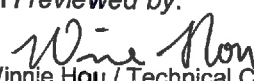


Prüfbericht-Nr.: Test Report No.:	50050477 001	Auftrags-Nr.: Order No.:	164058674	Seite 1 von 33 Page 1 of 33
Kunden-Referenz-Nr.: Client Reference No.:	N/A	Auftragsdatum: Order date:	22.03.2016	
Auftraggeber: Client:	Lenovo (Beijing) Limited, No. 6, Chuang Ye Road, Shangdi Information Industry Base, Haidian District, Beijing 100085, P.R. China			
Prüfgegenstand: Test item:	ThinkVision X24 Pro Wireless Charging Stand			
Bezeichnung / Typ-Nr.: Identification / Type No.:	HH-1601			
Auftrags-Inhalt: Order content:	FCC approval			
Prüfgrundlage: Test specification:	CFR47 FCC Part 15: Subpart C Section 15.247 CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209 FCC KDB publication 447498 D01 v06			
Wareneingangsdatum: Date of receipt:	05.05.2016	Refer to photo document		
Prüfmuster-Nr.: Test sample No.:	A000355351-002, A000355351-003			
Prüfzeitraum: Testing period:	10.05.2016 - 15.07.2016			
Ort der Prüfung: Place of testing:	Accurate Technology Co., Ltd.			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von / tested by:		kontrolliert von / reviewed by:		
28.07.2016 Sam Lin / Assistant Manager 		28.07.2016 Winnie Hou / Technical Certifier 		
Datum Date	Name / Stellung Name / Position	Unterschrift Signature	Datum Date	Name / Stellung Name / Position
Sonstiges / Other:	This report is for DTS equipment class. FCC ID: A5MHH1601			
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:		Prüfmuster vollständig und unbeschädigt Test item complete and undamaged		
* 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. 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.				

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 PEAK OUTPUT POWER

RESULT: Pass

5.1.3 6dB BANDWIDTH AND 99% BANDWIDTH

RESULT: Pass

5.1.4 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHz BANDWIDTH

RESULT: Pass

5.1.5 POWER SPECTRAL DENSITY

RESULT: Pass

5.1.6 SPURIOUS EMISSIONS

RESULT: Pass

5.1.7 CONDUCTED EMISSIONS

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 of Bluetooth 4.0 Low Energy mode

Appendix B: Test Results of RF Exposure - Bluetooth 4.0 Low Energy mode

2. Test Sites

2.1 Test Facilities

Accurate Technology Co., Ltd.

(FCC Registration No.: 752051 & IC Registration 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
Radio Spectrum Test				
Spectrum Analyzer	R & S	FSV40	101495	Jan.9, 2017
Conducted emissions				
Test Receiver	R & S	ESCS30	100307	Jan.9, 2017
L.I.S.N.	Schwarzbeck	NLSK8126	8126431	Jan.9, 2017
Pulse Limiter	R & S	ESH3-Z2	100815	Jan.9, 2017
50ΩCoaxial Switch	Anritsu Corp	MP59B	6200283933	Jan.9, 2017
Radiated emissions				
Spectrum Analyzer	R & S	FSV40	101495	Jan.9, 2017
Test Receiver	R & S	ESCS30	100307	Jan.9, 2017
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan.14, 2017
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan.14, 2017
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan.14, 2017
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan.14, 2017
RF Switching Unit+PreAMP	Compliance Direction	RSU-M2	38322	Jan.9, 2017
Pre-Amplifier	R & S	CBLU11835 40-01	3791	Jan.9, 2017
50 Coaxial Switch	Anritsu Corp	MP59B	6200506474	Jan.9, 2017
RF Coaxial Cable	SUHNER	N-3m	No.8	Jan.9, 2017
RF Coaxial Cable	RESENBERGER	N-3.5m	No.9	Jan.9, 2017
RF Coaxial Cable	SUHNER	N-6m	No.10	Jan.9, 2017
RF Coaxial Cable	RESENBERGER	N-12m	No.11	Jan.9, 2017
RF Coaxial Cable	RESENBERGER	N-0.5m	No.12	Jan.9, 2017

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

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

Items		Extended Uncertainty
CE	Disturbance Voltage (dBuV)	U=1.94dB, k=2, σ =95%
RE (9kHz-30MHz)	Field strength (dBuV/m)	U=3.08dB, k=2, σ =95%
RE (30-1000MHz)	Field strength (dBuV/m)	U=4.42dB, k=2, σ =95%
RE (above 1000MHz)	Field strength (dBuV/m)	U=4.06dB, k=2, σ =95%

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. 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 charging stand which is only can be used for the specified display by connected with Type C connector. And the product also can be used as a transmitter of wireless charger. The product also contains Mini DP connector and USB 3.0 port.

It supports Bluetooth Low Energy and A4WP technology.

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:	ThinkVision X24 Pro Wireless Charging Stand
Type Designation:	HH-1601
FCC ID:	A5MHH1601
IC:	5903G-HH1601
Type of Equipment:	Class B digital equipment
Equipment Class:	DTS
Wireless Technology:	Bluetooth 4.0 Low Energy
Rated output power:	02 dBm (Max.)
Operating Frequency Range:	2402-2480 MHz for Bluetooth
Channel Number:	40 channels for Bluetooth 4.0 Low Energy
Channel Separation:	2 MHz for Bluetooth 4.0 Low Energy
Type of Modulation:	GFSK
Operating Voltage:	DC 20V via AC/DC Adapter
Operating Temperature Range:	0°C to 35°C
Antenna Type:	FPCB Antenna for Bluetooth
Smart Antenna Systems:	Not Applicable
Number of Antenna:	1
Antenna Gain:	Max. 0dBi for Bluetooth

Table 3: Marketed AC/DC adapter

Description	Manufacturer	Model	S/N	Rating
AC/DC adapter	Lenovo	ADLX90NCC3A	11S45N0249Z1 ZX1B58T89X	Input: AC 100-240V, 50/60Hz, 1.2A MAX. Output: DC 20V, 4.5A

Table 4: List of Radio Frequency Channel, Bluetooth 4.0 Low Energy

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
0	2402.00	11	2424.00	22	2446.00	33	2468.00
1	2404.00	12	2426.00	23	2448.00	34	2470.00
2	2406.00	13	2428.00	24	2450.00	35	2472.00
3	2408.00	14	2430.00	25	2452.00	36	2474.00
4	2410.00	15	2432.00	26	2454.00	37	2476.00
5	2412.00	16	2434.00	27	2456.00	38	2478.00
6	2414.00	17	2436.00	28	2458.00	39	2480.00
7	2416.00	18	2438.00	29	2460.00	--	--
8	2418.00	19	2440.00	30	2462.00	--	--
9	2420.00	20	2442.00	31	2464.00	--	--
10	2422.00	21	2444.00	32	2466.00	--	--

3.3 Independent Operation Modes

The basic operation modes are:

- A. A4WP wireless charging
 - 1. Charging
 - i. Minimum load
 - ii. Medium load
 - iii. Maximum load
- B. Bluetooth Low Energy operating
 - 1. Transmitting
 - i. Low channel
 - ii. Middle channel
 - iii. High channel
 - 2. Receiving
 - i. Low channel
 - ii. Middle channel
 - iii. High channel
- C. USB 3.0 connect to PC with data transferring
- D. Mini Display port connect to PC with data transferring
- E. 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

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.

Table 5: List of Frequencies under Test, Bluetooth 4.0 Low Energy operation

RF Channel of Bluetooth 4.0 Low Energy			
Test Channel	Channel number	Frequency (MHz)	Remark
Low	0	2402.00	Max. output power level
Middle	19	2440.00	Max. output power level
High	39	2480.00	Max. output power level

4.3 Special Accessories and Auxiliary Equipment

Table 6: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N
Notebook PC	Lenovo	ThinkPad X240	SL10F31638
Mobile Phone	Apple	MG4J2 CH/A	F17NTK2QG5MV
Printer	HP	HP LaserJet 1015	CNFG030424
Display	LENOVO	ThinkVision X24 Pro	--

Table 7: List of Accessories and Cables

Interface(s) / Port (s)	Max. cable length, Shielding	Cable classification
USB port	Shielded, 170cm	USB cable
Mini-Display port	Shielded, 170cm	Mini-Display cable

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 below 1 GHz

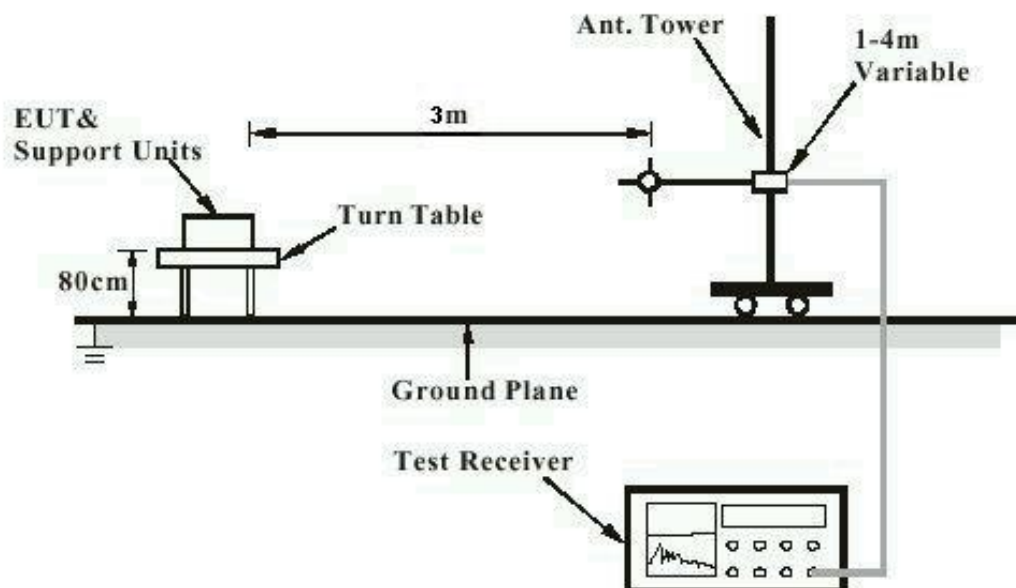


Diagram of Measurement Configuration for Radiation Test above 1 GHz

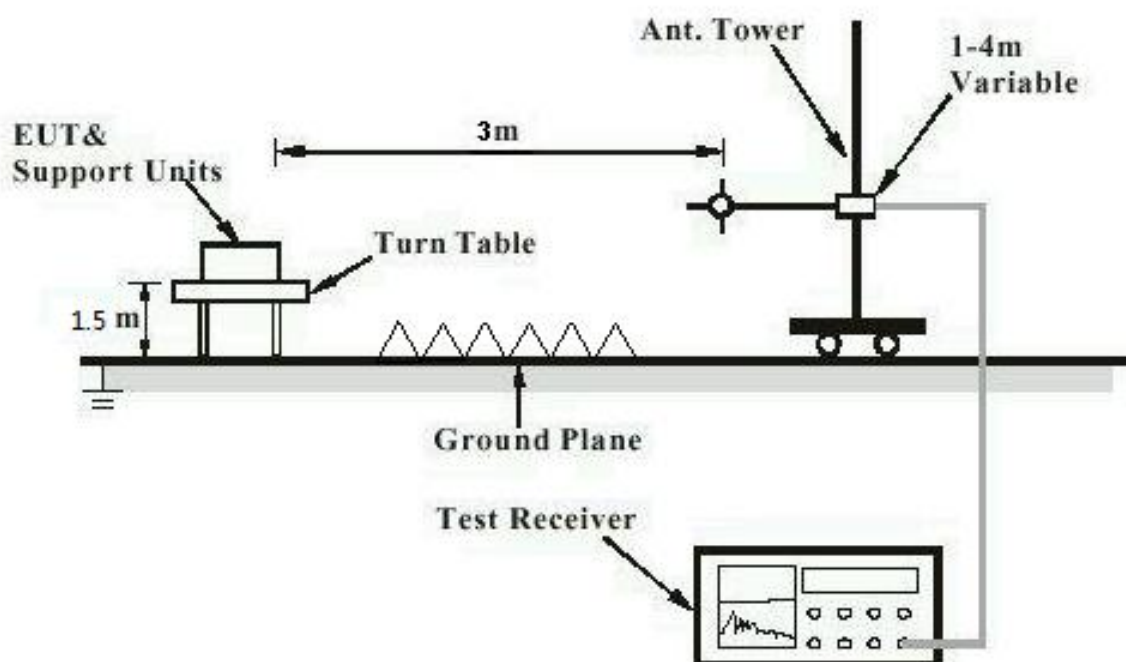


Diagram of Measurement Equipment Configuration for Conduction Measurement

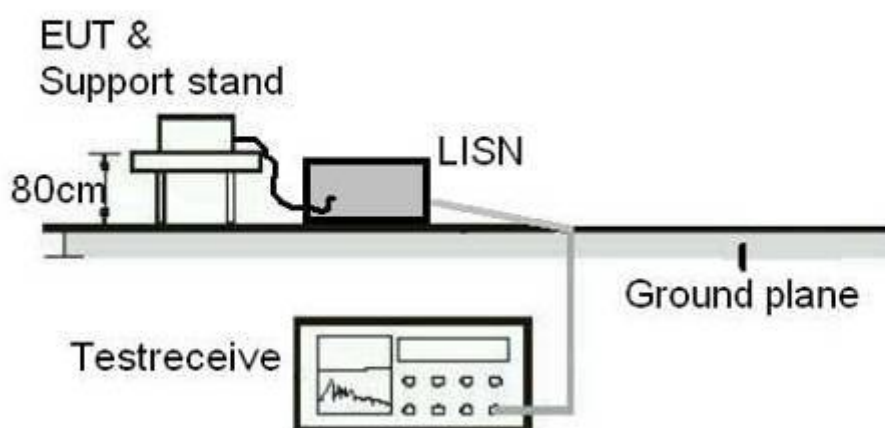
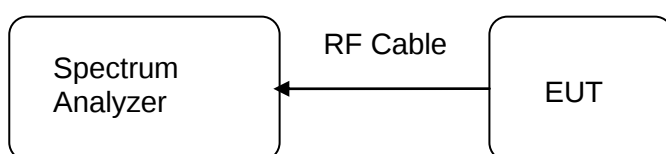


Diagram of Measurement Equipment Configuration for Transmitter Measurement



5. Test Results

5.1 Test Requirements & Test Suites - Part 15 Subpart C DTS equipment

5.1.1 Antenna Requirement

RESULT:**Pass**

Test standard	:	FCC Part 15.247(b)(4) and Part 15.203
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

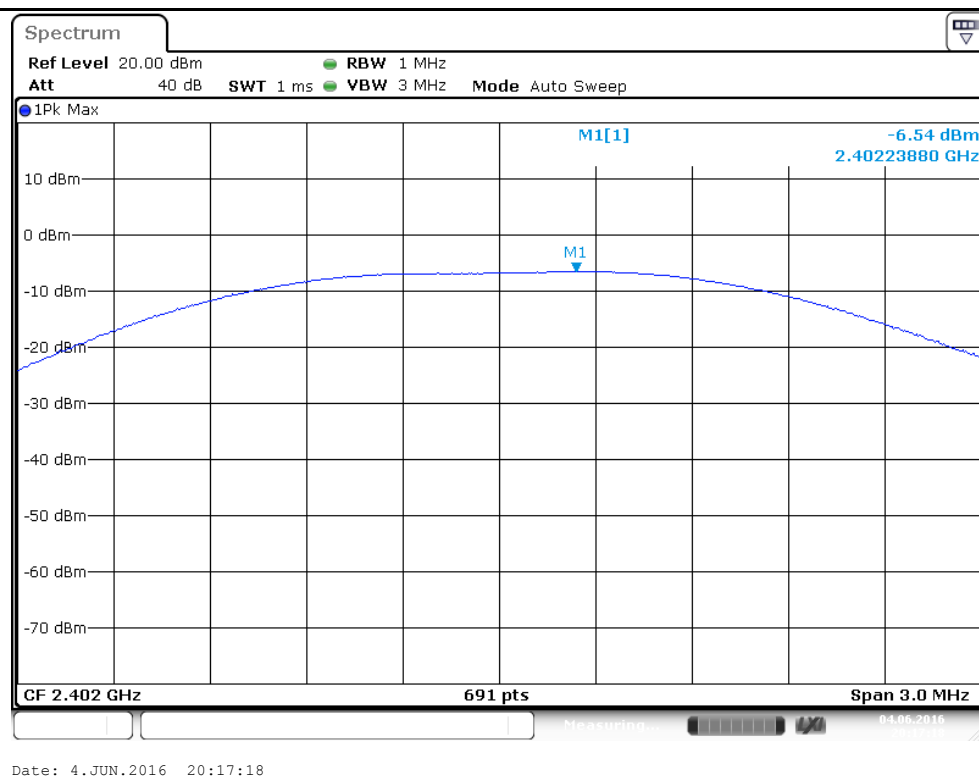
According to the manufacturer declared, the EUT has an internal antenna, the directional gain of antenna is 0 dBi for Bluetooth, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to compliance the provision.

