

Prüfbericht-Nr.: <i>Test Report No.:</i>	17046186 002	Auftrags-Nr.: <i>Order No.:</i>	164028024	Seite 1 von 14 Page 1 of 14
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	24.12.2014	
Auftraggeber: <i>Client:</i>	ETEK Technology (Shenzhen) Co., Ltd, 5/F, Section A, Academy of Aerospace Technology, Keji Nan 10th Rd., Hi-Tech Industrial Park, Shenzhen, China			
Prüfgegenstand: <i>Test item:</i>	Wireless Adapter			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	TD-2021N-USB			
Auftrags-Inhalt: <i>Order content:</i>	FCC and IC approval			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart B Section 15.107 CFR47 FCC Part 15: Subpart B Section 15.109 ICES-003 Issue 5 August 2012			
Wareneingangsdatum: <i>Date of receipt:</i>	16.12.2014	Refer to photo documents		
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000144382-003, A000144382-004			
Prüfzeitraum: <i>Testing period:</i>	30.12.2014 - 10.05.2015			
Ort der Prüfung: <i>Place of testing:</i>	Accurate Technology Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von / tested by:		kontrolliert von / reviewed by:		
08.09.2015 Lin Lin / Project Manager		09.09.2015 Sam Lin / Senior Project Manager		
Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>
Sonstiges / Other:				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

Prüfbericht - Nr.: 17046186 002
Test Report No.

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TEST SUMMARY

5.1.1 CONDUCTED EMISSION

RESULT: Passed

6.1.1 RADIATED EMISSION

RESULT: Passed

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1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test Results

2. Test Sites

2.1 Test Facilities

Accurate Technology Co., Ltd.

(FCC Registration No.: 752051 and IC Registered Test Sites number: 5077A-2)

F1, Bldg A, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen, 518057, P.R. China

The tests at the test site have been conducted under the supervision of a TÜV engineer.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
Conducted emissions				
Test Receiver	Rohde & Schwarz	ESCS30	100307	Jan.11, 2016
L.I.S.N.	Schwarzbeck	NLSK8126	8126431	Jan.11, 2016
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100305	Jan.11, 2016
Radiated emissions				
Spectrum Analyzer	Rohde&Schwarz	FSV40	101495	Jan.11, 2016
Test Receiver	Rohde& Schwarz	ESR	101817	Jul. 30, 2016
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan.15, 2016
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan.15, 2016
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan.15, 2016
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan.15, 2016
RF Switching Unit+PreAMP	Compliance Direction	RSU-M2	38322	Jan.10, 2016
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan.10, 2016
Pre-Amplifier	Agilent	8447D	294A10619	Jan.11, 2016

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

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

Table 2: Measurement Uncertainty

Items		Extended Uncertainty
CE	Disturbance Voltage (dBuV)	U=2.78dB, k=2, σ =95%
RE (30-1000MHz)	Field strength (dBuV/m)	U=4.24dB, k=2, σ =95%
RE (above 1000MHz)	Field strength (dBuV/m)	U=5.18dB, k=2, σ =95%

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached in this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The Accurate Technology Co., Ltd. facility located at F1, Bldg A, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen, 518057, P.R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3. General Product Information

3.1 Product Function and Intended Use

The EUT is wireless dongle which is designed to provide a high-speed and unrivaled wireless performance for your equipment. It implements 802.11 b/g/n protocols.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Information of EUT

Technical Specification	Value
Kind of Equipment:	Wireless Adapter
Type Designation:	TD-2021N-USB
FCC ID:	2AD53ETEK2401
IC:	12708A-ETEK2401
Type of Equipment:	Class B digital equipment
Operating Voltage:	DC 5V via USB port
Operating Temperature Range:	-20°C to 70°C

3.3 Independent Operation Modes

The basic operation modes are:

- A. Connect to PC
- B. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Bill of Material	- Circuit Diagram
- PCB Layout	- Instruction Manual
- Photo Document	- Rating Label

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5&6.

