPURIOUS RADIATED EMISSIONS

10.1 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 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.

10.2 Test Procedure

- 1.The setup of EUT is according with per ANSI/TIA Standard 603D 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 = $43 + 10 \log_{10}$ (power out in Watts)

10.3 Environmental Conditions

Temperature:	26 °C
Relative Humidity:	54%
ATM Pressure:	101 kPa
Test Voltage	DC6.4V

10.4 Summary of Test Results/Plots

According to the data below, the FCC Part22.917 and 24.238 standards, and had the worst margin of:

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

All test modes are performed, but only the worst case is recorded in this report.

For Band 5 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
46.34	-69.19	4.34	-64.85	-13.00	-51.85	H
1652.8	-58.43	4.94	-53.49	-13.00	-40.49	H
2479.2	-58.45	8.46	-49.99	-13.00	-36.99	H
46.34	-69.24	4.34	-64.90	-13.00	-51.90	V
1652.8	-57.12	4.94	-52.18	-13.00	-39.18	V
2479.2	-58.53	8.46	-50.07	-13.00	-37.07	V
Middle Channel (836.6MHz)						
46.34	-69.47	4.34	-65.13	-13.00	-52.13	H
1672.8	-57.47	5.11	-52.36	-13.00	-39.36	H
2509.2	-57.54	8.54	-49.00	-13.00	-36.00	H
46.34	-69.17	4.34	-64.83	-13.00	-51.83	V
1672.8	-58.32	5.11	-53.21	-13.00	-40.21	V
2509.2	-59.47	8.54	-50.93	-13.00	-37.93	V
High Channel (846.6MHz)						
46.34	-69.45	4.34	-65.11	-13.00	-52.11	H
1693.2	-56.43	5.29	-51.14	-13.00	-38.14	H
2539.8	-59.23	8.59	-50.64	-13.00	-37.64	H
46.34	-68.81	4.34	-64.47	-13.00	-51.47	V
1693.2	-57.11	5.29	-51.82	-13.00	-38.82	V
2539.8	-58.32	8.59	-49.73	-13.00	-36.73	V

For Band 4 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1712.4MHz)						
47.65	-66.32	4.34	-61.98	-13	-48.98	H
3424.8	-58.22	9.69	-48.53	-13	-35.53	H
5137.8	-56.95	13.35	-43.6	-13	-30.6	H
47.65	-66.53	4.34	-62.19	-13	-49.19	V
3424.8	-58.37	9.69	-48.68	-13	-35.68	V
5137.8	-57.53	13.35	-44.18	-13	-31.18	V
Middle Channel (1732.6MHz)						
47.65	-66.89	4.34	-62.55	-13	-49.55	H
3465.2	-58.65	9.73	-48.92	-13	-35.92	H
5197.8	-57.52	13.42	-44.1	-13	-31.1	H
47.65	-66.85	4.34	-62.51	-13	-49.51	V
3465.2	-58.11	9.73	-48.38	-13	-35.38	V
5197.8	-58.62	13.42	-45.2	-13	-32.2	V
High Channel (1752.6MHz)						
47.65	-66.75	4.34	-62.41	-13	-49.41	H
3505.5	-57.56	9.75	-47.81	-13	-34.81	H
5257.8	-58.99	13.67	-45.32	-13	-32.32	H
47.65	-66.79	4.34	-62.45	-13	-49.45	V
3505.2	-57.35	9.75	-47.6	-13	-34.6	V
5257.8	-58.78	13.67	-45.11	-13	-32.11	V

