Radio Test Report

Report No.: AGC16823250801ER02

PRODUCT DESIGNATION	:	Ruuvi Air
BRAND NAME	:	Ruuvi
MODEL NAME	:	Ruuvi Air
APPLICANT	:	Ruuvi Innovations Ltd.
DATE OF ISSUE	:	Oct. 16, 2025
STANDARD(S)	:	ETSI EN 300 328 V2.2.2 (2019-07)
REPORT VERSION	:	V1.0

Attestation of ***G***lobal ***C***ompliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Oct. 16, 2025	Valid	Initial Release

Table of Contents

1. General Information

Applicant	Ruuvi Innovations Ltd.
Address	Hameenkatu 10 B 132, RIIHIMAKI 11100, Finland
Manufacturer	Ruuvi Innovations Ltd.
Address	Hameenkatu 10 B 132, RIIHIMAKI 11100, Finland
Factory	Ruuvi Innovations Ltd.
Address	Hameenkatu 10 B 132, RIIHIMAKI 11100, Finland
Product Designation	Ruuvi Air
Brand Name	Ruuvi
Test Model	Ruuvi Air
Series Model(s)	N/A
Difference Description	N/A
Date of receipt of test item	Aug. 15, 2025
Date of Test	Aug. 15, 2025 to Oct. 14, 2025
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-EU-BLE-V1

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

Prepared By	Thea Huang Thea Huang (Project Engineer)	Oct. 16, 2025
Reviewed By	Bibo Zhang Bibo Zhang (Reviewer)	Oct. 16, 2025
Approved By	Angela Li Angela Li (Authorized Officer)	Oct. 16, 2025

2. Product Information

2.1 Product Technical Description

Equipment Type	non-FHSS adaptive equipment
Supported Technologies	Bluetooth Low Energy
Operation Frequency Range	2.4G ISM band (2402MHz-2480MHz)
Bluetooth Version	V5.4
Hardware Version	V1.0
Software Version	V1.0
Modulation Type	GFSK
Data Rate	☒ 125Kbps ☐ 500Kbps ☒ 1Mbps ☒ 2Mbps
Nominal Channel Bandwidth	☒ 1MHz ☒ 2MHz
Number of Channels	40 Channels
Maximum RF Output Power	2Mbps: -0.11dBm (E.I.R.P) 125Kbps: -2.57 (E.I.R.P)
Antenna Designation	☒ PCB Antenna (Temporary RF connector provided by manufacturer)
	☐ Dedicated Antenna
Antenna Gain	2.41dBi
Receiver Category	☐ Category 1 ☐ Category 2 ☒ Category 3
Power Supply	DC 5V
Geo-location capability	☐ Yes ☒ No
Extreme Operating Conditions	Lowest temperature range (LT): 0°C
	Normal temperature range (NT): 25°C
	Highest temperature range (HT): 50°C

Note:
1. The above information was declared by the manufacturer.
2. The equipment submitted are representative production models.
3. For more details, please refer to the User's manual of the EUT.

2.2 Test Frequency List

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz
03	2408 MHz	04	2410 MHz	05	2412 MHz
06	2414 MHz	07	2416 MHz	08	2418 MHz
09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz
15	2432 MHz	16	2434 MHz	17	2436 MHz
18	2438 MHz	19	2440 MHz	20	2442 MHz
21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz
27	2456 MHz	28	2458 MHz	29	2460 MHz
30	2462 MHz	31	2464 MHz	32	2466 MHz
33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz
39	2480 MHz	--	--	--	--

2.3 Objective

Perform Radio Spectrum tests for CE Marking according to the provisions of article 3.2 of the Radio Equipment Directive (2014/53/EU) for the Bluetooth function of the EUT.

2.4 Test Items and The Results

The tests were performed according to following standards:

ETSI EN 300 328 V2.2.2 (2019-07)	Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band; Harmonized Standard for access to radio spectrum

ETSI EN 300 328 test items and the results are as bellow:

No.	Test Item	Standard Require	Result
Transmitter Requirement			
1	RF Output Power	sub-clause 4.3.2.2	Pass
2	Power Spectral Density	sub-clause 4.3.2.3	Pass
3	Duty Cycle, Tx-sequence, Tx-gap	sub-clause 4.3.2.4	N/A (See Note1,2)
4	Medium Utilisation (MU) Factor	sub-clause 4.3.2.5	N/A (See Note1,2)
5	Adaptivity(non-FHSS)	sub-clause 4.3.2.6	N/A (See Note1,3)
6	Occupied Channel Bandwidth	sub-clause 4.3.2.7	Pass
7	Transmitter Unwanted Emissions in the Out-of-Band Domain	sub-clause 4.3.2.8	Pass
8	Transmitter Unwanted Emissions in the Spurious Domain	sub-clause 4.3.2.9	Pass
Receiver Requirement			
9	Receiver Spurious Emissions	sub-clause 4.3.2.10	Pass
10	Receiver Blocking	sub-clause 4.3.2.11	Pass

Note:

1. “N/A” means not applicable.
2. This device is a non-FHSS adaptive device and is not applicable to this test item.
3. The maximum RF output power of this device is less than 10dBm, so this test item is not applicable

2.5 Description of Test Modes

Test Mode	Description
LE125K_TX_2402_125Kbps	Bluetooth LE Transmitting mode (Channel: 2402, Rate: 125Kbps)
LE125K _TX_2440_125Kbps	Bluetooth LE Transmitting mode (Channel: 2440, Rate: 125Kbps)
LE125K _TX_2480_125Kbps	Bluetooth LE Transmitting mode (Channel: 2480, Rate: 125Kbps)
LE1M_TX_2402_1Mbps	Bluetooth LE Transmitting mode (Channel: 2402, Rate: 1Mbps)
LE1M_TX_2440_1Mbps	Bluetooth LE Transmitting mode (Channel: 2440, Rate: 1Mbps)
LE1M_TX_2480_1Mbps	Bluetooth LE Transmitting mode (Channel: 2480, Rate: 1Mbps)
LE2M_TX_2402_2Mbps	Bluetooth LE Transmitting mode (Channel: 2402, Rate: 2Mbps)
LE2M_TX_2440_2Mbps	Bluetooth LE Transmitting mode (Channel: 2440, Rate: 2Mbps)
LE2M_TX_2480_2Mbps	Bluetooth LE Transmitting mode (Channel: 2480, Rate: 2Mbps)
LE1M_RX_2402_1Mbps	Bluetooth LE Receiving mode (Channel: 2402, Rate: 1Mbps)
LE1M_RX_2480_1Mbps	Bluetooth LE Receiving mode (Channel: 2480, Rate: 1Mbps)
LE2M_RX_2402_2Mbps	Bluetooth LE Receiving mode (Channel: 2402, Rate: 2Mbps)
LE2M_RX_2480_2Mbps	Bluetooth LE Receiving mode (Channel: 2480, Rate: 2Mbps)
LE125K _RX_2402_125Kbps	Bluetooth LE Receiving mode (Channel: 2402, Rate: 125Kbps)
LE125K _RX_2480_125Kbps	Bluetooth LE Receiving mode (Channel: 2480, Rate: 125Kbps)
Note: All modes have been tested and the worst mode test data recording in the test report, if no any other data.	

3. Setup of Equipment Under Test

3.1 Setup Configuration of EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

3.2 Support Equipment

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.
The following peripheral devices and interface cables were connected during the measurement:

Whether support unit is used?				
☒ Yes ☐ No				
Item	Equipment	Trade Name	Model No.	Specification
1	Control Box	RISYM	USB-TTL	--

4. Test Environment

4.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

4.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories.)

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842(CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

4.3 Environmental Conditions

	Normal Conditions
Temperature range (℃)	15 - 35
Relative humidity range	45 % - 85 %
Pressure range (kPa)	86 - 106

4.4 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in Measurement” (GUM) published by ISO.

Test Item	Measurement Uncertainty
Uncertainty of Radio Frequency	Uc=±1 x 10^{-7}
Uncertainty of Total RF power, Conducted	Uc = ±0.8dB
Uncertainty of RF Power Density, Conducted	Uc = ±2.6dB
Uncertainty of Occupied Channel Bandwidth	U_c = ±2 %
Uncertainty of Spurious Emissions, Conducted	U_c = ±2.7dB
Uncertainty of Spurious Emissions, Radiated	U_c = ±5.4dB
Uncertainty of Temperature	U_c = 0.5° C
Uncertainty of Humidity	U_c = ±1 %
Uncertainty of DC and Low Frequency Voltages	U_c = ±2 %

4.5 List of Equipment Used

● RF Conducted Test System							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2025-05-08	2026-05-07
☐	AGC-ER-E041	Spectrum Analyzer	Agilent	N9020A	W1312-60196	2025-05-16	2026-05-15
☐	AGC-ER-E061	Spectrum Analyzer	Agilent	N9020A	MY52090123	2025-05-08	2026-05-07
☒	AGC-ER-E062	Power Sensor	Agilent	U2021XA	MY54110007	2025-01-14	2026-01-13
☐	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2025-01-14	2026-01-13
☐	AGC-ER-E027	Power Sensor	Agilent	U2021XA	MY5411000B	2025-01-14	2026-01-13
☒	AGC-ER-A001	6dB Attenuator	SAIGE	SMA-JK	N/A	2023-09-21	2025-09-20
☒	AGC-ER-A001	6dB Attenuator	SAIGE	SMA-JK	N/A	2025-09-10	2027-09-09
☒	AGC-ER-E079	Wireless Connectivity Tester	R&S	CMW270	101933	2025-05-08	2026-05-07
☒	AGC-ER-E075	Small Environmental Tester	SH-242	ESPEC	93008290	2024-07-24	2026-07-23
☒	AGC-ER-E059	Signal Generator	Agilent	N5182B	MY53050647	2025-01-14	2026-01-13
☒	AGC-ER-E060	Signal Generator	Agilent	N5171B	MY53050474	2025-05-08	2026-05-07
☒	AGC-ER-E083	Signal Generator	Agilent	E4421B	US39340815	2025-05-21	2026-05-20
☒	--	RF Connection Cable	N/A	1#	N/A	Each time	N/A
☒	--	RF Connection Cable	N/A	2#	N/A	Each time	N/A

● Radiated Spurious Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☐	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	100096	2025-01-14	2026-01-13
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2025-05-08	2026-05-07
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2025-05-08	2026-05-07
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2025-03-14	2027-03-13
☒	AGC-ER-E005	Wideband Antenna	SCHWARZBECK	VULB9168	VULB9168-494	2025-01-15	2027-01-14
☒	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2025-03-27	2026-03-26
☒	AGC-EM-E102	Broadband Ridged Horn Antenna	ETS	3117	00154520	2025-05-18	2026-05-17
☐	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2024-07-24	2026-07-23
☒	AGC-EM-A119	2.4G Filter	SongYi	N/A	N/A	2025-05-16	2027-05-15
☒	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2025-05-16	2027-05-15

● Test Software					
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information
☒	AGC-EM-S011	RSE Test System	Tonscend	TS+-Ver2.1(JS36-RSE)	4.0.0.0
☒	AGC-ER-S012	BT/WIFI Test System	Tonscend	JS1120-2	2.6
☐	AGC-ER-S009	BT/WIFI Test System	Tonscend	JS1120-3	2.6.77.0518

5. ETSI EN 300 328 Requirements for Transmitter

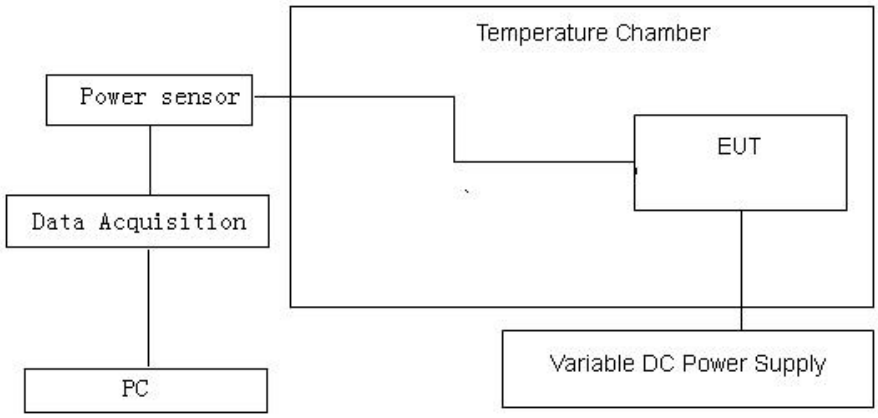
5.1 RF Output Power

The RF output power is defined as the mean equivalent isotropic radiated power (e.i.r.p.) of the equipment during a transmission burst.

Test Limit

RF Output Power <= 100mW (20dBm) over Normal and Extreme conditions.

Test Setup



Test Procedure

1) Use a fast power sensor and set the samples speed 1MS/s or faster.
2) Connect one power sensor to each transmit port, Trigger the power sensors so that they start sampling at the same time. For each instant in time, sum the power of the individual samples of all ports and store them. Use these stored samples in all following steps.
3) Find the start and stop times of each burst in the stored measurement samples.
4) Between the start and stop times of each individual burst calculate the RMS power over the burst. Save these P burst values, as well as the start and stop times for each burst.
5) The highest of all P burst values (Value “A” in dBm) will be used for maximum e.i.r.p calculations.
6) The cable loss factor shall be considered to the value “A”.
7) Add the (stated) antenna assembly gain “G” in dBi of the individual antenna. If applicable, add the additional beamforming gain “Y” in dB.
8) The RF output power (P) shall be calculated using the formula: P=A+G+Y

Test Result

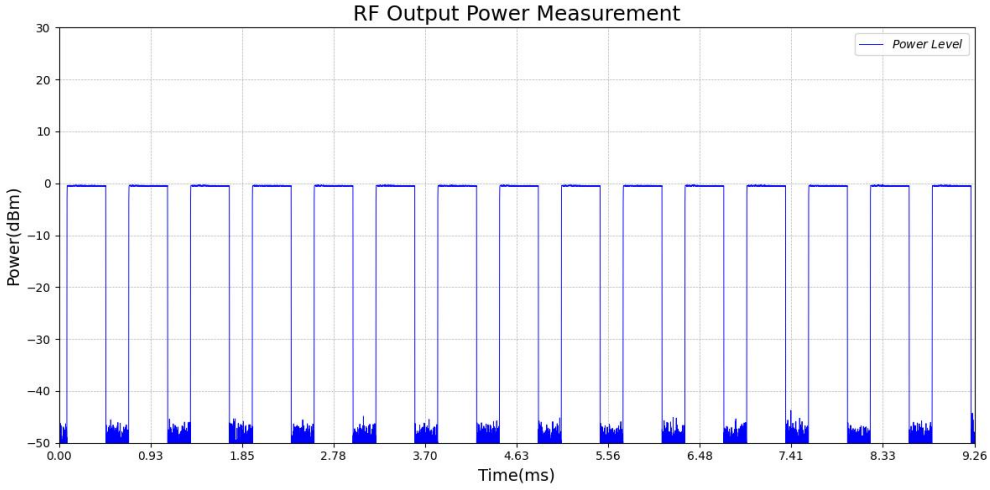
Test Temperature	26.3℃	Relative Humidity	53 %
Test Engineer	Allen Zhou	Testing Time	2025-09-02

Test Data of RF Output Power					
Test Mode	RF Output Power [dBm]			Limit [dBm]	Verdict
	NT	LT	HT		
LE1M_TX_2402_1Mbps	-0.51	-0.51	-0.51	20	Pass
LE1M_TX_2440_1Mbps	-0.62	-0.64	-0.62	20	Pass
LE1M_TX_2480_1Mbps	-0.14	-0.13	-0.12	20	Pass
LE2M_TX_2402_2Mbps	-0.48	-0.47	-0.47	20	Pass
LE2M_TX_2440_2Mbps	-0.54	-0.54	-0.54	20	Pass
LE2M_TX_2480_2Mbps	-0.13	-0.11	-0.13	20	Pass

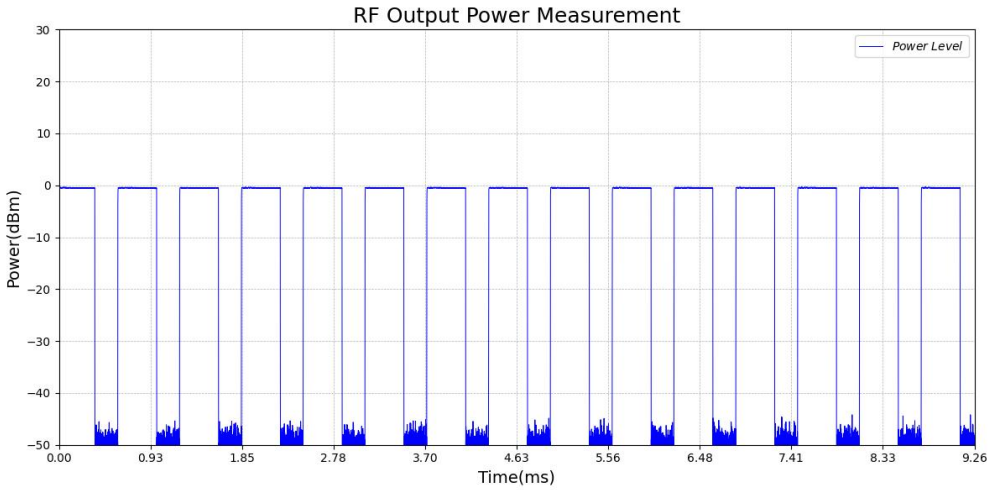
Test Temperature	27℃	Relative Humidity	43 %
Test Engineer	Allen Zhou	Testing Time	2025-10-16

Test Data of RF Output Power					
Test Mode	RF Output Power [dBm]			Limit [dBm]	Verdict
	NT	LT	HT		
LE125K_TX_2402_125Kbps	-3.85	-3.84	-3.86	20	Pass
LE125K_TX_2440_125Kbps	-3.32	-3.32	-3.32	20	Pass
LE125K_TX_2480_125Kbps	-2.58	-2.57	-2.57	20	Pass

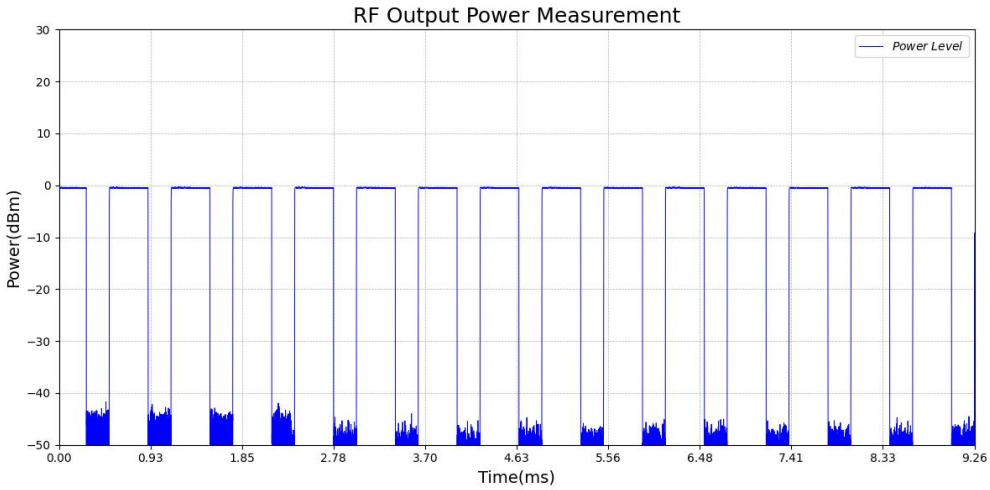
Test Graphs of RF Output Power



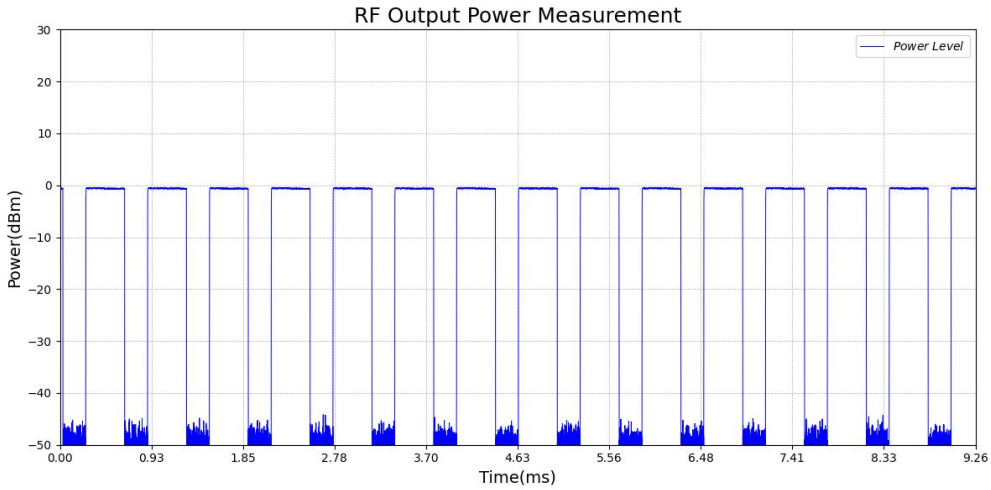
Test_Graph_LE1M_TX_ANT1_2402_1Mbps_Power_HT



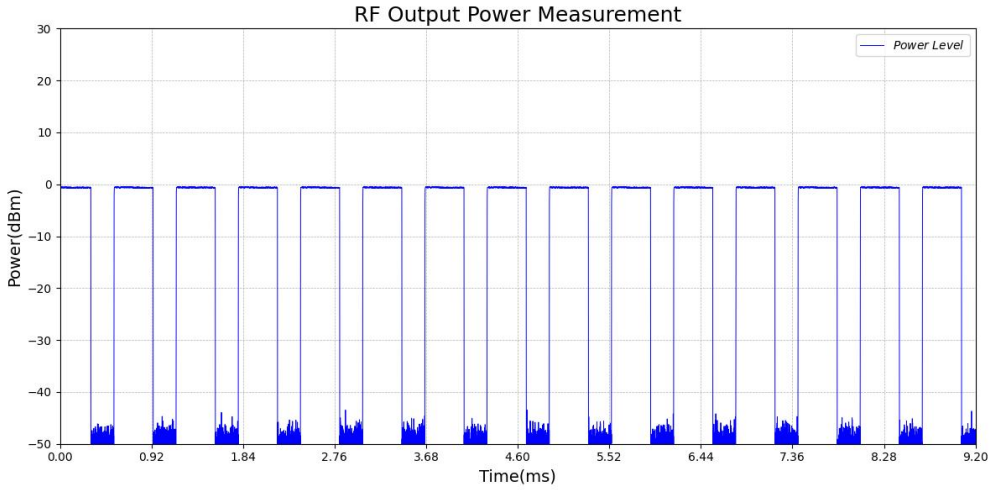
Test_Graph_LE1M_TX_ANT1_2402_1Mbps_Power_LT



