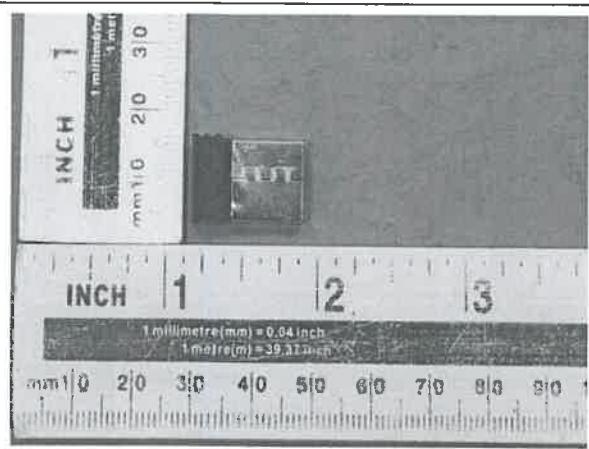


Prüfbericht-Nr.: <i>Test report No.:</i>	50087315 002	Auftrags-Nr.: <i>Order No.:</i>	164091064	Seite 1 von 21 <i>Page 1 of 21</i>
Kunden-Referenz-Nr.: <i>Client reference No.:</i>	N/A	Auftragsdatum: <i>Order date.:</i>	02.05.2017	
Auftraggeber: <i>Client:</i>	G.Tech Technology Ltd. No.8, Jinyuan 1st 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: Subpart B Section 15.107 CFR47 FCC Part 15: Subpart B Section 15.109 ICES-003 Issue 6			
Wareneingangsdatum: <i>Date of receipt:</i>	02.05.2017			
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000531117-002			
Prüfzeitraum: <i>Testing period:</i>	08.06.2017 - 19.06.2017			
Ort der Prüfung: <i>Place of testing:</i>	Shenzhen 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				
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 specifications(s) F(ail) = failed a.m. test specifications(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>				

V04

Test Summary

5.1.1 Conducted Emission

RESULT: Pass

5.1.2 Radiated Emission

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

None.

2 Test Sites

2.1 Test Facilities

Shenzhen Accurate Technology Co., Ltd.

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

FCC Registration No.: 752051

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

Shenzhen Accurate Technology Co., Ltd.

Kind of Equipment	Manufacturer	Type	S/N	Last Cal.	Cal. Interval
Spurious emission and Radiated emission					
Spectrum Analyzer	Rohde&Schwarz	FSV40	101495	2017-01-07	1 Year
Test Receiver	Rohde&Schwarz	ESCS30	100307	2017-01-07	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	2017-01-10	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	2017-01-10	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU11835 40-01	3791	2017-01-07	1 Year
Conducted Emission					
Test Receiver	Rohde & Schwarz	ESCS30	100307	2017-01-07	1 Year
L.I.S.N.	Schwarzbeck	NLSK8126	8126431	2017-01-07	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100815	2017-01-07	1 Year
50Ω Coaxial Switch	Anritsu Corp	MP59B	6200283933	2017-01-07	1 Year

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
Conducted Emission	± 2.96 dB
Radiated Emission	± 4.27 dB
Temperature	± 0.5 °C
Humidity	± 3.0 %

2.6 Location of Original Data

The original copies of all test data taken during actual testing were recorded 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 Shenzhen Accurate Technology Co., Ltd. Test 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 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 EUT

Technical Specification	Value
Kind of Equipment	Lenovo Wireless Receiver
Type Designation	RG51
FCC ID	009RG51
IC / HVIN	20090-RG51 / RG51
Operating Frequency	2403 ~ 2479MHz
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
Wireless Technology	2.4GHz wireless
Antenna Type	Integral Antenna
Max. Antenna Gain	2.15 dBi Max

3.3 Independent Operation Modes

The basic operation modes are:

A.1 On, normal operation

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- | | |
|--------------------|----------------------------------|
| - Application Form | - FCC/IC Label and Location Info |
| - Block Diagram | - Photo Document |
| - User Manual | |

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. All testing were performed according to the procedures in ANSI C63.4: 2014.

