TEST REPORT

Report number	:	**KR24-SRT0025**
Issue date	:	**2024-09-10**

Applicant	:	KAON Group Co., Ltd. 884-3, Seongnam-daero, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea TEL : 031-724-8666 FAX : 031-724-8999
Equipment under test (EUT)	:	トリプルチューナー（4K対応）モデル
Model name	:	KS-6100
Date of test	:	24.08.22 ~ 24.08.28
Test place	:	Eurofins KCTL Co.,Ltd. 65 Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea
Test results	:	PASS

The results in this report are applicable only to the equipment tested.
This report shall not be re-produced except in full without the written approval of ***Eurofins KCTL Co.,Ltd.***
Eurofins KCTL Co., Ltd. is in compliance with KS Q ISO 17025.

Tested by; Sehwan Park

Approved by; Harim Lee

1. Summary of Test

1. Purpose of test

Ordinance on Technical Standards Conformity Certification of Specified Radio Equipment
2.4GHz Band wide band low power data communication System

2. Standards

Certification Ordinance Article 2 Clause 1 Item19

1) Test Methods

Ministry of Internal Affairs and Communications Notification Article 88 Appendix 43

2) Deviation from standards

None

3. List of applied test to the EUT

Article 88 Appendix 43	Classification of EUT	Condition	Result
3	Frequency Tolerance	Conducted	PASS
4	Occupied Bandwidth	Conducted	PASS
4	Spread Bandwidth	Conducted	PASS
5	Unwanted (Spurious) Emission Strength	Conducted	PASS
6	RF Output Power Tolerance	Conducted	PASS
7	Secondary Emitted Radio Wave Strength	Conducted	PASS
13	Time of occupancy hopping frequency	Conducted	PASS
13	Spreading Factor	Conducted	PASS
12	Interference Prevention Function	Conducted	PASS

1) Test set up

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2) Modification to the EUT by laboratory

None

1. Test Information

1. Applicant
KAON Group Co., Ltd.
884-3, Seongnam-daero, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

2. Equipment under test
トリプルチューナー（4K対応）モデル

3. Model number
KS-6100

4. Serial number
N/A

5. Size
(W) 13.5 x (D) 13.5 x (H) 3.05

6. Terminal limitation
-10˚C to 50˚C

7. RF Specification Frequency range
2402-2480MHz

8. Number of RF Channels
79 Channels

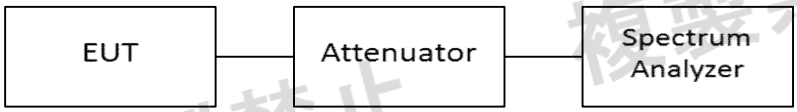
9. Modulation method
FHSS(GFSK, π/4-DQPSK, 8DPSK)

10. Data rate
1, 2, 3Mbps

10. Variation of the family model(s)
None

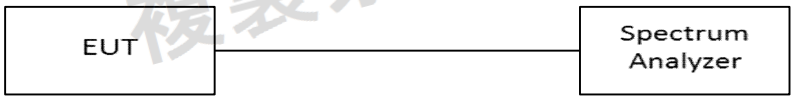
2. Configuration of equipment

1. Frequency tolerance, Occupied Bandwidth, Spread bandwidth, Unwanted(Spurious) emission strength, Time of occupancy hopping frequency



2. RF output power tolerance

3. Secondary emitted radio wave strength



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3. Test results (Rated voltage)

S/N : N/A

Environment of test room	Date of test	2024-08-22	2024-08-26	2024-08-28
	Temperature	21 °C	20 °C	21 °C
	Humidity	49 %	50 %	50 %

Peak Antenna Gain	0.60	dBi
Declaration Output Power	0.440	mW/MHz
Declaration Output Power	-3.57	dBm/MHz
E.I.R.P.	**-2.97**	**dBm/MHz**
Input Power Voltage	12.00	VDC

Tested Circit Insertion Loss		0	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.883	ms
	OFF TIME	0.847	ms
	Ratio	0.773	
Packet Type (Mode)		DH5	mode
Transmit Speed		1	MHz

Using TDF and offset function in Spectrum Analyzer.
Measurement of plots are included Loss value.
(Att : 10dB + Cable loss + EUT cable: 0.5dB offset)

Test category ；	2.4GHz Band Low-Power Data Communication System (Bluetooth+BDR [GFSK])
The reason why the tests are performed only at rated voltage :	N/A

Measurement Frequency		MHz	2402	2441	2480	Result	Limit	Note
Channel Number		Ch.	0	39	78	---	---	
Frequency Measurements		MHz	2401.985	2440.985	2479.985	**---**	---	
Frequency Tolerance		ppm	-6.224	-6.125	-6.028	**PASS**	$\pm 50\times10^{-6}$(50ppm)	
Occupied Bandwidth		MHz	---	78.15	---	**PASS**	83.5MHz or below	
Spread Bandwidth		MHz	---	70.46	---	**PASS**	500kHz or more	
RF Output Power		mW/MHz	0.126	0.099	0.091	**PASS**	3mW/MHz or below	
RF Output Power Tolerance		%	-71.45	-77.41	-79.35	**PASS**	+20%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	---	0.010	---	**PASS**	2.5uW/MHz or below	
		MHz	---	2206.900	---	-----		
	2387 to 2400MHz	uW/MHz	---	2.2699	---	**PASS**	25uW/MHz or below	
		MHz	---	2399.955	---	-----		
	2483.5 to 2496.5MHz	uW/MHz	---	0.0318	---	**PASS**	25uW/MHz or below	
		MHz	---	2483.649	---	-----		
	2496.5 to 12500MHz	uW/MHz	---	0.1750	---	**PASS**	2.5uW/MHz or below	
		MHz	---	4800.500	---	-----		
Secondary Emitted Radio Wave Strength	30 to 1000MHz	nW	---	0.0015	---	**PASS**	4nW or below	
		MHz	---	550.850	---	-----		
	1000 to 12500MHz	nW	---	0.0339	---	**PASS**	20nW or below	
		MHz	---	7049.000	---	-----		
Time of occupancy hopping frequency		sec	---	0.0029	---	**PASS**	0.4sec or below	
		sec	---	0.2448	---	**PASS**	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---		70.4600		**PASS**	5 or more	
Interference Prevention Function			Good			**PASS**		

3. Test results (-10% voltage)

S/N : N/A

Environment of test room	Date of test	2024-08-22	2024-08-26	2024-08-28
	Temperature	21 °C	20 °C	21 °C
	Humidity	49 %	50 %	50 %

Peak Antenna Gain	0.60	dBi
Declaration Output Power	0.440	mW/MHz
Declaration Output Power	-3.57	dBm/MHz
E.I.R.P.	**-2.97**	**dBm/MHz**
Input Power Voltage	10.80	VDC

Tested Circit Insertion Loss		0	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.883	ms
	OFF TIME	0.847	ms
	Ratio	0.773	
Packet Type (Mode)		DH5	mode
Transmit Speed		1	MHz

Using TDF and offset function in Spectrum Analyzer.
Measurement of plots are included Loss value.
(Att : 10dB + Cable loss + EUT cable: 0.5dB offset)

Test category ；	2.4GHz Band Low-Power Data Communication System (Bluetooth+BDR [GFSK])
The reason why the tests are performed only at rated voltage :	N/A

Measurement Frequency		MHz	2402	2441	2480	Result	Limit	Note
Channel Number		Ch.	0	39	78	---	---	
Frequency Measurements		MHz	2401.985	2440.990	2479.985	**---**	---	
Frequency Tolerance		ppm	-6.224	-4.076	-6.028	**PASS**	$\pm 50\times10^{-6}$(50ppm)	
Occupied Bandwidth		MHz	---	78.05	---	**PASS**	83.5MHz or below	
Spread Bandwidth		MHz	---	71.12	---	**PASS**	500kHz or more	
RF Output Power		mW/MHz	0.125	0.099	0.091	**PASS**	3mW/MHz or below	
RF Output Power Tolerance		%	-71.70	-77.59	-79.43	**PASS**	+20%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	---	0.012	---	**PASS**	2.5uW/MHz or below	
		MHz	---	2291.600	---	-----		
	2387 to 2400MHz	uW/MHz	---	2.5119	---	**PASS**	25uW/MHz or below	
		MHz	---	2399.968	---	-----		
	2483.5 to 2496.5MHz	uW/MHz	---	0.0366	---	**PASS**	25uW/MHz or below	
		MHz	---	2483.558	---	-----		
	2496.5 to 12500MHz	uW/MHz	---	0.1770	---	**PASS**	2.5uW/MHz or below	
		MHz	---	4819.500	---	-----		
Secondary Emitted Radio Wave Strength	30 to 1000MHz	nW	---	0.0017	---	**PASS**	4nW or below	
		MHz	---	987.890	---	-----		
	1000 to 12500MHz	nW	---	0.0328	---	**PASS**	20nW or below	
		MHz	---	8944.000	---	-----		
Time of occupancy hopping frequency		sec	---	0.0029	---	**PASS**	0.4sec or below	
		sec	---	0.2678	---	**PASS**	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---		71.1200		**PASS**	5 or more	
Interference Prevention Function			Good			**PASS**		

3. Test results (+10% voltage)

S/N : N/A

Environment of test room	Date of test	2024-08-22	2024-08-26	2024-08-28
	Temperature	21 °C	20 °C	21 °C
	Humidity	49 %	50 %	50 %

Peak Antenna Gain	0.60	dBi
Declaration Output Power	0.440	mW/MHz
Declaration Output Power	-3.57	dBm/MHz
E.I.R.P.	**-2.97**	**dBm/MHz**
Input Power Voltage	13.20	VDC

Tested Circit Insertion Loss		0	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.883	ms
	OFF TIME	0.847	ms
	Ratio	0.773	
Packet Type (Mode)		DH5	mode
Transmit Speed		1	MHz

Using TDF and offset function in Spectrum Analyzer.
Measurement of plots are included Loss value.
(Att : 10dB + Cable loss + EUT cable: 0.5dB offset)

Test category ；	2.4GHz Band Low-Power Data Communication System (Bluetooth+BDR [GFSK])
The reason why the tests are performed only at rated voltage :	N/A

Measurement Frequency		MHz	2402	2441	2480	Result	Limit	Note
Channel Number		Ch.	0	39	78	---	---	
Frequency Measurements		MHz	2401.985	2440.985	2479.985	**---**	---	
Frequency Tolerance		ppm	-6.224	-6.125	-6.028	**PASS**	$\pm 50\times10^{-6}$(50ppm)	
Occupied Bandwidth		MHz	---	78.08	---	**PASS**	83.5MHz or below	
Spread Bandwidth		MHz	---	70.86	---	**PASS**	500kHz or more	
RF Output Power		mW/MHz	0.125	0.099	0.090	**PASS**	3mW/MHz or below	
RF Output Power Tolerance		%	-71.59	-77.44	-79.44	**PASS**	+20%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	---	0.011	---	**PASS**	2.5uW/MHz or below	
		MHz	---	2312.800	---	-----		
	2387 to 2400MHz	uW/MHz	---	2.0845	---	**PASS**	25uW/MHz or below	
		MHz	---	2399.994	---	-----		
	2483.5 to 2496.5MHz	uW/MHz	---	0.0455	---	**PASS**	25uW/MHz or below	
		MHz	---	2483.662	---	-----		
	2496.5 to 12500MHz	uW/MHz	---	0.1517	---	**PASS**	2.5uW/MHz or below	
		MHz	---	4829.500	---	-----		
Secondary Emitted Radio Wave Strength	30 to 1000MHz	nW	---	0.0014	---	**PASS**	4nW or below	
		MHz	---	961.720	---	-----		
	1000 to 12500MHz	nW	---	0.0323	---	**PASS**	20nW or below	
		MHz	---	11116.000	---	-----		
Time of occupancy hopping frequency		sec	---	0.0029	---	**PASS**	0.4sec or below	
		sec	---	0.2621	---	**PASS**	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---		70.8600		**PASS**	5 or more	
Interference Prevention Function			Good			**PASS**		

4. Measurement equipment list

USE	Equipment	Company	Model No.	Serial No.	Calibrated by	Cal. Method	Cal. Due	Cal. Date
X	Spectrum Analyzer	R&S	FSW26	101353	HCT	(c)	24.10.13	23.10.13
X	DC Power Supply	AGILENT	E3632A	MY40008800	HCT	(c)	25.07.01	24.07.01
X	Signal generator	R & S	SMB100A	176206	HCT	(c)	25.01.18	24.01.18
X	Attenuator	HUBER+SUHNER	6610_SK-50-1/199_NE	2024-09-10	HCT	(c)	24.10.16	23.10.16
X	Power Sensor	R&S	NRP-Z81	1137.9009.02-106223-bB	HCT	(c)	25.04.24	24.04.24
X	Attenuator	HP	8491A	29738	HCT	(c)	24.10.12	23.10.12

Note1: "X" used equipment.

Note2: The validity of measurement equipment is one year from the first day of the following month of the calibration date.

Note3: Cal.Method …

a) : Calibration conducted by the National Institute of Information and Communications Technology～ NICT～ or a designated calibration agency under Article 102-18 paragraph (1)～ TELECOM Engineering Center, Intertek Japan K.K., Keysight Technologies, Inc～.

b) : Correction 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)～ TELECOM Engineering Center, Intertek Japan K.K., Keysight Technologies, Inc～.

d) : Calibration conducted by using other equipment that listed above from a) to c)

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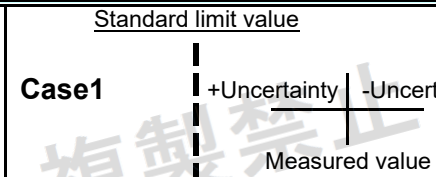
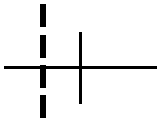
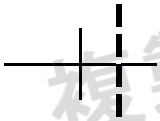
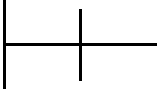
5. Uncertainty

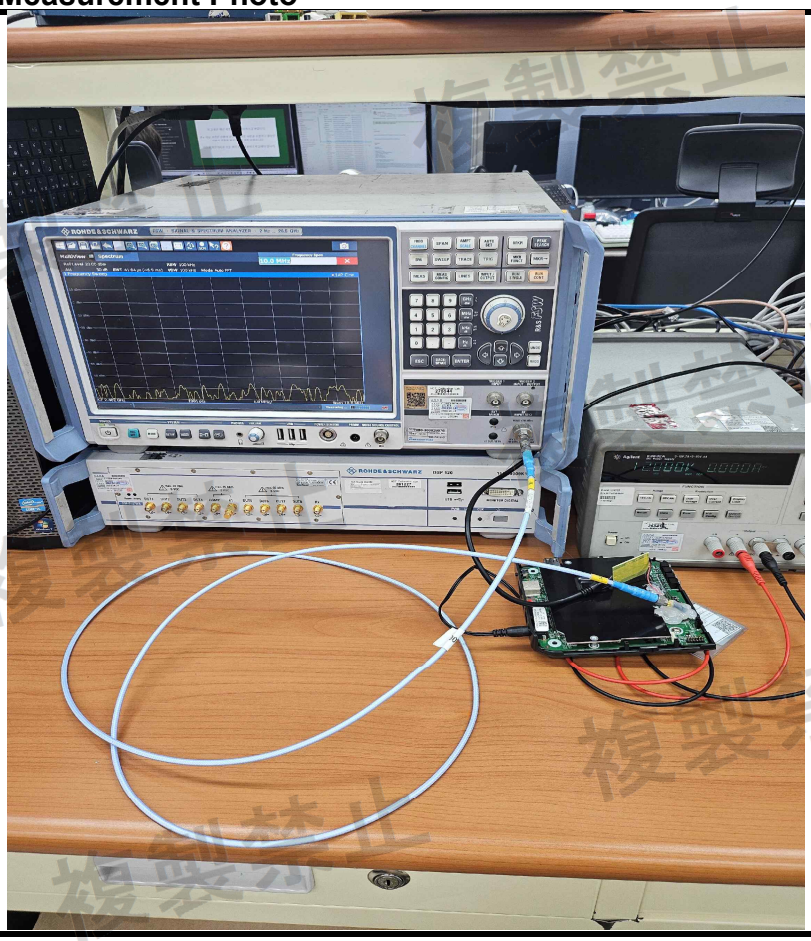
About uncertainty of measured value

Parameter	Uncertainty
Total RF power conducted	±0.9dB
Spurious emissions conducted	±1.9dB
Temperature	±1.0℃
Humidity	±3.3%

Judge	Measured value and standard limit value	
PASS	Case1 	Even if it takes uncertainty into consideration, a standard limit value is fulfilled.
	Case2 	Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.
FAIL	Case3 	Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.
	Case4 	Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.

6. Photographs

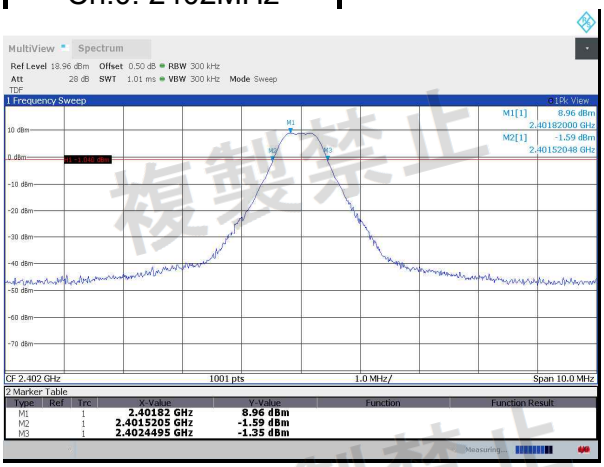
Conducted Measurement Photo



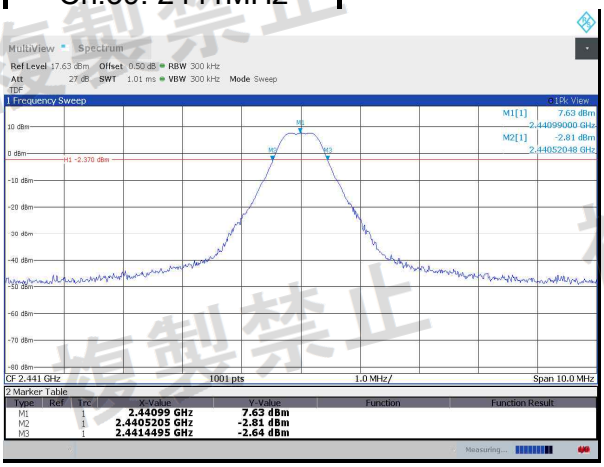
7. Test chart

7.1 Frequency tolerance (Rated voltage)

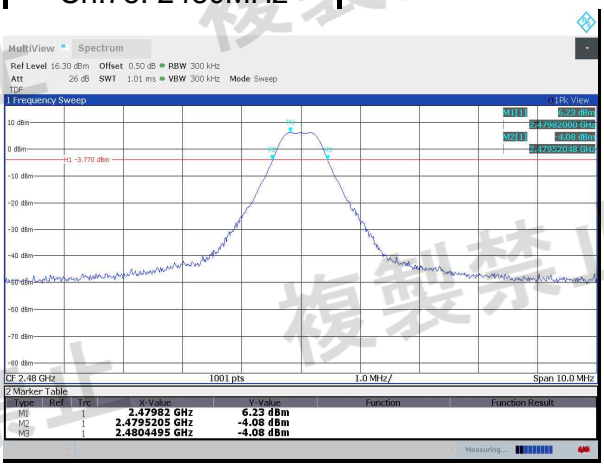
Ch.0: 2402MHz



Ch.39: 2441MHz



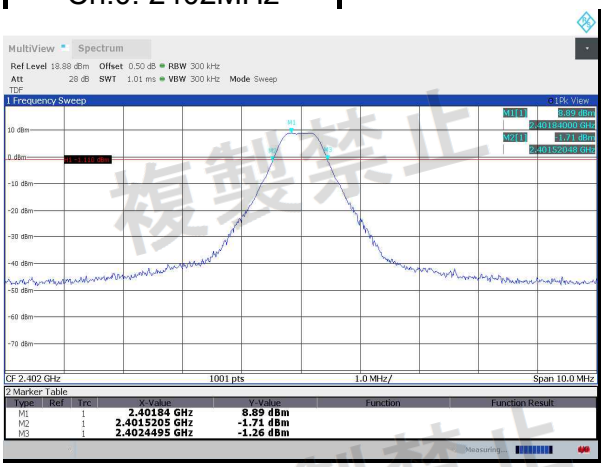
Ch.78: 2480MHz



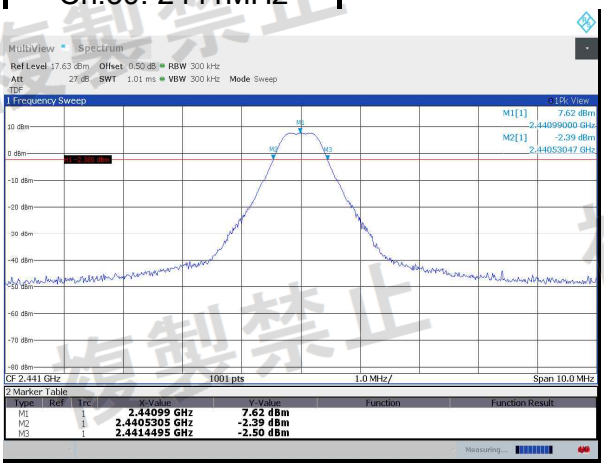
7. Test chart

7.1 Frequency tolerance (-10% voltage)

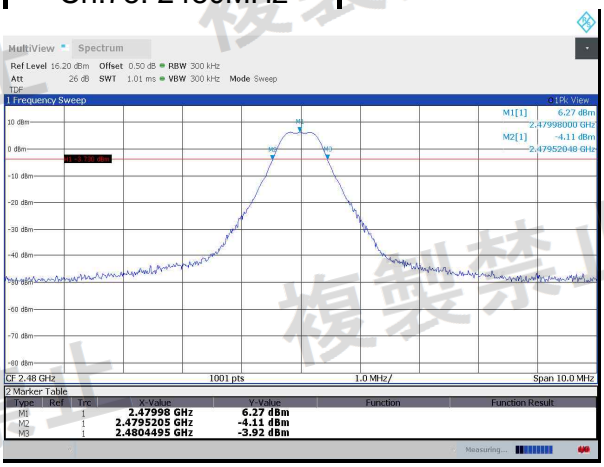
Ch.0: 2402MHz



Ch.39: 2441MHz



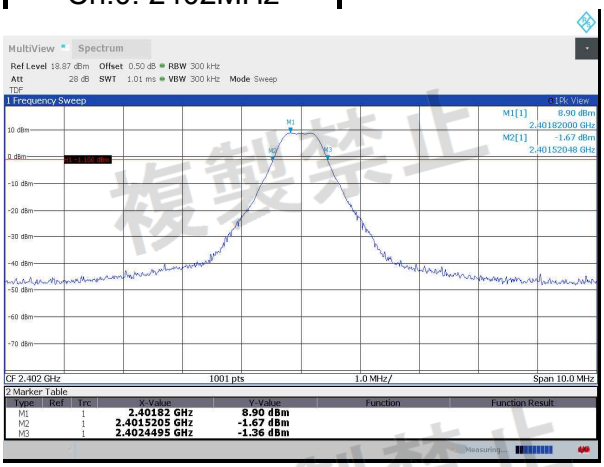
Ch.78: 2480MHz



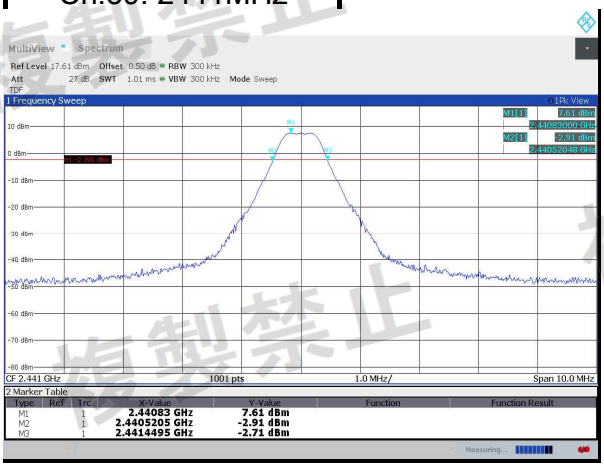
7. Test chart

7.1 Frequency tolerance (+10% voltage)

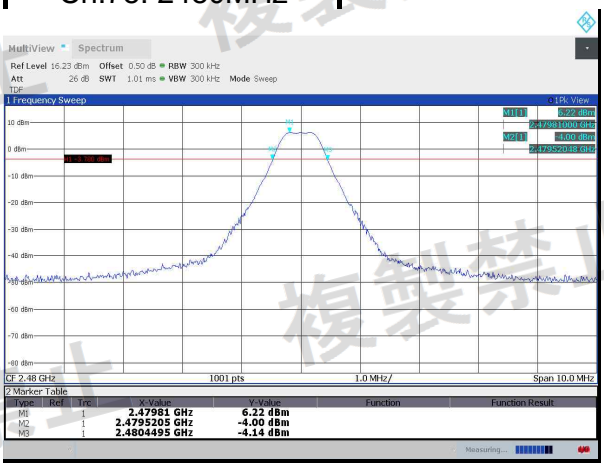
Ch.0: 2402MHz



Ch.39: 2441MHz



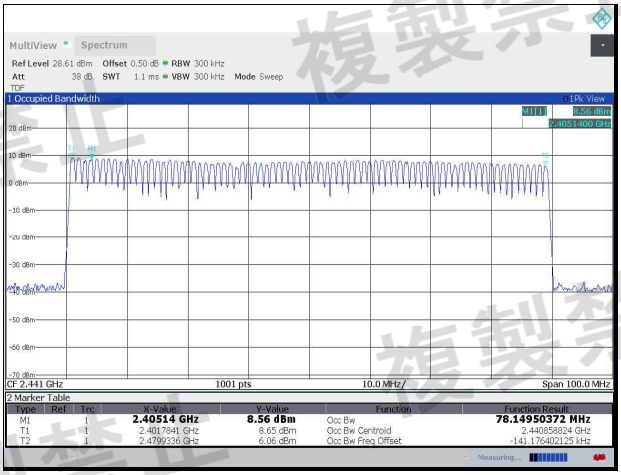
Ch.78: 2480MHz



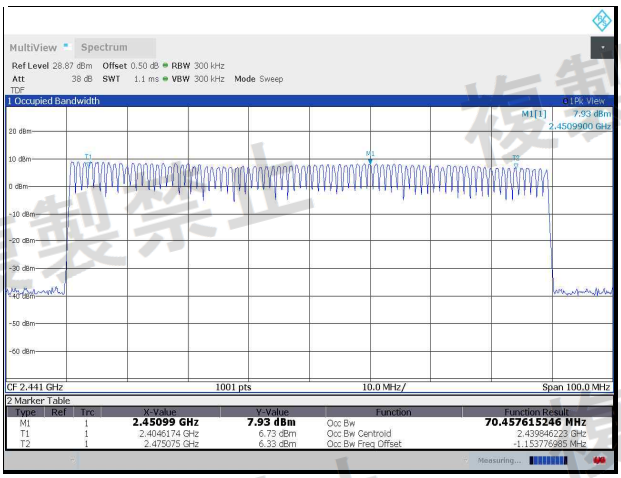
7. Test chart

7.2 Occupied bandwidth / Spread bandwidth (Rated voltage)

Occupied bandwidth



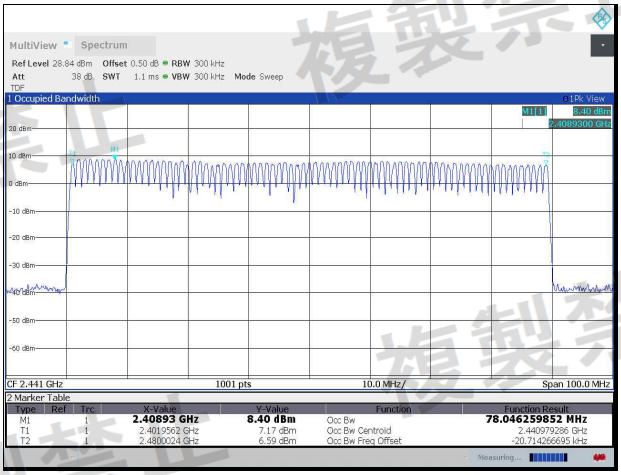
Spread bandwidth



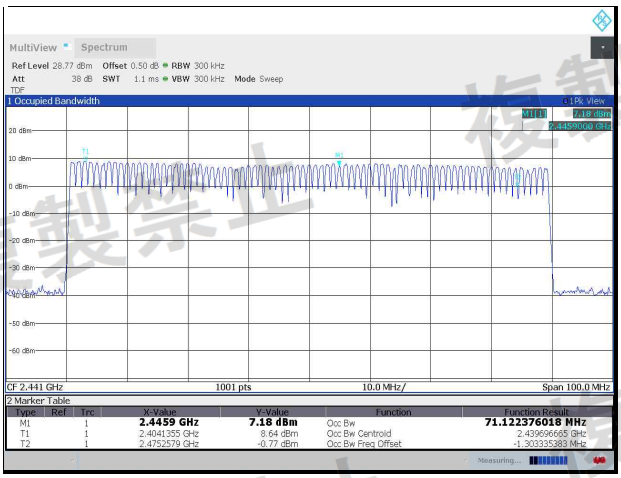
7. Test chart

7.2 Occupied bandwidth / Spread bandwidth (-10% voltage)

Occupied bandwidth



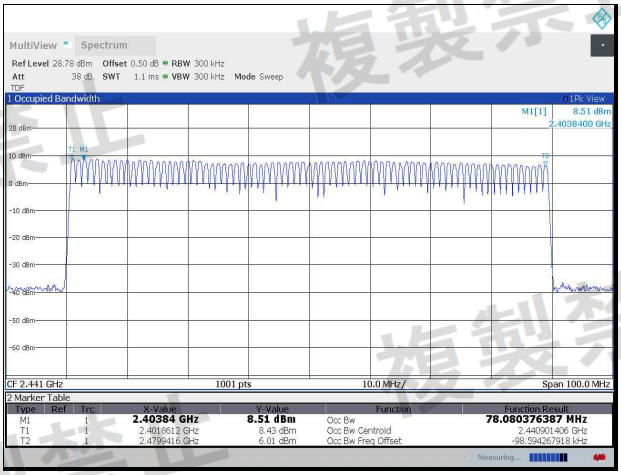
Spread bandwidth



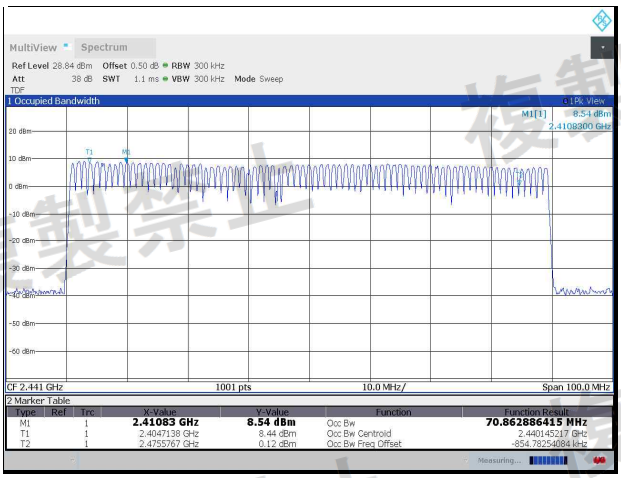
7. Test chart

7.2 Occupied bandwidth / Spread bandwidth (+10% voltage)

Occupied bandwidth



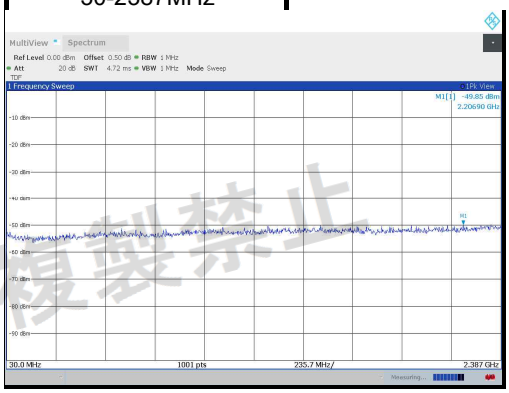
Spread bandwidth



7. Test chart

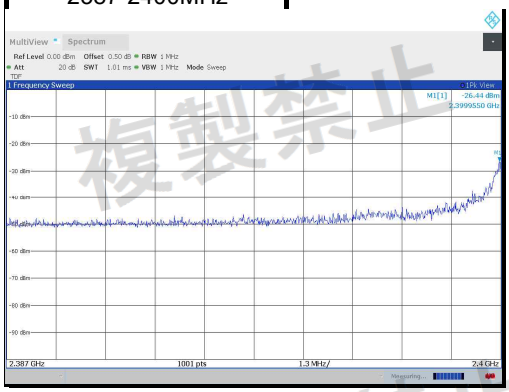
7.3 Unwanted(Spurious) emission strength (Rated voltage)