4.3 Special Accessories and Auxiliary Equipment

Table 4: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Laptop PC	Lenovo	X200	L3-ANW2G	--
Printer	HP	HP Laserjet 1015	CNFG030424	--

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

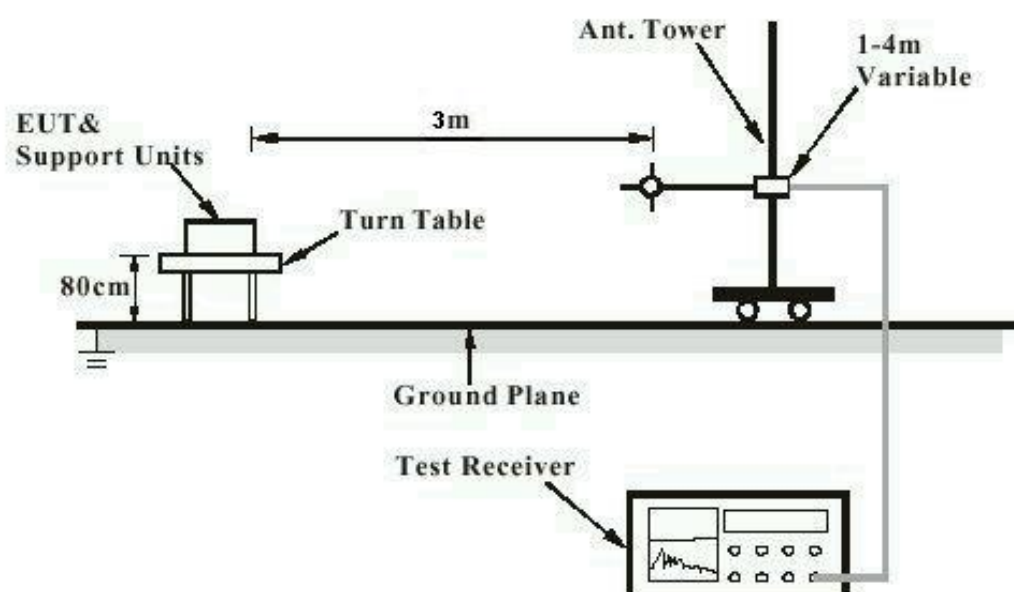
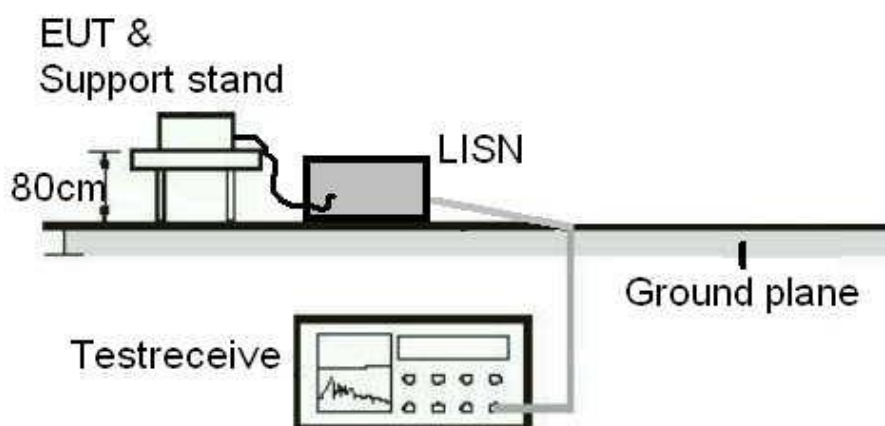


Diagram of Measurement Equipment Configuration for Conduction Measurement



5. Test Results EMISSION

5.1 Emission in the Frequency Range up to 30 MHz

5.1.1 Conducted Emission

RESULT:**Passed**

Date of testing	:	2014-12-30 to 2015-05-10
Test specification	:	CFR Title47 Part15 Subpart B Section 15.107(b) ICES-003 Issue 5
Frequency range	:	0.15 – 30MHz
Classification	:	Class B
Test procedure	:	ANSI C63.4:2009 ANSI C63.4:2014
Kind of test site	:	Shielded room

Test setup

Input Voltage	:	AC 120V, 60Hz
Operation mode	:	A
Ambient temperature	:	23°C
Relative humidity	:	48%
Atmospheric pressure	:	101 kPa

Refer to attached Appendix A for details.

