

FCC CFR47 PART 22H CERTIFICATION TEST REPORT FCC ID: 2BSTH-CT789

Product: GPS TRACKER

Trade Mark: N/A

Model No.: CT789

Family Model: CT782, CT784, CT781, OBD, CT795,
CT701, CT920, CT518, CT910

Report No.: N25062500109E

Issue Date: Dec. 23, 2025

Prepared for

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Prepared by

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TEST RESULT CERTIFICATION

Applicant's name	Beijing Zhongshun Chexiao Technology Co., Ltd.
Address.....	Floor 13, Room 11608, Building 523, Wangjing Dongyuan, Chaoyang District, Beijing, China
Manufacturer's Name	Beijing Zhongshun Chexiao Technology Co., Ltd.
Address.....	Floor 13, Room 11608, Building 523, Wangjing Dongyuan, Chaoyang District, Beijing, China
Product name.....	GPS TRACKER
Model and/or type reference ..	CT789
Trade Mark.....	N/A
Family Model.....	CT782, CT784, CT781, OBD, CT795, CT701, CT920, CT518, CT910
Test Sample Number.....	S2509170017-1#
Standards	FCC CFR 47 Part 22H
Test procedure	ANSI C63.26:2015
	ANSI/TIA-603-E-2016

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests..... Jun. 25, 2025 ~ Dec. 23, 2025

Date of Issue Dec. 23, 2025

Test Result..... **Pass**

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	GPS TRACKER
Trade Mark	N/A
Model Name	CT789
Family Model	CT782, CT784, CT781, OBD, CT795, CT701, CT920, CT518, CT910
Model Difference	All models have the same circuit and RF module, except for model names.
FCC ID:	2BSTH-CT789
Frequency Bands:	U.S. Bands: ☒ LTE FDD Band 5
Frequency Range:	LTE FDD Band 5 Uplink: 824MHz-849MHz, Downlink: 869MHz-894MHz;
Type of Modulation:	QPSK/16QAM/64QAM(Only Downlink)
Power Class	Class 3
SIM Card:	SIM 1 and SIM 2 is a chipset unit and tested as a single chipset. The SIM 1 is chosen for test.
Antenna:	FPC Antenna
Antenna gain:	Band 5: 2.5 dBi
Adapter	N/A
Battery	DC 3.7V, 150mAh, 0.555Wh
Power supply	DC 3.7V from battery
Extreme Vol. Limits:	DC 3.15V to DC 4.26V (Nominal DC 3.7V) (Note 1)
HW Version	YG-T89S
FW Version	YGT89S_V02
SW Version	YGT89S_V4.6
** Note1: The High Voltage DC 4.26V and Low Voltage 3.15V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2BSTH-CT789** filing to comply with the FCC Part 22H

1.3 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI/TIA-603-E-2016, FCC CFR 47 Part 2, Part 22, ANSI C63.26:2015.

1.4 TEST FACILITY

The test site used to collect the radiated data is located at:

ShenZhen NTEK Testing Technology Co., Ltd.

No. 24 Xinfu East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of China.

The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.26:2015& ANSI C63.4: 2014.

FCC Registration No.:463705

IC Registration No.:9270A,

CNAS Registration No.:L5516

MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.5dB

1.5 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

1.6 WORST-CASE CONFIGURATION AND MODE

The worst-case scenario for all measurements is based on the investigation results.

The device has LTE Bands of: Band 5

The RB Size was selected to measure for peak or average ERP and EIRP, which was based on the conducted power verification baseline data.

For the fundamental investigation of radiated emissions, the EUT is investigated for vertical and horizontal antenna orientations and X Y and Z orientations of the EUT alone. After the investigations the worst case was determined to be at X orientation for all LTE bands.

