

Test Report No:
77856RRF.002

Test Report

**Ordinance Regulating Radio Equipment, Radio Regulatory Commission Regulations No 18 - November 30, 1950 (as amended).
Second generation low power data communication system / Wireless LAN system.**

(*) Identification of item tested	IQ3 Mini
(*) Trademark	SALTO
(*) Model and /or type reference	IQ3M0B1 (type reference: P2336)
Other identification of the product	FCC ID: UKCIQ3M0B1, Contains: FCC ID: XPYNINAW106 IC: 10088A-IQ3M0B1, Contains: IC: 8595A-NINAW106
(*) Features	Wi-Fi and Bluetooth LE HW version: 1.0 SW version: 0210 (Control FW) + 0211 (Wi-Fi FW) + 0186 (FUS FW) + 0187 (BLE FW)
Applicant	SALTO SYSTEMS, S.L. Arkotz 9, Polígono Lanbarren 20180, Oiartzun, Gipuzkoa, SPAIN
Test method requested	Public notice of MIC No. 88 test method of specified radio equipment Annex 43, Article 2 Paragraph 1 Item 19
Summary	IN COMPLIANCE
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	2025-09-19
Report template No	FDT08_25 (*) "Data provided by the client"

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Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory competent to carry out the tests described in this report.

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.

DEKRA Testing and Certification S.A.U. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

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

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

Uncertainty

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

- Transmitting equipment. Antenna power and tolerances for antenna power Measurement uncertainty $\leq \pm 2.01$ dB
- Transmitting equipment. Frequency tolerance: Measurement uncertainty $\leq \pm 4.75$ kHz
- Transmitting equipment. Spurious emission intensity: Measurement uncertainty $\leq \pm 2.85$ dB
- Transmitting equipment. Permissible value for occupied bandwidth: Measurement uncertainty $\leq \pm 6.35$ kHz
- Transmitting equipment. Spread bandwidth: Measurement uncertainty $\leq \pm 710.28$ kHz
- Receiving equipment. Limit on secondary radiated emissions: Measurement uncertainty $\leq \pm 2.95$ 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 model IQ3M0B1 is IQ3 Mini with Bluetooth LE and Wi-Fi 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. The laboratory is not responsible for such information and it is not covered by accreditation.

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	77856B_5.1	IQ3 Mini	IQ3M0B1	---	2024-01-31	Element Under Test

Notes referenced to samples during the project:

Id	Type
S/01	Sample used for conducted tests

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
	[X]	AC: 100 Vac, 50 Hz / 60 Hz		[]	[]	[]
	[]	DC:				
Rated Power	--					
Clock frequencies.....	32 MHz, 32.768 KHz					
Other parameters.....	--					
Software version	0210 (Control FW) + 0211 (Wi-Fi FW) + 0186 (FUS FW) + 0187 (BLE FW)					
Hardware version	1.0					
Dimensions in cm (W x H x D)	Ø 5.3 cm, D=3.2 cm					
Mounting position	[X]	Table top equipment				
	[X]	Wall/Ceiling mounted equipment				
	[]	Floor standing equipment				
	[]	Hand-held equipment				
	[]	Other:				
Modules/parts..... :	Module/parts of test item		Type	Manufacturer		
	SoC + Antenna		BLE	ST + JOHANSON		
	Wi-Fi module		Wi-Fi Module	u-blox		
Accessories (not part of the test item)	Description		Type	Manufacturer		
	--					
Documents as provided by the applicant	Description		File name	Issue date		
	User Manual					
	FW Explanation Document					
	--					

⁽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)	2025-05-07
Date (finish)	2025-05-12

Document history

Report number	Date	Description
77856RRF.002	2025-09-19	First release.

Environmental conditions

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

Temperature	Min. = 5 °C Max. = 35 °C
Relative humidity	Min. = 45 % Max. = 85 %

Remarks and comments

The tests have been performed by the technical personnel: Carmen Vazquez.

Used instrumentation:

Control No.	Equipment	Model	Serial number	Manufacturer	Calibration date	Calibration Authority	Calibration Method
04826	SHIELDED ROOM	S101	N/A	ETS LINDGREN	N/A	N/A	c)
06158	SIGNAL AND SPECTRUM ANALYZER 10 Hz - 40 GHz	FSV40	101713	ROHDE AND SCHWARZ	2026-02-05	ROHDE AND SCHWARZ	c)
05880	DC POWER SUPPLY 30V/5A	U8002A	N/A	KEYSIGHT TECHNOLOGIES	N/A	N/A	c)
07760	DIGITAL MULTIMETER	175	46970084	FLUKE	2025-11-07	DEKRA TC	c)
07548	TEMPERATURE AND HUMIDITY PROBE	HWg-STE	60038034603	HW GROUP	2026-04-22	DEKRA TC	c)
04530	AVG POWER SENSOR 6 GHZ	NRP-Z91	102310	ROHDE AND SCHWARZ	2025-07-29	ROHDE AND SCHWARZ	c)

Note: Calibration Method

- a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designed calibration agency under Article 102-18 paragraph (1) of the Radio Law.
- b) Calibration conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) Japan Calibration Service System.
- 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 other equipment that is listed above from a) to c).

Testing verdicts

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

Summary

Bluetooth Low Energy (1M):

MIC No. 88 Annex 43			
Requirement – Test case		Verdict	Remark
Article 49-20 and Article 14 Table 8	Transmitting equipment. Antenna power. Tolerances for antenna power.	P	--
Article 5 and Annex 1 table 7-8	Transmitting equipment. Frequency tolerance.	P	--
Article 7 and Annex 3. 26	Transmitting equipment. Spurious emission intensity.	P	--
Article 6 and Annex 2. 30	Transmitting equipment. Permissible value for occupied bandwidth.	P	--
Article 24.2	Receiving equipment. Limit on secondary radiated emissions.	P	--
Article 9.4-5	Controlling equipment. Interference prevention function. Identification code transmission/reception.	P	--
Article 49-20	Antenna. Antenna gain	P	--
<u>Supplementary information and remarks:</u>			
None			

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

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TEST CONDITIONS

(*): Data provided by the client.

POWER SUPPLY (*):

Vnominal: 100 Vac, 50 Hz / 100 Vac, 60 Hz

Type of Power Supply: AC power supply

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.

ENVIROMENTAL CONDITIONS DURING TESTING:

Date	Temperature	Humidity
2024-05-07	21.96 – 22.46 °C	53.91 – 55.13 %
2024-05-08	20.94 – 23.17 °C	50.69 – 56.24 %
2024-05-09	23.47 – 23.67 °C	45.36 – 52.36 %
2024-05-12	23.07 – 26.47	45.04 -52.71 %

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 AC supply voltage is applied using a power supply.

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.

VOLTAGE FLUCTUATION TEST:

The product has a power supply of 100 Vac, 50 Hz / 60 Hz. According to Public notice of MIC No. 88 test method of specified radio equipment Annex 43, it must be performed voltage fluctuation test ($\pm 10\%$) in order to check extreme conditions as recorded in the notice. The deviations of the input voltages to the RF chipset/module, that can be measured at test points indicated below, were within the margin of $\pm 1\%$:



Hence, only nominal voltage tests results can be recorded in this test report, and it is demonstrated that results do not vary for different frequencies as well.

Input DUT Voltage	Input RF Module Voltage	Deviation from Vnom from Input RF Module (%)
Vnom (100 Vac, 50 Hz)	3.294 Vdc	---
Vmin (90 Vac, 50 Hz)	3.294 Vdc	0
Vmax (110 Vac, 50 Hz)	3.294 Vdc	0
Vnom (100 Vac, 60 Hz)	3.294 Vdc	---
Vmin (90 Vac, 60 Hz)	3.294 Vdc	0
Vmax (110 Vac, 60 Hz)	3.294 Vdc	0

PRODUCT INFORMATION

The following information is provided by the client:

Modulation:	GFSK.
Spread spectrum system:	No (Other digital modulation methods).
Nominal necessary Bandwidth:	1 MHz
Maximum declared antenna gain:	+1.5 dBi
Declared Antenna Power:	6 dBm (3.981071706 mW)
Type of Antenna:	Integral Antenna
Operating nominal frequency range:	2400 MHz to 2483.5 MHz
Nominal power supply:	100 Vac, 50 / 60 Hz
Type of power supply:	AC Power supply

SUMMARY TABLE

BTLE 1M

SISO

試験機器の状態 Test Condition	試験項目 (注3) Test Case		単位 Unit	制限 Limit	定格 (100 Vac) Nominal Voltage			備考 Notes
					2402 MHz	2440 MHz	2480 MHz	
常温 Nominal Temperature (20.94 - 26.47 °C) (45.04 - 56.24 %)	空中線電力 Antenna power and tolerances for antenna power	(TX1)	dBm	---	1,480	1,120	0,790	Measured antenna power (dBm)
		Duty Cycle Correction	dB	---	1,841	1,841	1,841	Duty Factor Correction (dB)
		Corrected power	dBm	---	3,321	2,961	2,631	
		Corrected power	mW	10	2,148	1,977	1,833	
	周波数の偏差 Frequency Tolerance	Deviation from maximum rated antenna power	%	---	-64,682	-67,491	-69,870	
		(TX1)	ppm	50	-3,513	-3,893	-3,911	
		Frequency error	Hz	---	-9400,000	-9500,000	-9700,000	
		Frequency Absolute value	MHz	---	2401,991	2439,991	2479,990	
	スプリアス発射の不要発射 Unwanted Emission Strength	30.0 to 2387.0 MHz	dBm/MHz	-26	-33,910	-56,900	-47,470	No spurious frequencies detected at less than 10 dB below the limit.
		(TX1)	MHz	---	2386,816	2301,083	893,998	
		2387.0 to 2400.0 MHz	dBm/MHz	-16	-37,170	-56,120	-58,450	No spurious frequencies detected at less than 10 dB below the limit.
		(TX1)	MHz	---	2399,994	2399,136	2399,607	
		2483.5 to 2496.5 MHz	dBm/MHz	-16	-58,620	-58,300	-47,310	No spurious frequencies detected at less than 10 dB below the limit.
		(TX1)	MHz	---	2489,112	2487,580	2483,542	
		2496.5 to 12500.0 MHz	dBm/MHz	-26	-52,190	-52,650	-51,700	No spurious frequencies detected at less than 10 dB below the limit.
		(TX1)	MHz	---	6838,350	6747,700	6990,590	
	占有周波数帯幅 Occupied Bandwidth	(TX1)	MHz	26	1,047	1,019	1,013	
		30.0 to 1000.0 MHz	dBm/100kHz	-54	-79,860	-79,170	-79,820	No spurious frequencies detected at less than 10 dB below the limit.
	副次的に発生する電波等の強度 Secondary Radiated Emissions Strength	(RX1)	MHz	---	821,723	889,772	979,221	
		1000.0 to 12500.0 MHz	dBm/MHz	-47	-62,150	-62,420	-61,970	No spurious frequencies detected at less than 10 dB below the limit.
		(RX1)	MHz	---	6988,980	6887,280	6935,030	
	拒信防止機能 Interference Prevention Function		良・否 Pass/Fail		Pass	Pass	Pass	BLE MAC : 00A83247A4B
	空中線利得 Antenna absolute gain (12.14 dBi or less)		良・否 Pass/Fail		Pass	Pass	Pass	

Antenna gain:	1,5	dBi
---------------	-----	-----

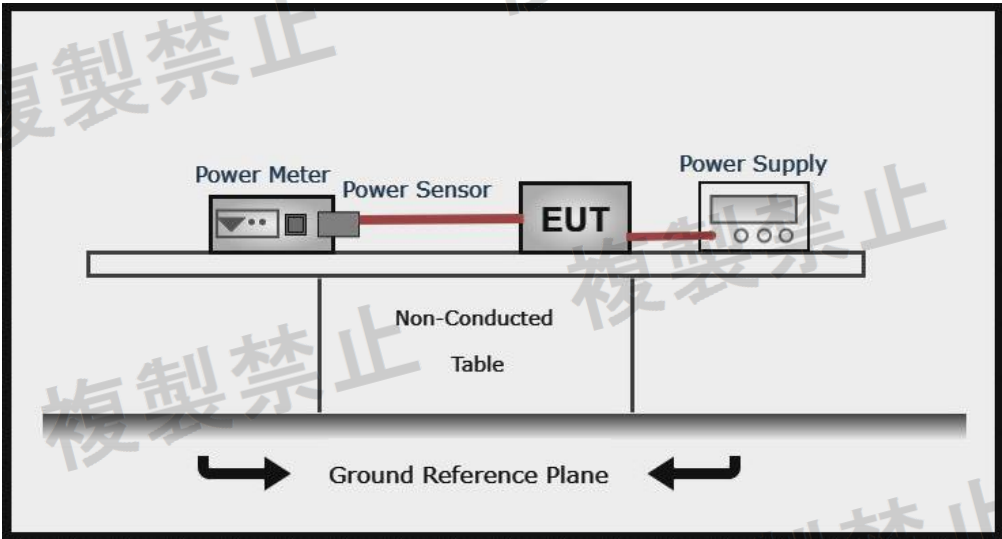
Rated Power (dBm):	6,0
Rated Power (mW):	3,981071705534970

	2402 MHz	2440 MHz	2480 MHz
Duty Cycle	0,654478163615160	0,654478163615160	0,654478163615160

TEST CASES DETAILS

Antenna power. Tolerances for antenna power

Test Setup:



Limits:

Mode	Limit	Tolerance
a) FH, FH+DS, FH+OFDM	3 mW/MHz	+20%
b) OFDM (Narrow bandwidth), DS	10 mW/MHz	
c) Other than a & b	10 mW	
d) OFDM (Wide band)	5 mW/MHz	

Test method:

According to MIC Notice No. 88 Annex 43

Test procedure:

The conducted RF output power measurements were made at the RF output terminals of the DUT, using an average power meter, selecting maximum transmission power of the DUT in the different test channels. The measurement is corrected with the duty cycle.

Results:

Mode: Other digital modulation methods than a & b.

