

Radio Test Report

Manufacturer: Renishaw Plc
Model: RMP400SQE



In accordance with ARIB STD-T66 and MIC No.
88 Annex 43 (Article 2 Paragraph 1 Item 19)

Prepared for: Renishaw Plc
New Mills
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COMMERCIAL-IN-CONFIDENCE

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SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Ryan Henley	Business Dev Director	Authorised Signatory	10 April 2026

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with ARIB STD-T66 and MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19): 3.7 (2014-10) for the tests detailed in section 1.3.

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1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
01	First version	07-Jan-2026
02	Correction made to Automatic Equipment Switch Off in application form – table 9	10-Mar-2026
03	Added reference to Radio Equipment Regulations to brief summary of results table	10-Apr-2026

Table 1

1.2 Introduction

Applicant	Renishaw Plc
Manufacturer	Renishaw Plc
Model Number(s)	RMP400SQE
Serial Number(s)	PCB: 00017472733 / EUT: 5RMY92, 5RMY64 and PCB: 00017472757 / EUT: 5RMY93
Hardware Version(s)	Production
Software Version(s)	Production
Number of Samples Tested	3
Test Specification/Issue/Date	ARIB STD-T66 and MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19): 3.7 (2014-10)
Order Number	PU03737302
Date	13-August-2025
Date of Receipt of EUT	07-October-2025
Start of Test	27-October-2025
Finish of Test	20-November-2025
Name of Engineer(s)	Joshua Peploe-Williams and Thomas Biddlecombe
Related Document(s)	Radio Equipment Regulations, Article 24 Radio Equipment Regulations, Article 14 Radio Equipment Regulations, Article 5 Table 1 Radio Equipment Regulations, Article 7, Table 3 Radio Equipment Regulations, Article 6, Table 2 Radio Equipment Regulations, Article 49-20 Radio Equipment Regulations, Article 9-4



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with ARIB STD-T66 and MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19) is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: 2.4GHz - FHSS				
2.2	3.2 (2)	Antenna Power	Pass	Radio Equipment Regulations, Article 14
2.3	3.2 (4)	Frequency Deviation	Pass	Radio Equipment Regulations, Article 5 Table 1
2.4	3.2 (6)	Permissible Value of Spurious or Unnecessary Radiation Intensity	Pass	Radio Equipment Regulations, Article 7, Table 3
2.5	3.2 (7)	Allowable Value for Occupied Bandwidth	Pass	Radio Equipment Regulations, Article 6, Table 2
2.6	3.2 (8)	Spread Bandwidth	Pass	Radio Equipment Regulations, Article 49-20
2.7	3.2 (9)	Process Gain	Pass	Radio Equipment Regulations, Article 49-20
2.8	3.2 (11)	Dwell Time	Pass	Radio Equipment Regulations, Article 49-20
2.9	3.3 (1)	Limit on Secondary Radiation	Pass	Radio Equipment Regulations, Article 24
2.10	3.6 (2)	Antenna Gain	Pass	Radio Equipment Regulations, Article 49-20



Configuration and Mode: 2.4GHz - DTS				
2.2	3.2 (2)	Antenna Power	Pass	Radio Equipment Regulations, Article 14
2.3	3.2 (4)	Frequency Deviation	Pass	Radio Equipment Regulations, Article 5 Table 1
2.4	3.2 (6)	Permissible Value of Spurious or Unnecessary Radiation Intensity	Pass	Radio Equipment Regulations, Article 7, Table 3
2.5	3.2 (7)	Allowable Value for Occupied Bandwidth	Pass	Radio Equipment Regulations, Article 6, Table 2
2.6	3.2 (8)	Spread Bandwidth	Pass	Radio Equipment Regulations, Article 49-20
2.9	3.3 (1)	Limit on Secondary Radiation	Pass	Radio Equipment Regulations, Article 24
2.10	3.6 (2)	Antenna Gain	Pass	Radio Equipment Regulations, Article 49-20
Configuration and Mode: 2.4GHz -				
2.1	Article 2, Item (19) Notice 88, Appendix 43	Voltage Variations	Pass	Article 2, Item (19) Notice 88, Appendix 43
2.11	3.4 (1)	Interference Protection Function	Pass	Radio Equipment Regulations, Article 9-4

Table 2



1.4 Customer Supplied Form

Equipment Description

Technical Description: <i>(Please provide a brief description of the intended use of the equipment)</i>	The Renishaw RMP400S (model RMP400SQE) is a new generation radio transmission probe capable of both touch-trigger and scanning measurement. It is only compatible for application with the Renishaw RMM-QE (Radio Machine Module) and the USI (Universal Sensor Interface).
Manufacturer:	Renishaw
Model:	RMP400SQE
Part Number:	A-6970-0001
Hardware Version:	Production
Software Version:	Production

Table 3

Transmitter Technical Characteristics – Frequency Characteristics

Transmitter channel switching frequency range:	2404 to 2480 MHz
Transmitter frequency alignment range:	to MHz
Please confirm that the OFDM system shall have one or more carriers per 1MHz Bandwidth	☐ Yes ☐ No

Table 4

Transmitter Power Characteristics

Maximum effective rated power (rated as stated by the manufacturer):	0.0025W
Average effected radiated power (rated as stated by the manufacturer):	W
Is transmitter intended for continuous duty	☐ Yes ☒ No
Is transmitter intended for intermittent duty	☒ Yes ☐ No
If intermittent state DUTY CYCLE	
Transmitter ON seconds	Transmitter OFF seconds
Is transmitter output power variable:	
Continuous duty	☐ Yes ☒ No
Maximum power	0.0025W
Continuously variable ☐	Stepped ☐
dB per step	
Maximum RF output power	0.0025W
Minimum RF output power	W

Table 5

Transmitter - Modulation

Frequency ☒ Phase ☐ Other ☐
If other supply details: GFSK

Table 6

Receiver Technical Characteristics – Frequency Characteristics

Receiver channel switching frequency range:	2404 MHz to 2480 MHz
Receiver frequency alignment range:	to MHz

Table 7

Channel Separation

Channel Separation	2000 kHz
State the maximum number of channels over which the equipment can operate:	39

Table 8

Automatic Equipment Switch Off

If the equipment is designed to automatically switch off at a predetermined voltage level which is higher or lower in value than the battery minimum and minimum calculated values this shall be clearly stated.	
Applies ☒	Does Not Apply ☐
5.9	V Cut off Voltage

Table 9

AC Power Source

AC supply frequency:		Hz
Voltage		V
Max current:		A
Single Phase ☐ Three Phase ☐		

Table 10

DC Power Source

Nominal voltage:		V
Extreme upper voltage:		V
Extreme lower voltage:		V
Max current:		A

Table 11

Battery Power Source

Voltage:	7.2V	V
End-point voltage:	5.9V	V (Point at which the battery will terminate)
Alkaline ☐ Leclanche ☐ Lithium ☐ Nickel Cadmium ☐ Lead Acid* ☐ *(Vehicle regulated)		
Other ☒	Please detail:	Lithium Thionyl Chloride

Table 12

Antenna Information

Frequency	2400 to 2483.5MHz
Gain	
Impedance	50 Ω
VSWR	<3:1
Weight	
Length	66mm
Diameter	
Finish	
Connector	Integral
Operating Temperature	
Flame Rating	
Polarisation	
RoHS Compliant	Yes
Pattern (i.e Omni Directional)	See Polar Plot

Table 13

I hereby declare that the information supplied is correct and complete.

Name: John Styles

Position held: Electronics Design Manager

Date: 01/10/2025

1.5 Product Information

1.5.1 Technical Description

The Renishaw RMP400S (model RMP400SQE) is a new generation radio transmission probe capable of both touch-trigger and scanning measurement. It is only compatible for application with the Renishaw RMM-QE (Radio Machine Module) and the USI (Universal Sensor Interface).

1.6 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Model: RMP400S, Serial Number: PCB: 00017472757 / EUT: 5RMY93			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: RMP400S, Serial Number: PCB: 00017472733 / EUT: 5RMY92			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: RMP400S PCB, Serial Number: 5RMY64			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 14



1.8 Test Location

TÜV SÜD conducted the following tests at our Octagon House Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: 2.4GHz - FHSS		
Antenna Power	Thomas Biddlecombe	UKAS
Frequency Deviation	Thomas Biddlecombe	UKAS
Permissible Value of Spurious or Unnecessary Radiation Intensity	Joshua Peploe-Williams	UKAS
Allowable Value for Occupied Bandwidth	Thomas Biddlecombe	UKAS
Spread Bandwidth	Thomas Biddlecombe	UKAS
Process Gain	Thomas Biddlecombe	UKAS
Dwell Time	Thomas Biddlecombe	UKAS
Limit on Secondary Radiation	Joshua Peploe-Williams	UKAS
Antenna Gain	Thomas Biddlecombe	UKAS
Configuration and Mode: 2.4GHz - DTS		
Allowable Value for Occupied Bandwidth	Thomas Biddlecombe	UKAS
Antenna Power	Thomas Biddlecombe	UKAS
Frequency Deviation	Thomas Biddlecombe	UKAS
Permissible Value of Spurious or Unnecessary Radiation Intensity	Joshua Peploe-Williams	UKAS
Spread Bandwidth	Thomas Biddlecombe	UKAS
Limit on Secondary Radiation	Joshua Peploe-Williams	UKAS
Antenna Gain	Thomas Biddlecombe	UKAS
Configuration and Mode: 2.4GHz -		
Voltage Variations	Joshua Peploe-Williams	UKAS
Interference Protection Function	Thomas Biddlecombe	UKAS

Table 15

Laboratory Address: TÜV SÜD, Octagon House,
Concorde Way, Fareham, Hampshire,
PO15 5RL, United Kingdom



2 Test Details

2.1 Voltage Variations

2.1.1 Specification Reference

ARIB STD-T66
MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19), Clause Article 2, Item (19) Notice 88, Appendix 43

2.1.2 Equipment Under Test and Modification State

RMP400S PCB, S/N: 5RMY64 - Modification State 0

2.1.3 Date of Test

28-October-2025

2.1.4 Test Method

The input voltage was set to $\pm 10\%$ of the nominal voltage specified by the manufacturer. Using a DVM the input voltage to the RF circuit was measured.

2.1.5 Environmental Conditions

Ambient Temperature	20.1 °C
Relative Humidity	42.3 %



2.1.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
Digital Multi-meter	Iso-tech	IDM93N	4435	12	06-Mar-2026
Power Supply	Rohde & Schwarz	HMP4040	4955	-	O/P Mon

Table 17

O/P Mon – Output Monitored using calibrated equipment



2.2 Antenna Power

2.2.1 Specification Reference

ARIB STD-T66, Clause 3.2 (2)
MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19)

2.2.2 Equipment Under Test and Modification State

RMP400S, S/N: PCB: 00017472757 / EUT: 5RMY93 - Modification State 0

2.2.3 Date of Test

17-November-2025

2.2.4 Test Method

The Power Spectral Density was measured using a spectrum analyser which was tuned to the test frequency with the relevant RBW to match the limit. The max hold function on the analyser was used to obtain output power and assessed against the power limit.

A power meter was used to obtain the total conducted output power and a percentage deviation from the measured power to the declared power was calculated and assessed against the tolerance limits.

The EUT was powered by fresh 2x 3.6V batteries.

