Report Number: 68.910.15.013.0	1				SUD
		FCC- TEST RE	PORT		
Report Number	:	68.910.15.013.01	Date of I	ssue:	Jun 15, 2015
Model	<u> </u>	JC-J054			
Product Type	:	Bluetooth Activity Tracker			
Applicant	:	Joint Chinese Ltd			
Address	:	Building 6, Huafeng Tech Park, Luotian Industrial Area, Songgang			
		Town, Baoan, Shenzhen, China			
Production Facility	:	Joint Chinese Ltd			
Address	:	Building 6, Huafeng Tech	Park, Luotia	n Indus	trial Area, Songgang
		Town, Baoan, Shenzhen, China			
Test Result	:	■ Positive	gative		
Total pages including		22			
Appendices	:	23			

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Details about the Test Laboratory

Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China

Telephone:	86 755 8828 6998
Fax:	86 755 828 5299





3 Description of the Equipment under Test

Description of the Equipment Under Test

Product:	Bluetooth Activity Tracker
Model no.:	JC-J054
FCC ID:	2AB73JCBLE-J054
Options and accessories:	NIL
Rating:	DC3.7V (supplied by Li-ion rechargeable battery) DC5V (charged by USB port)
RF Transmission	2402-2480MHz
Frequency: No. of Operated Channel:	40
Modulation:	GFSK
Duty Cycle:	69.6%
Antenna Type:	SMD Antenna
Antenna Gain:	-2.6dBi
Description of the EUT:	The Equipment Under Test (EUT) is a Bluetooth Activity Tracker with Bluetooth 4.0 function operating at 2.4GHz



4 Summary of Test Standards

Test Standards			
FCC Part 15 Subpart C	PART 15 - RADIO FREQUENCY DEVICES		
10-1-14 Edition	Subpart C - Intentional Radiators		

All the test methods were according to KDB558074 D01 DTS Meas Guidance v03r02 and ANSI C63.10 (2013).



5 Summary of Test Results

Technical Requirements					
FCC Part 15 Subpart C					
Test Condition	Pages	Test	Те	st Res	ult
		Site	Pass	Fail	N/A
§15.207 Conducted emission AC power port					\boxtimes
§15.247 (b) (1) Conducted peak output power	10	Site 2	\square		
§15.247(a)(1) 20dB bandwidth					\boxtimes
§15.247(a)(1) Carrier frequency separation					\square
§15.247(a)(1)(iii) Number of hopping frequencies					\square
§15.247(a)(1)(iii) Dwell Time					\square
§15.247(a)(2) 6dB bandwidth	11	Site 2			
§15.247(e) Power spectral density	13	Site 2			
§15.247(d) Spurious RF conducted emissions	14	Site 2			
§15.247(d) Band edge	18	Site 2			
§15.247(d) & §15.209 Spurious radiated emissions for transmitter	20	Site 2			
§15.203 Antenna requirement	See n	ote 1	\square		

Remark 1: N/A – Not Applicable.

Note 1: The EUT uses a permanently SMD Antenna, which gain is -2.6dBi. According to §15.203, it is considered sufficiently to comply with the provisions of this section.

6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2AB73JCBLE-1504 complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C Rules.

SUMMARY:

All tests according to the regulations cited on page 5 were

- Performed
- I Not Performed
- The Equipment under Test
- - Fulfills the general approval requirements.
- □ **Does not** fulfill the general approval requirements.

Sample Received Date:

Testing Start Date:

Testing End Date:

- Jiangsu TÜV Product Service Ltd. – Shenzhen Branch -

Reviewed by:

Gui

Phoebe Hu EMC Project Manager

Prepared by:

May 21, 2015

May 22, 2015

Jun 11, 2015

Tested by:

Calvin Wend

Calvin Weng EMC Project Engineer

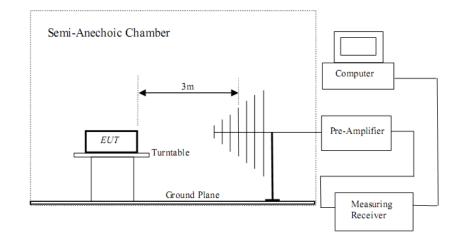
Leon.

