



Test report No:
 NIE: 59927RAN.002

Summation Test report

CTIA Test Plan for Wireless Device Over-the-Air Performance, Version 3.7.1, February 2018

Identification of item tested	Tracking device
Trademark	Cellotrack 10Y LTE C1 NA
Model and /or type reference	GC9773000
Other identification of the product	S/N: 2310287 FCC ID: QIPELS61-USA IC: 7830A-ELS61USA
Features	WCDMA and LTE cellular technologies
Manufacturer	Company name: Pointer Telocation Inc. Postal Address: 7715 NW 48 th Street, Suite 395 Doral, FL 33166 USA
Test method requested, standard	[1] CTIA Test Plan for Wireless Device Over-the-Air Performance, Version 3.7.1, February 2018
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Miguel Lacave Antennas Lab Manager
Date of issue	2019-03-07
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1. TEST CONDITIONS

1.1 Power supply (V)

Power supply (V) under test: V_n = supplied by its own 3.6 V_{DC} battery.

1.2 Test frequencies and output power

In the operating bands under test the measurements for Total Radiated Power (TRP) and Total Isotropic Sensitivity (TIS) measurements were on the lowest, middle and highest channels defined by the standard [1]. Continuum of channels across each supported band was performed for Intermediate Channel Sensitivity (ICS) tests.

The output power of the device under test was set to maximum for all tests.

1.3 Antenna orientation and setup requirements

The EUT is rotated along two different spherical axes: theta (θ) and phi (Φ). The relationship between the 3D Cartesian coordinate system (X, Y, Z) and the theta and phi axes is illustrated in the following figure. This coordinate system should be used as reference in all 3D radiation pattern graphs in section 4 as well as test setup photographs in Appendix B.

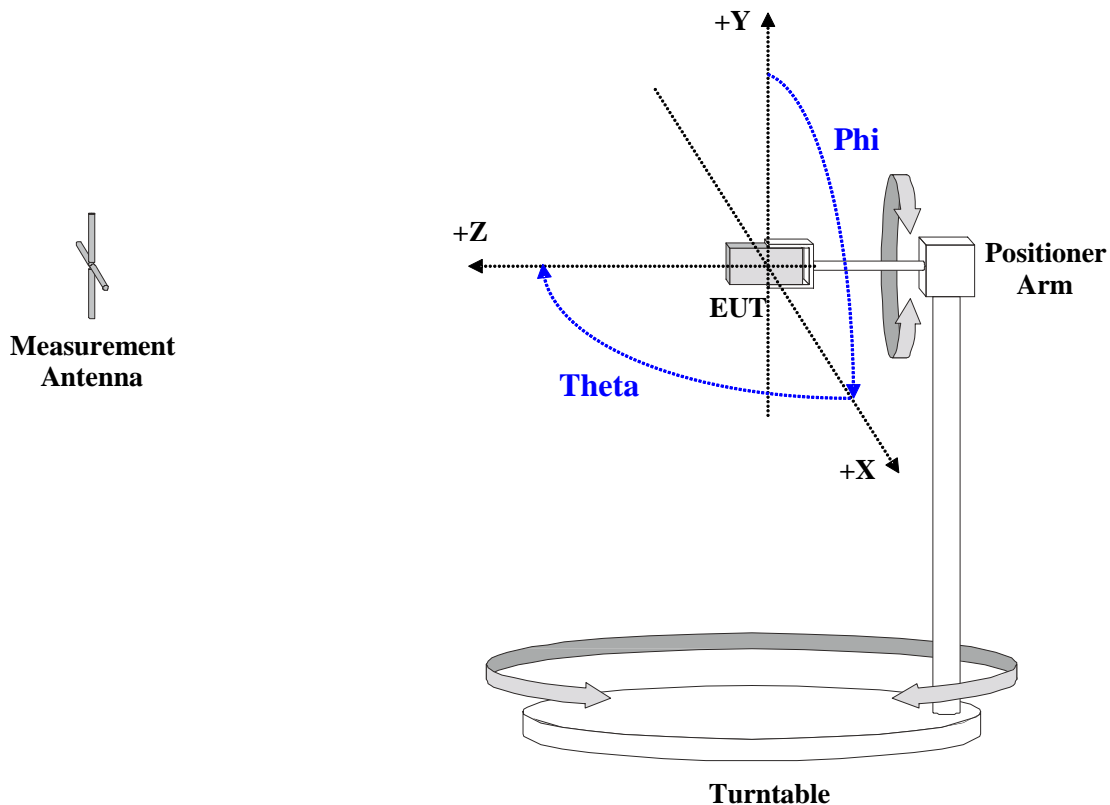


Fig. 1. Coordinate system.