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.3 CONFIGURATION OF EUT SYSTEM

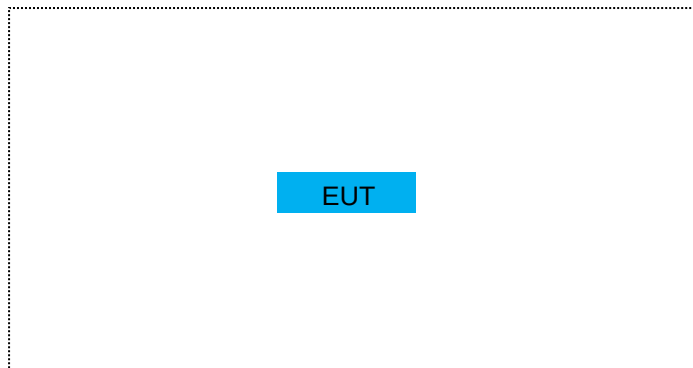
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	GPS TRACKER	CT789	FCC ID: 2BSTH-CT789	EUT

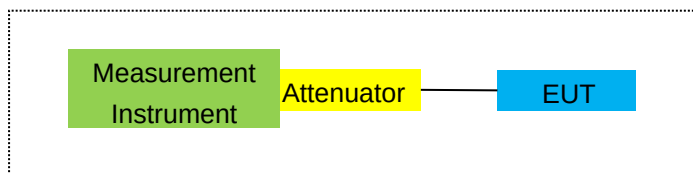
*Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.*

2.4 TEST SETUP

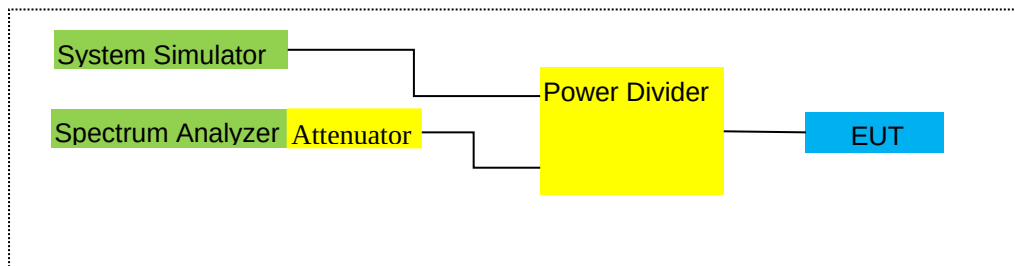
For Radiated Test Cases



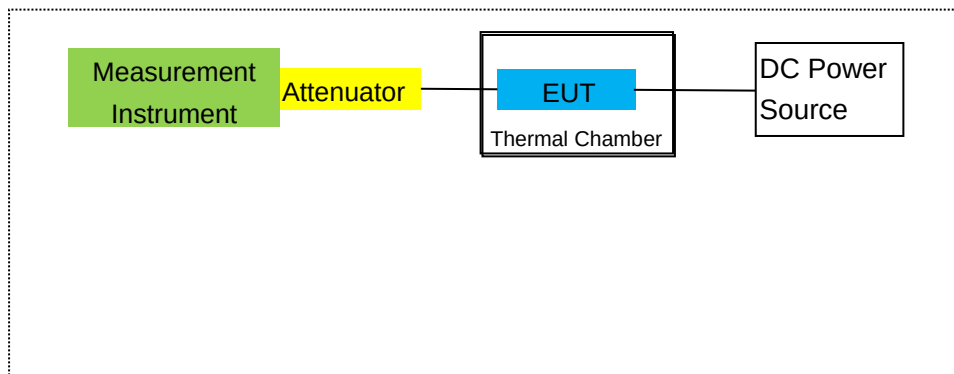
For Conducted Output Power



For Peak-to Average Ratio, Occupied Bandwidth, Conducted Band edge and Conducted Spurious Emission



For Frequency Stability



Note: EUT built-in battery-powered, the battery is fully-charged.

