

JAPAN MIC
TEST REPORT
For

SZ DJI TECHNOLOGY CO., LTD

14th floor, West Wing, Skyworth Semiconductor Design Building NO.18 Gaoxin South 4th Ave,
Nanshan, Shenzhen, Guangdong, China

Model: 3WWDZ-15.1B

This Report Concerns: <input checked="" type="checkbox"/> Original Report		Equipment Type: AGRAS T20	
Report Number:		RDG191203008-07B	
Report Date:		2019-12-13	
Reviewed By:		Dean Lau RF Supervisor	
Test Laboratory:		Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn	

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

Equipment Name		AGRAS T20
Tested Model Number		3WWDZ-15.1B
SDR Technical Parameters	Support Technical	1.4M Mode
	Modulation Type	OFDM
	Emission Type	D1D, X7W
	Frequency Range	2403.5-2477.5MHz
	Output Power	0.3mW/MHz for Chain 0, 0.4mW/MHz for Chain 1
Antenna Gain		4 dBi
Nominal Power Supply:		DC 51.8V from battery
Voltage Range		DC 46.62V to 56.98V
Serial Number		RDG191203008-RF-S1 (Assigned by BACL, Dongguan)
Received Date		2019.12.05
EUT Received Status:		Good

Objective

The objective of the manufacturer is to demonstrate compliance with Radio Law of Japan item 19 of Article 2 Paragraph 1

Test Methodology

All measurements contained in this report were conducted with technical regulations of the Radio Law of Japan.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “Δ”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

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This report is valid only with a valid digital signature. The digital signature may be available only under the e software above version 7.0.

This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk “★”.

EUT TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in engineering mode which provide by manufacturer. The EUT has 2 antennas, the system configure 1T1R depending on better performance by the system automatically recognizes.

For 1.4M mode, 38 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2403.5	20	2441.5
2	2405.5
...
...
...	...	37	2475.5
19	2439.5	38	2477.5

3channels were tested: 2403.5MHz, 2441.5MHz and 2477.5MHz

The extreme voltage test conditions which were declared by the manufacturer and the normal conditions are as below:

NV: Normal Voltage 51.8V_{DC}

LV: Low Voltage 46.62V_{DC}

HV: High Voltage 56.98V_{DC}

EUT Exercise Software

For 1.4M mode, the software “DjiSdrConsole.exe” was used which was provided by manufacturer. The maximum power was configured as below table:

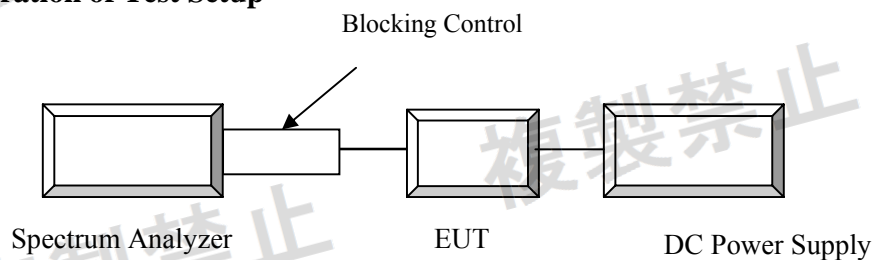
Mode	Channel	Frequency (MHz)	Power Level	
			Chain0	Chain1
1.4M	Low	2403.5	0	-1
	Middle	2441.5	0	-1
	High	2477.5	0	-1

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Pro instrument	DC Power Supply	pps3300	3300012

Configuration of Test Setup**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU 26	200256	2019-05-09	2020-05-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/04	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201048	2019-05-06	2020-05-06
Weinschel	Coaxial Attenuators	53-20-34	LN749	2019-09-06	2020-09-06
Agilent	USB Wideband Power Sensor	U2022XA	MY5417006	2019-09-23	2020-09-23
UNI-T	Multimeter	UT39A	M130199938	2019-07-23	2020-07-23
Pro instrument	DC Power Supply	pps3300	3300012	N/A	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

SUMMARY OF TEST RESULTS

MIC Notice No.88 Appendix No.43 Article 2, Paragraph 1, Item 19 Rules Section	Description of Test	Result
3	Frequency Error	Compliance
4	Occupied Bandwidth and Spreading Bandwidth	Compliance
5	Transmitter Spurious Emission and Unwanted Emission Intensity	Compliance
6	Antenna Output Power and Output Power Tolerance	Compliance
7	Receiver Spurious Emission and Unwanted Emission Intensity	Compliance
8	Transmission Antenna Gain	Not Applicable
9	Transmission Radiation Angle Width	Not Applicable
10	Frequency Hopping Dwell Time	Compliance
11	Interference Prevention Function	Compliance
Note 1	Construction Protection Confirmation	Compliance

Not Applicable: Please refer to 'Note 2' of Antenna Output Power and Output Power Tolerance section.

FREQUENCY ERROR

Limit

50ppm or below

Test Procedure

Set the EUT to the measurement frequency without modulation.

Setting of SA is following as: RB: 30 kHz / VB: 100 kHz / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.

Record the peak spot frequency.

If the EUT can't set at un-modulation mode, measure the 10dBc center frequency.

Test Data

Environmental Conditions

Temperature:	22.1°C
Relative Humidity:	35 %
ATM Pressure:	102.1 kPa

The testing was performed by Chris Mo on 2019-12-09.

Test Result: Compliance

For 1.4M mode:

Chain 0

Frequency (MHz)	Voltage	Measure Frequency (MHz)		Result	Tolerance	Limit
		F1	F2	MHz	ppm	
2403.5	LV	2402.932686	2404.052885	2403.493	-2.91	<50ppm
	NV	2402.932692	2404.052885	2403.493	-2.91	
	HV	2402.932692	2404.052898	2403.493	-2.91	
2441.5	LV	2440.933654	2442.052885	2441.493	-2.87	
	NV	2440.933654	2442.052885	2441.493	-2.87	
	HV	2440.933642	2442.052874	2441.493	-2.87	
2477.5	LV	2476.932686	2478.052874	2477.493	-2.83	
	NV	2476.932692	2478.052885	2477.493	-2.83	
	HV	2476.932692	2478.052885	2477.493	-2.83	

Chain 1

Frequency (MHz)	Voltage	Measure Frequency (MHz)		Result	Tolerance	Limit
		F1	F2	MHz	ppm	
2403.5	LV	2402.932894	2404.052862	2403.493	-2.91	<50ppm
	NV	2402.932692	2404.052885	2403.493	-2.91	
	HV	2402.932692	2404.052896	2403.493	-2.91	
2441.5	LV	2440.932674	2442.056712	2441.495	-2.05	
	NV	2440.932692	2442.056731	2441.495	-2.05	
	HV	2440.932684	2442.056724	2441.495	-2.05	
2477.5	LV	2476.932662	2478.052885	2477.493	-2.83	
	NV	2476.932692	2478.052885	2477.493	-2.83	
	HV	2476.932678	2478.052885	2477.493	-2.83	

Note:

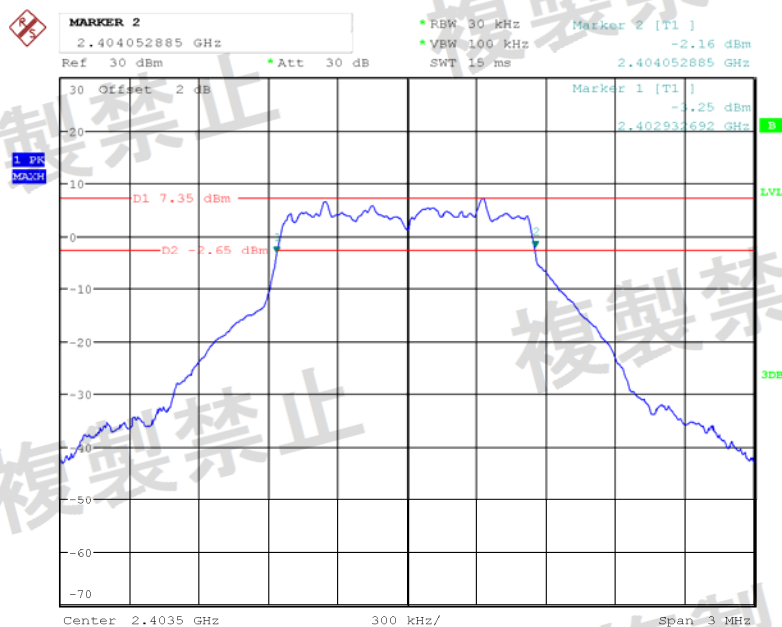
$$\text{Result} = (F1+F2)/2$$

$$\text{Tolerance} = (\text{Result}-\text{Test Frequency})/\text{Test Frequency} \times 10^6$$

Please refer to the plots for normal voltage test.

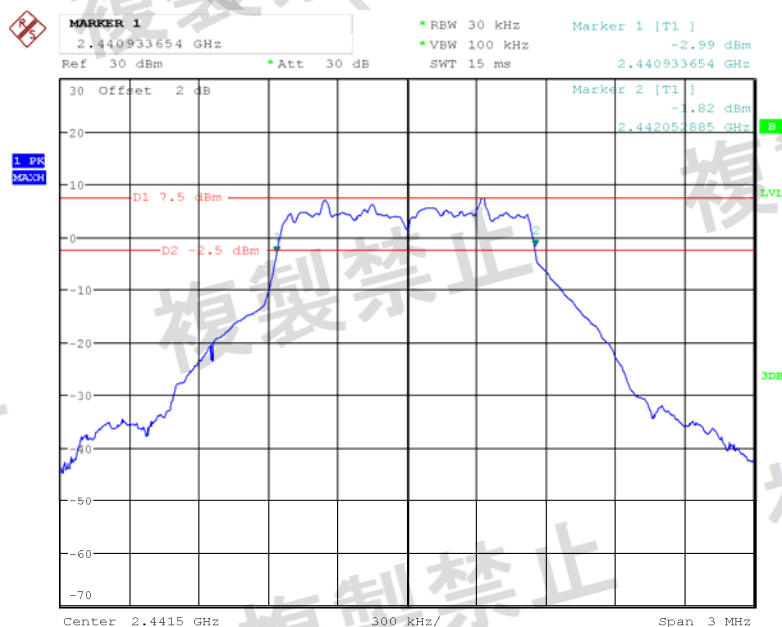
Chain 0

Low Channel



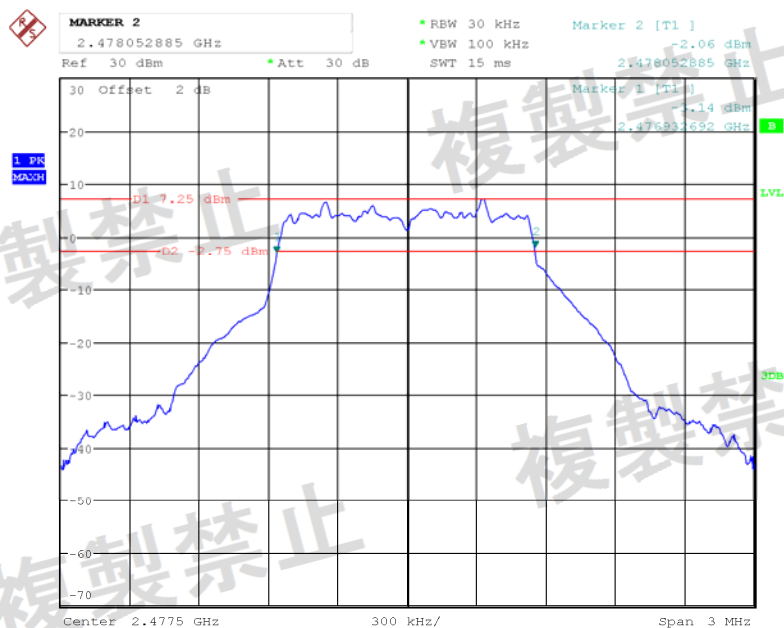
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Middle Channel



Date: 9.DEC.2019 13:54:34

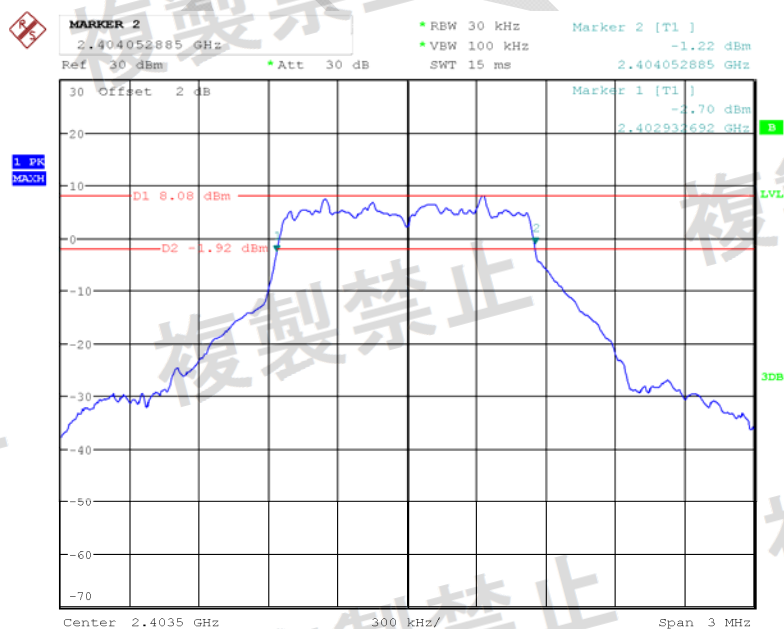
High Channel



Date: 9.DEC.2019 13:52:35

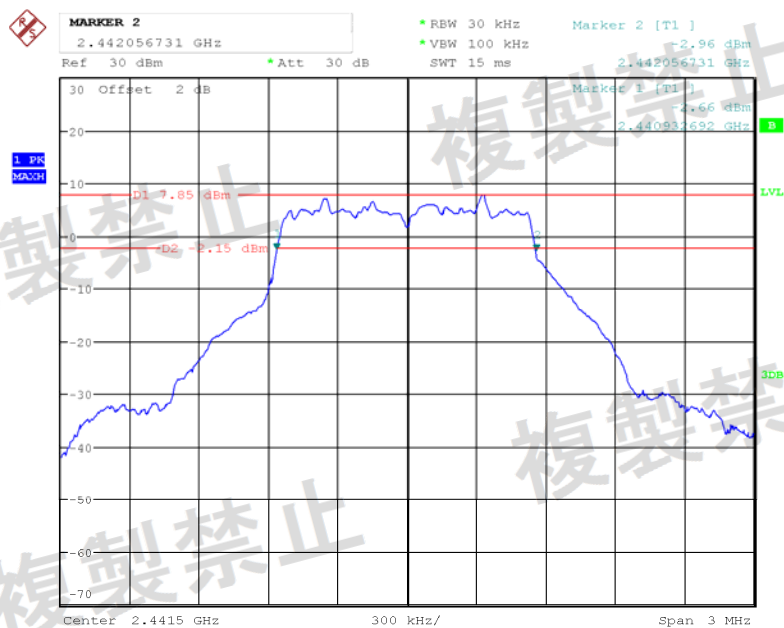
Chain 1

Low Channel



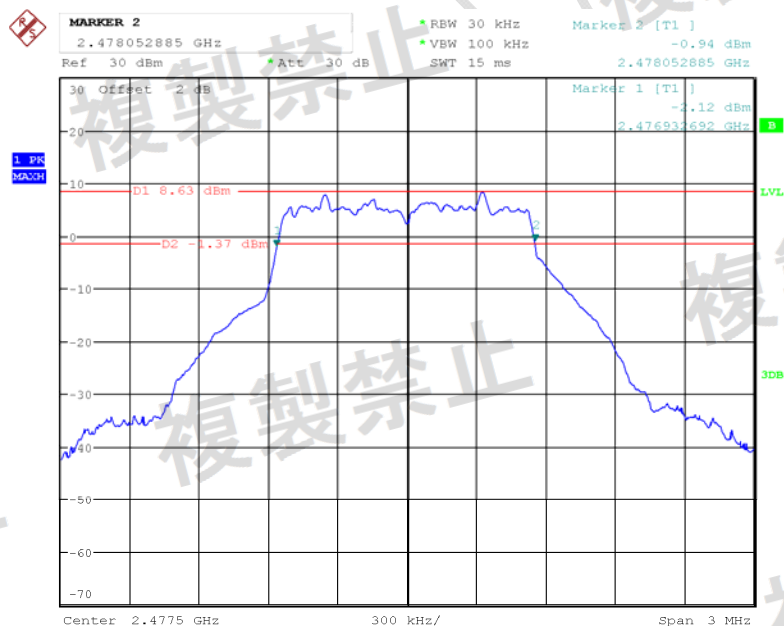
Date: 9.DEC.2019 13:44:28

Middle Channel



Date: 9.DEC.2019 13:46:12

High Channel



Date: 9.DEC.2019 13:49:11

OCCUPIED BANDWIDTH AND SPREADING BANDWIDTH

Limit

- Occupied bandwidth: FH \leq 83.5 MHz; DS \leq 26 MHz; OFDM \leq 38 MHz, Others \leq 26 MHz
- Spread Bandwidth: \geq 500 kHz(FH,DS), Spread factor $>$ 5.