30-2387MHz



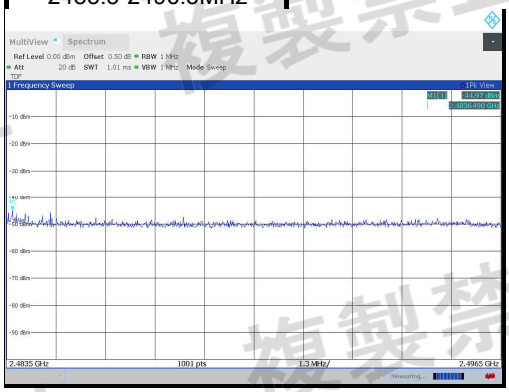
30-2387MHz(Detail)

2387-2400MHz



2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz

2496.5-12500MHz(Detail)

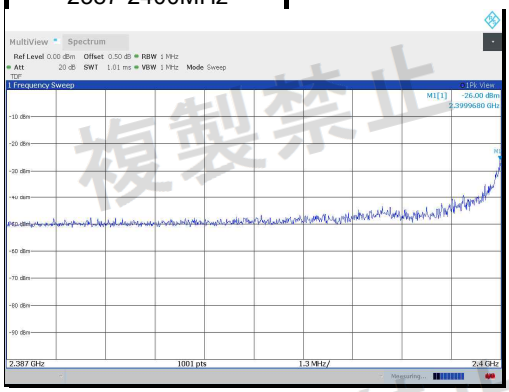
7. Test chart

7.3 Unwanted(Spurious) emission strength (-10% voltage)

30-2387MHz

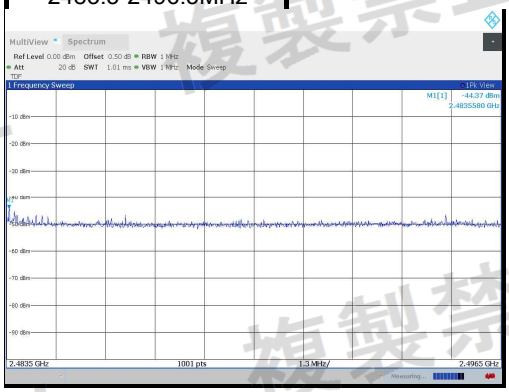
30-2387MHz(Detail)

2387-2400MHz



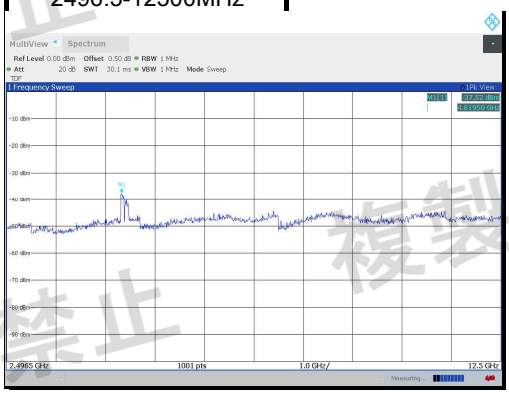
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz

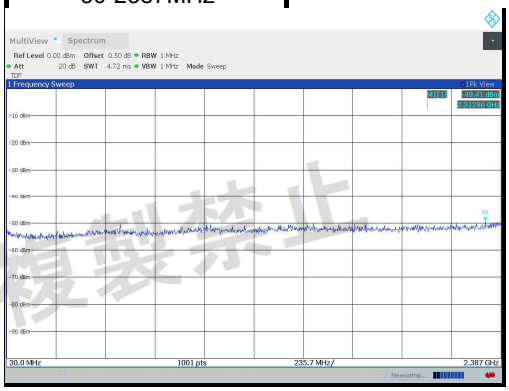


2496.5-12500MHz(Detail)

7. Test chart

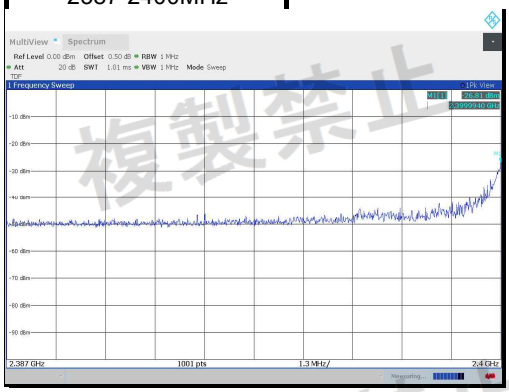
7.3 Unwanted(Spurious) emission strength (+10% voltage)

30-2387MHz



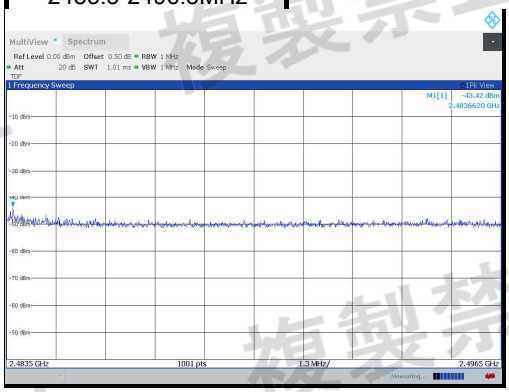
30-2387MHz(Detail)

2387-2400MHz



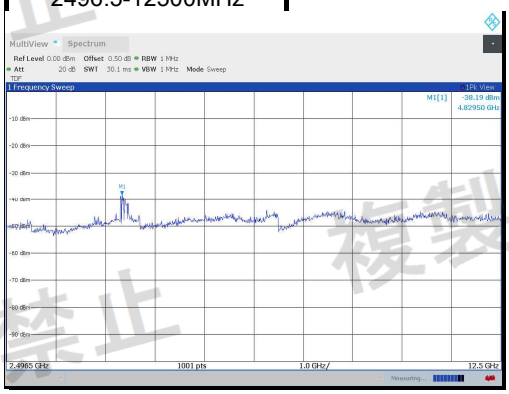
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz

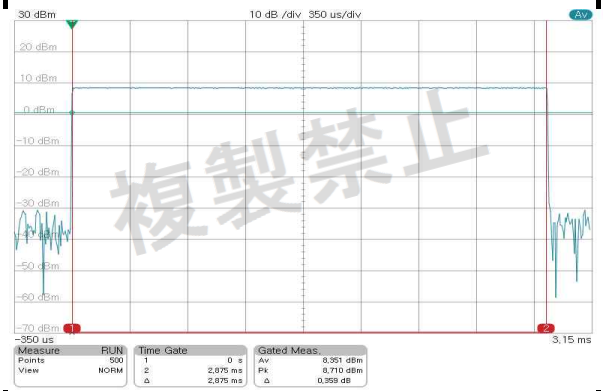


2496.5-12500MHz(Detail)

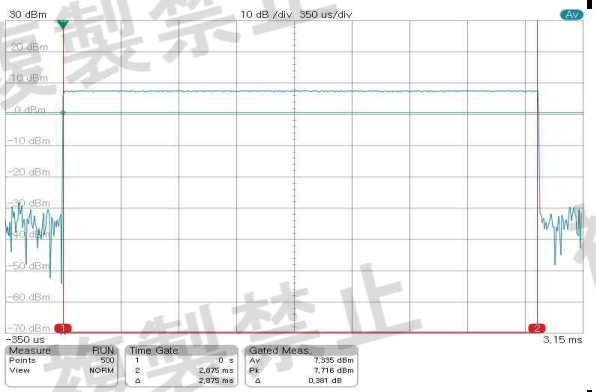
7. Test chart

7.4 RF output power tolerance (Rated voltage)

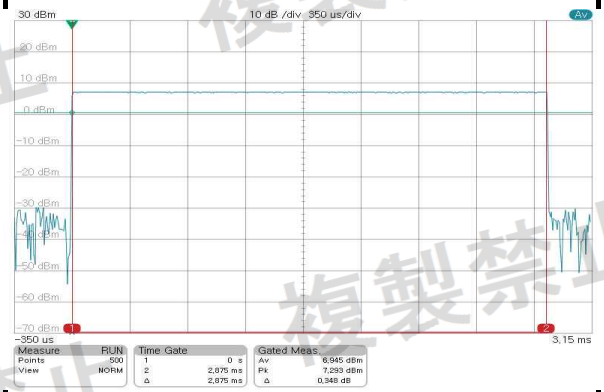
Ch.0: 2402MHz



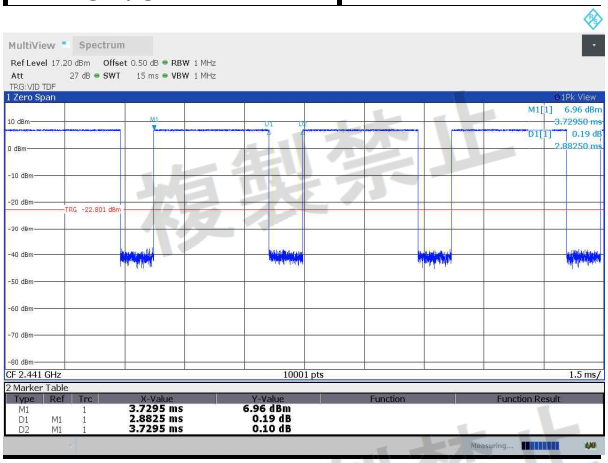
Ch.39: 2441MHz



Ch.78: 2480MHz



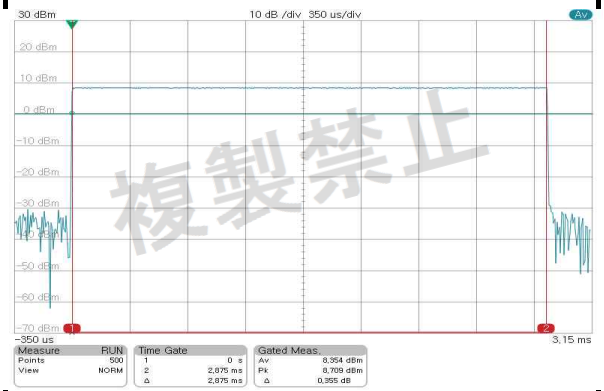
ON/OFF time



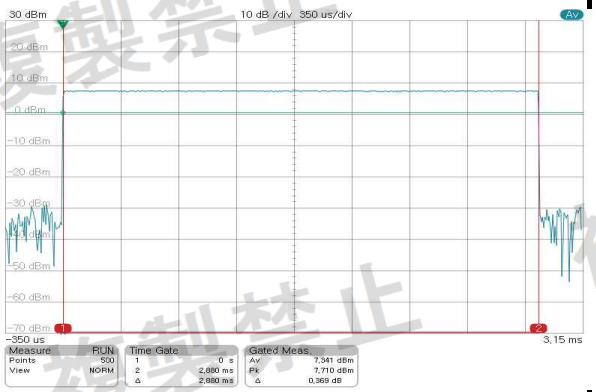
7. Test chart

7.4 RF output power tolerance (-10% voltage)

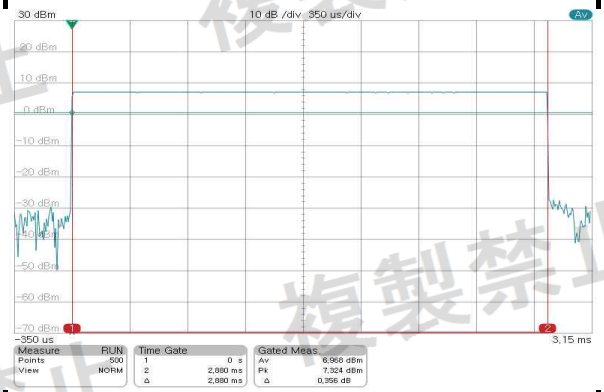
Ch.0: 2402MHz



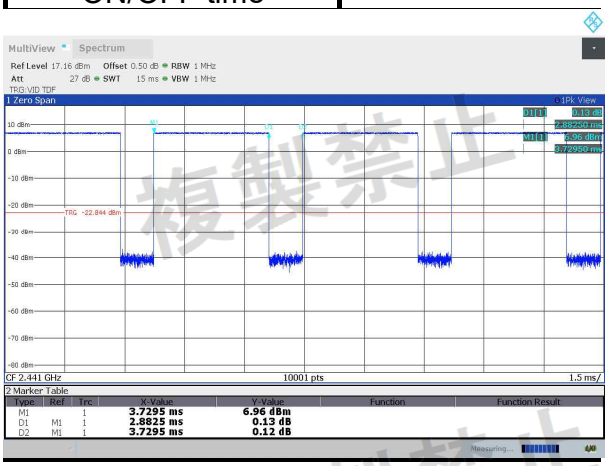
Ch.39: 2441MHz



Ch.78: 2480MHz



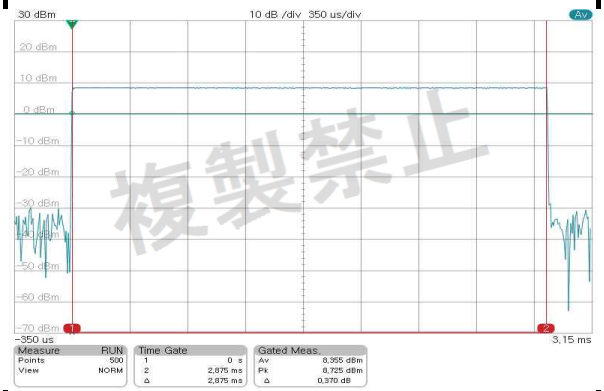
ON/OFF time



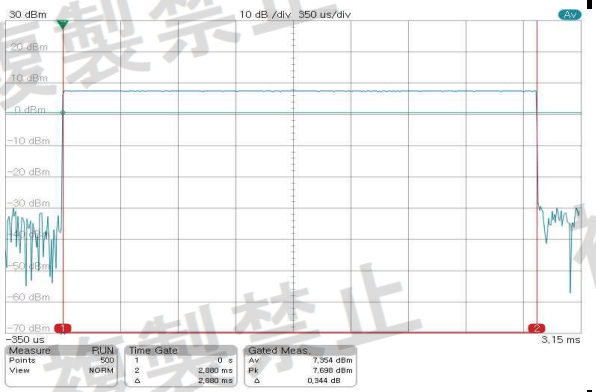
7. Test chart

7.4 RF output power tolerance (+10% voltage)

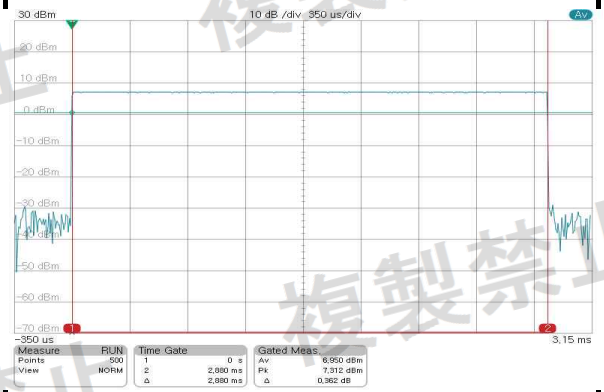
Ch.0: 2402MHz



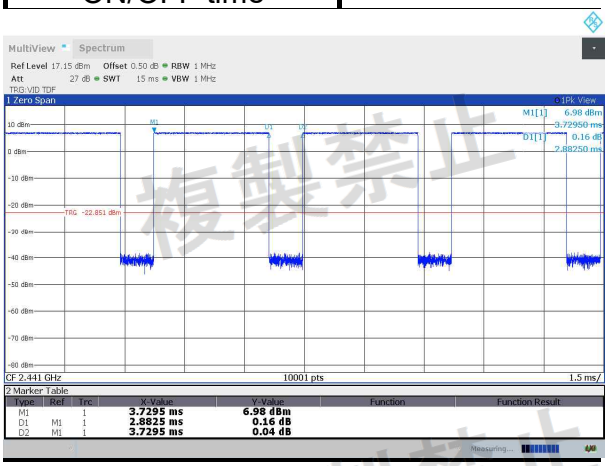
Ch.39: 2441MHz



Ch.78: 2480MHz



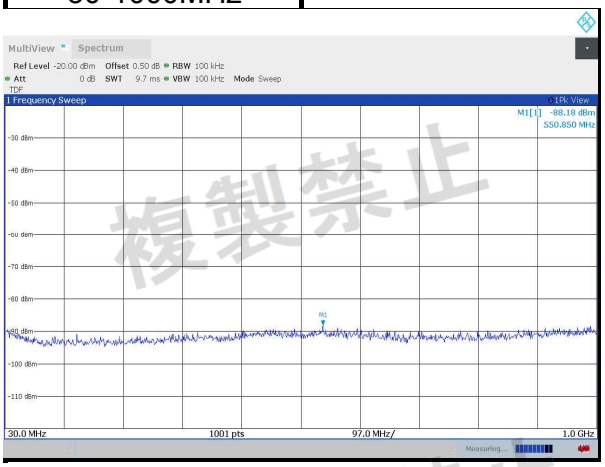
ON/OFF time



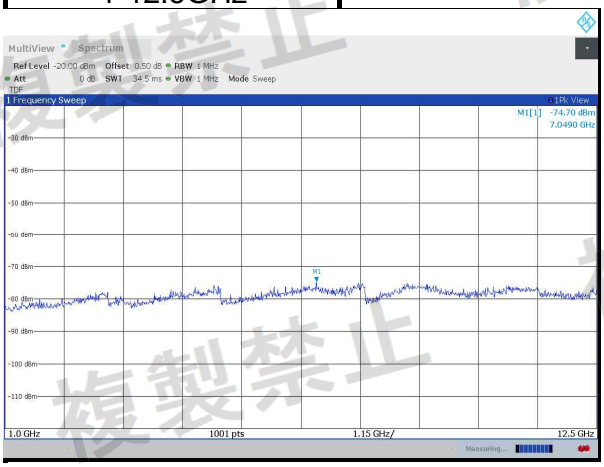
7. Test chart

7.5 Secondary emitted radio wave strength (Rated voltage)

30-1000MHz



1-12.5GHz



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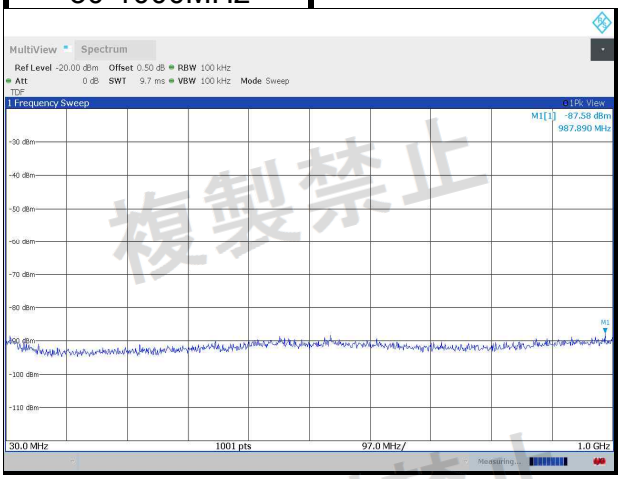
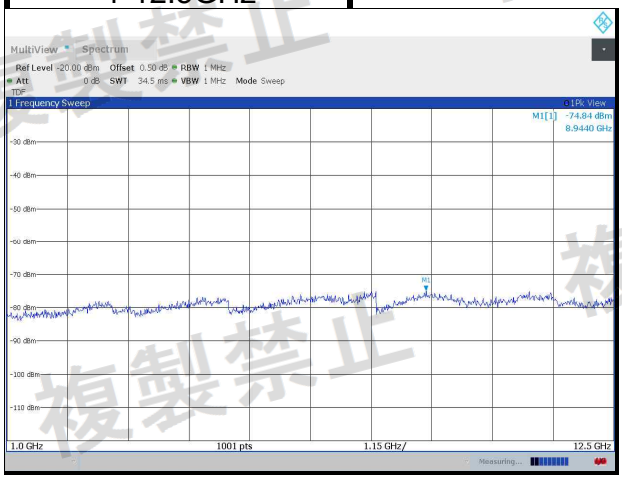
7. Test chart

7.5 Secondary emitted radio wave strength (-10% voltage)

30-1000MHz



1-12.5GHz



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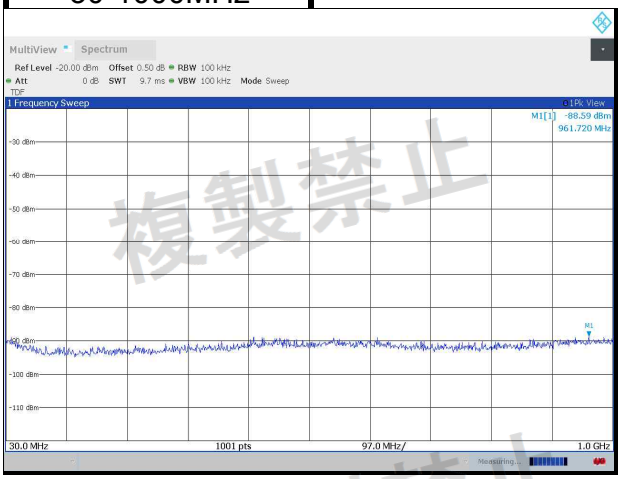
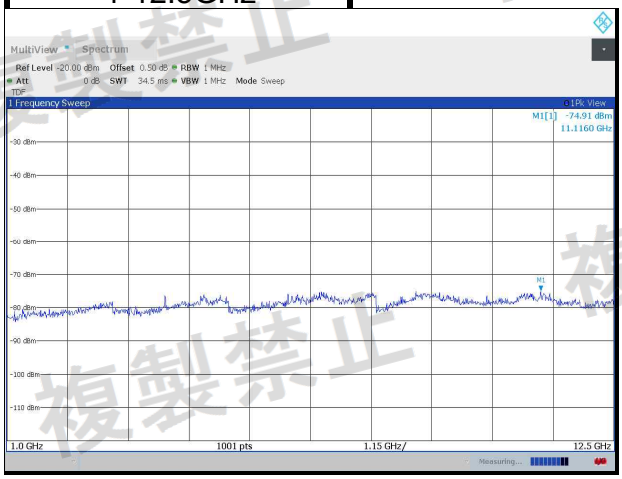
7. Test chart

7.5 Secondary emitted radio wave strength (+10% voltage)

30-1000MHz



1-12.5GHz



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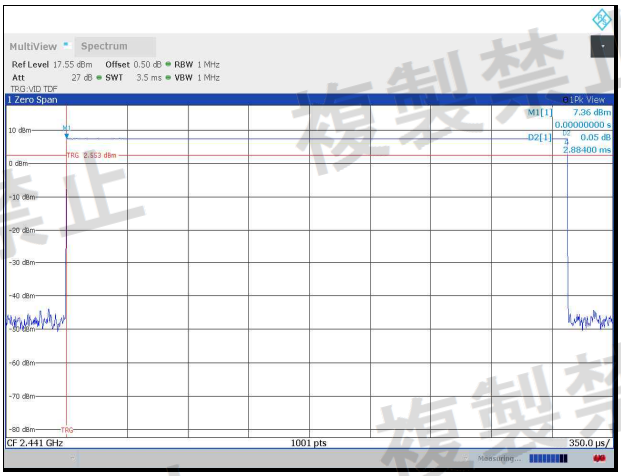
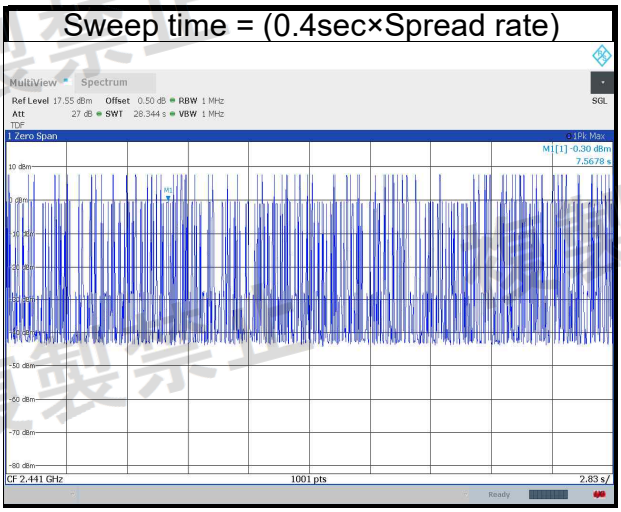
7. Test chart

7.6 Time of occupancy hopping frequency (Rated voltage)

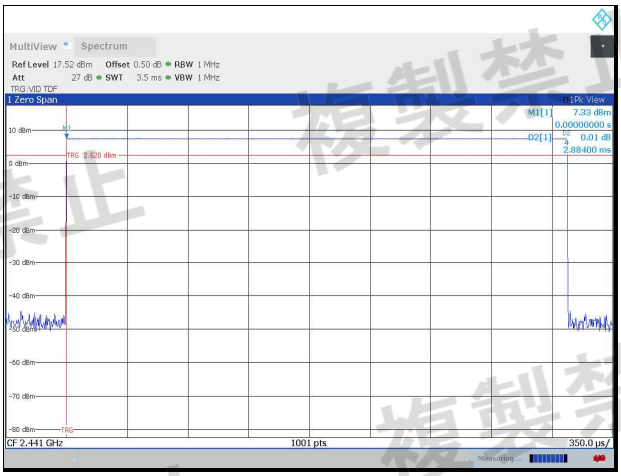


Sweep time = (0.4sec×Spread rate)

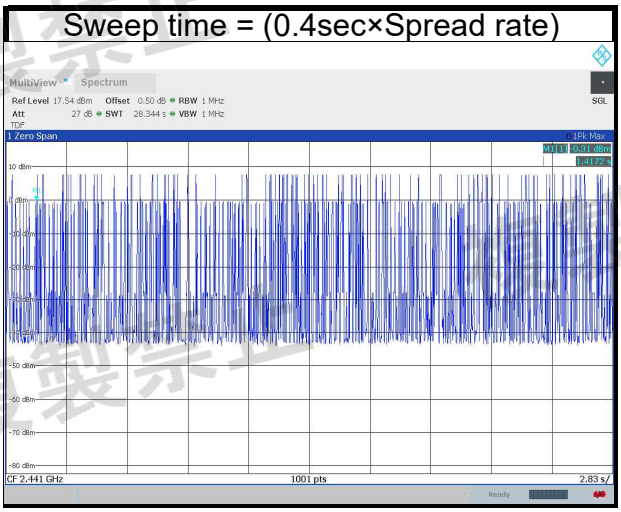


7. Test chart

7.6 Time of occupancy hopping frequency (-10% voltage)

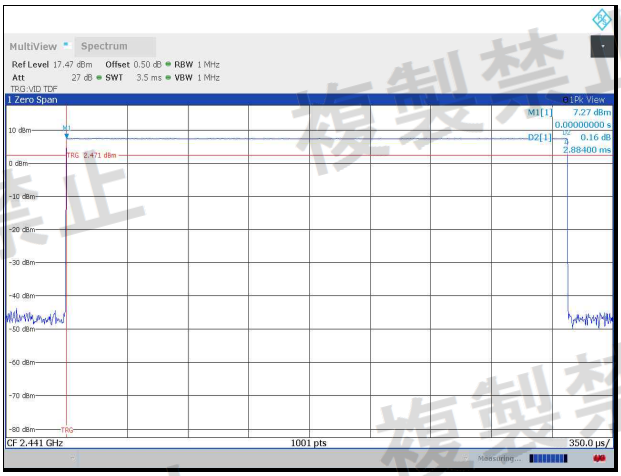


Sweep time = (0.4sec×Spread rate)

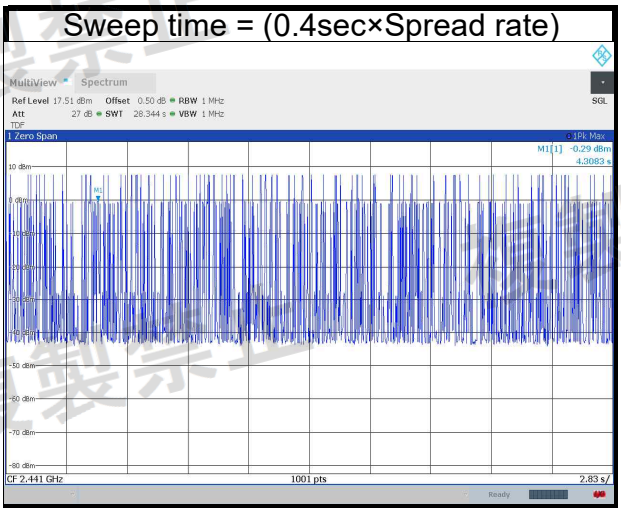


7. Test chart

7.6 Time of occupancy hopping frequency (+10% voltage)



Sweep time = (0.4sec×Spread rate)



3. Test results (Rated voltage)

S/N : N/A

Environment of test room	Date of test	2024-08-22	2024-08-26	2024-08-28
	Temperature	21 °C	20 °C	21 °C
	Humidity	49 %	50 %	50 %

Peak Antenna Gain	0.60	dBi
Declaration Output Power	0.44	mW/MHz
Declaration Output Power	-3.57	dBm/MHz
E.I.R.P.	**-2.97**	**dBm/MHz**
Input Power Voltage	12.00	VDC

Tested Circit Insertion Loss		0	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.883	ms
	OFF TIME	0.847	ms
	Ratio	0.773	
Packet Type (Mode)		DH5(AHF)	mode
Transmit Speed		1	MHz

Using TDF and offset function in Spectrum Analyzer.
Measurement of plots are included Loss value.