2.2.5 Environmental Conditions

Ambient Temperature	22.4 °C
Relative Humidity	26.3 %

2.2.6 Test Results

2.4GHz - FHSS

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	-
Limit Clause(s):	3.2(2)(a) 3.2(3)	Test Method(s):	Refer to Test Method
Additional Reference(s):	-		

DUT Configuration			
Mode:	FHSS GFSK (LE 2M)	Duty Cycle (%):	43.4
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	C (Pigtail Connector)	Peak Antenna Gain (dBi):	-4.87

Test Frequency (MHz)	Conducted Output Power (mW/MHz)					Limit (mW/MHz)
	A	B	C	D	Σ	
2442	-	-	1.30	-	-	3.00

Table 18 - Output Power Results

Test Frequency (MHz)	Conducted Output Power (mW)					Declared (mW)	Tolerance (%)	Limit (%)
	A	B	C	D	Σ			
Hopping	-	-	1.63	-	-	2.50	-34.98	-80 ≤ n ≤ +20

Table 19 - Output Power Tolerance Results

ARIB STD T-66, Limit Clause 3.2

Clause	Requirement
3.2(2)(a)	3 mW/MHz

Table 20 - Antenna Power Limit

2.4GHz - DTS

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	-
Limit Clause(s):	3.2(2)(a) 3.2(3)	Test Method(s):	Refer to Test Method
Additional Reference(s):	-		
Note(s):	3.6		

DUT Configuration			
Mode:	2 MB/s DTS	Duty Cycle (%):	43.4
Antenna Configuration:	SISO	DCCF (dB):	3.63
Active Port(s):	C (Pigtail Connector)	Peak Antenna Gain (dBi):	-4.87

Test Frequency (MHz)	Conducted Output Power (mW/MHz)					Limit (mW/MHz)
	A	B	C	D	Σ	
2404	-	-	1.23	-	-	3.00
2442	-	-	1.30	-	-	3.00
2480	-	-	1.23	-	-	3.00

Table 21 - Output Power Results

Test Frequency (MHz)	Conducted Output Power (mW)					Declared (mW)	Tolerance (%)	Limit (%)
	A	B	C	D	Σ			
2404	-	-	1.33	-	-	2.50	-46.63	$-80 \leq n \leq +20$
2442	-	-	1.41	-	-	2.50	-43.77	$-80 \leq n \leq +20$
2480	-	-	1.34	-	-	2.50	-46.52	$-80 \leq n \leq +20$

Table 22 - Output Power Tolerance Results

ARIB STD T-66, Limit Clause 3.2

Clause	Requirement
3.2(2)(a)	3 mW/MHz

Table 23 - Antenna Power Limit



2.2.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	18-Mar-2026
USB Power Sensor	Boonton	RTP5006	5184	12	29-Aug-2026
MXA Signal Analyser	Keysight Technologies	N9020B	5528	24	10-Sep-2027
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6350	12	02-Sep-2026
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	7137	12	29-Aug-2026

Table 24



2.3 Frequency Deviation

2.3.1 Specification Reference

ARIB STD-T66, Clause 3.2 (4)
MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19)

2.3.2 Equipment Under Test and Modification State

RMP400S, S/N: PCB: 00017472757 / EUT: 5RMY93 - Modification State 0

2.3.3 Date of Test

17-November-2025

2.3.4 Test Method

The frequency of the spectrum was measured using a spectrum analyser by finding the centre point of the 10 dB bandwidth. The deviation of the measured value from the assigned frequency was calculated in ppm.

The EUT was powered by fresh 2x 3.6V batteries.

2.3.5 Environmental Conditions

Ambient Temperature	22.4 °C
Relative Humidity	26.3 %



2.3.6 Test Results

2.4GHz - FHSS

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	3.2 (4)	Test Method(s):	Refer to test method
Additional Reference(s):	-		

DUT Configuration			
Mode:	2 MB/s DTS	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	C (Pigtail Connector)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	Frequency Error (ppm)				Limit (ppm)
	A	B	C	D	
2404	-	-	+29.264	-	±50.0
2442	-	-	+27.948	-	±50.0
2480	-	-	+32.347	-	±50.0

Table 25 - Frequency Tolerance Results

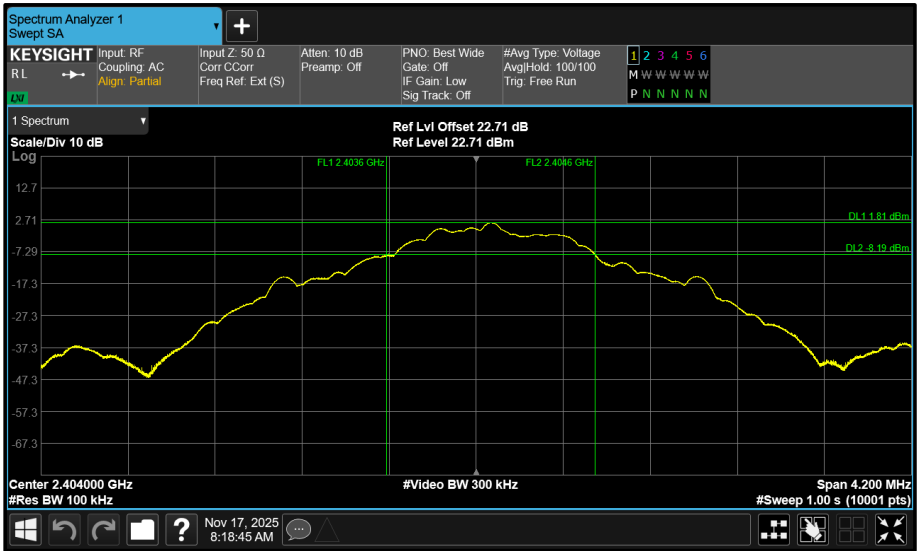


Figure 2 - 2404 MHz Frequency Tolerance

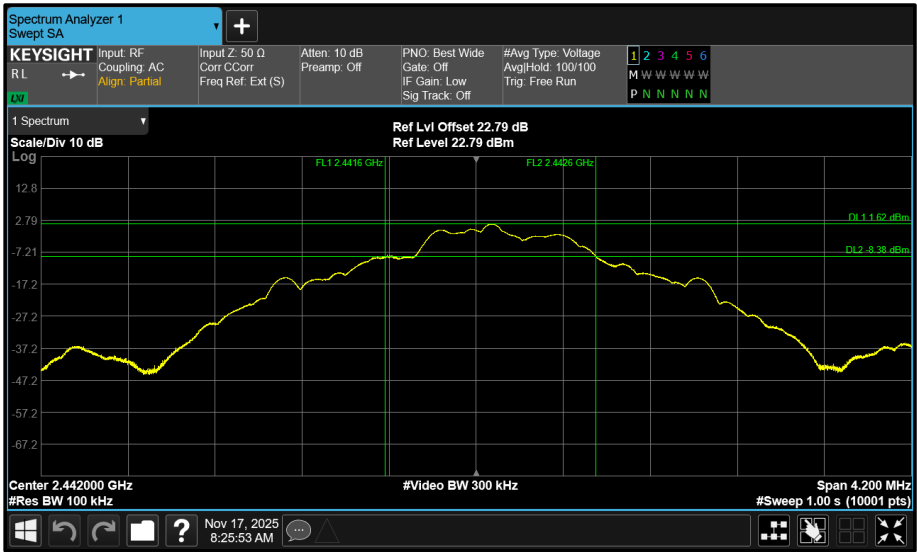


Figure 3 - 2442 MHz Frequency Tolerance

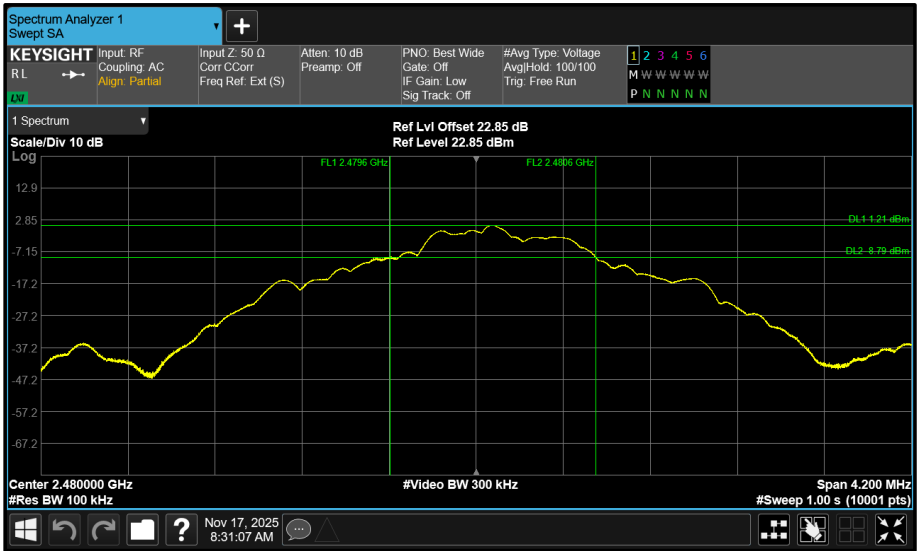


Figure 4 - 2480 MHz Frequency Tolerance

ARIB STD T-66, Limit Clause 3.2 (4)

$\pm 50 \times 10^{-6}$.



2.3.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	18-Mar-2026
MXA Signal Analyser	Keysight Technologies	N9020B	5528	24	10-Sep-2027
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6350	12	02-Sep-2026
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	7137	12	29-Aug-2026

Table 26



2.4 Permissible Value of Spurious or Unnecessary Radiation Intensity

2.4.1 Specification Reference

ARIB STD-T66, Clause 3.2 (6)
MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19)

2.4.2 Equipment Under Test and Modification State

RMP400S, S/N: PCB: 00017472733 / EUT: 5RMY92 - Modification State 0

2.4.3 Date of Test

27-October-2025 to 29-October-2025

2.4.4 Test Method

This test was performed in accordance with ARIB STD-T66 Clause 3.3 (1).
The EUT was connected via a 1m cable and 20 dB of attenuation.
A preliminary sweep was performed using EmX and for results within 10 dB a final measurement was performed.
A measurement bandwidth of 100 kHz was used for below 1 GHz and 1 MHz was used for above 1 GHz.
The EUT was battery powered and fully charged prior to testing.

2.4.5 Environmental Conditions

Ambient Temperature	19.9 - 20.3 °C
Relative Humidity	38.0 - 55.9 %



2.4.6 Test Results

2.4GHz - FHSS

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
*				

Table 27 - 802.15.4_TX, FHSS, 30 MHz to 13 GHz

*No emissions found within 6 dB of the limit.

