



中认信通

CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)

JAPAN MIC TEST REPORT

Applicant: DISIGN Incorporated

Address: 6-2-15, Kirigaoka, Midori-ku, Yokohama, Japan 226-0016

Product Name: Carbon Monoxide Alarm

Model Number: HS-720ES

Type of Equipment: Certification Ordinance Article 2, Paragraph 1, Item 19

Test method(s): MIC Notice No.88 of 2004, Appendix No.43
(Version: MIC Notice No.409 of 2023)

The above device has been tested and found compliant with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

Report Number: 2503V05972E-RF-07

Date Of Issue: 2025/7/21

Reviewed By: Calvin Chen

Title: RF Engineer

Approved By: Sun Zhong

Title: Manager

Test Laboratory: China Certification ICT Co., Ltd (Dongguan)
No. 113, Pingkang Road, Dalang Town, Dongguan,
Guangdong, China

Tel: +86-769-83085888

www.ccttt.com.cn

Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China.

Declarations

China Certification ICT Co., Ltd (Dongguan) is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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Each test item follows the test standard(s) without deviation.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	2503V05972E-RF-07	Original Report	2025/7/21

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Carbon Monoxide Alarm
EUT Model:	HS-720ES
Frequency Range:	2405-2480 MHz
Nominal RF Output Power (Conducted):	2.4 mW
Number of TX Chain(s):	1
Number of RX Chain(s):	1
Antenna Gain[▲]:	1.08dBi
Modulation Type:	O-QPSK
Rated Input Voltage:	DC 3V from Alkaline AA LR6 Battery
Sample Number:	36DW-1
EUT Received Date:	2025/7/11
EUT Received Status:	Good

Operation Frequency Detail

Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	2405	19	2445
12	2410	20	2450
13	2415	21	2455
14	2420	22	2460
15	2425	23	2465
16	2430	24	2470
17	2435	25	2475
18	2440	26	2480

The test frequencies were performed the test as below:

Test Channel	Frequency (MHz)
Lowest	2405
Middle	2440
Highest	2480

Accessory Information

Accessory Description	Manufacturer	Model	Parameters
Alkaline AA LR6 Battery *2	/	/	DC 1.5V

1.2 Objective

The objective of this current document is to demonstrate the EUT, as equipment type in Certification Ordinance Article 2-1-19 of Specific Radio Equipment Specified in Article 38-2-2 Paragraph 1 Item 1of the Radio Law, compliant with Article 49-20 of Radio equipment regulations.

1.3 Test Methodology

All measurements contained in this report were conducted with technical regulations of MIC Notice No.88 of 2004, Appendix No.43 (Version: MIC Notice No.409 of 2023).

1.4 Description of Test Configuration

1.4.1 EUT Operation Condition

EUT Operation Mode:	The system was configured for testing in Engineering Mode, which was provided by the manufacturer.		
Equipment Modifications:	No		
EUT Exercise Software:	EMI_Test_Tool.exe		
The software was provided by manufacturer. The maximum power was configured as below, that was provided by the manufacturer▲:			
Test Modes	Power Level Setting		
	Lowest	Middle	Highest
Zigbee	5.6	5.6	5.6

1.4.2 EUT Extremity Condition

Environment Element	Range	Value	Unit
Voltage Fluctuation:	NV	3	Vdc
	LV	2.6	Vdc
	HV	3.2	Vdc

Note: The EUT be operated at 2.6~3.2Vdc which was provided by manufacturer.

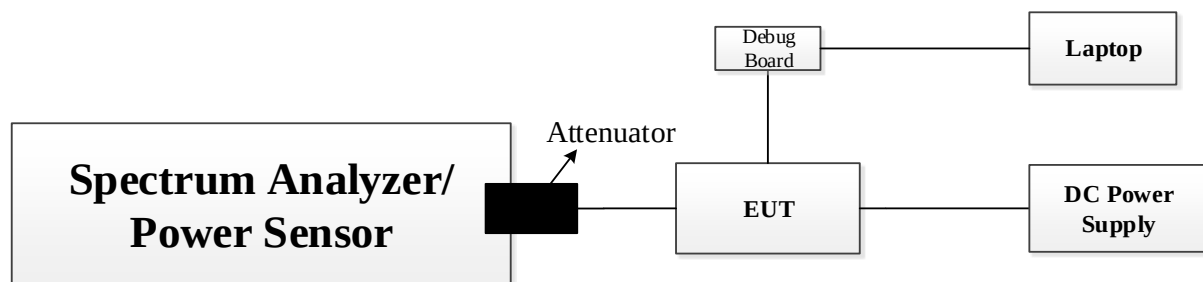
1.4.3 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386
Lenovo	Laptop	T460S	60PDTEK7
Telink	Debug Board	Unknown	Unknown
Unknown	Zigbee Bridge	Unknown	Unknown
XTOUCH	Phone	S40	04069092900015

1.4.4 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Detachable Power Cable	No	No	1	DC Power Supply	EUT
USB Cable	No	No	0.8	Laptop	Debug Board
Serial Cable	No	No	0.1	Debug Board	EUT

1.4.5 Block Diagram of Test Setup



1.5 Measurement Uncertainty

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Parameter	Measurement Uncertainty
Frequency Error	$\pm 0,5$ ppm
Occupied bandwidth and spreading bandwidth	± 5 %
RF output power, conducted	± 0.61 dB
Unwanted Emissions (TX&RX), conducted	± 2.47 dB
Temperature	± 1 °C
Humidity	± 5 %
DC and low frequency voltages	± 0.4 %
Duty Cycle	1 %

2. SUMMARY OF TEST RESULTS

Certification Ordinance Article 2-1-19 Conducted with: MIC Notice No.88 Appendix No.43	Description of Test	Result
1	Frequency Error	Compliant
2	Occupied Bandwidth	Compliant
3	Transmitter Spurious Emission and Unwanted Emission Intensity	Compliant
4	Antenna Output Power and Output Power Tolerance	Compliant
5	Receiver Spurious Emission and Unwanted Emission Intensity	Compliant
6	Carrier Sense Capability (1)	Not Applicable*
7	Carrier Sense Capability (2)	Not Applicable**
8	Carrier Sense Capability (3)	Not Applicable***
9	Transmission Frequency Switching Function	Not Applicable*
10	Transmission Antenna Gain	Not Applicable****
11	Transmission Radiation Angle Width	Not Applicable****
12	Interference Prevention Function	Compliant
13	Frequency Hopping Dwell Time	Not Applicable*****
14	Construction Protection Confirmation	Compliant

Note:

Not Applicable*: Only required for device with “compensating for the reduction of EIRP with output power” function.

Not Applicable**: Only required for OBW between 26MHz and 40MHz with OFDM modulation type.

Not Applicable***: Only required for outdoor use radio control of model airplanes.

Not Applicable****: This item not applicable when the EIRP less than the limit.

Not Applicable*****: Testing is only required for FHSS system devices.

3. REQUIREMENTS AND TEST PROCEDURES

3.1 Frequency Error

3.1.1 Limit

Within ± 50 ppm.

3.1.2 Test Procedure

Set the EUT to the measurement frequency without modulation.

Setting of SA is following as: Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode:

Positive peak / Trace mode: MAX Hold.

Record the peak spot frequency.

If the EUT can't set at un-modulation mode, measure the 10dBc center frequency.

3.2 Occupied Bandwidth

3.2.1 Limit

- Occupied bandwidth: ≤ 26 MHz

3.2.2 Test Procedure

1. Setting of SA is following as: RB: 30 kHz/VB: 30 kHz / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
2. EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 99% of occupied bandwidth to measure occupied bandwidth.

3.3 Transmitter Spurious Emission Strength and Unwanted Emission Intensity

3.3.1 Limit

- $30\text{MHz} \leq f < 2387\text{ MHz}: \leq 2.5\mu\text{W}/\text{MHz}$
- $2387\text{ MHz} \leq f \leq 2400\text{ MHz}: \leq 25\mu\text{W}/\text{MHz};$
- $2483.5\text{ MHz} < f \leq 2496.5\text{ MHz}: \leq 25\mu\text{W}/\text{MHz}$
- $2496.5\text{ MHz} < f \leq 12500\text{MHz}: \leq 2.5\mu\text{W}/\text{MHz}$

3.3.2 Test Procedure

❖ Conditions of Application Equipment (EUT)

- The modulation state shall be in continuously transmitting mode.

❖ Spectrum Analyzer Conditions

- Setting of SA start 30MHz and stop frequency 1000MHz, RB:100kHz/VB:100kHz, Sweep time: Auto. Sweep mode: continuous sweep. Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than $0.25\mu\text{W}/100\text{kHz}$.
- Setting of SA start 1000MHz and stop frequency 2387MHz, RB:1MHz/VB:1MHz, Sweep time: Auto. Sweep mode: continuous sweep. Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than $2.5\mu\text{W}/\text{MHz}$.
- Setting of SA start 2387MHz and stop frequency 2400MHz, RB:1MHz/VB:1MHz, Sweep time: Auto. Sweep mode: continuous sweep. Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than $25\mu\text{W}/\text{MHz}$.
- Setting of SA start 2483.5MHz and stop frequency 2496.5MHz, RB:1MHz/VB:1MHz, Sweep time: Auto. Sweep mode: continuous sweep. Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than $25\mu\text{W}/\text{MHz}$.
- Setting of SA start 2496.5MHz and stop frequency 12500MHz, RB:1MHz/VB:1MHz, Sweep time: Auto. Sweep mode: continuous sweep. Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than $2.5\mu\text{W}/\text{MHz}$.

If above test over the limit, the below test procedure should be used:

Step 1:

Center the frequency which was want to investigate, search the peak frequency.

Step 2:

Center frequency: Searched Frequency

Span: 0Hz

RBW: 1MHz(Above 1GHz), VBW: Same as RBW.

Sweep time: Auto(Minimum time to ensure measurement accuracy. *In case of burst wave, one burst shall be included per data point) Data points: 400 points or more. Sweep mode: Single Sweep.

Detection Mode: Sample

3.4 Antenna Output Power and Antenna Power Tolerance

3.4.1 Limit

Antenna output power:

- $\leq 10 \text{ mW}$
- The Output Power Tolerance must be within $+20\% \sim -80\%$.
- $\text{EIRP} \leq 12.14\text{dBm}$ (other from 2400-2483.5 MHz)

3.4.2 Test Procedure

- a) Set the EUT in continuous maximum power transmitting mode.
- b) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to power meter.
- c) Add a correction factor to the display.
- d) Set the power meter detector to average detector, to test average output power, record the result.
- e) Antenna Power Error is definition that actual measure antenna power tolerance between $+20\%$ to -80% power range that base on manufacturer declare the power density.

3.5 Receiver Spurious Emission and Unwanted Emission Intensity

3.5.1 Limit

- $\leq 4 \text{ nW}$ ($30 \text{ MHz} \leq f \leq 1000 \text{ MHz}$)
- $\leq 20 \text{ nW}$ ($1 \text{ GHz} \leq f \leq 12.5 \text{ GHz}$)

3.5.2 Test Procedure

❖ Conditions of Application Equipment (EUT)

- The modulation state shall be “continuous receiving mode”.

