

MEASUREMENT REPORT

EN 302 502 V2.1.1 WLAN 802.11a/n/ac

Applicant: Compex Systems Pte Ltd

Address: No:9 Harrison Road, Harrison Industrial Building, #05-01,
Singapore 369651

Product: 802.11ac Dual Band Module

Serial Model: WLE900VX, WLE900VX-I

Brand Name: COMPEX

Standards: ETSI EN 302 502 V2.1.1 (2017-03)

Result: Complies

Test Date: June 20 ~ July 11, 2017

Reviewed By : Jame Yuan
(Jame Yuan)

Approved By : Marlin Chen
(Marlin Chen)



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
1706RSU03104	Rev. 01	Initial report	07-11-2017	Valid

Note: This test report was based on MRT report number 1503RSU03008 and updated the standard EN 302 502 version from v1.2.1 to v2.1.1. Besides the receiver blocking items, there is no any other updated item.

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1. General Information

1.1. Applicant

Compex Systems Pte Ltd

No:9 Harrison Road, Harrison Industrial Building, #05-01, Singapore 369651

1.2. Manufacturer

Compex Systems Pte Ltd

No:9 Harrison Road, Harrison Industrial Building, #05-01, Singapore 369651

1.3. Testing Facility

Test Site

MRT Technology (Suzhou) Co., Ltd

Test Site Location

D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China

- MRT facility is a FCC registered (MRT Reg. No. 809388) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.
- MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.
- MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.
- MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.



1.4. Feature of Equipment under Test

Product Name:	802.11ac Dual Band Module
Model No :	WLE900VX, WLE900VX-I
Brand Name:	COMPEX
Frequency Range	802.11a/b/g/n/ac

Note: The difference of models is for different marketing requirement.

1.5. Product Specification Subjective

Frequency Range	802.11a /n-HT20/ac-VHT20: 5745 ~ 5825MHz
Channel Number	802.11a/n-HT20/ac-VHT20: 5
Type of Modulation	802.11a/n/ac: OFDM
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1299.9Mbps

1.6. Operation Frequency / Channel List

802.11a/n-HT20/ac-VHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745 MHz	153	5765 MHz	157	5785 MHz
161	5805 MHz	165	5825 MHz	N/A	N/A

1.7. Description of Available Antennas

Antenna No.	Manufacturer	Tx Paths	Max Directional Gain (dBi)
Antenna 1#	Kunshan Wavelink Electronic Co., Ltd.	3	2.4GHz: 2.0, 5GHz: 2.0
Antenna 2#	TAOGLAS Inc	3	2.4GHz: 4.5, 5GHz: 6.7
Antenna 3#	Compex Systems Pte Ltd	3	2.4GHz: 5.0, 5GHz: 5.0
Antenna 4#	Compex Systems Pte Ltd	3	2.4GHz: 5.0, 5GHz: 5.0
Antenna 5#	Smart Ant Inc	3	5GHz: 7.0
Antenna 6#	Kenbotong Communication LTD	3	5GHz: 10.0

Note 1: The frequency bands (5150~5350MHz & 5470~5725MHz) support the max antenna gain 7dBi and another frequency band (5725~5850MHz) supports the max antenna gain 10dBi.

Note 2: We selected the antenna 6# for all radiated emission testing.

1.8. Standards Applicable for Testing

The EUT complies with the requirements of ETSI EN 302 502 V2.1.1.

2. Test Summary

Clause EN 302 502	Test Parameter	Result (Pass/Fail)	Remark
4.2.7	Receiver Blocking	Pass	--

