

FCC Report

Application Purpose : Original grant

Applicant Name: TECNO MOBILE LIMITED

Equipment Type : Mobile Phone

Model Name : T420

Report Number : FCC 15050004-1

Standard(S) : FCC Part 15 Subpart B

Date Of Receipt : May 17, 2015

Date Of Issue : May 28, 2015

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	May 28, 2015	Valid	Original Report

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1. GENERAL INFORMATION

Test Model	T420
Applicant	TECNO MOBILE LIMITED
Address	RMS 05-15, 13A/F., SOUTH TOWER, WORLD FINANCE CTR, HARBOUR CITY, KLN, HK.
Manufacturer	SHENZHEN SMARTTEL CO., LTD.
Address	6th Floor, Block 15, shatoujiao Free TRADE Zone, Shenyan Road, Yantian District, Shenzhen, Guangdong, P.R.China
Equipment Type	Mobile Phone
Brand Name	TECNO
Hardware	A710_MAIN_PCB_V1.2
Software	N/A
Battery information:	Li-ion Battery: BL-5CAT Batterie: 4.255Wh Voltage: 3.7V Capacity: 1150mAh Limited Charge Voltage: 4.2V
Adapter Information:	Adapter : M45 Input: AC 100-240V 50/60Hz 150mA Output: DC 5V 500mA
Data of receipt	May 17, 2015
Date of test	May 17, 2015 to May 27, 2015
Deviation	None
Condition of Test Sample	Normal

We hereby certify that:

All measurement facilities used to collect the measurement data are located at
1F, No.9 Building, TGK Science & Technology Park, Yangtian Rd., NO.72 Bao'an Dist., GuangDong, China
The data evaluation, test procedures, and equipment configurations shown in this report were made in
accordance with the procedures given in ANSI C 63.4:2009. The sample tested as described in this report
is in compliance with the FCC Rules Part15 Subpart B.

The test results of this report relate only to the tested sample identified in this report.

2. TEST DESCRIPTION

2.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended 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	Conducted Emission Test	$\pm 3.2\text{dB}$
2	RF power, conducted	$\pm 0.16\text{dB}$
3	Spurious emissions, conducted	$\pm 0.21\text{dB}$
4	All emissions, radiated(<1G)	$\pm 4.7\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.7\text{dB}$
6	Temperature	$\pm 0.5^\circ\text{C}$
7	Humidity	$\pm 2\%$

2.2 DESCRIPTION OF TEST MODES

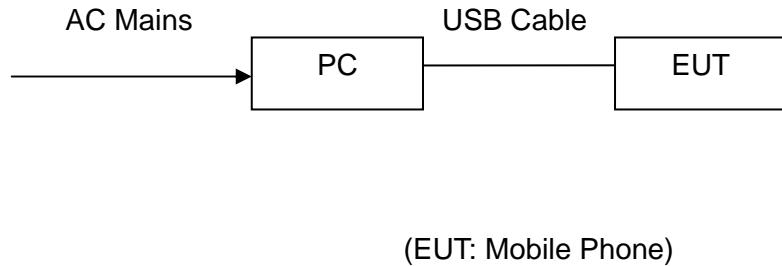
To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Exchange data

For Conducted Emission	
Final Test Mode	Description
Mode 1	Exchange data

For Radiated Emission	
Final Test Mode	Description
Mode 1	Exchange data

2.3 CONFIGURATION OF SYSTEM UNDER TEST



I/O Port of EUT			
I/O Port Type	Q'TY	Cable	Tested with
USB port	1	1m USB cable, unshielded	1

2.4 DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	PC	HP	Dx2700	CNG7140T7P	/
2	Keyboard	HP	SK-2880	435302-AA-	/
3	Mouse	DELL	MS111-1	/	/
4	Monitor	HP	HSTND-2F02	CND7160R3Z	/

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

3. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 , Subpart B			
Standard Section	Test Item	Judgment	Remark
15.107	CONDUCTED EMISSION	PASS	
15.109	RADIATED EMISSION	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this test report.

4. MEASUREMENT INSTRUMENTS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibrated	Calibrated until
ESPI Test Receiver	R&S	ESPI	100379	08/19/2014	08/18/2015
ESCI Test Receiver	R&S	ESCI	100005	08/19/2014	08/18/2015
LISN	AFJ	LS16	16010222119	08/19/2014	08/18/2015
LISN(EUT)	Mestec	AN3016	04/10040	08/19/2014	08/18/2015
pre-amplifier	CDSI	PAP-1G18-38	--	08/19/2014	08/18/2015
System Controller	CT	SC100	-	08/19/2014	08/18/2015
Bi-log Antenna	Chase	CBL6111C	2576	08/19/2014	08/18/2015
Spectrum analyzer	R&S	FSU26	200409	08/19/2014	08/18/2015
Horn Antenna	SCHWARZBECK	9120D	1141	08/19/2014	08/18/2015
Bi-log Antenna	Schwarebeck	VULB9163	9163/340	08/19/2014	08/18/2015
Pre Amplifier	H.P.	HP8447E	2945A02715	10/13/2014	10/12/2015
9*6*6 Anechoic	--	--	--	08/21/2014	08/20/2015

