DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29507456

Test Report No:
77497RRF.002

Partial Test Report
ARIB STD-T66 V 3.7 (2014-10-02)

(*) Identification of item tested	XS4 Original+ Electronic Lock Series including all mechanical variants
(*) Derived model not tested	XS4 One S Electronic Lock Series including all mechanical variants
(*) Trademark	SALTO
(*) Model and /or type reference	W60M / Type reference: E2131
Other identification of the product	FCC ID: UKCW60M IC: 10088A-W60M
(*) Features	Bluetooth LE HW version: 2.0 SW version: 0174(Control FW)+0186(FUS FW)+0187(BLE FW)+0197(HSE)+0202(Motor)
Manufacturer	SALTO SYSTEMS, S.L. Arkotz 9, Polígono Lanbarren 20180 Oiartzun (Gipuzkoa) - Spain
Test method requested, standard	ARIB STD-T66 V 3.7 (2014-10-02). Ordinance Regulating Radio Equipment, Radio Regulatory Commission Regulations No 18 - November 30, 1950 (as amended). Article 2 Paragraph 1 Item 19.
Approved by (name / position & signature)	José Manuel Gómez Galván EMC Consumer & RF Lab. Manager Firmado digitalmente por 53680346W JOSE MANUEL GOMEZ (C:A29507456)
Date of issue	2023-12-11
Report template No	FDT08_24 (*) "Data provided by the client"

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Competences and guarantees

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification S.A.U. at the time of performance of the test.

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The results presented in this Test Report apply only to the particular item under test established in this document.

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Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

The total uncertainty of the measurement system for the conducted testing of EUT is:

- Transmitting equipment. Spurious emission intensity Measurement uncertainty ≤ ± 2.85 dB
- Receiving equipment. Limit on secondary radiated emissions Measurement uncertainty ≤ ± 2.95 dB

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").

2. The sample consists of a XS4 Original+ | XS4 One S Electronic Lock Series including all mechanical variants. XS4 Original+ | XS4 One S Electronic Lock Series with RFID Mifare (ISO14443A & ISO15693 standard based) and Bluetooth LE technology.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial Nº	Date of Reception	Application
S/01	77497_3.1	XS4 Original+ Electronic Lock (Conducted)	W60M	--	2023-10-31	Element Under Test
S/01	77497_4.1	Module Battery	226481A	--	2023-10-31	Auxiliary Element

Notes referenced to samples during the project:

Id	Type
S/01	Sample used for conducted testing

Test sample description

Ports…… :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)		
	.....	.....	[ ]	[ ]	[ ]		
Supplementary information to the ports…… :	.....						
Rated power supply .....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	[ ]	AC:	[ ]	[ ]	[ ]	[ ]	[ ]
	[X]	DC: 4.5 Vdc (3 x LR6batteries)					
Rated Power .....:	N/A						
Clock frequencies.....:	27.12 MHz, 32 MHz, 32.768 KHz						
Other parameters .....:	N/A						
Software version .....:	0174 (Control FW) + 0186 (FUS FW) + 0187 (BLE FW) + 0197(HSE FW)+ 0202 (Motor)						
Hardware version .....:	2.0						
Dimensions in cm (W x H x D) ....:	External part: 6.7 x 29 x 2.0 cm Internal part: 6.7 x 15.0 x 2.0 cm						
Mounting position .....:	[ ]	Table top equipment					
	[ ]	Wall/Ceiling mounted equipment					
	[ ]	Floor standing equipment					
	[ ]	Hand-held equipment					
	[X]	Other: Door mounting					
Modules/parts.....:	Module/parts of test item			Type		Manufacturer	
	SoC + Antenna			BLE		ST + JOHANSON	
	.....			.....		.....	
	.....			.....		.....	
	.....			.....		.....	
	Description			Type		Manufacturer	

Accessories (not part of the test item) .....:	.....	.....	.....
Documents as provided by the applicant .....:	Description	File name	Issue date
	User manual	.....	.....
	FW Explanation	.....	.....
	.....	.....	.....

(3) Only for Medical Equipment

Identification of the client

SALTO SYSTEMS, S.L.
Arkotz 9, Polígono Lanbarren 20180 Oiartzun (Gipuzkoa) - Spain

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2023-11-15
Date (finish)	2023-11-15

Document history

Report number	Date	Description
77497RRF.	2023-12-11	First release.

Environmental conditions

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %

Remarks and comments

The tests have been performed by the technical personnel: Antonio Maireles.

Used instrumentation:

Control No.	Equipment	Model	Manufacturer	Next Calibration
6793	SHIELDED ROOM	S101	ETS LINDGREN	N/A
7794	SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz	FSV40	ROHDE AND SCHWARZ	2025-04-21

Testing verdicts

Fail	F
Not applicable	N/A
Not measured	N/M
Pass	P

Summary

Bluetooth Low Energy (1M)

ARIB STD-T66 PARAGRAPH			
Requirement – Test case		**Verdict**	**Remark**
Chapter 3 Subclause 3.2 (1)	Transmitting equipment. Modulation system	N/M	(1)
Chapter 3 Subclause 3.2 (2) and (3)	Transmitting equipment. Antenna power and tolerances for antenna power	N/M	(1)
Chapter 3 Subclause 3.2 (4)	Transmitting equipment. Frequency tolerance	N/M	(1)
Chapter 3 Subclause 3.2 (6)	Transmitting equipment. Spurious emission intensity	P	--
Chapter 3 Subclause 3.2 (7)	Transmitting equipment. Permissible value for occupied bandwidth	N/M	(1)
Chapter 3 Subclause 3.2 (8)	Transmitting equipment. Spread bandwidth	N/A	(2)
Chapter 3 Subclause 3.2 (9)	Transmitting equipment. Process gain	N/A	(2)
Chapter 3 Subclause 3.2 (10)	Transmitting equipment. Number of carriers	N/A	(3)
Chapter 3 Subclause 3.2 (11)	Transmitting equipment. Dwell time	N/A	(4)
Chapter 3 Subclause 3.3 (1)	Receiving equipment. Limit on secondary radiated emissions	P	--
Chapter 3 Subclause 3.6 (2)	Antenna. Antenna gain	N/M	(1)

Supplementary information and remarks:

(1) Test not requested by the client.
(2) Applies to spread spectrum systems.
(3) Applies to OFDM systems.
(4) Applies to Frequency Hopping systems.

Appendix A: Test results. Bluetooth Low Energy (1M)

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TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 4.5 Vdc

Type of Power Supply: 3 x LR6 batteries

TEST FREQUENCIES (*):

Modulation	Data rates	Low Channel:	Middle Channel	High Channel
BTLE GFSK	1 Mbit/s	2402 MHz	2440 MHz	2480 MHz

During transmitter test the EUT was controlled by a SW tool provided by the client to operate in a continuous transmit mode on the modulation schemes and test channels as required.

CONDUCTED MEASUREMENTS

The equipment under test was set up in a shielded room and its antenna port (SMA type) is connected to the spectrum analyser through a low loss RF cable. The reading of the spectrum analyser is corrected with the cable loss.

The Equipment Under Test (E.U.T) is set in continuous transmission with modulation using an implemented test mode. The test mode also permits to set the E.U.T. in receiving mode with the transmission disabled.