3. Receiver Blocking

3.1. Limit

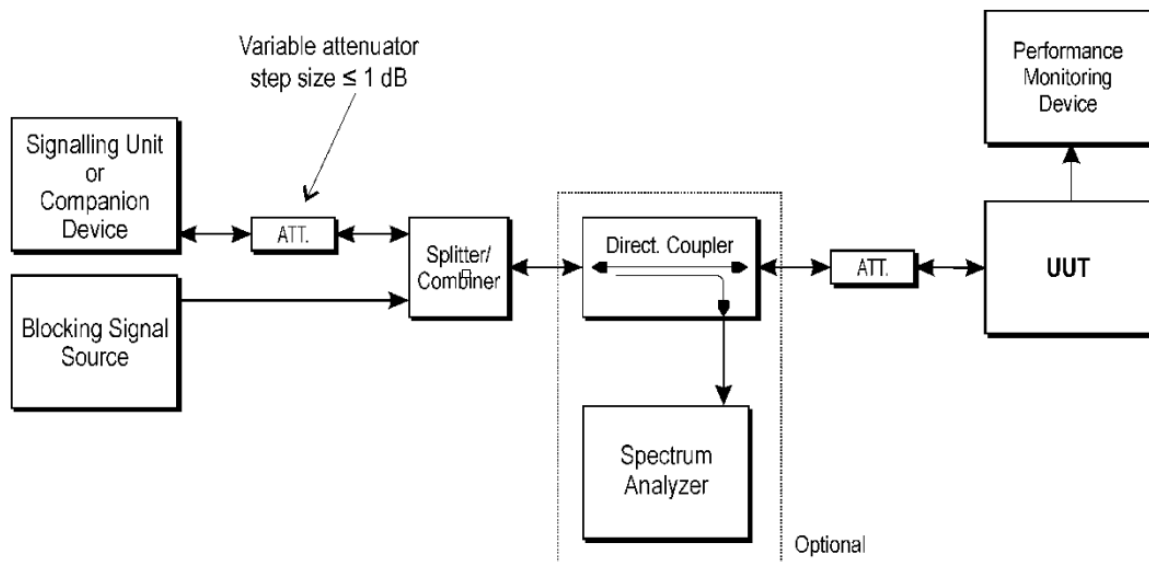
While maintaining the minimum performance criteria as defined in clause 4.2.7.3, the blocking levels at specified frequency offsets shall be equal to or greater than the limits defined in table 4.

Table 4: Receiver Blocking parameters			
Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm)	Type of blocking signal
$P_{\text{MIN}} + 6 \text{ dB}$	5 420 5 925	-42	CW
$P_{\text{MIN}} + 6 \text{ dB}$	5 320 6 025 6 125		CW

NOTE 1: P_{MIN} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.2.7.3 in the absence of any blocking signal.

NOTE 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.

