

TEST REPORT

Product Name : 2.4G WIRELESS RECEIVER
Mode No. : DOF00001
Report Number : BLA-RF-201807-A04
Date of Issue : July. 10, 2018
Test standard : Item 19 of Article 2 Paragraph 1
Test result : PASS

Prepared for:

BUFFALO INC.

**AKAMONDORI Bldg., 30-20, Ohsu 3-chome, Naka-ku, Nagoya 460-8315,
Japan**

Prepared by:

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Date: July. 10, 2018



2 Version

Version No.	Date	Description
00	July. 10, 2018	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 427-2470.75MHz) (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
Pseudorandom Frequency Hopping Sequence	Item 19 of Article 2 Paragraph 1	Notice 88 Appendix 43, 44, 45	PASS
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:

EUT: In this whole report EUT means Equipment Under Test.

Tx: In this whole report Tx (or tx) means the product in transmitting status.

Rx: In this whole report Rx (or rx) means the product in receiving status.

RF: In this whole report RF means Radiated Frequency.

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5 General Information

5.1 Client Information

Applicant:	BUFFALO INC.
Address of Applicant:	AKAMONDORI Bldg., 30-20, Ohsu 3-chome, Naka-ku, Nagoya 460-8315, Japan
Manufacturer:	BUFFALO INC.
Address of Manufacturer:	AKAMONDORI Bldg., 30-20, Ohsu 3-chome, Naka-ku, Nagoya 460-8315, Japan
Manufacturer:	Dongguan Newmen Electronics Technology Co. Ltd
Address of Manufacturer:	No.5,Xifa road,Lin village,Tangxia town,Dongguan,Guangdong,China
Manufacturer:	BUFFALO TECHNOLOGY(TAIWAN) INC.
Address of Manufacturer:	7F-8, 18, Lane609, Sec.5, Chung Hsin Rd., San Chung Dist, New Taipei City, 241, Taiwan
Factory:	Dongguan Newmen Electronics Technology Co. Ltd
Address of Factory:	No.5,Xifa road,Lin village,Tangxia town,Dongguan,Guangdong,China
Factory:	Miya Electronic Co. Ltd.
Address of Factory:	41-5 Nashinoki, Orido-cho- Nisshin-shi, Aichi 470-0115 Japan

5.2 General Description of EUT

Product Name:	2.4G WIRELESS RECEIVER
Model No.:	DOF00001
Operating Frequency:	2408 MHz to 2474 MHz
Conducted rated power:	F1D: 1.1mW
Number of Channels:	34 Channels
Type of Modulation:	FSK
Channel Separation:	2 MHz
Antenna Type:	Integral antenna
Antenna gain:	2.41dBi
Power Supply:	5V
Sample Received Date:	July 02, 2018
Sample tested Date:	July 04, 2018 to July 05, 2018

5.3 Description of Support Units

The EUT has been tested stand-alone.

5.4 Test Location

All tests were performed at:

Qianhai BlueAsia of Technical Services(Shenzhen) Co.,Ltd.

5 Floor, 6 Building, Second Guanlong Industrial Park , Xili Town, Nanshan District, Shenzhen, China

Telephone: TEL: +86-755-2305 9481

FAX: +86-755-2305 9481

No tests were sub-contracted.

6 Equipment List

Equipment	Manufacturer	Model	Serial No.	Due Date	Calibration body	Classification
Signal Generator	Agilent	E8257D	MY44320250	2019.5.23	GRGT	(c)
Communication test set test set	Anritsu	MT8852B	0814003	2019.5.23	GRGT	(c)
Spectrum Analyzer	Keysight	N9030A	MY52350152	2019.5.23	GRGT	(c)
Spectrum Analyzer	R&S	FSP40	100817	2018.8.28	GRGT	(c)
Signal Generator	Agilent	E4438C	MY45092582	2019.5.23	GRGT	(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 equipments is 1 year.

7 Radio Technical Requirements Specification

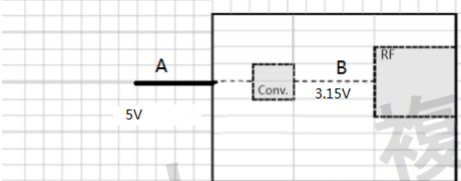
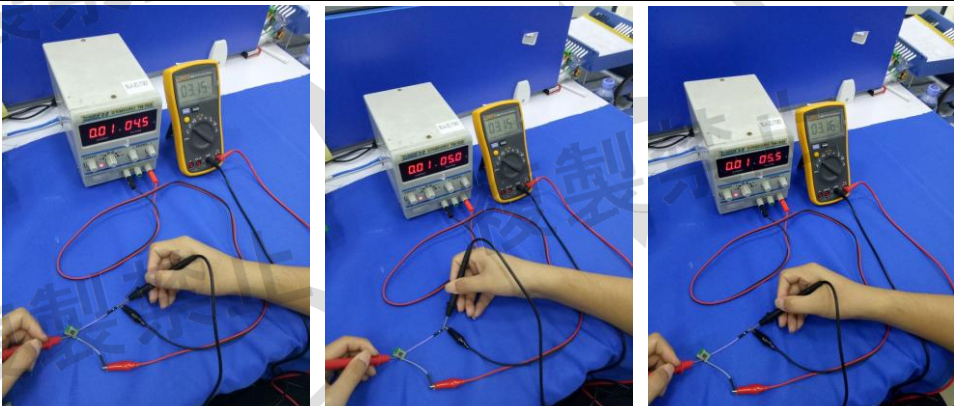
Table 1: Radio Technical Requirements Specification for 2.4 GHz band wide-band low-power data communication system (Item 19 of Article 2 Paragraph 1)

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 FH: Frequency hopping OFDM: Orthogonal frequency division multiplexing

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

7.1.1.1 EUT test voltage		
Power Supply:	5V	
Test voltage require:	The power supply is by 5V .	
Power Supply view:	 <p>Test below: 1: The fluctuation of B point is under $\pm 1\%$, when input voltage from A point to the test equipment is fluctuated by $\pm 10\%$.</p>	
		
	The measurement result of the voltage fluctuation at RF circuit when 5V +/- 10%.	
	DC INPUT	DC Output
4.5V		3.15V
5V		3.15V
5.5V		3.15V

7.1.1.2 Test frequency

Test frequencies:	If the EUT can be set to 3 of 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	2408	9	2426	18	2444	27	2462
1	2410	10	2428	19	2446	28	2464
2	2412	11	2430	20	2448	29	2466
3	2414	12	2432	21	2450	30	2468
4	2416	13	2434	22	2452	31	2470
5	2418	14	2436	23	2454	32	2472
6	2420	15	2438	24	2456	33	2474
7	2422	16	2440	25	2458	N/A	N/A
8	2424	17	2442	26	2460	N/A	N/A

Test frequencies are the lowest channel: 0 channel (2408 MHz), Middle channel, 16 channel (2440 MHz) and highest channel: 33 channel (2474 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 antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.41dBi.</p> 
Result: An antenna connector is available; all relevant tests will be carried out conducted.