Theta is the spherical axis that rotates along the Cartesian Y axis while Phi is the spherical axis that rotates along the Cartesian Z axis. The initial measurement position (Theta = 0° and Phi = 0°) is illustrated in each of the test setup photographs in Appendix B. The EUT has only one mechanical configuration each and they were tested in the “Free-space” configuration, whereby EUT has been placed directly on a support.

2. TEST RESULTS

2.1 Equipment Under Test (EUT) information

Manufacturer	Pointer Telocation Inc.
Model	Cellotrack 10Y LTE C1 NA; GC9773000
Serial Number(s)/ESN(s)/IMEI(s)	S/N: 2310287
FCC ID Number	QIPELS61-USA
Hardware Version	B
Software Version	65
Configuration of Primary Mechanical Mode	Integrated device with internal antenna (only one)

2.2 Bands and protocols supported by each antenna

Antenna Label	Bands and Protocols for Which the Antenna Is Connected to the Transmitter	Bands and Protocols for Which the Antenna Is Connected to the Primary Receiver and Is Always Active	Bands and Protocols for Which the Antenna Is Connected to the Primary Receiver and Is Dynamically Active	Bands and Protocols for Which the Antenna Is Connected to the Secondary Receiver and Is Always Active	Bands and Protocols for Which the Antenna Is Connected to the Secondary Receiver and Is Dynamically Active	Protocol/Band Pairs Which Cannot Be Used for Single Point Offset Tests per (Section 5.13, Section 6.15, and Section 6.13.3.3) Because the Antenna Tuning Changes
'A'	WCDMA II/IV/V LTE 2/4/5/12	WCDMA II/IV/V LTE 2/4/5/12	N/A	N/A	N/A	N/A

2.3 EUTs used for each test

Serial Number/ ESN/IMEI	CATL/ Chamber used	Cellular Radio Mode(s)	Band(s)	Test Type(s)	Test Condition(s)
S/N: 2310287	Code 20080208-00 / ETS Lindgren AMS- 8700	WCDMA, LTE	WCDMA II/IV/V LTE 2/4/5/12	TRP/TIS/ICS	Free Space

2.4 Cellular OTA Summation Test Report

WCDMA – TRP Test Results

Band / Tech	Channel	Frequency (MHz)	Conducted power (dBm)	Antenna Label					TRP (dBm)					NHPRP ± 45° (dBm)					NHPRP ± 30° (dBm)				
				FS	HL	HR	BHHL	BHHR	FS	HL	HR	BHHL	BHHR	FS	HL	HR	BHHL	BHHR	FS	HL	HR	BHHL	BHHR
WCDMA II	9262	1852.4	-	A	-	-	-	-	21.78	-	-	-	-	19.67	-	-	-	-	17.77	-	-	-	-
	9400	1880	-	A	-	-	-	-	21.90	-	-	-	-	20.01	-	-	-	-	18.26	-	-	-	-
	9538	1907.6	-	A	-	-	-	-	21.85	-	-	-	-	19.86	-	-	-	-	18.08	-	-	-	-
WCDMA IV	1312	1712.4	-	A	-	-	-	-	18.83	-	-	-	-	17.37	-	-	-	-	15.20	-	-	-	-
	1413	1732.6	-	A	-	-	-	-	18.95	-	-	-	-	17.51	-	-	-	-	15.44	-	-	-	-
	1513	1752.6	-	A	-	-	-	-	19.58	-	-	-	-	18.18	-	-	-	-	16.19	-	-	-	-
WCDMA V	4132	826.4	-	A	-	-	-	-	19.24	-	-	-	-	18.58	-	-	-	-	17.46	-	-	-	-
	4183	836.6	-	A	-	-	-	-	19.28	-	-	-	-	18.61	-	-	-	-	17.48	-	-	-	-
	4233	846.6	-	A	-	-	-	-	19.12	-	-	-	-	18.43	-	-	-	-	17.29	-	-	-	-

