

Prüfbericht-Nr.: <i>Test Report No.:</i>	17056242 002	Auftrags-Nr.: <i>Order No.:</i>	164051548	Seite 1 von 21 <i>Page 1 of 21</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	10.12.2015	
Auftraggeber: <i>Client:</i>	Dongguan Newmen Electronics Technology Co., LTD No.5, Xifa Road, Lin Village, Tangxia Town, Dongguan, Guangdong, China			
Prüfgegenstand: <i>Test item:</i>	Dongle			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	MX-133			
Auftrags-Inhalt: <i>Order content:</i>	FCC/IC Certification			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart B Section 15.107 CFR47 FCC Part 15: Subpart B Section 15.109			
Wareneingangsdatum: <i>Date of receipt:</i>	20.12.2015			
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000293406-003			
Prüfzeitraum: <i>Testing period:</i>	24.12.2015 - 26.12.2015			
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:		
27.01.2016 Owen Tian/Senior Project Engineer		27.01.2016 Winnie Hou/Technical Certifier		
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.: 17056242 002
Test Report No.

Seite 2 von 21
Page 2 of 21

TEST SUMMARY

5.1.1 CONDUCTED EMISSIONS

RESULT: Pass

5.2.1 RADIATED EMISSION

RESULT: Pass

Contents

1.	GENERAL REMARKS	4
1.1	COMPLEMENTARY MATERIALS	4
2.	TEST SITES	4
2.1	TEST FACILITIES	4
2.2	LIST OF TEST AND MEASUREMENT INSTRUMENTS.....	5
2.3	TRACEABILITY	5
2.4	CALIBRATION	6
2.5	MEASUREMENT UNCERTAINTY.....	6
2.6	LOCATION OF ORIGINAL DATA.....	6
2.7	STATUS OF FACILITY USED FOR TESTING.....	6
3.	GENERAL PRODUCT INFORMATION	7
3.1	PRODUCT FUNCTION AND INTENDED USE.....	7
3.2	RATINGS AND SYSTEM DETAILS	7
3.3	INDEPENDENT OPERATION MODES	7
3.4	NOISE GENERATING AND NOISE SUPPRESSING PARTS	7
3.5	SUBMITTED DOCUMENTS	8
4.	TEST SET-UP AND OPERATION MODES	9
4.1	PRINCIPLE OF CONFIGURATION SELECTION.....	9
4.2	TEST OPERATION AND TEST SOFTWARE	9
4.3	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	9
4.4	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....	9
4.5	TEST SETUP DIAGRAM	10
5.	TEST RESULTS	11
5.1	EMISSION IN THE FREQUENCY RANGE UP TO 30 MHz	11
5.1.1	<i>Conducted emissions.....</i>	<i>11</i>
5.2	EMISSION IN THE FREQUENCY RANGE ABOVE 30 MHz	14
5.2.1	<i>Radiated Emission</i>	<i>14</i>
6.	PHOTOGRAPHS OF THE TEST SET-UP	19
7.	LIST OF TABLES	21
8.	LIST OF PHOTOGRAPHS	21

Prüfbericht - Nr.: 17056242 002
Test Report No.**Seite 4 von 21**
Page 4 of 21

1. General Remarks

1.1 Complementary Materials

None.

2. Test Sites

2.1 Test Facilities

Accurate Technology Co., Ltd.

(FCC Registration No.: 752051)

(Test site Industry Canada No.: 5077A-2)

