

# TEST REPORT

**Report number** : KR21230421A

**Issue date** : 2023/04/21

**Applicant** : bHaptics Inc.  
Bldg 3-Unit 503, 70, Yuseong-daero 1689beon-gil, Yuseong-gu,  
Daejeon, Republic of Korea  
Tel. +82-42-867-2468 Fax. -

**Model name** : BHTH04D100

**Varinat model name** : N/A

**Serial number** : N/A

**Test procedure** : Radio equipment according to Certification Ordinance  
Article 2 Section 1 No. 19


**Date of test** : 2023/4/20

**Name of facility** : KRL Co., Ltd.


*The results in this report are applicable only to the equipment tested.*

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**Tested by :**

  
Moo-Hong, KIM

**Approved by :**

  
Kyu-Hyun, LEE

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Summary of Test Results

Test report No.	Description	Result
1	Frequency Tolerance	Pass
2	Occupied Bandwidth	Pass
3	Spurious emission intensity	Pass
4	Antenna Power	Pass
5	Spread-spectrum Bandwidth	NA
6	Secondary radiated emission	Pass
7	Holding Time	NA
8	Radio Interference Prevention Function	Pass

**Measurement equipment list**

USE	Equipment	Company	Model No.	Serial No.	Calibrated by	Cal. Method	Cal. Due	Cal. Date
X	FREQUENCY COUNTER	EIP	25B	9105-00535	KTICC	ㄆ(c)	Oct. 2023	Oct. 13, 2022
X	SPECTRUM ANALYZER	ROHDE&SCHWARZ	FSP	100665	KTICC	ㄆ(c)	Nov. 2023	Nov. 11, 2022
X	Auto Range DC Power Supply	ITECH	IT6721	600104011717610069	BCS	ㄆ(c)	May. 2023	May. 26, 2022
	TEMP & HUMI. CHAMBER	HITACHI	EC-25MHHP5	U5539026	KTICC	ㄆ(c)	Nov. 2023	Nov. 18, 2022
X	USB Average Power Sensor	AGILENT	U2004A	MY53340013	KTICC	ㄆ(c)	Oct. 2023	Oct. 13, 2022
	POWER DIVIDER	WILTRON	K240C	890093	KTICC	ㄆ(c)	Oct. 2023	Oct. 13, 2022
	STEP ATTENUATOR	AEROFLEX	AF9010-60-31	12987	BCS	ㄆ(c)	Jan. 2024	Jan. 6, 2023
	AC POWER SUPPLY	DAELIM	D-45	KRL-002	BCS	ㄷ(d)	Aug. 2023	Aug. 5, 2022
	FIXED ATTENUATOR	XMA CORP	4882-6140-06	KRL-009	KTICC	ㄆ(c)	Oct. 2023	Oct. 13, 2022

Note1: The calibration of measurement equipment is valid for one year period.

Note2: "X" used equipment.

Note3: Cal.Method ...

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 listed in the right column of Table No. 3 attached hereto, which shall have been given any of calibration, etc. listed above from a) to c)

## Specified Radio Equipment Test Report

Test Date : 2023-04-20

Class: Article 2 Paragraph 1 Item 19	Frequency : (2 402 ~ 2 480) MHz
Rated Power (mW) : 4 mW	Antenna Gain : 0.50 dBi
Rated Power (dBm) : 6.02 dBm	E.I.R.P : 6.52 dBm
Emission Designator : F1D	
Model Name : BHTH04D100	Test Location : RF TEST ROOM
Serial No. : N/A	Temp / Humid. 20℃ / 50%
Type of Emission : BLE	Tested By : MooHong, Kim

No.	Test Items	Test ch	Test Frequency MHz	Test Result			Unit	Technical Regulations
				Voltage	Voltage	Voltage		
1	Frequency Tolerance	0	2402.0		2401.997983		MHz	50 PPM or less
					-0.840		PPM	
		19	2440.0		2439.997940		MHz	
					-0.844		PPM	
		39	2480.0		2479.997867		MHz	
2	Occupied Bandwidth	0	2402.0		1.360		MHz	26MHz or less
		19	2440.0		1.370		MHz	
		39	2480.0		1.380		MHz	
3	Spurious Emission Intensity	0	2402 (1)		-55.86		dBm	(1) Below 2387 MHz : -26dBm (2) 2387 to 2400 MHz : -16dBm (3) 2483.5 to 2496.5 MHz : -16dBm (4) Over 2496.5 MHz : -26dBm
			2402 (2)		-18.21		dBm	
			2402 (3)		-58.72		dBm	
			2402 (4)		-51.45		dBm	
		19	2440 (1)		-55.57		dBm	
			2440 (2)		-53.28		dBm	
			2440 (3)		-53.44		dBm	
			2440 (4)		-50.19		dBm	
		39	2480 (1)		-56.06		dBm	
			2480 (2)		-58.69		dBm	
			2480 (3)		-33.33		dBm	
			2480 (4)		-50.51		dBm	
4	Antenna Power	0	2402.0		0.002183		W	0.01 W or less Error +20%-80%
					-45.43		%	
		19	2440.0		0.002529		W	
					-36.78		%	
		39	2480.0		0.002985		W	
5	Spread-spectrum Bandwidth	0	2402.0				kHz	500kHz or more
		19	2440.0				kHz	
		39	2480.0				kHz	
6	Secondary Radiated Emissions	0	2402 (1)		-72.71		dBm	(1) Below 1 GHz : -54dBm (2) 1 GHz or higher : -47dBm
			2402 (2)		-62.69		dBm	
		19	2440 (1)		-72.54		dBm	
			2440 (2)		-63.54		dBm	
		39	2480 (1)		-72.62		dBm	
			2480 (2)		-62.79		dBm	
7	Holding Time	0	2402.0				Sec	less than 0.4sec
		19	2440.0				Sec	
		39	2480.0				Sec	
8	Radio Interference Prevention Function	ID Code		MAC ADDRES : F9:25:66:38:AD:15				Carrier sense is not required

The input voltage to receiver RF circuit varies below  $\pm 1\%$  as the input voltage from the external power supply to the receiver varies  $\pm 10\%$ (excluding power supply).



