Radio equipment according to Certification Ordinance Article 2 Section 1 No.19

According to MIC Notice No. 88 Appendix 43

for

Wifi Module

Model No.: JWX6058

of

Applicant: jjPlus Corporation
Address: 15F-7, No. 2, Jianba Road, Zhonghe Dist., New Taipei City 235, Taiwan

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC Registration No.: TW1477, TW0020, TW1072

Industry Canada filed test laboratory Reg. No.: 20037

A2LA Accredited No.: 2732.01

Report No.: W6R22006-19993-J-1

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
TEL: 886-2-66068877 FAX: 886-2-66068879 E-mail: wts@wts-lab.com

複製禁止

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1 General Information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample, which has passed all the relevant tests conforms to a specification.

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems.

The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that is performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.

The test report may only be reproduced or published in full.

Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services (Taiwan) Co., Ltd.

Tester:

August 10, 2020 Spencer Yang 

Date WTS-Lab. Name Signature

Technical responsibility for area of testing:

August 10, 2020 Kevin Wang 

Date WTS Name Signature

1.2 Testing laboratory

1.2.1 Location

OATS
No.5-1, Lishui, Shuang Sing Village,
Wanli Dist., New Taipei City 207,
Taiwan (R.O.C.)

Company
Worldwide Testing Services (Taiwan) Co., Ltd.
6F, NO. 58, LANE 188, RUEY-KUANG RD.
NEIHU, TAIPEI 114, TAIWAN R.O.C.
Tel : +886-2-66068877
Fax : +886-2-66068879

1.2.2 Details of accreditation status

Accredited testing laboratory

A2LA accredited number: 2732.01

FCC filed test laboratory Reg. No. TW1477, TW0020, TW1072

Industry Canada filed test laboratory Reg. No. 20037

Telefication Reviewed Laboratory: TRL 0501

1.3 Details of applicant

Name : jjPlus Corporation
Street : 15F-7, No. 2, Jianba Road, Zhonghe Dist.,
Town : New Taipei City 235,
Country : Taiwan
Telephone : ./.
Fax : ./.

1.4 Application details

Date of receipt of test item : July 07, 2020
Date of test : from July 08, 2020 to July 29, 2020

1.5 Equipment information

Description of test item	: Wifi Module
Type identification	: JWX6058
Multi-listing model number	: ./.
Trade mark	: jjPlus CORP.
Frequency range	: 2.4000 GHz - 2.4835 GHz
Type of antenna	: Dipole antenna (for ANT 1~3) (for WLAN, BT2.0, BLE) PCB antenna (for ANT 4~6) (for WLAN, BT2.0, BLE)
Antenna gain	: ANT 1: 3.5 dBi ANT 2: 4 dBi ANT 3: 5.5 dBi ANT 4: 2.5 dBi ANT 5: 2.3 dBi ANT 6: 3.1 dBi

For Bluetooth2.0

Modulation technology	: FHSS
Modulation type	: GFSK, π/ 4DQPSK, 8DPSK
Tested frequencies	: 2.402 – 2.480 GHz
Frequency of the used channel	: Frequency: 2.402 GHz Frequency: 2.441 GHz Frequency: 2.480 GHz
Rated output power	: 0.3 mW/MHz (20 channels minimum) 0.08 mW/MHz (79 channels)
EIRP	: 13.29 dBm/MHz

For Bluetooth4.0

Modulation type	: GFSK
Tested frequencies	: 2.402 – 2.480 GHz
Frequency of the used channel	: Frequency: 2.402 GHz Frequency: 2.440 GHz Frequency: 2.480 GHz
Rated output power	: 1.5 mW

For WLAN

Modulation type	: DSSS、 OFDM
TTested frequencies	: 2.412 – 2.472 GHz
Frequency of the used channel	: 802.11 b/g/n20: Frequency (ch 1): 2.412 GHz Frequency (ch 7): 2.442 GHz Frequency (ch 13): 2.472 GHz 802.11 n40: Frequency (ch 3): 2.422 GHz Frequency (ch 7): 2.442 GHz Frequency (ch 11): 2.462 GHz
Rated output power	: 0.5 mW/MHz (802.11b) 0.4 mW/MHz (802.11g) 0.4 mW/MHz (802.11n20) 0.3 mW/MHz (802.11n40)
EIRP	: 2.82 dBm/MHz(802.11b) 1.41 dBm/MHz(802.11g) 2.22 dBm/MHz(802.11n20) 0.41 dBm/MHz(802.11n40)

Manufacturer: (if different from applicant)

Name	: jjPlus Corporation
Street	: 13F.-3, No.120, Qiaohe Rd., Zhonghe Dist.,
Town	: New Taipei City 235,
Country	: Taiwan

1.6 Assembly

The RF modules for both WLAN and Bluetooth are covered by the metal shielded board with soldering. For this EUT is opening only by destroying the equipment have been taken to satisfy sample requirement.

1.7 Testing method

According to MIC Notice No. 88 Appendix 43.

2 Technical Test

2.1 Summary of test results

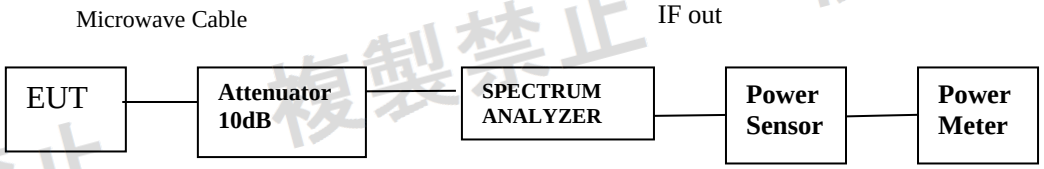
No deviations from the technical specifications were ascertained in the course of the test performed.

2.2 Test environment

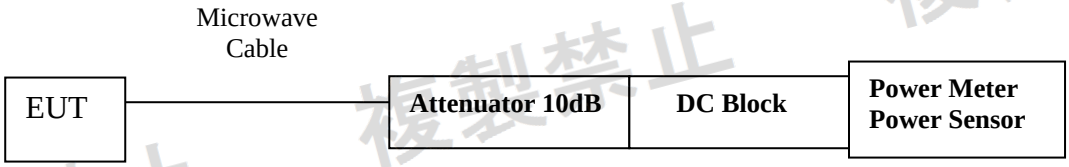
Temperature	:	5 ° C - 35 ° C
Relative humidity content	:	45% - 85%
Air pressure	:	990 - 1300 hPa
Details of power supply	:	3.3 Vd.c.
Other parameter	:	./.
Extreme conditions parameters	:	Vnom: 3.3 VDC Vmin: 2.97 VDC Vmax: 3.63 VDC

2.3 Test setup

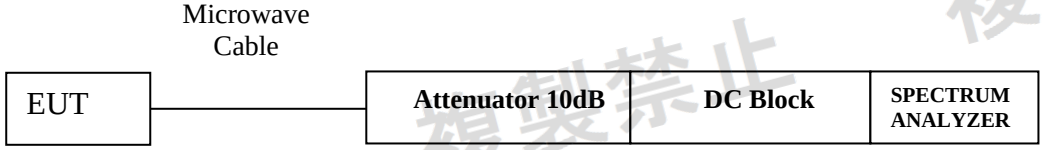
WLAN Antenna power



Bluetooth Antenna power and Dwell time



Frequency tolerance, Occupied bandwidth, Spreading bandwidth and Spurious emission



Test item Name	Measurement Uncertainty
Estimation Result of Uncertainty of Frequency Drift Measurement	Expanded Uncertainty: 6.11 Hz
Estimation Result of Uncertainty of Conducted Spurious Emission Measurement	Expanded Uncertainty: 1.33 dB
Estimation Result of Uncertainty of Bandwidth Measurement	Expanded Uncertainty: 0.45 kHz
Estimation Result of Uncertainty of Conducted Output Power Measurement	Expanded Uncertainty: 1.72 dB
Estimation Result of Uncertainty of Duty Cycle Measurement	Expanded Uncertainty: 0.1 ms

The decision rule is Measurement uncertainty is not taken into account.

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2.4 Test equipment utilized

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2020/6/11	2021/6/10
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2019/11/1	2020/10/31
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2019/9/24	2020/9/23
ETSTW-CE 008	HF-EICHLEITUNG RF STEP ATTENUATOR 139dB DPSP	334.6010.02	844581/024	R&S	Function Test	
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2020/7/17	2021/7/16
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2019/10/3	2020/10/2
ETSTW-CE 028	MXE EMI Receiver	N9038A	MY53220110	Agilent	2020/7/17	2021/7/16
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2020/6/12	2021/6/11
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2020/7/16	2021/7/15
ETSTW-RE 012	TUNABLE BANDREJECT FILTER	D.C 0309	146	K&L	Function Test	
ETSTW-RE 013	TUNABLE BANDREJECT FILTER	D.C 0336	397	K&L	Function Test	
ETSTW-RE 018	MICROWAVE HORN ANTENNA	AT4560	27212	AR	2020/7/17	2021/7/16
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	ETS-Lindgren	2020/7/8	2021/7/7
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	ETS-Lindgren	2020/4/22	2021/4/21
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2020/2/18	2021/2/17
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2020/5/8	2021/5/7
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2020/5/8	2021/5/7
ETSTW-RE 045	ESA-E SERIES SPECTRUM ANALYZER	E4404B	MY45111242	Agilent	Pre-test Use	
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2020/2/20	2021/2/19
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2020/2/20	2021/2/19
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2020/2/20	2021/2/19
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2020/3/6	2021/3/5
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	2020/2/20	2021/2/19
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2020/5/8	2021/5/7
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 069	Double-Ridged Guide Horn Antenna	3117	00069377	ETS-Lindgren	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2019/9/23	2020/9/22
ETSTW-RE 088	SOLID STATE AMPLIFIER	KMA180265A01	99057	KMIC	2019/9/18	2020/9/17
ETSTW-RE 091	Match Pad	MDCS1500	None	WOKEN	2020/5/22	2021/5/21

ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2020/2/20	2021/2/19
ETSTW-RE 112	AC POWER SOURCE	TFC-1005	T-0A023536	T-Power	Function test	
ETSTW-RE 115	2.4GHz Notch Filter	N0124411	473874	MICROWAVE CIRCUITS	2020/1/13	2021/1/12
ETSTW-RE 120	RF Player	MP9200	MP9210-111022	ADIVIC	Function test	
ETSTW-RE 122	SIGNAL GENERATOR	SMF100A	102149	R&S	2020/6/11	2021/6/10
ETSTW-RE 125	5GHz Notch filter	5NSL11-5200/E221.3-O/O	1	K&L Microwave	2019/8/8	2020/8/7
ETSTW-RE 126	5GHz Notch filter	5NSL12-5800/E221.3-O/O	1	K&L Microwave	2019/8/8	2020/8/7
ETSTW-RE 127	RF Switch Box	RFS-01	None	WTS	2020/2/20	2021/2/19
ETSTW-RE 128	5.3GHz Notch filter	N0153001	SN487233	Microwave Circuits	2019/8/8	2020/8/7
ETSTW-RE 129	5.5GHz Notch filter	N0555984	SN487234	Microwave Circuits	2019/8/8	2020/8/7
ETSTW-RE 130	Handheld RF Spectrum Analyzer	N9340A	CN0147000204	Agilent	Pre-test Use	
ETSTW-RE 142	Amplifier	8447D	2805A03378	Agilent	2020/5/8	2021/5/7
ETSTW-RE 147	Bi-log Hybrid Antenna	MCTD 2786B	BLB16M04005	ETC	2020/4/9	2021/4/8
ETSTW-RF 002	Electromagnetic field probe	LF-30	K-0007	STT	2020/6/9	2021/6/8
ETSTW-EMI 011	USB Compact Modulator	SFC-U	101689	R&S	2020/5/21	2021/5/20
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2020/3/9	2021/3/8
ETSTW-GSM 003	Radio Communication Analyzer	MT8820C	6201342073	Anritsu	2020/4/20	2021/4/19
ETSTW-GSM 004	Wideband Radio Communication Tester	CMW500	128092	R&S	2019/10/25	2020/10/24
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40 /12+9SS	3	WI	2020/1/13	2021/1/12
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	2020/1/13	2021/1/12
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	2020/1/13	2021/1/12
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	2020/1/13	2021/1/12
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2019/9/12	2020/9/11
ETSTW-GSM 024	Radio Communication Analyzer	MT8821C	None	Anritsu	2020/3/27	2021/3/26
ETSTW-GSM 025	Band Reject Filter	BRM19835	001	Micro-Tronics	2019/8/9	2020/8/8
ETSTW-Cable 011	SMA to N type Cable	RGU-400	None	THERMAX	Pre-test Use NCR	
ETSTW-Cable 016	BNC Cable	Switch Box	B Cable 1	Schwarz beck	2020/2/20	2021/2/19
ETSTW-Cable 017	BNC Cable	X Cable	B Cable 2	Schwarz beck	2020/2/20	2021/2/19
ETSTW-Cable 018	BNC Cable	Y Cable	B Cable 3	Schwarz beck	2020/2/20	2021/2/19
ETSTW-Cable 019	BNC Cable	Z Cable	B Cable 4	Schwarz beck	2020/2/20	2021/2/19
ETSTW-Cable 020	N TYPE Cable	OATS Cable 1	N30N30-L335-15M	JYE BAO CO.,LTD.	2020/7/1	2021/6/30
ETSTW-Cable 027	Microwave Cable	SUCOFLEX 104	279083	HUBER+SUHNER	2020/5/8	2021/5/7
ETSTW-Cable 028	Microwave Cable	FA147A0015M2020	30064-2	UTIFLEX	2019/9/18	2020/9/17
ETSTW-Cable 029	Microwave Cable	FA147A0015M2020	30064-3	UTIFLEX	2019/9/18	2020/9/17
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104 （S_Cable 9）	279067	HUBER+SUHNER	2020/2/20	2021/2/19

ETSTW-Cable 043	Microwave Cable	SUCOFLEX 104	317576	HUBER+SUHNER	2020/5/8	2021/5/7
ETSTW-Cable 047	Microwave Cable	SUCOFLEX 104	325518	HUBER+SUHNER	2020/7/3	2021/7/2
ETSTW-Cable 058	Microwave Cable	SUCOFLEX 104	none	HUBER+SUHNER	2020/6/5	2021/6/4
ETSTW-Cable 064	Microwave Cable	SUCOFLEX 104	MY28891	HUBER+SUHNER	2020/5/8	2021/5/7
ETSTW-Cable 071	N TYPE CABLE	EMCCFD400-NM-NM-25000	170239	EMCI	2020/6/5	2021/6/4
ETSTW-Cable 072	SMA type cable (8m)	SUCOFLEX 104	805800/4	HUBER+SUHNER	2020/5/8	2021/5/7
ETSTW-Cable 074	SMA type cable (2m)	SUCOFLEX 104	802563/4	HUBER+SUHNER	2020/5/8	2021/5/7
WTSTW-SW 002	EMI TEST SOFTWARE	EZ_EMC	None	Farad	Version ETS-03A1	
WTSTW-SW 006	EMI TEST SOFTWARE	e3	None	AUDIX	Version 9.161014	
WTSTW-SW 008	Signal studio	Agilent	None	AUDIX	Version 2.0.0.1	
ETSTW-TH 001	Thermohygrometer	608-H1	45204316	Testo	2019/9/9	2020/9/8
ETSTW-TH 002	Thermohygrometer	608-H1	45204317	Testo	2019/9/9	2020/9/8

3 Test results (enclosure)

☒ 1st test ☐ test after modification ☐ production test

Test case	Subclause	Required	Status
General provisions			
Frequency tolerance	5	☒	C
Occupied bandwidth	6	☒	C
Spurious emissions	7	☒	C
Transmitting equipment			
Antenna power	14	☒	C
SAR	14.2	☐	NA
Frequency stabilization	15	☒	C
Transmitter antenna			
Type, configuration, etc. of transmitting antenna	20	☒	C
Directional pattern of transmitting antenna	22	☒	C
Receiving equipment			
Spurious emission of receiver	24	☒	C
Refer to all articles for transmitter antenna	26	☒	C
Operating frequency 2400-2483.5MHz			
High Frequency/modulation section cannot be opened easily	49.20(1); a	☒	C
Communication method	49.20(1); b	☒	C
Modulation method	49.20(1); c	☒	C
Spread spectrum method	49.20(1); d	☒	C
Antenna power	49.20(1); e	☒	C
Absolute gain of transmitting antenna	49.20(1); f(1)	☒	C
Angular width of principal radiation (AWPR)	49.20(1); f(2)	☒	C
Number of carriers within 1 MHz bandwidth in OFDM	49.20(1); g	☐	NA
Diffusion bandwidth	49.20(1); h	☒	C
Spreading factor	49.20(1); i	☒	C
Frequency retention time (FH employed)	49.20(1); j	☒	C
Carrier sensing function	49.20(1); k	☒	C

Note 1: C = Conform NC = Not Conform NT = Not Tested NA = Not Applicable

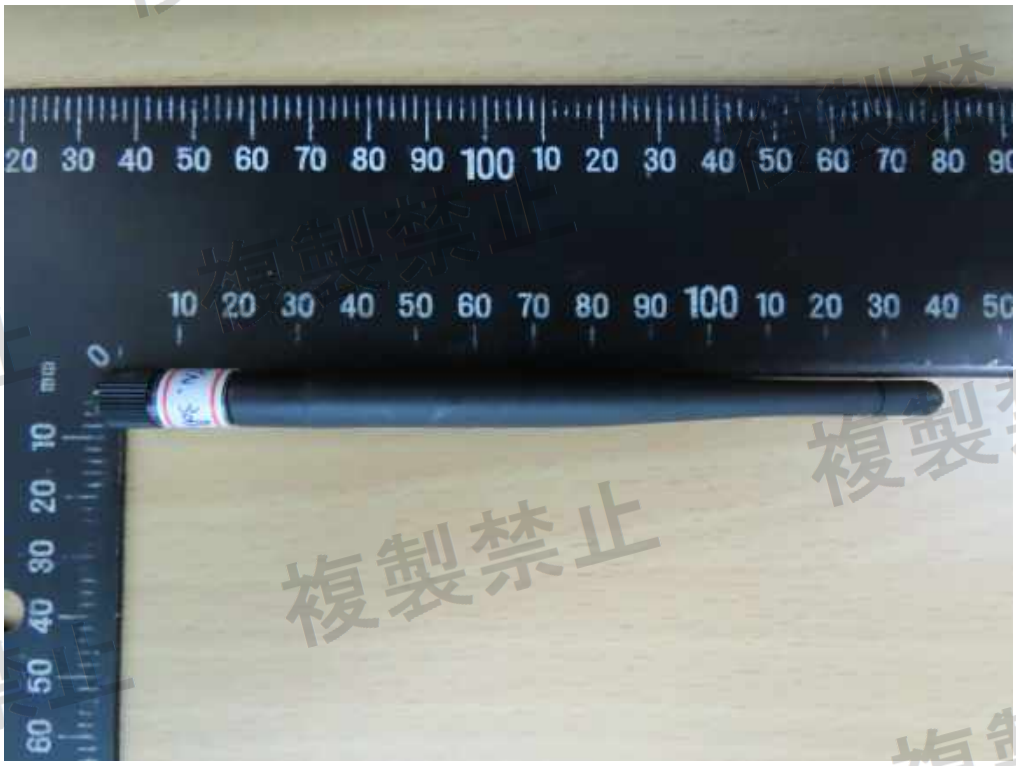
3.1 Antenna specifications

ANT1



Dipole Antenna / 3.5 dBi

ANT2



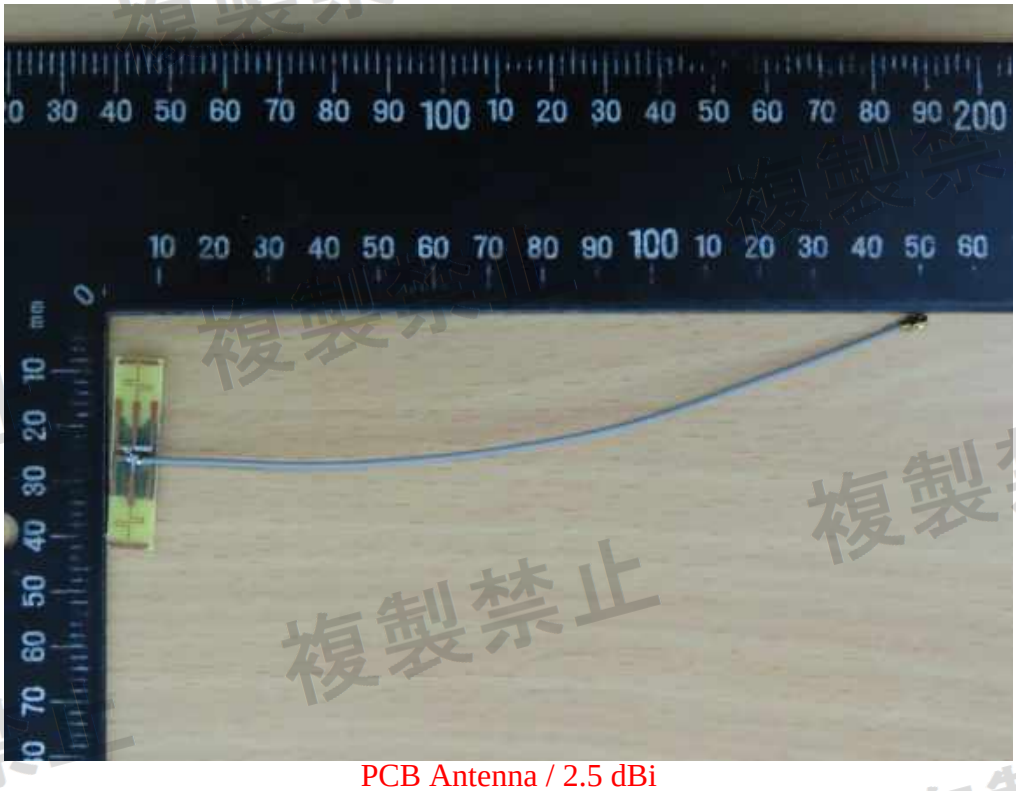
Dipole Antenna / 4 dBi

ANT3



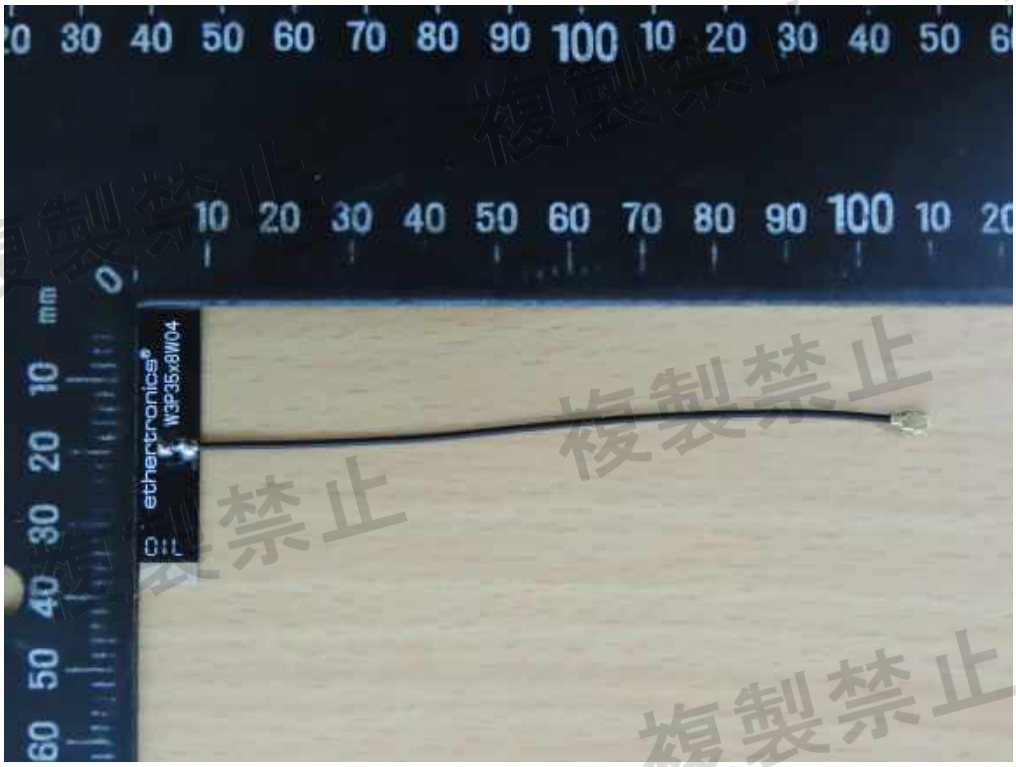
Dipole Antenna / 5.5 dBi

ANT4



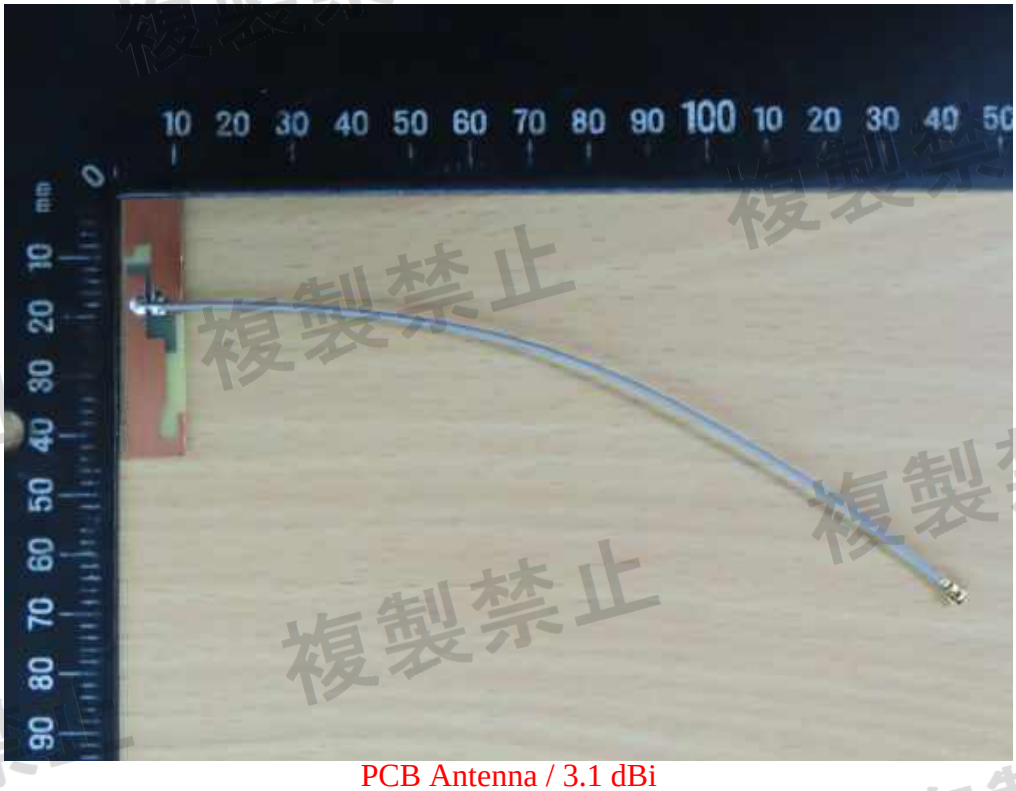
PCB Antenna / 2.5 dBi

ANT5



PCB Antenna / 2.3 dBi

ANT6



PCB Antenna / 3.1 dBi

3.2 Frequency Tolerance

Tolerance from nominal frequency:

Test date: July 18, 2020
Temperature: 24.9°C
Humidity: 52.1 %
Tester: Spencer Yang

Bluetooth 2.0: GFSK, π/ 4DQPSK, 8DPSK

Test conditions		2.402 GHz	2.441 GHz	2.480 GHz
V_{nom}= 3.3 V	Carrier frequency (GHz)	2.402004007	2.441000000	2.480000000
	Frequency tolerance (ppm)	1.668	0.000	0.000
V_{low}= 2.97 V	Carrier frequency (GHz)	2.402004007	2.441004007	2.480004007
	Frequency tolerance (ppm)	1.668	1.642	1.616
V_{high}= 3.63 V	Carrier frequency (GHz)	2.402004007	2.441000000	2.480000000
	Frequency tolerance (ppm)	1.668	0.000	0.000

Bluetooth 4.0

Test conditions		2.402 GHz	2.441 GHz	2.480 GHz
V_{nom}= 3.3 V	Carrier frequency (GHz)	2.402020032	2.440020032	2.480020032
	Frequency tolerance (ppm)	8.3	8.2	8.1
V_{low}= 2.97 V	Carrier frequency (GHz)	2.402020032	2.440020032	2.480020032
	Frequency tolerance (ppm)	8.3	8.2	8.1
V_{high}= 3.63 V	Carrier frequency (GHz)	2.402024039	2.440020032	2.480020032
	Frequency tolerance (ppm)	10.0	8.2	8.1

WLAN Mode: IEEE 802.11b/g/n20, IEEE 802.11 n40

Test conditions		2.412 GHz	2.422 GHz	2.442 GHz	2.462 GHz	2.472 GHz
V_{nom}= 3.3 V	Carrier frequency (GHz)	2.411981571	2.421.98141	2.44198125	2.46198125	2.47198125
	Frequency tolerance (ppm)	-7.641	-7.675	-7.678	-7.616	-7.585
V_{low}= 2.97 V	Carrier frequency (GHz)	2.41198141	2.421.98141	2.44198109	2.46198125	2.47198125
	Frequency tolerance (ppm)	-7.707	-7.675	-7.744	-7.616	-7.585
V_{high}= 3.63 V	Carrier frequency (GHz)	2.411981731	2.421981571	2.46198141	2.46198109	2.47198125
	Frequency tolerance (ppm)	-7.574	-7.609	-7.613	-7.681	-7.585

Test equipment used: ETSTW-RE 050, ETSTW-RE 055, ETSTW-RE 064, ETSTW-GSM 023

Limits:

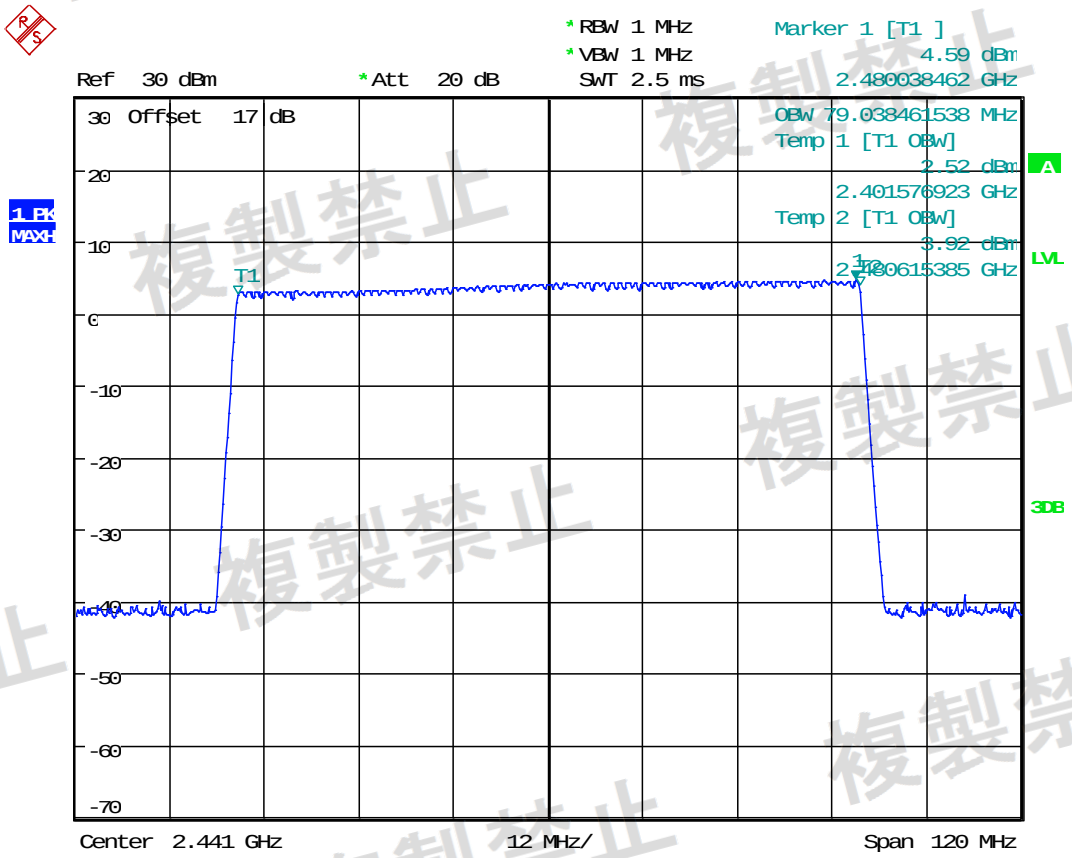
Under all test conditions	< 50 ppm

3.3 Occupied Bandwidth (99% channel power bandwidth)

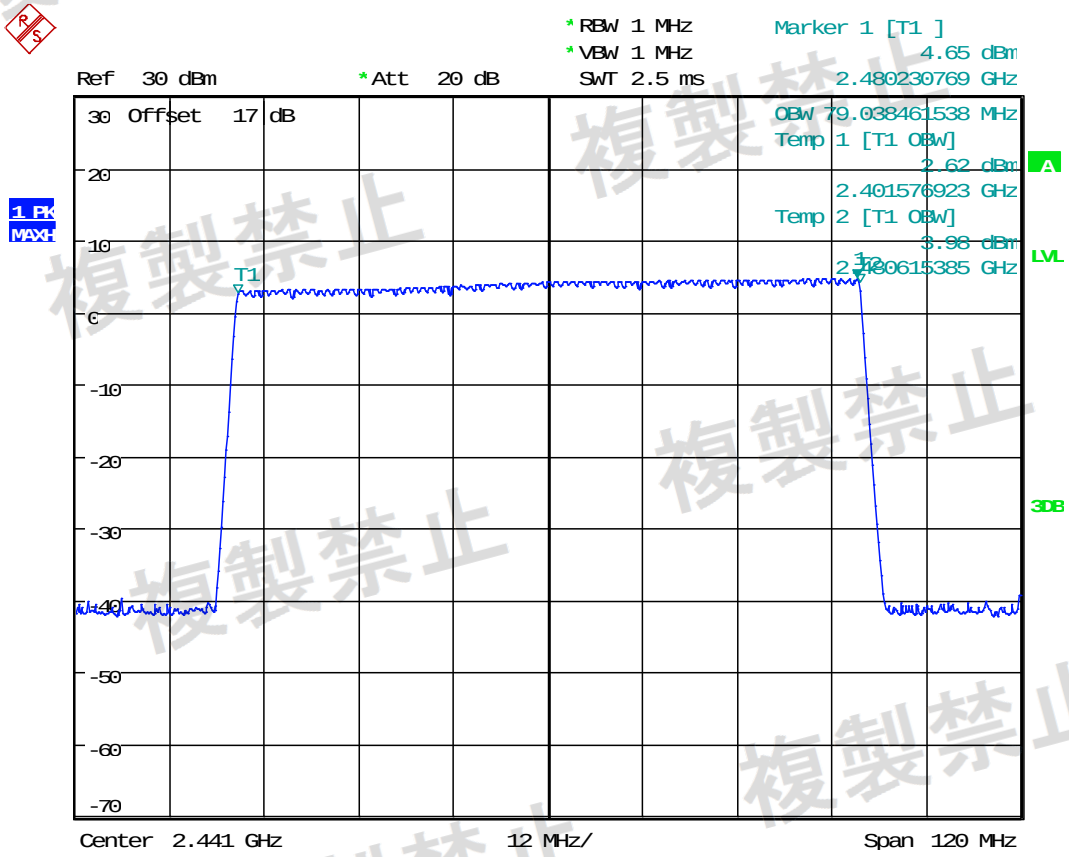
Test date: July 17, 2020-July 19, 2020
Temperature: 24.5 ˚C
Humidity: 52.7 %
Tester: Spencer Yang

Bluetooth 2.0

GFSK

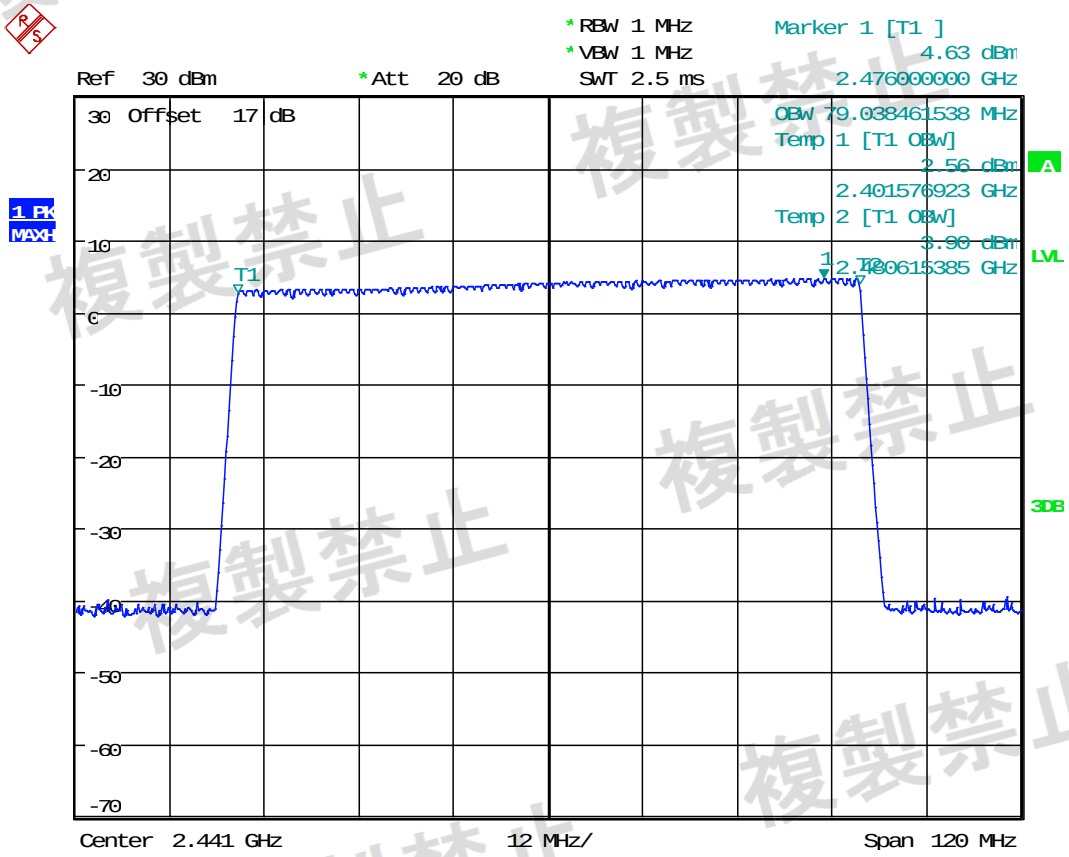


OCCUPIED BANDWIDTH 3.3V
Date: 17.JUL.2020 08:16:20



OCCUPIED BANDWIDTH 2.97V

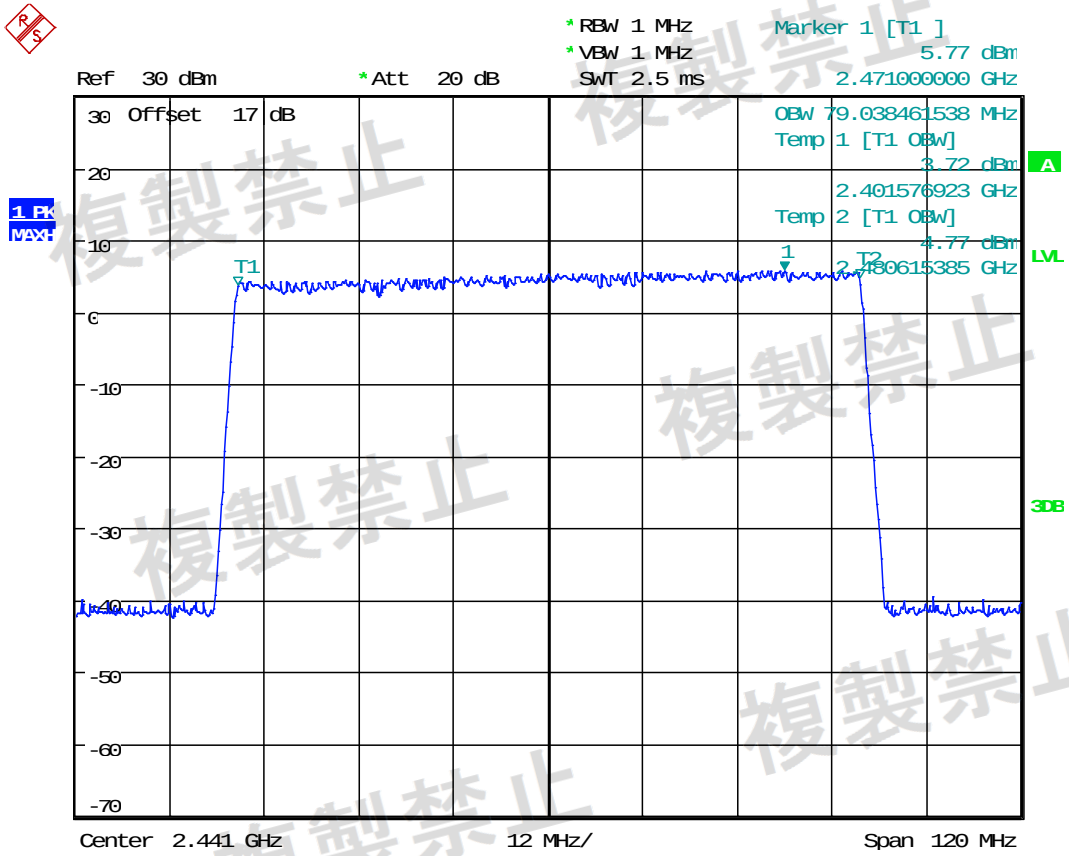
Date: 17.JUL.2020 08:17:56



OCCUPIED BANDWIDTH 3.63V

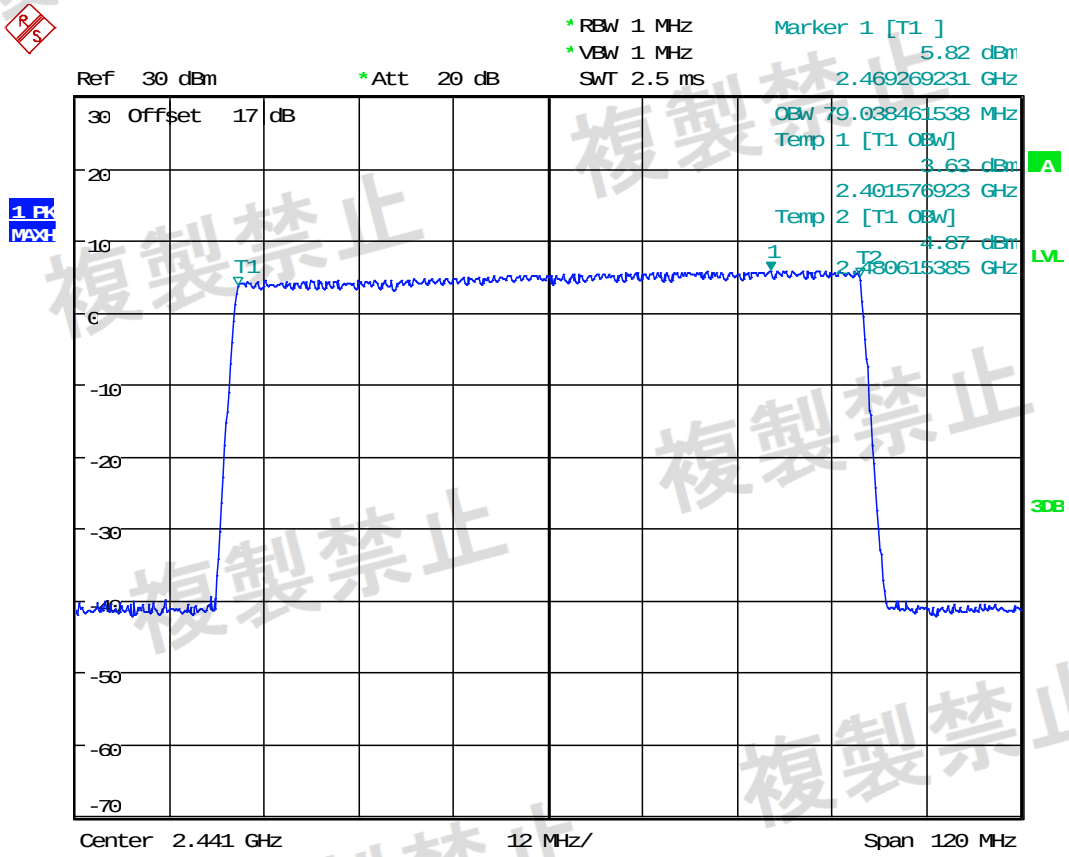
Date: 17.JUL.2020 08:22:55

π/ 4DQPSK



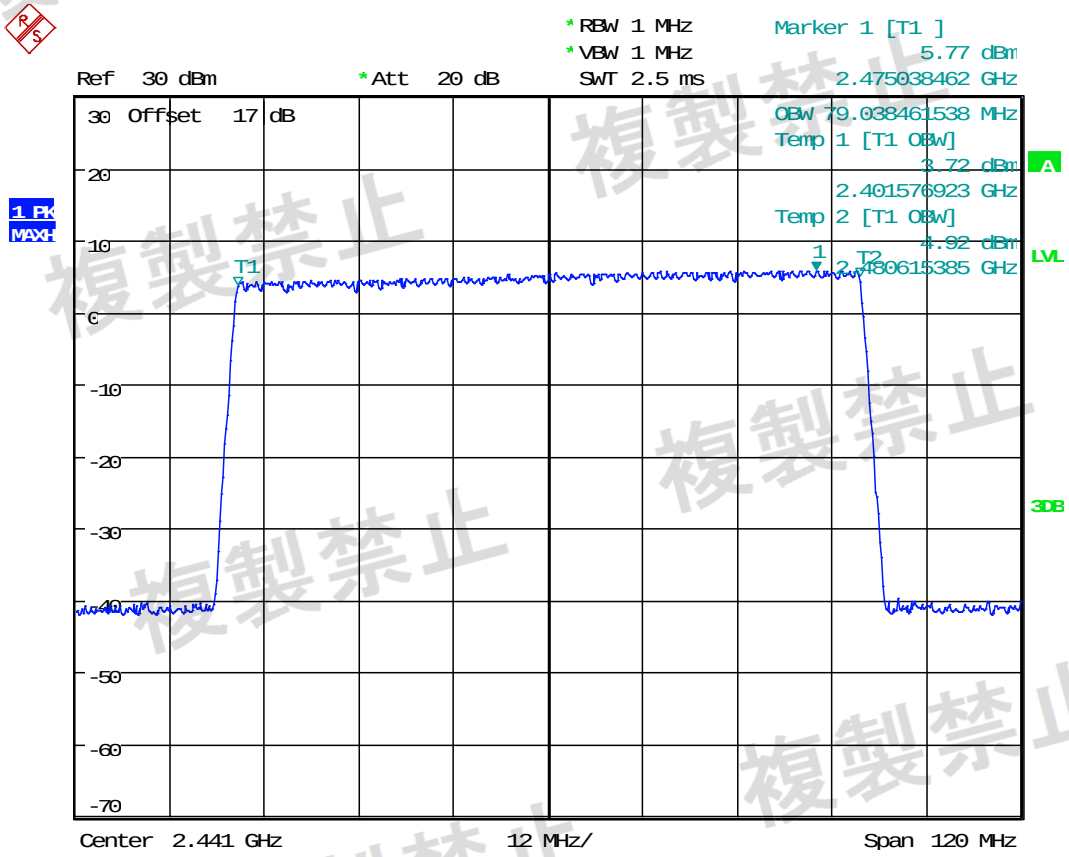
OCCUPIED BANDWIDTH EDR 2M 3.3V

Date: 17.JUL.2020 08:28:05



OCCUPIED BANDWIDTH EDR 2M 2.97V

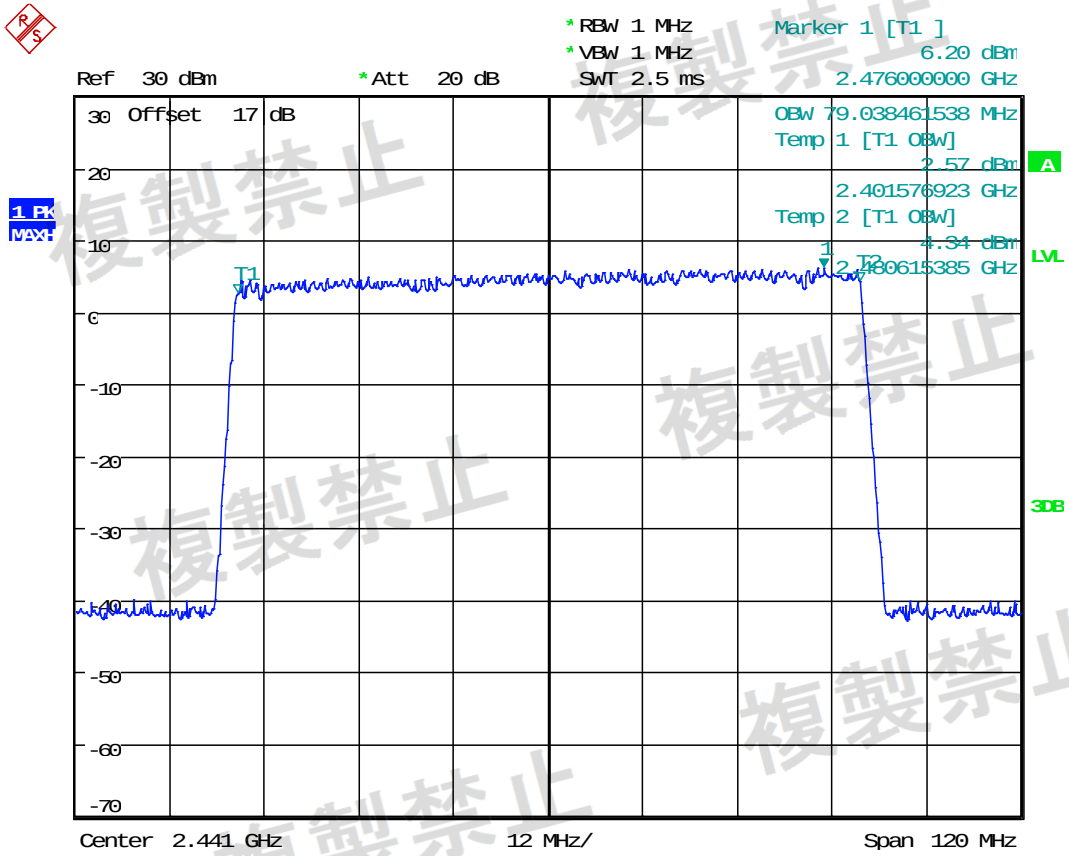
Date: 17.JUL.2020 08:29:22



OCCUPIED BANDWIDTH EDR 2M 3.63V

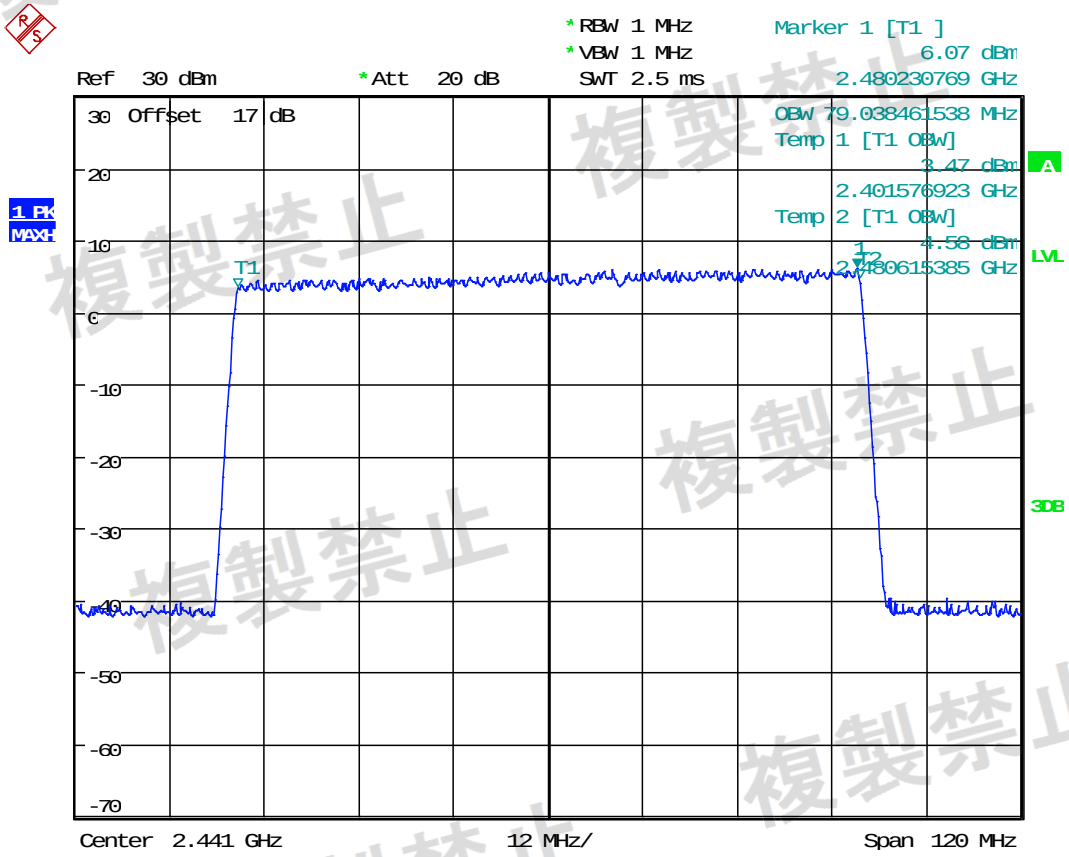
Date: 17.JUL.2020 08:25:43

8DPSK



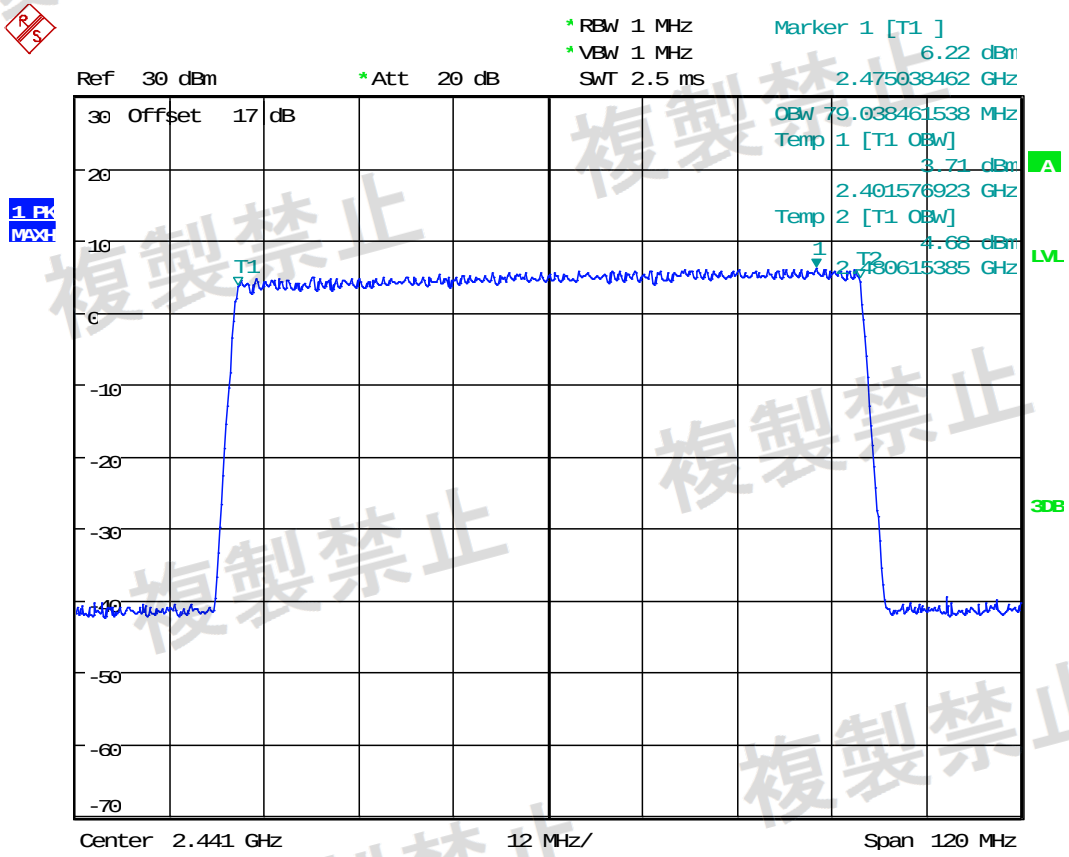
OCCUPIED BANDWIDTH EDR 3M 3.3V

Date: 17.JUL.2020 08:32:37



OCCUPIED BANDWIDTH EDR 3M 2.97V

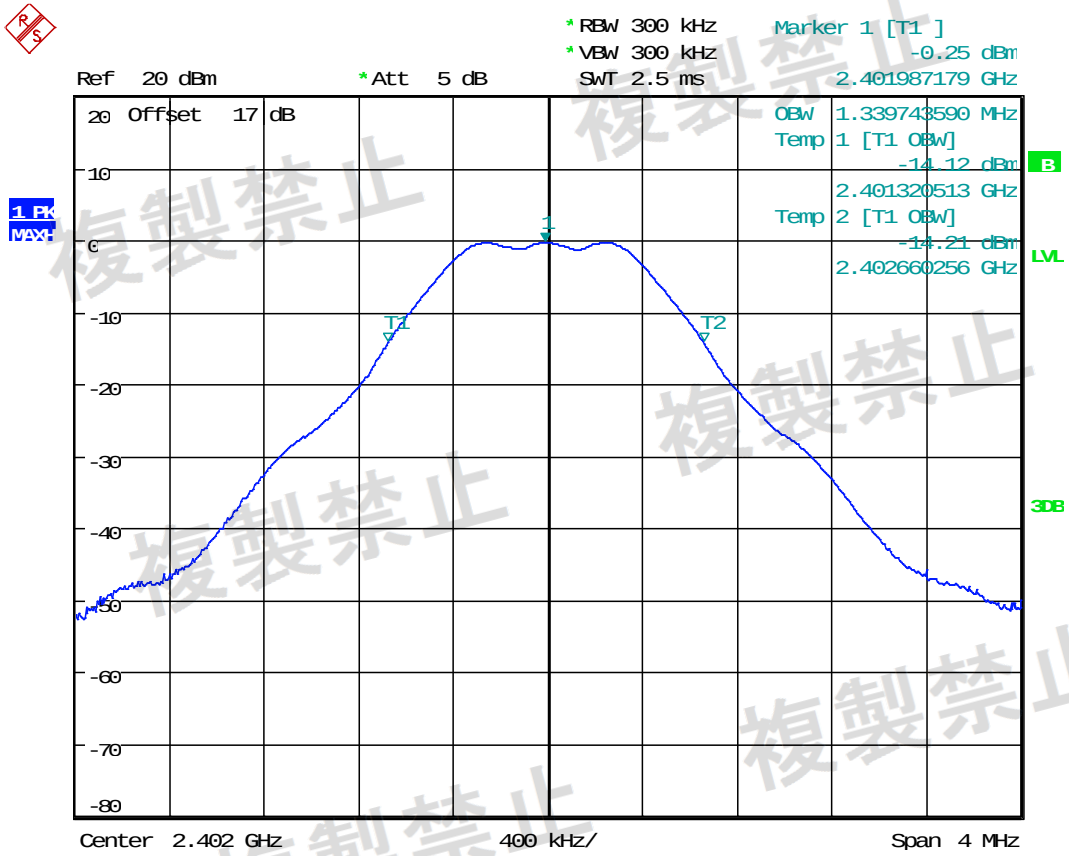
Date: 17.JUL.2020 08:31:53



OCCUPIED BANDWIDTH EDR 3M 3.63V

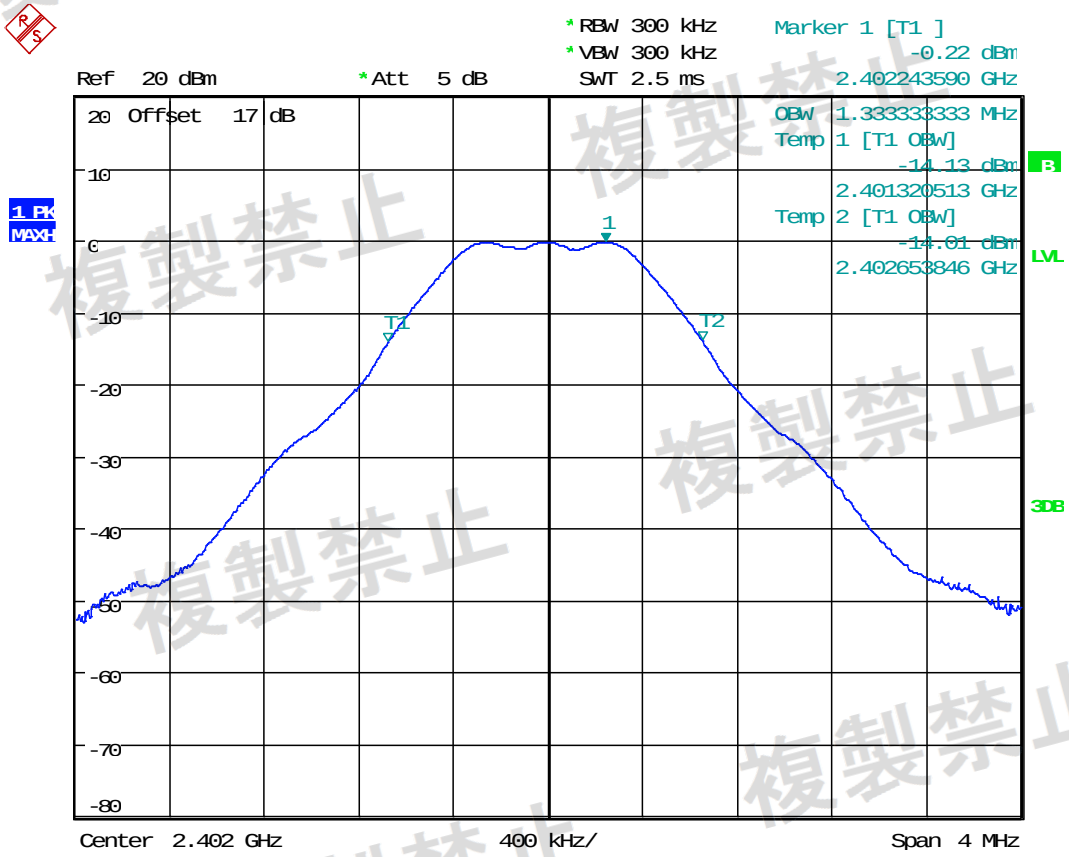
Date: 17.JUL.2020 08:34:37

Bluetooth 4.0



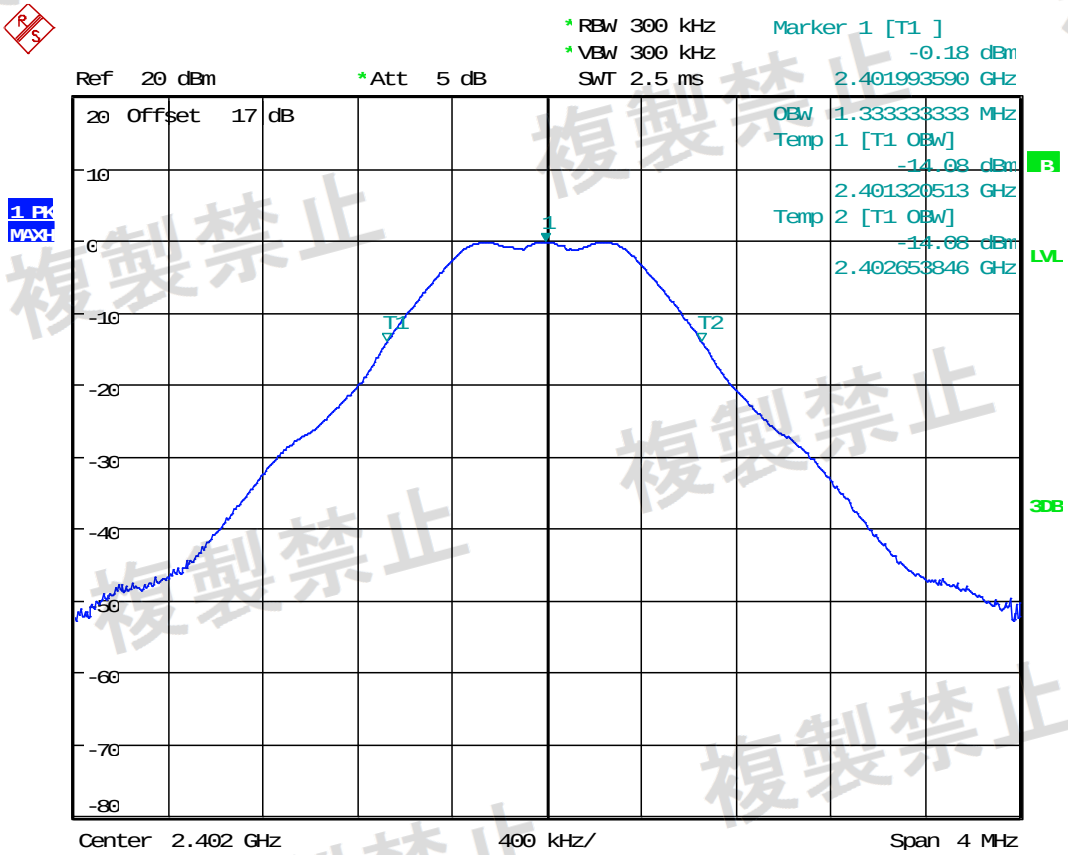
BLE OCCUPIED BANDWIDTH CH0 3.3V

Date: 17.JUL.2020 16:18:59



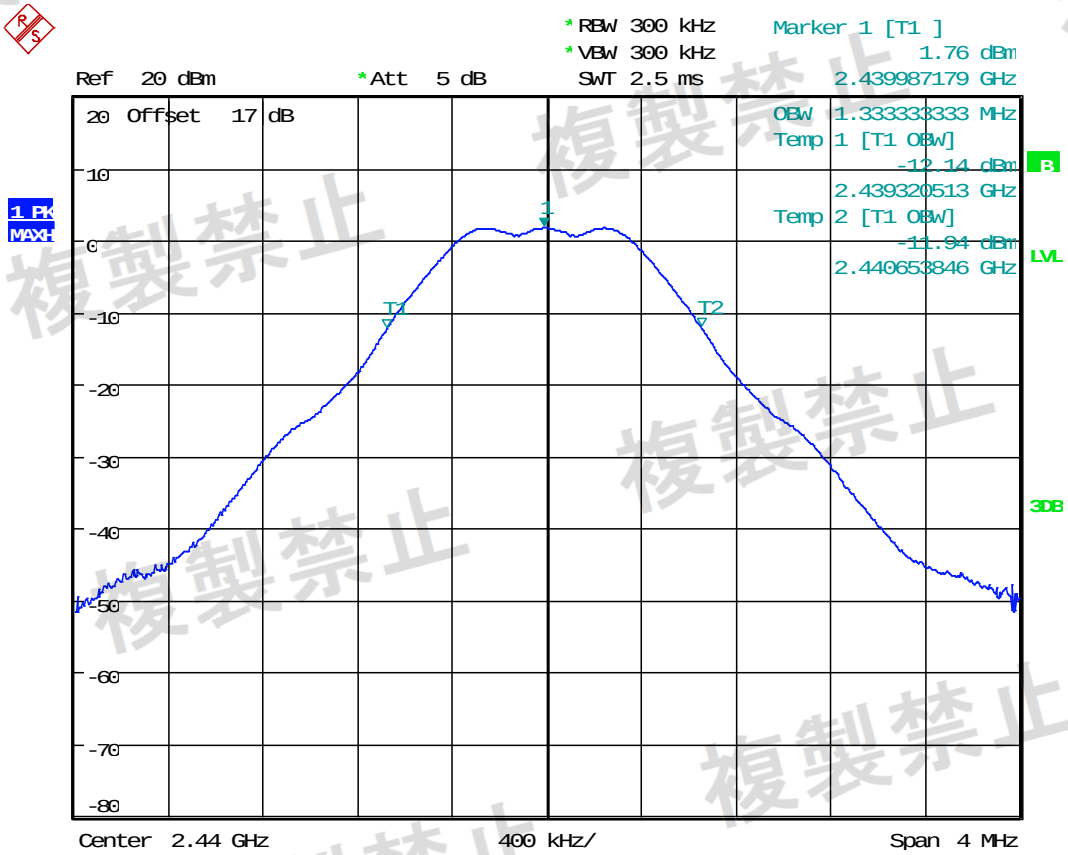
BLE OCCUPIED BANDWIDTH CH0 2.97V

Date: 17.JUL.2020 16:18:37



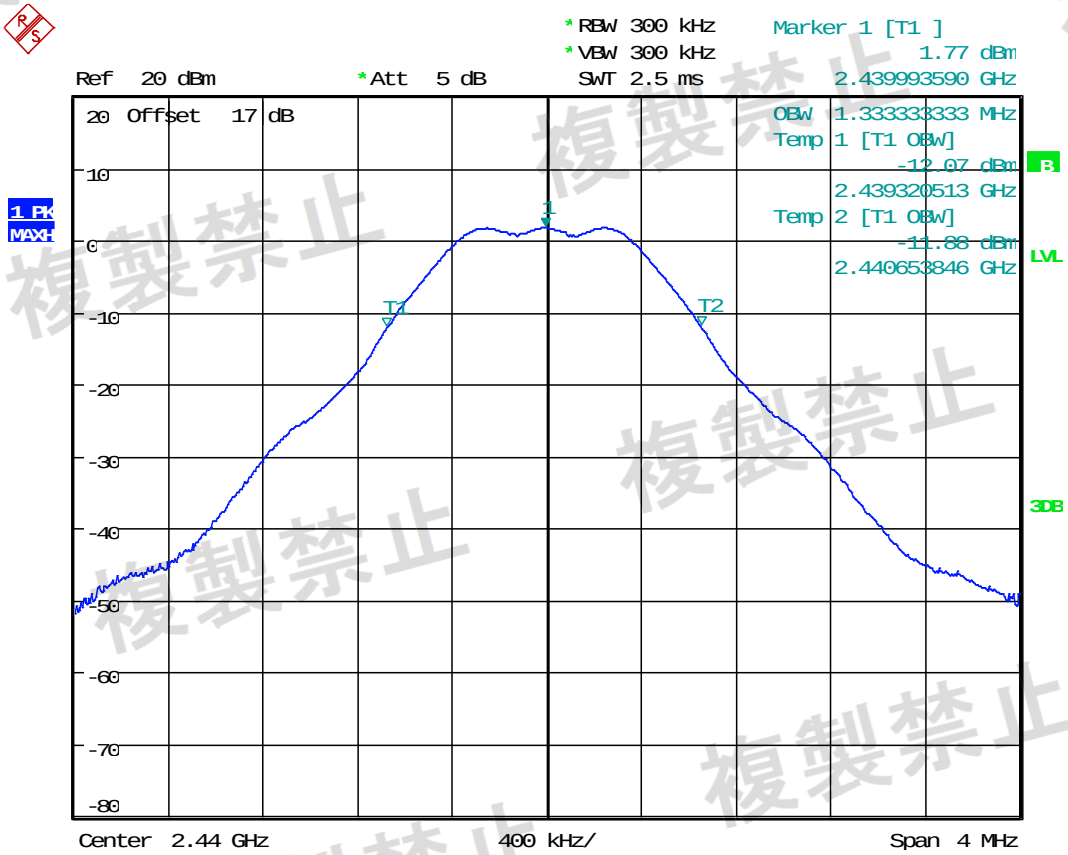
BLE OCCUPIED BANDWIDTH CH0 3.63V

Date: 17.JUL.2020 16:19:34



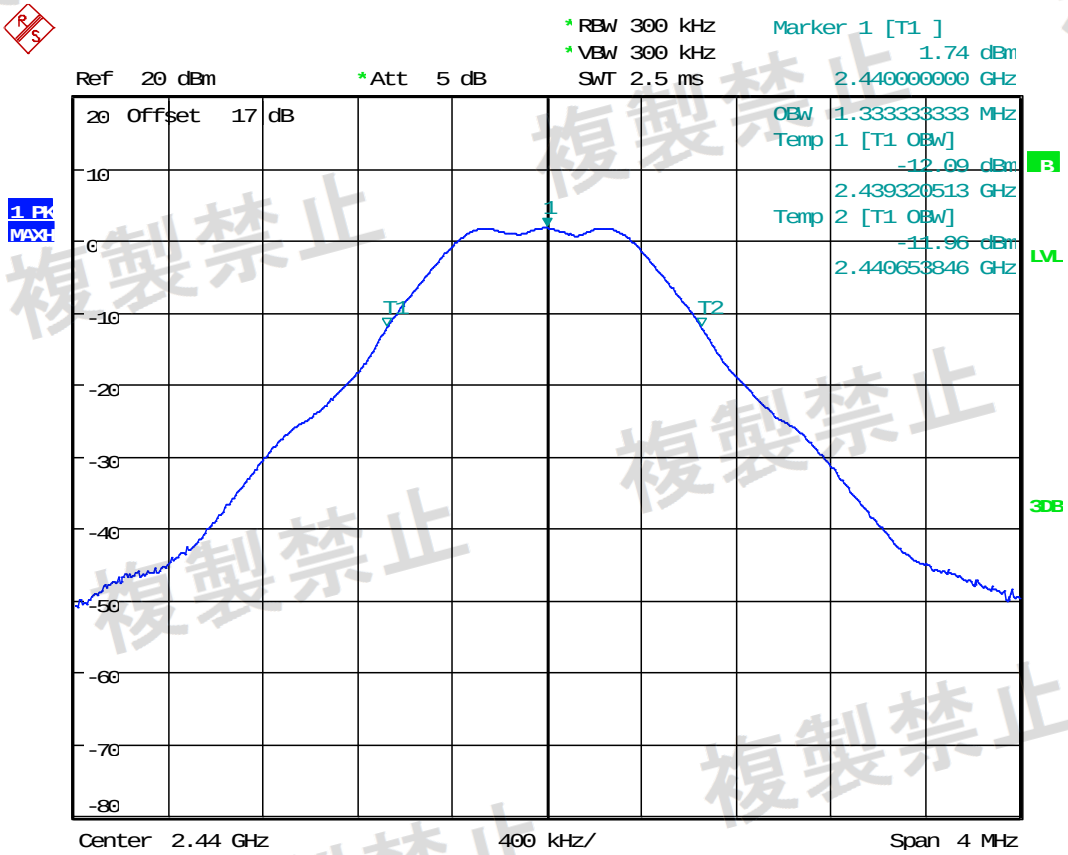
BLE OCCUPIED BANDWIDTH CH19 3.3V

Date: 17.JUL.2020 16:16:52



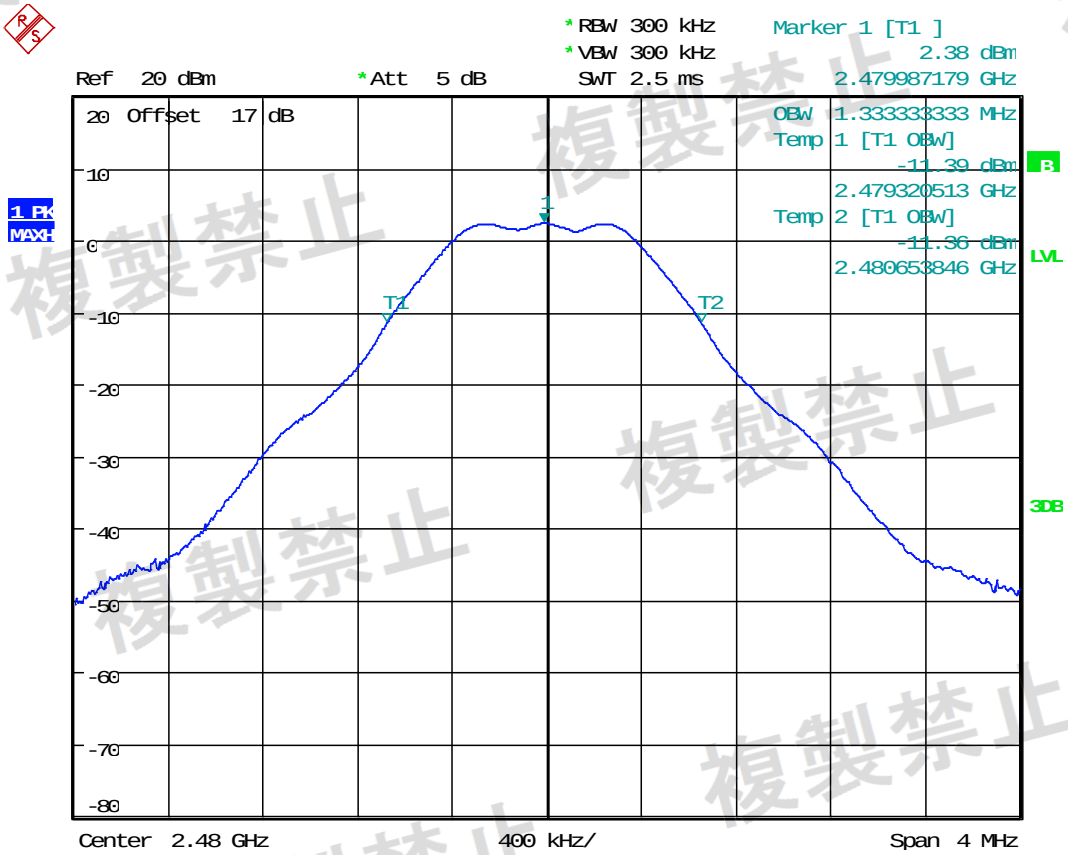
BLE OCCUPIED BANDWIDTH CH19 2.97V

Date: 17.JUL.2020 16:17:05



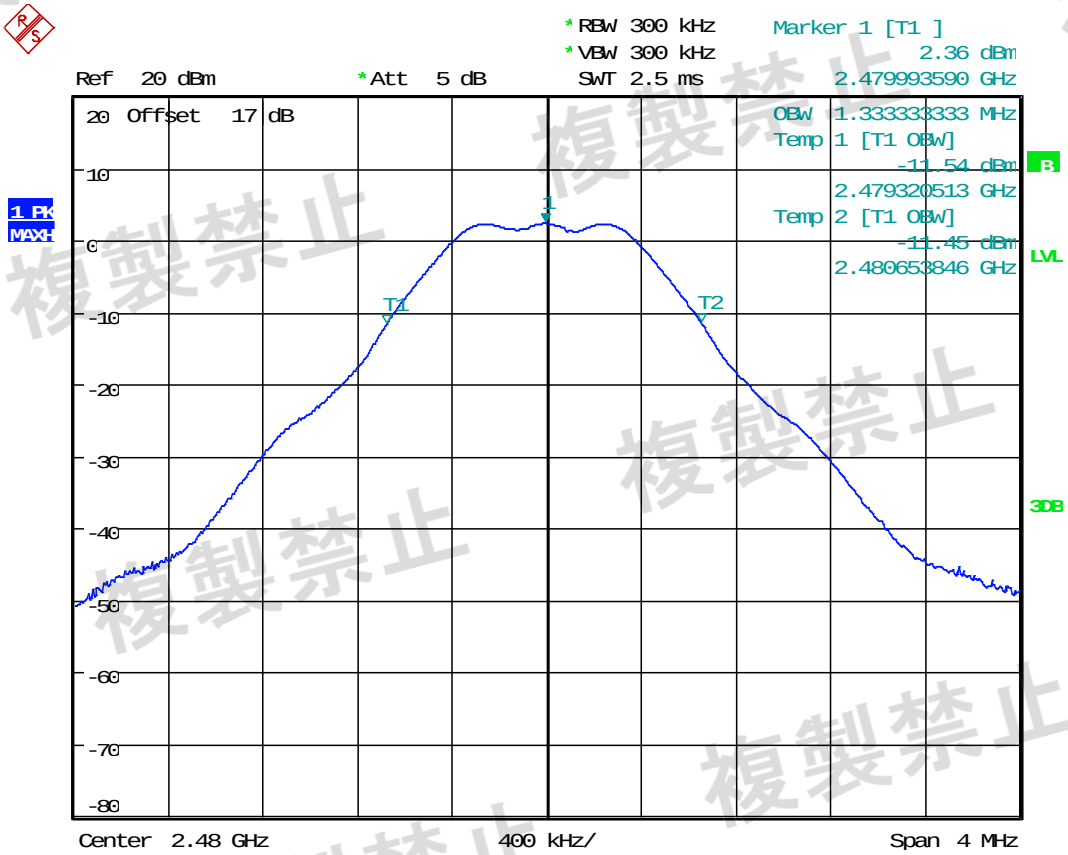
BLE OCCUPIED BANDWIDTH CH19 3.63V

Date: 17.JUL.2020 16:15:56



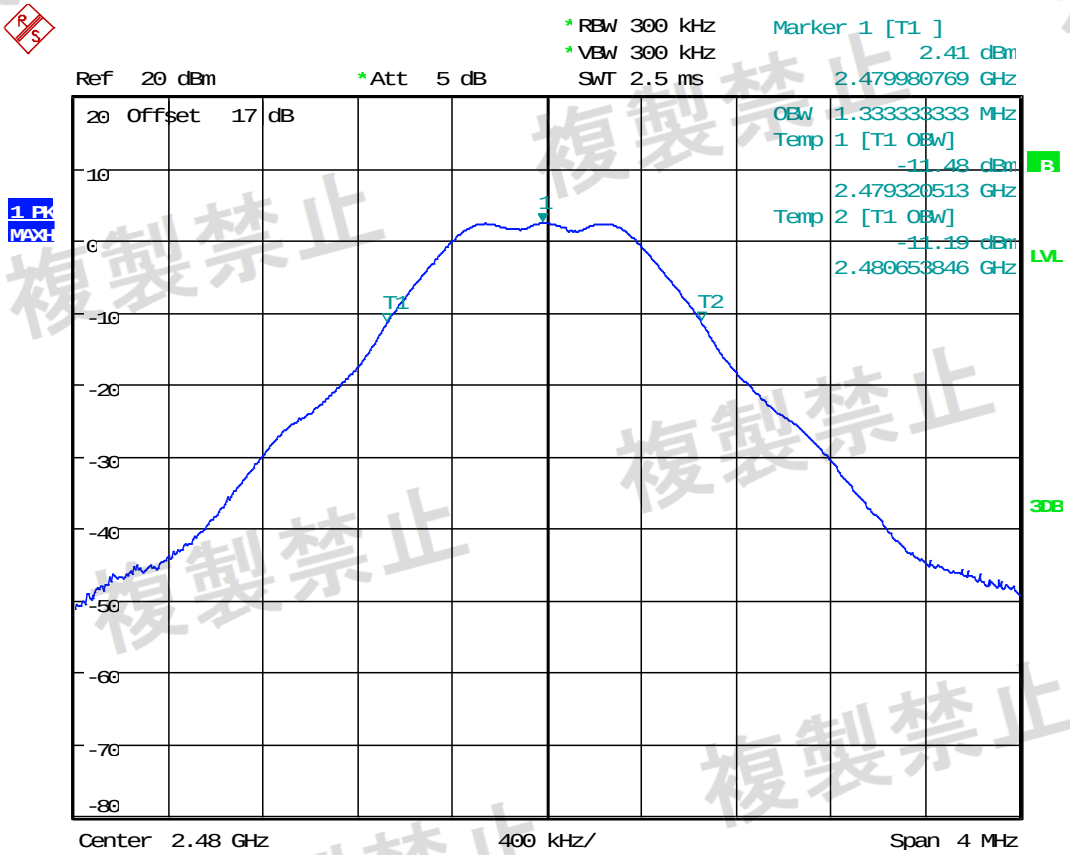
BLE OCCUPIED BANDWIDTH CH39 3.3V

Date: 17.JUL.2020 16:14:47



BLE OCCUPIED BANDWIDTH CH39 2.97V

Date: 17.JUL.2020 16:14:29



BLE OCCUPIED BANDWIDTH CH39 3.63V

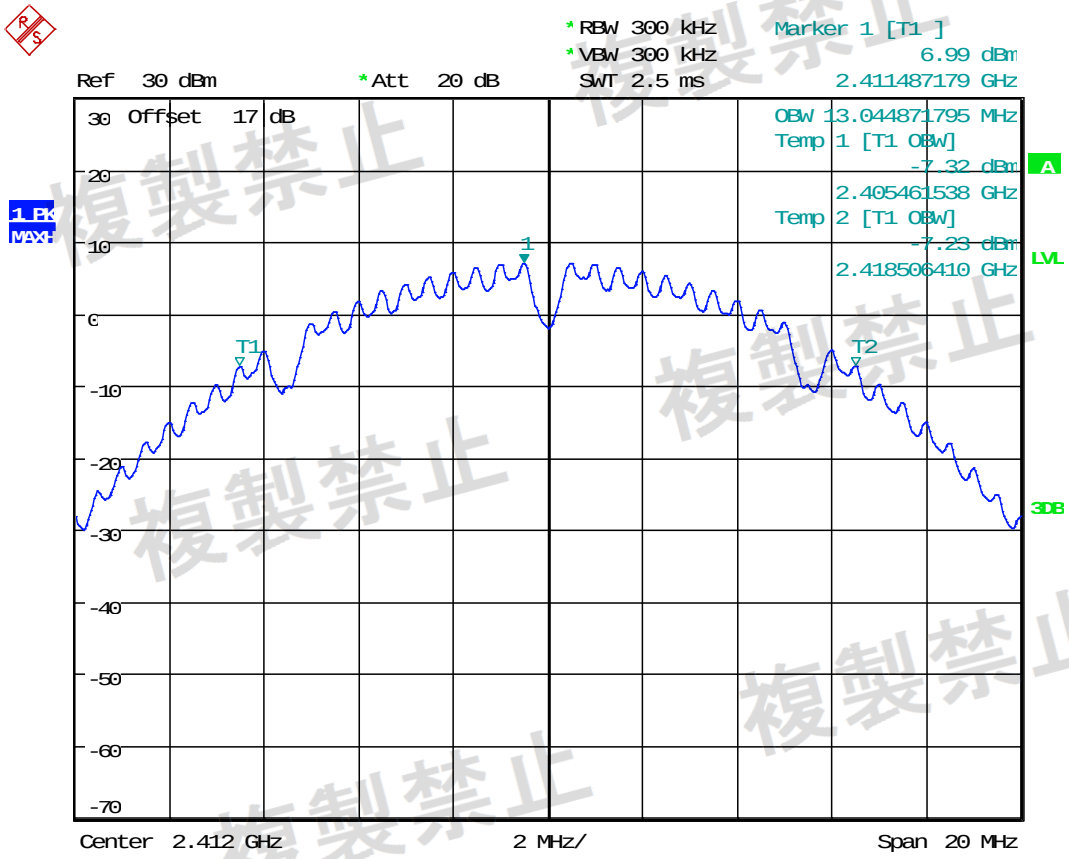
Date: 17.JUL.2020 16:15:30

Limits:

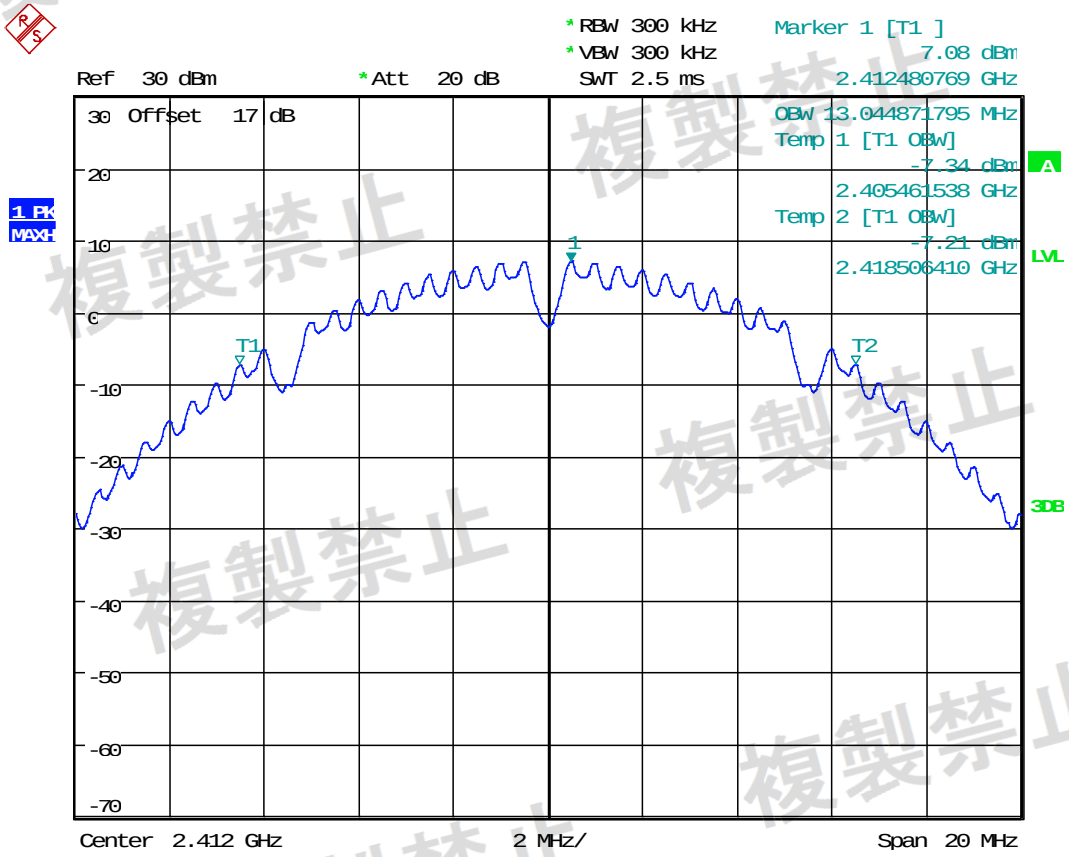
Under all test conditions	Occupied bandwidth: ≤ 83.5 MHz

Test equipment used: ETSTW-RE 050, ETSTW-RE 055, ETSTW-RE 064, ETSTW-GSM 023

WLAN
IEEE 802.11b

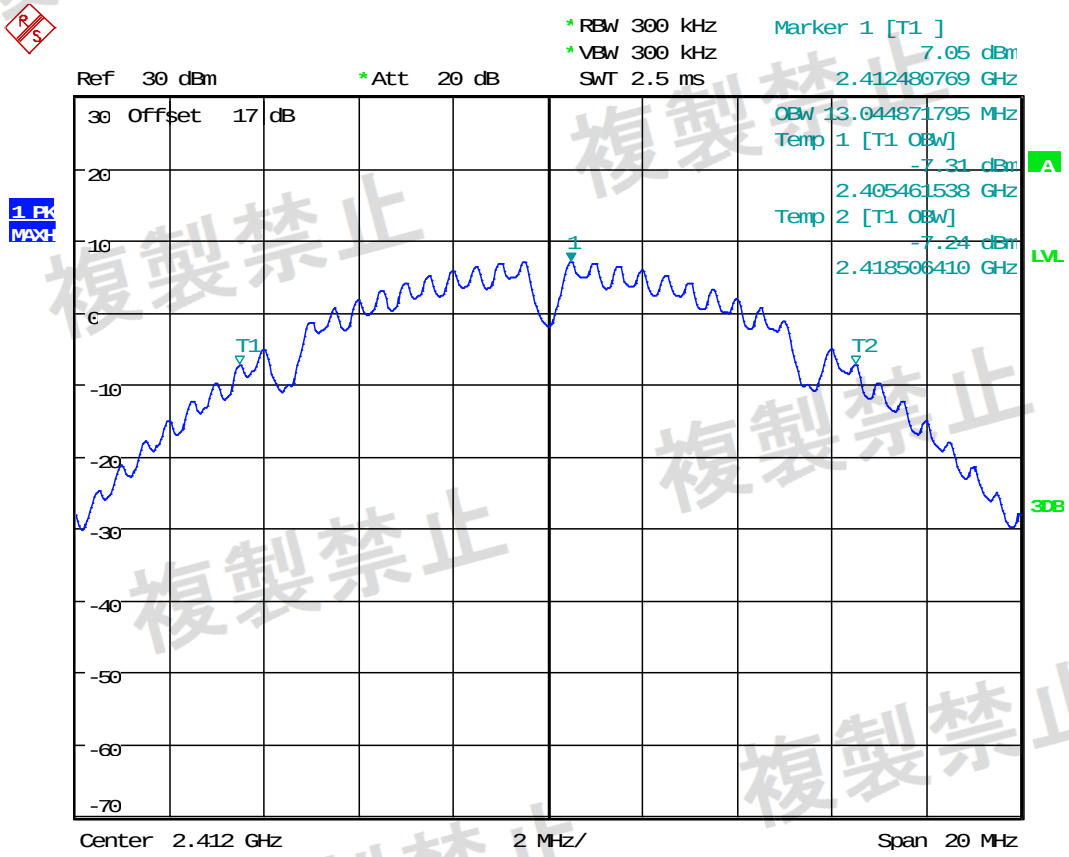


OCCUPIED BANDWIDTH 802.11B CH1 3.3V
Date: 19.JUL.2020 09:40:33



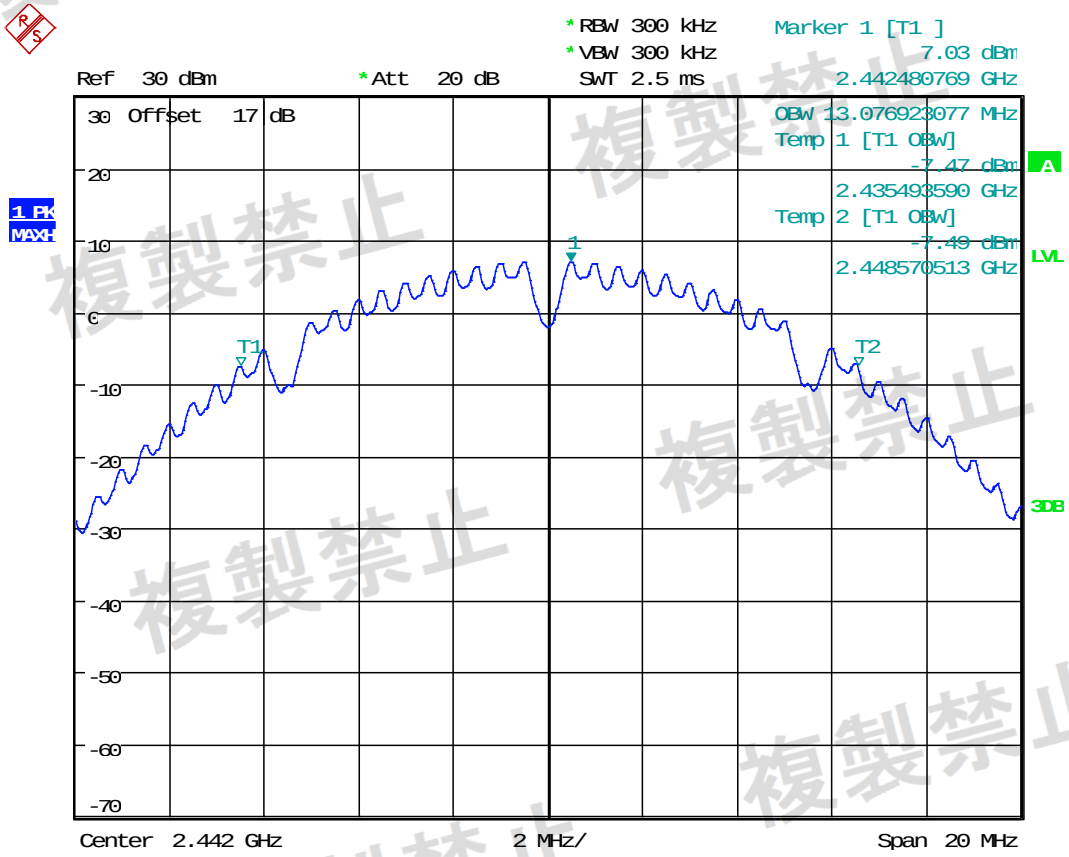
OCCUPIED BANDWIDTH 802.11B CH1 2.97V

Date: 19.JUL.2020 09:40:20



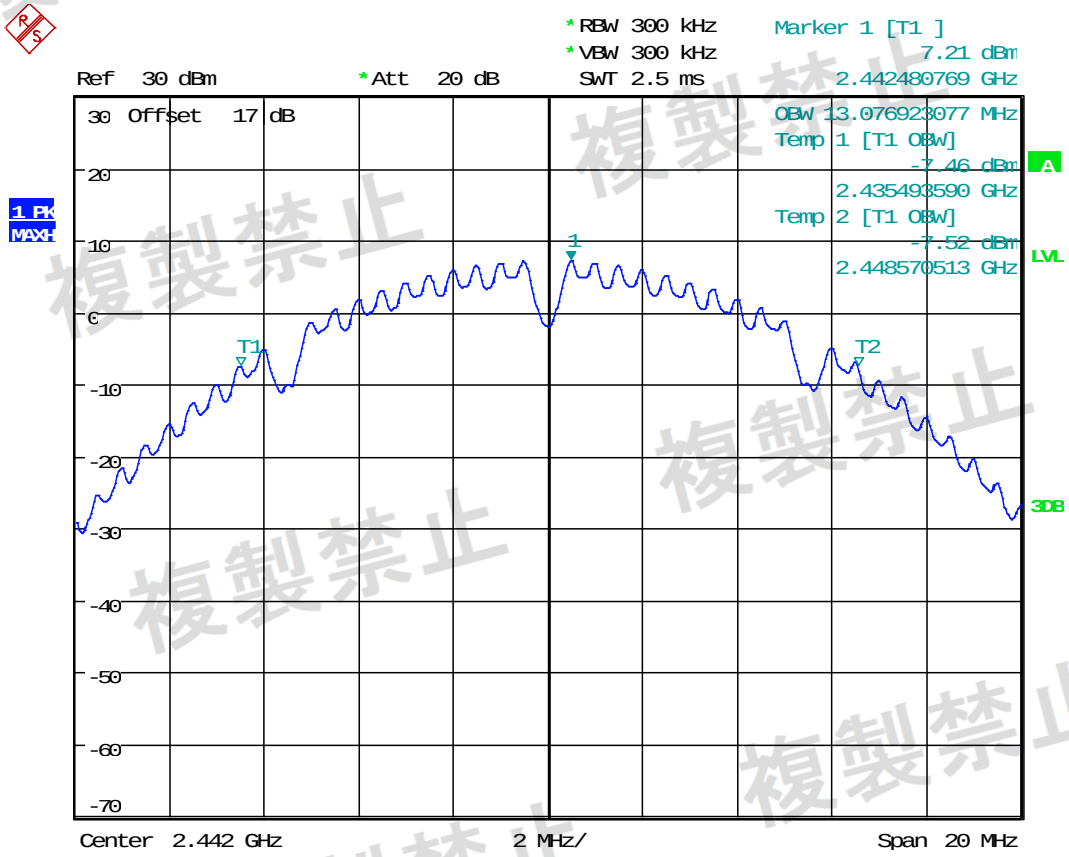
OCCUPIED BANDWIDTH 802.11B CH1 3.63V

Date: 19.JUL.2020 09:40:44



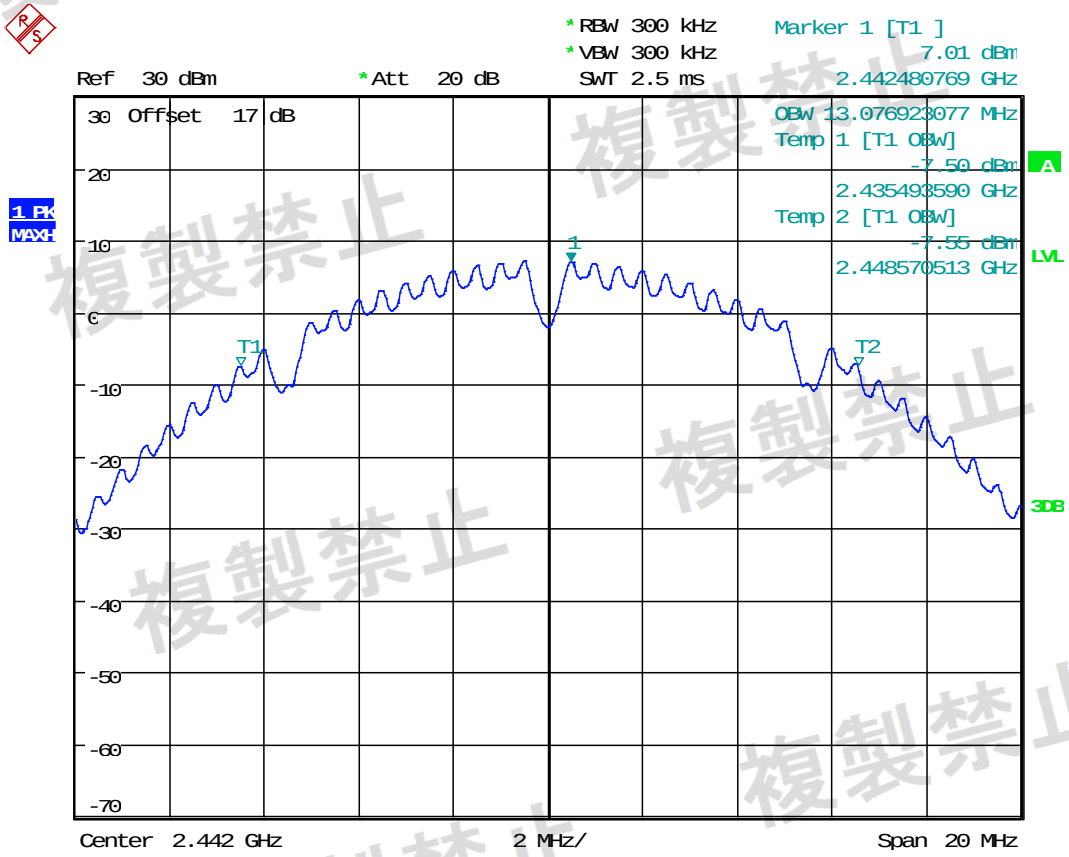
OCCUPIED BANDWIDTH 802.11B CH7 3.3V

Date: 19.JUL.2020 09:39:36



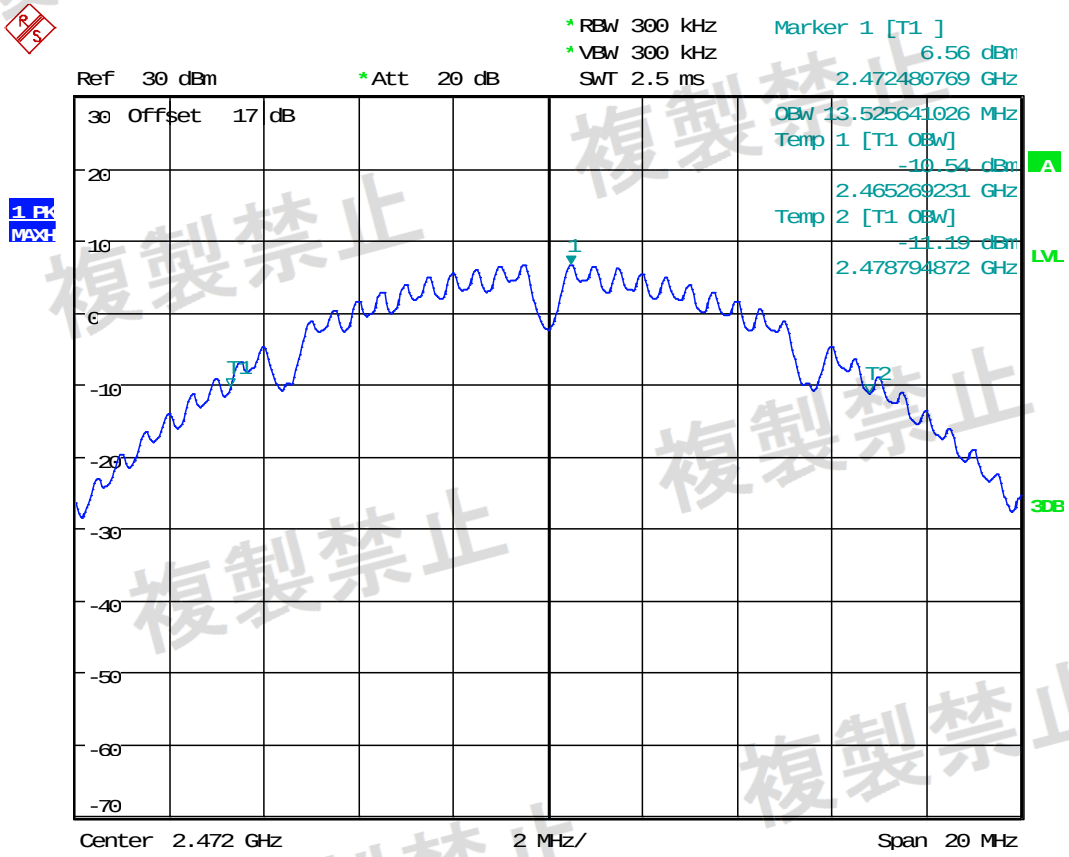
OCCUPIED BANDWIDTH 802.11B CH7 2.97V

Date: 19.JUL.2020 09:39:56



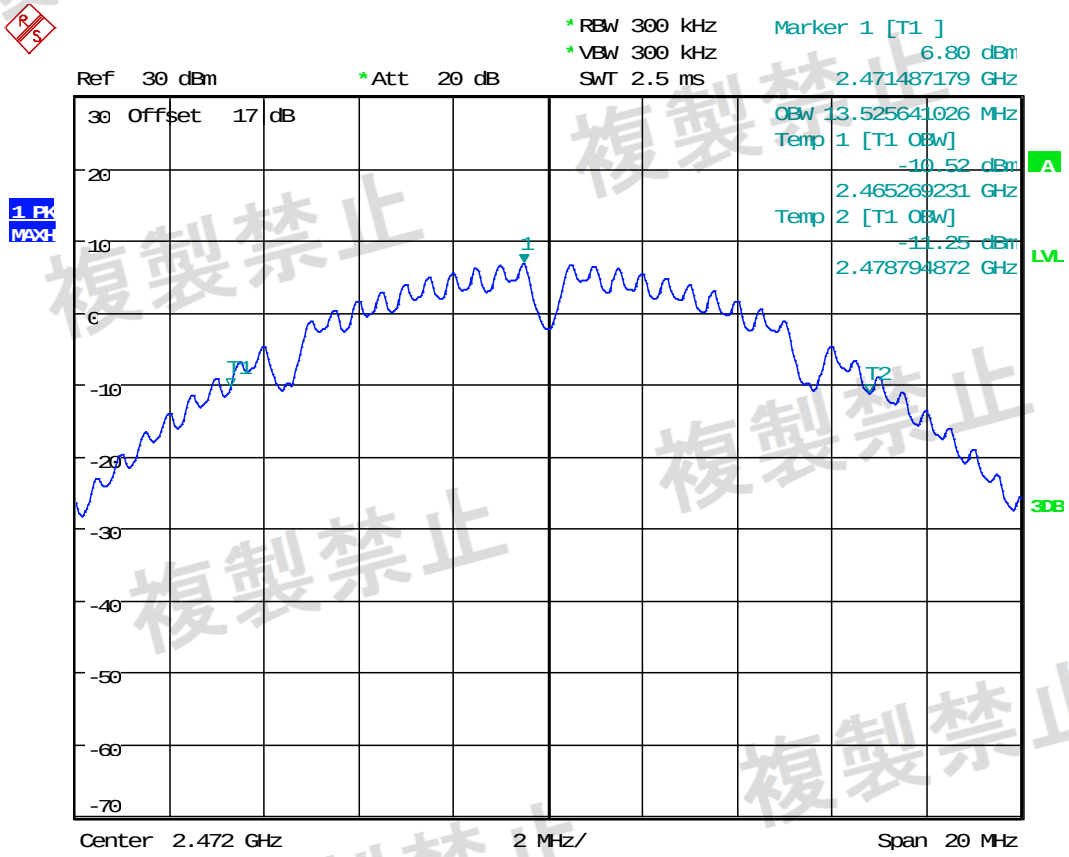
OCCUPIED BANDWIDTH 802.11B CH7 3.63V

Date: 19.JUL.2020 09:39:21



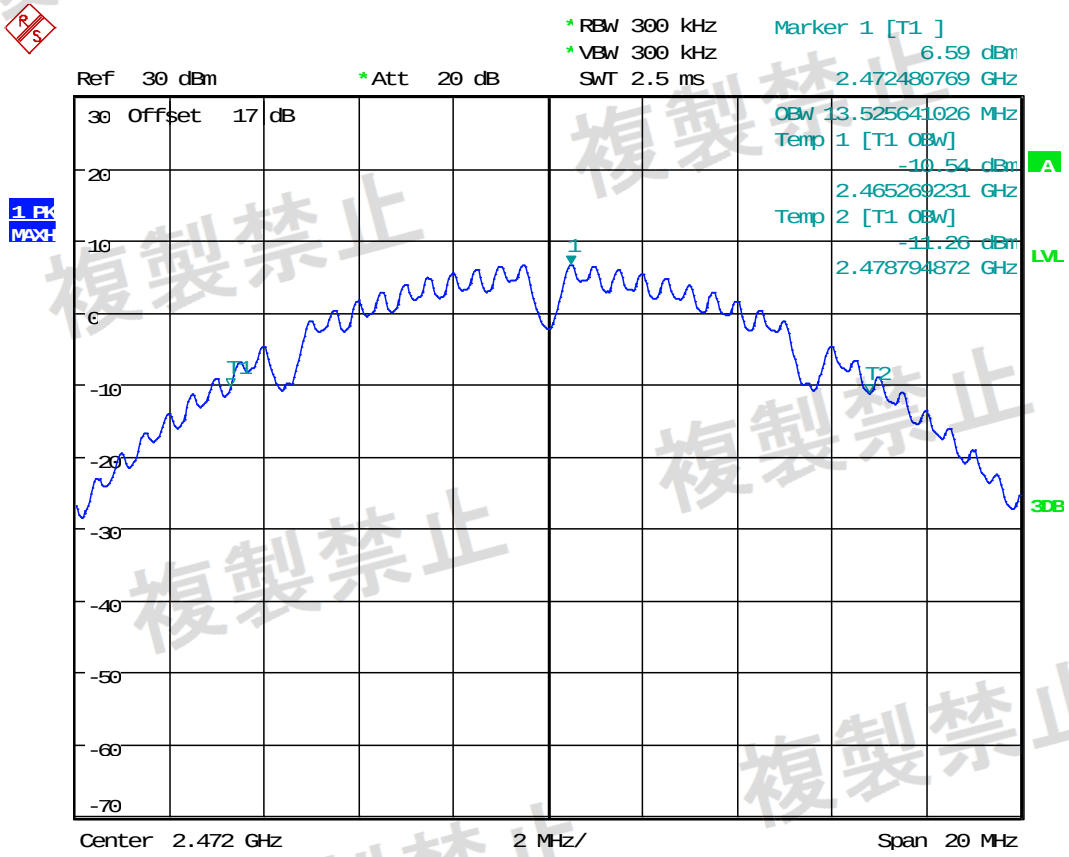
OCCUPIED BANDWIDTH 802.11B CH13 3.3V

Date: 19.JUL.2020 09:38:48



OCCUPIED BANDWIDTH 802.11B CH13 2.97V

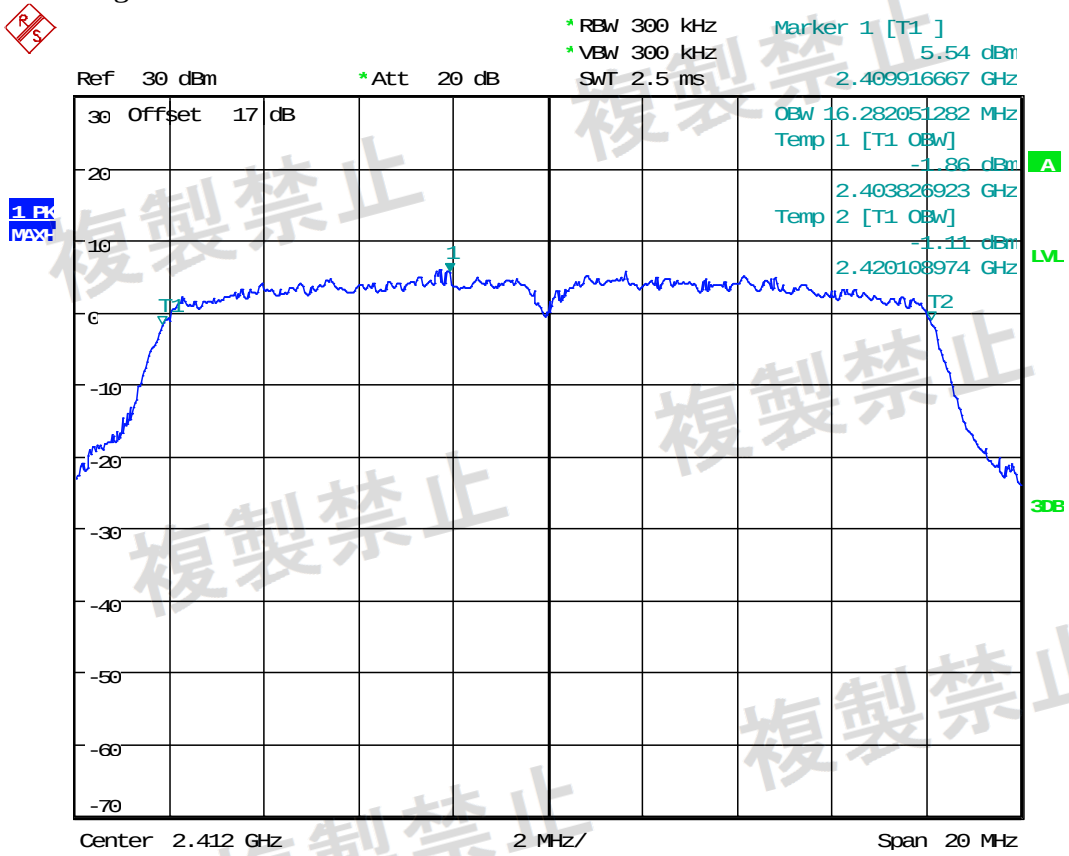
Date: 19.JUL.2020 09:38:35



OCCUPIED BANDWIDTH 802.11B CH13 3.63V

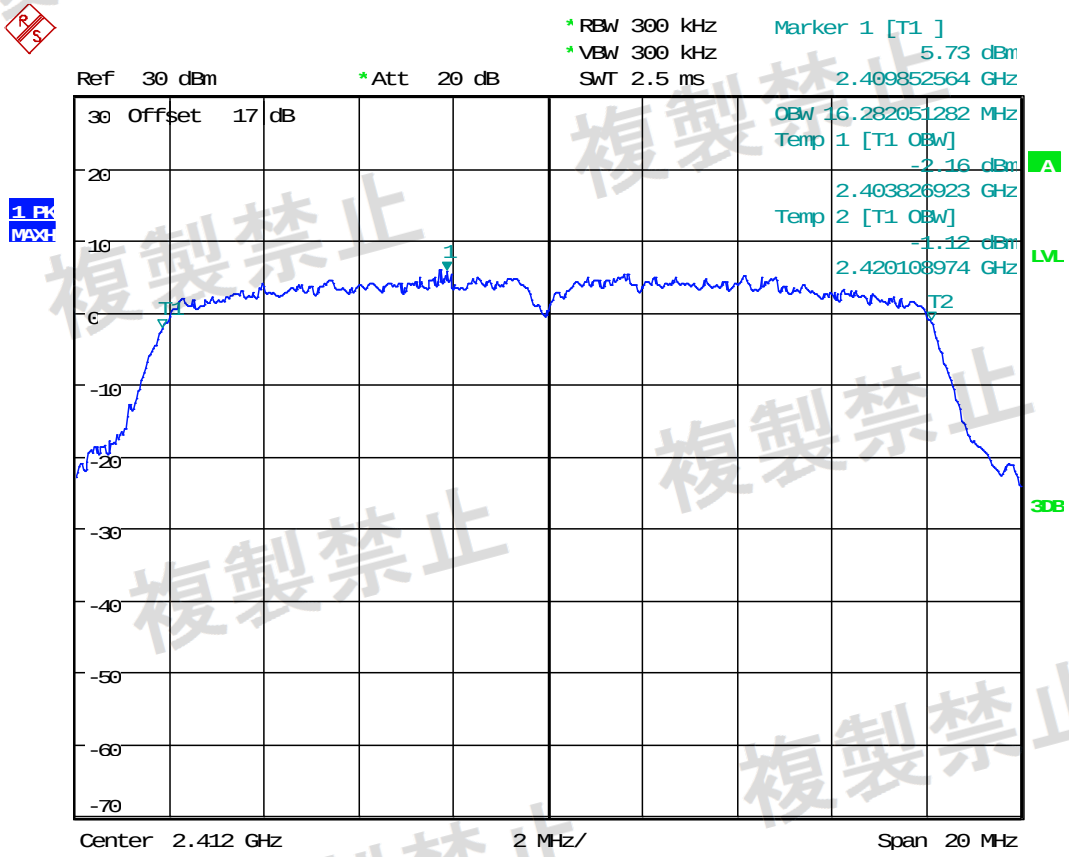
Date: 19.JUL.2020 09:38:59

IEEE 802.11g



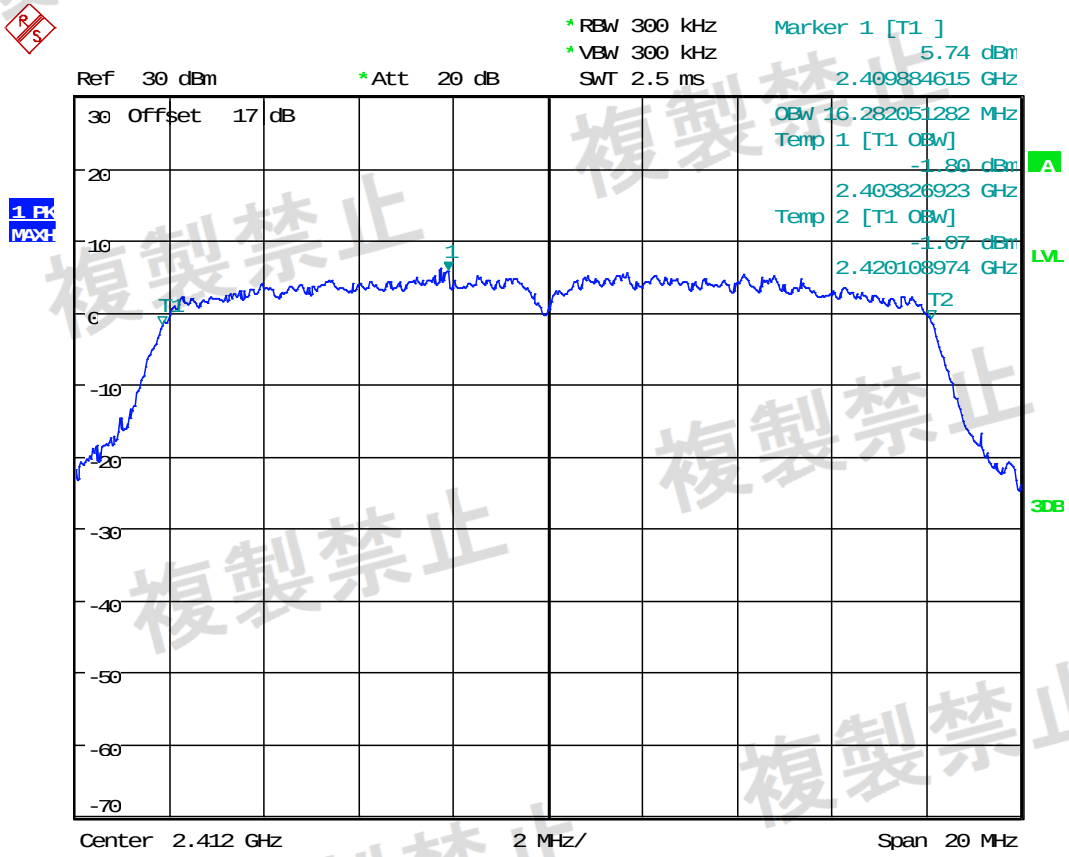
OCCUPIED BANDWIDTH 802.11G CH1 3.3V

Date: 19.JUL.2020 09:51:53



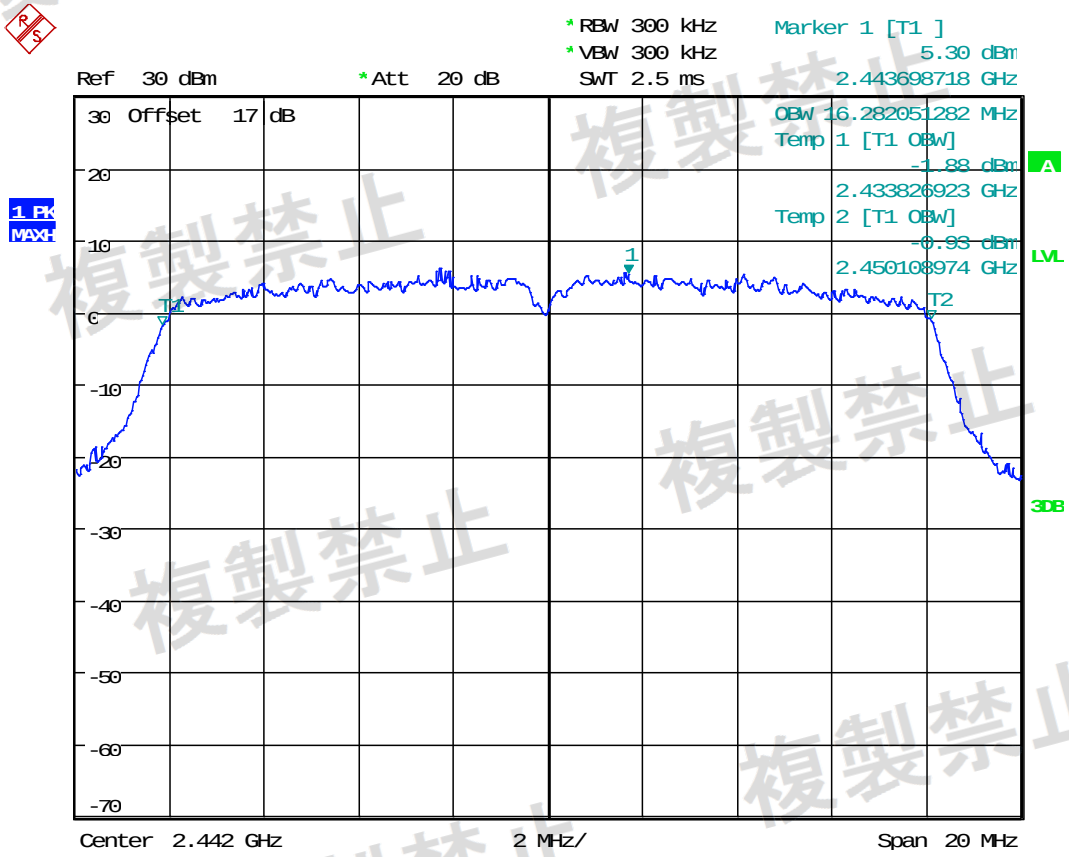
OCCUPIED BANDWIDTH 802.11G CH1 2.97V

Date: 19.JUL.2020 09:51:38



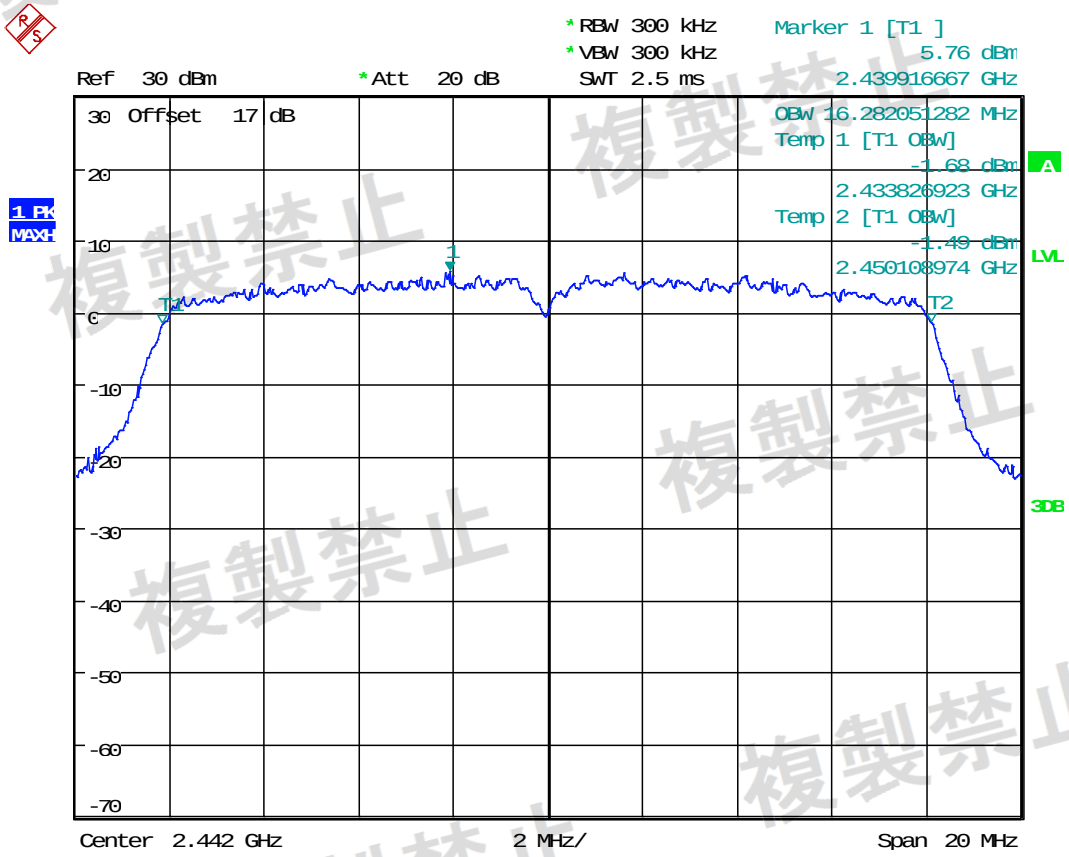
OCCUPIED BANDWIDTH 802.11G CH1 3.63V

Date: 19.JUL.2020 09:52:08



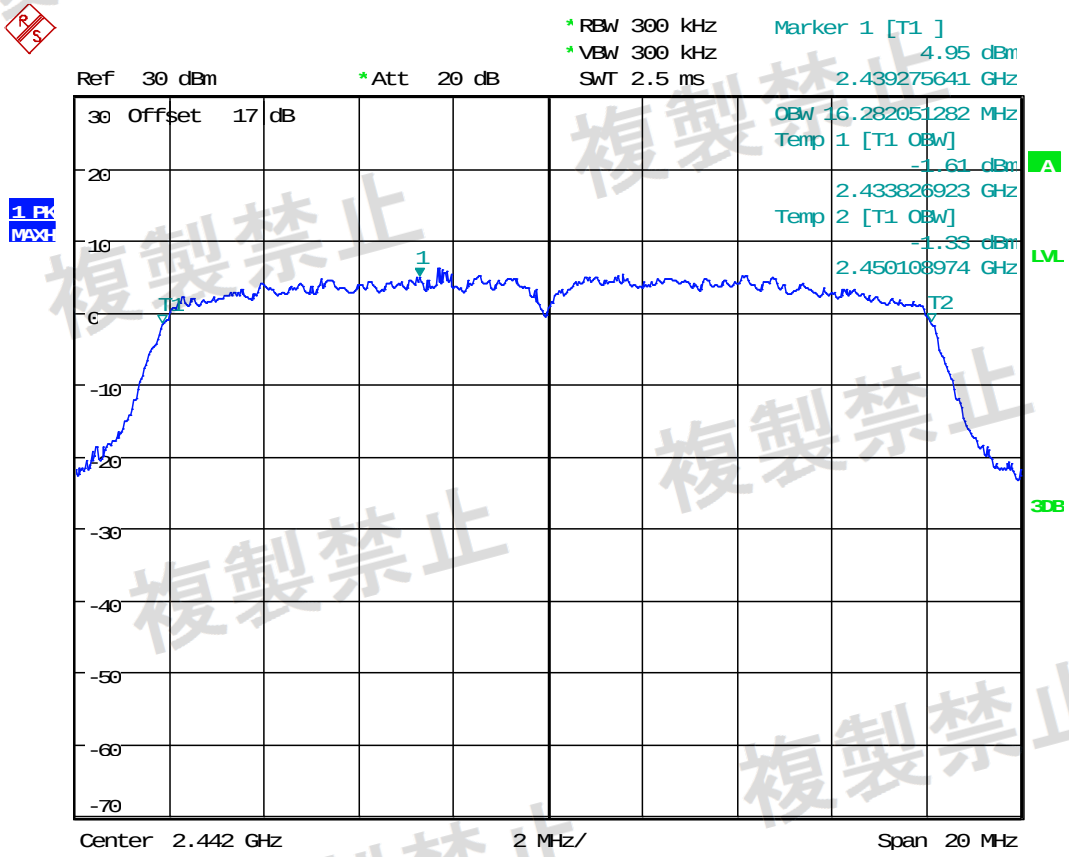
OCCUPIED BANDWIDTH 802.11G CH7 3.3V

Date: 19.JUL.2020 09:55:00



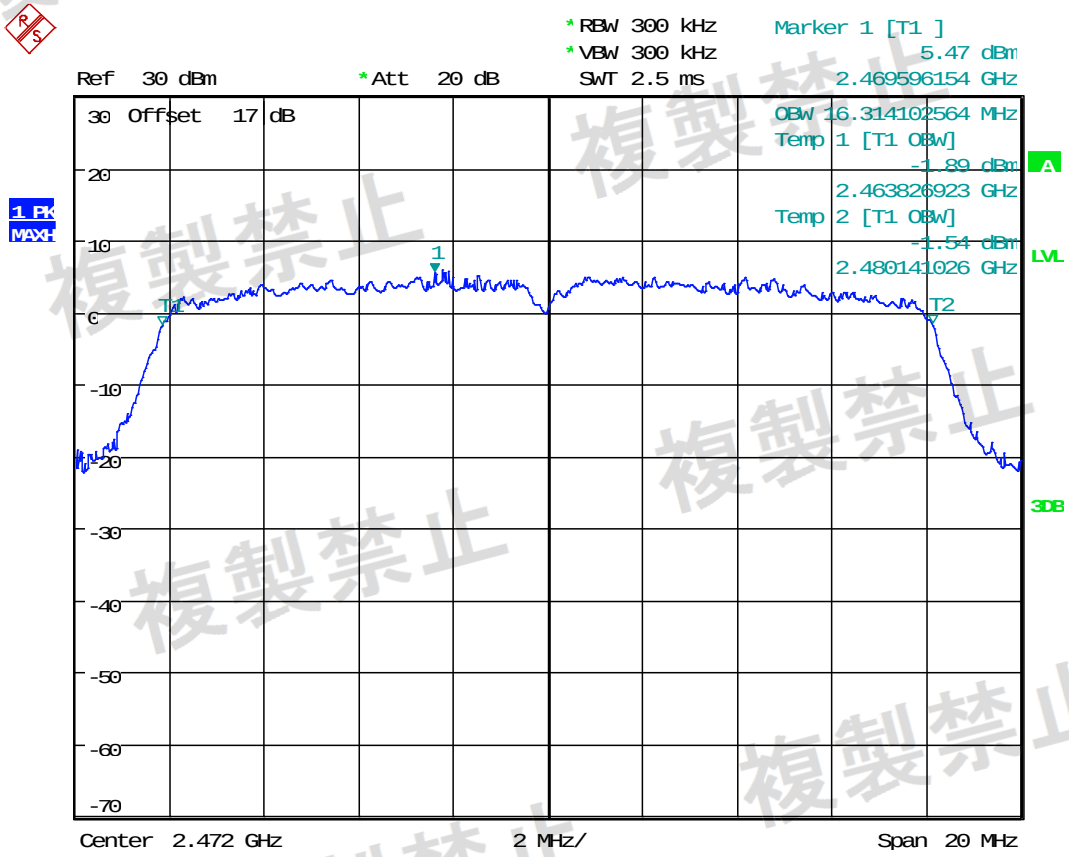
OCCUPIED BANDWIDTH 802.11G CH7 2.97V

Date: 19.JUL.2020 09:54:50



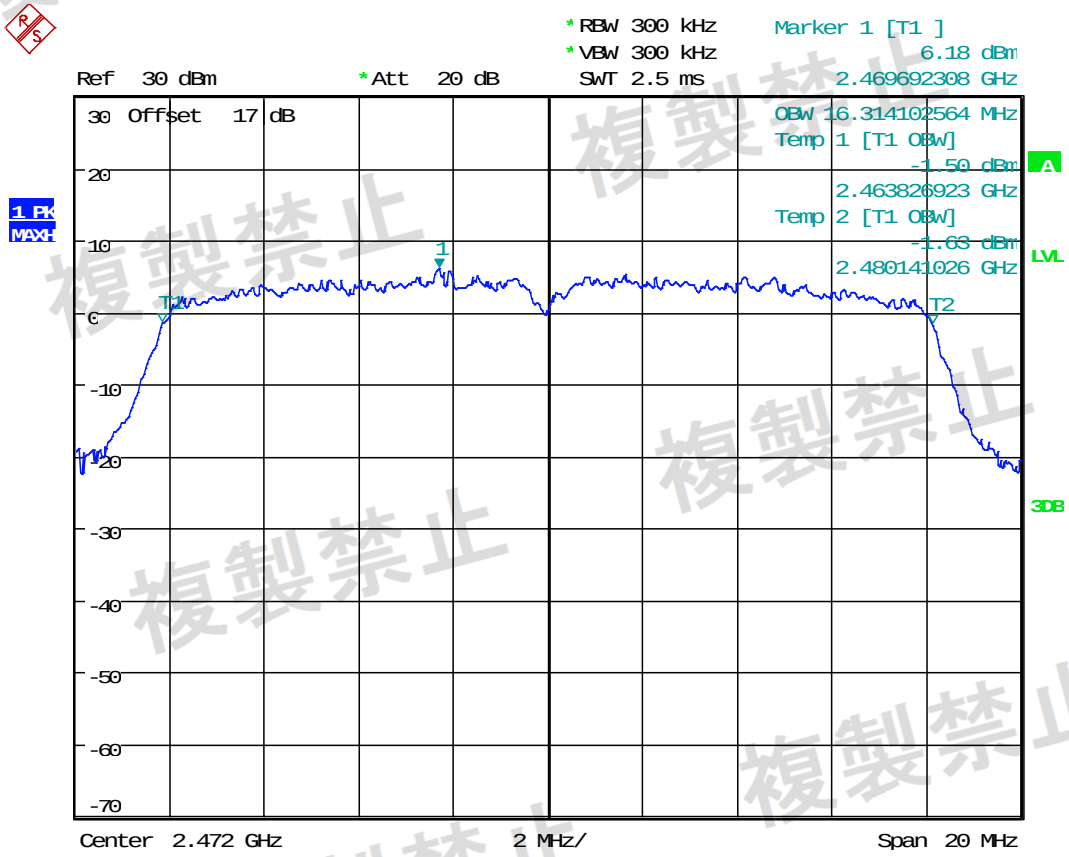
OCCUPIED BANDWIDTH 802.11G CH7 3.63V

Date: 19.JUL.2020 09:55:12



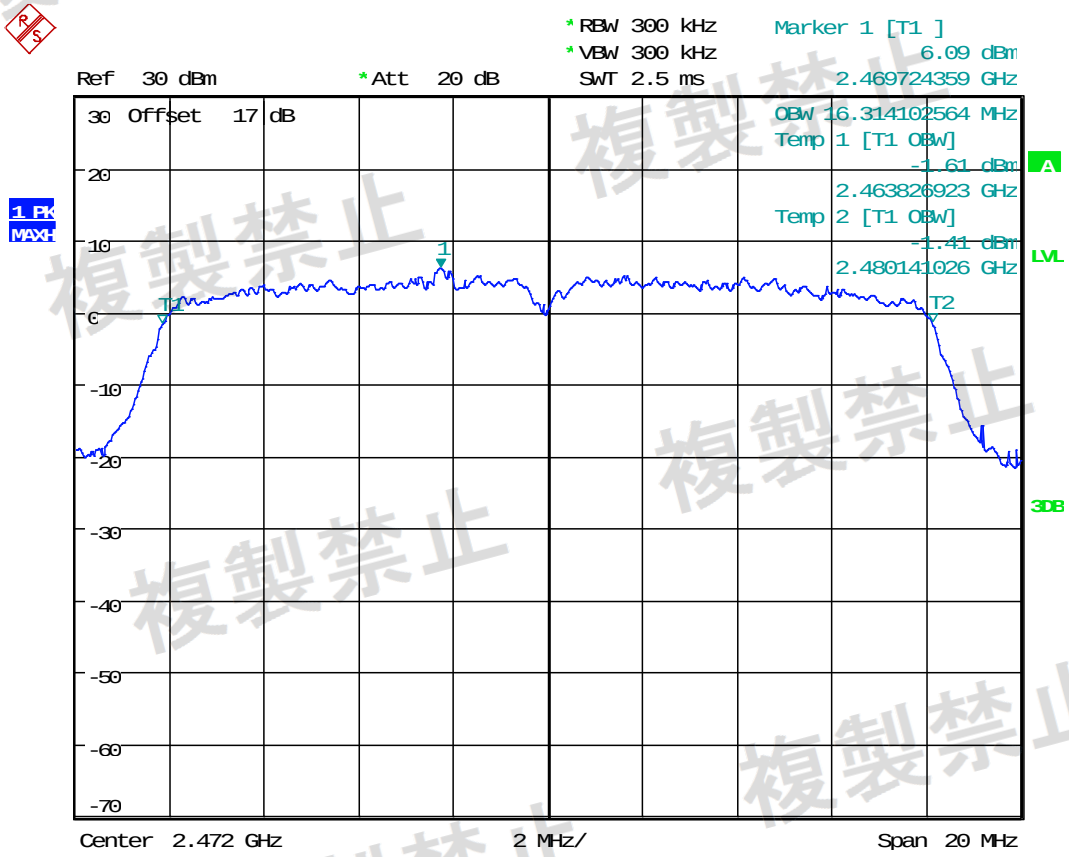
OCCUPIED BANDWIDTH 802.11G CH13 3.3V

Date: 19.JUL.2020 10:09:26



OCCUPIED BANDWIDTH 802.11G CH13 2.97V

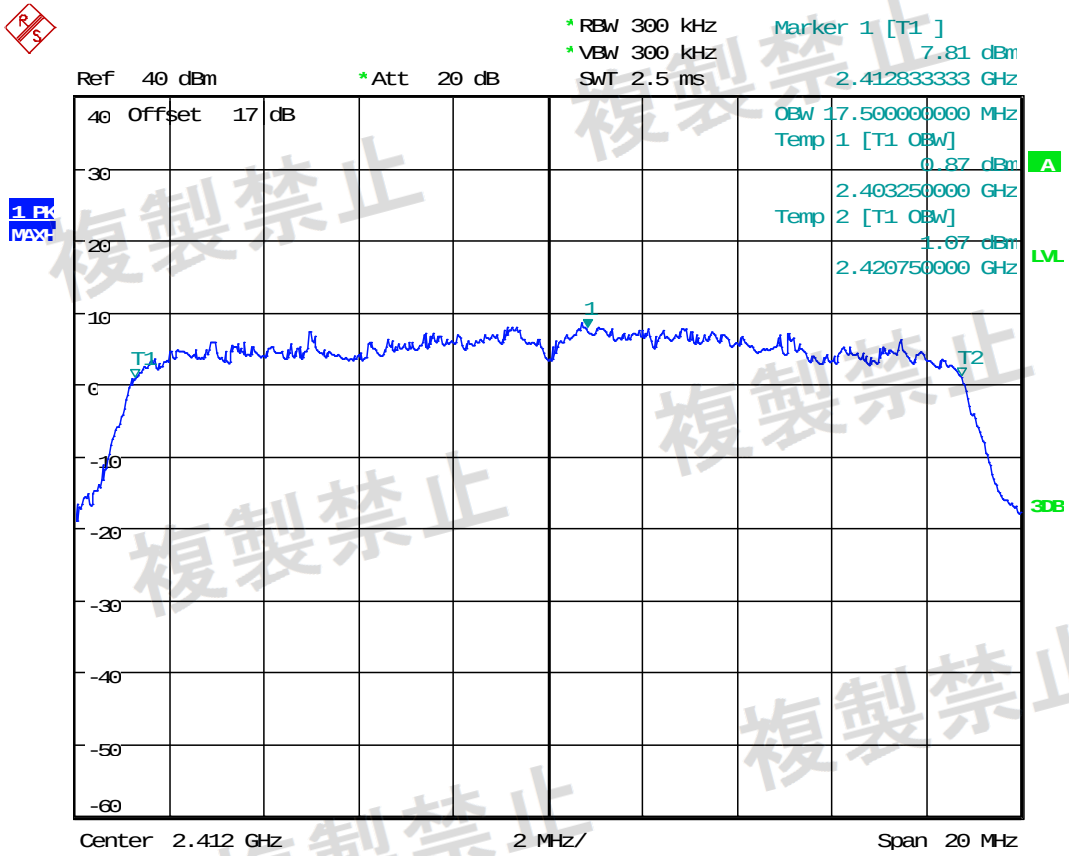
Date: 19.JUL.2020 10:09:42



OCCUPIED BANDWIDTH 802.11G CH13 3.63V

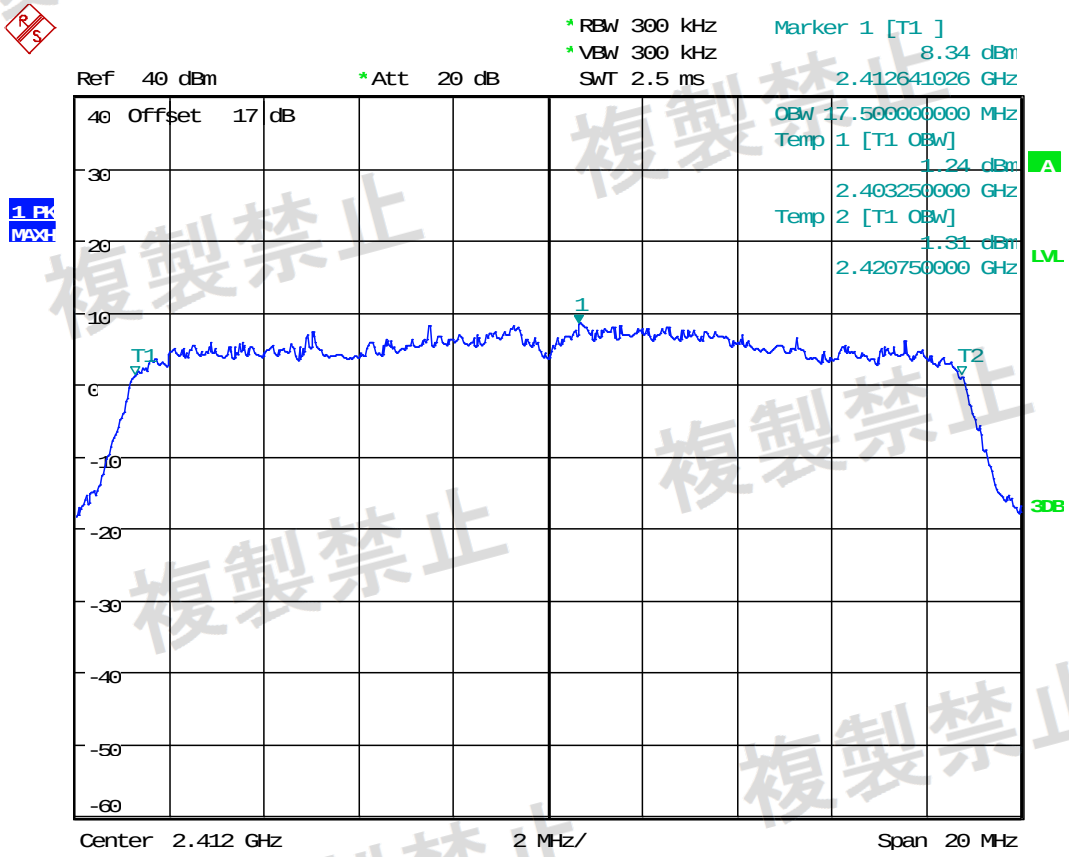
Date: 19.JUL.2020 10:09:02

IEEE 802.11n20



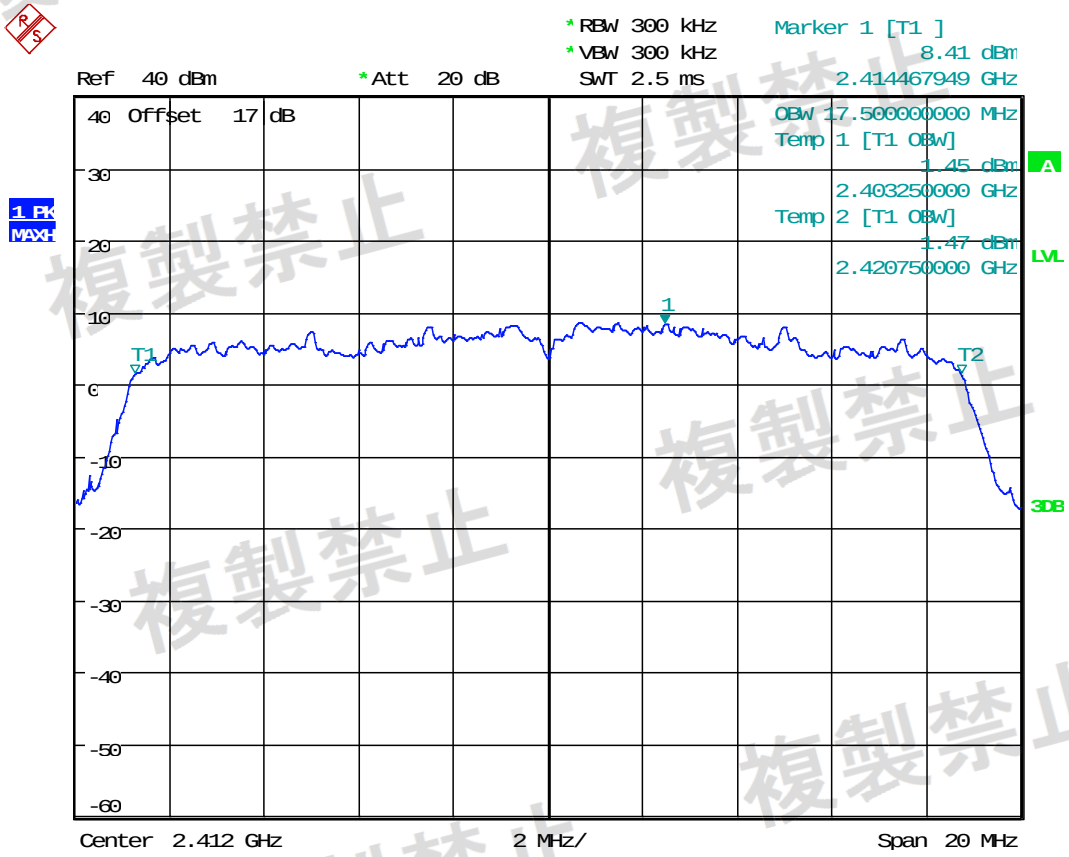
OCCUPIED BANDWIDTH 802.11N 20MHZ CH1 3.3V

