



Radio Test Report (Bluetooth LE)

Report No.: RJ190426C18A-2

Test Model: EPD-132

Series Model: EPD-092, EPD092, EPD132 (Refer to item 3.1 for the more details)

Received Date: May 17, 2019

Test Date: May 26 ~ May 28, 2019

Issued Date: Aug. 29, 2019

Applicant: ADVANTECH CO., LTD

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Release Control Record

Issue No.	Description	Date Issued
RJ190426C18A-2	Original release	Aug. 29, 2019



1 Certificate of Conformity

Product: WIRELESS Epaper CONTROL BOARD

Brand: Advantech

Test Model: EPD-132

Series Model: EPD-092, EPD092, EPD132 (Refer to item 3.1 for the more details)

Sample Status: Engineering sample

Applicant: ADVANTECH CO., LTD

Test Date: May 26 ~ May 28, 2019

Standards: ARIB STD-T66 (V3.7), MIC notice 88 Appendix 43
Article 2 Paragraph 1 of Item 19

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by :

Pettie Chen

Date:

Aug. 29, 2019

Pettie Chen / Senior Specialist

Approved by :

Bruce Chen

Date:

Aug. 29, 2019

Bruce Chen / Senior Project Engineer

2 Summary of Test Results

The EUT has been tested according to the following specifications:

Notice 88 Appendix 43 Reference	ARIB STD-T66 Ref.	Report Reference	Parameter	Test Results (Note)
General Provisions				
C	3.2 (4)	4.1	Frequency tolerance	C
D	3.2 (7)	4.2	Occupied bandwidth	C
E	3.2 (6)	4.4	Spurious emissions	C
Transmitting Equipment				
F	3.2 (2)	4.5	Antenna power	C
--	--	--	SAR	NA
Transmitting Antenna				
--	--	3.5	Type, configuration, etc. of transmitting antenna	C
--	--	3.5	Direction pattern of transmitting antenna	C
Receiving Equipment				
G	3.3 (1)	4.6	Spurious emissions of receiver	C
--	--	3.6	Refer to all articles for transmitting antenna	C
Operating Frequency 2400 to 2483.5MHz				
--	3.7 (1)a	3.2	Radio Frequency	C
--	3.7 (1)	3.4	Modulation section cannot be opened easily	C
--	3.1 (1)	3.1	Communication method	C
--	3.2 (1)a	3.1	Modulation method	C
--	3.2 (1)a	3.1	Spread spectrum method	C
--	3.2 (2)	4.5	Antenna power	C
--	3.6 (2)	3.5.2	Absolute gain of transmitting antenna	C
--	3.6 (2)	--	Angular width of principal radiation (AWPR)	NA
--	3.2 (10)	--	Number of carriers within 1 MHz bandwidth in OFDM	NA
--	3.2 (8)	4.3	Spreading bandwidth	C
--	3.2 (9)	4.3	Spreading factor	C
--	3.2 (11)	--	Frequency retention time (FH employed)	NA
--	3.4.1(1)	4.7	Interference Prevention Function	C
Note: C = Conform NC = Not Conform NT = Not Tested NA = Not Applicable				

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in TR 100 028-1.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Parameter	Uncertainty
Occupied Bandwidth	491.896Hz
Spurious emissions	3.508dB
Output power density	2.889dB
Adjacent Channel Leakage Power	1.35dB
Out of band radiated power	3.93dB
Frequency Tolerance	6805.18Hz
Burst length	0.01%

2.2 Modification Record

There were no modifications required for compliance.



3 General Information

3.1 General Description of EUT

Product	WIRELESS Epaper CONTROL BOARD
Brand	Advantech
Test Model	EPD-132
Series Model	EPD-092, EPD092, EPD132
Model Difference	Refer to Note
Status of EUT	Engineering sample
Nominal Voltage	5Vdc (Host)
Modulation Type	GFSK
Transfer Rate	1Mbps
Operating Frequency	2402 ~ 2480MHz
Number of Channel	40
Rated RF Output Power	3.00mW
Conducted RF Output Power	2.188mW
Radiated RF Output Power	6.967mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	Refer to note
Data Cable Supplied	Refer to note

Note:

1. All models are listed as below.

Product Name	Model	Difference
WIRELESS Epaper CONTROL BOARD	EPD-092	Marketing purpose
	EPD092	
	EPD-132	
	EPD132	

Model: EPD-092 and EPD092 are electrically identical, different model names are for marketing purpose.