WCDMA – TIS Test Results

Band / Tech	Channel	Frequency (MHz)	Conducted sensitivity (dBm)	Antenna Label					TIS (dBm)					NHPIS ± 45° (dBm)					NHPIS ± 30° (dBm)				
				FS	HL	HR	BHHL	BHHR	FS	HL	HR	BHHL	BHHR	FS	HL	HR	BHHL	BHHR	FS	HL	HR	BHHL	BHHR
WCDMA II	9662	1932.4	-	A	-	-	-	-	-109.5	-	-	-	-	-107.8	-	-	-	-	-106.1	-	-	-	-
	9800	1960	-	A	-	-	-	-	-110.5	-	-	-	-	-108.8	-	-	-	-	-107.2	-	-	-	-
	9938	1987.6	-	A	-	-	-	-	-108.0	-	-	-	-	-106.5	-	-	-	-	-104.4	-	-	-	-
WCDMA IV	1537	2112.4	-	A	-	-	-	-	-109.7	-	-	-	-	-107.9	-	-	-	-	-106.3	-	-	-	-
	1638	2132.6	-	A	-	-	-	-	-109.5	-	-	-	-	-107.9	-	-	-	-	-106.4	-	-	-	-
	1738	2152.6	-	A	-	-	-	-	-105.2	-	-	-	-	-103.2	-	-	-	-	-101.6	-	-	-	-
WCDMA V	4357	871.4	-	A	-	-	-	-	-106.6	-	-	-	-	-105.6	-	-	-	-	-104.3	-	-	-	-
	4408	881.6	-	A	-	-	-	-	-108.1	-	-	-	-	-107.1	-	-	-	-	-105.8	-	-	-	-
	4458	891.6	-	A	-	-	-	-	-106.1	-	-	-	-	-105.0	-	-	-	-	-103.7	-	-	-	-

Values that do not meet the CTIA recommended performance are marked in red font

FS = Free Space

HL = Hand Left (Hand Phantom Only)

HR = Hand Right (Hand Phantom Only)

BHHL = Beside Head and Hand Left Side (Head and Hand Phantom)

BHHR = Beside Head and Hand Right Side (Head and Hand Phantom)

- = Not Applicable

LTE – TRP Test Results

Band / Tech	Channel	Frequency (MHz)	Conducted power (dBm)	Antenna Label					TRP (dBm)					NHPRP ± 45° (dBm)					NHPRP ± 30° (dBm)				
				FS	HL	HR	BHHL	BHHR	FS	HL	HR	BHHL	BHHR	FS	HL	HR	BHHL	BHHR	FS	HL	HR	BHHL	BHHR
LTE 2	18650	1851.58	-	A	-	-	-	-	20.14	-	-	-	-	17.97	-	-	-	-	16.02	-	-	-	-
	18900	1880	-	A	-	-	-	-	21.13	-	-	-	-	19.07	-	-	-	-	17.29	-	-	-	-
	19150	1908.42	-	A	-	-	-	-	20.60	-	-	-	-	18.62	-	-	-	-	16.79	-	-	-	-
LTE 4	20000	1711.58	-	A	-	-	-	-	20.91	-	-	-	-	19.23	-	-	-	-	17.04	-	-	-	-
	20175	1732.5	-	A	-	-	-	-	19.86	-	-	-	-	18.04	-	-	-	-	15.57	-	-	-	-
	20350	1753.42	-	A	-	-	-	-	19.43	-	-	-	-	17.52	-	-	-	-	15.02	-	-	-	-
LTE 5	20450	825.58	-	A	-	-	-	-	18.23	-	-	-	-	17.55	-	-	-	-	16.42	-	-	-	-
	20525	836.5	-	A	-	-	-	-	17.92	-	-	-	-	17.24	-	-	-	-	16.11	-	-	-	-
	20600	847.42	-	A	-	-	-	-	18.71	-	-	-	-	18.06	-	-	-	-	16.93	-	-	-	-
LTE 12	23035	699.97	-	A	-	-	-	-	19.74	-	-	-	-	19.17	-	-	-	-	18.11	-	-	-	-
	23095	707.5	-	A	-	-	-	-	17.64	-	-	-	-	17.05	-	-	-	-	15.98	-	-	-	-
	23155	715.03	-	A	-	-	-	-	17.22	-	-	-	-	16.63	-	-	-	-	15.55	-	-	-	-

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BHHR = Beside Head and Hand Right Side (Head and Hand Phantom)