6. Emission in the Frequency Range above 30 MHz

6.1.1 Radiated Emission

RESULT:**Passed**

Date of testing	:	2014-12-30 to 2015-05-10
Test standard	:	CFR Title47 Part15 Subpart B Section 15.109(b) ICES-003 Issue 5
Frequency range	:	30 - 1000MHz, 1- 6GHz
Classification	:	Class B
Test procedure	:	ANSI C63.4:2009 ANSI C63.4:2014
Kind of test site	:	3m Chamber

Test setup

Input Voltage	:	AC 120V, 60Hz
Operation mode	:	A
Ambient temperature	:	23°C
Relative humidity	:	48%
Atmospheric pressure	:	101 kPa

Refer to attached Appendix A for details.

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Appendix A

Test Results of Radiated Emissions and Conducted Emissions

APPENDIX A.1: TEST RESULTS OF RADIATED EMISSIONS 2

APPENDIX A.2: TEST RESULTS OF CONDUCTED EMISSIONS..... 6

Appendix A.1: Test Results of Radiated Emissions



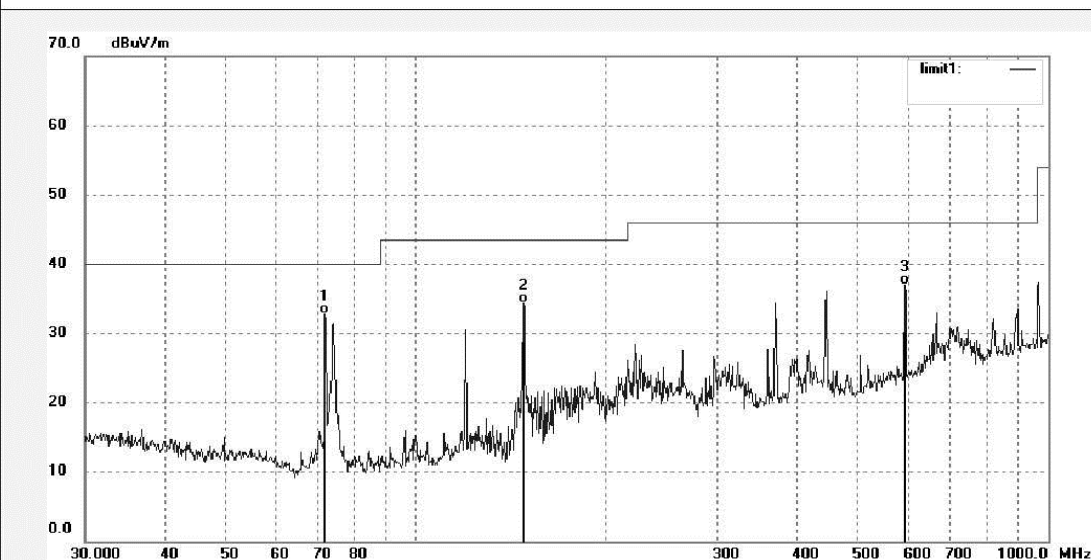
ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Ian2015-2 #260
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Wi-Fi Dongle
Mode: On
Model: TD-2021N-USB
Manufacturer: HUAWEI

Polarization: Horizontal
Power Source: DC 5V
Date: 15/02/10/
Time:
Engineer Signature:
Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	71.8319	49.17	-16.34	32.83	40.00	-7.17	QP			
2	147.9214	49.59	-15.19	34.40	43.50	-9.10	QP			
3	593.0497	40.00	-3.03	36.97	46.00	-9.03	QP			