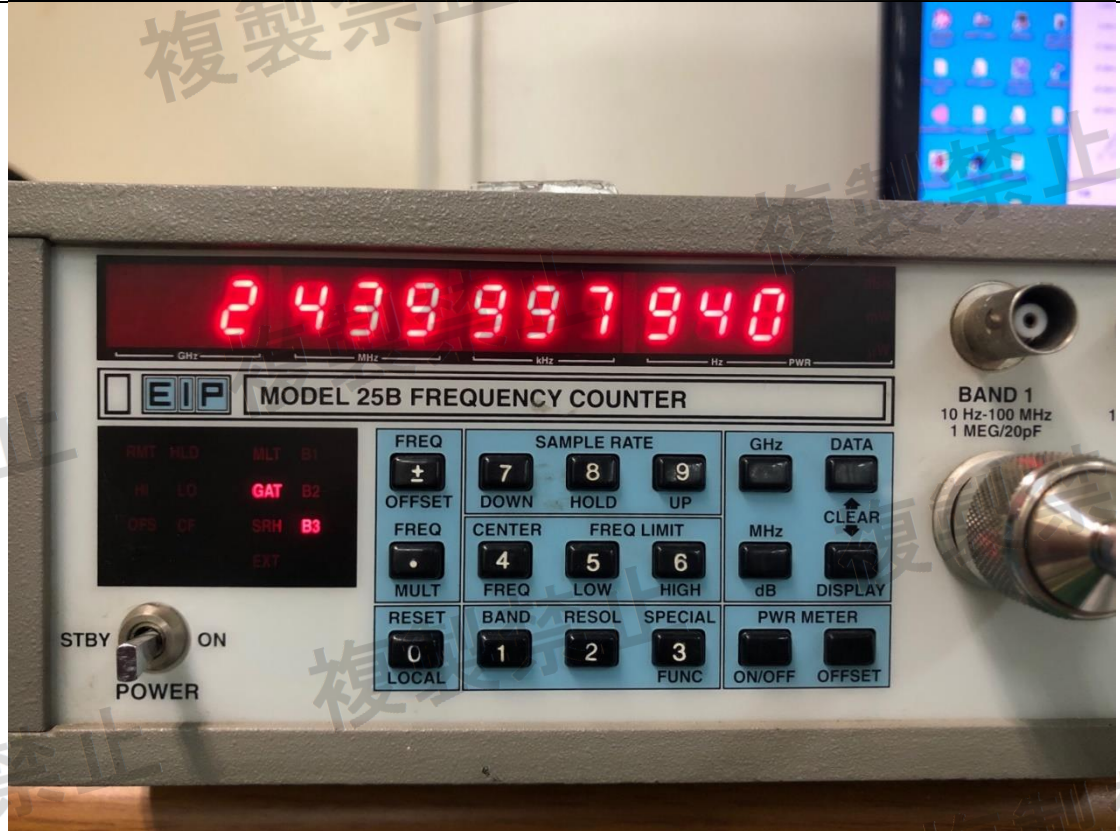
# BLE-1 Mbps Test Result

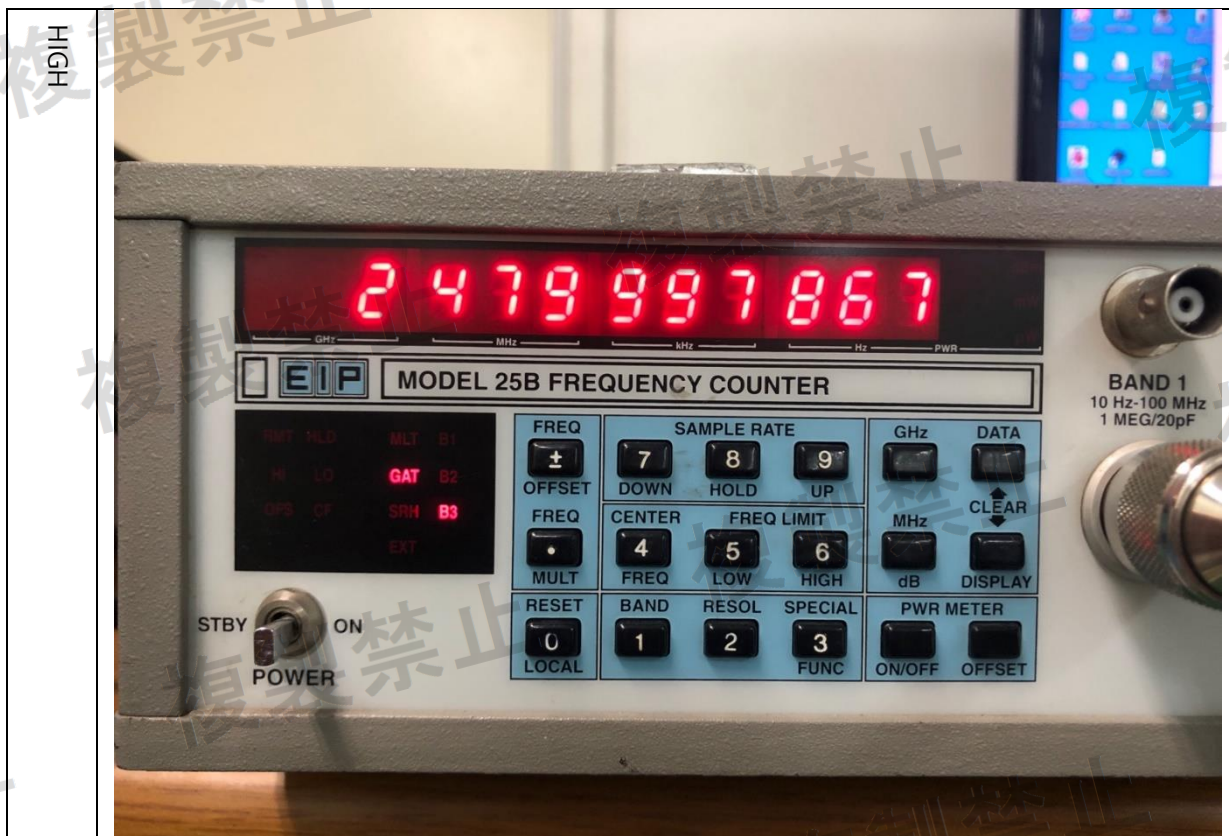
Frequency error

LOW



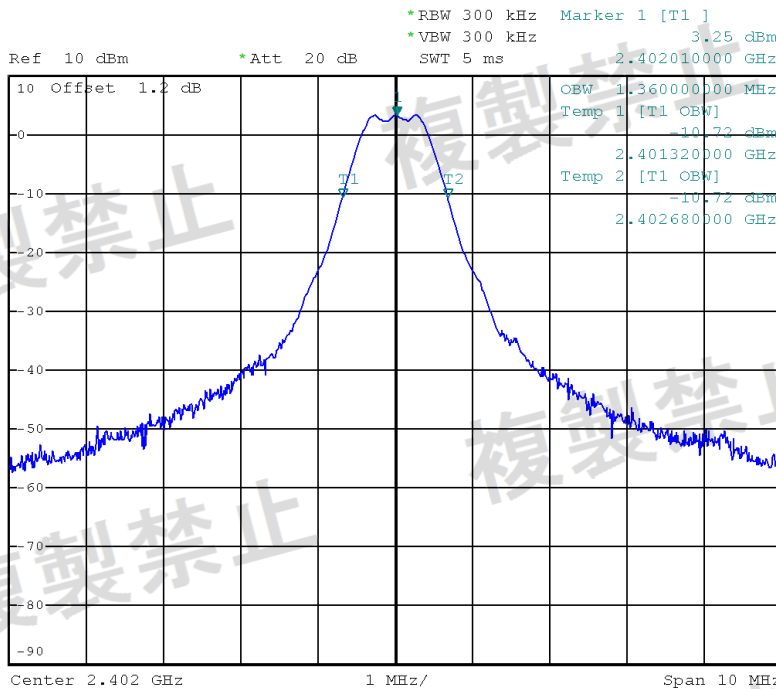
MID





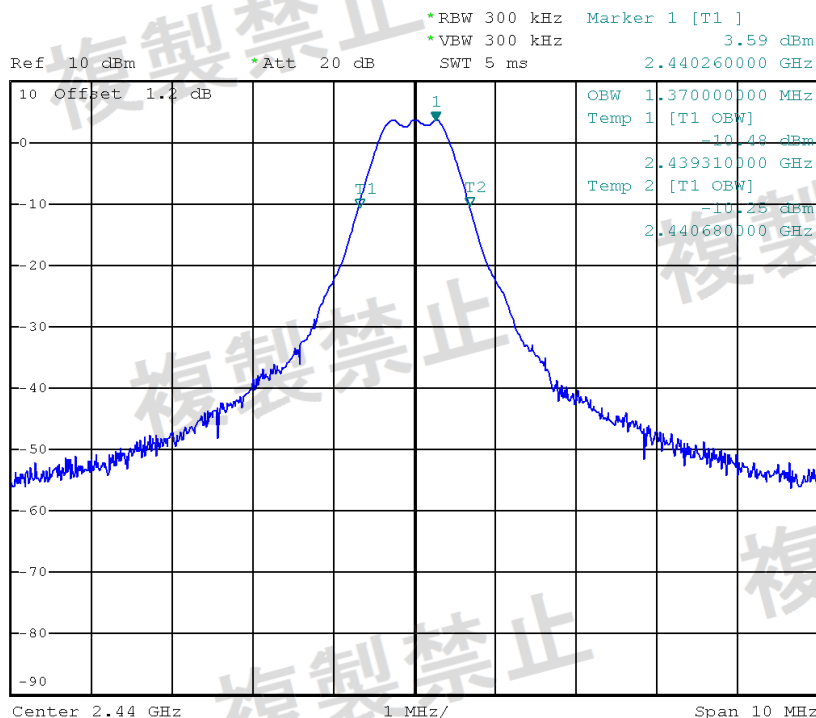
# Occupied Bandwidth

LOW



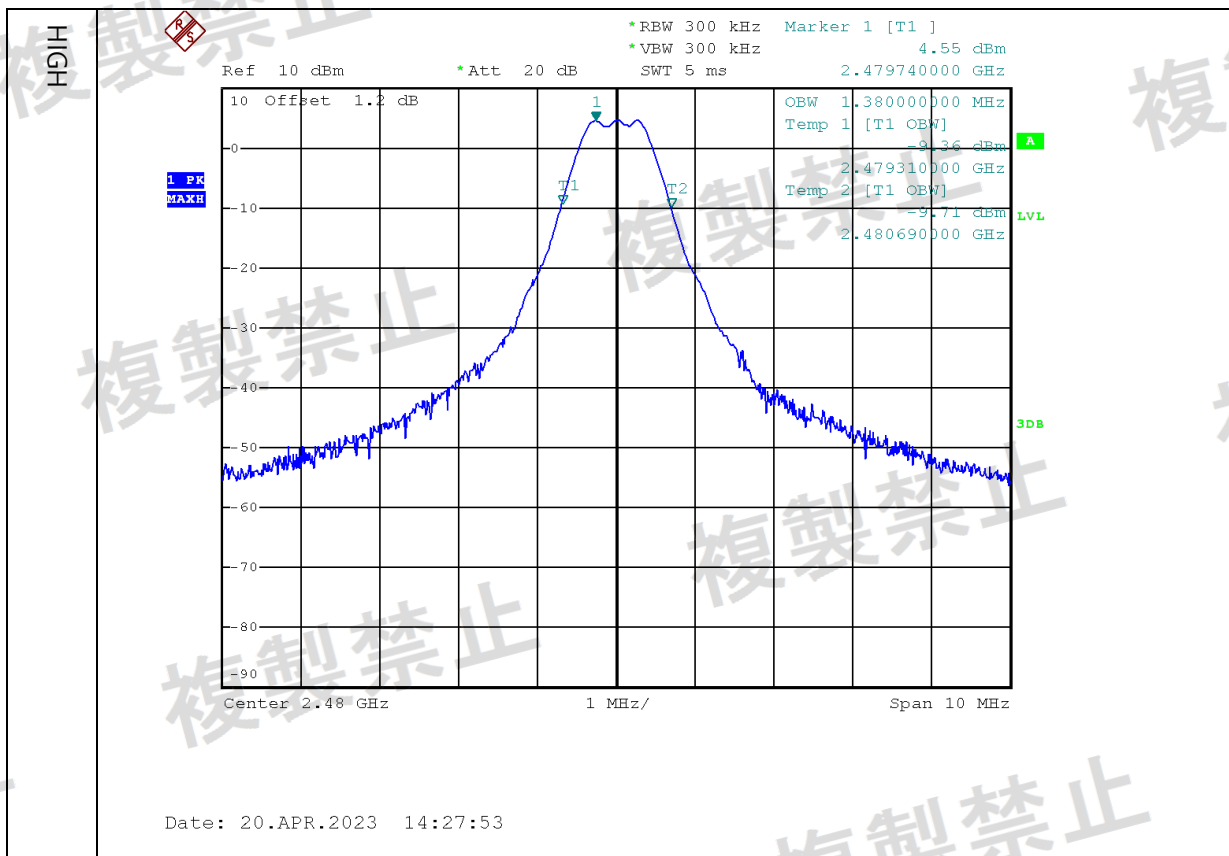
