FCC DFS TEST REPORT

FCC ID: 2ATYD-1101

Report Reference No. ..... :	19EFAS12030 61
Date of issue ..... :	2019-12-31
Testing Laboratory..... :	DongGuan ShuoXin Electronic Technology Co., Ltd.
Address ..... :	Zone A, 1F, No. 6, XinGang Road YuanGang Street, XinAn District, ChangAn Town, DongGuan City, GuangDong, China
Applicant's name ..... :	Kano Computing Limited
Address ..... :	3 Finsbury Ave London EC2M 2PA,London, United Kingdom
Manufacturer ..... :	Kano Computing Limited
Test specification:	
Test item description..... :	Kano PC
Trade Mark ..... :	Kano
Model/Type reference ..... :	1101, 1101-01, 1101-02, 1101B-02, 1101-03, 1101-04, 1110-01, 1110-02, 1110B-02, 1110-03, 1110-04, 1110
Ratings ..... :	Adapter:ES086A-U120300XYZ INPUT: 100-240V~ 50/60Hz 0.8A OUTPUT: DC 12V 3.0A

Responsible Engineer : Smile Wang

Smile Wang

Authorized Signatory: King Wang

King Wang

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TEST REPORT DECLARE

Applicant	:	Kano Computing Limited
Address	:	3 Finsbury Ave London EC2M 2PA,London, United Kingdom
Equipment under Test	:	Kano PC
Model No	:	1101, 1101-01, 1101-02, 1101B-02, 1101-03, 1101-04, 1110-01, 1110-02, 1110B-02, 1110-03, 1110-04, 1110
Trade Mark	:	Kano
Manufacturer	:	Kano Computing Limited
Address	:	3 Finsbury Ave London EC2M 2PA,London, United Kingdom

Test Standard Used:

FCC Part 15, Subpart E (Section 15.407) & RSS 247: Issue 2.

We Declare:

The equipment described above is tested by DongGuan ShuoXin Electronic Technology Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and DongGuan ShuoXin Electronic Technology Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

Report No:	19EFAS12030 61		
Date of Test:	2019-12-18	**Date of Report**:	2019-12-31

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of DongGuan ShuoXin Electronic Technology Co., Ltd.

1. EUT INFORMATION

1.1 EUT SPECIFICATION TABLE

Table 1: Specification of EUT

Product name	Kano PC
Brand Name	Kano
Model	1101
EUT function description	Kano PC with WiFi & BT function.
Power supply	Adapter:ES086A-U120300XYZ
HVIN	N/A
FVIN	N/A
Operational Mode	Slave
Operating Frequency Range	5260~5320MHz&5500~5700MHz
Modulation	OFDM

Note: This device was functioned as a□. Master ■Slave device during the DFS

1.2 DESCRIPTION OF AVAILABLE ANTENNAS TO THE EUT

Ant.	Brand	Model Name	Antenna Type / Connector	function	Gain (dBi)
ANT A	N/A	N/A	Integral	TX/RX	1.6
ANT B	N/A	N/A	Integral	TX/RX	1.6

2. U-NII DFS RULE REQUIREMENTS

2.1 WORKING MODES AND REQUIRED TEST ITEMS

The manufacturer shall state whether the UUT is capable of operating as a Master and/or a Client. If the UUT is capable of operating in more than one operating mode then each operating mode shall be tested separately. See tables 1 and 2 for the applicability of DFS requirements for each of the operational modes.

Table 5: Applicability of DFS requirements prior to use a channel

Requirement	Operational Mode		
	Master	Client without radar detection	Client with radar detection
Non-Occupancy Period	✓	Not required	✓
DFS Detection Threshold	✓	Not required	✓
Channel Availability Check Time	✓	Not required	Not required
Uniform Spreading	✓	Not required	Not required
U-NII Detection Bandwidth	✓	Not required	✓

Table 6: Applicability of DFS requirements during normal operation.

Requirement	Operational Mode		
	Master	Client without radar detection	Client with radar detection
DFS Detection Threshold	✓	Not required	✓
Channel Closing Transmission Time	✓	✓	✓
Channel Move Time	✓	✓	✓
U-NII Detection Bandwidth	✓	Not required	✓

2.2 TEST LIMITS AND RADAR SIGNAL PARAMETERS

DETECTION THRESHOLD VALUES

Table 7: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection.

Maximum Transmit Power	Value (See Notes 1 and 2)
⩾ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm

Note 1**:** This is the level at the input of the receiver assuming a 1.6 dBi receive antenna.
Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Table 8: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 80% of the UNII 99% transmission power bandwidth. See Note 3.