Leon Zhang EMC Test Engineer



7 Test Setups

7.1 Radiated test setups



7.2 Conducted RF test setups







8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
NoteBook	LENOVO	X240	

Test software: N/A.

The system was configured to channel 0, 19, and 39 for the test.

9 Technical Requirement

9.1 Conducted peak output power

Test Method

- Use the following spectrum analyzer settings: RBW > the 6 dB bandwidth of the emission being measured, VBW≥3RBW, Span≥3RBW Sweep = auto, Detector function = peak, Trace = max hold.
- 2. Add a correction factor to the display.
- 3. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power.

Limits

According to §15.247 (b) (1), conducted peak output power limit as below:

Frequency Range	Limit	Limit
MHz	W	dBm
2400-2483.5	≤1	≤30

Test result as below table

Frequency MHz	Conducted Peak Output Power dBm	Result
Top channel 2402MHz	-2.65	Pass
Middle channel 2440MHz	-4.19	Pass
Bottom channel 2480MHz	-4.98	Pass



9.2 6dB bandwidth

Test Method

- Use the following spectrum analyzer settings: RBW=100K, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
- Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
- 3. Allow the trace to stabilize, record the X dB Bandwidth value.

Limit

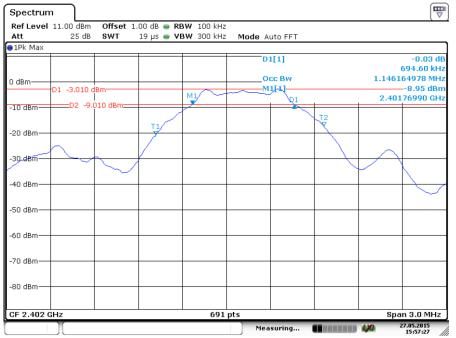
Limit [kHz]

≥500

Test result

Frequency MHz	6dB bandwidth kHz	Result
Top channel 2402MHz	694.6	Pass
Middle channel 2440MHz	677.3	Pass
Bottom channel 2480MHz	686.0	Pass

2402MHz

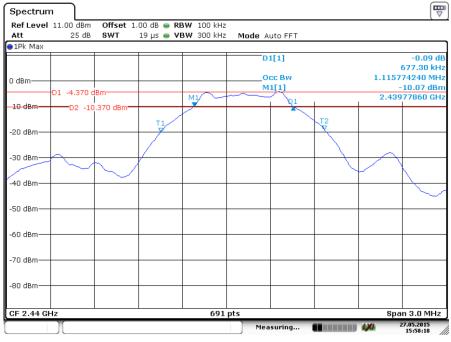


Date: 27.MAY.2015 15:57:27

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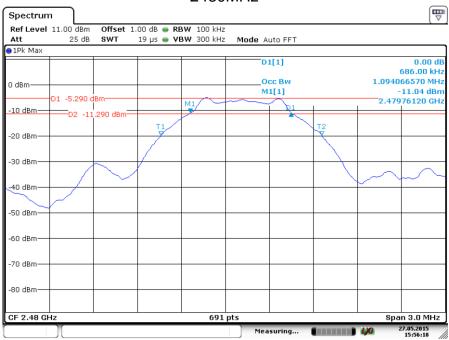


2440MHz



Date: 27.MAY.2015 15:58:18

2480MHz



Date: 27.MAY.2015 15:56:19



9.3 Power spectral density

Test Method

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

- Set analyzer center frequency to DTS channel center frequency. RBW=3kHz,VBW≥3RBW,Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
- 2. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
- 3. Repeat above procedures until other frequencies measured were completed.

