

TEST REPORT

Product : Portable PC
Trade mark : CHUWI
Model/Type reference : GemiBook Pro
Serial Number : N/A
Report Number : EED32M80078802
Date of Issue : Dec. 15, 2020
Product Class : Item 19 of Article 2 Paragraph 1
Test result : PASS

Prepared for:

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Dec. 15, 2020

Check No.: 4810171120

2 Version

Version No.	Date	Description
00	Dec. 15, 2020	Original

3 Test Summary

Test	Test Requirement	Limit/Severity	Result
Antenna Requirement	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43,B-1 (1)&(2)	PASS
Test frequency	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43, A-3	PASS
Frequency Error	Item 19 of Article 2 Paragraph 1	±50 PPM or less	PASS
Occupied Bandwidth	Item 19 of Article 2 Paragraph 1	83.5 MHz or less	PASS
Spread-spectrum Bandwidth	Item 19 of Article 2 Paragraph 1	500 kHz or more	PASS
Antenna Power	Item 19 of Article 2 Paragraph 1	Designated value: (1) FH, FH+DS , FH+OFDM 3mW/MHz (Used in the range of 2427-2470.75MHz) (2) OFDM , DS other than (1) :10mW/MHz (3) Other than (1) & (2) 10mW Tolerance: +20%,-80%	PASS
Spurious Emission of Tx	Item 19 of Article 2 Paragraph 1	(1) Below 2387 MHz : -26dBm (2) 2387 to 2400 MHz : -16dBm (3) 2483.5 through 2496.5 MHz : -16dBm (4) Over 2496.5 MHz : -26dBm	PASS
Dwell Time	Item 19 of Article 2 Paragraph 1	N/A	Reference
Interference prevention capability	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43, 44, 45	PASS
RF accessibility	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43, 44, 45	PASS
Spurious Emission of Rx	Item 19 of Article 2 Paragraph 1	(1) Below 1 GHz: -54dBm (2) 1GHz or higher: -47dBm	PASS

Remark:

Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

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5 General Information

5.1 Client Information

Applicant:	CHUWI Innovation And Technology (ShenZhen)co., Ltd.
Address of Applicant:	F2, Building 3 , Li jincheng Industrial Park , Industrial east Road, Longhua Street, Longhua District,ShenZhen City, China
Manufacturer:	CHUWI Innovation And Technology (ShenZhen)co., Ltd.
Address of Manufacturer:	F2, Building 3 , Li jincheng Industrial Park , Industrial east Road, Longhua Street, Longhua District,ShenZhen City, China
Factory:	JIANGSU LUCKYSTAR INTELLIGENT & TECHNOLOGY CO., LTD
Address of Factory:	Intelligent Terminal Pioneer Park (D), Yanlong Street Office, Yandu District Yancheng City, Jiangsu Province

5.2 General Description of EUT

Product Name:	Portable PC	
Model No.:	GemiBook Pro	
Trade Mark:	CHUWI	
Frequency Range of Operation:	5.0 BT Dual mode, 2400MHz to 2483.5MHz	
Bluetooth Version:	5.0(BLE)	
Operating Frequency:	2402 MHz to 2480 MHz	
Conducted rated power:	2.0mW	
Number of Channels:	40 Channels	
Type of Modulation:	GFSK	
Channel Separation:	2 MHz	
Antenna Type:	FPC antenna	
Antenna gain:	2.98 dBi	
Test Power Grade:	Default	
Test Software of EUT:	DRTU	
Power Supply:	Adapter	Model:A241-1202000D Input:100-240V~ 50/60Hz 0.8A Output:12.0V---2.0A 24.0
Test Voltage:	DC 12V	
Sample Received Date:	Nov. 17, 2020	
Sample tested Date:	Nov. 17, 2020 to Dec. 03, 2020	

5.3 EUT test environment range

Temperature:	23°C
Humidity:	54% RH
Atmospheric Pressure:	1010mbar

5.4 Description of Support Units

The EUT has been tested stand-alone.

5.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 3368 3668 Fax: +86 (0) 755 3368 3385

No tests were sub-contracted.

6 Equipment List

Equipment	Manufacturer	Model	Serial No.	Cal. Date	Due date	Calibration body	Classification
Spectrum Analyzer	R&S	FSV40	101200	09-02-2020	09-01-2021	LISAI	(c)
Temperature/Humidity Indicator	biaozhi	GM1360	EJ1611459	02-22-2020	02-21-2021	CTIMT	(c)
Signal Generator	Keysight	E8257D	MY53401106	02-17-2020	02-16-2021	CTIMT	(c)
Digital multimeter	FLUKE	111	90240138	05-13-2020	05-12-2021	CTIMT	(c)
Spectrum Analyzer	R&S	FSP40	100416	04-22-2020	04-21-2021	CTIMT	(c)

Remark:

- (a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.
- (b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992).
- (c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
- (d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c).

From JRL Article 24-2, paragraph 4, Item 2

Notice: Calibration duration for above equipment is 1 year.

7 Radio Technical Requirements Specification

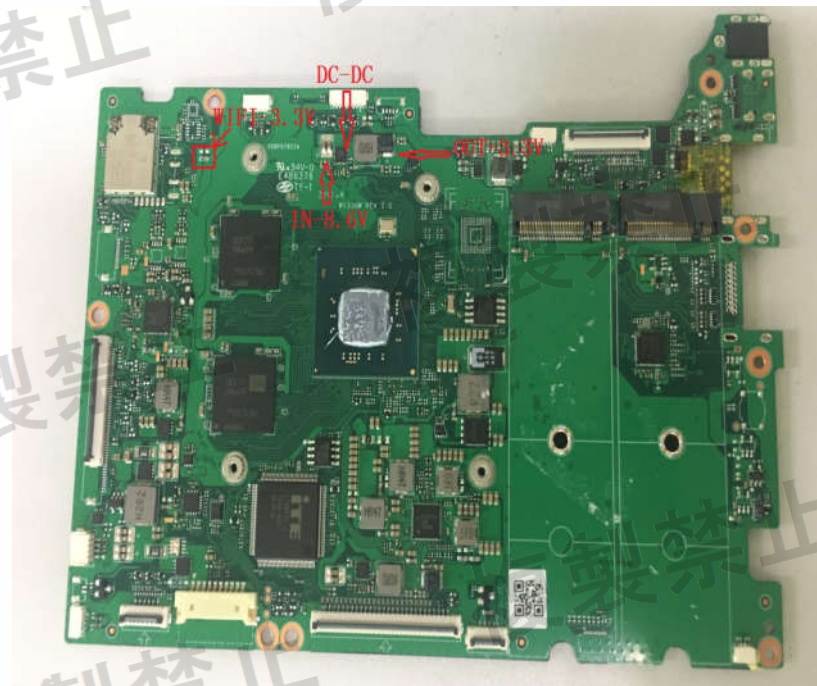
Table 1: Radio Technical Requirements Specification for 2.4 GHz band wide-band low-power data communication system (Item 19 of Article 2 Paragraph 1)

Items	Technical standard
Assigned frequency or designated frequency	2400-2483.5MHz
Communication method	One-way communication, simplex, semi-duplex, or duplex operation of digital signal transmission including spread spectrum
Tolerance of frequency ($\times 10^{-6}$)	± 50 PPM
Tolerance of occupied bandwidth	FH: 83.5MHz or less FH + OFDM: 83.5MHz or less Others: 26MHz or less FH + DS: 83.5MHz or less OFDM: 38MHz or less
Antenna power	Designated value (1) FH, FH+DS, FH+OFDM: 3mW/MHz (used in the range of 2427 - 2470.75 MHz) (2) OFDM, DS other than (1) 10mW/MHz (3) Other than (1) & (2) 10mW Tolerance: +20%, -80%
Antenna gain	1) 12.14 dBi or less in principle 2) In case of directional antenna (1) FH, FH+DS or FH+OFDM using 2427-2470.75 MHz EIRP \leq 16.91 dBm/MHz (2) OFDM or DS other than (1) EIRP \leq 22.14 dBm/MHz (3) Other than (1) and (2): 22.14 dBm or less (4) OFDM OBW 26 - 38MHz: 19.14dBm/MHz (5) Half-power angle of directional antenna (e) in case of the item 2): $e \leq 360/A$ (The A is 10 in maximum.)
Tolerance of spurious emission intensity	(1) Below 2387 MHz: 2.5 μ W (2) 2387 to 2400 MHz: 25 μ W (3) 2483.5 through 2496.5 MHz: 25 μ W (4) Over 2496.5 MHz: 2.5 μ W
Spreading bandwidth	500kHz or more
Limit of secondary radiated emissions	(1) Below 1 GHz: 4nW (2) 1 GHz or higher: 20nW
Interference prevention function	Shall have the function of automatic transmission and reception of identification sign.
Structure	Shall be of the structure that the RF and modulator sections excluding antenna cannot easily be opened.
Note	DS: Direct spread OFDM: Orthogonal frequency division multiplexing FH: Frequency hopping

Note: The Technical Standards described here do not cover all of the regulated items.