- = Not Applicable

LTE – TIS Test Results

Band / Tech	Channel	Frequency (MHz)	Conducted sensitivity (dBm)	Antenna Label					TIS (dBm)					NHPIS ± 45° (dBm)					NHPIS ± 30° (dBm)				
				FS	HL	HR	BHHL	BHHR	FS	HL	HR	BHHL	BHHR	FS	HL	HR	BHHL	BHHR	FS	HL	HR	BHHL	BHHR
LTE 2	650	1935	-	A	-	-	-	-	-94.1	-	-	-	-	-92.4	-	-	-	-	-90.5	-	-	-	-
	900	1960	-	A	-	-	-	-	-94.7	-	-	-	-	-93.0	-	-	-	-	-91.1	-	-	-	-
	1150	1985	-	A	-	-	-	-	-94.3	-	-	-	-	-92.6	-	-	-	-	-90.7	-	-	-	-
LTE 4	2000	2115	-	A	-	-	-	-	-94.8	-	-	-	-	-93.0	-	-	-	-	-91.4	-	-	-	-
	2175	2132.5	-	A	-	-	-	-	-94.4	-	-	-	-	-92.7	-	-	-	-	-91.3	-	-	-	-
	2350	2150	-	A	-	-	-	-	-93.2	-	-	-	-	-91.7	-	-	-	-	-90.3	-	-	-	-
LTE 5	2450	874	-	A	-	-	-	-	-93.5	-	-	-	-	-92.7	-	-	-	-	-91.5	-	-	-	-
	2525	881.5	-	A	-	-	-	-	-93.9	-	-	-	-	-93.1	-	-	-	-	-92.0	-	-	-	-
	2600	889	-	A	-	-	-	-	-93.3	-	-	-	-	-92.5	-	-	-	-	-91.4	-	-	-	-
LTE 12	5035	731.5	-	A	-	-	-	-	-91.6	-	-	-	-	-90.9	-	-	-	-	-89.8	-	-	-	-
	5095	737.5	-	A	-	-	-	-	-92.7	-	-	-	-	-92.0	-	-	-	-	-90.9	-	-	-	-
	5155	743.5	-	A	-	-	-	-	-89.0	-	-	-	-	-88.3	-	-	-	-	-87.1	-	-	-	-

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- = Not Applicable

WCDMA Intermediate Channel Relative Sensitivity (RS)

Band / Mode	Intermediate Channels	FS	BHHR
WCDMA Band II	9662-9728	Pass	-
	9740-9860	Pass	-
	9872-9938	Pass	-
WCDMA Band IV	1537-1578	Pass	-
	1590-1686	Pass	-
	1698-1738	Pass	-
WCDMA Band V	4357-4372	Pass	-
	4384-4432	Pass	-
	4444-4458	Pass	-

LTE Intermediate Channel Relative Sensitivity (RS)

Band	Channel Bandwidth (MHz)	Channel	Frequency (MHz)	UL RB Allocation	DL RB Allocation	FS EIS _(IC) (dBm) "A" receiver	BHHR EIS _(IC) (dBm) "A" receiver	FS EIS _(IC) (dBm) "B" receiver	BHHR EIS _(IC) (dBm) "B" receiver
2	10	650	1935	50 with RBstart=0	50 with RBstart=0	-98.71	-	-	-
2	10	740	1944	50 with RBstart=0	50 with RBstart=0	-99.21	-	-	-
2	10	820	1952	50 with RBstart=0	50 with RBstart=0	-100.37	-	-	-
2	10	900	1960	50 with RBstart=0	50 with RBstart=0	-100.16	-	-	-
2	10	980	1968	50 with RBstart=0	50 with RBstart=0	-98.46	-	-	-
2	10	1060	1976	50 with RBstart=0	50 with RBstart=0	-98.16	-	-	-
2	10	1150	1985	50 with RBstart=0	50 with RBstart=0	-99.58	-	-	-
4	10	2000	2115	50 with RBstart=0	50 with RBstart=0	-99.11	-	-	-
4	10	2090	2124	50 with RBstart=0	50 with RBstart=0	-99.57	-	-	-
4	10	2175	2132.5	50 with RBstart=0	50 with RBstart=0	-99.39	-	-	-
4	10	2260	2141	50 with RBstart=0	50 with RBstart=0	-99.04	-	-	-
4	10	2350	2150	50 with RBstart=0	50 with RBstart=0	-98.65	-	-	-
5	10	2450	874	25 with RBstart=25	50 with RBstart=0	-96.06	-	-	-
5	10	2525	881.5	25 with RBstart=25	50 with RBstart=0	-96.32	-	-	-
5	10	2600	889	25 with RBstart=25	50 with RBstart=0	-95.61	-	-	-
12	5	5035	731.5	20 with RBstart=5	25 with RBstart=0	-94.71	-	-	-
12	5	5065	734.5	20 with RBstart=5	25 with RBstart=0	-93.74	-	-	-
12	5	5095	737.5	20 with RBstart=5	25 with RBstart=0	-89.89	-	-	-
12	5	5125	740.5	20 with RBstart=5	25 with RBstart=0	-94.09	-	-	-
12	5	5155	743.5	20 with RBstart=5	25 with RBstart=0	-90.76	-	-	-