(Att : 10dB + Cable loss + EUT cable: 0.5dB offset)

Test category ;	2.4GHz Band Low-Power Data Communication System (Bluetooth+BDR [GFSK] *AFH)
The reason why the tests are performed only at rated voltage :	N/A

Measurement Frequency		MHz	2402	2441	2480	Result	Limit	Note
Channel Number		Ch.	0	39	78	---	---	
Frequency Measurements		MHz	---	---	---	**---**	---	
Frequency Tolerance		ppm	---	---	---	**---**	$\pm 50\times10^{-6}$(50ppm)	
Occupied Bandwidth		MHz	19.59	19.58	19.59	**PASS**	83.5MHz or below	
Spread Bandwidth		MHz	18.04	17.98	18.01	**PASS**	500kHz or more	
RF Output Power		mW/MHz	0.497445	0.385382	0.356589	**PASS**	3mW/MHz or below	
RF Output Power Tolerance		%	13.055602	-12.413145	-18.957113	**PASS**	+20%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	0.012	0.012	0.011	**PASS**	2.5uW/MHz or below	
		MHz	2352.900	2383.500	1980.800	-----		
	2387 to 2400MHz	uW/MHz	2.254	0.021	0.017	**PASS**	25uW/MHz or below	
		MHz	2399.981	2398.682	2397.201	-----		
	2483.5 to 2496.5MHz	uW/MHz	0.016	0.016	0.039	**PASS**	25uW/MHz or below	
		MHz	2493.130	2489.844	2483.740	-----		
	2496.5 to 12500MHz	uW/MHz	0.161	0.120	0.093	**PASS**	2.5uW/MHz or below	
		MHz	4819.500	4879.500	4919.500	-----		
Time of occupancy hopping frequency		sec	0.003	0.003	0.003	**PASS**	0.4sec or below	
		sec	0.228	0.259	0.256	**PASS**	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---	18.040	17.980	18.010	**PASS**	5 or more	
Interference Prevention Function			Good			**PASS**		

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3. Test results (+10% voltage)

S/N : N/A

Environment of test room	Date of test	2024-08-22	2024-08-26	2024-08-28
	Temperature	21 °C	20 °C	21 °C
	Humidity	49 %	50 %	50 %

Peak Antenna Gain	0.60	dBi
Declaration Output Power	0.44	mW/MHz
Declaration Output Power	-3.57	dBm/MHz
E.I.R.P.	**-2.97**	**dBm/MHz**
Input Power Voltage	10.80	VDC

Tested Circit Insertion Loss		0	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.883	ms
	OFF TIME	0.847	ms
	Ratio	0.773	
Packet Type (Mode)		DH5(AHF)	mode
Transmit Speed		1	MHz

Using TDF and offset function in Spectrum Analyzer.
Measurement of plots are included Loss value.

(Att : 10dB + Cable loss + EUT cable: 0.5dB offset)

Test category ;	2.4GHz Band Low-Power Data Communication System (Bluetooth+BDR [GFSK] *AFH)
The reason why the tests are performed only at rated voltage :	N/A

Measurement Frequency		MHz	2402	2441	2480	Result	Limit	Note
Channel Number		Ch.	0	39	78	---	---	
Frequency Measurements		MHz	---	---	---	---	---	
Frequency Tolerance		ppm	---	---	---	---	±50×10^{-6}(50ppm)	
Occupied Bandwidth		MHz	19.59	19.58	19.59	PASS	83.5MHz or below	
Spread Bandwidth		MHz	18.03	17.98	18.02	PASS	500kHz or more	
RF Output Power		mW/MHz	0.491797	0.384939	0.357130	PASS	3mW/MHz or below	
RF Output Power Tolerance		%	11.771967	-12.513925	-18.834058	PASS	+20%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	0.013	0.012	0.010	PASS	2.5uW/MHz or below	
		MHz	2367.000	2378.800	1896.100	-----		
	2387 to 2400MHz	uW/MHz	2.355	0.015	0.015	PASS	25uW/MHz or below	
		MHz	2399.994	2391.968	2397.500	-----		
	2483.5 to 2496.5MHz	uW/MHz	0.016	0.016	0.037	PASS	25uW/MHz or below	
		MHz	2493.117	2490.558	2484.909	-----		
	2496.5 to 12500MHz	uW/MHz	0.178	0.145	0.083	PASS	2.5uW/MHz or below	
		MHz	4819.500	4869.500	4929.500	-----		
Time of occupancy hopping frequency		sec	0.003	0.003	0.003	PASS	0.4sec or below	
		sec	0.245	0.248	0.259	PASS	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---	18.030	17.980	18.020	PASS	5 or more	
Interference Prevention Function			Good			PASS		

3. Test results (Rated voltage)

S/N : N/A

Environment of test room	Date of test	2024-08-22	2024-08-26	2024-08-28
	Temperature	21 °C	20 °C	21 °C
	Humidity	49 %	50 %	50 %

Peak Antenna Gain	0.60	dBi
Declaration Output Power	0.44	mW/MHz
Declaration Output Power	-3.57	dBm/MHz
E.I.R.P.	**-2.97**	**dBm/MHz**
Input Power Voltage	13.20	VDC

Tested Circit Insertion Loss		0	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.883	ms
	OFF TIME	0.847	ms
	Ratio	0.773	
Packet Type (Mode)		DH5(AHF)	mode
Transmit Speed		1	MHz

Using TDF and offset function in Spectrum Analyzer.
Measurement of plots are included Loss value.

(Att : 10dB + Cable loss + EUT cable: 0.5dB offset)

Test category ;	2.4GHz Band Low-Power Data Communication System (Bluetooth+BDR [GFSK] *AFH)
The reason why the tests are performed only at rated voltage :	N/A

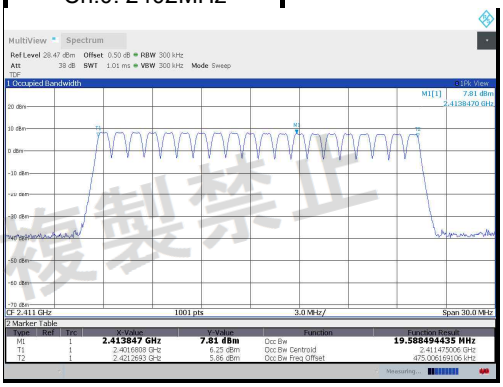
Measurement Frequency		MHz	2402	2441	2480	Result	Limit	Note
Channel Number		Ch.	0	39	78	---	---	
Frequency Measurements		MHz	---	---	---	---	---	
Frequency Tolerance		ppm	---	---	---	---	$\pm 50\times10^{-6}$(50ppm)	
Occupied Bandwidth		MHz	19.59	19.58	19.58	PASS	83.5MHz or below	
Spread Bandwidth		MHz	18.03	17.99	18.04	PASS	500kHz or more	
RF Output Power		mW/MHz	0.490214	0.387213	0.357227	PASS	3mW/MHz or below	
RF Output Power Tolerance		%	11.412236	-11.997004	-18.811955	PASS	+20%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	0.012	0.011	0.012	PASS	2.5uW/MHz or below	
		MHz	2371.700	1853.700	2348.100	-----		
	2387 to 2400MHz	uW/MHz	1.626	0.019	0.016	PASS	25uW/MHz or below	
		MHz	2399.994	2391.045	2399.162	-----		
	2483.5 to 2496.5MHz	uW/MHz	0.017	0.015	0.050	PASS	25uW/MHz or below	
		MHz	2494.662	2493.792	2483.662	-----		
	2496.5 to 12500MHz	uW/MHz	0.177	0.104	0.090	PASS	2.5uW/MHz or below	
		MHz	4839.500	4869.500	4939.500	-----		
Time of occupancy hopping frequency		sec	0.003	0.003	0.003	PASS	0.4sec or below	
		sec	0.239	0.253	0.242	PASS	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---	18.030	17.990	18.040	PASS	5 or more	
Interference Prevention Function			Good			PASS		

9. Test chart

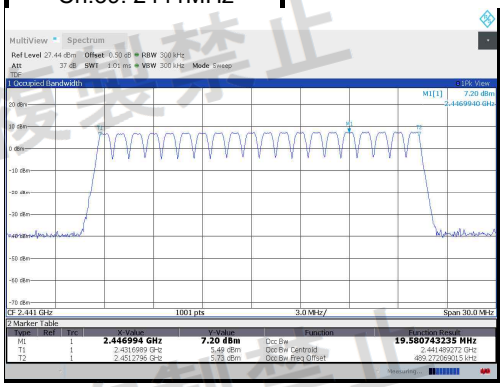
9.1 Occupied bandwidth / Spread bandwidth (Rated voltage)

Occupied bandwidth

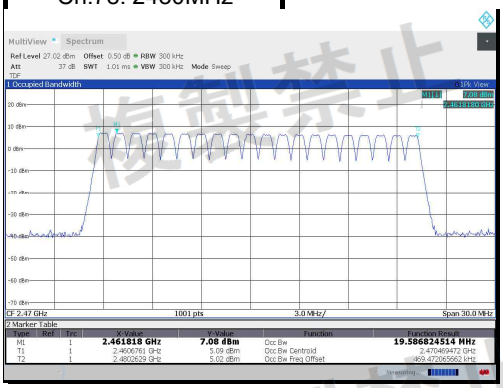
Ch.0: 2402MHz



Ch.39: 2441MHz

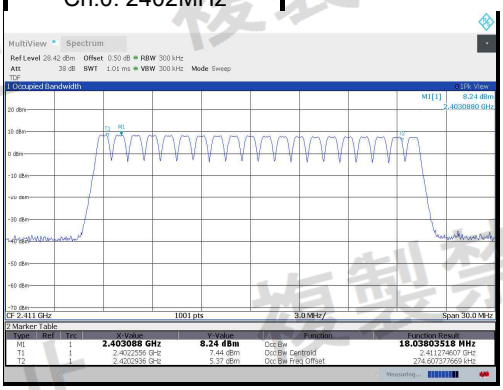


Ch.78: 2480MHz

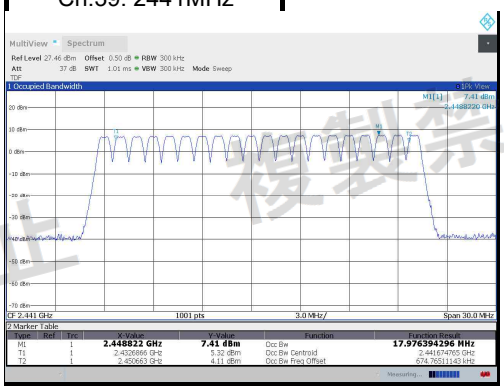


Spread bandwidth

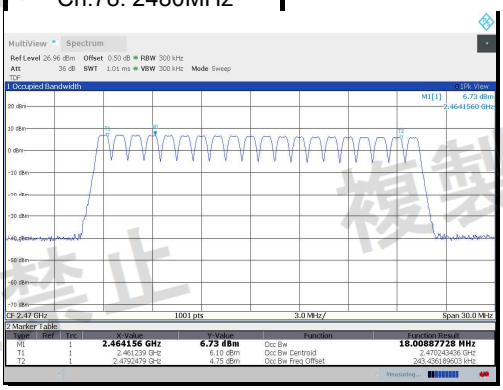
Ch.0: 2402MHz



Ch.39: 2441MHz



Ch.78: 2480MHz

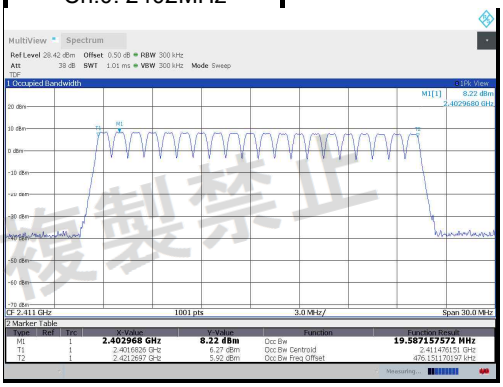


9. Test chart

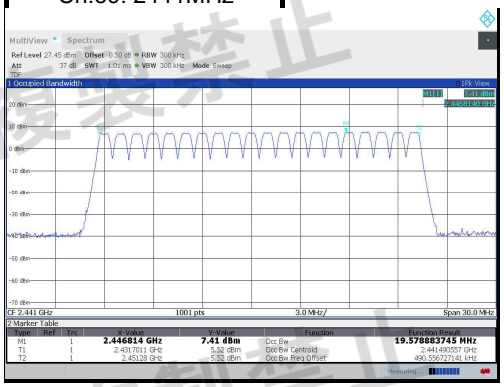
9.1 Occupied bandwidth / Spread bandwidth (-10% voltage)

Occupied bandwidth

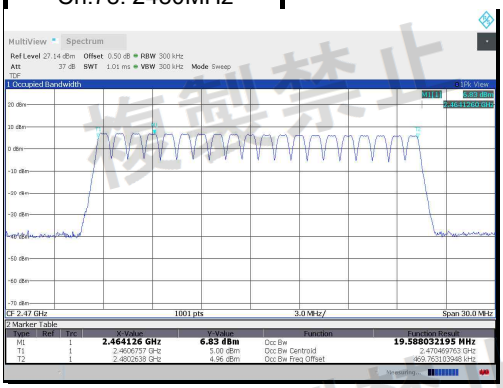
Ch.0: 2402MHz



Ch.39: 2441MHz

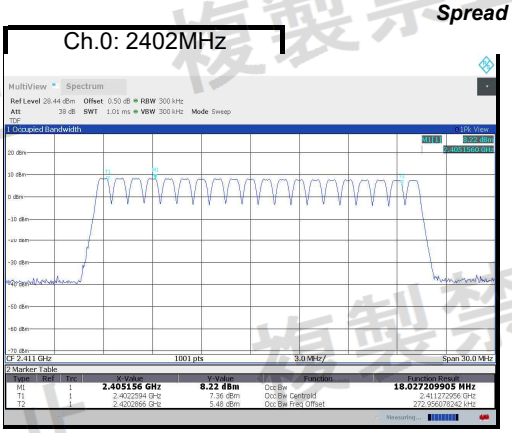


Ch.78: 2480MHz

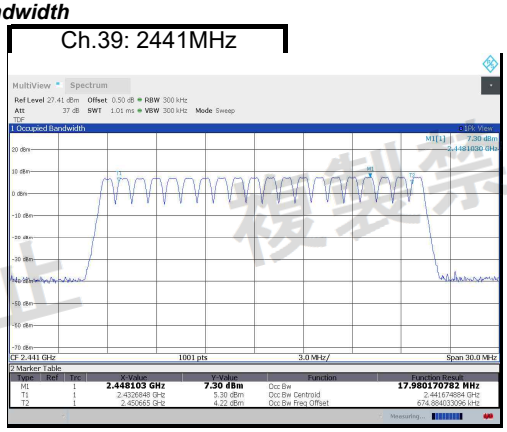


Spread bandwidth

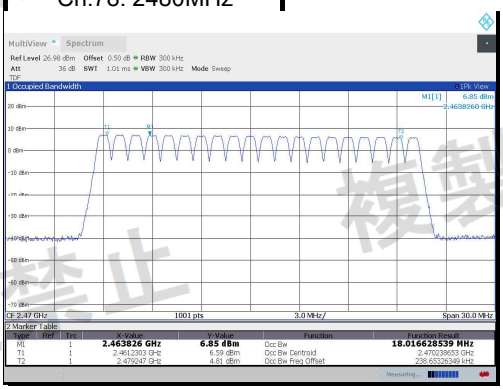
Ch.0: 2402MHz



Ch.39: 2441MHz



Ch.78: 2480MHz

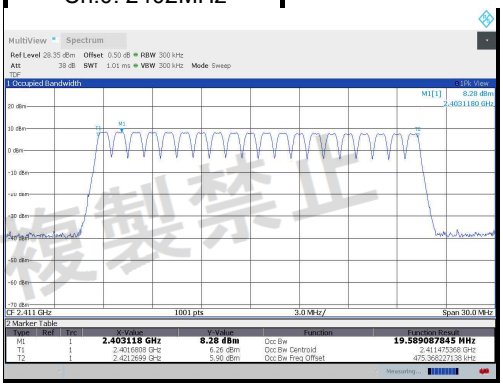


9. Test chart

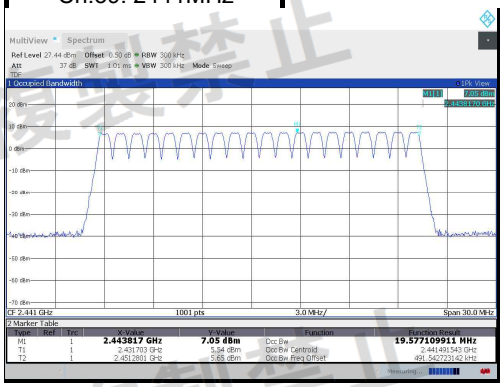
9.1 Occupied bandwidth / Spread bandwidth (+10% voltage)

Occupied bandwidth

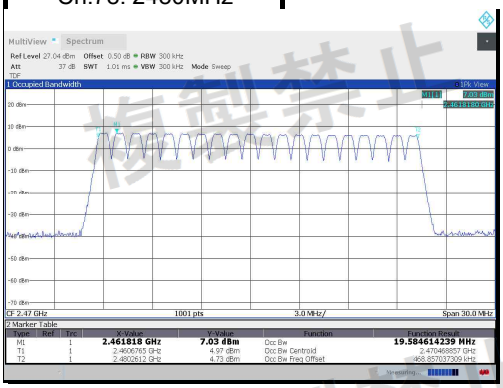
Ch.0: 2402MHz



Ch.39: 2441MHz

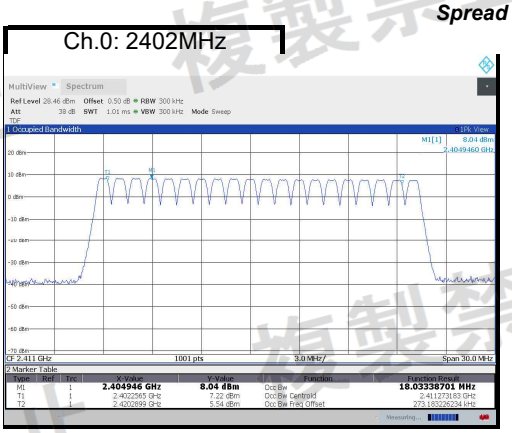


Ch.78: 2480MHz

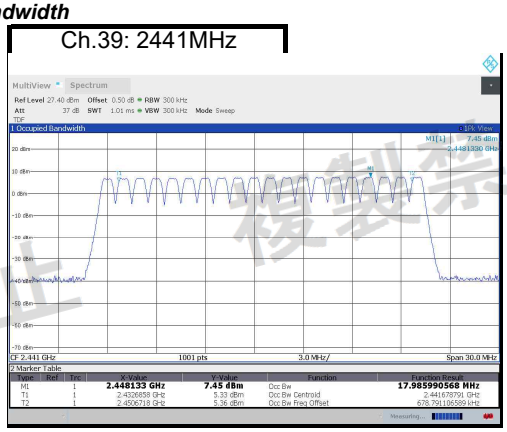


Spread bandwidth

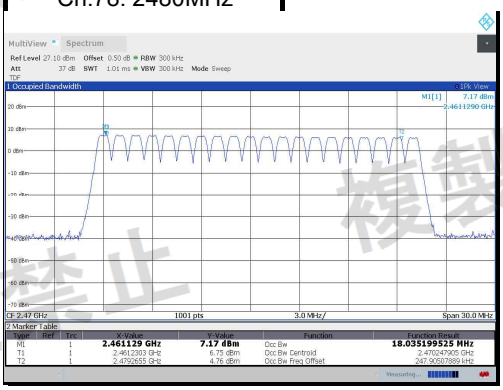
Ch.0: 2402MHz



Ch.39: 2441MHz



Ch.78: 2480MHz



9. Test chart

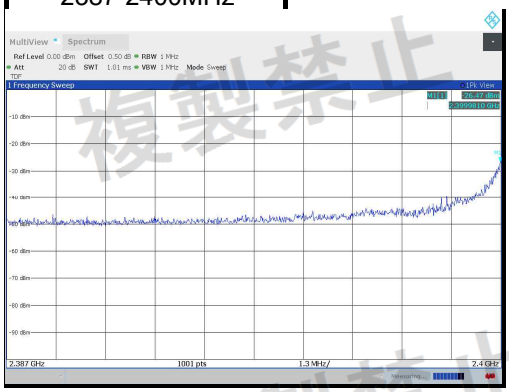
9.2 Unwanted(Spurious) emission strength (Rated voltage)

Ch.0: 2402MHz

30-2387MHz

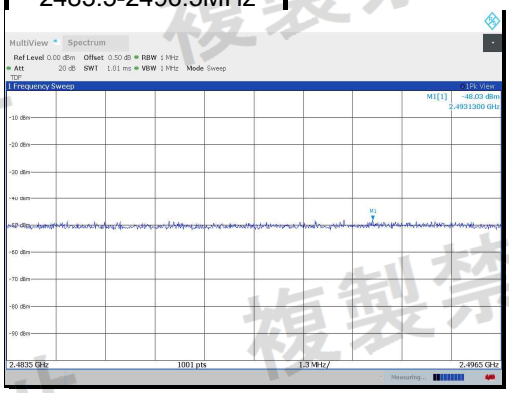
30-2387MHz(Detail)

2387-2400MHz



2387-2400MHz(Detail)

2483.5-2496.5MHz



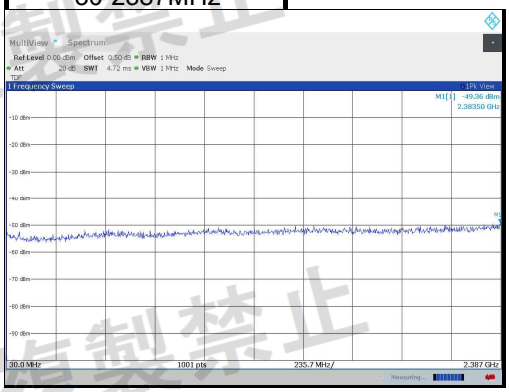
2483.5-2496.5MHz(Detail)

2496.5-12500MHz

2496.5-12500MHz(Detail)

Ch.39: 2441MHz

30-2387MHz

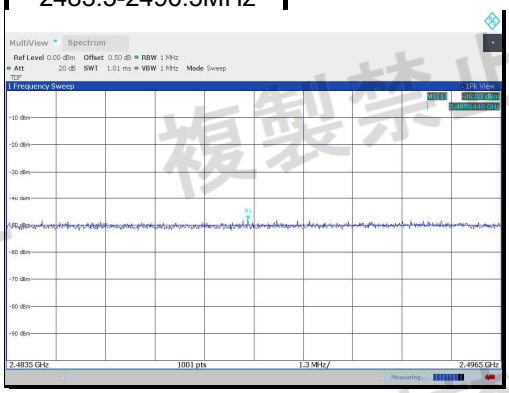


30-2387MHz(Detail)

2387-2400MHz

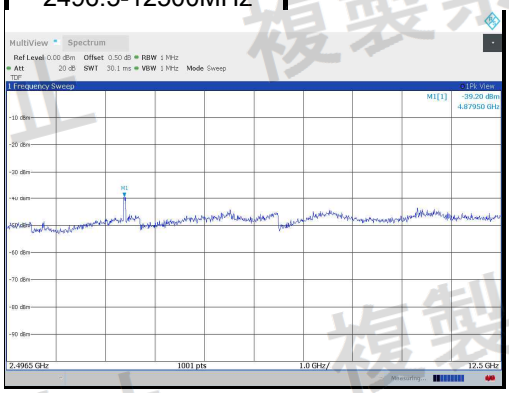
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz



2496.5-12500MHz(Detail)

複製禁止

Ch.78: 2480MHz

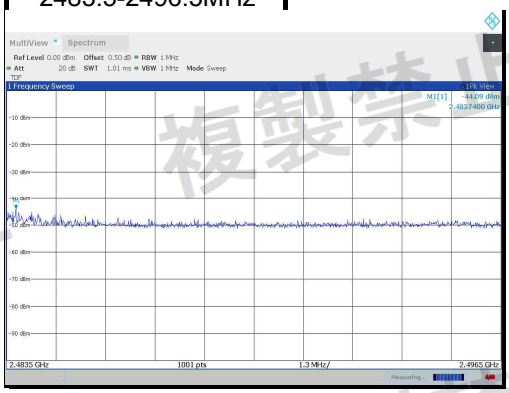
30-2387MHz

30-2387MHz(Detail)

2387-2400MHz

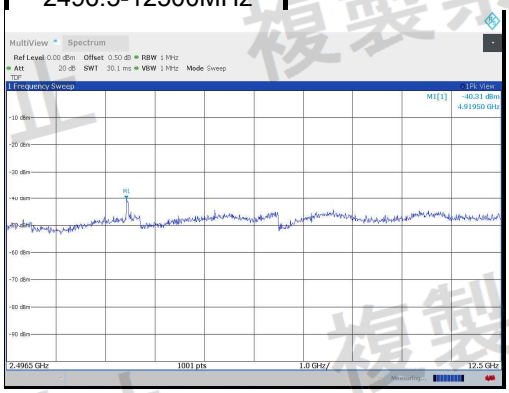
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz



2496.5-12500MHz(Detail)

複製禁止

9. Test chart

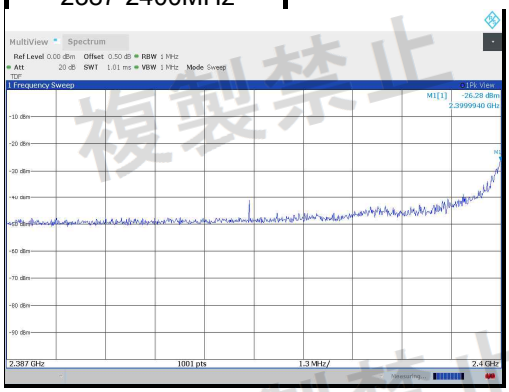
9.2 Unwanted(Spurious) emission strength (-10% voltage)

Ch.0: 2402MHz

30-2387MHz

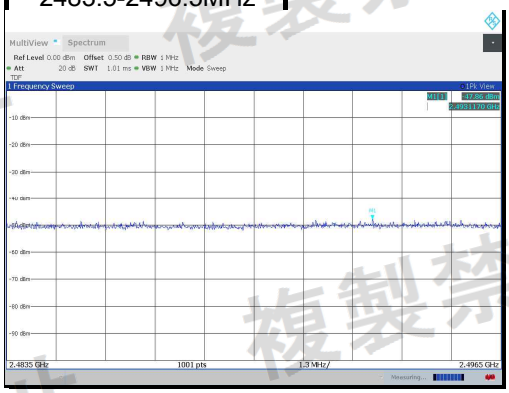
30-2387MHz(Detail)

2387-2400MHz



2387-2400MHz(Detail)

2483.5-2496.5MHz



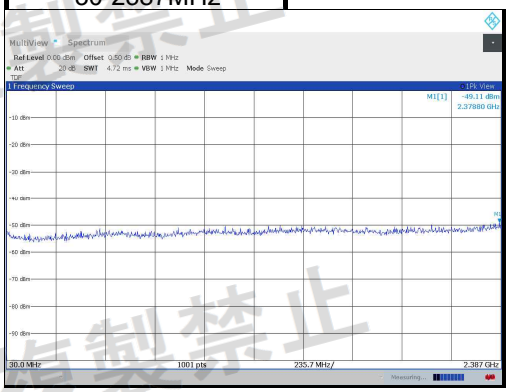
2483.5-2496.5MHz(Detail)

2496.5-12500MHz

2496.5-12500MHz(Detail)

Ch.39: 2441MHz

30-2387MHz



30-2387MHz(Detail)