For Band 2 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.4MHz)						
46.34	-69.29	4.34	-64.95	-13.00	-51.95	H
3704.8	-57.43	10.17	-47.26	-13.00	-34.26	H
5557.2	-58.17	14.69	-43.48	-13.00	-30.48	H
46.34	-68.83	4.34	-64.49	-13.00	-51.49	V
3704.8	-58.54	10.17	-48.37	-13.00	-35.37	V
5557.2	-58.56	14.69	-43.87	-13.00	-30.87	V
Middle Channel (1880MHz)						
46.34	-68.94	4.34	-64.60	-13.00	-51.60	H
3760.8	-58.46	10.26	-48.20	-13.00	-35.20	H
5640.0	-57.46	14.78	-42.68	-13.00	-29.68	H
46.34	-68.72	4.34	-64.38	-13.00	-51.38	V
3760.8	-57.87	10.26	-47.61	-13.00	-34.61	V
5640.0	-58.12	14.78	-43.34	-13.00	-30.34	V
High Channel (1907.6MHz)						
46.34	-69.42	4.34	-65.08	-13.00	-52.08	H
3815.2	-58.25	10.59	-47.66	-13.00	-34.66	H
5722.8	-58.14	15.03	-43.11	-13.00	-30.11	H
46.34	-69.15	4.34	-64.81	-13.00	-51.81	V
3815.2	-58.38	10.59	-47.79	-13.00	-34.79	V
5722.8	-57.62	15.03	-42.59	-13.00	-29.59	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.

11. FREQUENCY STABILITY

11.1 Standard Applicable

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Cellular Band

Frequency range (MHz)	Base, fixed (ppm)	Mobile >3 watts (ppm)	Mobile ≤3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	N/A	N/A
929 to 960	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

According to §27.54 The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

11.2 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

11.3 Environmental Conditions

Temperature:	26°C
Relative Humidity:	54%
ATM Pressure:	101kPa

11.4 Summary of Test Results/Plots

For WCDMA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	2.19	0.0026
40	NV	2.05	0.0024
30	NV	2.03	0.0024
20	NV	3.04	0.0036
10	NV	3.16	0.0038
0	NV	2.56	0.0031
-10	NV	3.48	0.0042
-20	NV	0.70	0.0008
-30	NV	2.83	0.0034

For WCDMA Band 4 Mode

Reference Frequency(Middle Channel): 1732.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	2.07	0.0012
40	NV	1.97	0.0011
30	NV	3.04	0.0018
20	NV	3.13	0.0018
10	NV	1.84	0.0011
0	NV	1.99	0.0011
-10	NV	3.30	0.0019
-20	NV	1.02	0.0006
-30	NV	3.00	0.0017

For WCDMA Band 2 Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	1.67	0.0009
40	NV	3.47	0.0018
30	NV	2.46	0.0013
20	NV	2.78	0.0015
10	NV	3.46	0.0018
0	NV	2.68	0.0014
-10	NV	3.75	0.0020
-20	NV	0.14	0.0001
-30	NV	3.29	0.0017

For HSDPA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	1.55	0.0018
40	NV	2.26	0.0027
30	NV	2.83	0.0034
20	NV	3.48	0.0042
10	NV	3.40	0.0041
0	NV	2.95	0.0035
-10	NV	2.74	0.0033
-20	NV	2.04	0.0024
-30	NV	2.27	0.0027

For HSDPA Band 4 Mode

Reference Frequency(Middle Channel): 1732.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	2.16	0.0012
40	NV	2.83	0.0016
30	NV	3.57	0.0021
20	NV	2.90	0.0017
10	NV	1.67	0.0010
0	NV	2.33	0.0013
-10	NV	3.08	0.0018
-20	NV	1.45	0.0008
-30	NV	1.90	0.0011

For HSDPA Band 2 Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	1.75	0.0009
40	NV	2.66	0.0014
30	NV	3.16	0.0017
20	NV	3.33	0.0018
10	NV	3.29	0.0018
0	NV	3.10	0.0017
-10	NV	2.66	0.0014
-20	NV	0.98	0.0005
-30	NV	2.16	0.0012

For HSUPA Band 5 Mode

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	1.65	0.0020
40	NV	3.10	0.0037
30	NV	3.39	0.0041
20	NV	3.55	0.0042
10	NV	3.15	0.0038
0	NV	3.03	0.0036
-10	NV	2.82	0.0034
-20	NV	1.46	0.0017
-30	NV	2.57	0.0031

For HSUPA Band 4 Mode

Reference Frequency(Middle Channel): 1732.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	2.24	0.0013
40	NV	3.07	0.0018
30	NV	2.86	0.0017
20	NV	3.25	0.0019
10	NV	3.22	0.0019
0	NV	2.67	0.0015
-10	NV	2.80	0.0016
-20	NV	1.06	0.0006
-30	NV	2.83	0.0016

