

JAPAN MIC
TEST REPORT
For

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Nanshan, Shenzhen, Guangdong, China

Model: 3WWDZ-15.1B

This Report Concerns: <input checked="" type="checkbox"/> Original Report		Equipment Type: AGRAS T20	
Report Number:		RDG191203008-07A	
Report Date:		2019-12-12	
Reviewed By:		Dean Lau RF Supervisor	
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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	10M Mode
	Modulation Type	OFDM
	Emission Type	D1D, X7W
	Frequency Range	2406.5-2476.5MHz
	Output Power	3mW/MHz.
Antenna Gain		4dBi
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 “△”. 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 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 was selected by manufacturer. The EUT has 2 antennas, the system configure 1T1R depending on better performance by the system automatically recognizes.

For 10M mode, 71 channels are provided for testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2406.5	37	2442.5
2	2407.5
...
...	...	70	2475.5
...	...	71	2476.5
36	2441.5	/	/

EUT was tested with channel 1, 36 and 71.

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

The software 'DjiSdrConsole.exe' was used for testing, which was provided by manufacture. The maximum power was configured as below table:

Mode	Channel	Frequency (MHz)	Power Level	
			Chain0	Chain1
10M	Low	2406.5	0	-1
	Middle	2441.5	2	0
	High	2476.5	3	1

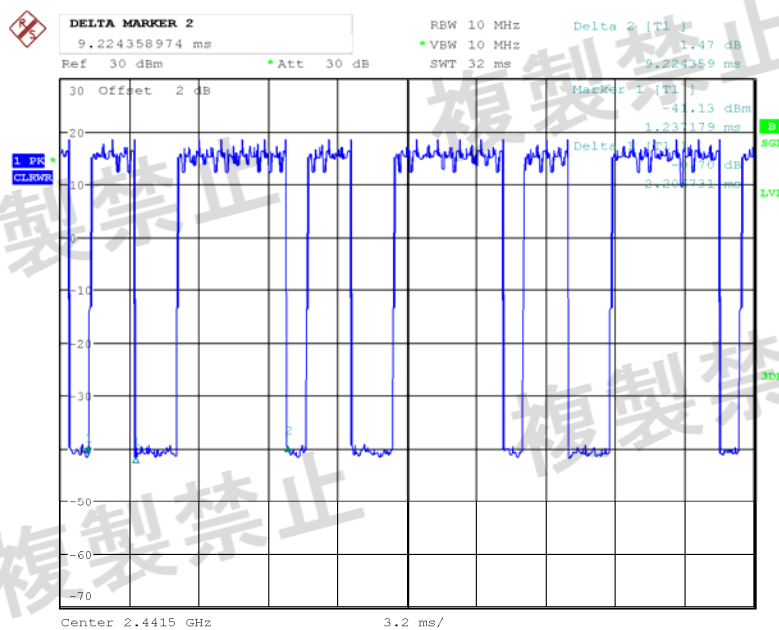
Duty cycle and Duty cycle factor:

Mode	Chain	T _{on} (ms)	T _{on+off} (ms)	Duty Cycle (%)	Duty Cycle Factor (dB)
10M	0	7.388	9.224	80.10	0.96
10M	1	7.387	10.045	73.5	1.33

Note: Duty Cycle Factor = 10*log(1/Duty Cycle)

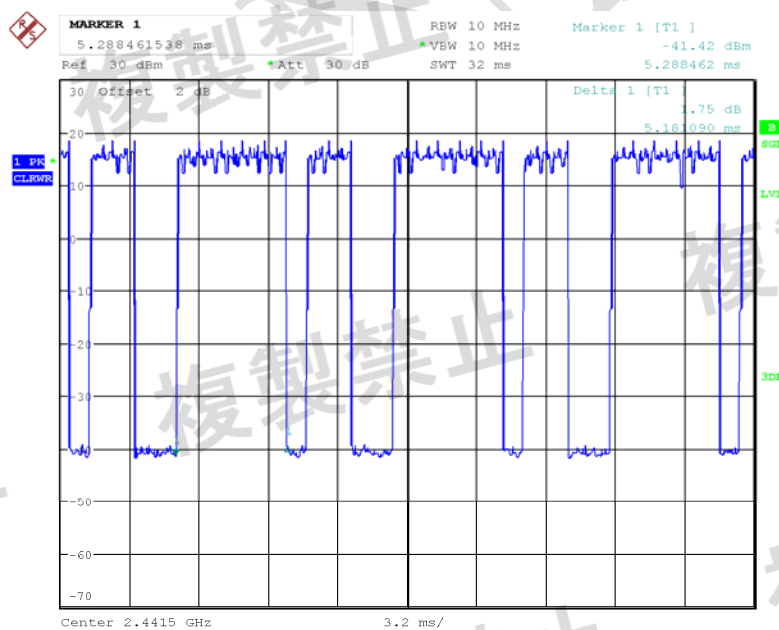
Chain 0:

10M-1



Date: 9.DEC.2019 16:20:42

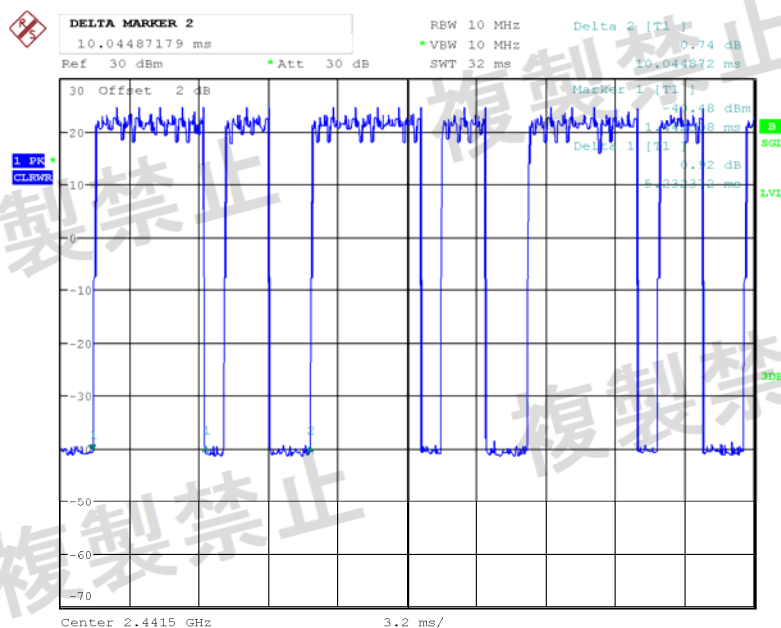
10M-2



Date: 9.DEC.2019 16:21:37

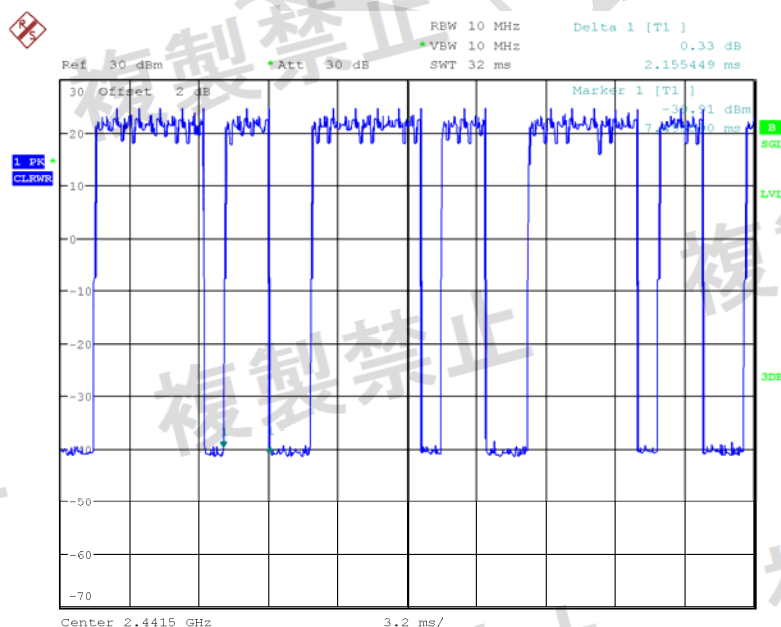
Chain 1:

10M-1



Date: 9.DEC.2019 15:46:58

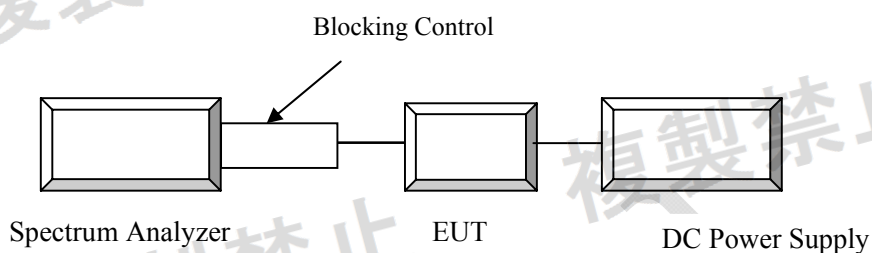
10M-2



Date: 9.DEC.2019 15:47:22

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		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	Carrier sense capability		Not Applicable**
11	Frequency Hopping Dwell Time		Not Applicable*
12	Interference Prevention Function		Compliance
Note 1	Construction Protection Confirmation		Compliance

Note:

Not Applicable: Please refer to 'Note 3' of Antenna Output Power and Output Power Tolerance section.

Not Applicable*: Testing is only required for FHSS system devices.

Not Applicable**: This item only required for bandwidth which more than 26MHz and less than 38MHz.

FREQUENCY ERROR

Limit

50ppm or below

Test Procedure

Set the EUT to the measurement frequency without modulation.
Setting of SA is following as: RBW: 300 kHz / VBW: 300 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*Test Mode: Transmitting*

Chain 0

Frequency (MHz)	Voltage	Measure Frequency (MHz)		Result	Tolerance	Limit
		F1	F2	MHz	ppm	
2406.5	LV	2401.884624	2411.24359	2406.564	26.59	<50ppm
	NV	2401.884615	2411.24359	2406.564	26.59	
	HV	2401.884628	2411.243596	2406.564	26.59	
2441.5	LV	2436.852552	2446.179481	2441.516	6.55	
	NV	2436.852564	2446.179487	2441.516	6.55	
	HV	2436.852572	2446.179482	2441.516	6.55	
2476.5	LV	2471.948718	2481.14736	2476.548	19.38	
	NV	2471.948718	2481.147436	2476.548	19.38	
	HV	2471.948724	2481.147422	2476.548	19.38	

Chain 1

Frequency (MHz)	Voltage	Measure Frequency (MHz)		Result	Tolerance	Limit
		F1	F2	MHz	ppm	
2406.5	LV	2401.884615	2411.179482	2406.532	13.30	<50ppm
	NV	2401.884615	2411.179487	2406.532	13.30	
	HV	2401.884626	2411.179482	2406.532	13.30	
2441.5	LV	2436.948716	2446.121786	2441.535	14.34	
	NV	2436.948718	2446.121795	2441.535	14.34	
	HV	2436.948718	2446.121795	2441.535	14.34	
2476.5	LV	2471.948728	2481.198712	2476.574	29.88	
	NV	2471.948718	2481.198718	2476.574	29.88	
	HV	2471.948712	2481.198718	2476.574	29.88	

Note:

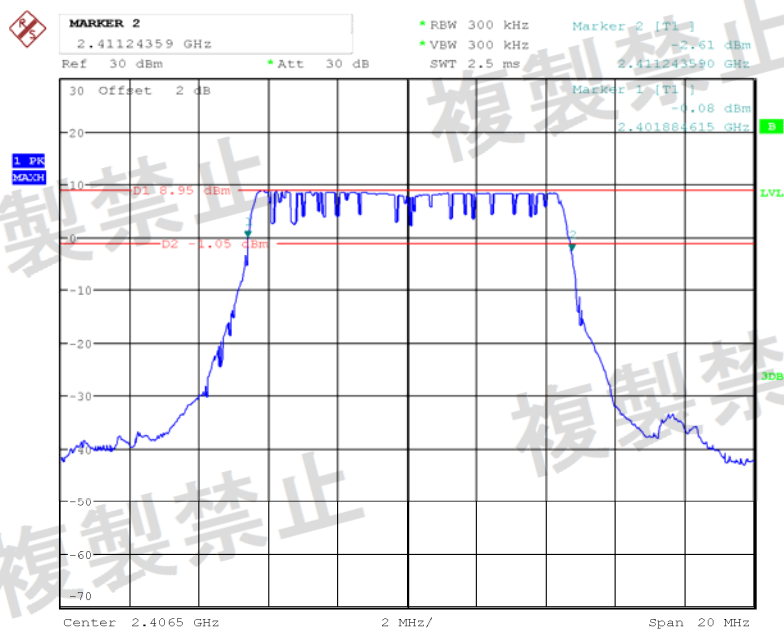
$$\text{Result} = (F1 + F2) / 2$$

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

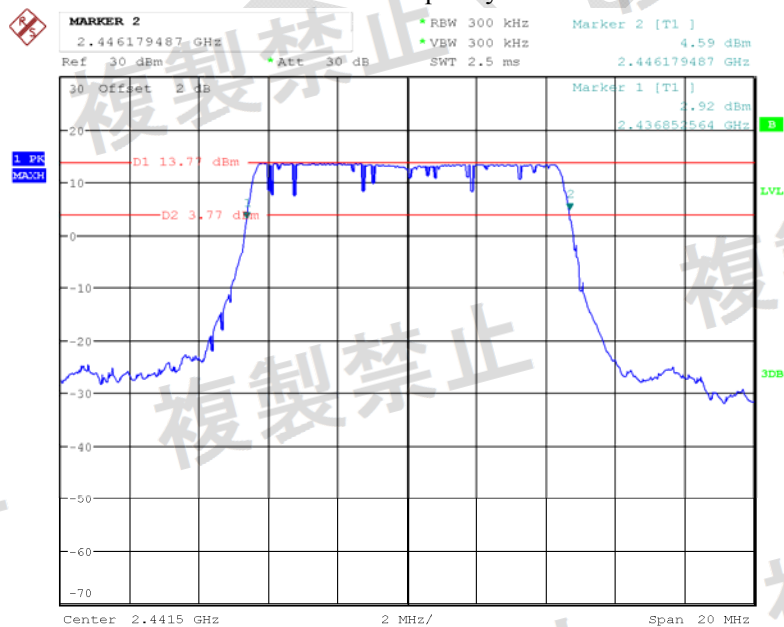
Please refer to the following plots for normal voltage:

Chain 0

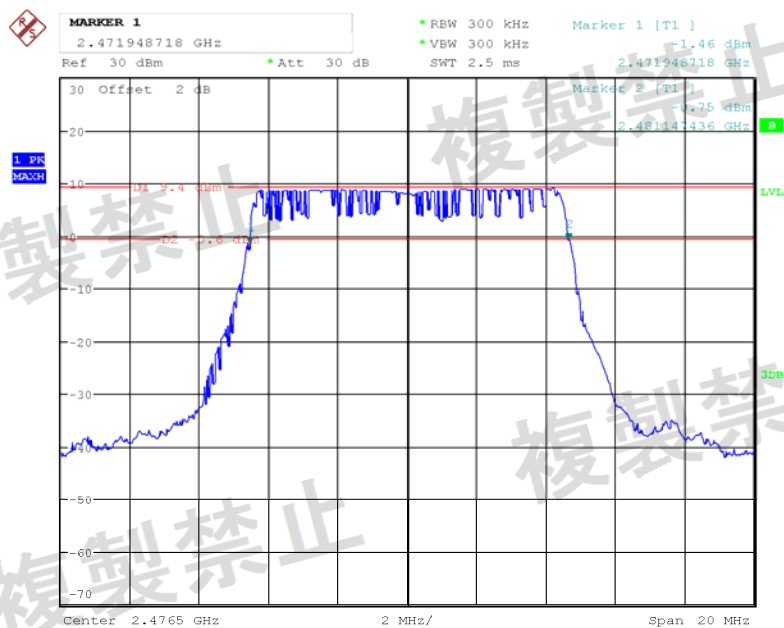
10M-Test Frequency:2406.5MHz



10M-Test Frequency:2441.5MHz



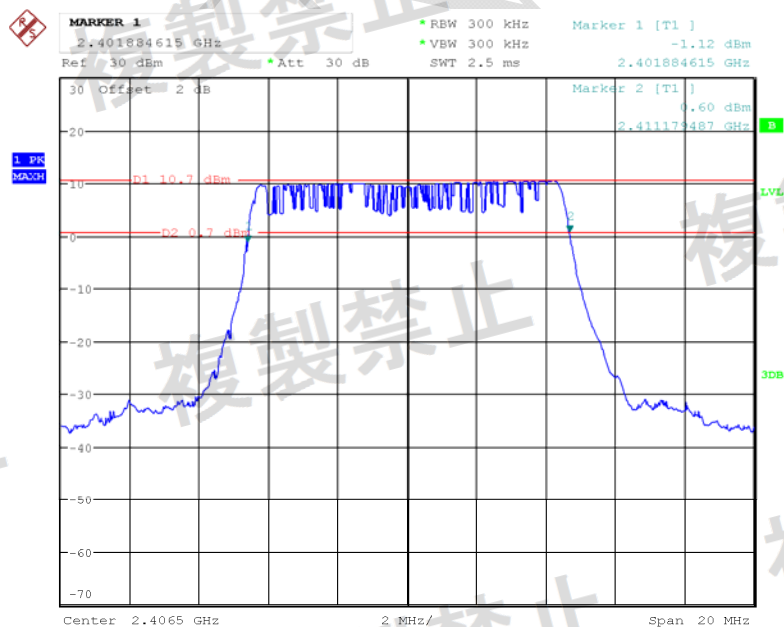
10M-Test Frequency:2476.5MHz



Date: 9.DEC.2019 16:47:02

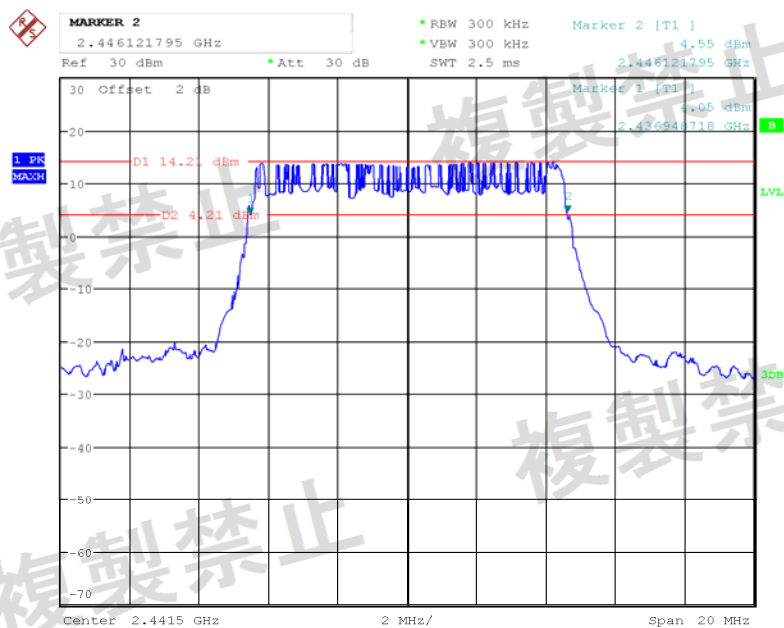
Chain 1

10M-Test Frequency:2406.5MHz



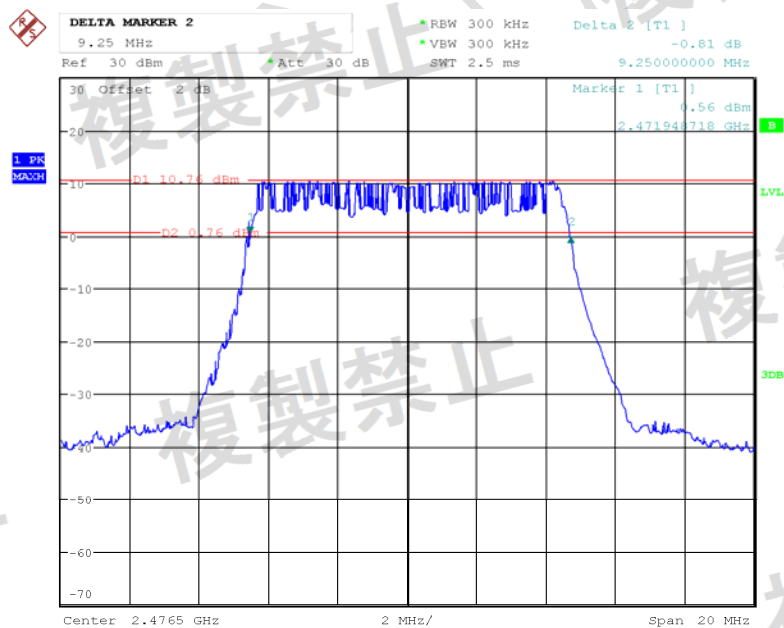
Date: 9.DEC.2019 18:40:53

10M-Test Frequency:2441.5MHz



Date: 9.DEC.2019 18:41:54

10M-Test Frequency:2476.5MHz



Date: 9.DEC.2019 18:43:20

OCCUPIED BANDWIDTH

Limit

- Occupied bandwidth: FH≤83.5 MHz; DS≤26 MHz; OFDM≤38 MHz, Others≤26 MHz

Test Procedure

- Setting of SA is following as: RBW: 300 kHz / VBW: 300 kHz / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
- EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 99% of occupied bandwidth to measure occupied bandwidth.

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	Channel	Occupied bandwidth (MHz)			
		LV	NV	HV	Limit
OFDM	Low	9.071	9.071	9.071	<26
	Middle	9.071	9.071	9.071	
	High	9.103	9.103	9.103	

Chain 1

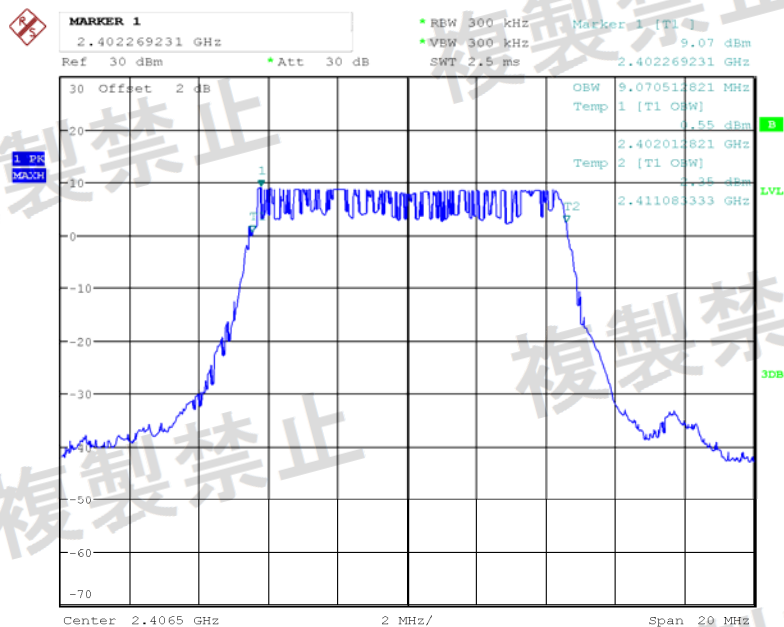
Mode	Channel	Occupied bandwidth (MHz)			
		LV	NV	HV	Limit
OFDM	Low	9.135	9.135	9.135	<26
	Middle	9.133	9.135	9.138	
	High	9.133	9.135	9.138	

Note: For OFDM modulation, Spread Bandwidth and Spread factor was not requirement.

Please refer to the following plots for normal voltage:

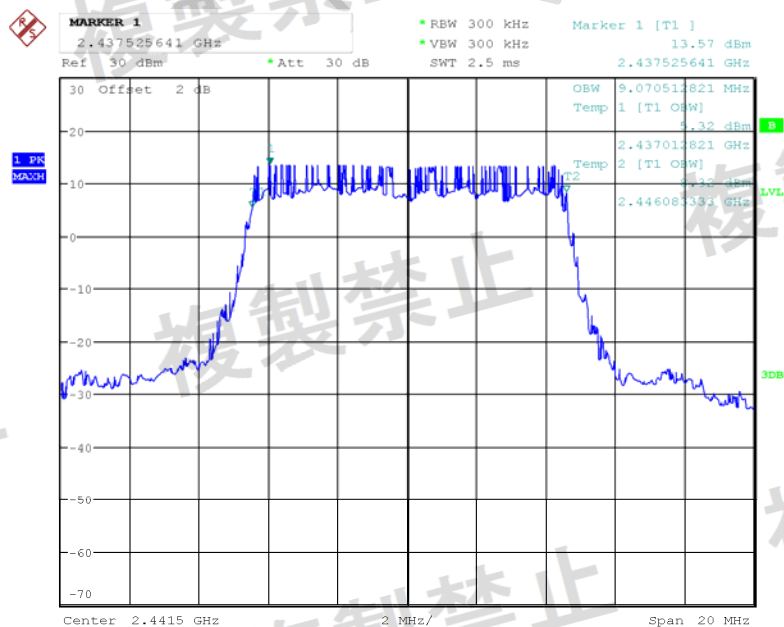
Chain 0

10M - Test Frequency:2406.5MHz



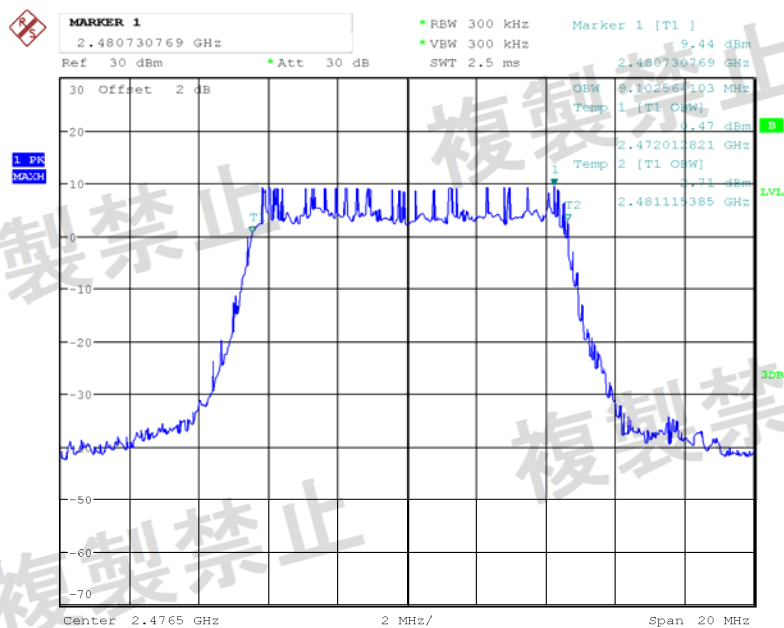
Date: 9.DEC.2019 17:03:00

10M - Test Frequency:2441.5MHz



Date: 9.DEC.2019 16:59:55

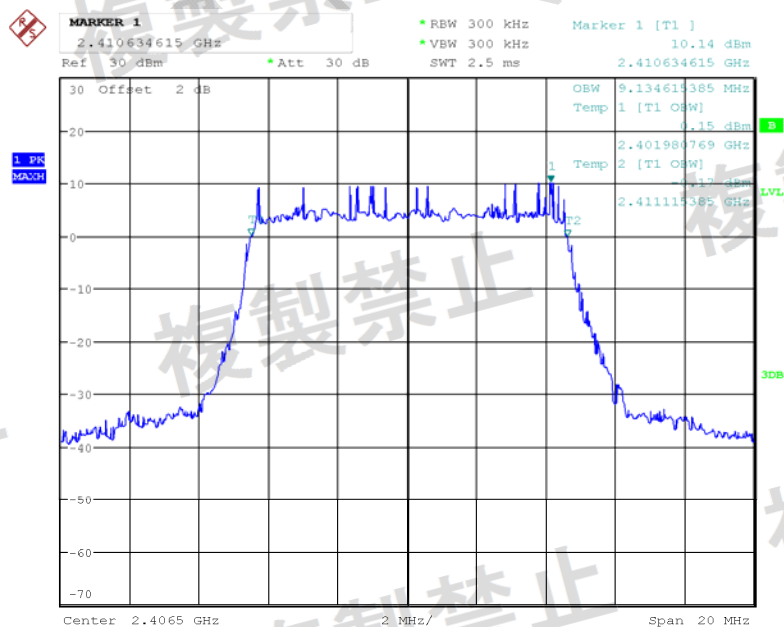
10M - Test Frequency:2476.5MHz



Date: 9.DEC.2019 17:00:38

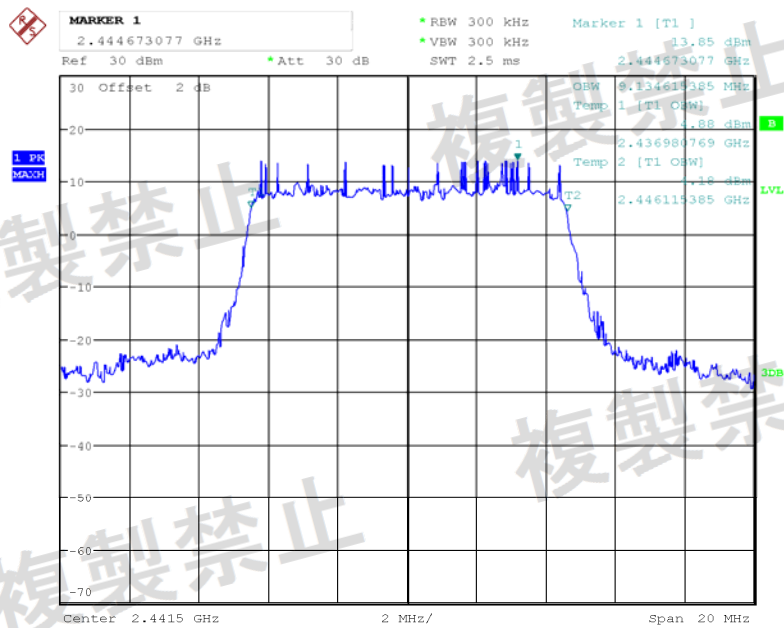
Chain 1

10M - Test Frequency:2406.5MHz



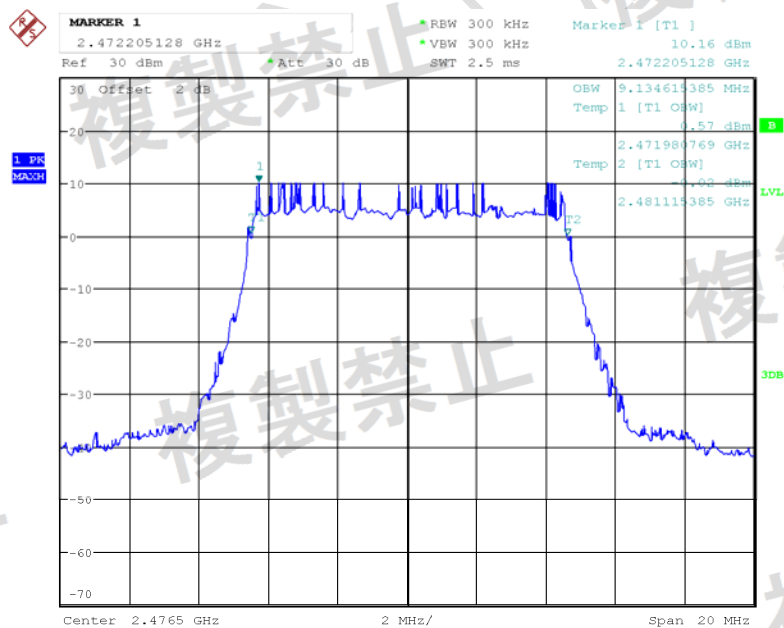
Date: 9.DEC.2019 18:44:50

10M - Test Frequency:2441.5MHz



Date: 9.DEC.2019 18:45:23

10M - Test Frequency:2476.5MHz



Date: 9.DEC.2019 18:44:19

TRANSMITTER SPURIOUS EMISSION STRENGTH AND UNWANTED EMISSION INTENSITY

Limit

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

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, RB:1MHz/VB: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, RB:1MHz/VB: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, RB:1MHz/VB: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, RB:1MHz/VB: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:	22.1~22.6 °C
Relative Humidity:	35~38 %
ATM Pressure:	101.9~102.5 kPa

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

Test Mode: Transmitting,

Test Result: Compliance, Please refer to the below plots

	Frequency Band	2406.5 MHz			2441.5 MHz			2476.5 MHz			Limit
		LV	NV	HV	LV	NV	HV	LV	NV	HV	
Raw data Chain 0	Band I (dBm/100kHz)	-45.34	-45.36	-45.38	-45.05	-45.05	-45.01	-56.05	-56.09	-56.11	-36dBm/100kHz (0.25 μW/100kHz)
	Band II (dBm/MHz)	-54.13	-54.13	-54.15	-53.70	-53.72	-53.74	-57.58	-57.54	-57.56	-26dBm/MHz (2.5 μW/MHz)
	Band III (dBm/MHz)	-17.39	-17.31	-17.36	-54.02	-54.04	-54.06	-43.76	-43.72	-43.78	-16dBm/MHz (25 μW/MHz)
	Band IV (dBm/MHz)	-43.98	-43.94	-43.96	-57.37	-57.41	-57.45	-18.72	-18.75	-18.74	-16dBm/MHz (25 μW/MHz)
	Band V (dBm/MHz)	-45.94	-45.98	-46.02	-48.27	-48.25	-48.29	-55.31	-55.31	-55.31	-26dBm/MHz (2.5 μW/MHz)
Raw data Chain 1	Band I (dBm/100kHz)	-53.06	-53.04	-53.00	-46.47	-46.51	-46.55	-54.10	-54.14	-54.12	-36dBm/100kHz (0.25 μW/100kHz)
	Band II (dBm/MHz)	-52.62	-52.60	-52.56	-57.13	-57.13	-57.15	-57.91	-57.87	-57.89	-26dBm/MHz (2.5 μW/MHz)
	Band III (dBm/MHz)	-16.83	-16.81	-16.82	-53.29	-53.29	-53.31	-53.44	-53.47	-53.42	-16dBm/MHz (25 μW/MHz)
	Band IV (dBm/MHz)	-52.19	-52.18	-52.17	-53.01	-53.01	-53.03	-21.66	-21.64	-21.62	-16dBm/MHz (25 μW/MHz)
	Band V (dBm/MHz)	-54.91	-54.95	-54.93	-40.37	-40.33	-40.29	-53.93	-53.93	-53.93	-26dBm/MHz (2.5 μW/MHz)

Note:

Band I: 30MHz~1000MHz

Band II: 1000MHz~2387MHz

Band III: 2387MHz~2400MHz

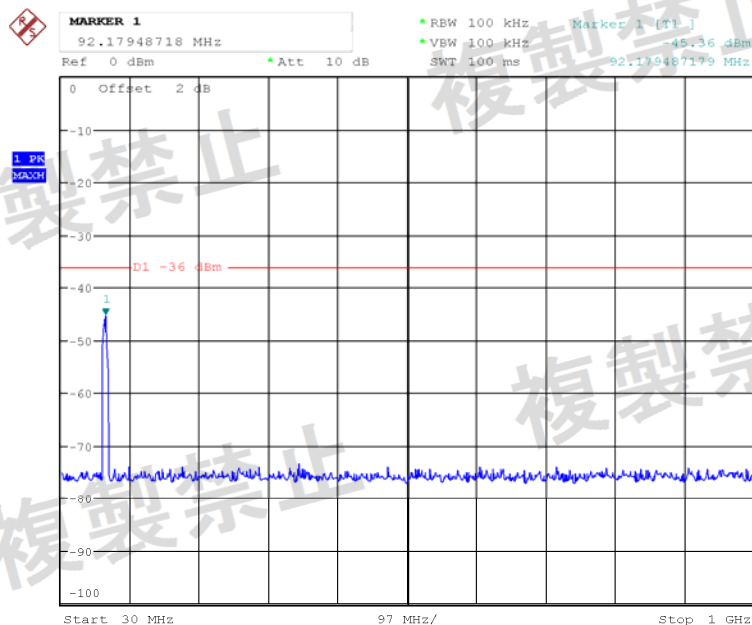
Band IV: 2483.5MHz~2496.5MHz

Band V: 2496.5MHz~12500MHz

Please refer to the following plots for normal voltage:

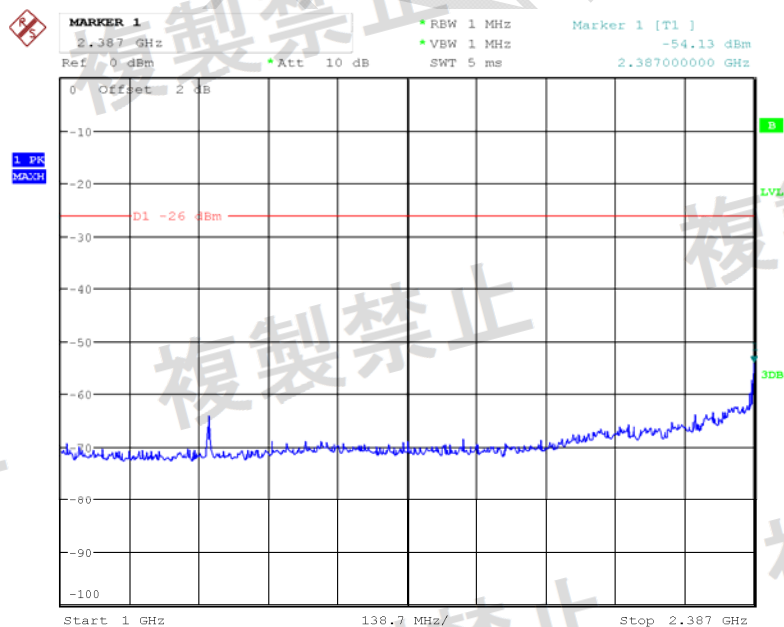
Chain 0 Low Channel:

30MHz~1000MHz



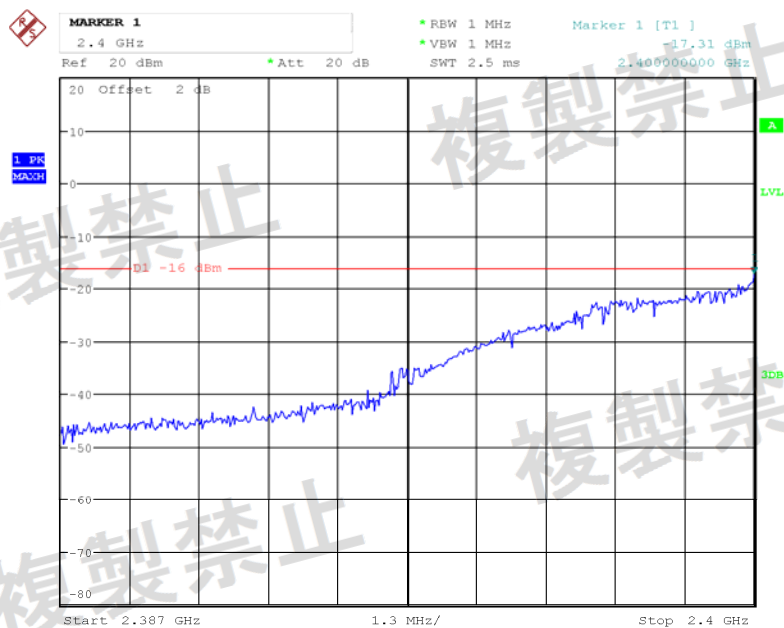
Date: 9.DEC.2019 17:53:54

1000MHz~2387MHz



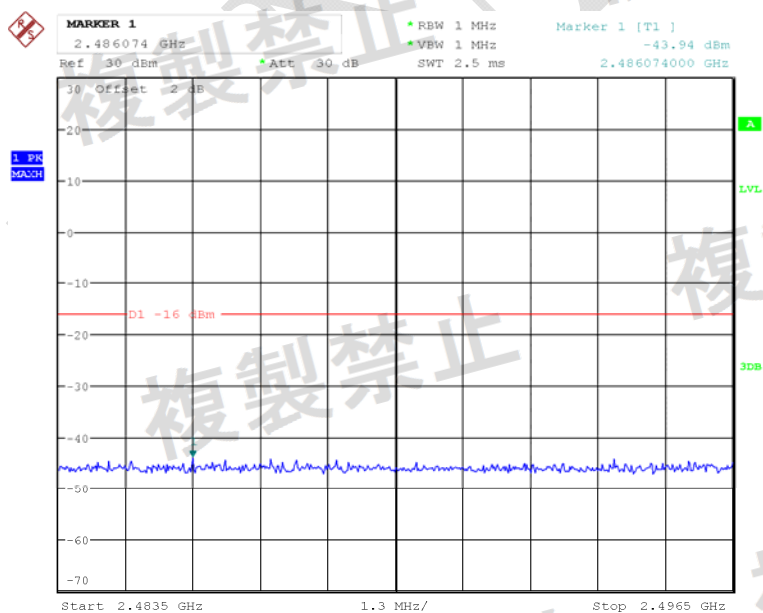
Date: 9.DEC.2019 17:54:54

2387MHz~2400MHz



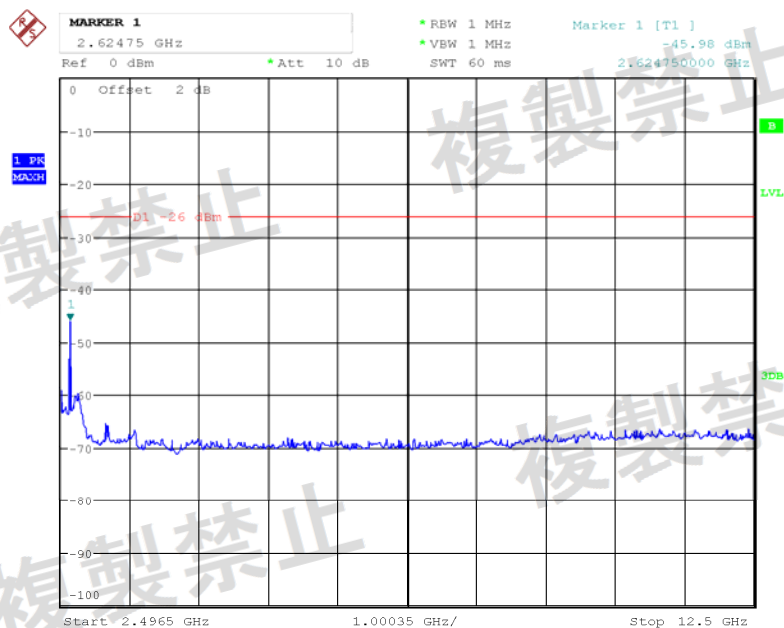
Date: 12.DEC.2019 14:27:19

2483.5MHz~2496.5MHz



Date: 12.DEC.2019 14:24:13

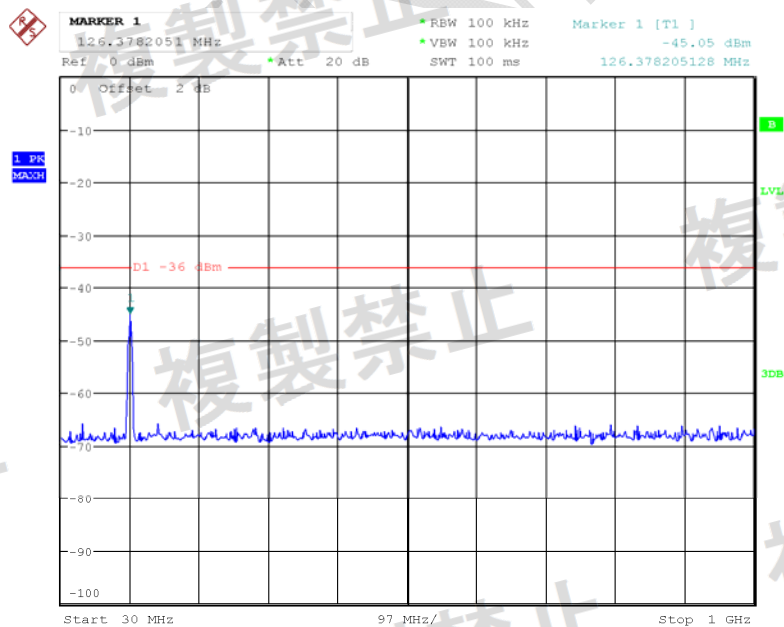
2496.5MHz~12500MHz



Date: 9.DEC.2019 17:57:51

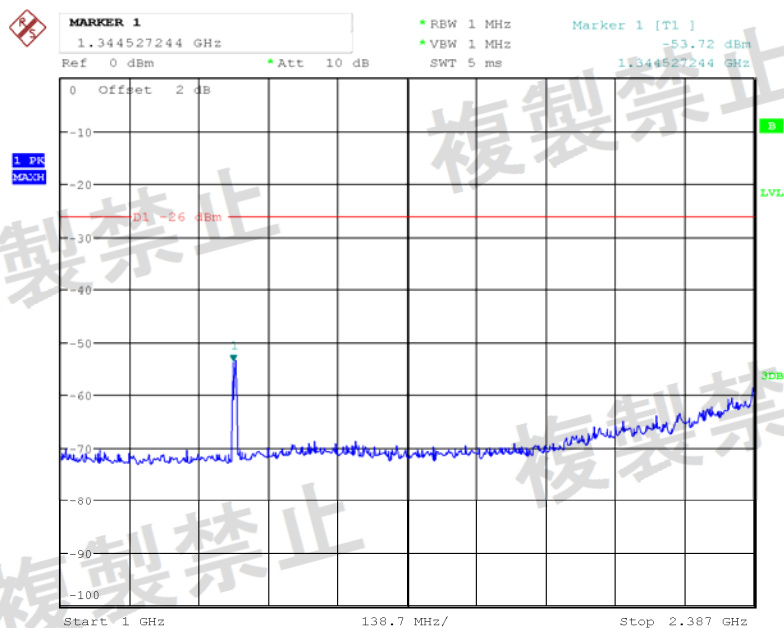
Middle Channel:

30MHz~1000MHz



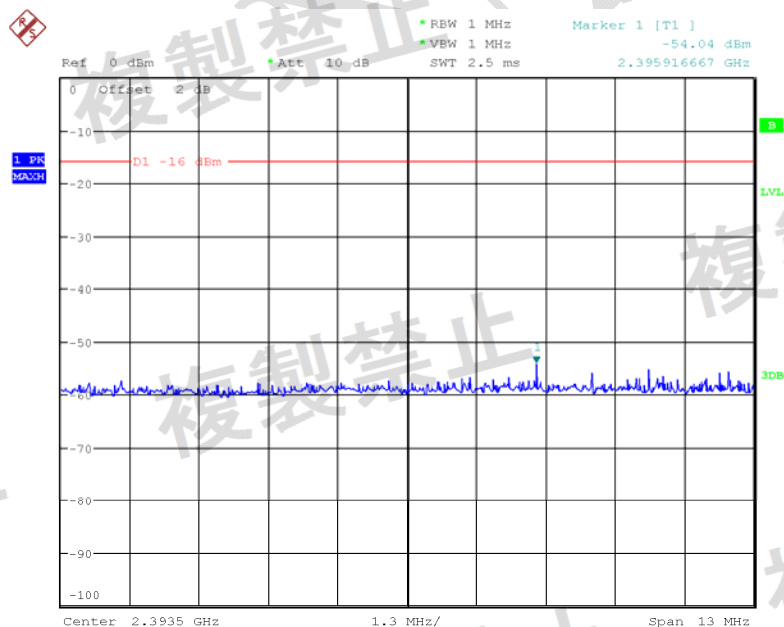
Date: 9.DEC.2019 18:01:36

1000MHz~2387MHz



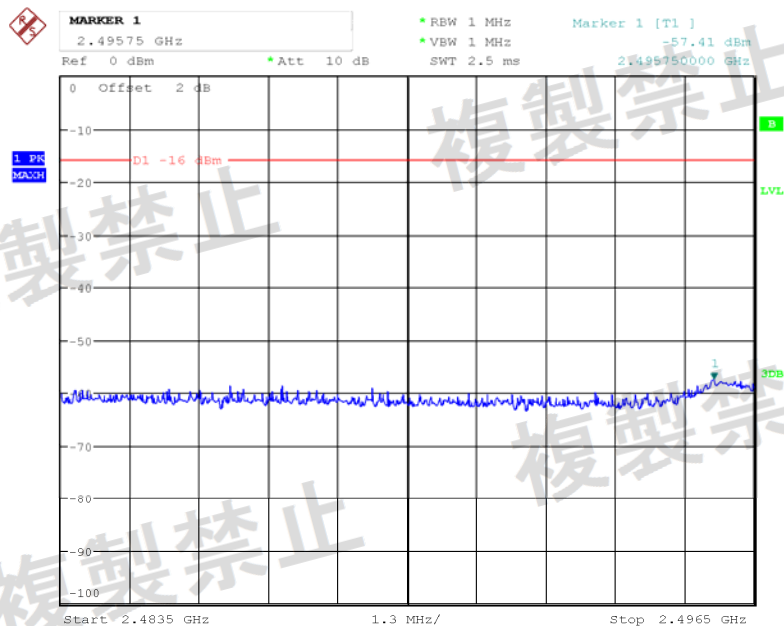
Date: 9.DEC.2019 18:00:39

2387MHz~2400MHz



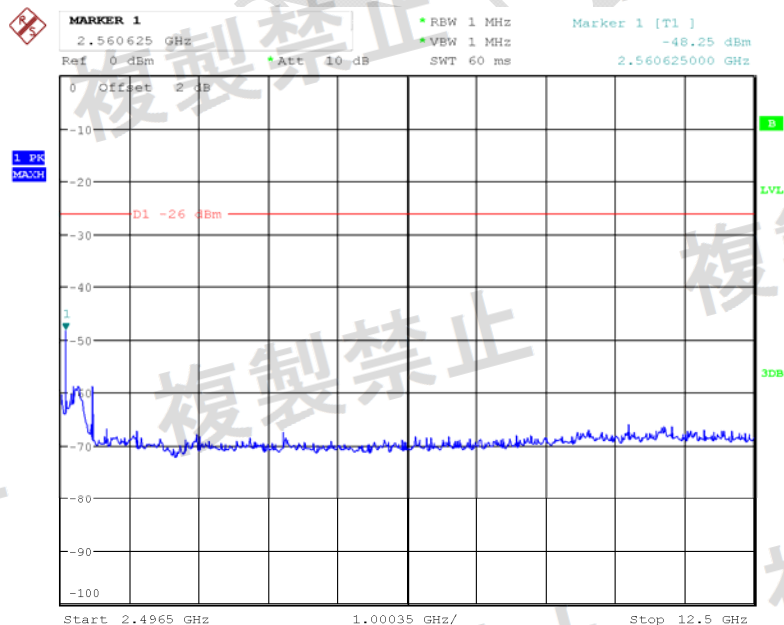
Date: 9.DEC.2019 17:59:55

2483.5MHz~2496.5MHz



Date: 9.DEC.2019 17:58:50

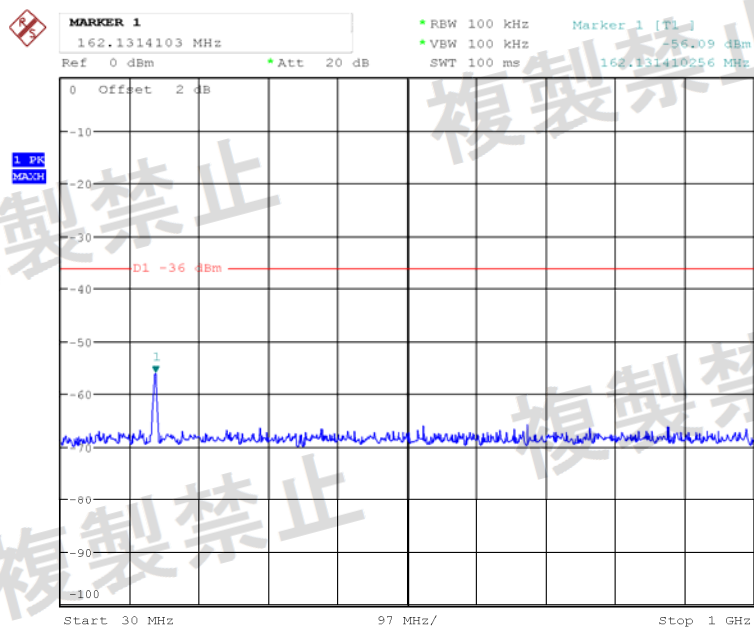
2496.5MHz~12500MHz



Date: 9.DEC.2019 17:58:16

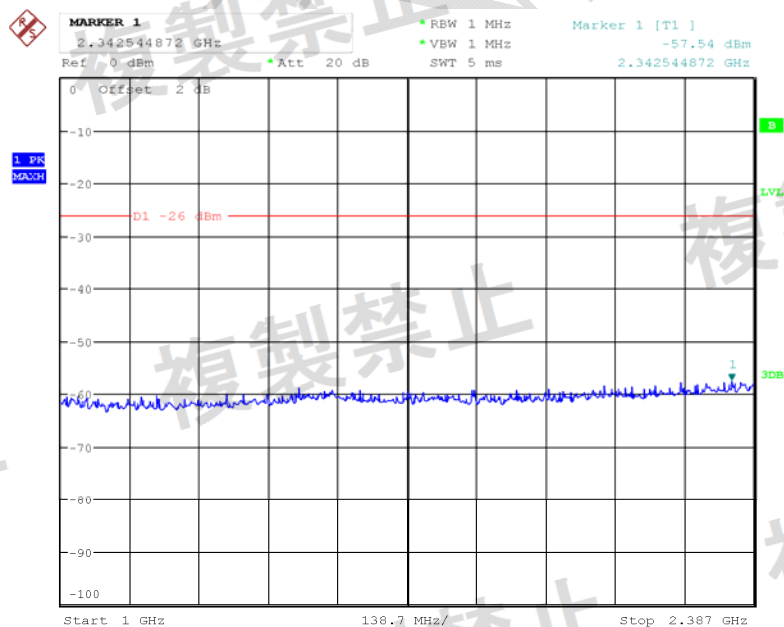
High Channel:

30MHz~1000MHz



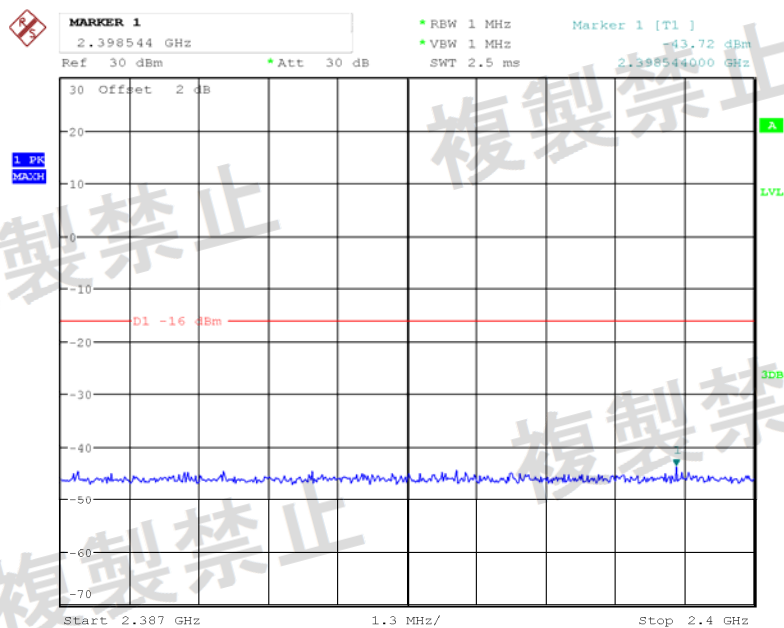
Date: 9.DEC.2019 18:02:16

1000MHz~2387MHz



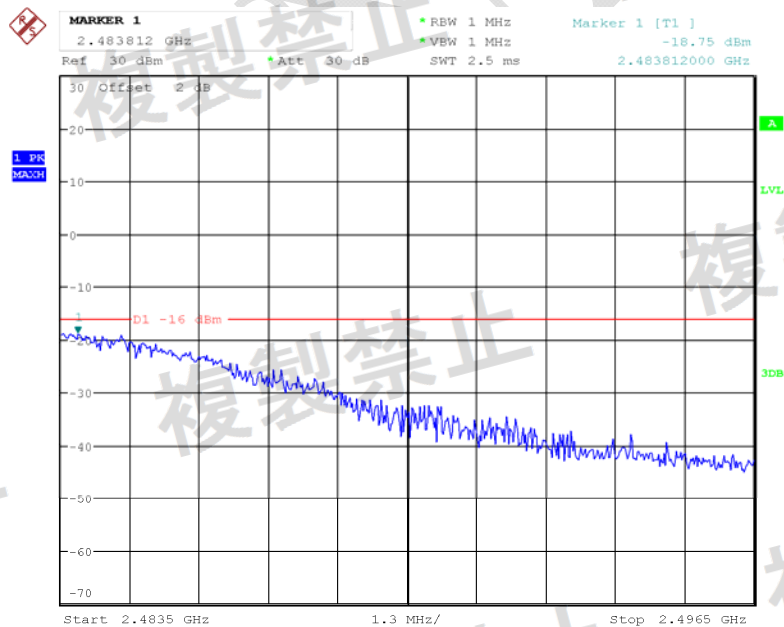
Date: 9.DEC.2019 18:03:04

2387MHz~2400MHz



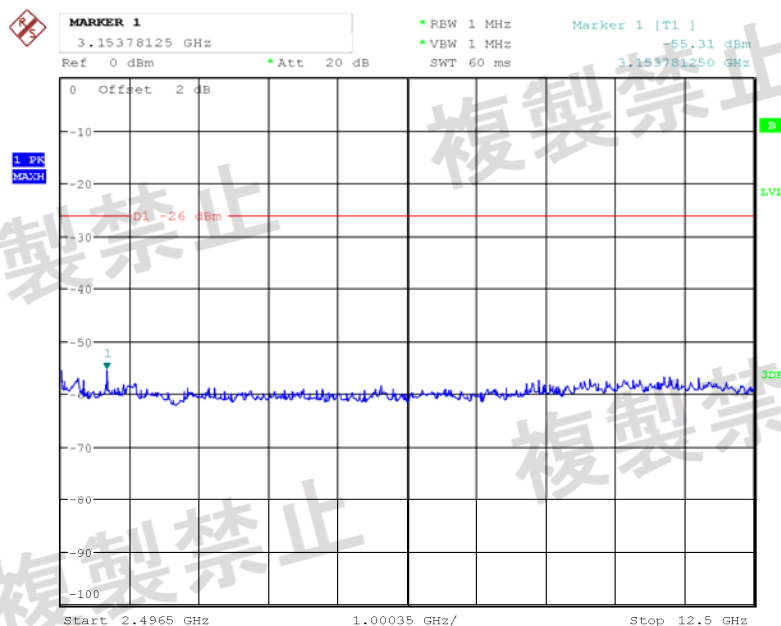
Date: 12.DEC.2019 14:23:07

2483.5MHz~2496.5MHz



Date: 12.DEC.2019 14:23:44

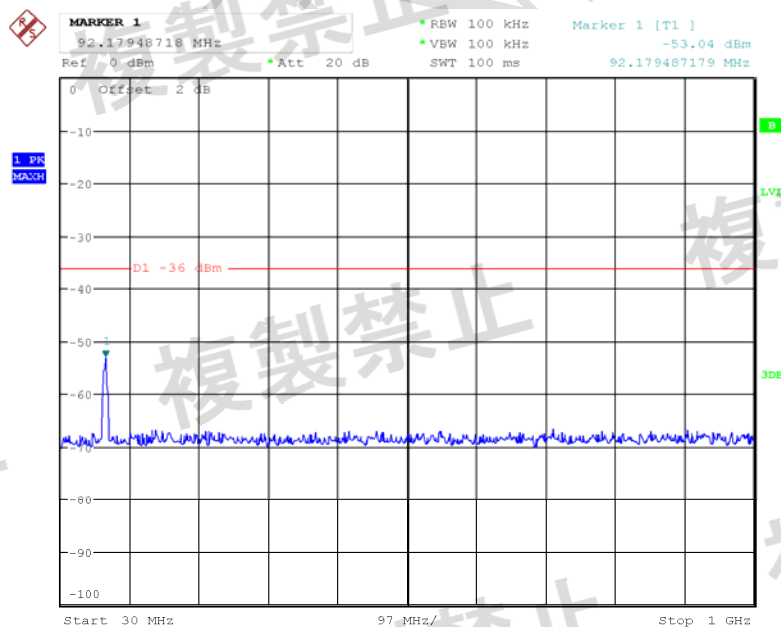
2496.5MHz~12500MHz



Date: 9.DEC.2019 18:05:15

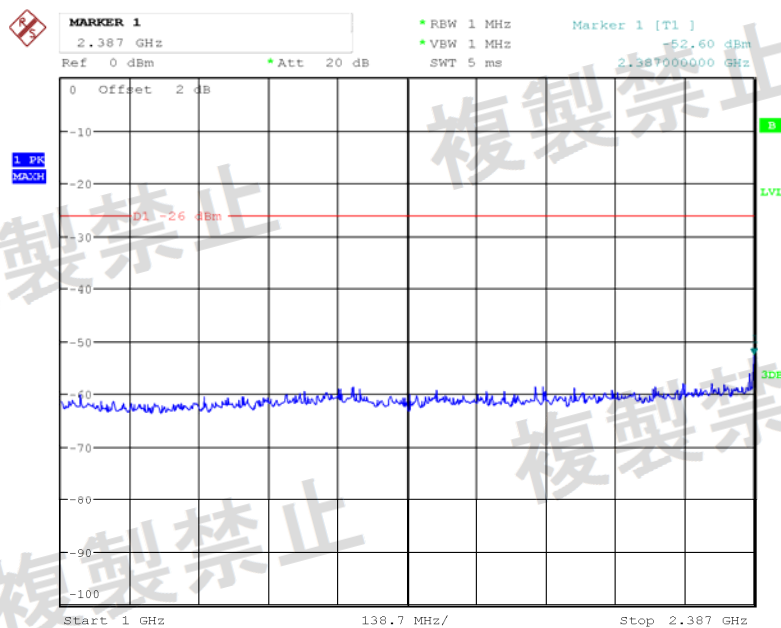
Chain 1
Low Channel:

30MHz~1000MHz



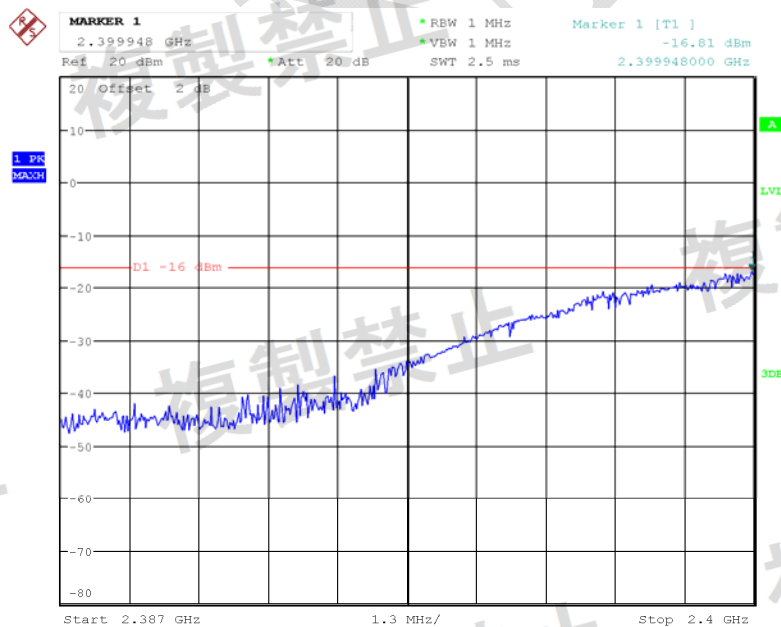
Date: 9.DEC.2019 18:20:42

1000MHz~2387MHz



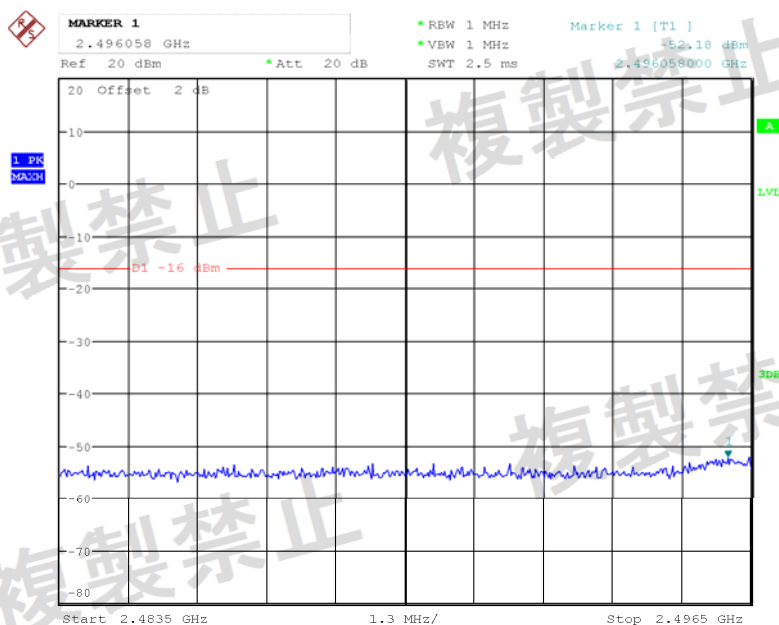
Date: 9.DEC.2019 18:21:24

2387MHz~2400MHz



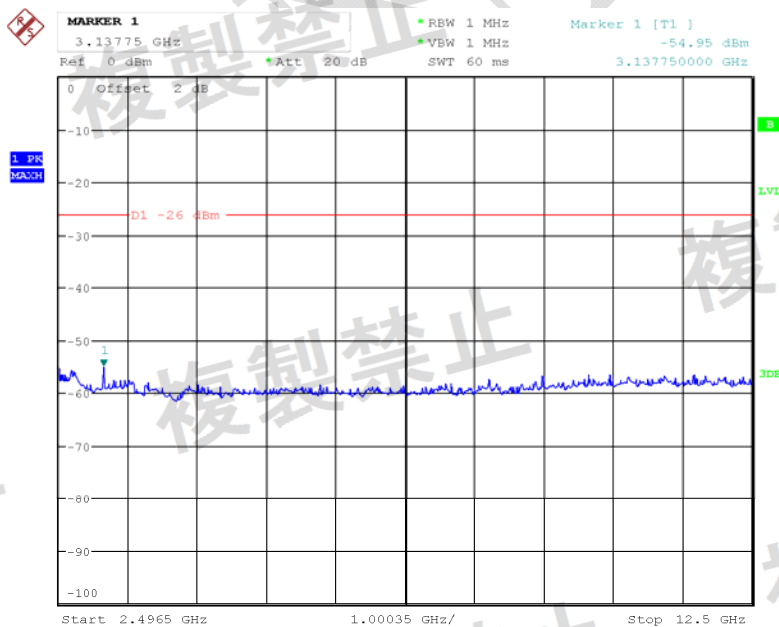
Date: 12.DEC.2019 14:29:48

2483.5MHz~2496.5MHz



Date: 12.DEC.2019 14:30:23

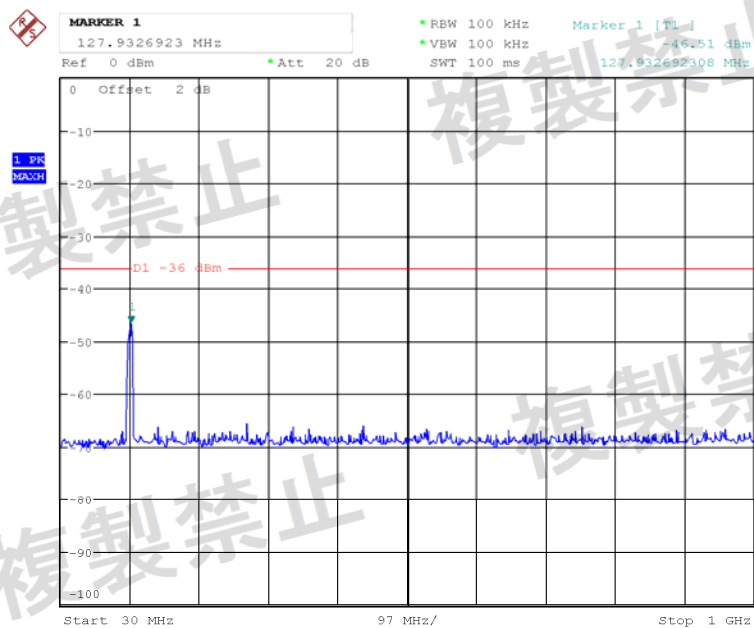
2496.5MHz~12500MHz



Date: 9.DEC.2019 18:23:23

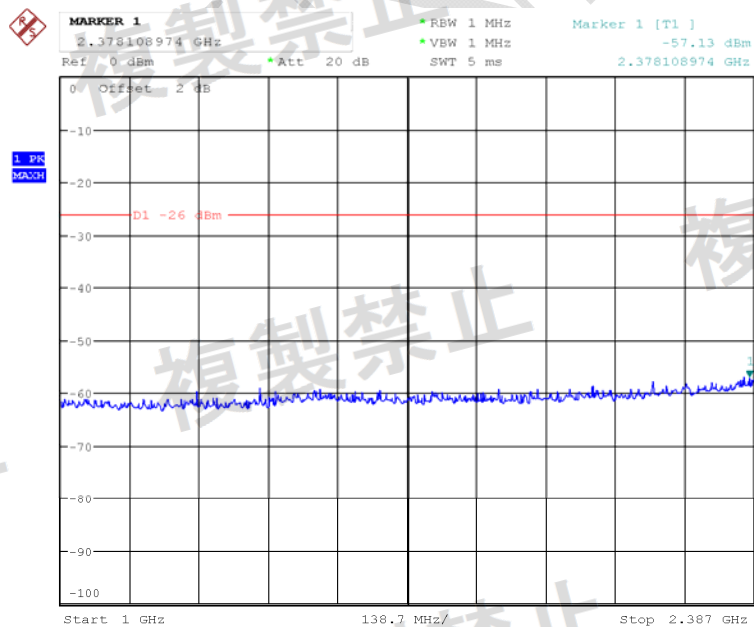
Middle Channel:

30MHz~1000MHz



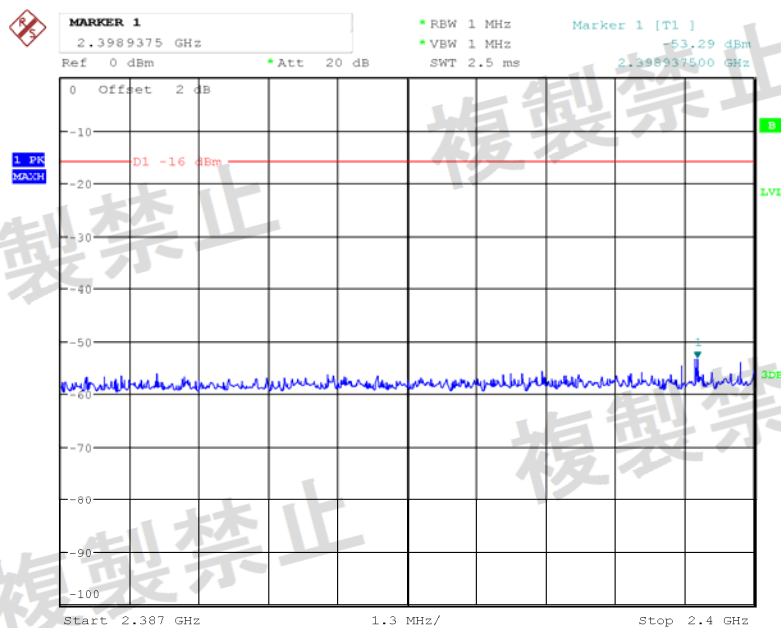
Date: 9.DEC.2019 18:13:22

1000MHz~2387MHz



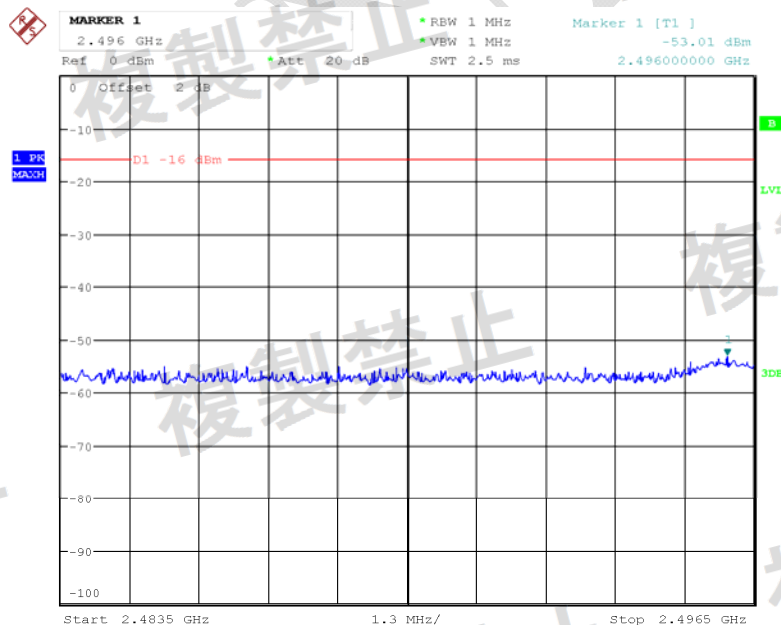
Date: 9.DEC.2019 18:14:24

2387MHz~2400MHz



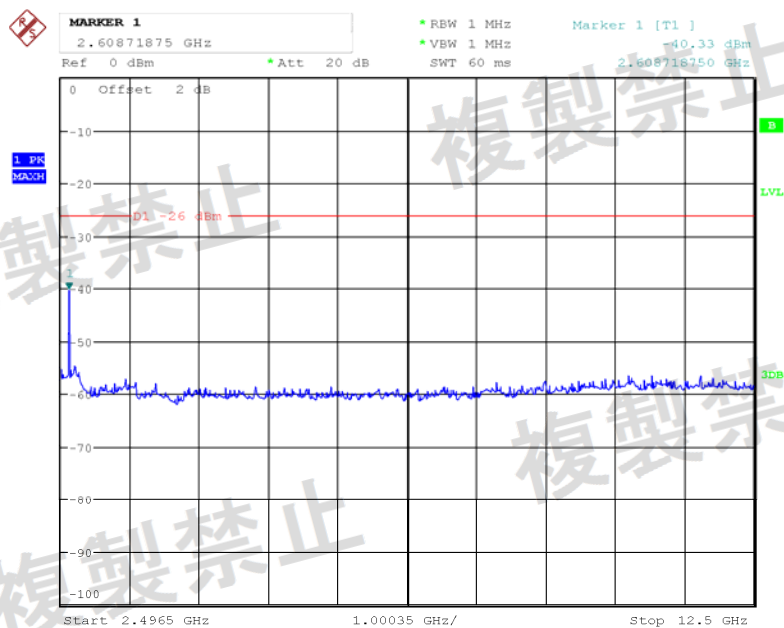
Date: 9.DEC.2019 18:15:01

2483.5MHz~2496.5MHz



Date: 9.DEC.2019 18:15:33

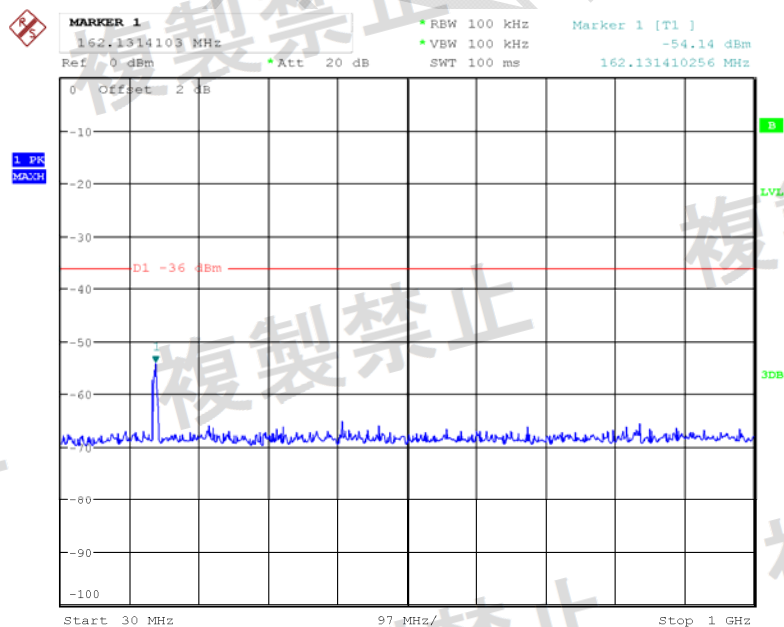
2496.5MHz~12500MHz



Date: 9.DEC.2019 18:16:06

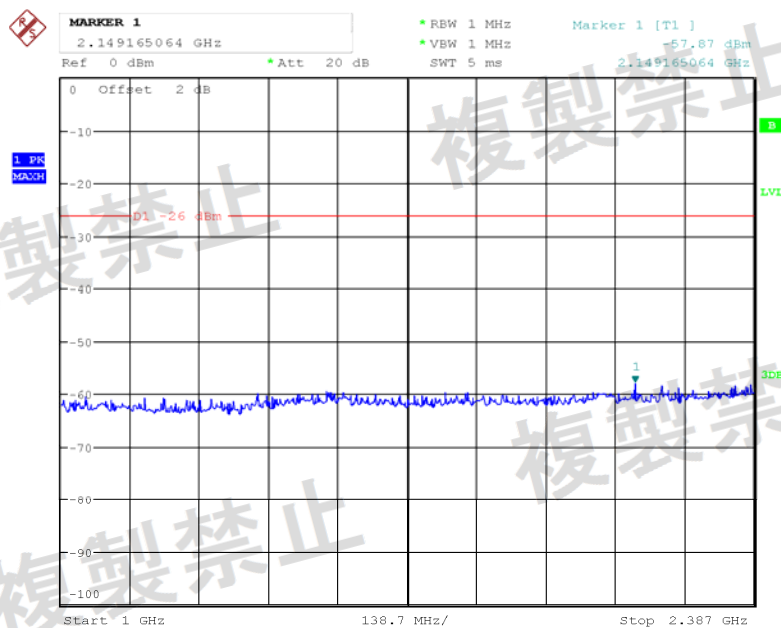
High Channel:

30MHz~1000MHz



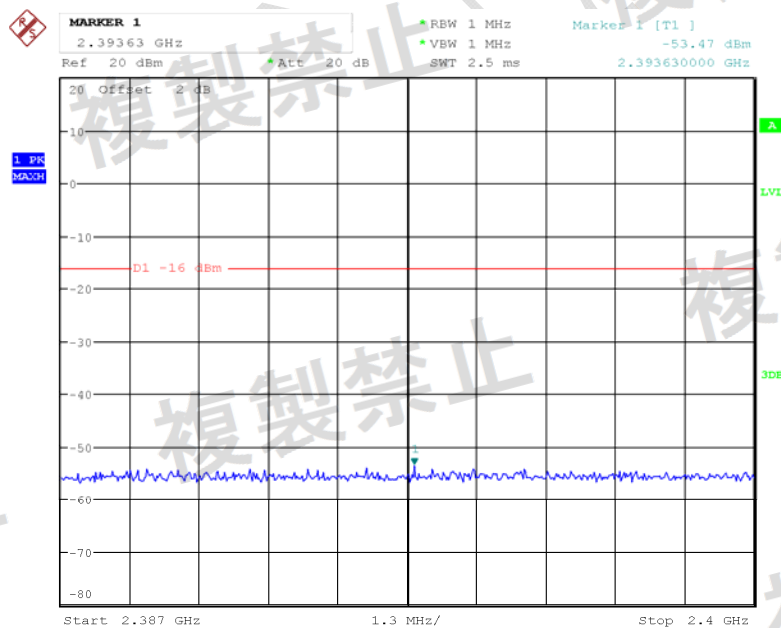
Date: 9.DEC.2019 18:20:17

1000MHz~2387MHz



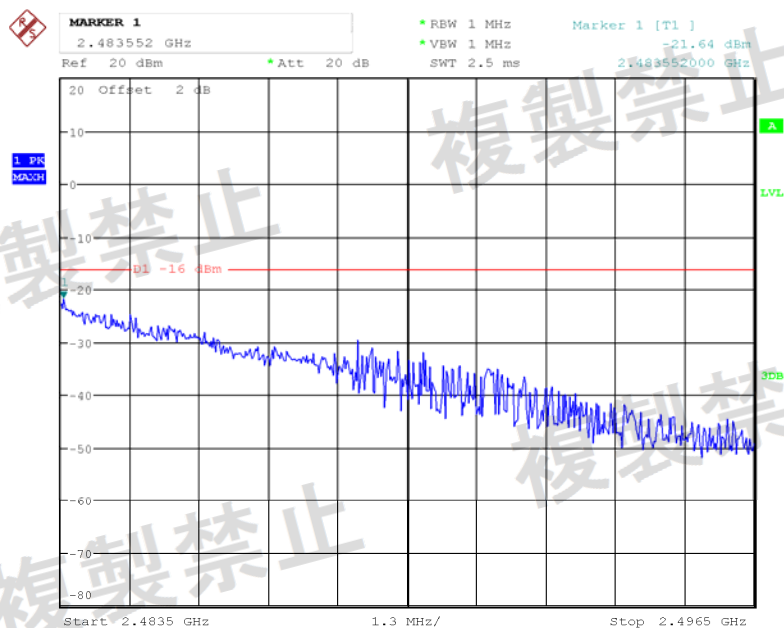
Date: 9.DEC.2019 18:19:45

2387MHz~2400MHz



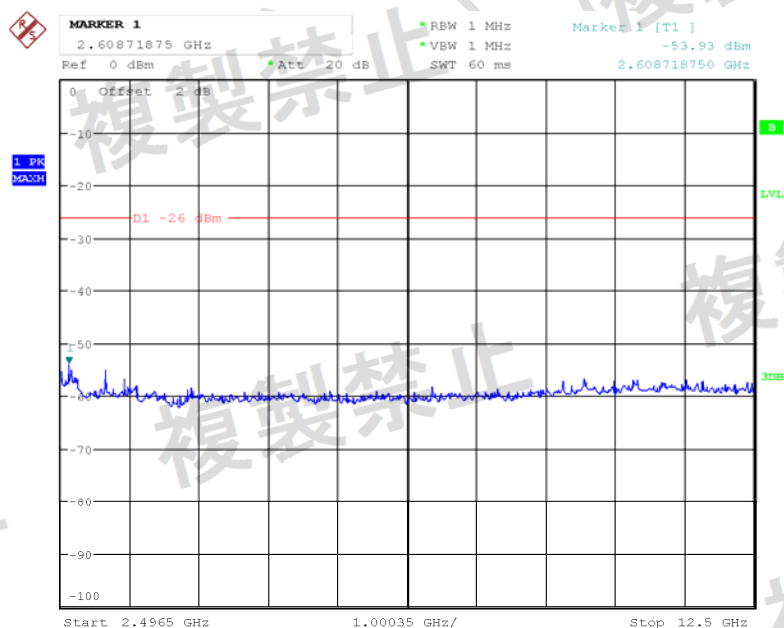
Date: 12.DEC.2019 14:31:48

2483.5MHz~2496.5MHz



Date: 12.DEC.2019 14:31:11

2496.5MHz~12500MHz



Date: 9.DEC.2019 18:16:34

ANTENNA OUTPUT POWER, ANTENNA POWER TOLERANCE AND TRANSMISSION ANTENNA GAIN

Limit

- $\leq 3 \text{ Mw /MHz}$ (FHSS from 2400-2483.5 MHz)
- $\leq 10 \text{ Mw/MHz}$ (OFDM/DSSS for bandwidth $\leq 26 \text{ MHz}$)
- $\leq 5 \text{ Mw/MHz}$ (OFDM for bandwidth $\leq 38 \text{ MHz}$)
- $\leq 10 \text{ Mw}$ (others)

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

E.i.r.p:

- $\leq 12.14 \text{ dBm/MHz}$ (OFDM, DS for 2400-2483.5 MHz)

Note: E.I.R.P will not be applied to the transmission antenna which has a gain of 2.14dBi or less.

Test Procedure

For FHSS UUT:

Connect the UUT to the power meter

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:	22.1~22.6 °C
Relative Humidity:	35~38 %
ATM Pressure:	101.9~102.5 kPa

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

Test Result: Compliance

Test Mode: Transmitting

10M:

Chain 0

Mode	Channel	Test Condition	Reading (dBm/MHz)	Duty cycle factor (dB)	Antenna output power (dBm/MHz)	Antenna output power (mW/MHz)		Antenna output tolerance (%)		EIRP (dBm/MHz)	
						Result	Limit	Result	Limit	Result	Limit
OFDM	Low	LV	3.24	0.96	4.20	2.63		-12.33		8.20	
		NV	3.26	0.96	4.22	2.64		-12.00		8.22	
		HV	3.28	0.96	4.24	2.66		-11.33		8.25	
	Middle	LV	3.32	0.96	4.28	2.68		-10.67		8.28	
		NV	3.34	0.96	4.30	2.69		-10.33		8.30	
		HV	3.38	0.96	4.34	2.72		-9.33		8.35	
	High	LV	3.06	0.96	4.02	2.53		-15.67		8.03	
		NV	3.02	0.96	3.98	2.50		-16.67		7.98	
		HV	3.04	0.96	4.00	2.51		-16.33		8.00	

Chain 1

Mode	Channel	Test Condition	Reading (dBm/MHz)	Duty cycle factor (dB)	Antenna output power (dBm/MHz)	Antenna output power (mW/MHz)		Antenna output tolerance (%)		EIRP (dBm/MHz)	
						Result	Limit	Result	Limit	Result	Limit
OFDM	Low	LV	2.99	1.33	4.32	2.71	10	-9.67	-80~+20	8.33	12.14
		NV	2.97	1.33	4.30	2.70		-10		8.31	
		HV	2.96	1.33	4.29	2.69		-10.33		8.3	
	Middle	LV	3.73	1.33	5.06	3.21		7		9.07	
		NV	3.71	1.33	5.04	3.20		6.67		9.05	
		HV	3.74	1.33	5.07	3.22		7.33		9.08	
	High	LV	3.28	1.33	4.61	2.90		-3.33		8.62	
		NV	3.26	1.33	4.59	2.88		-4		8.59	
		HV	3.27	1.33	4.60	2.89		-3.67		8.61	

Note 1: the antenna gain is 4dBi.

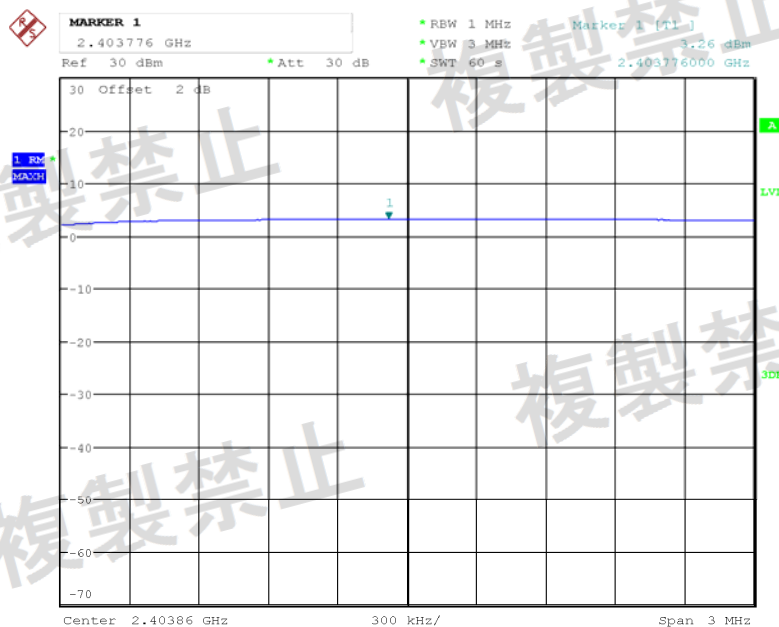
Note 2: the nominal Output power is 3mW/MHz.

Note 3: Transmission Antenna Gain and Transmission Radiation Angle Width are not required since EIRP less than 12.14dBm/MHz.