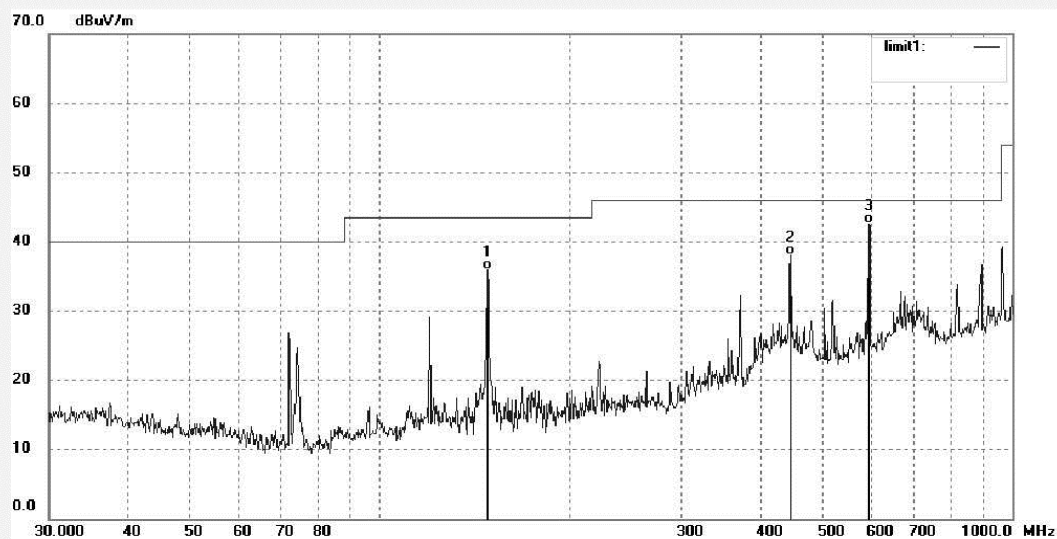
ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel: +86-0755-26503290
Fax: +86-0755-26503396

Job No.: Ian2015-2 #261
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Wi-Fi Dongle
Mode: On
Model: TD-2021N-USB
Manufacturer: HUAWEI

Polarization: Vertical
Power Source: DC 5V
Date: 15/02/10/
Time:
Engineer Signature:
Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	147.9214	51.13	-15.19	35.94	43.50	-7.56	QP			
2	446.4141	43.87	-5.84	38.03	46.00	-7.97	QP			
3	593.0497	45.58	-3.03	42.55	46.00	-3.45	QP			

**ACCURATE TECHNOLOGY CO., LTD.**
 F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel: +86-0755-26503290

Fax: +86-0755-26503396

Job No.: Ian2015-2 #264

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: Wi-Fi Dongle

Mode: On

Model: TD-2021N-USB

Manufacturer: HUAWEI

Polarization: Horizontal

Power Source: DC 5V

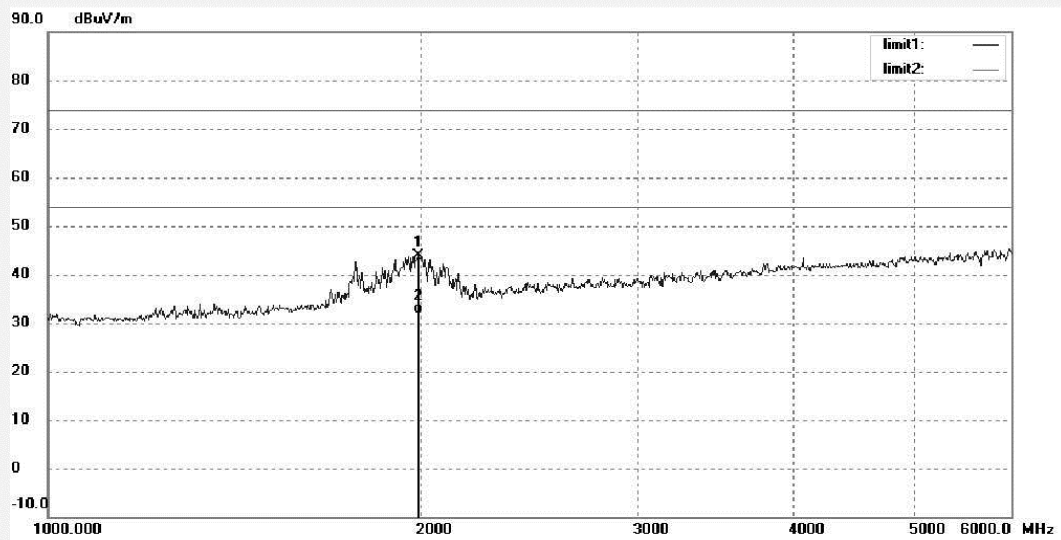
Date: 15/02/10/

Time:

Engineer Signature:

Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1989.803	52.87	-9.06	43.81	74.00	-30.19	peak			
2	1989.803	41.05	-9.06	31.99	54.00	-22.01	AVG			



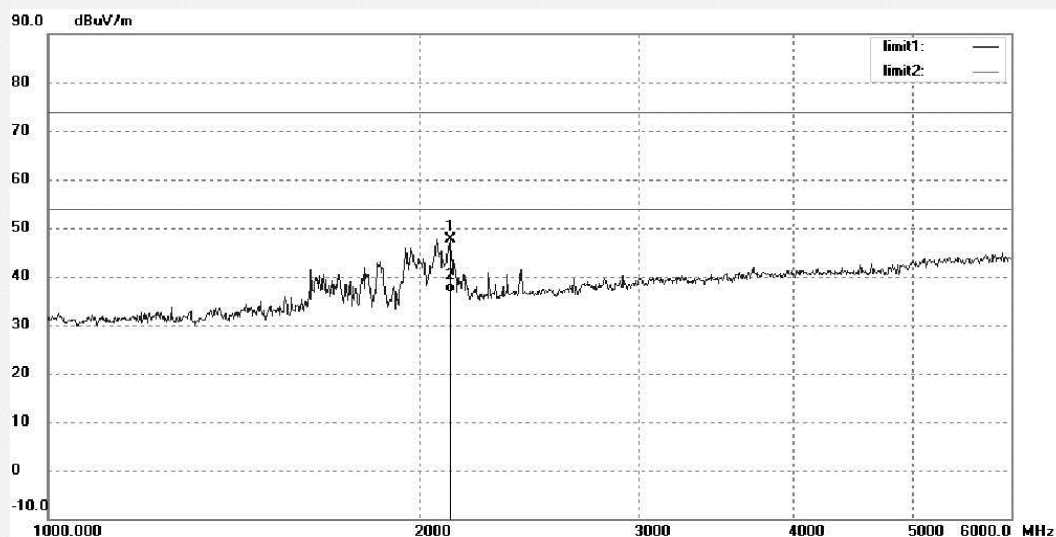
ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel: +86-0755-26503290
Fax: +86-0755-26503396

Job No.: Ian2015-2 #265
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Wi-Fi Dongle
Mode: On
Model: TD-2021N-USB
Manufacturer: HUAWEI

Polarization: Vertical
Power Source: DC 5V
Date: 15/02/10/
Time:
Engineer Signature:
Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2114.790	56.08	-8.46	47.62	74.00	-26.38	peak			
2	2114.790	44.99	-8.46	36.53	54.00	-17.47	AVG			

