



RF Exposure Evaluation Report

APPLICANT : TCT Mobile Limited
EQUIPMENT : Module
BRAND NAME : ALCATEL
MODEL NAME : one touch M600Q
FCC ID : RAD425
FILING TYPE : Certification
STANDARD : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091, 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

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SPORTON INTERNATIONAL (SHENZHEN) INC.

No. 101, Complex Building C, Guanlong Village, Xili Town, Nanshan District, Shenzhen, Guangdong, P.R.C.



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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	
DUT Type	Module
Brand Name	ALCATEL
Model Name	one touch M600Q
FCC ID	RAD425
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz
Mode	•GPRS/EGPRS •UMTS Rel 99 •HSDPA Rel 7, Cat14 •HSUPA Rel 6, Cat6 •HSPA+ Rel 7, Cat 7 (Downlink Only)
Antenna Type	Monopole Antenna
HW Version	V4.0
SW Version	ZX120200XX
DUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



3. Maximum RF average output power among production units

Maximum Target Burst Average Power for Production Unit (dBm)		
Mode / Band	GSM 850	GSM 1900
GPRS/ EDGE (GMSK, 1 Tx slot)	34	31
GPRS/ EDGE (GMSK, 2 Tx slots)	29	28
GPRS/ EDGE (GMSK, 3 Tx slots)	27	26
GPRS/ EDGE (GMSK, 4 Tx slots)	26	25
EDGE (8PSK, 1 Tx slot)	27	27
EDGE (8PSK, 2 Tx slots)	24	24
EDGE (8PSK, 3 Tx slots)	23	23
EDGE (8PSK, 4 Tx slots)	21	21

Maximum Target Power for Production Unit (dBm)		
Mode / Band	WCDMA Band II	WCDMA Band IV
RMC 12.2K	23	24
HSDPA Subtest-1	22	23
HSDPA Subtest-2	23	23
HSDPA Subtest-3	23	23
HSDPA Subtest-4	23	23
HSUPA Subtest-1	22	22
HSUPA Subtest-2	20	21
HSUPA Subtest-3	21	22
HSUPA Subtest-4	21	21
HSUPA Subtest-5	22	23



4. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

Band: GSM850 Channel	Burst Average Power (dBm)			Frame-Average Power (dBm)		
	128	189	251	128	189	251
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8
GPRS (GMSK, 1 Tx slot) – CS1	32.26	32.31	32.43	23.26	23.31	23.43
GPRS (GMSK, 2 Tx slots) – CS1	27.68	27.73	27.82	21.68	21.73	21.82
GPRS (GMSK, 3 Tx slots) – CS1	25.71	25.77	25.86	21.45	21.51	21.60
GPRS (GMSK, 4 Tx slots) – CS1	24.71	24.76	24.86	21.71	21.76	21.86
EDGE (GMSK, 1 Tx slot) – MCS1	32.24	32.30	32.41	23.24	23.30	23.41
EDGE (GMSK, 2 Tx slots) – MCS1	27.67	27.71	27.80	21.67	21.71	21.80
EDGE (GMSK, 3 Tx slots) – MCS1	25.72	25.76	25.87	21.46	21.50	21.61
EDGE (GMSK, 4 Tx slots) – MCS1	24.68	24.74	24.84	21.68	21.74	21.84
EDGE (8PSK, 1 Tx slot) – MCS5	25.69	25.70	25.81	16.69	16.70	16.81
EDGE (8PSK, 2 Tx slots) – MCS5	22.84	22.85	22.95	16.84	16.85	16.95
EDGE (8PSK, 3 Tx slots) – MCS5	21.86	21.86	21.95	17.60	17.60	17.69
EDGE (8PSK, 4 Tx slots) – MCS5	19.90	19.90	19.99	16.90	16.90	16.99

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.

The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB

Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB

Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB

Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

Band: GSM1900 Channel	Burst Average Power (dBm)			Frame-Average Power (dBm)		
	512	661	810	512	661	810
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8
GPRS (GMSK, 1 Tx slot) – CS1	29.20	29.17	29.40	20.20	20.17	20.40
GPRS (GMSK, 2 Tx slots) – CS1	26.31	26.30	26.38	20.31	20.30	20.38
GPRS (GMSK, 3 Tx slots) – CS1	24.30	24.30	24.38	20.04	20.04	20.12
GPRS (GMSK, 4 Tx slots) – CS1	23.31	23.30	23.39	20.31	20.30	20.39
EDGE (GMSK, 1 Tx slot) – MCS1	29.20	29.16	29.25	20.20	20.16	20.25
EDGE (GMSK, 2 Tx slots) – MCS1	26.34	26.27	26.38	20.34	20.27	20.38
EDGE (GMSK, 3 Tx slots) – MCS1	24.34	24.27	24.39	20.08	20.01	20.13
EDGE (GMSK, 4 Tx slots) – MCS1	23.33	23.30	23.38	20.33	20.30	20.38
EDGE (8PSK, 1 Tx slot) – MCS5	25.27	25.23	25.34	16.27	16.23	16.34
EDGE (8PSK, 2 Tx slots) – MCS5	22.40	22.36	22.47	16.40	16.36	16.47
EDGE (8PSK, 3 Tx slots) – MCS5	21.41	21.37	21.48	17.15	17.11	17.22
EDGE (8PSK, 4 Tx slots) – MCS5	19.40	19.39	19.51	16.40	16.39	16.51

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.