F1, Bldg. A, Changyuan New Material Port
Keyuan Rd., Science & Industry Park, Nanshan
Shenzhen, 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
Radiated emissions				
Spectrum Analyzer	Rohde & Schwarz	FSV40	101495	2016-01-09
Test Receiver	Rohde & Schwarz	ESCS30	100307	2016-01-09
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	2016-01-14
Loop Antenna	Schwarzbeck	FMZB1516	1516131	2016-01-14
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	2016-01-14
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	2016-01-14
RF Switching Unit+PreAMP	Compliance Direction	RSU-M2	38322	2016-01-09
Pre-Amplifier	Rohde&Schwarz	CBLU11835 40-01	3791	2016-01-09
50 Coaxial Switch	Anritsu Corp	MP59B	620050647 4	2016-01-09
RF Coaxial Cable	SUHNER	N-3m	No.8	2016-01-09
RF Coaxial Cable	RESENBERGER	N-3.5m	No.9	2016-01-09
RF Coaxial Cable	SUHNER	N-6m	No.10	2016-01-09
RF Coaxial Cable	RESENBERGER	N-12m	No.11	2016-01-09
RF Coaxial Cable	RESENBERGER	N-0.5m	No.12	2016-01-09
Conducted Emission				
Test Receiver	Rohde & Schwarz	ESCS30	100307	2016-01-09
L.I.S.N.	Schwarzbeck	NLSK8126	8126431	2016-01-09
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100815	2016-01-09
50Ω Coaxial Switch	Anritsu Corp	MP59B	6200283933	2016-01-09
Voltage Probe	Schwarzbeck	TK9416	N/A	2016-01-09
RF Current Probe	Rohde & Schwarz	EZ-17	100048	2016-01-09
8-Wire Impedance Stabilisation Network	Schwarzbeck	CAT5 8158	8158-0035	2016-01-09
RF Coaxial Cable	Suhner	N-2m	No.2	2016-01-09
RF Coaxial Cable	Suhner	N-2m	No.3	2016-01-09
RF Coaxial Cable	Suhner	N-2m	No.14	2016-01-09

2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, 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

Table 2: Measurement Uncertainty

Parameter	Uncertainty
Conducted Emission	$< \pm 2.23 \text{ dB}$
Radiated Emission	$< \pm 4.42 \text{ dB}$

2.6 Location of Original Data

The original copies of all test data taken during actual testing were retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

Accurate Technology Co., Ltd. test facility located at F1, Bldg. A, Changyuan New Material Port Keyuan Rd., Science & Industry Park, Nanshan, Shenzhen, 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 a USB dongle used with a 2.4GHz wireless presenter. It operates at 2.4GHz ISM frequency band.
For details refer to the User Manual and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

Technical Specification	Value
Kind of Equipment	Dongle
Type Designation	MX-133
FCC ID	V4P-MX133
IC	12487A-MX133
Operating Frequency	2402 – 2476MHz
Channel separation	1MHz
Number of Channel	75
Extreme Temperature Range	-15~+40°C
Operation Voltage	DC 5V (via USB port)
Modulation	GFSK
Antenna Gain	-2dBi

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, connected to PC
- B. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

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

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power 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. All testing were performed according to the procedures in ANSI C63.4: 2014.

4.3 Special Accessories and Auxiliary Equipment

The EUT was tested together with the following accessories:

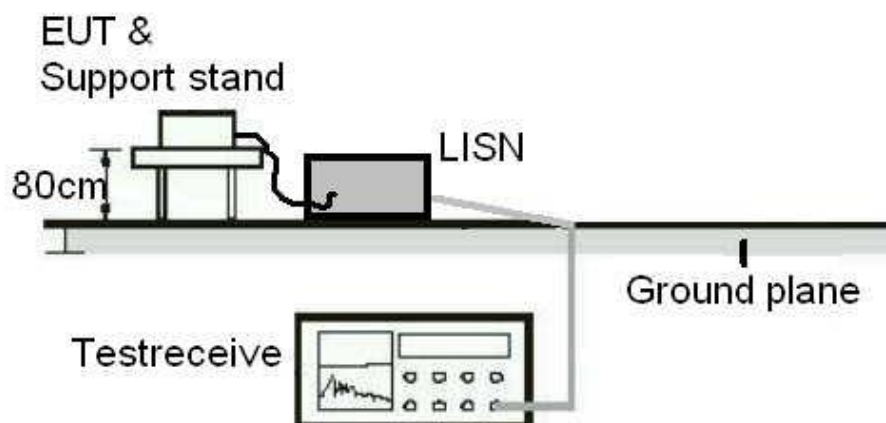
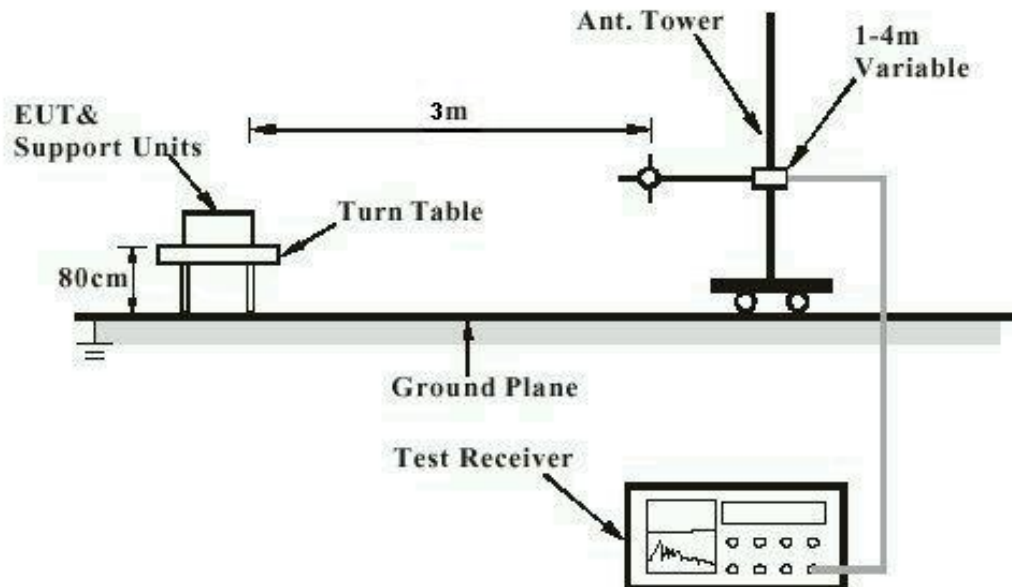
Description	Manufacturer	Part No.	S/N
Notebook	Lenovo	X240	N/A
Printer	HP	HP laserjet 1015	CNFG030424

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



5. Test Results

5.1 Emission in the Frequency Range up to 30 MHz

5.1.1 Conducted emissions

RESULT:**Pass**

Date of testing	:	2015-12-24
Test standard	:	FCC Part 15.107 (a) ICES-003 Issue 5 August 2012
Basic standard	:	ANSI C63.4: 2014
Frequency range	:	0.15 – 30MHz
Limits	:	FCC Part 15.107 (a) ICES-003 Issue 5 August 2012
Kind of test site	:	Shield room

Test setup

Input Voltage	:	AC 120V, 60Hz
Operation Mode	:	A
Earthing	:	Not Connected
Ambient temperature	:	25°C
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

For details refer to following test plot.

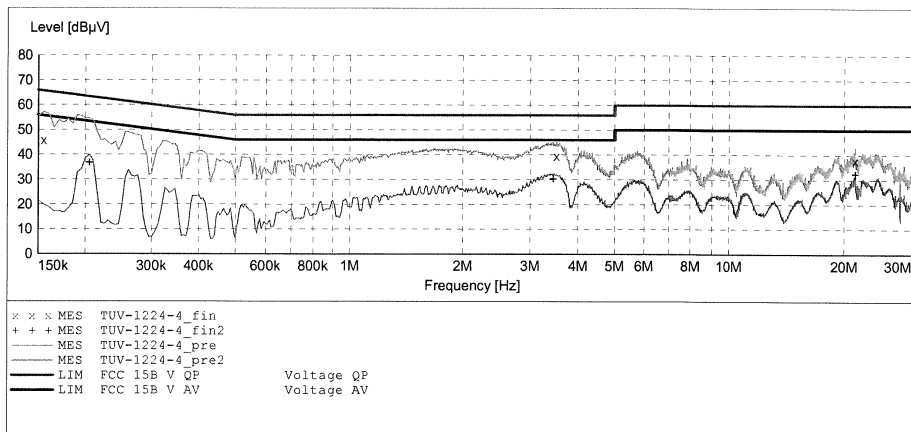
ACCURATE TECHNOLOGY CO.,LTD
CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Dongle M/N:MX-133
 Manufacturer: Dongguan Newmen Electronics Technology Co.,LTD
 Operating Condition: Connected to PC
 Test Site: 1#Shielding Room
 Operator: LGWADE
 Test Specification: L 120V/60Hz
 Comment: Mains Port
 Start of Test: 12/24/2015 /