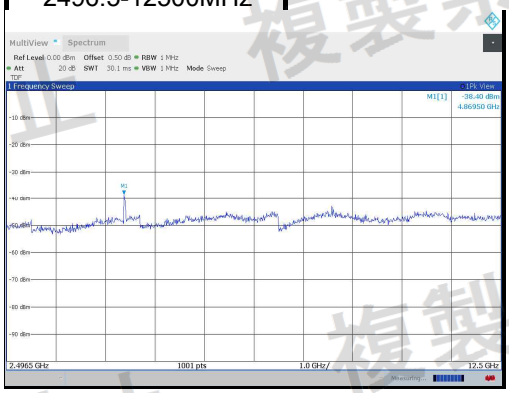
2387-2400MHz

2387-2400MHz(Detail)

2483.5-2496.5MHz

2483.5-2496.5MHz(Detail)

2496.5-12500MHz

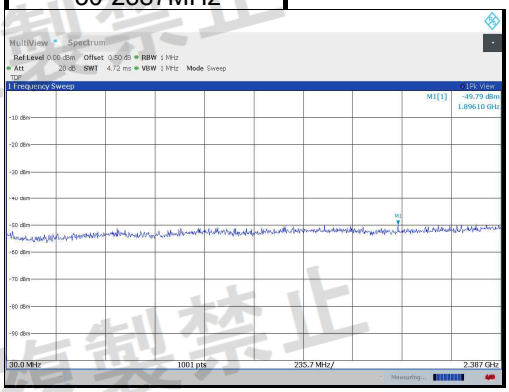


2496.5-12500MHz(Detail)

複製禁止

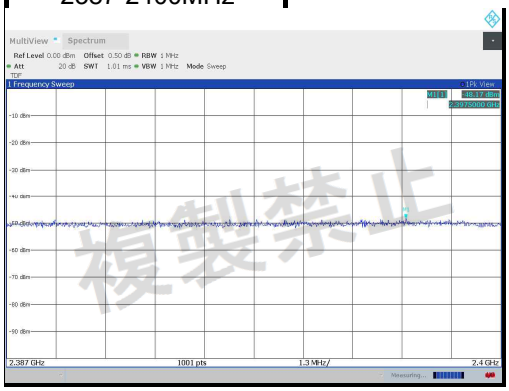
Ch.78: 2480MHz

30-2387MHz



30-2387MHz(Detail)

2387-2400MHz

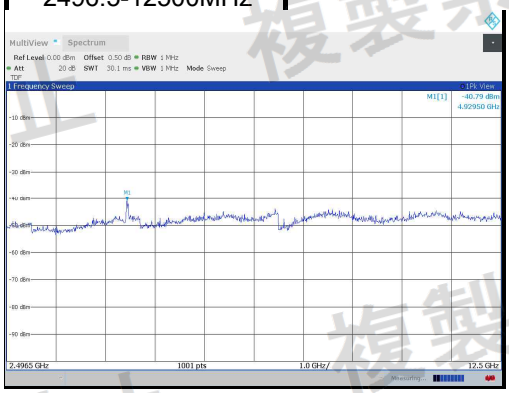


2387-2400MHz(Detail)

2483.5-2496.5MHz

2483.5-2496.5MHz(Detail)

2496.5-12500MHz



2496.5-12500MHz(Detail)

複製禁止

9. Test chart

9.2 Unwanted(Spurious) emission strength (+10% voltage)

Ch.0: 2402MHz

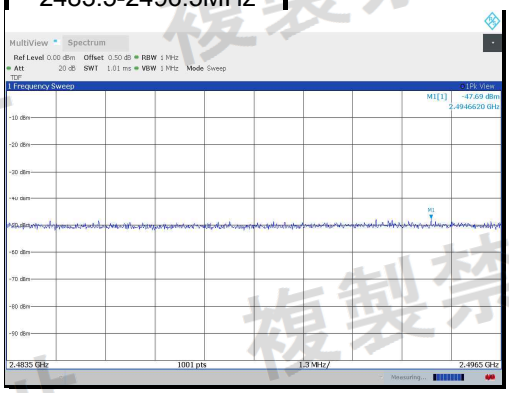
30-2387MHz

30-2387MHz(Detail)

2387-2400MHz

2387-2400MHz(Detail)

2483.5-2496.5MHz



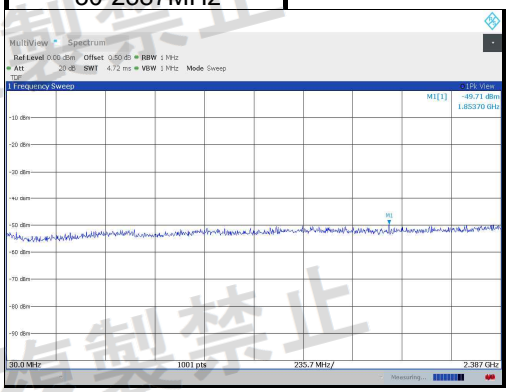
2483.5-2496.5MHz(Detail)

2496.5-12500MHz

2496.5-12500MHz(Detail)

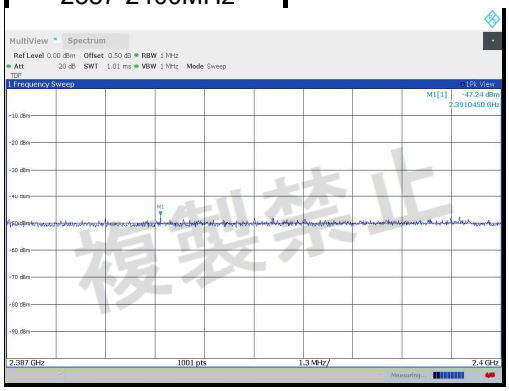
Ch.39: 2441MHz

30-2387MHz



30-2387MHz(Detail)

2387-2400MHz

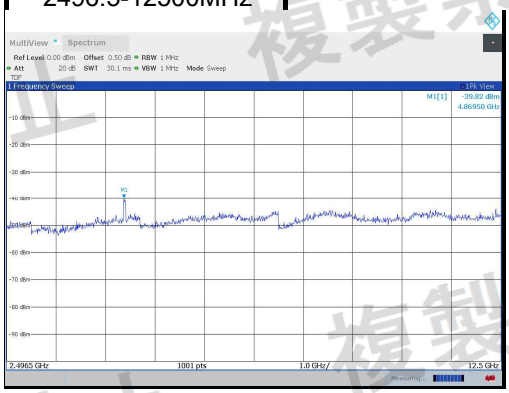


2387-2400MHz(Detail)

2483.5-2496.5MHz

2483.5-2496.5MHz(Detail)

2496.5-12500MHz

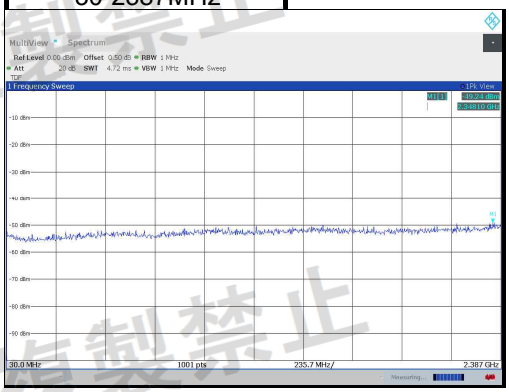


2496.5-12500MHz(Detail)

複製禁止

Ch.78: 2480MHz

30-2387MHz

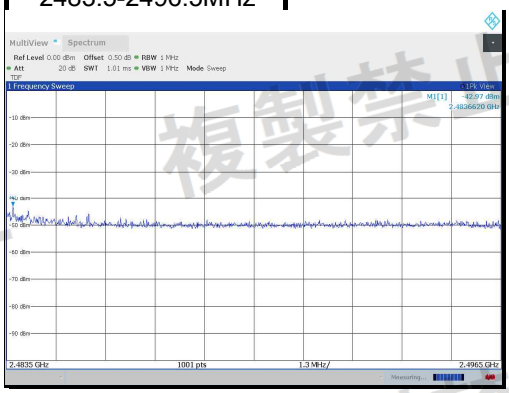


30-2387MHz(Detail)

2387-2400MHz

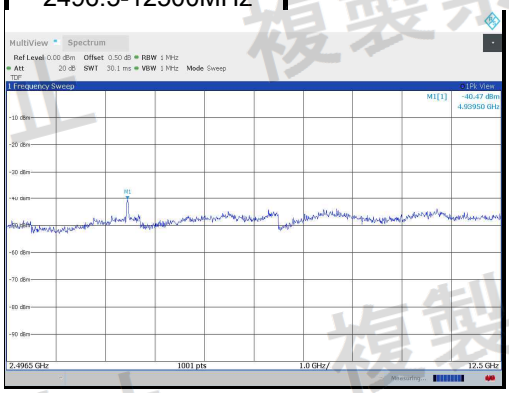
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz



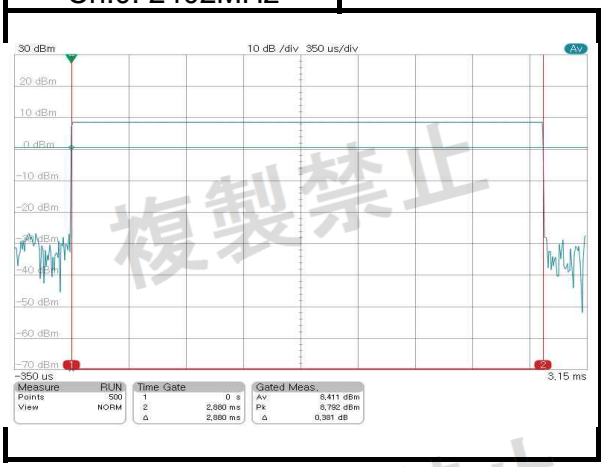
2496.5-12500MHz(Detail)

複製禁止

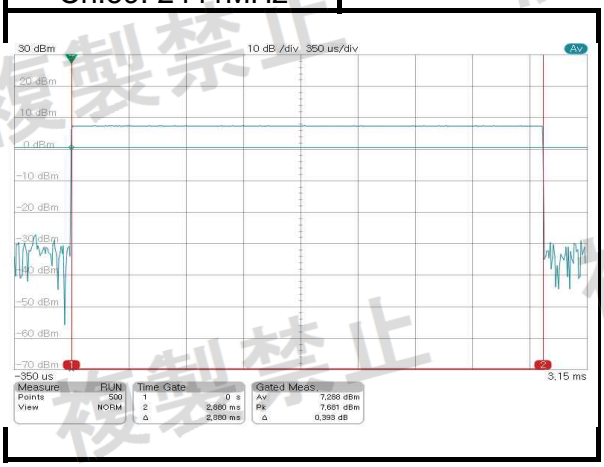
9. Test chart

9.3 RF output power tolerance (Rated voltage)

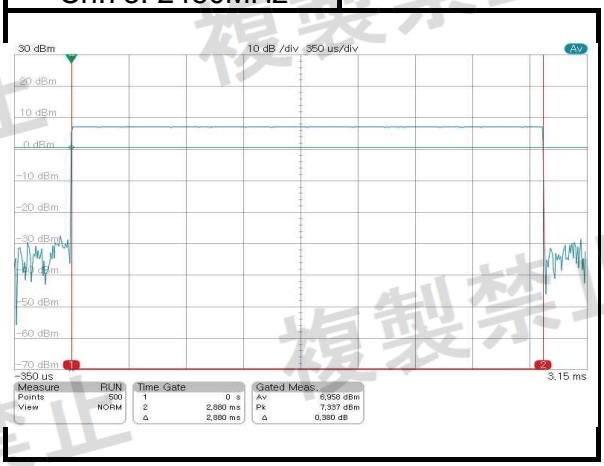
Ch.0: 2402MHz



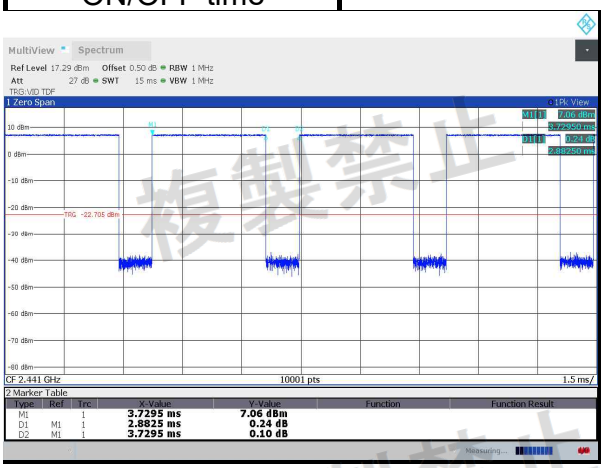
Ch.39: 2441MHz



Ch.78: 2480MHz



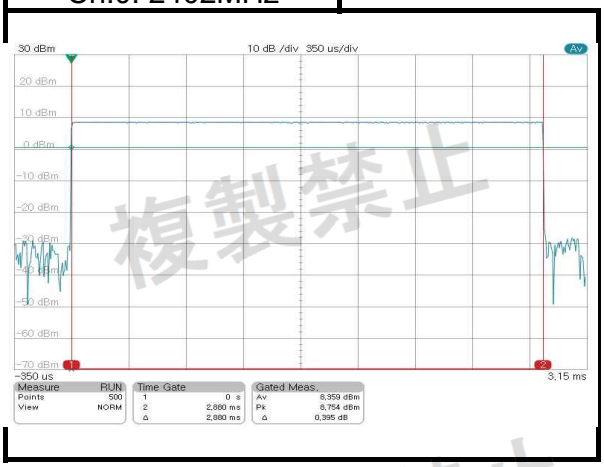
ON/OFF time



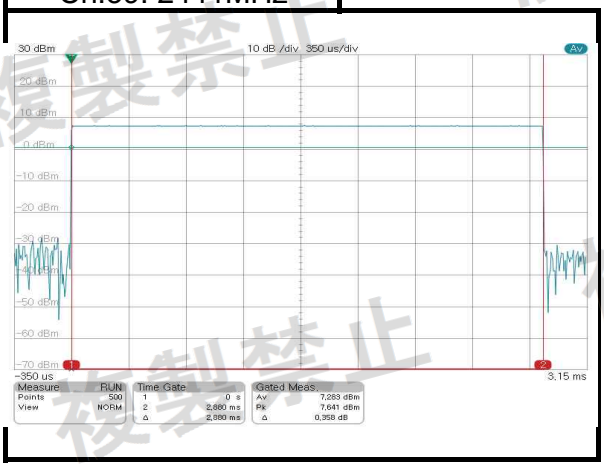
9. Test chart

9.3 RF output power tolerance (-10% voltage)

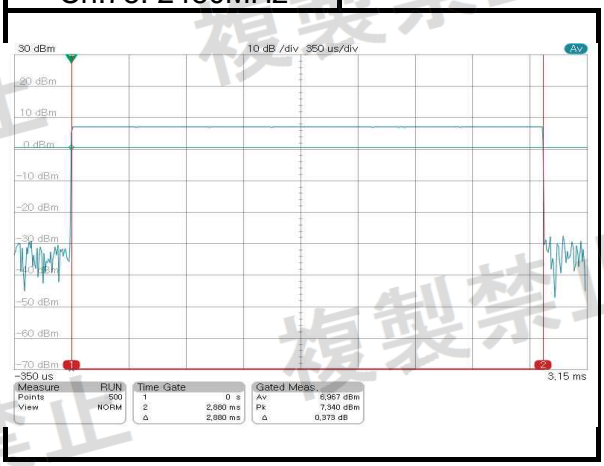
Ch.0: 2402MHz



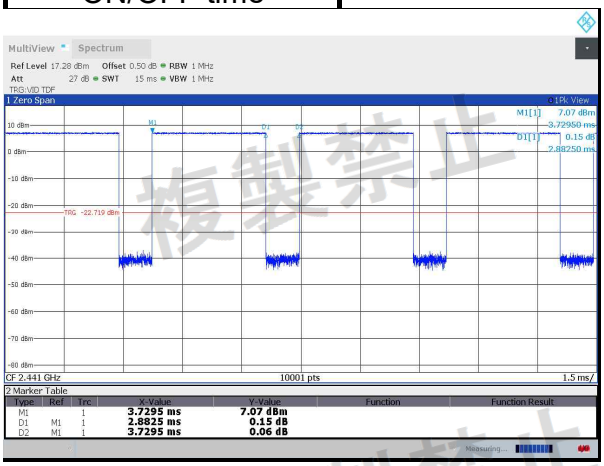
Ch.39: 2441MHz



Ch.78: 2480MHz



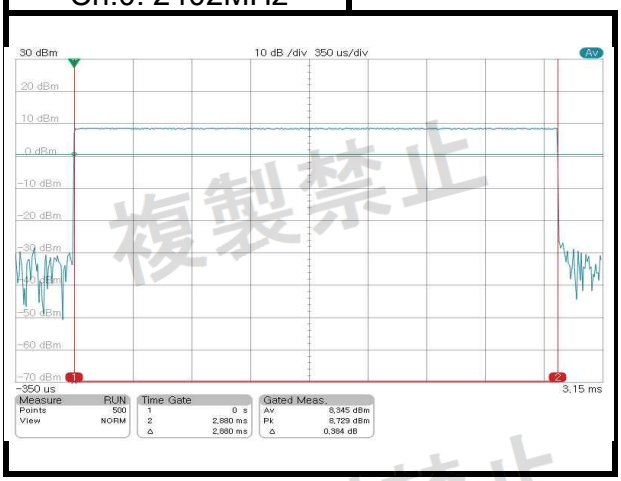
ON/OFF time



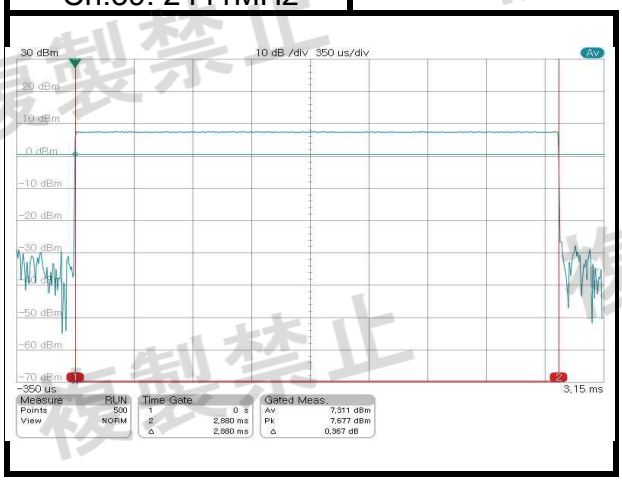
9. Test chart

9.3 RF output power tolerance (+10% voltage)

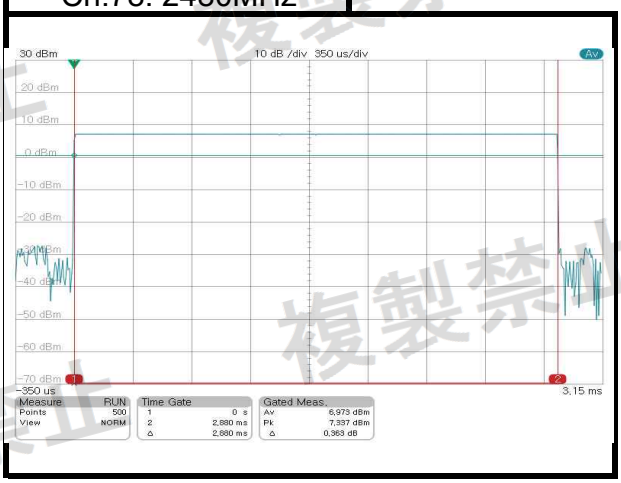
Ch.0: 2402MHz



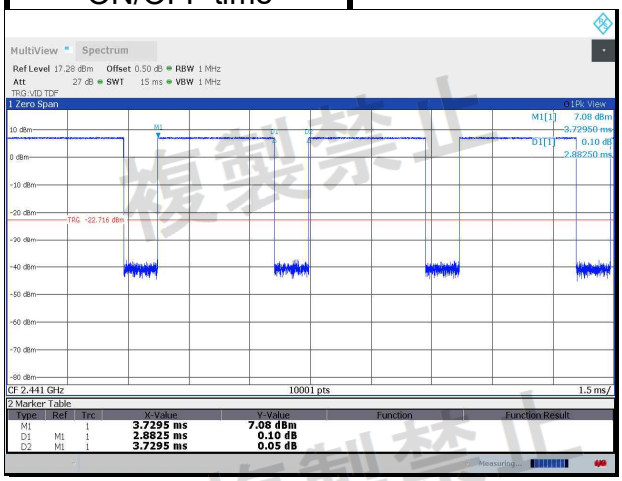
Ch.39: 2441MHz



Ch.78: 2480MHz



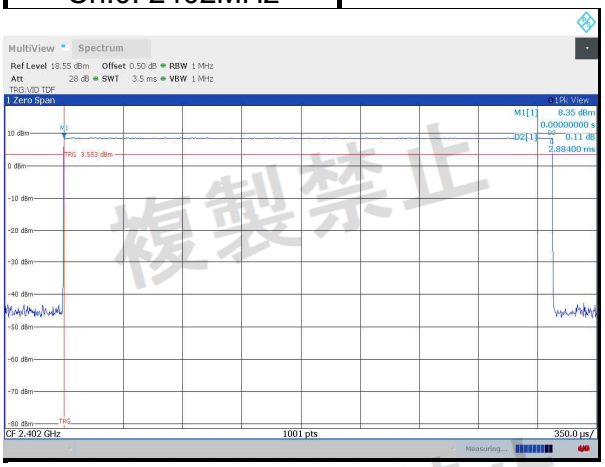
ON/OFF time



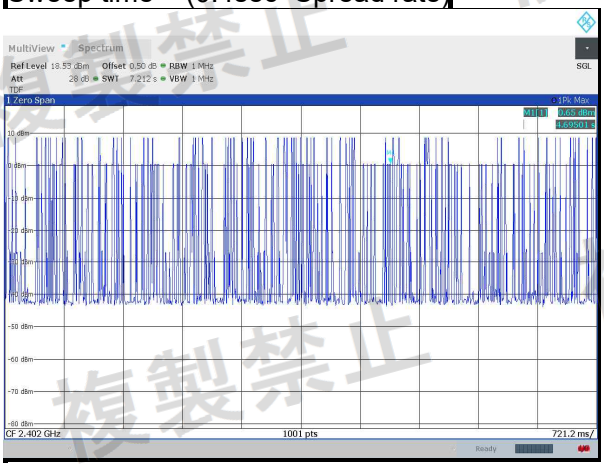
9. Test chart

9.4 Time of occupancy hopping frequency (Rated voltage)

Ch.0: 2402MHz

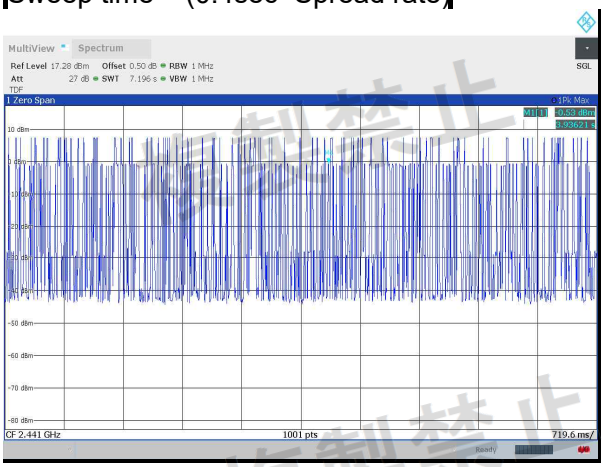


Sweep time = (0.4sec×Spread rate)



Ch.39: 2441MHz

Sweep time = (0.4sec×Spread rate)



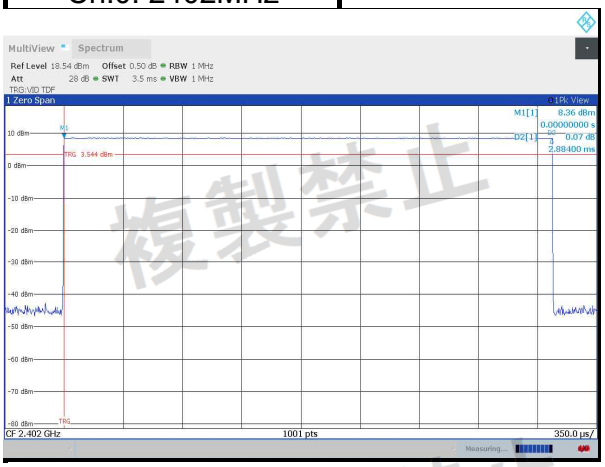
Ch.78: 2480MHz

Sweep time = (0.4sec×Spread rate)

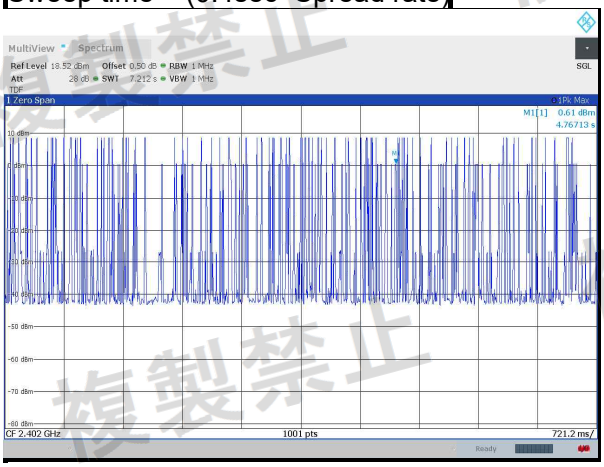
9. Test chart

9.4 Time of occupancy hopping frequency (-10% voltage)

Ch.0: 2402MHz

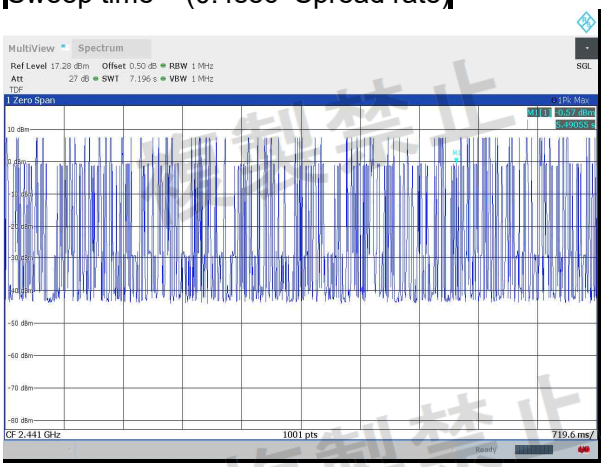


Sweep time = (0.4sec×Spread rate)



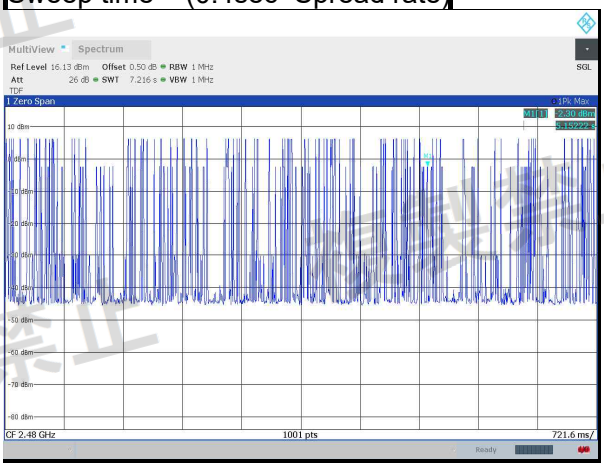
Ch.39: 2441MHz

Sweep time = (0.4sec×Spread rate)



Ch.78: 2480MHz

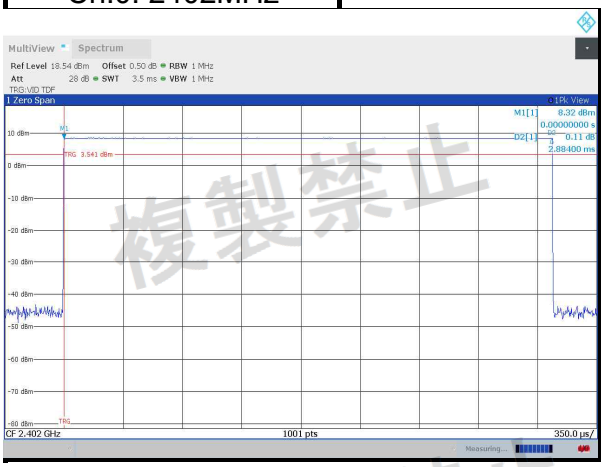
Sweep time = (0.4sec×Spread rate)



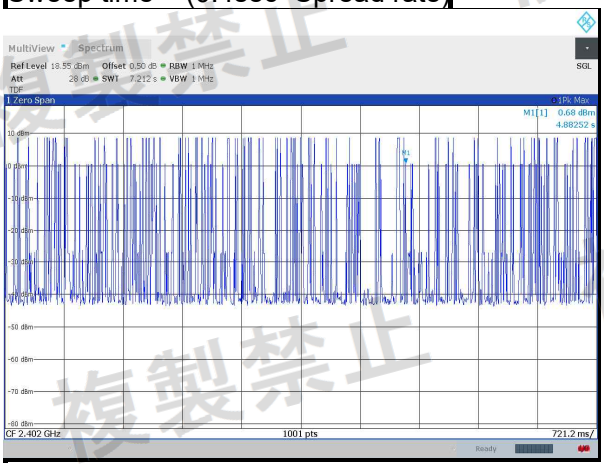
9. Test chart

9.4 Time of occupancy hopping frequency (+10% voltage)

Ch.0: 2402MHz

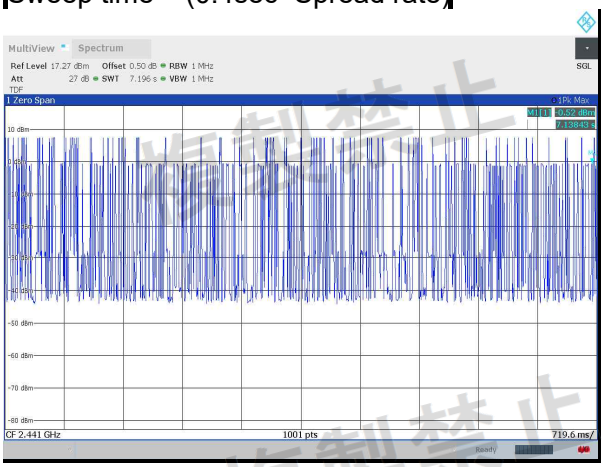


Sweep time = (0.4sec×Spread rate)



