



TEST REPORT FOR BLUETOOTH RF-CONFORMANCE TESTING

Report No: SRTC2018-9004(S)-18040801(A)-2

Product Name: Module

Product Model: SIM800C

Applicant: Shanghai SIMCom Wireless Solutions Ltd

Manufacturer: Shanghai SIMCom Wireless Solutions Ltd

Specification: Radio Frequency (RF) Bluetooth Test Specification

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30 Shixing Street, Shijingshan District,

Beijing, P.R.China

Tel: 86-10-57996123 Fax: 86-10-57996388

Contents

1 GENERAL INFORMATION	2
1.1 Notes of the test report	2
1.2 Information about the testing laboratory	2
1.3 Applicant’s details	2
1.4 Manufacturer’s details	2
1.5 Test Environment	3
2 DESCRIPTION OF THE EUT.....	4
3 REFERENCE SPECIFICATION	5
4 KEY TO NOTES AND RESULT CODES	6
5 RESULTS SUMMARY	7
6 TEST RESULTS.....	8
7 MEASUREMENT UNCERTAINTIES	10
7.1 RTSB-A Test System Measurement Uncertainty	10
7.2 Interlab Bluetooth RF Test Solution Measurement Uncertainty	11
8 TEST EQUIPMENT LIST.....	13
8.1 RTSB-A Test System	13
8.2 InterLab	13
Annex A –Protocol Implementation Conformance Statement(PICS)	15
Annex B –Protocol Implementation Extra Information For Testing(PIXIT)	16
Annex C –EUT Photograph	17

1 GENERAL INFORMATION

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).

The test results relate only to individual items of the samples which have been tested.

1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Address:	15th Building, No.30 Shixing Street, Shijingshan District
City:	Beijing
Country or Region:	P.R.China
Contacted person:	Peng Zhen
Tel:	+86 10 57996123
Fax:	+86 10 57996388
Email:	pengzhen@srtc.org.cn

1.3 Applicant's details

Company:	Shanghai SIMCom Wireless Solutions Ltd
Address:	SIM Technology Building, No. 633, Jinzhong Road, Changning District, Shanghai P.R.China
City:	Shanghai
Country or Region:	P.R.China
Contacted person:	Yi Liu
Tel:	18616707147
Fax:	---
Email:	liuyi@sunseagroup.com

1.4 Manufacturer's details

Company:	Shanghai SIMCom Wireless Solutions Ltd
Address:	SIM Technology Building, No. 633, Jinzhong Road, Changning District, Shanghai P.R.China
City:	Shanghai
Country or Region:	P.R.China
Contacted person:	Yi Liu
Tel:	18616707147
Fax:	---
Email:	liuyi@sunseagroup.com

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2018.4.8
Testing Start Date:	2018.4.8
Testing End Date:	2018.4.20

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient:	25	38
Maximum Extreme:	---	---
Minimum Extreme:	---	---

Normal Supply Voltage (V d.c.):	3.8
Maximum Extreme Supply Voltage (V d.c.):	---
Minimum Extreme Supply Voltage (V d.c.):	---

PIXIT:	See annex B
Conformance log reference:	Refer to LOG documents
Retention date for log reference:	5 years

2 DESCRIPTION OF THE EUT

Product Name:	Module
Product Model:	SIM800C
Software Revision:	R14.18
Hardware Revision:	V1.02
Bluetooth Address:	000000005AAD
PICS:	See Annex A
Description of EUT:	Module
Sampling Method:	Sample Delivered

3 REFERENCE SPECIFICATION

Specification	Version	Title
Radio Frequency(RF)	V 5.0.1	Radio Frequency Bluetooth Test Specification, Revision RF.

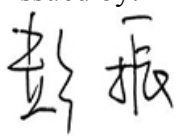
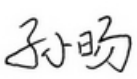
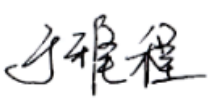
4 KEY TO NOTES AND RESULT CODES

Code	Meaning
PASS	Test result shows that the requirements of the relevant specification have been met.
FAIL	Test result shows that the requirements of the relevant specification have not been met.
NTNV	Normal voltage, Normal Temperature
RTSB-A	CTTL-SYSTEMS - RTSB-A Test System
InterLab	InterLab Bluetooth RF Test Solution

5 RESULTS SUMMARY

The following table summarises the test results obtained.