Date: 19.JUL.2020 10:21:56



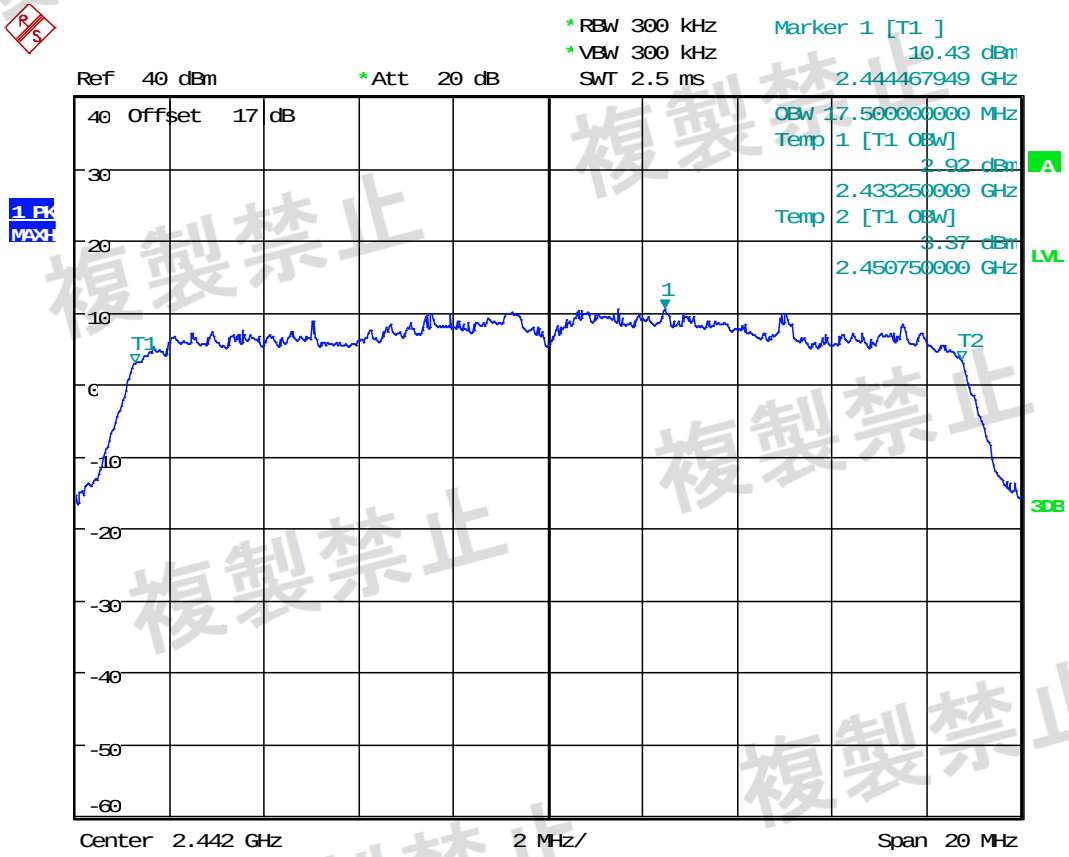
OCCUPIED BANDWIDTH 802.11N 20MHZ CH1 2.97V

Date: 19.JUL.2020 10:22:11



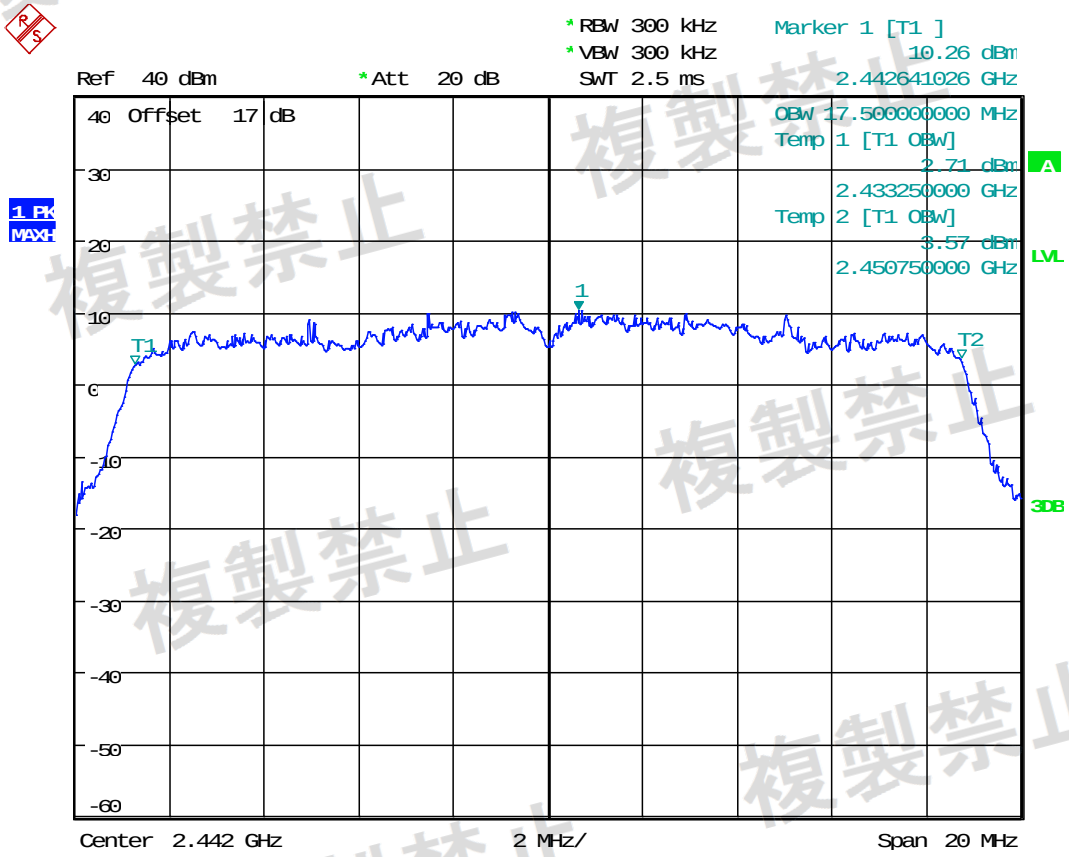
OCCUPIED BANDWIDTH 802.11N 20MHZ CH1 3.63V

Date: 19.JUL.2020 10:21:16



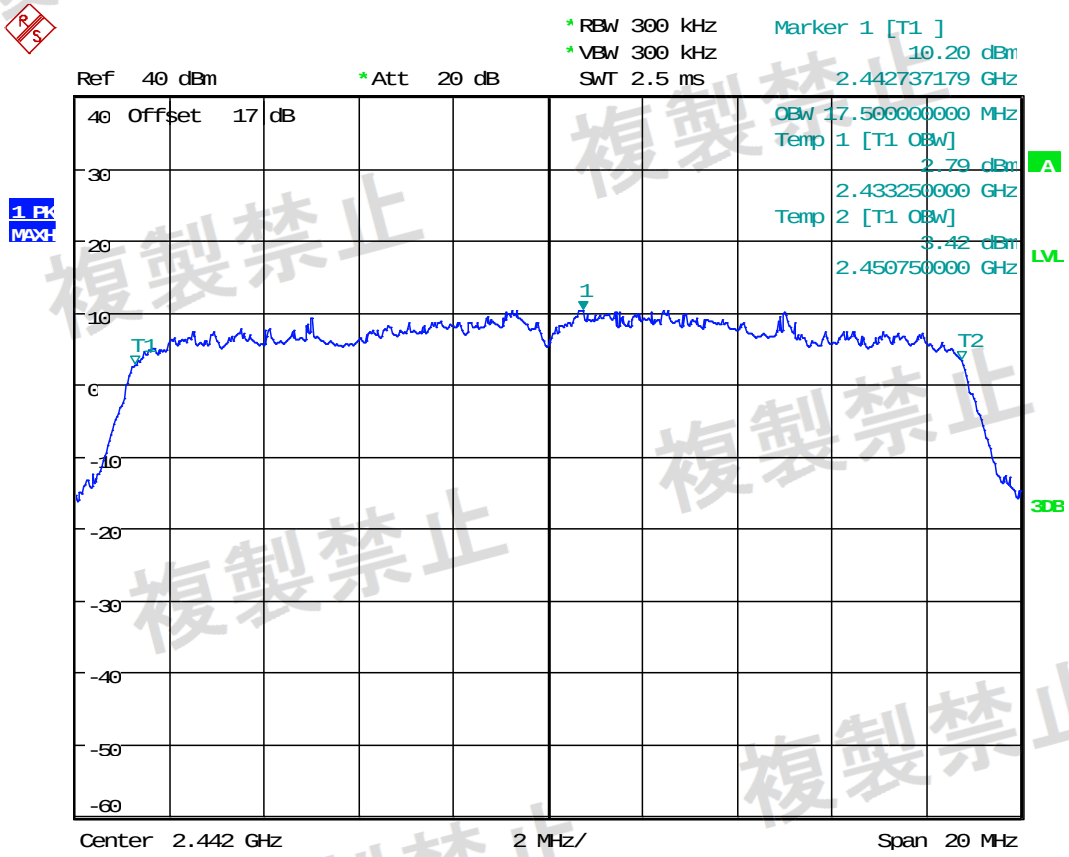
OCCUPIED BANDWIDTH 802.11N 20MHZ CH7 3.3V

Date: 19.JUL.2020 10:23:29



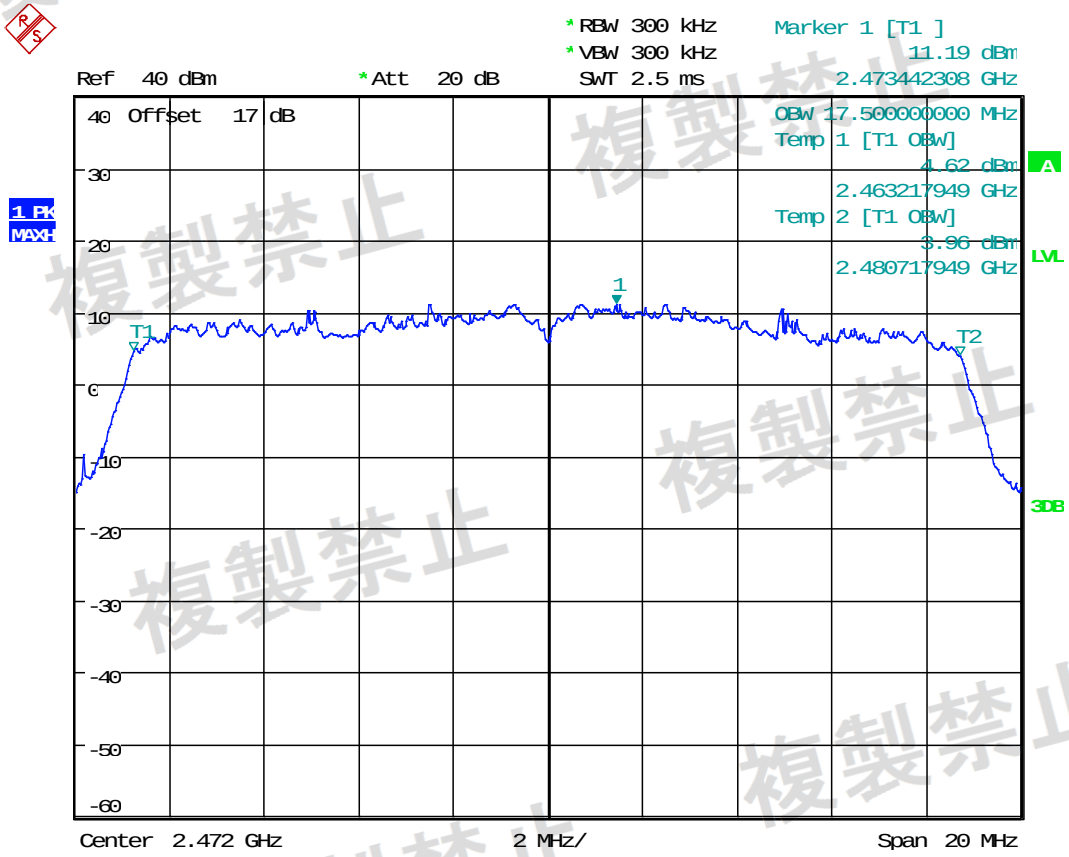
OCCUPIED BANDWIDTH 802.11N 20MHZ CH7 2.97V

Date: 19.JUL.2020 10:23:14



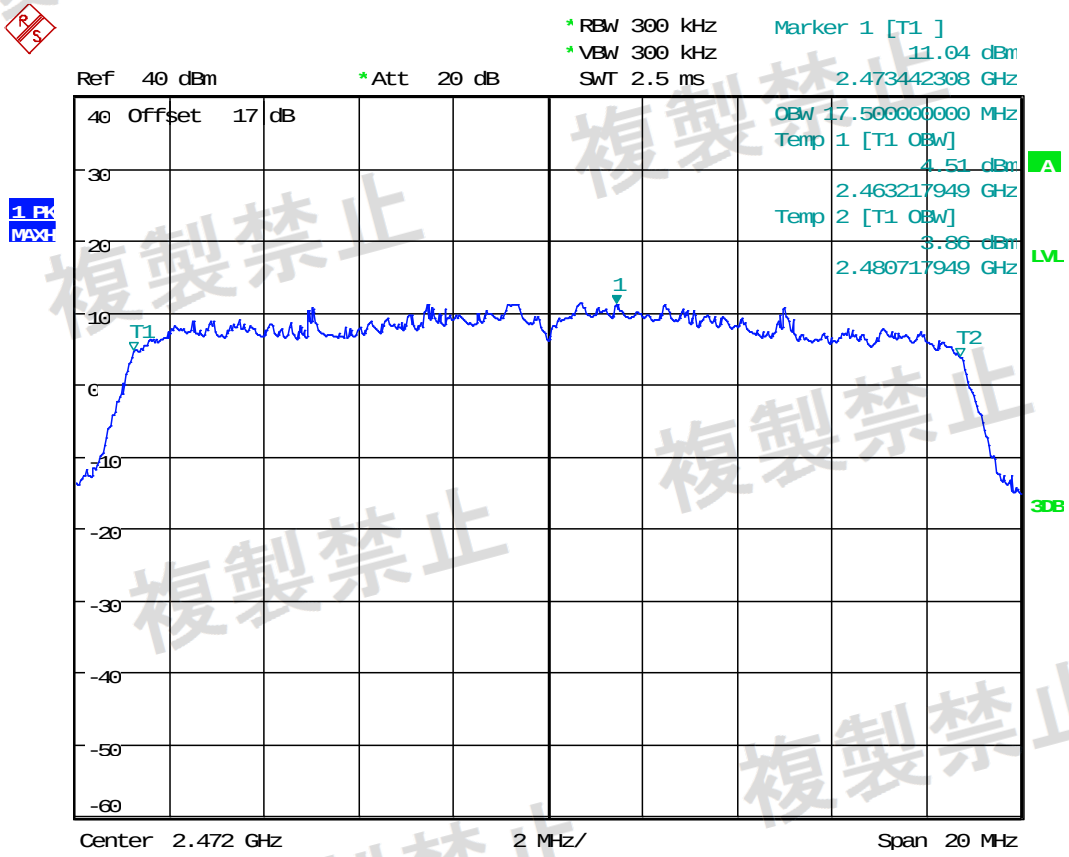
OCCUPIED BANDWIDTH 802.11N 20MHZ CH7 3.63V

Date: 19.JUL.2020 10:24:11



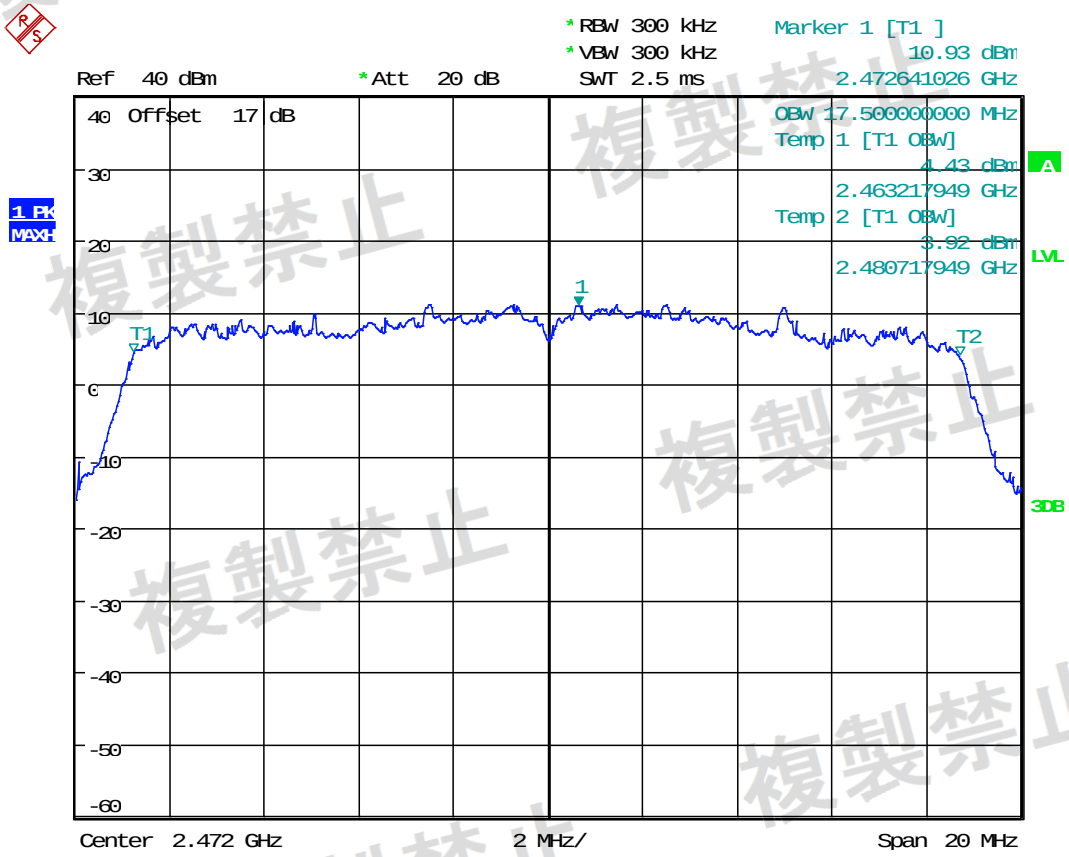
OCCUPIED BANDWIDTH 802.11N 20MHZ CH13 3.3V

Date: 19.JUL.2020 10:25:26



OCCUPIED BANDWIDTH 802.11N 20MHZ CH13 2.97V

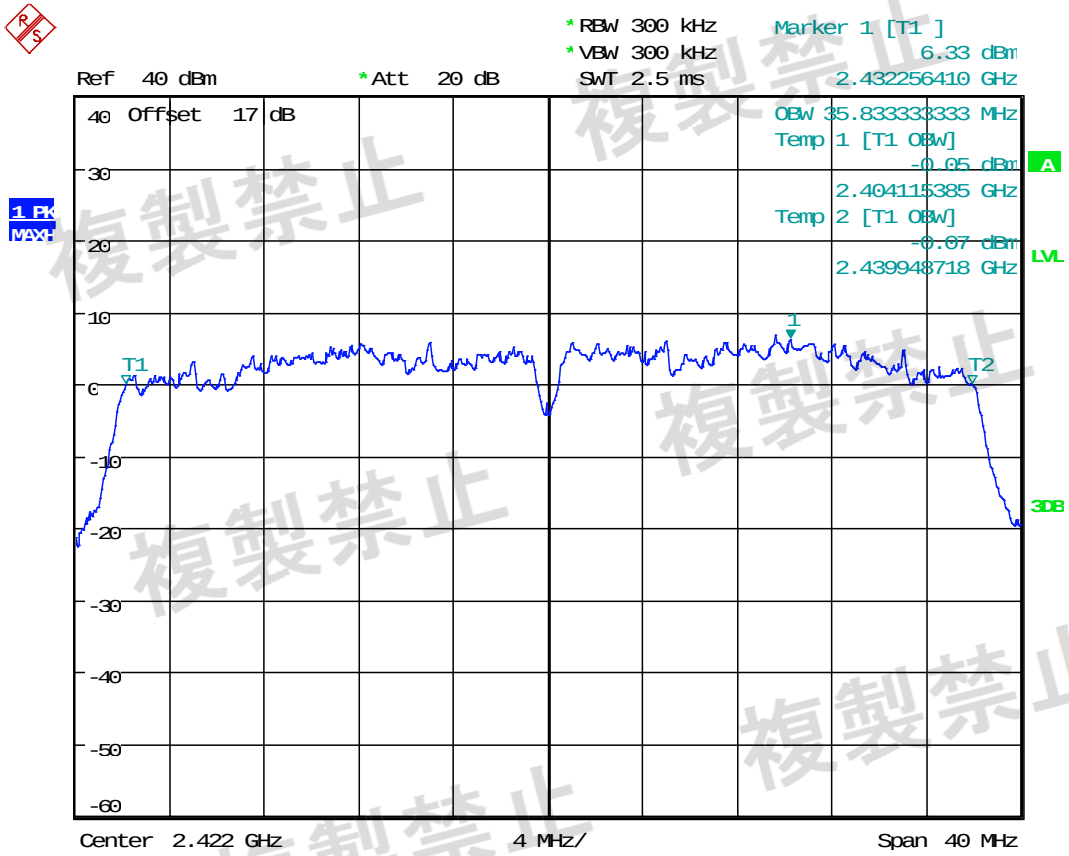
Date: 19.JUL.2020 10:25:38



OCCUPIED BANDWIDTH 802.11N 20MHZ CH13 3.63V

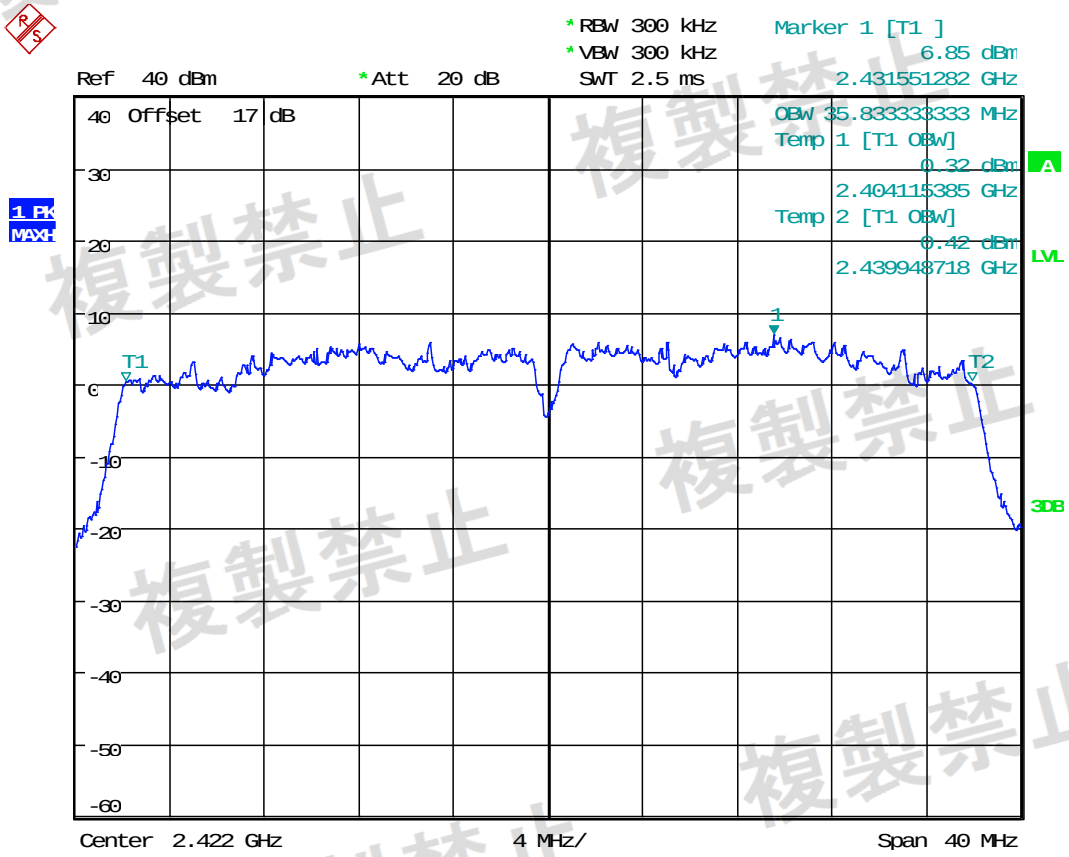
Date: 19.JUL.2020 10:24:47

IEEE 802.11 n40



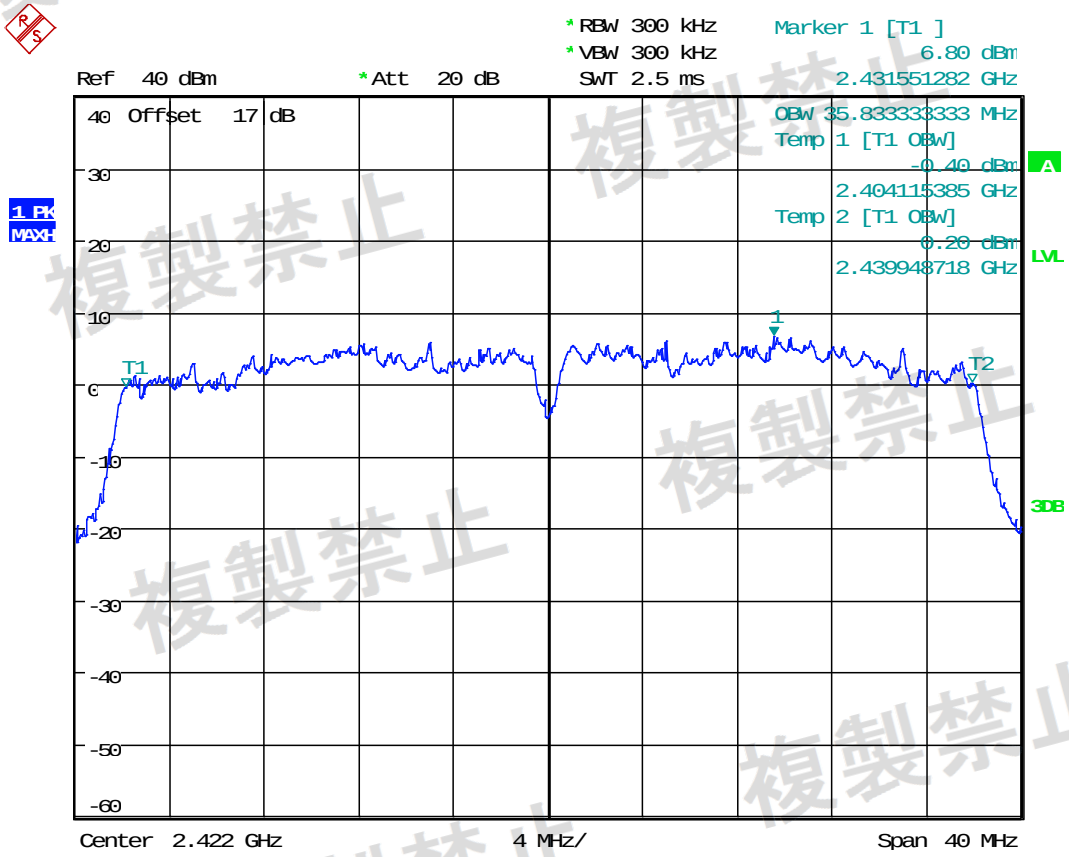
OCCUPIED BANDWIDTH 802.11N 40MHZ CH3 3.3V

Date: 19.JUL.2020 10:27:31



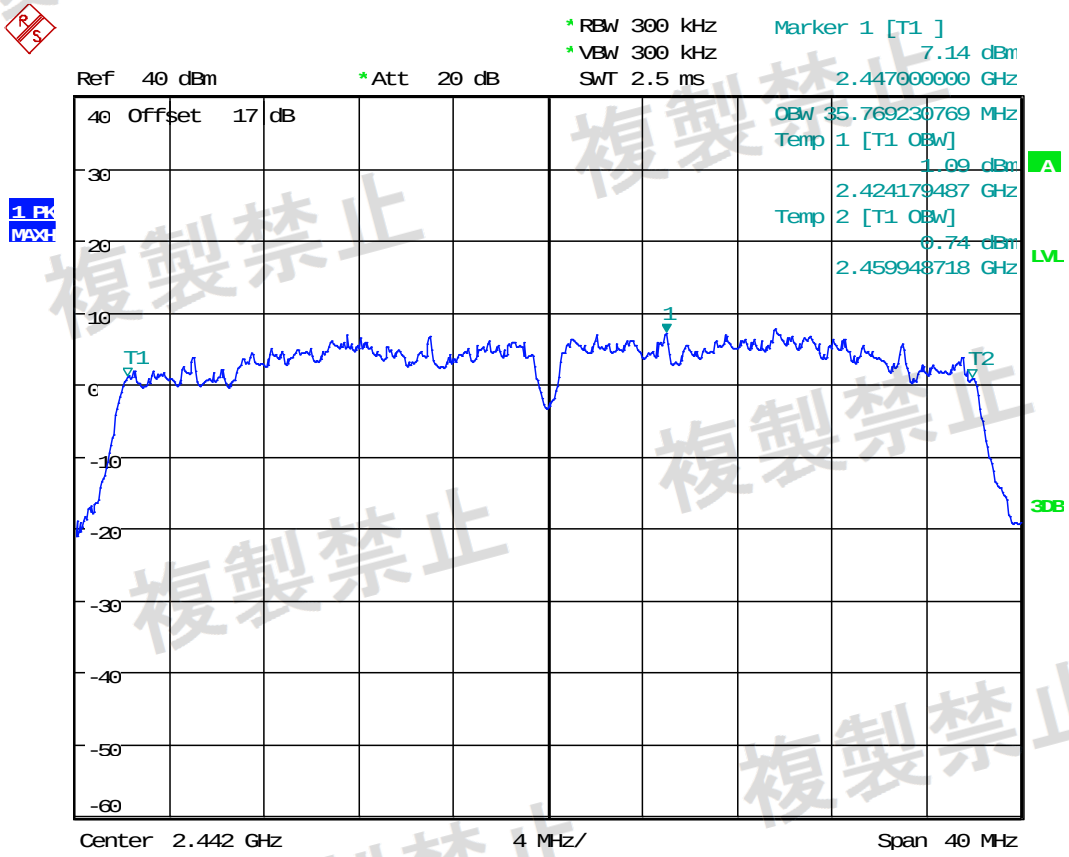
OCCUPIED BANDWIDTH 802.11N 40MHZ CH3 2.97V

Date: 19.JUL.2020 10:27:13



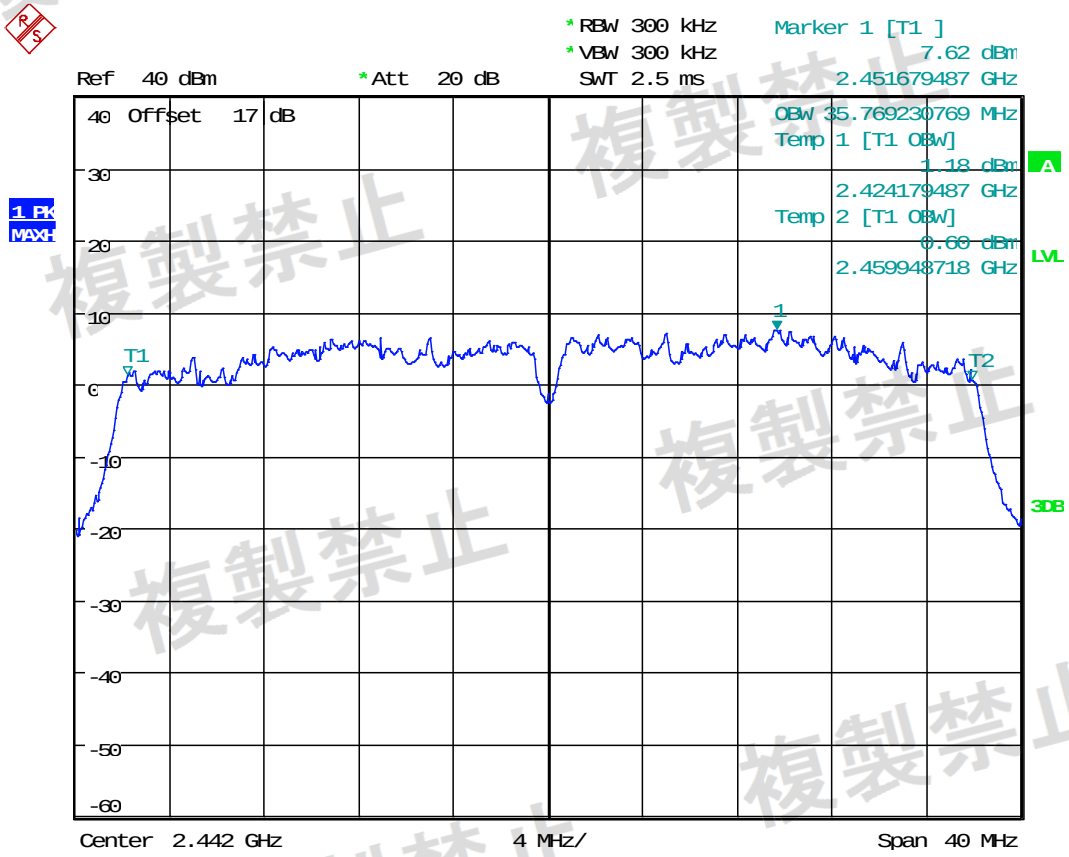
OCCUPIED BANDWIDTH 802.11N 40MHZ CH3 3.63V

Date: 19.JUL.2020 10:28:13



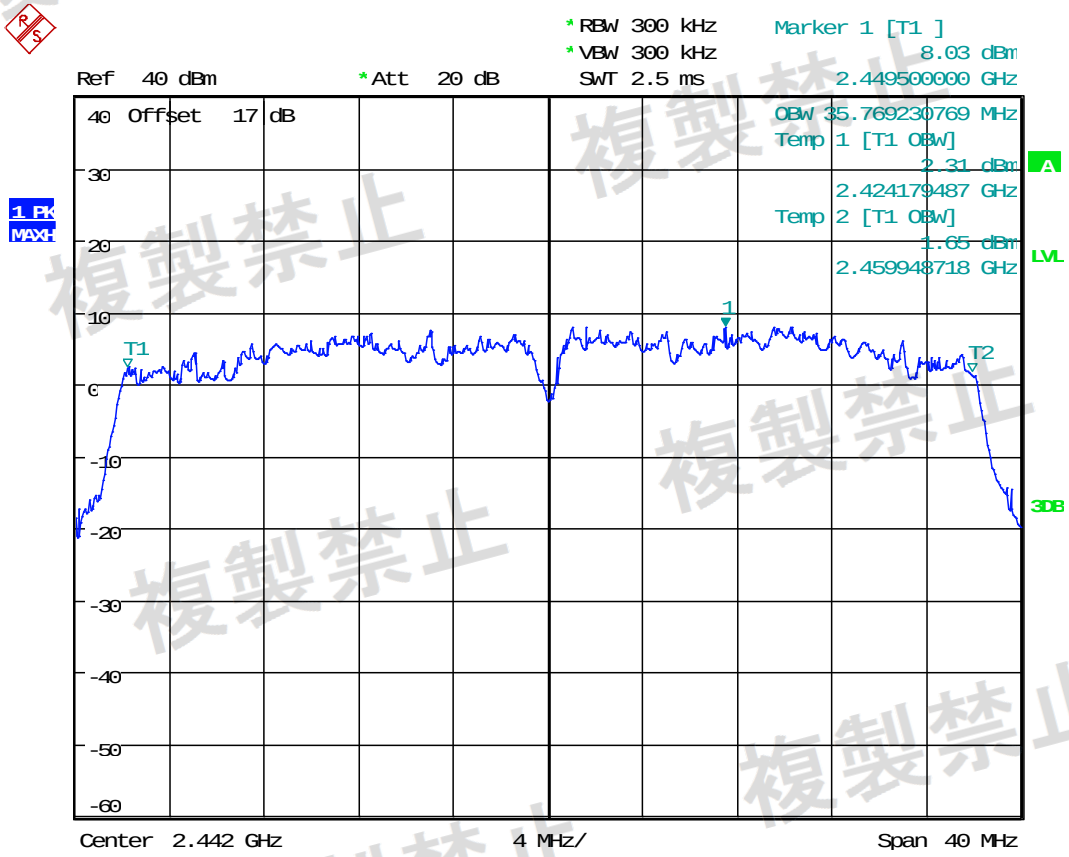
OCCUPIED BANDWIDTH 802.11N 40MHZ CH7 3.3V

Date: 19.JUL.2020 10:29:32



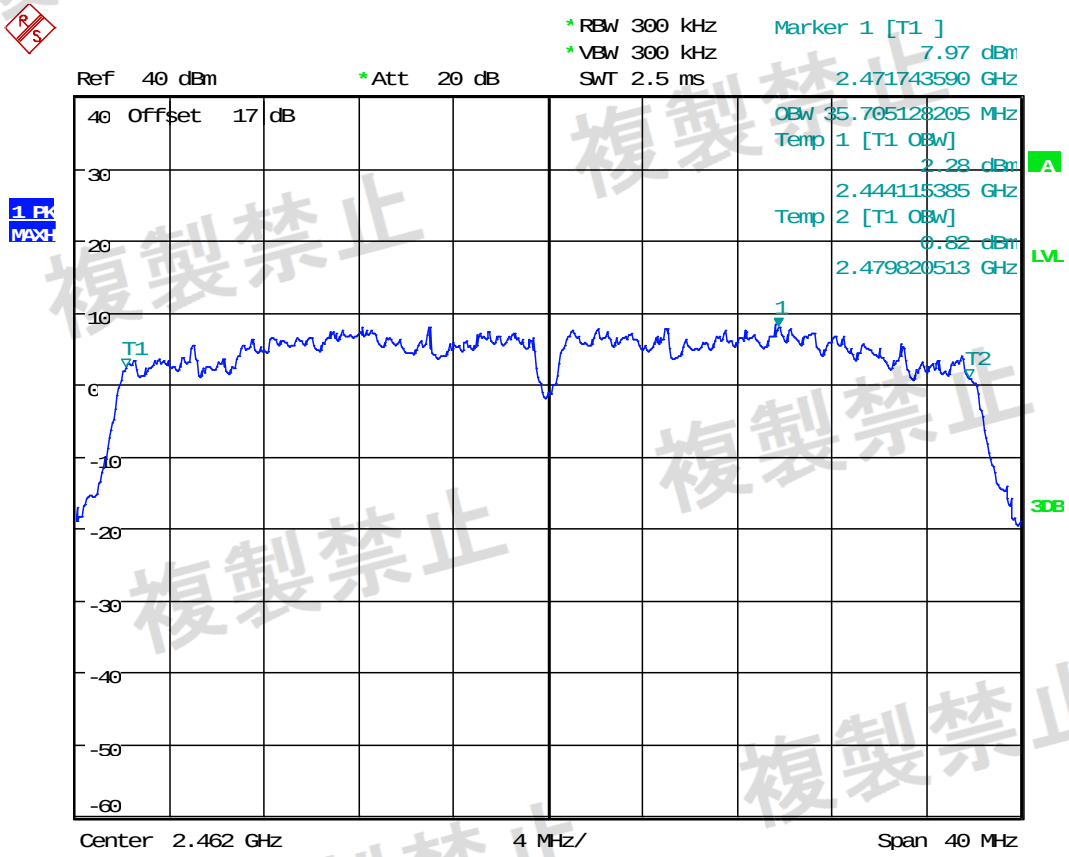
OCCUPIED BANDWIDTH 802.11N 40MHZ CH7 2.97V

Date: 19.JUL.2020 10:29:59



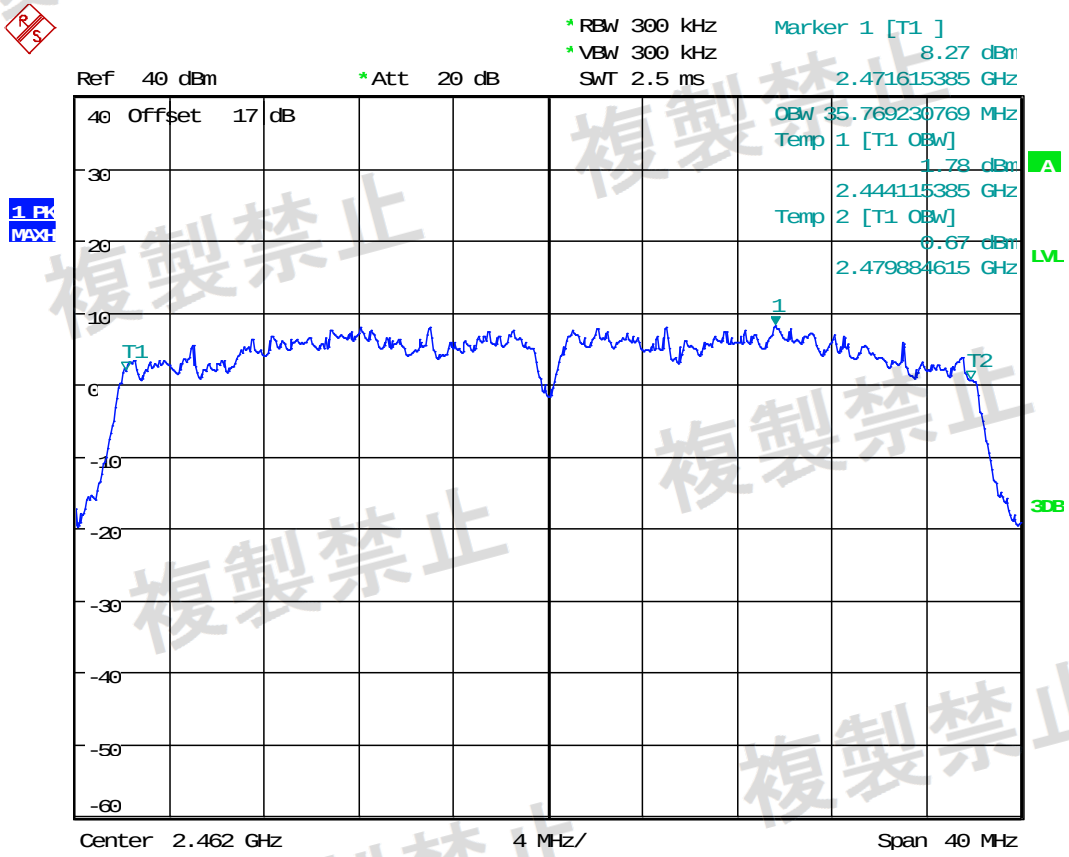
OCCUPIED BANDWIDTH 802.11N 40MHZ CH7 3.63V

Date: 19.JUL.2020 10:28:46



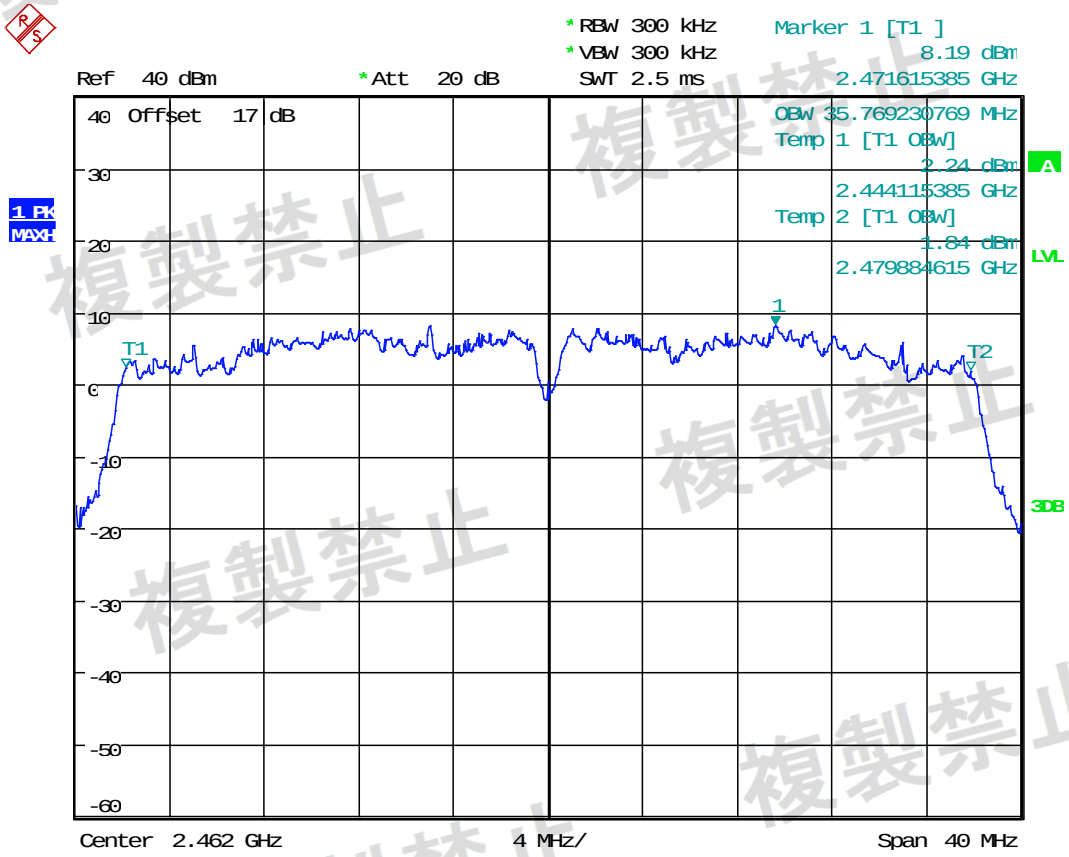
OCCUPIED BANDWIDTH 802.11N 40MHZ CH11 3.3V

Date: 19.JUL.2020 10:31:37



OCCUPIED BANDWIDTH 802.11N 40MHZ CH11 2.97V

Date: 19.JUL.2020 10:31:12



OCCUPIED BANDWIDTH 802.11N 40MHZ CH11 3.63V

Date: 19.JUL.2020 10:32:24

Limits:

Under all test conditions	FH: 83.5MHz
	FH+DS : 83.5MHz
	FH+OFDM : 83.5MHz
	OFDM : 38MHz
	Others : 26MHz

Test equipment used: ETSTW-RE 050, ETSTW-RE 055

3.4 Spreading Bandwidth & Spreading Factor

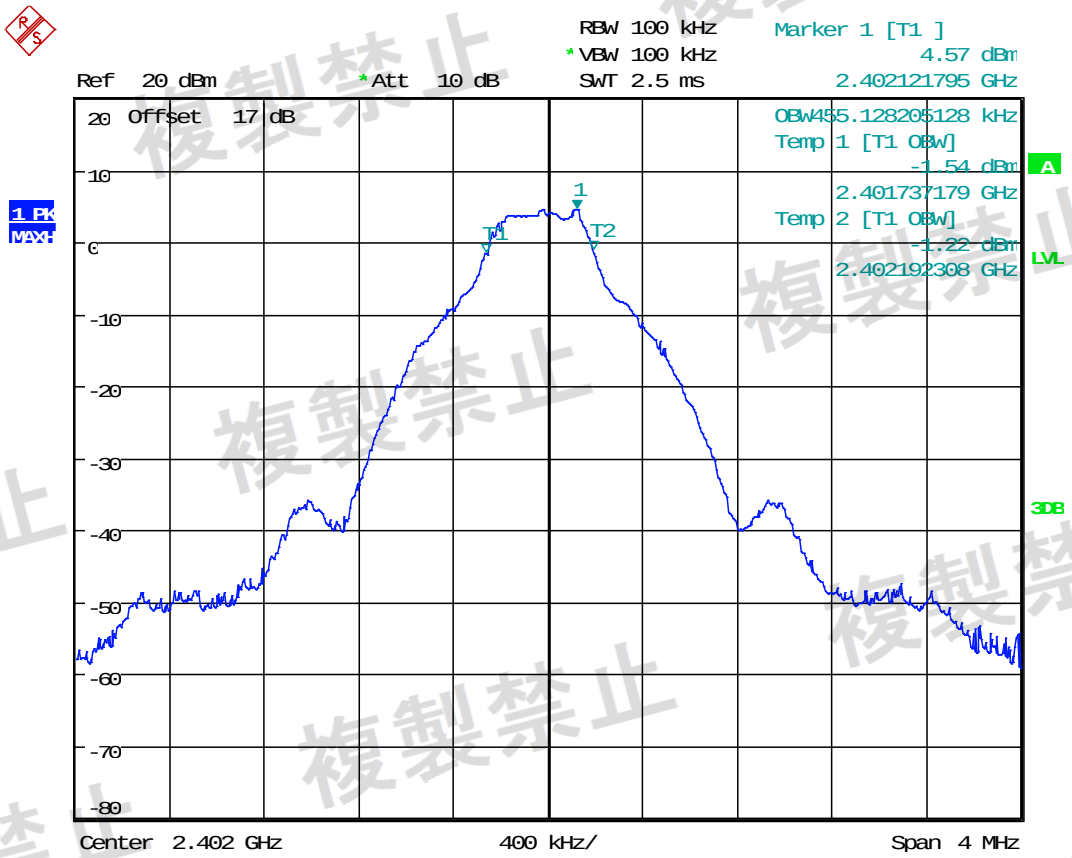
3.4.1 Spreading Bandwidth

Test date: July 17, 2020-July 29, 2020
Temperature: 22.6°C
Humidity: 50.6 %
Tester: Spencer Yang

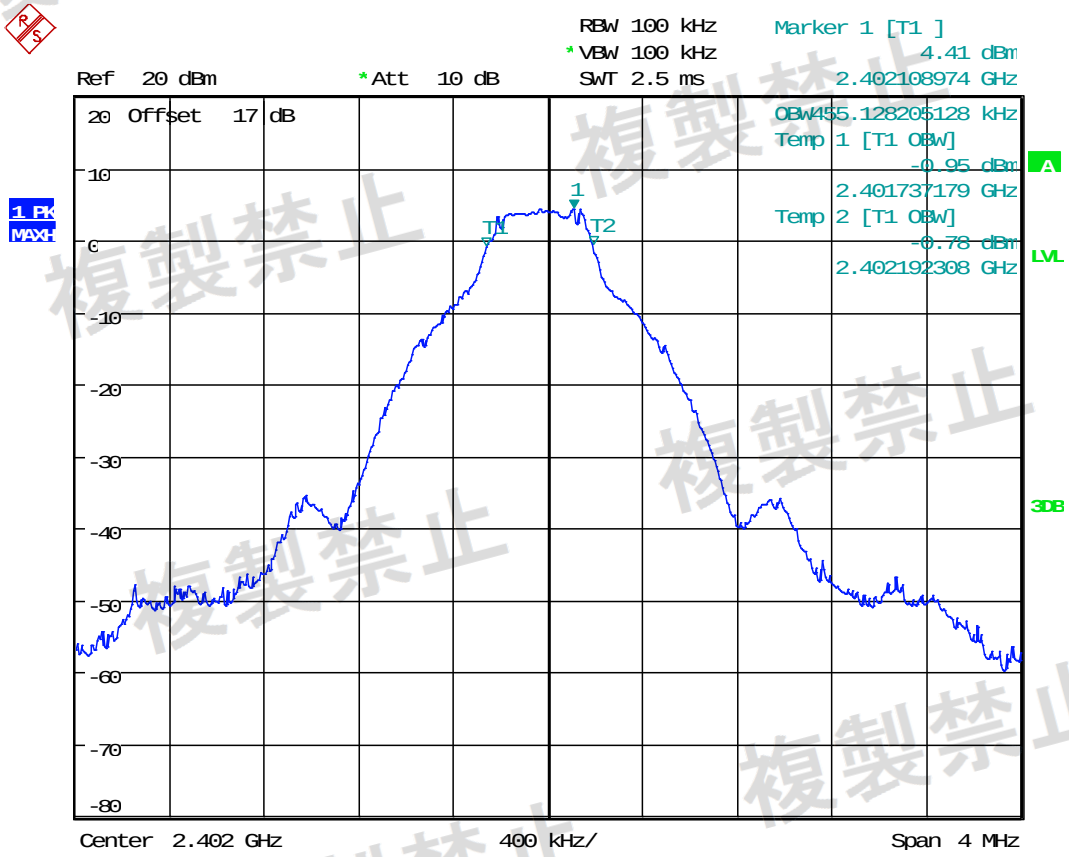
Bluetooth2.0

GFSK

Single channel for 20 channels

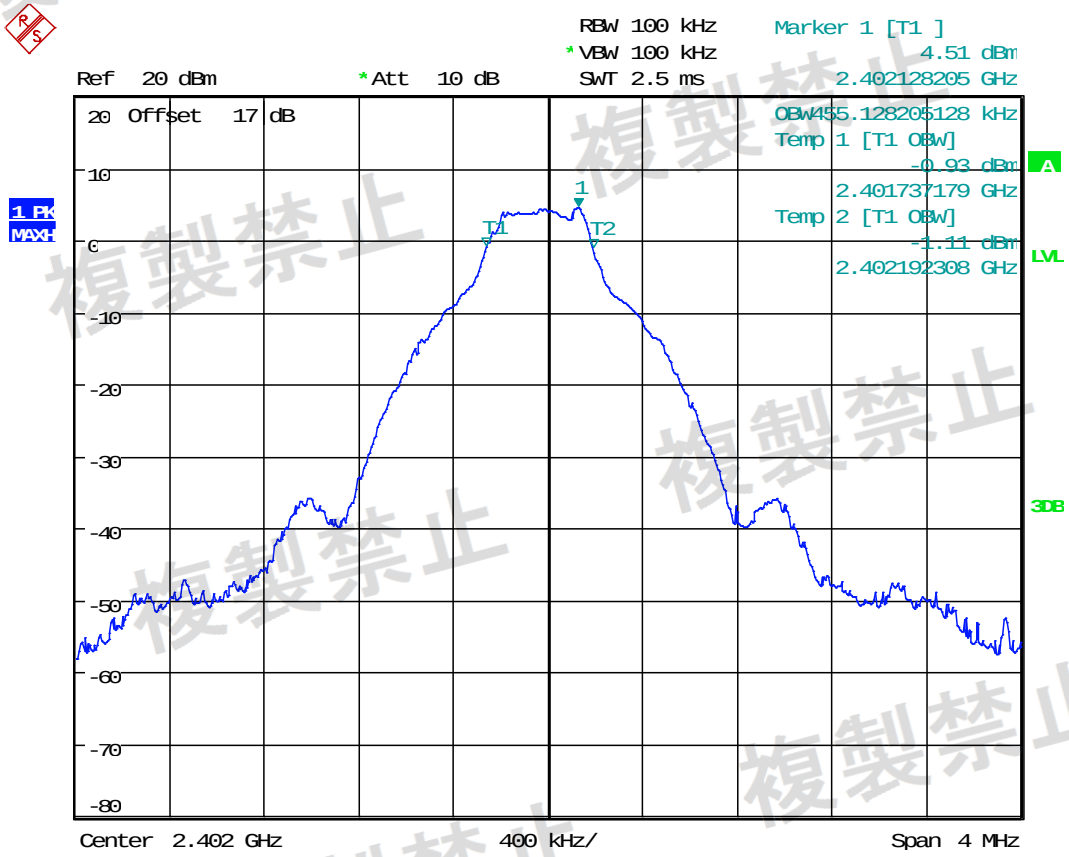


SPREADING BANDWIDTH 20 CHANNELS DH5 3.3V
Date: 29.JUL.2020 15:08:20



SPREADING BANDWIDTH 20 CHANNELS DH5 2.97V

Date: 29.JUL.2020 15:08:01



SPREADING BANDWIDTH 20 CHANNELS DH5 3.63V

Date: 29.JUL.2020 15:09:21

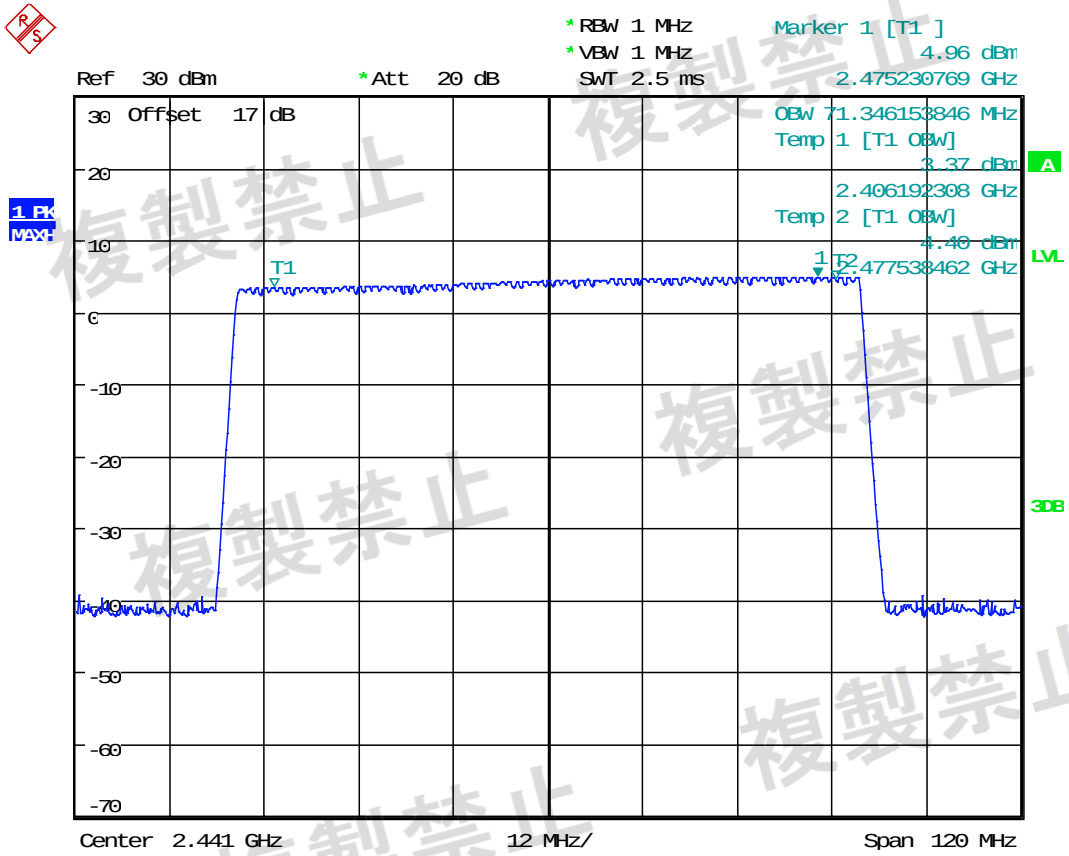
Minimal Spreading Bandwidth

= Smallest Spreading Bandwidth of a single channel + 0.9 * [(n-1)* channel separation]

= 0.455128205 17.1 17.555128

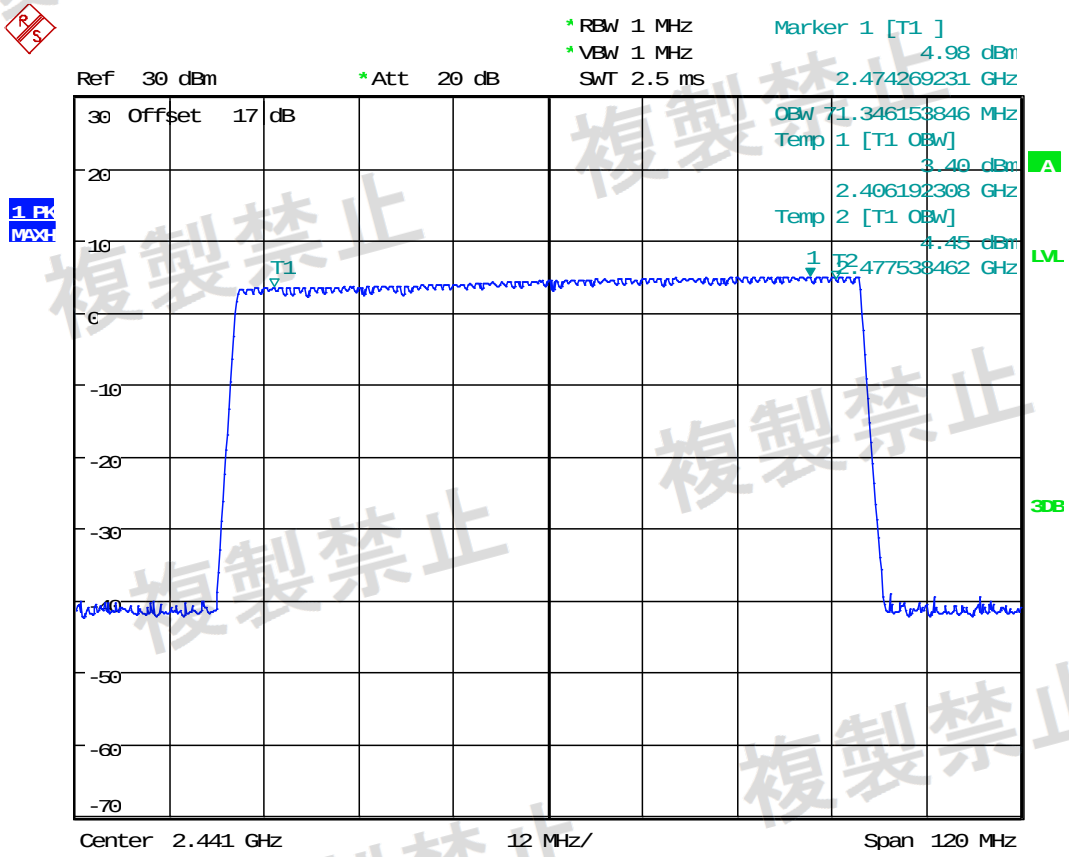
Note: n= minimum amount of channels

79 channels



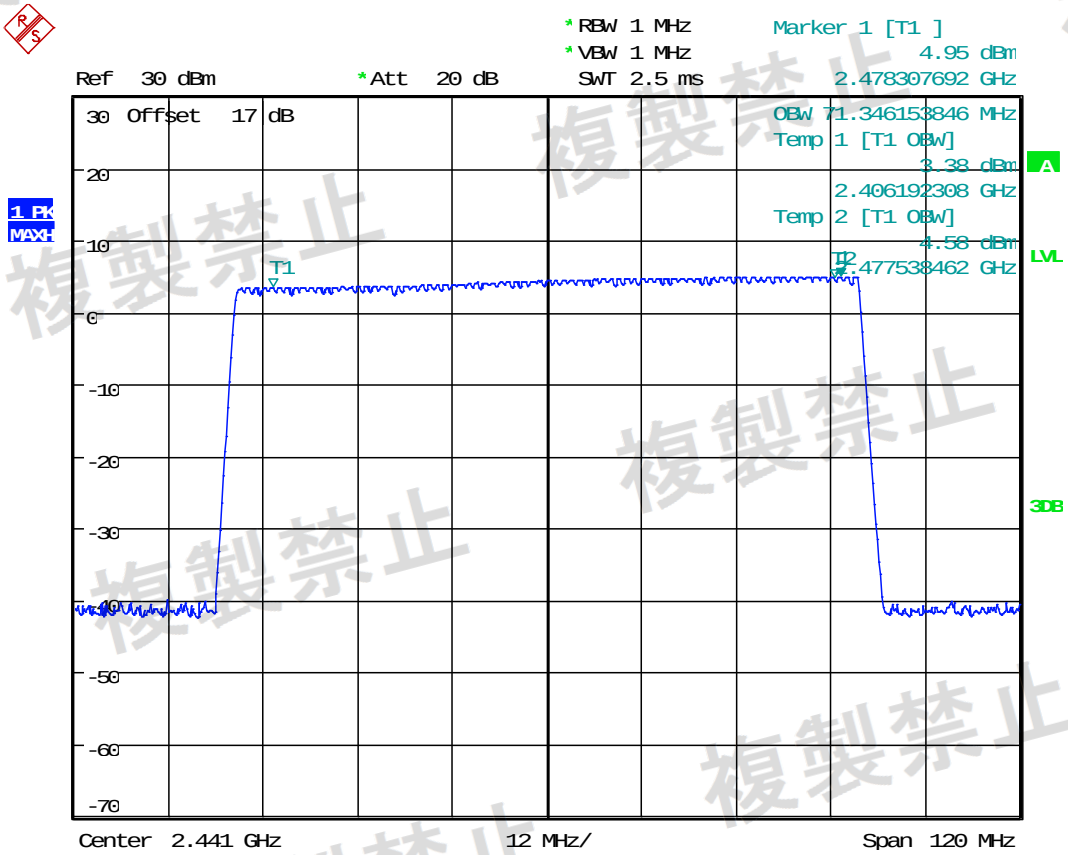
SPREADING BANDWIDTH 3.3V

Date: 17.JUL.2020 09:04:41



SPREADING BANDWIDTH 2.97V

Date: 17.JUL.2020 09:05:21

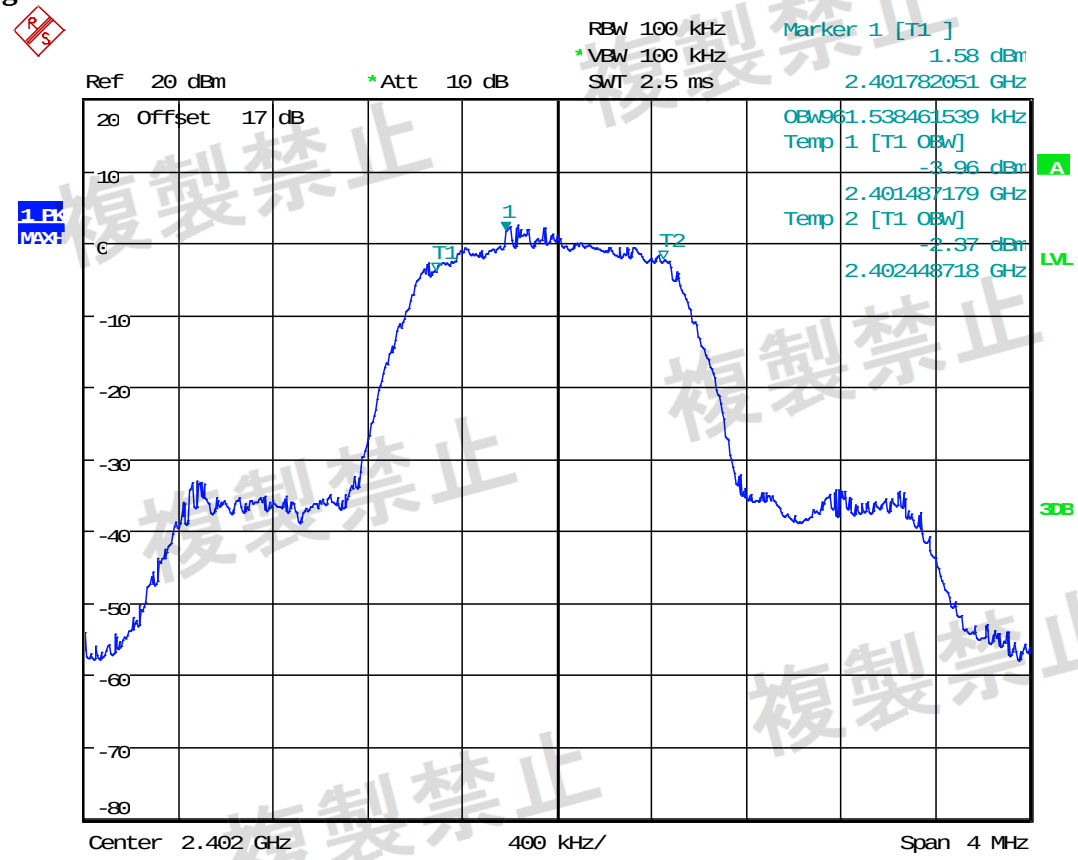


SPREADING BANDWIDTH 3.63V

Date: 17.JUL.2020 09:02:25

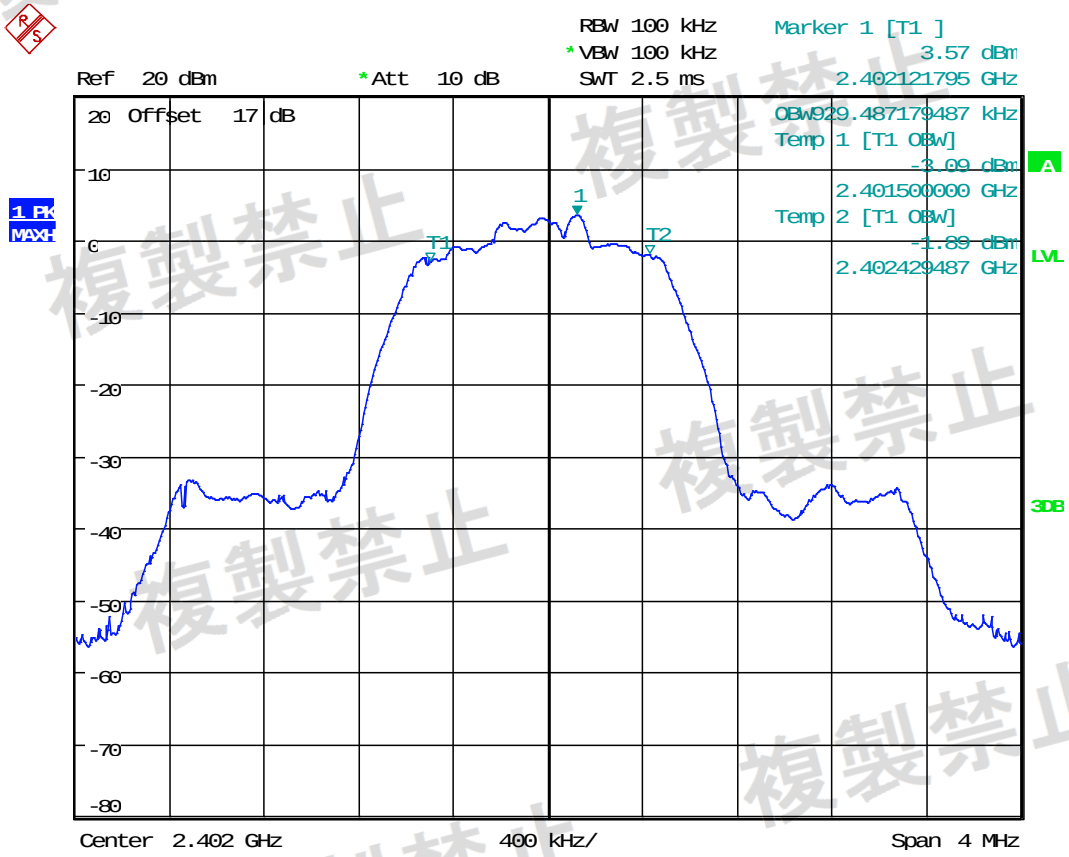
π/ 4DQPSK

Single channel for 20 channels



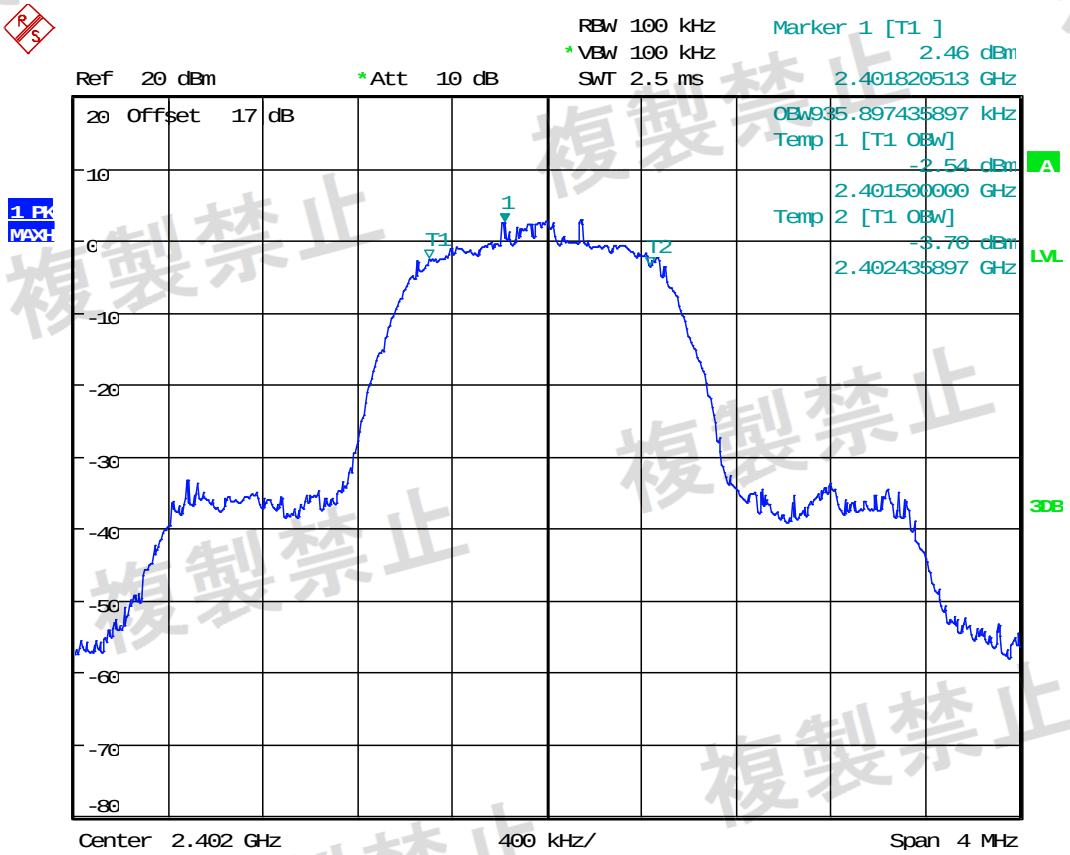
SPREADING BANDWIDTH 20 CHANNELS EDR 2DH5 3.3V

Date: 29.JUL.2020 15:01:34



SPREADING BANDWIDTH 20 CHANNELS EDR 2DH5 2.97V

Date: 29.JUL.2020 15:00:36



SPREADING BANDWIDTH 20 CHANNELS EDR 2DH5 3.63V

Date: 29.JUL.2020 15:01:45

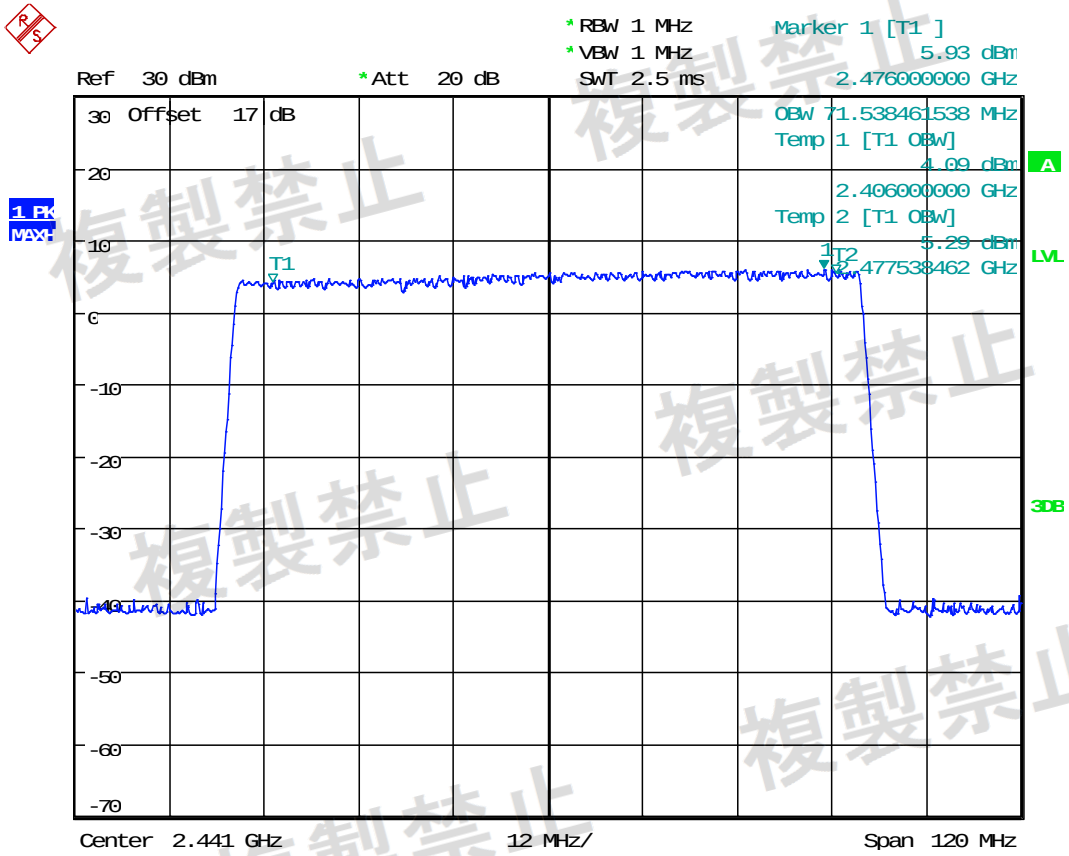
Minimal Spreading Bandwidth

= Smallest Spreading Bandwidth of a single channel + 0.9 * [(n-1)* channel separation]

= 0.929487179 17.1 18.029487

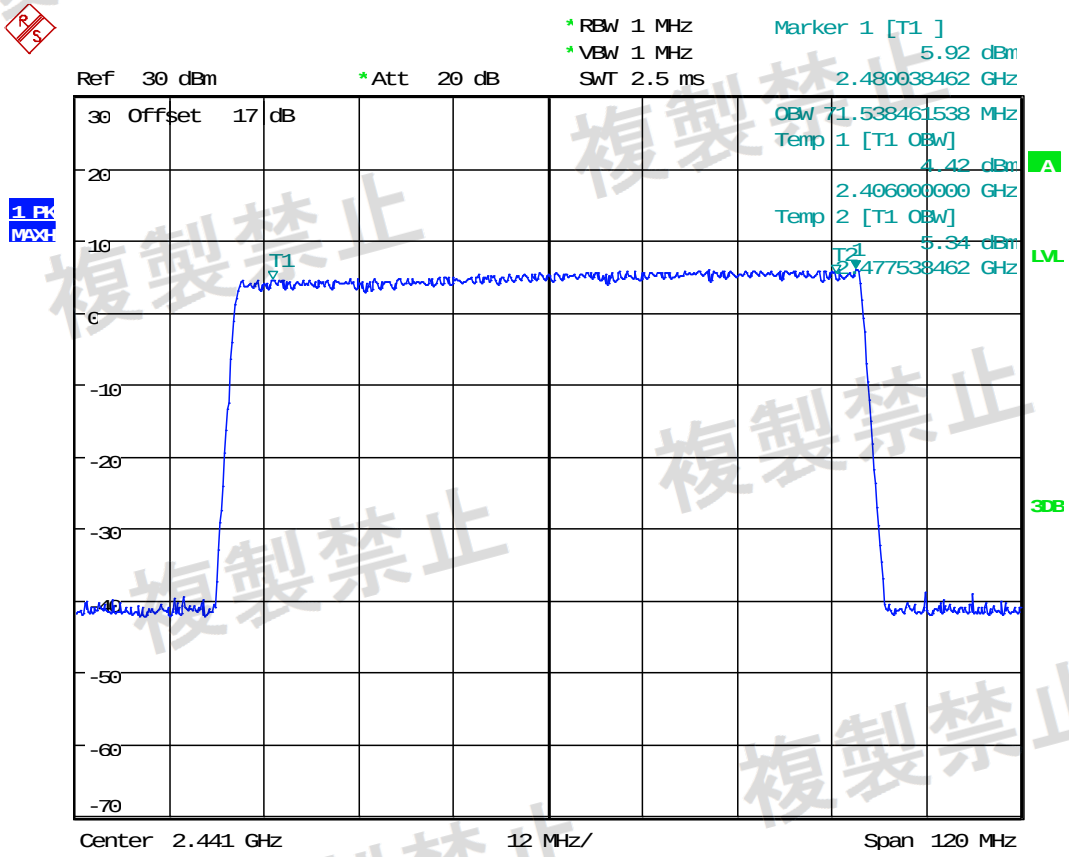
Note: n= minimum amount of channels

79 channels



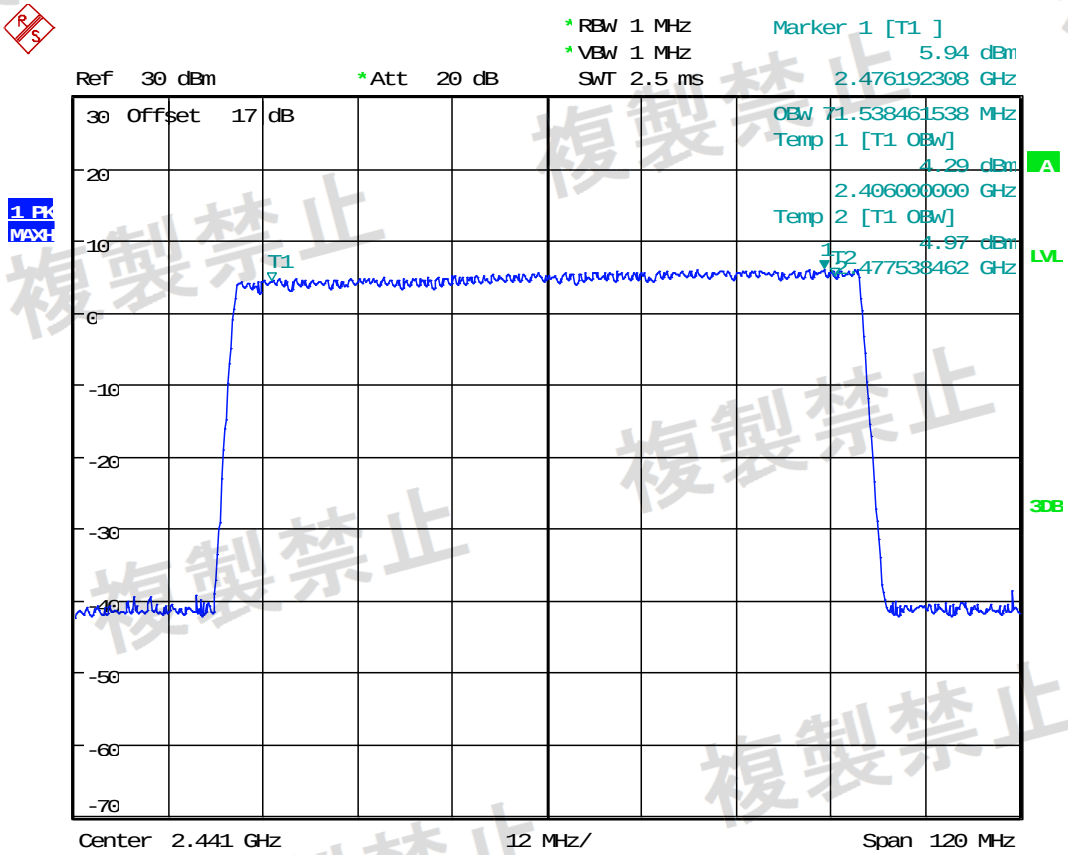
SPREADING BANDWIDTH EDR 2M 3.3V

Date: 17.JUL.2020 08:58:32



SPREADING BANDWIDTH EDR 2M 2.97V

Date: 17.JUL.2020 08:57:38

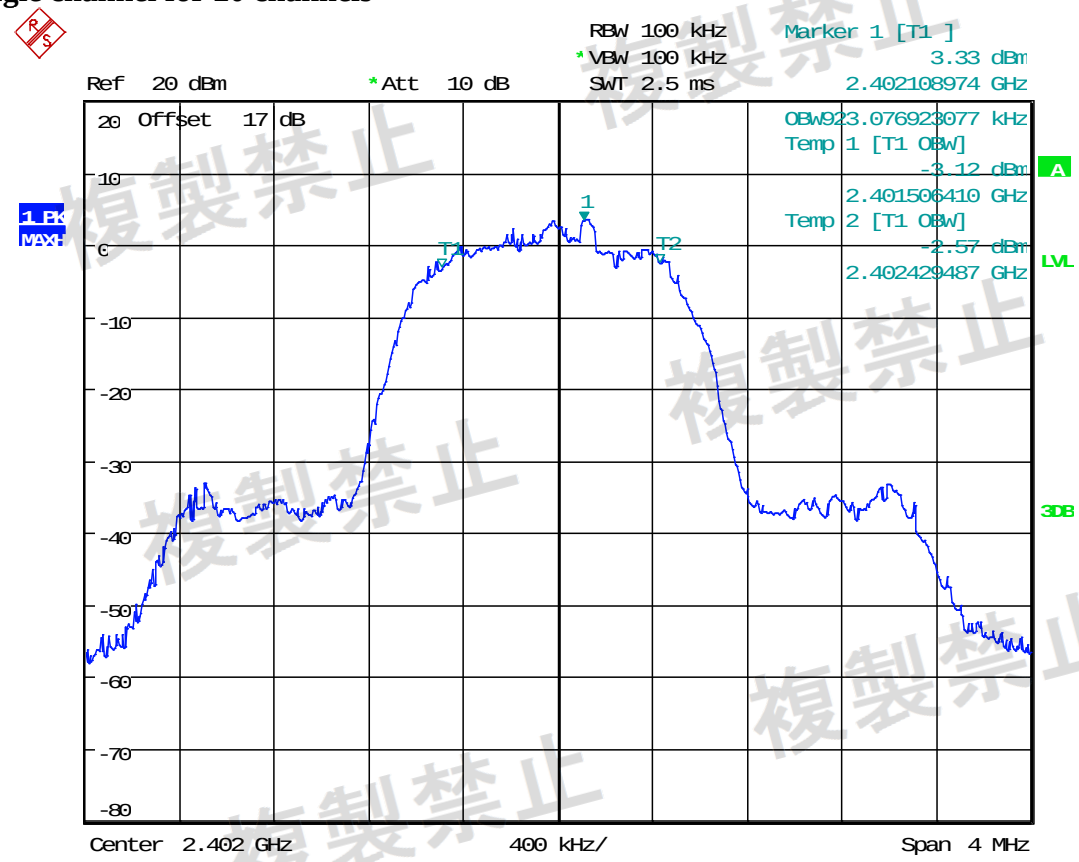


SPREADING BANDWIDTH EDR 2M 3.63V

Date: 17.JUL.2020 09:01:15

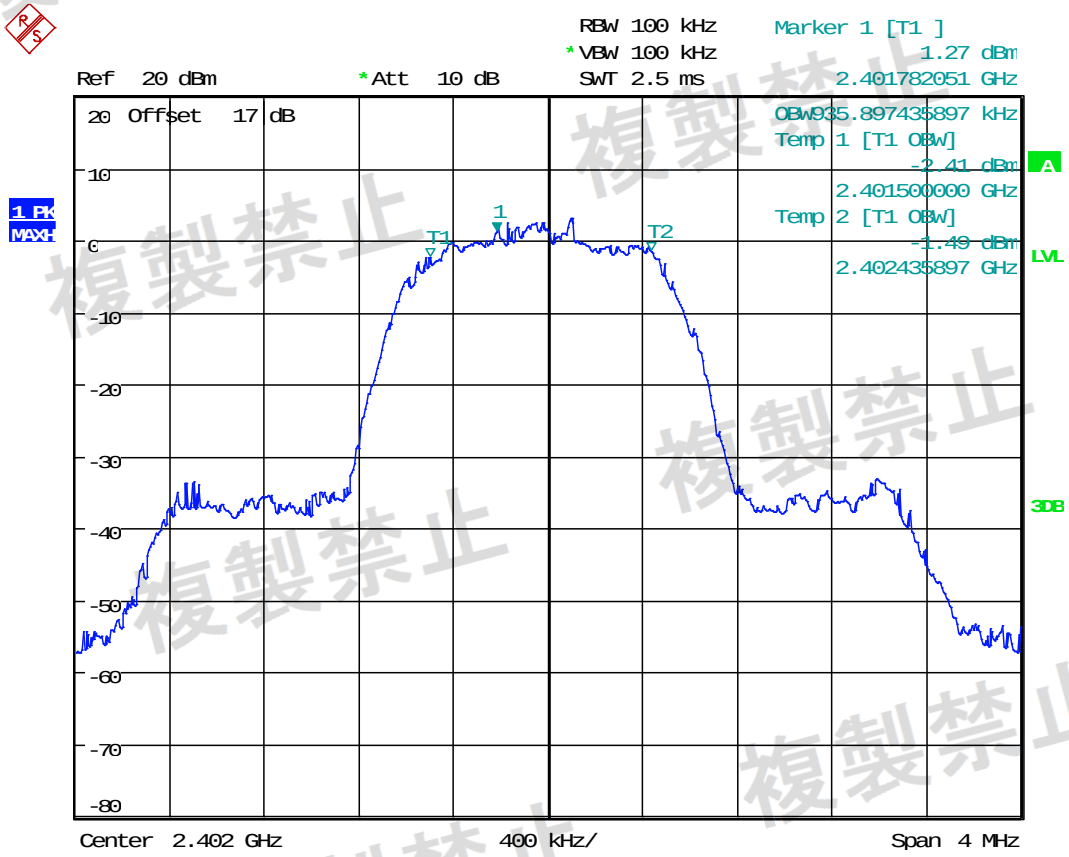
8DPSK

Single channel for 20 channels



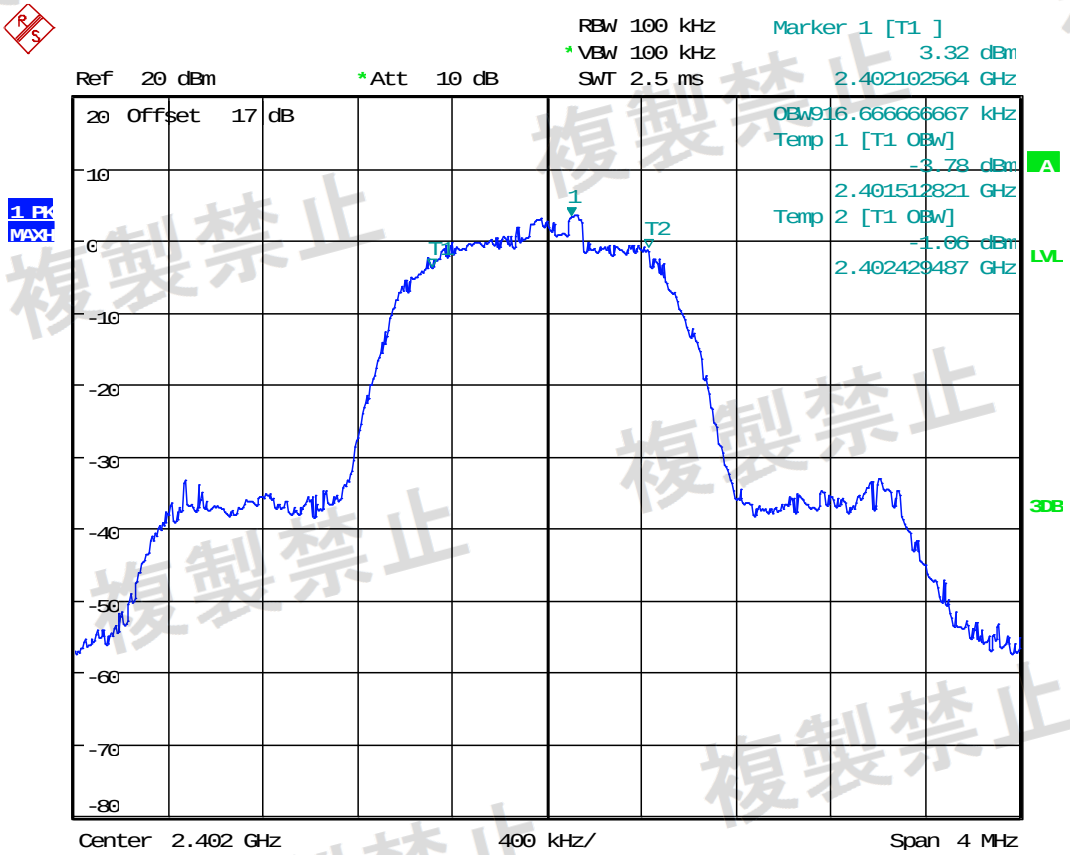
SPREADING BANDWIDTH 20 CHANNELS EDR 3DH5 3.3V

Date: 29.JUL.2020 15:03:52



SPREADING BANDWIDTH 20 CHANNELS EDR 3DH5 2.97V

Date: 29.JUL.2020 15:04:50



SPREADING BANDWIDTH 20 CHANNELS EDR 3DH5 3.63V

Date: 29.JUL.2020 15:03:39

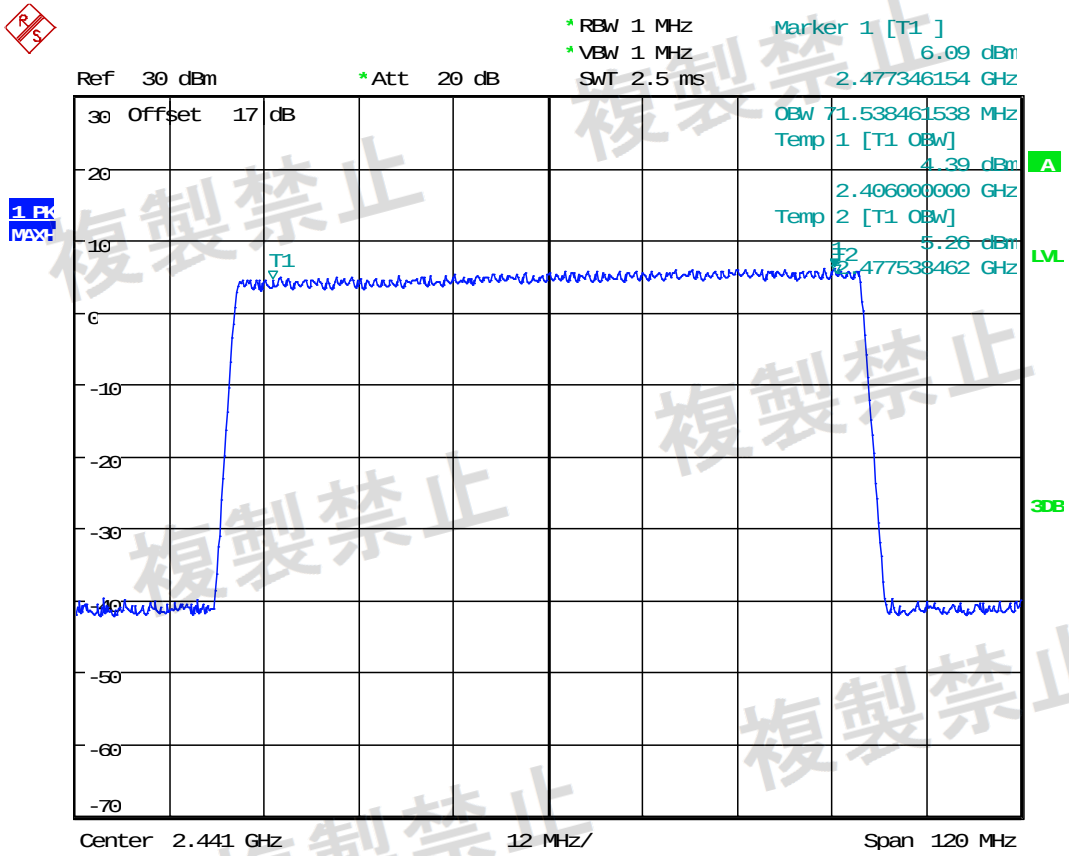
Minimal Spreading Bandwidth

= Smallest Spreading Bandwidth of a single channel + 0.9 * [(n-1)* channel separation]