5. EMC EMISSION TEST

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

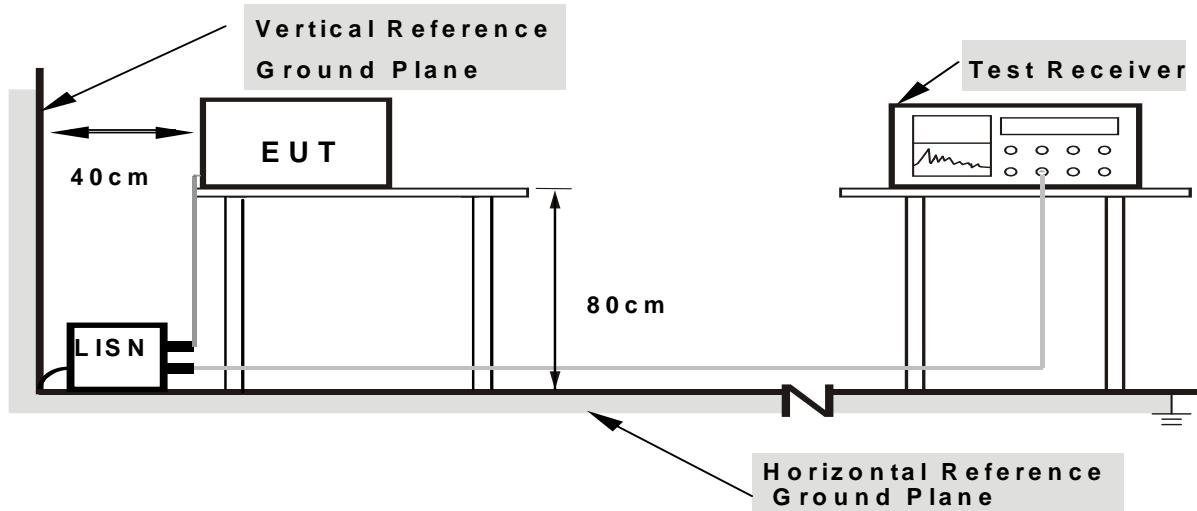
5.1.2 TEST PROCEDURE

- a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

5.1.3 DEVIATION FROM TEST STANDARD

No deviation

5.1.4 TEST SETUP

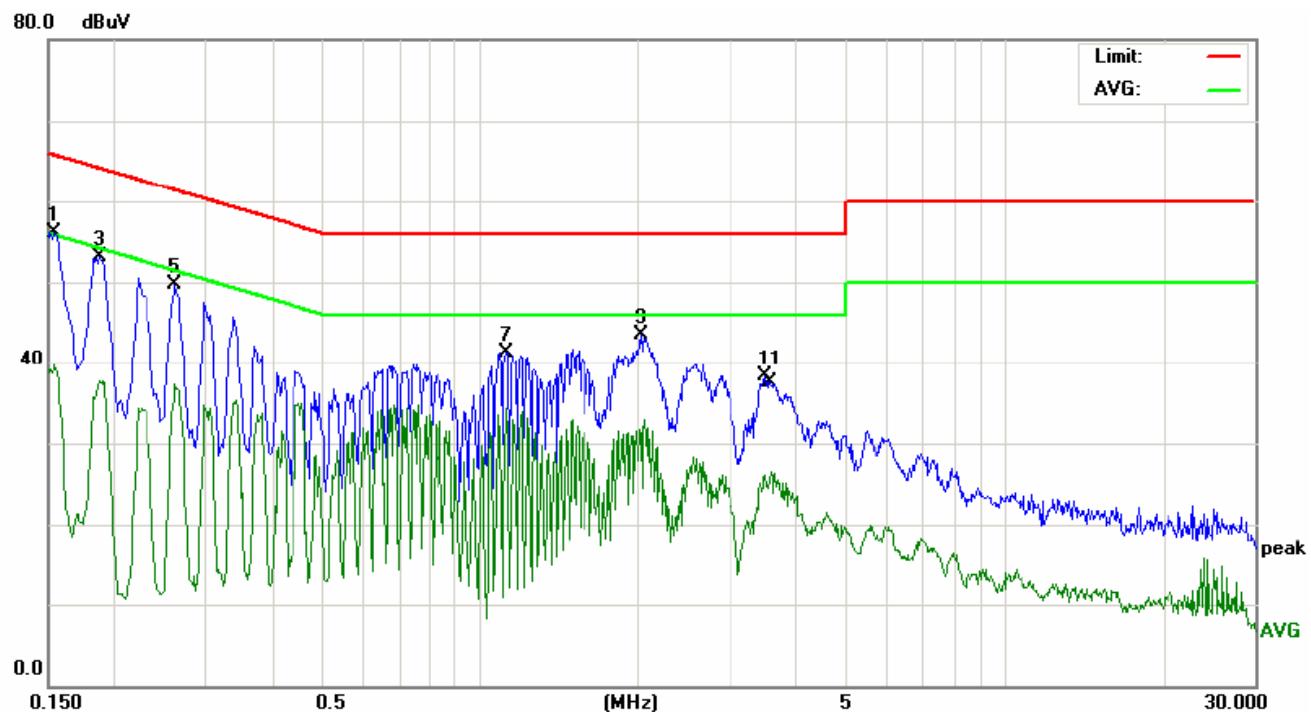


5.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

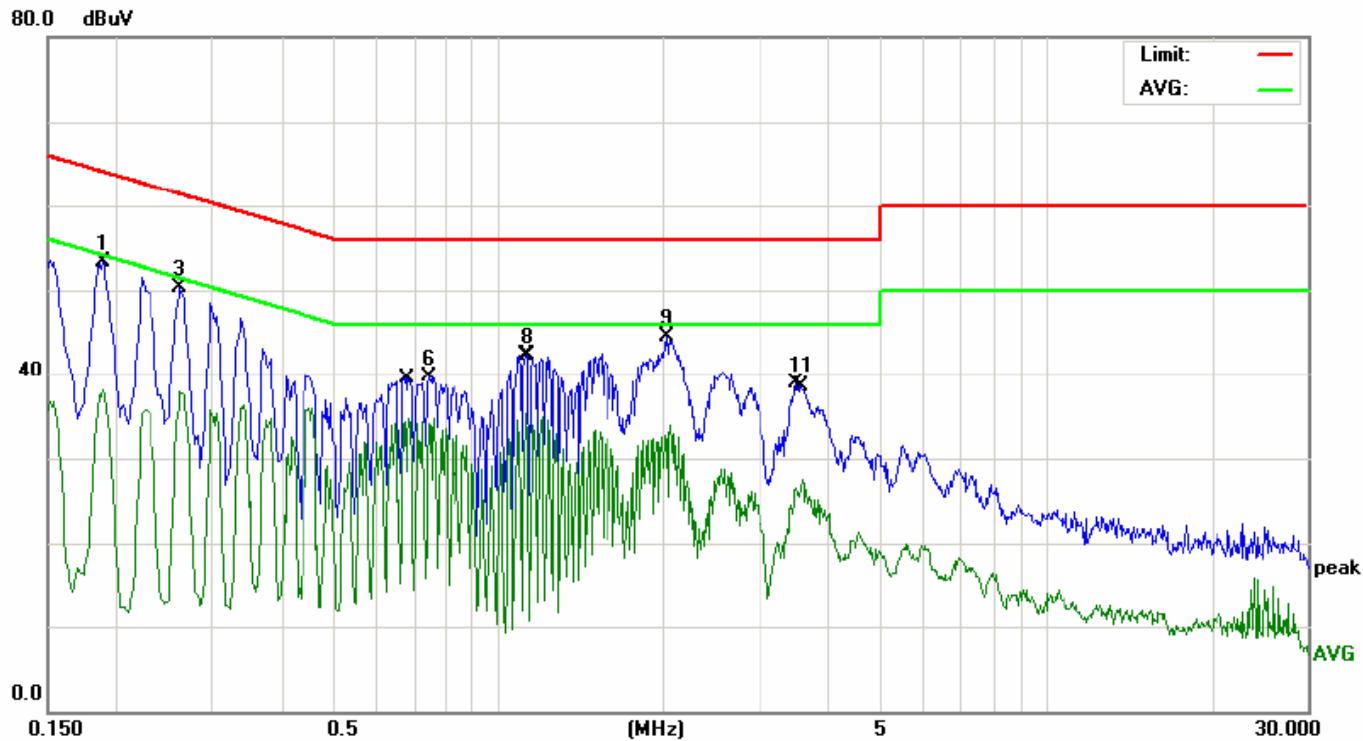
5.1.6 TEST RESULTS

EUT	Mobile Phone	Model Name	T420
Temperature	26 °C	Relative Humidity	54%
Pressure	1010hPa	Phase	L
Test Date	May 20, 2015	Test Mode	Mode 1



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over
			Level	Factor	ment		
1	*	0.1539	45.69	10.44	56.13	65.78	-9.65 peak
2		0.1539	29.19	10.44	39.63	55.78	-16.15 AVG
3		0.1874	42.71	10.34	53.05	64.15	-11.10 peak
4		0.1874	27.38	10.34	37.72	54.15	-16.43 AVG
5		0.2620	39.27	10.52	49.79	61.36	-11.57 peak
6		0.2620	26.83	10.52	37.35	51.36	-14.01 AVG
7		1.1220	30.62	10.75	41.37	56.00	-14.63 peak
8		1.1220	23.65	10.75	34.40	46.00	-11.60 AVG
