

Japan Test Report

Test Report
On Behalf of
MAKER Co., Ltd
For
Mini wireless speaker

Model No.: KSK-ET637, KSK-ET637-1, KSK-ET637-2, KSK-ET637-3,
KSK-ET637-4, KSK-ET637-5, KSK-ET637-6, KSK-ET637-7,
KSK-ET637-8, KSK-ET637-9

Prepared For: **MAKER Co., Ltd**
7-1-20 Nishinakajima Yodogawa-Ku, Osaka-City Osaka-fu, Japan

Prepared By: **Shenzhen HUAKE Testing Technology Co., Ltd.**
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Date of Test: **Apr. 30, 2025 ~ Jun. 19, 2025**
Date of Report: **Jun. 19, 2025**
Report Number: **HK2504302289-E**

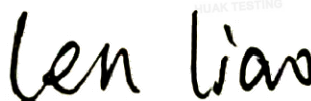
Test Result Certification

Applicant's Name : MAKER Co., Ltd
Address : 7-1-20 Nishinakajima Yodogawa-Ku, Osaka-City Osaka-fu, Japan
Manufacturer's Name : SHANGKAI ELECTRONIC TECHNOLOGY (DONG GUAN) CO., LTD
Address : 406, BLOCK B, CHANGLIAN INDUSTRIAL PARK, NO.116, WEST ZHEN AN ROAD, CHANG AN TOWN, DONGGUAN CITY, China
Product Description
Trade Mark : N/A
Product Name : Mini wireless speaker
Model and/or Type Reference : KSK-ET637, KSK-ET637-1, KSK-ET637-2, KSK-ET637-3, KSK-ET637-4, KSK-ET637-5, KSK-ET637-6, KSK-ET637-7, KSK-ET637-8, KSK-ET637-9
Standards : Article 2 Paragraph 1 of Item 19

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Date of Test :
Date (s) of Performance of Tests : Apr. 30, 2025 ~ Jun. 19, 2025
Date of Issue : Jun. 19, 2025
Test Result : Pass

Testing Engineer



Len Liao

Technical Manager



Sliver Wan

Authorized Signatory



Jason Zhou



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**** Modified History ****

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Jun. 19, 2025	Jason Zhou

1 Test Summary

1.1 Test Procedures and Results

Test procedures according to the technical standards:

Rule Section	Description of Test	Result
Transmitter Parameters		
3.2 (2)	Antenna Power (EIRP Antenna Power)	Complies
3.2 (3)	Tolerances for Antenna Power	Complies
3.2 (4)	Frequency Tolerance	Complies
3.2 (7)	Occupied Frequency Bandwidth	Complies
3.2 (9)	Process Gain	Complies
3.2 (10)	Number of Carriers	N/A
3.2 (11)	Dwell Time	Complies
3.2 (6)	Spurious Emissions	Complies
/	Interference Prevention Function	Complies
/	Carrier Sensing Function	N/A
Receiver Parameters		
3.3 (1)	Secondary Radiated Emissions	Complies

NOTE:

- 1) "N/A" denotes test is not applicable in this Test Report.
- 2) MIC Public Notice 88:2023, annex 1 and annex 43.
- 3) MIC Ordinance Regulating Radio Equipment Section 4.17 of Article 49.20.
- 4) Referenced in the standard ARIB STD-T66.

1.2 Information of the Test Laboratory

Shenzhen HUAKE Testing Technology Co., Ltd.

Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping,
Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization:

A2LA Accreditation Code is 4781.01.

FCC Designation Number is CN1229.

Canada IC CAB identifier is CN0045.

CNAS Registration Number is L9589.

1.3 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 2.71\text{dB}$
2	Radiated Emission Test	$\pm 4.26\text{dB}$
3	RF power, conducted	$\pm 0.37\text{dB}$
4	Spurious emissions, conducted	$\pm 2.20\text{dB}$
5	All emissions, radiated(<1G)	$\pm 3.90\text{dB}$
6	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$

2 General Information

2.1 General Description of EUT

Equipment	Mini wireless speaker
Model Name	KSK-ET637
Series Model	KSK-ET637-1, KSK-ET637-2, KSK-ET637-3, KSK-ET637-4, KSK-ET637-5, KSK-ET637-6, KSK-ET637-7, KSK-ET637-8, KSK-ET637-9
Model Difference	All model's the function, software and electric circuit are the same, only with a product model named different. Test sample model: KSK-ET637.
Antenna Type	PCB Antenna
Antenna Gain	-3.43dBi
Operation Frequency	2402-2480MHz
Number of Channels	79CH
Modulation Type	GFSK, Pi / 4DQPSK
Data Rate	1Mbps, 2Mbps
Power Source	DC5V From Type-C or DC3.7V From Battery
Power Rating	DC5V From Type-C or DC3.7V From Battery
Firmware Version	V1.0
Hardware Version	V1.0
Note: 1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. 2. Antenna gain Refer to the antenna specifications. 3. The cable loss data is obtained from the supplier. 4. The test results in the report only apply to the tested sample.	

2.1.1 Carrier Frequency of Channels

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

2.2 Operation of EUT during Testing

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
Carrier TX Mode	CH0	2402
	CH39	2441
	CH78	2480
Hopping on TX Mode	CH0 to CH78	2402 to 2480
TX Mode	CH0	2402
	CH39	2441
	CH78	2480
RX Mode	CH0	2402
	CH78	2480

2.3 Description of Test Setup

E-1
EUT

2.4 Test Conditions

The BT module was tested while in a continuous transmitter/receiver mode.

The EUT was tuned to a low, middle, and high channel for all tests. For all test case pre/scans were completed in all Modes to determine worst case levels.

Power Supply Voltage Fluctuation Test

Voltage mode	Input Voltage	Radio Unit Voltage
USB Input	DC 4.5V	3.31V
	DC 5.0V	3.30V
	DC 5.5V	3.30V
Battery	DC 3.33V	3.31V
	DC 3.7V	3.30V
	DC 4.07V	3.30V
Note: 1. The radio unit Voltage with the module regulator IC regulator. 2. The radio unit less than 1%, so the test only rated voltage (Normal voltage) with the battery.		

During the input supply voltage to the EUT from the external power source is varied by +/- 10%, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/-1%. Exempt extremely high and low supply voltage condition test, EUT only operated in normal voltage to test all regulations.

2.5 Description of Support Units (Conducted Mode)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Trade Mark	Model/Type No.	Specification	Note
1	Mini wireless speaker	N/A	KSK-ET637	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.6 Measurement Instruments List

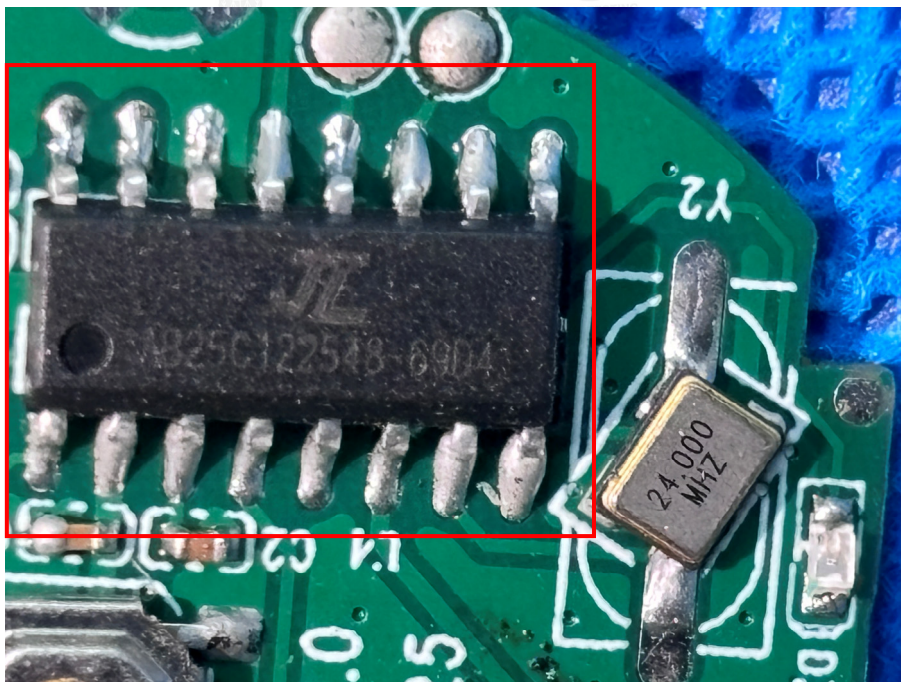
Item	Equipment	Manufacturer	Calibration Institution	Model No.	Serial No.	Equipment Number	Last Cal.	Cal. Interval
1	Spectrum analyzer	Agilent	Guangzhou LiSai Metrology & Test Co., Ltd.	N9020A	101431	HKE-025	2025/02/19	1 Year
2	Spectrum analyzer	R&S	Guangzhou LiSai Metrology & Test Co., Ltd.	FSV3044	25984	HKE-126	2025/02/19	1 Year
3	RF Automatic control unit	Tonscend	Guangzhou LiSai Metrology & Test Co., Ltd.	JS0806-2	71557	HKE-060	2025/02/19	1 Year
4	High pass filter unit	Tonscend	Guangzhou LiSai Metrology & Test Co., Ltd.	JS0806-F	17155	HKE-055	2025/02/19	1 Year
5	Wireless Communication Test Set	R&S	Guangzhou LiSai Metrology & Test Co., Ltd.	CMU200	105255	HKE-026	2025/02/19	1 Year
6	Wireless Communication Test Set	R&S	Guangzhou LiSai Metrology & Test Co., Ltd.	CMW500	103974	HKE-027	2025/02/19	1 Year
7	RF Test Software	Tonscend	/	JS1120-3 Version 3.5.39	/	HKE-083	/	/

Note: The calibration agency listed on the table corresponds to item ii c) of Article 24-2 paragraph 4.

3 RF Shielding Method

We apply the product for Japan RF certification. Number of terminals is 16, Terminal pitch is 1 mm. It is not easily removed. Please refer to following for photo for details.

Red circle part of the RF module soldered on the PCB.

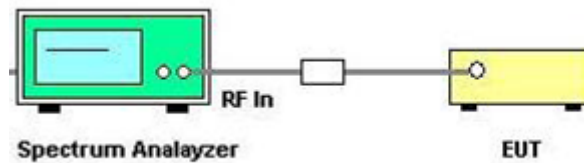


4 Antenna Power

4.1 Limit

Limit	3mW/MHz
Tolerance	+20%

4.2 Test Setup



4.3 Test Procedure

- (1) Configure EUT and assistant system according clause 2.2 and 4.3
 - (2) Set EUT work in test mode as described in clause 2.2
 - (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
 Centre Frequency: The centre frequency of the channel under test.
 Resolution BW: 1MHz (above 6dB bandwidth of signal)
 Video BW: 1MHz.
 Span: Wide enough to cover the complete power envelope of the signal of the EUT.
 Detector: Peak.
 Trace Mode: Max Hold.
 - (4) When the trace is complete, find the peak value of the power envelope and record.
- Note: The cable loss and attenuator loss have been put into spectrum analyzer as amplitude offset.

4.4 Test Result

EUT:	Mini wireless speaker	Test Date:	May 29, 2025
Temperature:	25°C	Tested by:	Len Liao
Humidity:	55 % RH	Test Voltage	Normal Voltage

Operation Mode	Conducted RF output power (dbm)	Conducted RF output power (mW)	Spread Bandwidth	Conducted RF output power density (mW/MHz)	Limit	Rated power density (mW/MHz)	Antenna Power Error (%)
GFSK mode	0.0004	1.0001	71.635	0.01396	3mW/MHz	0.03	-53.46
Pi / 4DQPSK mode	-0.4929	0.8927	71.663	0.01246	3mW/MHz	0.03	-58.48
Limit : +20% (Base on manufacturer declare antenna power density)							

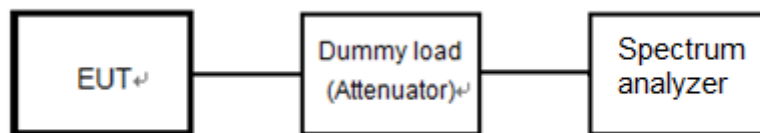
Operation Mode	Conducted RF output power density (mW/MHz)	Conducted RF output power density (dBm/MHz)	Antenna Gain (dBi)	EIRP(dBm/MHz)	Limit(dBm/MHz)
GFSK mode	0.01396	-18.551	-3.43	-21.981	6.91
Pi / 4DQPSK mode	0.01246	-19.045	-3.43	-22.475	6.91

5 Frequency Tolerance

5.1 Limit

+/- 50x 10⁻⁶ or less (50ppm)

5.2 Test Setup



5.3 Test Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. The EUT was directly connected to the spectrum analyzer.

5.4 EUT Operation during Test

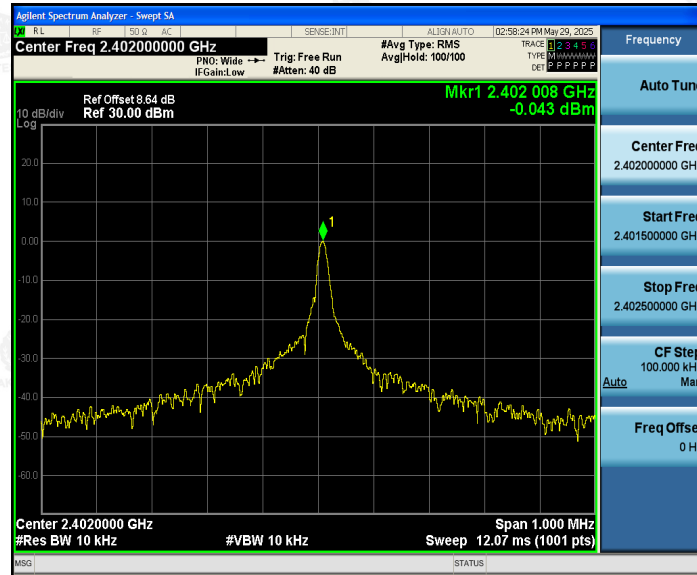
The EUT was placed on the test table and programmed in un-modulation function.