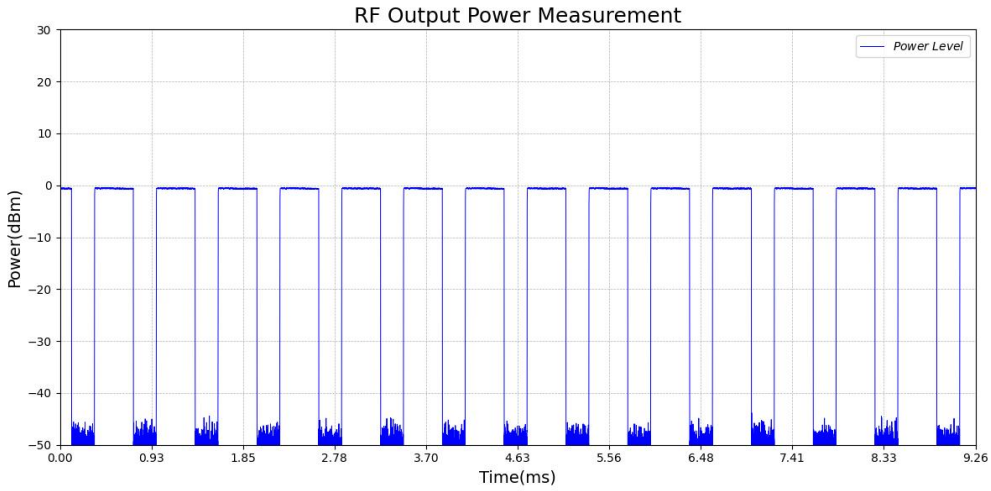
Test_Graph_LE1M_TX_ANT1_2402_1Mbps_Power_NT



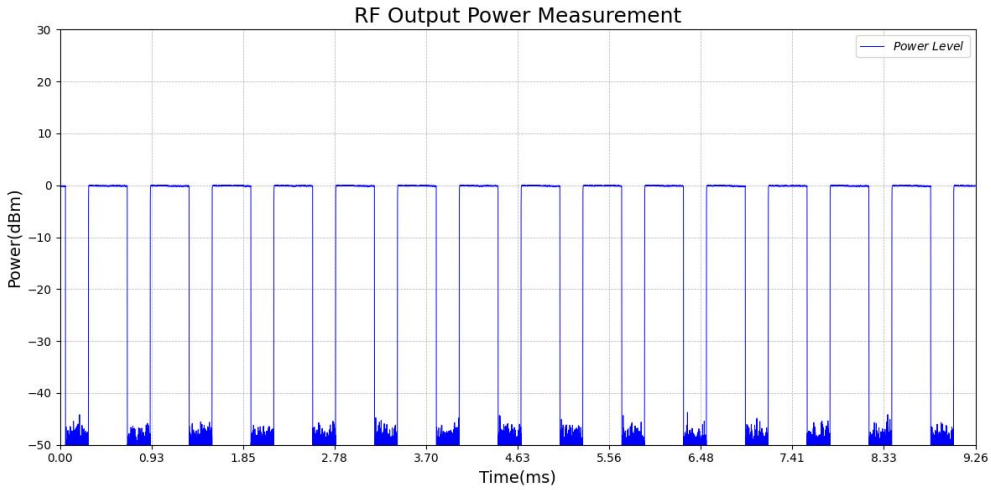
Test_Graph_LE1M_TX_ANT1_2440_1Mbps_Power_HT



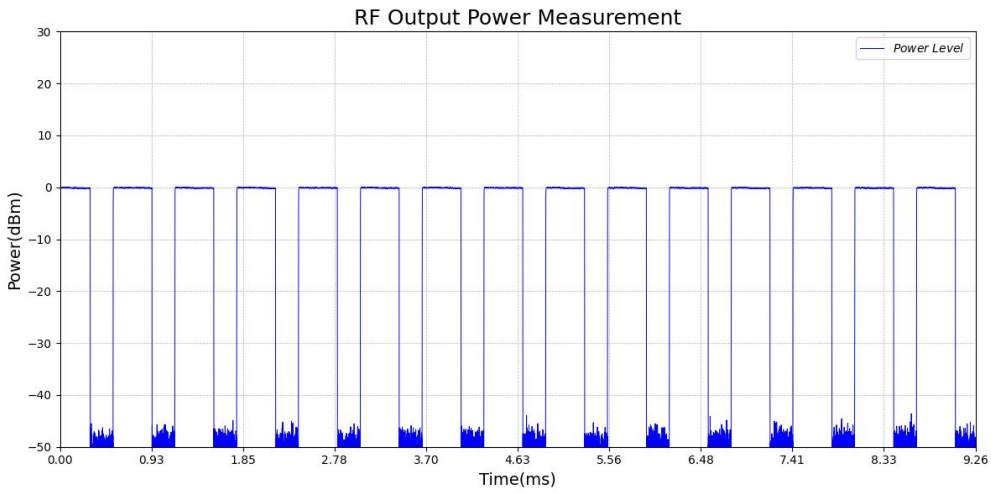
Test_Graph_LE1M_TX_ANT1_2440_1Mbps_Power_LT



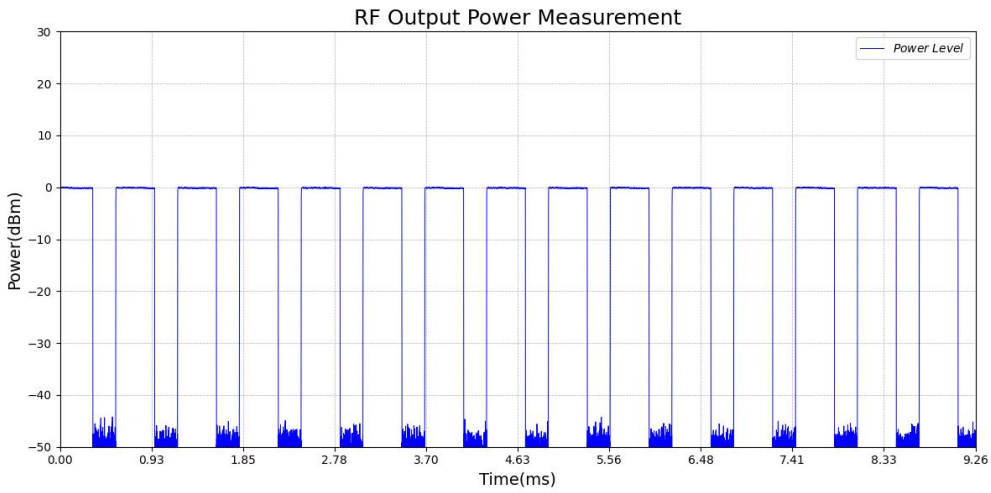
Test_Graph_LE1M_TX_ANT1_2440_1Mbps_Power_NT



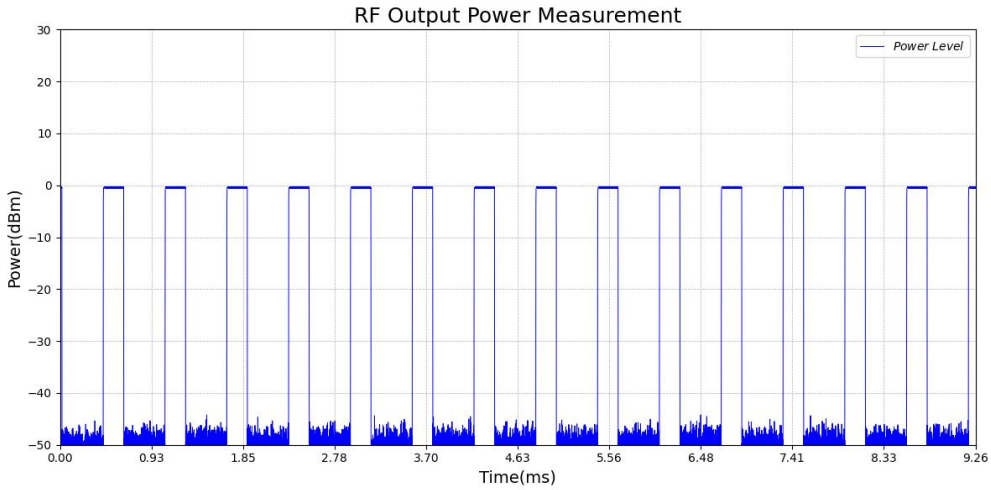
Test_Graph_LE1M_TX_ANT1_2480_1Mbps_Power_HT



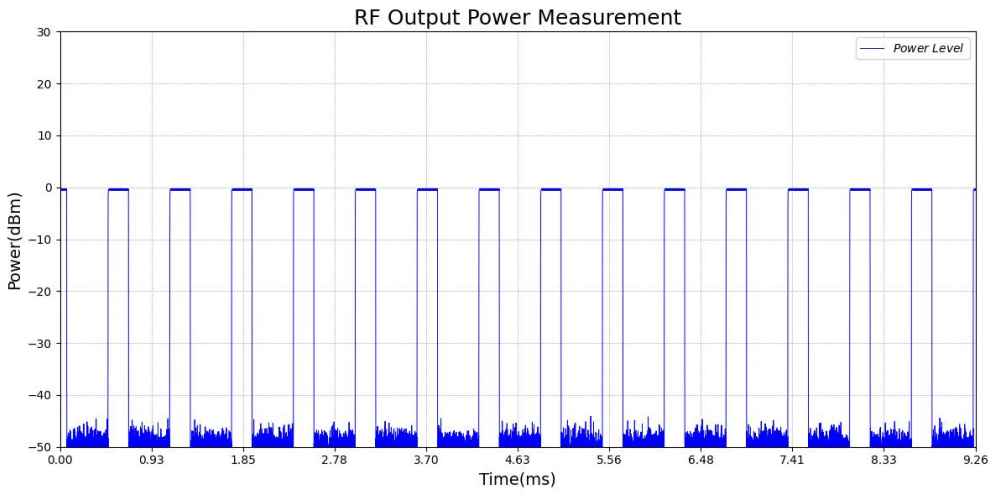
Test_Graph_LE1M_TX_ANT1_2480_1Mbps_Power_LT



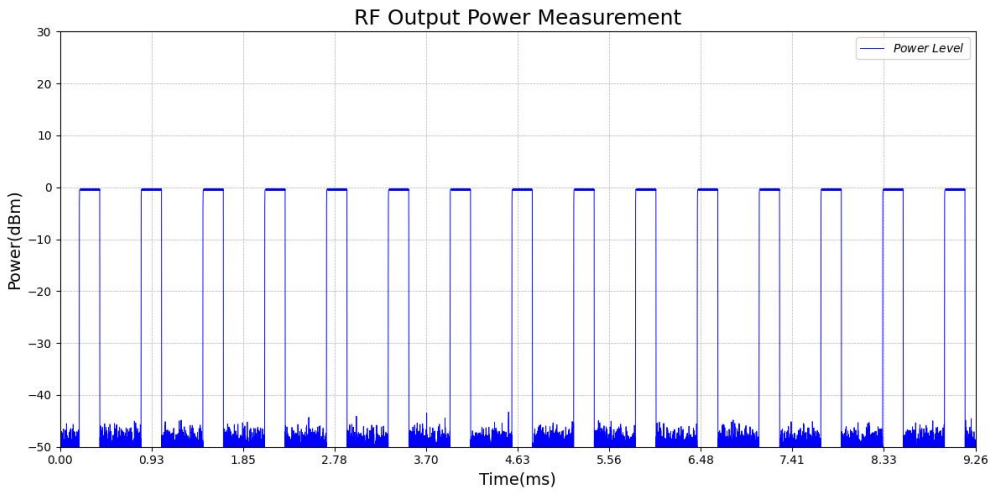
Test_Graph_LE1M_TX_ANT1_2480_1Mbps_Power_NT



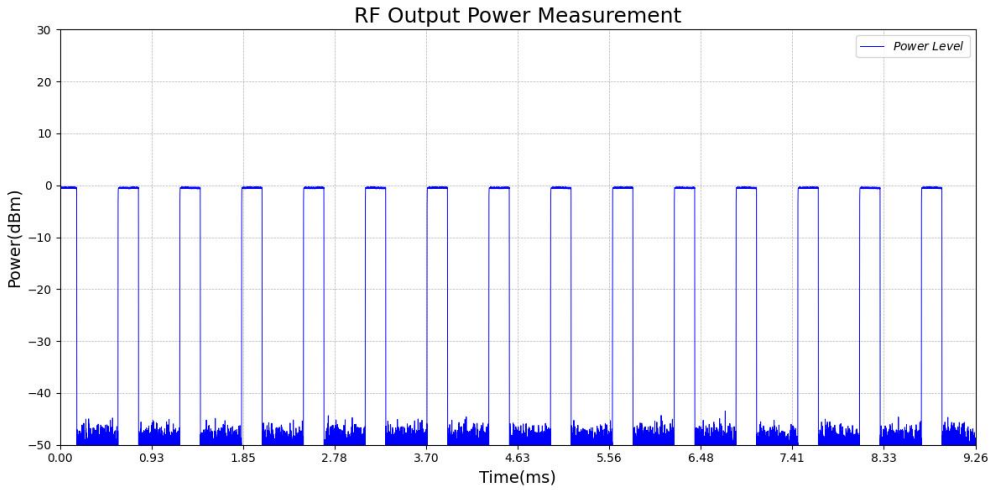
Test_Graph_LE2M_TX_ANT1_2402_2Mbps_Power_HT



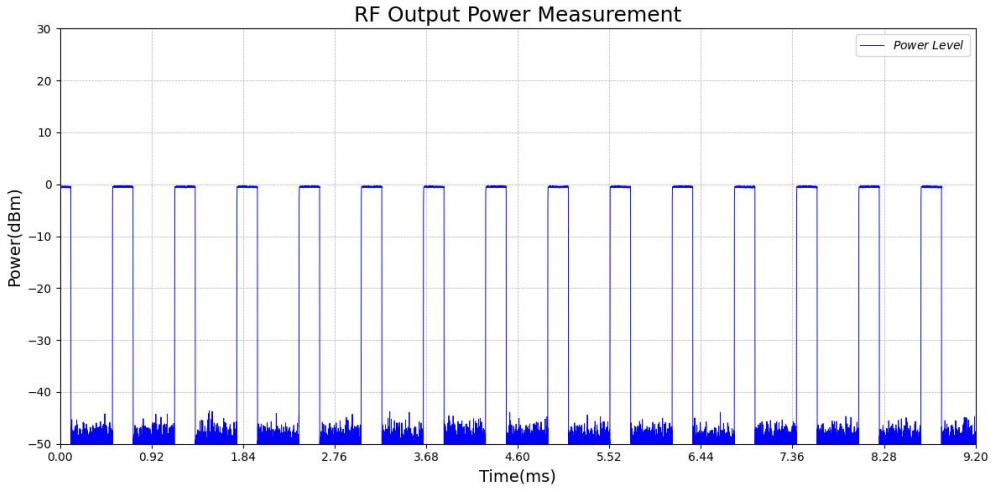
Test_Graph_LE2M_TX_ANT1_2402_2Mbps_Power_LT



Test_Graph_LE2M_TX_ANT1_2402_2Mbps_Power_NT



Test_Graph_LE2M_TX_ANT1_2440_2Mbps_Power_HT



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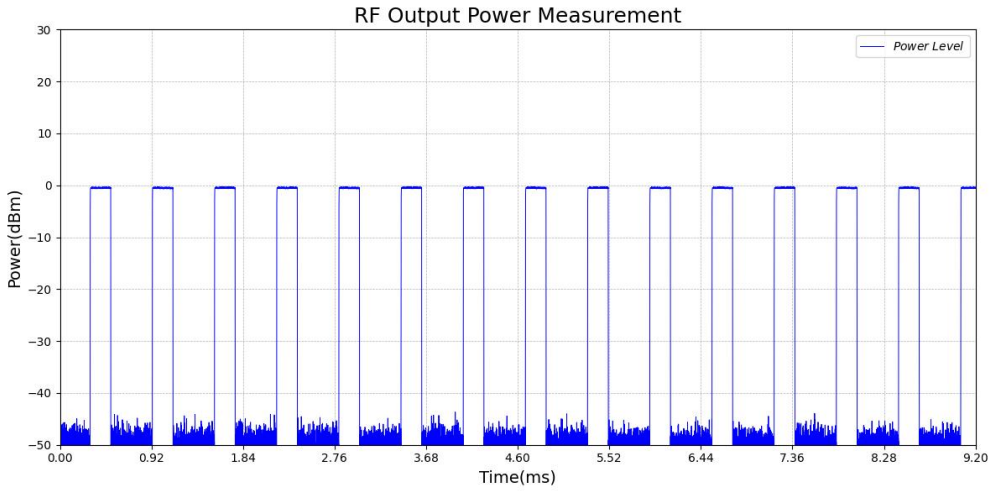

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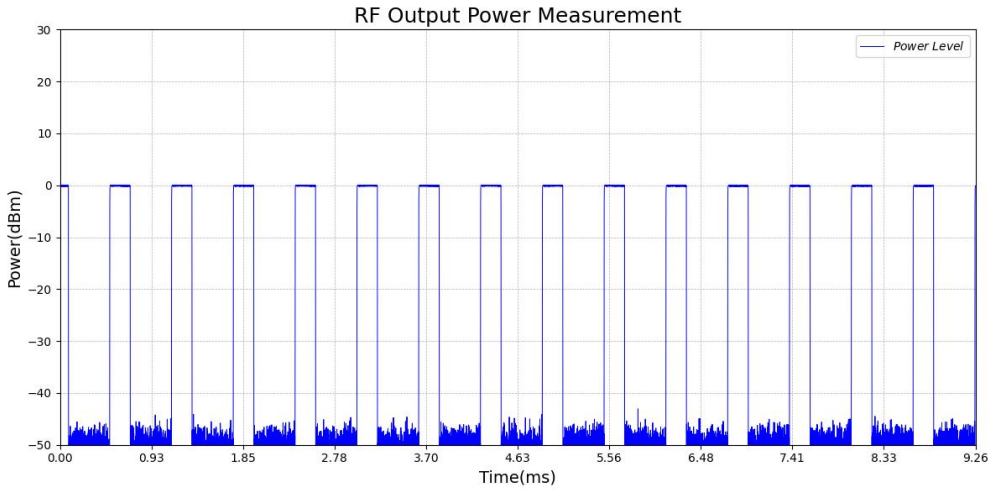
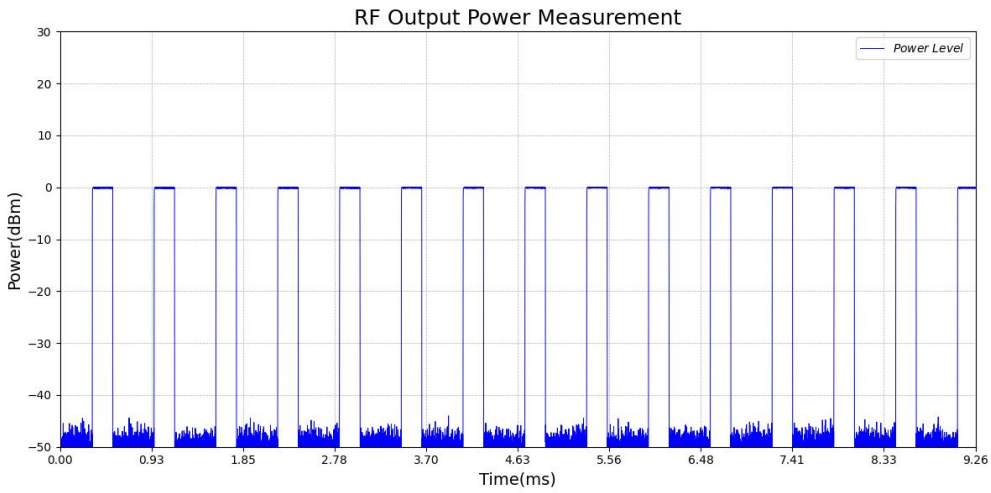


Test_Graph_LE2M_TX_ANT1_2480_2Mbps_Power_HT



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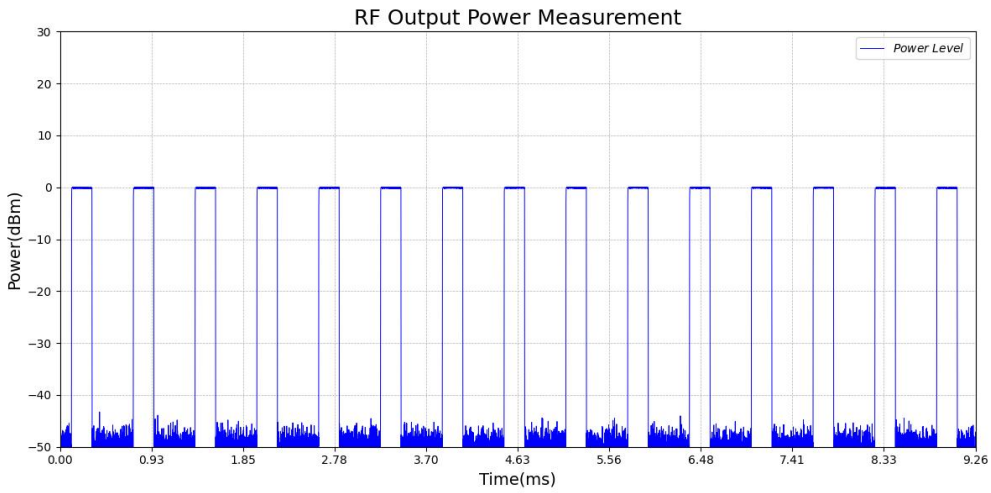
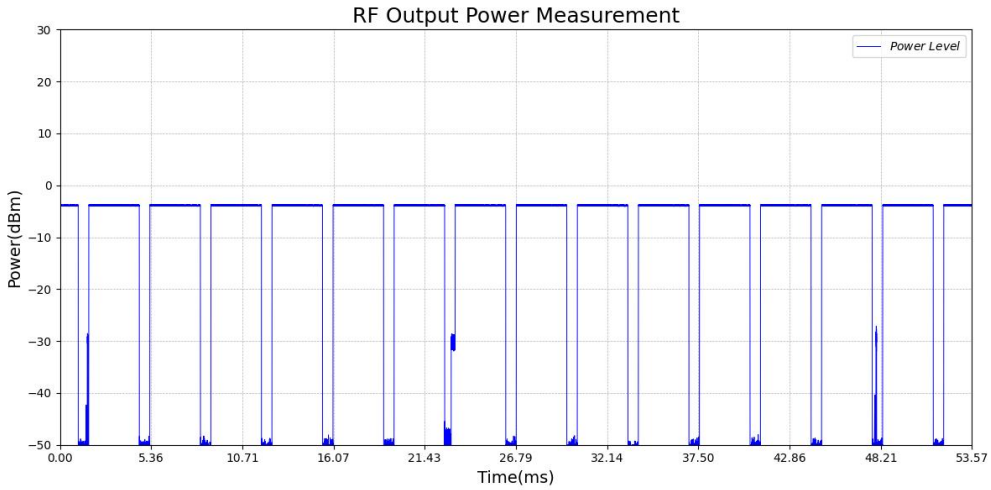
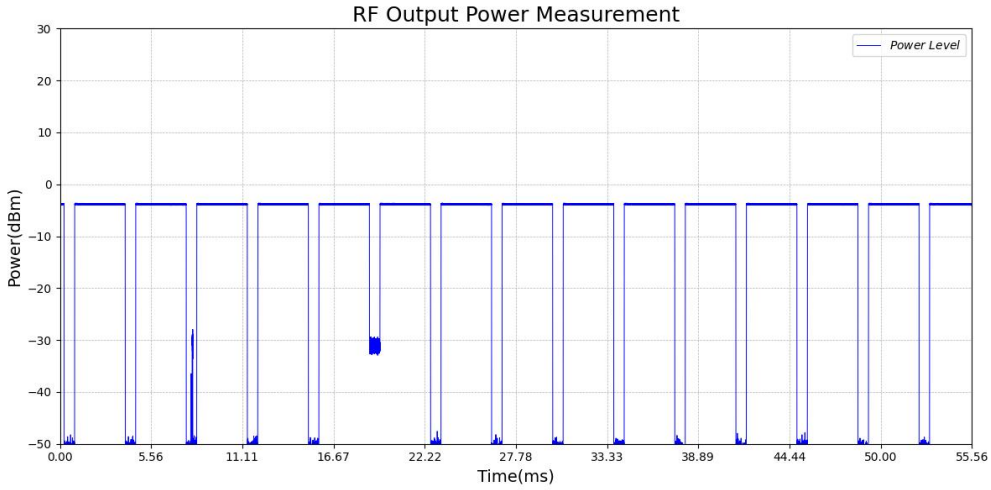