9		2.0260	32.72	10.71	43.43	56.00	-12.57 peak
10		2.0620	22.18	10.71	32.89	46.00	-13.11 AVG
11		3.4980	27.67	10.66	38.33	56.00	-17.67 peak
12		3.6020	15.86	10.65	26.51	46.00	-19.49 AVG

EUT	Mobile Phone	Model Name	T420
Temperature	26 °C	Relative Humidity	54%
Pressure	1010hPa	Phase	N
Test Date	May 20, 2015	Test Mode	Mode 1



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over
			Level	Factor	ment		
		MHz	dBuV	dB	dBuV	dBuV	dB
1		0.1884	42.96	10.33	53.29	64.10	-10.81 peak
2		0.1884	27.69	10.33	38.02	54.10	-16.08 AVG
3		0.2620	39.77	10.52	50.29	61.36	-11.07 peak
4		0.2620	27.33	10.52	37.85	51.36	-13.51 AVG
5		0.6860	23.83	10.87	34.70	46.00	-11.30 AVG
6		0.7459	29.02	10.72	39.74	56.00	-16.26 peak
7	*	1.1220	24.65	10.75	35.40	46.00	-10.60 AVG
8		1.1300	31.52	10.75	42.27	56.00	-13.73 peak
9		2.0260	33.72	10.71	44.43	56.00	-11.57 peak
10		2.0620	23.18	10.71	33.89	46.00	-12.11 AVG
11		3.4980	28.17	10.66	38.83	56.00	-17.17 peak
12		3.6020	16.86	10.65	27.51	46.00	-18.49 AVG

