

TEST REPORT

Product Name : PETKIT AIRSALON MAX
Model Number : PD10
FCC ID : 2A72N-PD10

Prepared for : PETKIT NETWORK TECHNOLOGY (SHANGHAI)
CO.,LTD.
Address : Room 4139, Building 2, 588 Zixing Road, Minhang District,
Shanghai

Prepared by : EMTEK (NINGBO) CO., LTD.
Address : 1F Building 4, 1177#, Lingyun Road, Ningbo National
Hi-Tech Zone, Ningbo, Zhejiang, China.

Tel: +86-574-27907998
Fax: +86-574-27721538

Report Number : ENB2209210166W00801R
Date(s) of Tests : September 21, 2022 to October 29, 2022
Date of Issue : October 31, 2022

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1 TEST RESULT CERTIFICATION

Applicant : PETKIT NETWORK TECHNOLOGY (SHANGHAI) CO.,LTD.
Address : Room 4139, Building 2, 588 Zixing Road, Minhang District, Shanghai
Manufacturer : DONGGUAN ZHIHANG PLASTIC TECHNOLOGY CO., LTD.
Address : Building 10, Pushikegu, Pushi 1st Road, Gangtou Village, Qiaotou Town, Dongguan City, Guangdong Province, P.R.C.
EUT : PETKIT AIRSALON MAX
Model Name : PD10
Trademark : N/A

Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 2 , Subpart J FCC 47 CFR Part 15, Subpart C	PASS

The above equipment was tested by EMTEK (NINGBO) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2 and Part 15.247

The test results of this report relate only to the tested sample identified in this report

Date of Test : September 21, 2022 to October 29, 2022

Prepared by : 
June Gao/Engineer

Reviewer : 
Vinay/Supervisor

Approved & Authorized Signer : 
Tony Wei/Manager



2 EUT TECHNICAL DESCRIPTION

Characteristics	Description
Product	PETKIT AIRSALON MAX
Model Number	PD10
Sample Number	1#
Device Type	Bluetooth V5.0
Data Rate :	Up to 2 Mbps
Modulation:	GFSK
Operating Frequency Range:	2402-2480 MHz
Number of Channels:	40 Channels
Transmit Power Max:	0.840 dBm
Antenna Type:	PCB Antenna
Antenna Gain:	-5.45 dBi
Power supply	AC 100-24V, 50/60Hz
Temperature Range:	0°C to +50°C
Date of Received:	September 21, 2022

Note: for more details, please refer to the User's manual of the EUT.

3 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.247(a)(2)	DTS (6dB) Bandwidth	PASS	
15.247(b)(3)	Maximum Average Conducted Output Power	PASS	
15.247(e)	Maximum Power Spectral Density Level	PASS	
15.247(d)	Unwanted Emission Into Non-Restricted Frequency Bands	PASS	
15.247(d) 15.209	Unwanted Emission Into Restricted Frequency Bands (conducted)	PASS	
15.247(d) 15.209	Radiated Spurious Emission	PASS	
15.207	Conducted Emission Test	PASS	
15.247(b)	Antenna Application	PASS	
	NOTE1: N/A (Not Applicable) NOTE2: According to FCC OET KDB 558074, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.		

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: 2A72N-PD10 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 15, Subpart C

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

4.2 MEASUREMENT EQUIPMENT USED

4.2.1 Conducted Emission Test Equipment

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-003	L.I.S.N	Rohde & Schwarz	ENV216	101193	July 07, 2022	1 Year
ENE-162-1	RF Cable	TIMES	2M(N-N)	605236-0001	July 01, 2022	1 Year
ENE-167-1	RF Cable	TIMES	0.5M(N-N)	605240-0002	July 01, 2022	1 Year
ENE-186	EMI Test Receiver	R&S	ESR7	102487	May 27, 2022	1 Year

