

FCC Test Report

Product Name	Lenovo 700 Ultraportable Bluetooth Speake	
Model No.	LX001	
FCC ID.	A5M-LX001	

Applicant	Lenovo (Beijing) Limited	
Address	No.6 Chuang Ye Road, Shangdi Information Industry Haidan District	
	Beijing, 100085 China	

Date of Receipt	Dec. 27, 2018
Issued Date	Feb. 11, 2019
Report No.	18C0536R-RFUSP01V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.

The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.



Test Report

Issued Date: Feb. 11, 2019 Report No.: 18C0536R-RFUSP01V00

DEKRA

Product Name	Lenovo 700 Ultraportable Bluetooth Speaker			
Applicant	Lenovo (Beijing) Limited			
Address	No.6 Chuang Ye Road, Shangdi Information Industry Haidan District			
	Beijing, 100085 China			
Manufacturer	1.Lenovo (Beijing) Limited			
	2.Luxshare Electronic Technology (KunShan) Ltd.			
Model No.	LX001			
FCC ID.	A5M-LX001			
EUT Rated Voltage	DC 3.85V (Power by battery) or DC 5V(Power by USB)			
EUT Test Voltage	DC 5V (Power by USB)			
Trade Name	enovo			
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2017			
	ANSI C63.4: 2014, ANSI C63.10: 2013			
	KDB 558074 D01 15.247 Meas Guidance v05			
Test Result	Complied			
Documented By	Rita Huang			
	(Senior Adm. Specialist / Rita Huang)			
Tested By	Paul Jiang			

(Engineer / Paul Jiang)

Approved By

2

(Director / Vincent Lin)



TABLE OF CONTENTS

Des	scription	Page
1.	GENERAL INFORMATION	5
1.1.	EUT Description	5
1.2.	Operational Description	7
1.3.	Tested System Details	
1.4.	Configuration of Tested System	
1.5.	EUT Exercise Software	
1.6.	Test Facility	9
1.7.	List of Test Equipment	
2.	CONDUCTED EMISSION	
2.1.	Test Setup	
2.2.	Limits	
2.3.	Test Procedure	
2.4.	Uncertainty	
2.5.	Test Result of Conducted Emission	
3.	PEAK POWER OUTPUT	
3.1.	Test Setup	
3.2.	Limit	
3.3.	Test Procedure	
3.4.	Uncertainty	
3.5.	Test Result of Peak Power Output	
4.	RADIATED EMISSION	20
4.1.	Test Setup	
4.2.	Limits	21
4.3.	Test Procedure	
4.4.	Uncertainty	
4.5.	Test Result of Radiated Emission	
5.	RF ANTENNA CONDUCTED TEST	
5.1.	Test Setup	
5.2.	Limits	
5.3.	Test Procedure	
5.4.	Uncertainty	
5.5.	Test Result of RF Antenna Conducted Test	
6.	BAND EDGE	
6.1.	Test Setup	
6.2.	Limit	
6.3.	Test Procedure	
6.4.	Uncertainty	
6.5.	Test Result of Band Edge	
7.	CHANNEL NUMBER	64
7.1.	Test Setup	64
7.2.	Limit	

DEKRA

7.3.	Test Procedure
7.4.	Uncertainty
7.5.	Test Result of Channel Number
8.	CHANNEL SEPARATION
8.1.	Test Setup
8.2.	Limit
8.3.	Test Procedure
8.4.	Uncertainty
8.5.	Test Result of Channel Separation
9.	DWELL TIME72
9.1.	Test Setup
9.2.	Limit
9.3.	Test Procedure
9.4.	Uncertainty
9.5.	Test Result of Dwell Time
10.	OCCUPIED BANDWIDTH
10.1.	Test Setup
10.2.	Limits77
10.3.	Test Procedure
10.4.	Uncertainty
10.5.	Test Result of Occupied Bandwidth
11.	EMI REDUCTION METHOD DURING COMPLIANCE TESTING
Attachme Attachme	ent 1: EUT Test Photographs ent 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Lenovo 700 Ultraportable Bluetooth Speaker		
Trade Name	Lenovo		
Model No.	LX001		
FCC ID.	A5M-LX001		
Frequency Range	2402-2480MHz		
Channel Number	79		
Type of Modulation	FHSS: GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps)		
Antenna Type	PIFA Antenna		
Channel Control	Auto		
Antenna Gain	Refer to the table "Antenna List"		
USB Type C Cable	Shielded, 1.0m		

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	LUXSHARE	N/A	PIFA Antenna	-0.1 dBi for 2.4 GHz

Note:

1. The antenna of EUT conforms to FCC 15.203.

Center Frequency of Each Channel:

-							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 78:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 MHz		

- 1. The EUT is a Lenovo 700 Ultraportable Bluetooth Speaker with a built-in Bluetooth V3.0, V2.1+EDR transceiver, this report for Bluetooth V3.0, V2.1+EDR.
- 2. These tests were conducted on a sample for the purpose of demonstrating compliance of Bluetooth transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
- 3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test
- 4. Bluetooth operation was evaluated at both 1Mb/s and 3Mb/s data rates. 2Mb/s data rate was found, through pre-testing, to produce emissions similar to those for 3Mb/s.
- 5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit - 1Mbps (GFSK)
	Mode 2: Transmit - 3Mbps (8DPSK)

1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Pre	oduct	Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude 5580	GDZN7H2	Non-Shielded, 0.8m
2	Test Fixture	N/A	N/A	N/A	N/A

Signal Cable Type		Signal cable Description
A	USB Cable	Shielded, 1.8m
В	UART Cable	Non-Shielded, 0.2m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- 1. Setup the EUT as shown in Section 1.4.
- 2. Execute software "RTLBTAPP V5.2.2.16" on the Notebook PC.
- 3. Configure the test mode, the test channel, and the data rate.
- 4. Press "OK" to start the continuous Transmit.
- 5. Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual	
Temperature (°C)	15-35	20-35	
Humidity (%RH)	25-75	30-65	
Barometric pressure (mbar)	860-1060	950-1000	

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

http://www.dekra.com.tw/english/about/certificates.aspx?bval=5

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: <u>http://www.dekra.com.tw/index_en.aspx</u>

Site Description:	Accredited by TAF Accredited Number: 3023
Site Name: Site Address:	DEKRA Testing and Certification Co., Ltd No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C. TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : <u>info.tw@dekra.com</u>

FCC Accreditation Number: TW3023



1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment		Manufacturer	r Model No.		Serial No.		Cali. Date	Due. Date
	Temperature Chamb	ber	WIT GROUP		TH-1S-B		EQ-201-00146	2018/02/12	2019/02/11
Х	Spectrum Analyzer		Agilent		N9010A		MY53470892	2018/09/27	2019/09/26
Х	Peak Power Analyze	er	Keysight		8990B		MY51000410	2018/08/01	2019/07/31
Х	Wideband Power Se	ensor	Keysight		N1923A		MY56080003	2018/07/25	2019/07/24
Х	Wideband Power Se	ensor	Keysight		N1923A		MY56080004	2018/07/25	2019/07/24
Х	EMI Test Receiver		R&S		ESCS 30		100369	2018/11/19	2019/11/18
Х	LISN		R&S		ESH3-Z5		836679/017	2019/02/09	2020/02/08
Х	LISN		R&S		ENV216		100097	2019/02/09	2020/02/08
Х	Coaxial Cable		DEKRA		RG 400		LC018-RG	2018/06/21	2019/06/20
For	For Radiated measurements /Site3/CB8								
	Equipment	Manu	facturer	Mo	odel No.	Serial	No.	Cali. Date	Due. Date
Х	Spectrum Analyzer	R&S		FS	SP40 10017		0	2018/03/12	2019/03/11
Х	Loop Antenna	Teseq		HI	LA6121 37133		6	2018/10/13	2019/10/12
Х	Bilog Antenna	Schaf	fner Chase	CF	BL6112B 2707			2018/06/24	2019/06/23
Х	Coaxial Cable	DEKF	RA	RC	G 214 LC00		3-RG	2018/06/14	2019/06/13
Х	Pre-Amplifier	Jet-Po	ower	JP	PA-10M1G33 17010		01000330010	2018/06/14	2019/06/13
Х	Horn Antenna	ETS-I	Lindgren	31	17	00135	5205	2018/05/03	2019/05/02
Х	Horn Antenna	SCHV	VARZBECK	91	20D	576		2018/12/18	2019/12/17
Х	Pre-Amplifier	EMCI		EN	EMC012630SE 9802		0	2018/04/10	2019/04/09
Х	Horn Antenna	Com-Power		Ał	H-840	10104	13	2019/01/09	2020/01/08
Х	Amplifier + Cable	EMCI	[EN	AC184045SE	98037	'0	2018/03/21	2019/03/20
Х	Filter	MICR	O-TRONICS	BF	RM50702	G270		2018/08/06	2019/08/05
Х	Filter	MICR	O-TRONICS	BF	RM50716	G196		2018/08/06	2019/08/05

Note:

1. Loop Antenna is calibrated every two year, the other equipments are calibrated every one year.

2. The test instruments marked with "X" are used to measure the final test results.

3. Test Software version :QuieTek EMI 2.0 V2.1.113.



2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBµV) Limit							
Frequency	Lin	nits					
MHz	QP	AV					
0.15 - 0.50	66-56	56-46					
0.50-5.0	56	46					
5.0 - 30	60	50					

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and Peripherals are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

2.4. Uncertainty

± 2.26 dB



2.5. Test Result of Conducted Emission

Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Conducted Emission Test
Power Line	:	Line 1
Test date	:	2019/01/23
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV)	(dB)	(dBuV)	
1	*	0.162	9.745	36.840	46.585	-19.072	65.657	QUASIPEAK
2		0.185	9.738	31.580	41.318	-23.682	65.000	QUASIPEAK
3		0.494	9.750	26.600	36.350	-19.821	56.171	QUASIPEAK
4		2.205	9.830	9.140	18.970	-37.030	56.000	QUASIPEAK
5		3.224	9.863	19.640	29.503	-26.497	56.000	QUASIPEAK
6		9.224	10.048	20.440	30.488	-29.512	60.000	QUASIPEAK

- 1. All Reading Levels are Quasi-Peak and average value.
- 2. " * ", means this data is the worst emission level.
- 3. Measurement Level = Reading Level + Correct Factor



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Conducted Emission Test
Power Line	:	Line 1
Test date	:	2019/01/23
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV)	(dB)	(dBuV)	
1		0.162	9.745	21.670	31.415	-24.242	55.657	AVERAGE
2		0.185	9.738	18.130	27.868	-27.132	55.000	AVERAGE
3	*	0.494	9.750	20.130	29.880	-16.291	46.171	AVERAGE
4		2.205	9.830	4.340	14.170	-31.830	46.000	AVERAGE
5		3.224	9.863	9.910	19.773	-26.227	46.000	AVERAGE
6		9.224	10.048	13.970	24.018	-25.982	50.000	AVERAGE