5.5 Test Result

EUT:	Mini wireless speaker	Test Date:	May 29, 2025
Temperature:	25°C	Tested by:	Len Liao
Humidity:	55 % RH	Test Voltage	Normal Voltage
Operation Mode:	Carrier TX mode		

Test Frequency (MHz)	Measured (MHz)	Tolerance (MHz)	Result (ppm)	Limit (ppm)
2402	2402.008	0.008	3.33056	+/-50
2441	2441.008	0.008	3.27735	+/-50
2480	2480.007	0.007	2.82258	+/-50

CH00: 2402MHz



CH39: 2441MHz

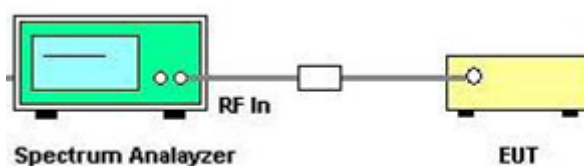


6 Occupied Frequency Bandwidth

6.1 Limit

Permissible value for occupied bandwidth using the FH system, a hybrid system combining DS and FH systems, or a hybrid system combining FH and OFDM systems shall be 83.5 MHz or less, while necessary bandwidth (minimum occupied bandwidth sufficient to ensure information transmission of required quality at a required transmission rate for the system used under specified conditions for a given emission type) using a system other than any of the above shall be 26MHz.

6.2 Test Setup



6.3 Test Procedure

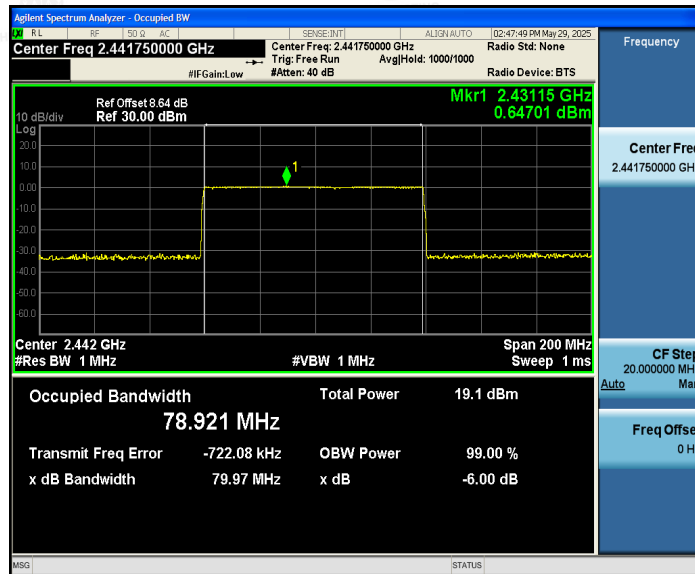
- (1) Configure EUT and assistant system according to clause 2.2 and 6.3
- (2) Set EUT work in carrier TX mode as described in clause 2.2
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
Centre Frequency: The centre frequency of the channel under test.
Resolution BW: 1MHz
Video BW: 1MHz
Span: Wide enough to cover the complete power envelope of the signal of the EUT.
Detector: Peak.
Trace Mode: Max Hold.
- (4) When the trace is complete, measure the occupied bandwidth (99% bandwidth) with spectrum analyzer's bandwidth measure function.

6.4 Test Result

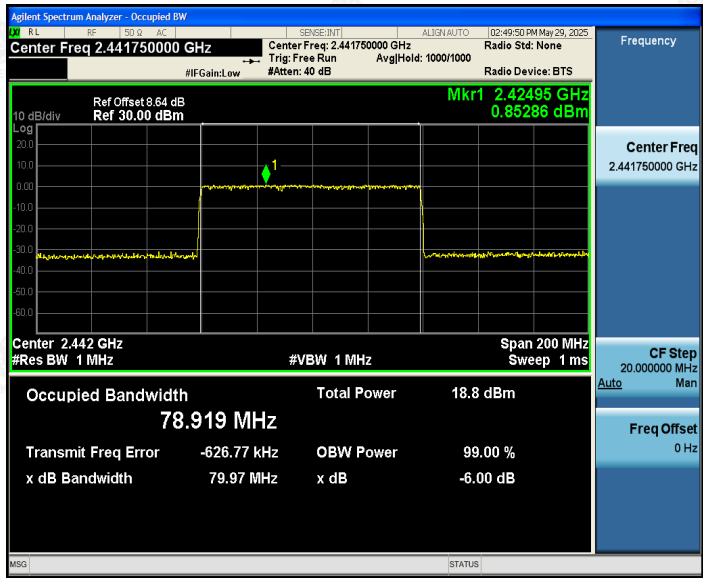
EUT:	Mini wireless speaker	Test Date:	May 29, 2025
Temperature:	25°C	Tested by:	Len Liao
Humidity:	55 % RH	Test Voltage	Normal Voltage

Operation Mode (MHz)	Test Frequency (MHz)	Test Result [MHz]	Limit [MHz]	Verdict
Hopping GFSK TX Mode	/	78.921	<=83.5	PASS
Hopping Pi / 4DQPSK TX Mode	/	78.919	<=83.5	PASS

GFSK TX Mode



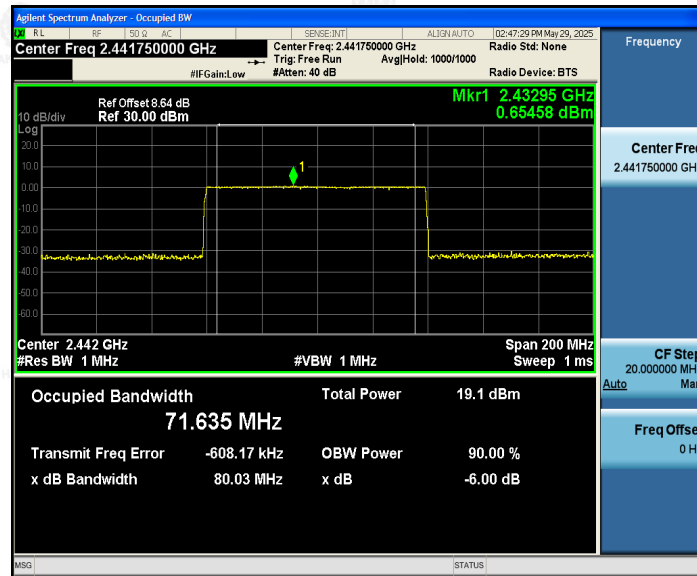
Pi / 4DQPSK TX Mode



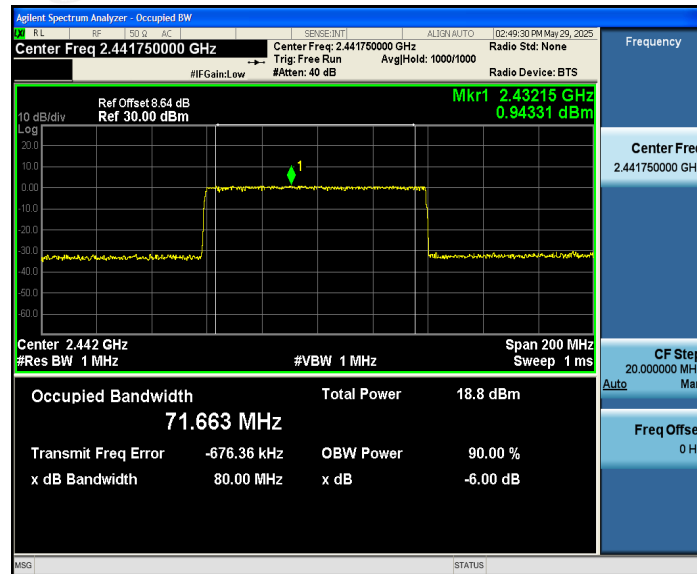
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Operation Mode (MHz)	Test Channel	Test Result [MHz]
Hopping GFSK TX Mode	/	71.635
Hopping Pi / 4DQPSK TX Mode	/	71.663

GFSK TX Mode



Pi / 4DQPSK TX Mode

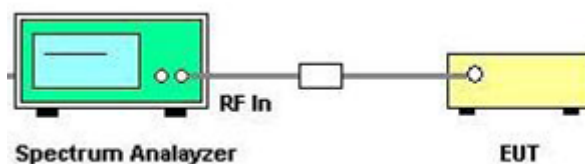


7 Dwell time

7.1 Limit

Frequency Dwell time (time during which radio waves continue to be emitted at a specified frequency) of a transmitting equipment using the FH system shall be 0.4 seconds or less.

7.2 Test Setup



7.3 Test Procedure

- (1) Configure EUT and assistant system according clause 2.2 and 8.3
- (2) Set EUT work in carrier TX mode as described in clause 2.2
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
 Centre Frequency: The centre frequency of the middle hopping channel.
 Resolution BW: 1MHz.
 Video BW: 1MHz.
 Span: 0Hz.
 Detector: Peak.
 Trace Mode: Max Hold.
 Sweep: Video Trigger
- (4) When the trace is complete, measure the sending time of 1 burst and the duty cycle of 1 burst cycle.
- (5) Calculate dwell time follow below formula:

$$\text{Dwell time} = (0.4(\text{s}) \times \text{spreading rate} \times \text{sending time of 1 burst(s)}) / (\text{burst cycle(s)} \times \text{No. of hopping channel})$$

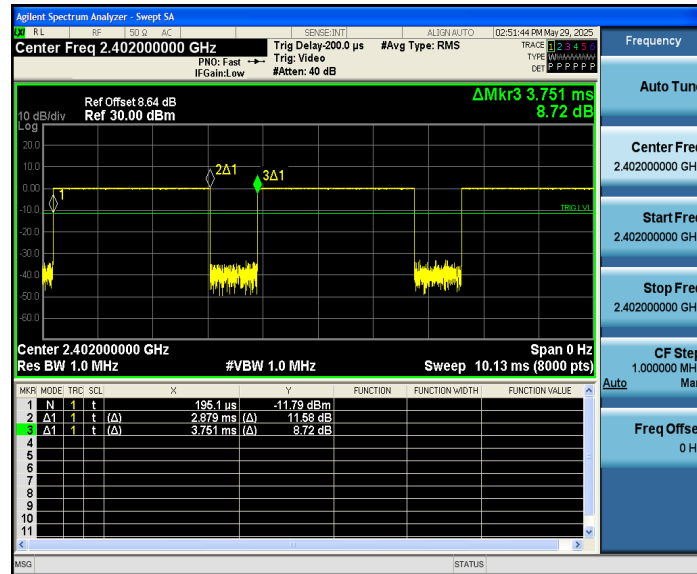
$$\text{Spreading rate} = \text{Spread bandwidth (actual measurement value)} / \text{Transmission rate.}$$

7.4 Test Result

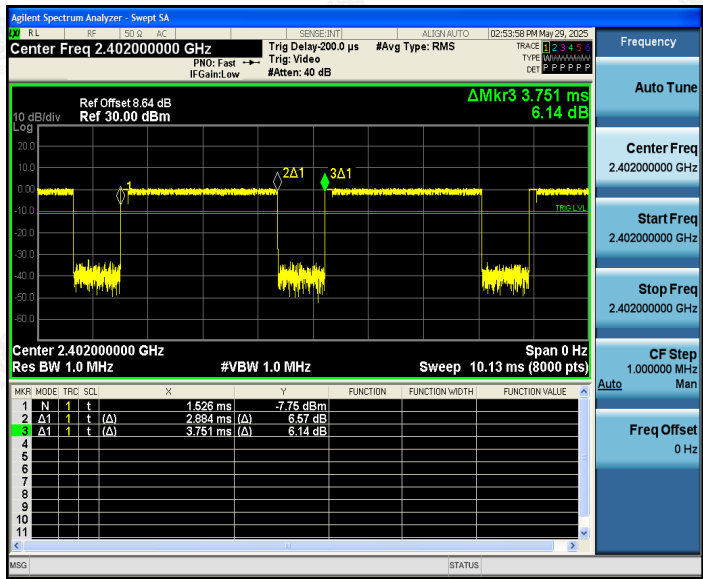
EUT:	Mini wireless speaker	Test Date:	May 29, 2025
Temperature:	25°C	Tested by:	Len Liao
Humidity:	55 % RH	Test Voltage	Normal Voltage
Operation Mode:	Hopping mode		

Test Condition	Test Mode	Ant	transmission time of 1 burst (ms)	burst cycle (ms)	spreading rate	Dwell Time[s]	Limit[s]	Verdict
TNVN	DH5	Ant1	2.88	3.751	71.635	0.2785	<0.4	PASS
TNVN	2DH5	Ant1	2.88	3.751	35.832	0.1393	<0.4	PASS

DH5



2DH5



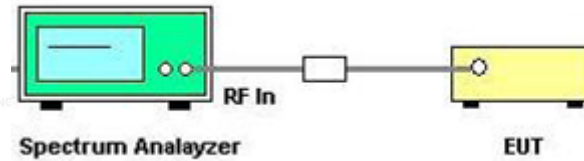
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8 Process Gain

8.1 Limit

Process gain (value obtained by dividing the spread bandwidth by a frequency equal to the transmission rate of the modulation signal; this also applies hereafter) in the spread spectrum system shall be 5 or more.