Limit

Limit [dBm]

≤8

Test result

•	Deput
density	Result
dBm	
-14.63	Pass
-15.84	Pass
-16.80	Pass
	-14.63 -15.84



9.4 Spurious RF conducted emissions

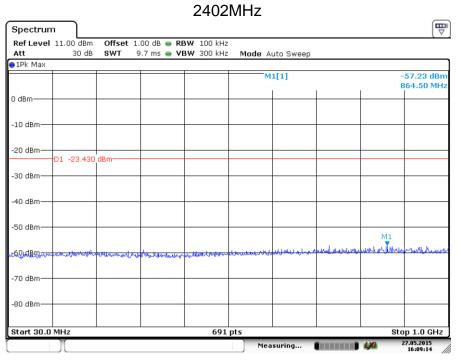
Test Method

- 1. Establish a reference level by using the following procedure:
 - a. Set RBW=100 kHz. VBW≥3RBW. Detector =peak, Sweep time = auto couple, Trace mode = max hold.
 - b. Allow trace to fully stabilize, use the peak marker function to determine the maximum PSD level.
- 2. Use the maximum PSD level to establish the reference level.
 - a. Set the center frequency and span to encompass frequency range to be measured.
 - b. Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements, report the three highest emissions relative to the limit.
- 3. Repeat above procedures until other frequencies measured were completed.

Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

Spurious RF conducted emissions



Date: 27.MAY.2015 16:09:14

Report Number: 68.910.15.013.01

Spectrum			
Att 30 dB	Offset 1.00 dB RBV		
Att 30 dB	SWT 240 ms 🖷 VBV	V 300 kHz Mode Auto Sweep	
IPK Mdx		M1[1]	-3.43 dBr 2.4070 GH
0 dBrivit			
-10 dBm			
-20 dBm	dBm		
-30 dBm			
-40 dBm			
-50 dBm		under marker marker have	And a share of the state of the
50 dBm www.unu	and an		I and the second and the second secon
-70 dBm			
-80 dBm			
Start 1.0 GHz		691 pts	Stop 25.0 GHz

Date: 27.MAY.2015 16:08:56

2440MHz

Spectrum	τ								
Ref Level Att	11.00 dBm 30 dB	Offset SWT	1.00 dB 👄 RE 9.7 ms 👄 VE						
1Pk Max	30 QB	511	9.7 ms 🖶 Vi	3W 300 KHZ	MODEA	uto Sweep			
					M	1[1]	1		58.21 dBn 78.20 MH
0 dBm									
-10 dBm									
-20 dBm	D1 -24.810	dBm							
-30 dBm									
-40 dBm									
-50 dBm									м
réa demana	whateleter	actionation	howwww.	And the second	unikadr v Mwa	مرميرورمطاهونعاه	<u> اولالي اي اي</u>	a di te ^{bl} er _m andri serada di	peenterratife
-70 dBm									
-80 dBm									
Start 30.0	MHz	1		691	pts	1		Sto	p 1.0 GHz
)[]				Mea	suring		1/0 2	27.05.2015 16:10:07

Date: 27.MAY.2015 16:10:07

Report Number: 68.910.15.013.01

Spectrun	n									
	11.00 dBm		1.00 dB 👄							
Att	30 dB	SWT	240 ms 👄	VBW	300 kHz	Mode	Auto Sweep			
∋1Pk Max										
							M1[1]			-4.81 dBn 2.4410 GH:
							1	1	ı í	2.4410 GH.
0 dBm										
-10 dBm										
-20 dBm										
	D1 -24.810) dBm								
-30 dBm										
-40 dBm										
-50 dB n			-				المعدية			
	un martine	mento	ubunder	num	whom	when	mound	and man	manundal	mannalin
-60 dem	v		_	_						
-70 dBm—										
-80 dBm										
Start 1.0 0	GHz	1	1		691	pts			Stop	25.0 GHz
)(easuring			27.05.2015
							e as ar my m			16:09:45
ate: 27.MAY.	2015 16:09:	45								