The calculated method are shown as below:

Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB

Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB

Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB

Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB



<WCDMA Conducted Power>

Band		WCDMA Band II			WCDMA Band IV		
Tx Channel		9262	9400	9538	1312	1413	1513
Frequency (MHz)		1852.4	1880	1907.6	1712.4	1732.6	1752.6
3GPP Rel 99	RMC 12.2Kbps	21.62	21.73	21.64	21.80	22.26	21.75
3GPP Rel 7	HSDPA Subtest-1	20.86	20.98	20.82	21.26	21.59	21.06
3GPP Rel 7	HSDPA Subtest-2	20.97	21.12	20.85	21.13	21.55	21.03
3GPP Rel 7	HSDPA Subtest-3	21.02	21.15	20.94	21.09	21.47	21.01
3GPP Rel 7	HSDPA Subtest-4	20.95	21.13	20.82	21.07	21.54	20.98
3GPP Rel 6	HSUPA Subtest-1	20.05	20.23	19.82	20.11	20.45	20.18
3GPP Rel 6	HSUPA Subtest-2	18.69	18.73	18.49	18.97	19.35	19.01
3GPP Rel 6	HSUPA Subtest-3	19.81	19.68	19.49	19.86	20.07	19.99
3GPP Rel 6	HSUPA Subtest-4	18.72	19.13	19.43	19.26	19.98	19.91
3GPP Rel 6	HSUPA Subtest-5	20.43	20.40	20.25	20.43	20.75	20.56
3GPP MPR specification	MPR result	WCDMA Band II			WCDMA Band IV		
0	HSDPA Subtest-1	0.00	0.00	0.00	0.00	0.00	0.00
0	HSDPA Subtest-2	-0.11	-0.14	-0.03	0.13	0.04	0.03
≤0.5	HSDPA Subtest-3	-0.16	-0.17	-0.12	0.17	0.12	0.05
≤0.5	HSDPA Subtest-4	-0.09	-0.15	0.00	0.19	0.05	0.08
≤0	HSUPA Subtest-1	0.38	0.17	0.43	0.32	0.30	0.38
≤2	HSUPA Subtest-2	1.74	1.67	1.76	1.46	1.40	1.55
≤1	HSUPA Subtest-3	0.62	0.72	0.76	0.57	0.68	0.57
≤2	HSUPA Subtest-4	1.71	1.27	0.82	1.17	0.77	0.65
≤0	HSUPA Subtest-5	0.00	0.00	0.00	0.00	0.00	0.00



5. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Table with 5 columns: Frequency range (MHz), Electric field strength (V/m), Magnetic field strength (A/m), Power density (mW/cm²), Averaging time (minutes). It is divided into two sections: (A) Limits for Occupational/Controlled Exposures and (B) Limits for General Population/Uncontrolled Exposure.

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 = PG / (4πR²)

Where:

- S = Power Density
P = Output Power at Antenna Terminals
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

6. Radio Frequency Radiation Exposure Evaluation

WWAN Operating frequency \leq 1.5GHz

Mode	Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Maximum Conducted Power (dBm)	Source Base-Time Average Power (mW)	ERP (mW)	Calculated RF Exposure (mW/cm ²)	Limit (mW/cm ²)
GPRS/ EDGE 850 (GMSK, 1 Tx slot)	824.20	-3.10	0.49	34.00	316.23	94.41	0.03	0.55
GPRS/ EDGE 850 (GMSK, 2 Tx slots)	824.20	-3.10	0.49	29.00	100.00	29.85	0.01	0.55
GPRS/ EDGE 850 (GMSK, 3 Tx slots)	824.20	-3.10	0.49	27.00	125.89	37.58	0.01	0.55
GPRS/ EDGE 850 (GMSK, 4 Tx slots)	824.20	-3.10	0.49	26.00	149.28	44.57	0.01	0.55
EDGE 850 (8PSK, 1 Tx slot)	824.20	-3.10	0.49	27.00	251.19	74.99	0.02	0.55
EDGE 850 (8PSK, 2 Tx slots)	824.20	-3.10	0.49	24.00	251.19	74.99	0.02	0.55
EDGE 850 (8PSK, 3 Tx slots)	824.20	-3.10	0.49	23.00	199.53	59.57	0.02	0.55
EDGE 850 (8PSK, 4 Tx slots)	824.20	-3.10	0.49	21.00	125.89	37.58	0.01	0.55

WWAN Operating frequency $>$ 1.5GHz

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)
GPRS/ EDGE 1900 (GMSK, 1 Tx slot)	1850.20	-2.80	0.52	31.00	158.49	83.18	0.02	1.00
GPRS/ EDGE 1900 (GMSK, 2 Tx slots)	1850.20	-2.80	0.52	28.00	158.49	83.18	0.02	1.00
GPRS/ EDGE 1900 (GMSK, 3 Tx slots)	1850.20	-2.80	0.52	26.00	149.28	78.34	0.02	1.00
GPRS/ EDGE 1900 (GMSK, 4 Tx slots)	1850.20	-2.80	0.52	25.00	158.49	83.18	0.02	1.00
EDGE 1900 (8PSK, 1 Tx slot)	1850.20	-2.80	0.52	27.00	501.19	263.03	0.05	1.00
EDGE 1900 (8PSK, 2 Tx slots)	1850.20	-2.80	0.52	24.00	251.19	131.83	0.03	1.00
EDGE 1900 (8PSK, 3 Tx slots)	1850.20	-2.80	0.52	23.00	199.53	104.71	0.02	1.00
EDGE 1900 (8PSK, 4 Tx slots)	1850.20	-2.80	0.52	21.00	125.89	66.07	0.01	1.00
WCDMA Band II	1852.40	-2.80	0.52	23.00	199.53	104.71	0.02	1.00
WCDMA Band IV	1712.40	-2.60	0.55	24.00	251.19	138.04	0.03	1.00

Conclusion:

Per 47 CFR §2.1091, 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 ANSI/IEEE C95.1-1992.