3.TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	MXA Signal Analyzer	Agilent	N9020A	MY49100060	2025.04.17	2026.04.16	1 year
2	Test Receiver	R&S	ESPI	101318	2025.04.17	2026.04.16	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2025.05.11	2026.05.10	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
5	Broadband Horn Antenna	SCHWARZBECK	BBHA 9120 D	2816	2024.5.18	2027.5.17	3 year
6	Broadband Horn Antenna	SCHWARZBECK	BBHA 9120 D	2817	2024.5.18	2027.5.17	3 year
7	Amplifier	EM	EM-30180	060538	2025.04.17	2026.04.16	1 year
8	Active Loop Antenna	SCHWARZBECK	FMZB 1519 B	055	2024.05.17	2027.05.16	3 year
9	Power Meter	R&S	NRVS	100696	2025.04.17	2026.04.16	1 year
10	Power Sensor	R&S	URV5-Z4	0395.1619.05	2025.04.17	2026.04.16	1 year
11	Test Cable	N/A	R-01	N/A	2023.06.17	2026.06.16	3 year
12	Test Cable	N/A	R-02	N/A	2023.06.17	2026.06.16	3 year
13	Test Cable	N/A	R-03	N/A	2023.06.17	2026.06.16	3 year
14	Test Receiver	R&S	ESCI	101160	2025.04.17	2026.04.16	1 year
15	LISN	R&S	ENV216	101313	2025.04.17	2026.04.16	1 year
16	LISN	EMCO	3816/2	00042990	2025.04.17	2026.04.16	1 year
17	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2024.04.26	2027.04.25	3 year
18	Field strength probe	narda	EP601	711WX81278	2025.04.17	2026.04.16	1 year
19	Test Cable	N/A	C01	N/A	2023.05.06	2026.05.05	3 year
20	Test Cable	N/A	C02	N/A	2023.05.06	2026.05.05	3 year
21	Test Cable	N/A	C03	N/A	2023.05.06	2026.05.05	3 year
22	Spectrum Analyzer	Agilent	E4440A	MY41000130	2025.04.17	2026.04.16	1 year
23	EMI Test Receiver	R&S	ESCI	101160	2025.04.17	2026.04.16	1 year
24	Universal Radio Communication Tester	R&S	CMU200	105747	2025.04.17	2026.04.16	1 year

25	High and Low Temperature Box	WEISS	WT 20/40 EMC Simpac	58226119460030	2024.05.30	2027.05.29	3 year
26	DC Power Source	N/A	PS-6005D	20170402923	2024.04.25	2027.04.24	3 year
27	MXG Vector Signal Generator	Agilent	N5183B	MY57280984	2025.04.17	2026.04.16	1 year
28	Log-Periodic Antenna	SCHWARZBECK	VULB 9162	584	2025.04.17	2026.04.16	1 year
29	Log-Periodic Antenna	SCHWARZBECK	VULB 9162	586	2025.04.17	2026.04.16	1 year

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable& DC Power Source which is scheduled for calibration every 3 years

Measurement Software

Item	Manufacturer	Software Name	Software Version	Description
1	MWRFTtest	MTS 8200	2.0	RF Conducted Test
2	Farad	EZ-EMC_RE	AIT-03A	RadiatedTest
3	raditeq	RadiMation	2023.1.3	RadiatedTest

4. OUTPUT POWER

4.1 OUTPUT POWER MEASUREMENT

LTE Measurement Procedure:

All LTE bands conducted power peak and average are obtained from the CMW500 telecommunication test set. The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".³

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10, 15, 20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

Test data reference attachment.

5. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

MODES TESTED

Band 5

RESULTS

PASS

Test data reference attachment.

6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §22.901, §22.917

FCC: §22.359

LIMITS

FCC: §22.917

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.

(m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Show citation box.

(c)(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

TEST PROCEDURE

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

Set the spectrum analyzer span to include the block edge frequency

Set a marker to point the corresponding band edge frequency in each test case.

Set resolution bandwidth to at least 1% of emission bandwidth.

MODES TESTED

Band 5

RESULTS

Test data reference attachment.

7. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917

LIMITS

1. 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.
2. The Band 7/41 emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $55 + 10 \log (P)$ dB.

TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

MODES TESTED

Band 5

7.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

Test data reference attachment.

8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913

LIMITS:

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17

KDB 971168 v02r01 RF power output using broadband peak and average power meter method.