2480MHz

				2400					
Spectrun	n								
Ref Level	11.00 dBm	Offset	1.00 dB 曼 RE	3W 100 kHz					
Att	30 dB	SWT	9.7 ms 👄 ۷	BW 300 kHz	Mode A	uto Sweep			
⊖1Pk Max									
					М	1[1]			57.53 dBm 33.70 MHz
0 dBm									55.70 MHZ
-10 dBm									
-20 dBm									
-30 dBm	D1 -26.870	dBm							
-50 abiii									
-40 dBm									
-50 dBm									
						the to be	. In Italia	M1	munhamallal
utell geographic	mouthed	nthuinn.	mannoun	www.	veralitary and the	Ծանրագրություն	a Walter and a constraint		Constraint (Alline
-70 dBm—									
-80 dBm									
Start 30.0	MHz			691	pts				p 1.0 GHz
					Mea	suring		4/0	27.05.2015 16:11:45

Date: 27.MAY.2015 16:11:45

Spectrun	n								
	11.00 dBm			3W 100 kHz					
Att 1Pk Max	30 dB	SWT	240 ms 👄 V I	3W 300 kHz	Mode A	uto Sweep			
• TPK Max					м	1[1]			-6.87 dBm 2.4760 GHz
0 dBm									
-10 dBm-									
10 0.0.0									
-20 dBm—									
-30 dBm	-D1 -26.870	dBm							
-40 dBm—									
-50 dBm						Mythen 1	Ann an an A	L. S. M. S. Audi	
-60 dBm	menertulon	Valent Contraction	nunun	un and and a	ny ny ny manana ny manana ny manana ana ana ana ana ana ana ana ana		- muniter	marth down do a	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
-70 dBm—									
-80 dBm									
Start 1.0 G	GHz			691	pts			Stop	25.0 GHz
)(suring			27.05.2015 16:11:30

Date: 27.MAY.2015 16:11:30



9.5 Band edge

Test Method

1 Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious $RBW = 100 \text{ kHz}, VBW \ge RBW$, Sweep = auto, Detector function = peak, Trace = max hold.

- 2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
- 3 The level displayed must comply with the limit specified in this Section.

Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

Test result

Refle	vel 1	1.00 dBm	Offset	1 00 dB 👄	RBW 100 kHz							
Att		30 dB	SWT		VBW 300 kHz		lode A	uto Sw	een			
1Pk M	ax						iouo A	410 011	000			
						<u> </u>	M	4[1]				-30.16 dB
											2.	399440 GL
0 dBm—	-					<u> </u>	M	1[1]				-3.22 dB
											2.	402440 G
-10 dBrr	1-1-								_			1 1
00 40-												
-20 dBrr		1 -23.220	dBm									
-30 dBrr												M4
-50 abri	'											riy 🖉
-40 dBm				_								
												IN I
-50 dBm				_							M2	al d'hal
											Martin	1000
-60 dBn	mp	withour	man	nahadhaana	a da la constancia da la c	dantat	adaalaabaaaa	worthe	mon	www.	Y Martin Martin	
-70 dBrr	-			-					-			
-80 dBrr												
						L						
Start 2	.31 G	HZ			691	pts					stop	2.404 GHz
larker		1 1	×			1	-		1	-		
Type M1	Ref	Trc 1	X-val	ue)244 GHz	<u>Y-value</u> -3.22 dB	-	Func	tion		Fun	ction Resu	It
M2		1		2.39 GHz	-55.15 dB							
M3		1		2.39 GHz	-37.90 dB							
M4		1	2.39	9944 GHz	-30.16 dB							

Date: 27.MAY.2015 16:07:45

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Page 18 of 23

Ref Le	vel 1	1.00 dBn	Offset 1.	00 dB 🥃 🛙	RBW 100 kHz					
Att		30 de		.1 ms 👄	/BW 300 kHz	Mode A	uto Swe	ер		
1Pk Ma	эх									
						M	1[1]			-5.27 dBr
0 dBm—										79910 GH
U QAPIII						M	2[1]			-52.11 dBr 183500 GH
-10 dBm	_						I		2.4	63300 GF
- 11										
-20 dBm	-				++					
++		1 -25.27	0 dBm							
-30 dBm	-				+ +				+	
J. K	.									
40 dBm									+	<u> </u>
	NIP .									
гой авт	_₩J	Mahar		мз						
-60 dBm		-00 -004	Muerner	Jonam	ananana an	u hundrunde	Section And	manutur	munhant	nen
00 0011										
-70 dBm										
-80 dBm										
Start 2	.477	GHz			691 p	its	1	I	Stop	2.55 GHz
1arker										
Туре	Ref	Trc	X-value		Y-value	Func	tion	Fun	ction Result	t
M1		1	2.4799		-5.27 dBn					
M2 M3		1		35 GHz .5 GHz	-52.11 dBn -58.66 dBn					