5.2 RADIATED EMISSION MEASUREMENT

5.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

5.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

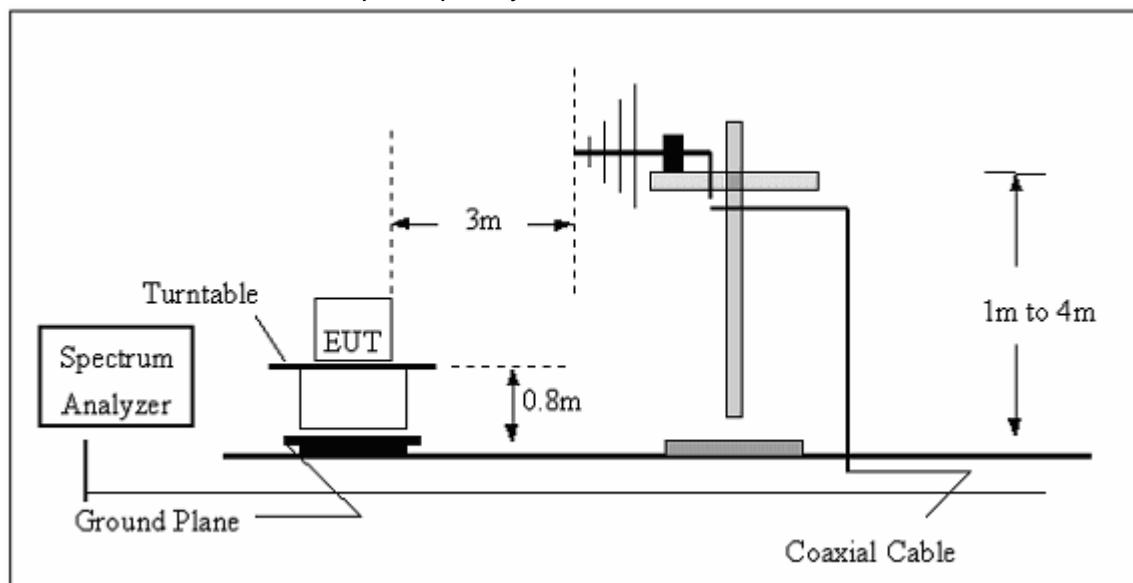
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