= 0.91666666 17.1 18.016667

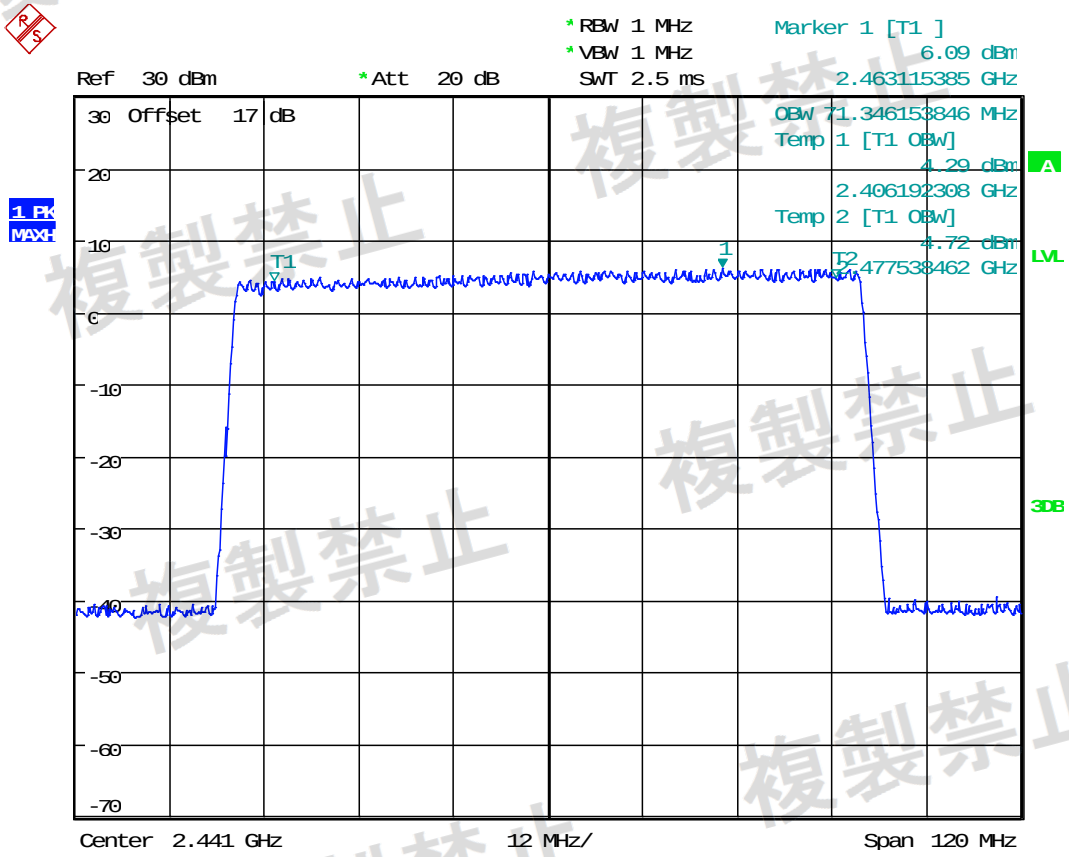
Note: n= minimum amount of channels

79 channels



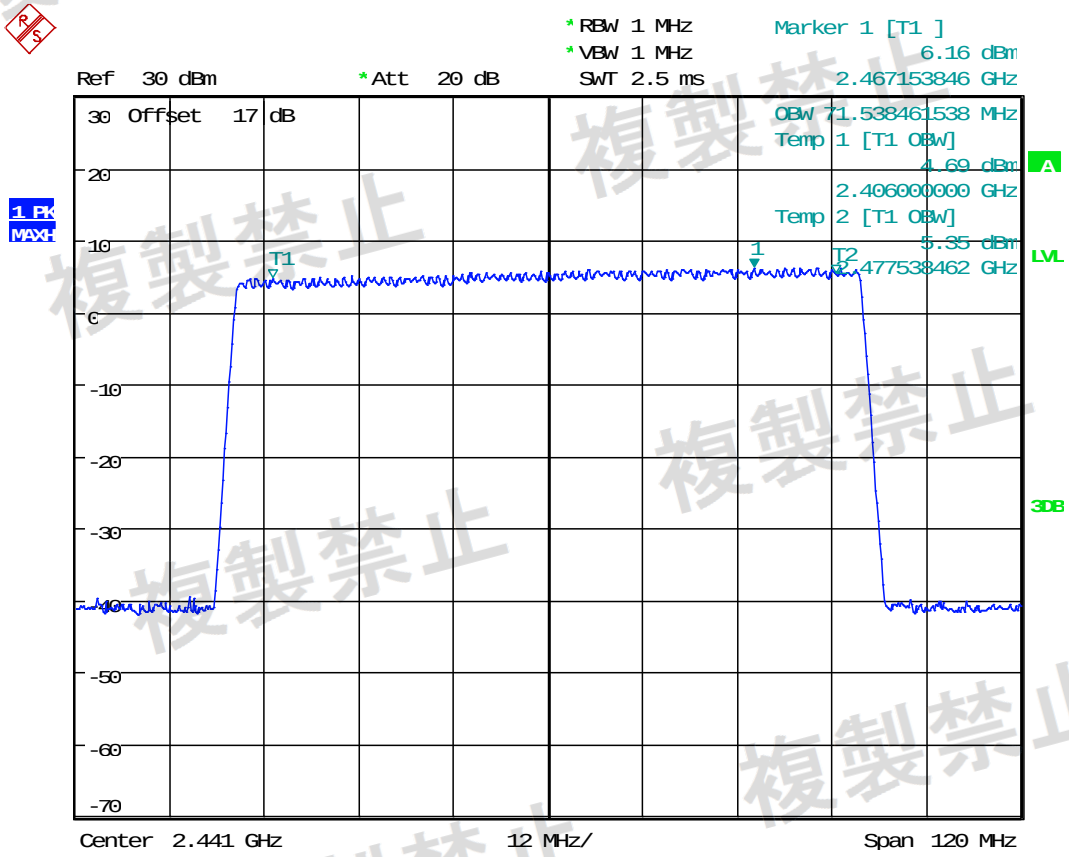
SPREADING BANDWIDTH EDR 3M 3.3V

Date: 17.JUL.2020 08:53:50



SPREADING BANDWIDTH EDR 3M 2.97V

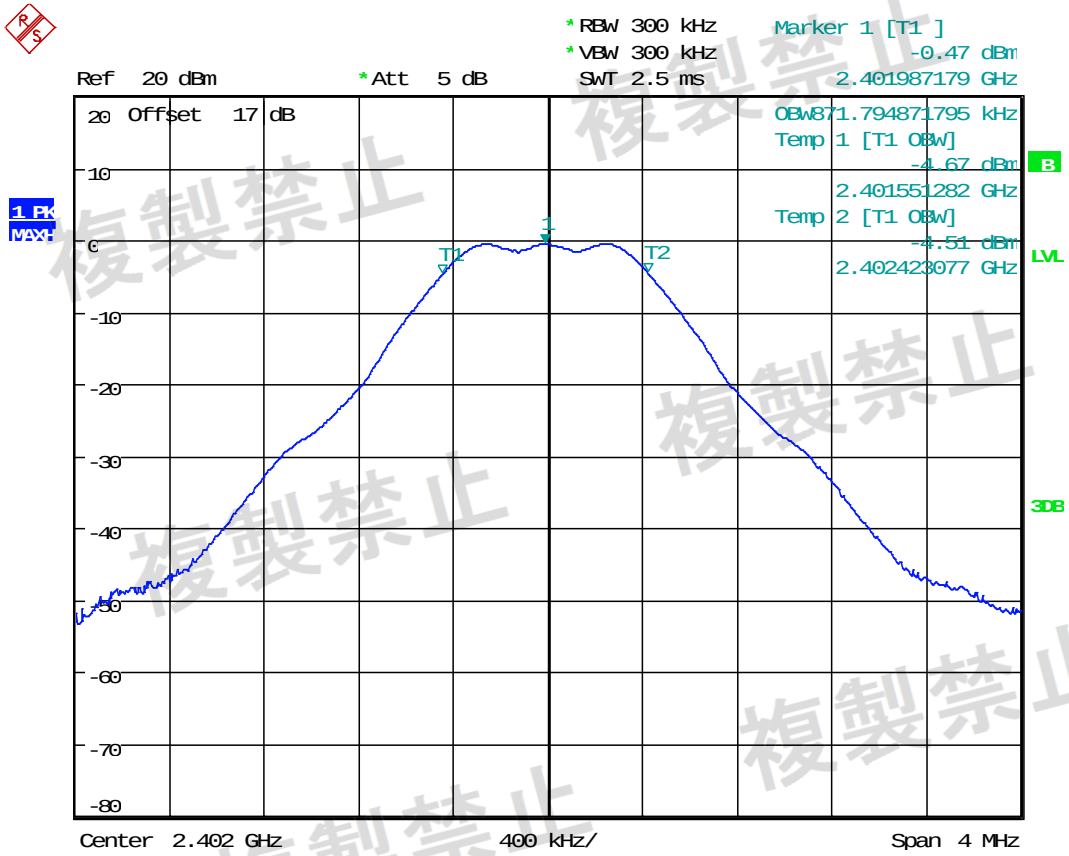
Date: 17.JUL.2020 08:54:32



SPREADING BANDWIDTH EDR 3M 3.63V

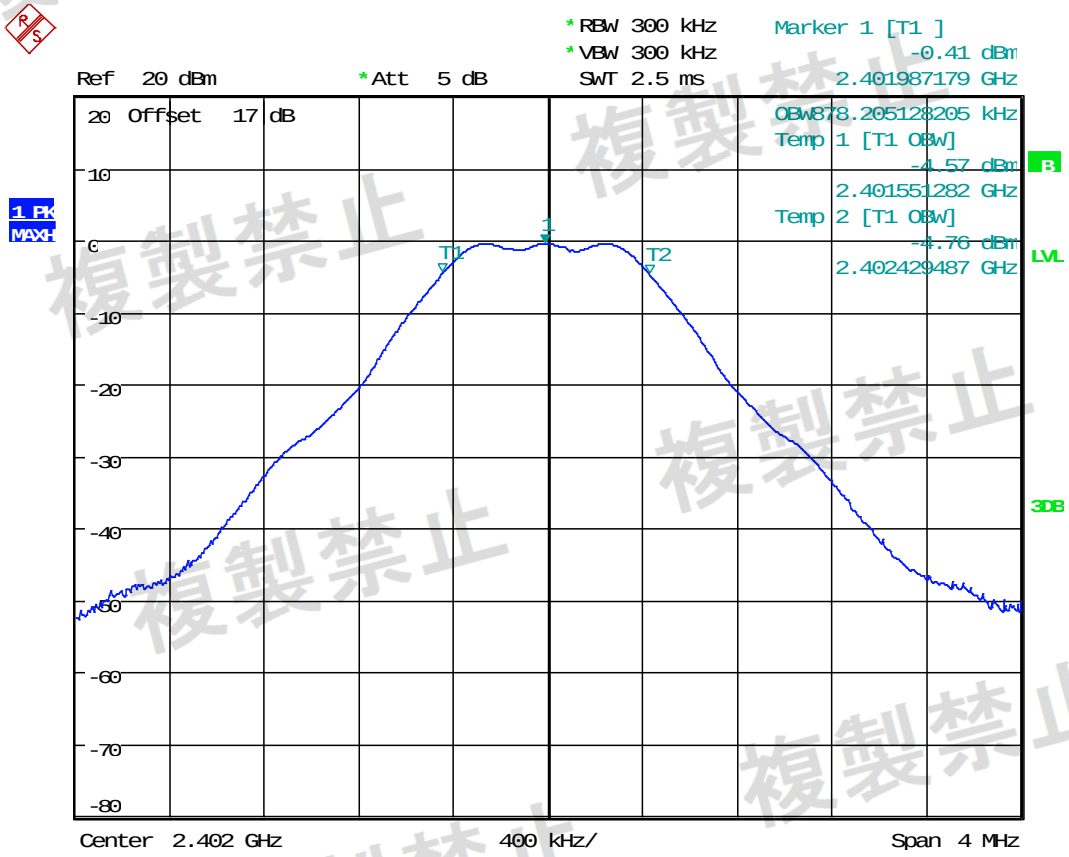
Date: 17.JUL.2020 08:51:16

Bluetooth4.0



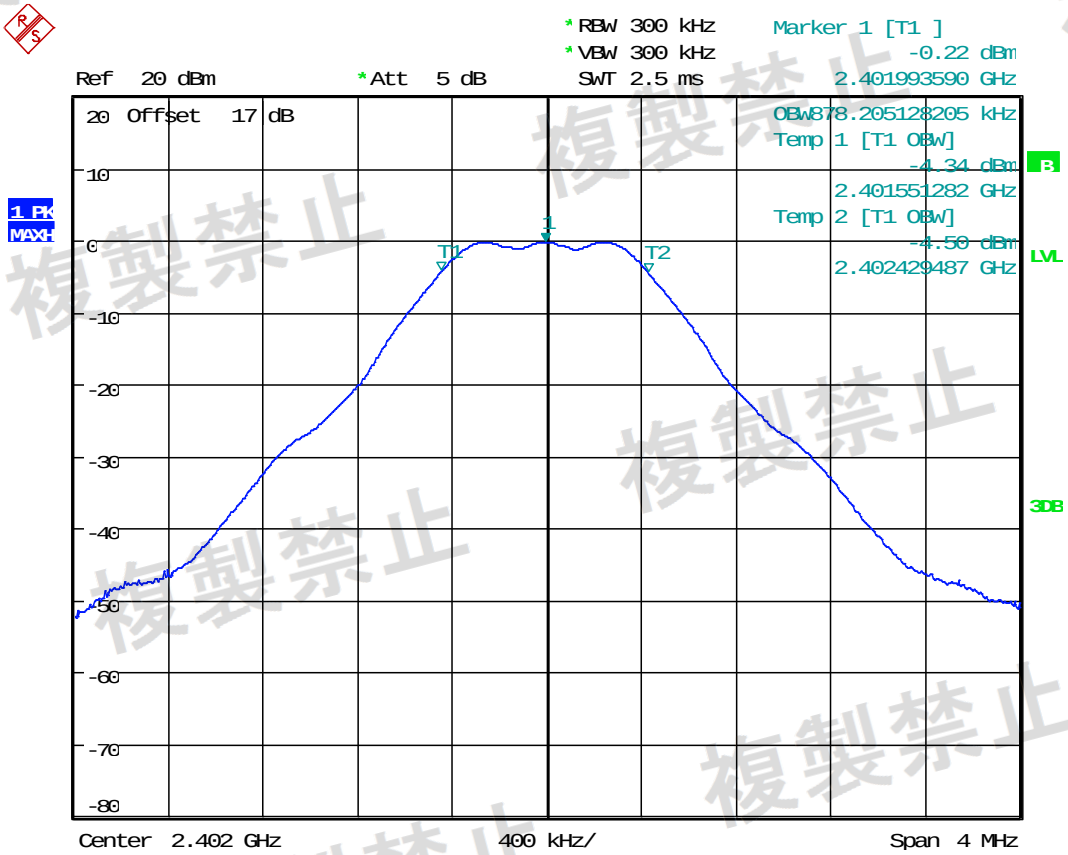
BLE SPREADING BANDWIDTH CH0 3.3V

Date: 17.JUL.2020 16:23:46



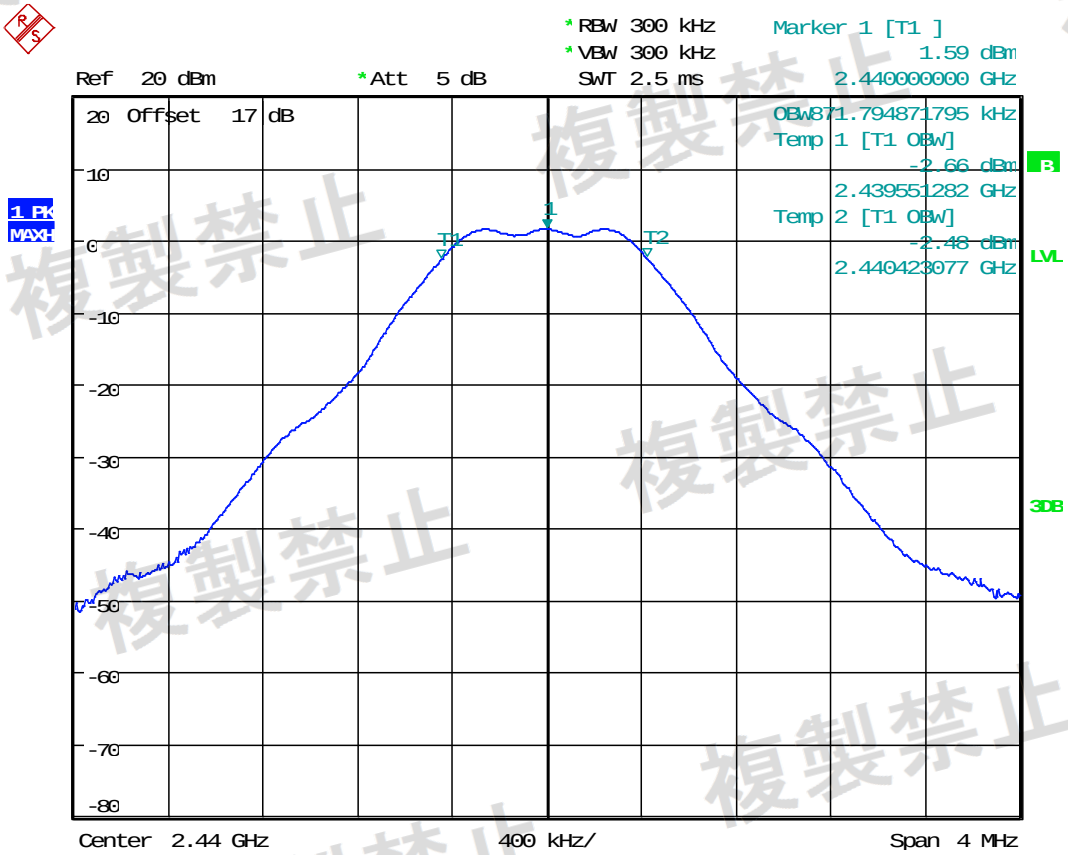
BLE SPREADING BANDWIDTH CH0 2.97V

Date: 17.JUL.2020 16:24:08



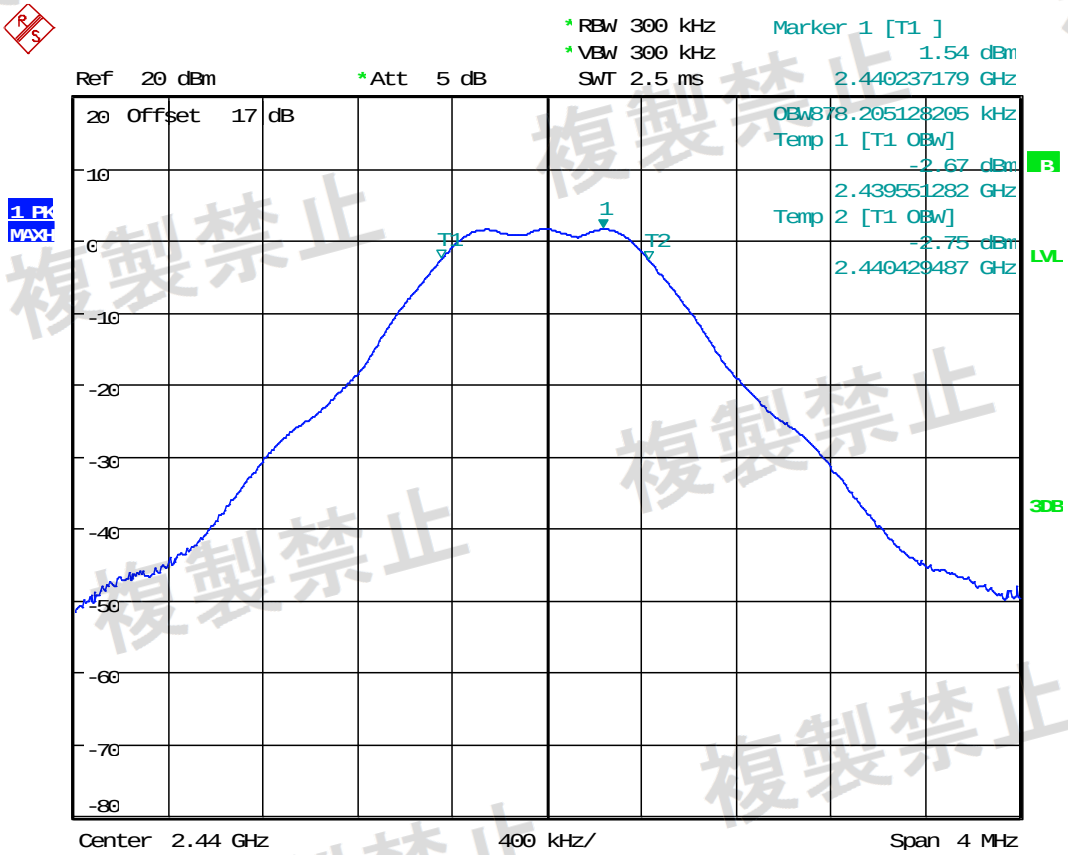
BLE SPREADING BANDWIDTH CH0 3.63V

Date: 17.JUL.2020 16:22:55



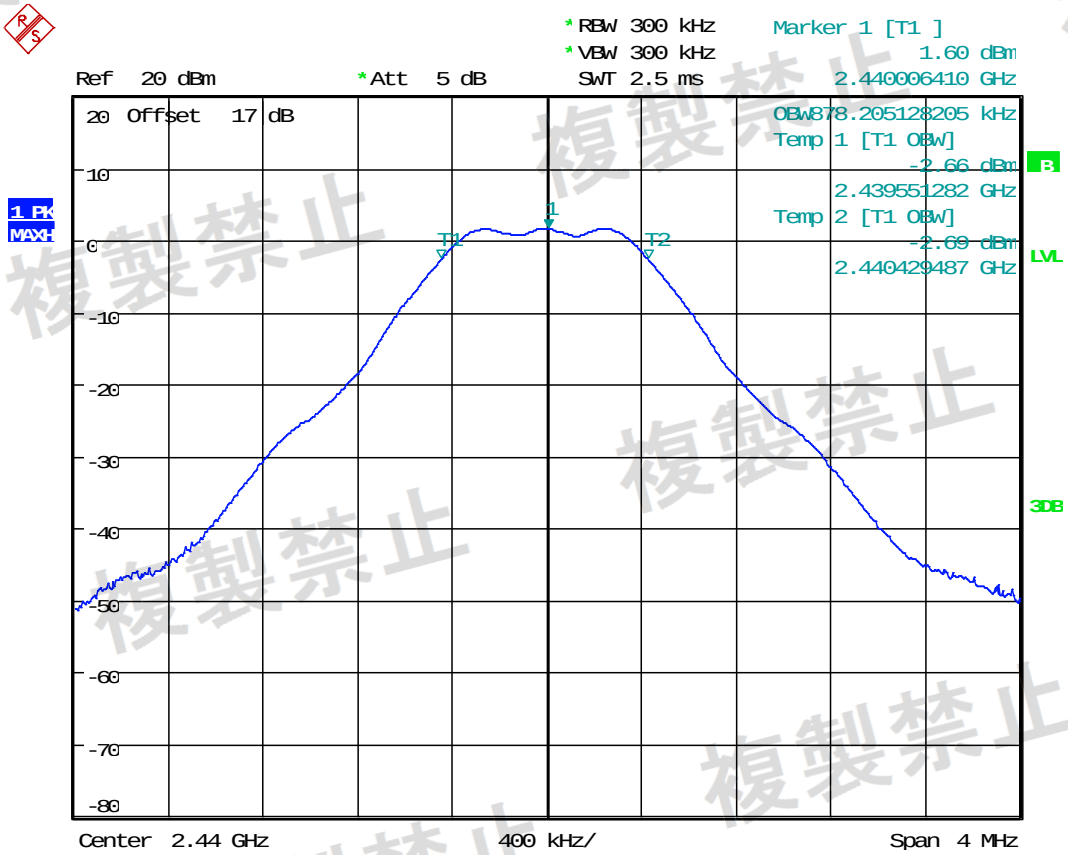
BLE SPREADING BANDWIDTH CH19 3.3V

Date: 17.JUL.2020 16:25:30



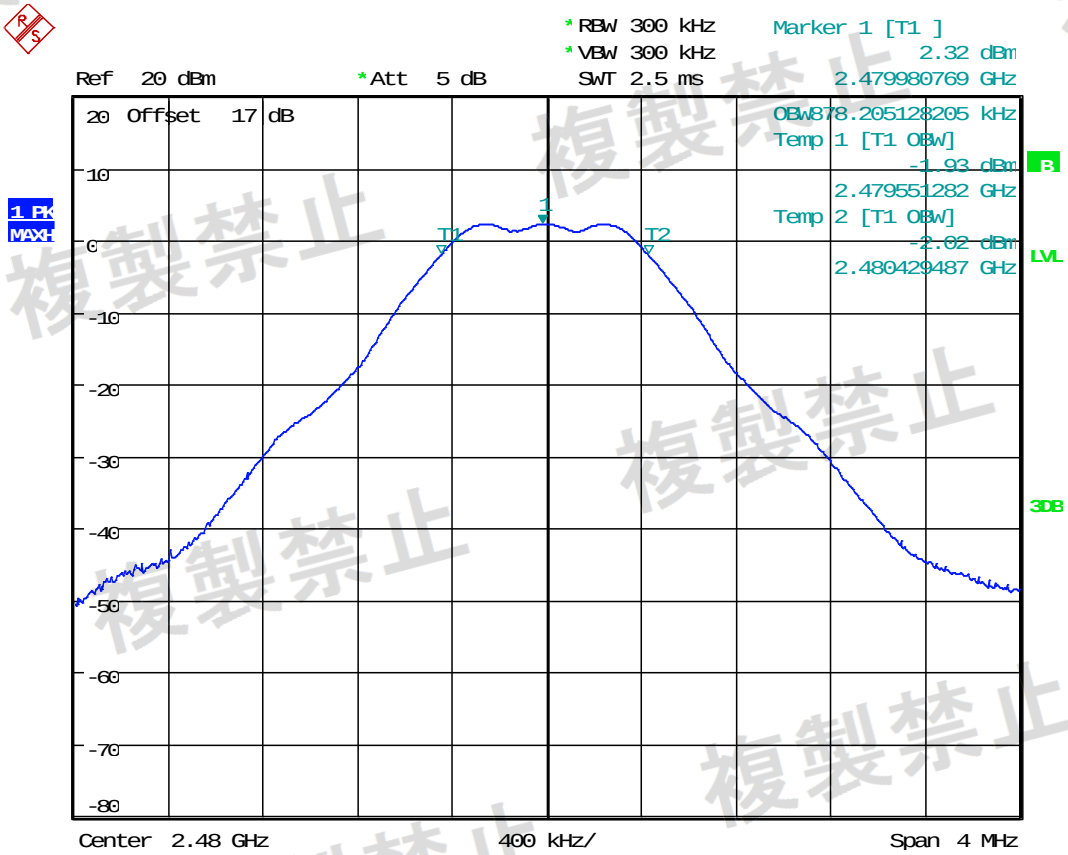
BLE SPREADING BANDWIDTH CH19 2.97V

Date: 17.JUL.2020 16:25:12



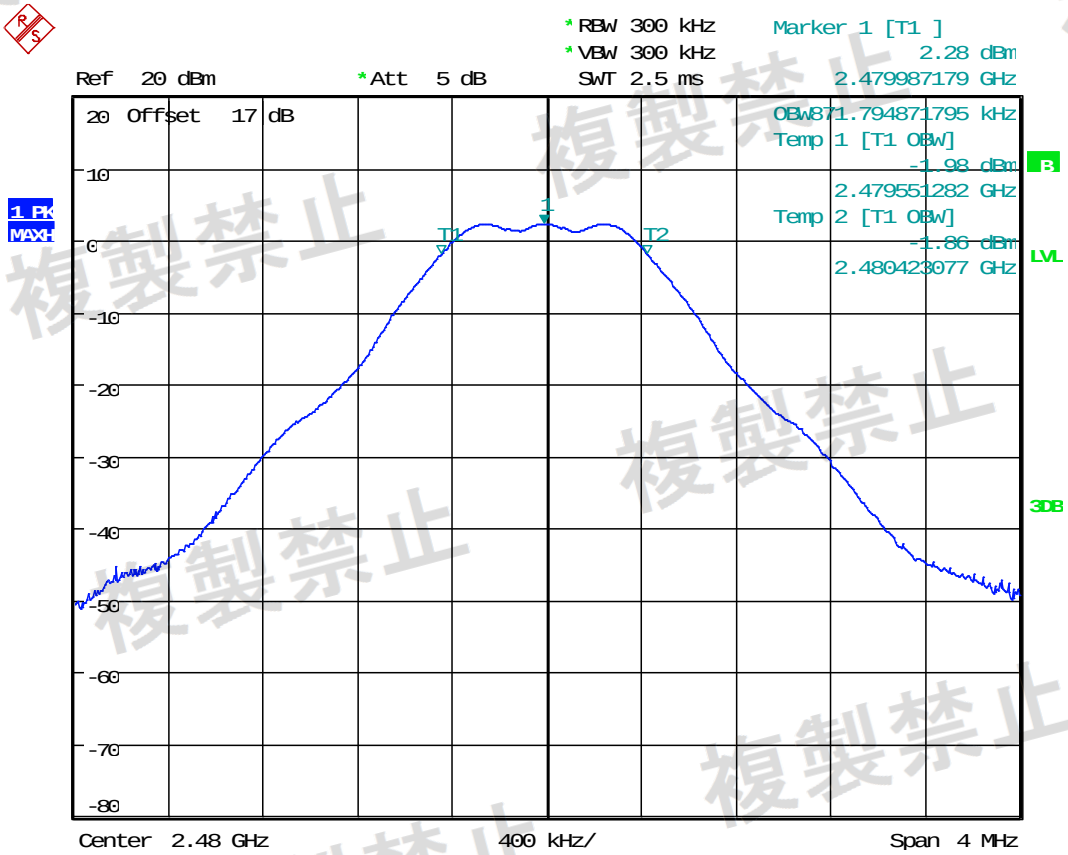
BLE SPREADING BANDWIDTH CH19 3.63V

Date: 17.JUL.2020 16:26:49



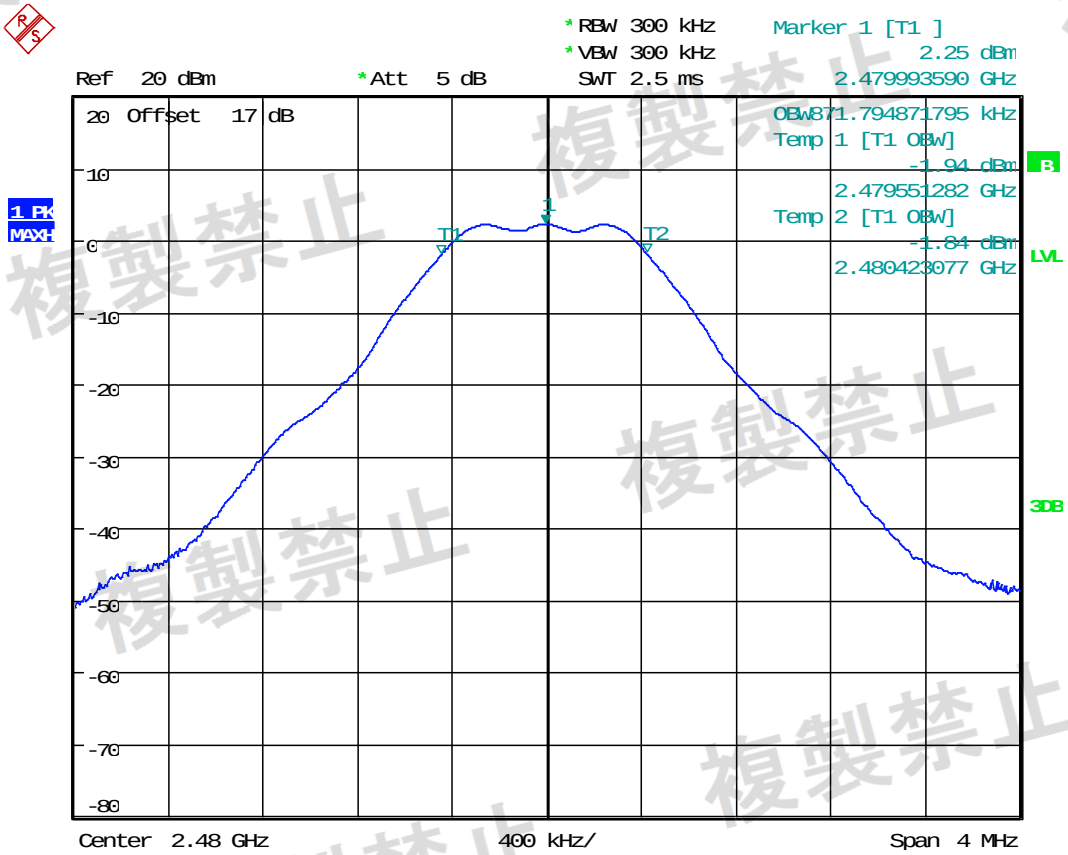
BLE SPREADING BANDWIDTH CH39 3.3V

Date: 17.JUL.2020 16:28:05



BLE SPREADING BANDWIDTH CH39 2.97V

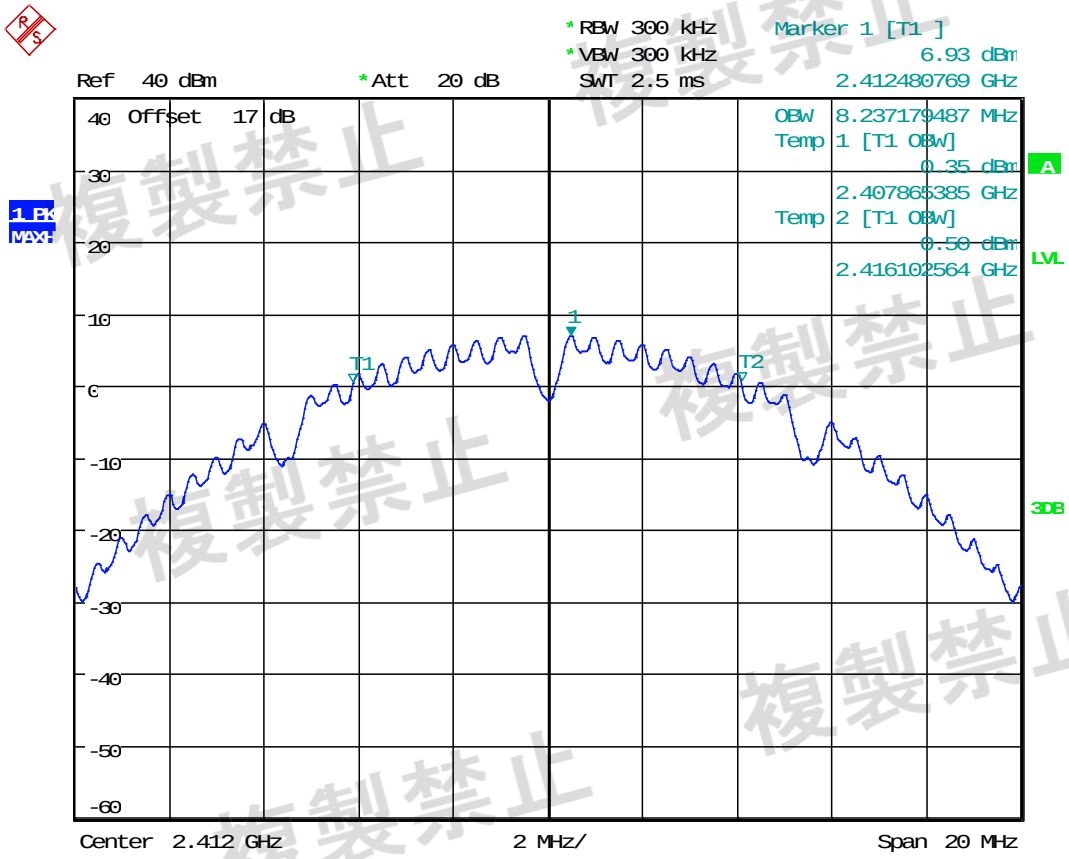
Date: 17.JUL.2020 16:28:20



BLE SPREADING BANDWIDTH CH39 3.63V

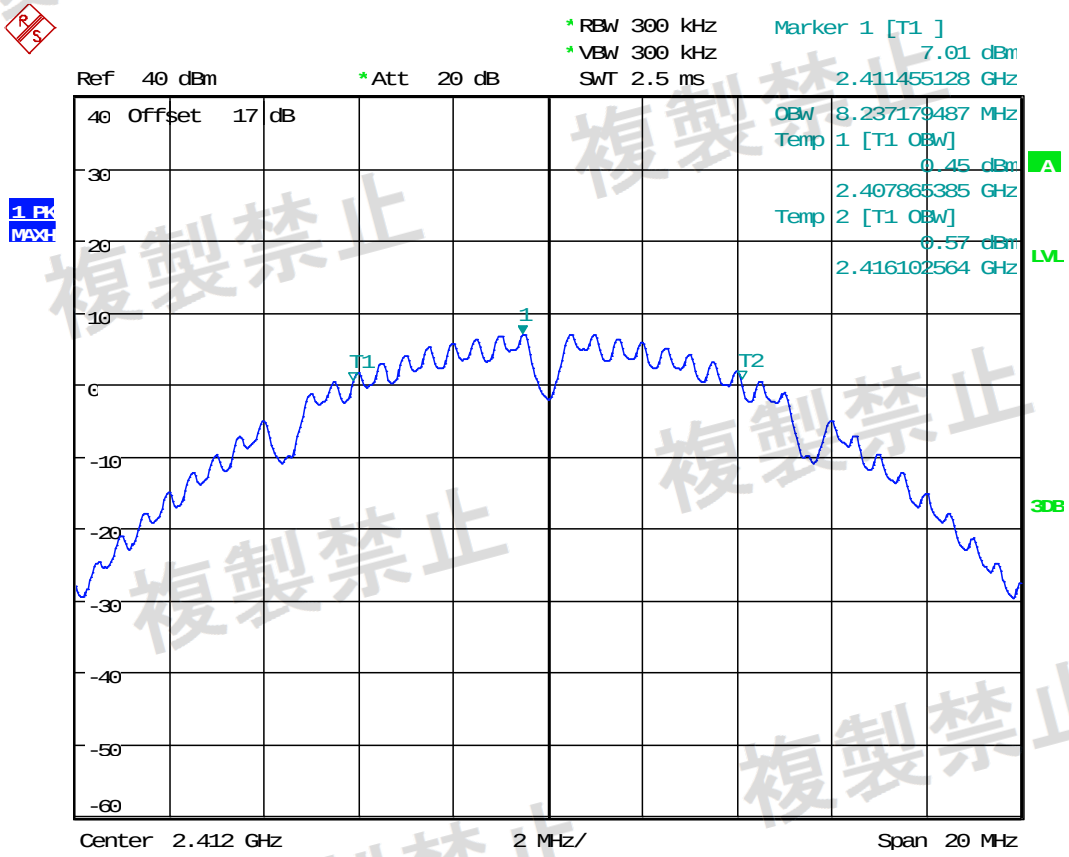
Date: 17.JUL.2020 16:27:23

WLAN
IEEE 802.11b



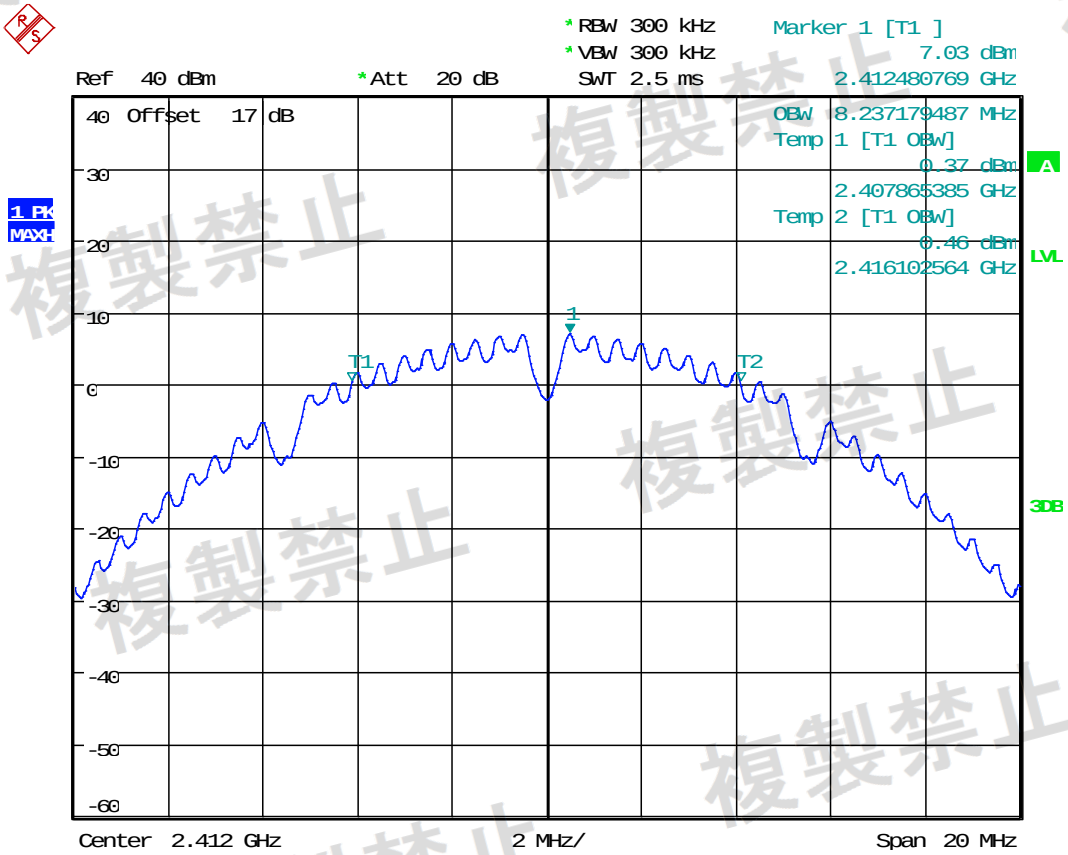
SPREADING BANDWIDTH 802.11B CH1 3.3V

Date: 19.JUL.2020 10:56:13



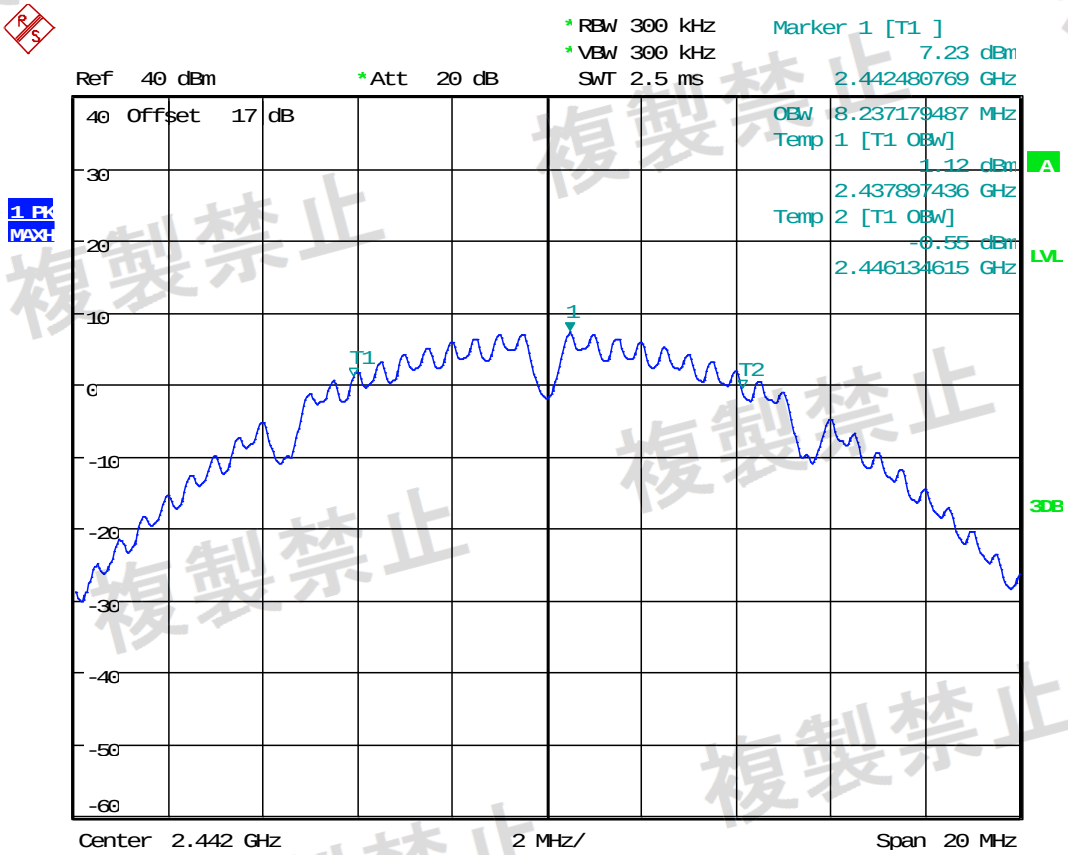
SPREADING BANDWIDTH 802.11B CH1 2.97V

Date: 19.JUL.2020 10:56:34



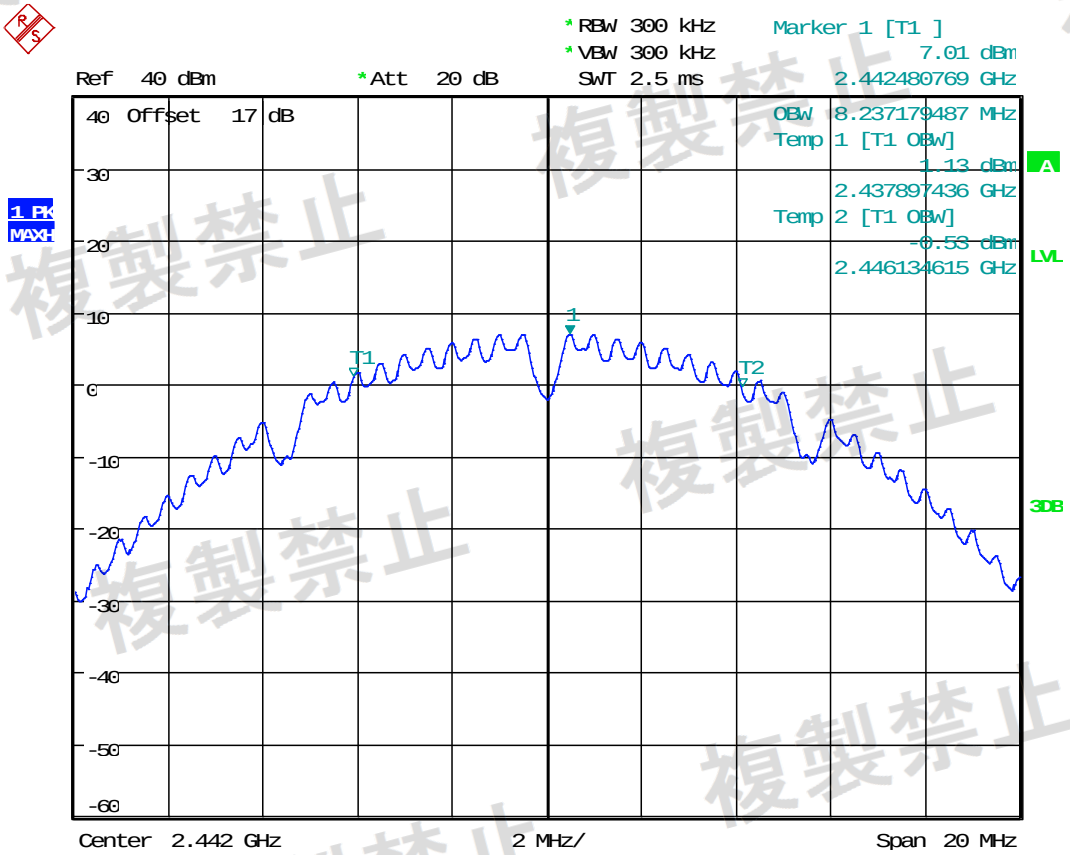
SPREADING BANDWIDTH 802.11B CH1 3.63V

Date: 19.JUL.2020 10:55:12



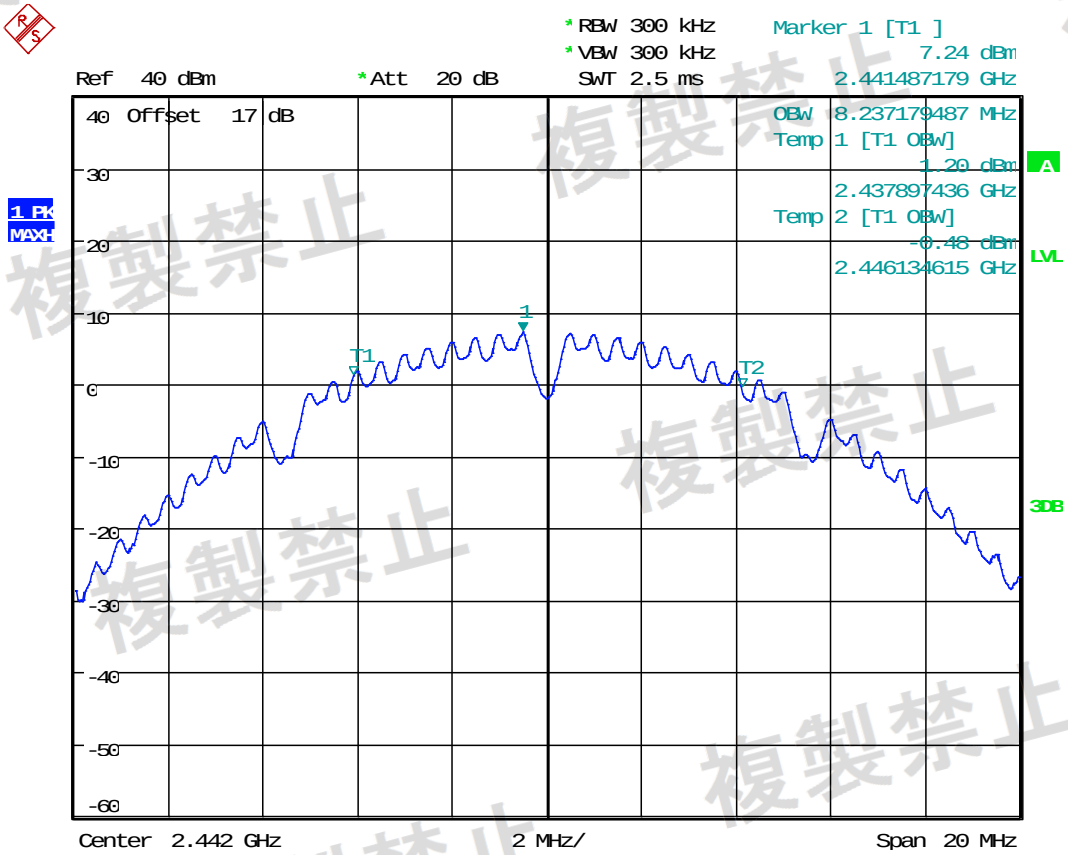
SPREADING BANDWIDTH 802.11B CH7 3.3V

Date: 19.JUL.2020 10:58:01



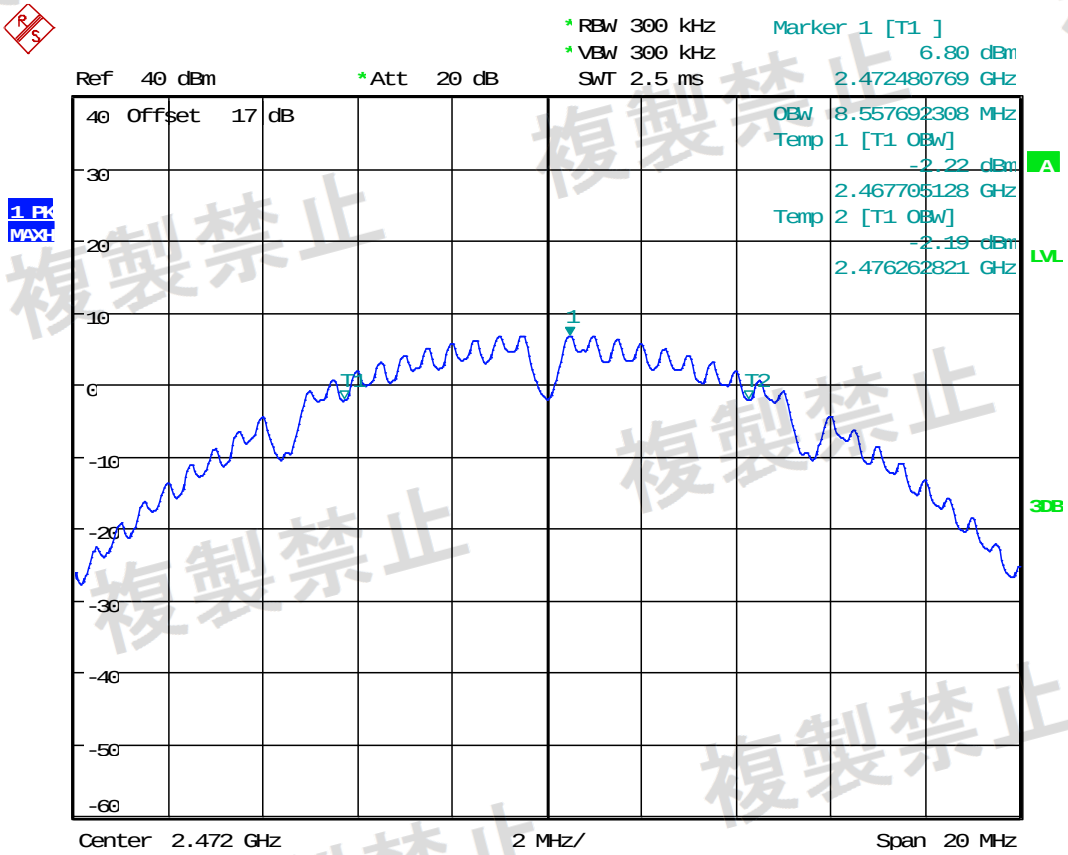
SPREADING BANDWIDTH 802.11B CH7 2.97V

Date: 19.JUL.2020 10:57:44



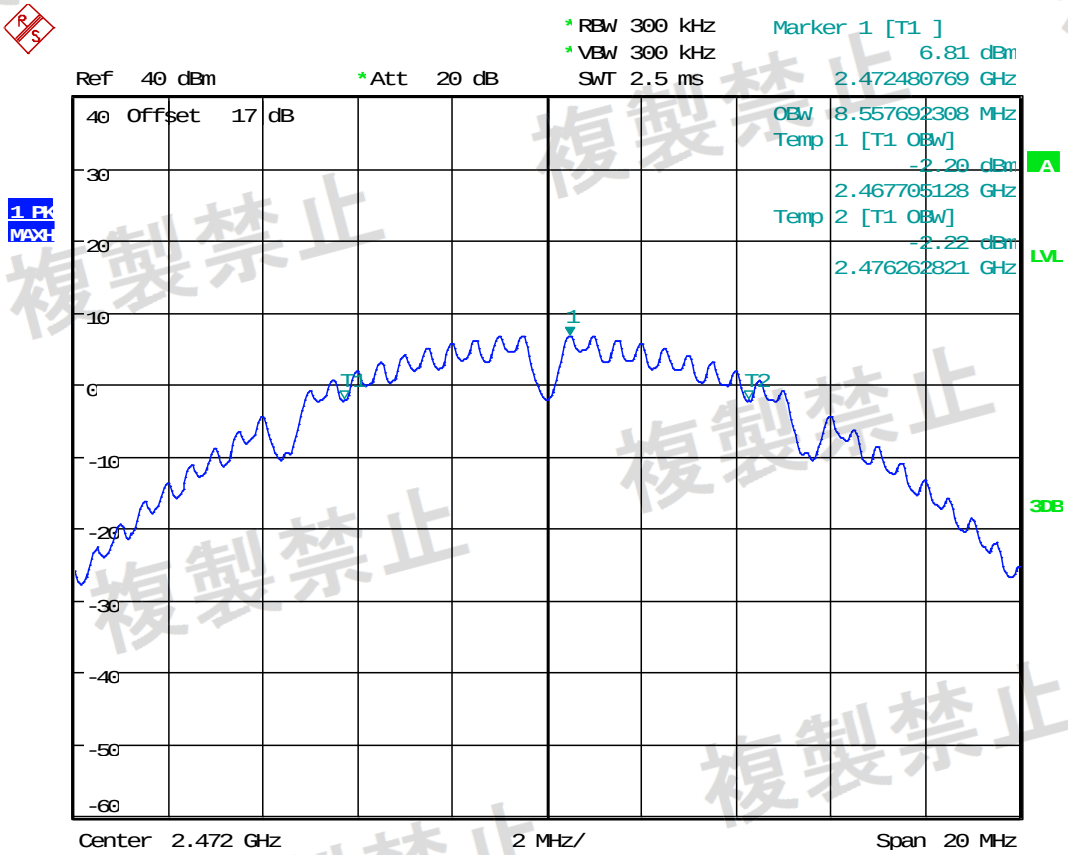
SPREADING BANDWIDTH 802.11B CH7 3.63V

Date: 19.JUL.2020 10:58:43



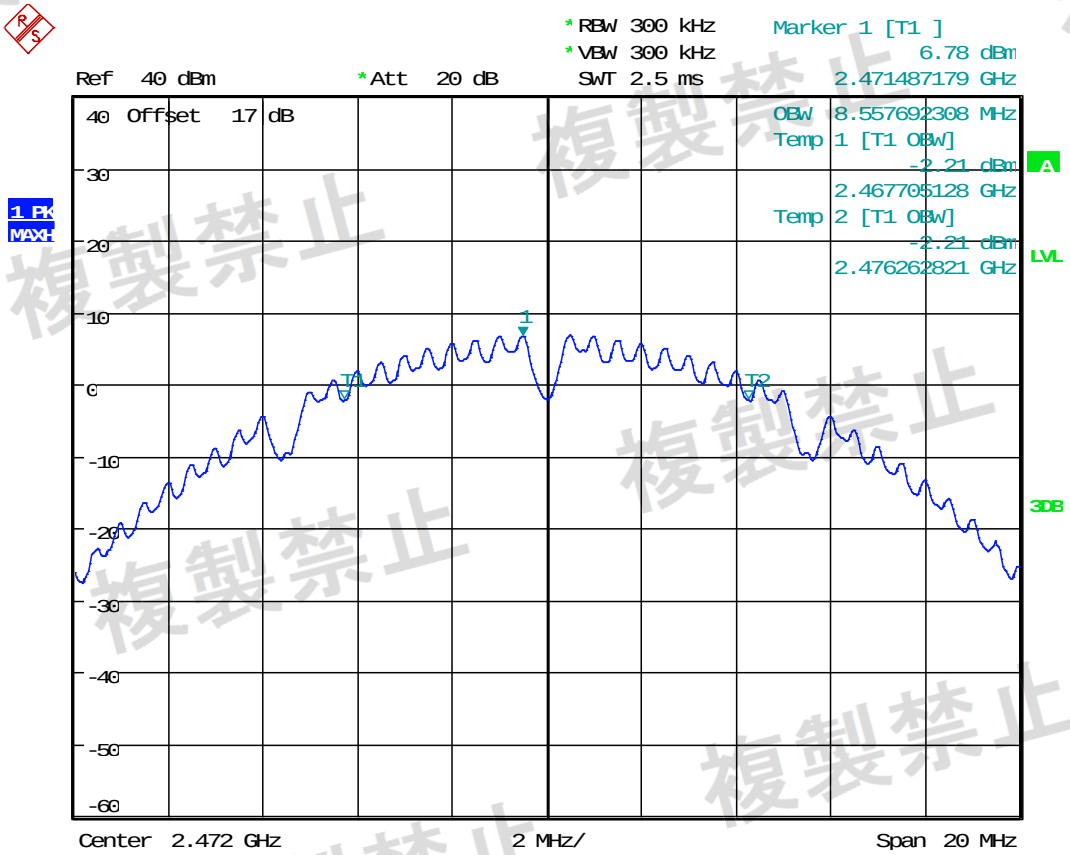
SPREADING BANDWIDTH 802.11B CH13 3.3V

Date: 19.JUL.2020 10:59:57



SPREADING BANDWIDTH 802.11B CH13 2.97V

Date: 19.JUL.2020 11:00:13



SPREADING BANDWIDTH 802.11B CH13 3.63V

Date: 19.JUL.2020 10:59:13

Limits:

Under all test conditions	DS, FH, FH+DS, FH+OFDM : 500kHz or more

Test equipment used: ETSTW-RE 050, ETSTW-RE 055, ETSTW-RE 064, ETSTW-GSM 023

3.4.2 Spreading Factor

Bluetooth2.0:

Spreading Factor = Spreading Bandwidth / Baudrate = 71.538461538 / 1 = 71.538461538

Limits:

Under all test conditions	Occupied bandwidth: ≥ 500 kHz Spreading factor: Operating frequency 2400 – 2483 MHz: ≥ 5 Operating frequency 2471 – 2497 MHz: ≥ 10

Test equipment used: ETSTW-RE 055

WLAN

Spreading Factor	
IEEE 802.11b	6.2237

Spreading factor: Spreading bandwidth / throughput (1.375 Mbps)

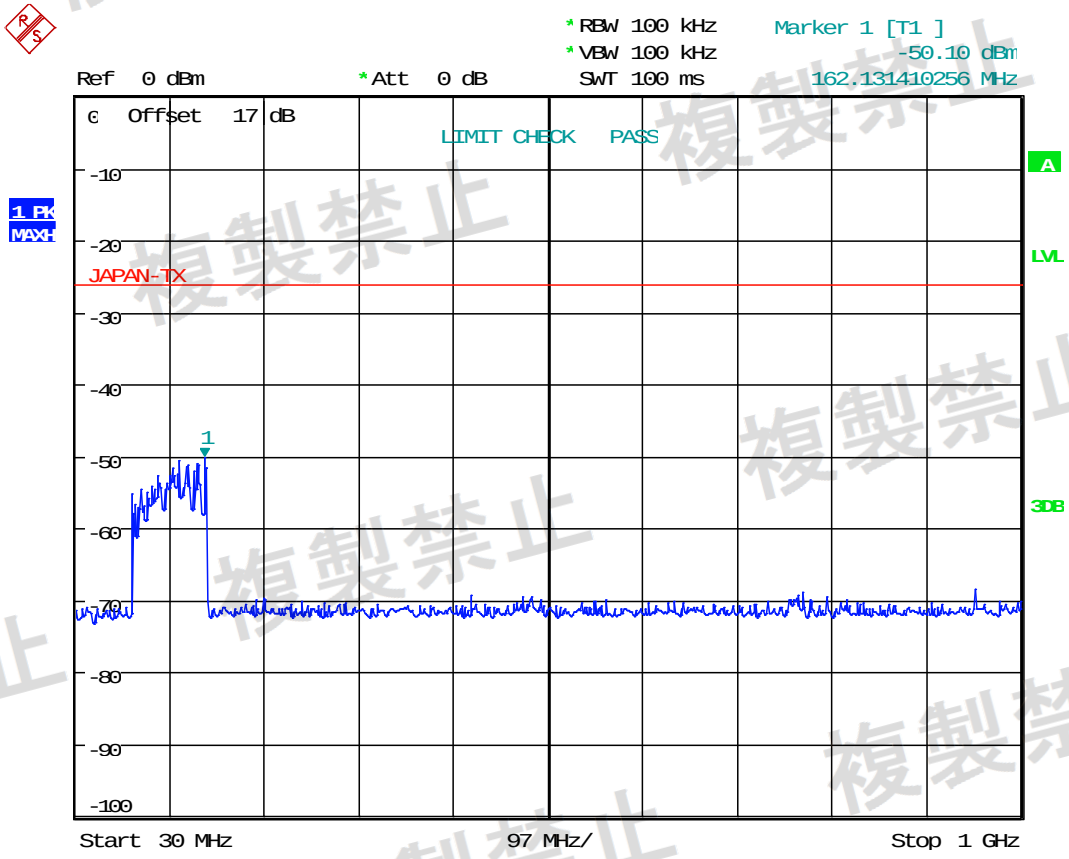
Under all test conditions	Operating frequency 2400 – 2483 MHz: ≥ 5 Operating frequency 2471 – 2497 MHz: ≥ 10

Test equipment used: ETSTW-RE 055

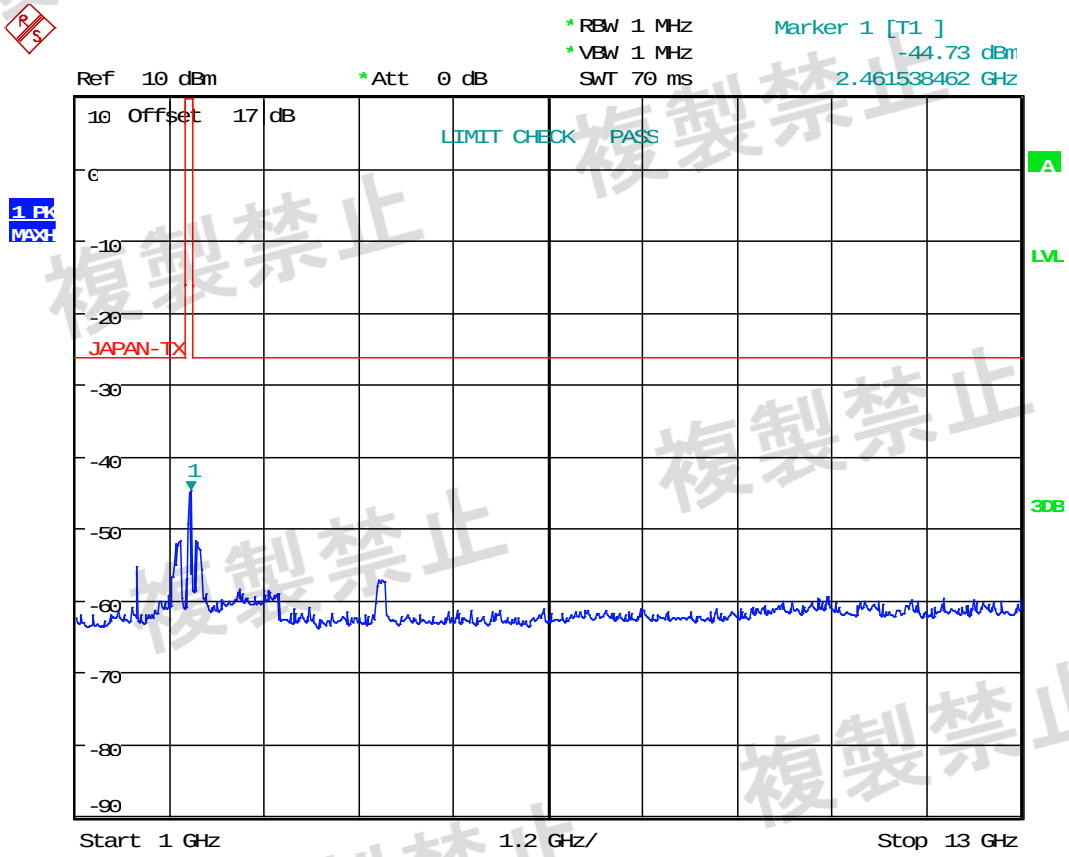
3.5 Spurious emissions (conducted)_transmitter

Test date: July 17, 2020-July 19, 2020
Temperature: 24.5 ˚C
Humidity: 52.7 %
Tester: Spencer Yang

Bluetooth2.0
GFSK

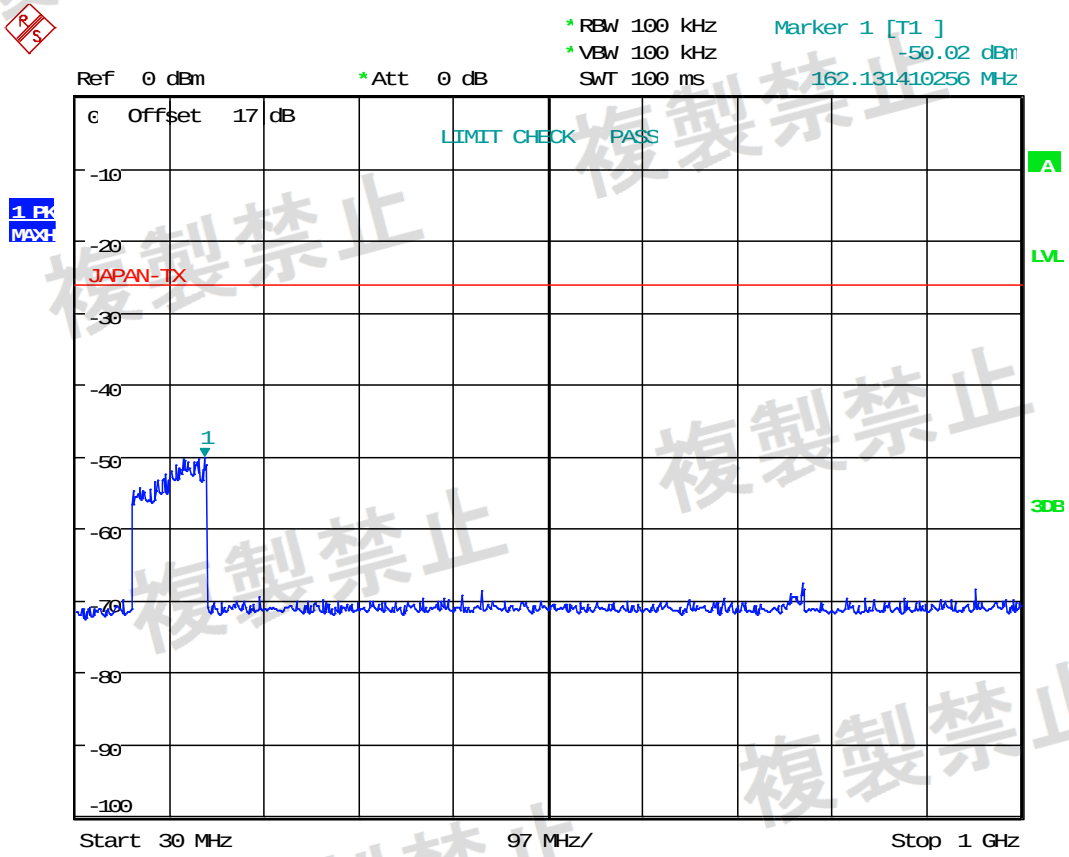


CONDUCTED SPURIOUS EMISSION TX 3.3V
Date: 17.JUL.2020 09:45:40



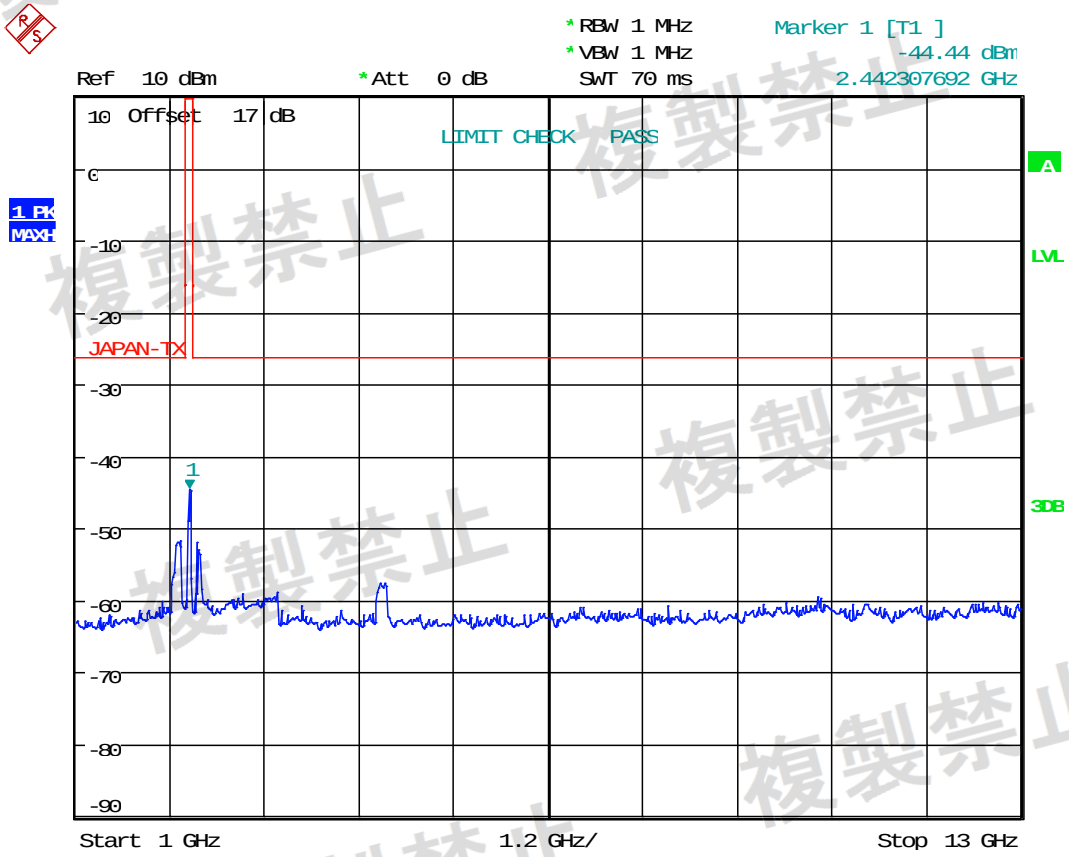
CONDUCTED SPURIOUS EMISSION TX 3.3V

Date: 17.JUL.2020 11:03:01



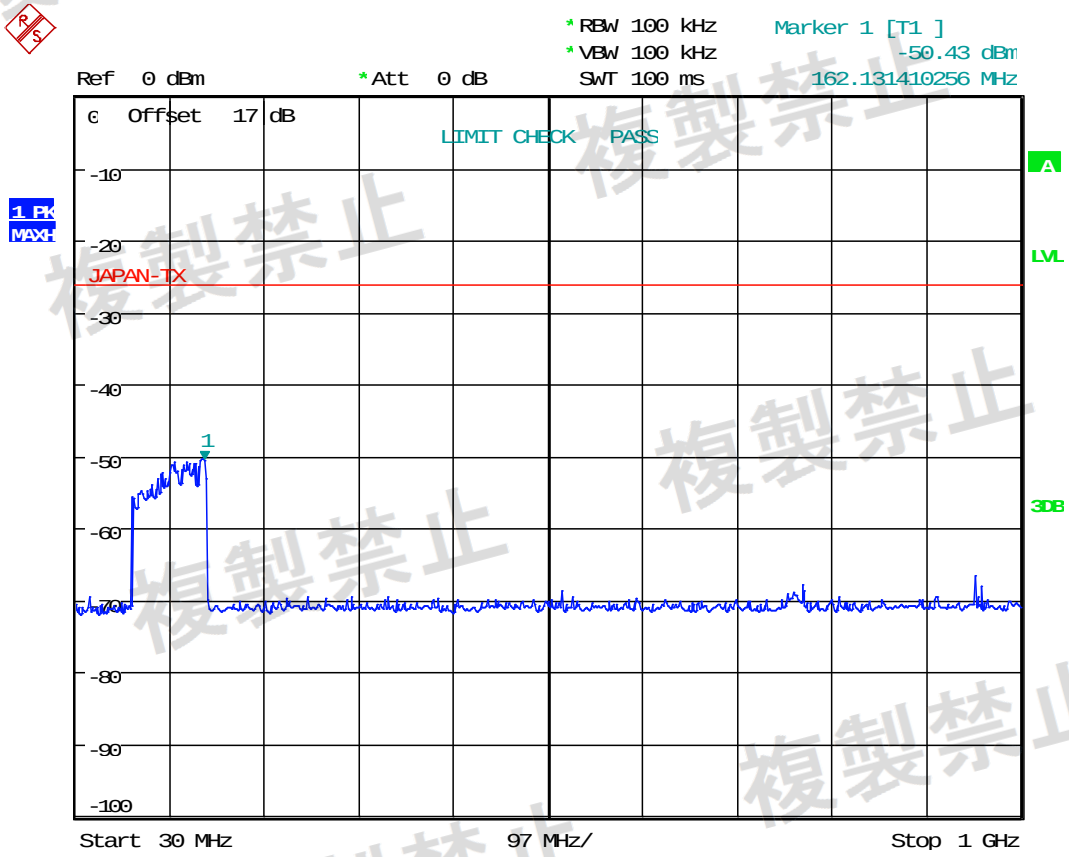
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Date: 17.JUL.2020 09:49:17



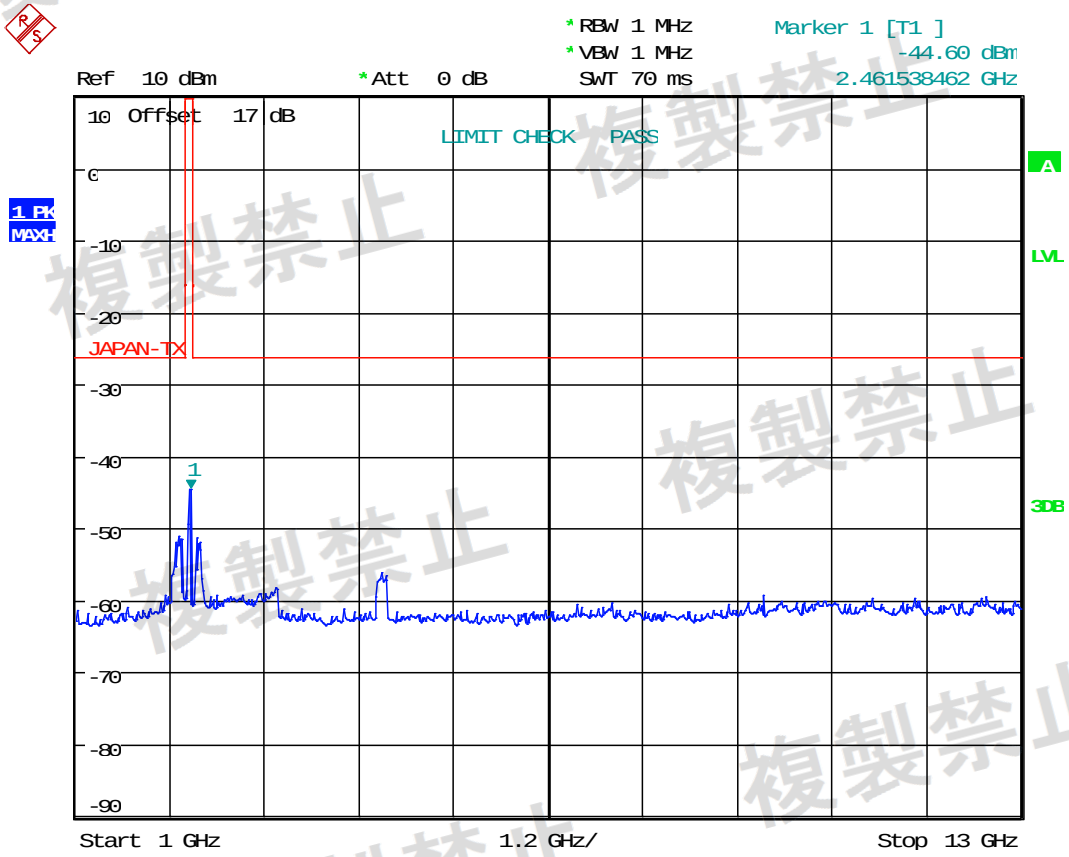
CONDUCTED SPURIOUS EMISSION TX 2.97V

Date: 17.JUL.2020 11:03:26



CONDUCTED SPURIOUS EMISSION TX 3.63V

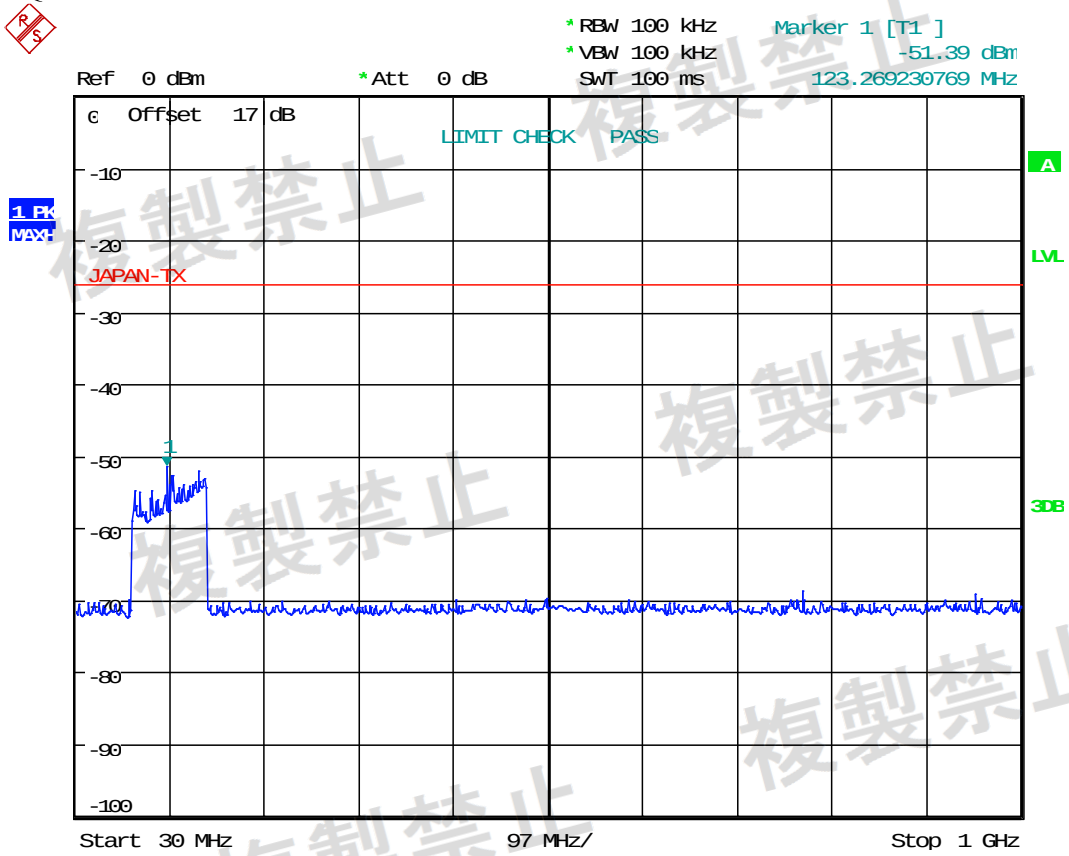
Date: 17.JUL.2020 09:42:55



CONDUCTED SPURIOUS EMISSION TX 3.63V

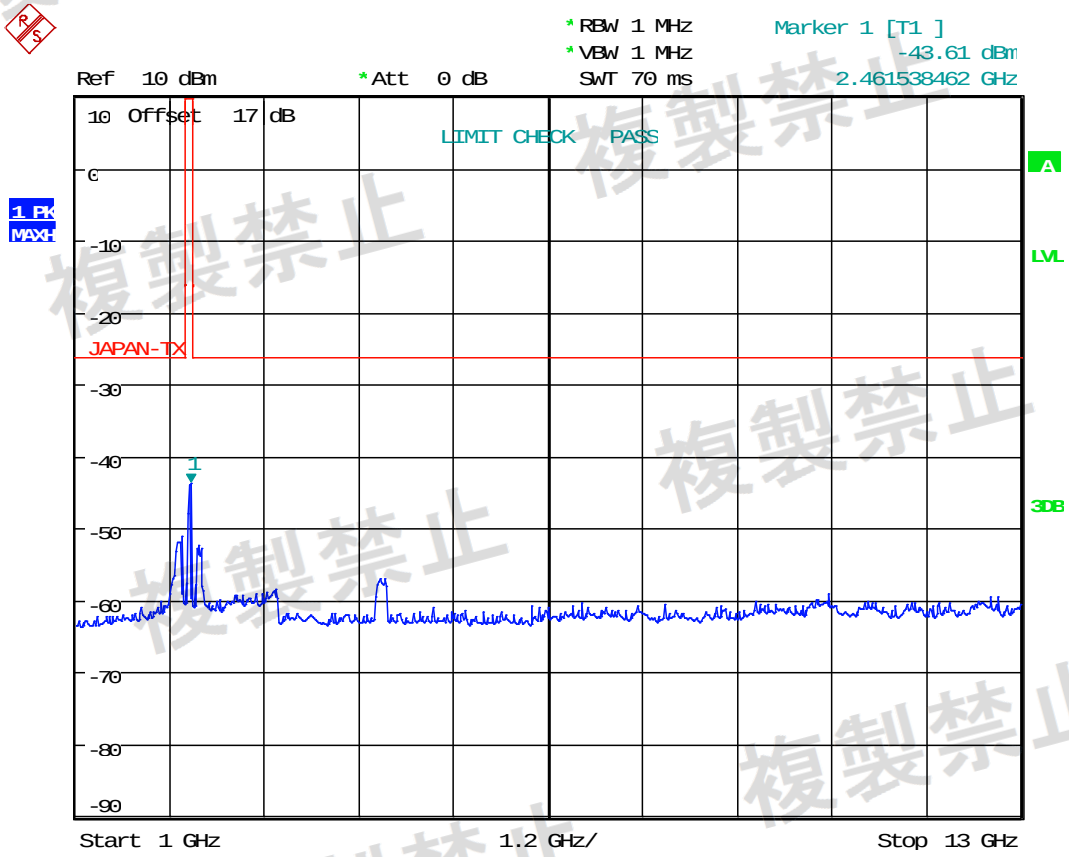
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π/ 4DQPSK



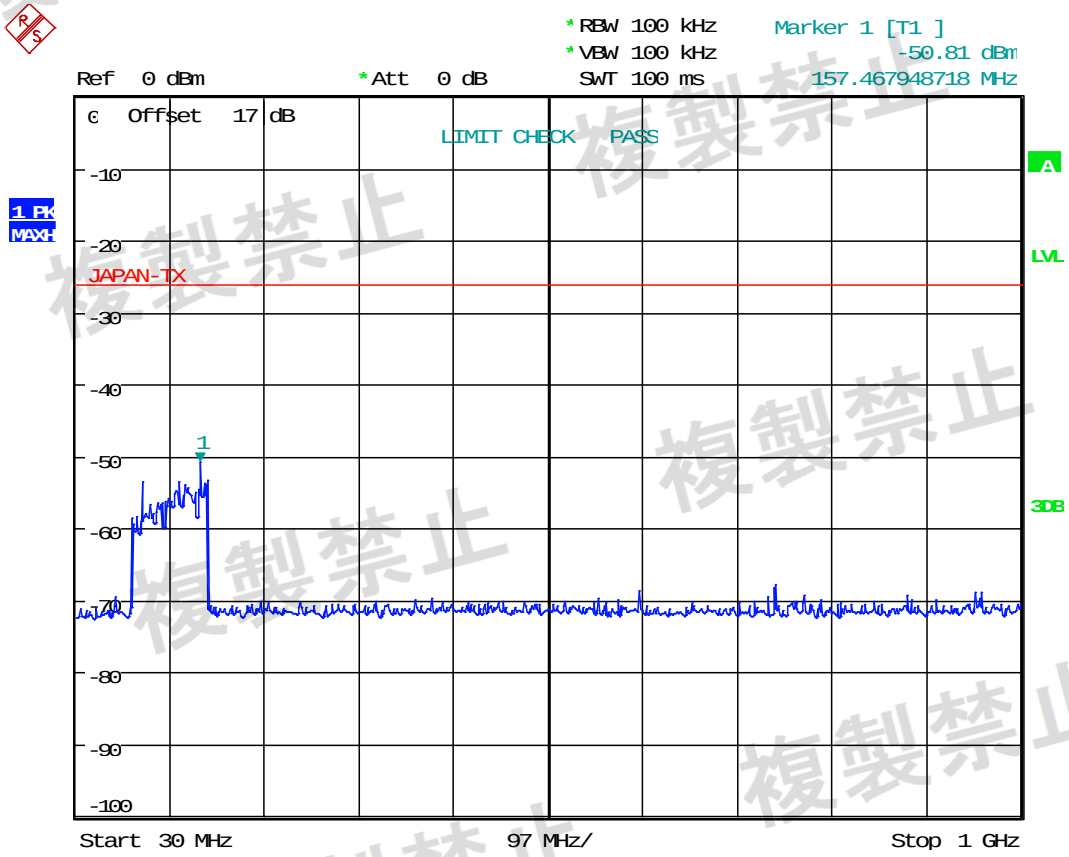
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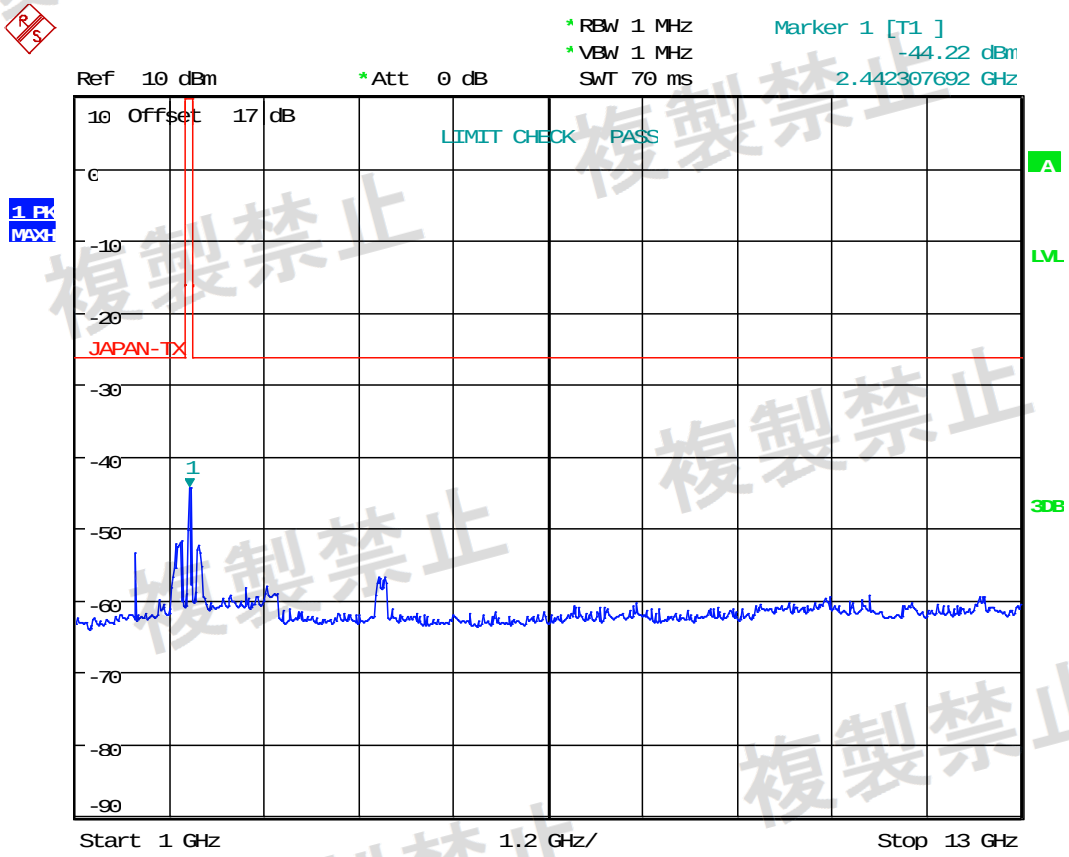
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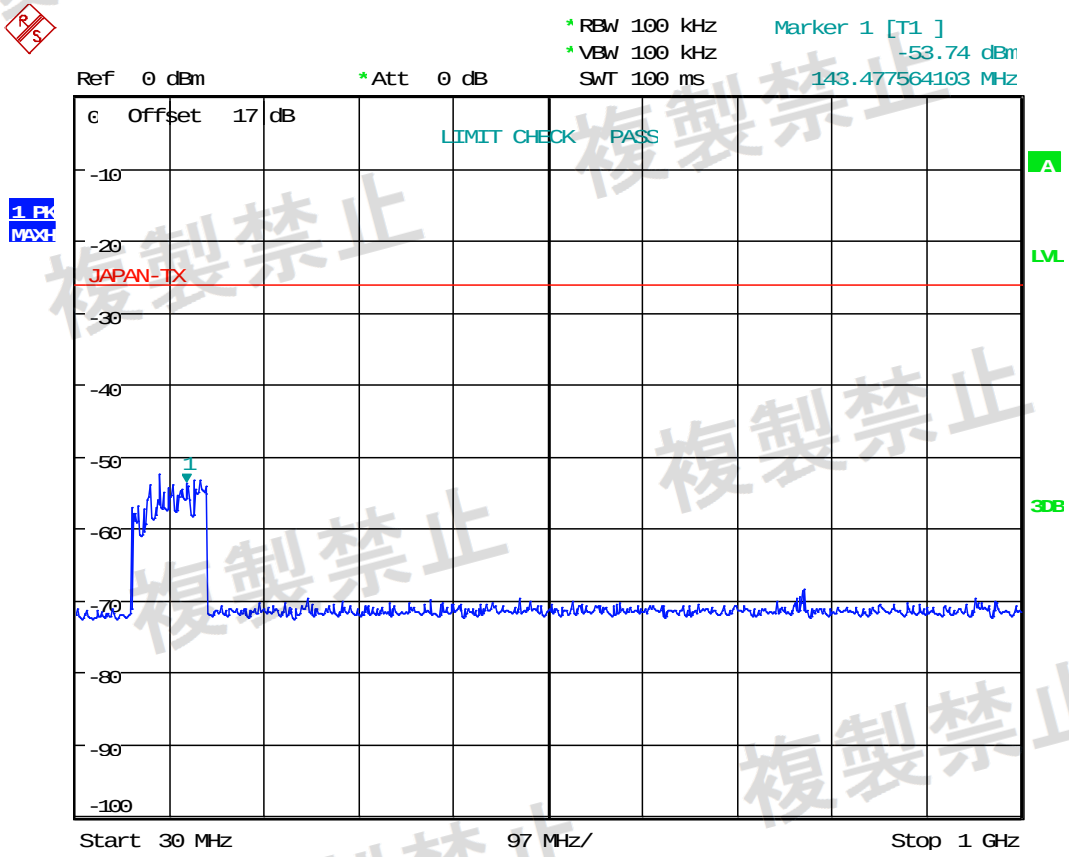
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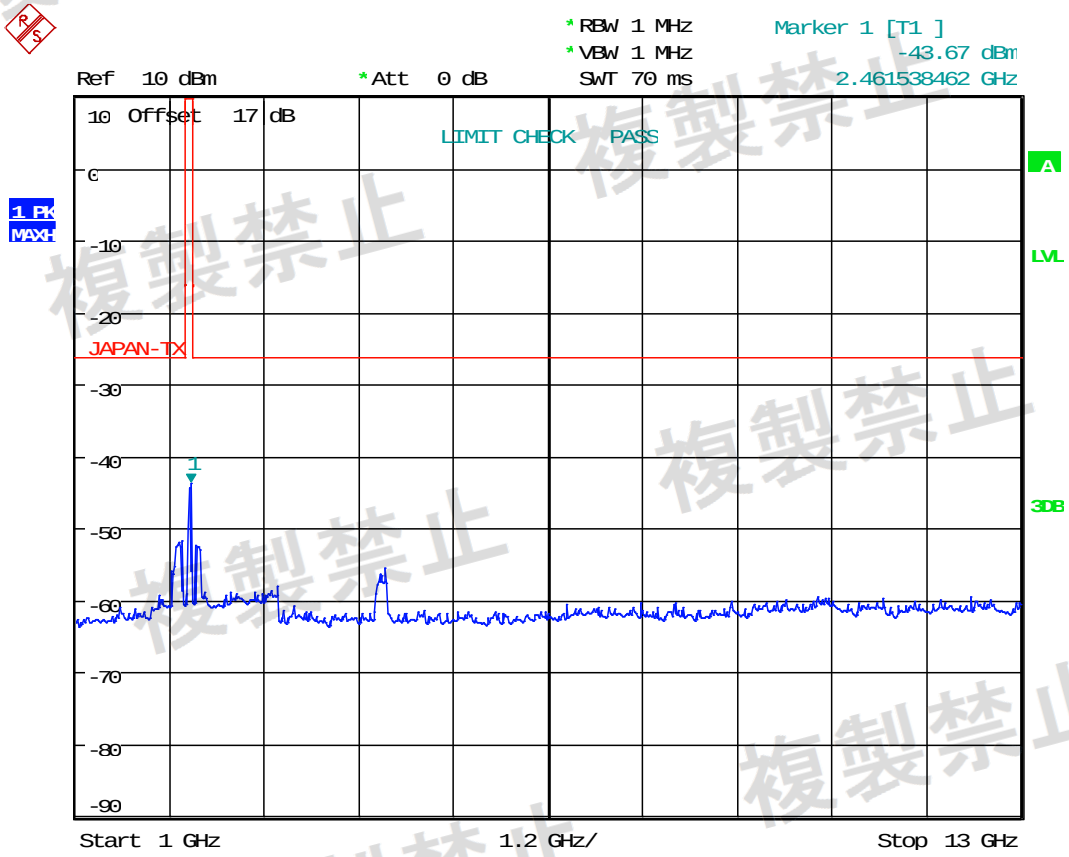
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Date: 17.JUL.2020 10:56:32



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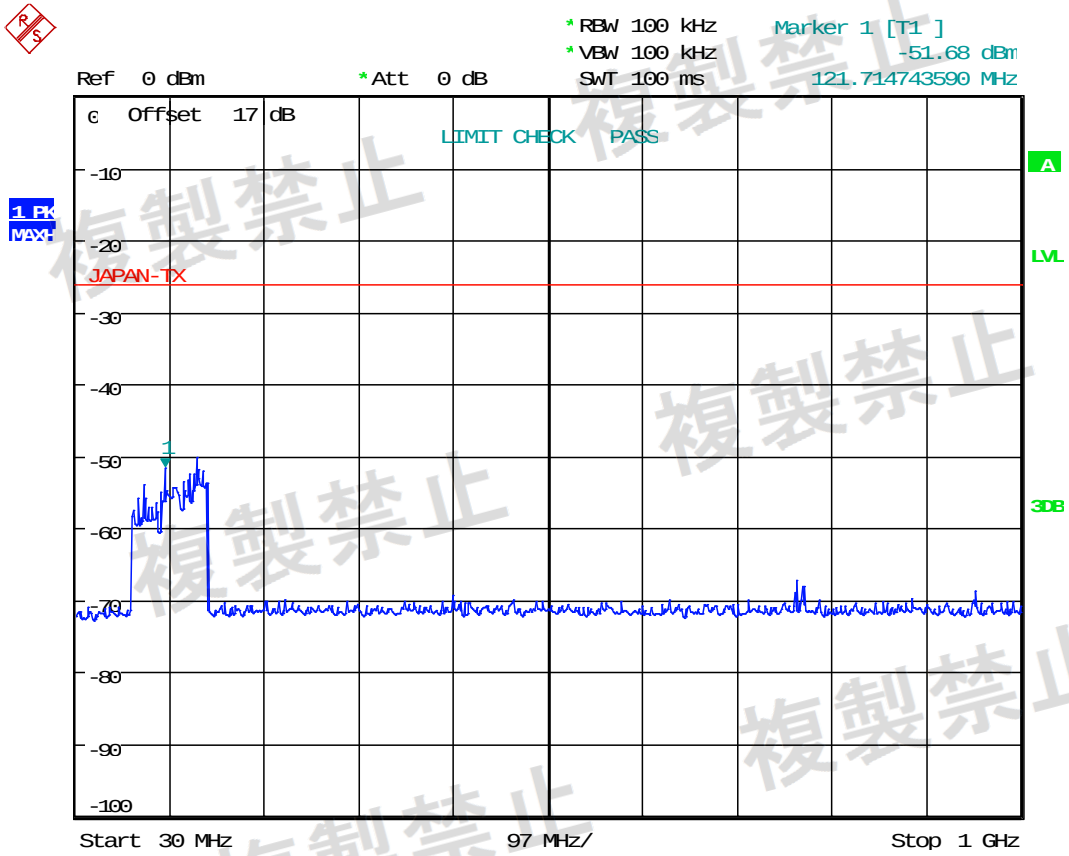
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CONDUCTED SPURIOUS EMISSION EDR 2M TX 3.63V

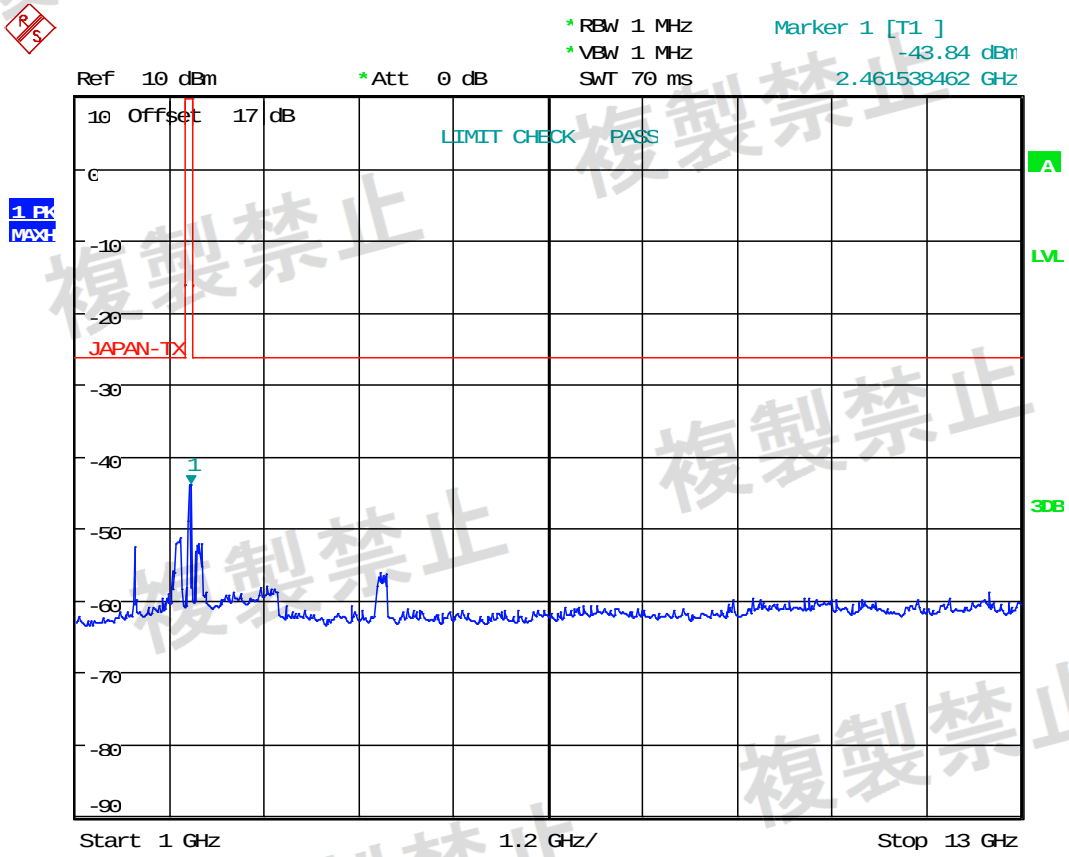
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8DPSK



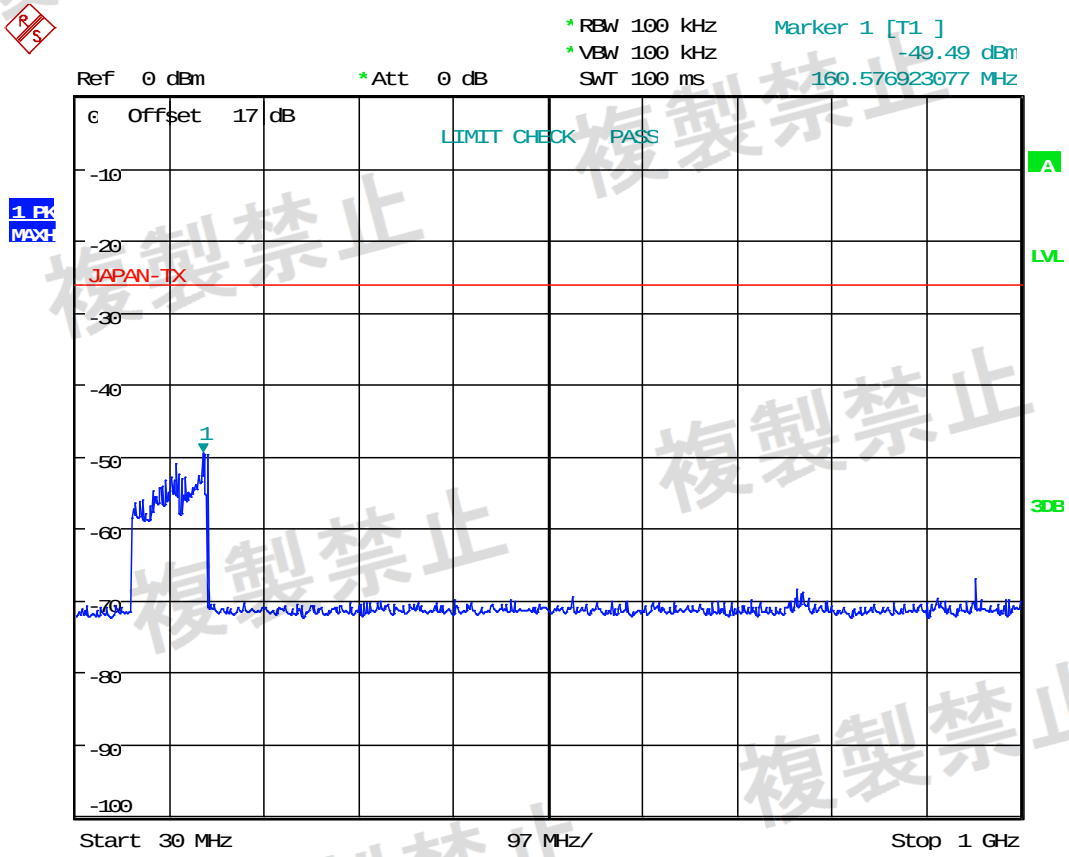
CONDUCTED SPURIOUS EMISSION EDR 3M TX 3.3V

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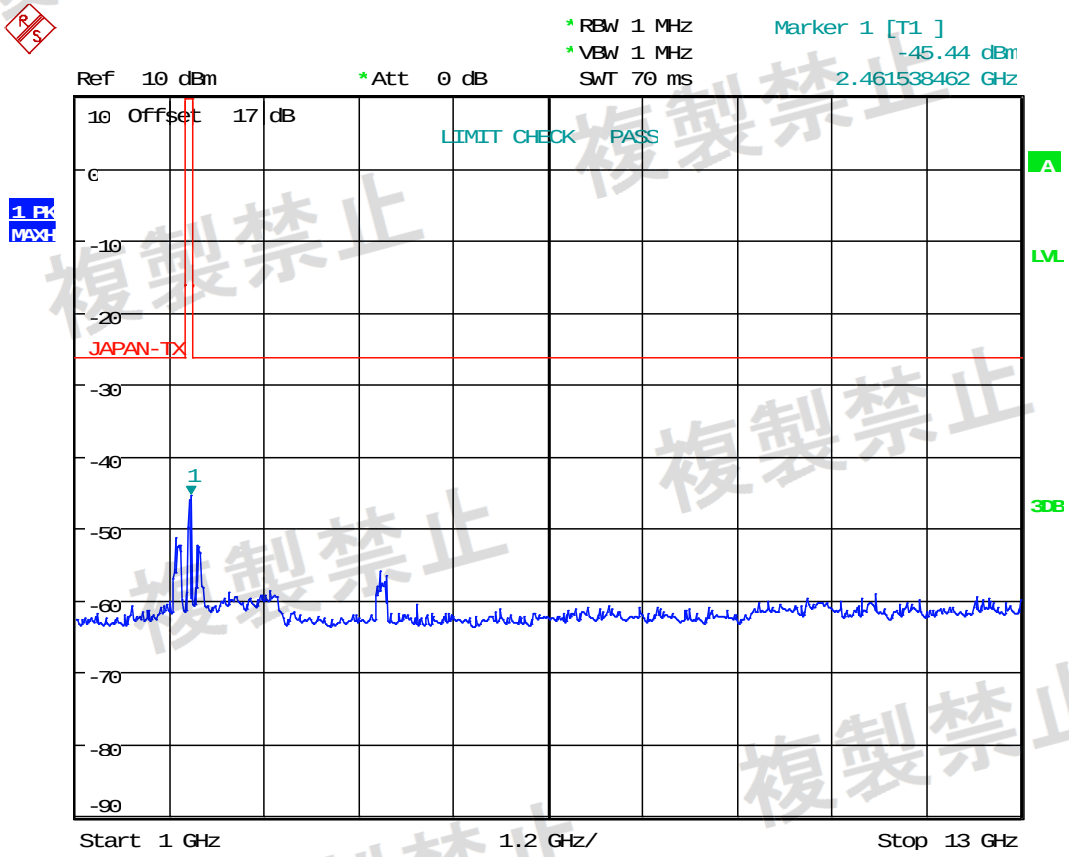
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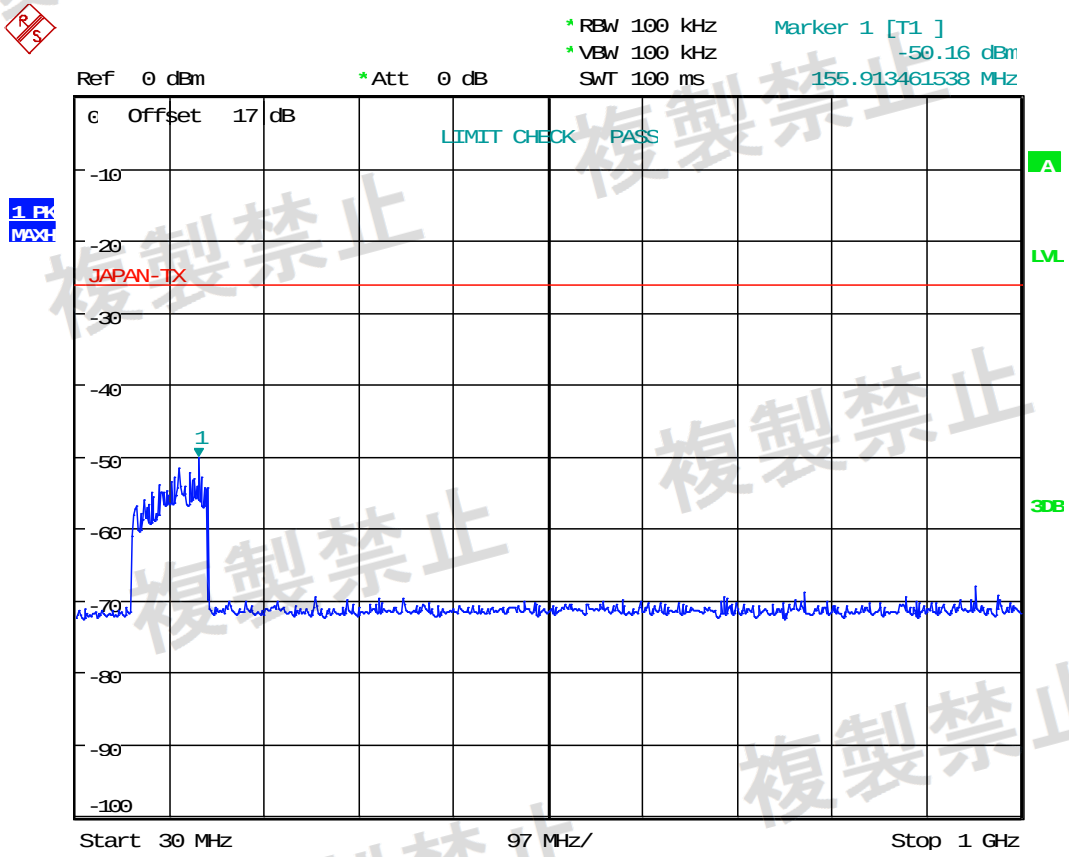
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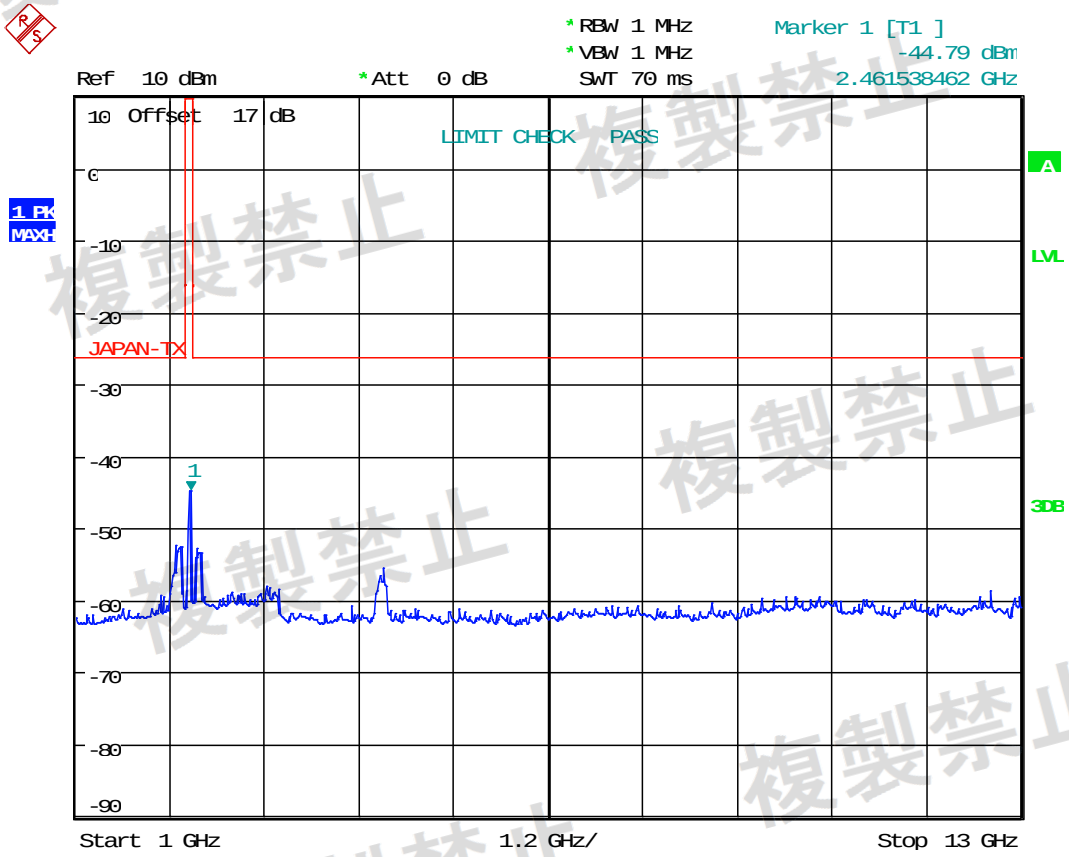
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CONDUCTED SPURIOUS EMISSION EDR 3M TX 3.63V

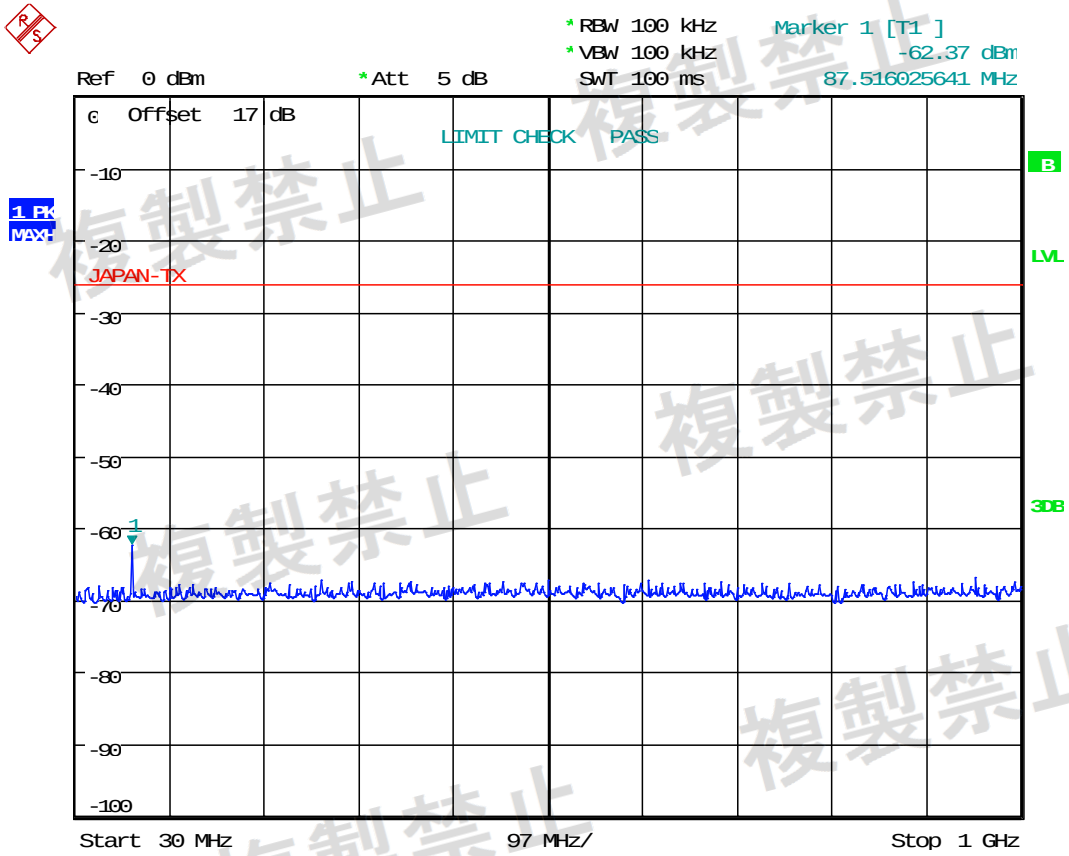
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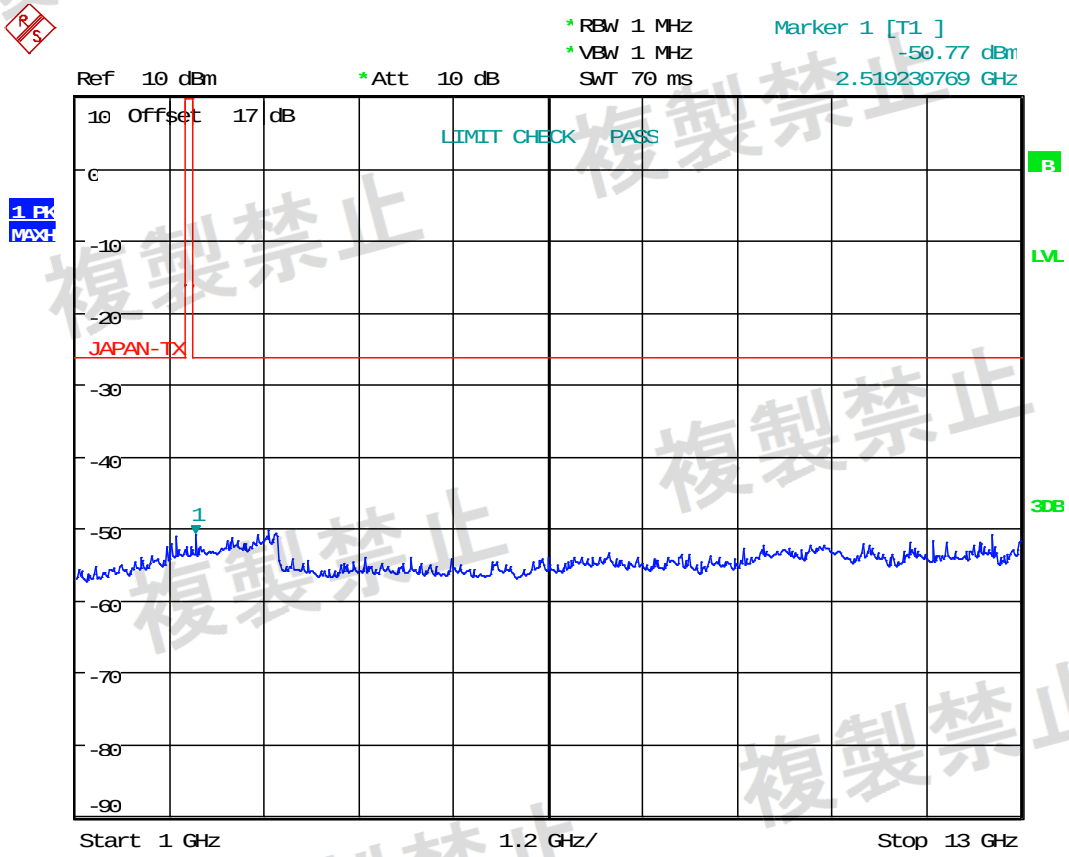
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Bluetooth4.0



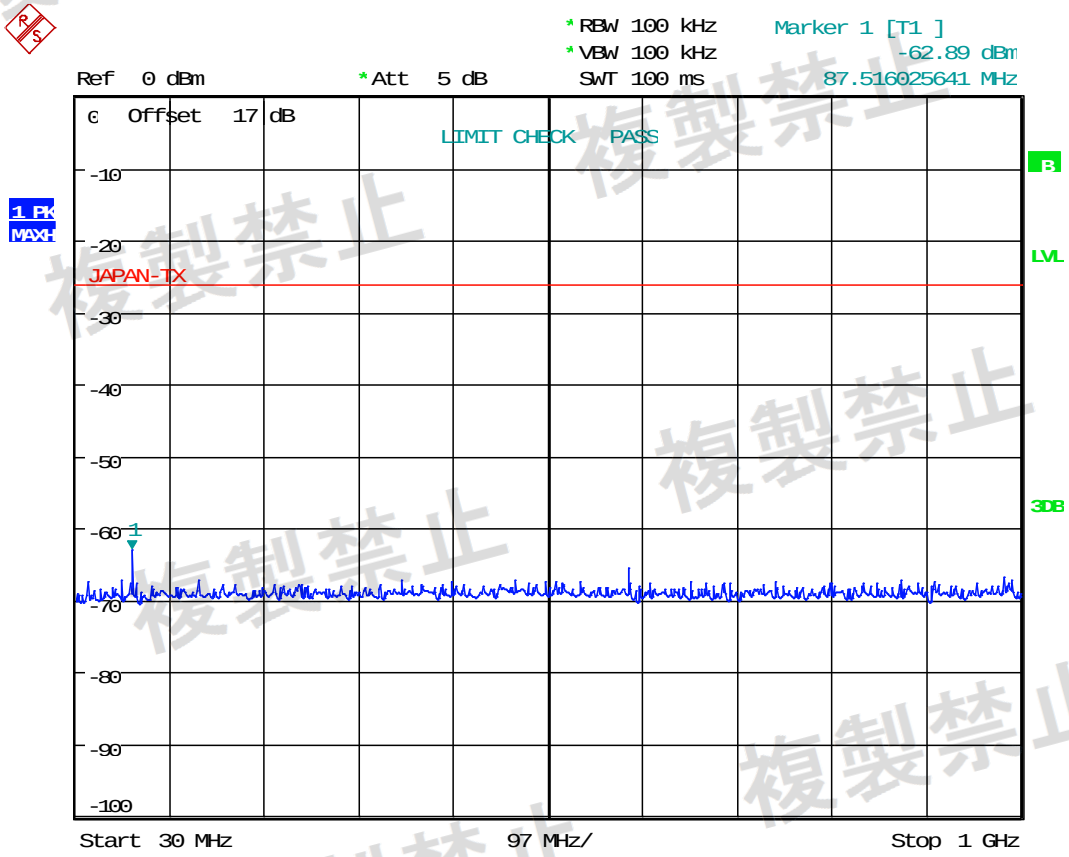
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Date: 17.JUL.2020 17:28:26



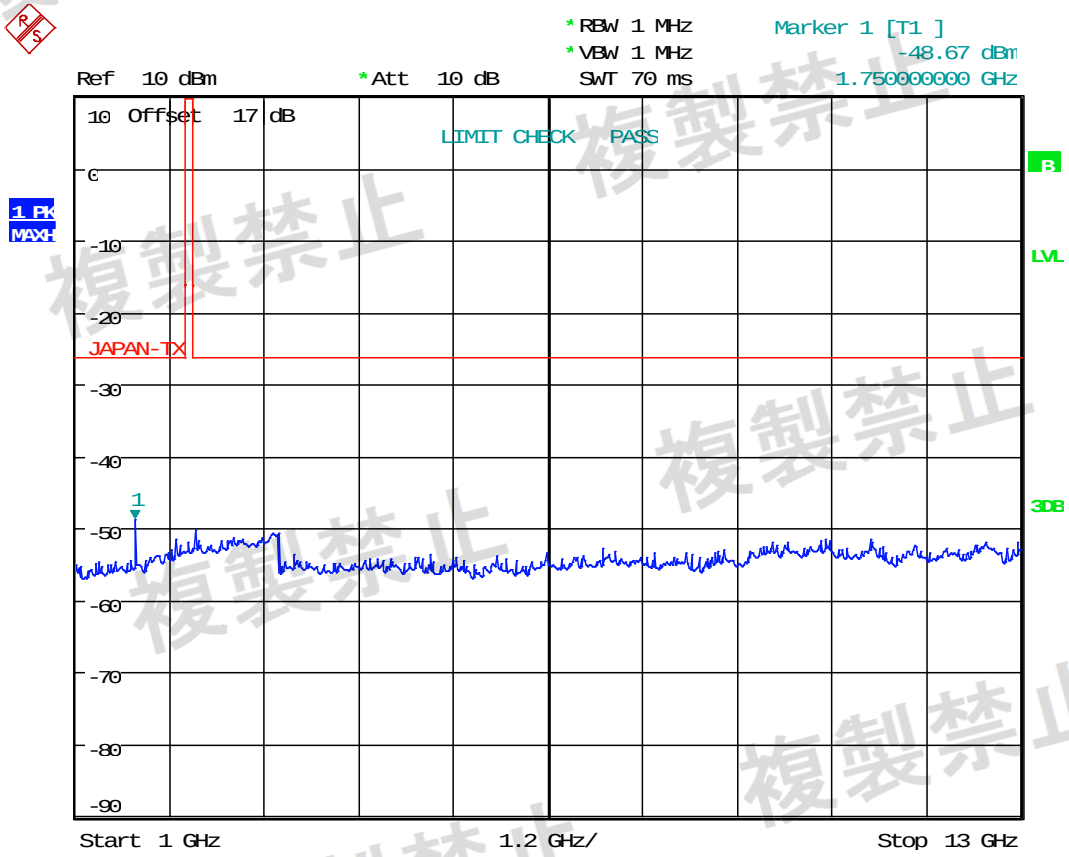
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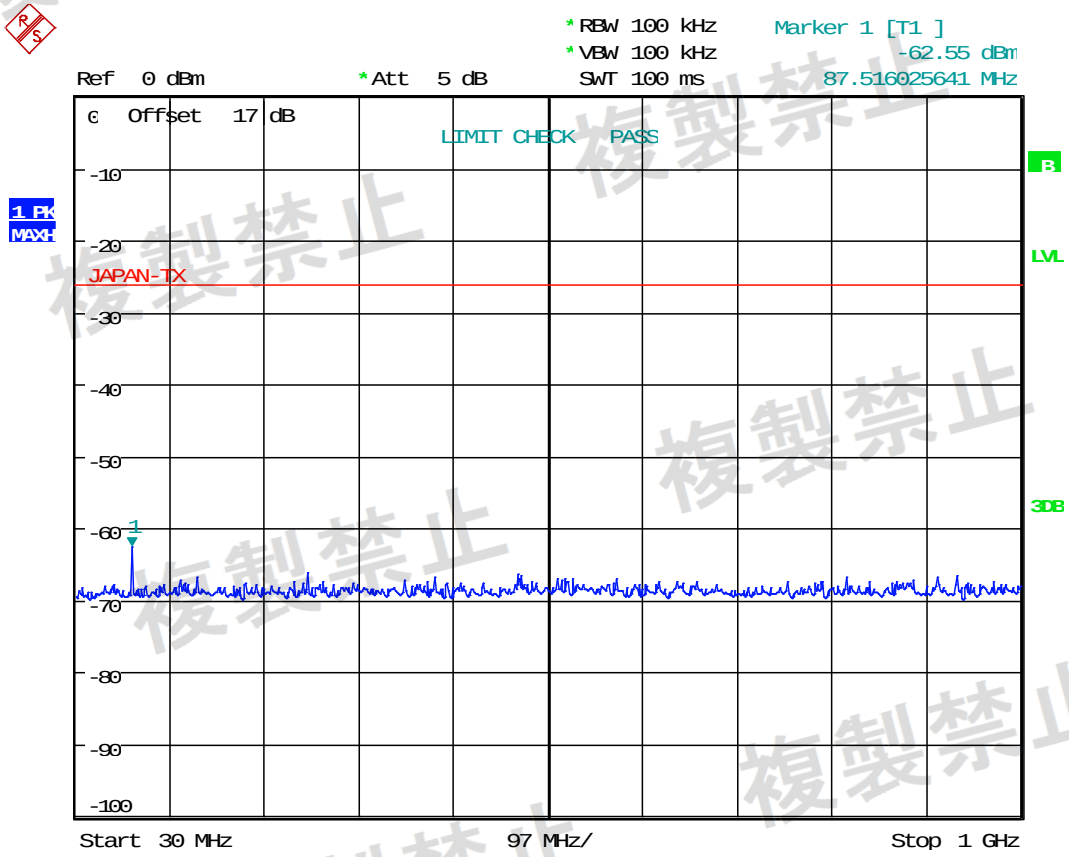
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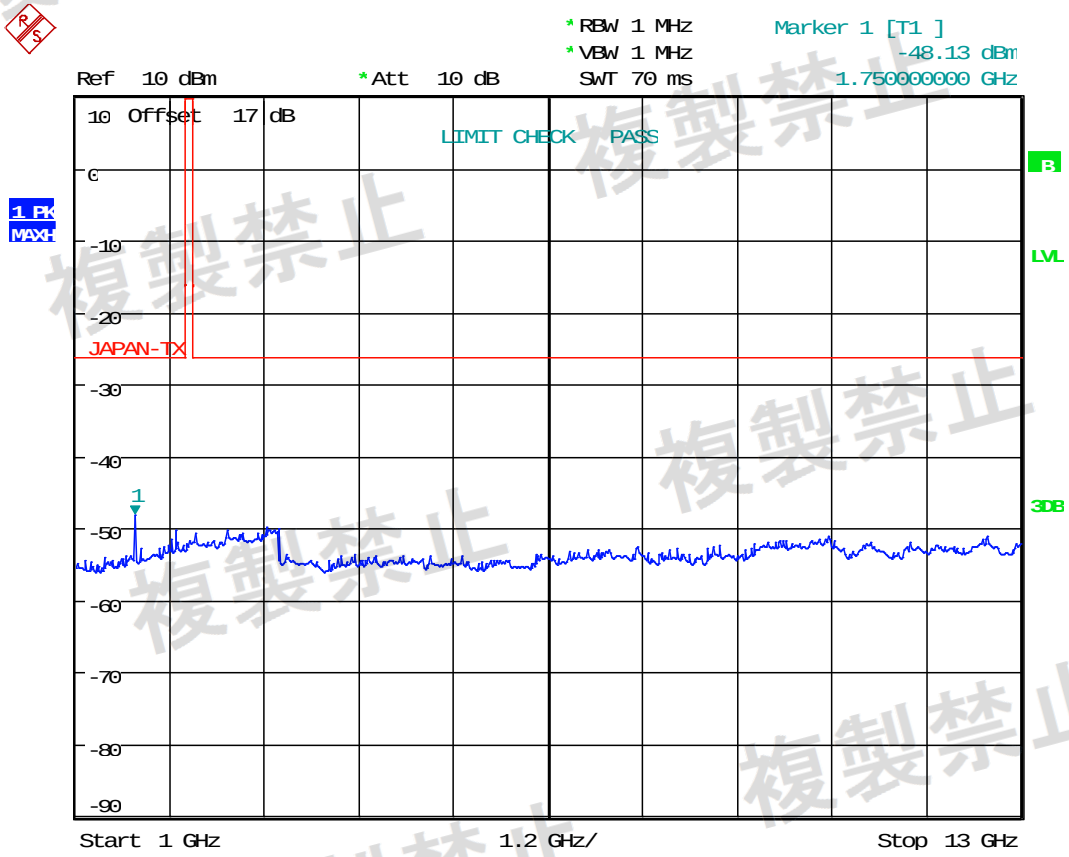
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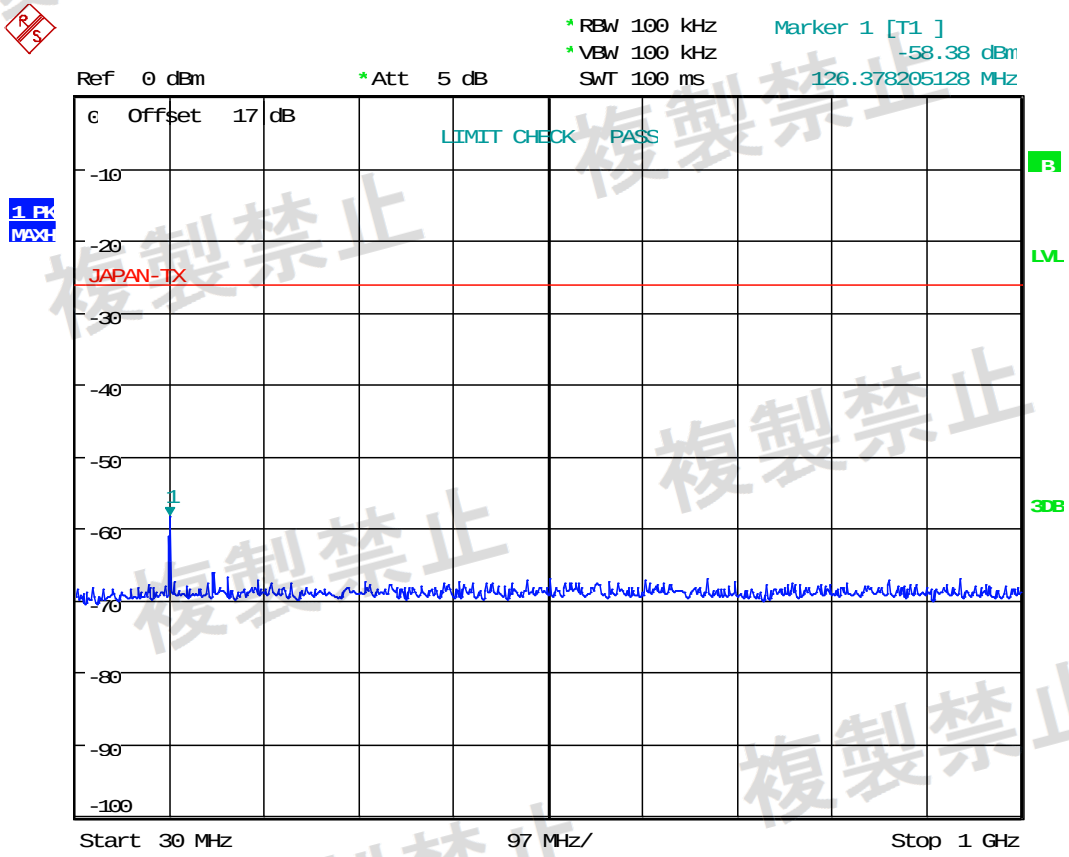
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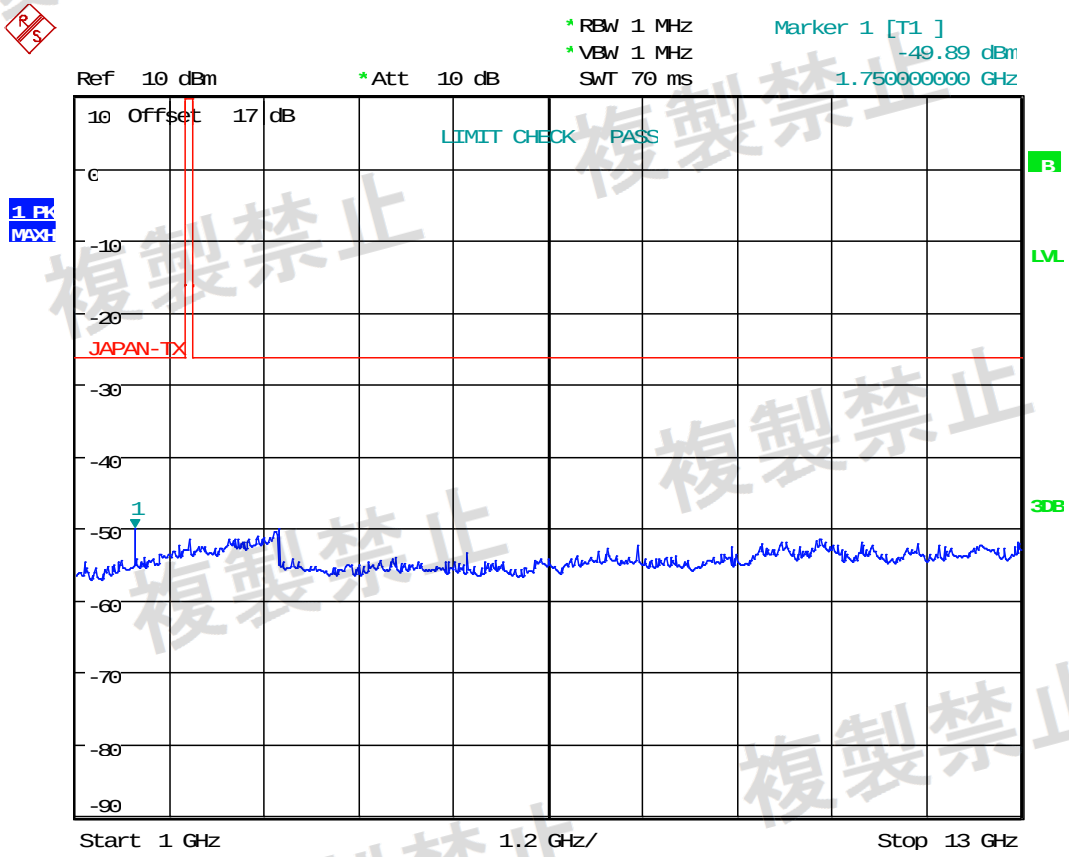
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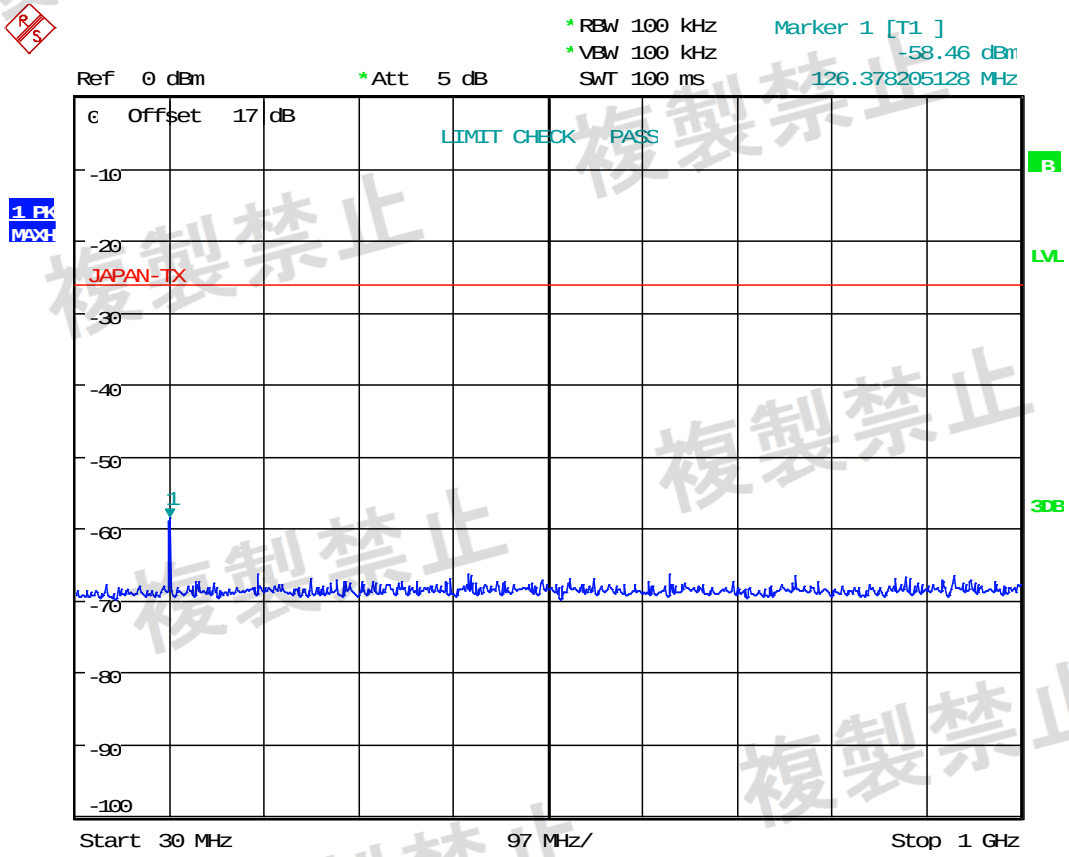
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Date: 17.JUL.2020 17:27:03



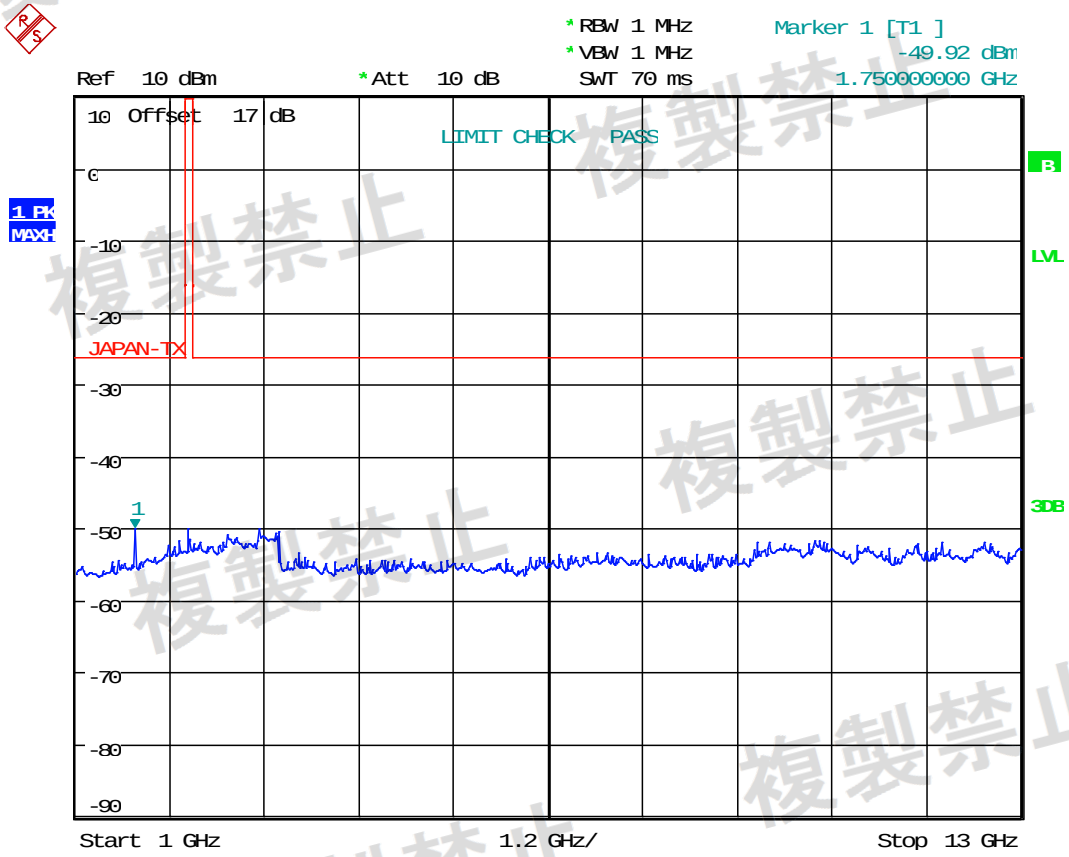
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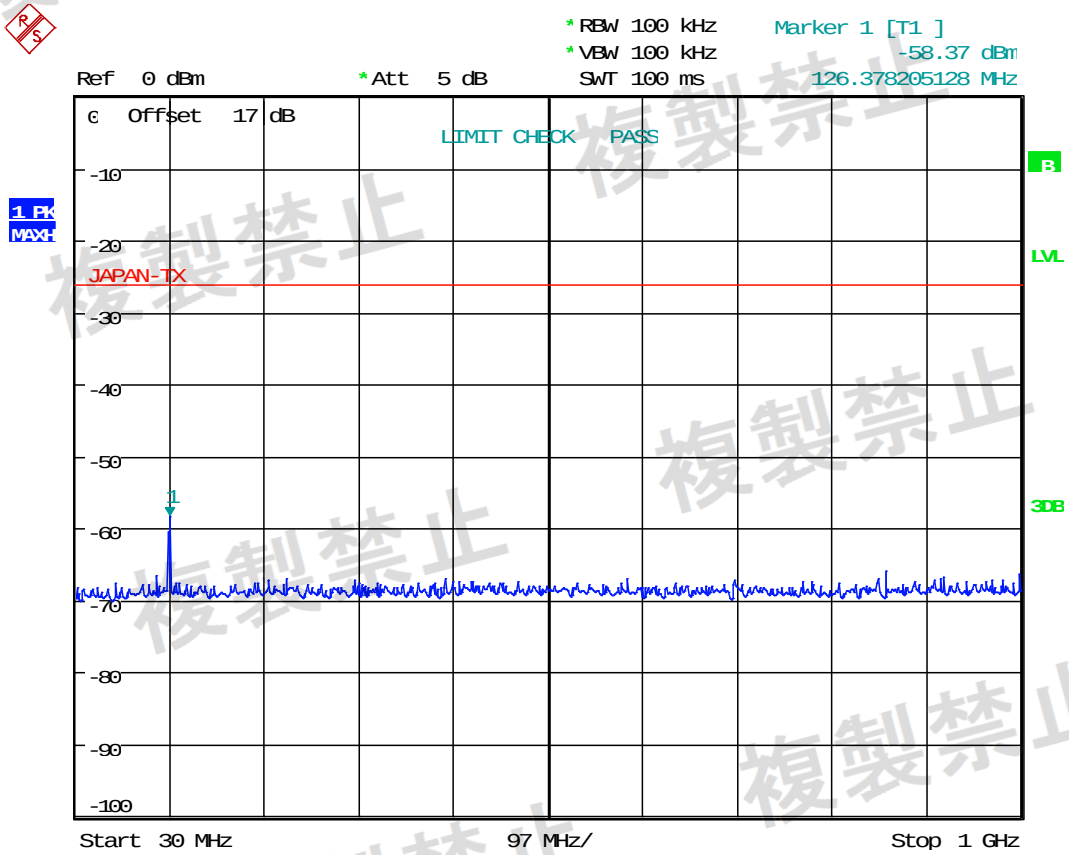
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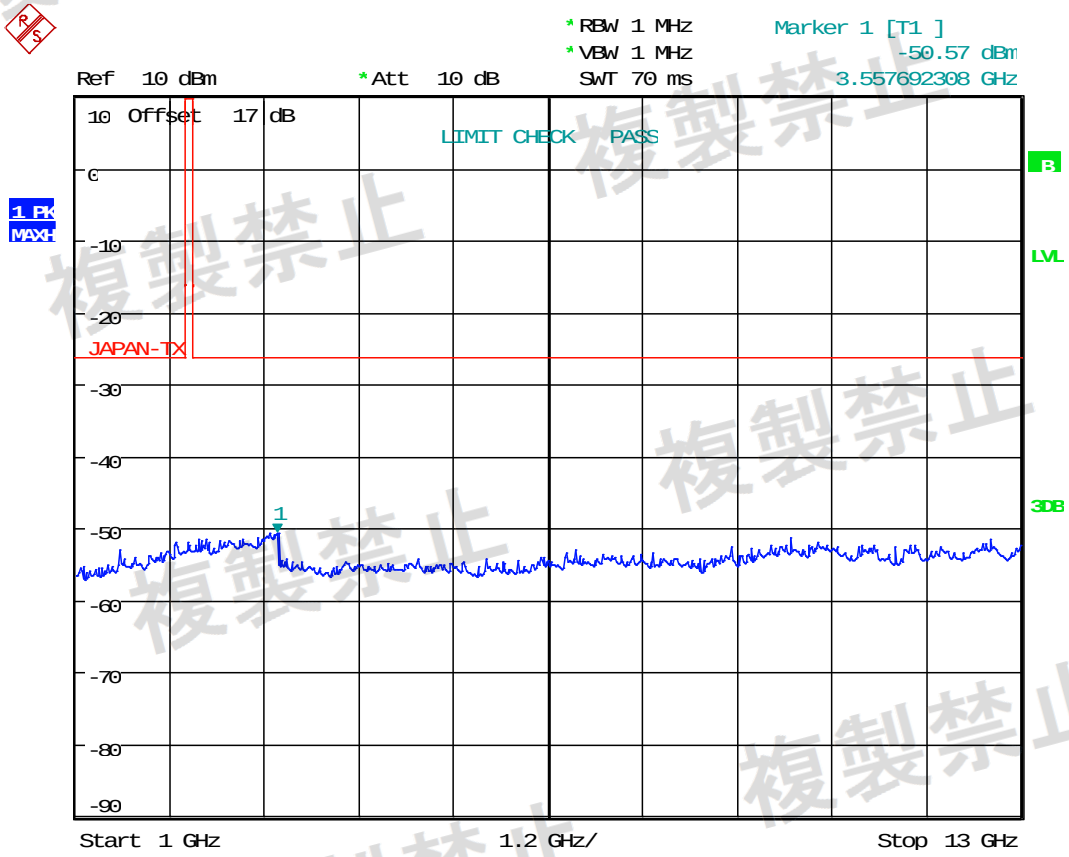
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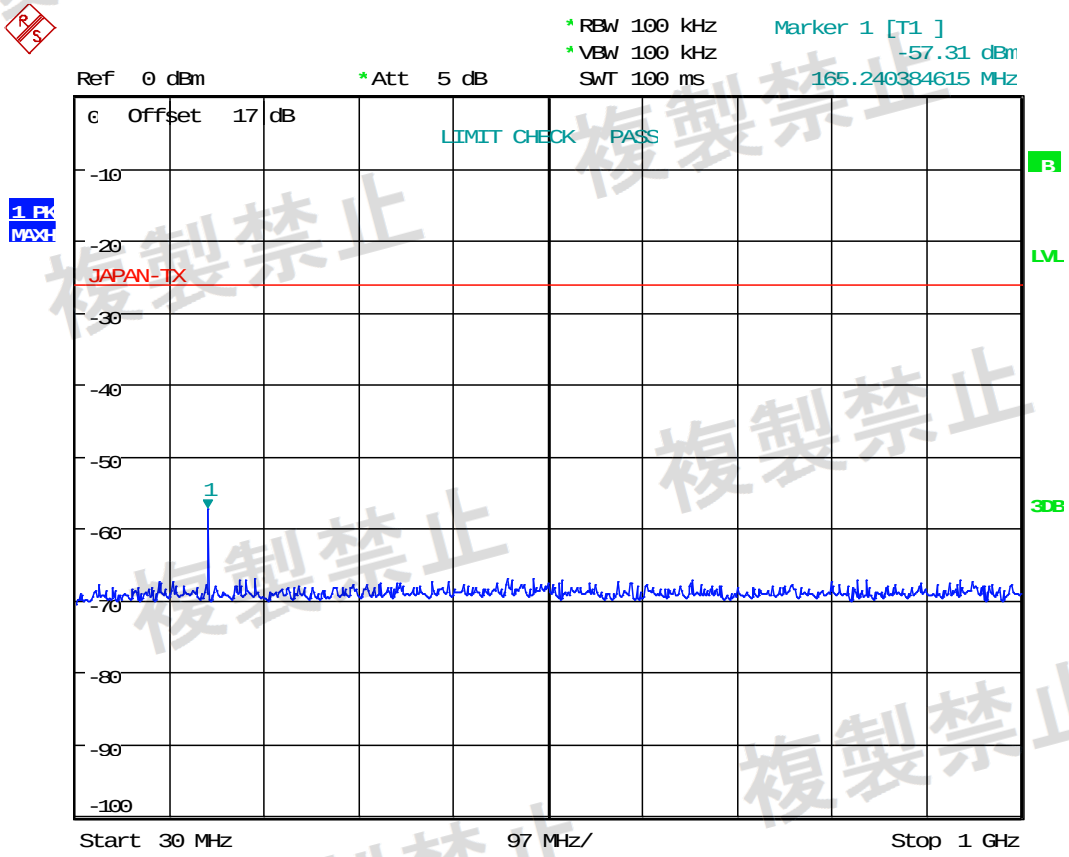
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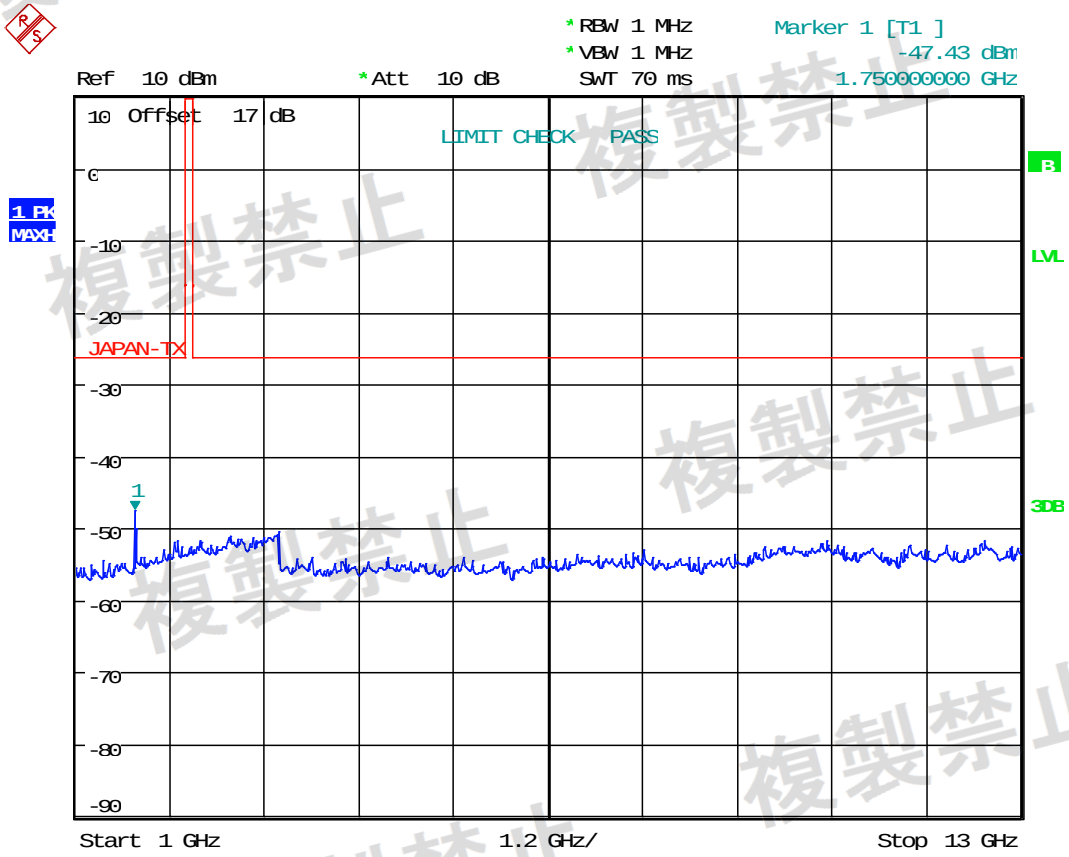
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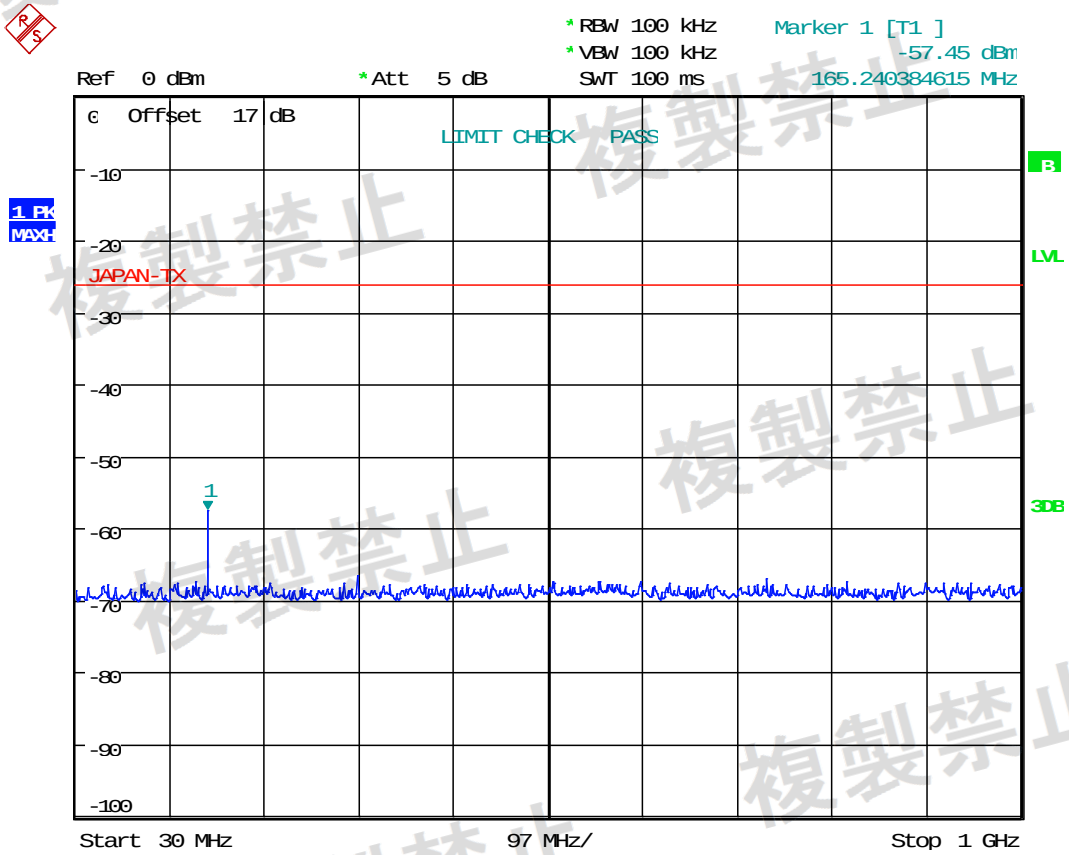
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Date: 17.JUL.2020 17:23:32



