



# Variant FCC RF Test Report

APPLICANT : TCL Communication Ltd.  
EQUIPMENT : HSDPA/HSUPA/UMTS triple band/GSM quad band Mobile phone  
MODEL NAME : 4024E  
FCC ID : 2ACCJB030  
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E)  
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

This is a variant report which is only valid together with the original report. The product was received on Dec. 01, 2015 and testing was completed on Dec. 07, 2015. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-D-2010 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (SHENZHEN) INC., the test report shall not be reproduced except in full.

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## REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG582702-01	Rev. 01	This is a variant report for 4024E. The detail difference between previous and current is only adding the 2 <sup>nd</sup> battery. Based on the similarity between two models, only the worst cases of Radiated Spurious Emission from original test report (Sporton Report Number FG582702) were verified for the differences.	Dec. 11, 2015



## SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiation	$< 43 + 10 \log_{10}(P[\text{Watts}])$	PASS	Under limit 11.86 dB at 1672.000 MHz



# 1 General Description

## 1.1 Applicant

**TCL Communication Ltd.**

5F, C-Tower, No. 232, Liang Jing Road, ZhangJiang High-Tech Park, Pudong Area, Shanghai, 201203,  
P. R. China

## 1.2 Manufacturer

**TCL Communication Ltd.**

5F, C-Tower, No. 232, Liang Jing Road, ZhangJiang High-Tech Park, Pudong Area, Shanghai, 201203,  
P. R. China

## 1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	HSDPA/HSUPA/UMTS triple band/GSM quad band Mobile phone
Model Name	4024E
FCC ID	2ACCJB030
EUT supports Radios application	GSM/GPRS/EGPRS(Downlink Only)/WCDMA/HSPA/ WLAN2.4GHz 802.11b/g/n HT20/ Bluetooth v2.1+EDR
HW Version	PIO
SW Version	V1.0
EUT 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.

## 1.4 Product Specification subjective to this standard

Product Specification subjective to this standard	
<b>Tx Frequency</b>	<b>GSM/GPRS:</b> 850: 824.2 MHz ~ 848.8 MHz 1900: 1850.2 MHz ~ 1909.8MHz <b>WCDMA:</b> Band V: 826.4 MHz ~ 846.6 MHz Band II: 1852.4 MHz ~ 1907.6 MHz
<b>Rx Frequency</b>	<b>GSM/GPRS:</b> 850: 869.2 MHz ~ 893.8 MHz 1900: 1930.2 MHz ~ 1989.8 MHz <b>WCDMA:</b> Band V: 871.4 MHz ~ 891.6 MHz Band II: 1932.4 MHz ~ 1987.6 MHz
<b>Antenna Type</b>	PIFA Antenna
<b>Type of Modulation</b>	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK(Downlink Only) WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink)

## 1.5 Specification of Accessory

Specification of Accessory				
<b>AC Adapter 1</b>	<b>Brand Name</b>	ALCATEL	<b>Model Name</b>	A75A-500550-US
	<b>Power Rating</b>	I/P: 100-240Vac, 150mA, O/P: 5Vdc, 550mA		
	<b>P/N</b>	CBA3007AG0C4		
<b>AC Adapter 2</b>	<b>Brand Name</b>	ALCATEL	<b>Model Name</b>	TUUS050055-B00
	<b>Power Rating</b>	I/P: 100-240Vac, 150mA, O/P: 5Vdc, 550mA		
	<b>P/N</b>	CBA3007AG0C1		
<b>Battery 1</b>	<b>Brand Name</b>	ALCATEL onetouch	<b>Model Name</b>	TLi014C7
	<b>Power Rating</b>	3.7Vdc, 1450mAh		
	<b>P/N</b>	CAB1450001C7		
<b>Battery 2</b>	<b>Brand Name</b>	ALCATEL onetouch	<b>Model Name</b>	TLi014CA
	<b>Power Rating</b>	3.7Vdc, 1450mAh		
	<b>P/N</b>	B1450002CAT000TU		
<b>USB Cable</b>	<b>Brand Name</b>	JIAYIKANG	<b>Model Name</b>	CDA0000030C3
	<b>Signal Line Type</b>	1.0m, shielded cable, without core		
<b>Earphone 1</b>	<b>Brand Name</b>	SHENGHUA	<b>Model Name</b>	CCB3160A11C6
	<b>Signal Line Type</b>	1.0m, non-shielded cable, without core		
<b>Earphone 2</b>	<b>Brand Name</b>	JIAYIKANG	<b>Model Name</b>	CCB0010A11C7
	<b>Signal Line Type</b>	1.0m, non-shielded cable, without core		

## 1.6 Modification of EUT

No modifications are made to the EUT during all test items.