8.2 Test Setup



8.3 Test Procedure

- (1) Configure EUT and assistant system according clause 2.2 and 9.3
- (2) Set EUT work in carrier TX mode as described in clause 2.2

8.4 Test Result

EUT:	Mini wireless speaker	Test Date:	May 29, 2025
Temperature:	25 ⁰ C	Tested by:	Len Liao
Humidity:	55 % RH	Test Voltage	Normal Voltage
Test result:	CONFORM		

9 Transmitter Spurious Emissions (Conducted)

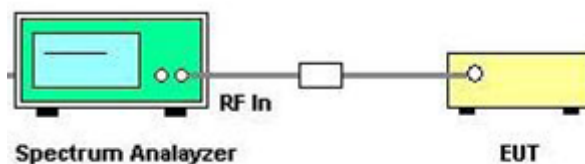
9.1 Limit

Permissible mean power of spurious emission of each frequency supplied to a feeder, that is, mean power of spurious emission in the 1 MHz bandwidth at frequency f other than frequency band used shall be as follows:

a. $2,387\text{MHz} \leq f \leq 2,400\text{MHz}$ and $2,483.5\text{MHz} < f \leq 2,496.5\text{MHz}$ 25 μW or less

b. $2,387\text{MHz} > f$ and $2,496.5\text{MHz} < f$ 2.5 μW or less

9.2 Test Setup



9.3 Test Procedure

- (1) Configure EUT and assistant system according clause 2.2 and 11.3
- (2) Set EUT work in Hopping on TX mode as described in clause 2.2
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
Resolution BW: 1MHz.
Video BW: 1MHz.
Detector: Peak.
Trace Mode: Max Hold
- (4) When the trace is complete, measure the Transmitter Spurious Emissions (conducted) with spectrum analyzer's bandwidth measure function.

9.4 Test Result

Note: All modes have been tested. Only the worst result was reported as below:

TX mode:

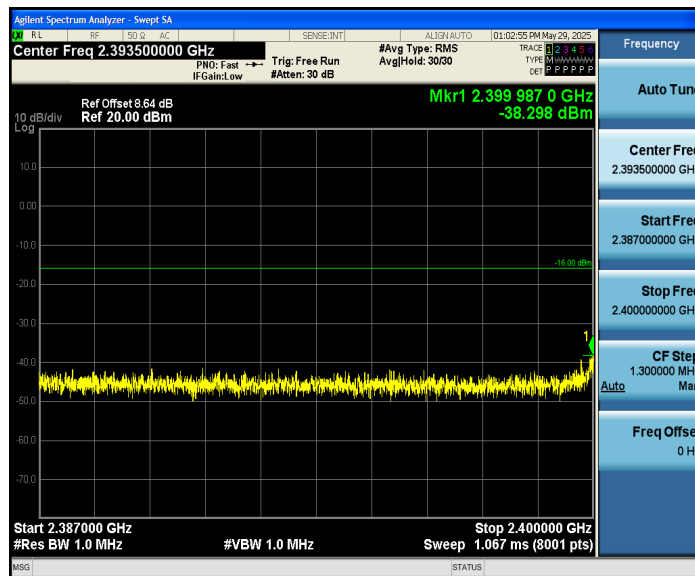
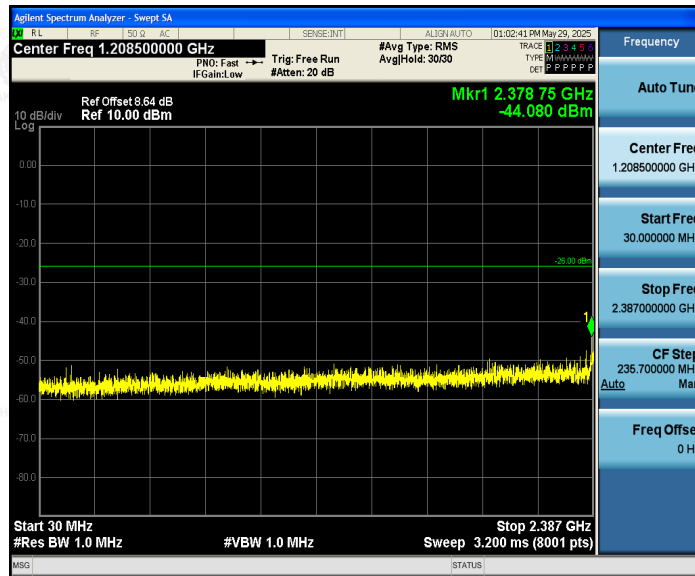
EUT:	Mini wireless speaker	Test Date:	May 29, 2025
Temperature:	25°C	Tested by:	Len Liao
Humidity:	55 % RH	Test Voltage	Normal Voltage

Operation Mode (MHz)	Test Frequency (MHz)	StartFre[MHz]	StopFre[MHz]	Mkr Fre[MHz]	Max.Level[dBm]	Max.Level[μW]	Limit[μW]	Verdict
GFSK TX Mode	2402	30	2387	2378.75	-44.08	0.0391	<2.5	PASS
	2402	2387	2400	2399.99	-38.30	0.1479	<25	PASS
	2402	2483.5	2496.5	2487.15	-41.07	0.0782	<25	PASS
	2402	2496.5	13000	4804.23	-42.88	0.0515	<2.5	PASS
	2441	30	2387	2303.62	-49.85	0.0104	<2.5	PASS
	2441	2387	2400	2392.74	-41.14	0.0769	<25	PASS
	2441	2483.5	2496.5	2489.09	-39.53	0.1114	<25	PASS
	2441	2496.5	13000	4881.96	-42.23	0.0598	<2.5	PASS
	2480	30	2387	2291.54	-49.70	0.0107	<2.5	PASS
	2480	2387	2400	2389.45	-41.83	0.0656	<25	PASS
	2480	2483.5	2496.5	2487.51	-40.68	0.0855	<25	PASS
	2480	2496.5	13000	2503.85	-43.20	0.0479	<2.5	PASS
Pi / 4DQPSK TX Mode	2402	30	2387	2378.46	-43.34	0.0463	<2.5	PASS
	2402	2387	2400	2400.00	-29.48	1.1272	<25	PASS
	2402	2483.5	2496.5	2488.57	-40.81	0.0830	<25	PASS
	2402	2496.5	13000	4804.23	-42.64	0.0545	<2.5	PASS
	2441	30	2387	143.73	-41.67	0.0681	<2.5	PASS
	2441	2387	2400	2393.04	-41.28	0.0745	<25	PASS
	2441	2483.5	2496.5	2489.27	-38.64	0.1368	<25	PASS
	2441	2496.5	13000	4882.49	-42.37	0.0579	<2.5	PASS

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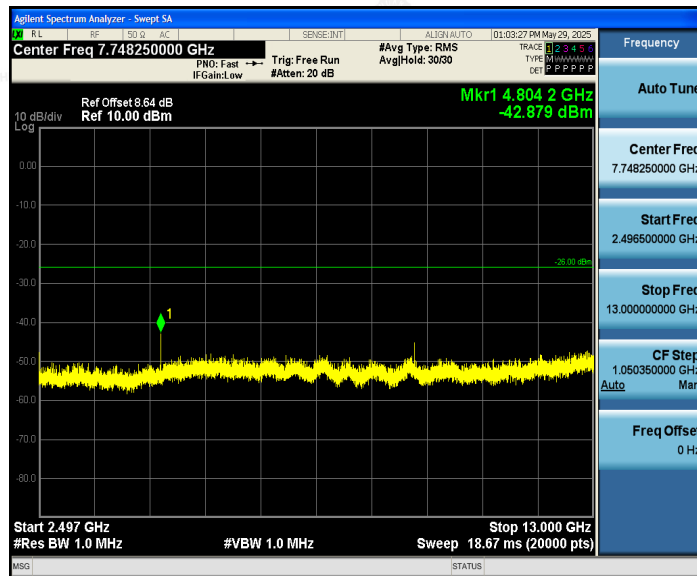
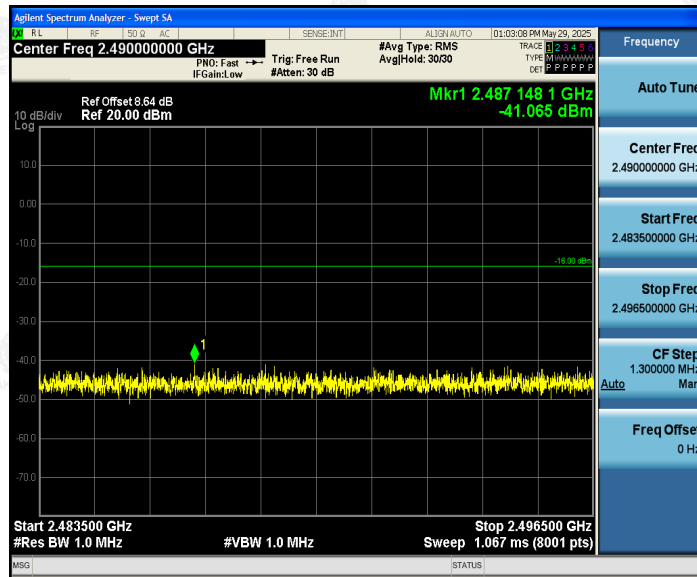
	2480	30	2387	2371.97	-49.46	0.0113	<2.5	PASS
	2480	2387	2400	2389.45	-41.69	0.0678	<25	PASS
	2480	2483.5	2496.5	2494.22	-40.22	0.0951	<25	PASS
	2480	2496.5	13000	4960.22	-43.32	0.0466	<2.5	PASS