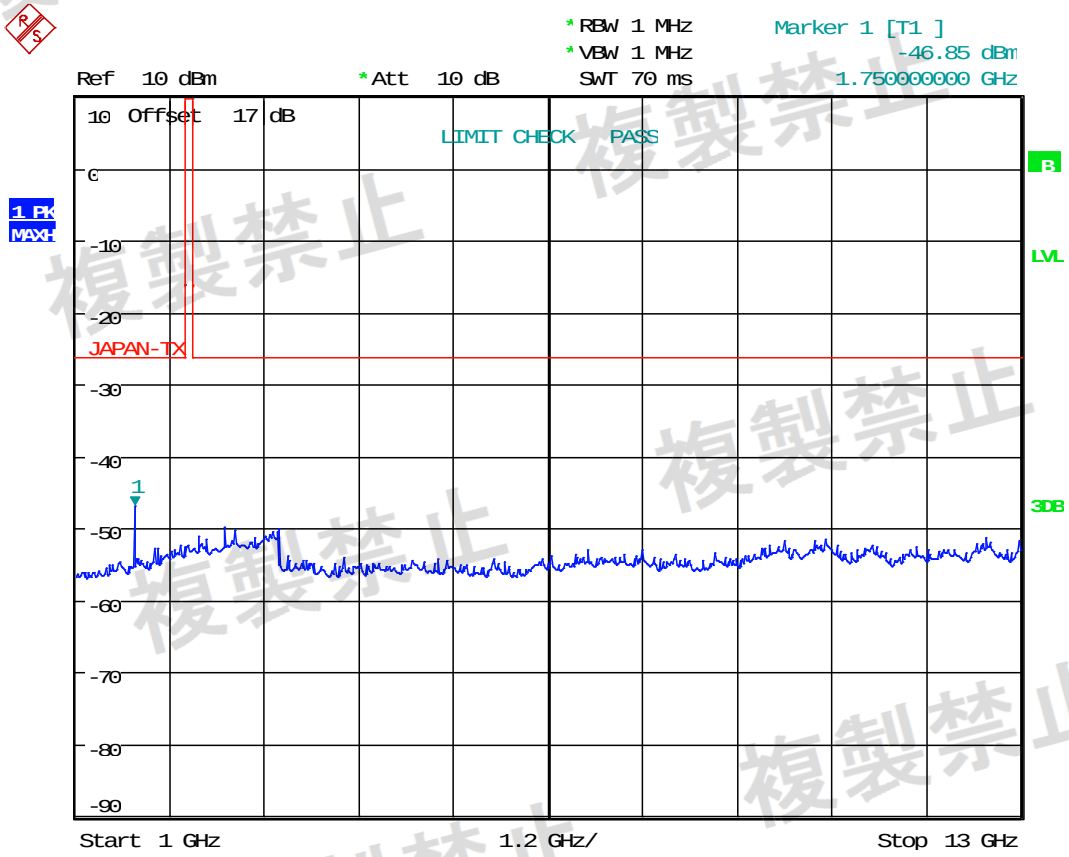
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Date: 17.JUL.2020 19:08:19



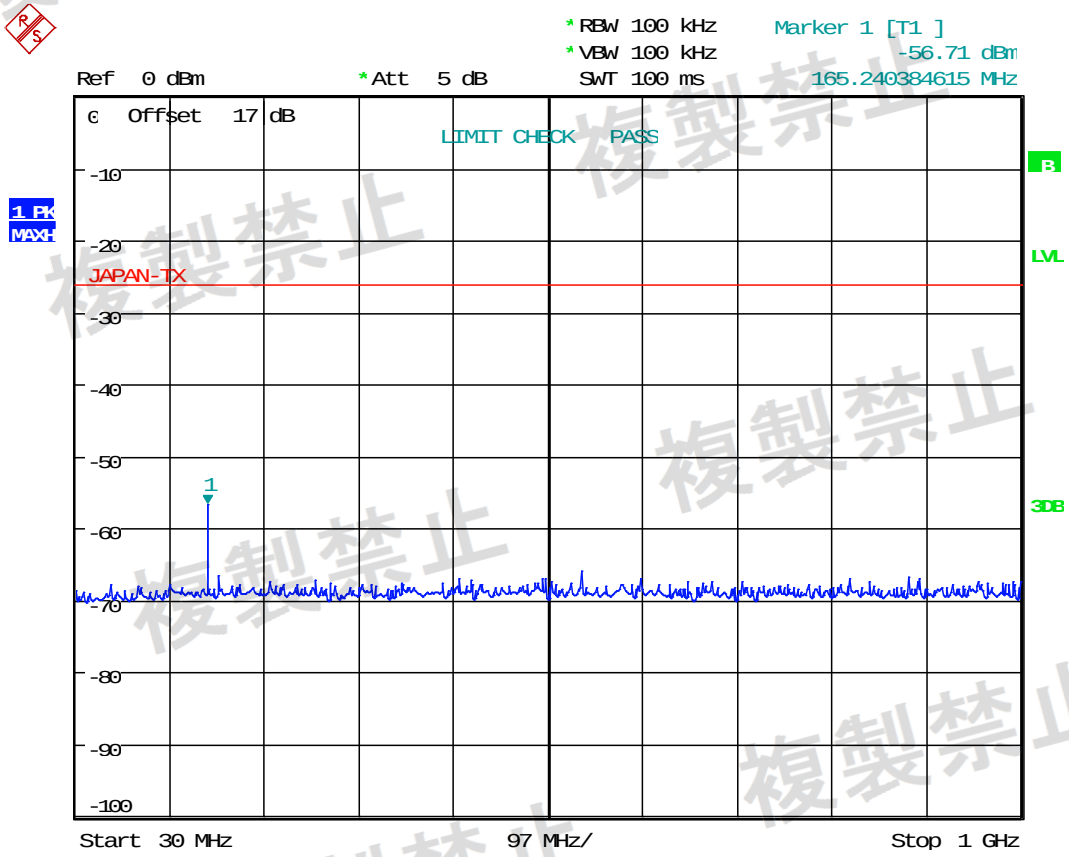
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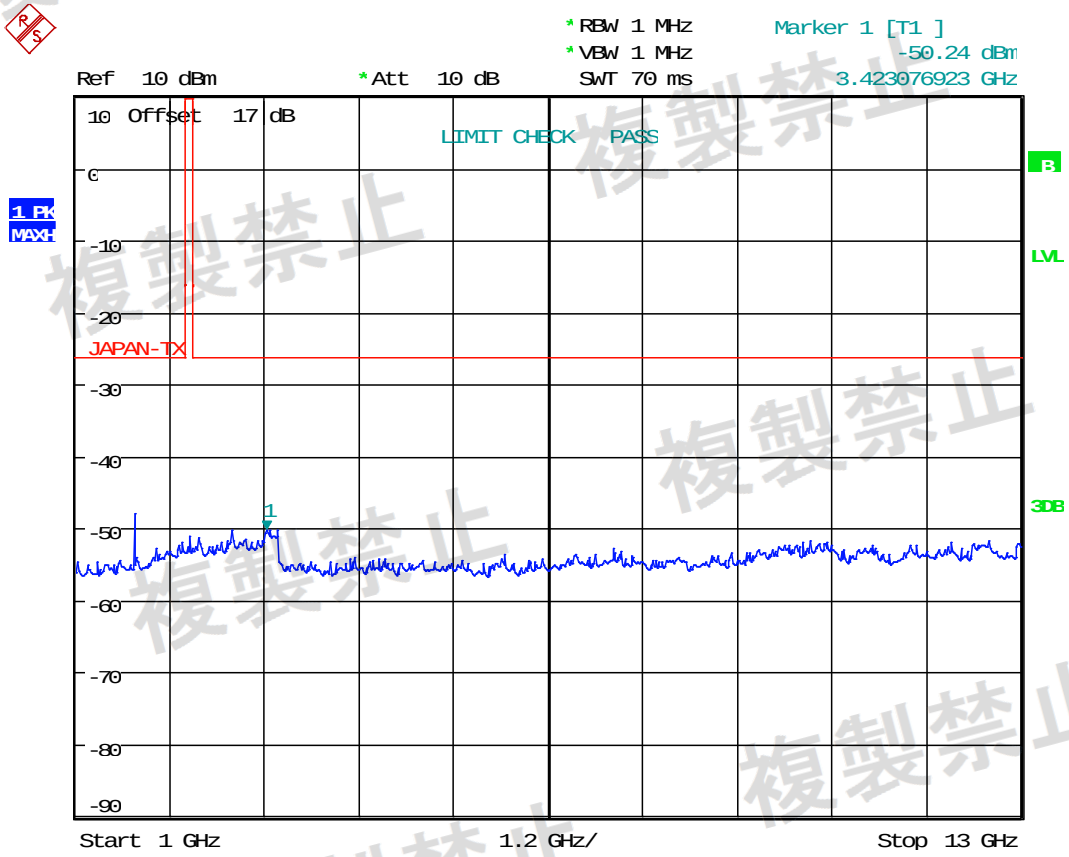
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BLE CONDUCTED SPURIOUS EMISSION TX CH39 3.63V

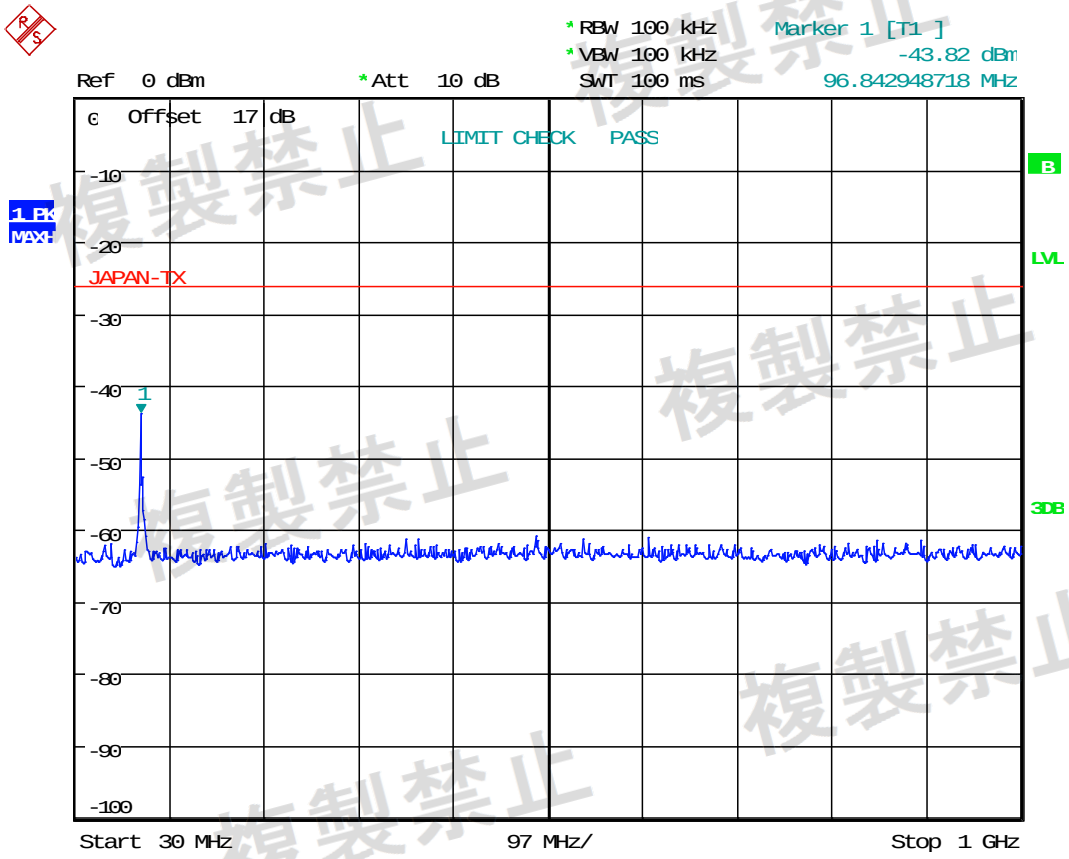
Date: 17.JUL.2020 17:24:22



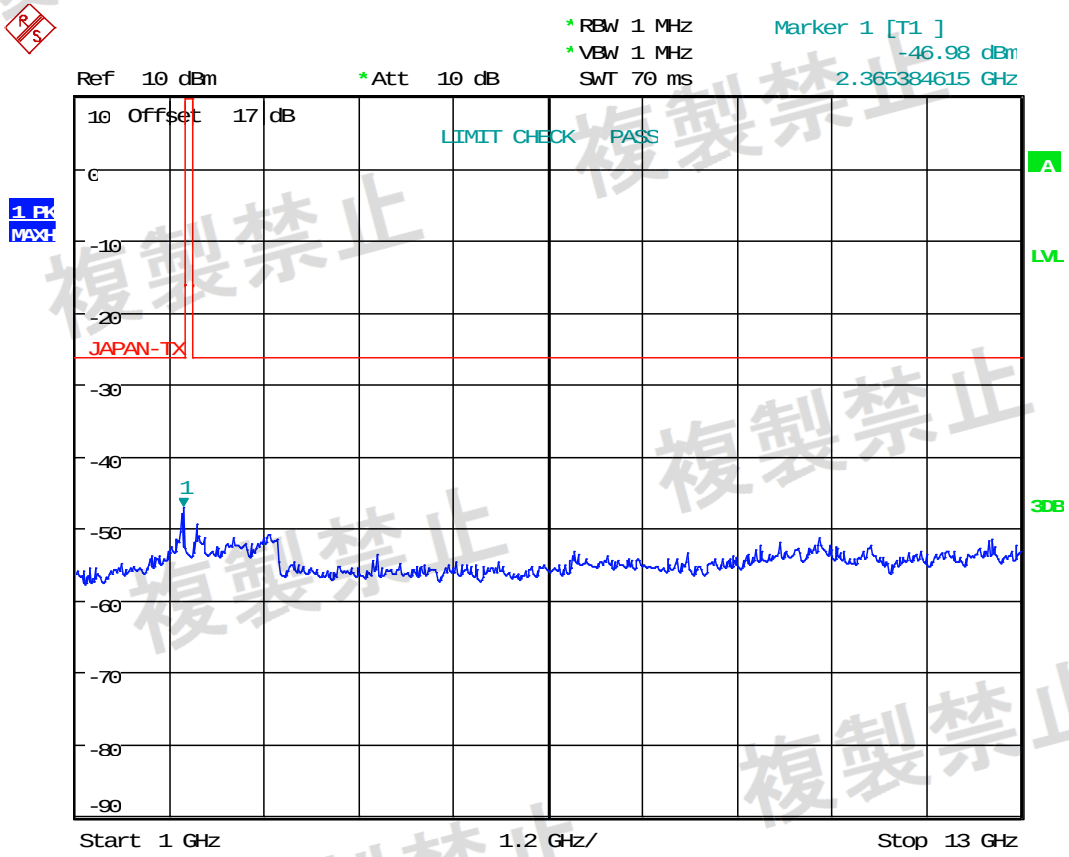
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Date: 17.JUL.2020 19:07:20

WLAN
IEEE 802.11b

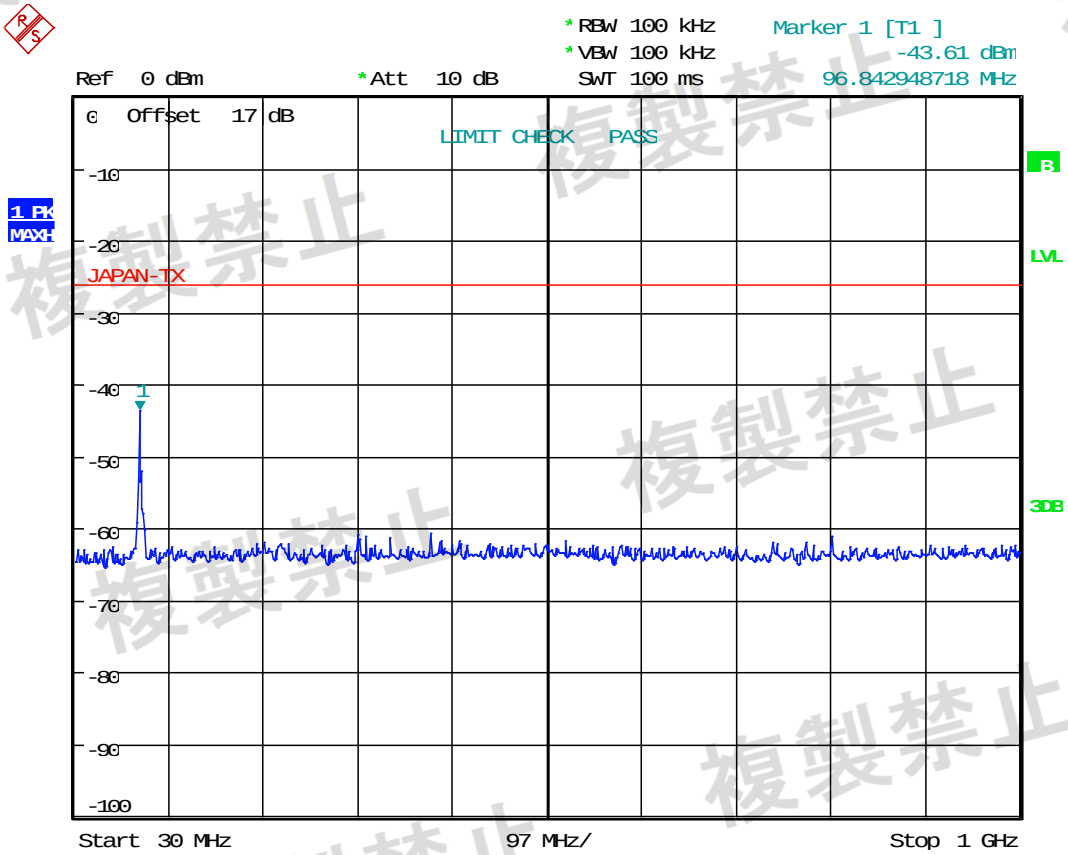


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Date: 19.JUL.2020 12:20:09



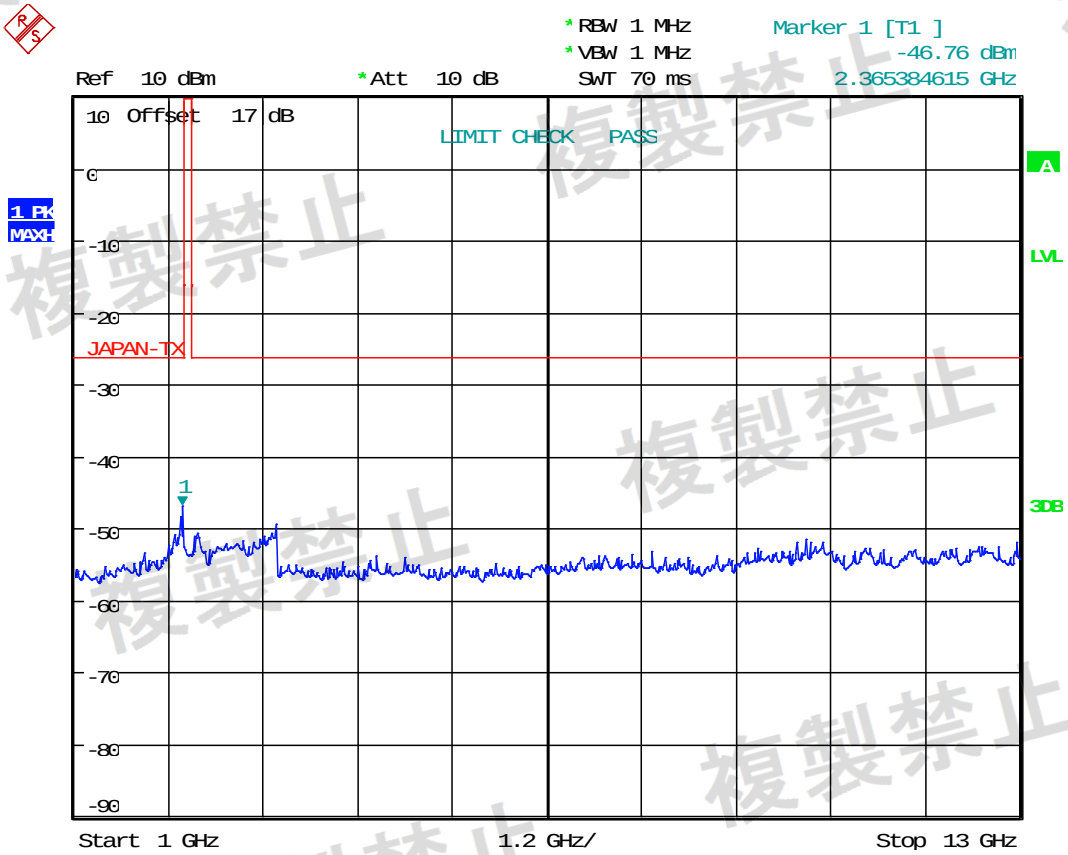
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Date: 19.JUL.2020 14:17:33



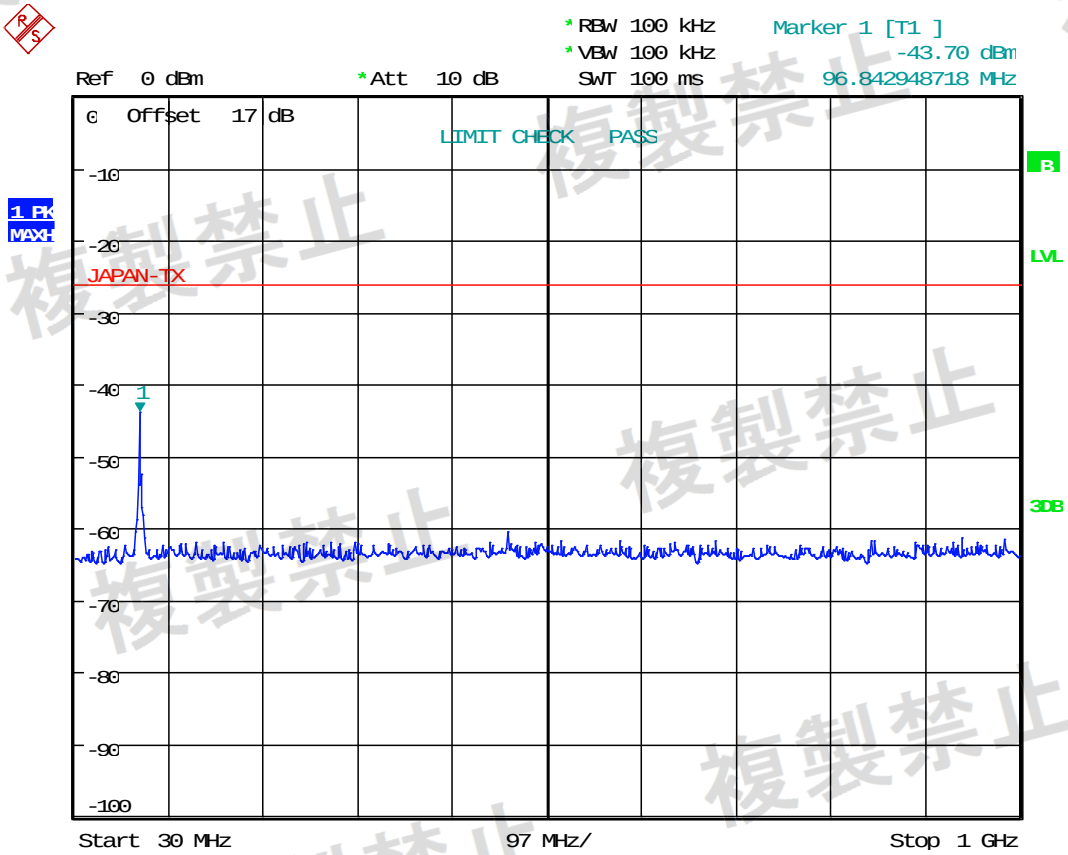
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Date: 19.JUL.2020 12:19:54



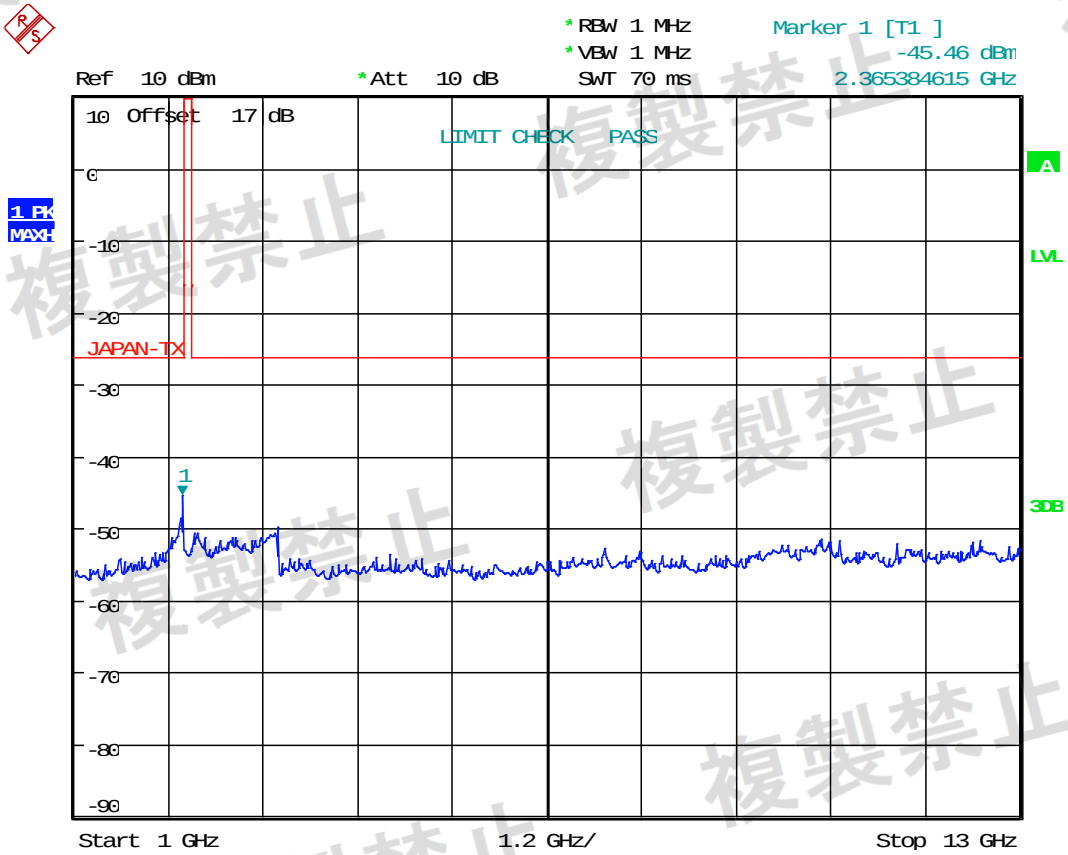
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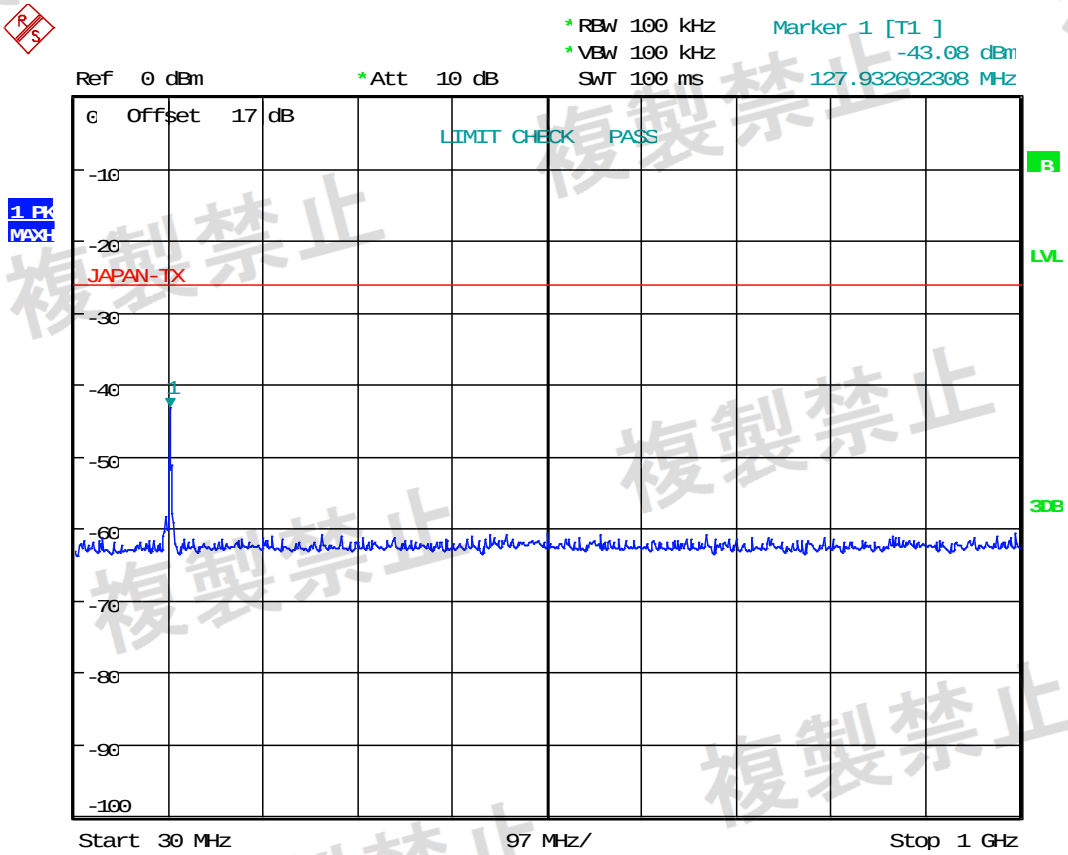
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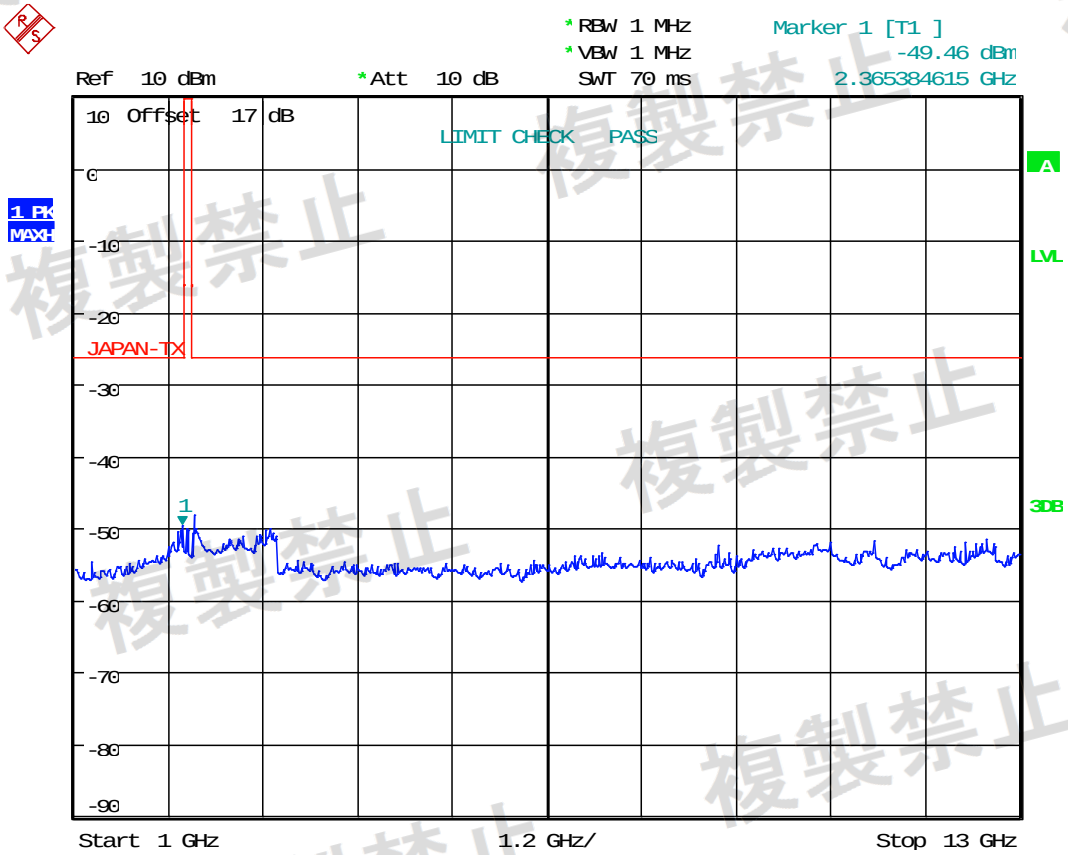
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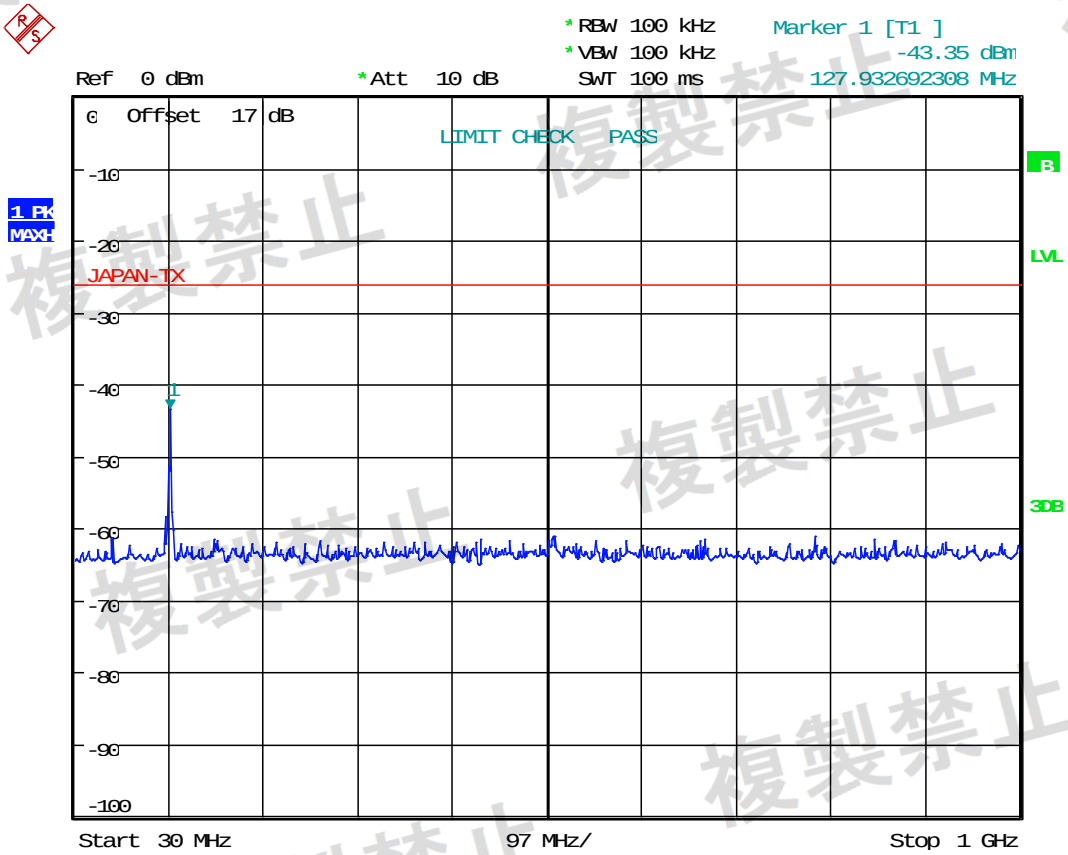
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Date: 19.JUL.2020 12:25:04



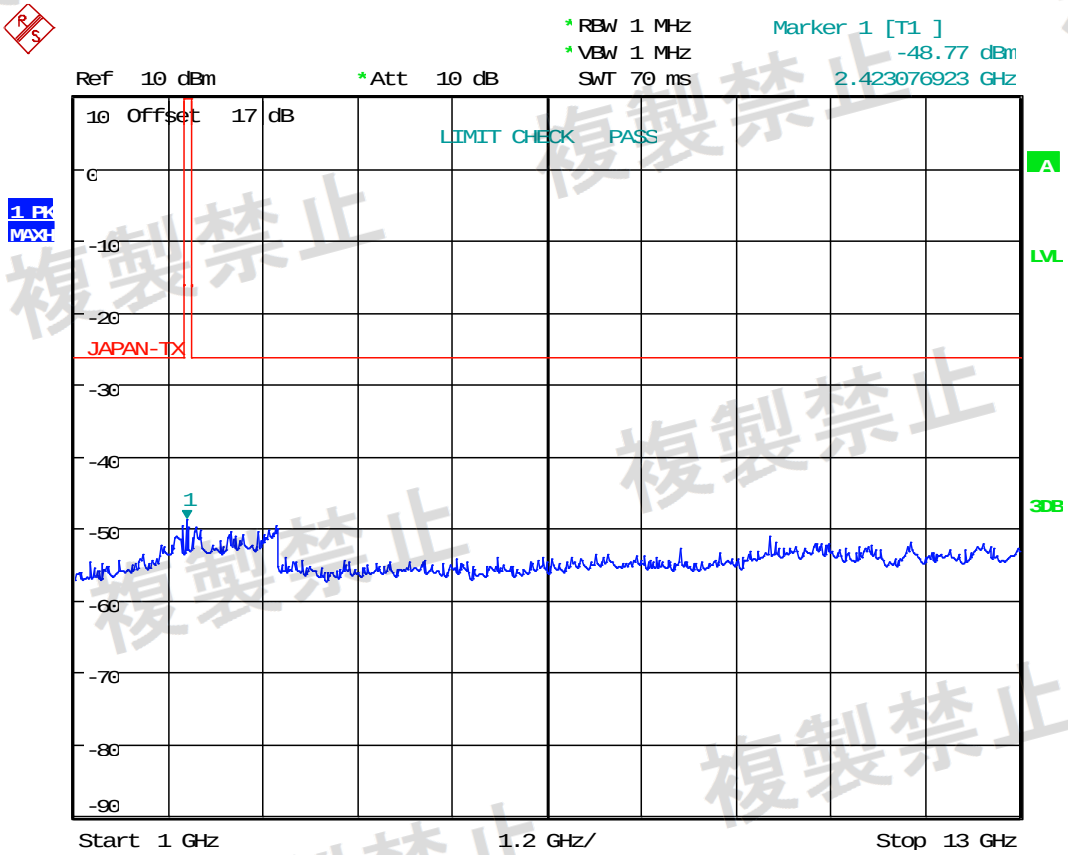
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Date: 19.JUL.2020 14:16:00



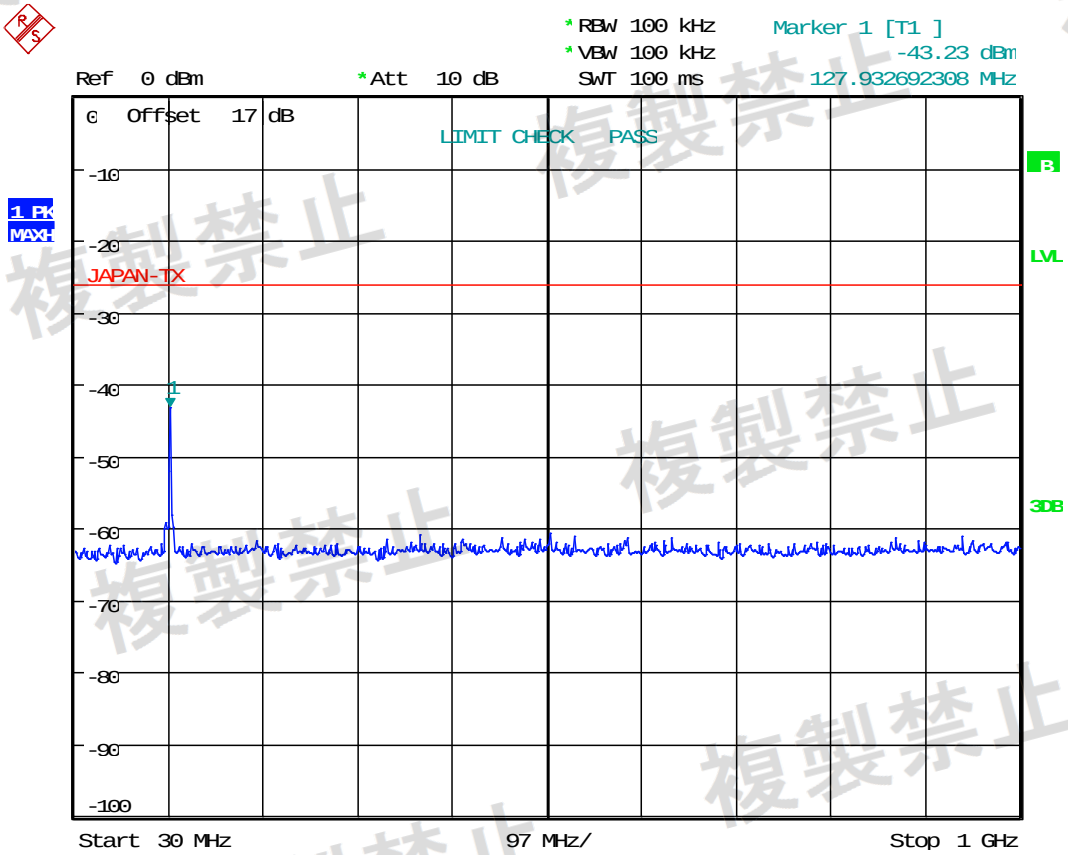
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Date: 19.JUL.2020 12:25:25



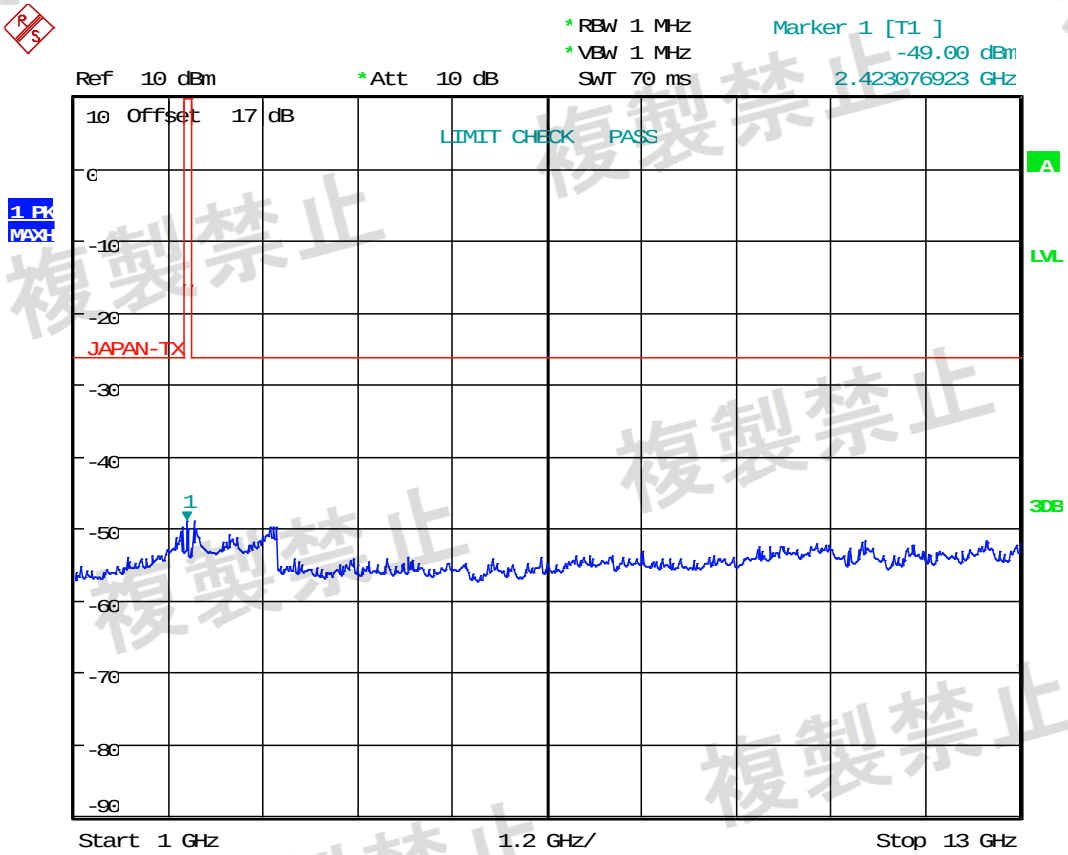
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Date: 19.JUL.2020 14:15:18



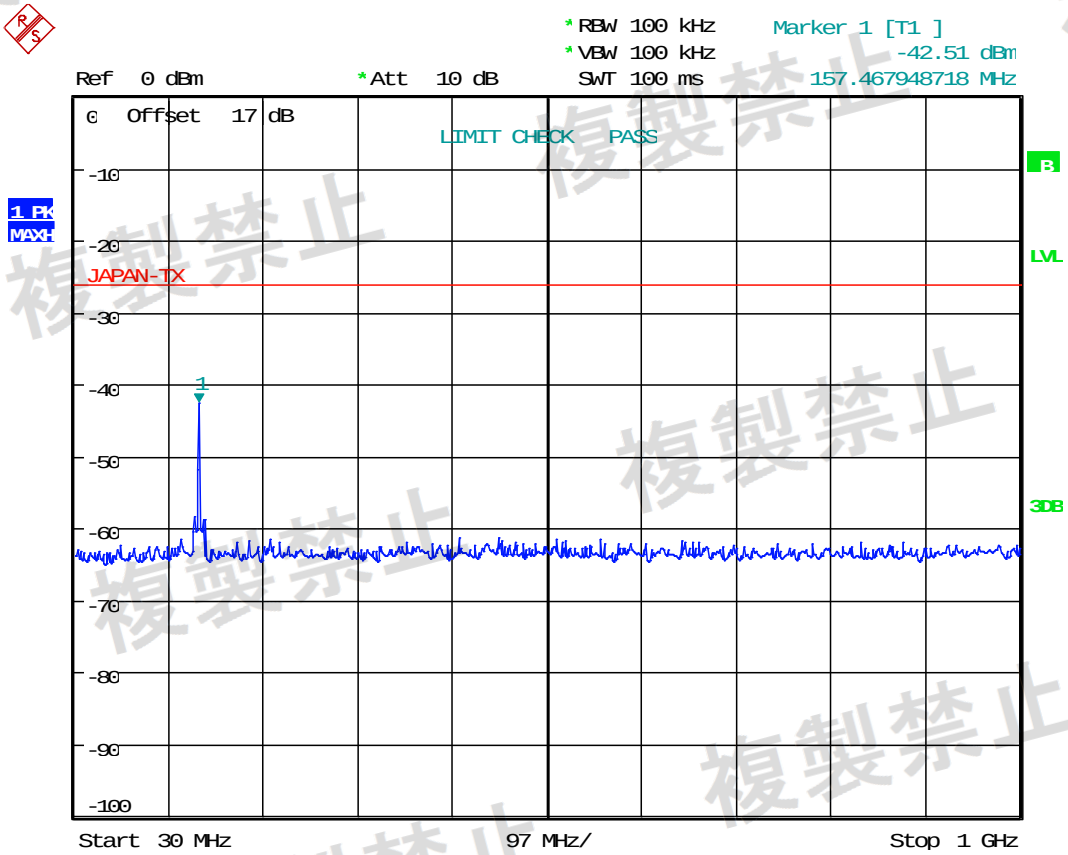
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Date: 19.JUL.2020 12:23:15



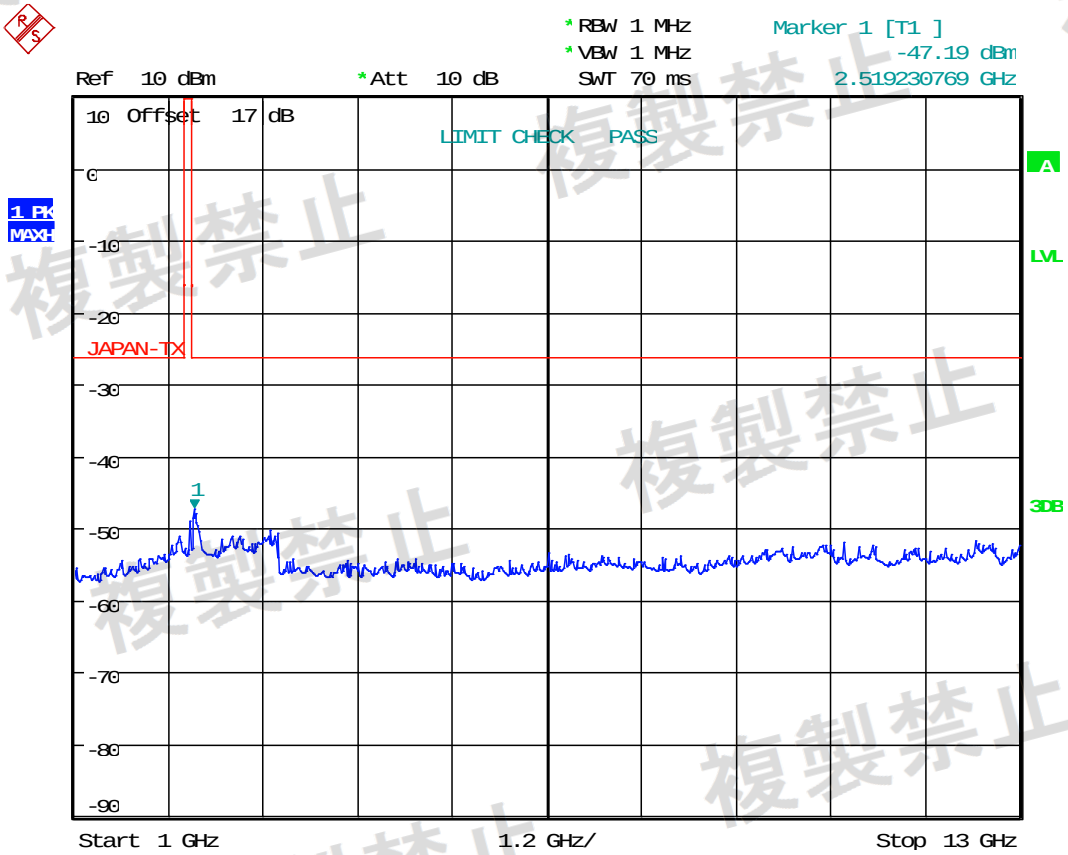
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Date: 19.JUL.2020 14:16:27



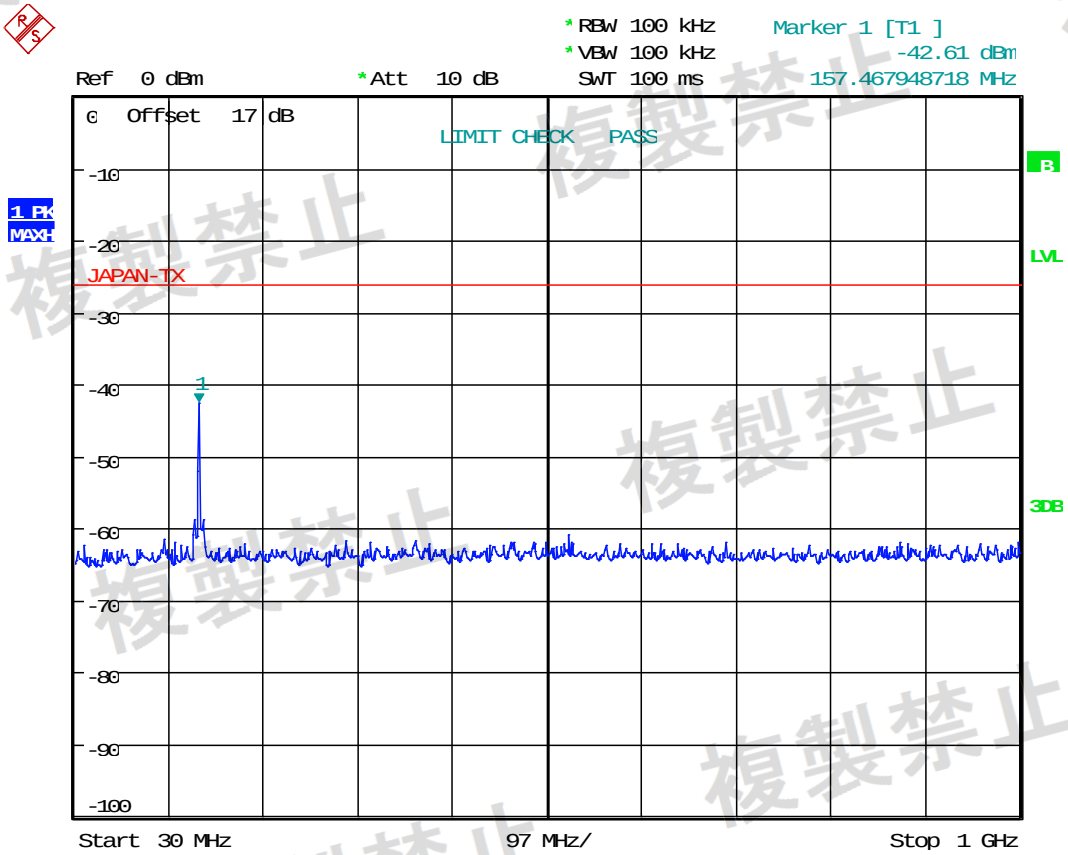
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Date: 19.JUL.2020 12:26:32



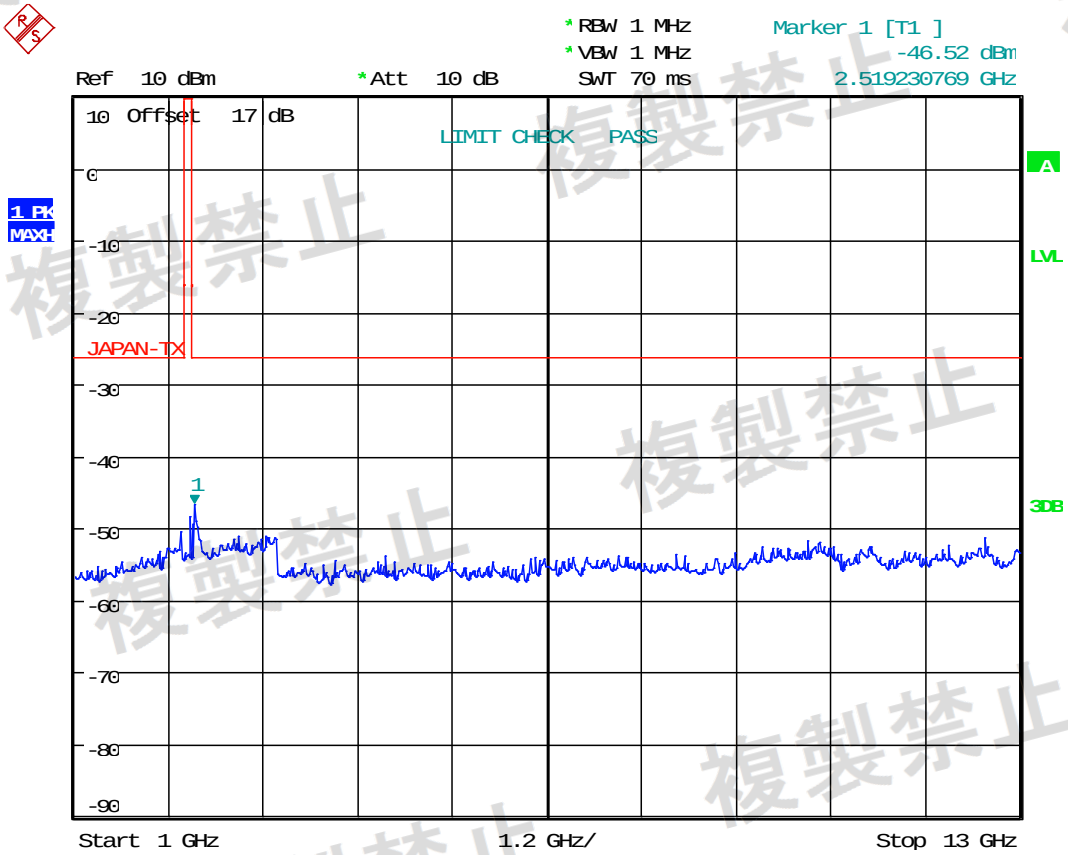
CONDUCTED SPURIOUS EMISSION 802.11B CH13 3.3V

Date: 19.JUL.2020 14:14:22



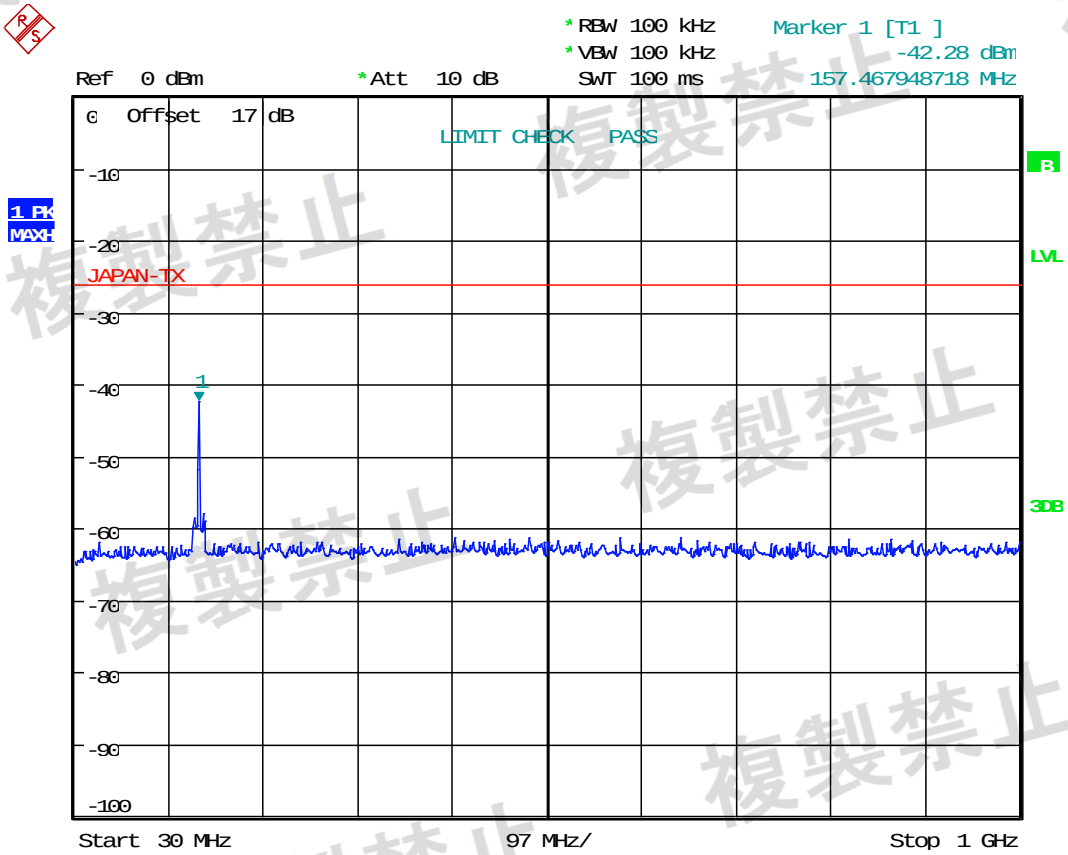
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Date: 19.JUL.2020 12:26:17



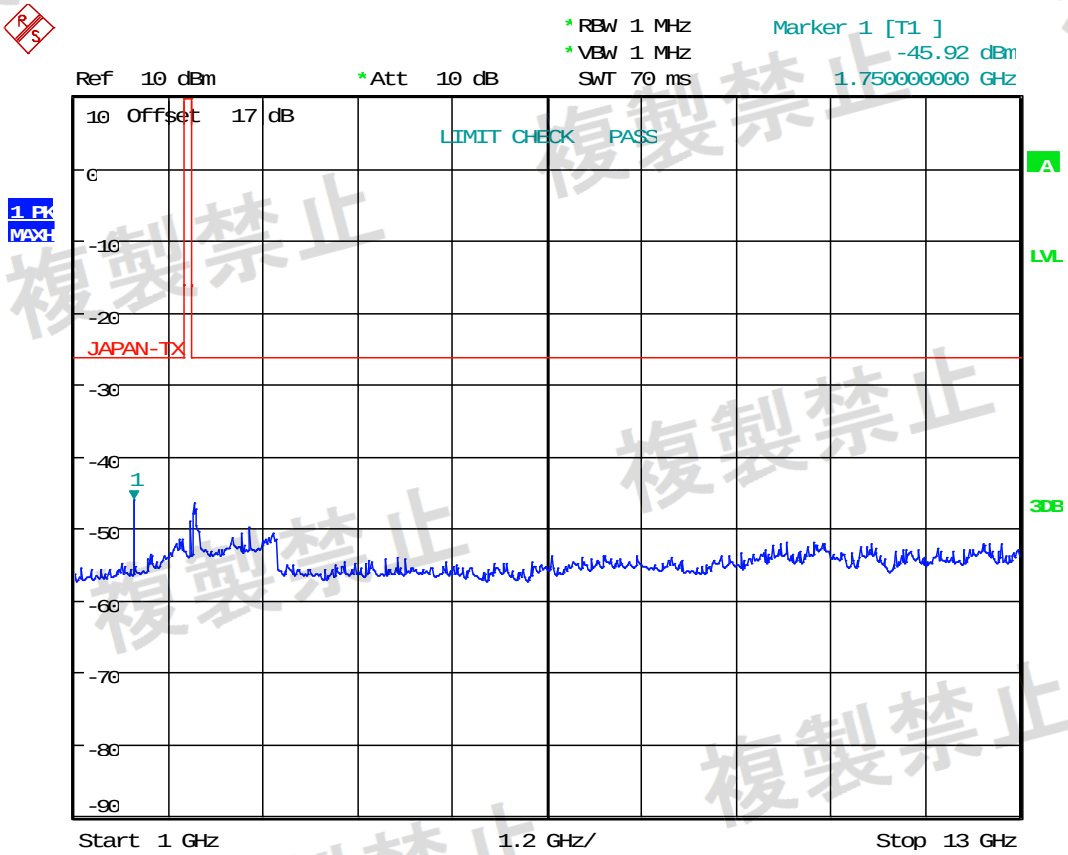
CONDUCTED SPURIOUS EMISSION 802.11B CH13 2.97V

Date: 19.JUL.2020 14:14:54



CONDUCTED SPURIOUS EMISSION 802.11B CH13 3.63V

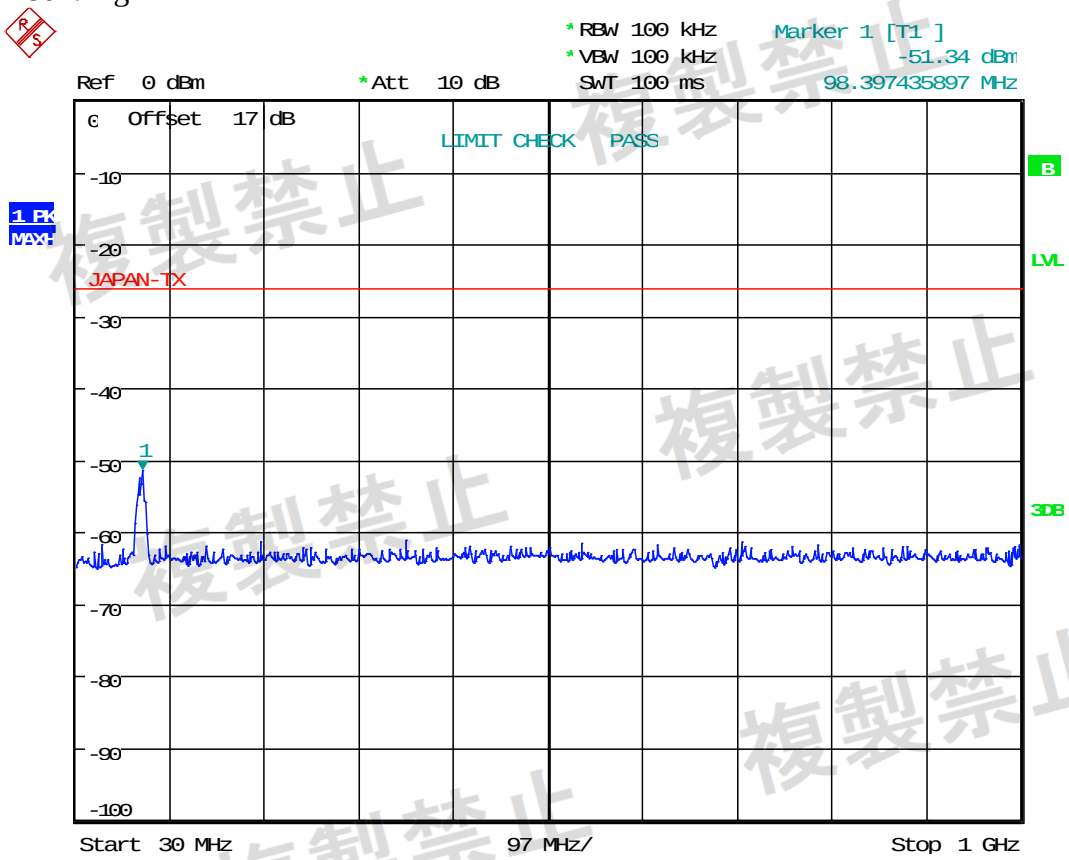
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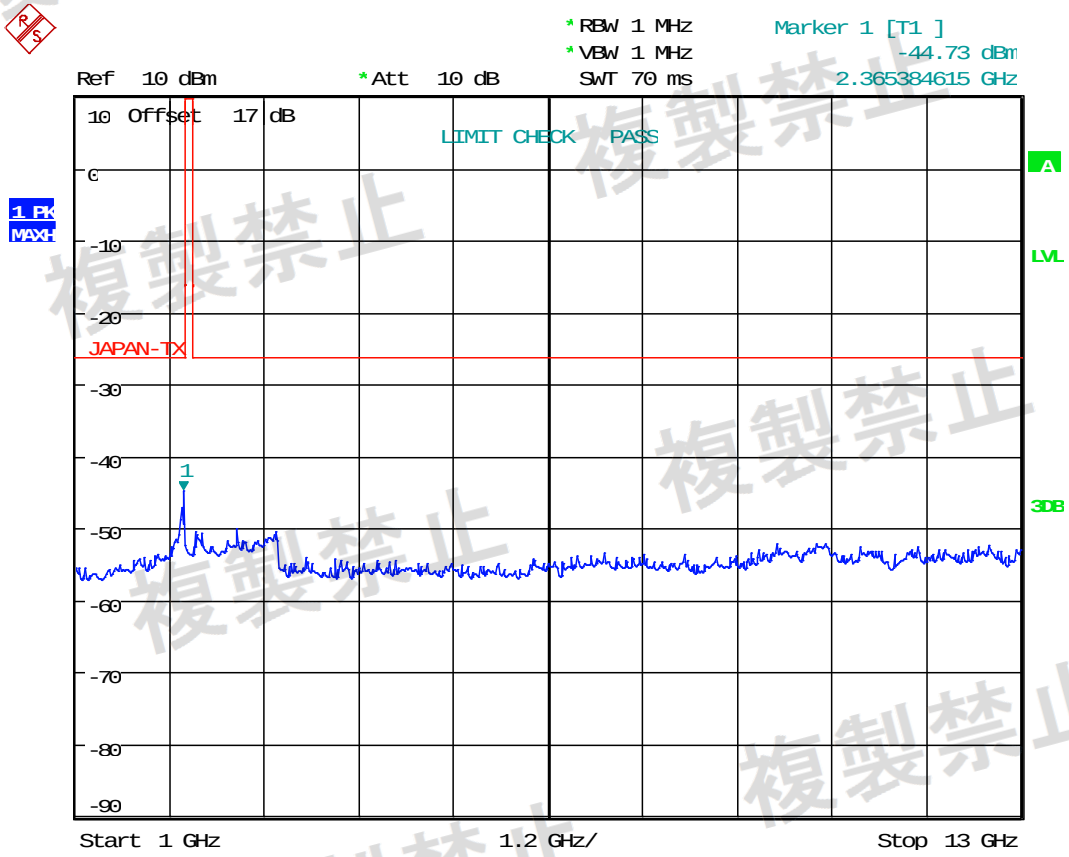
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Date: 19.JUL.2020 14:14:06

IEEE 802.11g

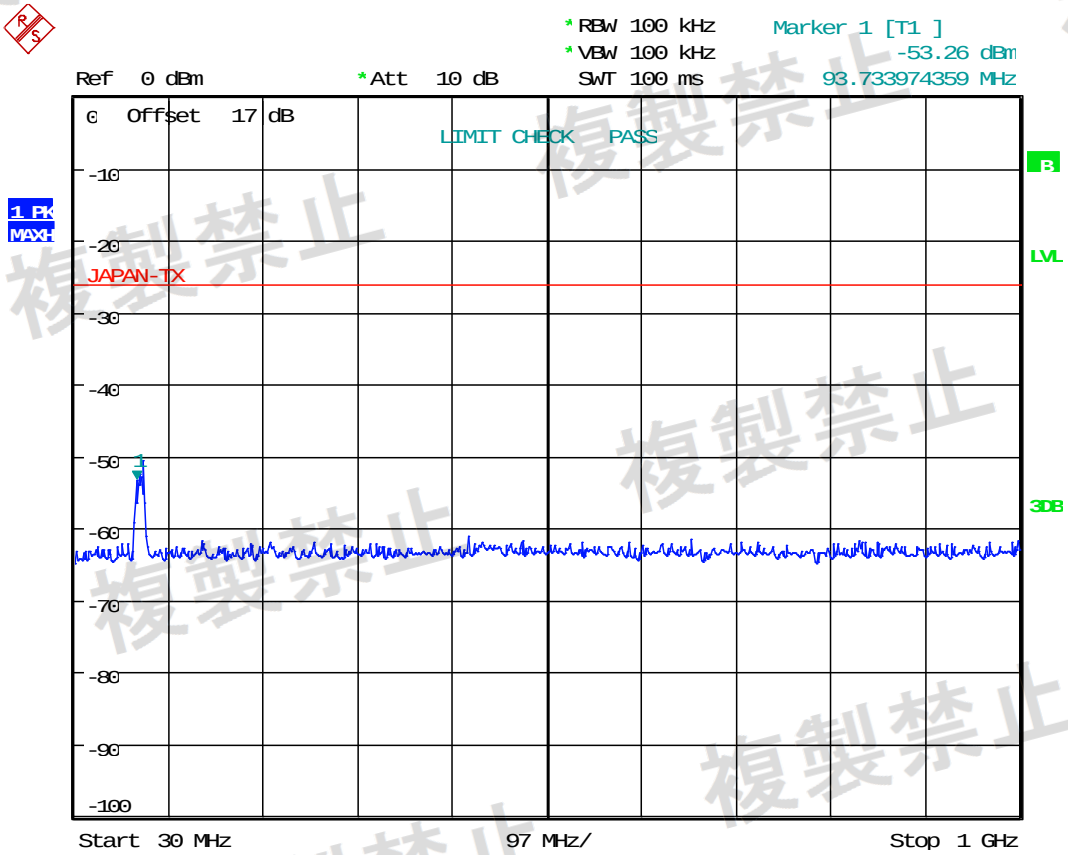


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Date: 19.JUL.2020 12:32:46



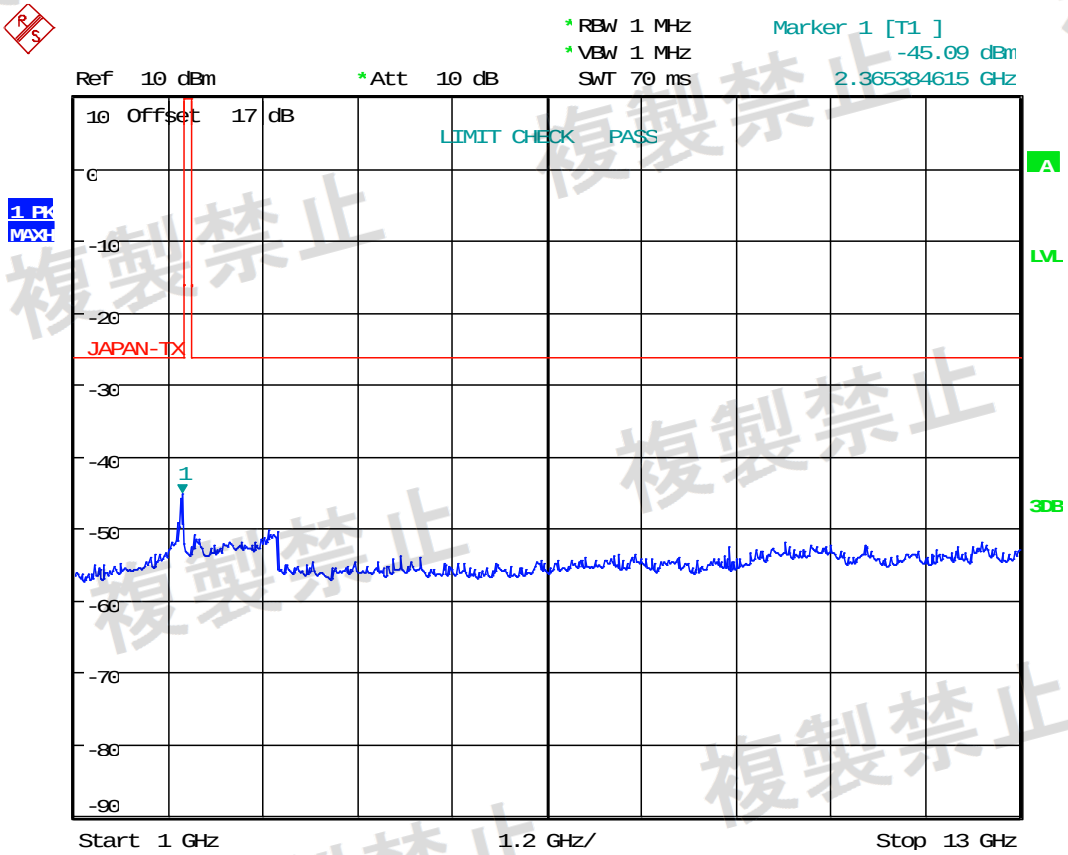
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Date: 19.JUL.2020 13:52:33



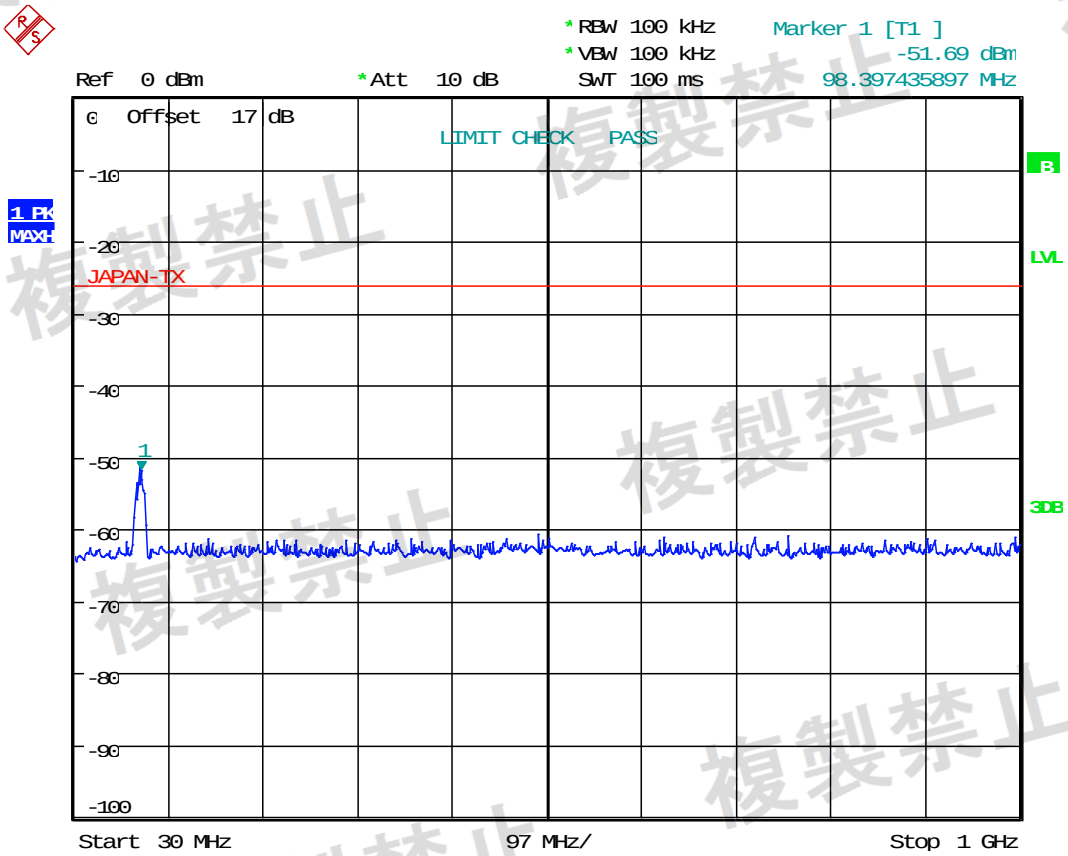
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Date: 19.JUL.2020 12:33:03



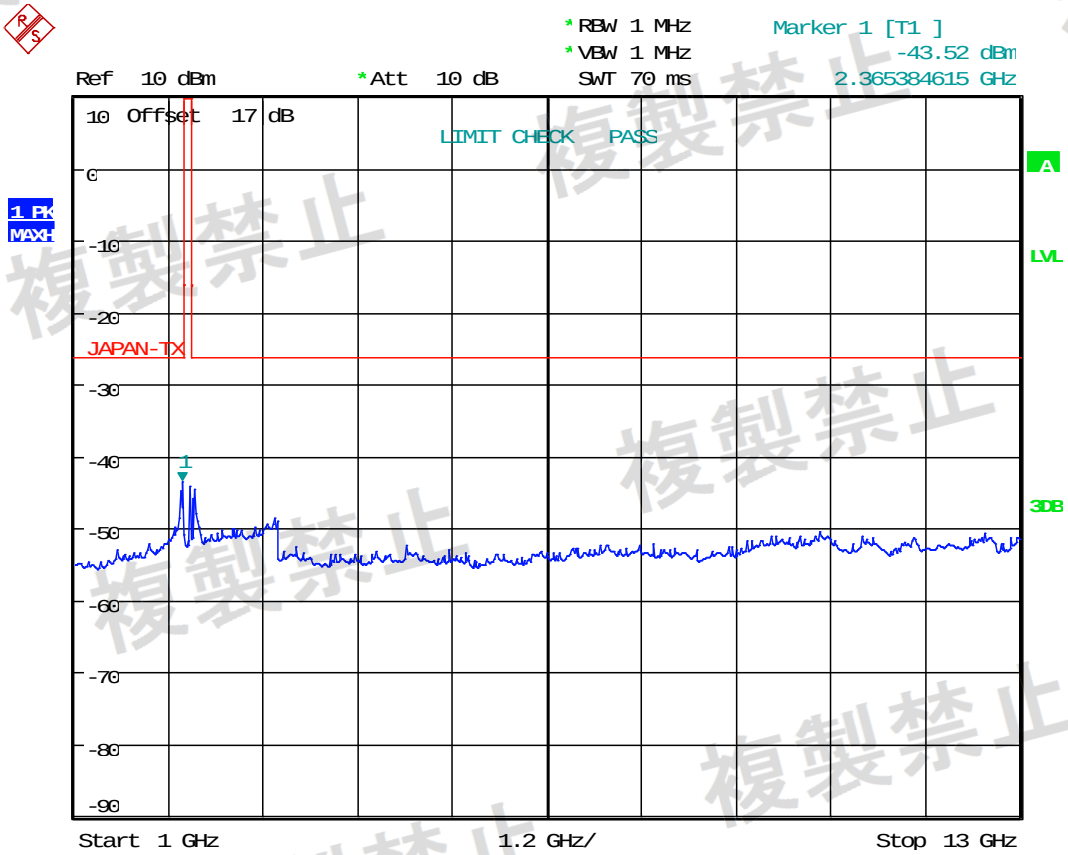
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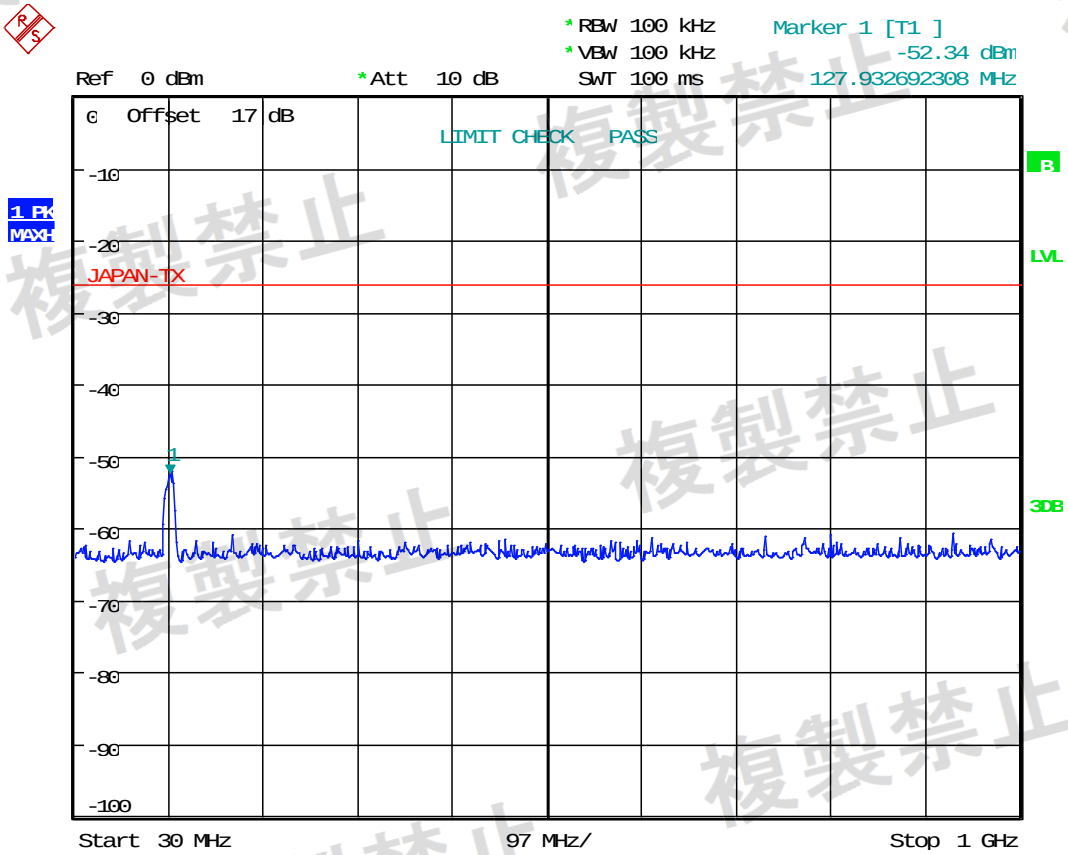
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Date: 19.JUL.2020 12:31:50



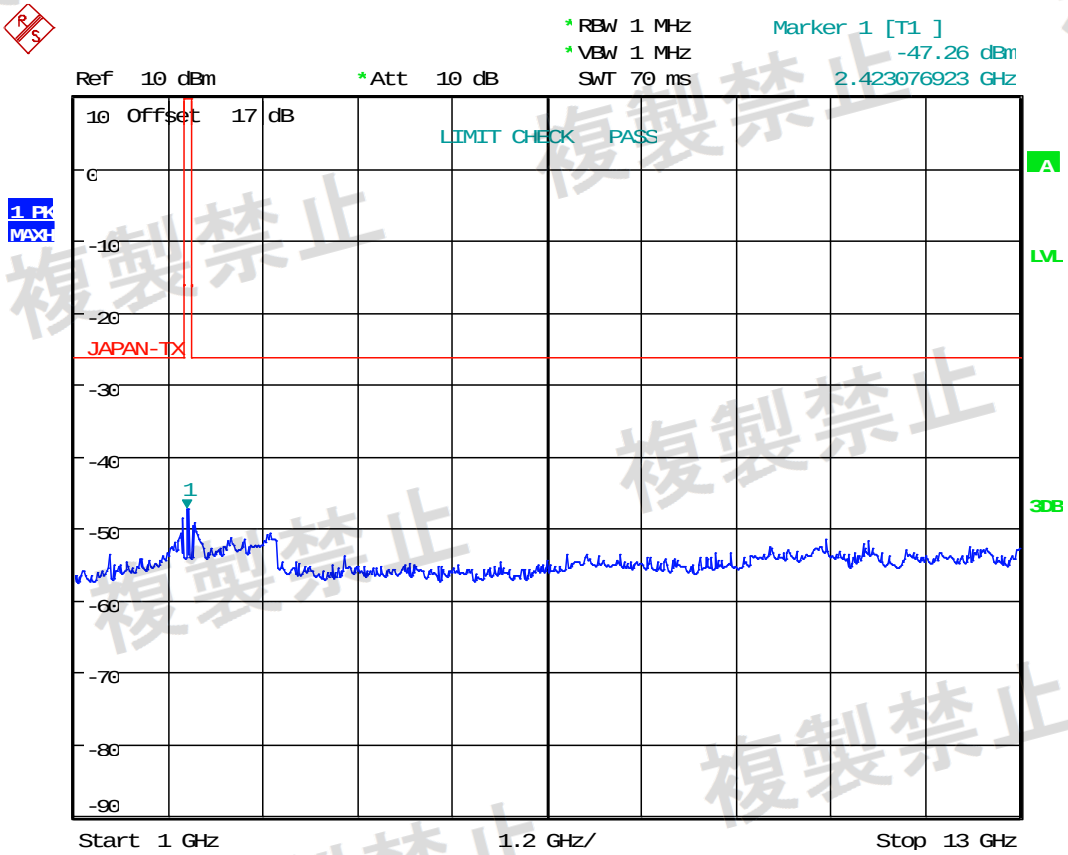
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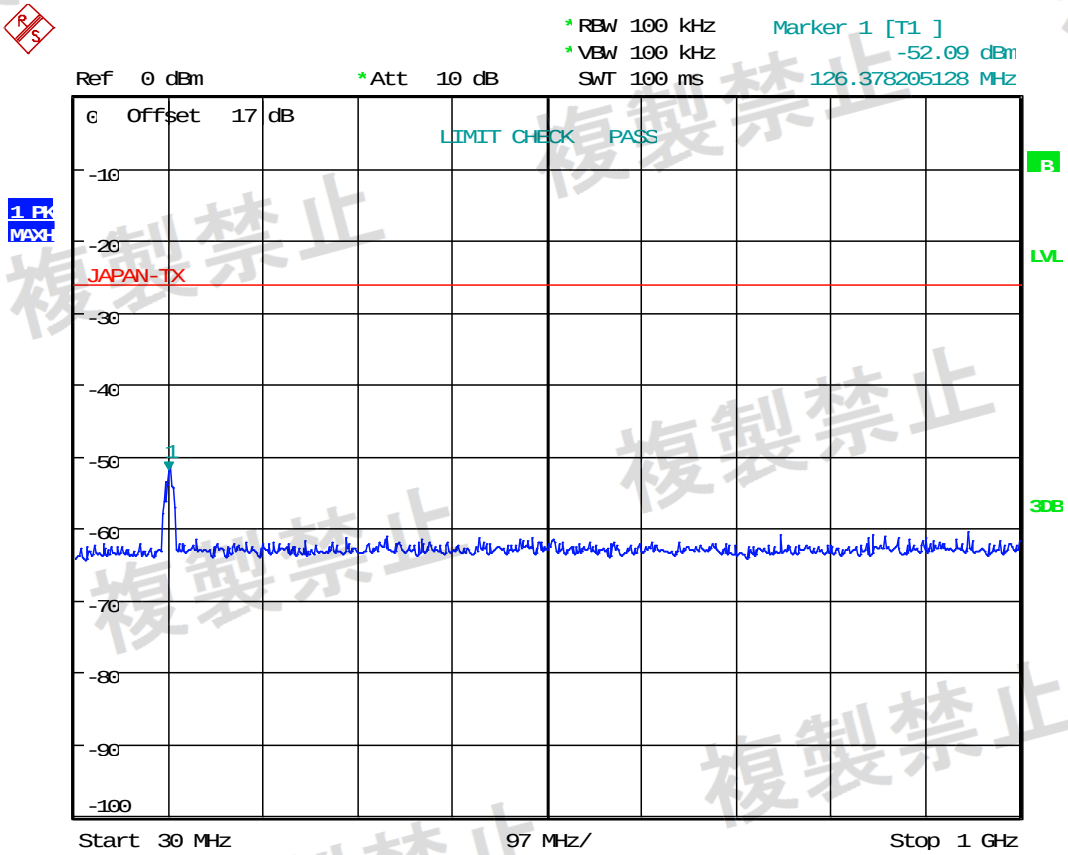
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Date: 19.JUL.2020 12:34:20



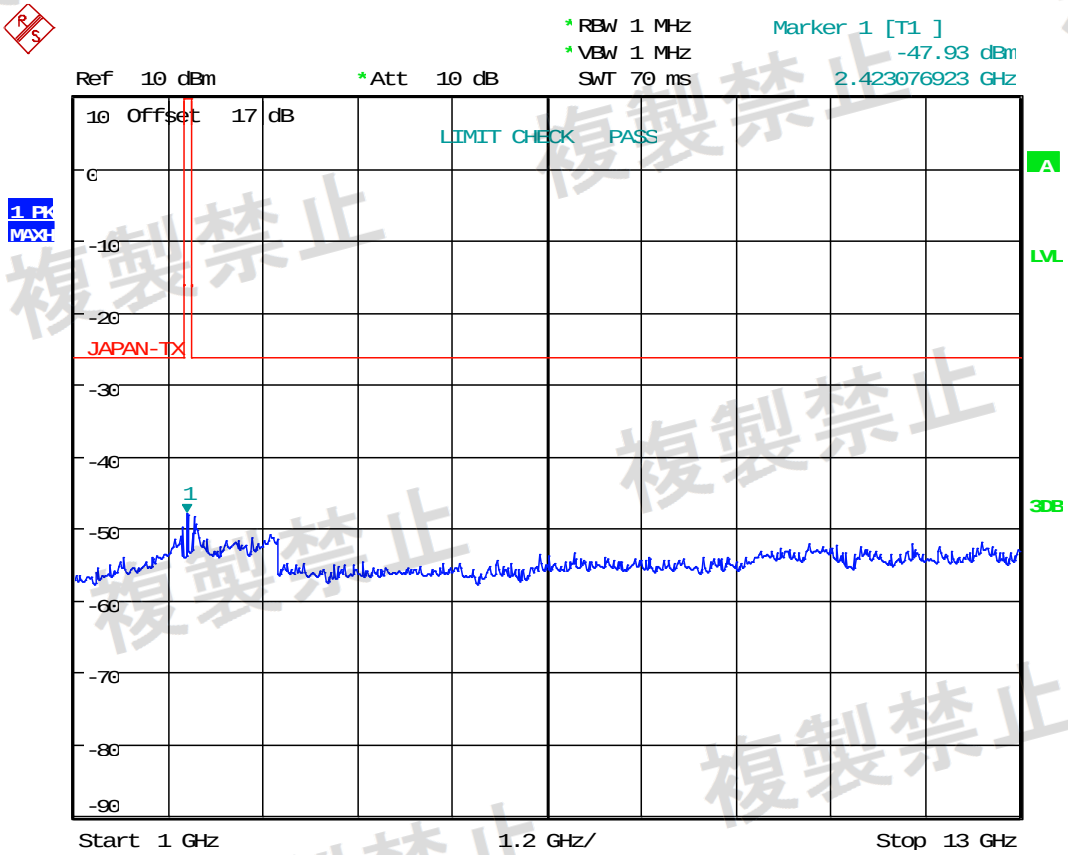
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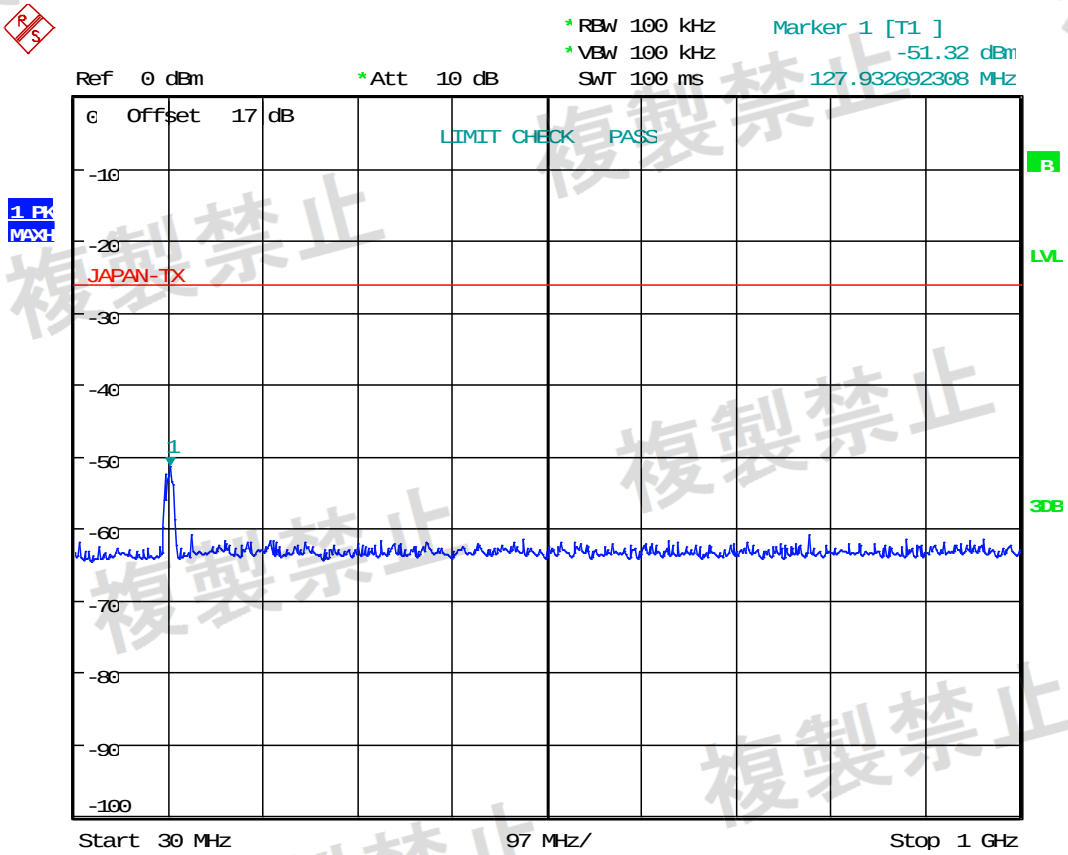
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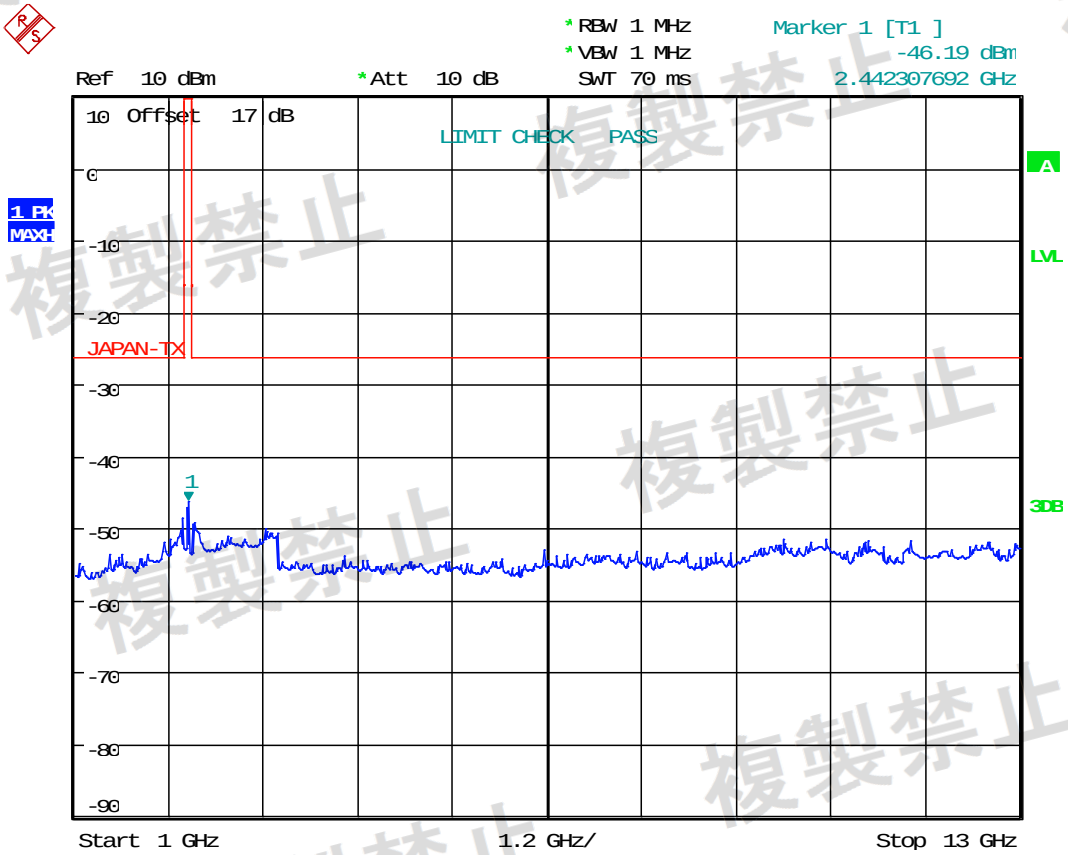
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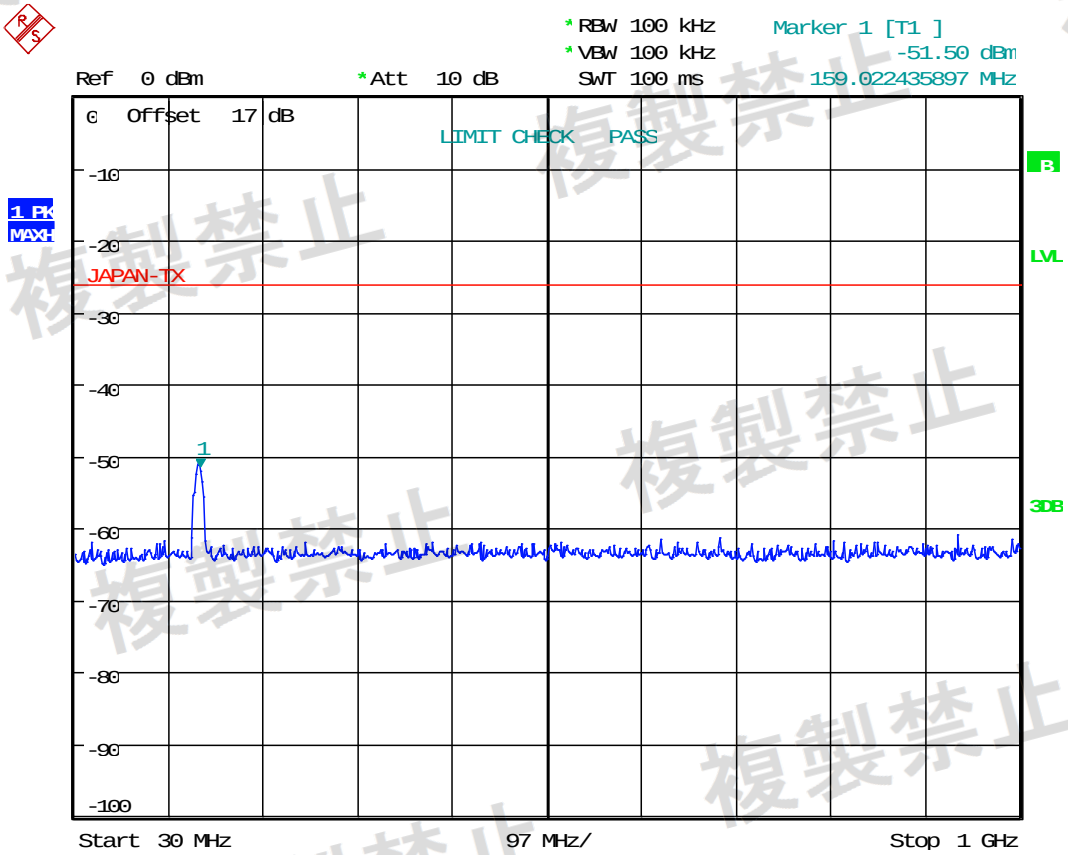
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Date: 19.JUL.2020 12:35:31



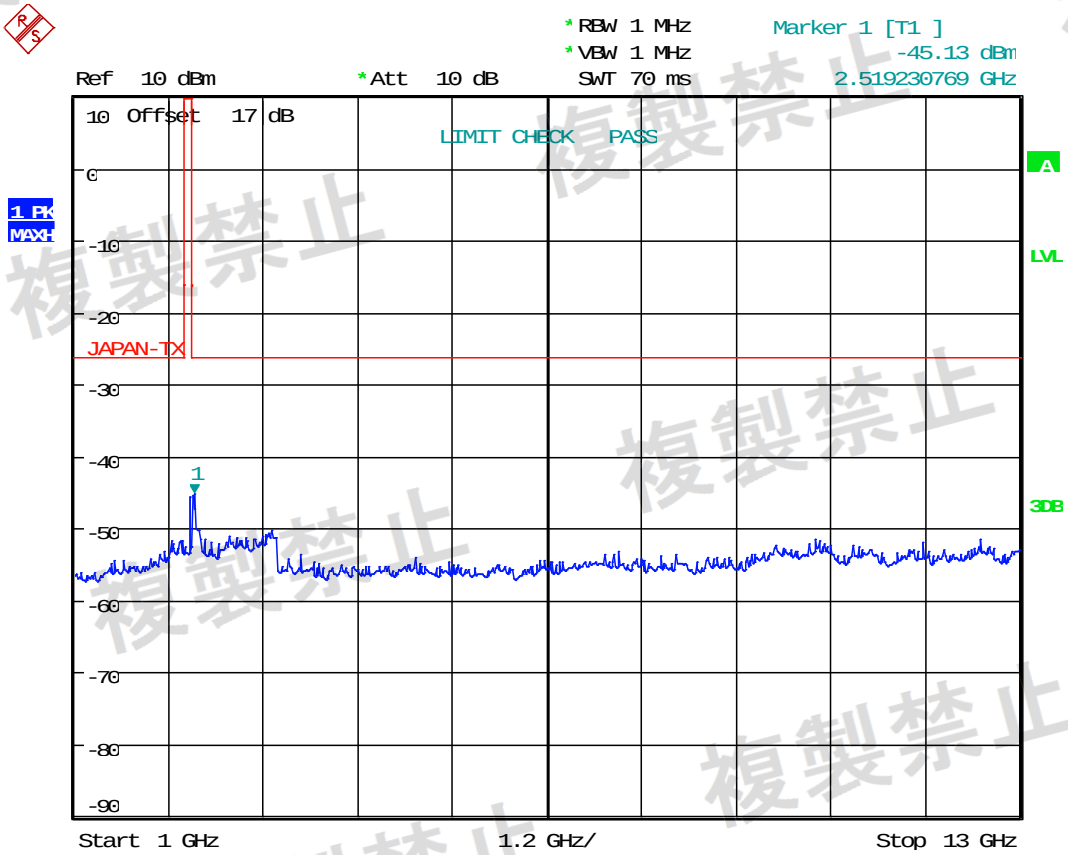
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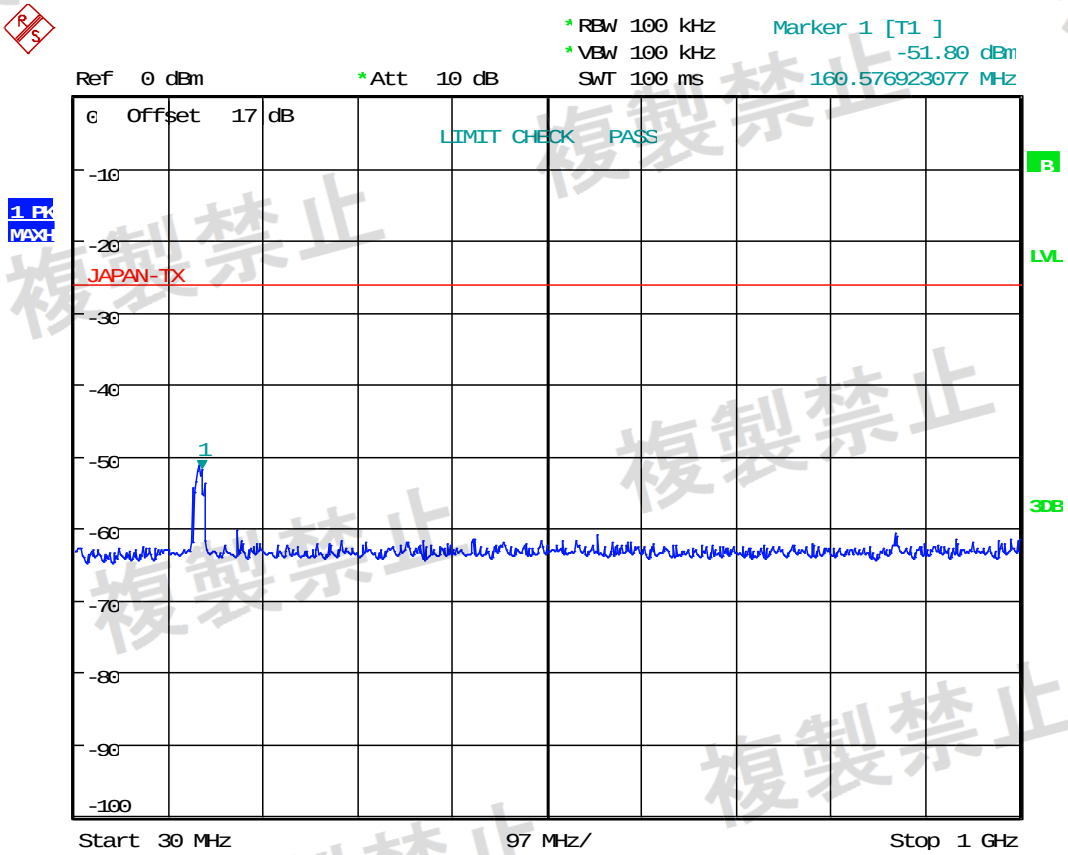
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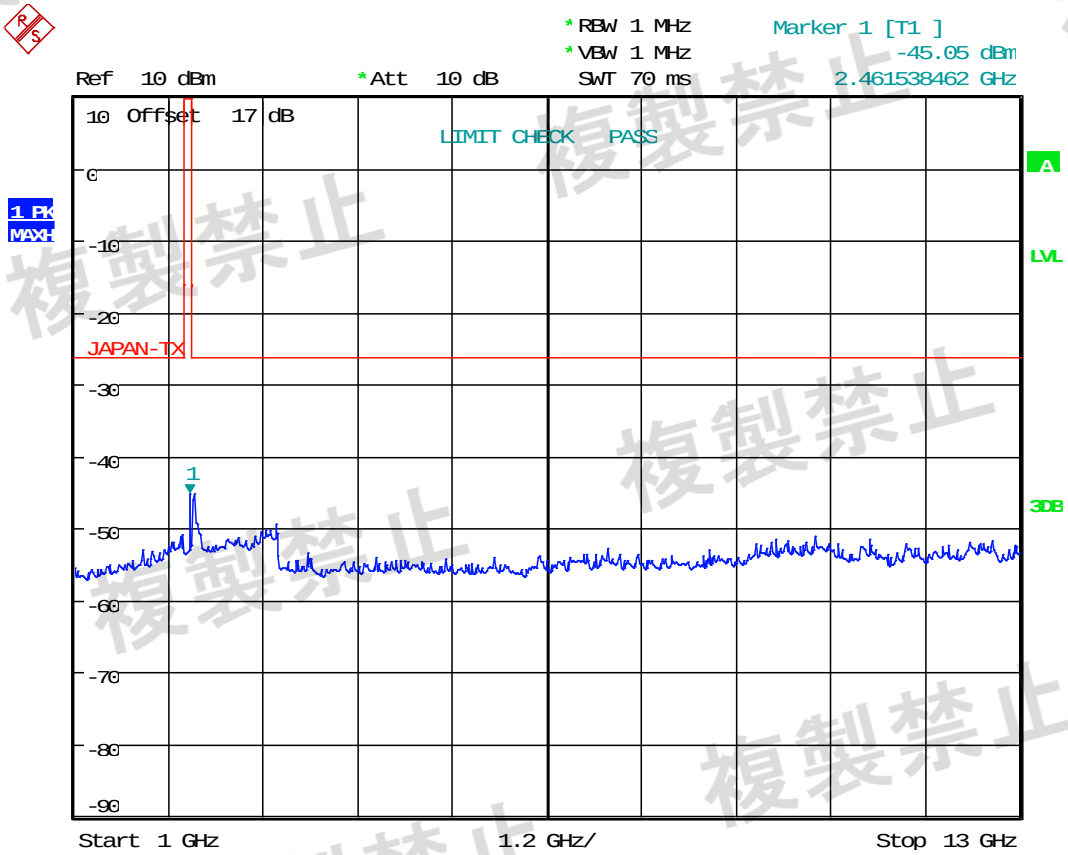
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Date: 19.JUL.2020 14:19:39



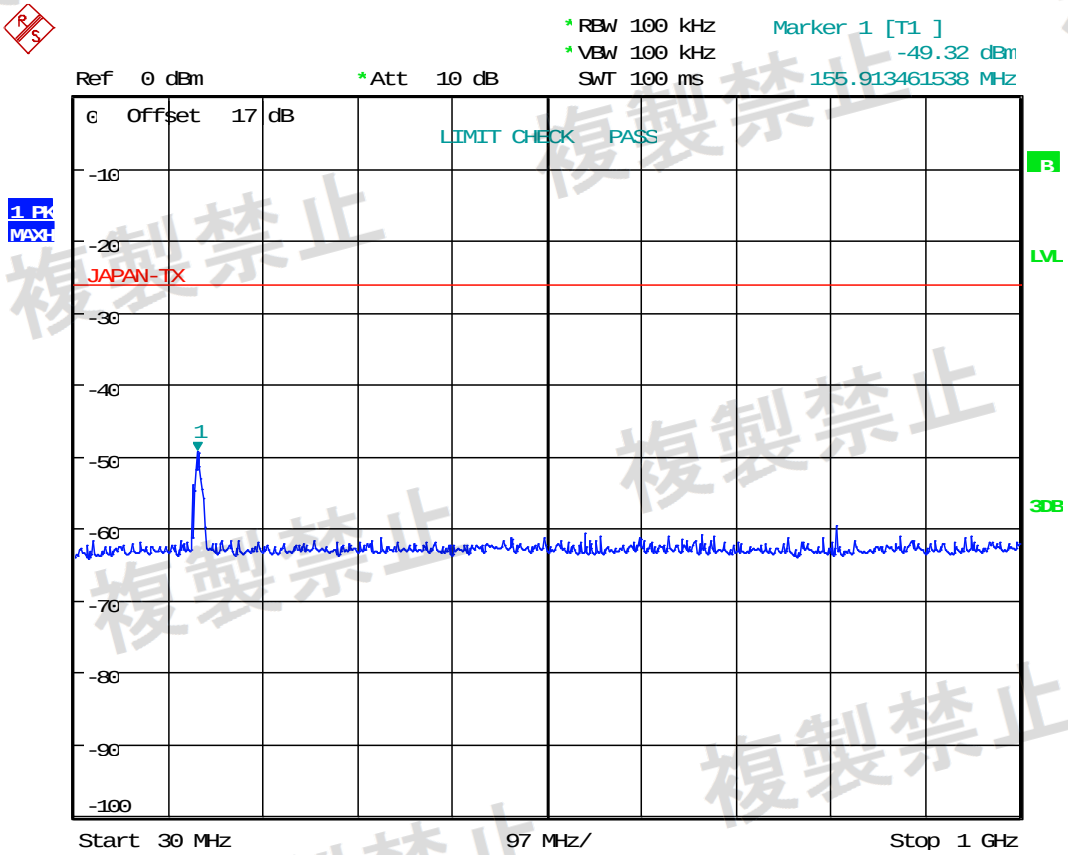
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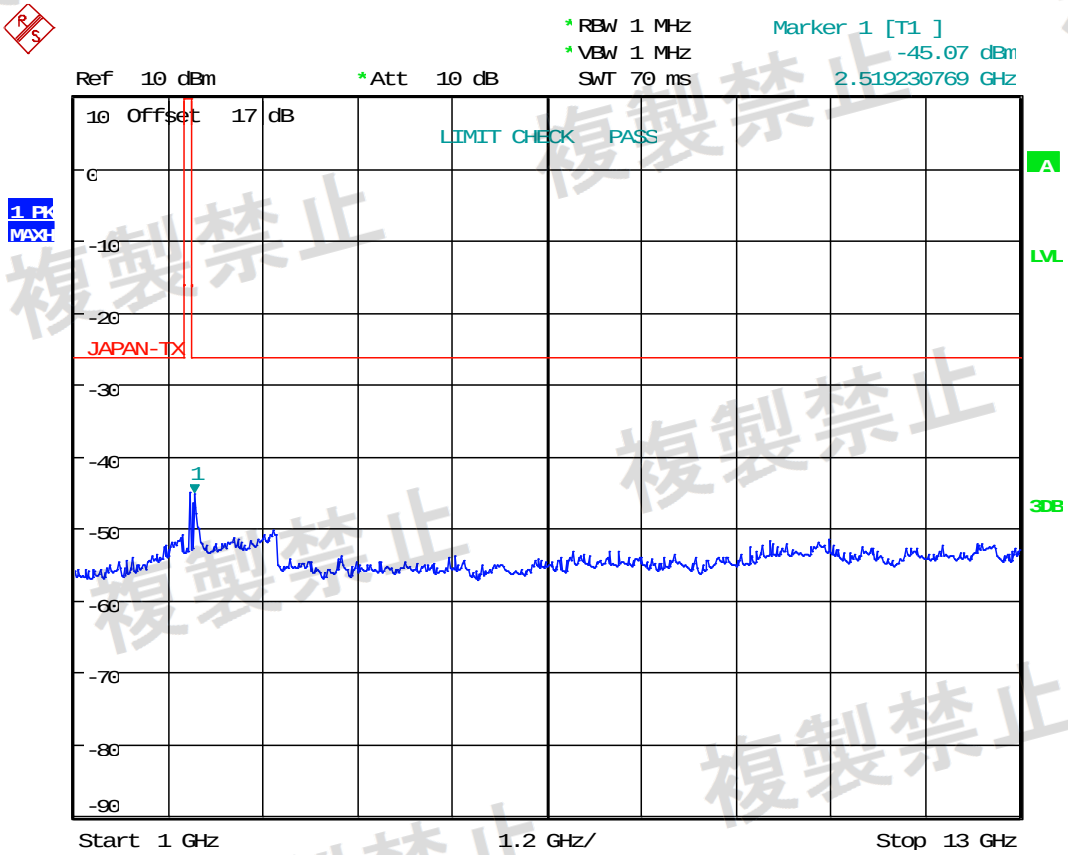
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Date: 19.JUL.2020 14:18:52



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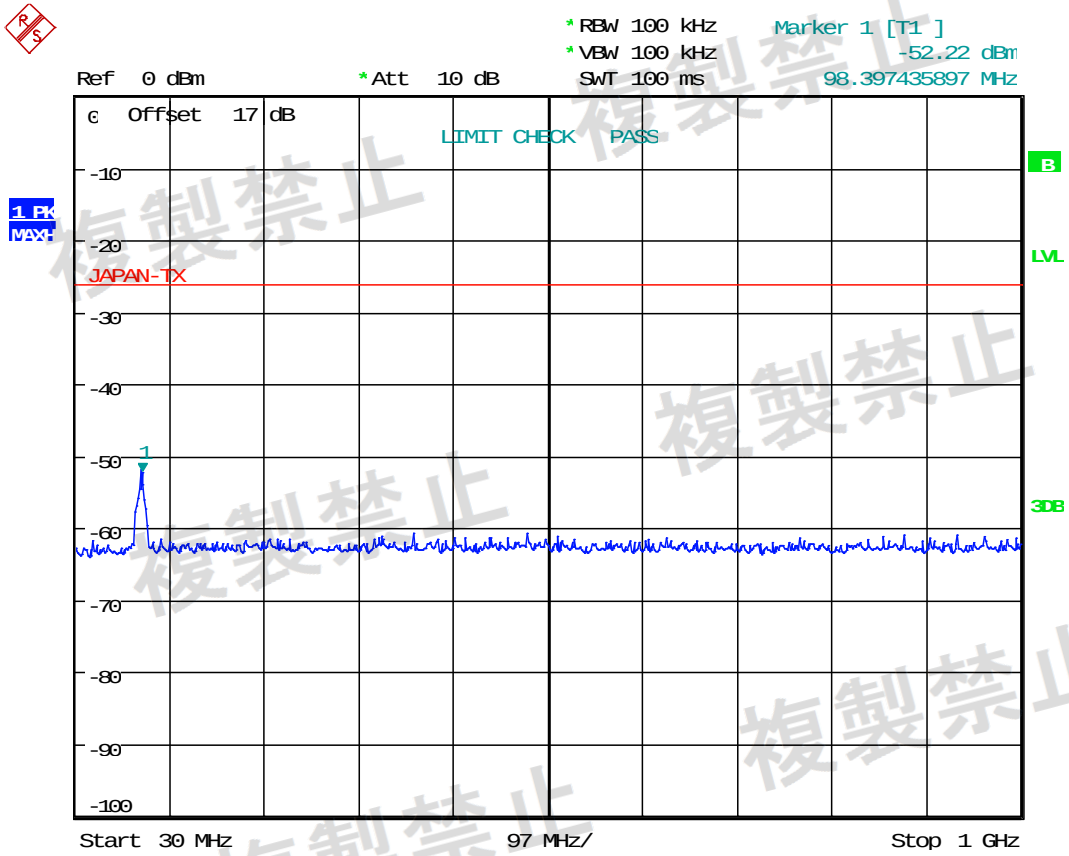
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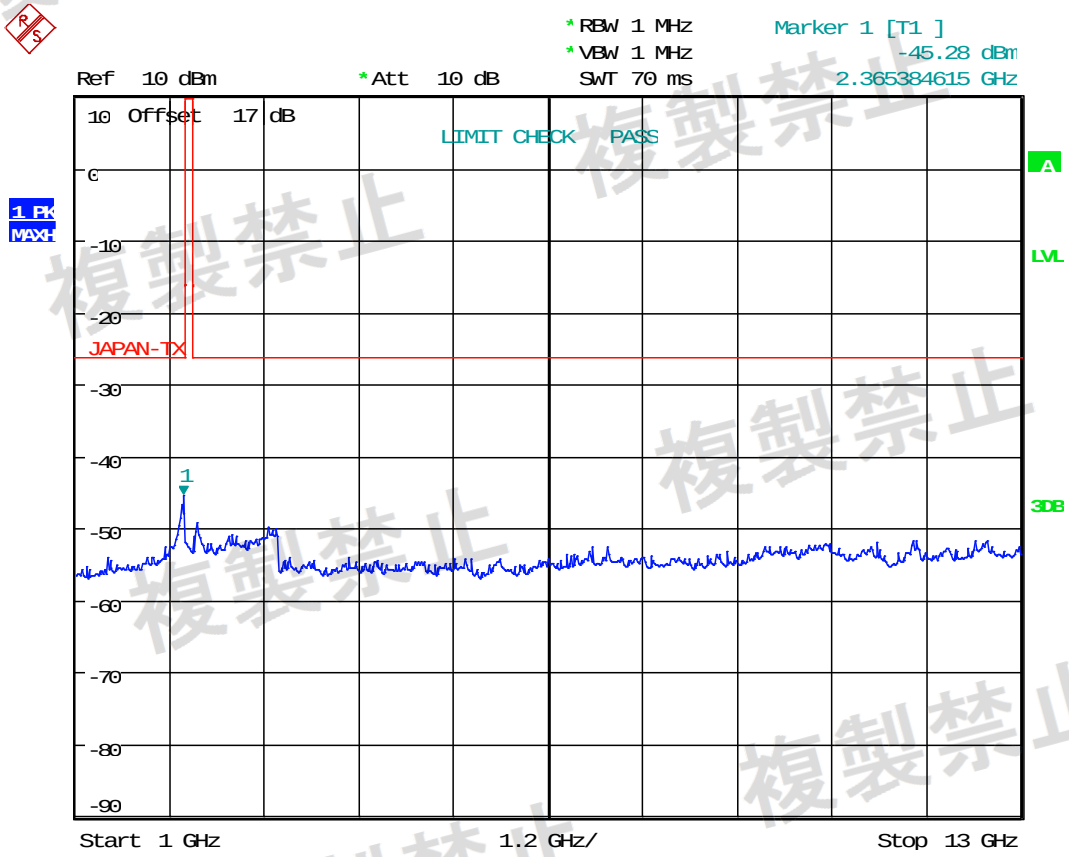
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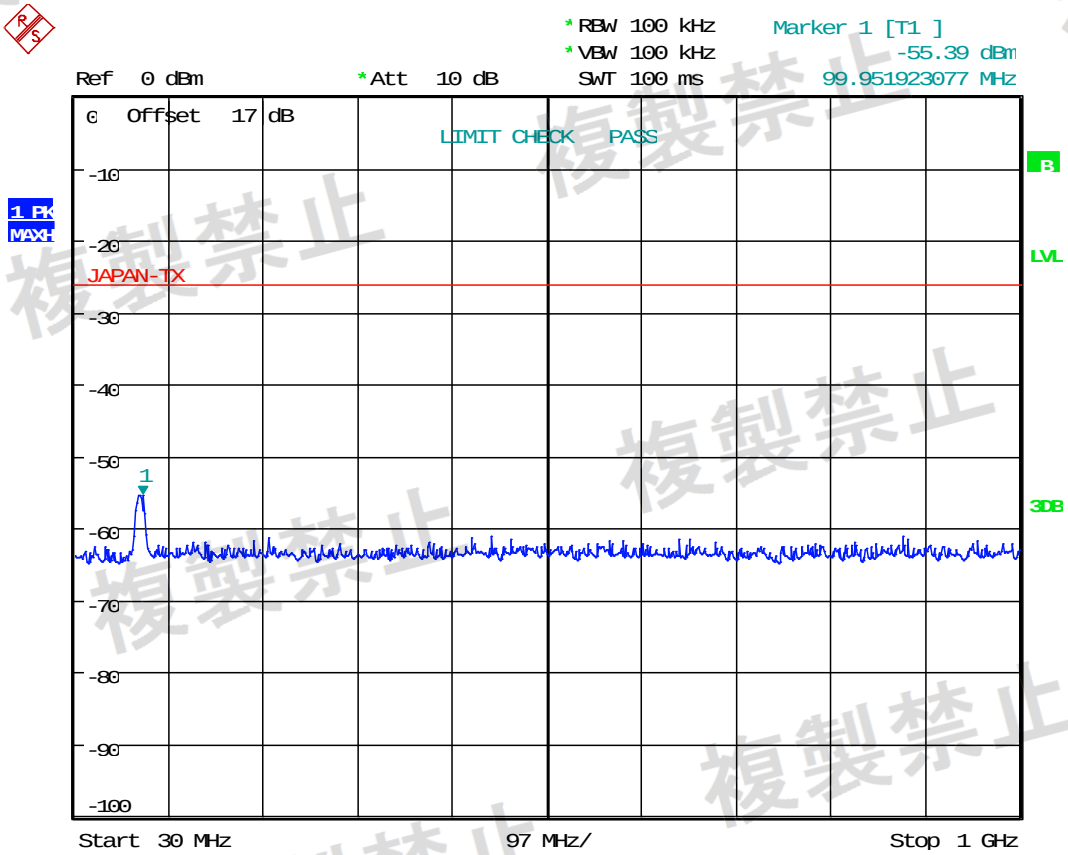
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Date: 19.JUL.2020 12:43:28



