



TEST REPORT

Product Name: Portable Label Maker Smart Mini Label Maker

Trademark: N/A

Model Number: N15, N15A, N15B, N15C, N15D, N15E, N15D, N15P, A15, D15, P15, E15, L15, N15Pro, L12, A12, A15, B15, C15, D15, E15, F15, G15, H15, I15, K15, L15, M15, O15, P15, Q15, R15, S15, T15, V15, W15, X15, Y15

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Sample Received Date: Aug. 04, 2025

Sample tested Date: Aug. 04, 2025 to Aug. 18, 2025

Issue Date: Aug. 18, 2025

Report No.: CTB25080406821RF01

Test Standards: MIC Public Notice 88:2004, annex 1 and annex 43
Ordinance Article 2 paragraph 1 item (19)

Test Results: PASS

Remark: This is Bluetooth radio test report.

Compiled by: Reviewed by: Approved by:

Zhou Kui

Arron Liu

ZhouKuiArron LiuBin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

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1 TEST SUMMARY

1VERSION

Report No.	Issue Date	Description	Approved
CTB25080406821RF01	Aug. 18, 2025	Original	Valid

1.2 Test description

Part	Rule Section	Description	Result
4.1	3	Frequency Error	Complies
4.2	4	Occupied Bandwidth (99%) and Spread-spectrum (90%)	Complies
4.3	5	Unwanted Emission Intensity	Complies
4.4	6	Antenna Power Error	Complies
4.5	7	Limitation of Collateral Emission of Receiver	Complies
4.6	8	Transmission Antenna Gain(EIRP Antenna Power)	Complies
4.7	9	Transmission Radiation Angle Width (3dB Beam width)	N/A
4.8	10	Radio Interference Prevention Capability	Complies
4.9	Note 1	Carrier Sense Capability	N/A
4.10	Note 2	Construction Protection Confirmation	Complies

Note:

1. "N/A" denotes test is not applicable in this Report.
2. "Note 1" is MIC Notice No.88 Appendix No.43.
3. "Note 2" is MIC Ordinance Regulating Radio Equipment Section 4.17 of Article 49.20.

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 %.

Item	Uncertainty
Occupancy bandwidth	54.3kHz
Conducted output power Above 1G	0.9dB
Conducted output power below 1G	0.9dB
Power Spectral Density , Conduction	0.9dB
Conduction spurious emissions	2.0dB
Out of band emission	2.0dB
3m camber Radiated spurious emission(30MHz-1GHz)	4.6dB
3m chamber Radiated spurious emission(1GHz-18GHz)	5.1dB
3m chamber Radiated spurious emission(18GHz-40GHz)	3.4dB
Frequency Error	54.3Hz
Adjacent channel power below 1G	2.6dB
Adjacent channel power Above 1G	2.8dB
humidity uncertainty	5.5%
Temperature uncertainty	0.63℃
frequency	1×10^{-7}

2 GENERAL INFORMATION

2.1 General description of EUT

Model(s):	N15, N15A, N15B, N15C, N15D, N15E, N15D, N15P, A15, D15, P15, E15, L15, N15Pro, L12, A12, A15, B15, C15, D15, E15, F15, G15, H15, I15, K15, L15, M15, O15, P15, Q15, R15, S15, T15, V15, W15, X15, Y15
Model Description:	All the model are the same circuit and RF module, only the name is different. Test sample model: N15
Bluetooth Version:	Bluetooth 5.0
Hardware Version:	MA12-N15P-A1
Software Version:	0.0.2

Operation Frequency: Bluetooth: 2402-2480MHz

Max. RF output power: 1M:2mW
2M:2mW

Type of Modulation: Bluetooth: GFSK

Antenna installation: PCB antenna

Antenna Gain: 2.499dBi

Ratings: DC 5V charging from adapter
DC 3.7V by battery

Note: For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.2 Description of test modes

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List 2.4G Band							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

Note: Test performed at the lowest/middle/highest frequencies selected in the list above for EUT supported while working on specified mode.

Pretest Mode	Description
Transmitting mode	Low channel: 2402MHz
	Middle channel: 2440MHz
	High channel: 2480MHz
Receiver mode	Low channel: 2402MHz

2.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

During the measurement the environmental conditions were within the listed ranges.

Supply Voltage			
	supply power V	Rated module power V	Tolerance (%)
Normal	3.7	3.3	
+10%	4.07	3.3	
-10%	3.33	3.3	
Others			
Temperature (°C)		20-25	
Relative humidity		54 %.	
ATM Pressure:		1010 mbar	
Note 1: When the input voltage is reduced or increased by 10%, the regulator voltage changes of less than 1%. So the following test items are conducted in the normal voltage.			

2.4 Block diagram showing the configuration of system tested

Transmitting mode



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	Mfr/Brand	Model/Type No.	Note
1	Portable Label Maker Smart Mini Label Maker	N/A	N15, N15A, N15B, N15C, N15D, N15E, N15D, N15P, A15, D15, P15, E15, L15, N15Pro, L12, A12, A15, B15, C15, D15, E15, F15, G15, H15, I15, K15, L15, M15, O15, P15, Q15, R15, S15, T15, V15, W15, X15, Y15	EUT

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 equipment list

No.	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY52090073	A.14.16	2026/6/27
2	Power Sensor	Agilent	U2021XA	MY56120032	/	2026/6/27
3	Power Sensor	Agilent	U2021XA	MY56120034	/	2026/6/27
4	Communication test set	R&S	CMW500	108058	V3.5.80	2026/6/27
5	Spectrum Analyzer	KEYSIGHT	N9020A	MY51289897	A.14.16	2026/6/27
6	Signal Generator	Agilent	N5181A	MY50140365	A.01.60	2026/6/27
7	Vector signal generator	Agilent	N5182A	MY47420195	A.01.87	2026/6/27
8	Communication test set	Agilent	E5515C	MY50102567	B.19.07 (E1962B)	2026/6/27
9	2.4 GHz Filter	Shenxiang	MSF2400-24 83.5MS-1154	20181015001	/	2026/6/29
10	5 GHz Filter	Shenxiang	MSF5150-58 50MS-1155	20181015001	/	2026/6/29
11	Filter	Xingbo	XBLBQ-DZA 120	190821-1-1	/	2026/6/29
12	BT&WI-FI Automatic test software	Microwave	MTS8310	Ver. 2.0.0.0	/	/
13	Rohde & Schwarz SFU Broadcast Test System	R&S	SFU	101017	/	2026/6/27
14	Temperature humidity chamber	Hongjing	TH-80CH	DG-15174	/	2026/6/27
15	234G Automatic test software	Microwave	MTS8200	Ver. 2.0.0.0	/	/
16	966 chamber	C.R.T.	966	/	/	2027/6/21
17	Receiver	R&S	ESPI	100362	RF_ATTEN_7 (104489/003)	2026/6/27
18	Amplifier	HP	8447E	2945A02747	/	2026/6/27

19	Amplifier	Agilent	8449B	3008A01838	/	2026/6/27
20	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00869	/	2026/6/27
21	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA9120D	01911	/	2026/6/27
22	EMI test software	Fala	EZ-EMC	FA-03A2 RE	/	/
23	Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-224	/	2026/6/27
24	loop antenna	ZHINAN	ZN30900A	GTS534	/	/
25	40G Horn antenna	A/H/System	SAS-574	588	/	2026/6/27
26	Amplifier	AEROFLEX	Aeroflex	097	/	2026/6/27
27	Power Metter	KEYSIGHT	N1912AP	N/A	A.05.00	2026/6/27
28	DC power supply	Agilent	E3640A	MY53050046	/	2026/6/27

Remark: Calibration institution "Guangzhou Lisai Measurement and Testing Co., LTD."

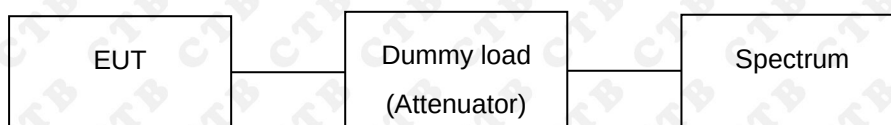
3 TEST CONDITIONS AND RESULTS

3.1 Frequency error

3.1.1 Limit

Item	Limits
Frequency Error	+/-50ppm

3.1.2 Test configuration



3.1.3 Test procedure

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: non-modulation

Spectrum Condition:

Frequency: test frequency

Span: 1000 kHz

RBW: 10 kHz

VBW: 10 kHz

Sweep time: Auto

Detector mode: Positive peak

Indication mode: max hold

3.1.4 Test results

1M:

Test voltage (V)	Frequency (MHz)	Read (MHz)	Deviation (MHz)	Tolerance (ppm)	Limit (ppm)	Result
Normal Voltage	2402	2402.016	0.016	6.661	+/-50.00	Pass
	2440	2440.016	0.016	6.557		
	2480	2480.017	0.017	6.855		

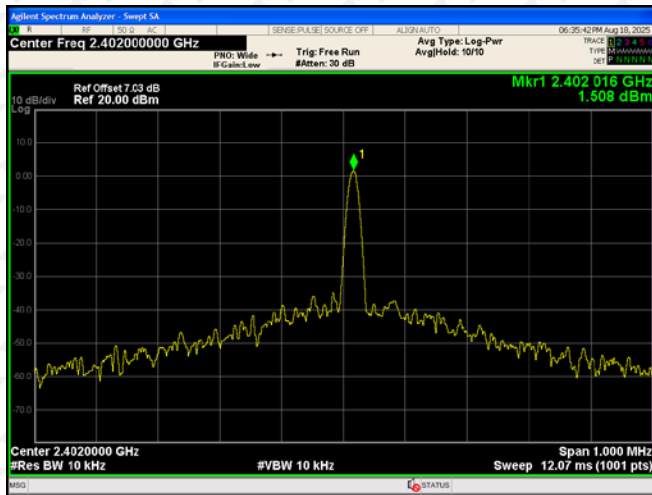
2M:

Test voltage (V)	Frequency (MHz)	Read (MHz)	Deviation (MHz)	Tolerance (ppm)	Limit (ppm)	Result
Normal Voltage	2402	2402.016	0.016	6.661	+/-50.00	Pass
	2440	2440.016	0.016	6.557		
	2480	2480.017	0.017	6.855		

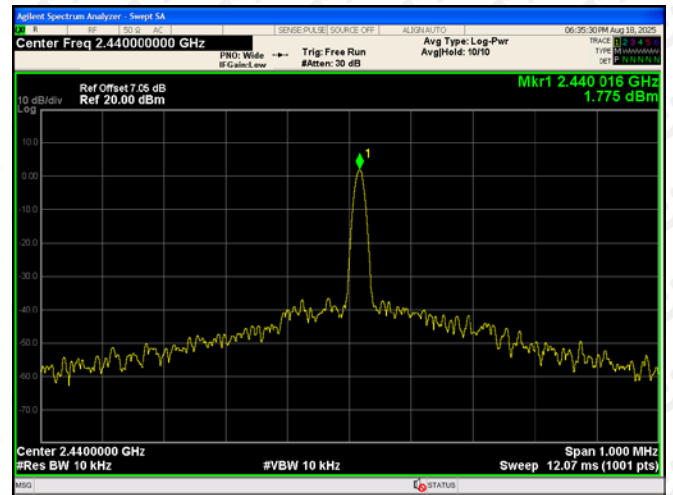
Note: Below test graph is the worst data.

