

MEASUREMENT REPORT

EN 300 328 V2.1.1 WLAN 802.11b/g/n

Applicant: Compex Systems Pte Ltd

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

Product: 802.11ac Dual Band Module

Model No.: WLE900VX, WLE900VX-I

Brand Name: COMPEX

Standards: EN 300 328 V2.1.1 (2016-11)

Result: Complies

Test Date: June 24 ~ July 11, 2017

Reviewed By :

Jame Yuan

(Jame Yuan)

Approved By :

Marlinchen

(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
1706RSU03102	Rev. 01	Initial report	07-11-2017	Valid

Note: This test report was based on MRT report number 1612RSU02301 and updated the standard EN 300 328 version from v1.9.1 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
Wi-Fi Specification:	802.11a/b/g/n/ac

1.5. Product Specification Subjective to this Standard

Wi-Fi Specification	
Frequency Range	802.11b/g/n-HT20: 2412 ~ 2472MHz 802.11n-HT40: 2422 ~ 2462MHz
Channel Number	802.11b/g/n-HT20: 13 802.11n-HT40: 9
Type of Modulation	802.11b: DSSS 802.11g/n: OFDM
Data Rate	802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 450Mbps

Note: For other features of this EUT, test report will be issued separately.

1.6. Operation Frequency / Channel List

802.11b/g/n-HT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	2457 MHz	11	2462 MHz	12	2467 MHz
13	2472 MHz	--	--	--	--

802.11n-HT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
03	2422 MHz	04	2427 MHz	05	2432 MHz
06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	10	2457 MHz	11	2462 MHz

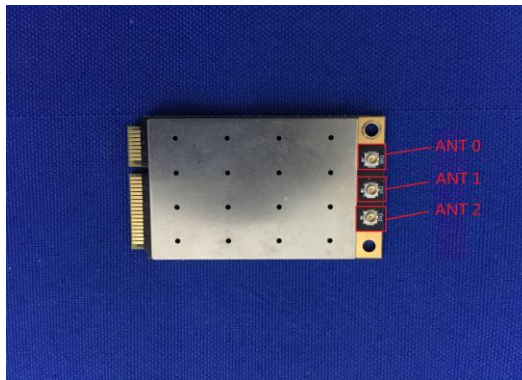
1.7. Description of Available Antennas

Antenna Type	Manufacturer	Tx Paths	Max Directional Gain (dBi)
Dipole Antenna 1#	Kunshan Wavelink Electronic Co., Ltd.	3	2.4GHz: 2.0, 5GHz: 2.0
Dipole Antenna 2#	Smart Ant Inc	3	2.4GHz: 4.5, 5GHz: 7.0
PCB Antenna 3#	TAOGLAS Inc	3	2.4GHz: 4.5, 5GHz: 6.7
PCB Antenna 4#	Compex Systems Pte Ltd	3	2.4GHz: 5.0, 5GHz: 5.0
PCB Antenna 5#	Compex Systems Pte Ltd	3	2.4GHz: 5.0, 5GHz: 5.0

Note: We selected the dipole antenna 2# and PCB antenna 4# for all radiated emission testing.

1.8. Description of Antenna RF Port

Antenna RF Port			
--	2.4/5GHz Antenna RF Port		
	2.4/5GHz	2.4/5GHz	2.4/5GHz
Software Control Port	Ant 0	Ant 1	Ant 2

Antenna RF Port Plot


1.9. Standards Applicable for Testing

The EUT complies with the requirements of ETSI EN 300 328 V2.1.1.

2. Test Summary

Clause (EN 300328)	Test Parameter	Result (Pass/Fail)	Remark
Receiver Parameters			
4.3.2.11	Receiver Blocking	Pass	---

3. Receiver Blocking

3.1. Limit

The minimum performance criterion shall be a PER less than or equal to 10 %. The manufacturer may declare alternative performance criteria as long as that is appropriate for the intended use of the equipment.