PRODUCT INFORMATION

The following information is provided by the supplier, in accordance with clause 5.4.1:

Information	Description
Modulation:	GFSK.
Spread spectrum system:	No (Other digital modulation methods).
Nominal necessary Bandwidth:	1 MHz
Maximum declared antenna gain:	+0.5 dBi
Rated Antenna Power:	+6 dBm
Type of Antenna:	Integral Chip antenna.
Operating nominal frequency range:	2400 MHz to 2483.5 MHz

TEST CASES DETAILS

Subclause 3.2 (6). Spurious emission intensity

Limits

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

a. 2,387 MHz ≤ f ≤ 2,400 MHz and 2,483.5 MHz < f ≤ 2,496.5 MHz 25 μW (-16 dBm) or less.

b. 2,387 MHz > f and 2,496.5 MHz < f 2.5 μW (-26 dBm) or less.

Results

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

- LOW CHANNEL:

  Spurious frequencies detected at less than 20 dB below the limit:

Spurious Frequency (MHz)	Emission Level (dBm)	Detector
2399.93	-31.36	RMS

  No spurious frequencies detected at less than 6 dB below the limit.

- MIDDLE CHANNEL:

  No spurious frequencies detected at less than 20 dB below the limit.

- HIGH CHANNEL

  No spurious frequencies detected at less than 20 dB below the limit.

Verdict

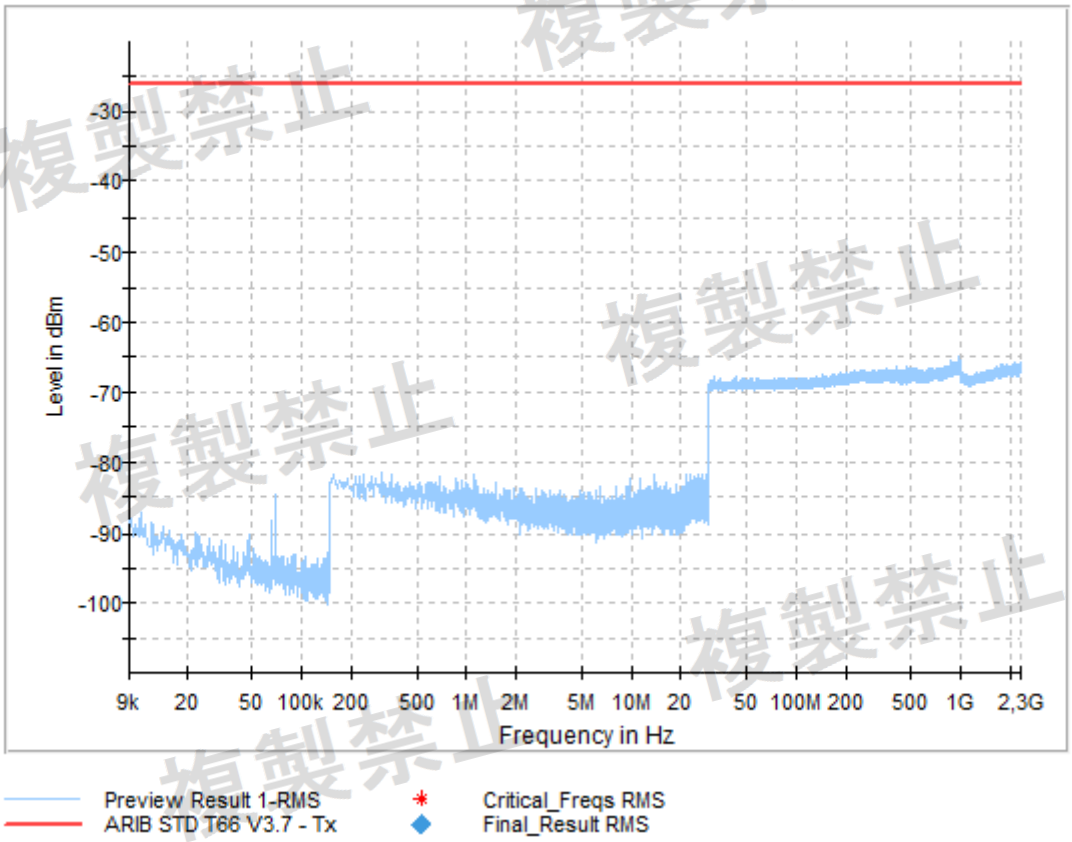
Pass

Attachments

Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = Low

Frequency Range MHz = [0.009, 2300] Equipment Type = Digital Transmission System (DTS)

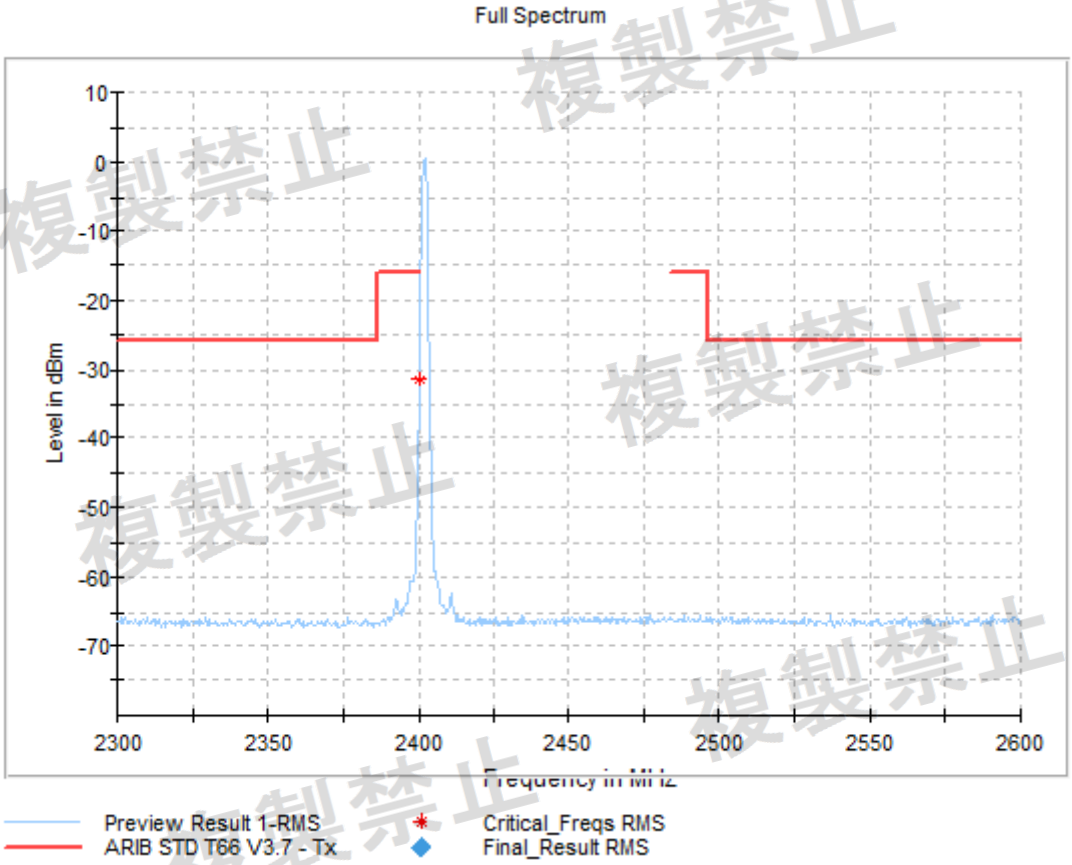
Images:



Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = Low

Frequency Range MHz = [2300, 2600] Equipment Type = Digital Transmission System (DTS)

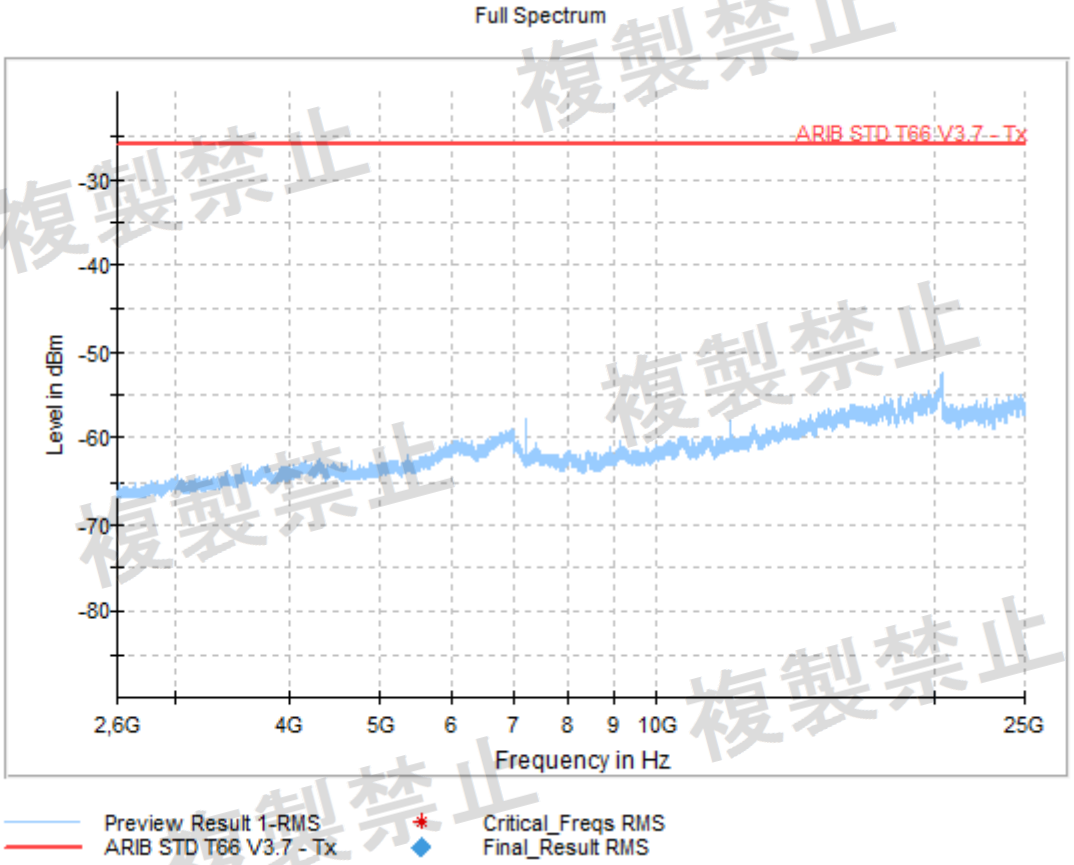
Images:



Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = Low

Frequency Range MHz = [2600, 25000] Equipment Type = Digital Transmission System (DTS)

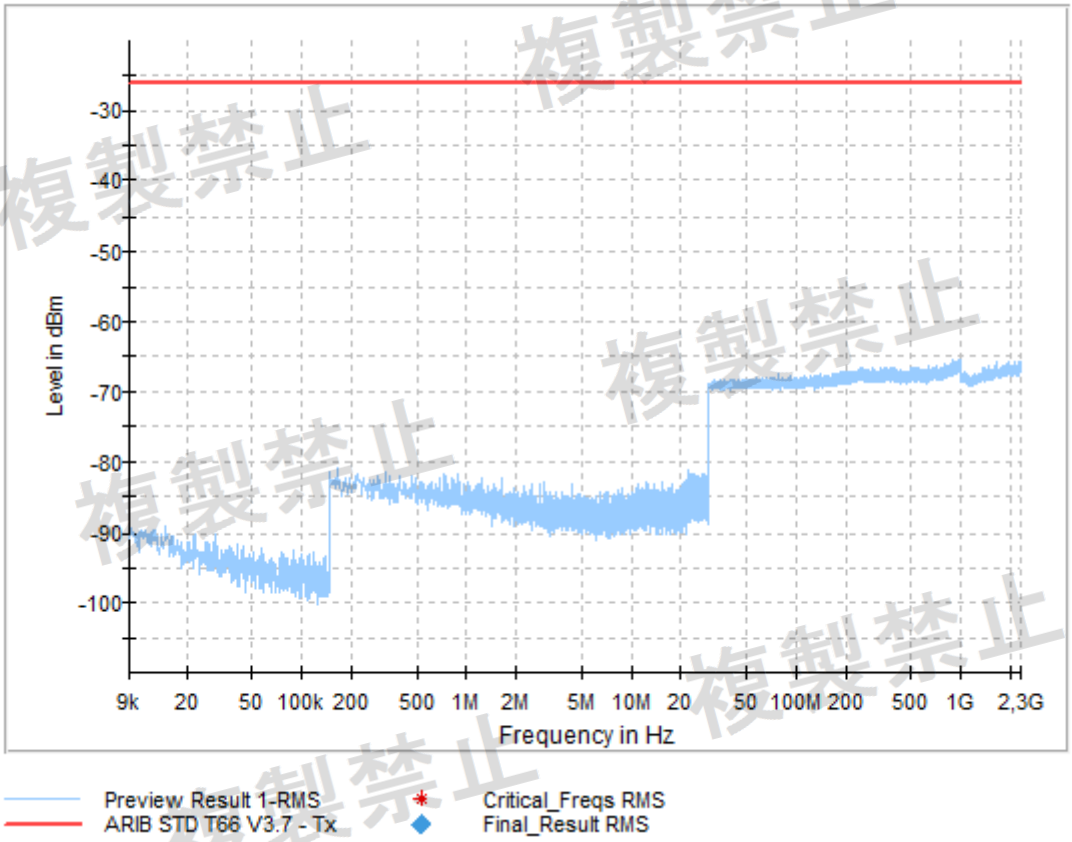
Images:



Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = Middle

Frequency Range MHz = [0.009, 2300] Equipment Type = Digital Transmission System (DTS)