Refer to EUT photo for details.

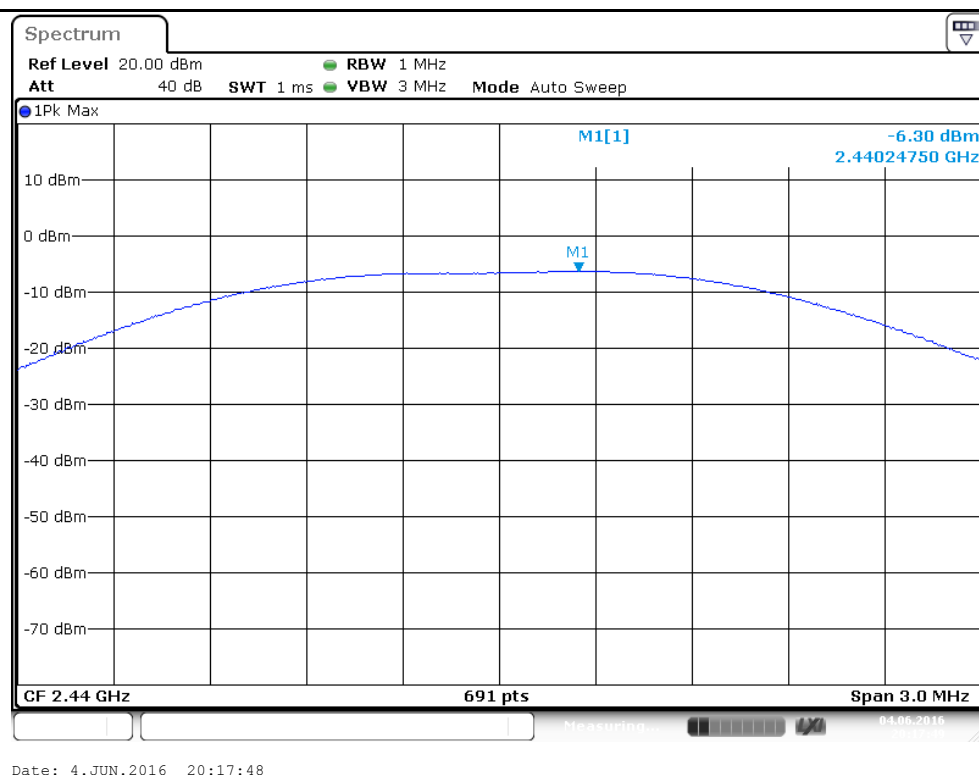
Channel	Channel Frequency (MHz)	Bluetooth 4.0 Low Energy					
		Measured Result (dBm)	Cable Loss (dB)	Peak Output Power		Limit (W)	Verdict
				dBm	W		
Low Channel	2402	-6.54	0.3	-6.24	0.00024	1	Pass
Middle Channel	2440	-6.30	0.3	-6.00	0.00025	1	Pass
High Channel	2480	-6.76	0.3	-6.46	0.00023	1	Pass
Note: Peak Output Power (dBm) = Measured Result + Cable Loss							

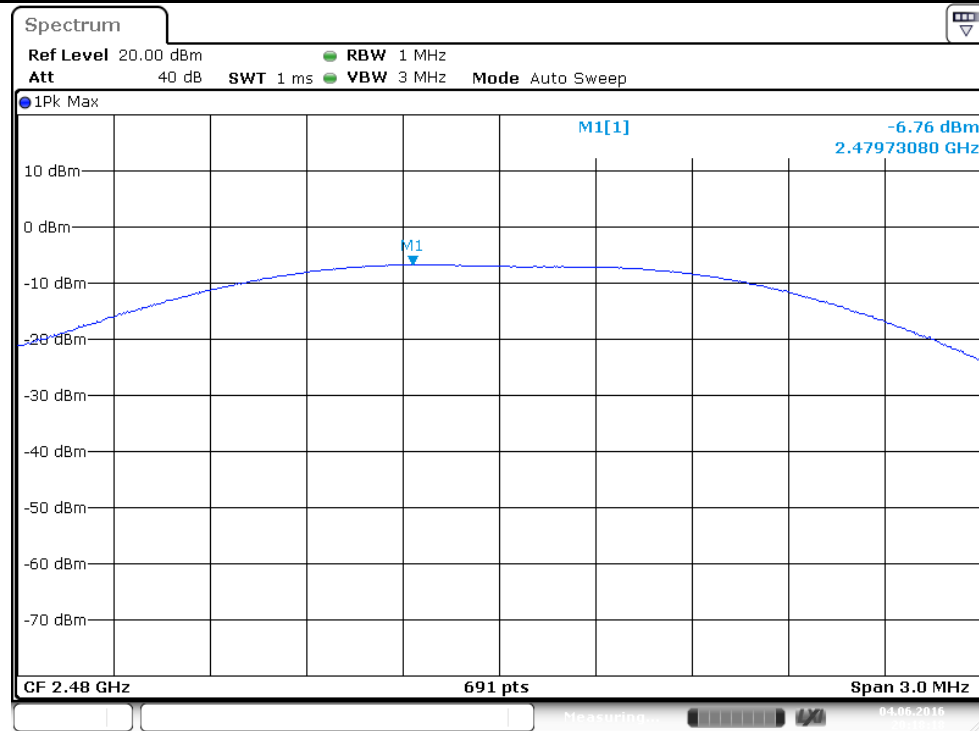
Test Graph of Peak Output Power, Bluetooth 4.0 Low Energy mode

Low Channel



Middle Channel



High Channel


Date: 4.JUN.2016 20:18:18

5.1.3 6dB Bandwidth and 99% Bandwidth

RESULT:**Pass**

Date of testing : 2016-06-04
Test standard : FCC Part 15.247(a)(2)
RSS-247 Section 5.2
RSS-Gen Issue 4 Clause 6.6
Basic standard : ANSI C63.10:2013
FCC KDB 558074 v03r05
Kind of test site : Shielded room

Test setup

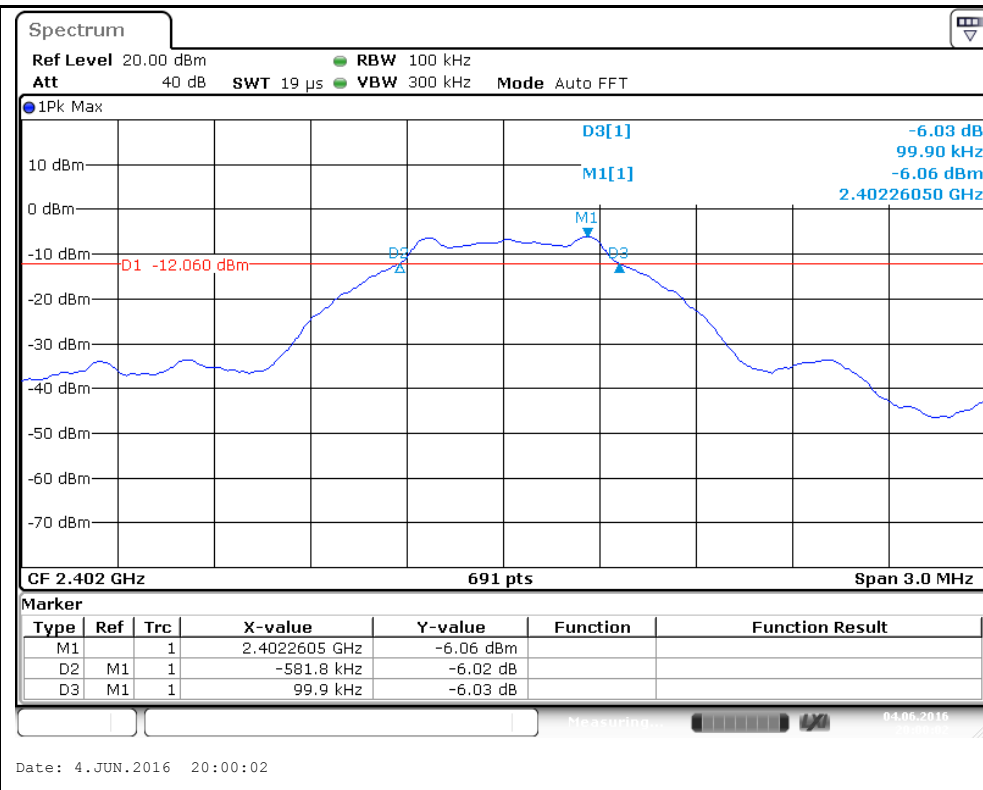
Test Channel : Low/ Middle/ High
Operation Mode : B.1
Ambient temperature : 22°C
Relative humidity : 53%
Atmospheric pressure : 101.0 kPa

Table 9: Test result of 6dB Bandwidth and 99% Bandwidth, Bluetooth Low Energy operation

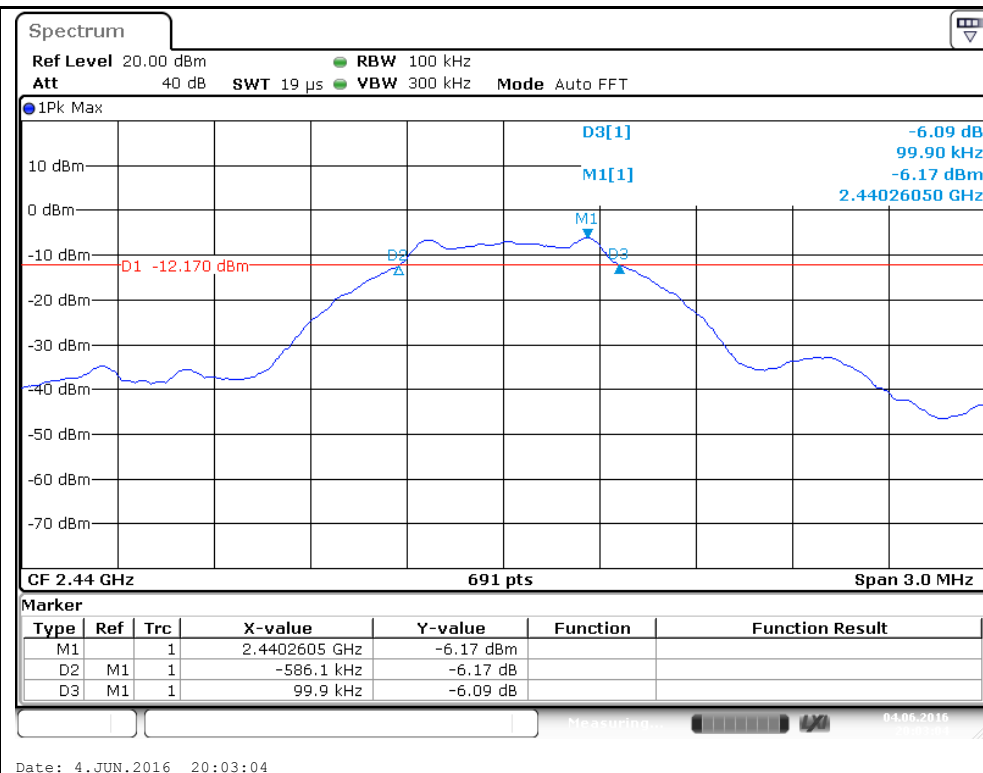
Bluetooth 4.0 Low Energy					
Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	99% Bandwidth (kHz)	Limit (kHz)	Verdict
Low Channel	2402	681.7	1102.75	at least 500	Pass
Mid Channel	2440	686.0	1098.41	at least 500	Pass
High Channel	2480	686.0	1098.41	at least 500	Pass

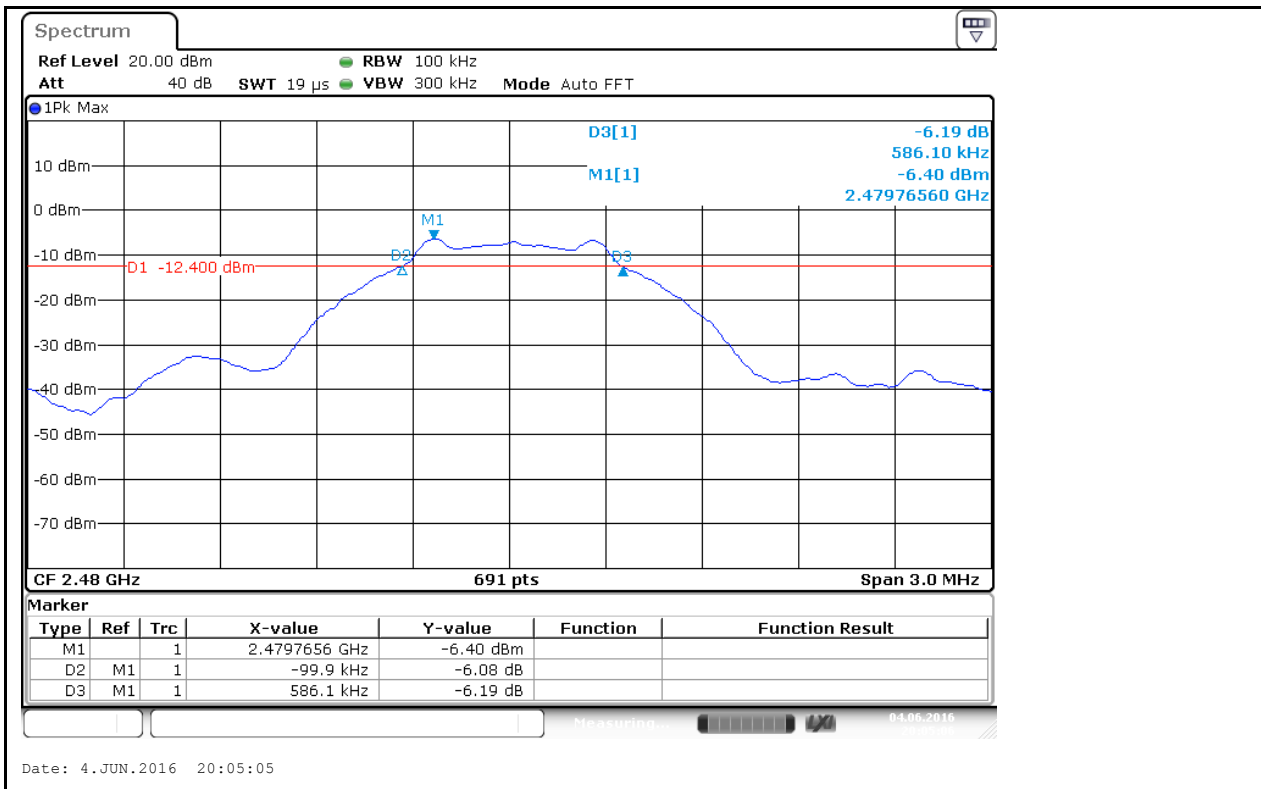
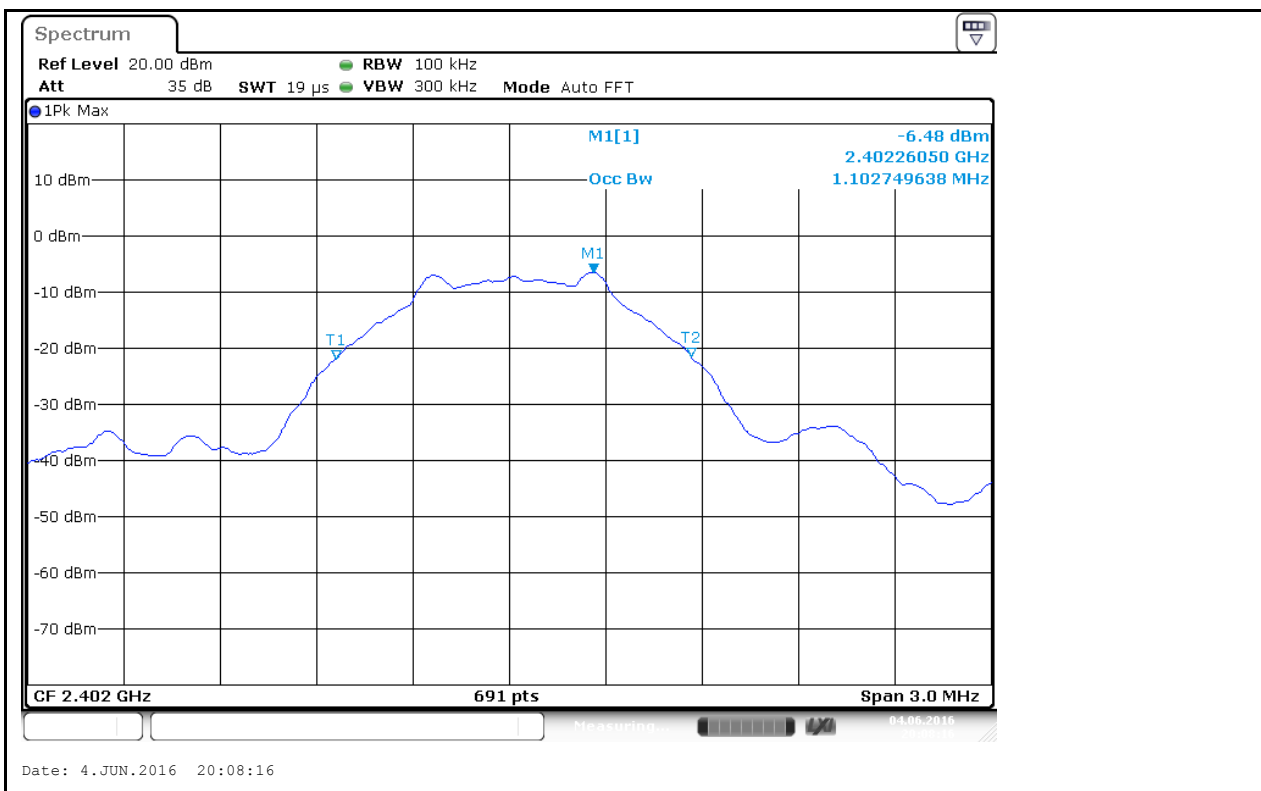
Test Graph of 6dB Bandwidth, Bluetooth 4.0 Low Energy mode