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)	Type of blocking signal
$P_{\text{MIN}} + 6 \text{ dB}$	2380, 2503.5	-53	CW
$P_{\text{MIN}} + 6 \text{ dB}$	2300, 2330, 2360	-47	CW
$P_{\text{MIN}} + 6 \text{ dB}$	2523.5, 2553.5 2583.5, 2613.5 2643.5, 2673.5	-47	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 4.3.2.11.3 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 levels have to be corrected by the actual antenna assembly gain.

3.2. Test Setup

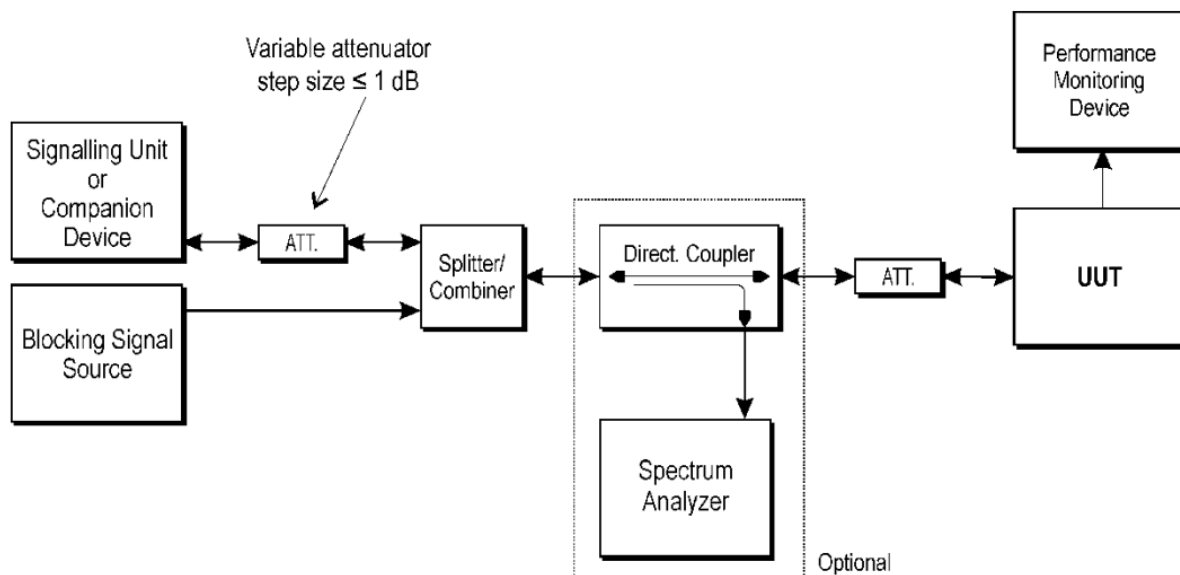


Figure 6: Test Set-up for receiver blocking

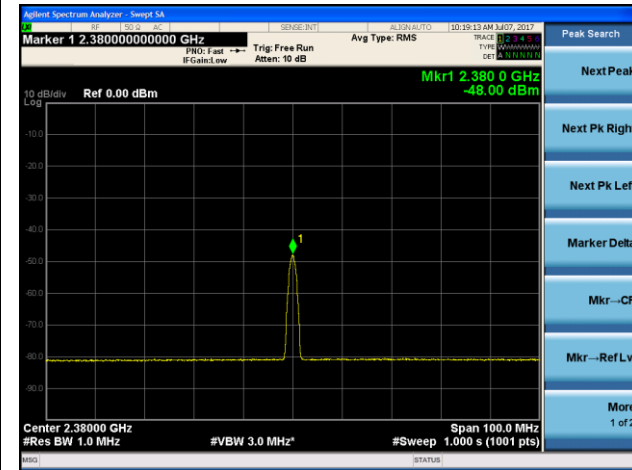
3.3. Test Procedure

Refer to ETSI EN 300 328 V2.1.1 (2016-11) Clause 5.4.11.2.1.