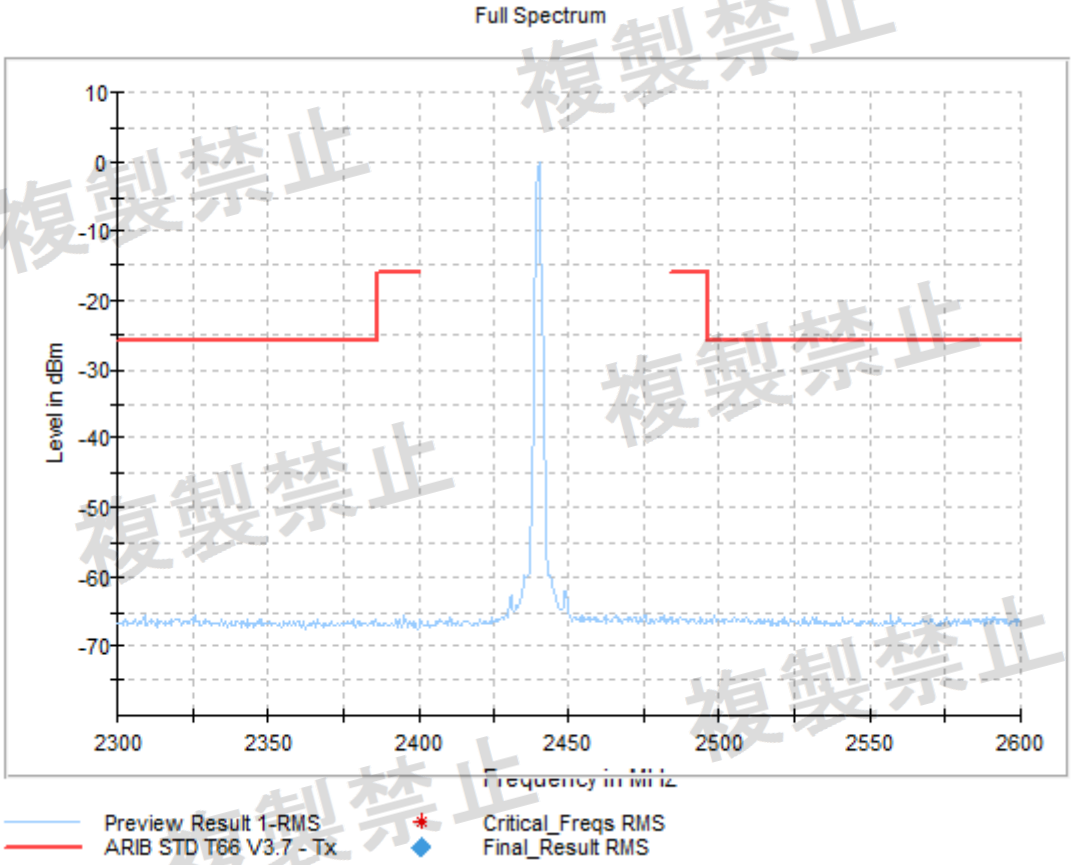
Images:



Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = Middle

Frequency Range MHz = [2300, 2600] Equipment Type = Digital Transmission System (DTS)

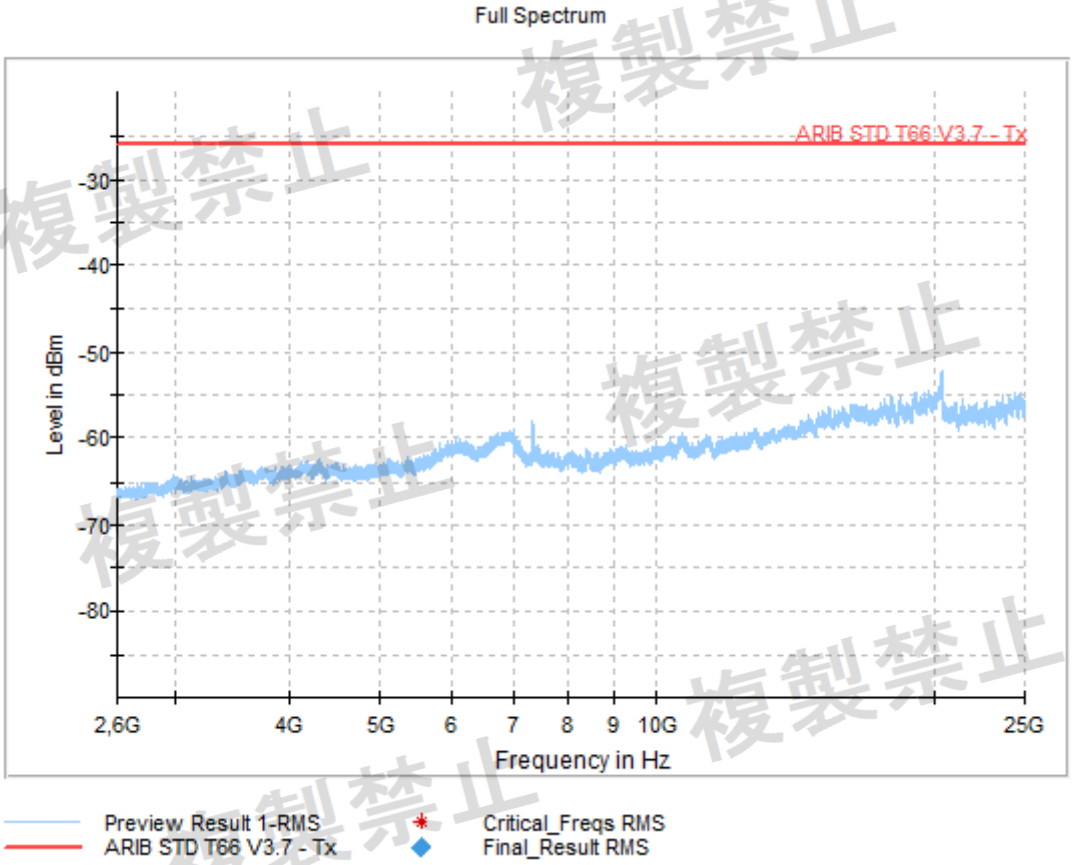
Images:



Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = Middle

Frequency Range MHz = [2600, 25000] Equipment Type = Digital Transmission System (DTS)

