

TEST REPORT

Report number : KC-2022-R-051

Issue date : 2022-09-08

Applicant : CISCO SYSTEMS, INC.
170 West Tasman Drive, San Jose, CA 95134, USA

Equipment under test (EUT) : Cisco Webex Room Bar

Model name : TTC7-28

Date of test : 2022-06-16 ~ 2022-09-08

Test place : Keyco Co., Ltd.

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 Keyco.

Tested by; Kwanheon Lee

Approved by; Minchul Shin

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
1	Voltage fluctuation	Conducted	PASS
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
8	Carrier Sensing Function (1)	Conducted	N/A
9	Carrier Sensing Function (2)	Conducted	N/A
10	Absolute Gain of Transmission Antenna	Conducted	N/A
11	Angle Width of Principal Radiation from Transmission Antenna	Conducted	N/A
12	Interference Prevention Function	Conducted	PASS
13	Hopping frequency dwell time	Conducted	PASS

1) Test set up

Table-Top

2) Modification to the EUT by laboratory

None

2. Test Information

1. Applicant

CISCO SYSTEMS, INC.
170 West Tasman Drive, San Jose, CA 95134, USA
Phone: +47-911-20-180 / Fax: +47-6712-5234

2. Equipment under test

Cisco Webex Room Bar

3. Model number

TTC7-28

4. Serial number

FOC2601P5HP

5. Size

(W) 534 × (D) 64.4 × (H) 82 mm

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

BDR: GFSK, EDR: $\pi/4$ DQPSK, EDR: 8DPSK

10. Data rate

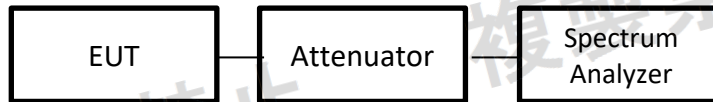
BDR: 1DH-5, EDR: 2DH-5, EDR: 3DH-5

10. Variation of the family model(s)

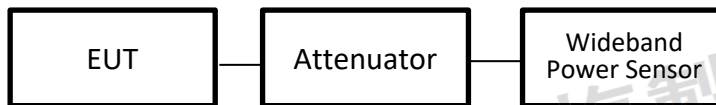
CS-BAR-W-K9, CS-BAR-W-C-K9, CS-BAR-K9++,
CS-BAR-K9=, CS-BAR-T-K9, CS-BAR-NR-K9,
CS-BAR-NR-K9++, CS-BAR-T-C-K9, CS-BAR-MM-K9,
CS-BAR-MM-NR-K9, CS-BAR-C-K9=, CS-BAR-NR-K9=,
CS-BAR-NR-K7, CS-BAR-NR-K7=

3. Configuration of equipment

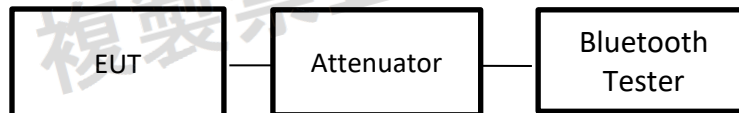
1. Frequency tolerance, Occupied bandwidth, Unwanted(Spurious) emission strength, Spread bandwidth, Secondary emitted radio wave strength, Time of occupancy hopping frequency



2. RF output power tolerance,



3. Interference Prevention Function



4. 試験機器リスト Measurement equipment list

USE	Equipment	Company	Model No.	Serial No.	Calibrated	Cal. Method	Cal. Due	Cal. Date
x	System DC Power Supply	HP	6674A	MY41003722	HCT	c)	2023.04.15	2022.04.15
x	System DC Power Supply	HP	6653A	3602A-02255	HCT	c)	2023.04.15	2022.04.15
x	Spectrum Analyzer	R&S	FSV40-N	101322	HCT	c)	2023.04.15	2022.04.15
x	Power Sensor	R&S	NRP-Z11	103195	HCT	c)	2023.04.15	2022.04.15
x	Signal Generator	R&S	SMB100A	177685	HCT	c)	2023.04.15	2022.04.15
x	Signal Generator	Agilent	N5182A	MY47420121	HCT	c)	2023.04.15	2022.04.15
x	Digital Multimeter	Agilent	34401A	US36107178	HCT	c)	2023.04.15	2022.04.15
x	Bluetooth Tester	TESCOM	TC-3000C	3000C000868	HCT	c)	2023.01.14	2022.01.14

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)

5. 測定の不確かさ

About uncertainty of measured value

Parameter	Uncertainty
Total RF power conducted	± 1.30 dB
Spurious emissions conducted	± 1.29 dB
Temperature	± 0.60 °C
Humidity	± 2.90 %

判定	Measured value and standard limit value	
PASS	Case1	Standard limit value +Uncertainty -Uncertainty Measured value 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. 測定写真

Photographs

Conducted Measurement Photo



試驗結果

Test results

Environment of test room	Date of test	2022-06-16 ~ 2022-09-02
	Temperature	(23.5~26.5) °C
	Humidity	(55~ 65) %

Peak Antenna Gain	3.10	dBi
Declaration Output Power	0.1	mW/MHz
Declaration Output Power	-10.0000	dBm/MHz
E.I.R.P.	-6.9000	dBm/MHz
Input Power Voltage	12.3	VDC

Tested Circuit Insertion Loss		Refer to the insertion loss	
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.910	ms
	OFF TIME	0.860	ms
	Ratio	0.7719	
Packet Type (Mode)		1DH5	mode
Transmit Speed		1	MHz

Test category ;	2.4GHz Band Low-Power Data Communication System (BluetoothV4.1+EDR [GFSK])
The reason why the tests are performed only at rated voltage;	When the input voltage to receiver RF circuit varies below $\pm 1\%$ as the input voltage from the external power supply to the receiver varies $\pm 10\%$ (excluding power supply)

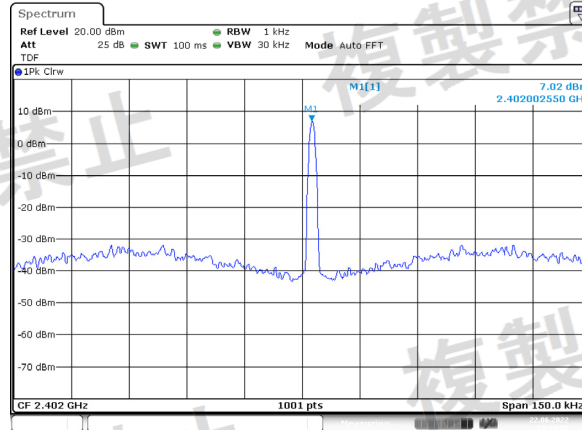
Measurement Frequency	MHz	2402	2441	2480	Result	Limit	Note
Channel Number	Ch.	0	39	78	---	---	
Frequency Measurements	MHz	2402.002550	2441.007040	2480.011540	---	---	
Frequency Tolerance	ppm	1.06162	2.88406	4.65323	PASS	$\pm 50 \times 10^{-6}$ (50ppm)	
Occupied Bandwidth	MHz	---	78.721	---	PASS	83.5MHz or below	
Spread Bandwidth	MHz	---	71.329	---	PASS	500kHz or more	
RF Output Power	mW/MHz	---	0.104036	---	PASS	3mW/MHz or below	
RF Output Power Tolerance	%	---	4.035660	---	PASS	+20 to -80%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	---	0.002360	---	PASS	2.5uW/MHz or below
		MHz	---	1444.000	---	---	
	2387 to 2400MHz	uW/MHz	---	7.049109	---	PASS	25uW/MHz or below
		MHz	---	2399.968	---	---	
	2483.5 to 2496.5MHz	uW/MHz	---	0.066362	---	PASS	25uW/MHz or below
		MHz	---	2483.532	---	---	
Secondary Emitted Radio Wave Strength	2496.5 to 12500MHz	uW/MHz	---	0.002665	---	PASS	2.5uW/MHz or below
		MHz	---	2501.500	---	---	
	30 to 1000MHz	nW	---	0.016602	---	PASS	4nW or below
		MHz	---	993.700	---	---	
	1000 to 12500MHz	nW	---	0.483222	---	PASS	20nW or below
		MHz	---	6980.000	---	---	
Time of occupancy hopping frequency	sec	---	0.002910	---	PASS	0.4sec or below	
	sec	---	0.293910	---	PASS	0.4sec or below	0.4sec*Spread rate
Spreading Factor	---	---	71.329000	---	PASS	5 or more	
Interference Prevention Function		Good			PASS		
Transmitting antenna absolute gain		N/A			N/A	*1	
Angular width of the main radiation of the transmitting antenna		N/A			N/A	*1	