Model: EPD-132 and EPD132 are electrically identical, different model names are for marketing purpose.

Model: EPD-132 is chosen for the final tests.



2. The following antennas were provided to the EUT.

For EUT Model: EPD-092, EPD092:

Ant. No.	Type	P/N	Connector	Gain (dBi)			
1	Dipole	AN2450-92K01BRS	SMA Male Reverse	5.03			
2	Dipole	AN2450-5511BRS	SMA Male Reverse	2.89			
3	Dipole	RFDPA131000SBLB808	Reverse SMA Plug	Freq. (MHz)	ZX Plane	ZY Plane	XY Plane
				2400	2.17	1.01	0.65
				2450	2.57	2.11	1.07
				2500	2.92	1.79	0.82
4	Monopole	AJMQ1J-B0009	I-PEX I	3.61			

For EUT Model: EPD-132, EPD132:

Ant. No.	Type	P/N	Connector	Gain (dBi)			
1	Dipole	AN2450-92K01BRS	SMA Male Reverse	5.03			
2	Dipole	AN2450-5511BRS	SMA Male Reverse	2.89			
3	Dipole	RFDPA131000SBLB808	Reverse SMA Plug	Freq. (MHz)	ZX Plane	ZY Plane	XY Plane
				2400	2.17	1.01	0.65
				2450	2.57	2.11	1.07
				2500	2.92	1.79	0.82
4	Monopole	AJMQ1J-B0007	I-PEX I	1.51			

*Antenna 1 with maximum gain was chosen for the final tests.

3. The following Accessories for the EUT. (Optional)

Type	Length
RF SMA cable	L=150mm
Antenna magnetic base	L=100mm
FPC Cable 10P-0.5mm for DCU2.0	7.9cm
Micro USB cable	60cm
daughter board with Switch and LED	-

3.2 Description of Test Modes

40 channels are provided to this EUT:

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

By means of test software (Wireless Tool) provided by manufacture, the power levels during the tests were set according to the following codes:

Modulation type: GFSK	
Channel	Power Setting
0	Default
19	Default
39	Default

3.3 Test Conditions

Test Conditions	Voltage (Vdc)
V_{normal}	5
$V_{max. (+10\%)}$	5.5
$V_{min. (-10\%)}$	4.5

3.4 Assembly

The RF circuit was covered by metal shielding case, and the metal shielding case won't be easy to be opened.



3.5 Antenna Specifications

3.5.1 Antenna Gain

For EUT Model: EPD-092, EPD092:

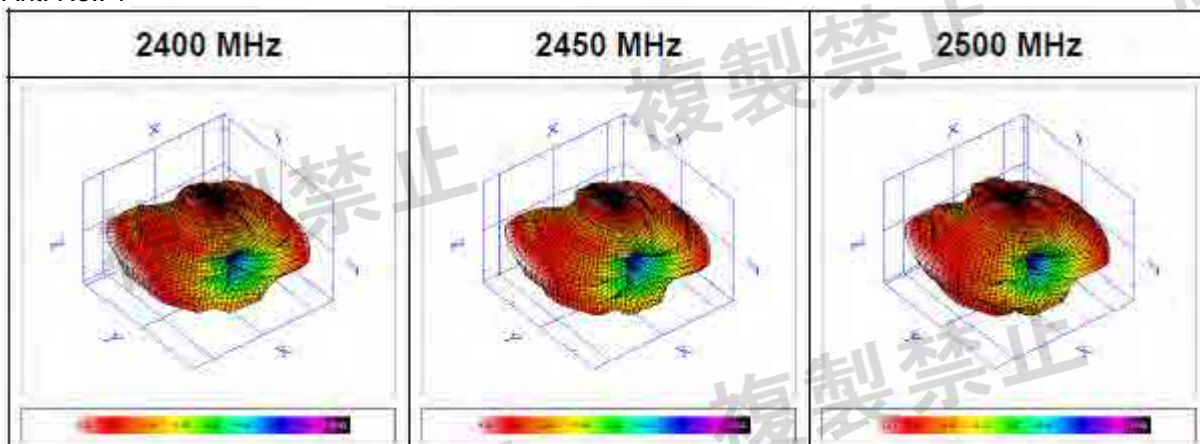
Ant. No.	Type	P/N	Connector	Gain (dBi)			
1	Dipole	AN2450-92K01BRS	SMA Male Reverse	5.03			
2	Dipole	AN2450-5511BRS	SMA Male Reverse	2.89			
3	Dipole	RFDPA131000SBLB808	Reverse SMA Plug	Freq. (MHz)	ZX Plane	ZY Plane	XY Plane
				2400	2.17	1.01	0.65
				2450	2.57	2.11	1.07
				2500	2.92	1.79	0.82
4	Monopole	AJMQ1J-B0009	I-PEX I	3.61			