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	Average	1.0 s	9 kHz	NSLK8126 2008


MEASUREMENT RESULT: "TUV-1224-4_fin"

12/24/2015	Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
	MHz	dBµV	dB	dBµV	dB			
	0.155000	45.80	10.5	66	19.9	QP	L1	GND
	3.510000	39.50	11.1	56	16.5	QP	L1	GND
	21.325000	37.90	11.4	60	22.1	QP	L1	GND

MEASUREMENT RESULT: "TUV-1224-4_fin2"

12/24/2015	Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
	MHz	dBµV	dB	dBµV	dB			
	0.205000	36.70	10.5	53	16.7	AV	L1	GND
	3.440000	30.20	11.1	46	15.8	AV	L1	GND
	21.325000	32.30	11.4	50	17.7	AV	L1	GND

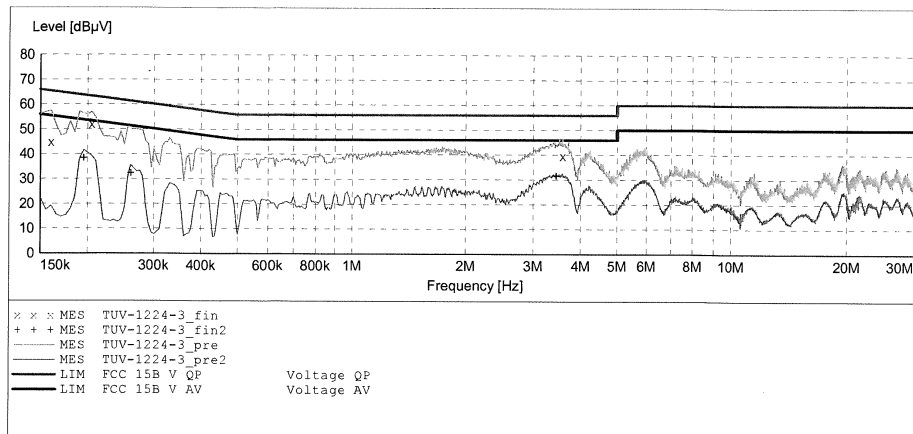
ACCURATE TECHNOLOGY CO.,LTD
CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Dongle M/N:MX-133
 Manufacturer: Dongguan Newmen Electronics Technology Co.,LTD
 Operating Condition: Connected to PC
 Test Site: 1#Shielding Room
 Operator: LGWADE
 Test Specification: N 120V/60Hz
 Comment: Mains Port
 Start of Test: 12/24/2015 /

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	Average			
			QuasiPeak	1.0 s	9 kHz	NSLK8126 2008
			Average			


MEASUREMENT RESULT: "TUV-1224-3_fin"

12/24/2015

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.160000	44.80	10.5	66	20.7	QP	N	GND
0.205000	52.10	10.5	63	11.3	QP	N	GND
3.580000	39.50	11.1	56	16.5	QP	N	GND

MEASUREMENT RESULT: "TUV-1224-3_fin2"

12/24/2015

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	38.30	10.5	54	15.5	AV	N	GND
0.260000	32.30	10.6	51	19.1	AV	N	GND
3.440000	31.50	11.1	46	14.5	AV	N	GND

5.2 Emission in the Frequency Range above 30 MHz

5.2.1 Radiated Emission

RESULT:**Pass**

Date of testing	:	2015-12-26
Test standard	:	FCC Part 15.109 (a) ICES-003 Issue 5 August 2012
Test procedure	:	ANSI C63.4: 2014
Frequency range	:	30 - 6000MHz
Equipment Classification	:	Class B
Limits	:	FCC Part 15.109 (a) ICES-003 Issue 5 August 2012
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Input Voltage	:	AC 120V, 60Hz
Operation mode	:	A
Earthing	:	Not connected
Ambient temperature	:	23°C
Relative humidity	:	48%
Atmospheric pressure	:	101kPa

For details refer to following test plot.


