

RF EXPOSURE EVALUATION REPORT

Issued to

TCT Mobile Limited

For

Wifi Display Dongle

Model Name : HOME V102/V102
Trade Name : ALCATEL
onetouch
Brand Name : ALCATEL
onetouch
FCC ID : RAD507
Standard : 47CFR 2.1091
KDB 447498 D01 General RF
Exposure Guidance v05r02
Test date : 2014-5-28
Issue date : 2014-6-13

by

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Date 2014.6.13

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Change History		
Issue	Date	Reason for change
1.0	June 13, 2014	First edition

1. TESTING LABORATORY

1.1. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China 518101
FCC Registration Number:	695796

1.2. Accreditation Certificate

Accredited Testing Laboratory: No. CNAS L3572

2. TECHNICAL INFORMATION

Note: the following data is based on the information by the applicant.

2.1. Identification of Applicant

Company Name:	TCT Mobile Limited
Address:	5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203

2.2. Identification of Manufacturer

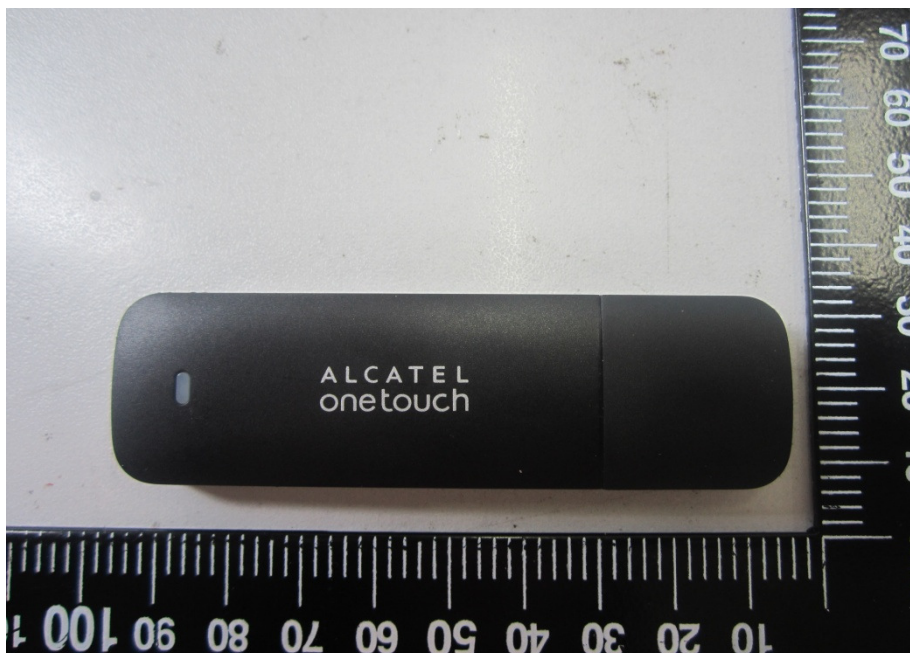
Company Name:	TCL COMMUNICATION TECHNOLOGY HOLDINGS LIMITED
Address:	70 Huifeng 4rd, ZhongKai Hi-tech Development District, Huizhou, Guangdong 516006 P.R.China (TCL Mobile Communication Co., LTD. Huizhou)

2.3. Equipment Under Test (EUT)

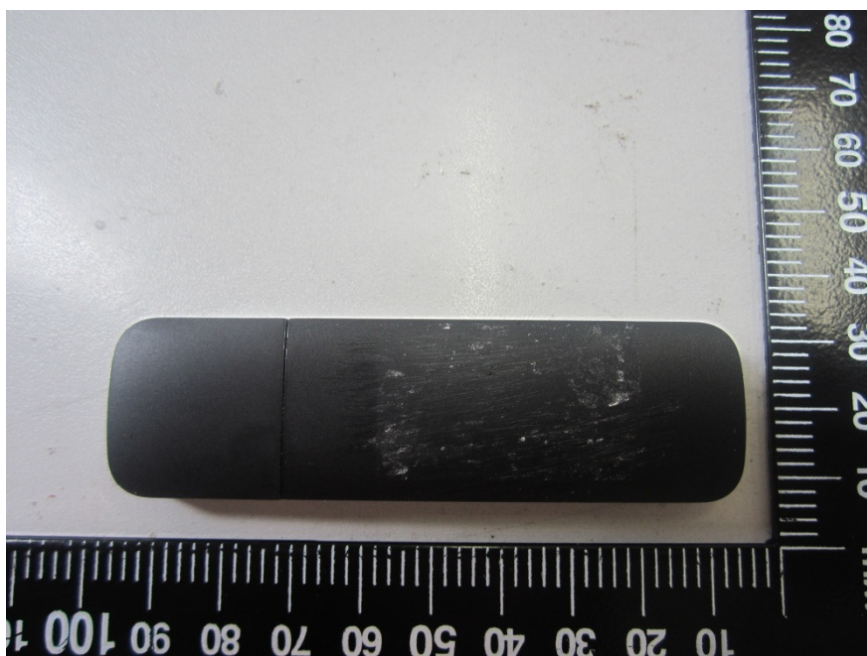
Model Name:	HOME V102/V102
Trade Name:	ALCATEL onetouch
Brand Name:	ALCATEL onetouch
Hardware Version:	V1.2
Software Version:	V1.1.4
Frequency Bands:	Wifi802.11b/g/n:2412-2462MHz; Wifi802.11a/n: 5170-5805MHz;
Modulation Mode:	Wifi802.11b: DSSS; Wifi802.11a/g/n: OFDM;
Antenna type:	Fixed Internal Antenna
Development Stage:	Identical prototype

