

Lenovo (Beijing) Limited

Application
For
Certification

FCC ID: A5MBT500

Lenovo 500 2.0 Bluetooth Speaker

Model: BT500

2.4GHz Transceiver

Report No.: 150212033SZN-002

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-13]

Prepared and Checked by:

Approved by:

Sign on file

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Project Engineer

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Senior Project Engineer
Date: April 27, 2015

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
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- The evaluation data of the report will be kept for 3 years from the date of issuance.

TRF no.: FCC 15C_Tx_b

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MEASUREMENT/TECHNICAL REPORT

Lenovo 500 2.0 Bluetooth Speaker

Model: BT500

FCC ID: A5MBT500

This report concerns (check one) Original Grant ☒ Class II Change ☐

Equipment Type: DTS – Part 15 Digital Transmission Systems

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes ☐ No ☒

If yes, defer until :
date

Company Name agrees to notify the Commission by:
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes ☐ No ☒

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [10-01-13] Edition] provision.

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List of attached file

Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf

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EXHIBIT 1

SUMMARY OF TEST RESULTS

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1.0 Summary of Test results

Lenovo 500 2.0 Bluetooth Speaker

Model: BT500

FCC ID: A5MBT500

TEST	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
AC Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

EXHIBIT 2

GENERAL DESCRIPTION

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2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a Lenovo 500 2.0 Bluetooth Speaker with Bluetooth function operating at 2402-2480MHz includes 40 channels with 2MHz channel spacing. The EUT was powered by D.C. 3.7V from internal rechargeable battery. For more detailed features description, please refer to the user's manual.

Type of Modulation: GFSK.

Bluetooth Version: 4.0 BLE

Antenna Type: Integral Antenna.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

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2.2 Related Submittal(s) Grants

This is an application for certification of:

DTS- Part 15 Digital Transmission Systems (Bluetooth BLE transmitter).

Remaining FCC certification portion is subject to the following procedure:

DSS- Part 15 Spread Spectrum Transmitter (Bluetooth FHSS portion):

150212033SZN-001

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009) and KDB 558074. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the “**Justification Section**” of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, Block D, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 242492).

EXHIBIT 3

SYSTEM TEST CONFIGURATION

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3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by a fully charged 3.7V internal rechargeable battery and charged by AC/DC adapter through AC 120/60Hz input during the test.

All data rate were tested and only the worst case data is shown in the report.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

The unit was placed in the center of the turntable when powered by batteries and the rear of unit shall be flushed with the rear of the table when it was powered by adapter.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

No software is used.

3.3 Special Accessories

N/A.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance – Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

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3.5 Equipment Modification

Any modifications installed previous to testing by Lenovo (Beijing) Limited will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch.

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
Ipod	Apple	A1509
AC Adapter	TP Link	T050100-2AS
USB Cable	N/A	Unshielded 120cm

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EXHIBIT 4

MEASUREMENT RESULTS

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Applicant: Lenovo (Beijing) Limited

Date of Test: March 4, 2015

Model: BT500

4.0 **Measurement Results**

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter have a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

Maximum Antenna Gain: 0dBi		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2402	0.21	1.05
Middle Channel: 2440	-0.17	0.96
High Channel: 2480	-0.38	0.92

Cable loss: 0.5 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 0.21dBm

For RF Exposure, the information is saved with filename: RF exposure.pdf.

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Applicant: Lenovo (Beijing) Limited

Date of Test: March 4, 2015

Model: BT500

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a)(2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

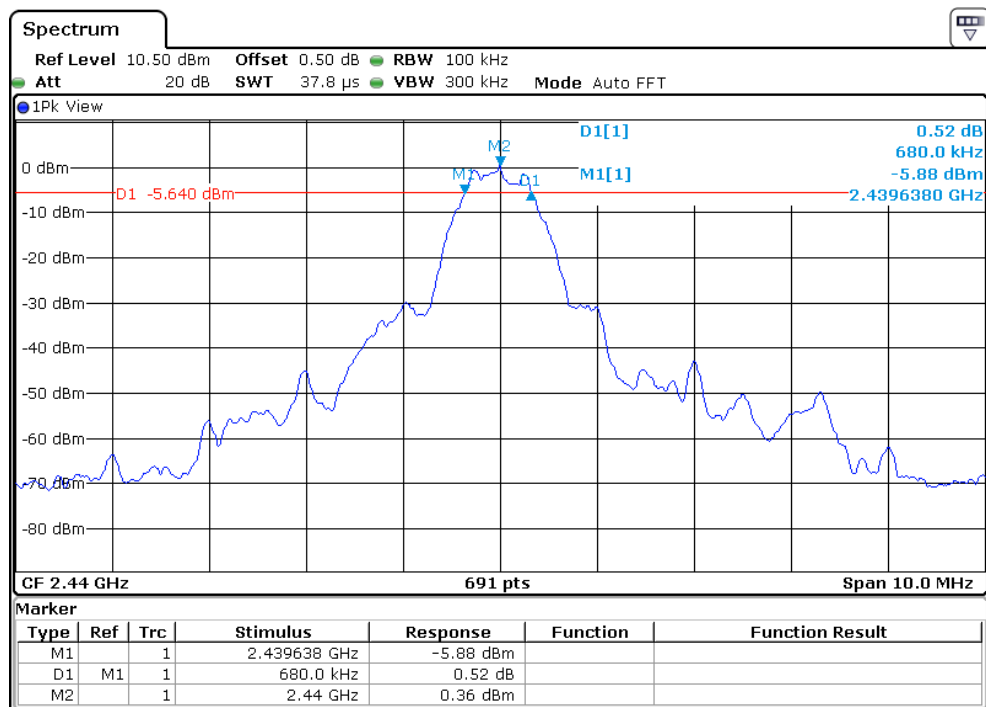
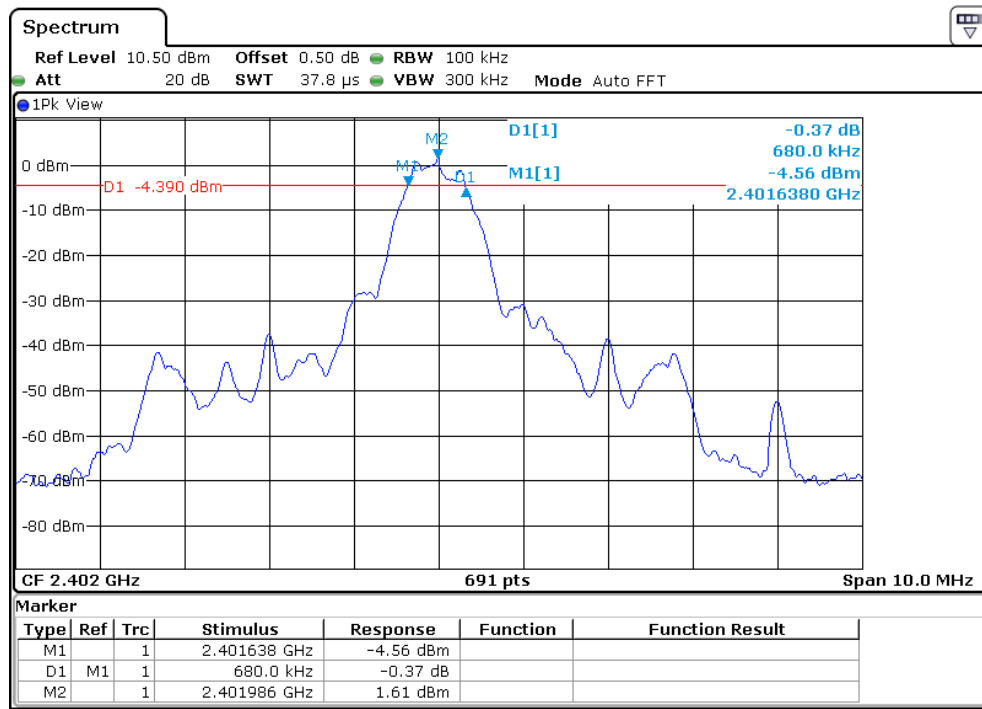
Limit: The 6 dB Bandwidth is at least 500 kHz.