For EUT Model: EPD-132, EPD132:

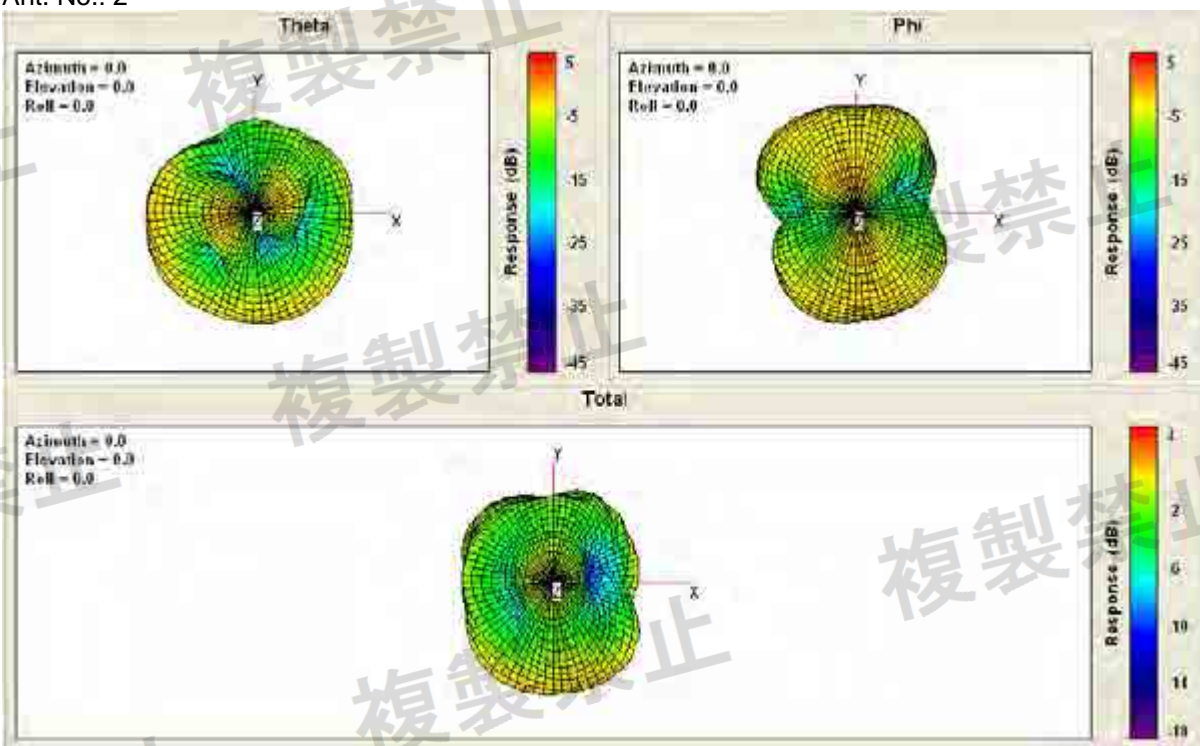
Ant. No.	Type	P/N	Connector	Gain (dBi)			
1	Dipole	AN2450-92K01BRS	SMA Male Reverse	5.03			
2	Dipole	AN2450-5511BRS	SMA Male Reverse	2.89			
3	Dipole	RFDPA131000SBLB808	Reverse SMA Plug	Freq. (MHz)	ZX Plane	ZY Plane	XY Plane
				2400	2.17	1.01	0.65
				2450	2.57	2.11	1.07
				2500	2.92	1.79	0.82
4	Monopole	AJMQ1J-B0007	I-PEX I	1.51			