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.: LGW2015 #2266

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Dongle

Mode: Connected to PC

Model: MX-133

Manufacturer: Dongguan Newmen Electronics Technology Co.,LTD

Polarization: Horizontal

Power Source: DC 5V

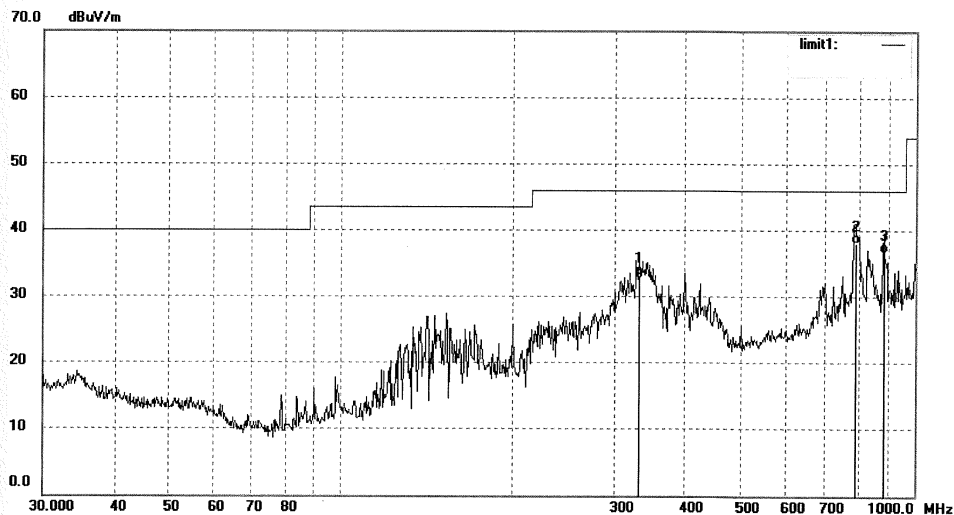
Date: 15/12/26/

Time:

Engineer Signature: LGWADE

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	330.1949	41.42	-8.34	33.08	46.00	-12.92	QP			
2	787.8513	38.24	-0.23	38.01	46.00	-7.99	QP			
3	881.4067	35.52	1.16	36.68	46.00	-9.32	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.: LGW2015 #2267

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Dongle

Mode: Connected to PC

Model: MX-133

Manufacturer: Dongguan Newmen Electronics Technology Co.,LTD

Polarization: Vertical

Power Source: DC 5V

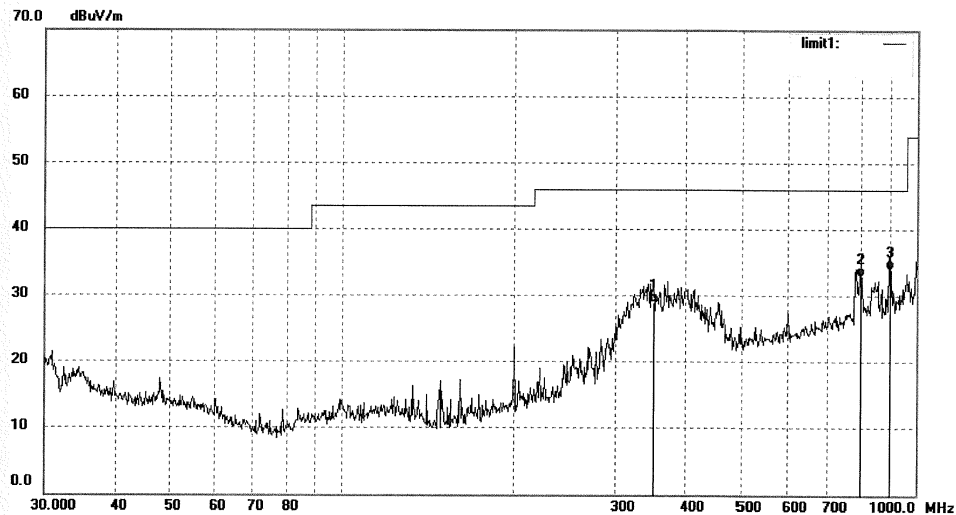
Date: 15/12/26/

Time:

Engineer Signature: LGWADE

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	350.4768	36.63	-7.75	28.88	46.00	-17.12	QP			
2	798.9796	32.91	0.02	32.93	46.00	-13.07	QP			
3	900.1473	32.70	1.28	33.98	46.00	-12.02	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.: LGW2015 #2268

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Dongle

Mode: Connected to PC

Model: MX-133

Manufacturer: Dongguan Newmen Electronics Technology Co.,LTD

Polarization: Horizontal

Power Source: DC 5V

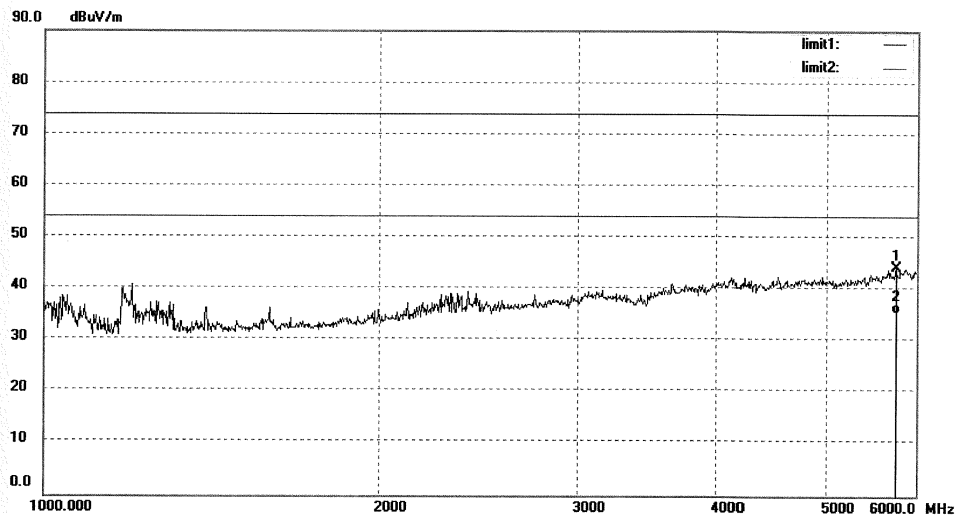
Date: 15/12/26/

Time:

Engineer Signature: LGWADE

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	5747.456	42.63	1.53	44.16	74.00	-29.84	peak			
2	5747.456	33.94	1.53	35.47	54.00	-18.53	AVG			