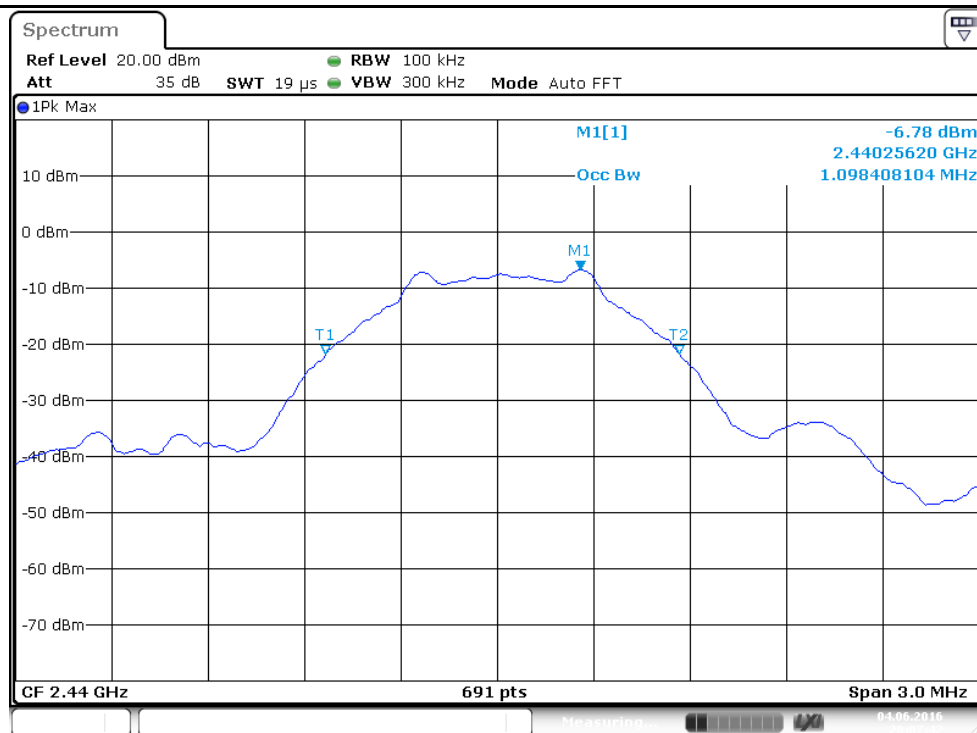
Low Channel



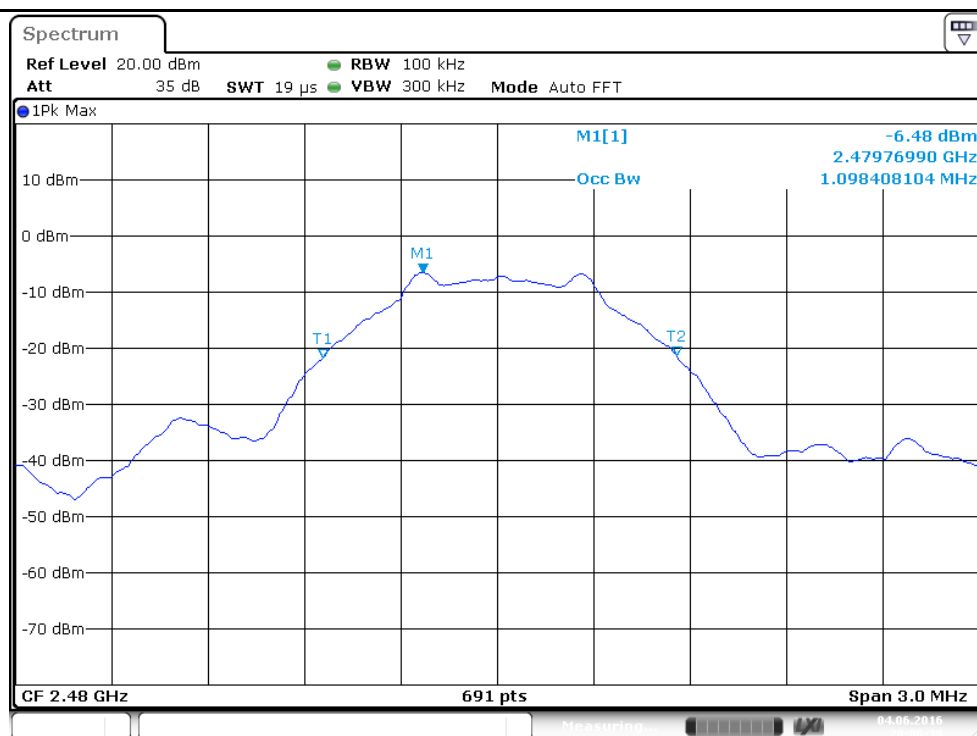
Middle Channel



High Channel

Test Graph of 99% Bandwidth, Bluetooth 4.0 Low Energy mode
Low Channel


Middle Channel


Date: 4. JUN. 2016 20:07:42

High Channel


Date: 4. JUN. 2016 20:06:38

5.1.4 Conducted Spurious Emissions measured in 100 kHz Bandwidth

RESULT:**Pass**

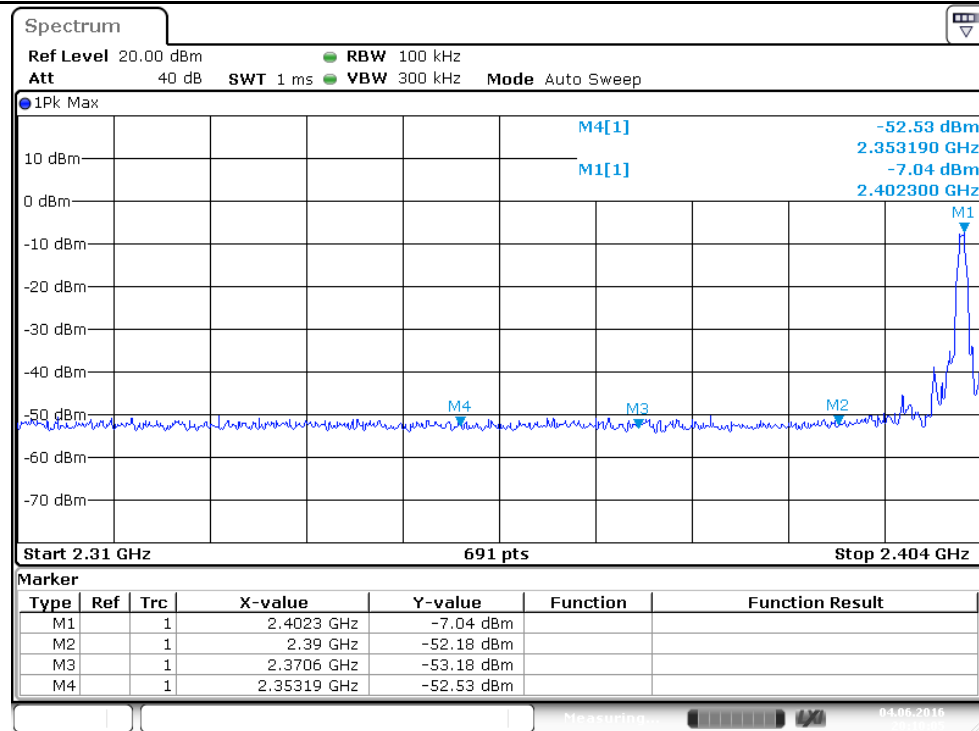
Date of testing	:	2016-06-04
Test standard	:	FCC part 15.247(d) RSS-247 Section 5.5 RSS-Gen Issue 4 Clause 6.13
Basic standard	:	ANSI C63.10:2013 FCC KDB 558074 v03r05
Limit	:	20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power); In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a)
Kind of test site	:	Shield room

Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	B.1
Ambient temperature	:	22°C
Relative humidity	:	53%
Atmospheric pressure	:	101.0 kPa

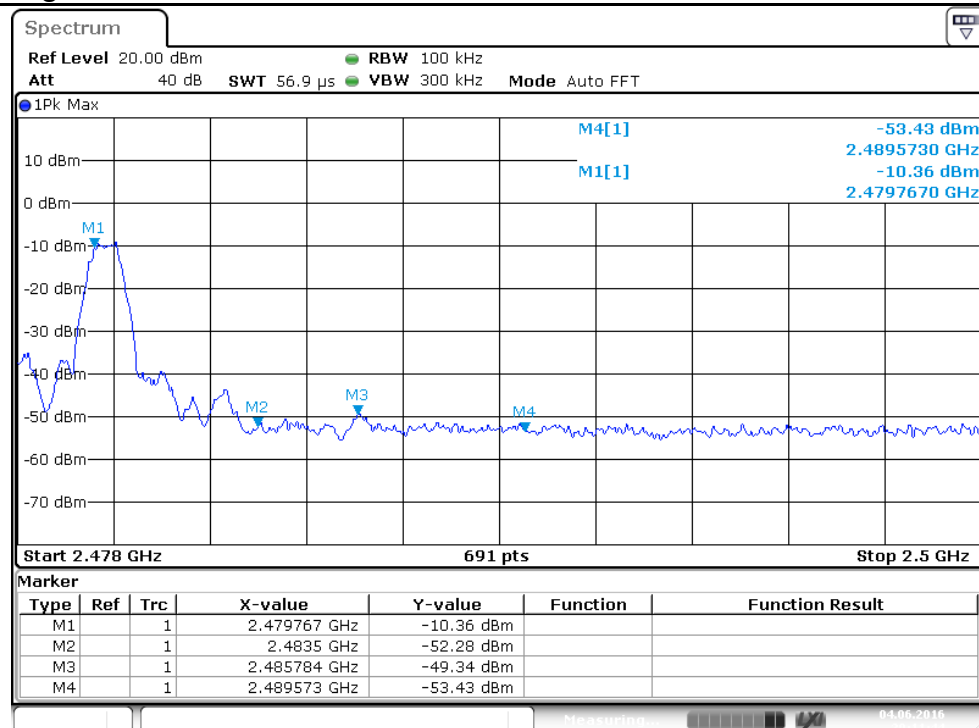
Test results of 100kHz Bandwidth of Frequency Band Edge by Conducted method refer to following test graph, and compliance is achieved as well.

Test Graph of 100 kHz Bandwidth of Frequency Band Edge, Bluetooth 4.0 Low Energy mode Low Channel



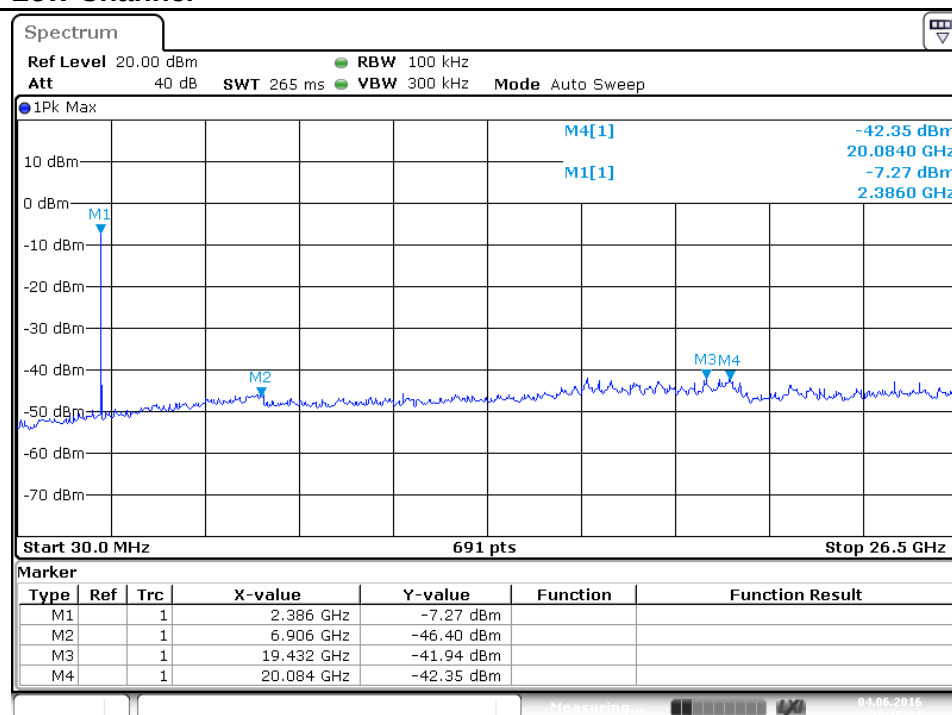
Date: 4.JUN.2016 20:10:05

High Channel



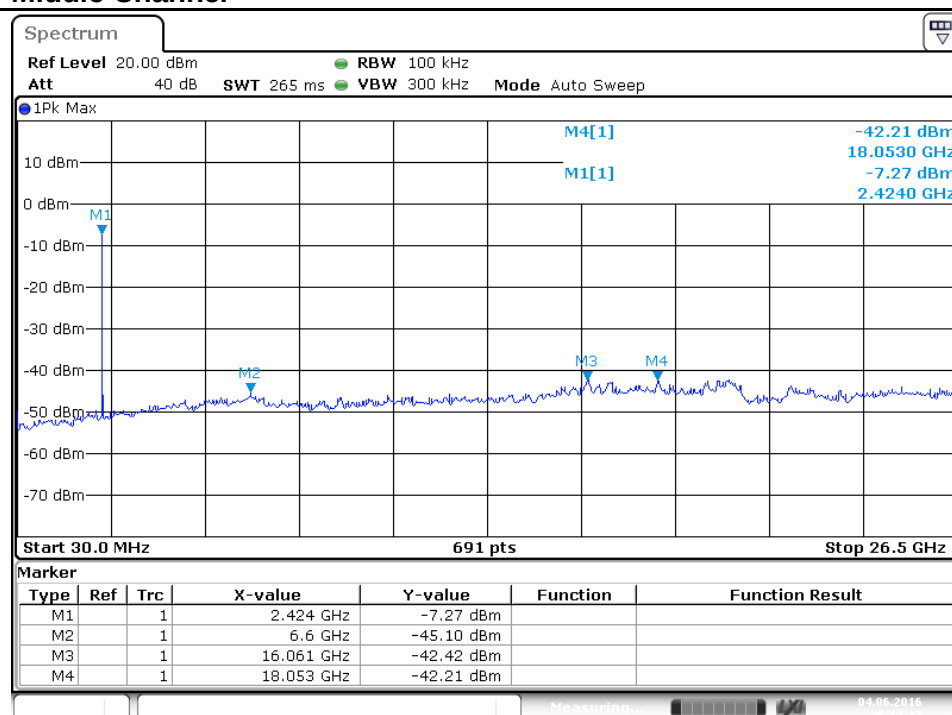
Date: 4.JUN.2016 20:11:43

Test Graph of Conducted spurious emissions measured in 100 kHz Bandwidth, Bluetooth 4.0 Low Energy mode Low Channel