GFSK TX Mode 2402MHz



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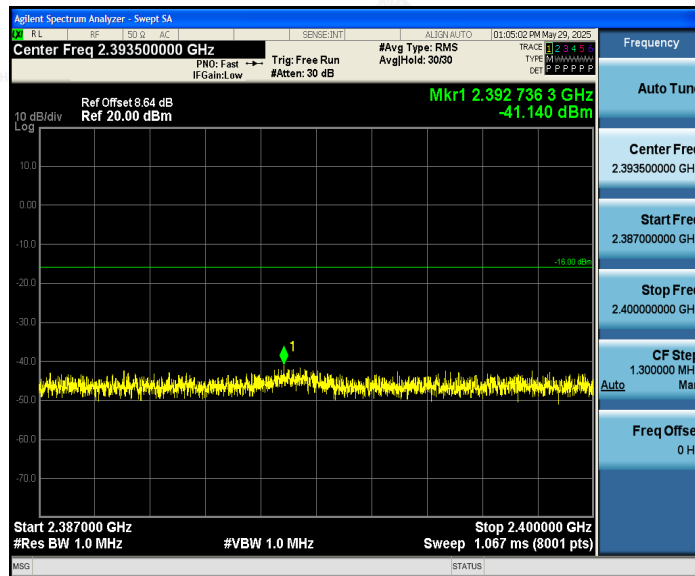
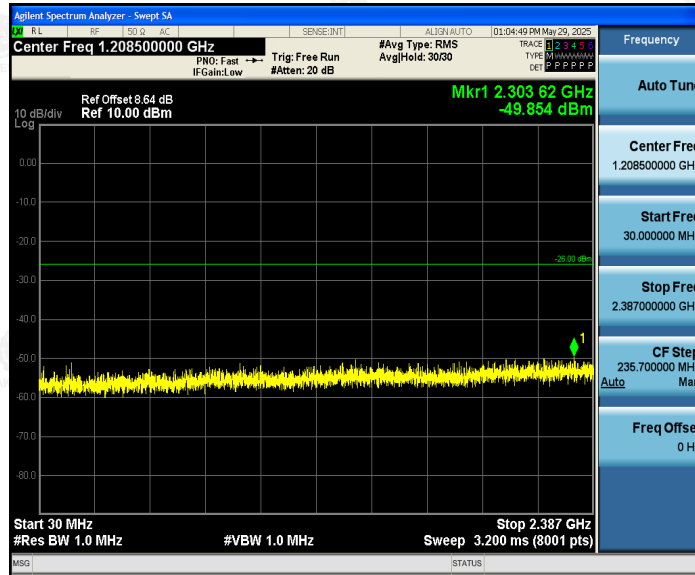
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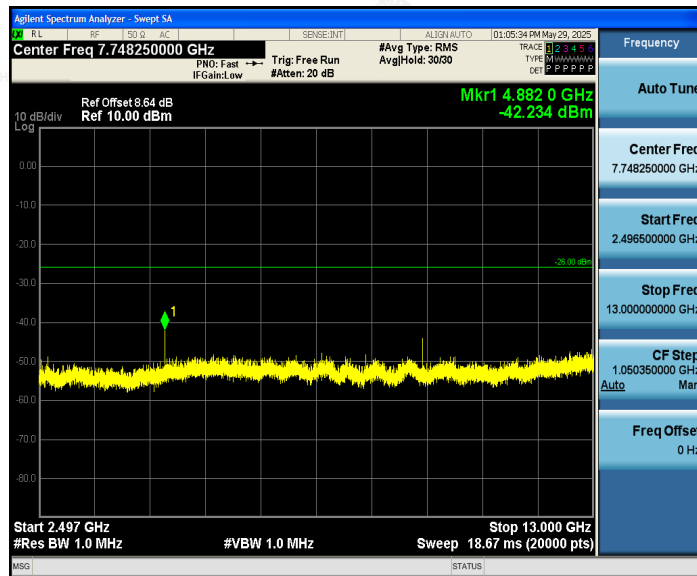
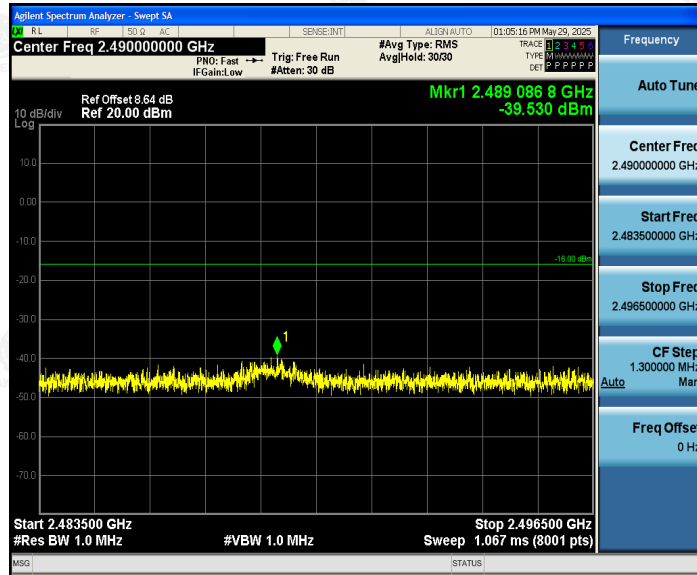


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GFSK TX Mode 2441MHz

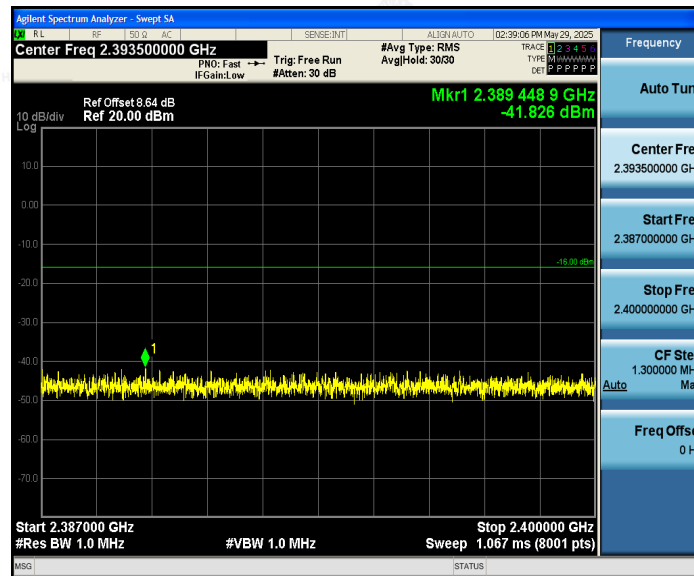
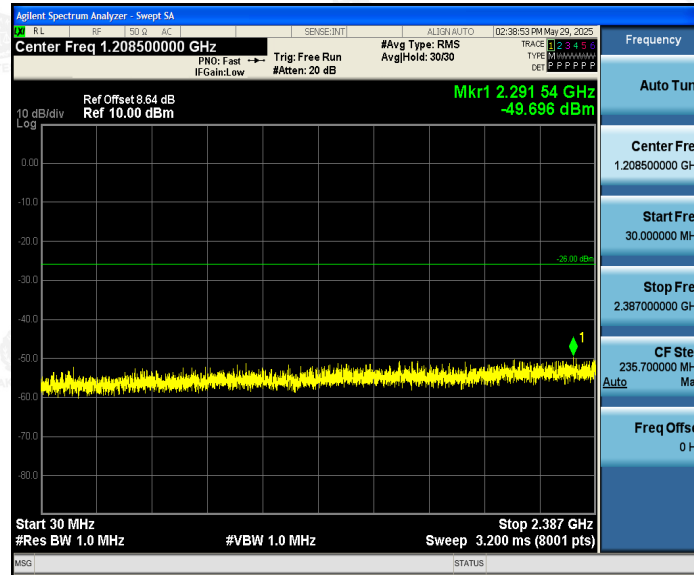


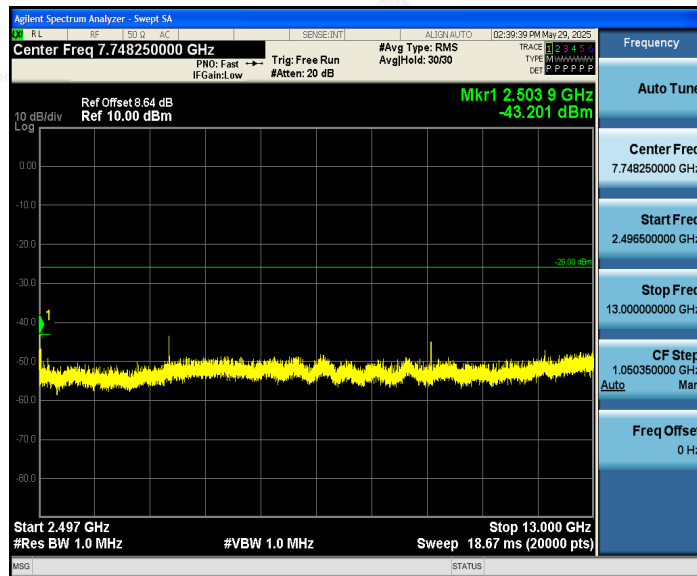
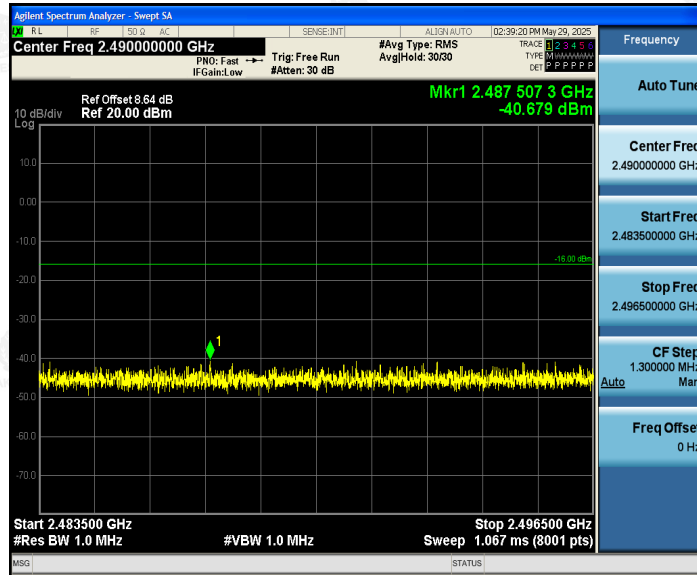


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GFSK TX Mode 2480MHz

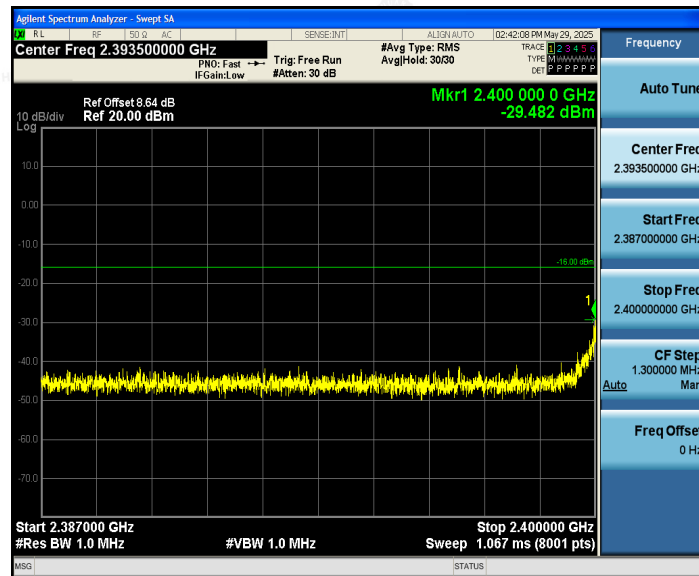
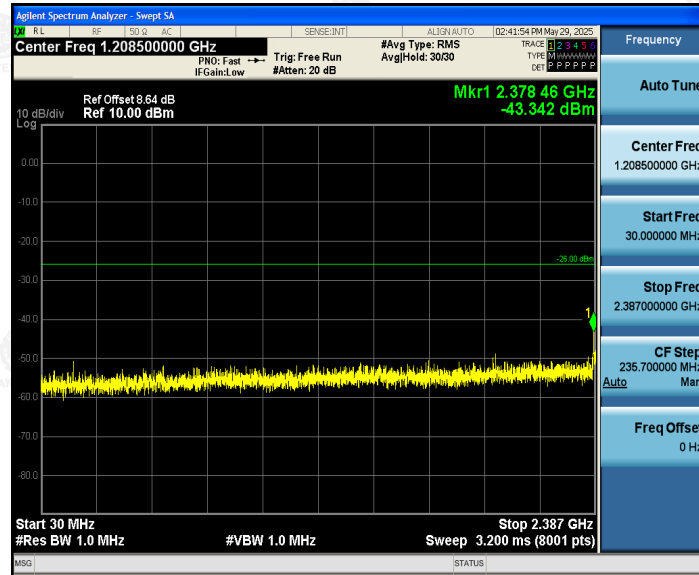


