



RF Exposure Evaluation Report

APPLICANT : TCT Mobile Limited
EQUIPMENT : WIFI Display Receiver
BRAND NAME : ALCATEL
MODEL NAME : one touch V100
FCC ID : RAD365
FILING TYPE : Certification
STANDARD : OET Bulletin 65 Supplement C (Edition 01-01)

We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the device has been evaluated in accordance with FCC OET Bulletin 65 Supplement C (Edition 01-01), and pass the limit. Without written approval of SPORTON INTERNATIONAL (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Deputy Manager

Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (SHENZHEN) INC.

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Table of Contents

1. ADMINISTRATION DATA 4

 1.1. Testing Laboratory 4

 1.2. Applicant 4

 1.3. Manufacturer 4

2. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT) 5

3. RF EXPOSURE LIMIT INTRODUCTION 6

4. MAXIMUM RF AVERAGE OUTPUT POWER AMONG PRODUCTION UNITS 7

5. CONDUCTED RF OUTPUT POWER (UNIT: DBM)..... 8

6. RADIO FREQUENCY RADIATION EXPOSURE EVALUATION 11



Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA321801	Rev. 01	Initial issue of report	Jul. 03, 2013
FA321801	Rev. 02	Update report for revising brand name from ALCA TEL onetouch to ALCA TEL.	Jul. 04, 2013
FA321801	Rev. 03	Update report for adding the data of MIMO mode	Jul. 17, 2013



1. Administration Data

1.1. Testing Laboratory

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.
Test Site Location	No. 101, Complex Building C, Guanlong Village, Xili Town, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL:+86-755-8637-9589 FAX: +86-755-8637-9595

1.2. 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

1.3. 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. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	WIFI Display Receiver
Brand Name	ALCATEL
Model Name	one touch V100
FCC ID	RAD365
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5805 MHz
Mode	•802.11a/b/g/n HT20/HT40
Antenna Type	Ant. 0: Chip Antenna Ant. 1: Chip Antenna
HW Version	PCB V3.0
SW Version	V1.9.1
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. EUT is only used to plug to TV's HDMI port and can't used for other devices.

3. RF Exposure Limit Introduction

The FCC categorizes the RF exposure limit based on the intended usage of the device and the user's awareness and ability to exercise control over his or her exposure. This is a consumer product to be used in the home, hence this device was evaluated by mobile device with general population/uncontrolled exposure condition. The definition of these category are shown as follows:

▪ **Mobile Devices:**

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to be generally used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitters' radiating structures and the body of the user or nearby persons. Transmitters designed to be used by consumers or workers that can be easily re-located are considered mobile devices if they meet the 20 centimeter separation requirement. The FCC rules for evaluating mobile devices for RF compliance are found in 47 CFR 2.1091.

▪ **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.

Per OET Bulletin 65, the power density limit for General Population/Uncontrolled Exposure summary here:

Table: Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Power Density (S) (mW/cm²)
0.3–1.34	*(100)
1.34–30	*(180/f ²)
30–300	0.2
300–1500	f/1500
1500–100,000	1.0

f = frequency in MHz

* = Plane-wave equivalent power density



4. Maximum RF average output power among production units

IEEE 802.11 Average Power (dBm)				
WLAN 2.4GHz				
Ant. Chain / Mode	11b	11g	HT20	HT40
Ant. Chain 0	17	14	12	12
Ant. Chain 1	16.5	14	11.5	11.5
Ant. Chain 0+1			13.5	13

IEEE 802.11 Average Power (dBm)			
WLAN 5.8GHz			
Ant. Chain / Mode	11a	HT20	HT40
Ant. Chain 0	10	10	10
Ant. Chain 1	10	10	10
Ant. Chain 0+1		13	13



5. Conducted RF Output Power (Unit: dBm)

<WLAN 2.4GHz Conducted Power>

Ch.	Freq. (MHz)	Ant. Chain	802.11b RF Power (dBm)			
			DSSS Data Rate			
			1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412	0	16.44	16.42	16.20	16.33
CH 06	2437	0	16.49	16.33	16.10	16.09
CH 11	2462	0	16.55	16.38	16.19	16.28
CH 01	2412	1	16.29	16.15	15.69	15.75
CH 06	2437	1	16.46	16.21	16.40	16.07
CH 11	2462	1	16.42	16.37	15.97	16.37