5.2.3 DEVIATION FROM TEST STANDARD

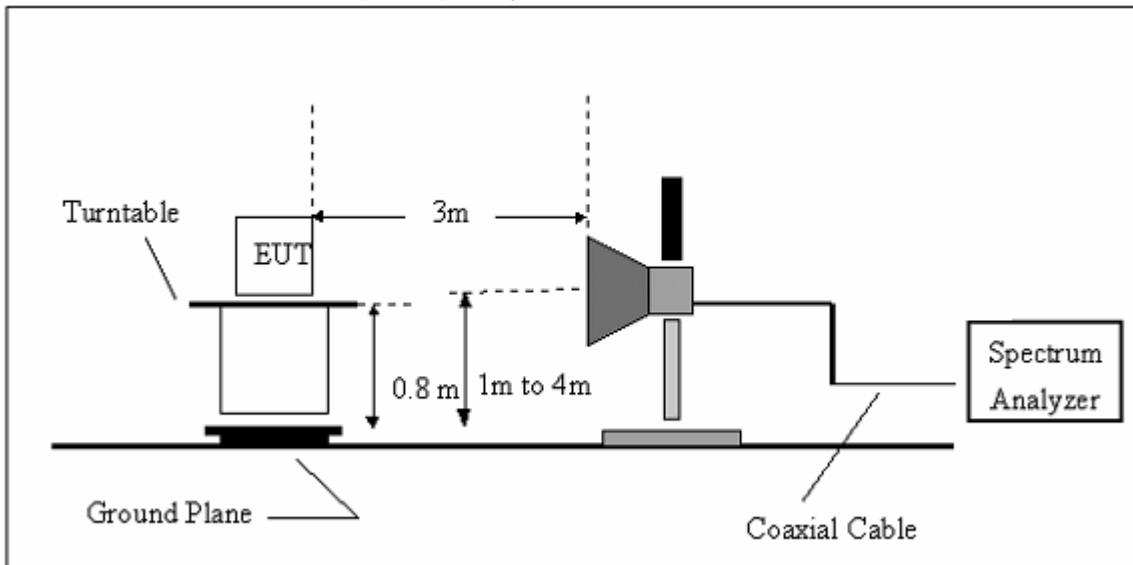
No deviation

5.2.4 TEST SETUP

(A) Radiated Emission Test-Up Frequency 30MHz~1GHz



(B) Radiated Emission Test-Up Frequency Above 1GHz

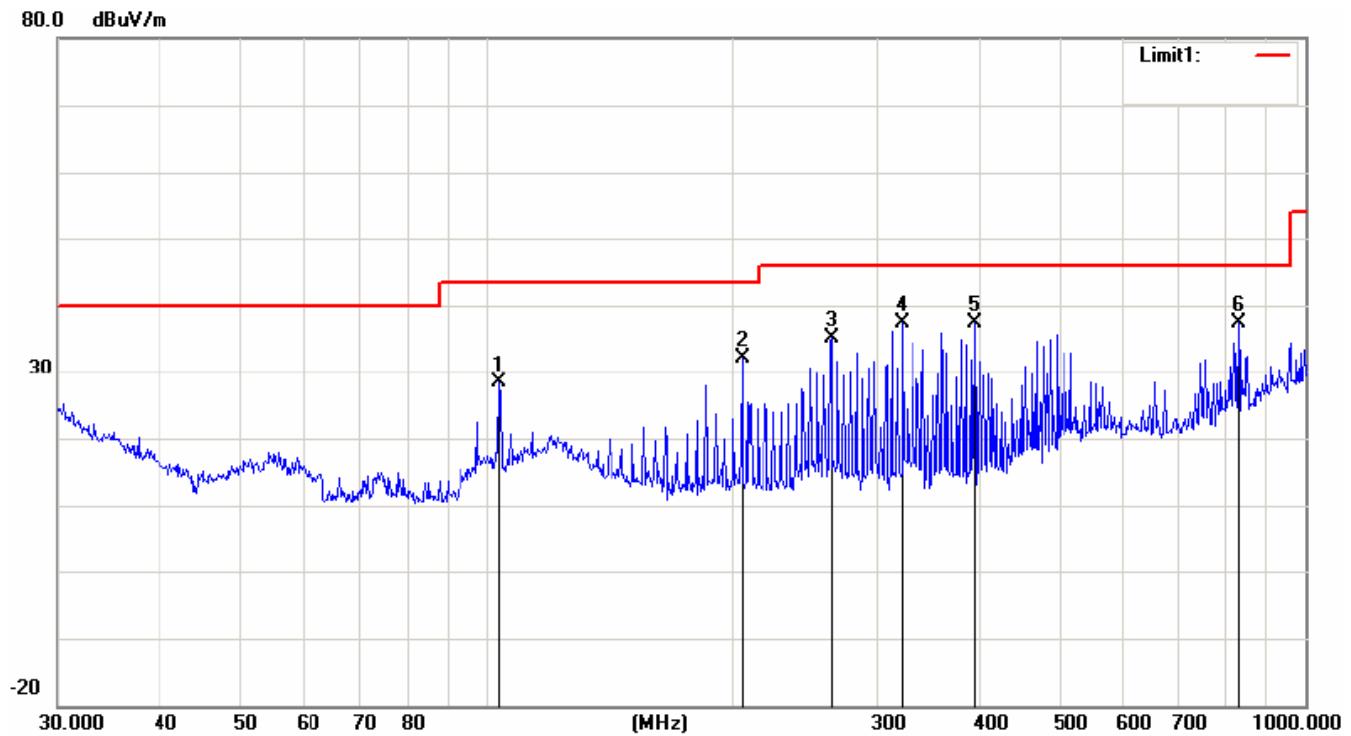


5.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

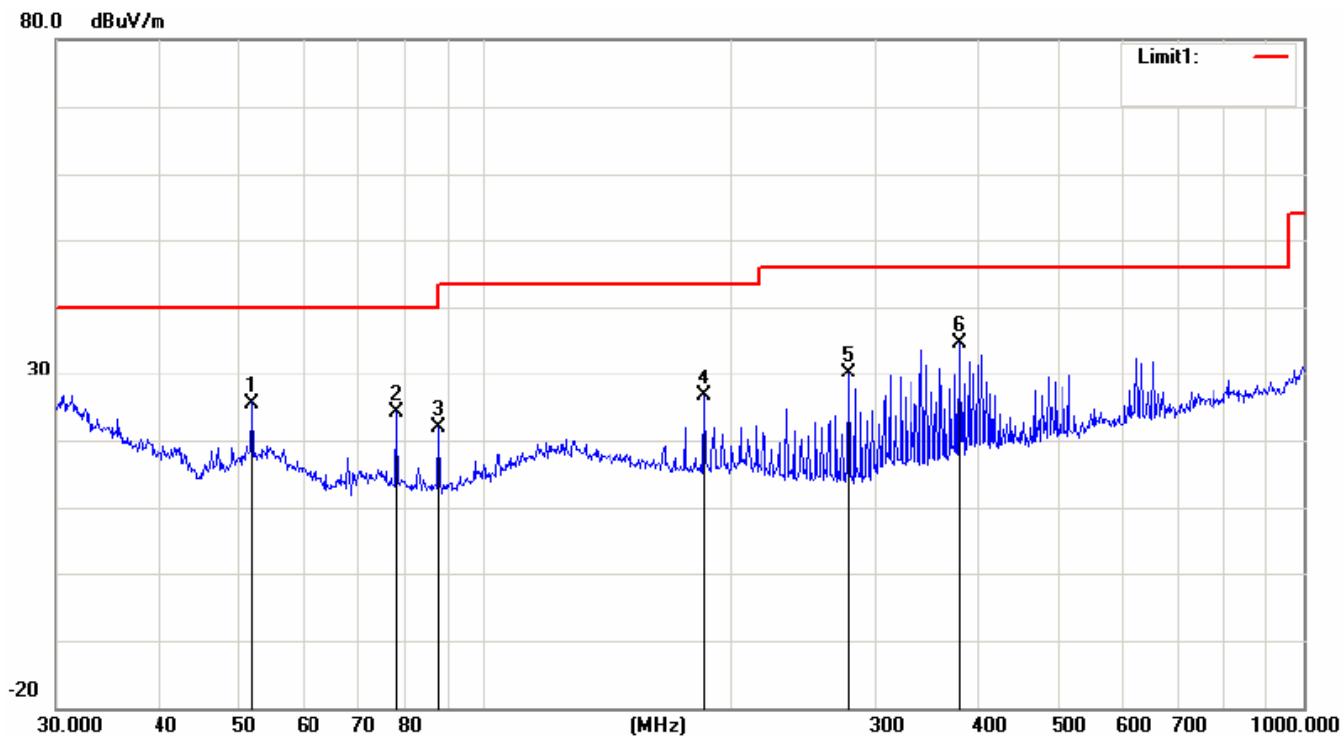
5.2.5.1 TEST RESULTS (BETWEEN 30M – 1000 MHZ)

EUT	Mobile Phone	Model Name	T420
Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Polarization :	Horizontal
Test Mode	Mode 1	Test Date	May 20, 2015



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		103.8054	33.56	-5.27	28.29	43.50	-15.21	peak
2		204.9550	37.17	-5.00	32.17	43.50	-11.33	peak
3		263.8190	41.43	-6.36	35.07	46.00	-10.93	peak
4		322.1886	42.00	-4.56	37.44	46.00	-8.56	peak
5		394.8544	40.02	-2.65	37.37	46.00	-8.63	peak
6	*	830.4002	32.27	5.20	37.47	46.00	-8.53	peak

EUT	Mobile Phone	Model Name	T420
Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Polarization :	Vertical
Test Mode	Mode 1	Test Date	May 20, 2015



5.2.5.2 TEST RESULTS(1GHZ TO 6GHZ)

EUT	Mobile Phone	Model Name	T340
Temperature	20 °C	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 1
Test Date	January 23, 2015		

Freq. (MHz)	Ant. Pol.	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
		H/V	PK	AV	PK	AV	PK
1686.23	V	60.07	39.03	74	54	-13.93	-14.97
2904.53	V	59.74	39.84	74	54	-14.26	-14.16
1689.34	H	58.20	39.34	74	54	-15.80	-14.66
2882.51	H	59.76	40.76	74	54	-14.24	-13.24

Remark:

All emissions not reported were more than 20dB below the specified limit or in the noise floor.