*1 Measurement only if the E.I.R.P. exceeds 6.91dBm

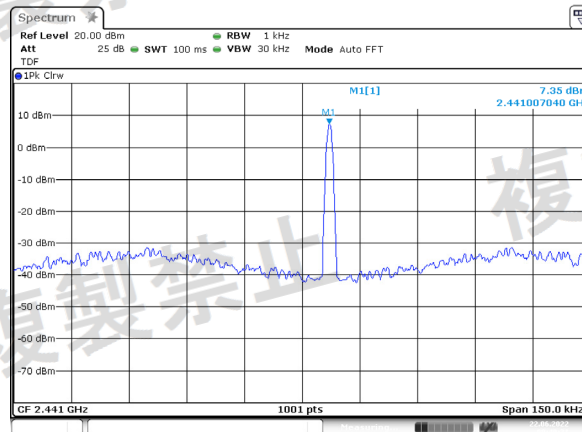
測定チャート Test chart

周波数の偏差 Frequency tolerance

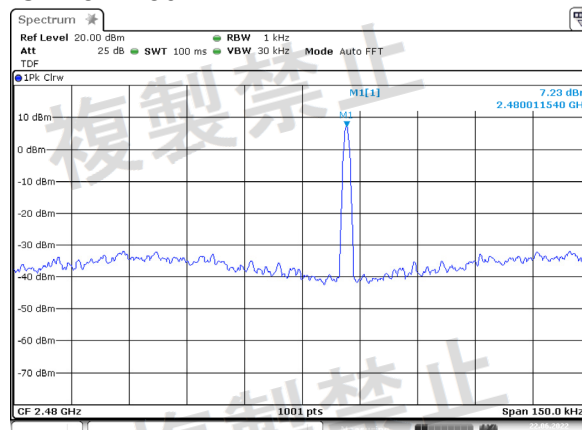
Ch.0: 2402MHz



Ch.39: 2441MHz

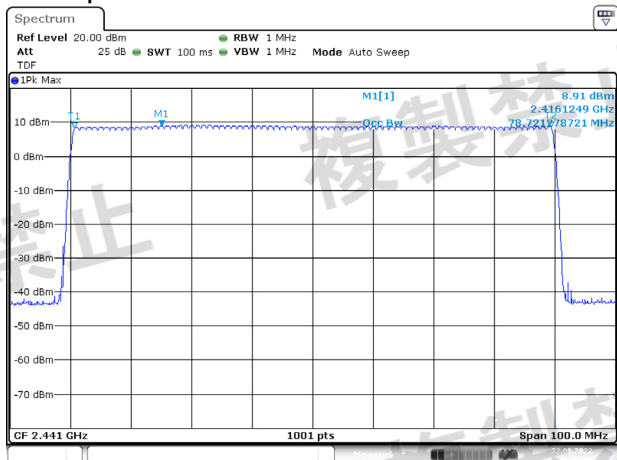


Ch.78: 2480MHz

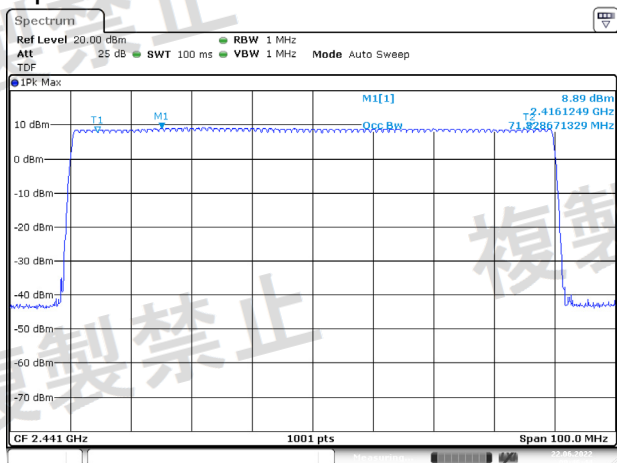


占有周波数帯幅及び拡散帯域幅
Occupied bandwidth / Spread bandwidth

Occupied bandwidth

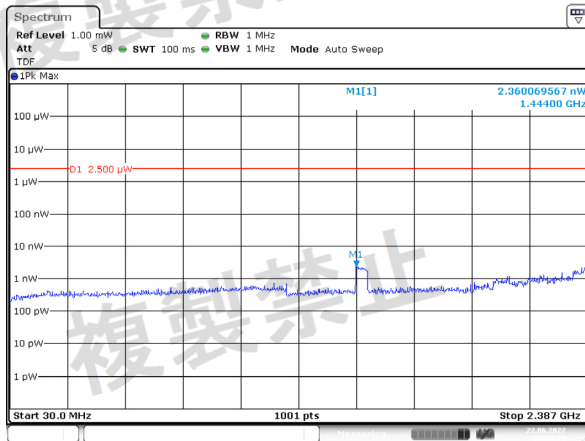


Spread bandwidth

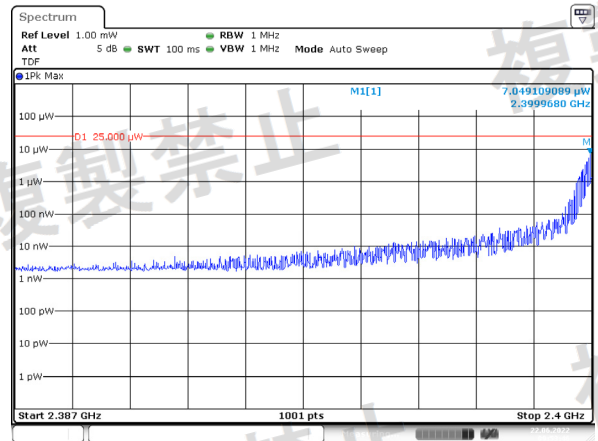


スプリアスの発射又は不要発射の強度
Unwanted(Spurious) emission strength

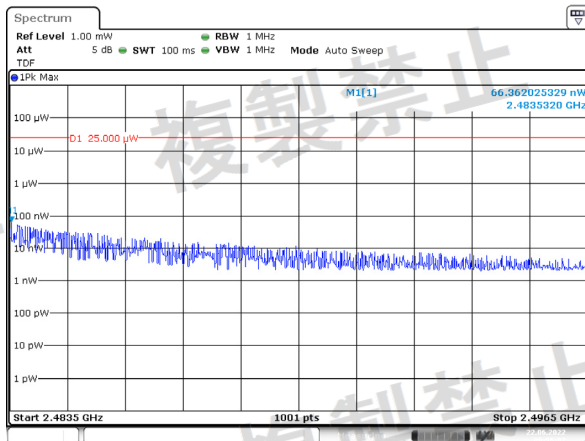
30-2387MHz



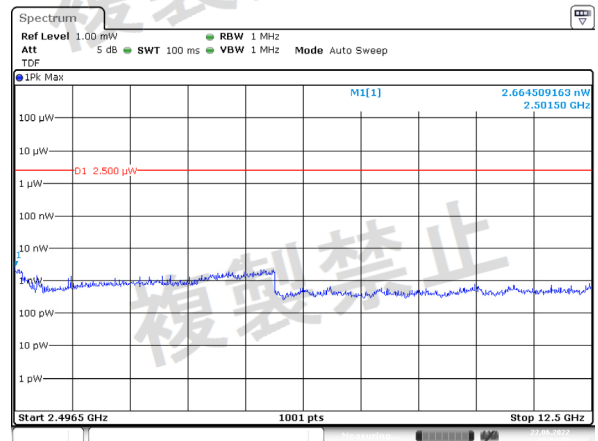
2387-2400MHz



2483.5-2496.5MHz

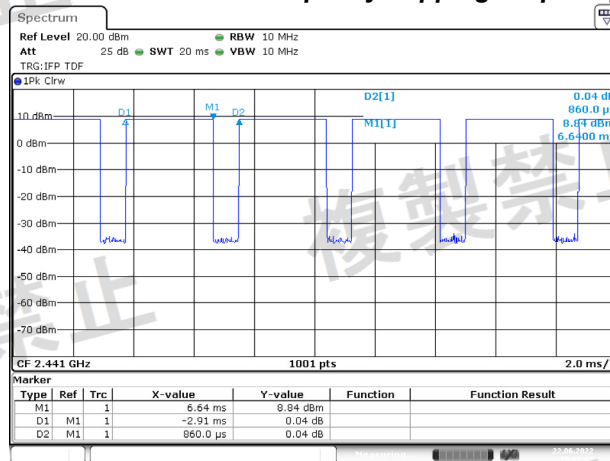


2496.5-12500MHz

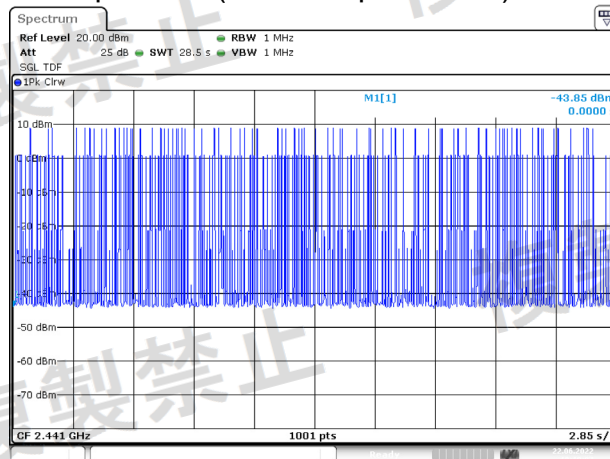


ホッピング周波数帯流時間

Time of occupancy hopping frequency



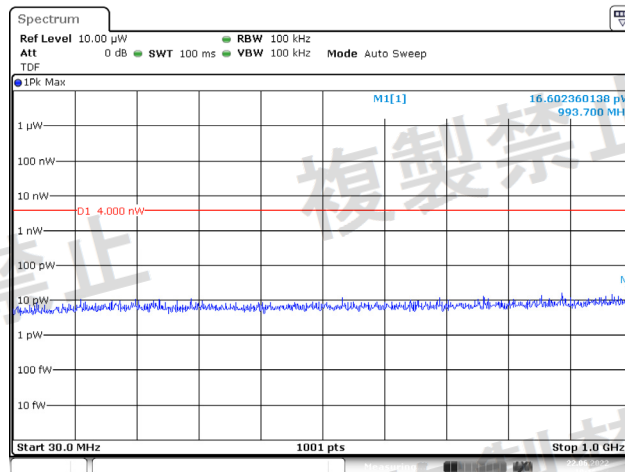
Sweep time = (0.4sec×Spread rate)



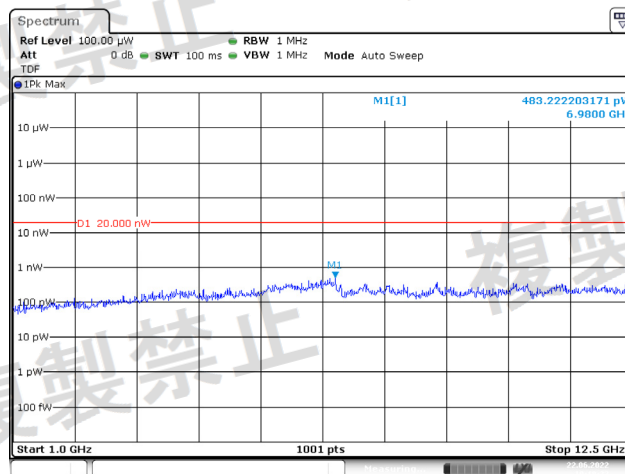
副次的に発する電波等の限度

Secondary emitted radio wave strength

30MHz-1GHz



1-12.5GHz



試驗結果

Test results

Environment of test room	Date of test	2022-06-16 ~ 2022-09-02
	Temperature	(23.5~26.5) °C
	Humidity	(55~ 65) %

Peak Antenna Gain	3.10	dBi
Declaration Output Power	0.1	mW/MHz
Declaration Output Power	-10.0000	dBm/MHz
E.I.R.P.	-6.9000	dBm/MHz
Input Power Voltage	12.3	VDC

Tested Circuit Insertion Loss		Refer to the insertion loss	
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.910	ms
	OFF TIME	0.860	ms
	Ratio	0.7719	
Packet Type (Mode)		2DH5	mode
Transmit Speed		2	MHz

Test category ;	2.4GHz Band Low-Power Data Communication System (BluetoothV4.1+EDR [4DQPSK])
The reason why the tests are performed only at rated voltage;	When the input voltage to receiver RF circuit varies below $\pm 1\%$ as the input voltage from the external power supply to the receiver varies $\pm 10\%$ (excluding power supply)

Measurement Frequency	MHz	2402	2441	2480	Result	Limit	Note
Channel Number	Ch.	0	39	78	---	---	
Frequency Measurements	MHz	2402.002100	2441.006440	2480.010940	---	---	
Frequency Tolerance	ppm	0.87427	2.63826	4.41129	PASS	$\pm 50 \times 10^{-6}$ (50ppm)	
Occupied Bandwidth	MHz	---	78.921	---	PASS	83.5MHz or below	
Spread Bandwidth	MHz	---	71.528	---	PASS	500kHz or more	
RF Output Power	mW/MHz	---	0.064561	---	PASS	3mW/MHz or below	
RF Output Power Tolerance	%	---	-35.438698	---	PASS	+20 to -80%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	---	0.002359	---	PASS	2.5uW/MHz or below
		MHz	---	2385.800	---	---	
	2387 to 2400MHz	uW/MHz	---	10.110516	---	PASS	25uW/MHz or below
		MHz	---	2399.994	---	---	
	2483.5 to 2496.5MHz	uW/MHz	---	0.067061	---	PASS	25uW/MHz or below
		MHz	---	2483.545	---	---	
Secondary Emitted Radio Wave Strength	2496.5 to 12500MHz	uW/MHz	---	0.002557	---	PASS	2.5uW/MHz or below
		MHz	---	2541.500	---	---	
	30 to 1000MHz	nW	---	0.017055	---	PASS	4nW or below
		MHz	---	989.830	---	---	
	1000 to 12500MHz	nW	---	0.512618	---	PASS	20nW or below
		MHz	---	6647.000	---	---	
Time of occupancy hopping frequency	sec	---	0.002910	---	PASS	0.4sec or below	
	sec	---	0.285180	---	PASS	0.4sec or below	0.4sec*Spread rate
Spreading Factor	---	---	71.528000	---	PASS	5 or more	
Interference Prevention Function		Good			PASS		
Transmitting antenna absolute gain		N/A			N/A	*1	
Angular width of the main radiation of the transmitting antenna		N/A			N/A	*1	

*1 Measurement only if the E.I.R.P. exceeds 6.91dBm

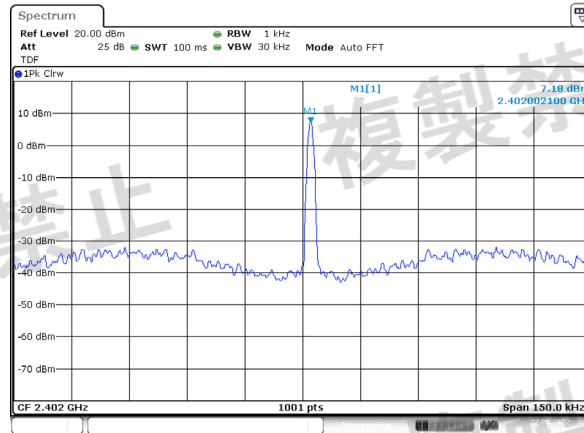
測定チャート

Test chart

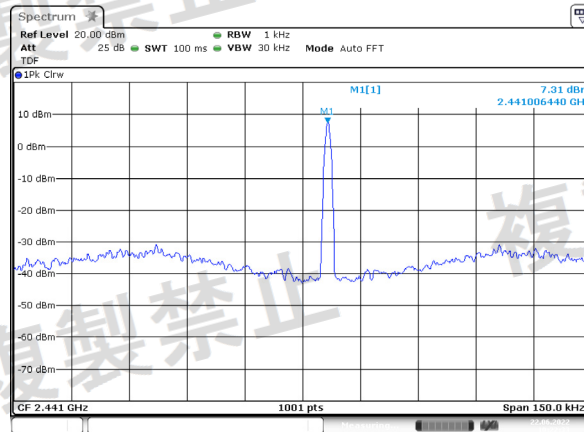
周波数の偏差

Frequency tolerance

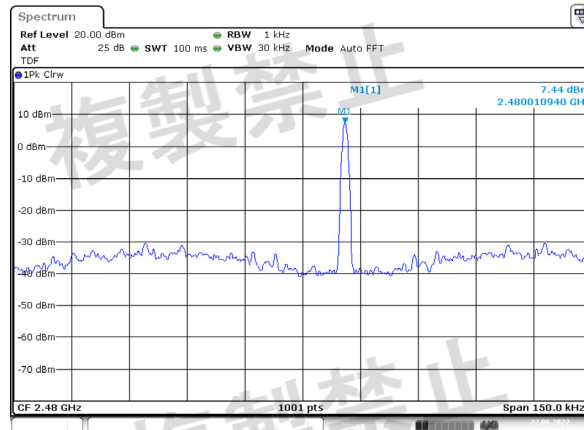
Ch.0: 2402MHz



Ch.39: 2441MHz

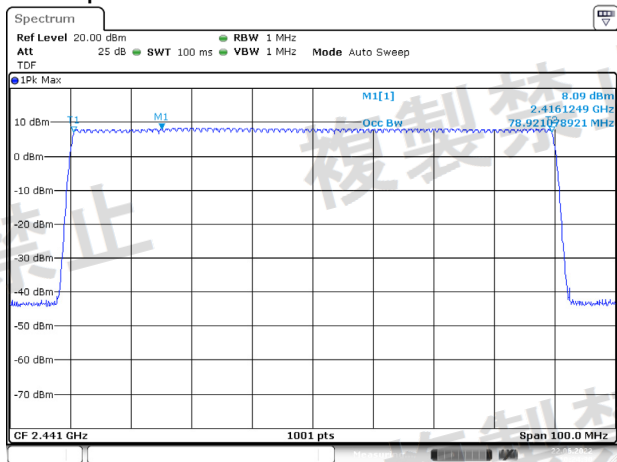


Ch.78: 2480MHz

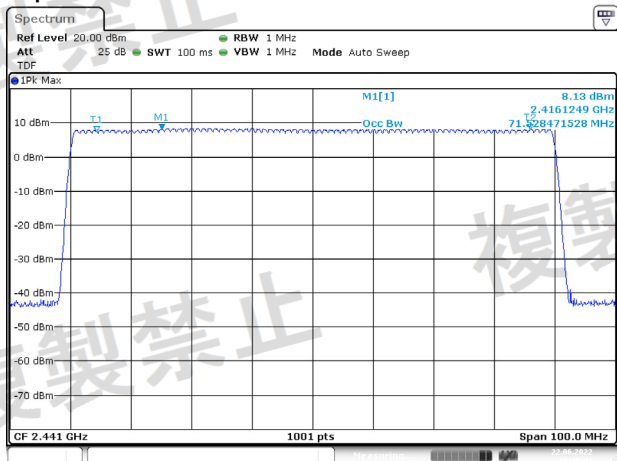


占有周波数帯幅及び拡散帯域幅
Occupied bandwidth / Spread bandwidth

Occupied bandwidth

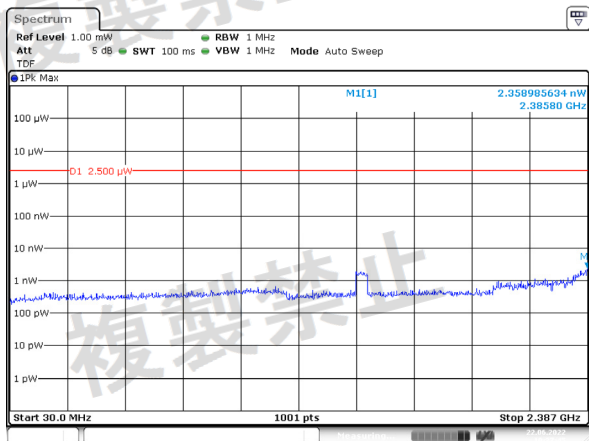


Spread bandwidth

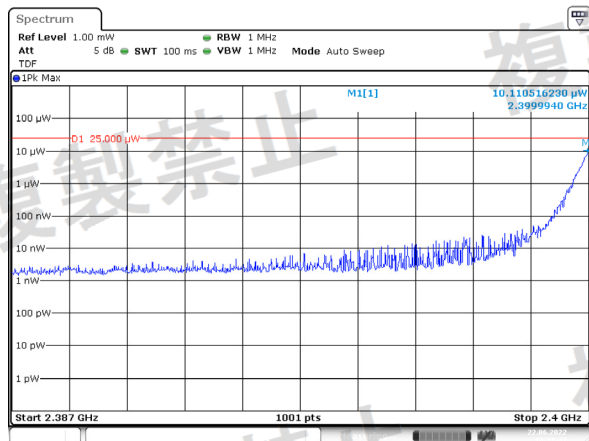


スプリアスの発射又は不要発射の強度
Unwanted(Spurious) emission strength

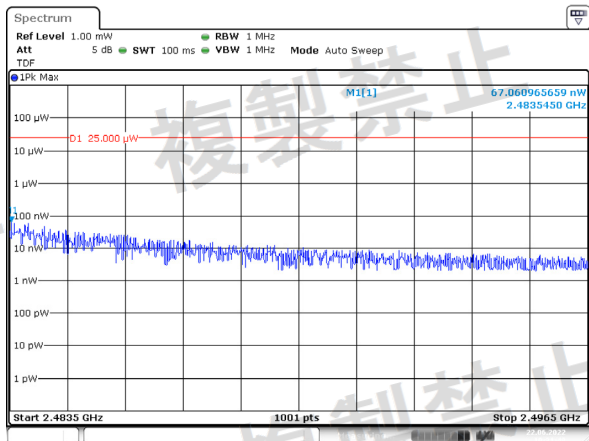
30-2387MHz



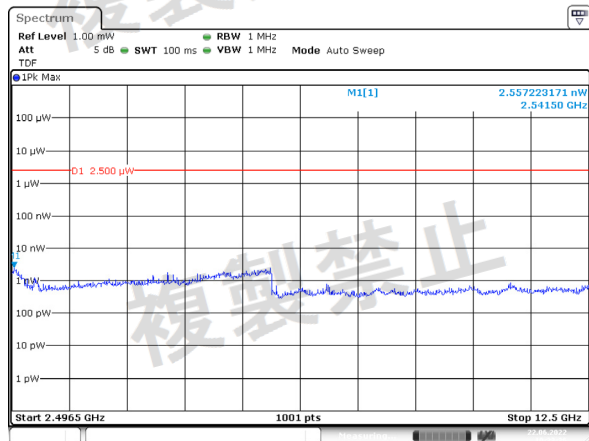
2387-2400MHz



2483.5-2496.5MHz

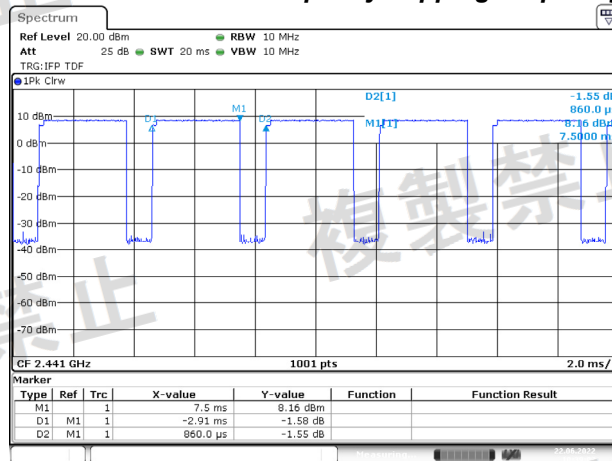


2496.5-12500MHz

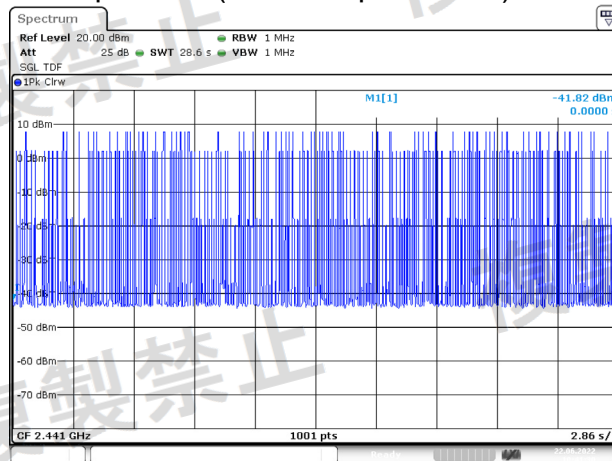


ホッピング周波数帯流時間

Time of occupancy hopping frequency



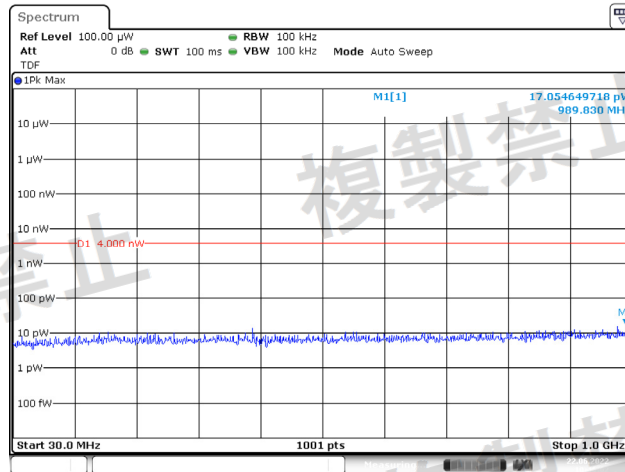
Sweep time = (0.4sec×Spread rate)



