

Prüfbericht-Nr.: <i>Test report No.:</i>	50087315 001	Auftrags-Nr.: <i>Order No.:</i>	164091064	Seite 1 von 22 <i>Page 1 of 22</i>
Kunden-Referenz-Nr.: <i>Client reference No.:</i>	N/A	Auftragsdatum: <i>Order date.:</i>	02.05.2017	
Auftraggeber: <i>Client:</i>	G.Tech Technology Ltd. No.8, Jinyuan 1st Road, Tangjiawan Town High-tech Zone, Zhuhai, China			
Prüfgegenstand: <i>Test item:</i>	Lenovo Wireless Receiver			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	RG51 (Lenovo)			
Auftrags-Inhalt: <i>Order content:</i>	Test report			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15.249 CFR47 FCC Part 15.207 CFR47 FCC Part 15.209 CFR47 FCC Part 15.203 CFR47 FCC Part 2.1093		RSS-Gen Issue 4, November 2014 RSS-210 Issue 9, August 2016 RSS-102 Issue 5, March 2015	
Wareneingangsdatum: <i>Date of receipt:</i>	02.05.2017	Please refer to photo documents		
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000531117-001 A000531117-002			
Prüfzeitraum: <i>Testing period:</i>	08.06.2017 - 19.06.2017			
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:		
				
20.06.2017	Hardy Suo / Assistant Project Manager	20.06.2017	Owen Tian / 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:				
FCC ID: 009RG51, IC: 20090-RG51 Hardware Version Identification Number (HVIN): RG51, Product Marketing Name (PMN): Lenovo Wireless Receiver This report is only for radio transmitter function, and pls. refer to TÜV report 50087315 002 for data transmission with PC function.				
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 P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n)		4 = ausreichend 5 = mangelhaft N/A = nicht anwendbar N/T = nicht getestet		
Legend: 1 = very good 2 = good 3 = satisfactory P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s)		4 = sufficient 5 = poor 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>				

Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 FUNDAMENTAL & HARMONICS RADIATED EMISSION

RESULT: Pass

5.1.3 20dB BANDWIDTH

RESULT: Pass

5.1.4 99% BANDWIDTH

RESULT: Pass

5.1.5 RADIATED SPURIOUS EMISSION & BAND EDGE

RESULT: Pass

5.1.6 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

6.1.1 ELECTROMAGNETIC FIELDS

RESULT: Pass

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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.

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

FCC Registration No.: 752051

IC Assigned Code: 5077A-2

The tests at the test sites 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

Radio Spectrum Test (Accurate Technology Co., Ltd.)				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Spectrum Analyzer	R&S	ESPI3	100396/003	06.01.2018
Radiated Emission & Spurious Emission (Accurate Technology Co., Ltd.)				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Spectrum Analyzer	R&S	FSV40	101495	06.01.2018
Test Receiver	R&S	ESCS30	100307	06.01.2018
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	09.01.2018
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	09.01.2018
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	09.01.2018
RF Switching Unit+PreAMP	Compliance Direction	RSU-M2	38322	09.01.2018
Pre-Amplifier	R&S	CBLU11835 40-01	3791	06.01.2018
50 Coaxial Switch	Anritsu Corp	MP59B	6200506474	06.01.2018
RF Coaxial Cable	SUHNER	N-3m	No.8	06.01.2018
RF Coaxial Cable	RESENBERGER	N-3.5m	No.9	06.01.2018
RF Coaxial Cable	SUHNER	N-6m	No.10	06.01.2018
RF Coaxial Cable	RESENBERGER	N-12m	No.11	06.01.2018
50_ Coaxial Switch	Anritsu Corp	MP59B	6200283933	06.01.2018

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

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table

Item		Extended Uncertainty
Radiated Emission (9kHz-30MHz)	Field strength (dBμV/m)	U=3.08dB, k=2, σ=95%
Radiated Emission (30-1000MHz)	Field strength (dBμV/m)	U=4.42dB, k=2, σ=95%
Radiated Emission (above 1000MHz)	Field strength (dBμV/m)	U=4.06dB, k=2, σ=95%
Conducted Emission (0.15 - 30MHz)	Disturbance Voltage (dBuV)	U=±2.90dB, k=2, σ=95%
Radio Spectrum		± 0.60 dB
Ambient Temperature		25 °C
Relative Humidity		56 %
Atmospheric Pressure		101 kPa

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A of 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. Test facility located at F1, Bldg. A, Changyuan New Material Port Keyuan Rd., Science & Industry Park, Nanshan Shenzhen, 518057, P.R. China is listed on the US Federal Communications Commission and Innovation, Science and Economic Development Canada list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is Lenovo Wireless Receiver operating in 2403-2479MHz with 16 channels. The EUT is powered by DC 5.0V via USB port.

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

3.2 Ratings and System Details

Table 2: Technical Specification of Transmitter

Technical Specification	Value
Kind of Equipment	Lenovo Wireless Receiver
Type Designation	RG51
Trade mark	Lenovo
FCC ID	OO9RG51
IC / HVIN	20090-RG51 / RG51
Operating Frequency	2403 ~ 2479MHz
Operating Temperature Range	0 °C ~ +40 °C
Operating Voltage	DC 5.0V via USB port
Testing Voltage	DC 5.0V via USB port
Type of Modulation	GFSK
Channel Number	16 channels
Channel Separation	Various
Antenna Type	Integral Antenna (PCB Antenna)
Antenna number	1
Antenna Gain	2.15 dBi Max

Table 3: RF Channel and Frequency

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
01	2403.00	05	2407.00	09	2414.00	13	2419.00
02	2426.00	06	2422.00	10	2436.00	14	2439.00
03	2441.00	07	2445.00	11	2459.00	15	2453.00
04	2463.00	08	2466.00	12	2473.00	16	2479.00

Remark: The RF channel and Frequency are declared by the manufacturer.

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, transmitting mode
 - 1. Low channel
 - 2. Middle channel
 - 3. High channel
- B. On, normal transmitting mode
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- | | |
|---------------------------|-------------------------|
| - Application Form | |
| - Block Diagram | - Circuit Diagram |
| - FCC Label and Location | - Operation Description |
| - Model Difference Letter | - User Manual |

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

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. All testing were performed according to the procedures in ANSI C63.10: 2013.

4.3 Special Accessories and Auxiliary Equipment

None.

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

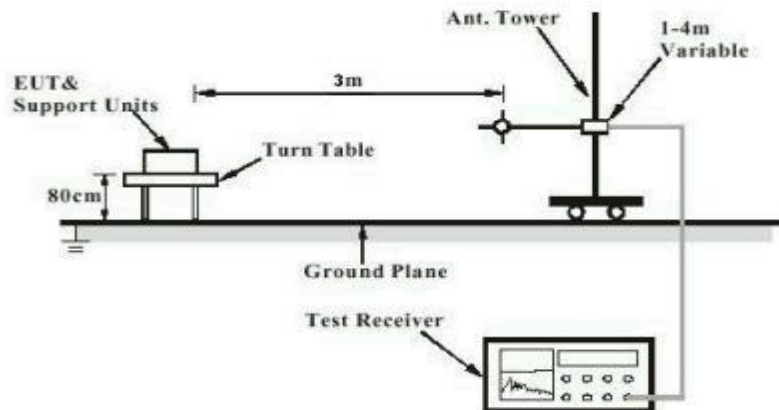


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

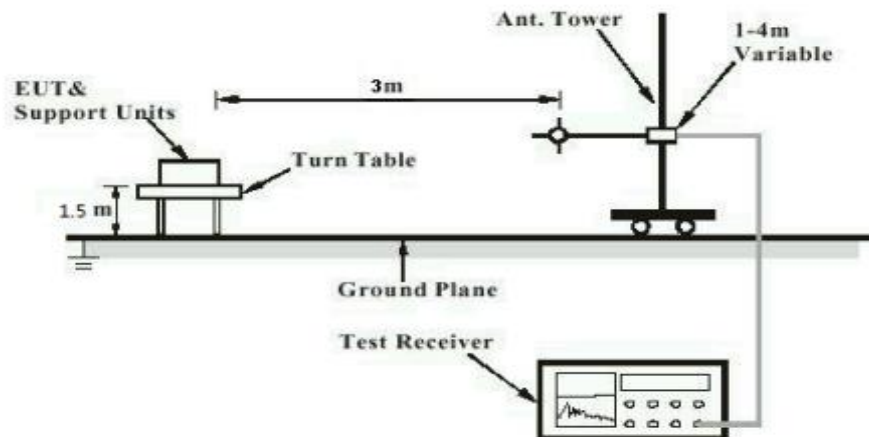
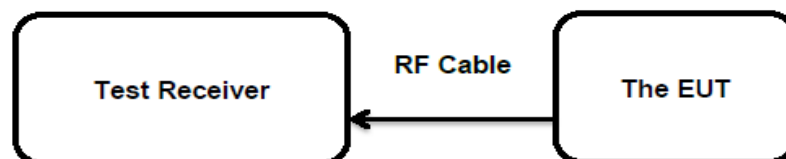