4.2.2 Radiated Emission Test Equipment

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-002	EMI Test Receiver	Rohde & Schwarz	ESCI	101107	July 07, 2022	1 Year
ENE-009	Pre-Amplifier	CD	PAP-0203	22015	July 07, 2022	1 Year
ENE-010	Bilog Antenna	Schwarzbeck	VULB9163	9163-467	July 12, 2021	2 Year
ENE-025-1	Cable	Huber + Suhner	CBL3-NN-0.5 M	101216-214050 0-2	July 07, 2022	1 Year
ENE-025-2	Cable	Huber + Suhner	CBL3-NN-3.0 M	101216-214300 0-2	July 07, 2022	1 Year
ENE-025-3	Cable	Huber + Suhner	CBL3-NN-9.0 M	101216-214900 0	July 07, 2022	1 Year
ENE-170	EXA Signal Analyzer	KEYSIGHT	N9010B	MY60242457	March 01, 2022	1 Year
ENE-090	Pre-Amplifier	Connphy Microwave Inc.	GLN-1G40G-4 165-K	0319104	Nov 22, 2021	1 Year
ENE-060	Horn Antenna	Schwarzbeck	BBHA 9120	9120D-707	April 13, 2021	2 Year
ENE-101-1	Cable	SMAMSMAM	A50-0.5M	N/A	July 07, 2022	1 Year
ENE-101-2	Cable	SMAMSMAM	A50-3M	N/A	July 07, 2022	1 Year
ENE-101-4	Cable	SMAMSMAM	A50-6M	N/A	July 07, 2022	1 Year

4.2.3 Radio Frequency Test Equipment

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-253	EXG Analog Singnal Generator	Keysight	N5173B	MY61253062	July 05, 2022	1 Year
ENE-254	MXG Vector Singnal Generator	Keysight	N5182B	MY61350131	July 05, 2022	1 Year
ENE-255	Frepquency Extender	Keysight	N5183BX07	MY61500104	July 05, 2022	1 Year
ENE-256	EXA Signal Anaalyzer	Keysight	N9010B	MY62060219	July 05, 2022	1 Year
ENE-257	WIRELESS CONNECTIVITY TESTER	ROHDE & SCHWARZ	CMW 270	1201.0002K75-102608-Pb	July 05, 2022	1 Year
ENE-257-1	Up/Down -Converter	ROHDE & SCHWARZ	CMW-Z800A	1211.4530.02	/	/
ENE-172	RF Control Unit	Tonscend	JS0806-2(V.6E)	21L8060521	March 01, 2022	1 Year
ENE-092	DC Power Supply	KEFUNA	KDP3603	2004D3062946	July 07, 2022	1 Year
ENE-093	Attenuator 10dB	talent Microwave	TA10A2-S-18	N/A	July 07, 2022	1 Year
ENE-094	Attenuator 20dB	talent Microwave	TA20A2-S-18	N/A	July 07, 2022	1 Year

4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (Bluetooth V5.0 DTS :1 Mbps and 2 Mbps) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Frequency and Channel list for Bluetooth V5.0 DTS:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	19	2440	...	...
1	2404	20	2442	37	2476
2	2406	21	2444	38	2478
...	...	...	...	39	2480
Note: $f_c = 2402\text{MHz} + k \times 2\text{MHz}$ $k=1$ to 39					

Test Frequency and channel for Bluetooth V5.0 DTS:

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	19	2440	39	2480

4.4 TEST SOFTWARE

Item	Software
Radiated Emission:	EMC (Ver. EMEC-3A1)
Conducted Emission	EZ-EMC (Ver. CON-03A1)

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

1F Building 4, 1177#, Lingyun Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang, China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 32.

5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.

: Accredited by CNAS, 2019.04.02

The certificate is valid until 2023.1.20

The Laboratory has been assessed and proved to be in compliance with CNA S-CL01:2018 (identical to ISO/IEC 17025:2017)

The Certificate Registration Number is L6666.

Accredited by FCC

Designation Number: CN1302

Test Firm Registration Number: 436491

Accredited by A2LA

The certificate is valid until May 31, 2023

The Certificate Number is 4321.03.

Accredited by Industry Canada, November 14, 2016

The Certificate Registration Number is 46405-9469.

Name of Firm

: EMTEK (NINGBO) CO., LTD.

Site Location

: 1F Building 4, 1177#, Lingyun Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang, China.