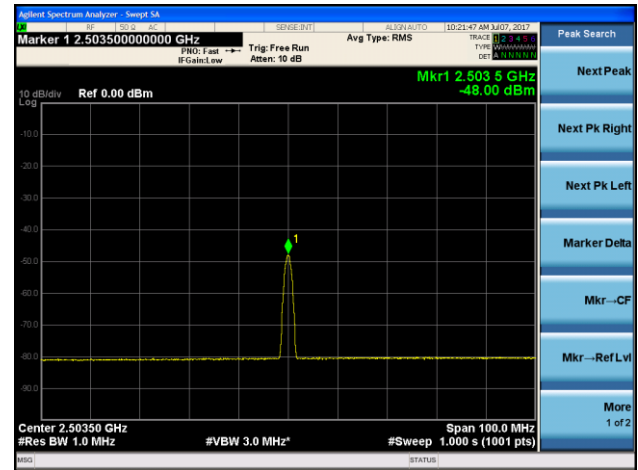
3.4. Test Result

Blocking Signal Calibration Plots

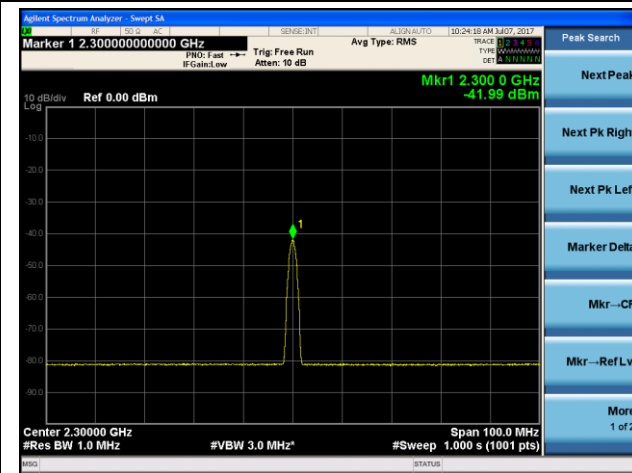
2380MHz



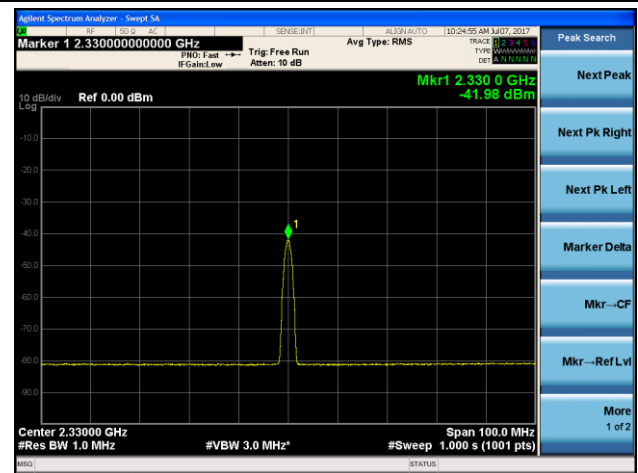
2503.5MHz