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard

FCC Part 15.203

RSS-Gen Clause 8.3

According to the manufacturer declared, the EUT has an integral antenna, the directional gain of antenna is 2.15dBi max, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 Fundamental & Harmonics Radiated Emission

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.249(a) RSS-210 Clause B.10(a)
Basic standard	: ANSI C63.10: 2013
Limits	: Refer to FCC Part 15.209(a) Refer to RSS-210 Clause B.10(a)
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

Date of testing	: 17.06.2017
Input voltage	: DC 5.0V via USB port
Operation mode	: A
Ambient temperature	: 23°C
Relative humidity	: 48 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix A.

5.1.3 20dB Bandwidth

RESULT:**Pass****Test Specification**

Test standard : FCC Part 15.215
Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 17.06.2017
Input voltage : DC 5.0V via USB port
Operation mode : A
Ambient temperature : 23 °C
Relative humidity : 48 %
Atmospheric pressure : 101 kPa

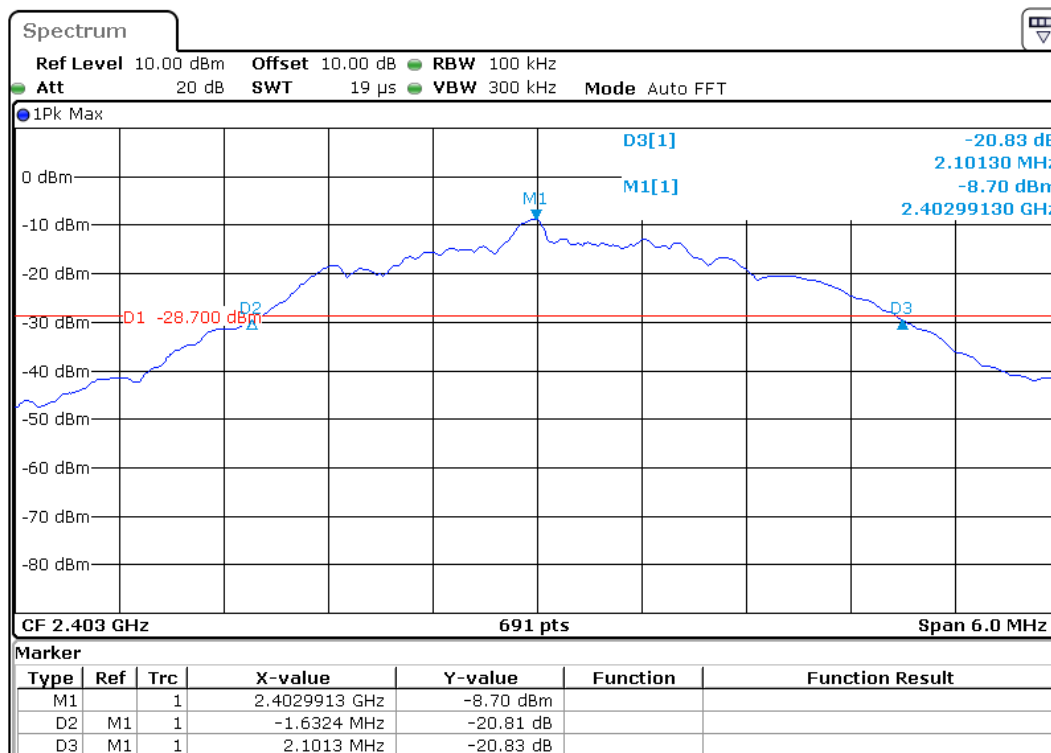
Table 4: Test Result of 20dB Bandwidth

Channel	Channel Frequency (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
Low Channel	2403	3.734	Within the assigned frequency band 2400~2483.5MHz
High Channel	2479	2.370	
Maximum Measured Value		3.734	

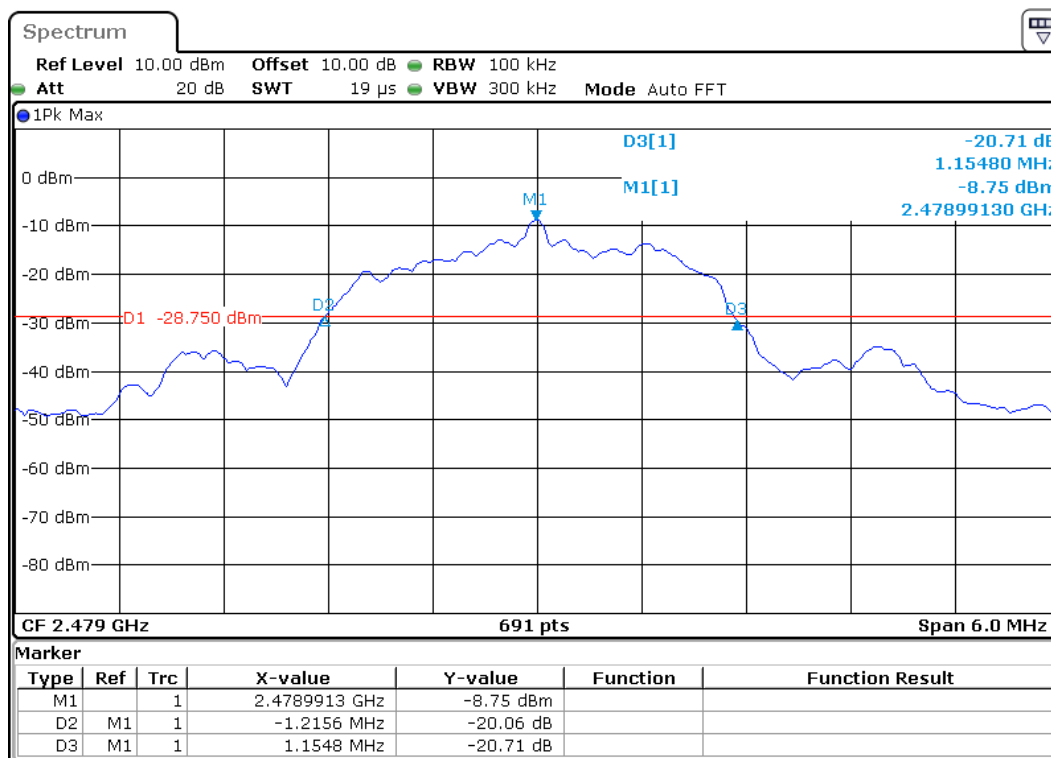
For the measurement records, refer to following test plot:

Test Plot of 20dB Bandwidth

Low CH



High CH



5.1.4 99% Bandwidth

RESULT:**Pass****Test Specification**

Test standard : RSS-Gen Clause 6.6
Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 17.06.2017
Input voltage : DC 5.0V via USB port
Operation mode : A
Ambient temperature : 23 °C
Relative humidity : 48 %
Atmospheric pressure : 101 kPa