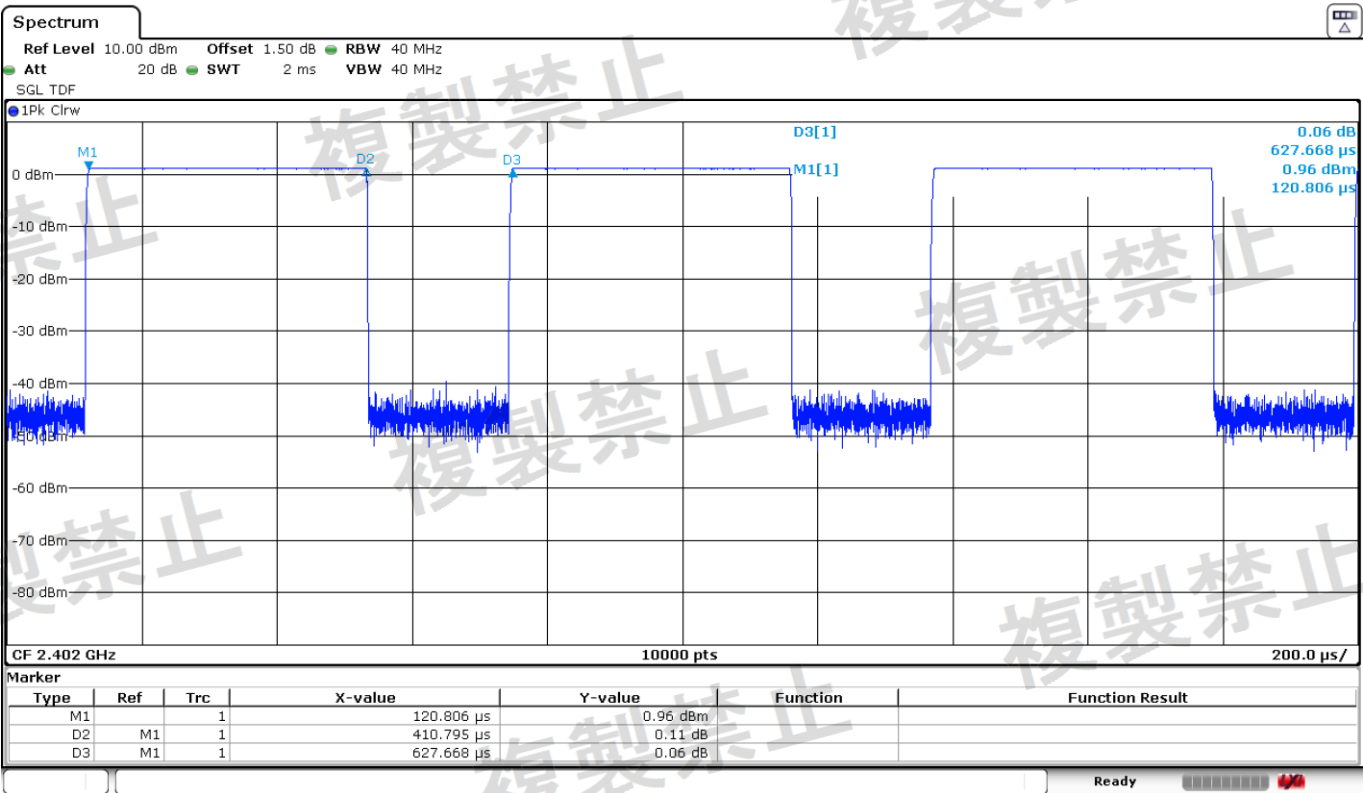
Channel	Duty Cycle (%)	Duty Factor Correction (dB)	Measured antenna power with Duty Cycle Correction (dBm)	Antenna power with Duty Cycle Correction (mW)	Deviation from maximum rated antenna power (%)
Low (2402 MHz)	65.447816	1.841000	3.321000	2.148325	-64.681683
Middle (2440 MHz)	65.447816	1.841000	2.961000	1.977424	-67.491270
High (2480 MHz)	65.447816	1.841000	2.631000	1.832736	-69.869940

Verdict:

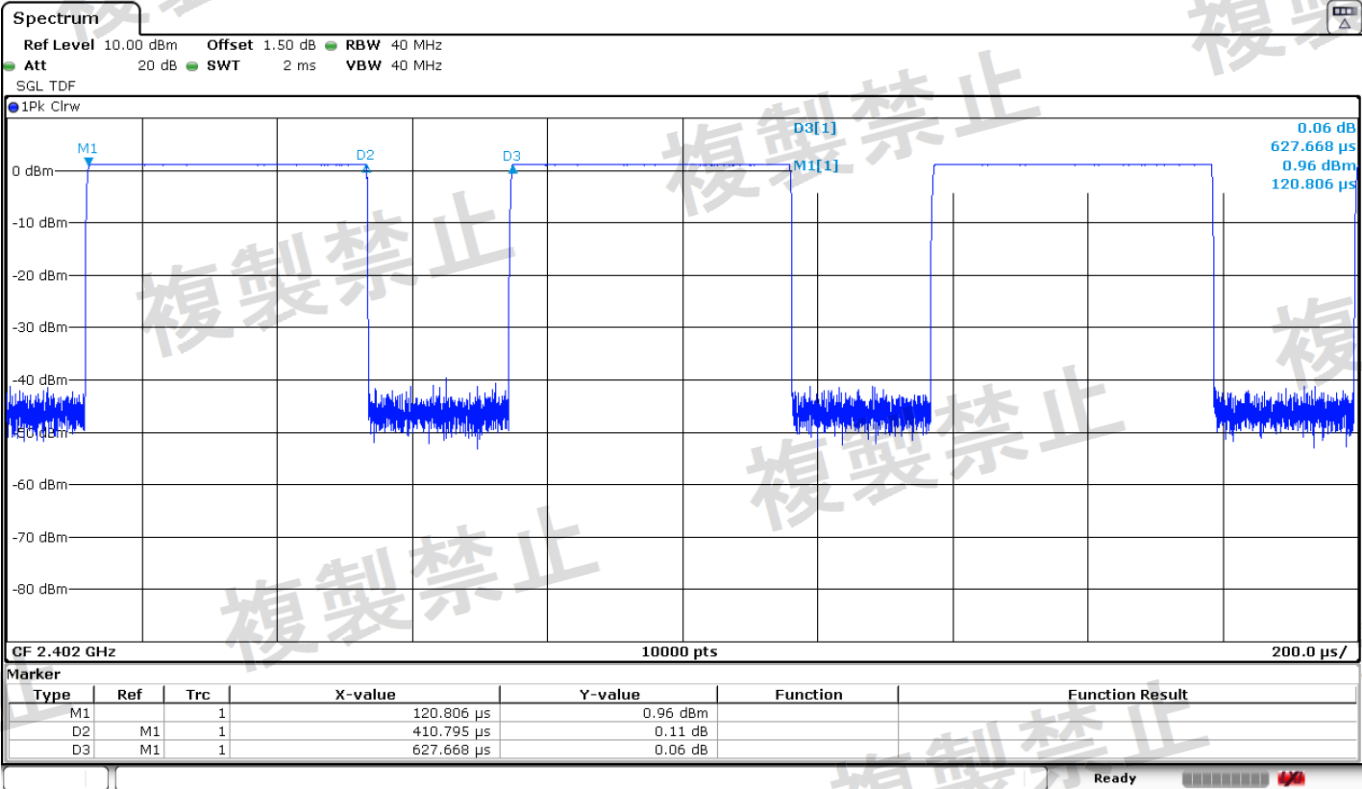
PASS

Duty Cycle:

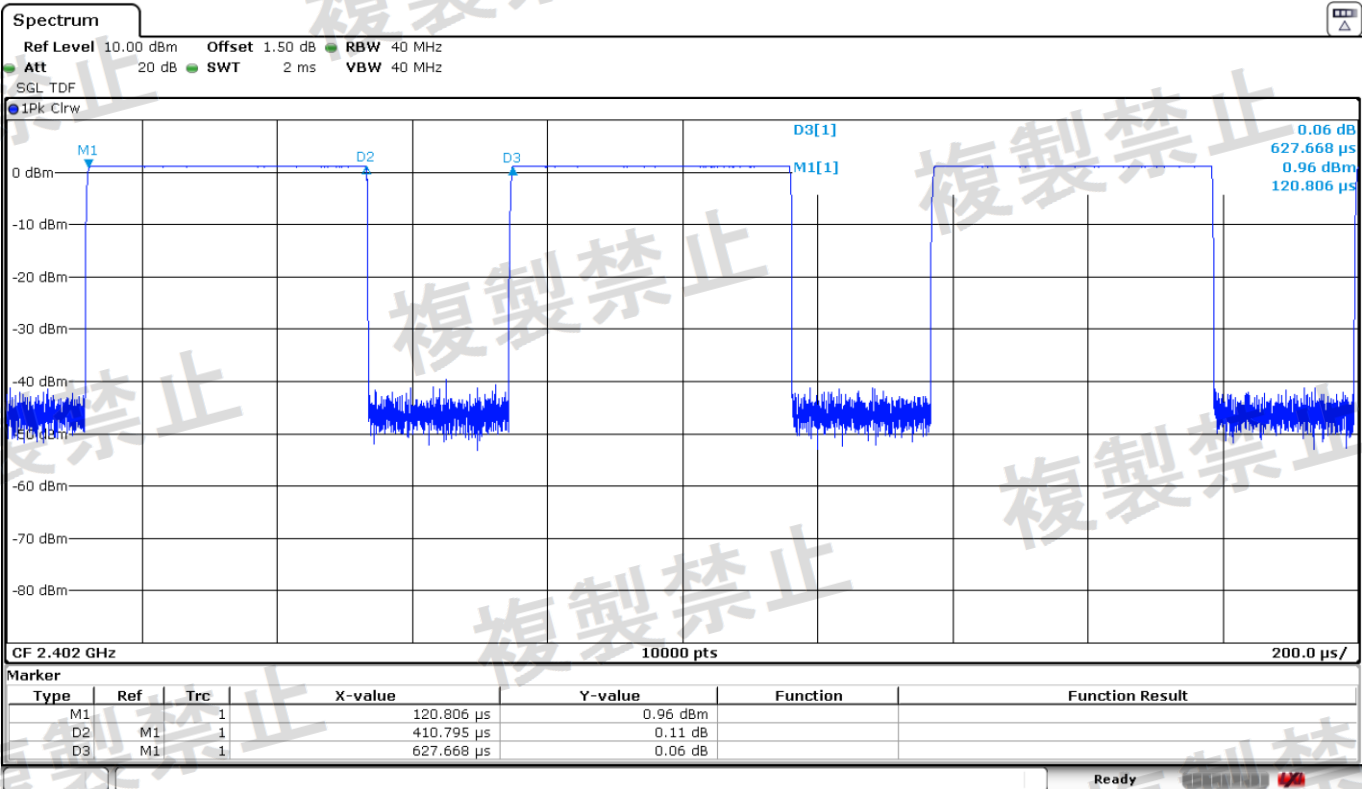
- LOW CHANNEL:



MIDDLE CHANNEL:

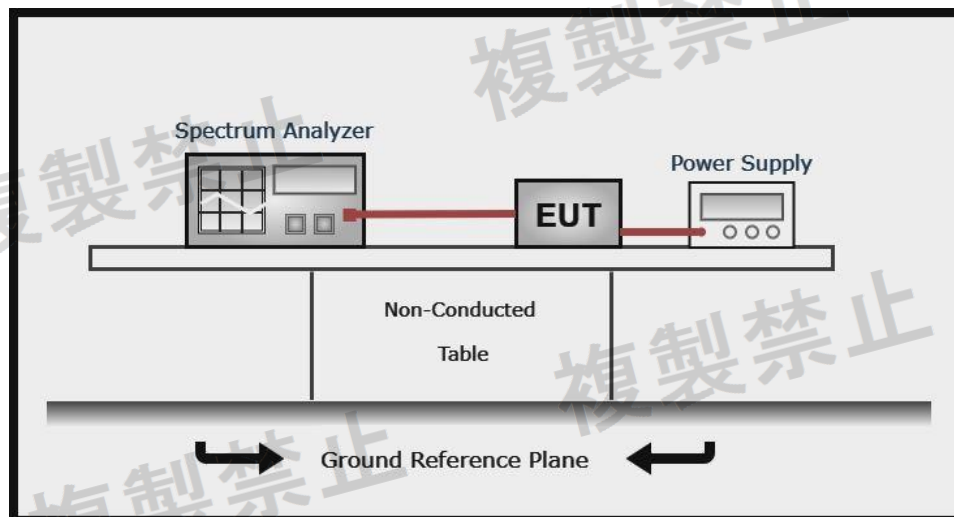


HIGH CHANNEL:



Frequency tolerance

Test Setup:



Limits:

Frequency tolerance shall be $\pm 50 \times 10^{-6}$ (50 ppm).

Test method:

According to MIC Notice No. 88 Annex 43

Test procedure:

The DUT is connected to the spectrum analyzer and it is configured at maximum output power in the different test channels. FL and FH frequencies are measured as worst-case frequencies at 10 dBc respect the maximum emission founded. The frequency error is calculated as the difference between the arithmetic mean (Frequency Absolute value) and the nominal value.

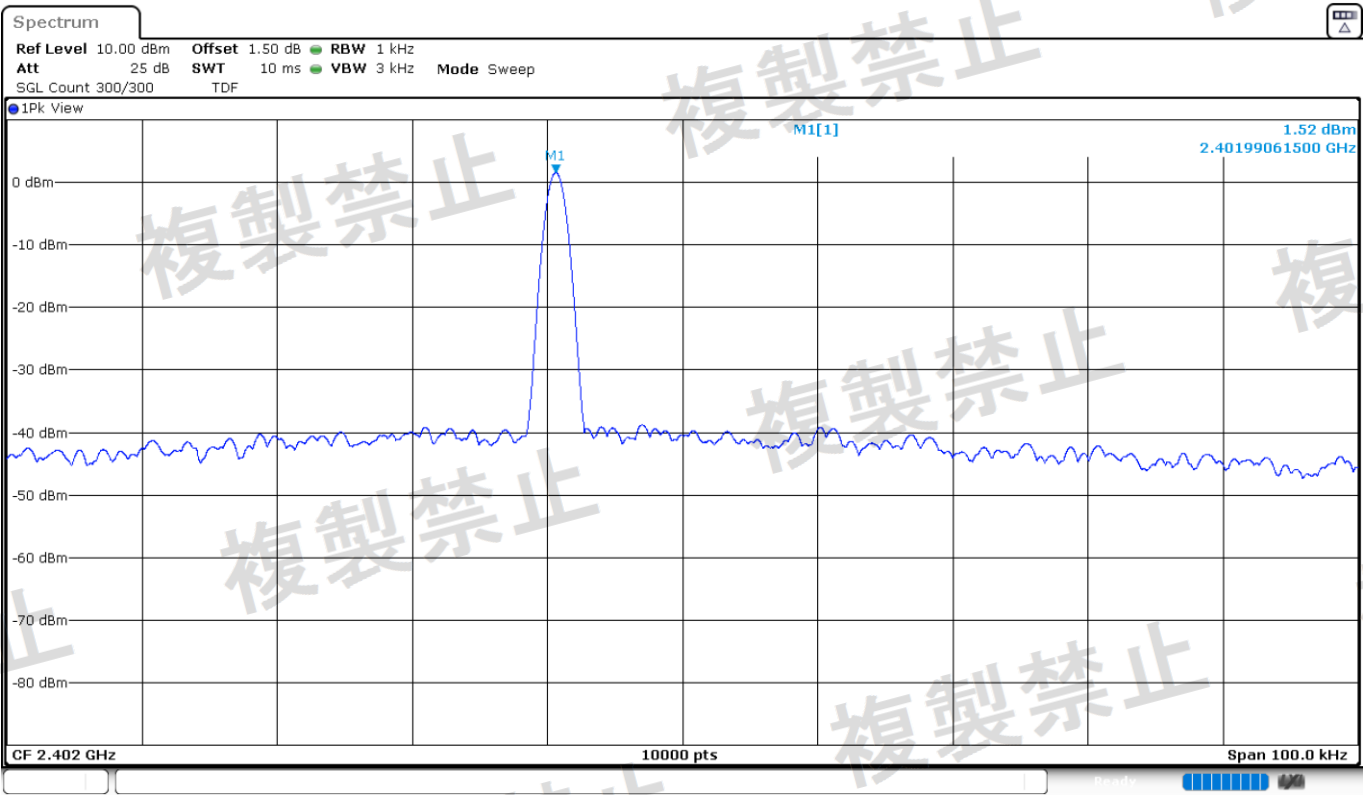
Results:

Channel	Frequency error (Hz)	Frequency Absolute value (MHz)	Frequency error (ppm)
Low (2402 MHz)	-9400	2401.990615	-3.913405
Middle (2440 MHz)	-9500	2439.990515	-3.893442
High (2480 MHz)	-9700	2479.990315	-3.911290
Measurement uncertainty	< ± 4.79 kHz		