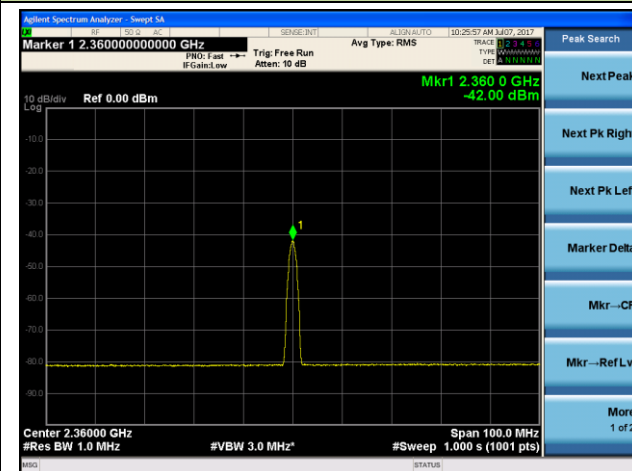
2300MHz



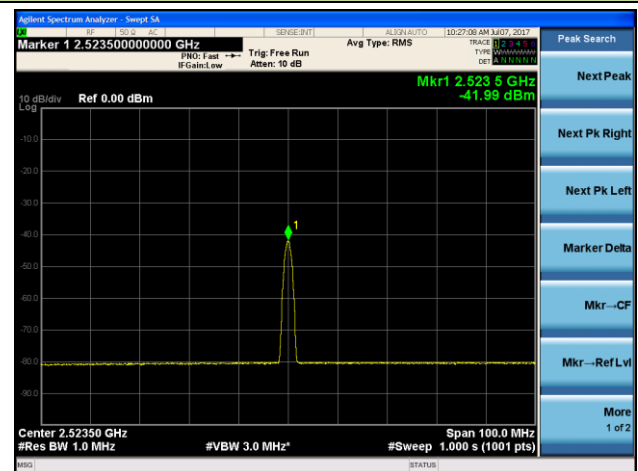
2330MHz

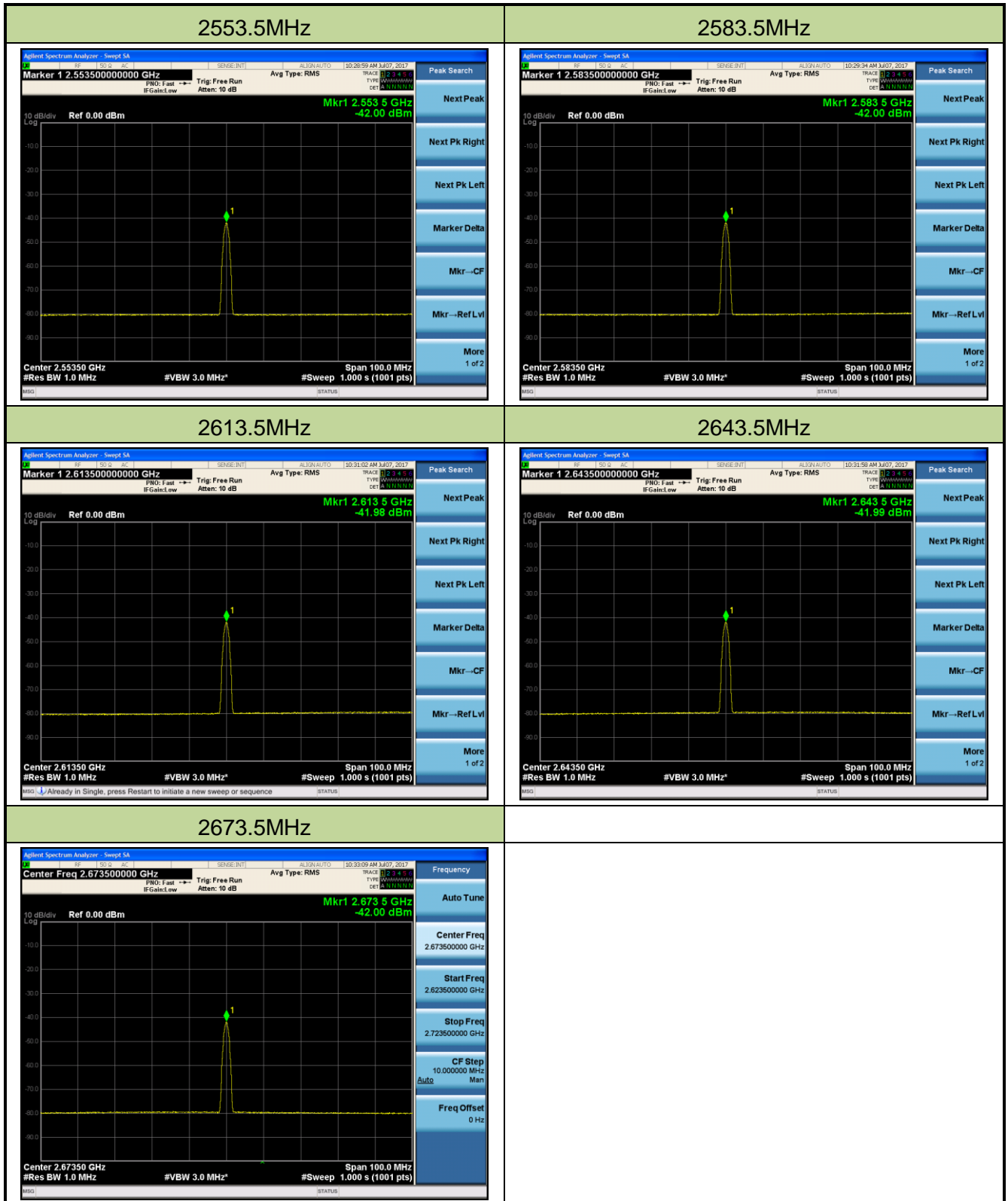


2360MHz



2523.5MHz





Note: This interference level has been included the antenna gain.