Ch.	Freq. (MHz)	Ant. Chain	802.11g RF Power (dBm)							
			OFDM Data Rate							
			6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412	0	13.40	13.35	13.08	13.12	13.10	13.25	13.16	13.19
CH 06	2437	0	13.64	13.40	13.52	13.51	13.56	13.51	13.57	13.37
CH 11	2462	0	13.52	13.46	13.48	13.54	13.57	13.51	13.56	13.57
CH 01	2412	1	13.33	13.30	13.21	13.22	13.18	13.12	13.15	13.33
CH 06	2437	1	13.38	13.55	13.59	13.58	13.37	13.45	13.51	13.50
CH 11	2462	1	13.62	13.38	13.59	13.60	13.46	13.52	13.52	13.57



Ch.	Freq. (MHz)	Ant. Chain	WLAN 2.4GHz 802.11n HT-20 RF Power (dBm)							
			OFDM Data Rate							
			6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 01	2412	0	11.47	11.42	11.38	11.37	11.32	11.46	11.45	11.35
CH 06	2437	0	11.71	10.75	10.71	10.71	10.90	10.90	10.97	10.89
CH 11	2462	0	11.85	11.63	11.72	11.75	11.77	11.78	11.79	11.71
CH 01	2412	1	10.72	10.55	10.43	10.66	10.70	10.70	10.67	10.66
CH 06	2437	1	10.62	10.74	10.73	10.94	11.05	10.77	10.98	11.06
CH 11	2462	1	11.08	10.81	10.75	10.86	10.82	11.04	11.04	11.01
Channel	Frequency (MHz)	Ant. Chain	13 Mbps	26 Mbps	39 Mbps	52 Mbps	78 Mbps	104 Mbps	117 Mbps	130 Mbps
CH 01	2412	0+1(0)	10.87	10.65	10.67	10.63	10.70	10.77	10.70	10.61
		0+1(1)	9.69	9.54	9.47	9.32	9.41	9.45	9.43	9.46
		0+1	13.33	13.14	13.13	13.03	13.11	13.17	13.12	13.08
CH 06	2437	0+1(0)	10.62	10.52	10.44	10.37	10.43	10.47	10.41	10.48
		0+1(1)	9.56	9.41	9.39	9.22	9.33	9.39	9.37	9.37
		0+1	13.14	13.01	12.96	12.84	12.93	12.97	12.93	12.97
CH 11	2462	0+1(0)	10.35	10.20	10.11	10.05	10.14	10.23	10.24	10.31
		0+1(1)	9.24	9.11	9.06	8.90	9.01	9.04	9.05	9.06
		0+1	12.84	12.70	12.63	12.52	12.62	12.69	12.70	12.74

Ch.	Freq. (MHz)	Ant. Chain	WLAN 2.4GHz 802.11n HT-40 RF Power (dBm)							
			OFDM Data Rate							
			13.5 Mbps	27 Mbps	40.5 Mbps	54 Mbps	81 Mbps	108 Mbps	121.5 Mbps	135 Mbps
CH 03	2422	0	11.56	11.29	11.26	11.25	11.16	11.06	10.99	11.05
CH 06	2437	0	11.54	11.62	11.64	11.64	11.48	11.47	11.49	11.52
CH 09	2452	0	11.70	11.65	11.70	11.69	10.56	11.49	11.52	11.53
CH 03	2422	1	11.01	10.63	10.55	10.63	10.30	10.45	10.46	10.44
CH 06	2437	1	11.08	11.01	11.01	10.84	10.92	10.94	11.00	10.64
CH 09	2452	1	10.95	11.01	10.97	10.80	10.95	10.88	10.87	10.63
Channel	Frequency (MHz)	Ant. Chain	27 Mbps	54 Mbps	81 Mbps	108 Mbps	162 Mbps	216 Mbps	243 Mbps	270 Mbps
CH 03	2422	0+1(0)	10.16	10.06	9.95	9.78	9.88	9.89	10.01	9.95
		0+1(1)	9.64	9.49	9.35	9.20	9.29	9.29	9.21	9.15
		0+1	12.92	12.79	12.67	12.51	12.60	12.61	12.64	12.58
CH 06	2437	0+1(0)	9.94	9.81	9.70	9.48	9.61	9.66	9.78	9.73
		0+1(1)	9.46	9.30	9.09	8.88	8.99	9.02	8.97	8.95
		0+1	12.72	12.57	12.42	12.20	12.32	12.36	12.40	12.37
CH 09	2452	0+1(0)	9.71	9.63	9.55	9.34	9.49	9.57	9.70	9.65
		0+1(1)	8.98	8.90	8.80	8.68	8.90	9.03	9.02	9.07
		0+1	12.37	12.29	12.20	12.04	12.21	12.32	12.38	12.38