4.3 Special Accessories and Auxiliary Equipment

Table 3: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Note
Notebook	Lenovo	4290-RT8	R9-FW93G	--

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)

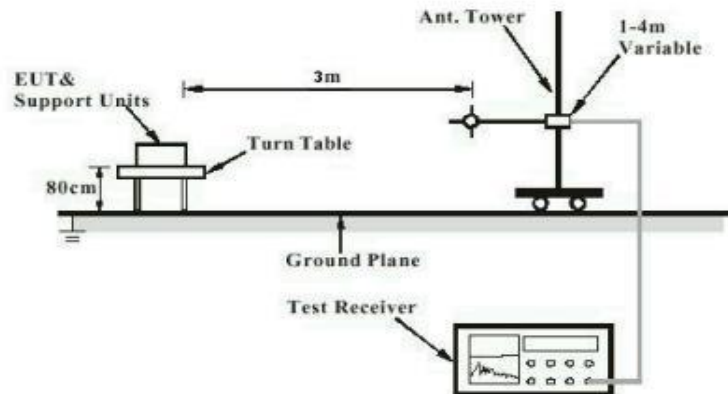
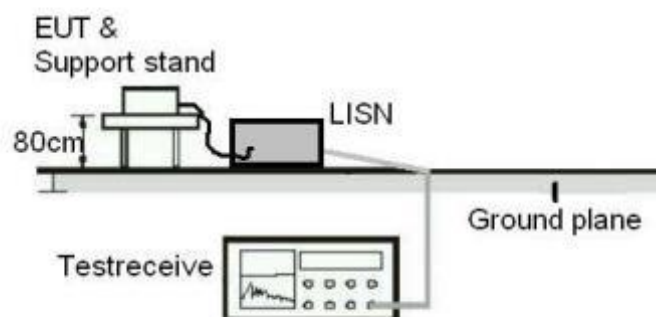


Diagram of Measurement Configuration for Mains Conduction Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Conducted Emission

RESULT:

Pass

Test Specification

Test standard	FCC Part 15.107(a) ICES-003
Basic standard	ANSI C63.4: 2014
Frequency range	0.15 – 30MHz
Limits	FCC Part 15.107(a) ICES-003 Table 2
Kind of test site	Shielded Room

Test Setup

Date of testing	17.06.2017
Input voltage	Powered by USB port of notebook with Input: 120V/60Hz
Operation mode	All testing mode refer to clause 3.3
Earthing	Not connected
Ambient temperature	23 °C
Relative humidity	48 %
Atmospheric pressure	101 kPa

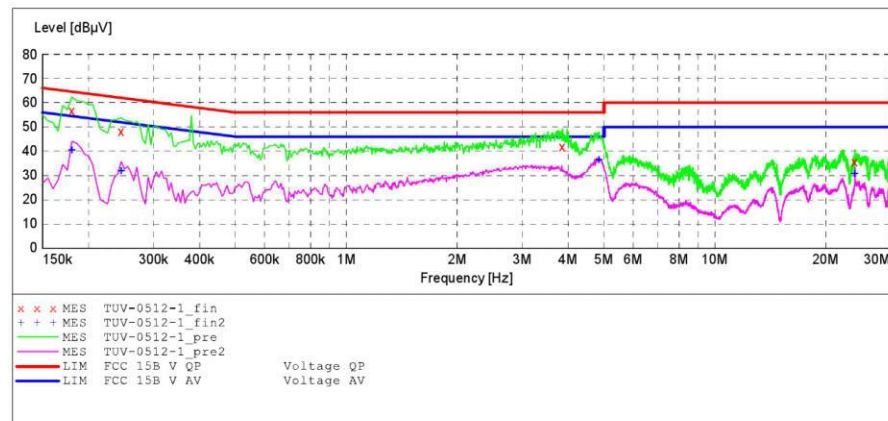
The measurement records are in the following pages.