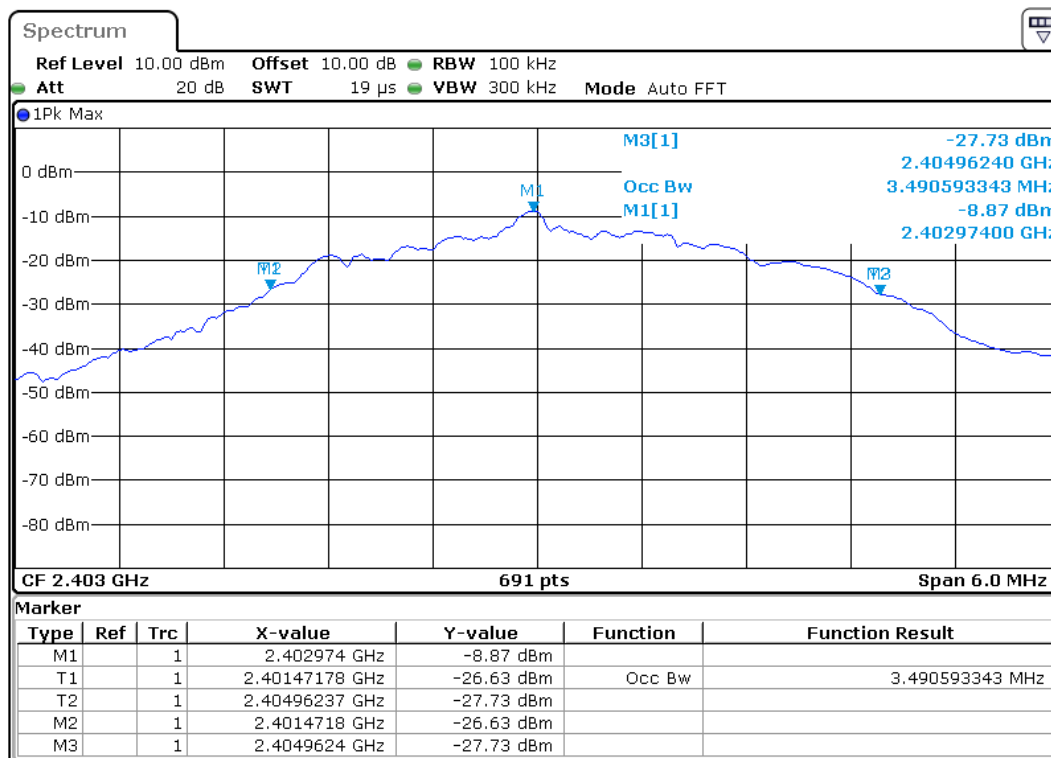
Table 5: Test Result of 99% Bandwidth

Channel	Channel Frequency (MHz)	99% Bandwidth (MHz)
Low Channel	2403	3.491
Mid Channel	2439	3.169
High Channel	2479	2.258
Maximum Measured Value		3.491

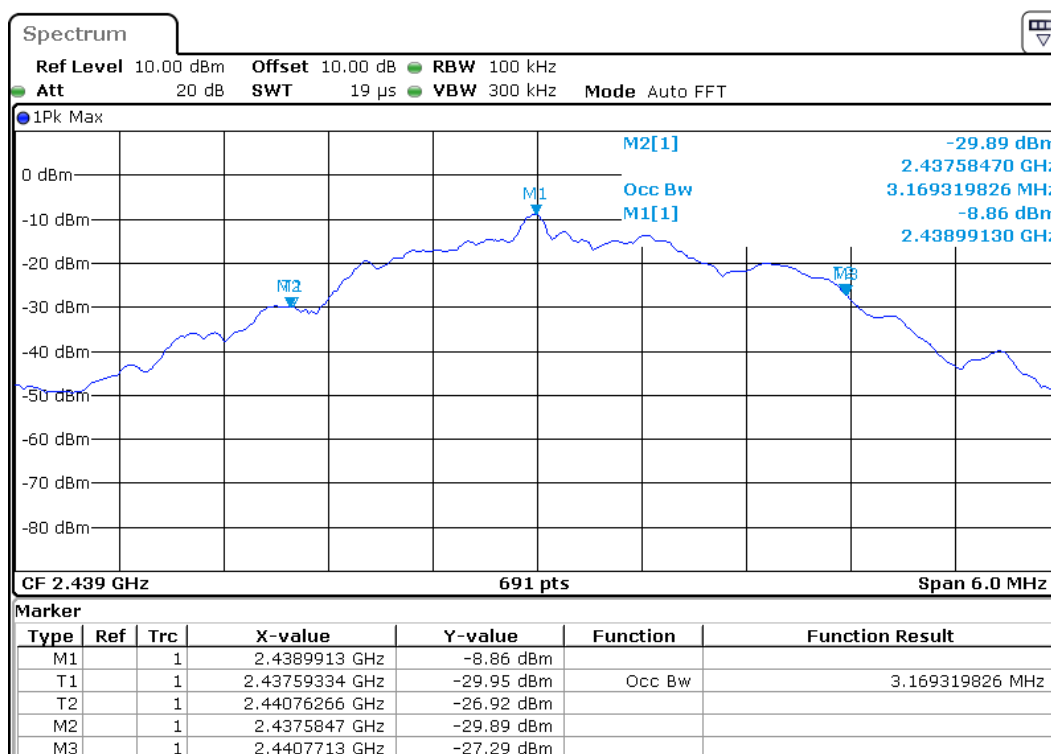
For the measurement records, refer to following test plot:

Test Plot of 99% Bandwidth

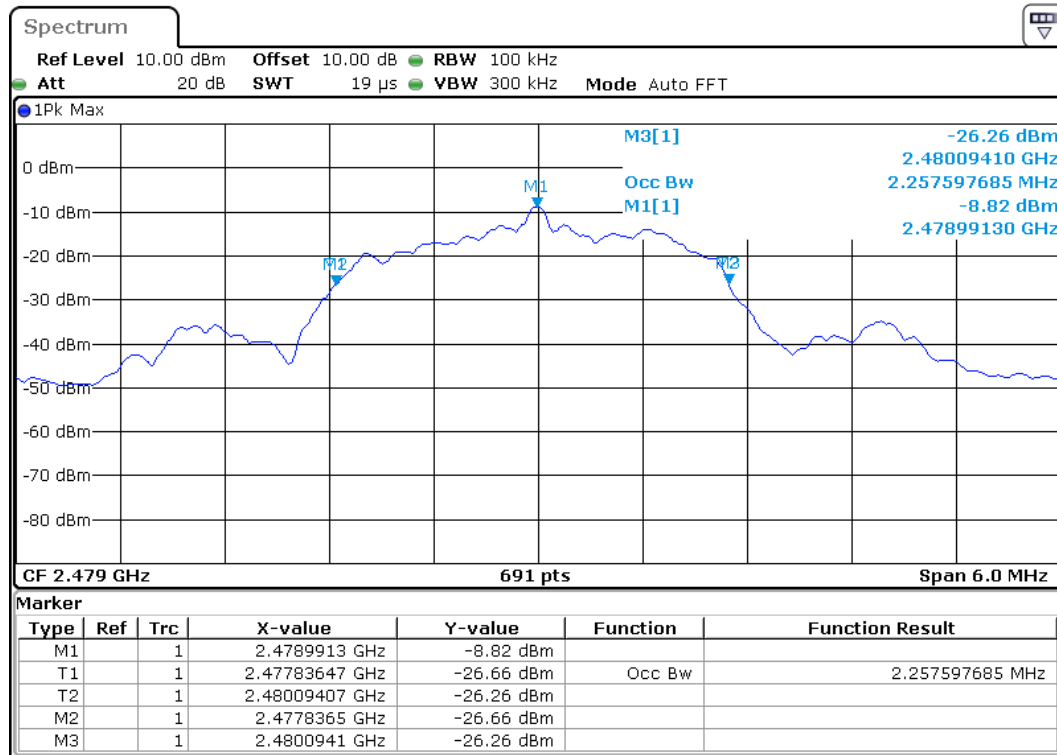
Low CH



Mid CH



High CH



5.1.5 Radiated Spurious Emission & Band Edge

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.249 (d) & FCC Part 15.205 RSS-Gen Clause 8.8 & 8.9
Basic standard	: ANSI C63.10: 2013
Limits	: Refer to FCC Part 15.209 (a) and 15.249 (d) RSS-Gen Clause 8.8 & 8.9
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

Date of testing	: 17.06.2017
Input voltage	: DC 5.0V via USB port
Operation mode	: A
Ambient temperature	: 23°C
Relative humidity	: 48 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix A.