6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

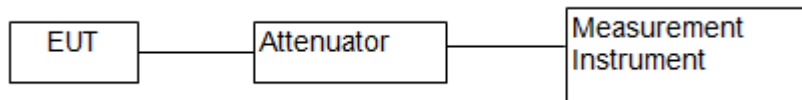
Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$ MHz
Uncertainty for Output power test	± 0.83 dB
Conducted Emissions Test	± 2.0 dB
Radiated Emission Test	± 2.0 dB
Occupied Bandwidth Test	± 1.0 dB
Power density test	± 1.85 dB
All emission, radiated	± 3 dB
Antenna Port Emission	± 3 dB
Temperature	$\pm 0.5^{\circ}\text{C}$
Humidity	$\pm 3\%$

Measurement Uncertainty for a level of Confidence of 95%

7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP 1

The Bluetooth V5.0 DTS component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



7.2 RADIO FREQUENCY TEST SETUP 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

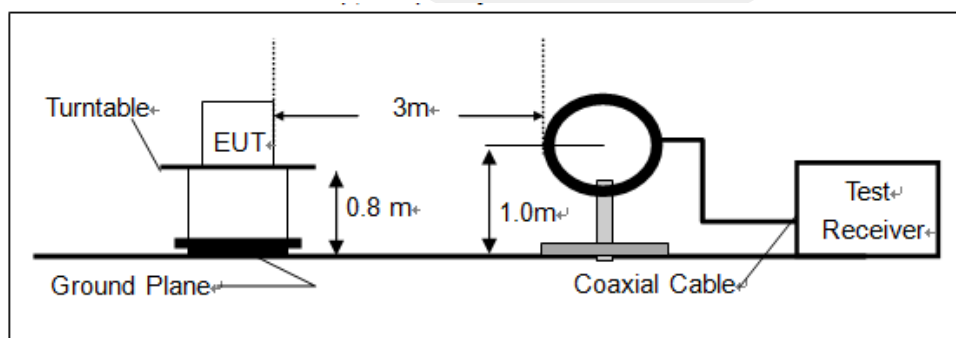
30MHz-1GHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

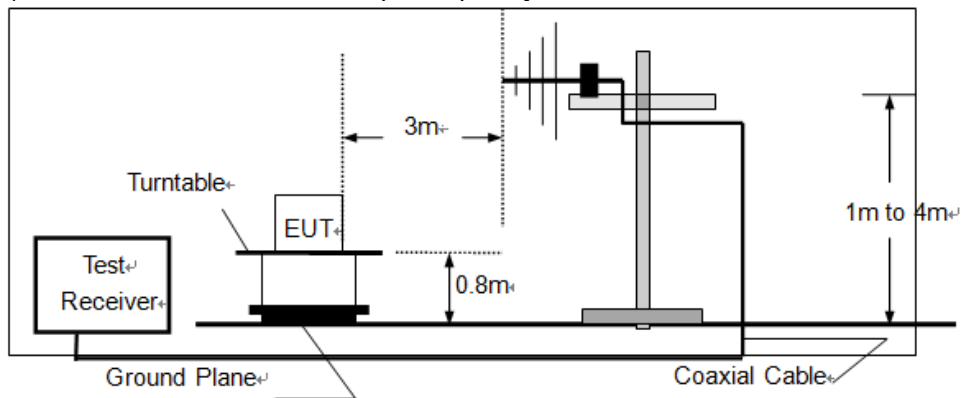
Above 1GHz:

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

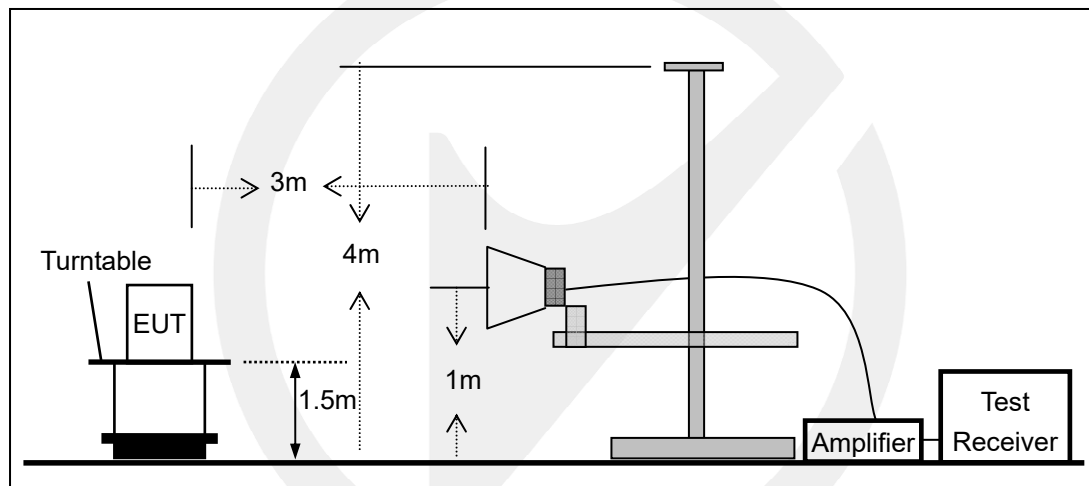
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