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

EUT: Wireless receiver M/N:RG51
 Manufacturer: Lenovo
 Operating Condition: On
 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 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-0512-1_fin"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.180000	56.80	10.5	65	7.7	QP	L1	GND
0.245000	48.10	10.6	62	13.8	QP	L1	GND
3.860000	41.70	11.1	56	14.3	QP	L1	GND
23.995000	35.60	11.5	60	24.4	QP	L1	GND

MEASUREMENT RESULT: "TUV-0512-1_fin2"

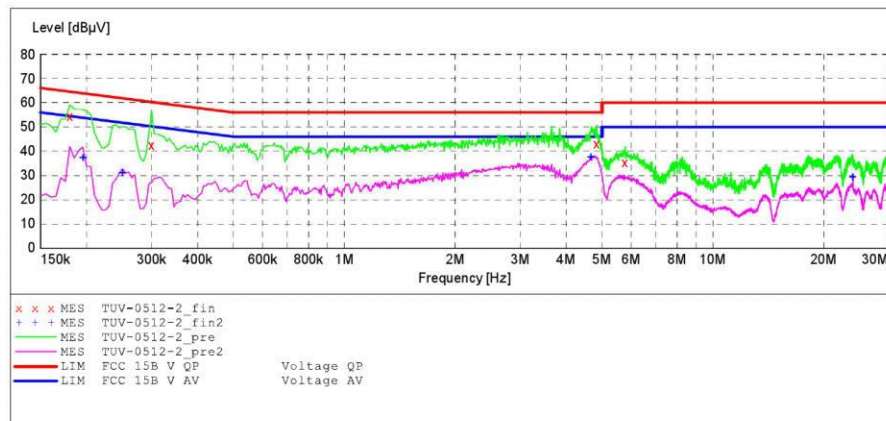
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.180000	40.30	10.5	55	14.2	AV	L1	GND
0.245000	31.90	10.6	52	20.0	AV	L1	GND
4.850000	36.50	11.1	46	9.5	AV	L1	GND
23.995000	30.70	11.5	50	19.3	AV	L1	GND

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

EUT: Wireless receiver M/N:RG51
 Manufacturer: Lenovo
 Operating Condition: On
 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 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-0512-2_fin"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.180000	54.30	10.5	65	10.2	QP	N	GND
0.300000	42.30	10.6	60	17.9	QP	N	GND
4.840000	43.10	11.1	56	12.9	QP	N	GND
5.780000	35.20	11.2	60	24.8	QP	N	GND

MEASUREMENT RESULT: "TUV-0512-2_fin2"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.195000	37.30	10.5	54	16.5	AV	N	GND
0.250000	31.00	10.6	52	20.8	AV	N	GND
4.670000	37.60	11.1	46	8.4	AV	N	GND
23.995000	29.20	11.5	50	20.8	AV	N	GND

5.1.2 Radiated Emission

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

Test standard	FCC Part 15.109(a) ICES-003
Basic standard	ANSI C63.4: 2014
Frequency range	30 - 6000MHz
Classification	Class B
Limits	FCC Part 15.109(a) ICES-003 Table 5 & Table 7
Kind of test site	3m Semi-anechoic Chamber

Test Setup

Date of testing	12.06.2017
Input voltage	Charged by USB port of adapter or notebook with Input: 120V/60Hz
Operation mode	All testing mode refer to clause 3.3
Earthing	Not connected
Ambient temperature	23 °C
Relative humidity	48 %
Atmospheric pressure	101 kPa

The measurement records are in the following pages.


