

MIC 5G WIFI TEST REPORT

Application No.:	ZR/2019/A0029
Applicant:	Lenovo(Shanghai) Electronics Technology Co., Ltd.
Address of Applicant:	Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone
Manufacturer:	23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong P.R.China
Address of Manufacturer:	Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone
Factory:	MOTOROLA (WUHAN) MOBILITY TECHNOLOGIES COMMUNICATION CO. LTD.
Address of Factory:	19 GAOXIN 4TH RD, EAST LAKE HIGH TECH ZONE, WUHAN HUBEI CHINA
Product Name:	Portable Tablet Computer
Model No.:	Lenovo TB-X606F
Trade Mark:	Lenovo
Standards:	Item 19-3 of Article 2 Paragraph 1
Date of Receipt:	2019/11/9
Date of Test:	2019/11/10 to 2019/12/09
Date of Issue:	2019/12/10
Test Result:	PASS *

* In the configuration tested, the EUT (Equipment under test) complied with the standards specified above.

Authorized Signature:

Derek Yang

Derek Yang
Wireless Laboratory Manager

Member of the CTS Group (CSTC Group)

1 Version

Revision Record			
Version	Chapter	Date	Modifier
00		2019/12/10	Original



Member of the CTS Group (CSTC Group)

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Test	Test Requirement	Limit/Severity	Result
Antenna Requirement		Notice 88 Appendix 43.B-1 (1)&(2)	PASS
Frequency Error		±20 PPM or less	PASS
Occupied Bandwidth		19.7MHz or less for 20MHz system; 38MHz or less for 40MHz system; 78MHz or less for 80MHz system	PASS
Spurious Emission of Tx		OB: ≤19.7MHz <8455MHz, >5745MHz: ≤2.5 μV/MHz OB: 19.7-38MHz <5420MHz, >5760MHz: ≤2.5 μV/MHz OB: 38-78MHz <5340MHz, >5800MHz: ≤2.5 μV/MHz	PASS
Antenna Power		10mW/MHz or less for 20MHz system 5mW/MHz or less for 40MHz system 2.5mW/MHz or less for 80MHz system Tolerance: +50% to -50%	PASS
Equivalent isotropically radiated power (EIRP)		20mW/MHz or less for 20MHz system 25mW/MHz or less for 40MHz system 12.5mW/MHz or less for 80MHz system OB: ≤20MHz	PASS
Adjacent channel power tolerance	Item 19-3 of Article 2-1	Channel power of ±10MHz 1. Frequency offset = 20MHz ≤25dBc 2. Frequency offset = 40MHz ≤40dBc OB: 20-40MHz Channel power of ±20MHz 1. Frequency offset = 40MHz ≤25dBc 2. Frequency offset = 80MHz ≤40dBc OB: 40-80MHz Channel power of ±40MHz 1. Frequency offset = 80MHz ≤25dBc	PASS
Tolerance of Unwanted Emission Intensity		Attached table 1, 2, 3	PASS
Spurious Emission of Rx		(1) Below 1 GHz: ≤4nW(-54dBm) (2) 1GHz-10GHz: ≤20nW(-47dBm) (3) 10GHz or higher: ≤20nW(-47dBm)	PASS
Interference prevention function		Notice 88 Appendix 43, 44, 45	PASS
Carrier sense function		Shall not transmit radio wave when receiving over 100mV/m	PASS
Transmission Burst Length		8ms or less	PASS

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

Bx: In this whole report Bx (or α) means Receiver

RF: In this whole report RF means Radio Frequency.

4 General Information

4.1 Client Information

Applicant: Lenovo(Shanghai) Electronics Technology Co., Ltd.
Address of Applicant: Section 304-305, Building No. 4, # 222, Meiye Road, China (Shanghai) Pilot Free Trade Zone
Manufacturer: 23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong P.R.China
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Factory: MOTOROLA (WUHAN) MOBILITY TECHNOLOGIES COMMUNICATION CO.,LTD.
Address of Factory: 19 GAOXIN 4TH RD, EAST LAKE HIGH TECH ZONE, WUHAN HUBEI CHINA

4.2 General Description of EUT

Product Name: Portable Tablet Computer
Model No.: Lenovo TB-X606F
Trade Mark: Lenovo

4.3 Technical Specifications

Operation Frequency: 5470-5725MHz
Modulation Technique: OFDM
Transmit Data Rate: 802.11a: 6M/9M/12M/18M/24M/36M/48M/54M bps
802.11n20/n40:MCS0/ MCS1/ MCS2/ MCS3/ MCS4/ MCS5/ MCS6/ MCS7
802.11ac20/ac40/ac80:MCSA0/ MCSAC1/ MCSAC2/ MCSAC3/ MCSAC4/ MCSAC5/ MCSAC6/ MCSAC7
Channel Separation: 5 MHz
Antenna Type: ☐ External, ☒ Integrated
Antenna Gain: -2.51dBi
Normal antenna power: 10mW/MHz for 20MHz system;
EUT power supply: Lithium Battery (3.86V)

4.4 Details of Test Mode

Test Mode	Description of Test Mode
Engineering mode	Using test software to control EUT working in continuous transmitting and receiving, and channel and modulation type.

4.5 Description of Support Units

The EUT has been tested independent unit.

4.6 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab
No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China 518057
Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594
No tests were sub-contracted.

4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

• FCC -Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Industry Canada (IC)

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.



4.8 Measurement Uncertainty

No.	Parameter	Measurement Uncertainty
1	Radio Frequency	$< \pm 1 \times 10^{-5}$
2	Total RF power, conducted	$< \pm 1.5 \text{ dB}$
3	RF power density, conducted	$< \pm 3 \text{ dB}$
4	Spurious emissions, conducted	$< \pm 3 \text{ dB}$
5	All emissions, radiated	$< \pm 6 \text{ dB (30MHz - 1GHz)}$ $< \pm 6 \text{ dB (above 1GHz)}$
6	Temperature	$< \pm 1^\circ\text{C}$
7	Humidity	$< \pm 5 \%$
8	DC and low frequency voltages	$< \pm 3 \%$

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5 Instruments Used during Test

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
Humi Temp Indicator	Shanghai Meteorological Industry Factory	HTC-1	W006-14	2019/4/15	2020/4/15
Spectrum Analyzer	Rohde & Schwarz	FSV	W025-05	2019/2/13	2020/2/12
Barometer	ChangChun	DYM3	SEI0098	2019/4/3	2020/4/3
Dual Output Mobile Communication DC Source	Agilent Technologies Inc	86311B	W009-09	2019/7/15	2020/7/14
Digital Multimeter	Fuke	15B+	W059-01	2019/2/13	2020/2/12
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	W005-21	2019/4/9	2020/4/9
Wideband Radio Communication Tester	Arriault	MT8822C	5201502984	2019/6/25	2020/6/25
Universal Radio Communication Tester	Rohde & Schwarz	CNU200	W005-01	2019/6/25	2020/6/25
Wideband Radio Communication Tester CMW500	Rohde & Schwarz	CMW500	W005-20	2019/11/18	2020/11/17
Wideband Radio Communication Tester CMW500	Rohde & Schwarz	CMW500	W005-19	2019/11/18	2020/11/17
Dual Antenna Combiner	Anite	Dual Antenna Combiner	SN1C21113	2018/8/26	2020/8/26

Remark:

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

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

Notice: Calibration duration for above equipments is 1 year.



6.2 E.U.T. test conditions

Power supply:

The RF unit is supplied DC 3.86V. The fluctuation of input voltage to the circuit of RF unit of test equipment is under $\pm 1\%$, when input voltage from DC3.86V to the test equipment is fluctuated by $\pm 10\%$. So all measurement has been conducted by only rated voltage.

The measurement result of the voltage fluctuation at RF circuit when DC3.3V \pm 1%.			
DC Input		input voltage to the circuit	Deviation
High Voltage	4.4V	3.33V	0.91%
Normal Voltage	3.86V	3.30V	0.00%
Low Voltage	3.5V	3.28V	-0.61%

-10 -55.0 °C	If the EUT can be set to 3 of more different (carrier) frequencies in allocated band, testing shall be performed using the Lowest, Middle and the Highest frequency (L, M and H). If there are 2 or fewer frequencies, testing shall be performed with the available frequencies.
45-85 % RH	
101KPa -102 KPa	

45-85 % RH

101KPa -102 KPa

If the EUT can be set to 3 or more different (carrier) frequencies in 1 allocated band, testing shall be performed using the Lowest, Middle and the Highest frequency (L, M and H). If there are 2 or fewer frequencies, testing shall be performed with the available frequencies.

Operation Frequency of channel		Band III (5.47-5.725GHz)
Channel	Frequency	
100	5500MHz	
102	5510 MHz	
104	5520MHz	
106	5530MHz	
108	5540MHz	
110	5550 MHz	
112	5560MHz	
114	5570MHz	
116	5580MHz	
118	5590 MHz	
120	5600MHz	
122	5610MHz	
124	5620MHz	
126	5630 MHz	
128	5640MHz	
132	5660MHz	
134	5670 MHz	
136	5680MHz	
140	5700MHz	

For 802.11a/n/ac(HT20):

Channel	Frequency
100	5500MHz
120	5600MHz
140	5700MHz
144	5720MHz

For 802.11ac/n(HT40):

Channel	Frequency
102	5510MHz
118	5590 MHz
134	5670MHz
142	5710MHz



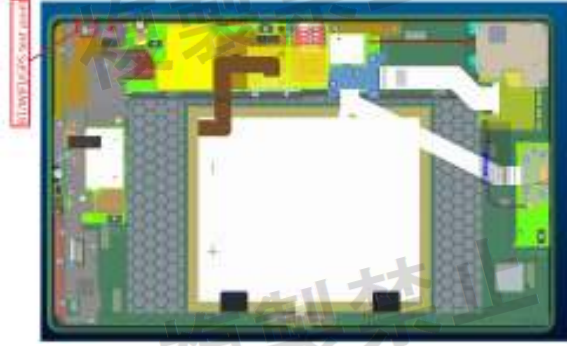
For 802.11ac(HT80):

Channel	Frequency
106	5530MHz
122	5610MHz
138	5690MHz



6.3 Antenna Requirement Standard requirement

Applicable for equipment with an antenna terminal, including testing terminals) If an antenna connector is available, all relevant tests will be carried out conducted. If not, tests will be carried out in an anechoic room or with a suitable test-fixture.



EUT Antenna

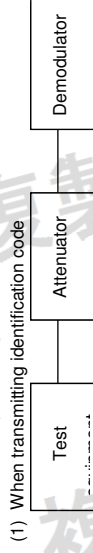
The antenna is external antenna on the main PCB and no consideration of replacement. The best case gain of the antenna is -2.51 dBi.

Result: An antenna connector is available; all relevant tests will be carried out conducted.



6.4 Interference prevention function

1) Measurement system diagram



2) Condition of measuring instrument

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

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

4) Measuring operation procedure

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

A) Transmit the predetermined identification code from test equipment.

B) Confirm the transmitted identification code by demodulator.

84:b8:b8:a3:03:28

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

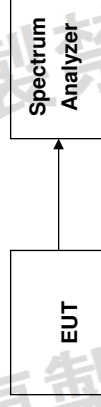
6.5 Frequency Error

Test Requirement: Item 19-3 of Article 2-1

Tolerance of frequency: $\pm 20 \times 10^{-6}$

Test Status: Test the EUT in transmitting mode without modulation.

Test Configuration:



Test Procedure:

1) Test Conditions:

Spectrum Analyzer is used for measurement.

2) EUT conditions:

Modulation/Spread/Hopping OFF, CW Tx

3) Spectrum Analyzer conditions:

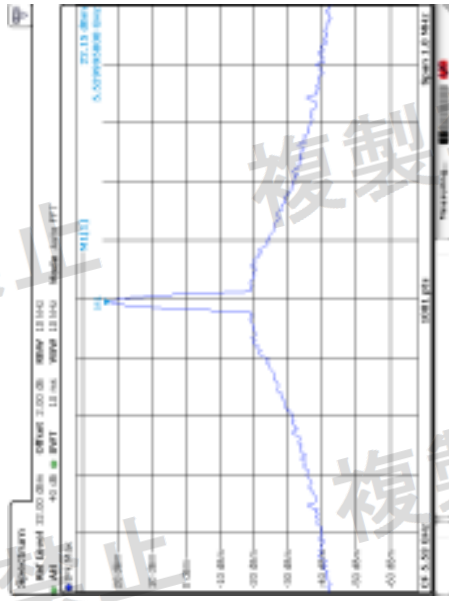
Frequency: Test Frequency

Span 1MHz

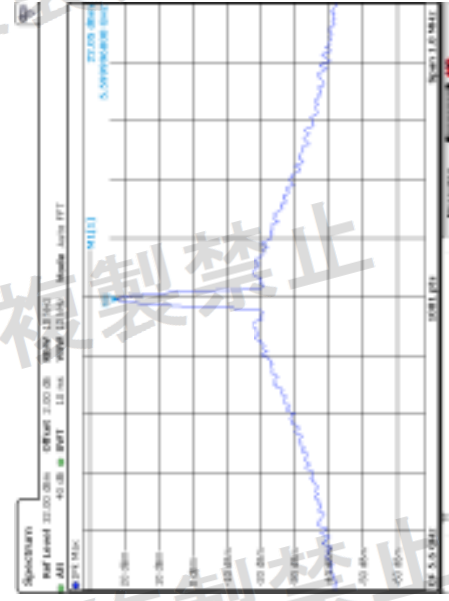
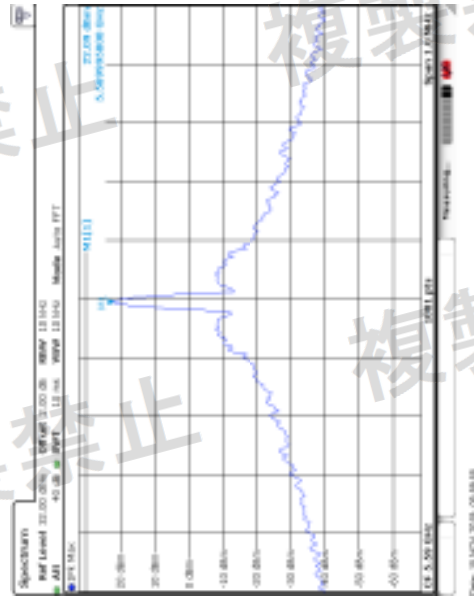
RBW 10 kHz (Modulation OFF),

VBW 10 kHz (Modulation OFF).