KDB 971168 D01 Power Meas License Digital Systems v02r01, "Measurement Guidance for Certification of Licensed Digital Transmitters"

MODES TESTED

Band 5

RESULTS

Pass

8.2 LTE BAND 5

Radiated Power (ERP) for Band 5											
Mode	RB/RB SIZE	Frequency	Result							Limit	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP		
1.4MHz Band QPSK	6/0	824.7	20.25	2.01	5.30	2.15	21.39	137.721	Horizontal	7	Pass
		836.5	20.85	2.01	5.30	2.15	21.99	158.125	Horizontal	7	Pass
		848.3	19.85	2.02	5.70	2.15	21.38	137.404	Horizontal	7	Pass
3.0MHz Band QPSK	15/0	825.5	21.41	2.01	5.30	2.15	22.55	179.887	Horizontal	7	Pass
		836.5	20.44	2.01	5.30	2.15	21.58	143.880	Horizontal	7	Pass
		847.5	20.48	2.02	5.70	2.15	22.01	158.855	Horizontal	7	Pass
5.0MHz Band QPSK	25/0	826.5	19.20	2.01	5.30	2.15	20.34	108.143	Horizontal	7	Pass
		836.5	20.58	2.01	5.30	2.15	21.72	148.594	Horizontal	7	Pass
		846.5	20.64	2.02	5.70	2.15	22.17	164.816	Horizontal	7	Pass
10.0MHz Band QPSK	50/0	829	19.40	2.01	5.30	2.15	20.54	113.240	Horizontal	7	Pass
		836.5	20.66	2.01	5.30	2.15	21.8	151.356	Horizontal	7	Pass
		844	19.85	2.02	5.70	2.15	21.38	137.404	Horizontal	7	Pass
1.4MHz Band QPSK	6/0	824.7	21.89	2.01	5.30	2.15	23.03	200.909	Vertical	7	Pass
		836.5	21.45	2.01	5.30	2.15	22.59	181.552	Vertical	7	Pass
		848.3	19.40	2.02	5.70	2.15	20.93	123.880	Vertical	7	Pass
3.0MHz Band QPSK	15/0	825.5	21.46	2.01	5.30	2.15	22.6	181.970	Vertical	7	Pass
		836.5	20.86	2.01	5.30	2.15	22	158.489	Vertical	7	Pass
		847.5	18.47	2.02	5.70	2.15	20	100.000	Vertical	7	Pass
5.0MHz Band QPSK	25/0	826.5	18.66	2.01	5.30	2.15	19.8	95.499	Vertical	7	Pass
		836.5	21.33	2.01	5.30	2.15	22.47	176.604	Vertical	7	Pass
		846.5	19.71	2.02	5.70	2.15	21.24	133.045	Vertical	7	Pass
10.0MHz Band QPSK	50/0	829	18.40	2.01	5.30	2.15	19.54	89.950	Vertical	7	Pass
		836.5	22.45	2.01	5.30	2.15	23.59	228.560	Vertical	7	Pass
		844	19.63	2.02	5.70	2.15	21.16	130.617	Vertical	7	Pass