Note 1: The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows:
- For the Short Pulse Radar Test Signals this instant is the end of the Burst.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar Burst generated.
- For the Long Pulse Radar Test Signal this instant is the end of the 12 second period defining the Radar Waveform.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

PARAMETERS OF DFS TEST SIGNALS

Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table 9: Short Pulse Radar Test Waveforms.

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Table 10: Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Numberof Pulsesper Burst	Numberof Bursts	Minimum Percentage of Successful Detection	Minimum Number ofTrials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 11: Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Numberof Pulsesper Burst	Numberof Bursts	Minimum Percentage of Successful Detection	Minimum Number ofTrials
6	1	333	9	0.333	300	70%	30

3. TEST INSTRUMENTS

Table 1: Test instruments list.

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until	Cal. Interval
1	Spectrum analyzer	KEYSIGHT	N9010A	MY55150427	05/05/2020	1Y
2	MXG Vector Signal Generator	KEYSIGHT	N5182B	MY53052051	05/05/2020	1 Y
3	EXG Analog Signal Generator	KEYSIGHT	N5171B	MY53051415	05/05/2020	1 Y

Note: Calibration interval of instruments listed above is one year.

4. TEST RESULTS

4.1 SUMMARY OF TEST RESULT

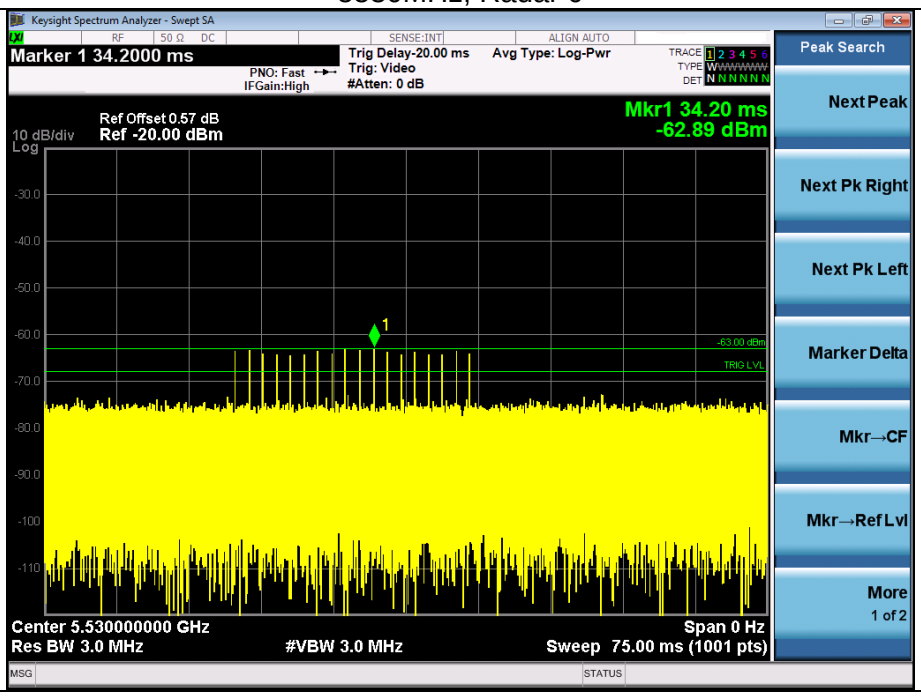
FCC Rules		Description of Test	Result
FCC 15.407	KDB 905462 D02	Non-Occupancy Period	Pass
FCC 15.407	KDB 905462 D02	Channel Closing Transmission Time	Pass
FCC 15.407	KDB 905462 D02	Channel Move Time	Pass

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

6 TEST MODE DFS TEST RESULT

6.1 DFS RADAR WAVEFORM CALIBRATION RESULT

Master DFS Threshold Level
DFS Threshold level:-60.4dBm
The Interference Radar Detection Threshold Levelis (-62dBm) + ([1.6dBi]) + {0 dB}=-60.00dBm. That had been taken into account the master output power range and antenna gain.