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.: LENOVO #1910

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: On

Model: RG51

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: DC 5V

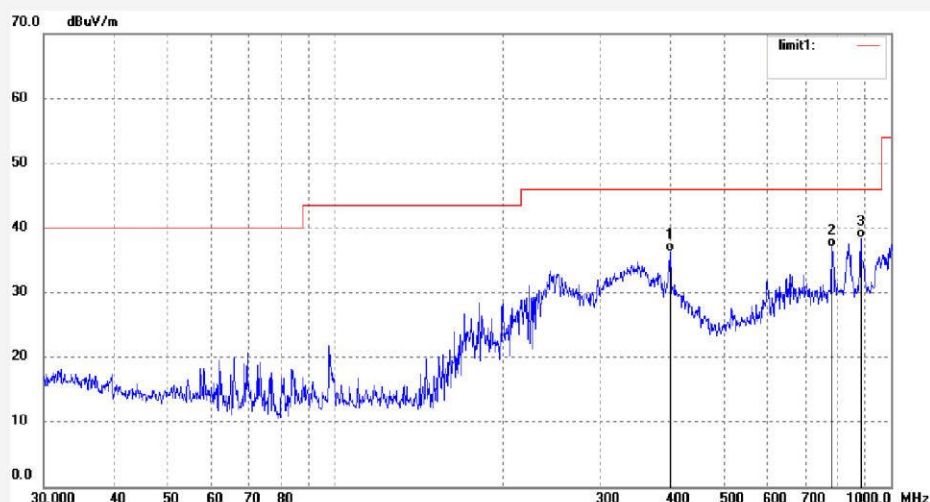
Date: 17/06/12/

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
6	827.4934	36.25	1.30	37.55	47.00	-9.45	peak			
1	400.4318	42.73	-6.43	36.30	46.00	-9.70	QP			
2	782.3452	36.69	0.41	37.10	46.00	-8.90	QP			
3	881.4067	36.32	2.04	38.36	46.00	-7.64	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.: LENOVO #1911

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: On

Model: RG51

Manufacturer: Lenovo

Polarization: Vertical

Power Source: DC 5V

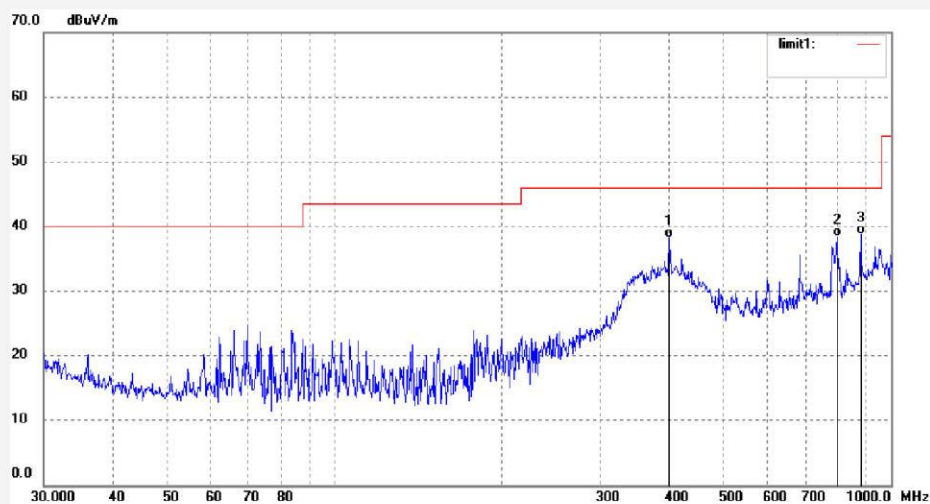
Date: 17/06/12/

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
3	881.4067	36.32	2.04	38.36	46.00	-7.64	QP			
1	399.0300	44.68	-6.48	38.20	46.00	-7.80	QP			
2	798.9796	37.56	0.81	38.37	46.00	-7.63	QP			
3	881.4067	36.78	2.04	38.82	46.00	-7.18	QP			

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Test Report No.

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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.: LENOVO #1916