- 1. All Reading Levels are Quasi-Peak and average value.
- 2. " * ", means this data is the worst emission level.
- 3. Measurement Level = Reading Level + Correct Factor



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Conducted Emission Test
Power Line	:	Line 2
Test date	:	2019/01/23
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV)	(dB)	(dBuV)	
1	*	0.150	9.739	39.320	49.059	-16.941	66.000	QUASIPEAK
2		0.205	9.738	29.400	39.138	-25.291	64.429	QUASIPEAK
3		0.502	9.740	27.120	36.860	-19.140	56.000	QUASIPEAK
4		3.642	9.873	22.460	32.333	-23.667	56.000	QUASIPEAK
5		10.271	10.097	14.740	24.837	-35.163	60.000	QUASIPEAK
6		20.634	10.388	6.860	17.248	-42.752	60.000	QUASIPEAK

- 1. All Reading Levels are Quasi-Peak and average value.
- 2. " * ", means this data is the worst emission level.
- 3. Measurement Level = Reading Level + Correct Factor



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Conducted Emission Test
Power Line	:	Line 2
Test date	:	2019/01/23
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV)	(dB)	(dBuV)	
1		0.150	9.739	22.560	32.299	-23.701	56.000	AVERAGE
2		0.205	9.738	16.160	25.898	-28.531	54.429	AVERAGE
3	*	0.502	9.740	20.340	30.080	-15.920	46.000	AVERAGE
4		3.642	9.873	9.740	19.613	-26.387	46.000	AVERAGE
5		10.271	10.097	8.630	18.727	-31.273	50.000	AVERAGE
6		20.634	10.388	1.110	11.498	-38.502	50.000	AVERAGE

- 1. All Reading Levels are Quasi-Peak and average value.
- 2. " * ", means this data is the worst emission level.
- 3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

3.1. Test Setup



3.2. Limit

The maximum peak power shall be less 1Watt.

3.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

3.4. Uncertainty

± 1.19 dB

3.5. Test Result of Peak Power Output

Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Peak Power Output
Test Site	:	No.3 OATS
Test date	:	2019/01/18
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency	Measurement	Required Limit	Result
	(MHz)	(dBm)		
Channel 00	2402.00	6.83	1 Watt= 30 dBm	Pass
Channel 39	2441.00	6.50	1 Watt= 30 dBm	Pass
Channel 78	2480.00	7.24	1 Watt= 30 dBm	Pass



:	Lenovo 700 Ultraportable Bluetooth Speaker
:	Peak Power Output
:	No.3 OATS
:	2019/01/18
:	Mode 2: Transmit - 3Mbps (8DPSK)
	: : : :

Channel No.	Frequency	Measurement	Required Limit	Result
	(MHz)	(dBm)		
Channel 00	2402.00	9.28	1 Watt= 30 dBm	Pass
Channel 39	2441.00	9.49	1 Watt= 30 dBm	Pass
Channel 78	2480.00	10.25	1 Watt= 30 dBm	Pass



4. Radiated Emission

4.1. Test Setup

Under 30MHz



Above 1GHz



4.2. Limits

General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits						
Frequency MHz	Field strength	Measurement distance				
IVITIZ	(microvolts/meter)	(meter)				
0.009-0.490	2400/F(kHz)	300				
0.490-1.705	24000/F(kHz)	30				
1.705-30	30	30				
30-88	100	3				
88-216	150	3				
216-960	200	3				
Above 960	500	3				

Remarks: 1. RF Voltage $(dB\mu V) = 20 \log RF$ Voltage (uV)

- 2. In the Above Table, the tighter limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna. The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

4.4. Uncertainty

± 4.08 dB above 1GHz
± 4.22 dB below 1GHz



4.5. Test Result of Radiated Emission

Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Harmonic Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2019/01/22
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)(2402MHz)

Horizontal



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1	*	4804.000	2.511	46.230	48.740	-25.260	74.000	PEAK
2		7206.000	9.511	38.260	47.771	-26.229	74.000	PEAK
3		9608.000	10.394	38.320	48.714	-25.286	74.000	PEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



- Product Lenovo 700 Ultraportable Bluetooth Speaker :
- Test Item Harmonic Radiated Emission : No.3 OATS
- Test Site
- : Test date : 2019/01/22

Test Mode

Mode 1: Transmit - 1Mbps (GFSK)(2402MHz) :



		Frequency Correct Factor		Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		4804.000	2.923	43.190	46.112	-27.888	74.000	PEAK
2	*	7206.000	9.988	40.380	50.369	-23.631	74.000	PEAK
3		9608.000	10.847	38.160	49.007	-24.993	74.000	PEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



- Product Lenovo 700 Ultraportable Bluetooth Speaker :
- Harmonic Radiated Emission Test Item : No.3 OATS
- Test Site
- : Test date : 2019/01/22

:

Test Mode

Mode 1: Transmit - 1Mbps (GFSK)(2441MHz)

Horizontal



		Frequency	requency Correct Factor		Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		4882.000	2.025	43.770	45.795	-28.205	74.000	PEAK
2		7323.000	9.762	38.270	48.031	-25.969	74.000	PEAK
3	*	9764.000	9.682	38.690	48.371	-25.629	74.000	PEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



- Product Lenovo 700 Ultraportable Bluetooth Speaker :
- Harmonic Radiated Emission Test Item : No.3 OATS
- Test Site
- : Test date : 2019/01/22

Test Mode Mode 1: Transmit - 1Mbps (GFSK)(2441MHz) :



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		4882.000	2.488	41.690	44.178	-29.822	74.000	PEAK
2	*	7323.000	10.375	38.510	48.884	-25.116	74.000	PEAK
3		9764.000	10.315	38.490	48.805	-25.195	74.000	PEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



- Product Lenovo 700 Ultraportable Bluetooth Speaker :
- Harmonic Radiated Emission Test Item : No.3 OATS
- Test Site :
- Test date : 2019/01/22 :

Test Mode

Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)

Horizontal



		Frequency Correct Factor		Frequency Correct Factor Reading Level Measure Level		Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)		
1		4960.000	2.582	42.900	45.482	-28.518	74.000	PEAK	
2	*	7440.000	10.555	37.840	48.395	-25.605	74.000	PEAK	
3		9920.000	10.206	37.680	47.886	-26.114	74.000	PEAK	

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Harmonic Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2019/01/22
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		4960.000	3.398	41.250	44.649	-29.351	74.000	PEAK
2	*	7440.000	11.214	38.400	49.614	-24.386	74.000	PEAK
3		9920.000	11.245	38.120	49.365	-24.635	74.000	PEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



- Product : Lenovo 700 Ultraportable Bluetooth Speaker
- Test Item : Harmonic Radiated Emission
- Test Site
 - Site : No.3 OATS
- Test date : 2019/01/22

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)(2402MHz)

Horizontal



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1	*	4804.000	2.511	47.310	49.820	-24.180	74.000	PEAK
2		7206.000	9.511	38.920	48.431	-25.569	74.000	PEAK
3		9608.000	10.394	37.680	48.074	-25.926	74.000	PEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
ITOuuot	•	Lenovo 700 Ollupolluole Bluetootii Speaker

- Test Item : Harmonic Radiated Emission
- Test Site
 - Site : No.3 OATS
- Test date : 2019/01/22

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)(2402MHz)

Vertical



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		4804.000	2.923	43.660	46.582	-27.418	74.000	PEAK
2	*	7206.000	9.988	39.350	49.339	-24.661	74.000	PEAK
3		9608.000	10.847	38.280	49.127	-24.873	74.000	PEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



:	Lenovo 700 Ultraportable Bluetooth Speaker
:	Harmonic Radiated Emission
:	No.3 OATS
:	2019/01/22
:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)
	: : : :

Horizontal



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		4882.000	2.025	43.920	45.945	-28.055	74.000	PEAK
2		7323.000	9.762	38.670	48.431	-25.569	74.000	PEAK
3	*	9764.000	9.682	38.840	48.521	-25.479	74.000	PEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



:	Lenovo 700 Ultraportable Bluetooth Speaker
:	Harmonic Radiated Emission
:	No.3 OATS
:	2019/01/22
:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)
	: : : :



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		4882.000	2.488	41.680	44.168	-29.832	74.000	PEAK
2		7323.000	10.375	38.650	49.024	-24.976	74.000	PEAK
3	*	9764.000	10.315	38.960	49.275	-24.725	74.000	PEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



- Product Lenovo 700 Ultraportable Bluetooth Speaker :
- Harmonic Radiated Emission Test Item : No.3 OATS
- Test Site
- : Test date : 2019/01/22 :

Test Mode

Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

Horizontal



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		4960.000	2.582	41.760	44.342	-29.658	74.000	PEAK
2	*	7440.000	10.555	38.290	48.845	-25.155	74.000	PEAK
3		9920.000	10.206	37.920	48.126	-25.874	74.000	PEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



- Product Lenovo 700 Ultraportable Bluetooth Speaker :
- Harmonic Radiated Emission Test Item :
- Test Site
 - No.3 OATS : : 2019/01/22
- Test date Test Mode :
 - Mode 2: Transmit 3Mbps (8DPSK) (2480MHz)



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		4960.000	3.398	41.340	44.739	-29.261	74.000	PEAK
2	*	7440.000	11.214	38.140	49.354	-24.646	74.000	PEAK
3		9920.000	11.245	37.860	49.105	-24.895	74.000	PEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



- Product Lenovo 700 Ultraportable Bluetooth Speaker :
- Test Item General Radiated Emission : No.3 OATS
- Test Site
- : Test date : 2019/01/23
- Test Mode Mode 1: Transmit - 1Mbps (GFSK) (2441MHz) :

Horizontal



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1	*	39.700	3.796	29.249	33.045	-6.955	40.000	QUASIPEAK
2		338.460	-2.503	22.144	19.641	-26.359	46.000	QUASIPEAK
3		421.880	1.836	22.728	24.564	-21.436	46.000	QUASIPEAK
4		602.300	7.225	21.325	28.550	-17.450	46.000	QUASIPEAK
5		868.080	7.816	21.428	29.244	-16.756	46.000	QUASIPEAK
6		988.360	8.763	21.260	30.023	-23.977	54.000	QUASIPEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 8. No emission found between lowest internal used/generated frequency to 30MHz.