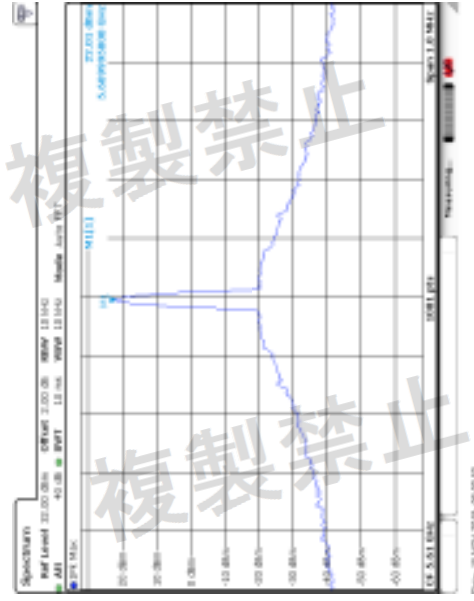


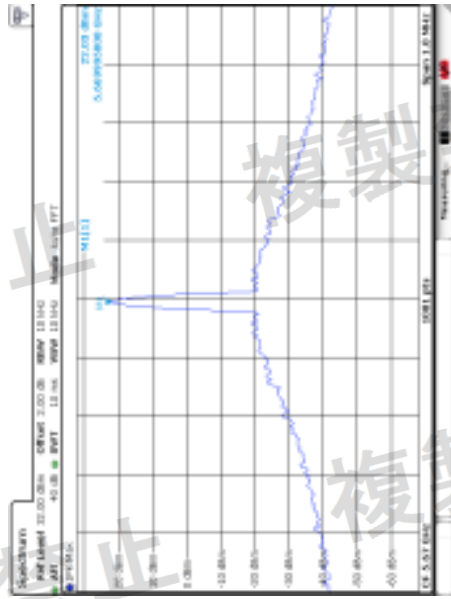


Test Channel: 118

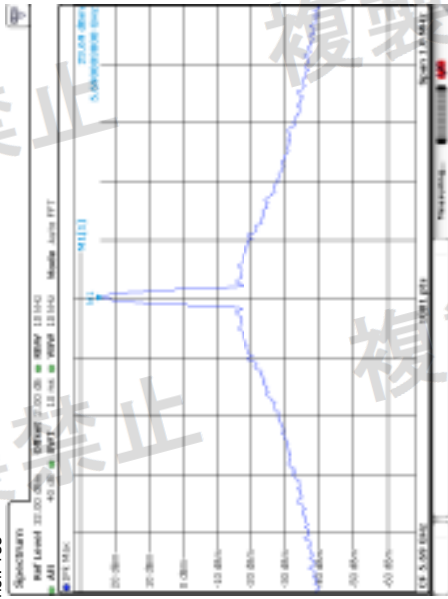


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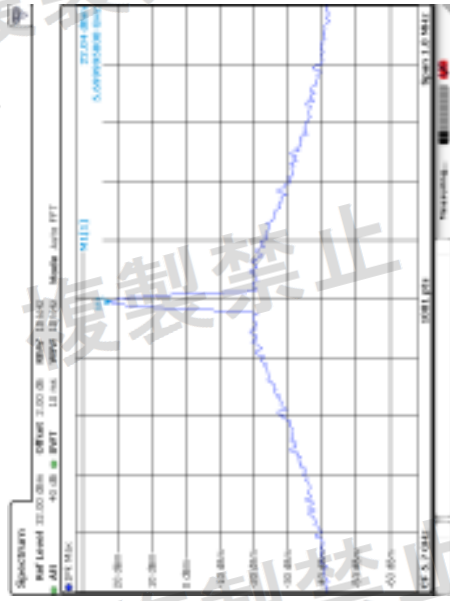


Test Channel: 138

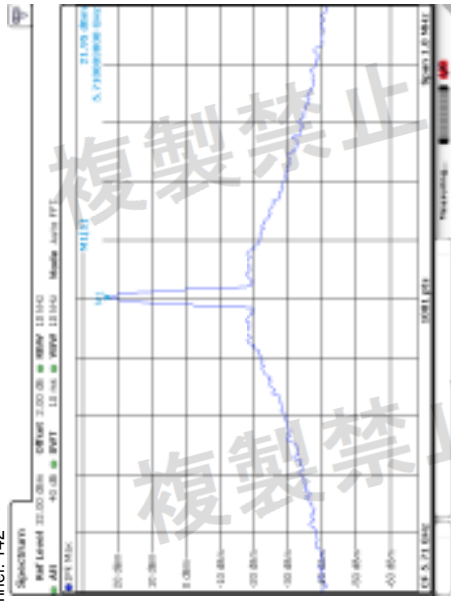


Test Channel: 140


 中華民國教育部
 地址：台北市中正區
 電話：(02) 2351-2345
 傳真：(02) 2351-2346
 網址：http://www.moe.gov.tw



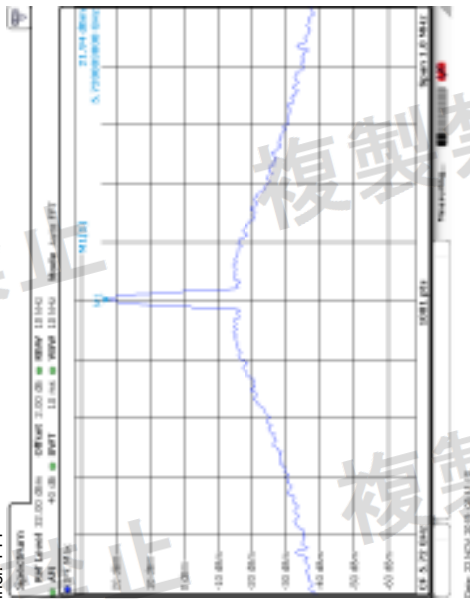
Test Channel: 142



Date: 22 NOV 2018 08:12:08

[illegible]

Test Channel: 144



6.6 Occupied Bandwidth (99%)

Test Requirement: Item 19-3 of Article 2-1

20MHz or less for 20MHz system; 20~40 for 40MHz system;
40~80MHz for 80MHz system;

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

- 1) Test Conditions:
Spectrum Analyzer is used for measurement.
- 2) EUT conditions:

Modulation/Spread

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

- 3) Spectrum Analyzer conditions:

Frequency: Test Frequency
Span 30 MHz for 802.11a/n/ac(HT20); 60 MHz for 802.11 n/ac(HT40);
120 MHz for 802.11 ac(HT80)
RBW 100KHz
VBW 100KHz
Sweep Time Auto
detector mode Sample
Indication mode Maxhold
Sweep 10 times
OBW 99%

Test ch	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		3.86V DC	4.4V DC	3.5V DC		
100	5500	16.50	N/A	N/A	MHz	
120	5600	16.54	N/A	N/A	MHz	20 MHz or less
140	5700	16.42	N/A	N/A	MHz	
144	5720	16.42	N/A	N/A	MHz	

802.11n20

Test ch	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		3.86V DC	4.4V DC	3.5V DC		
100	5500	17.62	N/A	N/A	MHz	
120	5600	17.62	N/A	N/A	MHz	19 MHz or less
140	5700	17.54	N/A	N/A	MHz	
144	5720	17.62	N/A	N/A	MHz	

802.11ac20

Test ch	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		3.86V DC	4.4V DC	3.5V DC		
100	5500	17.62	N/A	N/A	MHz	
120	5600	17.58	N/A	N/A	MHz	20 MHz or less
140	5700	17.58	N/A	N/A	MHz	
144	5720	17.54	N/A	N/A	MHz	

802.11n40

Test ch	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		3.86V DC	4.4V DC	3.5V DC		
102	5510	35.96	N/A	N/A	MHz	
118	5590	36.04	N/A	N/A	MHz	20-40 MHz
134	5670	35.96	N/A	N/A	MHz	
142	5710	35.96	N/A	N/A	MHz	

Test ch	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		3.86V DC	4.4V DC	3.5V DC		
102	5510	36.04	N/A	N/A	MHz	
118	5590	35.96	N/A	N/A	MHz	20-40 MHz
134	5670	35.88	N/A	N/A	MHz	
142	5710	35.96	N/A	N/A	MHz	

802.11ac80

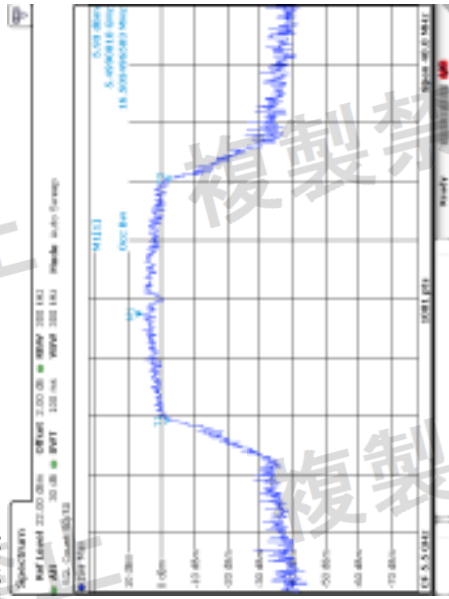
Test ch	Test Frequency (MHz)	Test Result			Unit	Limit
		Normal Voltage	High Voltage	Low Voltage		
		3.86V DC	4.4V DC	3.5V DC		
106	5530	75.44	N/A	N/A	MHz	
122	5610	75.28	N/A	N/A	MHz	40-80 MHz
138	5690	75.28	N/A	N/A	MHz	



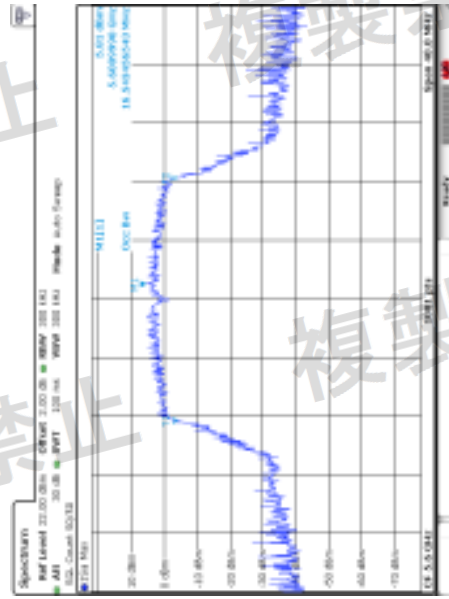
Test plot as follows:

802.11a

Test Channel: 100



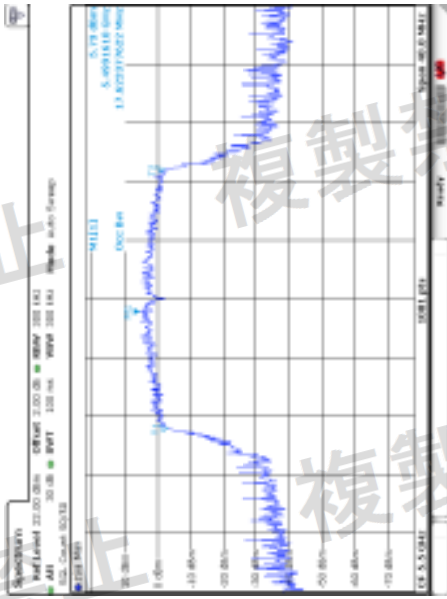
Test Channel: 120

[illegible]

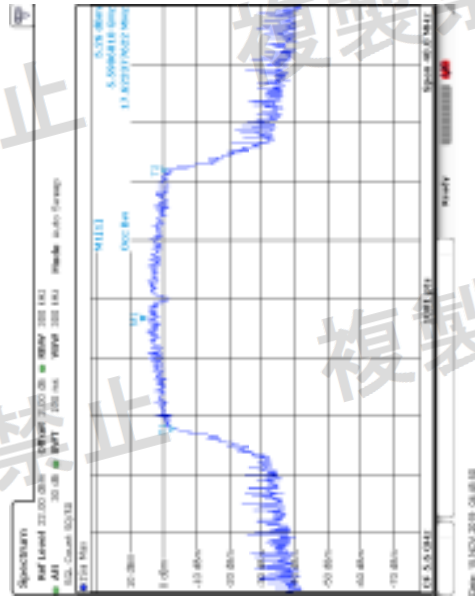
Member of the 1976 Group (1976-1986)

802.11n20

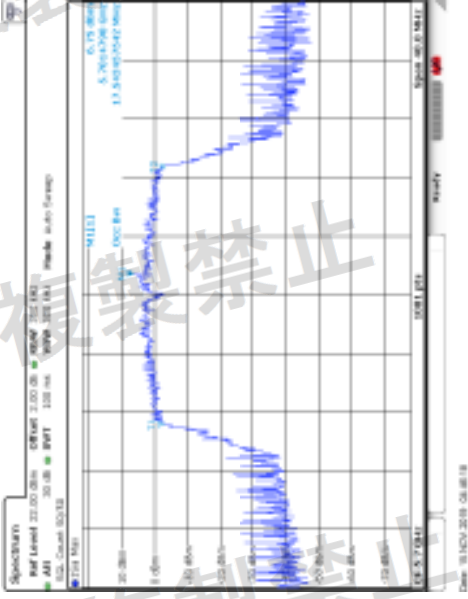
Test Channel: 100



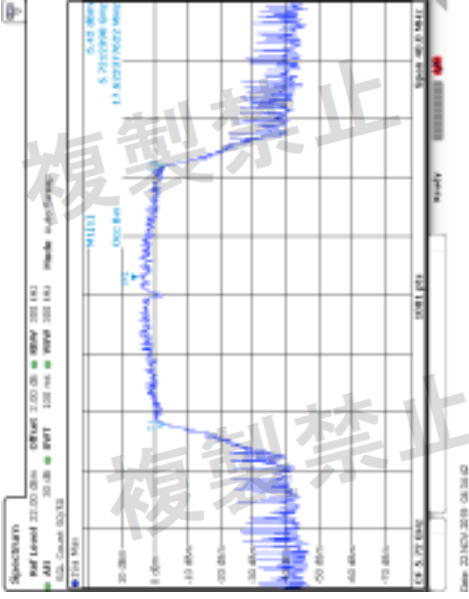
Test Channel: 120



Test Channel: 140

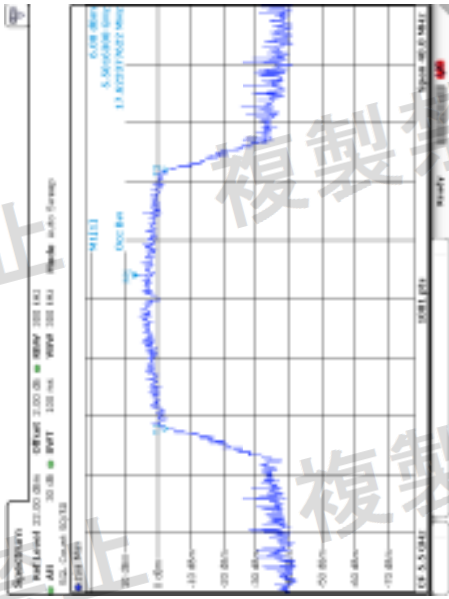


Test Channel: 144

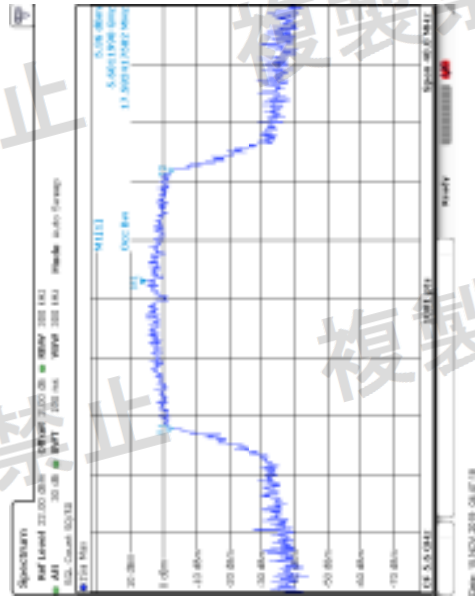


802.11ac20

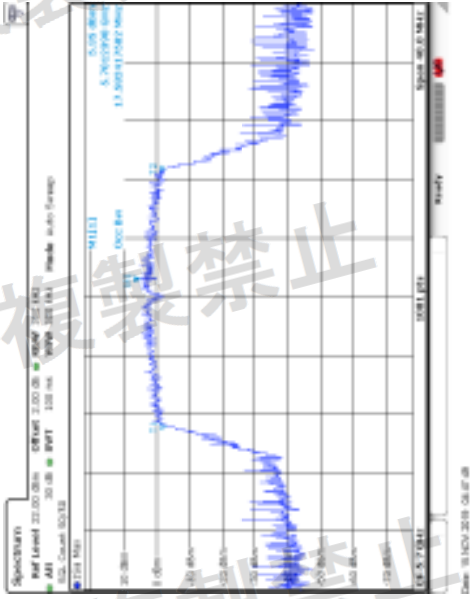
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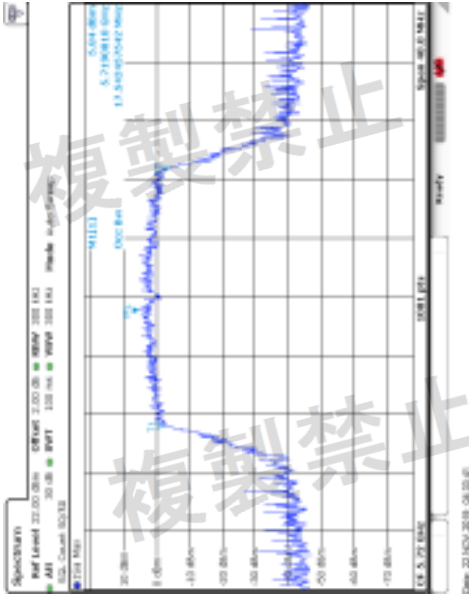
Test Channel: 120