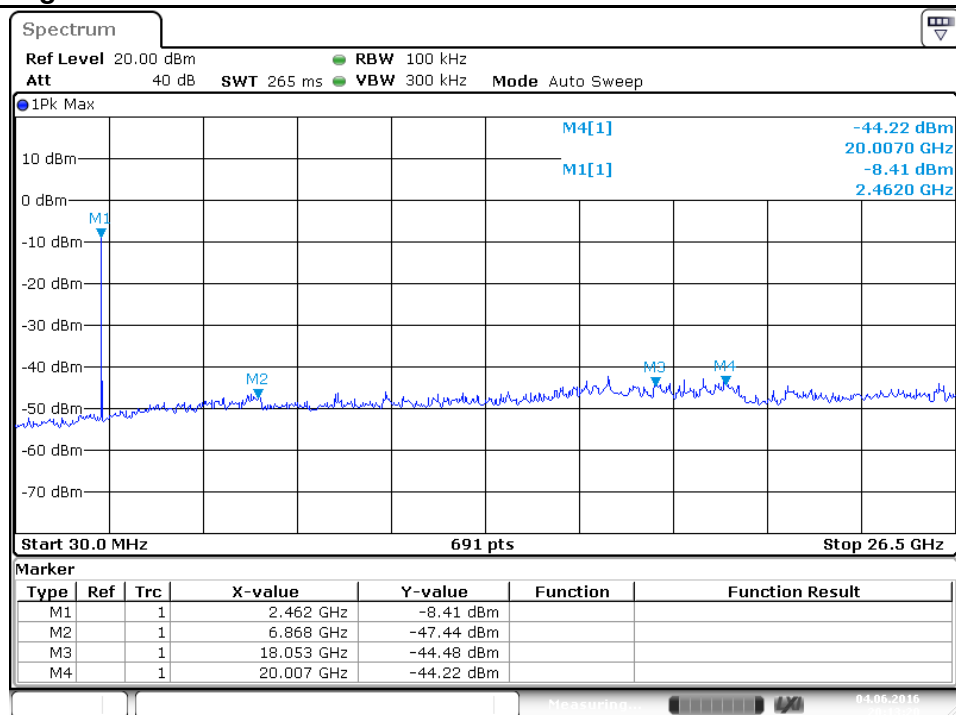


Date: 4.JUN.2016 20:15:30

Middle Channel



Date: 4.JUN.2016 20:14:16

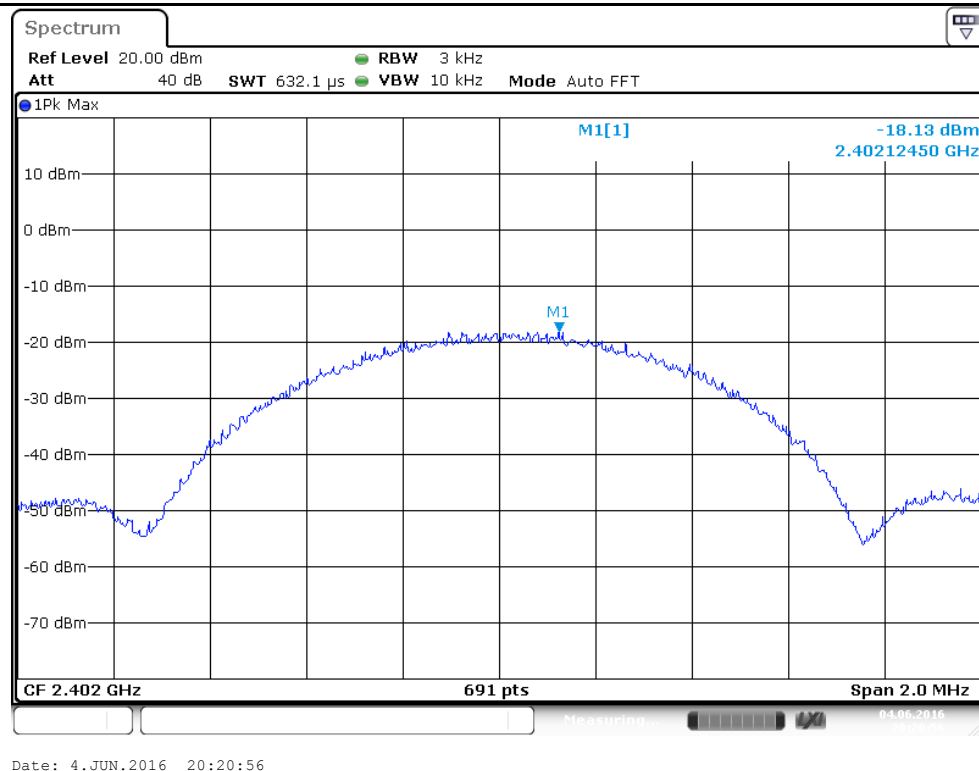
High Channel


Date: 4. JUN. 2016 20:13:20

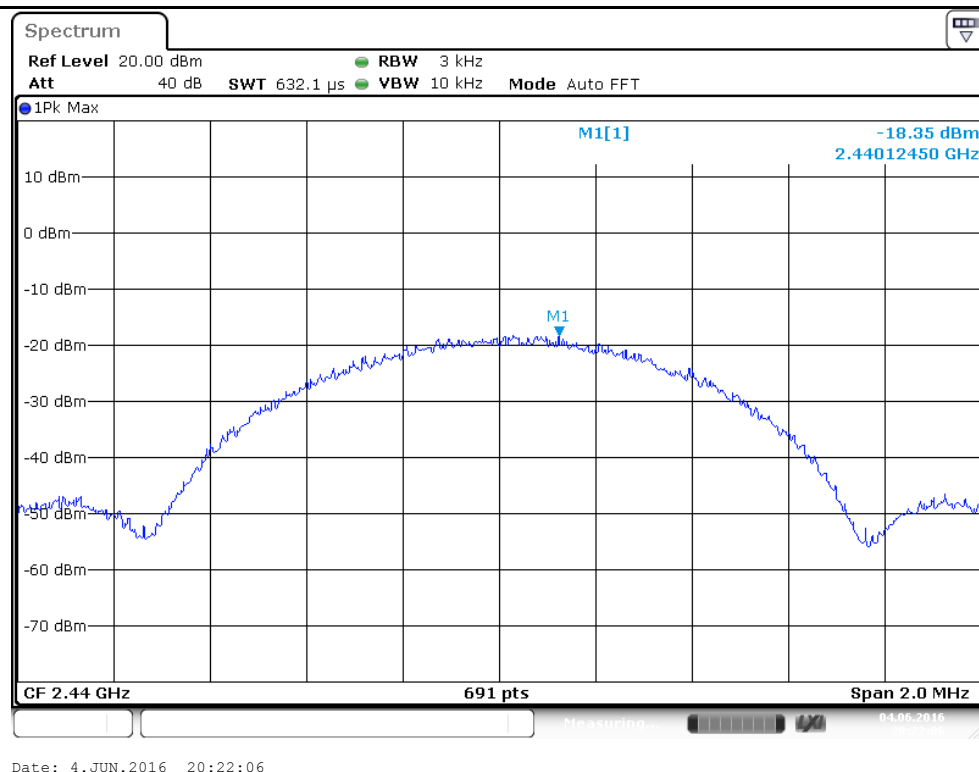
Note:
PSD = Measured Result + Cable Loss

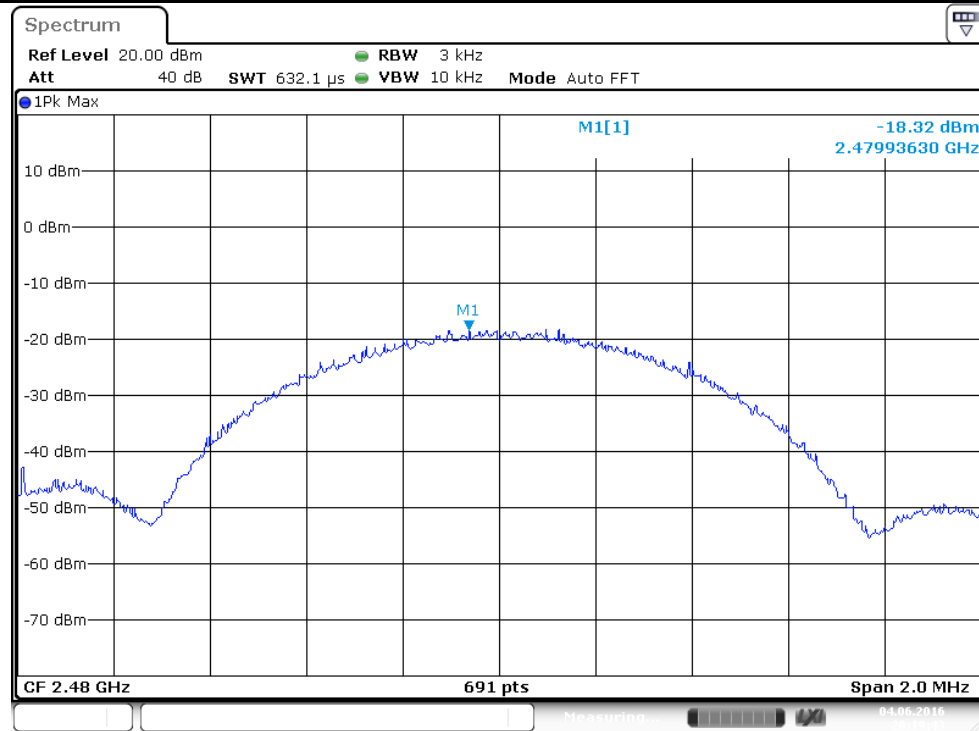
Test Graph of Power Spectral Density, Bluetooth 4.0 Low Energy mode

Low Channel



Middle Channel



High Channel


Date: 4.JUN.2016 20:19:43

5.1.6 Spurious Emissions

RESULT:**Pass**

Date of testing	:	2016-05-10 to 2016-07-15
Test standard	:	FCC part 15.247(d) RSS-247 Section 5.5 and Section 3.3 RSS-Gen Issue 4 Clause 6.13
Basic standard	:	ANSI C63.10:2013
Limits	:	Refer to 15.209(a) RSS-Gen Issue 4 Clause 8.9 and 8.10
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	B.1
Ambient temperature	:	23°C
Relative humidity	:	50%
Atmospheric pressure	:	101.0 kPa

The EUT supports A4WP wireless charging technology and operates at 6.78 MHz fundamental ISM frequency as the charging energy transfer. According to theory of operation and exemption condition that described in FCC Part 18, the limits for spurious emissions defined in this standard do not apply to the fundamental ISM frequency. Therefore the test result at 6.78 MHz frequency can be ignored.

Refer to attached Appendix A for details.

5.1.7 Conducted emissions

RESULT:**Pass**

Date of testing	:	2016-05-10 to 2016-07-15
Test standard	:	FCC Part 15.207 RSS-Gen Clause 8.8
Basic standard	:	ANSI C63.10: 2013
Frequency range	:	0.15MHz – 30MHz
Limits	:	FCC Part 15.207(a) Table 3 of RSS-Gen
Kind of test site	:	Shield Room

Test Setup

Input Voltage	:	DC 20V via AC/DC Adapter
Operation Mode	:	B+C+D
Ambient temperature	:	23°C
Relative humidity	:	50%
Atmospheric pressure	:	101.0 kPa

The EUT supports A4WP wireless charging technology and operates at 6.78 MHz fundamental ISM frequency as the charging energy transfer. According to theory of operation and exemption condition that described in FCC Part 18, the limits for conducted disturbance defined in this standard do not apply to the fundamental ISM frequency. Therefore the test result at 6.78 MHz frequency can be ignored.

Refer to attached Appendix A for details.

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8. List of Photographs

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Appendix A

Test Results of Bluetooth 4.0 Low Energy Mode

APPENDIX A.1: SPURIOUS EMISSIONS OF BLUETOOTH 4.0 LOW ENERGY OPERATION 2

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Appendix A.1: Spurious Emissions of Bluetooth 4.0 Low Energy operation Low Channel

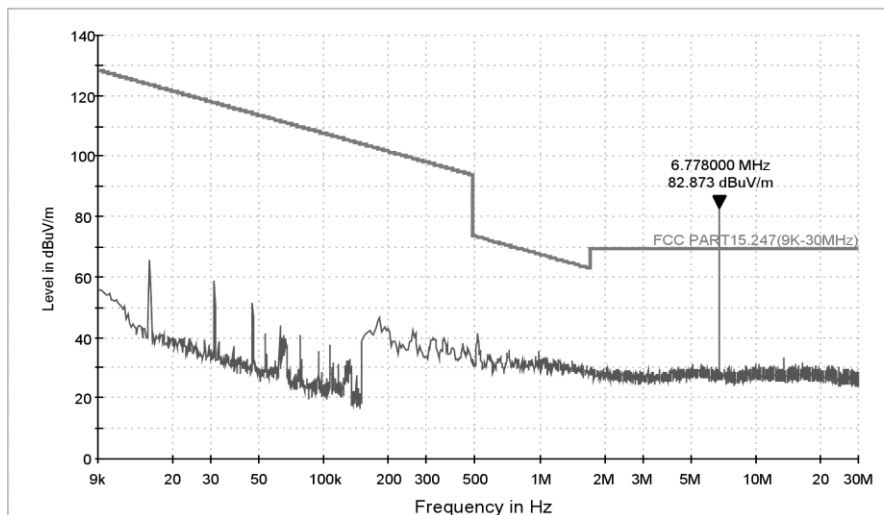
ACCURATE TECHNOLOGY CO.,LTD

RADIATED EMISSION

Common Information

Test Description: EMC32 Standard Report Setup
Operating Conditions:
Operator Name:

FCC PART15.247(9K-30MHz)



Protocol

Test Start: 2016-7-11 8:59:33
Test Stop: 2016-7-11 9:01:58

EUT Information

EUT Name:	ThinkVision X24 Pro Wireless Charging Stand M/N:HH-1601
Manufacturer:	Lenovo
Operation Mode:	TX 2402MHz
Operator	LGWADE
Power :	AC 120V/60Hz
Antenna Polarization:	X
Comment:	

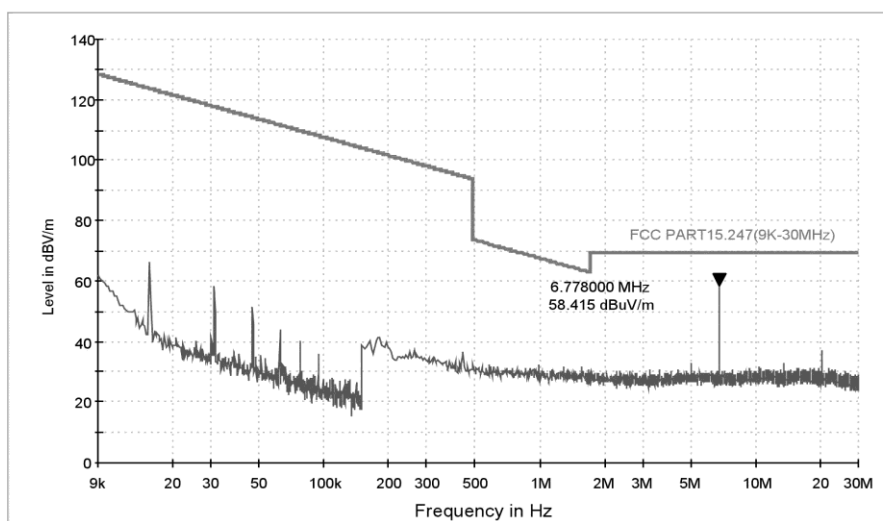
ACCURATE TECHNOLOGY CO.,LTD

RADIATED EMISSION

Common Information

Test Description: EMC32 Standard Report Setup
Operating Conditions:
Operator Name:

FCC PART15.247(9K-30MHz)



Protocol

Test Start: 2016-7-11 8:56:17
Test Stop: 2016-7-11 8:58:42

EUT Information

EUT Name:	ThinkVision X24 Pro Wireless Charging Stand M/N:HH-1601
Manufacturer:	Lenovo
Operation Mode:	TX 2402MHz
Operator	LGWADE
Power :	AC 120V/60Hz
Antenna Polarization:	Y
Comment:	

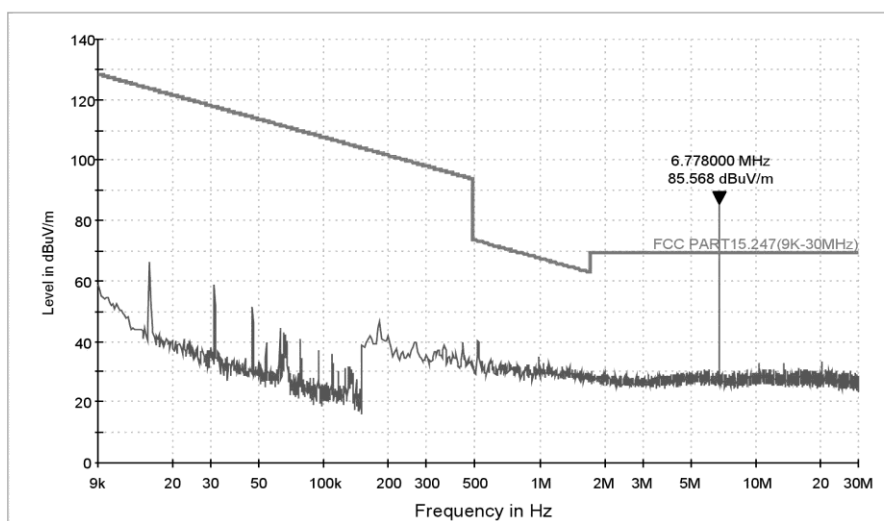
ACCURATE TECHNOLOGY CO.,LTD

RADIATED EMISSION

Common Information

Test Description: EMC32 Standard Report Setup
Operating Conditions:
Operator Name:

FCC PART15.247(9K-30MHz)



Protocol

Test Start: 2016-7-11 8:52:07
Test Stop: 2016-7-11 8:54:32

EUT Information

EUT Name:	ThinkVision X24 Pro Wireless Charging Stand M/N:HH-1601
Manufacturer:	Lenovo
Operation Mode:	TX 2402MHz
Operator	LGWADE
Power :	AC 120V/60Hz
Antenna Polarization:	Z
Comment:	

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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: lenovo #985

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2402MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Vertical

Power Source: AC 120V/60Hz

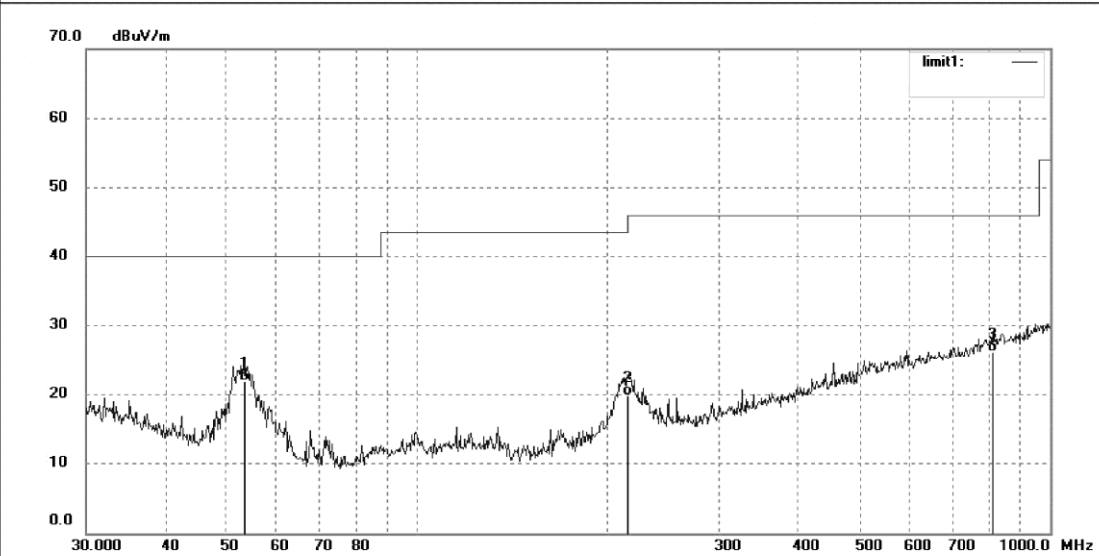
Date: 16/06/04/

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	53.5052	34.82	-12.87	21.95	40.00	-18.05	QP			
2	215.2677	31.66	-11.86	19.80	43.50	-23.70	QP			
3	810.2653	25.94	0.19	26.13	46.00	-19.87	QP			

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Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: lenovo #986

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2402MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: AC 120V/60Hz

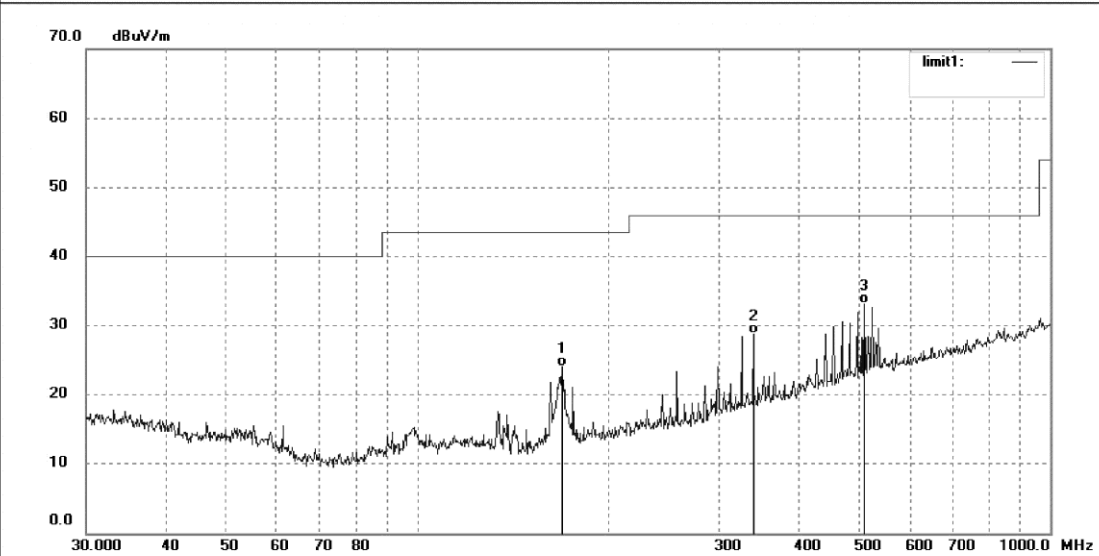
Date: 16/06/04/

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	169.5989	37.78	-13.74	24.04	43.50	-19.46	QP			
2	339.5887	36.92	-8.08	28.84	46.00	-17.16	QP			
3	508.2581	37.73	-4.58	33.15	46.00	-12.85	QP			

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Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: lenovo #969

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2402MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Vertical

Power Source: AC 120V/60Hz

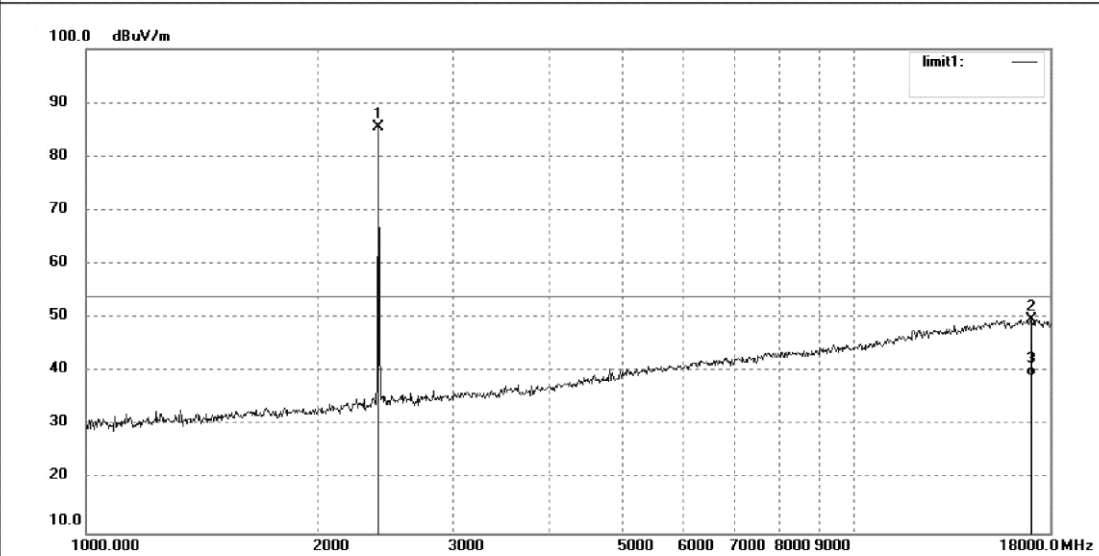
Date: 16/06/04/

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	2402.000	92.92	-7.45	85.47	/	/	peak			
2	17038.146	7.83	41.85	49.68	74.00	-24.32	peak			
3	17038.146	-2.62	41.85	39.23	54.00	-14.77	AVG			

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Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: lenovo #970

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2402MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: AC 120V/60Hz

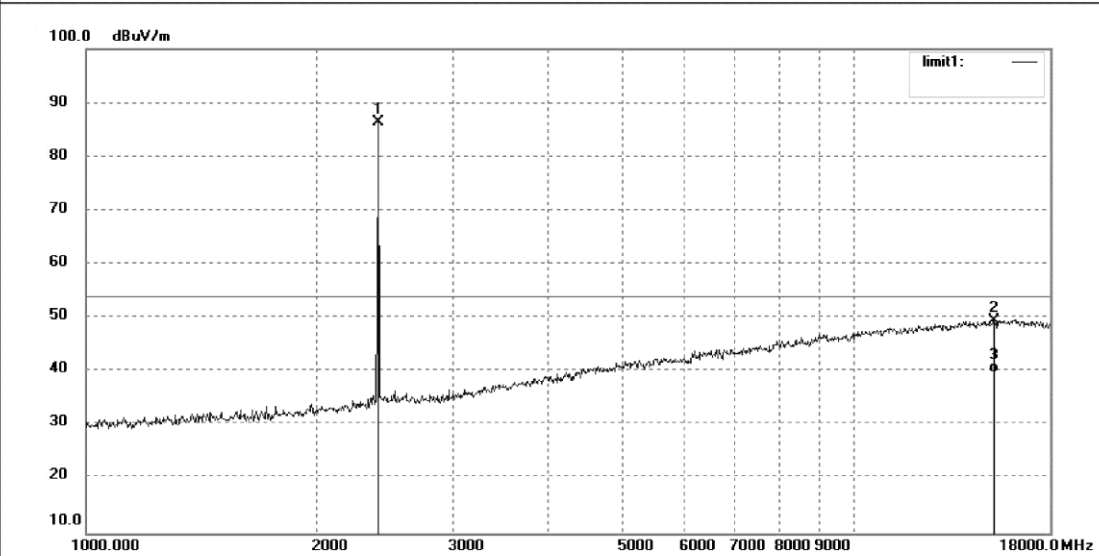
Date: 16/06/04/

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	2402.000	93.88	-7.45	86.43	/	/	peak			
2	15221.824	8.86	40.66	49.52	74.00	-24.48	peak			
3	15221.824	-0.78	40.66	39.88	54.00	-14.12	AVG			

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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: lenovo #979

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2402MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: AC 120V/60Hz

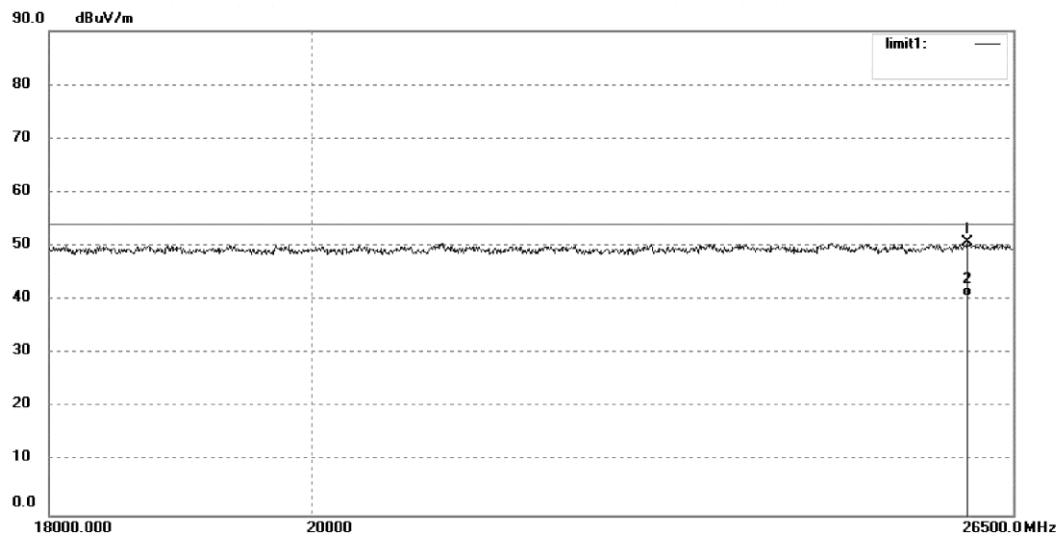
Date: 16/06/04/

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	26012.563	34.27	16.50	50.77	74.00	-23.23	peak			
2	26012.563	24.08	16.50	40.58	54.00	-13.42	AVG			

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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: lenovo #980

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2402MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Vertical

Power Source: AC 120V/60Hz

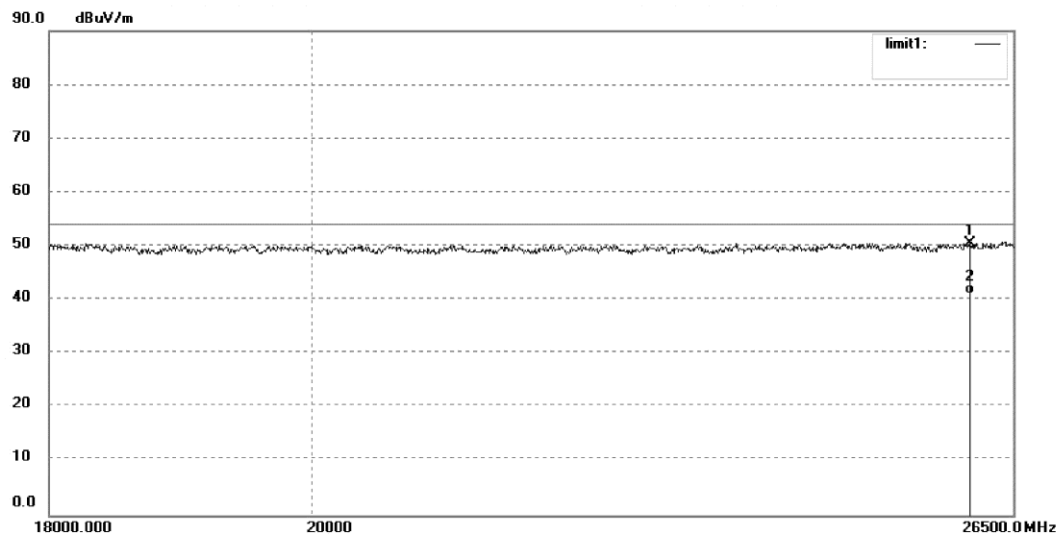
Date: 16/06/04/

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	26042.764	33.24	17.20	50.44	74.00	-23.56	peak			
2	26042.764	23.75	17.20	40.95	54.00	-13.05	AVG			