FS = Free Space
 BHHR = Beside Head and Hand Right Side (Head and Hand Phantom)
 - = Not Applicable

3. EXPANDED MEASUREMENT UNCERTAINTIES

The expanded measurement uncertainties are listed below for the different frequency bands covered in this report. These uncertainties refer to a coverage factor of 2, corresponding to 95% confidence level.

Table 1. **Total Normal and Alternate TRP Measurement Uncertainty results for AMS-8700**

Test Method	TRP Test Configuration	Uncertainty Expanded Uncertainty (k=2, 95 % confidence level) [dB]					
		LTE 700 699-798 MHz	Cellular 824-894 MHz	AWS-1 Tx 1710-1755 MHz	PCS 1850-1990 MHz	LTE 41 2300-2800 MHz	Limits according to CTIA test plan v3.7.1, table 7-8
Normal	FREE SPACE	1.48	1.60	1.52	1.56	1.65	2.0
	PHANTOM HEAD AND HAND	2.14	2.22	2.17	2.20	2.26	2.4
	PHANTOM HAND ONLY	1.74	1.84	1.78	1.81	1.89	2.2
	LAPTOPS OVER 30cm	1.71	1.94	1.89	1.75	1.93	2.0
Alternate	FREE SPACE	1.54	1.65	1.58	1.61	1.70	2.0
	PHANTOM HEAD AND HAND	2.18	2.26	2.21	2.23	2.30	2.4
	PHANTOM HAND ONLY	1.79	1.89	1.83	1.86	1.93	2.2
	LAPTOPS OVER 30cm	1.76	1.98	1.93	1.80	1.98	2.0

Table 2. **Total Normal, RSS based and Alternate TIS Measurement Uncertainty results for AMS-8700**

Test Method	TIS Test Configuration	Uncertainty Expanded Uncertainty (k=2, 95 % confidence level) [dB]						
		LTE 700 699-798 MHz	Cellular 824-894 MHz	GPS 1575.42 MHz	PCS 1850-1990 MHz	AWS-1 Rx 2110-2155 MHz	LTE 41 2300-2800 MHz	Limits according to CTIA test plan v3.7.1, table 7-8
Normal	FREE SPACE	1.67	1.77	--	1.74	1.59	1.82	2.3
	PHANTOM HEAD AND HAND	2.27	2.35	--	2.32	2.21	2.38	2.6
	PHANTOM HAND ONLY	1.90	1.99	--	1.96	1.83	2.03	2.4
	LAPTOPS OVER 30cm	1.88	2.09	--	1.91	2.04	2.08	2.3
RSS based	FREE SPACE	1.77	1.87	--	1.84	1.70	1.91	2.3
	PHANTOM HEAD AND HAND	2.35	2.43	--	2.40	2.29	2.46	2.6
	PHANTOM HEAD ONLY	1.99	2.08	--	2.05	1.93	2.12	2.4
	LAPTOPS OVER 30cm	1.97	2.17	--	2.00	2.12	2.17	2.3
Alternate	FREE SPACE	1.81	1.91	--	1.88	1.74	1.95	2.3
	PHANTOM HEAD AND HAND	2.38	2.46	--	2.43	2.33	2.49	2.6
	PHANTOM HAND ONLY	2.03	2.12	--	2.09	1.96	2.15	2.4
	LAPTOPS OVER 30cm	2.01	2.20	--	2.04	2.16	2.20	2.3