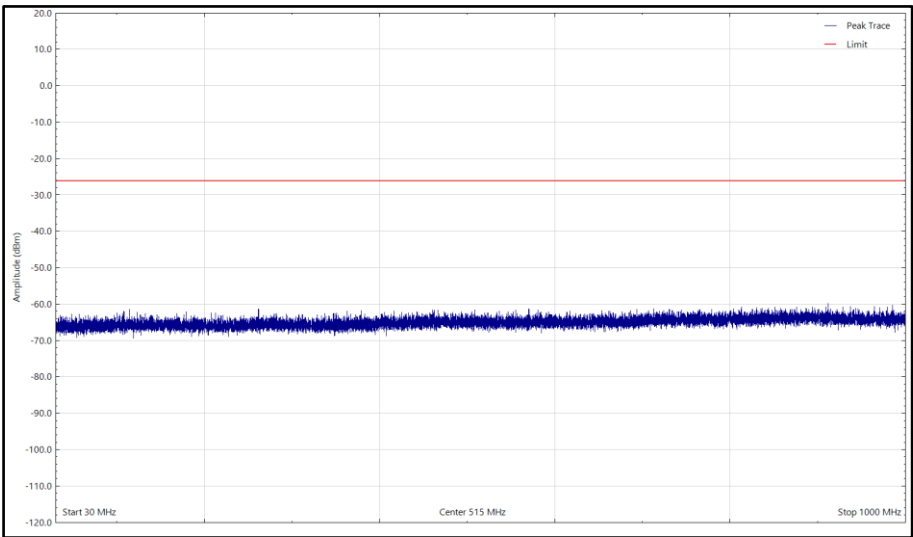


Figure 5 - 802.15.4_TX, FHSS, 30 MHz to 1 GHz, Vertical (Peak)

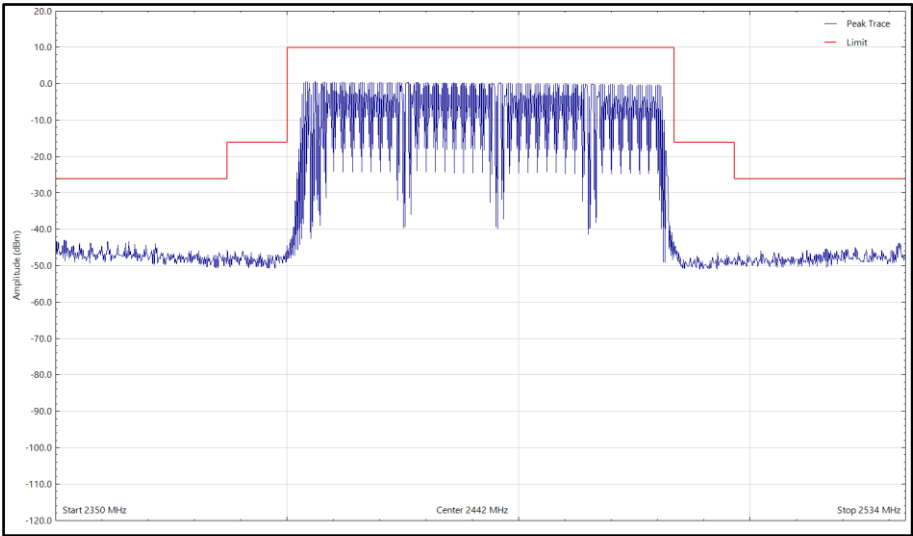


Figure 6 - 802.15.4_TX, FHSS, 2.350 GHz to 2.534 GHz, Vertical (Peak)

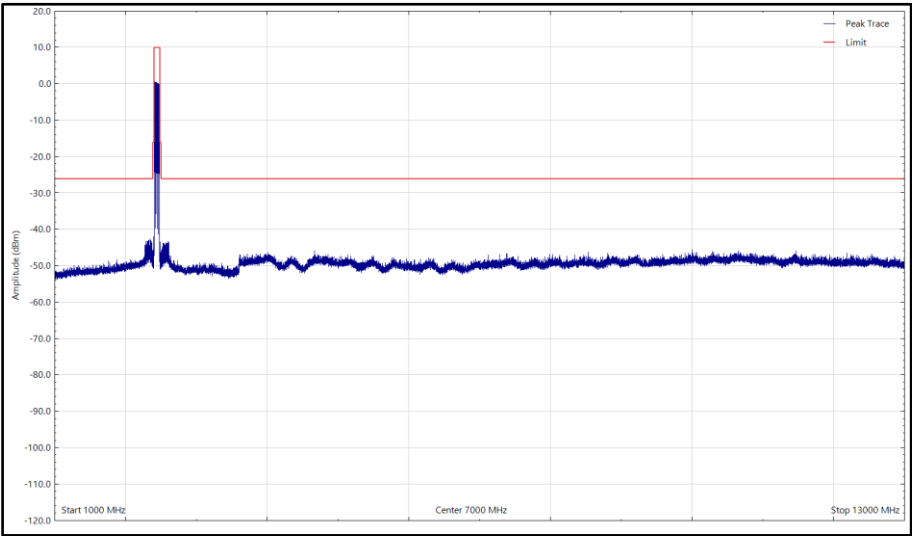


Figure 7 - 802.15.4_TX, FHSS, 1 GHz to 13 GHz, Vertical (Peak)

ARIB STD-T66, Limit Clause 3.2 (6)

Frequency Range	Limit
2387 MHz to 2400 MHz and 2483.5 MHz to 2496.5 MHz	25 μ W or -16 dBm
<2387 MHz and >2496.5 MHz	2.5 μ W or -26 dBm



2.4GHz - DTS

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
*				

Table 28 - 802.15.4_TX, 2404 MHz, 30 MHz to 13 GHz

*No emissions found within 6 dB of the limit.

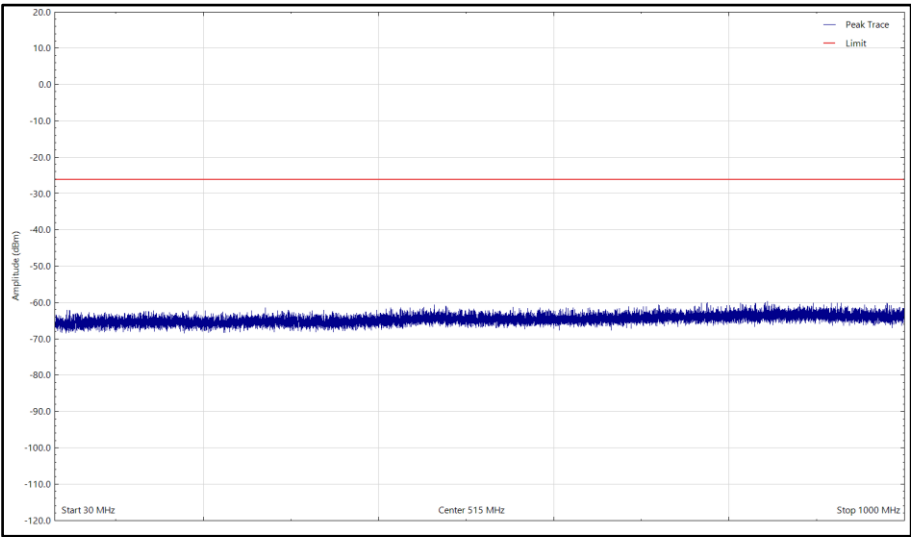


Figure 8 - 802.15.4_TX, 2404 MHz, 30 MHz to 1 GHz, Vertical (Peak)

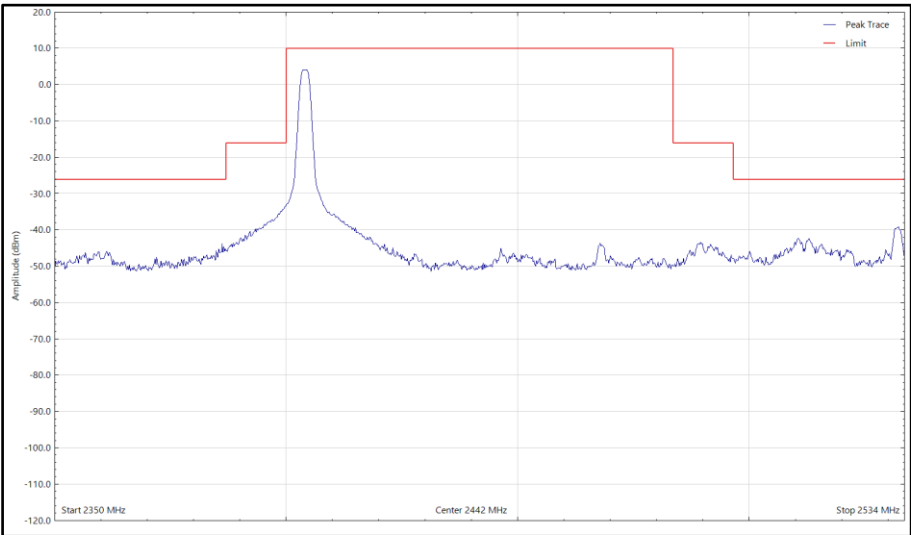


Figure 9 - 802.15.4_TX, 2404 MHz, 2.350 GHz to 2.534 GHz, Vertical (Peak)

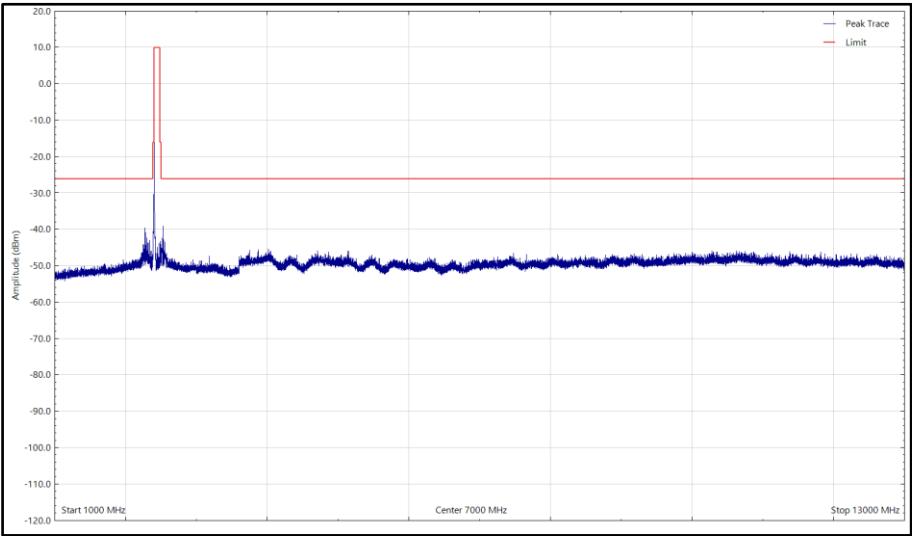


Figure 10 - 802.15.4_TX, 2404 MHz, 1 GHz to 13 GHz, Vertical (Peak)



Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
*				

Table 29 - 802.15.4_TX, 2442 MHz, 30 MHz to 13 GHz

*No emissions found within 6 dB of the limit.