GFSK	
Frequency (MHz)	6 dB Bandwidth (KHz)
2402	680.0
2440	680.0
2480	680.0

The test plots are attached as below.

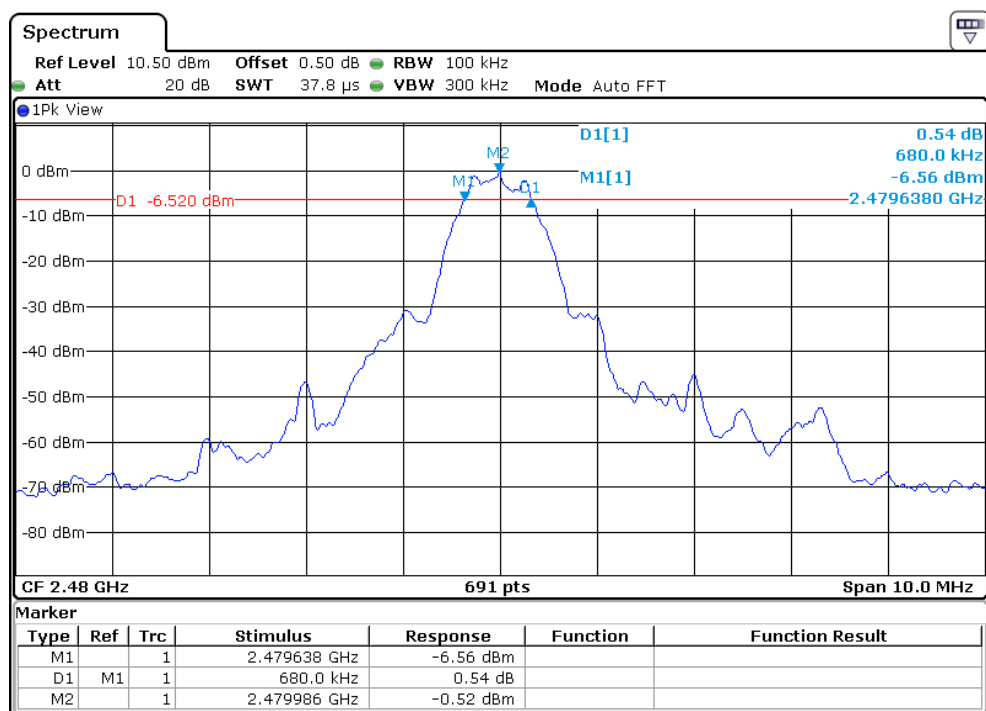
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GFSK



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Applicant: Lenovo (Beijing) Limited