Product	•	Lenovo 700 Ultraportable Bluetooth Speaker
Trouuer	•	Lenovo 700 Oltraportable Didetootii Speaker

- Test Item General Radiated Emission : No.3 OATS
- Test Site
- : Test date : 2019/01/23

Test Mode

Mode 1: Transmit - 1Mbps (GFSK) (2441MHz) :



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1	*	35.820	-4.215	30.309	26.094	-13.906	40.000	QUASIPEAK
2		239.520	-0.167	23.063	22.896	-23.104	46.000	QUASIPEAK
3		462.620	1.113	22.390	23.503	-22.497	46.000	QUASIPEAK
4		592.600	3.699	22.288	25.987	-20.013	46.000	QUASIPEAK
5		763.320	5.388	22.189	27.577	-18.423	46.000	QUASIPEAK
6		943.740	9.135	22.322	31.457	-14.543	46.000	QUASIPEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 8. No emission found between lowest internal used/generated frequency to 30MHz.



enovo 700 Ultraportable Bluetooth S	: Lenovo 700 Ultraportable Bluetooth Speak	ter
eneral Radiated Emission	: General Radiated Emission	
o.3 OATS	: No.3 OATS	
019/01/23	: 2019/01/23	
lode 2: Transmit - 3Mbps (8DPSK) (: Mode 2: Transmit - 3Mbps (8DPSK) (244)	MHz)
)19/01/23 Iode 2: Transmit - 3Mbps (8DPSK) (: 2019/01/23 : Mode 2: Transmit - 3Mbps (8DPSK) (244) 	MH





		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1	*	31.940	4.575	28.926	33.501	-6.499	40.000	QUASIPEAK
2		97.900	-3.708	23.870	20.162	-23.338	43.500	QUASIPEAK
3		410.240	1.753	22.322	24.075	-21.925	46.000	QUASIPEAK
4		604.240	7.199	22.103	29.302	-16.698	46.000	QUASIPEAK
5		821.520	7.861	21.018	28.879	-17.121	46.000	QUASIPEAK
6		941.800	8.242	21.855	30.097	-15.903	46.000	QUASIPEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 8. No emission found between lowest internal used/generated frequency to 30MHz.


Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2019/01/23
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1	*	35.820	-4.215	29.618	25.403	-14.597	40.000	QUASIPEAK
2		212.360	0.160	23.623	23.783	-19.717	43.500	QUASIPEAK
3		404.420	0.920	22.771	23.691	-22.309	46.000	QUASIPEAK
4		619.760	4.001	22.816	26.817	-19.183	46.000	QUASIPEAK
5		854.500	7.614	20.946	28.560	-17.440	46.000	QUASIPEAK
6		990.300	9.344	21.717	31.061	-22.939	54.000	QUASIPEAK

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 8. No emission found between lowest internal used/generated frequency to 30MHz.

5. **RF Antenna Conducted Test**

5.1. Test Setup



5.2. Limits

According to FCC Section 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 measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

5.4. Uncertainty

± 1.20dB

5.5. Test Result of RF Antenna Conducted Test

Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	RF Antenna Conducted Test
Test Site	:	No.3 OATS
Test date	:	2019/01/23
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

Figure Channel 00: Spurious Emission(30MHz-25GHz) 15.08 Reading Value 20 RBW: 100k, VBW: 1M Sweep Time: Auto 10 0 -10 -20 -30 dBm -40 -50 -60 -70 -80 -90 5 10 15 20 25 GHz





Note: The above test pattern is synthesized by multiple of the frequency range.



- Product Lenovo 700 Ultraportable Bluetooth Speaker :
- Test Item RF Antenna Conducted Test :
- Test Site
- No.3 OATS : Test date 2019/01/23 :
- Test Mode Mode 2: Transmit - 3Mbps (8DPSK) :







Figure Channel 78:



Note: The above test pattern is synthesized by multiple of the frequency range.



6. Band Edge

6.1. Test Setup

RF Radiated Measurement:

Above 1GHz



RF Conducted Measurement



6.2. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.3. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The bandwidth setting below 1GHz and above 1GHz on the field strength meter is 120 kHz and 1MHz, respectively.

6.4. Uncertainty

- ± 4.08 dB above 1GHz
- ± 4.22 dB below 1GHz

6.5. **Test Result of Band Edge**

Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2019/01/23
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

Horizontal



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		2383.623	-2.715	45.824	43.109	-30.891	74.000	PEAK
2		2390.000	-2.687	43.956	41.269	-32.731	74.000	PEAK
3		2400.000	-2.660	66.451	63.791	-10.209	74.000	PEAK
4	*	2401.884	-2.658	101.890	99.232	25.232	74.000	PEAK

- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. 1.
- 2.
- Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 "*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2019/01/23
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

Horizontal



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		2390.000	-2.687	31.526	28.839	-25.161	54.000	AVERAGE
2		2400.000	-2.660	56.785	54.125	0.125	54.000	AVERAGE
3	*	2402.029	-2.657	101.509	98.852	44.852	54.000	AVERAGE

- 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
- 2. 3.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "* ", means this data is the worst emission level.
- 4.
- Measurement Level = Reading Level + Correct Factor. 5.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



Product	•	Lenovo 700 Ultraportable Bluetooth Speaker	
TTOuuci	•	Lenovo 700 Ontaportable Didetobili Speaker	

No.3 OATS

- Test Item Band Edge :
- Test Site •
- Test date 2019/01/23 :

Test Mode

Mode 1: Transmit - 1Mbps (GFSK) (2402MHz) :

Vertical



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		2388.551	-4.154	45.121	40.967	-33.033	74.000	PEAK
2		2390.000	-4.159	44.895	40.736	-33.264	74.000	PEAK
3		2400.000	-4.171	67.885	63.714	-10.286	74.000	PEAK
4	*	2401.884	-4.171	103.182	99.011	25.011	74.000	PEAK

- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. 1.
- 2.
- Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. 3.
- 4.
- 5. Measurement Level = Reading Level + Correct Factor.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2019/01/23
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)





		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		2390.000	-4.159	31.995	27.836	-26.164	54.000	AVERAGE
2		2400.000	-4.171	58.094	53.923	-0.077	54.000	AVERAGE
3	*	2402.029	-4.171	102.816	98.645	44.645	54.000	AVERAGE

- 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
- 2. 3.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "* ", means this data is the worst emission level.
- 4.
- Measurement Level = Reading Level + Correct Factor. 5.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



- Product Lenovo 700 Ultraportable Bluetooth Speaker :
- Test Item Band Edge :
- Test Site No.3 OATS :
- Test date 2019/01/23 :

Test Mode :

Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

Horizontal



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2479.877	-2.605	94.758	92.153	18.153	74.000	PEAK
2		2483.500	-2.601	44.435	41.833	-32.167	74.000	PEAK

- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. 1.
- 2.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- "*", means this data is the worst emission level. 4.
- Measurement Level = Reading Level + Correct Factor. 5.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2019/01/23
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

Horizontal



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	-2.605	94.365	91.760	37.760	54.000	AVERAGE
2		2483.500	-2.601	31.376	28.774	-25.226	54.000	AVERAGE

- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. 1.
- 2.
- Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. 3.
- 4.
- Measurement Level = Reading Level + Correct Factor. 5.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



Product	•	Lenovo 700 Ultraportable Bluetooth Speaker
TTOULUCI	•	Lenovo 700 Omaportable Didetoom Speaker

- Test Item Band Edge :
- Test Site :
- No.3 OATS Test date 2019/01/23 :

Test Mode :

Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

Vertical



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1	*	2479.877	-3.978	99.915	95.937	21.937	74.000	PEAK
2		2483.500	-3.966	46.545	42.578	-31.422	74.000	PEAK
3		2483.645	-3.966	47.539	43.573	-30.427	74.000	PEAK

- 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
- 2. 3.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level.
- 4.
- Measurement Level = Reading Level + Correct Factor. 5.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2019/01/23
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	-3.978	99.548	95.570	41.570	54.000	AVERAGE
2		2483.500	-3.966	34.964	30.997	-23.003	54.000	AVERAGE

- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. 1.
- 2.
- Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. 3.
- 4.
- Measurement Level = Reading Level + Correct Factor. 5.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



Product	•	I enovo 700 Illtraportable Bluetooth Speaker	,
TTOULUCE		Lenovo 700 Omaportable Diuctobili Speaker	

- Test Item Band Edge :
- Test Site :
- No.3 OATS Test date 2019/01/23 :

Test Mode

Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz) :

Horizontal



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		2385.797	-2.706	44.676	41.971	-32.029	74.000	PEAK
2		2390.000	-2.687	43.685	40.998	-33.002	74.000	PEAK
3		2400.000	-2.660	75.607	72.947	-1.053	74.000	PEAK
4	*	2402.029	-2.657	103.311	100.654	26.654	74.000	PEAK

- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. 1.
- 2.
- 3.
- "*", means this data is the worst emission level. 4.
- Measurement Level = Reading Level + Correct Factor. 5.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2019/01/23
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

Horizontal



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		2390.000	-2.687	31.353	28.666	-25.334	54.000	AVERAGE
2		2400.000	-2.660	65.592	62.932	8.932	54.000	AVERAGE
3	*	2402.029	-2.657	99.561	96.904	42.904	54.000	AVERAGE

- All readings above 1GHz are performed with peak and/or average measurements as necessary.
 Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2019/01/23
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

Vertical



		Frequency	Correct Factor	Reading Level	Measure Level	Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		2387.681	-4.151	46.104	41.953	-32.047	74.000	PEAK
2		2390.000	-4.159	44.359	40.200	-33.800	74.000	PEAK
3		2400.000	-4.171	76.634	72.463	-1.537	74.000	PEAK
4	*	2402.029	-4.171	104.674	100.503	26.503	74.000	PEAK

- All readings above 1GHz are performed with peak and/or average measurements as necessary. 1.
- 2. Peak measurements: RBW = 1MHz, VBW = 3MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 "*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.



Product		Lenovo 700 Ultraportable Bluetooth Speaker
TTOULUCE	•	Lenovo 700 Ontaportable Didetobili Speaker

- Test Item Band Edge :
- Test Site No.3 OATS :
- Test date 2019/01/23 :

Test Mode

Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz) :

Vertical



		Frequency Correct Factor		Reading Level Measure Level		Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1		2390.000	-4.159	31.859	27.700	-26.300	54.000	AVERAGE
2		2400.000	-4.171	66.954	62.783	8.783	54.000	AVERAGE
3	*	2402.029	-4.171	100.926	96.755	42.755	54.000	AVERAGE

- All readings above 1GHz are performed with peak and/or average measurements as necessary. 1.
- 2.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. 3.
- 4.
- Measurement Level = Reading Level + Correct Factor. 5.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test date	:	2019/01/23
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

Horizontal



		Frequency Correct Factor		Reading Level Measure Level		Margin	Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1	*	2480.022	-2.605	96.536	93.931	19.931	74.000	PEAK
2		2483.500	-2.601	43.720	41.118	-32.882	74.000	PEAK
3		2483.935	-2.601	44.917	42.316	-31.684	74.000	PEAK

- All readings above 1GHz are performed with peak and/or average measurements as necessary. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. 1.
- 2.
- 3.
- 4.
- Measurement Level = Reading Level + Correct Factor. 5.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.