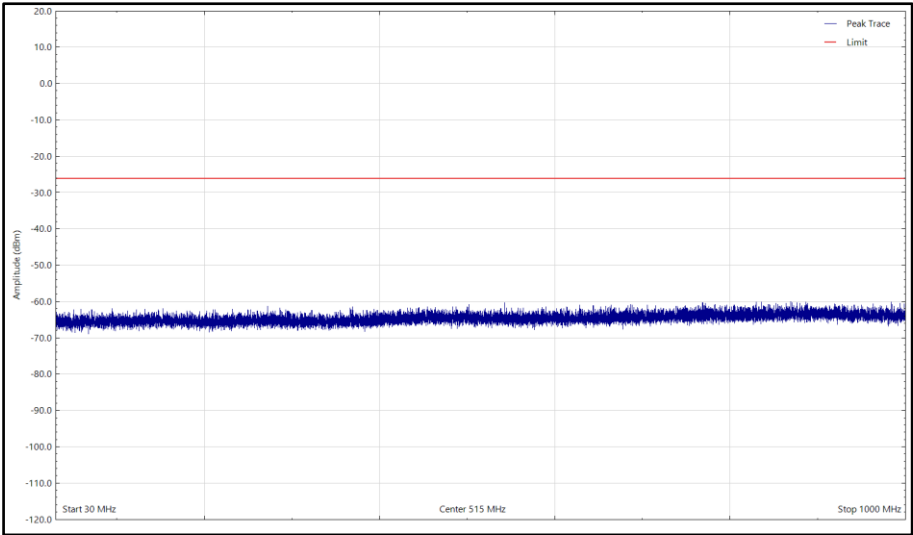


Figure 11 - 802.15.4_TX, 2442 MHz, 30 MHz to 1 GHz, Vertical (Peak)

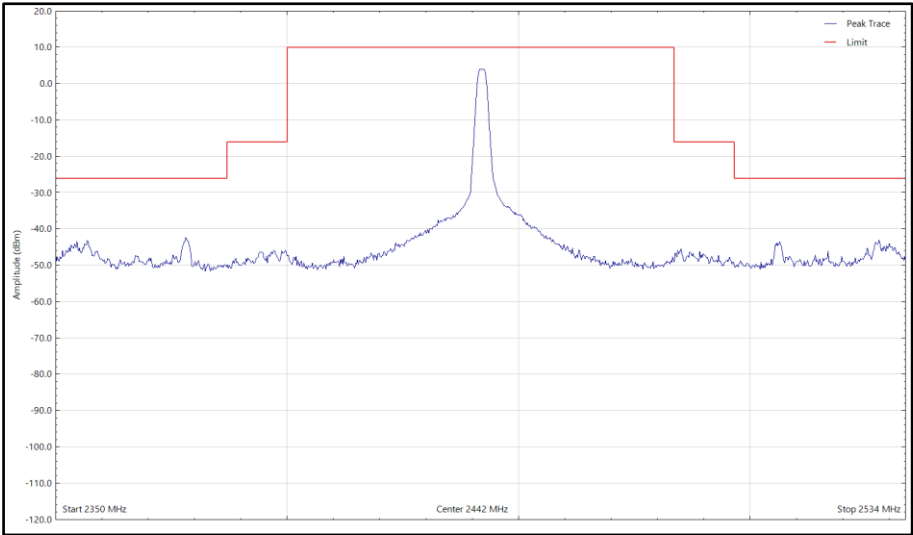


Figure 12 - 802.15.4_TX, 2442 MHz, 2.350 GHz to 2.534 GHz, Vertical (Peak)

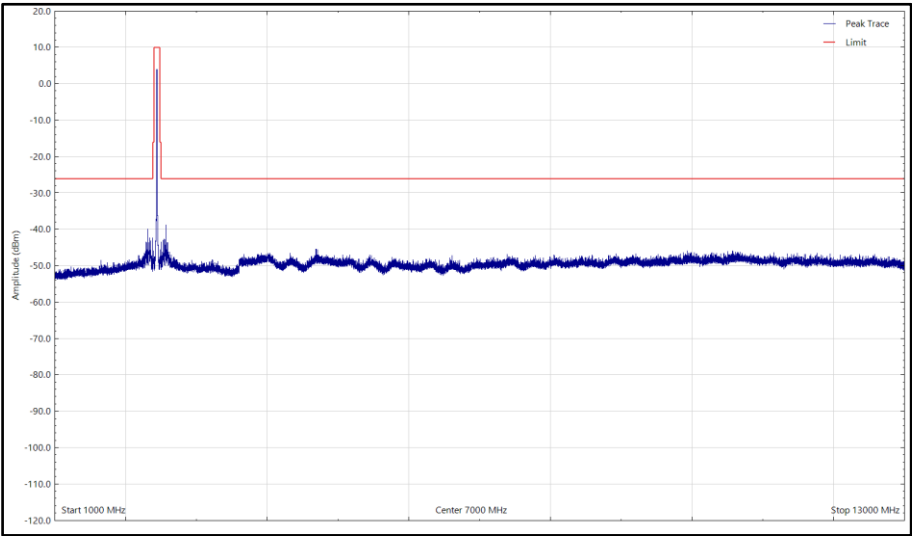


Figure 13 - 802.15.4_TX, 2442 MHz, 1 GHz to 13 GHz, Vertical (Peak)



Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
*				

Table 30 - 802.15.4_TX, 2480 MHz, 30 MHz to 13 GHz

*No emissions found within 6 dB of the limit.

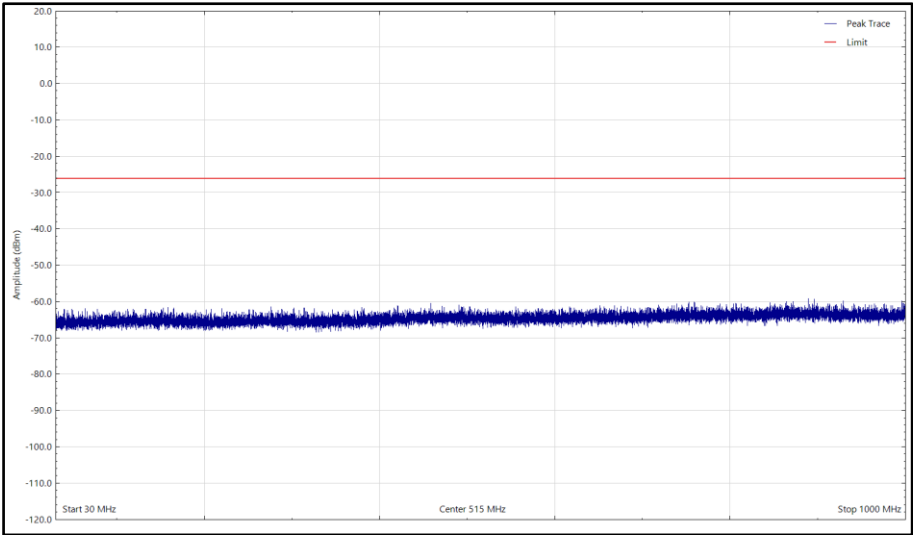


Figure 14 - 802.15.4_TX, 2480 MHz, 30 MHz to 1 GHz, Vertical (Peak)

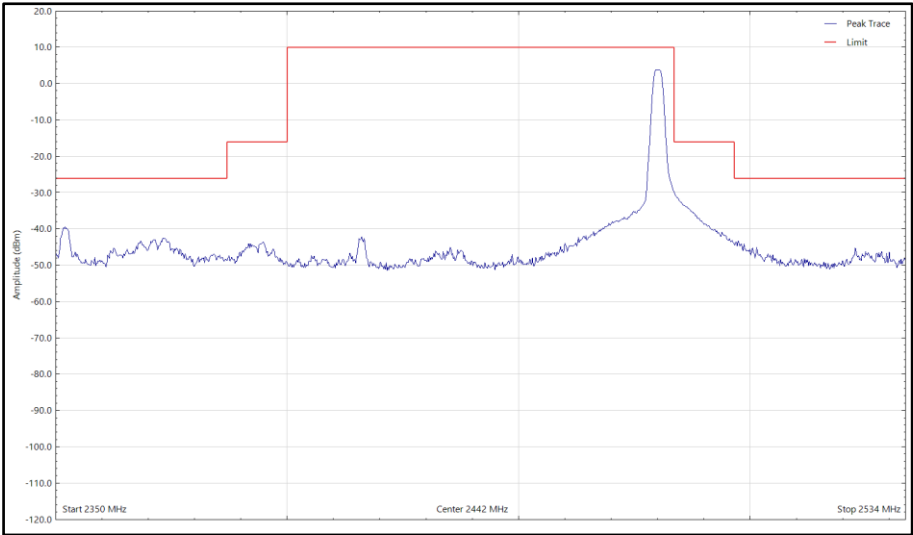


Figure 15 - 802.15.4_TX, 2480 MHz, 2.350 GHz to 2.534 GHz, Vertical (Peak)

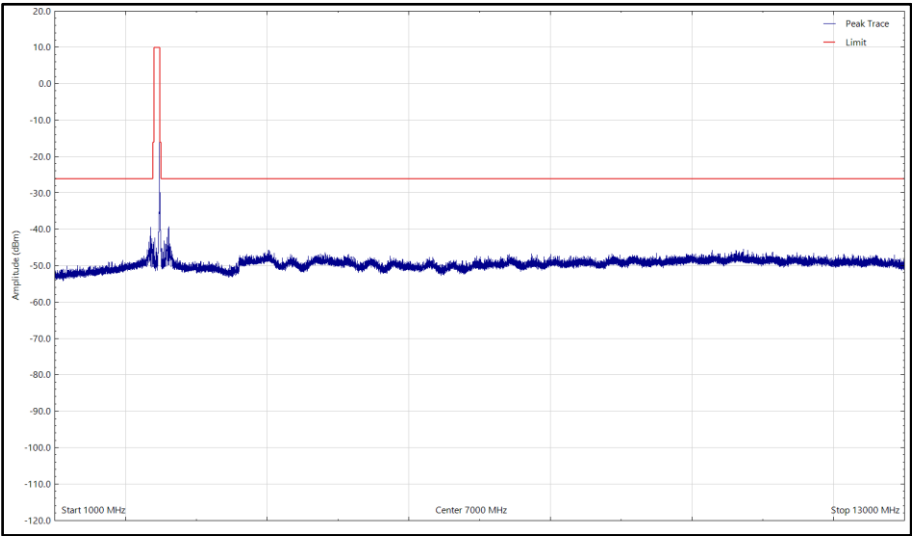


Figure 16 - 802.15.4_TX, 2480 MHz, 1 GHz to 13 GHz, Vertical (Peak)

ARIB STD-T66, Limit Clause 3.2 (6)

Frequency Range	Limit
2387 MHz to 2400 MHz and 2483.5 MHz to 2496.5 MHz	25 μ W or -16 dBm
<2387 MHz and >2496.5 MHz	2.5 μ W or -26 dBm



2.4.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	18-Mar-2026
Emissions Software	TUV SUD	EmX V3.5.5	5125	-	Software
Attenuator 5W 20dB DC-18GHz	Aaren	AT40A-4041-D18-20	5497	12	23-Apr-2026
3 GHz High pass Filter	Wainwright	WHKX12-2580-3000-18000-80SS	5547	12	30-May-2026
1m Coaxial Cable Assy	Junkosha	MWX221-01000AMSAMS/A	6381	12	30-Jul-2026
MXA Signal Analyser	Keysight Technologies	N9020B	6876	24	31-Aug-2026

Table 31



2.5 Allowable Value for Occupied Bandwidth

2.5.1 Specification Reference

ARIB STD-T66, Clause 3.2 (7)
MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19)

2.5.2 Equipment Under Test and Modification State

RMP400S, S/N: PCB: 00017472757 / EUT: 5RMY93 - Modification State 0

2.5.3 Date of Test

17-November-2025

2.5.4 Test Method

The spectrum analyser was tuned to the test frequency with a span to incorporate the entire bandwidth of the modulated signal. Allowing for the trace to stabilize, the bandwidth whereby 99% power of the power resides was recorded.

The EUT was powered by fresh 2x 3.6V batteries.