7.1 Transmitter Requirements

7.1.1 EUT test voltage and Frequency

EUT test voltage		
Power Supply:	Adapter	Model:A241-1202000D Input:100-240V~ 50/60Hz 0.8A Output:12.0V --- 2.0A 24.0W
Test voltage require:	Supply the rated voltage and the rated voltage $\pm 10\%$ to power supply. However, If the fluctuation of input voltage to the circuit of RF unit (except power supply) of test equipment is under $\pm 1\%$, when input voltage from external power supply to the test equipment is fluctuated by $\pm 10\%$: Conduct the test with the rated voltage only.	
RF circuit test points		
Power Supply result:	The measurement result of the voltage fluctuation at RF circuit when DC 12V $\pm 10\%$.	
	DC Input	RF circuit
	13.20V	3.31V
	12.00V	3.30V
	10.80V	3.30V

Test frequency

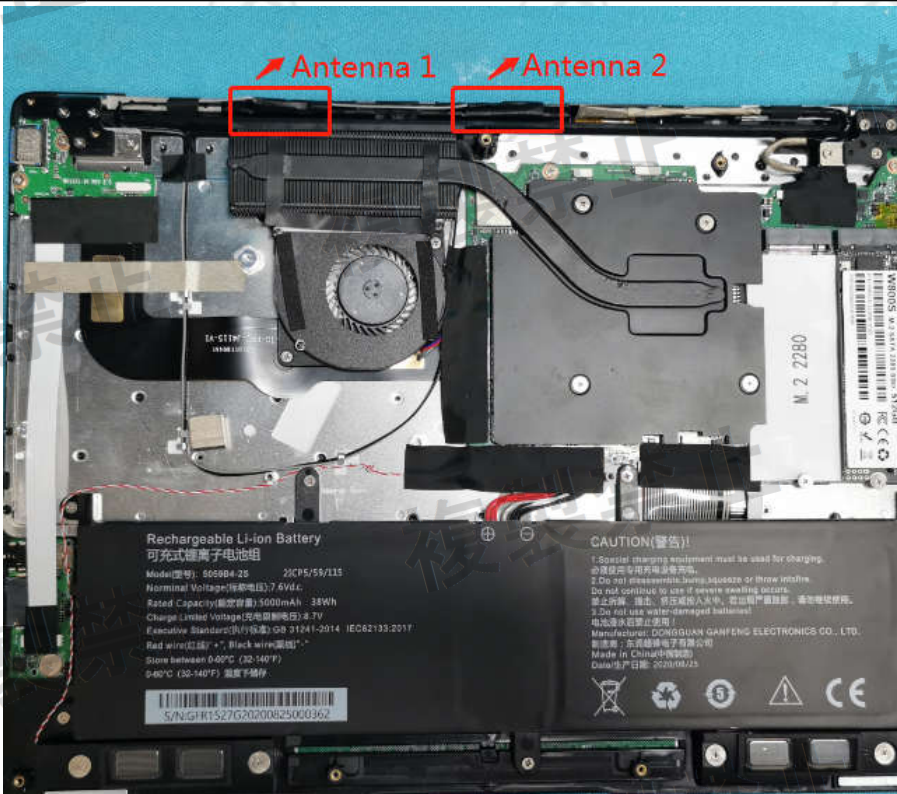
Test frequencies:	If the EUT can be set to 3 or more different (carrier) frequencies in 1 allocated band, testing shall be performed using the Lowest, Middle and the Highest frequency (L,M and H). If there are 2 or fewer frequencies, testing shall be performed with the available frequencies.	
Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

EUT channels and frequencies list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

Test frequencies are the lowest channel: 0 channel (2402 MHz), Middle channel: 19 channel (2440 MHz) and highest channel: 39 channel (2480 MHz)


7.1.2 Antenna Requirement

Standard requirement	
Applicable for equipment with an antenna terminal, including testing terminals) If an antenna connector is available, all relevant tests will be carried out conducted. If not, tests will be carried out in an anechoic room or with a suitable test-fixture.	
EUT Antenna	 <p>The image shows the internal components of a laptop. At the top, two antenna terminals are highlighted with red boxes and labeled 'Antenna 1' and 'Antenna 2'. Below them is the cooling fan and various electronic components. At the bottom, a large black battery is visible with the following text: 'Rechargeable Li-ion Battery', 'Model: 66884-28', '20CP5/55/115', 'Nominal Voltage: 7.6Vdc', 'Rated Capacity: 5000mAh', '38Wh', 'Charge Limited Voltage: 8.7V', 'Executive Standard: GB 31241-2014 IEC62133:2011', 'Red wire: (+), Black wire: (-)', 'Store between 0-40°C (32-104°F)', '0-60°C (32-140°F) 温度存储', 'S/N: GH1527G20200825000362'. To the right of the battery, there is a 'CAUTION' section with instructions in English and Chinese, and various safety symbols including CE, a triangle with an exclamation mark, and a crossed-out trash can.</p>
The antenna is FPC antenna. The best case gain of the antenna is 2.98 dBi.	
Result: An antenna connector is available, all relevant tests will be carried out conducted.	

7.1.3 Frequency Error

Measurement Record:

Uncertainty: $\pm 10\text{Hz}$

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23°C	Humid.: 54%	Press.: 1010 mbar
Test Status:	Enter the unmodulation mode for the product. Test in Channel lowest (2402MHz), middle (2440MHz) and highest(2480MHz), keep in continuously transmitting status.		
Test Configuration:	 <pre> graph LR A[PN9 Signal Generator] --> B[EUT] B --> C[Spectrum Analyzer] </pre>		
Test Conditions:	Frequency Counter or Spectrum Analyzer is used for measurement.		
EUT conditions:	Modulation/Spread/Hopping off, CW Tx If EUT does not accept "Modulation OFF" mode in the measurement, you may use "Modulation ON" mode. In that case you can use the Max power Frequency as the measuring results.		
Spectrum Analyzer conditions:	Frequency: Test Frequency Span 1MHz RBW 10KHz (Modulation OFF), VBW 10KHz (Modulation OFF), Sweep Time Auto Detector mode Positive peak Indication mode Max hold		
Technical standard:	Tolerance of frequency: $\pm 50 \times 10^{-6}$		
Test result:	PASS		

Measurement Record:

Uncertainty: $\pm 10\text{Hz}$

Test Result:

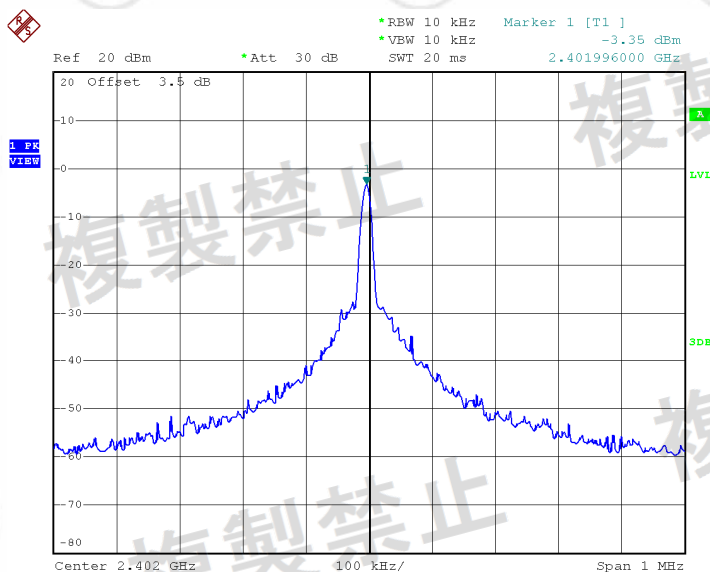
Test channel	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		DC 12V	N/A	N/A		
Lowest	2402.0	2401.996	N/A	N/A	MHz	$\pm 50\text{ PPM}$ or less
		-1.665	N/A	N/A	PPM	
Middle	2440.0	2439.998	N/A	N/A	MHz	
		-0.819	N/A	N/A	PPM	
Highest	2480.0	2479.996	N/A	N/A	MHz	
		-1.612	N/A	N/A	PPM	

Note: The nominal frequency shall be confirmed by the applicant and test lab.