❖ Spectrum Analyzer Conditions

- Start Frequency: Start Frequency of frequency range to measure (30MHz to 1GHz)
- Stop Frequency: Stop Frequency of frequency range to measure (1GHz to 12.5GHz)
- Span: AUTO (Measurement Range)
- RBW: 100 kHz, VBW: 100 kHz for Frequency $< 1 \text{ GHz}$
- RBW: 1MHz, VBW: 1MHz for Frequency $> 1 \text{ GHz}$
- Sweep time: AUTO or more
- Sweep mode: Auto Sweep
- Detection: Positive Peak
- Reference Level: Enough level for maximum dynamic range

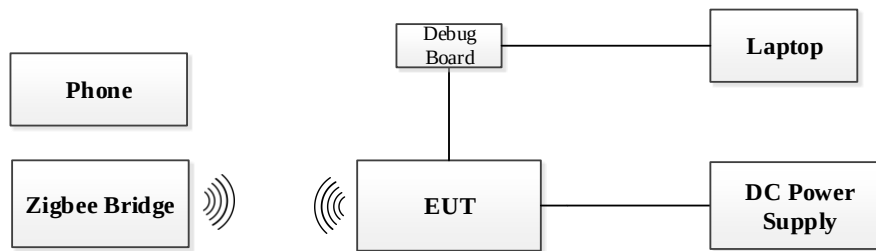
3.6 Interference Prevention Function

3.6.1 Requirement

The EUT shall have the interference prevention capability to transmit or to receive the identification automatically, so that sender and receiver shall exclude other equipment.

3.6.2 Test Procedure

Measurement System Diagram:



In the case that the EUT has the function of automatically transmitting the identification code:

1. Transmit the predetermined identification codes from EUT
2. Check the transmitted identification codes with the demodulator.

In the case of receiving the identification codes:

1. Transmit the predetermined identification codes from the counterpart.
2. Check if communication is normal
3. Transmit the signal other than predetermined ID codes from the counterpart.
4. Check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

3.7 Construction Protection Confirmation

3.7.1 Requirements

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

4. TEST DATA AND RESULTS

4.1 Test Environmental Conditions & Test Equipment List and Details

Test Date:		2025/7/15-2025/7/18			
Tester:		LingLing Li			
Environmental Conditions:					
Temperature: (°C)	25.4-25.7	Relative Humidity: (%)	57-63	ATM Pressure: (kPa)	99.5-99.7

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date	Calibration Agency	Calibration Method ^{Note}
R&S	Spectrum Analyzer	FSU26	200256	2025/3/31	2026/3/30	BACL Cal	C
zhuoxiang	Multimeter	UT39A+	C210582554	2025/1/6	2026/1/5	BACL Cal	C
Agilent	USB Average Power Sensor	U2001H	MY50000432	2025/3/31	2026/3/30	BACL Cal	C

*** Statement of Traceability:** China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Note:

A. Calibration conducted by the National Institute of Information and Communications Technology (NICT) (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1).

B. Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992).

C. Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).

D. Calibration conducted by using measuring instruments and other equipment which shall have been given any of calibration, etc. listed above from a) to c)

4.2 Frequency Error

Test Result: Compliant. Please refers to following table and plots.

Test Mode: Carrier transmitting mode

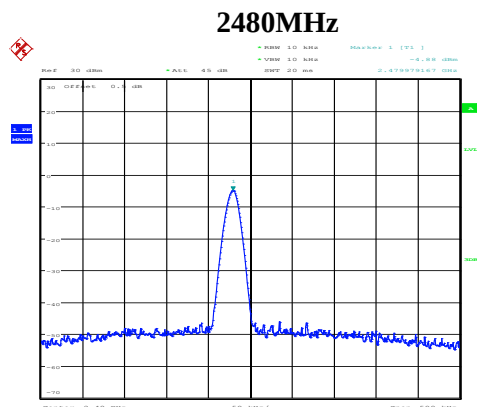
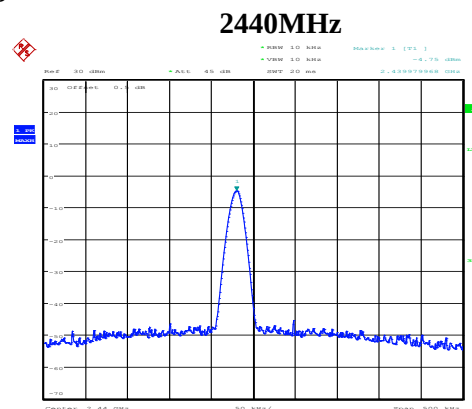
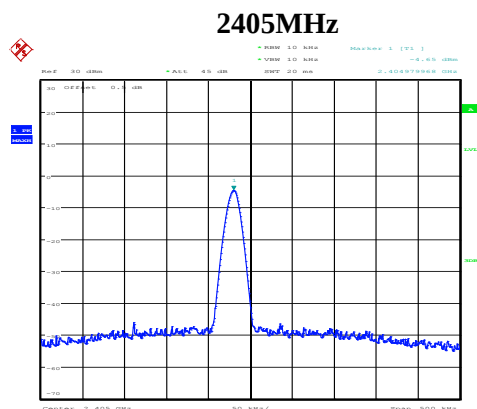
Unmodulated Signal

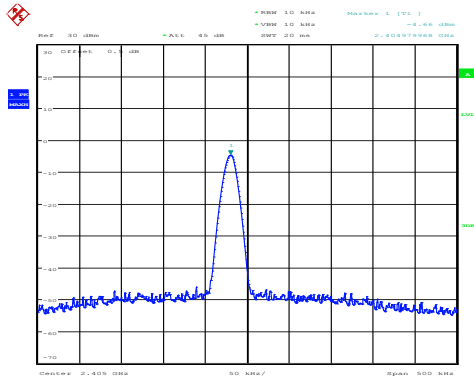
Test Condition	Mode	Channel	Test Frequency (MHz)	Measured Frequency (MHz)	Result (ppm)	Limit (ppm)
NV	Single Carrier	Low	2405	2404.979968	-8.33	≤ 50
		Middle	2440	2439.979968	-8.21	
		High	2480	2479.979167	-8.40	
LV	Single Carrier	Low	2405	2404.979968	-8.33	
		Middle	2440	2439.979968	-8.21	
		High	2480	2479.979167	-8.40	
HV	Single Carrier	Low	2405	2404.979968	-8.33	
		Middle	2440	2439.979968	-8.21	
		High	2480	2479.979167	-8.40	

Note: Tolerance (Result) = (Measured Frequency - Test Frequency)/Test Frequency*10⁶

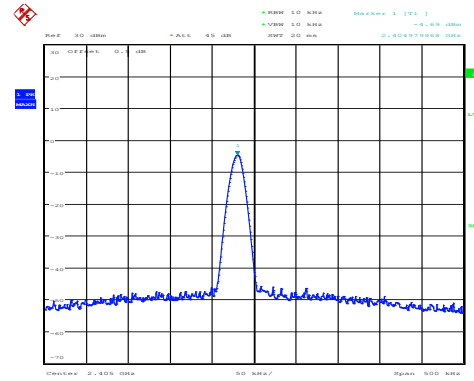
Please refer to the following plots:

Normal Voltage Test

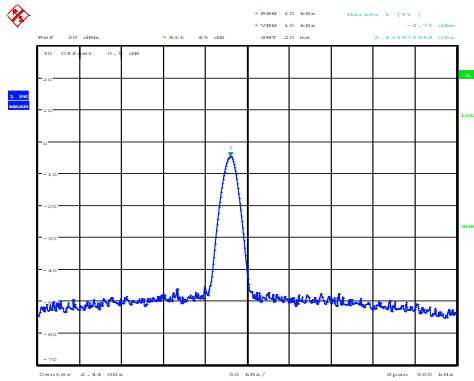


**Low Voltage Test
2405MHz**

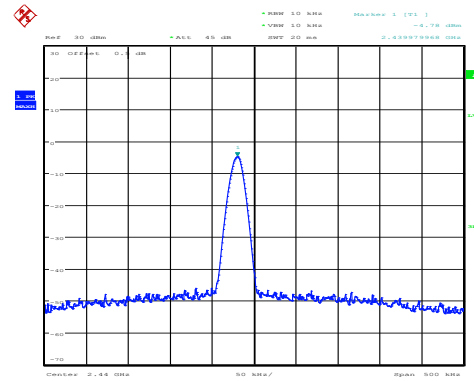
ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 18.JUL.2025 19:04:36

**High Voltage Test
2405MHz**

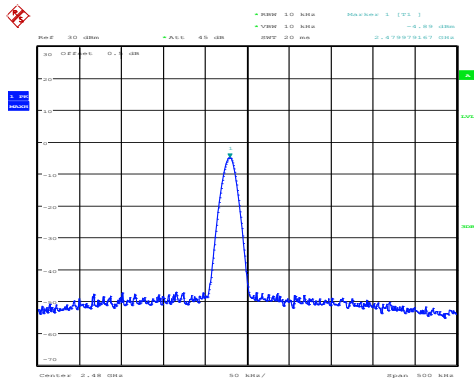
ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 18.JUL.2025 19:04:07

2440MHz

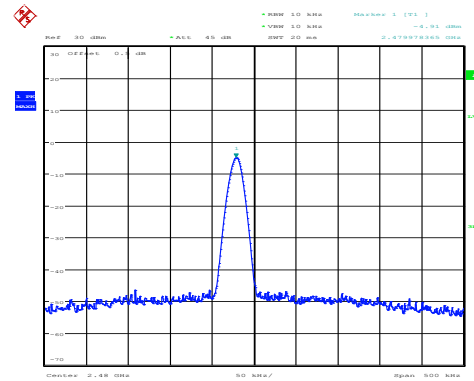
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Date: 18.JUL.2025 19:03:00

2440MHz

ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 18.JUL.2025 19:02:30

2480MHz

ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 18.JUL.2025 19:00:58

2480MHz

ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 18.JUL.2025 19:00:38

4.3 Occupied Bandwidth

Test Result: Compliant. Please refers to following table and plots.

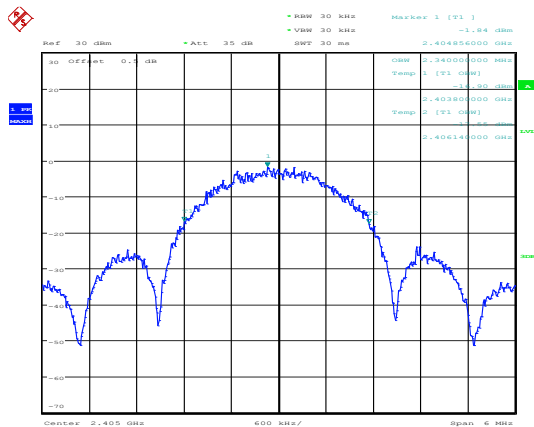
Test Mode: Transmitting

Test Condition	Test Mode	Occupied Bandwidth (MHz)			
		Low Channel	Middle Channel	High Channel	Limit
NV	Zigbee	2.340	2.328	2.076	≤ 26
LV		2.304	2.328	2.064	≤ 26
HV		2.316	2.340	2.052	≤ 26

Please refer to the following plots:

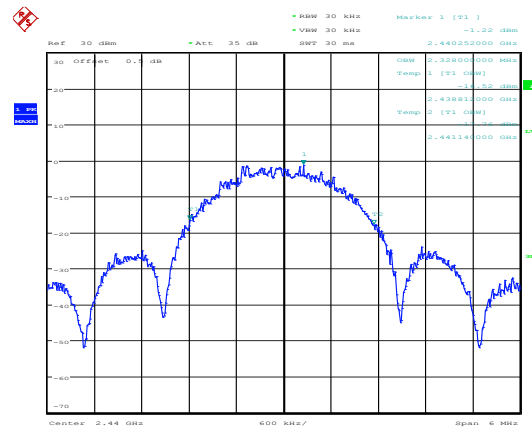
Normal Voltage Test

Low Channel



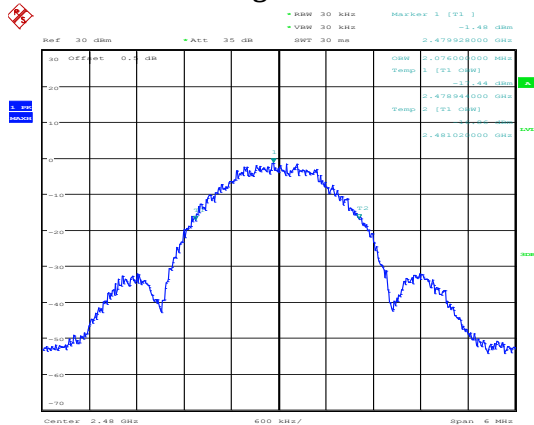
ProjectNo.:2503V05972E-RFTester:LingLing Li
Date: 15.JUL.2025 14:23:16