2.5.5 Environmental Conditions

Ambient Temperature	22.4 °C
Relative Humidity	26.3 %



2.5.6 Test Results

2.4GHz - FHSS

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	-
Limit Clause(s):	3.2(7)	Test Method(s):	Refer to Test Method
Additional Reference(s):	-		

DUT Configuration			
Mode:	2 MB/s FHSS	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	C (Pigtail Connector)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (MHz)
	A	B	C	D	Maximum	
2404-2480	-	-	78.008	-	78.008	≤83.5

Table 32 - 99% Bandwidth Results

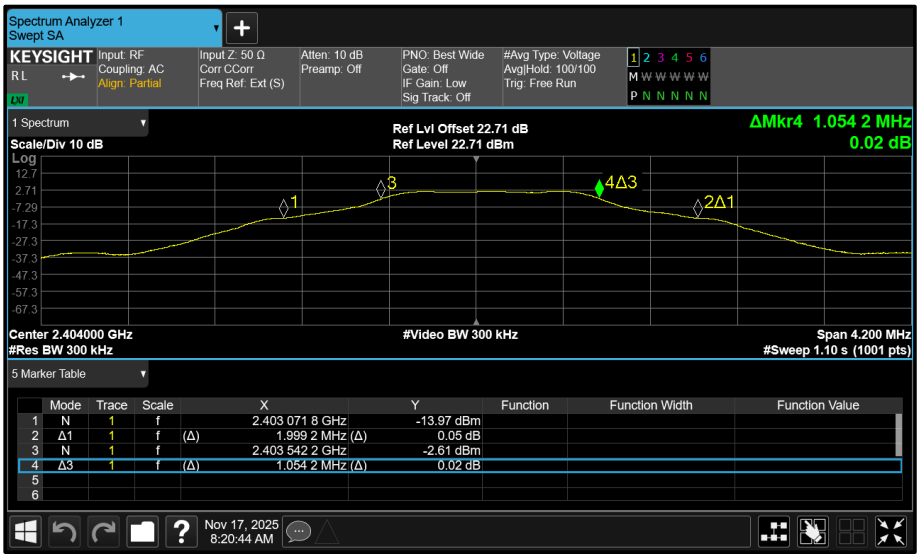


Figure 17 - 2404 MHz Occupied Bandwidth

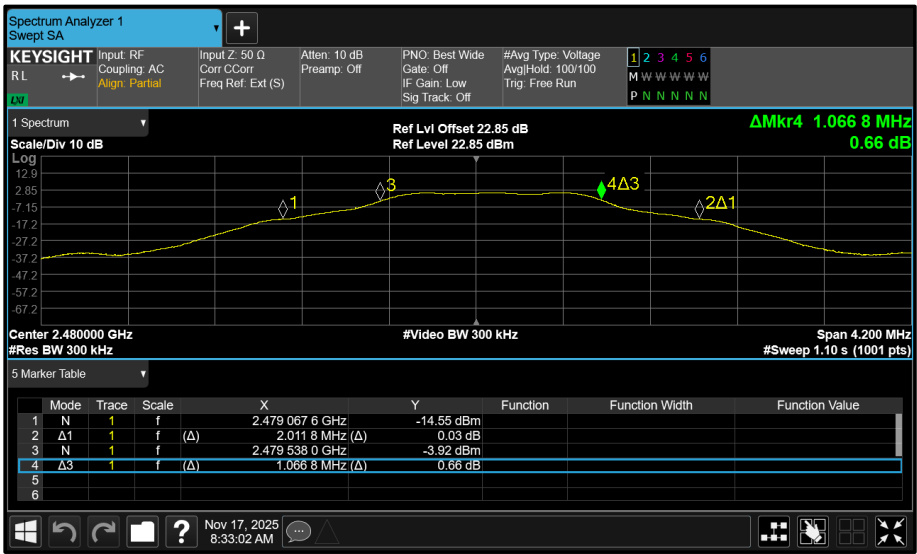


Figure 18 - 2480 MHz Occupied Bandwidth

ARIB STD T-66, Limit Clause 3.2 (7)

Permissible value of occupied frequency bandwidth for transmission devices using a FH system, a DS-FH hybrid system, or a FH-OFDM hybrid system is at most 83.5MHz; for transmission devices using an OFDM system is at most 38MHz; and for transmission devices using any other system the necessary frequency bandwidth is at most 26MHz.



2.4GHz - DTS

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	-
Limit Clause(s):	3.2(7)	Test Method(s):	Refer to Test Method
Additional Reference(s):	-		

DUT Configuration			
Mode:	2 MB/s DTS	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	C (Pigtail Connector)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (MHz)
	A	B	C	D	Maximum	
2404	-	-	1.999	-	1.999	≤26.0
2442	-	-	2.008	-	2.008	≤26.0
2480	-	-	2.012	-	2.012	≤26.0

Table 33 - 99% Bandwidth Results

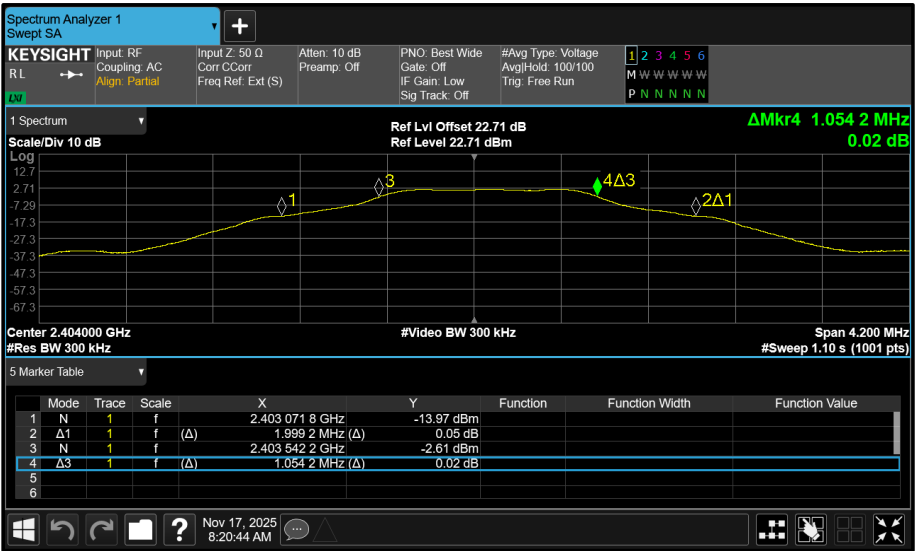


Figure 19 - 2404 MHz Occupied Bandwidth

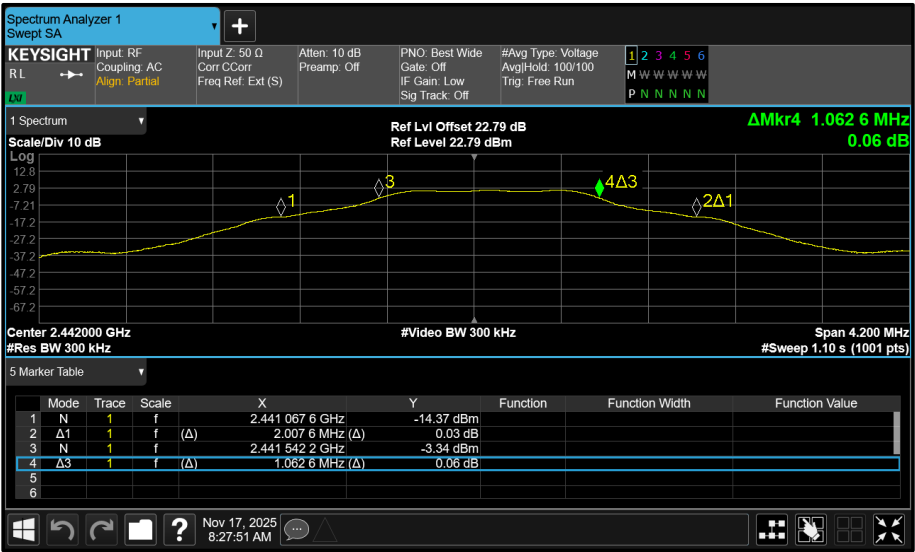
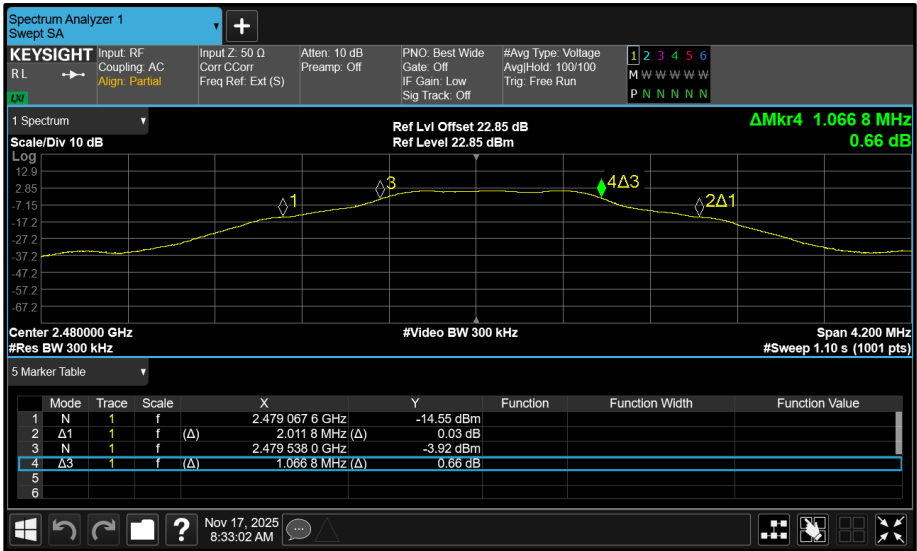


Figure 20 - 2442 MHz Occupied Bandwidth



ARIB STD T-66, Limit Clause 3.2 (7)

Permissible value of occupied frequency bandwidth for transmission devices using a FH system, a DS-FH hybrid system, or a FH-OFDM hybrid system is at most 83.5MHz; for transmission devices using an OFDM system is at most 38MHz; and for transmission devices using any other system the necessary frequency bandwidth is at most 26MHz.



2.5.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	18-Mar-2026
MXA Signal Analyser	Keysight Technologies	N9020B	5528	24	10-Sep-2027
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6350	12	02-Sep-2026
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	7137	12	29-Aug-2026

Table 34



2.6 Spread Bandwidth

2.6.1 Specification Reference

ARIB STD-T66, Clause 3.2 (8)
MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19)

2.6.2 Equipment Under Test and Modification State

RMP400S, S/N: PCB: 00017472757 / EUT: 5RMY93 - Modification State 0

2.6.3 Date of Test

17-November-2025

2.6.4 Test Method

The spectrum analyser was tuned to the test frequency with a span to incorporate the entire bandwidth of the modulated signal. Allowing for the trace to stabilize, the bandwidth whereby 90% power of the power resides was recorded.

The EUT was powered by fresh 2x 3.6V batteries.