Result plot as follows:

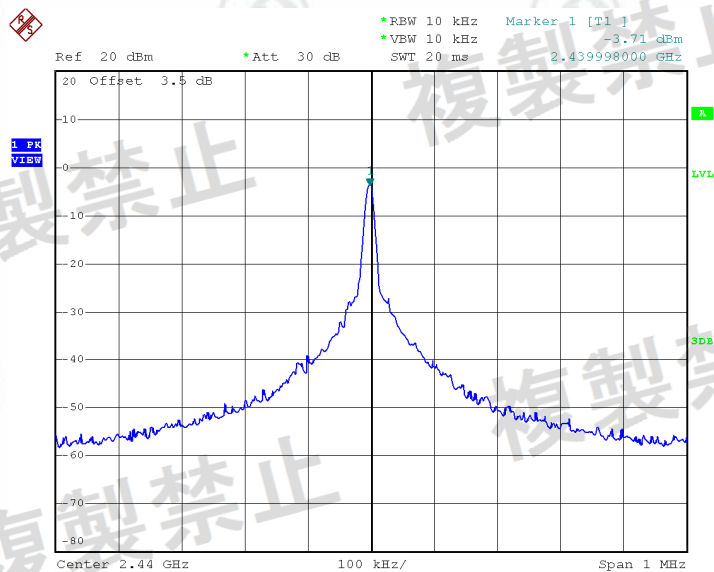
Normal Voltage:

Channel 0: 2.402 GHz:



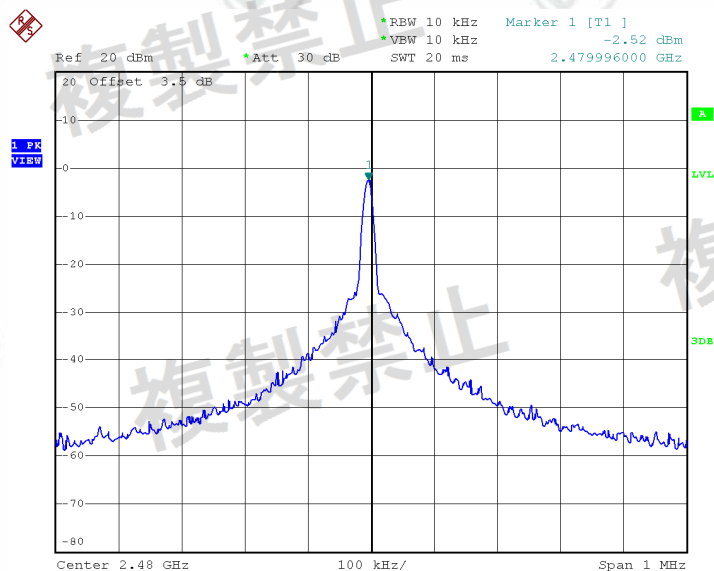
Date: 19.NOV.2020 13:46:41

Channel 19: 2.440 GHz:



Date: 19.NOV.2020 13:51:07

Channel 39: 2.480 GHz




Date: 19.NOV.2020 13:52:24

Test Result: The unit does meet the requirements.

7.1.4 Occupied Bandwidth (99%)

Measurement Record:

Uncertainty: $\pm 10\text{KHz}$

Test Requirement:	Item 19 of Article 2 Paragraph 1
Test Method:	MIC Notice No.88 Appendix No.43
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
Test Configuration:	 <pre> graph LR A[PN9 Signal Generator] --> B[EUT] B --> C[Spectrum Analyzer] </pre>
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.
Spectrum Analyzer conditions:	Frequency: Test Frequency Span 3MHz RBW 100kHz VBW 100kHz Sweep Time Auto detector mode Positive peak Indication mode Max hold OBW 99%
Technical standard:	26 MHz or less
Test result:	PASS

Measurement Record:

Uncertainty: $\pm 10\text{KHz}$

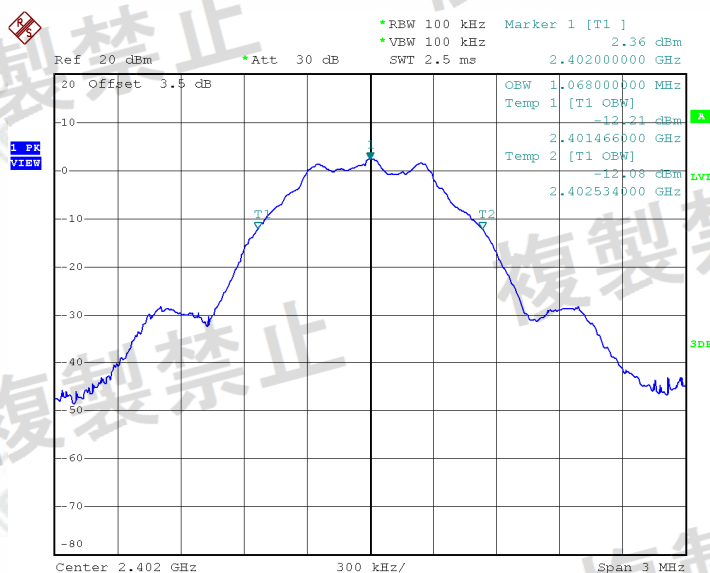
Test Result:

Test channel	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		DC 12V	N/A	N/A		
Channel 0	2402.0	1.068	N/A	N/A	MHz	26 MHz or less
Channel 19	2440.0	1.062	N/A	N/A	MHz	
Channel 39	2480.0	1.062	N/A	N/A	MHz	

Result plot as follows:

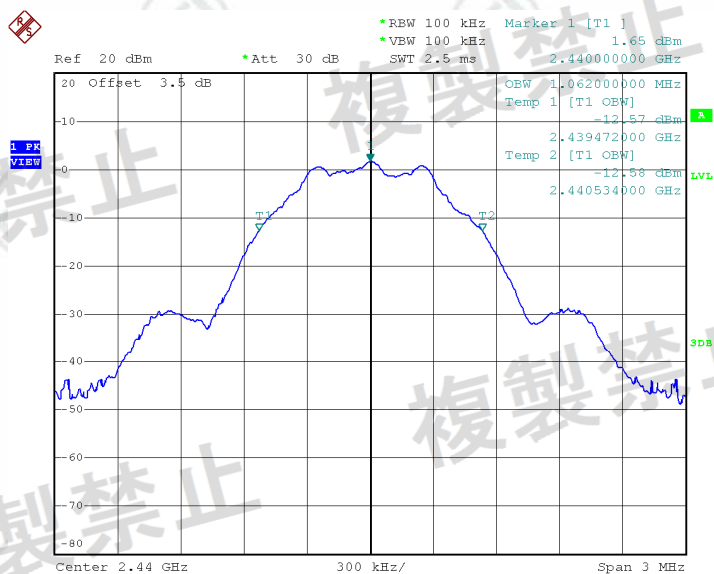
Normal Voltage:

Channel 0: 2.402 GHz:



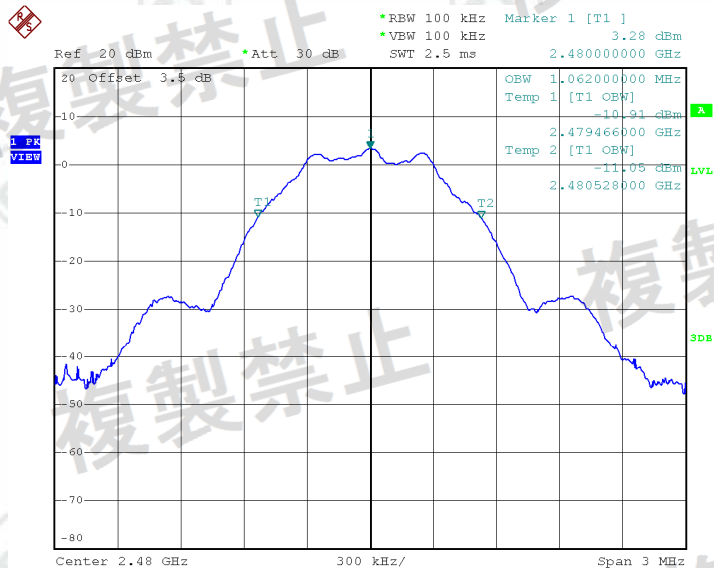
Date: 19.NOV.2020 13:30:55

Channel 19: 2.440 GHz:



Date: 19.NOV.2020 13:33:59

Channel 39: 2.480 GHz:




Date: 19.NOV.2020 13:38:36

Test Result: The unit does meet the requirements.