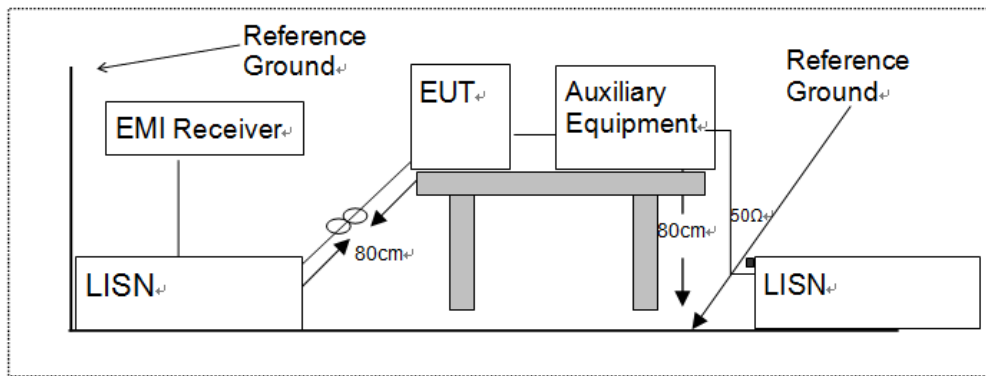


7.3 CONDUCTED EMISSION TEST SETUP

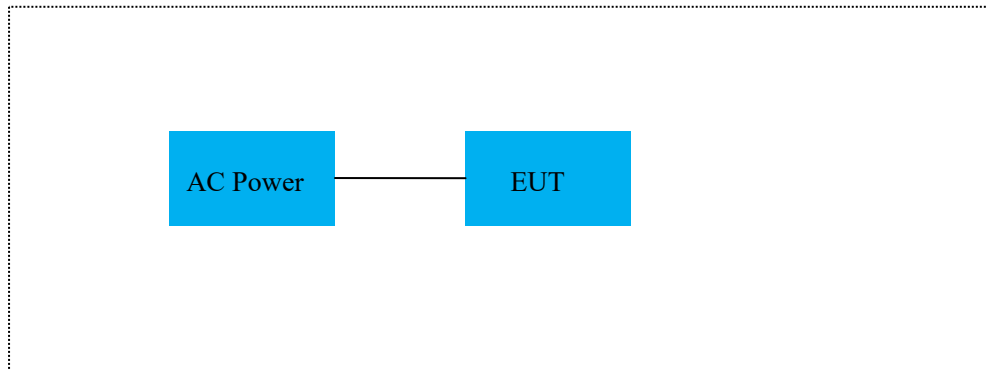
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



7.5 SUPPORT EQUIPMENT

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
XIAOMI Adapter	XIAOMI	MDY-08-EH	YJ2808135006051

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

8 TEST REQUIREMENTS

8.1 DTS 6DB BANDWIDTH

8.1.1 Applicable Standard

According to FCC Part 15.247(a)(2) and KDB 558074 D01 15.247 Meas Guidance v05r02

8.1.2 Conformance Limit

The minimum -6 dB bandwidth shall be at least 500 kHz.

8.1.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.1.4 Test Procedure

The EUT was operating in Bluetooth V5.0 DTS mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW = 100 kHz.

Set the video bandwidth (VBW) =300 kHz.

Set Span=2 times OBW

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

Allow the trace to stabilize.