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MID



Date: 20.APR.2023 14:26:28







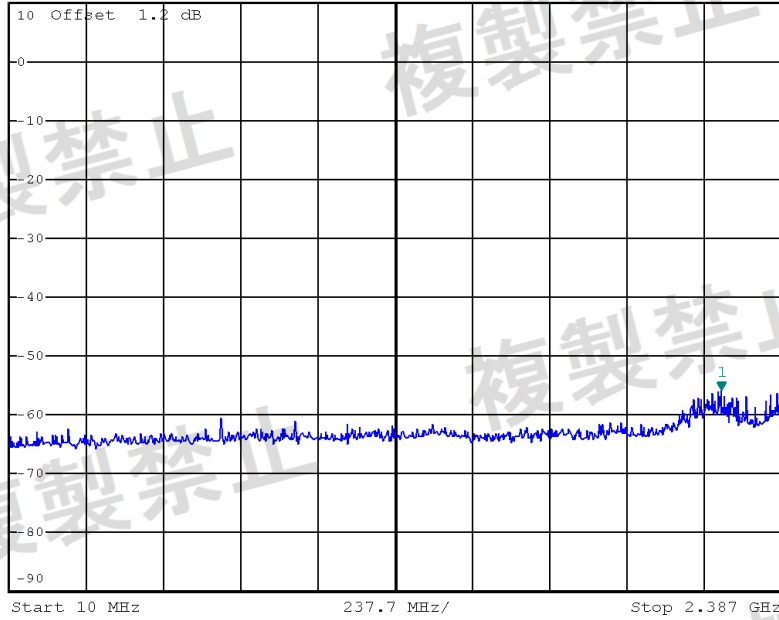
# Spurious Emission Intensity

LOW



Ref 10 dBm \*Att 20 dB \*RBW 1 MHz \*VEW 1 MHz SWT 15 ms Marker 1 [T1] -55.86 dBm 2.199217000 GHz