7.1.5 Spread spectrum Bandwidth (90%)

Measurement Record:

Uncertainty: $\pm 10\text{KHz}$

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23°C	Humid.: 54%	Press.: 1010 mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.		
Test Configuration:	 <pre> graph LR A[PN9 Signal Generator] --> B[EUT] B --> C[Spectrum Analyzer] </pre>		
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.		
Spectrum Analyzer conditions:	Frequency: Test Frequency Span 3MHz RBW 100kHz VBW 100kHz Sweep Time Auto detector mode Positive peak Indication mode Max hold OBW 90%		
Technical standard:	500kHz or more		
Test result:	PASS		

Measurement Record:

Uncertainty: $\pm 10\text{KHz}$

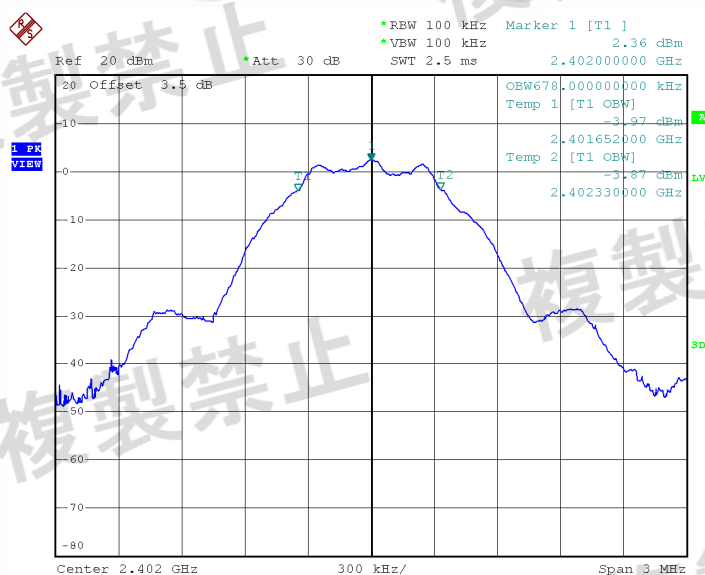
Test Result:

Test channel	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		DC 12V	N/A	N/A		
Channel 0	2402.0	0.678	N/A	N/A	MHz	500 kHz or more
Channel 19	2440.0	0.684	N/A	N/A	MHz	
Channel 39	2480.0	0.684	N/A	N/A	MHz	

Result plot as follows:

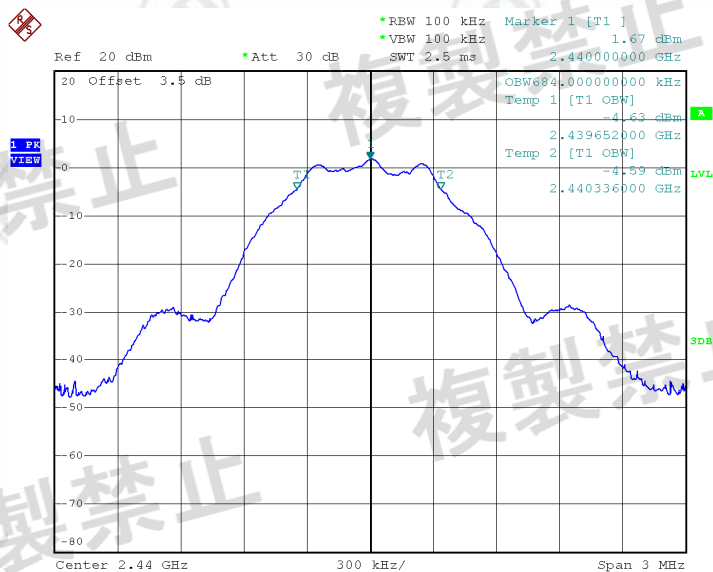
Normal Voltage:

Channel 0: 2.402 GHz:



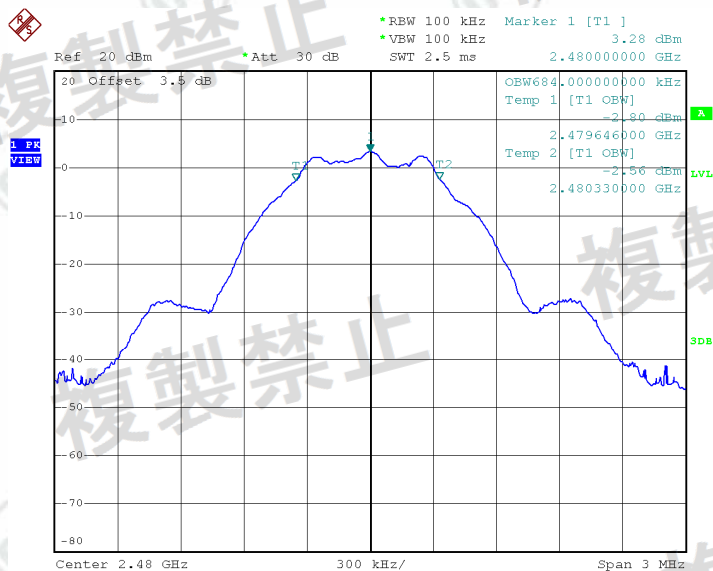
Date: 19.NOV.2020 13:31:32

Channel 19: 2.440 GHz:



Date: 19.NOV.2020 13:32:25

Channel 39: 2.480 GHz:



Date: 19.NOV.2020 13:39:55

Test Result: The unit does meet the requirements.

7.1.6 Antenna Power

Measurement Record:

Uncertainty: ± 10 kHz / ± 1 dB

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23.0°C	Humid.: 54%	Press.: 1010 mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.		
Test Configuration:	<div style="display: flex; align-items: center; justify-content: center; gap: 20px;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">PN9 Signal Generator</div> <div style="flex-grow: 1; border-bottom: 1px solid black; position: relative;"> <div style="position: absolute; left: 0; top: -10px;">→</div> <div style="position: absolute; right: 0; top: -10px;">→</div> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;">EUT</div> <div style="flex-grow: 1; border-bottom: 1px solid black; position: relative;"> <div style="position: absolute; left: 0; top: -10px;">→</div> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;">Spectrum Analyzer</div> </div>		
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.		
Spectrum Analyzer conditions(FHSS):	Frequency: Test Frequency Span 40MHz RBW 10MHz VBW 10MHz Sweep Time Auto Detector mode Positive peak Indication mode Max hold		
Technical standard:	Antenna Power (1) FH, FH+DS, FH+OFDM 3mW/MHz or less (used in the range of 2427 - 2470.75 MHz) (2) OFDM, DS other than (1) 10mW/MHz or less (3) Other than (1) & (2) 10mW or less Tolerance: +20% -80%		
Test result:	PASS		

Measurement Record:

Uncertainty: ± 10 kHz / ± 1 dB

Test Result:

GFSK:

Modulation	Test channels	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		DC 12V	N/A	N/A		
GFSK	Channel 0 (2402MHz)	1.79	N/A	N/A	mW	10mW or less Error +20%~ -80%
		-10.5	N/A	N/A	%	
GFSK	Channel 19 (2440 MHz)	1.88	N/A	N/A	mW	
		-6	N/A	N/A	%	
GFSK	Channel 39 (2480 MHz)	1.92	N/A	N/A	mW	
		-4	N/A	N/A	%	

Remark:

The rate conducted power is 2.0mW.

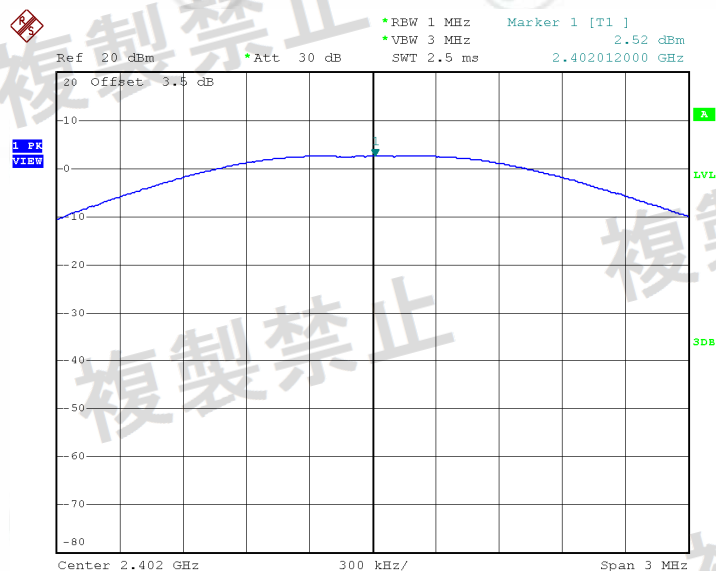
Tolerance (%) :[(test value- rate power)/rater power]*100

Result plot as follows:

Normal Voltage:

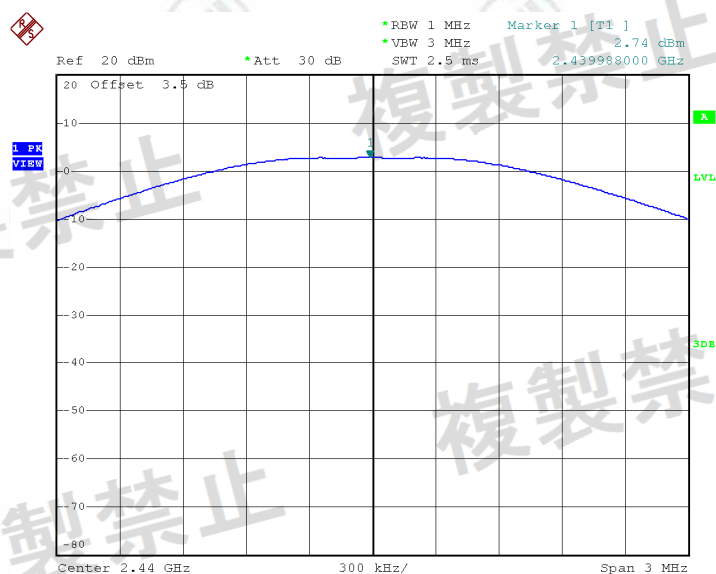
GFSK

Channel 0 (2.402 GHz)