1M:

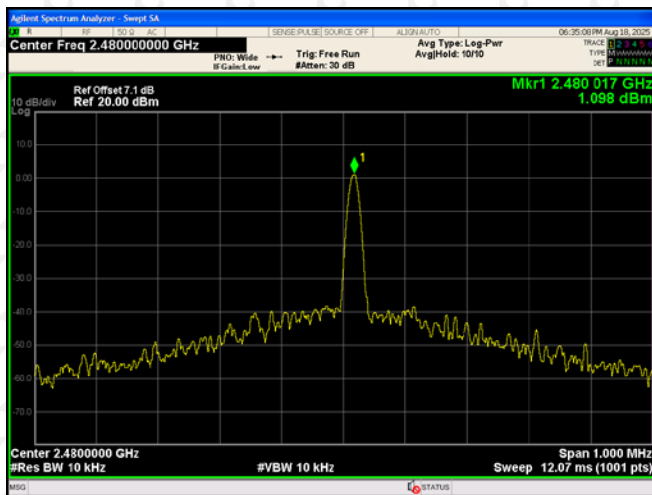
Normal Voltage



2402MHz



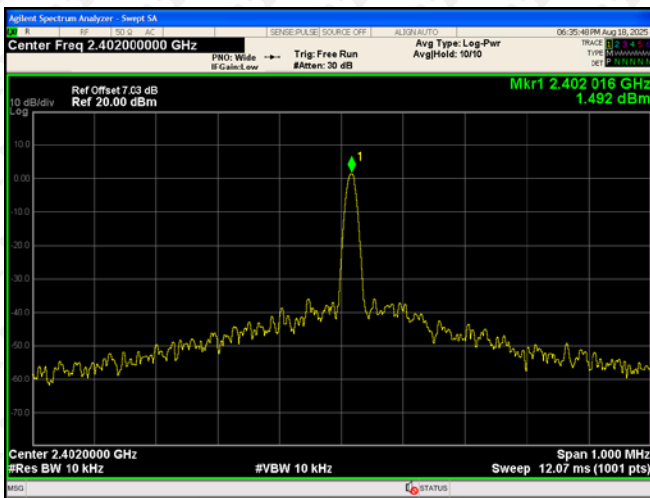
2440MHz



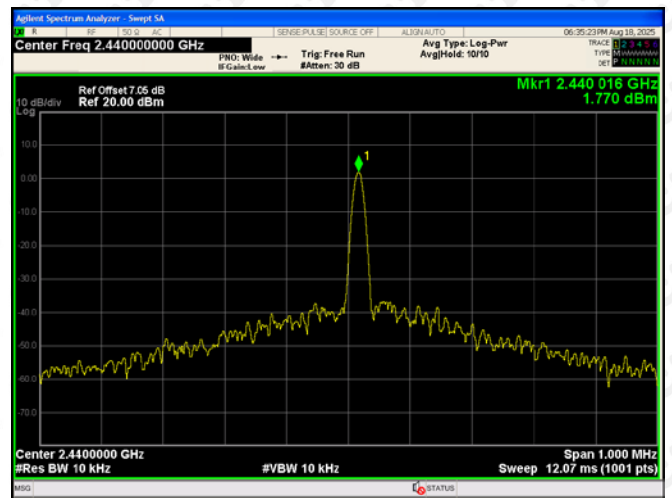
2480MHz

2M:

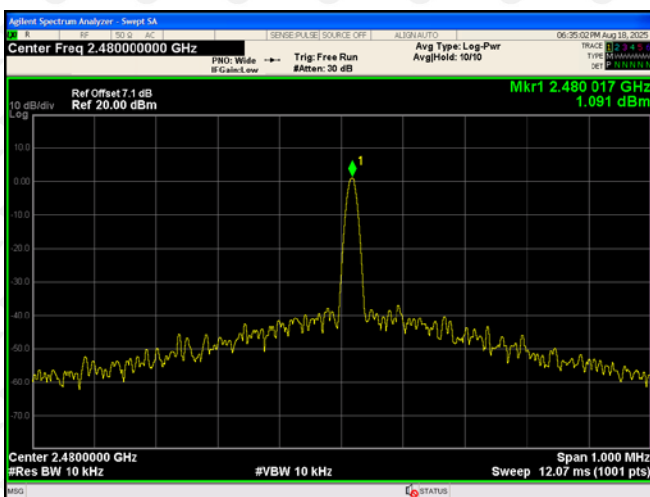
Normal Voltage



2402MHz



2440MHz



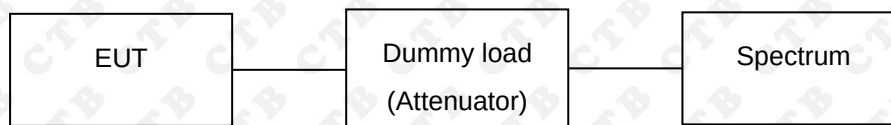
2480MHz

3.2 Antenna output power and output power tolerance

3.2.1 Limit

Item	Limits
Antenna Power Density	$\leq 3\text{mW/MHz}$ (FH form 2427 - 2470.75MHz) $\leq 10\text{mW/MHz}$ (OFDM, DS-SS, OFDM, DS-SS, OFDM, DS-SS) $\leq 10\text{mW}$ (Other from 2400~2483.5MHz)
Antenna Power Error	+20% (Base on manufacturer declare antenna power density)

3.2.2 Test configuration



3.2.3 Test procedure

Step 1:

Connect the UUT to the spectrum analyzer as TEST CONFIGURATION and use the following settings:

- Centre Frequency: The centre frequency of the channel under test.
- RBW: 1 MHz
- VBW: 1 MHz
- Span: Wide enough to cover the complete power envelope of the signal of the UUT.
- Detector: Peak
- Trace Mode: Max Hold

Step 2:

When the trace is complete, find the peak value of the power envelope and record the frequency.

Step 3:

Make the following changes to the settings of the spectrum analyzer:

- Centre Frequency: Equal to the frequency recorded in step 2.
- Span: 0 MHz
- RBW: 1 MHz
- VBW: 1 MHz
- Detector: RMS
- Trace Mode: Max Hold

3.2.4 Test results

1M:

Test voltage	Channel (MHz)	Average burst power(dBm)	Output power (mW)	Limit (mW)	Rated output power (mW)	Tolerance (%)	Limit	Result
Normal Voltage	2402	1.518	1.418	10	2	-29.080	20%	Pass
	2440	1.820	1.521	10	2	-23.973		
	2480	1.145	1.302	10	2	-34.917		

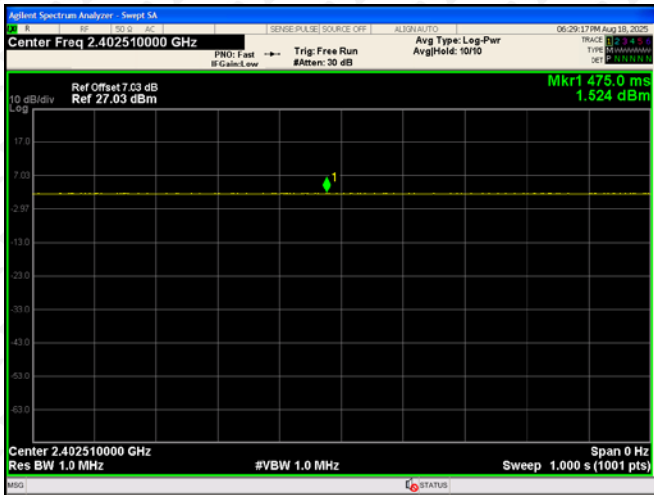
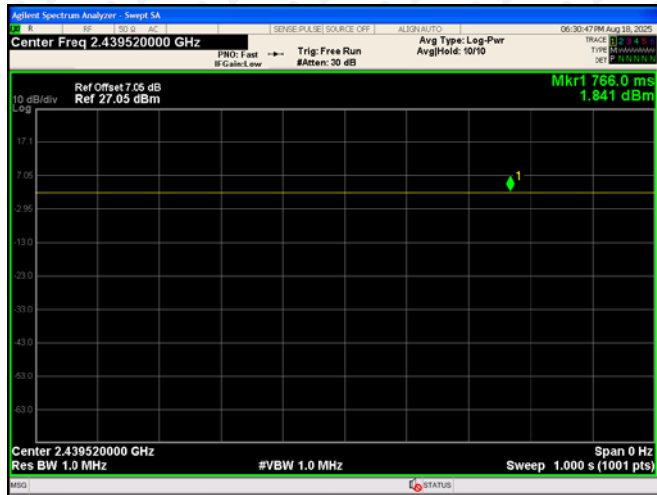
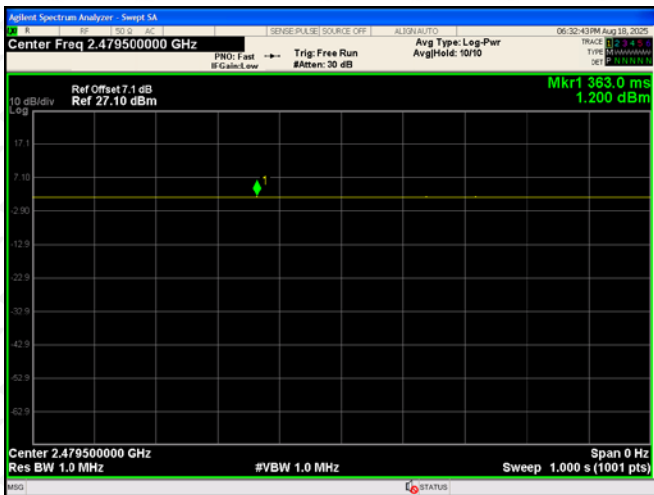
2M:

Test voltage	Channel (MHz)	Average burst power(dBm)	Output power (mW)	Limit (mW)	Rated output power (mW)	Tolerance (%)	Limit	Result
Normal Voltage	2402	1.524	1.420	10	2	-28.982	20%	Pass
	2440	1.841	1.528	10	2	-23.604		
	2480	1.200	1.318	10	2	-34.087		

1M:



2M:

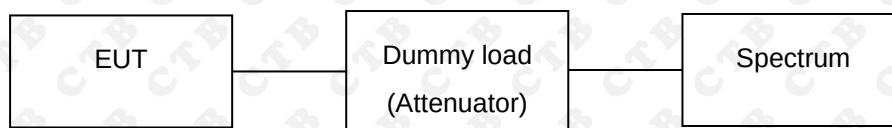
Test condition:	Normal Voltage	Test graph
		
2402MHz		2440MHz
		
2480MHz		

3.3 Occupied bandwidth and spreading bandwidth

3.3.1 Limit

Item	Limits
Occupied Bandwidth:	FH≤83.5 MHz; OFDM≤40MHz, DS≤26 MHz; Others≤26 MHz

3.3.2 Test configuration



3.3.3 Test procedure

1. Setting of SA is following as follow:

RBW: 300 kHz

VBW: 300 kHz

Sweep time: Auto

Sweep Mode: Continuous sweep

Detect mode: Positive peak

Trace mode: Max hold

- EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 99% of occupied bandwidth to measure occupied bandwidth.
- EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 90% of occupied bandwidth to measure spread bandwidth.
- Spread Factor=Spread Bandwidth/modulation rate. The modulation rate: MR=1.375Mbps for 2.4g

3.3.4 Test results

1M:

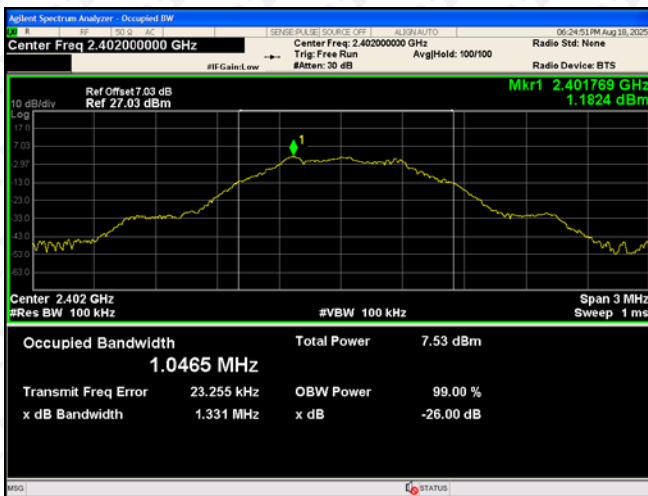
Test voltage (V)	Channel (MHz)	Occupy 99% Bandwidth (MHz)	Limit (MHz)	Result
Normal Voltage	2402	1.0465	<26	Pass
	2440	1.0489		
	2480	1.0508		

2M:

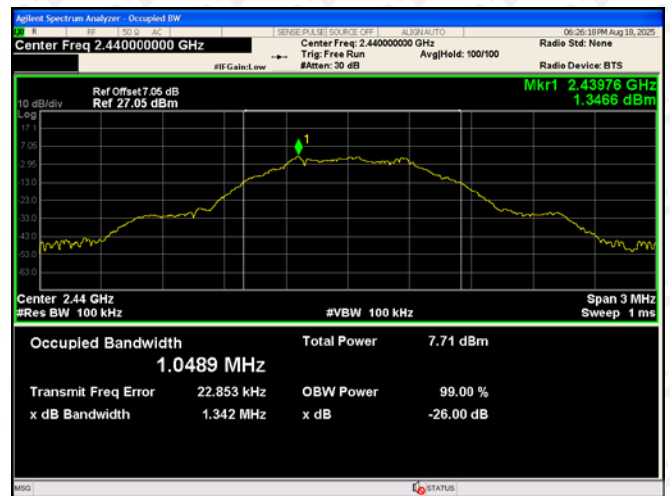
Test voltage (V)	Channel (MHz)	Occupy 99% Bandwidth (MHz)	Limit (MHz)	Result
Normal Voltage	2402	2.0616	<26	Pass
	2440	2.0637		
	2480	2.0445		

1M:

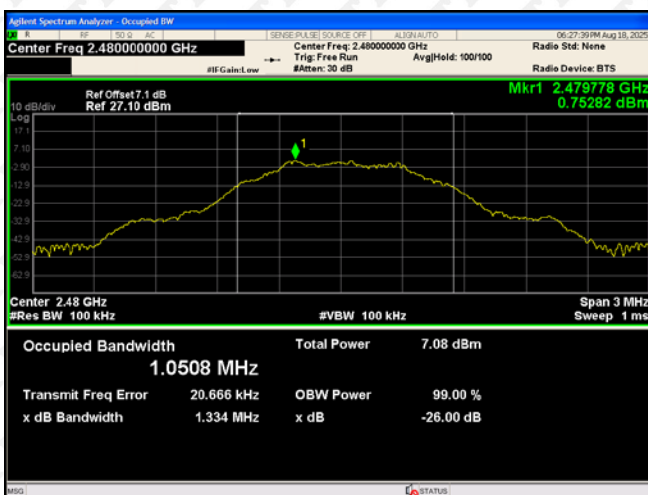
Normal Voltage: 99% Bandwidth



2402MHz



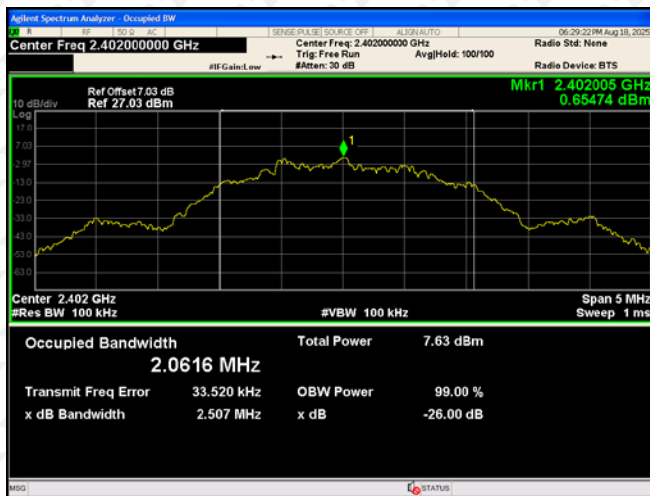
2440MHz



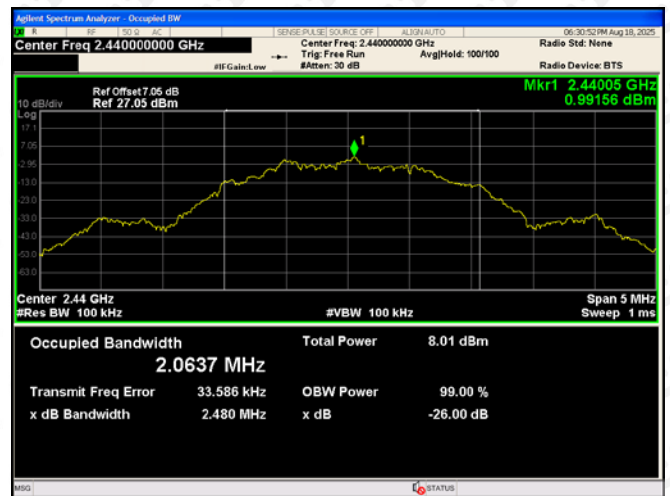
2480MHz

2M:

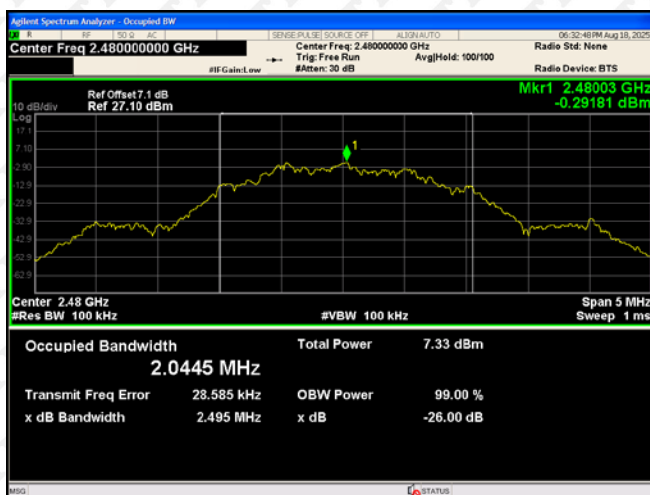
Normal Voltage: 99% Bandwidth



2402MHz



2440MHz



2480MHz

1M:

Test voltage (V)	Channel (MHz)	Spread 90% Bandwidth(MHz)	Spread Factor	Spread Bandwidth Limit (MHz)	Spread Factor Limit	Result
Normal Voltage	2402	0.6716	N/A	>0.5	N/A	Pass
	2440	0.6758				
	2480	0.6761				

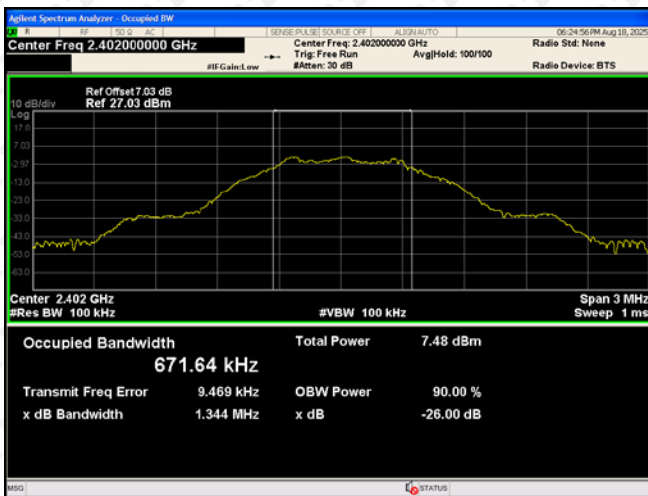
2M:

Test voltage (V)	Channel (MHz)	Spread 90% Bandwidth(MHz)	Spread Factor	Spread Bandwidth Limit (MHz)	Spread Factor Limit	Result
Normal Voltage	2402	1.2839	N/A	>0.5	N/A	Pass
	2440	1.2797				
	2480	1.2554				

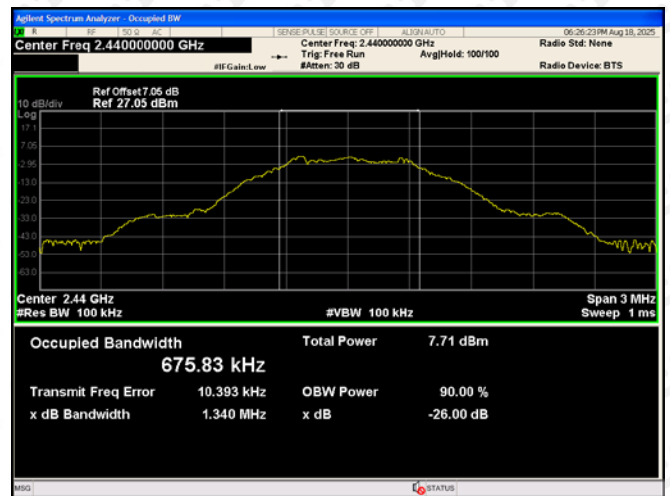
Note: N/A means not applicable to this modulation type.

1M:

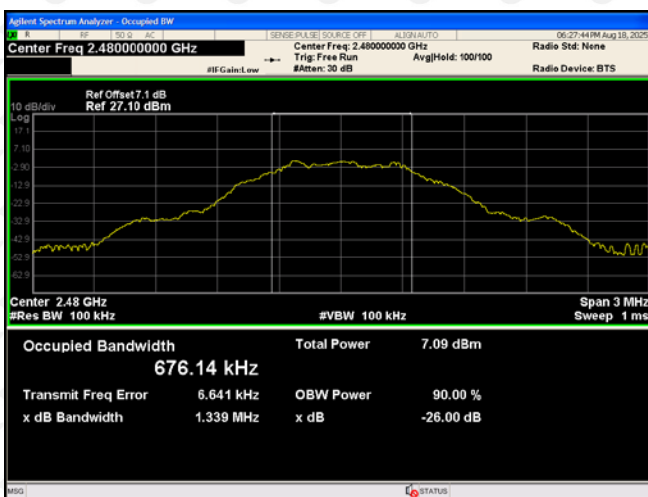
Normal Voltage: 90% Bandwidth



2402MHz



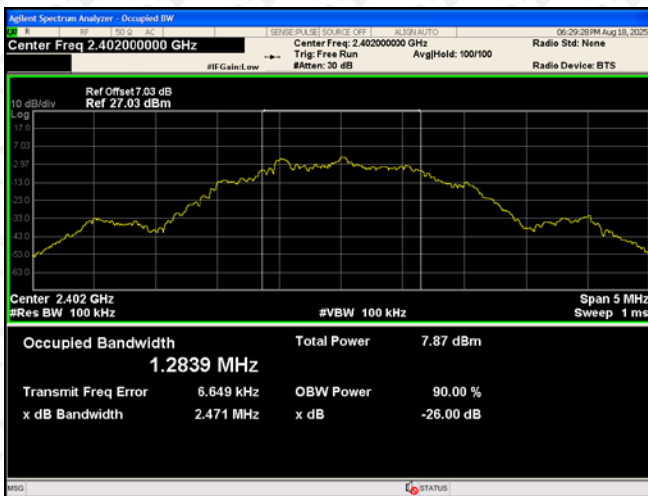
2440MHz



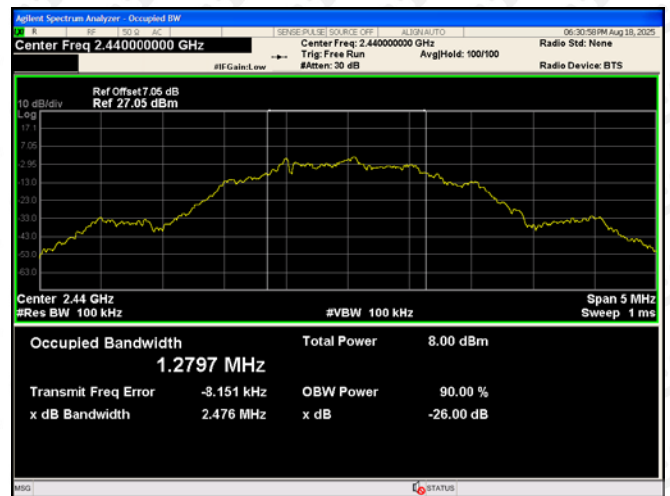
2480MHz

2M:

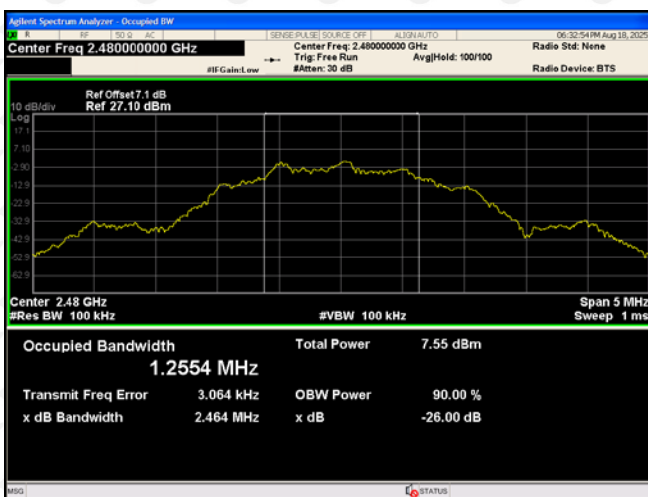
Normal Voltage: 90% Bandwidth



2402MHz



2440MHz



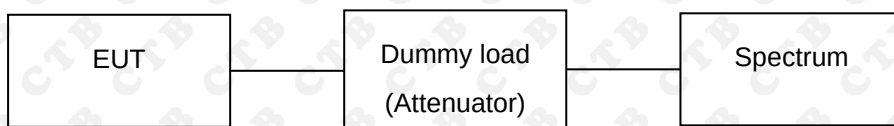
2480MHz

3.4 Unwanted emission strength

3.4.1 Limit

Item	Limits
TX Spurious Emission	$\leq 2.5 \mu\text{W/MHz} (30\text{MHz} \leq f \leq 1000\text{MHz})$
	$\leq 2.5 \mu\text{W/MHz} (1000\text{MHz} < f \leq 2387\text{MHz})$
	$\leq 25 \mu\text{W/MHz} (2387\text{MHz} < f \leq 2400\text{MHz})$
	$\leq 25 \mu\text{W/MHz} (2483.5\text{MHz} \leq f < 2496.5\text{MHz})$
	$\leq 2.5 \mu\text{W/MHz} (2496.5\text{MHz} \leq f < 12500\text{MHz})$

3.4.2 Test configuration



3.4.3 Test procedure

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: modulation

Spectrum Condition:

Frequency: 30MHz-12.5GHz

RBW: 100 kHz (30MHz-1GHz), 1MHz (1GHz-12.5GHz)

VBW: 100 kHz (30MHz-1GHz), 1MHz (1GHz-12.5GHz)

Sweep time: Auto

Detector mode: Positive peak

Indication mode: max hold

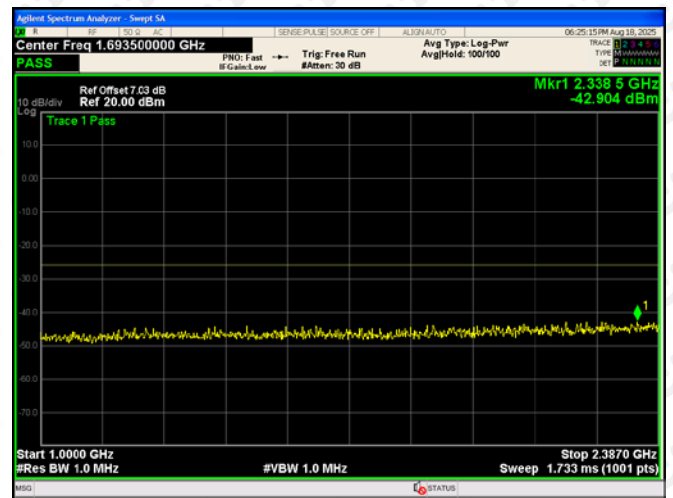
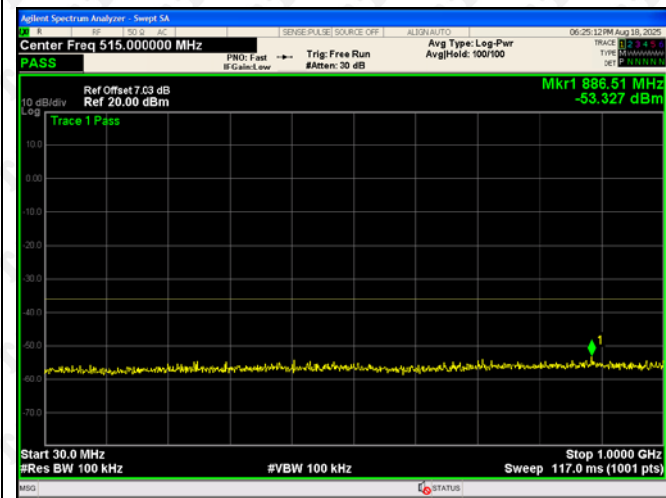
3.4.4 Test results

Test mode	Test Channel	Test freq. range	Emission Frequency (MHz)	Test result (dBm/MHz)	Test result (uW/MHz)	limits (uW/MHz)	Result
1M	Low	30MHz≤f≤1000MHz	886.51	-53.33	0.046	2.5	PASS
		1000MHz < f≤2387MHz	2338.46	-42.9	0.051	2.5	PASS
		2387MHz < f≤2400MHz	2399.86	-29.31	1.172	25	PASS
		2483.5MHz≤f < 2496.5MHz	2494.93	-42.07	0.062	25	PASS
		2496.5MHz≤f < 12750MHz	2599.04	-40.51	0.089	2.5	PASS
	Middle	30MHz≤f≤1000MHz	503.36	-53.69	0.004	2.5	PASS
		1000MHz < f≤2387MHz	2381.45	-41.97	0.064	2.5	PASS
		2387MHz < f≤2400MHz	2398.78	-42.92	0.051	25	PASS
		2483.5MHz≤f < 2496.5MHz	2489.91	-42.79	0.053	25	PASS
		2496.5MHz≤f < 12750MHz	5182.92	-39.59	0.110	2.5	PASS
	High	30MHz≤f≤1000MHz	995.15	-53.39	0.005	2.5	PASS
		1000MHz < f≤2387MHz	2288.52	-40.69	0.085	2.5	PASS
		2387MHz < f≤2400MHz	2387.05	-43.2	0.048	25	PASS
		2483.5MHz≤f < 2496.5MHz	2483.6	-36.49	0.224	25	PASS
		2496.5MHz≤f < 12750MHz	12626.96	-40.89	0.081	2.5	PASS

Test mode	Test Channel	Test freq. range	Emission Frequency (MHz)	Test result (dBm/MHz)	Test result (uW/MHz)	limits (uW/MHz)	Result
2M	Low	30MHz≤f≤1000MHz	856.44	-53.49	0.045	2.5	PASS
		1000MHz < f≤2387MHz	2335.68	-42.96	0.051	2.5	PASS
		2387MHz < f≤2400MHz	2399.99	-21.61	6.902	25	PASS
		2483.5MHz≤f < 2496.5MHz	2487.59	-42.47	0.057	25	PASS
		2496.5MHz≤f < 12750MHz	2599.04	-40.29	0.094	2.5	PASS
	Middle	30MHz≤f≤1000MHz	915.61	-53.95	0.004	2.5	PASS
		1000MHz < f≤2387MHz	2248.3	-41.61	0.069	2.5	PASS
		2387MHz < f≤2400MHz	2396.93	-42.23	0.060	25	PASS
		2483.5MHz≤f < 2496.5MHz	2496.4	-41.79	0.066	25	PASS
		2496.5MHz≤f < 12750MHz	5182.92	-40.32	0.093	2.5	PASS
	High	30MHz≤f≤1000MHz	825.4	-53.96	0.004	2.5	PASS
		1000MHz < f≤2387MHz	2288.52	-41.01	0.079	2.5	PASS
		2387MHz < f≤2400MHz	2389.22	-41.12	0.077	25	PASS
		2483.5MHz≤f < 2496.5MHz	2485.36	-34.1	0.389	25	PASS
		2496.5MHz≤f < 12750MHz	2670.81	-40.47	0.090	2.5	PASS

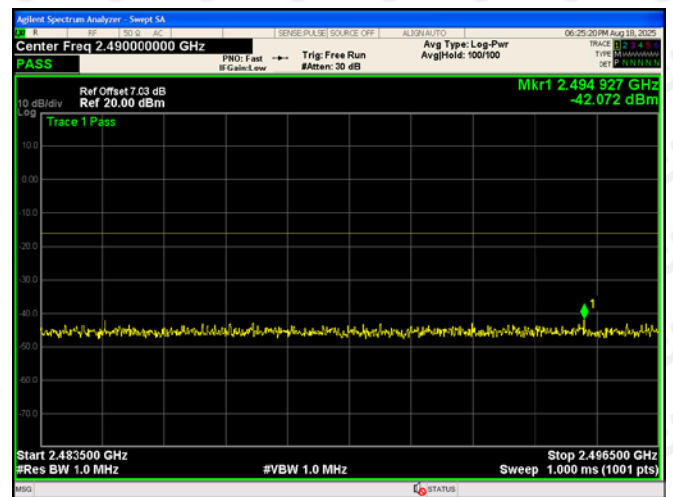
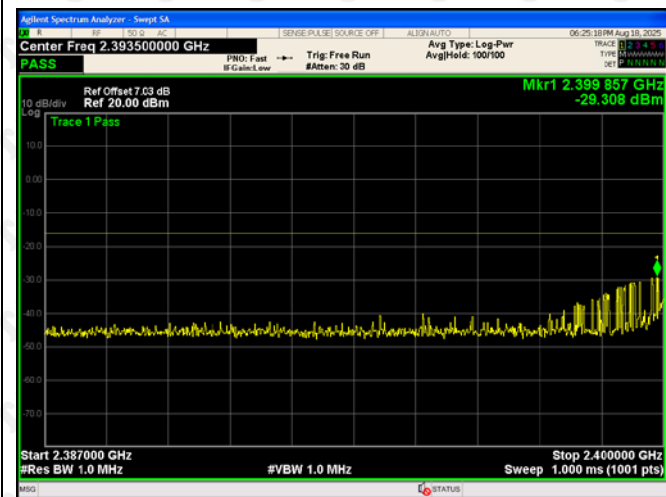
1M:

Test channel: 2402MHz



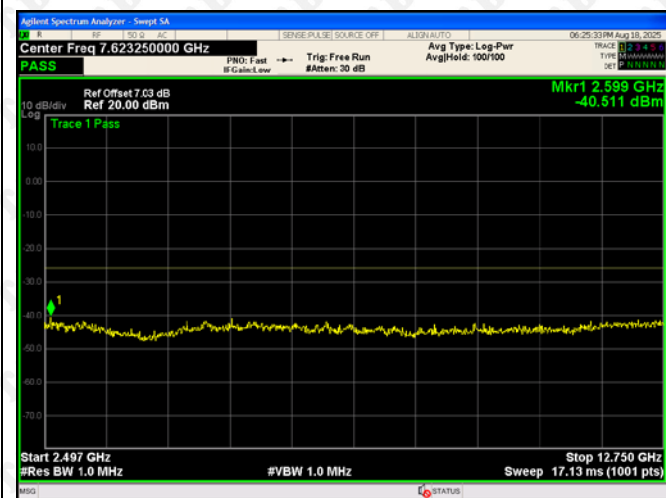
30MHz~1GHz

1GHz~2.387GHz



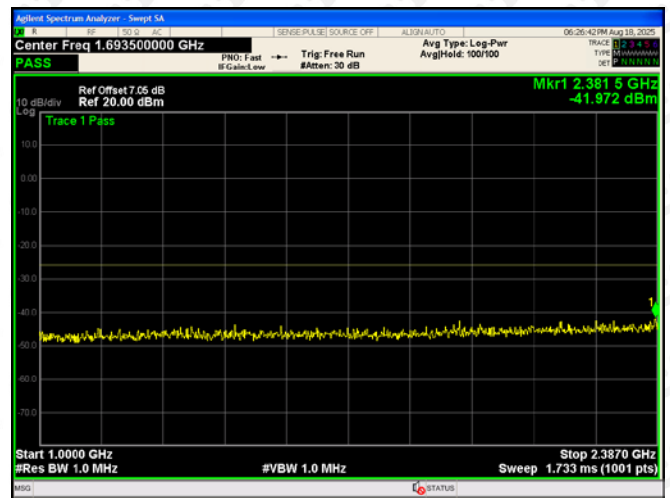
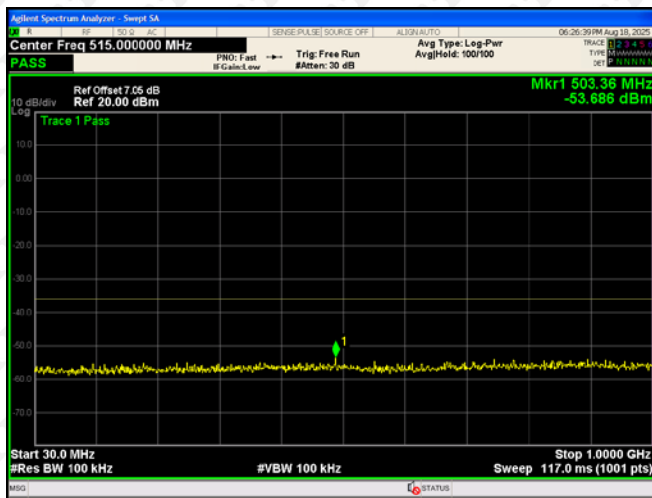
2.387GHz~2.4 GHz