Test Engineer	Andy Zhu	Temperature	25°C
Test Data	2017/07/07	Relative Humidity	52%
Test Mode	802.11b	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
01	$P_{\min} + 6 \text{ dB}$	2300.0	-42	CW	7.1	< 10%	Pass
		2330.0	-42		6.8		Pass
		2360.0	-42		2.5		Pass
		2380.0	-51		2.4		Pass
		2503.5	-51		2.2		Pass
		2523.5	-42		3.6		Pass
		2553.5	-42		2.9		Pass
		2583.5	-42		3.4		Pass
		2613.5	-42		2.7		Pass
		2643.5	-42		2.7		Pass
		2673.5	-42		2.1		Pass
13	$P_{\min} + 6 \text{ dB}$	2300.0	-42	CW	2.7	< 10%	Pass
		2330.0	-42		2.5		Pass
		2360.0	-42		3.6		Pass
		2380.0	-51		1.9		Pass
		2503.5	-51		1.4		Pass
		2523.5	-42		2.0		Pass
		2553.5	-42		2.4		Pass
		2583.5	-42		2.8		Pass
		2613.5	-42		1.7		Pass
		2643.5	-42		2.7		Pass
		2673.5	-42		2.0		Pass

Test Engineer	Andy Zhu	Temperature	25°C
Test Data	2017/07/07	Relative Humidity	52%
Test Mode	802.11g	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
01	$P_{\text{MIN}} + 6 \text{ dB}$	2300.0	-42	CW	4.2	< 10%	Pass
		2330.0	-42		4.8		Pass
		2360.0	-42		5.8		Pass
		2380.0	-51		4.2		Pass
		2503.5	-51		6.0		Pass
		2523.5	-42		5.7		Pass
		2553.5	-42		5.4		Pass
		2583.5	-42		5.3		Pass
		2613.5	-42		4.0		Pass
		2643.5	-42		4.3		Pass
		2673.5	-42		5.7		Pass
13	$P_{\text{MIN}} + 6 \text{ dB}$	2300.0	-42	CW	0.2	< 10%	Pass
		2330.0	-42		0.2		Pass
		2360.0	-42		0.3		Pass
		2380.0	-51		0.2		Pass
		2503.5	-51		0.3		Pass
		2523.5	-42		0.4		Pass
		2553.5	-42		0.3		Pass
		2583.5	-42		0.4		Pass
		2613.5	-42		0.1		Pass
		2643.5	-42		0.3		Pass
		2673.5	-42		0.1		Pass

4. Measurement Uncertainty

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

Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 5 \%$
RF output power, conducted	$\pm 1,5 \text{ dB}$
Power Spectral Density, conducted	$\pm 3 \text{ dB}$
Unwanted Emissions, conducted	$\pm 3 \text{ dB}$
All emissions, radiated	$\pm 6 \text{ dB}$
Temperature	$\pm 3 \text{ }^{\circ}\text{C}$
Supply voltages	$\pm 3 \%$
Time	$\pm 5 \%$

5. List of Measuring Instrument

Receiver Blocking - TR3

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Wideband Radio Communication Tester	R&S	CMW500	MRTSUE06243	1 year	2018/02/14
Vector Signal Generator	Agilent	E4438C	MRTSUE06026	1 year	2017/12/06
Directional Coupler	Narda	4216-20	MRTSUE06065	1 year	2018/03/28
Power Splitter	Mini-Circuits	ZFRSC-123-S+	MRTSUE06122	N/A	N/A
Temperature/Humidity Meter	Yuhuaze	HTC-2	MRTSUE06180	1 year	2017/12/20

Software	Version	Function
e3	V8.3.5	EMI Test Software

The End