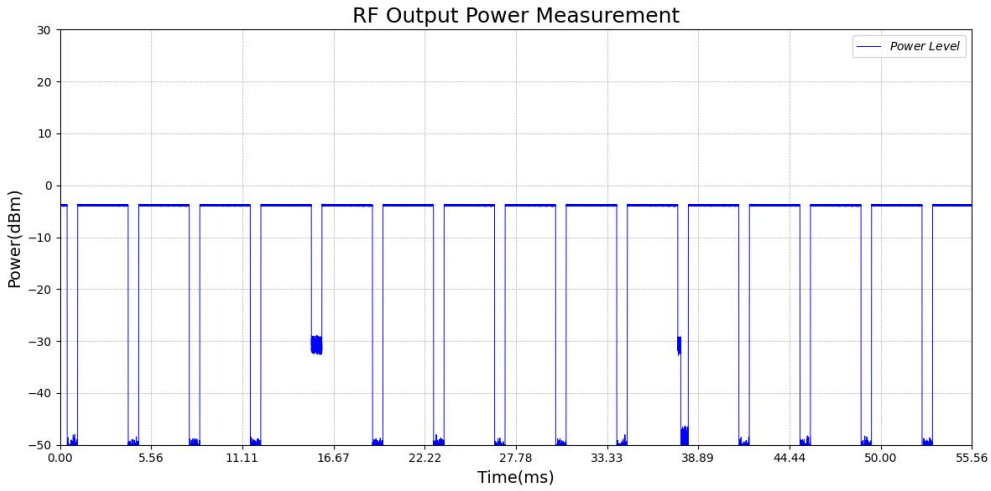
Test_Graph_LE2M_TX_ANT1_2480_2Mbps_Power_NT



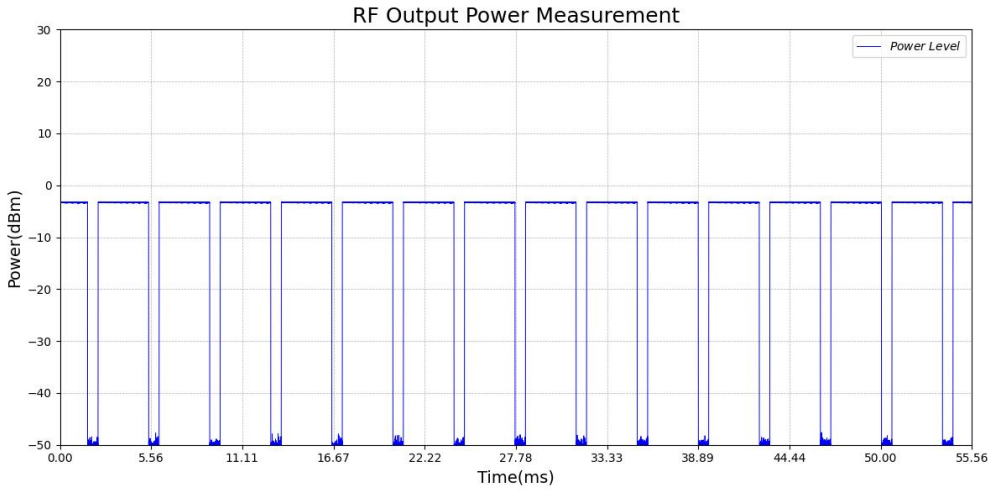
Test_Graph_LE125K_TX_ANT1_2402_125Kbps_Power_HT



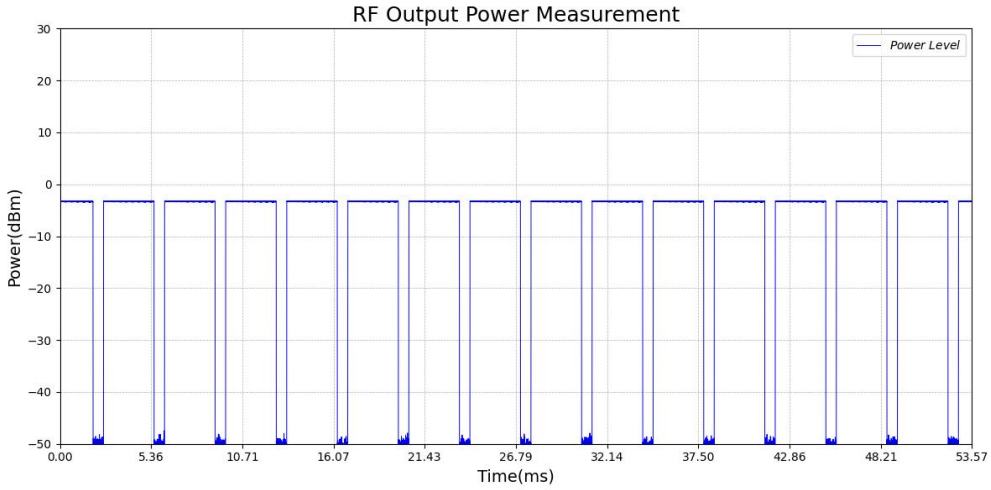
Test_Graph_LE125K_TX_ANT1_2402_125Kbps_Power_LT



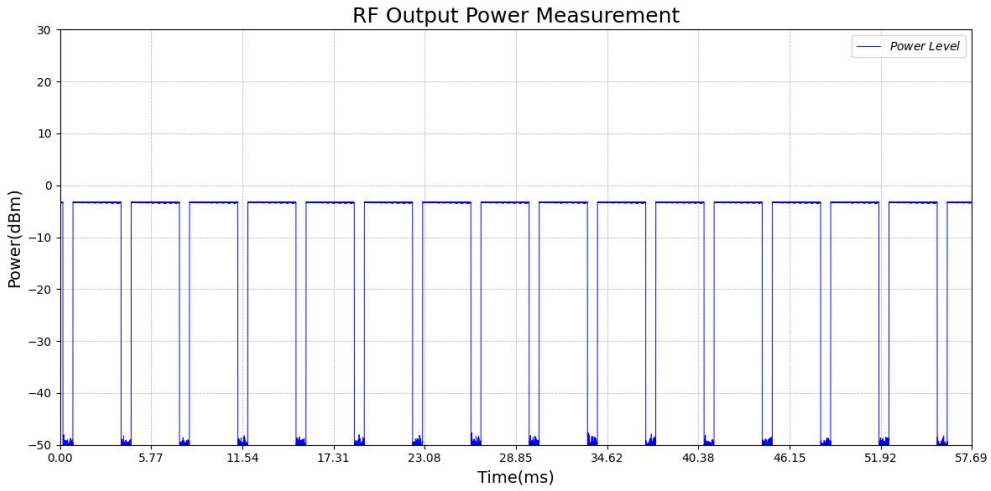
Test_Graph_LE125K_TX_ANT1_2402_125Kbps_Power_NT



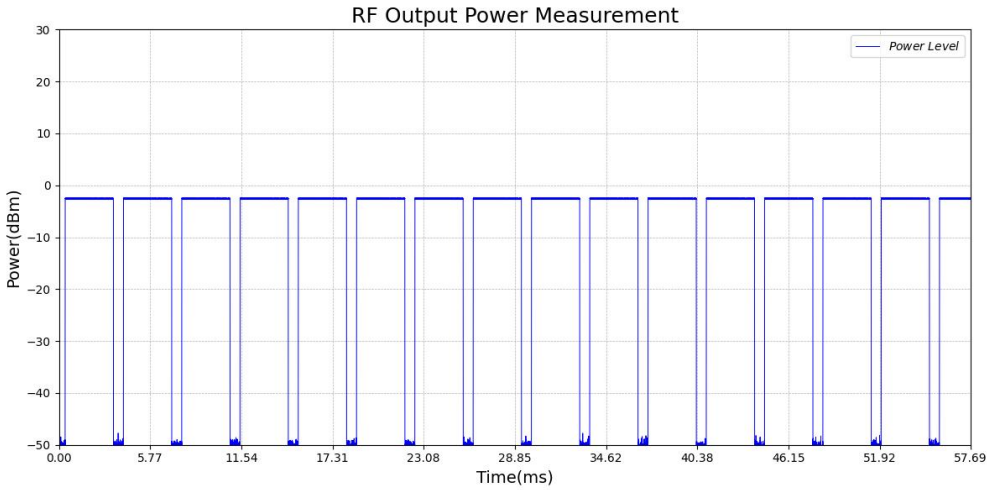
Test_Graph_LE125K_TX_ANT1_2440_125Kbps_Power_HT



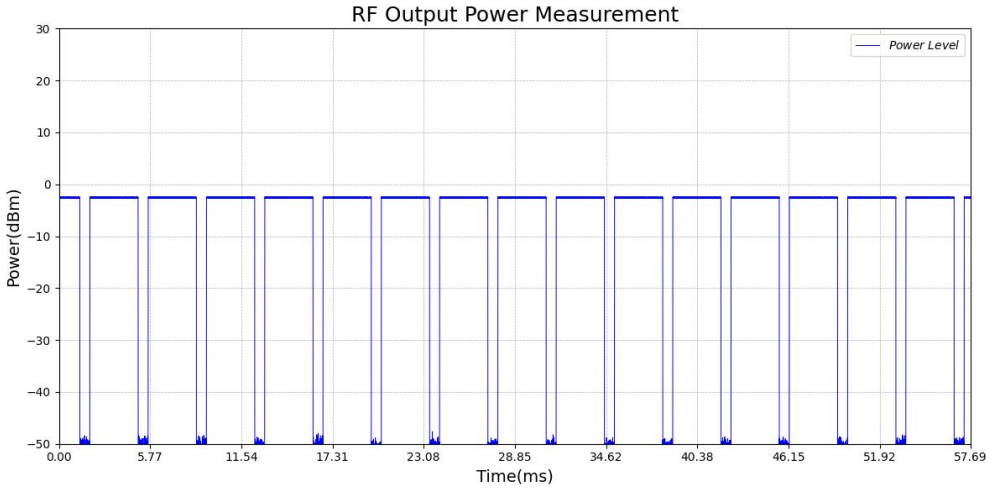
Test_Graph_LE125K_TX_ANT1_2440_125Kbps_Power_LT



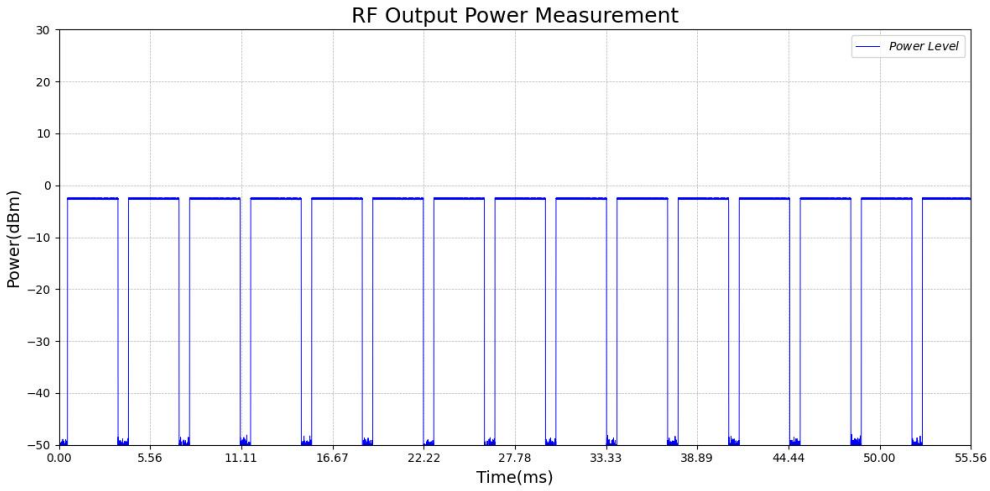
Test_Graph_LE125K_TX_ANT1_2440_125Kbps_Power_NT



Test_Graph_LE125K_TX_ANT1_2480_125Kbps_Power_HT



Test_Graph_LE125K_TX_ANT1_2480_125Kbps_Power_LT



Test_Graph_LE125K_TX_ANT1_2480_125Kbps_Power_NT

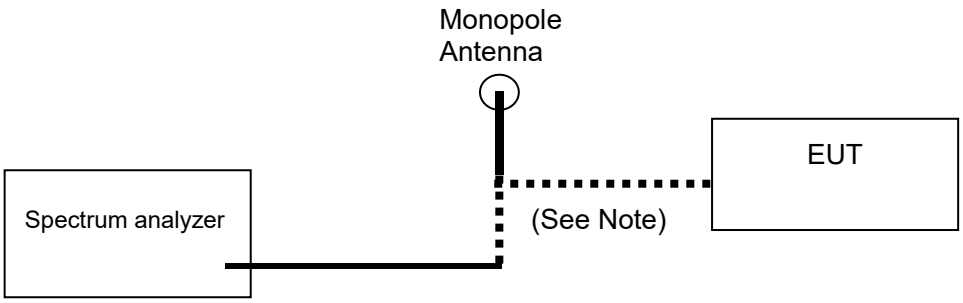
5.2 Power Spectral Density

The Power Spectral Density (PSD) is the mean equivalent isotropic radiated power (e.i.r.p.) spectral density in a 1 MHz bandwidth during a transmission burst.

Test Limit

The maximum Power Spectral Density for non-FHSS equipment is 10 dBm per MHz.

Test Setup



Remarks:
EUT was direct connected to test equipment through coupling device.

Test Procedure

1) Set the frequency from 2400MHz to 2483.5MHz, use 10kHz RBW and 30kHz VBW for pre-scan. The number of sweep points shall be more than 8350.Wait for the trace to be completed and save the (trace) data set to a file.
2) Add up the values for amplitude (power) for all the samples in the file.
3) Normalize the individual values for amplitude so that the sum is equal to the RF Output Power (e.i.r.p) measured in 5.1.
4) Starting from the first sample in the file (lowest frequency), add up the power of the following samples representing a 1MHz segment and record the results for power and position (i.e. sample #1 to #100). This is the Power Spectral Density (e.i.r.p) for the first 1MHz segment which shall be recorded.
5) Shift the start point of the samples added up in step 5 by 1 sample and repeat the procedure in step 4(i.e. sample #2 to #101).
6) Repeat step 5 until the end of the data set and record the radiated power spectral Density values for each of the 1MHz segments.
7) The cable loss factor shall be considered to the test result.
8) The highest value shall be recorded in the test report.

Test Result

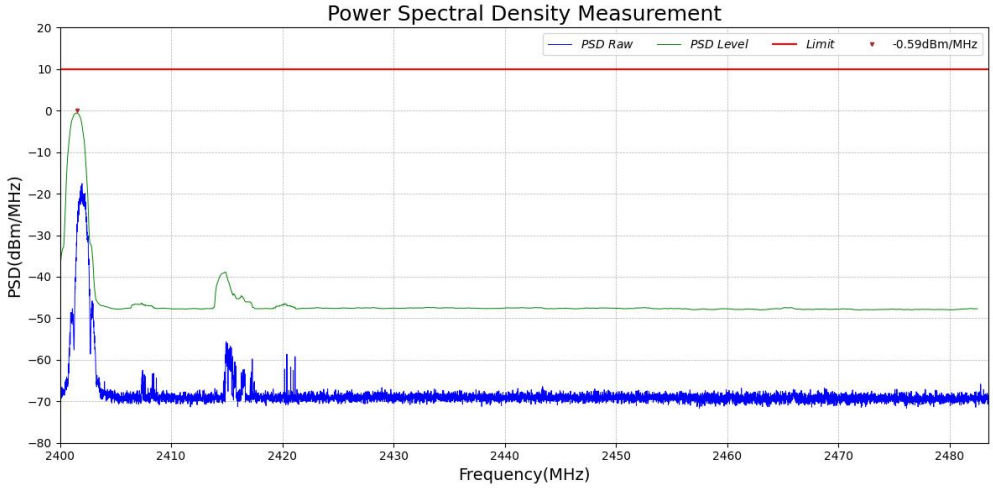
Test Temperature	26.3℃	Relative Humidity	53 %
Test Engineer	Allen Zhou	Testing Time	2025-09-02

Test Data of Power Spectral Density			
Test Mode	Power Spectral Density [dBm/MHz]	Limit [dBm/MHz]	Verdict
LE1M_TX_2402_1Mbps	-0.59	10	Pass
LE1M_TX_2440_1Mbps	-0.70	10	Pass
LE1M_TX_2480_1Mbps	-0.22	10	Pass
LE2M_TX_2402_2Mbps	-1.55	10	Pass
LE2M_TX_2440_2Mbps	-1.62	10	Pass
LE2M_TX_2480_2Mbps	-1.23	10	Pass

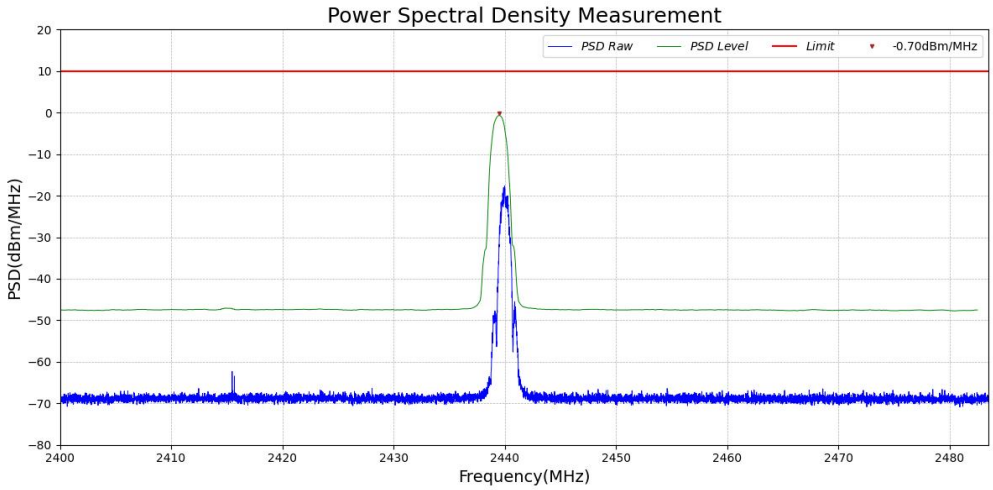
Test Temperature	27℃	Relative Humidity	43 %
Test Engineer	Allen Zhou	Testing Time	2025-10-16

Test Data of Power Spectral Density			
Test Mode	Power Spectral Density [dBm/MHz]	Limit [dBm/MHz]	Verdict
LE125K_TX_2402_125Kbps	-3.25	10	Pass
LE125K_TX_2440_125Kbps	-3.41	10	Pass
LE125K_TX_2480_125Kbps	-2.67	10	Pass