Ch.39: 2441MHz

Sweep time = (0.4sec×Spread rate)



Ch.78: 2480MHz

Sweep time = (0.4sec×Spread rate)

3. Test results (Rated voltage)

S/N : N/A

Environment of test room	Date of test	2024-08-22	2024-08-26	2024-08-28
	Temperature	21 °C	20 °C	21 °C
	Humidity	49 %	50 %	50 %

Peak Antenna Gain	0.60	dBi
Declaration Output Power	0.440	mW/MHz
Declaration Output Power	-3.57	dBm/MHz
E.I.R.P.	**-2.97**	**dBm/MHz**
Input Power Voltage	12.00	VDC

Tested Circit Insertion Loss		0	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.887	ms
	OFF TIME	0.849	ms
	Ratio	0.773	
Packet Type (Mode)		3DH5	mode
Transmit Speed		1	MHz

Using TDF and offset function in Spectrum Analyzer.
Measurement of plots are included Loss value.
(Att : 10dB + Cable loss + EUT cable: 0.5dB offset)

Test category ；	2.4GHz Band Low-Power Data Communication System (Bluetooth+EDR [8DPSK])
The reason why the tests are performed only at rated voltage :	N/A

Measurement Frequency		MHz	2402	2441	2480	Result	Limit	Note
Channel Number		Ch.	0	39	78	---	---	
Frequency Measurements		MHz	2401.980	2440.980	2479.985	**---**	---	
Frequency Tolerance		ppm	-8.326	-8.193	-6.048	**PASS**	±50×10^{-6}(50ppm)	
Occupied Bandwidth		MHz	---	78.23	---	**PASS**	83.5MHz or below	
Spread Bandwidth		MHz	---	71.01	---	**PASS**	500kHz or more	
RF Output Power		mW/MHz	0.133	0.106	0.097	**PASS**	3mW/MHz or below	
RF Output Power Tolerance		%	-69.87	-75.89	-77.89	**PASS**	+20%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	---	0.013	---	**PASS**	2.5uW/MHz or below	
		MHz	---	2385.800	---	-----		
	2387 to 2400MHz	uW/MHz	---	6.6527	---	**PASS**	25uW/MHz or below	
		MHz	---	2399.968	---	-----		
	2483.5 to 2496.5MHz	uW/MHz	---	0.0190	---	**PASS**	25uW/MHz or below	
		MHz	---	2484.208	---	-----		
	2496.5 to 12500MHz	uW/MHz	---	0.2371	---	**PASS**	2.5uW/MHz or below	
		MHz	---	4829.500	---	-----		
Secondary Emitted Radio Wave Strength	30 to 1000MHz	nW	---	0.0014	---	**PASS**	4nW or below	
		MHz	---	464.610	---	-----		
	1000 to 12500MHz	nW	---	0.0359	---	**PASS**	20nW or below	
		MHz	---	9059.000	---	-----		
Time of occupancy hopping frequency		sec	---	0.0029	---	**PASS**	0.4sec or below	
		sec	---	0.2428	---	**PASS**	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---		71.0100		**PASS**	5 or more	
Interference Prevention Function			Good			**PASS**		

3. Test results (-10% voltage)

S/N : N/A

Environment of test room	Date of test	2024-08-22	2024-08-26	2024-08-28
	Temperature	21 °C	20 °C	21 °C
	Humidity	49 %	50 %	50 %

Peak Antenna Gain	0.60	dBi
Declaration Output Power	0.440	mW/MHz
Declaration Output Power	-3.57	dBm/MHz
E.I.R.P.	**-2.97**	**dBm/MHz**
Input Power Voltage	10.80	VDC

Tested Circit Insertion Loss		0	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.887	ms
	OFF TIME	0.849	ms
	Ratio	0.773	
Packet Type (Mode)		3DH5	mode
Transmit Speed		1	MHz

Using TDF and offset function in Spectrum Analyzer.
Measurement of plots are included Loss value.
(Att : 10dB + Cable loss + EUT cable: 0.5dB offset)

Test category ；	2.4GHz Band Low-Power Data Communication System (Bluetooth+EDR [8DPSK])
The reason why the tests are performed only at rated voltage :	N/A

Measurement Frequency		MHz	2402	2441	2480	Result	Limit	Note
Channel Number		Ch.	0	39	78	---	---	
Frequency Measurements		MHz	2401.985	2440.985	2479.985	**---**	---	
Frequency Tolerance		ppm	-6.245	-6.145	-6.048	**PASS**	$\pm 50\times10^{-6}$(50ppm)	
Occupied Bandwidth		MHz	---	78.33	---	**PASS**	83.5MHz or below	
Spread Bandwidth		MHz	---	71.4	---	**PASS**	500kHz or more	
RF Output Power		mW/MHz	0.131	0.105	0.097	**PASS**	3mW/MHz or below	
RF Output Power Tolerance		%	-70.25	-76.09	-77.90	**PASS**	+20%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	---	0.012	---	**PASS**	2.5uW/MHz or below	
		MHz	---	2385.800	---	-----		
	2387 to 2400MHz	uW/MHz	---	8.0538	---	**PASS**	25uW/MHz or below	
		MHz	---	2399.981	---	-----		
	2483.5 to 2496.5MHz	uW/MHz	---	0.0228	---	**PASS**	25uW/MHz or below	
		MHz	---	2483.610	---	-----		
	2496.5 to 12500MHz	uW/MHz	---	0.2228	---	**PASS**	2.5uW/MHz or below	
		MHz	---	4809.500	---	-----		
Secondary Emitted Radio Wave Strength	30 to 1000MHz	nW	---	0.0016	---	**PASS**	4nW or below	
		MHz	---	917.150	---	-----		
	1000 to 12500MHz	nW	---	0.0361	---	**PASS**	20nW or below	
		MHz	---	9094.000	---	-----		
Time of occupancy hopping frequency		sec	---	0.0029	---	**PASS**	0.4sec or below	
		sec	---	0.2457	---	**PASS**	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---		71.4000		**PASS**	5 or more	
Interference Prevention Function			Good			**PASS**		

3. Test results (+10% voltage)

S/N : N/A

Environment of test room	Date of test	2024-08-22	2024-08-26	2024-08-28
	Temperature	21 °C	20 °C	21 °C
	Humidity	49 %	50 %	50 %

Peak Antenna Gain	0.60	dBi
Declaration Output Power	0.440	mW/MHz
Declaration Output Power	-3.57	dBm/MHz
E.I.R.P.	**-2.97**	**dBm/MHz**
Input Power Voltage	13.20	VDC

Tested Circit Insertion Loss		0	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.887	ms
	OFF TIME	0.849	ms
	Ratio	0.773	
Packet Type (Mode)		3DH5	mode
Transmit Speed		1	MHz

Using TDF and offset function in Spectrum Analyzer.
Measurement of plots are included Loss value.
(Att : 10dB + Cable loss + EUT cable: 0.5dB offset)

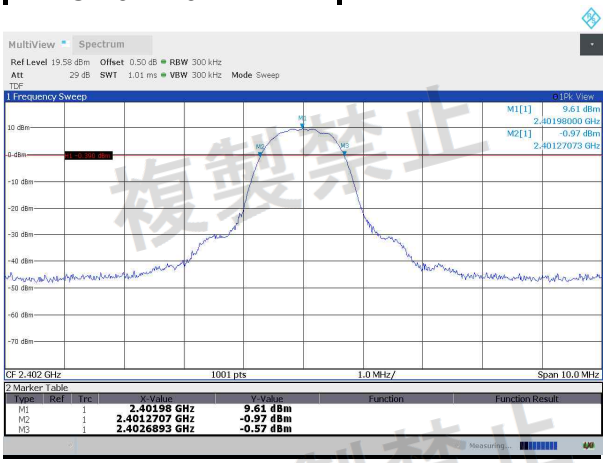
Test category ；	2.4GHz Band Low-Power Data Communication System (Bluetooth+EDR [8DPSK])
The reason why the tests are performed only at rated voltage :	N/A

Measurement Frequency		MHz	2402	2441	2480	Result	Limit	Note
Channel Number		Ch.	0	39	78	---	---	
Frequency Measurements		MHz	2401.985	2440.985	2479.980	**---**	---	
Frequency Tolerance		ppm	-6.245	-6.145	-8.065	**PASS**	±50×10^{-6}(50ppm)	
Occupied Bandwidth		MHz	---	78.43	---	**PASS**	83.5MHz or below	
Spread Bandwidth		MHz	---	70.72	---	**PASS**	500kHz or more	
RF Output Power		mW/MHz	0.132	0.105	0.097	**PASS**	3mW/MHz or below	
RF Output Power Tolerance		%	-70.10	-76.14	-77.87	**PASS**	+20%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	---	0.012	---	**PASS**	2.5uW/MHz or below	
		MHz	---	2133.900	---	-----		
	2387 to 2400MHz	uW/MHz	---	9.2257	---	**PASS**	25uW/MHz or below	
		MHz	---	2399.981	---	-----		
	2483.5 to 2496.5MHz	uW/MHz	---	0.0297	---	**PASS**	25uW/MHz or below	
		MHz	---	2483.597	---	-----		
	2496.5 to 12500MHz	uW/MHz	---	0.1910	---	**PASS**	2.5uW/MHz or below	
		MHz	---	4829.500	---	-----		
Secondary Emitted Radio Wave Strength	30 to 1000MHz	nW	---	0.0016	---	**PASS**	4nW or below	
		MHz	---	38.240	---	-----		
	1000 to 12500MHz	nW	---	0.0381	---	**PASS**	20nW or below	
		MHz	---	9082.000	---	-----		
Time of occupancy hopping frequency		sec	---	0.0029	---	**PASS**	0.4sec or below	
		sec	---	0.2803	---	**PASS**	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---		70.7200		**PASS**	5 or more	
Interference Prevention Function			Good			**PASS**		

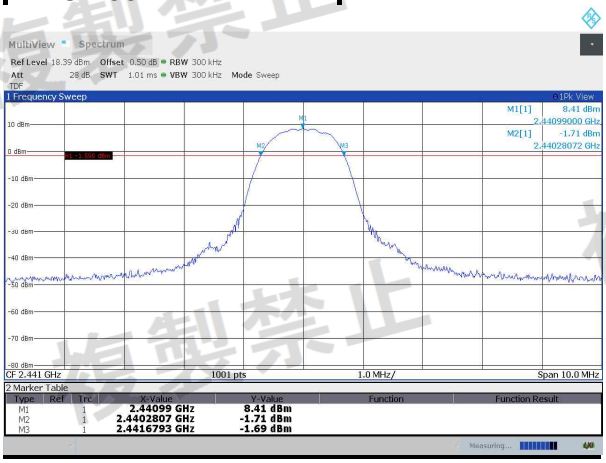
7. Test chart

7.1 Frequency tolerance (Rated voltage)

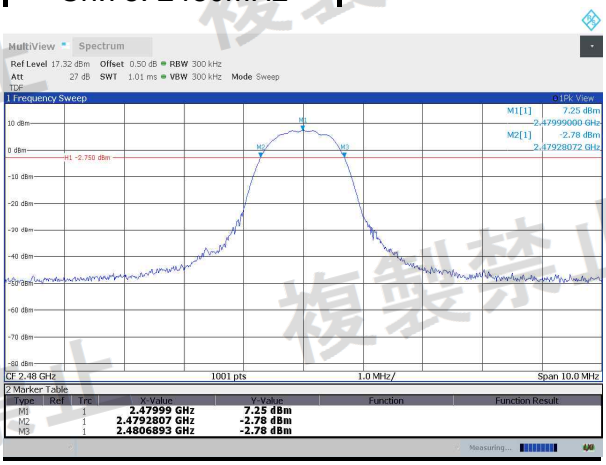
Ch.0: 2402MHz



Ch.39: 2441MHz



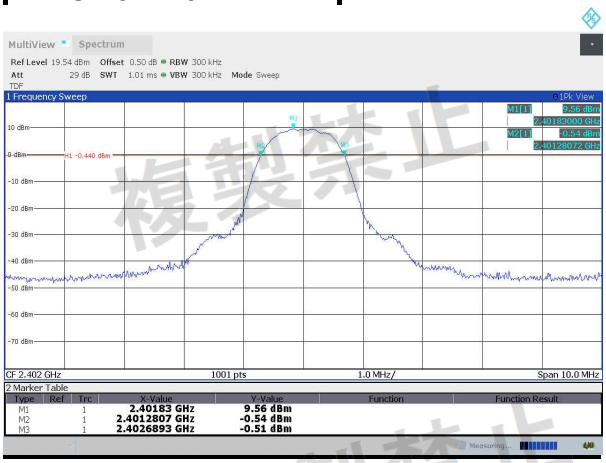
Ch.78: 2480MHz



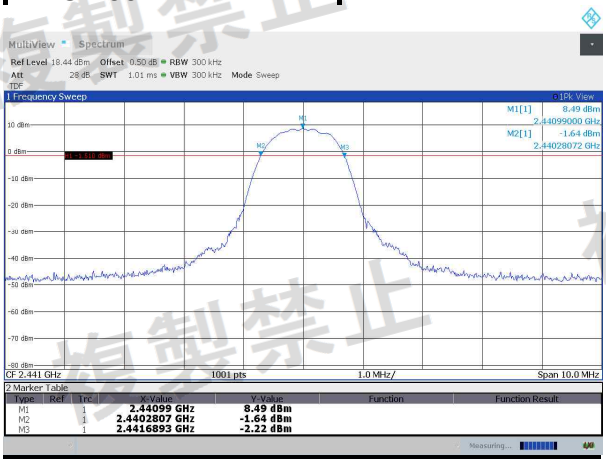
7. Test chart

7.1 Frequency tolerance (-10% voltage)

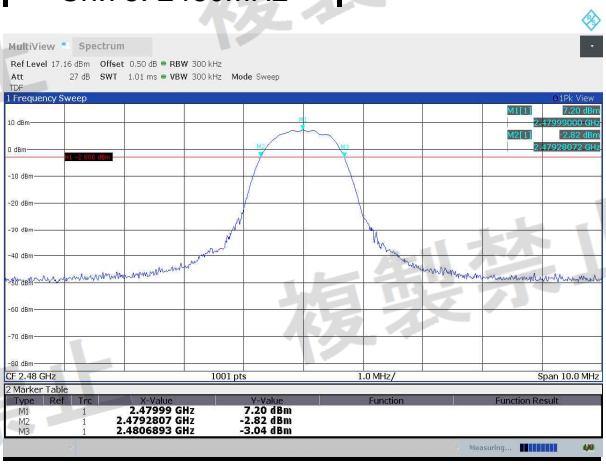
Ch.0: 2402MHz



Ch.39: 2441MHz



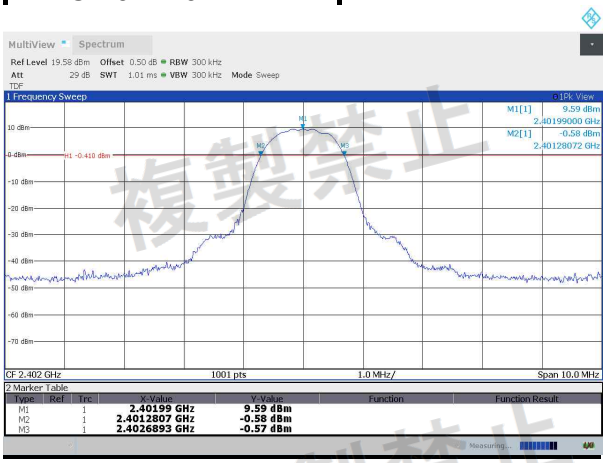
Ch.78: 2480MHz



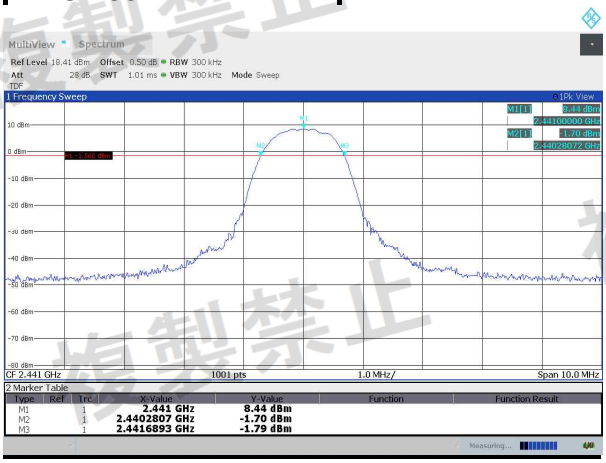
7. Test chart

7.1 Frequency tolerance (+10% voltage)

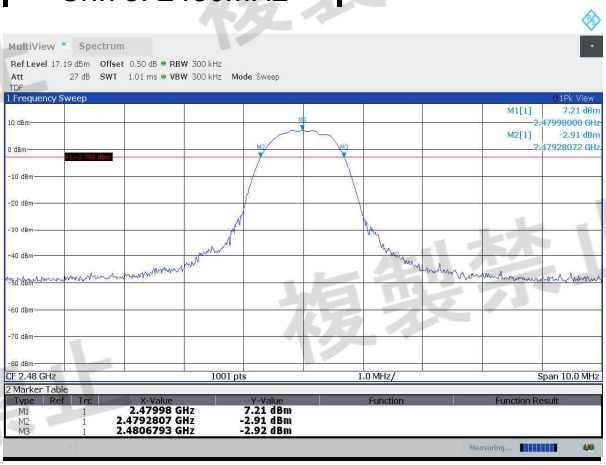
Ch.0: 2402MHz



Ch.39: 2441MHz



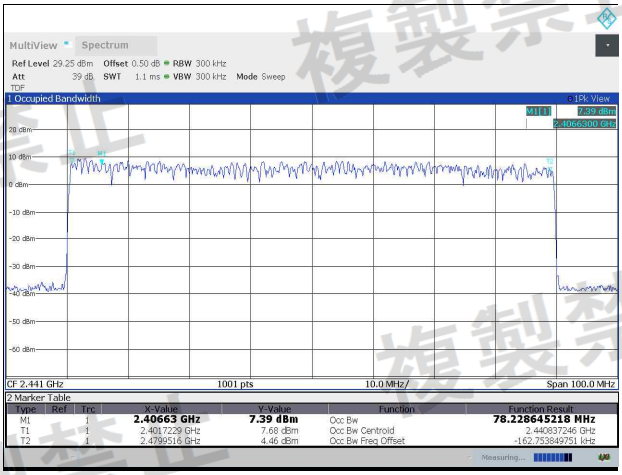
Ch.78: 2480MHz



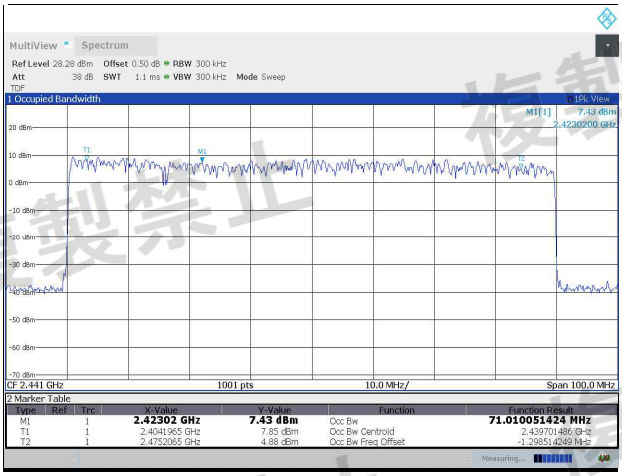
7. Test chart

7.2 Occupied bandwidth / Spread bandwidth (Rated voltage)

Occupied bandwidth



Spread bandwidth

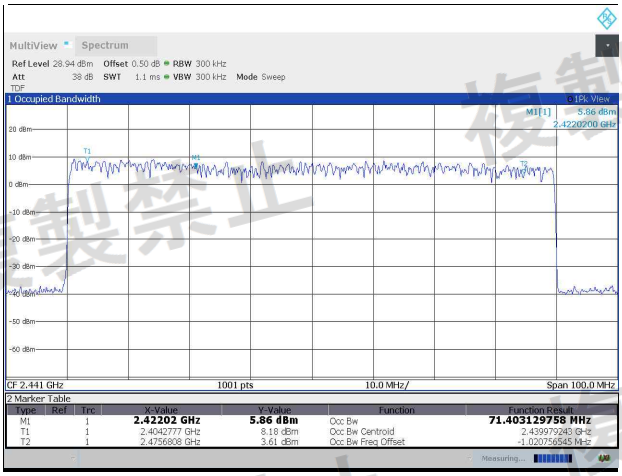


7. Test chart

7.2 Occupied bandwidth / Spread bandwidth (-10% voltage)

Occupied bandwidth

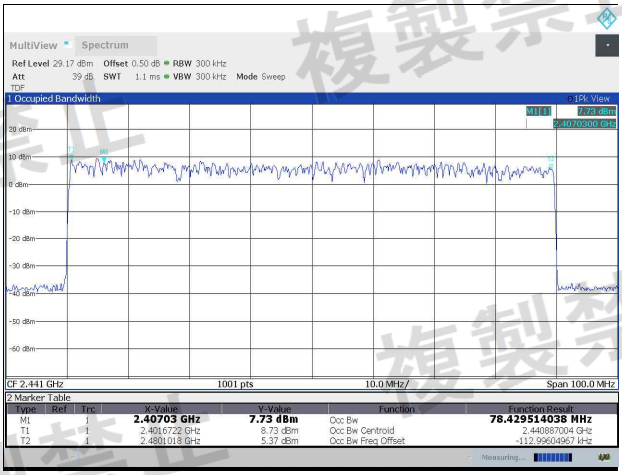
Spread bandwidth



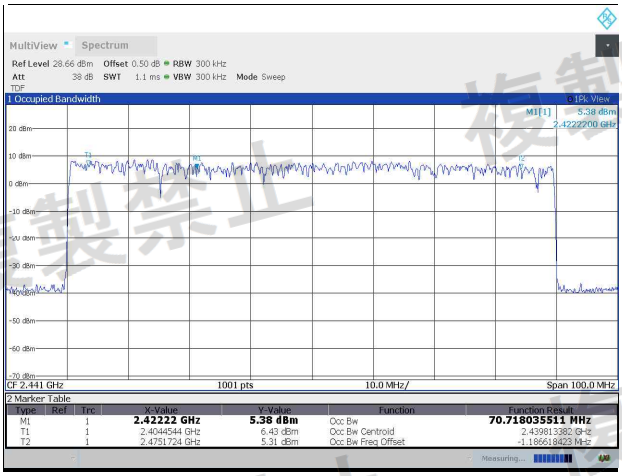
7. Test chart

7.2 Occupied bandwidth / Spread bandwidth (+10% voltage)

Occupied bandwidth



Spread bandwidth



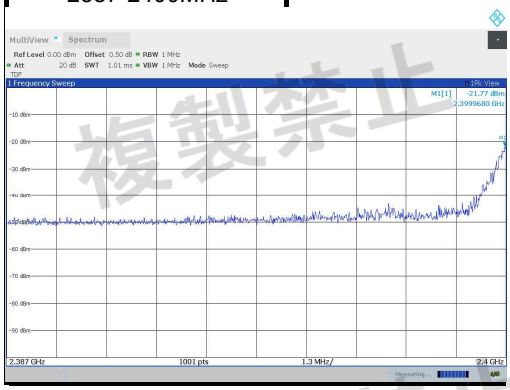
7. Test chart

7.3 Unwanted(Spurious) emission strength (Rated voltage)

30-2387MHz

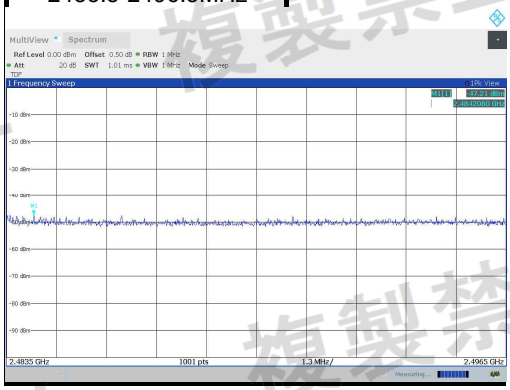
30-2387MHz(Detail)

2387-2400MHz



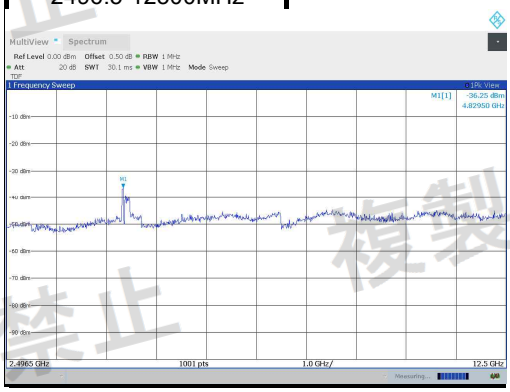
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz



2496.5-12500MHz(Detail)

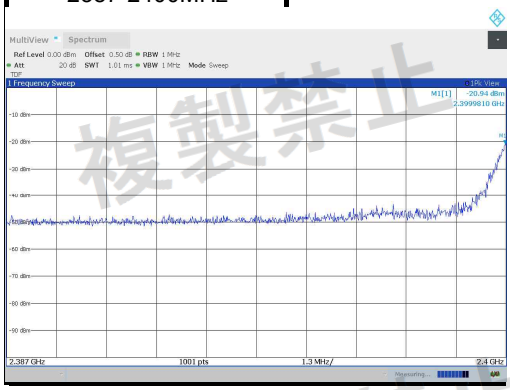
7. Test chart

7.3 Unwanted(Spurious) emission strength (-10% voltage)

30-2387MHz

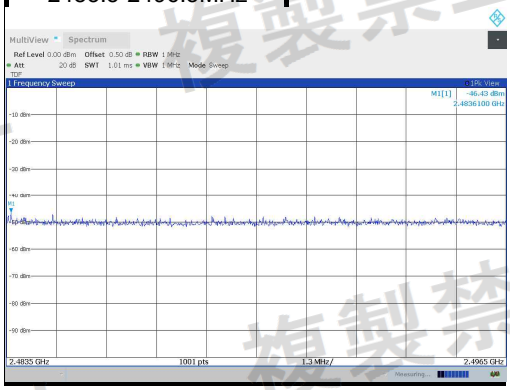
30-2387MHz(Detail)

2387-2400MHz



2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz

2496.5-12500MHz(Detail)

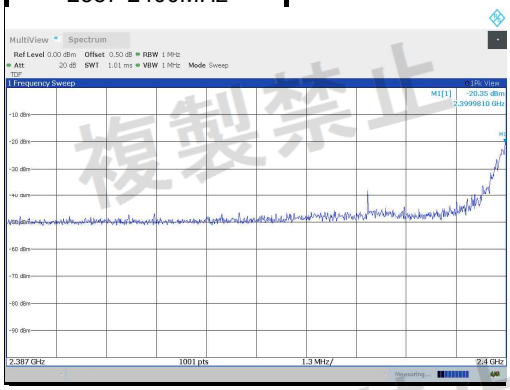
7. Test chart

7.3 Unwanted(Spurious) emission strength (+10% voltage)

30-2387MHz

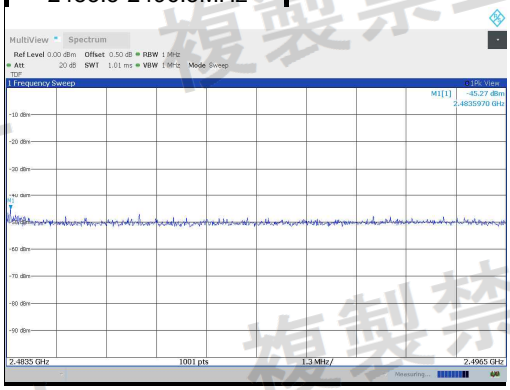
30-2387MHz(Detail)

2387-2400MHz



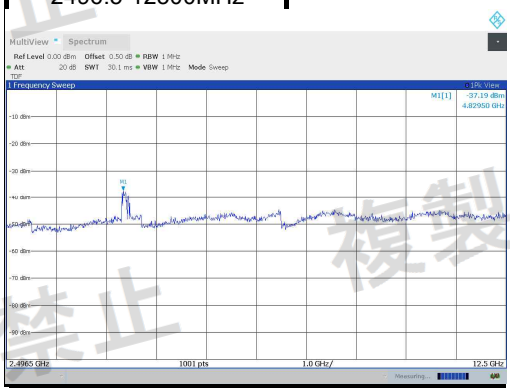
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz

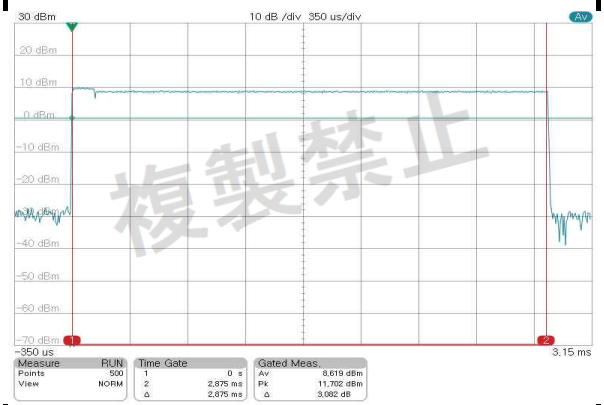


2496.5-12500MHz(Detail)