Test Procedure

❖ Conditions of Application Equipment (EUT)

- The modulation state shall be “continuous frequency-hopping mode” by spread spectrum.

❖ Spectrum Analyzer Conditions

- Span: 200 MHz
- RBW: 300 kHz
- VBW: 300 kHz
- Sweep time: Auto, Marker: Marker Off
- Log scale : 10dB/Div, Data points : 501points (400 points or more)
- Detection: Positive Peak, Sweep mode: Continuous

Spread Factor= Spread Bandwidth/modulation rate. The modulation rate: MR=1.

Test Data

Environmental Conditions

Temperature:	22.1°C
Relative Humidity:	35 %
ATM Pressure:	102.1 kPa

The testing was performed by Chris Mo on 2019-12-09.

Test Result: Compliance*Test Mode: Transmitting*

Chain 0

Voltage	LV	NV	HV	Limit
Occupied Bandwidth(MHz)	75.00	75.00	75.00	$\leq 83.5\text{MHz}$
Spreading Bandwidth(MHz)	67.91	68.91	67.91	$\geq 500\text{kHz}$
Spreading Factor	67.91	68.91	67.91	>5

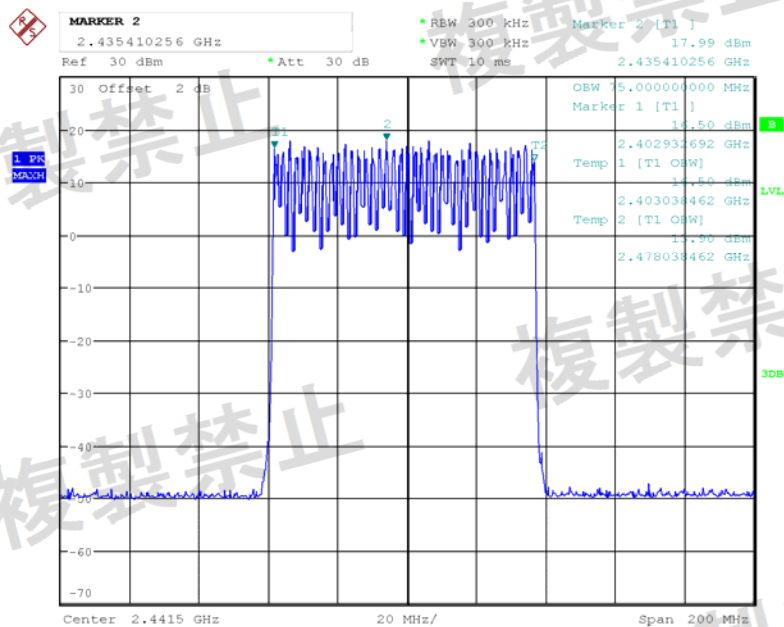
Chain 1

Voltage	LV	NV	HV	Limit
Occupied Bandwidth(MHz)	75.000	75.000	75.000	$\leq 83.5\text{MHz}$
Spreading Bandwidth(MHz)	67.95	67.95	67.95	$\geq 500\text{kHz}$
Spreading Factor	67.95	67.95	67.95	>5

Please refer to the below plots for normal voltage test.

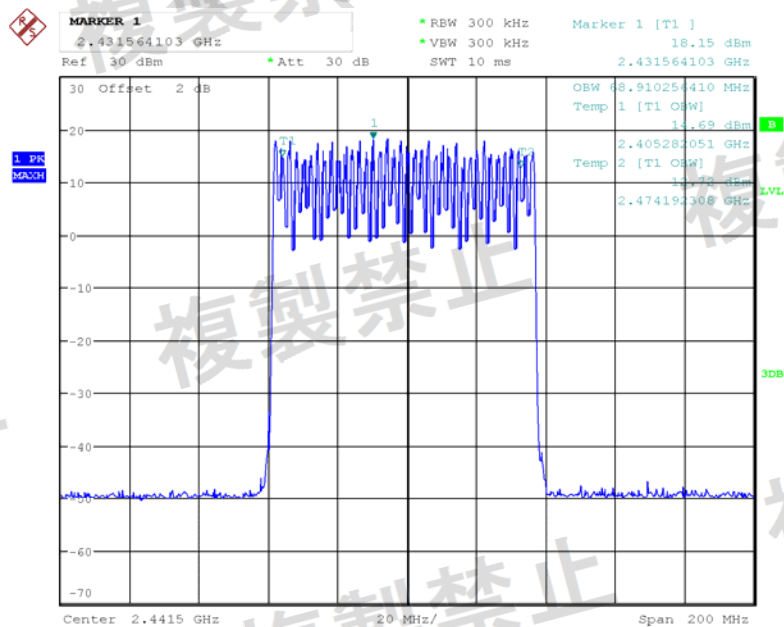
Chain 0

Occupied bandwidth



Date: 9.DEC.2019 14:01:30

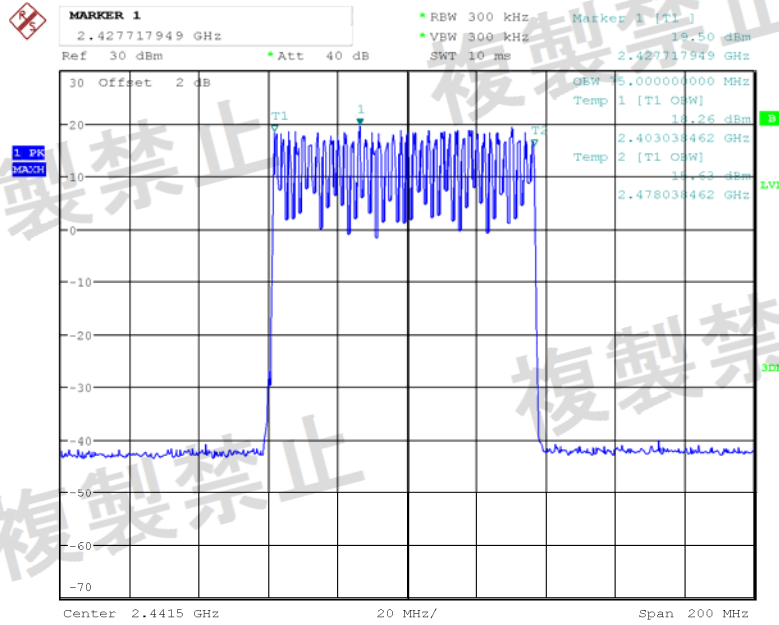
Spreading bandwidth



Date: 9.DEC.2019 14:05:17

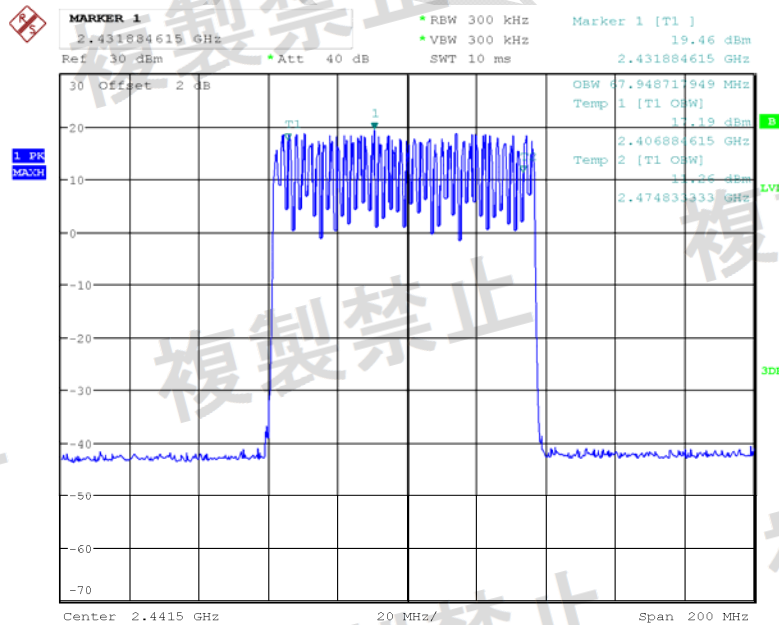
Chain 1

Occupied bandwidth



Date: 9.DEC.2019 12:00:03

Spreading bandwidth



Date: 9.DEC.2019 11:55:48

TRANSMITTER SPURIOUS EMISSION STRENGTH AND UNWANTED EMISSION INTENSITY

Limit

- $f < 1000 \text{ MHz}$: $\leq 0.25 \mu\text{W}/100\text{kHz}$
- $f < 2387 \text{ MHz}$, $f > 2496.5 \text{ MHz}$: $\leq 2.5 \mu\text{W}/\text{MHz}$
- $2387 \text{ MHz} \leq f \leq 2400 \text{ MHz}$; $2483.5 \text{ MHz} < f \leq 2496.5 \text{ MHz}$: $\leq 25 \mu\text{W}/\text{MHz}$

Test Procedure

❖ Conditions of Application Equipment (EUT)

- The modulation state shall be in continuously transmitting mode.

❖ Spectrum Analyzer Conditions

- Setting of SA start 30MHz and stop frequency 1000MHz, RB:100kHz/VB:100kHz, Sweep time: Auto. Sweep mode: continuous sweep .Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. reading value + cable loss shall be less than $0.25 \mu\text{W}/100\text{kHz}$.
- Setting of SA start 1000MHz and stop frequency 2387MHz, RBW: 1MHz/VBW: 1MHz, Sweep time: Auto. Sweep mode: continuous sweep .Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. Reading value + cable loss shall be less than $2.5 \mu\text{W}/\text{MHz}$.
- Setting of SA start 2387MHz and stop frequency 2400MHz, RBW: 1MHz/VBW: 1MHz, Sweep time: Auto. Sweep mode: continuous sweep .Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. Reading value + cable loss shall be less than $25 \mu\text{W}/\text{MHz}$.
- Setting of SA start 2483.5MHz and stop frequency 2496.5MHz, RBW: 1MHz/VBW: 1MHz, Sweep time: Auto. Sweep mode: continuous sweep .Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. Reading value + cable loss shall be less than $25 \mu\text{W}/\text{MHz}$.
- Setting of SA start 2496.5MHz and stop frequency 12500MHz, RBW: 1MHz/VBW: 1MHz, Sweep time: Auto. Sweep mode: continuous sweep .Detect mode: Positive peak/Trace mode: max hold. Then to mark peak. Reading value + cable loss shall be less than $2.5 \mu\text{W}/\text{MHz}$.

Test Data**Environmental Conditions**

Temperature:	22.1°C
Relative Humidity:	35 %
ATM Pressure:	102.1 kPa

The testing was performed by Chris Mo on 2019-12-09.

Test Result: Compliance

Test Mode: Transmitting

Chain 0:

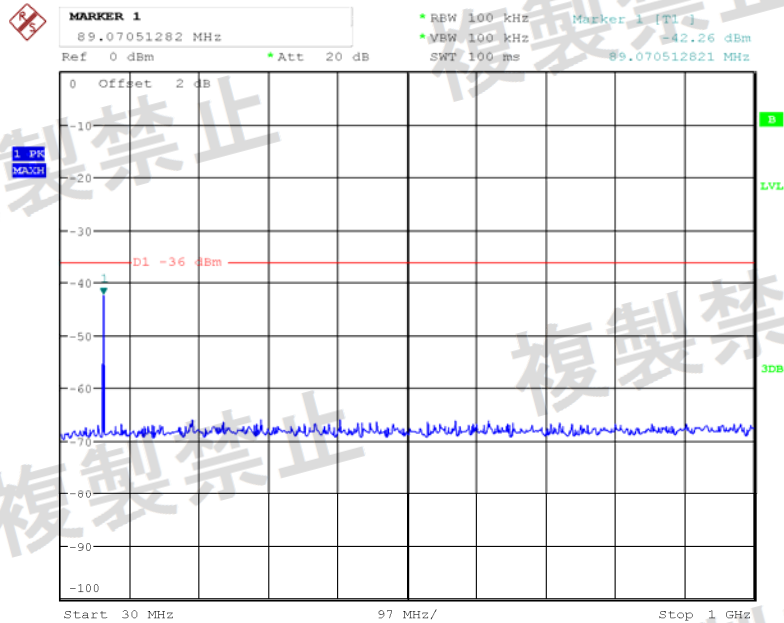
	Frequency Band	2403.5 MHz			2441.5 MHz			2477.5 MHz			Limit
		LV	NV	HV	LV	NV	HV	LV	NV	HV	
Raw data	Band I (dBm/100kHz)	-42.26	-42.26	-51.08	-40.67	-40.69	-40.71	-41.20	-41.24	-41.22	-36dBm/100kHz (0.25 μ W/100kHz)
	Band II (dBm/MHz)	-54.84	-54.88	-51.24	-56.97	-56.99	-57.03	-57.34	-57.36	-57.36	-26dBm/MHz (2.5 μ W/MHz)
	Band III (dBm/MHz)	-25.14	-25.14	-23.42	-54.56	-54.52	-54.48	-56.03	-56.07	-56.05	-16dBm/MHz (25 μ W/MHz)
	Band IV (dBm/MHz)	-55.90	-55.88	-53.58	-54.79	-54.75	-54.71	-45.69	-45.67	-45.67	-16dBm/MHz (25 μ W/MHz)
	Band V (dBm/MHz)	-37.32	-37.36	-38.20	-50.19	-50.23	-50.27	-55.54	-55.56	-55.60	-26dBm/MHz (2.5 μ W/MHz)