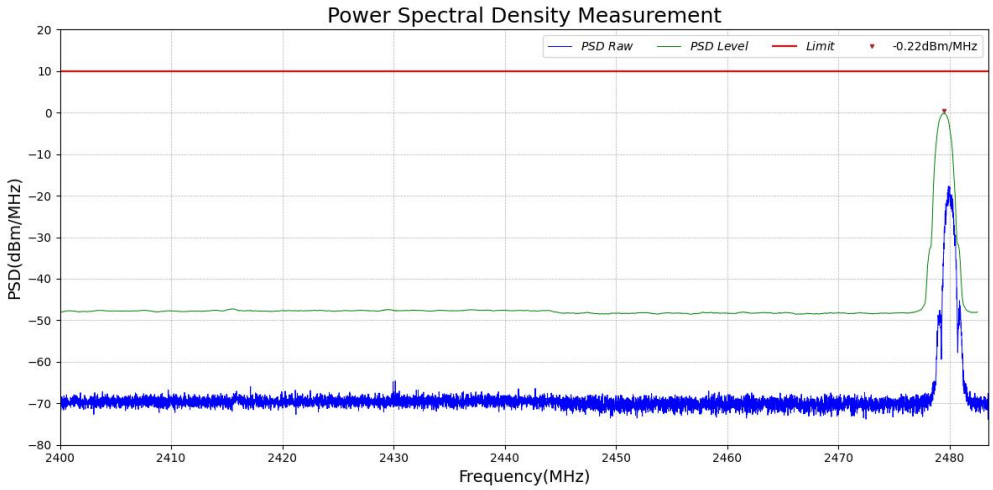
Test Graphs of Power Spectral Density



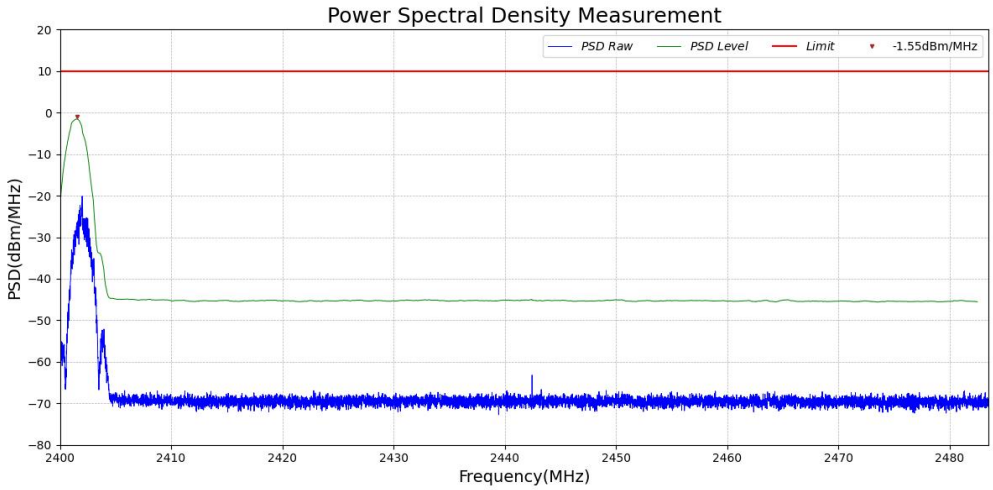
Test_Graph_LE1M_TX_ANT1_2402_1Mbps_PSD



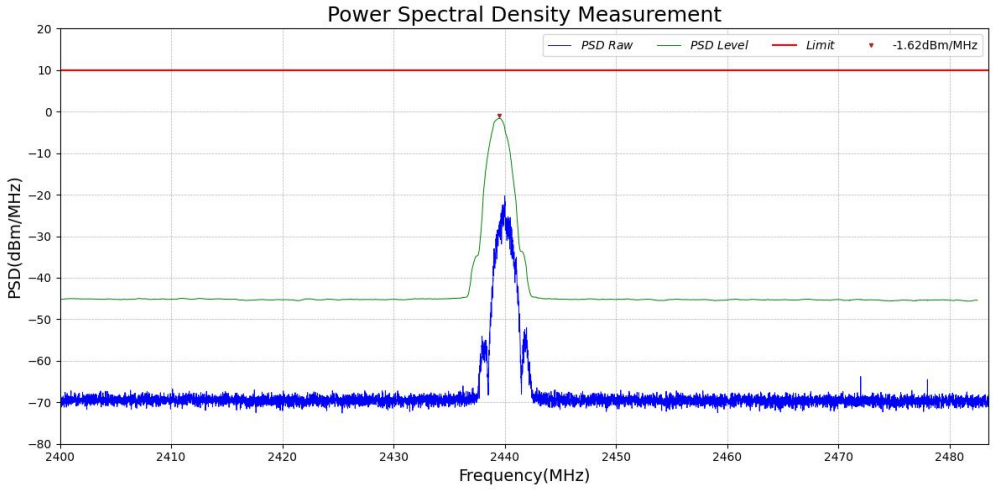
Test_Graph_LE1M_TX_ANT1_2440_1Mbps_PSD



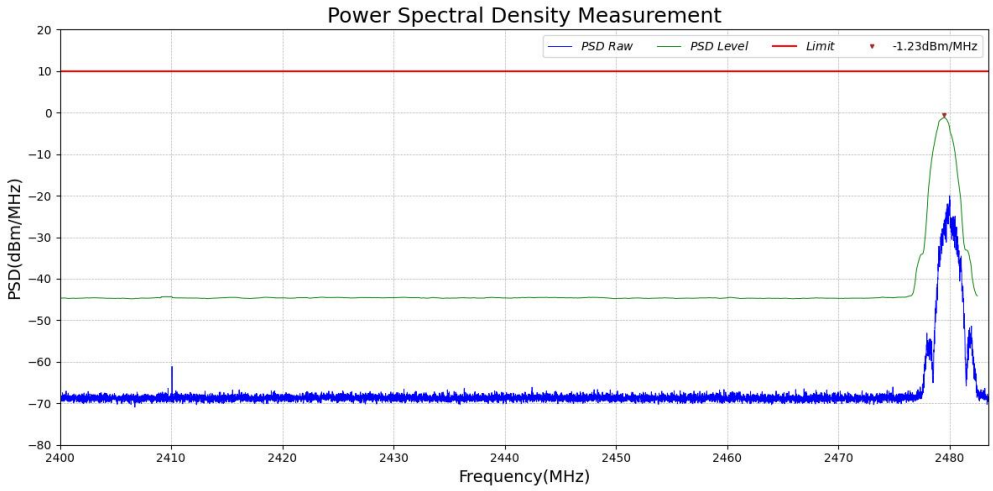
Test_Graph_LE1M_TX_ANT1_2480_1Mbps_PSD



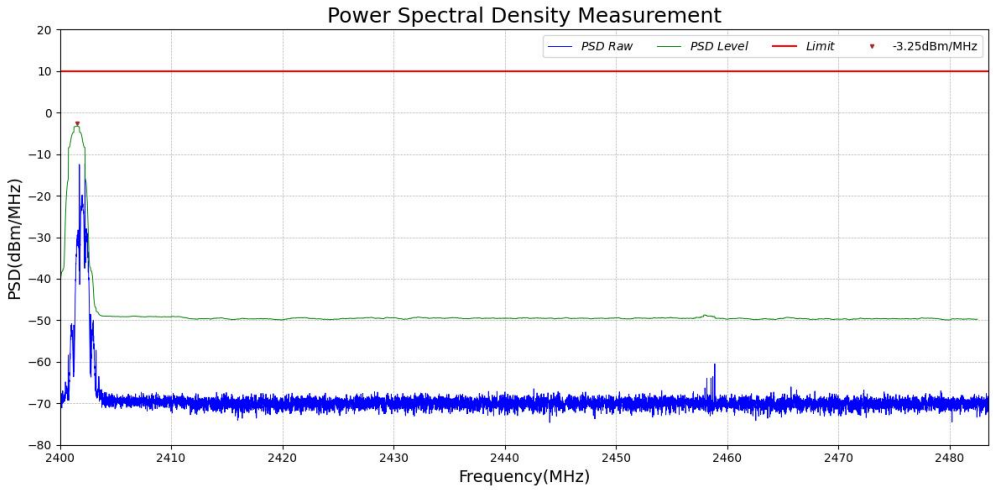
Test_Graph_LE2M_TX_ANT1_2402_2Mbps_PSD



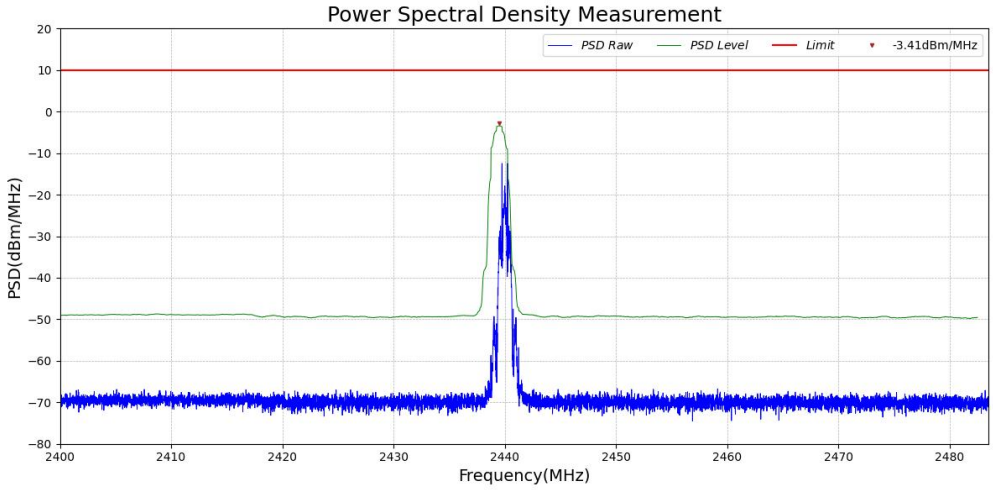
Test_Graph_LE2M_TX_ANT1_2440_2Mbps_PSD



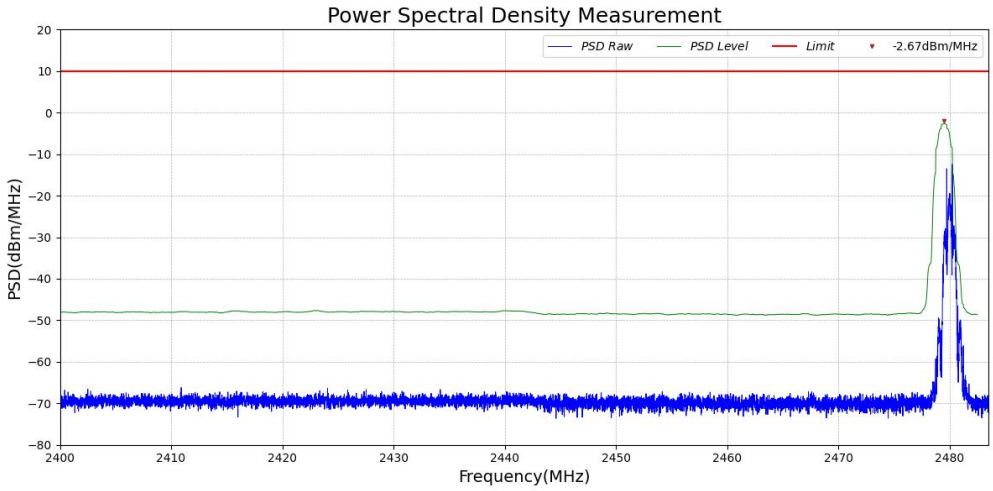
Test_Graph_LE2M_TX_ANT1_2480_2Mbps_PSD



Test_Graph_LE125K_TX_ANT1_2402_125Kbps_PSD



Test_Graph_LE125K_TX_ANT1_2440_125Kbps_PSD



Test_Graph_LE125K_TX_ANT1_2480_125Kbps_PSD

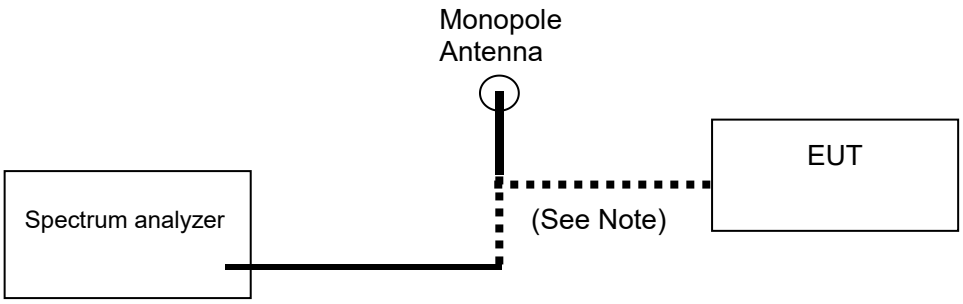
5.3 Occupied Channel Bandwidth

The Occupied Channel Bandwidth is the bandwidth that contains 99 % of the power of the signal.

Test Limit

The Occupied Channel Bandwidth shall fall completely within the band 2400MHz to 2483.5MHz.

Test Setup



Remarks:
EUT was direct connected to test equipment through coupling device.

Test Procedure

1) The spectrum analyser shall be used the following settings:
2) Centre Frequency: The centre frequency of the channel under test
   - Resolution BW: ~1% of the span without going below 1%
   - Video BW: 3×RBW
   - Span: 2×OBW
   - Detector: RMS
   - Trace mode: Max Hold
3) Wait until the trace is completed, find the peak value of the trace and place the analyser marker on this peak.
4) Use the 99 % bandwidth function of the spectrum analyser to measure the Occupied Channel Bandwidth of the UUT. This value shall be recorded.

Test Result

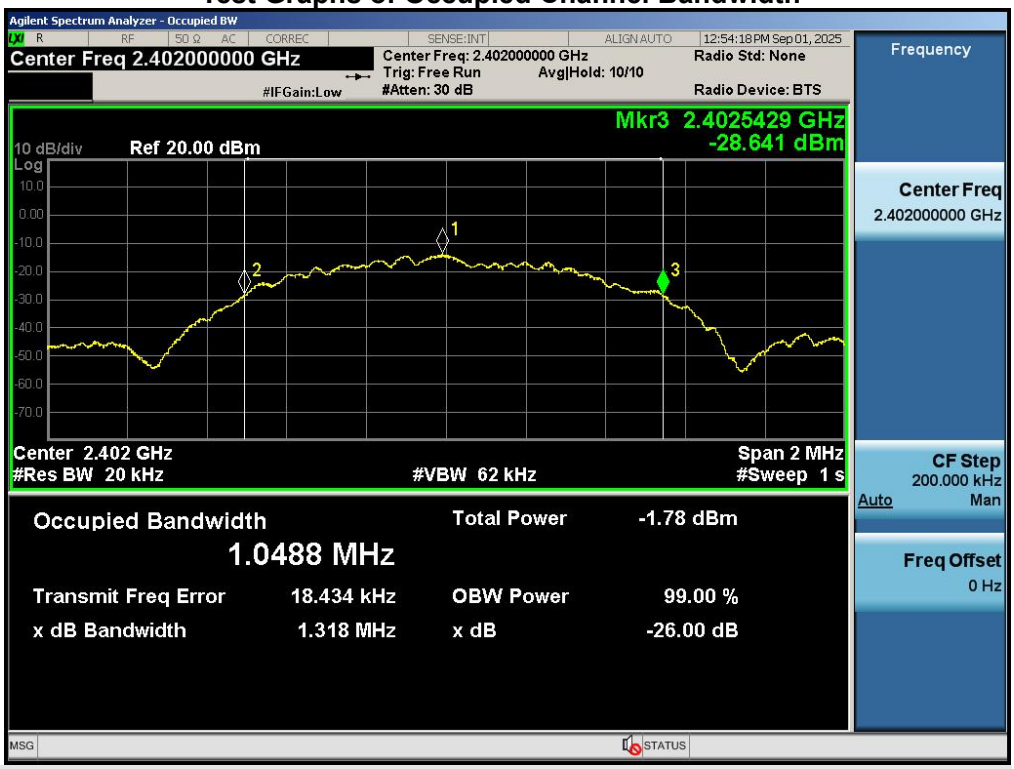
Test Temperature	26.3℃	Relative Humidity	53 %
Test Engineer	Allen Zhou	Testing Time	2025-09-02

Test Data of Occupied Channel Bandwidth					
Test Mode	Occupied Channel Bandwidth [MHz]			Limit [MHz]	Verdict
	OCB	FL	FH		
LE1M_TX_2402_1Mbps	1.049	2401.494	2402.543	2400 to 2483.5	Pass
LE1M_TX_2480_1Mbps	1.051	2479.493	2480.544	2400 to 2483.5	Pass
LE2M_TX_2402_2Mbps	2.055	2401.000	2403.055	2400 to 2483.5	Pass
LE2M_TX_2480_2Mbps	2.059	2478.999	2481.058	2400 to 2483.5	Pass

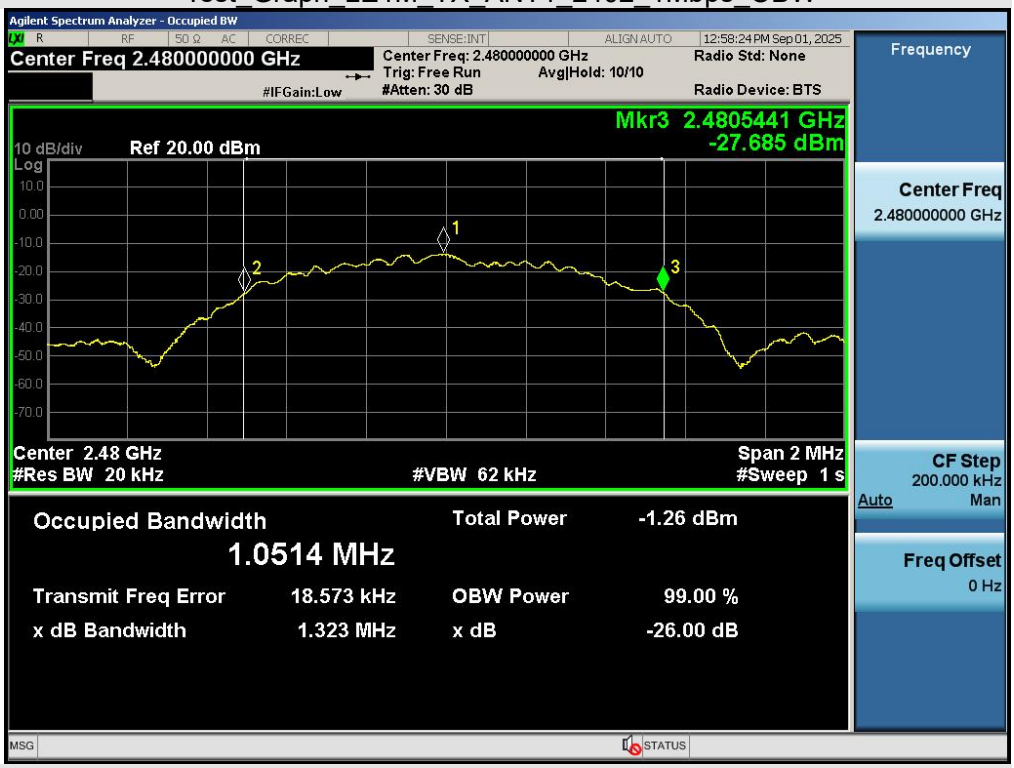
Test Temperature	27℃	Relative Humidity	43 %
Test Engineer	Allen Zhou	Testing Time	2025-10-14

Test Data of Occupied Channel Bandwidth					
Test Mode	Occupied Channel Bandwidth [MHz]			Limit [MHz]	Verdict
	OCB	FL	FH		
LE125K_TX_2402_125Kbps	1.046	2401.484	2402.530	2400 to 2483.5	Pass
LE125K_TX_2480_125Kbps	1.048	2479.482	2480.530	2400 to 2483.5	Pass

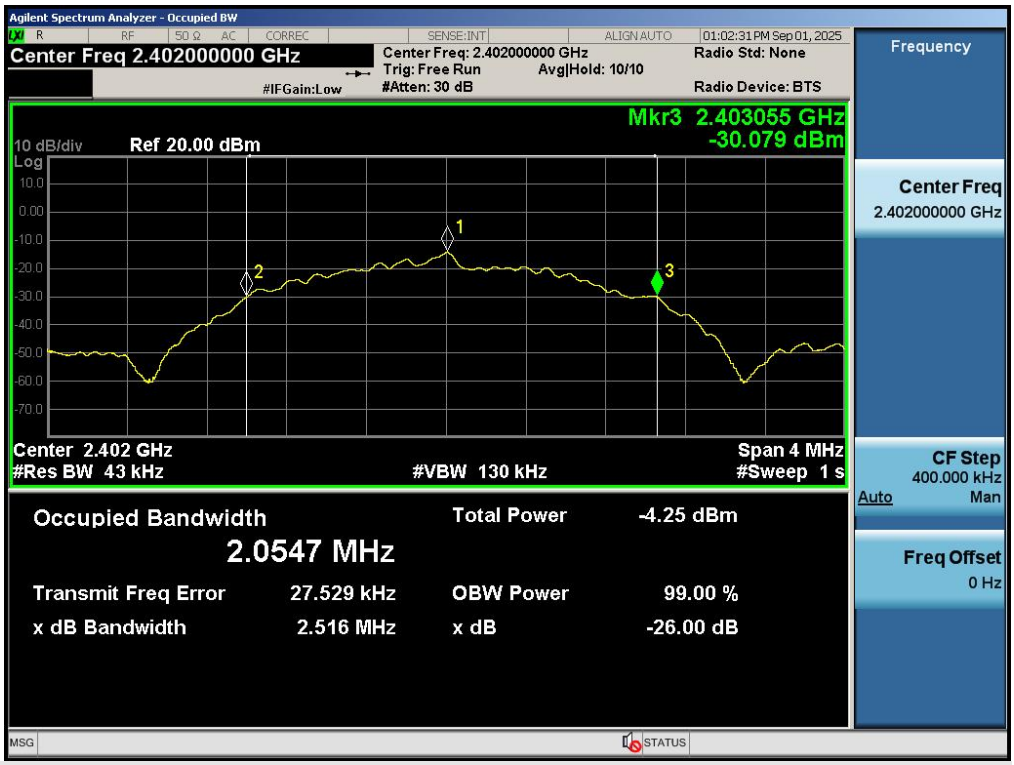
Test Graphs of Occupied Channel Bandwidth



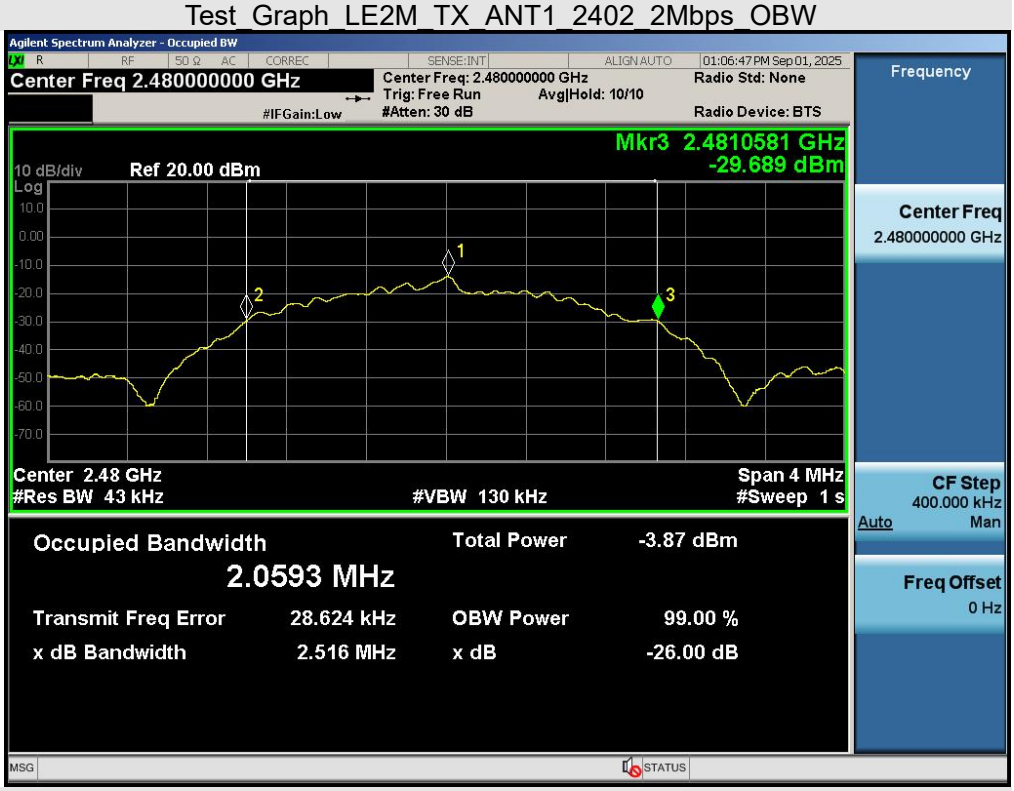
Test_Graph_LE1M_TX_ANT1_2402_1Mbps_OBW



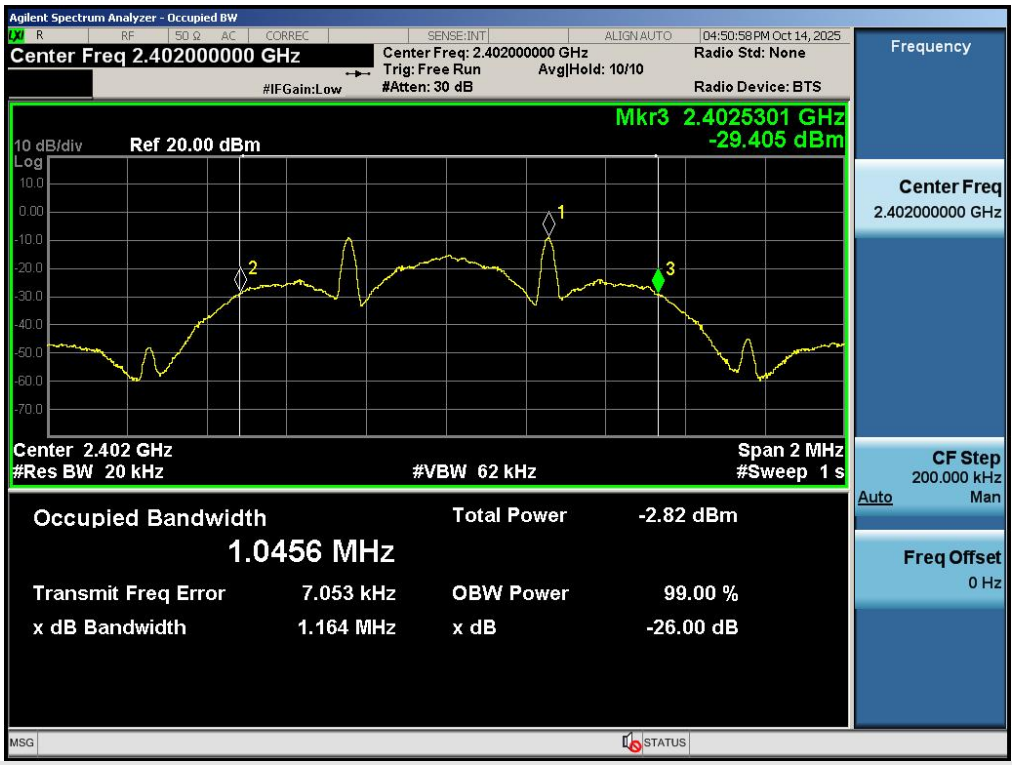
Test_Graph_LE1M_TX_ANT1_2480_1Mbps_OBW



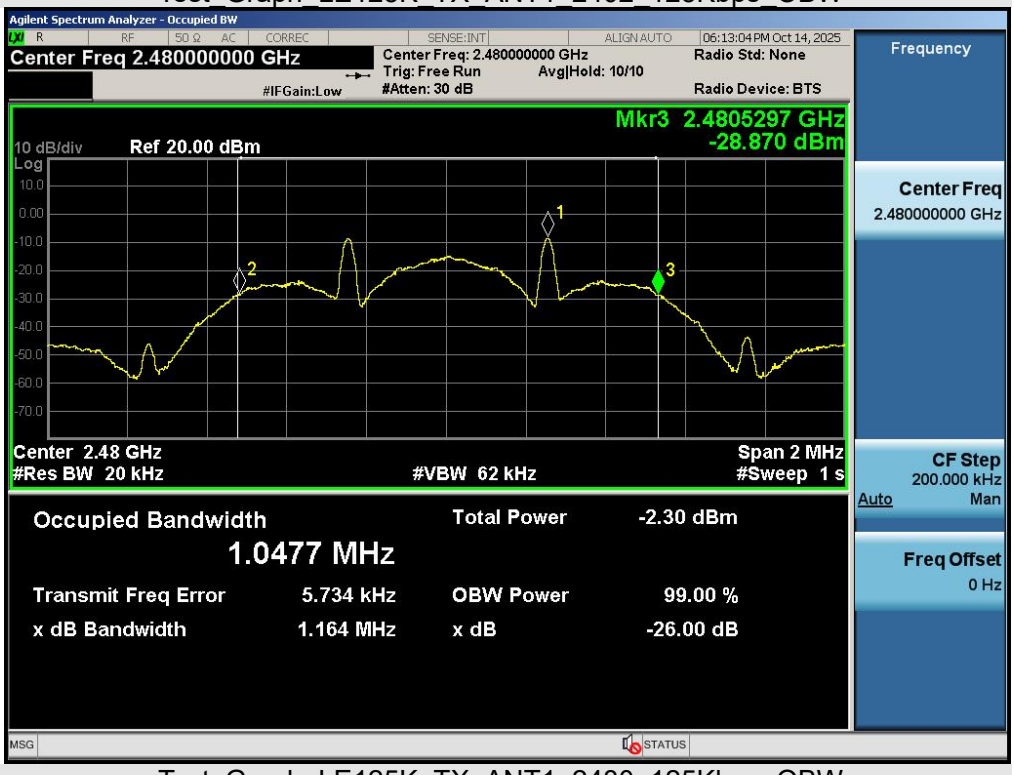
Test_Graph_LE2M_TX_ANT1_2402_2Mbps_OBW



Test_Graph_LE2M_TX_ANT1_2480_2Mbps_OBW



Test_Graph_LE125K_TX_ANT1_2402_125Kbps_OBW



Test_Graph_LE125K_TX_ANT1_2480_125Kbps_OBW

5.4 Adaptivity(non-FHSS)

The method of adaptivity is using LBT based on LBE.