Date of Test: March 4, 2015

Model: BT500

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

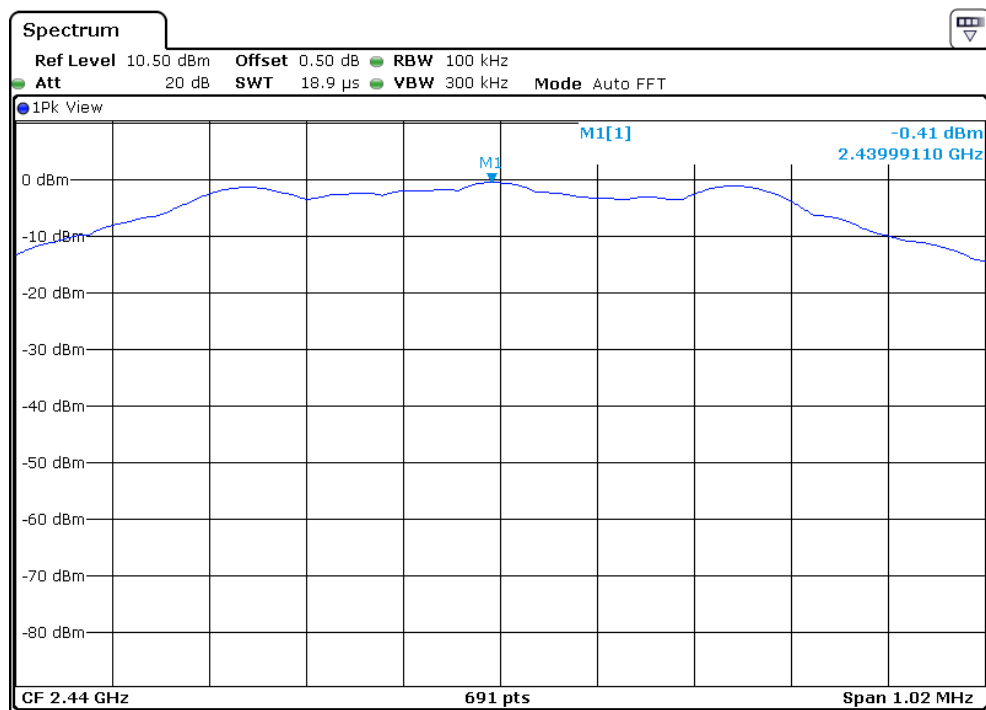
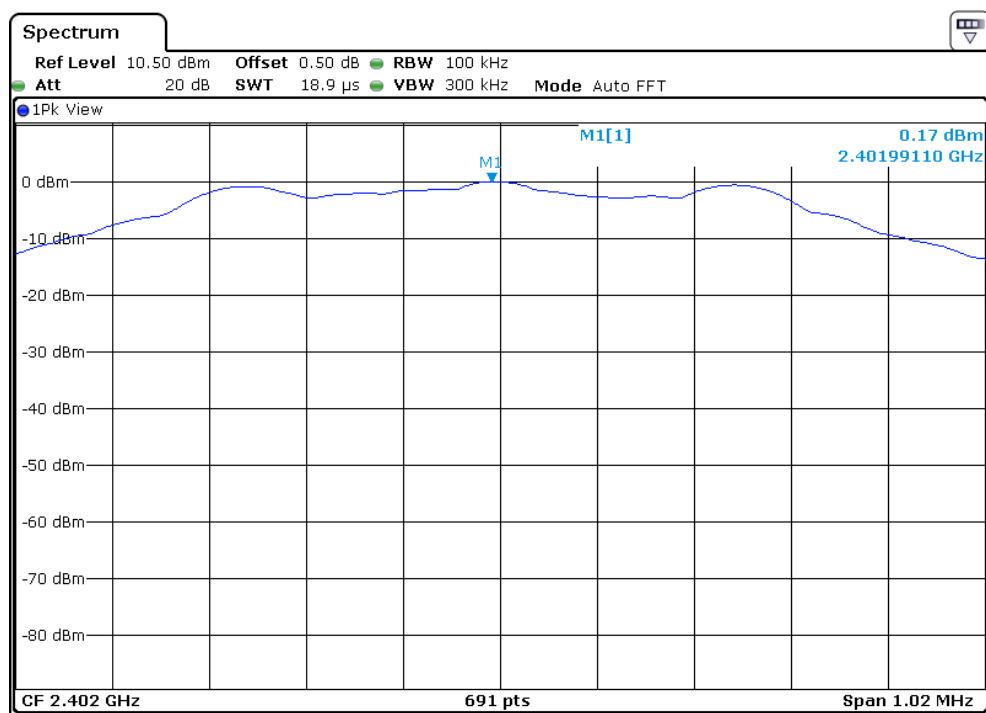
Limit: The Power Density does not exceed 8dBm/3 kHz.

GFSK	
Frequency (MHz)	Power Density (dBm) with RBW 100KHz
2402	0.17
2440	-0.41
2480	-1.16

The test plots are attached as below.

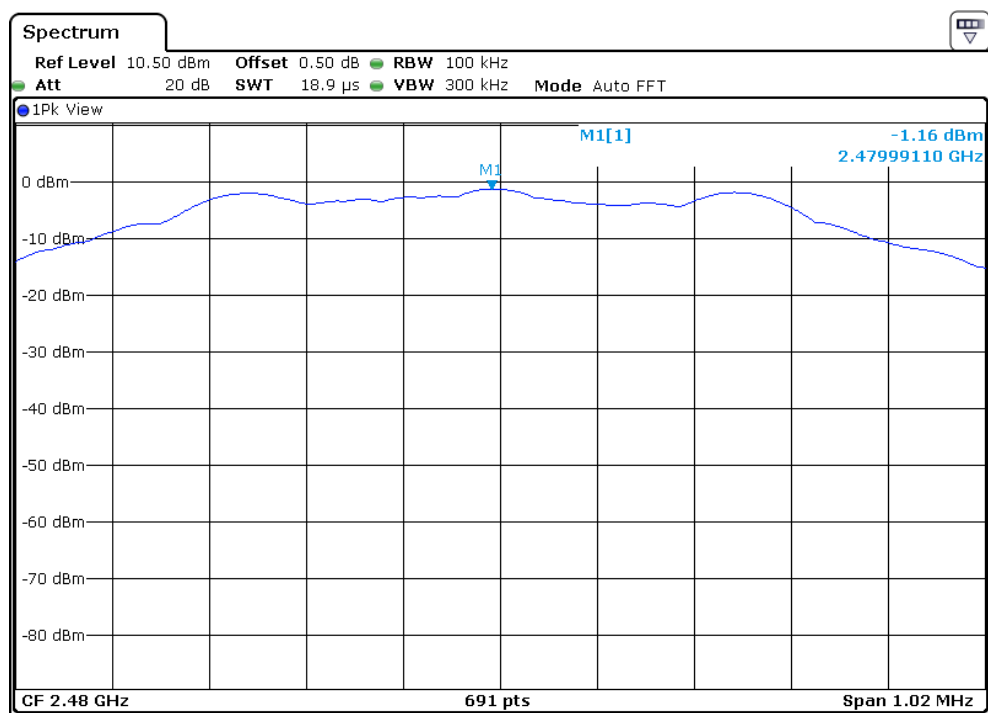
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GFSK



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Applicant: Lenovo (Beijing) Limited
Date of Test: March 4, 2015
Model: BT500

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. The Measurement Procedure was set according to the FCC KDB 558074.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