2.4835GHz~2.4965GHz



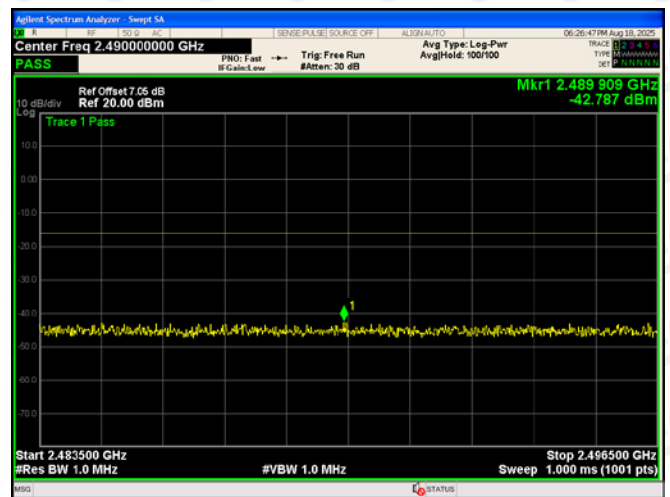
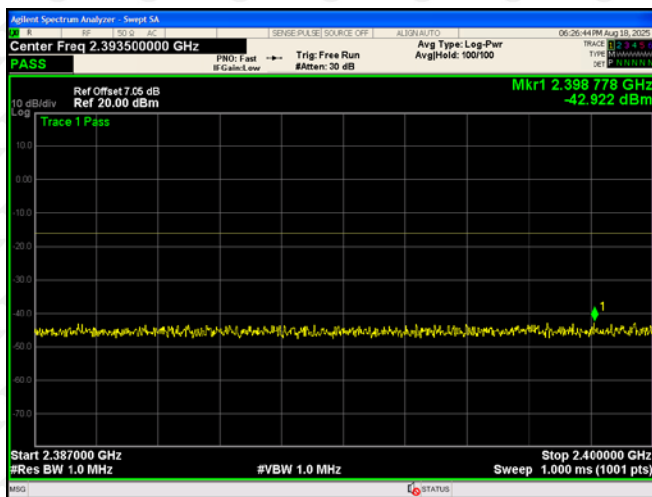
2.4965GHz~12.5GHz

Test channel: 2440MHz



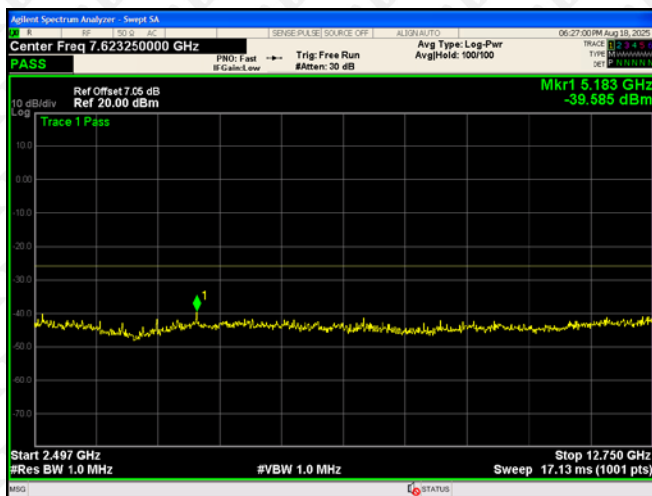
30MHz~1GHz

1GHz~2.387GHz



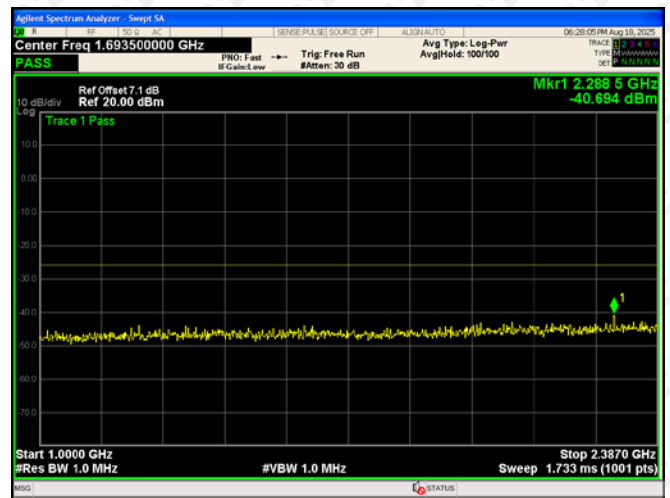
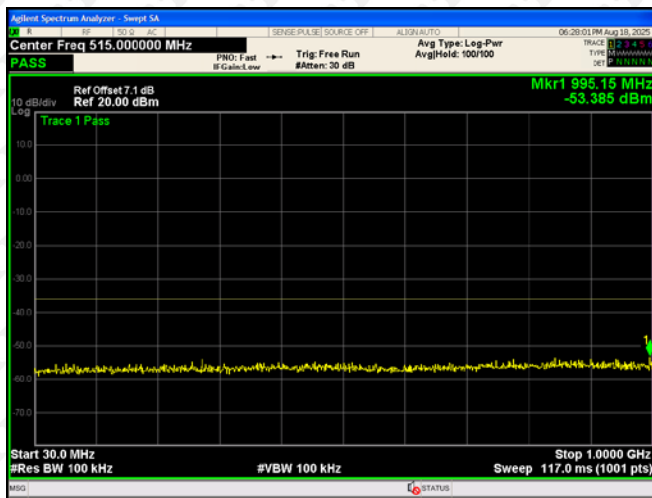
2.387GHz~2.4 GHz

2.4835GHz~2.4965GHz



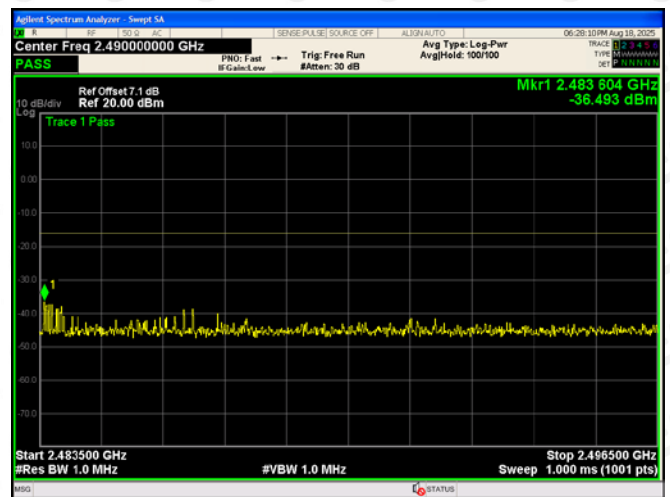
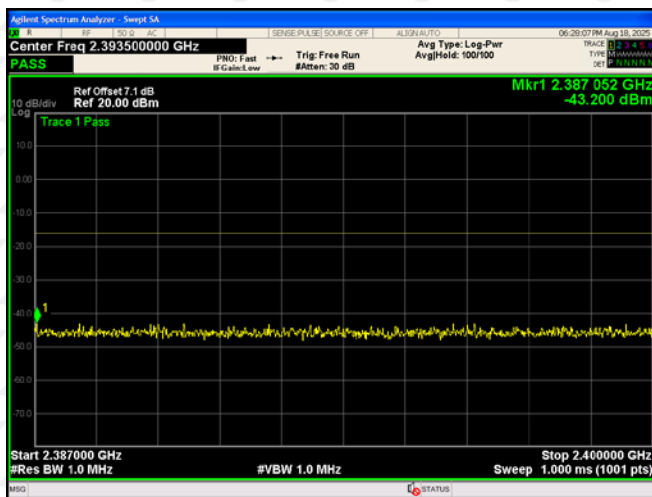
2.4965GHz~12.5GHz

Test channel: 2480MHz



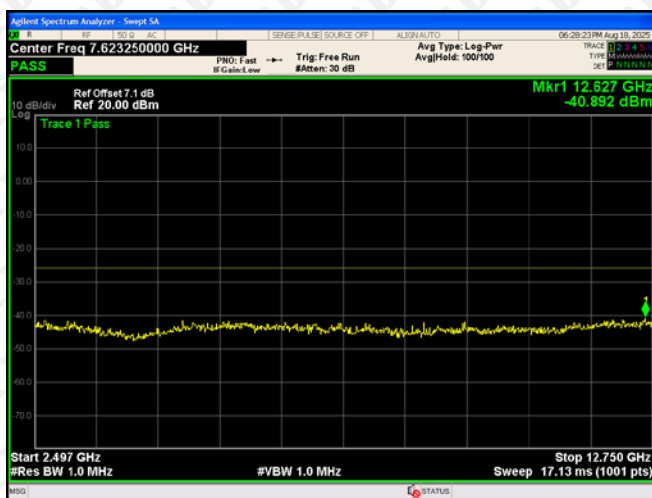
30MHz~1GHz

1GHz~2.387GHz



2.387GHz~2.4 GHz

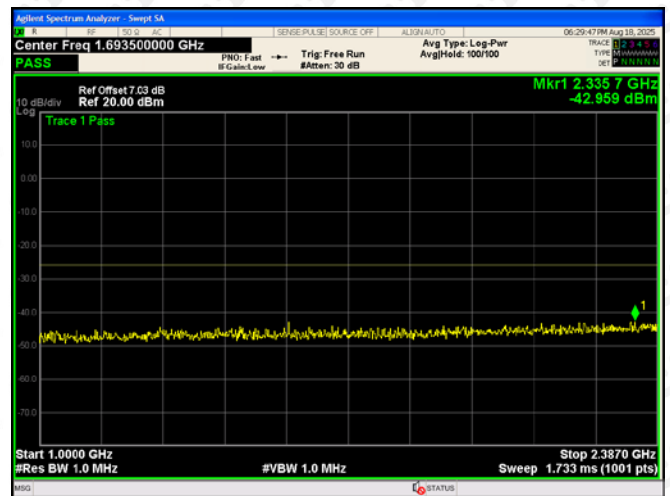
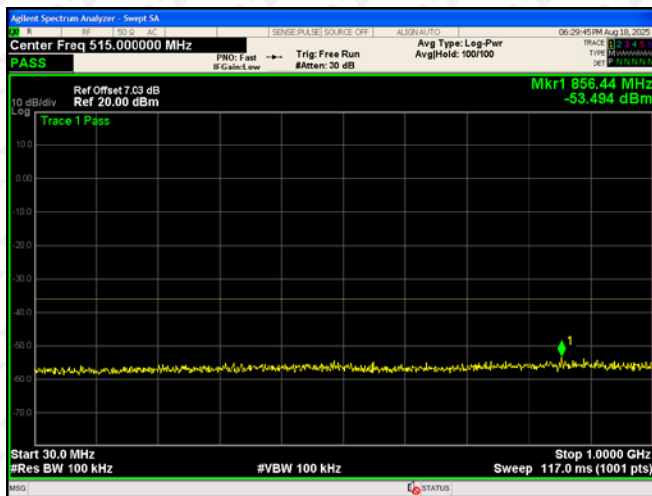
2.4835GHz~2.4965GHz