Chain 1:

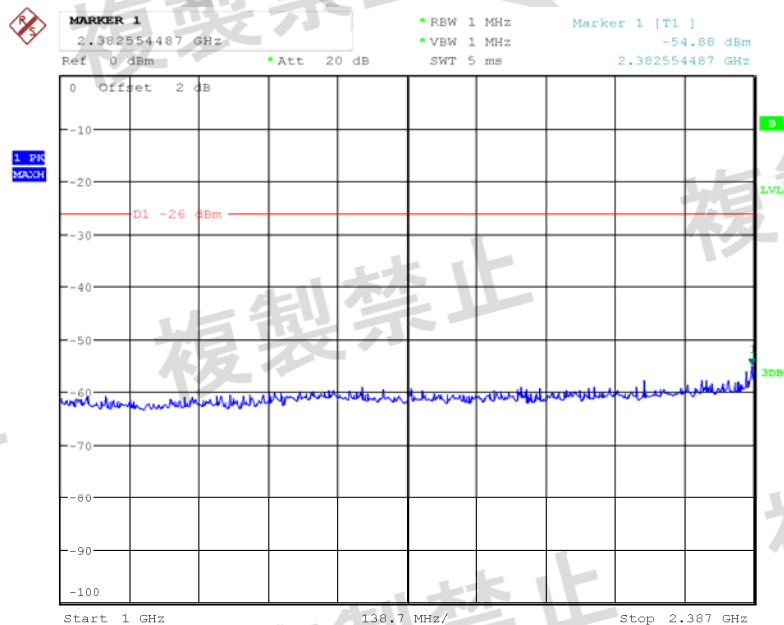
	Frequency Band	2403.5 MHz			2441.5 MHz			2477.5 MHz			Limit
		LV	NV	HV	LV	NV	HV	LV	NV	HV	
Raw data	Band I (dBm/100kHz)	-44.65	-44.63	-44.67	-46.41	-46.43	-46.47	-47.77	-47.75	-47.75	-36dBm/100kHz (0.25 μ W/100kHz)
	Band II (dBm/MHz)	-47.64	-47.66	-47.70	-49.24	-49.22	-49.26	-48.06	-48.08	-48.04	-26dBm/MHz (2.5 μ W/MHz)
	Band III (dBm/MHz)	-24.21	-24.17	-24.19	-47.85	-47.85	-47.81	-47.38	-47.42	-47.46	-16dBm/MHz (25 μ W/MHz)
	Band IV (dBm/MHz)	-46.66	-46.68	-46.68	-47.00	-47.02	-47.00	-41.54	-41.50	-41.54	-16dBm/MHz (25 μ W/MHz)
	Band V (dBm/MHz)	-43.56	-43.60	-43.64	-44.60	-44.64	-44.60	-45.28	-45.24	-45.26	-26dBm/MHz (2.5 μ W/MHz)

Note: Band I: 30MHz~1000MHz
 Band II: 1000MHz~2387MHz
 Band III: 2387MHz~2400MHz
 Band IV: 2483.5MHz~2496.5MHz
 Band V: 2496.5MHz~12500MHz

Please refer to the below plots for normal voltage test.

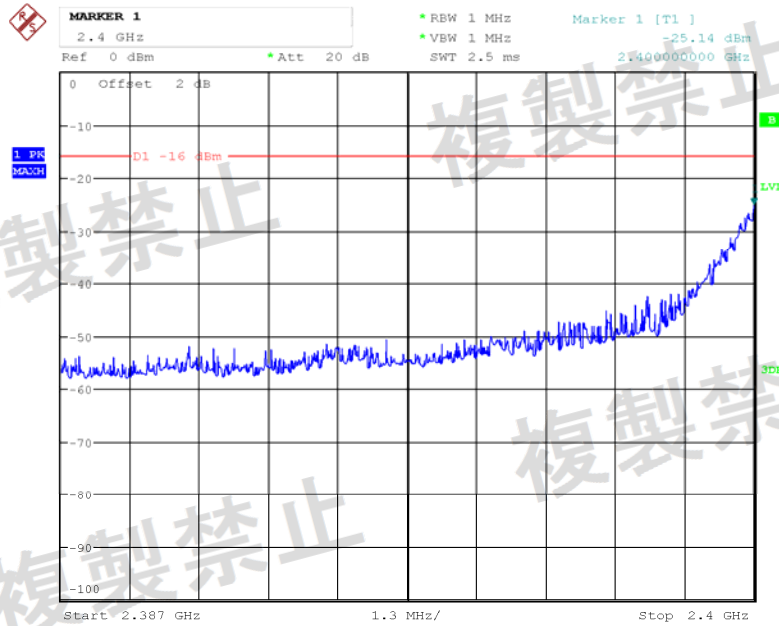
Chain 0**Low Channel****30MHz~1GHz**

Date: 9.DEC.2019 14:17:08

1GHz~2.387GHz

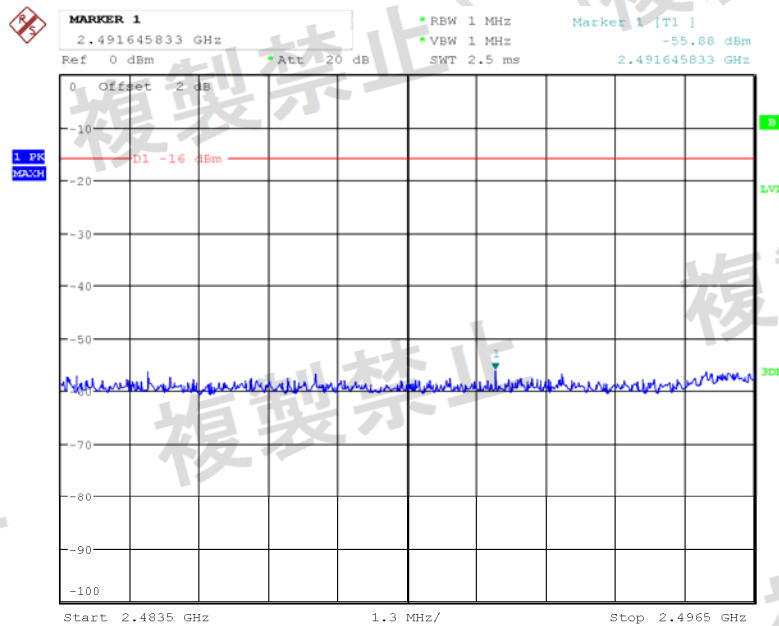
Date: 9.DEC.2019 14:18:03

2.387GHz~2.4GHz



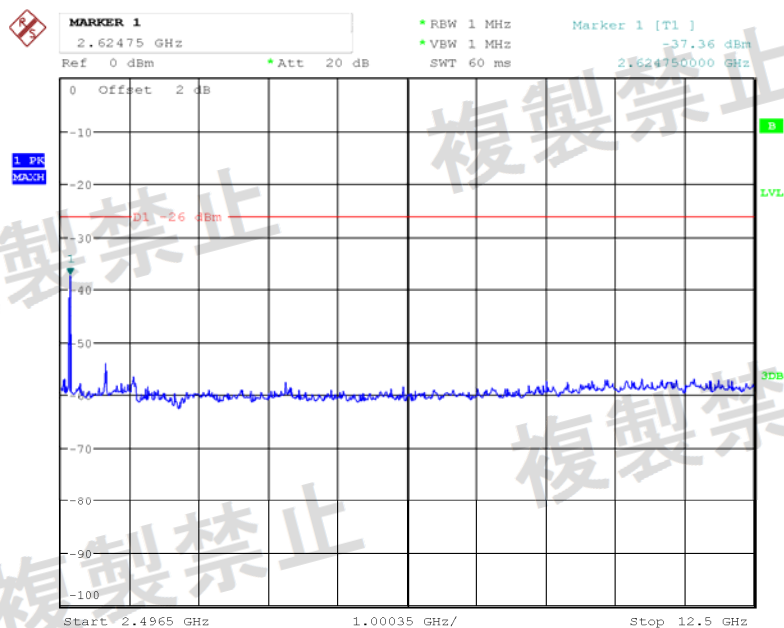
Date: 9.DEC.2019 14:18:52

2.4835GHz~2.4965GHz



Date: 9.DEC.2019 14:19:17

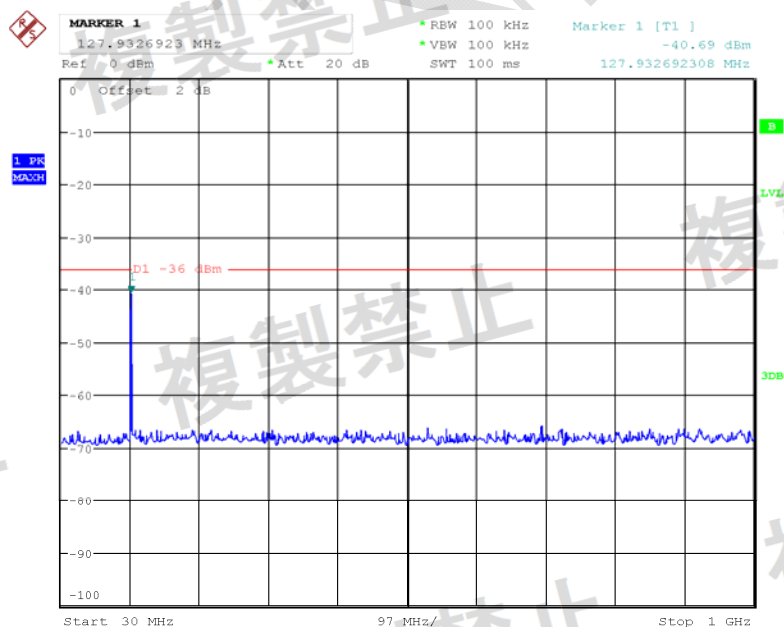
2.4965GHz~12.5GHz



Date: 9.DEC.2019 14:20:19

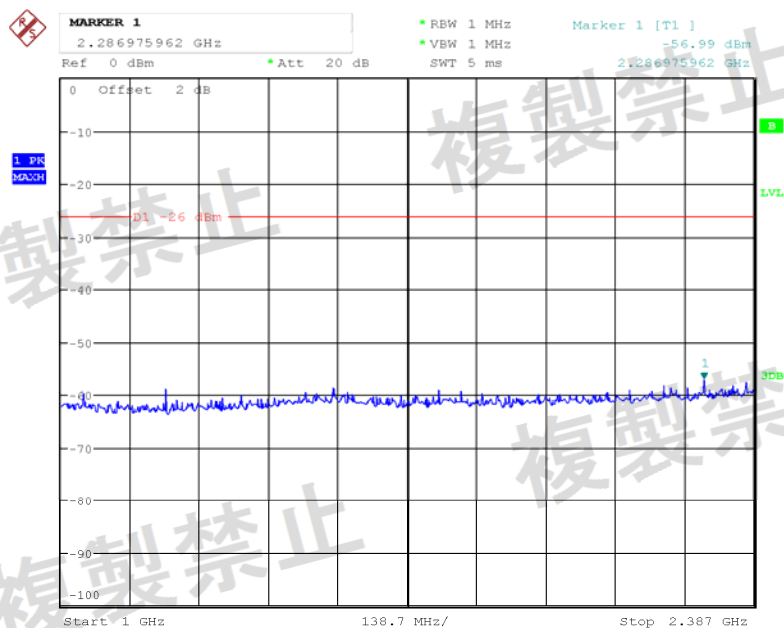
Middle Channel:

30MHz~1GHz



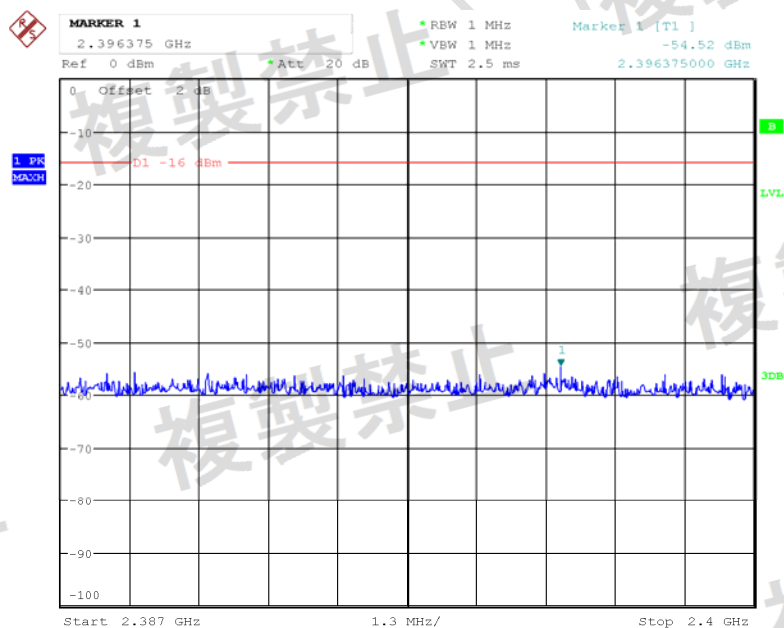
Date: 9.DEC.2019 14:24:50

1GHz~2.387GHz



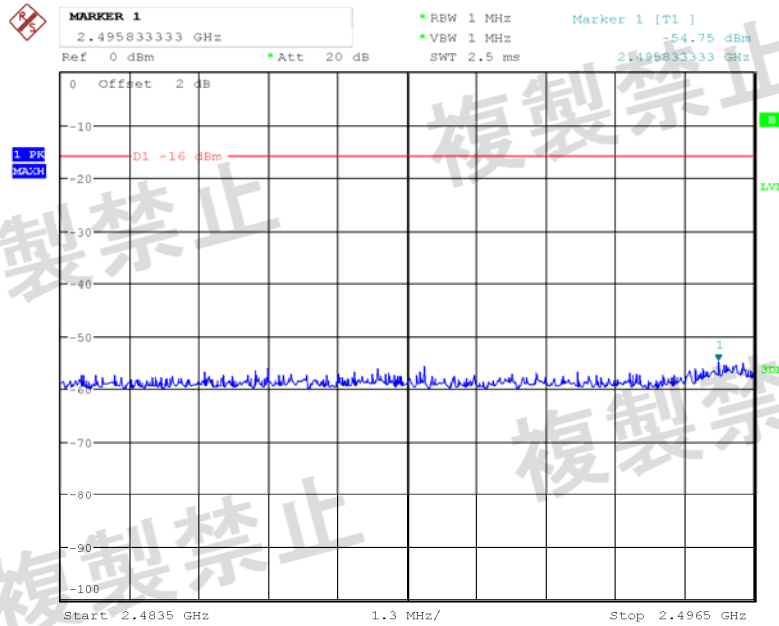
Date: 9.DEC.2019 14:23:26

2.387GHz~2.4GHz



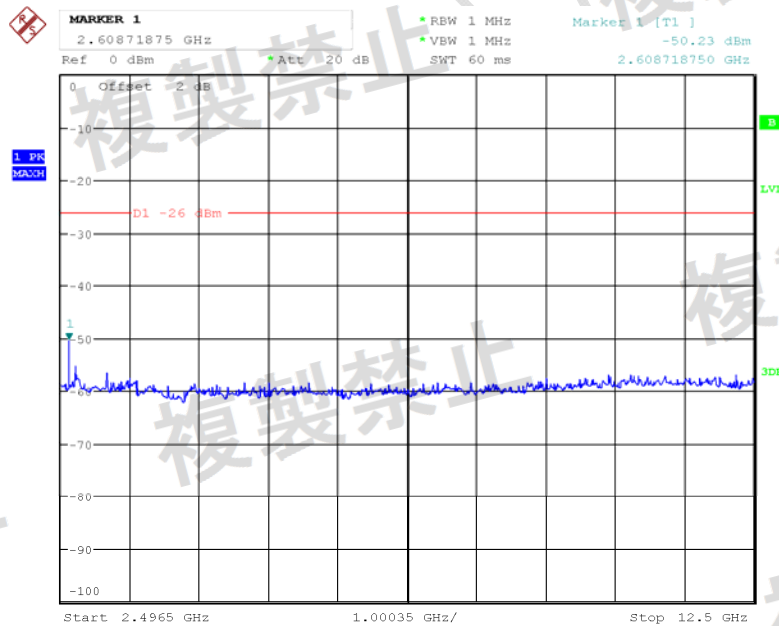
Date: 9.DEC.2019 14:22:49

2.4835GHz~2.4965GHz



Date: 9.DEC.2019 14:22:17

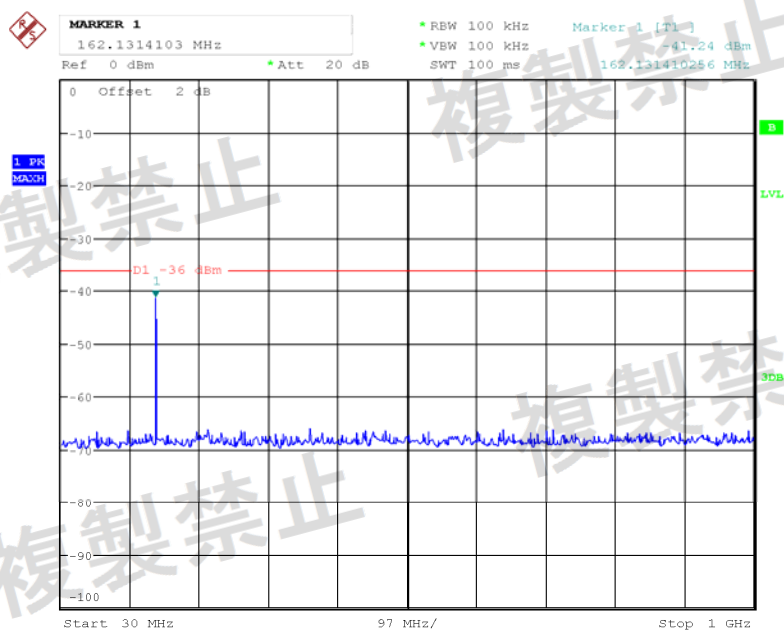
2.4965GHz~12.5GHz



Date: 9.DEC.2019 14:20:46

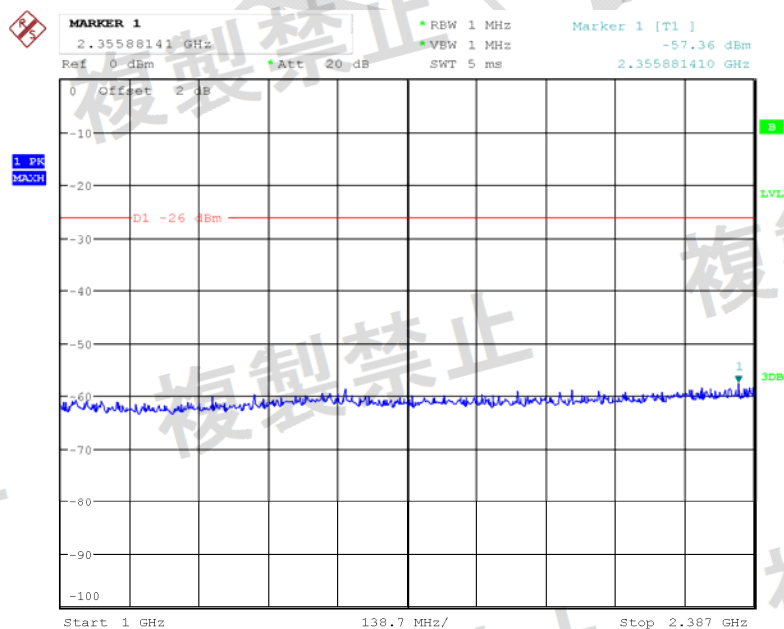
High Channel:

30MHz~1GHz



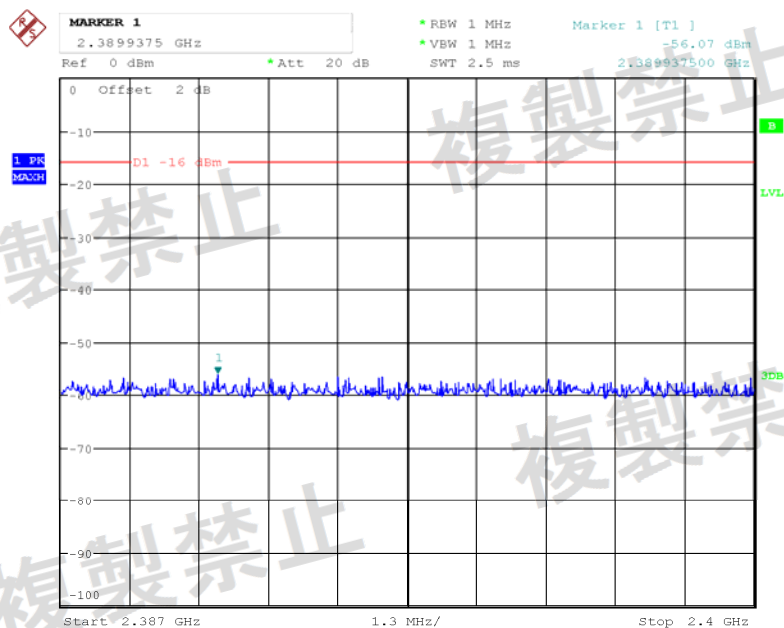
Date: 9.DEC.2019 14:25:33

1GHz~2.387GHz



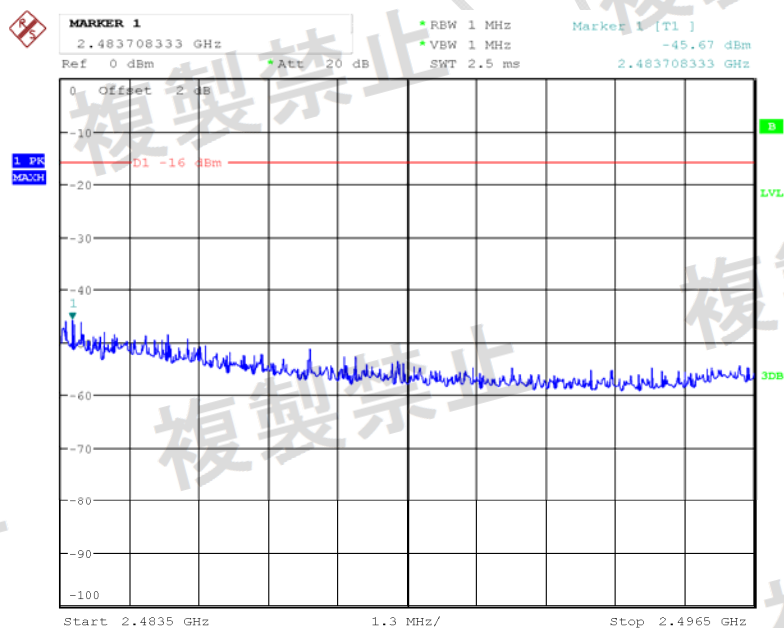
Date: 9.DEC.2019 14:26:12

2.387GHz~2.4GHz



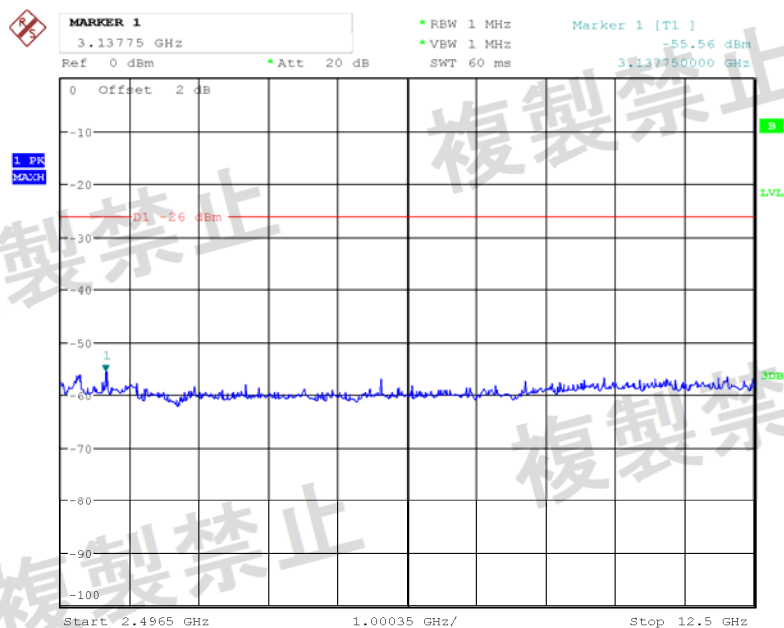
Date: 9.DEC.2019 14:26:39

2.4835GHz~2.4965GHz



Date: 9.DEC.2019 14:27:11

2.4965GHz~12.5GHz

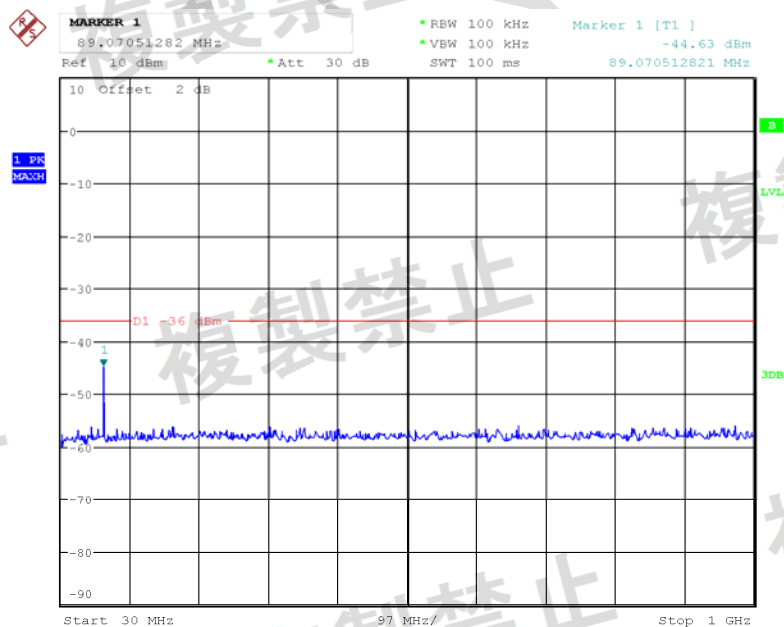


Date: 9.DEC.2019 14:27:43

Chain 1

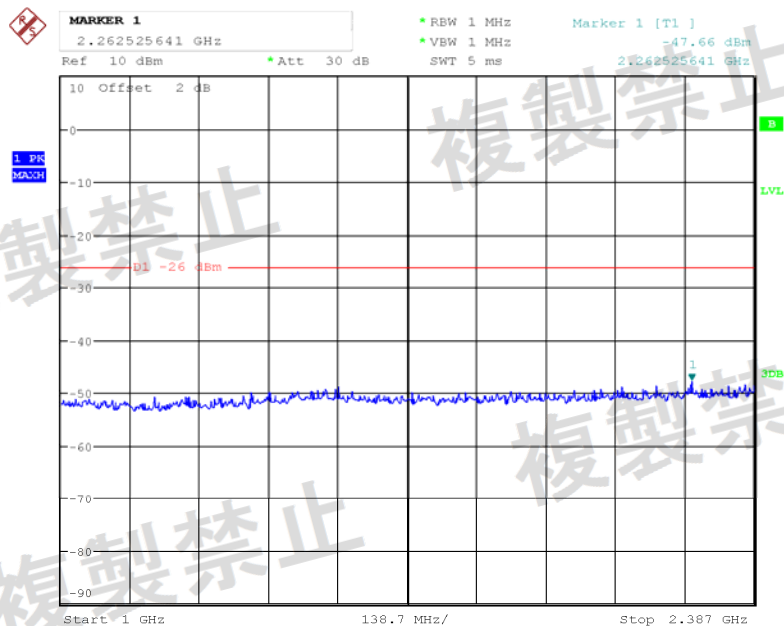
Low Channel:

30MHz~1GHz



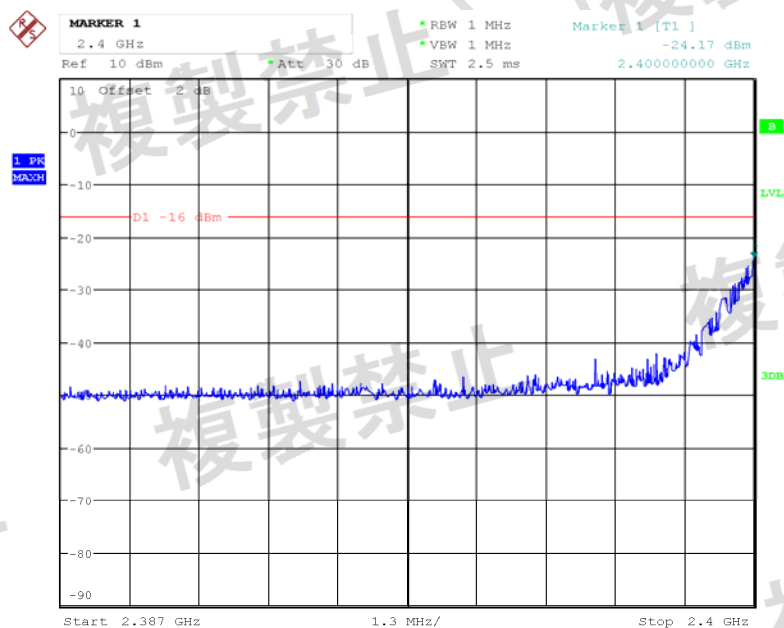
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1GHz~2.387GHz