## 1.7 Testing Location

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755- 3320-2398	
Test Site No.	Sporton Site No.	FCC Registration No.
	03CH01-SZ	831040

## 1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 2, 22(H), 24(E)
- ♦ ANSI / TIA / EIA-603-D-2010
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

### Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



## **2 Test Configuration of Equipment Under Test**

### **2.1 Test Mode**

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 10th harmonic for GSM850.
2. 30 MHz to 10th harmonic for GSM1900.

All modes and data rates and positions were investigated.

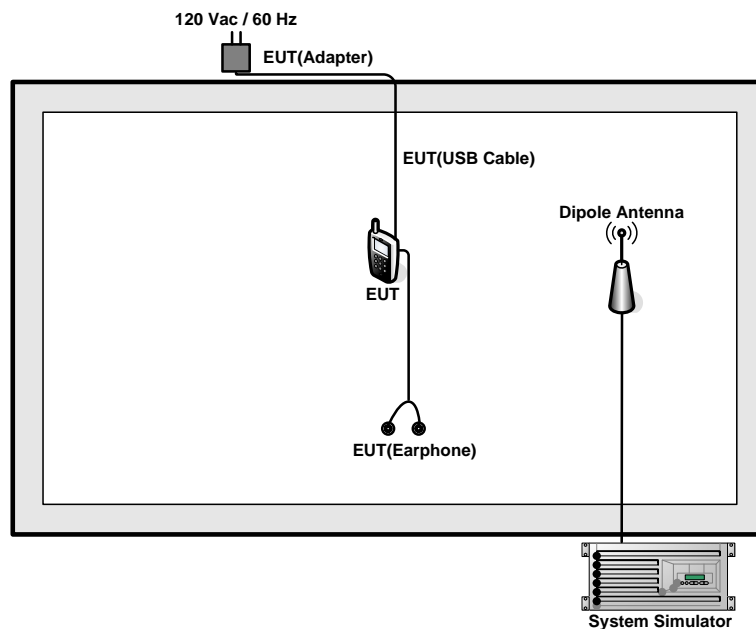
Test modes are chosen to be reported as the worst case configuration below:

<b>Test Modes</b>	
<b>Band</b>	<b>Radiated TCs</b>
<b>GSM 850</b>	■ GSM Link
<b>GSM 1900</b>	■ GSM Link

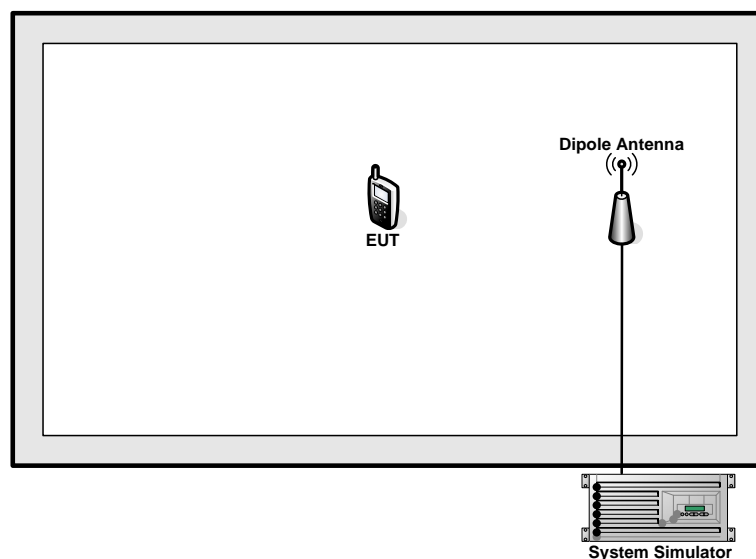


## 2.2 Connection Diagram of Test System

For 22H



For 24E



## 2.3 Support Unit used in test configuration

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m

### 3 Radiated Test Items

#### 3.1 Measuring Instruments

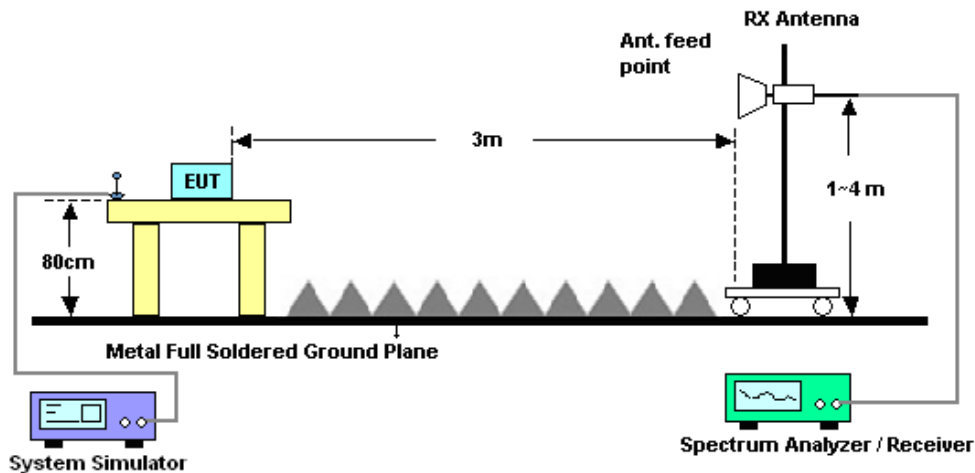
See list of measuring instruments of this test report.