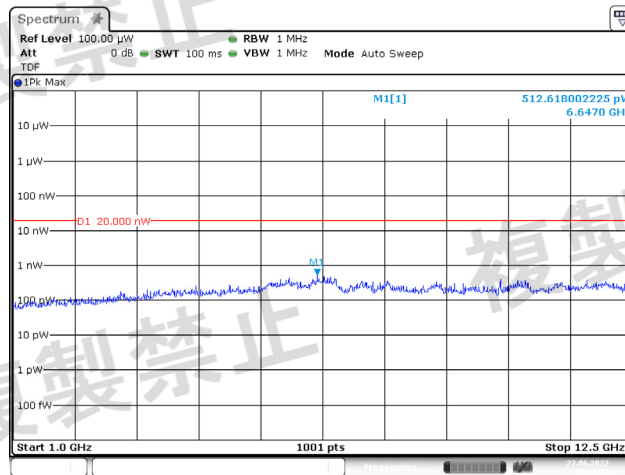
副次的に発する電波等の限度

Secondary emitted radio wave strength

30MHz-1GHz



1-12.5GHz



試驗結果

Test results

Environment of test room	Date of test	2022-06-16 ~ 2022-09-02
	Temperature	(23.5~26.5) °C
	Humidity	(55~ 65) %

Peak Antenna Gain	3.10	dBi
Declaration Output Power	0.1	mW/MHz
Declaration Output Power	-10.0000	dBm/MHz
E.I.R.P.	-6.9000	dBm/MHz
Input Power Voltage	12.3	VDC

Tested Circuit Insertion Loss		Refer to the insertion loss	
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.910	ms
	OFF TIME	0.860	ms
	Ratio	0.7719	
Packet Type (Mode)		3DH5	mode
Transmit Speed		3	MHz

Test category ;	2.4GHz Band Low-Power Data Communication System (BluetoothV4.0+EDR [8DPSK])
The reason why the tests are performed only at rated voltage;	When the input voltage to receiver RF circuit varies below $\pm 1\%$ as the input voltage from the external power supply to the receiver varies $\pm 10\%$ (excluding power supply)

Measurement Frequency	MHz	2402	2441	2480	Result	Limit	Note
Channel Number	Ch.	0	39	78	---	---	
Frequency Measurements	MHz	2402.001950	2441.006440	2480.010790	---	---	
Frequency Tolerance	ppm	0.81182	2.63826	4.35081	PASS	$\pm 50 \times 10^{-6}$ (50ppm)	
Occupied Bandwidth	MHz	---	78.921	---	PASS	83.5MHz or below	
Spread Bandwidth	MHz	---	71.628	---	PASS	500kHz or more	
RF Output Power	mW/MHz	---	0.064175	---	PASS	3mW/MHz or below	
RF Output Power Tolerance	%	---	-35.825050	---	PASS	+20 to -80%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	---	0.002233	---	PASS	2.5uW/MHz or below
		MHz	---	2381.100	---	---	
	2387 to 2400MHz	uW/MHz	---	9.726971	---	PASS	25uW/MHz or below
		MHz	---	2399.994	---	---	
	2483.5 to 2496.5MHz	uW/MHz	---	0.066953	---	PASS	25uW/MHz or below
		MHz	---	2483.649	---	---	
	2496.5 to 12500MHz	uW/MHz	---	0.002074	---	PASS	2.5uW/MHz or below
		MHz	---	2501.500	---	---	
Secondary Emitted Radio Wave Strength	30 to 1000MHz	nW	---	0.014938	---	PASS	4nW or below
		MHz	---	977.230	---	---	
	1000 to 12500MHz	nW	---	0.446736	---	PASS	20nW or below
		MHz	---	6934.000	---	---	
Time of occupancy hopping frequency	sec	---	0.002910	---	PASS	0.4sec or below	
	sec	---	0.285180	---	PASS	0.4sec or below	0.4sec*Spread rate
Spreading Factor	---	---	71.628000	---	PASS	5 or more	
Interference Prevention Function		Good			PASS		
Transmitting antenna absolute gain		N/A			N/A	*1	
Angular width of the main radiation of the transmitting antenna		N/A			N/A	*1	

*1 Measurement only if the E.I.R.P. exceeds 6.91dBm

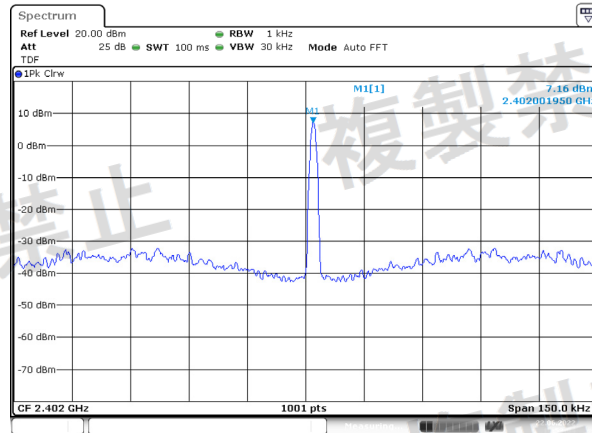
測定チャート

Test chart

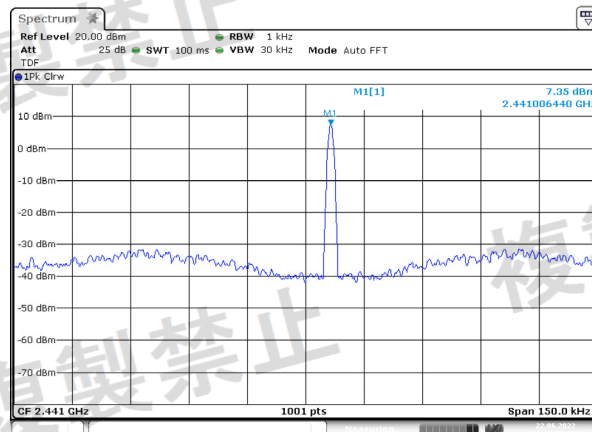
周波数の偏差

Frequency tolerance

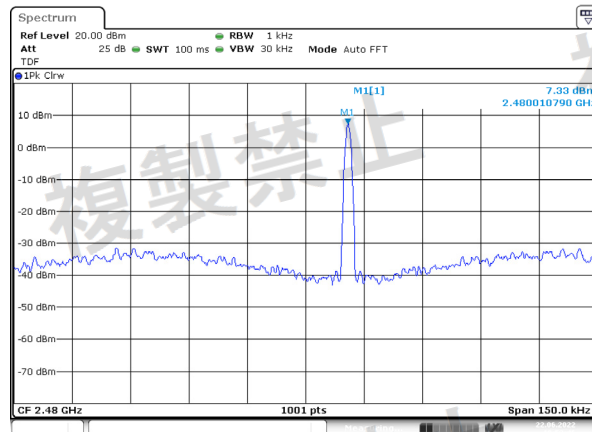
Ch.0: 2402MHz



Ch.39: 2441MHz

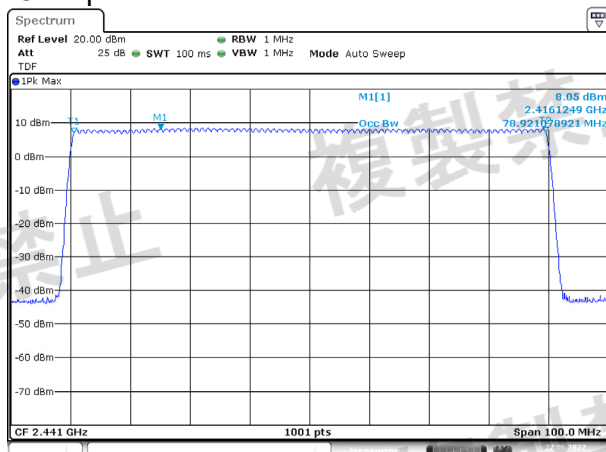


Ch.78: 2480MHz

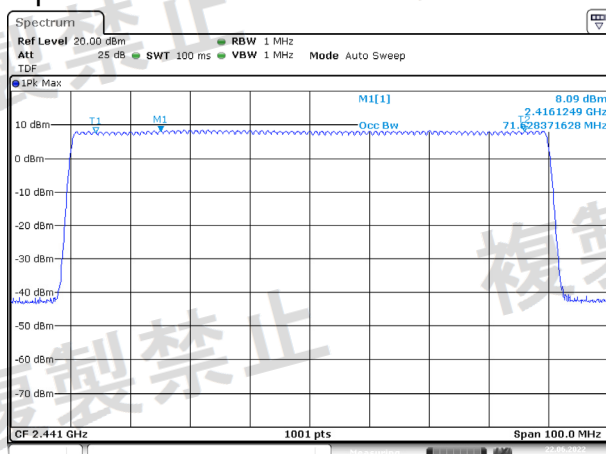


占有周波数帯幅及び拡散帯域幅
Occupied bandwidth / Spread bandwidth

Occupied bandwidth

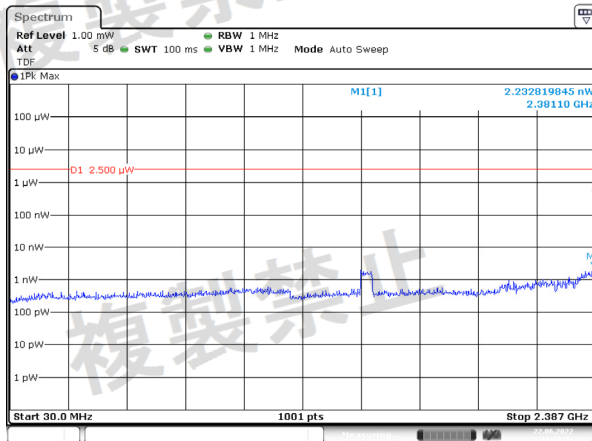


Spread bandwidth

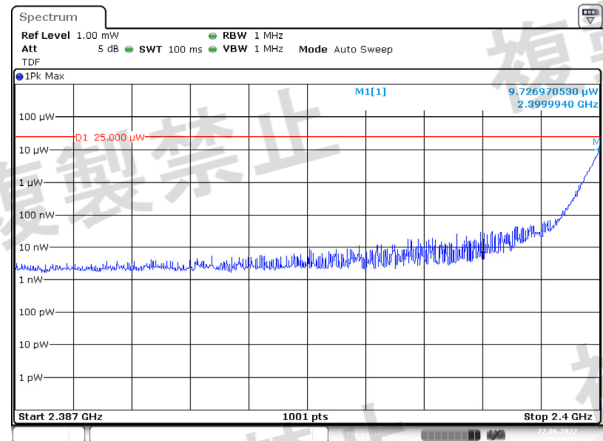


スプリアスの発射又は不要発射の強度
Unwanted(Spurious) emission strength

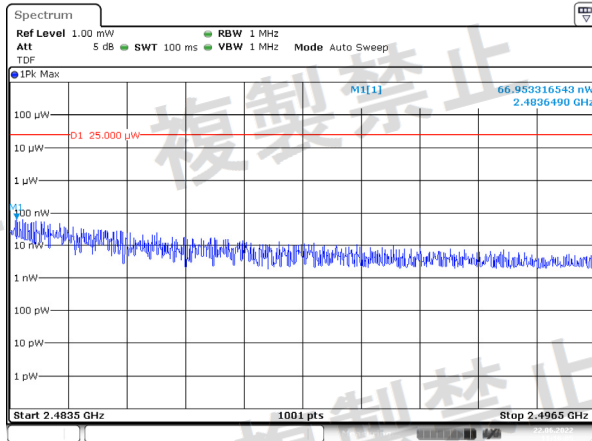
30-2387MHz



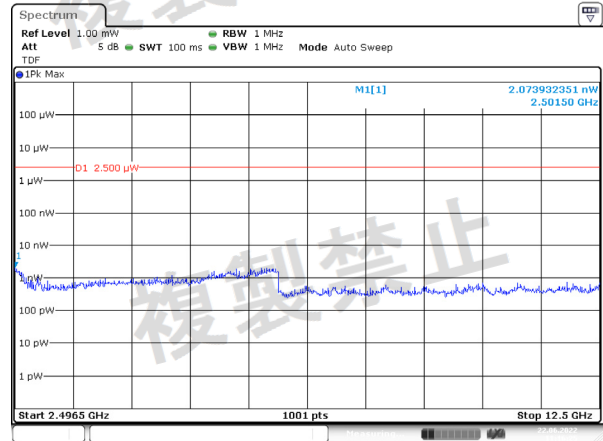
2387-2400MHz



2483.5-2496.5MHz

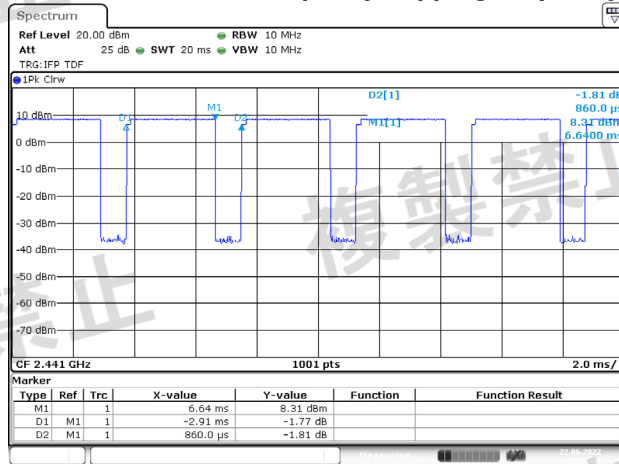


2496.5-12500MHz

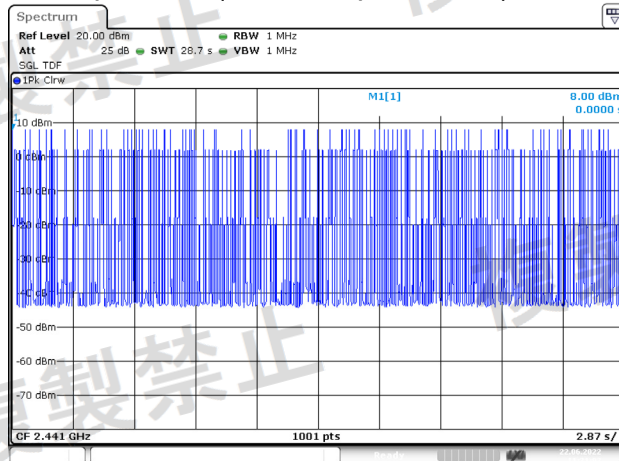


ホッピング周波数帯流時間

Time of occupancy hopping frequency



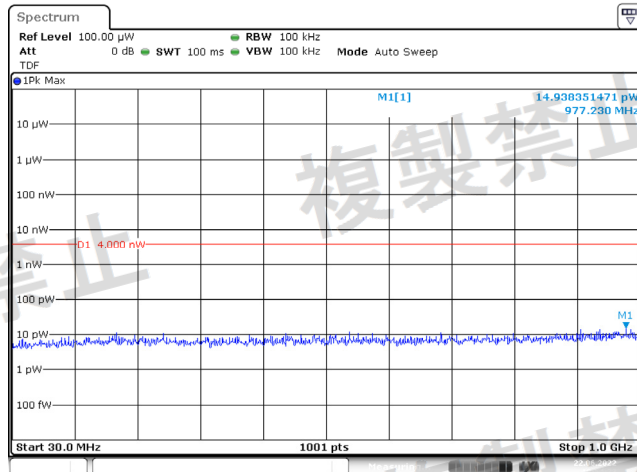
Sweep time = (0.4sec×Spread rate)