Middle Channel



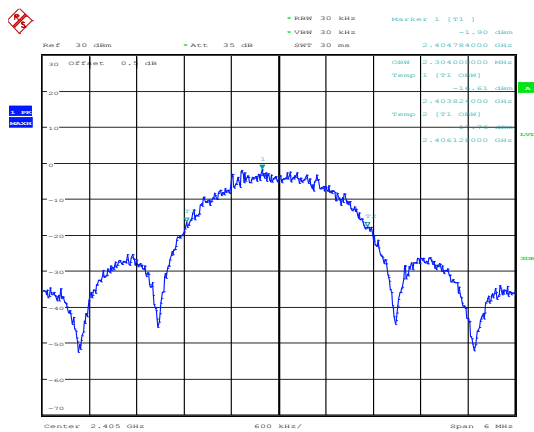
ProjectNo.:2503V05972E-RFTester:LingLing Li
Date: 15.JUL.2025 14:24:19

High Channel



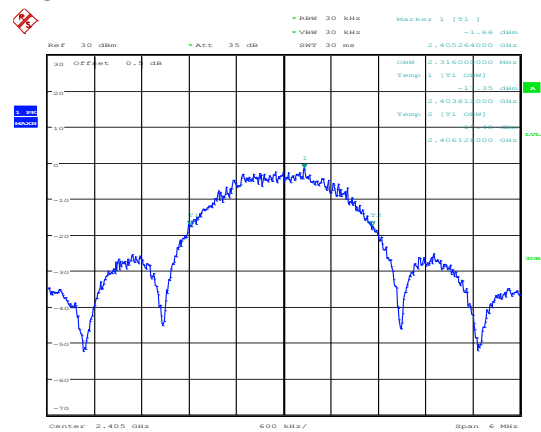
ProjectNo.:2503V05972E-RFTester:LingLing Li
Date: 15.JUL.2025 14:22:11

Low Voltage Test



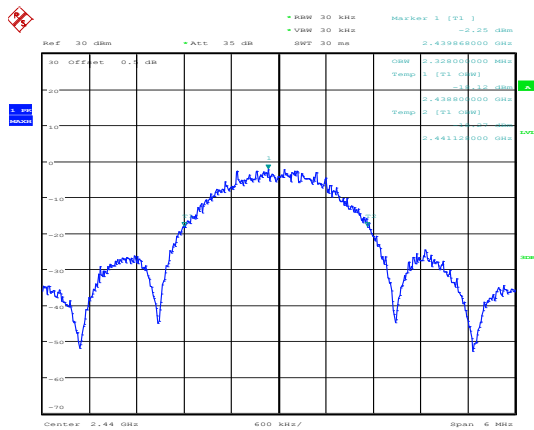
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Date: 18.JUL.2025 11:04:05

High Voltage Test

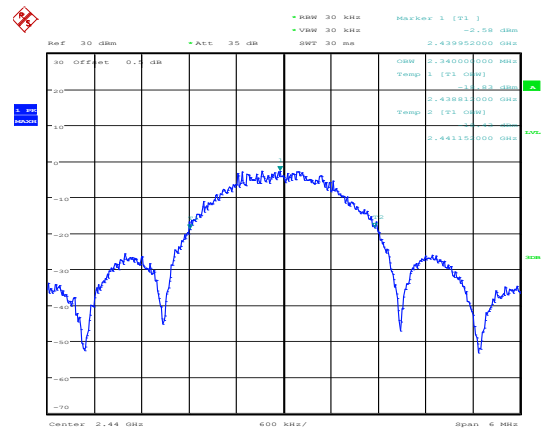


ProjectNo.:2503V05972E-RFTester:LingLing Li
Date: 18.JUL.2025 11:14:46

Middle Channel

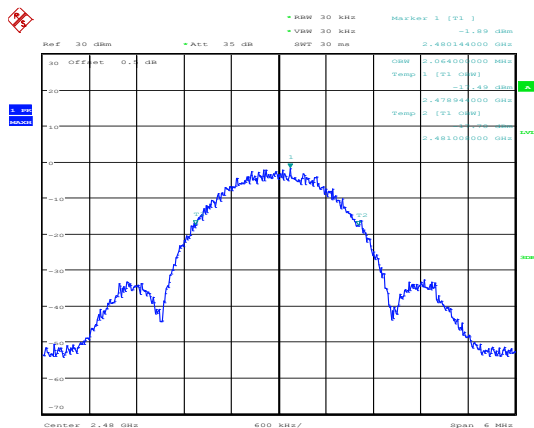


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Date: 18.JUL.2025 11:06:12

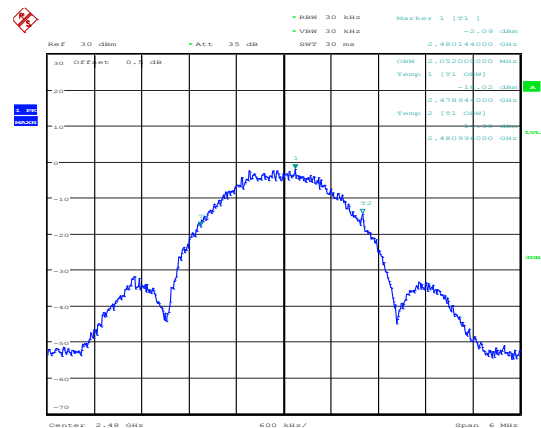


ProjectNo.:2503V05972E-RFTester:LingLing Li
Date: 18.JUL.2025 11:12:52

High Channel



ProjectNo.:2503V05972E-RFTester:LingLing Li
Date: 18.JUL.2025 11:09:06



ProjectNo.:2503V05972E-RFTester:LingLing Li
Date: 18.JUL.2025 11:11:15

4.4 Transmitter Spurious Emission Strength and Unwanted Emission Intensity

Test Result: Compliant. Please refers to following tables and plots.

Test Mode: Transmitting

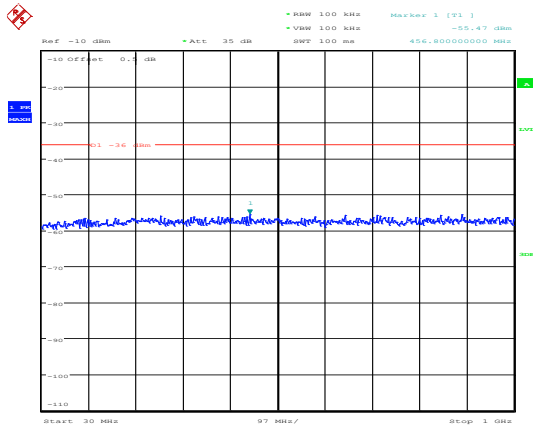
Test Condition	Channel	Test Band (RBW)	Frequency Range		Max. Emission Located (GHz)	Result (dBm)	Result (μW/RBW)	Limit (μW/RBW)
			Start (GHz)	Stop (GHz)				
NV	Low	Band I (100kHz)	0.03	1	0.457	-55.47	0.003	0.25
		Band II (1MHz)	1	2.387	2.06	-45.37	0.029	2.5
		Band III (1MHz)	2.387	2.4	2.4	-34.56	0.350	25
		Band IV (1MHz)	2.4	2.4965	2.495	-43.84	0.041	25
		Band V (1MHz)	2.4965	12.5	4.797	-39.58	0.110	2.5
	Middle	Band I (100kHz)	0.03	1	0.47	-55.07	0.003	0.25
		Band II (1MHz)	1	2.387	2.268	-44.89	0.032	2.5
		Band III (1MHz)	2.387	2.4	2.393	-44.54	0.035	25
		Band IV (1MHz)	2.4	2.4965	2.488	-43.18	0.048	25
		Band V (1MHz)	2.4965	12.5	3.157	-39.77	0.105	2.5
	High	Band I (100kHz)	0.03	1	0.564	-55.11	0.003	0.25
		Band II (1MHz)	1	2.387	2.323	-44.67	0.034	2.5
		Band III (1MHz)	2.387	2.4	2.388	-44.32	0.037	25
		Band IV (1MHz)	2.4	2.4965	2.484	-35.20	0.302	25
		Band V (1MHz)	2.4965	12.5	4.957	-40.64	0.086	2.5

Test Condition	Channel	Test Band (RBW)	Frequency Range		Max. Emission Located (GHz)	Result (dBm)	Result (μW/RBW)	Limit (μW/RBW)
			Start (GHz)	Stop (GHz)				
LV	Low	Band I (100kHz)	0.03	1	0.818	-55.02	0.003	0.25
		Band II (1MHz)	1	2.387	2.256	-44.91	0.032	2.5
		Band III (1MHz)	2.387	2.4	2.4	-35.38	0.290	25
		Band IV (1MHz)	2.4	2.4965	2.487	-44.10	0.039	25
		Band V (1MHz)	2.4965	12.5	4.797	-39.96	0.101	2.5
	Middle	Band I (100kHz)	0.03	1	0.261	-54.99	0.003	0.25
		Band II (1MHz)	1	2.387	2.323	-44.59	0.035	2.5
		Band III (1MHz)	2.387	2.4	2.388	-43.64	0.043	25
		Band IV (1MHz)	2.4	2.4965	2.488	-43.92	0.041	25
		Band V (1MHz)	2.4965	12.5	4.877	-39.65	0.109	2.5
	High	Band I (100kHz)	0.03	1	0.967	-55.18	0.003	0.25
		Band II (1MHz)	1	2.387	2.276	-44.61	0.035	2.5
		Band III (1MHz)	2.387	2.4	2.388	-43.70	0.043	25
		Band IV (1MHz)	2.4	2.4965	2.484	-35.86	0.259	25
		Band V (1MHz)	2.4965	12.5	4.957	-40.61	0.087	2.5

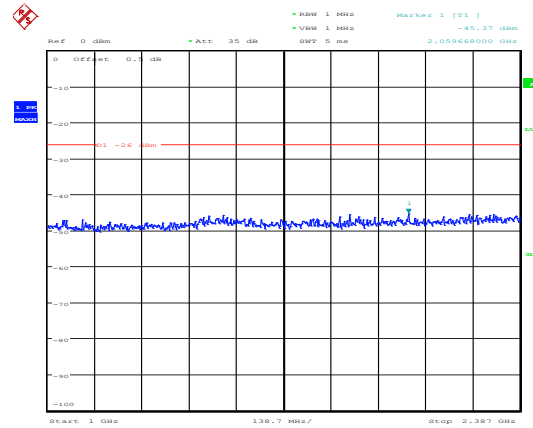
Test Condition	Channel	Test Band (RBW)	Frequency Range		Max. Emission Located (GHz)	Result (dBm)	Result (μW/RBW)	Limit (μW/RBW)
			Start (GHz)	Stop (GHz)				
HV	Low	Band I (100kHz)	0.03	1	0.977	-55.39	0.003	0.25
		Band II (1MHz)	1	2.387	2.387	-44.82	0.033	2.5
		Band III (1MHz)	2.387	2.4	2.4	-35.19	0.303	25
		Band IV (1MHz)	2.4	2.4965	2.49	-44.23	0.038	25
		Band V (1MHz)	2.4965	12.5	3.157	-39.72	0.107	2.5
	Middle	Band I (100kHz)	0.03	1	0.697	-55.66	0.003	0.25
		Band II (1MHz)	1	2.387	2.207	-44.70	0.034	2.5
		Band III (1MHz)	2.387	2.4	2.396	-43.97	0.040	25
		Band IV (1MHz)	2.4	2.4965	2.488	-44.01	0.040	25
		Band V (1MHz)	2.4965	12.5	4.877	-39.79	0.105	2.5
	High	Band I (100kHz)	0.03	1	0.965	-55.38	0.003	0.25
		Band II (1MHz)	1	2.387	2.218	-45.68	0.027	2.5
		Band III (1MHz)	2.387	2.4	2.398	-44.35	0.037	25
		Band IV (1MHz)	2.4	2.4965	2.484	-35.96	0.254	25
		Band V (1MHz)	2.4965	12.5	3.157	-40.13	0.097	2.5