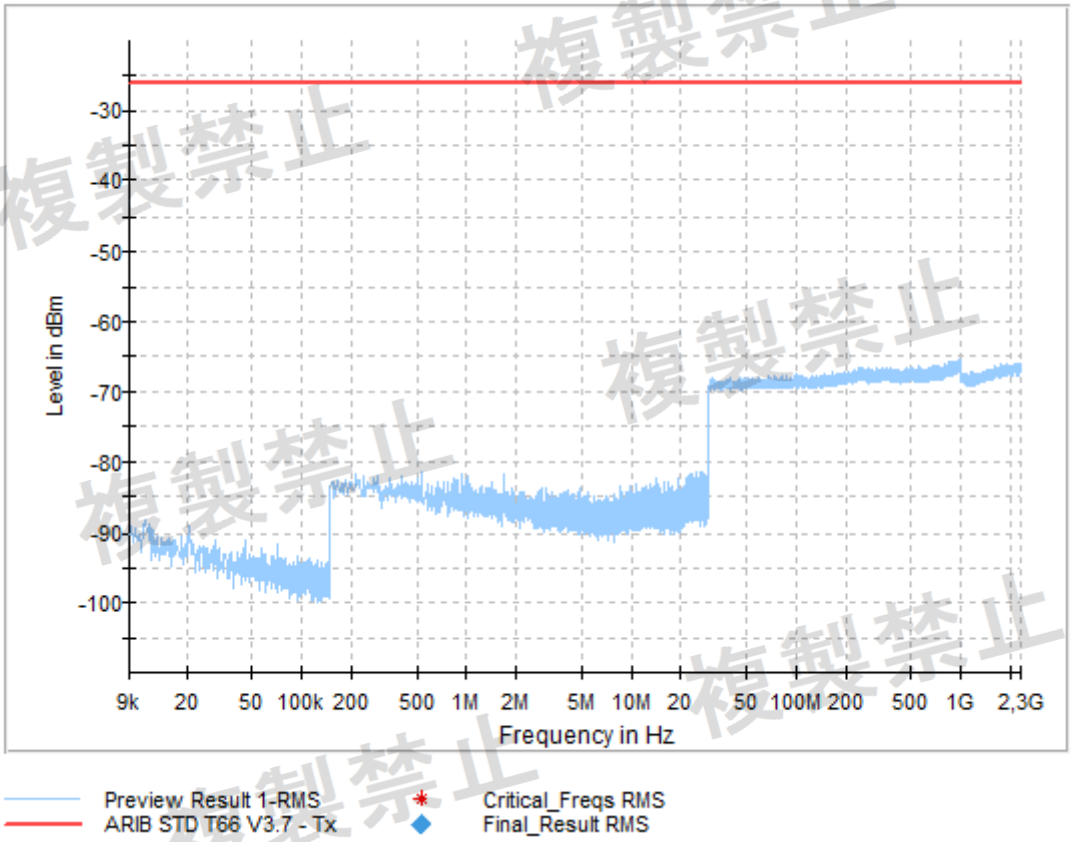
Images:



Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = High

Frequency Range MHz = [0.009, 2300] Equipment Type = Digital Transmission System (DTS)

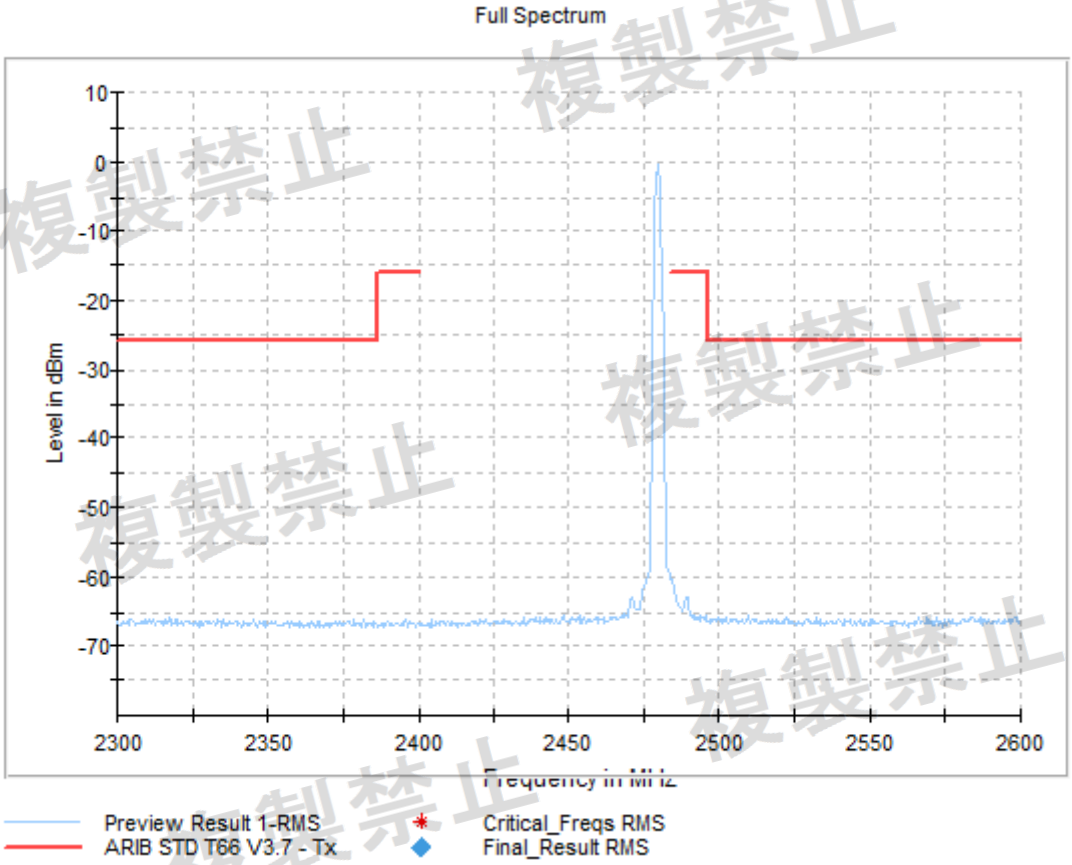
Images:



Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = High

Frequency Range MHz = [2300, 2600] Equipment Type = Digital Transmission System (DTS)

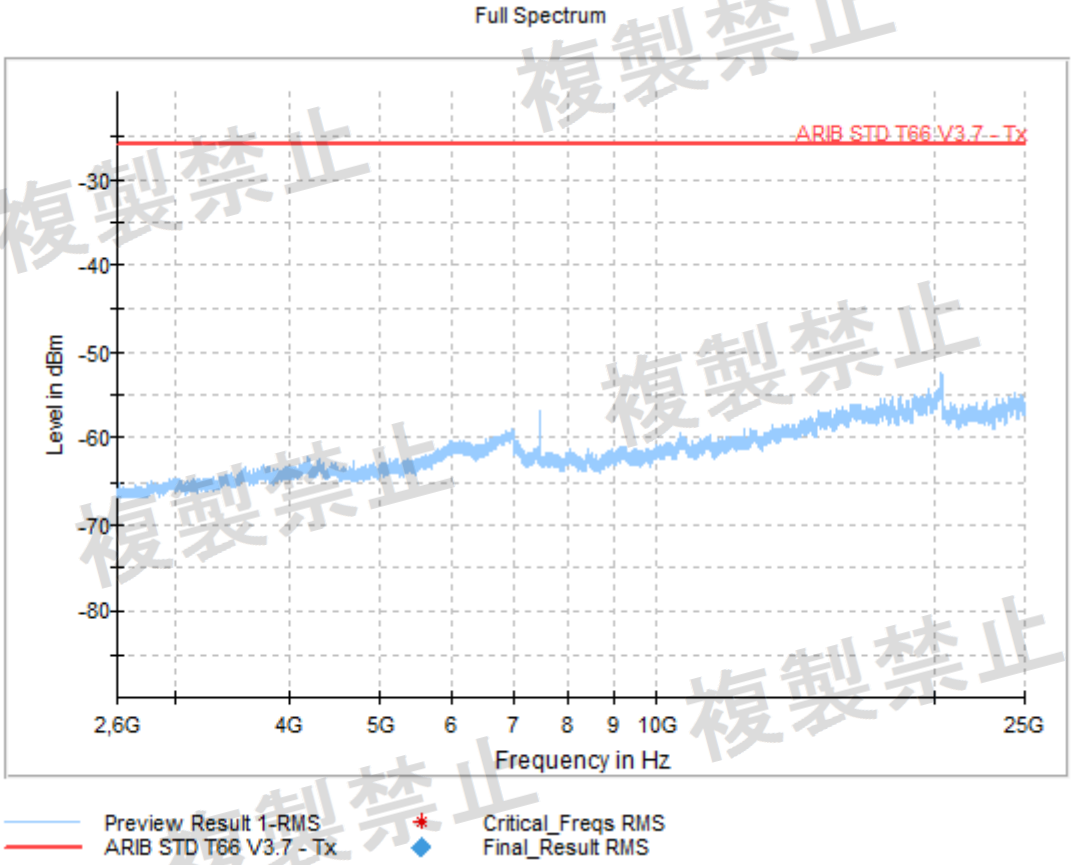
Images:



Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = High

Frequency Range MHz = [2600, 25000] Equipment Type = Digital Transmission System (DTS)

Images:



Subclause 3.3 (1). Receiving equipment. Limit on secondary radiated emissions

Limits

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4 nW (-54 dBm) or less at a frequency below 1 GHz and 20 nW (-47 dBm) or less at a frequency of 1 GHz or higher as measured using the circuit.

Results

Modulation: BTLE 5.2 (GFSK 1 Mbit/s)

- LOW CHANNEL:

  Spurious frequencies detected at less than 20 dB below the limit:

Spurious Frequency (MHz)	Emission Level (dBm)	Detector
20352.92	-62.29	PEAK

  No spurious frequencies detected at less than 6 dB below the limit.

- MIDDLE CHANNEL:

  Spurious frequencies detected at less than 20 dB below the limit:

Spurious Frequency (MHz)	Emission Level (dBm)	Detector
20381.67	-61.90	PEAK

  No spurious frequencies detected at less than 6 dB below the limit.

- HIGH CHANNEL:

  Spurious frequencies detected at less than 20 dB below the limit:

Spurious Frequency (MHz)	Emission Level (dBm)	Detector
20359.58	-62.51	PEAK

  No spurious frequencies detected at less than 6 dB below the limit.

Verdict

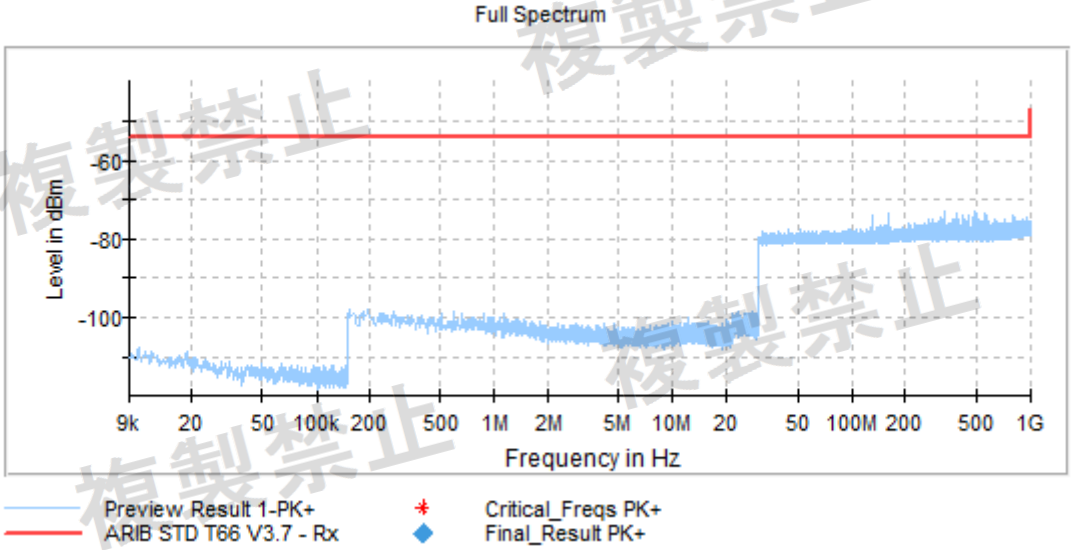
Pass

Attachments

Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = Low

Frequency Range MHz = [0.009, 1000] Equipment Type = Digital Transmission System (DTS)

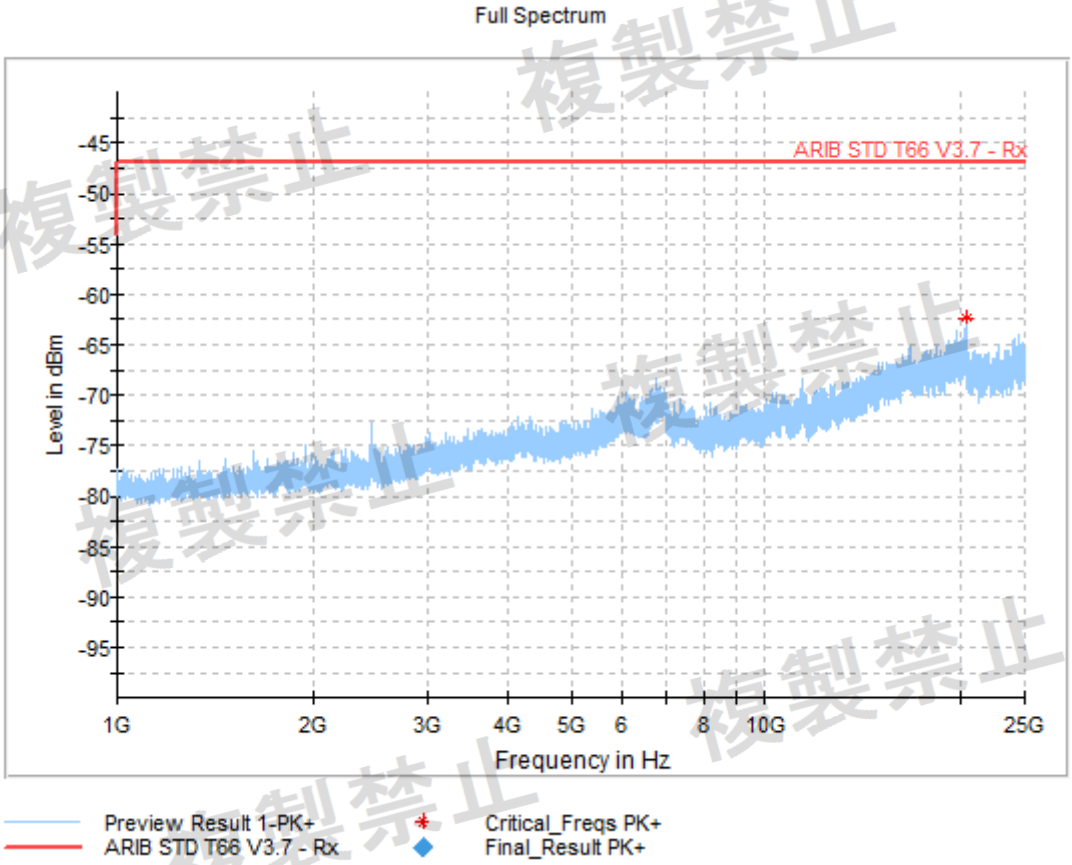
Images:



Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = Low

Frequency Range MHz = [1000, 25000] Equipment Type = Digital Transmission System (DTS)