Radiated Power (ERP) for Band 5											
Mode	RB/RB SIZE	Frequency	Result							Limit	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Factor (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP		
1.4MHz Band 16 QAM	6/0	824.7	19.46	2.01	5.30	2.15	20.6	114.815	Horizontal	7	Pass
		836.5	20.19	2.01	5.30	2.15	21.33	135.831	Horizontal	7	Pass
		848.3	19.29	2.02	5.70	2.15	20.82	120.781	Horizontal	7	Pass
3.0MHz Band 16 QAM	15/0	825.5	19.73	2.01	5.30	2.15	20.87	122.180	Horizontal	7	Pass
		836.5	18.79	2.01	5.30	2.15	19.93	98.401	Horizontal	7	Pass
		847.5	19.33	2.02	5.70	2.15	20.86	121.899	Horizontal	7	Pass
5.0MHz Band 16 QAM	25/0	826.5	19.41	2.01	5.30	2.15	20.55	113.501	Horizontal	7	Pass
		836.5	18.93	2.01	5.30	2.15	20.07	101.625	Horizontal	7	Pass
		846.5	19.49	2.02	5.70	2.15	21.02	126.474	Horizontal	7	Pass
10.0MHz Band 16 QAM	50/0	829	18.96	2.01	5.30	2.15	20.1	102.329	Horizontal	7	Pass
		836.5	18.29	2.01	5.30	2.15	19.43	87.700	Horizontal	7	Pass
		844	19.13	2.02	5.70	2.15	20.66	116.413	Horizontal	7	Pass
1.4MHz Band 16 QAM	6/0	824.7	20.78	2.01	5.30	2.15	21.92	155.597	Vertical	7	Pass
		836.5	20.47	2.01	5.30	2.15	21.61	144.877	Vertical	7	Pass
		848.3	19.80	2.02	5.70	2.15	21.33	135.831	Vertical	7	Pass
3.0MHz Band 16 QAM	15/0	825.5	18.28	2.01	5.30	2.15	19.42	87.498	Vertical	7	Pass
		836.5	19.64	2.01	5.30	2.15	20.78	119.674	Vertical	7	Pass
		847.5	18.24	2.02	5.70	2.15	19.77	94.842	Vertical	7	Pass
5.0MHz Band 16 QAM	25/0	826.5	19.05	2.01	5.30	2.15	20.19	104.472	Vertical	7	Pass
		836.5	17.37	2.01	5.30	2.15	18.51	70.958	Vertical	7	Pass
		846.5	19.33	2.02	5.70	2.15	20.86	121.899	Vertical	7	Pass
10.0MHz Band 16 QAM	50/0	829	18.46	2.01	5.30	2.15	19.6	91.201	Vertical	7	Pass
		836.5	21.22	2.01	5.30	2.15	22.36	172.187	Vertical	7	Pass
		844	20.99	2.02	5.70	2.15	22.52	178.649	Vertical	7	Pass

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Factor Gain(dB)=Antenna Gain(dB) + Amplifier Factor (dB)

ERP(dBm)=EIRP-2.15

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1053, §22.917

LIMIT

§22.917 (e) and §24.238 and §90.691 (a): Out of band emissions. 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.

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). 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.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). 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.

The unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth in the 1 MHz band immediately outside and adjacent to the channel edge of the equipment. Beyond the 1 MHz band immediately outside the channel edge of the equipment, a resolution bandwidth of 1 MHz shall be employed. A narrower resolution bandwidth is allowed to be used provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz or 1% of the occupied bandwidth as applicable.

The power of any unwanted emissions measured from the channel edge of the equipment shall be attenuated below the transmitter power, P (dBW), as follows:

- a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB at the channel edges and $55 + 10 \log_{10}(p)$ at 5.5 MHz away and beyond the channel edges where p in (a) and (b) is the transmitter power measured in watts.

MODES TESTED

LTE Band 5

RESULTS

PASS

9.1 LTE BAND 5

QPSK EIRP POWER FOR LTE BAND 5 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1649.4	-48.09	2.78	27.50	-23.37	-13	-10.37	Horizontal
1649.4	-48.40	2.78	27.50	-23.68	-13	-10.68	Vertical
2474.1	-50.35	2.90	27.80	-25.45	-13	-12.45	Vertical
2474.1	-56.23	2.90	27.80	-31.33	-13	-18.33	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-47.43	2.78	27.48	-22.73	-13	-9.73	Horizontal
1673	-54.84	2.78	27.48	-30.14	-13	-17.14	Vertical
2509.5	-49.01	2.91	27.70	-24.22	-13	-11.22	Vertical
2509.5	-55.61	2.91	27.70	-30.82	-13	-17.82	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-52.10	2.78	27.43	-27.45	-13	-14.45	Horizontal
1696.6	-53.07	2.78	27.43	-28.42	-13	-15.42	Vertical
2544.9	-52.76	2.92	27.74	-27.94	-13	-14.94	Vertical
2544.9	-50.11	2.92	27.74	-25.29	-13	-12.29	Horizontal

QPSK EIRP POWER FOR LTE BAND 5 (10MHZ BANDWIDTH)