3.5.2 Antenna Pattern

Ant. No.: 1

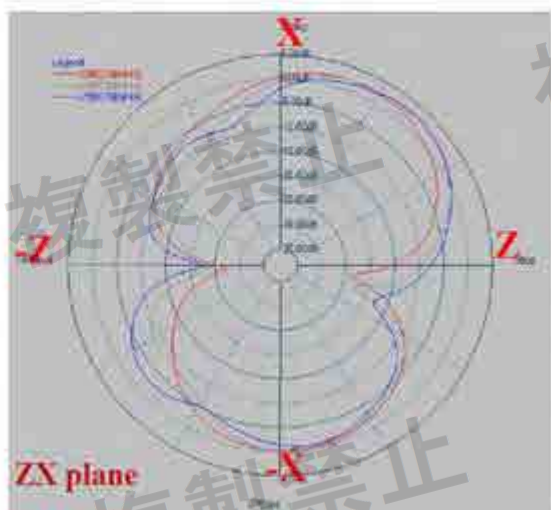


Ant. No.: 2



Ant. No.: 3
Phi=0.00deg

Gain, dB



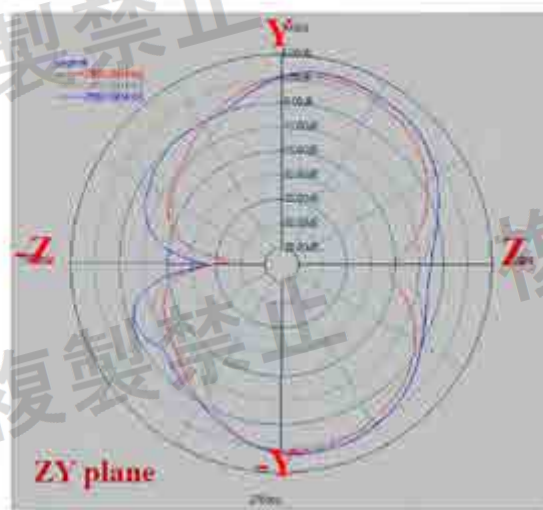
Theta=90.00deg

Gain, dB

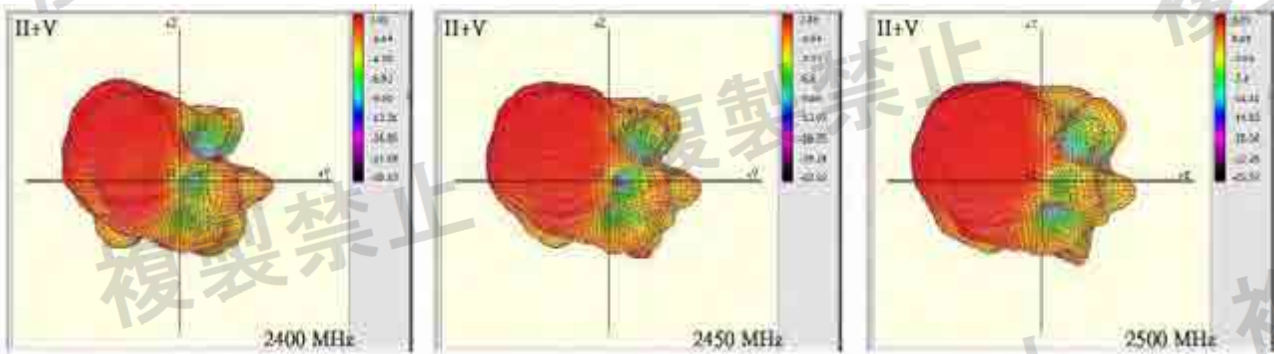


Phi=90.00deg

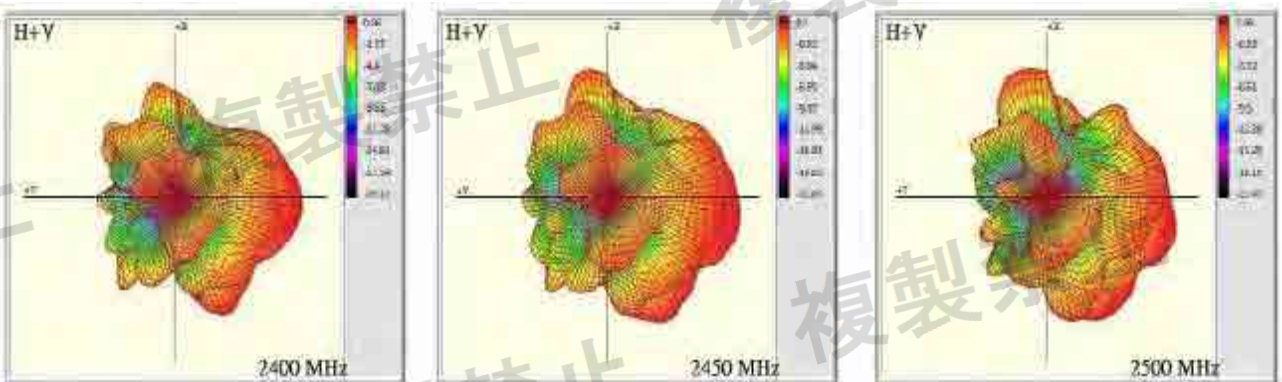
Gain, dB



For EUT Model: EPD-092, EPD092
Ant. No.: 4



For EUT Model: EPD-132, EPD132:
Ant. No.: 4





4 Test Results

4.1 Frequency Tolerance Measurement

4.1.1 Limits of Frequency Tolerance Measurement

Tolerance of frequency shall be ± 50 ppm

4.1.2 Test Setup



4.1.3 Test Results

Environmental Conditions		25 deg.C, 68% RH					
Channel	Frequency (MHz)	V _{normal}		V _{max.}		V _{min.}	
		Carrier frequency (MHz)	Frequency tolerance (ppm)	Carrier frequency (MHz)	Frequency tolerance (ppm)	Carrier frequency (MHz)	Frequency tolerance (ppm)
0	2402	2401.978880	-8.792	2401.978880	-8.792	2401.978880	-8.792
19	2440	2439.979460	-8.418	2439.979460	-8.418	2439.979460	-8.418
39	2480	2479.977380	-9.120	2479.977670	-9.004	2479.977380	-9.120