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

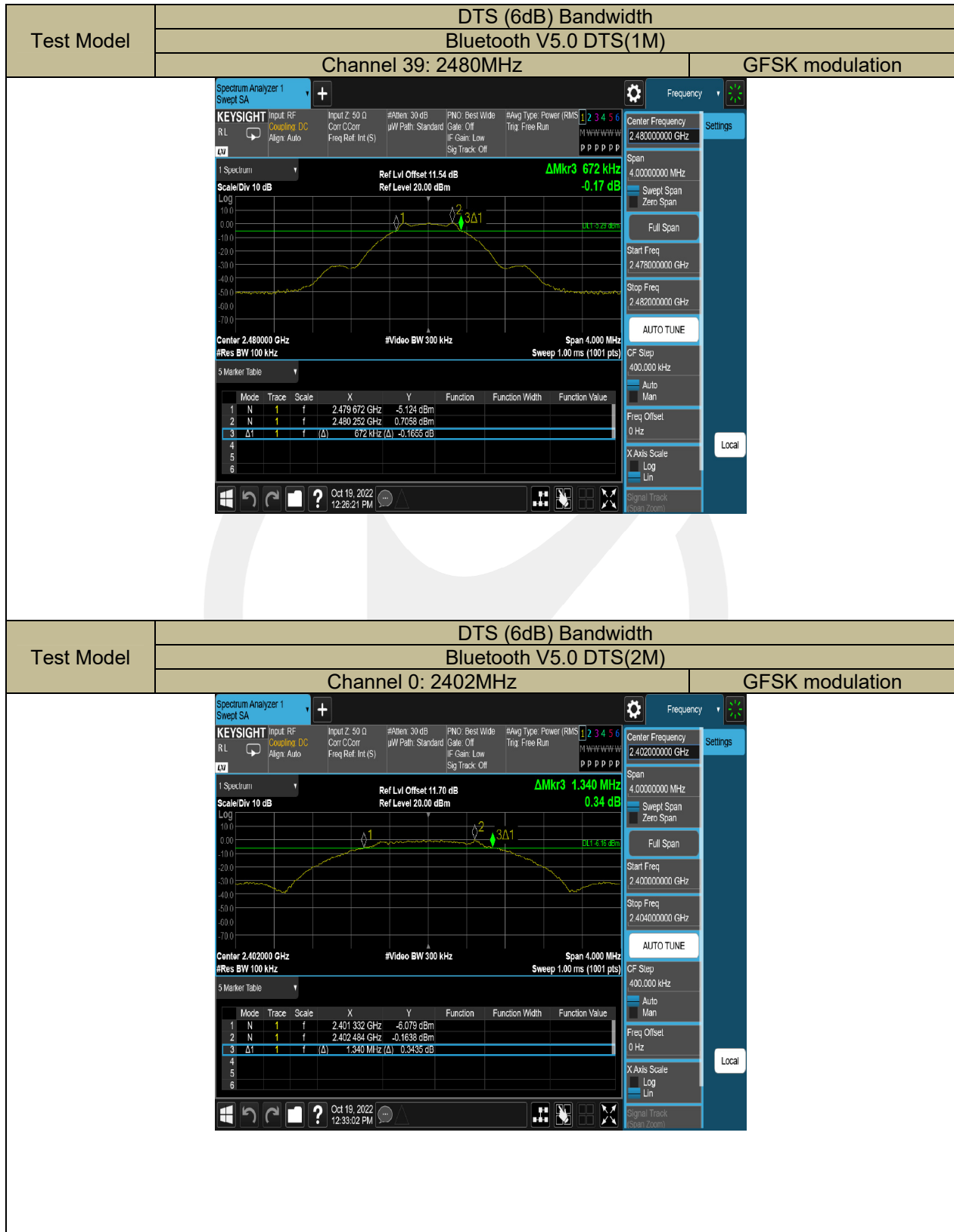
Measure and record the results in the test report.