7.1.3 Frequency Error

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 24°C	Humid.: 55%	Press.: 1010 mbar
Test Status:	Test the EUT in transmitting mode without modulation. Test in Channel lowest (2408MHz), middle (2440MHz) and highest (2474MHz), keep in continuously transmitting status.		
Test Configuration:			
<div><div>EUT</div><div>Spectrum Analyzer</div></div>			
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 ON), VBW 10KHz (Modulation ON), Sweep Time Auto Detector mode Positive peak Indication mode Max hold		
Technical standard:	Tolerance of frequency: $\pm 50 \times 10^{-6}$		
Test result:	PASS		

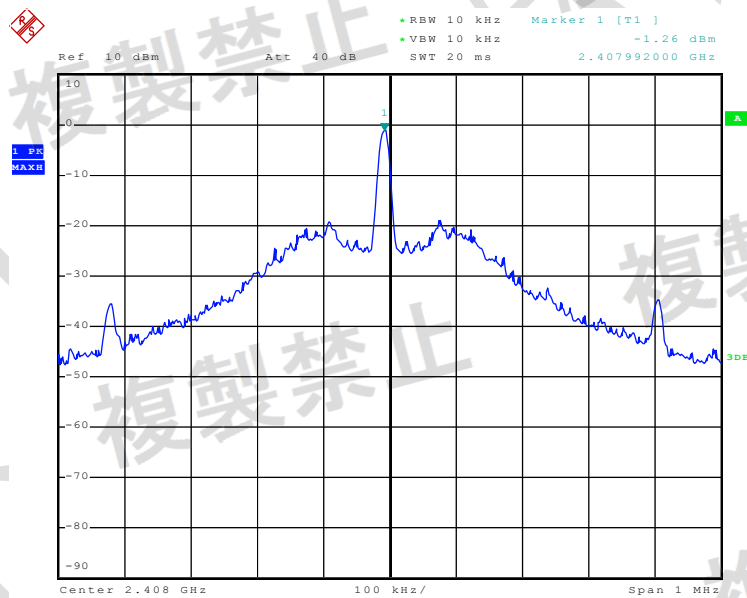
Measurement Record:
Uncertainty: $\pm 10\text{Hz}$
Test Result:

Test channel	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
Lowest	2408.0	5V	N/A	N/A	MHz	$\pm 50\text{ PPM}$ or less
		2407.992	N/A	N/A	PPM	
		-3.32	N/A	N/A	MHz	
Middle	2440.0	2439.992	N/A	N/A	PPM	
		-3.28	N/A	N/A	MHz	
		2473.992	N/A	N/A	PPM	
Highest	2474.0	-3.23	N/A	N/A	MHz	
			N/A	N/A	PPM	
			N/A	N/A		

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

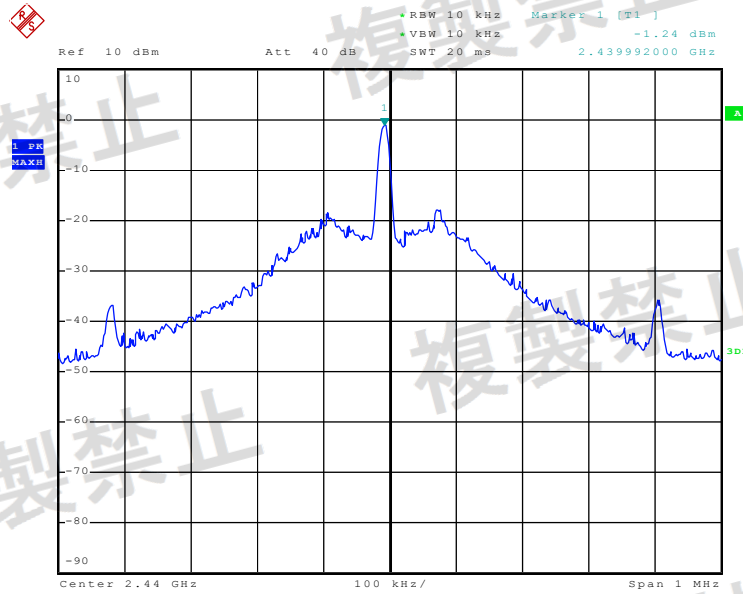
Result plot as follows:
Normal Voltage

Channel 0: 2.408 GHz:



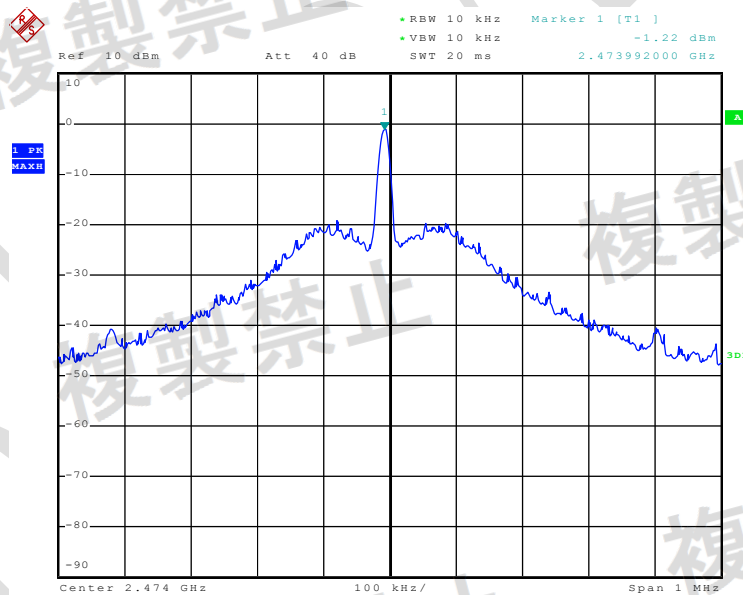
Date: 4.JUL.2018 15:23:04

Channel 16: 2.440 GHz



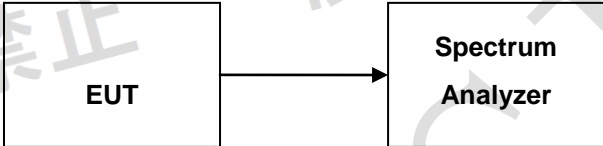
Date: 4.JUL.2018 15:25:35

Channel 33: 2.474 GHz



Date: 4.JUL.2018 15:26:05

7.1.4 Occupied Bandwidth (99%)

Test Requirement:	Item 19 of Article 2 Paragraph 1
Test Method:	MIC Notice No.88 Appendix No.43
EUT Operation:	
Ambient:	Temp.: 24.0°C Humid.: 55% Press.: 1010mbar
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 EUT[EUT] --> SA[Spectrum Analyzer] </pre>
EUT conditions:	Modulation/Spread/Hopping on, 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 40MHz RBW 1MHz VBW 1MHz Sweep Time Auto detector mode Positive peak Indication mode Max hold OBW 99%
Technical standard:	83.5MHz
Test result:	PASS

Measurement Record:

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

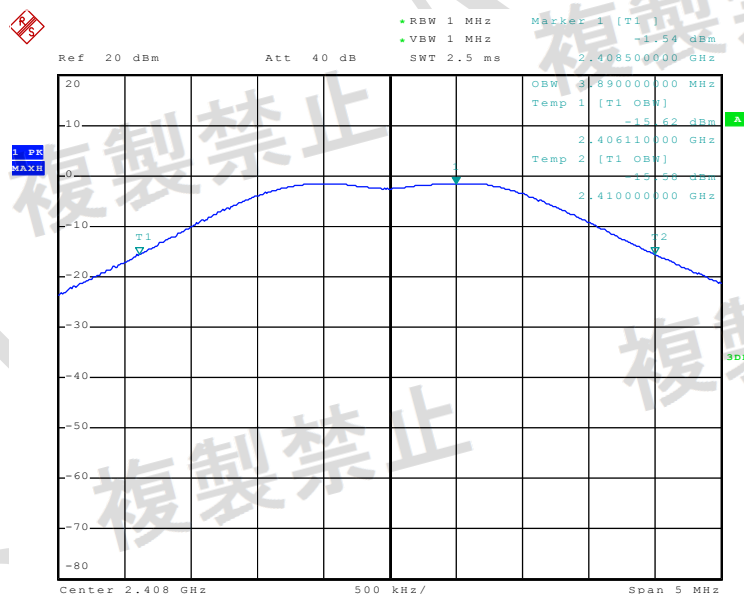
Test Result:

Test channel	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		5V	N/A	N/A		
Channel 0	2408.0	3.890	N/A	N/A	MHz	26 MHz or less
Channel 16	2440.0	3.860	N/A	N/A	MHz	26 MHz or less
Channel 33	2474.0	3.860	N/A	N/A	MHz	26 MHz or less

Result plot as follows:

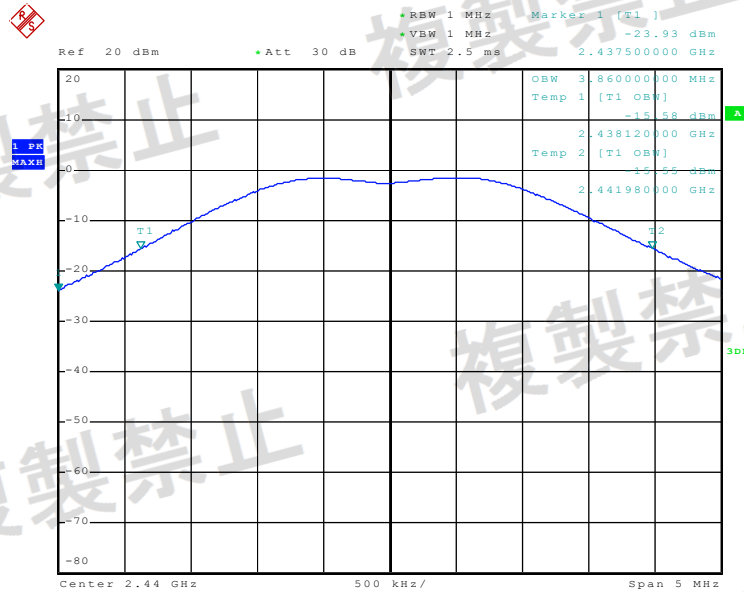
Normal Voltage

Channel 0



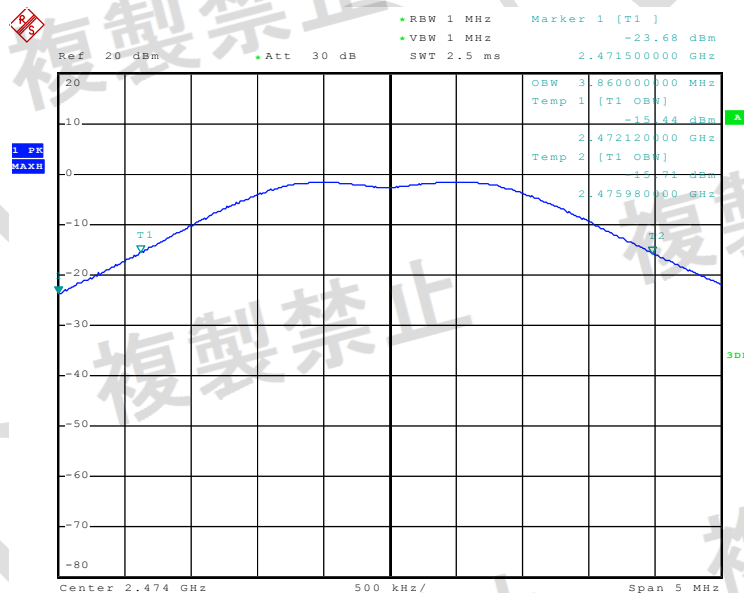
Date: 4 JUL 2018 15:33:25

Channel 16



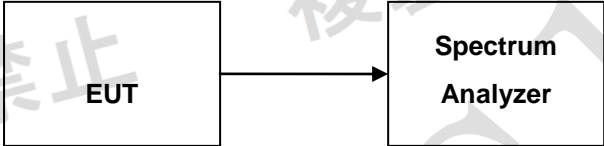
Date: 4.JUL.2018 15:35:45

Channel 33



Date: 4.JUL.2018 15:36:13

7.1.5 Spread spectrum Bandwidth (90%)

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 24.0°C	Humid.: 55%	Press.: 1010 mbar
Test Status:	Pre-Scan has been conducted to determine the worst-case mode formal 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 EUT[EUT] --> SA[Spectrum Analyzer] </pre>		
EUT conditions:	Modulation/Spread/Hopping on, 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 40MHz RBW 1MHz VBW 1MHz Sweep Time Auto detector mode Positive peak Indication mode Max hold OBW 90%		
Technical standard:	500kHz or more		
Test result:	PASS		

Measurement Record:

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

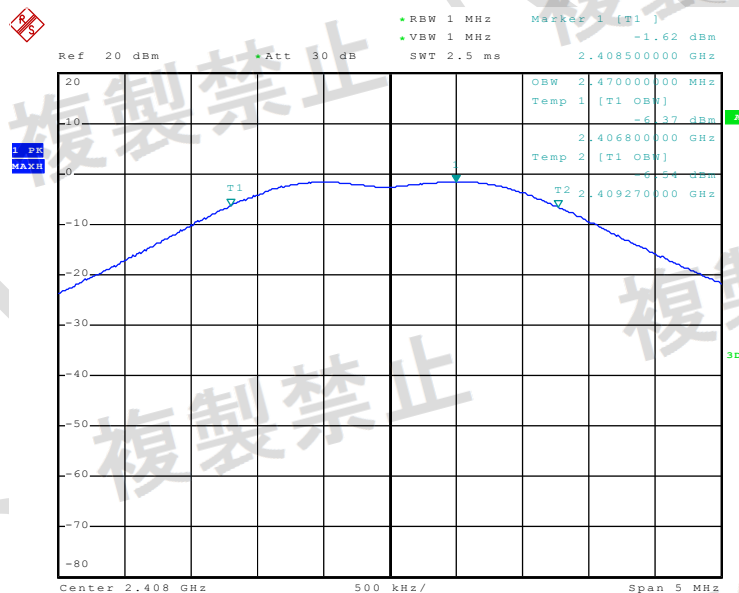
Test Result:

Test channel	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		5V	N/A	N/A		
Channel 0	2408.0	2.470	N/A	N/A	MHz	500 kHz or more
Channel 16	2440.0	2.460	N/A	N/A	MHz	500 kHz or more
Channel 33	2474.0	2.460	N/A	N/A	MHz	500 kHz or more

Result plot as follows:

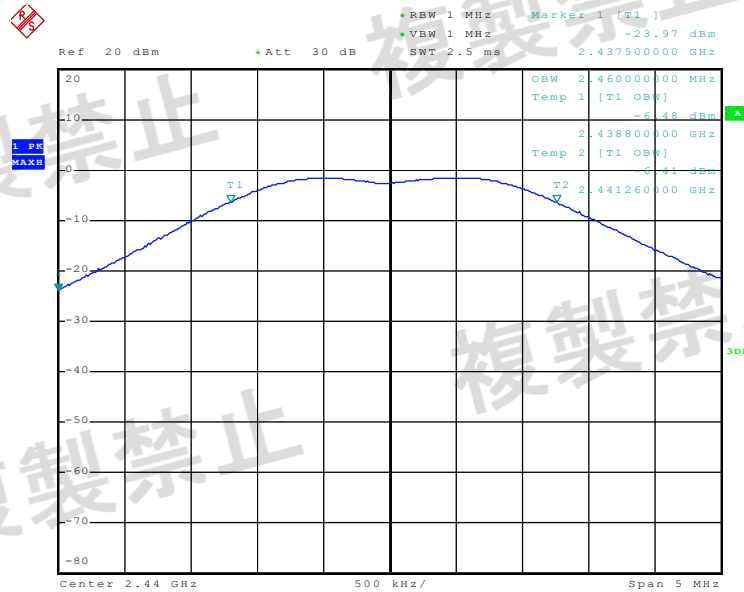
Normal Voltage

Channel 0



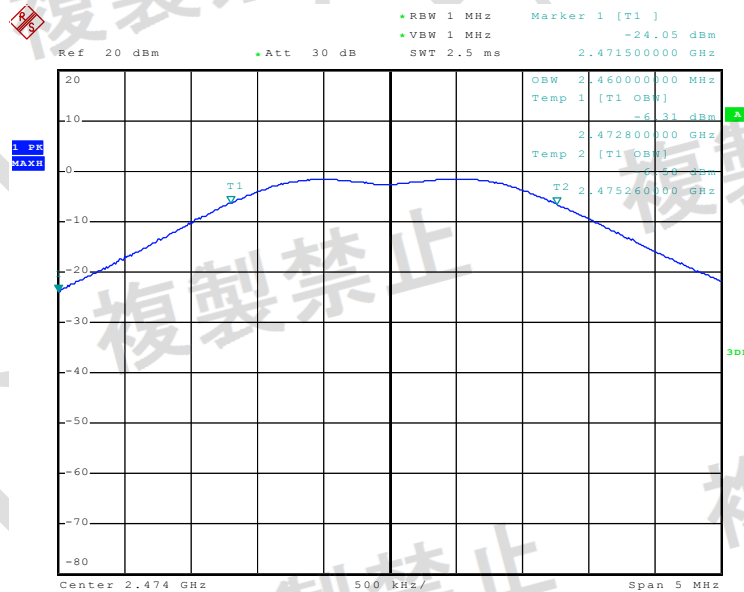
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Channel 16