Date: 27.MAY.2015 16:12:44



9.6 Spurious radiated emissions for transmitter

Test Method

- 1. The EUT is placed on a turntable, which is 0.8m above ground plane.
- 2. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- Use the following spectrum analyzer settings: Span = wide enough to fully capture the emission being measured, RBW = 1 MHz for f ≥ 1GHz, 100 kHz for f < 1 GHz, VBW ≥ RBW, Sweep = auto, Detector function = peak, Trace = max hold
- 4. Follow the guidelines in ANSI C63.4-2009 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 5. Set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the duty cycle per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from 20log(duty cycle/100 ms), in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Limit

According to part 15.247(d), the radio emission outside the operating frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Radiated emissions which fall in the restricted bands, as defined in section15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dBµV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK



Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Transmitting spurious emission test result as below:

2402MHz

Frequency	Emission Level	Polarization	Limit	Detector	Result
MHz	dBuV/m		dBµV/m		
68.9	16.85	Horizontal	40	QP	Pass
48.7	17.00	Vertical	40	QP	Pass
2402	75.31	Horizontal	-	PK	-
2402	70.48	Vertical	-	PK	-
*4804	46.33	Horizontal	74	PK	Pass
*4804	45.34	Vertical	74	PK	Pass

2440MHz

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBµV/m	Detector	Result
2440	73.66	Horizontal	·	PK	-
2440	69.20	Vertical	-	PK	-
*4880	45.55	Horizontal	74	PK	Pass
*4880	44.77	Vertical	74	PK	Pass

2480MHz

Frequency	Emission Level	Polarization	Limit	Detector	Result
MHz	dBuV/m		dBµV/m		
2480	70.38	Horizontal	-	PK	-
2480	67.82	Vertical	-	PK	-
*4960	45.50	Horizontal	74	PK	Pass
*4960	43.33	Vertical	74	PK	Pass

Remark:

 QP Emission Level= Antenna Factor +Cable Loss + Reading PK Emission Level= Antenna Factor +Cable Loss - Amp. Factor + Reading AV Emission Level= PK Emission Level+20log (dutycycle)

(2) Data of measurement within 30-1000MHz frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

(3) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

10 Test Equipment List

List of Test Instruments

	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE	
CE	EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	2015-8-17	\square
	LISN	Rohde & Schwarz	ENV4200	100249	2015-8-17	\square
	LISN	Rohde & Schwarz	ENV216	100326	2015-8-17	
	ISN	Rohde & Schwarz	ENY81	100177	2015-8-17	
	ISN	Rohde & Schwarz	ENY81- CAT6	101664	2015-8-17	
	High Voltage Proble	Rohde & Schwarz	TK9420(VT9 420)	9420-58	2015-8-17	
	RF Current probe	Rohde & Schwarz	EZ-17	100816	2015-8-17	
С	Signal Analyzer	Rohde & Schwarz	FSV40	101030	2015-8-17	\bowtie
RE	EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2015-8-17	\bowtie
	Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2017-8-17	\boxtimes
	Horn Antenna	Rohde & Schwarz	HF907	102294	2017-8-17	\bowtie
	Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2015-8-17	\square
	Pre-amplifier	Rohde & Schwarz	SCU 40A	100432	2015-8-17	\square
	3m Semi-anechoic chamber	TDK	9X6X6		2019-5-29	\boxtimes

C - Conducted RF tests

- Conducted peak output power
- 6dB bandwidth
- Power spectral density*
- Spurious RF conducted emissions
- Band edge

11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

Items	Extended Uncertainty		
Radiation emission	U=4.32dB (30MHz-25GHz)		
Output power test	0.94 dB		
Power density test	2.10 dB		
Bandwidth	1x10-9		