Please refer to the below plots:
Normal Voltage Test

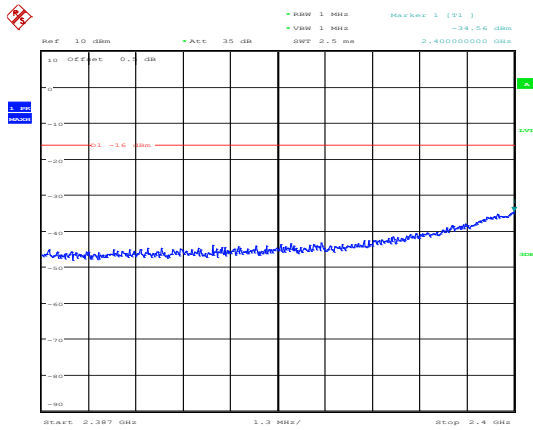
Lowest Channel



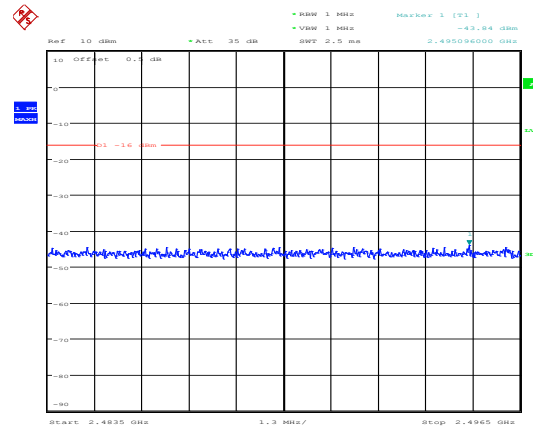
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Date: 15.JUL.2025 14:15:16



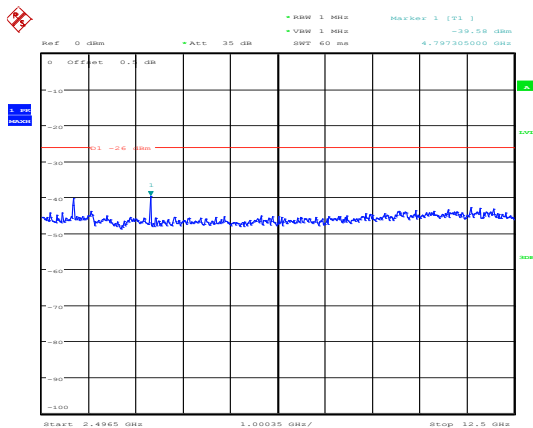
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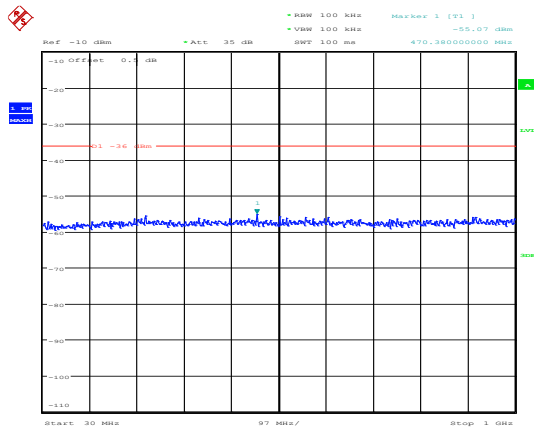


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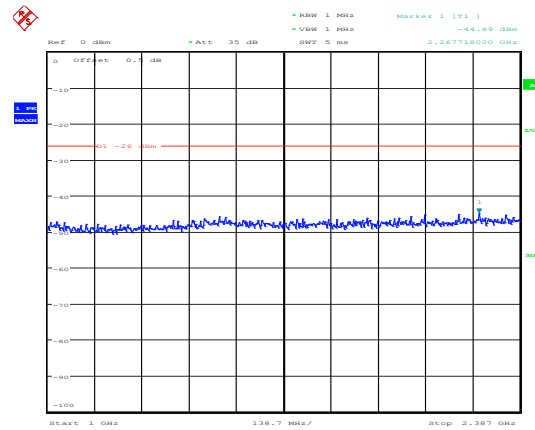


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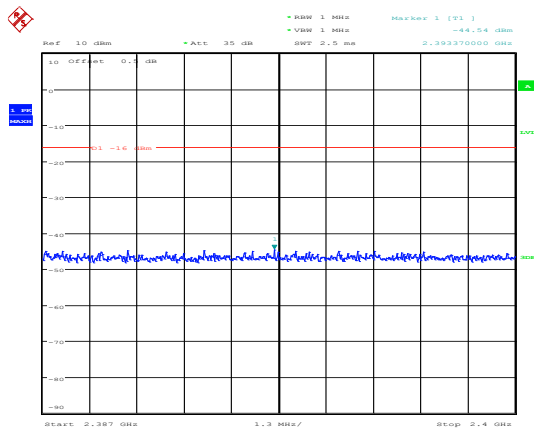
Middle Channel



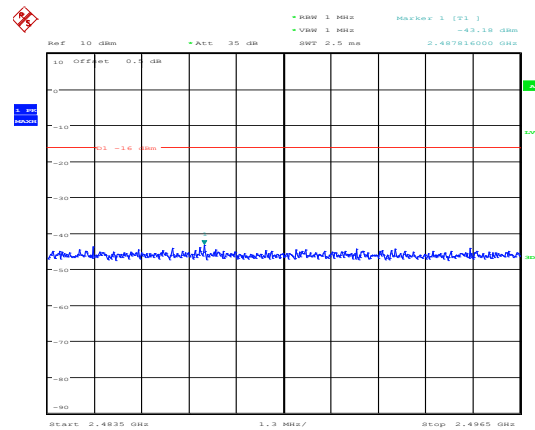
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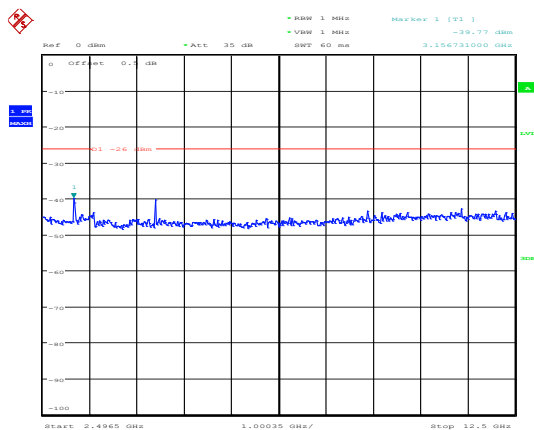
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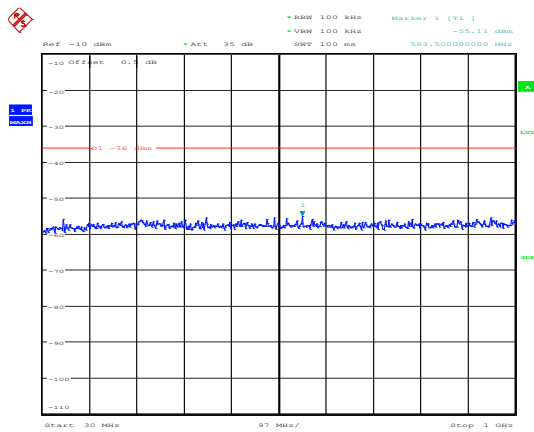


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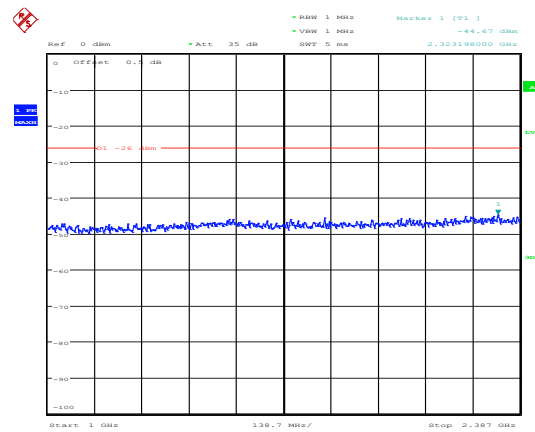


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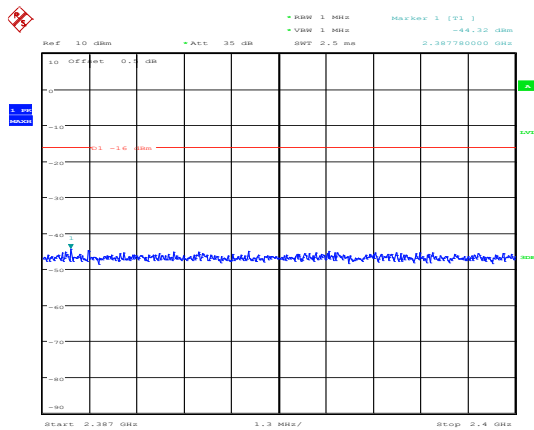
Highest Channel



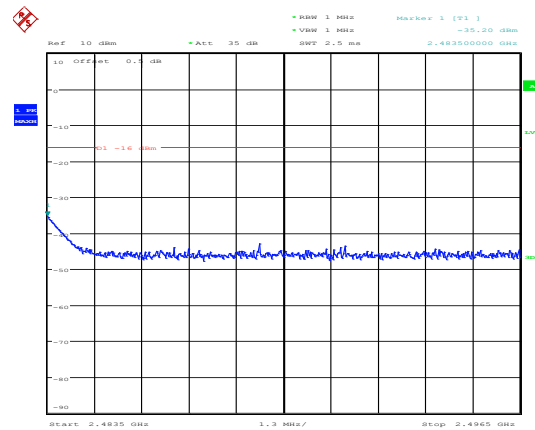
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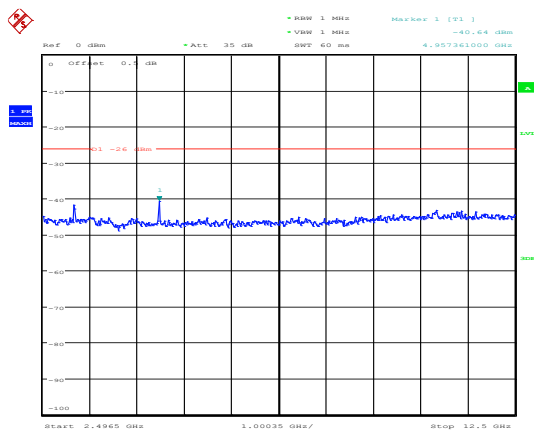
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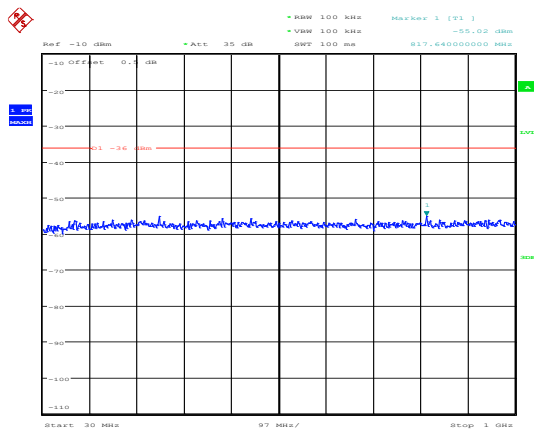