5.1.6 Conducted Emission on AC Mains

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.207(a) RSS-Gen Clause 8.8
Basic standard	: ANSI 63.10: 2013
Frequency range	: 0.15 – 30MHz
Limits	: FCC Part 15.207(a) RSS-Gen Clause 8.8
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 17.06.2017
Input voltage	: AC 120V/60Hz
Operation mode	: B
Earthing	: Not connected
Ambient temperature	: 23°C
Relative humidity	: 48 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix A.

6 Safety Human Exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT:**Pass****Test Specification**

Test standard : CFR47 FCC Part 2.1093
RSS-102

Limit : FCC KDB Publication 447498 v06
RSS-102 Clause 2.5.1

Measurement Record for CFR47 FCC Part 2.1093

The minimum distance for the EUT is less than 5mm.

The maximum specified e.i.r.p.: 84.56dBuV/m @3m = -10.7dBm=0.09mW

Antenna Gain: 2.15dBi max

According to KDB 447498 D01 v06 4.3.1 a)

Exempted Power for this Bluetooth device: 9.5mW, hence the EUT is compliance with the RF exposure.

Measurement Record for RSS-102

The minimum distance for the EUT is less than 5mm.

The maximum specified e.i.r.p.: 84.56dBuV/m @3m = -10.7dBm=0.09mW

Antenna Gain: 2.15dBi max

According to RSS-102 Clause 2.5.1

Exempted Power for this device: 4mW, hence the EUT is compliance with the RF exposure.

7 Photographs of the Test Set-Up

Photograph 1: Set-up for Radiated Spurious Emission up to 1GHz

Please refer to the attached setup photos.

Photograph 2: Set-up for Radiated Spurious Emission above 1GHz

Please refer to the attached setup photos.

Photograph 3: Set-up for Conducted Emission on AC Mains

Please refer to the attached setup photos.

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Appendix A

Test Results of Radiated Emission and AC Conducted Emission

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Note: The radiated spurious emission were measured from 9KHz to 26.5GHz, the measurements from 9KHz-30MHz and 18-26.5GHz were greater than 20dB below the limit, so the radiated Spurious Emissions (9kHz – 30MHz and 18-26.5GHz) tests were recorded but not showed in the appendix B.

Appendix A.1: Test Plots of Radiated Spurious Emission

Low CH 30MHz-1GHz



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.: LGW2017 #2730

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: TX 2403MHz

Model: RG51

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: DC 5V

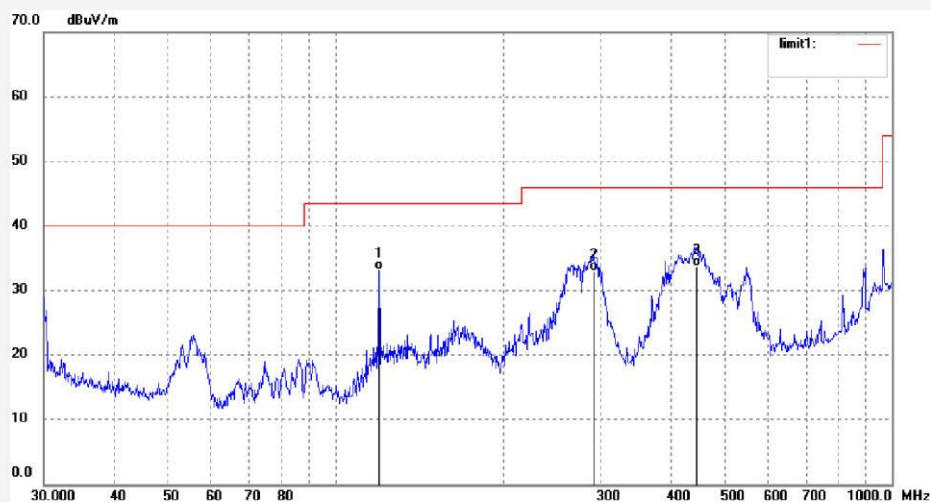
Date: 17/06/17/

Time:

Engineer Signature: WADE

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	119.8555	46.26	-13.06	33.20	43.50	-10.30	QP			
2	291.0360	42.24	-9.27	32.97	46.00	-13.03	QP			
3	446.4141	39.15	-5.41	33.74	46.00	-12.26	QP			



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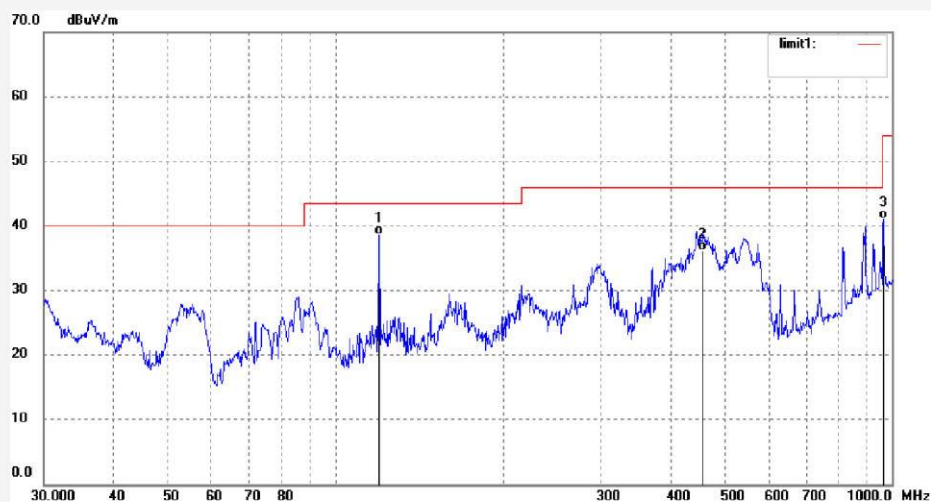
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

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

Job No.: LGW2017 #2731
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Wireless receiver
Mode: TX 2403MHz
Model: RG51
Manufacturer: Lenovo

Polarization: Vertical
Power Source: DC 5V
Date: 17/06/17/
Time:
Engineer Signature: WADE
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	119.8555	51.70	-13.06	38.64	43.50	-4.86	QP			
2	457.5072	41.41	-5.22	36.19	46.00	-9.81	QP			
3	965.5421	37.75	3.35	41.10	54.00	-12.90	QP			

Mid CH 30MHz-1GHz



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.: LGW2017 #2732

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: TX 2439MHz

Model: RG51

Manufacturer: Lenovo

Polarization: Vertical

Power Source: DC 5V

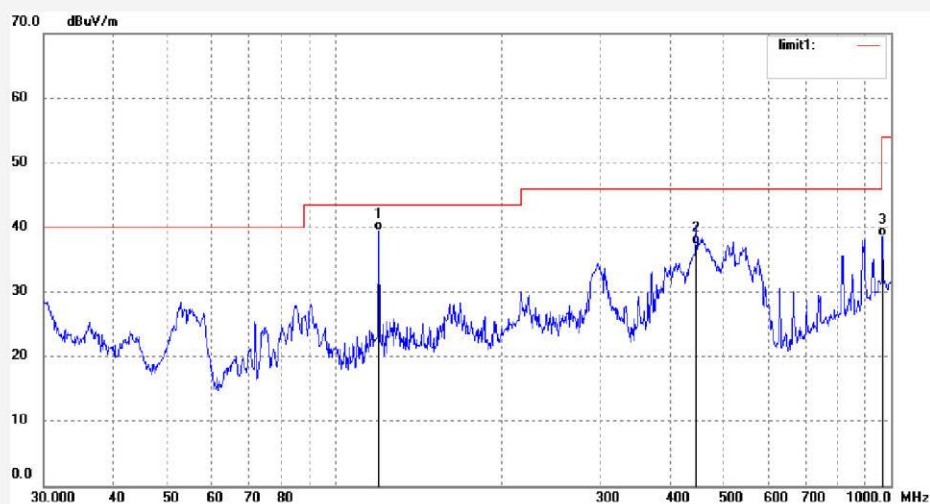
Date: 17/06/17/

Time:

Engineer Signature: WADE

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	119.8555	52.50	-13.06	39.44	43.50	-4.06	QP			
2	446.4141	42.73	-5.41	37.32	46.00	-8.68	QP			
3	962.1621	35.22	3.33	38.55	54.00	-15.45	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.: LGW2017 #2733

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: TX 2439MHz

Model: RG51

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: DC 5V

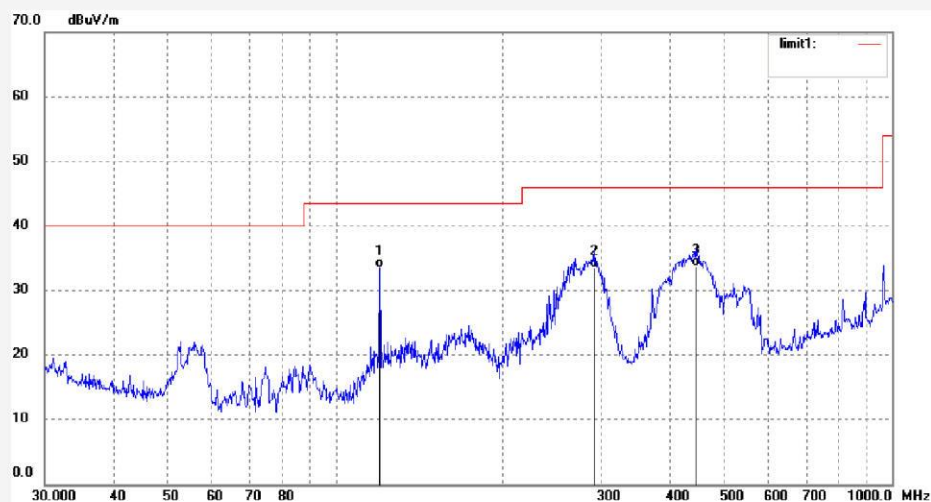
Date: 17/06/17/

Time:

Engineer Signature: WADE

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	119.8555	46.57	-13.06	33.51	43.50	-9.99	QP			
2	291.0360	42.75	-9.27	33.48	46.00	-12.52	QP			
3	443.2943	39.12	-5.44	33.68	46.00	-12.32	QP			

High CH 30MHz-1GHz**ACCURATE TECHNOLOGY CO., LTD.**

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Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: LGW2017 #2734

Polarization: Horizontal

Standard: FCC Class B 3M Radiated

Power Source: DC 5V

Test item: Radiation Test

Date: 17/06/17/

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

Time:

EUT: Wireless receiver

Engineer Signature: WADE

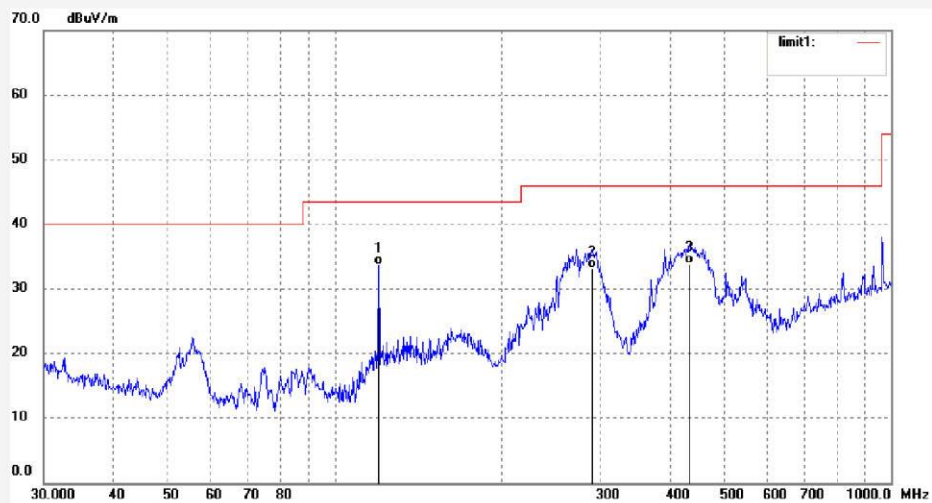
Mode: TX 2479MHz

Distance: 3m

Model: RG51

Manufacturer: Lenovo

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	119.8555	46.73	-13.06	33.67	43.50	-9.83	QP			
2	290.0172	42.52	-9.31	33.21	46.00	-12.79	QP			
3	434.0649	39.37	-5.53	33.84	46.00	-12.16	QP			



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Site: 2# Chamber

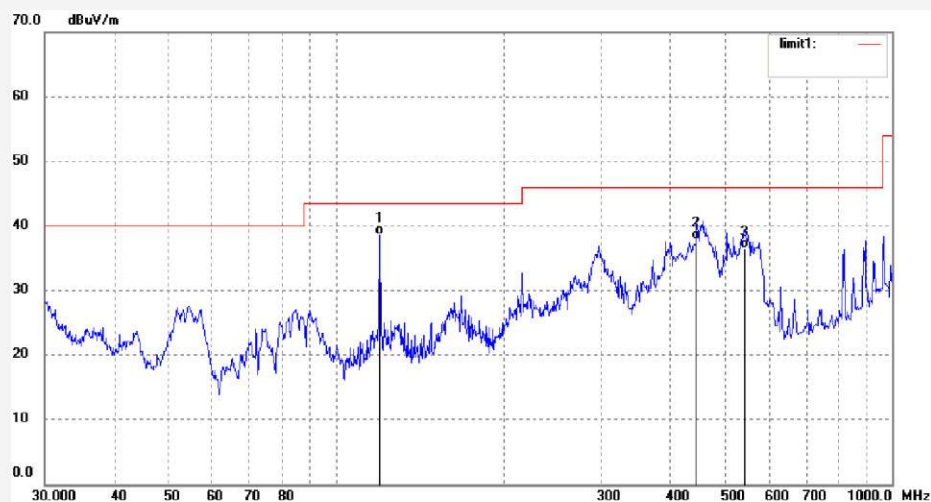
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: LGW2017 #2735
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Wireless receiver
Mode: TX 2479MHz
Model: RG51
Manufacturer: Lenovo

Polarization: Vertical
Power Source: DC 5V
Date: 17/06/17/
Time:
Engineer Signature: WADE
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	119.8555	51.71	-13.06	38.65	43.50	-4.85	QP			
2	444.8514	43.37	-5.43	37.94	46.00	-8.06	QP			
3	543.2740	39.79	-3.27	36.52	46.00	-9.48	QP			

Low CH 1GHz-18GHz



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Job No.: LGW2017 #2714

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: TX 2403MHz

Model: RG51

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: DC 5V

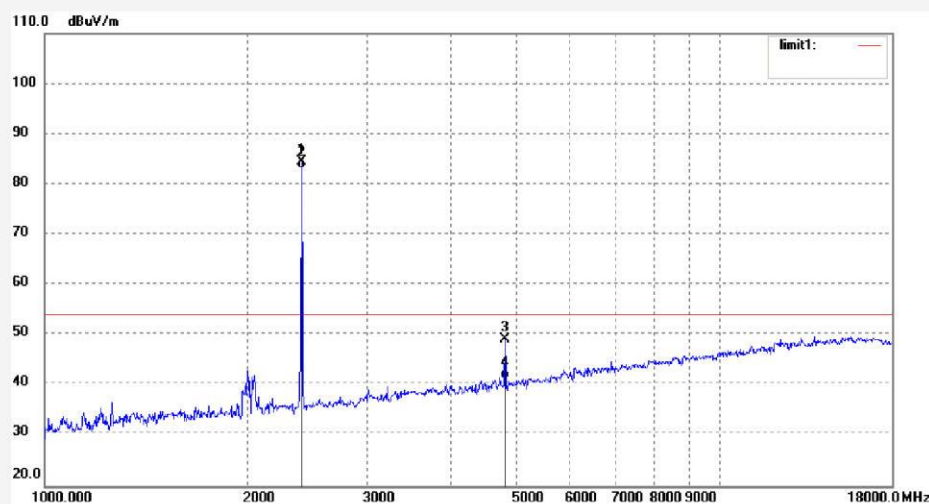
Date: 17/06/17/

Time:

Engineer Signature: WADE

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	2403.000	86.17	-1.61	84.56	114.00	-29.44	peak			
2	2403.000	84.67	-1.61	83.06	94.00	-10.94	AVG			
3	4806.024	44.29	4.92	49.21	74.00	-24.79	peak			
4	4806.024	36.43	4.92	41.35	54.00	-12.65	AVG			



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Fax:+86-0755-26503396

Job No.: LGW2017 #2715

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: TX 2403MHz

Model: RG51

Manufacturer: Lenovo

Polarization: Vertical

Power Source: DC 5V

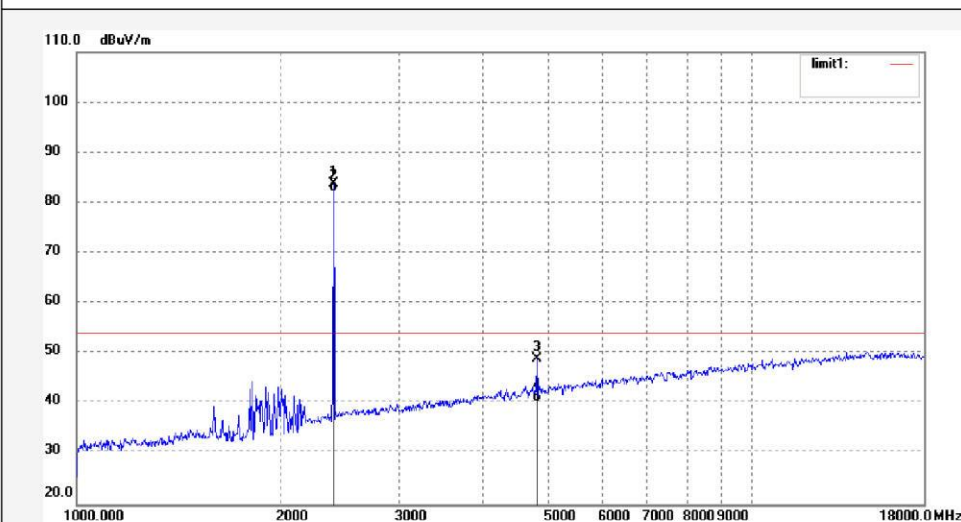
Date: 17/06/17/

Time:

Engineer Signature: WADE

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	2403.000	85.39	-1.61	83.78	114.00	-30.22	peak			
2	2403.000	83.89	-1.61	82.28	94.00	-11.72	AVG			
3	4806.022	43.89	4.92	48.81	74.00	-25.19	peak			
4	4806.022	35.49	4.92	40.41	54.00	-13.59	AVG			

Mid CH 1GHz-18GHz



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Job No.: LGW2017 #2718

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: TX 2439MHz

Model: RG51

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: DC 5V

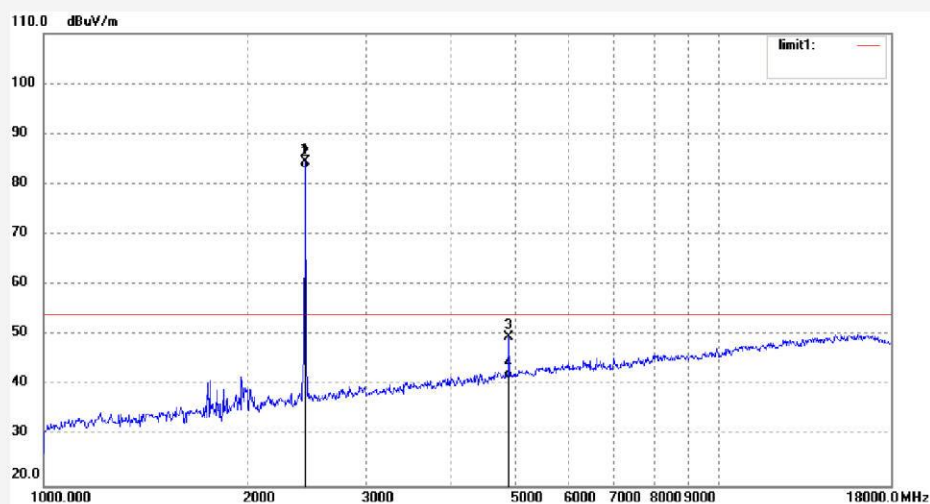
Date: 17/06/17/

Time:

Engineer Signature: WADE

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	2439.000	85.87	-1.46	84.41	114.00	-29.59	peak			
2	2439.000	84.47	-1.46	83.01	94.00	-10.99	AVG			
3	4878.025	44.05	5.57	49.62	74.00	-24.38	peak			
4	4878.025	35.76	5.57	41.33	54.00	-12.67	AVG			



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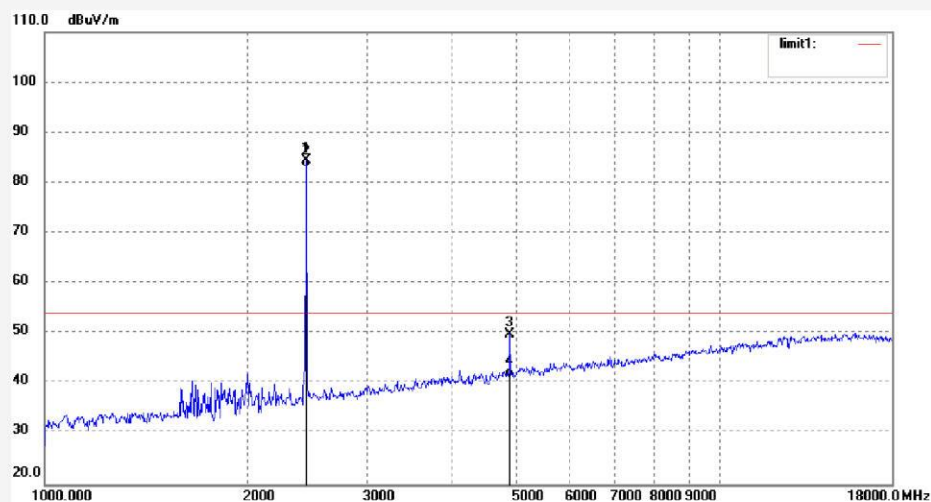
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: LGW2017 #2719
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Wireless receiver
Mode: TX 2439MHz
Model: RG51
Manufacturer: Lenovo

Polarization: Vertical
Power Source: DC 5V
Date: 17/06/17/
Time:
Engineer Signature: WADE
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	2439.000	85.99	-1.46	84.53	114.00	-29.47	peak			
2	2439.000	84.59	-1.46	83.13	94.00	-10.87	AVG			
3	4878.024	44.32	5.57	49.89	74.00	-24.11	peak			
4	4878.024	35.67	5.57	41.24	54.00	-12.76	AVG			

High CH 1GHz-18GHz



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Site: 2# Chamber

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Fax:+86-0755-26503396

Job No.: LGW2017 #2720

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: TX 2479MHz

Model: RG51

Manufacturer: Lenovo

Polarization: Vertical

Power Source: DC 5V

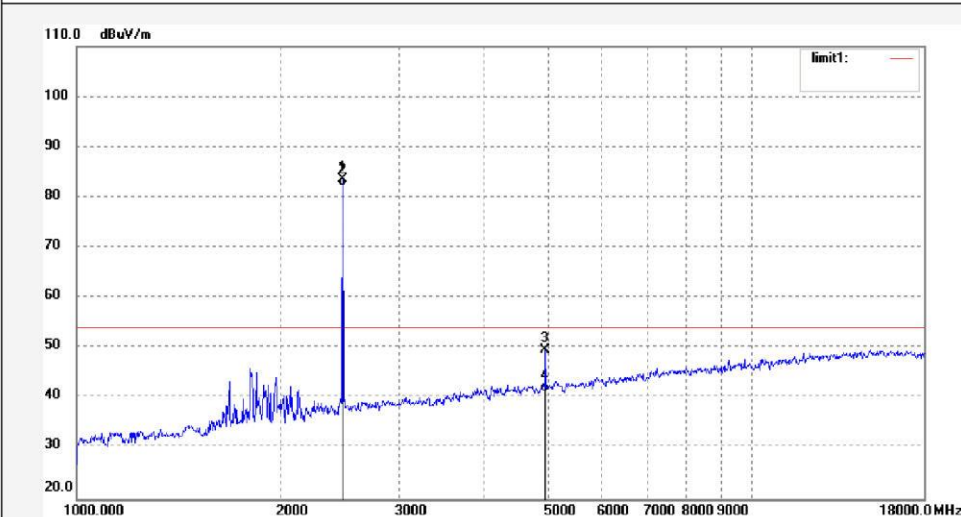
Date: 17/06/17/

Time:

Engineer Signature: WADE

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	2479.000	85.00	-1.40	83.60	114.00	-30.40	peak			
2	2479.000	83.60	-1.40	82.20	94.00	-11.80	AVG			
3	4958.020	43.59	6.08	49.67	74.00	-24.33	peak			
4	4958.020	35.16	6.08	41.24	54.00	-12.76	AVG			



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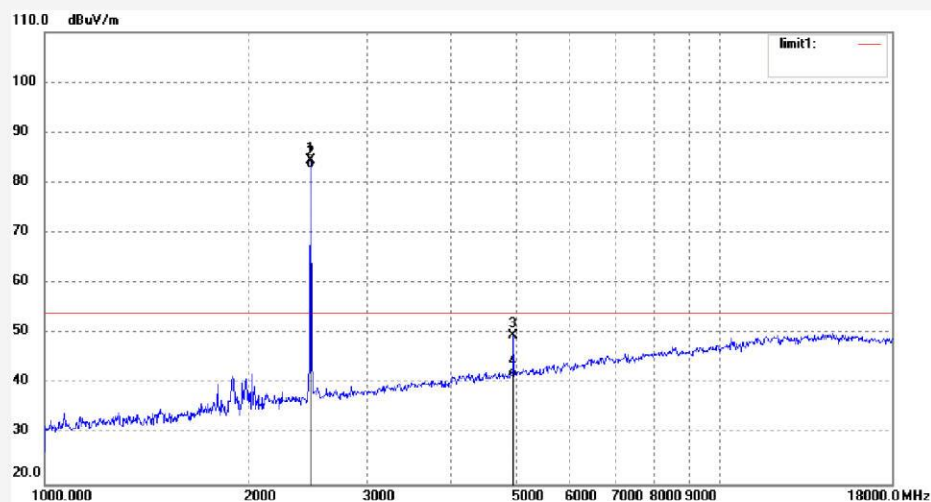
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: LGW2017 #2721
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Wireless receiver
Mode: TX 2479MHz
Model: RG51
Manufacturer: Lenovo

Polarization: Horizontal
Power Source: DC 5V
Date: 17/06/17/
Time:
Engineer Signature: WADE
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	2479.000	85.78	-1.40	84.38	114.00	-29.62	peak			
2	2479.000	84.38	-1.40	82.98	94.00	-11.02	AVG			
3	4958.021	43.42	6.08	49.50	74.00	-24.50	peak			
4	4958.021	35.16	6.08	41.24	54.00	-12.76	AVG			

Appendix A.2: Test plots of band edge

Low CH



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Job No.: LGW2017 #2717

Standard: FCC Part 15 PEAK 2.4G

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: TX 2403MHz

Model: RG51

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: DC 5V

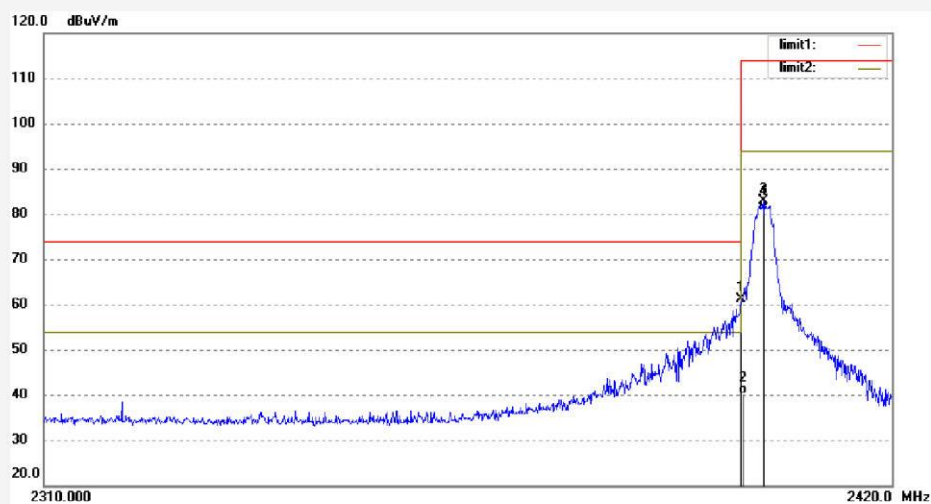
Date: 17/06/17/

Time:

Engineer Signature: WADE

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	2400.000	62.78	-1.62	61.16	74.00	-12.84	peak			
2	2400.000	41.87	-1.62	40.25	54.00	-13.75	AVG			
3	2403.000	84.57	-1.61	82.96	114.00	-31.04	peak			
4	2403.000	83.07	-1.61	81.46	94.00	-12.54	AVG			



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

Job No.: LGW2017 #2716

Standard: FCC Part 15 PEAK 2.4G

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: TX 2403MHz

Model: RG51

Manufacturer: Lenovo

Polarization: Vertical

Power Source: DC 5V

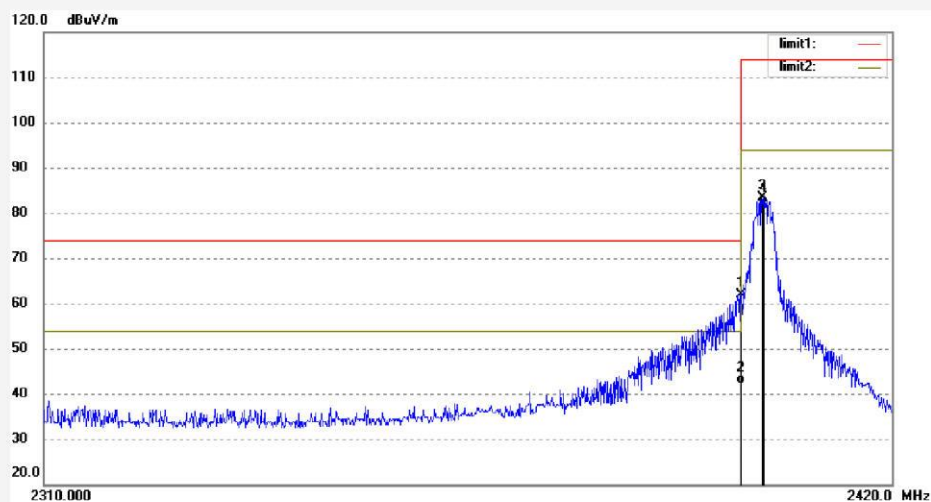
Date: 17/06/17/

Time:

Engineer Signature: WADE

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	2400.000	63.41	-1.62	61.79	74.00	-12.21	peak			
2	2400.000	43.83	-1.62	42.21	54.00	-11.79	AVG			
3	2403.000	85.02	-1.61	83.41	114.00	-30.59	peak			
4	2403.000	83.52	-1.61	81.91	94.00	-12.09	AVG			

High CH



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Site: 2# Chamber

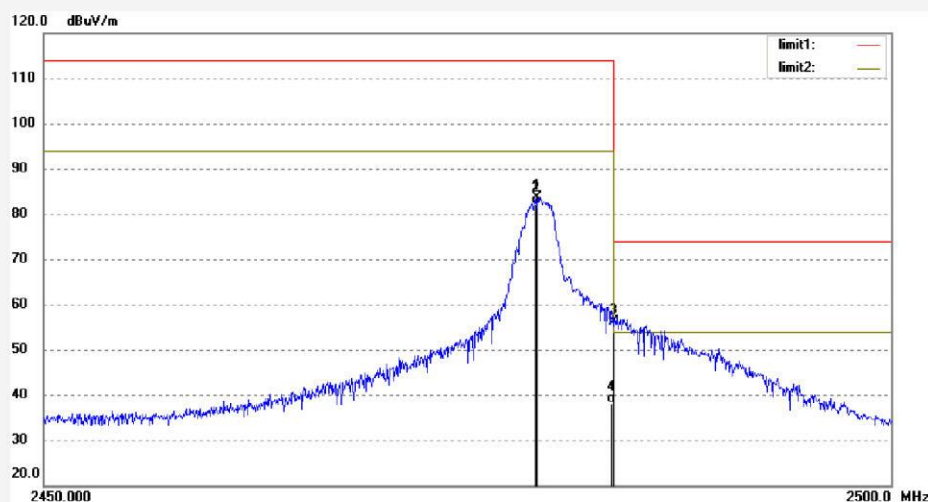
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: LGW2017 #2722
Standard: FCC Part 15 PEAK 2.4G
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Wireless receiver
Mode: TX 2479MHz
Model: RG51
Manufacturer: Lenovo