5530MHz, Radar 0


6.2 CHANNEL MOVE TIME, CHANNEL CLOSING TRANSMISSION TIME AND NON-OCCUPANCY PERIOD FOR CLIENT BEACON TEST PLOTS

In-service MonitoringLimit

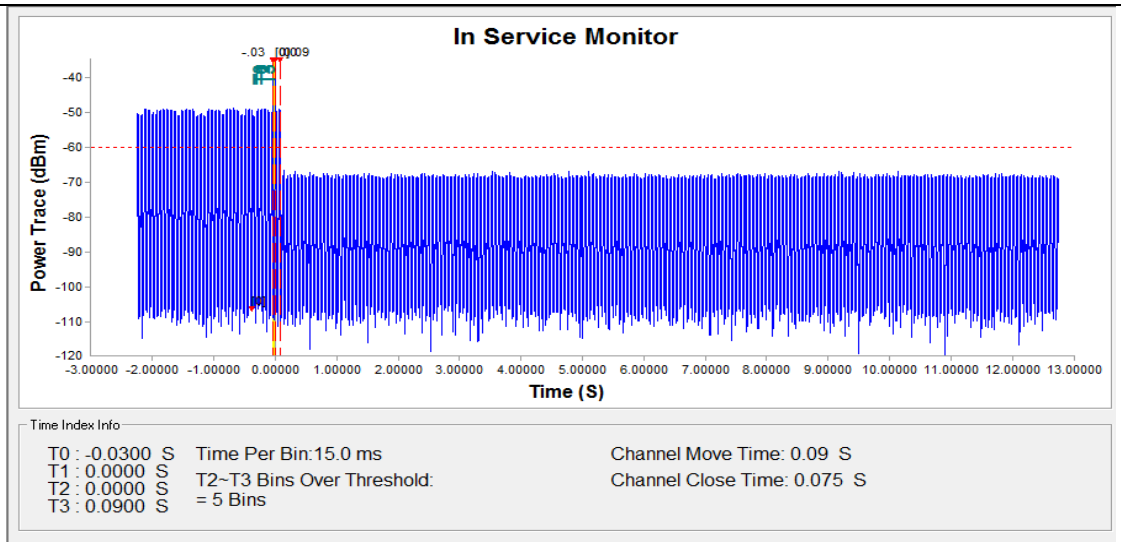
In-service Monitoring Limit	
Channel Move Time	10 sec
Channel Closing Transmission Time	200 ms+ an aggregate of 60 ms over remaining 10 sec periods.
Non-occupancy period	Minimum 30 minutes

Test Procedures

Test Method
Refer as FCC KDB 905642 D02,clause 7.8.3verified during In-Service Monitoring;Channel Closing Transmission Time, Channel Move Time.Client Device will associate with the EUT. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the EUT during theobservation time (Channel Move Time). Compare the Channel Move Time and ChannelClosingTransmission Timelimits.
Refer as FCC KDB 905642 D02,clause 7.8.3verified during In-Service Monitoring; Non-Occupancy Period.Client Device will associate with the EUT. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the EUT during theobservation time (Non-Occupancy Period). Compare the Non-Occupancy Periodlimits.

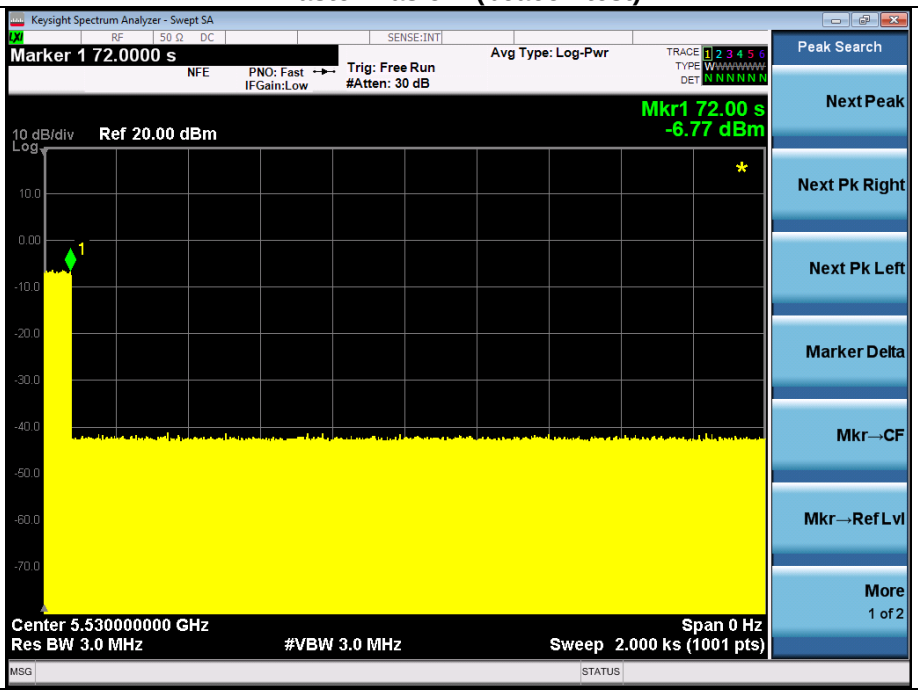
Test Result of Channel Closing Transmission and Channel Move Time

Channel Move Time & Channel Closing Transmission Time



Non-associated test

Master was off. (beacon test)



Test Item	Limit	Results
Non-Occupancy Period	30 minutes	Pass

********** END **********