Prüfbericht - Nr.: 17056242 002
Test Report No.
Seite 18 von 21
Page 18 of 21

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.: LGW2015 #2269

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Dongle

Mode: Connected to PC

Model: MX-133

Manufacturer: Dongguan Newmen Electronics Technology Co.,LTD

Polarization: Vertical

Power Source: DC 5V

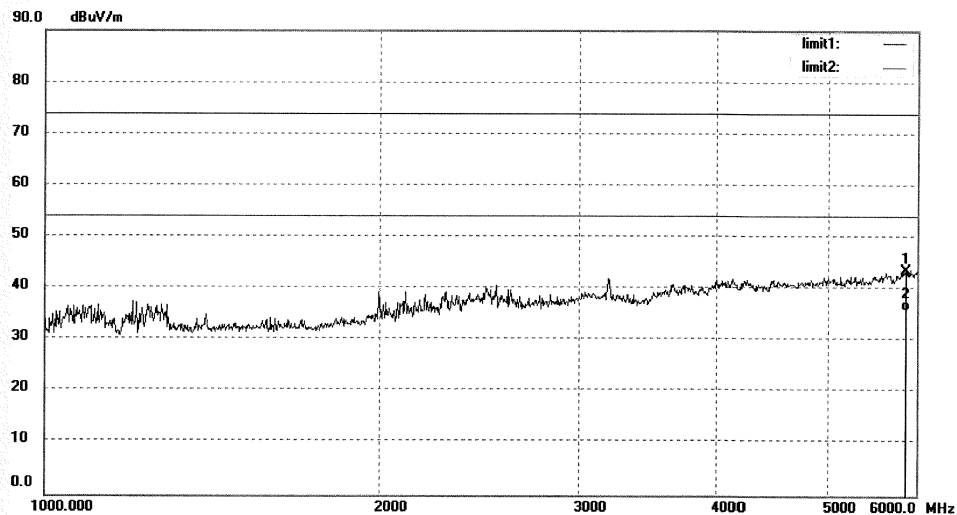
Date: 15/12/26/

Time:

Engineer Signature: LGWADE

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	5861.858	41.70	1.95	43.65	74.00	-30.35	peak			
2	5861.858	33.85	1.95	35.80	54.00	-18.20	AVG			

6. Photographs of the Test Set-Up

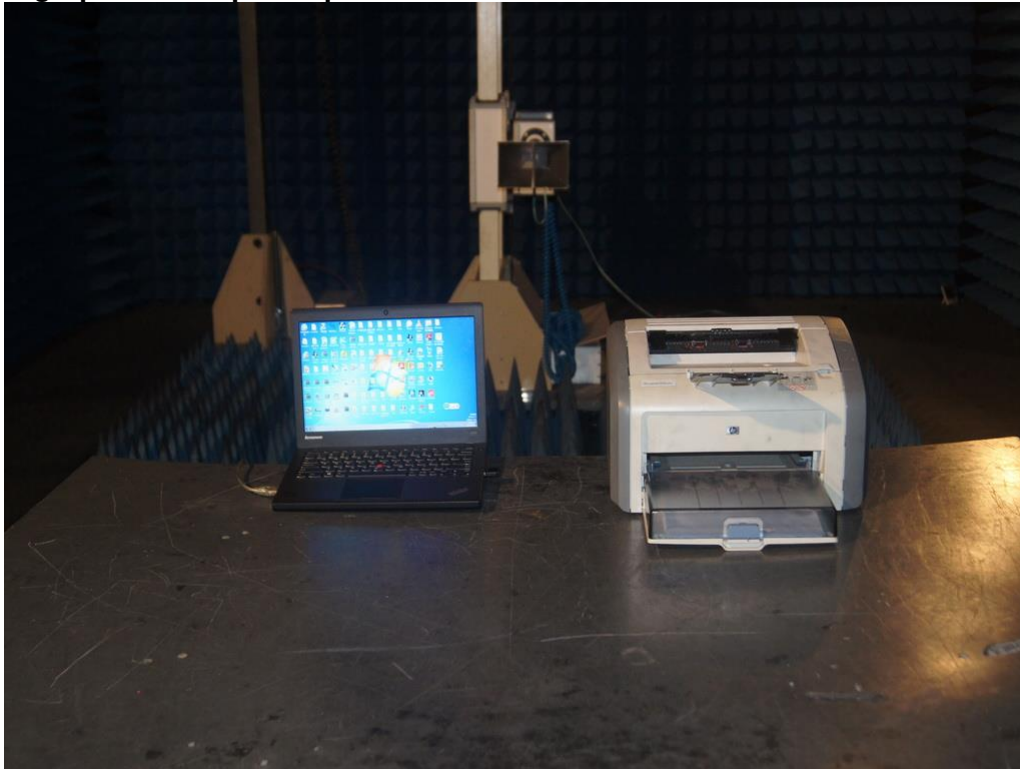
Photograph 1: Set-up for Conducted Emissions



Photograph 2: Set-up for Spurious Emissions for below 1GHz



Photograph 3: Set-up for Spurious Emissions for above 1GHz



7. List of Tables

Table 1: List of Test and Measurement Equipment	5
Table 2: Measurement Uncertainty	6
Table 3: Technical Specification of EUT	7

8. List of Photographs

Photograph 1: Set-up for Conducted Emissions	19
Photograph 2: Set-up for Spurious Emissions for below 1GHz	19
Photograph 3: Set-up for Spurious Emissions for above 1GHz	20