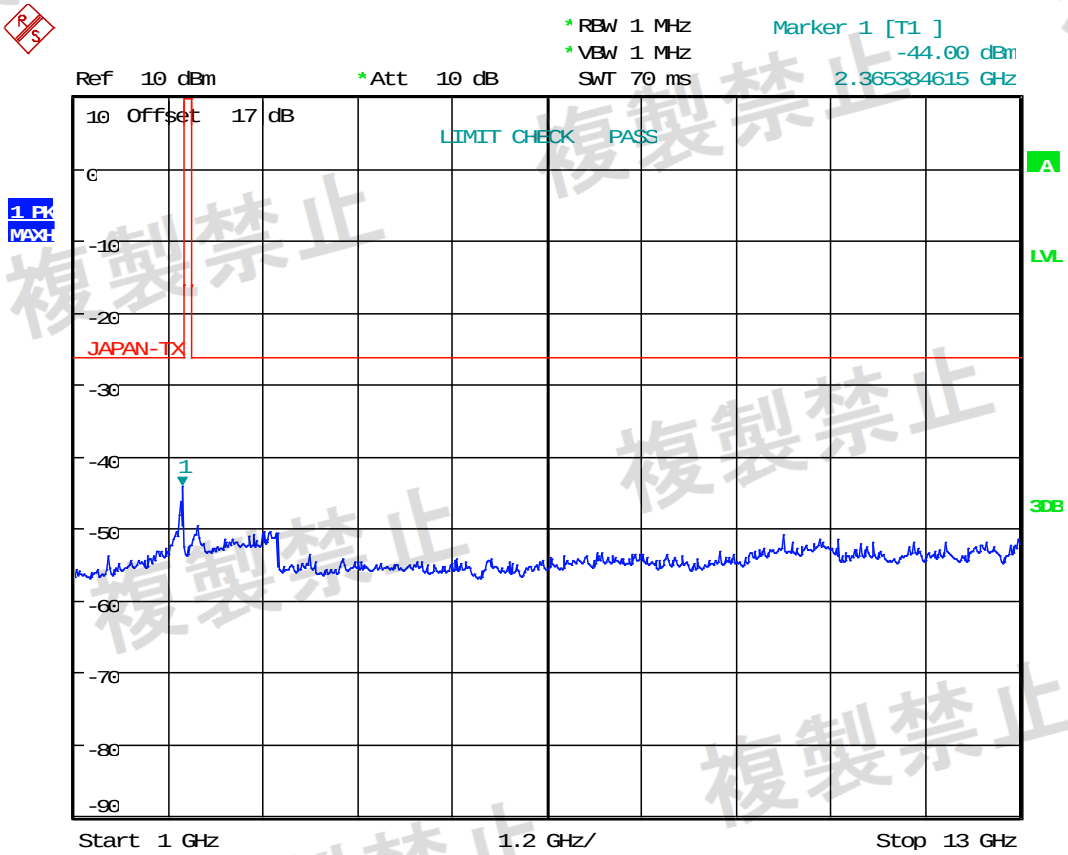
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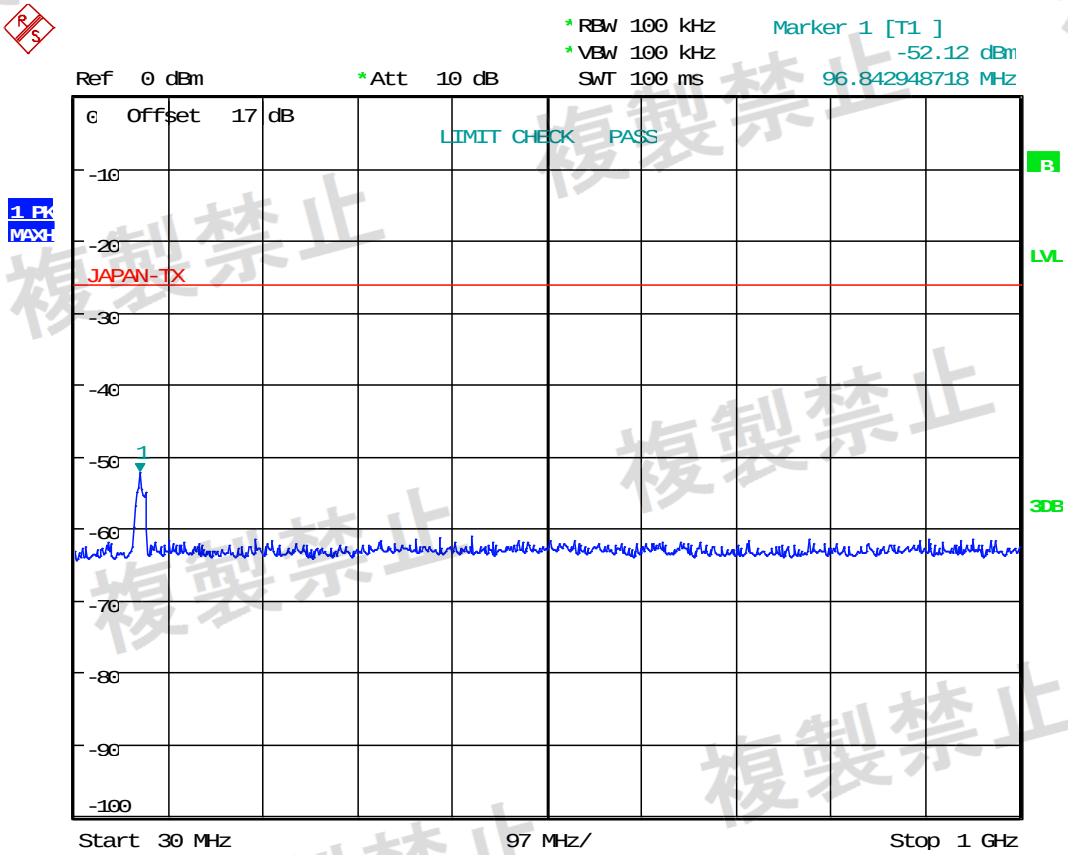
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Date: 19.JUL.2020 12:41:55



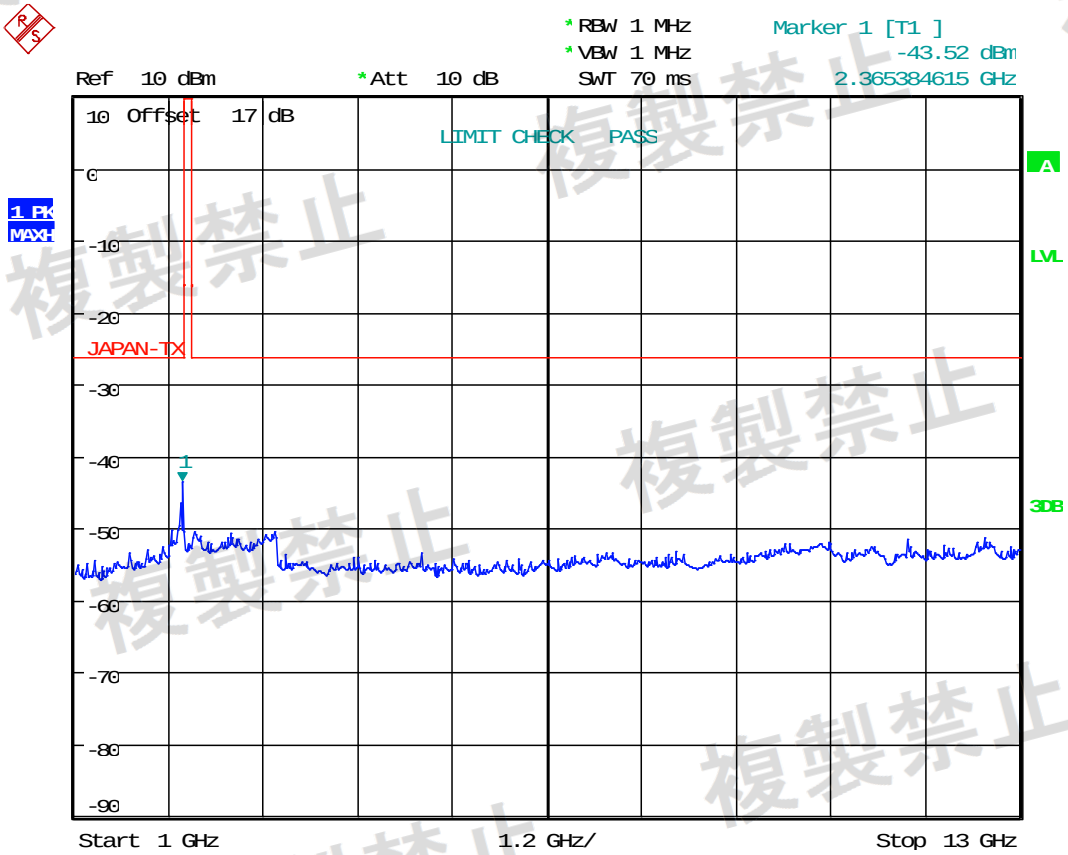
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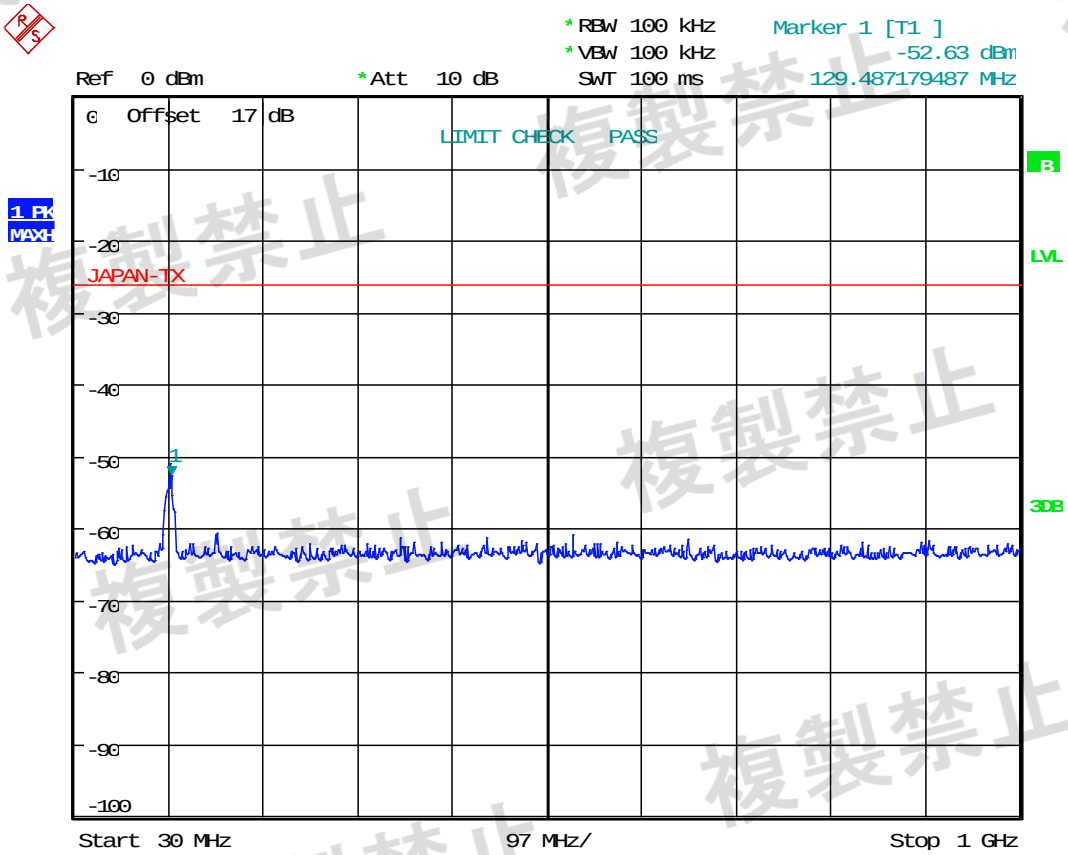
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Date: 19.JUL.2020 12:45:03



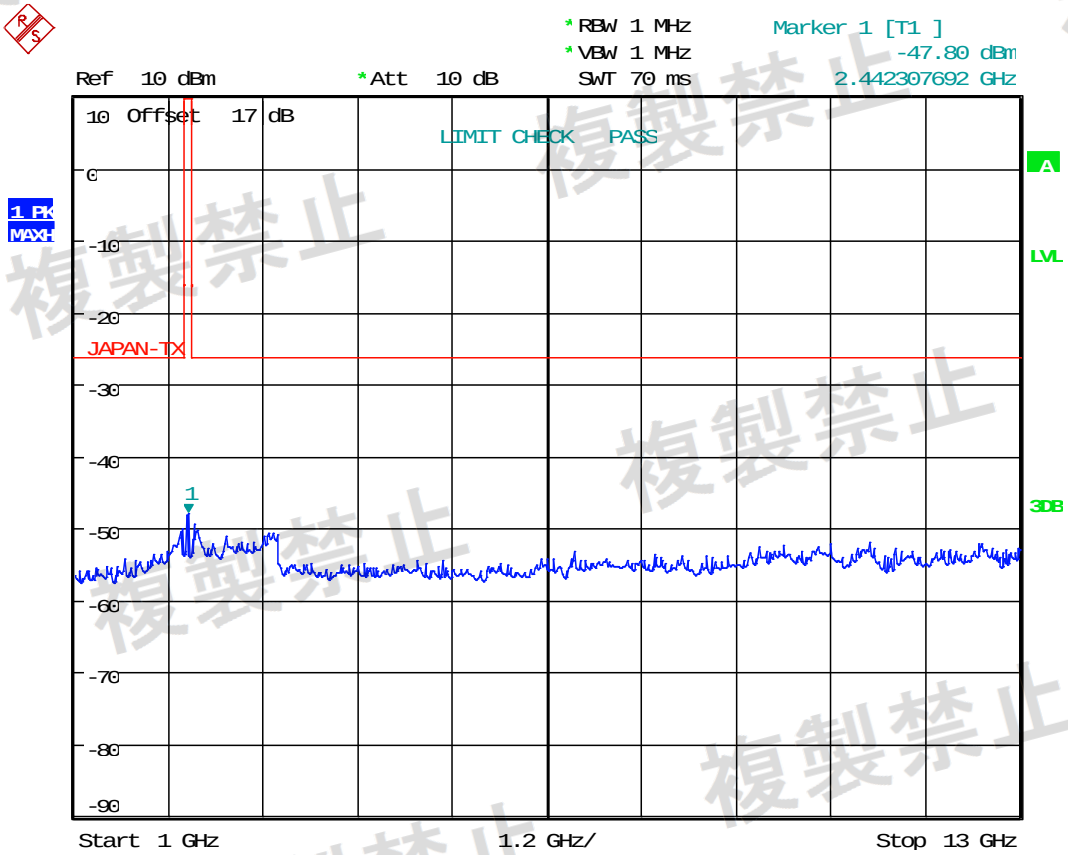
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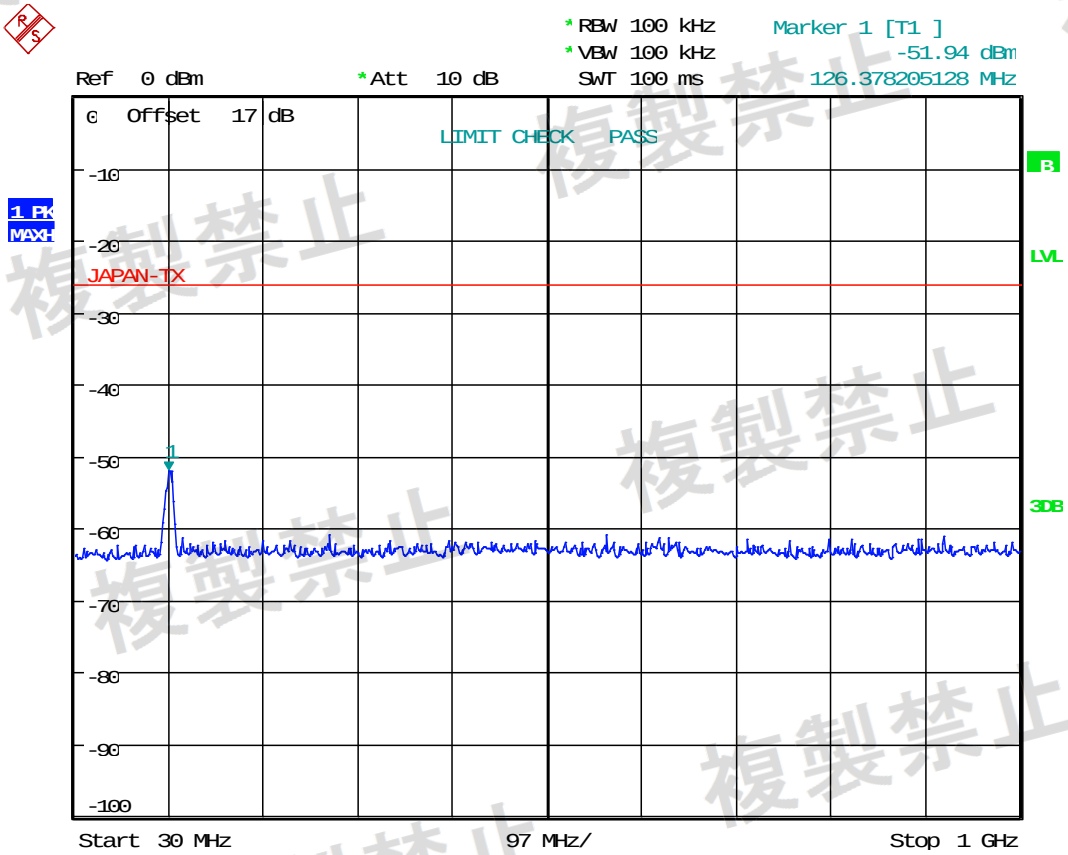
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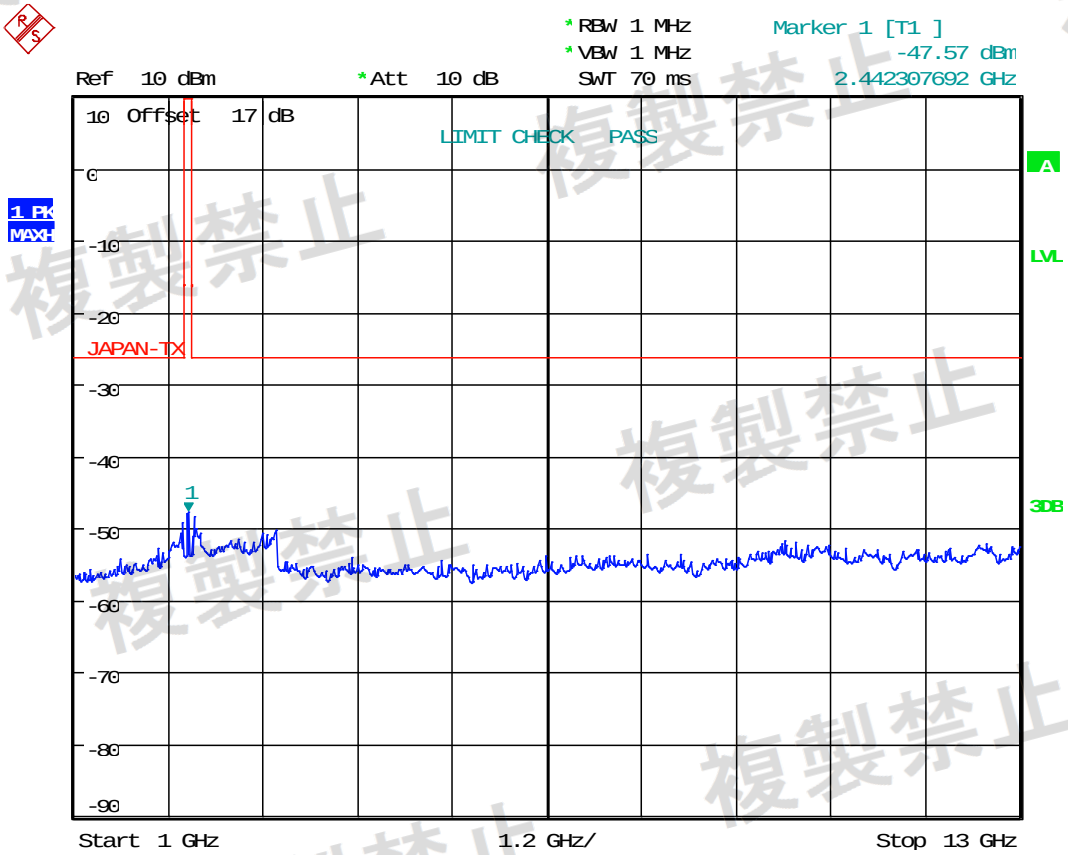
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Date: 19.JUL.2020 13:39:05



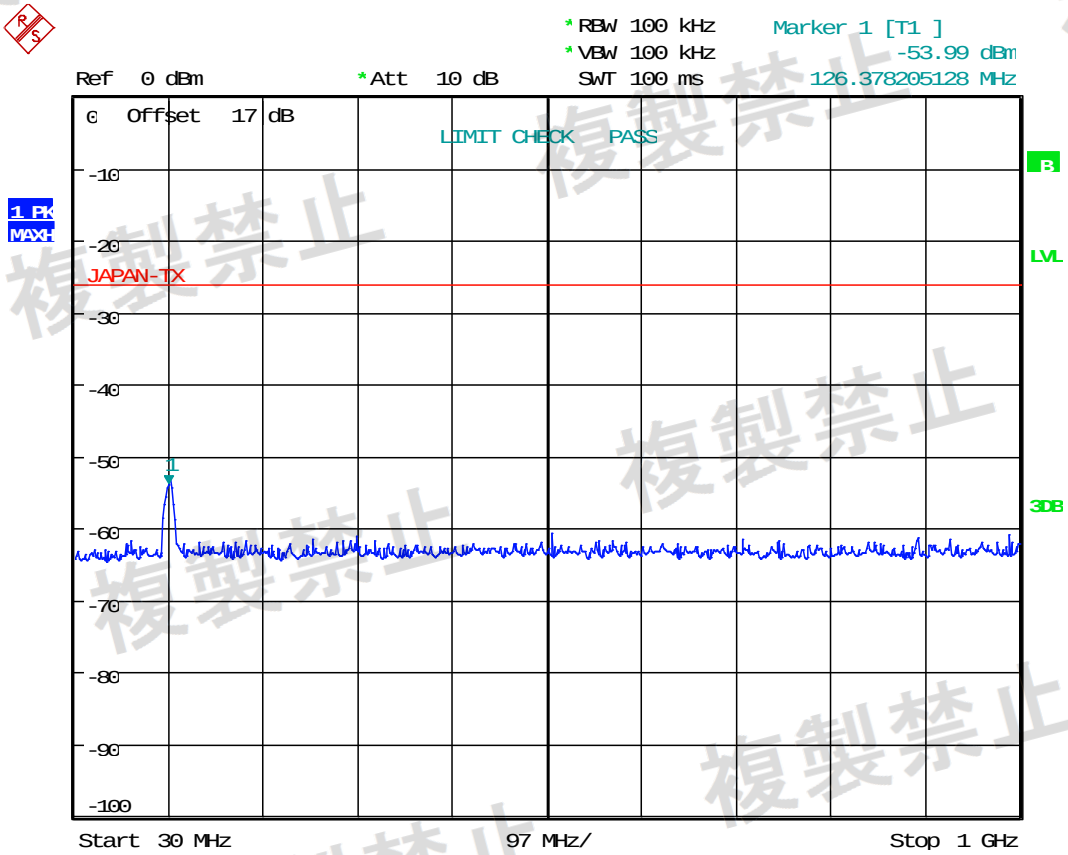
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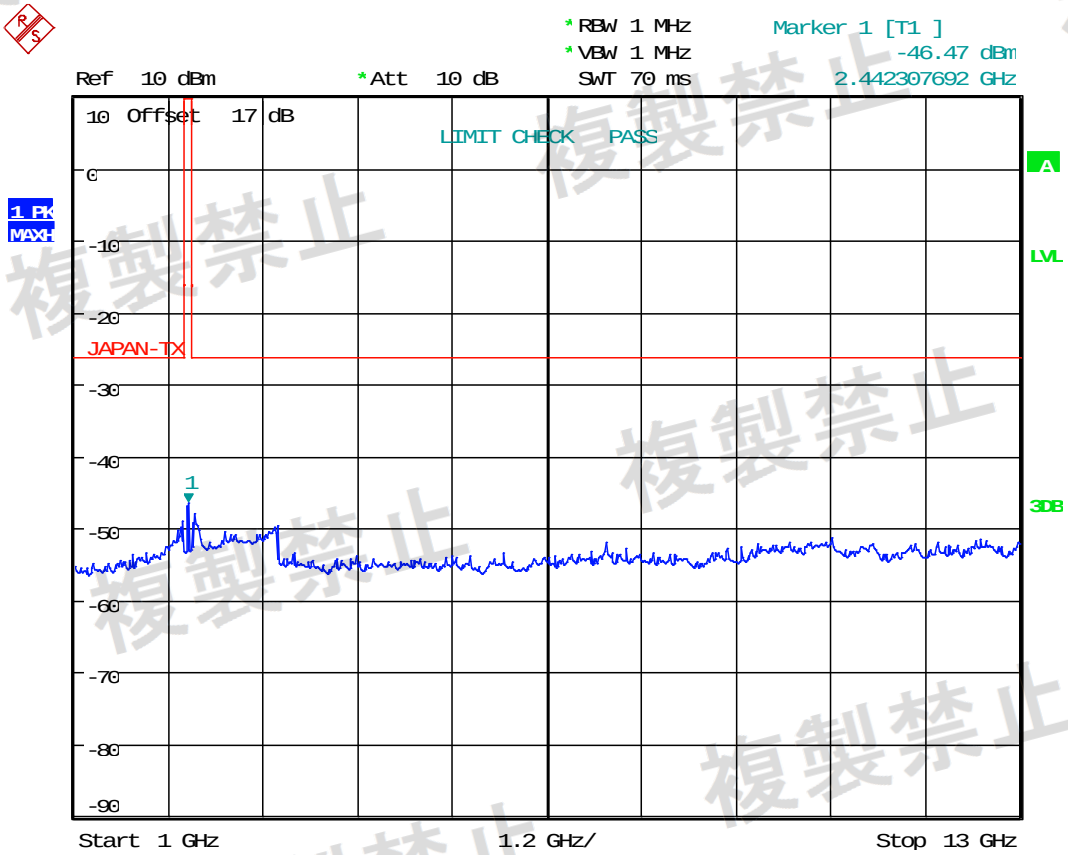
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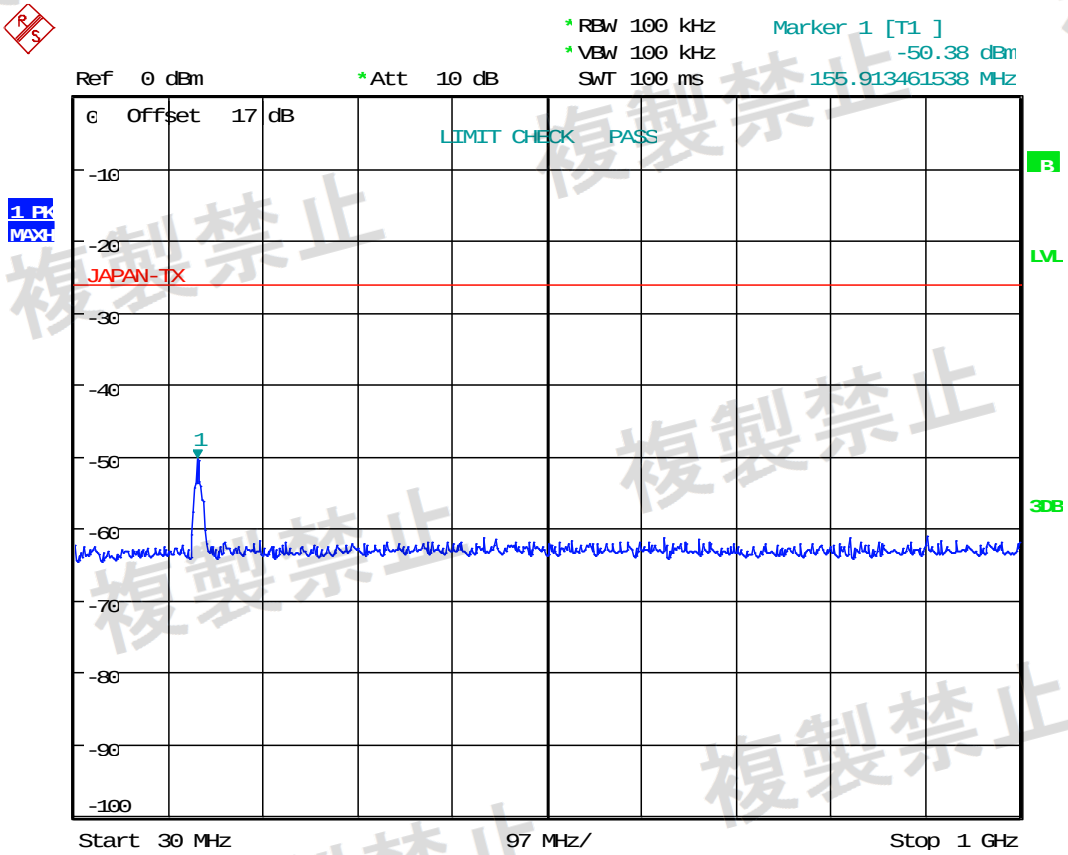
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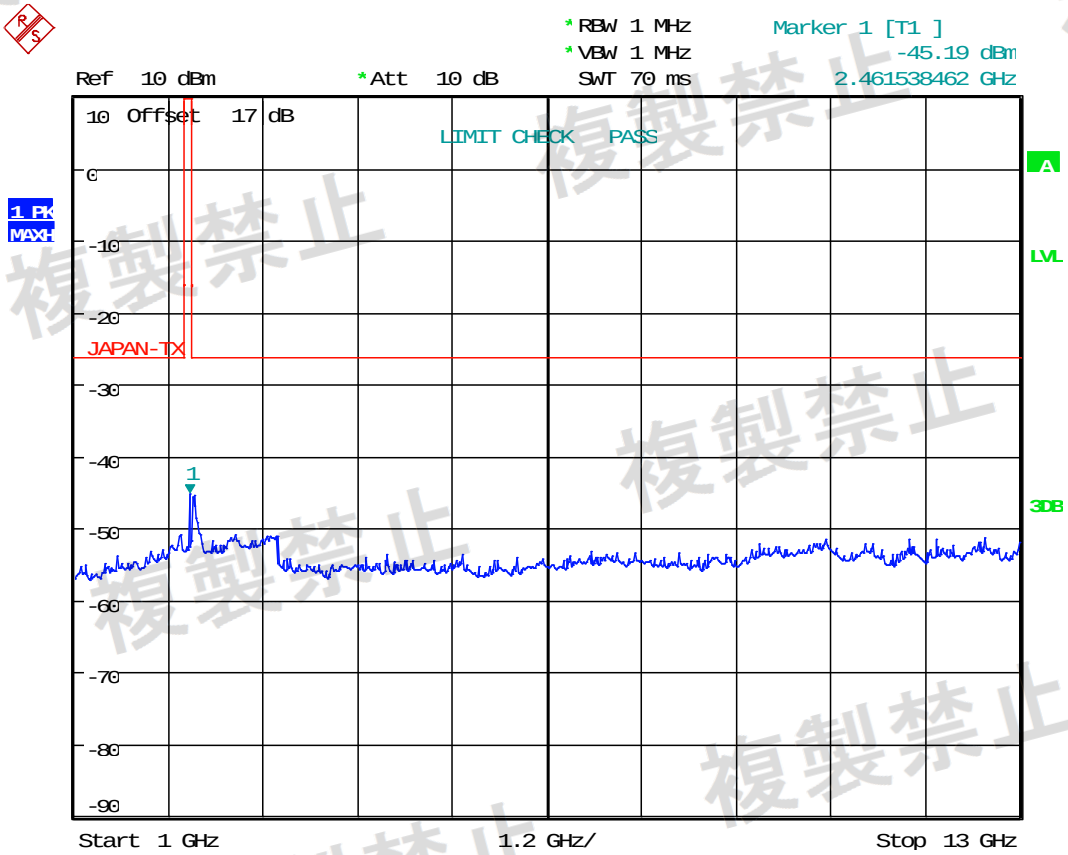
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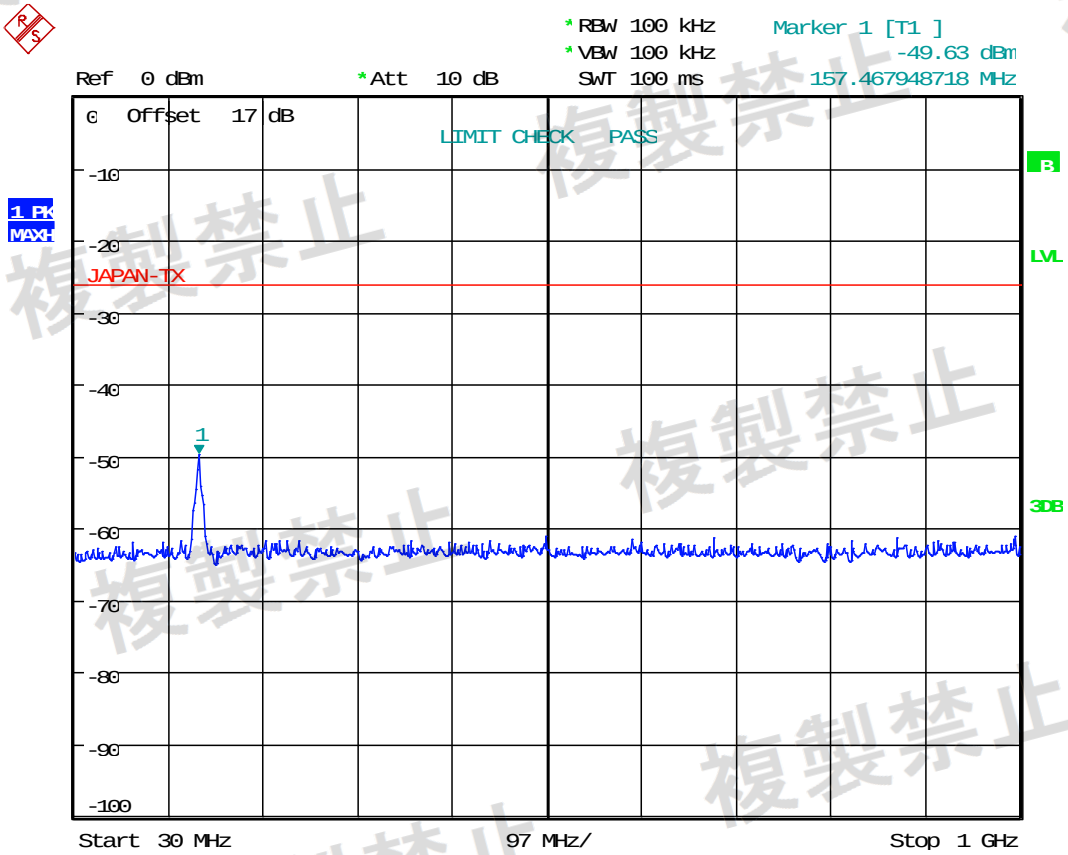
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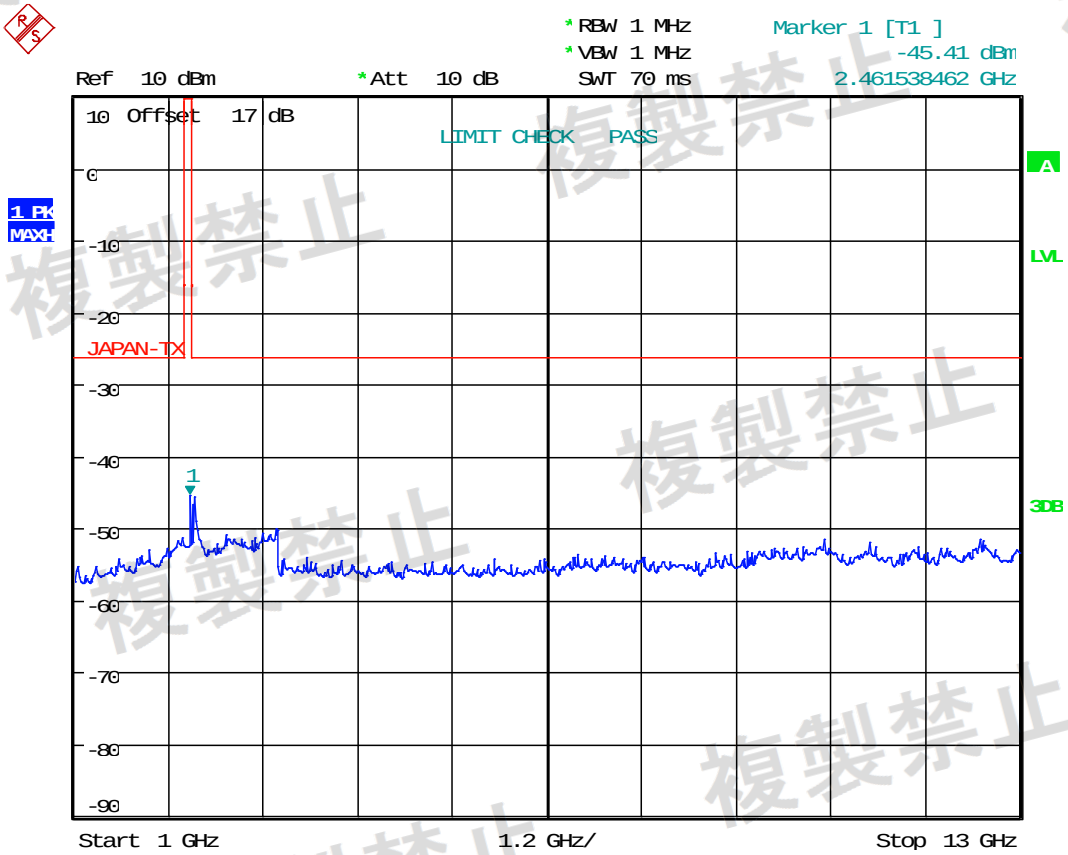
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Date: 19.JUL.2020 13:41:49



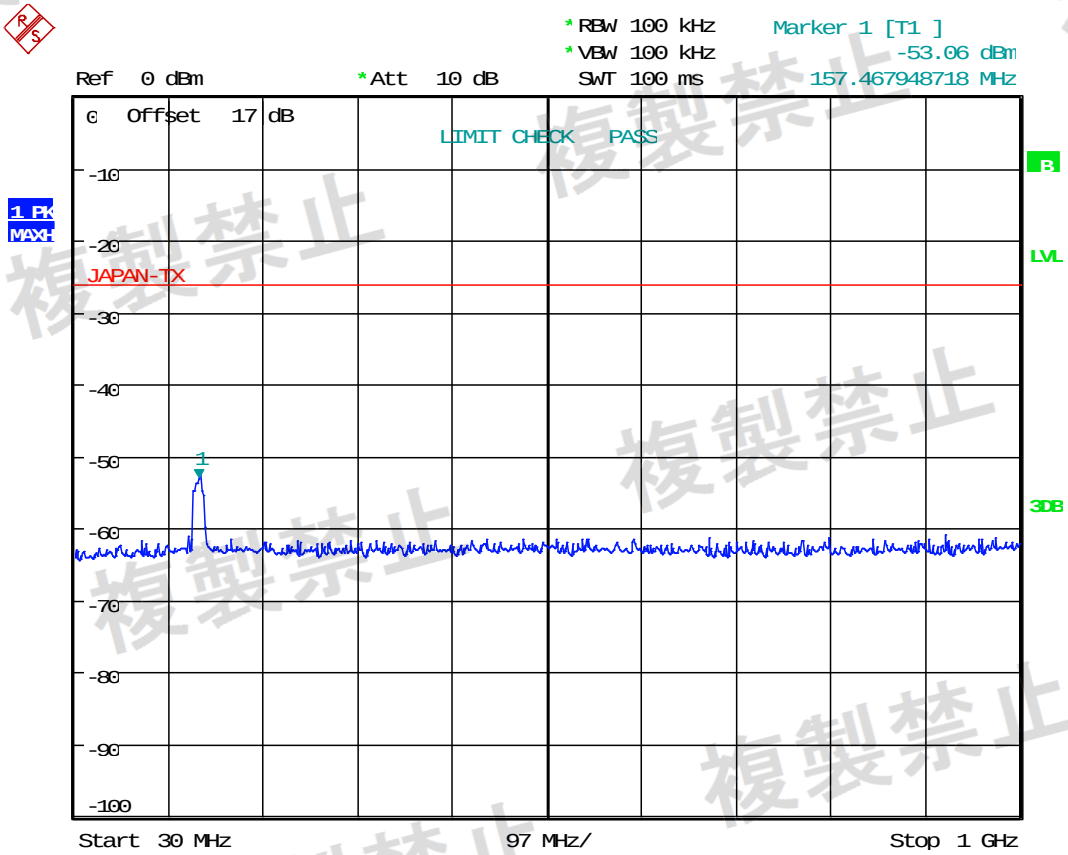
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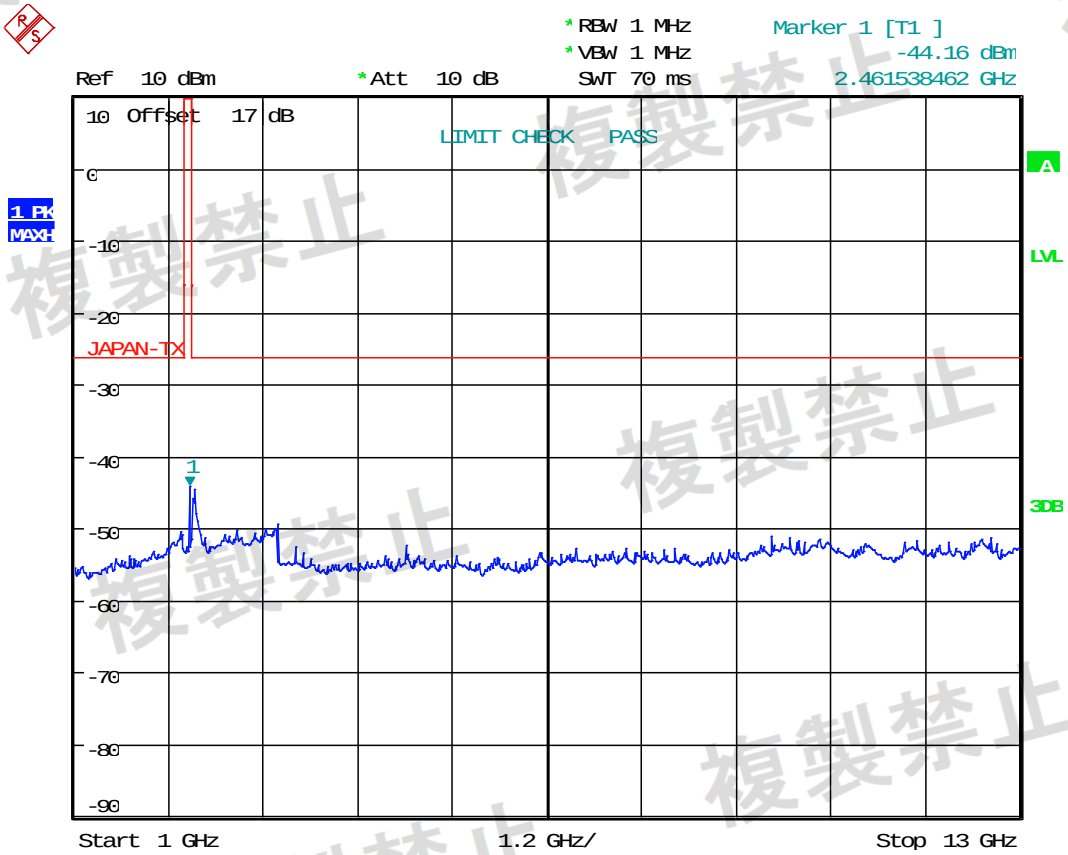
CONDUCTED SPURIOUS EMISSION 802.11N 20MHZ CH13 2.97V

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CONDUCTED SPURIOUS EMISSION 802.11N 20MHZ CH13 3.63V

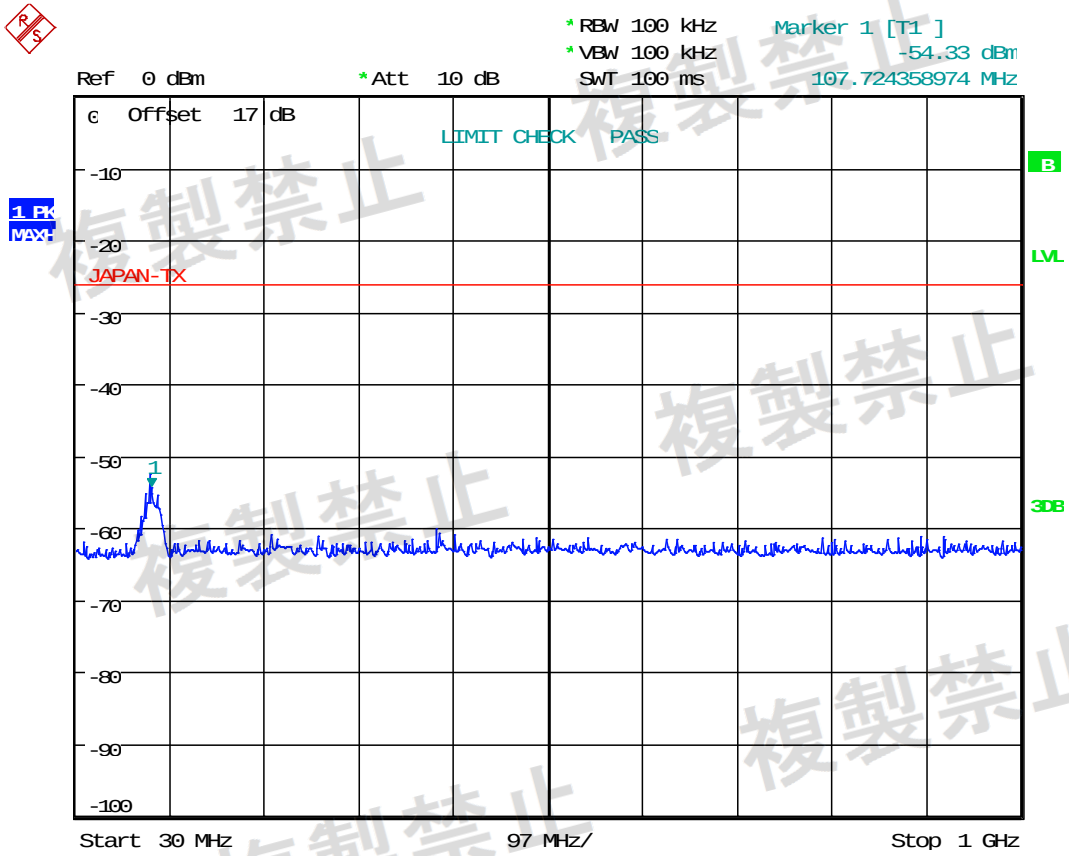
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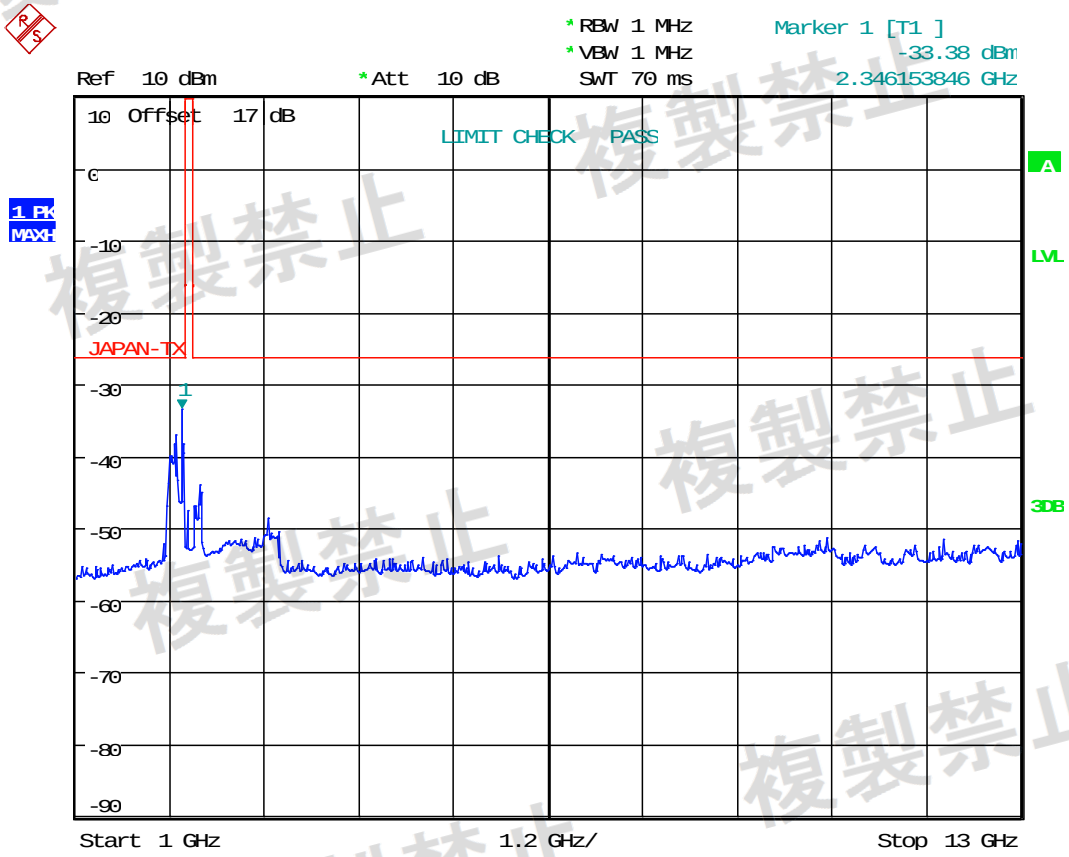
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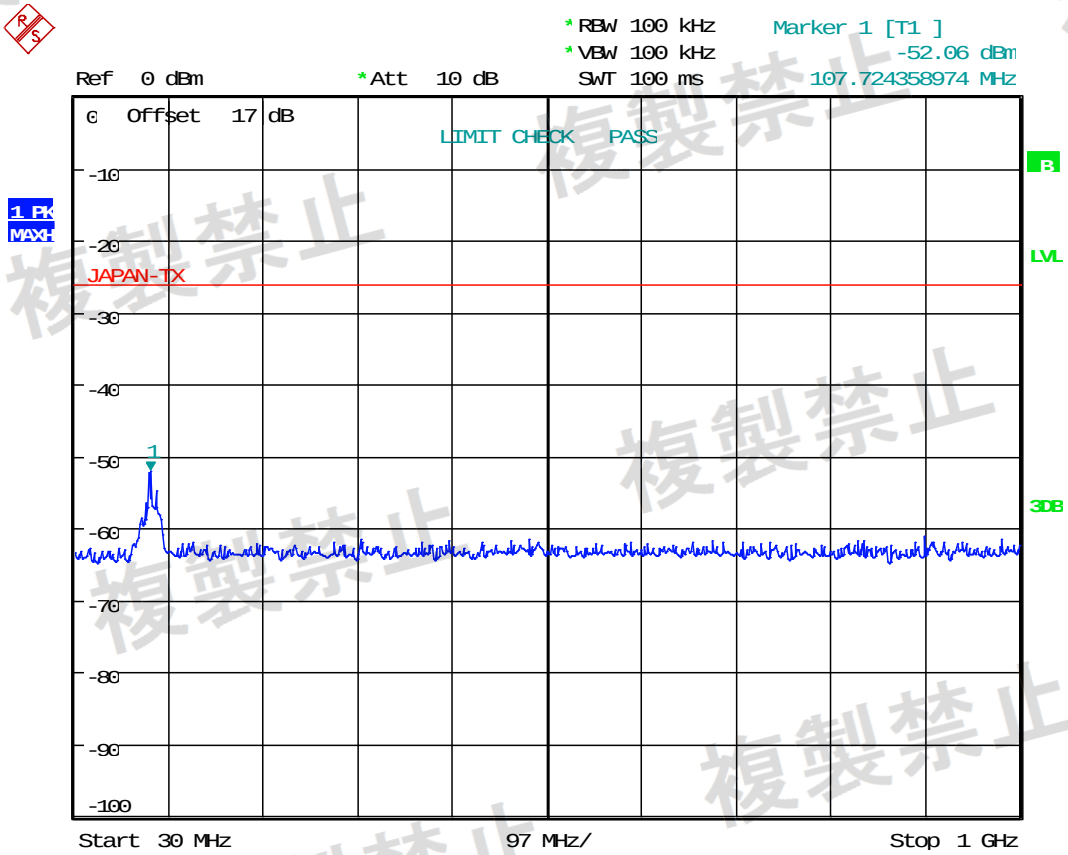
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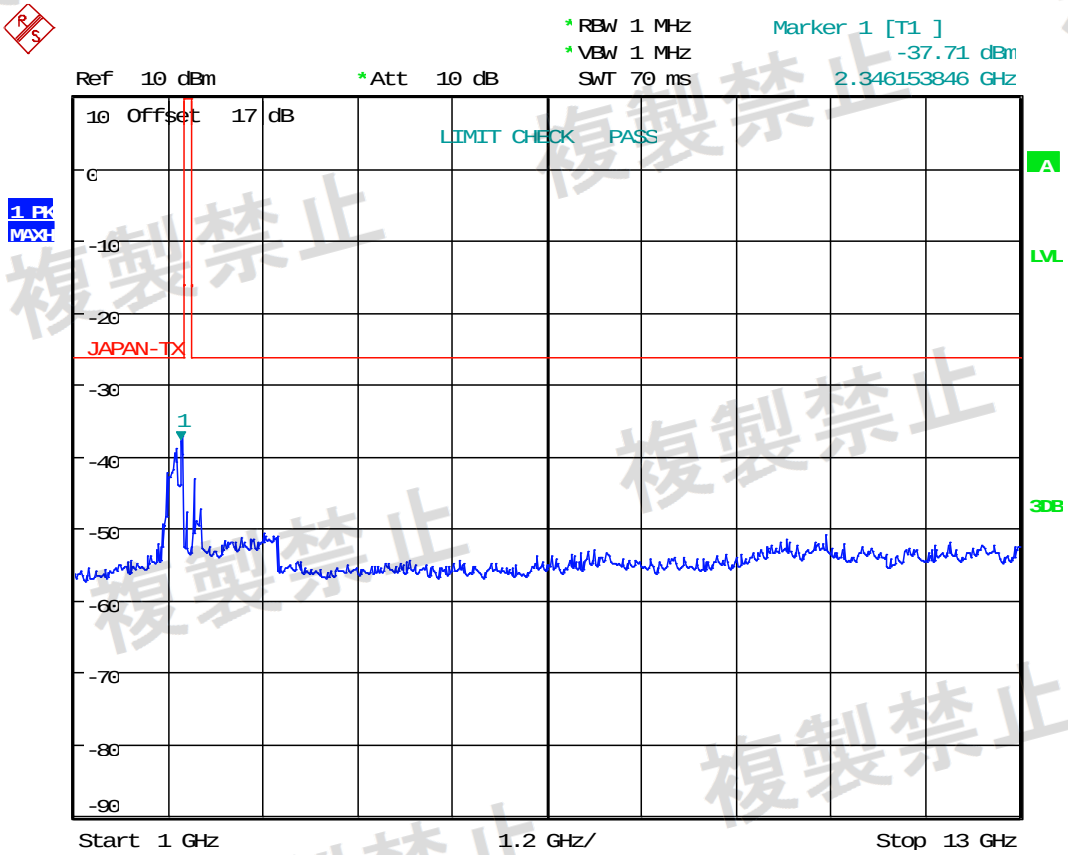
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Date: 19.JUL.2020 13:30:28



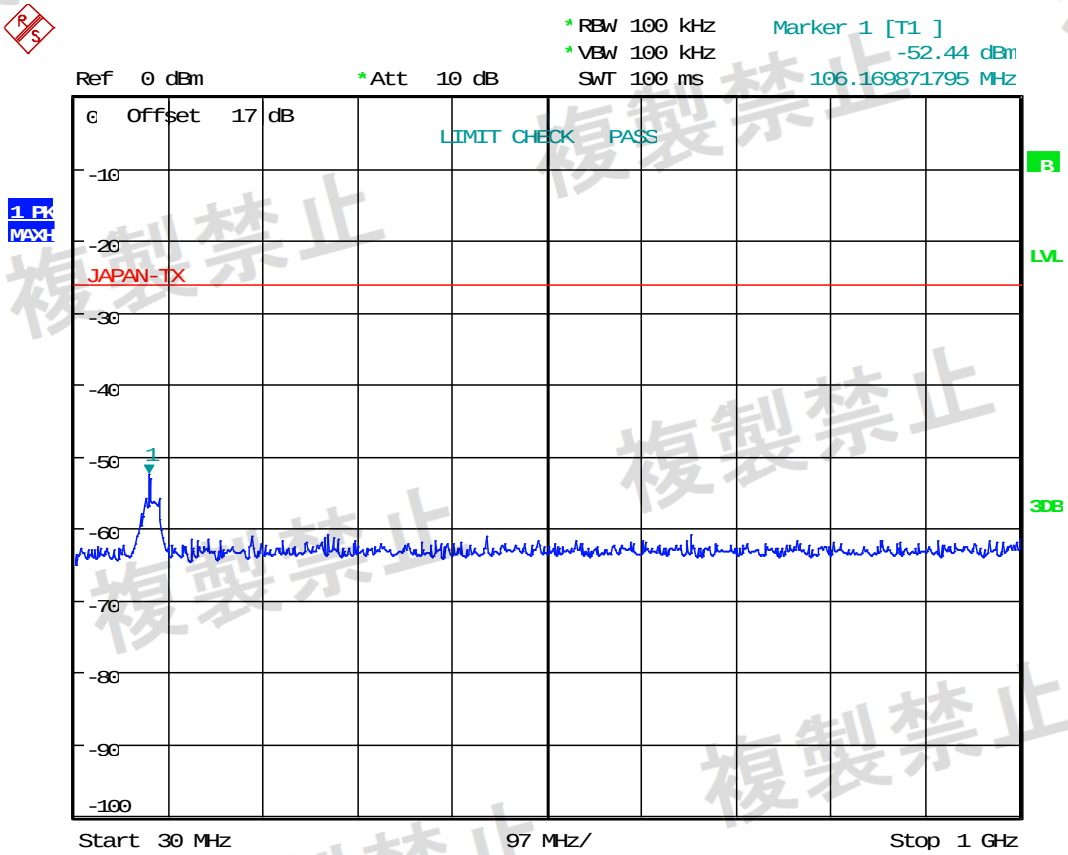
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Date: 19.JUL.2020 12:57:26



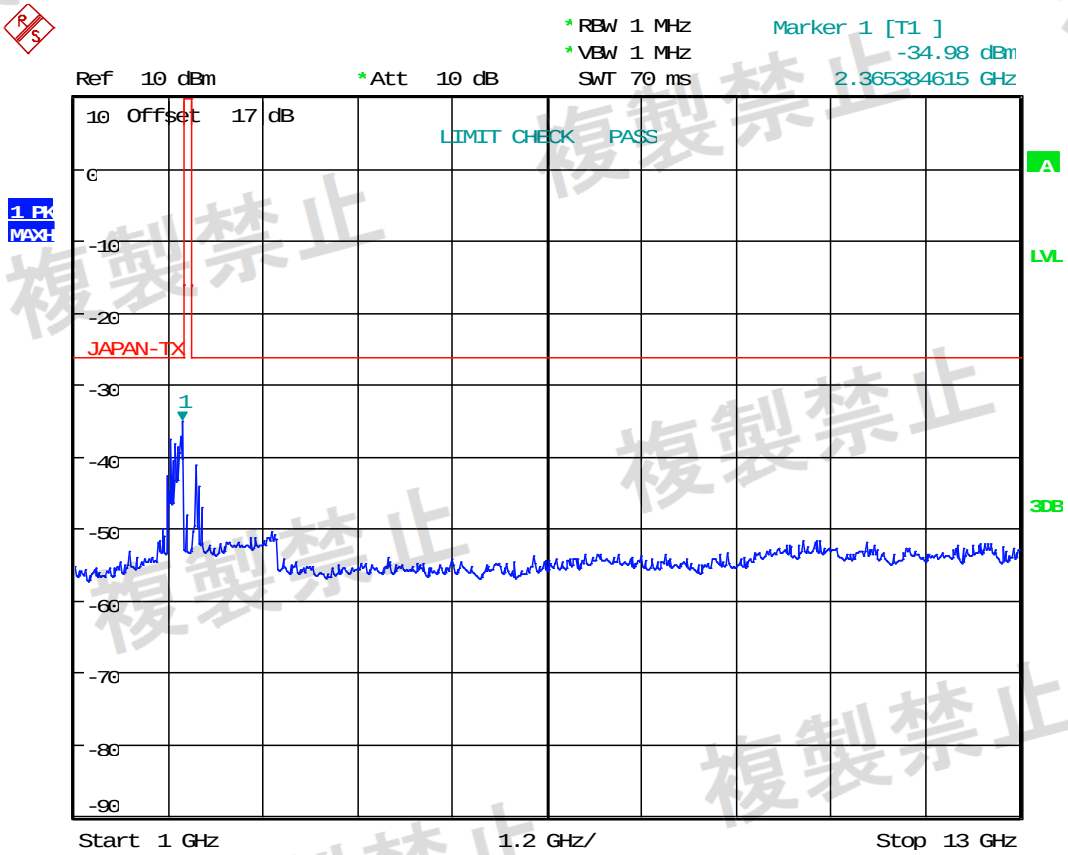
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Date: 19.JUL.2020 13:32:59



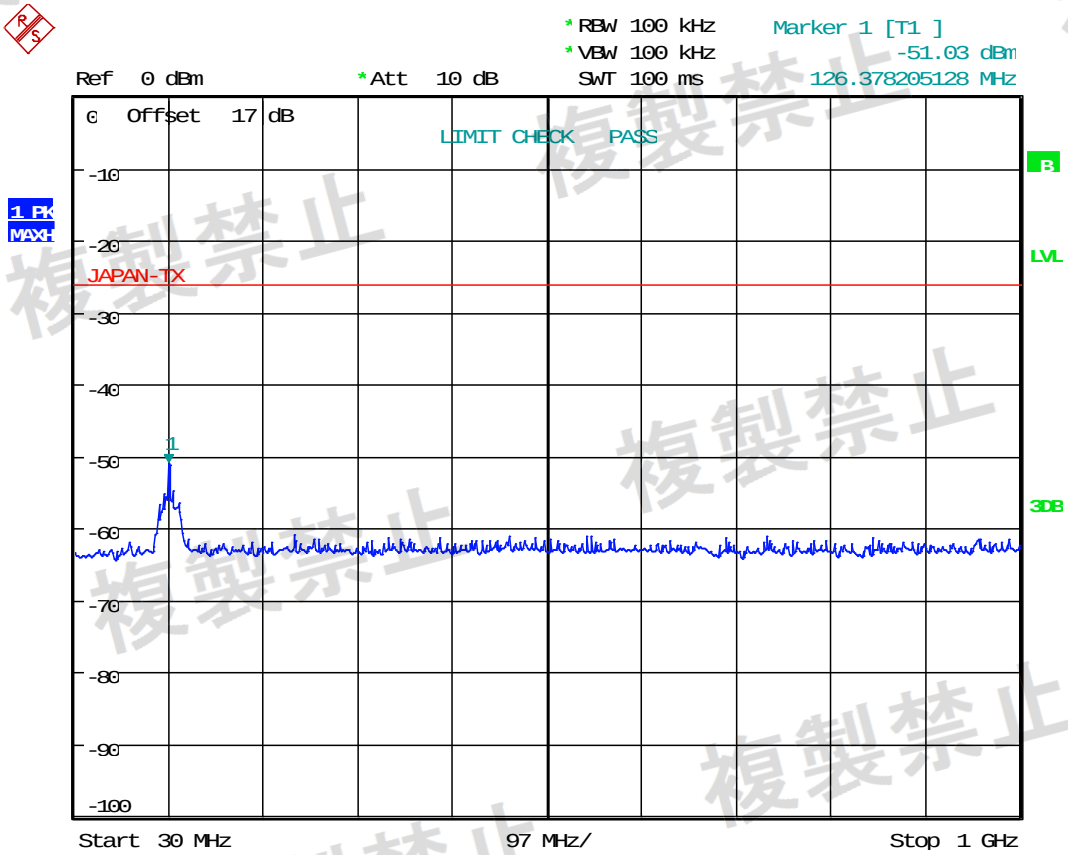
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Date: 19.JUL.2020 13:00:31



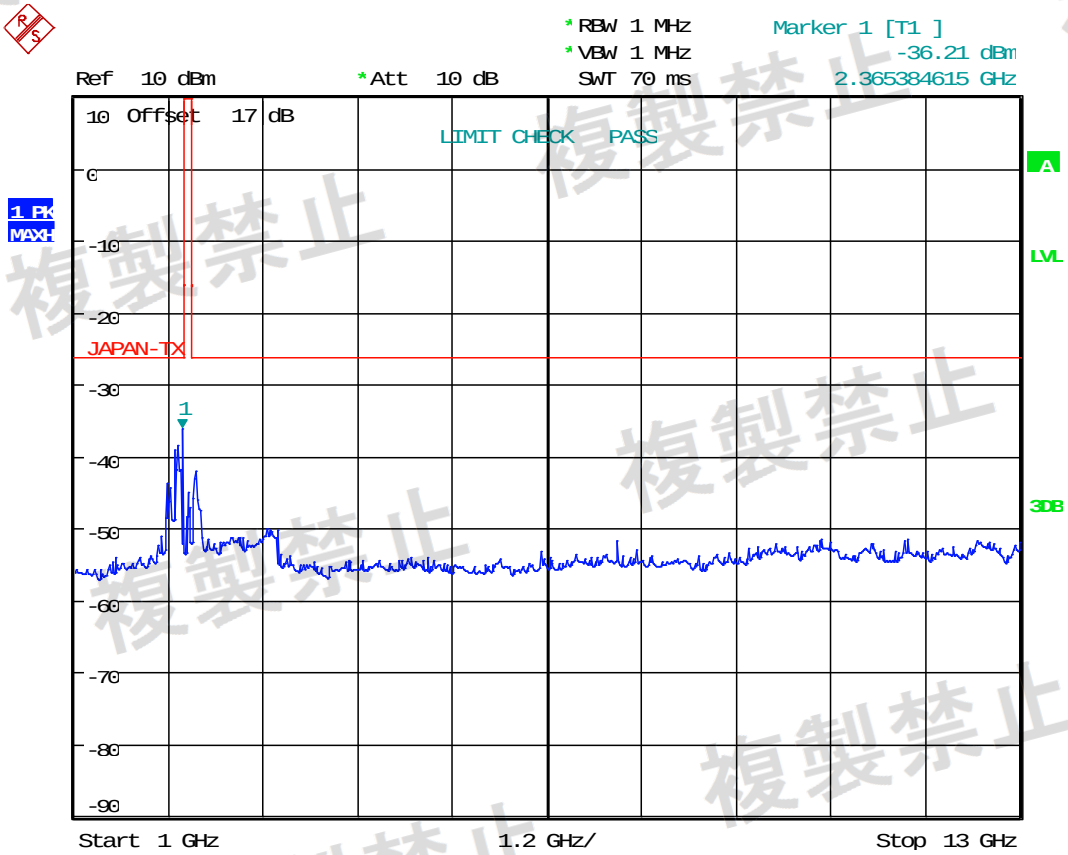
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Date: 19.JUL.2020 13:30:03



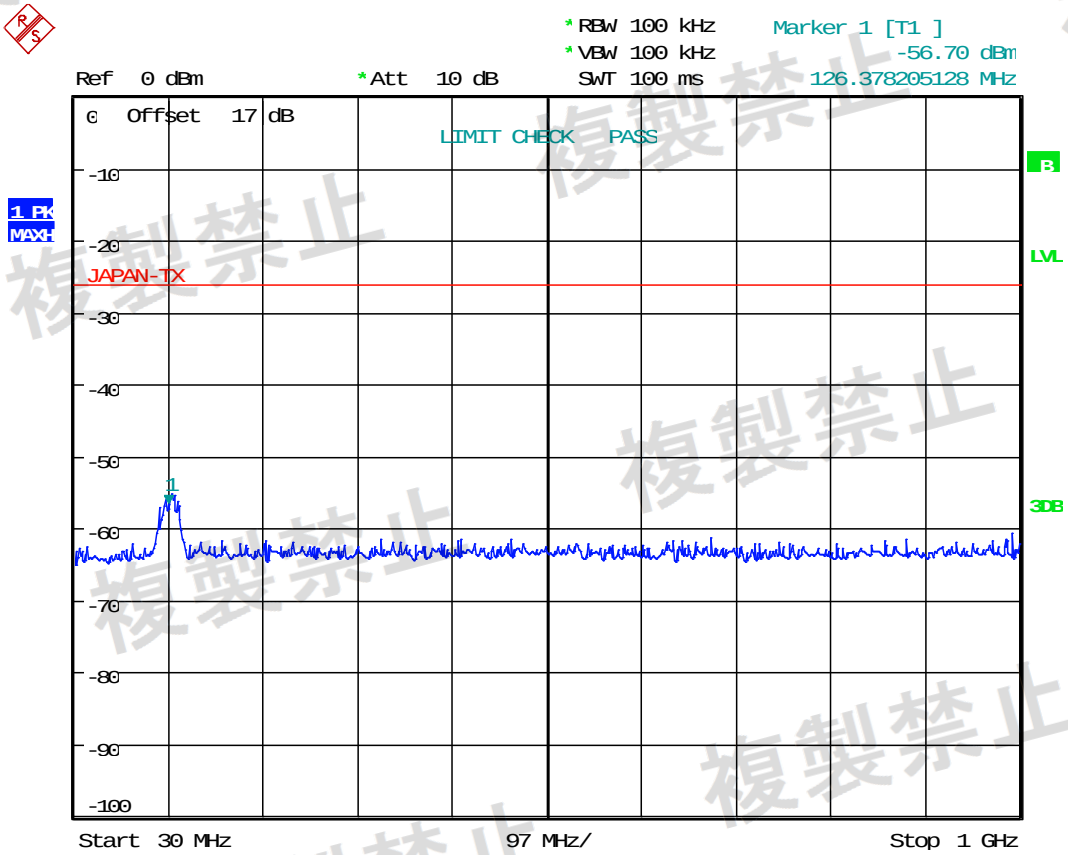
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Date: 19.JUL.2020 13:03:54



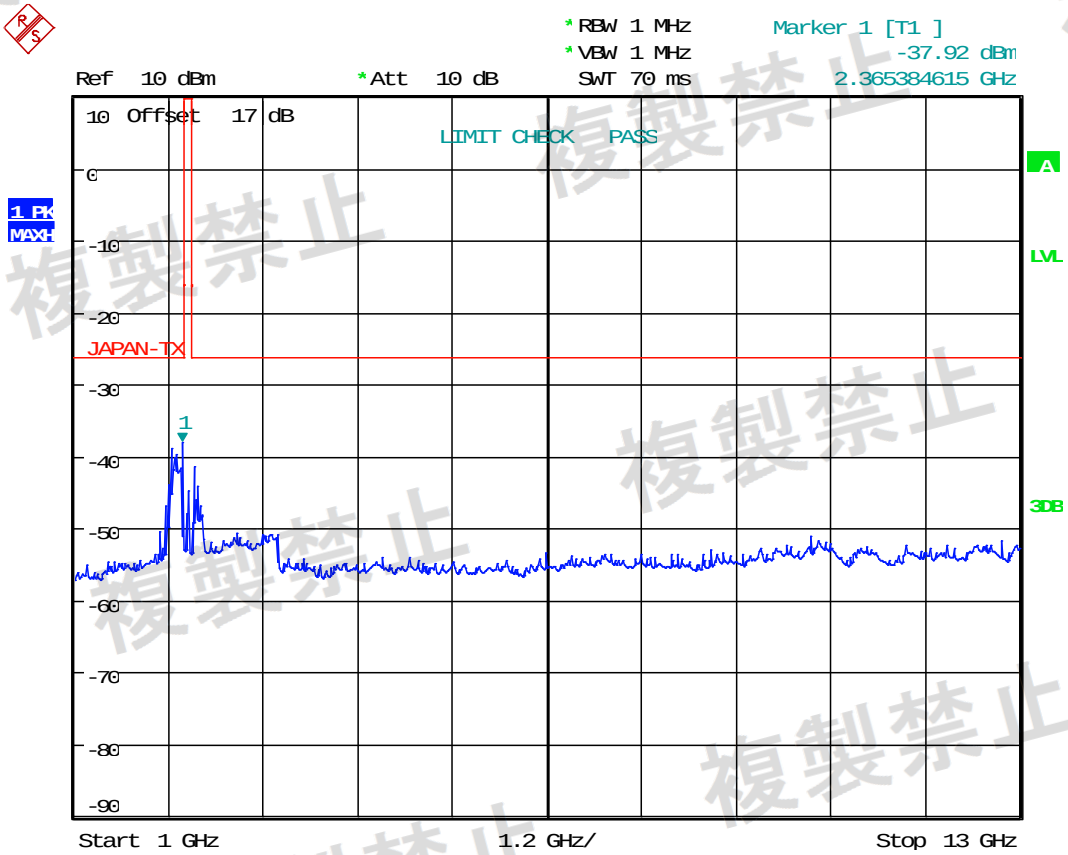
CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH7 3.3V

Date: 19.JUL.2020 13:27:17



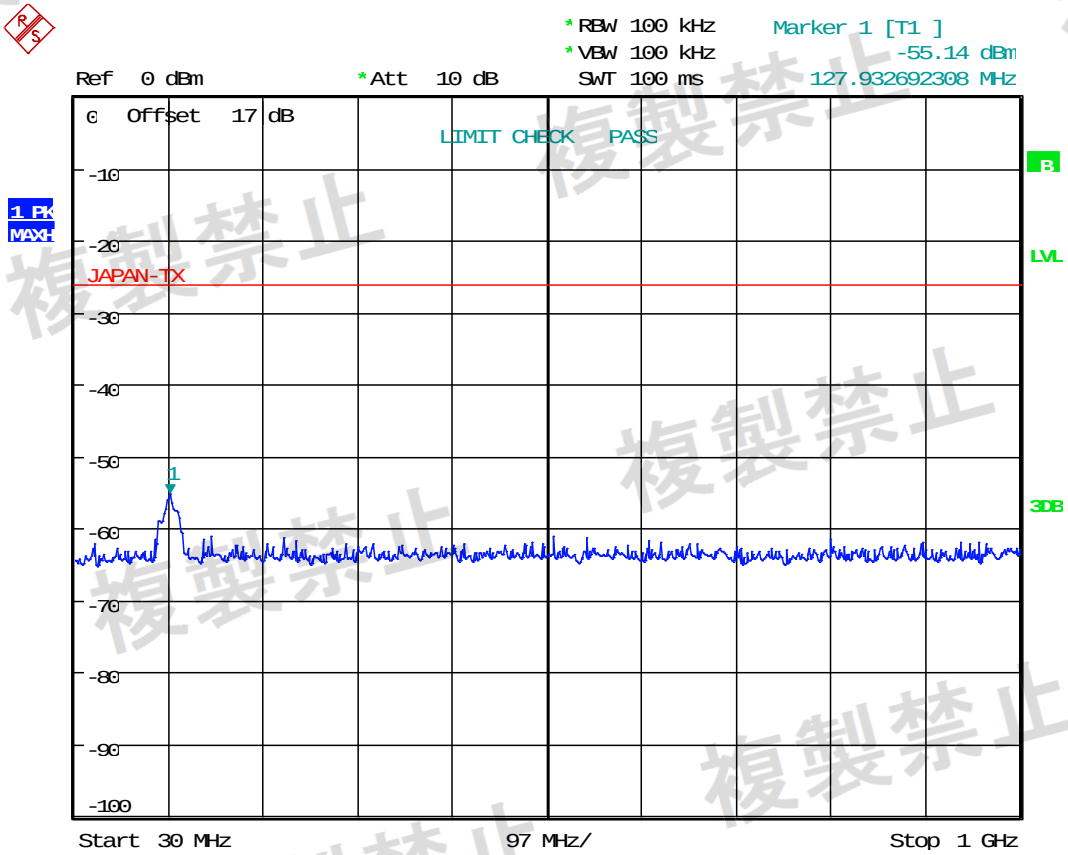
CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH7 2.97V

Date: 19.JUL.2020 13:04:13



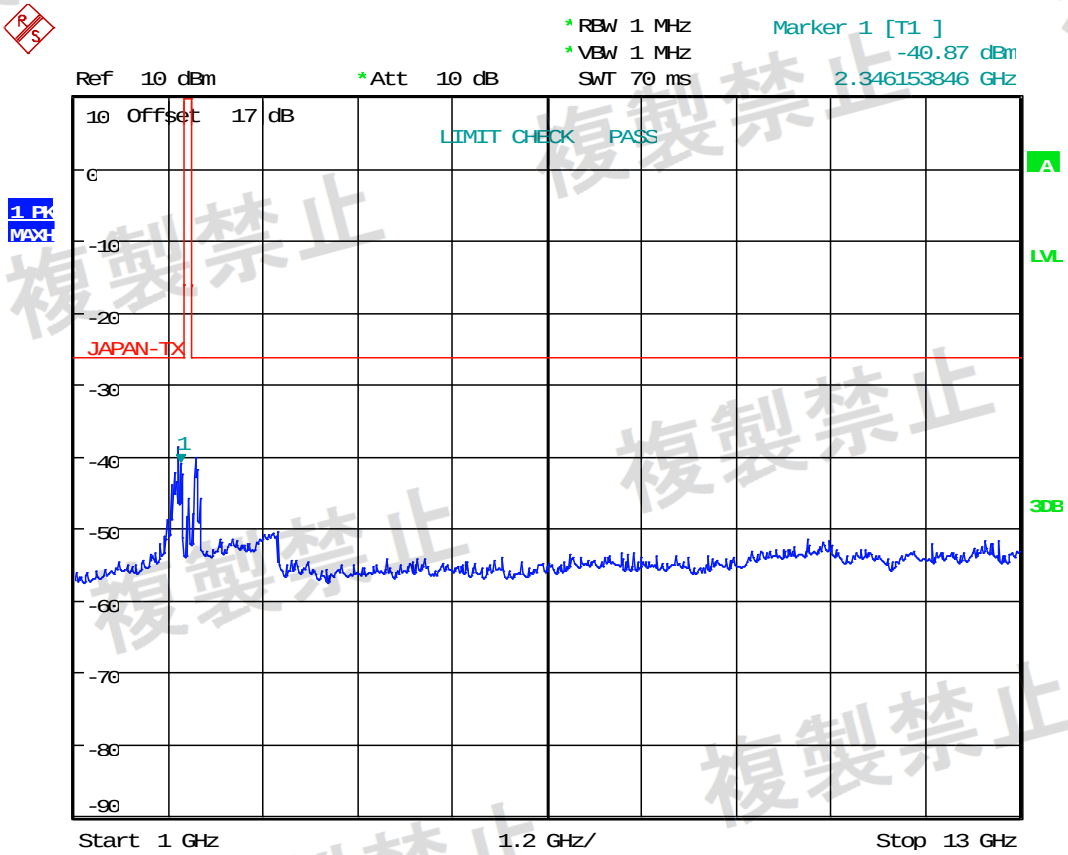
CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH7 2.97V

Date: 19.JUL.2020 13:26:22



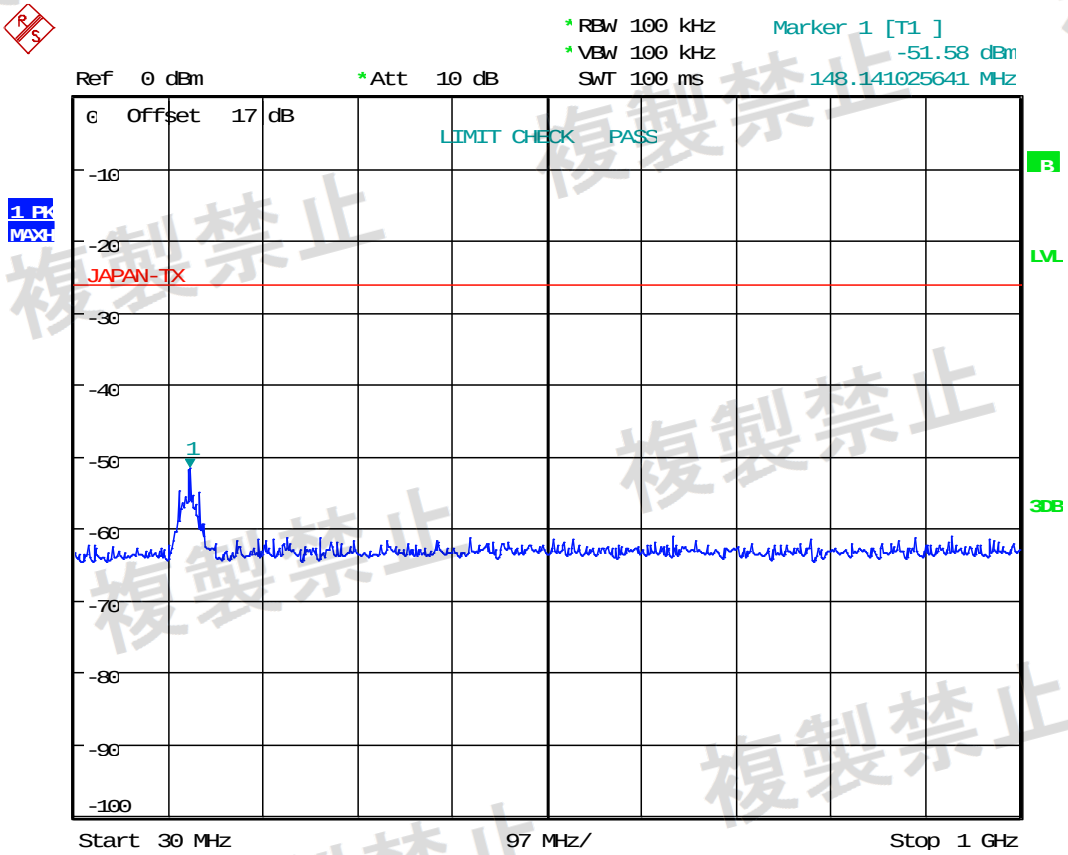
CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH7 3.63V

Date: 19.JUL.2020 13:03:09



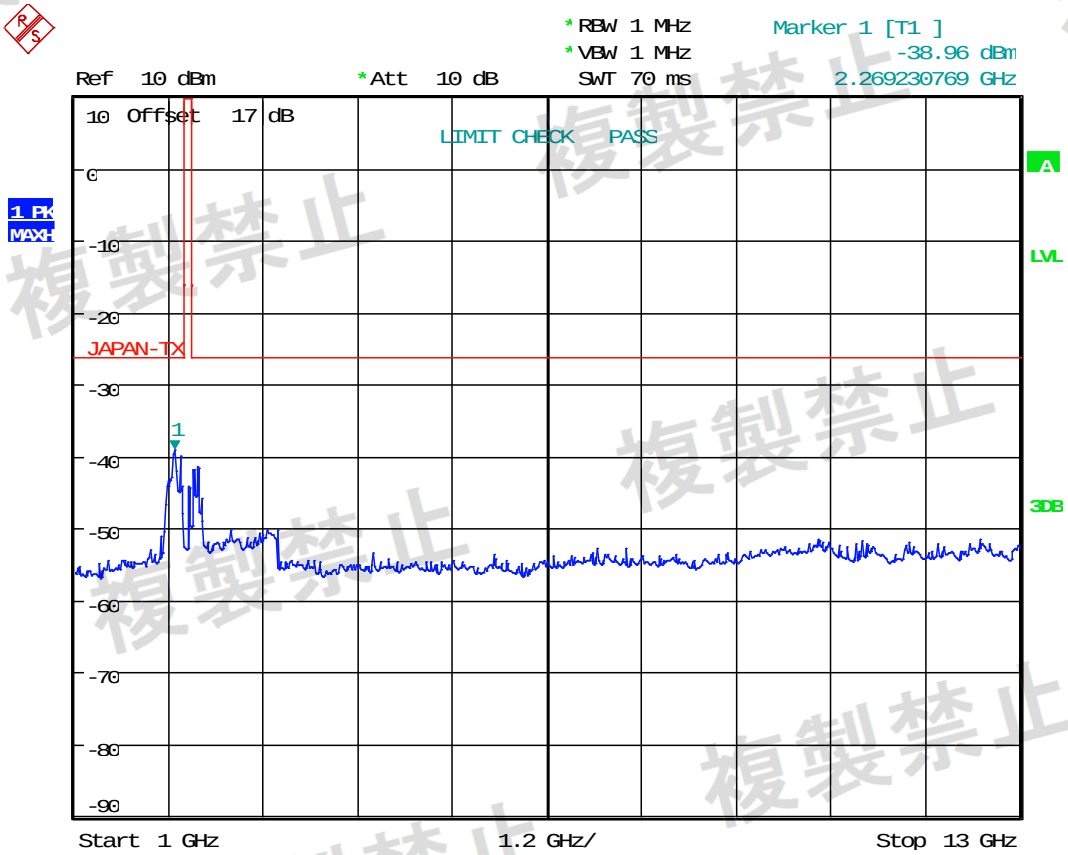
CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH7 3.63V

Date: 19.JUL.2020 13:27:31



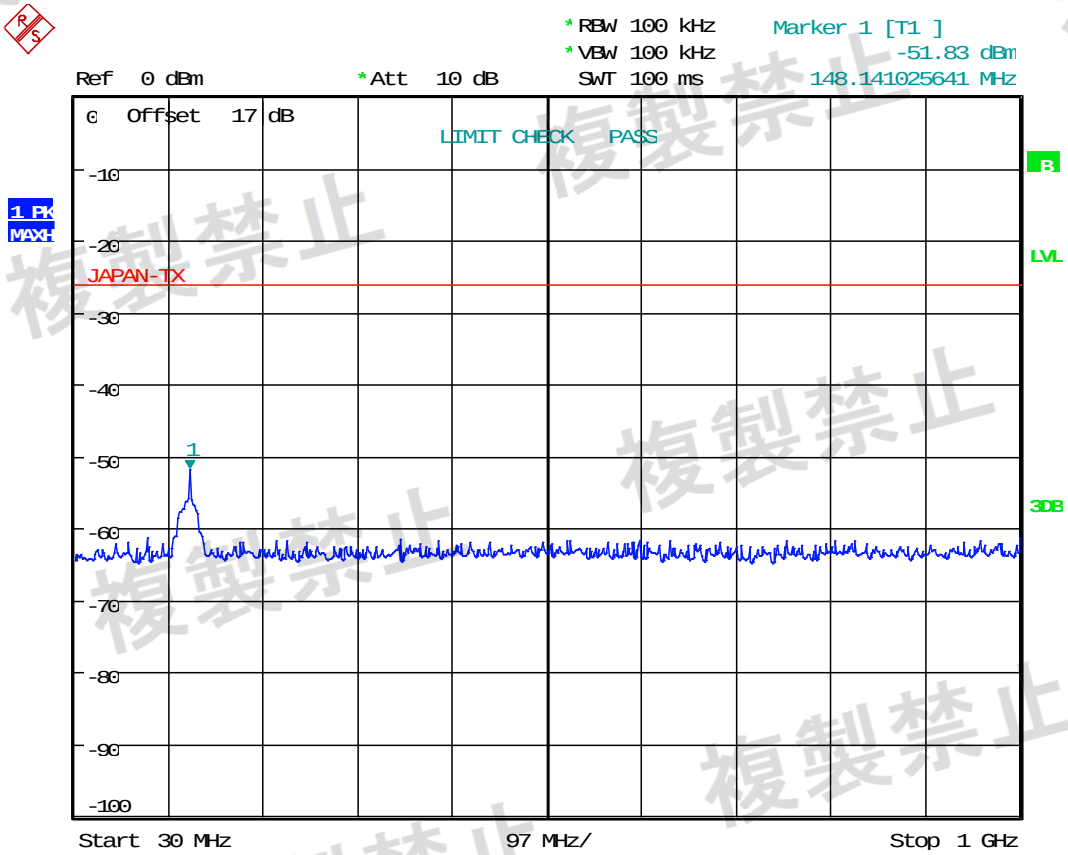
CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH11 3.3V

Date: 19.JUL.2020 13:05:41



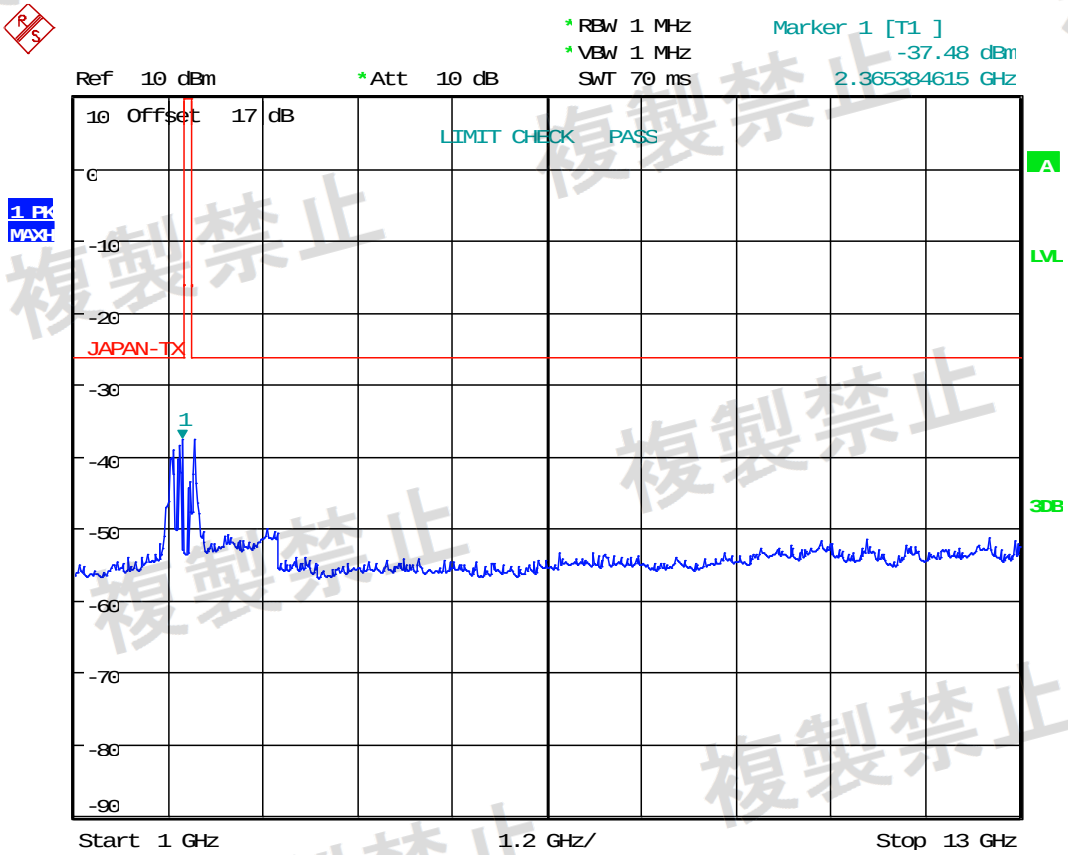
CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH11 3.3V

Date: 19.JUL.2020 13:19:49



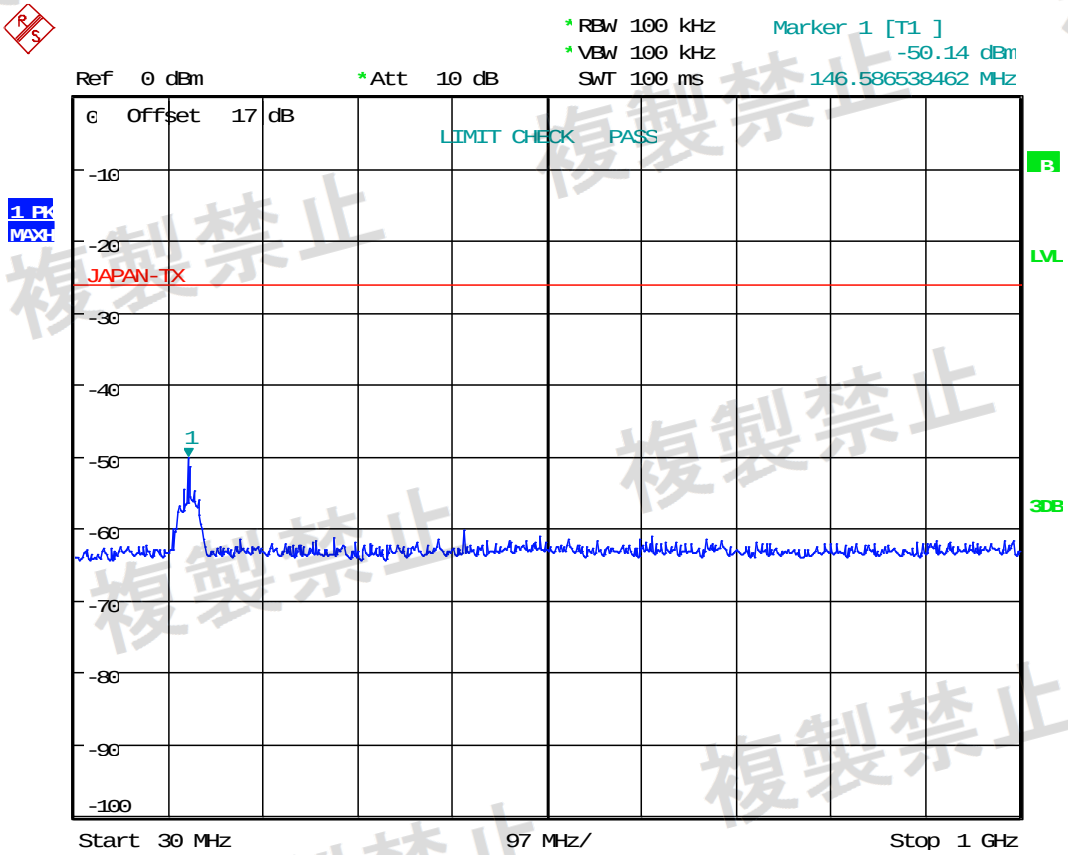
CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH11 2.97V

Date: 19.JUL.2020 13:05:16



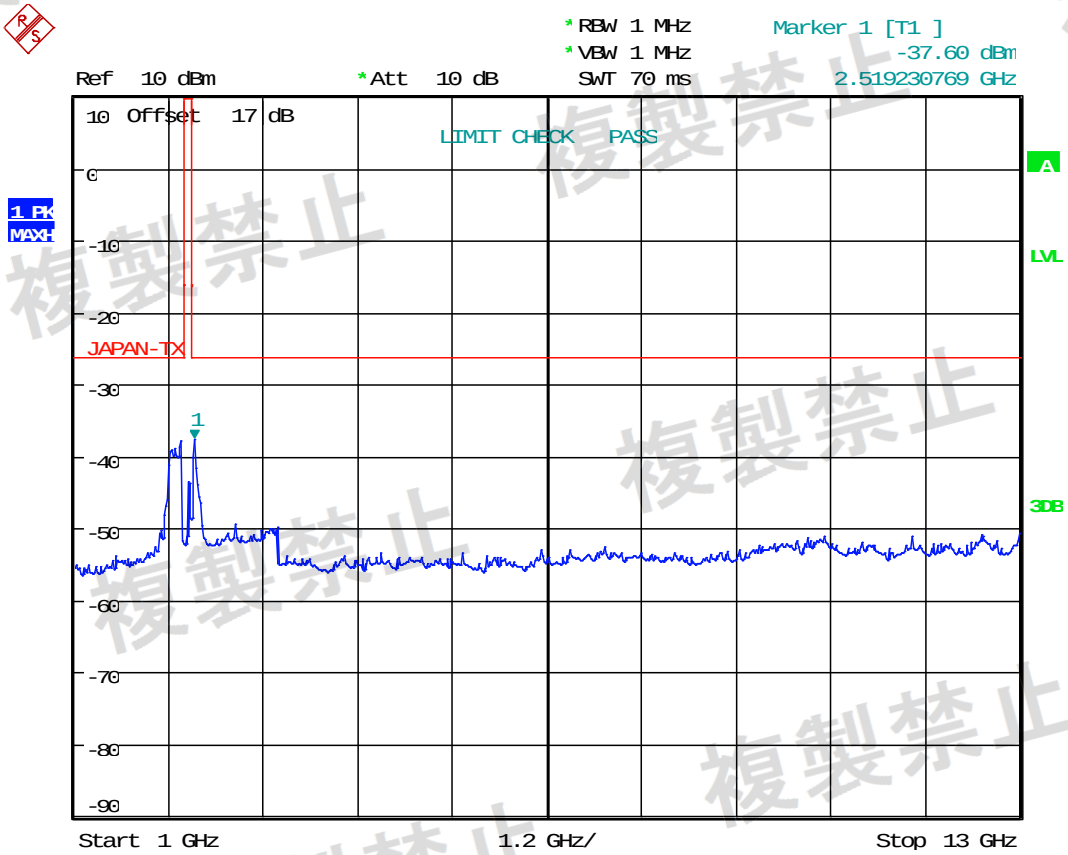
CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH11 2.97V

Date: 19.JUL.2020 13:23:33



CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH11 3.63V

Date: 19.JUL.2020 13:06:59

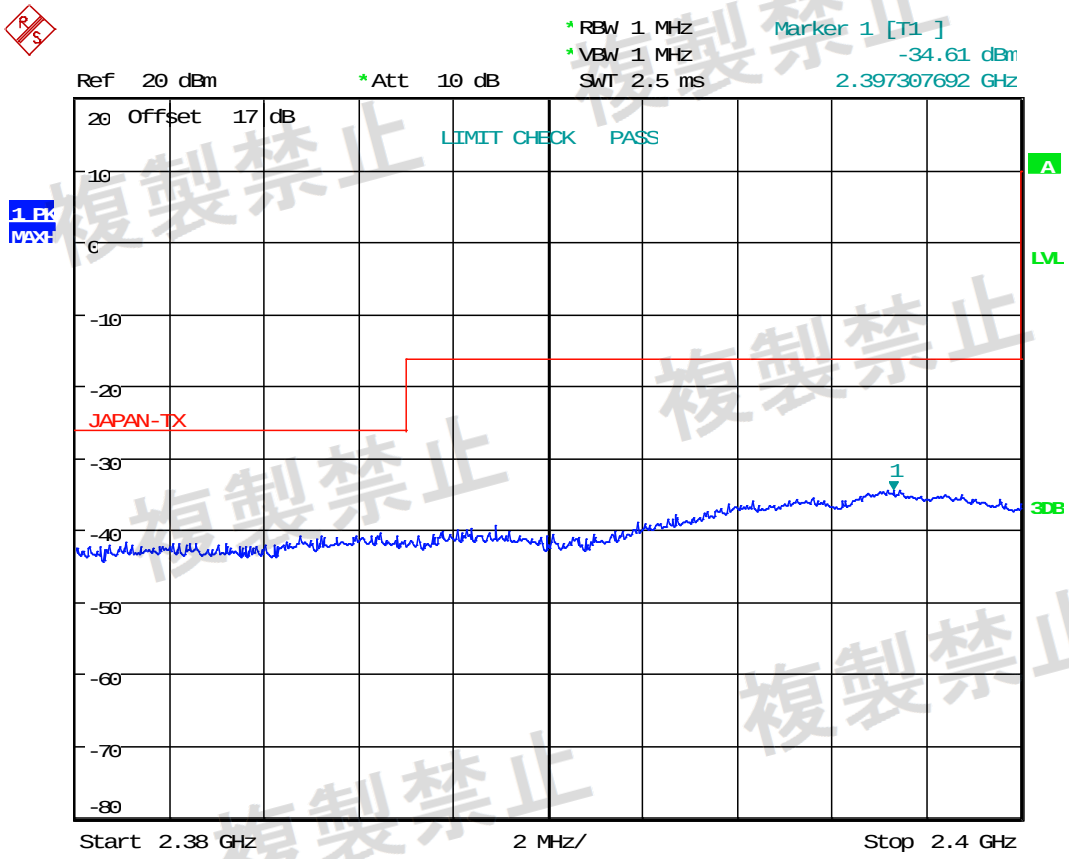


CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH11 3.63V

Date: 19.JUL.2020 13:18:20

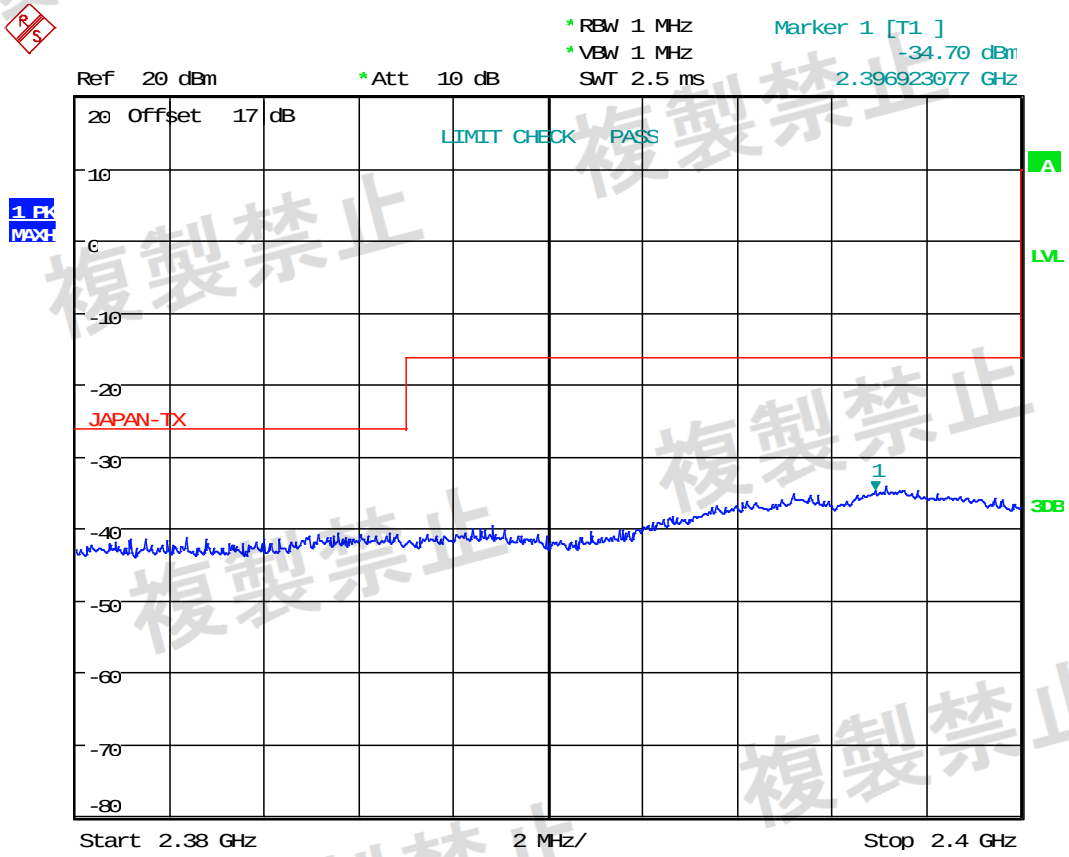
Out Band Leakage Power

IEEE 802.11b



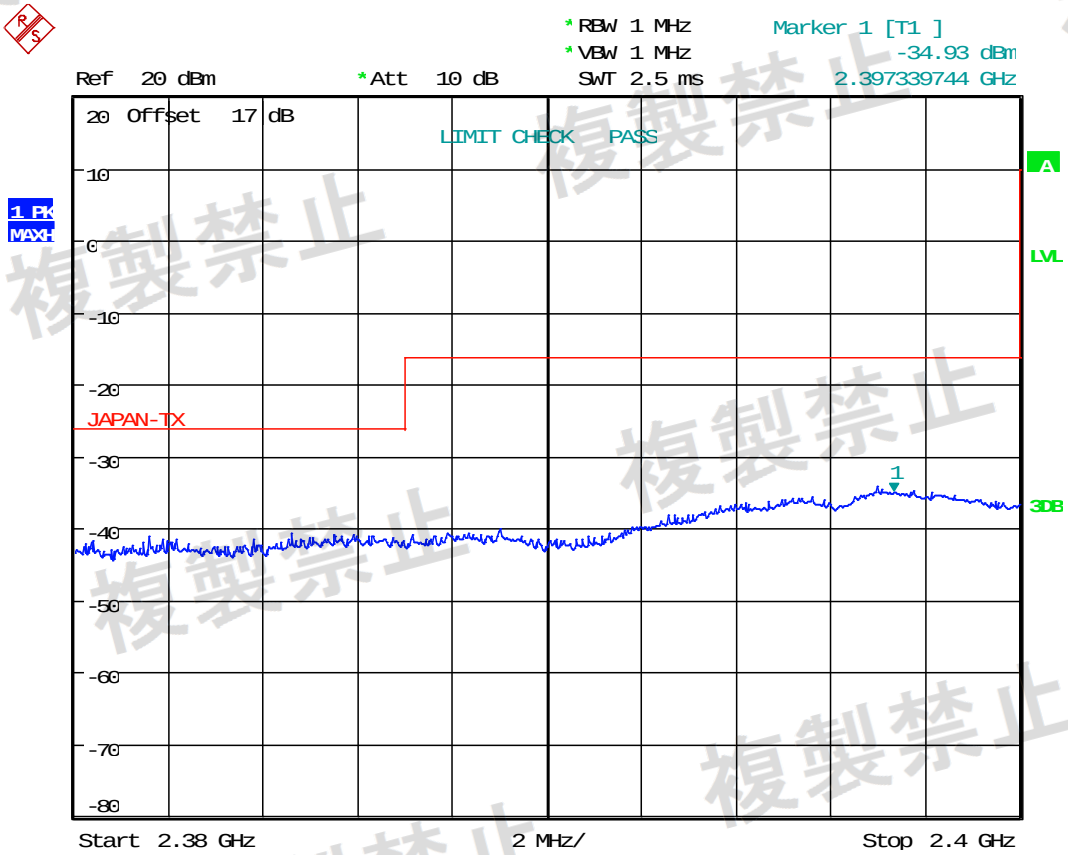
OUT BAND LEAKAGE POWER 802.11B CH1 3.3V

Date: 19.JUL.2020 11:38:02



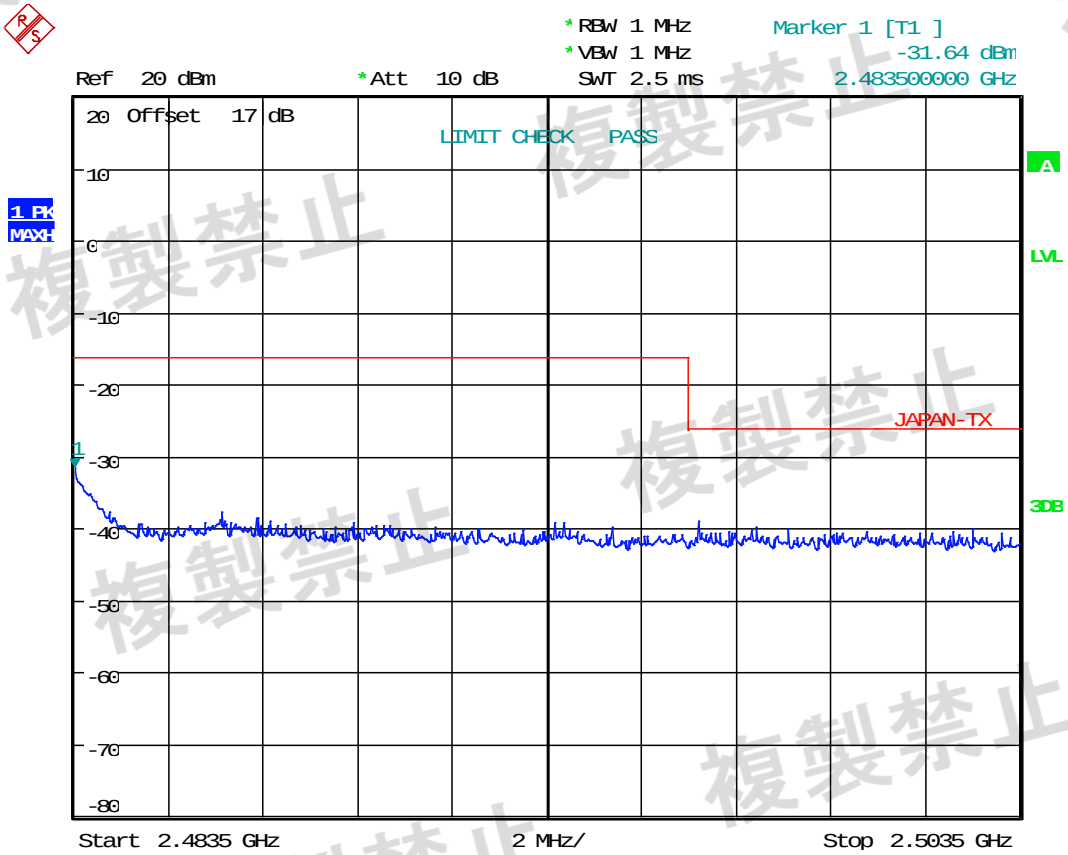
OUT BAND LEAKAGE POWER 802.11B CH1 2.97V

Date: 19.JUL.2020 11:38:30



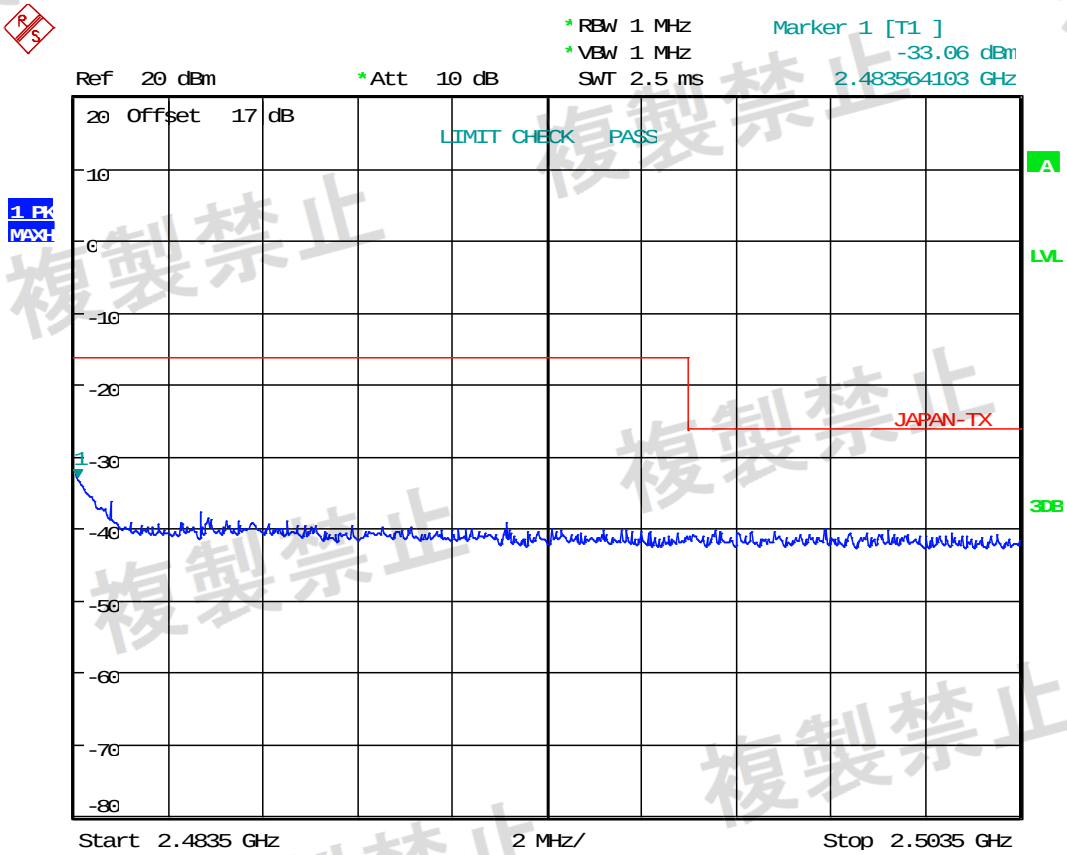
OUT BAND LEAKAGE POWER 802.11B CH1 3.63V

Date: 19.JUL.2020 11:35:52



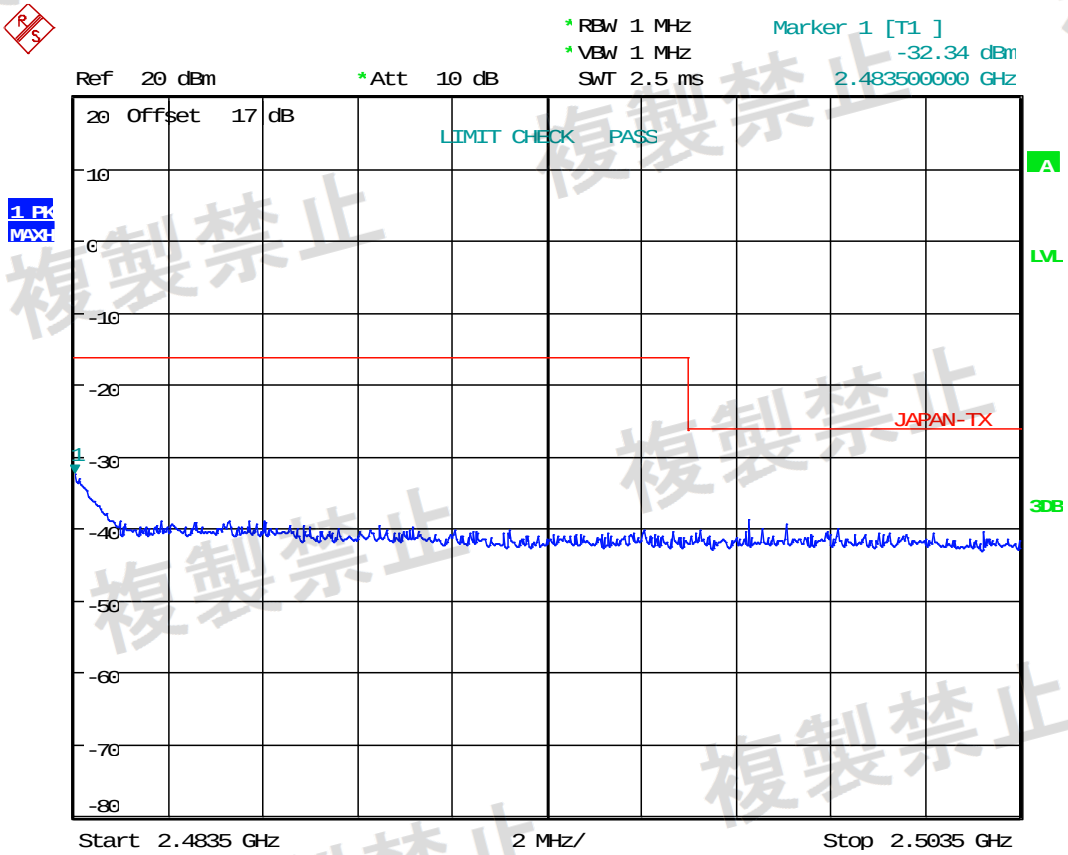
OUT BAND LEAKAGE POWER 802.11B CH13 3.3V

Date: 19.JUL.2020 12:04:22



OUT BAND LEAKAGE POWER 802.11B CH13 2.97V

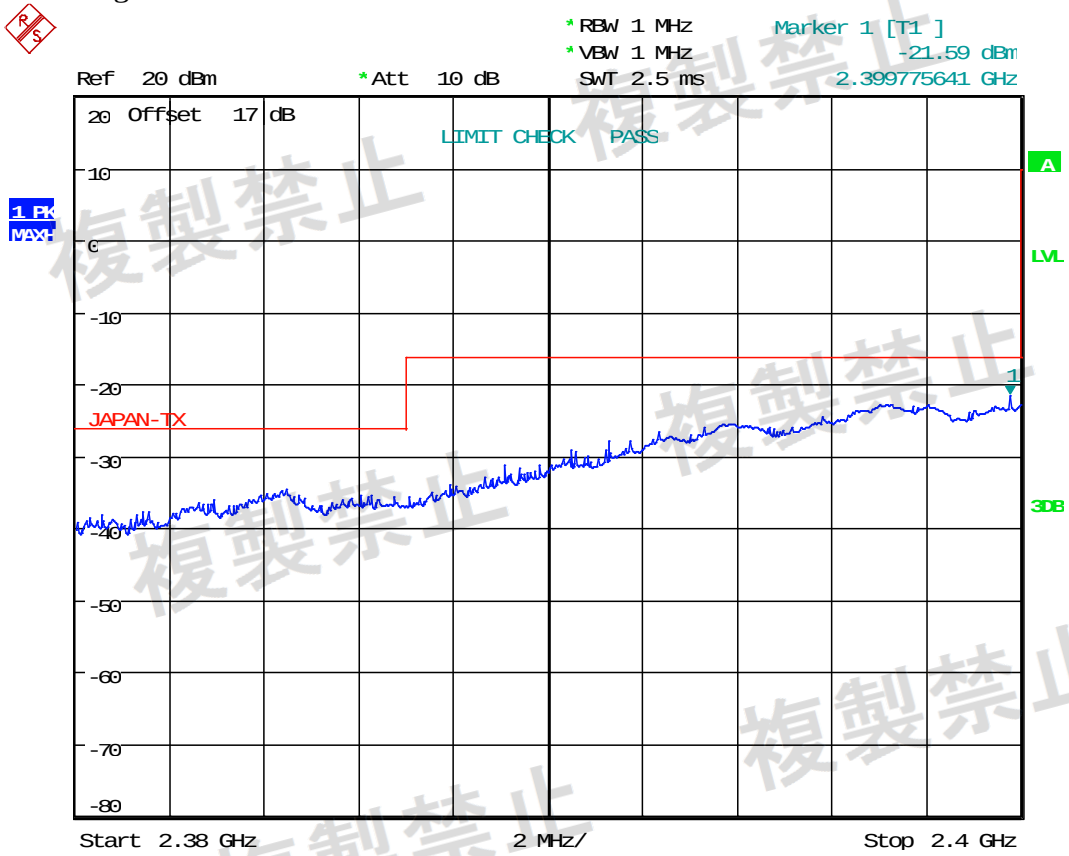
Date: 19.JUL.2020 12:04:08



OUT BAND LEAKAGE POWER 802.11B CH13 3.63V

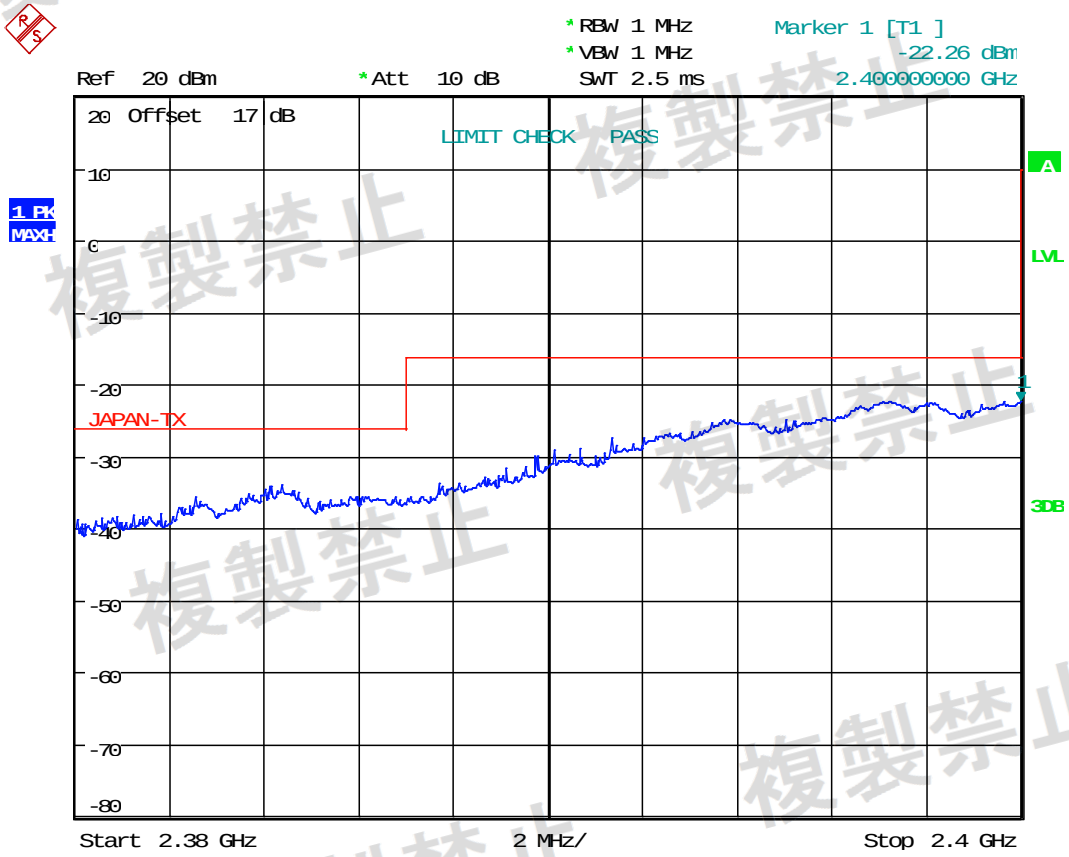
Date: 19.JUL.2020 12:07:09

IEEE 802.11g



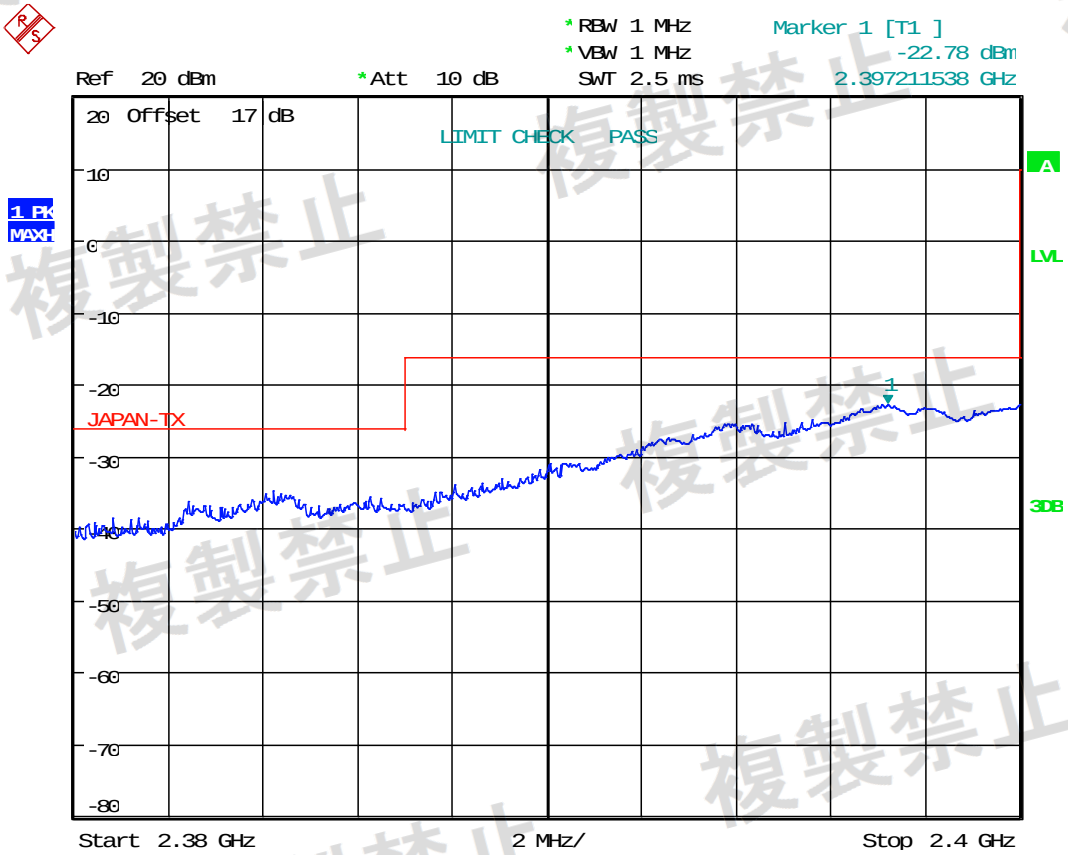
OUT BAND LEAKAGE POWER 802.11G CH1 3.3V

Date: 19.JUL.2020 11:34:21



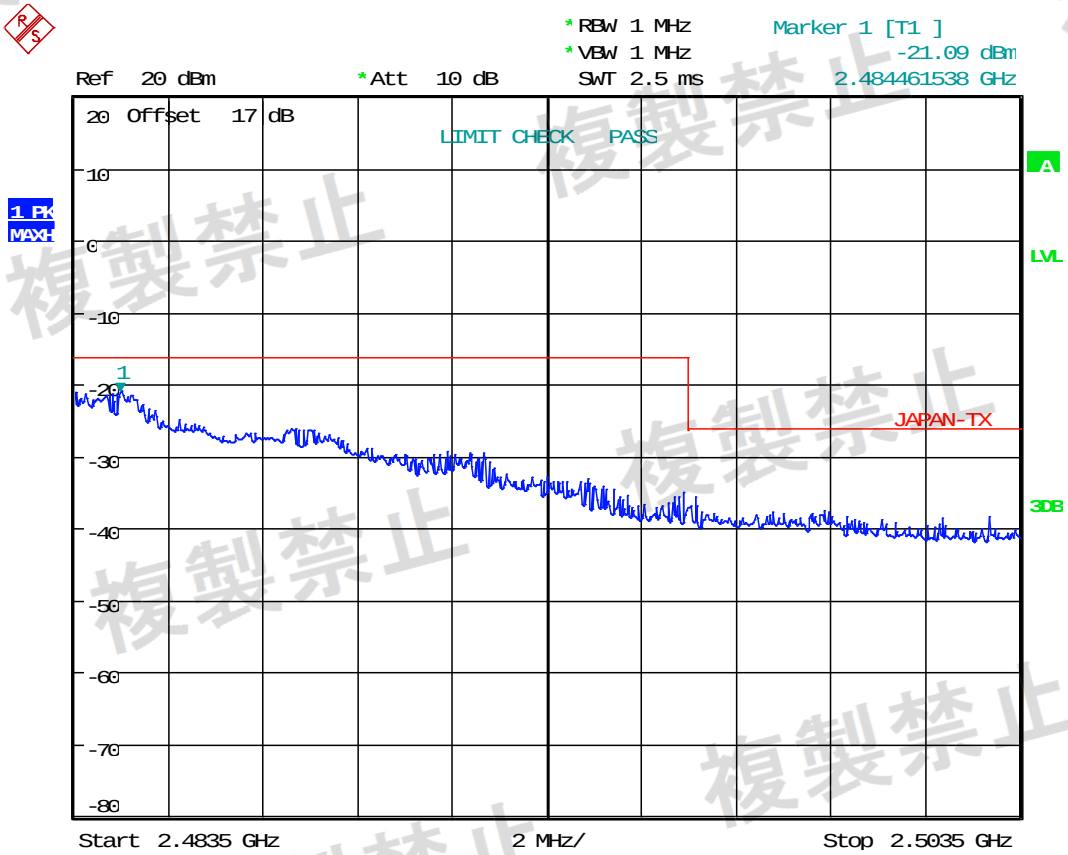
OUT BAND LEAKAGE POWER 802.11G CH1 2.97V

Date: 19.JUL.2020 11:18:31



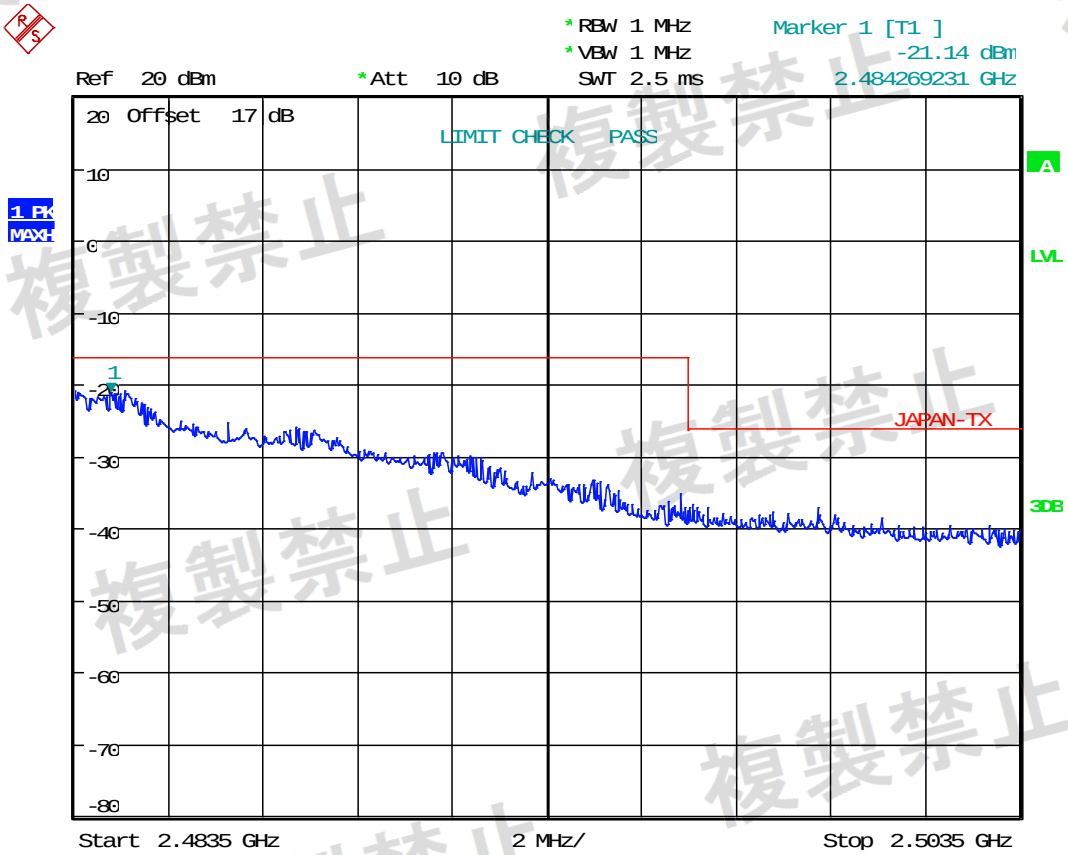
OUT BAND LEAKAGE POWER 802.11G CH1 3.63V

Date: 19.JUL.2020 11:35:18



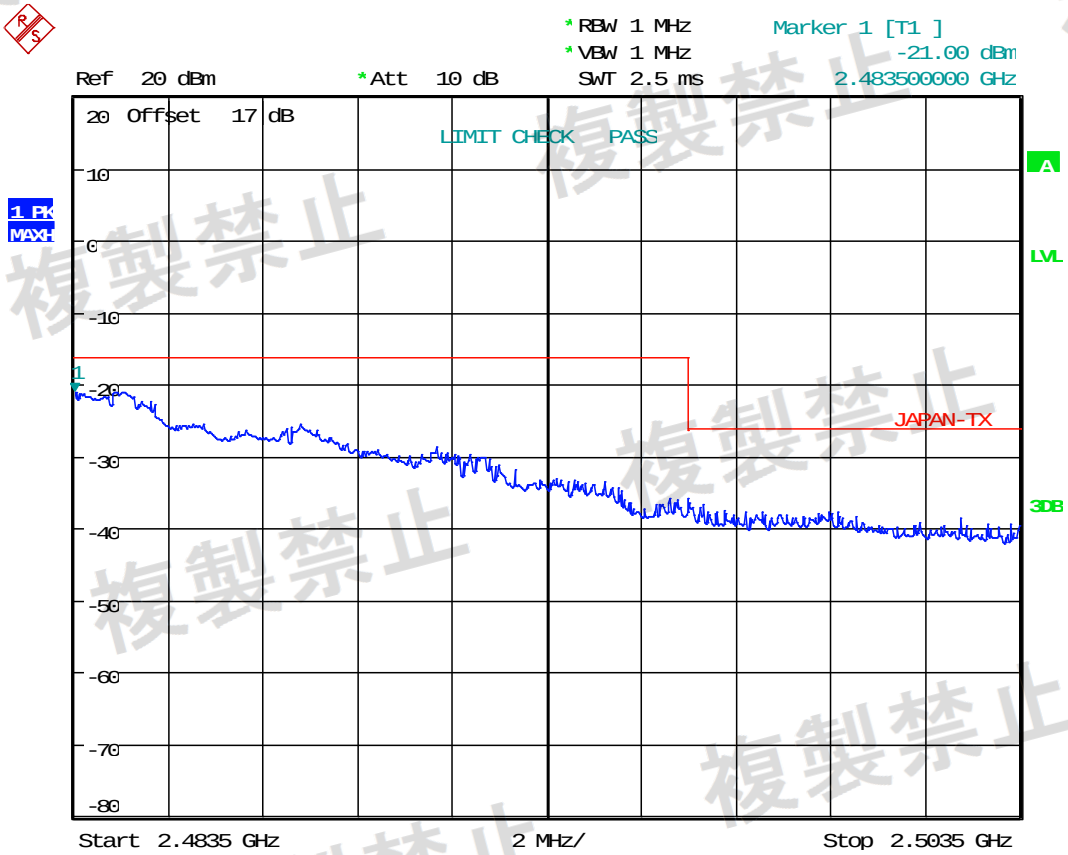
OUT BAND LEAKAGE POWER 802.11G CH13 3.3V