1 PK  
MAXH

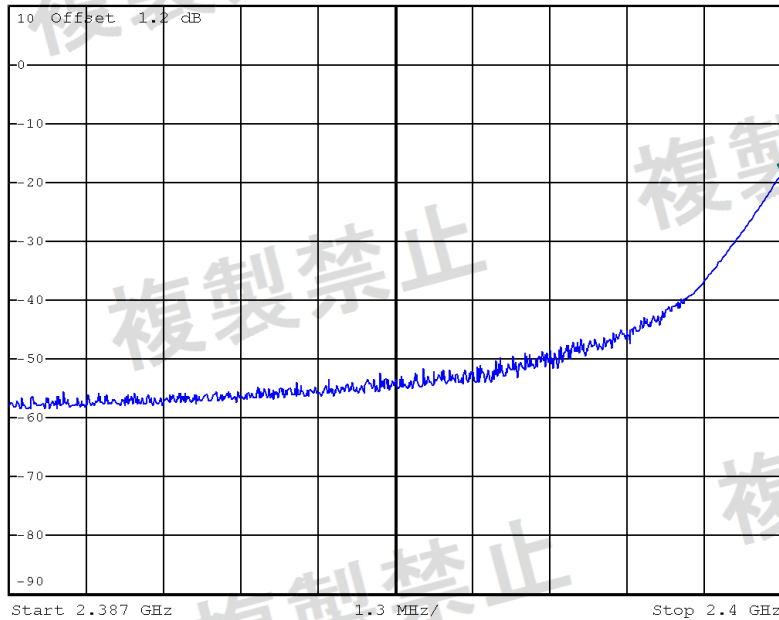


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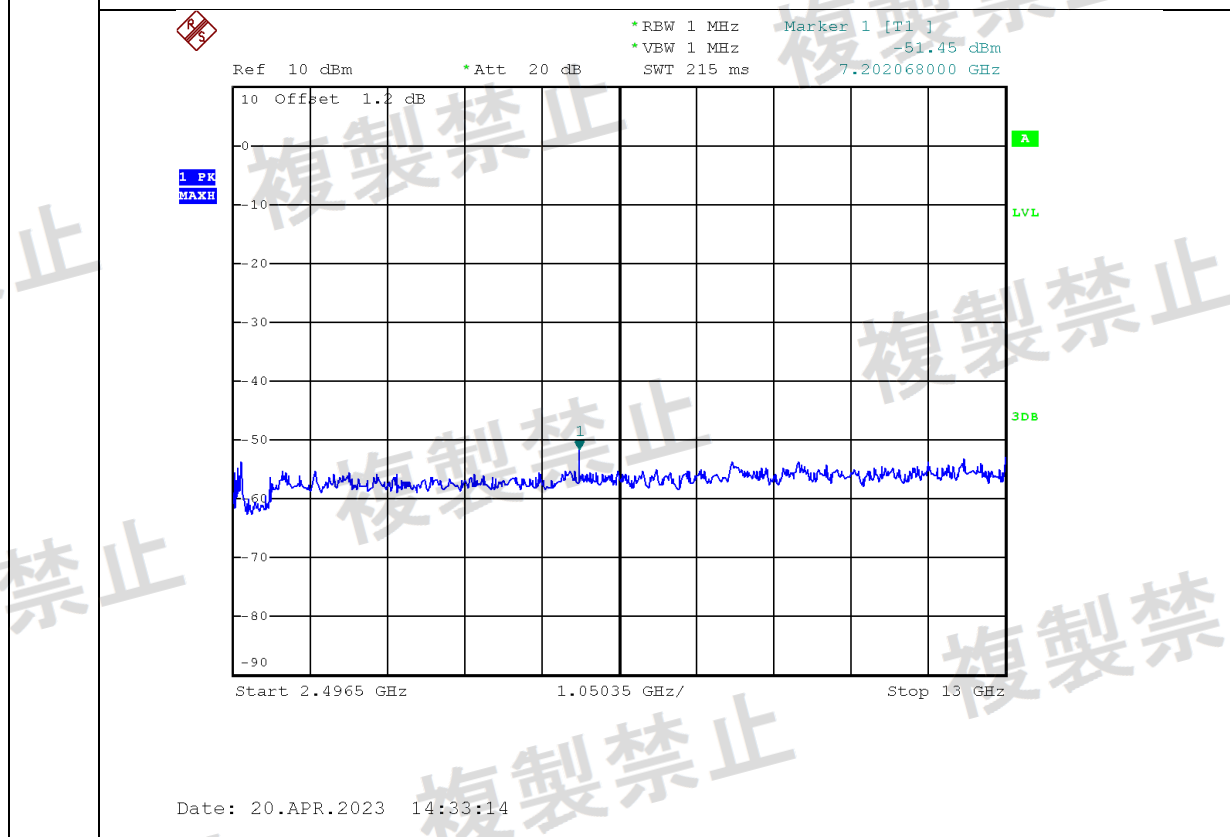
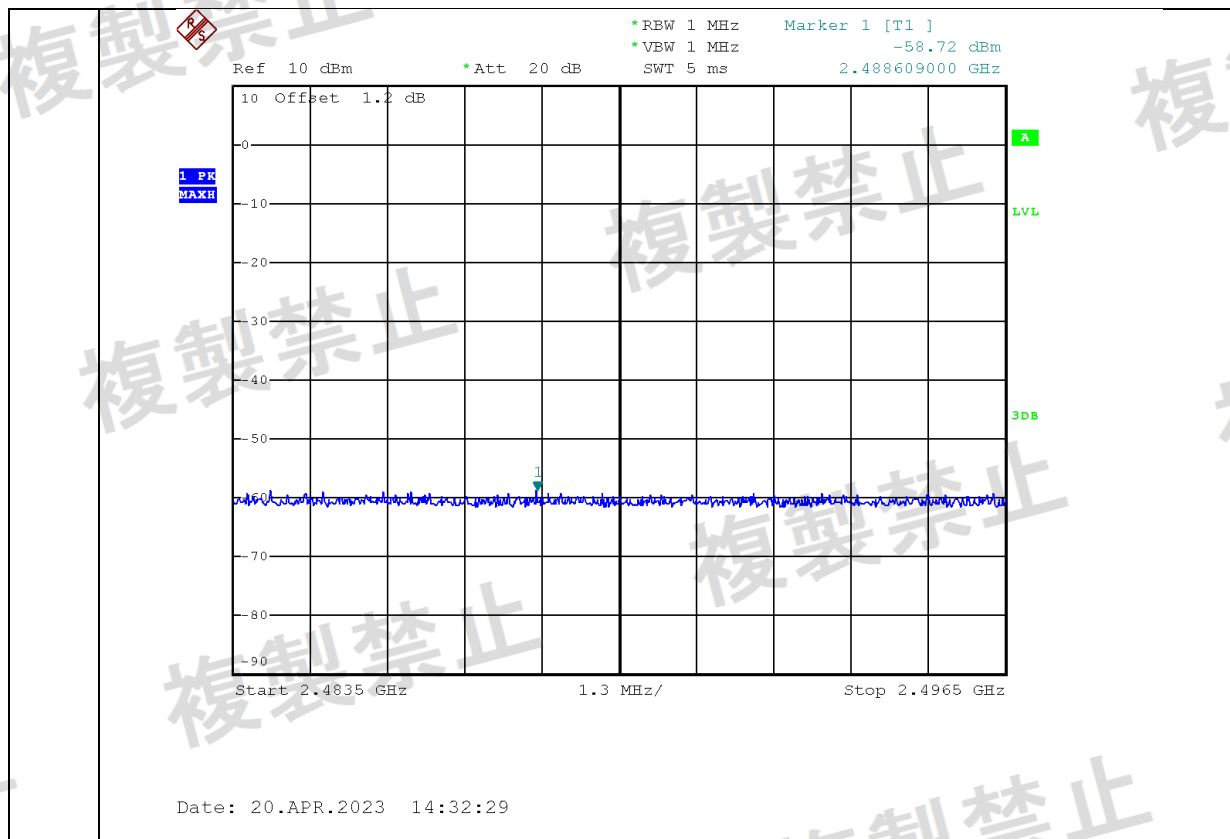


Ref 10 dBm \*Att 20 dB \*RBW 1 MHz \*VEW 1 MHz SWT 5 ms Marker 1 [T1] -18.21 dBm 2.400000000 GHz

1 PK  
MAXH



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# Spurious Emission Intensity

MID



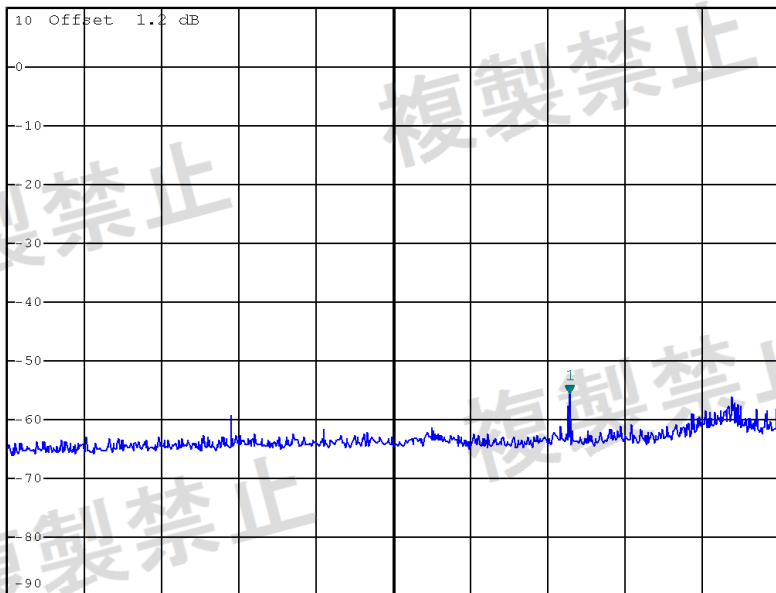
Ref 10 dBm \*Att 20 dB \*RBW 1 MHz \*VEW 1 MHz SWT 15 ms Marker 1 [T1]

-55.57 dBm

1.738079000 GHz

10 Offset 1.2 dB

1 PK  
MAXH



Start 10 MHz 237.7 MHz/ Stop 2.387 GHz

Date: 20.APR.2023 14:34:18



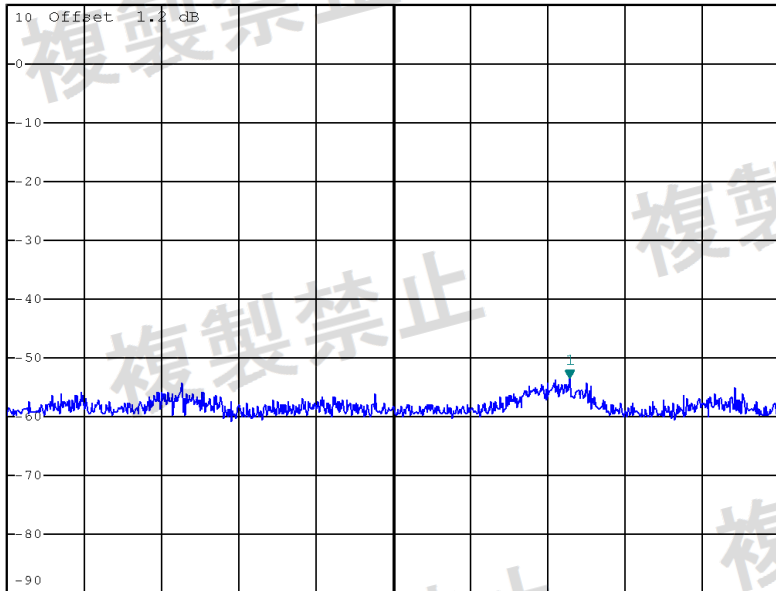
Ref 10 dBm \*Att 20 dB \*RBW 1 MHz \*VEW 1 MHz SWT 5 ms Marker 1 [T1]