<WLAN 5.8GHz Conducted Power>

Ch.	Freq. (MHz)	Ant. Chain	802.11a RF Power (dBm)							
			OFDM Data Rate							
			6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 149	5745	0	9.54	9.45	9.59	9.56	9.27	9.24	9.59	9.21
CH 157	5785	0	9.41	9.07	9.03	9.08	9.24	9.48	9.48	9.49
CH 161	5805	0	9.64	9.50	9.09	9.53	9.13	9.52	9.57	9.12
CH 149	5745	1	9.83	9.82	9.52	9.24	9.46	9.47	9.17	9.41
CH 157	5785	1	9.35	9.22	9.40	9.20	9.27	9.12	9.09	9.15
CH 161	5805	1	9.34	9.27	9.14	9.16	9.18	9.13	9.10	9.49

Ch.	Freq. (MHz)	Ant. Chain	WLAN 5.8GHz 802.11n HT-20 RF Power (dBm)							
			OFDM Data Rate							
			6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 149	5745	0	9.65	9.29	9.58	9.19	9.54	9.53	9.59	9.20
CH 157	5785	0	9.46	9.47	9.21	9.44	9.21	9.45	9.43	9.47
CH 161	5805	0	9.86	9.81	9.74	9.63	9.62	9.61	9.56	9.69
CH 149	5745	1	9.53	9.33	9.28	9.28	9.21	9.24	9.39	9.23
CH 157	5785	1	9.60	9.22	9.17	9.46	9.44	9.16	9.38	9.17
CH 161	5805	1	9.26	9.18	9.18	9.14	9.28	9.31	9.33	9.17
Channel	Frequency (MHz)	Ant. Chain	13 Mbps	26 Mbps	39 Mbps	52 Mbps	78 Mbps	104 Mbps	117 Mbps	130 Mbps
CH 149	5745	0+1(0)	9.81	9.65	9.62	9.54	9.64	9.70	9.69	9.65
		0+1(1)	9.75	9.68	9.50	9.41	9.16	9.16	9.14	9.08
		0+1	12.79	12.67	12.57	12.48	12.42	12.45	12.43	12.38
CH 157	5785	0+1(0)	9.16	9.07	9.05	8.99	9.11	9.21	9.25	9.27
		0+1(1)	8.97	8.88	8.77	8.68	8.77	8.79	8.74	8.70
		0+1	12.08	11.98	11.92	11.84	11.95	12.02	12.01	12.00
CH 161	5805	0+1(0)	8.68	8.61	8.58	8.50	8.60	8.66	8.66	8.65
		0+1(1)	8.45	8.32	8.21	8.12	8.21	8.27	8.31	8.35
		0+1	11.58	11.47	11.41	11.32	11.42	11.48	11.50	11.51

Ch.	Freq. (MHz)	Ant. Chain	WLAN 5.8GHz 802.11n HT-40 RF Power (dBm)							
			OFDM Data Rate							
			13.5 Mbps	27 Mbps	40.5 Mbps	54 Mbps	81 Mbps	108 Mbps	121.5 Mbps	135 Mbps
CH 151	5755	0	9.62	9.59	9.54	9.68	9.42	9.65	9.58	9.60
CH 159	5795	0	9.78	9.73	9.29	9.77	9.77	9.27	9.71	9.33
CH 151	5755	1	9.57	9.68	9.58	9.52	9.51	9.52	9.47	9.34
CH 159	5795	1	9.70	9.59	9.62	9.66	9.58	9.26	9.32	9.30
Channel	Frequency (MHz)	Ant. Chain	27 Mbps	54 Mbps	81 Mbps	108 Mbps	162 Mbps	216 Mbps	243 Mbps	270 Mbps
CH 151	5755	0+1(0)	9.64	9.47	9.34	9.13	9.27	9.51	9.45	9.46
		0+1(1)	9.46	9.29	9.22	9.09	9.26	9.43	9.40	9.39
		0+1	12.56	12.39	12.29	12.12	12.28	12.48	12.44	12.44
CH 159	5795	0+1(0)	8.94	8.76	8.70	8.47	8.60	8.80	8.73	8.74
		0+1(1)	8.86	8.69	8.61	8.44	8.57	8.72	8.70	8.66
		0+1	11.91	11.74	11.67	11.47	11.60	11.77	11.73	11.71