#### 3.2 Test Setup

##### 3.2.1 For radiated test from 30MHz to 1GHz



##### 3.2.2 For radiated test above 1GHz



#### 3.3 Test Result of Radiated Test

Please refer to Appendix A.



### **3.4 Field Strength of Spurious Radiation Measurement**

#### **3.4.1 Description of Field Strength of Spurious Radiated Measurement**

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

#### **3.4.2 Test Procedures**

1. The testing follows FCC KDB 971168 D01 v02r02 Section 5.8 and ANSI / TIA-603-D-2010 Section 2.2.12.
2. The EUT was placed on a rotatable wooden table 0.8 meters above the ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11.  $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
12.  $ERP \text{ (dBm)} = EIRP - 2.15$
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. The limit line is derived from  $43 + 10\log(P)$  dB below the transmitter power P(Watts)  
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$   
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$   
 $= -13\text{dBm}.$



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver&SA	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GHz	May 26, 2015	Dec. 07, 2015	May 25, 2016	Radiation (03CH01-SZ)
Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz;Max 30dBm	Jun. 07, 2015	Dec. 07, 2015	Jun. 06, 2016	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	23188	30MHz-2GHz	Oct. 17, 2015	Dec. 07, 2015	Oct. 16, 2016	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1285	1GHz~18GHz	Jan. 20, 2015	Dec. 07, 2015	Jan. 19, 2016	Radiation (03CH01-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Aug.19, 2015	Dec. 07, 2015	Aug. 18, 2016	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz ~3000MHz / 30 dB	Jan. 28, 2015	Dec. 07, 2015	Jan. 27, 2016	Radiation (03CH01-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Jan. 28, 2015	Dec. 07, 2015	Jan. 27, 2016	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	May 05, 2015	Dec. 07, 2015	May 04, 2016	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Dec. 07, 2015	NCR	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Dec. 07, 2015	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Dec. 07, 2015	NCR	Radiation (03CH01-SZ)



## **5 Uncertainty of Evaluation**

### **Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)**

<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2Uc(y)</math>)</b>	<b>4.8dB</b>
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## Appendix A. Test Results of Radiated Test

### Radiated Spurious Emission

GSM850 (GSM)									
Channel	Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1672	-26.81	-13	-13.81	-30.50	-33.50	0.56	9.40	H
	2510	-38.69	-13	-25.69	-44.93	-46.39	0.75	10.60	H
	3346	-48.95	-13	-35.95	-58.25	-58.55	0.85	12.60	H
	4182	-49.57	-13	-36.57	-60.39	-59.13	0.89	12.60	H
	5018	-50.60	-13	-37.60	-64.02	-60.21	0.94	12.70	H
	5854	-51.32	-13	-38.32	-64.55	-61.06	1.11	13.00	H
	6691	-48.15	-13	-35.15	-65.35	-56.48	1.22	11.70	H
	7528	-48.85	-13	-35.85	-67.47	-56.31	1.69	11.30	H
	8364	-46.78	-13	-33.78	-66.73	-54.30	1.63	11.30	H
	1672	-24.86	-13	-11.86	-30.93	-31.55	0.56	9.40	V
	2510	-35.13	-13	-22.13	-43.47	-42.83	0.75	10.60	V
	3346	-51.08	-13	-38.08	-57.94	-60.68	0.85	12.60	V
	4182	-48.28	-13	-35.28	-58.57	-57.84	0.89	12.60	V
	5018	-54.00	-13	-41.00	-65.99	-63.61	0.94	12.70	V
	5854	-50.90	-13	-37.90	-66.55	-60.64	1.11	13.00	V
	6691	-49.21	-13	-36.21	-65.84	-57.54	1.22	11.70	V
	7528	-51.66	-13	-38.66	-69.64	-59.12	1.69	11.30	V
	8364	-47.63	-13	-34.63	-65.86	-55.15	1.63	11.30	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

GSM1900 (GSM)									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	3760	-42.64	-13	-29.64	-53.89	-54.37	0.87	12.60	H
	5640	-41.27	-13	-28.27	-57.15	-53.30	1.07	13.10	H
	7520	-38.65	-13	-25.65	-57.55	-48.26	1.69	11.30	H
	3760	-45.09	-13	-32.09	-57.56	-56.82	0.87	12.6	V
	5640	-35.40	-13	-22.40	-52.79	-47.43	1.07	13.1	V
	7520	-41.75	-13	-28.75	-59.97	-51.36	1.69	11.3	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.