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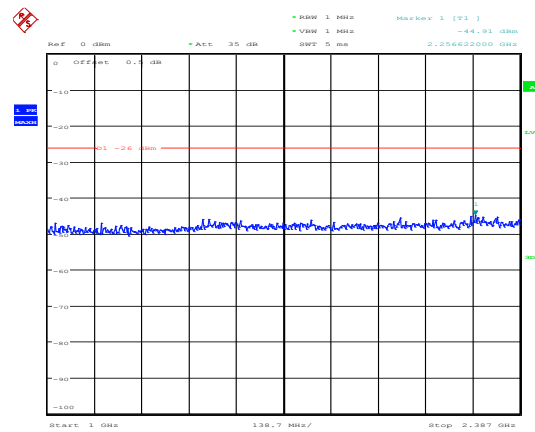
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Low Voltage Test

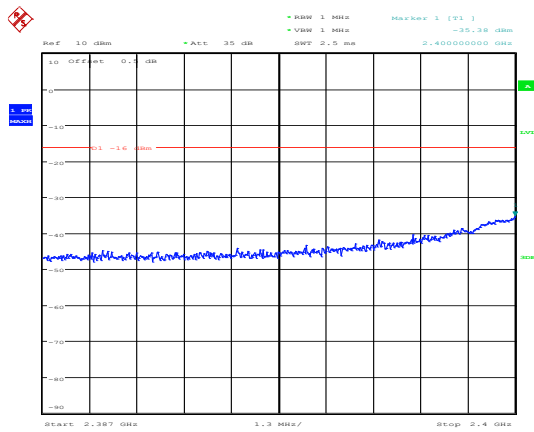


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Date: 18.JUL.2025 11:03:00

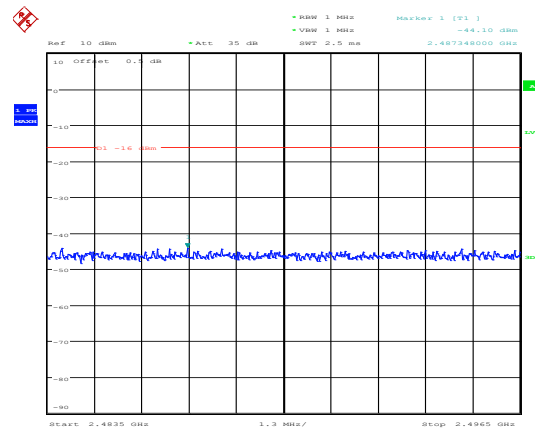
Lowest Channel



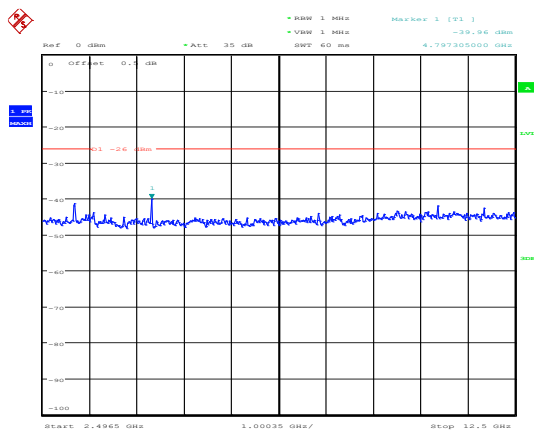
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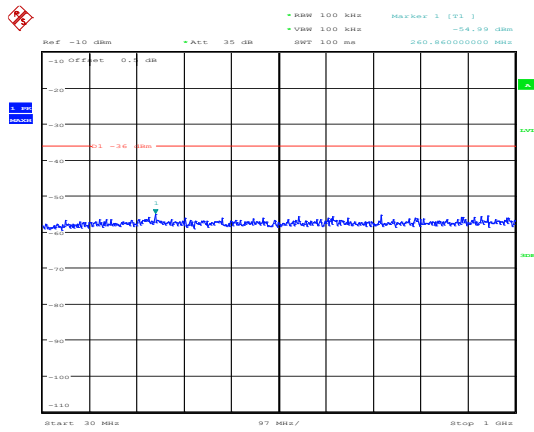


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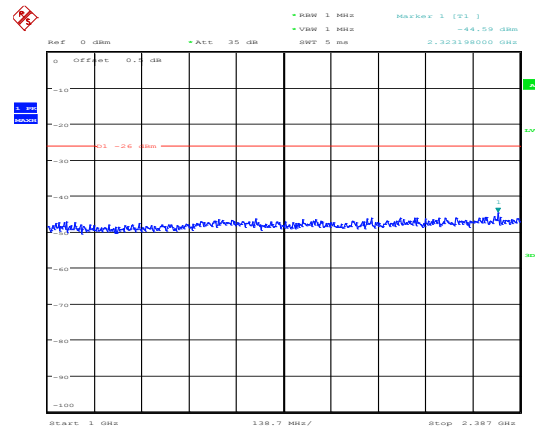


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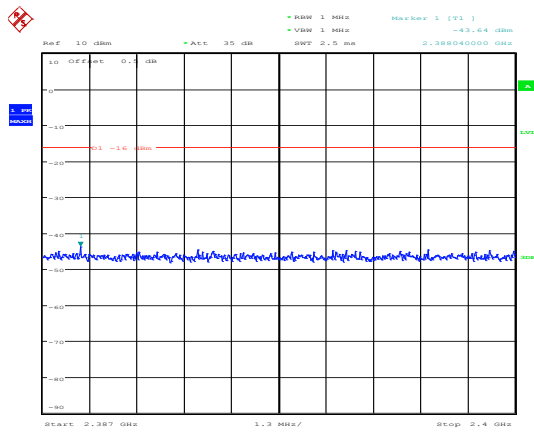
Middle Channel



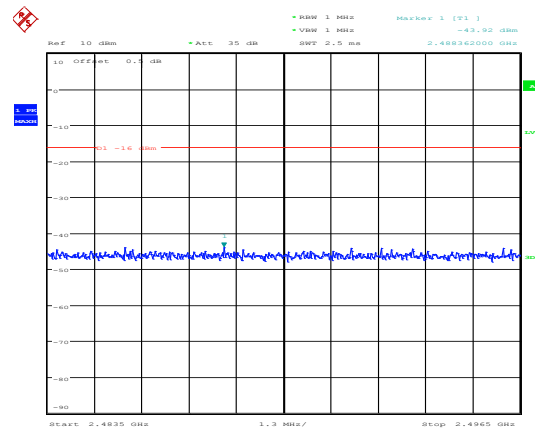
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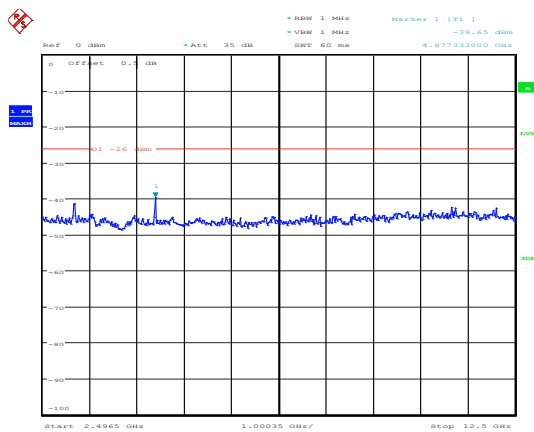
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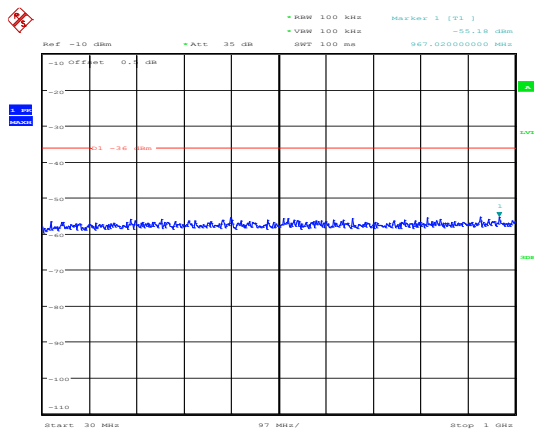


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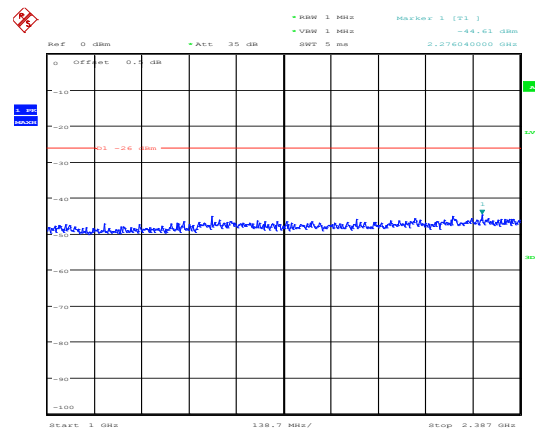


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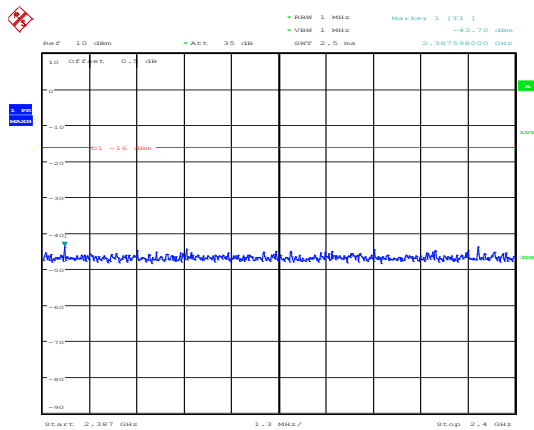
Highest Channel



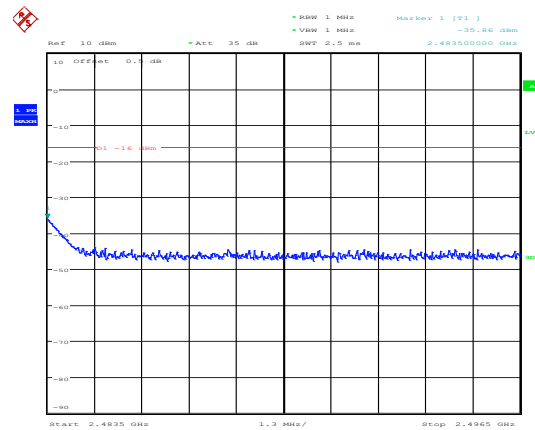
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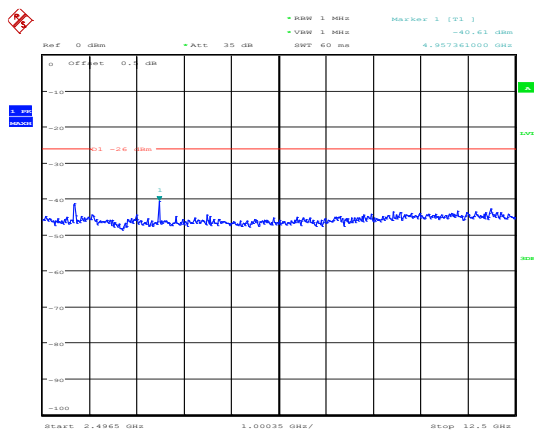
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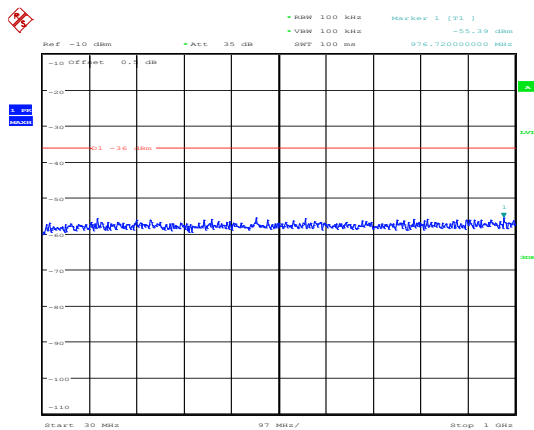