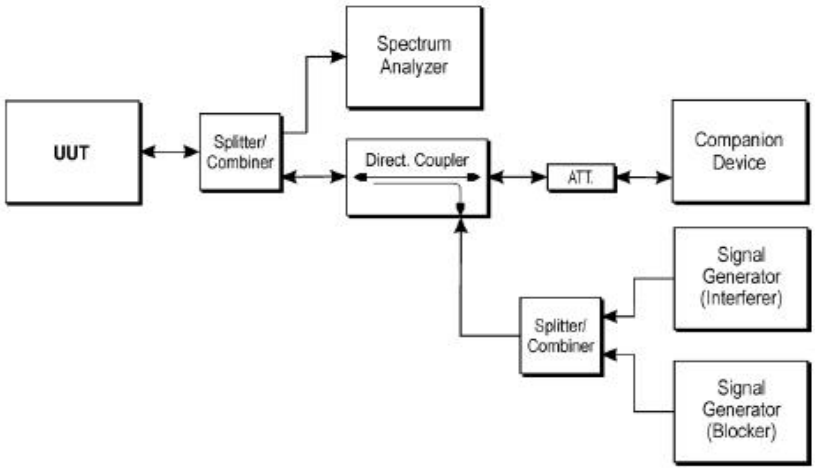
Adaptive non-FHSS using LBT is a mechanism by which non-FHSS adaptive equipment avoids transmissions in a channel in the presence of an interfering signal in that channel. This mechanism shall operate as intended in the presence of an unwanted signal on frequencies other than those of the operating band.

Test Limit

- The Channel Occupancy Time shall be less than 13ms.
- If implemented, Short Control Signalling Transmissions of adaptive equipment using wide band modulations other than FHSS shall have a maximum duty cycle of 10 % within an observation period of 50 ms.
- For power levels less than 20 dBm e.i.r.p., the CCA threshold level (TL) may be relaxed to:
- TL = -70 dBm/MHz + 10 × log10 (100mW / Pout) (Pout in mW e.i.r.p.)
- An unwanted CW signal as defined in the below table.

Wanted signal mean power from companion device	Unwanted signal frequency (MHz)	Unwanted signal power (dBm)
sufficient to maintain the link (see note 2)	2 395 or 2 488,5 (see note 1)	-35 (see note 3)
NOTE 1: The highest frequency shall be used for testing operating channels within the range 2 400 MHz to 2 442 MHz, while the lowest frequency shall be used for testing operating channels within the range 2 442 MHz to 2 483,5 MHz. See clause 5.4.6.1.		
NOTE 2: A typical conducted value which can be used in most cases is -50 dBm/MHz.		
NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna.		

Test Setup



Test Procedure

1) The EUT connect to a companion device during the test. Adjust the received signal level at the EUT to the value of -50dBm/MHz.
2) the analyzer shall be set as below: RBW>=Occupied Channel Bandwidth (if the analyser does not support this setting, the highest available setting shall be used) and VBW>=3×RBW.
3) Configure the EUT for normal transmission with a sufficiently high payload to allow demonstration of compliance of the adaptive mechanism on the channel being tested.
4) Adding the interference signal and verification of reaction to the interference signal.
5) Adding the unwanted signal and verification of reaction to the unwanted signal.
6) Removing the interference and unwanted signal.

Test Result

Note：The EIRP of the EUT is less than 10dBm, So the adaptivity test is not applicable for the EUT.

5.5 Transmitter Unwanted Emissions in the Out-of-Band Domain

In the present document, transmitter unwanted emissions in the out-of-band domain are emissions when the equipment is in Transmit mode, on frequencies immediately outside the allocated band, but excluding unwanted emissions in the spurious domain.

Test Limit

The transmitter unwanted emissions in the out-of-band domain shall not exceed the values provided by the mask in figure 3.

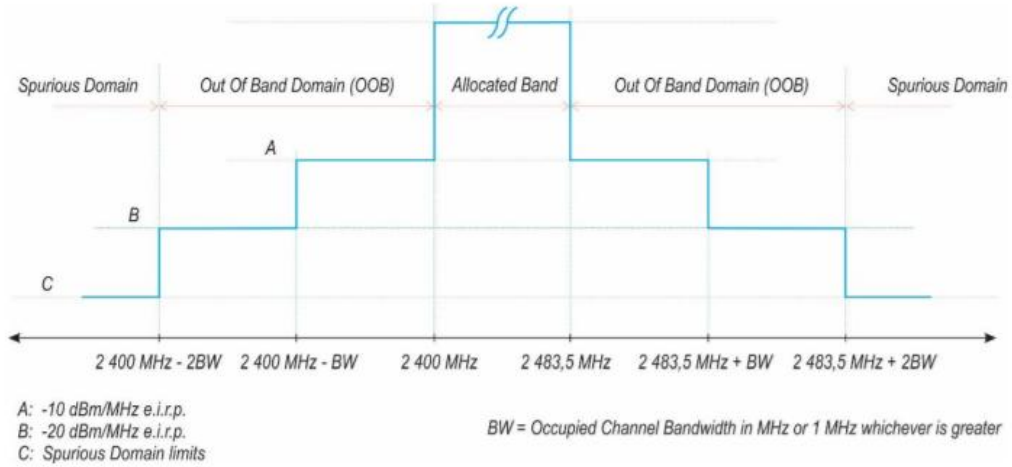
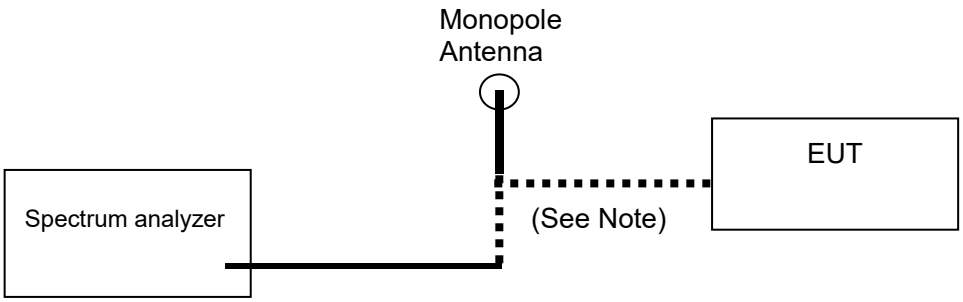


Figure 3: Transmit mask

Test Setup



Remarks:
EUT was direct connected to test equipment through coupling device.

Test Procedure

1) The spectrum analyzer shall be used the following settings:
   - Centre Frequency: 2484MHz
   - Resolution BW: 1MHz; Video BW: 3MHz; Span: 0Hz; Detector: RMS
   - Trace mode: Max Hold; Sweep Points: 5000
2) Segment 2 483.5 MHz to 2 483.5 MHz + BW
   - Adjust the trigger level to select the transmissions with the highest power level.
   - Increase the center frequency in steps of 1 MHz and repeat this measurement for every 1 MHz segment within the range 2 483.5 MHz to 2 483.5 MHz + BW.
3) Segment 2 483.5 MHz + BW to 2 483.5 MHz + 2BW
   - Change the center frequency of the analyzer to 2 484 MHz + BW and perform the measurement for the first 1 MHz segment within range 2 483.5 MHz + BW to 2 483.5 MHz + 2BW. Increase the center frequency in 1 MHz steps and repeat the measurements to cover this whole range. The center frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + 2 BW – 0.5MHz.
4) Segment 2 400 MHz - BW to 2 400 MHz
   - Change the center frequency of the analyzer to 2 399.5 MHz and perform the measurement for the first 1 MHz segment within range 2 400 MHz - BW to 2 400 MHz Reduce the center frequency in 1 MHz steps and repeat the measurements to cover this whole range. The center frequency of the last 1 MHz segment shall be set to 2 400 MHz - 2BW + 0.5MHz.
5) Segment 2 400 MHz - 2BW to 2 400 MHz - BW
   - Change the center frequency of the analyzer to 2 399,5 MHz - BW and perform the measurement for the first 1 MHz segment within range 2 400 MHz - 2BW to 2 400 MHz - BW. Reduce the center frequency in 1 MHz steps and repeat the measurements to cover this whole range. The center frequency of the last 1 MHz segment shall be set to 2 400 MHz - 2BW + 0.5MHz.
6) The cable loss and attenuator factor shall be considered to the test result.

Test Result

Test Temperature	26.3℃	Relative Humidity	53 %
Test Engineer	Allen Zhou	Testing Time	2025-09-02

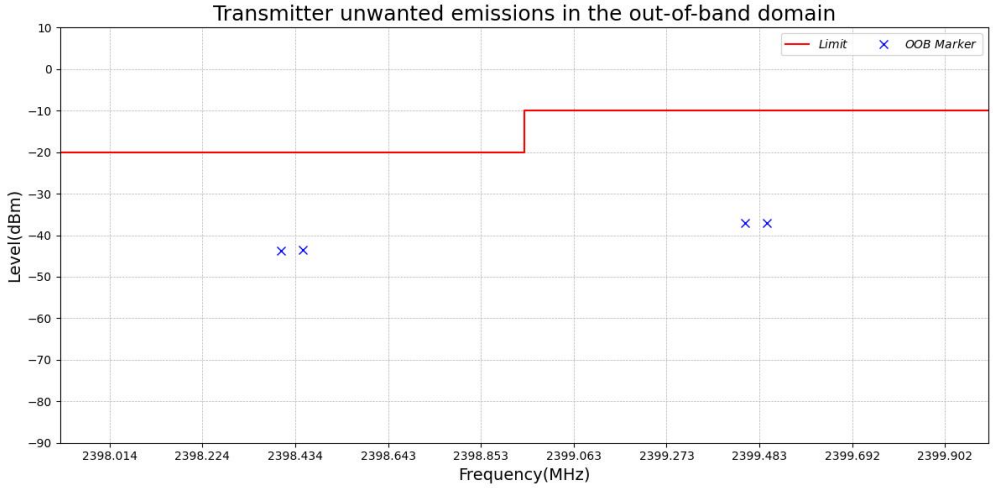
Test Data of OOB Emissions				
Test Mode	Frequency [MHz]	Level [dBm]	Limit [dBm]	Verdict
LE1M_TX_2402_1Mbps	2399.5	-37.15	-10	Pass
LE1M_TX_2402_1Mbps	2399.451	-37.13	-10	Pass
LE1M_TX_2402_1Mbps	2398.451	-43.61	-20	Pass
LE1M_TX_2402_1Mbps	2398.402	-43.81	-20	Pass
LE1M_TX_2402_1Mbps	2484	-52.4	-10	Pass
LE1M_TX_2402_1Mbps	2484.049	-52.41	-10	Pass
LE1M_TX_2402_1Mbps	2485.049	-51.04	-20	Pass
LE1M_TX_2402_1Mbps	2485.098	-51.58	-20	Pass
LE1M_TX_2480_1Mbps	2399.5	-48.66	-10	Pass
LE1M_TX_2480_1Mbps	2399.449	-49.37	-10	Pass
LE1M_TX_2480_1Mbps	2398.449	-53.06	-20	Pass
LE1M_TX_2480_1Mbps	2398.398	-53.0	-20	Pass
LE1M_TX_2480_1Mbps	2484	-45.74	-10	Pass
LE1M_TX_2480_1Mbps	2484.051	-46.18	-10	Pass
LE1M_TX_2480_1Mbps	2485.051	-49.4	-20	Pass
LE1M_TX_2480_1Mbps	2485.102	-50.18	-20	Pass
LE2M_TX_2402_2Mbps	2399.5	-31.68	-10	Pass
LE2M_TX_2402_2Mbps	2398.5	-43.12	-10	Pass
LE2M_TX_2402_2Mbps	2398.445	-44.07	-10	Pass
LE2M_TX_2402_2Mbps	2397.445	-47.46	-20	Pass
LE2M_TX_2402_2Mbps	2396.445	-49.75	-20	Pass
LE2M_TX_2402_2Mbps	2396.39	-50.11	-20	Pass
LE2M_TX_2402_2Mbps	2484	-51.96	-10	Pass
LE2M_TX_2402_2Mbps	2485	-50.83	-10	Pass
LE2M_TX_2402_2Mbps	2485.055	-51.31	-10	Pass
LE2M_TX_2402_2Mbps	2486.055	-51.44	-20	Pass
LE2M_TX_2402_2Mbps	2487.055	-51.83	-20	Pass
LE2M_TX_2402_2Mbps	2487.11	-51.62	-20	Pass
LE2M_TX_2480_2Mbps	2399.5	-48.91	-10	Pass
LE2M_TX_2480_2Mbps	2398.5	-51.06	-10	Pass

LE2M_TX_2480_2Mbps	2398.441	-52.87	-10	Pass
LE2M_TX_2480_2Mbps	2397.441	-52.28	-20	Pass
LE2M_TX_2480_2Mbps	2396.441	-50.71	-20	Pass
LE2M_TX_2480_2Mbps	2396.382	-50.21	-20	Pass
LE2M_TX_2480_2Mbps	2484	-44.24	-10	Pass
LE2M_TX_2480_2Mbps	2485	-46.99	-10	Pass
LE2M_TX_2480_2Mbps	2485.059	-47.22	-10	Pass
LE2M_TX_2480_2Mbps	2486.059	-48.32	-20	Pass
LE2M_TX_2480_2Mbps	2487.059	-50.05	-20	Pass
LE2M_TX_2480_2Mbps	2487.118	-49.48	-20	Pass

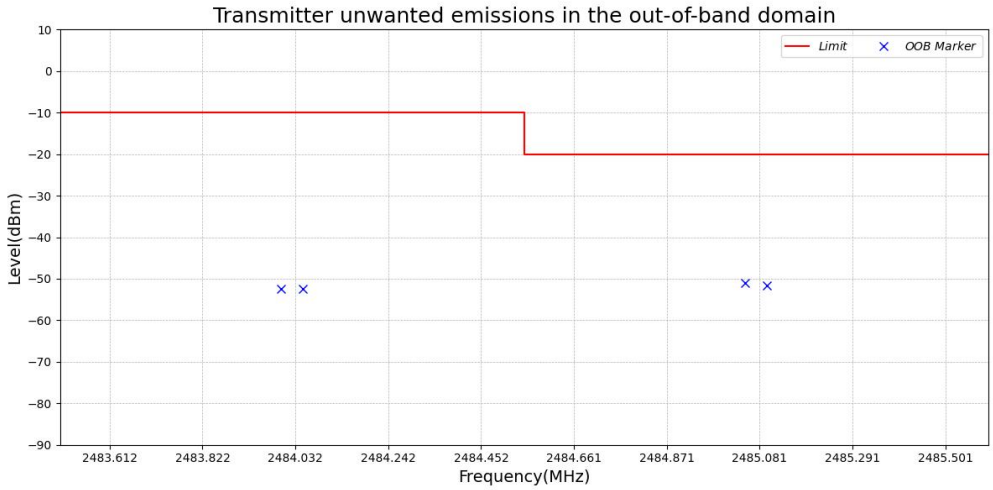
Test Temperature	27℃	Relative Humidity	43 %
Test Engineer	Allen Zhou	Testing Time	2025-10-16

Test Data of OOB Emissions				
Test Mode	Frequency [MHz]	Level [dBm]	Limit [dBm]	Verdict
LE125K_TX_2402_125Kbps	2399.5	-41.42	-10	Pass
LE125K_TX_2402_125Kbps	2399.454	-42.14	-10	Pass
LE125K_TX_2402_125Kbps	2398.454	-48.41	-20	Pass
LE125K_TX_2402_125Kbps	2398.408	-48.27	-20	Pass
LE125K_TX_2402_125Kbps	2484	-54.21	-10	Pass
LE125K_TX_2402_125Kbps	2484.046	-53.39	-10	Pass
LE125K_TX_2402_125Kbps	2485.046	-53.14	-20	Pass
LE125K_TX_2402_125Kbps	2485.092	-53.22	-20	Pass
LE125K_TX_2480_125Kbps	2399.5	-50.57	-10	Pass
LE125K_TX_2480_125Kbps	2399.452	-51.49	-10	Pass
LE125K_TX_2480_125Kbps	2398.452	-52.72	-20	Pass
LE125K_TX_2480_125Kbps	2398.404	-53.69	-20	Pass
LE125K_TX_2480_125Kbps	2484	-49.43	-10	Pass
LE125K_TX_2480_125Kbps	2484.048	-49.42	-10	Pass
LE125K_TX_2480_125Kbps	2485.048	-52.83	-20	Pass
LE125K_TX_2480_125Kbps	2485.096	-52.54	-20	Pass

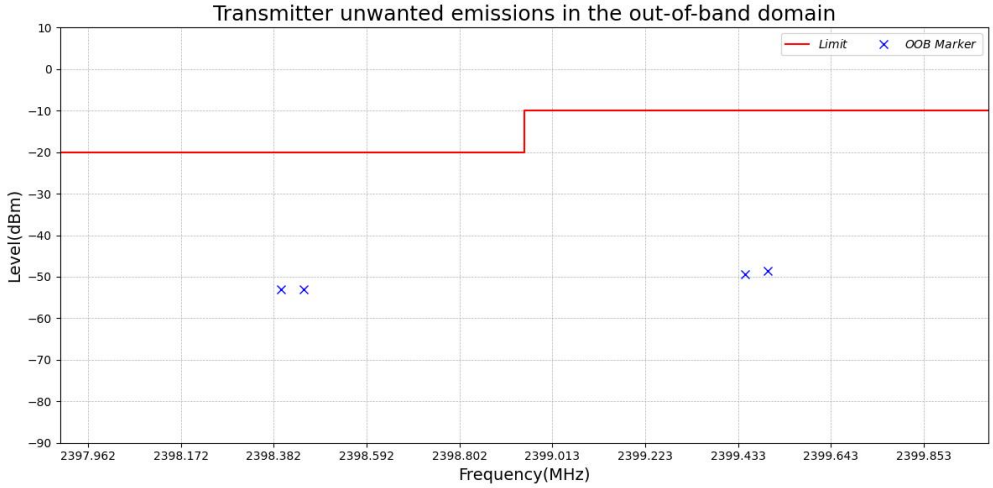
Test Graphs of OOB Emissions



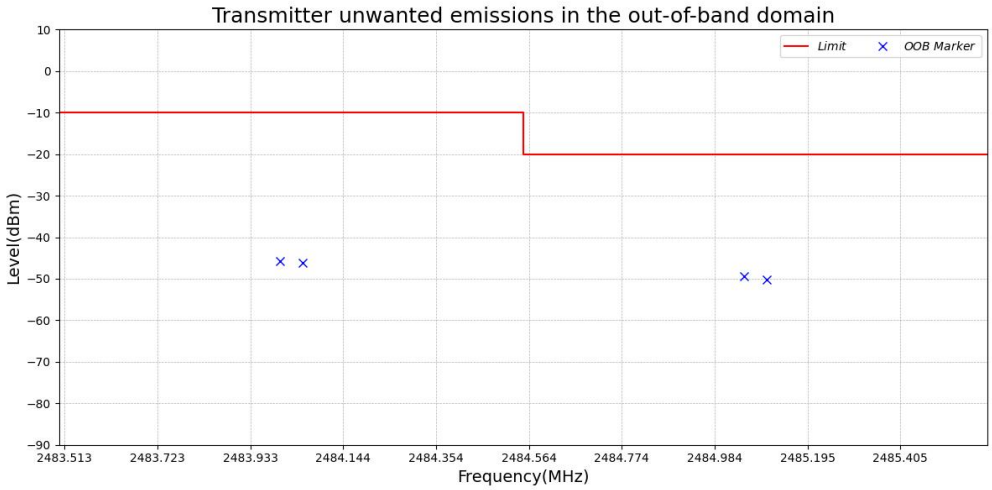
Test_Graph_LE1M_TX_ANT1_2402_1Mbps_OOB_L



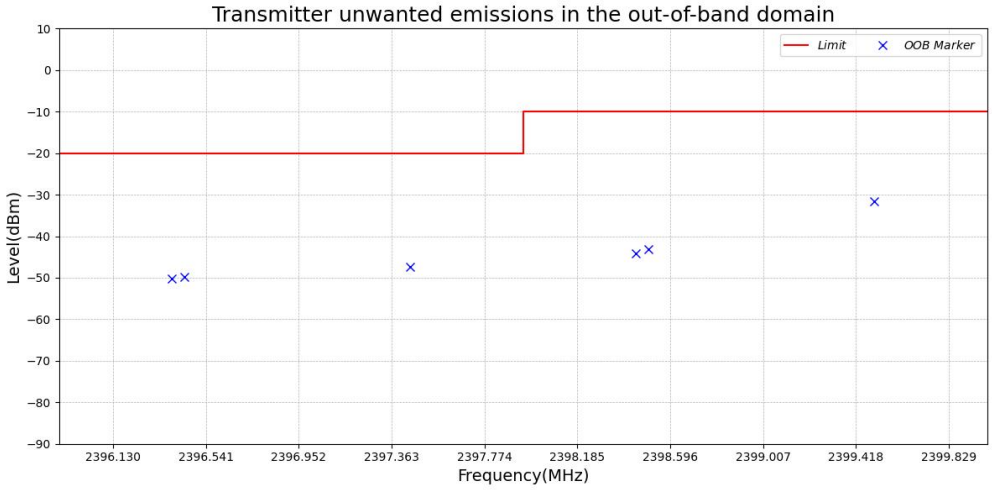
Test_Graph_LE1M_TX_ANT1_2402_1Mbps_OOB_R