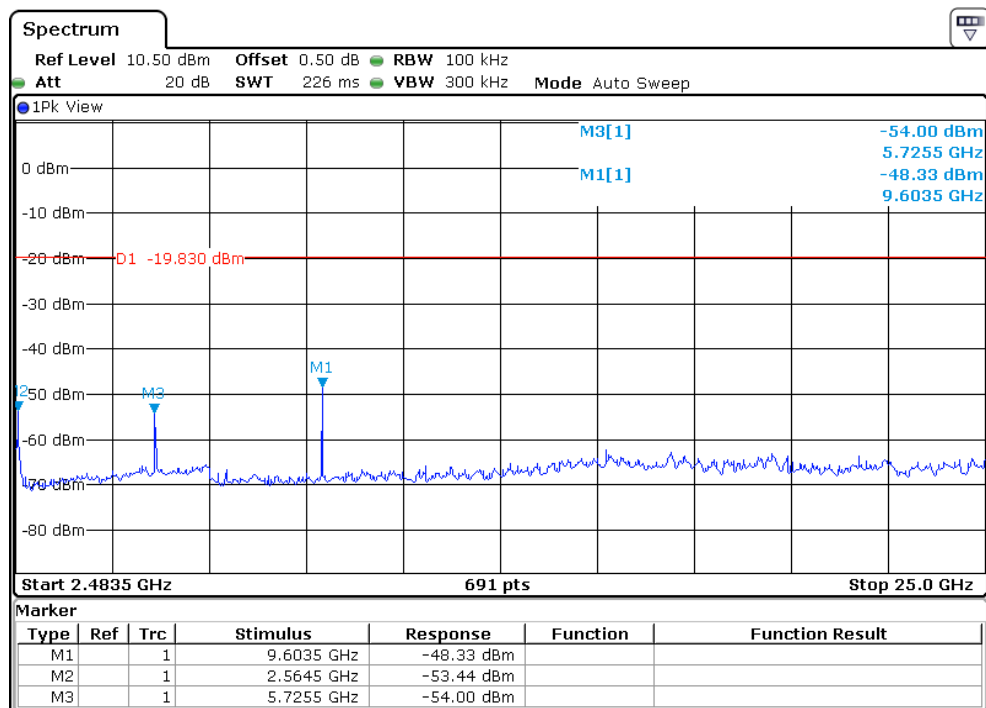
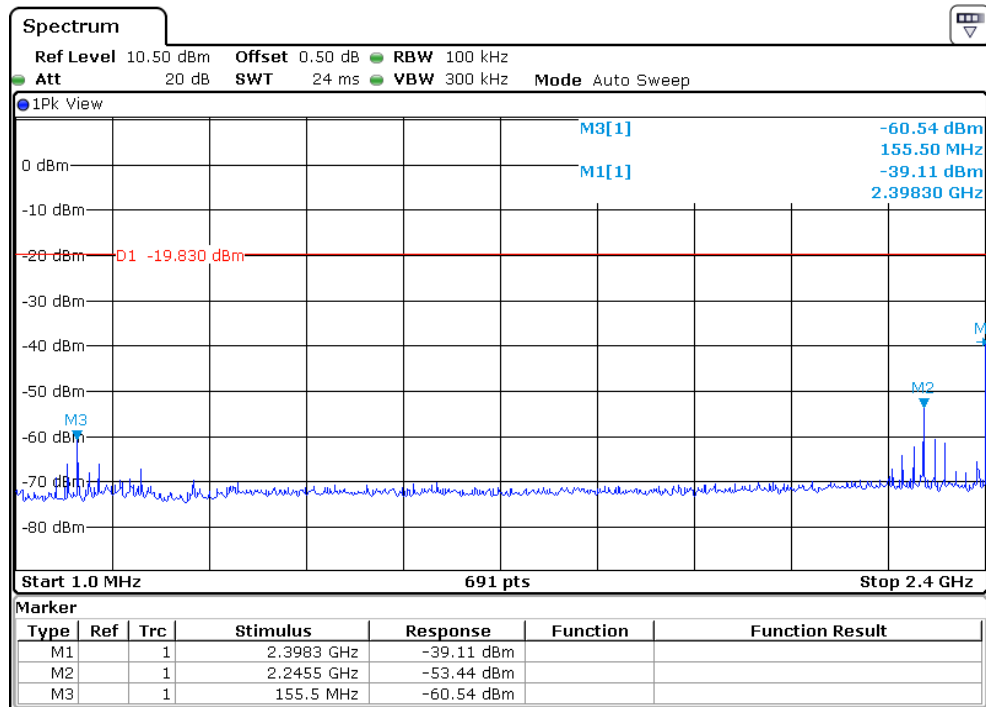
Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for GFSK.

The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.

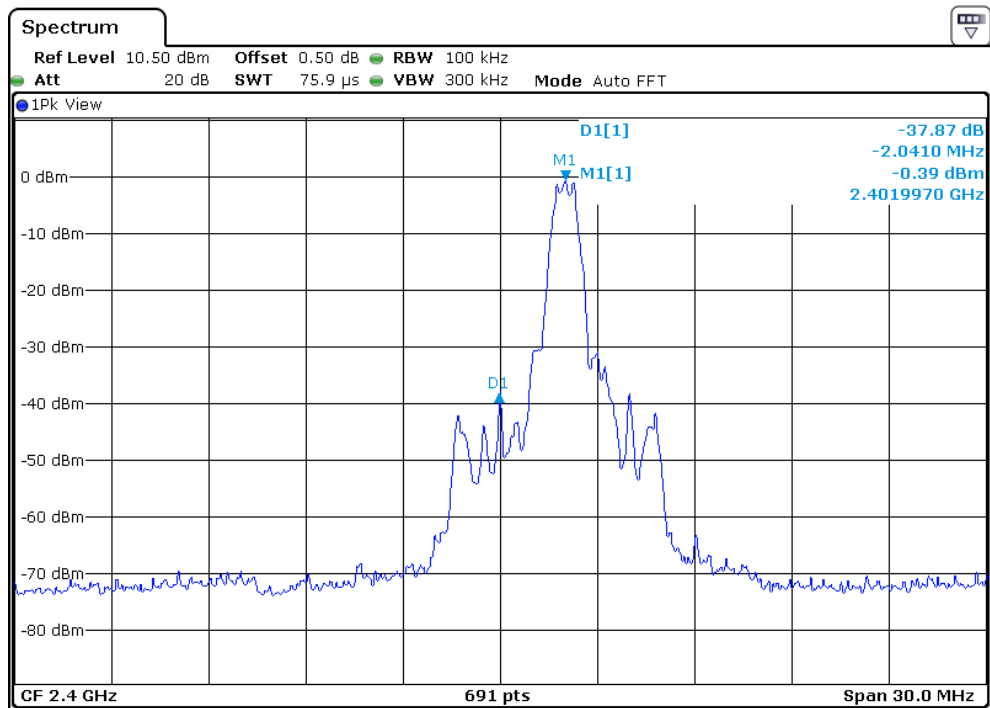
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GFSK
(2402MHz) Reference Level: 0.17dBm