Middle Channel

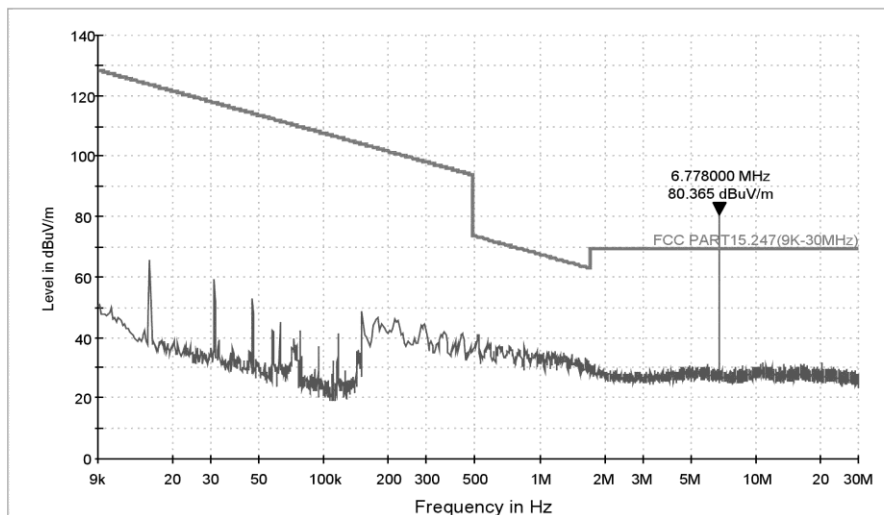
ACCURATE TECHNOLOGY CO.,LTD

RADIATED EMISSION

Common Information

Test Description: EMC32 Standard Report Setup
Operating Conditions:
Operator Name:

FCC PART15.247(9K-30MHz)



Protocol

Test Start: 2016-7-11 9:12:39
Test Stop: 2016-7-11 9:15:05

EUT Information

EUT Name:	ThinkVision X24 Pro Wireless Charging Stand M/N:HH-1601
Manufacturer:	Lenovo
Operation Mode:	TX 2440MHz
Operator	LGWADE
Power :	AC 120V/60Hz
Antenna Polarization:	X
Comment:	

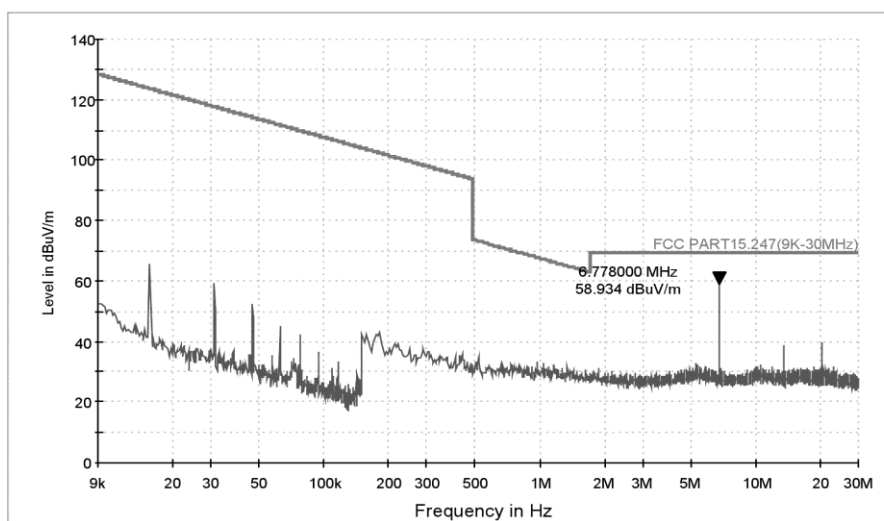
ACCURATE TECHNOLOGY CO.,LTD

RADIATED EMISSION

Common Information

Test Description: EMC32 Standard Report Setup
Operating Conditions:
Operator Name:

FCC PART15.247(9K-30MHz)



Protocol

Test Start: 2016-7-11 9:17:37
Test Stop: 2016-7-11 9:20:02

EUT Information

EUT Name:	ThinkVision X24 Pro Wireless Charging Stand M/N:HH-1601
Manufacturer:	Lenovo
Operation Mode:	TX 2440MHz
Operator	LGWADE
Power :	AC 120V/60Hz
Antenna Polarization:	Y
Comment:	

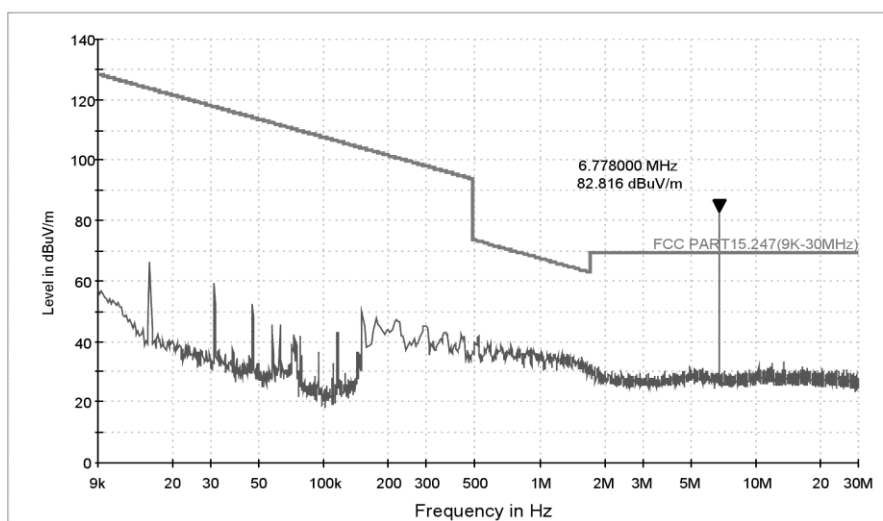
ACCURATE TECHNOLOGY CO.,LTD

RADIATED EMISSION

Common Information

Test Description: EMC32 Standard Report Setup
Operating Conditions:
Operator Name:

FCC PART15.247(9K-30MHz)



Protocol

Test Start: 2016-7-11 9:21:29
Test Stop: 2016-7-11 9:23:54

EUT Information

EUT Name:	ThinkVision X24 Pro Wireless Charging Stand M/N:HH-1601
Manufacturer:	Lenovo
Operation Mode:	TX 2440MHz
Operator	LGWADE
Power :	AC 120V/60Hz
Antenna Polarization:	Z
Comment:	



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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.: lenovo #987

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2440MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: AC 120V/60Hz

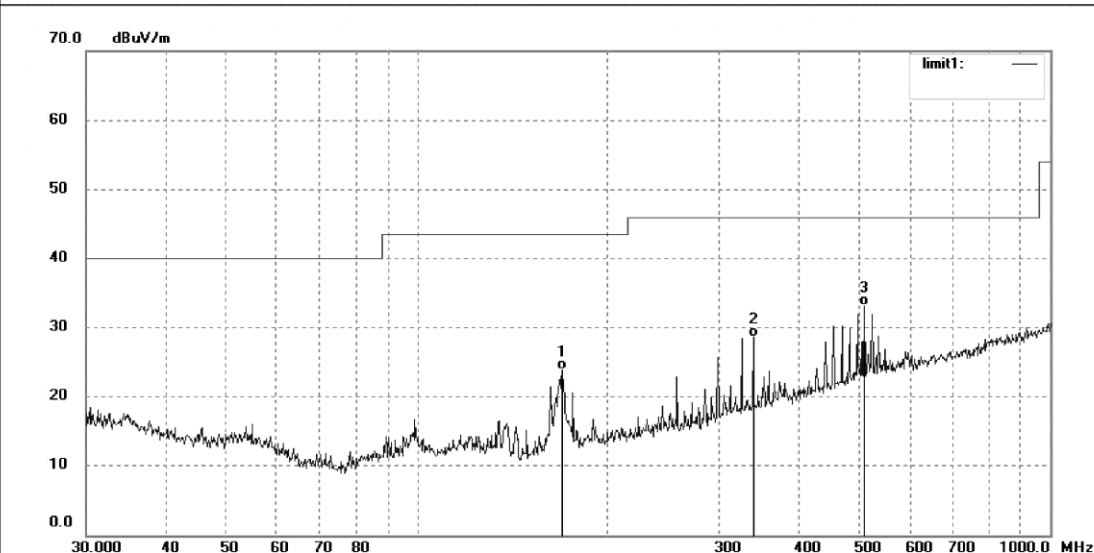
Date: 16/06/04/

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	169.5989	37.63	-13.74	23.89	43.50	-19.61	QP			
2	339.5887	36.78	-8.08	28.70	46.00	-17.30	QP			
3	508.2581	37.67	-4.58	33.09	46.00	-12.91	QP			

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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: lenovo #988

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2440MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Vertical

Power Source: AC 120V/60Hz

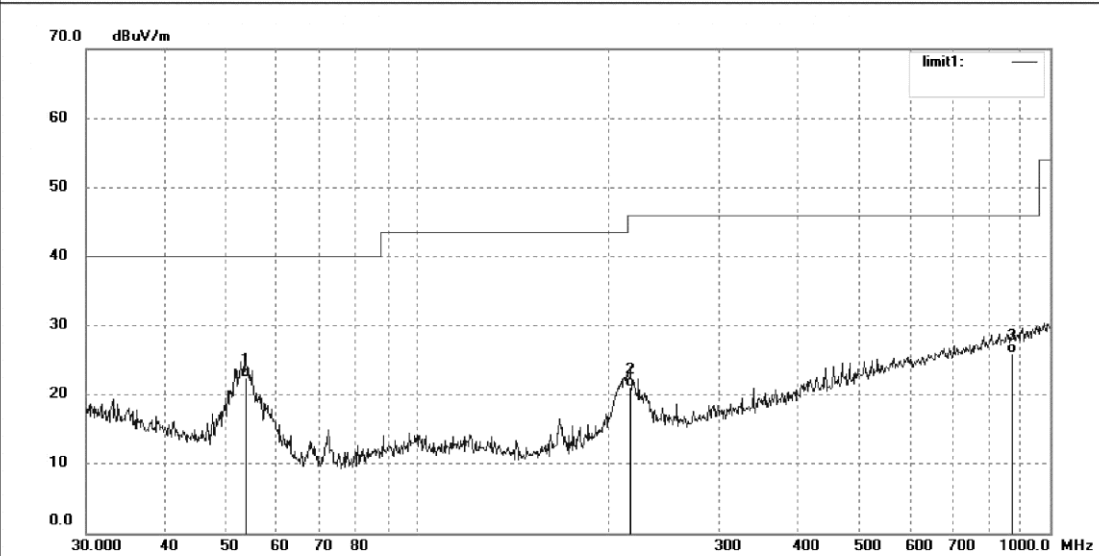
Date: 16/06/04/

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	53.6931	35.34	-12.88	22.46	40.00	-17.54	QP			
2	217.5442	32.93	-11.79	21.14	46.00	-24.86	QP			
3	872.1832	24.96	1.07	26.03	46.00	-19.97	QP			

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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: lenovo #973

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2440MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Vertical

Power Source: AC 120V/60Hz

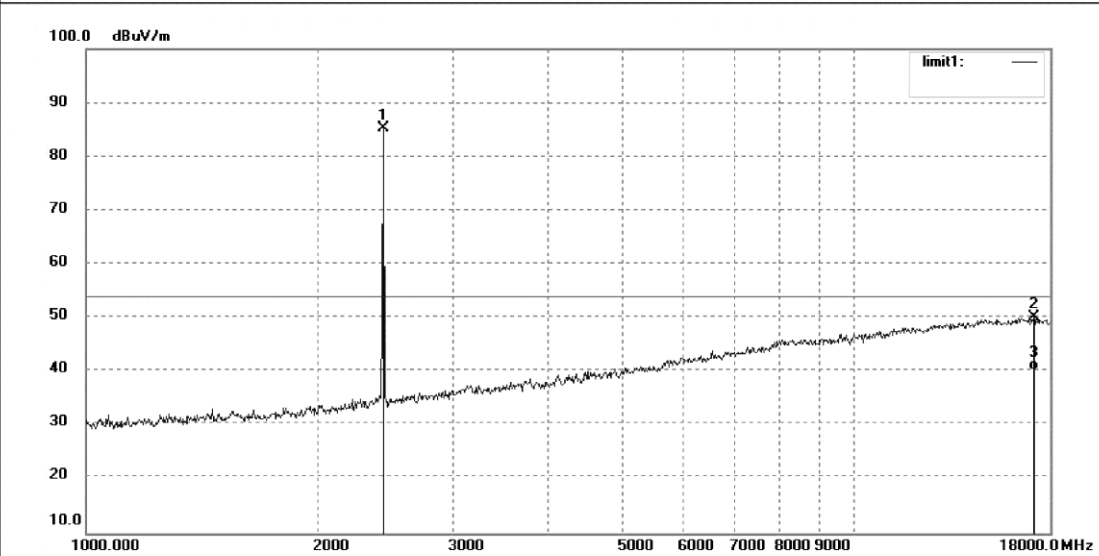
Date: 16/06/04/

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	2440.000	92.57	-7.36	85.21	/	/	peak			
2	17136.924	7.87	42.25	50.12	74.00	-23.88	peak			
3	17136.924	-1.90	42.25	40.35	54.00	-13.65	AVG			

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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: lenovo #974

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2440MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: AC 120V/60Hz

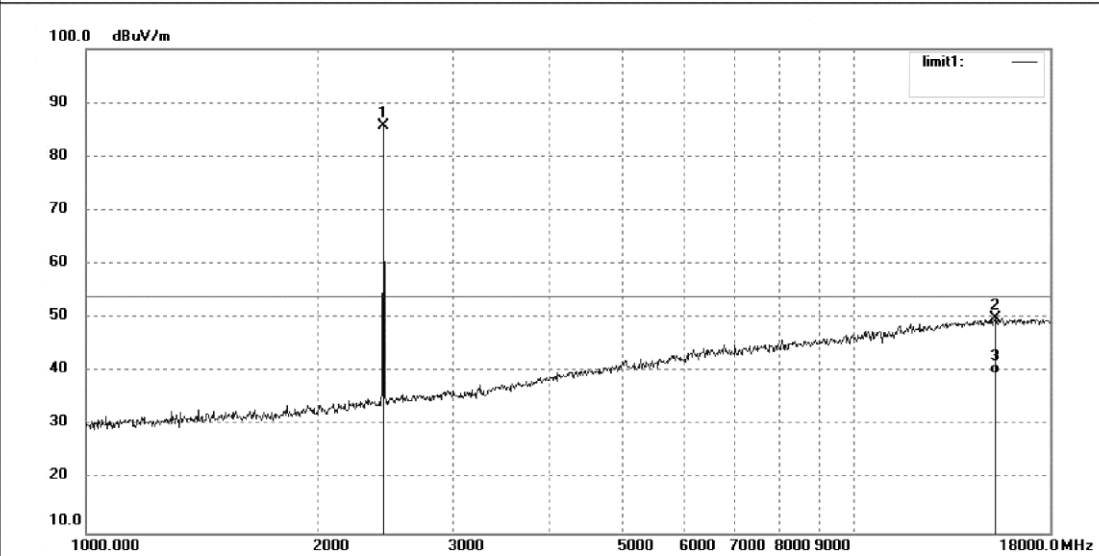
Date: 16/06/04/

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	2440.000	93.03	-7.36	85.67	/	/	peak			
2	15265.885	9.41	40.57	49.98	74.00	-24.02	peak			
3	15265.885	-1.06	40.57	39.51	54.00	-14.49	AVG			

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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: lenovo #981

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2440MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Vertical

Power Source: AC 120V/60Hz

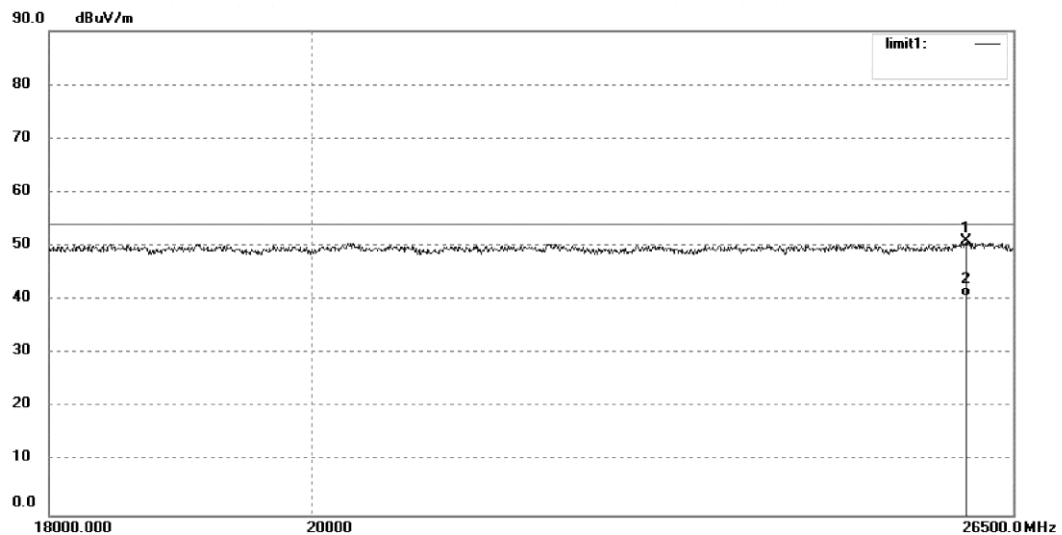
Date: 16/06/04/

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	26002.504	33.62	17.23	50.85	74.00	-23.15	peak			
2	26002.504	23.34	17.23	40.57	54.00	-13.43	AVG			