Appendix A.2: Test Results of Conducted Emissions

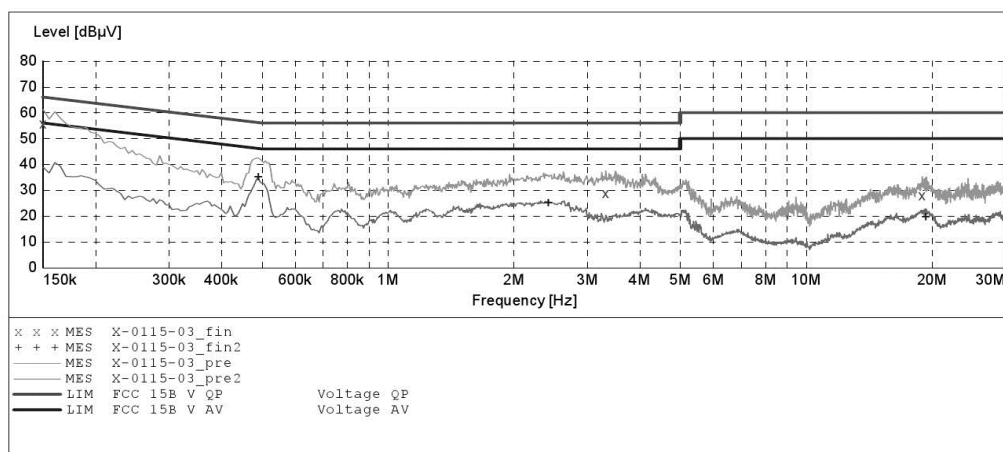
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Wi-Fi Dongle M/N:TD-2021N-USB
Manufacturer: HUAWEI
Operating Condition: On
Test Site: 1#Shielding Room
Operator: LAN
Test Specification: N 120V/60Hz
Comment:
Start of Test: 1/15/2015 /

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
Start Stop Step Detector Meas. IF Transducer
Frequency Frequency Width Time Bandw.
150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
Average



MEASUREMENT RESULT: "X-0115-03_fin"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	55.60	10.5	66	10.4	QP	N	GND
3.320000	28.80	11.1	56	27.2	QP	N	GND
18.950000	27.80	11.4	60	32.2	QP	N	GND

MEASUREMENT RESULT: "X-0115-03_fin2"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.490000	35.00	10.7	46	11.2	AV	N	GND
2.420000	25.00	11.0	46	21.0	AV	N	GND
19.325000	19.70	11.4	50	30.3	AV	N	GND

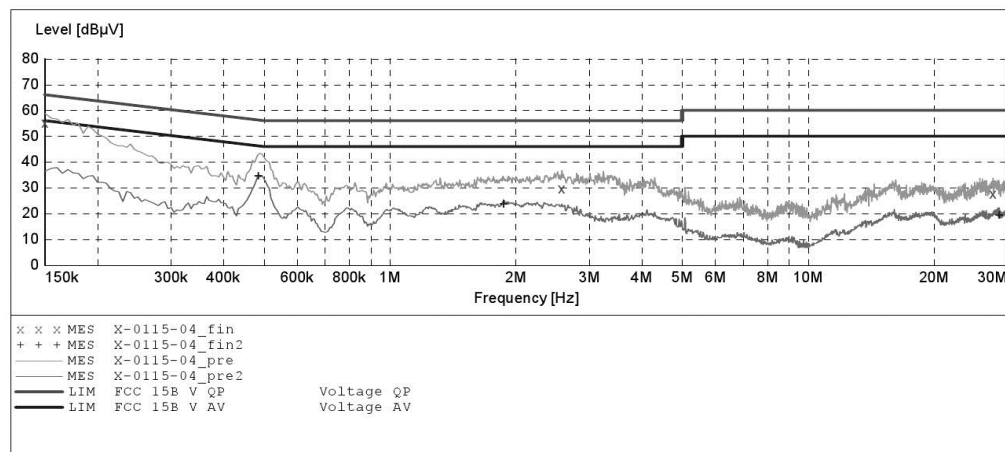
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Wi-Fi Dongle M/N:TD-2021N-USB
 Manufacturer: HUAWEI
 Operating Condition: On
 Test Site: 1#Shielding Room
 Operator: LAN
 Test Specification: L 120V/60Hz
 Comment:
 Start of Test: 1/15/2015 /

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "X-0115-04_fin"

1/15/2015	Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
	0.150000	55.00	10.5	66	11.0	QP	L1	GND
	2.580000	29.60	11.0	56	26.4	QP	L1	GND
	27.700000	27.50	11.5	60	32.5	QP	L1	GND

MEASUREMENT RESULT: "X-0115-04_fin2"

1/15/2015	Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
	0.485000	34.30	10.7	46	12.0	AV	L1	GND
	1.870000	23.50	11.0	46	22.5	AV	L1	GND
	28.625000	19.30	11.5	50	30.7	AV	L1	GND