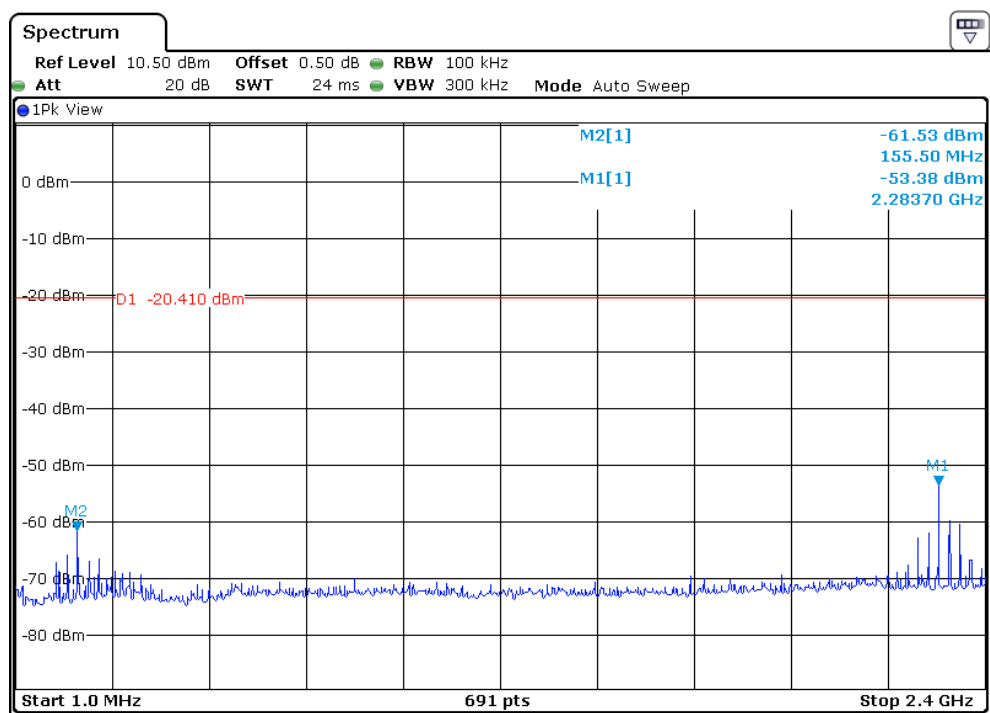


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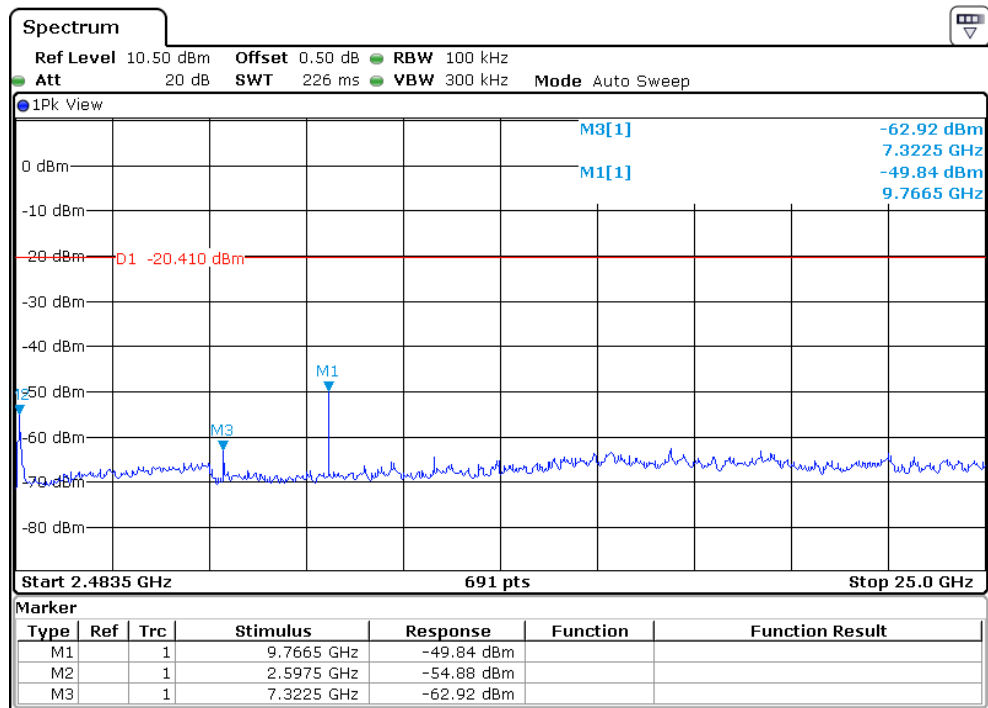
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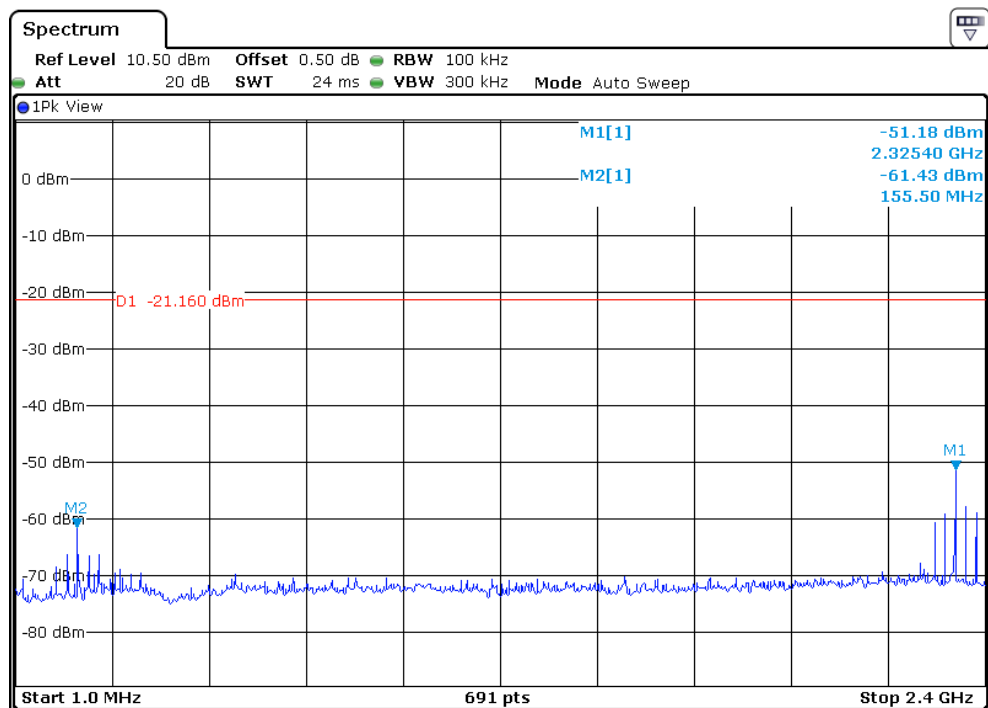
(2440MHz) Reference Level: -0.41dBm