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

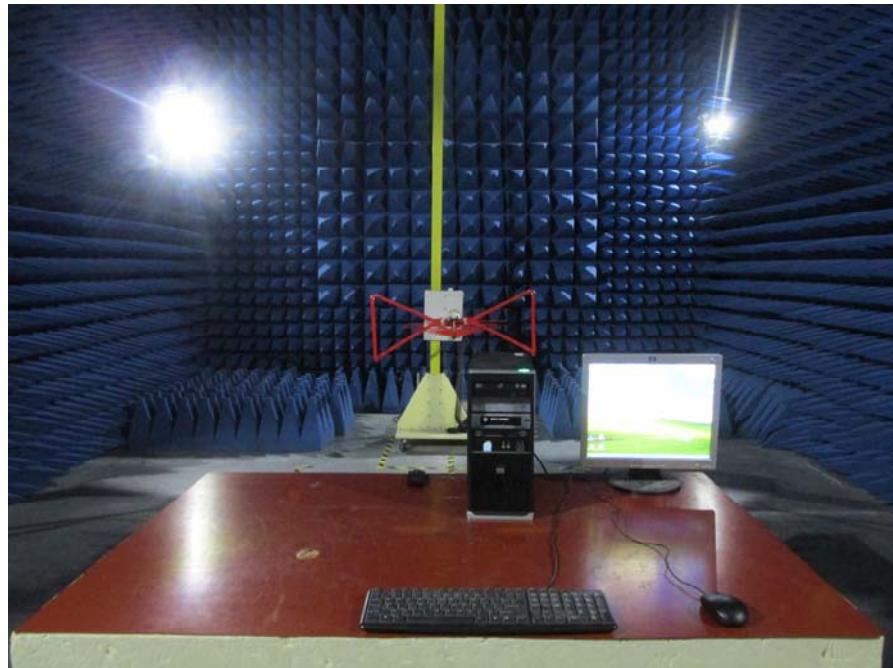
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