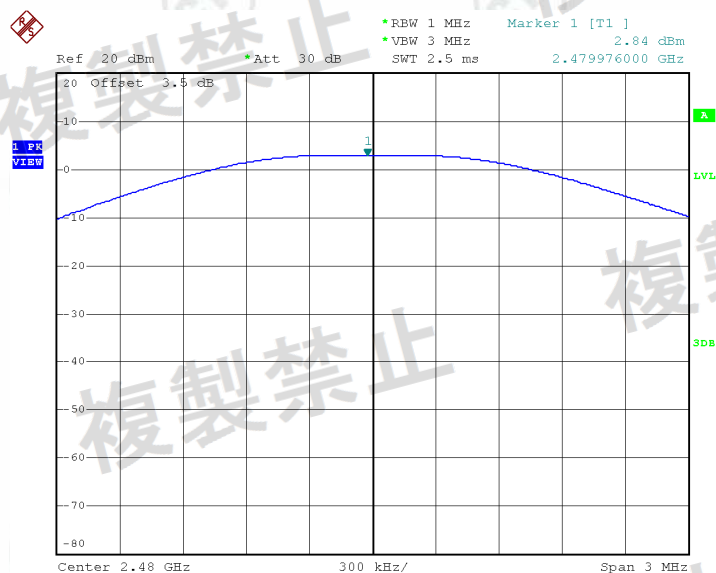
Date: 19.NOV.2020 13:26:24

Channel 19 (2.440GHz)



Date: 19.NOV.2020 13:27:21

Channel 39 (2.480GHz)



Date: 19.NOV.2020 13:28:02

Test result: The unit does meet the requirements.

7.1.7 Spurious Emissions of Tx

Measurement Record:

Uncertainty: ±1dB

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23.0°C	Humid.: 54%	Press.: 1010 mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.		
Test Configuration:	<div style="display: flex; align-items: center; justify-content: center; gap: 20px;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">PN9 Signal Generator</div> <div style="font-size: 24px;">→</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">EUT</div> <div style="font-size: 24px;">→</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">Spectrum Analyzer</div> </div>		
EUT conditions:	Modulation/Spread/Hopping on, PN9 Modulation Tx For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.		
Measurement Procedure:	Step1 All spurious are measured from 30MHz to 13GHz by peak mode. Step2 If the value measured by Step1 is 2dB or less, measure in average mode.		
Spectrum Analyzer conditions(Step1):	Frequency: 30MHz – 2400MHz , 2483.5MHz –13GHz RBW 1000kHz (30 – 1GHz) , 1000KHz (over 1GHz) VBW 1000kHz (30 – 1GHz) , 1000KHz (over 1GHz) Sweep Time Auto detector mode Positive peak Indication mode Max hold		
Spectrum Analyzer conditions(Step 2):	Frequency: Spurious Frequency Span 0Hz RBW 1MHz VBW 1MHz Sweep Time Auto Detector mode Sample Indication mode Max hold		
Technical standard:	(1) Below 2387 MHz : 2.5μW/MHz (2) 2387 to 2400 MHz : 25μW/MHz (3) 2483.5 through 2496.5 MHz : 25μW/MHz (4) Over 2496.5 MHz : 2.5μW/MHz		
Test result:	PASS		

Measurement Record:

Uncertainty: $\pm 1\text{dB}$

Test Result:

GFSK:

Test channel	Test Result						Unit	Limit
	Normal Voltage		High Voltage		Low Voltage			
	DC 12V		N/A		N/A			
Channel (2402MHz)	Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	dBm	(1) Below 2387 MHz: -26dBm/MHz (2) 2387 to 2400 MHz :-16dBm/MHz (3) 2483.5 through 2496.5 MHz : -16dBm/MHz (4)Over 2496.5 MHz: -26dBm/MHz
	2259.722	-47.37	N/A	N/A	N/A	N/A		
	2400.000	-18.72	N/A	N/A	N/A	N/A		
	2494.498	-47.66	N/A	N/A	N/A	N/A		
	10794.265	-40.96	N/A	N/A	N/A	N/A		

Test channel	Test Result						Unit	Limit
	Normal Voltage		High Voltage		Low Voltage			
	DC 12V		N/A		N/A			
Channel (2440MHz)	Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	dBm	(1) Below 2387 MHz: -26dBm/MHz (2) 2387 to 2400 MHz :-16dBm/MHz (3) 2483.5 through 2496.5 MHz : -16dBm/MHz (4)Over 2496.5 MHz: -26dBm/MHz
	2335.146	-47.80	N/A	N/A	N/A	N/A		
	2398.544	-47.23	N/A	N/A	N/A	N/A		
	2487.608	-47.02	N/A	N/A	N/A	N/A		
	9071.691	-39.86	N/A	N/A	N/A	N/A		

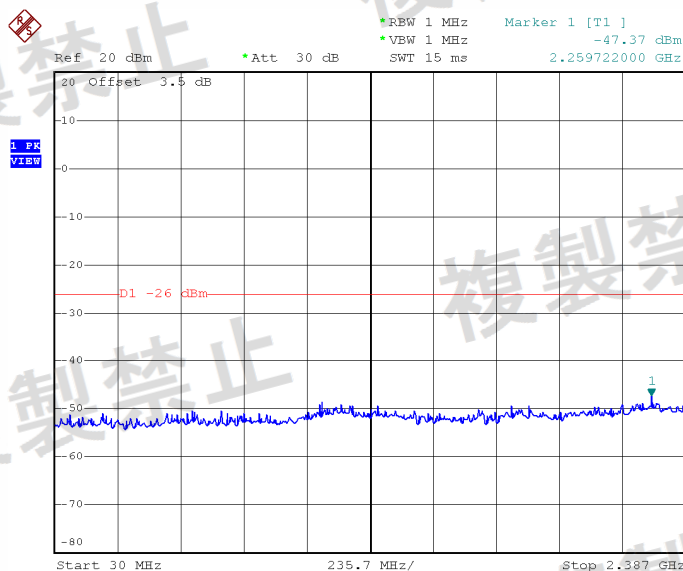
Test channel	Test Result						Unit	Limit
	Normal Voltage		High Voltage		Low Voltage			
	DC 12V		N/A		N/A			
Channel (2480MHz)	Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	dBm	(1) Below 2387 MHz: -26dBm/MHz (2) 2387 to 2400 MHz :-16dBm/MHz (3) 2483.5 through 2496.5 MHz : -16dBm/MHz (4)Over 2496.5 MHz: -26dBm/MHz
	2283.292	-47.82	N/A	N/A	N/A	N/A		
	2392.876	-47.10	N/A	N/A	N/A	N/A		
	2483.500	-35.40	N/A	N/A	N/A	N/A		
	3546.850	-41.05	N/A	N/A	N/A	N/A		

Result plot as follows:

GFSK (Normal Voltage)

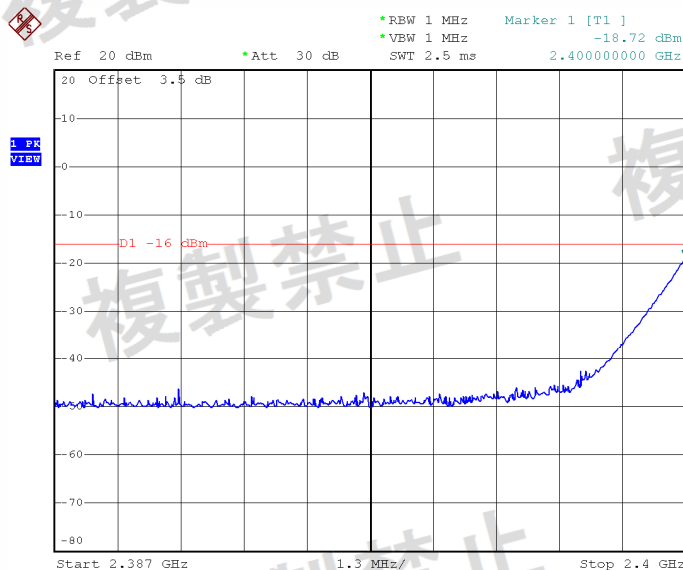
Channel 0 (2.402 GHz)

30MHz-2.387GHz:



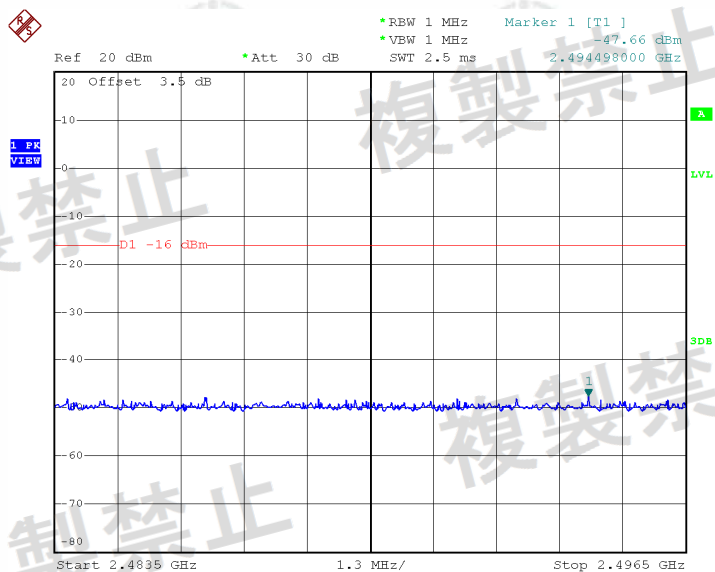
Date: 19.NOV.2020 13:56:05

2.387GHz-2.4GHz:



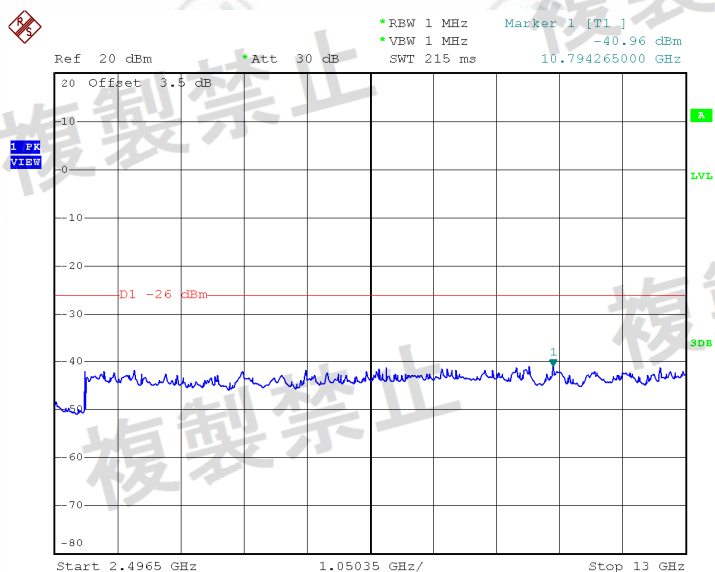
Date: 19.NOV.2020 13:58:22

2.4835GHz-2.4965GHz:



Date: 19.NOV.2020 13:59:01

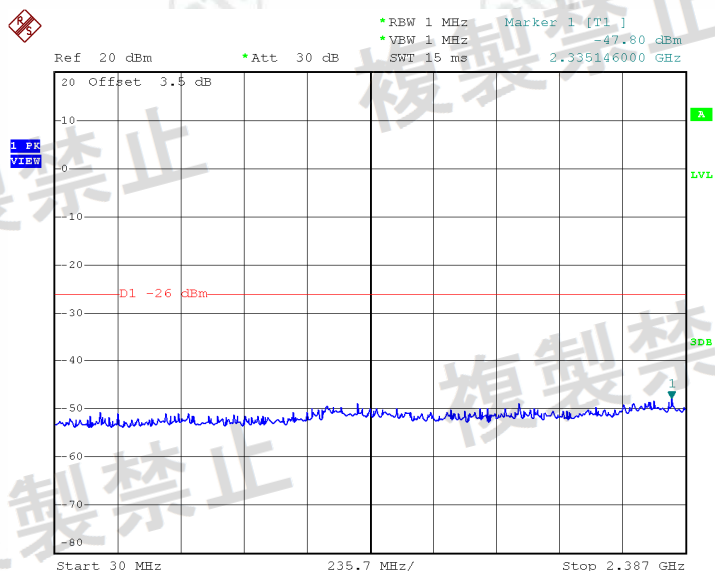
2.4965GHz-13GHz:



Date: 19.NOV.2020 13:57:43

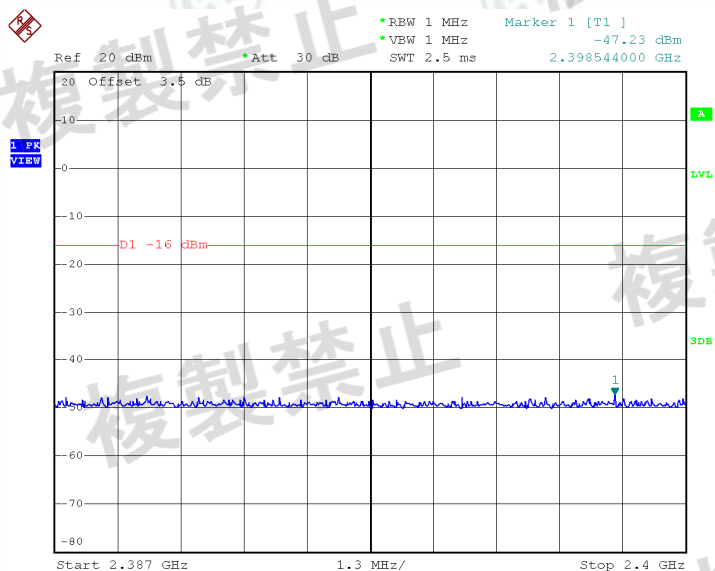
Channel 19 (2.440 GHz)

30MHz-2.387GHz:



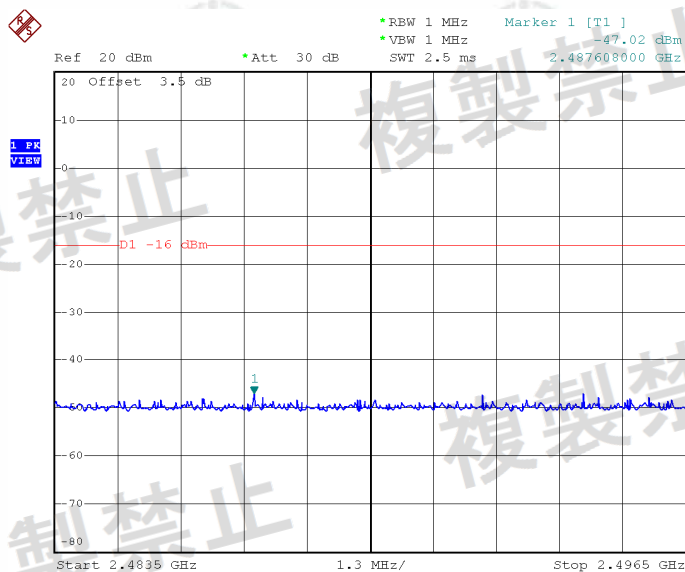
Date: 19.NOV.2020 14:01:32

2.387GHz-2.4GHz:



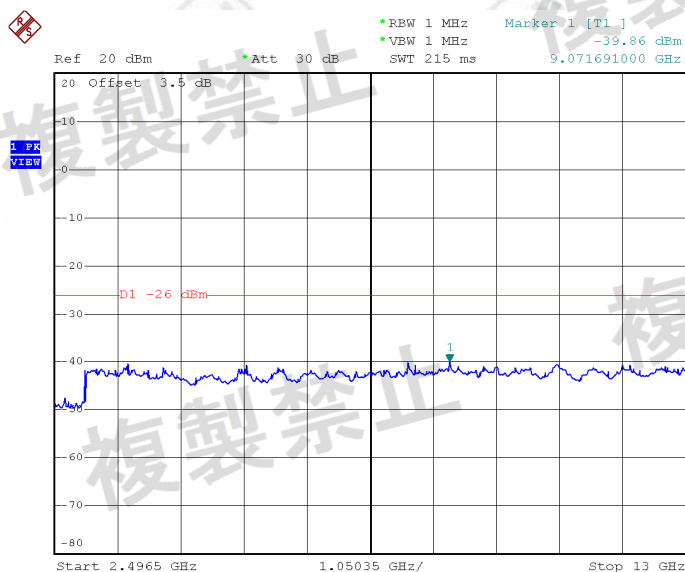
Date: 19.NOV.2020 14:00:48

2.4835GHz-2.4965GHz:



Date: 19.NOV.2020 13:59:47

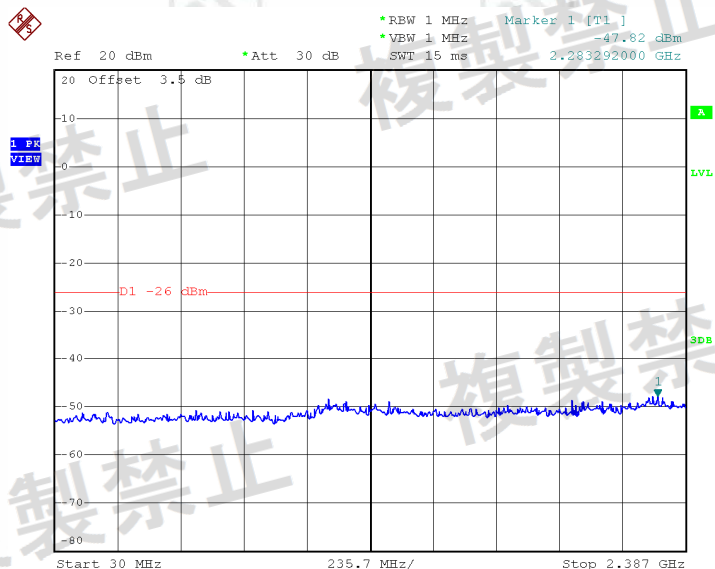
2.4965GHz-13GHz:



Date: 19.NOV.2020 14:03:40

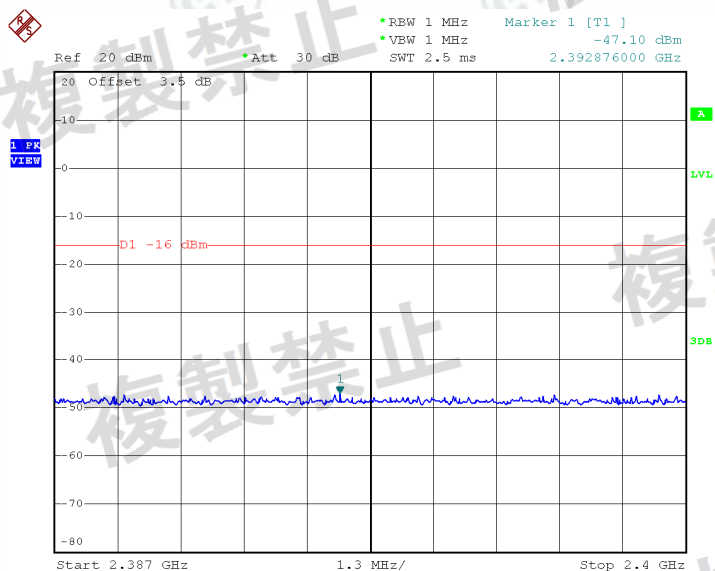
Channel 39 (2.480 GHz)

30MHz-2.387GHz:



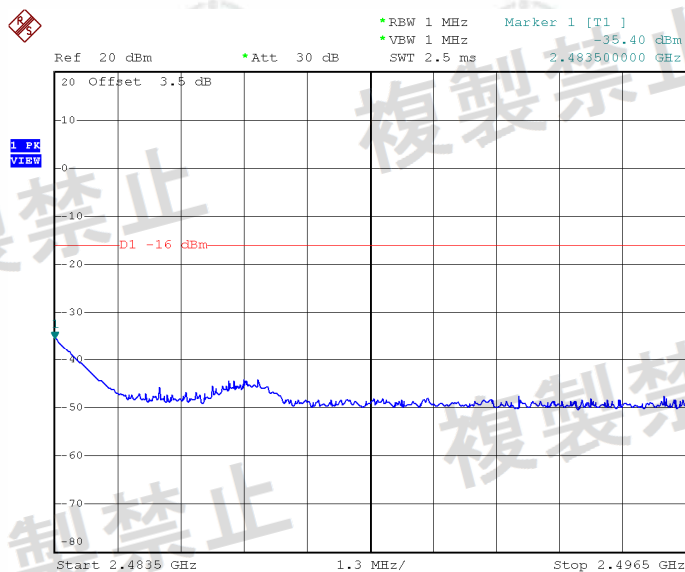
Date: 19.NOV.2020 14:06:22

2.387GHz-2.4GHz:



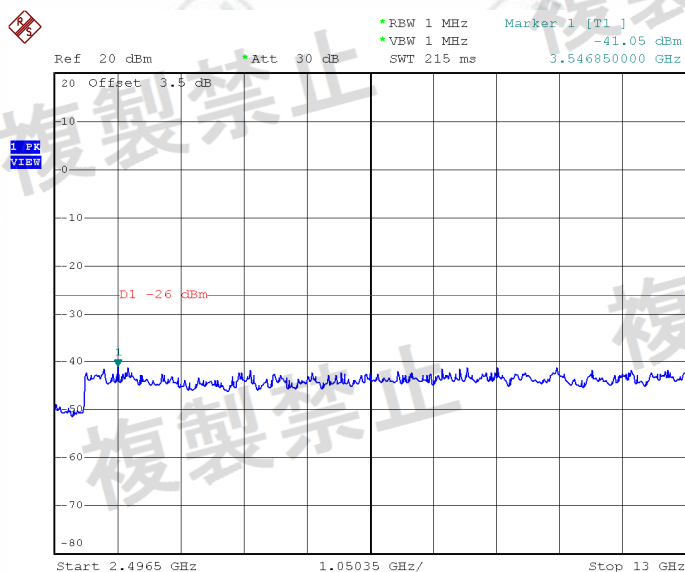
Date: 19.NOV.2020 14:08:00

2.4835GHz-2.4965GHz:



Date: 19.NOV.2020 14:08:46

2.4965GHz-13GHz:



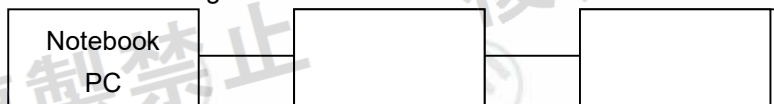
Date: 19.NOV.2020 14:05:38

Test Result: The unit does meet the requirements.

7.1.8 Interference prevention function

1) Measurement system diagram

(1) When transmitting identification code



2) Condition of measuring instrument

(1) Demodulator must be able to demodulate the transmitting signal emitted by test equipment and to indicate the identification code.

3) Condition of test equipment The mode of normal use.

4) Measuring operation procedure

(1) When test equipment has the function to transmit identification code automatically:

A) Transmit the predetermined identification code from test equipment.

B) Confirm the transmitted identification code by demodulator.

34:C9:3D:EF:11:72

5) Test result: The unit does meet the requirements (Good).

Test result: PASS

7.1.9 RF accessibility

Standard requirement

Article 49-20, paragraph 1 (a)

The EUT shall be constructed in such a way that sensitive RF parts, (like modulation and oscillator parts) cannot be reached easily by the user. These parts shall be covered by soldered metal caps or glue or by other mechanical covers. If the covers are fixed with screws, these shall be not the common type(s) like a Phillips, but special versions like Torx, so that the user cannot open the device with common tools.

<input type="checkbox"/>	Sealed with special screws.
<input type="checkbox"/>	Plastic chassis is being welded using ultrasonic waves.
<input type="checkbox"/>	Chassis is glued using a special adhesive.
<input type="checkbox"/>	Metal covers are spot-fused.
<input type="checkbox"/>	Cover is specially interlocked.
<input checked="" type="checkbox"/>	RF and Modulation components are covered with shielding case and this shielding case is soldered.
<input type="checkbox"/>	Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
<input type="checkbox"/>	Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.
<input type="checkbox"/>	Shield case is welded at RF and modulation parts, and ID-ROM is glued with anon-transparent laminating agent.
<input type="checkbox"/>	RF and Modulation parts are mounted on PCB with surface mount technology, and there is no any adjustable parts on PCB or adjustable parts are not exposed.



7.2 Receiver Requirements

7.2.1 Spurious Emissions of Rx

Measurement Record:

Uncertainty: $\pm 1\text{dB}$

Test Requirement:	Item 19 of Article 2-1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 23.0°C	Humid.: 54%	Press.: 1010 mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.		
Test Configuration:	 <pre> graph LR A[PN9 Signal Generator] --> B[EUT] B --> C[Spectrum Analyzer] </pre>		
EUT conditions:	Rx		
Measurement Procedure:	Step 1 All spurious are measured from 30 MHz to 13 GHz by peak mode. Step 2 If the value measured by Step1 is 2 dB or less, measure in average mode.		
Spectrum Analyzer conditions(Step 1):	Frequency: 30 MHz – 2400 MHz , 2483.5 MHz –13 GHz RBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz) VBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz) Sweep Time Auto detector mode Positive peak Indication mode Max hold		
Spectrum Analyzer Conditions(Step 2):	Frequency: Spurious Frequency Span 0 Hz RBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz) VBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz) Sweep Time Auto detector mode Sample Indication mode Max hold		
Technical standard:	(1) Below 1 GHz : 4 nW or less (2) 1 GHz and over : 20 nW or less		
Test result:	PASS		

Measurement Record:

Uncertainty: $\pm 1\text{dB}$

Test Result:

Test channel	Test Result						Unit	Limit
	Normal Voltage		High Voltage		Low Voltage			
	DC 12V		N/A		N/A			
Channel 0: 2402MHz	Frequency (MHz)	Level (dBm)	Frequency(MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	dBm	(1) Below 1 GHz :-54dBm (2) 1 GHz to 13 GHz : -47dBm
	538.280	-76.46	N/A	N/A	N/A	N/A		
	3304.000	-61.67	N/A	N/A	N/A	N/A		