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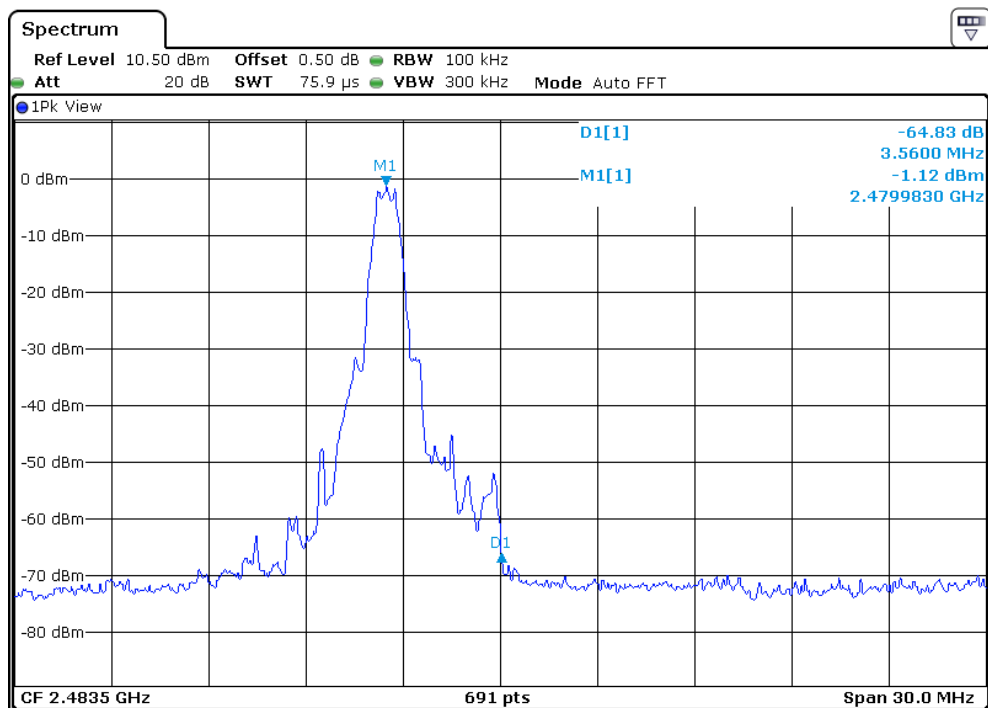
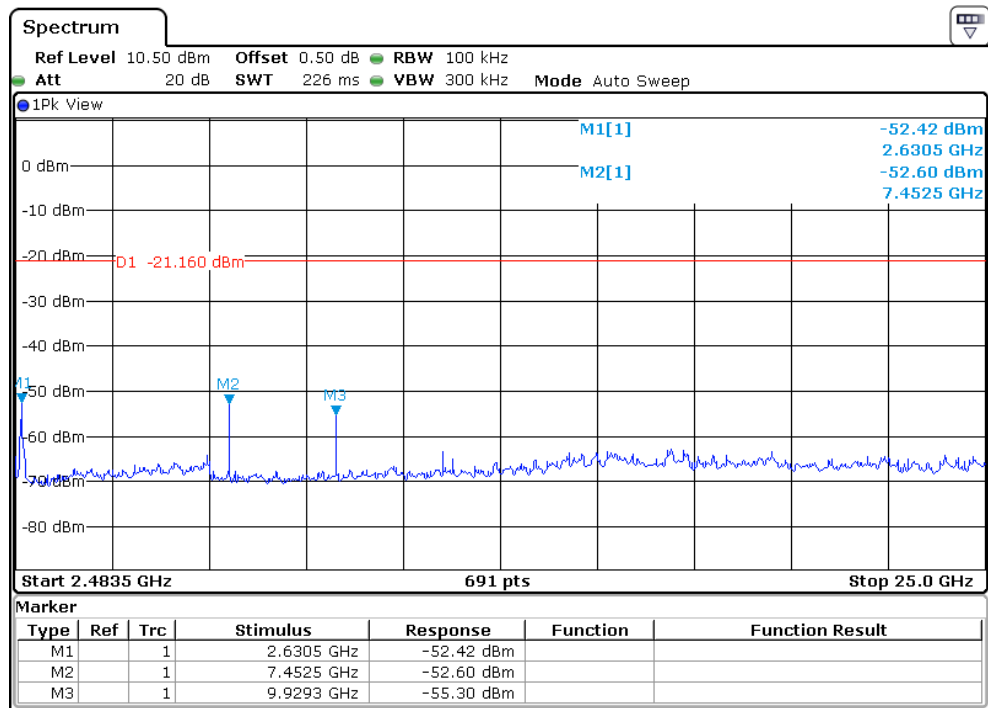


(2480MHz) Reference Level: -1.16dBm



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Applicant: Lenovo (Beijing) Limited
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4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

- ☒ Not required, since all emissions are more than 20dB below fundamental
☐ See attached data sheet

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Applicant: Lenovo (Beijing) Limited
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Model: BT500

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b), (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

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Applicant: Lenovo (Beijing) Limited

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Model: BT500

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD$$

Where

- FS = Field Strength in dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- CF = Cable Attenuation Factor in dB
- AF = Antenna Factor in dB
- AG = Amplifier Gain in dB
- PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD$$