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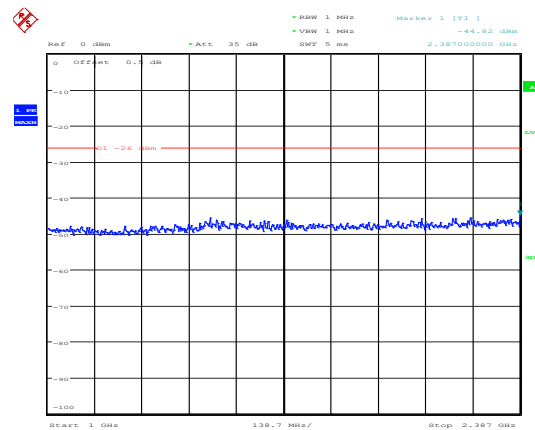
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High Voltage Test

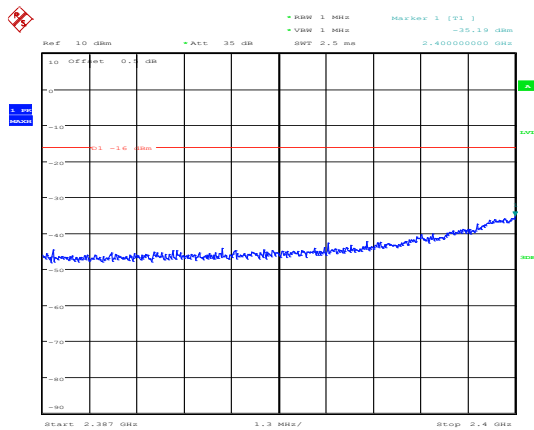


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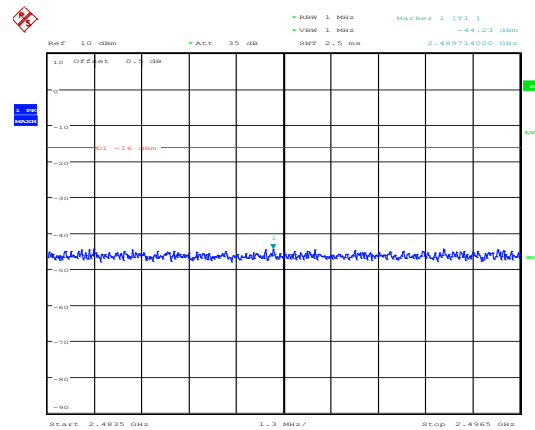
Lowest Channel



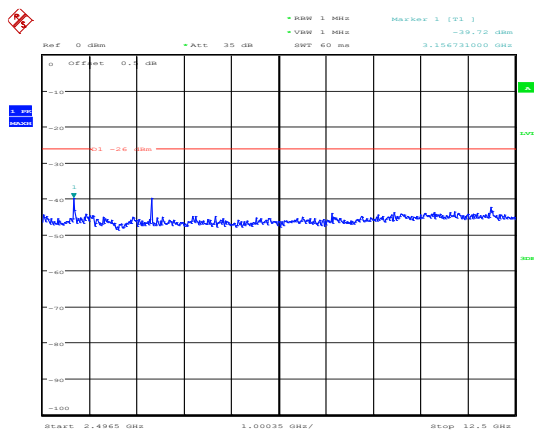
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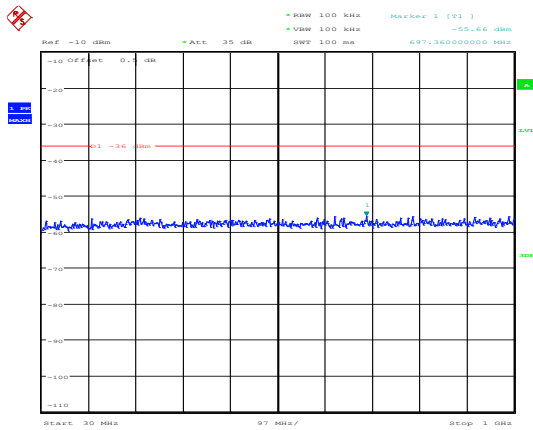


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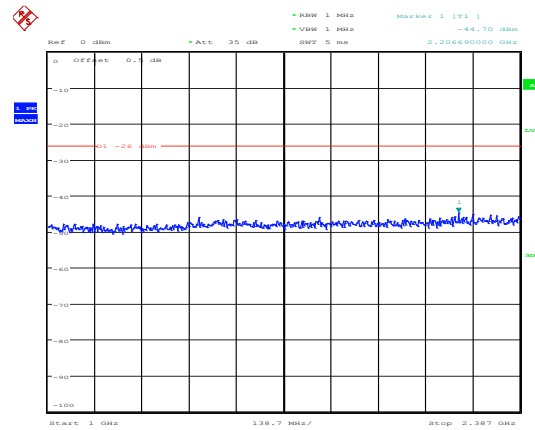


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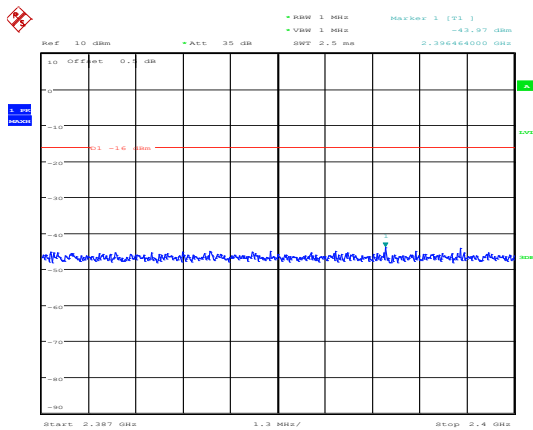
Middle Channel



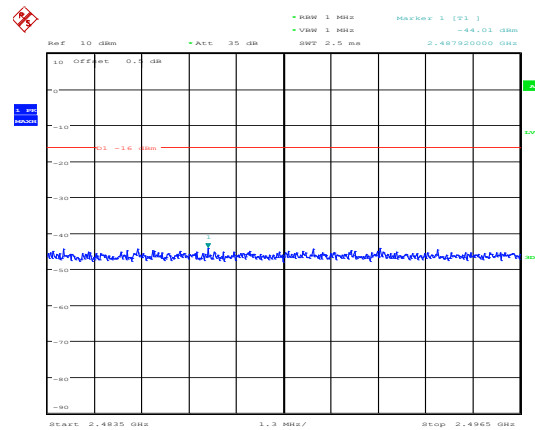
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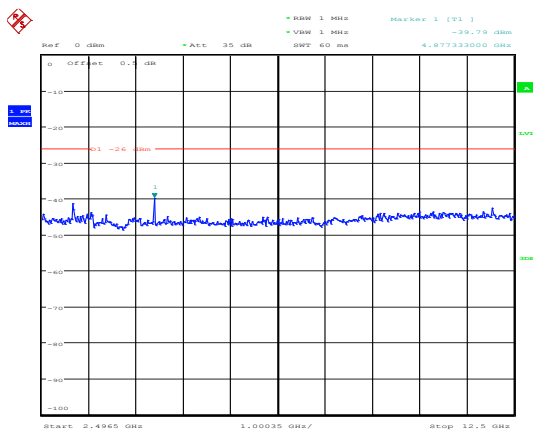
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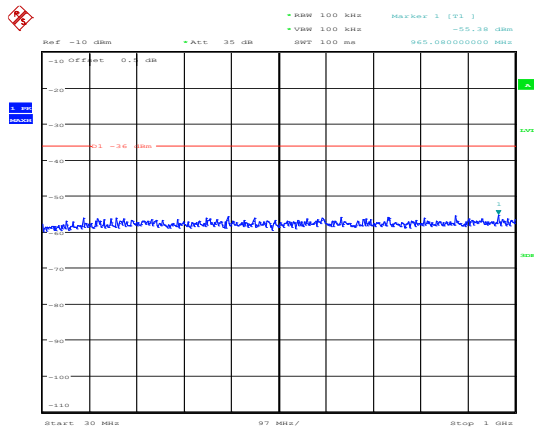


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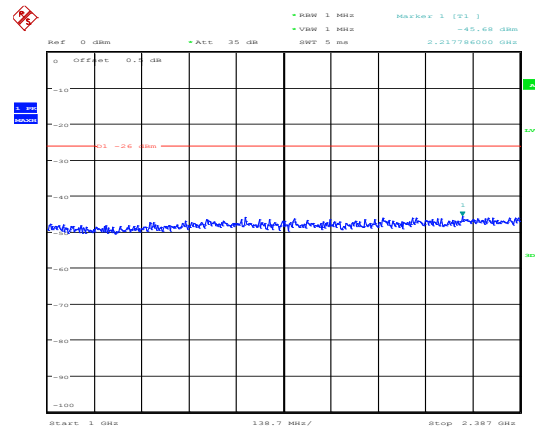


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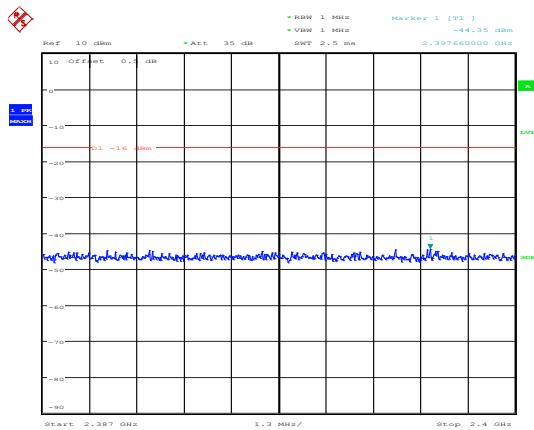
Highest Channel



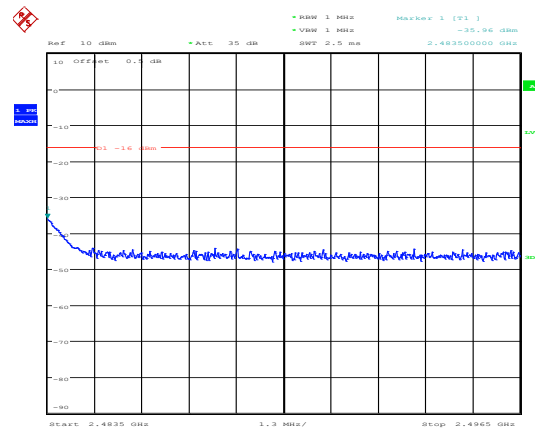
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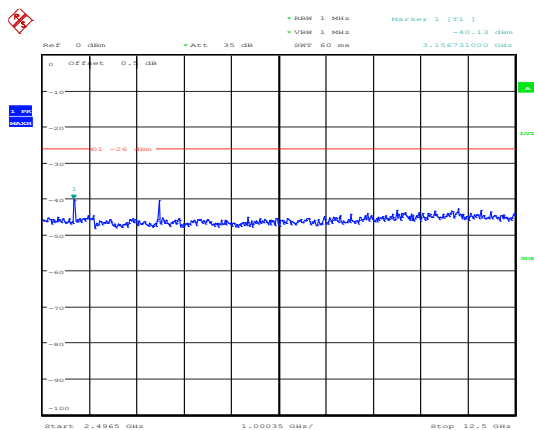
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Date: 18.JUL.2025 11:10:47



ProjectNo.:2503V05972E-RFTester:LingLing Li
Date: 18.JUL.2025 11:10:59

4.5 Antenna Output Power and Antenna Power Tolerance

Test Result: Compliant. Please refers to following tables and plots.