Test Channel: 140

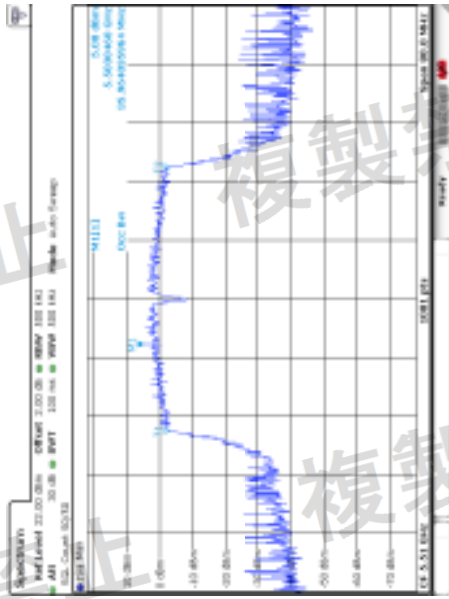


Test Channel: 144

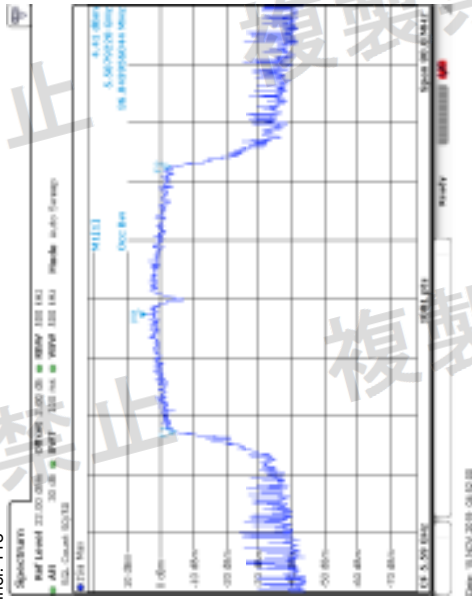


802.11n40

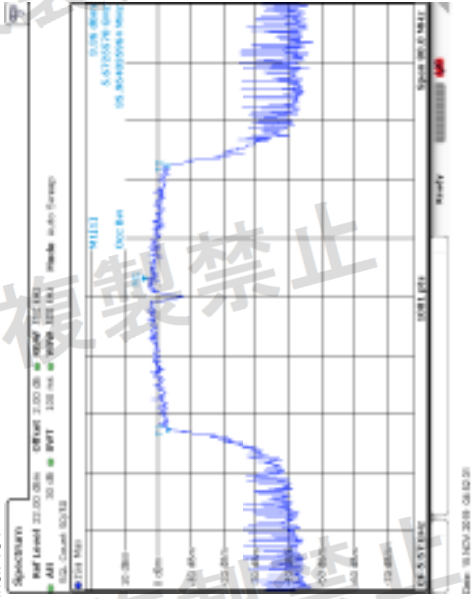
Test Channel: 102



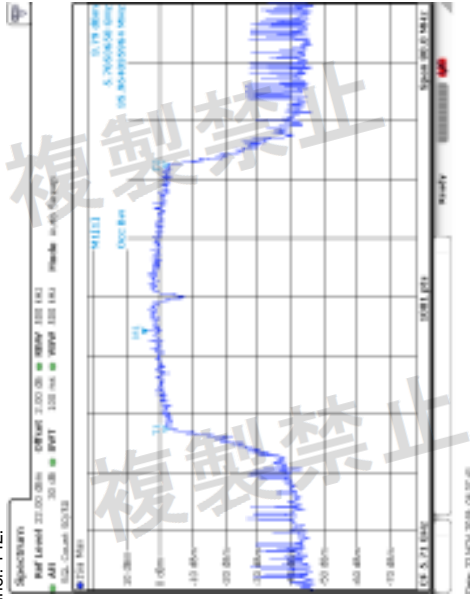
Test Channel: 118



Test Channel: 134

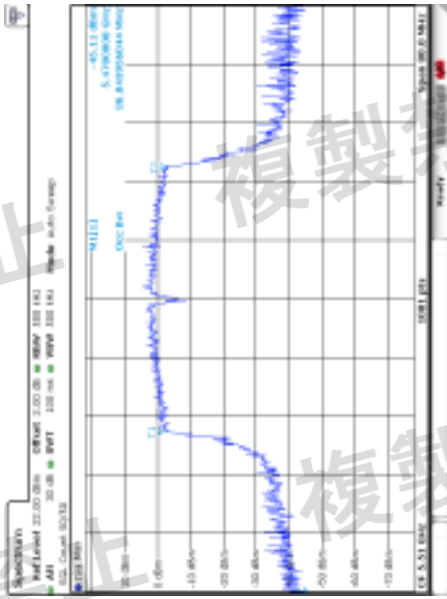


Test Channel: 142

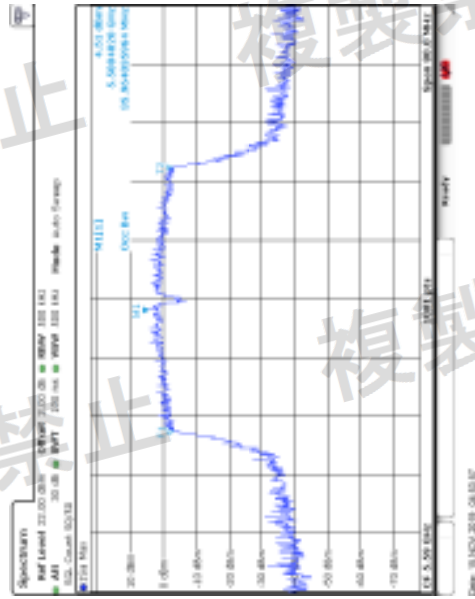


802.11ac40

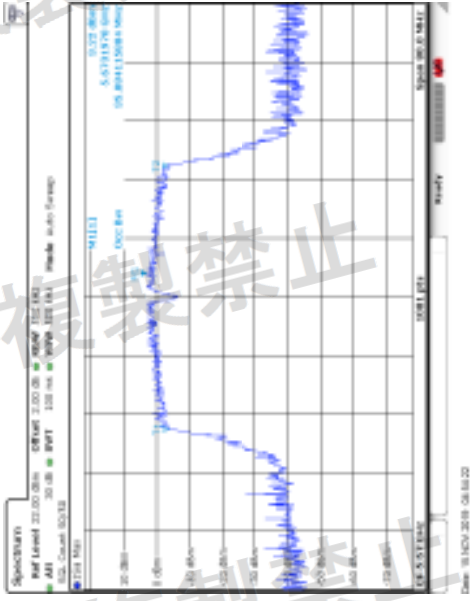
Test Channel: 102



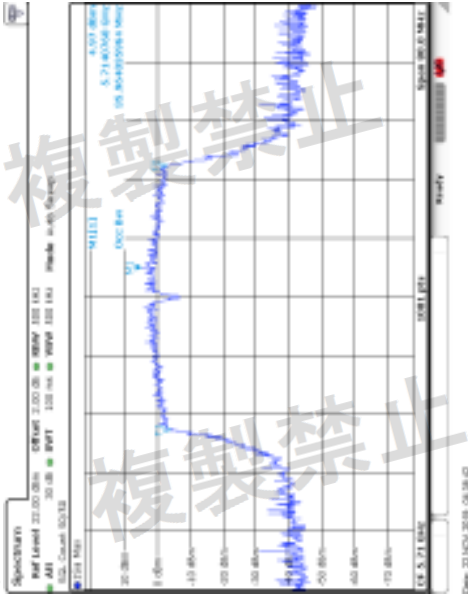
Test Channel: 118



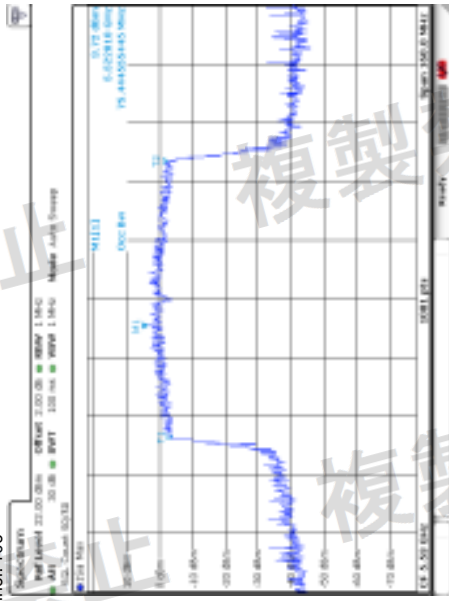
Test Channel: 134



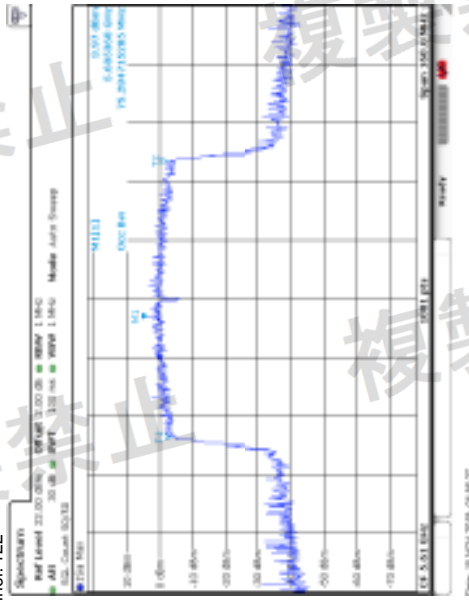
Test Channel: 142



802.11ac80
Test Channel: 106



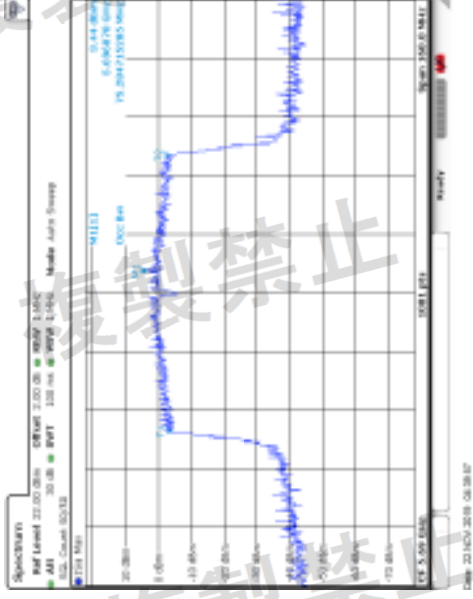
Test Channel: 122



Test Channel: 138:



China's first and largest independent third-party inspection and certification organization. SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch is a subsidiary of SGS-CSTC Standards Technical Services Co., Ltd. (SGS-CSTC) and is authorized to provide inspection and certification services for products and services. The company is a member of the International Organization of Standardization (ISO) and the International Electrotechnical Commission (IEC). The company is also a member of the China National Accreditation Center (CNAS) and the China Inspection and Certification Association (CICA). The company is committed to providing high-quality inspection and certification services to its clients.



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6.7 Antenna Power

Test Requirement:

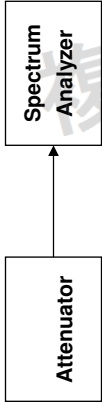
Item 19-3 of Article 2-1

10mW/MHz or less for 20MHz system; 5mW/MHz or less for 40MHz system;
2.5mW/MHz or less for 80MHz system

Test Status:
Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

- 1) Test Conditions:
Spectrum Analyzer is used for measurement.
- 2) EUT conditions:
Modulation/Spread
For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.
- 3) Spectrum Analyzer conditions:
Frequency: Test Frequency
Span 30MHz for 802.11a/n/ac(HT20); 60 MHz for 802.11n/ac(HT40); 120 MHz for 802.11ac(HT80)
RBW 1 MHz
VBW 3 MHz
Sweep Time Auto
detector mode Positive peak
Indication mode Max hold

Test Data:

Mode	Test channel	Test Frequency (MHz)	Test Result			Unit	Declared Power	Limit
			NV	HV	LV			
802.11a	100	5500	3.31	N/A	N/A	mW/MHz	3.5 mW /MHz	10mW /MHz or less Tolerance: + 50% to -50%
			-5.43	N/A	N/A	%		
	120	5600	2.99	N/A	N/A	mW/MHz		
			-14.57	N/A	N/A	%		
	140	5700	2.91	N/A	N/A	mW/MHz		
			-16.86	N/A	N/A	%		
144	5720	3.04	N/A	N/A	mW/MHz			
		-13.14	N/A	N/A	%			
802.11n20	100	5500	2.96	N/A	N/A	mW/MHz	3.5 mW /MHz	10mW /MHz or less Tolerance: + 50% to -50%
			-15.43	N/A	N/A	%		
	120	5600	2.86	N/A	N/A	mW/MHz		
			-18.29	N/A	N/A	%		
	140	5700	2.74	N/A	N/A	mW/MHz		
			-21.71	N/A	N/A	%		
144	5720	2.47	N/A	N/A	mW/MHz			
		-29.43	N/A	N/A	%			
802.11n40	102	5510	1.34	N/A	N/A	mW/MHz	2 mW /MHz	5mW /MHz or less Tolerance: + 50% to -50%
			-33.00	N/A	N/A	%		
	118	5590	1.38	N/A	N/A	mW/MHz		
			-20.67	N/A	N/A	%		
	134	5670	1.29	N/A	N/A	mW/MHz		
			-35.50	N/A	N/A	%		
142	5710	1.29	N/A	N/A	mW/MHz			
		-35.50	N/A	N/A	%			
802.11ac20	100	5500	2.95	N/A	N/A	mW/MHz	3.5 mW /MHz	10mW /MHz or less Tolerance: + 50% to -50%
			-15.71	N/A	N/A	%		
	120	5600	2.77	N/A	N/A	mW/MHz		
			-20.86	N/A	N/A	%		
	140	5700	2.73	N/A	N/A	mW/MHz		
			-22.00	N/A	N/A	%		
144	5720	2.51	N/A	N/A	mW/MHz			
		-28.29	N/A	N/A	%			
802.11ac40	102	5510	1.41	N/A	N/A	mW/MHz	2 mW /MHz	5mW /MHz or less
			-29.50	N/A	N/A	%		



China General Inspection and Testing Co., Ltd. (hereinafter referred to as "the Company") is a company established in the People's Republic of China. The Company is a member of the SGS Group, which is a global network of independent member organizations. The Company is authorized to perform inspection and testing services for its members. The Company is a member of the SGS Group, which is a global network of independent member organizations. The Company is authorized to perform inspection and testing services for its members. The Company is a member of the SGS Group, which is a global network of independent member organizations. The Company is authorized to perform inspection and testing services for its members.