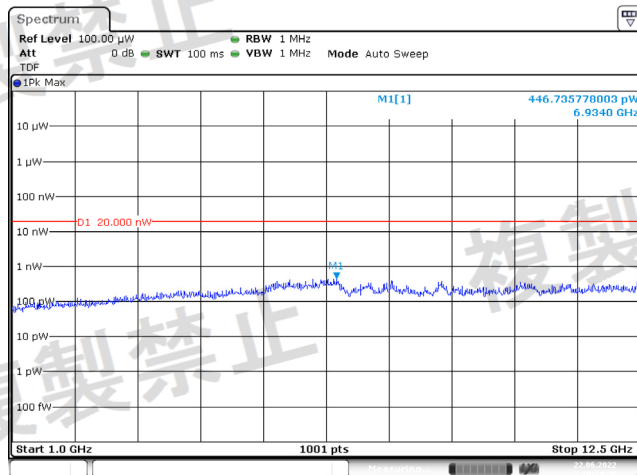
副次的に発する電波等の限度

Secondary emitted radio wave strength

30MHz-1GHz



1-12.5GHz



1. 試驗結果

Test results

S/N:

Environment of test room	Date of test	2022-06-16 ~ 2022-09-08
	Temperature	(23.5~26.5) °C
	Humidity	(55~ 65) %

Peak Antenna Gain	3.10	dBi
Declaration Output Power	0.5	mW/MHz
Declaration Output Power	-3.0103	dBm/MHz
E.I.R.P.	0.0897	dBm/MHz
Input Power Voltage	12.3	VDC

Tested Circuit Insertion Loss		Refer to the insertion loss	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.880	ms
	OFF TIME	0.880	ms
	Ratio	0.7660	
Packet Type (Mode)		DH5	mode
Transmit Speed		1	MHz

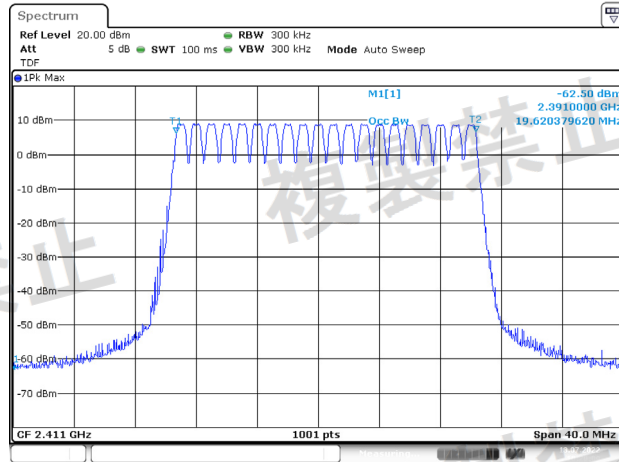
Test category ;	2.4GHz Band Low-Power Data Communication System (BluetoothV2.1+EDR [GFSK] *AFH)
-----------------	---

Measurement Frequency		MHz	2402 ~ 2421	2432 ~ 2451	2461 ~ 2480	Result	Limit	Note
Channel Number		Ch.	0~19	30~49	59~78	---	---	
Frequency Measurements		MHz	---	---	---	---	---	
Frequency Tolerance		ppm	---	---	---	---	±50×10 ⁻⁶ (50ppm)	
Occupied Bandwidth		MHz	19.62	19.58	19.58	PASS	83.5MHz or below	
Spread Bandwidth		MHz	18.102	17.902	18.022	PASS	500kHz or more	
RF Output Power		mW/MHz	0.423710	0.394361	0.412090	PASS	10mW/MHz or below	
RF Output Power Tolerance		%	-15.257984	-21.127828	-17.581944	PASS	+20 to -80%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	0.002717	0.002134	0.002397	PASS	2.5uW/MHz or below	
		MHz	1448.700	1458.100	1486.300	----		
	2387 to 2400MHz	uW/MHz	8.465116	0.002690	0.003145	PASS	25uW/MHz or below	
		MHz	2399.968	2395.591	2399.201	----		
	2483.5 to 2496.5MHz	uW/MHz	0.003654	0.002835	0.069704	PASS	25uW/MHz or below	
		MHz	2483.610	2486.260	2483.532	----		
	2496.5 to 12500MHz	uW/MHz	0.002773	0.002551	0.002478	PASS	2.5uW/MHz or below	
		MHz	2521.500	2591.500	2511.500	----		
Time of occupancy hopping frequency		sec	0.002880	0.002880	0.002880	PASS	0.4sec or below	
		sec	0.336960	0.368640	0.374400	PASS	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---	18.102000	17.902000	18.022000	PASS	5 or more	
Interference Prevention Function			PASS			PASS		
Transmitting antenna absolute gain			N/A			N/A	*1	
Angular width of the main radiation of the transmitting antenna			N/A			N/A	*1	

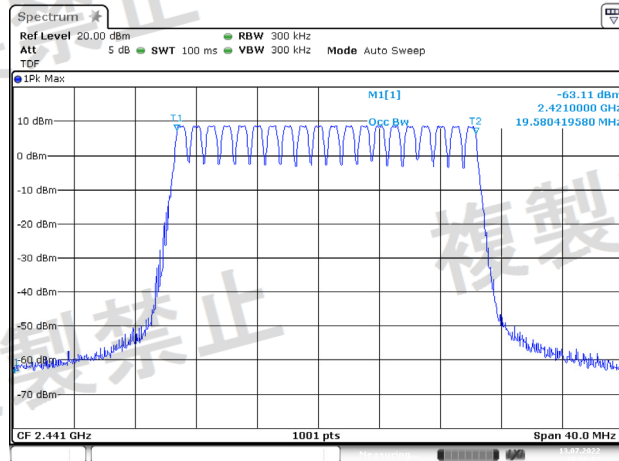
*1 Measurement only if the E.I.R.P. exceeds 6.91dBm