4.2 Occupied Bandwidth Measurement (99% power bandwidth)

4.2.1 Limits of Occupied Bandwidth Measurement

Item	Limit
Occupied bandwidth	<26MHz

4.2.2 Test Setup

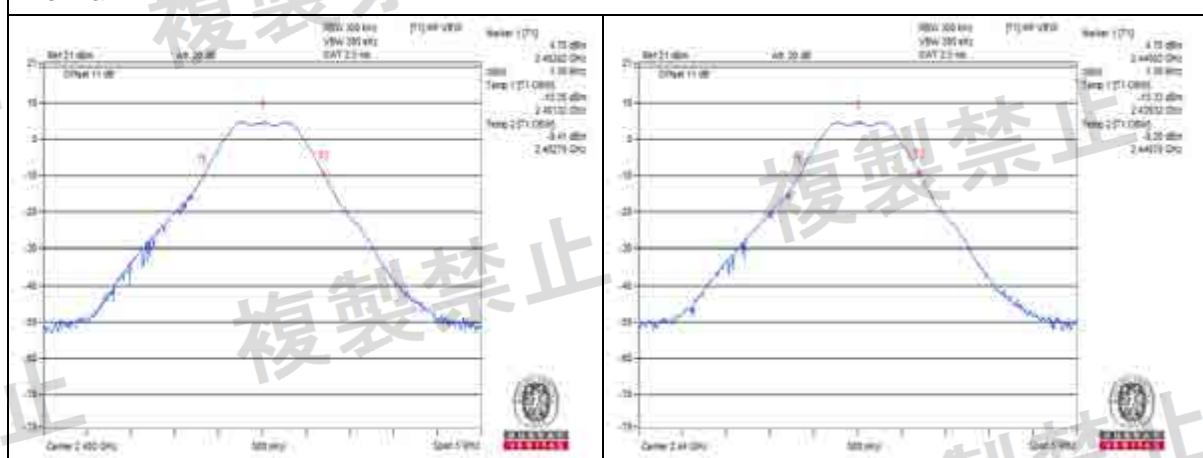


4.2.3 Test Results

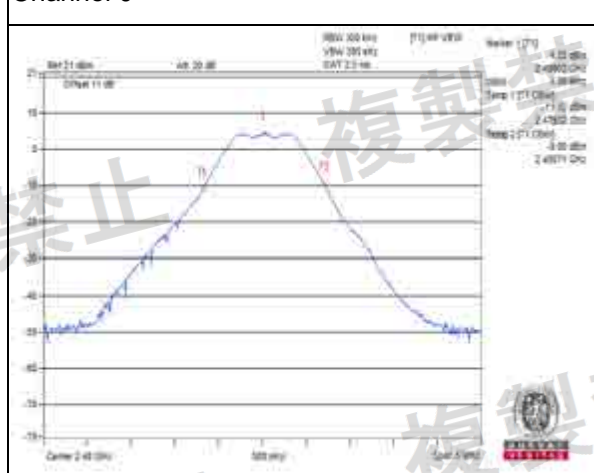
Environmental Conditions		25 deg.C, 68% RH		
Channel	Frequency (MHz)	V _{normal}	V _{max.}	V _{min.}
		Occupied Bandwidth (MHz)	Occupied Bandwidth (MHz)	Occupied Bandwidth (MHz)
0	2402	1.38	1.38	1.38
19	2440	1.38	1.38	1.38
39	2480	1.39	1.39	1.39

Note: 1. For the test plots please refer to the below pages.