2.6.5 Environmental Conditions

Ambient Temperature	22.4 °C
Relative Humidity	26.3 %



2.6.6 Test Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	-
Limit Clause(s):	3.2(8)	Test Method(s):	Refer to Test Method
Additional Reference(s):	-		

DUT Configuration			
Mode:	2 MB/s DTS	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	C (Pigtail Connector)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	99% Bandwidth (MHz)					Limit (MHz)
	A	B	C	D	Maximum	
2404	-	-	1.054	-	1.054	≥0.5
2442	-	-	1.063	-	1.063	≥0.5
2480	-	-	1.067	-	1.067	≥0.5

Table 35 - 99% Bandwidth Results

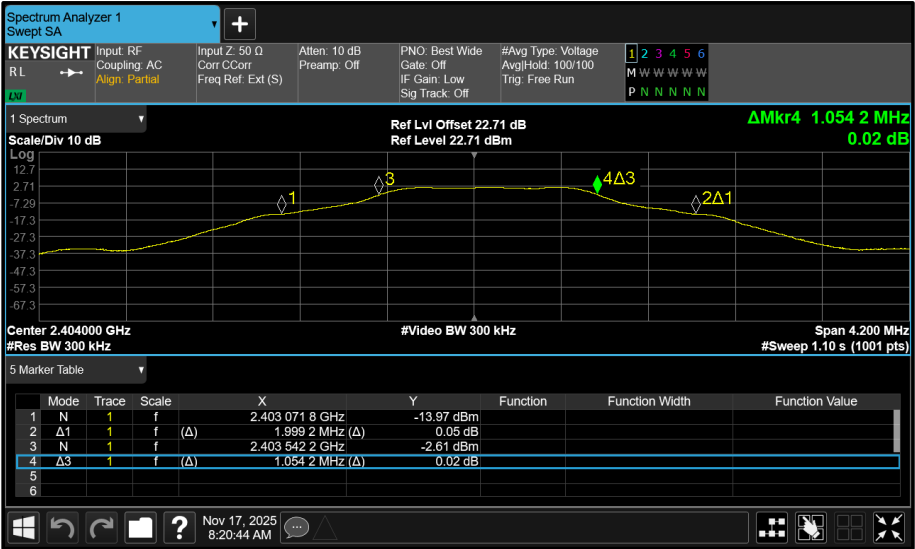


Figure 22 - 2404 MHz Occupied Bandwidth

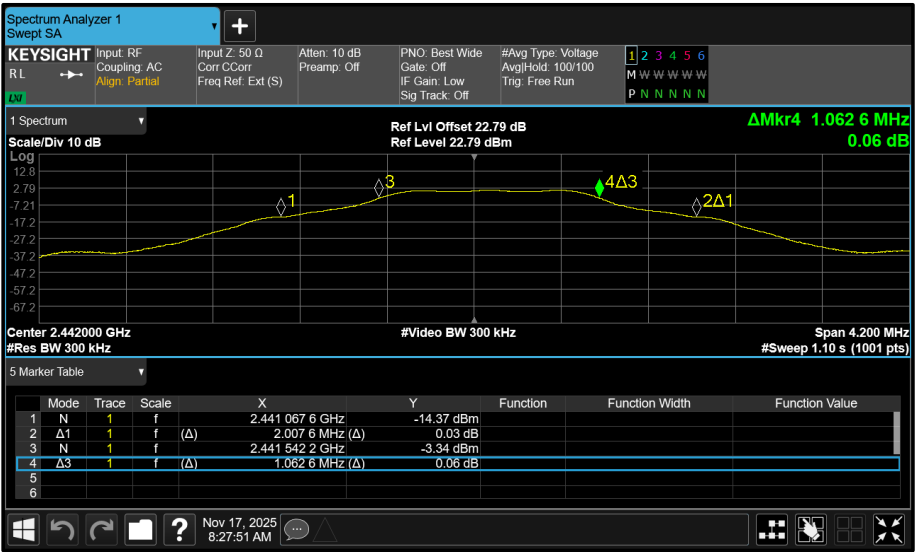


Figure 23 - 2442 MHz Occupied Bandwidth

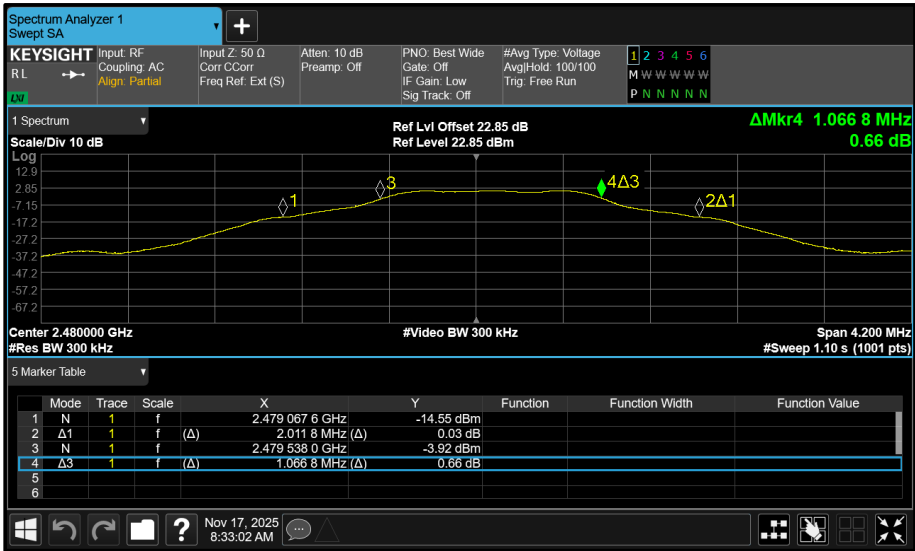


Figure 24 - 2480 MHz Occupied Bandwidth

ARIB STD T-66, Limit Clause 3.2 (8)

For spread spectrum systems, the spread bandwidth must be at least 500kHz.



2.6.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	18-Mar-2026
MXA Signal Analyser	Keysight Technologies	N9020B	5528	24	10-Sep-2027
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6350	12	02-Sep-2026
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	7137	12	29-Aug-2026

Table 36



2.7 Process Gain

2.7.1 Specification Reference

ARIB STD-T66, Clause 3.2 (9)
MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19)

2.7.2 Equipment Under Test and Modification State

RMP400S, S/N: PCB: 00017472757 / EUT: 5RMY93 - Modification State 0

2.7.3 Date of Test

17-November-2025

2.7.4 Test Method

The process gain was calculated via the following method:

$(\text{Spread Bandwidth MHz} * \text{Minimum number of hopping channels}) / \text{Data rate Mb/s}$

The minimum number of hopping channels was confirmed to be 39 by the customer.

2.7.5 Environmental Conditions

Ambient Temperature	22.4 °C
Relative Humidity	26.3 %

2.7.6 Test Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	-
Limit Clause(s):	3.2(9)	Test Method(s):	Refer to Test Method
Additional Reference(s):	-		

DUT Configuration			
Mode:	2 Mb/s FHSS	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	C (Pigtail Connector)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	90% Spread Bandwidth (MHz)	Spread Factor	
		Minimum	Limit
2404	1.054	20.553	≥5.0
2442	1.063	20.729	≥5.0
2480	1.067	20.807	≥5.0

Table 37 - Process Gain

ARIB STD T-66, Limit Clause 3.2 (9)

For spread spectrum systems, the process gain must be at least 5.



2.8 Dwell Time

2.8.1 Specification Reference

ARIB STD-T66, Clause 3.2 (11)
MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19)

2.8.2 Equipment Under Test and Modification State

RMP400S, S/N: PCB: 00017472757 / EUT: 5RMY93 - Modification State 0

2.8.3 Date of Test

17-November-2025

2.8.4 Test Method

The spectrum analyser was tuned to the test frequency with a zero Hz span and a low enough RBW to avoid picking up transmissions on other channels. The trace was swept for long enough to conclude the hopping channel does not exceed the limits.

The EUT was powered by fresh 2x 3.6V batteries.

2.8.5 Environmental Conditions

Ambient Temperature	22.4 °C
Relative Humidity	26.3 %

2.8.6 Test Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	-
Limit Clause(s):	3.2(11)	Test Method(s):	Refer to Test Method
Additional Reference(s):	-		

DUT Configuration			
Mode:	2 MB/s FHSS	Duty Cycle (%):	43.4
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	C (Pigtail Connector)	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	Time of Occupancy			Limit (ms)
	Dwell Time (ms)	Number of Transmissions	Time of Occupancy (ms)	
2404	0.218	800	174.5	400.0

Table 38 - Time of Occupancy Results

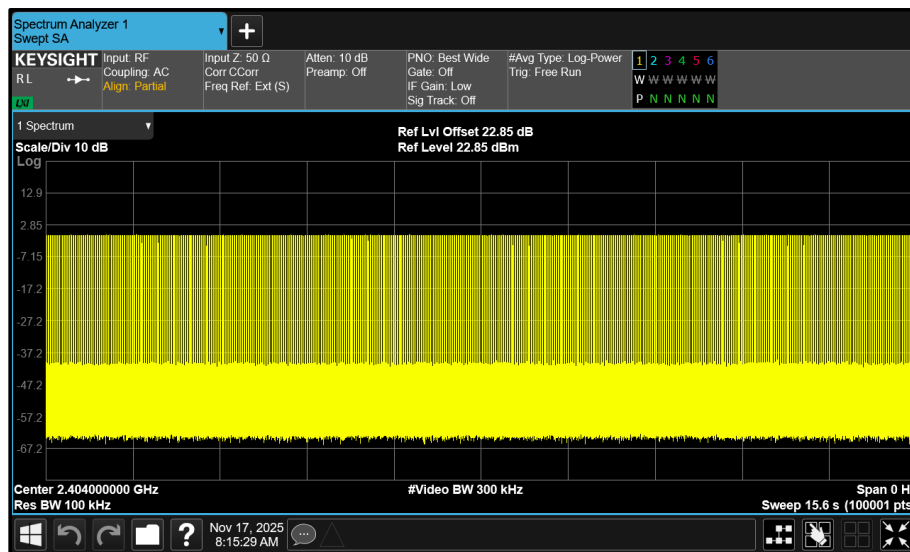


Figure 25 - 2404 MHz Accumulated Transmit Time

ARIB STD T66, Limit Clause 3.2 (11)

For transmission devices that use a FH system, the frequency dwell time should be at most 0.4 seconds, except transmission devices for radio controllers used with outdoor model airplanes, for which the dwell time should be at most 0.05 seconds. For transmission devices that use a DS system or DS hybrid system that does not involve an OFDM system, the total frequency dwell time for an arbitrary frequency, within a time of 0.4 seconds multiplied by the process gain, should be at most 0.4 seconds.



2.8.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	18-Mar-2026
MXA Signal Analyser	Keysight Technologies	N9020B	5528	24	10-Sep-2027
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6350	12	02-Sep-2026
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	7137	12	29-Aug-2026

Table 39



2.9 Limit on Secondary Radiation

2.9.1 Specification Reference

ARIB STD-T66, Clause 3.3 (1)
MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19)

2.9.2 Equipment Under Test and Modification State

RMP400S, S/N: PCB: 00017472733 / EUT: 5RMY92 - Modification State 0

2.9.3 Date of Test

27-October-2025 to 29-October-2025

2.9.4 Test Method

This test was performed in accordance with ARIB STD-T66 Clause 3.3 (1).
The EUT was connected via a 1m cable and 20 dB of attenuation.
A preliminary sweep was performed using EmX and for results within 10 dB a final measurement was performed.
A measurement bandwidth of 100 kHz was used for below 1 GHz and 1 MHz was used for above 1 GHz.
The EUT was battery powered and fully charged prior to testing.

2.9.5 Environmental Conditions

Ambient Temperature	19.9 - 20.3 °C
Relative Humidity	38.0 - 55.9 %



2.9.6 Test Results

2.4GHz - FHSS

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
*				

Table 40 - 802.15.4_RX, FHSS, 30 MHz to 13 GHz

*No emissions found within 6 dB of the limit.