6. EUT TEST PHOTO

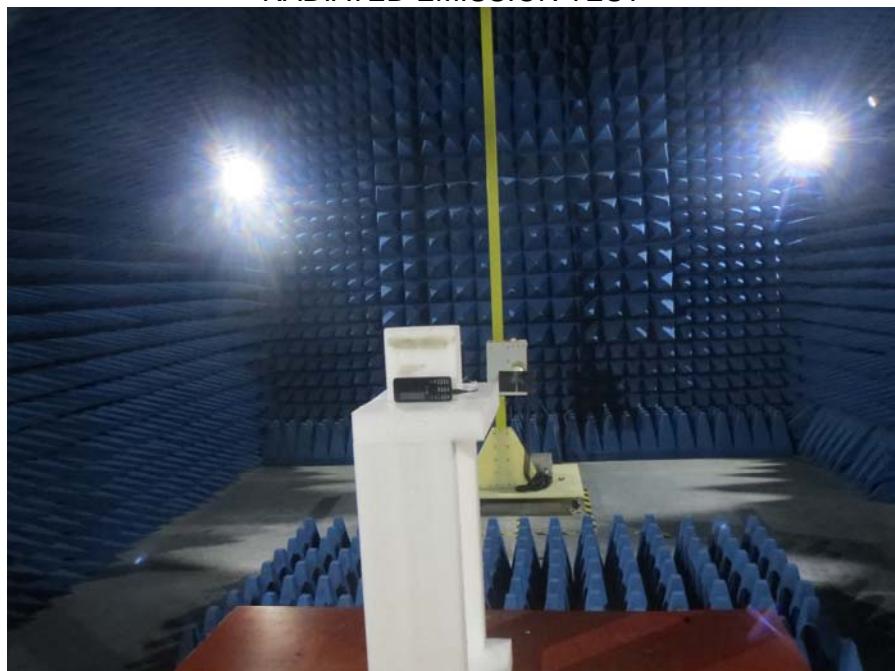
CONDUCTED EMISSION TEST



RADIATED EMISSION TEST



RADIATED EMISSION TEST

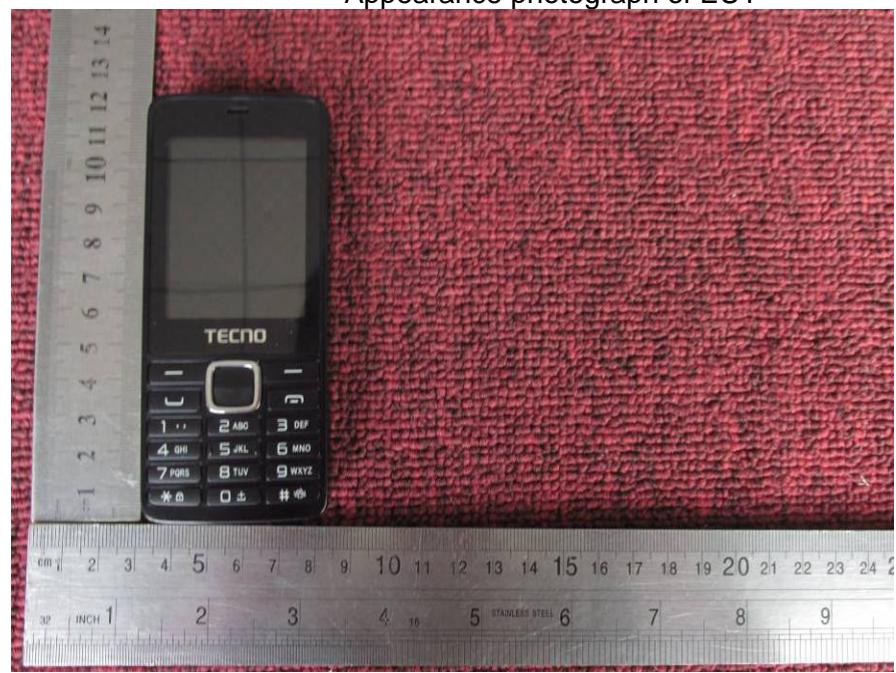


7. PHOTOGRAPHS OF EUT

Appearance photograph of EUT



Appearance photograph of EUT



Appearance photograph of EUT



Appearance photograph of EUT



Appearance photograph of EUT



Appearance photograph of EUT



Appearance photograph of EUT



Appearance photograph of EUT



Internal photograph of EUT



Internal photograph of EUT