- Product Lenovo 700 Ultraportable Bluetooth Speaker :
- Test Item Band Edge :
- Test Site No.3 OATS :
- Test date 2019/01/23 :

Test Mode :

Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	-2.605	92.473	89.868	35.868	54.000	AVERAGE
2		2483.500	-2.601	31.223	28.621	-25.379	54.000	AVERAGE

- All readings above 1GHz are performed with peak and/or average measurements as necessary. 1.
- 2.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. 3.
- "*", means this data is the worst emission level. 4.
- 5. Measurement Level = Reading Level + Correct Factor.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



- Product Lenovo 700 Ultraportable Bluetooth Speaker
- Test Item Band Edge :
- Test Site •
- No.3 OATS Test date 2019/01/23 :

Test Mode

Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz) :



		Frequency Correct Factor		Reading Level	Reading Level Measure Level		Limit	Detector Type
		(MHz)	(dB)	(dBuV)	(dBuV/m)	(dB)	(dBuV/m)	
1	*	2480.022	-3.978	101.829	97.851	23.851	74.000	PEAK
2		2483.500	-3.966	48.248	44.281	-29.719	74.000	PEAK
3		2483.645	-3.966	49.440	45.474	-28.526	74.000	PEAK

- All readings above 1GHz are performed with peak and/or average measurements as necessary. 1.
- 2. Peak measurements: RBW = 1MHz, VBW = 3MHz, Sweep: Auto.
- Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. "*", means this data is the worst emission level. 3.
- 4.
- 5. Measurement Level = Reading Level + Correct Factor.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



- Product Lenovo 700 Ultraportable Bluetooth Speaker :
- Test Item Band Edge :
- Test Site No.3 OATS :
- Test date 2019/01/23 :

Test Mode

Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz) :

Vertical



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	-3.978	97.755	93.777	39.777	54.000	AVERAGE
2		2483.500	-3.966	34.854	30.887	-23.113	54.000	AVERAGE

- All readings above 1GHz are performed with peak and/or average measurements as necessary. 1.
- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. 2.
- 3.
- "*", means this data is the worst emission level. 4.
- 5. Measurement Level = Reading Level + Correct Factor.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)(Hopping off)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

10 Keysight Spectrum Analyzer - Swept SA			
Center Freq 2.397000000 GH		ALIGN AUTO 01:52:57 PMJ Avg Type: Log-Pwr TRACE	an 19, 2019 1 2 3 4 5 6 Frequency
Ref Offset 0.5 dB	Gain:Low #Atten: 20 dB	oer Mkr3 2.399 999 8 -51.64	5 GHz Auto Tune
0.500 -9.50			-1417 dbm 2.397000000 GHz
-29.5		3	Start Freq 2.390000000 GHz
-59.5 -69.5			Stop Freq 2.404000000 GHz
Start 2.390000 GHz #Res BW 100 kHz	#VBW 300 kHz	Stop 2.4040 Sweep (#Swp) 2.667 ms (400	00 GHz 001 pts) CF Step 1.400000 MHz Auto Man
1 N 1 f 2.402.056.8 2 N 1 f 2.400.000.0 3 N 1 f 2.399.999.8 4 - - - - 5 - - - - 6 - - - - -	0 GHz 5.83 dBm 0 GHz -51.64 dBm 5 GHz -51.64 dBm		Freq Offset 0 Hz
7 8 9 9 10 11			
MSG		STATUS	·

Figure Channel 78:

🊺 Keysigh	ht Spectrum	Analyzer - Si	wept SA								- 2 -
Center	r Freq	50 s 2.4890	α AC 000000 GH	lz	SE Tria: Fra	NSE:INT	Avg Typ	ALIGN AUTO	02:35:56 P	MJan 19, 2019	Frequency
10 dB(d	Re liv R e	f Offset 0	15 dB	NO: Fast G Gain:Low	#Atten: 2	0 dB		Mkr3 2.	483 936 -55.	15 GHz 97 dBm	Auto Tune
-9.50		1								-13.46 (0.95	Center Freq 2.489000000 GHz
-29.5	ſ	h	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~								Start Freq 2.478000000 GHz
-69.5					al mit the second	********			-	en Munmanes	Stop Freq 2.50000000 GHz
Start 2 #Res E	2.47800 3W 100	GHz kHz		#VB\	N 300 kHz		Sweep (#Swp) 2.	Stop 2.5 667 ms (4	0000 GHz 0001 pts)	CF Step 2.20000 MHz
1 N 2 N 3 N 4 5 6 7 8 9 10 11	10 TRC SC 1 f 1 f 1 f 1 f 1 f 1 f		x 2.480 009 11 2.483 500 01 2.483 936 11	5 GHz 0 GHz 5 GHz	¥ 6.54 di -57.67 di -55.97 di	Bm Bm Bm Bm		NCTION WIDTH	FUNCT		Freq Offset
MSG								STATU	s		



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (Hopping off)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

🊺 Keysig	pht Spect	rum A	nalyzer - Sw	vept SA												
Cente	er Fre	eq 2	50 S	e AC 00000 C	SHz		SEI	NSE:I	NT]	Avg	Туре	LIGN AUTO	02:45:26 P	M Jan 19, 2019 DE 1 2 3 4 5 6	F	requency
10 dB/	div	Ref Ref	Offset 0.	5 dB dBm	PNO: Fast IFGain:Lov	, -	#Atten: 2	0 dE			N	/kr3 2.3	399 787 -48.	40 GHz 21 dBm		Auto Tune
-9.50 -19.5														-15.86 dBm	2.39	Center Freq 7000000 GHz
-29.5 -39.5 -49.5											-	32		Ly	2.39	Start Freq 0000000 GHz
-69.5 -69.5 -79.5	nlennam		lewnes/whi	under	n mar		n Jile of the second state	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	an a	رمىلىيەللەر _{ىلىدە}	_				2.40	Stop Freq 4000000 GHz
Start #Res	2.390 BW 1	000	GHz kHz		#\	/BW	300 kHz			Swee	p (#	swp) 2.6	8top 2.40 667 ms (4	4000 GHz 0001 pts)	Auto	CF Step 1.400000 MHz Man
1 N 2 N 3 N 4 5 6 7 8 9 9				2.402 104 2.400 000 2.399 787	40 GHz 00 GHz 40 GHz		4.14 df -50,64 df -48.21 df	Bm Bm Bm	FUNC		FUN	CTION WIDTH	FUNCT			Freq Offset 0 Hz
MSG								-		_		STATUS	10	,*		

Figure Channel 78:

🊺 Key	sight Sp	ectrum	Analyzer	Swep	xt SA													- 2 -
Cent	ter F	ء req	۶ ۶ 2.489	0 S	AC	GHz		SI Tries For	ENSE:	NT	Avg	Туре	LIGN AUTO	03:	03:56 PI TRAC	MJan 19, 2 E 1 2 3 4	5 6	Frequency
10 dF	Sidiv	Re	f Offset	0.5 0 di	dB Bm	PNO: IFGair	:Fast G n:Low	#Atten:	20 dE	3		N	1kr3 2	.483	512 -56.	65 GI 29 dB	Hz m	Auto Tune
Log 0.500 -9.50 -19.5		Å	1													-14.21	dēm	Center Freq 2.489000000 GHz
-29.6 -39.5 -49.5	ſ		hy		● ³	+						_					_	Start Freq 2.478000000 GHz
-69.5 -69.5 -79.5							ويرمحونهم		~~~~	47.09.494	****	u,e, efe	(proposed)		sands	ans		Stop Freq 2.50000000 GHz
Star #Res	t 2.47 s BW	'800 100	GHz kHz				#VBV	V 300 KH:	z		Swee	p (#	Swp) 2	Stop .667 r	o 2.50 ns (4	0000 G 0001 p	Hz ts)	CF Step 2.200000 MHz Auto Man
1 2 3 4 5 6 7 8 9 10 11 11				2.2.2.	× .479 959 .483 500 .483 512	9 65 G 9 00 G 2 65 G	Hz Hz Hz	* -56.72 d -56.29 d	IBm IBm	FUNG	TION	FUN	CTION WIDT		FUNCTR	on value	·	Freq Offset 0 Hz
MSG													STAT	US				



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)(Hopping on)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

📕 Keysight Sp	ectrum Analyzer -	Swept SA								
Center F	req 2.397	000000 GH	z	SENS	E:INT]	Avg Typ	ALIGN AUTO e: Log-Pwr	01:55:01 P	4Jan 19, 2019 E 1 2 3 4 5 6	Frequency
10 dB(div	Ref Offset	PN IFG 0.5 dB 0 dBm	O: Fast ⊂ ain:Low	#Atten: 20	dB		Mkr3 2.3	99 918 -54.	65 GHz 87 dBm	Auto Tune
-9.50 -19.5								\wedge	-13.28/08m	Center Free 2.397000000 GHz
-29.5 -39.5 -49.5							3			Start Fred 2.390000000 GH
-59.5 -69.5 -79.5	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	la mariana	unterti ^{d t} urre		newletin	numer fritten				Stop Free 2.404000000 GH
Start 2.3 #Res BW	90000 GHz 100 kHz		#VBW	/ 300 kHz	EUN	Sweep (#	Swp) 2.6	top 2.404 667 ms (4	000 GHz 0001 pts)	CF Ster 1.400000 MH <u>Auto</u> Ma
1 N 2 N 3 N 4 5 6 7	1 f 1 f 1 f	2.403 001 10 2.400 000 00 2.399 918 65) GHz) GHz 5 GHz	6.25 dBr -57.01 dBr -54.87 dBr	n n n			PUNCTN		Freq Offse 0 H
8 9 10 11 1 MSG				m			STATUS	5	•	

Figure Channel 78 Hopping:

Keysight Spectrum	Analyzer - Swej	pt SA									
Center Freq	50 Q 2.48900	AC 0000 GH	z	SE	NSE:INT]	Avg	AL Type: I	IGN AUTO	02:37:44 P	M Jan 19, 2019 DE 1 2 3 4 5 6	Frequency
Ref	Offset 0.5	dB	IO:Fast (iain:Low	Trig: Fre #Atten: 2	e Run 0 dB		м	kr3 2.4	85 103 -57	25 GHz 79 dBm	Auto Tune
-9.50	1 10.50 0									-13.75 dBm	Center Freq 2.489000000 GHz
-29.5 -39.5 -49.5	h	2	● ³								Start Freq 2.478000000 GHz
-69.5 -79.5		* A Horney	wara wa	un and a state of the state of	,			et any herten	ernanden	n yu muu	Stop Freq 2.500000000 GHz
Start 2.47800 #Res BW 100	GHz kHz	x	#VB	W 300 kHz	F	Swee	ep (#S	wp) 2.6 поммотн	Stop 2.5 667 ms (4	0000 GHz 0001 pts)	CF Step 2.200000 MHz Auto Man
1 N 1 f 2 N 1 f 3 N 1 f 4 5 5 5 6 7 8 9 9 10 11 11	22222	.478 907 50 .483 500 00 .485 103 25) GHz) GHz 5 GHz	6.25 d -61.01 d -57.79 d	Bm Bm Bm						Freq Offset 0 Hz
		_			-		-			,	
Mara								STATUS	1		