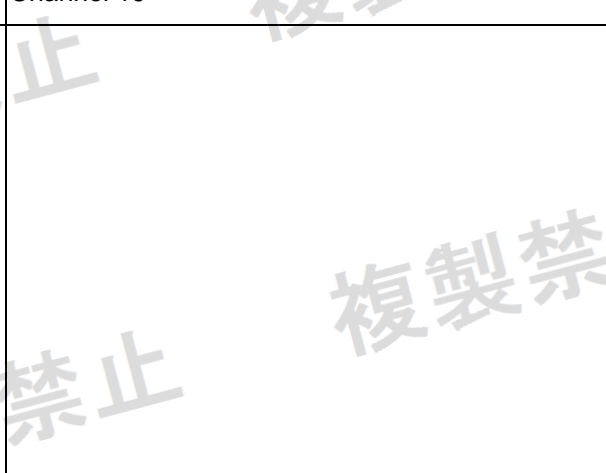
V_{normal}



Channel 0



Channel 19

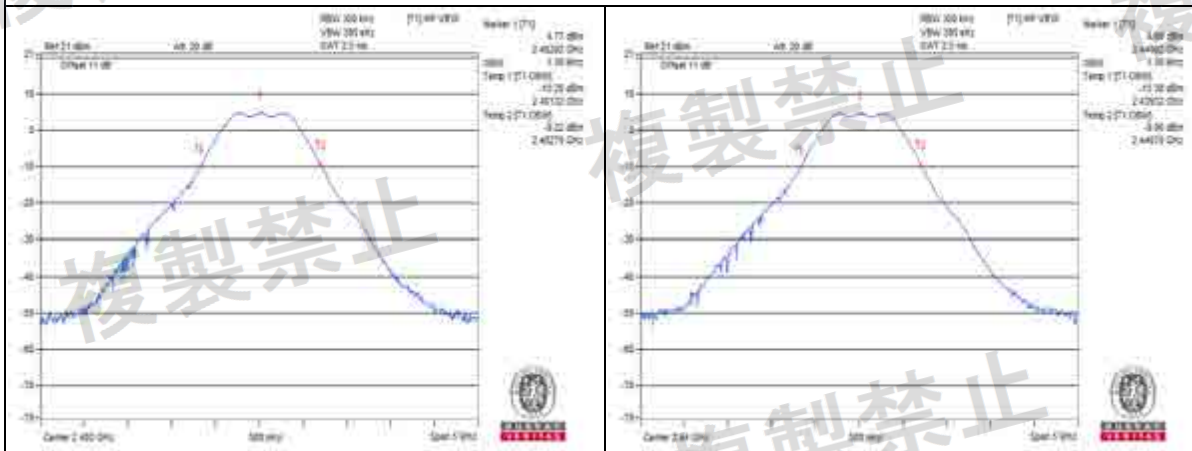


Channel 39

Measurement uncertainty: ± 206.50 Hz

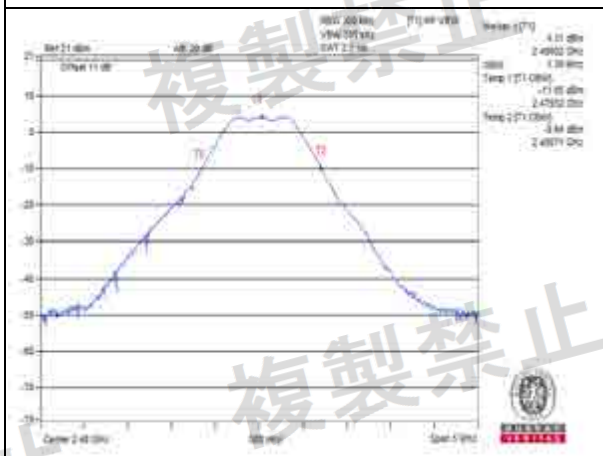