2.3.1. Photographs of the EUT

1. EUT front view



2. EUT rear view



2.3.2. Identification of all used EUT

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
1#	V1.2	V1.1.4

2.4. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	47 CFR§2.1091	Radiofrequency Radiation Exposure Evaluation: mobile devices
2	KDB 447498 D01v05r02	General RF Exposure Guidance

3. DEVICE CATEGORY AND RF EXPOSURE LIMIT

Per user manual, this device is a Wifi Display Dongle. Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

Mobile Devices:

47CFR 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

GENERAL POPULATION / UNCONTROLLED EXPOSURE

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	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

4. MEASUREMENT OF CONDUCTED PEAK OUTPUT POWER.

1. Wifi 2.4G Conducted Average Output Power

Band	Channel	Frequency (MHz)	Output Power(dBm)	
			802.11b (DSSS)	802.11g (OFDM)
WiFi 2.4G	1	2412	15.38	11.95
	6	2437	15.28	12.28
	11	2462	15.61	12.61

Band	Antenna	Channel	Frequency (MHz)	Output Power(dBm)
				802.11n20
WiFi 2.4G (MIMO)	ANT1	1	2412	11.84
		6	2437	12.24
		11	2462	12.37
	ANT2	1	2412	11.65
		6	2437	12.30
		11	2462	12.13
	ANT1+ANT2	1	2412	13.76
		6	2437	14.16
		11	2462	14.32

Band	Antenna	Channel	Frequency (MHz)	Output Power(dBm)
				802.11n40
WiFi 2.4G (MIMO)	ANT1	3	2422	11.85
		6	2437	12.37
		9	2452	12.26
	ANT2	3	2422	11.76
		6	2437	12.48
		9	2452	12.23
	ANT1+ANT2	3	2422	13.82
		6	2437	14.61
		9	2452	14.39

2. Wifi 5G Conducted Average Output Power

Mode	Channel	Frequency(MHz)	Out Power(dBm)
802.11a	36	5180	11.24
	44	5220	10.23
	48	5240	10.02
	52	5260	11.06
	60	5300	11.03
	64	5320	10.61
	100	5500	10.71
	116	5580	9.57
	140	5700	10.62
	149	5745	9.81
	157	5785	8.99
	161	5805	9.22

Mode	Antenna	Channel	Frequency(MHz)	Out Power(dBm)
802.11n(HT20) (MIMO)	ANT3	36	5180	11.63
		44	5220	10.23
		48	5240	9.76
		52	5260	10.62
		60	5300	10.68
		64	5320	10.24
		100	5500	10.70
		116	5580	9.66
		140	5700	10.44
		149	5745	9.24
		157	5785	8.19
		161	5805	8.41
	ANT4	36	5180	11.57
		44	5220	10.31
		48	5240	9.57
		52	5260	9.98
		60	5300	10.04
		64	5320	9.86
		100	5500	9.72
		116	5580	9.34
		140	5700	10.01

		149	5745	9.01
		157	5785	7.89
		161	5805	8.02
	ANT3+ANT4	36	5180	14.61
		44	5220	13.28
		48	5240	12.68
		52	5260	13.32
		60	5300	13.38
		64	5320	13.06
		100	5500	13.25
		116	5580	12.51
		140	5700	13.24
		149	5745	12.14
		157	5785	11.05
		161	5805	11.23

Mode	Antenna	Channel	Frequency(MHz)	Out Power(dBm)
802.11n(HT40) (MIMO)	ANT3	38	5190	10.07
		46	5230	9.20
		54	5270	10.10
		62	5310	9.94
		102	5510	10.14
		110	5550	9.97
		134	5670	6.80
		151	5755	8.63
		159	5795	7.93
	ANT4	38	5190	9.93
		46	5230	9.25
		54	5270	10.06
		62	5310	9.54
		102	5510	10.21
		110	5550	9.77
		134	5670	6.59
		151	5755	8.35
		159	5795	7.83
		38	5190	13.01
		46	5230	12.24
		54	5270	13.09

	ANT3+ANT4	62	5310	12.75
		102	5510	13.19
		110	5550	12.88
		134	5670	9.71
		151	5755	11.50
		159	5795	10.89

Note:

The EUT has 4 antennas, ANT1&ANT2 for 2.4GHz Band, ANT3&ANT4 for 5GHz Band.

5. RF EXPOSURE EVALUATION

Standalone transmission MPE evaluation

Bands	Frequency (MHz)	Antenna Gain (dBi)	Conducted Average Power (dBm)	Time-averaging EIRP (mW)	Power density (mW/cm ²)	Limit for MPE (mW/cm ²)
802.11b	2462	2	15.61	57.68	0.0115	1.0
802.11n20 (MIMO)	2462	2	14.32	42.85	0.0085	
802.11n40 (MIMO)	2437	2	14.61	45.81	0.0091	
802.11a	5180	2	11.24	21.09	0.0042	
802.11n20 (MIMO)	5180	2	14.61	45.81	0.0091	
802.11n40 (MIMO)	5510	2	13.19	33.04	0.0066	

Note:

1. MPE calculation method

$$\text{Power Density} = \text{EIRP} / 4\pi R^2$$

Where: $\text{EIRP} = P \cdot G$

P = Peak out power

G = Antenna gain

R = Separation distance (20cm)

2. According to section 3, we know the limit for MPE of wifi 802.11a/b/g/n is 1.0mW/cm²

Simultaneous transmission MPE evaluation

There is only one transmitter incorporated in this Wifi Display Dongle, wifi 802.11b/g/n (2.4GHz) and wifi802.11a/n (5GHz) can not simultaneous transmission, so simultaneous transmission is not required