占有周波数帯幅及びび拡散帯域幅
Occupied bandwidth

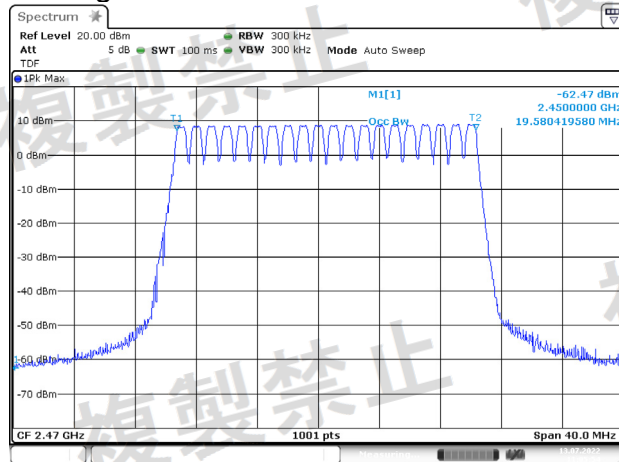
Ch:Low



Ch:Mid

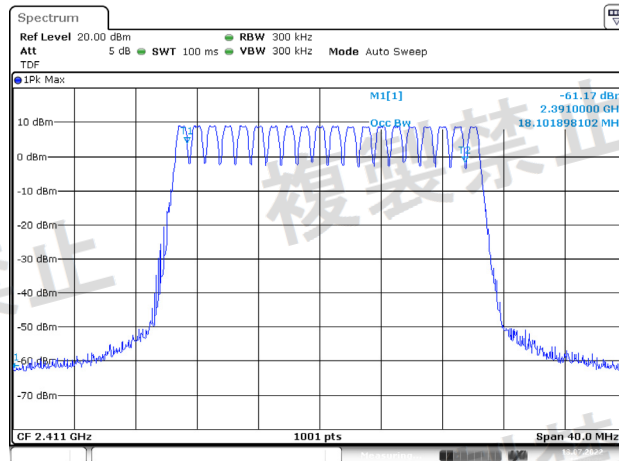


Ch:High

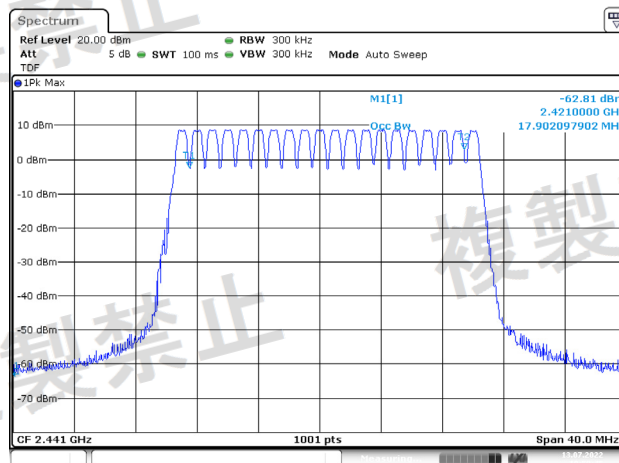


占有周波数帯幅及び拡散帯域幅
Spread bandwidth

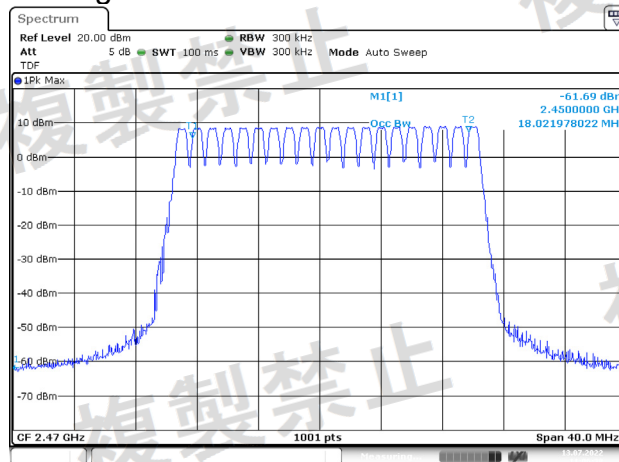
Ch:Low



Ch:Mid

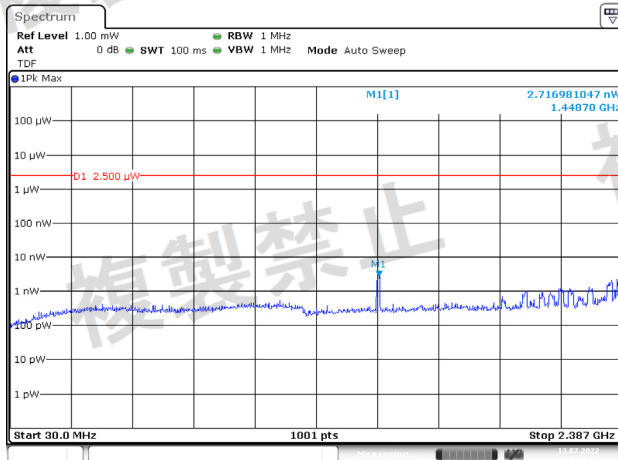


Ch:High

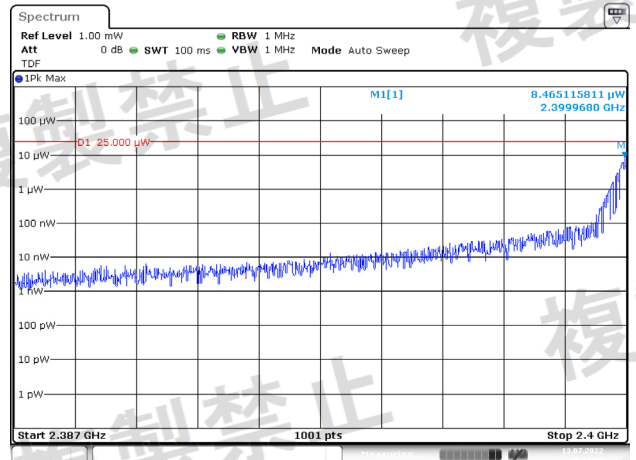


スプリアス発射又は不要発射の限度
Unwanted(Spurious) emission strength

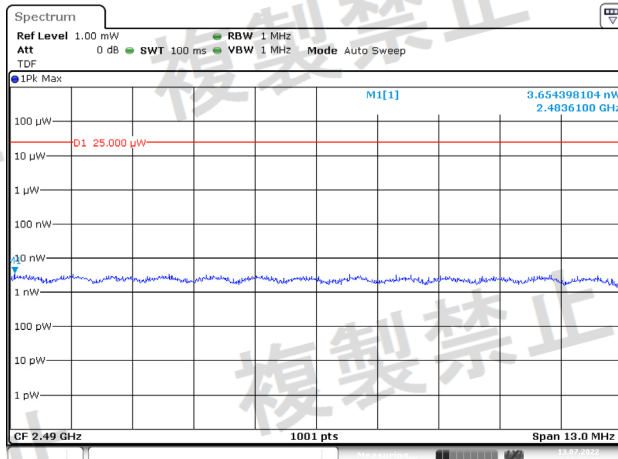
Ch:Low
30-2387MHz



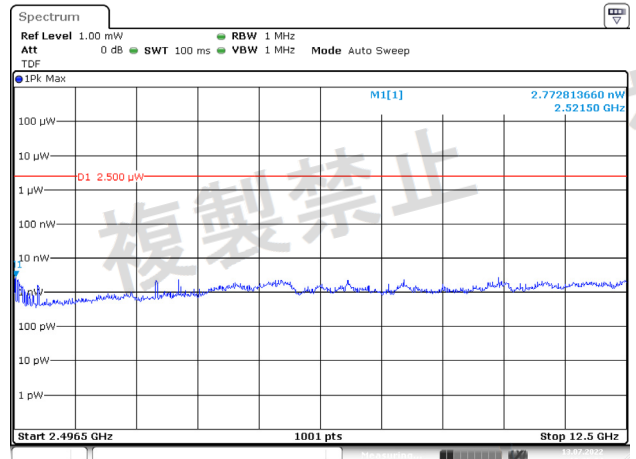
2387-2400MHz



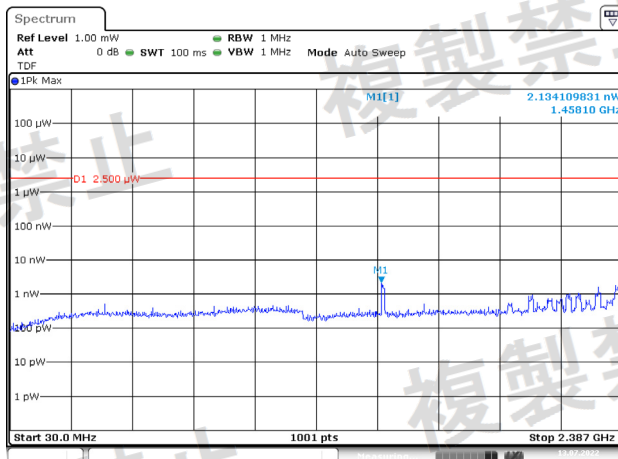
2483.5-2496.5MHz



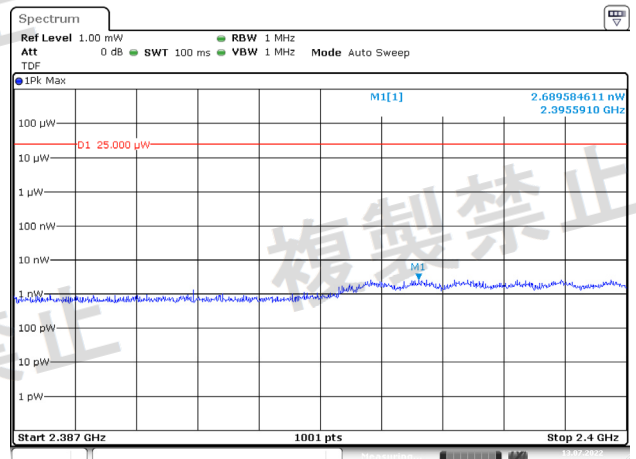
2496.5-12500MHz



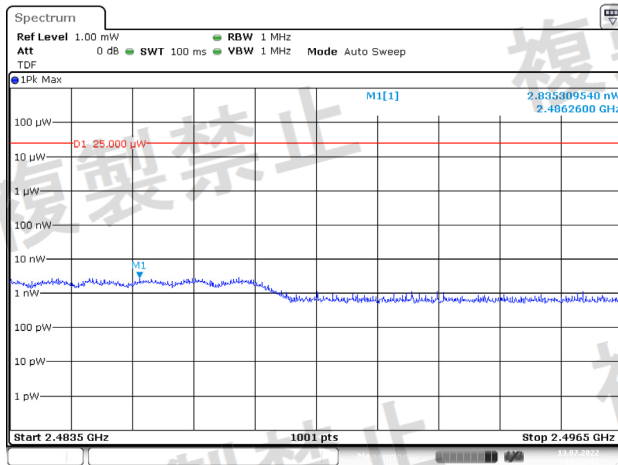
Ch:Mid
30-2387MHz



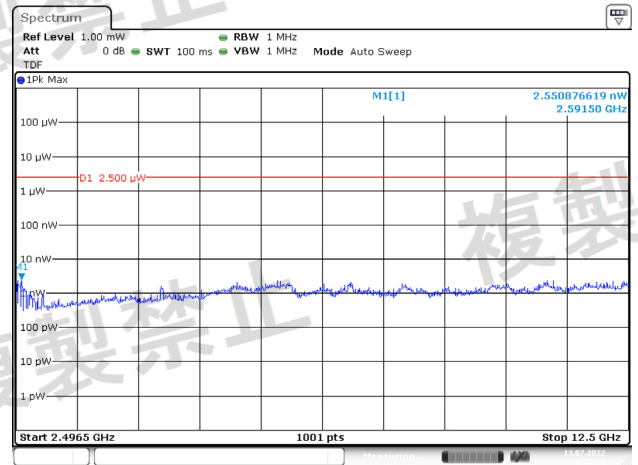
2387-2400MHz



2483.5-2496.5MHz

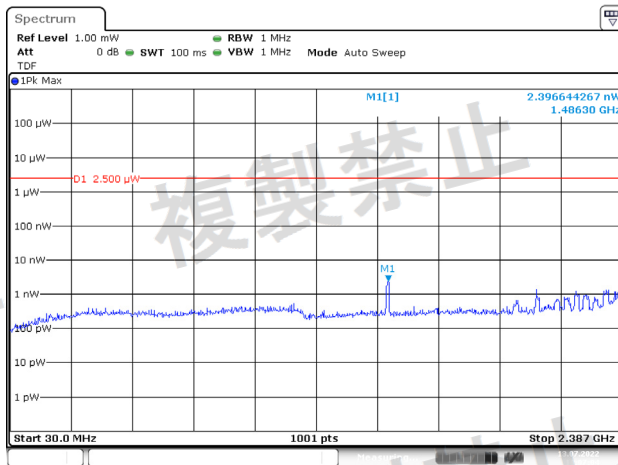


2496.5-12500MHz

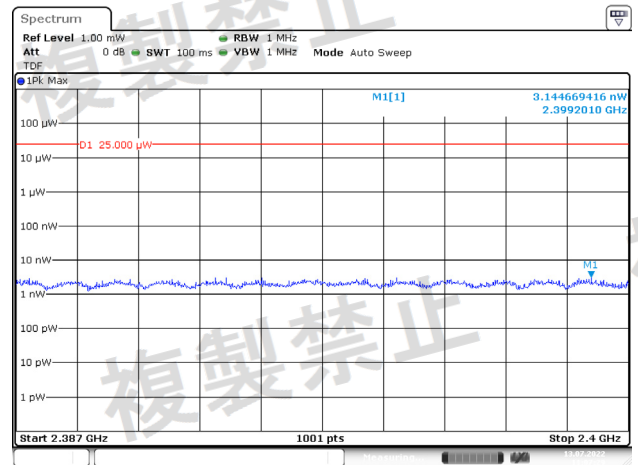


Ch:High

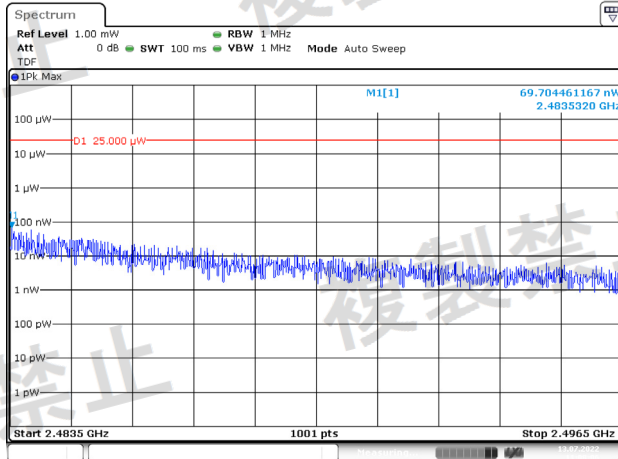
30-2387MHz



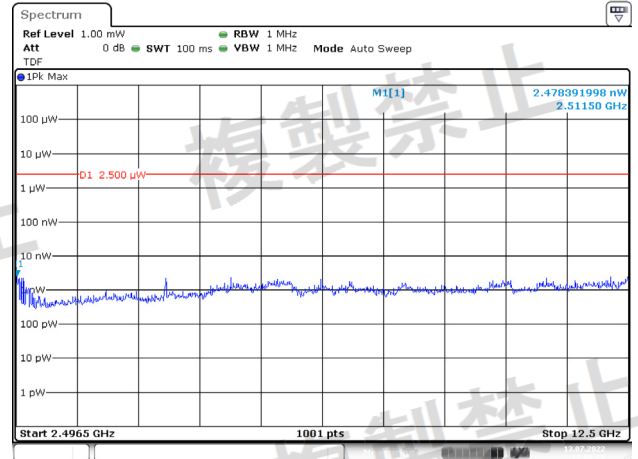
2387-2400MHz



2483.5-2496.5MHz



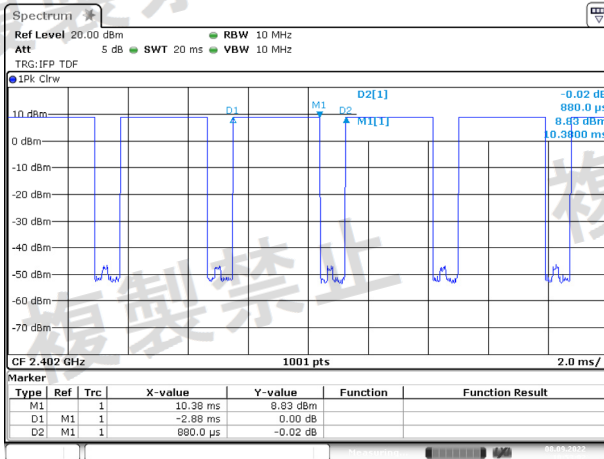
2496.5-12500MHz



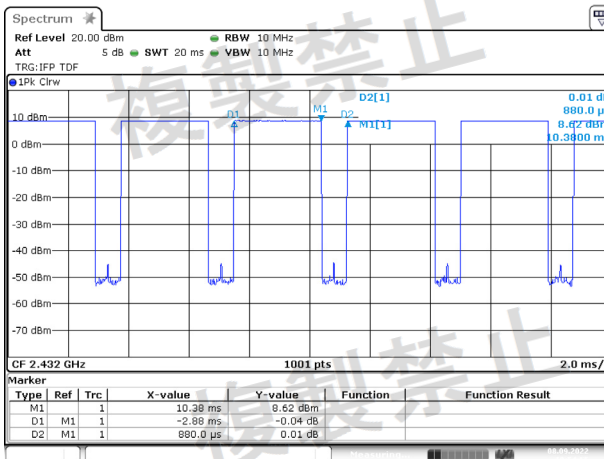
ホッピング周波数帯流時間

Time of occupancy hopping frequency

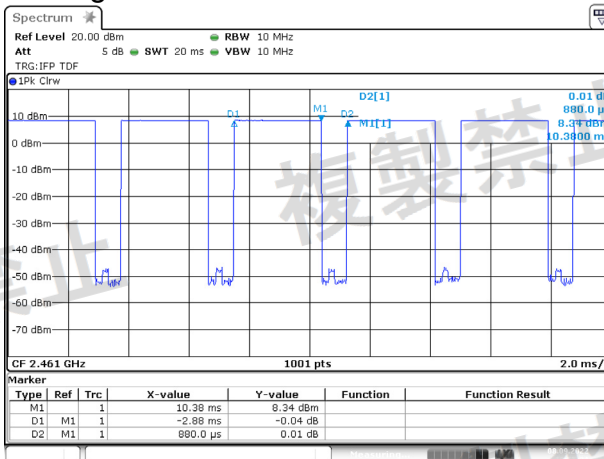
Ch:Low



Ch:Mid

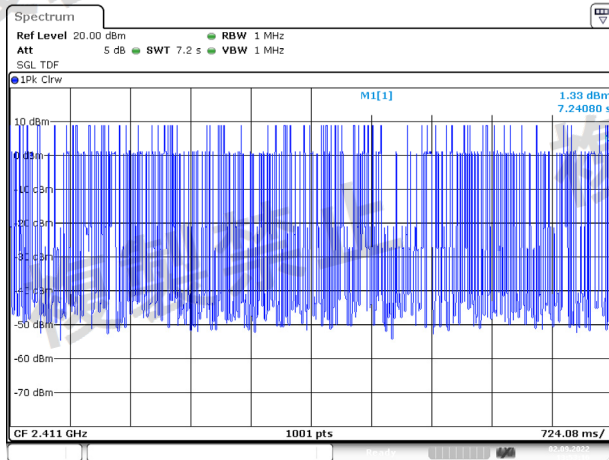


Ch:High

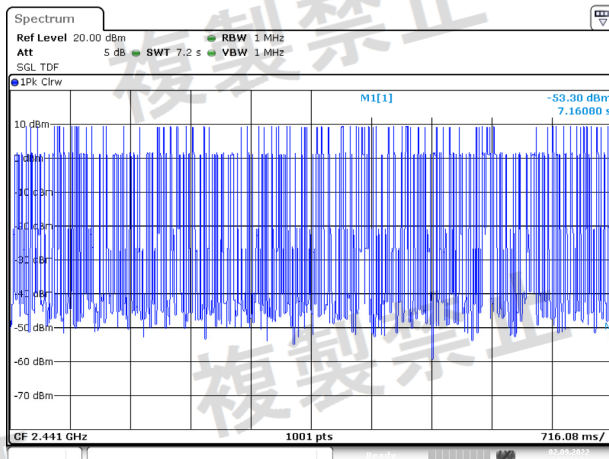


Sweep time = (0.4sec×Spread rate)

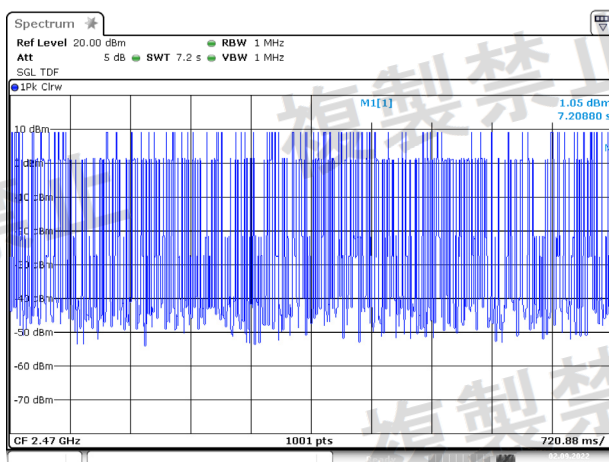
Ch:Low



Ch:Mid



Ch:High



試驗結果

Test results

S/N:

Environment of test room	Date of test	2022-06-16 ~ 2022-09-08
	Temperature	(23.5~26.5) °C
	Humidity	(55~ 65) %

Peak Antenna Gain	3.10	dBi
Declaration Output Power	0.5	mW/MHz
Declaration Output Power	-3.0103	dBm/MHz
E.I.R.P.	0.0897	dBm/MHz
Input Power Voltage	12.3	VDC

Tested Circuit Insertion Loss		Refer to the insertion loss	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.880	ms
	OFF TIME	0.880	ms
	Ratio	0.7660	
Packet Type (Mode)		2DH5	mode
Transmit Speed		2	MHz

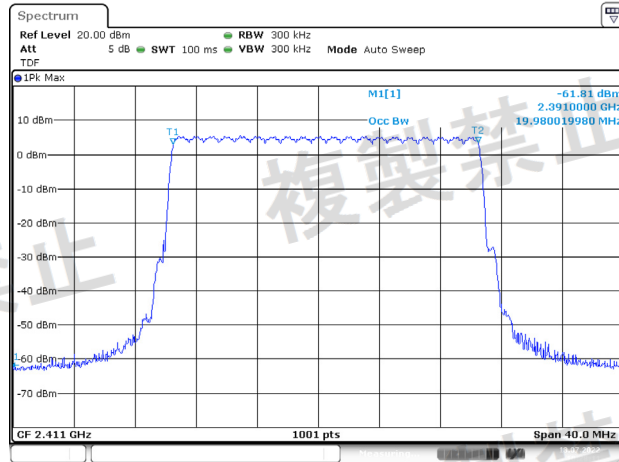
Test category ; 2.4GHz Band Low-Power Data Communication System (BluetoothV2.1+EDR [4DQPSK] *AFH)

Measurement Frequency		MHz	2402 ~ 2421	2432 ~ 2451	2461 ~ 2480	Result	Limit	Note
Channel Number		Ch.	0~19	30~49	59~78	---	---	
Frequency Measurements		MHz	---	---	---	---	---	
Frequency Tolerance		ppm	---	---	---	---	±50×10 ⁻⁶ (50ppm)	
Occupied Bandwidth		MHz	19.98	19.98	19.98	PASS	83.5MHz or below	
Spread Bandwidth		MHz	18.182	18.142	18.062	PASS	500kHz or more	
RF Output Power		mW/MHz	0.181198	0.171439	0.199081	PASS	10mW/MHz or below	
RF Output Power Tolerance		%	-63.760375	-65.712155	-60.183827	PASS	+20 to -80%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	0.001975	0.001776	0.001869	PASS	2.5uW/MHz or below	
		MHz	1453.400	2374.000	1486.300	-----		
	2387 to 2400MHz	uW/MHz	5.815885	0.001951	0.002771	PASS	25uW/MHz or below	
		MHz	2399.994	2394.318	2390.305	-----		
	2483.5 to 2496.5MHz	uW/MHz	0.003818	0.002205	0.044760	PASS	25uW/MHz or below	
		MHz	2483.727	2486.364	2483.857	-----		
	2496.5 to 12500MHz	uW/MHz	0.002962	0.002386	0.001947	PASS	2.5uW/MHz or below	
		MHz	2521.500	2591.500	2621.500	-----		
Time of occupancy hopping frequency		sec	0.002880	0.002880	0.002880	PASS	0.4sec or below	
		sec	0.371520	0.374400	0.368640	PASS	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---	18.182000	18.142000	18.062000	PASS	5 or more	
Interference Prevention Function			PASS			PASS		
Transmitting antenna absolute gain			N/A			N/A	*1	
Angular width of the main radiation of the transmitting antenna			N/A			N/A	*1	