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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: lenovo #982

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2440MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: AC 120V/60Hz

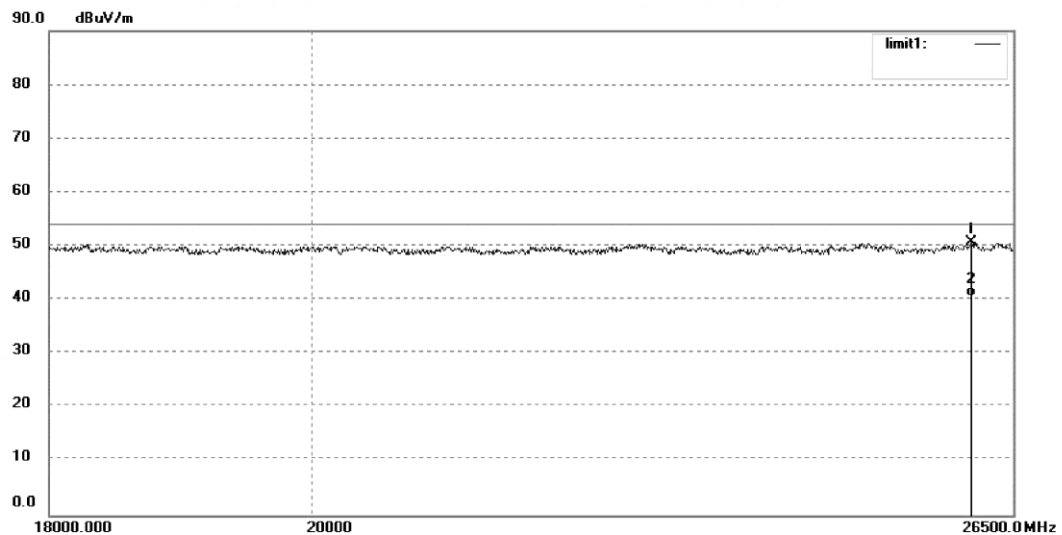
Date: 16/06/04/

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	26062.917	34.17	16.50	50.67	74.00	-23.33	peak			
2	26062.917	24.08	16.50	40.58	54.00	-13.42	AVG			

High Channel

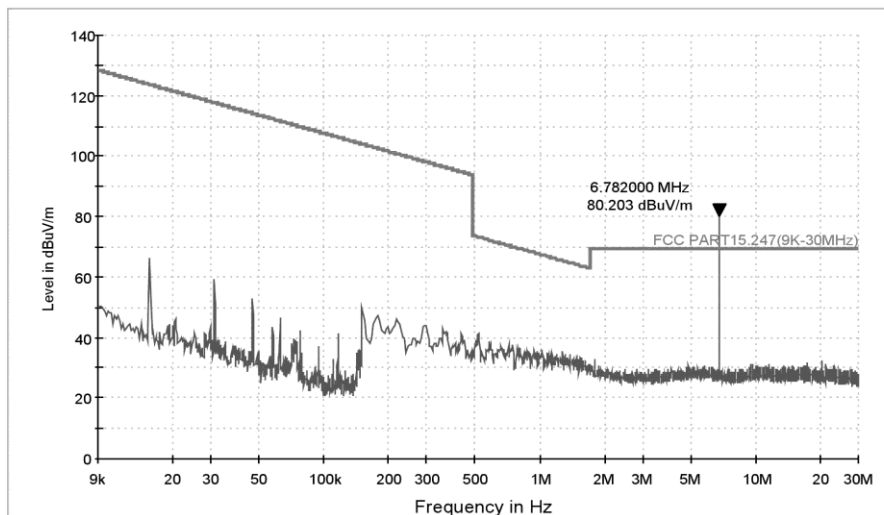
ACCURATE TECHNOLOGY CO.,LTD

RADIATED EMISSION

Common Information

Test Description: EMC32 Standard Report Setup
Operating Conditions:
Operator Name:

FCC PART15.247(9K-30MHz)



Protocol

Test Start: 2016-7-11 9:35:02
Test Stop: 2016-7-11 9:37:27

EUT Information

EUT Name:	ThinkVision X24 Pro Wireless Charging Stand M/N:HH-1601
Manufacturer:	Lenovo
Operation Mode:	TX 2480MHz
Operator	LGWADE
Power :	AC 120V/60Hz
Antenna Polarization:	X
Comment:	

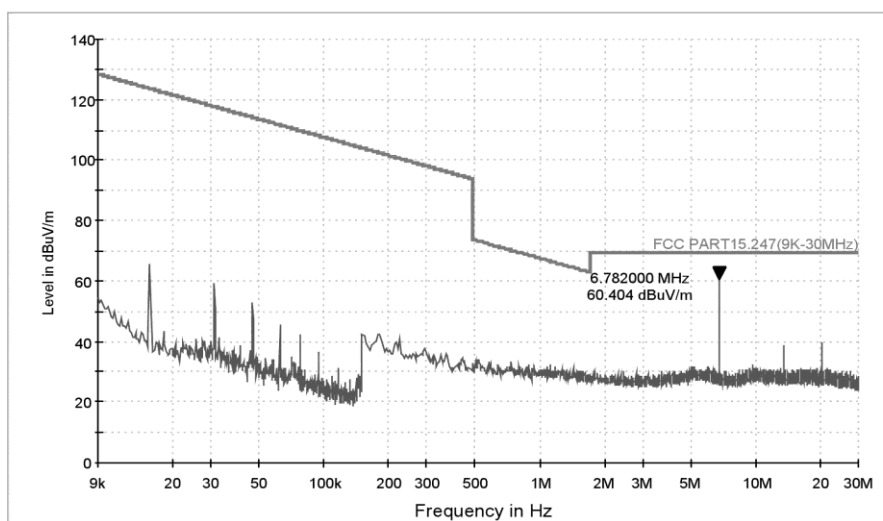
ACCURATE TECHNOLOGY CO.,LTD

RADIATED EMISSION

Common Information

Test Description: EMC32 Standard Report Setup
Operating Conditions:
Operator Name:

FCC PART15.247(9K-30MHz)



Protocol

Test Start: 2016-7-11 9:28:54
Test Stop: 2016-7-11 9:31:18

EUT Information

EUT Name:	ThinkVision X24 Pro Wireless Charging Stand M/N:HH-1601
Manufacturer:	Lenovo
Operation Mode:	TX 2480MHz
Operator	LGWADE
Power :	AC 120V/60Hz
Antenna Polarization:	Y
Comment:	

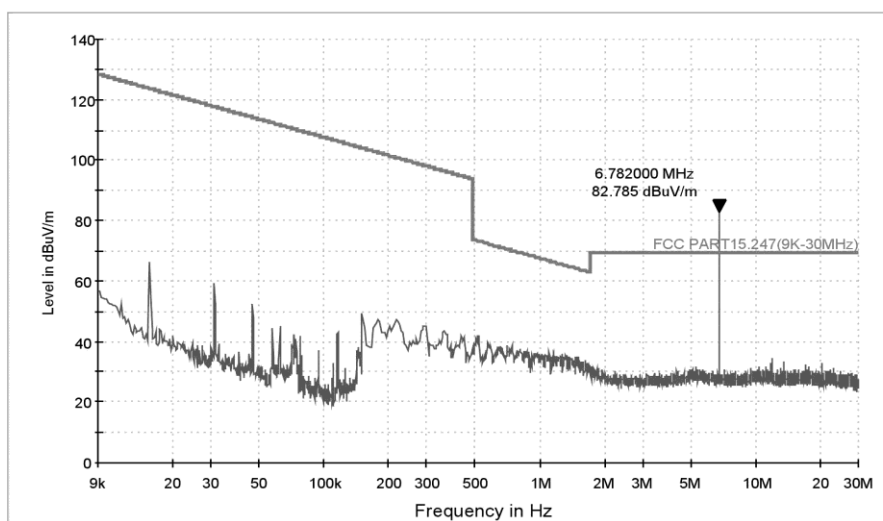
ACCURATE TECHNOLOGY CO.,LTD

RADIATED EMISSION

Common Information

Test Description: EMC32 Standard Report Setup
Operating Conditions:
Operator Name:

FCC PART15.247(9K-30MHz)



Protocol

Test Start: 2016-7-11 9:24:48
Test Stop: 2016-7-11 9:27:12

EUT Information

EUT Name:	ThinkVision X24 Pro Wireless Charging Stand M/N:HH-1601
Manufacturer:	Lenovo
Operation Mode:	TX 2480MHz
Operator	LGWADE
Power :	AC 120V/60Hz
Antenna Polarization:	Z
Comment:	

**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 #989

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2480MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Vertical

Power Source: AC 120V/60Hz

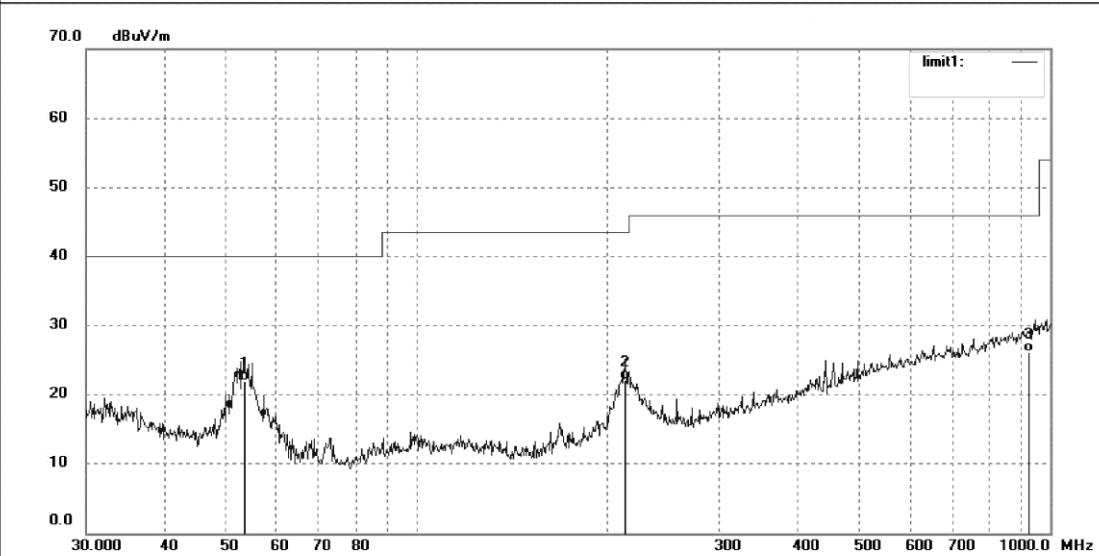
Date: 16/06/04/

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	53.3179	34.80	-12.85	21.95	40.00	-18.05	QP			
2	213.0150	34.18	-12.00	22.18	43.50	-21.32	QP			
3	925.7563	24.48	1.74	26.22	46.00	-19.78	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.: lenovo #990

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2480MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: AC 120V/60Hz

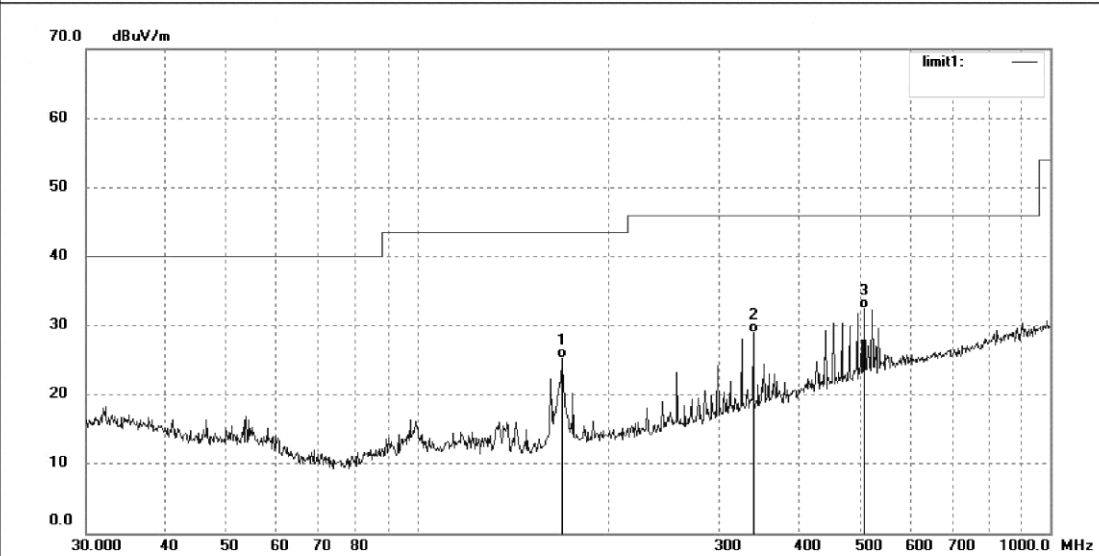
Date: 16/06/04/

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	169.5989	38.99	-13.74	25.25	43.50	-18.25	QP			
2	339.5887	37.08	-8.08	29.00	46.00	-17.00	QP			
3	508.2581	37.09	-4.58	32.51	46.00	-13.49	QP			

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 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: lenovo #975

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2480MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: AC 120V/60Hz

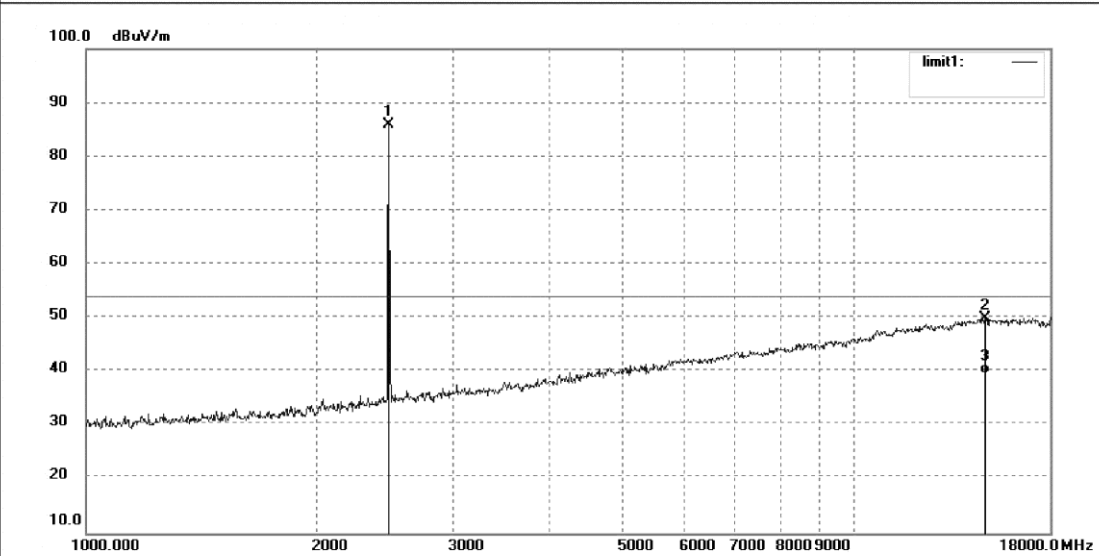
Date: 16/06/04/

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	2480.000	93.29	-7.37	85.92	/	/	peak			
2	14788.154	8.11	41.74	49.85	74.00	-24.15	peak			
3	14788.154	-2.18	41.74	39.56	54.00	-14.44	AVG			

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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.: lenovo #976

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2480MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Vertical