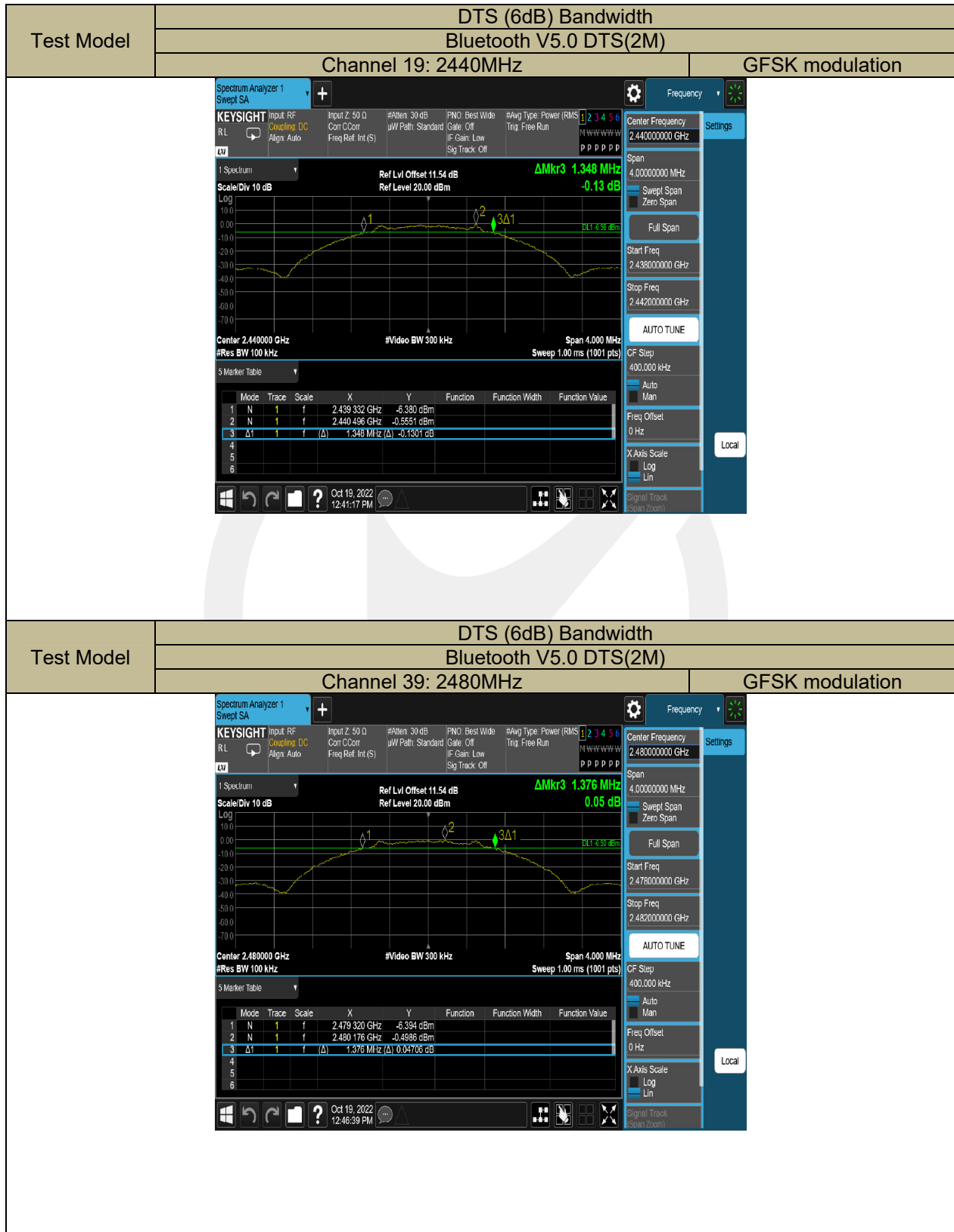
Test Results

Temperature:	25.5° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Bandwidth (kHz)	Limit (kHz)	Verdict
BLE 1M	0	2402	668.0	>500	PASS
	19	2440	684.0	>500	PASS
	39	2480	672.0	>500	PASS
BLE 2M	0	2402	1340.0	>500	PASS
	19	2440	1348.0	>500	PASS
	39	2480	1376.0	>500	PASS







8.2 MAXIMUM AVERAGE CONDUCTED OUTPUT POWER

8.2.1 Applicable Standard

According to FCC Part 15.247(b)(3) and KDB 558074 D01 15.247 Meas Guidance v05r02

8.2.2 Conformance Limit

The maximum peak conducted output power of the intentional radiator for systems using digital modulation in the 2400 - 2483.5 MHz bands shall not exceed: 1 Watt (30dBm).

8.2.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.2.4 Test Procedure

■ According to FCC Part 15.247(b)(3)

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum output power setting and enable the EUT transmit continuously.

Measure the conducted output power with cable loss and record the results in the test report.

■ According to FCC Part 15.247(b)(4):

Conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Results

Temperature:	25.5° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)	Limit (dBm)	Verdict
BLE 1M	0	2402	0.68	30	PASS
	19	2440	0.64	30	PASS
	39	2480	0.84	30	PASS
BLE 2M	0	2402	0.67	30	PASS
	19	2440	0.62	30	PASS
	39	2480	0.81	30	PASS

8.3 MAXIMUM POWER SPECTRAL DENSITY

8.3.1 Applicable Standard

According to FCC Part 15.247(e) and KDB 558074 D01 15.247 Meas Guidance v05r02

8.3.2 Conformance Limit

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.3.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.3.4 Test Procedure

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance

The transmitter output (antenna port) was connected to the spectrum analyzer

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: 3 kHz

Set the VBW to: 10 kHz.