Example

Assume a receiver reading of 62.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$\begin{aligned} RA &= 62.0 \text{ dB}\mu\text{V} \\ AF &= 7.4 \text{ dB} \\ CF &= 1.6 \text{ dB} \\ AG &= 29.0 \text{ dB} \\ PD &= 0 \text{ dB} \\ FS &= 62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V/m} \end{aligned}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm} [(42 \text{ dB}\mu\text{V/m})/20] = 125.9 \mu\text{V/m}$$

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Model: BT500

4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission at 37.760MHz is passed by 7.9dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

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Applicant: Lenovo (Beijing) Limited
Date of Test: March 4, 2015
Model: BT500
Worst Case Operating Mode: BT Link

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	30.000	25.9	20.0	18.6	24.5	40.0	-15.5
Horizontal	65.405	31.8	20.0	13.5	25.3	40.0	-14.7
Horizontal	101.780	26.1	20.0	17.0	23.1	43.5	-20.4
Vertical	30.485	33.1	20.0	18.2	31.3	40.0	-8.7
Vertical	37.760	45.0	20.0	7.1	32.1	40.0	-7.9
Vertical	54.735	26.3	20.0	22.1	28.4	40.0	-11.6

- NOTES:
1. Quasi-Peak detector is used except for others stated.
 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative value in the margin column shows emission below limit.
 4. All emissions are below the QP limit.

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Applicant: Lenovo (Beijing) Limited
 Date of Test: March 4, 2015
 Model: BT500
 Mode: Transmitting (TX-Channel 00)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*4804.000	55.3	36.1	34.2	53.4	74.0	-20.6
Horizontal	*2390.000	55.1	36.8	36.9	55.2	74.0	-18.8

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*4804.000	46.1	36.1	34.2	44.2	54.0	-9.8
Horizontal	*2390.000	42.5	36.8	36.9	42.6	54.0	-11.4

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

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Applicant: Lenovo (Beijing) Limited
Date of Test: March 4, 2015
Model: BT500
Mode: Transmitting (TX-Channel 19)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*4880.000	53.4	36.1	34.6	51.9	74.0	-22.1
Horizontal	*7320.000	54.3	35.6	37.1	55.8	74.0	-18.2

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*4880.000	45.7	36.1	34.6	44.2	54.0	-9.8
Horizontal	*7320.000	42.4	35.6	37.1	43.9	54.0	-10.1

- NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative value in the margin column shows emission below limit.
 4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

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Applicant: Lenovo (Beijing) Limited
 Date of Test: March 4, 2015
 Model: BT500
 Mode: Transmitting (TX-Channel 39)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*4960.000	54.6	36.1	34.6	53.1	74.0	-20.9
Horizontal	*7440.000	55.6	35.6	37.2	57.2	74.0	-16.8
Horizontal	*2485.012	44.5	20.0	28.0	52.5	74.0	-21.5

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	*4960.000	43.3	36.1	34.6	41.8	54.0	-12.2
Horizontal	*7440.000	42.1	35.6	37.2	43.7	54.0	-10.3
Horizontal	*2485.012	32.5	20.0	28.0	40.5	54.0	-13.5

- NOTES: 1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

INTERTEK TESTING SERVICES

4.9 Conducted Emission

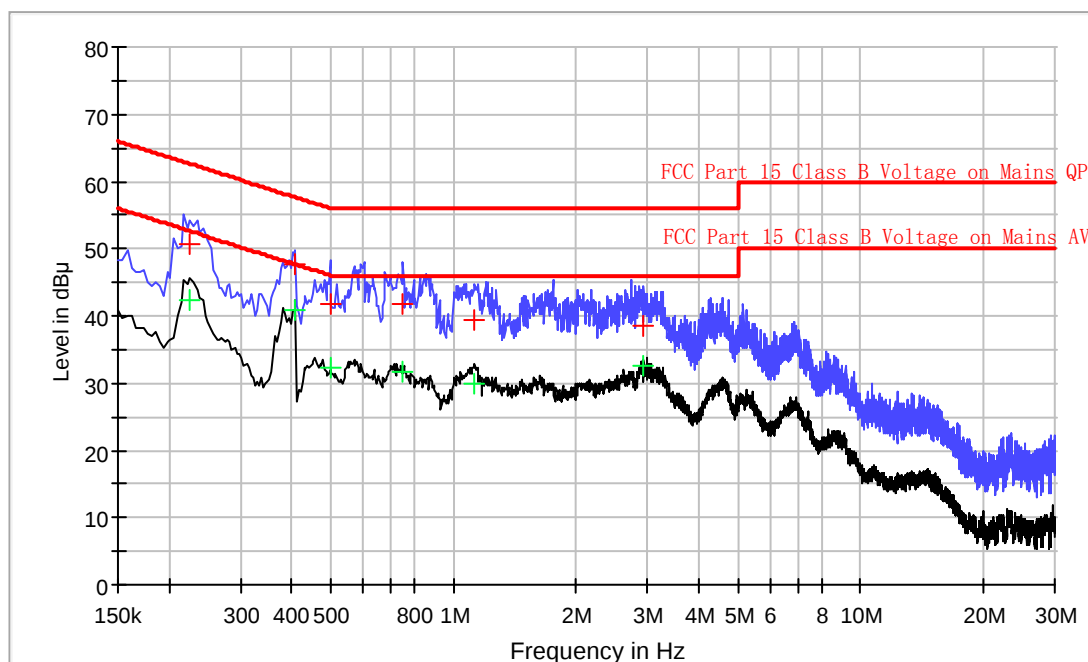
Worst Case Conducted emission at 0.414MHz is Passed by 6.0dB margin

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

INTERTEK TESTING SERVICES

Applicant: Lenovo (Beijing) Limited
Date of Test: March 4, 2015
Model: BT500
Worst Case Operating Mode: BT Link
Line: Live

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.226	50.7	L1	9.8	11.9	62.6
0.410	47.8	L1	9.8	9.8	57.6
0.498	41.9	L1	9.8	14.1	56.0
0.750	41.8	L1	10.0	14.2	56.0
1.126	39.5	L1	9.9	16.5	56.0
2.938	38.5	L1	9.9	17.5	56.0