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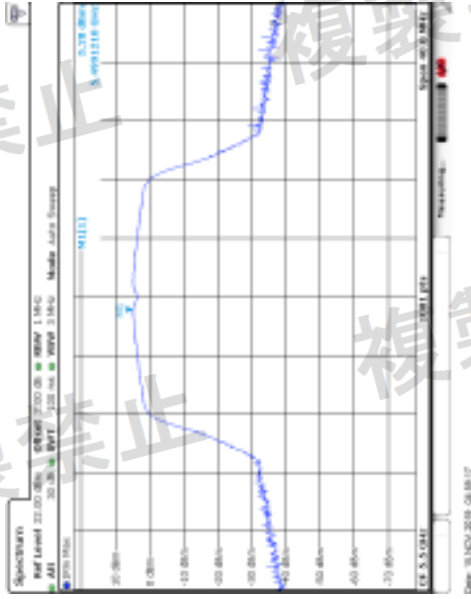
	118	5590	1.37	mW/MHz		Tolerance: + 50% to -50%
				N/A	N/A	
802.11ac80	134	5670	1.29	N/A	N/A	2.5mW /MHz or less Tolerance: + 50% to -50%
	142	5710	1.32	N/A	N/A	
	106	5530	0.51	N/A	N/A	
	122	5610	0.49	N/A	N/A	
802.11ac80	138	5690	0.49	N/A	N/A	
			-30.00	N/A	N/A	

Remark:
NV=Normal Voltage
HV=Normal Voltage
LV=Normal Voltage

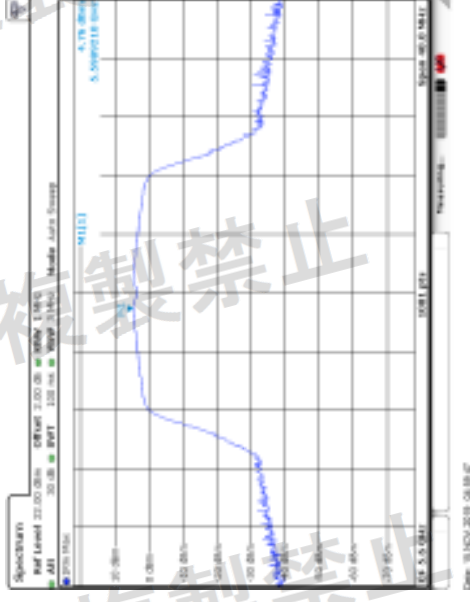
Test plot as follows:

802.11a

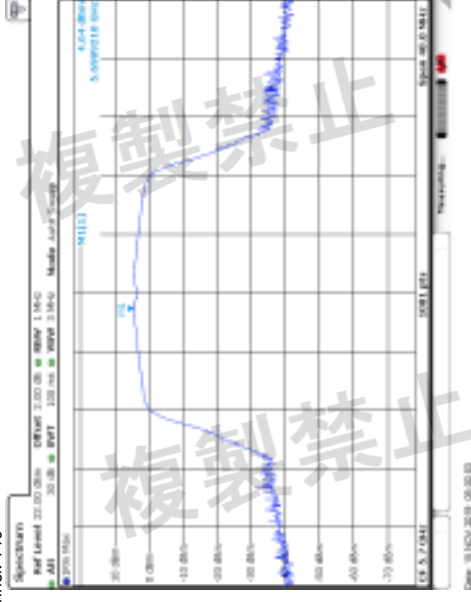
Test Channel: 100



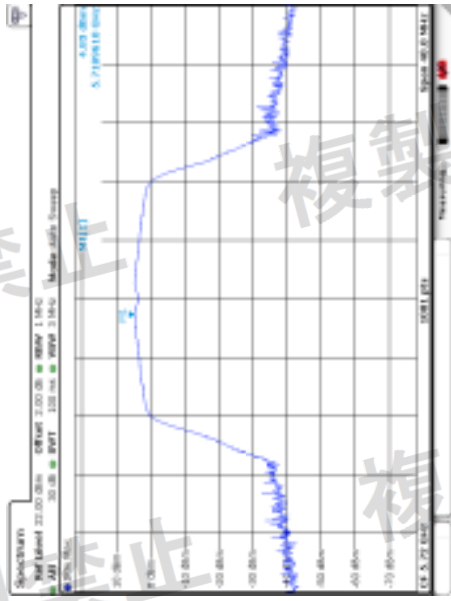
Test Channel: 120



Test Channel: 140

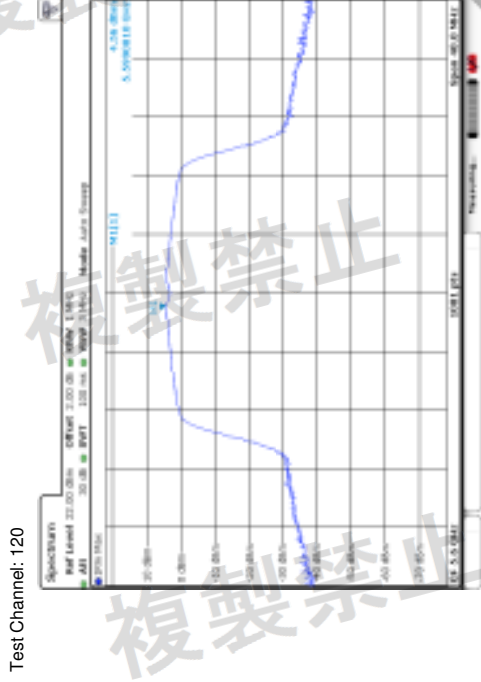
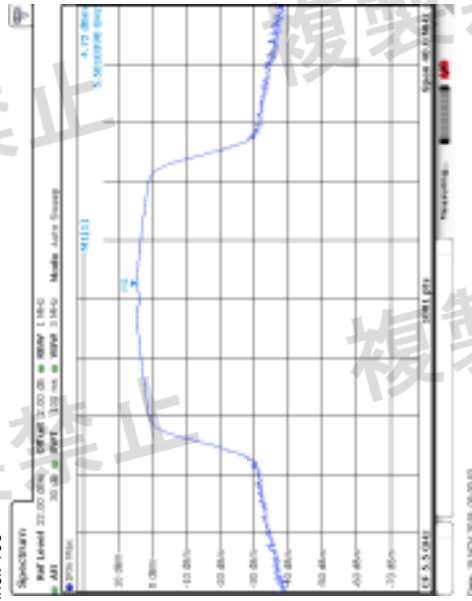


Test Channel: 144

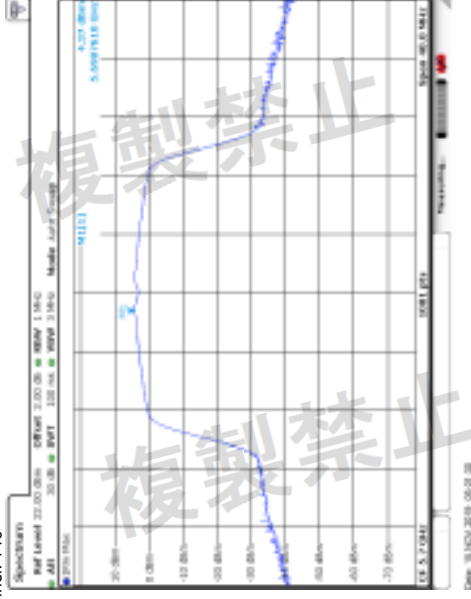


802.11n20

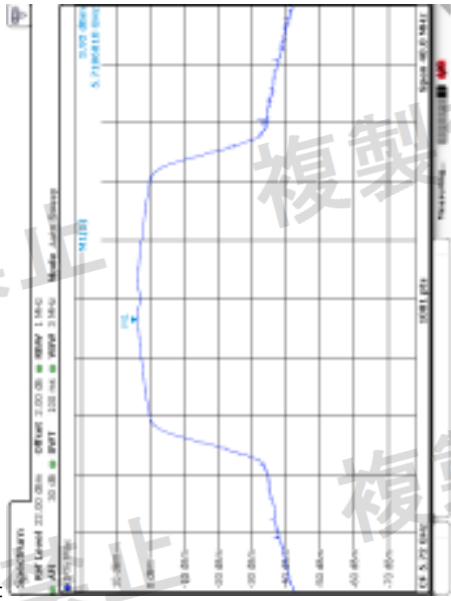
Test Channel: 100



Test Channel: 140

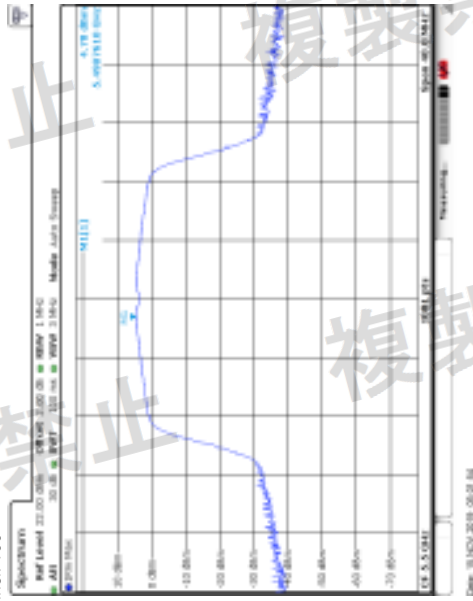


Test Channel: 144

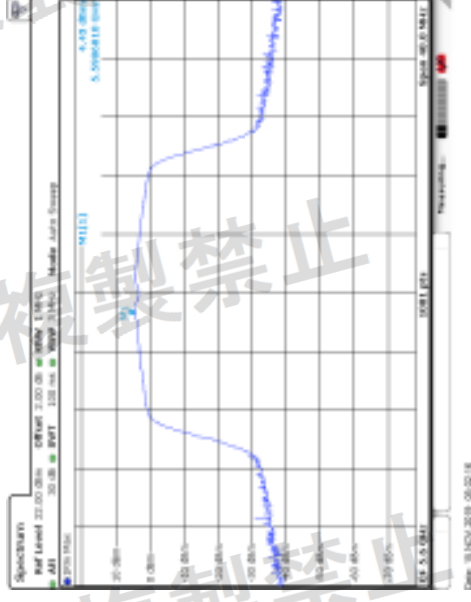


802.11ac20

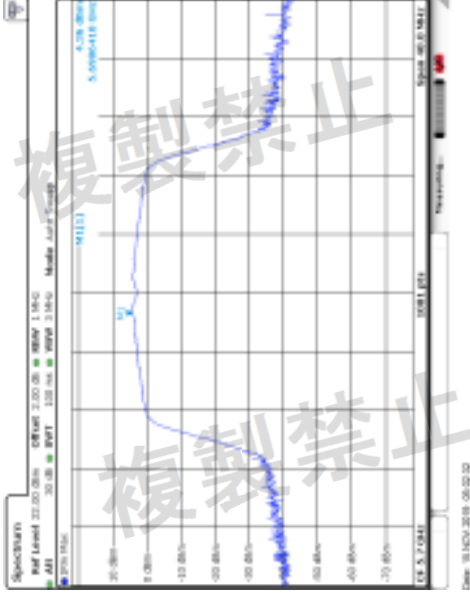
Test Channel: 100



Test Channel: 120



Test Channel: 140

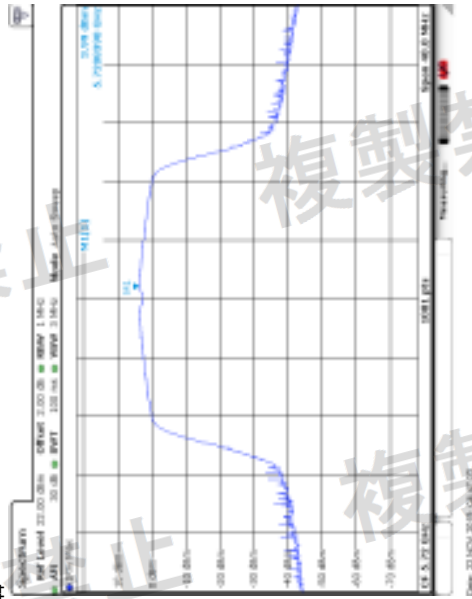


China's first and largest independent laboratory, SGS-CSTC has been established in 1993. It is a member of the International Organization of Standardization (ISO) and the International Union of Pure and Applied Chemistry (IUPAC). SGS-CSTC is a leading provider of testing and inspection services in China and abroad. The company has a wide range of testing and inspection services, including mechanical testing, chemical analysis, and environmental testing. SGS-CSTC is committed to providing high-quality testing and inspection services to its customers.



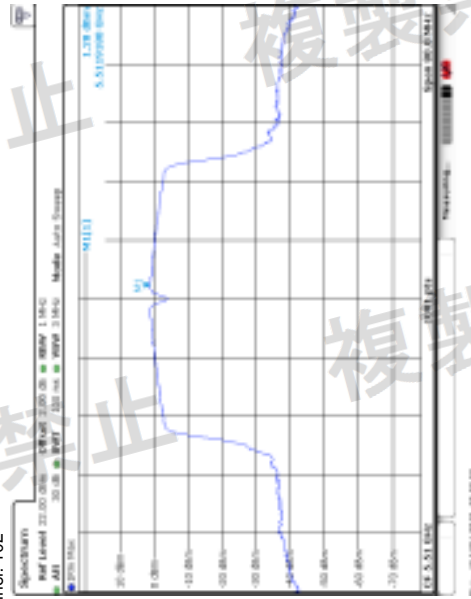
China's first and largest independent laboratory, SGS-CSTC has been established in 1993. It is a member of the International Organization of Standardization (ISO) and the International Union of Pure and Applied Chemistry (IUPAC). SGS-CSTC is a leading provider of testing and inspection services in China and abroad. The company has a wide range of testing and inspection services, including mechanical testing, chemical analysis, and environmental testing. SGS-CSTC is committed to providing high-quality testing and inspection services to its customers.

Test Channel: 144

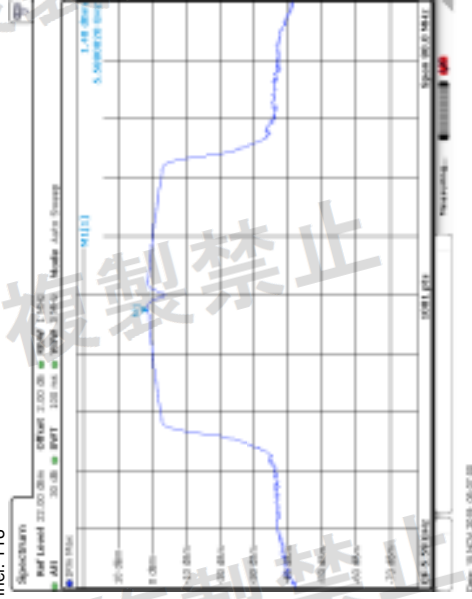


802.11n40

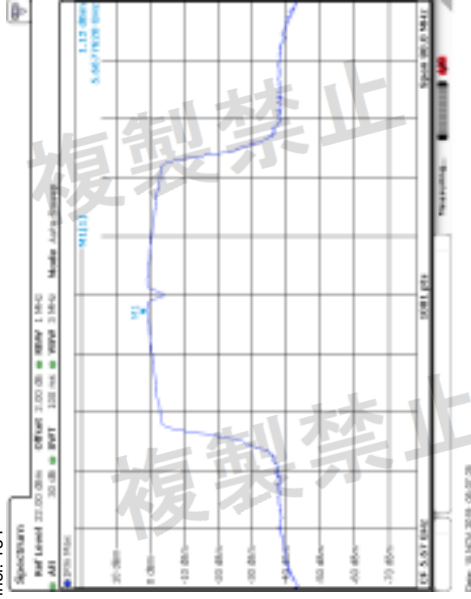
Test Channel: 102



Test Channel: 118



Test Channel: 134



(1) Set the test frequency, continuous emitting or periodic(constant cycle and constant burst length) burst emitting status.

(2) Set test spread code to the device that uses spread code and modulate it by standard code test

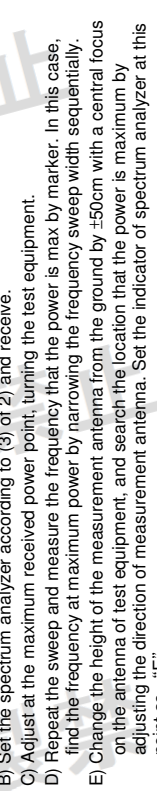
- (3) In OFDM, set it as burst transmission. Adjust it as maximum time ratio of least subcarrier number existence at normal operating condition. However, if it is not possible, constant cycle signal.

Measuring operation

each other.

A) Set the height and direction of test equipment and measurement antenna approximately facing each other.

B) Set the spectrum analyzer according to (a) of 2) and receive.



point as "E".