PASS	26
FAIL	0
Total	26

This Test Report Is Issued by: Mr. Peng Zhen 	Checked by: Mr. Sun Yang 
Tested by: Mr. Yu Yacheng 	Issued date: 20180606

6 TEST RESULTS

The following tables reflect the requirements of the relevant specification and show the tests performed. Result files verifying these verdicts are available for inspection at SRTC.

No.	Test Case Id	Conditions	Verdict	Platform
1.	TRMCA01C.- Output Power	NTNV	PASS	RTSB-A
2.	TRMCA02C.- Power density	NTNV	PASS	RTSB-A
3.	TRMCA03C.- Power Control	NTNV	PASS	RTSB-A
4.	TRMCA04C.- TX Output Spectrum - Frequency range	NTNV	PASS	RTSB-A
5.	TRMCA05C.- TX Output Spectrum - 20 dB Bandwidth	NTNV	PASS	RTSB-A
6.	TRMCA06C.- TX Output Spectrum -Adjacent channel power	NTNV	PASS	RTSB-A
7.	TRMCA07C.- Modulation Characteristics	NTNV	PASS	RTSB-A
8.	TRMCA08C.- Initial Carrier Frequency Tolerance	NTNV	PASS	RTSB-A
9.	TRMCA09C.- Carrier Frequency Drift	NTNV	PASS	RTSB-A
10.	TRMCA10C.- EDR Relative Transmit Power	NTNV	PASS	RTSB-A
11.	TRMCA11C.- EDR Carrier Frequency Stability and Modulation Accuracy	NTNV	PASS	RTSB-A
12.	TRMCA12C.- EDR Differential Phase Encoding	NTNV	PASS	RTSB-A
13.	TRMCA13C.- EDR In-band Spurious Emissions	NTNV	PASS	Interlab
14.	TRMCA14C.- Enhance Power Control	NTNV	PASS	RTSB-A
15.	TRMCA15C.- EDR Guard Time	NTNV	PASS	Interlab
16.	TRMCA16C.- EDR Synchronization Sequence and Trailer	NTNV	PASS	RTSB-A
17.	RCVCA01C.- Sensitivity - single slot packets	NTNV	PASS	RTSB-A
18.	RCVCA02C.- Sensitivity - multi-slot packets	NTNV	PASS	RTSB-A
19.	RCVCA03C.- C/I performance	NTNV	PASS	RTSB-A
20.	RCVCA04C.- Blocking performance	NTNV	PASS	Interlab
21.	RCVCA05C.- Intermodulation performance	NTNV	PASS	RTSB-A
22.	RCVCA06C.- Maximum input level	NTNV	PASS	RTSB-A

No.	Test Case Id	Conditions	Verdict	Platform
23.	RCVCA07C.- EDR Sensitivity	NTNV	PASS	RTSB-A
24.	RCVCA08C.- EDR BER Floor Performance	NTNV	PASS	Interlab
25.	RCVCA09C.- EDR C-I Performance	NTNV	PASS	Interlab
26.	RCVCA10C.- EDR Maximum Input Level	NTNV	PASS	RTSB-A

7 MEASUREMENT UNCERTAINTIES

According to Radio Frequency (RF) Bluetooth Test Specification, Revision RF.TS/5.0.1, the following uncertainty values^{1,2} have been calculated and compared to the specified limits as in the table below.

7.1 RTSB-A Test System Measurement Uncertainty

Testing Path Architecture	RF Tester uncertainty(95% confidence level)		Test cases validated in Testing Path
Testing Path1 Tx_Normal	In BT Band	0.46 dB	TRM_01-16
	Out Of BT Band(worst case)	0.83 dB	
Testing Path2 TxRx_Direct	In BT Band	1.16 dB	TRM_11,12 RCV_01,02,06-08,10
Testing Path3 Rx_CI	Wanted signal uncertainty level	1.16 dB	RCV_03,09
	Interfering signal uncertainty level(worst case)	0.69dB	
Testing Path4 Rx_IPPATH_PSG _EUT_INBAND	Wanted signal uncertainty level	1.16 dB	RCV_05
	Interfering signal uncertainty level(worst case)-ESG	0.69dB	
	Interfering signal uncertainty level(worst case)-ASG	1.31dB	
Testing Path5 Rx_BPPATH_PSG _EUT_OUTBAND	Wanted signal uncertainty level	1.16 dB	RCV_04
	Interfering signal uncertainty level-30MHz to 2GHz	0.872 dB	
	Interfering signal uncertainty level-2GHz to	1.31dB	