-53.28 dBm

2.396451000 GHz

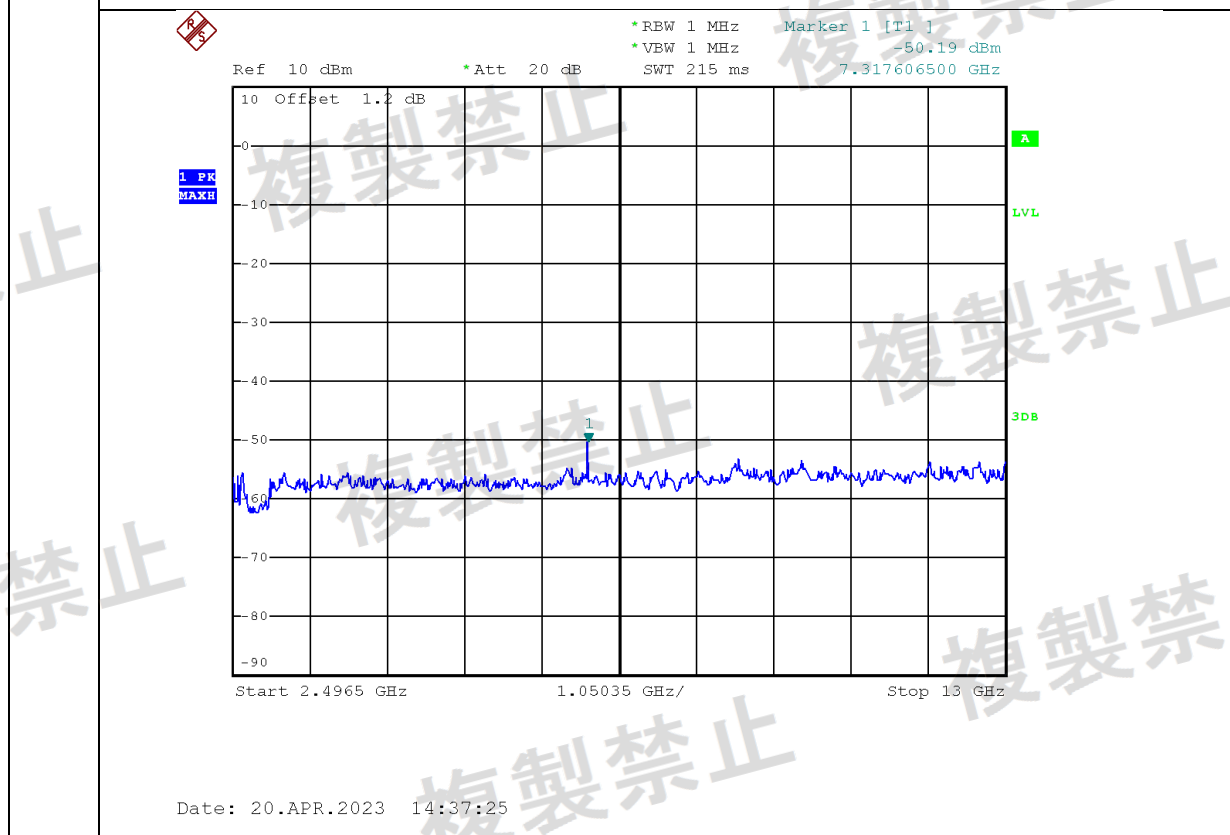
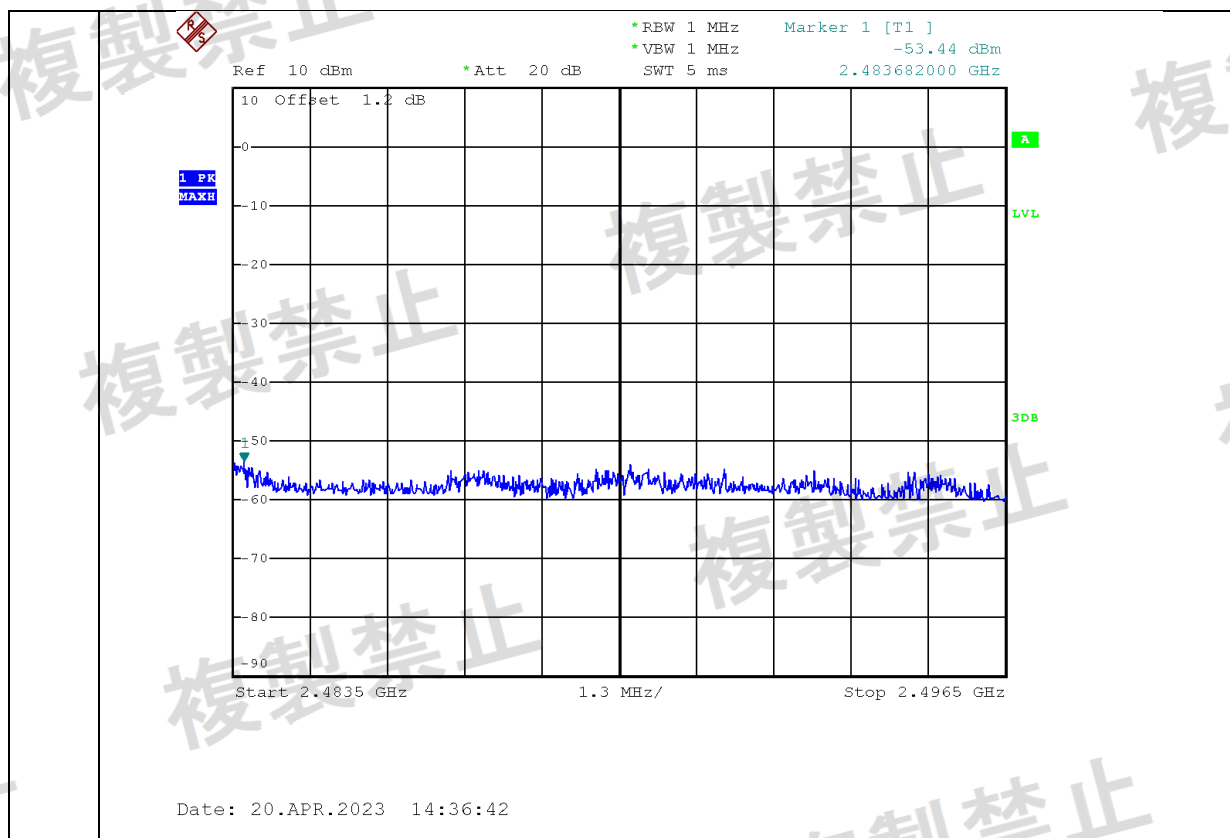
10 Offset 1.2 dB

1 PK  
MAXH



Start 2.387 GHz 1.3 MHz/ Stop 2.4 GHz

Date: 20.APR.2023 14:35:40





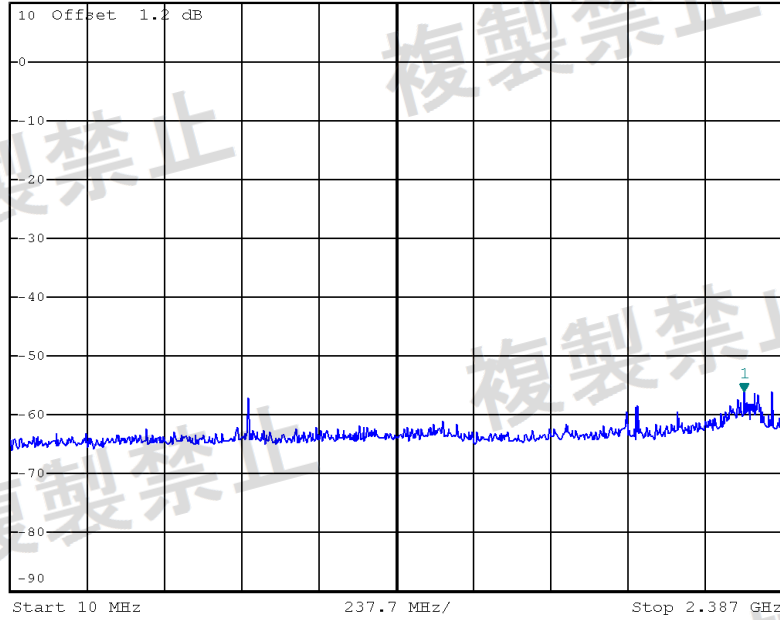
# Spurious Emission Intensity

HIGH



Ref 10 dBm \*Att 20 dB \*RBW 1 MHz \*VEW 1 MHz \*SWT 15 ms Marker 1 [T1] -56.06 dBm 2.265773000 GHz