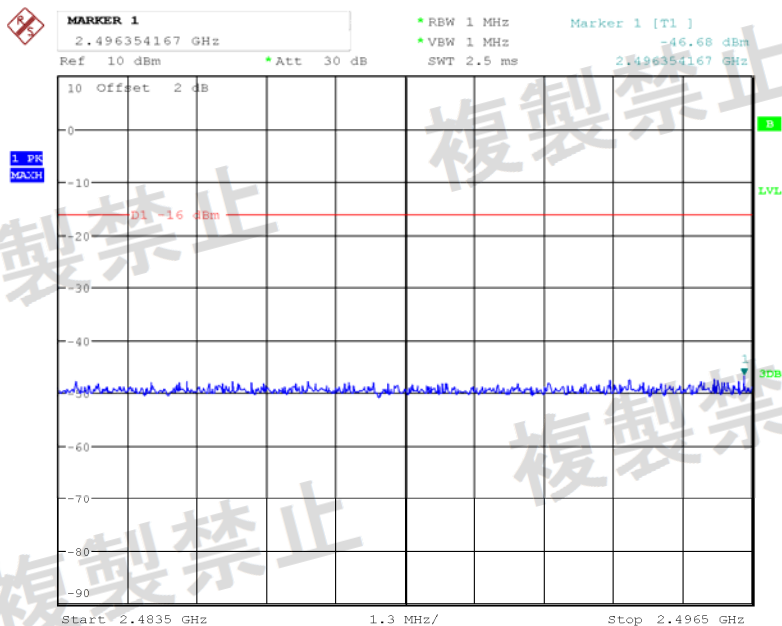
Date: 9.DEC.2019 13:15:13

2.387GHz~2.4GHz



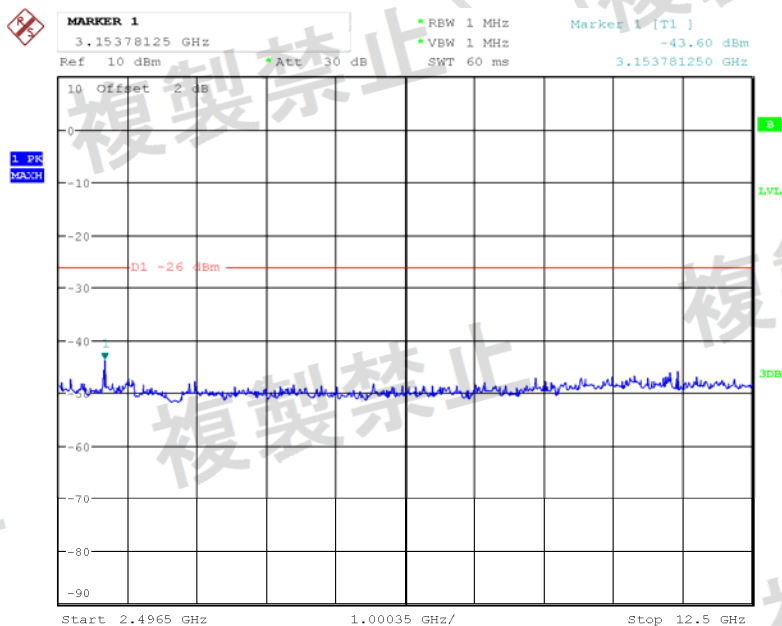
Date: 9.DEC.2019 13:17:04

2.4835GHz~2.4965GHz



Date: 9.DEC.2019 13:17:41

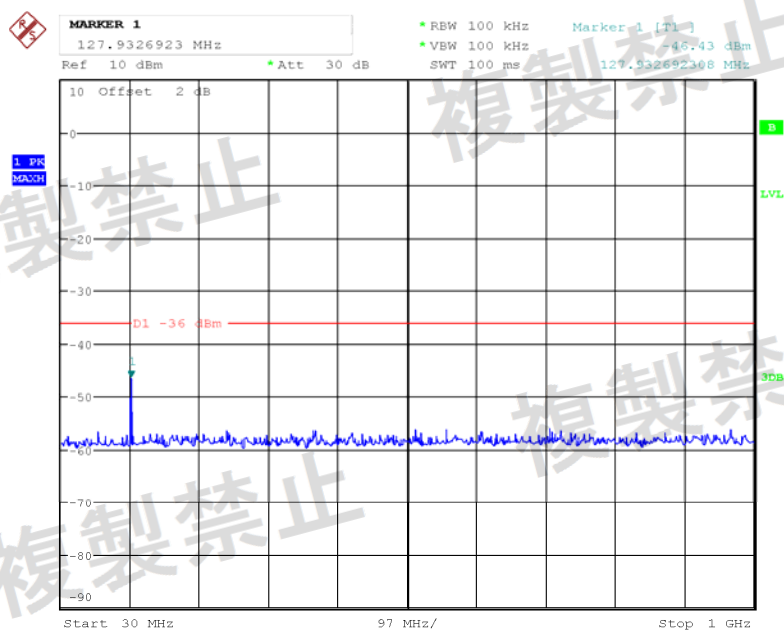
2.4965GHz~12.5GHz



Date: 9.DEC.2019 13:18:22

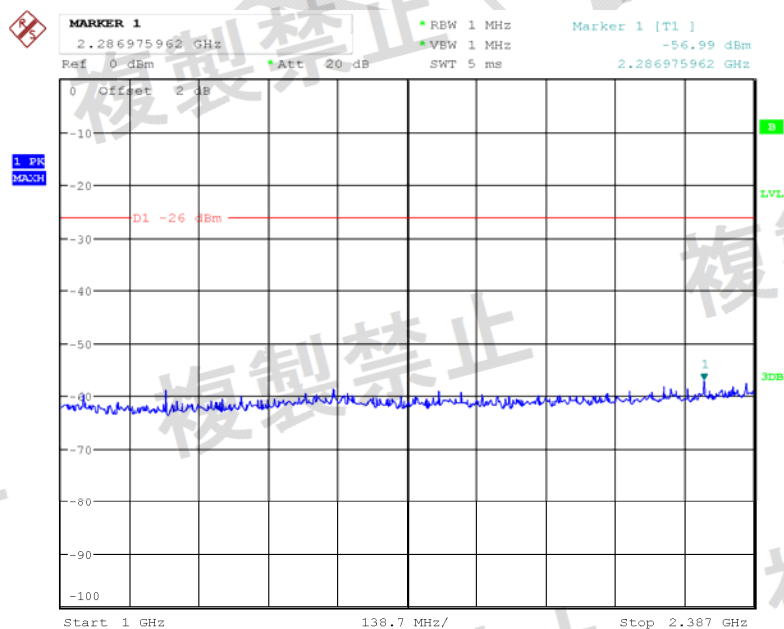
Middle Channel:

30MHz~1GHz



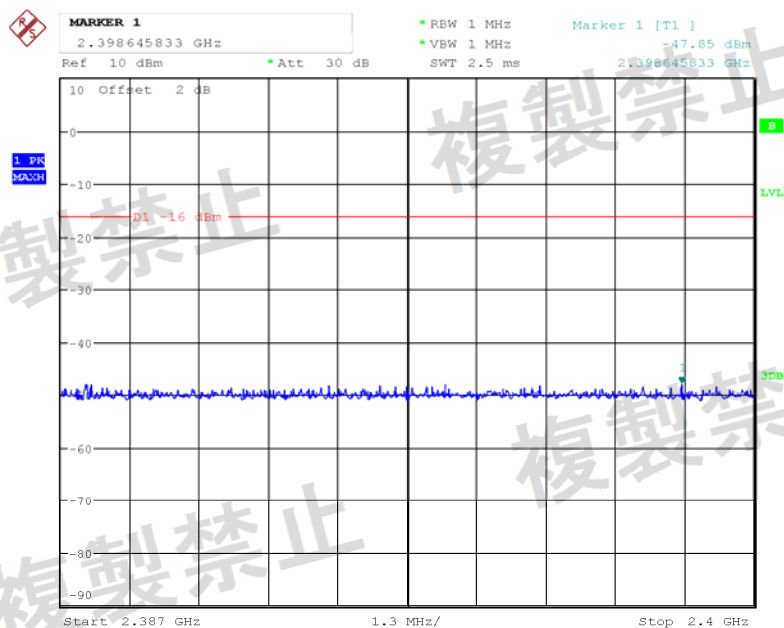
Date: 9.DEC.2019 13:23:15

1GHz~2.387GHz



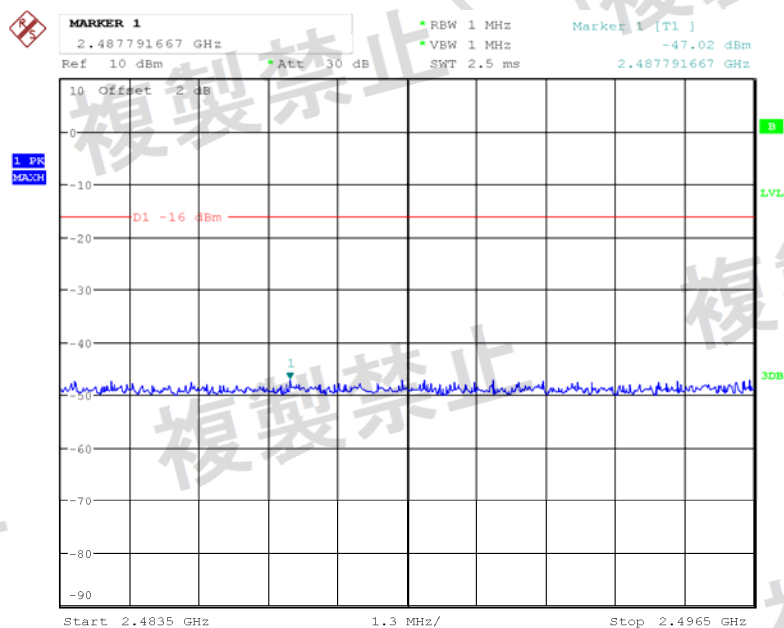
Date: 9.DEC.2019 14:23:26

2.387GHz~2.4GHz



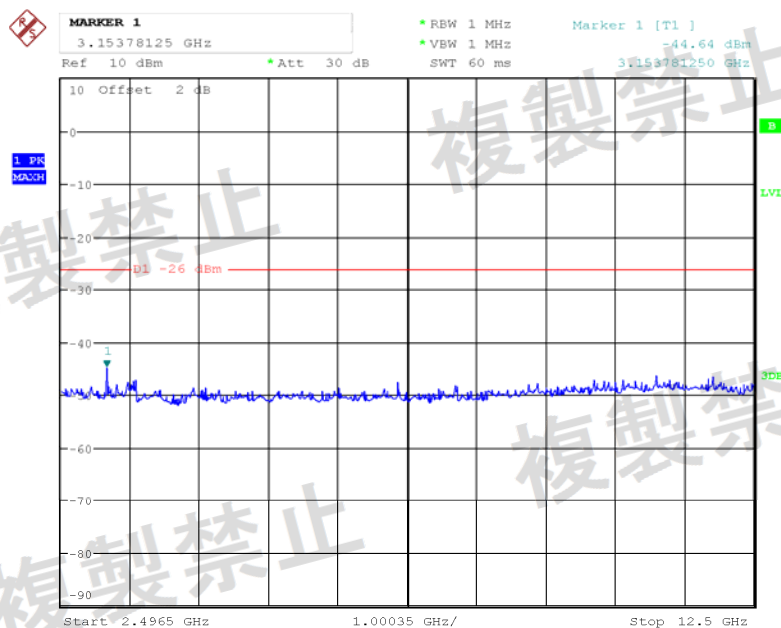
Date: 9.DEC.2019 13:20:54

2.4835GHz~2.4965GHz



Date: 9.DEC.2019 13:19:46

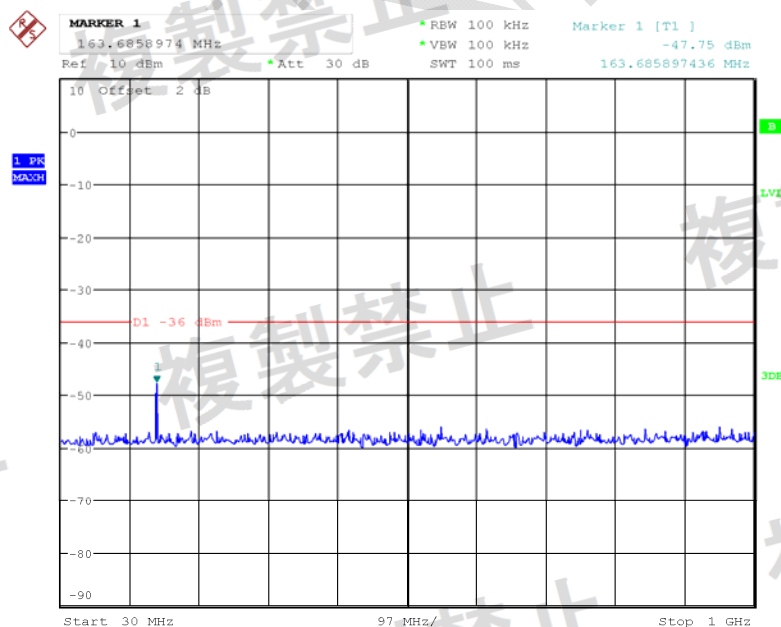
2.4965GHz~12.5GHz



Date: 9.DEC.2019 13:18:49

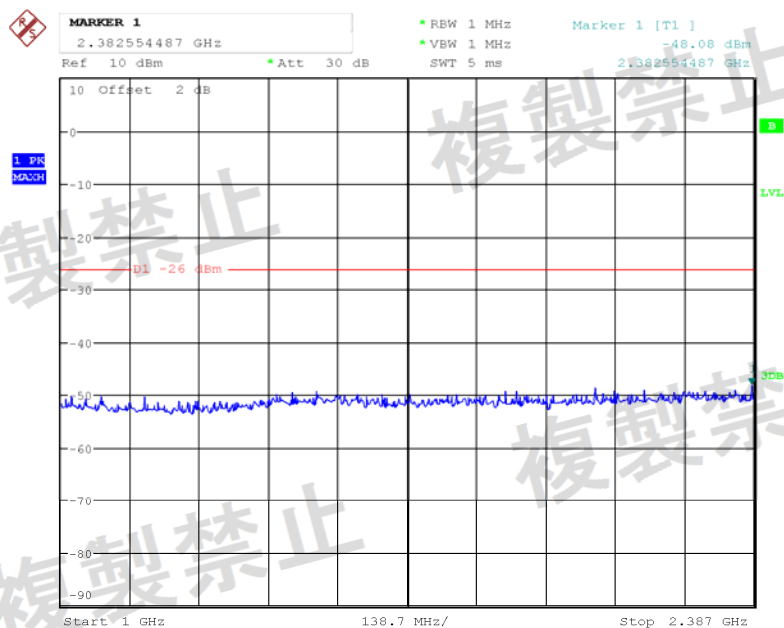
High Channel:

30MHz~1GHz



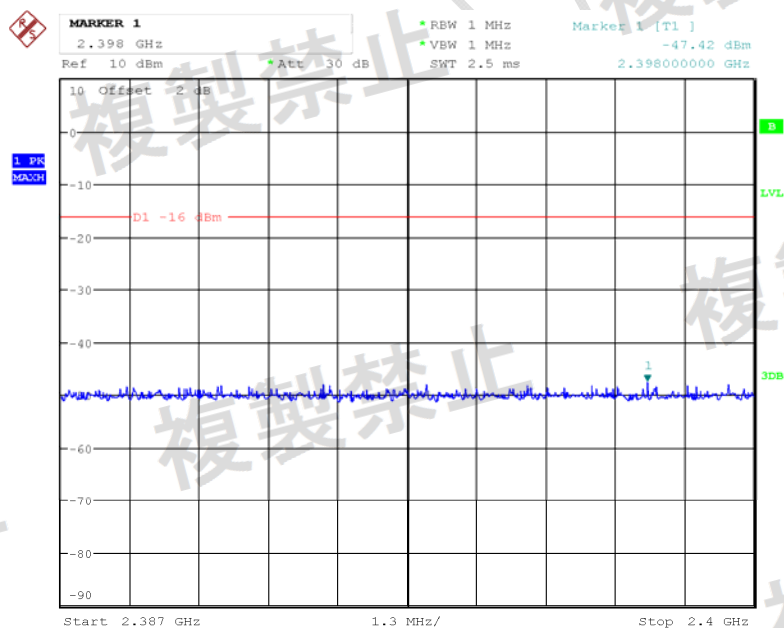
Date: 9.DEC.2019 13:23:40

1GHz~2.387GHz



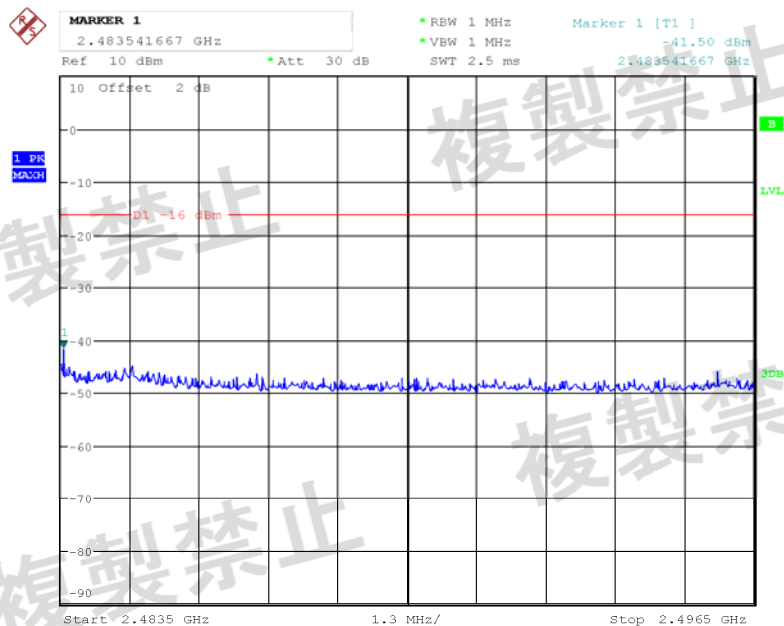
Date: 9.DEC.2019 13:24:14

2.387GHz~2.4GHz



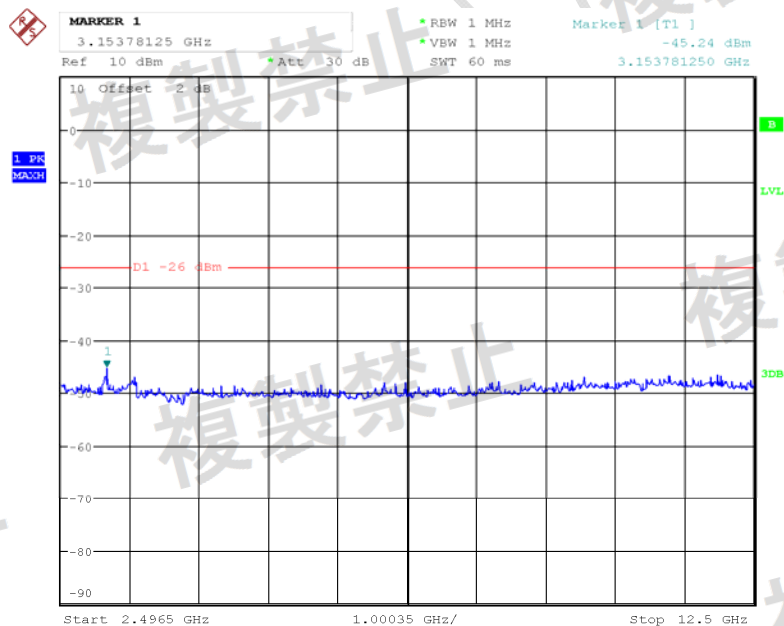
Date: 9.DEC.2019 13:24:49

2.4835GHz~2.4965GHz



Date: 9.DEC.2019 13:25:33

2.4965GHz~12.5GHz



Date: 9.DEC.2019 13:26:13

ANTENNA OUTPUT POWER AND ANTENNA POWER TOLERANCE

Limit

- ≤ 3 mW/MHz(FHSS from 2402-2480 MHz which contains 2427-2470.75MHz)
- ≤ 10 mW/MHz (OFDM, DSSS from 2400-2483.5 MHz)
- ≤ 10 mW (other from 2400-2483.5 MHz)

The Output Power Tolerance must be within +20%, -80%.

- EIRP ≤ 6.91 dBm/MHz(FHSS from 2402-2480 MHz)

Test Procedure

For FHSS UUT:

Connect the UUT to the power meter in a state of hopping mode.

For OFDM, DSSS UUT:

Step 1:

Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: The centre frequency of the channel under test.
- RBW: 1 MHz.
- VBW: 1 MHz.
- Span: Wide enough to cover the complete power envelope of the signal of the UUT.
- Detector: Peak.
- Trace Mode: Max Hold.

Step 2:

When the trace is complete, find the peak value of the power envelope and record the frequency.

Step 3:

Make the following changes to the settings of the spectrum analyser:

- Centre Frequency: Equal to the frequency recorded in step 2.
- Span: 3 MHz.
- RBW: 1 MHz.
- VBW: 1 MHz.
- Detector: Average (see note).
- Trace Mode: Max Hold.

For other UUT:

Make the following changes to the settings of the spectrum analyser:

- Centre Frequency: The centre frequency of the channel under test.
- Span: 5MHz.
- RBW: 3 MHz.
- VBW: 10 MHz.
- Detector: Peak
- Trace Mode: Max Hold.

NOTE: The detector mode "Average" is often referred to as "RMS Average" or "Sample" but do not use Video Average.

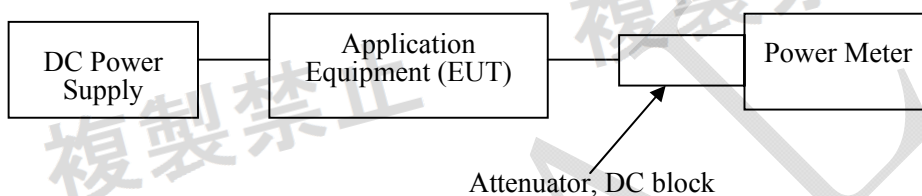
When the trace is complete, capture the trace, for example using the "View" option on the spectrum analyser. For Find the peak value of the trace and place the analyser marker on this peak. This level is recorded as D.

D shall be recorded in the test report.

The maximum PD, which is e.i.r.p. PSD (spectral density power) or power, is calculated from the above measured value D, and the applicable antenna assembly gain "G" in dBi, according to the formula below. If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the highest gain shall be used.

$$PD = D + G$$

Test Setup Block diagram



Test Data

Environmental Conditions

Temperature:	22.1°C
Relative Humidity:	35 %
ATM Pressure:	102.1 kPa

The testing was performed by Chris Mo on 2019-12-09.

Test Result: Compliance

*Test Mode: Transmitting**Chain 0*

Mode	Test Condition	Reading (dBm)	Spread bandwidth (MHz)	Duty cycle (%)	Antenna output power (mW/MHz)		Antenna power tolerance (%)		EIRP (dBm/MHz)	
					Result	Limit	Result	Limit	Result	Limit
Normal	LV	3.98	68.910	11.8	0.3075	3	2.5	-80~ +20	-1.12	6.91
	NV	3.95	68.910	11.8	0.3054		1.8		-1.15	
	HV	3.94	68.910	11.8	0.3047		1.6		-1.16	

Chain 1

Mode	Test Condition	Reading (dBm)	Spread bandwidth (MHz)	Duty cycle (%)	Antenna output power (mW/MHz)		Antenna power tolerance (%)		EIRP (dBm/MHz)	
					Result	Limit	Result	Limit	Result	Limit
Normal	LV	5.64	67.949	14.3	0.3771	3	-5.73	-80~ +20	-0.24	6.91
	NV	5.66	67.949	14.3	0.3789		-5.27		-0.21	
	HV	5.68	67.949	14.3	0.3806		-4.85		-0.2	

Note:

1) Antenna Output power (mW/MHz) = Reading (mW)/Duty cycle (%) / Spread Bandwidth (MHz)

2) Antenna Output Power Tolerance = (Antenna Output power - Declared Power) / Declared Power * 100%

3) Declared Power: 0.3mW/MHz for Chain 0, 0.4mW/MHz for Chain 1.

Note 2: Transmission Antenna Gain and Transmission Radiation Angle Width are not required since EIRP less than 6.91dBm/MHz.

RECEIVER SPURIOUS EMISSION AND UNWANTED EMISSION INTENSITY

Limit

- $\leq 4 \text{ nW}$ ($30 \text{ MHz} \leq f \leq 1000 \text{ MHz}$)
- $\leq 20 \text{ nW}$ ($1 \text{ GHz} \leq f \leq 12.5 \text{ GHz}$)

Test Procedure

❖ Conditions of Application Equipment (EUT)

- The modulation state shall be “continuous receiving mode”.

❖ Spectrum Analyzer Conditions

- Start Frequency: Start Frequency of frequency range to measure (30MHz or 1GHz)
- Stop Frequency: Stop Frequency of frequency range to measure (1GHz or 12.5GHz)
- Span: AUTO (Measurement Range)
- RBW: 100 kHz, VBW: 100 kHz for Frequency < 1 GHz
- RBW: 1MHz, VBW: 1MHz for Frequency > 1 GHz
- Sweep time: AUTO or more
- Sweep mode: Auto Sweep
- Detection: Positive Peak
- Reference Level: Enough level for maximum dynamic range

Measurement Result

Environmental Conditions

Temperature:	22.1°C
Relative Humidity:	35 %
ATM Pressure:	102.1 kPa

The testing was performed by Chris Mo on 2019-12-09.

Test Result: Compliance, please see the below tables

Test Mode: Receiving

Chain 0

	Frequency band	2403.5 MHz			2441.5 MHz			2477.5 MHz			Limit
		LV	NV	HV	LV	NV	HV	LV	NV	HV	
Raw data	Band VI dBm	-65.50	-65.52	-65.54	-65.61	-65.57	-65.61	-65.64	-65.64	-65.66	-54dBm (4nW)
	Band VII dBm	-51.56	-51.54	-51.56	-51.74	-51.78	-51.76	-51.85	-51.81	-51.85	-47dBm (20nW)

Chain 1

	Frequency band	2403.5 MHz			2441.5 MHz			2477.5 MHz			Limit
		LV	NV	HV	LV	NV	HV	LV	NV	HV	
Raw data	Band VI dBm	-73.00	-73.02	-73.06	-73.04	-73.08	-73.04	-73.04	-73.06	-73.10	-54dBm (4nW)
	Band VII dBm	-54.10	-54.06	-54.06	-54.10	-54.08	-54.08	-55.59	-55.63	-55.61	-47dBm (20nW)

Note:

Band VI: 30MHz~1000MHz

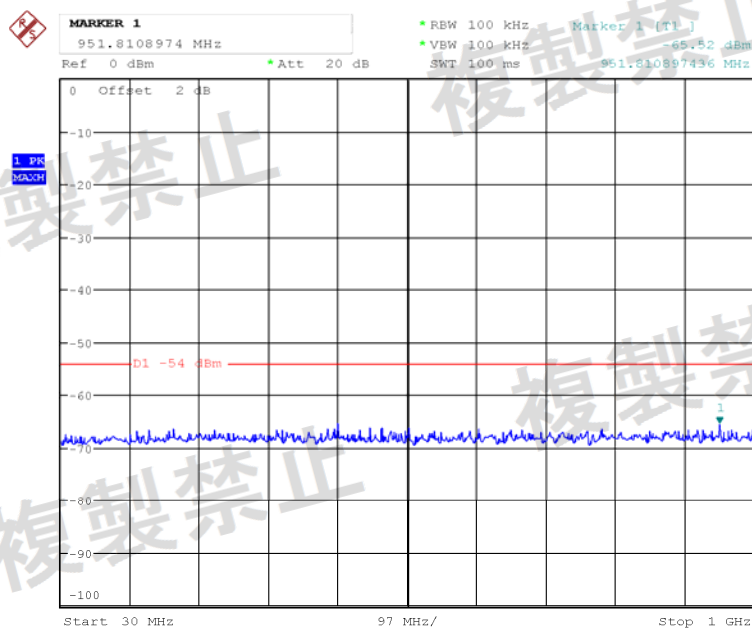
Band VII: 1000MHz~12500MHz

Please refer to the below plots for normal voltage test.