	12.75GHz		
--	----------	--	--

7.2 Interlab Bluetooth RF Test Solution Measurement Uncertainty

Uncertainty values for BR/EDR

Measurement uncertainty	RF Tester uncertainty	Specification limit	Test Case
Absolute RF power	0.90 dB	1.2 dB	TRM01,02,03,04,05,14
Absolute RF power (wanted channel)	0.90 dB	1.2 dB	TRM 06,13
Absolute RF power (for unwanted emissions in the BT band)	0.90 dB	3 dB	
Freq dev uncertainty in payload(GFSK)	4 kHz	4 kHz	TRM 07,08,09
Freq drift uncertainty(GFSK)	1 kHz	1 kHz	
Absolute radio frequency	5 kHz	5 kHz	
Relative RF Power	0.50 dB	1 dB	TRM 10
Absolute radio frequency	5 kHz	5 kHz	TRM 11
RMS DEVM	3%	<5%	
Relative drift radio frequency	1 kHz	1 kHz	
Symbol Error	1ppm	1ppm	TRM12
Frequency Accuracy	<0.5us or 1 ppm	1ppm	
Absolute RF power (wanted channel)	0.74 dB	1.2 dB	RCV01,02,06,07,08,10
Absolute RF power (wanted channel)	0.88 dB	1.2 dB	RCV03,09
Absolute RF power (for interfering signal)	1.12 dB	3 dB	
Absolute RF power (wanted channel)	0.88 dB	1.2 dB	RCV04
Absolute RF power (for 1st interfering signal)	1.12 dB	3 dB	
Absolute RF power (for 2nd interfering)	1.78 dB	3 dB	

Measurement uncertainty	RF Tester uncertainty	Specification limit	Test Case
signal)			
Absolute RF power (wanted channel)	0.88 dB	1.2 dB	RCV05
Absolute RF power (for 1st interfering signal)	1.07 dB	3 dB	
Absolute RF power (for 2nd interfering signal)	1.20 dB	3 dB	

Note 1: All values reflect a 95% confidence level.

Note 2: All values are valid for operating system temperatures between 20°C and 30°C.

8 TEST EQUIPMENT LIST

Conformance testing was performed using test equipment calibrated in accordance with CNAS accreditation requirements. Calibration, configuration records and equipment details used for conformance testing are available for inspection at SRTC if required.

8.1 RTSB-A Test System

Hardware:					
No.	Equipment Name	Manufacturer	Model Number	Serial Number	Calibration Due Date
1	Spectrum Analyzer	Agilent	N9030A	MY51380467	2018.08.20
2	Sweep Generator	Agilent	E8257D	MY46520645	2019.03.01
3	RF Signal Generator	Agilent	E4438C	MY45093904	2018.08.20
4	Bluetooth Test Set	Anritsu	MT8852B	1142010	2019.03.01
6	Switching Unit	CTTL	CTTLBTTS IFSG	---	---
Software:					
Test Engine ver 2.0.0					

8.2 InterLab

Hardware:					
Items	Test Equipment Name	Manufacturer	Model	Serial Number	Cal Due data
001	Spectrum Analyzer	R&S	FSL3	104526	2018.12.14
002	Sweep Generator	R&S	SMF100A	104774	2018.12.14
003	RF Signal Generator	R&S	SMBV100A	261074	2018.12.14
004	Bluetooth Test Set	R&S	CMW270	100555	2018.12.13
005	Switching Unit	InterLab	---	---	---
006	Temperature and Humidity	ESPEC	E0517	92000390	2018.08.19

	Box				
007	Power Supply	R&S	HMP2020	021921846	2018.12.14
008	Power Sensor	R&S	NRP-Z21	104690	2018.12.14
Software:					
Test Engine ver 5.1.2					

Annex A –Protocol Implementation Conformance Statement(PICS)

PICS performance for Radio(BR/EDR)

Item	Capability	Reference	Status	Support: Yes or No	Values Allowed	Values Supported
1	Power Class 1	RF, 3	M,1	YES		
2	Power Class 2	RF, 3	M,1	NO		
3	Power Class 3	RF, 3	M,1	NO		
4	Power Control	RF, 3	C.1	YES	-	-
5	1-slot packets supported	BB,6.5	M	YES	-	-
6	3-slot packets supported	BB,6.5	O	YES	-	-
7	5-slot packets supported	BB,6.5	O	YES	-	-
8	79 Channels	RF, 2	M	YES	-	-
9	Support for GFSK modulation	RF, 3.1	M	YES		
10	Support for $\pi/4$ -DQPSK modulation	RF, 3.2	C.2	YES		
11	Support for 8DPSK modulation	RF, 3.2	C.3	YES		
12	Enhanced Power Control	RF,3	C.4	YES		

M.1: Must choose one only one power class.