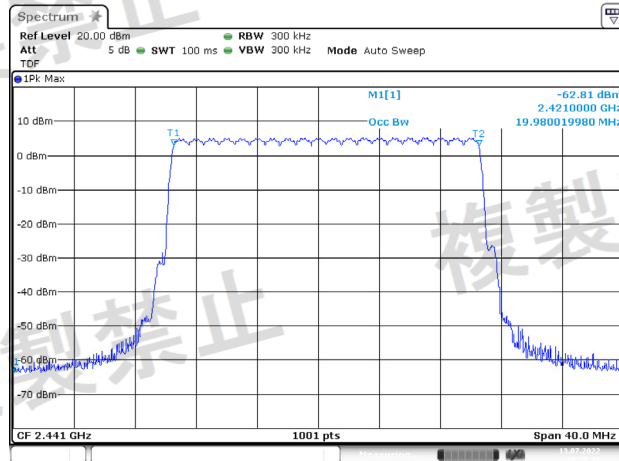
*1 Measurement only if the E.I.R.P. exceeds 6.91dBm

占有周波数帯幅及び拡散帯域幅
Occupied bandwidth

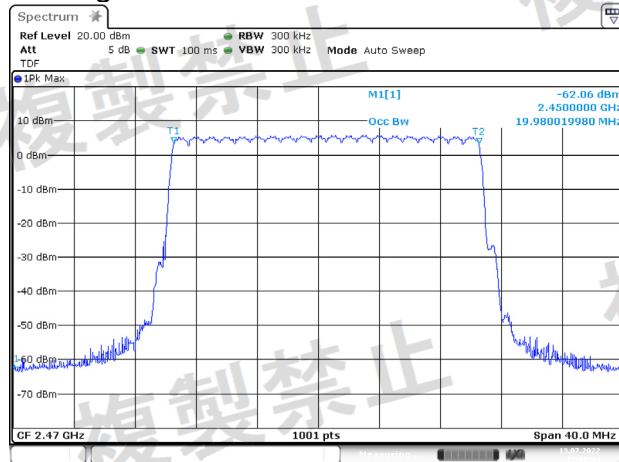
Ch:Low



Ch:Mid

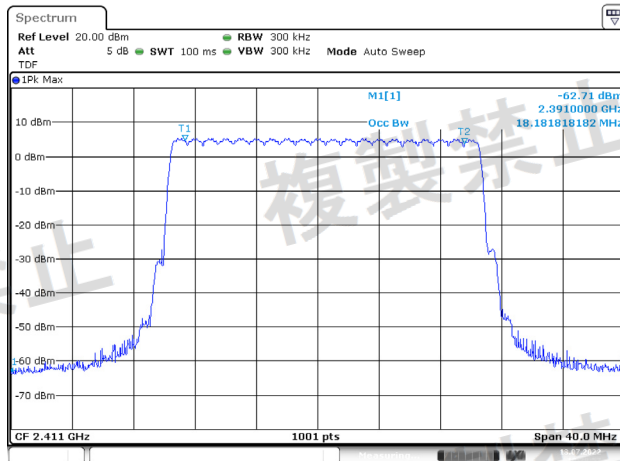


Ch:High

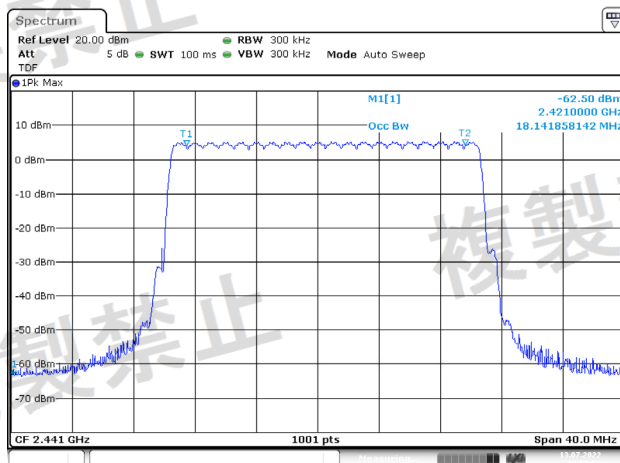


占有周波数帯幅及び拡散帯域幅
Spread bandwidth

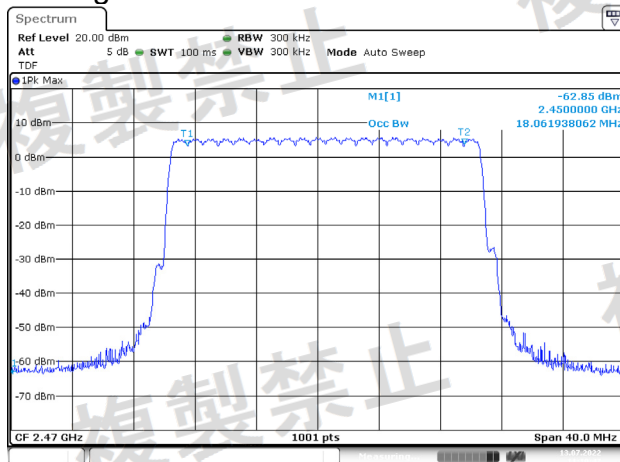
Ch:Low



Ch:Mid

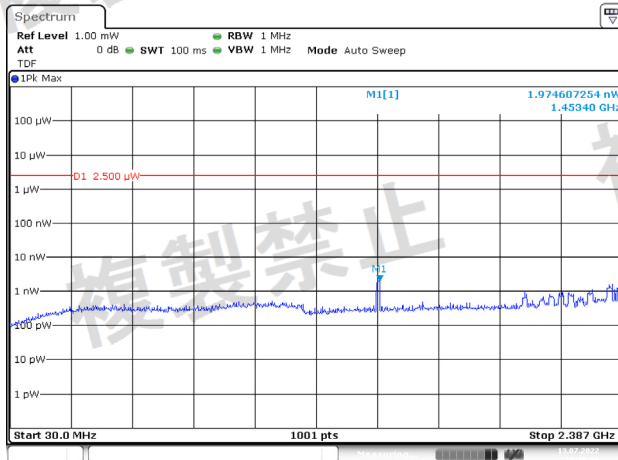


Ch:High

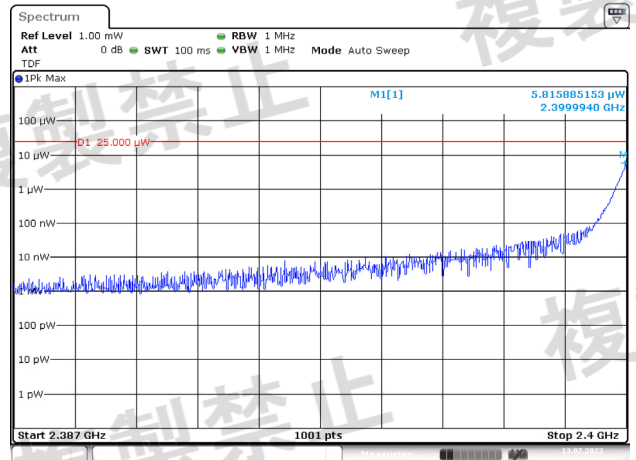


スプリアス発射又は不要発射の限度
Unwanted(Spurious) emission strength

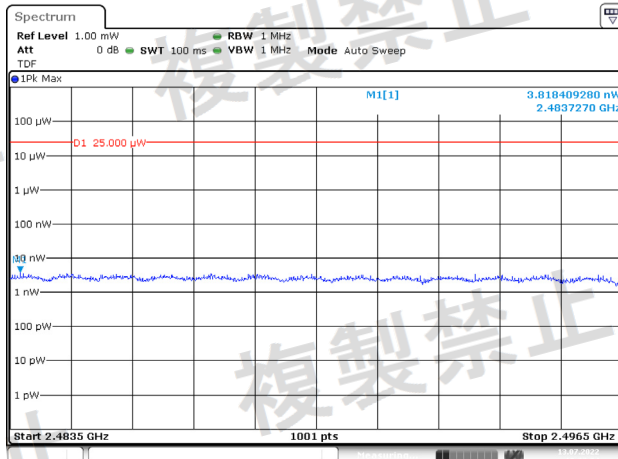
Ch:Low
30-2387MHz



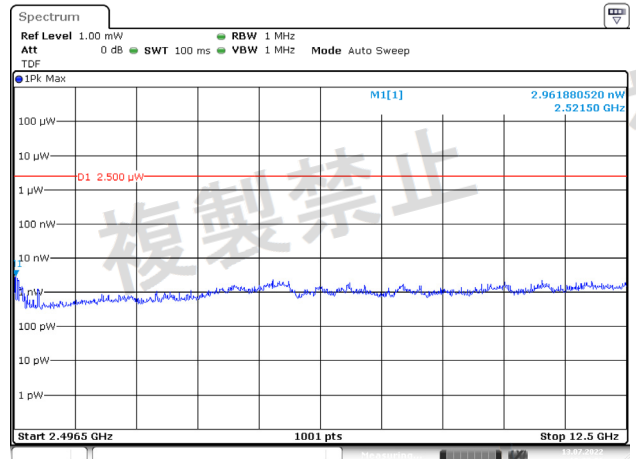
2387-2400MHz



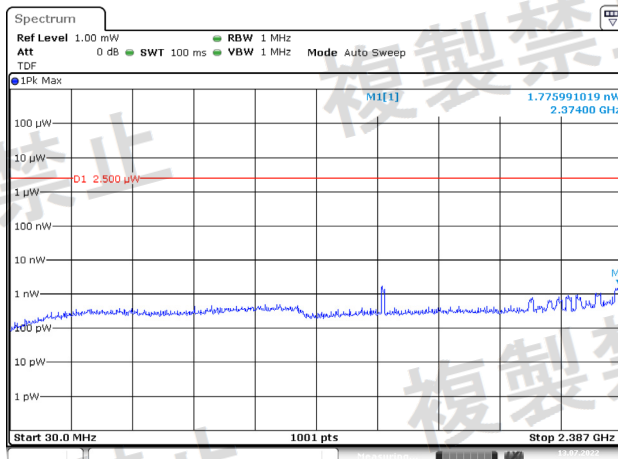
2483.5-2496.5MHz



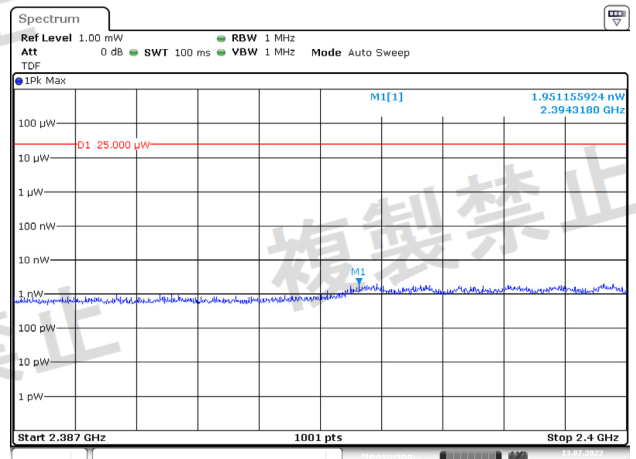
2496.5-12500MHz



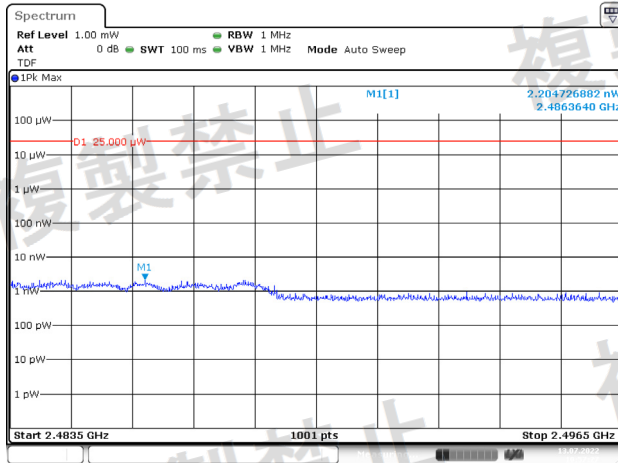
Ch:Mid
30-2387MHz



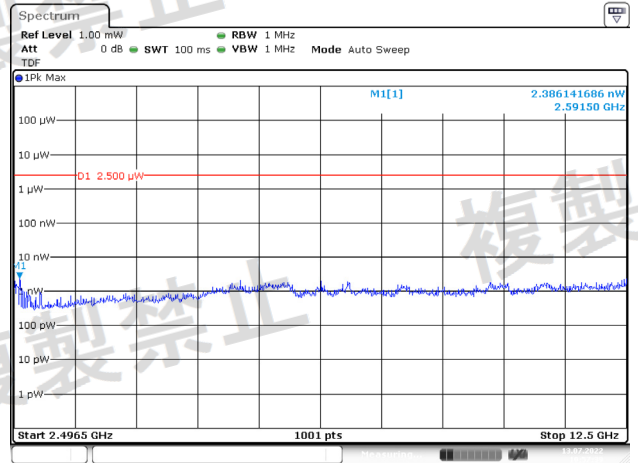
2387-2400MHz



2483.5-2496.5MHz

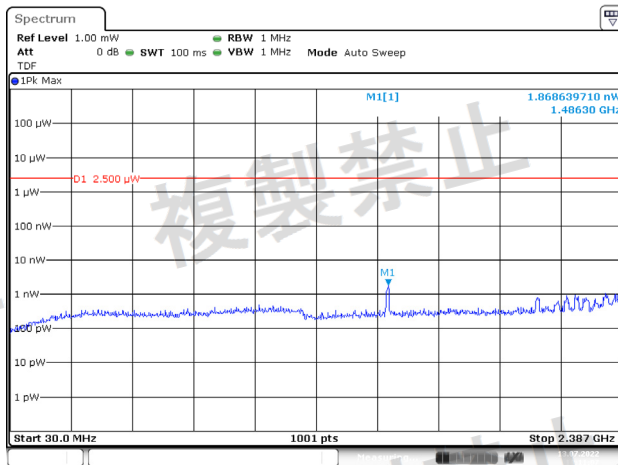


2496.5-12500MHz

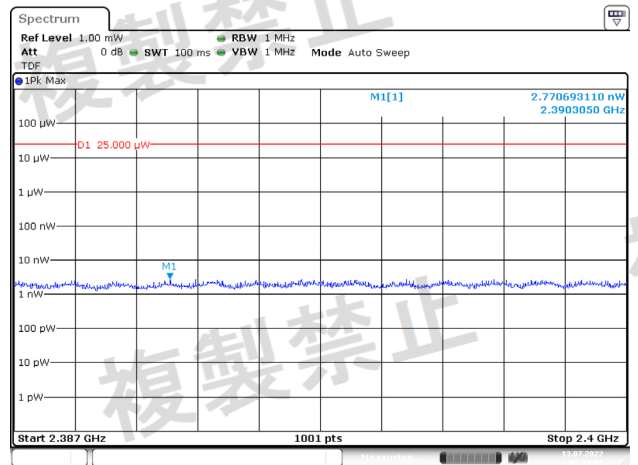


Ch:High

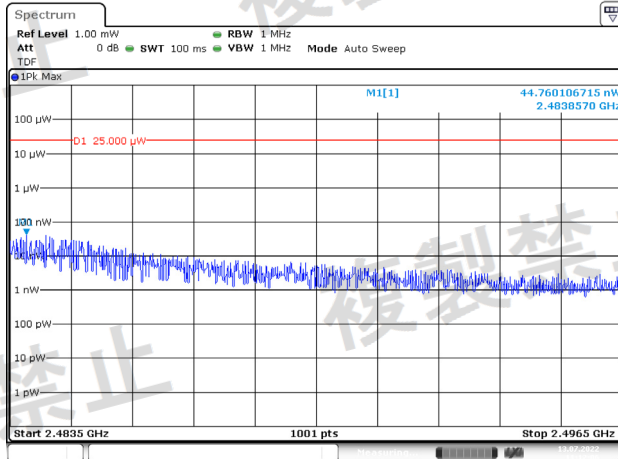
30-2387MHz



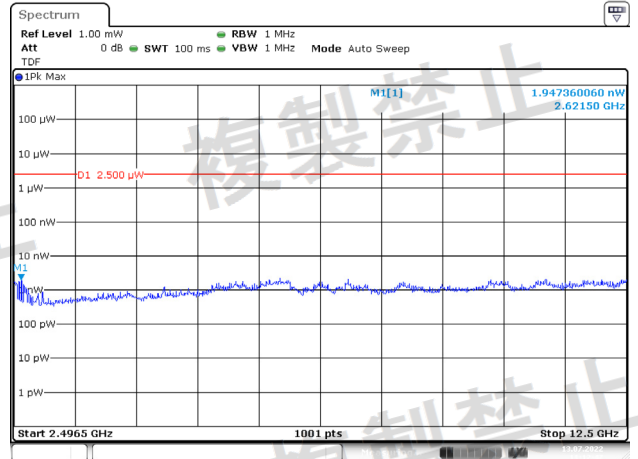
2387-2400MHz



2483.5-2496.5MHz



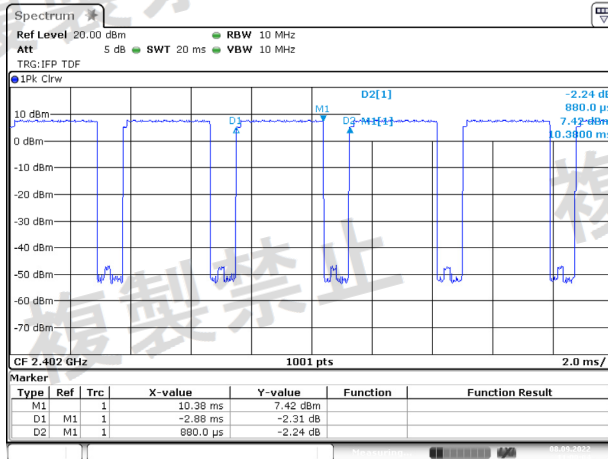
2496.5-12500MHz



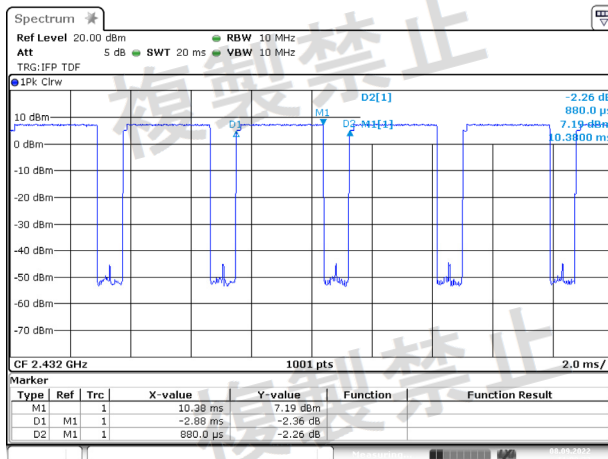
ホッピング周波数帯流時間

Time of occupancy hopping frequency

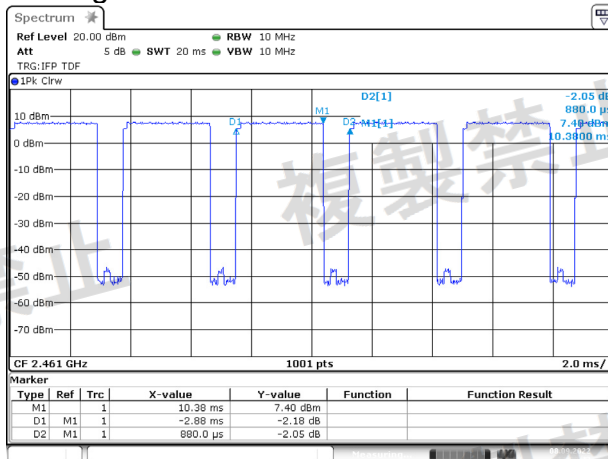
Ch:Low



Ch:Mid

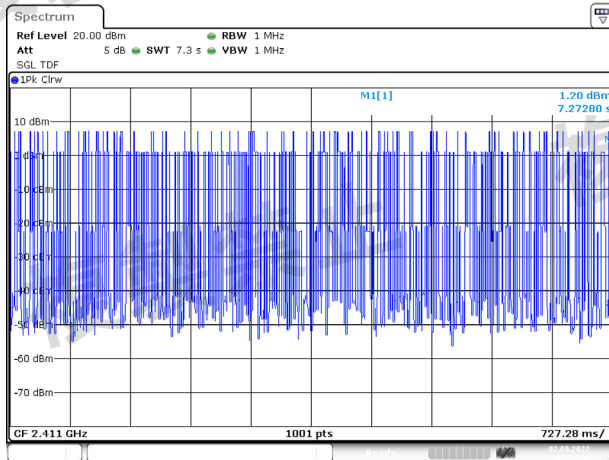


Ch:High

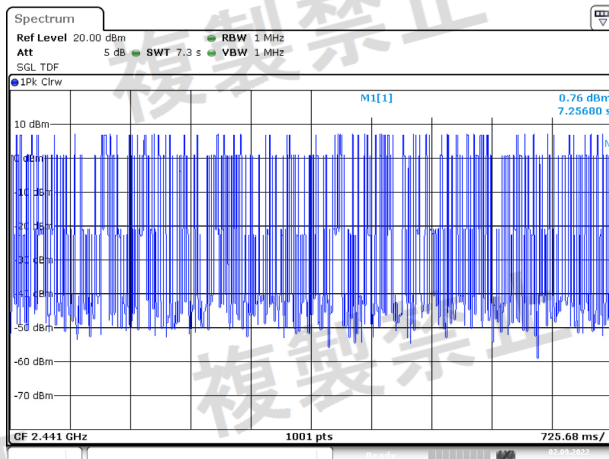


Sweep time = (0.4sec×Spread rate)

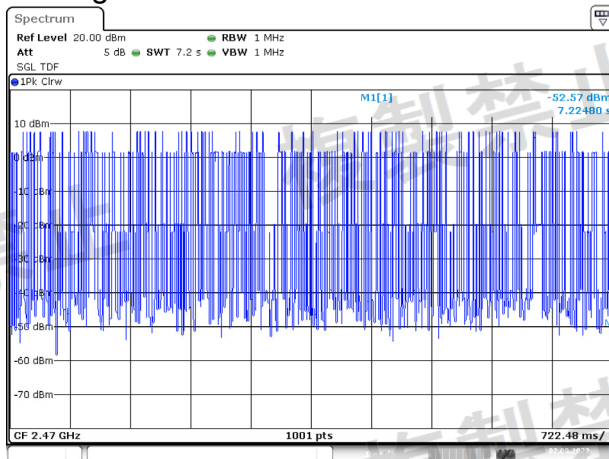
Ch:Low



Ch:Mid



Ch:High



試驗結果

Test results

S/N:

Environment of test room	Date of test	2022-06-16 ~ 2022-09-08
	Temperature	(23.5~26.5) °C
	Humidity	(55~ 65) %

Peak Antenna Gain	3.10	dBi
Declaration Output Power	0.5	mW/MHz
Declaration Output Power	-3.0103	dBm/MHz
E.I.R.P.	0.0897	dBm/MHz
Input Power Voltage	12.3	VDC

Tested Circit Insertion Loss		Refer to the insertion loss	dB