2.4965GHz~12.5GHz

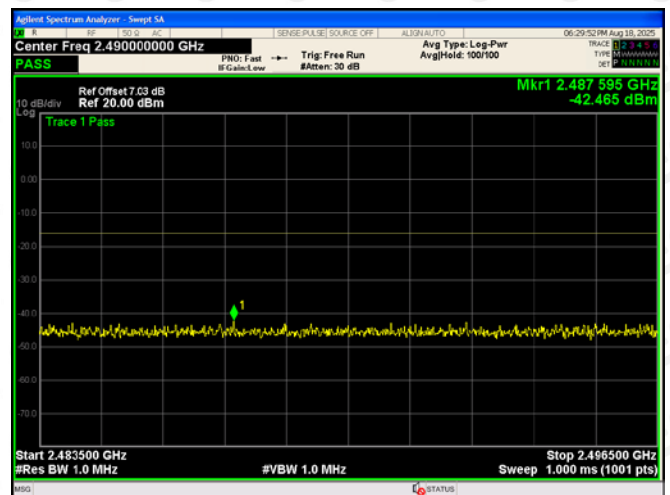
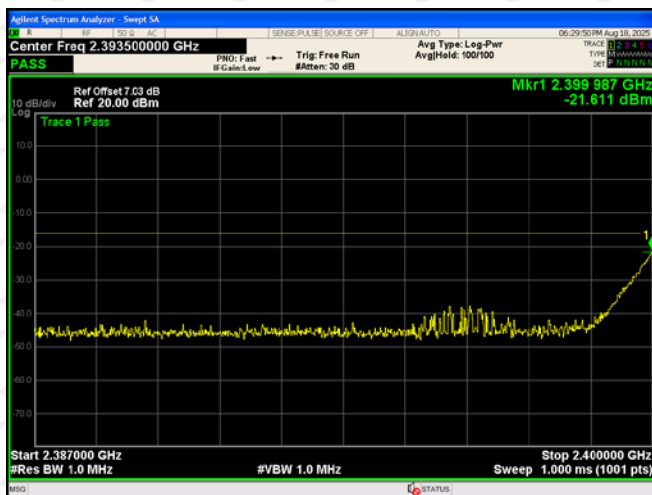
2M:

Test channel: 2402MHz



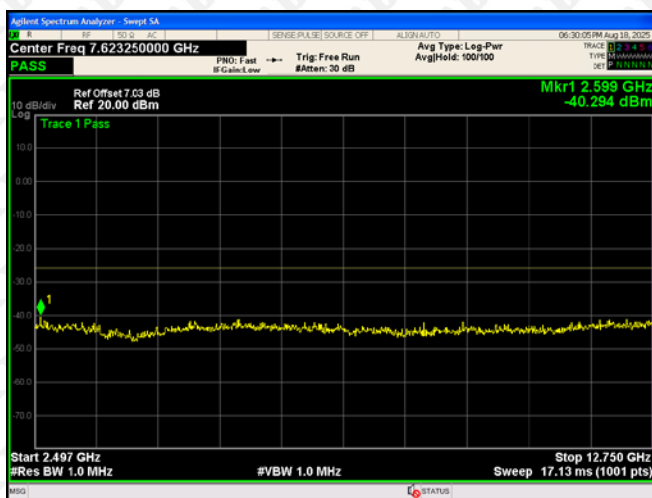
30MHz~1GHz

1GHz~2.387GHz



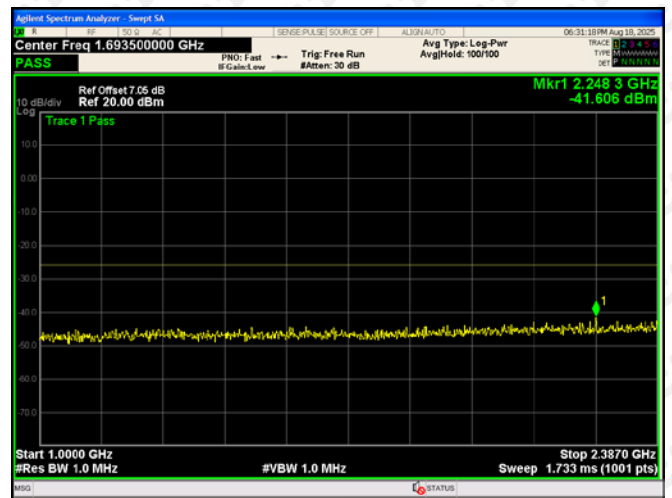
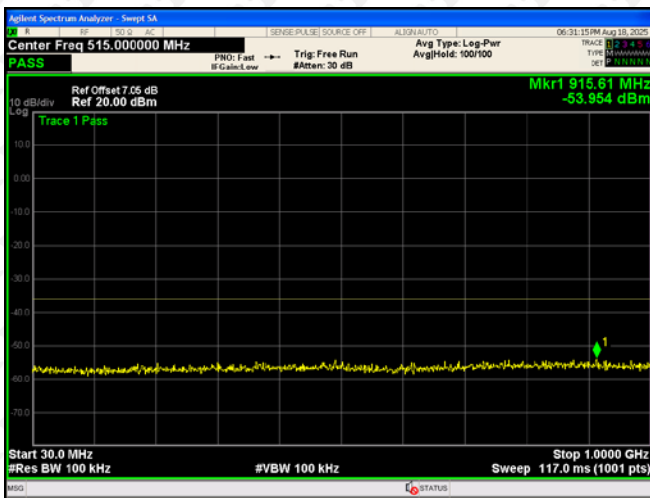
2.387GHz~2.4 GHz

2.4835GHz~2.4965GHz



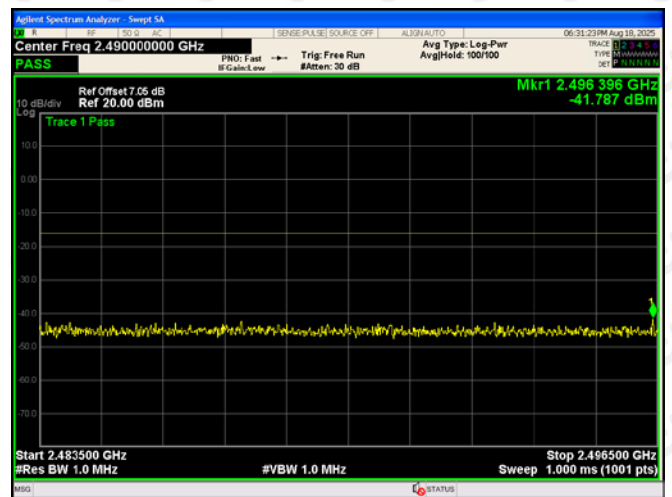
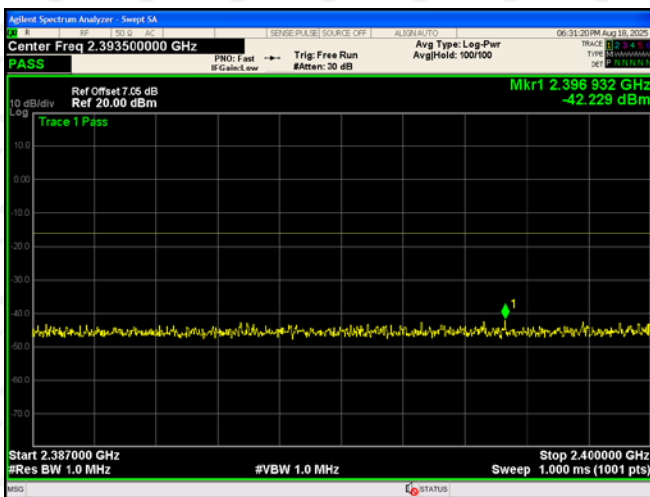
2.4965GHz~12.5GHz

Test channel: 2440MHz



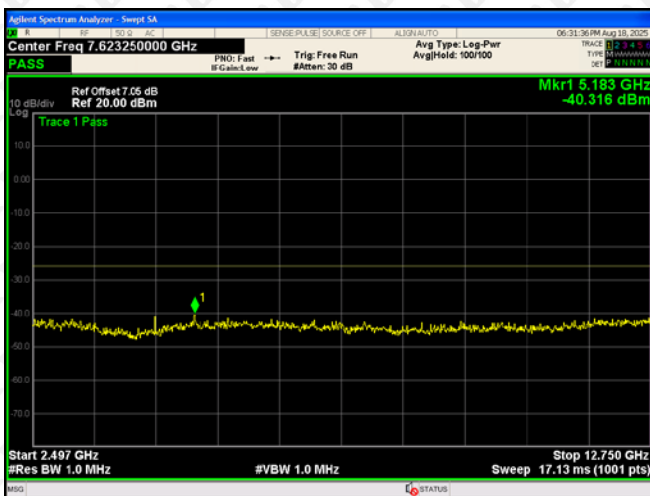
30MHz~1GHz

1GHz~2.387GHz



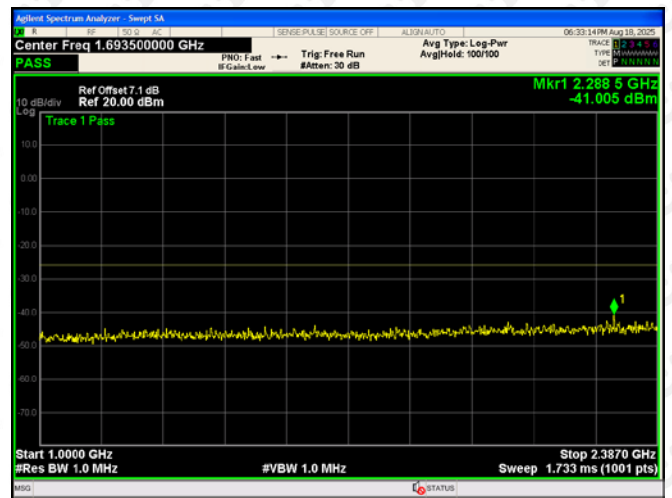
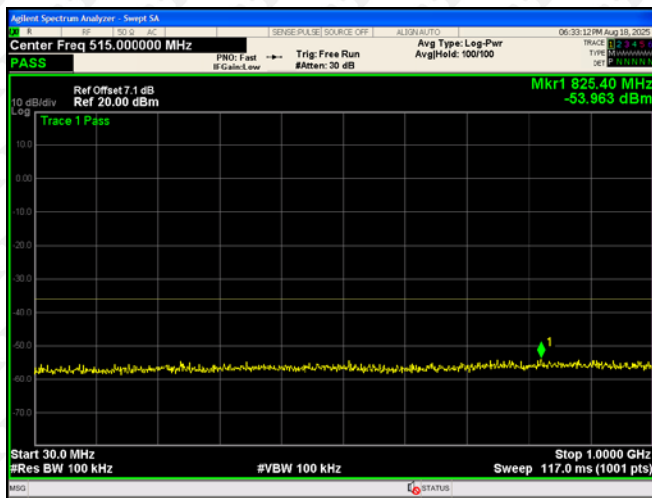
2.387GHz~2.4 GHz