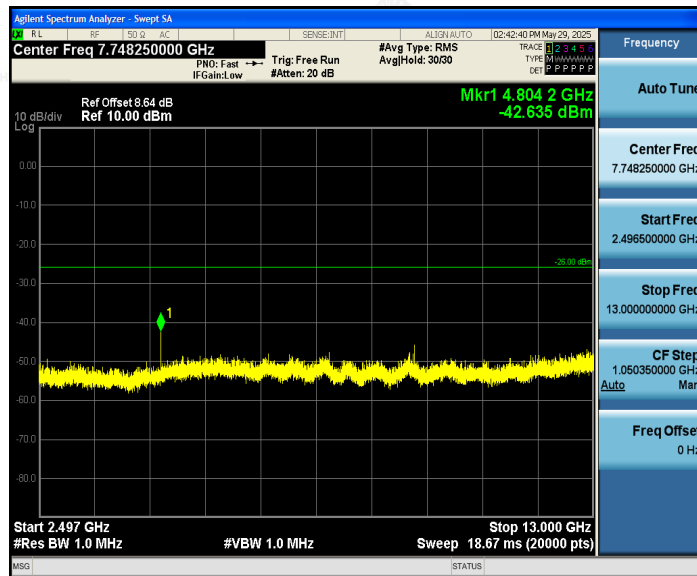
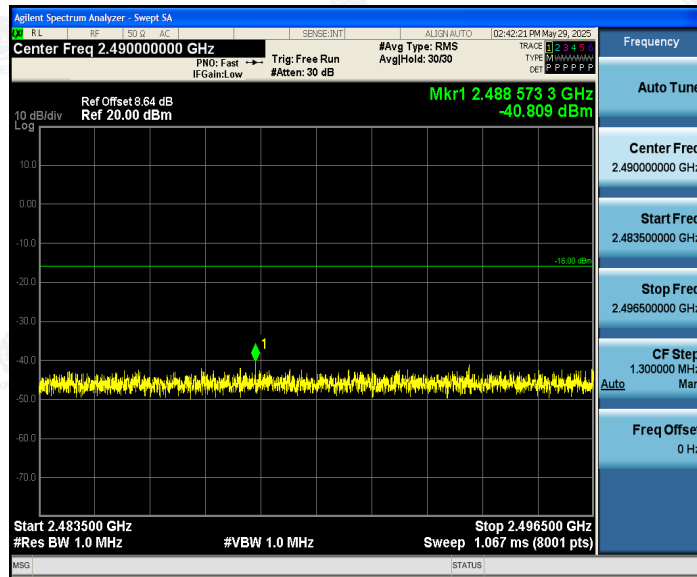


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Pi / 4DQPSK TX Mode 2402MHz

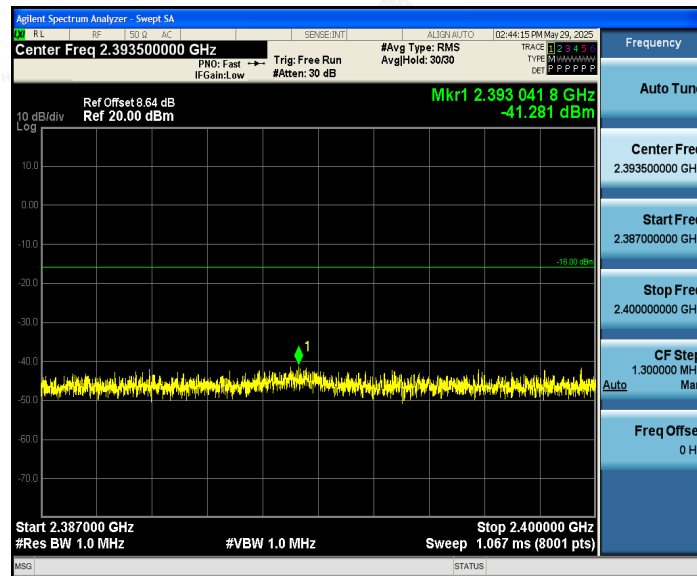
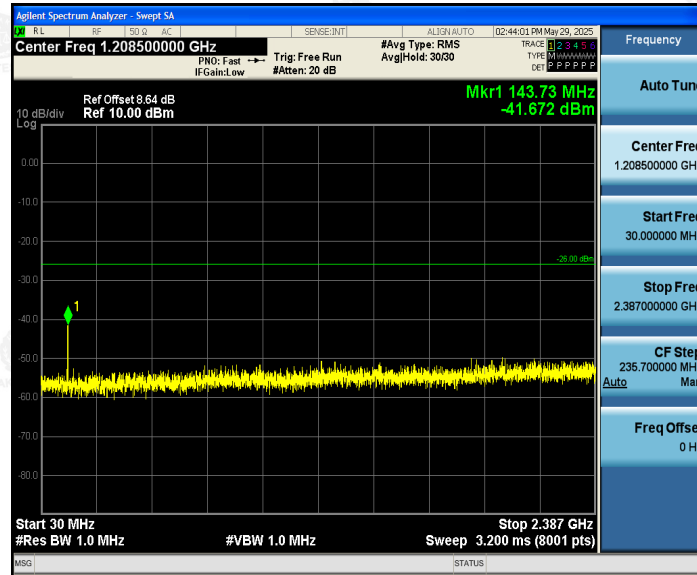


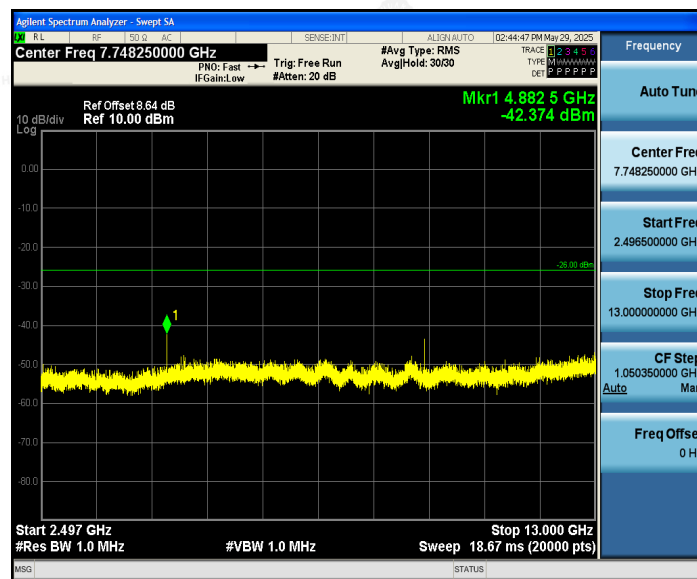
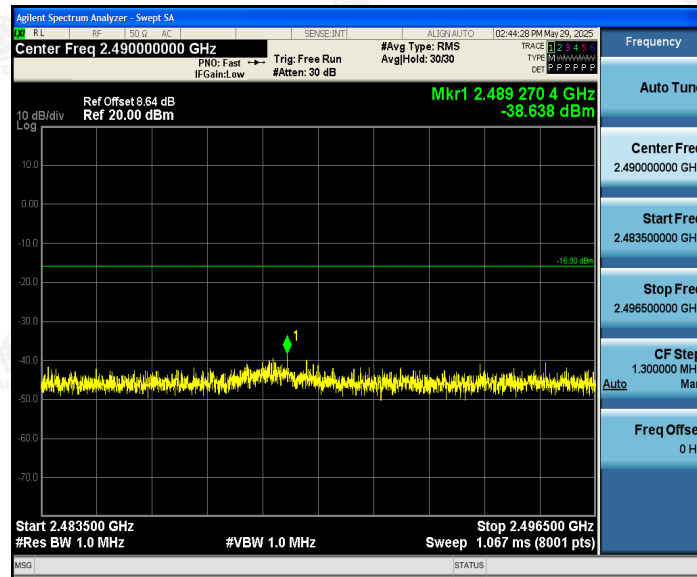


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Pi / 4DQPSK TX Mode 2441MHz

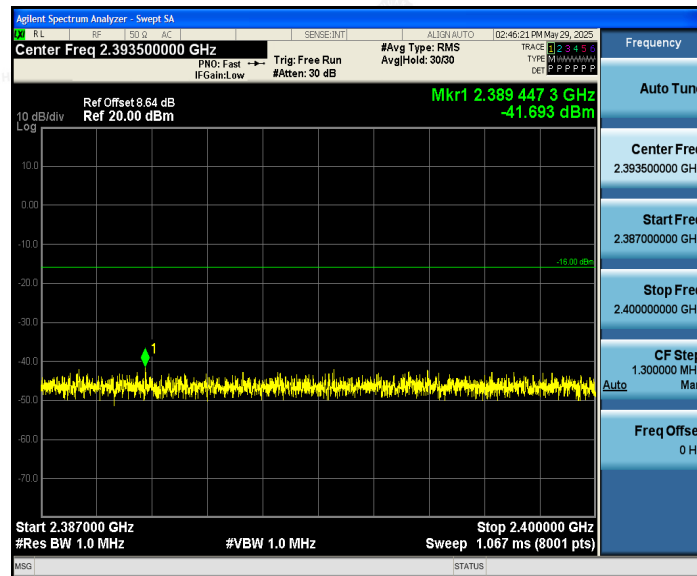
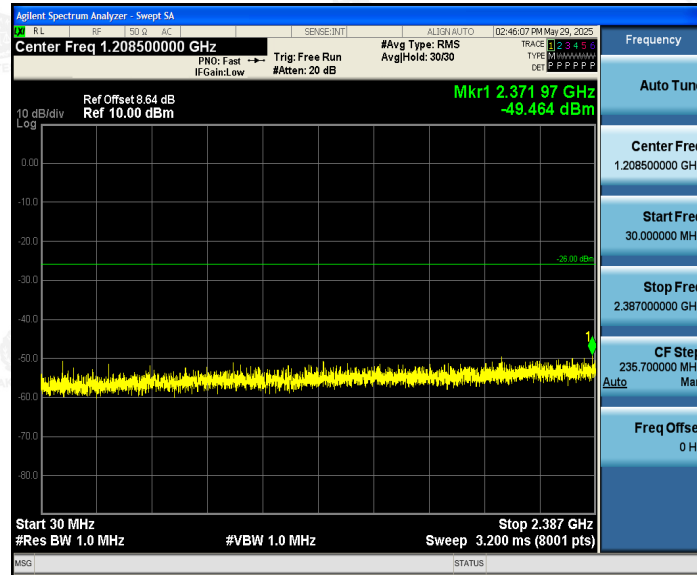




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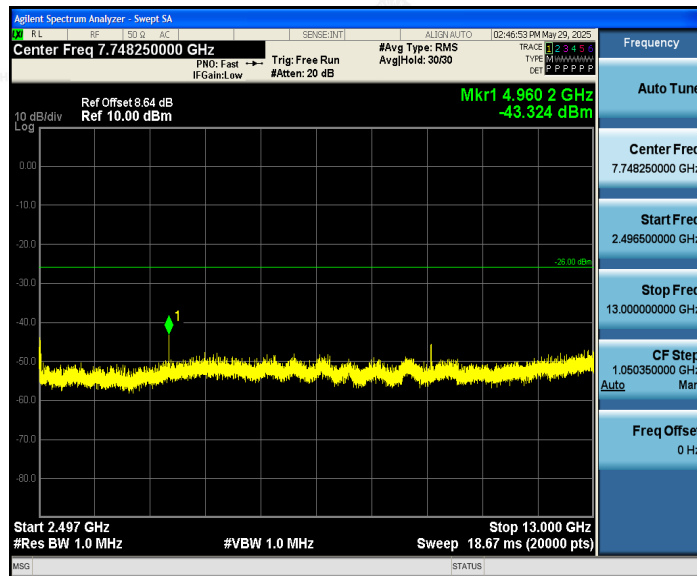
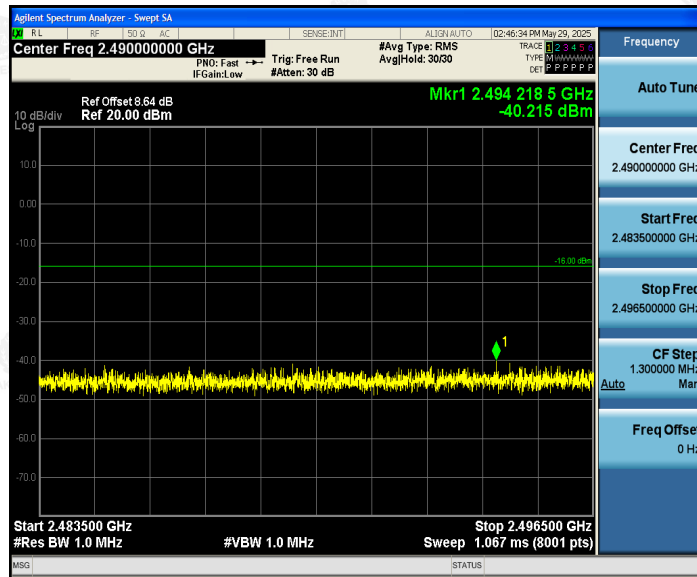
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Pi / 4DQPSK TX Mode 2480MHz