Test Mode: Transmitting

Duty Cycle and Declared Power:

Mode	Ton (ms)	Ton+Toff (ms)	Duty Cycle (%)	Antenna Gain (dBi)	Declared Power (mW)
Zigbee	100	100	100.00	1.08	2.40

Antenna output power

Test Condition	Mode	Channel	Conducted Power (dBm)	Antenna Output Power (mW)		Antenna Output Tolerance (%)		EIRP (dBm)	
				Result	Limit	Result	Limit	Result	Limit
NV	Zigbee	Low	3.78	2.388	≤ 10	-0.50	-80~+20	4.86	≤ 12.14
		Middle	3.61	2.296		-4.33		4.69	
		High	3.66	2.323		-3.21		4.74	
LV	Zigbee	Low	3.75	2.371	≤ 10	-1.21	-80~+20	4.83	≤ 12.14
		Middle	3.59	2.286		-4.75		4.67	
		High	3.69	2.339		-2.54		4.77	
HV	Zigbee	Low	3.74	2.366	≤ 10	-1.42	-80~+20	4.82	≤ 12.14
		Middle	3.61	2.296		-4.33		4.69	
		High	3.71	2.350		-2.08		4.79	

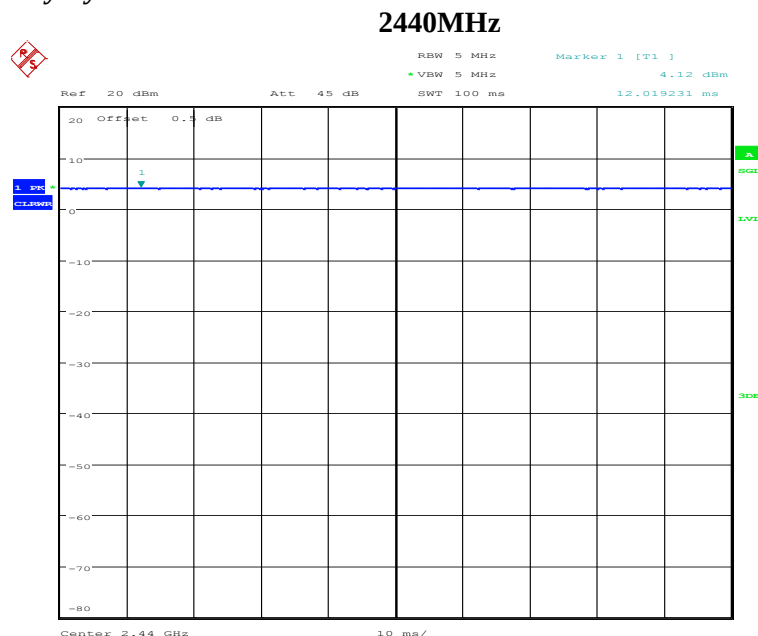
Note:

1. Antenna Output Power Tolerance = (Antenna Output power - Declared Power)/Declared Power*100%

2. Antenna output power (mW) = Conducted power(mW)/Duty cycle = $10^{(Conducted\ power(dBm)/10)}$ /Duty cycle

3. EIRP (dBm) = $10 \cdot \log(Antenna\ output\ power\ (mW)) + Antenna\ Gain$

Test Plots for Duty Cycle:



ProjectNo.:2503V05972E-RF Tester:LingLing Li
Date: 15.JUL.2025 14:26:40

4.6 Receiver Spurious Emission and Unwanted Emission Intensity

Test Result: Compliant, please see the below tables and plots

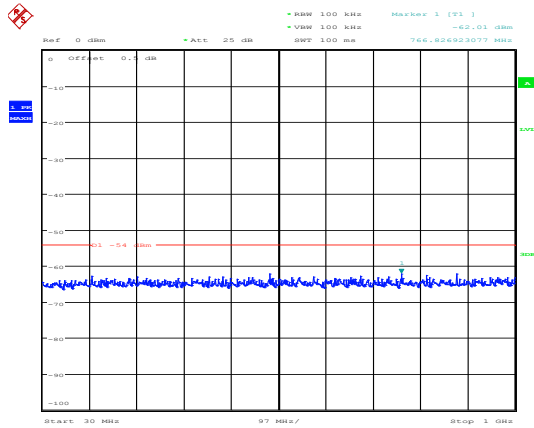
Test Mode: Receiving

Test Condition	Channel	Test Band (RBW)	Frequency Range		Max. Emission Located (GHz)	Result (dBm)	Result (nW)	Limit (nW)
			Start (GHz)	Stop (GHz)				
NV	Low	Band I (100kHz)	0.03	1	0.767	-62.01	0.630	4
		Band II (1MHz)	1	12.5	3.175	-56.32	2.333	20
	Middle	Band I (100kHz)	0.03	1	0.344	-62.22	0.600	4
		Band II (1MHz)	1	12.5	3.175	-57.27	1.875	20
	High	Band I (100kHz)	0.03	1	0.167	-62.13	0.612	4
		Band II (1MHz)	1	12.5	3.175	-56.24	2.377	20

Test Condition	Channel	Test Band (RBW)	Frequency Range		Max. Emission Located (GHz)	Result (dBm)	Result (nW)	Limit (nW)
			Start (GHz)	Stop (GHz)				
NV	Low	Band I (100kHz)	0.03	1	0.315	-61.39	0.726	4
		Band II (1MHz)	1	12.5	3.156	-54.43	3.606	20
	Middle	Band I (100kHz)	0.03	1	0.154	-62.53	0.558	4
		Band II (1MHz)	1	12.5	3.156	-55.64	2.729	20
	High	Band I (100kHz)	0.03	1	0.208	-61.67	0.681	4
		Band II (1MHz)	1	12.5	3.175	-55.59	2.761	20

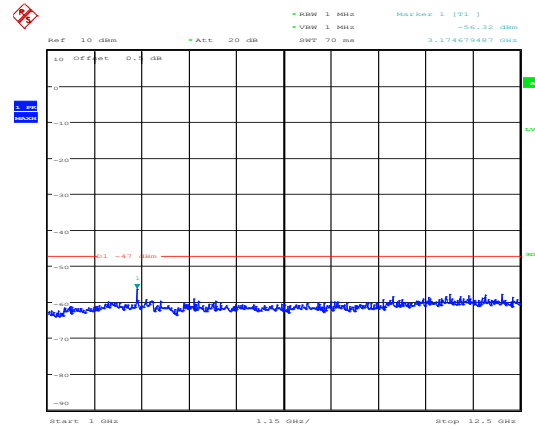
Test Condition	Channel	Test Band (RBW)	Frequency Range		Max. Emission Located (GHz)	Result (dBm)	Result (nW)	Limit (nW)
			Start (GHz)	Stop (GHz)				
NV	Low	Band I (100kHz)	0.03	1	0.922	-61.54	0.701	4
		Band II (1MHz)	1	12.5	3.175	-55.76	2.655	20
	Middle	Band I (100kHz)	0.03	1	0.139	-62.41	0.574	4
		Band II (1MHz)	1	12.5	3.156	-55.44	2.858	20
	High	Band I (100kHz)	0.03	1	0.253	-62.09	0.618	4
		Band II (1MHz)	1	12.5	3.175	-54.07	3.917	20

Normal Voltage:



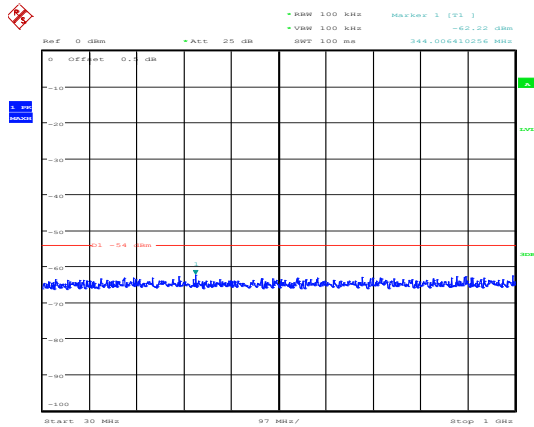
ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 15.JUL.2025 14:34:18

Lowest Channel

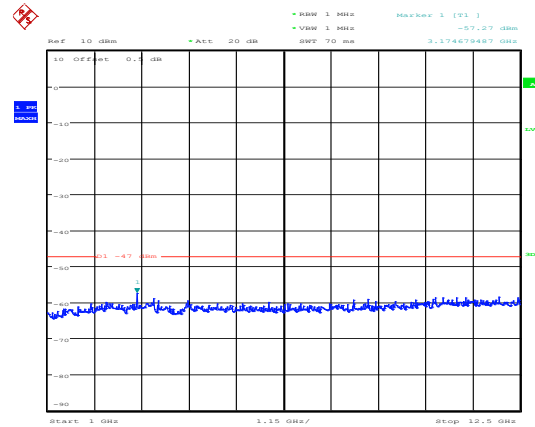


ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 15.JUL.2025 14:36:53

Middle Channel

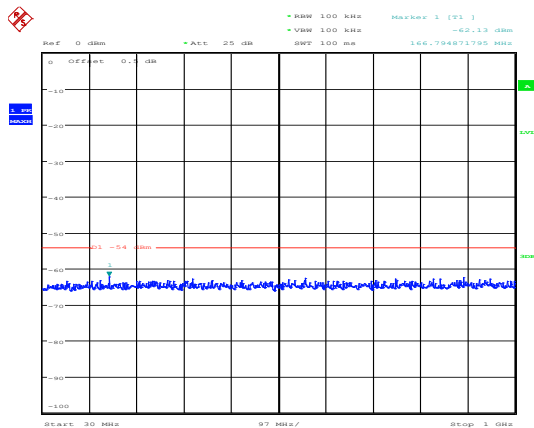


ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 15.JUL.2025 14:34:42

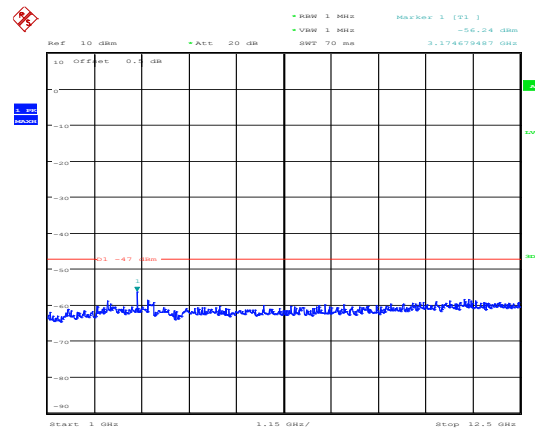


ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 15.JUL.2025 14:37:11

Highest Channel

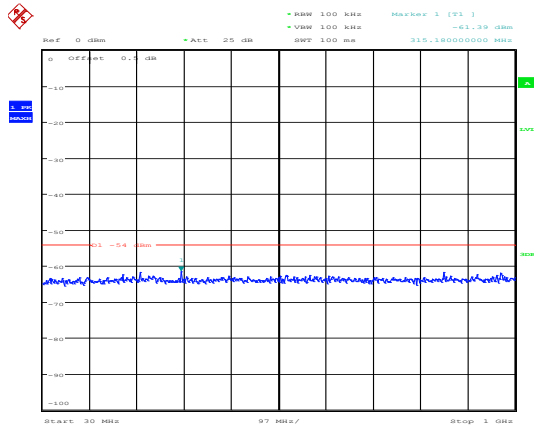


ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 15.JUL.2025 14:35:05



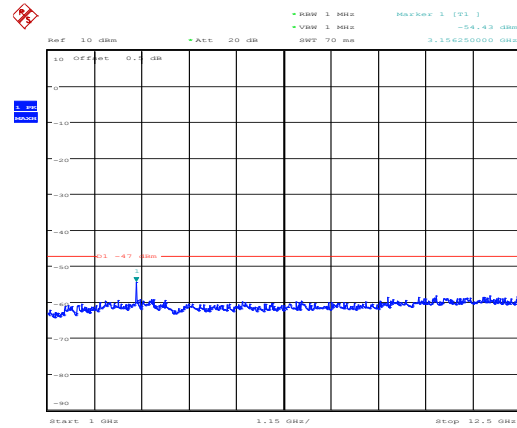
ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 15.JUL.2025 14:37:29