Frequency equal to the Transmission rate		1	MHz
Transmission Time	ON TIME	2.880	ms
	OFF TIME	0.880	ms
	Ratio	0.7660	
Packet Type (Mode)		3DH5	mode
Transmit Speed		3	MHz

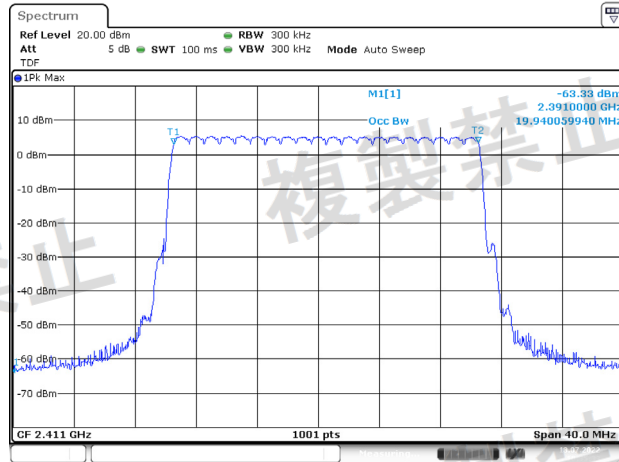
Test category ;	2.4GHz Band Low-Power Data Communication System (BluetoothV4.0+EDR [8DPSK])
-----------------	---

Measurement Frequency		MHz	2402 ~ 2421	2432 ~ 2451	2461 ~ 2480	Result	Limit	Note
Channel Number		Ch.	0~19	30~49	59~78	---	---	
Frequency Measurements		MHz	---	---	---	---	---	
Frequency Tolerance		ppm	---	---	---	---	±50×10 ⁻⁶ (50ppm)	
Occupied Bandwidth		MHz	19.94	19.98	19.98	PASS	83.5MHz or below	
Spread Bandwidth		MHz	18.182	18.142	18.062	PASS	500kHz or more	
RF Output Power		mW/MHz	0.180781	0.171834	0.198623	PASS	10mW/MHz or below	
RF Output Power Tolerance		%	-63.843723	-65.633113	-60.275402	PASS	+20 to -80%	
Unwanted (Spurious) Emission Strength	30 to 2387MHz	uW/MHz	0.002049	0.001488	0.001773	PASS	2.5uW/MHz or below	
		MHz	1448.700	1460.400	1488.700	-----		
	2387 to 2400MHz	uW/MHz	5.877738	0.002006	0.002726	PASS	25uW/MHz or below	
		MHz	2399.994	2394.487	2392.201	-----		
	2483.5 to 2496.5MHz	uW/MHz	0.003265	0.002505	0.047706	PASS	25uW/MHz or below	
		MHz	2489.545	2486.623	2483.584	-----		
	2496.5 to 12500MHz	uW/MHz	0.002696	0.002483	0.002389	PASS	2.5uW/MHz or below	
		MHz	2511.500	2511.500	2631.500	-----		
Time of occupancy hopping frequency		sec	0.002880	0.002880	0.002880	PASS	0.4sec or below	
		sec	0.377280	0.383040	0.371520	PASS	0.4sec or below	0.4sec×Spread rate
Spreading Factor		---	18.182000	18.142000	18.062000	PASS	5 or more	
Interference Prevention Function			PASS			PASS		
Transmitting antenna absolute gain			N/A			N/A	*1	
Angular width of the main radiation of the transmitting antenna			N/A			N/A	*1	

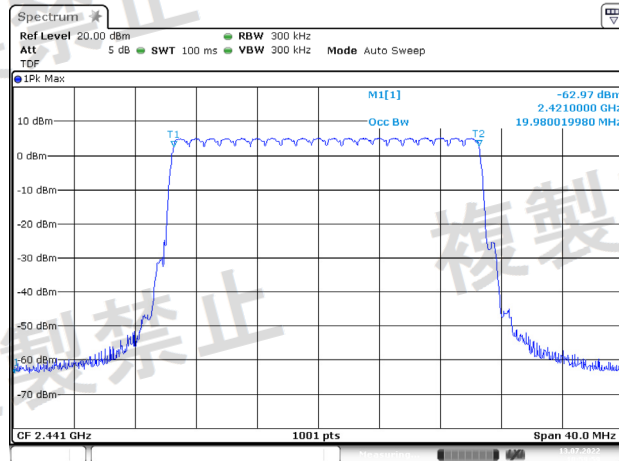
*1 Measurement only if the E.I.R.P. exceeds 6.91dBm