Set Detector = peak.

Set Sweep time = auto couple.

Set Trace mode = max hold.

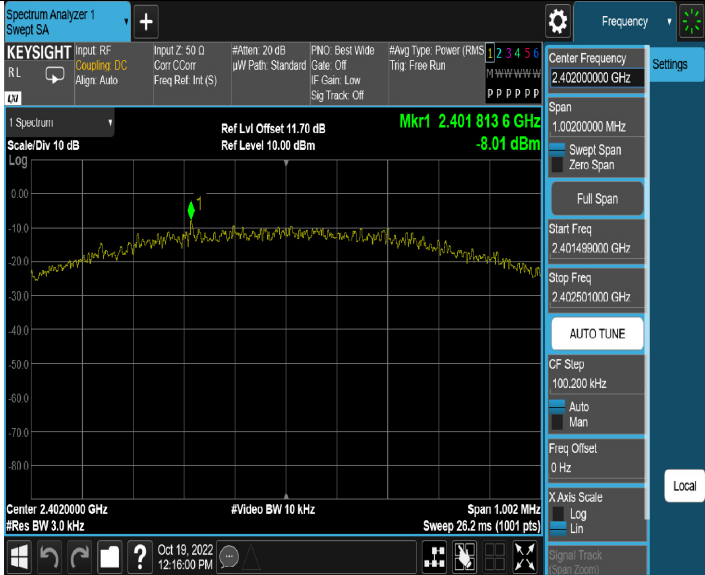
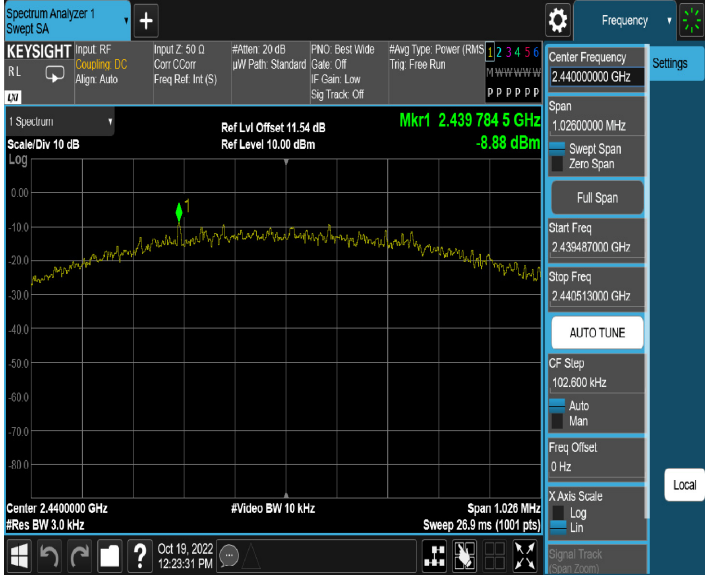
Allow trace to fully stabilize.