1 PR  
MAXH

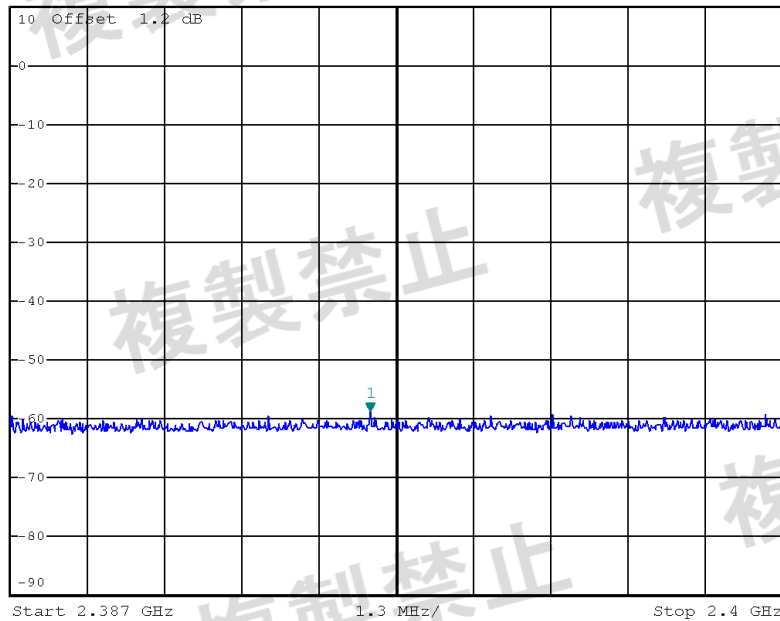


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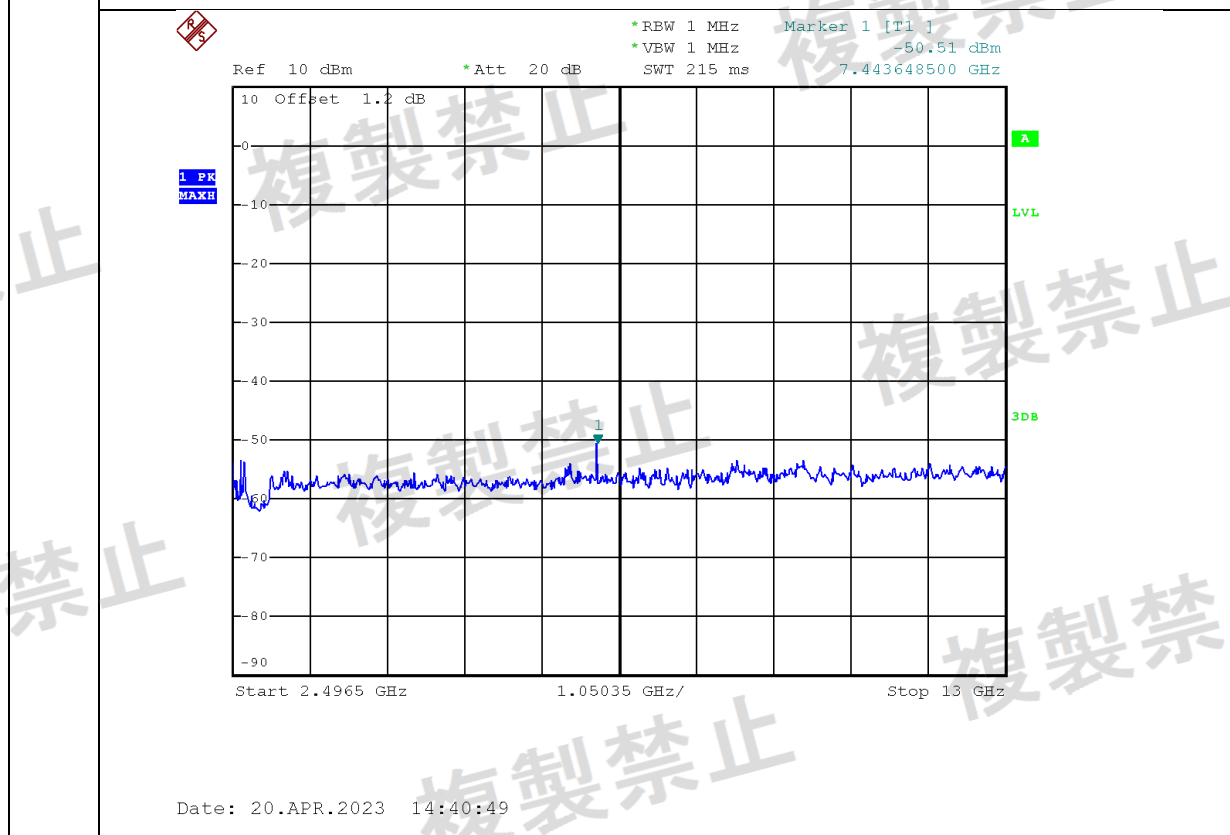
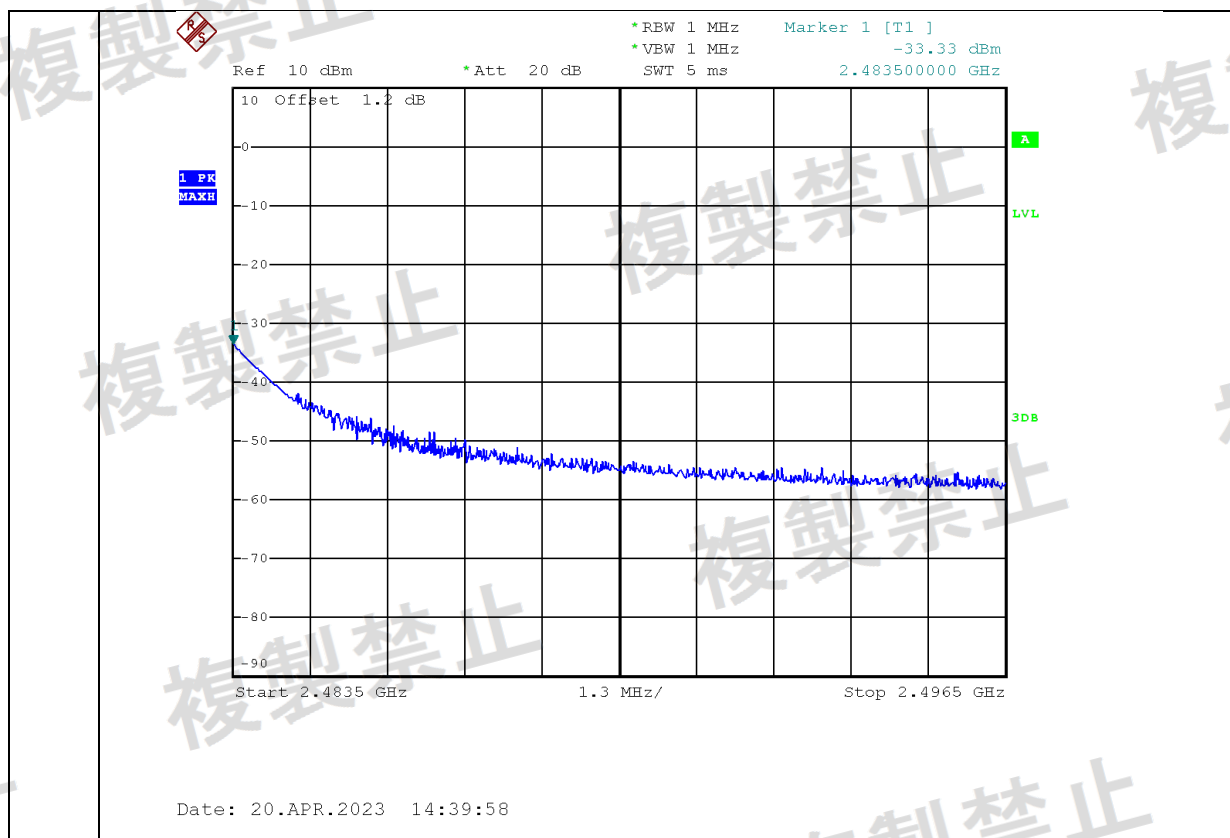


Ref 10 dBm \*Att 20 dB \*RBW 1 MHz \*VEW 1 MHz \*SWT 5 ms Marker 1 [T1] -58.69 dBm 2.393058000 GHz