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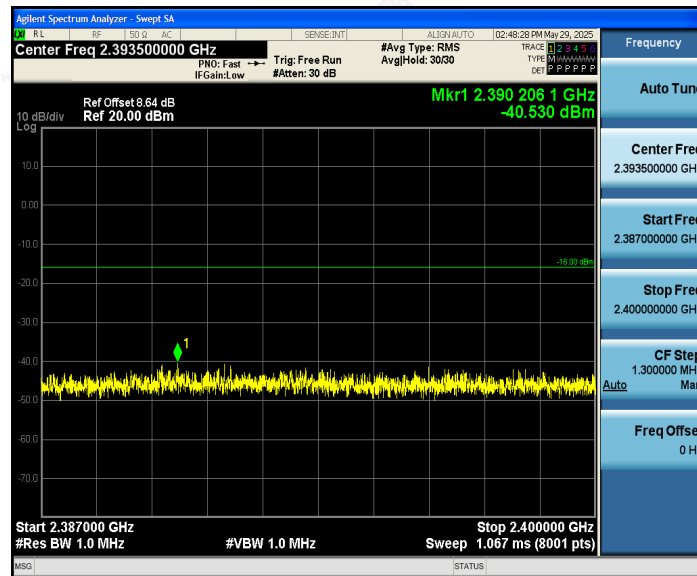
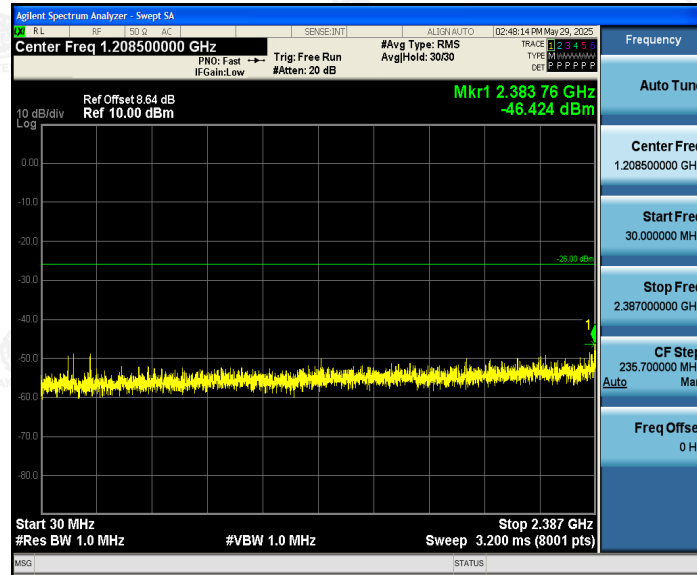
Hopping on TX mode:

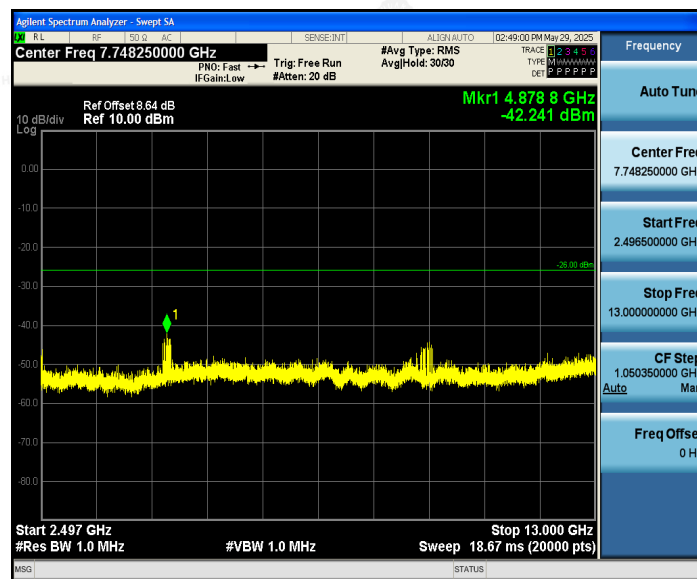
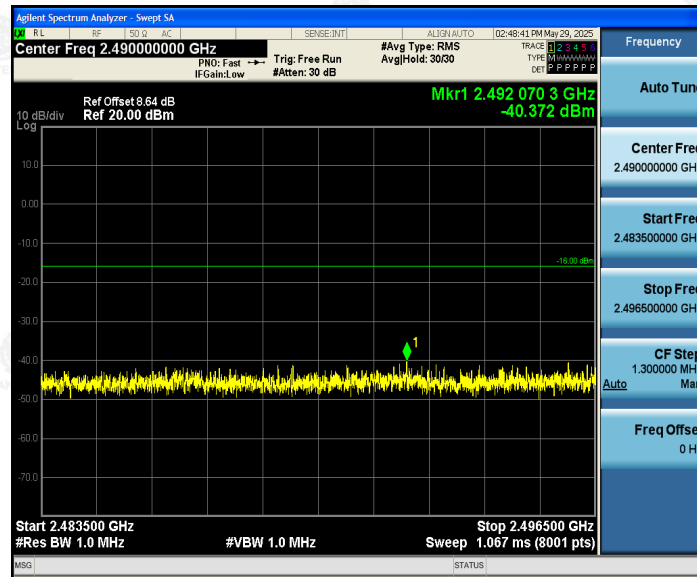
EUT:	Mini wireless speaker	Test Date:	May 29, 2025
Temperature:	25°C	Tested by:	Len Liao
Humidity:	55 % RH	Test Voltage	Normal Voltage

Operation Mode (MHz)	StartFre[MHz]	StopFre[MHz]	Mkr Fre[MHz]	Max.Level[dBm]	Max.Level[μW]	Limit[μW]	Verdict
BR	30	2387	2383.76	-46.42	0.0228	<2.5	PASS
	2387	2400	2390.21	-40.53	0.0885	<25	PASS
	2483.5	2496.5	2492.07	-40.37	0.0918	<25	PASS
	2496.5	13000	4878.81	-42.24	0.0597	<2.5	PASS
EDR	30	2387	145.79	-44.67	0.0341	<2.5	PASS
	2387	2400	2390.22	-40.37	0.0918	<25	PASS
	2483.5	2496.5	2492.56	-40.28	0.0938	<25	PASS
	2496.5	13000	4916.10	-43.44	0.0453	<2.5	PASS

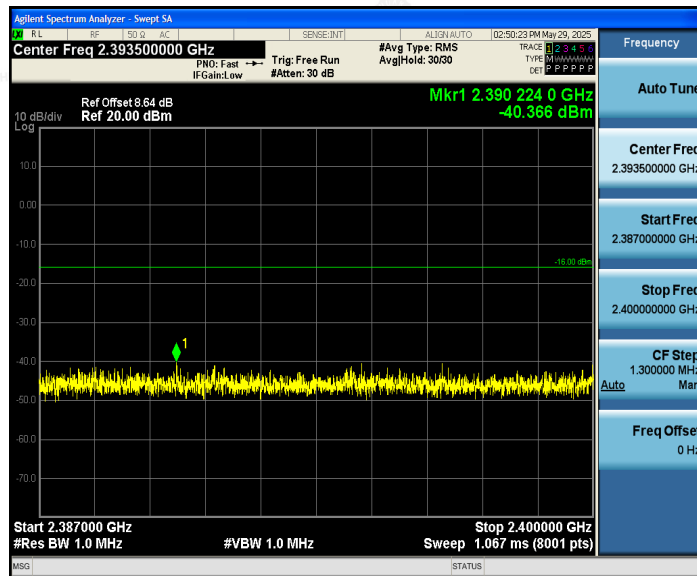
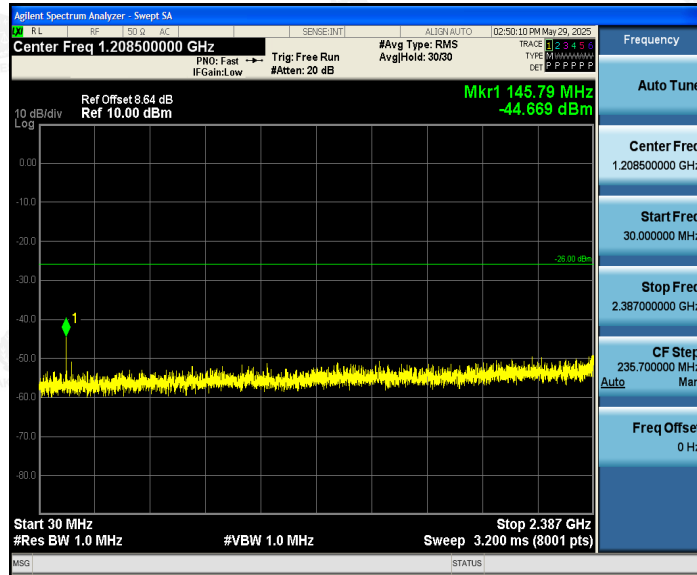
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BR



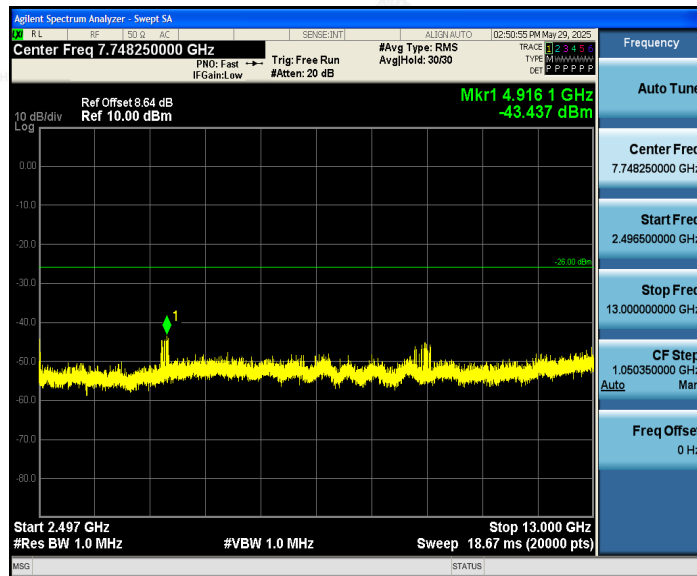
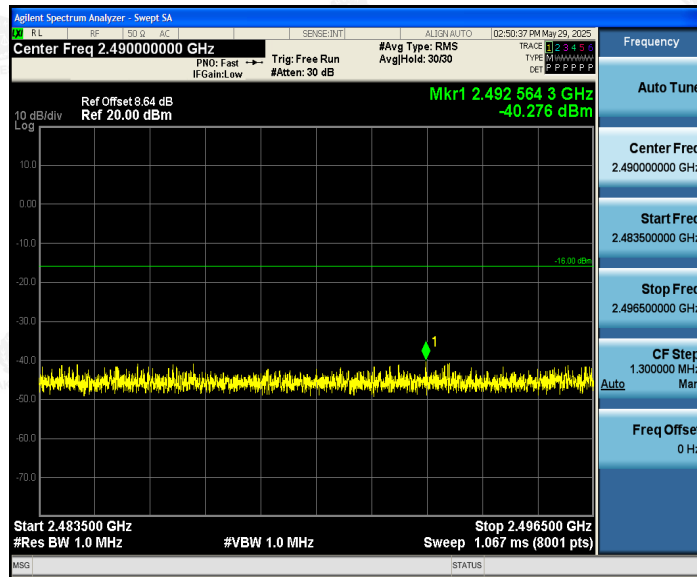


EDR



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10 Interference Prevention Function

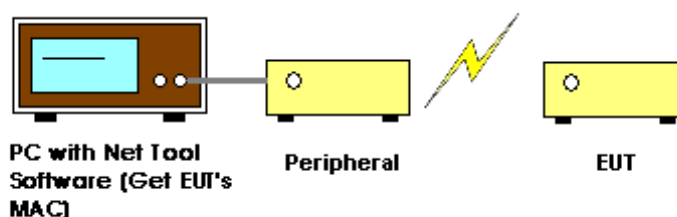
10.1 Limit

Item	Limits
Identification code	≥ 48 bits

10.2 Measuring ID Code Software

Item	Limits
MAC IP List	MAC Scan

10.3 Test Setup



10.4 Test Procedure

- (1) In the case that the EUT has the function of automatically transmitting the identification code:
 - a. Transmit the predetermined identification codes form EUT.
 - b. Check the transmitted identification codes with the demodulator.
- (2) In the case of receiving the identification code:
 - a. Transmit the predetermined identification codes form the counterpart.
 - b. Check if communication is normal.
 - c. Transmit the signals other than predetermined ID codes form the counterpart.
 - d. check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

10.5 Test Result

EUT:	Mini wireless speaker	Test Date:	May 29, 2025
Temperature:	25 ⁰ C	Tested by:	Len Liao
Humidity:	55 % RH	Test Voltage	Normal Voltage
Test result:	CONFORM (MAC: 41:39:78:3D:AC:FC)		

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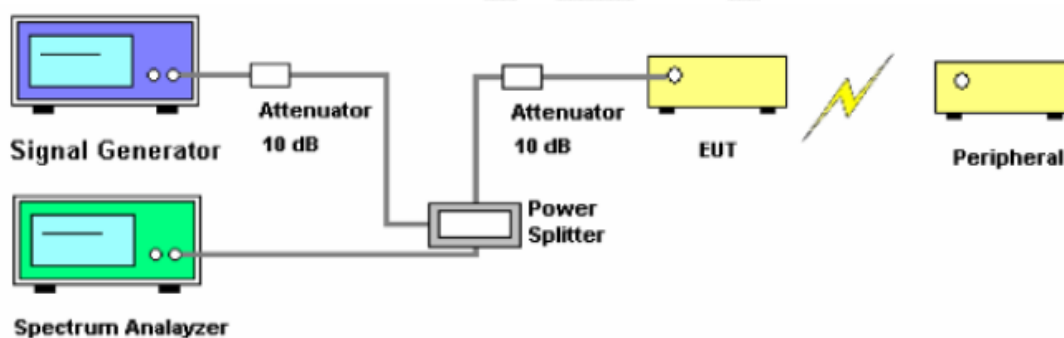
11 Carrier Sensing Function

11.1 Limit

The device shall not transmit radio wave when receiving 100Mw/m

11.2 Test Setup

❖ Measurement System Diagram



❖ Conditions of Application Equipment (EUT)

- The EUT state shall be “normal mode link with wireless router”.