Note 4: Antenna output power (mW/MHz) = $10^{((\text{Reading}(\text{dBm/MHz}) + \text{Duty cycle factor})/10)}$

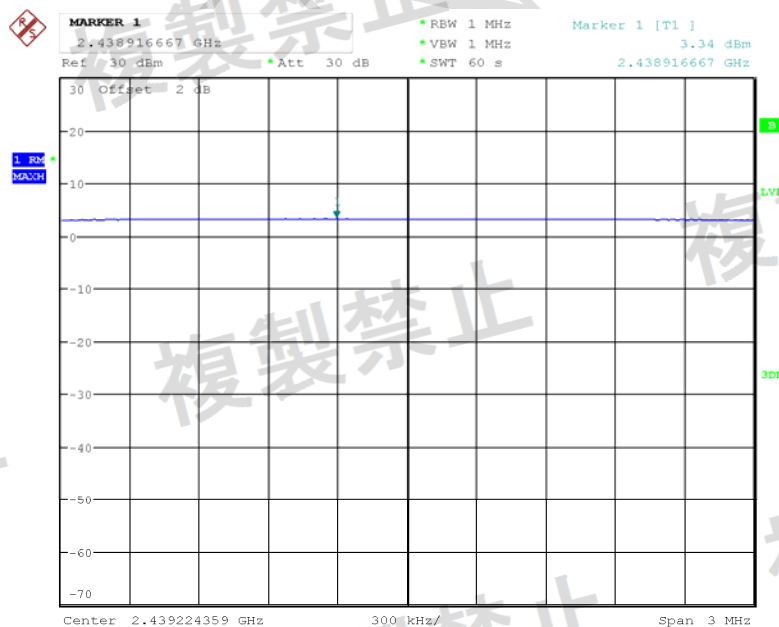
Please refer to the plots below for normal voltage.
Chain 0

2406.5MHz



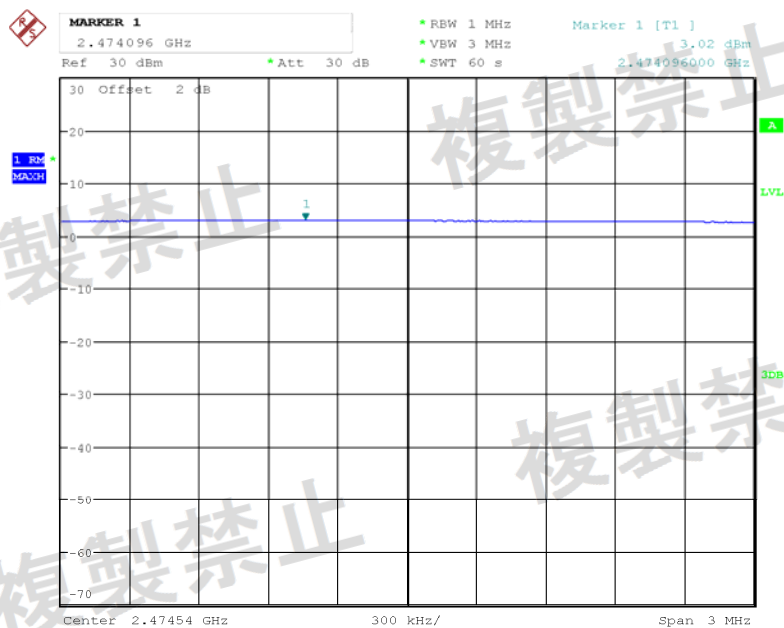
Date: 12.DEC.2019 14:20:22

2441.5MHz



Date: 9.DEC.2019 16:34:08

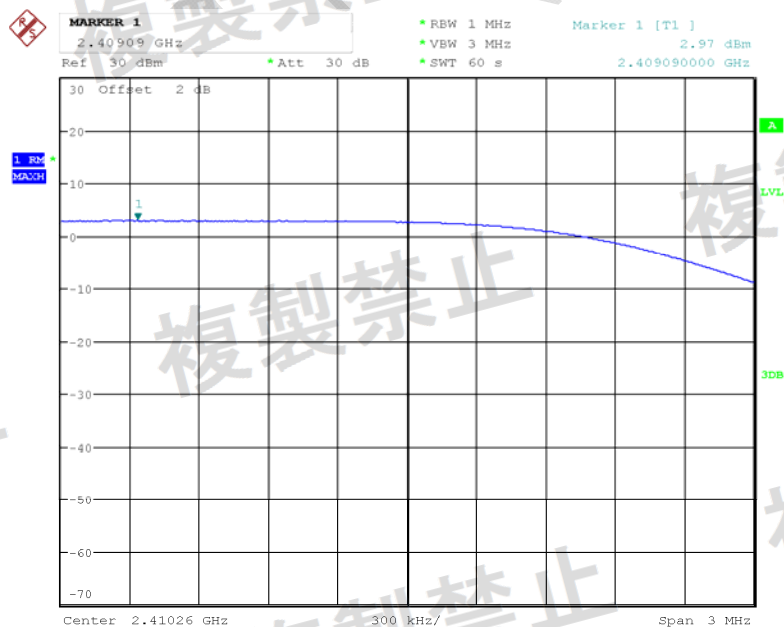
2476.5MHz



Date: 12.DEC.2019 14:22:01

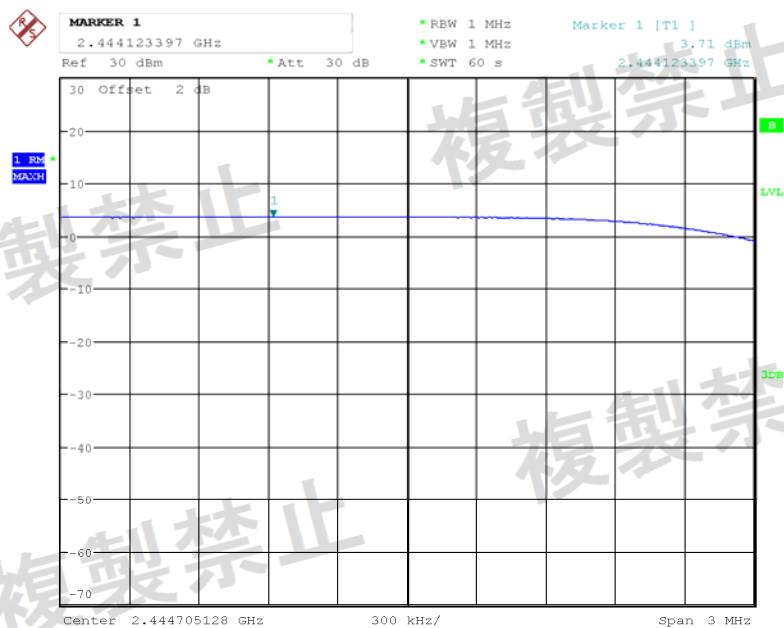
Chain 1

2406.5MHz



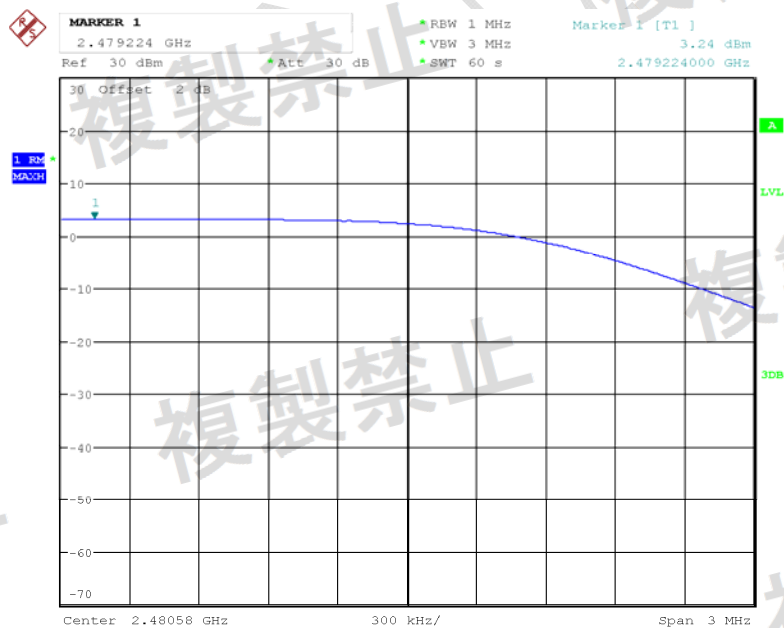
Date: 12.DEC.2019 14:38:16

2441.5MHz



Date: 9.DEC.2019 18:53:26

2476.5MHz



Date: 12.DEC.2019 14:36:17

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: Compliant, please see the below tables and plots

Test Mode: Receiving

Chain 0

Mode	Channel	Test Band (RBW)	Frequency range (MHz)	Result (dBm)			Limit (dBm)	Limit (nW)
				LV	NV	HV		
OFDM	Low	Band I (100kHz)	30-1000	-66.00	-66.02	-65.98	-54	4
		Band II (1MHz)	1000-12500	-50.93	-50.93	-50.95	-47	20
	Middle	Band I (100kHz)	30-1000	-65.82	-65.84	-65.88	-54	4
		Band II (1MHz)	1000-12500	-53.69	-53.69	-53.71	-47	20
	High	Band I (100kHz)	30-1000	-66.59	-66.59	-66.59	-54	4
		Band II (1MHz)	1000-12500	-53.03	-53.05	-53.09	-47	20

Chain 1

Mode	Channel	Test Band (RBW)	Frequency range (MHz)	Result (dBm)			Limit (dBm)	Limit (nW)
				LV	NV	HV		
OFDM	Low	Band I (100kHz)	30-1000	-65.5	-65.46	-65.42	-54	4
		Band II (1MHz)	1000-12500	-52.05	-52.05	-52.01	-47	20
	Middle	Band I (100kHz)	30-1000	-65.75	-65.79	-65.77	-54	4
		Band II (1MHz)	1000-12500	-53.84	-53.88	-53.84	-47	20
	High	Band I (100kHz)	30-1000	-65.28	-65.26	-65.22	-54	4
		Band II (1MHz)	1000-12500	-51.65	-51.67	-51.71	-47	20

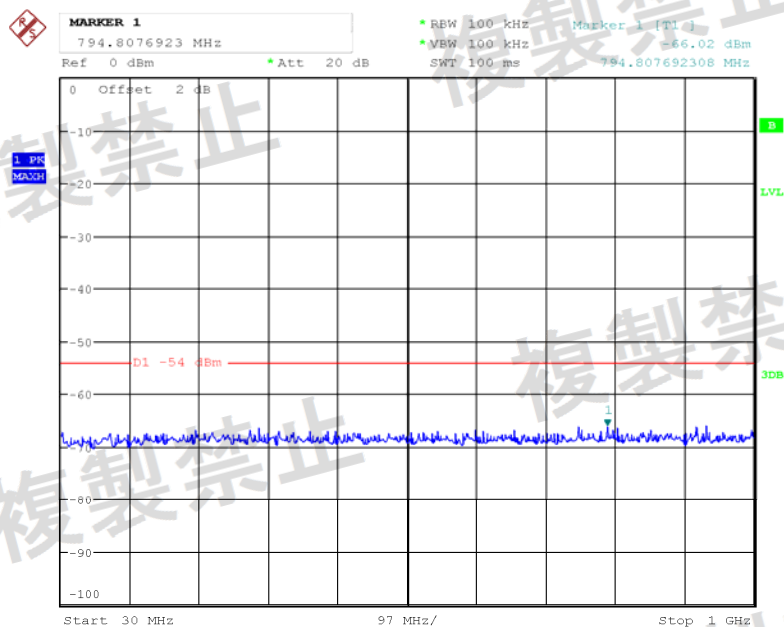
Note: Band VI: 30MHz~1000MHz Band VII: 1000MHz~12500MHz

Please refer to the plots below for normal voltage.

Chain 0:

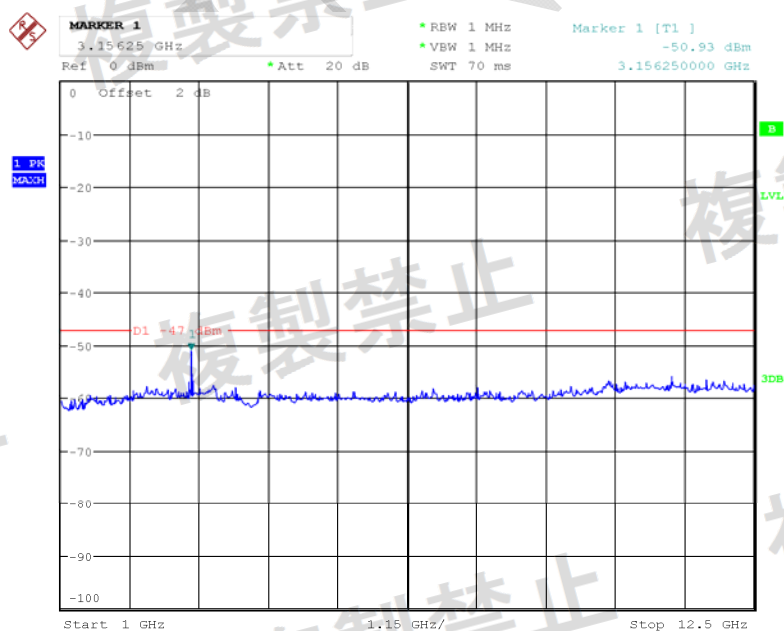
Test Frequency: 2406.5MHz

30MHz~1000MHz



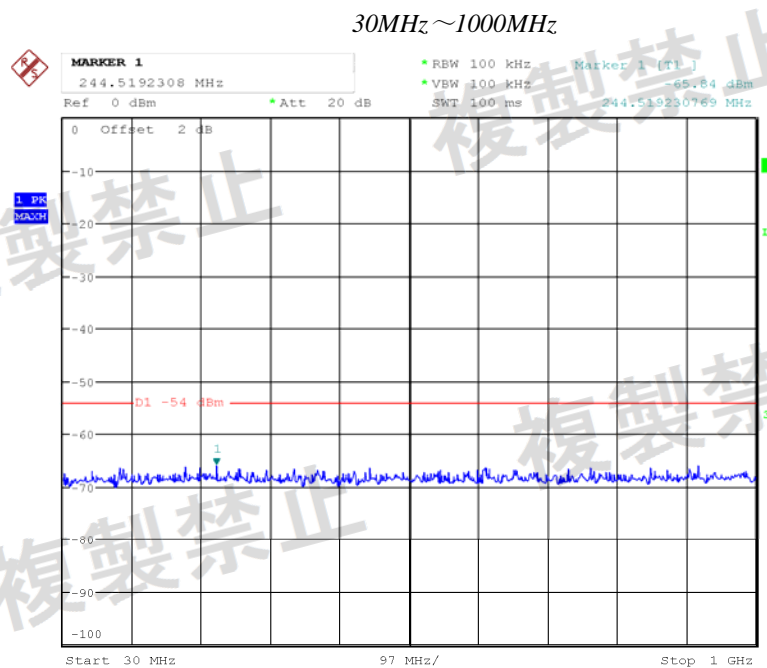
Date: 9.DEC.2019 18:06:41

1000MHz~12500MHz

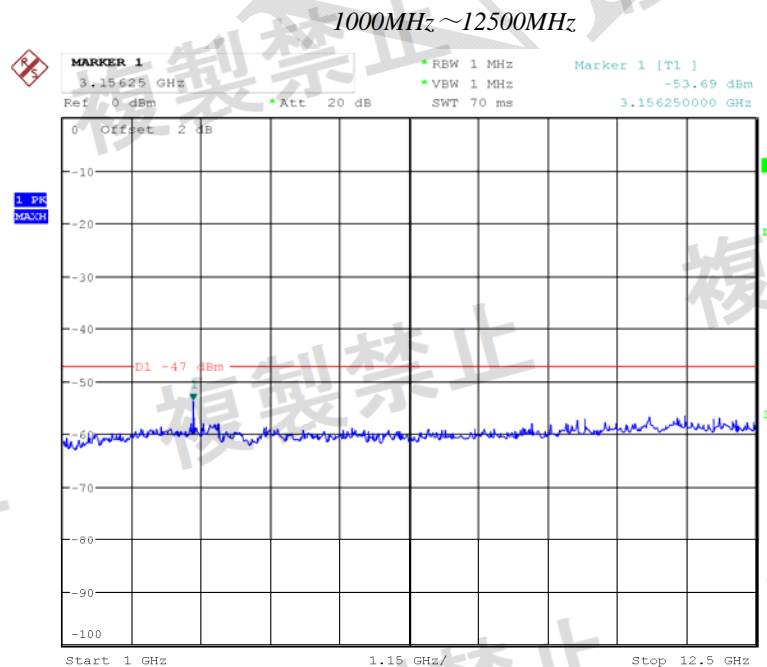


Date: 9.DEC.2019 18:09:05

Test Frequency: 2441.5MHz:



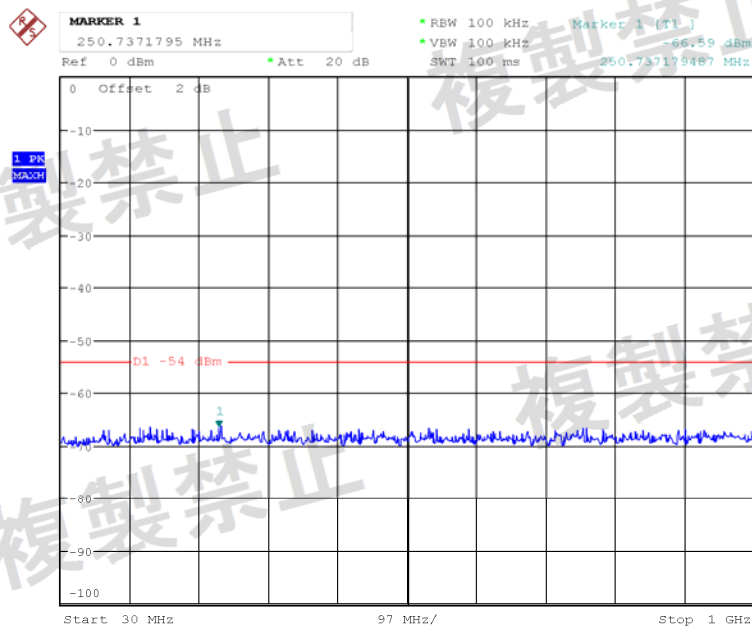
Date: 9.DEC.2019 18:07:07



Date: 9.DEC.2019 18:08:36

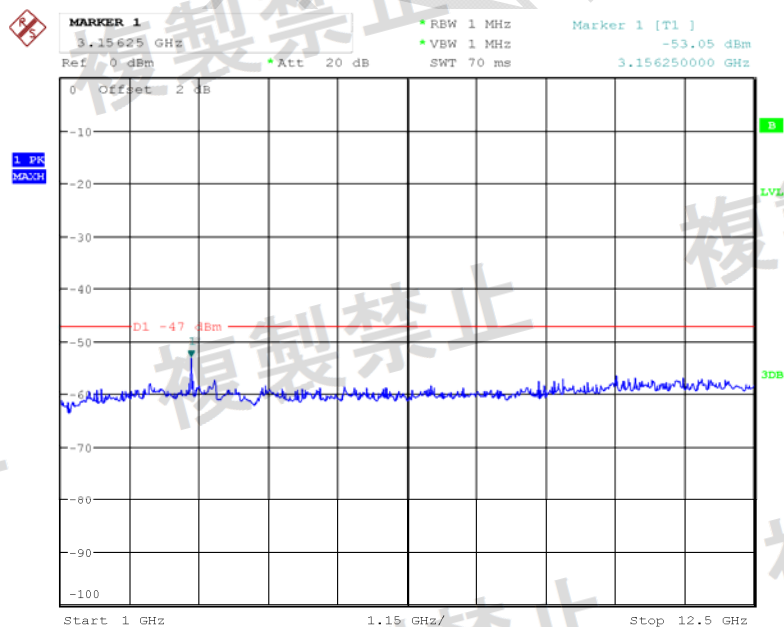
Test Frequency: 2476.5MHz:

30MHz~1000MHz



Date: 9.DEC.2019 18:07:32

1000MHz~12500MHz

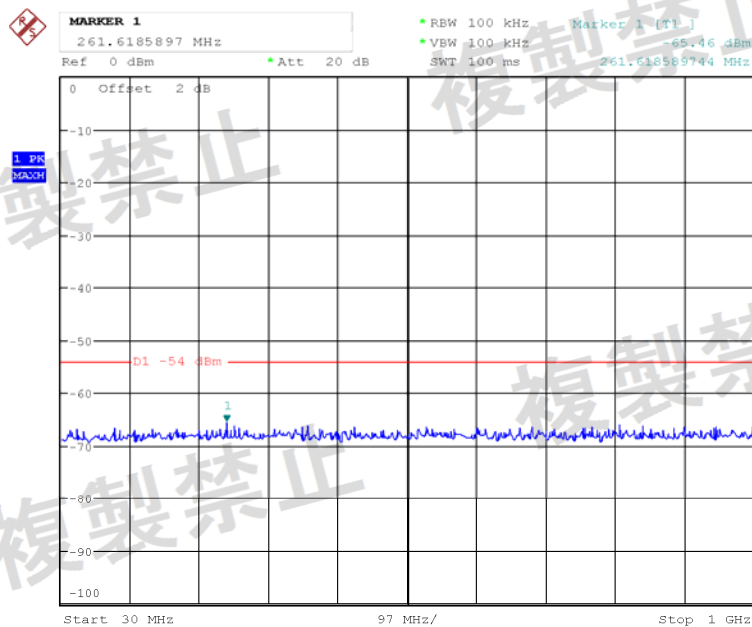


Date: 9.DEC.2019 18:08:05

Chain 1:

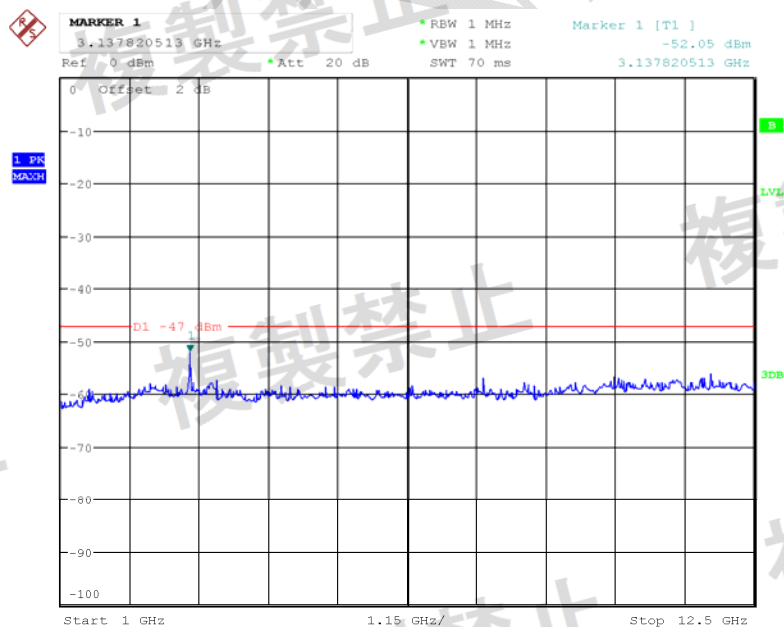
Test Frequency: 2406.5MHz

30MHz~1000MHz



Date: 9.DEC.2019 18:11:45

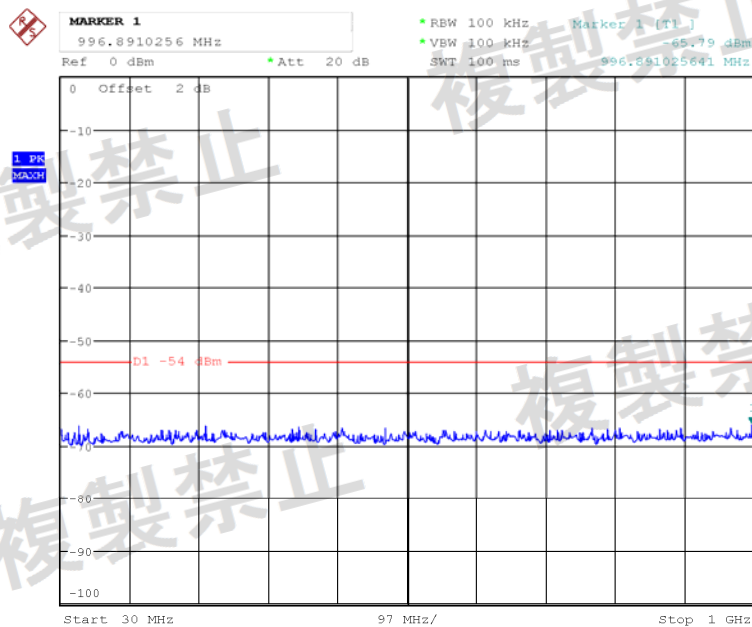
1000MHz~12500MHz



Date: 9.DEC.2019 18:11:08

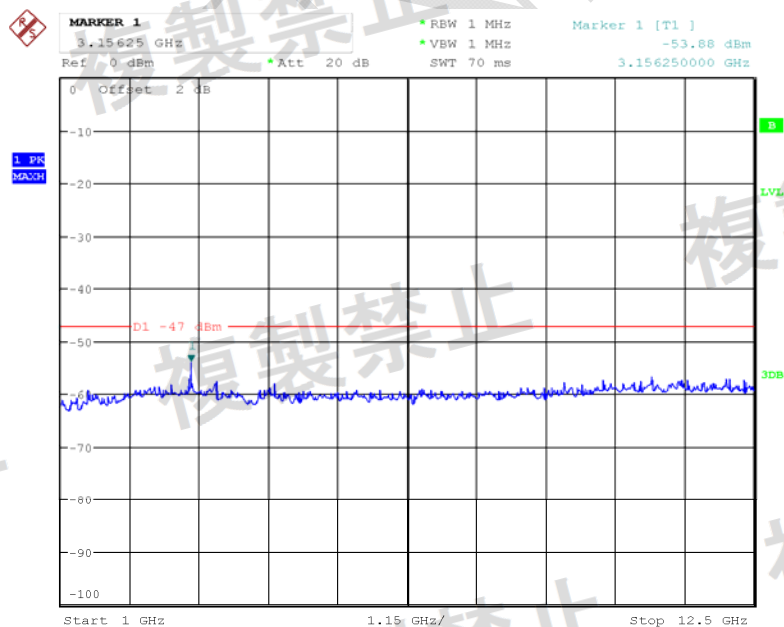
Test Frequency: 2441.5MHz:

30MHz~1000MHz



Date: 9.DEC.2019 18:12:35

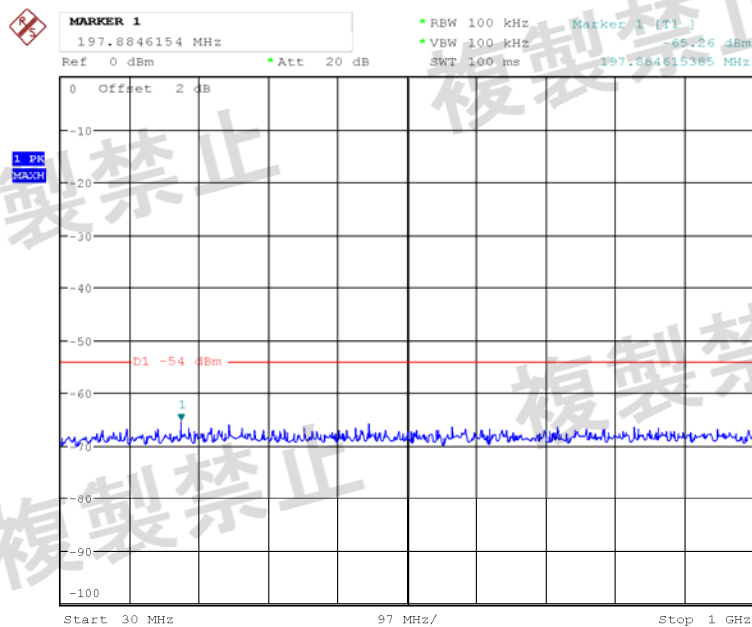
1000MHz~12500MHz



Date: 9.DEC.2019 18:10:31

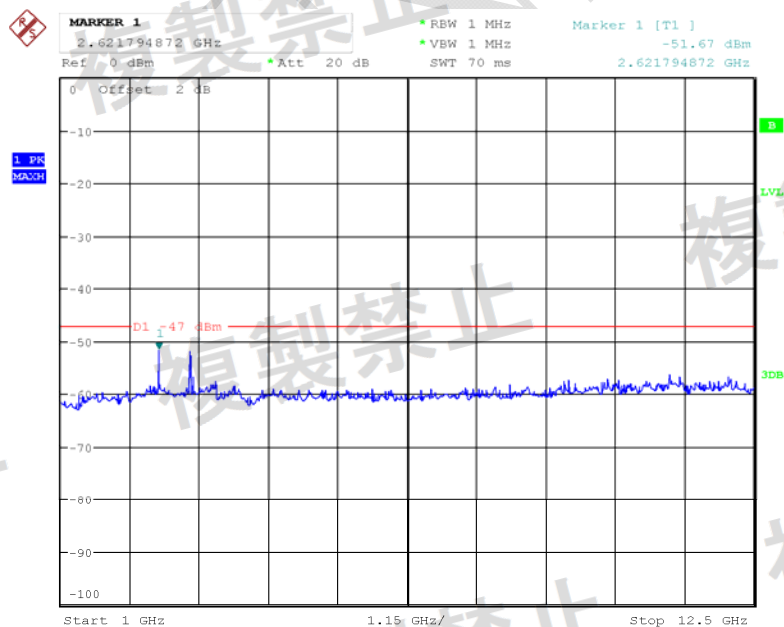
Test Frequency: 2476.5MHz:

30MHz~1000MHz



Date: 9.DEC.2019 18:12:12

1000MHz~12500MHz



Date: 9.DEC.2019 18:10:12

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****