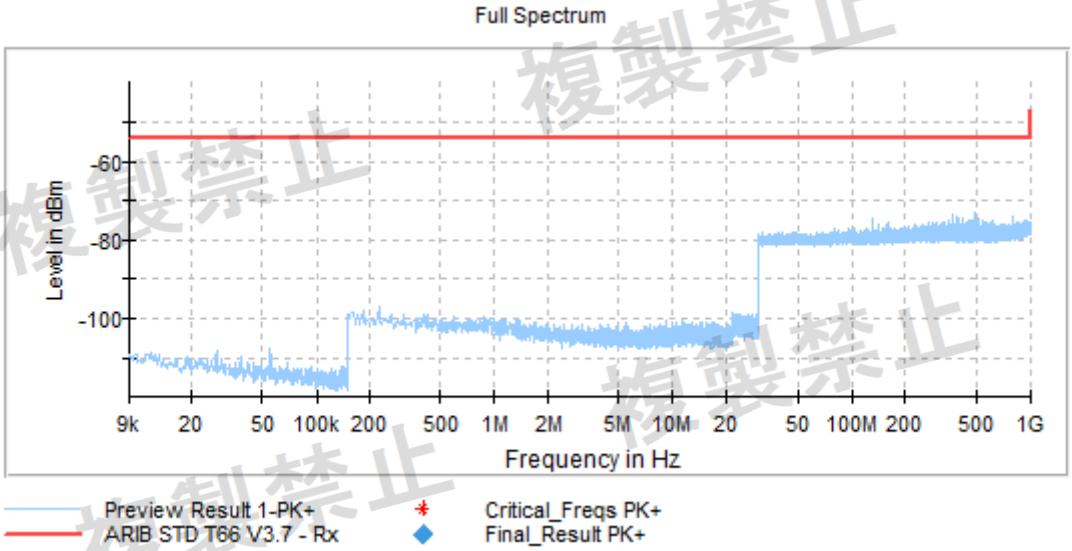
Images:



Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = Middle

Frequency Range MHz = [0.009, 1000] Equipment Type = Digital Transmission System (DTS)

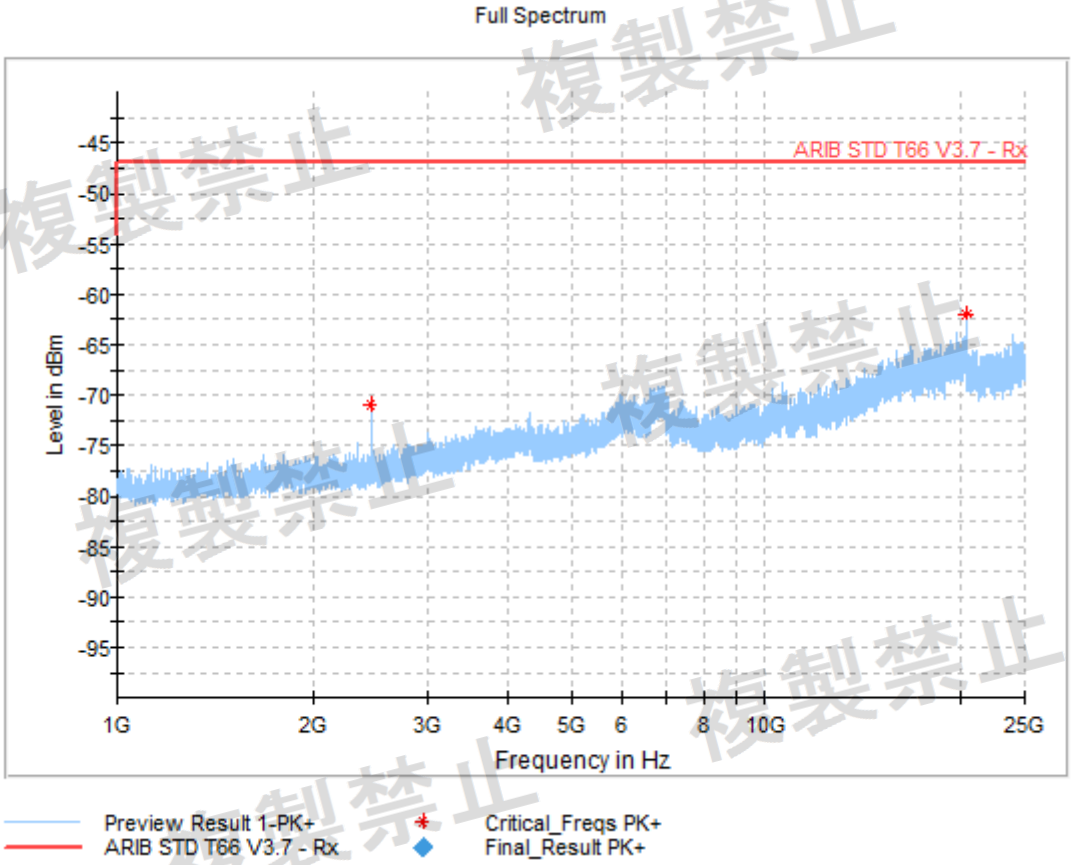
Images:



Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = Middle

Frequency Range MHz = [1000, 25000] Equipment Type = Digital Transmission System (DTS)

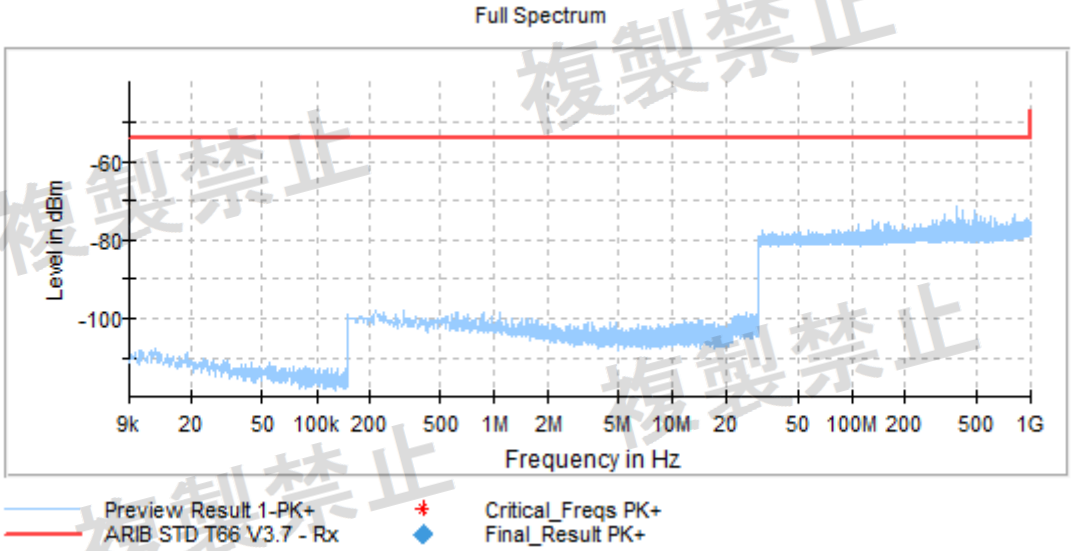
Images:



Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = High

Frequency Range MHz = [0.009, 1000] Equipment Type = Digital Transmission System (DTS)

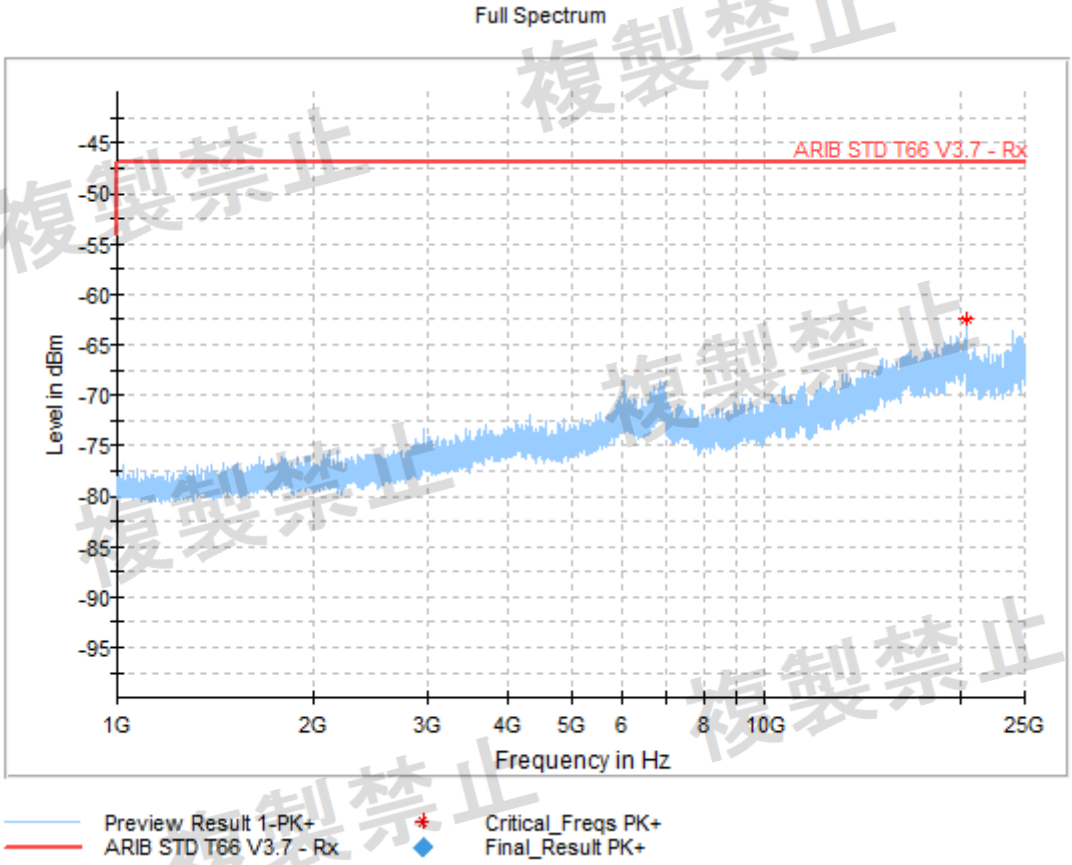
Images:

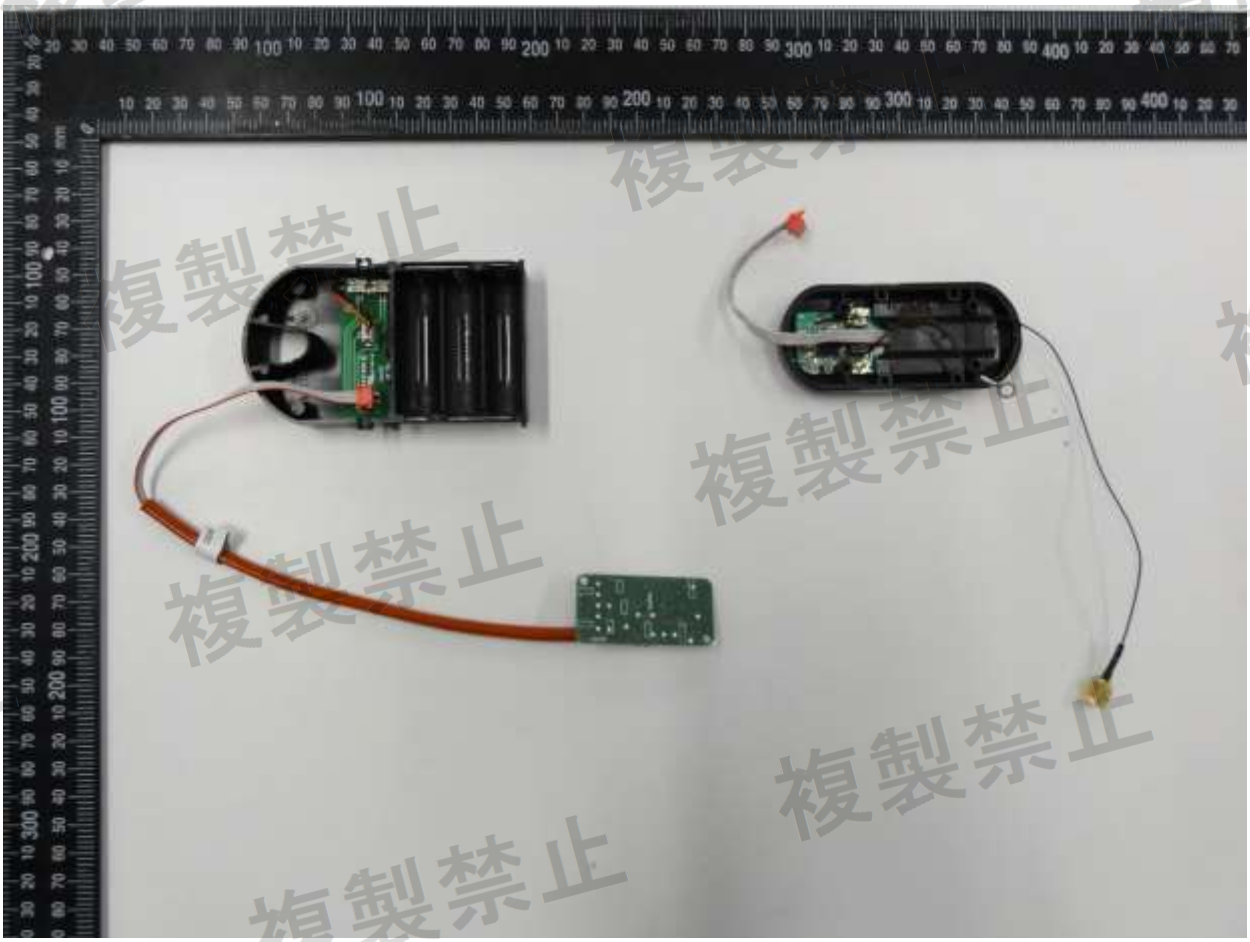


Modulation = BTLE 5.2 (GFSK 1 Mbit/s) Channel = High

Frequency Range MHz = [1000, 25000] Equipment Type = Digital Transmission System (DTS)

Images:



Appendix B: Photographs

EQUIPMENT VIEW