Internal photograph of EUT



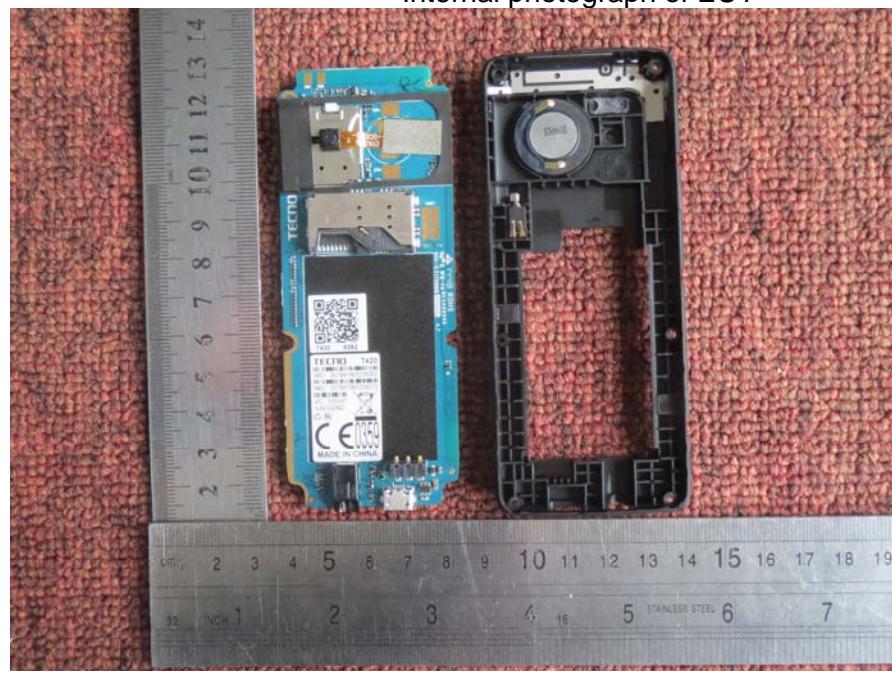
Internal photograph of EUT



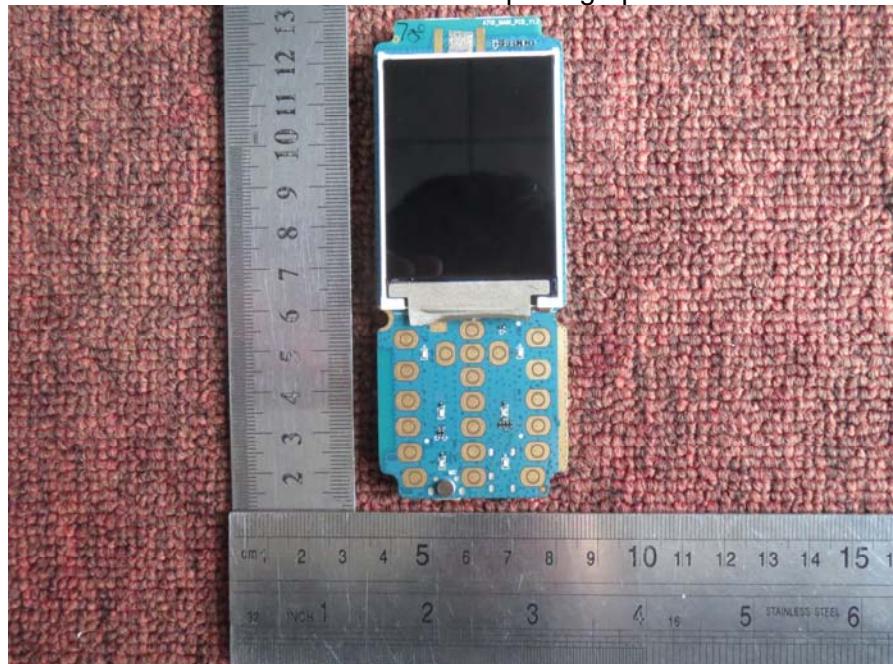
Internal photograph of EUT



Internal photograph of EUT



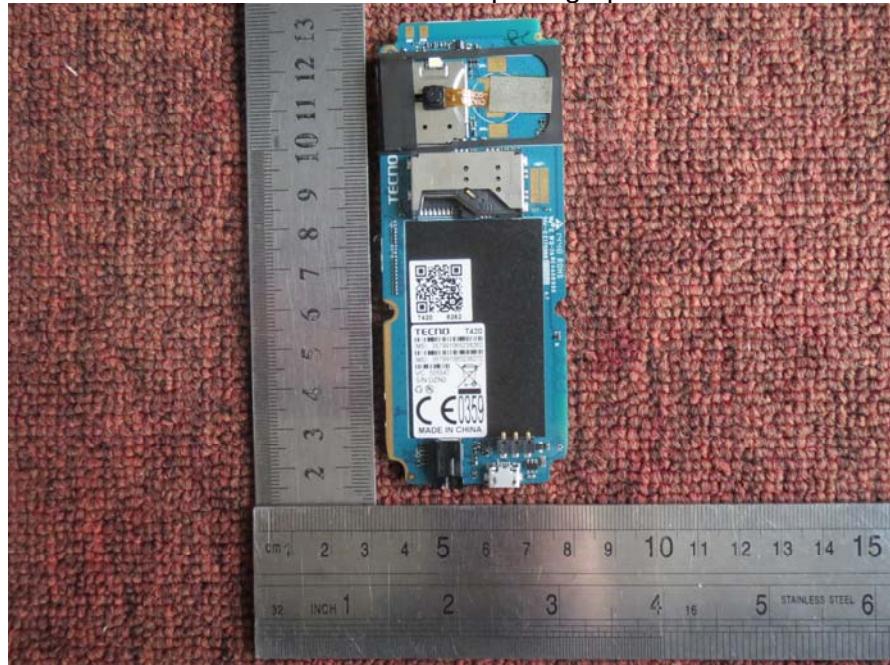
Internal photograph of EUT



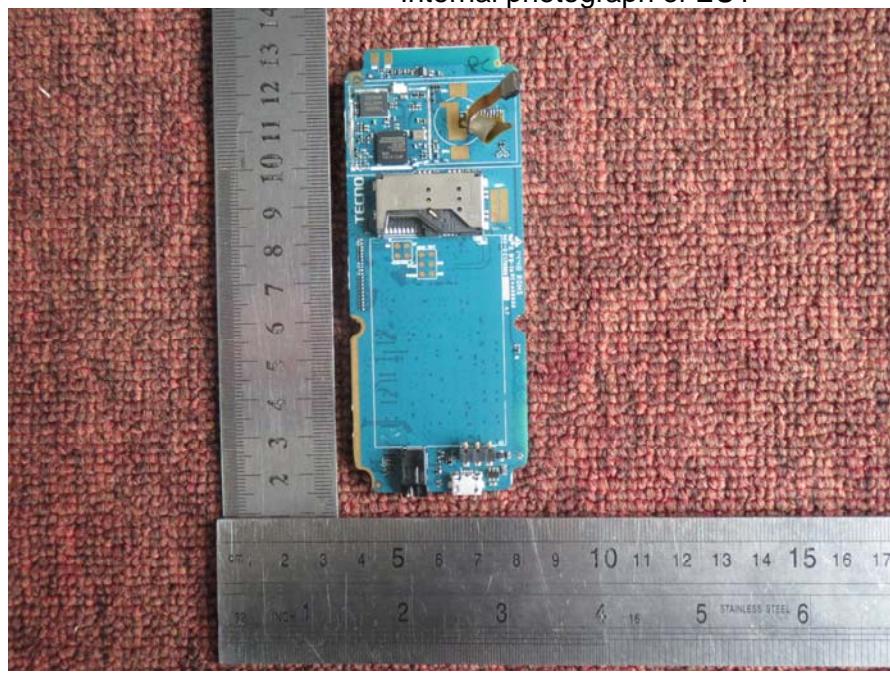
Internal photograph of EUT



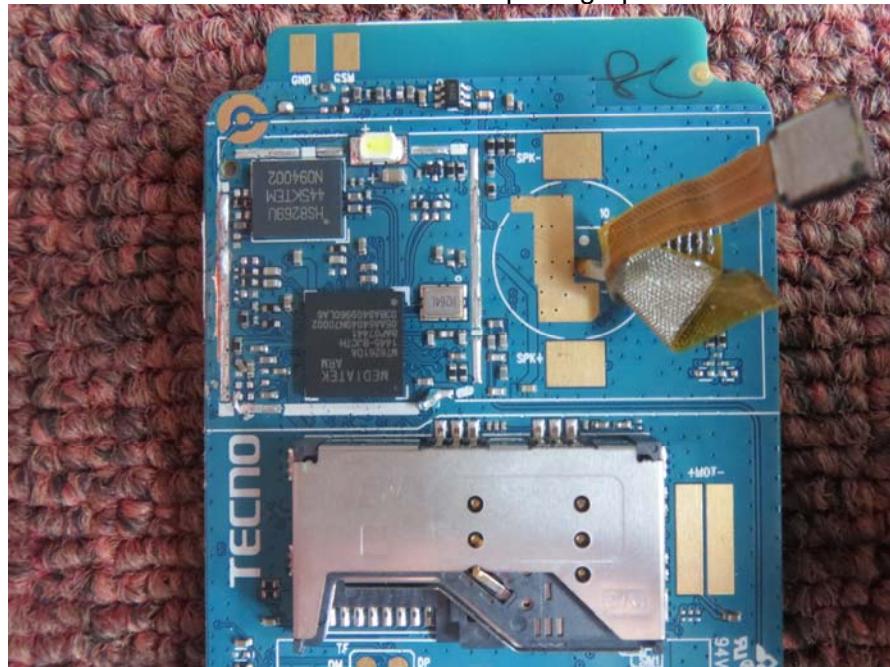
Internal photograph of EUT



Internal photograph of EUT



Internal photograph of EUT



—END OF REPORT—