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (Hopping on)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

Keysight Spectrum Analyzer - Swept SA			
Center Freq 2.397000000 /	GHz	ALIGN AUTO 02:48:30 PM Jan 19, 2019 Avg Type: Log-Pwr TRACE 1 2 3 4 5	6 Frequency
Ref Offset 0.5 dB	PNO: Fast This: Free Kun IFGain:Low #Atten: 20 dB	Mkr3 2.399 724 05 GH2 -47.82 dBm	Auto Tune
0.500 -9.50		-13.12 dBr	Center Freq 2.397000000 GHz
-29.5		3.2 yland	Start Freq 2.390000000 GHz
-69.5 -69.5	understrikter and garrent har many lithed		Stop Freq 2.404000000 GHz
Start 2.390000 GHz #Res BW 100 kHz	#VBW 300 kHz	Stop 2.404000 GH Sweep (#Swp) 2.667 ms (40001 pts	CF Step 1.400000 MHz Auto Man
1 N 1 f 2.402.99 2 N 1 f 2.400.00 3 N 1 f 2.400.00 3 N 1 f 2.399.72 4 5 6 6 6 6 7 7 1 <th1< th=""> <th1< th=""> 1 1<</th1<></th1<>	9 00 GHz 6.88 dBm 0 00 GHz -51.60 dBm 4 05 GHz -47.82 dBm		Freq Offset 0 Hz
7 8 9 10 11			
MSG		STATUS	

Figure Channel 78 Hopping:

🚺 Keysight Sp	ectrum Analy	zer - Swe	pt SA								
Center F	^{RF} req 2.4	50 Q 8900	AC 0000 GH	z	SEN	SE:INT	Avg Typ	ALIGN AUTO	03:06:15 P	MJan 19, 2019 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref Of	set 0.5 0.50 d	dB Bm	VO: Fast C Jain:Low	#Atten: 20) dB		Mkr3 2.	485 003 -57.	15 GHz 07 dBm	Auto Tune
0.500 4411 -9.50	n th									-1254 dDm	Center Freq 2.489000000 GHz
-29.5 -39.5 -49.5		n L	. ^2	▲3							Start Freq 2.478000000 GHz
-69.5 -69.5 -79.5			Not and Harrison	-		handraad ay the	hilmonometan	ana ang tang tang tang tang tang tang ta	and a start of the	eren Mer	Stop Freq 2.500000000 GHz
Start 2.4 #Res BW	7800 GH 100 kH	lz Z	×	#VB	W 300 kHz	EUN	Sweep (#Swp) 2	Stop 2.5 .667 ms (4	0000 GHz 0001 pts)	CF Step 2.200000 MHz Auto Man
1 N 2 N 3 N 4 5		222	2.479 821 6 2.483 500 0 2.485 003 1) GHz) GHz 5 GHz	7.46 dE -59.16 dB -57.07 dB	im m m				E	Freq Offset 0 Hz
7 8 9 10 11											
MSG		-		_				STAT	s		



7. Channel Number

7.1. Test Setup



7.2. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 75 hopping frequencies.

7.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

7.4. Uncertainty

N/A

7.5. Test Result of Channel Number

Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Channel Number
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

Frequency Range	Measurement	Required Limit	Recult	
(MHz)	(Hopping Channel)	(Hopping Channel)	Kesult	
2402 ~ 2480	79	>75	Pass	

2402-2421MHz

2422-2441MHz

BIK Keysight Spectrum Analyzer - Swept SA	ar - Sergt SA							
Center Freq 2.411000000 GHz Trig: Free Run	AUGN AUTO 02:38:43 PH Jan 19, 2019 Avg Type: Log-Pwr TRACE 1 2 3 4 5 6 TVPE NWWWWW	Frequency	AL BF Sol B AC SENSE-DNT ALION AUTO [02:39:12 PM]an 19,2019 Center Freq 2.431500000 GHz Avg Type: Log-Pwr Trace [1:3:45:6 Free	quency				
IFGaint.ow #Atten: 20 dB Ref Offset 0.5 dB	Mkr2 2.421 000 GHz 6.62 dBm	Auto Tune	Ref Offset 0.5 dB Control of the Con	Auto Tune				
		Center Freq 2.411000000 GHz		enter Freq 500000 GHz				
1935 295 395 495		Start Freq 2.400500000 GHz	175 295 395 495 495	Start Freq 500000 GHz				
40 5 40 5 		Stop Freq 2.421500000 GHz	05 2.441	Stop Freq 500000 GHz				
Start 2.40050 GHz #Res BW 100 kHz #VBW 100 kHz	Stop 2.42150 GHz Sweep (#Swp) 2.533 ms (1001 pts)	CF Step 2.100000 MHz Auto Man	Start 2.42150 GHz #Res BW 100 kHz #VBW 100 kHz Sweep (#Swp) 2.467 ms (1001 pts) 4400	CF Step				
ID:01 ID:01 <th< td=""><td>UNCTION FUNCTION WIDTH FUNCTION WAVE A</td><td>Freq Offset 0 Hz</td><td>ID:0 ID:0 <th< td=""><td>req Offset 0 Hz</td></th<></td></th<>	UNCTION FUNCTION WIDTH FUNCTION WAVE A	Freq Offset 0 Hz	ID:0 ID:0 <th< td=""><td>req Offset 0 Hz</td></th<>	req Offset 0 Hz				
6 77 78 9 9 10 11			6					
e men	STATUS		MEG STATUS					

2442-2461MHz

2462-2480MHz

Keysight Spectrum Analyzer - Swept SA				000	BE Keysir	ght Spectrum	Analyzer - Swe	ept SA								000
Center Freq 2.451500000 GHz	SENSE:INT	Avg Type: Log-Pwr	02:39:41 PM Jan 19, 2019 TRACE 1 2 3 4 5 6	Frequency	Cente	er Freq	2.47150	00000 GH	z	SEN	SE:INT	Avg Type	ALIGN AUTO	02:40:15 PI TRAC	# Jan 19, 2019 E 1 2 3 4 5 6	Frequency
PNO: Fas IFGain:Lo	#Atten: 20 dB	Mkr	2 2.461 00 GHz	Auto Tune				PN	IO: Fast G	#Atten: 20	dB		Mkr	2 2 480	00 GHz	Auto Tune
10 dB/div Ref 10.50 dBm			5.67 dBm		10 dB/	div R	f Offset 0.5	dBm						6.	10 dBm	
	MM	m	MM	Center Freq 2.451500000 GHz	-9:50	*\^	M	M	M	\mathcal{M}	M	\mathcal{M}	M	M	*2	Center Freq 2.471500000 GHz
-29.5 				Start Freq 2.441500000 GHz	-29.5 -39.5 -49.5										h	Start Freq 2.461500000 GHz
69.5 				Stop Freq 2.461500000 GHz	-69.5 -69.5 -79.5 -											Stop Freq 2.481500000 GHz
Start 2.44150 GHz #Res BW 100 kHz #	/BW 100 kHz	Sweep (#Swp) 2.	Stop 2.46150 GHz 467 ms (1001 pts)	CF Step 2.000000 MHz Auto Man	Start #Res	2.46150 BW 100	GHz kHz		#VBW	100 kHz		Sweep	(#Swp) 2	Stop 2.48 .467 ms (8150 GHz 1001 pts)	CF Step 2.000000 MHz Auto Man
1 N 1 f 2.442 00 GHz 2 N 1 f 2.461 00 GHz 3 4 5	5,48 dBm 5,67 dBm		1002-1100 002-5	Freq Offset 0 Hz	1 N 2 N 3 4 5			2.452.00 2.480.00) GHz) GHz	5.96 dE 6.10 dE	m m					Freq Offset 0 Hz
6 7 8 9 10 11					6 7 8 9 10 11											
MSG	-	STATUS			MSG								STATU	5	-	



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Channel Number
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)

Frequency Range	Measurement	Required Limit	Result		
(MHz)	(Hopping Channel)	(Hopping Channel)	Kesuit		
$2402 \sim 2480$	79	>75	Pass		

2402-2421MHz

2422-2441MHz

Keysight Spectrum Analyzer - Swept SA		1.1.1. (Inc.) (Inc.)	🚛 🗱 Keysight Spectrum Analyzer - Swept SA	0.00
Center Freq 2.411000000 GHz	Avg Type: Log-Pwr TACE 1 2 3 4 5 Trace 1 2 3 4 5 Trace 1 2 3 4 5	5 Frequency	Mail RF So g Acc SERVE INT ALIGN AUTO 02:96:19 PM Jan 19, 2019 Center Freq 2.431500000 GHz Avg Type: Log-Pwr Trace[1:2:3:4:5:6	Frequency
PNO: Fast C Ing: Fre IFGein:Low #Atten: 2	0 dB DET P NNNN	Auto Tune	PNO: Fast Ing, Free Run IFGaint.ow #Atten: 20 dB	Auto Tune
Ref Offset 0.5 dB 10 dB/div Ref 10.50 dBm	3.95 dBm		Ref Offset 0.5 dB	100000000
oso the man and a man and a man	homen and the second	Center Freq 2.411000000 GHz	1000 Mar 100 M	Center Freq 431500000 GHz
205 205 405		Start Freq 2.400500000 GHz	eq 395 395 395 495 2	Start Freq 421500000 GHz
49.5 69.5 -79.5		Stop Freq 2.421500000 GHz	#6	Stop Freq 441500000 GHz
Start 2.40050 GHz #Res BW 100 kHz #VBW 100 kHz	Stop 2.42150 GHz Sweep (#Swp) 2.533 ms (1001 pts	CF Step 2.100000 MHz Auto Man	ep Start 2.42150 GHz Stop 2.44150 GHz H-z #Res BW 100 kHz #VBW 100 kHz Sweep (#Swp) 2.467 ms (1001 pts) Auto	CF Step 2.000000 MHz o Man
Log local line local 1 A 1 f 2.402 000 GHz 6.76 dl 2 N 1 f 2.402 000 GHz 3.96 dl 3 - - 2.421 000 GHz 3.96 dl 4 - - - 6 - - - 8 - - -	m 10xeron kon 10xe	Freq Offset 0 Hz	Workboll tric period X A22 00 GHz Y TUDE 500 TuDE 500 Work1	Freq Offset 0 Hz
9 10 11 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	STATUS			