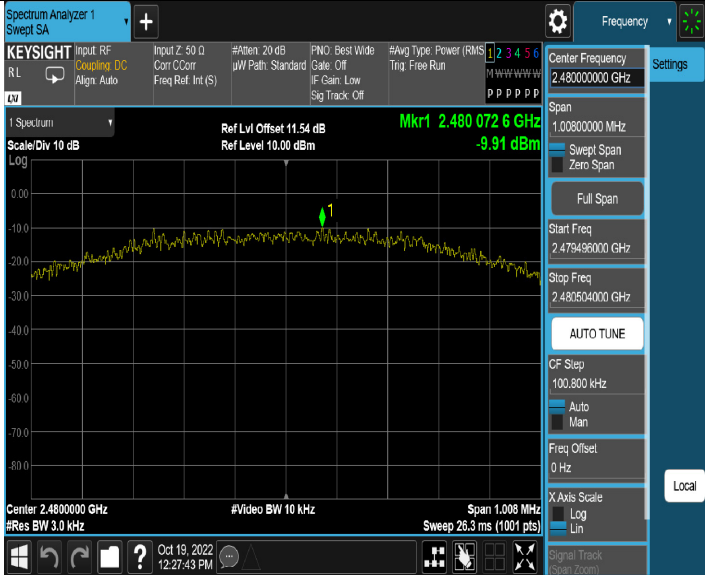
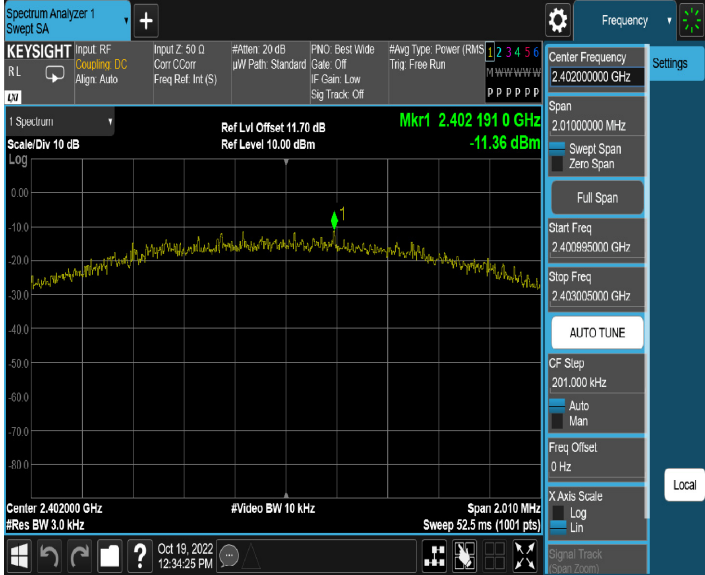
Use the peak marker function to determine the maximum amplitude level within the RBW.

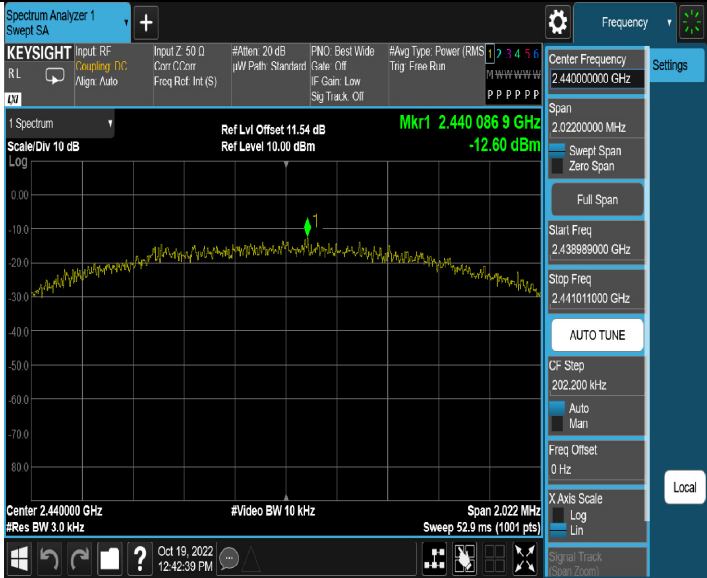
8.3.5 Test Results

Temperature:	25.5° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
BLE 1M	0	2402	-8.01	<8	PASS
	19	2440	-8.88	<8	PASS
	39	2480	-9.91	<8	PASS
BLE 2M	0	2402	-11.36	<8	PASS
	19	2440	-12.60	<8	PASS
	39	2480	-13.09	<8	PASS
Note: N/A					

Test Model	Power Spectral Density	
	Bluetooth V5.0 DTS(1M)	
	Channel 0: 2402MHz	GFSK modulation
		
Test Model	Power Spectral Density	
	Bluetooth V5.0 DTS(1M)	
	Channel 19: 2440MHz	GFSK modulation
		

Test Model	Power Spectral Density	
	Bluetooth V5.0 DTS(1M)	
	Channel 39: 2480MHz	GFSK modulation
		
Test Model	Power Spectral Density	
	Bluetooth V5.0 DTS(2M)	
	Channel 0: 2402MHz	GFSK modulation
		

Test Model	Power Spectral Density	
	Bluetooth V5.0 DTS(2M)	
	Channel 19: 2440MHz	GFSK modulation
		
Test Model	Power Spectral Density	
	Bluetooth V5.0 DTS(2M)	
	Channel 39: 2480MHz	GFSK modulation
	