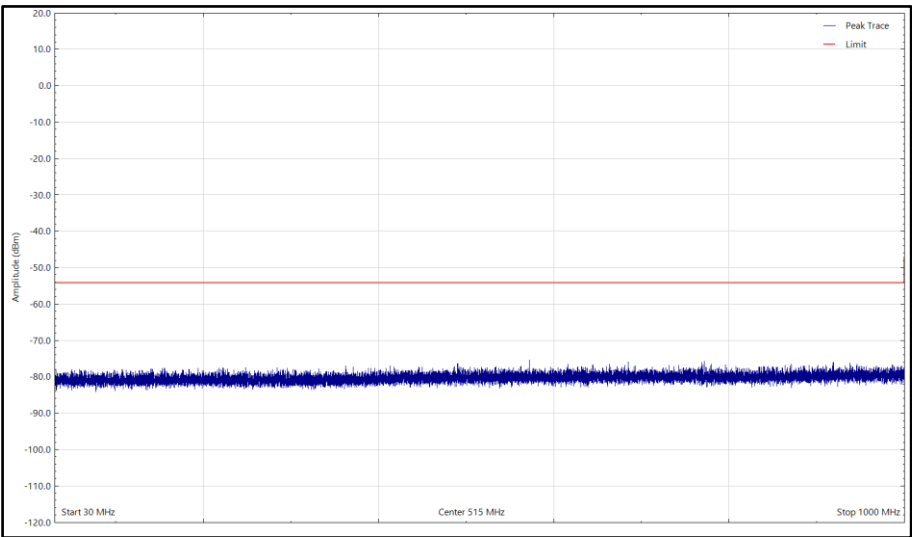


Figure 26 - 802.15.4_RX, FHSS, 30 MHz to 1 GHz, Vertical (Peak)

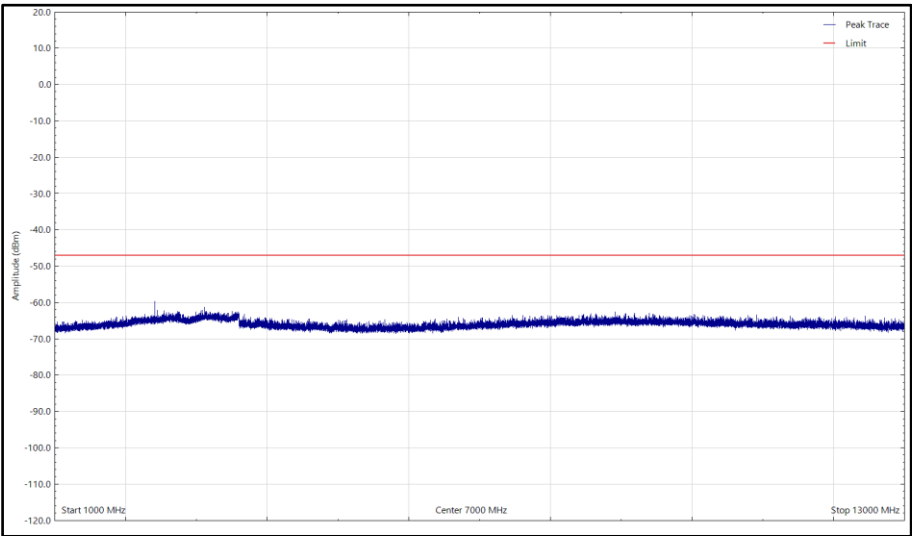


Figure 27 - 802.15.4_RX, FHSS, 1 GHz to 13 GHz, Vertical (Peak)



2.4GHz - DTS

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
*				

Table 41 - 802.15.4_RX, 2404 MHz, 30 MHz to 13 GHz

*No emissions found within 6 dB of the limit.

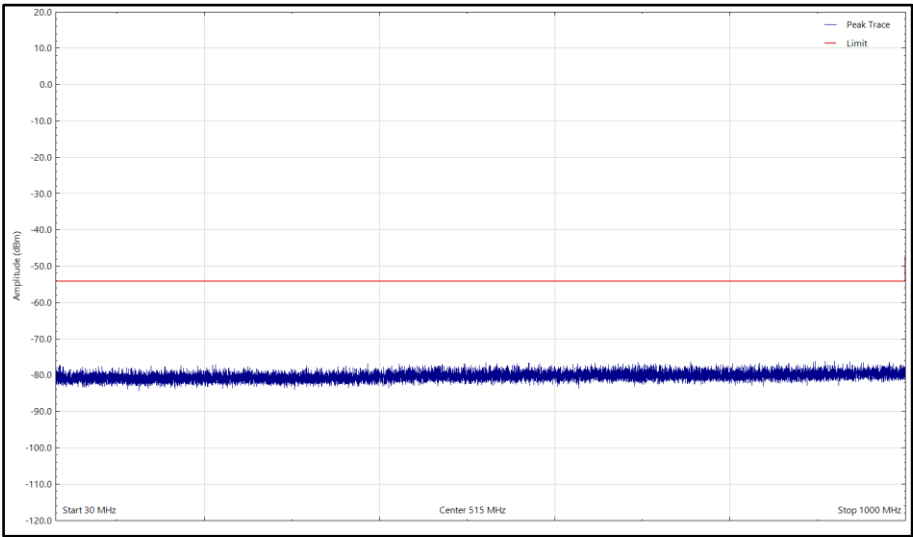


Figure 28 - 802.15.4_RX, 2404 MHz, 30 MHz to 1 GHz, Vertical (Peak)

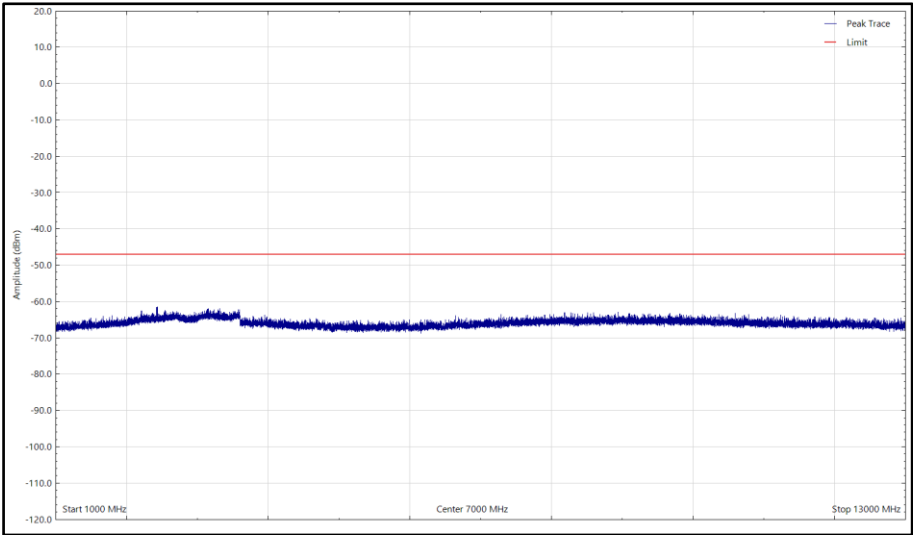


Figure 29 - 802.15.4_RX, 2404 MHz, 1 GHz to 13 GHz, Vertical (Peak)



Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
*				

Table 42 - 802.15.4_RX, 2442 MHz, 30 MHz to 13 GHz

*No emissions found within 6 dB of the limit.

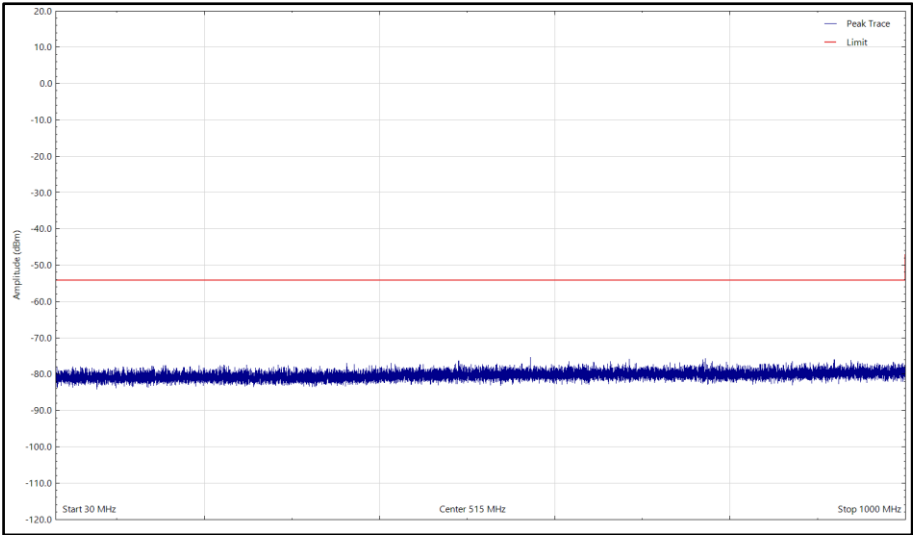


Figure 30 - 802.15.4_RX, 2442 MHz, 30 MHz to 1 GHz, Vertical (Peak)

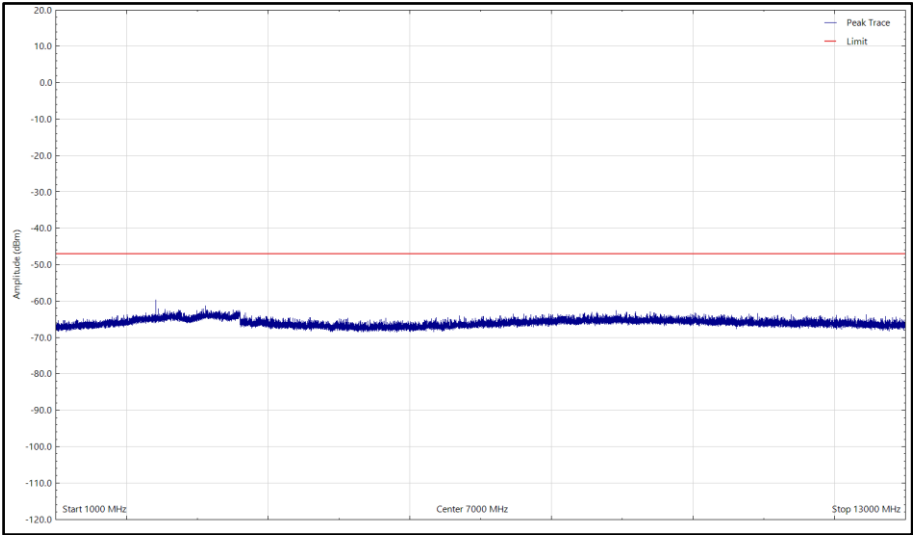


Figure 31 - 802.15.4_RX, 2442 MHz, 1 GHz to 13 GHz, Vertical (Peak)



Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
*				

Table 43 - 802.15.4_RX, 2480 MHz, 30 MHz to 13 GHz

*No emissions found within 6 dB of the limit.