2442-2461MHz

2462-2480MHz

Keysight Spectrum Analyzer - Swept SA		0.0	🗱 Keysight Spectrum Analyzer - Swept SA	010 00
Center Freq 2.451500000 GHz Teles Freq 2.451500000 GHz	Aug Type: Log-Pwr TRACE 1 2 3 4 5 6	Frequency	AL RF S0:0: AC SEME:INT ALION AUTO G3:0:00 PM Jap 19, 2019 Center Freq 2.471500000 GHz Tric Face Pure Avg Type: Log-Pwr Trace[1:2:3:4:5:6] Free	quency
PNO: Faat Contracting IFGein:Low #Atten: 20 dB	Mkr2 2.461 00 GHz	Auto Tune	PHOC Fast RATER to 0 dB OCT P KNNWN BATER to 0 dB OCT P KNNWN BATER to 0.5 dB MKNWN BATER to 0.5 dB	Auto Tune
10 gBddiv Ref 10.50 dBm 9 50 Hand Angeland Alexandron A	6.66 dBm	Center Freq 2.451500000 GHz	10 Billow Ref 10.50 dBm 8.26 dBm 10 Billow Ref 10.50 dBm 200	enter Freq 500000 GHz
405		Start Freq 2.441500000 GHz	235 235 485	Start Freq 500000 GHz
49.5 49.5 -79.5		Stop Freq 2.461500000 GHz	49.5 49.5 79.5 79.5 24.81	Stop Freq 500000 GHz
Start 2.44150 GHz #Res BW 100 kHz #VBW 100 kHz	Stop 2.46150 GHz Sweep (#Swp) 2.467 ms (1001 pts)	CF Step 2.000000 MHz Auto Man	Start 2.46150 GHz #Res BW 100 kHz #VBW 100 kHz Sweep (#Swp) 2.467 ms (1001 pt) 	CF Step 000000 MHz Man
1 N 1 7 2.442 00 GHz 5.83 dBm 3 1 f 2.491 00 GHz 6.86 dBm 3 4 - - 5 - - - 6 - - - 7 - - - 8 - - - 9 - - -		Freq Offset 0 Hz	1 N 1 1 2.4452.00 GHz 7.95 dBm 3 1 f 2.480.00 GHz 8.26 dBm 6 3 4	req Offset 0 Hz
10	status			

8. Channel Separation

8.1. Test Setup



8.2. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

8.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

8.4. Uncertainty

± 283Hz

8.5. Test Result of Channel Separation

Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Channel Separation
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

Channel No.		Measurement	Limit	Limit of (2/3)*20dB	B Result	
	(MHz)	Level	(1.11)	Donduridth (1-11-)		
		(kHz)	(KHZ)	Bandwidin (KHZ)		
00	2402	1000	>25 kHz	648.0	Pass	
39	2441	1000	>25 kHz	680.0	Pass	
78	2480	1000	>25 kHz	648.0	Pass	

NOTE: The 20dB Bandwidth is refer to section 10.

🊺 Ke	ysight	Spect	rum /	Analyzer - Swe	ept SA								
<mark>⊯</mark> R Cen	L Iter	Fre	RF eq 2	50 Ω 2.40200	AC 0000 GH	z	SE	NSE:INT	Avg Typ	ALIGN AUTO	01:52:25 PI TRAC	MJan 19, 2019 E 1 2 3 4 5 6	Frequency
10 d	B/div		Ref Ref	Offset 0.5	dB IBm	IO: Wide Gain:Low	#Atten: 2	20 dB		Mkr	2 2.403 5.4	00 GHz	Auto Tune
Log 0.500 -9.50 -19.5		-						¥1	2				Center Freq 2.402000000 GHz
-29.5 -39.5 -49.5						materia				heren	44		Start Freq 2.397000000 GHz
-59.5 -69.5 -79.5	d and a	0'***** *	للجيلم								- and the second s	1000-200 <u>110-20</u>	Stop Freq 2.407000000 GHz
Cen #Re	ter s B	2.4(W 1	020 00	00 GHz kHz		#VE	3W 100 kHz	2	#	¢Sweep 5	Span 1 00.0 ms (0.00 MHz 1001 pts)	CF Step 1.000000 MHz Auto Man
MKR 1 2 3 4 5 6 7 8 9 10 11 <	MODE N N		SCI f f		X 2.402 0 2.403 0	0 GHz 0 GHz	Y 5.38 d 5.55 d	Bm Bm 	NCTION FU	INCTION WIDTH	FUNCTIO		Freq Offset 0 Hz
MSG										STATU	3		t

Channel 00 (2402MHz)

🇾 Ke	eysight	Spect	rum A	Analyzer - Swe	pt SA								
<mark>⊮</mark> ℝ Cer	nter	Fre	RF q 2	50 Ω 2.44100	AC 0000 GH	z			Avg Ty	ALIGN AUTO	03:26:42 P TRAC TY	M Jan 19, 2019 E 1 2 3 4 5 6 E M WWWW	Frequency
10 d	B/di [,]		Ref Ref	Offset 0.5 f 10.50 d	dB IBm	iO: wide Gain:Low	#Atten:	20 dB		Mk	00 GHz 54 dBm	Auto Tune	
Log 0.500 -9.50								¥1	2				Center Freq 2.441000000 GHz
-29.5 -39.5 -49.5	; ; ;					and the second	~			A Manun			Start Freq 2.436000000 GHz
-59.5 -69.5 -79.5	i	نان بەرىلەر ر		energy with a second	erap gurana							hadalan bernes	Stop Freq 2.446000000 GHz
Cer #Re	nter es B	2.44 W 1	410 00	00 GHz kHz		#VI	3W 100 kHz	2		#Sweep :	Span 1 500.0 ms (0.00 MHz 1001 pts)	CF Step 1.000000 MHz Auto Man
MKR 1 2 3 4 5 6 7 8 9 10 11	MODE N N		SCI f		X 2.441 0 2.442 0	0 GHz 0 GHz	Y 5.44 c 5.54 c	Bm Bm 		UNCTION WIDTH			Freq Offset
MSG										STATU	IS		

Channel 39 (2441MHz)

Channel 78 (2480MHz)

Center Fre	RF 50 Ω	AC	0.51		-				
	q 2.48000	0000 GHz	Talas Face	NSE:INT	Avg Typ	ALIGN AUTO e: Log-Pwr	02:35:27 PI TRAC	MJan 19, 2019 E 1 2 3 4 5 6	Frequency
10 dB(div	Ref Offset 0.5	PNO: Wid IFGain:Lo dB 1Bm	de 🎧 Trig: Free ow #Atten: 2	0 dB		Mkr	1 2.479 6.0	00 GHz	Auto Tune
-9.50				*2					Center Freq 2.480000000 GHz
-29.5 -39.5 -49.5	- marahalanmar					And and a second second			Start Freq 2.475000000 GHz
-59.5								<u>/hafaabbuudgebaa</u> a	Stop Freq 2.485000000 GHz
Center 2.48 #Res BW 1	30000 GHz 00 kHz	#	VBW 100 kHz		#	Sweep 5	Span 1 00.0 ms (0.00 MHz 1001 pts)	CF Step 1.000000 MHz Auto Man
MSS MODE FRG 1 N 1 2 N 1 3 - - 6 - - 7 - - 8 - - 9 - - 10 - - 11 - -		X 2.479 00 GHz 2.480 00 GHz	z 6.08 di z 6.00 di	FUNC Bm Bm		NCTION WIDTH			Freq Offset 0 Hz



:	Lenovo 700 Ultraportable Bluetooth Speaker
:	Channel Separation
:	No.3 OATS
:	Mode 2: Transmit - 3Mbps (8DPSK)
	: : :

	Eroquonou	Measurement	Limit	Limit of (2/3)*20dB	Result	
Channel No.	(MHz)	Level	(1/1/2)	Dandwidth (kHz)		
	(IVITIZ)	(kHz)	(KIIZ)	Dalidwidtli (KHZ)		
00 2402		1000	>25 kHz	904.0	Pass	
39	2441	1000	>25 kHz	904.0	Pass	
78	2480	1000	>25 kHz	904.0	Pass	

NOTE: The 20dB Bandwidth is refer to section 10.

🎉 Keysight	t Spectrui	n Analyzer - S	wept SA								
Center	Frec	RF 50	Ω AC	lz	SEN	ISE:INT	Avg Type	ALIGN AUTO E: Log-Pwr	02:44:51 P TRAC	M Jan 19, 2019 E 1 2 3 4 5 6	Frequency
			PI IF	NO: Wide G Gain:Low	#Atten: 20) dB			0 0 100		Auto Tune
10 dB/div	v R	ef Offset 0 ef 10.50	0.5 dB d Bm					MK	2 2.403 2.	00 GHZ 74 dBm	
Log 0.500 —					m	Linger	2				Center Freq
-9.50											2.402000000 GHz
-29.5 -39.5				m	~~		- \ -	m			Start Freq
-49.5	h-dul	and the state of the	un Unorth and and and	-				<u> </u>	and and the second	and an and an and an and an and an	2.037000000 0112
-69.5											Stop Freq 2.407000000 GHz
-79.5											
Center #Res B	2.402 W 10	2000 GH: 0 kHz	Z	#VB۱	№ 100 kHz		#	Sweep 5	Span 1 00.0 ms (0.00 MHz 1001 pts)	CF Step 1.000000 MHz
MKR MODE	TRC S	CL f	× 2.402 0	0 GHz	2.60 dE	FUN Bm	NCTION FUN	ICTION WIDTH	FUNCT	ON VALUE	
2 N 3 4	1		2.403 0	0 GHZ	2./4 dE	3m					Freq Offset 0 Hz
6 7											
8 9 10											
11					ш						
MSG								STATU	s		

Channel 00 (2402MHz)



🎉 Keysight Spectru	um Analyzer - Swep	ot SA							
Center Fre	RF 50 Ω q 2.44100	AC 0000 GHz	Tria: Fu		Avg Type	ALIGN AUTO e: Log-Pwr	03:27:46 P TRAC	M Jan 19, 2019 CE 1 2 3 4 5 6 DE M WWWWW	Frequency
10 dB/div	Ref Offset 0.5 Ref 10.50 d	dB Bm	Low #Atten:	20 dB		Mkr	2 2.442 3.	00 GHz 39 dBm	Auto Tune
-9.50 -19.5			~		2				Center Freq 2.441000000 GHz
-29.5 -39.5 -49.5		manul				h	The second se		Start Fred 2.436000000 GHz
-59.5	dand see also be						- V-Mar	hi-induction	Stop Fred 2.446000000 GHz
Center 2.44 #Res BW 10	1000 GHz)0 kHz	X	#VBW 100 kH	Iz FU	#	Sweep 5	Span 1 00.0 ms (0.00 MHz 1001 pts)	CF Step 1.000000 MHz <u>Auto</u> Mar
1 N 1 2 N 1 3 4 5 5	f	2.441 00 GI 2.442 00 GI	Hz 3.26 Hz 3.39	dBm dBm				====	Freq Offset 0 Hz
7 8 9 10 11									
MSG			III			STATUS	6	- F	

Channel 39 (2441MHz)