1 PR  
MAXH

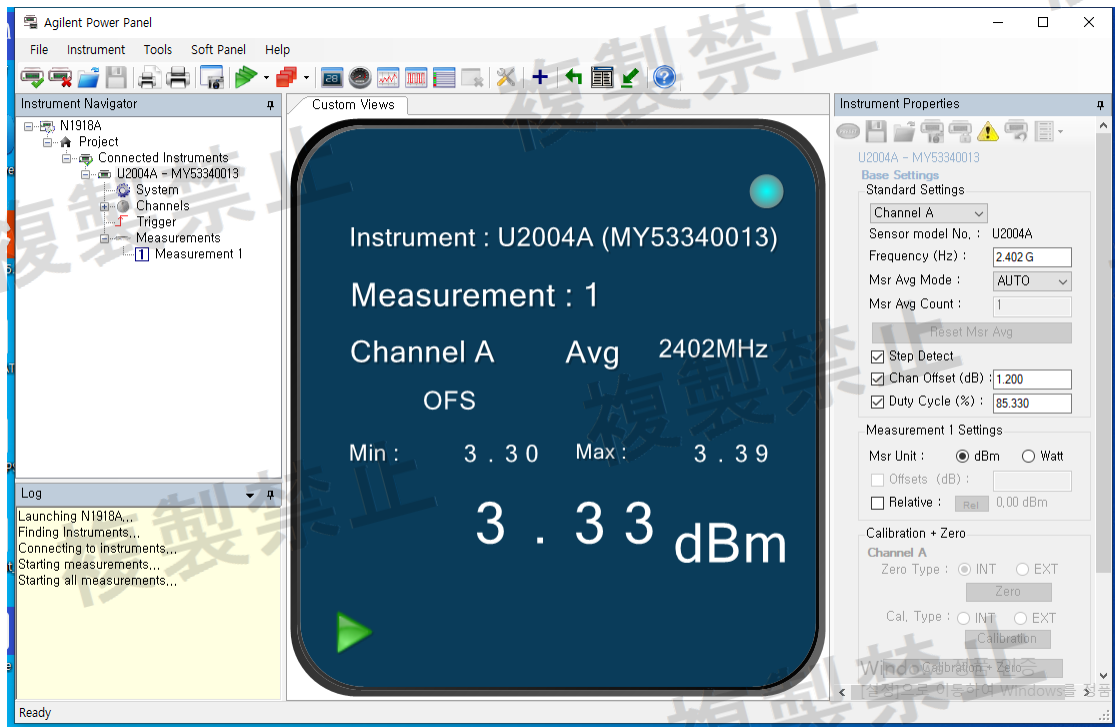


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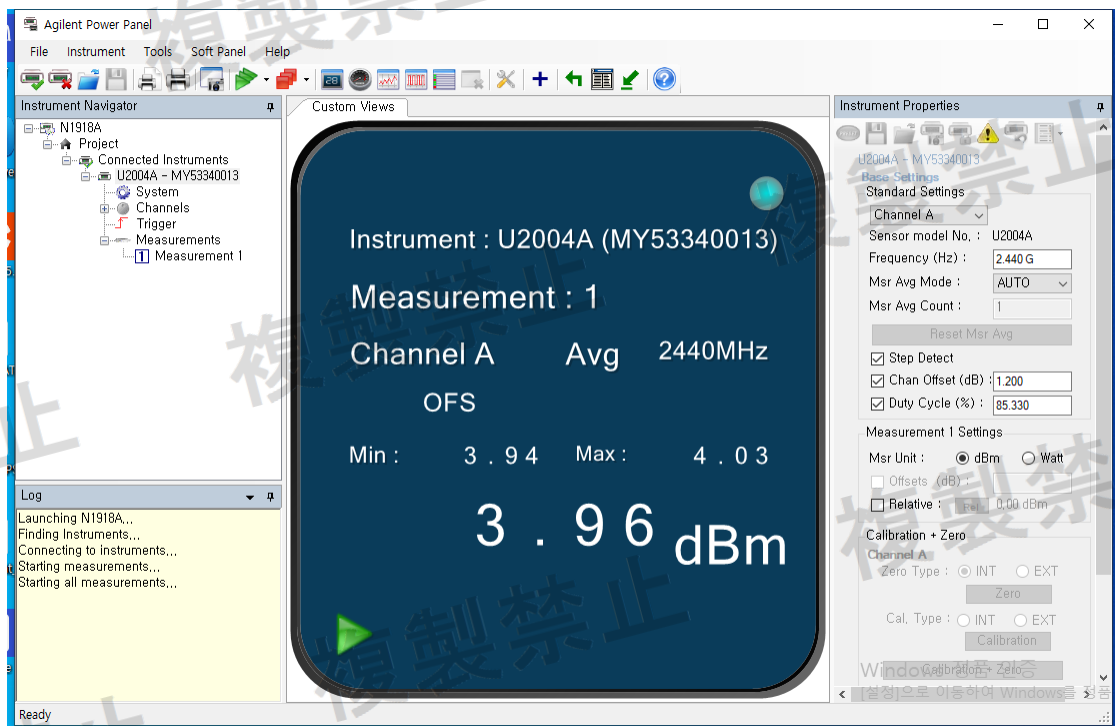


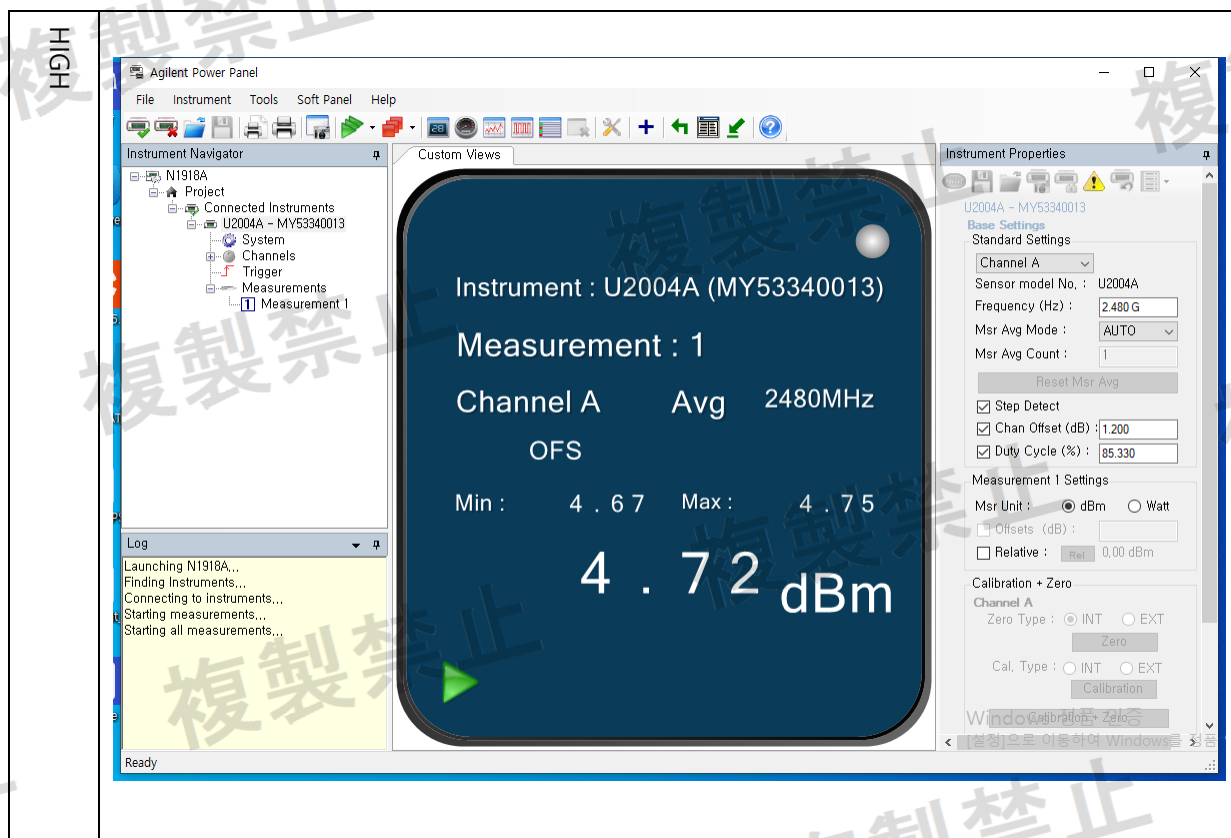
## Antenna Power

LOW



MID







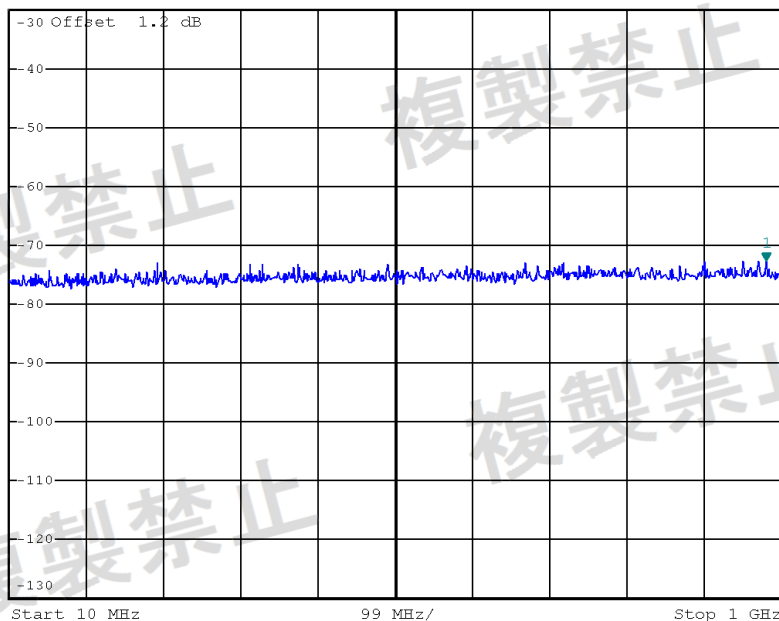
## Secondary Radiated Emissions

LOW



1 PK  
MAXH

Ref -30 dBm Att 10 dB  
\*RBW 1 MHz \*VEW 1 MHz SWT 5 ms  
Marker 1 [T1] -72.71 dBm  
980.200000000 MHz