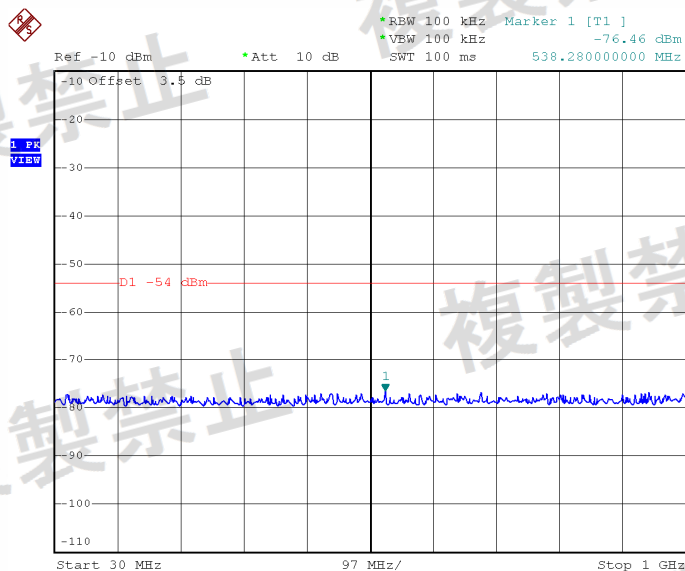
Test channel	Test Result						Unit	Limit
	Normal Voltage		High Voltage		Low Voltage			
	DC 12V		N/A		N/A			
Channel 19: 2440MHz	Frequency (MHz)	Level (dBm)	Frequency(MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	dBm	(1) Below 1 GHz :-54dBm (2) 1 GHz to 13 GHz : -47dBm
	976.720	-76.42	N/A	N/A	N/A	N/A		
	8944.000	-61.37	N/A	N/A	N/A	N/A		

Test channel	Test Result						Unit	Limit
	Normal Voltage		High Voltage		Low Voltage			
	DC 12V		N/A		N/A			
Channel 39: 2480MHz	Frequency (MHz)	Level (dBm)	Frequency(MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	dBm	(1) Below 1 GHz :-54dBm (2) 1 GHz to 13 GHz : -47dBm
	967.020	-76.25	N/A	N/A	N/A	N/A		
	6736.000	-61.76	N/A	N/A	N/A	N/A		

Result plot as follows:

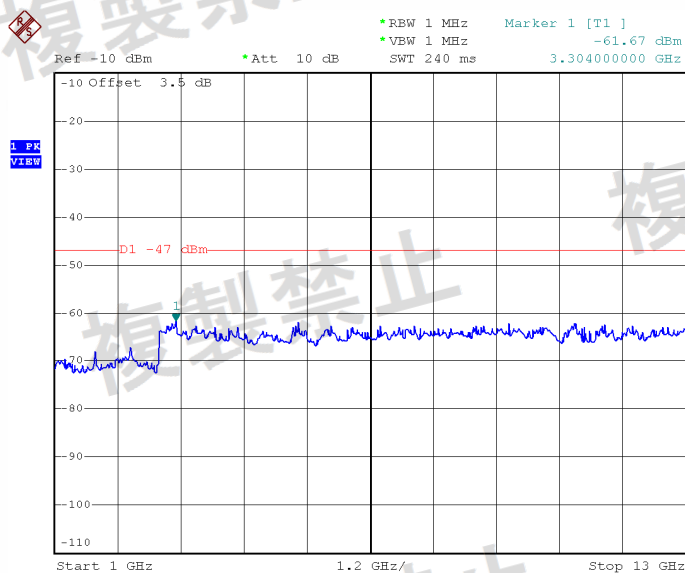
Channel 0: 2402MHz

30MHz-1GHz



Date: 19.NOV.2020 14:11:46

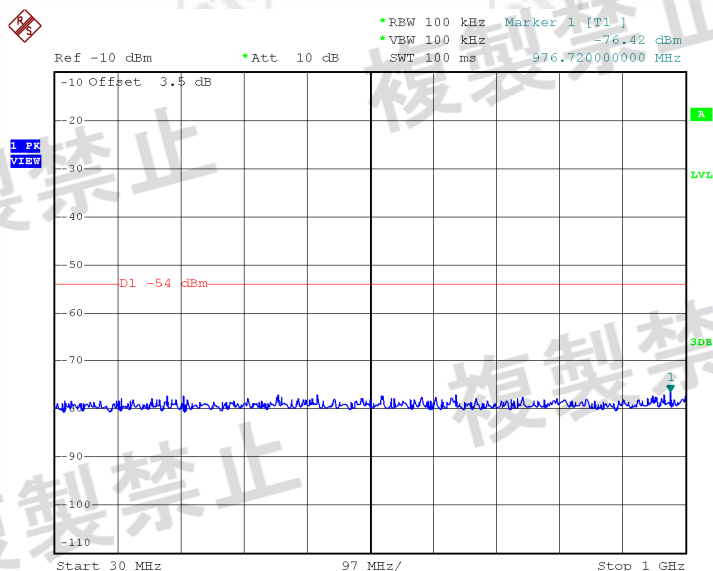
1GHz -13GHz



Date: 19.NOV.2020 14:14:13

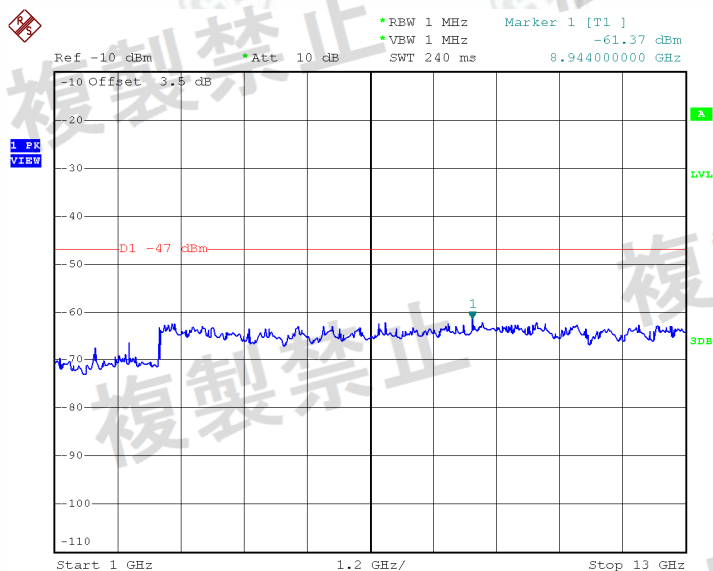
Channel 19: 2440MHz

30MHz-1GHz



Date: 19.NOV.2020 14:12:20

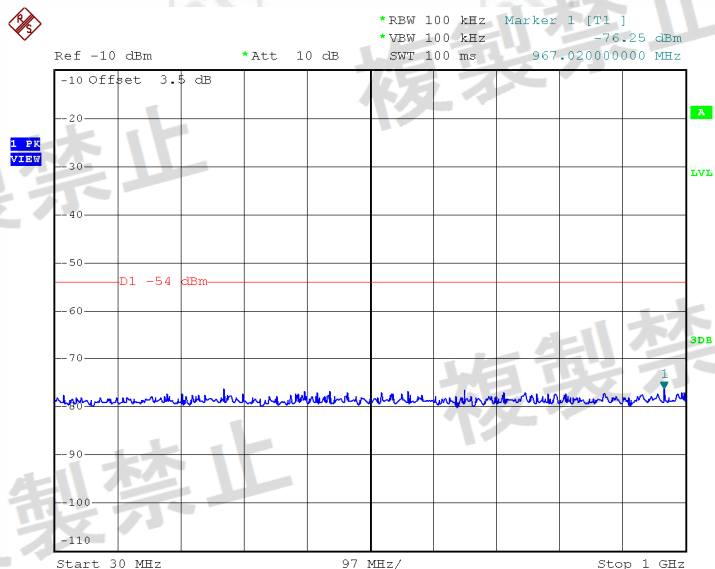
1GHz -13GHz



Date: 19.NOV.2020 14:14:58

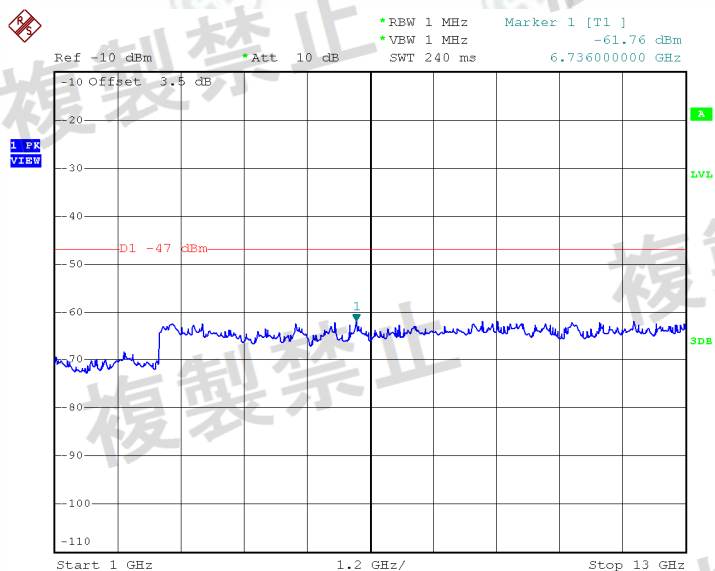
Channel 39: 2480MHz

30MHz-1GHz



Date: 19.NOV.2020 14:12:56

1GHz -13GHz



Date: 19.NOV.2020 14:15:23