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: On

Model: RG51

Manufacturer: Lenovo

Polarization: Vertical

Power Source: DC 5V

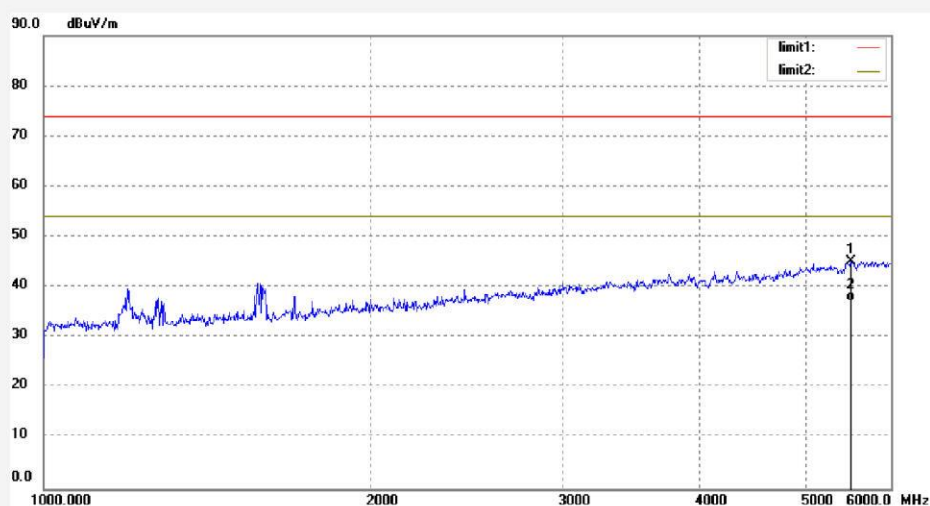
Date: 17/06/12/

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
2	5321.268	27.27	6.88	34.15	54.00	-19.85	AVG			
1	5505.541	37.79	7.42	45.21	74.00	-28.79	peak			
2	5505.541	29.74	7.42	37.16	54.00	-16.84	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.: LENOVO #1917

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: Wireless receiver

Mode: On

Model: RG51

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: DC 5V

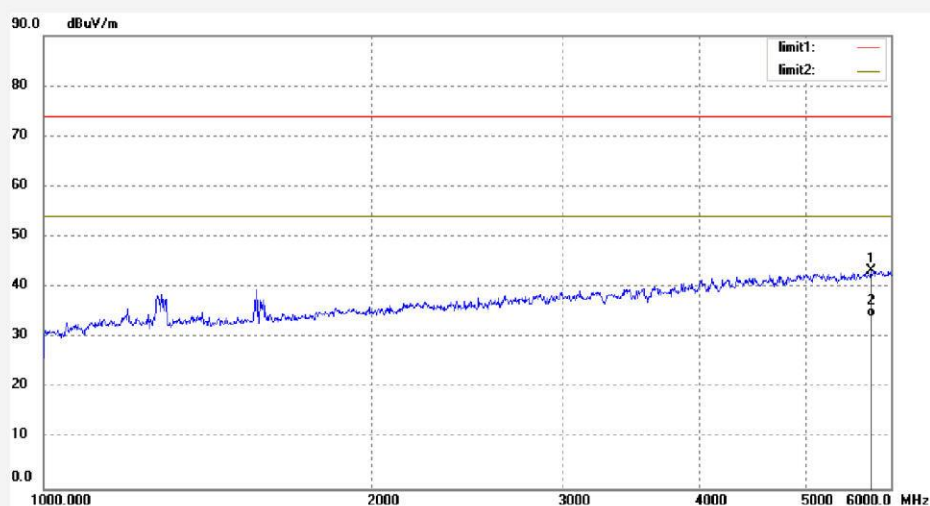
Date: 17/06/12/

Time:

Engineer Signature: WADE

Distance: 3m

Note:



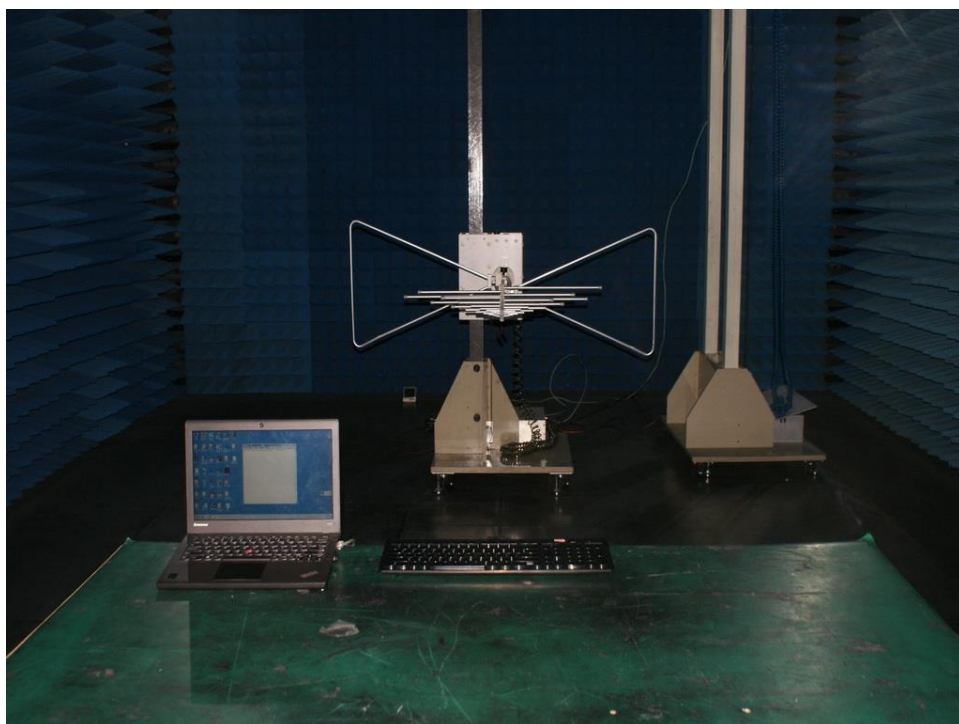
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
2	5505.541	29.74	7.42	37.16	54.00	-16.84	AVG			
1	5747.456	35.57	7.79	43.36	74.00	-30.64	peak			
2	5747.456	26.36	7.79	34.15	54.00	-19.85	AVG			

6 Photographs of the Test Set-Up

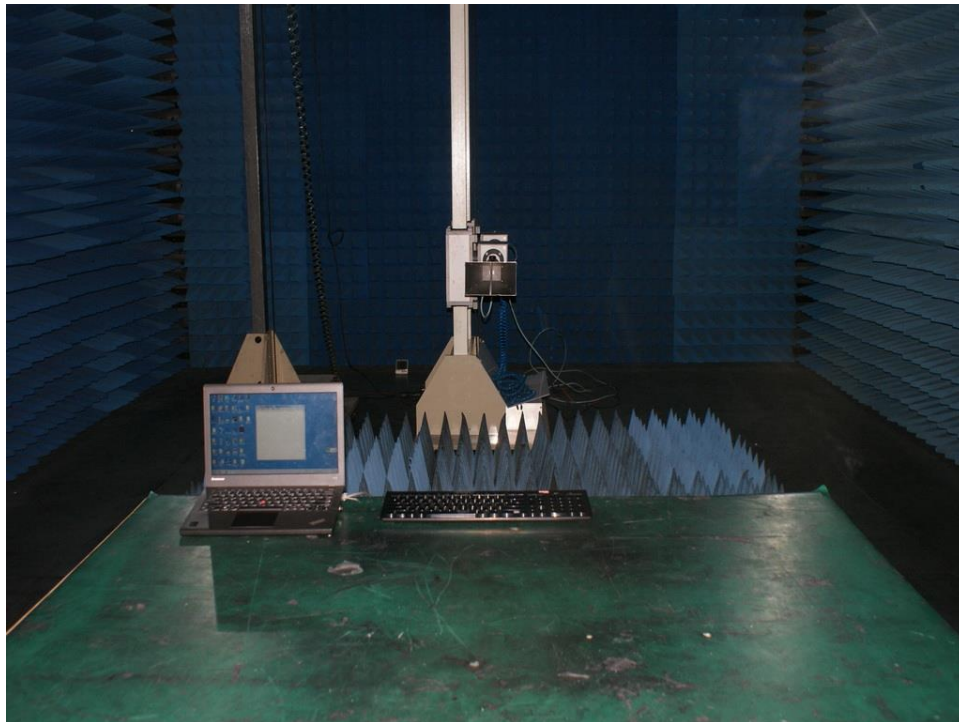
Photograph 1: Set-up for Conducted Emission



Photograph 2: Set-up for Radiated Emission (30MHz ~ 1GHz)



Photograph 3: Set-up for Radiated Emission (1GHz ~ 6GHz)



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