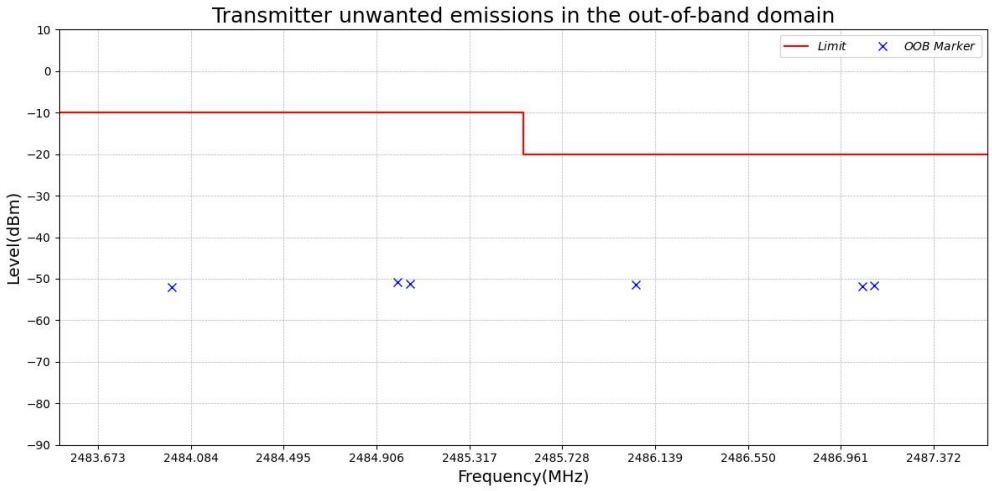
Test_Graph_LE1M_TX_ANT1_2480_1Mbps_OOB_L



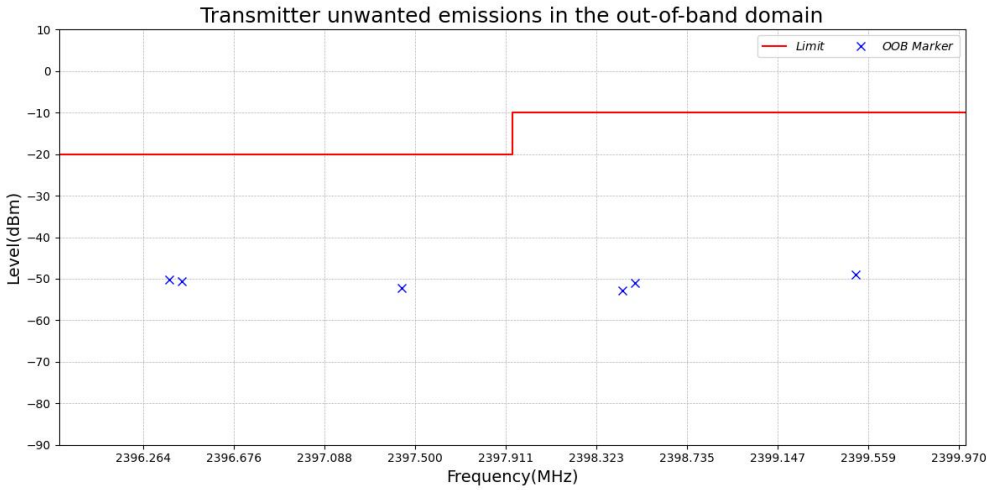
Test_Graph_LE1M_TX_ANT1_2480_1Mbps_OOB_R



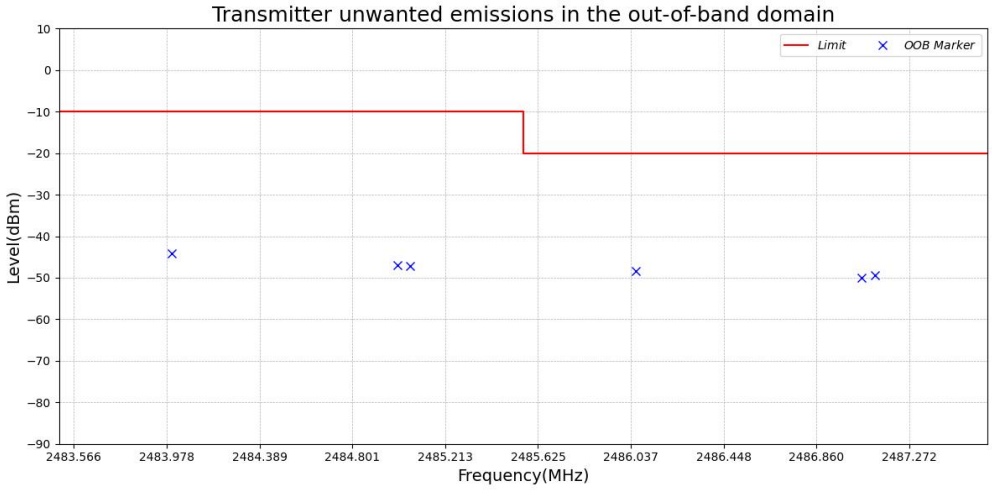
Test_Graph_LE2M_TX_ANT1_2402_2Mbps_OOB_L



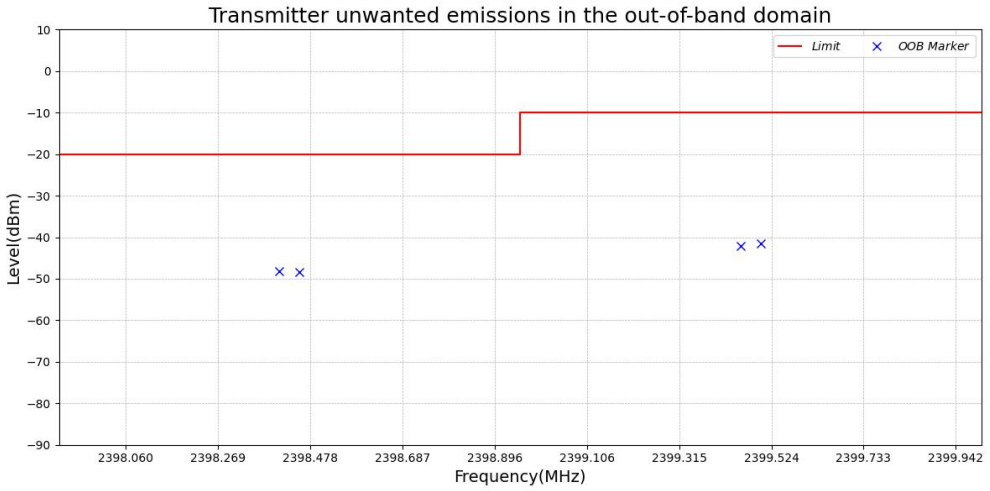
Test_Graph_LE2M_TX_ANT1_2402_2Mbps_OOB_R



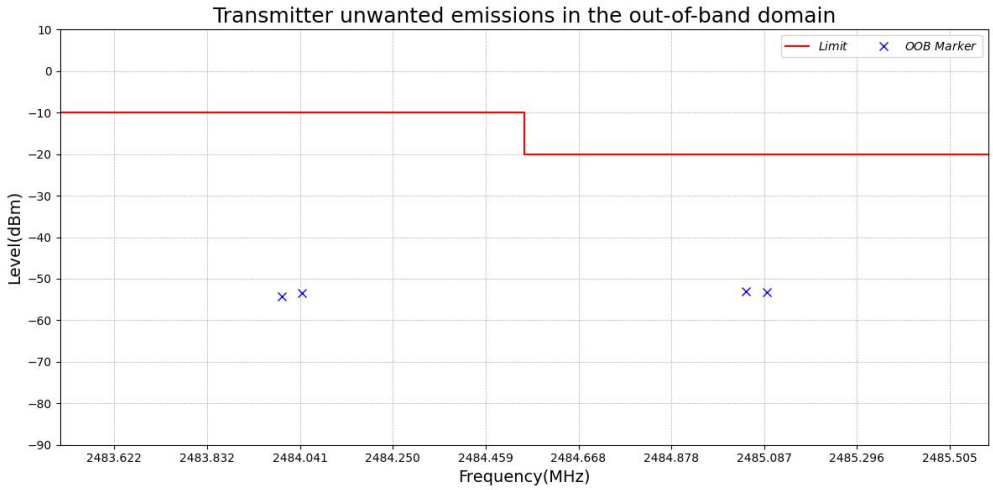
Test_Graph_LE2M_TX_ANT1_2480_2Mbps_OOB_L



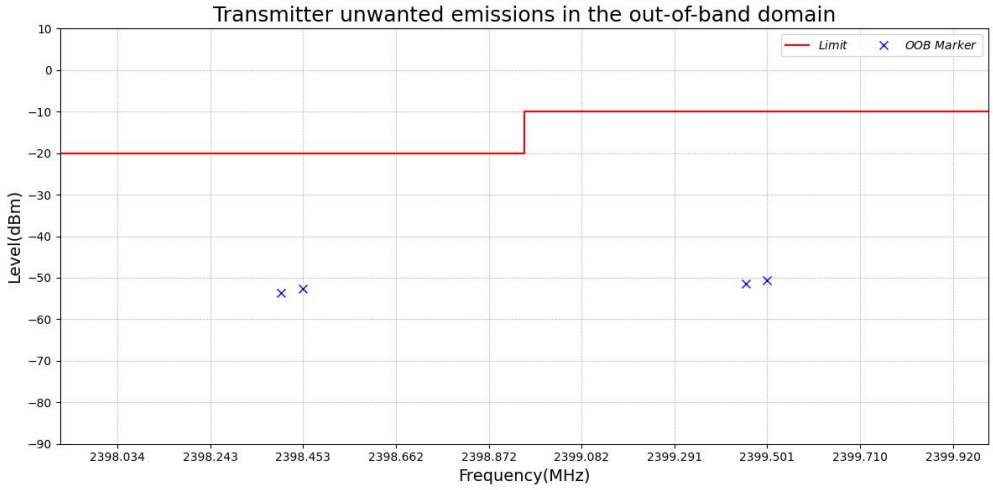
Test_Graph_LE2M_TX_ANT1_2480_2Mbps_OOB_R



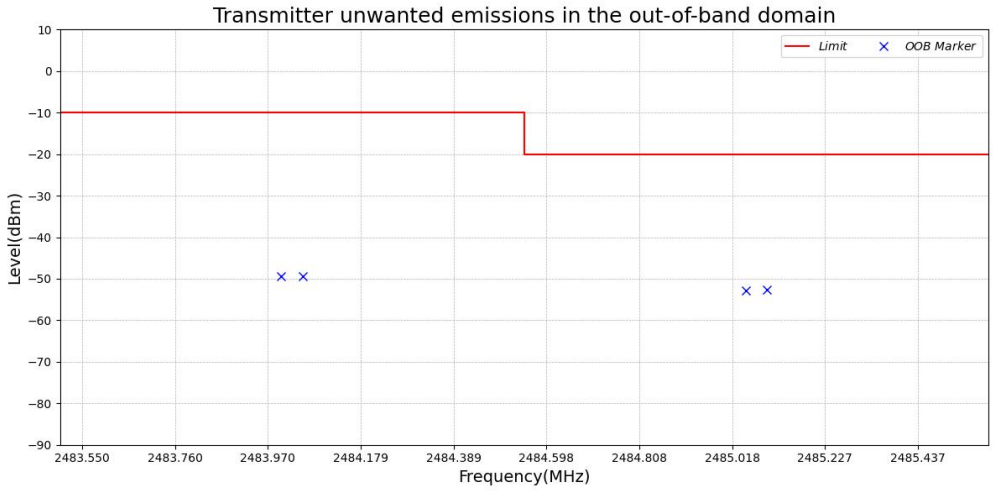
Test_Graph_LE125K_TX_ANT1_2402_125Kbps_OOB_L



Test_Graph_LE125K_TX_ANT1_2402_125Kbps_OOB_R



Test_Graph_LE125K_TX_ANT1_2480_125Kbps_OOB_L



Test_Graph_LE125K_TX_ANT1_2480_125Kbps_OOB_R

5.6 Transmitter Unwanted Emissions in the Spurious Domain

In the present document, transmitter unwanted emissions in the spurious domain are emissions outside the allocated band and outside the Out-of-band Domain as indicated in figure 3 when the equipment is in Transmit mode.

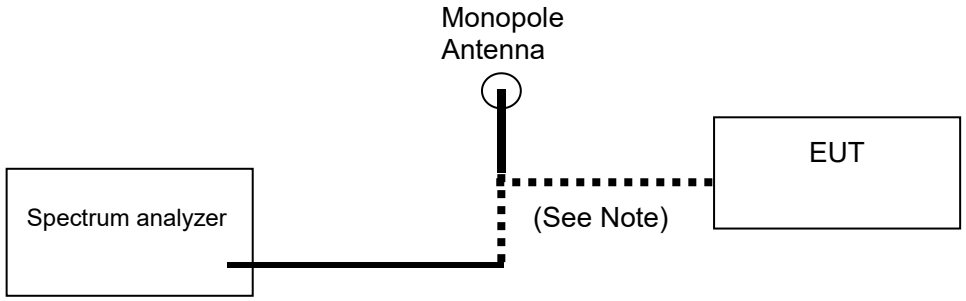
Test Limit

The transmitter unwanted emissions in the spurious domain shall not exceed the values.

Frequency Range	Maximum Power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 694 MHz	-54 dBm	100 kHz
694 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz

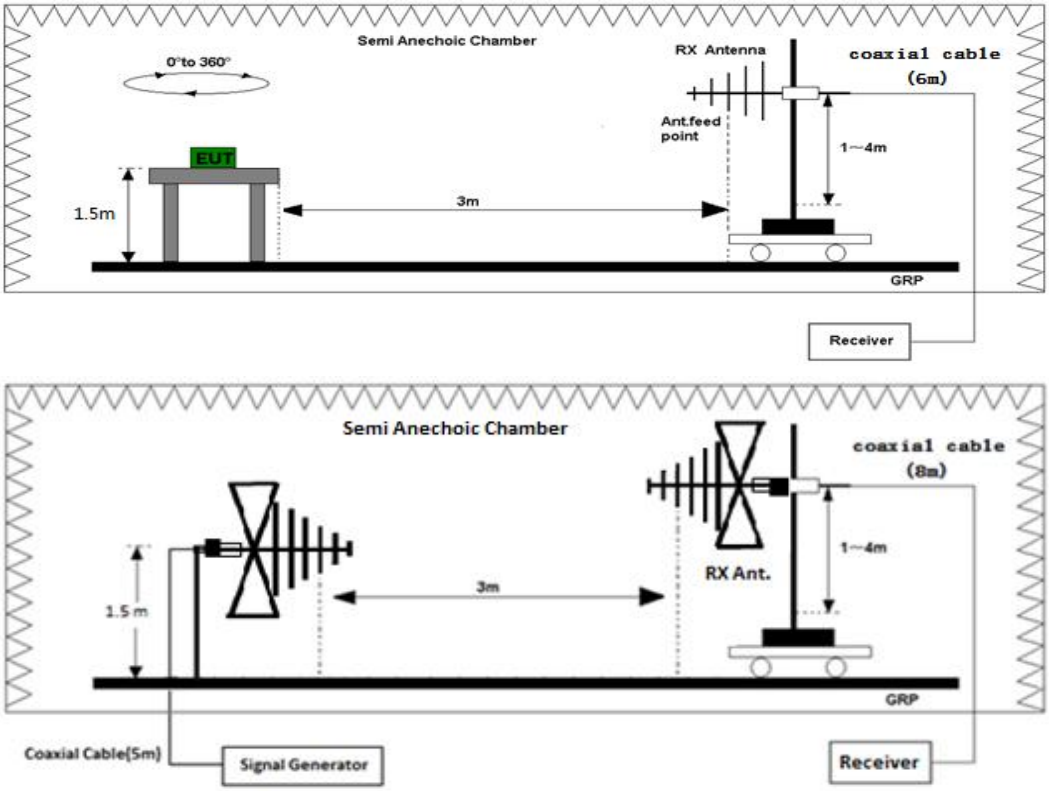
Test Setup

☒ **Conducted Measurement Method:**

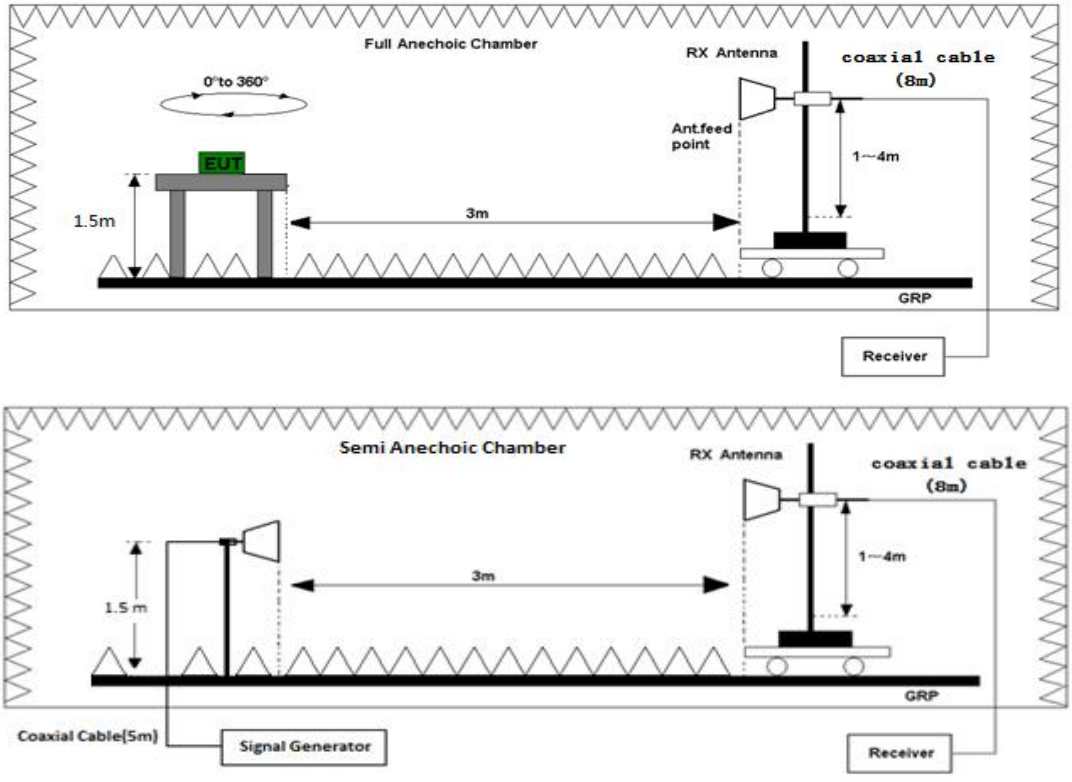


Remarks:
EUT was direct connected to test equipment through coupling device.

☒ **Radiated Measurement Method:**



Radiated Emission Test Set-Up Frequency 30 MHz ~ 1 GHz



Radiated Emission Test Set-Up Frequency Above 1 GHz

Test Procedure

1) The emissions over the range 30 MHz to 1 000 MHz shall be identified.
2) Spectrum analyzer settings:
   - Resolution bandwidth: 100 kHz
   - Video bandwidth: 300 kHz
   - Detector mode: Peak
   - Sweep Points: ≥19 400
   - Trace Mode: Max Hold
   - Allow the trace to stabilize. Any emissions identified during the sweeps above and that fall within the 6 dB range below the applicable limit or above, shall be individually measured using RMS detector and compared to the limits.
3) The emissions over the range 1 GHz to 12,75 GHz shall be identified.
   - Resolution bandwidth: 1 MHz
   - Video bandwidth: 3 MHz
   - Detector mode: Peak
   - Trace Mode: Max Hold
   - Sweep Points: ≥23 500
   - Allow the trace to stabilize. Any emissions identified during the sweeps above and that fall within the 6 dB range below the applicable limit or above, shall be individually measured using RMS detector and compared to the limits.
4) For radiated method, the applicable measurement procedures as described in the EN 300 328 V2.2.2 annex C.2 and C.4 are used.