11.3 Test Procedure

- (1) SG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SG and power level is $(on\ 22.79+G-20*\log(f)dBm)$ (G is the antenna gain, f is the test frequency).
- (2) Turn off the RF signal of the SG.
- (3) EUT have transmitted the maximum modulation signal and fixed channelize.
- (4) Setting of SA :RBW/VBW=1MHz/1MHz, Span=50MHz, Sweep time=auto, Sweep mode=continuous, Detect mode=positive peak
- (5) SG RF signal on.
- (6) EUT shall be stop the transmitted any signal and SG RF signal off, the EUT will be continuous

11.4 Test Result

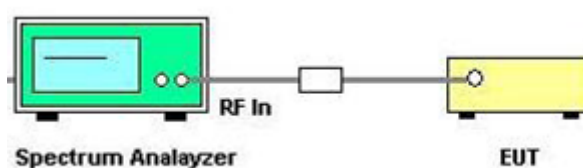
EUT:	Mini wireless speaker	Test Date:	/
Temperature:	25°C	Tested by:	/
Humidity:	55 % RH	Test Voltage	/
Test result:	Not applicable other than OFDM modulation.		

12 Secondary Radiated Emissions

12.1 Limit

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4nW or less at a frequency below 1 GHz and 20nW or less at a frequency of 1 GHz or higher as measured using the circuit.

12.2 Test Setup



12.3 Test Procedure

- (1) Configure EUT and assistant system according to clause 2.2 and 14.2
- (2) Set EUT work in Hopping mode as described in clause 2.2
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
 - For below 1G:
 - Resolution BW: 100KHz.
 - Video BW: 100KHz.
 - Detector: Peak.
 - Trace Mode: Max Hold
 - For above 1G:
 - Resolution BW: 1MHz.
 - Video BW: 1MHz.
 - Detector: Peak.
 - Trace Mode: Max Hold
- (4) When the trace is complete, measure the Secondary Radiated Emissions with spectrum analyzer's bandwidth measure function.

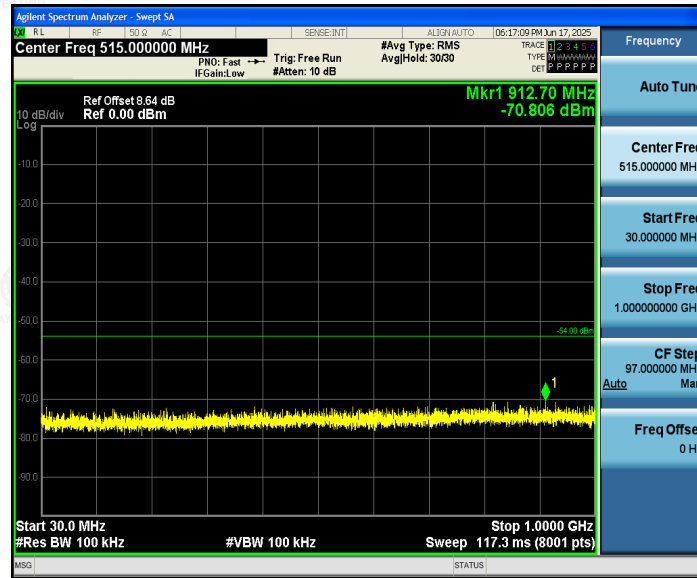
12.4 Test Result

EUT:	Mini wireless speaker	Test Date:	May 29, 2025
Temperature:	25°C	Tested by:	Len Liao
Humidity:	55 % RH	Test Voltage	Normal Voltage
Note: The worst test channel of all channels was showed as the follow.			

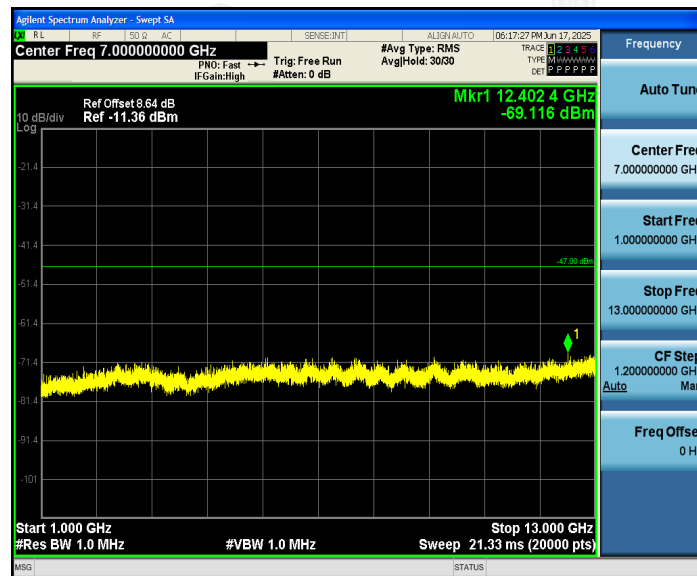
Operation Mode (MHz)	Test Channel	StartFre [MHz]	StopFre [MHz]	Mkr Fre [MHz]	Max.Level[dBm]	Max.Level[nW]	Limit[nW]	Verdict
GFSK RX Mode	2402	30	1000	912.70	-70.81	0.0830	<4	PASS
	2402	1000	13000	12402.37	-69.12	0.1225	<20	PASS
	2441	30	1000	919.73	-70.90	0.0813	<4	PASS
	2441	1000	13000	12755.19	-68.91	0.1285	<20	PASS
	2480	30	1000	709.49	-70.88	0.0817	<4	PASS
	2480	1000	13000	12867.99	-69.23	0.1194	<20	PASS
Pi / 4DQPSK RX Mode	2402	30	1000	932.71	-70.45	0.0902	<4	PASS
	2402	1000	13000	12880.59	-67.85	0.1641	<20	PASS
	2441	30	1000	816.67	-71.16	0.0766	<4	PASS
	2441	1000	13000	12858.99	-69.15	0.1216	<20	PASS
	2480	30	1000	823.70	-70.62	0.0867	<4	PASS
	2480	1000	13000	12645.38	-68.79	0.1321	<20	PASS

GFSK RX Mode:

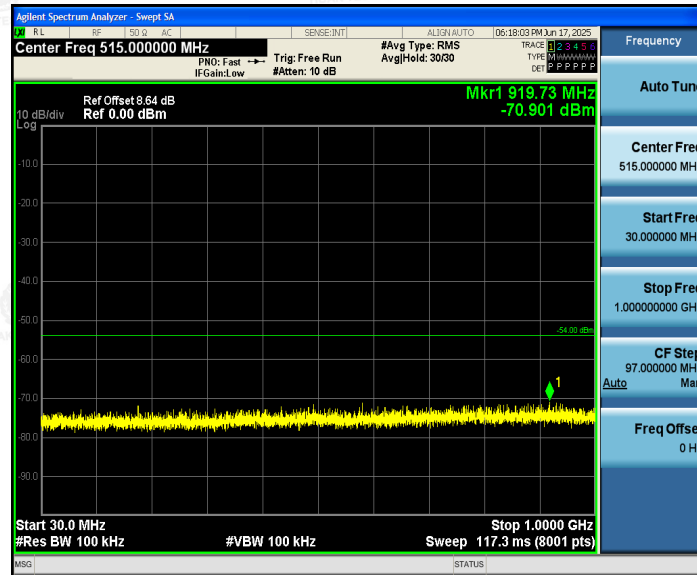
CH 00:2402MHz-RX-Frequency Band 1 ($30 \text{ MHz} \leq f < 1000 \text{ MHz}$)



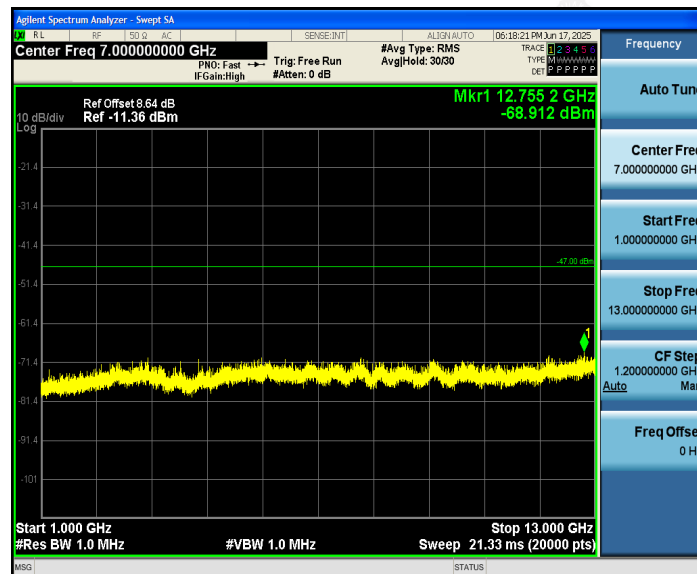
CH 00:2402MHz-RX-Frequency Band 2 ($1000 \text{ MHz} \leq f < 13000 \text{ MHz}$)



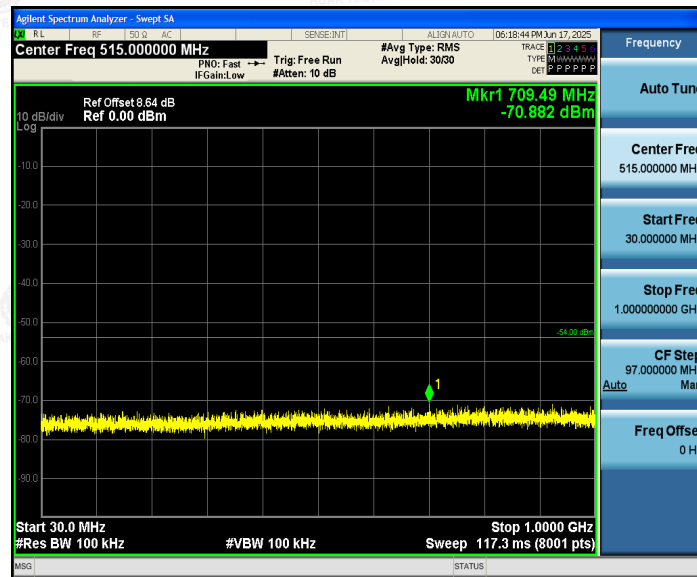
CH 39:2441MHz-RX-Frequency Band 1 ($30 \text{ MHz} \leq f < 1000 \text{ MHz}$)



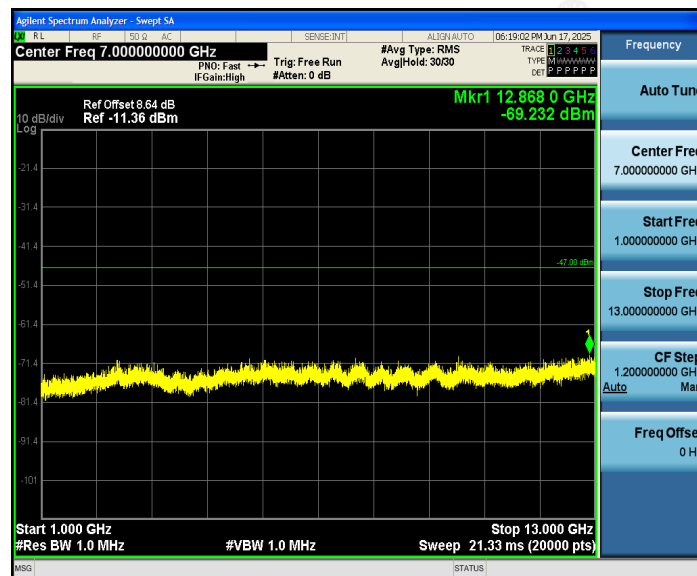
CH 39:2441MHz-RX-Frequency Band 2 ($1000 \text{ MHz} \leq f < 13000 \text{ MHz}$)