Low Voltage:



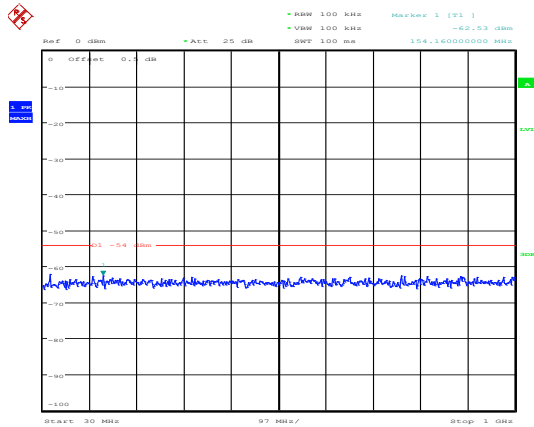
ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 18.JUL.2025 13:06:00

Lowest Channel

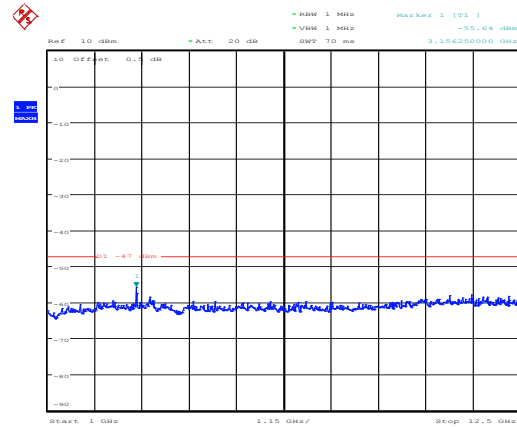


ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 18.JUL.2025 13:06:18

Middle Channel

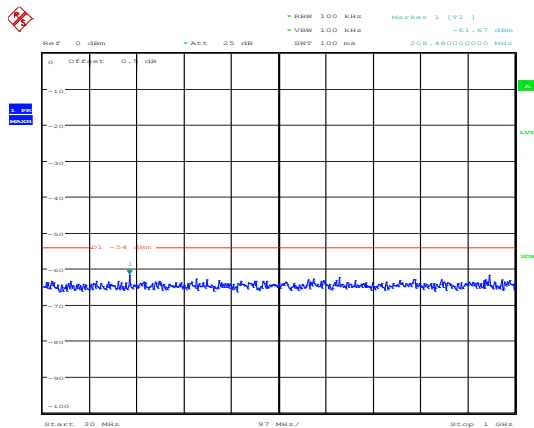


ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 18.JUL.2025 13:06:38

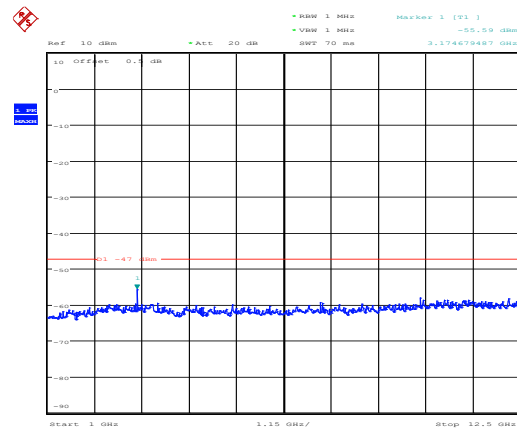


ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 18.JUL.2025 13:07:13

Highest Channel

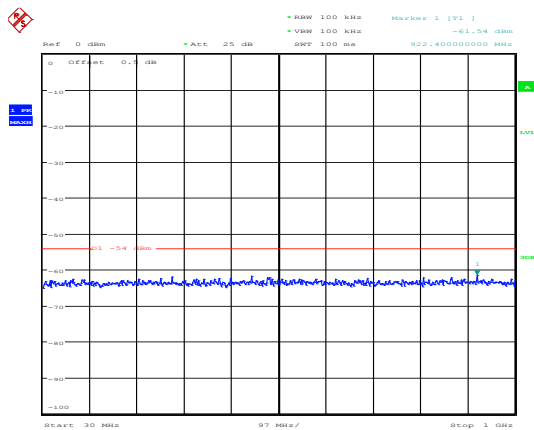


ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 18.JUL.2025 13:07:29



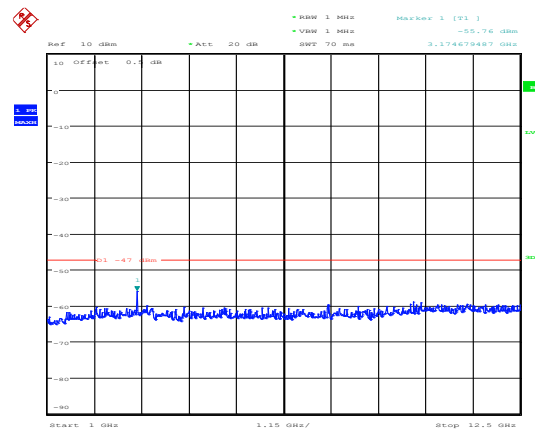
ProjectNo.:2503V05972E-RF Tester:Lingling Li
Date: 18.JUL.2025 13:08:07

High Voltage:



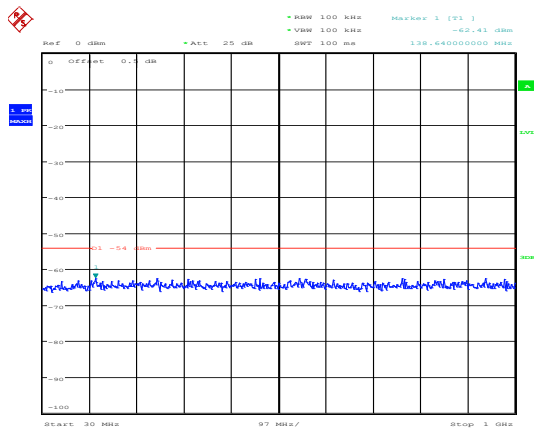
ProjectNo.:2503V05972E-RF Tester:LingLing Li
Date: 18.JUL.2025 13:09:08

Lowest Channel

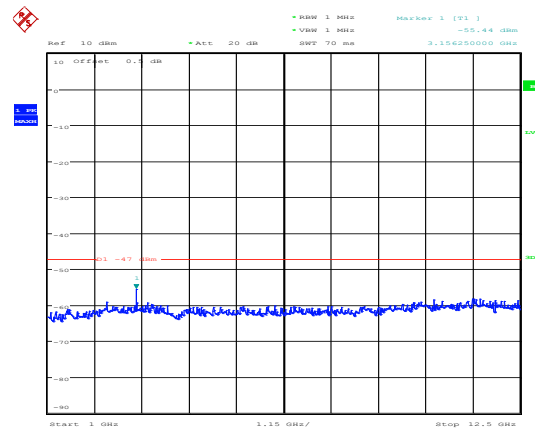


ProjectNo.:2503V05972E-RF Tester:LingLing Li
Date: 18.JUL.2025 13:09:41

Middle Channel

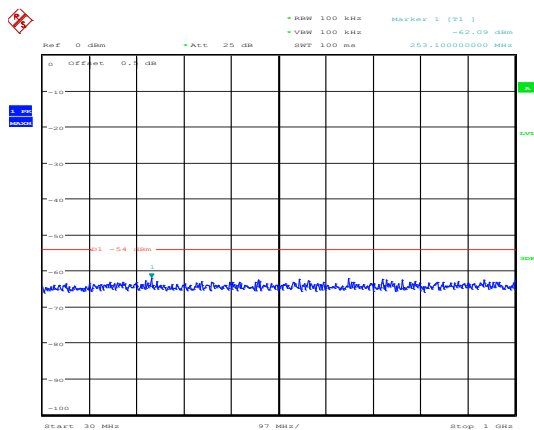


ProjectNo.:2503V05972E-RF Tester:LingLing Li
Date: 18.JUL.2025 13:10:02

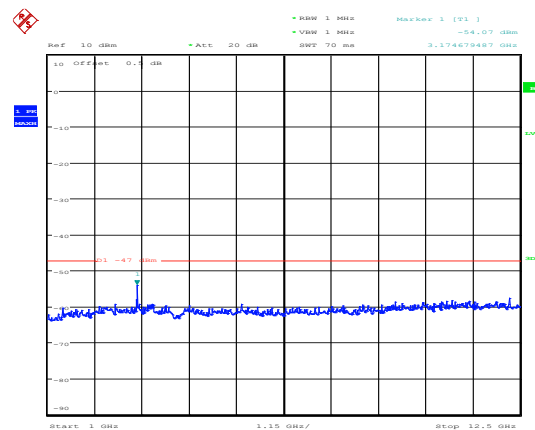


ProjectNo.:2503V05972E-RF Tester:LingLing Li
Date: 18.JUL.2025 13:11:26

Highest Channel



ProjectNo.:2503V05972E-RF Tester:LingLing Li
Date: 18.JUL.2025 13:12:35



ProjectNo.:2503V05972E-RF Tester:LingLing Li
Date: 18.JUL.2025 13:13:04

4.7 Interference Prevention Function

Test Result: Compliant, please see the below table.

Item	Result	Requirement	Verdict
Methodology to transmit ID Code:	Automatically	Automatically	Good
Methodology to receive ID Code:	Automatically	Automatically	Good
Identification Codes (ID Codes):	a4:c1:38:01:7b:9c:51:6b	/	/
Bits of ID Codes:	64 bits	48 bits or more	Compliant
Screenshot:	Mac a4:c1:38:01:7b:9c:51:6b		

4.8 Construction Protection Confirmation

Result: Compliant. please see the below table.

☒	Sealed with screws.
☐	Plastic chassis is being welded using ultrasonic waves.
☐	Cover 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.
☐	Other If 'Other', describe the method here. Then delete this text.
Photographs	
	

5. EUT PHOTOGRAPHS

Please refer to the attachment 2503V05972E-RF EXP EUT EXTERNAL PHOTOGRAPHS and 2503V05972E-RF INP EUT INTERNAL PHOTOGRAPHS.

6. TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2503V05972E-RF-07-TSP TEST SETUP PHOTOGRAPHS.

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