V_{max}.



Channel 0

Channel 19

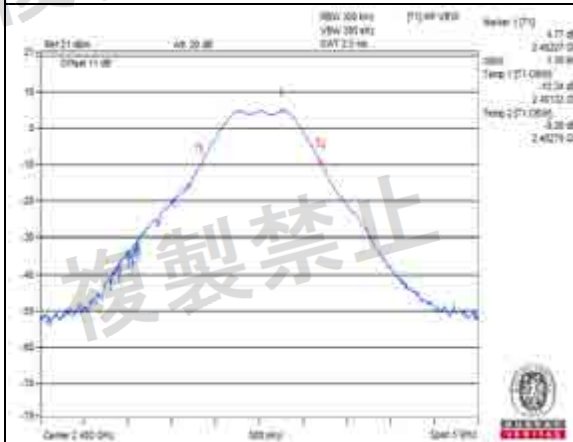


Channel 39

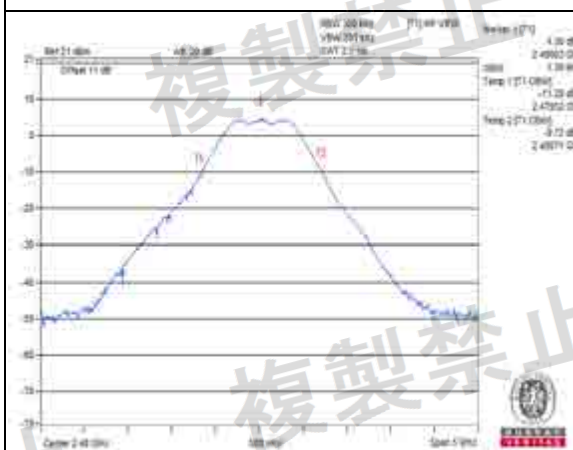
Measurement uncertainty: ± 206.50 Hz



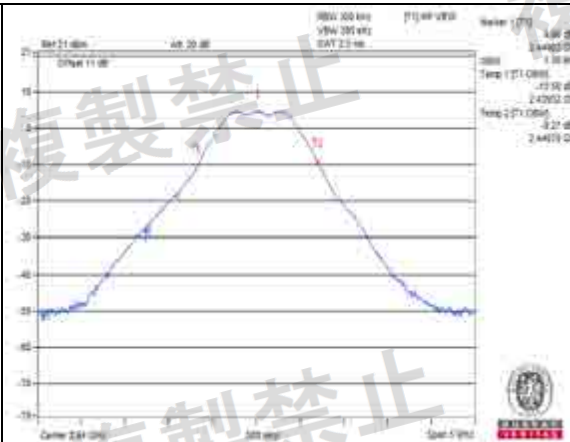
V_{min}.