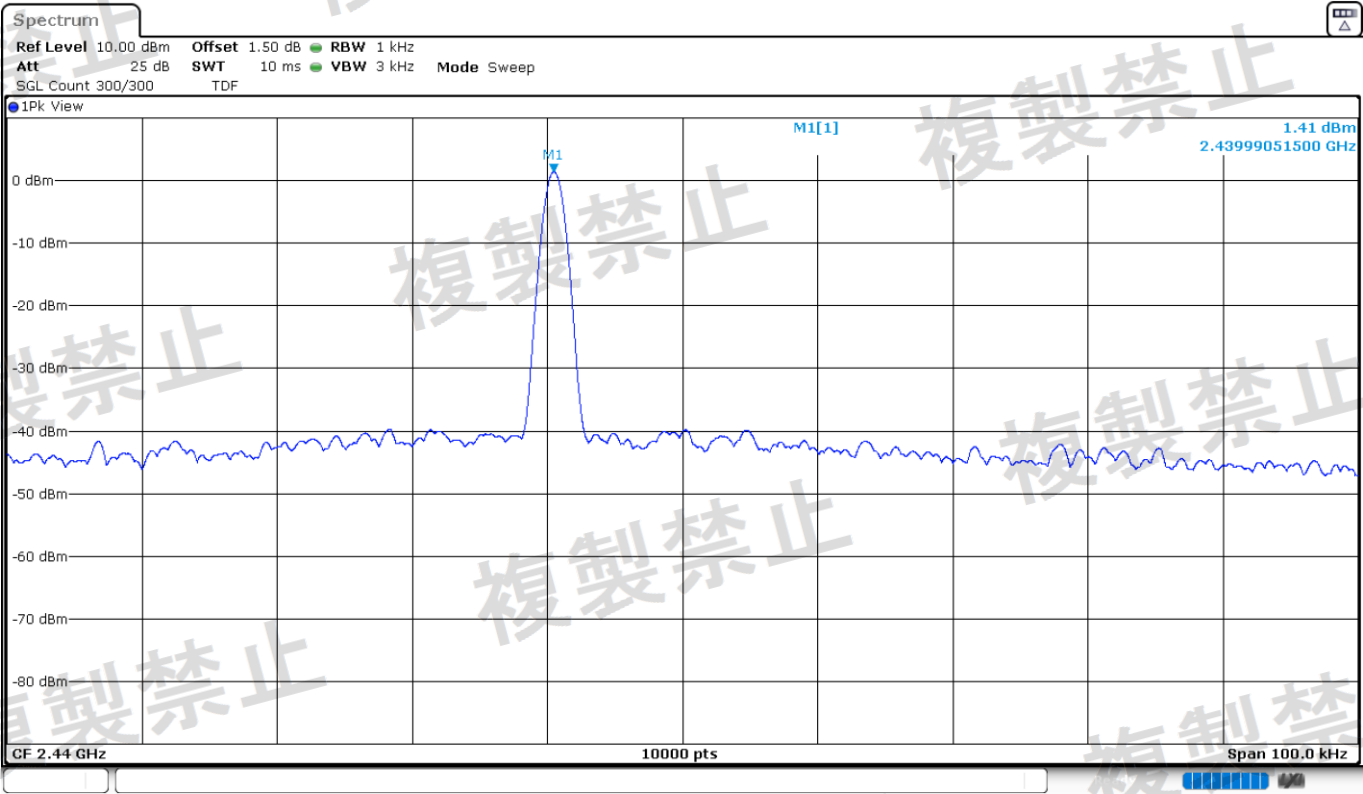
Verdict:

PASS

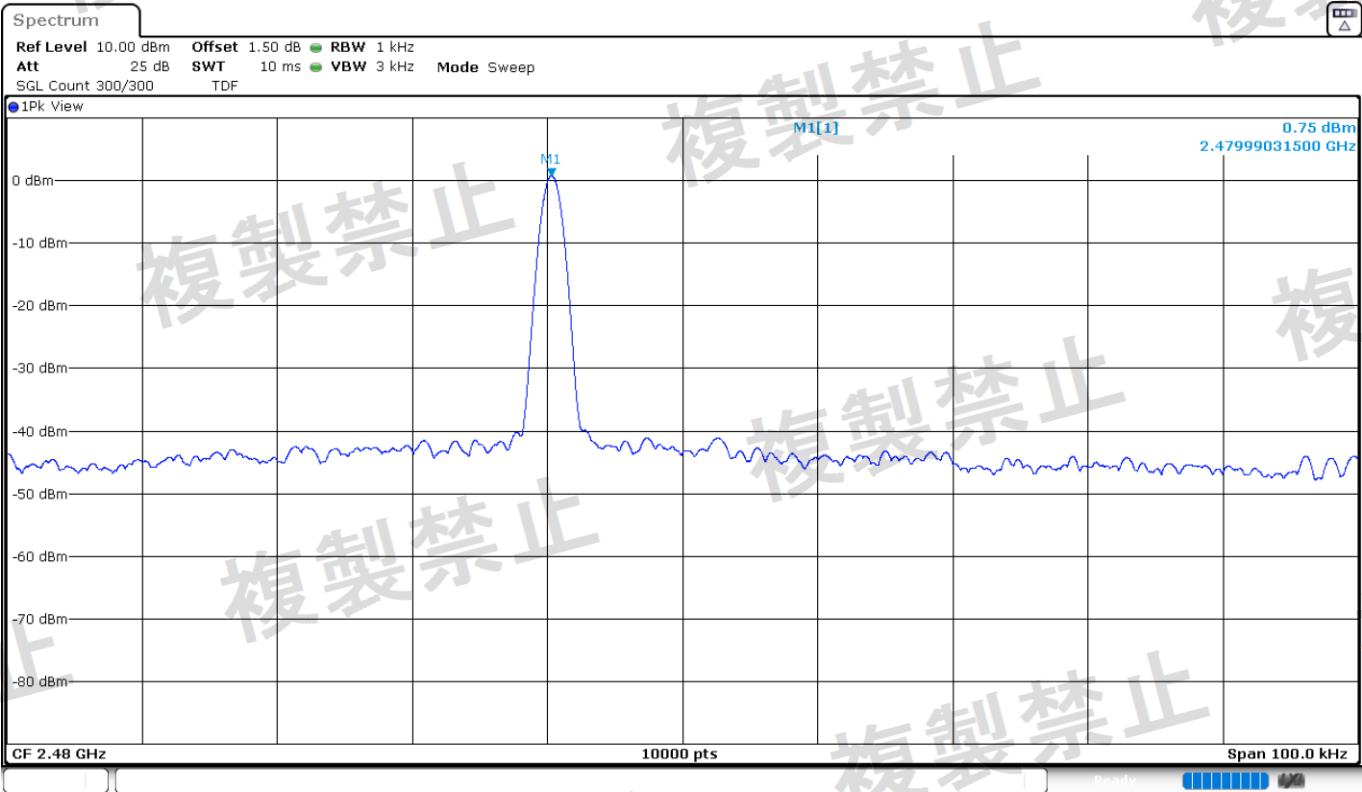
• LOW CHANNEL:



• MIDDLE CHANNEL:

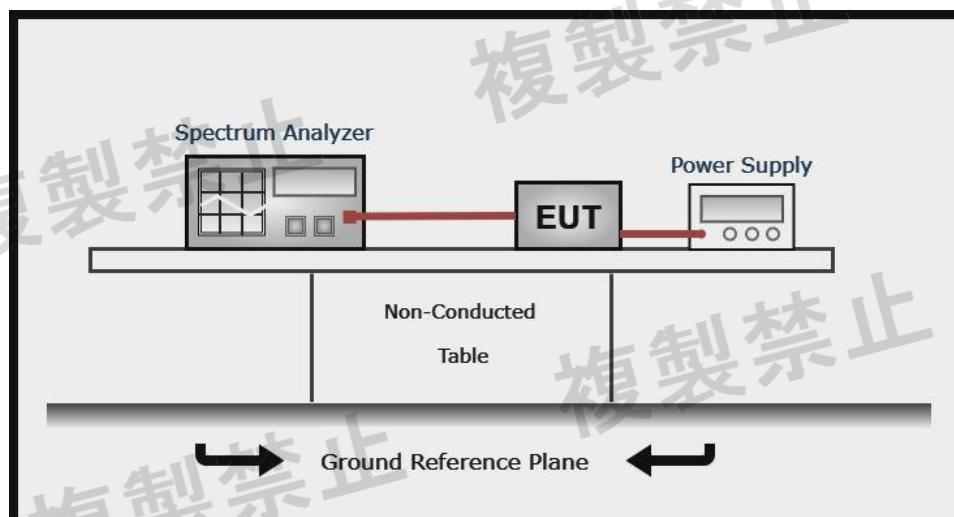


- HIGH CHANNEL:



Spurious emission intensity

Test Setup:



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:

- $2,387 \text{ MHz} \leq f < 2,400 \text{ MHz}$ and $2,483.5 \text{ MHz} < f \leq 2,496.5 \text{ MHz}$ $25 \text{ } \mu\text{W}$ (-16 dBm) or less.
- $2,387 \text{ MHz} > f$ and $2,496.5 \text{ MHz} < f$ $2.5 \text{ } \mu\text{W}$ (-26 dBm) or less.

Test method:

According to MIC Notice No. 88 Annex 43

Test procedure:

The DUT is connected to the spectrum analyzer and it is configured at maximum output power in the different test channels. The spectrum analyzer is configured with the parameters (RWB, VBW, frequency span) indicated in the test method. It is ensure to have at least 10 dB of margin between background noise and limit line.

Results:

- LOW CHANNEL:
No spurious frequencies detected at less than 10 dB below the limit.

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)
2386.81600	-53.91	-26.00
2399.99400	-37.17	-16.00
2489.11200	-58.62	-16.00

6838.350000	-52.19	-26.00
-------------	--------	--------

- MIDDLE CHANNEL:
No spurious frequencies detected at less than 10 dB below the limit.

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)
2301.083000	-56.9	-26.00
2399.136000	-56.12	-16.00
2487.580000	-58.3	-16.00
6747.700000	-52.65	-26.00

- HIGH CHANNEL:
No spurious frequencies detected at less than 10 dB below the limit.

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)
893.998000	-47.47	-26.00
2399.607000	-58.45	-16.00
2483.542000	-47.31	-16.00
6990.590000	-51.7	-26.00

Measurement uncertainty <± 2.77 dB

Verdict:

PASS

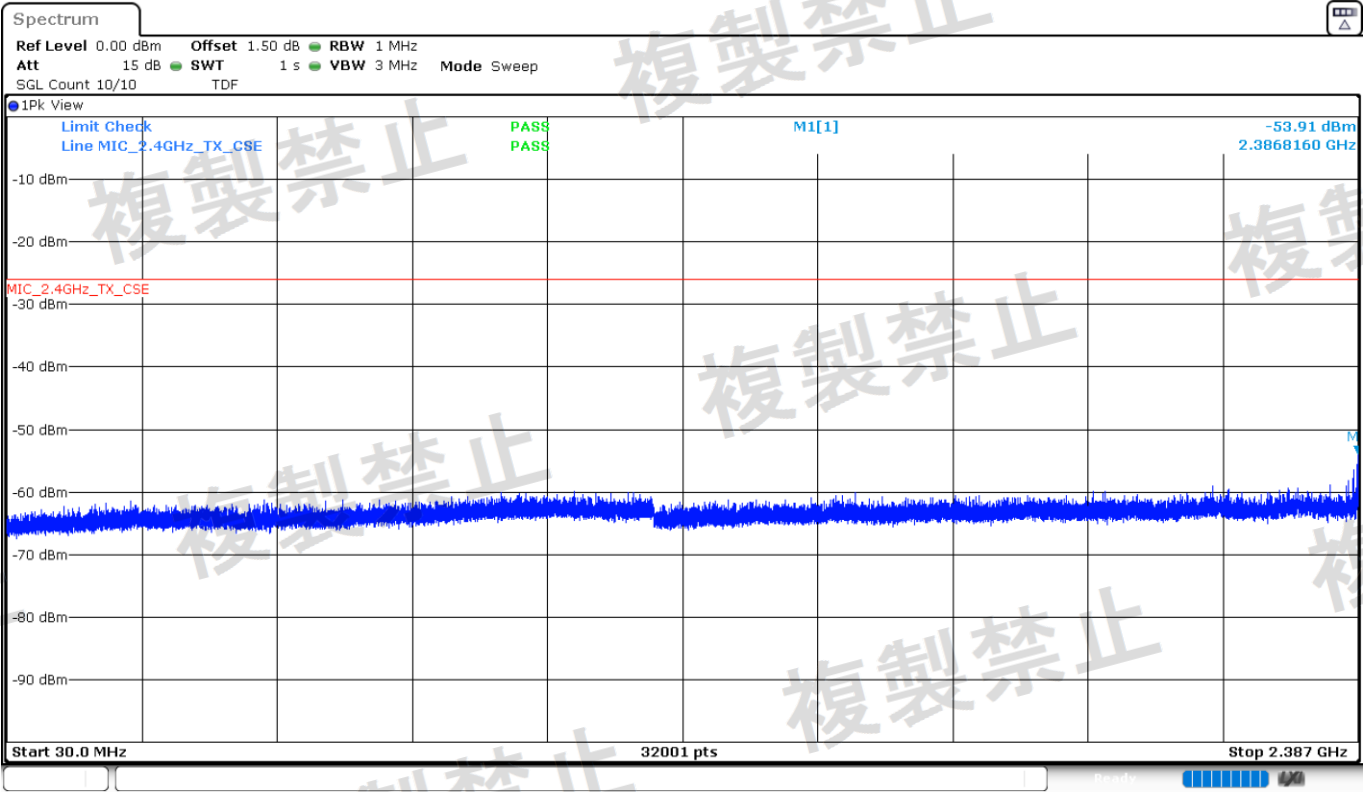
Subrange

Receiver: [FSV 40]
9 kHz - 150 kHz
150 kHz - 30 MHz
30 MHz - 1 GHz
1 GHz - 2.3 GHz
2.3 GHz - 2.6 GHz
2.6 GHz - 12.5 GHz
12.5 GHz - 25 GHz