Chain 0

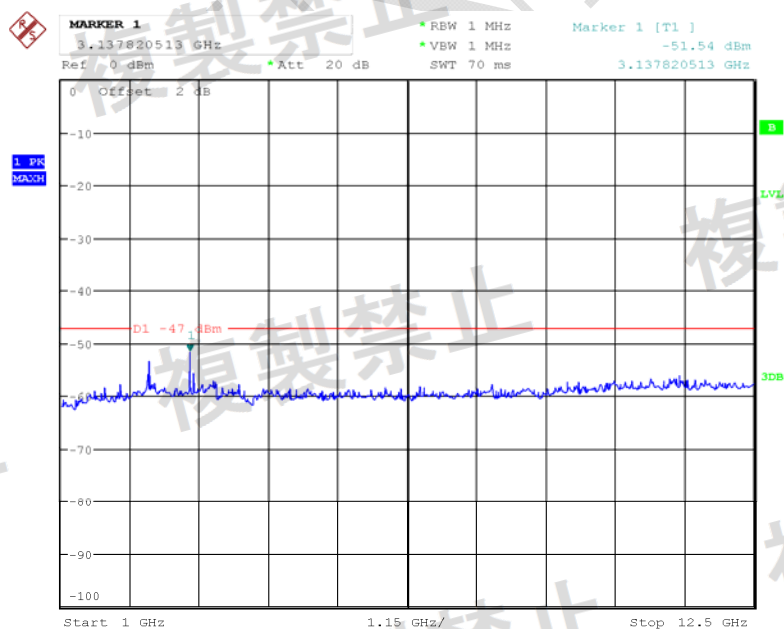
Test Frequency: 2403.5MHz

30MHz~1000MHz



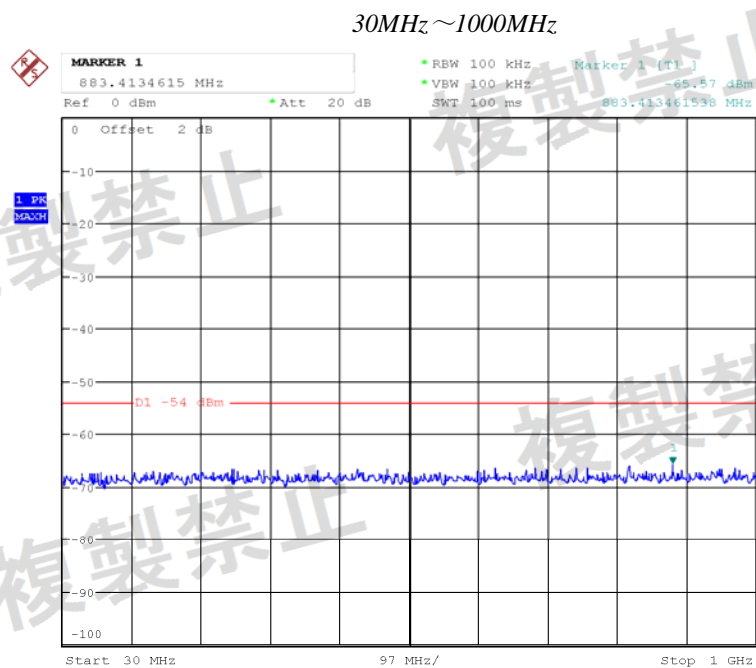
Date: 9.DEC.2019 14:38:12

1000MHz~12500MHz

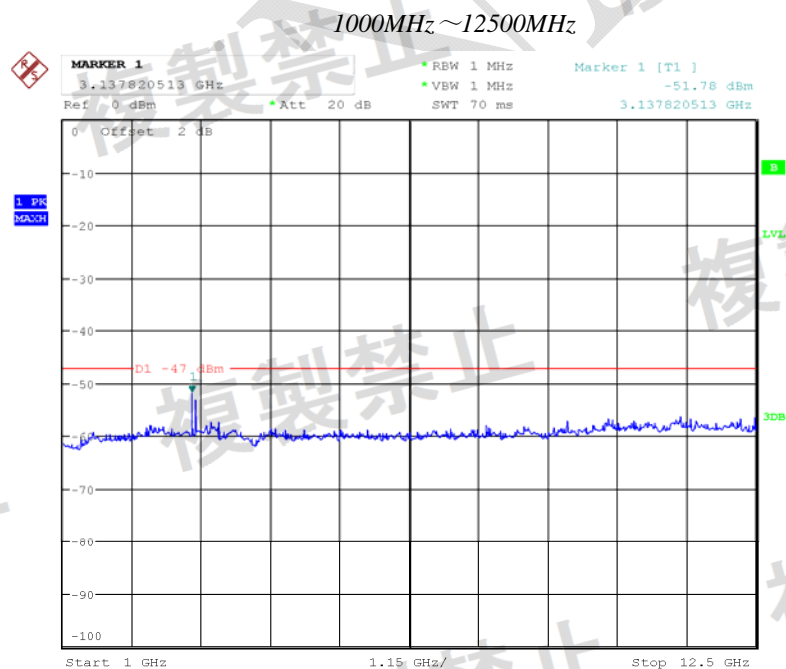


Date: 9.DEC.2019 14:34:29

Test Frequency: 2441.5MHz:



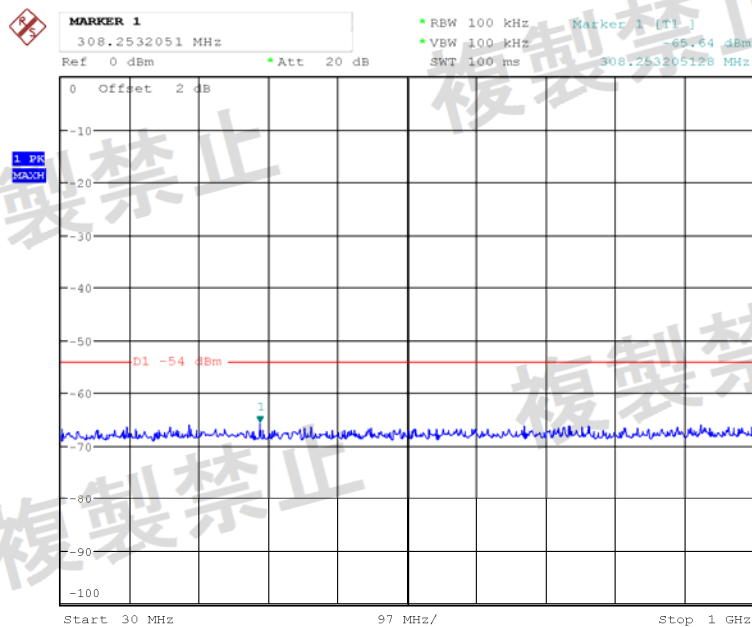
Date: 9.DEC.2019 14:37:43



Date: 9.DEC.2019 14:35:01

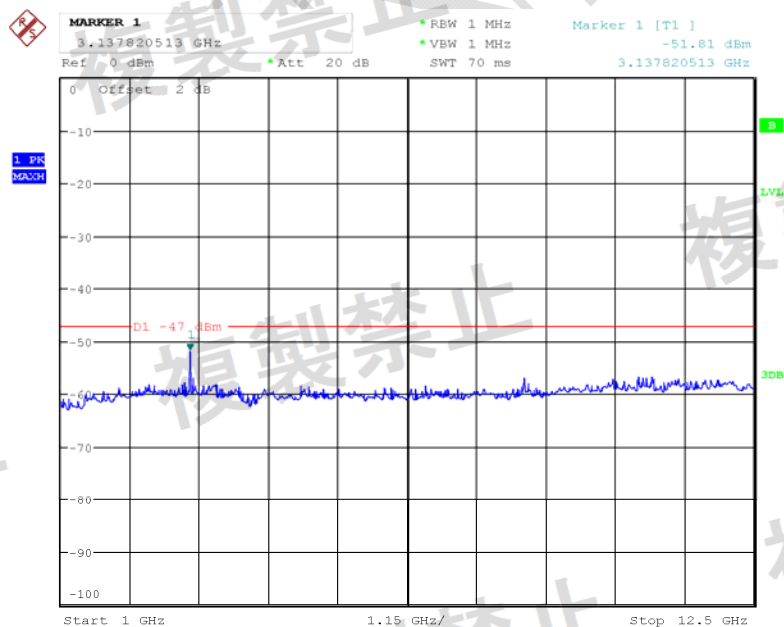
Test Frequency: 2477.5MHz:

30MHz~1000MHz



Date: 9.DEC.2019 14:37:26

1000MHz~12500MHz

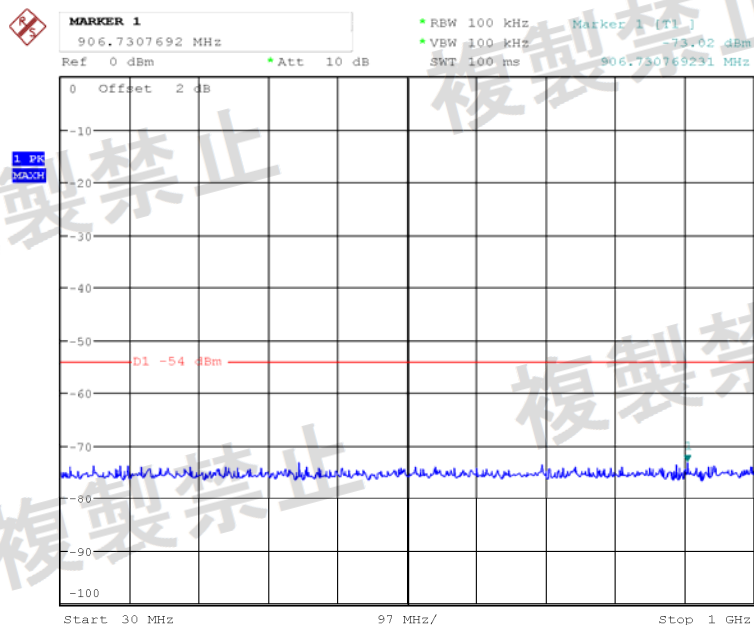


Date: 9.DEC.2019 14:35:18

Chain 1

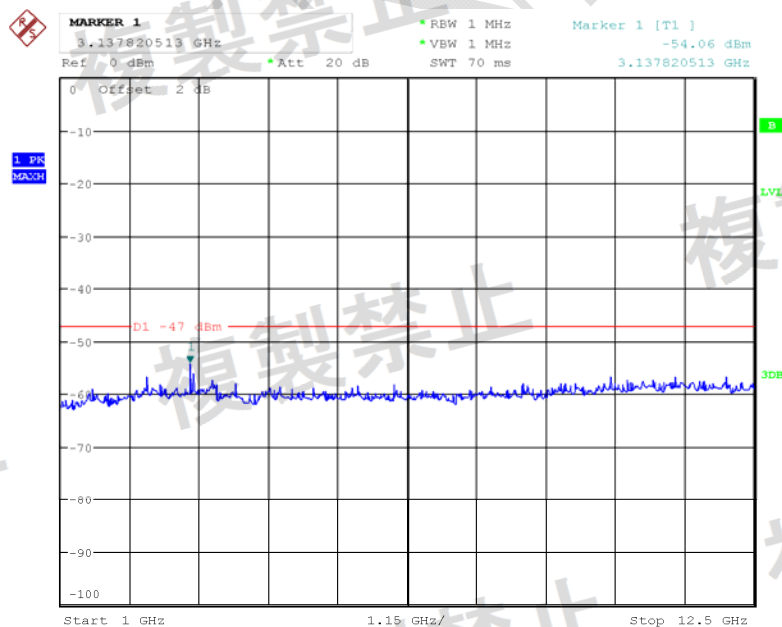
Test Frequency: 2403.5MHz

30MHz~1000MHz



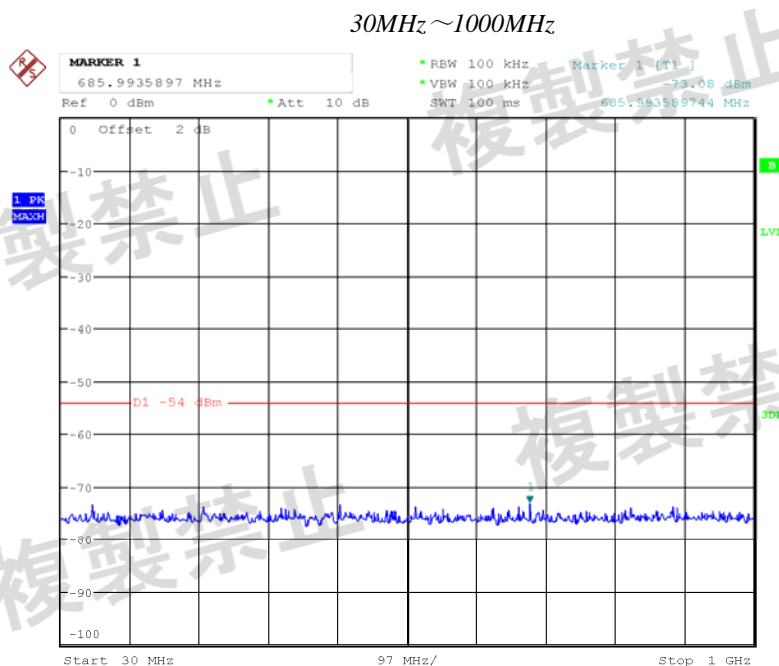
Date: 9.DEC.2019 13:35:09

1000MHz~12500MHz

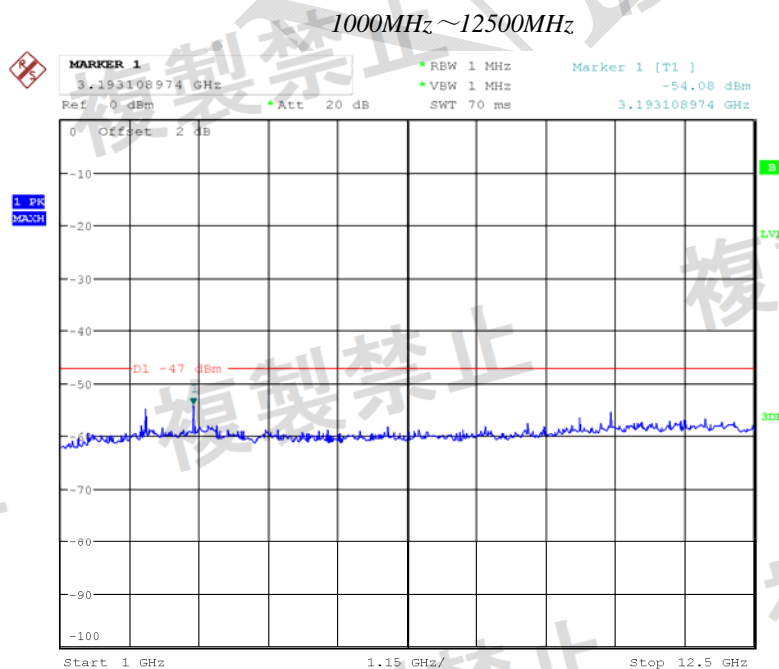


Date: 9.DEC.2019 14:39:34

Test Frequency: 2441.5MHz:

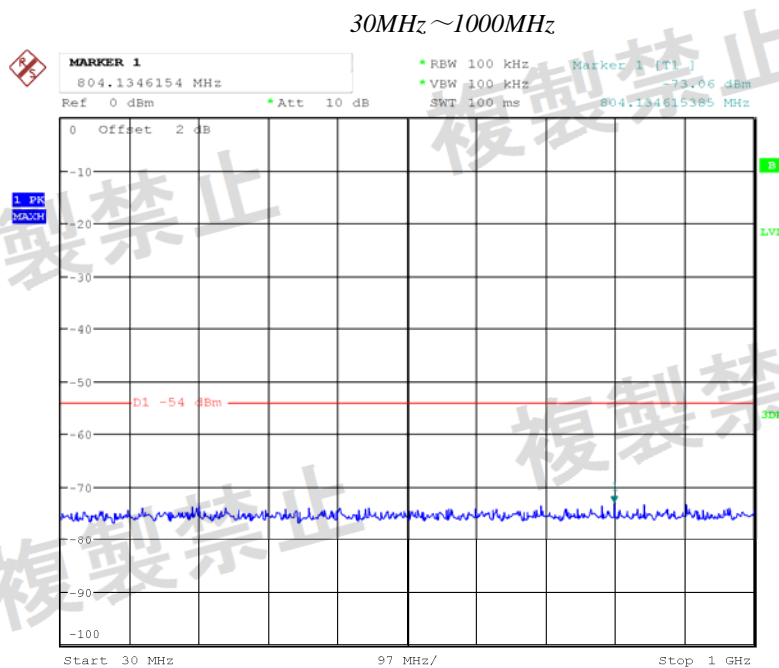


Date: 9.DEC.2019 13:35:35

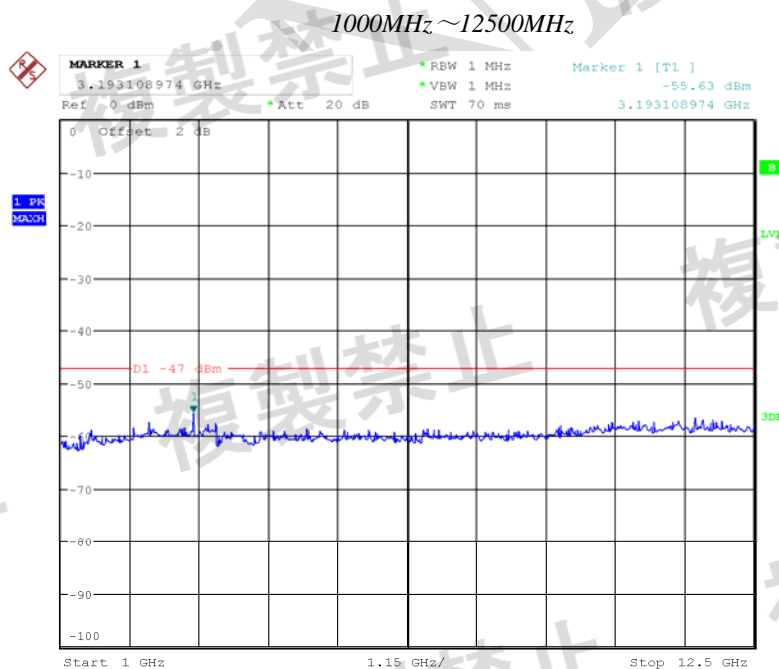


Date: 9.DEC.2019 14:40:06

Test Frequency: 2477.5MHz:



Date: 9.DEC.2019 13:27:44



Date: 9.DEC.2019 14:40:29

FREQUENCY HOPPING DWELL TIME

Applicable Standard

According to Radio Law Radio Equipment Regulations Article 49-20, frequency dwell time is 0.4 seconds or below.

Test Procedure

❖ Conditions of Application Equipment (EUT)

- Set the application equipment (EUT) to the measurement frequency.
- The modulation state shall be “continuous (burst) transmission mode”. If impossible, it shall be “continuous frequency-hopping mode”.

❖ Spectrum Analyzer Conditions

For spreading bandwidth:

- Span: 200MHz
- RBW: 300kHz, VBW: 300kHz
- Log scale: 10dB/Div, Data points: 501points (400 points or more)
- Detection: Positive Peak, Sweep mode: Continuous

For duty cycle and hopping number:

- Center Frequency: 2441.0 MHz
- RBW/VBW: ≥ 1 MHz
- Log scale: 10dB/Div, Data points: 501points (400 points or more)
- Detection: Sample, Sweep mode: Continuous

Test Data

Environmental Conditions

Temperature:	22.1~24.8°C
Relative Humidity:	35~46 %
ATM Pressure:	101.9~102.5 kPa

The testing was performed by Chris Mo from 2019-12-09 to 2019-12-13

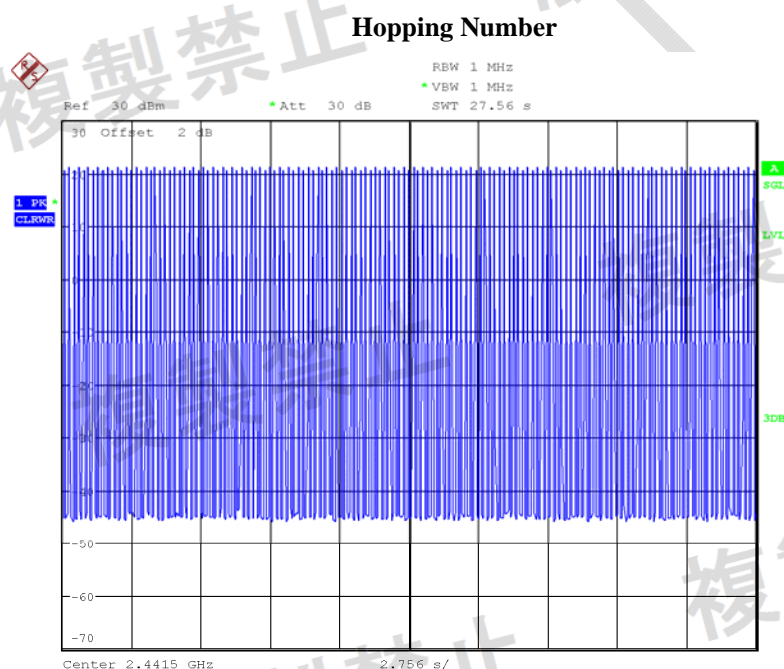
Test Result: Compliance

1.4M mode:

Chain	Spreading bandwidth (MHz)	Duty Cycle			Observed Period (s)	Hops in Observed Period	Dwell Time (s)	Limit (s)	Result
		T _{on} (ms)	T _{on} +T _{off} (ms)	T _{on} /(T _{on} +T _{off}) (%)					
Chain 0	68.91	1.17948	10.002	11.79	27.56	151	0.178	0.4	Pass
Chain 1	67.949	1.4391	10.098	14.25	27.18	147	0.212	0.4	Pass

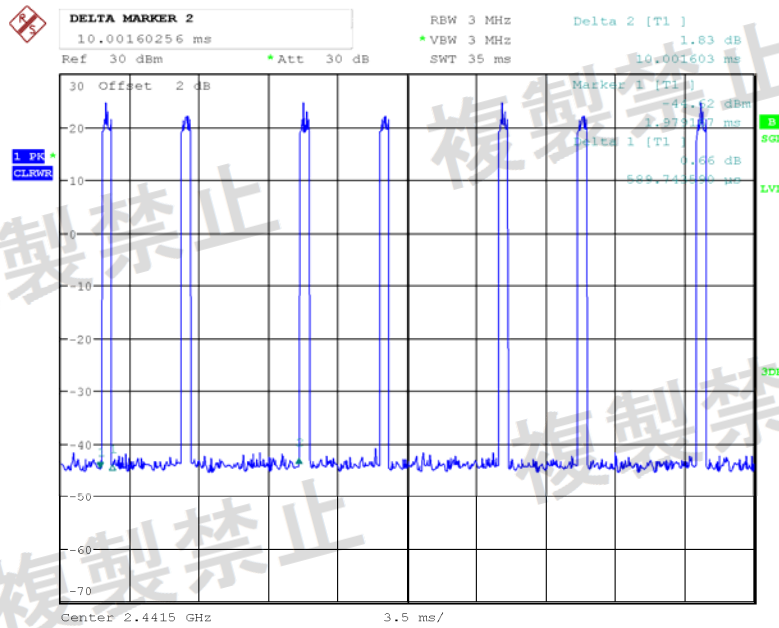
Note: Dwell time = Time per one hopping (On time) * hopping number (within the time obtained by multiplying the spread rate by 0.4s)

Chain 0:



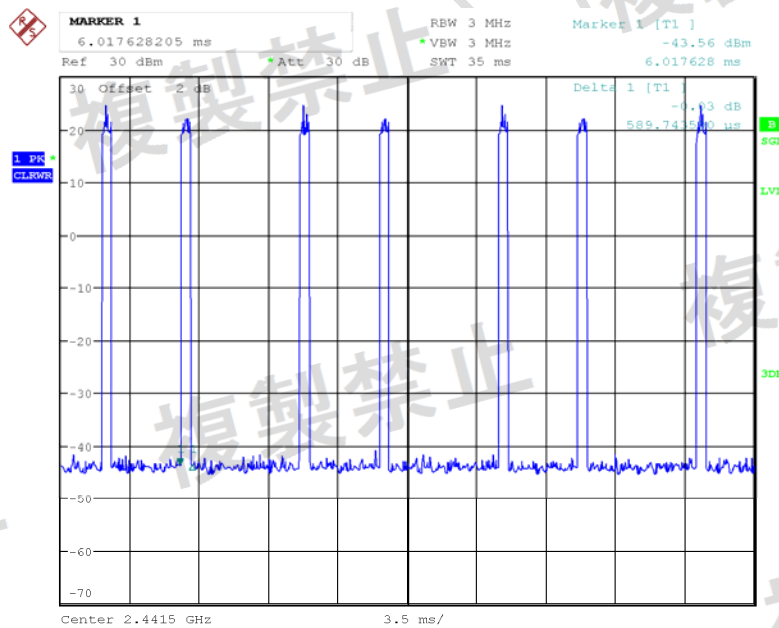
Date: 13.DEC.2019 19:14:33

Duty Cycle-1



Date: 9.DEC.2019 14:11:56

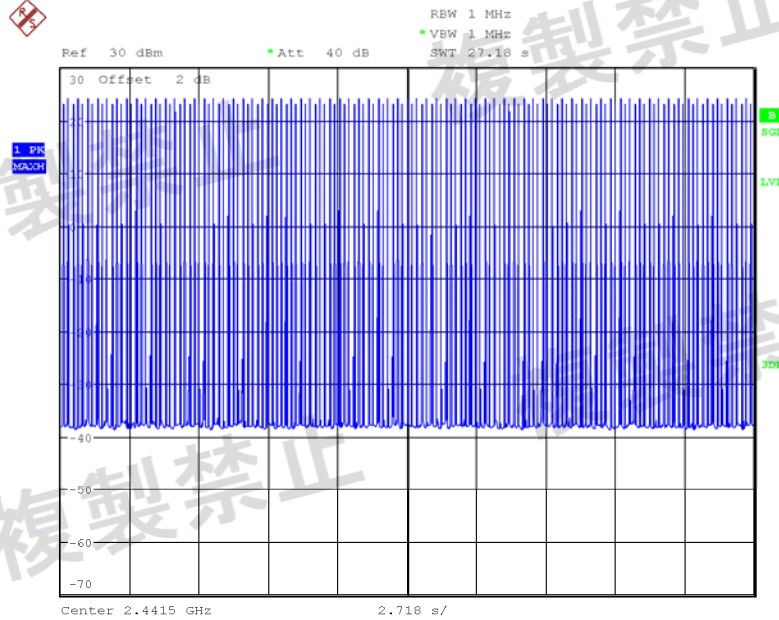
Duty Cycle-2



Date: 9.DEC.2019 14:12:31

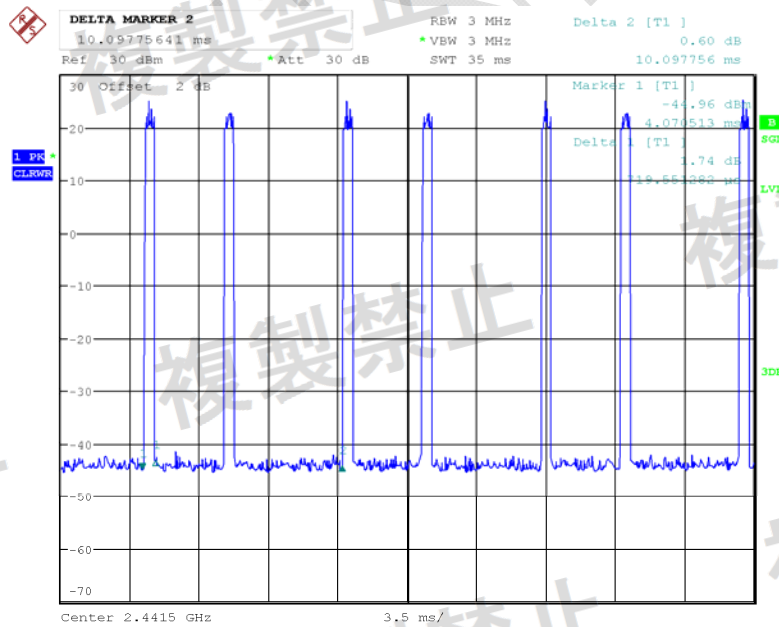
Chain 1:

Hopping Number



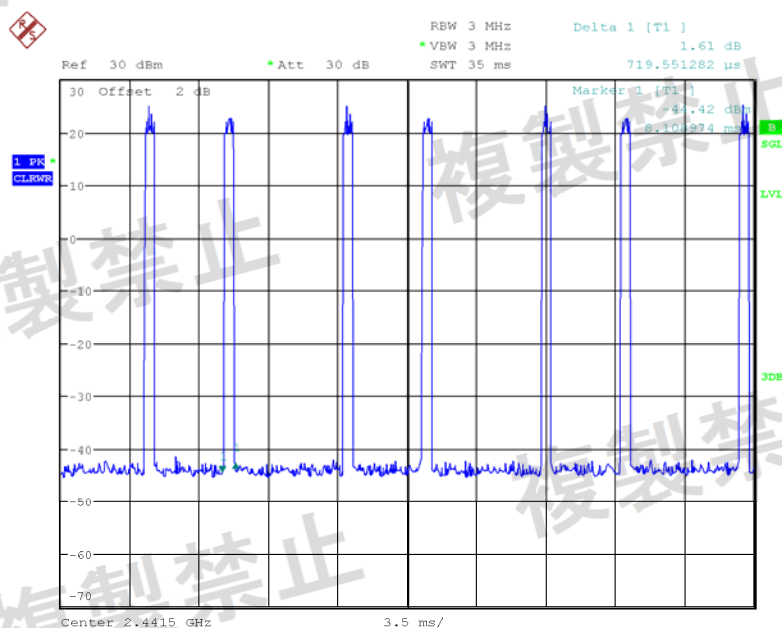
Date: 9.DEC.2019 13:09:05

Duty Cycle-1



Date: 9.DEC.2019 15:42:11

Duty Cycle-2



Date: 9.DEC.2019 15:42:43

INTERFERENCE PREVENTION FUNCTION

Requirement

The EUT shall have the interference prevention capability to transmit or to receive the identification automatically, so that sender and receiver shall exclude other equipment.

Test Procedure

In the case that the EUT has the function of automatically transmitting the identification code:

1. Transmit the predetermined identification codes from EUT
2. Check the transmitted identification codes with the demodulator.

In the case of receiving the identification codes:

1. Transmit the predetermined identification codes from the counterpart.
2. Check if communication is normal
3. Transmit the signal other than predetermined ID codes from the counterpart.
4. Check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

Measurement Result

Environmental Conditions

Temperature:	22.1°C
Relative Humidity:	35 %
ATM Pressure:	102.1 kPa

The testing was performed by Chris Mo on 2019-12-09.

Test Result: Good

CONSTRUCTION PROTECTION CONFIRMATION

Limit

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

Confirmation Method

The EUT has shielding cover the high-frequency section except for the antenna system, the shielding can't be opened easily. Please refer the EUT photo.

****END OF REPORT****