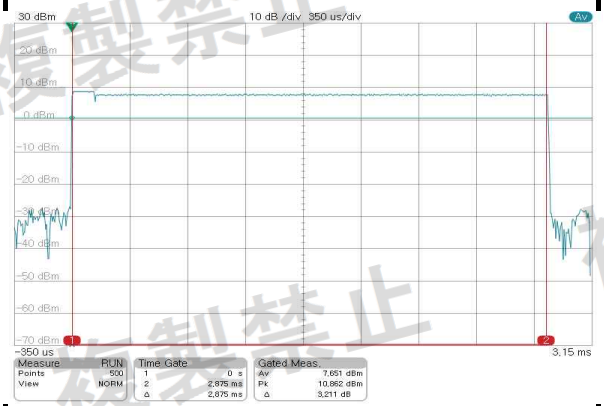
7. Test chart

7.4 RF output power tolerance (Rated voltage)

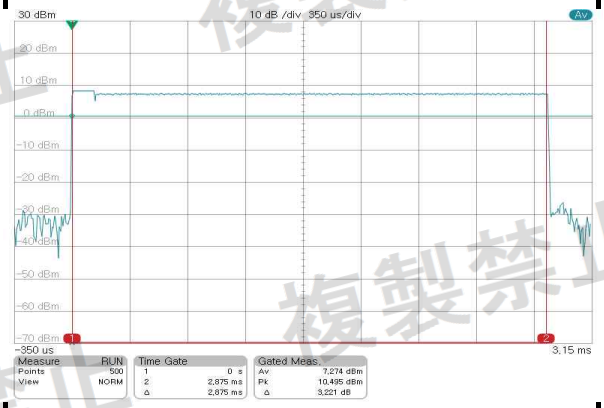
Ch.0: 2402MHz



Ch.39: 2441MHz



Ch.78: 2480MHz

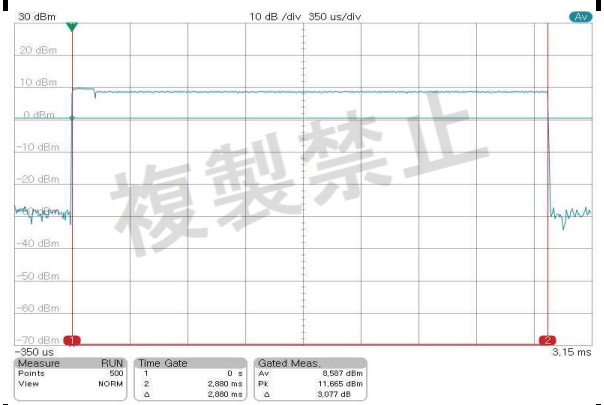


ON/OFF time

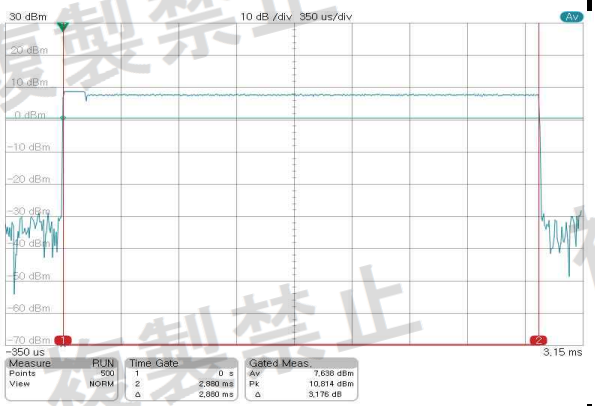
7. Test chart

7.4 RF output power tolerance (-10% voltage)

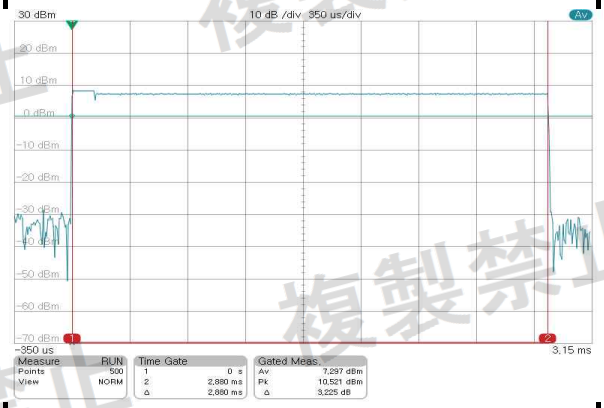
Ch.0: 2402MHz



Ch.39: 2441MHz



Ch.78: 2480MHz

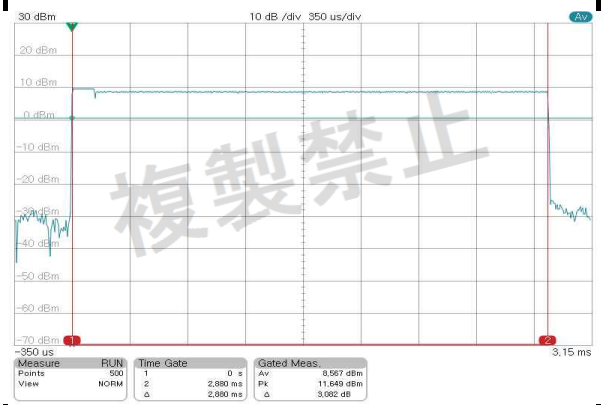


ON/OFF time

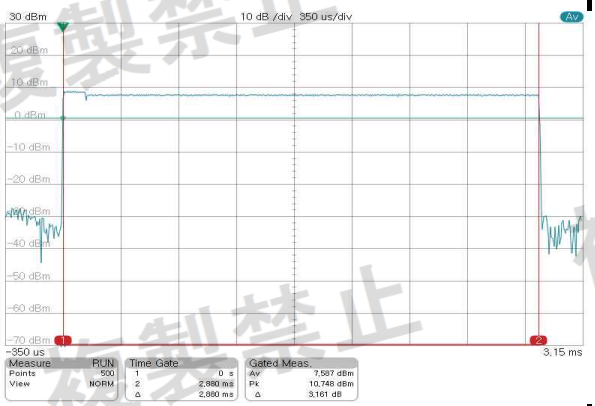
7. Test chart

7.4 RF output power tolerance (+10% voltage)

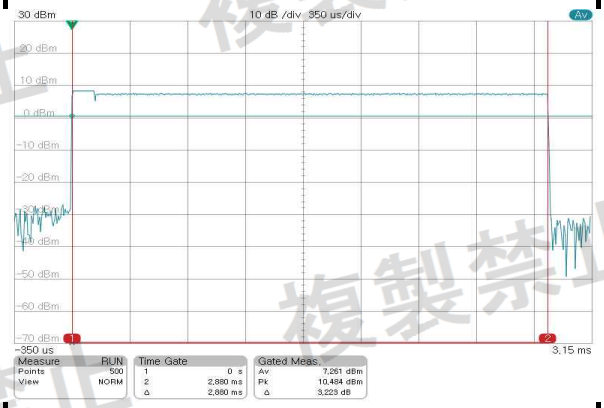
Ch.0: 2402MHz



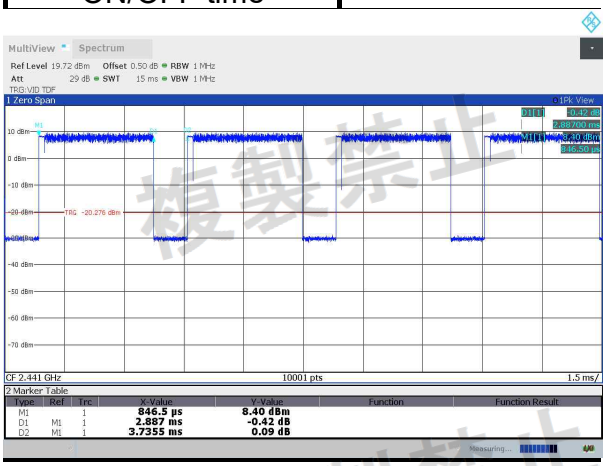
Ch.39: 2441MHz



Ch.78: 2480MHz



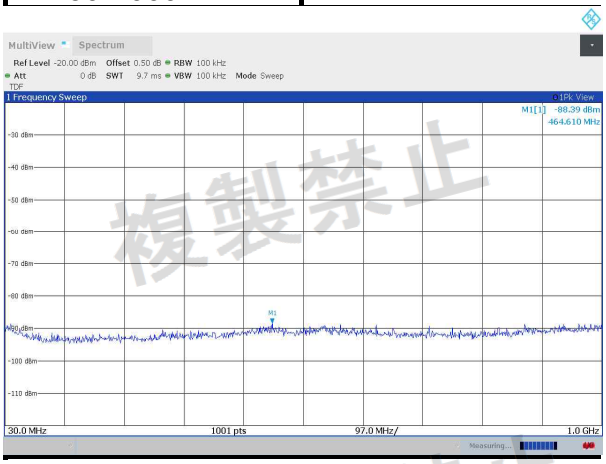
ON/OFF time



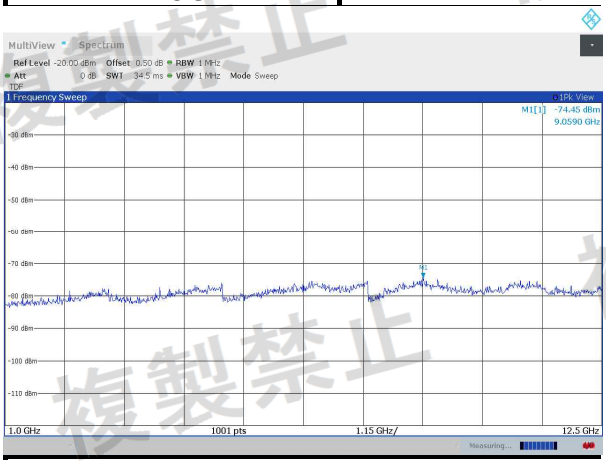
7. Test chart

7.5 Secondary emitted radio wave strength (Rated voltage)

30-1000MHz



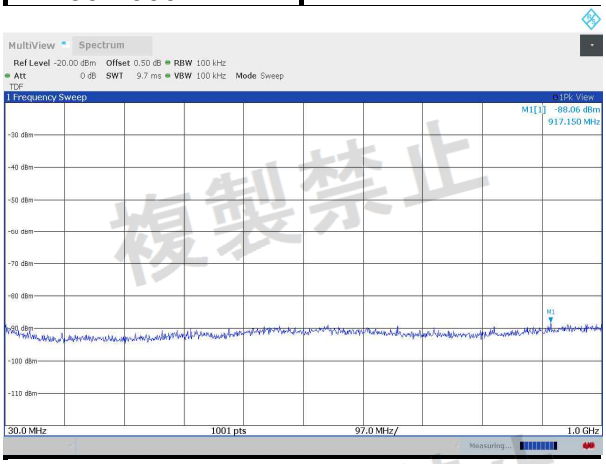
1-12.5GHz



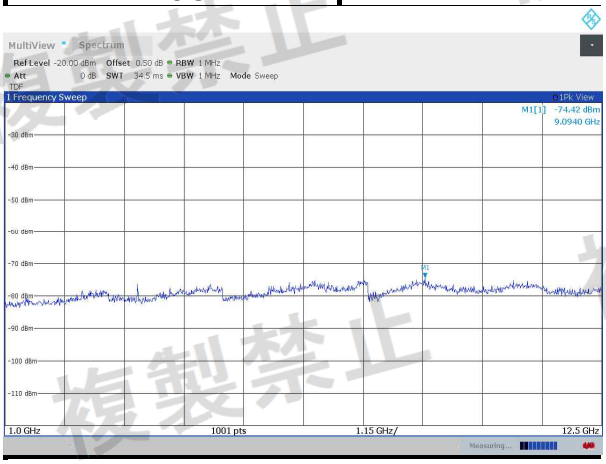
7. Test chart

7.5 Secondary emitted radio wave strength (-10% voltage)

30-1000MHz



1-12.5GHz

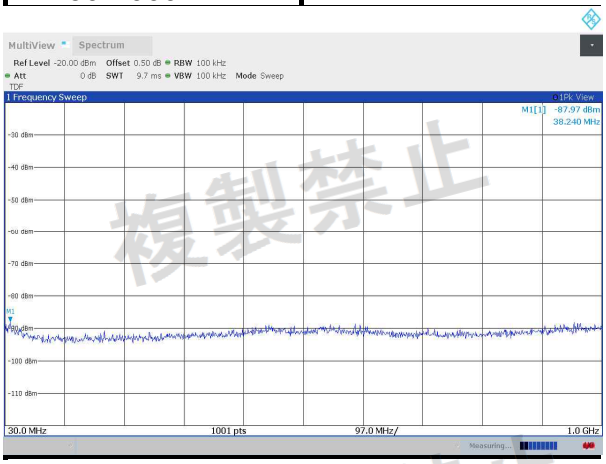


複製禁止

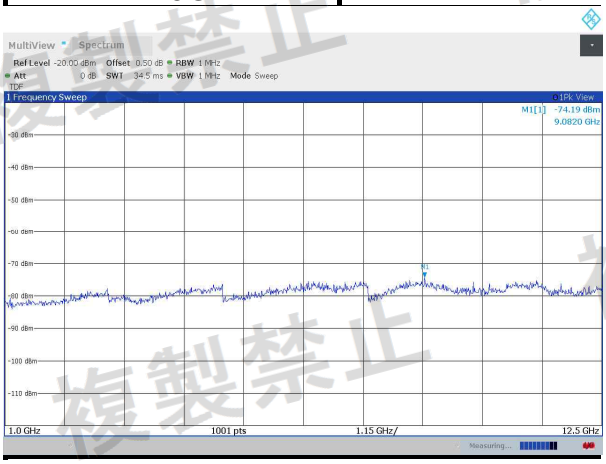
7. Test chart

7.5 Secondary emitted radio wave strength (+10% voltage)

30-1000MHz



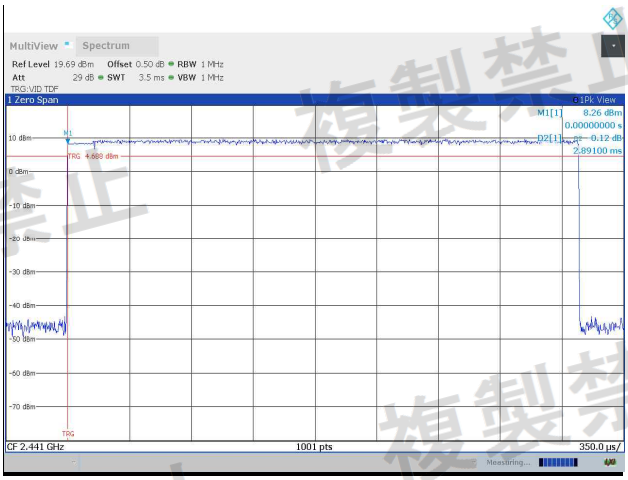
1-12.5GHz



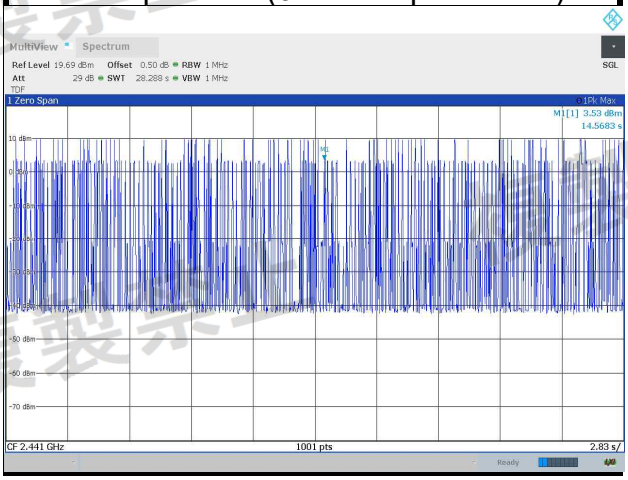
複製禁止

7. Test chart

7.6 Time of occupancy hopping frequency (Rated voltage)

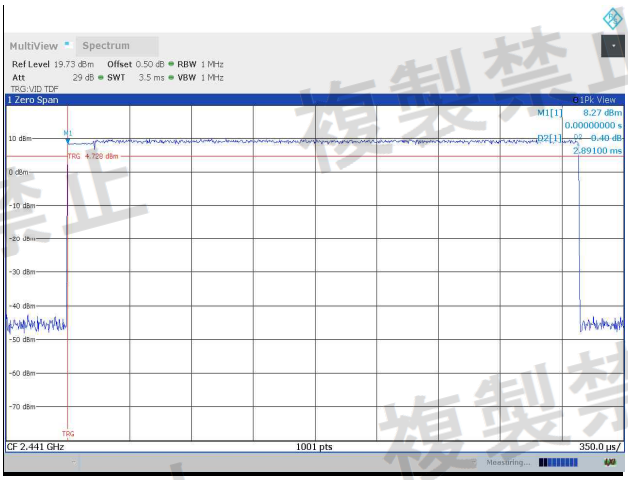


Sweep time = (0.4sec×Spread rate)

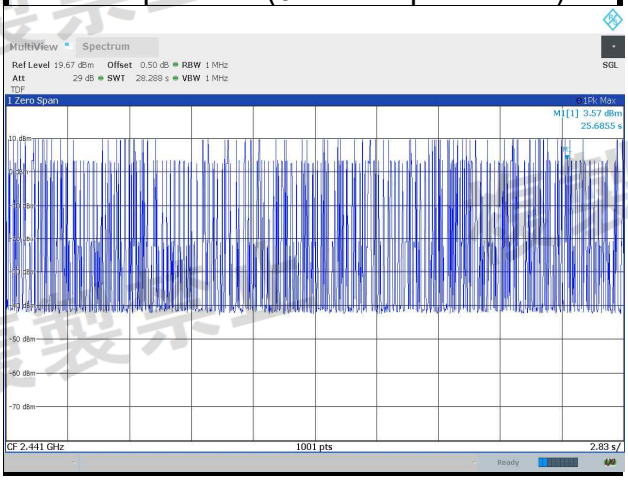


7. Test chart

7.6 Time of occupancy hopping frequency (-10% voltage)

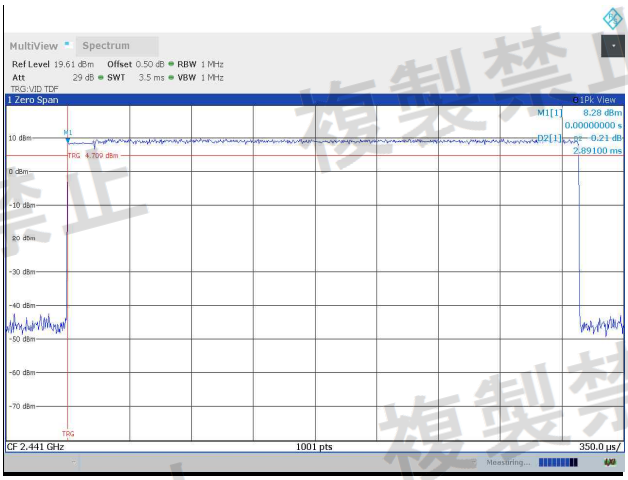


Sweep time = (0.4sec×Spread rate)

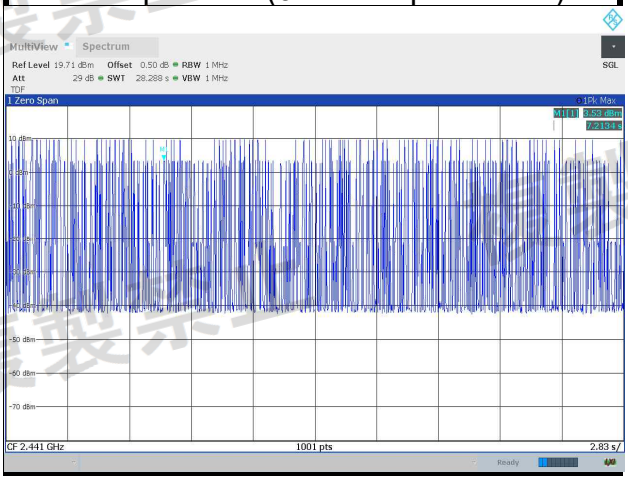


7. Test chart

7.6 Time of occupancy hopping frequency (+10% voltage)



Sweep time = (0.4sec×Spread rate)



3. Test results (Rated voltage)

S/N : N/A

Environment of test room	Date of test	2024-08-22	2024-08-26	2024-08-28
	Temperature	21 °C	20 °C	21 °C
	Humidity	49 %	50 %	50 %

Peak Antenna Gain	0.60	dBi
Declaration Output Power	0.44	mW/MHz
Declaration Output Power	-3.57	dBm/MHz
E.I.R.P.	**-2.97**	**dBm/MHz**
Input Power Voltage	12.00	VDC

Tested Circit Insertion Loss		0	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.888	ms
	OFF TIME	0.849	ms
	Ratio	0.773	
Packet Type (Mode)		3DH5(AFH)	mode
Transmit Speed		1	MHz

Using TDF and offset function in Spectrum Analyzer.
Measurement of plots are included Loss value.

(Att : 10dB + Cable loss + EUT cable: 0.5dB offset)

Test category ;	2.4GHz Band Low-Power Data Communication System (Bluetooth+EDR [8DPSK] *AFH)
The reason why the tests are performed only at rated voltage :	N/A

Measurement Frequency		MHz	2402	2441	2480	Result	Limit	Note
Channel Number		Ch.	0	39	78	---	---	
Frequency Measurements		MHz	---	---	---	**---**	---	
Frequency Tolerance		ppm	---	---	---	**---**	±50×10^{-6}(50ppm)	
Occupied Bandwidth		MHz	19.96	19.92	19.91	**PASS**	83.5MHz or below	
Spread Bandwidth		MHz	18.16	18.15	18.04	**PASS**	500kHz or more	
RF Output Power		mW/MHz	0.510586	0.408609	0.380670	**PASS**	3mW/MHz or below	
RF Output Power Tolerance		%	16.042307	-7.134250	-13.484153	**PASS**	+20%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	0.017	0.011	0.013	**PASS**	2.5uW/MHz or below	
		MHz	2369.300	2044.400	2378.800	-----		
	2387 to 2400MHz	uW/MHz	9.661	0.018	0.020	**PASS**	25uW/MHz or below	
		MHz	2399.994	2396.565	2397.825	-----		
	2483.5 to 2496.5MHz	uW/MHz	0.016	0.015	0.025	**PASS**	25uW/MHz or below	
		MHz	2493.688	2492.091	2483.844	-----		
	2496.5 to 12500MHz	uW/MHz	0.220	0.183	0.131	**PASS**	2.5uW/MHz or below	
		MHz	4839.500	4889.500	4959.500	-----		
Time of occupancy hopping frequency		sec	0.003	0.003	0.003	**PASS**	0.4sec or below	
		sec	0.262	0.257	0.283	**PASS**	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---	18.160	18.150	18.040	**PASS**	5 or more	
Interference Prevention Function			Good			**PASS**		

3. Test results (-10% voltage)

S/N : N/A

Environment of test room	Date of test	2024-08-22	2024-08-26	2024-08-28
	Temperature	21 °C	20 °C	21 °C
	Humidity	49 %	50 %	50 %

Peak Antenna Gain	0.60	dBi
Declaration Output Power	0.44	mW/MHz
Declaration Output Power	-3.57	dBm/MHz
E.I.R.P.	**-2.97**	**dBm/MHz**
Input Power Voltage	10.80	VDC

Tested Circit Insertion Loss		0	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.888	ms
	OFF TIME	0.849	ms
	Ratio	0.773	
Packet Type (Mode)		3DH5(AFH)	mode
Transmit Speed		1	MHz

Using TDF and offset function in Spectrum Analyzer.
Measurement of plots are included Loss value.

(Att : 10dB + Cable loss + EUT cable: 0.5dB offset)

Test category ：	2.4GHz Band Low-Power Data Communication System (Bluetooth+EDR [8DPSK] *AFH)
The reason why the tests are performed only at rated voltage :	N/A

Measurement Frequency		MHz	2402	2441	2480	Result	Limit	Note
Channel Number		Ch.	0	39	78	---	---	
Frequency Measurements		MHz	---	---	---	**---**	---	
Frequency Tolerance		ppm	---	---	---	**---**	±50×10^{-6}(50ppm)	
Occupied Bandwidth		MHz	19.94	19.93	19.94	**PASS**	83.5MHz or below	
Spread Bandwidth		MHz	18.11	18.15	18.22	**PASS**	500kHz or more	
RF Output Power		mW/MHz	0.511171	0.409174	0.377430	**PASS**	3mW/MHz or below	
RF Output Power Tolerance		%	16.175285	-7.005863	-14.220438	**PASS**	+20%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	0.012	0.013	0.012	**PASS**	2.5uW/MHz or below	
		MHz	2376.400	2371.700	1453.400	-----		
	2387 to 2400MHz	uW/MHz	9.977	0.021	0.017	**PASS**	25uW/MHz or below	
		MHz	2399.994	2395.461	2397.565	-----		
	2483.5 to 2496.5MHz	uW/MHz	0.019	0.016	0.031	**PASS**	25uW/MHz or below	
		MHz	2492.338	2495.364	2485.688	-----		
	2496.5 to 12500MHz	uW/MHz	0.236	0.176	0.117	**PASS**	2.5uW/MHz or below	
		MHz	4800.500	4879.500	4939.500	-----		
Time of occupancy hopping frequency		sec	0.003	0.003	0.003	**PASS**	0.4sec or below	
		sec	0.269	0.243	0.246	**PASS**	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---	18.110	18.150	18.220	**PASS**	5 or more	
Interference Prevention Function			Good			**PASS**		

3. Test results (+10% voltage)

S/N : N/A

Environment of test room	Date of test	2024-08-22	2024-08-26	2024-08-28
	Temperature	21 °C	20 °C	21 °C
	Humidity	49 %	50 %	50 %

Peak Antenna Gain	0.60	dBi
Declaration Output Power	0.44	mW/MHz
Declaration Output Power	-3.57	dBm/MHz
E.I.R.P.	**-2.97**	**dBm/MHz**
Input Power Voltage	13.20	VDC

Tested Circit Insertion Loss		0	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.888	ms
	OFF TIME	0.849	ms
	Ratio	0.773	
Packet Type (Mode)		3DH5(AFH)	mode
Transmit Speed		1	MHz

Using TDF and offset function in Spectrum Analyzer.
Measurement of plots are included Loss value.