Date: 19.JUL.2020 12:10:32



OUT BAND LEAKAGE POWER 802.11G CH13 2.97V

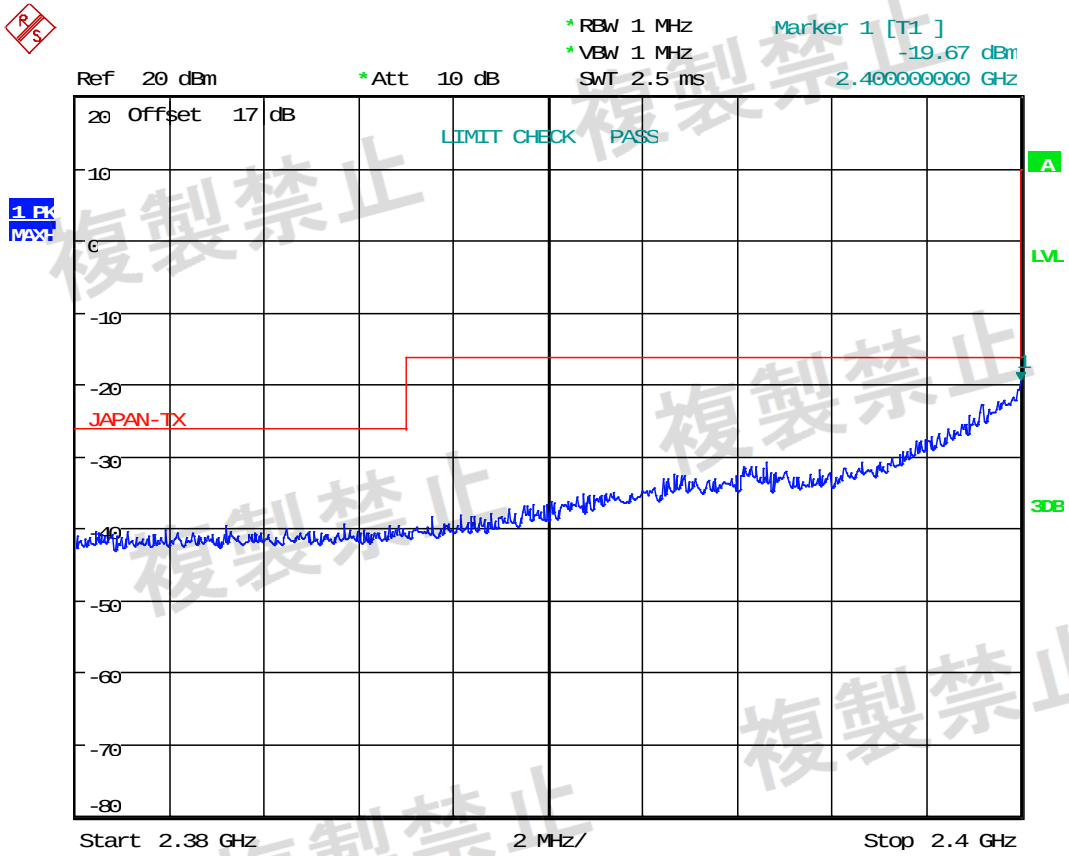
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OUT BAND LEAKAGE POWER 802.11G CH13 3.63V

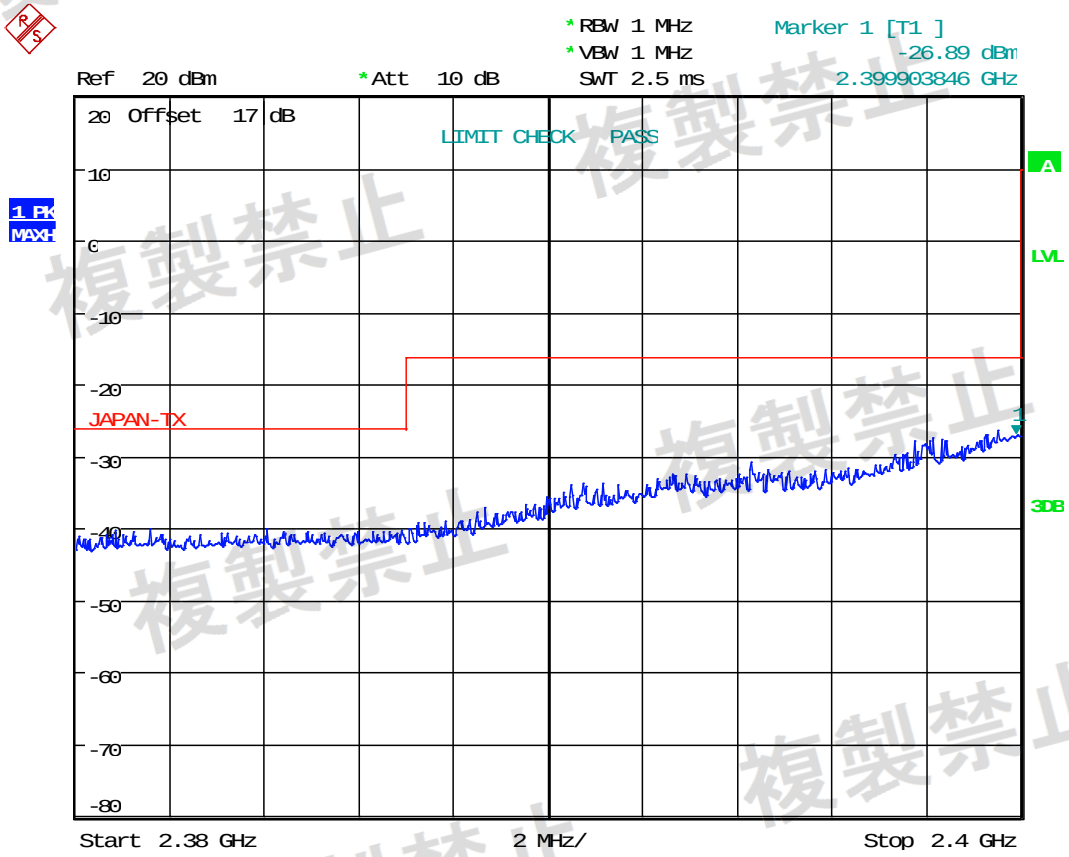
Date: 19.JUL.2020 12:09:20

IEEE 802.11n20



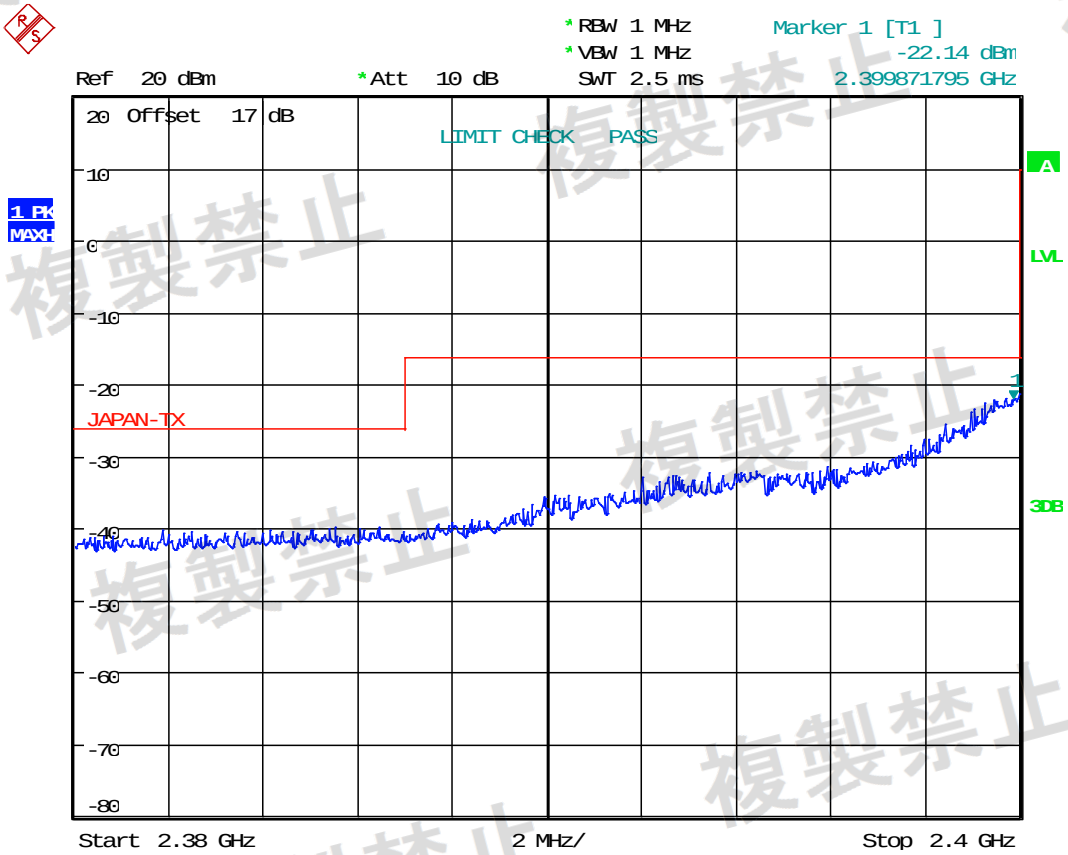
OUT BAND LEAKAGE POWER 802.11N 20MHZ CH1 3.3V

Date: 19.JUL.2020 11:40:47



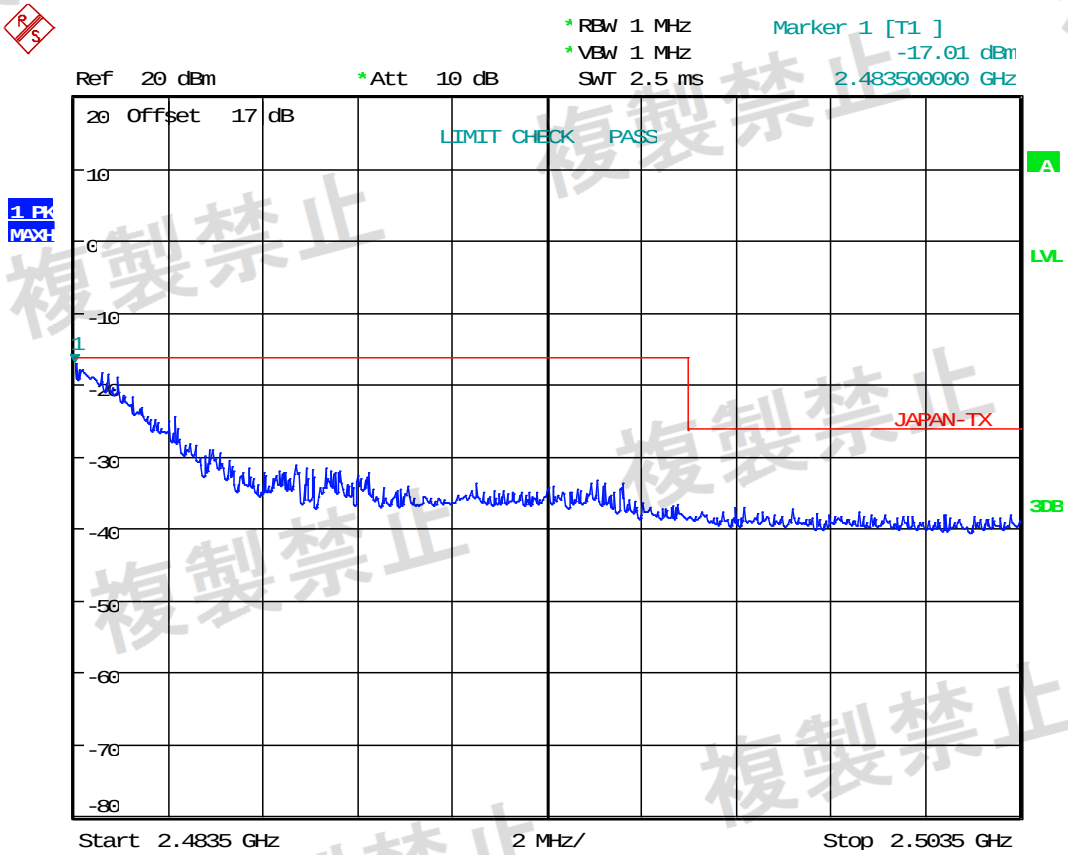
OUT BAND LEAKAGE POWER 802.11N 20MHZ CH1 2.97V

Date: 19.JUL.2020 11:39:55



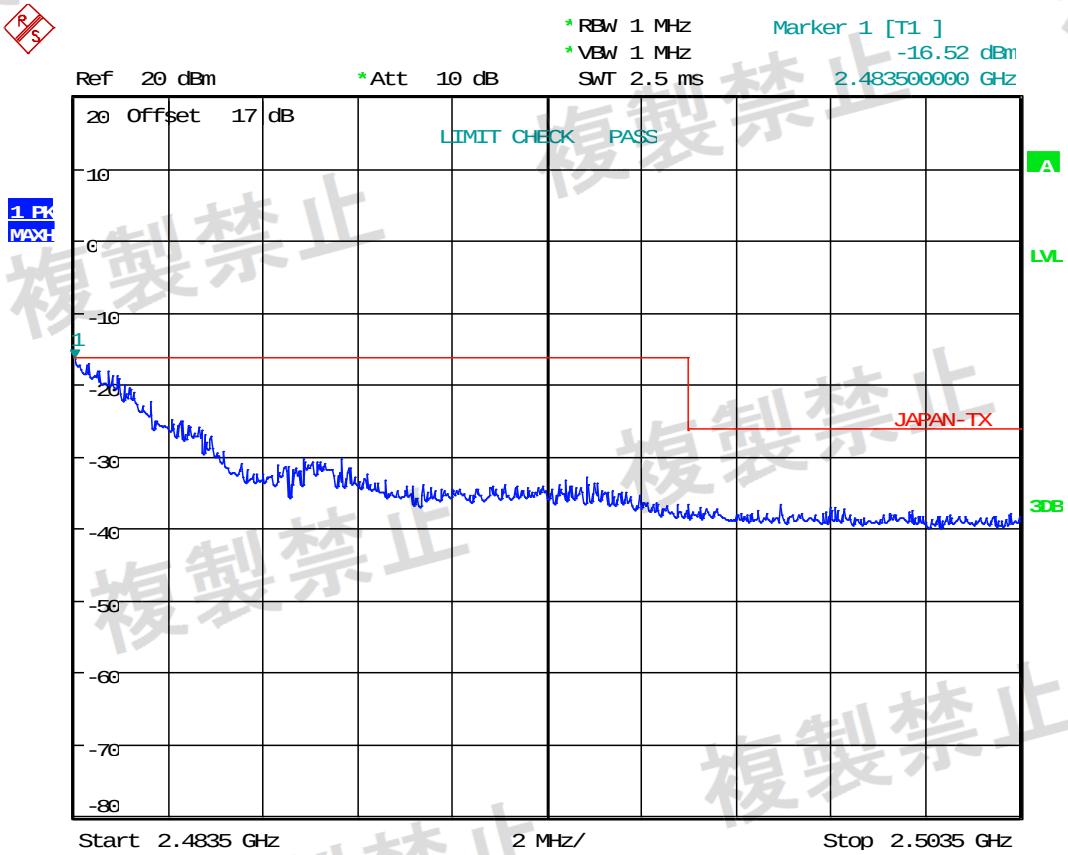
OUT BAND LEAKAGE POWER 802.11N 20MHZ CH1 3.63V

Date: 19.JUL.2020 11:41:55



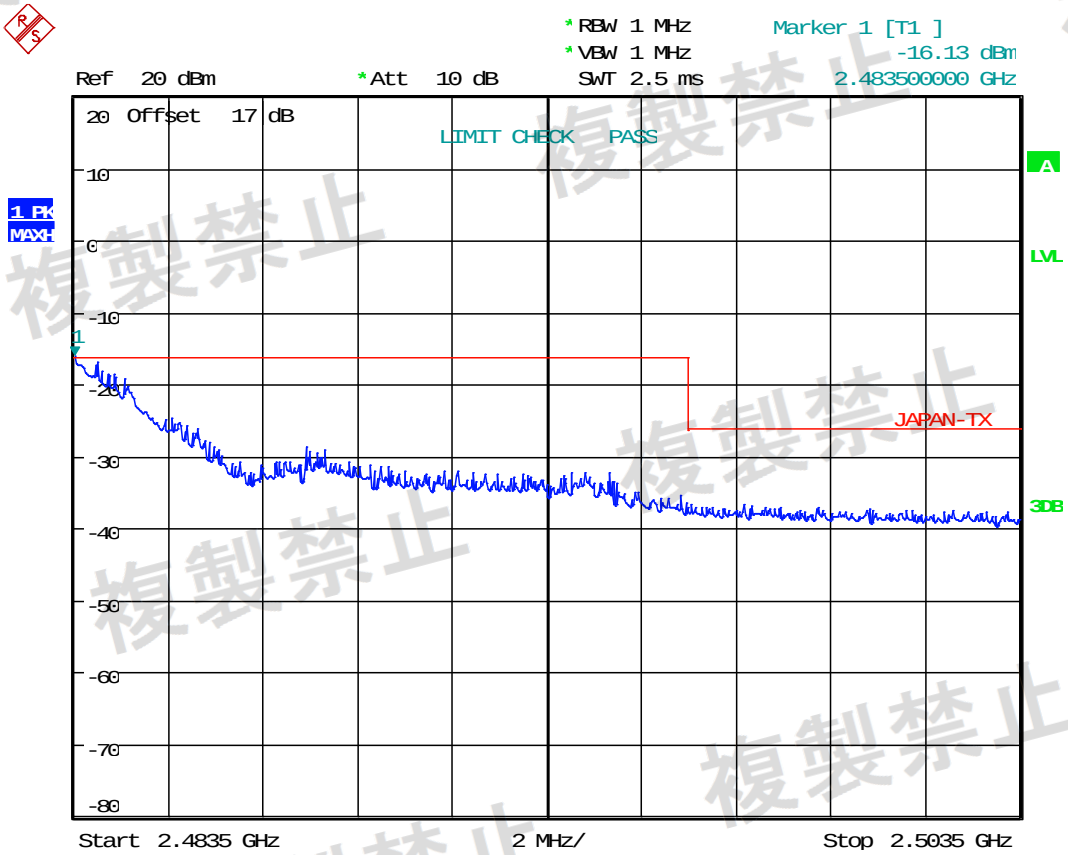
OUT BAND LEAKAGE POWER 802.11N 20MHZ CH13 3.3V

Date: 19.JUL.2020 12:01:26



OUT BAND LEAKAGE POWER 802.11N 20MHZ CH13 2.97V

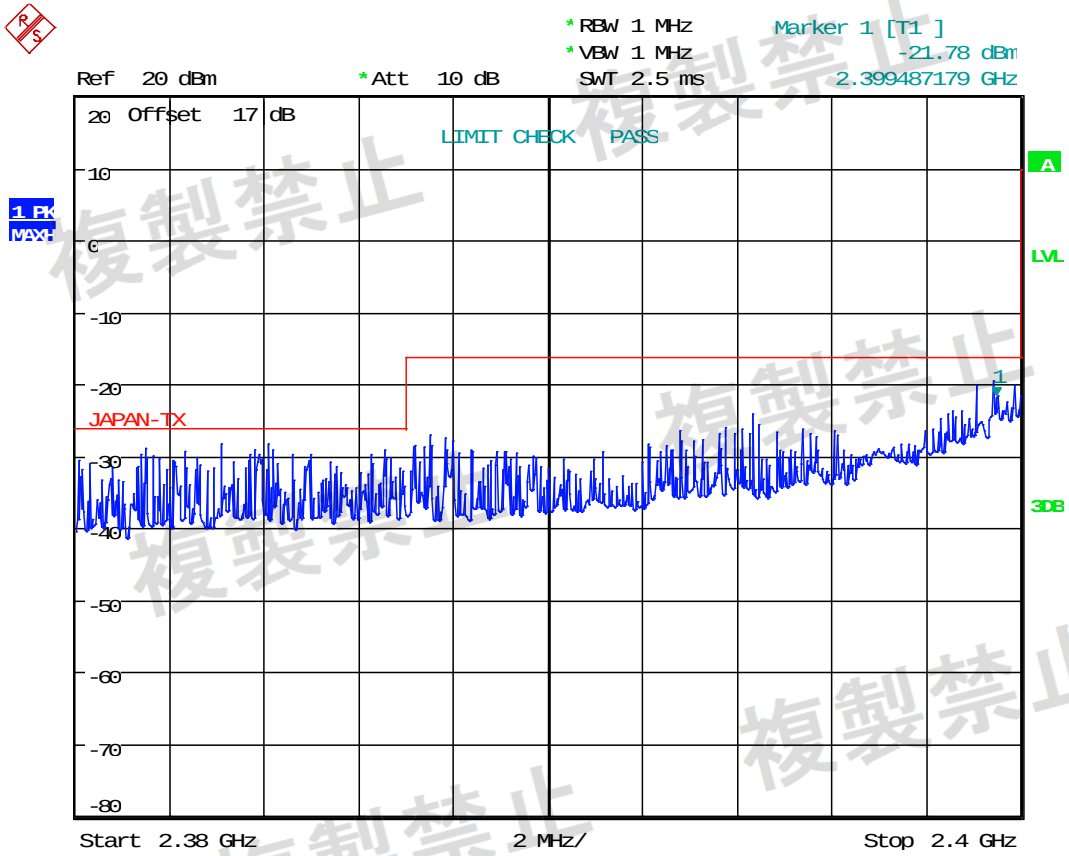
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OUT BAND LEAKAGE POWER 802.11N 20MHZ CH13 3.63V

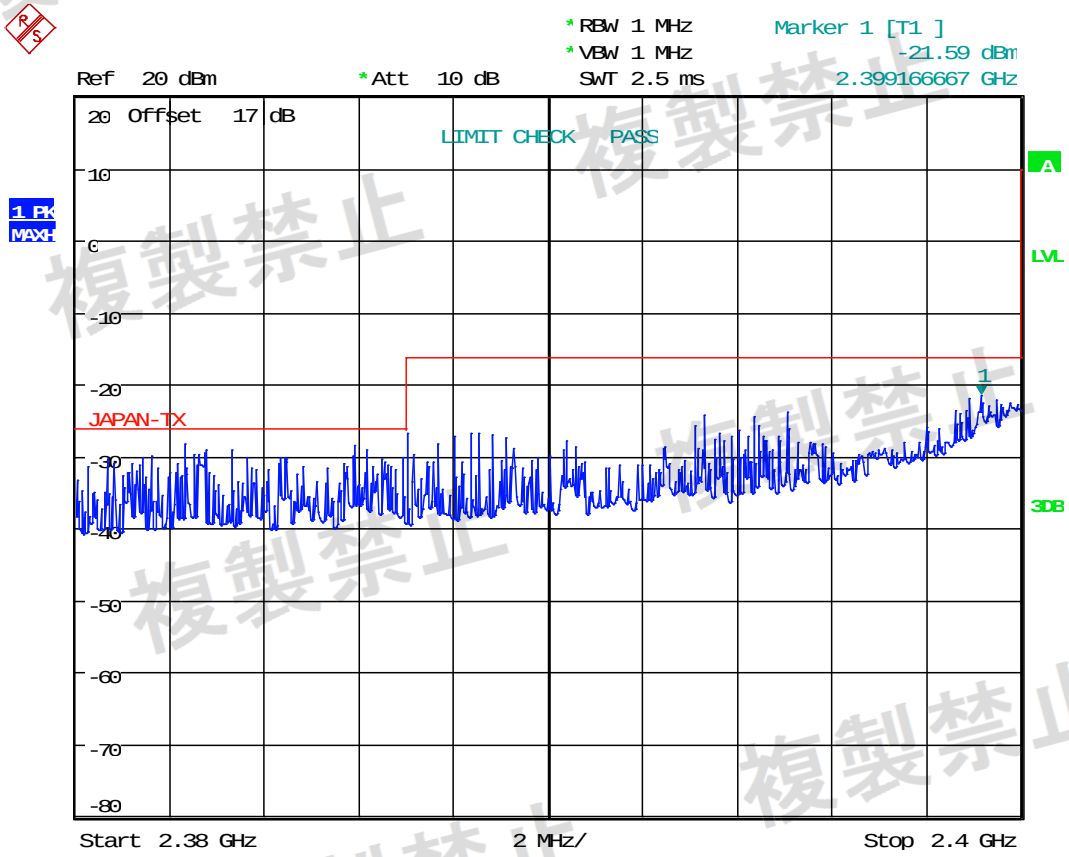
Date: 19.JUL.2020 12:00:26

IEEE 802.11n40



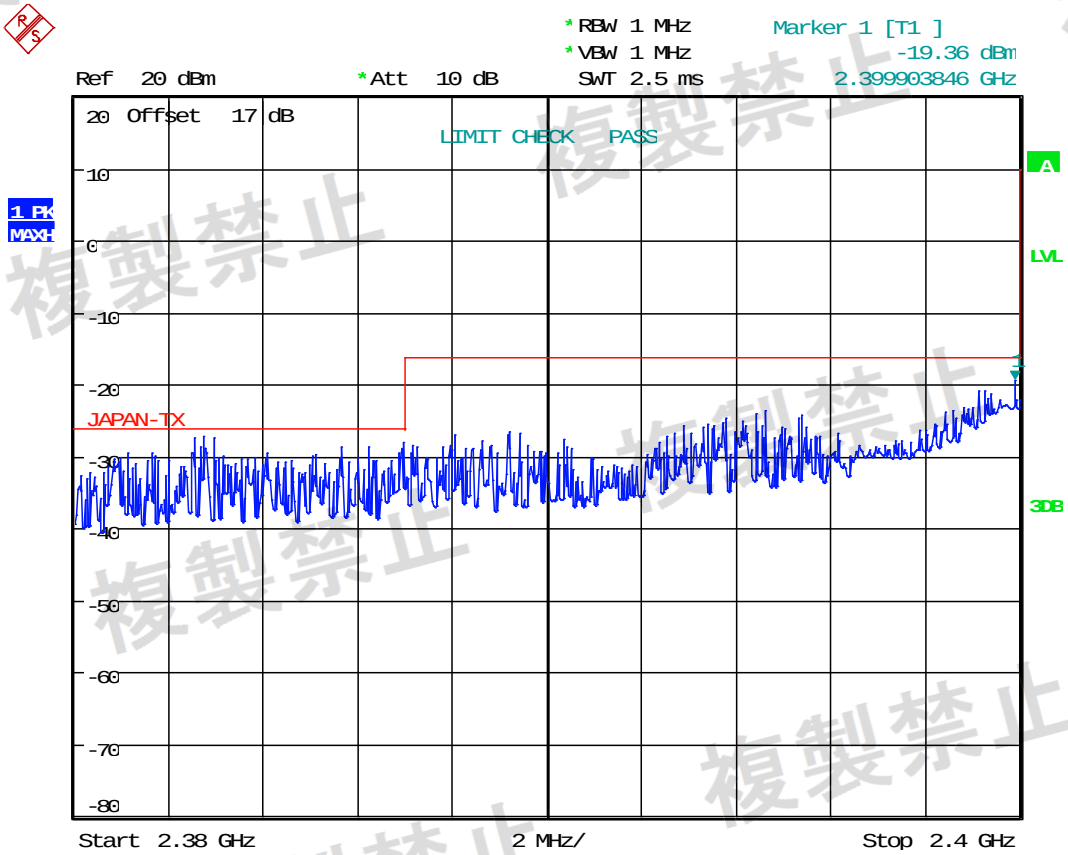
OUT BAND LEAKAGE POWER 802.11N 40MHZ CH3 3.3V

Date: 19.JUL.2020 11:47:34



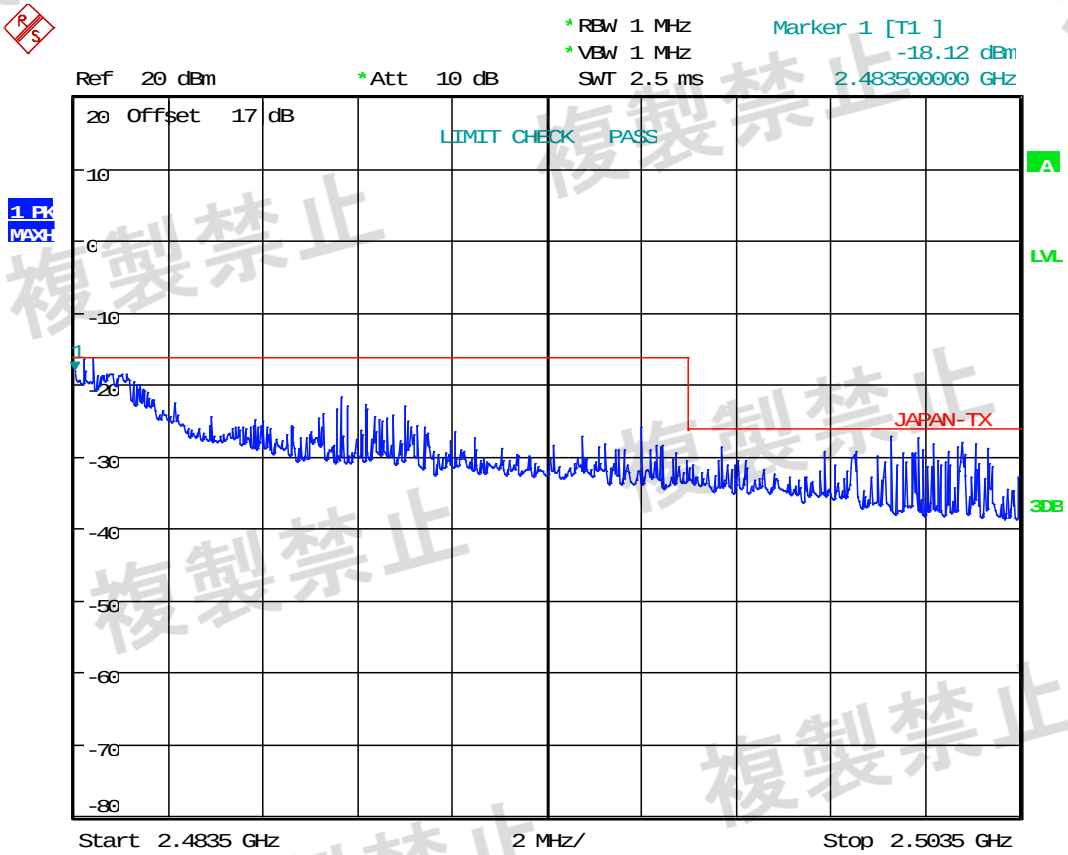
OUT BAND LEAKAGE POWER 802.11N 40MHZ CH3 2.97V

Date: 19.JUL.2020 11:48:37



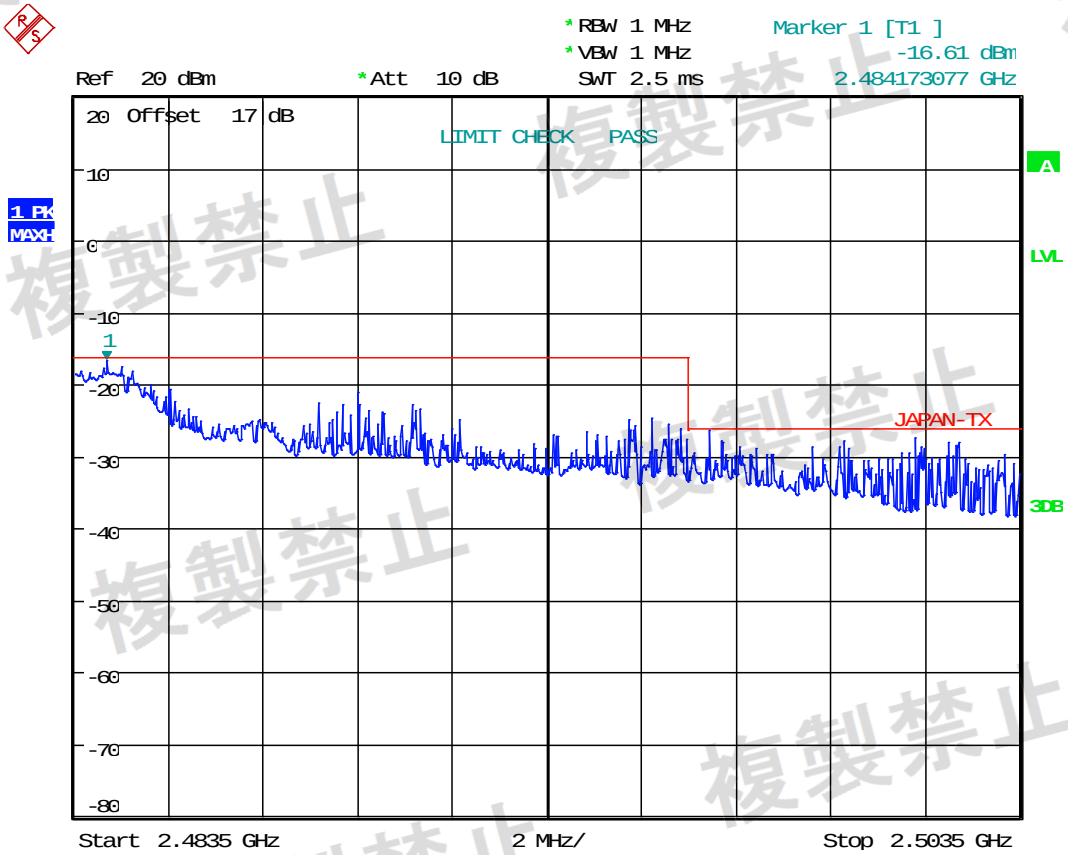
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Date: 19.JUL.2020 11:46:10



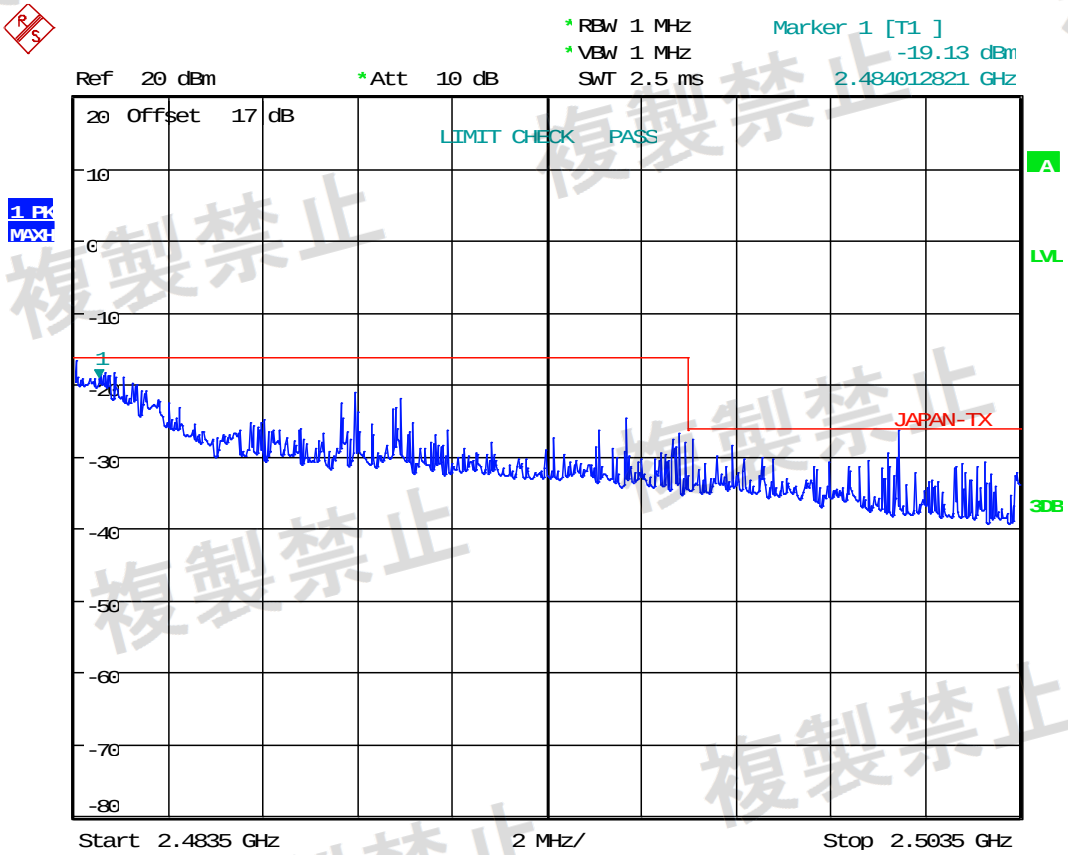
OUT BAND LEAKAGE POWER 802.11N 40MHZ CH11 3.3V

Date: 19.JUL.2020 11:56:19



OUT BAND LEAKAGE POWER 802.11N 40MHZ CH11 2.97V

Date: 19.JUL.2020 11:56:03



OUT BAND LEAKAGE POWER 802.11N 40MHZ CH11 3.63V

Date: 19.JUL.2020 11:57:16

Limits:

Transmitting operating	Operating frequency 2400 – 2483 MHz: Below 2387MHz : 2.5μW/MHz (-26 dBm) 2387 to 2400MHz : 25μW/MHz (-16 dBm) 2483.5 through 2496.5MHz : 25μW/MHz (-16 dBm) Over 2496.5MHz : 2.5μW/MHz (-16 dBm)

Test equipment used: ETSTW-RE 050, ETSTW-RE 055, ETSTW-RE 064, ETSTW-GSM 023

3.6 Antenna Power

Test date: July 18, 2020
Temperature: 24.9 ˚C
Humidity: 52.1 %
Tester: Spencer Yang

For Bluetooth2.0:
Mode: GFSK

Temperature	Voltage	Total conducted power	
℃	VDC	(dBm)	mW
23	3.3	5.92	3.91
23	2.97	5.03	3.18
23	3.63	5.79	3.79

Mode: π/ 4DQPSK

Temperature	Voltage	Total conducted power	
℃	VDC	(dBm)	mW
23	3.3	6.46	4.43
23	2.97	7.22	5.27
23	3.63	7.70	5.89

Mode: 8DPSK

Temperature	Voltage	Total conducted power	
℃	VDC	(dBm)	mW
23	3.3	6.78	4.76
23	2.97	7.79	6.01
23	3.63	6.67	4.65

Bluetooth4.0
CH0

Temperature	Voltage	Total conducted power
℃	VDC	mW
23	3.3	0.97
23	2.97	0.96
23	3.63	0.97

CH19

Temperature	Voltage	Total conducted power
℃	VDC	mW
23	3.3	1.46
23	2.97	1.48
23	3.63	1.48

CH39

Temperature	Voltage	Total conducted power
℃	VDC	mW
23	3.3	1.69
23	2.97	1.76
23	3.63	1.71

Mode: GFSK

Total conducted power	Spreading Bandwidth (20 channels)	Result	Tolerance
(mW)	(MHz)	(mW/MHz)	(mW/MHz)
3.91	17.555128	0.2227	-25.76%
Total conducted power	Spreading Bandwidth (79 channels)	Result	Tolerance
(mW)	(MHz)	(mW/MHz)	(mW/MHz)
3.91	71.34615385	0.0548	-31.50%

Mode: π/ 4DQPSK

Total conducted power	Spreading Bandwidth(20 channels)	Result	Tolerance
(mW)	(MHz)	(mW/MHz)	(mW/MHz)
5.89	18.02949	0.3267	8.90%
Total conducted power	Spreading Bandwidth(79 channels)	Result	Tolerance
(mW)	(MHz)	(mW/MHz)	(mW/MHz)
5.89	71.53846154	0.0823	2.92%

Mode: 8DPSK

Total conducted power	Spreading Bandwidth (20 channels)	Result	Tolerance
(mW)	(MHz)	(mW/MHz)	(mW/MHz)
6.01	18.01667	0.3336	11.19%
Total conducted power	Spreading Bandwidth (79 channels)	Result	Tolerance
(mW)	(MHz)	(mW/MHz)	(mW/MHz)
6.01	71.53846154	0.0840	5.01%

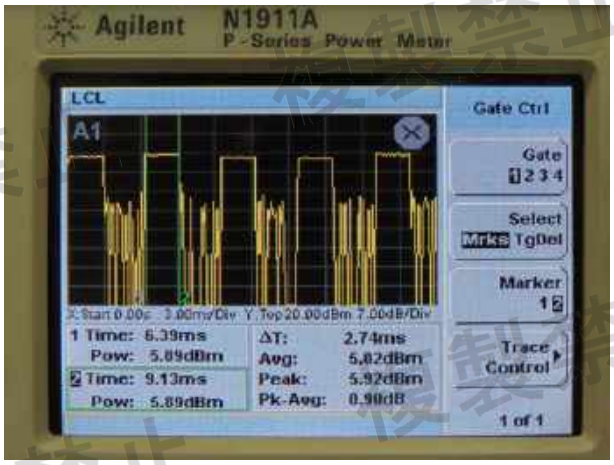
Rated output power for Bluetooth 2.0 Normal+EDR

Rated output power
0.3 mW/MHz (20 channels minimum)
0.08 mW/MHz (79 channels)

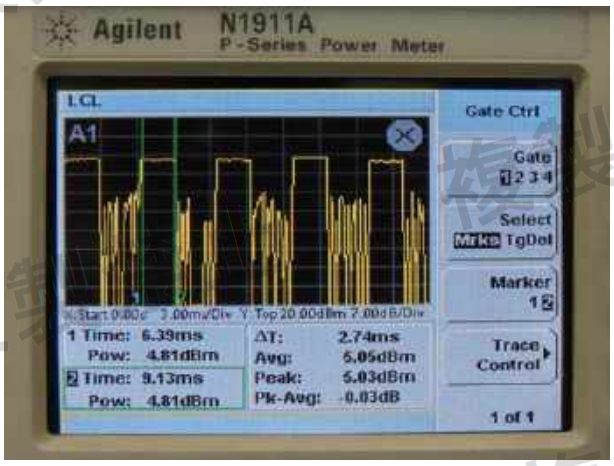
Bluetooth4.0

Tolerance based on rated output power 1.5 mW	
0.96 mW (Min.)	-36.00 %
1.76 mW (Max.)	17.33 %

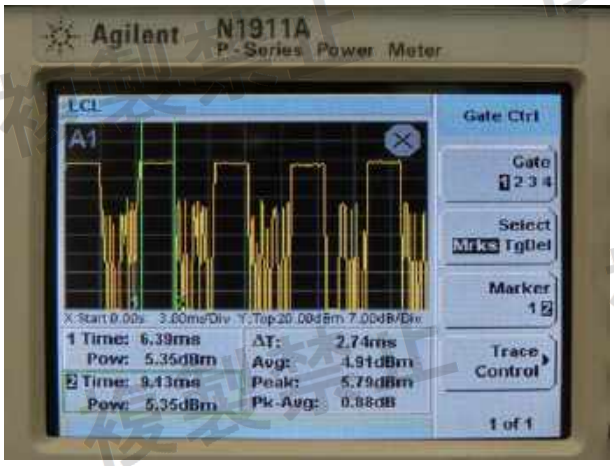
Mode: GFSK
3.3VDC



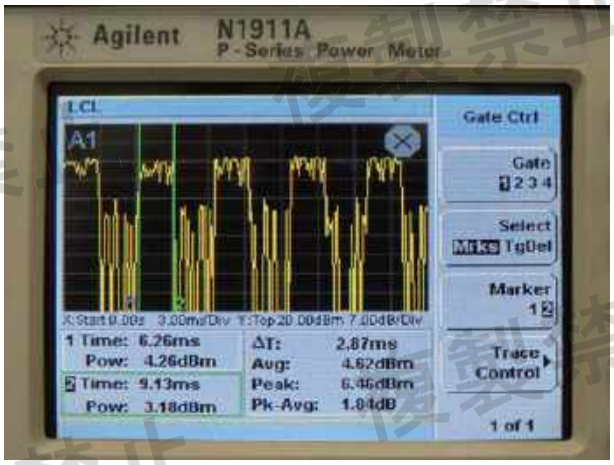
2.97VDC



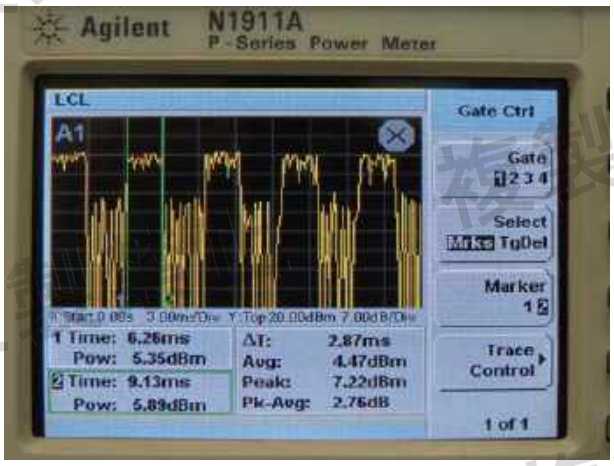
3.63VDC



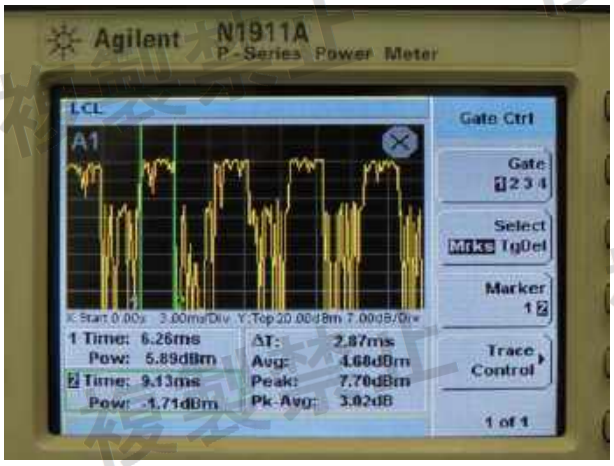
Mode: π/ 4DQPSK
3.3 VDC



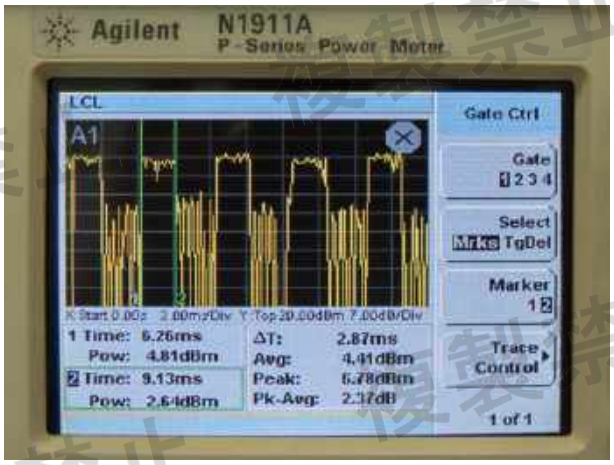
2.97VDC



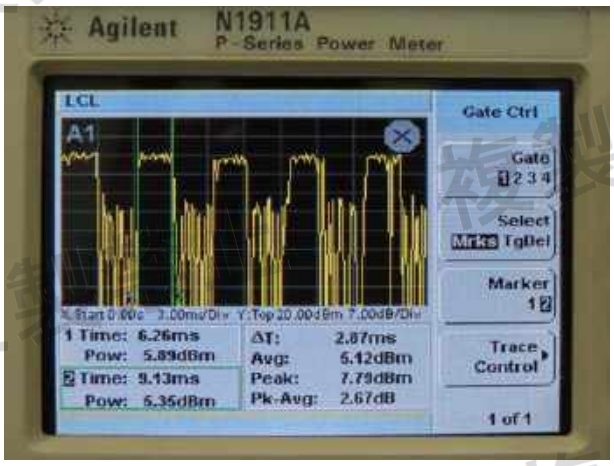
3.63VDC



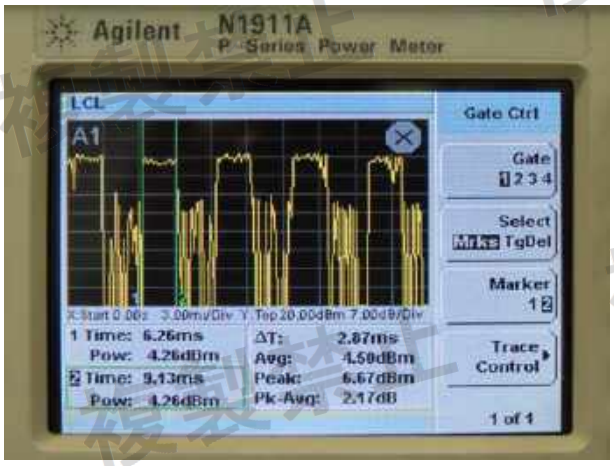
Mode: 8DPSK
3.3 VDC



2.97VDC



3.63VDC



For WLAN:

	Channel	Voltage	Avg. Result (mW/MHz)
IEEE 802.11b	Low channel	3.3V	0.42
		2.97V	0.41
		3.63V	0.42
	Middle channel	3.3V	0.52
		2.97V	0.50
		3.63V	0.54
	High channel	3.3V	0.51
		2.97V	0.51
		3.63V	0.51

	Channel	Voltage	Avg. Result (mW/MHz)
IEEE 802.11g	Low channel	3.3V	0.30
		2.97V	0.33
		3.63V	0.39
	Middle channel	3.3V	0.35
		2.97V	0.33
		3.63V	0.35
	High channel	3.3V	0.36
		2.97V	0.34
		3.63V	0.36

	Channel	Voltage	Avg. Result (mW/MHz)
IEEE 802.11n20	Low channel	3.3V	0.35
		2.97V	0.35
		3.63V	0.35
	Middle channel	3.3V	0.28
		2.97V	0.30
		3.63V	0.31
	High channel	3.3V	0.44
		2.97V	0.47
		3.63V	0.47

	Channel	Voltage	Avg. Result (mW/MHz)
IEEE 802.11n40	Low channel	3.3V	0.31
		2.97V	0.25
		3.63V	0.30
	Middle channel	3.3V	0.29
		2.97V	0.25
		3.63V	0.26
	High channel	3.3V	0.20
		2.97V	0.20
		3.63V	0.19

Rated output power	Antenna power (mW/MHz)	Tolerance
0.5 mW/MHz (802.11b)	0.41 (Min.)	-18.00 %
0.5 mW/MHz (802.11b)	0.54 (Max.)	8.00 %
0.4 mW/MHz (802.11g)	0.30 (Min.)	-25.00 %
0.4 mW/MHz (802.11g)	0.39 (Max.)	-2.50 %
0.4 mW/MHz (802.11n20)	0.28 (Min.)	-30.00 %
0.4 mW/MHz (802.11n20)	0.47 (Max.)	17.50%
0.3 mW/MHz (802.11n40)	0.19 (Min.)	-36.67 %
0.3 mW/MHz (802.11n40)	0.31 (Max.)	3.33 %

Limits:

Under all test conditions	Conducted	(1) FH, FH+DS, FH+OFDM 3mW/MHz (used in the range of 2427 - 2470.75MHz)
		(2) Other than (1) of DS : 10mW/MHz
		(3) Other than (1) of OFDM Occupied bandwidth ≤ 26MHz : 10mW/MHz 26MHz < Occupied bandwidth ≤ 38MHz : 5mW/MHz
		Tolerance: +20%,-80%

Test equipment used: ETSTW-RE 050, ETSTW-RE 064, ETSTW-GSM 023, ETSTW-RE 073, ETSTW-RE 074

3.7 Angular width of principal radiation (AWPR)

The angular width of principal radiation (AWPR), which follows from the antenna pattern specifications, shall satisfy the expression 360/A degrees.

To be assessed:

AWPR < 360/A

For Bluetooth2.0:

A represents the value determined by dividing an equivalent isotropically radiated power by the value obtained by applying an antenna power with the mean power of 3 mW to the transmitting antenna with its absolute gain being 2.14 dB, and shall be 1 when it is lower than 1.

The max. gain of the antenna is 5.5 dBi, so the resulting EIRP is:

Highest Antenna Power	mW/MHz	dBm/MHz
	6.01	7.79

Maximum Antenna gain(dBi)	Highest Antenna Power (dBm/MHz)	EIRP (dBm/MHz)
5.50	**7.79**	**13.29**

HPBW

EIRP	dBm/MHz	A	HPBW limit
BT2.0	13.29	4.35	82.76

For WLAN:

A represents the value determined by dividing an equivalent isotropically radiated power by the value obtained by applying an antenna power with the mean power of 10 mW to the transmitting antenna with its absolute gain being 2.14 dB, and shall be 1 when it is lower than 1.

The max. gain of the antenna is 5.5 dBi, so the resulting EIRP is:

802.11b

	mW/MHz	dBm/MHz
Highest Antenna Power	0.54	-2.68

Maximum Antenna gain(dBi)	Highest Antenna Power (dBm/MHz)	EIRP (dBm/MHz)
5.50	**-2.68**	**2.82**

802.11g

	mW/MHz	dBm/MHz
Highest Antenna Power	0.39	-4.09

Maximum Antenna gain(dBi)	Highest Antenna Power (dBm/MHz)	EIRP (dBm/MHz)
5.50	**-4.09**	**1.41**

802.11n20

	mW/MHz	dBm/MHz
Highest Antenna Power	0.47	-3.28

Maximum Antenna gain(dBi)	Highest Antenna Power (dBm/MHz)	EIRP (dBm/MHz)
5.50	**-3.28**	**2.22**

802.11n40

	mW/MHz	dBm/MHz
Highest Antenna Power	0.31	-5.09

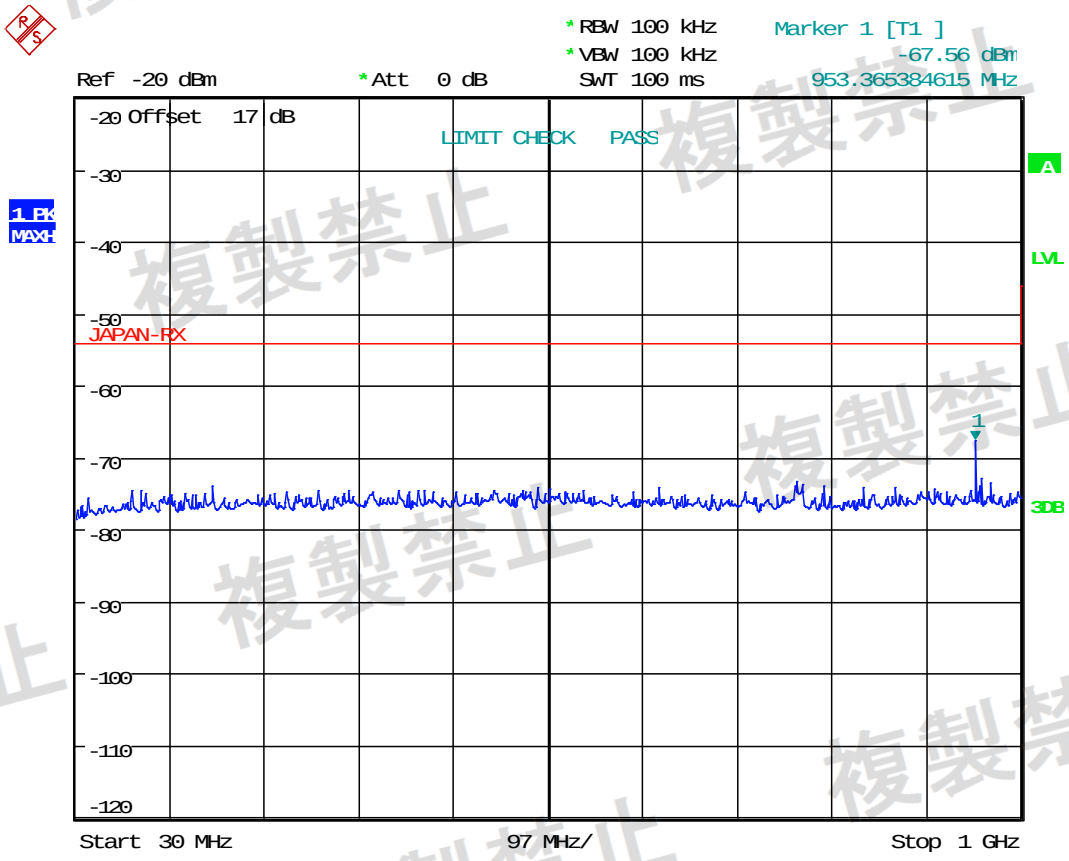
Maximum Antenna gain(dBi)	Highest Antenna Power (dBm/MHz)	EIRP (dBm/MHz)
5.50	**-5.09**	**0.41**

Both EIRP values are lower than 12.14 dBm/MHz, so there is no need to calculate a half power beamwidth for the antenna. It is allowed to have an antenna with an Omni characteristic (360 degrees)

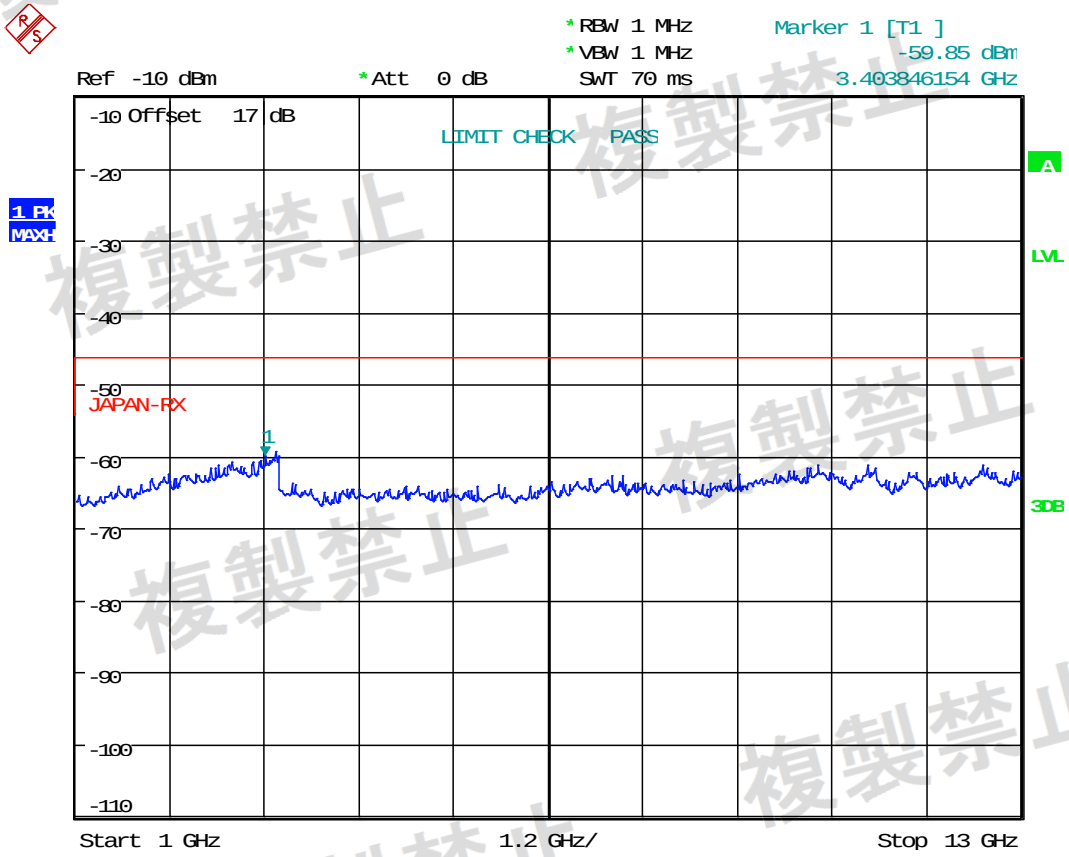
3.8 Spurious emission receiver

Test date: July 17, 2020-July 19, 2020
Temperature: 24.8 ˚C
Humidity: 52.7 %
Tester: Spencer Yang

Bluetooth 2.0
GFSK

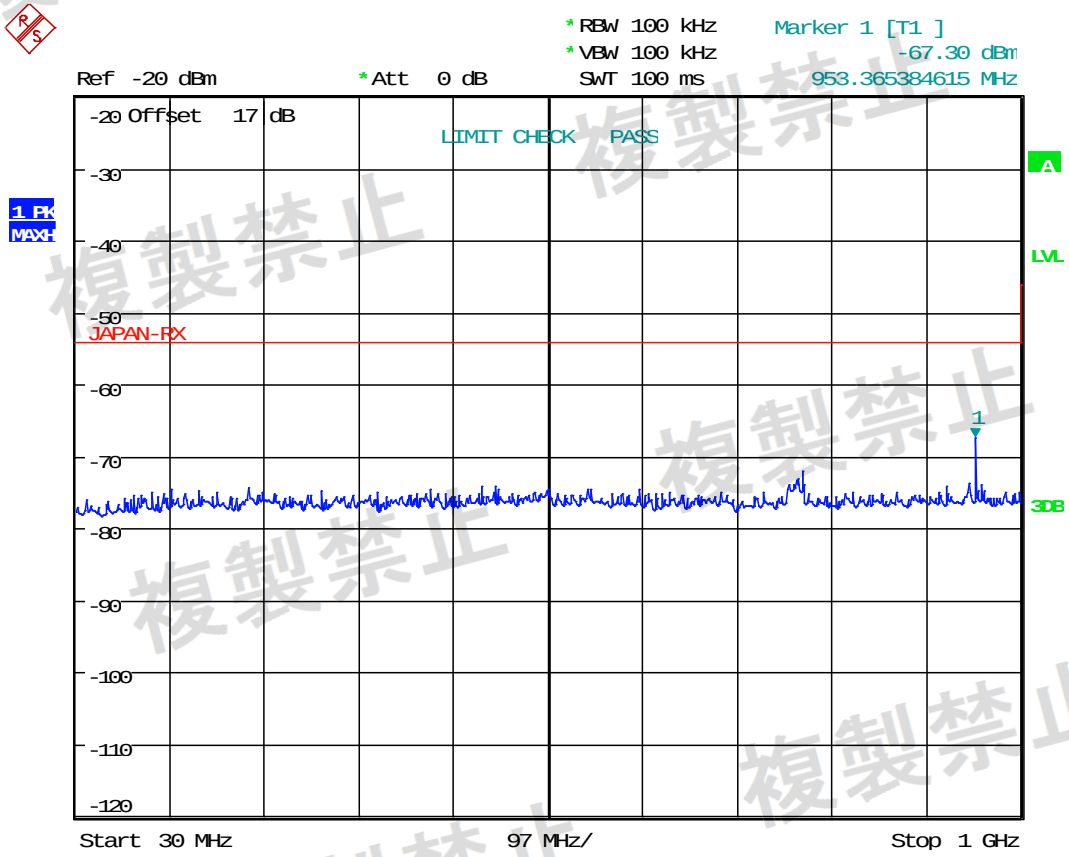


CONDUCTED SPURIOUS EMISSION RX 3.3V
Date: 17.JUL.2020 10:22:53



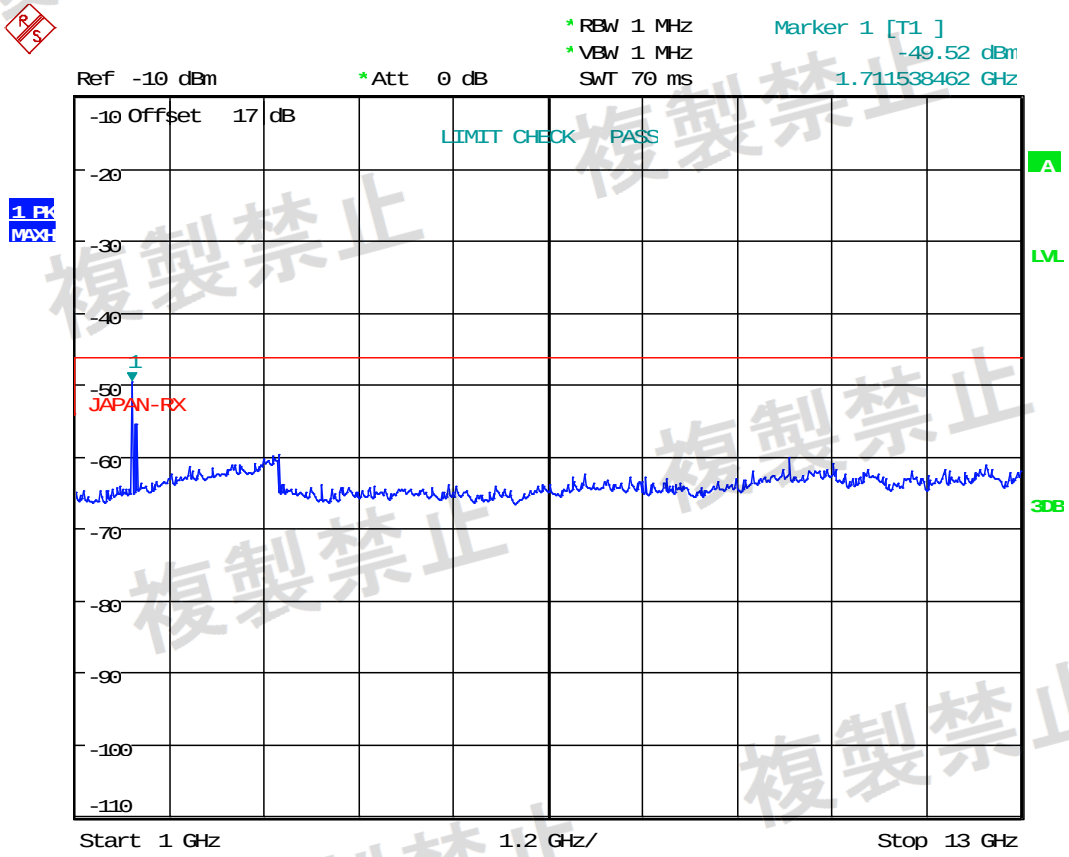
CONDUCTED SPURIOUS EMISSION RX 3.3V

Date: 17.JUL.2020 10:28:13



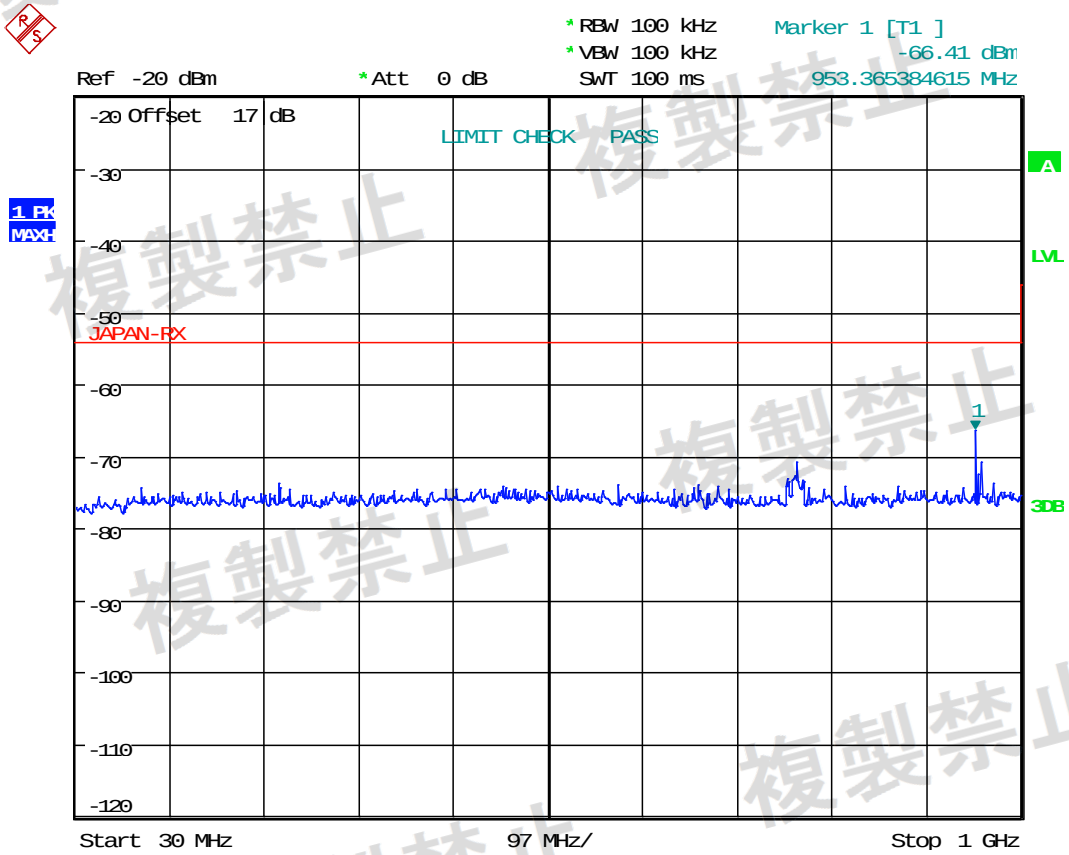
CONDUCTED SPURIOUS EMISSION RX 2.97V

Date: 17.JUL.2020 10:23:10



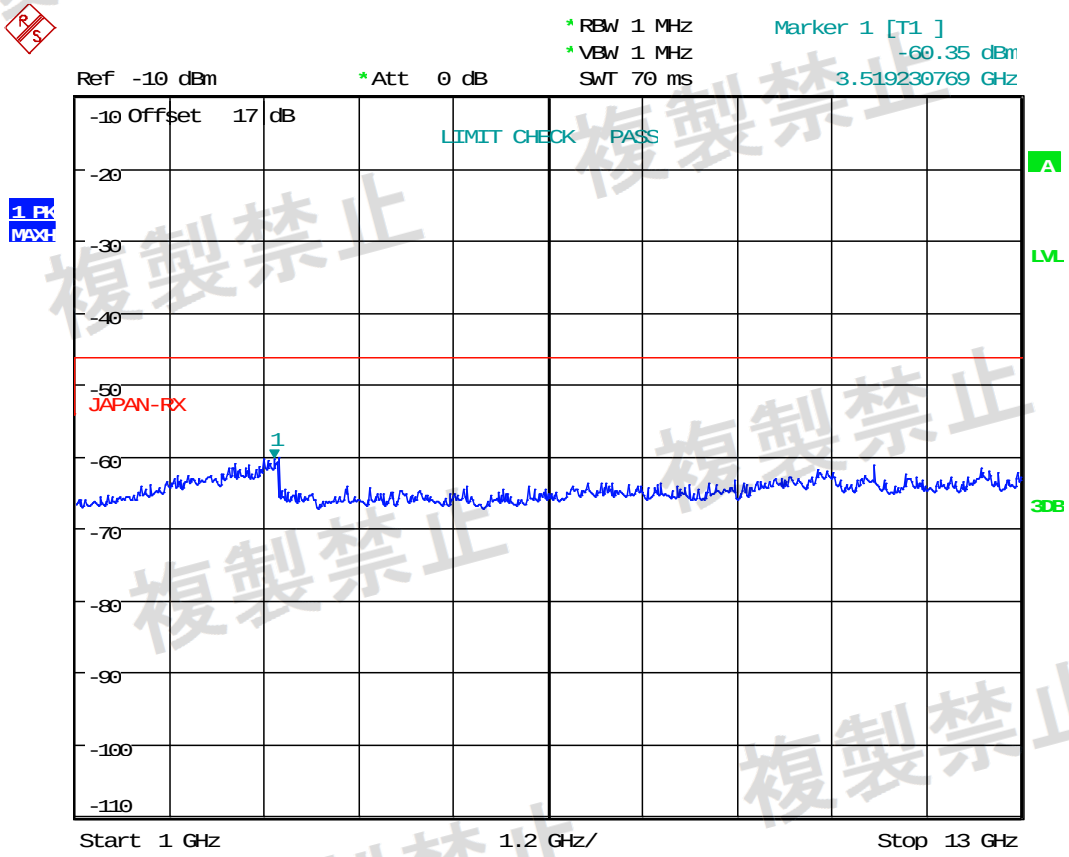
CONDUCTED SPURIOUS EMISSION RX 2.97V

Date: 17.JUL.2020 10:27:01



CONDUCTED SPURIOUS EMISSION RX 3.63V

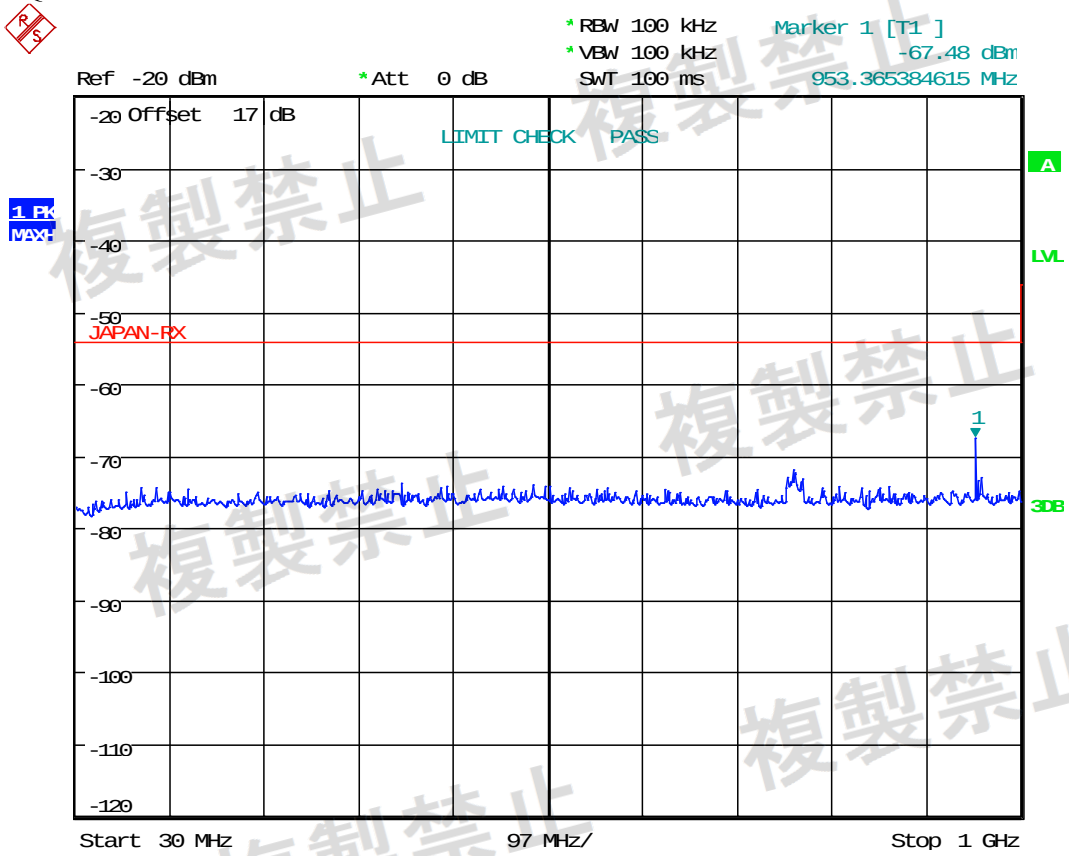
Date: 17.JUL.2020 10:22:06



CONDUCTED SPURIOUS EMISSION RX 3.63V

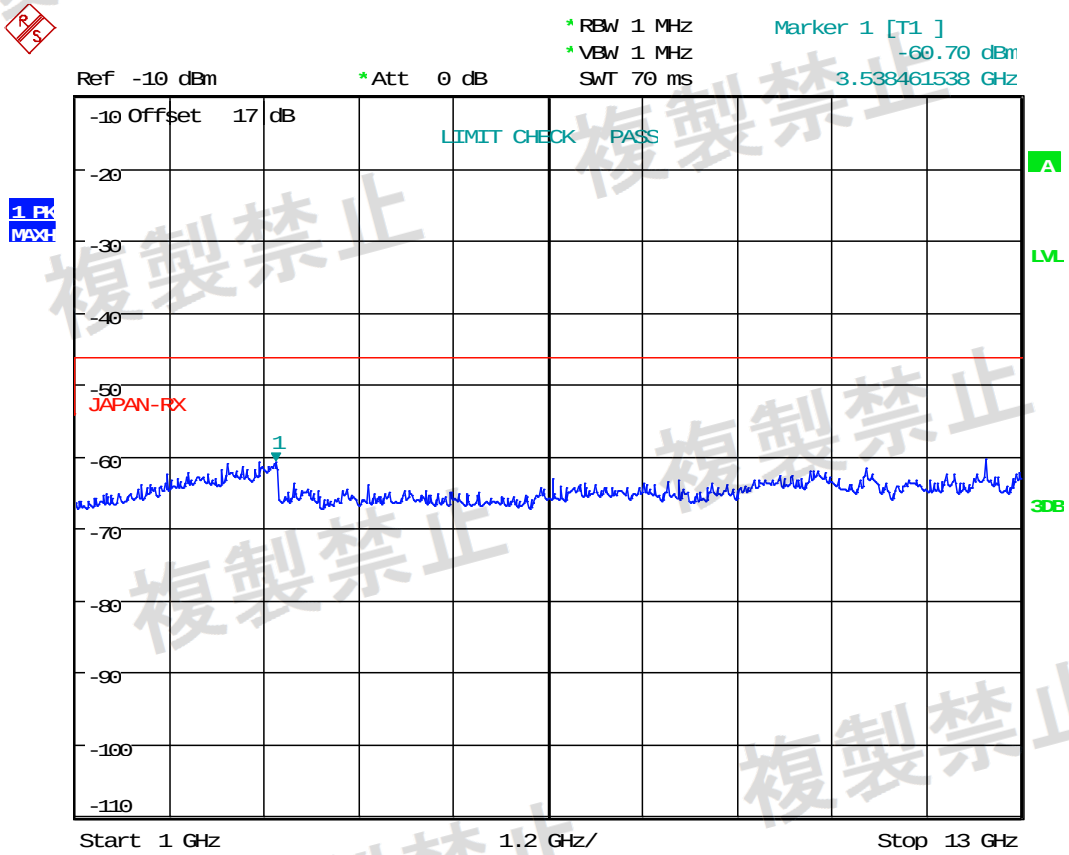
Date: 17.JUL.2020 10:29:20

π/ 4DQPSK



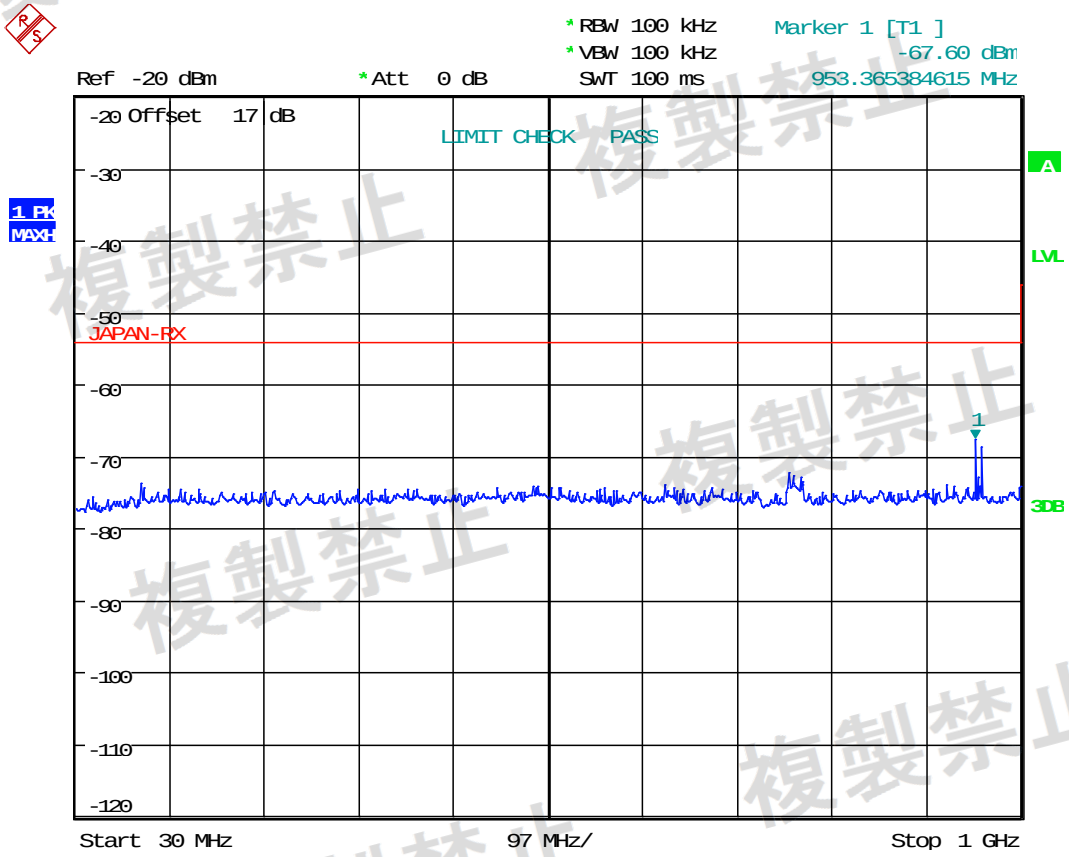
CONDUCTED SPURIOUS EMISSION EDR 2M RX 3.3V

Date: 17.JUL.2020 10:20:37



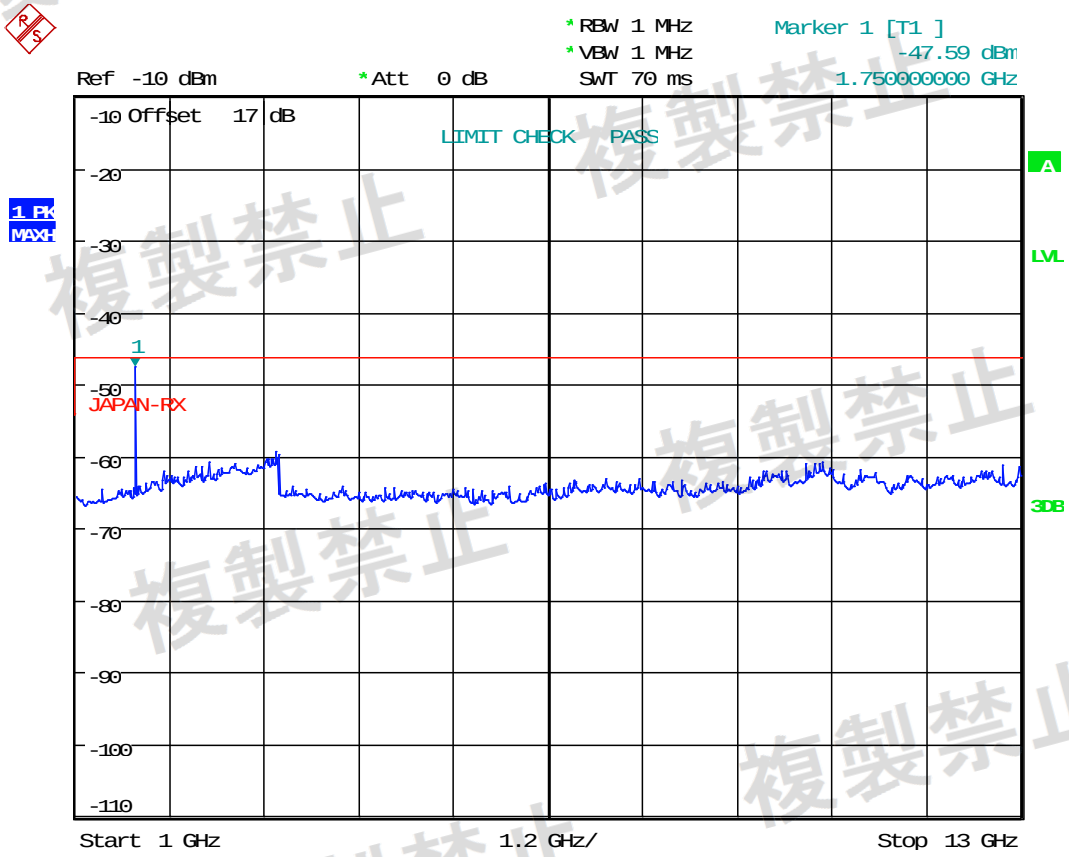
CONDUCTED SPURIOUS EMISSION EDR 2M RX 3.3V

Date: 17.JUL.2020 10:30:55



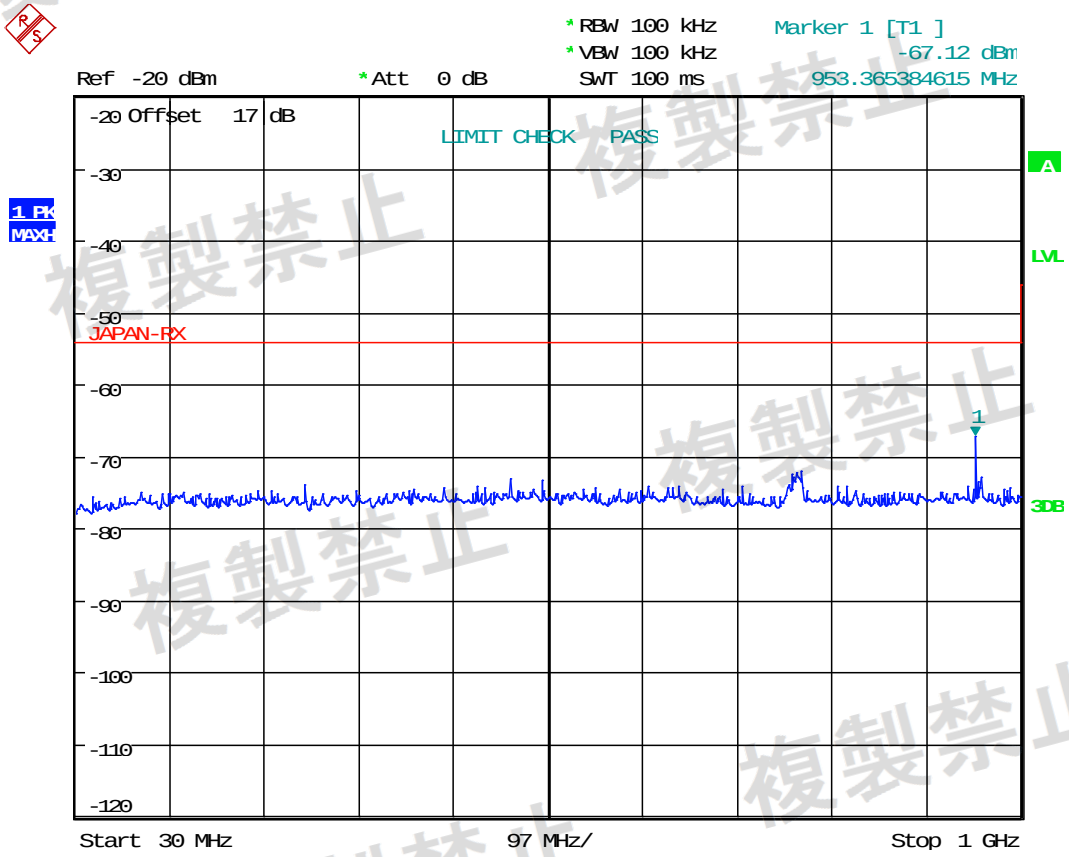
CONDUCTED SPURIOUS EMISSION EDR 2M RX 2.97V

Date: 17.JUL.2020 10:20:06



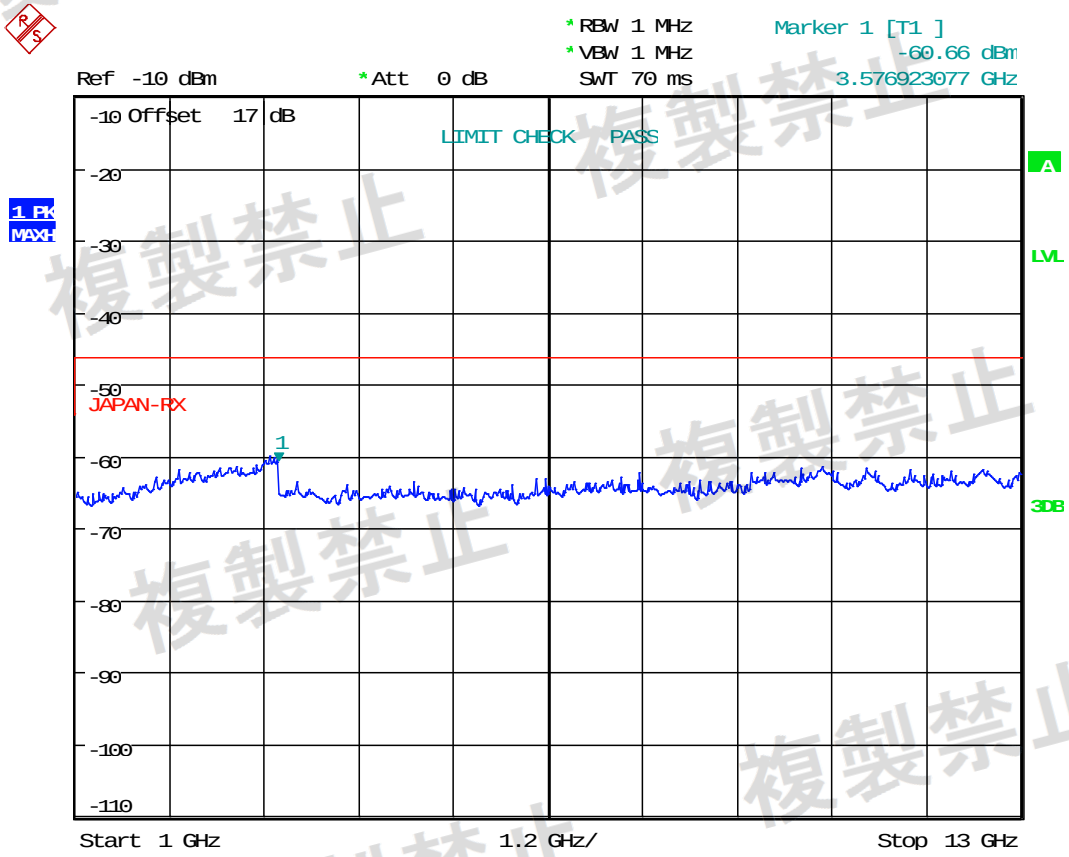
CONDUCTED SPURIOUS EMISSION EDR 2M RX 2.97V

Date: 17.JUL.2020 10:31:45



CONDUCTED SPURIOUS EMISSION EDR 2M RX 3.63V

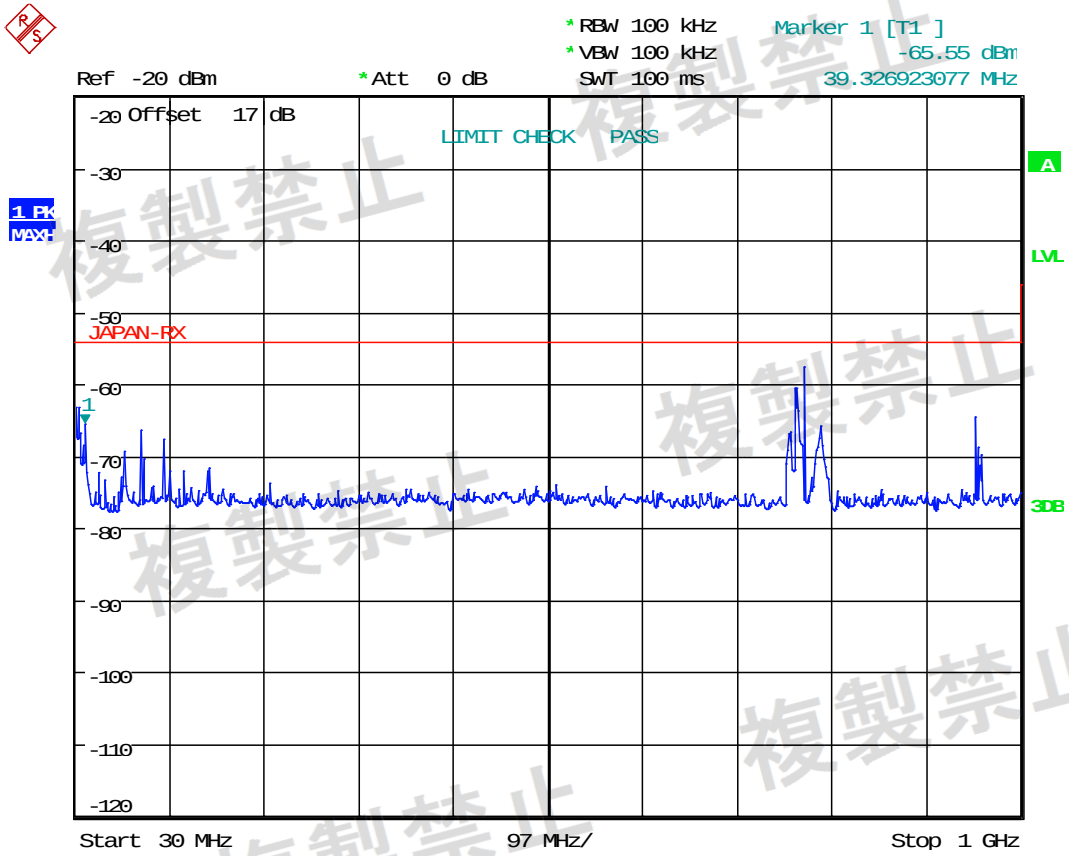
Date: 17.JUL.2020 10:21:27



CONDUCTED SPURIOUS EMISSION EDR 2M RX 3.63V

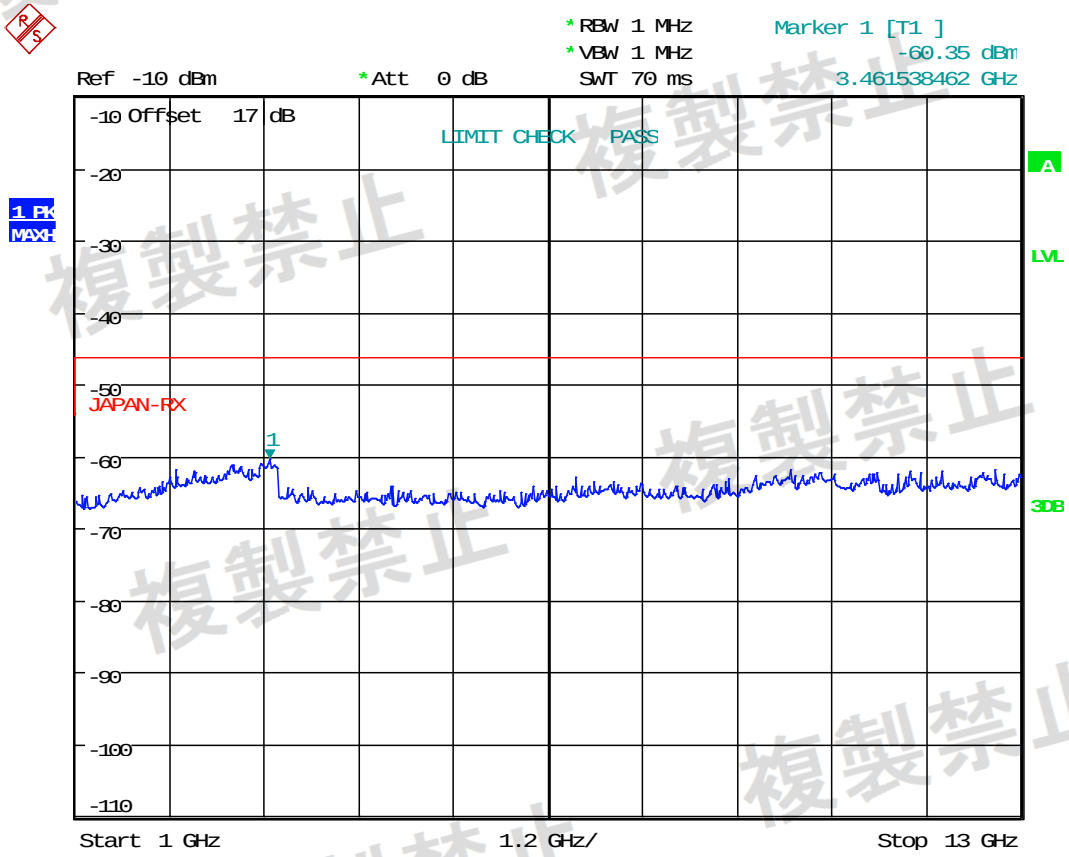
Date: 17.JUL.2020 10:30:10

8DPSK



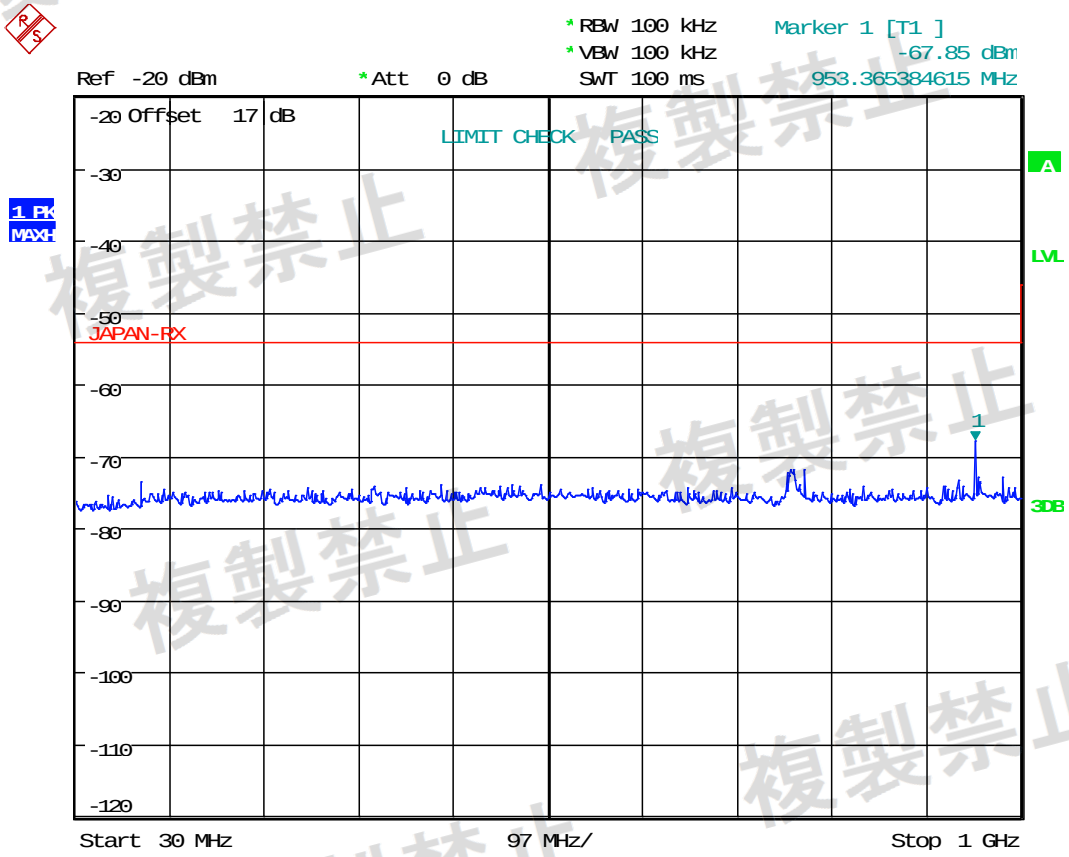
CONDUCTED SPURIOUS EMISSION EDR 3M RX 3.3V

Date: 17.JUL.2020 10:18:26



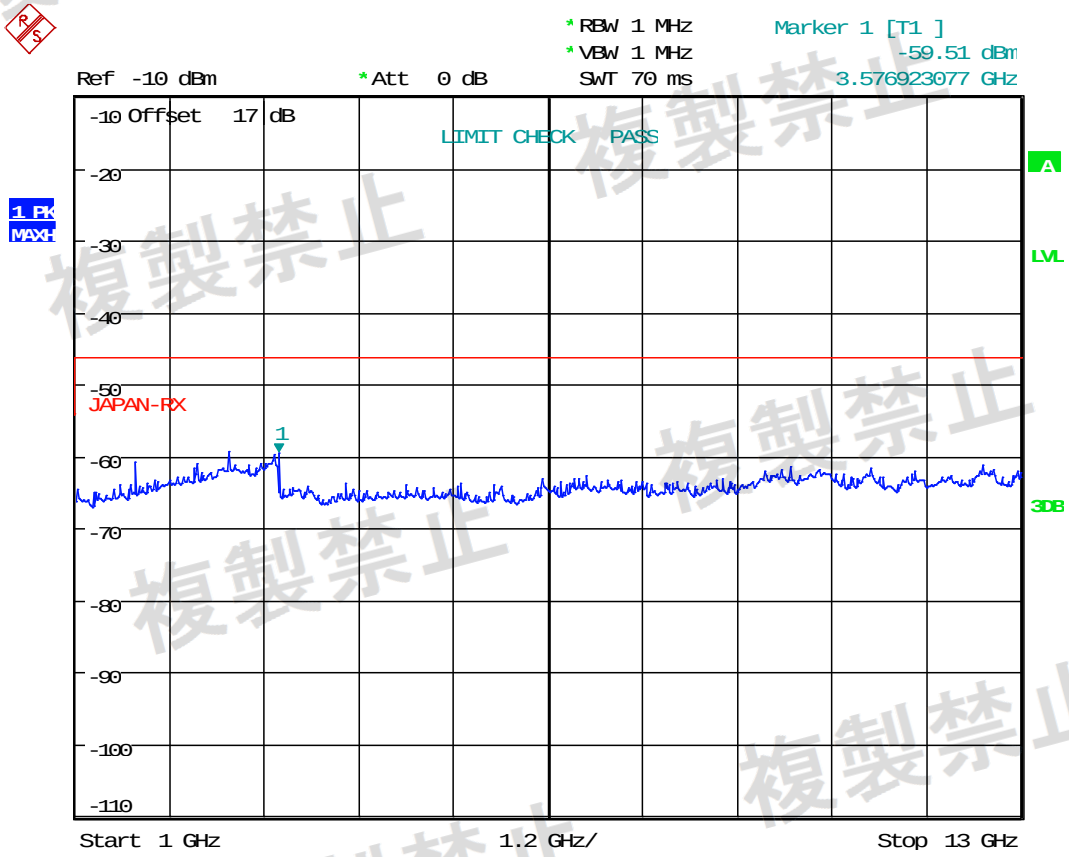
CONDUCTED SPURIOUS EMISSION EDR 3M RX 3.3V

Date: 17.JUL.2020 10:35:17



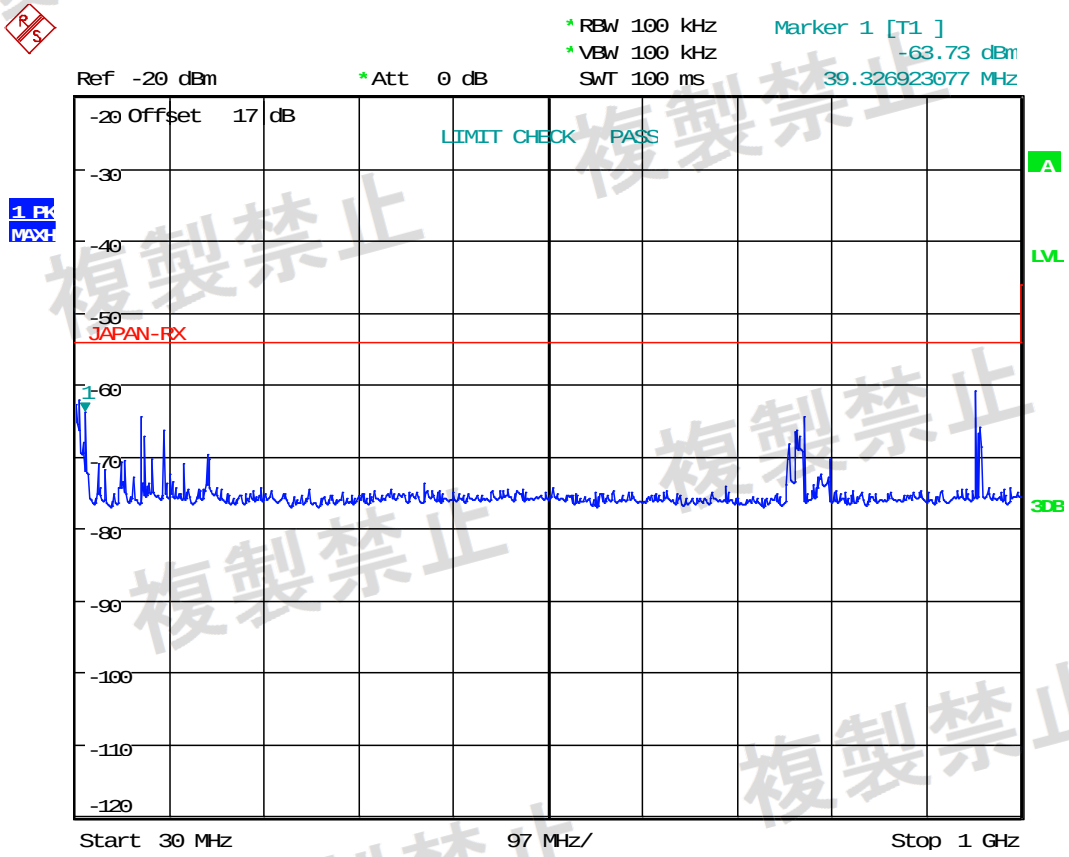
CONDUCTED SPURIOUS EMISSION EDR 3M RX 2.97V

Date: 17.JUL.2020 10:19:05



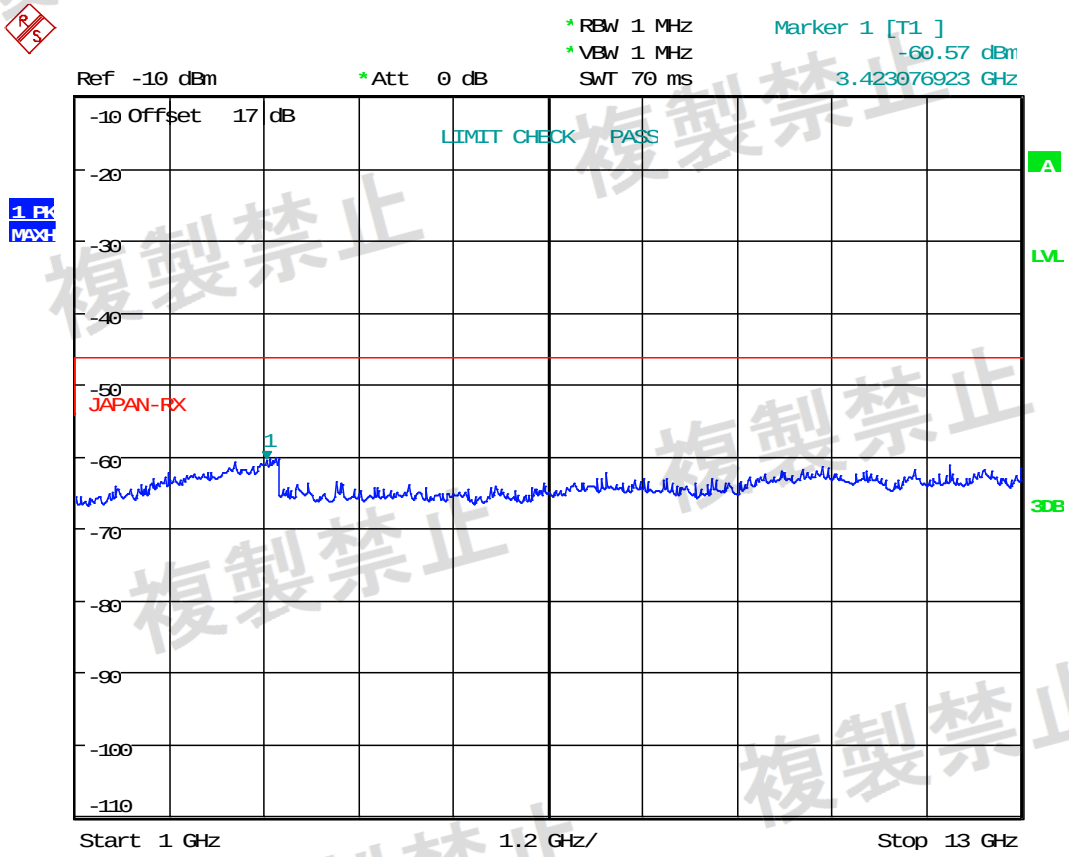
CONDUCTED SPURIOUS EMISSION EDR 3M RX 2.97V

Date: 17.JUL.2020 10:32:28



CONDUCTED SPURIOUS EMISSION EDR 3M RX 3.63V

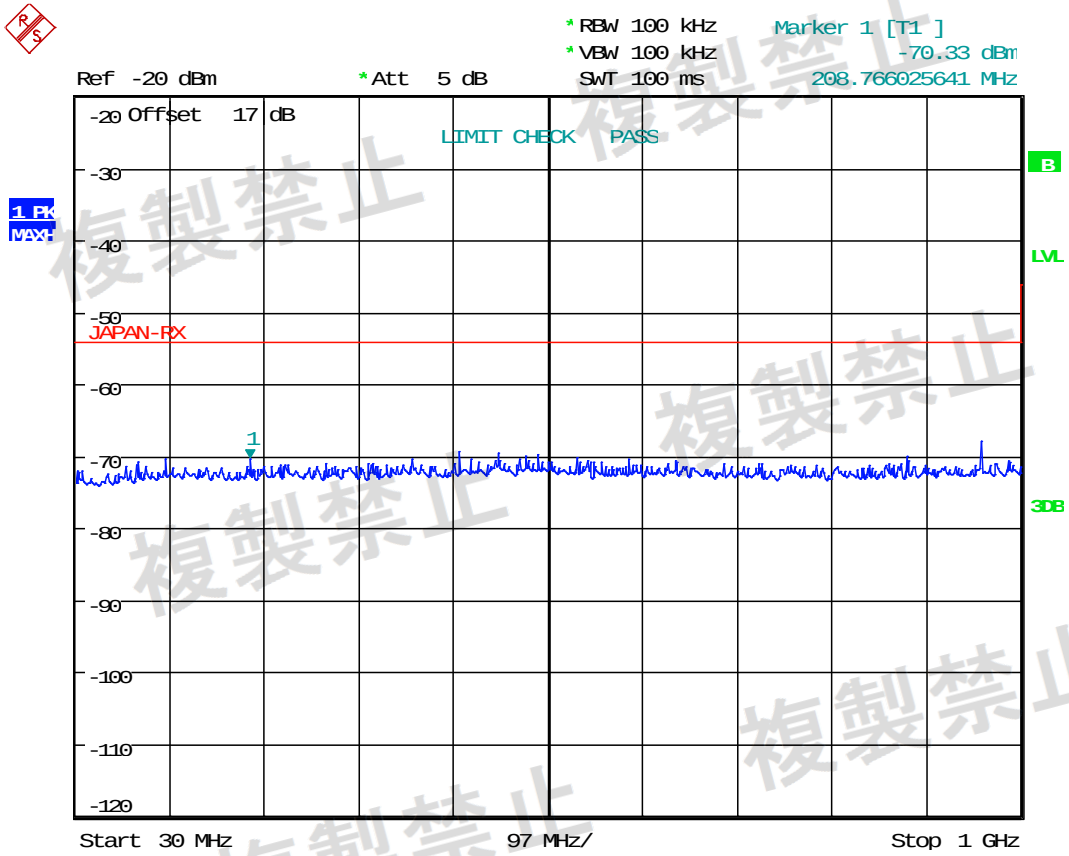
Date: 17.JUL.2020 10:16:28



CONDUCTED SPURIOUS EMISSION EDR 3M RX 3.63V

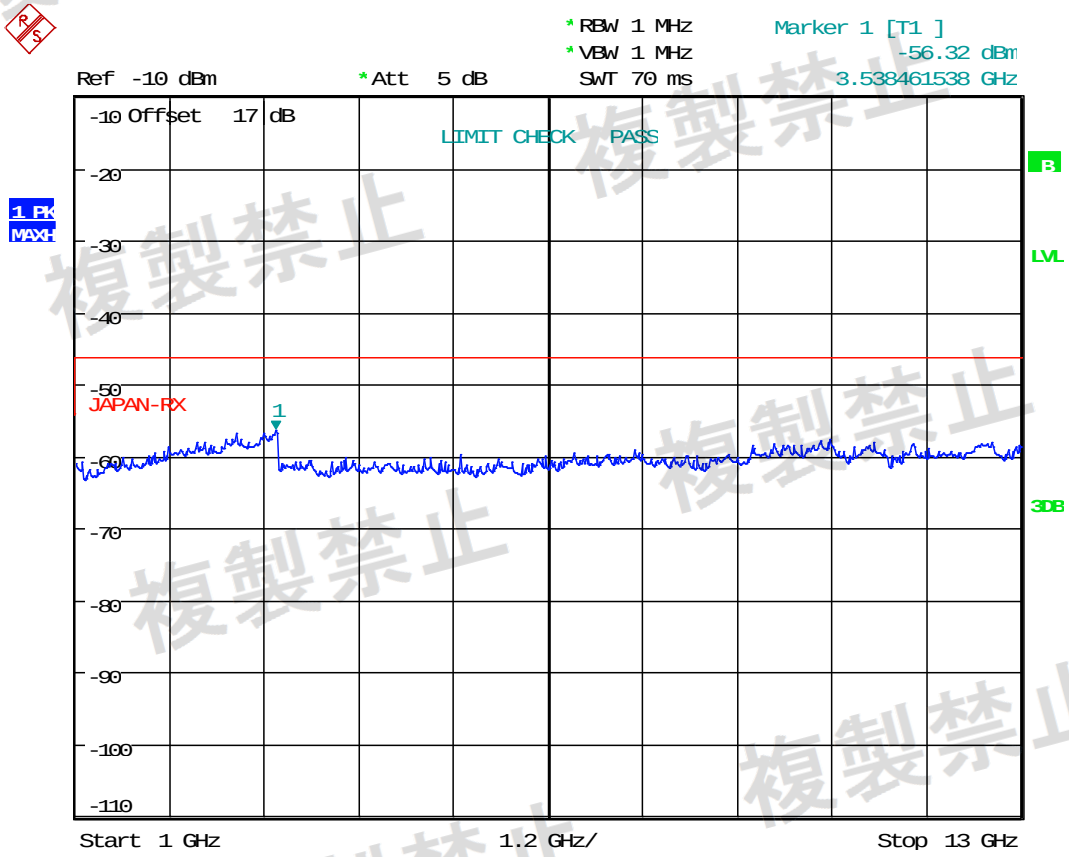
Date: 17.JUL.2020 10:36:18

Bluetooth4.0



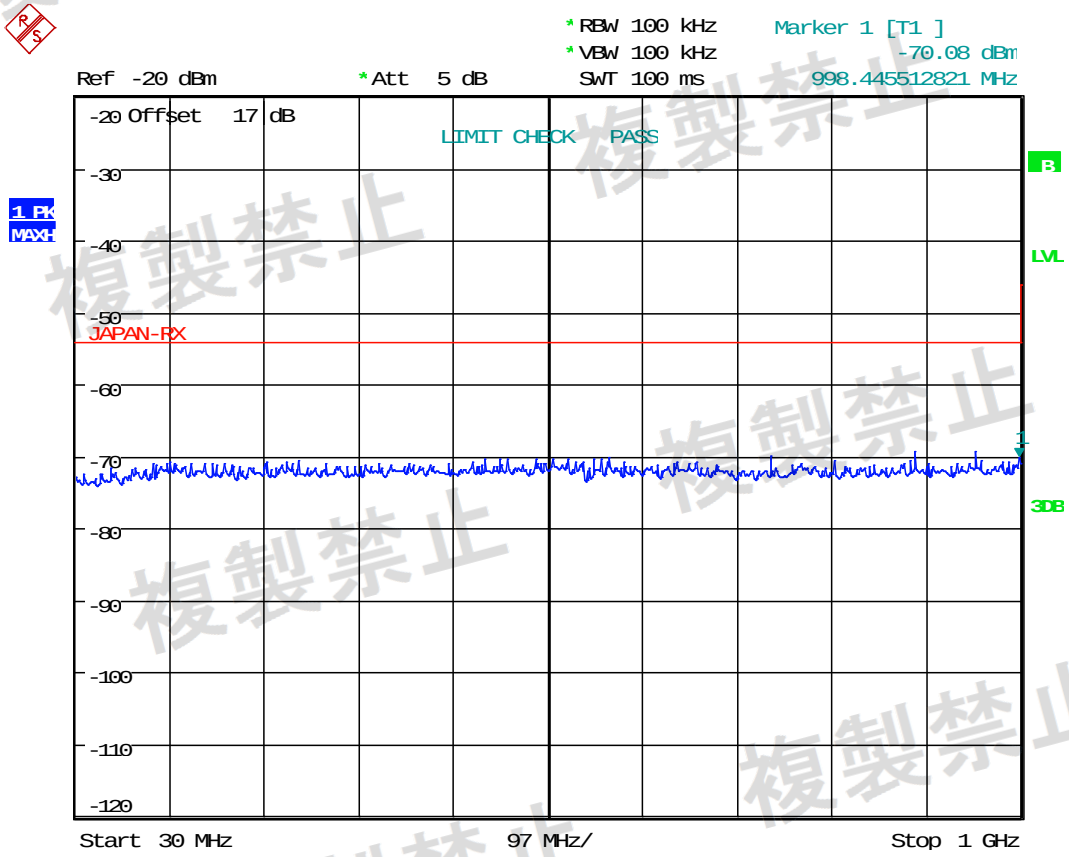
BLE CONDUCTED SPURIOUS EMISSION RX CH0 3.3V

Date: 17.JUL.2020 17:33:06



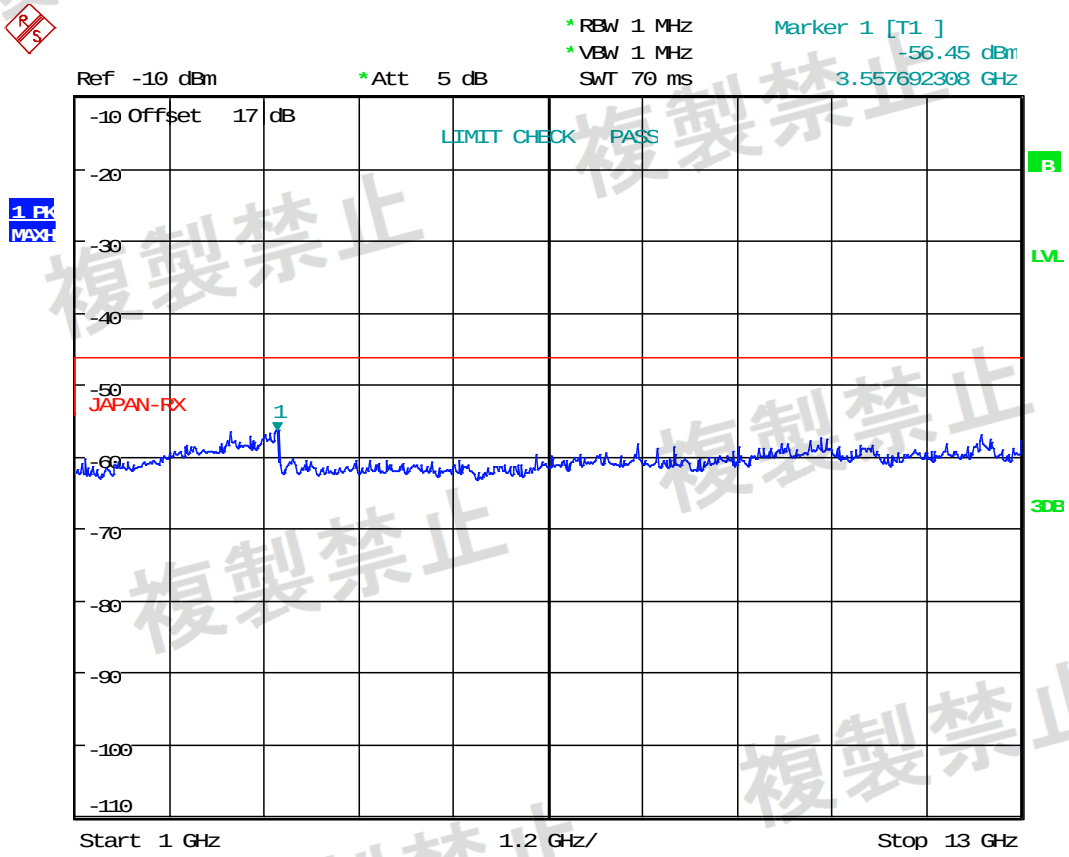
BLE CONDUCTED SPURIOUS EMISSION RX CH0 3.3V

Date: 17.JUL.2020 17:54:31



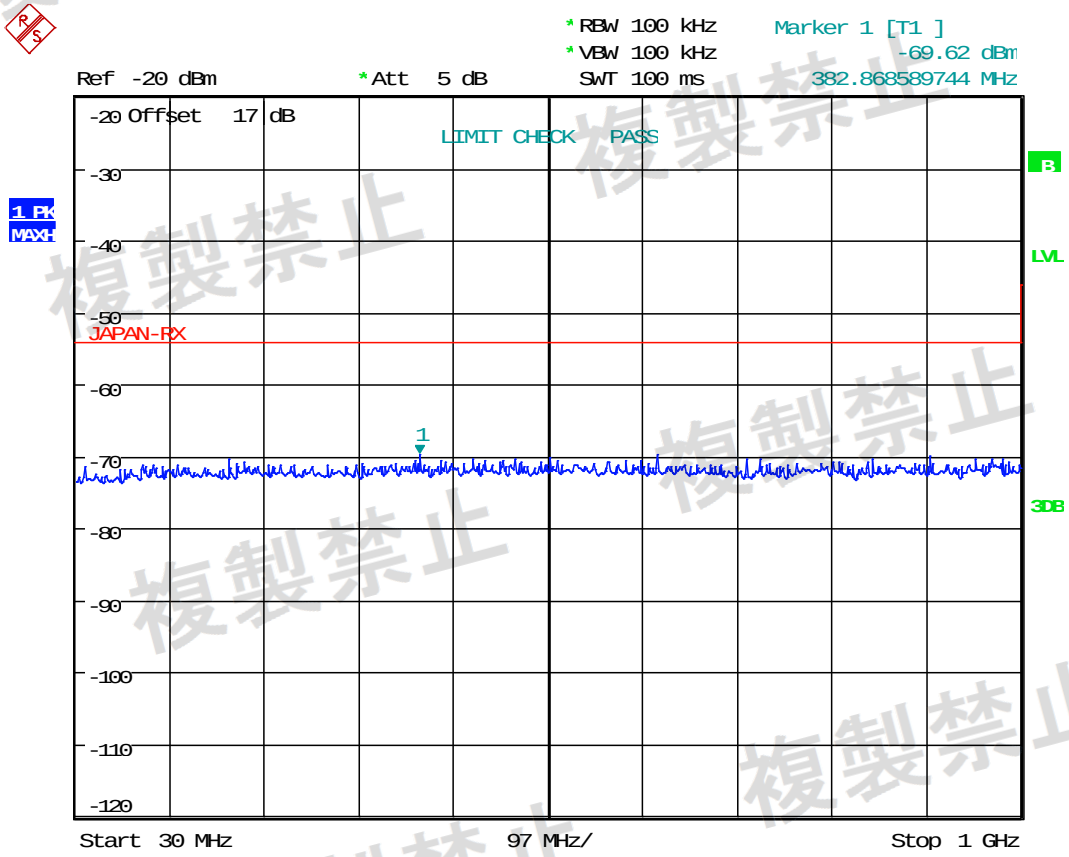
BLE CONDUCTED SPURIOUS EMISSION RX CH0 2.97V

Date: 17.JUL.2020 17:33:53



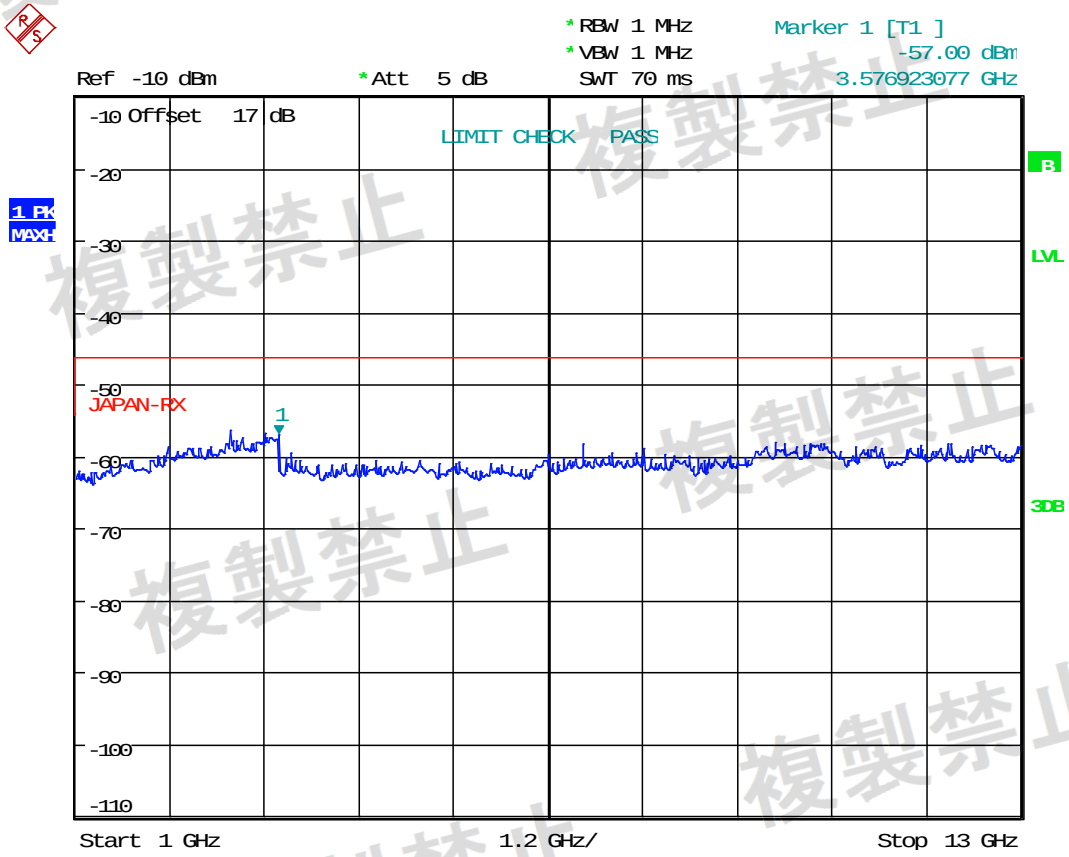
BLE CONDUCTED SPURIOUS EMISSION RX CH0 2.97V

Date: 17.JUL.2020 17:54:04



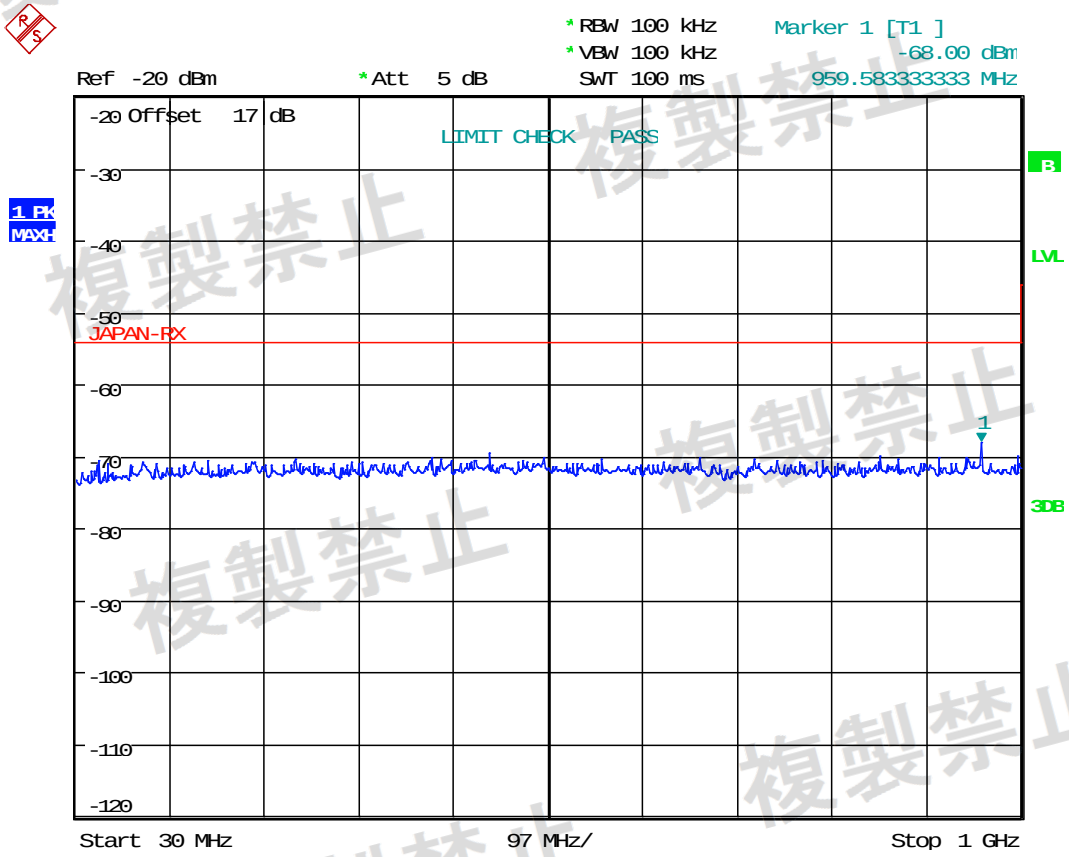
BLE CONDUCTED SPURIOUS EMISSION RX CH0 3.63V

Date: 17.JUL.2020 17:32:06



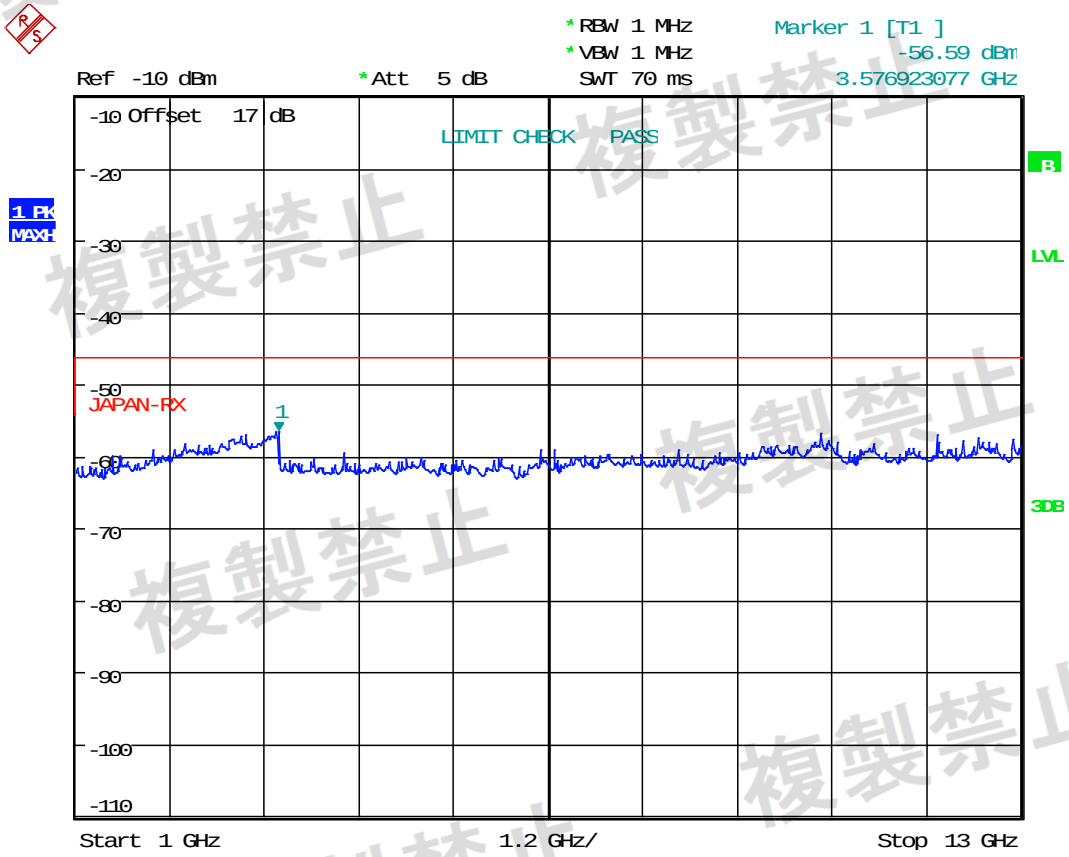
BLE CONDUCTED SPURIOUS EMISSION RX CH0 3.63V