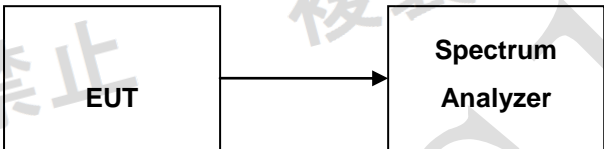
Date: 4.JUL.2018 15:35:22

Channel 33



Date: 4.JUL.2018 15:36:33

7.1.6 Antenna Power

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 24°C	Humid.: 55%	Press.: 1010mbar
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 EUT[EUT] --> SA[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(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:

Test channels	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		5V	N/A	N/A		
Channel 0	2408	1.20	N/A	N/A	mW/MHz	10 mW /MHz or less Error +20%~ -80%
		9.09	N/A	N/A	%	
Channel 16	2440	0.97	N/A	N/A	mW/MHz	
		-11.82	N/A	N/A	%	
Channel 33	2474	0.82	N/A	N/A	mW/MHz	
		-25.45	N/A	N/A	%	

Remark:

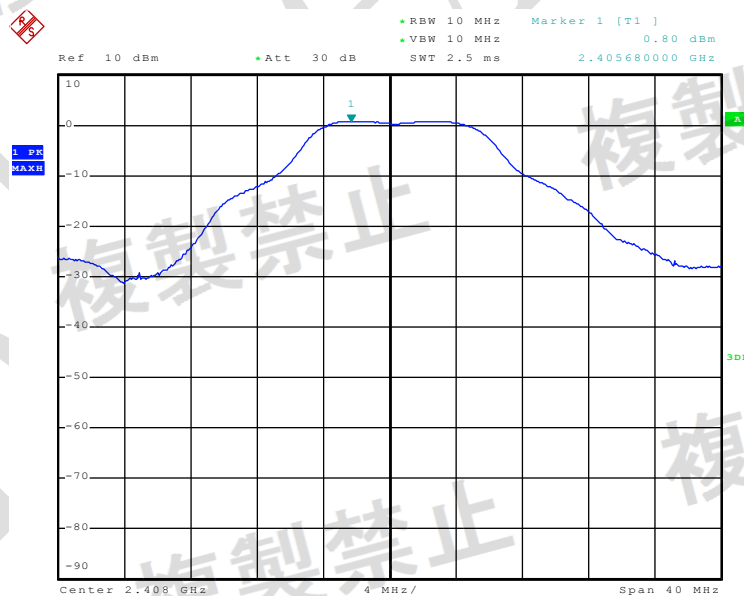
Conducted rated power: 1.1mW

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

Result plot as follows:
Normal Voltage

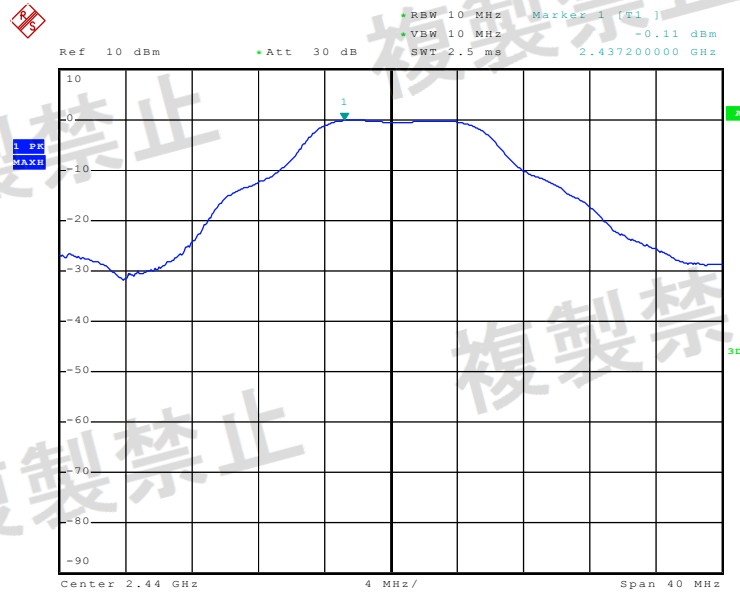
GFSK

Channel 0 (2408 MHz)



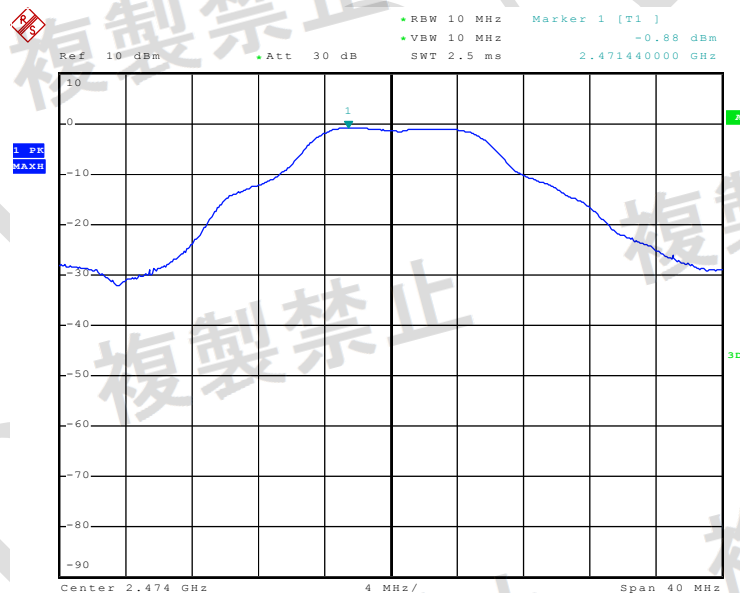
Date: 5..III..2018 17:52:54

Channel 16 (2440MHz)



Date: 5.JUL.2018 17:53:24

Channel 33 (2474MHz)



Date: 5.JUL.2018 17:53:44

7.1.7 Spurious Emissions of Tx

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 24°C	Humid.: 55%	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 EUT[EUT] --> SA[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.		
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(Step 1):	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			
	5V		N/A		N/A			
Channel (2408MHz)	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
	34.714	-45.53	N/A	N/A	N/A	N/A		
	2396.126	-30.91	N/A	N/A	N/A	N/A		
	2493.692	-51.86	N/A	N/A	N/A	N/A		
	9260.754	-43.61	N/A	N/A	N/A	N/A		

Test channel	Test Result						Unit	Limit
	Normal Voltage		High Voltage		Low Voltage			
	5V		N/A		N/A			
Channel (2440MHz)	Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	Frequen cy (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
	34.714	-45.30	N/A	N/A	N/A	N/A		
	2394.982	-49.59	N/A	N/A	N/A	N/A		
	2489.298	-52.53	N/A	N/A	N/A	N/A		
	9344.782	-43.25	N/A	N/A	N/A	N/A		