- F) Remove the test equipment from the turntable, set the opening of substitution antenna at the same location as the opening of the test equipment, and receive by outputting radio wave of the same frequency from the standard signal generator for substitution.
- G) Adjust at the maximum power point, turning the substitution antenna. Set the spectrum analyzer according to (4) of 2)
- H) Change the height of the measurement antenna from the ground by $\pm 50\text{cm}$ with a central focus on the substitution antenna, and adjust the direction of measurement antenna to the location that the received power is maximum.
- I) Adjust output of standard signal generator and record the power P_s that is equal to "E". Or record P_s by counting backward from the difference with "E" as the close value to "E" (within $\pm 1\text{dB}$).
- J) Antenna power before correction is derived from the following calculating formula:
$$PO = PS + GS - GT - LF$$

PS; Output of standard signal generator (dBm)
GS; Absolute gain of substitution antenna (dBi)
GT; Antenna absolute gain of test equipment (dBi)
LF; Loss of electric supply line between standard signal generator and substitution antenna (dB)
- K) Antenna power is as follows,
a. Continuous wave: Correct the result of J) by (1) of 2), and derive the average power per 1MHz
b. Burst wave: using corrected value like continuous wave and transmission time ratio, mean power of burst is calculated by next formula.
mean power of burst = Corrected value of J) by (1) of 2) / transmission time ratio transmission time ratio = burst transmission time / burst repetition time
- L) In OFDM, if some subcarriers exist, measure antenna power respectively, maximum measured value shall be regarded as the measurement result.



Test Data:

Test channel	Test Frequency (MHz)	Antenna Gain (dBi)	Test		Limit
			Antenna Power mW/MHz	EIRP mW/MHz	
100	5500	-2.51	3.31	1.86	50mW /MHz or less
120	5600	-2.51	2.99	1.68	
140	5700	-2.51	2.91	1.63	
144	5720	-2.51	3.04	1.71	

802.11n20

Test channel	Test Frequency (MHz)	Antenna Gain (dBi)	Test		Limit
			Antenna Power mW/MHz	EIRP mW/MHz	
100	5500	-2.51	2.96	1.66	50mW /MHz or less
120	5600	-2.51	2.86	1.60	
140	5700	-2.51	2.74	1.54	
144	5720	-2.51	2.47	1.39	

802.11ac20

Test channel	Test Frequency (MHz)	Antenna Gain (dBi)	Test		Limit
			Antenna Power mW/MHz	EIRP mW/MHz	
100	5500	-2.51	2.91	1.63	50mW /MHz or less
120	5600	-2.51	2.77	1.55	
140	5700	-2.51	2.73	1.53	
144	5720	-2.51	2.51	1.41	

802.11n40

Test channel	Test Frequency (MHz)	Antenna Gain (dBi)	Test		Limit
			Antenna Power mW/MHz	EIRP mW/MHz	
102	5510	-2.51	1.34	0.75	25mW /MHz or less
118	5590	-2.51	1.38	0.77	
134	5670	-2.51	1.29	0.72	
142	5710	-2.51	1.29	0.56	

802.11ac40

Test channel	Test Frequency (MHz)	Antenna Gain (dBi)	Test		Limit
			Antenna Power mW/MHz	EIRP mW/MHz	
102	5510	-2.51	1.41	0.79	25mW /MHz or less
118	5590	-2.51	1.37	0.77	
134	5670	-2.51	1.29	0.72	
142	5710	-2.51	1.32	0.74	

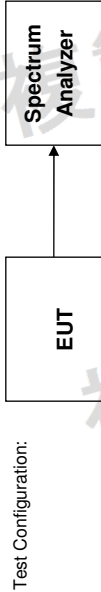
802.11ac80

Test channel	Test Frequency (MHz)	Antenna Gain (dBi)	Test		Limit
			Antenna Power mW/MHz	EIRP mW/MHz	
106	5530	-2.51	0.51	0.29	12.5mW /MHz or less
122	5610	-2.51	0.49	0.27	
138	5690	-2.51	0.49	0.27	



6.9 Adjacent Channel Power Tolerance

Test Requirement: Item 19-3 of Article 2 Paragraph 1
Mean power $\pm 20\text{MHz}$ (18MHz) distance of carrier: $\geq -25\text{dB}$.
Mean power $\pm 40\text{MHz}$ (18MHz) distance of carrier: $\geq -40\text{dB}$.
Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channels were selected for the final test as listed below.



- Test Procedure:
- 1) Test Conditions:
Power meter or Spectrum Analyzer is used for measurement.
 - 2) EUT conditions:
Modulation/Spread
For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.
 - 3) Spectrum Analyzer conditions:
Frequency: Test Frequency
RBW 1 MHz, VBW 3 MHz
Span 100 MHz for 802.11a/n(HT20); 200 MHz for 802.11 n(HT40)
Tx bandwidth 18MHz
For 802.11 a/n(HT20):
Adjacent channel bandwidth 10MHz, Channel spacing 20MHz
Alternate channel bandwidth 10MHz, Channel spacing 40MHz
For 802.11 n(HT40):
Adjacent channel bandwidth 20MHz, Channel spacing 40MHz
Alternate channel bandwidth 20MHz, Channel spacing 80MHz
Sweep Time Auto
detector mode Positive peak
Indication mode Max hold

Test Data:

802.11a				
Channel	100	120	144	
Frequency	5500	5600	5720	Unit
Fc - 40MHz	-50.95	-50.93	-51.15	dBc/20MHz
Fc - 20MHz	-36.35	-37.25	-38.73	dBc/20MHz
Fc + 20MHz	-36.77	-37.22	-39.42	dBc/20MHz
Fc + 40MHz	-51.12	-51.15	-51.33	dBc/20MHz

802.11n20				
Channel	100	120	144	
Frequency	5500	5600	5720	Unit
Fc - 40MHz	-49.92	-49.41	-50.13	dBc/20MHz
Fc - 20MHz	-35.89	-35.21	-36.69	dBc/20MHz
Fc + 20MHz	-36.91	-35.87	-37.45	dBc/20MHz
Fc + 40MHz	-50.46	-50.04	-50.69	dBc/20MHz

802.11ac20				
Channel	100	120	144	
Frequency	5500	5600	5720	Unit
Fc - 40MHz	-50.05	-50.26	-50.96	dBc/20MHz
Fc - 20MHz	-36.05	-36.50	-38.00	dBc/20MHz
Fc + 20MHz	-36.99	-36.71	-38.91	dBc/20MHz
Fc + 40MHz	-50.96	-50.63	-51.17	dBc/20MHz

802.11n40				
Channel	102	118	142	
Frequency	5510	5590	5710	Unit
Fc - 80MHz	-48.94	-48.76	-49.45	dBc/40MHz
Fc - 40MHz	-36.56	-35.44	-37.13	dBc/40MHz
Fc + 40MHz	-35.55	-36.90	-36.66	dBc/40MHz
Fc + 80MHz	-48.81	-47.61	-48.65	dBc/40MHz

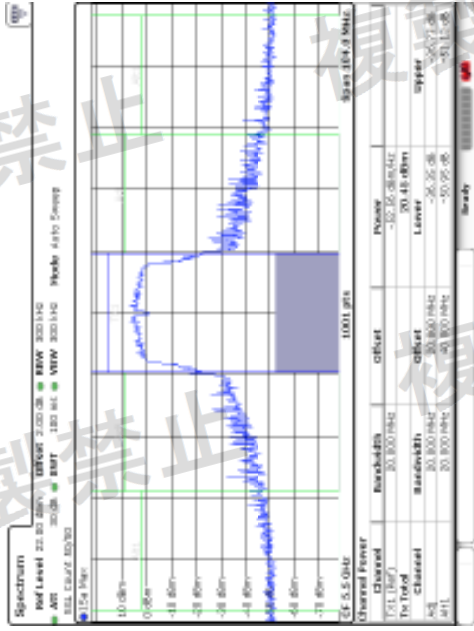
802.11ac40				
Channel	102	118	142	Limit
Frequency	5510	5590	5710	
Fc - 80MHz	-49.58	-49.23	-49.10	≤ -40
Fc - 40MHz	-37.35	-37.49	-39.00	≤ -25
Fc + 40MHz	-38.94	-38.58	-39.27	≤ -25
Fc + 80MHz	-49.80	-48.96	-48.90	≤ -40

802.11ac80				
Channel	106	122	138	Limit
Frequency	5530	5610	5690	
Fc - 80MHz	-38.33	-37.66	-40.06	≤ -25
Fc + 80MHz	-39.75	-38.59	-40.01	≤ -25

Test plot as follows:

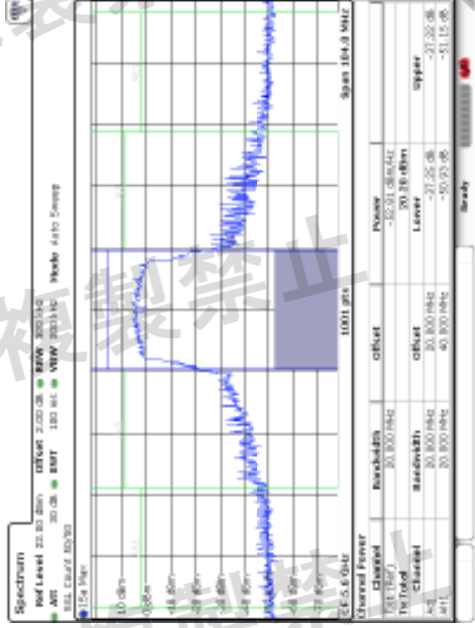
802.11a

Test Channel: 100



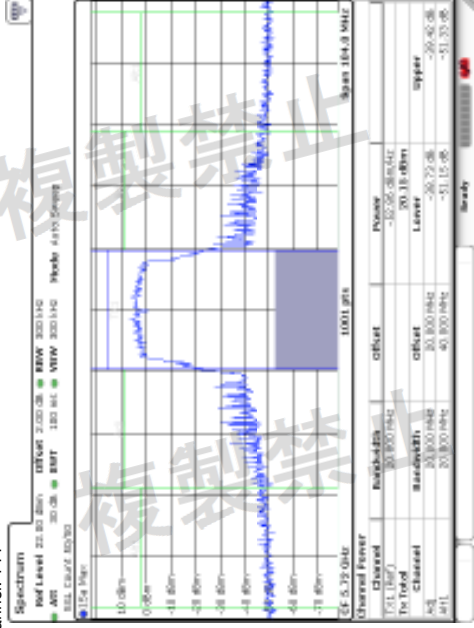
Date: 11 DEC 2019 09:15:40

Test Channel: 120

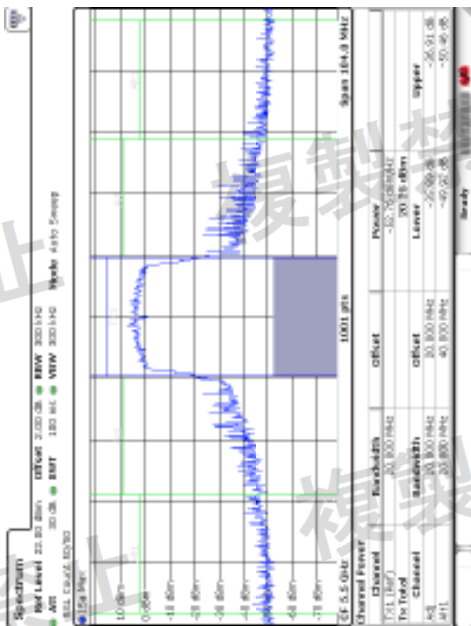


Date: 11 DEC 2019 09:14:50

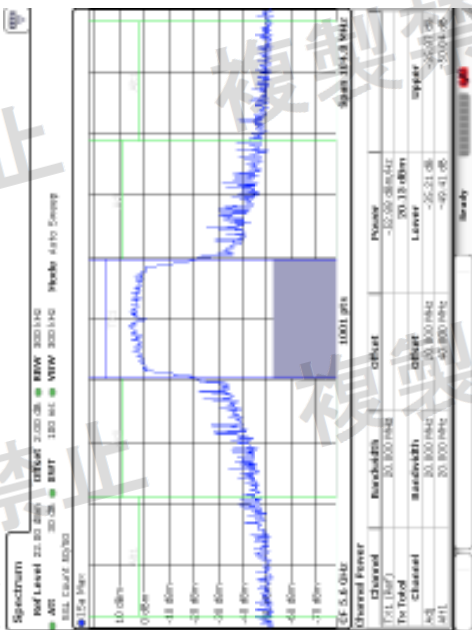
Test Channel: 144



Date: 11 DEC 2019 09:14:37



Test Channel: 120

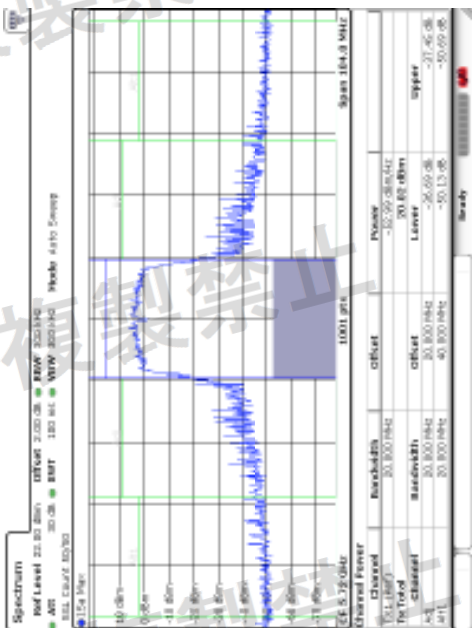


Date: 14 DEC 2019 09:48:45

[illegible]

地址: 深圳市福田区福安路100号
 邮编: 518040
 电话: 0755-26520000
 传真: 0755-26520001
 电子邮箱: info@wzq.com.cn
 网站: www.wzq.com.cn

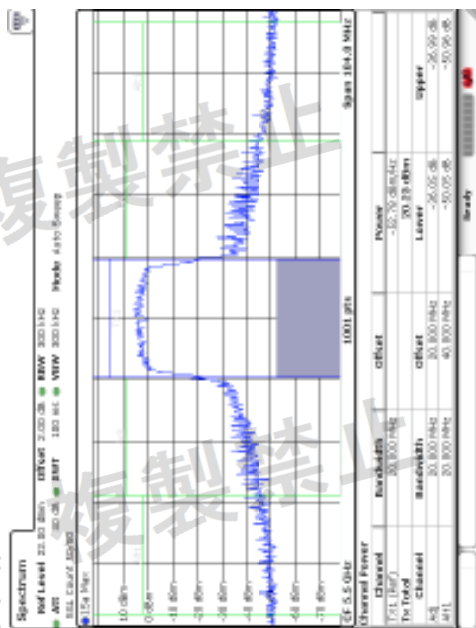
Member of the 1995 Green Party (UK)



Date: 11 DEC 2019 09:15:40

802.11ac20

Test Channel: 100



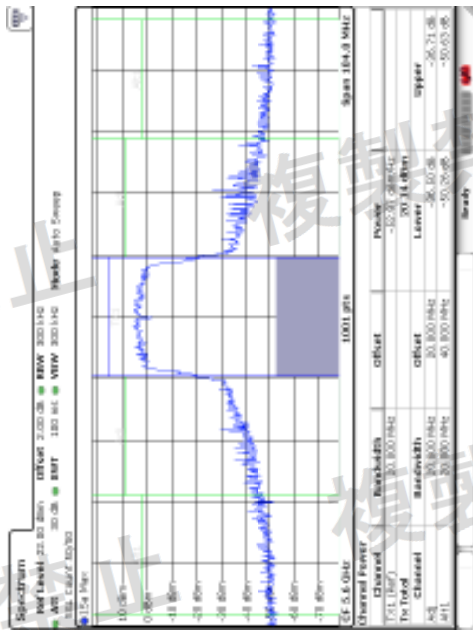
Date: 14 DEC 2018 09:24:55

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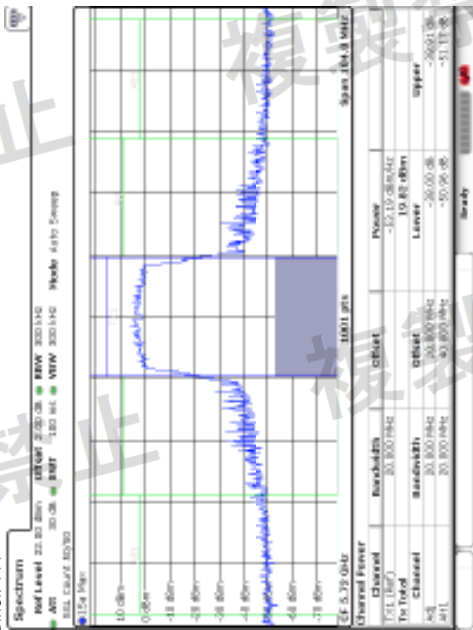
Dr. Thomas H. O. Muller, President, American Society of Human Genetics, 1000 University Avenue, Berkeley, CA 94720-5080, USA. Tel: +1 415 849 2000. Fax: +1 415 849 2001. Email: tom.muller@berkeley.edu