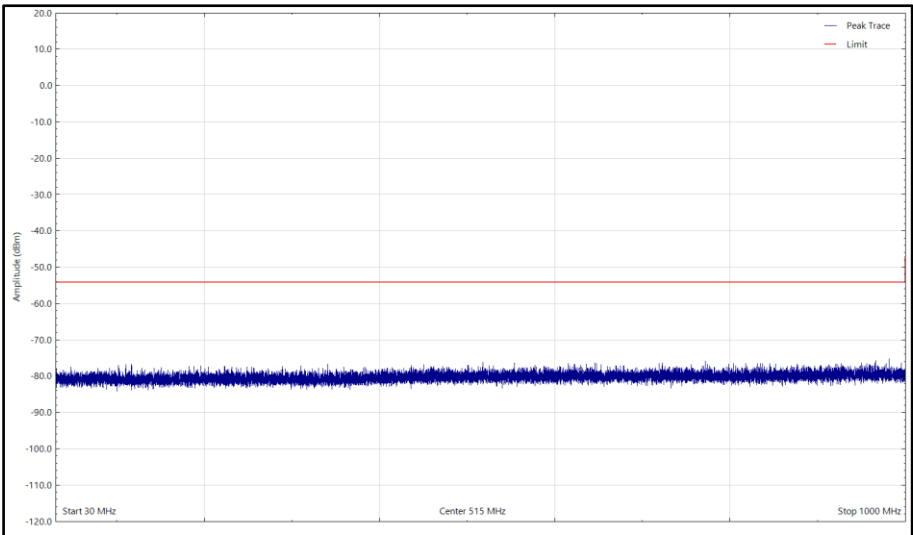


Figure 32 - 802.15.4_RX, 2480 MHz, 30 MHz to 1 GHz, Vertical (Peak)

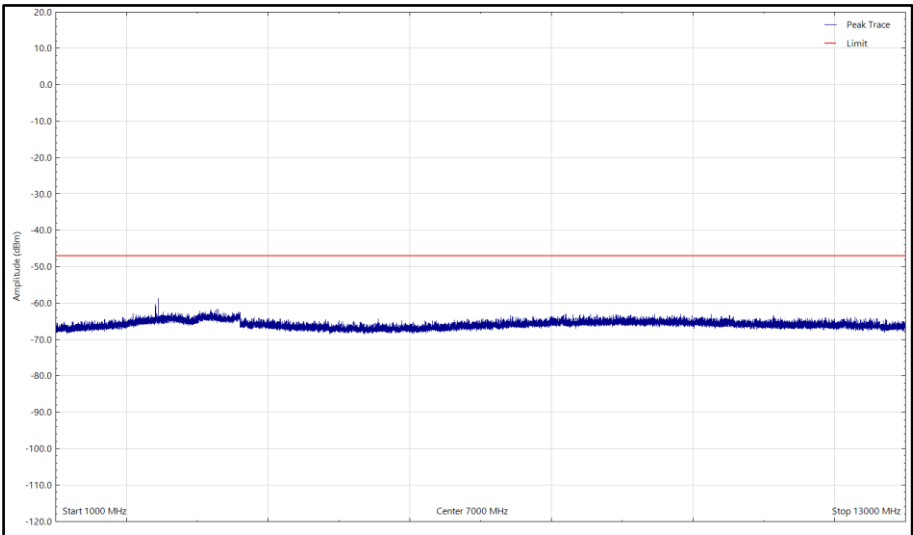


Figure 33 - 802.15.4_RX, 2480 MHz, 1 GHz to 13 GHz, Vertical (Peak)

ARIB STD-T66, Limit Clause 3.3 (1)

The limit at which secondary radiation will not hinder the function of other radio equipment is, if a fictional antenna circuit with the same electrical constant as the receiving antenna were to be used in calculations, at most 4nW if using a frequency below 1GHz and at most 20nW if using a frequency above or equal to 1GHz.



2.9.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	18-Mar-2026
Emissions Software	TUV SUD	EmX V3.5.5	5125	-	Software
Attenuator 5W 20dB DC-18GHz	Aaren	AT40A-4041-D18-20	5497	12	23-Apr-2026
1m Coaxial Cable Assy	Junkosha	MWX221-01000AMSAMS/A	6381	12	30-Jul-2026
MXA Signal Analyser	Keysight Technologies	N9020B	6876	24	31-Aug-2026

Table 44

2.10 Antenna Gain

2.10.1 Specification Reference

ARIB STD-T66, Clause 3.6 (2)
MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19)

2.10.2 Equipment Under Test and Modification State

RMP400S, S/N: PCB: 00017472757 / EUT: 5RMY93 - Modification State 0

2.10.3 Date of Test

17-November-2025

2.10.4 Test Method

The maximum half power beamwidth was calculated by determining the EIRP relative to an antenna with a transmitting power of 12.14 dBm/MHz (16.37 mW/MHz).

$$A = \text{EIRP (mW/MHz)} / 16.37$$

$$\text{Maximum Half-Power Beamwidth} = 360 \text{ degrees} / A.$$

2.10.5 Environmental Conditions

Ambient Temperature	22.4 °C
Relative Humidity	26.3 %

2.10.6 Test Results

2.4GHz - FHSS

Parameter	Results
Frequency Range (MHz)	2404-2480
Antenna Gain (dBi)	-4.87
Half-Power Beamwidth	360 degrees
EIRP (mW/MHz)	0.43
A	0.026
Calculated Maximum Half-Power Beamwidth	360 degrees

Table 45

ARIB STD-T66, Limit Clause 3.6 (2)

The absolute gain of transmitting antennas must be at most 12.14 dB.



2.11 Interference Protection Function

2.11.1 Specification Reference

ARIB STD-T66, Clause 3.4 (1)
MIC No. 88 Annex 43 (Article 2 Paragraph 1 Item 19)

2.11.2 Equipment Under Test and Modification State

RMP400S, S/N: PCB: 00017472757 / EUT: 5RMY93 - Modification State 0

2.11.3 Date of Test

20-November-2025

2.11.4 Test Method

This test was performed in accordance with Notification 88, Annex 45, clause 9.

The device under test was connected to a signal analyser and using a digital demodulation measurement application the demod bits were shown on screen which were used to determine the transmitted identification code.

The EUT was powered by fresh 2x 3.6V batteries.

2.11.5 Environmental Conditions

Ambient Temperature	21.0 °C
Relative Humidity	22.1 %

2.11.6 Test Results

2.4GHz -

Result: The client device under test transmitted an identification code to the master device to identify itself as a valid/authorised client.

After a header of 01010101 01010101 the EUT transmitted the binary code 00001001 00111001 00010011 10010011 which in hex will be 09 39 13 93.

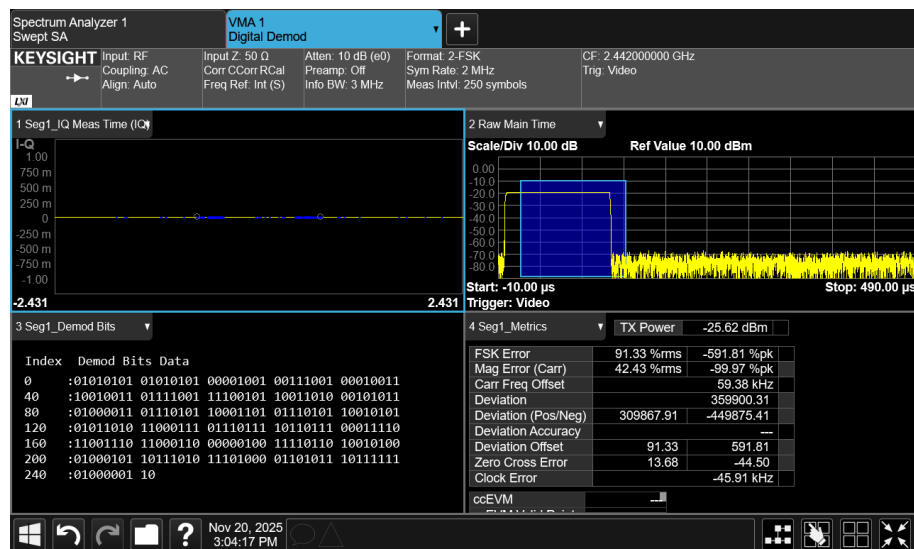


Figure 34 - Evidence

Radio Equipment Regulations Article 9-4, paragraph 1, item 8

Client devices should send an identification code to the master device in order to identify itself as a valid/authorized client.



2.11.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
Digital Multi-meter	Iso-tech	IDM93N	4435	12	06-Mar-2026
Attenuator 5W 20dB DC-18GHz	Aaren	AT40A-4041-D18-20	5497	12	23-Apr-2026
Modular Power System Mainframe	Keysight Technologies	N6701C	5835	-	TU
DC Power Module 60V 20A 300W	Keysight Technologies	N6754A	5836	-	O/P Mon
MXA Signal Analyser	Keysight Technologies	N9020B	6418	24	15-Oct-2027
Directional Coupler 0.5-18 GHz	RF-Lambda	RFDC5M18G20	6913	-	O/P Mon
1m SMA Cable	Junkosha	MWX221-01000AMSAMS/B	6921	12	08-Dec-2025

Table 46

TU - Traceability Unscheduled

O/P Mon – Output Monitored using calibrated equipment

3 Photographs

3.1 Equipment Under Test (EUT)



Figure 35 - EUT Front



Figure 36 - EUT Left Hand Side



Figure 37 - EUT Back

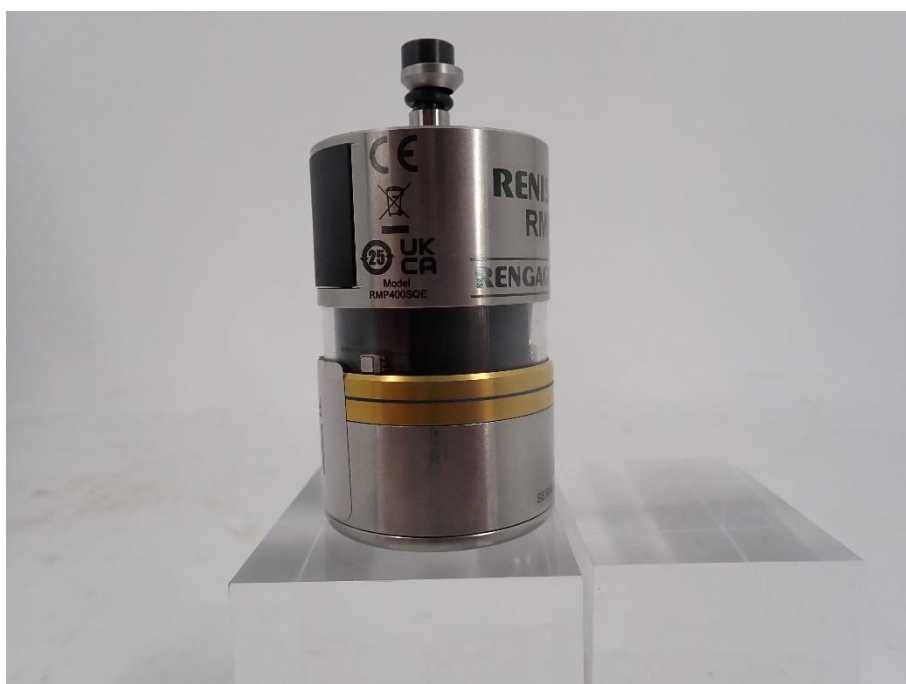


Figure 38 - EUT Right Hand Side



Figure 39 - EUT Bottom



Figure 40 - EUT Top



4 Test Equipment Information

4.1 Customer Support Equipment

The following customer supplied test equipment was used during testing covered by this document.

Item	Serial Number	Test Section	Description
RMM-QE	ANT154	2.7	Used as a companion device to send packets for Interference Protection Function
USI Dev Board	37	2.7	Used to control the RMM-QE for Interference Protection Function
Laptop	CND2272R4Z	2.7	Used Renishaw's proprietary software to control the RMM-QE and USI Dev Board

5 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Antenna Power	± 0.64 dB
Frequency Deviation	± 25.32 kHz
Permissible Value of Spurious or Unnecessary Radiation Intensity	± 3.454 dB
Allowable Value for Occupied Bandwidth	± 42.21 kHz
Spread Bandwidth	± 42.21 kHz
Process Gain	-
Dwell Time	0.3 %
Limit on Secondary Radiation	± 3.45 dB
Antenna Gain	-
Voltage Variations	
Interference Protection Function	-

Table 47

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2021, Clause 4.4.3 (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.