Date: 17.JUL.2020 17:55:18



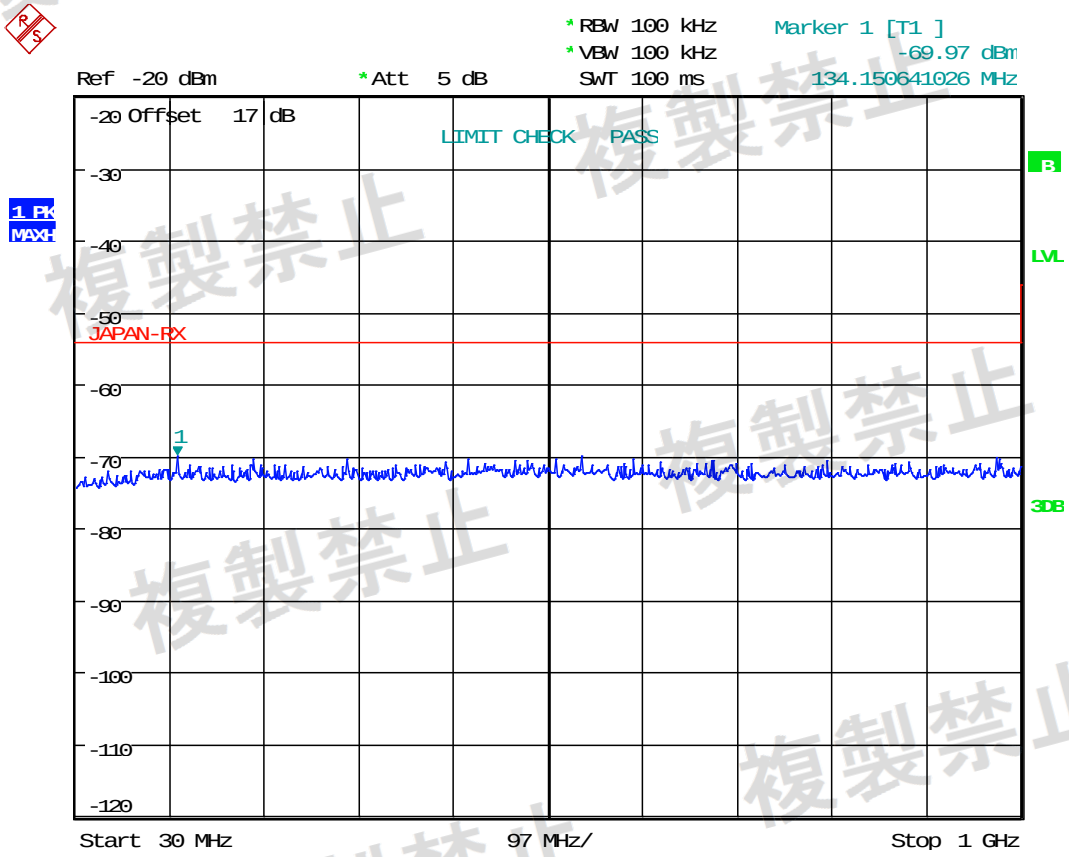
BLE CONDUCTED SPURIOUS EMISSION RX CH19 3.3V

Date: 17.JUL.2020 17:35:43



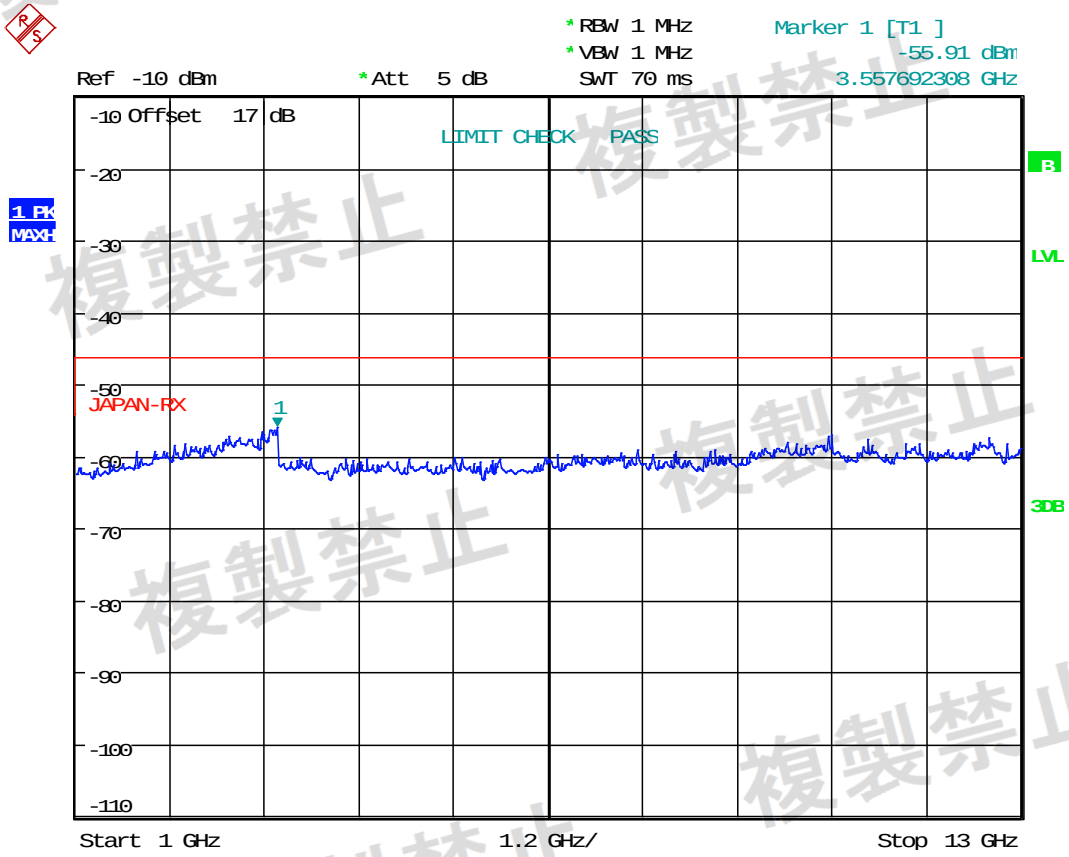
BLE CONDUCTED SPURIOUS EMISSION RX CH19 3.3V

Date: 17.JUL.2020 17:56:46



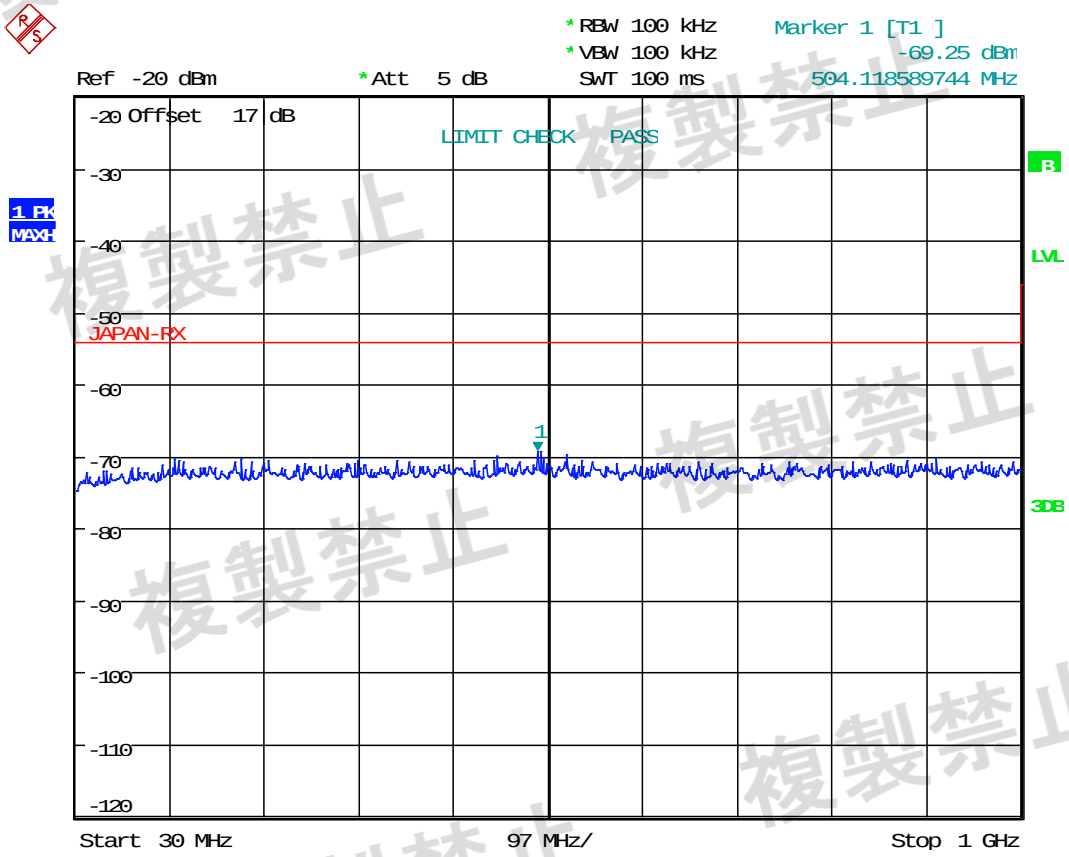
BLE CONDUCTED SPURIOUS EMISSION RX CH19 2.97V

Date: 17.JUL.2020 17:35:14



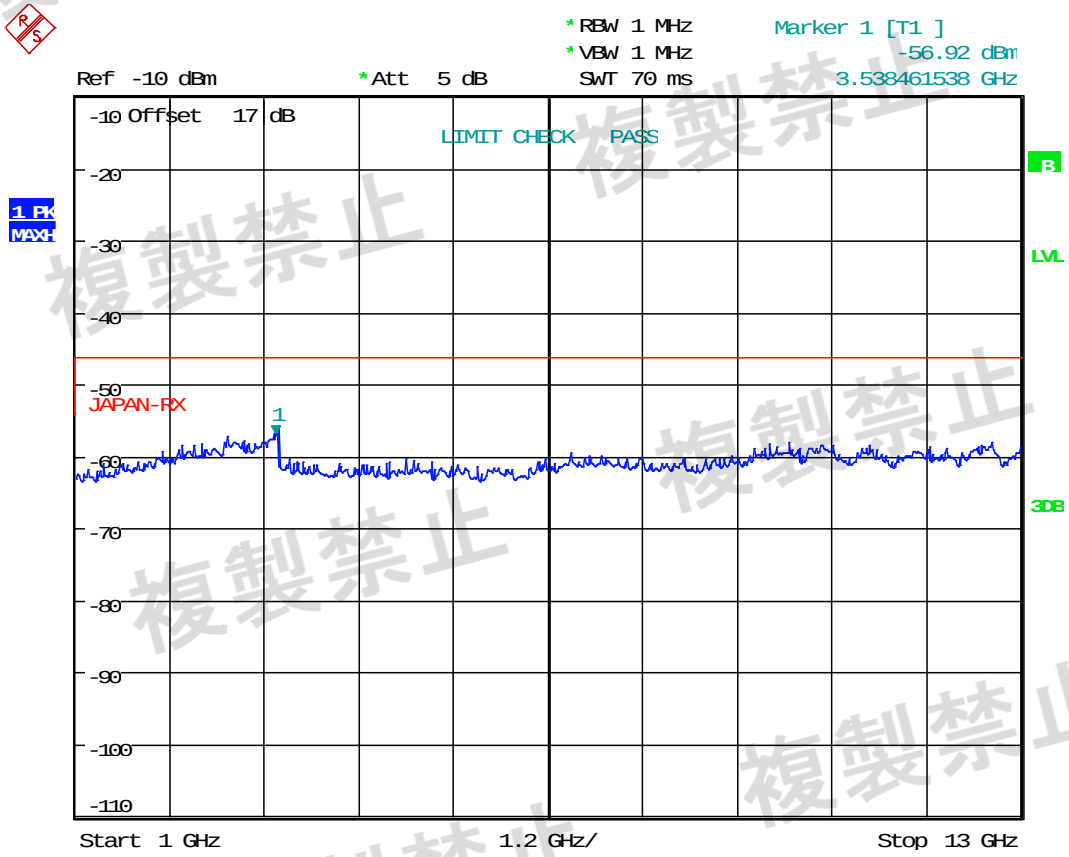
BLE CONDUCTED SPURIOUS EMISSION RX CH19 2.97V

Date: 17.JUL.2020 17:57:10



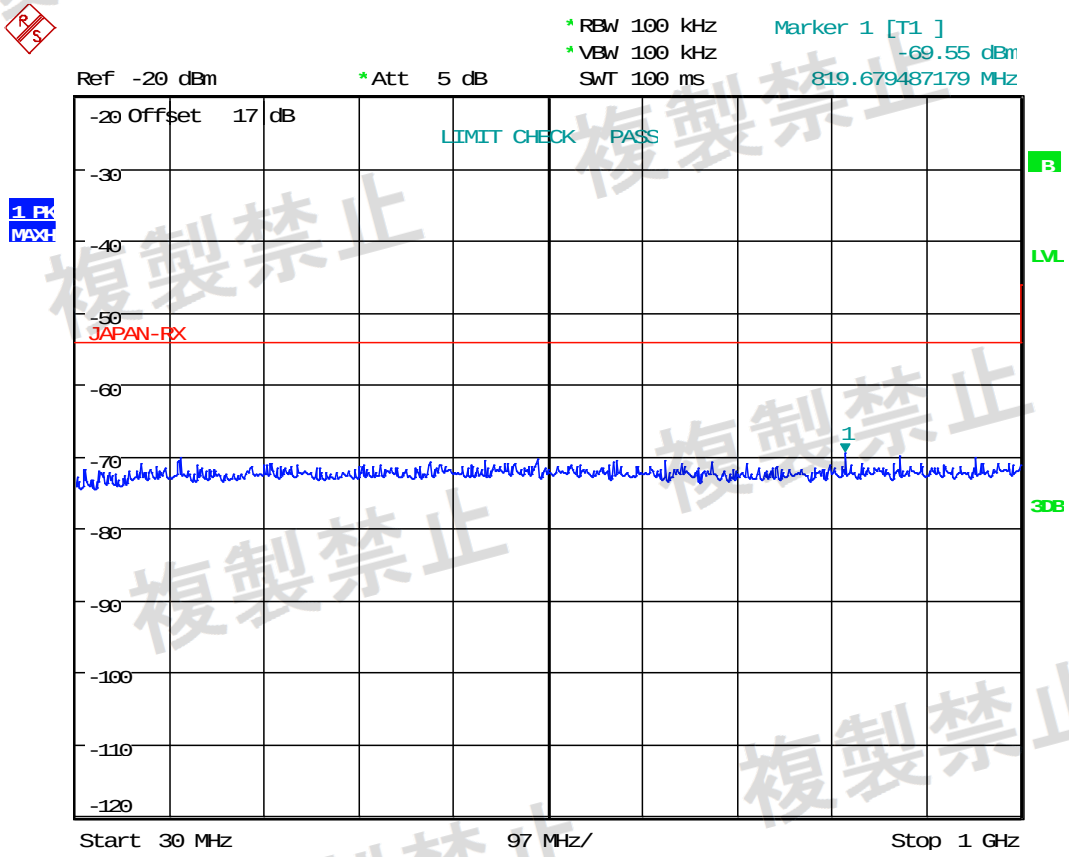
BLE CONDUCTED SPURIOUS EMISSION RX CH19 3.63V

Date: 17.JUL.2020 17:36:32



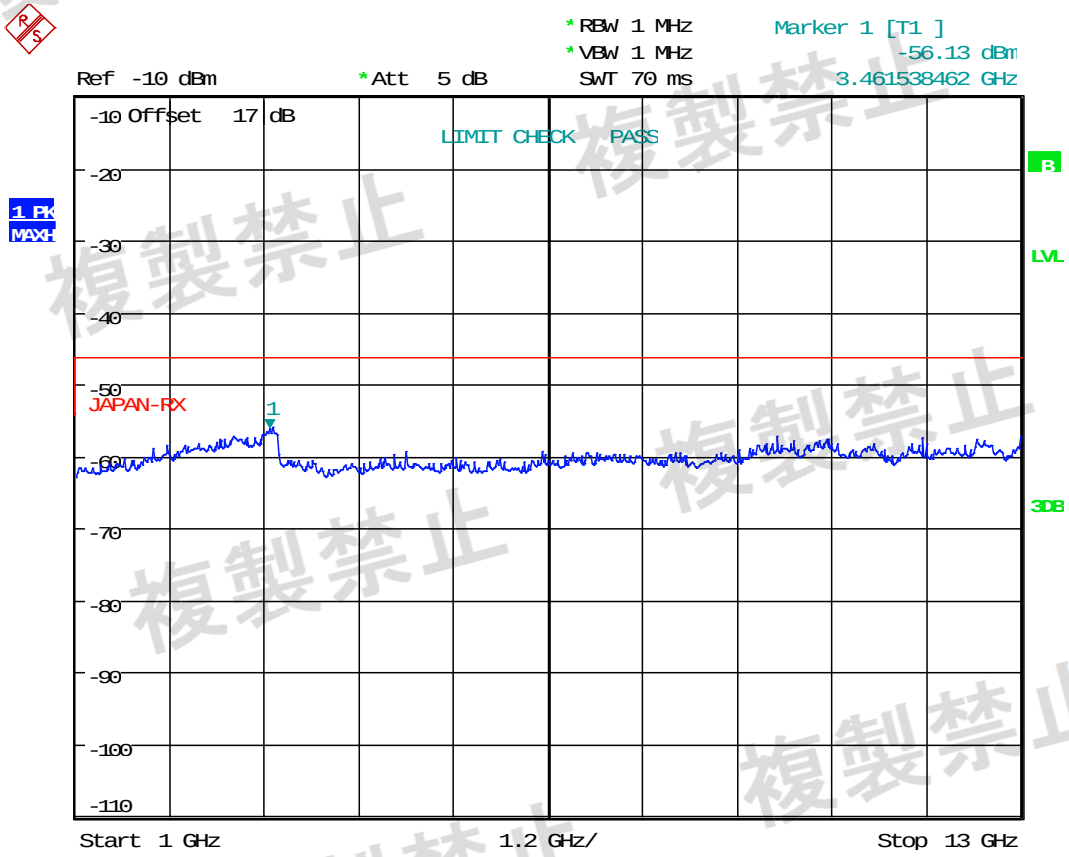
BLE CONDUCTED SPURIOUS EMISSION RX CH19 3.63V

Date: 17.JUL.2020 17:55:48



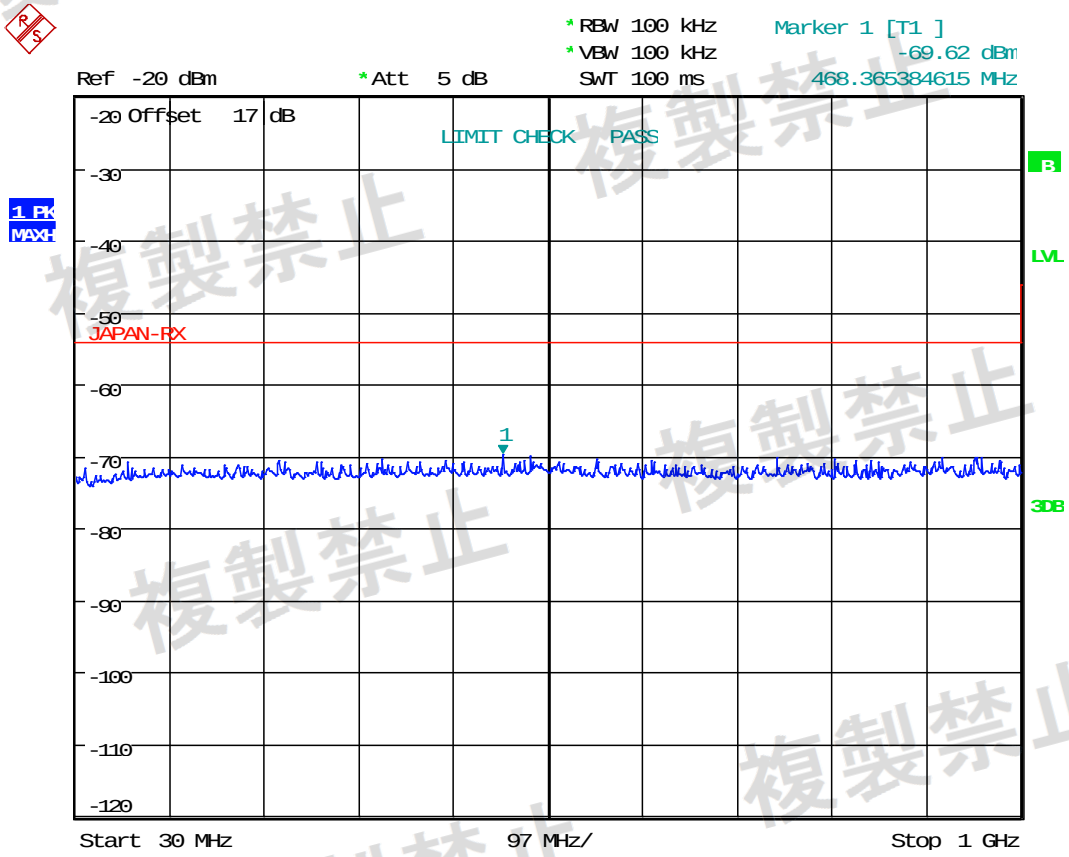
BLE CONDUCTED SPURIOUS EMISSION RX CH39 3.3V

Date: 17.JUL.2020 17:38:07



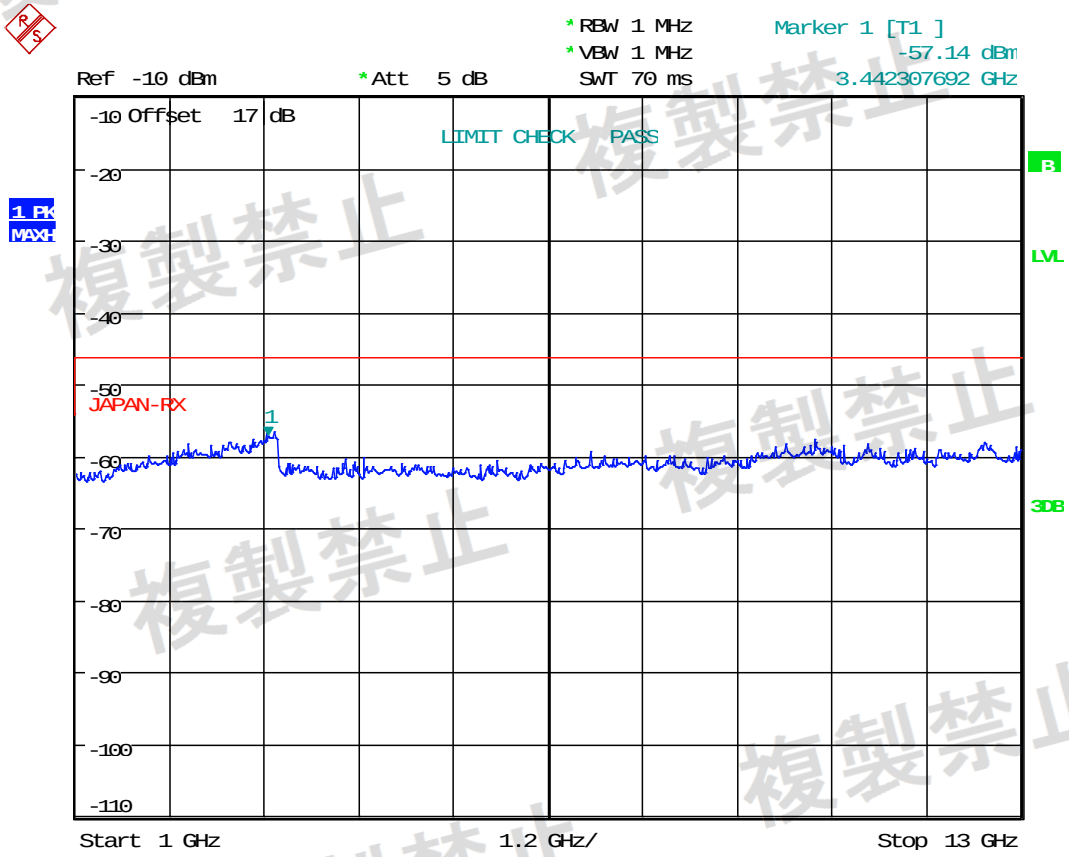
BLE CONDUCTED SPURIOUS EMISSION RX CH39 3.3V

Date: 17.JUL.2020 17:59:41



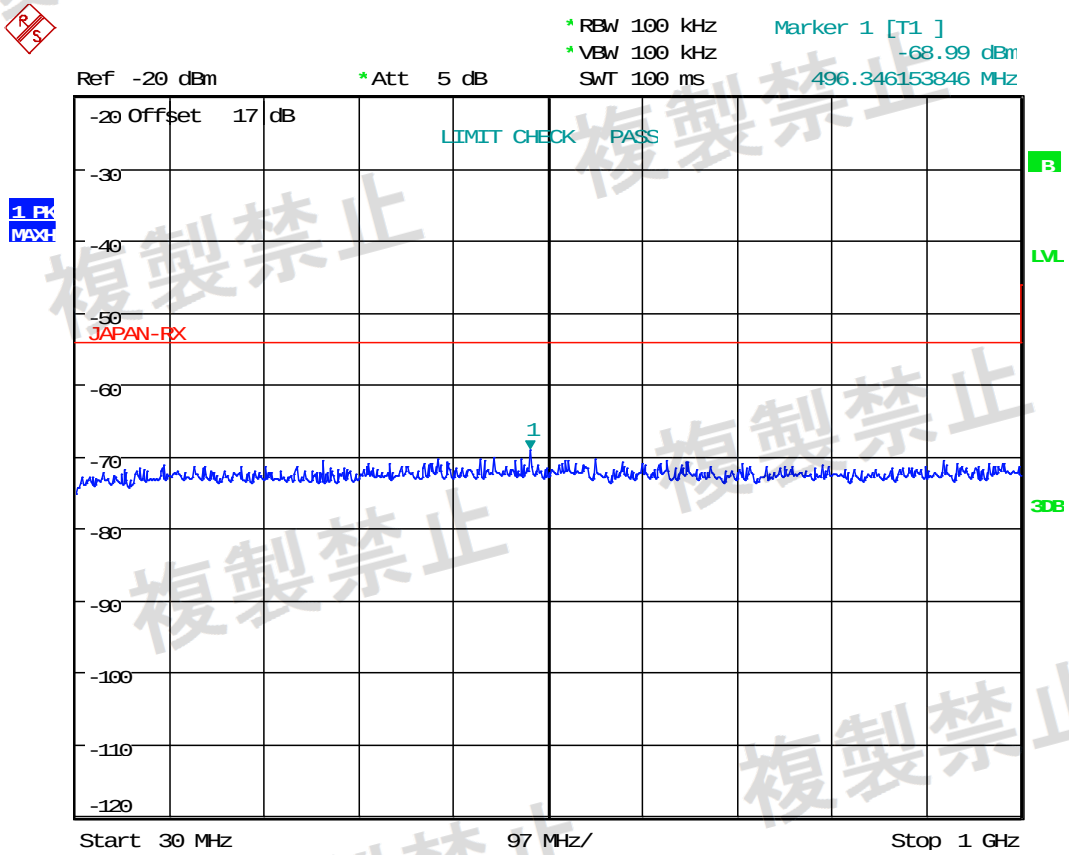
BLE CONDUCTED SPURIOUS EMISSION RX CH39 2.97V

Date: 17.JUL.2020 17:38:26



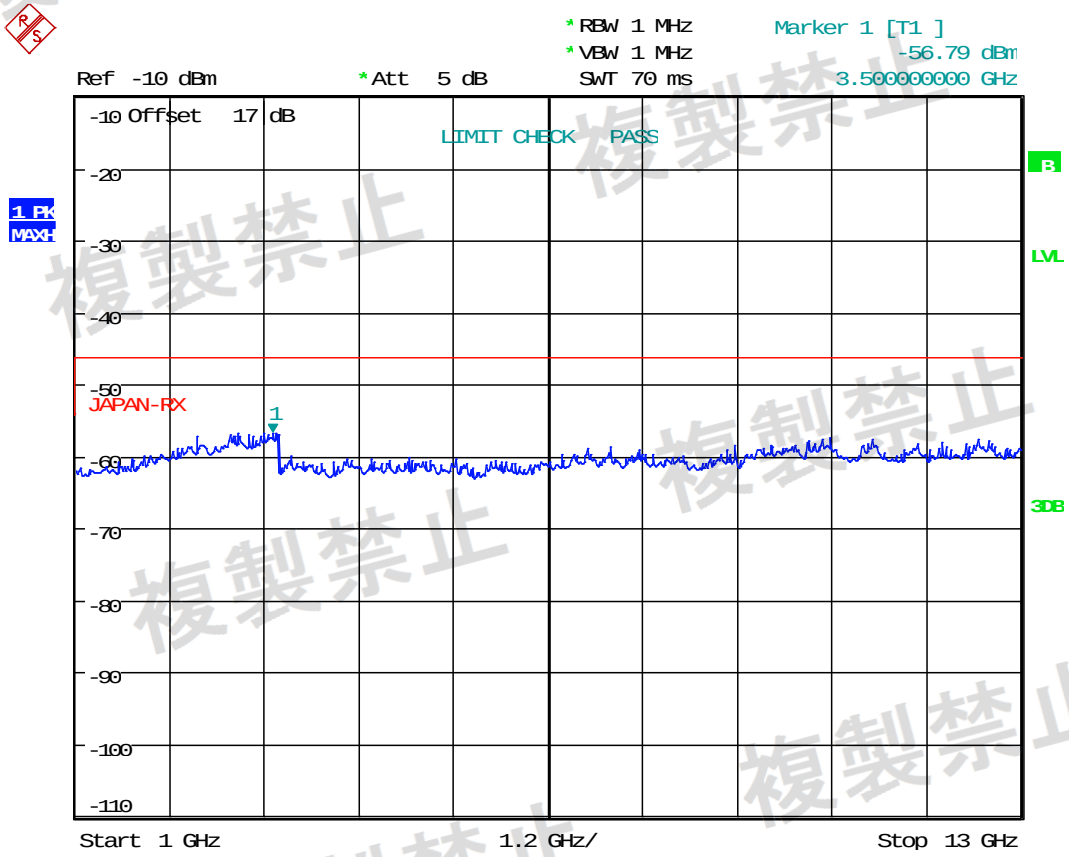
BLE CONDUCTED SPURIOUS EMISSION RX CH39 2.97V

Date: 17.JUL.2020 17:58:28



BLE CONDUCTED SPURIOUS EMISSION RX CH39 3.63V

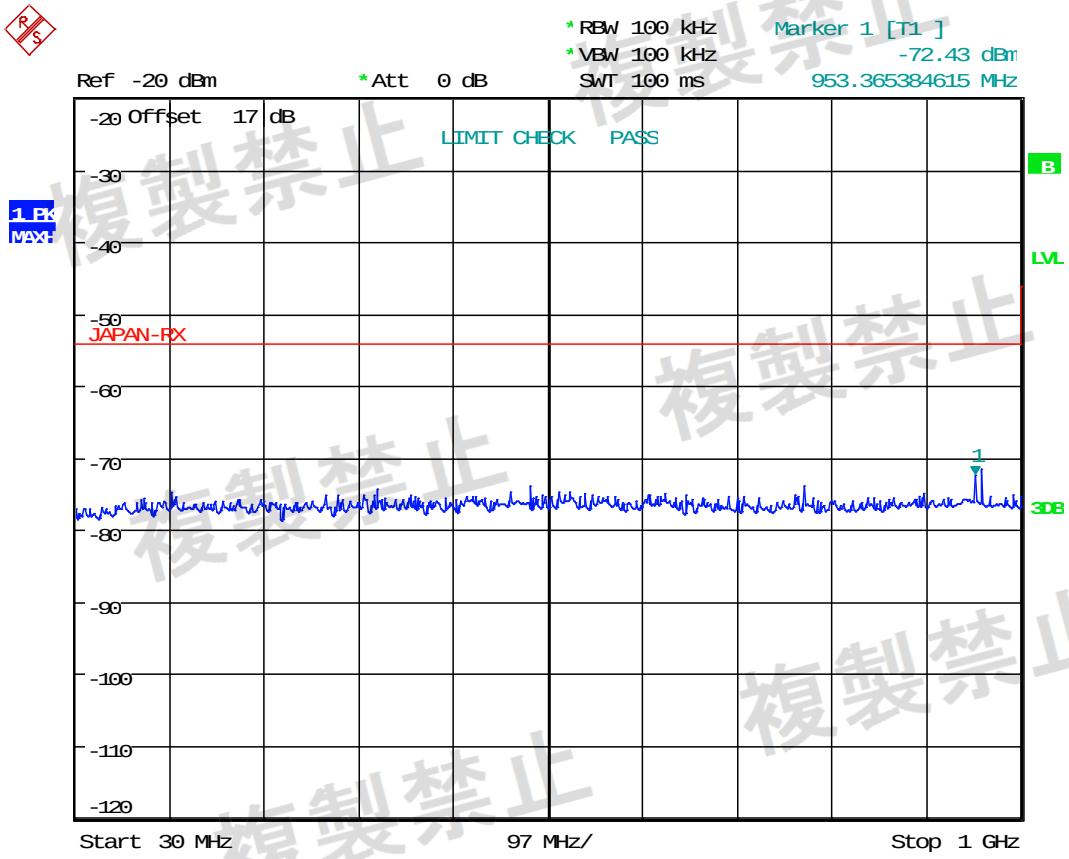
Date: 17.JUL.2020 17:37:06



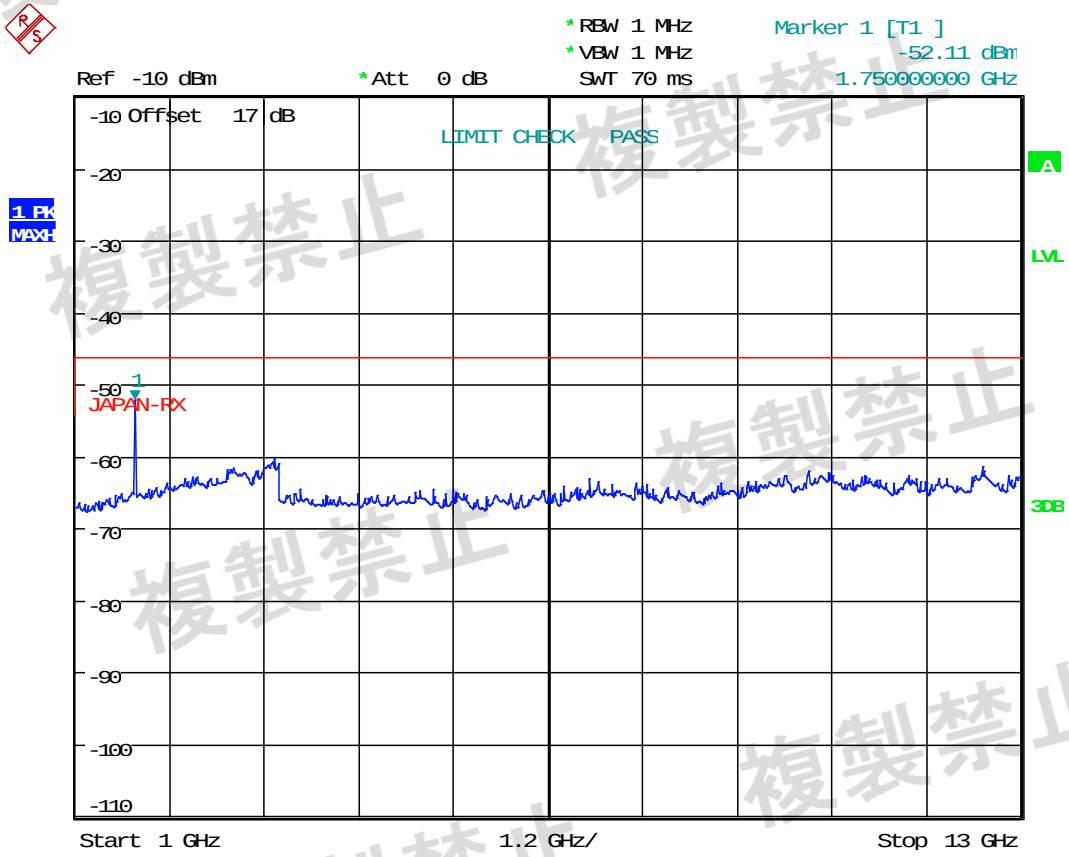
BLE CONDUCTED SPURIOUS EMISSION RX CH39 3.63V

Date: 17.JUL.2020 18:00:57

WLAN Mode:
IEEE 802.11b

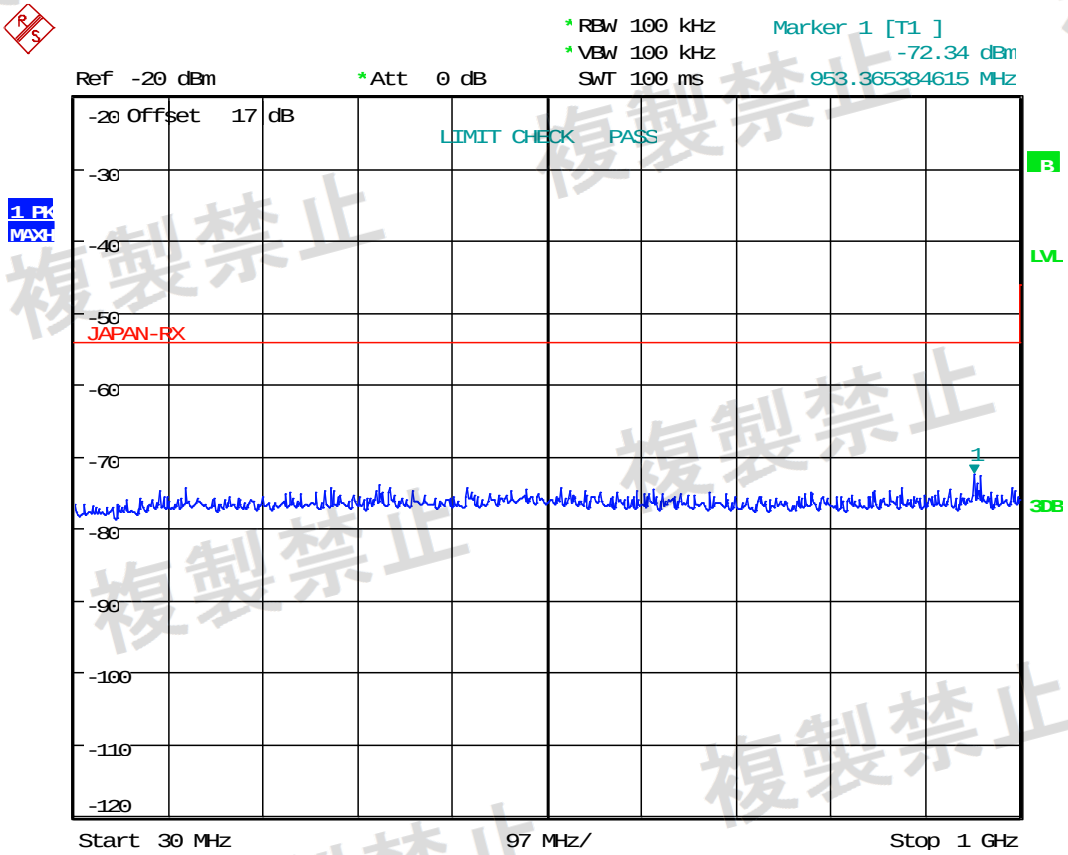


RX CONDUCTED SPURIOUS EMISSION 802.11B CH1 3.3V
Date: 19.JUL.2020 15:04:53



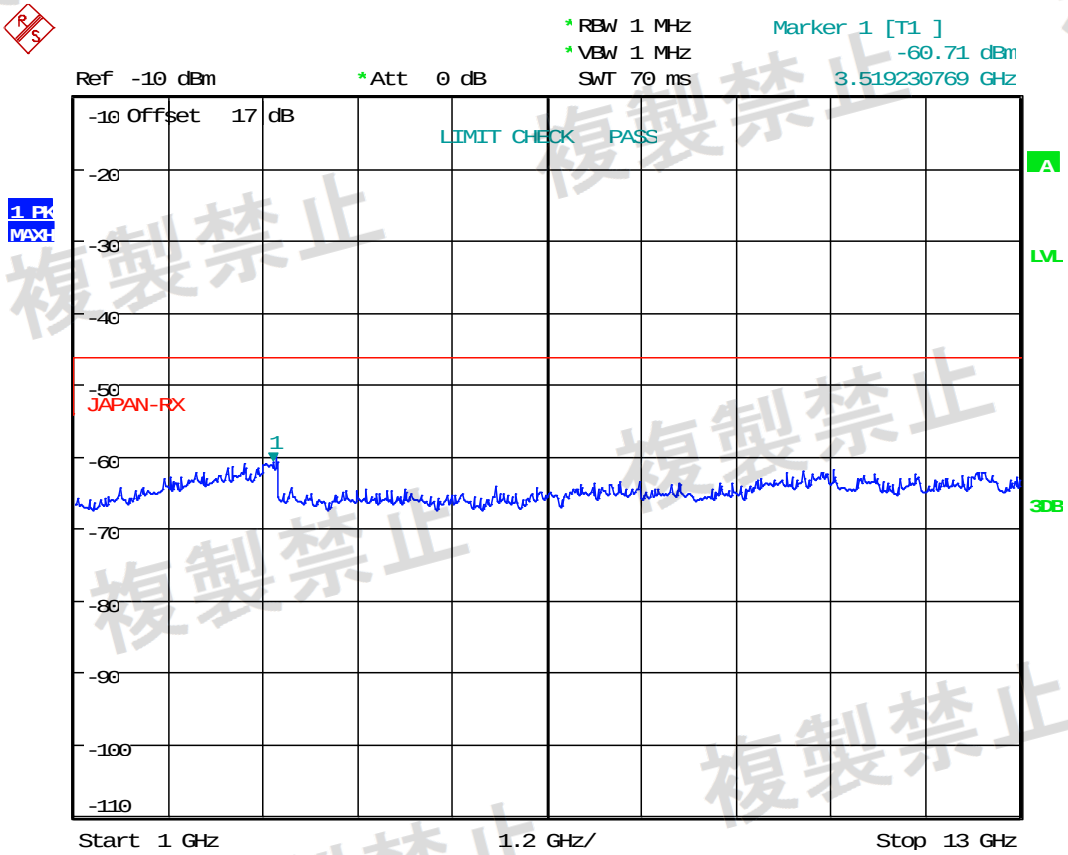
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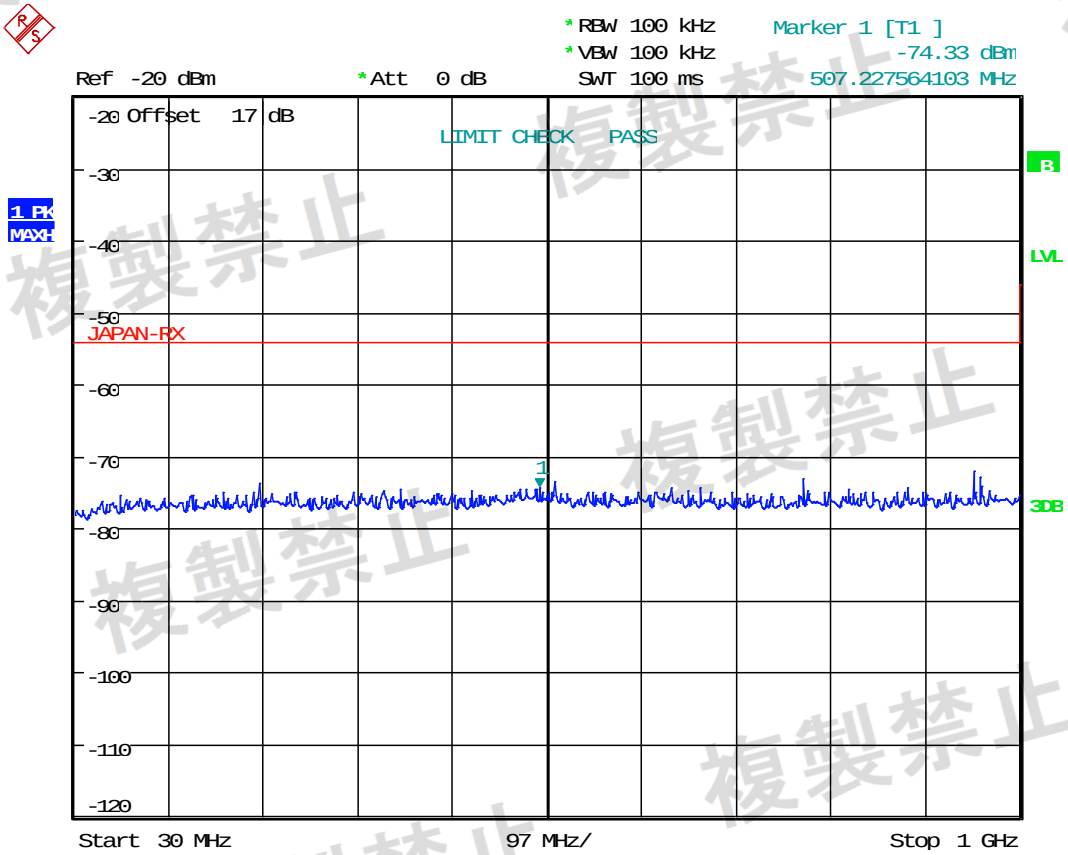
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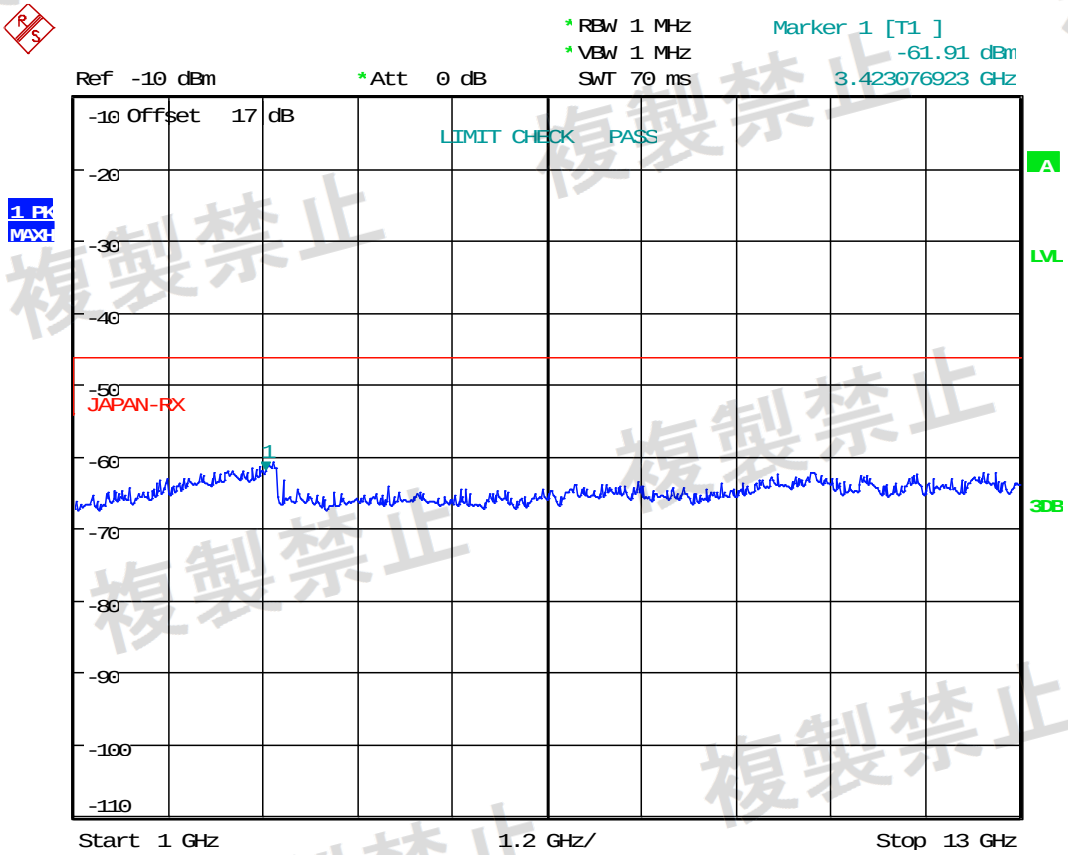
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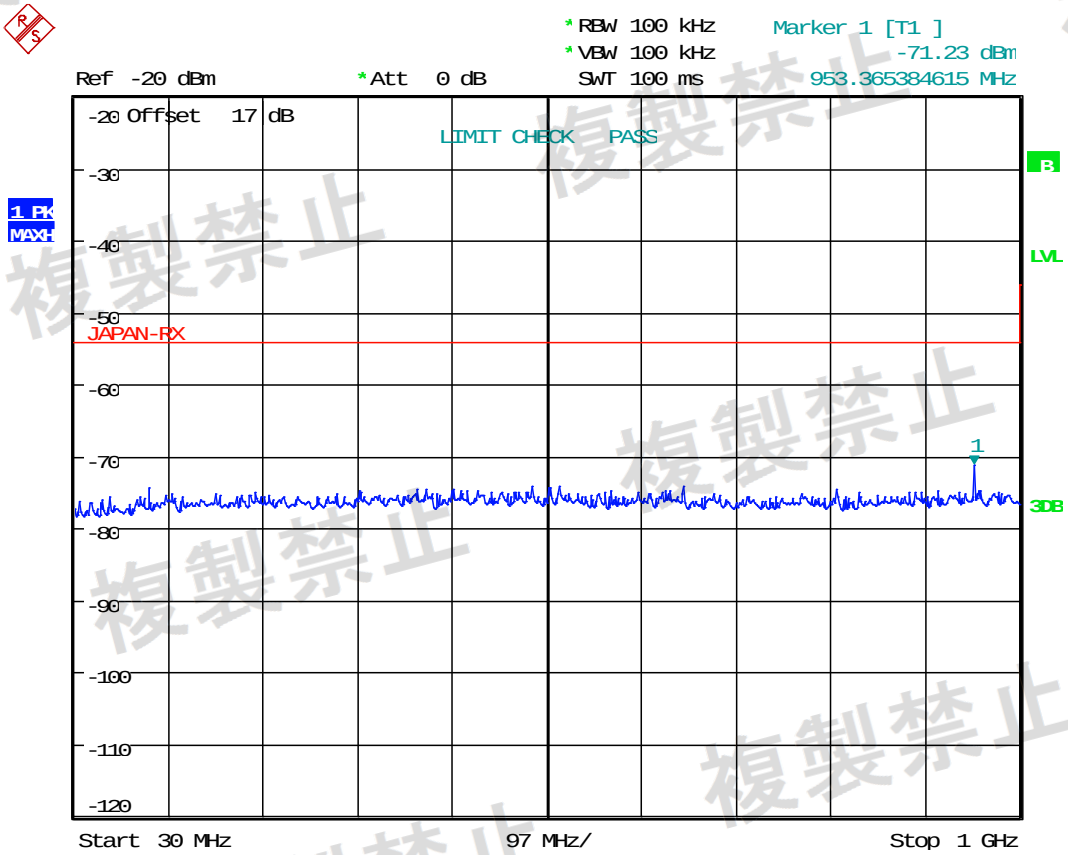
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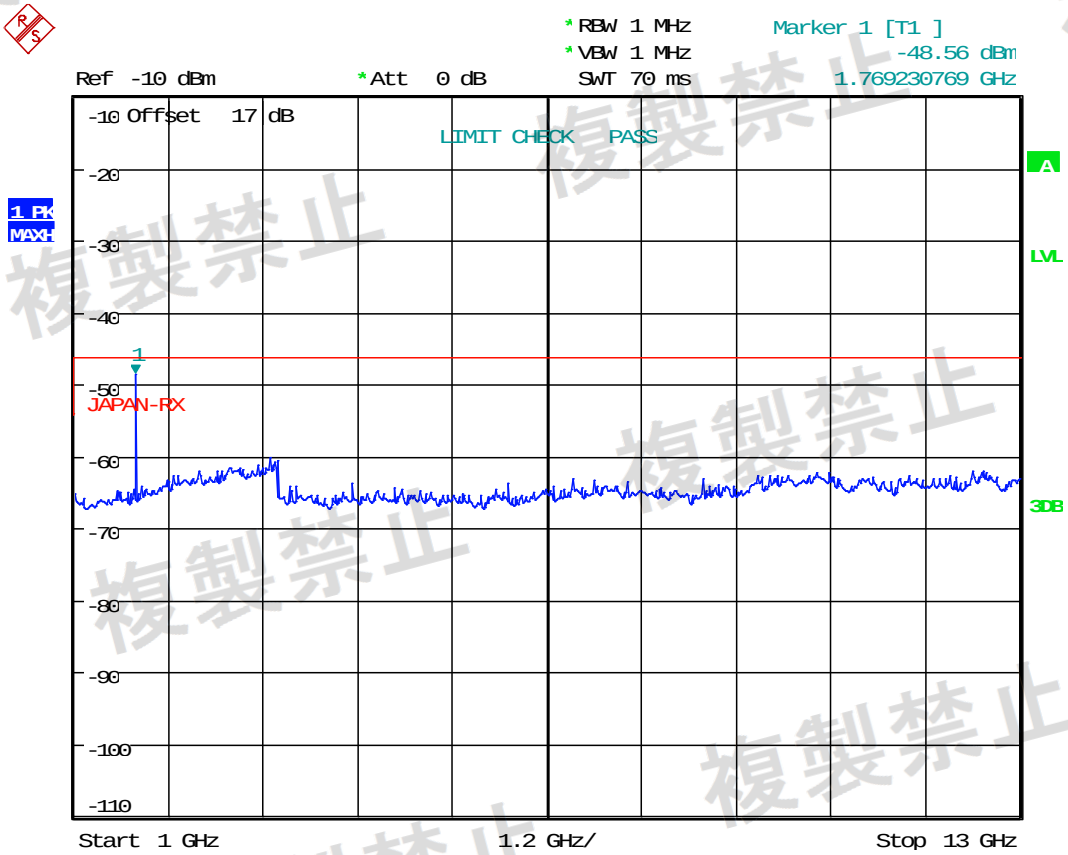
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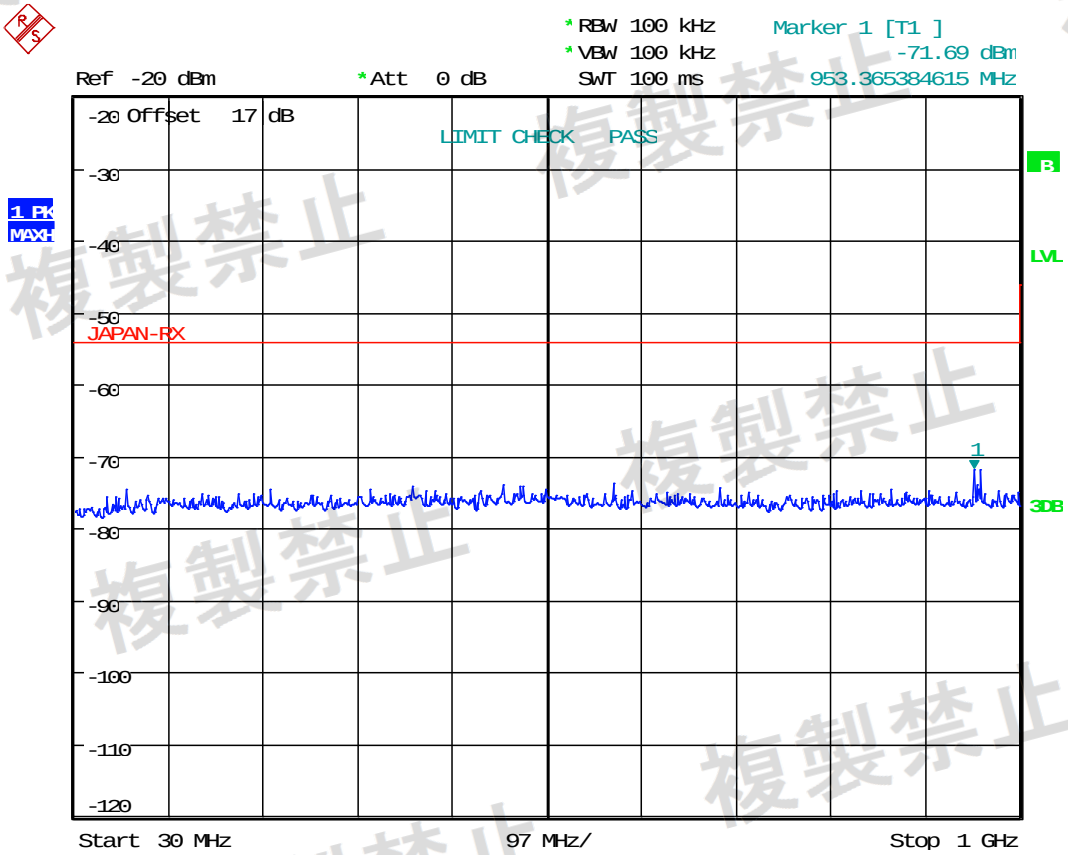
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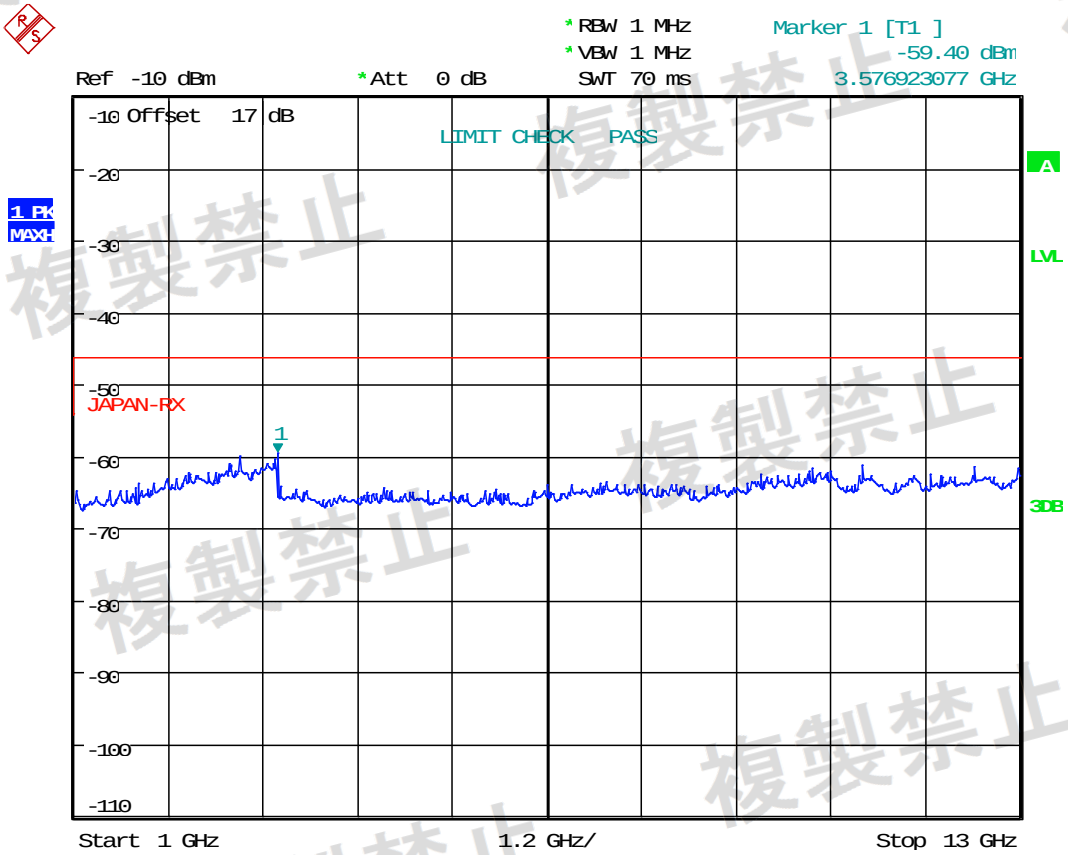
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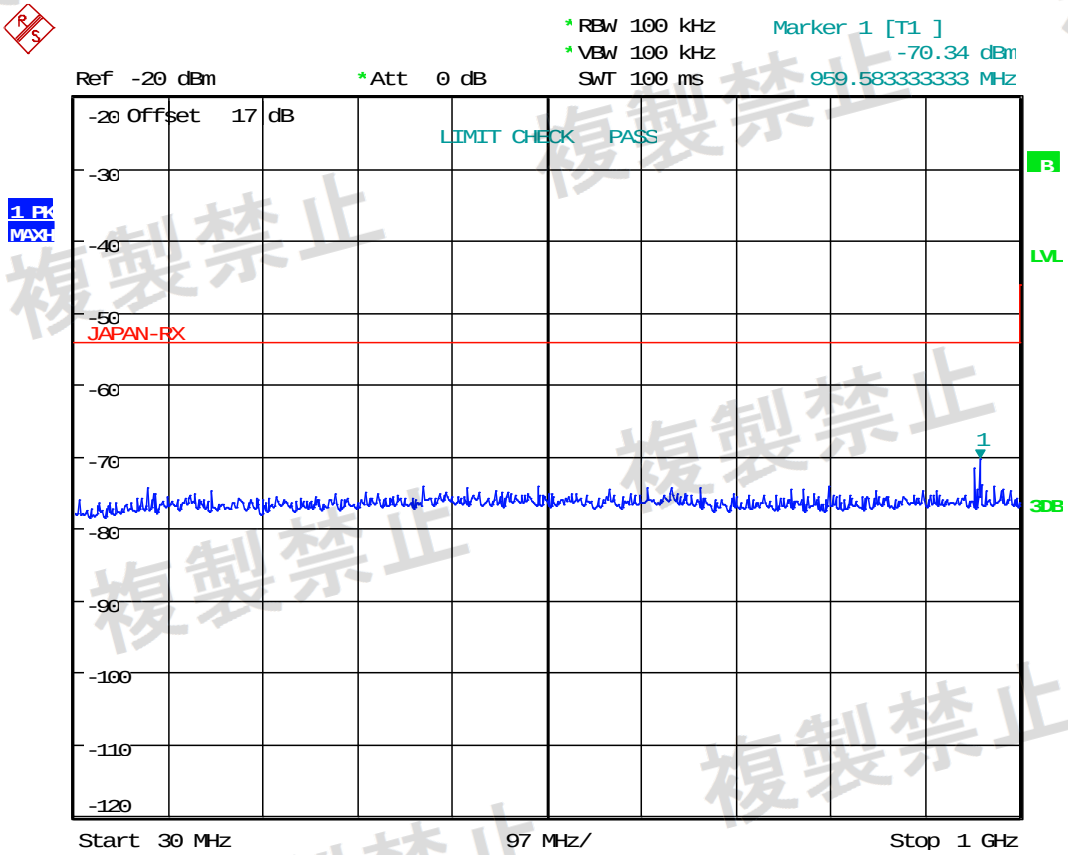
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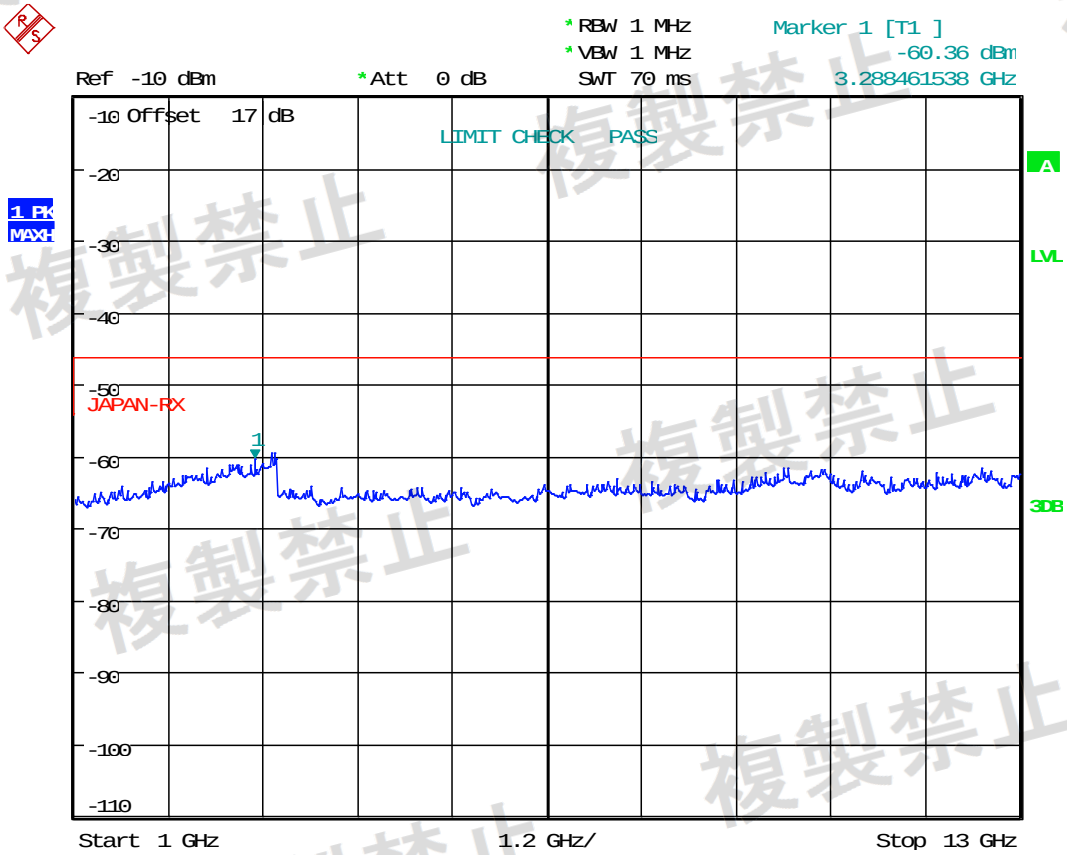
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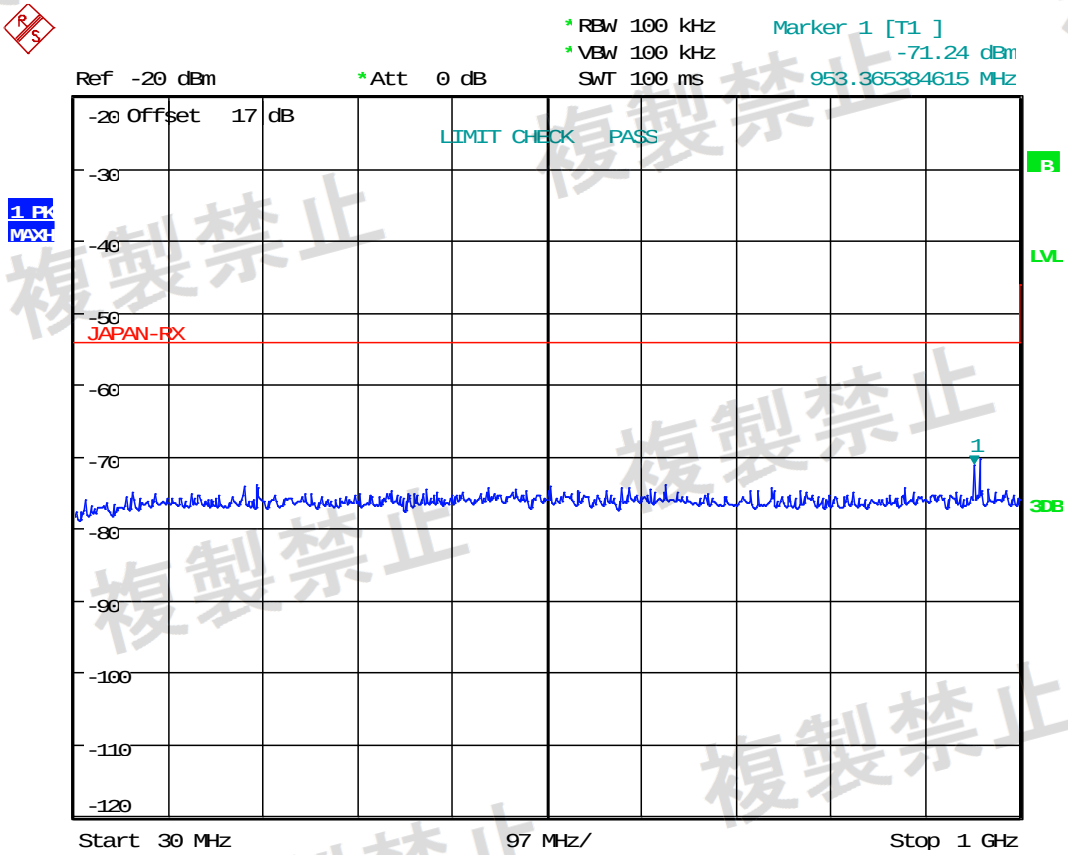
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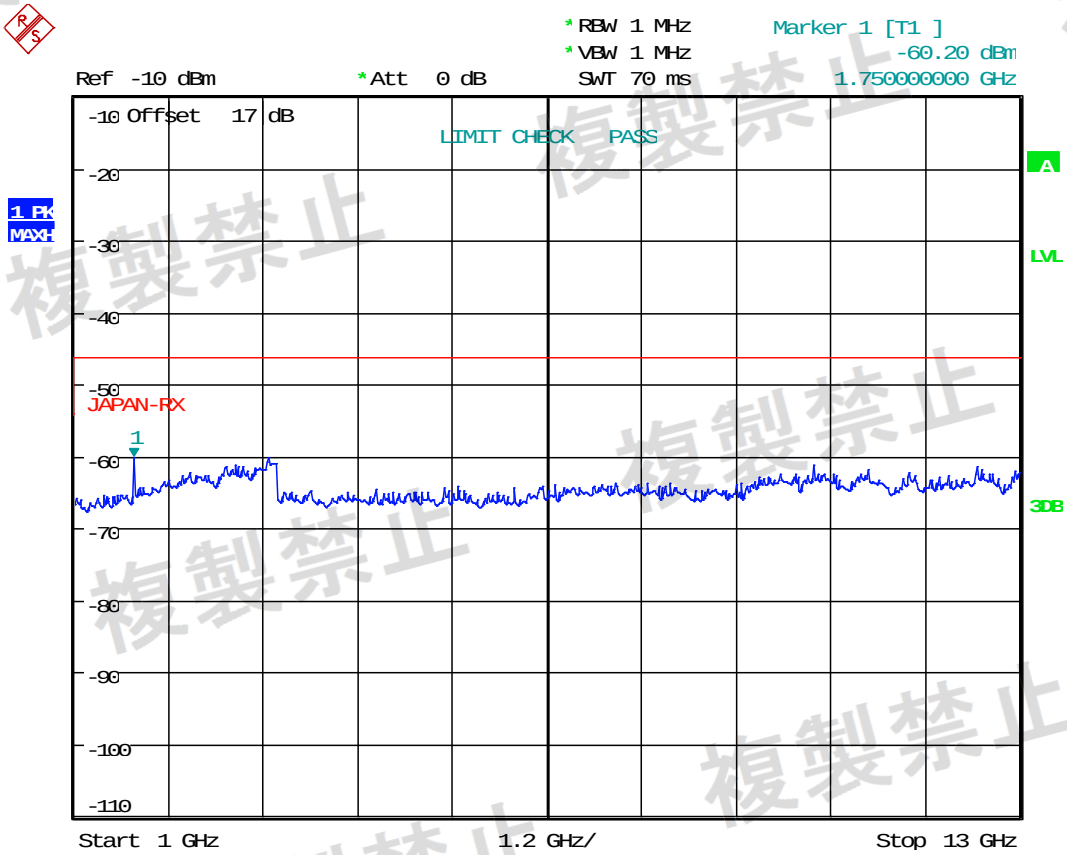
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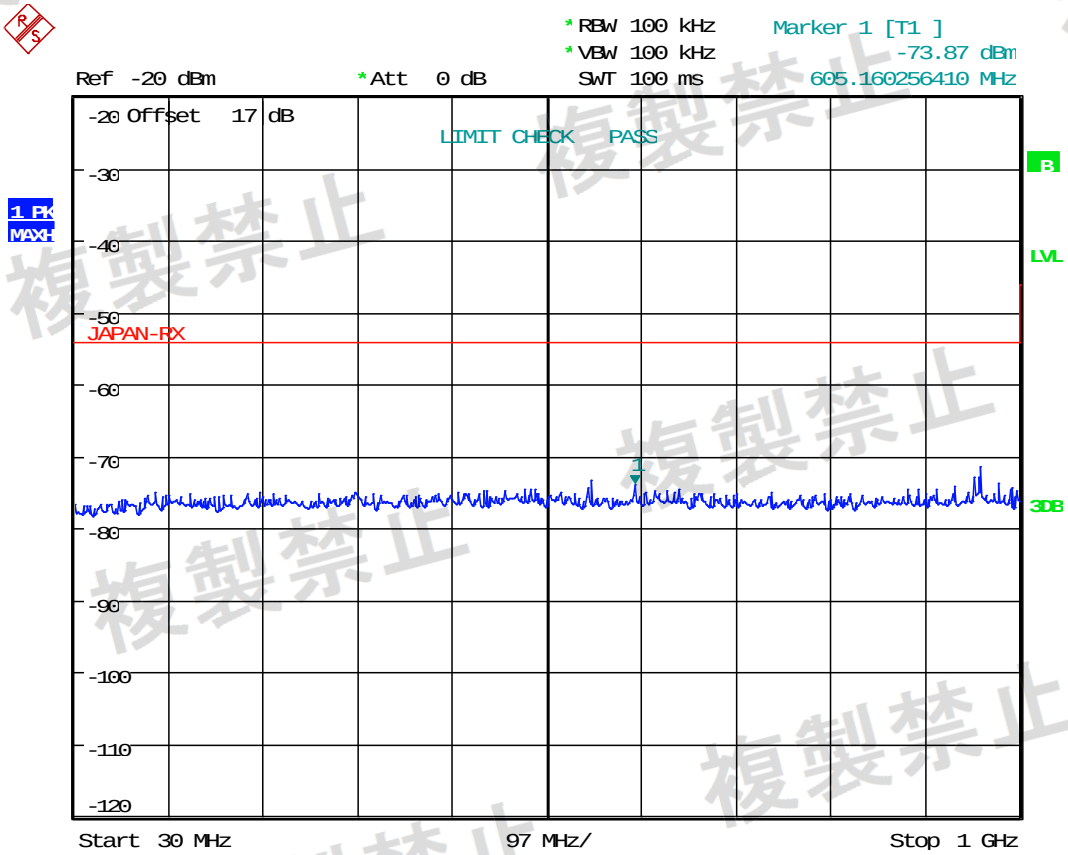
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Date: 19.JUL.2020 15:12:57



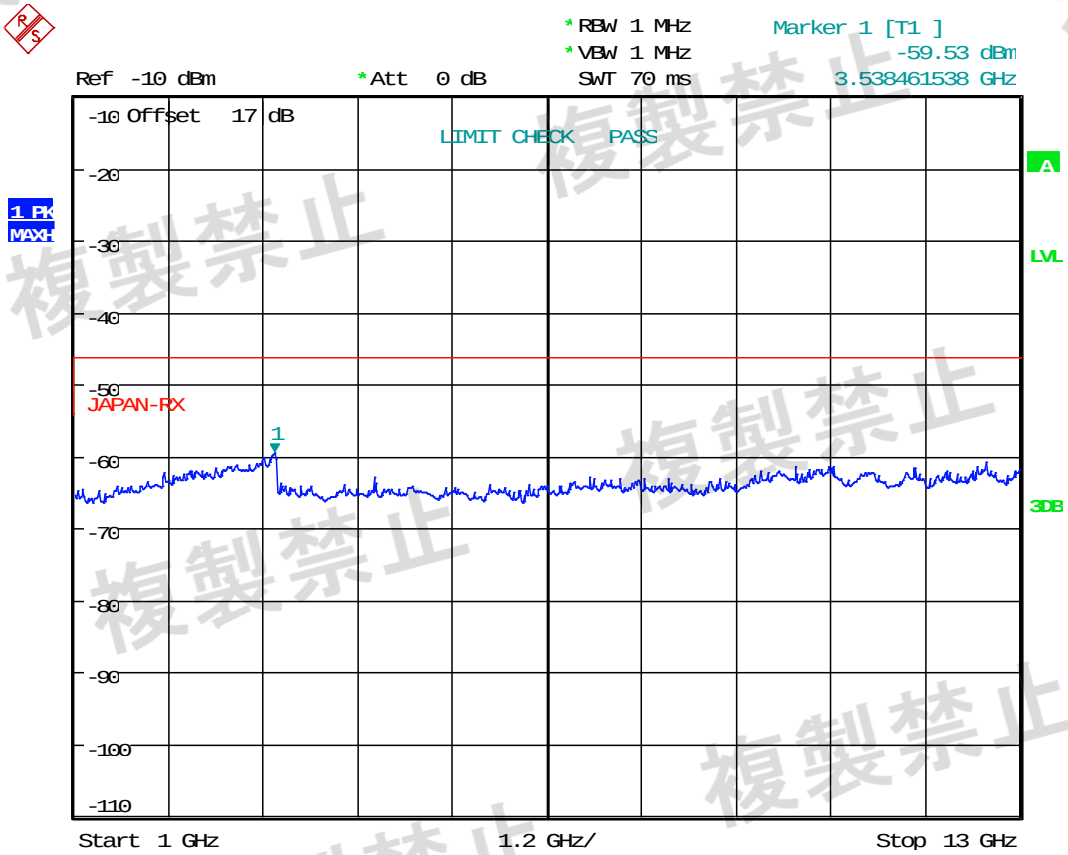
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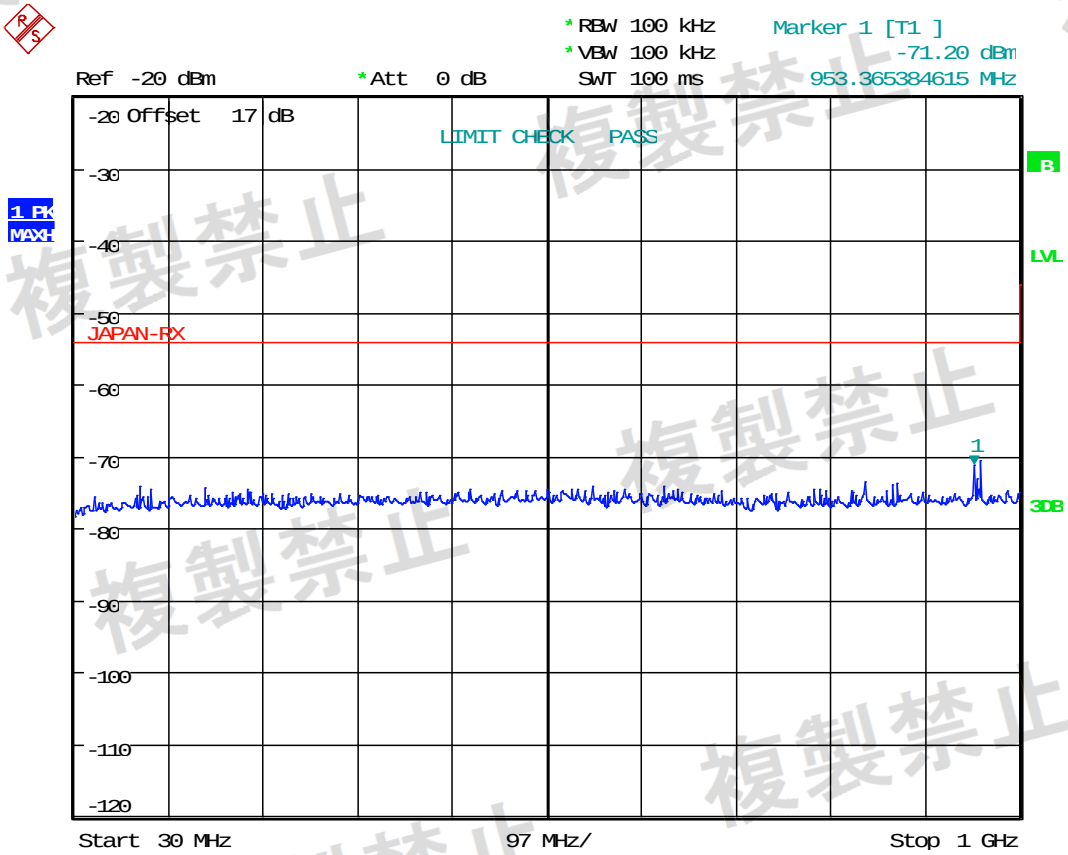
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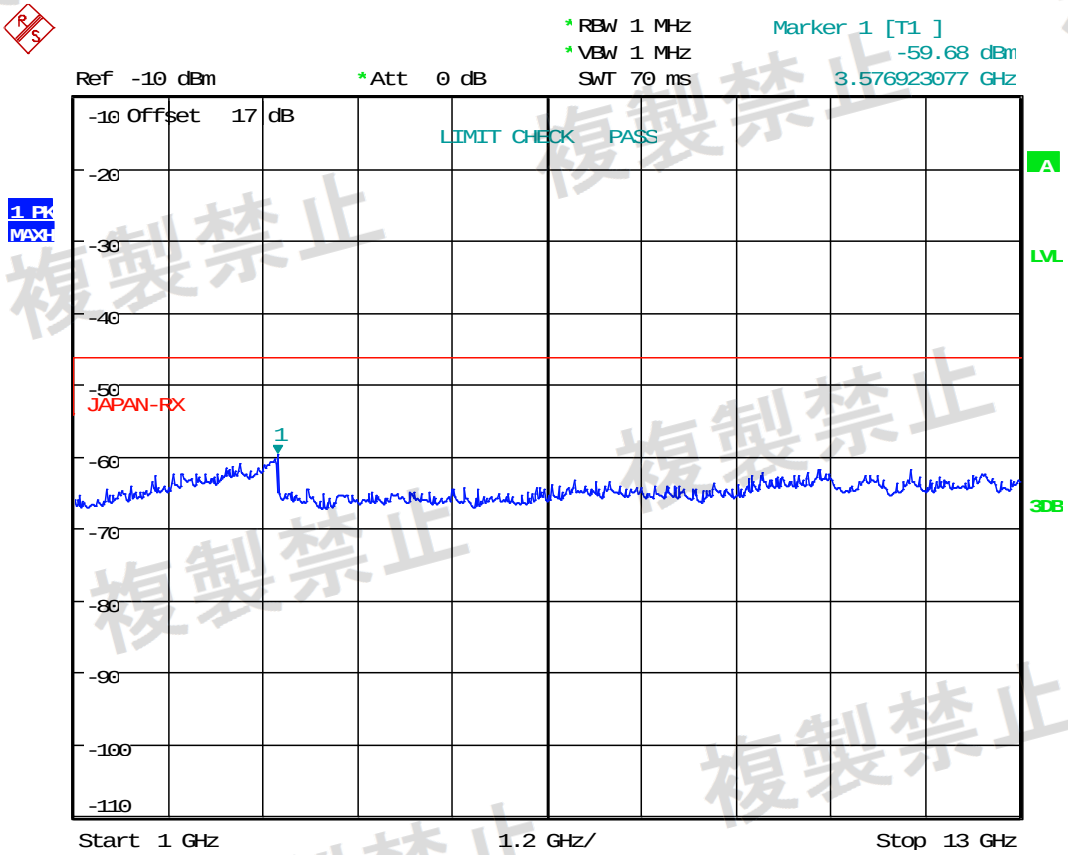
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Date: 19.JUL.2020 15:16:19



RX CONDUCTED SPURIOUS EMISSION 802.11B CH13 3.63V

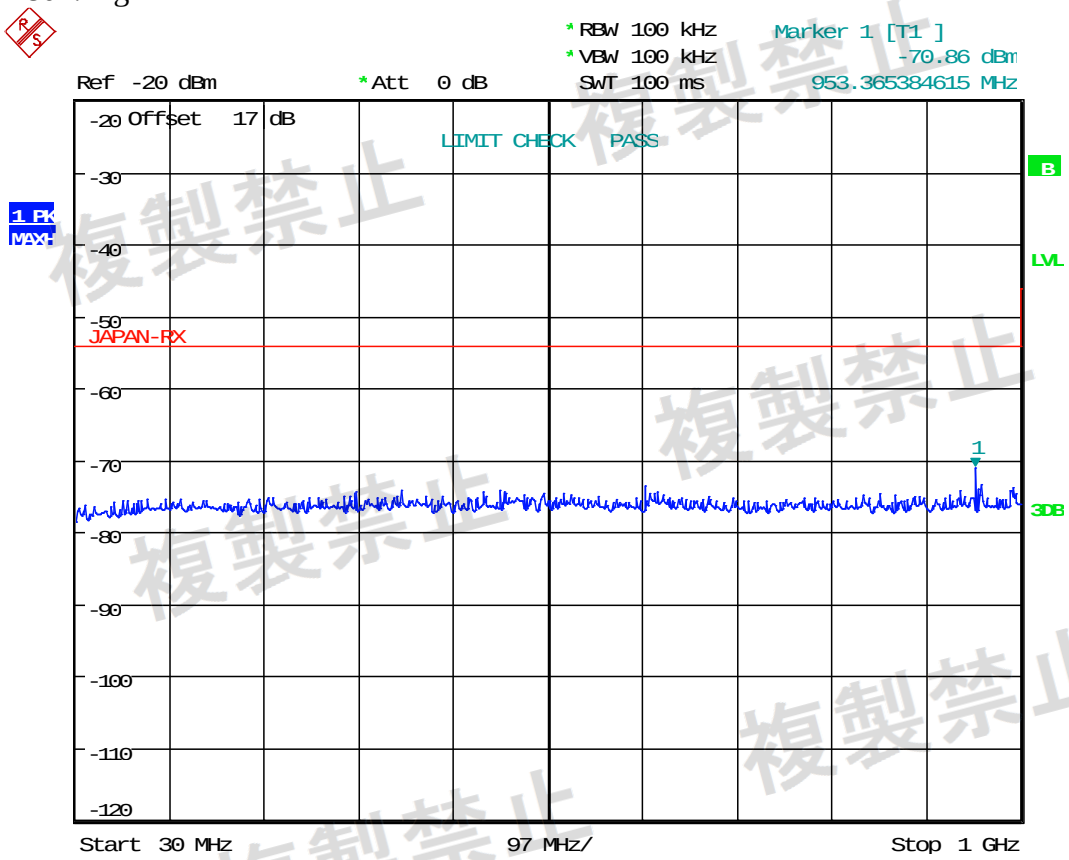
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RX CONDUCTED SPURIOUS EMISSION 802.11B CH13 3.63V

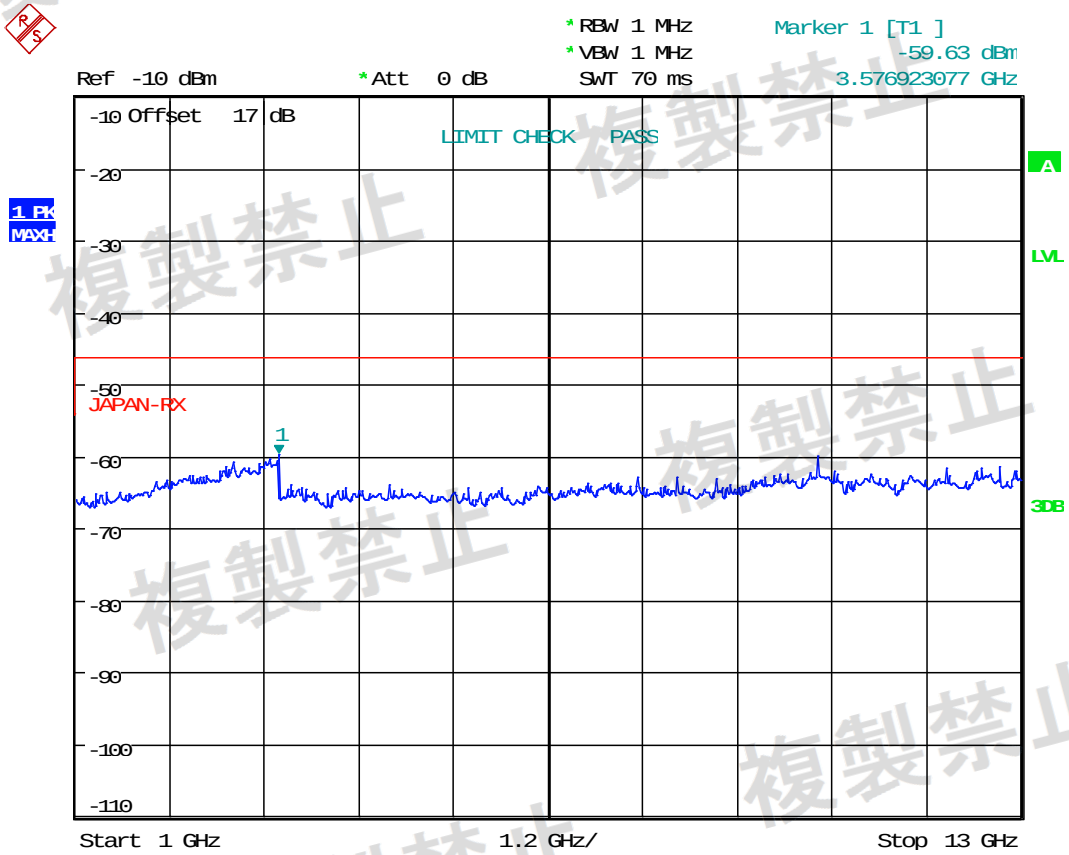
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IEEE 802.11g



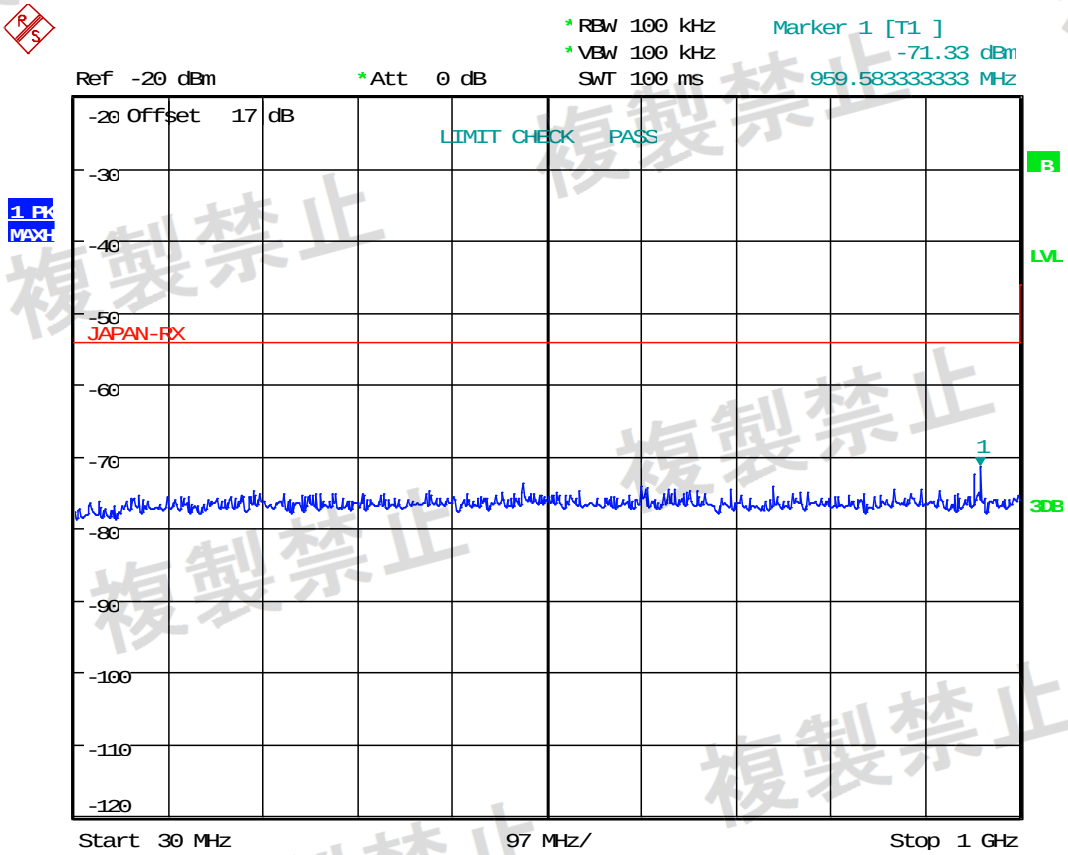
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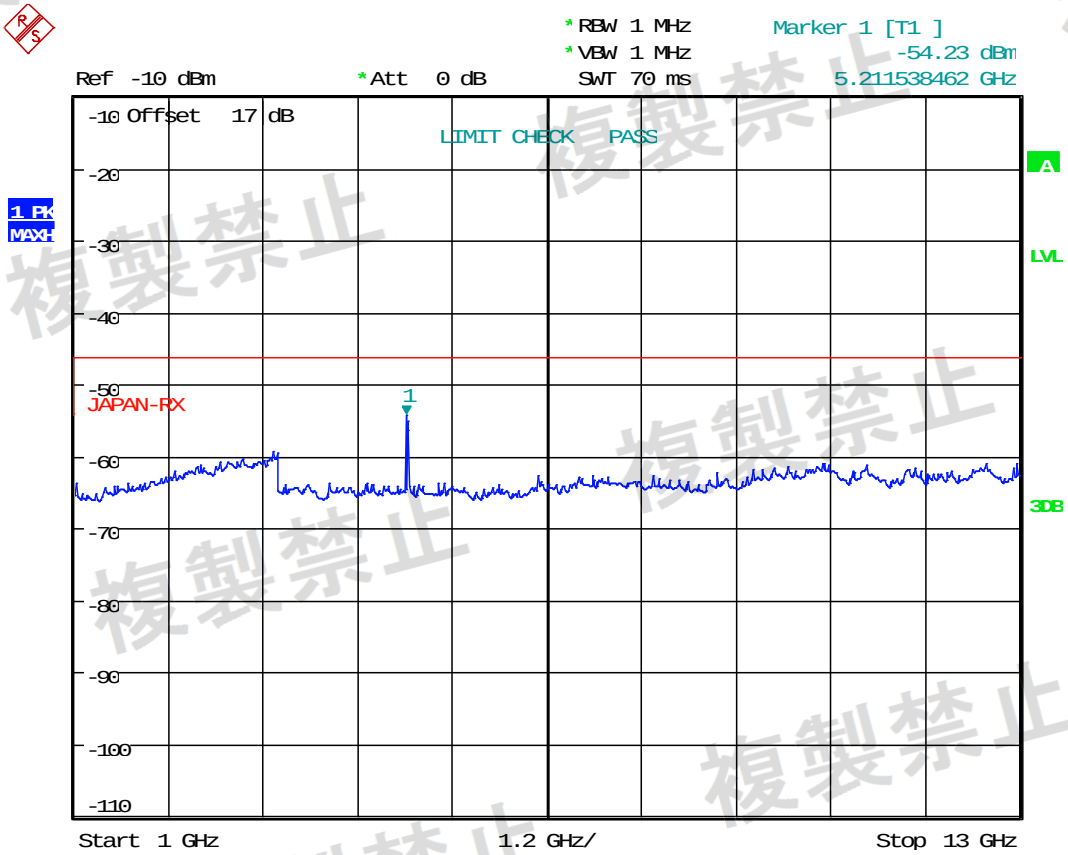
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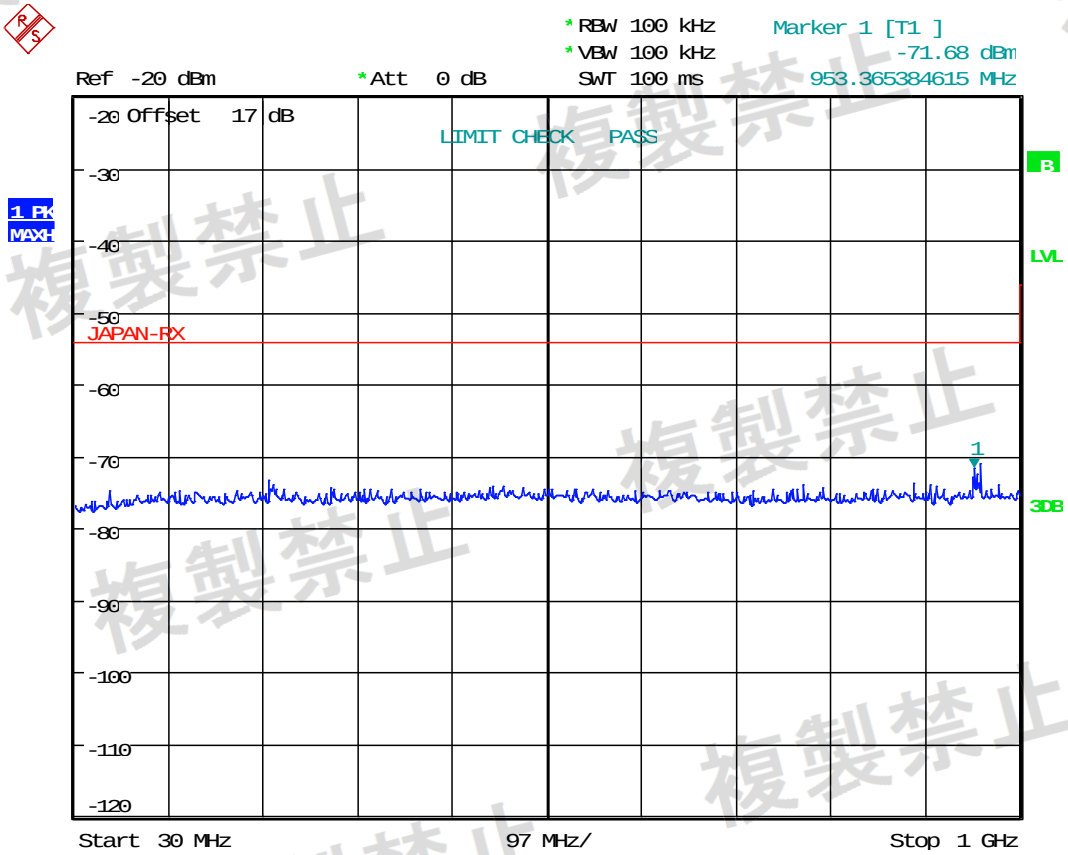
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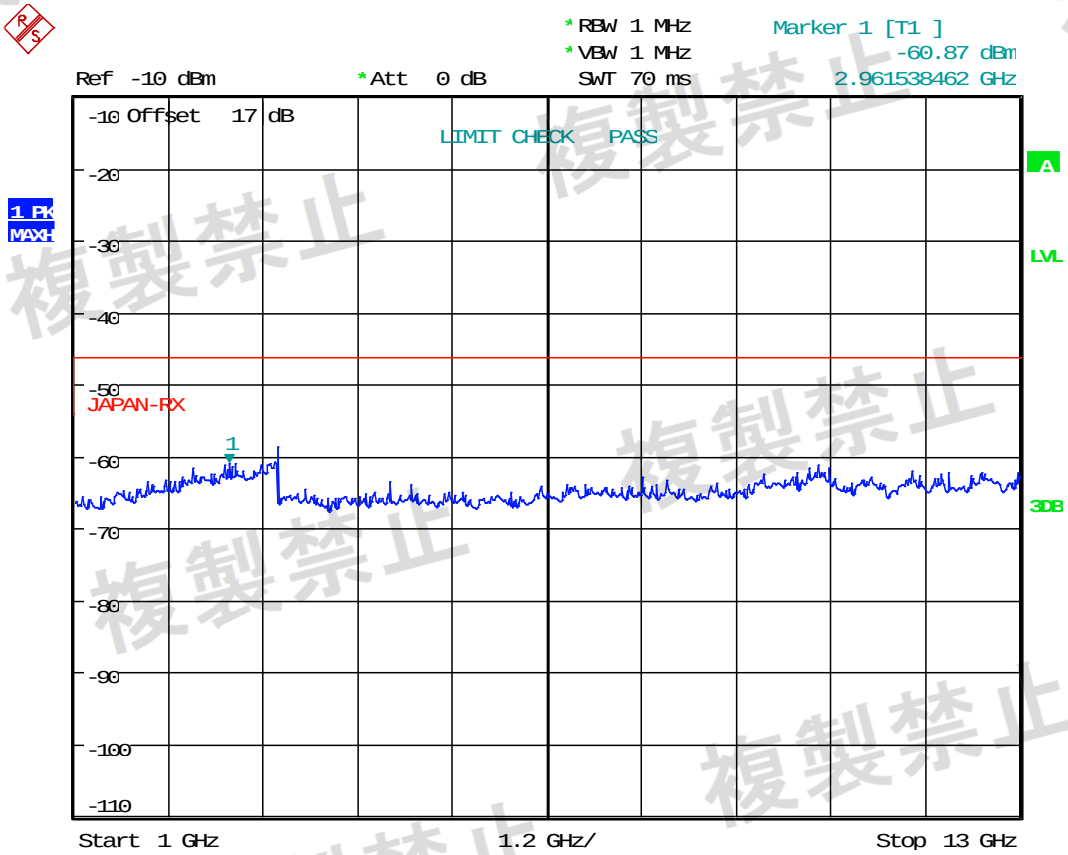
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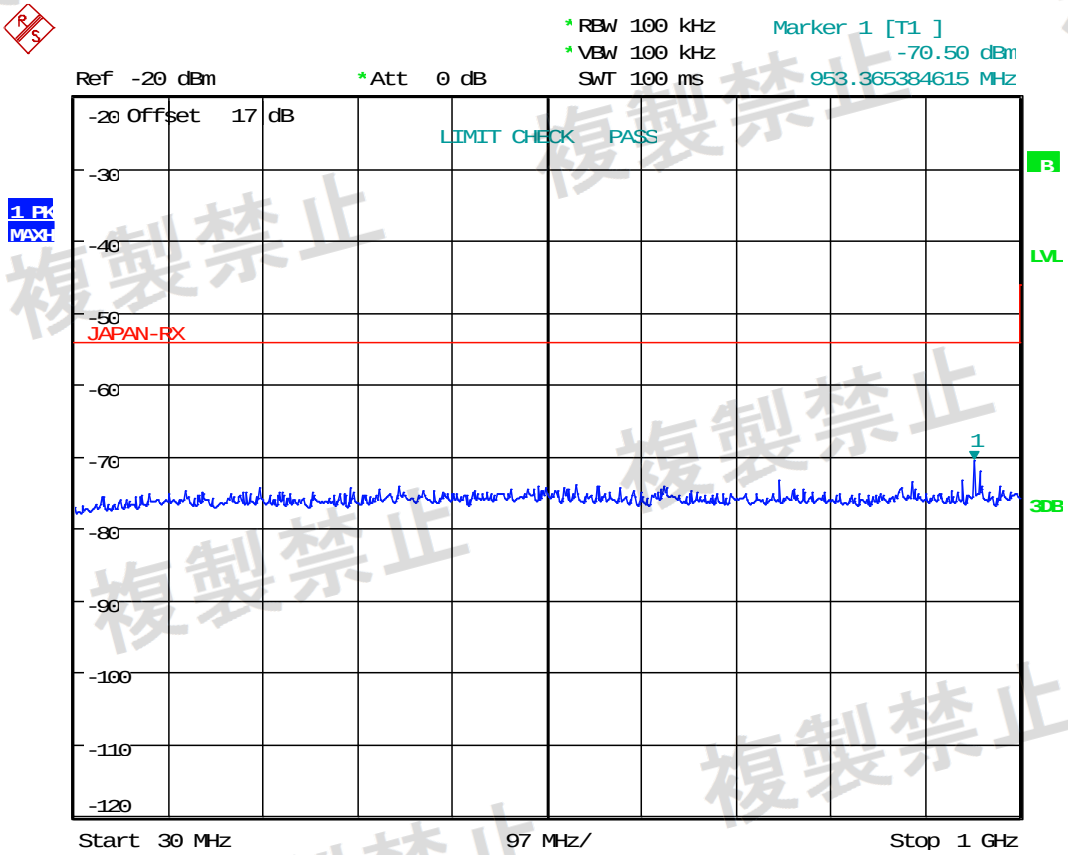
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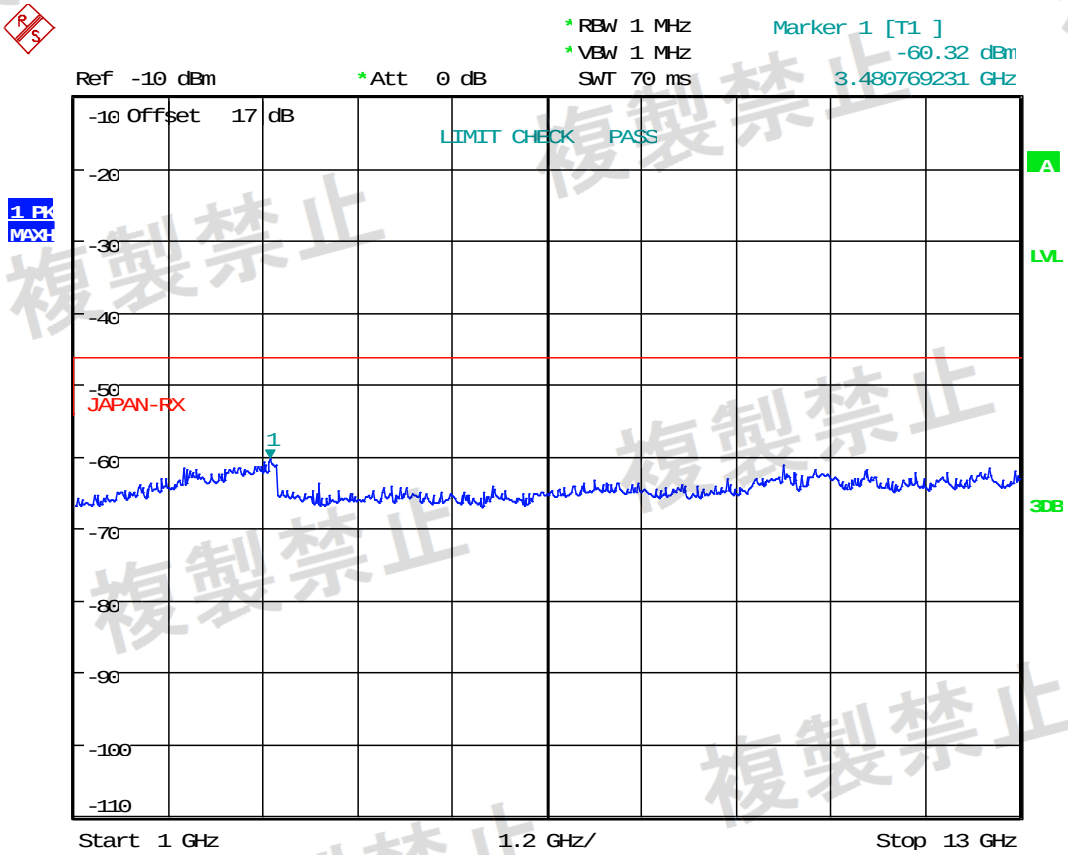
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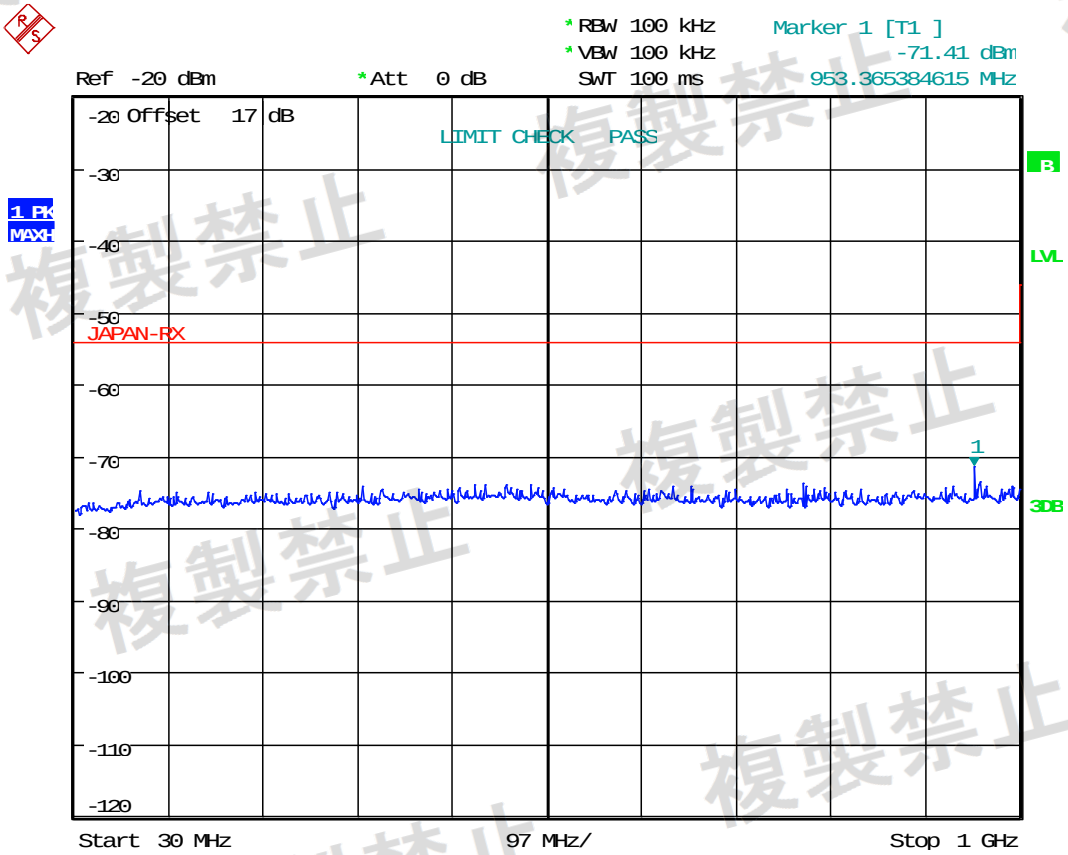
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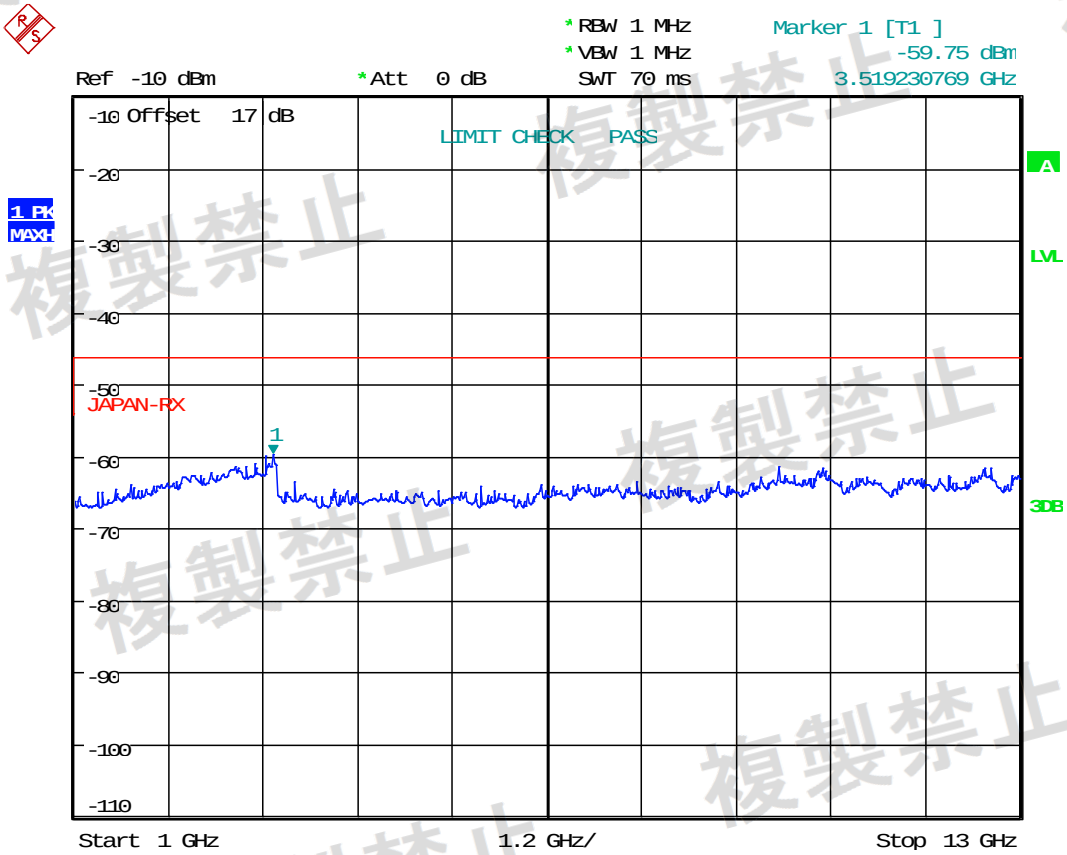
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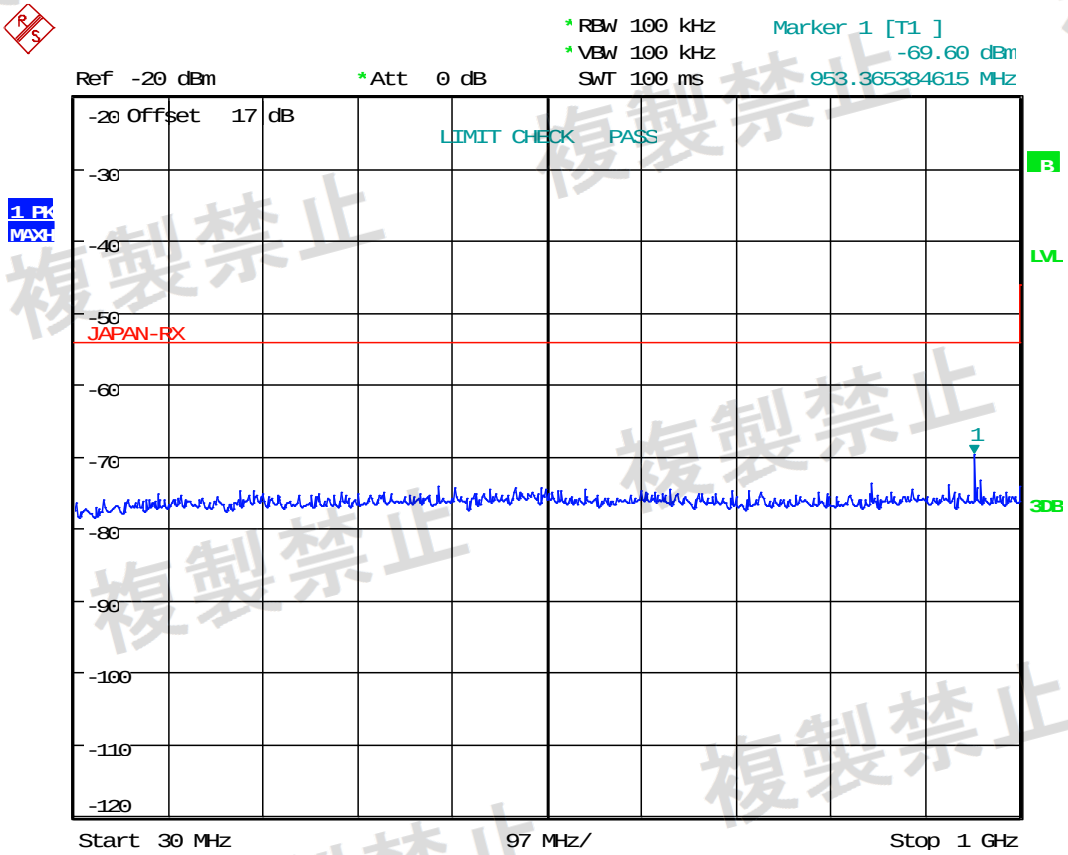
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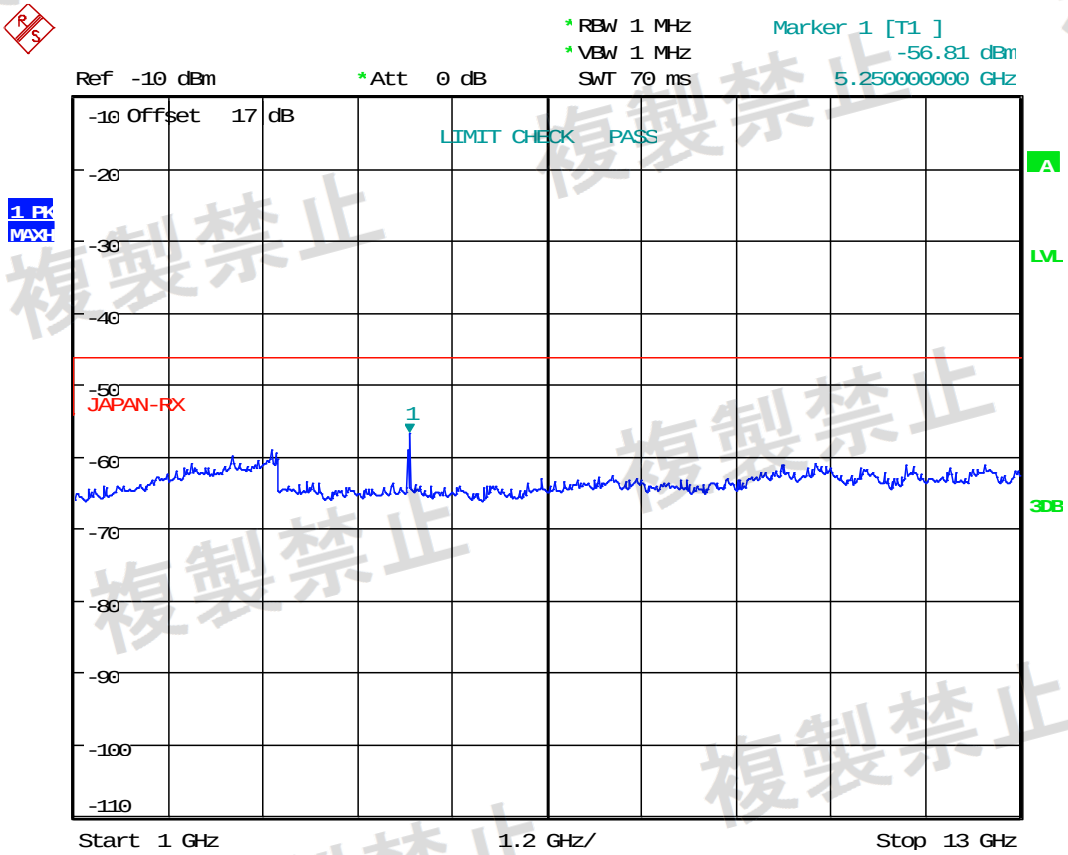
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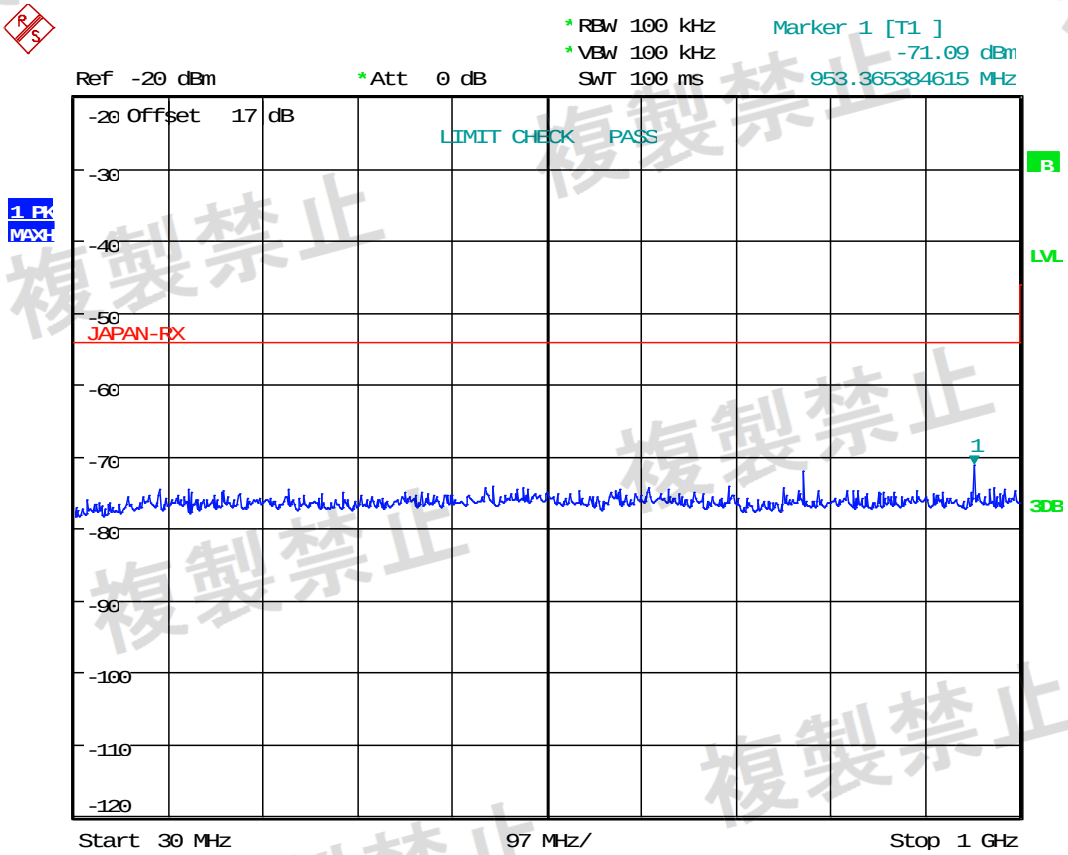
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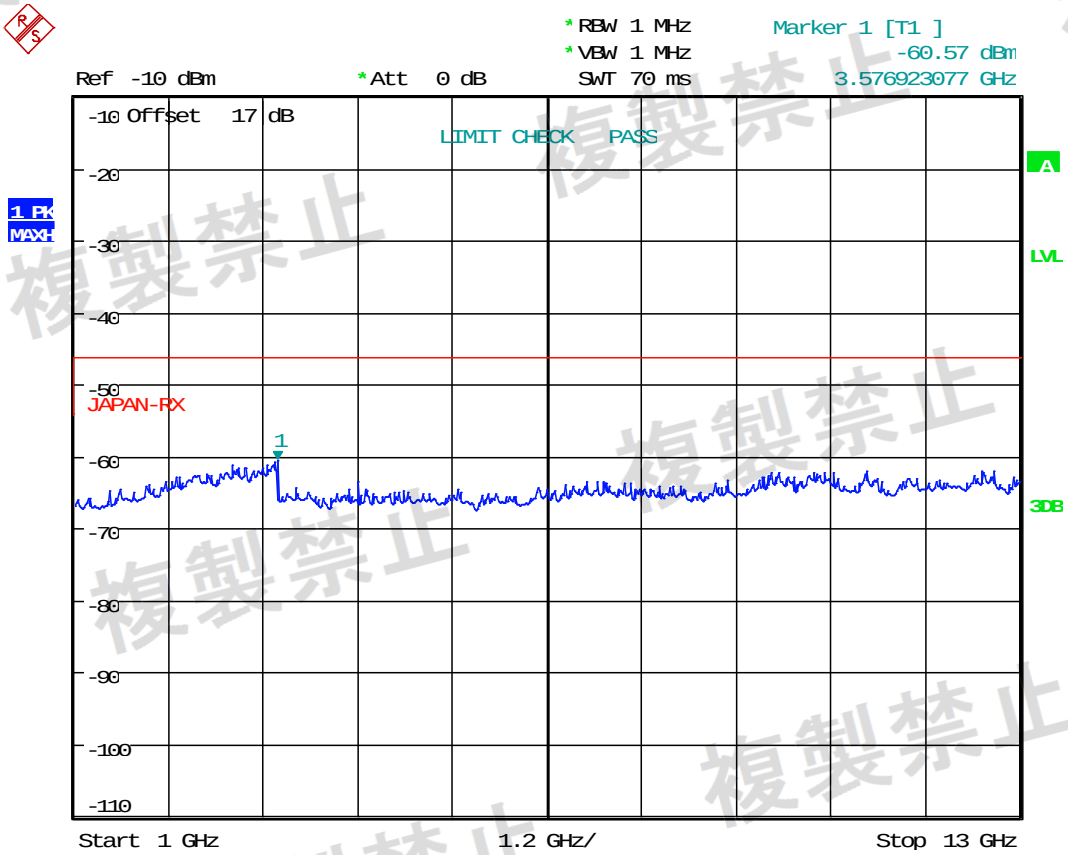
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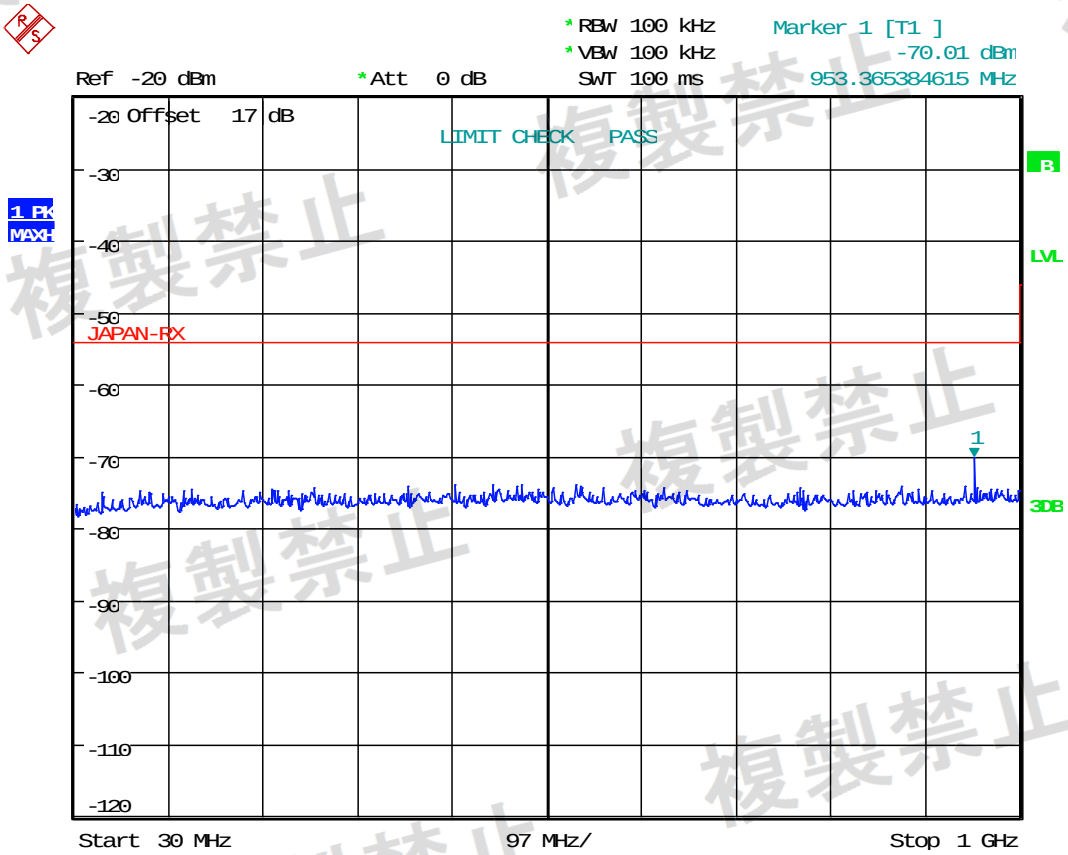
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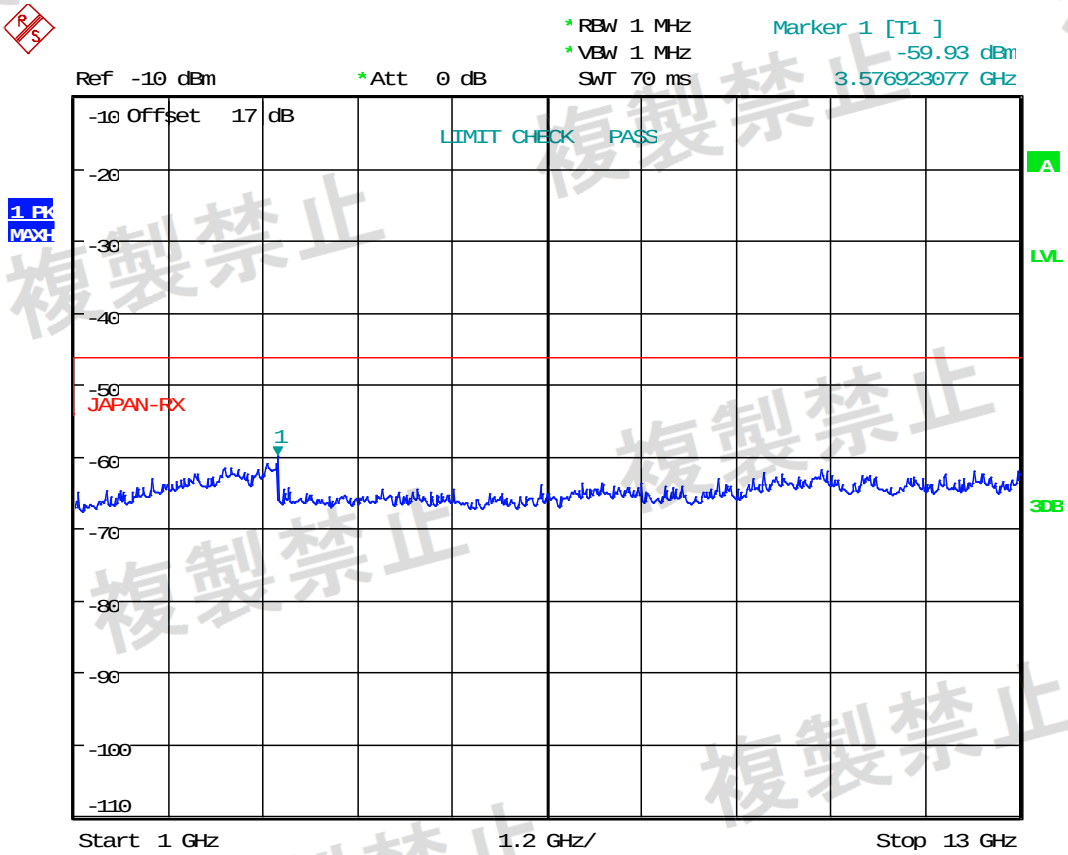
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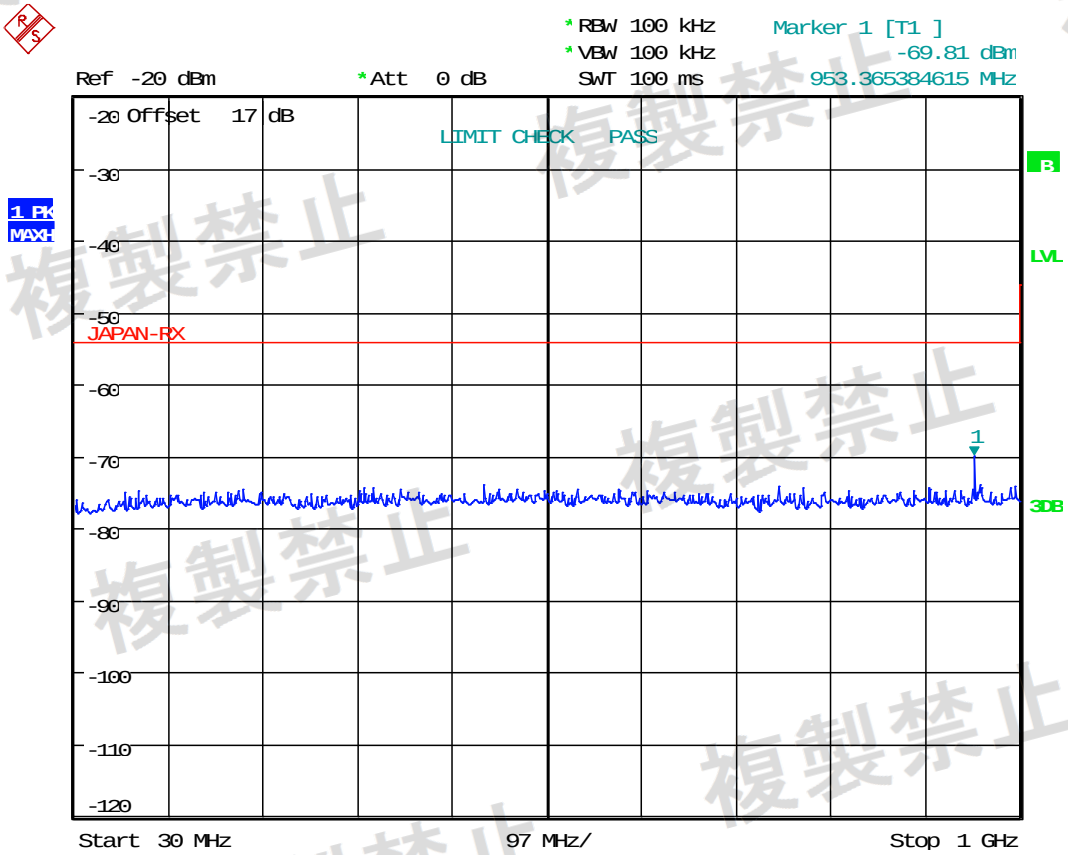
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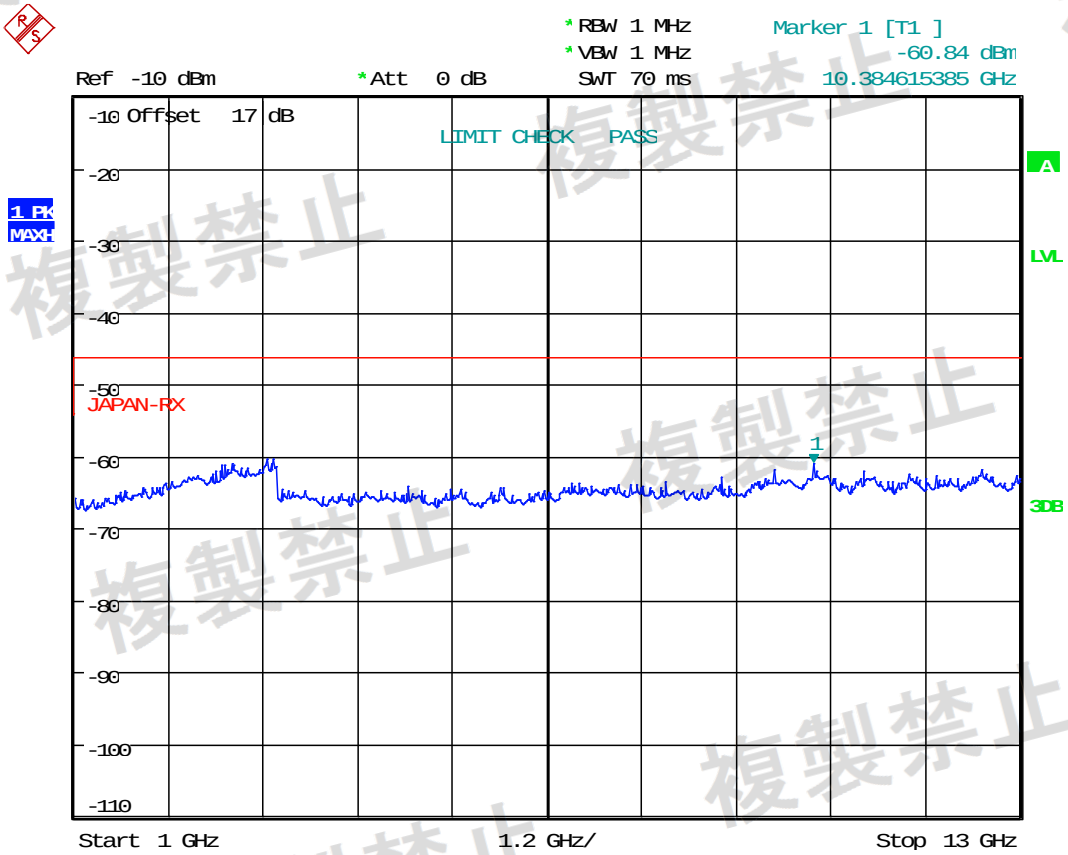
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RX CONDUCTED SPURIOUS EMISSION 802.11G CH13 3.63V