6. Radio Frequency Radiation Exposure Evaluation

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna

For this device, the calculation is as follows:

WLAN (Ant. Chain 0)

Mode	Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum Conducted Power (dBm)	Source Base-Time Average Power (mW)	EIRP (mW)	Calculated RF Exposure (mW/cm ²)	Limit (mW/cm ²)
WLAN 2.4GHz (802.11b)	2412	-4.7	0.34	17	50.12	16.98	0.00	1.00
WLAN 2.4GHz (802.11g)	2412	-4.7	0.34	14	25.12	8.51	0.00	1.00
WLAN 2.4GHz (802.11n-HT20)	2412	-4.7	0.34	12	15.85	5.37	0.00	1.00
WLAN 2.4GHz (802.11n-HT40)	2422	-4.7	0.34	12	15.85	5.37	0.00	1.00
WLAN 5.8GHz (802.11a)	5745	-3.1	0.49	10	10.00	4.90	0.00	1.00
WLAN 5.8GHz (802.11n-HT20)	5745	-3.1	0.49	10	10.00	4.90	0.00	1.00
WLAN 5.8GHz (802.11n-HT40)	5755	-3.1	0.49	10	10.00	4.90	0.00	1.00

WLAN (Ant. Chain 1)

Mode	Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum Conducted Power (dBm)	Source Base-Time Average Power (mW)	EIRP (mW)	Calculated RF Exposure (mW/cm ²)	Limit (mW/cm ²)
WLAN 2.4GHz (802.11b)	2412	-4.7	0.34	16.5	44.67	15.14	0.00	1.00
WLAN 2.4GHz (802.11g)	2412	-4.7	0.34	14.0	25.12	8.51	0.00	1.00
WLAN 2.4GHz (802.11n-HT20)	2412	-4.7	0.34	11.5	14.13	4.79	0.00	1.00
WLAN 2.4GHz (802.11n-HT40)	2422	-4.7	0.34	11.5	14.13	4.79	0.00	1.00
WLAN 5.8GHz (802.11a)	5745	-3.1	0.49	10.0	10.00	4.90	0.00	1.00
WLAN 5.8GHz (802.11n-HT20)	5745	-3.1	0.49	10.0	10.00	4.90	0.00	1.00
WLAN 5.8GHz (802.11n-HT40)	5755	-3.1	0.49	10.0	10.00	4.90	0.00	1.00

WLAN (Ant. Chain 0+1)

Mode	Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum Conducted Power (dBm)	Source Base-Time Average Power (mW)	EIRP (mW)	Calculated RF Exposure (mW/cm ²)	Limit (mW/cm ²)
WLAN 2.4GHz (802.11n-HT20)	2412	-1.69	0.68	13.5	22.39	15.17	0.00	1.00
WLAN 2.4GHz (802.11n-HT40)	2422	-1.69	0.68	13.0	19.95	13.52	0.00	1.00
WLAN 5.8GHz (802.11n-HT20)	5745	-0.09	0.98	13.0	19.95	19.54	0.00	1.00
WLAN 5.8GHz (802.11n-HT40)	5755	-0.09	0.98	13.0	19.95	19.54	0.00	1.00

Note: According to "Maximum RF average output power among production units" to evaluate radiation exposure.



Conclusion:

Per part 2.1091(c), EUT source-based time-averaged ERP < 1.5W for RF operating frequency \leq 1.5GHz, EUT source-based time-averaged EIRP < 3W for RF operating frequency > 1.5GHz, routine evaluation of MPE is not required; MPE calculation is sufficient to show compliance. The MPE calculation results indicate that the EUT complies with the RF exposure limit of FCC OET Bulletin 65 Supplement C (Edition 01-01).