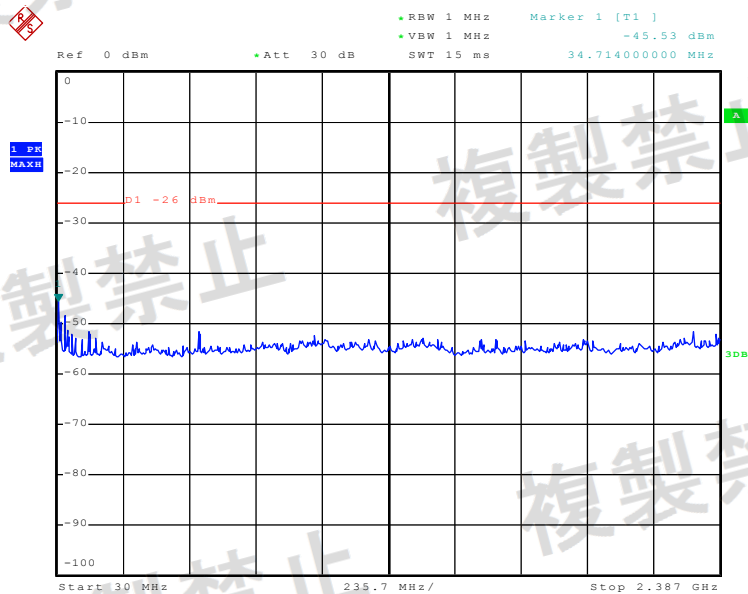
Test channel	Test Result						Unit	Limit
	Normal Voltage		High Voltage		Low Voltage			
	5V		N/A		N/A			
Channel (2474MHz)	Frequency (MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	Frequen cy (MHz)	Level (dBm)	dBm	(1) Below 2387 MHz: -26dBm/MHz (2) 2387 to 2400 MHz :-16dBm/MHz (3) 2483.5 through 2496.5 MHz : -16dBm/MHz (4)Over 2496.5 MHz: -26dBm/MHz
	1986.310	-52.76	N/A	N/A	N/A	N/A		
	2395.528	-52.93	N/A	N/A	N/A	N/A		
	2487.816	-52.06	N/A	N/A	N/A	N/A		
	2496.500	-32.21	N/A	N/A	N/A	N/A		

Result plot as follows:

GFSK(Normal Voltage)

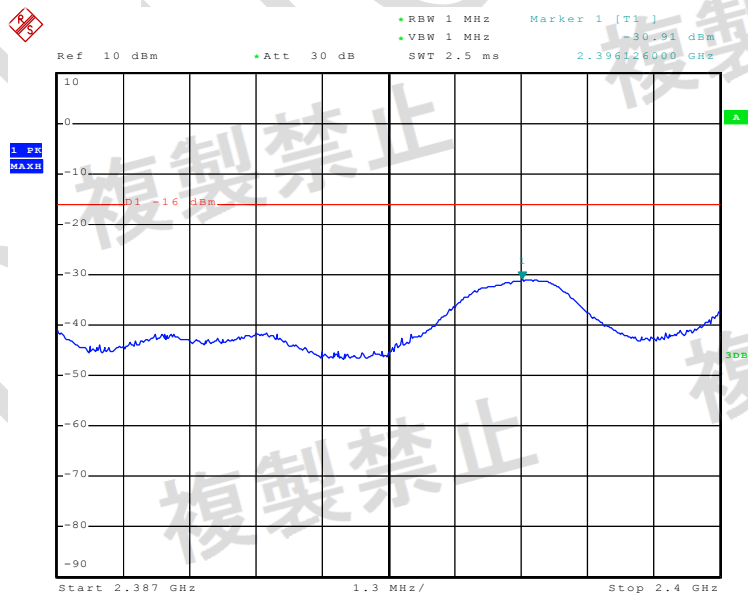
Channel 0 (2.408 GHz)

30MHz-2.387GHz:



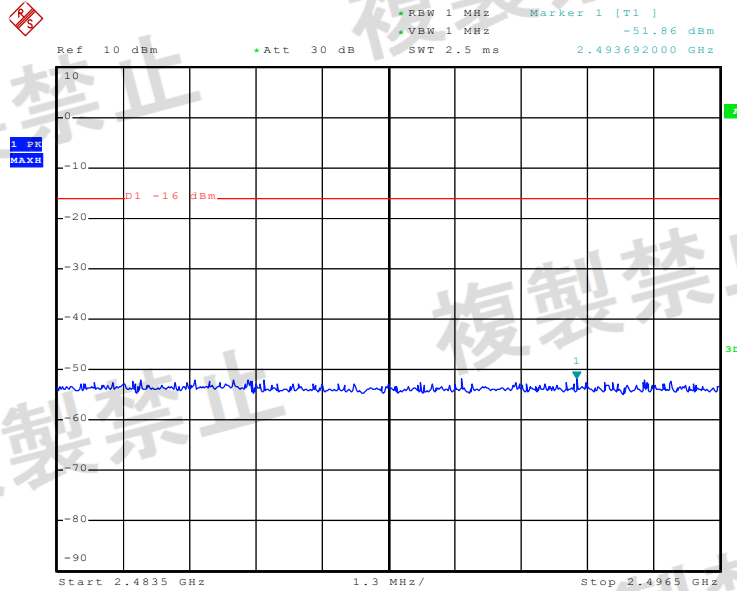
Date: 4.JUL.2018 16:40:27

2.387GHz-2.4GHz:



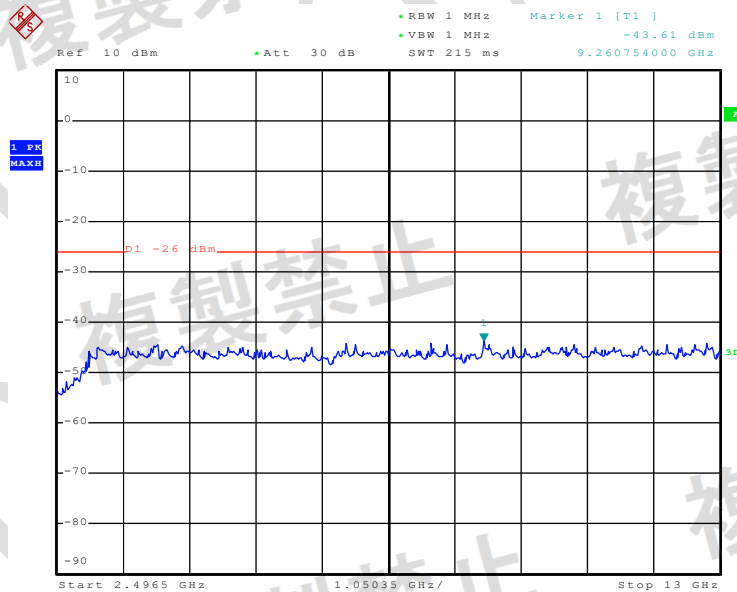
Date: 4.JUL.2018 15:46:50

2.4835GHz-2.4965GHz:



Date: 4.JUL.2018 15:47:22

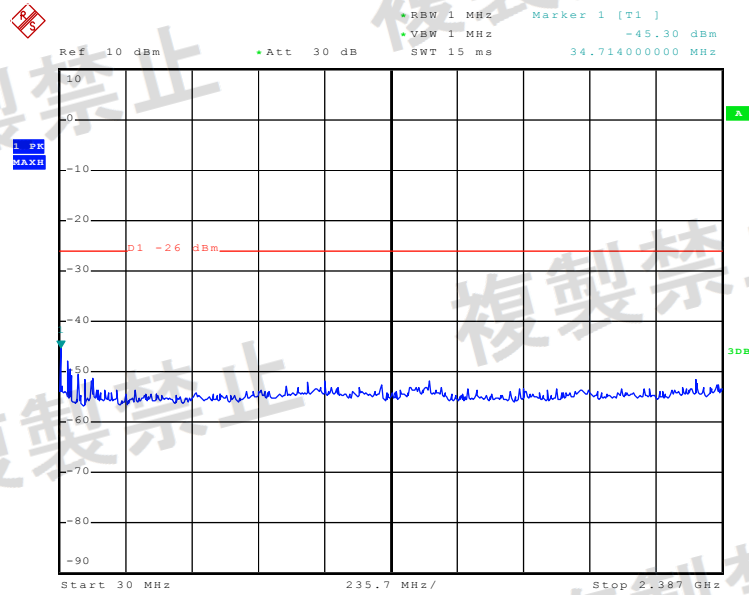
2.4965GHz-13GHz:



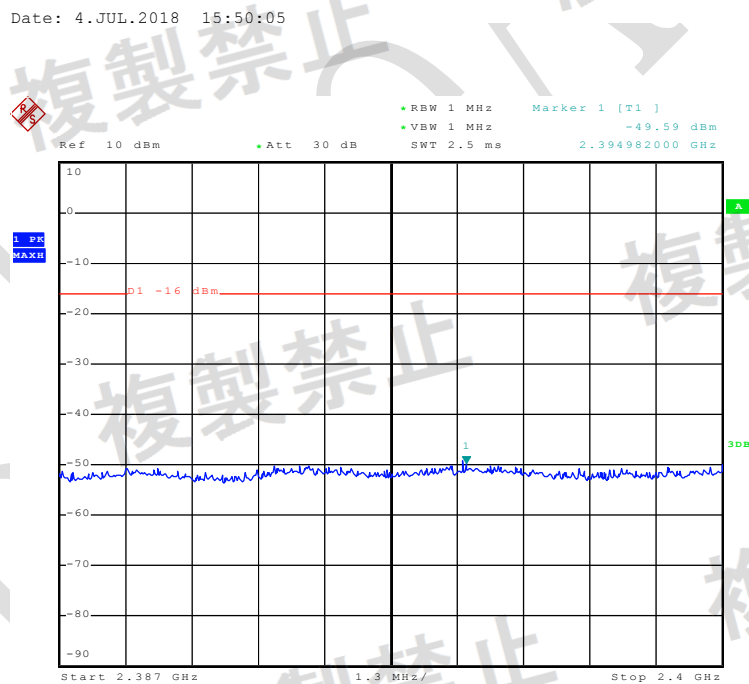
Date: 4.JUL.2018 15:47:59

Channel 16 (2.440 GHz)

30MHz-2.387GHz:

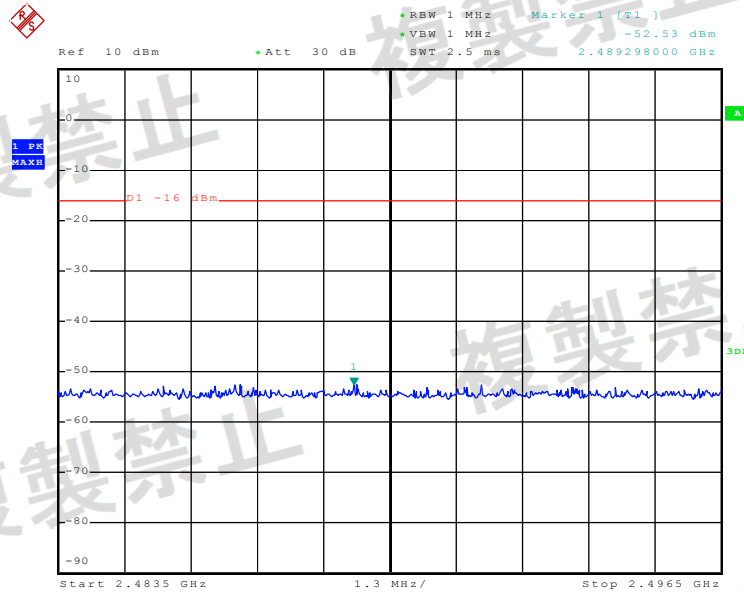


2.387GHz-2.4GHz:



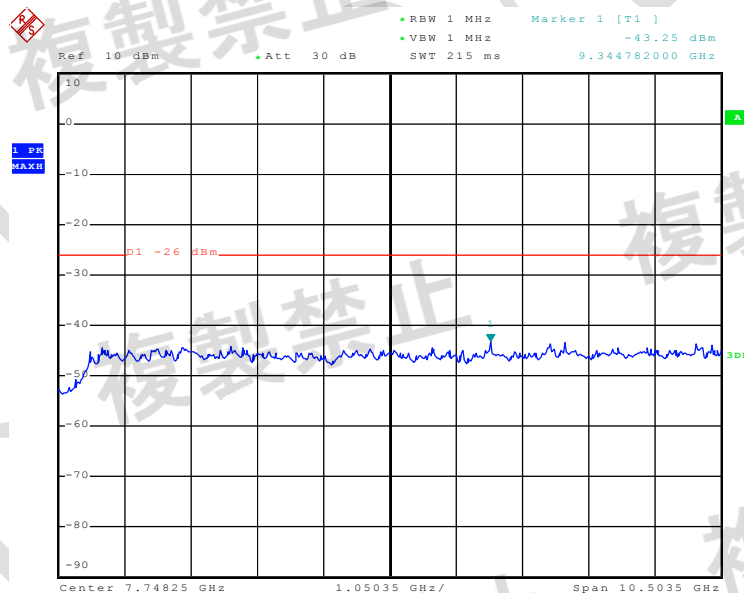
Date: 4.JUL.2018 15:50:44

2.4835GHz-2.4965GHz:



Date: 4.JUL.2018 15:51:37

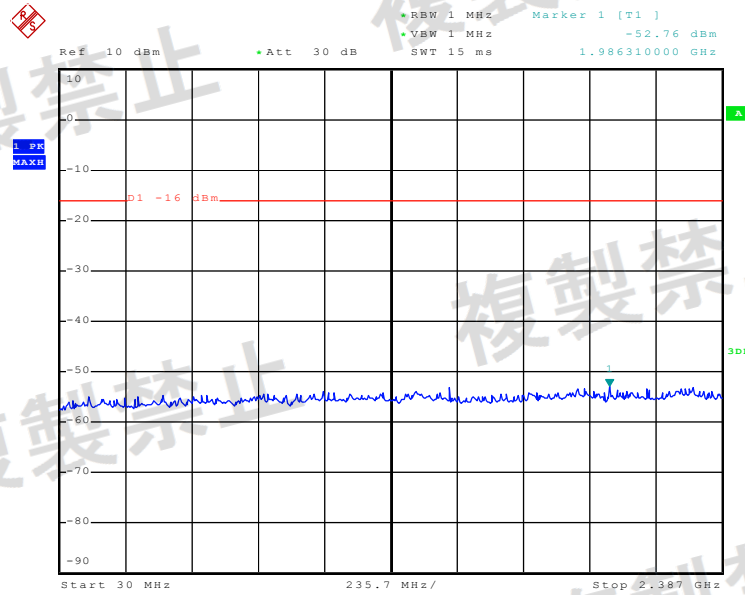
2.4965GHz-13GHz:



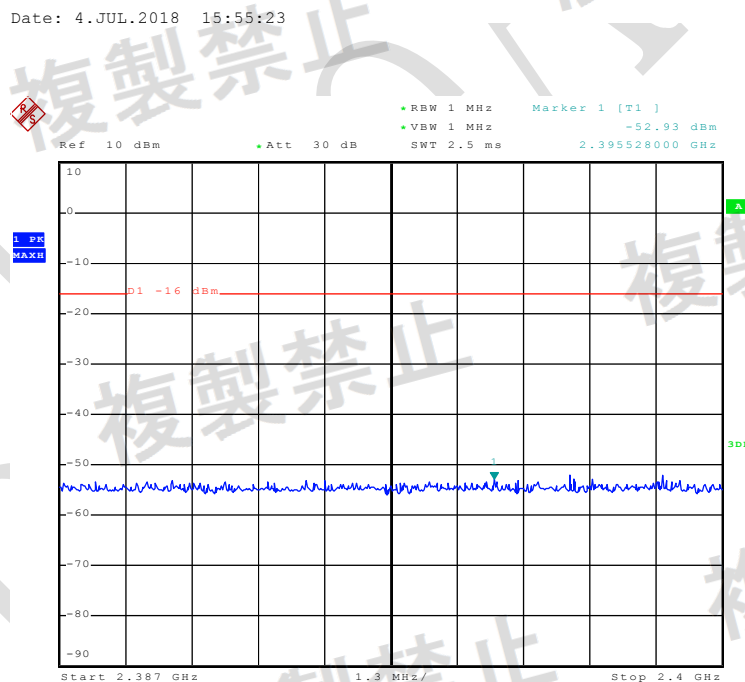
Date: 4.JUL.2018 15:49:19

Channel 33 (2.474 GHz)

30MHz-2.387GHz:

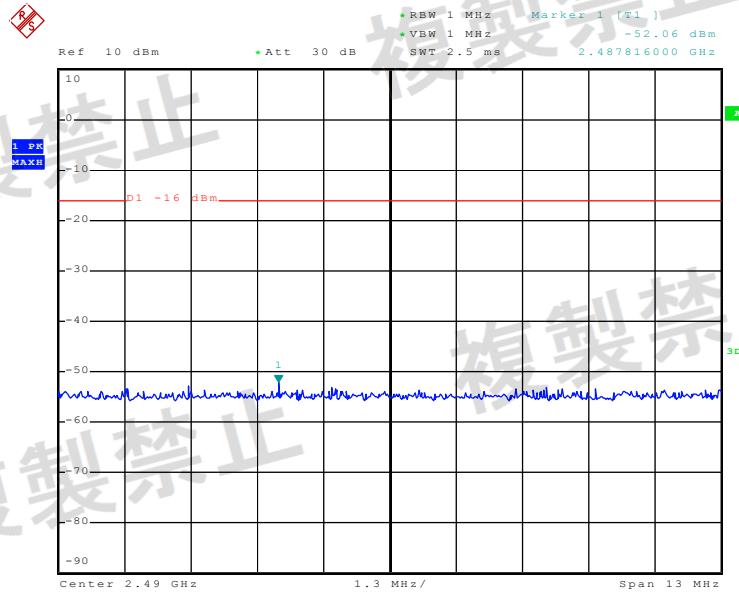


2.387GHz-2.4GHz:



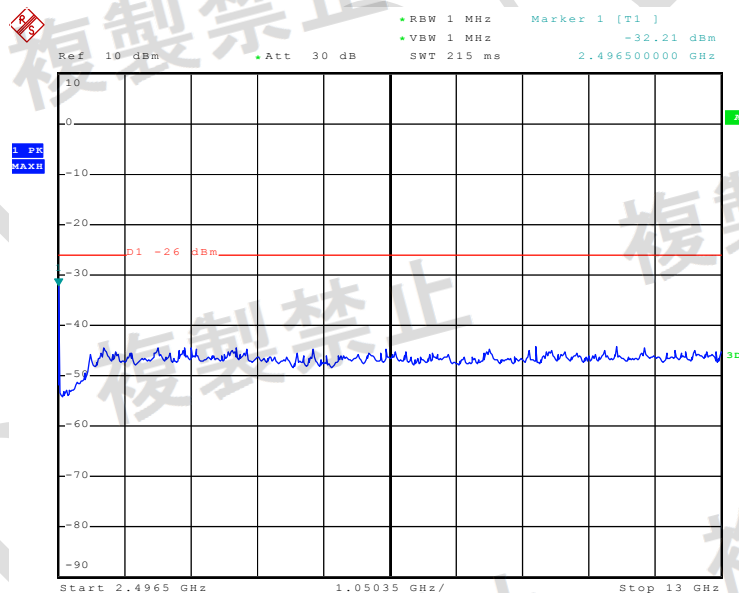
Date: 4.JUL.2018 15:52:26

2.4835GHz-2.4965GHz:



Date: 4.JUL.2018 15:52:06

2.4965GHz-13GHz:



Date: 4.JUL.2018 17:04:38

7.1.8 Interference prevention function

Not tested

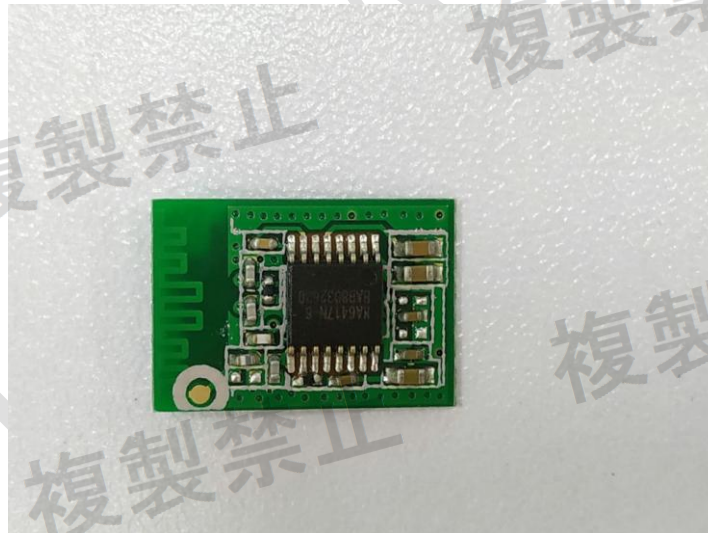
7.1.9 RF accessibility

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.

PCB board is made using the surface mount technology.



7.2 Receiver Requirements

7.2.1 Spurious Emissions of Rx

Test Requirement:	Item 19 of Article 2 Paragraph 1		
Test Method:	MIC Notice No.88 Appendix No.43		
EUT Operation:			
Ambient:	Temp.: 24°C	Humid.: 55%	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 EUT[EUT] --> SA[Spectrum Analyzer] </pre>		
EUT conditions:	Rx		
Measurement Procedure:	Step1 All spurious are measured from 30MHz to 13 GHz by peak mode. Step2 If the value measured by Step1 is 2dB or less, measure in average mode.		
Spectrum Analyzer conditions(Step 1):	Frequency: 30MHz – 2400MHz , 2483.5MHz –13GHz 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		

Test Result
GFSK:

Test channel	Test Result						Unit	Limit
	Normal Voltage		High Voltage		Low Voltage			
	5V		N/A		N/A			
Channel (2408)MHz	Frequency (MHz)	Level (dBm)	Frequenc y(MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	dBm	(1) Below 1 GHz :-54dBm (2) 1 GHz to 13 GHz : -47dBm
	191.020	-56.31	N/A	N/A	N/A	N/A		
	10672.000	-63.70	N/A	N/A	N/A	N/A		

Test channel	Test Result						Unit	Limit
	Normal Voltage		High Voltage		Low Voltage			
	5V		N/A		N/A			
Channel (2440)MHz	Frequency (MHz)	Level (dBm)	Frequenc y(MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	dBm	(1) Below 1 GHz :-54dBm (2) 1 GHz to 13 GHz : - 47dBm
	191.020	-56.35	N/A	N/A	N/A	N/A		
	11728.000	-63.33	N/A	N/A	N/A	N/A		

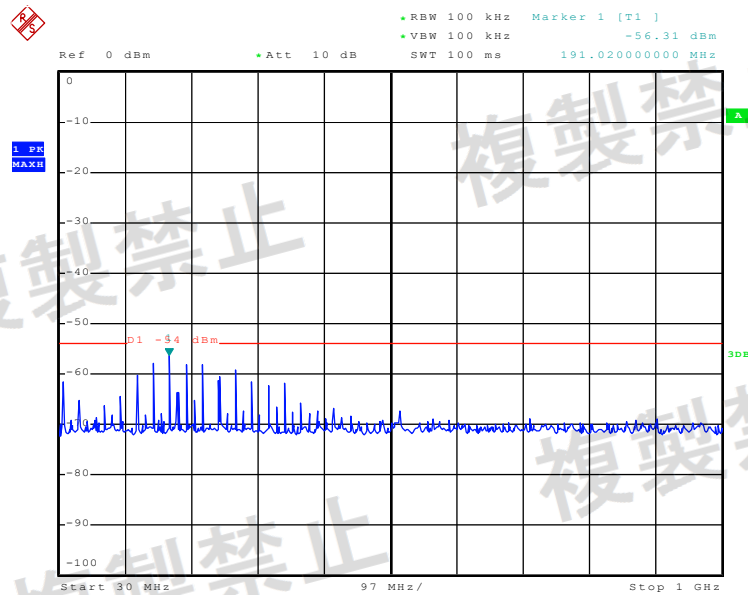
Test channel	Test Result						Unit	Limit
	Normal Voltage		High Voltage		Low Voltage			
	5V		N/A		N/A			
Channel (2474)MHz z	Frequency (MHz)	Level (dBm)	Frequenc y(MHz)	Level (dBm)	Frequency (MHz)	Level (dBm)	dBm	(1) Below 1 GHz :-54dBm (2) 1 GHz to 13 GHz : - 47dBm
	191.020	-56.51	N/A	N/A	N/A	N/A		
	4048.000	-63.03	N/A	N/A	N/A	N/A		

Result plot as follows:

GFSK (Normal Voltage)