Test Result

☒ **Conducted Measurement Method:**

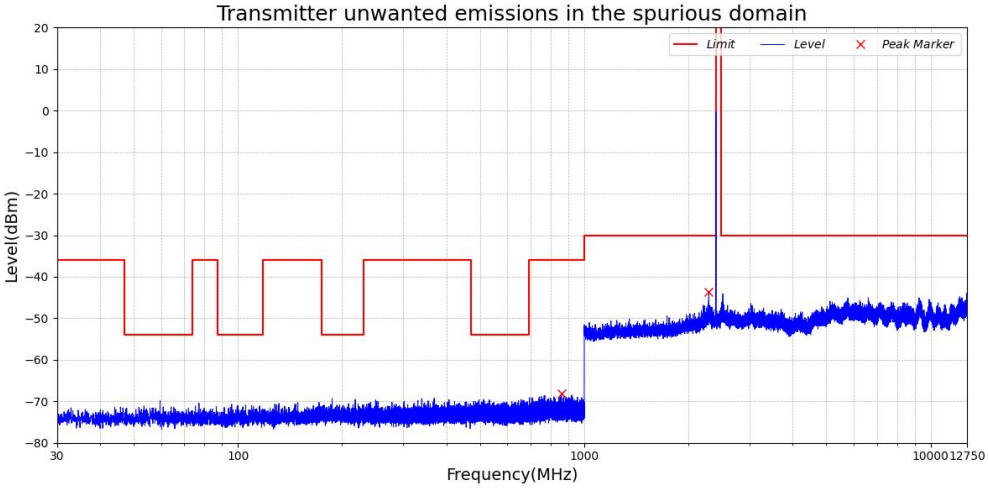
Test Temperature	26.3℃	Relative Humidity	53 %
Test Engineer	Allen Zhou	Testing Time	2025-09-02

Test Data of Transmitter Spurious Emissions				
Test Mode	Frequency [MHz]	Level [dBm]	Limit [dBm]	Verdict
LE1M_TX_2402_1Mbps	859.313	-68.21	-36.00	Pass
LE1M_TX_2402_1Mbps	2290.585	-43.66	-30.00	Pass
LE1M_TX_2480_1Mbps	854.689	-67.37	-36.00	Pass
LE1M_TX_2480_1Mbps	2368.137	-44.63	-30.00	Pass
LE2M_TX_2402_2Mbps	873.184	-68.64	-36.00	Pass
LE2M_TX_2402_2Mbps	2306.252	-43.98	-30.00	Pass
LE2M_TX_2480_2Mbps	793.771	-68.13	-36.00	Pass
LE2M_TX_2480_2Mbps	2591.786	-44.48	-30.00	Pass

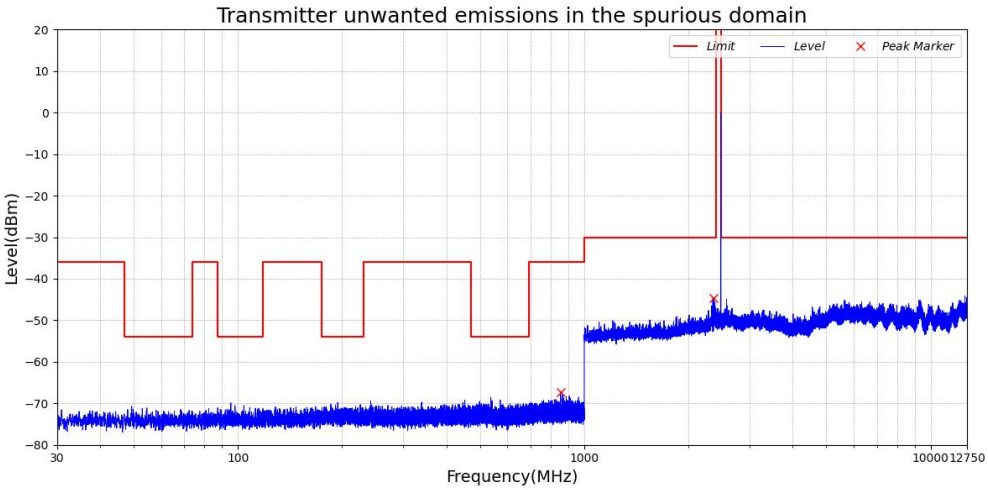
Test Temperature	27℃	Relative Humidity	43 %
Test Engineer	Allen Zhou	Testing Time	2025-10-16

Test Data of Transmitter Spurious Emissions				
Test Mode	Frequency [MHz]	Level [dBm]	Limit [dBm]	Verdict
LE125K_TX_2402_125Kbps	832.54	-67.87	-36.00	Pass
LE125K_TX_2402_125Kbps	6151.372	-44.42	-30.00	Pass
LE125K_TX_2480_125Kbps	918.582	-68.77	-36.00	Pass
LE125K_TX_2480_125Kbps	12167.181	-43.19	-30.00	Pass

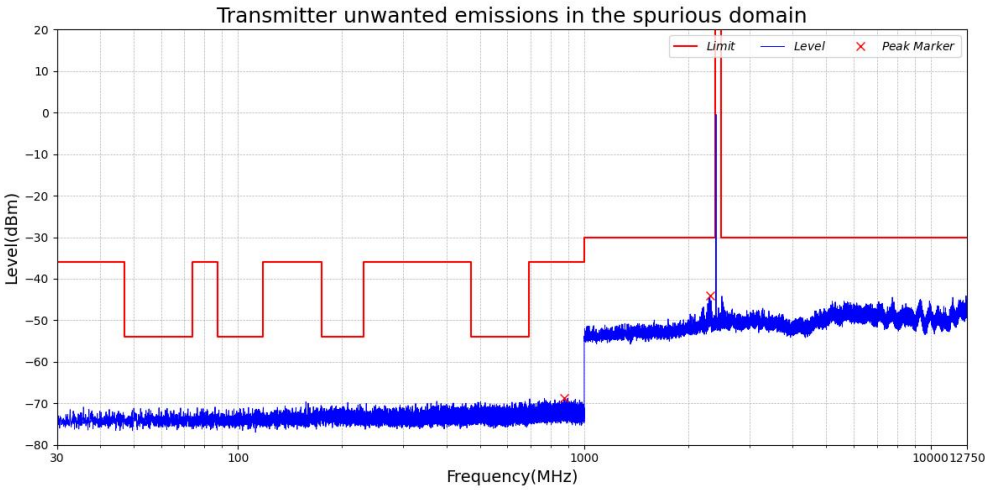
Test Graphs of Transmitter Conducted Spurious Emissions



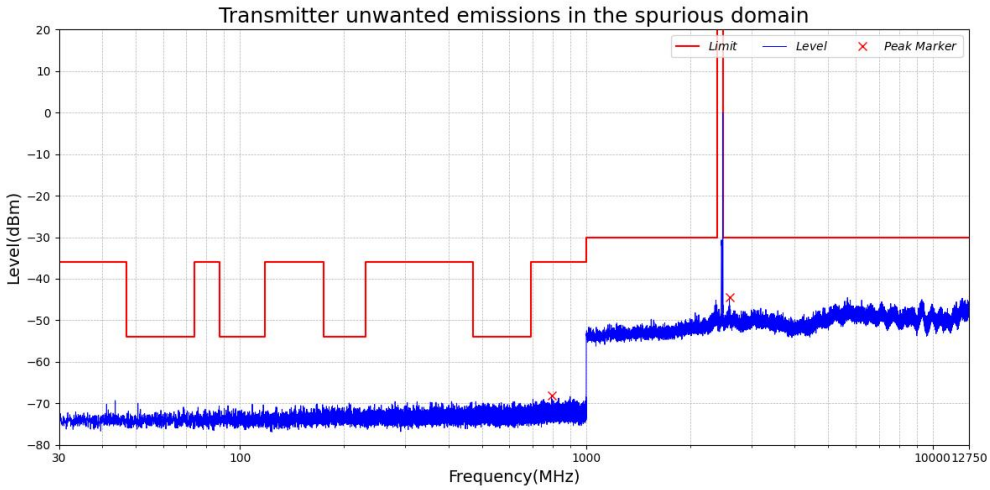
Test_Graph_LE1M_TX_ANT1_2402_1Mbps_TX



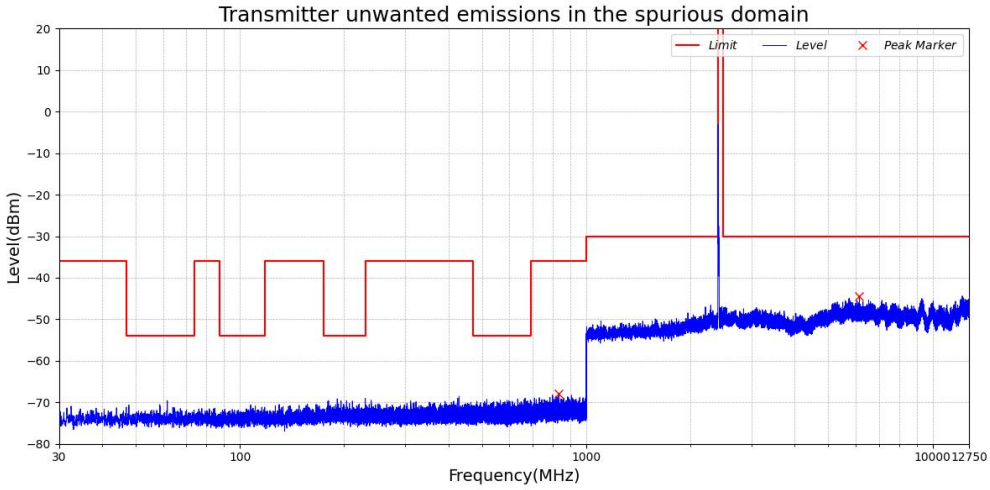
Test_Graph_LE1M_TX_ANT1_2480_1Mbps_TX



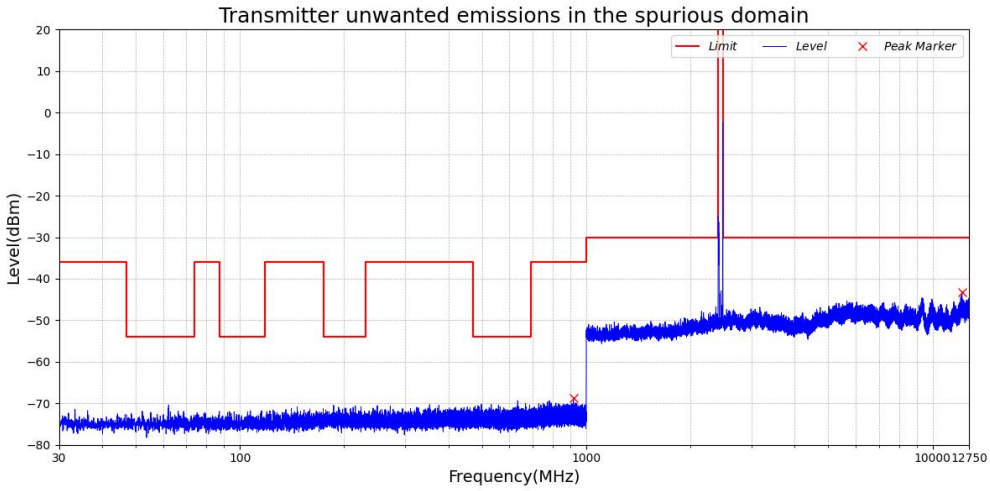
Test_Graph_LE2M_TX_ANT1_2402_2Mbps_TX



Test_Graph_LE2M_TX_ANT1_2480_2Mbps_TX



Test_Graph_LE125K_TX_ANT1_2402_125Kbps_TX



Test_Graph_LE125K_TX_ANT1_2480_125Kbps_TX

☒ **Radiated Measurement Method:**

Test Temperature	26.3℃	Relative Humidity	53 %
Test Engineer	Allen Zhou	Testing Time	2025-09-02
Worst Mode	LE1M_TX_2402_1Mbps		
Verdict	Pass		

■ Transmitter Spurious Emission below 1GHz (30MHz-1GHz)

Frequency (MHz)	Reading Level (dBμV/m)	S.G. (dBm)	Cable Loss (dB)	Ant.Gain (dBi)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
Antenna Polarity: Vertical							
76.15	32.42	-59.91	0.04	-0.90	-60.85	-36.00	24.85
154.58	28.48	-66.02	0.06	0.70	-65.38	-36.00	29.38
356.20	31.57	-68.11	0.25	6.28	-62.09	-36.00	26.09
429.43	27.68	-72.71	0.34	6.92	-66.13	-36.00	30.13
626.85	28.96	-70.10	0.51	7.14	-63.48	-54.00	9.48
755.13	27.83	-70.48	0.61	6.35	-64.74	-36.00	28.74
Other (30-1000)	--	--	--	--	--	-36.00/-54.00	--
Antenna Polarity: Horizontal							
82.96	30.24	-64.11	0.04	0.22	-63.93	-36.00	27.93
156.30	27.30	-66.17	0.06	0.80	-65.43	-36.00	29.43
348.78	29.13	-69.37	0.24	5.54	-64.07	-36.00	28.07
431.50	27.77	-72.77	0.34	6.83	-66.28	-36.00	30.28
628.40	29.01	-70.85	0.51	7.22	-64.14	-54.00	10.14
727.78	27.88	-71.99	0.59	6.65	-65.93	-36.00	29.93
Other (30-1000)	--	--	--	--	--	-36.00/-54.00	--

■ Transmitter Spurious Emission above 1GHz (1GHz-12.75GHz)

Frequency (MHz)	Reading Level (dBμV/m)	S.G. (dBm)	Cable Loss (dB)	Ant.Gain (dBi)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
Antenna Polarity: Vertical							
4804	52.08	-47.79	2.65	9.34	-41.10	-30.00	11.10
7206	47.32	-55.03	3.13	11.32	-46.84	-30.00	16.84
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
Other (1000-12750)	--	--	--	--	--	-30.00	--
Antenna Polarity: Horizontal							
4804	51.77	-48.86	2.65	9.34	-42.17	-30.00	12.17
7206	44.48	-56.43	3.13	11.32	-48.24	-30.00	18.24
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
Other (1000-12750)	--	--	--	--	--	-30.00	--

Note:

1. The margins of the other spectrum are not exceeding the minimum value of margin, and this part of the results without recording in the test report.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "--" remark, if no specific emission from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Emission Level=S.G.+ Ant.Gain- Cable Loss, Margin= Limit- Emission Level

Test Temperature	26.3℃	Relative Humidity	53 %
Test Engineer	Allen Zhou	Testing Time	2025-09-02
Worst Mode	LE1M_TX_2480_1Mbps		
Verdict	Pass		

■ Transmitter Spurious Emission below 1GHz (30MHz-1GHz)

Frequency (MHz)	Reading Level (dBμV/m)	S.G. (dBm)	Cable Loss (dB)	Ant.Gain (dBi)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
Antenna Polarity: Vertical							
84.38	31.80	-61.72	0.04	0.54	-61.22	-36.00	25.22
161.09	27.92	-66.40	0.06	1.28	-65.18	-36.00	29.18
354.48	30.11	-67.89	0.25	6.02	-62.12	-36.00	26.12
426.73	26.25	-73.11	0.33	6.98	-66.46	-36.00	30.46
626.13	29.67	-69.40	0.51	7.14	-62.77	-54.00	8.77
759.82	27.72	-72.38	0.61	6.55	-66.44	-36.00	30.44
Other (30-1000)	--	--	--	--	--	-36.00/-54.00	--
Antenna Polarity: Horizontal							
90.34	31.82	-62.43	0.04	1.40	-61.07	-54.00	7.07
154.19	27.09	-66.49	0.06	0.70	-65.85	-36.00	29.85
353.54	29.42	-68.72	0.25	5.89	-63.08	-36.00	27.08
431.68	27.34	-72.16	0.34	6.83	-65.67	-36.00	29.67
628.16	28.58	-70.40	0.51	7.22	-63.70	-54.00	9.70
727.24	28.45	-71.23	0.59	6.65	-65.17	-36.00	29.17
Other (30-1000)	--	--	--	--	--	-36.00/-54.00	--

■ Transmitter Spurious Emission above 1GHz (1GHz-12.75GHz)

Frequency (MHz)	Reading Level (dBμV/m)	S.G. (dBm)	Cable Loss (dB)	Ant.Gain (dBi)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
Antenna Polarity: Vertical							
4960	52.18	-47.70	2.65	9.34	-41.01	-30.00	11.01
7440	46.85	-55.18	3.13	11.32	-46.99	-30.00	16.99
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
Other (1000-12750)	--	--	--	--	--	-30.00	--
Antenna Polarity: Horizontal							
4960	51.85	-48.94	2.65	9.34	-42.25	-30.00	12.25
7440	44.70	-57.57	3.13	11.32	-49.38	-30.00	19.38
--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--
Other (1000-12750)	--	--	--	--	--	-30.00	--

Note:

1. The margins of the other spectrum are not exceeding the minimum value of margin, and this part of the results without recording in the test report.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "--" remark, if no specific emission from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Emission Level=S.G.+ Ant.Gain- Cable Loss, Margin= Limit- Emission Level

6. ETSI EN 300 328 Requirements for Receiver

6.1 Receiver Unwanted Emissions in the Spurious Domain

Receiver spurious emissions are emissions at any frequency when the equipment is in receive mode.

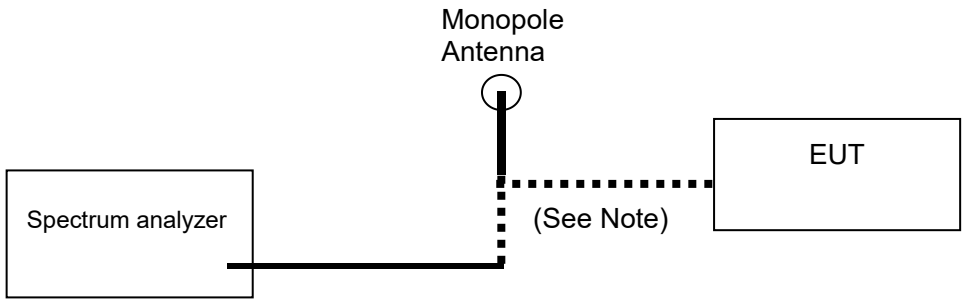
Test Limit

The transmitter unwanted emissions in the spurious domain shall not exceed the values.

Frequency Range	Maximum Power	Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12.75 GHz	-47 dBm	1 MHz

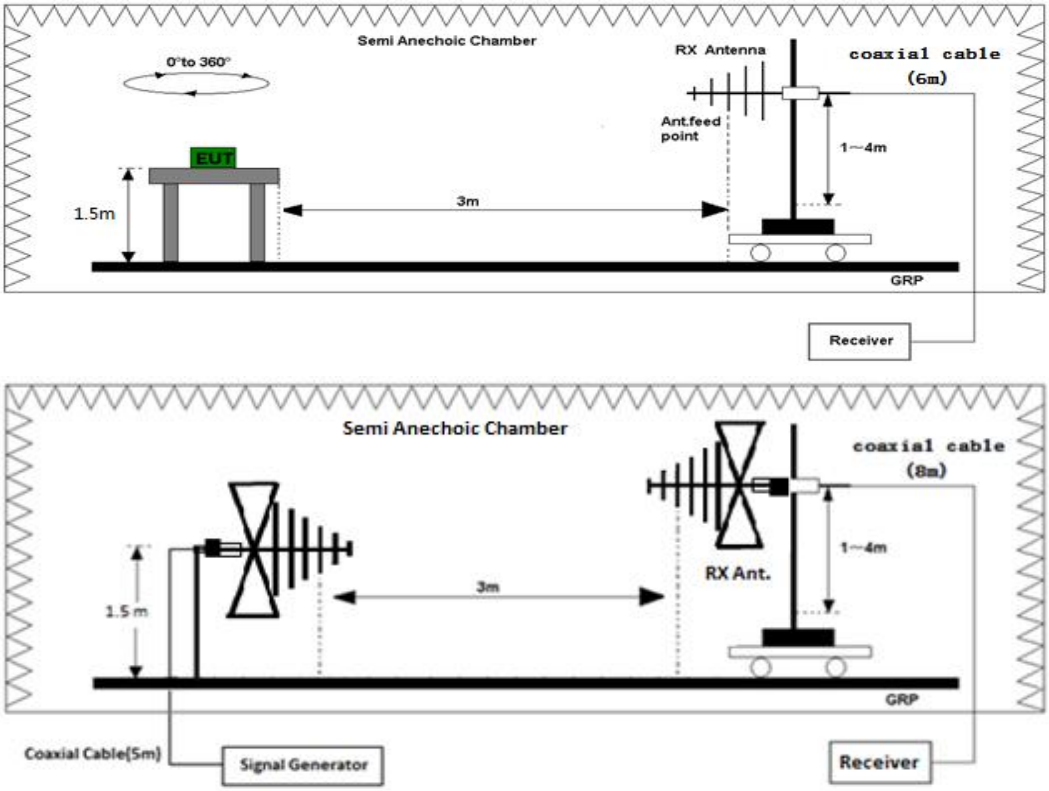
Test Setup

☒ **Conducted Measurement Method:**

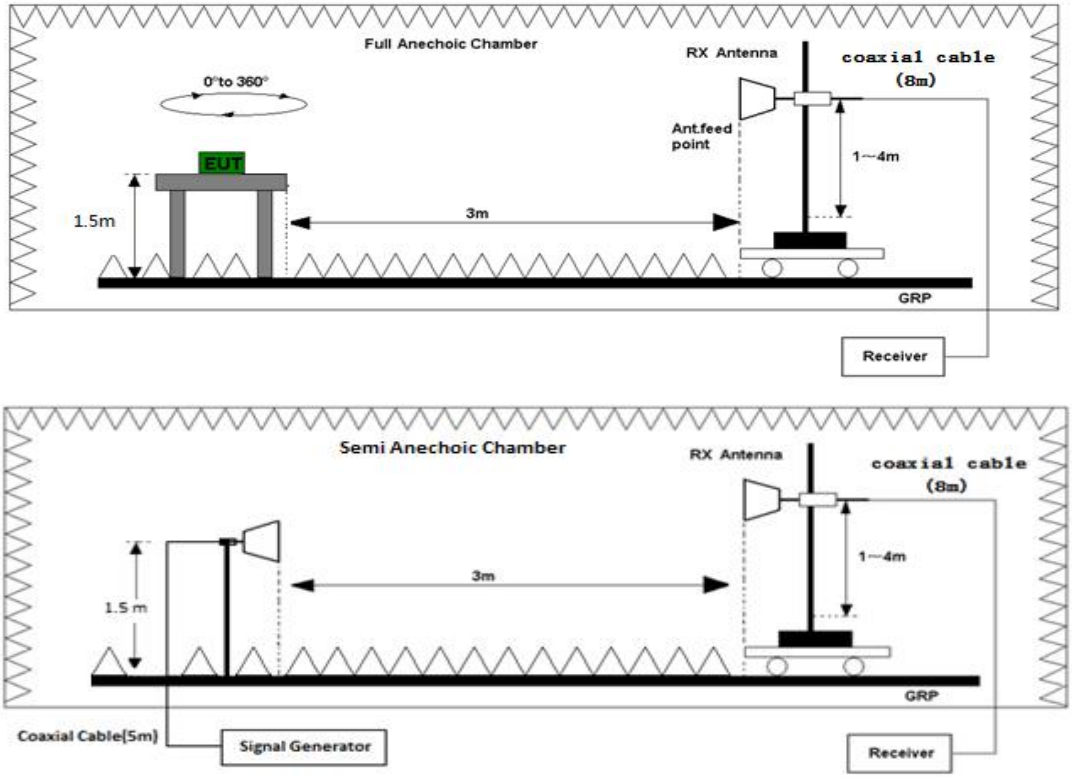


Remarks:
EUT was direct connected to test equipment through coupling device.

☒ **Radiated Measurement Method:**



Radiated Emission Test Set-Up Frequency 30 MHz ~ 1 GHz



Radiated Emission Test Set-Up Frequency Above 1 GHz

Test Procedure

1) The emissions over the range 30 MHz to 1 000 MHz shall be identified.
2) Spectrum analyzer settings:
   - Resolution bandwidth: 100 kHz
   - Video bandwidth: 300 kHz
   - Detector mode: Peak
   - Sweep Points: ≥19 400
   - Trace Mode: Max Hold
   - Allow the trace to stabilize. Any emissions identified during the sweeps above and that fall within the 6 dB range below the applicable limit or above, shall be individually measured using RMS detector and compared to the limits.
3) The emissions over the range 1 GHz to 12,75 GHz shall be identified.
   - Resolution bandwidth: 1 MHz
   - Video bandwidth: 3 MHz
   - Detector mode: Peak
   - Trace Mode: Max Hold
   - Sweep Points: ≥23 500
   - Allow the trace to stabilize. Any emissions identified during the sweeps above and that fall within the 6 dB range below the applicable limit or above, shall be individually measured using RMS detector and compared to the limits.
4) For radiated method, the applicable measurement procedures as described in the EN 300 328 V2.2.2 annex C.2 and C.4 are used.