(Att : 10dB + Cable loss + EUT cable: 0.5dB offset)

Test category ：	2.4GHz Band Low-Power Data Communication System (Bluetooth+EDR [8DPSK] *AFH)
The reason why the tests are performed only at rated voltage :	N/A

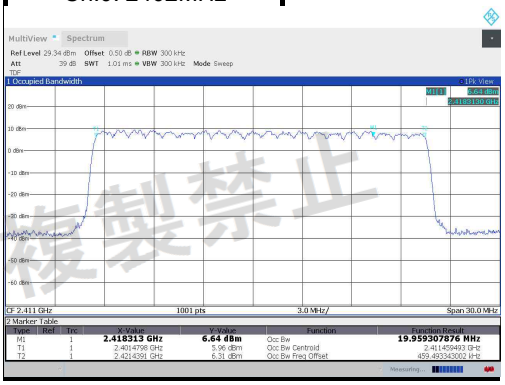
Measurement Frequency		MHz	2402	2441	2480	Result	Limit	Note
Channel Number		Ch.	0	39	78	---	---	
Frequency Measurements		MHz	---	---	---	**---**	---	
Frequency Tolerance		ppm	---	---	---	**---**	$\pm 50\times10^{-6}$(50ppm)	
Occupied Bandwidth		MHz	19.95	19.94	19.94	**PASS**	83.5MHz or below	
Spread Bandwidth		MHz	18.19	18.06	18.14	**PASS**	500kHz or more	
RF Output Power		mW/MHz	0.509744	0.413492	0.381283	**PASS**	3mW/MHz or below	
RF Output Power Tolerance		%	15.850923	-6.024542	-13.344743	**PASS**	+20%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	0.013	0.013	0.012	**PASS**	2.5uW/MHz or below	
		MHz	2383.500	2376.400	2103.300	-----		
	2387 to 2400MHz	uW/MHz	9.977	0.019	0.016	**PASS**	25uW/MHz or below	
		MHz	2399.994	2398.175	2393.981	-----		
	2483.5 to 2496.5MHz	uW/MHz	0.016	0.019	0.032	**PASS**	25uW/MHz or below	
		MHz	2492.506	2493.766	2483.948	-----		
	2496.5 to 12500MHz	uW/MHz	0.267	0.185	0.138	**PASS**	2.5uW/MHz or below	
		MHz	4809.500	4869.500	4939.500	-----		
Time of occupancy hopping frequency		sec	0.003	0.003	0.003	**PASS**	0.4sec or below	
		sec	0.225	0.262	0.249	**PASS**	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---	18.190	18.060	18.140	**PASS**	5 or more	
Interference Prevention Function			Good			**PASS**		

9. Test chart

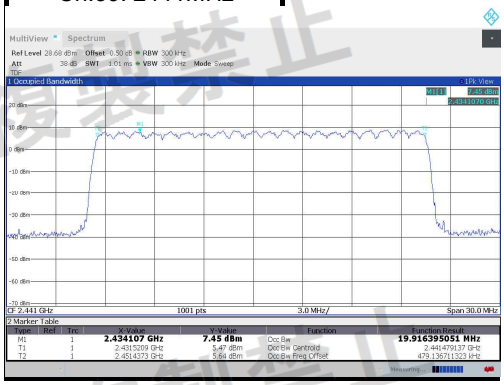
9.1 Occupied bandwidth / Spread bandwidth (Rated voltage)

Occupied bandwidth

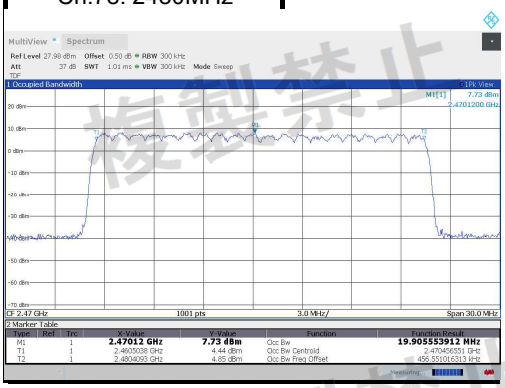
Ch.0: 2402MHz



Ch.39: 2441MHz

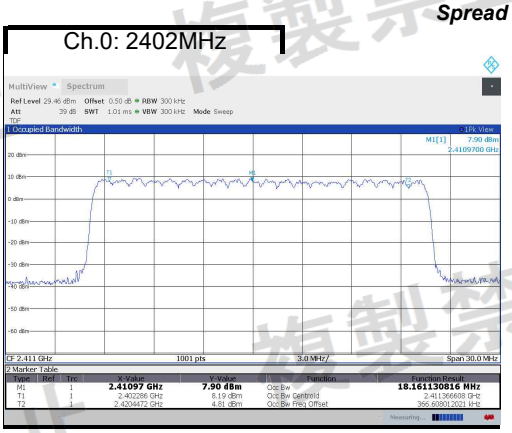


Ch.78: 2480MHz

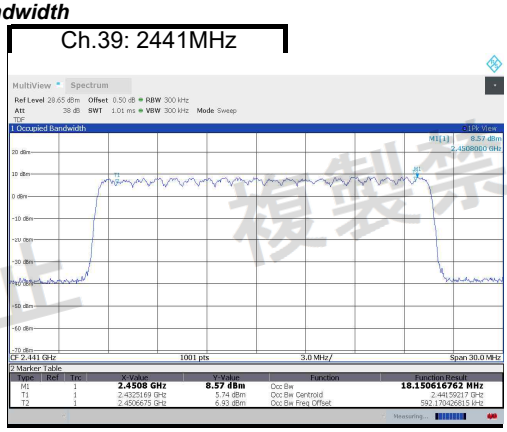


Spread bandwidth

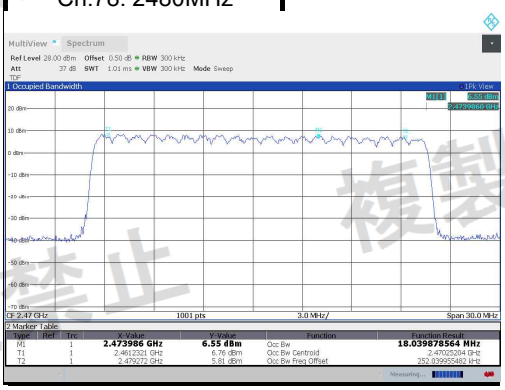
Ch.0: 2402MHz



Ch.39: 2441MHz



Ch.78: 2480MHz

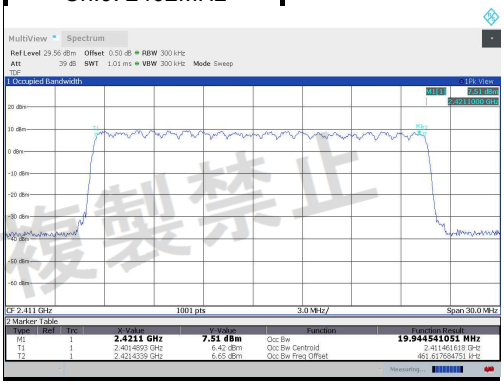


9. Test chart

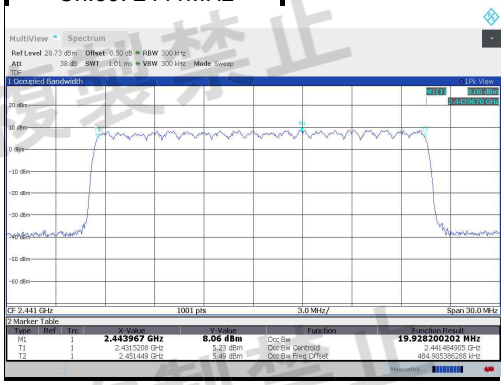
9.1 Occupied bandwidth / Spread bandwidth (-10% voltage)

Occupied bandwidth

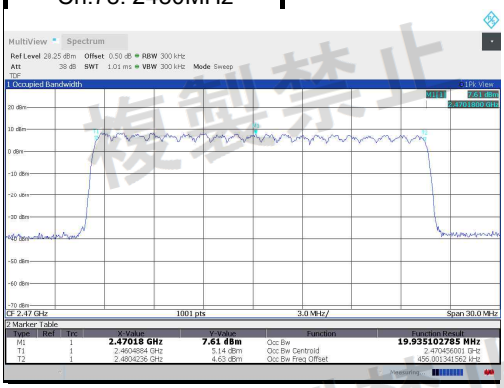
Ch.0: 2402MHz



Ch.39: 2441MHz

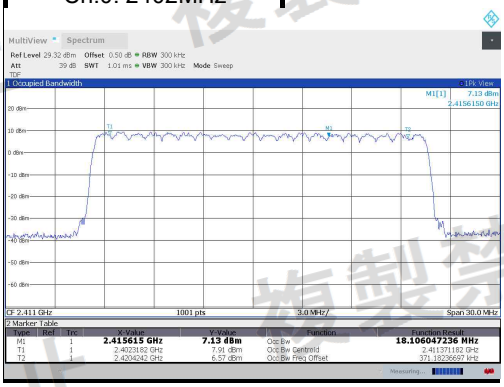


Ch.78: 2480MHz



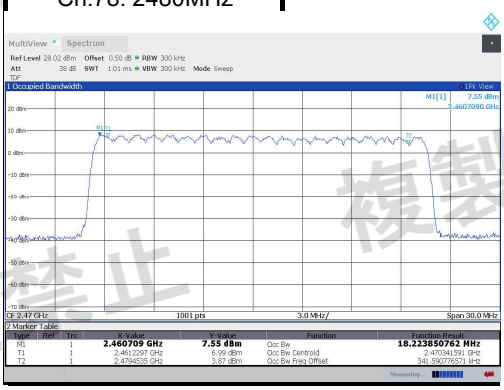
Spread bandwidth

Ch.0: 2402MHz



Ch.39: 2441MHz

Ch.78: 2480MHz

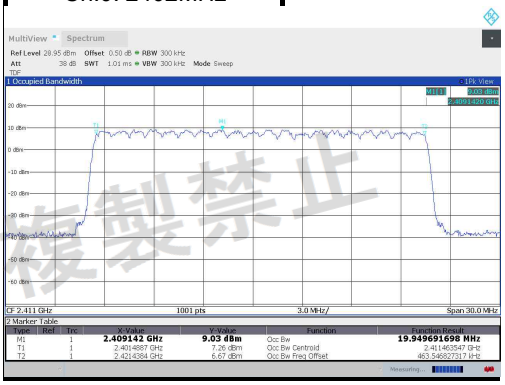


9. Test chart

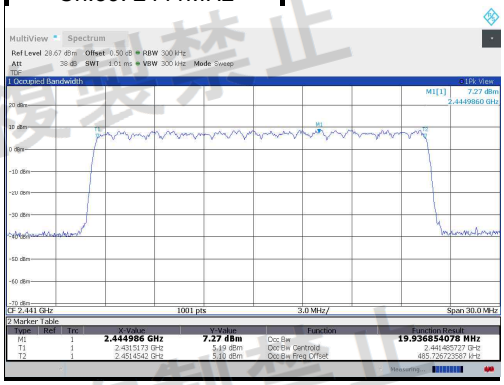
9.1 Occupied bandwidth / Spread bandwidth (+10% voltage)

Occupied bandwidth

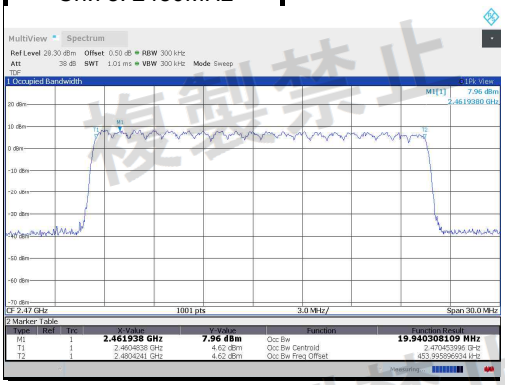
Ch.0: 2402MHz



Ch.39: 2441MHz

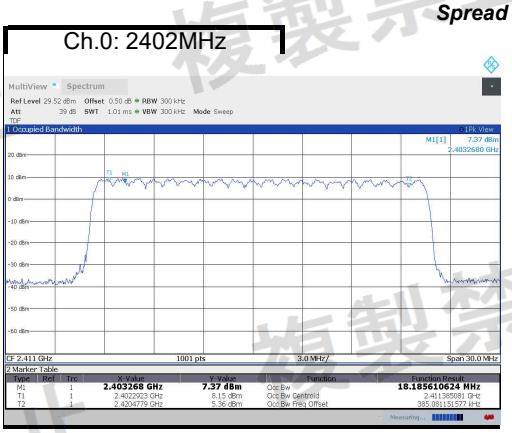


Ch.78: 2480MHz

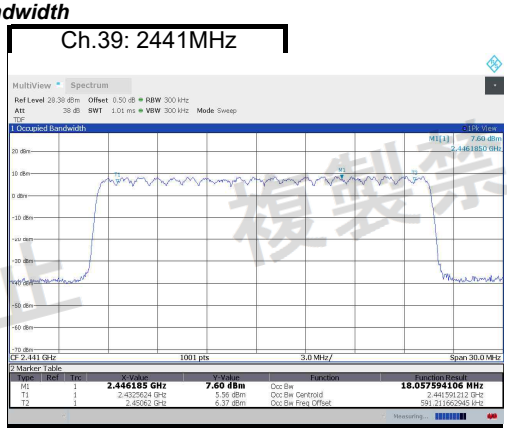


Spread bandwidth

Ch.0: 2402MHz



Ch.39: 2441MHz



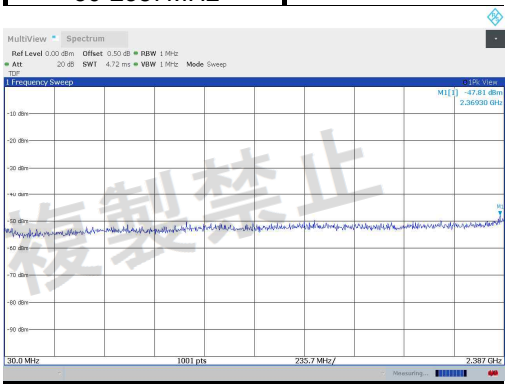
Ch.78: 2480MHz

9. Test chart

9.2 Unwanted(Spurious) emission strength (Rated voltage)

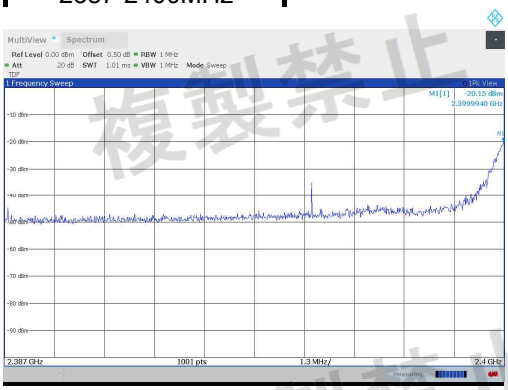
Ch.0: 2402MHz

30-2387MHz



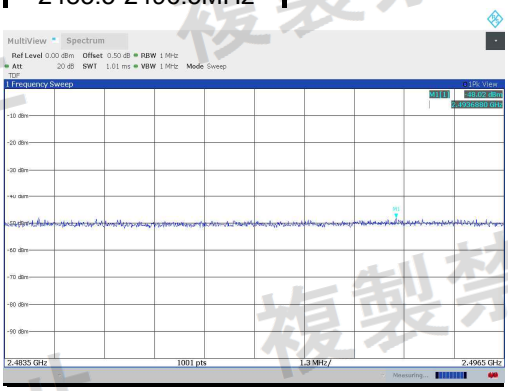
30-2387MHz(Detail)

2387-2400MHz



2387-2400MHz(Detail)

2483.5-2496.5MHz



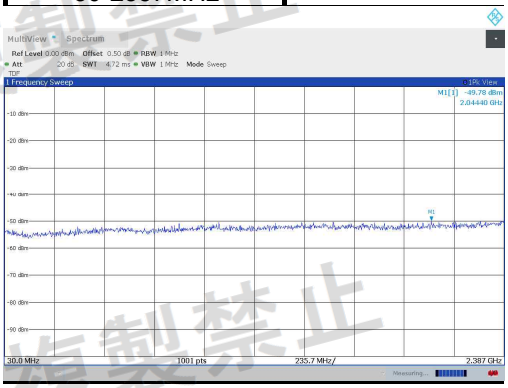
2483.5-2496.5MHz(Detail)

2496.5-12500MHz

2496.5-12500MHz(Detail)

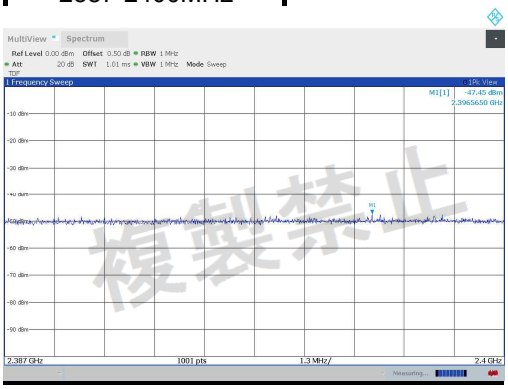
Ch.39: 2441MHz

30-2387MHz



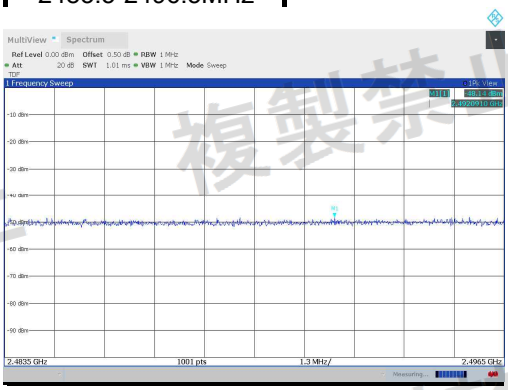
30-2387MHz(Detail)

2387-2400MHz



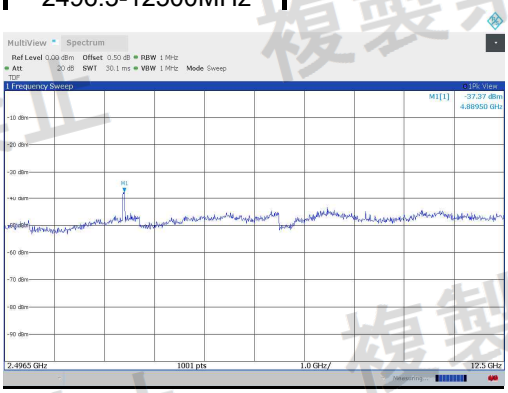
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

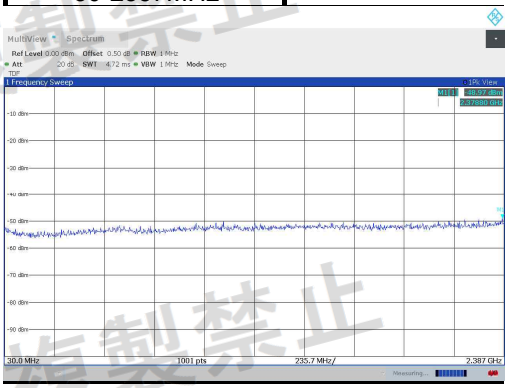
2496.5-12500MHz



2496.5-12500MHz(Detail)

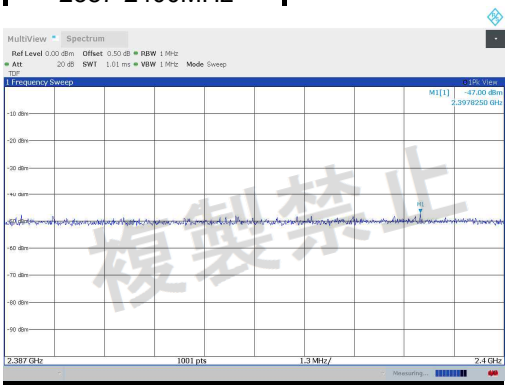
Ch.78: 2480MHz

30-2387MHz



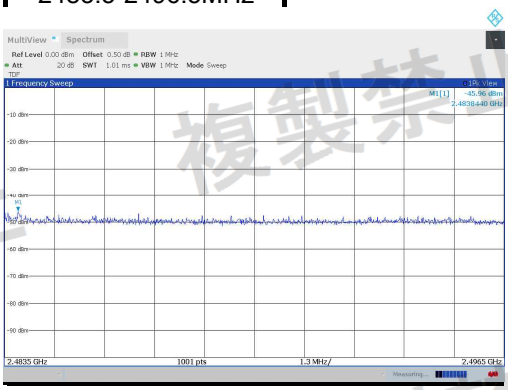
30-2387MHz(Detail)

2387-2400MHz



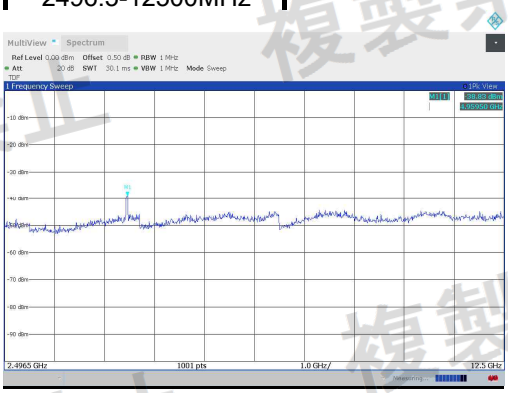
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz



2496.5-12500MHz(Detail)

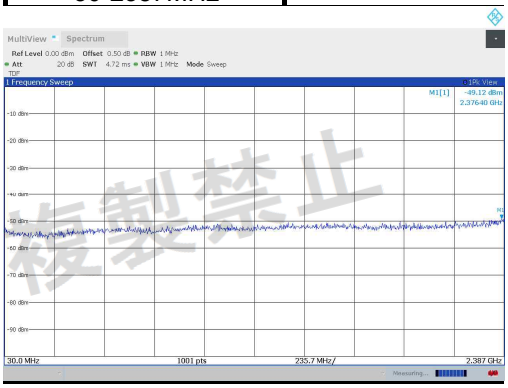
複製禁止

9. Test chart

9.2 Unwanted(Spurious) emission strength (-10% voltage)

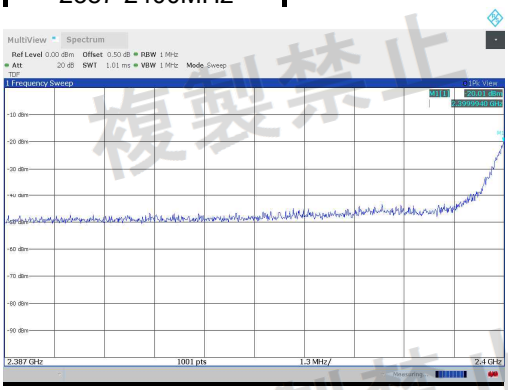
Ch.0: 2402MHz

30-2387MHz



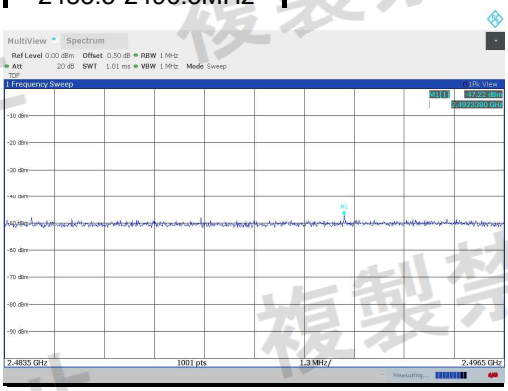
30-2387MHz(Detail)

2387-2400MHz



2387-2400MHz(Detail)

2483.5-2496.5MHz



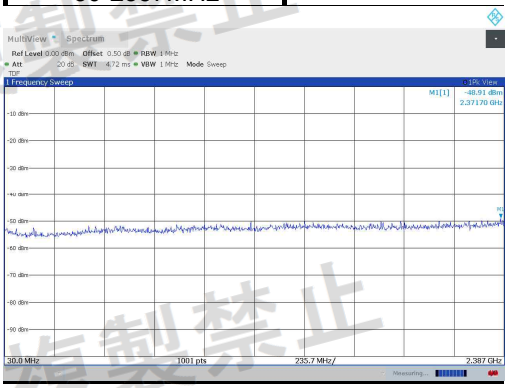
2483.5-2496.5MHz(Detail)

2496.5-12500MHz

2496.5-12500MHz(Detail)

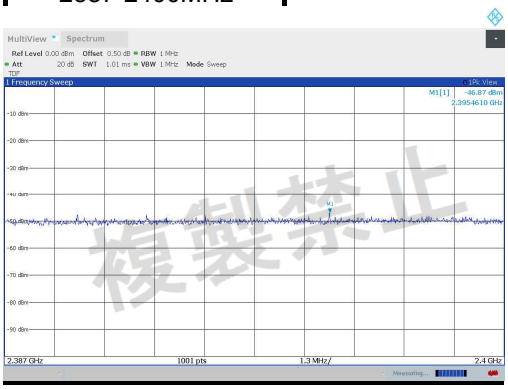
Ch.39: 2441MHz

30-2387MHz



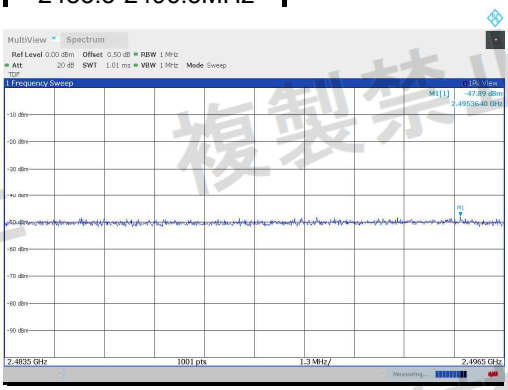
30-2387MHz(Detail)

2387-2400MHz



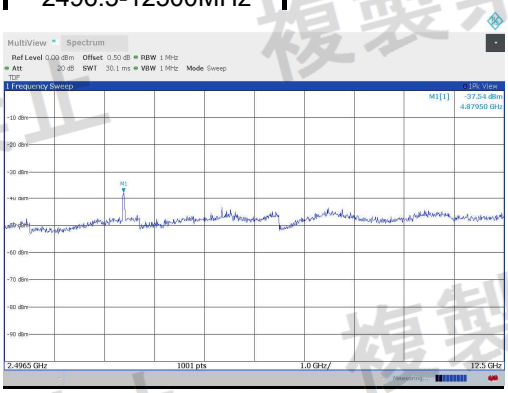
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

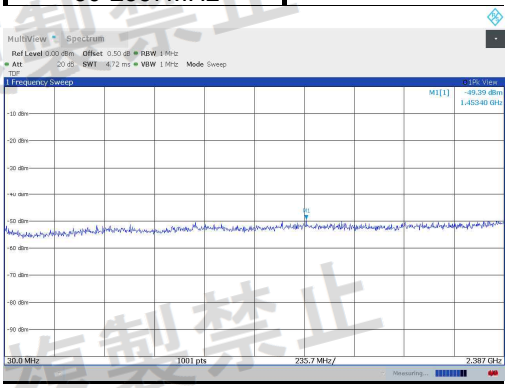
2496.5-12500MHz



2496.5-12500MHz(Detail)

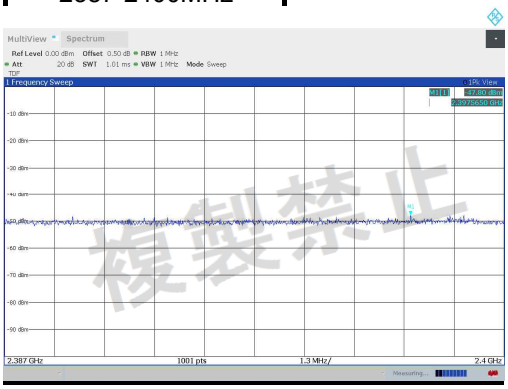
Ch.78: 2480MHz

30-2387MHz



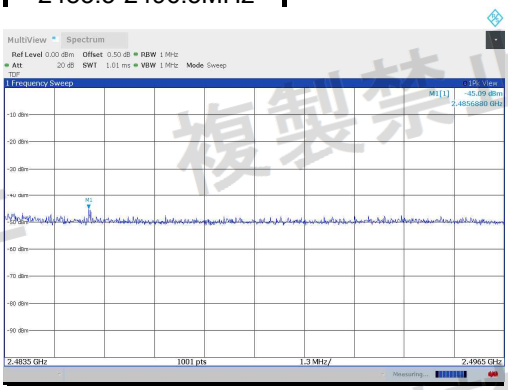
30-2387MHz(Detail)

2387-2400MHz



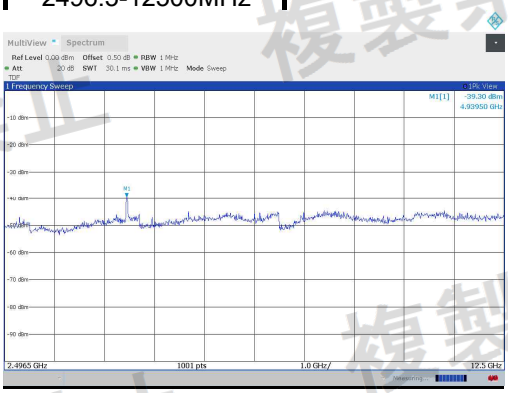
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz



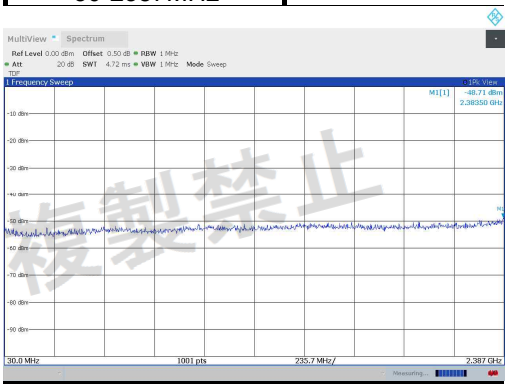
2496.5-12500MHz(Detail)

9. Test chart

9.2 Unwanted(Spurious) emission strength (+10% voltage)

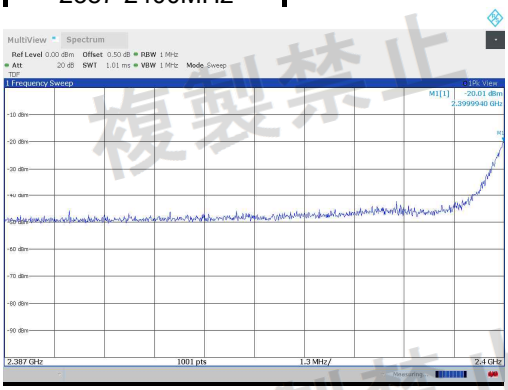
Ch.0: 2402MHz

30-2387MHz



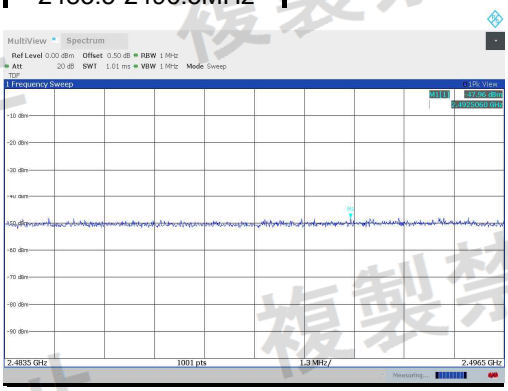
30-2387MHz(Detail)

2387-2400MHz



2387-2400MHz(Detail)

2483.5-2496.5MHz



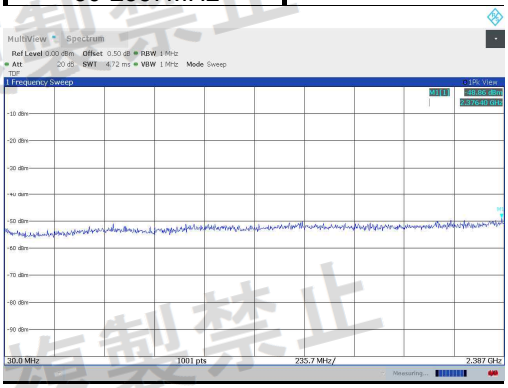
2483.5-2496.5MHz(Detail)

2496.5-12500MHz

2496.5-12500MHz(Detail)

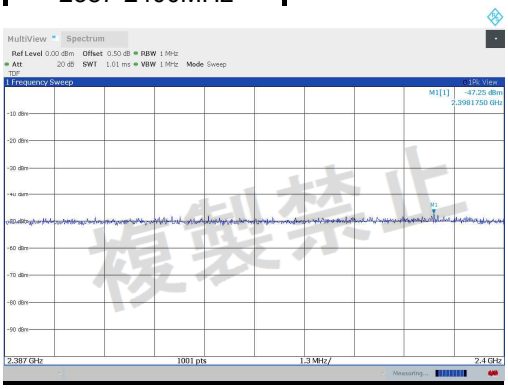
Ch.39: 2441MHz

30-2387MHz



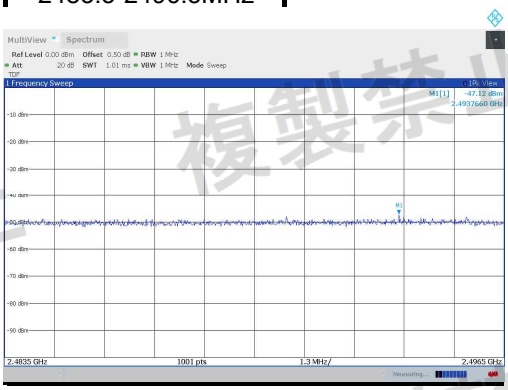
30-2387MHz(Detail)

2387-2400MHz



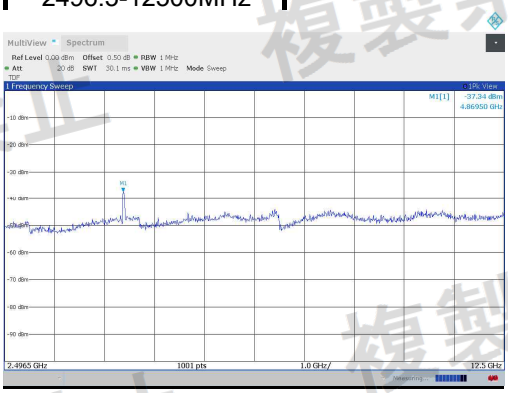
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz



2496.5-12500MHz(Detail)

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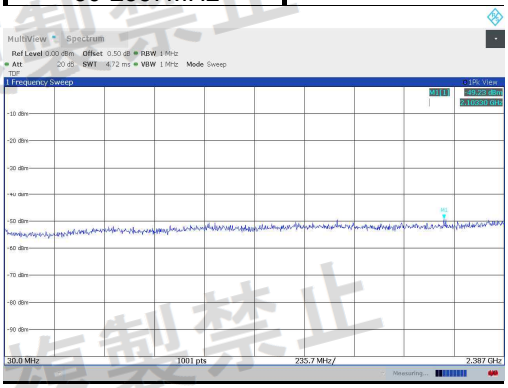
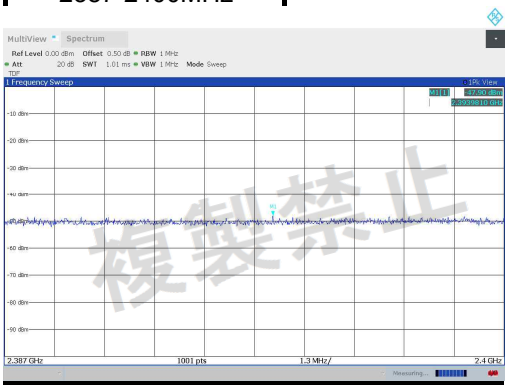
Ch.78: 2480MHz

30-2387MHz



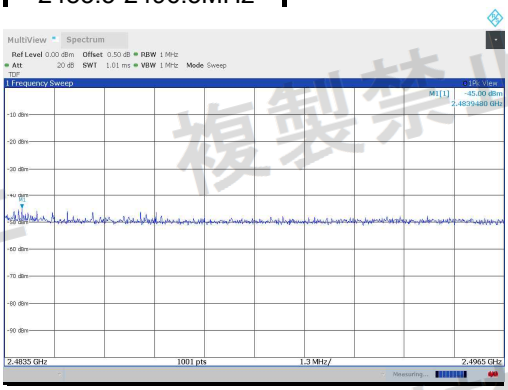
30-2387MHz(Detail)

2387-2400MHz



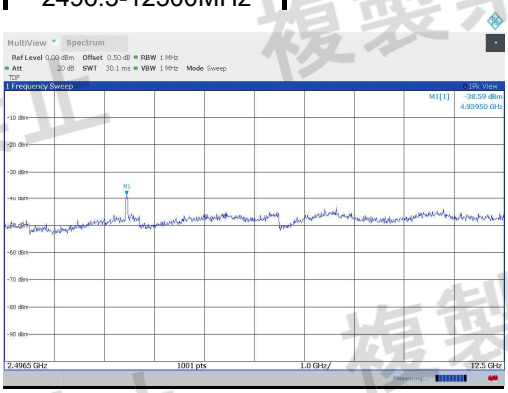
2387-2400MHz(Detail)

2483.5-2496.5MHz



2483.5-2496.5MHz(Detail)

2496.5-12500MHz

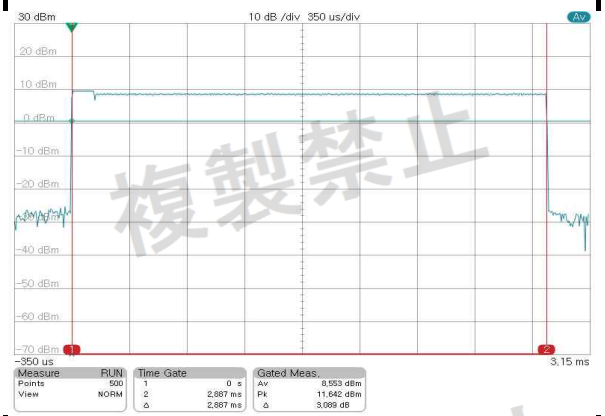


2496.5-12500MHz(Detail)

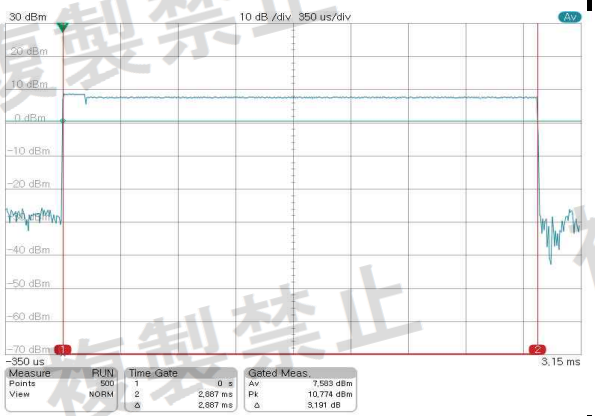
9. Test chart

9.3 RF output power tolerance (Rated voltage)

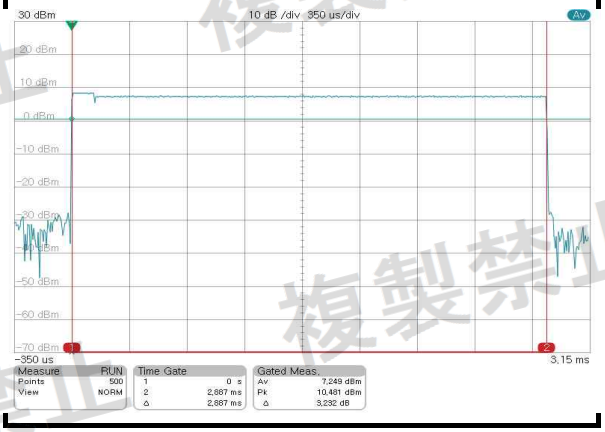
Ch.0: 2402MHz



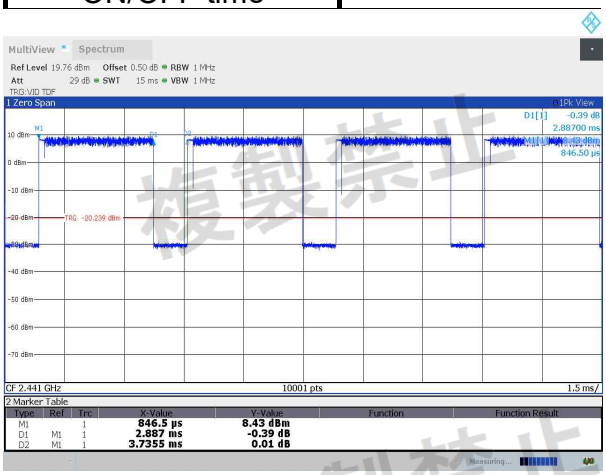
Ch.39: 2441MHz



Ch.78: 2480MHz



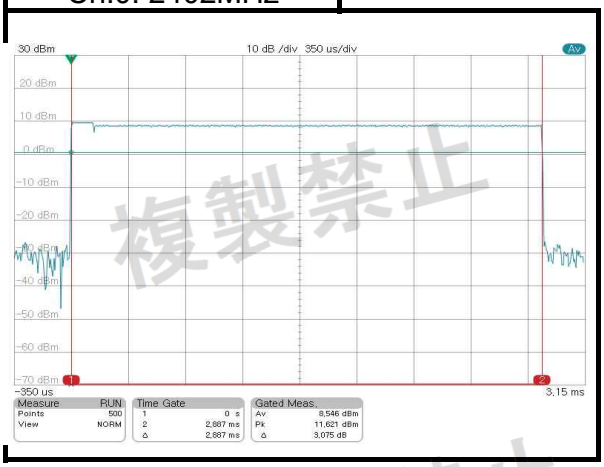
ON/OFF time



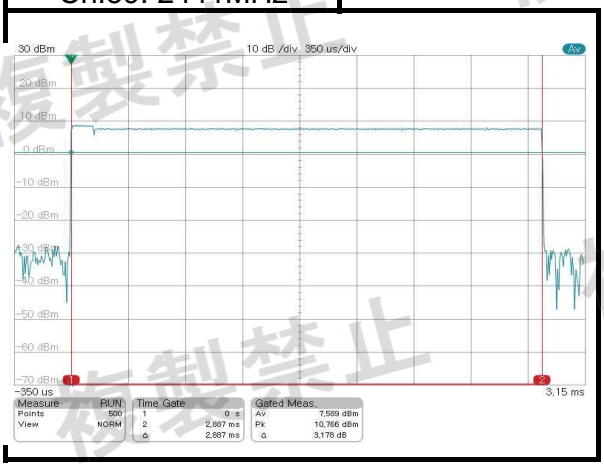
9. Test chart

9.3 RF output power tolerance (-10% voltage)

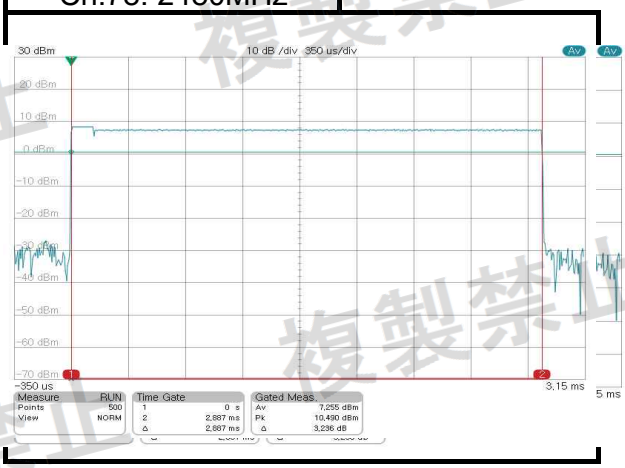
Ch.0: 2402MHz



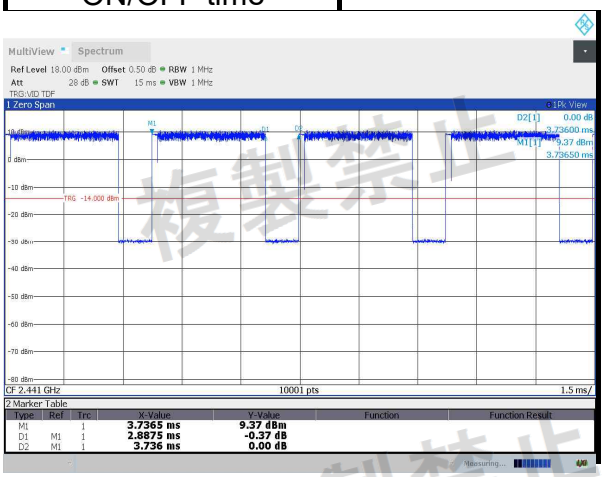
Ch.39: 2441MHz



Ch.78: 2480MHz



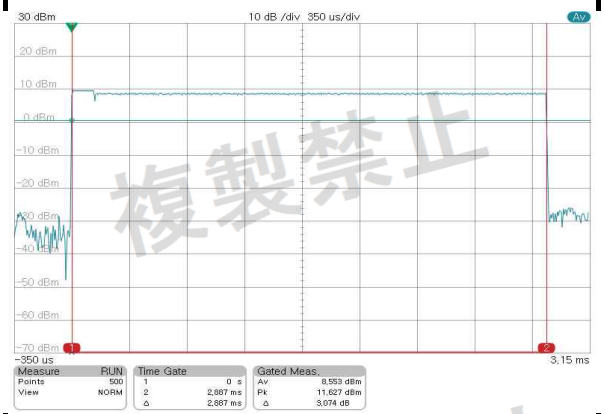
ON/OFF time



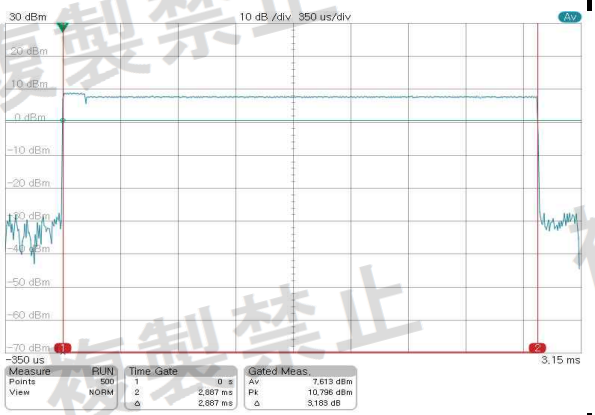
9. Test chart

9.3 RF output power tolerance (+10% voltage)

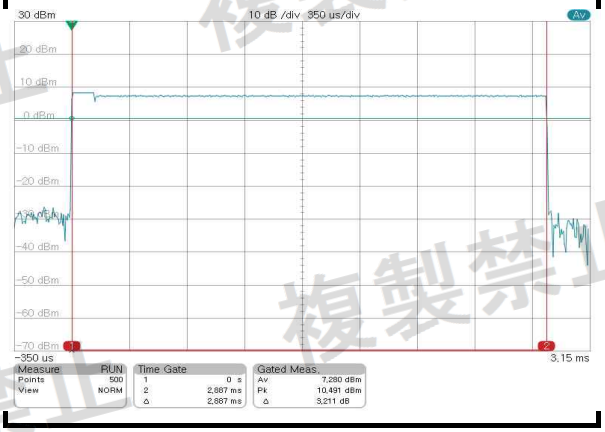
Ch.0: 2402MHz



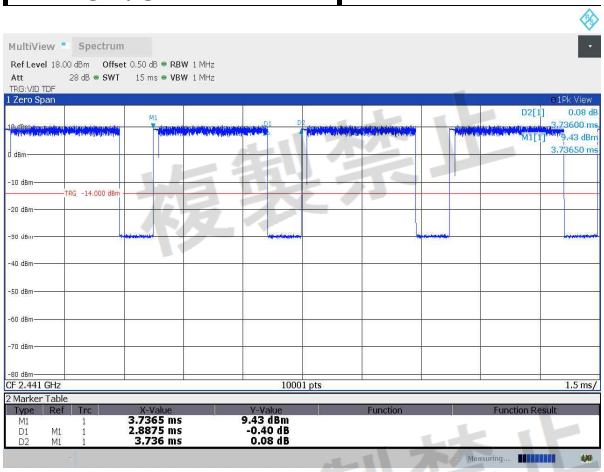
Ch.39: 2441MHz



Ch.78: 2480MHz



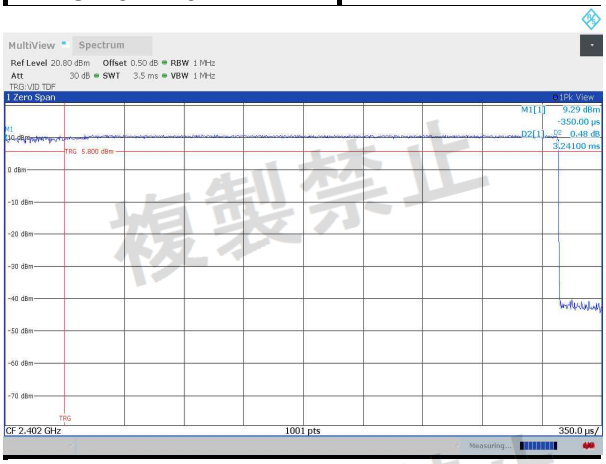
ON/OFF time



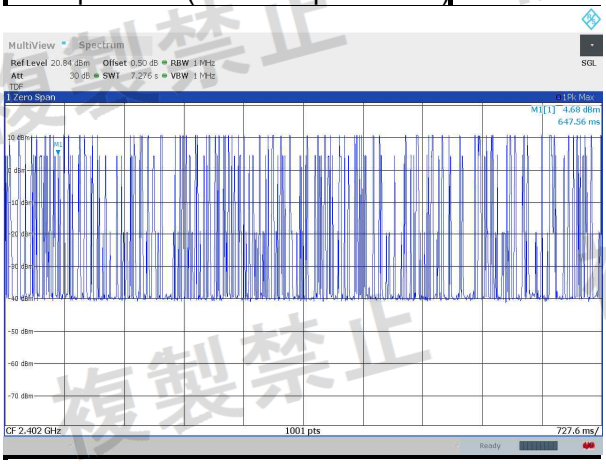
9. Test chart

9.4 Time of occupancy hopping frequency (Rated voltage)

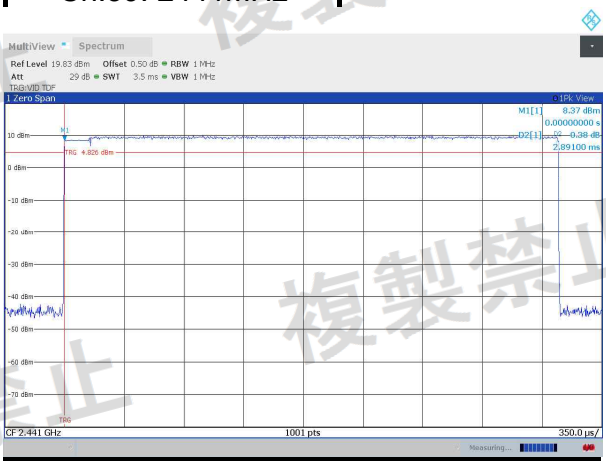
Ch.0: 2402MHz



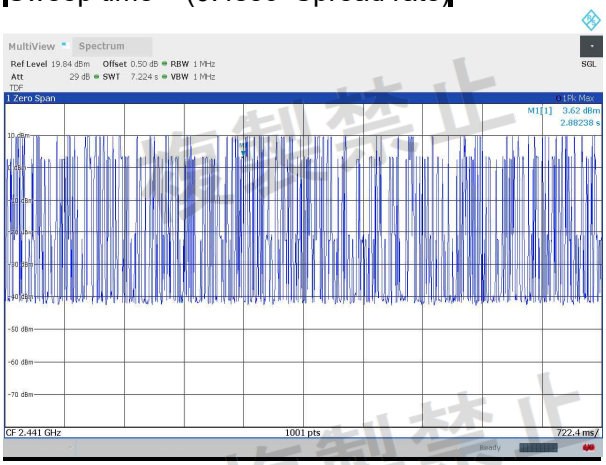
Sweep time = (0.4sec×Spread rate)



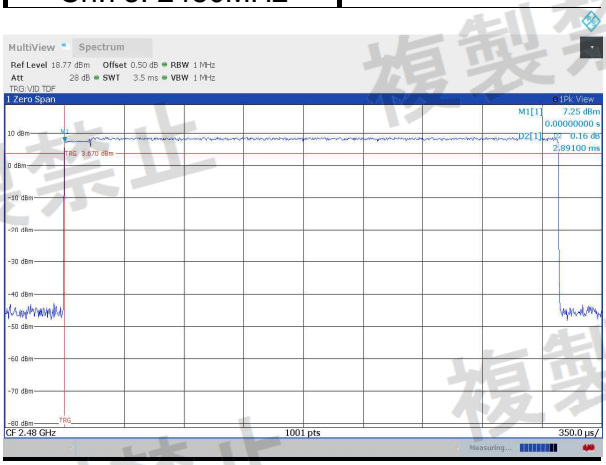
Ch.39: 2441MHz



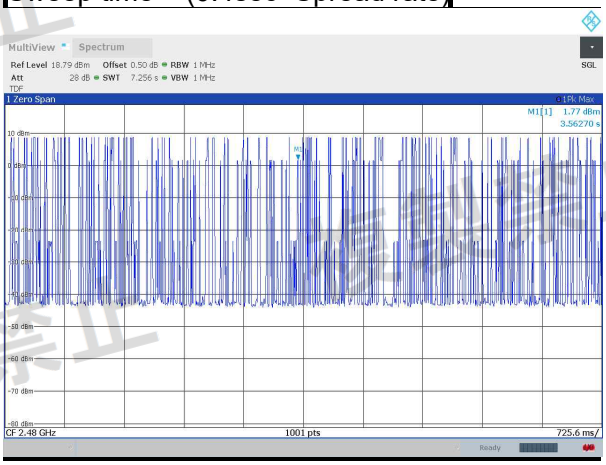
Sweep time = (0.4sec×Spread rate)



Ch.78: 2480MHz

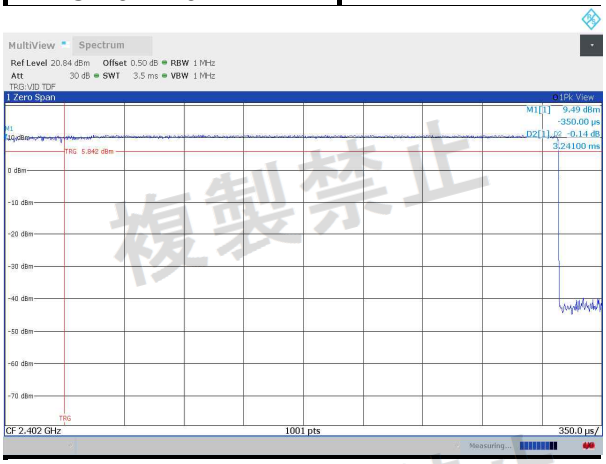
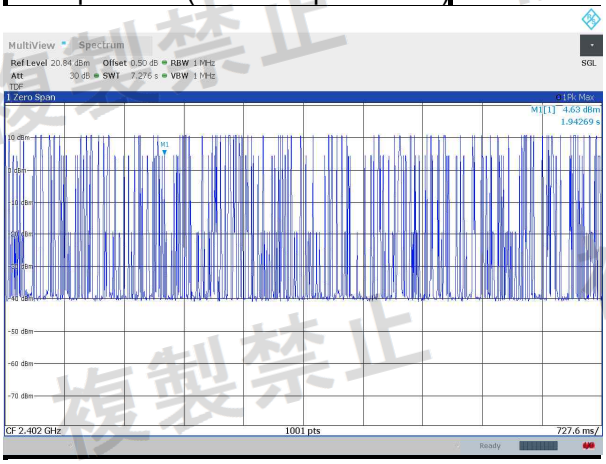


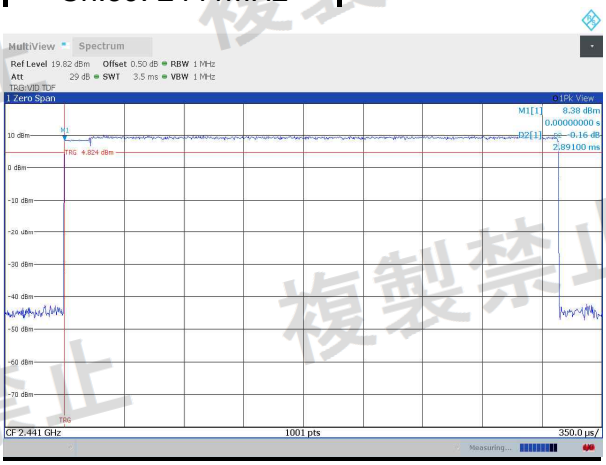
Sweep time = (0.4sec×Spread rate)

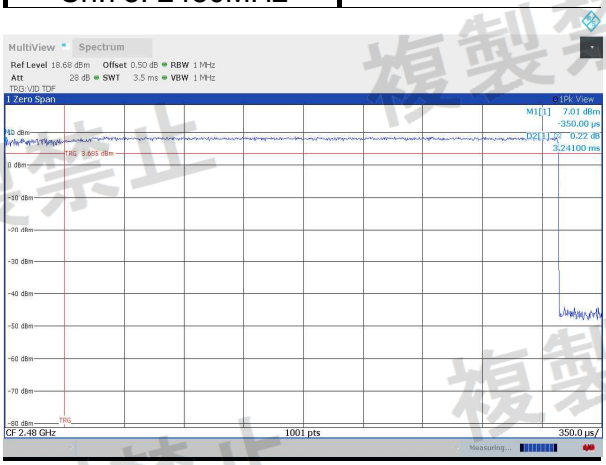
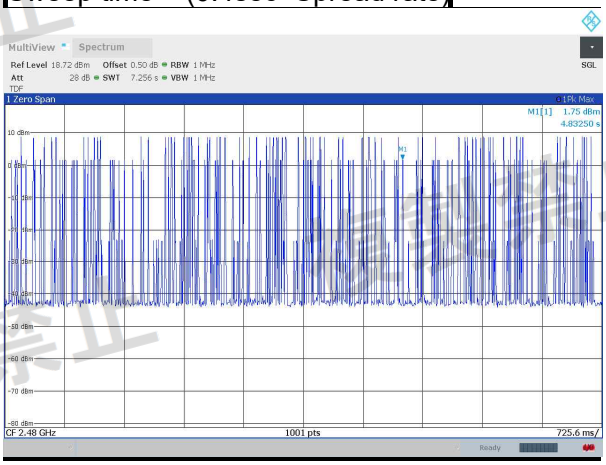


9. Test chart

9.4 Time of occupancy hopping frequency (-10% voltage)

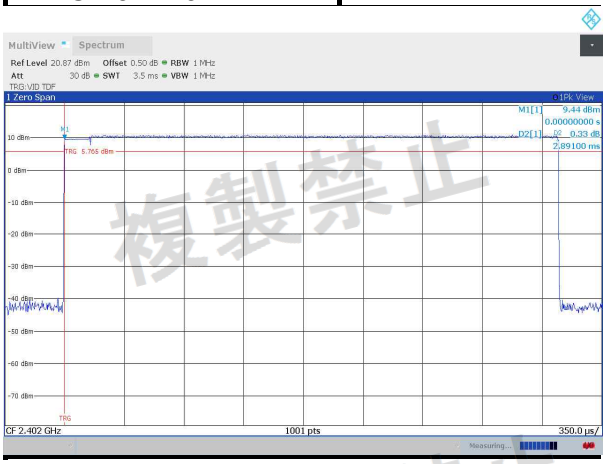
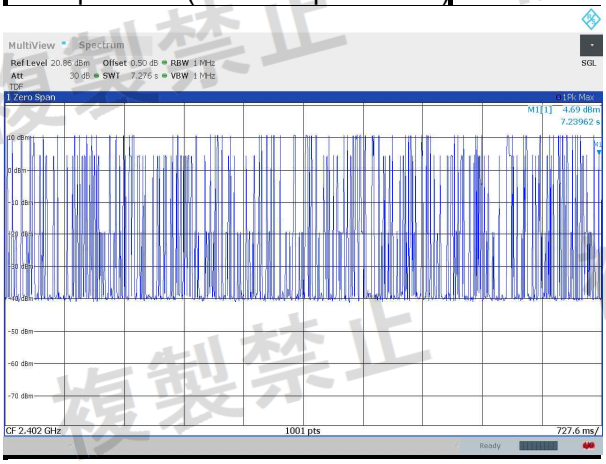
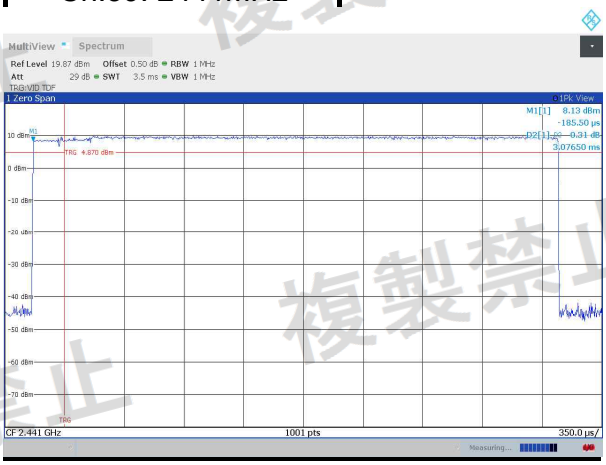
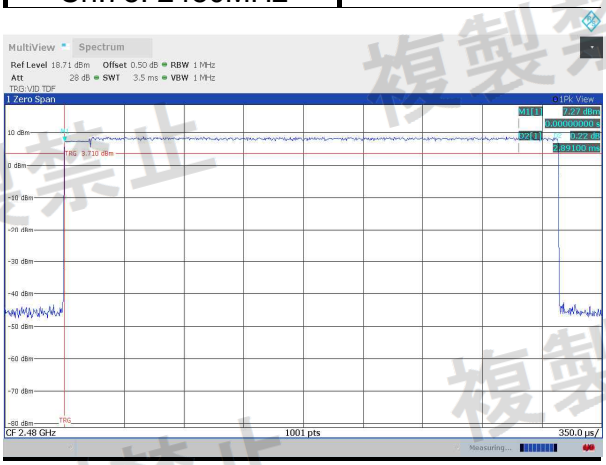
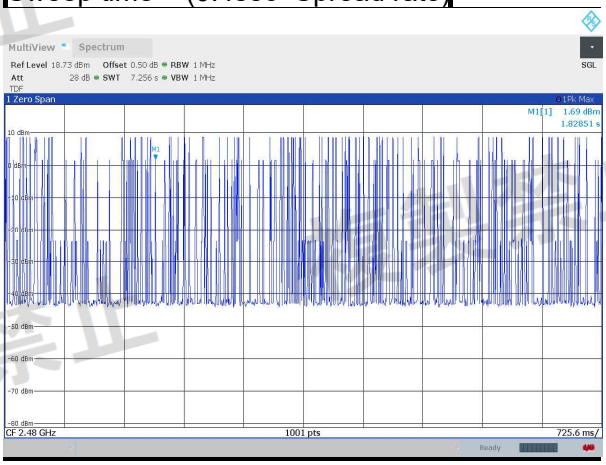
Ch.0: 2402MHz	Sweep time = (0.4sec×Spread rate)
	

Ch.39: 2441MHz	Sweep time = (0.4sec×Spread rate)
	

Ch.78: 2480MHz	Sweep time = (0.4sec×Spread rate)
	

9. Test chart

9.4 Time of occupancy hopping frequency (+10% voltage)

Ch.0: 2402MHz	Sweep time = (0.4sec×Spread rate)
	
Ch.39: 2441MHz	Sweep time = (0.4sec×Spread rate)
	
Ch.78: 2480MHz	Sweep time = (0.4sec×Spread rate)
	

10. Laboratory description

1. Location
Name: Eurofins KCTL Co., Ltd
65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Telephone Number: +82 31 285 0894
Facsimile Number: +82 505 299 8311

2. Accreditation and Registration

1) FCC
Site Designation No.: KR0040
Site Registration No.: 687132

2) VCCI
Registration No.: R-20080, G-20078, C-20059, T-20056

3) Industry Canada
Registration No.: 8035A
Test Site No.: 8035A-2

4) KOLAS
Registration No.: KT231

複製禁止