Result Table AV

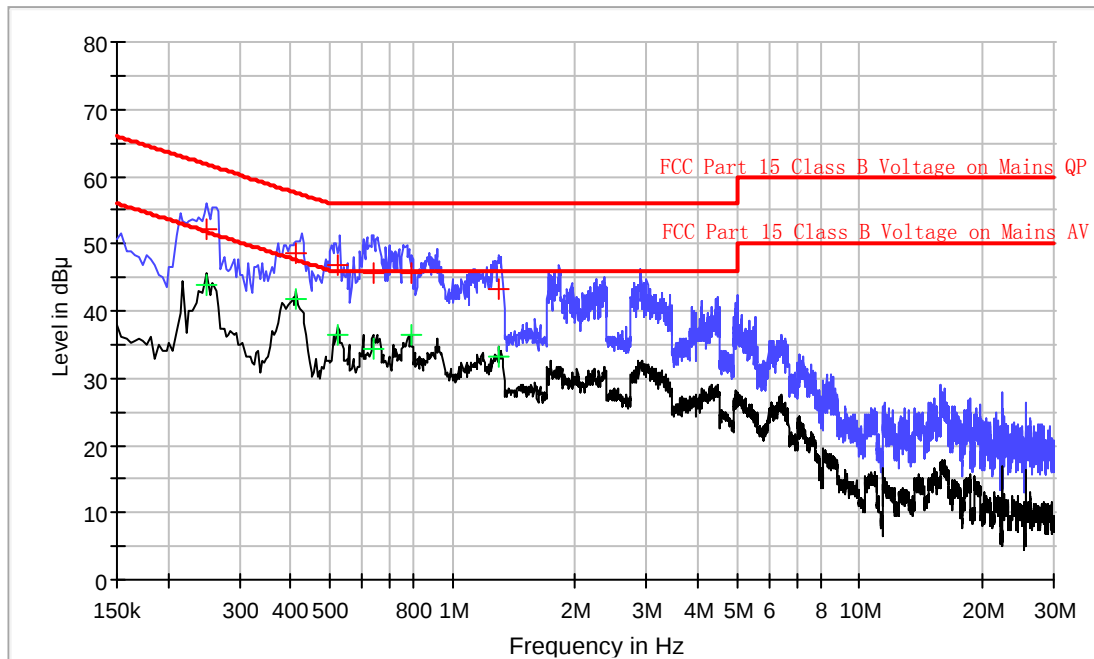
Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.226	42.5	L1	9.8	10.1	52.6
0.410	41.0	L1	9.8	6.6	47.6
0.498	32.2	L1	9.8	13.8	46.0
0.750	31.7	L1	10.0	14.3	46.0
1.126	29.9	L1	9.9	16.1	46.0
2.938	32.6	L1	9.9	13.4	46.0

TRF no.: FCC 15C_TX_b
FCC ID: A5MBT500
Report No.: 150212033SZN-002

INTERTEK TESTING SERVICES

Applicant: Lenovo (Beijing) Limited
Date of Test: March 4, 2015
Model: BT500
Worst Case Operating Mode: BT Link
Line: Neutral

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.250	52.1	N	10.1	9.7	61.8
0.414	48.6	N	10.1	9.0	57.6
0.522	46.7	N	10.1	9.3	56.0
0.638	45.7	N	10.2	10.3	56.0
0.790	45.7	N	10.2	10.3	56.0
1.302	43.3	N	10.2	12.7	56.0

Result Table AV

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.250	43.9	N	10.1	7.9	51.8
0.414	41.6	N	10.1	6.0	47.6
0.522	36.6	N	10.1	9.4	46.0
0.638	34.5	N	10.2	11.5	46.0
0.790	36.4	N	10.2	9.6	46.0
1.302	33.1	N	10.2	12.9	46.0

TRF no.: FCC 15C_TX_b
FCC ID: A5MBT500
Report No.: 150212033SZN-002

INTERTEK TESTING SERVICES

Applicant: Lenovo (Beijing) Limited

Date of Test: March 4, 2015

Model: BT500

4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

☐ Not required - No digital part

☐ Test results are attached

☒ Included in the separated report.

TRF no.: FCC 15C_TX_b

FCC ID: A5MBT500

Report No.: 150212033SZN-002

INTERTEK TESTING SERVICES

Applicant: Lenovo (Beijing) Limited

Date of Test: March 4, 2015

Model: BT500

4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
x	Not applicable, duty cycle was not used.

EXHIBIT 5
EQUIPMENT PHOTOGRAPHS

INTERTEK TESTING SERVICES

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

EXHIBIT 6

PRODUCT LABELLING

INTERTEK TESTING SERVICES

6.0 **Product Labeling**

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

EXHIBIT 7

TECHNICAL SPECIFICATIONS

INTERTEK TESTING SERVICES

7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 8
INSTRUCTION MANUAL

INTERTEK TESTING SERVICES

8.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

EXHIBIT 9
CONFIDENTIALITY REQUEST

9.0 **Confidentiality Request**

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

INTERTEK TESTING SERVICES

EXHIBIT 10

MISCELLANEOUS INFORMATION

INTERTEK TESTING SERVICES

10.0 **Discussion of Pulse Desensitization**

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF*.

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

EXHIBIT 11
TEST EQUIPMENT LIST

INTERTEK TESTING SERVICES

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	21-May-14	21-May-15
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	21-May-14	21-May-15
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	28-Jun-14	28-Jun-15
SZ185-01	EMI Receiver	R&S	ESCI	100547	7-Feb-15	7-Feb-16
SZ061-09	Horn Antenna	ETS	3115	00092346	1-Nov-14	1-Nov-15
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	3-Sep-14	3-Sep-15
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	29-Apr-14	29-Apr-15
EM031-03	EXA Spectrum Analyzer	R&S	FSV40	101506	09-Jun-14	09-Jun-15
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	11-Oct-14	11-Apr-15
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	11-Oct-14	11-Apr-15
SZ062-02	RF Cable	RADIAL	RG 213U	--	19-Apr-14	19-Apr-15
SZ062-05	RF Cable	RADIAL	0.04-26.5GHz	--	31-Dec-14	30-Jun-15
SZ062-12	RF Cable	RADIAL	0.04-26.5GHz	--	9-Oct-14	9-Apr-15
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	9-Oct-14	9-Apr-15
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	21-May-14	21-May-15
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	1-Nov-14	1-Nov-15
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	1-Nov-14	1-Nov-15
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Jun-14	16-Jun-15