C.1: Mandatory to support if 1/1 is supported, ELSE Optional to support if 1/2 OR 1/3 is supported.

Mandatory if SUM_ICS 21/4 OR SUM_ICS 21/6 OR (SUM_ICS 21/8 AND EDR Support) is

C.2: claimed; ELSE Optional if SUM_ICS 21/3 OR SUM_ICS 21/5 OR SUM_ICS 21/8 is claimed; ELSE Excluded.

Mandatory if SUM_ICS 21/4 OR SUM_ICS 21/6 OR (SUM_ICS 21/8 AND EDR Support) is

C.3: claimed; ELSE Optional if 1/8 AND (SUM_ICS 21/3 OR SUM_ICS 21/5 OR SUM_ICS 21/8) is claimed; ELSE Excluded.

C.4: Optional if Sum_ICS,21/8 AND 1/4 supported, ELSE Excluded.

Annex B –Protocol Implementation Extra Information For Testing(PIXIT)

Item	Identifier	Units	Comments	Value
Classic Bluetooth				
RF:P 1	Timer for TX power control	ms	TRM/CA/03 Power Control	1000
RF:P 2	Inband Image frequency	MHz	RCV/CA/03 C/I Performance RCV/CA/09 EDR C/I Performance	3
RF:P 3	Value n for Intermodulation test	Integer	RCV/CA/05 Intermodulation Performance	5
RF:P 6	Type of power source		Chapter 6.4, RF Test Specification	DC
RF:P 7	Nominal power source voltage	V	Chapter 6.4, RF Test Specification	3.8
RF:P 8	Operating temperature range	°C	Chapter 6.5, RF Test Specification	25
RF:P 9	Extreme power source voltage	V	Chapter 6.5, RF Test Specification	NA
RF:P 10	Antenna gain	dB	Chapter 6.9, RF Test Specification	2.18

Annex C –EUT Photograph

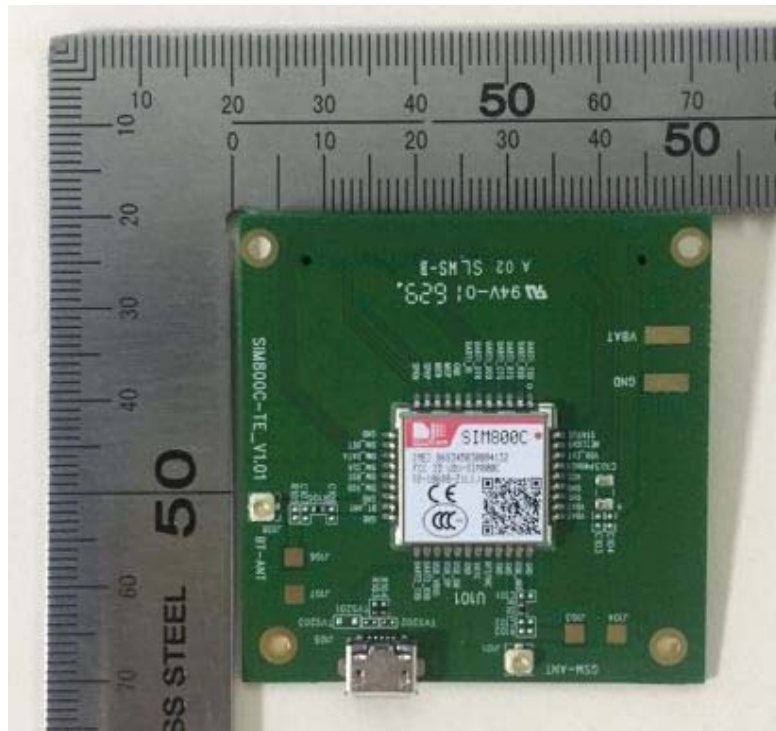


Photo1: The front view of EUT



Photo2: The vertical view of EUT

---End of Test Report---