3.2. Test Setup



Test Set-up for receiver blocking

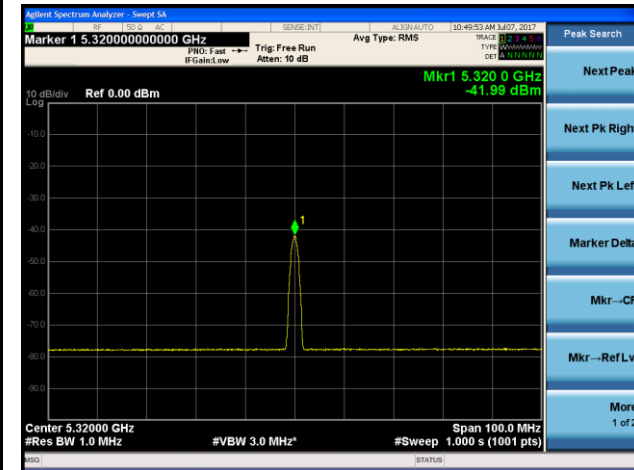
3.3. Test Procedure

Refer to ETSI EN 302 502 V2.1.1 (2017-03) Clause 5.4.7.2.1

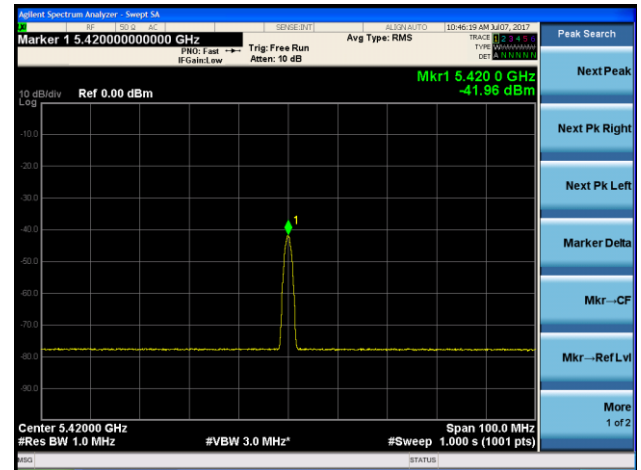
3.4. Test Result

Blocking Signal Calibration Plots

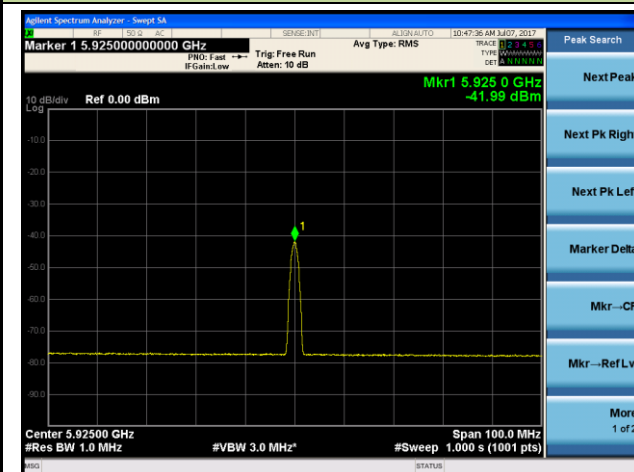
5320MHz



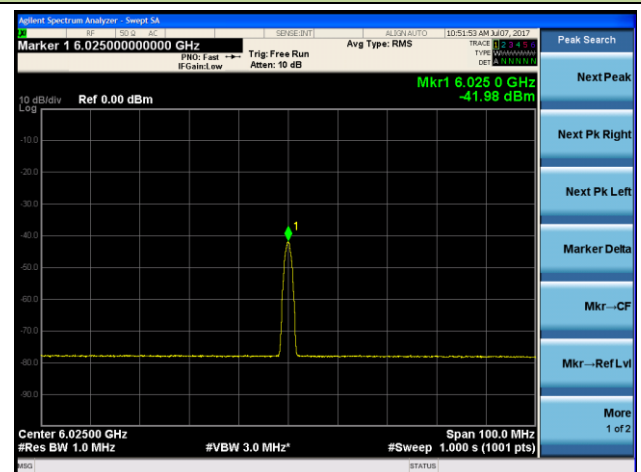
5420MHz



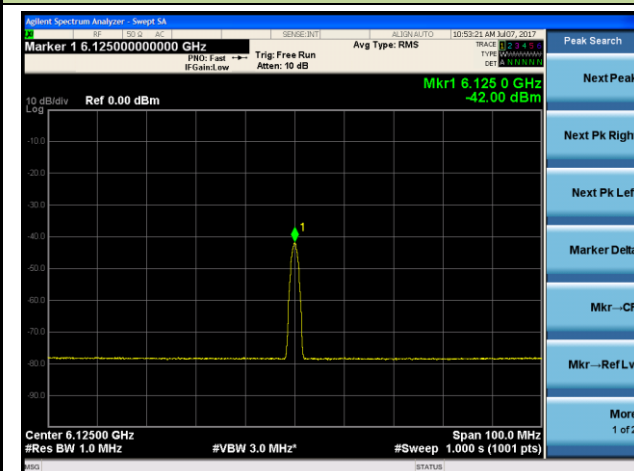
5925MHz



6025MHz



6125MHz



Test Engineer	Andy Zhu	Temperature	26°C
Test Data	2017/07/07	Relative Humidity	54%
Test Mode	802.11a	Test Site	TR4

Channel	Wanted Signal Mean Power from Companion Device (dBm)	Blocking Signal Frequency (MHz)	Blocking Signal Power (dBm)	Type of Blocking Signal	PER Test Result	Limit (PER)	Test Result
149	$P_{\text{MIN}} + 6 \text{ dB}$	5420	-42	CW	0.0	< 10%	Pass
		5925			0.1		Pass
		5320			0.1		Pass
		6025			0.0		Pass
		6125			0.0		Pass

4. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Radio Frequency	± 10 ppm
RF output power, conducted	± 1.5 dB
Power Spectral Density, conducted	± 3 dB
Spurious Emissions, radiated	± 6 dB
Temperature	± 2 °C
Humidity	± 5 %
Time	± 10 %

5. List of Measuring Instrument

Receiver Blocking - TR3

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
Vector Signal Generator	Agilent	E4438C	MY49872484	1 year	2017/12/06
4 Ch. Simultaneous Sampling 14	Agilent	U2531A	TW55453505	N/A	N/A
4 Ch. Simultaneous Sampling 14	Agilent	U2531A	TW55453512	N/A	N/A
Wideband Radio Communication Tester	R&S	CMW 500	1201.0002K50	1 year	2017/11/10
Directional Coupler	Narda	4216-20	1395	1 year	2018/03/28
Power Splitter	Mini-Circuits	ZFRSC-123-S+	N/A	N/A	N/A
Temperature/Humidity Meter	Yuhuaze	HTC-2	N/A	1 year	2017/12/20

Software	Version	Function
e3	V8.3.5	EMI Test Software

The End