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Factor(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1658	-54.33	2.78	27.50	-29.61	-13	-16.61	Horizontal
1658	-52.60	2.78	27.50	-27.88	-13	-14.88	Vertical
2487	-56.01	2.90	27.80	-31.11	-13	-18.11	Vertical
2487	-57.63	2.90	27.80	-32.73	-13	-19.73	Horizontal
Test Results for Mid Channel 836.5MHz							
1673	-53.57	2.78	27.48	-28.87	-13	-15.87	Horizontal
1673	-49.24	2.78	27.48	-24.54	-13	-11.54	Vertical
2509.5	-57.52	2.91	27.70	-32.73	-13	-19.73	Vertical
2509.5	-49.61	2.91	27.70	-24.82	-13	-11.82	Horizontal
Test Results for High Channel 844MHz							
1688	-54.70	2.78	27.43	-30.05	-13	-17.05	Horizontal
1688	-50.78	2.78	27.43	-26.13	-13	-13.13	Vertical
2532	-50.88	2.92	27.74	-26.06	-13	-13.06	Vertical
2532	-51.71	2.92	27.74	-26.89	-13	-13.89	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

. Over Limit= : P_{Mea}(dBm)-Limit(dBm)

. Both QPSK and 16QAM has been tested, the worst case is QPSK mode, the report just reported the worst case.

10. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

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

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

Temp. = -30° to $+50^{\circ}\text{C}$

Voltage = low voltage, DC 3.15V, Normal, DC 3.7V and High voltage, DC 4.26V.

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to -30°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until $+50^{\circ}\text{C}$ is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

MODES TESTED

LTE Band 5

RESULTS

See the following pages.

10.1 LTE BAND 5

Band 5 QPSK, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	836.5	8	0.009564	2.5
3.7	836.5	12	0.014345	2.5
4.26	836.5	1	0.001195	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	21	0.025105	2.5
Extreme (50C)	836.5	6	0.007173	2.5
Extreme (40C)	836.5	22	0.026300	2.5
Extreme (30C)	836.5	6	0.007173	2.5
Extreme (10C)	836.5	15	0.017932	2.5
Extreme (0C)	836.5	12	0.014345	2.5
Extreme (-10C)	836.5	14	0.016736	2.5
Extreme (-20C)	836.5	26	0.031082	2.5
Extreme (-30C)	836.5	17	0.020323	2.5

Band 5 16QAM, (10MHz BANDWIDTH RB size 50 RB Offset 0)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
3.15	836.5	24	0.028691	2.5
3.7	836.5	13	0.015541	2.5
4.26	836.5	10	0.011955	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
Normal (25C)	836.5	25	0.029886	2.5
Extreme (50C)	836.5	23	0.027496	2.5
Extreme (40C)	836.5	13	0.015541	2.5
Extreme (30C)	836.5	13	0.015541	2.5
Extreme (10C)	836.5	1	0.001195	2.5
Extreme (0C)	836.5	25	0.029886	2.5
Extreme (-10C)	836.5	11	0.013150	2.5
Extreme (-20C)	836.5	6	0.007173	2.5
Extreme (-30C)	836.5	5	0.005977	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

11. Peak-to-Average Ratio

11.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

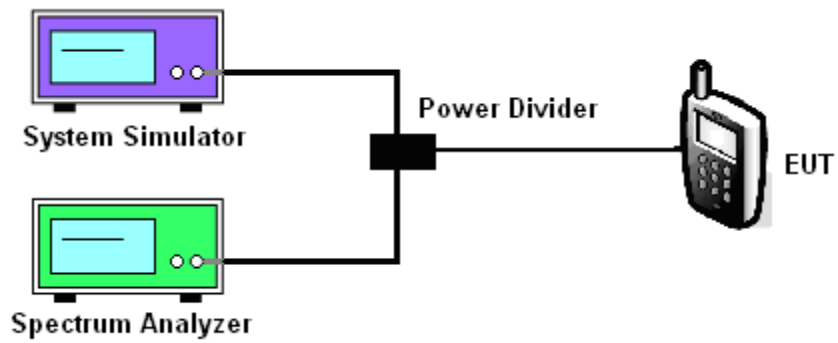
11.2 Measuring Instruments

See list of measuring instruments of this test report.

11.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. For LTE operating modes:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

11.4 Test Setup



MODES TESTED

LTE Band 5

Test data reference attachment.

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