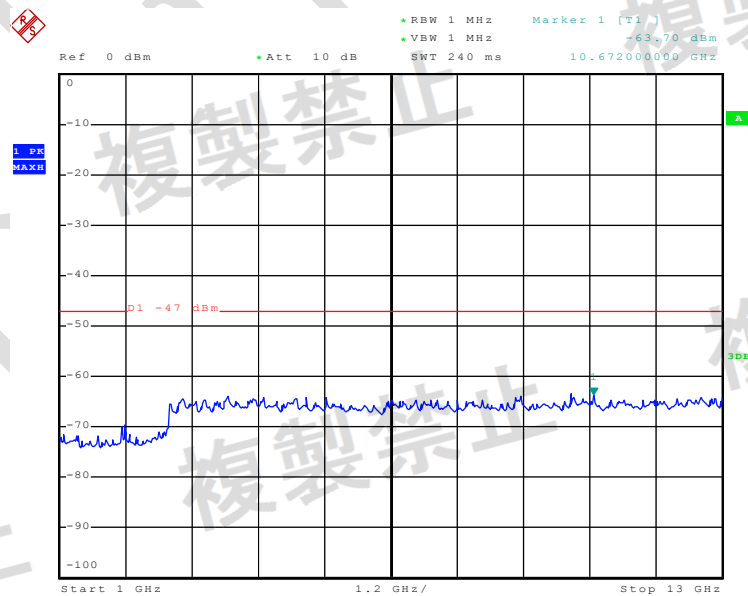
Channel 0 (2.408 GHz)

30MHz to 1 GHz:



Date: 5.JUL.2018 17:55:38

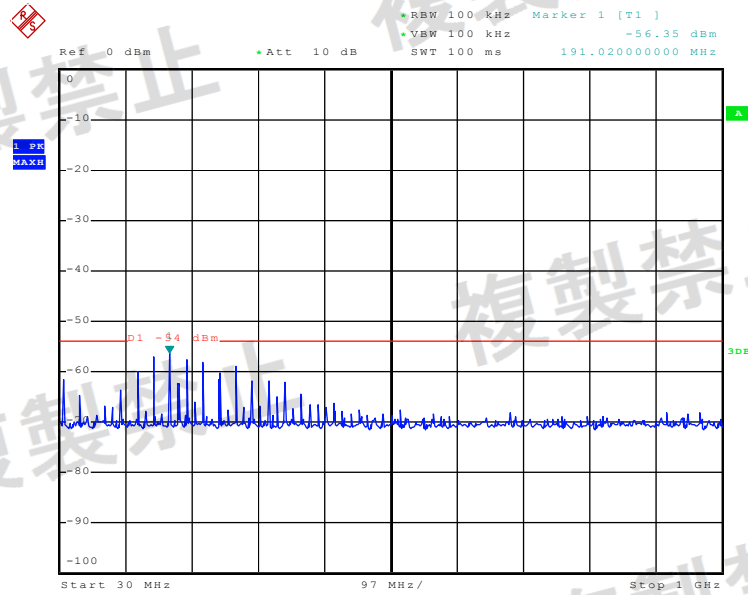
1GHz -13GHz



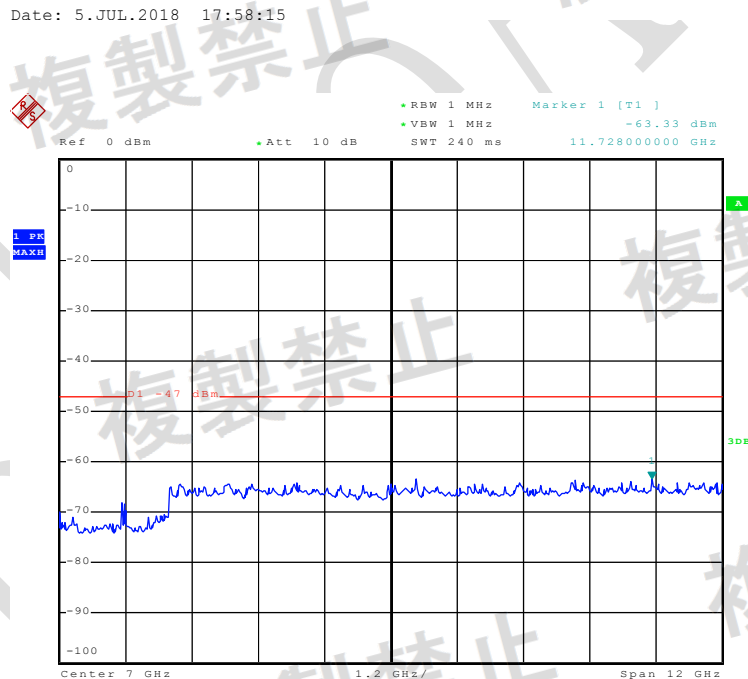
Date: 5.JUL.2018 17:56:35

Channel 16 (2.440 GHz)

30MHz to 1 GHz:



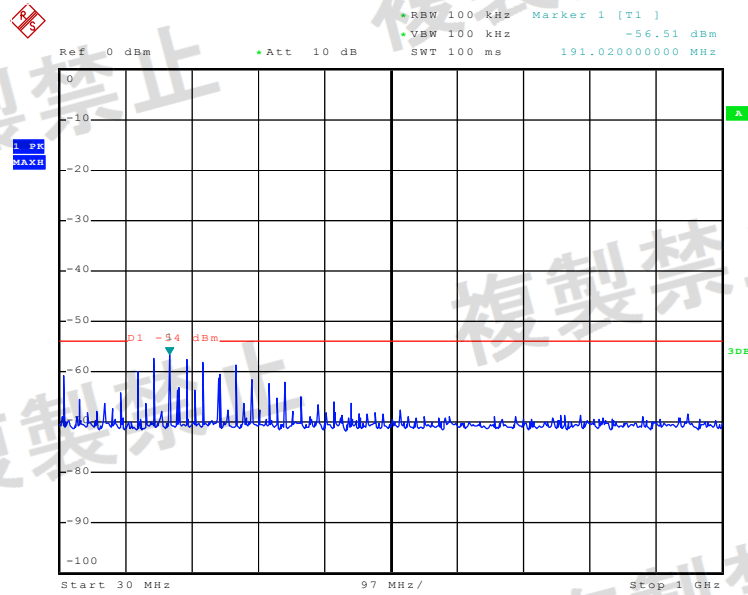
1GHz -13GHz:



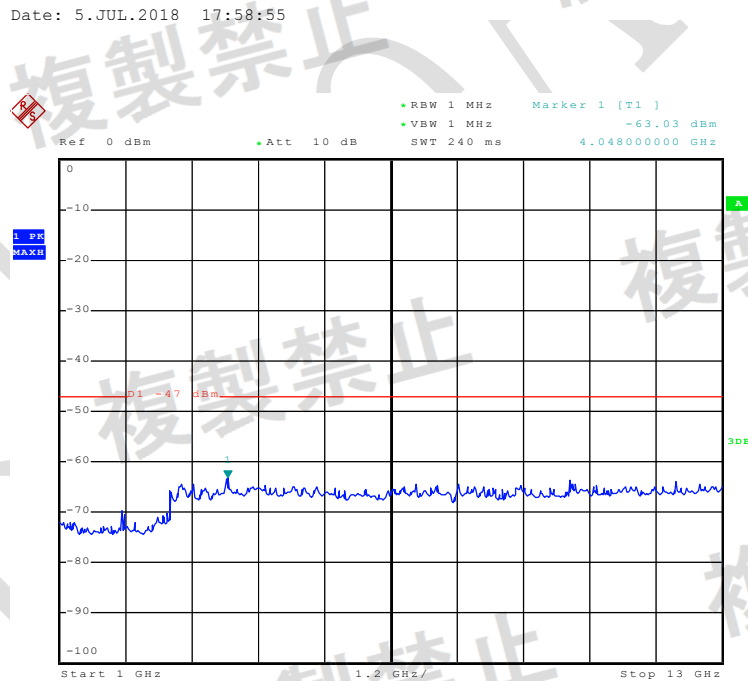
Date: 5.JUL.2018 17:57:24

Channel 33 (2.474 GHz)

30MHz to 1 GHz:



1GHz -13GHz:



Date: 5.JUL.2018 17:59:19

*** End of Report ***

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