Polarization: Horizontal
Power Source: DC 5V
Date: 17/06/17/
Time:
Engineer Signature: WADE
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	2479.000	84.94	-1.40	83.54	114.00	-30.46	peak			
2	2479.000	83.54	-1.40	82.14	94.00	-11.86	AVG			
3	2483.500	57.46	-1.40	56.06	74.00	-17.94	peak			
4	2483.500	39.64	-1.40	38.24	54.00	-15.76	AVG			



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Site: 2# Chamber

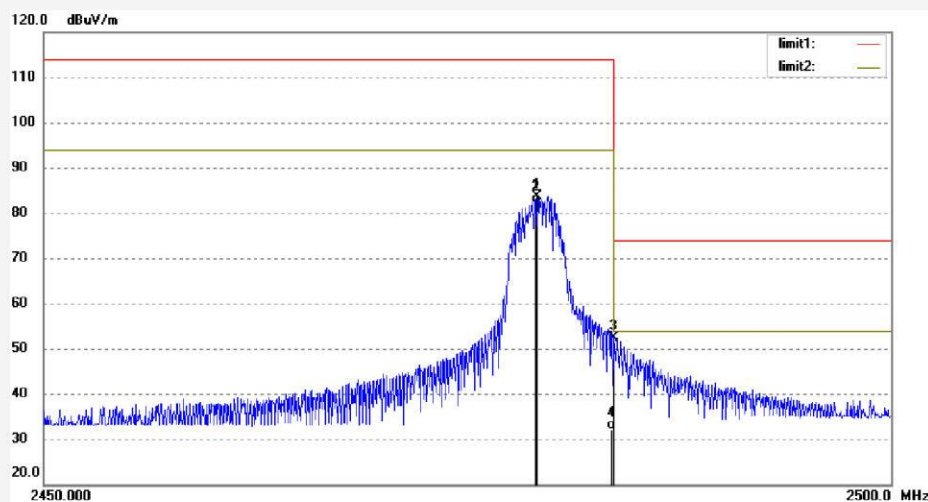
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: LGW2017 #2723
Standard: FCC Part 15 PEAK 2.4G
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Wireless receiver
Mode: TX 2479MHz
Model: RG51
Manufacturer: Lenovo

Polarization: Vertical
Power Source: DC 5V
Date: 17/06/17/
Time:
Engineer Signature: WADE
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	2479.000	85.00	-1.40	83.60	114.00	-30.40	peak			
2	2479.000	83.60	-1.40	82.20	94.00	-11.80	AVG			
3	2483.500	53.66	-1.40	52.26	74.00	-21.74	peak			
4	2483.500	33.54	-1.40	32.14	54.00	-21.86	AVG			

Appendix A.3: Test Plots of Conducted Emission B Mode

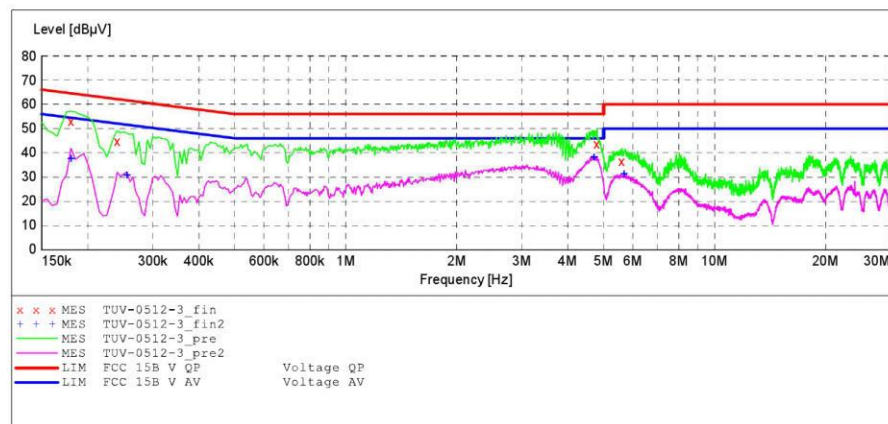
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Wireless receiver M/N:RG51
Manufacturer: Lenovo
Operating Condition: TX
Test Site: 1#Shielding Room
Operator: WADE
Test Specification: N 120V/60Hz
Comment: Mains Port
Start of Test: 6/17/2017 /

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

Short Description: SUB_STD_VTERM2 1.70
Start Stop Step Detector Meas. IF Transducer
Frequency Width Frequency Width Time Bandw.
9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
Average
150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
Average



MEASUREMENT RESULT: "TUV-0512-3_fin"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.180000	52.90	10.5	65	11.6	QP	N	GND
0.240000	44.60	10.6	62	17.5	QP	N	GND
4.800000	43.50	11.1	56	12.5	QP	N	GND
5.610000	36.30	11.2	60	23.7	QP	N	GND

MEASUREMENT RESULT: "TUV-0512-3_fin2"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.180000	37.60	10.5	55	16.9	AV	N	GND
0.255000	30.60	10.6	52	21.0	AV	N	GND
4.710000	38.00	11.1	46	8.0	AV	N	GND
5.690000	31.10	11.2	50	18.9	AV	N	GND

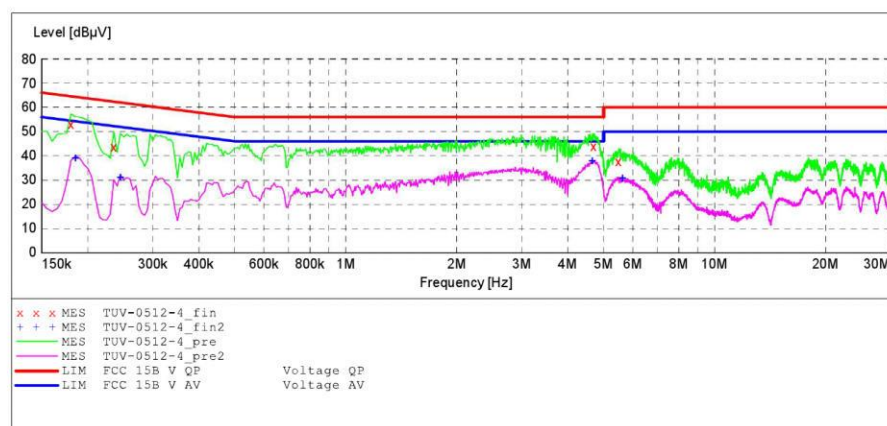
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 B

EUT: Wireless receiver M/N:RG51
 Manufacturer: Lenovo
 Operating Condition: TX
 Test Site: 1#Shielding Room
 Operator: WADE
 Test Specification: L 120V/60Hz
 Comment: Mains Port
 Start of Test: 6/17/2017 /

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

Short Description: SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Width Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "TUV-0512-4_fin"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.180000	52.90	10.5	65	11.6	QP	L1	GND
0.235000	43.60	10.6	62	18.7	QP	L1	GND
4.700000	43.70	11.1	56	12.3	QP	L1	GND
5.490000	37.40	11.2	60	22.6	QP	L1	GND

MEASUREMENT RESULT: "TUV-0512-4_fin2"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.185000	39.00	10.5	54	15.3	AV	L1	GND
0.245000	30.80	10.6	52	21.1	AV	L1	GND
4.660000	37.80	11.1	46	8.2	AV	L1	GND
5.630000	30.70	11.2	50	19.3	AV	L1	GND