Channel 78 (2480MHz)

🇾 Ke	ysight	Spect	rum A	Analyzer - Swe	ept SA								
KN R Cen	L Iter	Fre	RF q 2	50 Ω 2.48000	AC 0000 GH	łz	SEI	NSE:INT	Avg Typ	ALIGN AUTO e: Log-Pwr	03:03:25 PI TRAC	MJan 19, 2019 E 1 2 3 4 5 6	Frequency
10 d	B/div	,	Ref Ref	Offset 0.5	odB JBm	NO: Wide (Gain:Low	#Atten: 2	0 dB		Mkr	1 2.479 4.0	00 GHz 06 dBm	Auto Tune
Log 0.500 -9.50 -19.5						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~1.~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	2					Center Freq 2.480000000 GHz
-29.5 -39.5 -49.5			0							- Renauth Land Land			Start Freq 2.475000000 GHz
-59.5 -69.5 -79.5				-								ethere and the second	Stop Freq 2.485000000 GHz
Cen #Re	ter s Bl	2.48 W 1	800 00	00 GHz kHz		#VB	W 100 kHz		#	Sweep 5	Span 1 00.0 ms (0.00 MHz 1001 pts)	CF Step 1.000000 MHz Auto Man
MKR 1 2 3 4 5 6 7 8 9 10 11 <					x 2,479 0 2,480 0	0 GHz 0 GHz	¥ 4.06 di 4.08 di	EUN Bm Bm Bm Bm Bm Bm Bm Bm Bm Bm Bm Bm Bm		NCTION WIDTH	FUNCTIO		Freq Offset 0 Hz
MSG										STATUS	5		



9. Dwell Time

9.1. Test Setup



9.2. Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

9.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

9.4. Uncertainty

 \pm 25msec



9.5. Test Result of Dwell Time

Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Dwell Time
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (Channel 00,39,78 –DH5)

Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Dwell Time (ms)	Limit (ms)	Result
2402	2.890	101	31600	291.890	400	Pass
2441	2.890	107	31600	309.230	400	Pass
2480	2.890	100	31600	289.000	400	Pass

Dwell time = Time slot length*Hopping of number

Sweep time= 79 CHannel * 0.4


CH 00 Time Interval between hops

CH 00 Transmission Time

			-
Center Freq 2.402000000 GHz Avg Type: Log-Pwr TRACE 1 2 3 4 5	6 Frequency	Center Freq 2.402000000 GHz Trig Delay-500.0 µs Avg Type: Log-Pwr TRACE 2.3 4.5 6 Freque	ncy
PROC Fast Ing. Une Avginoid: In Ort Province IFGainLow Atten: 20 dB 10 eBidiv Ref 10.50 dB	Auto Tune	PHOC Fast -+ Trig: Video Official Video Autor Official Video Official Video	o Tune
	Center Freq 2.402000000 GHz	1 2/201 (2.402000) 1 2/202000	er Frec X00 GH:
.95	Start Freq 2.402000000 GHz	9 450	rt Free X00 GH
.295	Stop Freq 2.402000000 GHz	19 295 Sto 242 20000	p Free
	CF Step 510.000 kHz Auto Man		F Step X00 MH Mar
	Freq Offset 0 Hz	et dz	Offse 0 Ha
Res BW 510 kHz #VBW 3.0 MHz Sweep 31.60 s (30001 pts	5)	Center 2.402000000 GHz Span 0 Hz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 10.00 ms (1001 pts)	
MSG STATUS	8	MSG STATUS	

CH39 Time Interval between hops

CH 39Transmission Time

Keysight Spectrum Analyzer - Swept SA		0.0	BE Ke	ysight Sp	ectrum Analyzer - Swept SA									0.0
RL RF 50.0 AC SENSE:INT ALIGN AUTO 01:17:02 PM Ja Center Freq 2.441000000 GHz Avg Type: Log-Pwr TRACE 1	an 19,2019 1 2 3 4 5 6	Frequency	Cen	ter F	reg 2.44100000	0 GHz	-	Trig Dela	ry-500.0 µs	Avg Type	Log-Pwr	01:28:38 PI TRAC	H Jan 19, 2019	Frequency
PRO: Faur ++ Trig: Free Run Avg/Hold: 1/1 Trigin BrGainLow Atten: 20 dB Avg/Hold: 1/1 Definition 10 dB/div Ref 10.50 dBm	PNNNN	Auto Tune	10 di	B/div	Ref Offset 0.5 dB Ref 10.50 dBm	PNO: Fas IFGain:Lo	N	Trig: Vide Atten: 20	eo 0 dB		۵	Mkr2 2	.890 ms 0.26 dB	Auto Tune
		Center Freq 2.441000000 GHz	0.500	H	1		Δ1						TROLVL	Center Freq 2.441000000 GHz
		Start Freq 2.441000000 GHz	-9.50 -19.5											Start Fred 2.441000000 GH:
-295		Stop Freq 2.441000000 GHz	-29.5 -39.5						-					Stop Freq 2.441000000 GHz
		CF Step 510.000 kHz Auto Man	-49.5	1.1				under	heduisedik	eneralist	d	Nindhikk	19/4/hurgh	CF Step 1.000000 MH Auto Mar
85		Freq Offset 0 Hz	-69.5	UMM.			- Service	fui (e se	- of sect	Alatastia			Freq Offse 0 H;
275 Center 2,441000000 GHz Spi Dec BW 510 HHz Sween 31 60 5(200	an 0 Hz		-79.5 Cen	ter 2.	441000000 GHz		/BW	1.0 MHz			Sween 1	S 0.00 ms (pan 0 Hz	
MSG STATUS	se. post		MSG					Miriz			STATUS		pray	

CH 78 Time Interval between hops

CH 78 Transmission Time

🐹 Keysight Spectrum Analyzer - Swept SA		0.0.0	BE Keysight	t Spectrum Analyzer - Swept SA					0.0.0
Center Freq 2.480000000 GHz Aug Type: Log-Pwr	01:39:21 PH Jan 19, 2019 TRACE 1 2 3 4 5 6	Frequency	Center	Freq 2.48000000	0 GHz	Trig Delay-500.0 p	s Avg Type: Log-Pwr	01:32:06 PH Jan 19, 2019 TRACE 1 2 3 4 5 6	Frequency
PROFast Trip: Une Avg Hold: 1/1 IFGainLow Atten: 20 dB 10 dB/div Ref 015st0.5 dB	DET P NNNN N	Auto Tune	10 dB/di	Ref Offset 0.5 dB Ref 10.50 dBm	PNO: Fast -+ IFGain:Low	" Trig: Video Atten: 20 dB	4	Mkr2 2.890 ms -0.17 dB	Auto Tune
		Center Freq 2.480000000 GHz	0.500	V1	₹2∆1			280 <i>1.VL</i>	Center Freq 2.480000000 GHz
99) -195		Start Freq 2.480000000 GHz	-9:50 -19:5 —						Start Freq 2.480000000 GHz
.395		Stop Freq 2.480000000 GHz	-29.5						Stop Freq 2.480000000 GHz
-05	in the second	CF Step 510.000 kHz Auto Man	-49.5			و. المعاملة المعامدة .	eirbenderlaid i	starijski fandata sa	CF Step 1.000000 MHr Auto Mar
85		Freq Offset 0 Hz	-69.5 —	v	MARY	all dan de alle al este este este este este este este est	Netter a sur a	an la cue de la deserva	Freq Offse 0 Hi
735 Center 2.480000000 GHz	Span 0 Hz		-79.5 Center	2.48000000 GHz				Span 0 Hz	
Res BW 510 KHz #VBW 3.0 MHz Sweep 3 MSG Status	31.60 s (30001 pts)		Res BW	/ 1.0 MHz	#VBW	1.0 MHz	Sweep 1	0.00 ms (1001 pts)	

Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.



Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Dwell Time
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (Channel 00,39,78 –DH5)

Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.900	99	31600	287.100	400	Pass
2441	2.890	110	31600	317.900	400	Pass
2480	2.890	106	31600	306.340	400	Pass

Dwell time = Time slot length*Hopping of number

Sweep time= 79 CHannel * 0.4



CH 00 Time Interval between hops

CH 00 Transmission Time

		11 11 11 11 11 11		The second second	the second		10.000	Contraction of the property of							1		Contraction of the local division of the loc
Center Freq 2.40	2000000 GHz	SERGE:2NT	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6	Frequency	Cen	ter	Freg 2,40200	00000 GHz		Trig Dela	sy-500.0 µs	Avg Type	Log-Pwr	01:33:33 PM	E 1 2 3 4 5 6	Frequency
Ref Offse 10 dB/div Ref 10.5	PNO: Fast -+ IFGain:Low t0.5 dB 50 dBm	≓ Trig: Line Atten: 20 dB	Avg Hold: 1/1	TYPE NUMMER DET PINNINN	Auto Tune	10 di	B/div	Ref Offset 0.5 Ref 10.50 c	PNC IFGa IBm	t Fast 🗝 in:Low	Atten: 2	eo 0 dB		۵	Mkr2 2.	900 ms 0.62 dB	Auto Tun
0.500					Center Freq 2.40200000 GHz	0.500	\square	(Jacoba and a start and a start	P.P	2Δ1						19IO LVL	Center Free 2.402000000 GH
-9.50					Start Freq 2.402000000 GHz	-9.50 -19.5											Start Free 2.402000000 GH
-29.5					Stop Freq 2.402000000 GHz	-29.5 -39.5											Stop Fred 2.402000000 GH
-49.5			والملي المانية	an a	CF Step 510.000 kHz Auto Man	-49.5					المتغلقدية	بالمالية	ور والر أواد والله ال	4	and an light	الم الدوري	CF Step 1.000000 MH Auto Mar
-69.5					Freq Offset 0 Hz	-69.5	dete			Left 4	Mar Mar.	ad on a let	and and and	*#Ifelfer	Let stranget	lediation of	Freq Offse 0 H
.79.5 Center 2.40200000	0 GHz			Span 0 Hz		-79.5		2.402000000 G	Hz						s	pan 0 Hz	
Res BW 510 kHz	#VBW	/ 3.0 MHz	Sweep	31.60 s (30001 pts)		Res	BW	1.0 MHz	076	#VBV	V 1.0 MHz		1	Sweep 1	0.00 ms (*	1001 pts)	
MSG			STATU	5		MSG								STATUS			