Member of the 1985 Congress (1985-1986)

Test Channel: 120



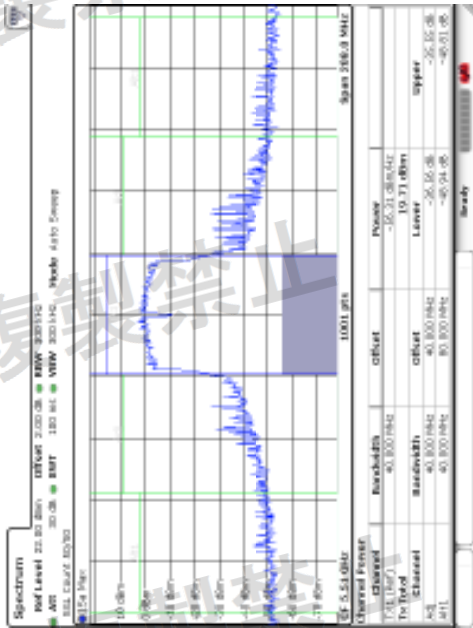
Test Channel: 144



Date: 11 DEC 2019 10:25:50

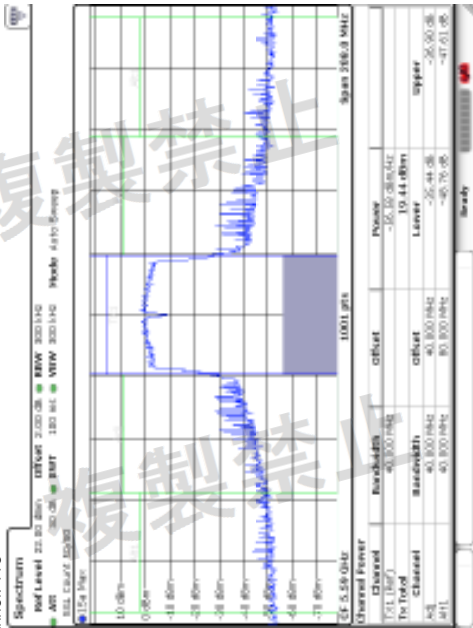
802.11n40

Test Channel: 102



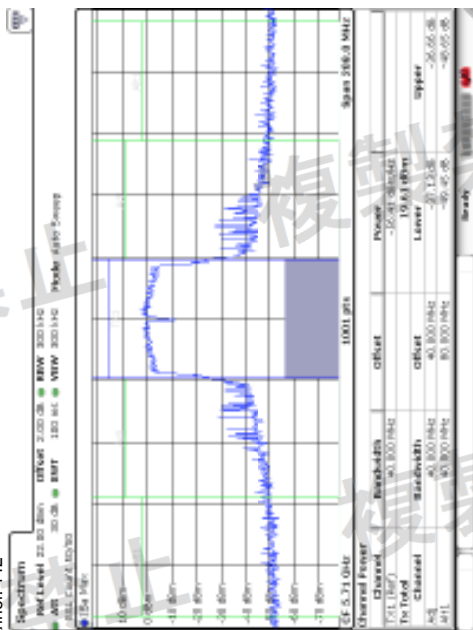
Date: 11 DEC 2019 12:17:50

Test Channel: 118



Date: 11 DEC 2019 12:16:17

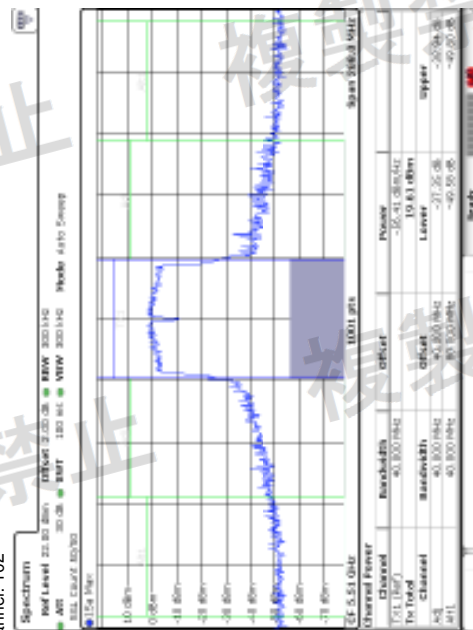
Test Channel: 142



Date: 14 DEC 2018 12:45:35

802.11ac40

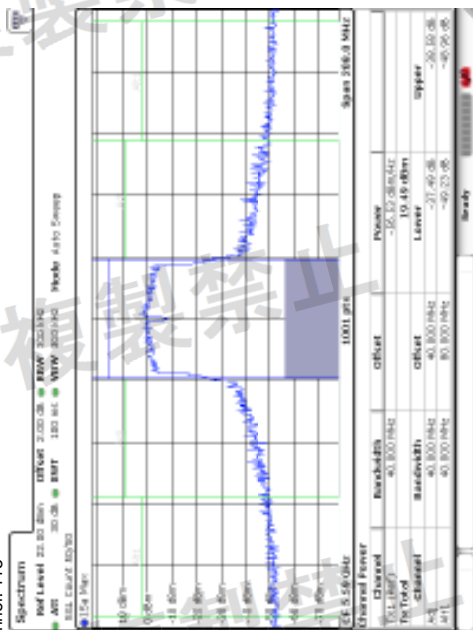
Test Channel: 102



Downloaded At: 11:52 11 September 2009

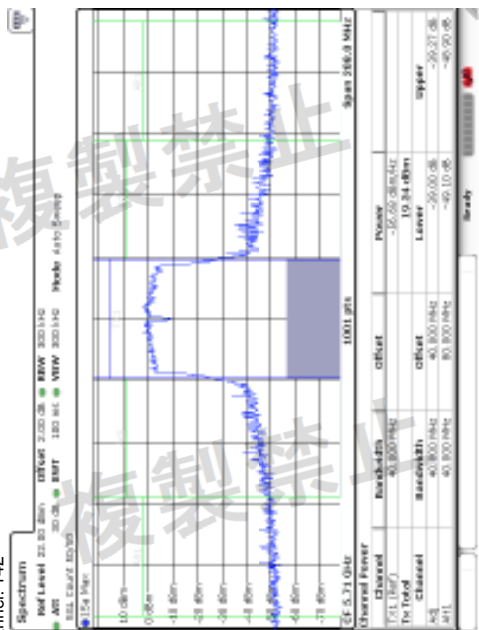
[illegible]

Test Channel: 118



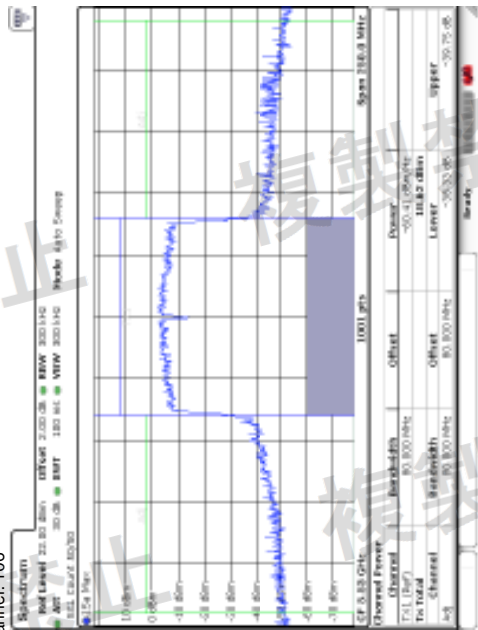
Date: 11 DEC 2018 12:20:45

Test Channel: 142

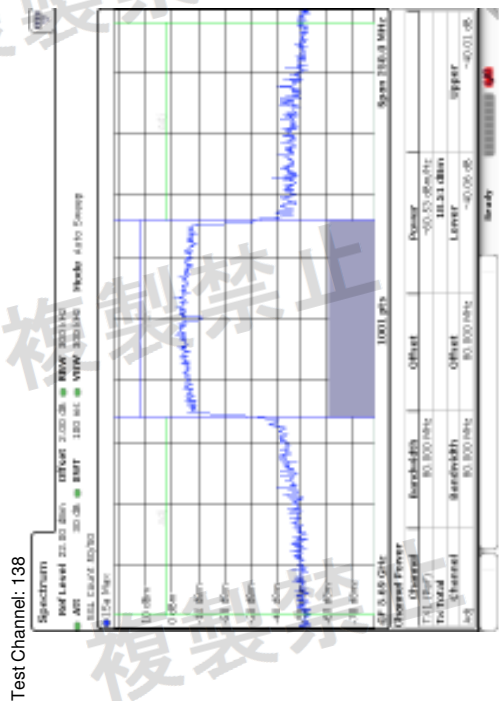
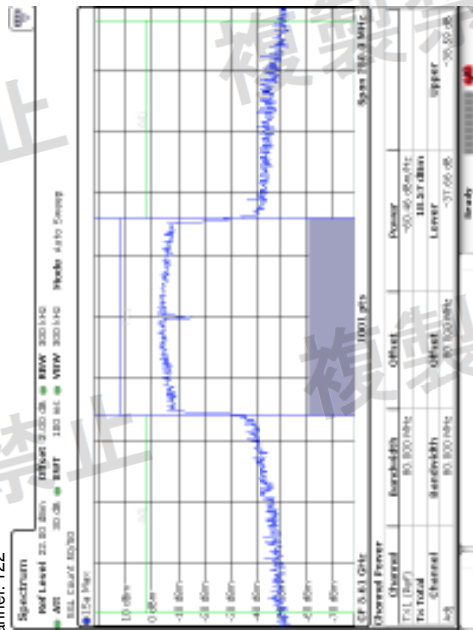


Date: 14 DEC 2018 12:24:57

[illegible]



Test Channel: 122



Date: 11 DEC 2019 12:24:45

6.10 Tolerance of Unwanted Emission Intensity

Test Requirement: Item 19-3 of Article 2-1

20MHz	5460MHz or less:2.5μW/MHz 5460-5470MHz:12.5μW/MHz 5745-5765MHz:12.5μW/MHz Over 5765MHz:2.5μW/MHz
40MHz	5460MHz or less:2.5μW/MHz 5460-5470MHz:50μW/MHz 5770MHz or more:12.5μW/MHz
80MHz	5460MHz or less:12.5μW/MHz 5460-5469.5MHz:50μW/MHz 5469.5-5470 MHz:12.5μW/MHz

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.



Test Procedure:

- 1) Test Conditions:
Spectrum Analyzer is used for measurement.
- 2) EUT conditions:
Modulation/Spread

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

- 3) Spectrum Analyzer conditions:

Step 1

All spurious are measured from 5140MHz to 5340MHz by peak mode.

Step 2:

Frequency: Spurious Frequency
RBW 1 MHz
VBW 1 MHz
Sweep Time Auto

detector mode Sample
Indication mode Max hold



Test Data:

802.11a				
Channel	100	120	144	
Frequency	5500	5600	5720	
Result	0.0634	0.0266	0.0201	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5460-5470MHz	1.0000	0.0140	
Frequency	5460-5470MHz	0.0208	0.0108	
Result	0.0308	0.0235	0.0308	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5745-5765MHz	0.0369	0.0336	
Frequency	5745-5765MHz	0.0336	0.0371	
Result	0.0371	0.0371	0.0371	
Limit	≤ 2.5	≤ 2.5	≤ 2.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	

802.11a(EIRP value)

Channel	100	120	144	
Frequency	5500	5600	5720	
Result	0.0356	0.0149	0.0113	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5460-5470MHz	0.9610	0.0117	
Frequency	5460-5470MHz	0.0117	0.0079	
Result	0.0134	0.0132	0.2193	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5745-5765MHz	0.0207	0.0188	
Frequency	5745-5765MHz	0.0208	0.0208	
Result	0.0208	0.0208	0.0208	
Limit	≤ 2.5	≤ 2.5	≤ 2.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	

802.11n20

Channel	100	120	144	
Frequency	5500	5600	5720	
Result	0.0611	0.0285	0.0244	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5460-5470MHz	0.8966	0.0208	
Frequency	5460-5470MHz	0.0156	0.0156	
Result	0.0212	0.0259	0.4046	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5745-5765MHz	0.0337	0.0333	
Frequency	5745-5765MHz	0.0479	0.0479	
Result	0.0479	0.0479	0.0479	
Limit	≤ 2.5	≤ 2.5	≤ 2.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	

802.11n20(EIRP value)

Channel	100	120	144	
Frequency	5500	5600	5720	
Result	0.0343	0.0160	0.0137	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5460-5470MHz	0.3908	0.0117	
Frequency	5460-5470MHz	0.0087	0.0087	
Result	0.0119	0.0146	0.2270	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5745-5765MHz	0.0189	0.0187	
Frequency	5745-5765MHz	0.0269	0.0269	
Result	0.0269	0.0269	0.0269	
Limit	≤ 2.5	≤ 2.5	≤ 2.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	

802.11ac20

Channel	100	120	144	
Frequency	5500	5600	5720	
Result	0.0492	0.0229	0.0205	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5460-5470MHz	0.2911	0.0198	
Frequency	5460-5470MHz	0.0140	0.0140	
Result	0.0212	0.0256	0.3083	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5745-5765MHz	0.0342	0.0387	
Frequency	5745-5765MHz	0.0423	0.0423	
Result	0.0423	0.0423	0.0423	
Limit	≤ 2.5	≤ 2.5	≤ 2.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	

802.11ac20(EIRP value)

Channel	100	120	144	
Frequency	5500	5600	5720	
Result	0.0276	0.0128	0.0115	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5460-5470MHz	0.1633	0.0111	
Frequency	5460-5470MHz	0.0079	0.0079	
Result	0.0119	0.0144	0.1730	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5745-5765MHz	0.0192	0.0217	
Frequency	5745-5765MHz	0.0237	0.0237	
Result	0.0237	0.0237	0.0237	
Limit	≤ 2.5	≤ 2.5	≤ 2.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	

802.11n40

Channel	102	128	142	
Frequency	5510	5590	5710	
Result	0.1076	0.0338	0.0211	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5460-5470MHz	0.8610	0.0208	
Frequency	5460-5470MHz	0.0158	0.0158	
Result	0.0297	0.0310	0.1164	
Limit	≤ 50	≤ 50	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5745-5765MHz	0.0297	0.0310	
Frequency	5745-5765MHz	0.0310	0.1164	
Result	0.0310	0.0310	0.1164	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	

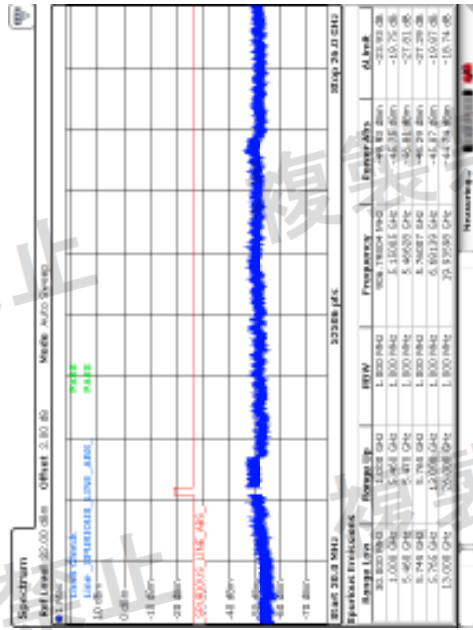
802.11n40(EIRP value)

Channel	102	128	142	
Frequency	5510	5590	5710	
Result	0.0604	0.0190	0.0119	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5460-5470MHz	0.4831	0.0117	
Frequency	5460-5470MHz	0.0089	0.0089	
Result	0.0167	0.0174	0.0653	
Limit	≤ 50	≤ 50	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5745-5765MHz	0.0167	0.0174	
Frequency	5745-5765MHz	0.0653	0.0653	
Result	0.0653	0.0653	0.0653	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	