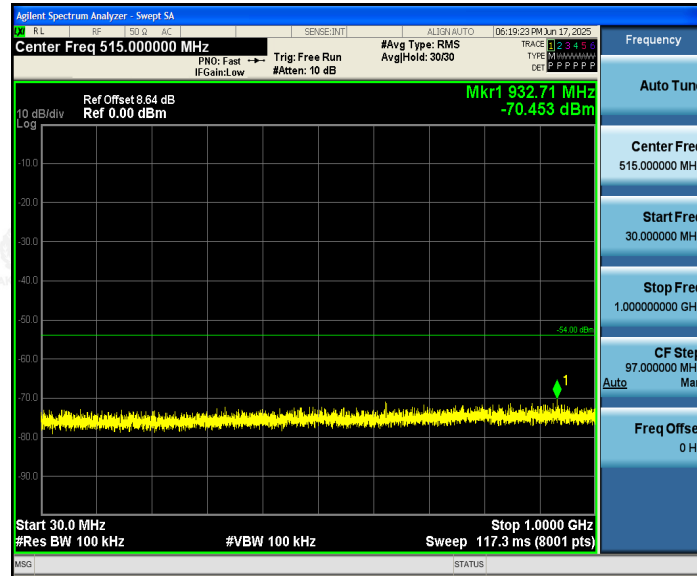
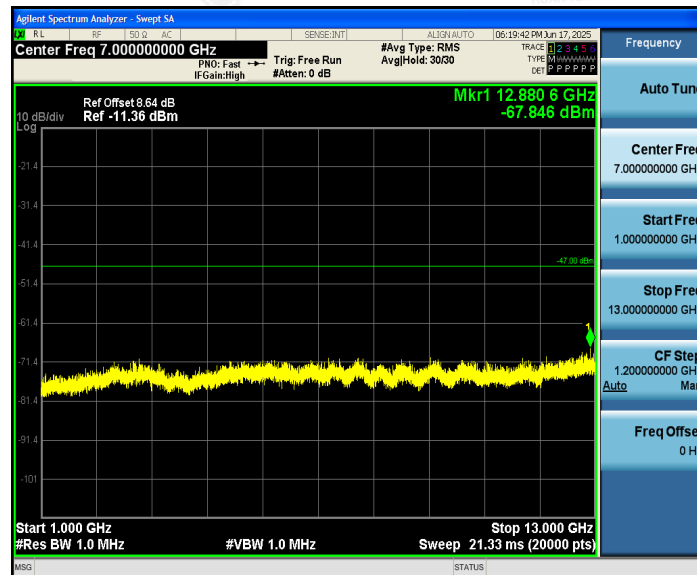
CH 78:2480MHz-RX-Frequency Band 1 ($30 \text{ MHz} \leq f < 1000 \text{ MHz}$)

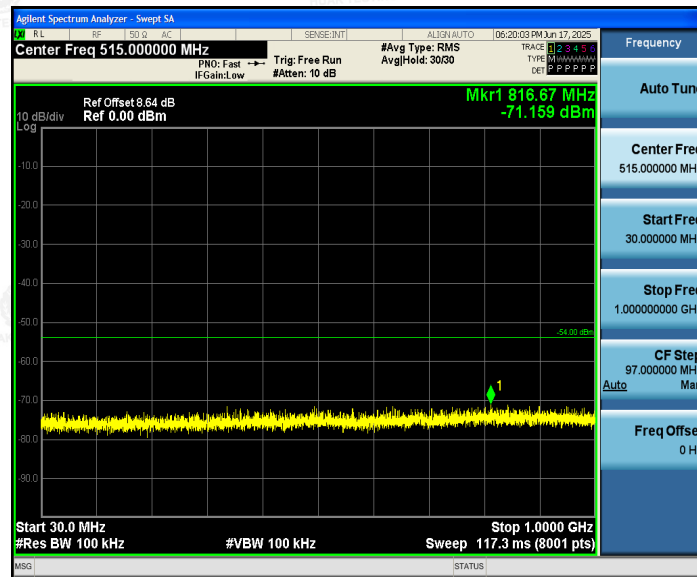
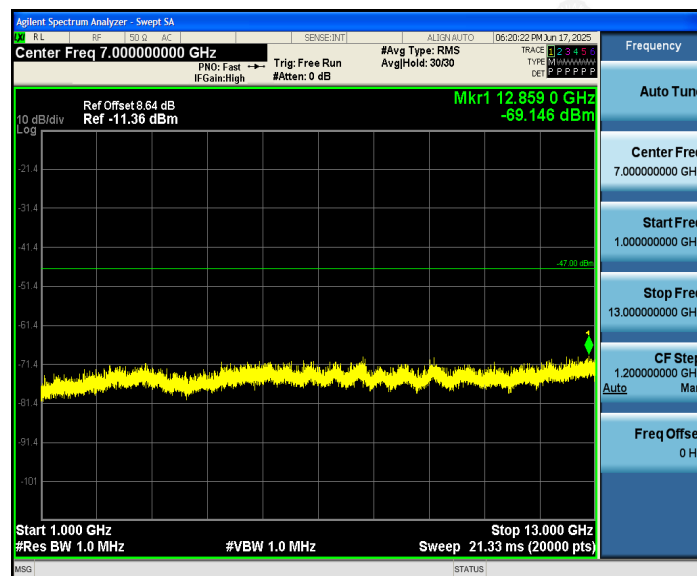


CH 78:2480MHz-RX-Frequency Band 2 ($1000 \text{ MHz} \leq f < 13000 \text{ MHz}$)

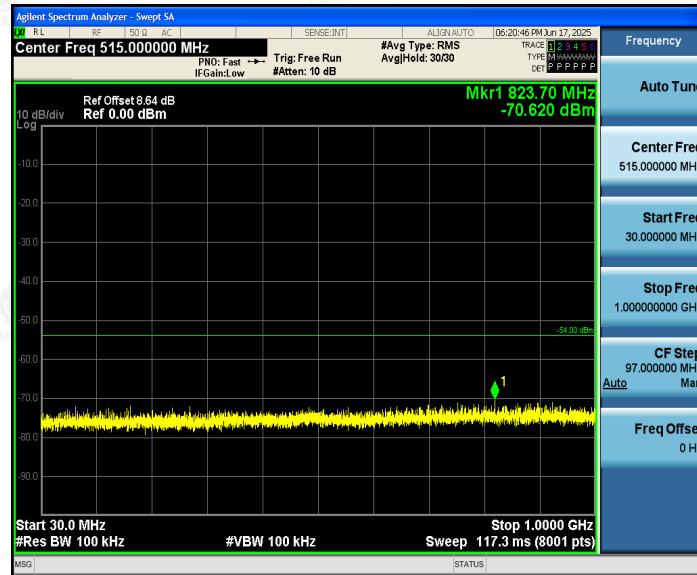


Pi / 4DQPSK RX Mode:

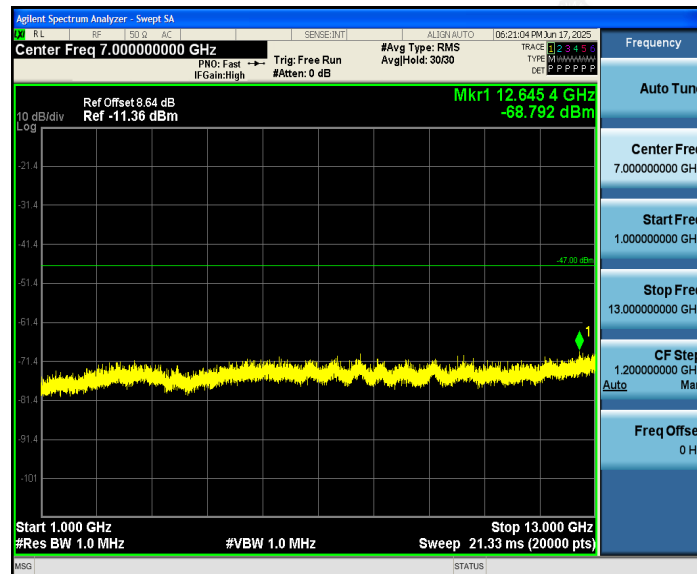
CH 00:2402MHz-RX-Frequency Band 1 ($30 \text{ MHz} \leq f < 1000 \text{ MHz}$)

CH 00:2402MHz-RX-Frequency Band 2 ($1000 \text{ MHz} \leq f < 13000 \text{ MHz}$)


CH 39:2441MHz-RX-Frequency Band 1 ($30\text{ MHz} \leq f < 1000\text{ MHz}$)

CH 39:2441MHz-RX-Frequency Band 2 ($1000\text{ MHz} \leq f < 13000\text{ MHz}$)


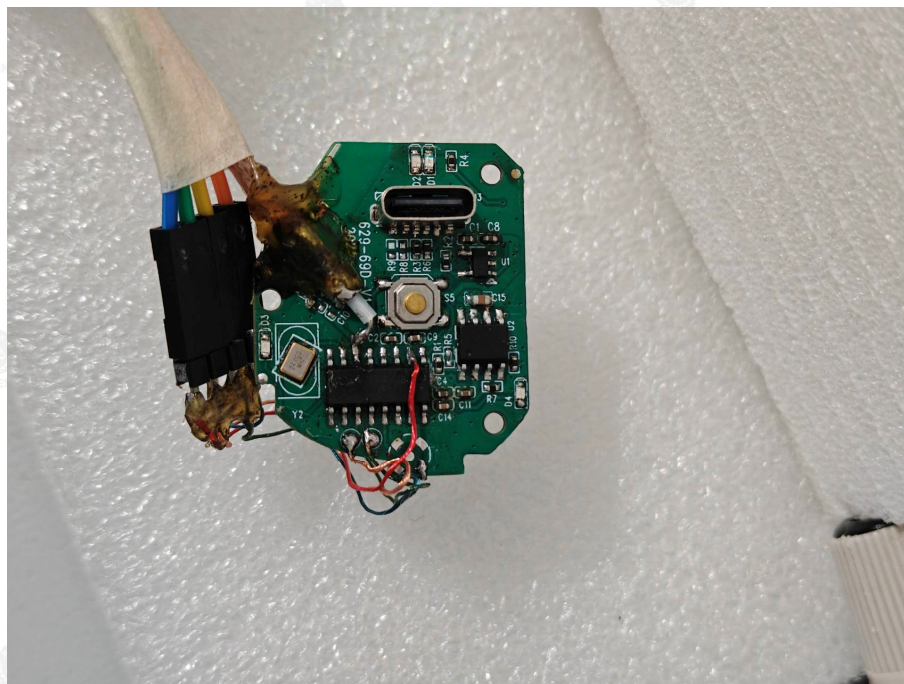
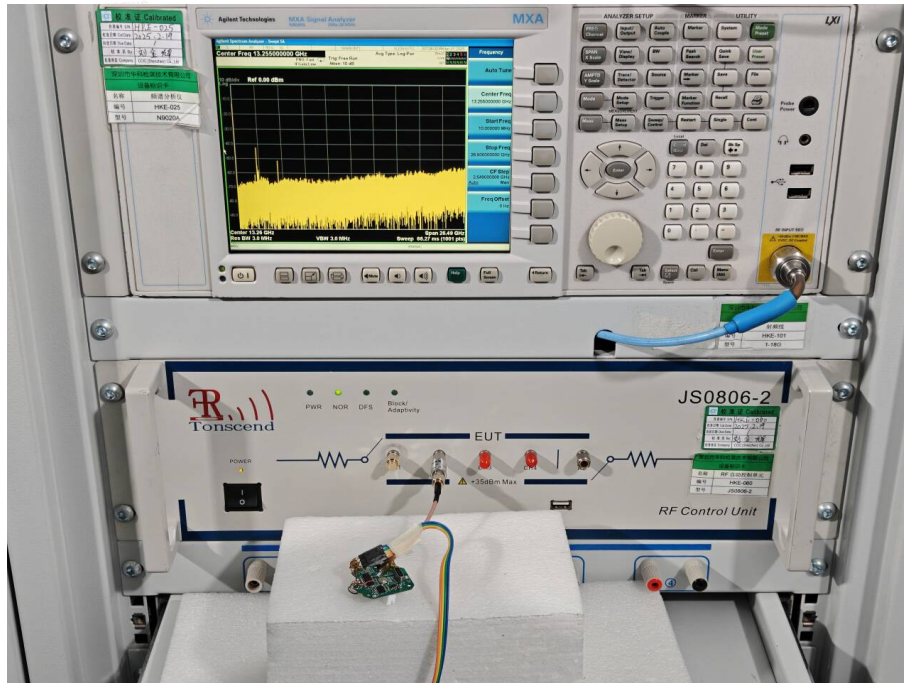
CH 78:2480MHz-RX-Frequency Band 1 ($30 \text{ MHz} \leq f < 1000 \text{ MHz}$)



CH 78:2480MHz-RX-Frequency Band 2 ($1000 \text{ MHz} \leq f < 13000 \text{ MHz}$)



13 Photographs of Test



14 Photos of the EUT

Reference to the report: ANNEX A of external photos and ANNEX B of internal photos

-----End of report-----