CH39 Time Interval between hops

CH 39Transmission Time

🐹 Keysight Spectrum Analyzer - Swept SA		0.0	BK Keys	ight Specti	um Analyzer - Sn	rept SA								0.0
RL RF 50 0 AC SENSE: 3NT ALSON AUTO Center Freg 2.441000000 GHz Avg Type: Log-Pwr	01:25:40 PM Jan 19, 2019 TRACE 1 2 3 4 5 6	Frequency	Cent	er Fre	g 2.44100	00000 GHz		Trig Del	ay-500.0 µs	Avg Type	Log-Pwr	01:27:34 PP TRAC	E 1 2 3 4 5 6	Frequency
PRC:Faut +- Trig: Free Run Avg Hold: 1/1 IFGainLow Atten: 20 dB 10 dB/div Ref 10.50 dBm	DET P NNNN N	Auto Tune	10 dB	div	Ref Offset 0. Ref 10.50	PNO: IFGair 5 dB dBm	Fast -+	Trig: Vid Atten: 2	leo 0 dB		۵	Mkr2 2.	890 ms 0.47 dB	Auto Tune
		Center Freq 2.441000000 GHz	0.500	1		*****	201						TRO LVL	Center Freq 2.441000000 GHz
ess en		Start Freq 2.441000000 GHz	-9.50 -19.5	-										Start Freq 2.441000000 GHz
.995	Transidati	Stop Freq 2.441000000 GHz	-29.5 -39.5											Stop Freq 2.441000000 GHz
-85 -63		CF Step 510.000 kHz <u>Auto</u> Man	-49.5				.ixtur		al hugh sign	yndiaerdau	Mature 1	enterply	klakletajiksi	CF Step 1.000000 MHz Auto Man
69.5		Freq Offset 0 Hz	-69.5	Υr.			dition	r			ul carate			Freq Offset 0 Hz
-795			-79.5											
Center 2.441000000 GHz Res BW 510 kHz #VBW 3.0 MHz Sweep 3	Span 0 Hz 1.60 s (30001 pts)		Cente Res E	er 2.44 BW 1.0	1000000 C MHz	GHz	#VBW	1.0 MHz			Sweep 1	S 0.00 ms (pan 0 Hz 1001 pts)	
MSG STATUS		-	MSG								STATUS			

CH 78 Time Interval between hops

CH 78 Transmission Time

Keysight Spectrum Analyzer - Snept SA		0.0.0	BK Ke	rsight Sp	ectrum Analyzer - Sin	ept SA								0.0.0
RL RF 50 0 AC SENSE:0NT AUTO 01:08:14 PM/3 Center Freq 2.480000000 GHz Avg Type: Log-Pwr TRACE	an 19,2019 1 2 3 4 5 6	Frequency	Cen	ter F	reg 2.48000	00000 GHz		Trig Dela	ry-500.0 µs	Avg Type	Log-Pwr	01:32:53 PP TRAC	E 1 2 3 4 5 6	Frequency
FRO: Fair +> Trig: Line Avg/Nold: 1/1 Trig: Line IFGain.Low Atten: 20 dB 0 0 0 10 dB/div Ref 0ffset 0.5 dB 0 0 0	PNNNN	Auto Tune	10 di	3/div	Ref Offset 0. Ref 10.50	PNO: IFGair 5 dB dBm	Fast -+	Trig: Vid Atten: 2	eo 0 dB		۵	Mkr2 2.	890 ms 0.05 dB	Auto Tune
		Center Freq 2.480000000 GHz	0.500	Ť		-14-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-	2Δ1						TRO LVL	Center Freq 2.480000000 GHz
9.5		Start Freq 2.480000000 GHz	-9.50 -19.5											Start Freq 2.480000000 GHz
.985 - An Iller - An Iller 1985 - Anne Anne Anne Anne Anne Anne Anne An	<u>h</u> p	Stop Freq 2.480000000 GHz	-29.5 -39.5						-					Stop Freq 2.480000000 GHz
		CF Step 510.000 kHz Auto Man	-49.5				1.44	MARIE	hunderlight	Late therebience	Verstrad	manua	mandle	CF Step 1.000000 MHz Auto Man
25	0000000	Freq Offset 0 Hz	-69.5	aki.			Altree	691 - m e r			. Absolution.	1	1. dravi je v	Freq Offset 0 Hz
	an A Ha		-79.5		480000000									
Res BW 510 kHz #VBW 3.0 MHz Sweep 31.60 s (300	001 pts)		Res	BW 1	1.0 MHz	9112	#VBW	/ 1.0 MHz			Sweep 1	0.00 ms (1001 pts)	
MSG STATUS			MSG								STATUS			

Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.



10. Occupied Bandwidth

10.1. Test Setup



10.2. Limits

N/A

10.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

10.4. Uncertainty

± 283Hz



10.5. Test Result of Occupied Bandwidth

Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	972		NA
39	2441	1020		NA
78	2480	972		NA

Figure Channel 00:

🎉 Keysight Spect	trum Analyzer - Sw	vept SA								
Center Fre	RF 50 Ω eq 2.4020	2 AC 00000 GH	z	SENS	SE:INT	Avg Type	ALIGN AUTO : Log-Pwr	01:56:28 PI TRAC	M Jan 19, 2019 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref Offset 0. Ref 10.50	5 dB dBm	lO:Wide ⊆⊾ Gain:Low	#Atten: 20	dB		Mkr2	2.401 5 -16.	32 GHz 52 dBm	Auto Tune
-9.50			2~~	~~~~		~3			-16.33 dBm	Center Freq 2.402000000 GHz
-29.5 -39.5 -49.5	and a constant								· ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Start Freq 2.400500000 GHz
-59.5 -69.5 -79.5										Stop Freq 2.403500000 GHz
Center 2.4 #Res BW 3	02000 GHz 30 kHz		#VBW	/ 100 kHz	500/	Sweep	(#Swp) 3	Span 3 .200 ms (.000 MHz 1001 pts)	CF Step 300.000 kHz <u>Auto</u> Man
Million 1 1 1 N 1 2 N 1 3 N 1 4 - - 5 - - 6 - - 7 - - 8 - - 9 - 10 11 - -		x 2.401 975 2.401 532 2.402 504	9 GHz 2 GHz 4 GHz	<u>3.67 dB</u> -16.52 dB -16.69 dB				FUNCTION		Freq Offset 0 Hz
MSG							STATUS	6		

🊺 Key	ysight S	Spectru	um Ai	nalyzer - Sw	rept SA													
Cen	ter	Fre	RF q 2	50 Ω .44100	AC	GH	z	_	SEN	Run		Avg Ty	ALIGN AUT	ro wr	02:02:28 PI TRAC	M Jan 19, 2019 E 1 2 3 4 5 E M WWWW	€ 6	Frequency
		F	Ref	Offset 0.	5 dB	IFG	iO: Wide Sain:Lov	e L _b	#Atten: 2	0 dB			Mk	r2 2	2.440 4	81 GH	N Z	Auto Tune
10 dl Log -9.50	B/div	F	Ref	10.50	dBm		€ ²	~~~	~~~~`	1	~~~	Ń	8		-16.4	40 aBn -16.38 dBr		Center Freq 2.441000000 GHz
-29.5 -39.5 -49.5		~~~			~~	~								\checkmark	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mana		Start Freq 2.439500000 GHz
-59.5 -69.5 -79.5																		Stop Freq 2.442500000 GHz
Cen #Re	ter 2 s BV	2.44 N 30	100) ki)0 GHz Iz			#V	/BW	100 kHz			Sweep	(#Swp)	3.2	Span 3 200 ms (.000 MH 1001 pts	z j)	CF Step 300.000 kHz Auto Man
MKR 1 2 3 4 5 6 7 8 9 10 11 <					× 2.440 2.441	0 979	9 GHz 1 GHz 1 GHz		3.62 dE -16.40 dE -16.44 dE	3m 3m 3m	FUNCTI				FUNCTIO			Freq Offset 0 Hz
MSG													STA	ATUS				

Figure Channel 39:

Figure Channel 78:





Product	:	Lenovo 700 Ultraportable Bluetooth Speaker
110000	•	Lene to the permeter Line to the permeter

- Test Item : Occupied Bandwidth Data
- Test Site : No.3 OATS

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1356		NA
39	2441	1356		NA
78	2480	1356		NA

Figure Channel 00:

🊺 Ke	eysight S	pectrum	Analyzer - Sw	ept SA								
<mark>⊮</mark> ℝ Cer	L nter l	R Freq	F 50 Ω	AC 00000 GH	łz	SEN	ISE:INT	Avg Typ	ALIGN AUTO e: Log-Pwr	02:50:32 P TRAC	M Jan 19, 2019 E 1 2 3 4 5 6	Frequency
10.4	PNO: Wide Irig: Free Kun IFGain:Low #Atten: 20 dB Mkr2 2.401 325 GHz -20 19 dBm							Auto Tune				
-19.50			10.50		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	¹	~~~~	m	3		-19.97 dBm	Center Freq 2.402000000 GHz
-29.5 -39.5 -49.5	~	~~~~							h		۵. میں	Start Freq 2.400500000 GHz
-59.5 -69.5 -79.5												Stop Freq 2.403500000 GHz
Cer #Re	enter 2.402000 GHz Span 3.000 MHz Res BW 30 kHz #VBW 100 kHz Sweep (#Swp) 3.200 ms (1001 pts)									CF Step 300.000 kHz <u>Auto</u> Man		
1 2 3 4 5 6 7 8 9	N N N	1 f 1 f 1 f		× 2.401 91 2.401 32 2.402 68	9 GHz 5 GHz 1 GHz	0.03 dE -20.19 dE -20.53 dE	BING BIN BIN BIN		NCTION WIDTH	FUNCTI		Freq Offset 0 Hz
10 11 < MSG						m			STATUS	\$		



🎉 Keysight Sp	oectrum Analyzer - Swep	t SA							
Center F	RF 50 Ω Freq 2.441000	AC 0000 GHz	SE	NSE:INT	Avg Type	ALIGN AUTO : Log-Pwr	02:59:25 Pr TRAC	4Jan 19, 2019 E 1 2 3 4 5 6	Frequency
	PNO: Wide Trig: Free Run Trig: Free Run DET P NNNNN IFGain:Low #Atten: 20 dB DET P NNNNN Ref Offset 0.5 dB Mkr2 2.440 325 GHz								Auto Tune
10 dB/div Log -9.50	Ref 10.50 dl		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3	-20.0	-19.79 dBm	Center Freq 2.441000000 GHz
-29.5	~~~~~					La	\	à	Start Freq 2.439500000 GHz
-59.5 -69.5 -79.5									Stop Freq 2.442500000 GHz
Center 2 #Res BW	.441000 GHz / 30 kHz	#	≠VBW 100 kHz		Sweep (#Swp) 3.	Span 3 .200 ms (.000 MHz 1001 pts)	CF Step 300.000 kHz Auto Man
MRX MODE 1 N 1 N 2 N 3 N 4 5 6 7 6 6 7 8 9 9 10 11 1<		2.441 132 GH 2.440 325 GH 2.441 681 GH	z 0.21 d z -20.01 d z -19.97 d				FUNCTION		Freq Offset 0 Hz
MSG						STATUS			

Figure Channel 39:

Figure Channel 78:





11. EMI Reduction Method During Compliance Testing

No modification was made during testing.