占有周波数帯幅及び拡散帯域幅
Occupied bandwidth

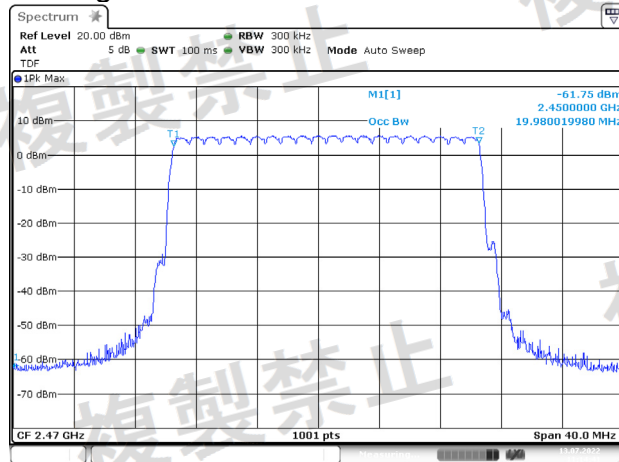
Ch:Low



Ch:Mid

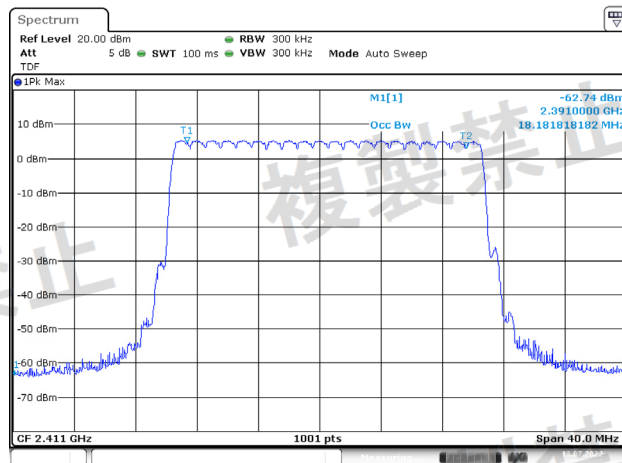


Ch:High

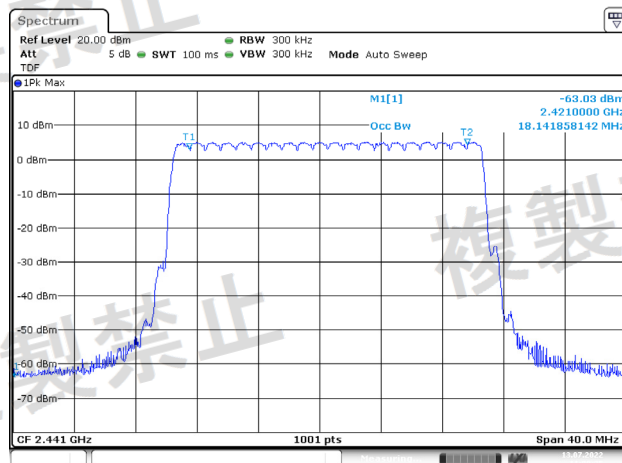


占有周波数帯幅及び拡散帯域幅
Spread bandwidth

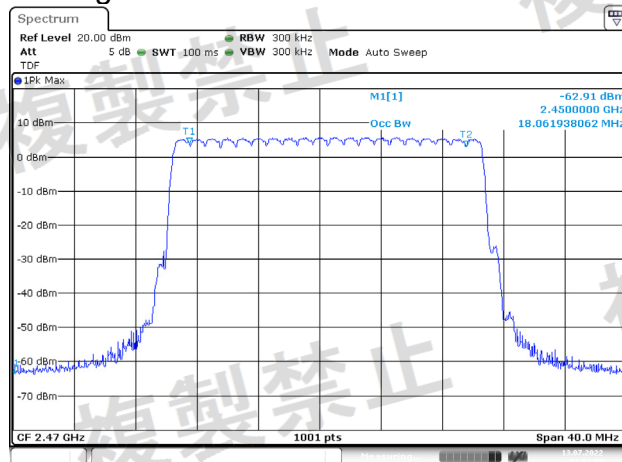
Ch:Low



Ch:Mid

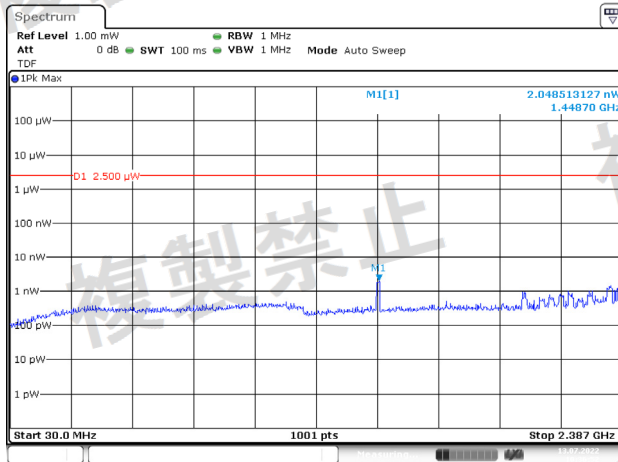


Ch:High

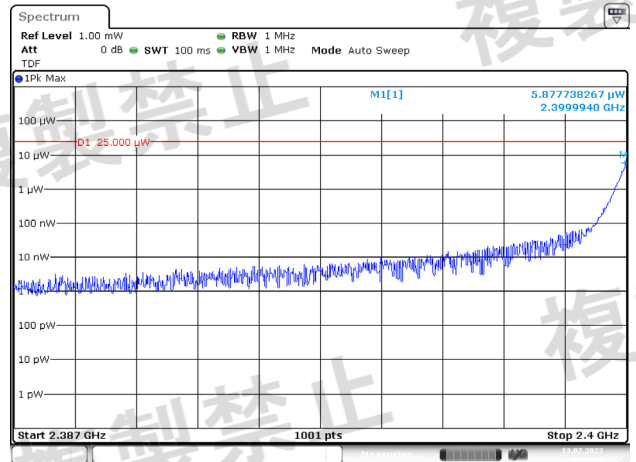


スプリアス発射又は不要発射の限度
Unwanted(Spurious) emission strength

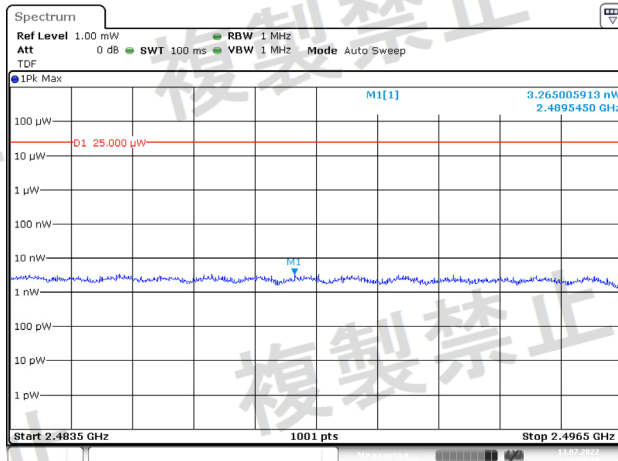
Ch:Low
30-2387MHz



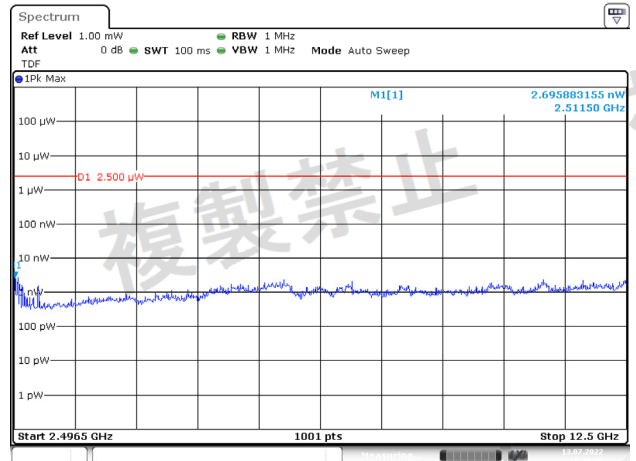
2387-2400MHz



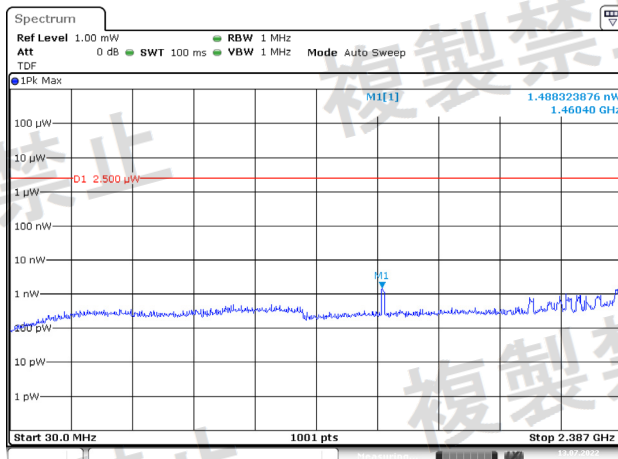
2483.5-2496.5MHz



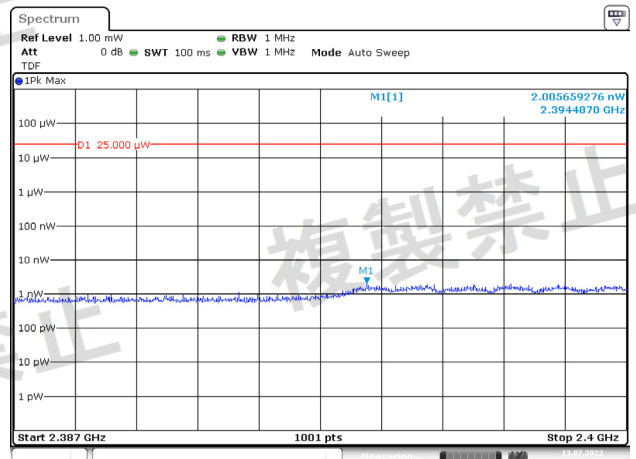
2496.5-12500MHz



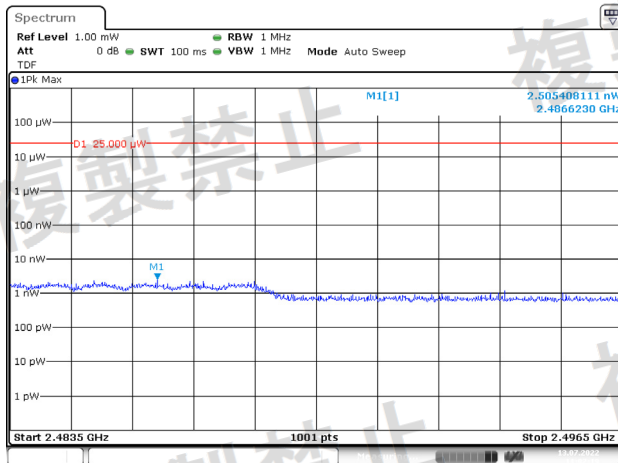
Ch:Mid
30-2387MHz



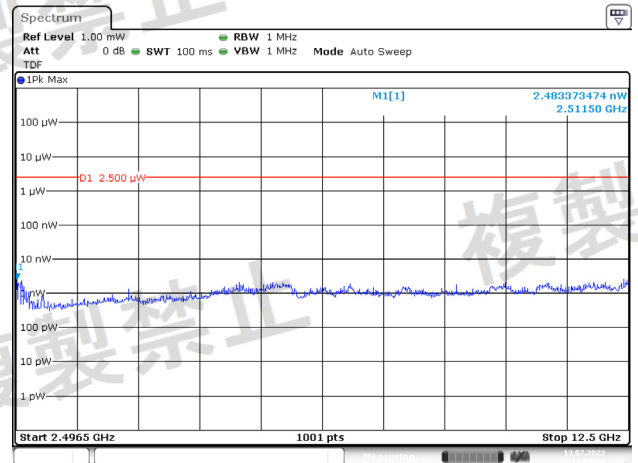
2387-2400MHz



2483.5-2496.5MHz

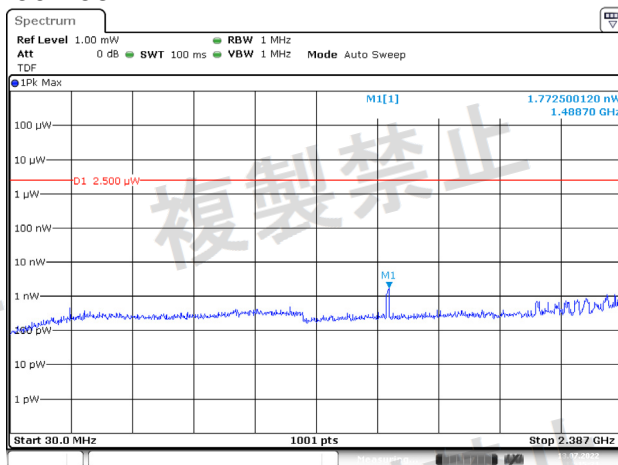


2496.5-12500MHz

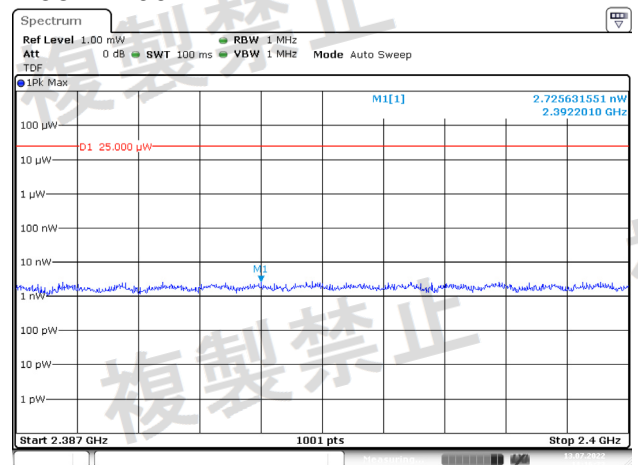


Ch:High

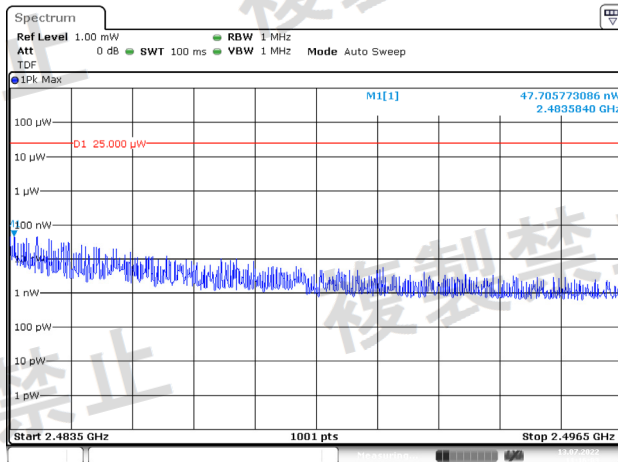
30-2387MHz



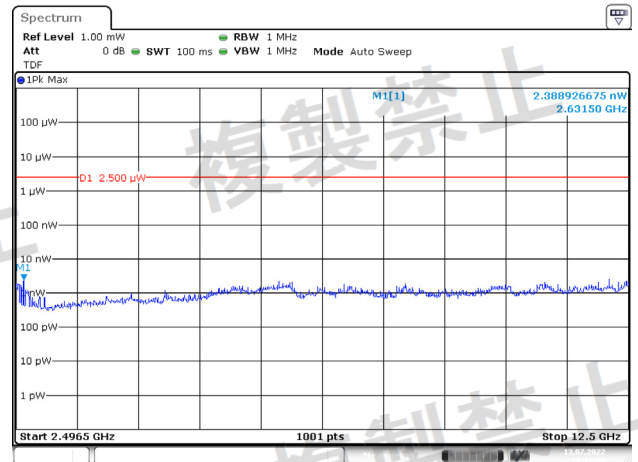
2387-2400MHz



2483.5-2496.5MHz



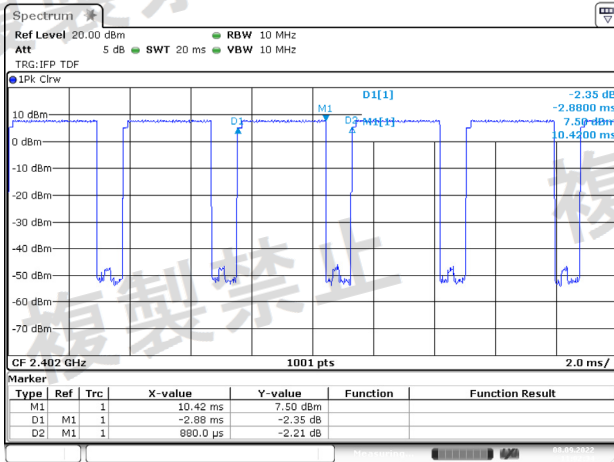
2496.5-12500MHz



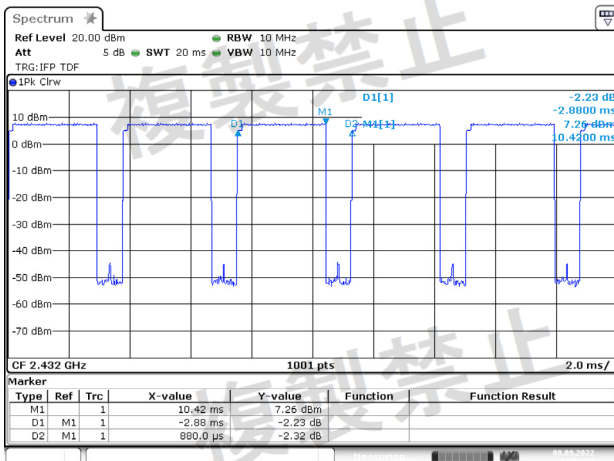
ホッピング周波数帯流時間

Time of occupancy hopping frequency

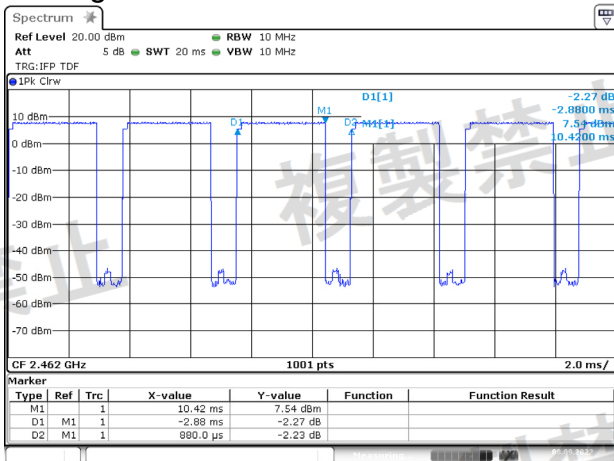
Ch:Low



Ch:Mid

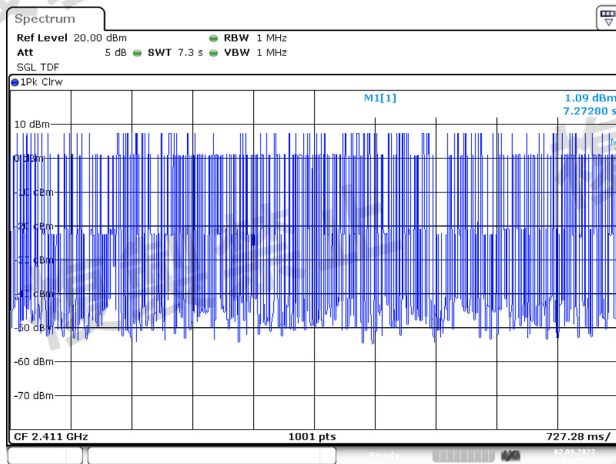


Ch:High

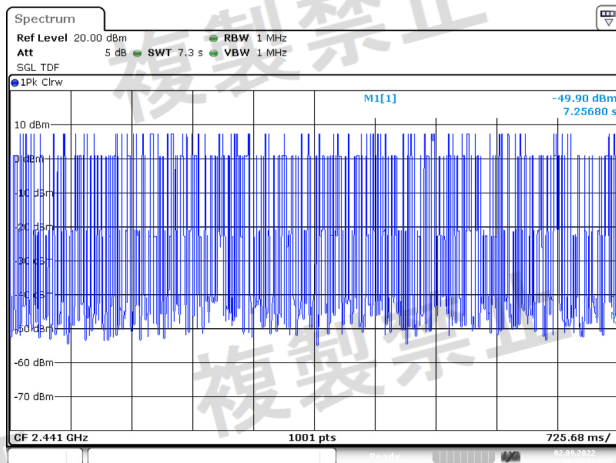


Sweep time = (0.4sec×Spread rate)

Ch:Low



Ch:Mid



Ch:High