For HSUPA Band 2 Mode

Reference Frequency(Middle Channel): 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	NV	1.76	0.0009
40	NV	2.05	0.0011
30	NV	3.00	0.0016
20	NV	3.36	0.0018
10	NV	2.95	0.0016
0	NV	1.86	0.0010
-10	NV	3.12	0.0017
-20	NV	0.37	0.0002
-30	NV	1.54	0.0008

So, Frequency Stability Versus Input Voltage is:

Reference Frequency(Middle Channel): WCDMA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	3.01	0.0036
	NV	2.84	0.0034
	HV	2.06	0.0025
Reference Frequency(Middle Channel): WCDMA 1732.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	3.48	0.0020
	NV	3.19	0.0018
	HV	3.42	0.0020
Reference Frequency(Middle Channel): WCDMA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	3.02	0.0016
	NV	2.78	0.0015
	HV	3.56	0.0019

Reference Frequency(Middle Channel): HSDPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	3.54	0.0042
	NV	2.73	0.0033
	HV	2.96	0.0035
Reference Frequency(Middle Channel): HSDPA 1732.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	2.42	0.0014
	NV	3.51	0.0020
	HV	2.87	0.0017
Reference Frequency(Middle Channel): HSDPA 1880 MHz, Limit: 2.5ppm			
Environment	Power Supplied	Frequency Measure with Time Elapsed	

Temperature (°C)	(VDC)	Frequency (Hz)	Error (ppm)
20	LV	2.51	0.0013
	NV	2.81	0.0015
	HV	3.58	0.0019
Reference Frequency(Middle Channel): HSUPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	3.29	0.0039
	NV	3.34	0.0040
	HV	2.54	0.0030
Reference Frequency(Middle Channel): HSUPA 1732.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	3.04	3.04
	NV	2.56	2.56
	HV	2.95	2.95
Reference Frequency(Middle Channel): HSUPA 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	LV	3.32	0.0018
	NV	3.37	0.0018
	HV	2.88	0.0015

12. EUT PHOTO

EUT Photo 1



EUT Photo 2



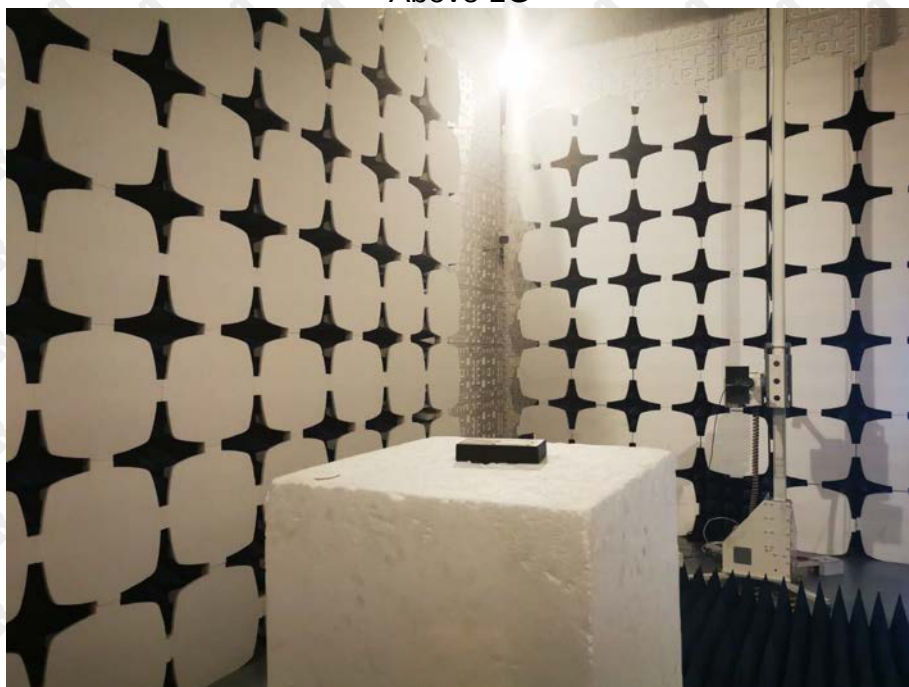
13. EUT TEST PHOTO

Radiated Emission

Below 1G



Above 1G



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