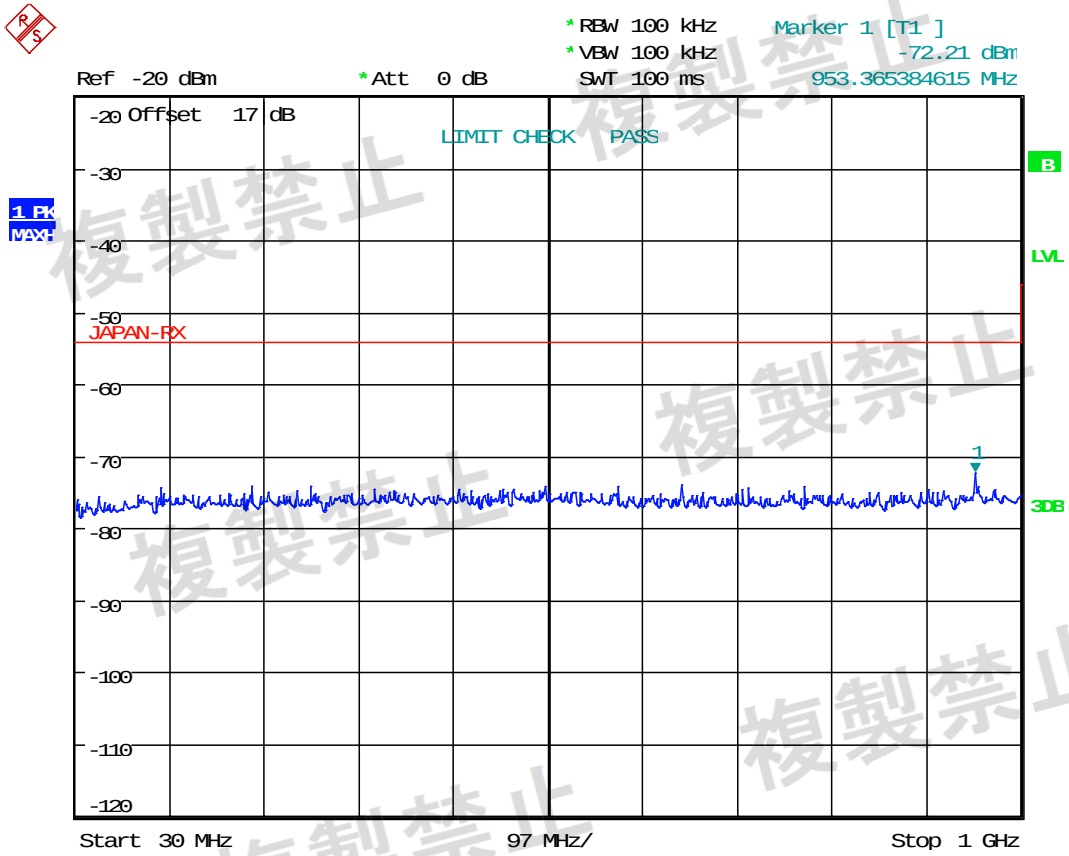
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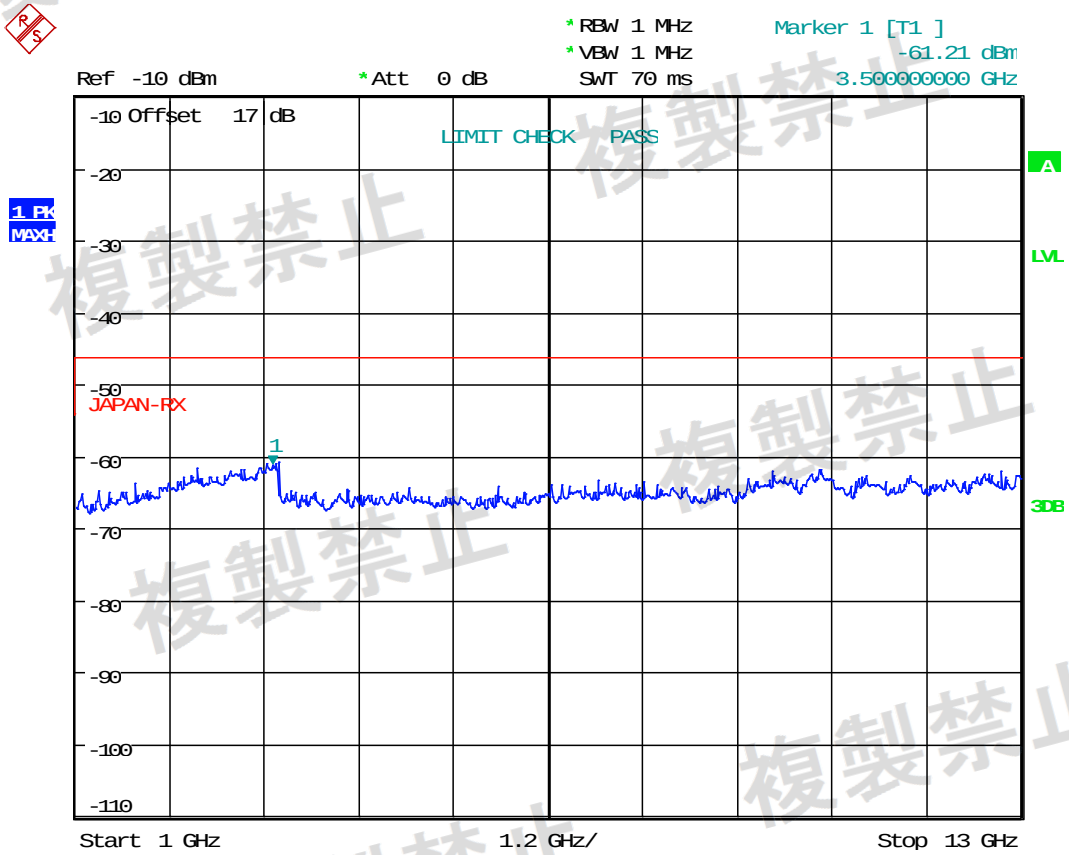
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Date: 19.JUL.2020 15:37:07

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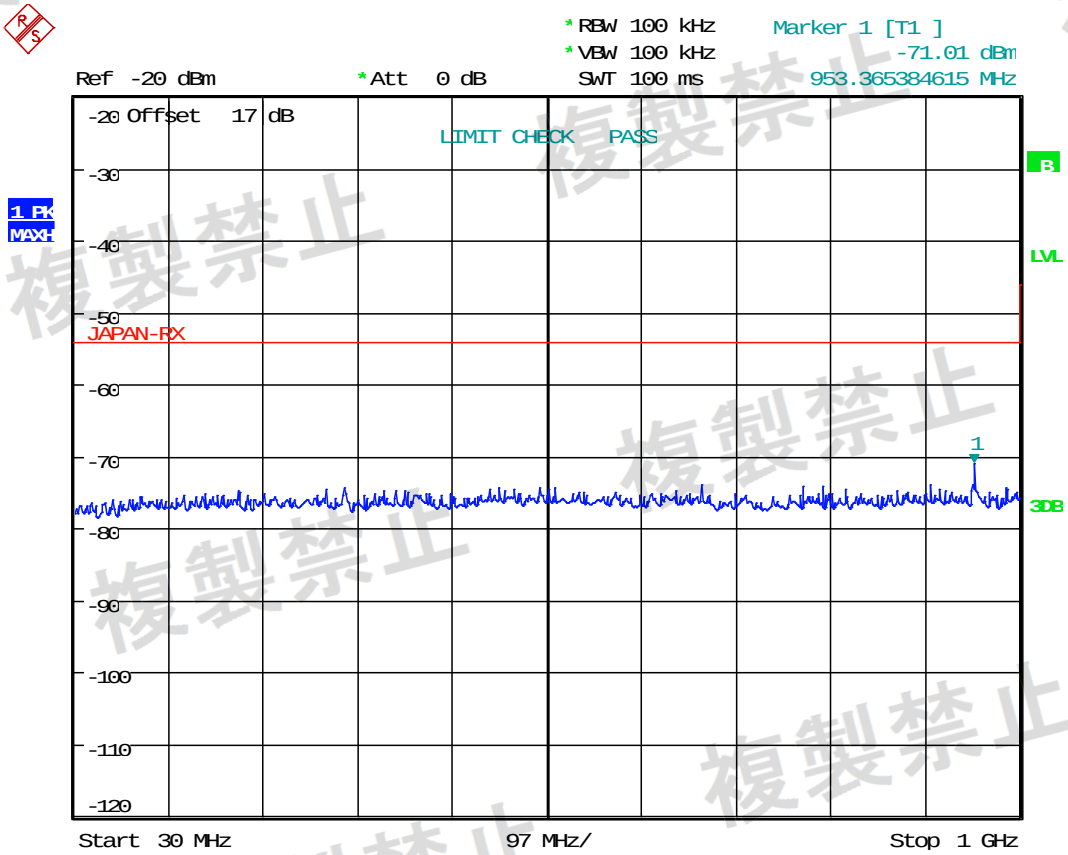


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Date: 19.JUL.2020 15:43:00



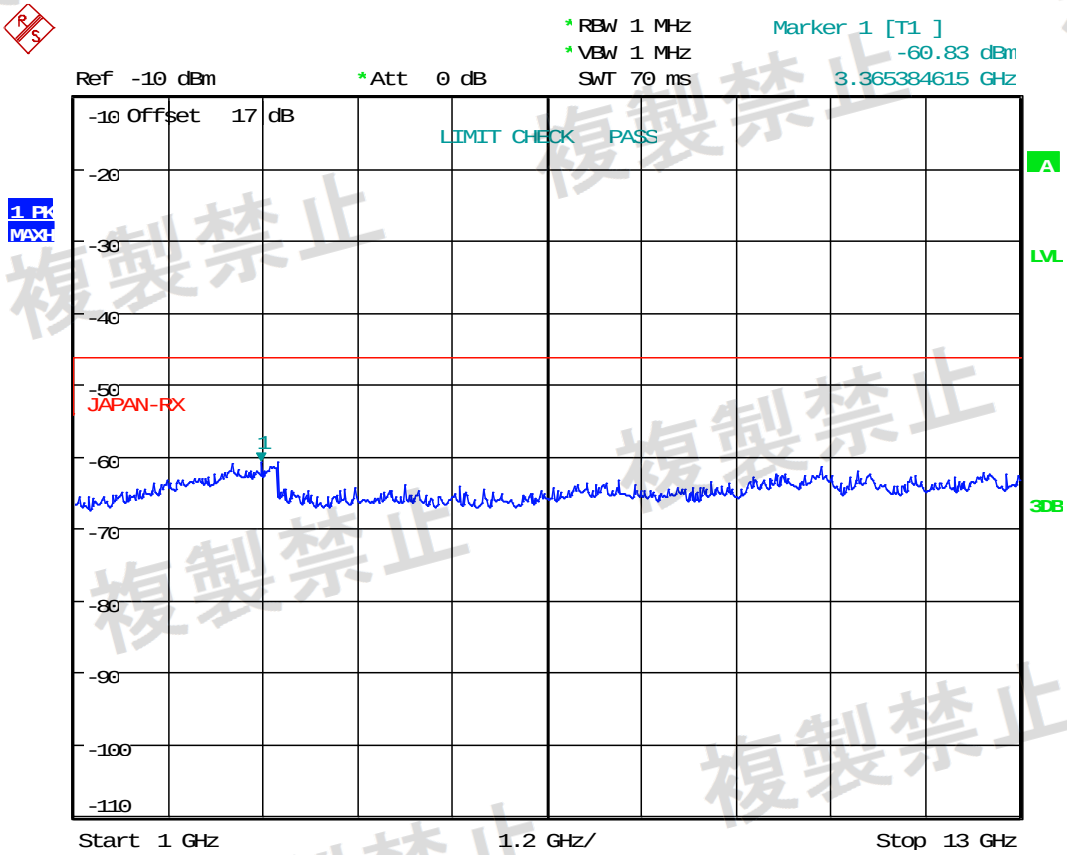
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Date: 19.JUL.2020 15:42:11



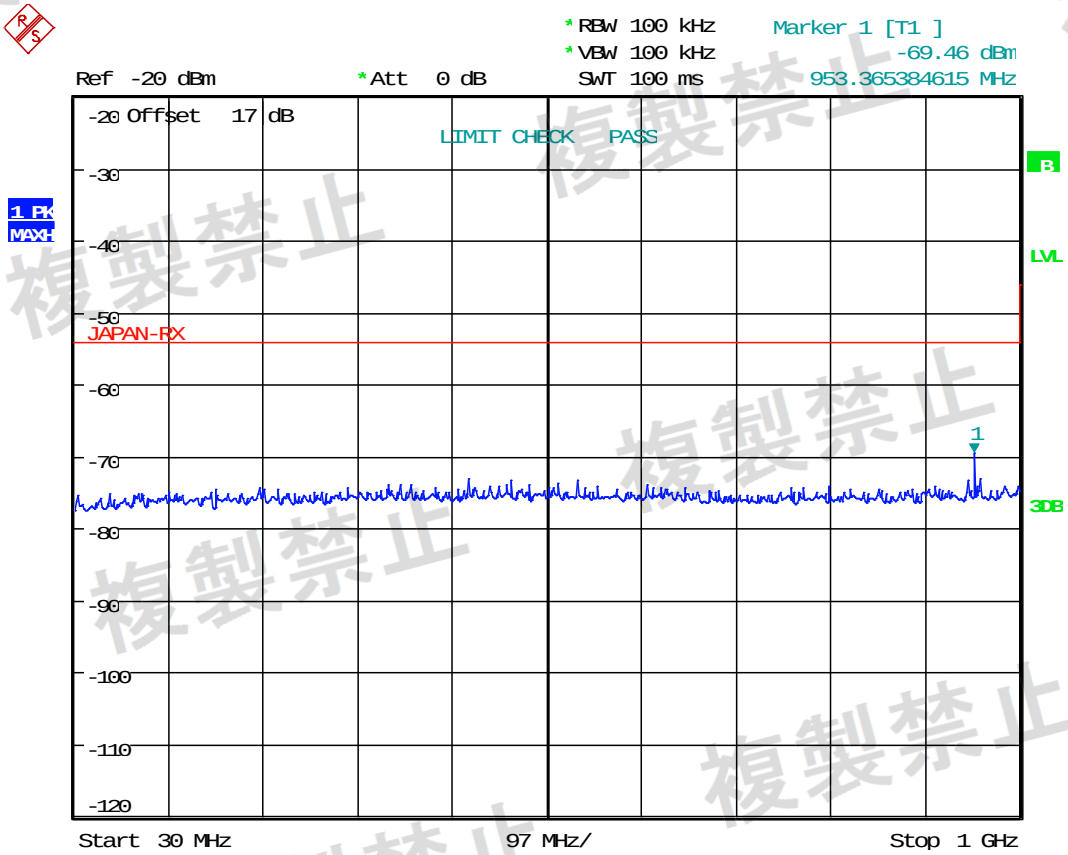
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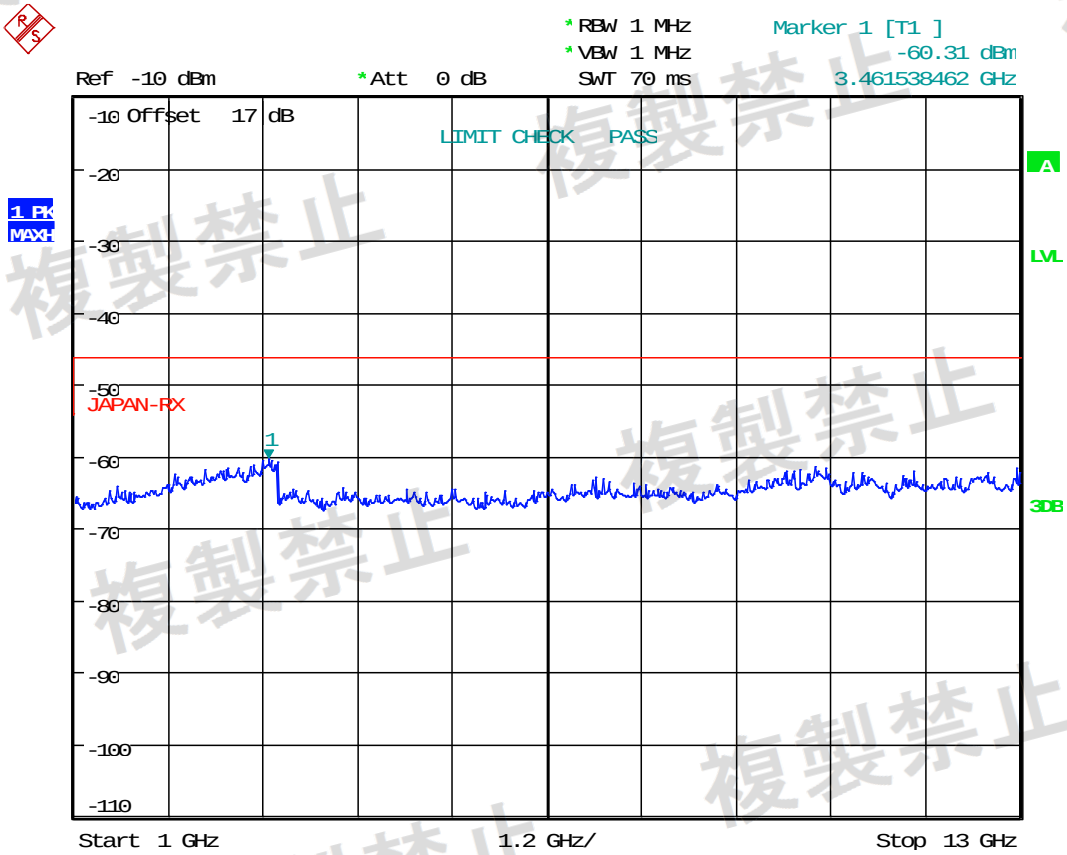
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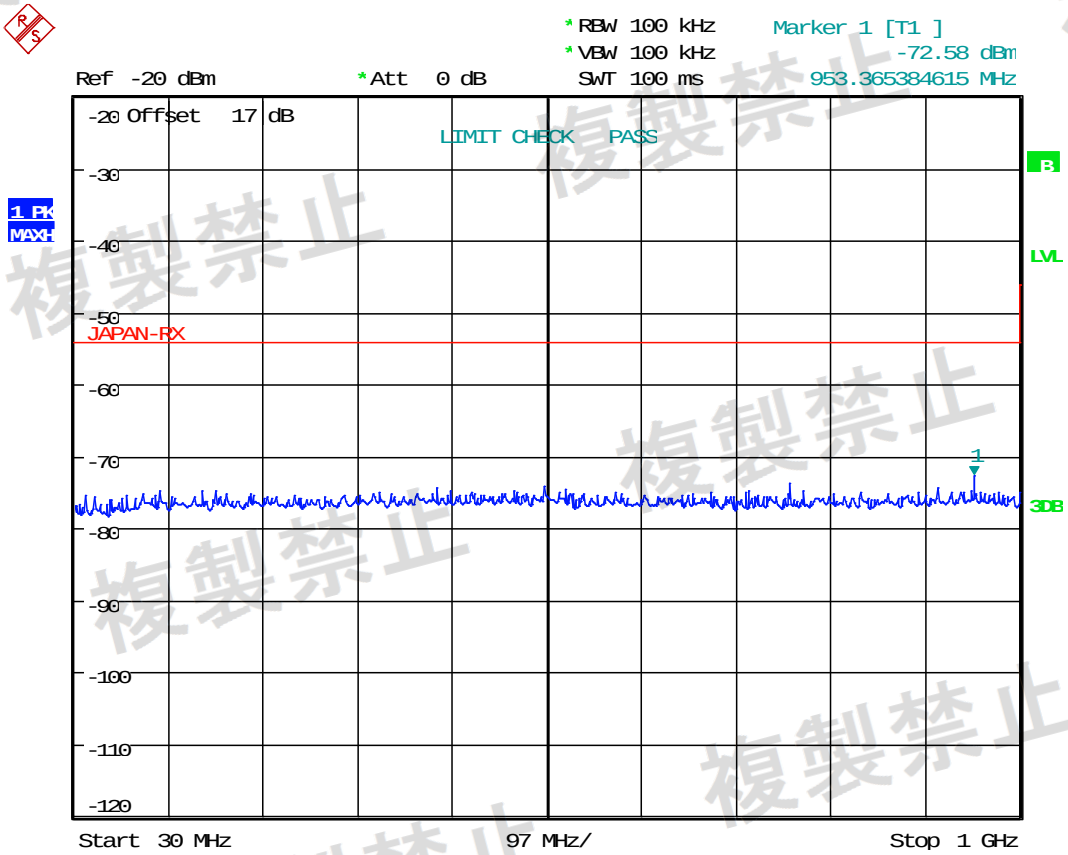
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Date: 19.JUL.2020 15:41:06



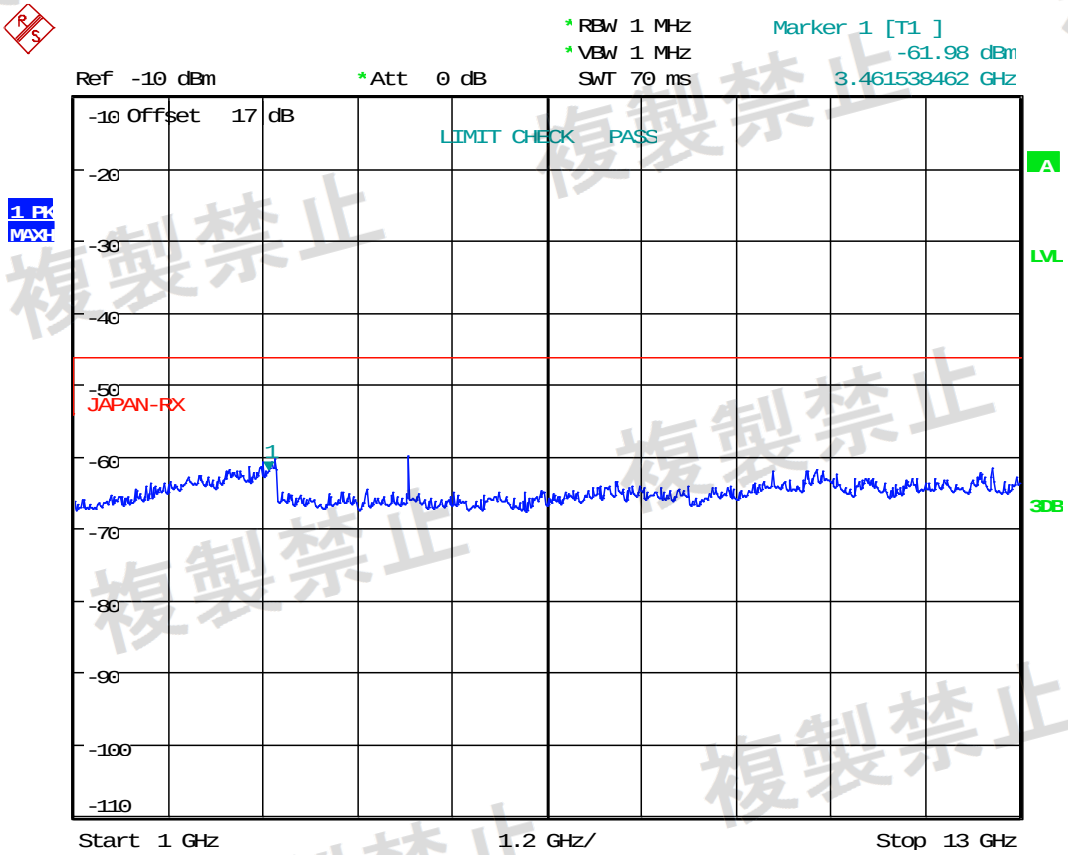
RX CONDUCTED SPURIOUS EMISSION 802.11N 20MHZ CH1 3.63V

Date: 19.JUL.2020 15:41:53



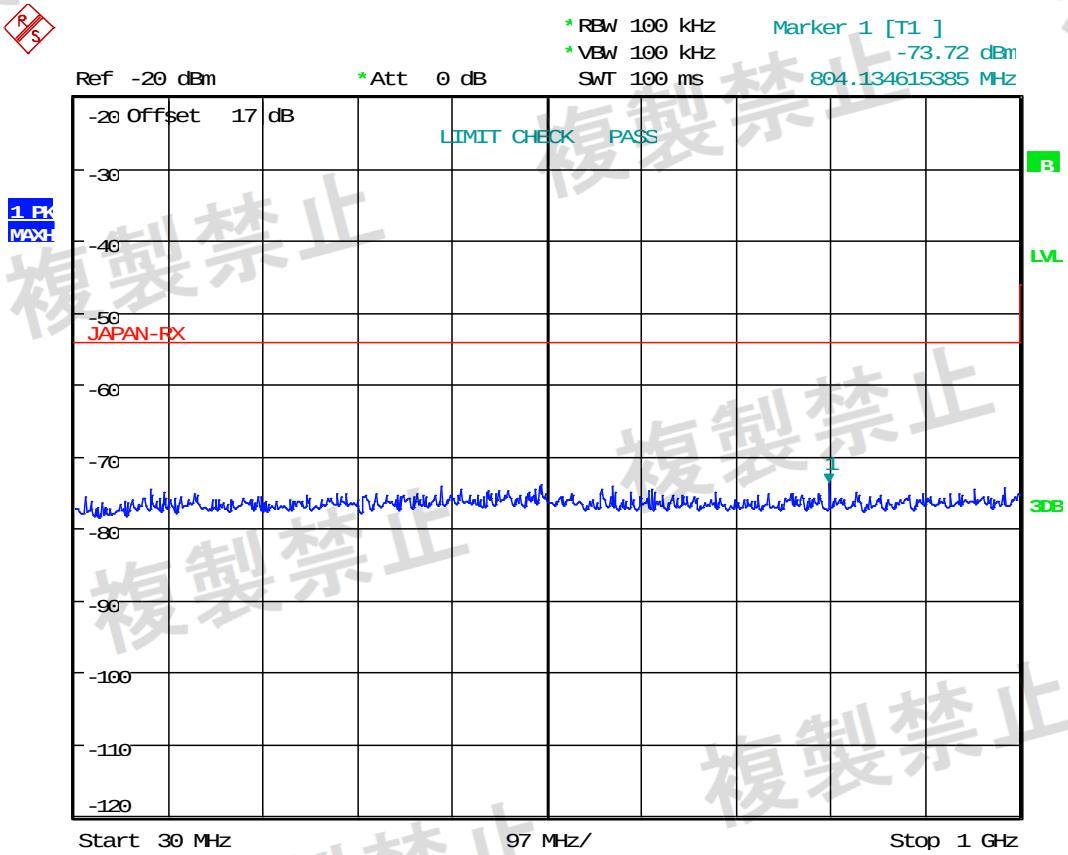
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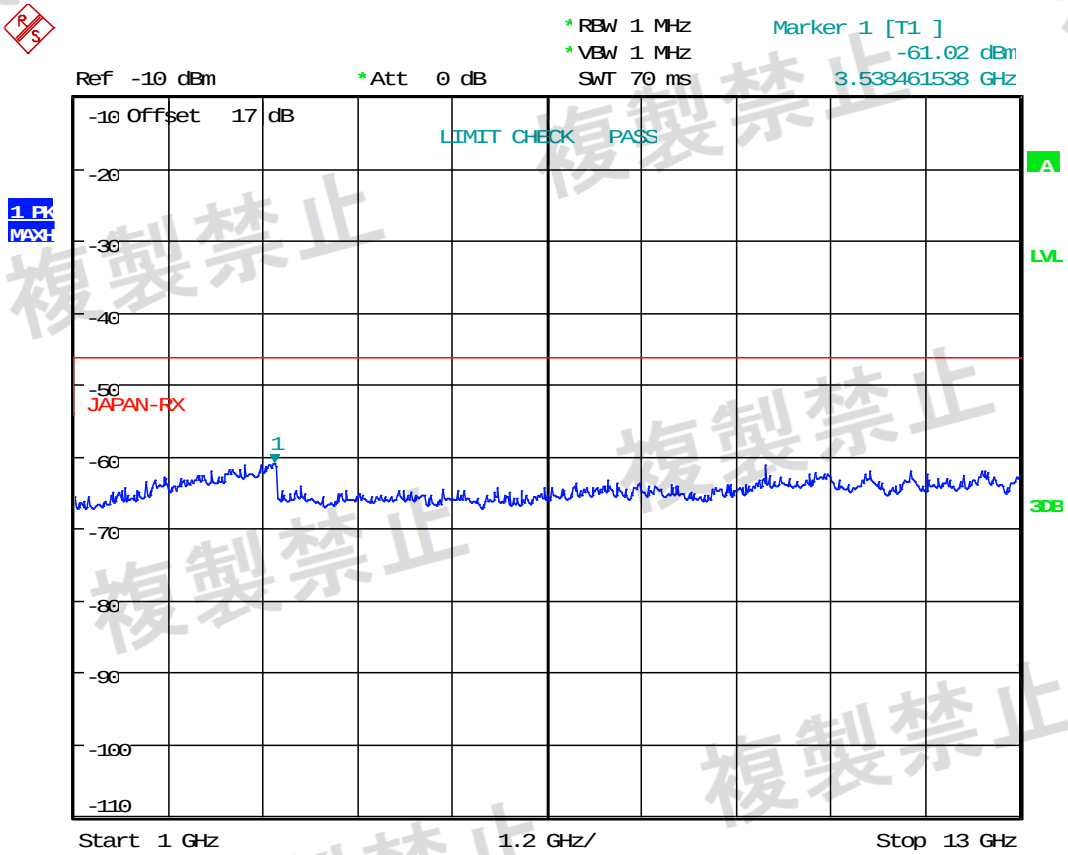
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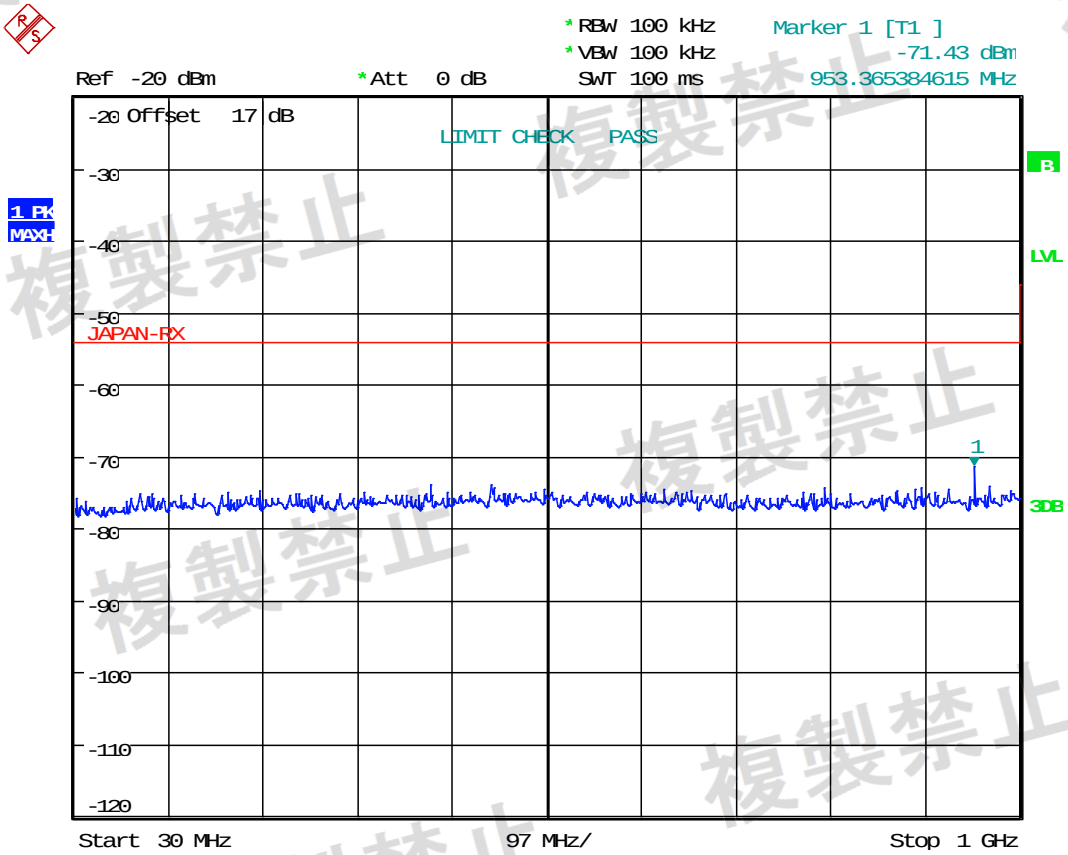
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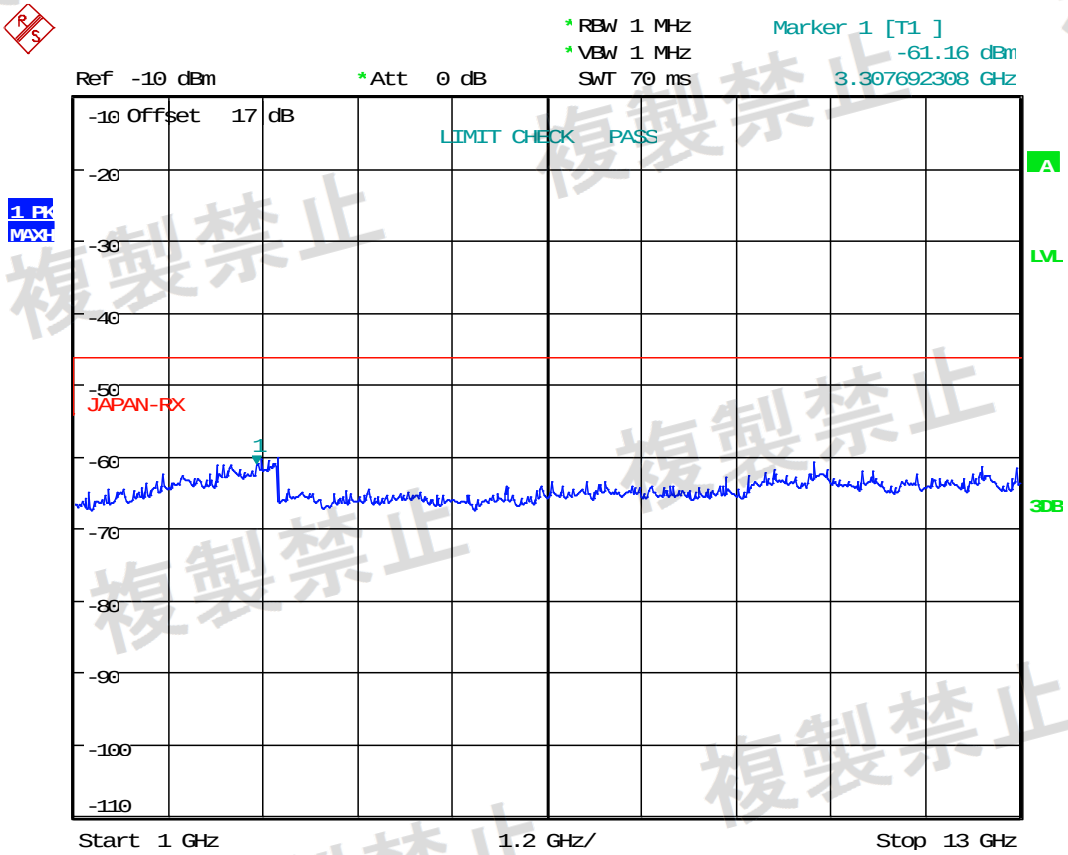
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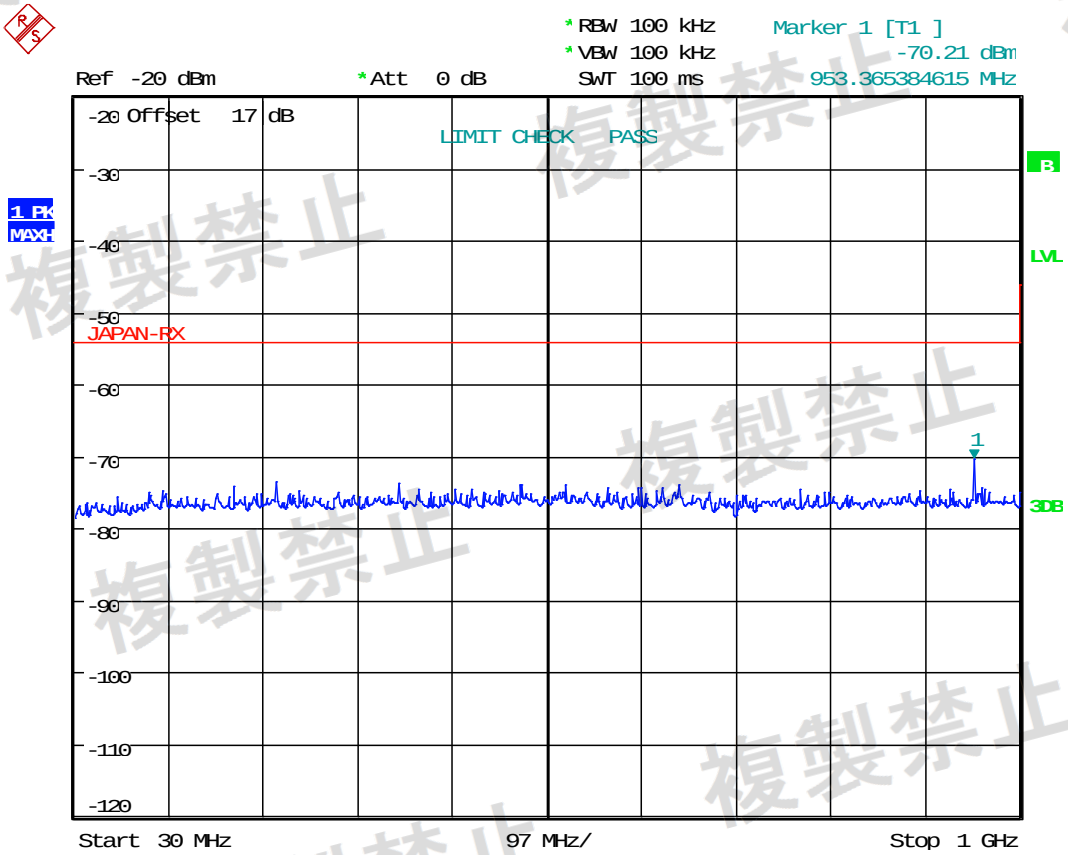
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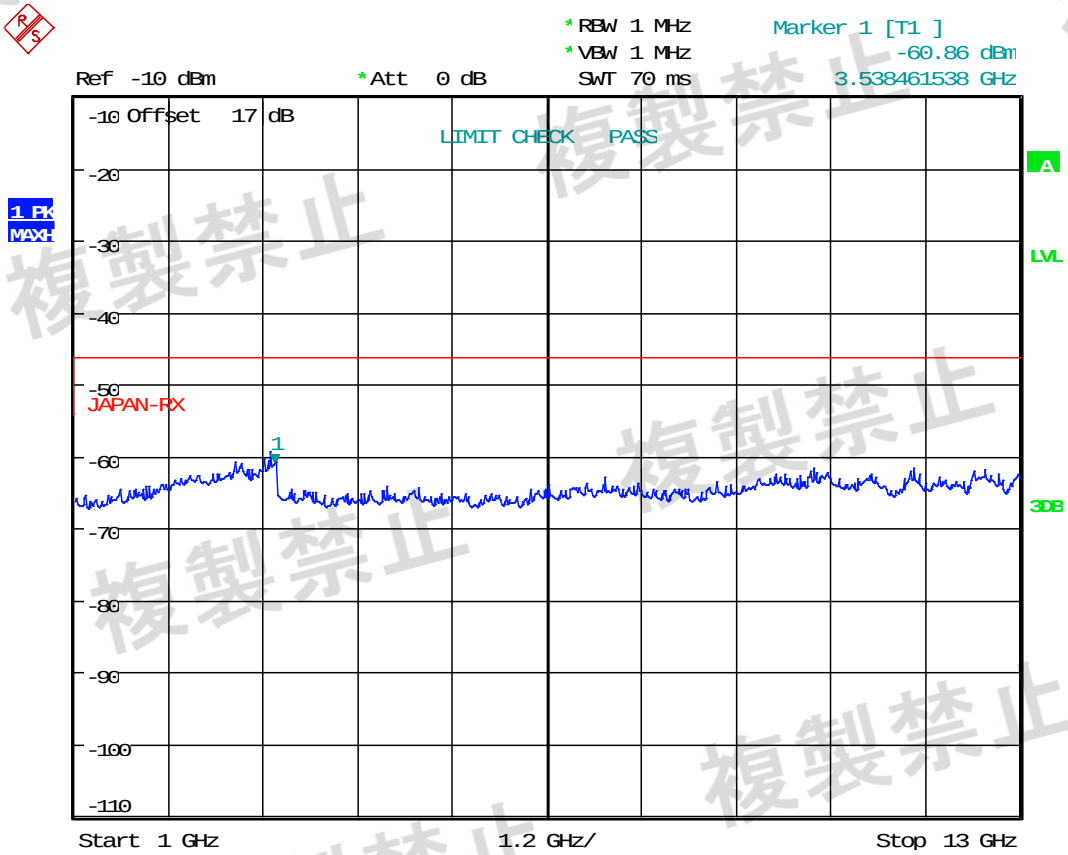
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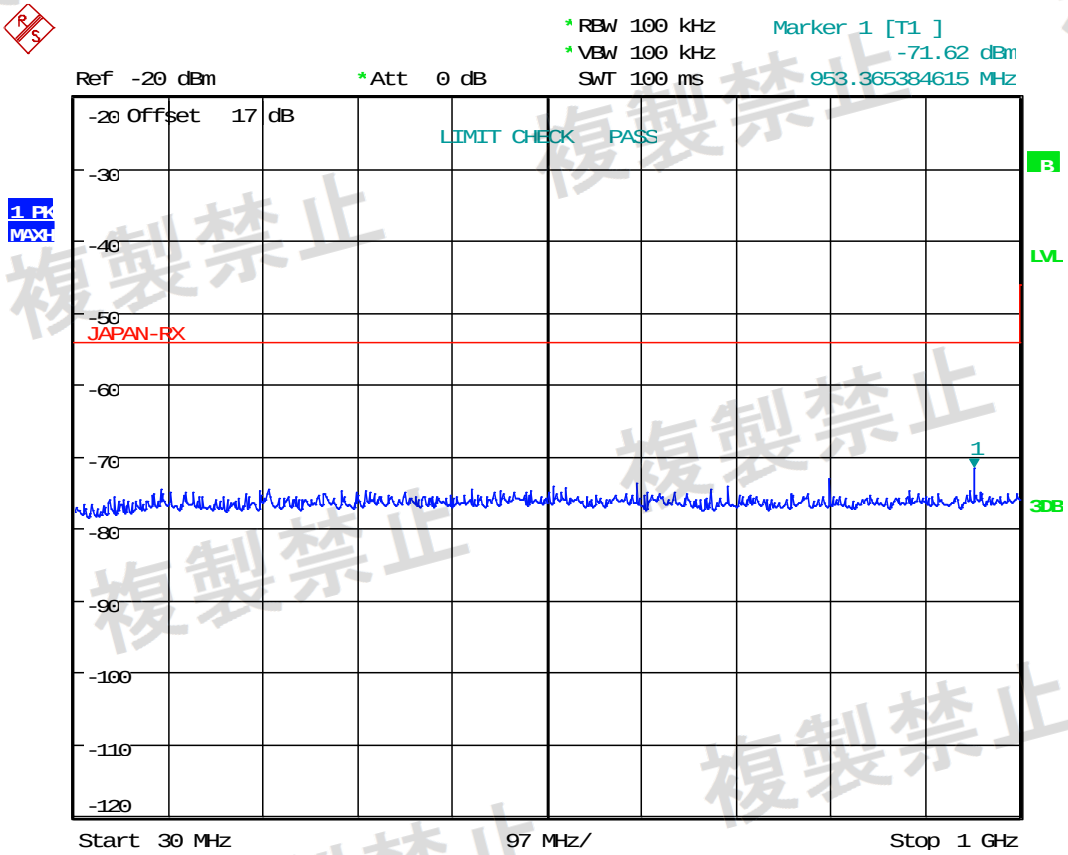
RX CONDUCTED SPURIOUS EMISSION 802.11N 20MHZ CH13 3.3V

Date: 19.JUL.2020 15:50:22



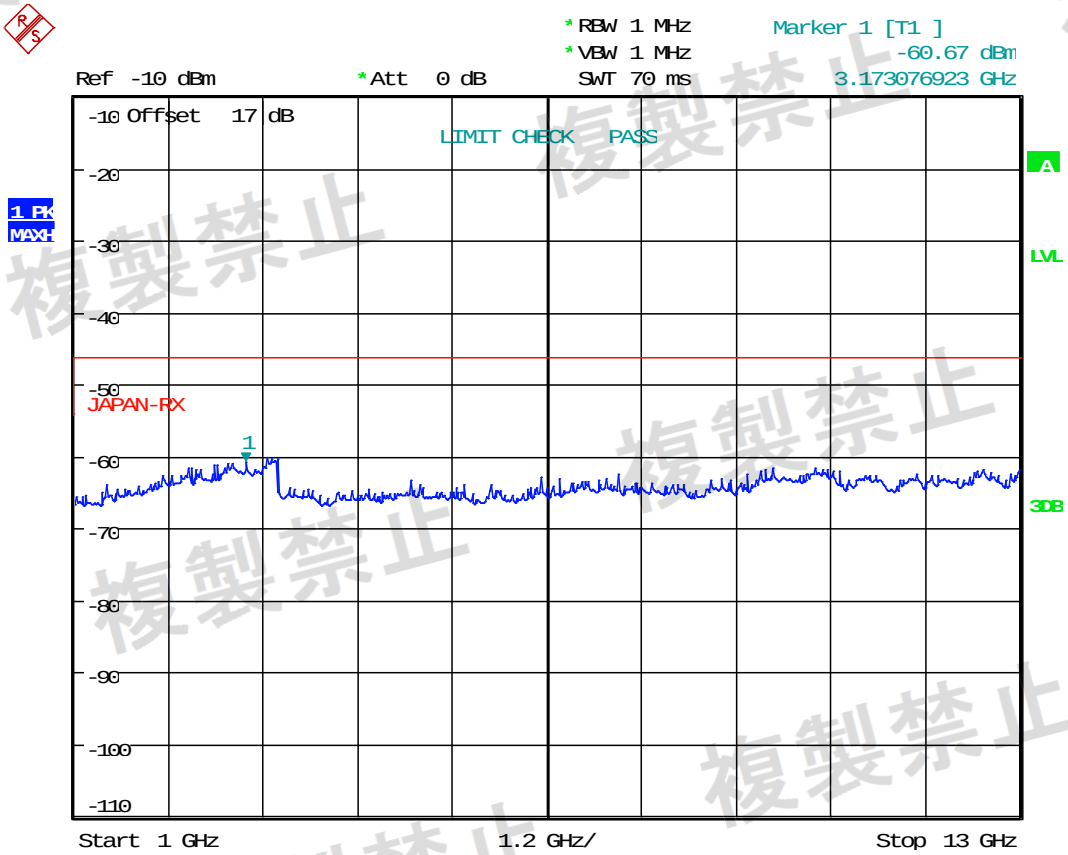
RX CONDUCTED SPURIOUS EMISSION 802.11N 20MHZ CH13 3.3V

Date: 19.JUL.2020 15:49:43



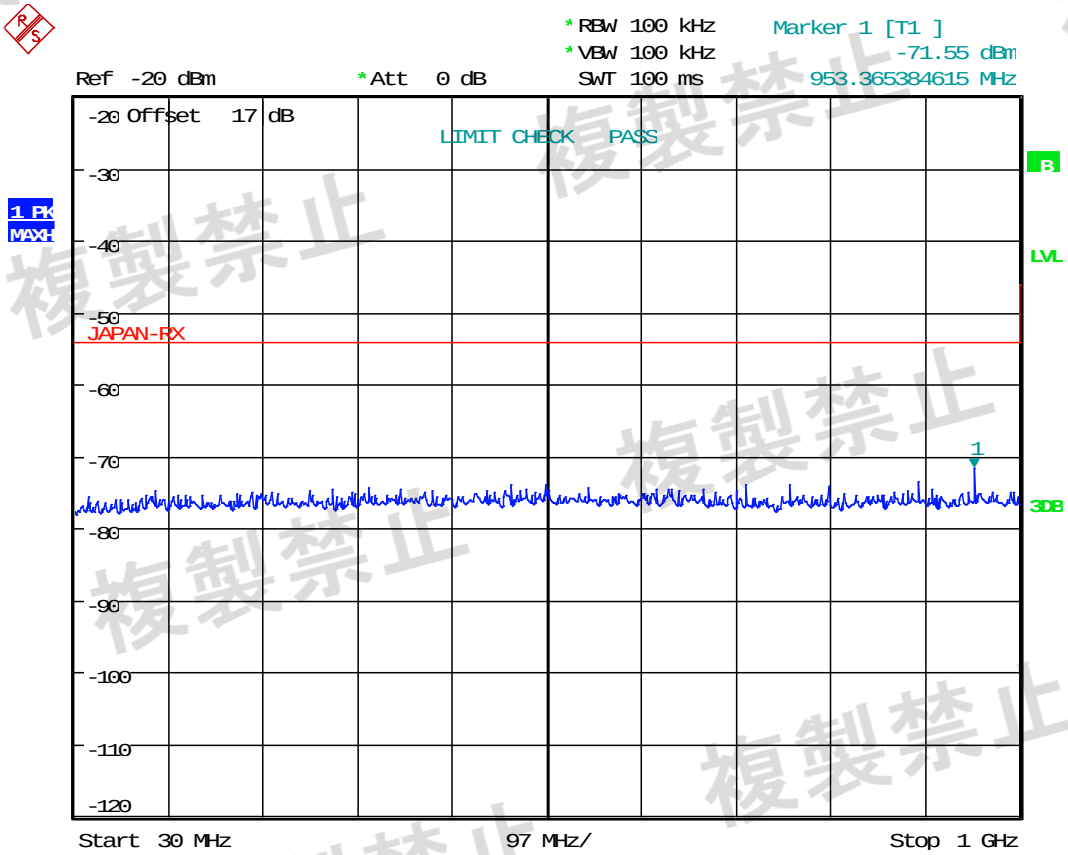
RX CONDUCTED SPURIOUS EMISSION 802.11N 20MHZ CH13 2.97V

Date: 19.JUL.2020 15:50:38



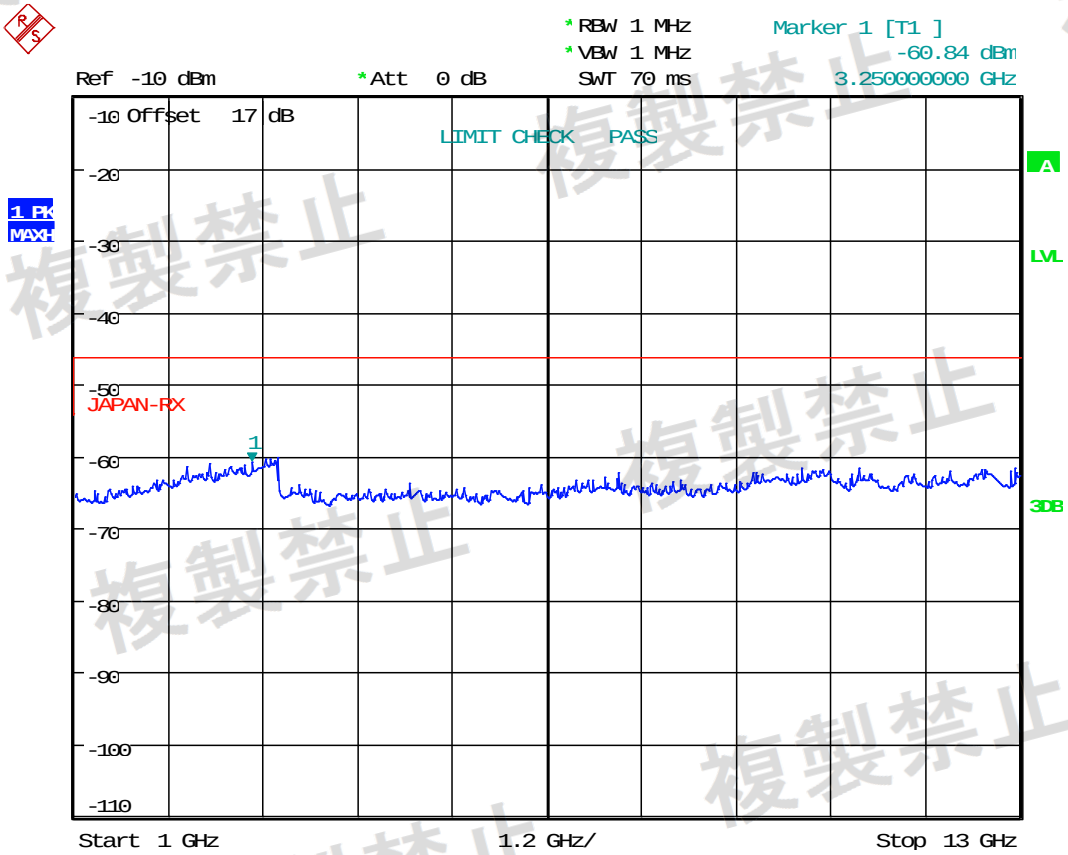
RX CONDUCTED SPURIOUS EMISSION 802.11N 20MHZ CH13 2.97V

Date: 19.JUL.2020 15:52:01



RX CONDUCTED SPURIOUS EMISSION 802.11N 20MHZ CH13 3.63V

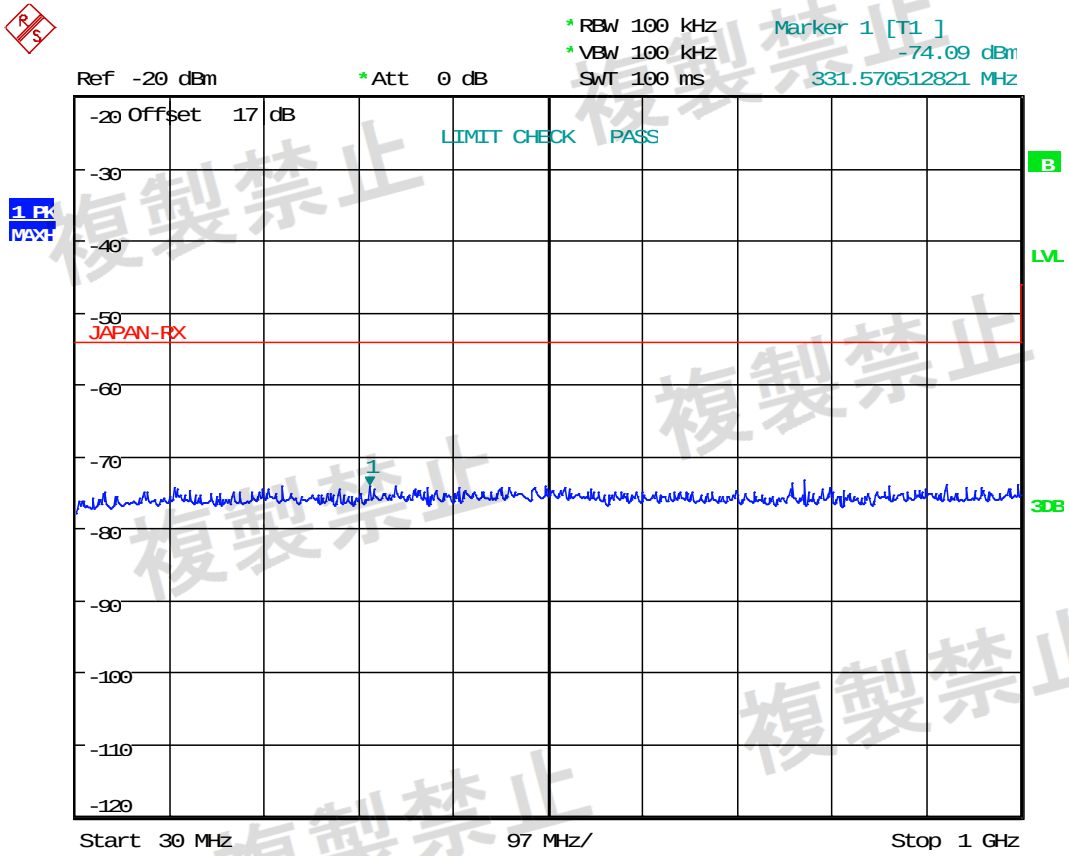
Date: 19.JUL.2020 15:47:34



RX CONDUCTED SPURIOUS EMISSION 802.11N 20MHZ CH13 3.63V

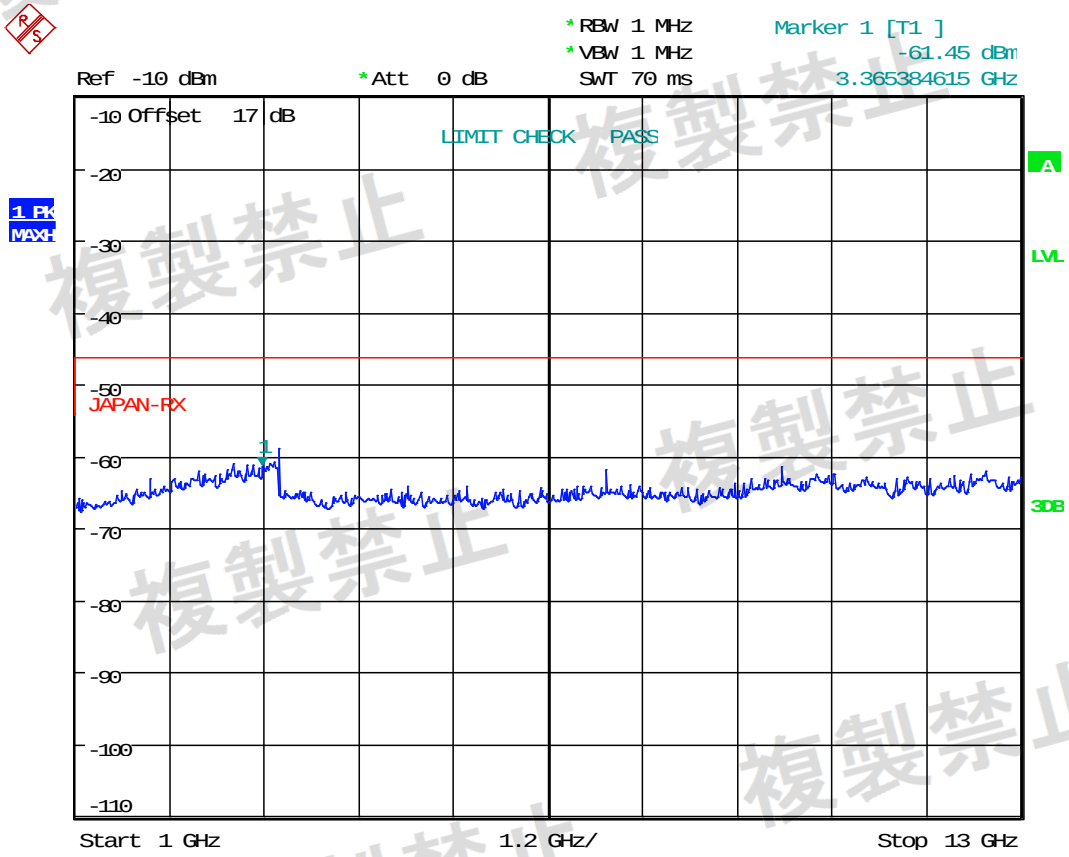
Date: 19.JUL.2020 15:48:34

IEEE 802.11n40



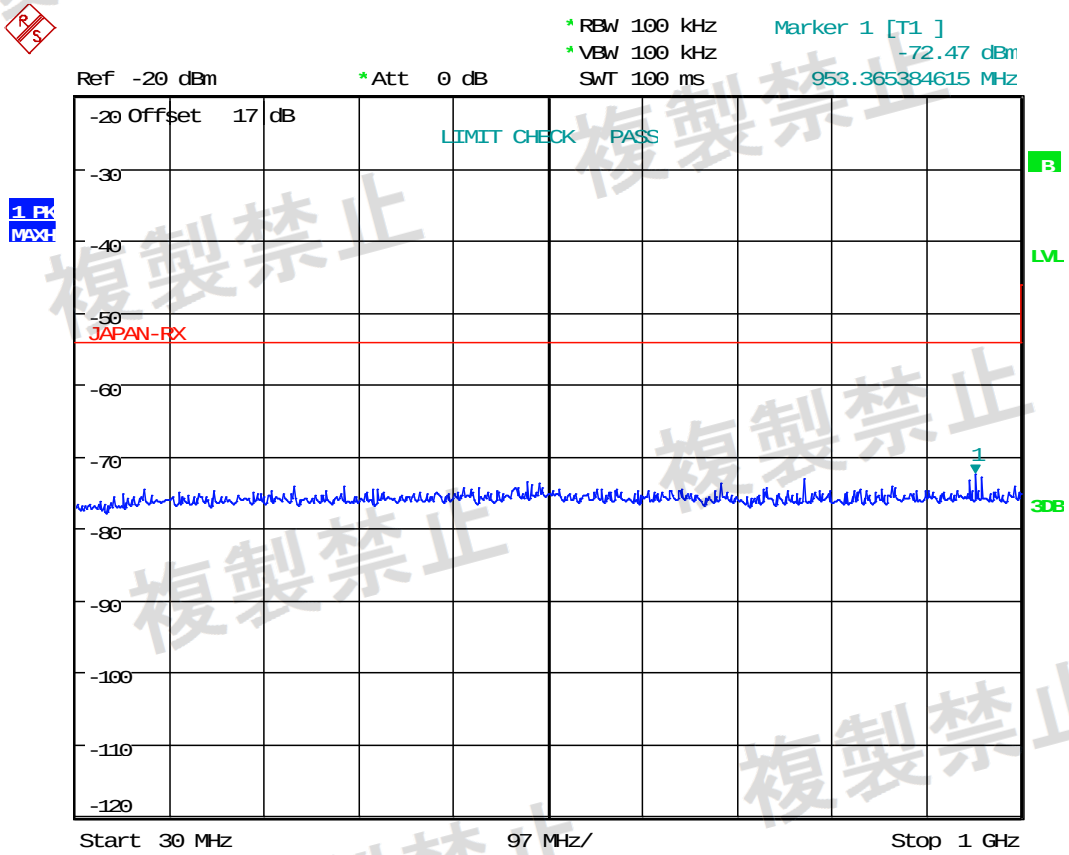
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH3 3.3V

Date: 19.JUL.2020 15:57:02



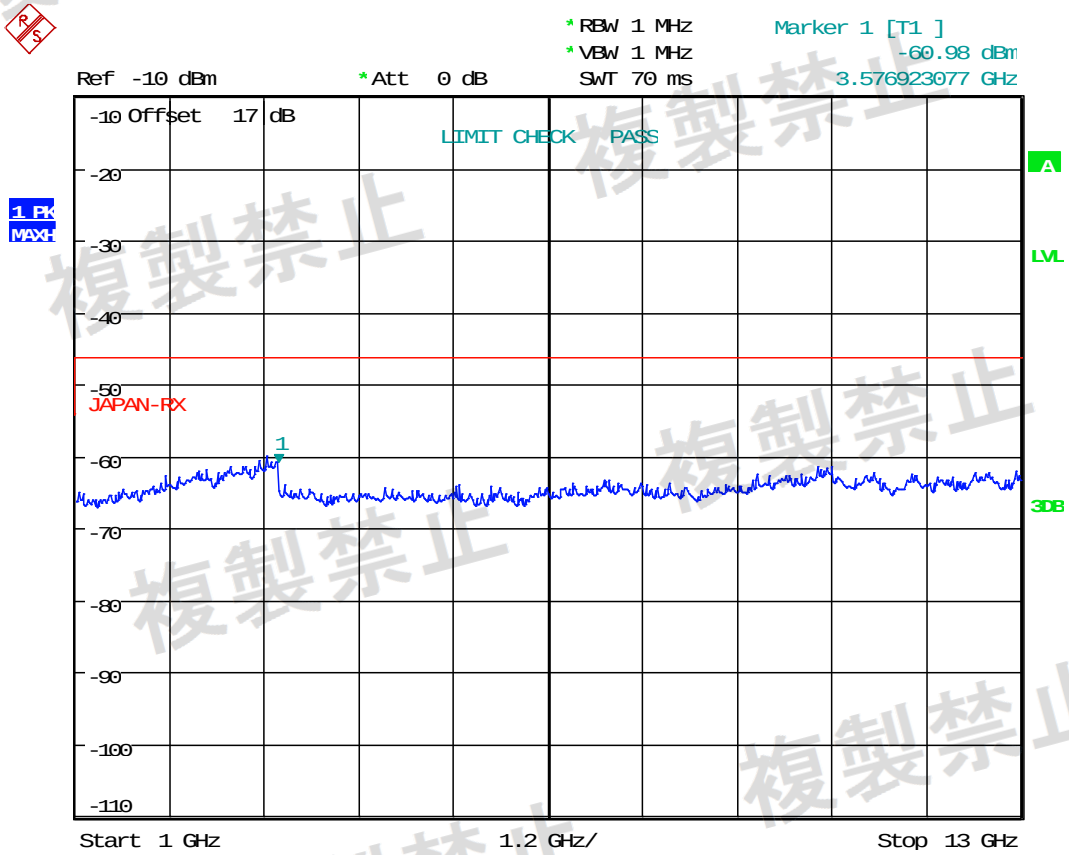
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH3 3.3V

Date: 19.JUL.2020 15:57:13



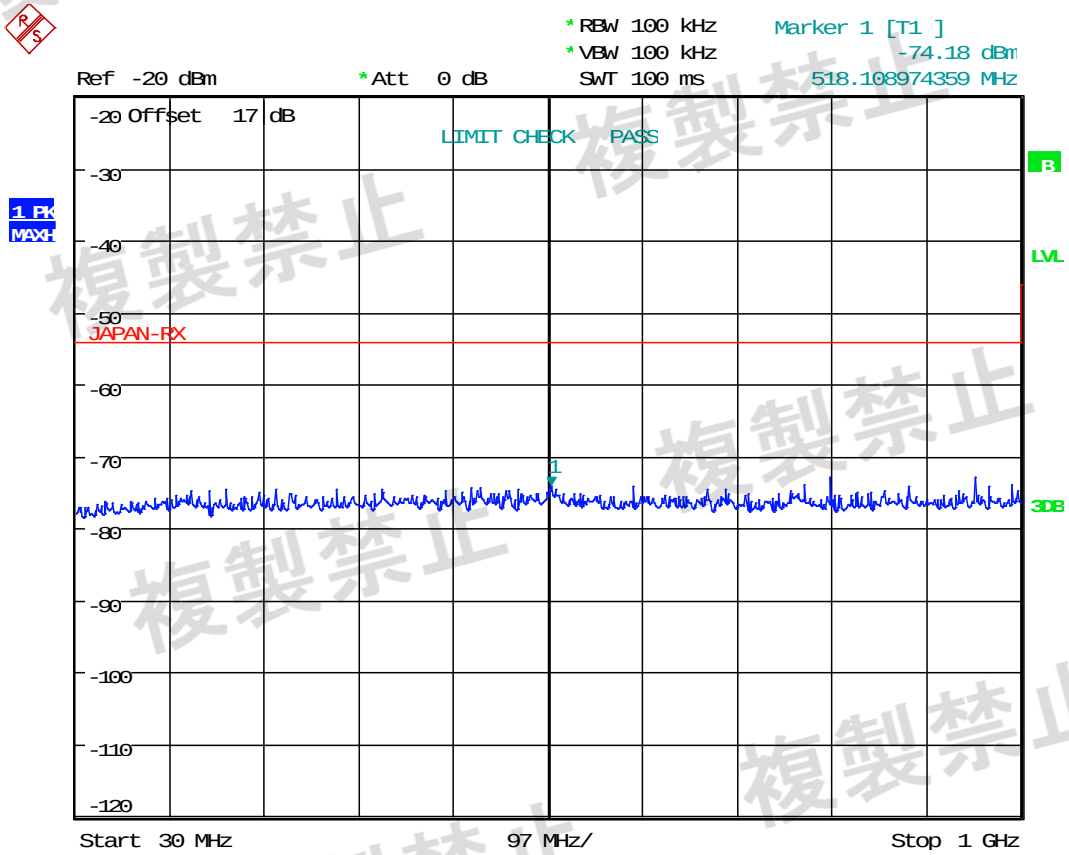
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH3 2.97V

Date: 19.JUL.2020 15:55:07



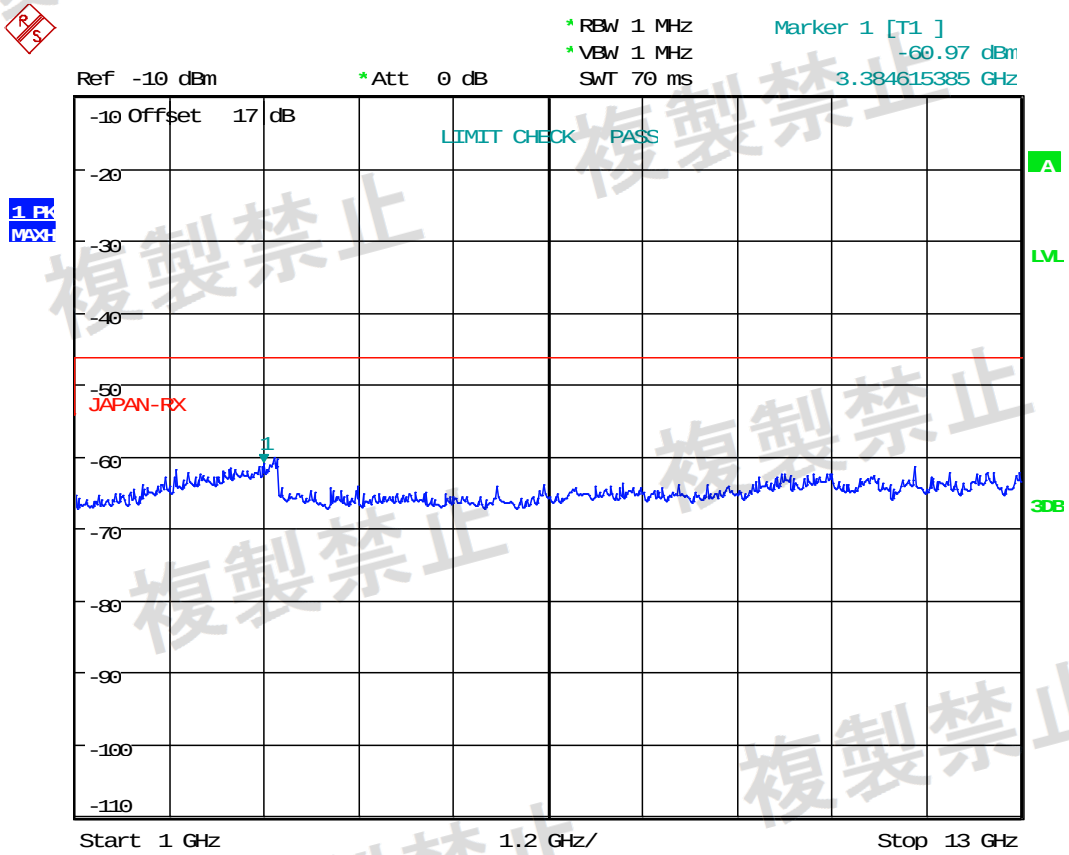
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH3 2.97V

Date: 19.JUL.2020 15:54:11



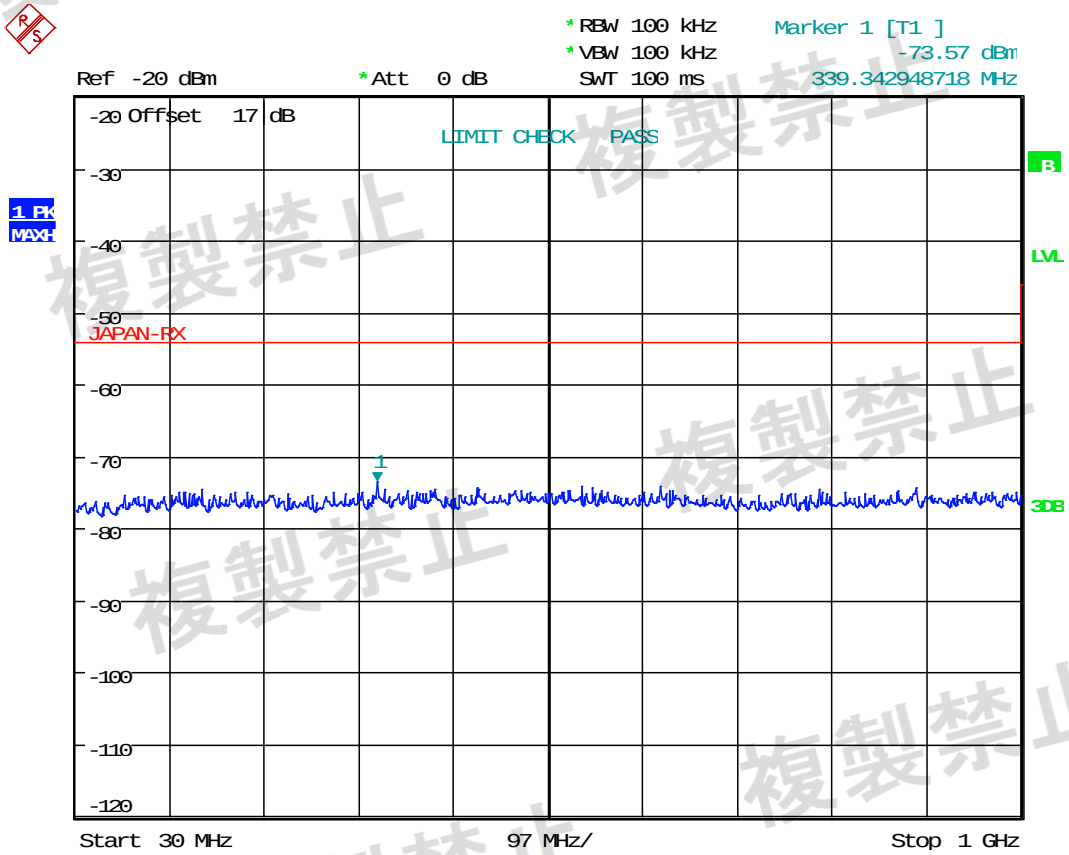
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH3 3.63V

Date: 19.JUL.2020 15:58:28



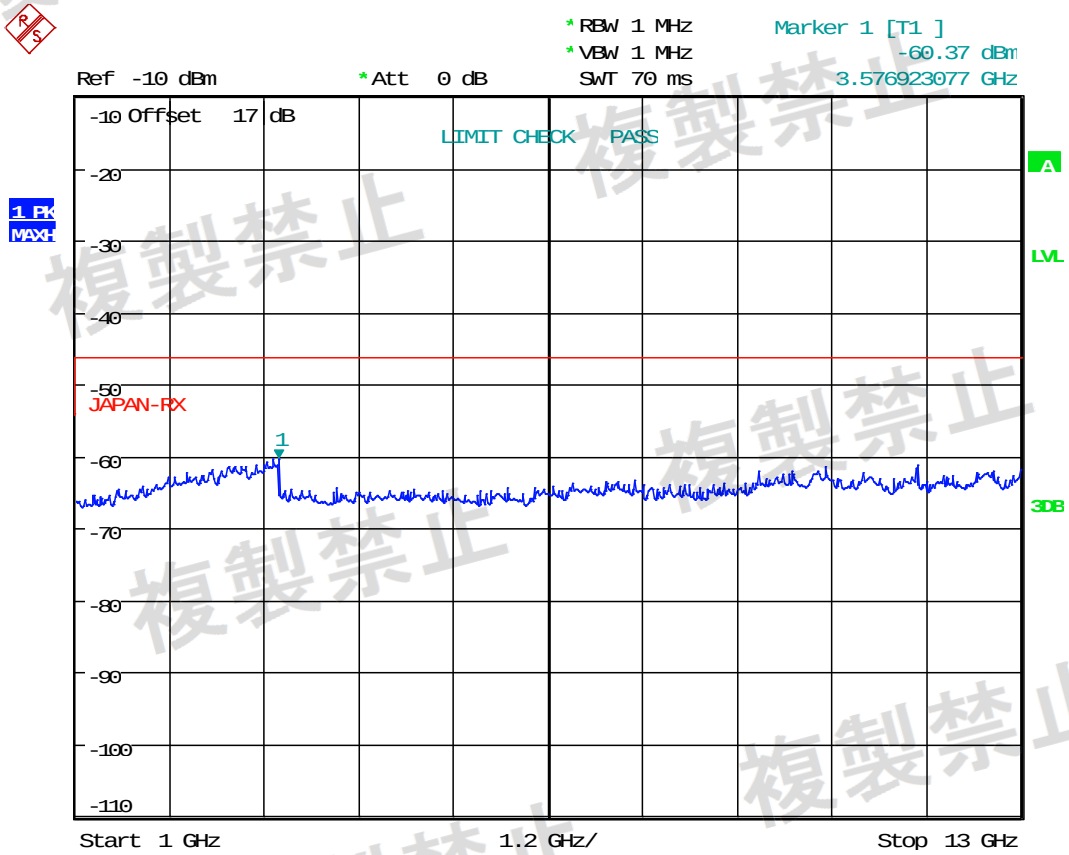
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH3 3.63V

Date: 19.JUL.2020 15:58:12



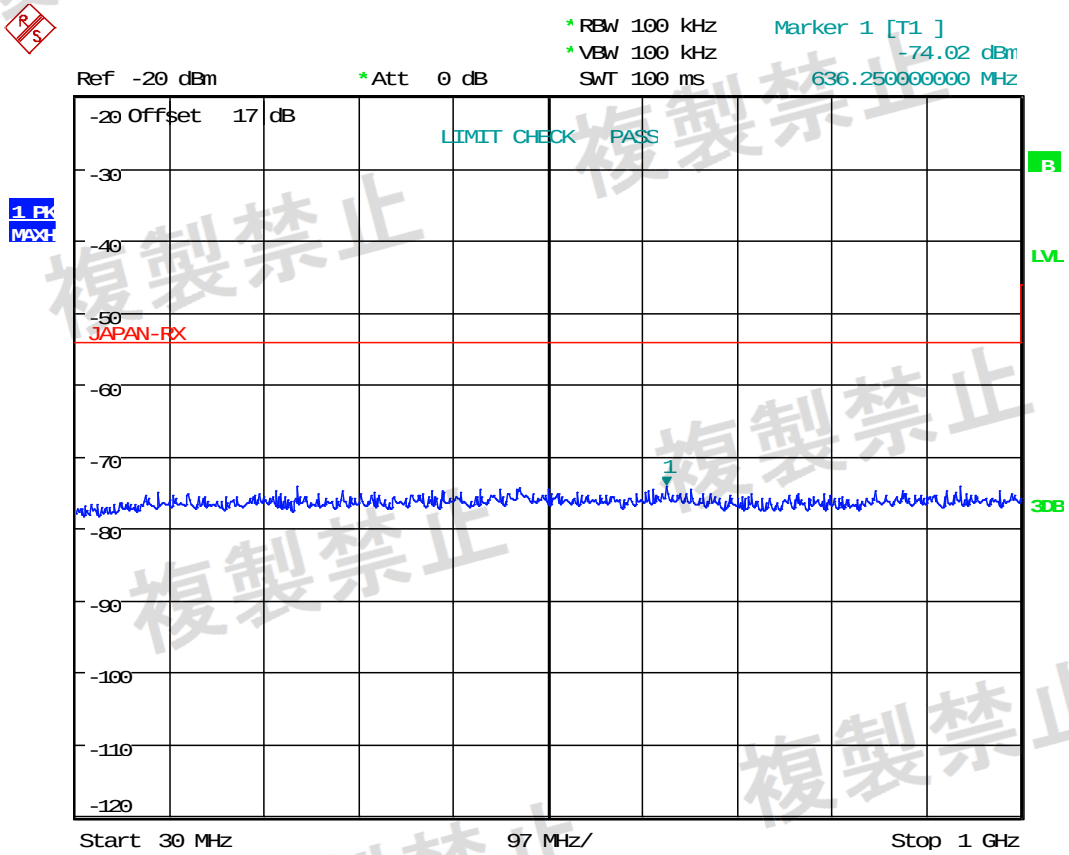
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH7 3.3V

Date: 19.JUL.2020 16:08:52



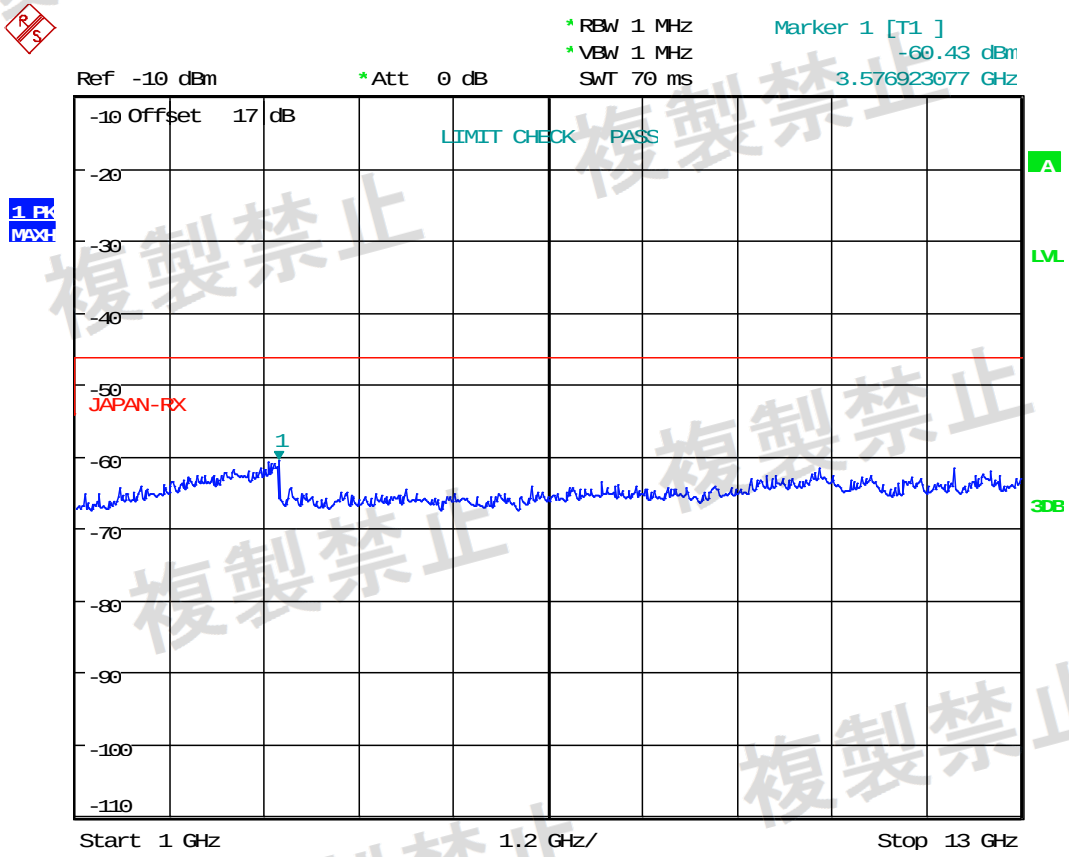
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH7 3.3V

Date: 19.JUL.2020 16:08:39



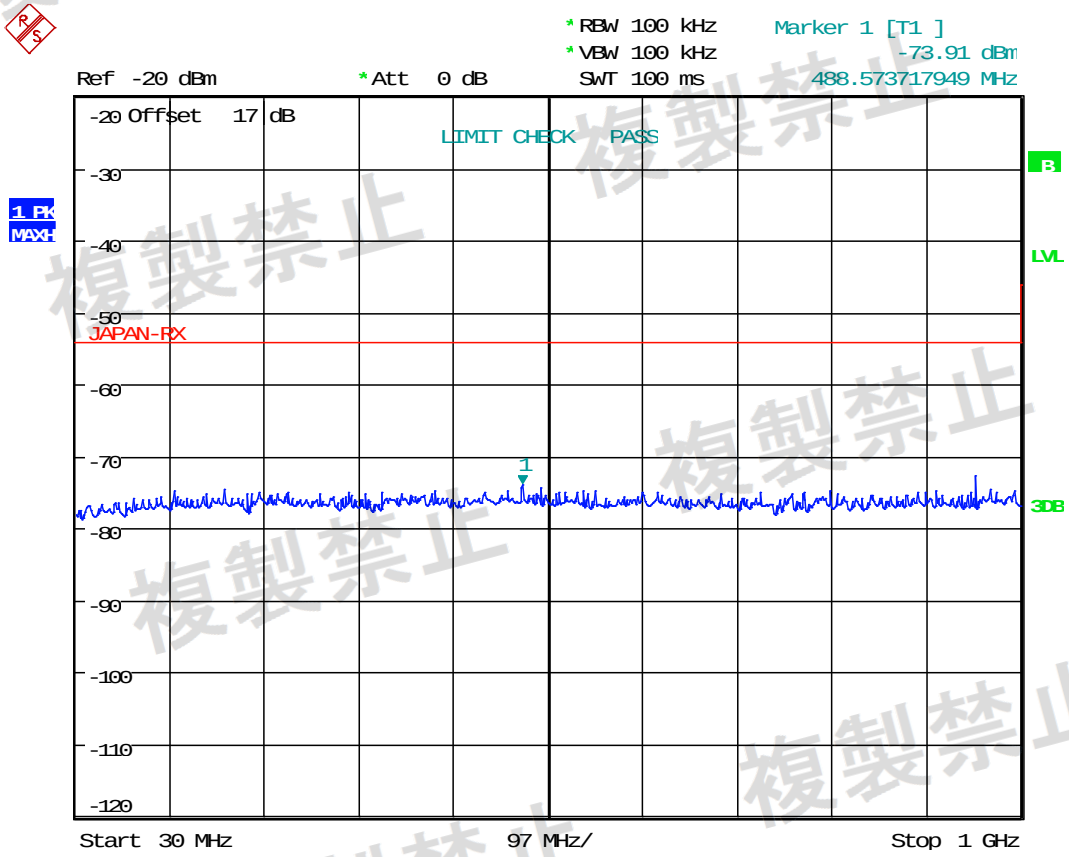
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH7 2.97V

Date: 19.JUL.2020 16:10:14



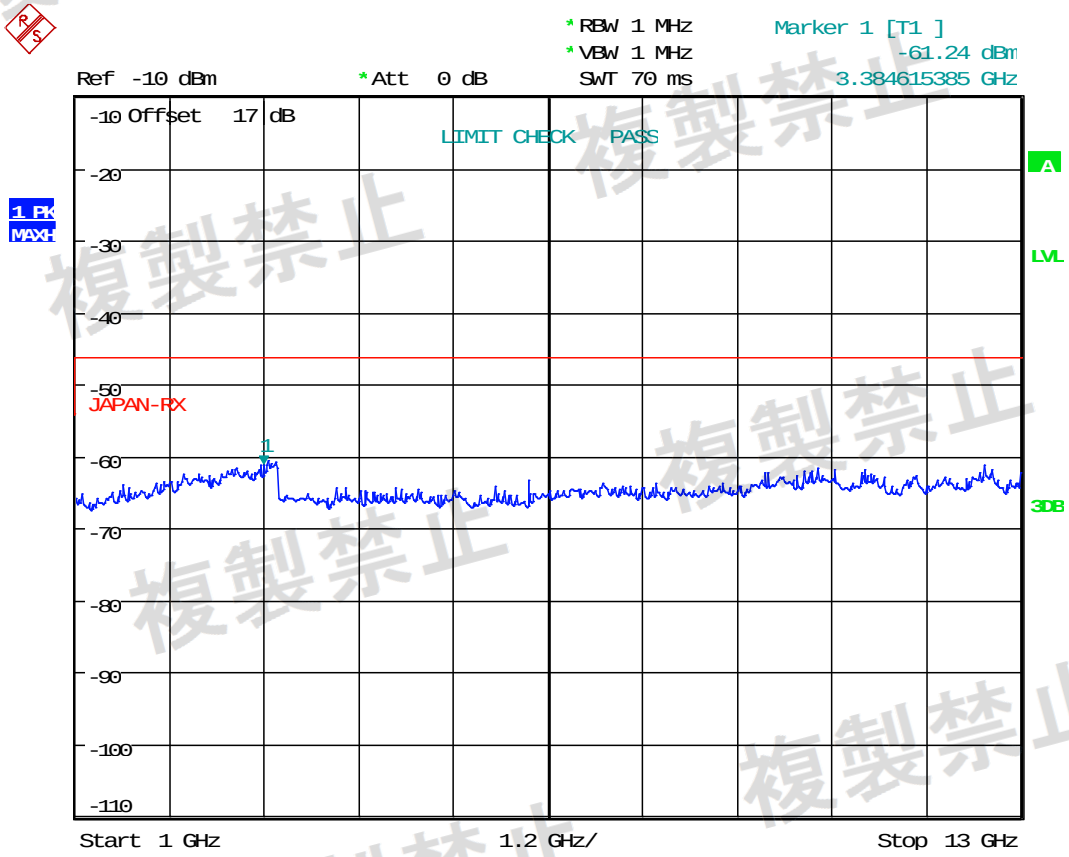
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH7 2.97V

Date: 19.JUL.2020 16:11:31



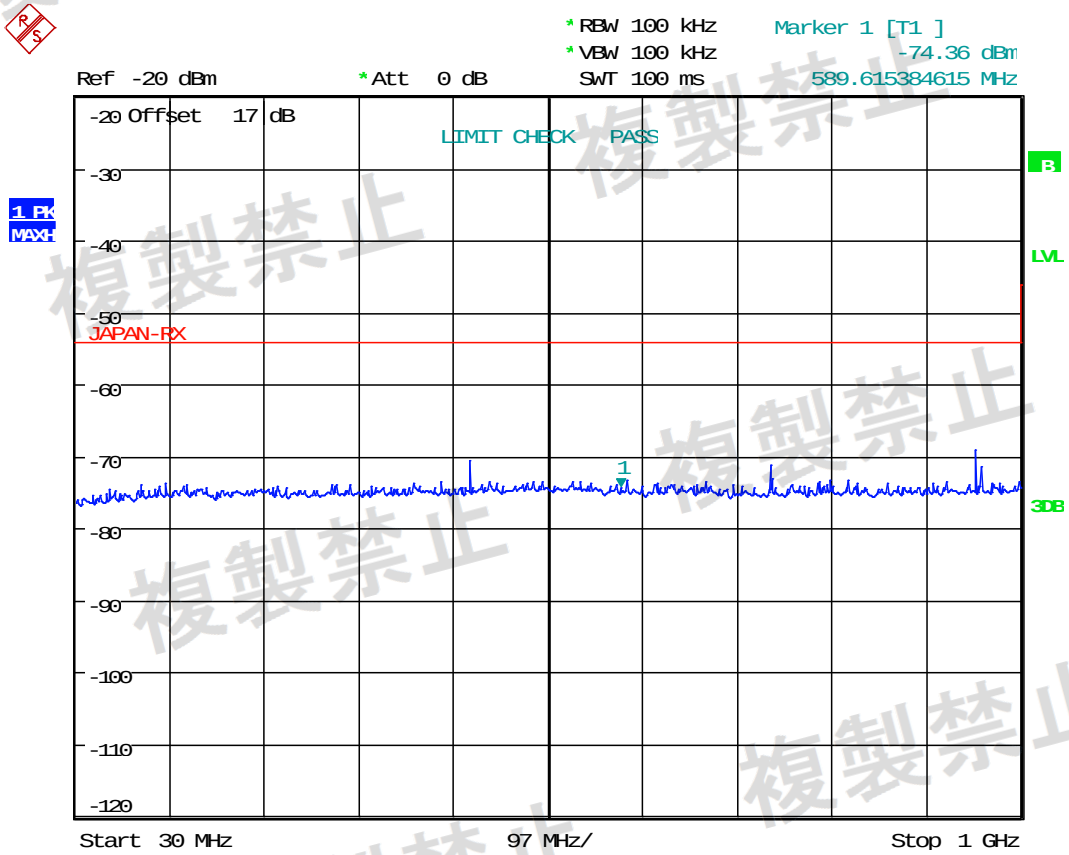
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH7 3.63V

Date: 19.JUL.2020 16:07:24



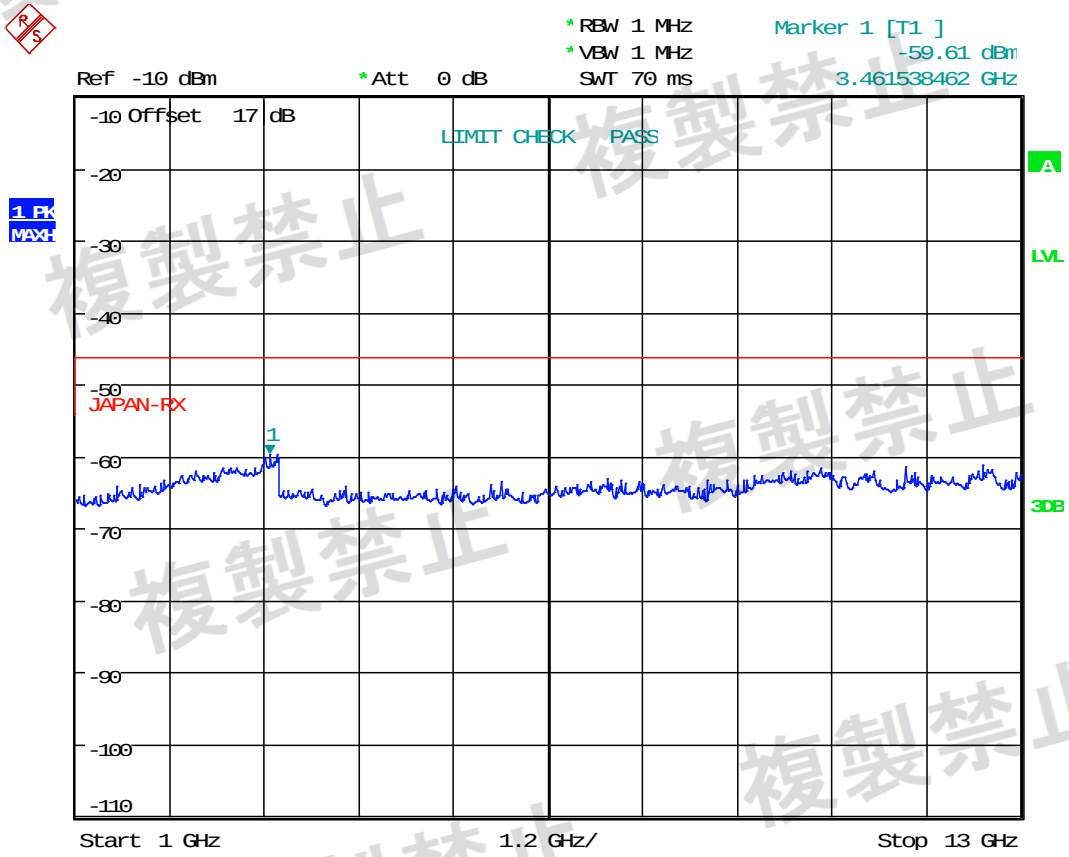
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH7 3.63V

Date: 19.JUL.2020 16:07:37



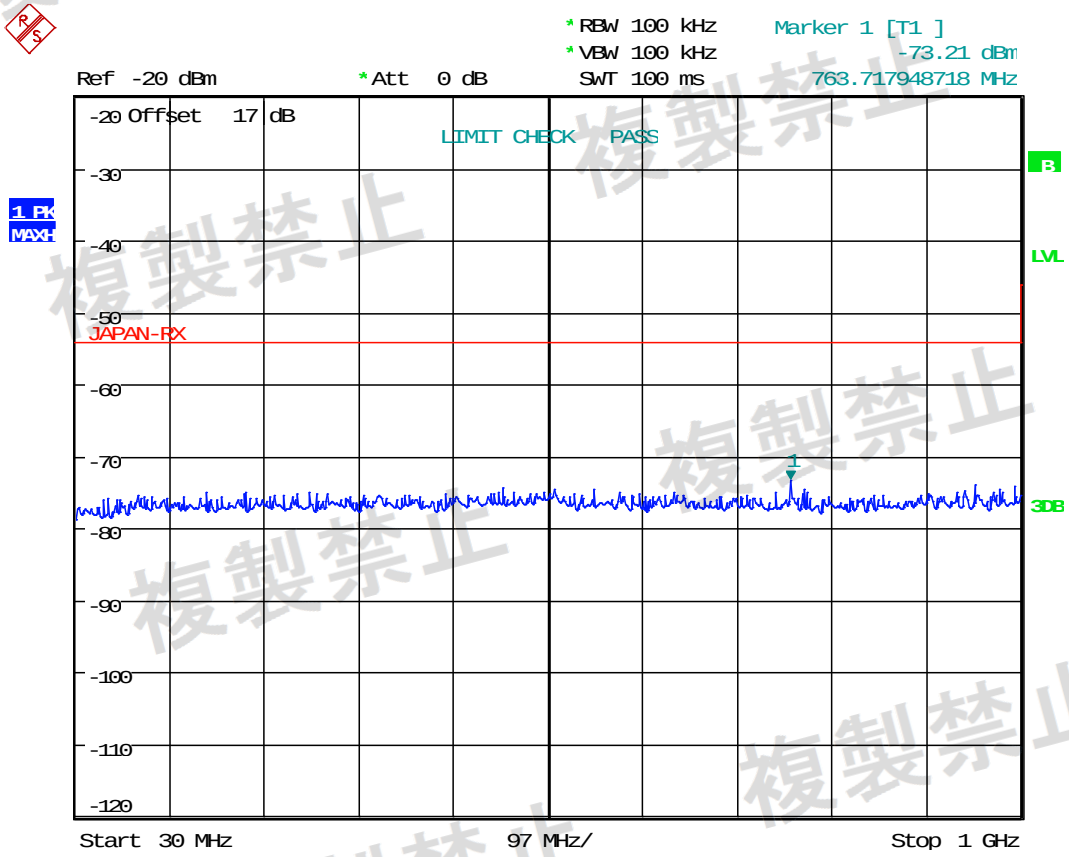
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH11 3.3V

Date: 19.JUL.2020 16:17:16



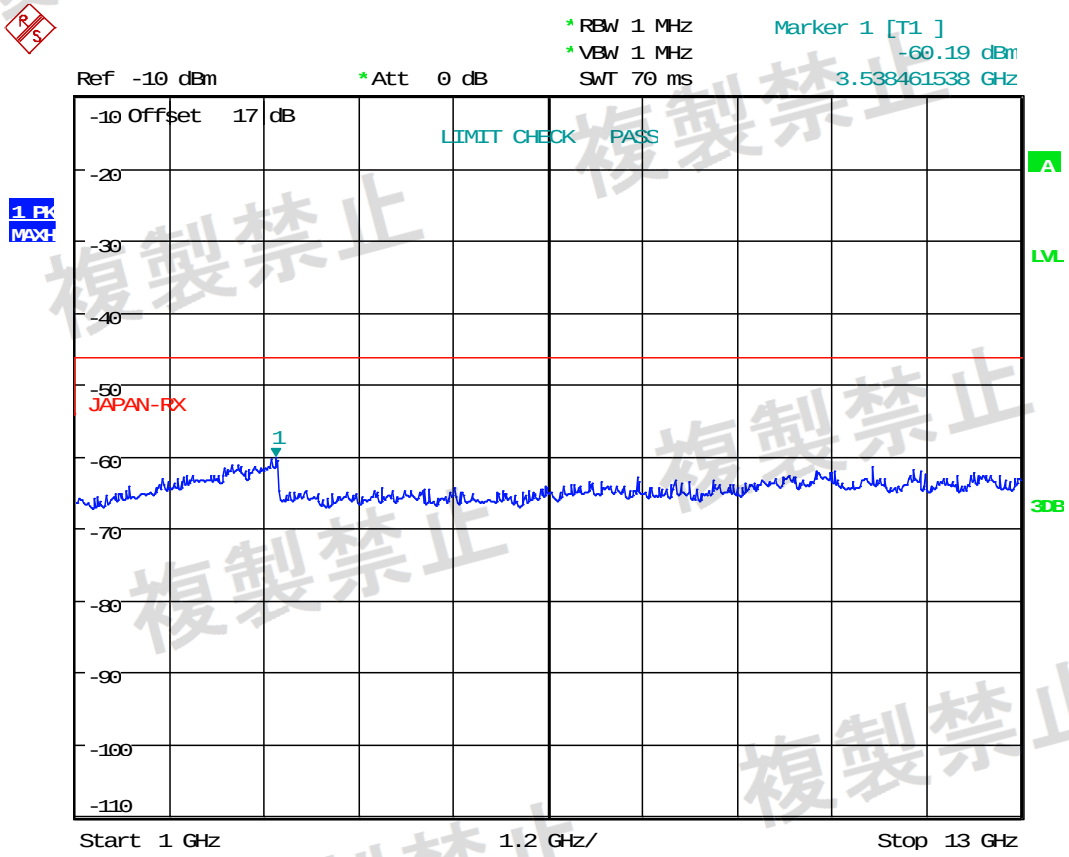
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH11 3.3V

Date: 19.JUL.2020 16:18:24



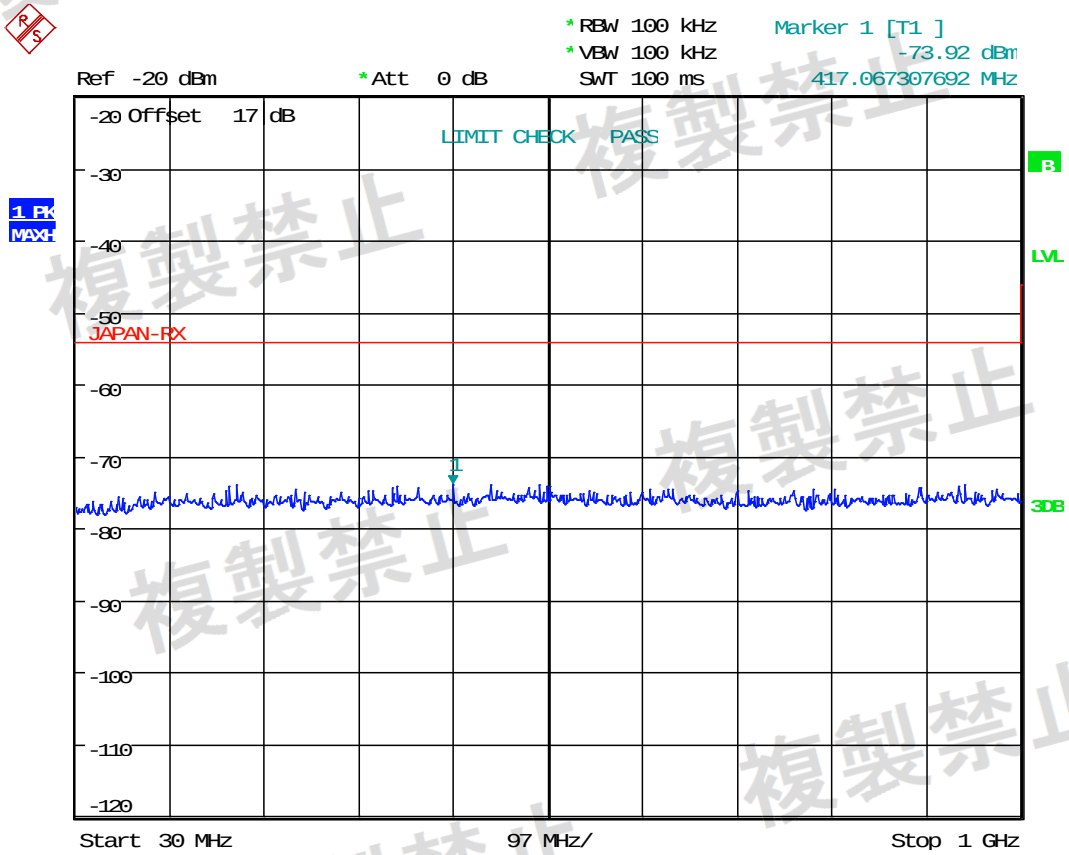
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH11 2.97V

Date: 19.JUL.2020 16:12:36



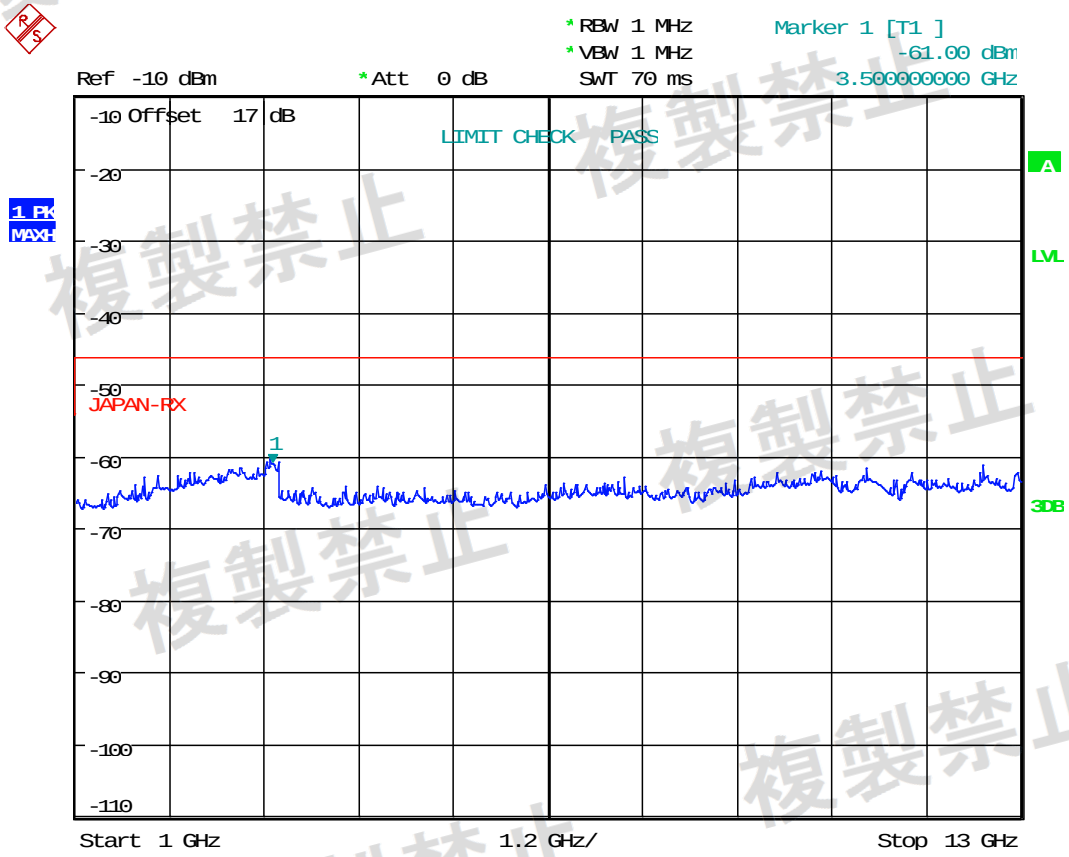
RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH11 2.97V

Date: 19.JUL.2020 16:12:03



RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH11 3.63V

Date: 19.JUL.2020 16:19:39



RX CONDUCTED SPURIOUS EMISSION 802.11N 40MHZ CH11 3.63V
Date: 19.JUL.2020 16:18:54

Limit values:

Receiver operating	≤ 1000 MHz: ≤ 4nW (-54 dBm) ≥ 1000 MHz: ≤ 20nW (-47 dBm)

Test equipment used: ETSTW-RE 050, ETSTW-RE 055, ETSTW-RE 064, ETSTW-GSM 023

3.9 Time of Occupancy (Dwell Time)

Test date: July 18, 2020
Temperature: 24.9 °C
Humidity: 52.1 %
Tester: Spencer Yang

Mode: GFSK, π/ 4DQPSK, 8DPSK

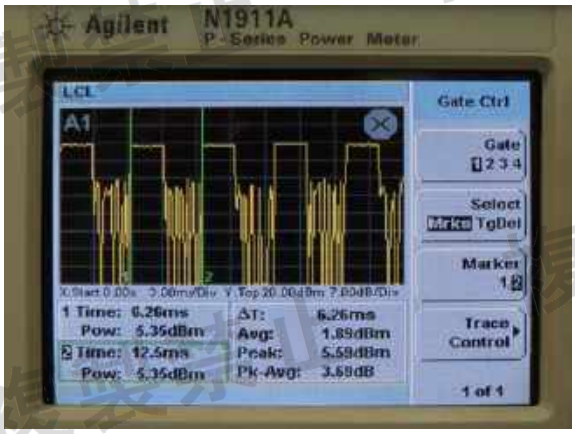
Test conditions		Operating mode	Measurement period	Time of Occupancy
T_{nom}= 23 ° C	V_{nom} =3.3 V	normal transmitting DH5	28.62	0.1661s
	V_{low} =2.97 V			
	V_{high} =3.63 V			

Note: Measurement period = Spreading Bandwidth (71.538461538 MHz) × 0.4 seconds = 28.62 sec.

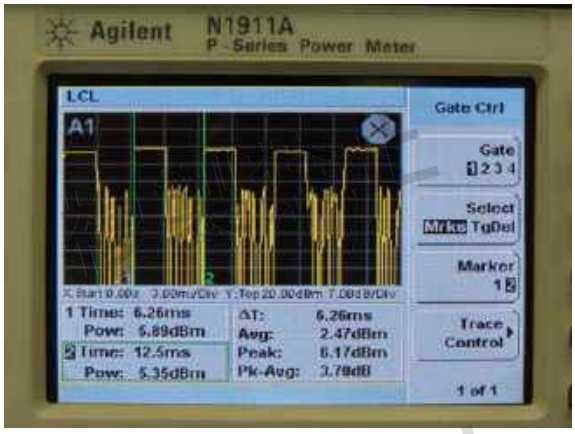
Duty cycle = 2.87 / 6.26 =0.4585

Dwell time = [spreading rate / 79 channels] × duty cycle × 0.4 seconds
= 71.538461538 / 79 ×0.4585 ×0.4 = 0.1661

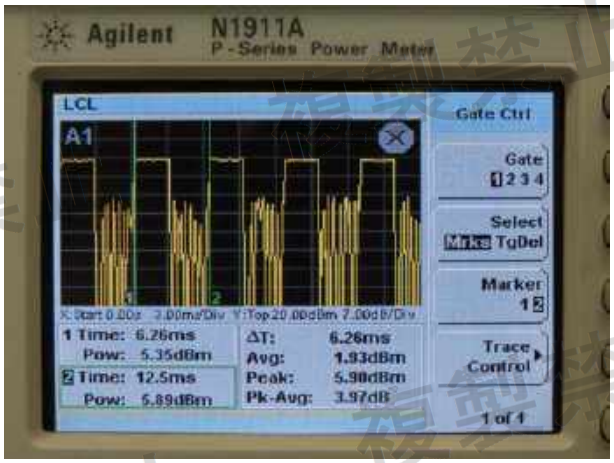
Mode: GFSK
3.3 VDC



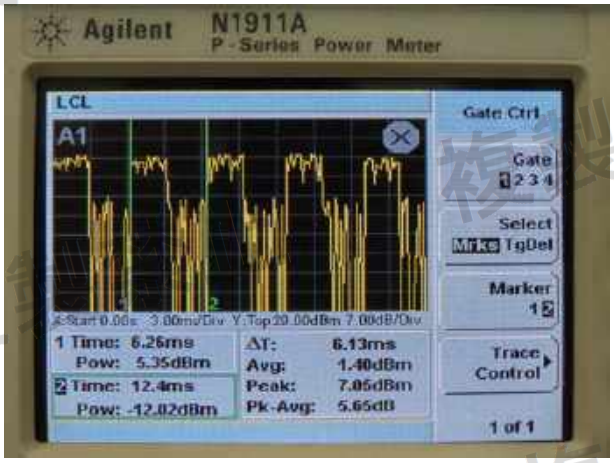
2.97 VDC



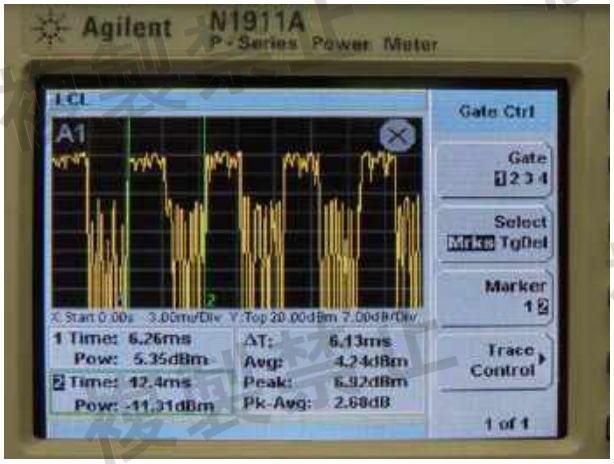
3.63 VDC



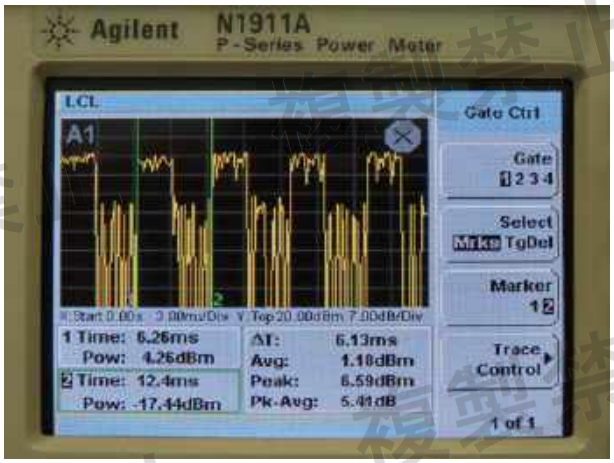
Mode: π / 4DQPSK
3.3 VDC



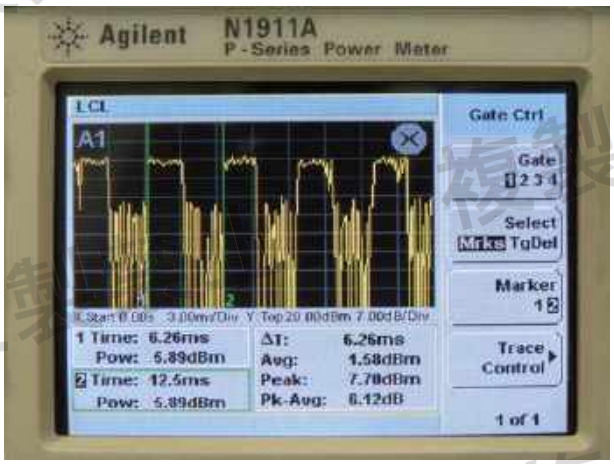
2.97 VDC



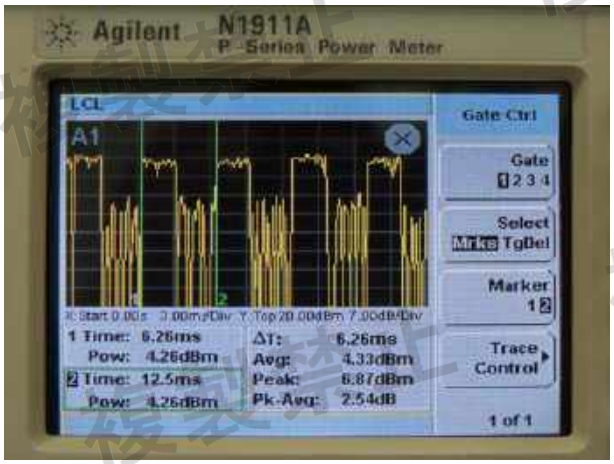
3.63 VDC



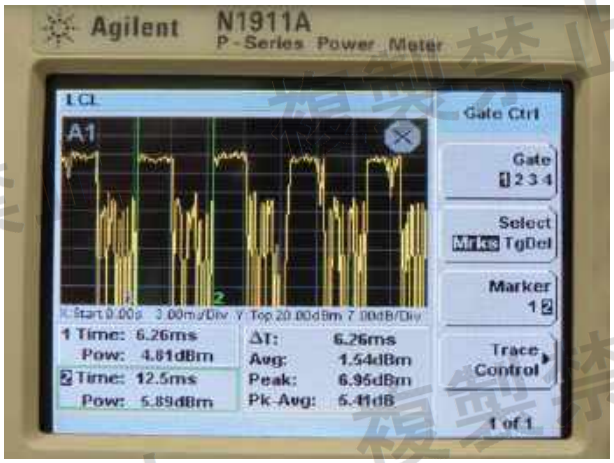
Mode: 8DPSK
3.3 VDC



2.97 VDC



3.63 VDC



Limits:

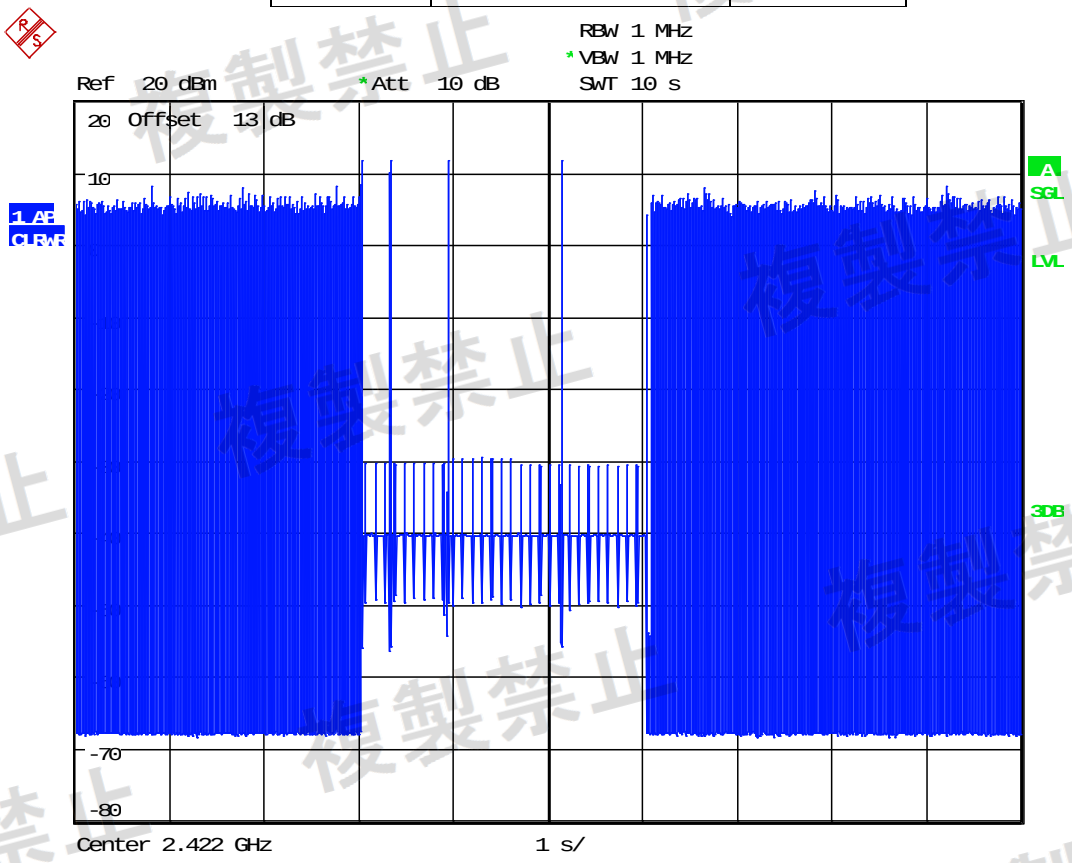
Holding time of hopping frequency	≤ 0.4 sec. The total sum of holding time at arbitrary frequencies within the time multiplied 0.4 sec. by the spreading rate.

Test equipment used: ETSTW-RE 050, ETSTW-RE 064, ETSTW-GSM 023, ETSTW-RE 073, ETSTW-RE 074

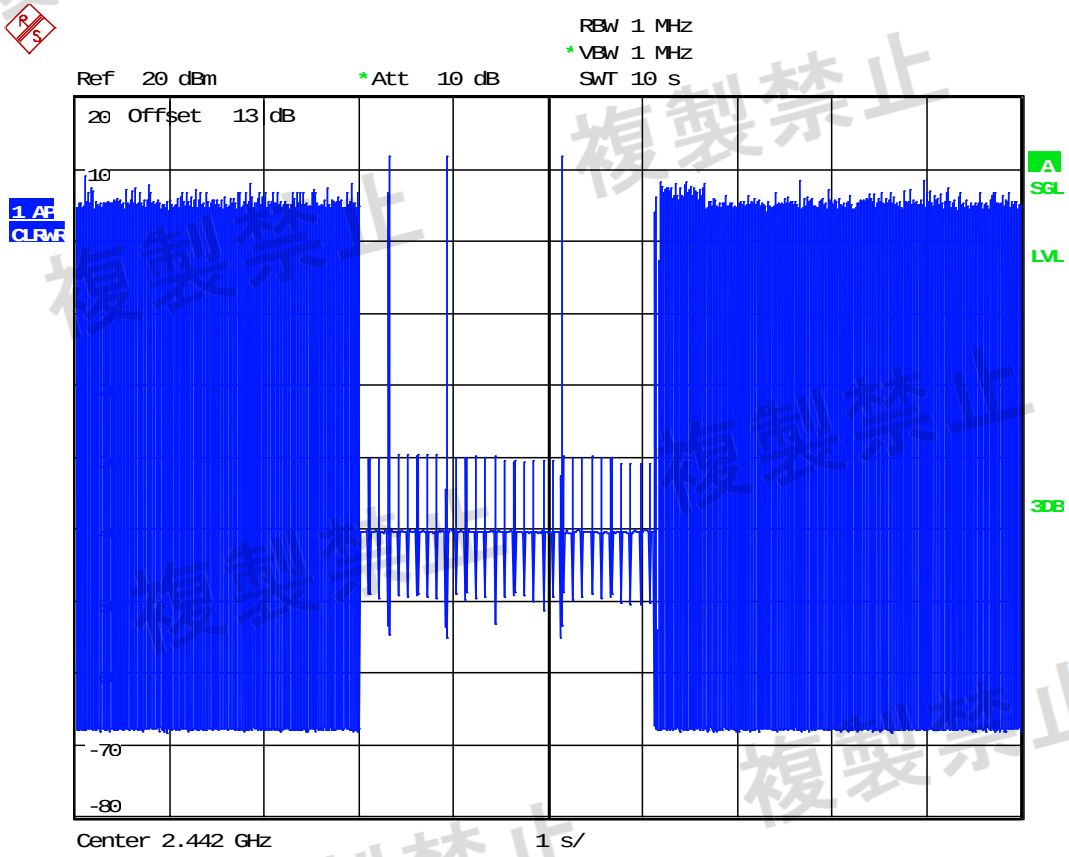
3.10 Carrier sensing function

Test date: July 27, 2020
Temperature: 25.9 °C
Humidity: 49.2 %
Tester: Spencer Yang

Frequency (MHz)	Max. Antenna Gain (dBi)	Input Level (dBm)
2422	5.5	-39.39
2442	5.5	-39.46
2462	5.5	-39.54

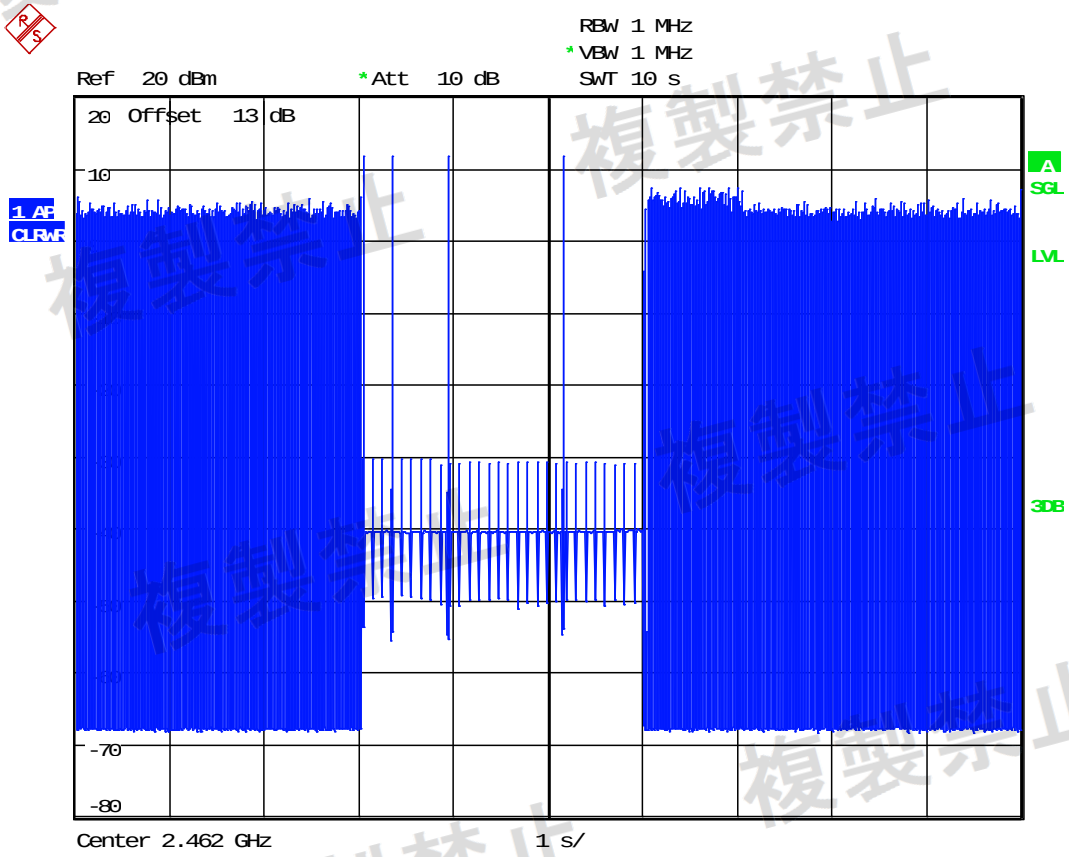


CARRIER SENSING 802.11N 40MHZ CH3
Date: 28.JUL.2020 18:12:30



CARRIER SENSING 802.11N 40MHZ CH7

Date: 28.JUL.2020 18:15:01



CARRIER SENSING 802.11N 40MHZ CH11

Date: 28.JUL.2020 18:17:27

Explanation: Antenna Voltage (in dBm) = 22.79 + max. antenna Gain - 20 x Log f (f in MHz). This voltage will be generated in de direction of the max. Gain.

Limit: Shall not transmit radio wave when receiving over 100mV/m

Test equipment used: ETSTW-RE 050, ETSTW-RE 055, ETSTW-RE 122