Test Result

☒ **Conducted Measurement Method:**

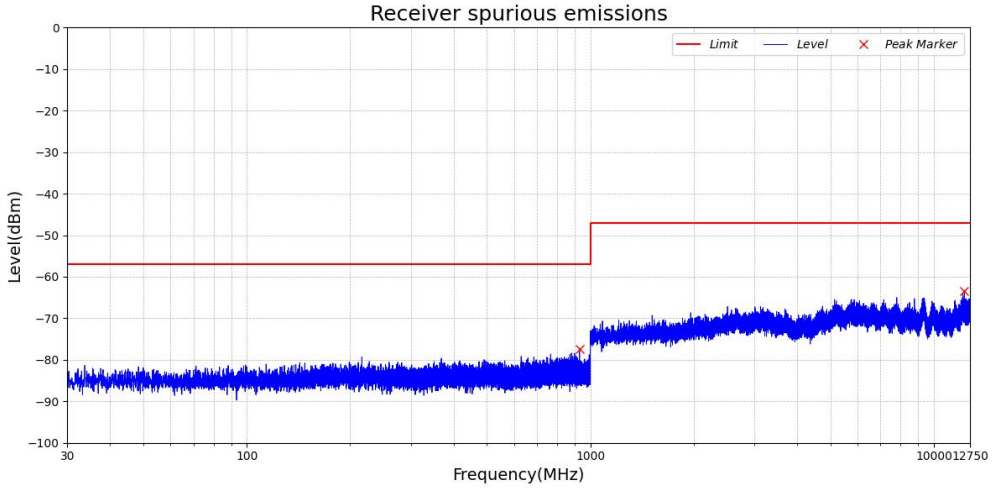
Test Temperature	26.3℃	Relative Humidity	53 %
Test Engineer	Allen Zhou	Testing Time	2025-09-02

Test Data of Receiver Spurious Emissions				
Test Mode	Frequency [MHz]	Level [dBm]	Limit [dBm]	Verdict
LE1M_RX_2402_1Mbps	930.192	-77.45	-57.00	Pass
LE1M_RX_2402_1Mbps	12281.958	-63.38	-47.00	Pass
LE1M_RX_2480_1Mbps	990.041	-78.06	-57.00	Pass
LE1M_RX_2480_1Mbps	12405.725	-64.42	-47.00	Pass
LE2M_RX_2402_2Mbps	862.777	-78.41	-57.00	Pass
LE2M_RX_2402_2Mbps	12592.158	-64.31	-47.00	Pass
LE2M_RX_2480_2Mbps	914.511	-78.24	-57.00	Pass
LE2M_RX_2480_2Mbps	6781.392	-65.03	-47.00	Pass

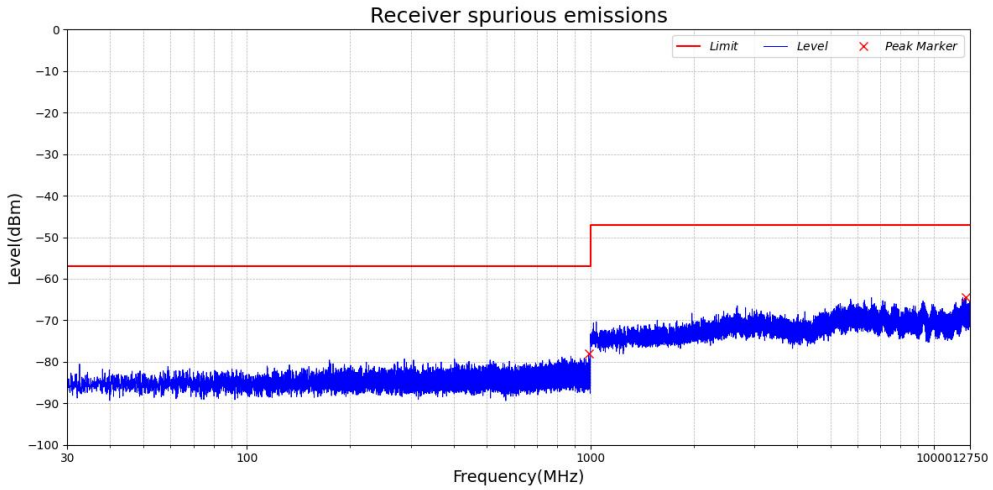
Test Temperature	27℃	Relative Humidity	43 %
Test Engineer	Allen Zhou	Testing Time	2025-10-16

Test Data of Receiver Spurious Emissions				
Test Mode	Frequency [MHz]	Level [dBm]	Limit [dBm]	Verdict
LE125K_BR_2402_125Kbps	760.96	-79.59	-57.00	Pass
LE125K_BR_2402_125Kbps	12118.633	-64.57	-47.00	Pass
LE125K_BR_2480_125Kbps	809.751	-79.03	-57.00	Pass
LE125K_BR_2480_125Kbps	12165.633	-63.92	-47.00	Pass

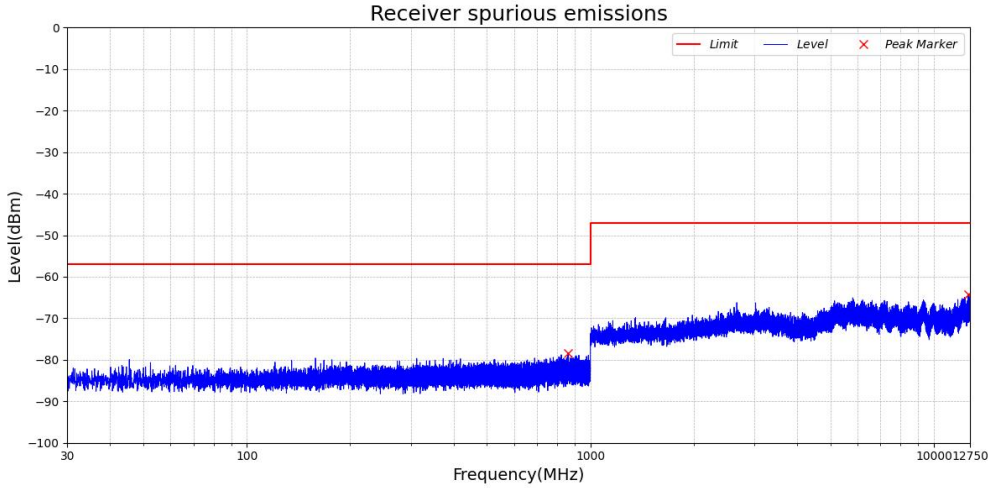
Test Graphs of Receiver Conducted Spurious Emissions



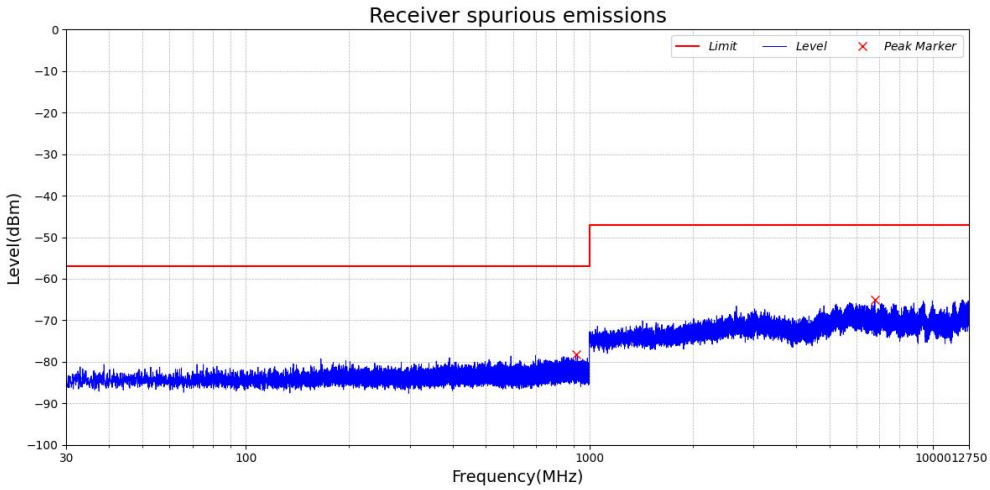
Test_Graph_LE1M_RX_ANT1_2402_1Mbps_RX



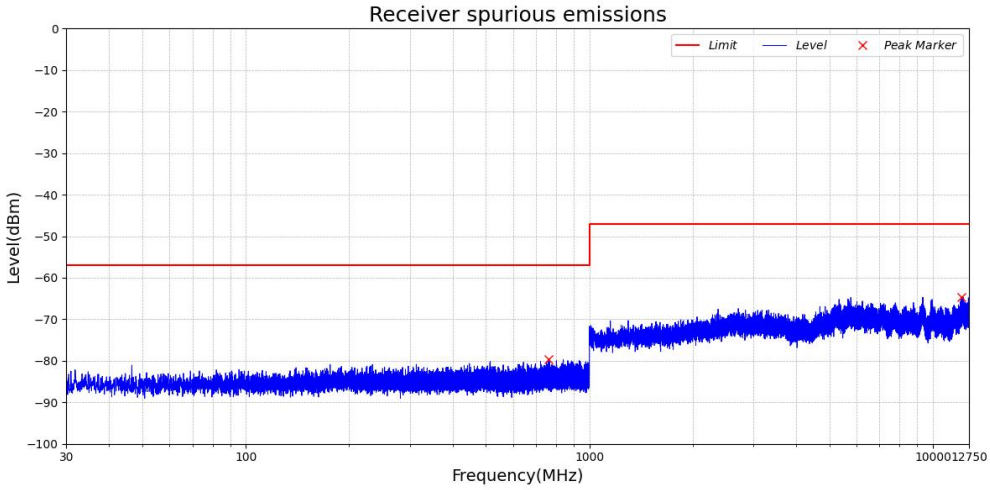
Test_Graph_LE1M_RX_ANT1_2480_1Mbps_RX



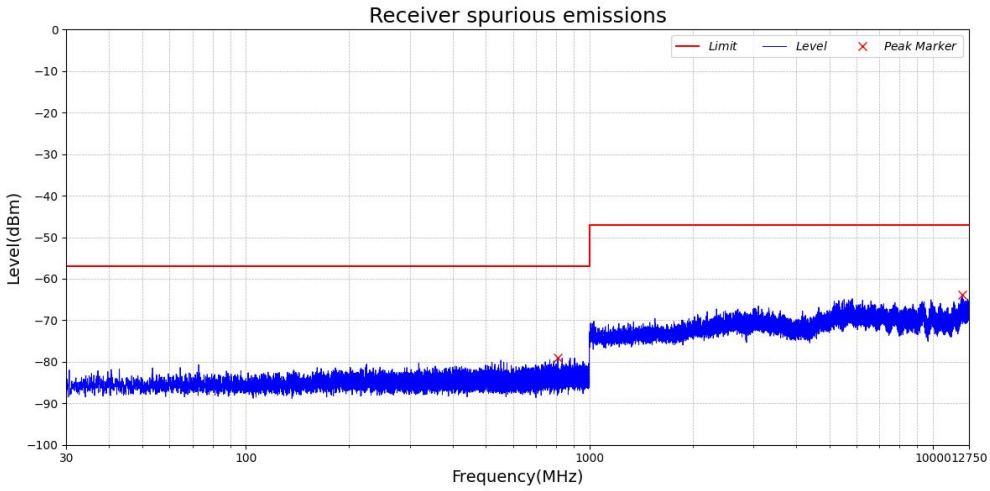
Test_Graph_LE2M_RX_ANT1_2402_2Mbps_RX



Test_Graph_LE2M_RX_ANT1_2480_2Mbps_RX



Test_Graph_LE125K_RX_ANT1_2402_125Kbps_RX



Test_Graph_LE125K_RX_ANT1_2480_125Kbps_RX

☒ **Radiated Measurement Method:**

Test Temperature	26.3℃	Relative Humidity	53 %
Test Engineer	Allen Zhou	Testing Time	2025-09-02
Worst Mode	LE1M_RX_2402_1Mbps		
Verdict	Pass		

■ Receiver Spurious Emission below 1GHz (30MHz-1GHz)

Frequency (MHz)	Reading Level (dBμV/m)	S.G. (dBm)	Cable Loss (dB)	Ant.Gain (dBi)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
Antenna Polarity: Vertical							
93.51	27.42	-66.38	0.04	1.64	-64.78	-57.00	7.78
160.86	29.71	-64.49	0.06	1.20	-63.35	-57.00	6.35
355.57	29.20	-70.26	0.25	6.15	-64.36	-57.00	7.36
532.48	27.54	-72.90	0.44	6.72	-66.62	-57.00	9.62
674.87	31.14	-68.59	0.55	6.64	-62.50	-57.00	5.50
833.16	29.85	-70.09	0.66	6.51	-64.24	-57.00	7.24
Other (30-1000)	--	--	--	--	--	-57.00	--
Antenna Polarity: Horizontal							
103.72	28.66	-65.16	0.04	1.00	-64.20	-57.00	7.20
164.18	29.88	-63.89	0.06	1.52	-62.43	-57.00	5.43
344.37	29.30	-69.12	0.24	5.62	-63.74	-57.00	6.74
537.06	27.50	-73.00	0.45	7.02	-66.43	-57.00	9.43
679.08	29.30	-69.97	0.55	6.44	-64.09	-57.00	7.09
830.12	27.23	-72.17	0.66	6.30	-66.53	-57.00	9.53
Other (30-1000)	--	--	--	--	--	-57.00	--

■ Receiver Spurious Emission above 1GHz (1GHz-12.75GHz)

Frequency (MHz)	Reading Level (dBμV/m)	S.G. (dBm)	Cable Loss (dB)	Ant.Gain (dBi)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
Antenna Polarity: Vertical							
1741.79	31.98	-67.17	1.22	6.84	-61.55	-47.00	14.55
--	--	--	--	--	--	--	--
Other (1000-12750)	--	--	--	--	--	-47.00	--
Antenna Polarity: Horizontal							
1679.02	33.36	-65.79	1.19	6.67	-60.31	-47.00	13.31
--	--	--	--	--	--	--	--
Other (1000-12750)	--	--	--	--	--	-47.00	--

Note:

1. The margins of the other spectrum are not exceeding the minimum value of margin, and this part of the results without recording in the test report.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “--” remark, if no specific emission from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that’s already beyond the background noise floor.
3. Emission Level=S.G.+ Ant.Gain- Cable Loss, Margin= Limit- Emission Level

Test Temperature	26.3℃	Relative Humidity	53 %
Test Engineer	Allen Zhou	Testing Time	2025-09-02
Worst Mode	LE1M_RX_2480_1Mbps		
Verdict	Pass		

■ Receiver Spurious Emission below 1GHz (30MHz-1GHz)

Frequency (MHz)	Reading Level (dBμV/m)	S.G. (dBm)	Cable Loss (dB)	Ant.Gain (dBi)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
Antenna Polarity: Vertical							
95.17	27.88	-67.14	0.04	1.80	-65.38	-57.00	8.38
159.30	29.09	-66.02	0.06	1.10	-64.98	-57.00	7.98
356.52	29.48	-68.96	0.25	6.28	-62.93	-57.00	5.93
534.96	26.19	-73.61	0.44	6.84	-67.21	-57.00	10.21
676.79	30.73	-68.89	0.55	6.56	-62.88	-57.00	5.88
830.50	30.08	-68.90	0.66	6.30	-63.26	-57.00	6.26
Other (30-1000)	--	--	--	--	--	-57.00	--
Antenna Polarity: Horizontal							
115.82	27.27	-67.99	0.04	1.40	-66.63	-57.00	9.63
159.62	29.62	-64.12	0.06	1.10	-63.08	-57.00	6.08
344.42	30.92	-67.03	0.24	5.62	-61.65	-57.00	4.65
536.50	28.01	-72.63	0.45	6.96	-66.12	-57.00	9.12
674.09	29.27	-70.43	0.55	6.64	-64.34	-57.00	7.34
828.30	27.20	-71.97	0.66	6.40	-66.23	-57.00	9.23
Other (30-1000)	--	--	--	--	--	-57.00	--

■ Receiver Spurious Emission above 1GHz (1GHz-12.75GHz)

Frequency (MHz)	Reading Level (dBμV/m)	S.G. (dBm)	Cable Loss (dB)	Ant.Gain (dBi)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
Antenna Polarity: Vertical							
1728.41	31.40	-67.51	1.22	6.84	-61.89	-47.00	14.89
--	--	--	--	--	--	--	--
Other (1000-12750)	--	--	--	--	--	-47.00	--
Antenna Polarity: Horizontal							
1679.48	33.12	-66.07	1.19	6.67	-60.59	-47.00	13.59
--	--	--	--	--	--	--	--
Other (1000-12750)	--	--	--	--	--	-47.00	--

Note:

1. The margins of the other spectrum are not exceeding the minimum value of margin, and this part of the results without recording in the test report.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "--" remark, if no specific emission from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Emission Level=S.G.+ Ant.Gain- Cable Loss, Margin= Limit- Emission Level

6.2 Receiver Blocking

Receiver blocking is a measure of the ability of the equipment to receive a wanted signal on its operating channel without exceeding a given degradation due to the presence of an unwanted input signal (blocking signal) at frequencies other than those of the operating band and spurious responses.

Test Limit

☐ Receiver Blocking parameters for Receiver Category 1 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 4)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 4)	Type of blocking signal
(-133 dBm + 10 × log10(OCBW)) or -68 dBm whichever is less (see note 2)	2 380 2 504	-34	CW
(-139 dBm + 10 × log10(OCBW)) or -74 dBm whichever is less (see note 3)	2 300 2 330 2 360 2 524 2 584 2 674		

NOTE 1: OCBW is in Hz.
NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 26 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.2.11.3 in the absence of any blocking signal.
NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 20 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.2.11.3 in the absence of any blocking signal.
NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

☐ Receiver Blocking parameters for Receiver Category 2 equipment

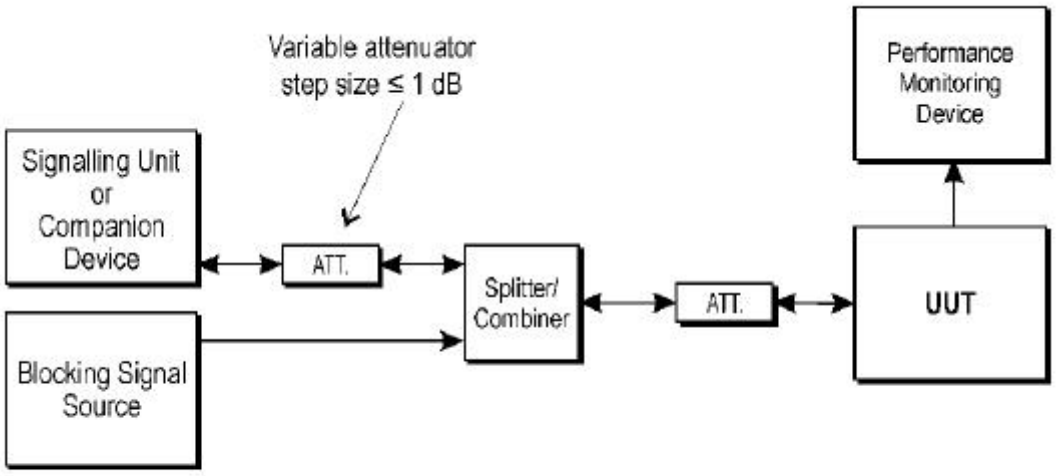
Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × log10(OCBW) + 10 dB) or (-74 dBm + 10 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW

NOTE 1: OCBW is in Hz.
NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 26 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.2.11.3 in the absence of any blocking signal.
NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

☒ Receiver Blocking parameters for Receiver Category 3 equipment

Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
(-139 dBm + 10 × log10(OCBW) + 20 dB) or (-74 dBm + 20 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to Pmin + 30 dB where Pmin is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.2.11.3 in the absence of any blocking signal. NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.			

Test Setup



Test Set-up for receiver blocking

Test Procedure

■ For non-FHSS equipment, having more than one operating channel, the operating channels on which the testing has to be performed shall be selected as follows:

- For testing blocking frequencies less than 2 400 MHz, the equipment shall operate on the lowest operating channel.
- For testing blocking frequencies greater than 2 500 MHz, the equipment shall operate on the highest operating channel.

■ The simplified conducted measure procedures are as follows:

1) For non-FHSS equipment, the UUT shall be set to the lowest operating channel on which the blocking test has to be performed.
2) The blocking signal generator is set to the first frequency as defined in the appropriate table corresponding to the receiver category and type of equipment.
3) With the blocking signal generator switched off, a communication link is established between the UUT and the associated companion device using the test setup. The level of the wanted signal shall be set to the value provided in the table corresponding to the receiver category and type of equipment. This level may be measured directly at the output of the companion device and a correction is made for the coupling loss into the UUT. The actual level for the wanted signal shall be recorded in the test report.
4) The blocking signal at the UUT is set to the level provided in the table corresponding to the receiver category and type of equipment. It shall be verified and recorded in the test report that the performance criteria is met.
5) Repeat step 4 for each remaining combination of frequency and level for the blocking signal as provided in the table corresponding to the receiver category and type of equipment.
6) Repeat step 2 to step 5 with the UUT operating at the highest operating channel.

Test Result

Test Temperature	26.3℃	Relative Humidity	53 %
Test Engineer	Allen Zhou	Testing Time	2025-09-02

Test Data of Receiver Blocking_ BLE 1Mbps						
Test channel	Blocking Signal Frequency (MHz)	Blocking Signal Power(dBm)	Wanted signal mean power from companion device(dBm)	Performance PER	Limit PER	Result
Low	2 300	-31.59	-56.38	1.13%	10%	Pass
	2 380	-31.59	-56.38	0.87%	10%	Pass
High	2 504	-31.59	-56.37	2.74%	10%	Pass
	2 584	-31.59	-56.37	1.99%	10%	Pass

Test Data of Receiver Blocking_ BLE 2Mbps						
Test channel	Blocking Signal Frequency (MHz)	Blocking Signal Power(dBm)	Wanted signal mean power from companion device(dBm)	Performance PER	Limit PER	Result
Low	2 300	-31.59	-54.00	0.41%	10%	Pass
	2 380	-31.59	-54.00	1.24%	10%	Pass
High	2 504	-31.59	-54.00	0.69%	10%	Pass
	2 584	-31.59	-54.00	1.13%	10%	Pass

Test Temperature	27℃	Relative Humidity	43 %
Test Engineer	Allen Zhou	Testing Time	2025-10-16

Test Data of Receiver Blocking_ BLE 125Kbps						
Test channel	Blocking Signal Frequency (MHz)	Blocking Signal Power(dBm)	Wanted signal mean power from companion device(dBm)	Performance PER	Limit PER	Result
Low	2 300	-31.59	-56.39	1.21%	10%	Pass
	2 380	-31.59	-56.39	0.93%	10%	Pass
High	2 504	-31.59	-56.39	2.97%	10%	Pass
	2 584	-31.59	-56.39	1.91%	10%	Pass

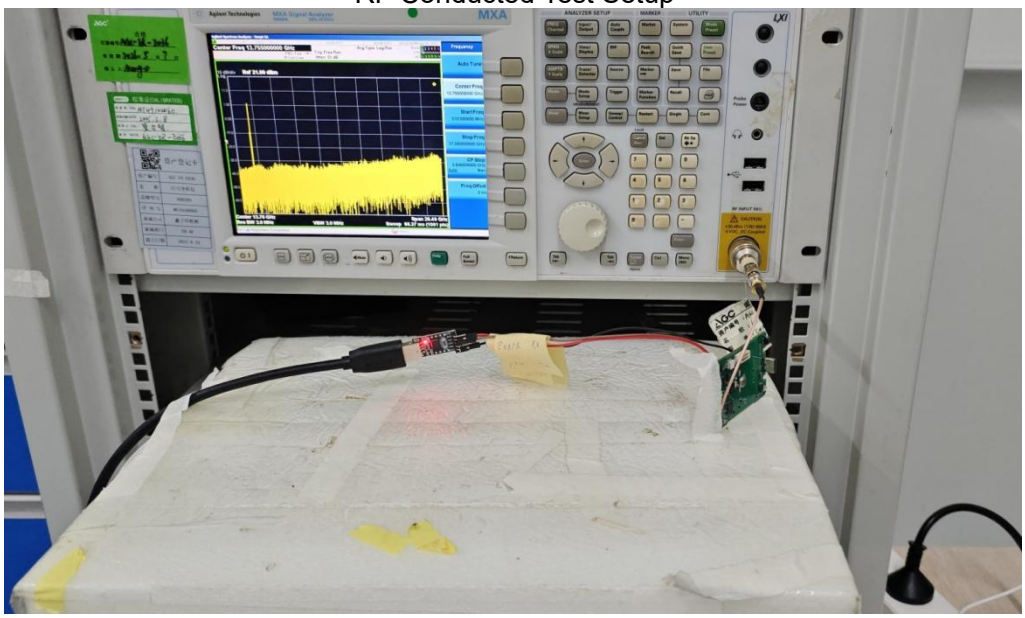
Note: The levels of the blocking signal and wanted signal have to be corrected for the (in-band) antenna assembly gain.

Appendix I: Photographs of Test Setup

Radiated Spurious Emissions Below 1GHz Test Setup

Radiated Spurious Emissions Above 1GHz Test Setup

RF Conducted Test Setup



Appendix II: Photographs of Test EUT

Refer to the Report No.: AGC16823250801AP01

Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the “Company”) solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the “Clients”).
2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

-----End of Report-----