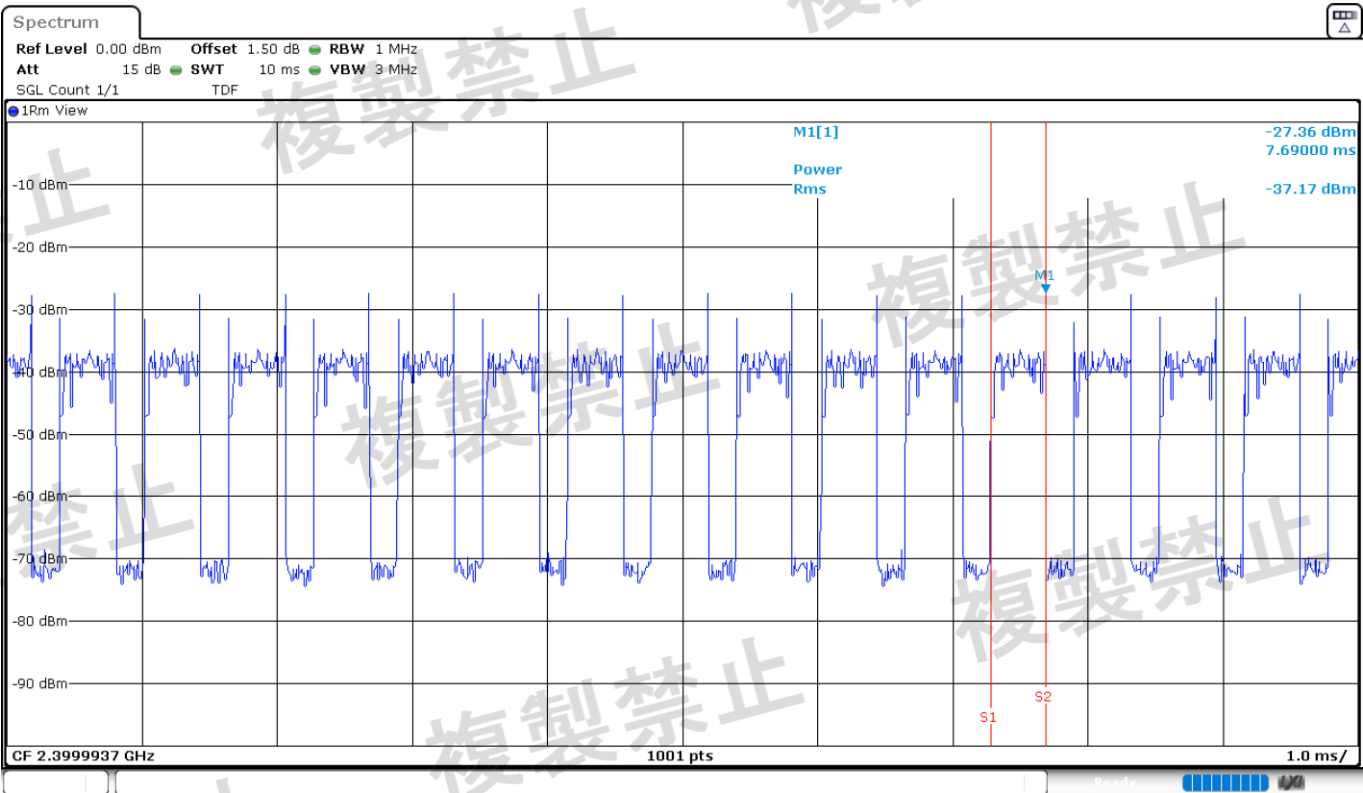
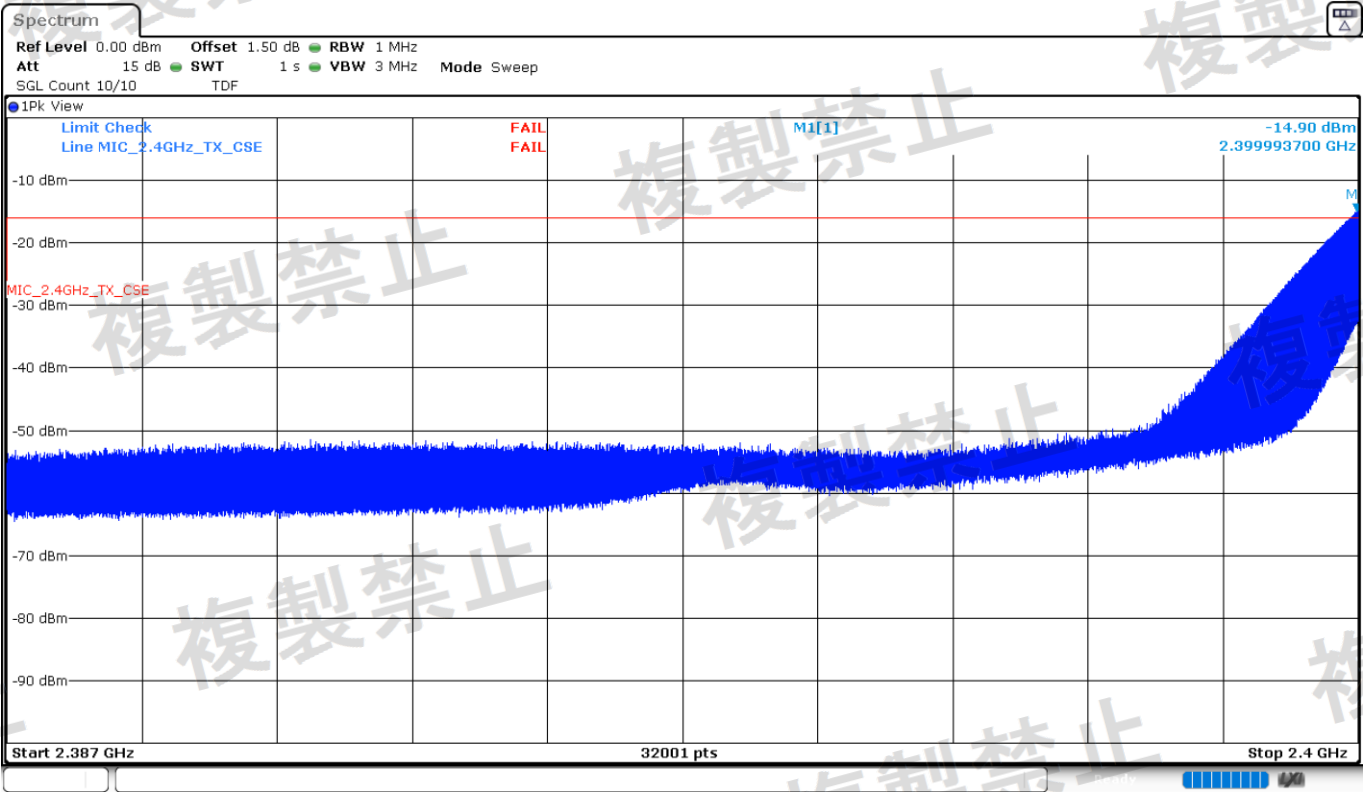
Step Size	Detectors	Bandwidth	Sweep Time	Preamp
141 Hz	PK+	300 Hz	1 s	0 dB
3.317 kHz	PK+	10 kHz	1 s	0 dB
97 kHz	PK+	1 MHz	1 s	0 dB
130 kHz	PK+	1 MHz	1 s	0 dB
30 kHz	PK+	1 MHz	1 s	0 dB
330 kHz	PK+	1 MHz	1 s	0 dB
416.667 kHz	PK+	1 MHz	1 s	0 dB

• LOW CHANNEL:

Frequency range 30 MHz – 2.387 GHz:

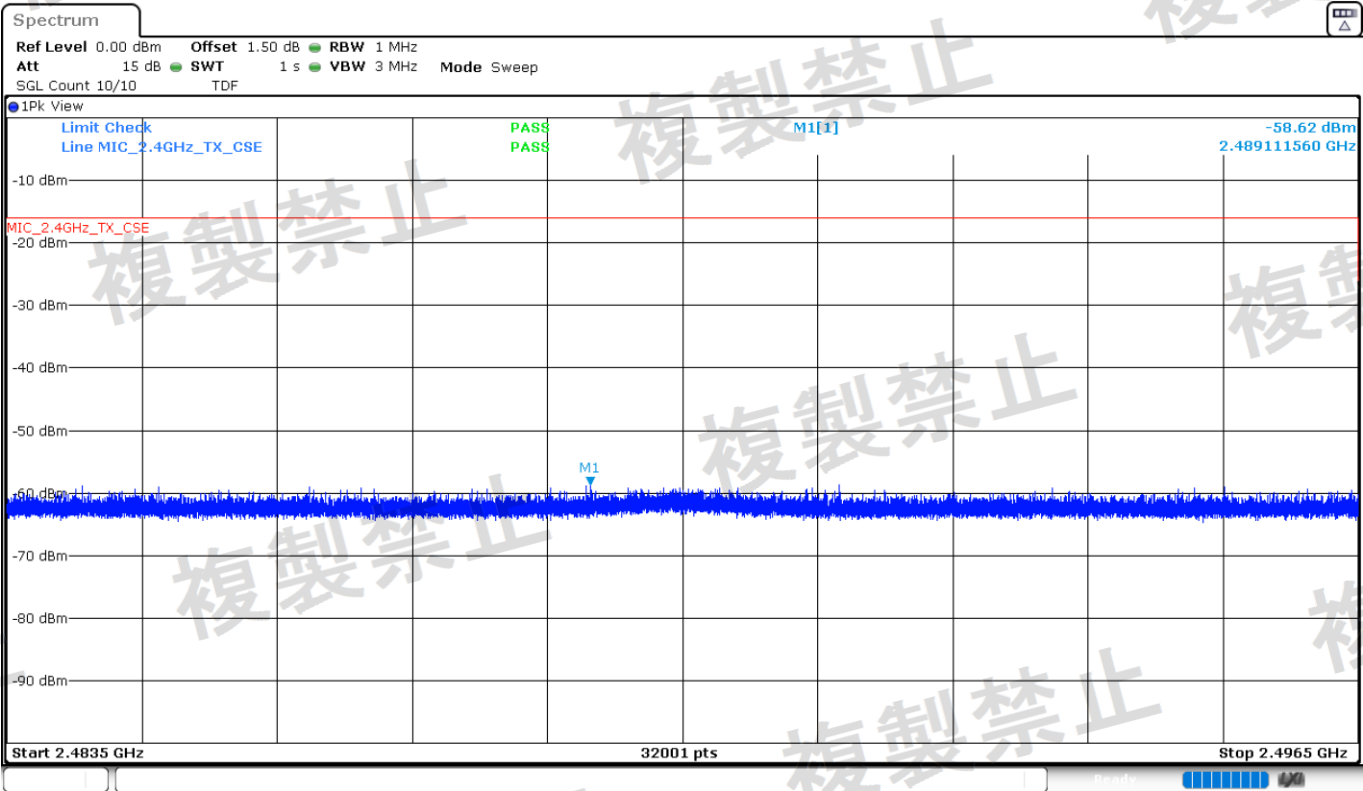


Frequency range 2.387 – 2.400 GHz:

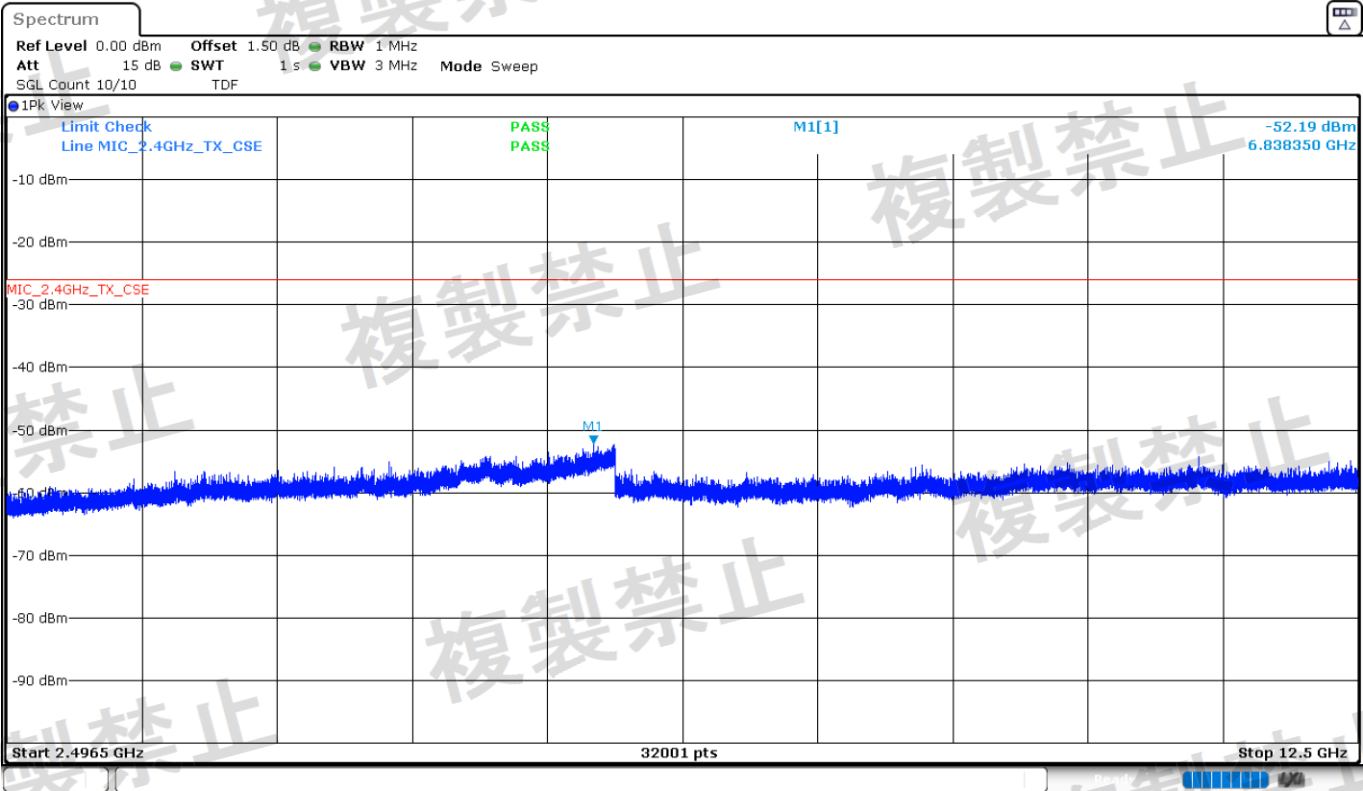


Test method according to Section V, paragraph 5 “Measurement Operating instructions”, clause (c).

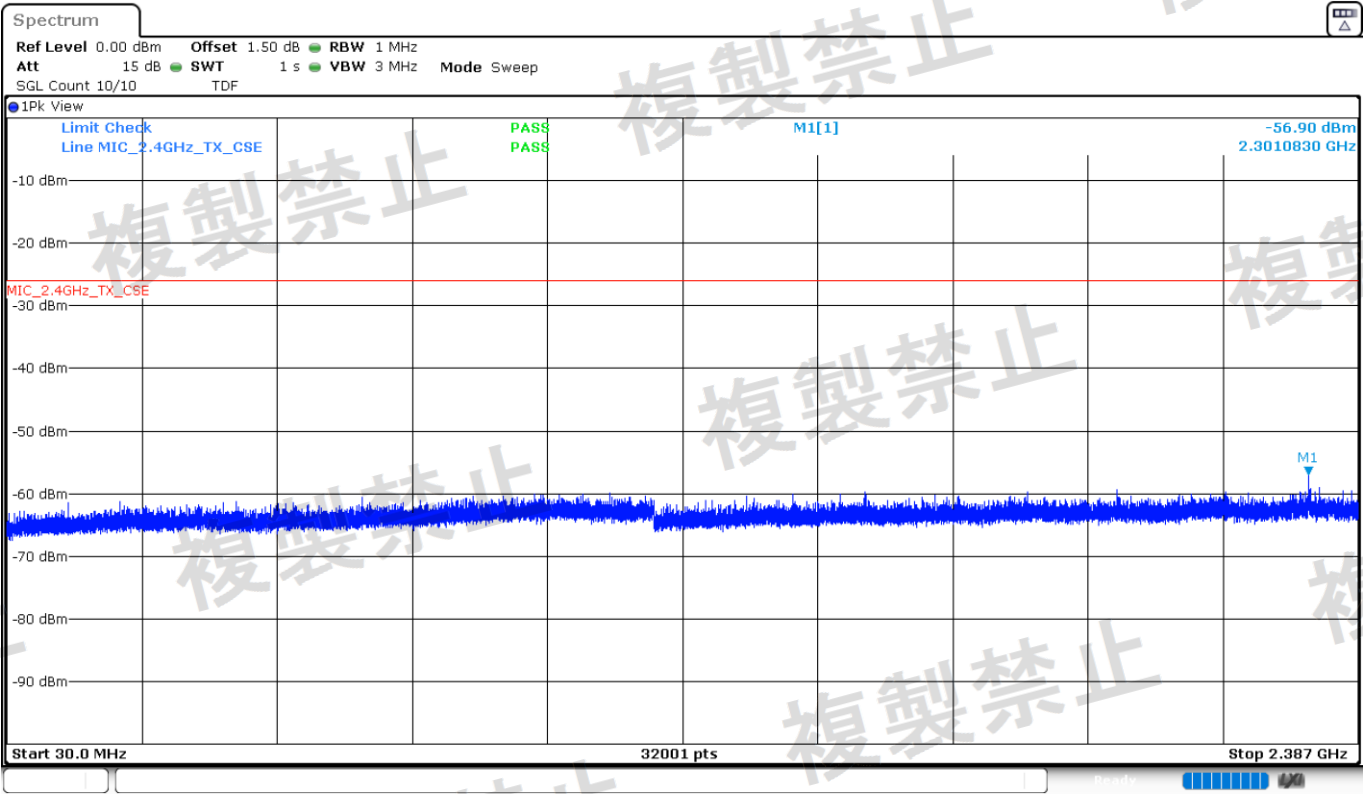
Frequency range 2.4835 – 2.4965 GHz:



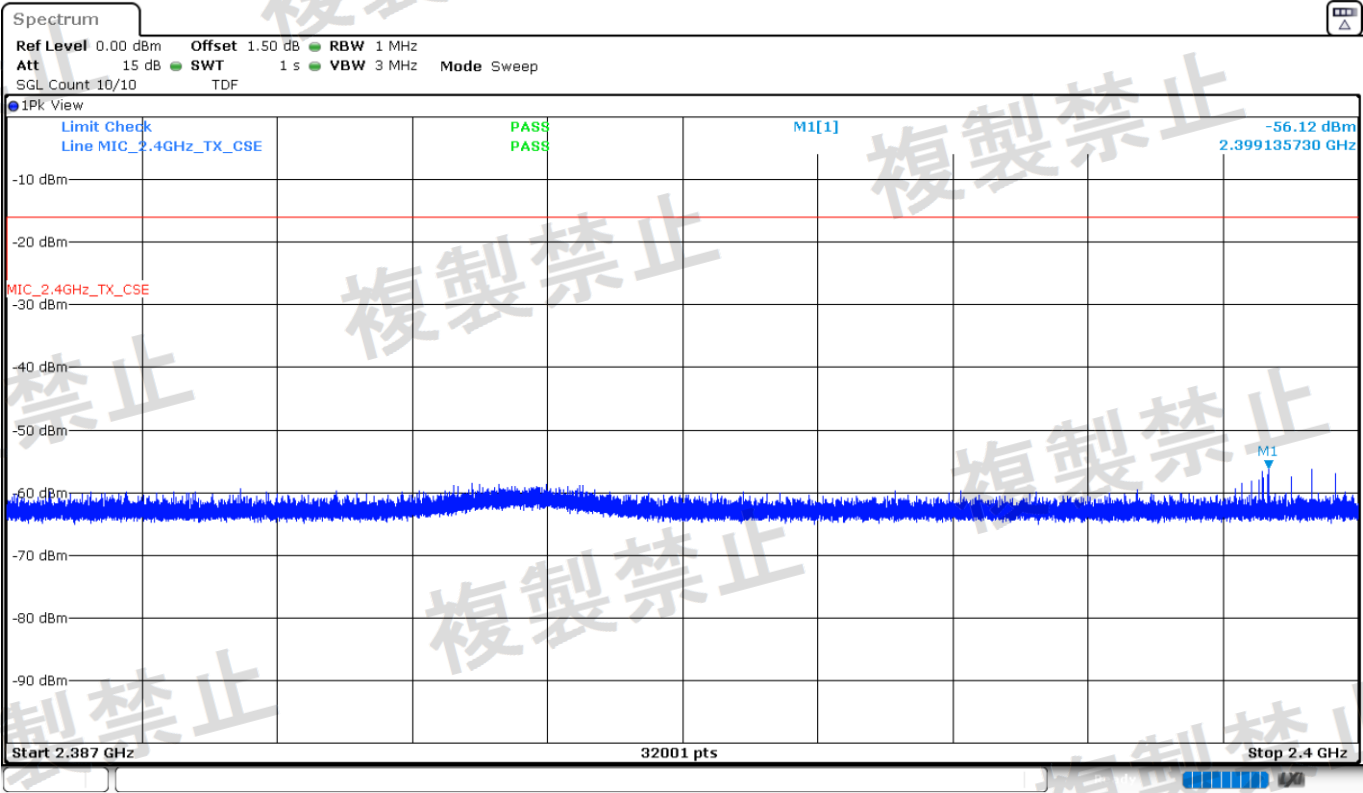
Frequency range 2.4965 – 12.5 GHz:



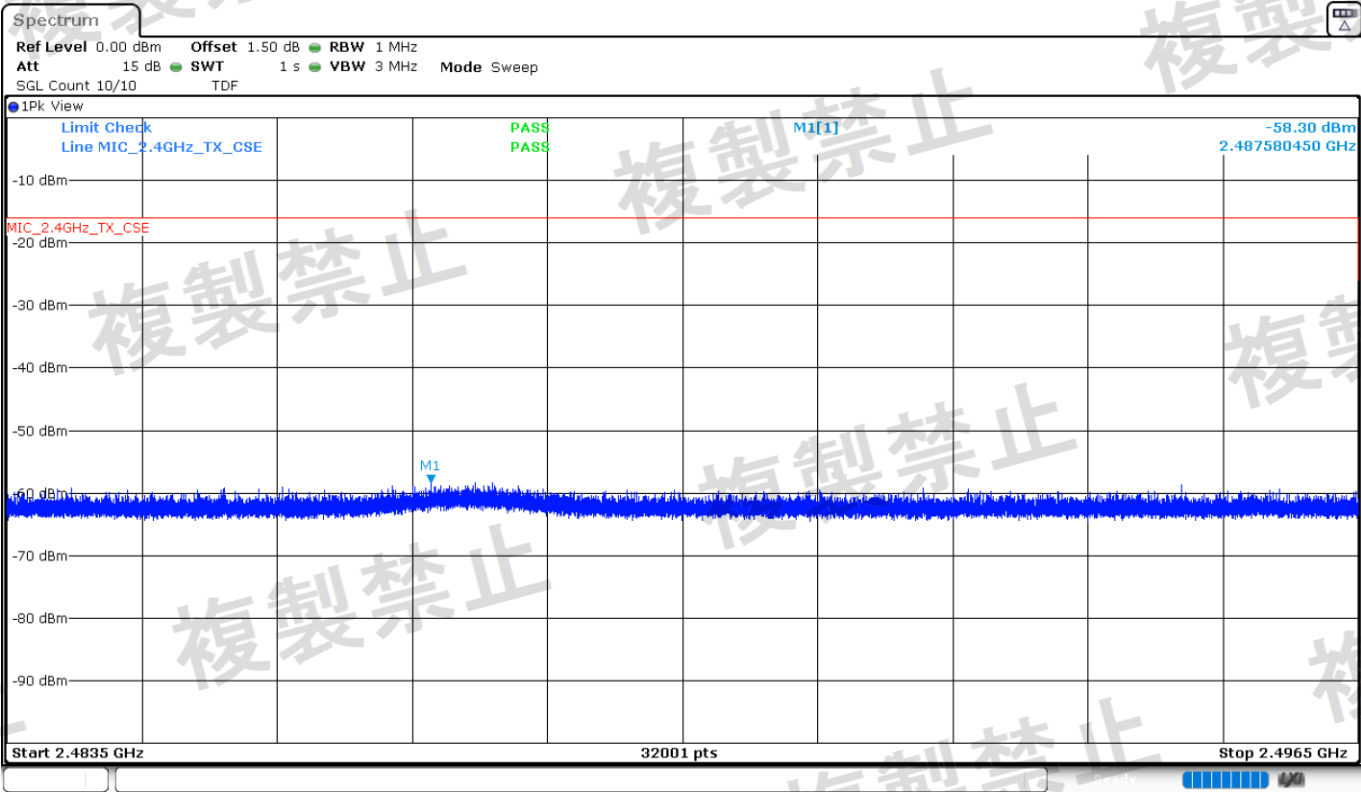
- MIDDLE CHANNEL:
Frequency range 30 MHz – 2.387 GHz:



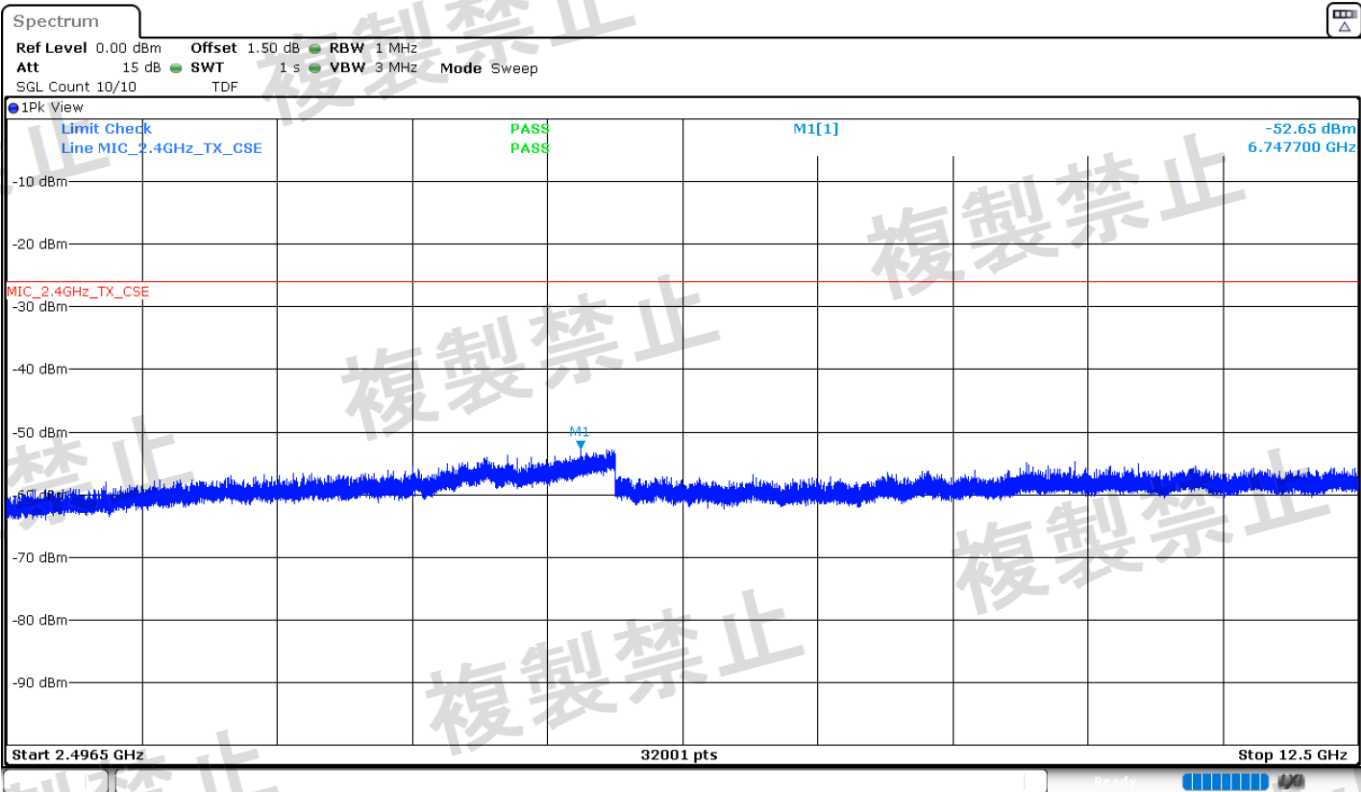
Frequency range 2.387 – 2.400 GHz:



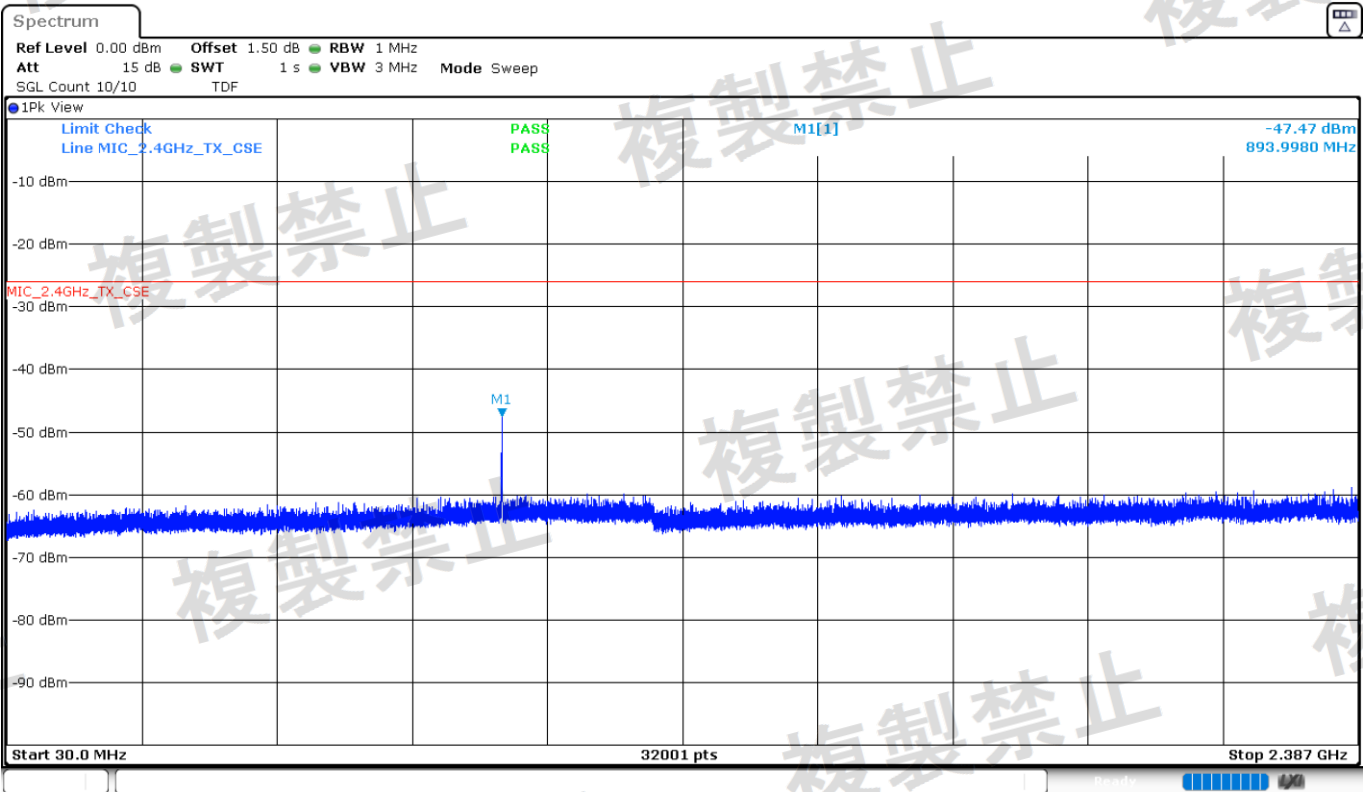
Frequency range 2.4835 – 2.4965 GHz:



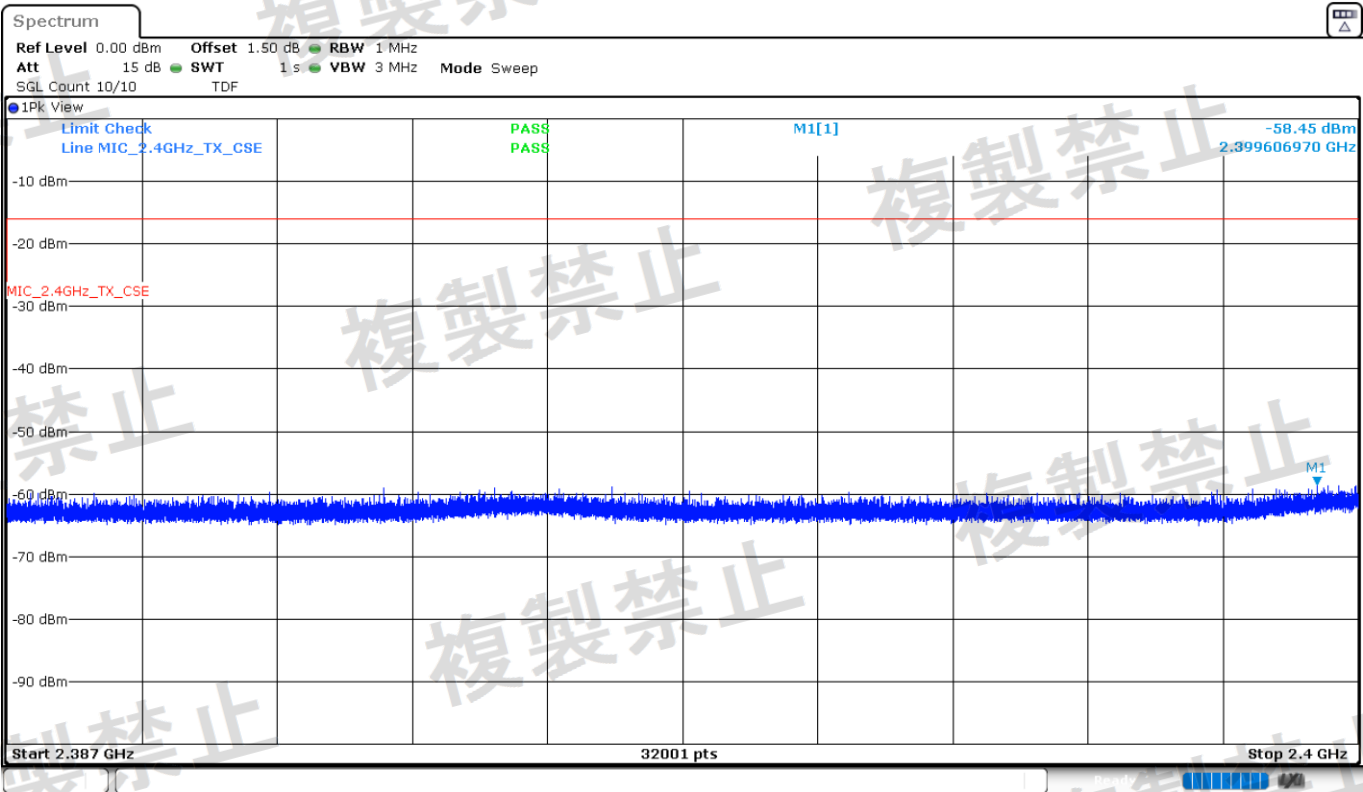
Frequency range 2.4965 – 12.5 GHz:



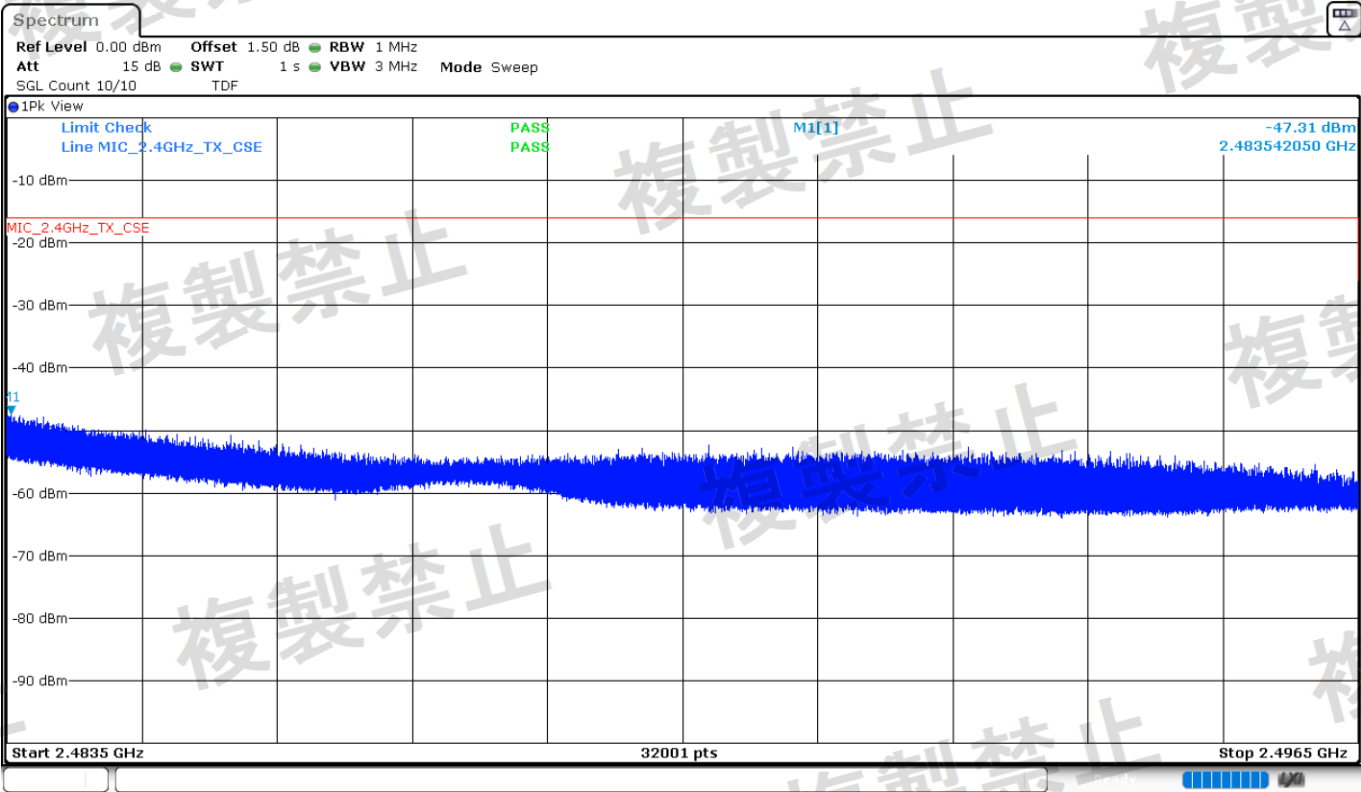
- HIGH CHANNEL:
Frequency range 30 MHz – 2.387 GHz:



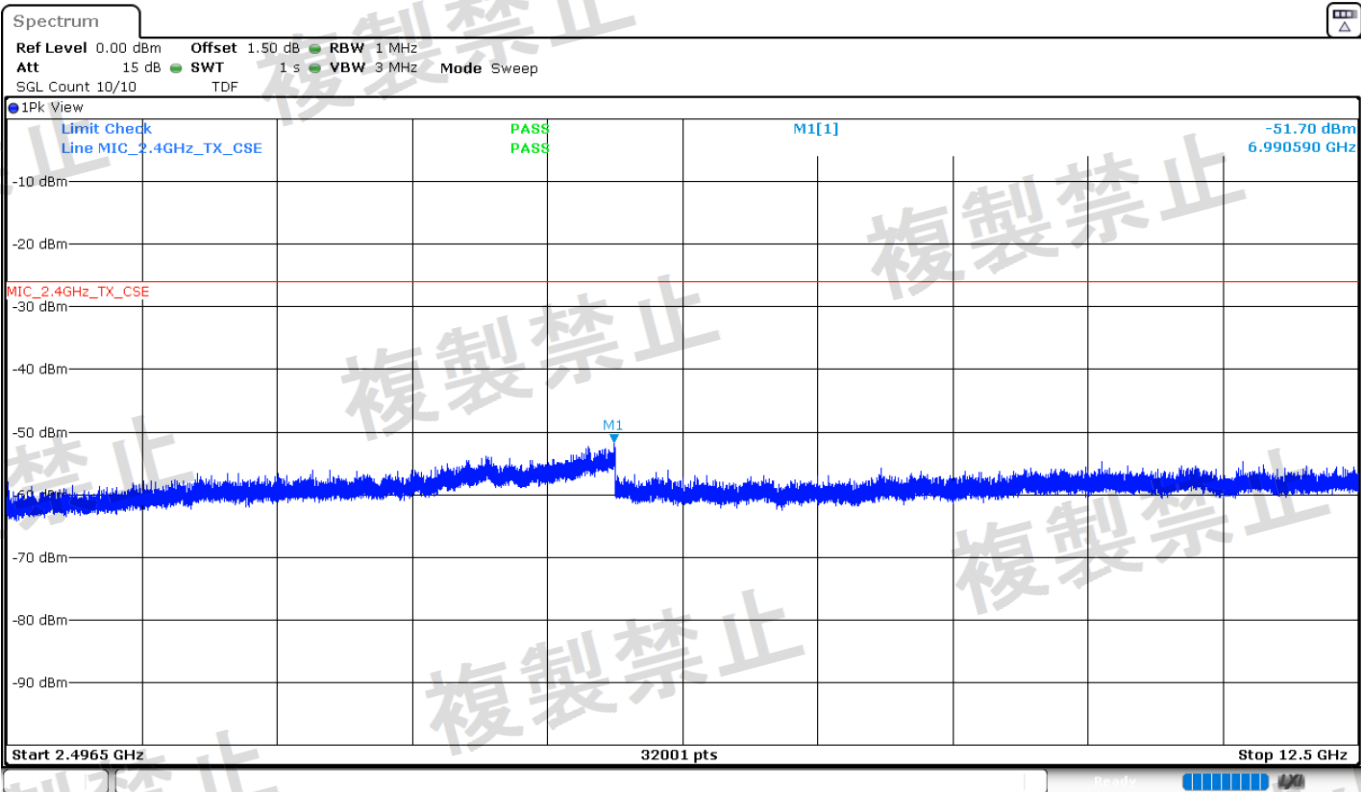
Frequency range 2.387 – 2.400 GHz:



Frequency range 2.4835 – 2.4965 GHz:

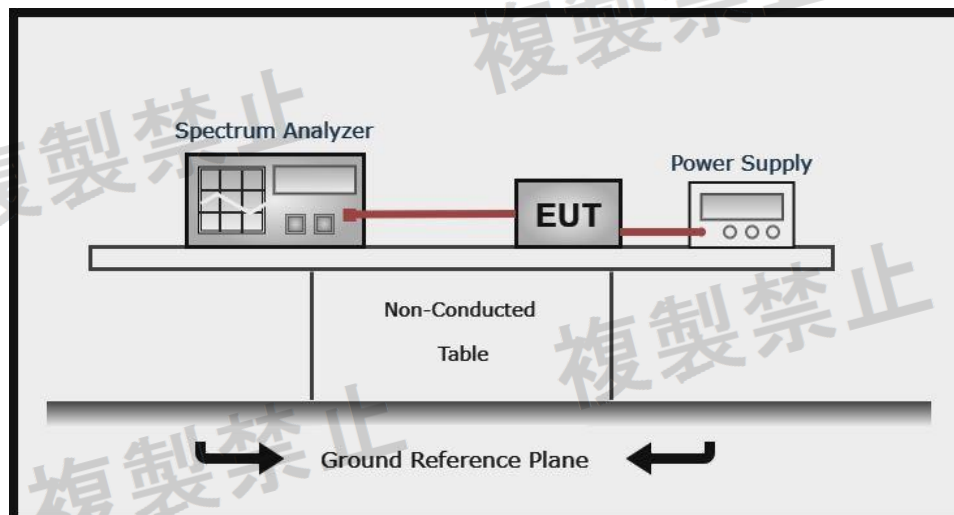


Frequency range 2.4965 – 12.5 GHz:



Permissible value for occupied bandwidth

Test Setup:



Limits:

Mode	Limit
FH	83.5 MHz
FH+DS	83.5 MHz
FH+OFDM	83.5 MHz
OFDM (Narrow bandwidth), DS	26 MHz
OFDM (Wide band)	40 MHz
Others	26 MHz

Test method:

According to MIC Notice No. 88 Annex 43

Test procedure:

The DUT is connected to the spectrum analyzer and it is configured at maximum output power in the different test channels. The spectrum analyzer is with the function 99% occupied bandwidth.

Results:

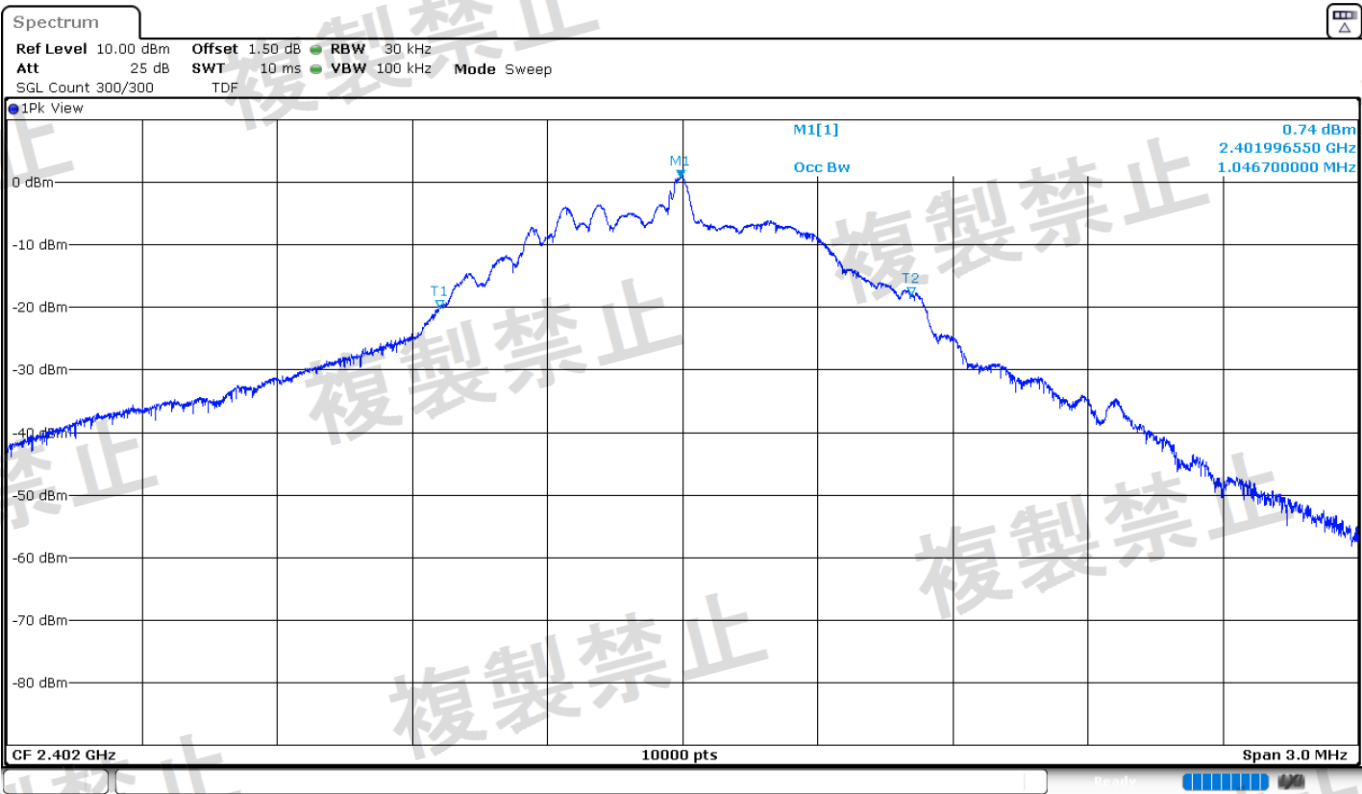
Mode: Other digital modulation methods.

	Low Channel 2402 MHz	Middle Channel 2440 MHz	High Channel 2480 MHz
99% occupied bandwidth (MHz)	1.046700	1.019400	1.012500
Limit	<26 MHz		
Measurement uncertainty (kHz)	<± 3.70		

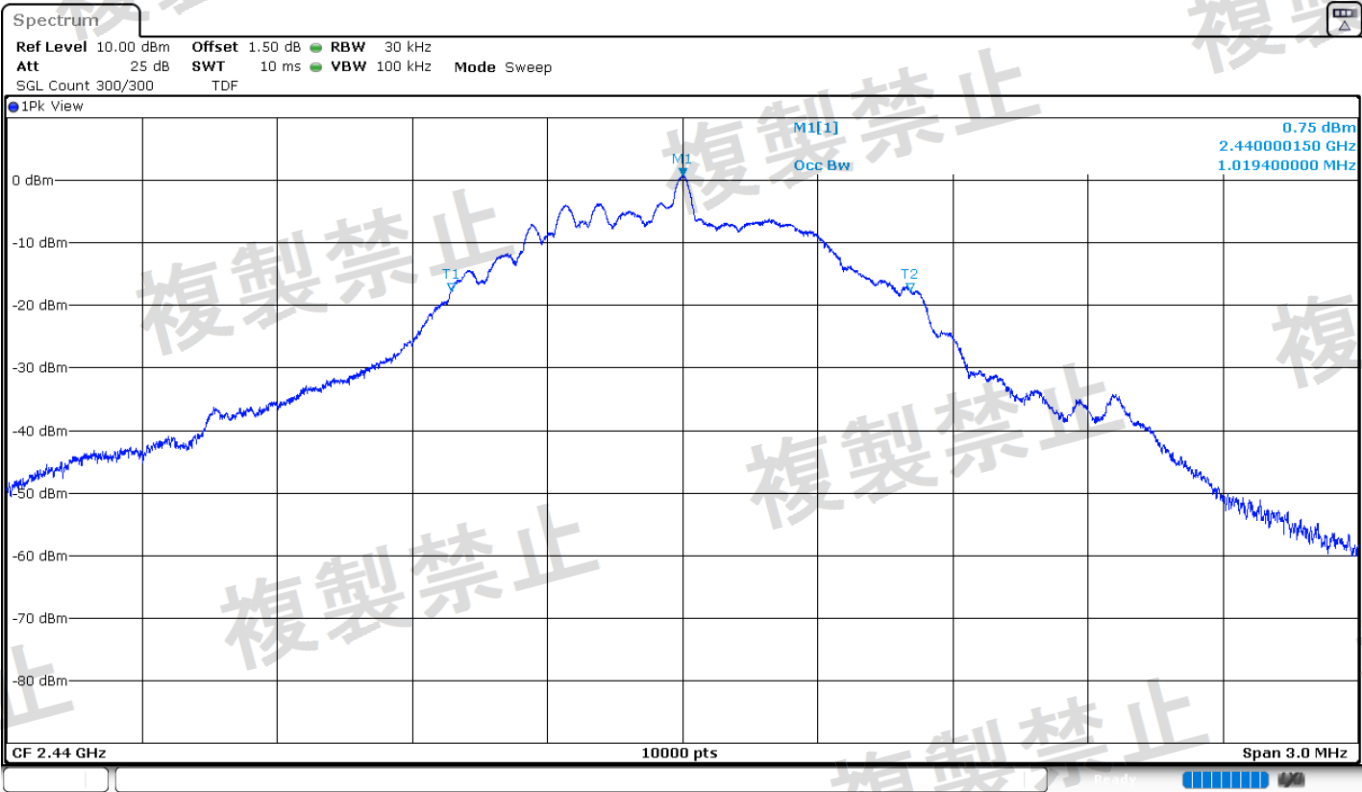
Verdict:

PASS

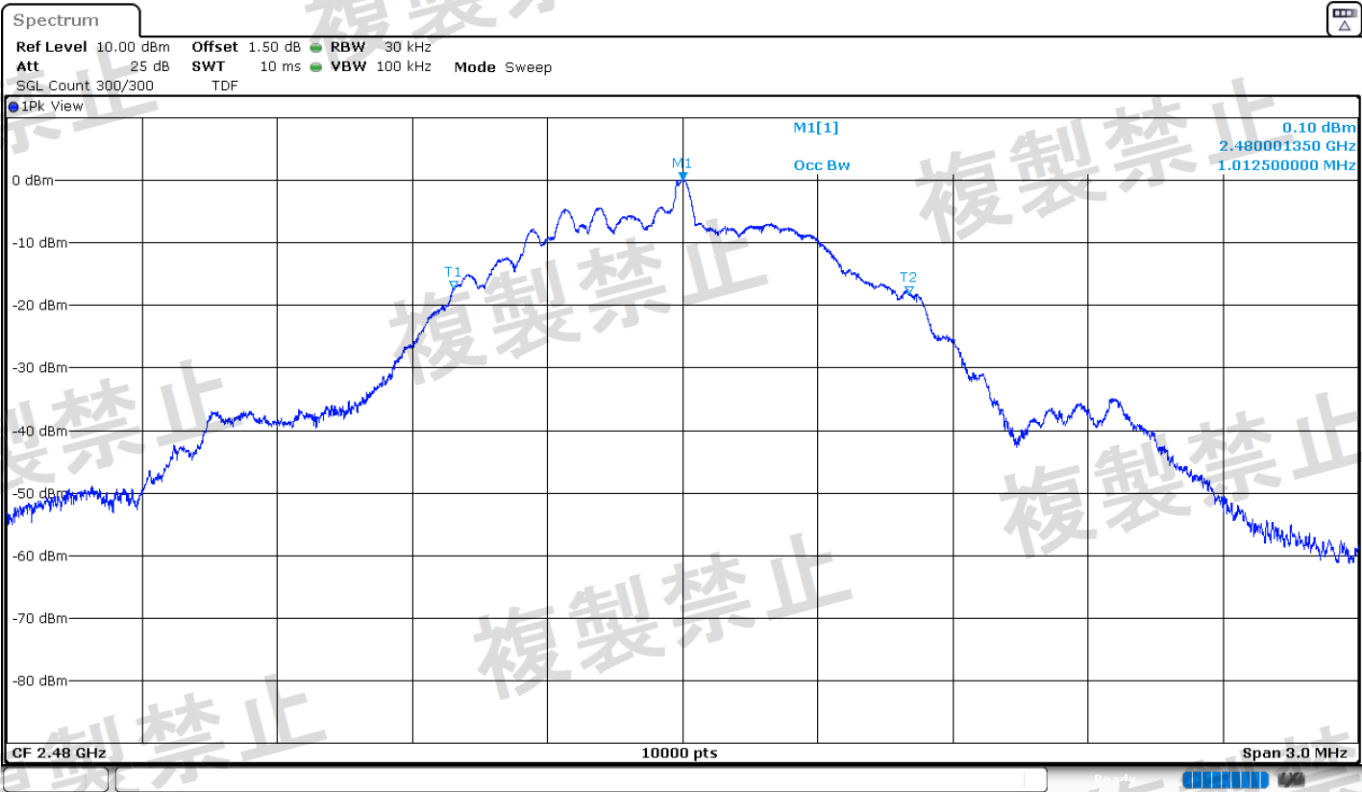
- LOW CHANNEL:



MIDDLE CHANNEL:

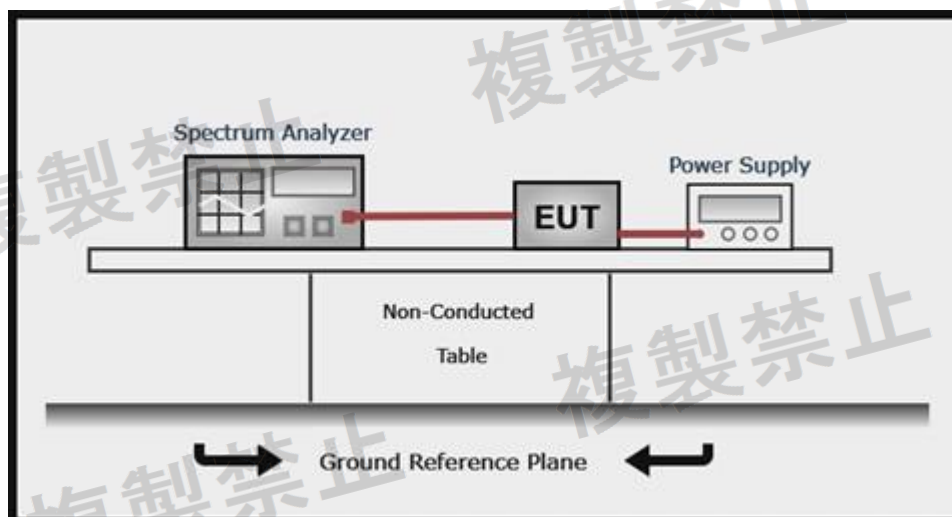


HIGH CHANNEL:



Limit on secondary radiated emissions

Test Setup:



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.

Test method:

According to MIC Notice No. 88 Annex 43

Test procedure:

The DUT is connected to the spectrum analyzer and it is configured in reception mode in the different test channels. The spectrum analyzer is configured with the parameters (RWB, VBW, frequency span) indicated in the test standard. It is ensure to have at least 10 dB of margin between background noise and limit line.

Results:

- LOW CHANNEL:
No spurious frequencies detected at less than 10 dB below the limit.

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)
821.723000	-79.86	-54.00
6988.980000	-62.15	-47.00

- MIDDLE CHANNEL:
No spurious frequencies detected at less than 10 dB below the limit.

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)
889.772000	-79.17	-54.00
6887.280000	-62.42	-47.00

- HIGH CHANNEL:
No spurious frequencies detected at less than 10 dB below the limit.

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)
979.221000	-79.82	-54.00
6939.030000	-61.97	-47.00

Measurement uncertainty <± 2.94 dB

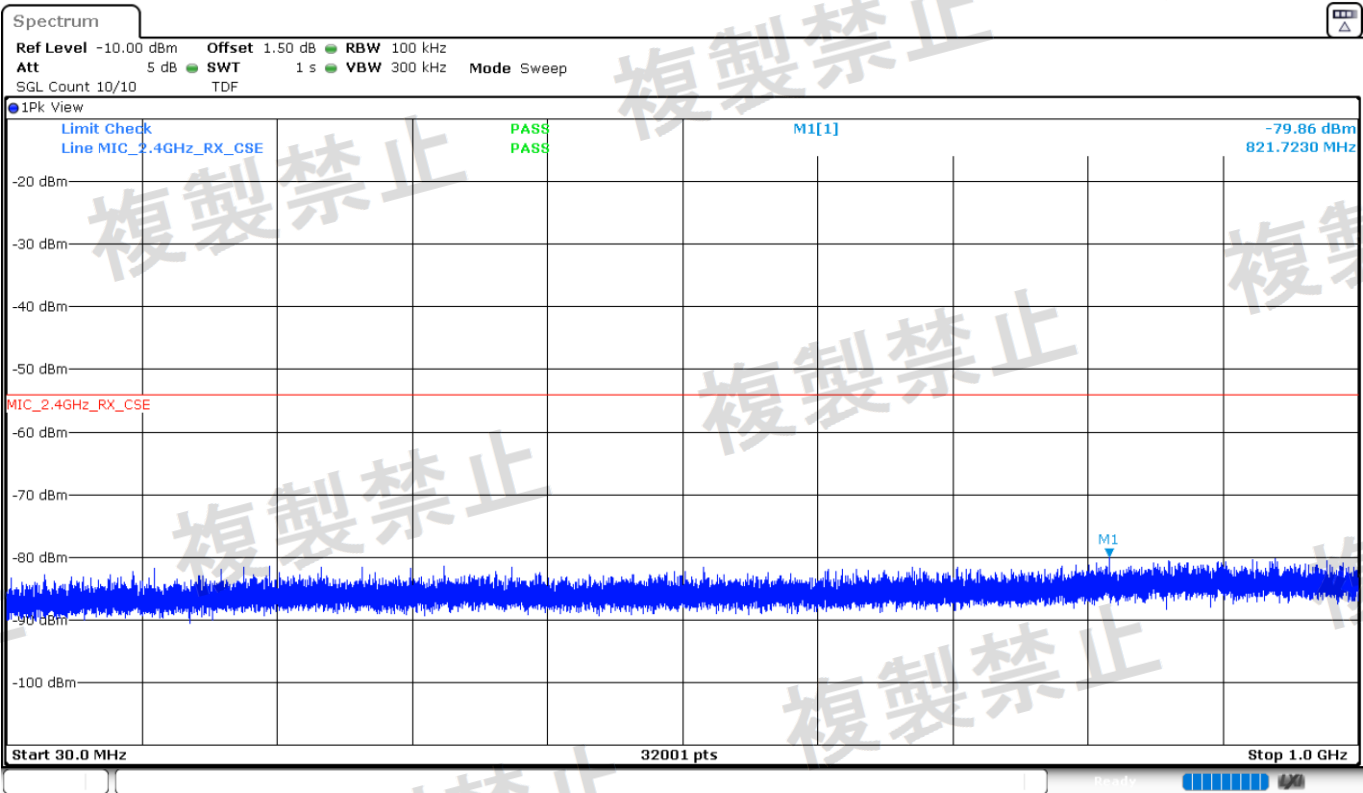
Verdict:

PASS

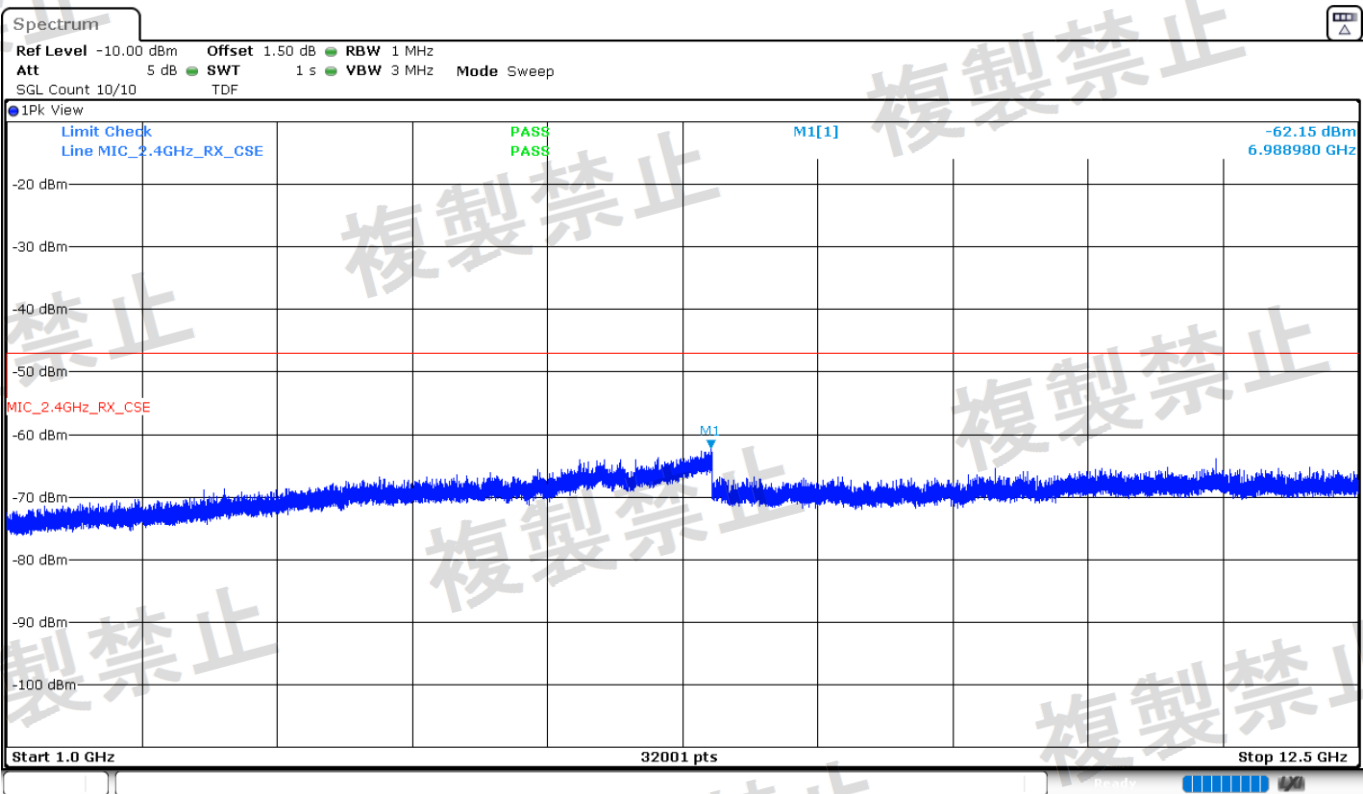
Spectrum analyzer parameters:

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
9 kHz - 150 kHz	141 Hz	PK+	300 Hz	1 s	0 dB
150 kHz - 30 MHz	2,985 kHz	PK+	10 kHz	1 s	0 dB
30 MHz - 1 GHz	32,333 kHz	PK+	100 kHz	1 s	0 dB
1 GHz - 12,5 GHz	383,333 kHz	PK+	1 MHz	1 s	0 dB
12,5 GHz - 25 GHz	416,667 kHz	PK+	1 MHz	1 s	0 dB