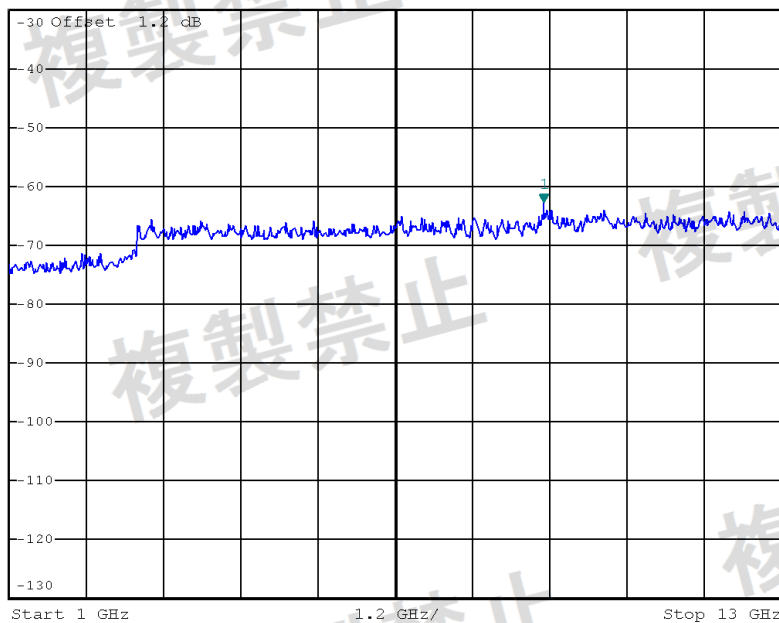


Date: 20.APR.2023 14:45:30



1 PK  
MAXH

Ref -30 dBm Att 10 dB  
\*RBW 1 MHz \*VEW 1 MHz SWT 240 ms  
Marker 1 [T1] -62.69 dBm  
9.292000000 GHz



Date: 20.APR.2023 14:46:10

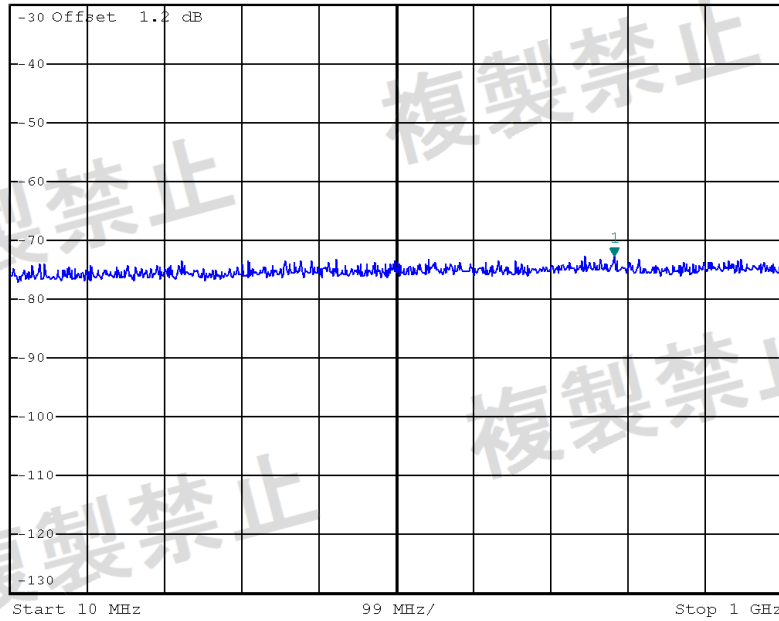
## Secondary Radiated Emissions

MID



1 PK  
MAXH

Ref -30 dBm Att 10 dB  
\*RBW 1 MHz Marker 1 [T1]  
\*VEW 1 MHz -72.54 dBm  
SWT 5 ms 783.190000000 MHz

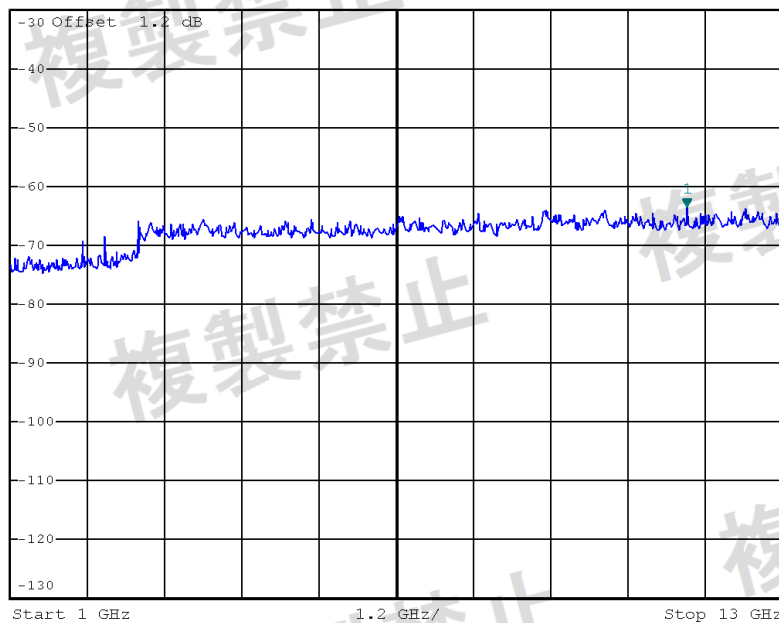


Date: 20.APR.2023 14:47:01



1 PK  
MAXH

Ref -30 dBm Att 10 dB  
\*RBW 1 MHz Marker 1 [T1]  
\*VEW 1 MHz -63.54 dBm  
SWT 240 ms 11.512000000 GHz



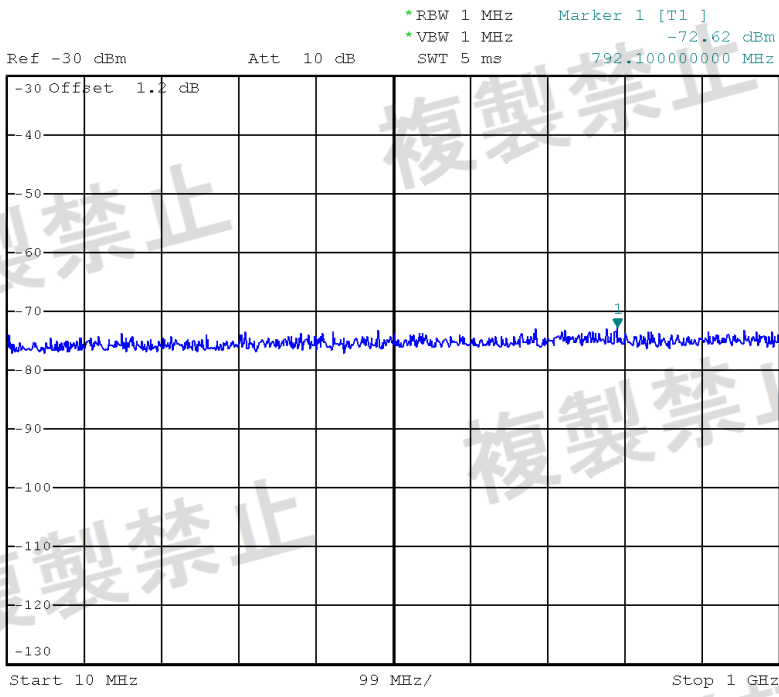
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# Secondary Radiated Emissions

HIGH



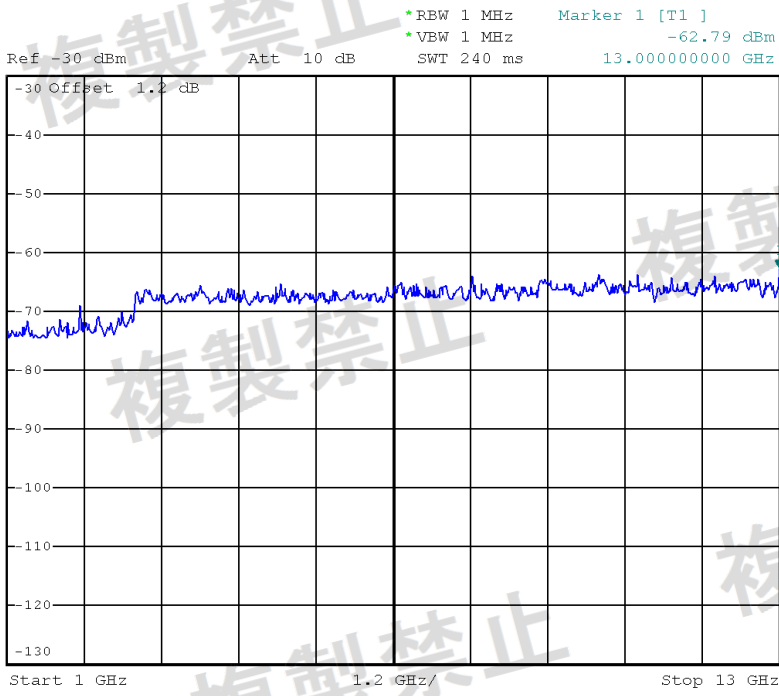
1 PR  
MAXH



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1 PR  
MAXH



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