2.4835GHz~2.4965GHz



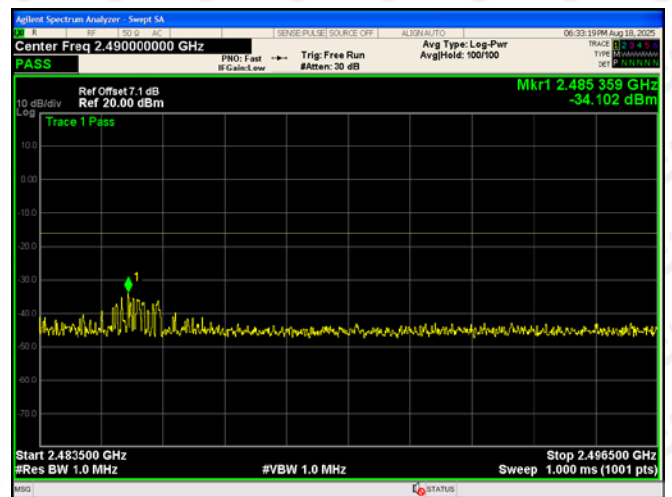
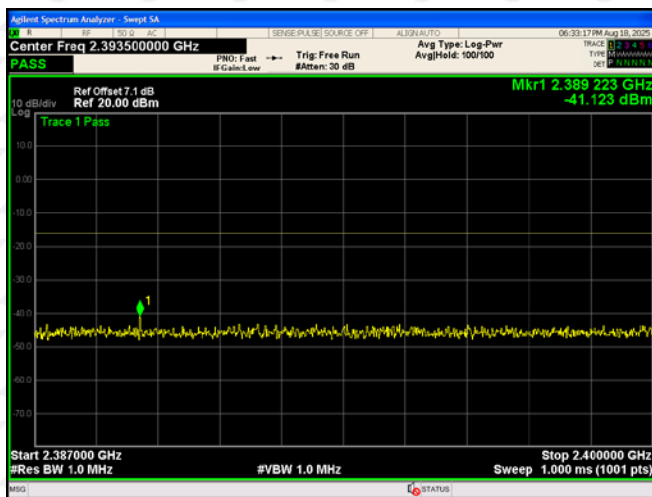
2.4965GHz~12.5GHz

Test channel: 2480MHz



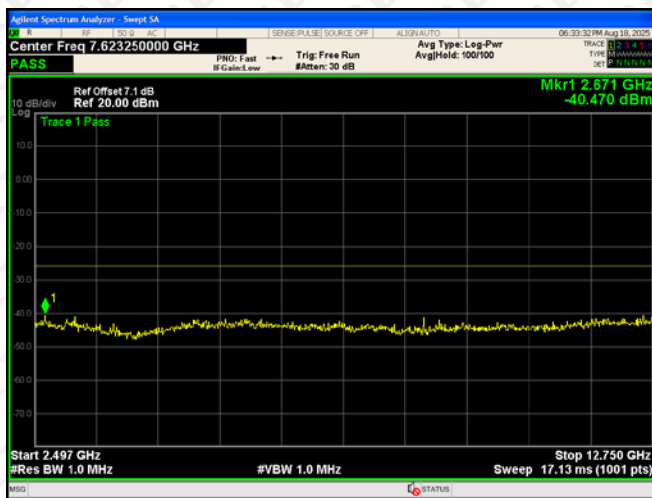
30MHz~1GHz

1GHz~2.387GHz



2.387GHz~2.4 GHz

2.4835GHz~2.4965GHz



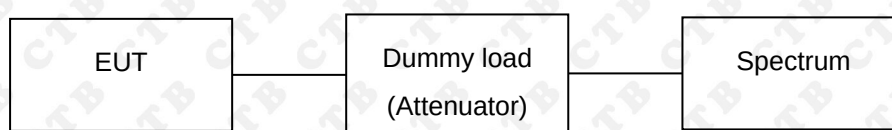
2.4965GHz~12.5GHz

3.5 Secondary radiated emission strength

3.5.1 Limit

Item	Limits
RX Spurious Emission:	$\leq 4\text{nW}$ ($f < 1\text{GHz}$)
	$\leq 20\text{nW}$ ($1\text{GHz} \leq f$)

3.5.2 Test configuration



3.5.3 Test procedure

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: modulation

Spectrum Condition:

Frequency: 30MHz-12.75GHz

RBW: 100 KHz (30MHz-1GHz), 1MHz (1GHz-12.75GHz)

VBW:100 KHz (30MHz-1GHz), 1MHz (1GHz-12.75GHz)

Sweep time: Auto

Detector mode: Positive peak

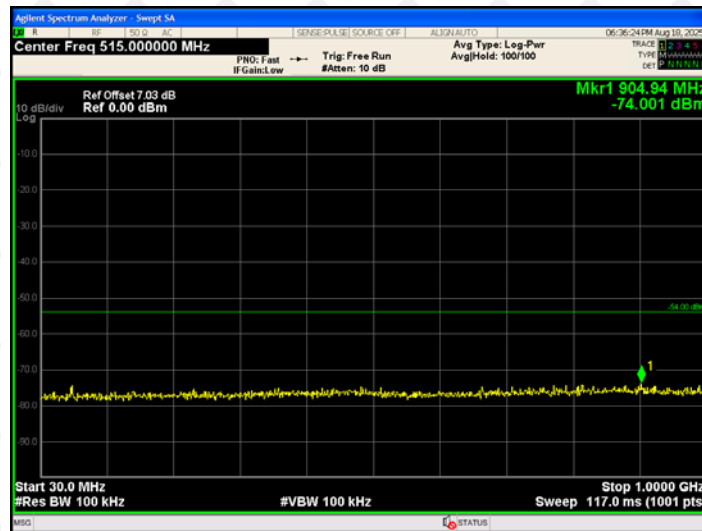
Indication mode: max hold

3.5.4 Test results

1M:

Test Channel	Test freq. range	Emission Frequency (MHz)	Test result dBm	Test result nW	Limit nW	Result
L	$30\text{MHz} \leq f \leq 1000\text{MHz}$	904.94	-74	0.040	4	PASS
	$1000\text{MHz} < f \leq 12750\text{MHz}$	2645	-60.95	0.804	20	PASS

30MHz~1GHz

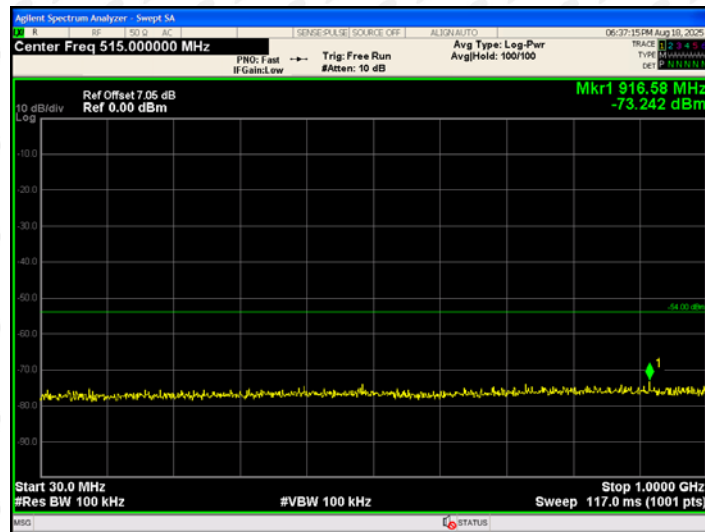


1GHz~12.75GHz



Test Channel	Test freq. range	Emission Frequency (MHz)	Test result dBm	Test result nW	Limit nW	Result
M	30MHz≤f≤1000MHz	916.58	-73.24	0.047	4	PASS
	1000MHz < f≤12750MHz	2692	-60.22	0.951	20	PASS

30MHz~1GHz

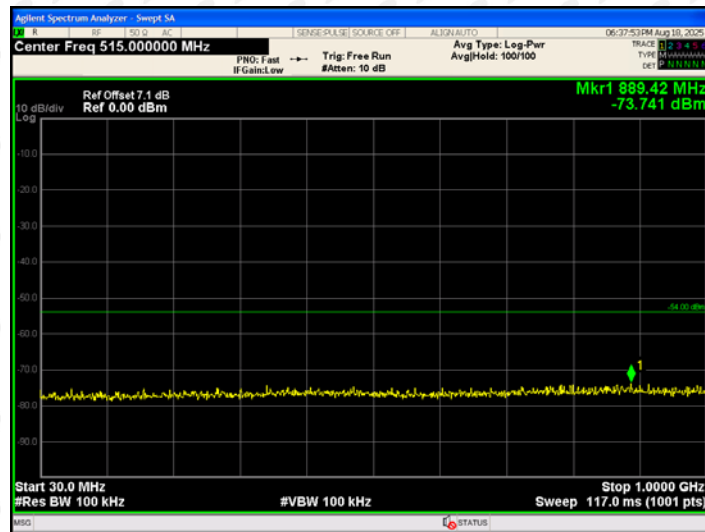


1GHz~12.75GHz



Test Channel	Test freq. range	Emission Frequency (MHz)	Test result dBm	Test result nW	Limit nW	Result
H	30MHz≤f≤1000MHz	889.42	-73.74	0.042	4	PASS
	1000MHz < f≤12750MHz	5171.25	-61.16	0.766	20	PASS

30MHz~1GHz



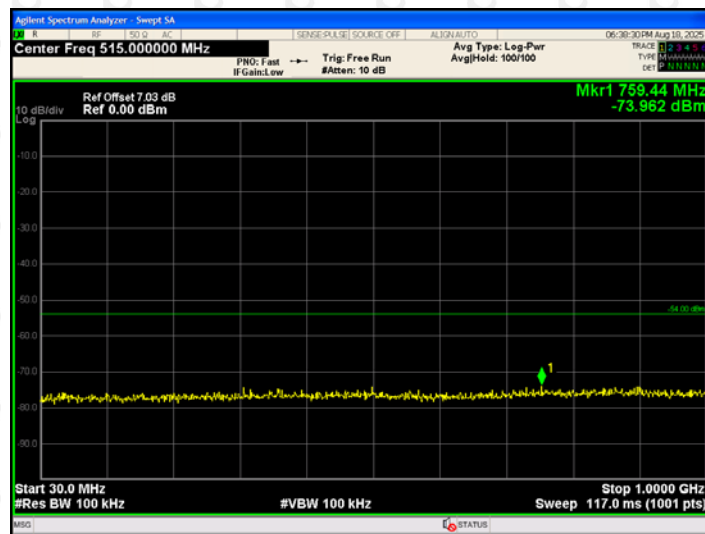
1GHz~12.75GHz



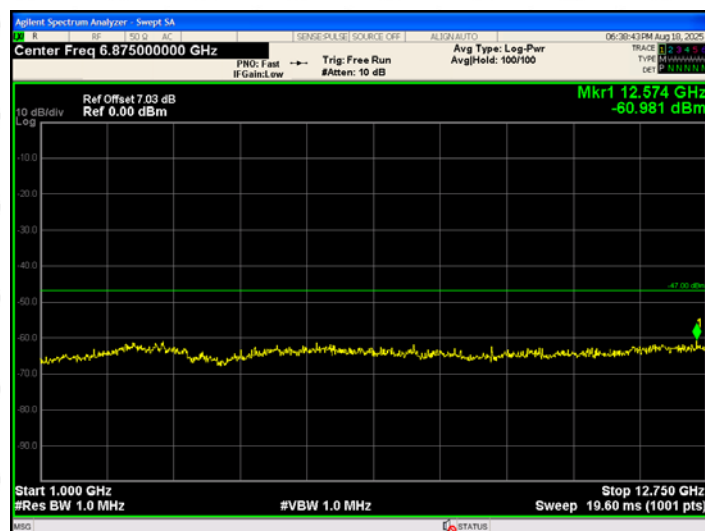
2M:

Test Channel	Test freq. range	Emission Frequency (MHz)	Test result dBm	Test result nW	Limit nW	Result
L	30MHz≤f≤1000MHz	759.44	-73.96	0.040	4	PASS
	1000MHz < f≤12750MHz	12573.75	-60.98	0.798	20	PASS