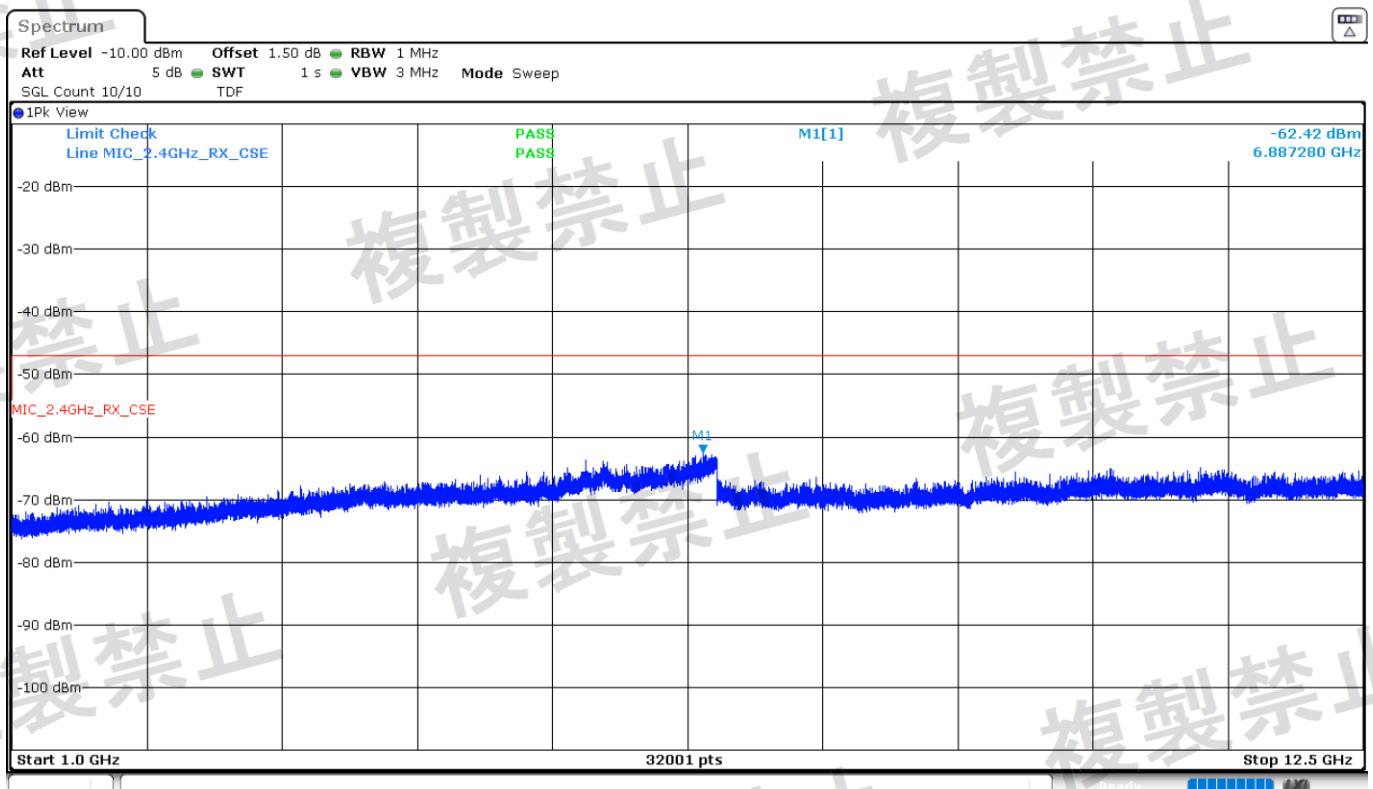
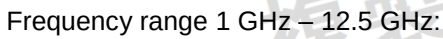
- LOW CHANNEL:
Frequency range 30 MHz - 1 GHz:



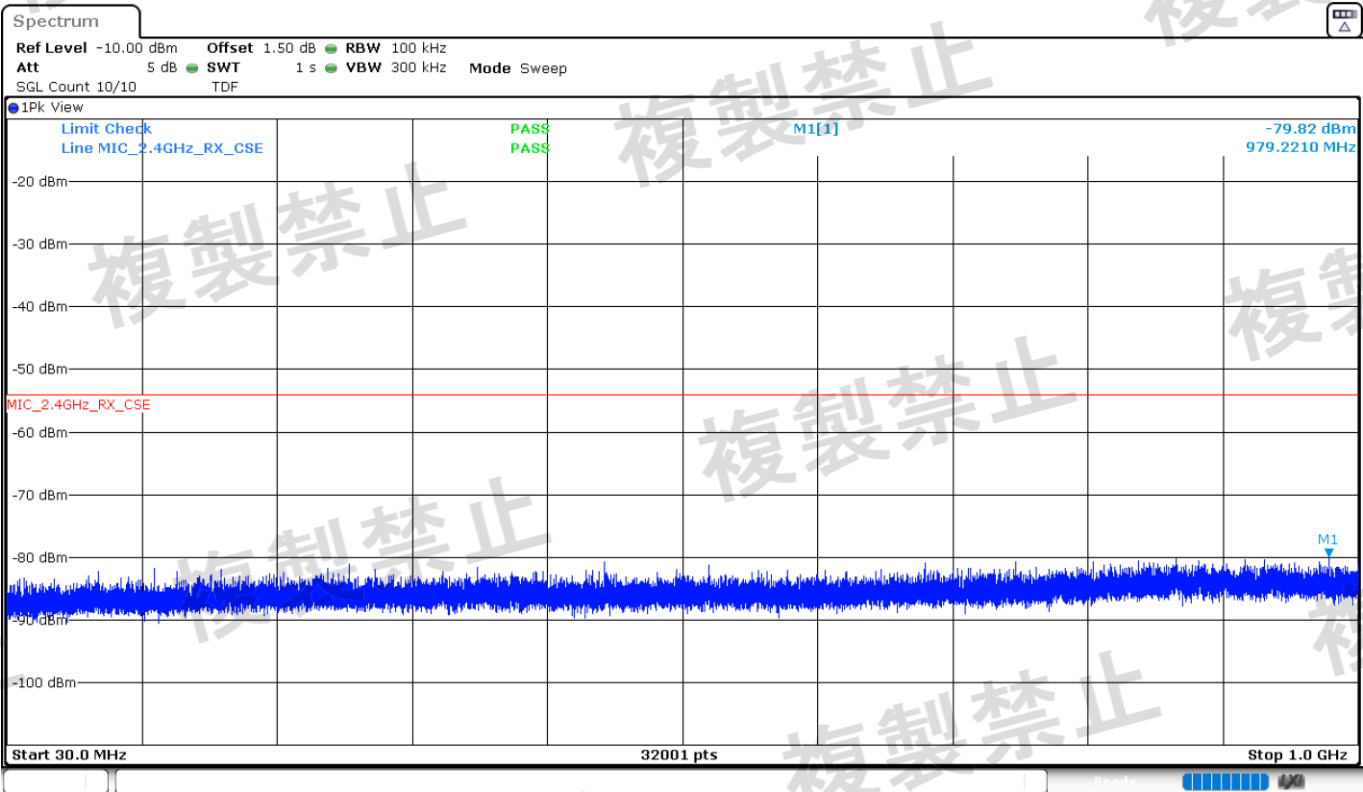
Frequency range 1 GHz – 12.5 GHz:



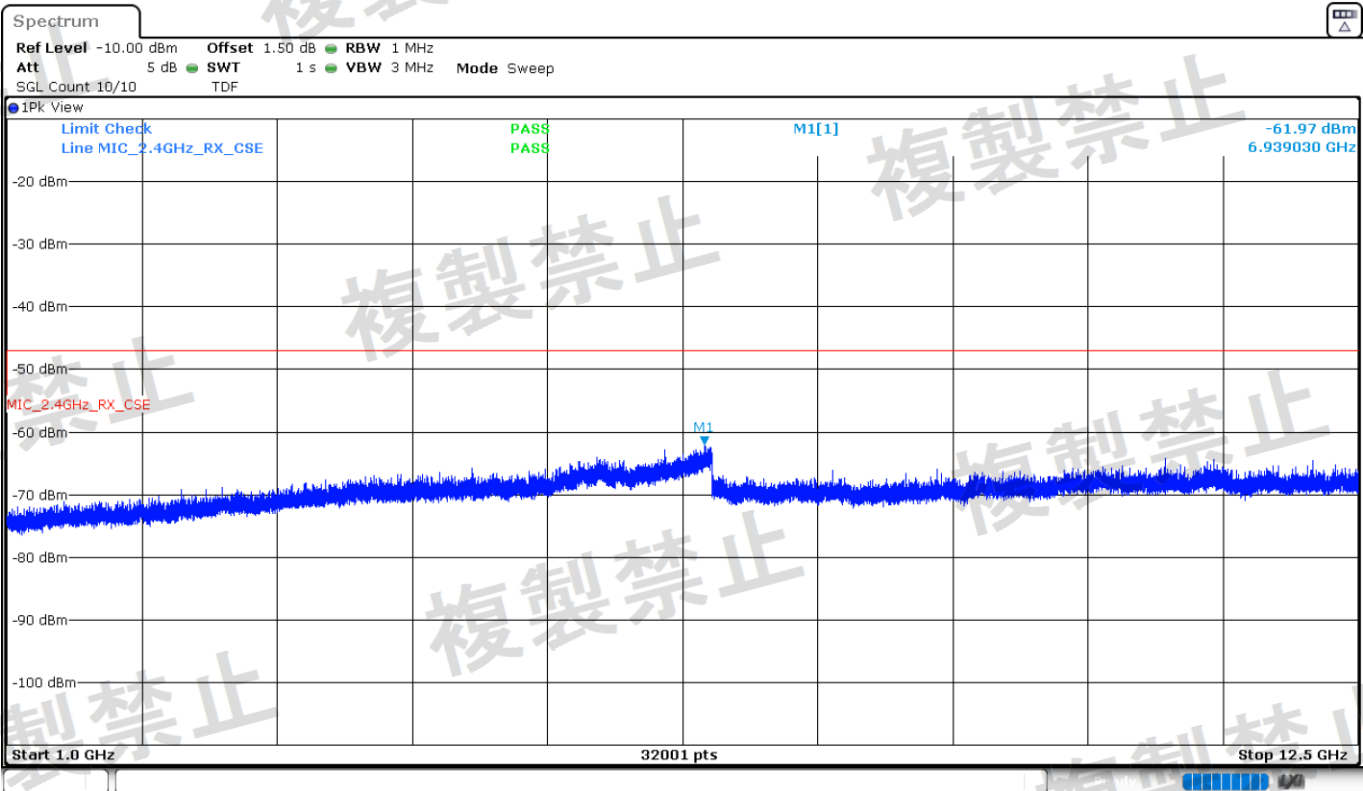
- Frequency range 30 MHz - 1 GHz:



- HIGH CHANNEL:
Frequency range 30 MHz - 1 GHz:

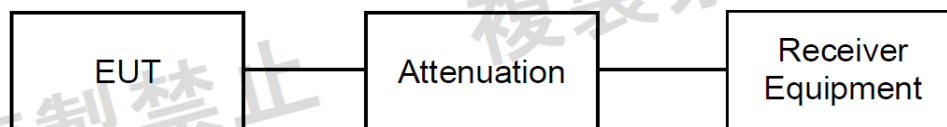


Frequency range 1 GHz – 12.5 GHz:



Controlling equipment. Interference prevention function. Identification code transmission/reception

Test Setup:



Limits:

Radio equipment used mainly on the same premises and automatically transmits or receives identification code.

Test method:

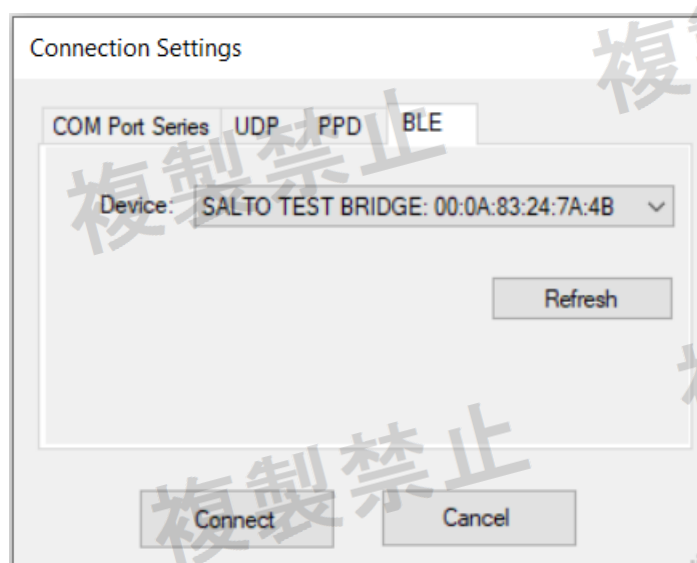
According to MIC Notice No. 88 Annex 43

Test procedure:

The DUT is placed on a shielded room to isolate it. With the DUT turned off and using a spectrum analyzer and an antenna, it is checked that no signal from other devices are present inside the shielded room in the frequency range of interest. Then, the DUT is turned ON. Using an ancillary device, the MAC address is checked and registered.

Results:

BLE MAC
000A83247A4B

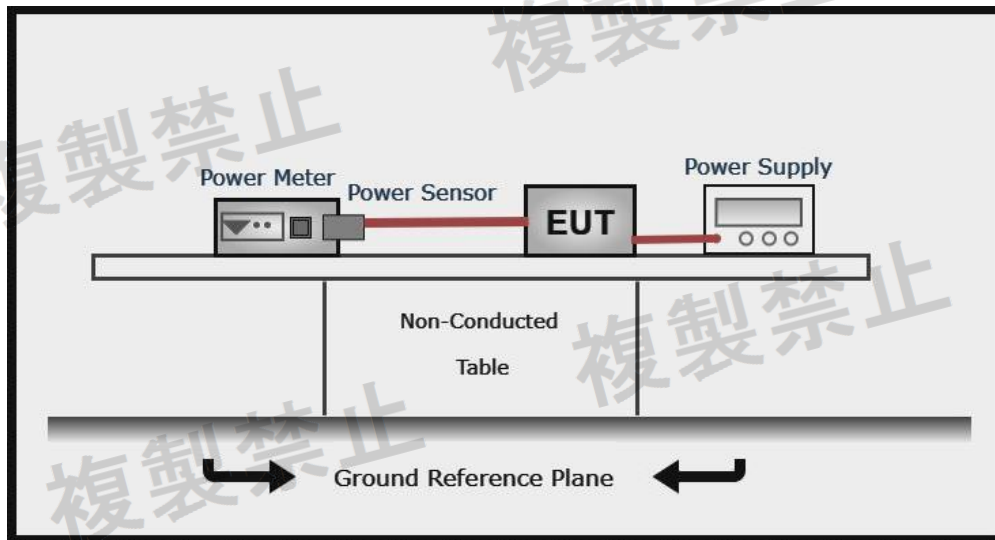


Verdict:

PASS

Antenna. Antenna gain

Test Setup:



Limits:

a: The absolute gain of the transmitting antenna shall be 12.14 dB or less. However, when the equivalent isotropic radiated power EIRP (equivalent isotropic radiated power in the 1 MHz bandwidth in the case of spread spectrum and OFDM systems) is equal to or less than the value obtained by applying an antenna power with the mean power of 10 mW with its absolute gain being 12.14 dB, the shortage shall be compensated for by the gain of the transmitting antenna (Note that mean power is 10 mW in the 1 MHz bandwidth in the case of spread spectrum and OFDM systems; however, mean power of 3 mW in the 1 MHz bandwidth is applied if the FH system, a hybrid system combining DS and FH systems, or a hybrid system combining FH and OFDM systems is employed and the frequency band of 2,427 - 2,470.75 MHz is used).

b: The Half-Power Beam width Angle HPBA (angle between two points at which radiated power becomes 1/2) of the transmitting antenna's horizontal and vertical planes shall not exceed the value as determined by the following formula:

$$HPBA \leq 360 / A \text{ [degrees]}$$

where constant A is equal to the value obtained by dividing the equivalent isotropic radiated power EIRP (equivalent isotropic radiated power in the 1 MHz bandwidth in the case of spread spectrum and OFDM systems) by the value obtained by applying an antenna power with the mean power of 10 mW with its absolute gain being 2.14 dB, and shall be assumed to be 1 if it is less than 1 (Note that mean power is 10 mW in the 1 MHz bandwidth in the case of spread spectrum and OFDM systems; however, mean power of 3 mW in the 1 MHz bandwidth is applied if the FH system, a hybrid system combining DS and FH systems, or a hybrid system combining the FH and OFDM systems is employed and the frequency band of 2,427 - 2,470.75 MHz is used).

Therefore

$$A = EIRP \text{ (mW)} / (10 \text{ mW} \times \text{absolute gain}) = EIRP \text{ (mW)} / 16.37$$

Where absolute gain is the linear value corresponding to 2.14 dB = 1.637.

Test method:

According to MIC Notice No. 88 Annex 43

Test procedure

The conducted RF output power measurements were made at the RF output terminals of the DUT, using an average power meter, selecting maximum transmission power of the DUT in the different test channels. The measurement is corrected with the duty cycle. Antenna gain is added to these results in order to calculate the E.I.R.P.

Results:

Maximum Declared Antenna Gain: 1.5 dBi

Channel	Measured antenna power (dBm)	Radiated power EIRP (dBm)	Radiated power EIRP (mW)	A = EIRP (mW) /16.37
Low (2402 MHz)	1.480000	2.980000	1.990000	< 1
Middle (2440 MHz)	1.120000	2.620000	1.830000	< 1
High (2480 MHz)	0.790000	2.290000	1.690000	< 1

Since A is < 1, it is assumed to be 1, and therefore the half-power beam width must be 360° or less.

Verdict:

PASS

Appendix B: Photographs

EQUIPMENT VIEW