Power Source: AC 120V/60Hz

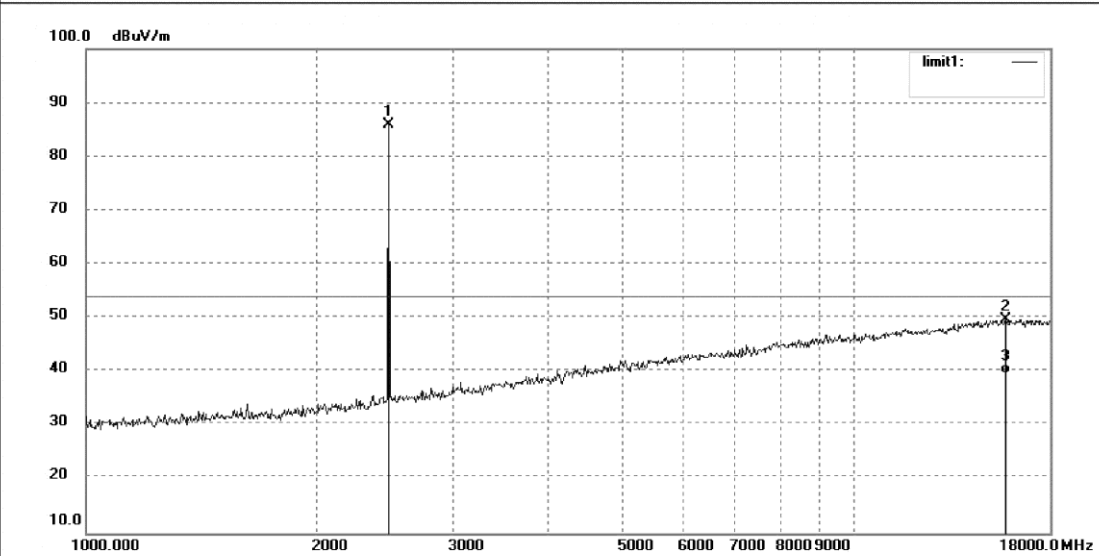
Date: 16/06/04/

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	2480.000	93.32	-7.37	85.95	/	/	peak			
2	15759.048	9.65	40.05	49.70	74.00	-24.30	peak			
3	15759.048	-0.48	40.05	39.57	54.00	-14.43	AVG			

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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.: lenovo #983

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2480MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: AC 120V/60Hz

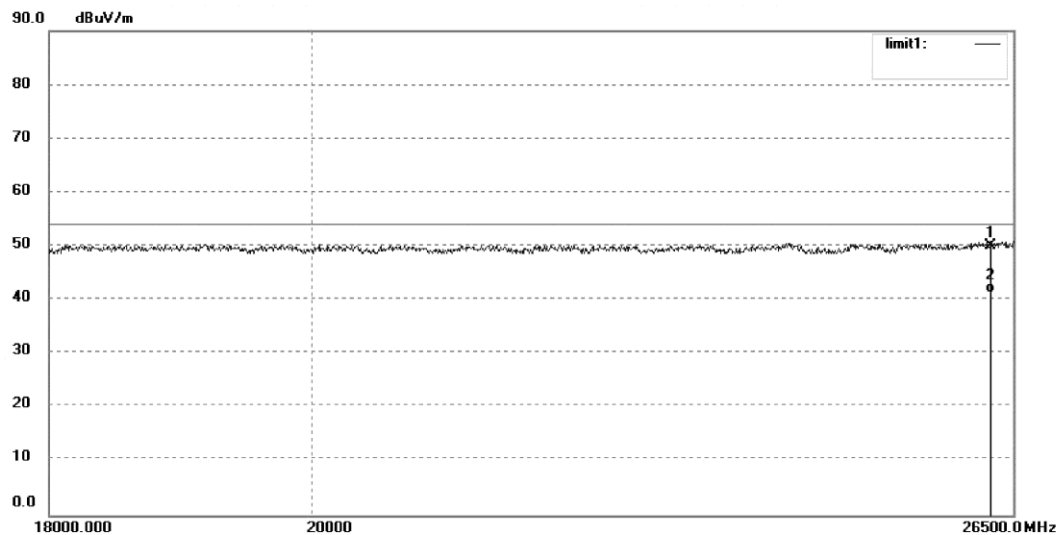
Date: 16/06/04/

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	26265.307	33.62	16.50	50.12	74.00	-23.88	peak			
2	26265.307	24.75	16.50	41.25	54.00	-12.75	AVG			

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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.: lenovo #984

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2480MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Vertical

Power Source: AC 120V/60Hz

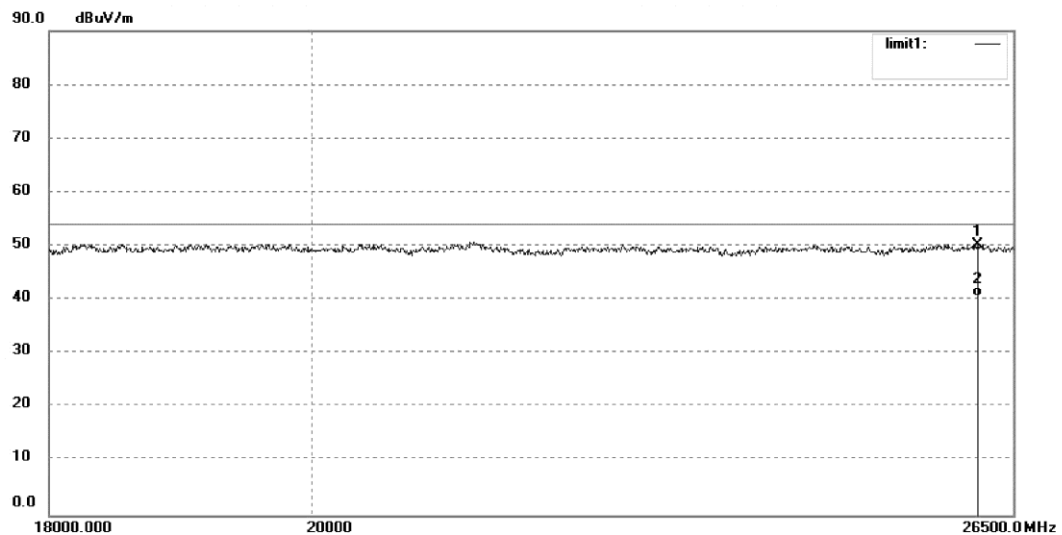
Date: 16/06/04/

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	26123.470	33.12	17.15	50.27	74.00	-23.73	peak			
2	26123.470	23.43	17.15	40.58	54.00	-13.42	AVG			

Appendix A.2: Radiated Emissions in Restricted Bands
 Low Channel
**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 #972

Standard: FCC (Band Edge)

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2402MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Vertical

Power Source: AC 120V/60Hz

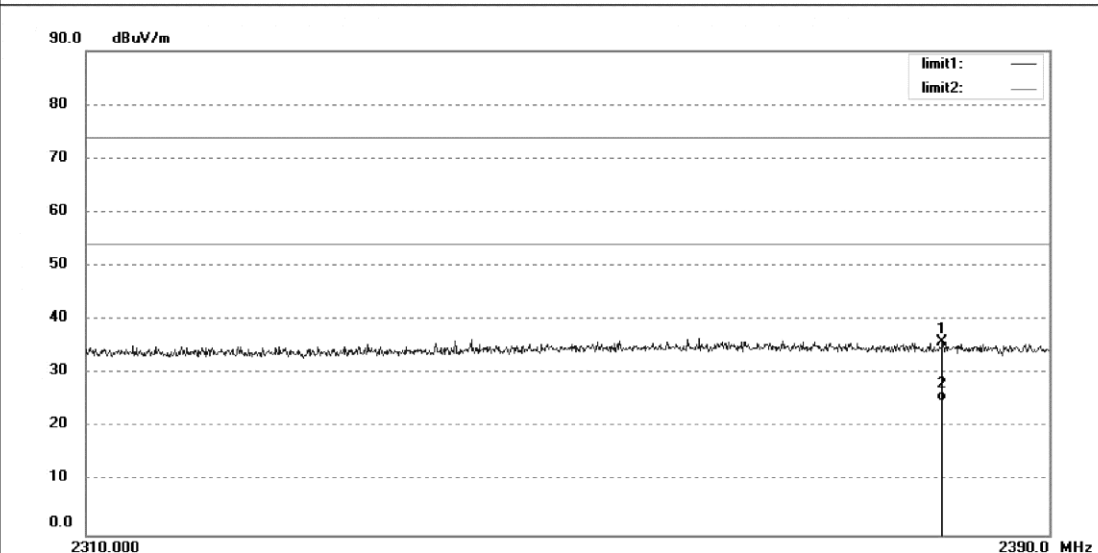
Date: 16/06/04/

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	2381.040	43.52	-7.59	35.93	74.00	-38.07	peak			
2	2381.040	32.43	-7.59	24.84	54.00	-29.16	AVG			

Produkte
Products



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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.: lenovo #971

Standard: FCC (Band Edge)

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2402MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: AC 120V/60Hz

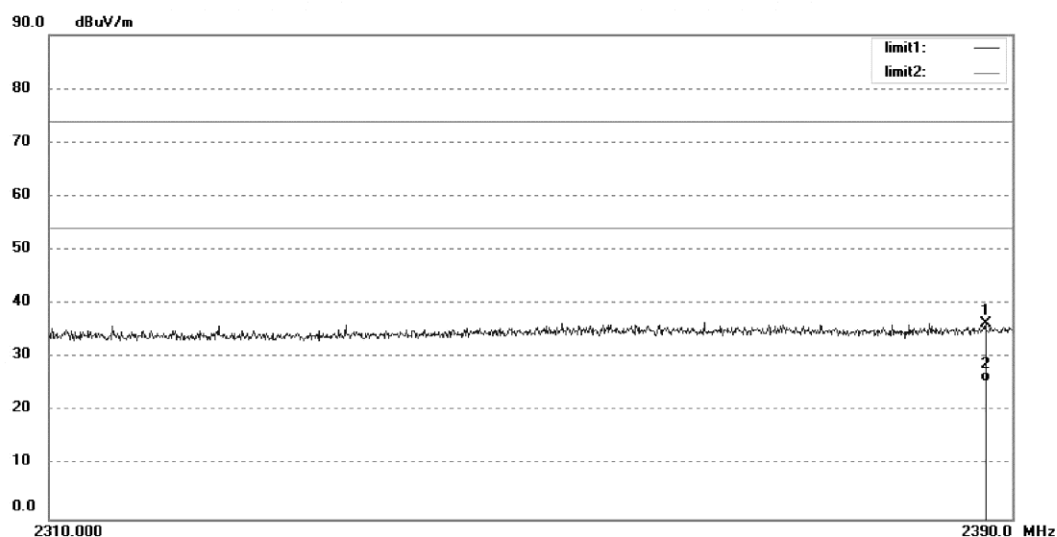
Date: 16/06/04/

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	2387.760	43.80	-7.54	36.26	74.00	-37.74	peak			
2	2387.760	33.10	-7.54	25.56	54.00	-28.44	AVG			

Produkte
Products

High Channel



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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.: lenovo #977

Standard: FCC (Band Edge)

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2480MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Vertical

Power Source: AC 120V/60Hz

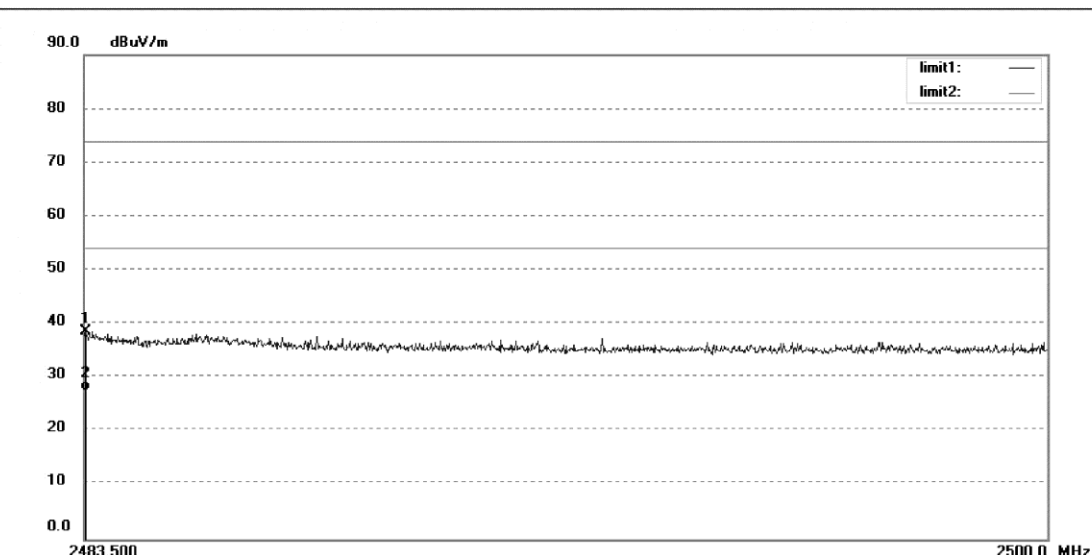
Date: 16/06/04/

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	2483.533	45.92	-7.37	38.55	74.00	-35.45	peak			
2	2483.533	34.84	-7.37	27.47	54.00	-26.53	AVG			



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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.: lenovo #978

Standard: FCC (Band Edge)

Test item: Radiation Test

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

EUT: ThinkVision X24 Pro Wireless Charging Stand

Mode: TX 2480MHz

Model: HH-1601

Manufacturer: Lenovo

Polarization: Horizontal

Power Source: AC 120V/60Hz

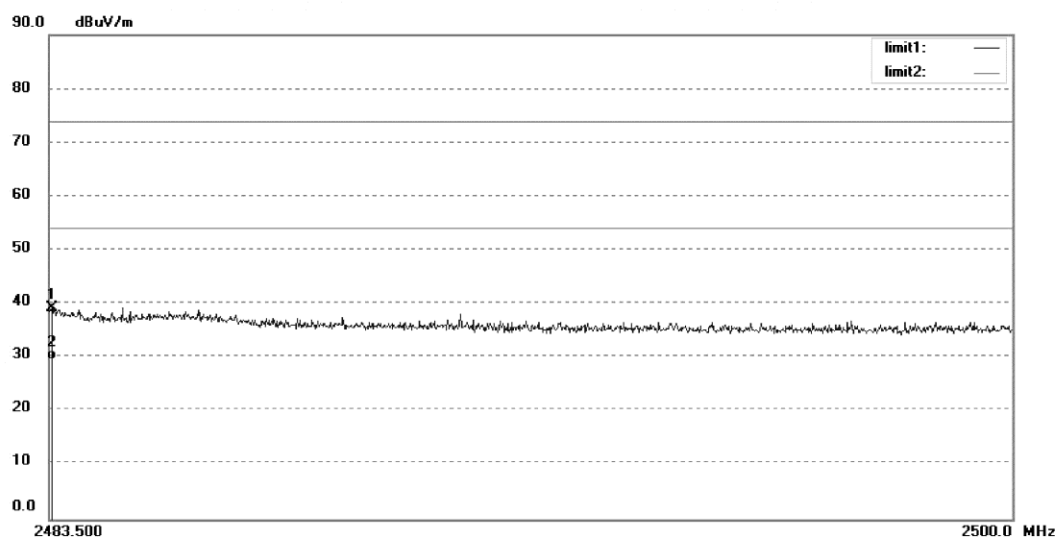
Date: 16/06/04/

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	2483.550	46.54	-7.37	39.17	74.00	-34.83	peak			
2	2483.550	36.93	-7.37	29.56	54.00	-24.44	AVG			

Appendix B

Test Results of RF Exposure - Bluetooth 4.0 Low Energy Mode

APPENDIX B.1: RF EXPOSURE COMPLIANCE	2
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Appendix B.1: RF Exposure Compliance

Radio Frequency Exposure Compliance

RESULT:

Pass

Test standard : FCC 1.1310
RSS-102 Issue 5
KDB 447498 D01 General RF Exposure Guidance v06

This device is Bluetooth 4.0 Low Energy.

This RF exposure evaluation is only for Bluetooth 4.0 Low Energy operation.

Since the maximum peak output power of the transmitter is 0.25 mW. The maximum peak output power is less than 10mW (FCC Limit) and 4mW (IC Limit), hence the EUT is excluded from SAR evaluation according to FCC KDB 447498 D01: Mobile Portable RF Exposure and RSS-102 Issue 5.