30MHz~1GHz

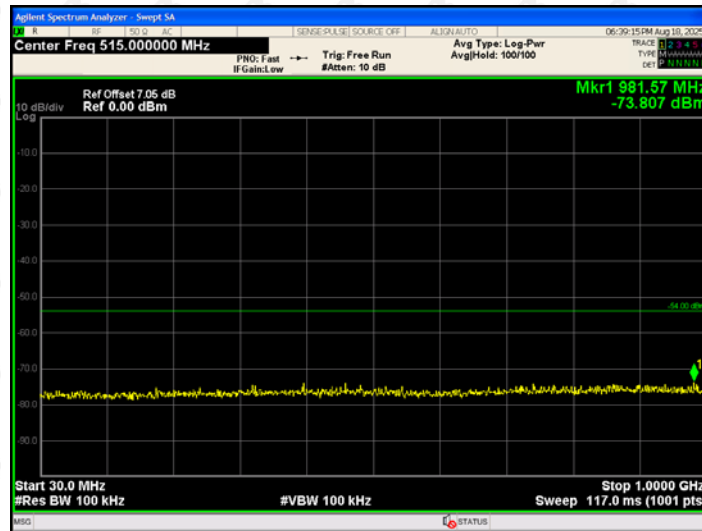


1GHz~12.75GHz

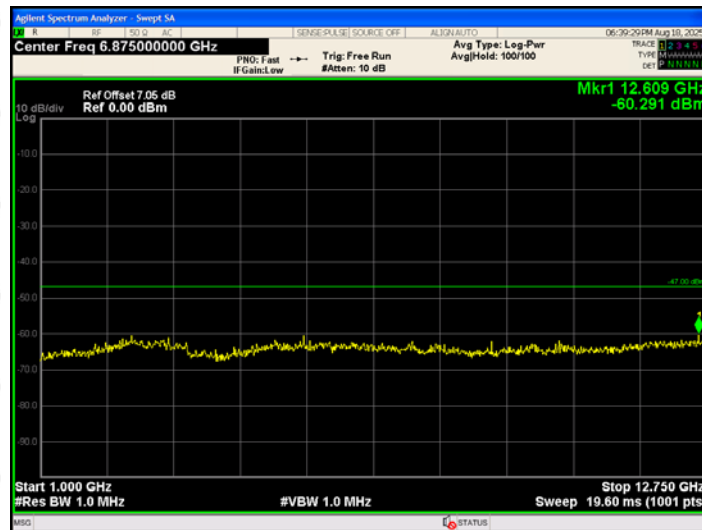


Test Channel	Test freq. range	Emission Frequency (MHz)	Test result dBm	Test result nW	Limit nW	Result
M	30MHz≤f≤1000MHz	981.57	-73.81	0.042	4	PASS
	1000MHz < f≤12750MHz	12609	-60.29	0.935	20	PASS

30MHz~1GHz

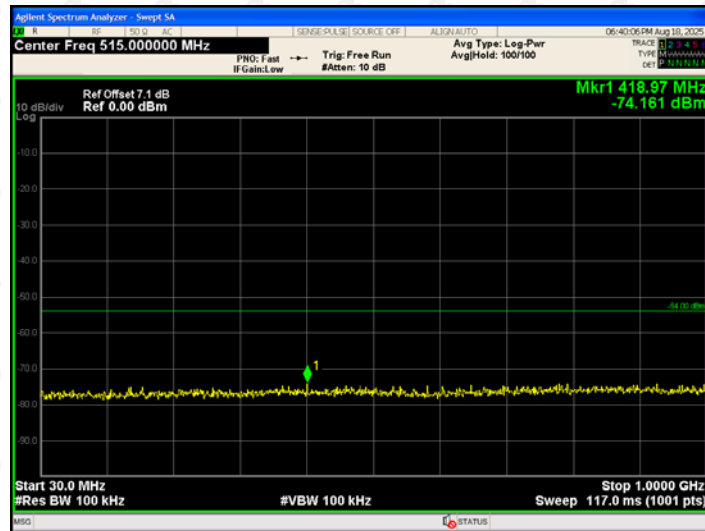


1GHz~12.75GHz

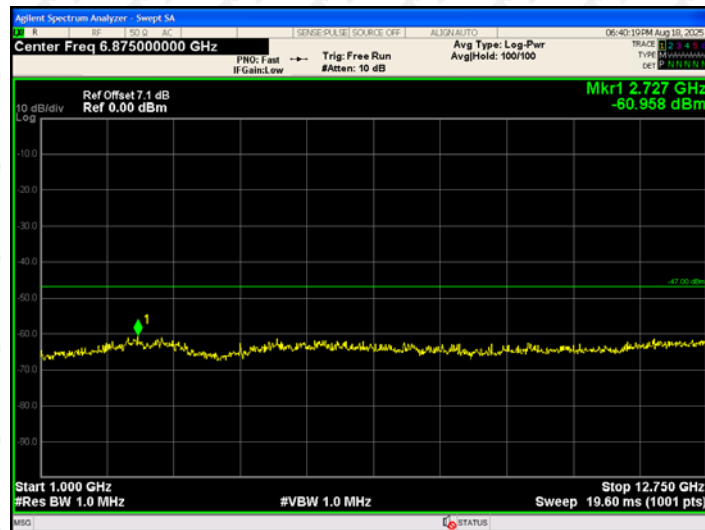


Test Channel	Test freq. range	Emission Frequency (MHz)	Test result dBm	Test result nW	Limit nW	Result
H	30MHz≤f≤1000MHz	418.97	-74.16	0.038	4	PASS
	1000MHz < f≤12750MHz	2727.25	-60.96	0.802	20	PASS

30MHz~1GHz



1GHz~12.75GHz



3.6 Transmission Antenna Gain (EIRP Antenna Power) Measurement

3.6.1 Limit

Ltem	Limits
EIRP Power Density	$\leq 12.14 \text{ dBm/MHz}$ (OFDM.DS from 2400-2483.5MHz) $\leq 12.14 \text{ dBm}$ (Other from 2400-2483.5MHz)
Remark: This test item will not be applied to Antenna gain is lower than 2.14dBi.	

3.6.2 Test Procedure

1. Set EUT ad measuring antenna at the same height and roughly facing aech other.
2. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of the measuring antenna. The output level at the spectrum analyzer is read sa "E".
3. Remove the EUT from the turn table and put the replacing antenna facing to measuring antenna at same height. Set the standard signal generator (SSG) at same frequency and transmit on then receive the signal.
4. Swing the replacing antenna give a maximum receiving level.
5. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of replacing antenna height and swing it to find the maximum receiving level.
6. Set SSG output power at Pt to give the equivalent output level of "E" or caluate Pt with SSG output which gives the nearest of "E" and difference ($\pm 1\text{dB}$).Record the Pt.
7. Calculate EIRP by the formula below $\text{EIRP} = G_t - L + P_t$
Gt: gain of replacing antenna (dBi)
L: feeder loss between SSG and replacing antenna
Pt: Output power of the SSG
8. If the antenna for the EUT has circular polarization. Sum of V-field and H-field will be result if measuring antenna is linear polarization.

3.6.3 Test results

1M

Test voltage	Test modulation	Output power (dBm/MHz)	Gain	EIRP (dBm/MHz)	Result
			(dBi)		
Normal Voltage	GFSK	1.518	2.499	4.017	Pass
		1.820	2.499	4.319	
		1.145	2.499	3.644	

2M

Test voltage	Test modulation	Output power (dBm/MHz)	Gain	EIRP (dBm/MHz)	Result
			(dBi)		
Normal Voltage	GFSK	1.524	2.499	4.023	Pass
		1.841	2.499	4.340	
		1.200	2.499	3.699	

3.7 Construction protection method

3.7.1 Requirement

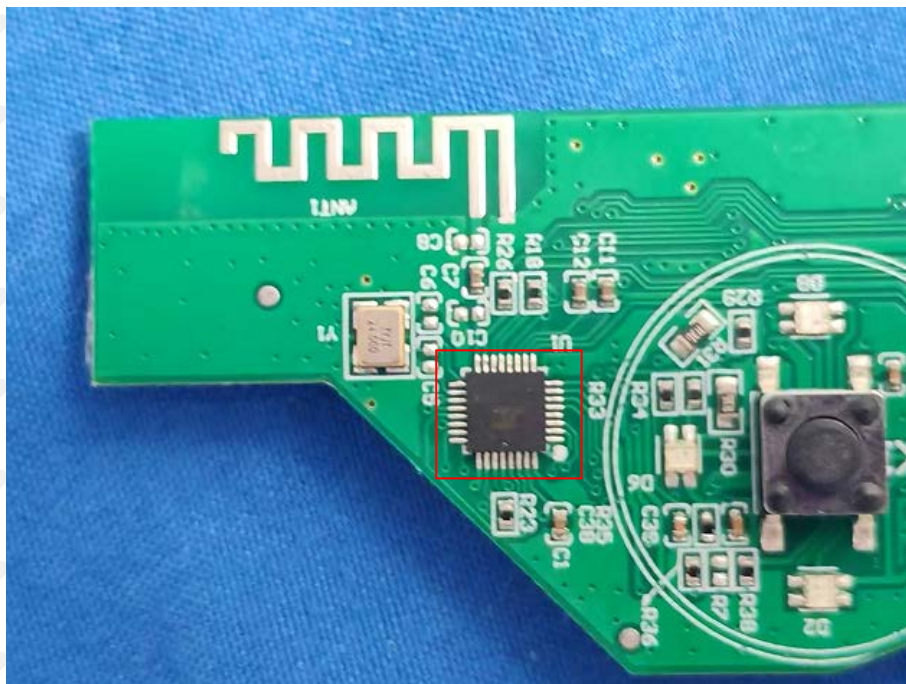
The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily

3.7.2 Confirmation method

☐	Sealed with special screws.
☐	Plastic chassis is being welded using ultrasonic wavs.
☐	Chassis is glued using a special adhesive.
☐	Metal covers are spot-fused.
☐	Cover is specially interlocked.
☐	RF and Modulation components are covered with shielding case and this shielding case is soldered.
☐	Shield case is welded ant RF and modulations parts, and ID-ROM is welded using BGA Method.
☐	Shield case is welded ant RF and modulations parts, and ID-ROM is glued at its lead with a special adhesive.
☐	Shield case is welded ant RF and modulations parts, and ID-ROM is glued with a non-transparent laminating agent.
☒	Other: All RF and modulation section packet in one IC, and IC is welded using BGA Method, and RF module is welded on the main board,end-User can't open it easily.

3.7.3 The photos of construction protection

The red circle is welding point.



3.8 Interference prevention function

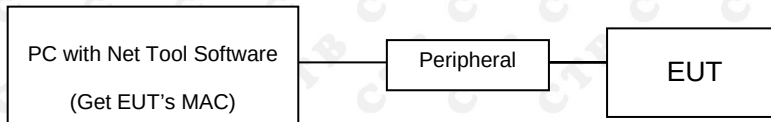
3.8.1 Limit

Item	Limits
Identification code	≥ 48 bits

3.8.2 Measuring ID code software

Item	Limits
MAC IP List	MAC Scan

3.8.3 Test setup



3.8.4 Test procedure

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

3.8.5 Test result

PASS

Bluetooth Device Address: 2222C88A0249

4 EUT PHOTOGRAPHS

EUT Photo 1



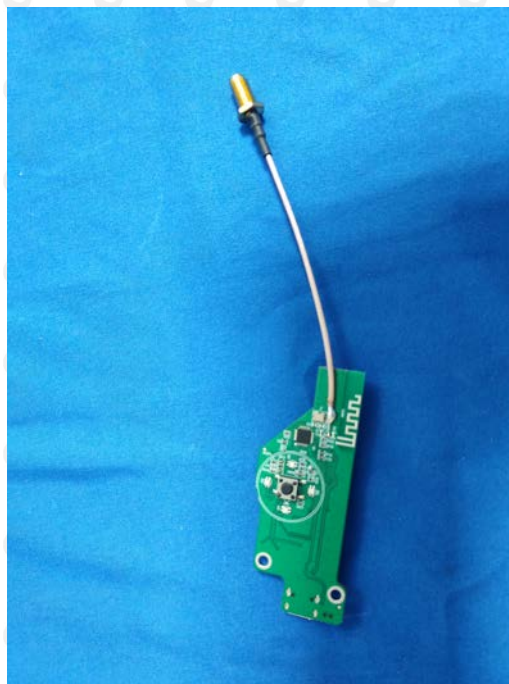
EUT Photo 2



EUT Photo 3



5 TEST SETUP PHOTOS OF EUT



***** END OF REPORT *****