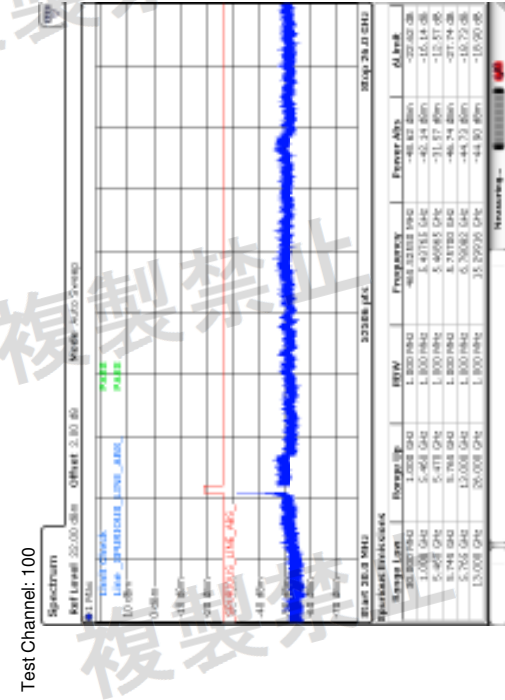
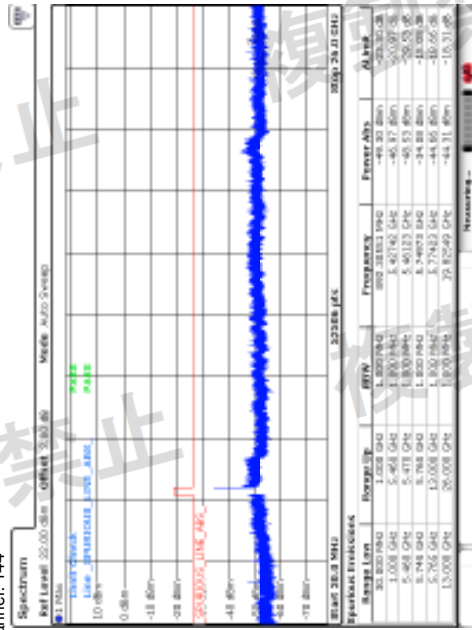
802.11ac40

Channel	102	128	142	
Frequency	5510	5590	5710	
Result	0.1919	0.0206	0.0279	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5460-5470MHz	0.4550	0.0228	
Frequency	5460-5470MHz	0.0174	0.0174	
Result	0.0387	0.0435	0.0505	
Limit	≤ 50	≤ 50	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	
Channel	5745-5765MHz	0.0387	0.0435	
Frequency	5745-5765MHz	0.0505	0.0505	
Result	0.0505	0.0505	0.0505	
Limit	≤ 12.5	≤ 12.5	≤ 12.5	PASS
Unit	μW/MHz	μW/MHz	μW/MHz	



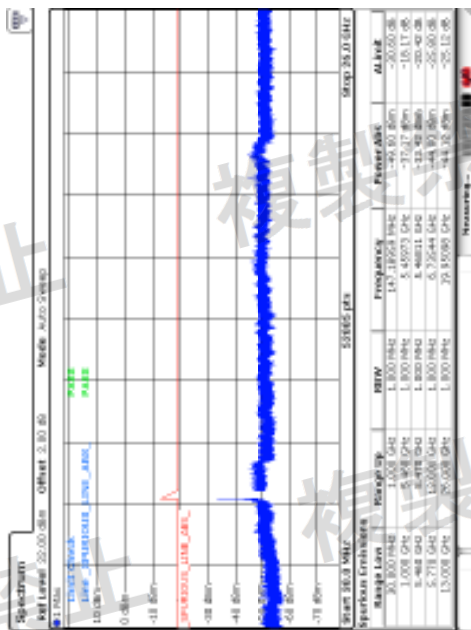


Test Channel: 144

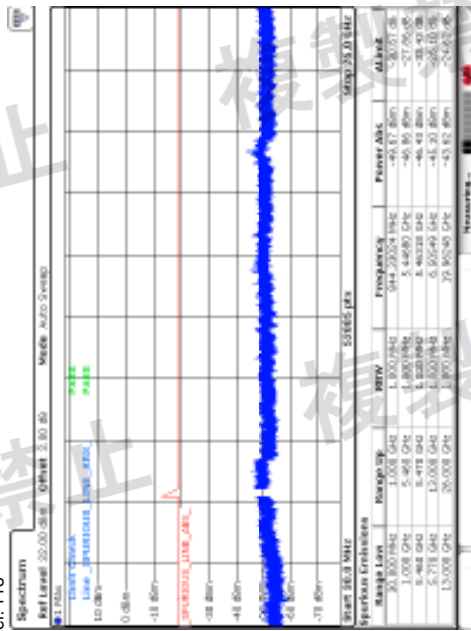


Date: 01 DEC 2019 11:42:45





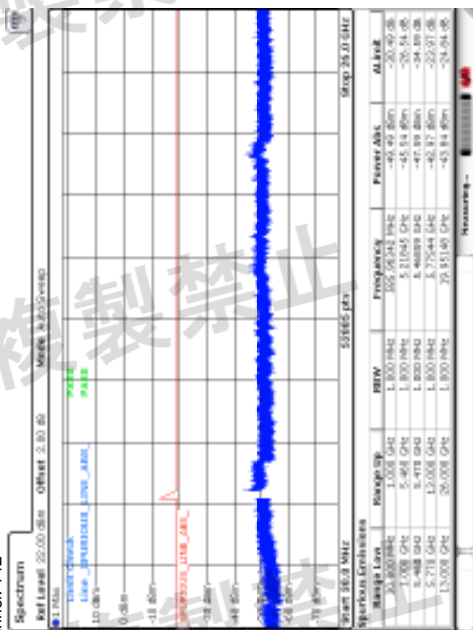
Date: 11 DEC 2018
Test Channel: 118



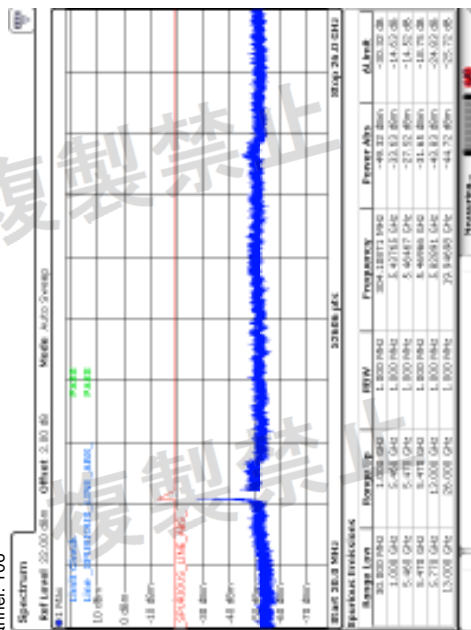
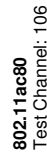
Date: 01 DEC 2016 11:51:53

Letters generally appeared in a list, the one nearest to the bottom of the column being the latest. The letters were signed by the author, and the name of the author was printed in the margin of the column. The letters were arranged in the order of their receipt, and the date of receipt was printed in the margin of the column. The letters were arranged in the order of their receipt, and the date of receipt was printed in the margin of the column.

Member of the IEEE



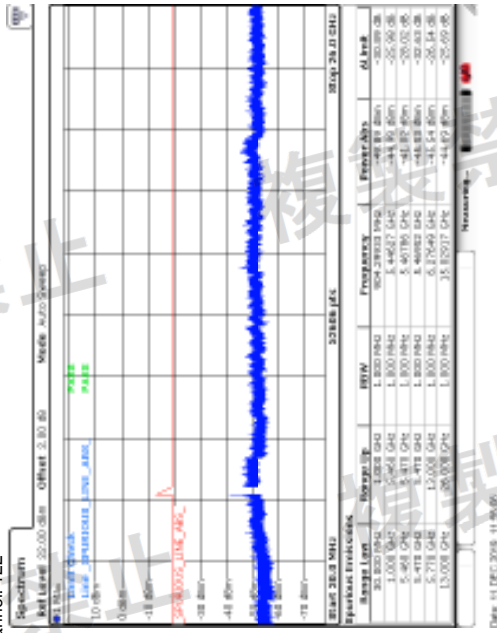
Date: 11 DEC 2019 11:52:35



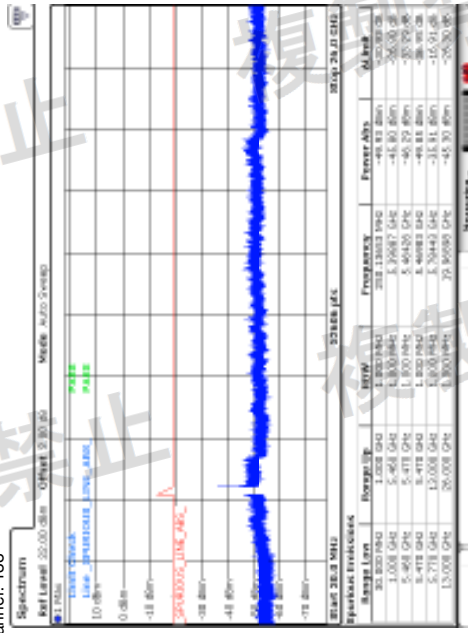
Date: 14 DEC 2018 11:51:35

[illegible]

1 800 763 0666
1 800 763 0666
1 800 763 0666



Test Channel: 138



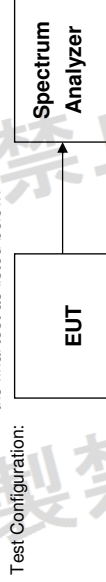
Phone: 614.293.7000 • 44-000-365

6.11 Spurious Emissions of Rx

Test Requirement: Item 19-3 of Article 2-1

- (1) Below 1 GHz : 4 nW or less
(2) 1 GHz and over : 20 nW or less

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.



Test Configuration:

Test Procedure:

- 1) Test Conditions:
Spectrum Analyzer is used for measurement.

- 2) EUT conditions:

Modulation/Spread

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

- 3) Spectrum Analyzer conditions:

Step 1

All spurious are measured from 30 MHz to 40 GHz by peak mode.

Step 2:

Frequency: Spurious Frequency

RBW 1 MHz

VBW 1 MHz

Sweep Time Auto

detector mode Sample

Indication mode Max hold

1000

Test Data:

Test Frequency	Test Result			Unit	Limit
	Normal Voltage	High Voltage	Low Voltage		
	3.86V DC	4.4V DC	3.5V DC		
30MHz-1GHz	-82.64	N/A	N/A	dBm	(1) Below 1 GHz : 4nw(-54dBm)
1 GHz -10GHz	-72.00	N/A	N/A		(2) 1 GHz and over : 20nw(-47 dBm)
10GHz -26 GHz	-70.78	N/A	N/A		

802.11n20

Test Frequency	Test Result			Unit	Limit
	Normal Voltage	High Voltage	Low Voltage		
	3.86V DC	4.4V DC	3.5V DC		
30MHz-1GHz	-83.15	N/A	N/A	dBm	(1) Below 1 GHz : 4nw(-54dBm)
1 GHz -10GHz	-71.75	N/A	N/A		(2) 1 GHz and over : 20nw(-47 dBm)
10GHz -26 GHz	-70.72	N/A	N/A		

802.11ac20

Test Frequency	Test Result			Unit	Limit
	Normal Voltage	High Voltage	Low Voltage		
	3.86V DC	4.4V DC	3.5V DC		
30MHz-1GHz	-82.46	N/A	N/A	dBm	(1) Below 1 GHz : 4nw(-54dBm)
1 GHz -10GHz	-71.52	N/A	N/A		(2) 1 GHz and over : 20nw(-47 dBm)
10GHz -26 GHz	-70.55	N/A	N/A		

802.11n40

Test Frequency	Test Result			Unit	Limit
	Normal Voltage	High Voltage	Low Voltage		
	3.86V DC	4.4V DC	3.5V DC		
30MHz-1GHz	-82.25	N/A	N/A	dBm	(1) Below 1 GHz : 4nw(-54dBm)
1 GHz -10GHz	-71.70	N/A	N/A		(2) 1 GHz and over : 20nw(-47 dBm)
10GHz -26 GHz	-70.71	N/A	N/A		

802.11ac40

Test Frequency	Test Result			Unit	Limit
	Normal Voltage	High Voltage	Low Voltage		
	3.86V DC	4.4V DC	3.5V DC		
30MHz-1GHz	-82.76	N/A	N/A	dBm	(1) Below 1 GHz : 4nw(-54dBm)
1 GHz -10GHz	-71.40	N/A	N/A		(2) 1 GHz and over : 20nw(-47 dBm)
10GHz -26 GHz	-70.58	N/A	N/A		

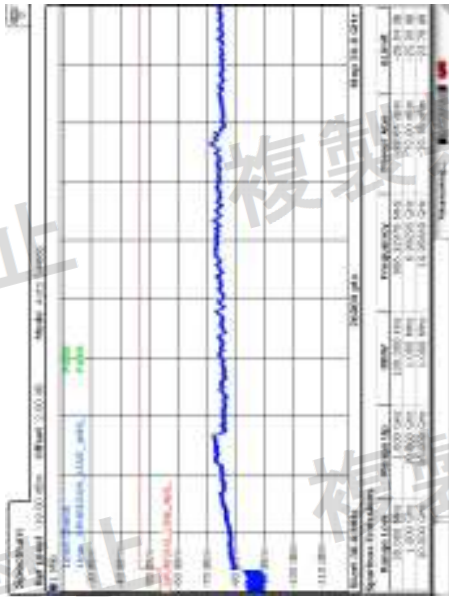
802.11ac80

Test Frequency	Test Result			Unit	Limit
	Normal Voltage	High Voltage	Low Voltage		
	3.86V DC	4.4V DC	3.5V DC		
30MHz-1GHz	-82.37	N/A	N/A	dBm	(1) Below 1 GHz : 4nw(-54dBm)
1 GHz -10GHz	-71.76	N/A	N/A		(2) 1 GHz and over : 20nw(-47 dBm)
10GHz -26 GHz	-70.31	N/A	N/A		

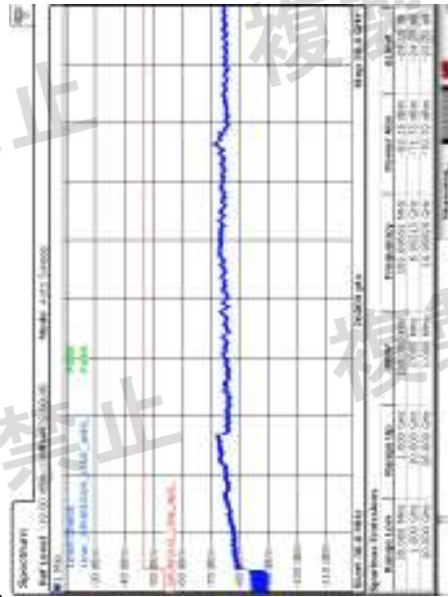


Test plot as follows:

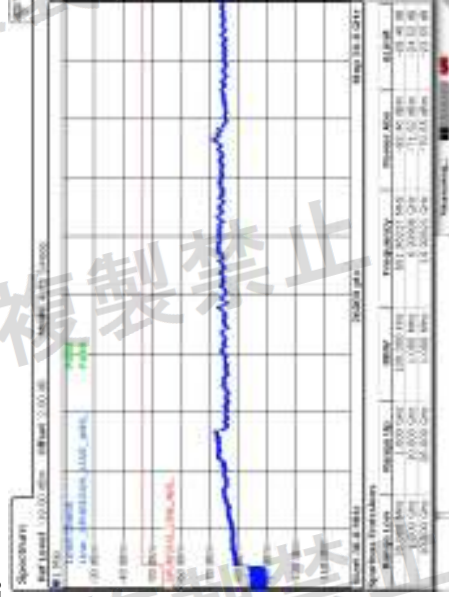
802.11a



802.11n20

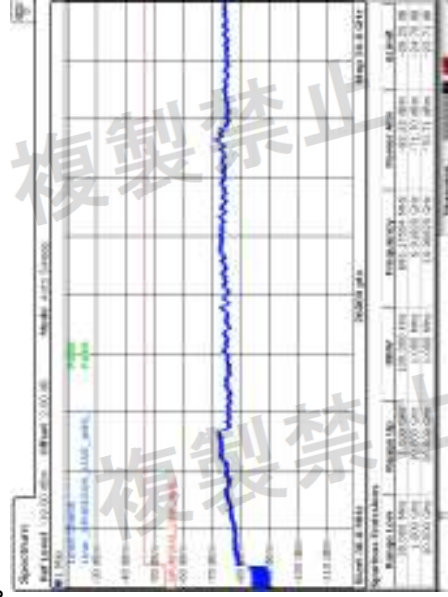


802.11ac20



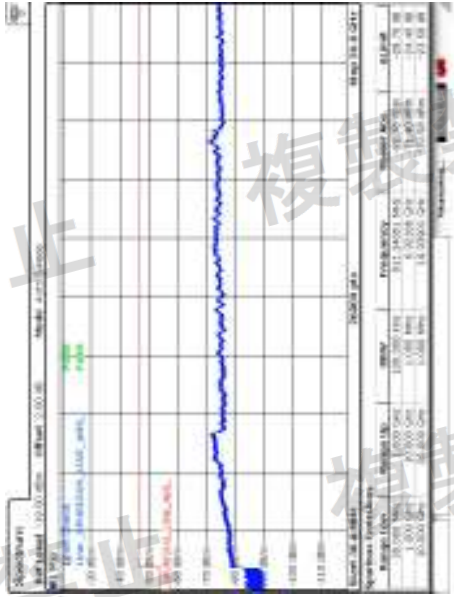
Date: 08/14/2014 09:59:28

802.11n40

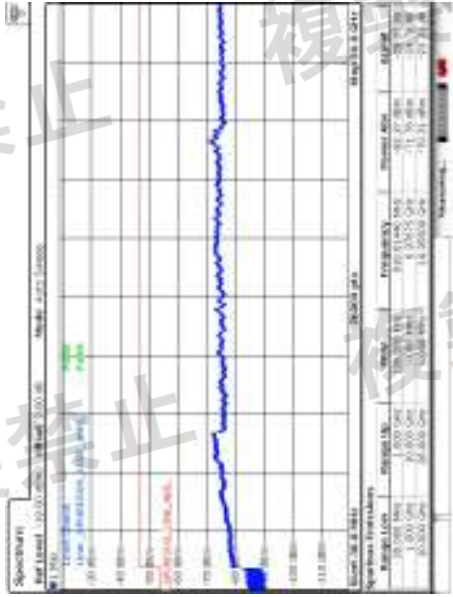


There is now just one more

802.11ac40



802.11ac80



Test result: The unit does meet the requirements.

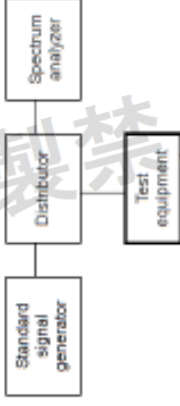


6.12 Carrier sense capability

Test Requirement: Item 19-3 of Article 2-1

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

Test Configuration: Test with test equipment only



Test Procedure:

- 1) Test Conditions:

Spectrum Analyzer and signal generator is used for measurement.

- 2) EUT conditions:

Set the test equipment at the test frequency and the test spread code, and set it to the receiving mode, when using external test equipment, establish a connection

- 3) Set the standard signal generator as follows:

Carrier frequency: Center frequency of receiving frequency band of test equipment

Modulation: No modulation (when the carrier sense function does not work by the the unmodulated subcarrier in center frequency, shift the frequency or modulate if needed.)

Output level: In the antenna input unit of a test equipment, field intensity is equivalent to the value which becomes 100mV/m.

- 4) Set the spectrum analyzer as follows:

Center frequency: Center frequency of the bandwidth used.

Sweep frequency band: 50MHz

Resolution bandwidth: Approximately 1 MHz

Video bandwidth: Approximately same as the resolution bandwidth

Y-axis scale: 10dB/Div

Trigger condition: Free-run

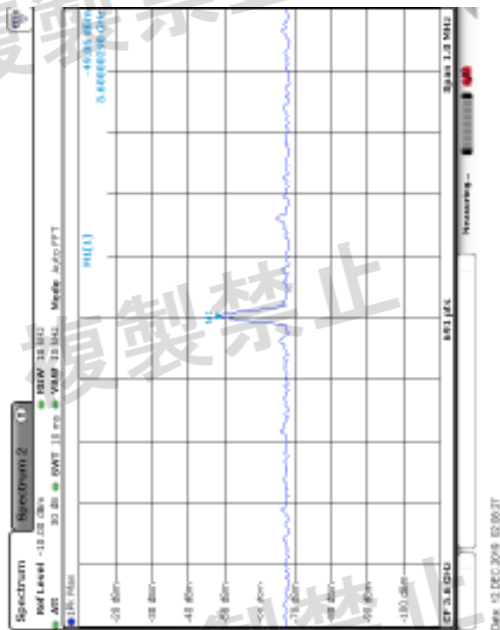
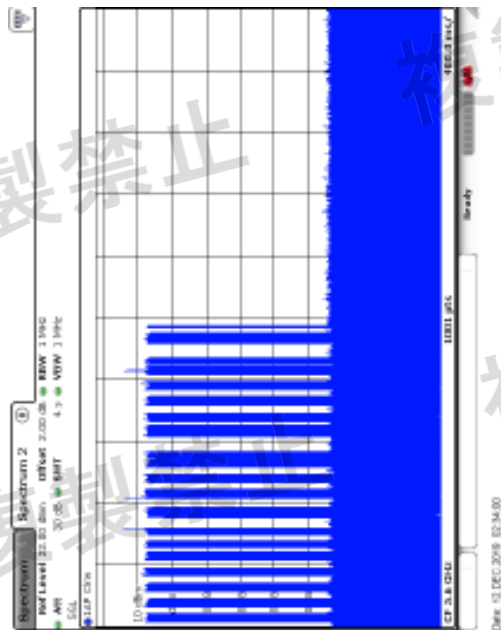
Detective mode: Positive peak



- (1) Test with test equipment only: Set the test equipment to the transmitting operation with the output of standard signal generator OFF, and confirm that it emits radio wave, using spectrum analyzer.
- (2) Set the test equipment to the receiving mode.
- (3) Set the test equipment to the transmitting operation with the output of standard signal generator ON, and confirm that it does not emit radio wave, using spectrum analyzer.

Test result: The product shall not transmit radio wave when receiving over 100mV/m. The unit does meet the requirements

Result plot as follows:



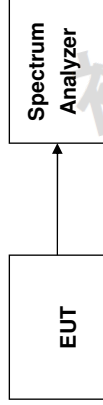
6.13 Burst Length

Test Requirement: Item 19-3 of Article 2 Paragraph 1

8ms or less

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

- 1) Test Conditions:
Frequency Counter or Spectrum Analyzer is used for measurement.

- 2) EUT conditions:

Modulation/Spread On

- 3) Spectrum Analyzer conditions:

Frequency: Test Frequency

Span 0 MHz

RBW 1 MHz,

VBW 1 MHz,

Detector mode Positive peak

Indication mode Max hold

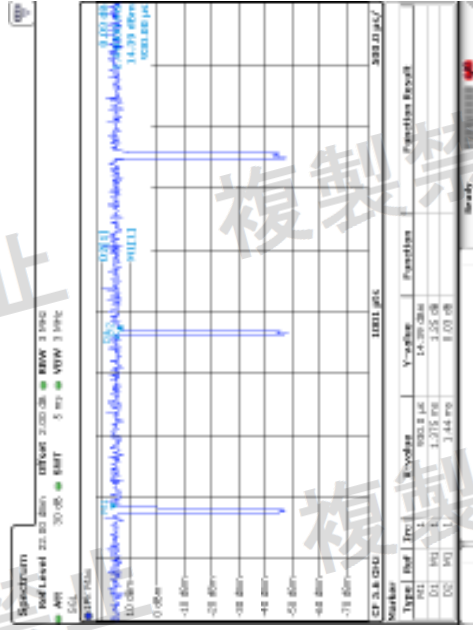
Test Data:

	Test value(ms)	Limit	Result
802.11a	1.440	≤ 8ms	Pass
802.11n	1.355	≤ 8ms	Pass
802.11n40	0.693	≤ 8ms	Pass
802.11ac	1.355	≤ 8ms	Pass
802.11ac40	0.705	≤ 8ms	Pass
802.11ac80	0.368	≤ 8ms	Pass

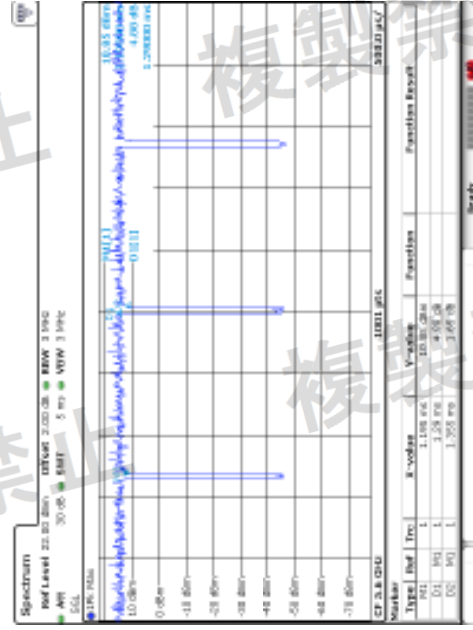


Result plot as follows:

802.11a:

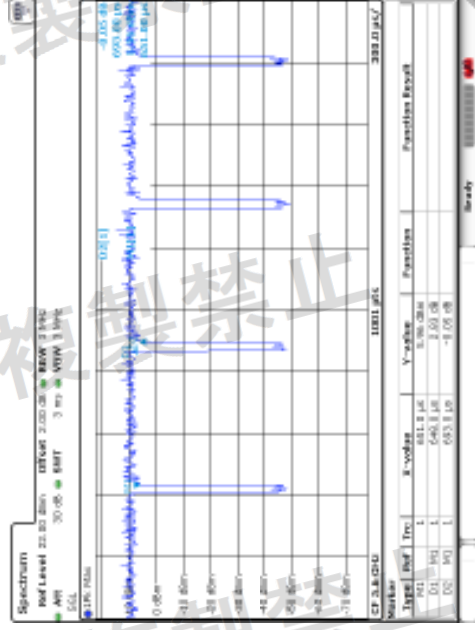


Date: 11 DEC 2018 14:14:27

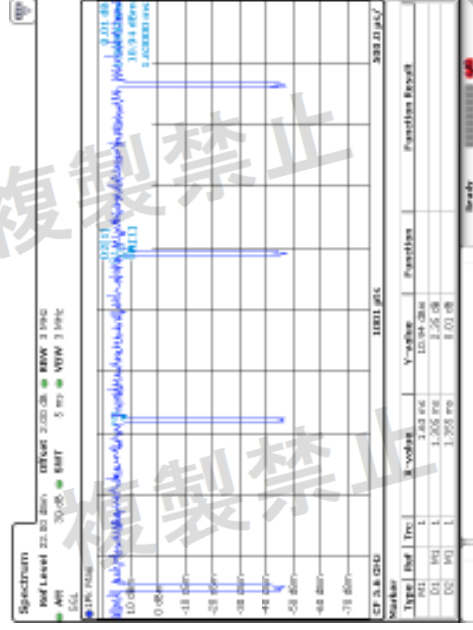


Date: 14 DEC 2018 11:45:00

802.11n40:



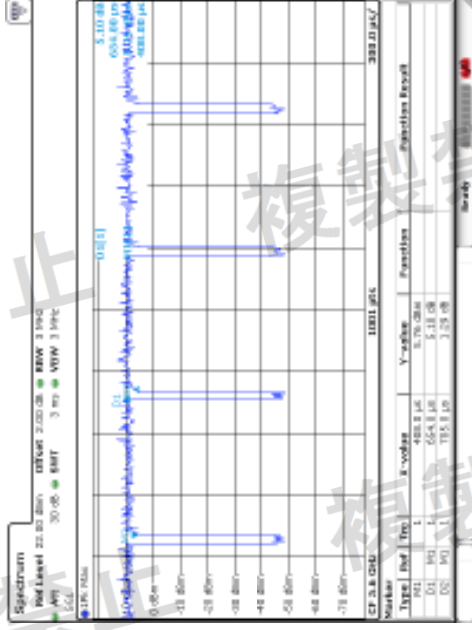
Date: 01 DEC 2016 14:47:34



Date: 01 DEC 2016 14:45:50

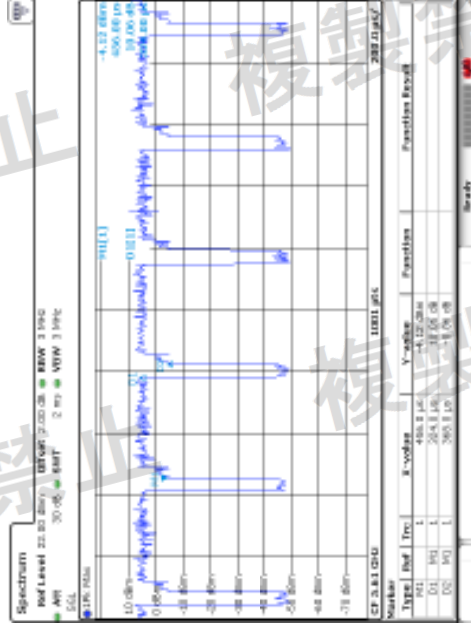
Test result: The unit does meet the requirements.

802.11ac40:



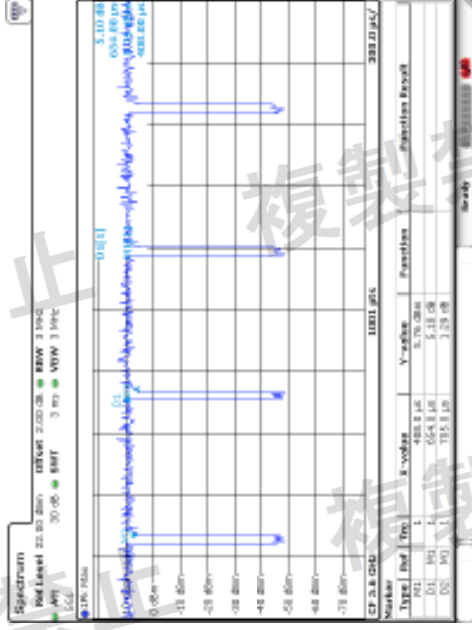
Date: 11 DEC 2019 14:00:00

802.11ac80:



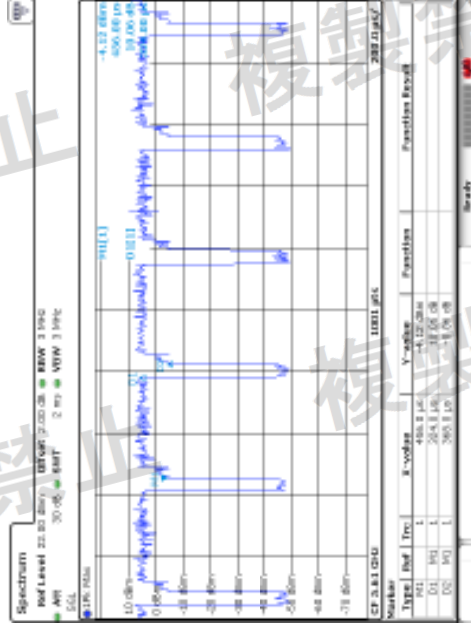
Date: 11 DEC 2019 14:02:21

802.11ac40:



Date: 11 DEC 2019 14:00:00

802.11ac80:



Date: 11 DEC 2019 14:02:21

6.14 RF accessibility

Standard requirement

Article 2, Item (19) Notice 88 Appendix 43, 44, 45

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

RF and Modulation parts are mounted on PCB with surface mount technology, and there is no any adjustable parts on PCB or adjustable parts are not exposed.

7 EUT Test Setup



--End of the Report--