Channel 0



Channel 39



Channel 19

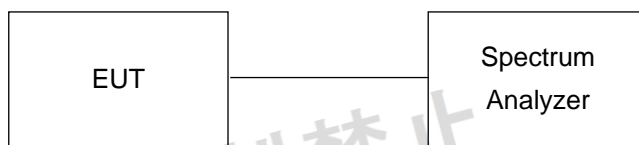
Measurement uncertainty: ± 206.50 Hz

4.3 Spreading Bandwidth Measurement (90% power bandwidth)

4.3.1 Limits of Spreading Bandwidth and Spreading Factor Measurement

Item	Limit	Remark
Spreading Bandwidth	$\geq 500\text{kHz}$	
Spreading Factor	≥ 5	Operating frequency 2400 to 2483.5MHz

4.3.2 Test Setup



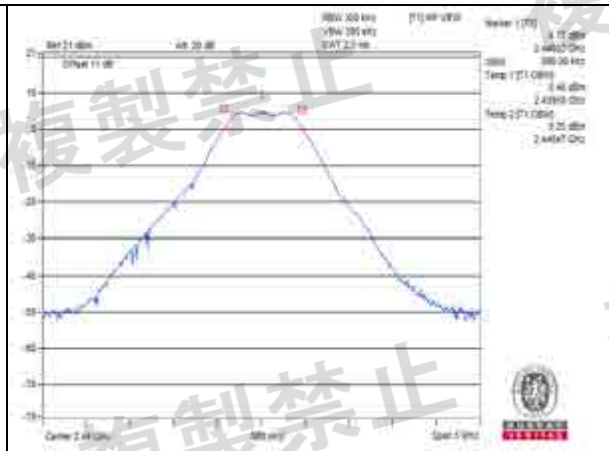
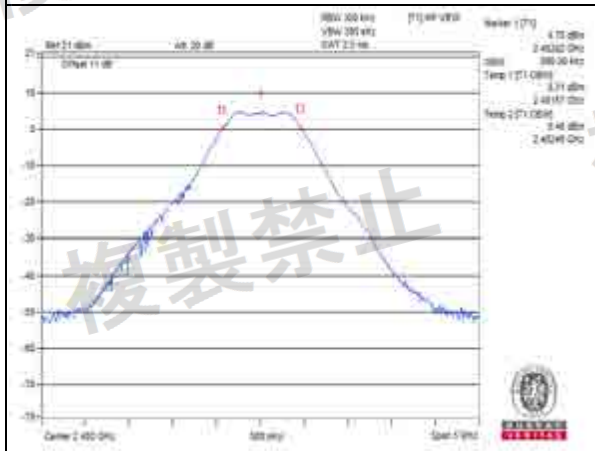
4.3.3 Test Results

Environmental Conditions		25 deg.C, 68% RH					
Channel	Frequency (MHz)	V _{normal}		V _{max.}		V _{min.}	
		Occupied Bandwidth (MHz)	Spreading Factor	Occupied Bandwidth (MHz)	Spreading Factor	Occupied Bandwidth (MHz)	Spreading Factor
0	2402	0.89	14.24	0.89	14.24	0.89	14.24
19	2440	0.89	14.24	0.89	14.24	0.89	14.24
39	2480	0.89	14.24	0.89	14.24	0.89	14.24

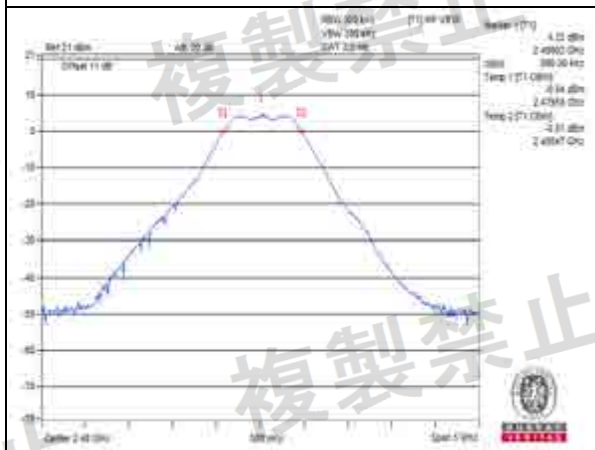
Note: 1. For the test plots please refer to the below pages.
 2. Spreading Factor: 90% channel power bandwidth / 0.0625



Vnormal



Channel 0



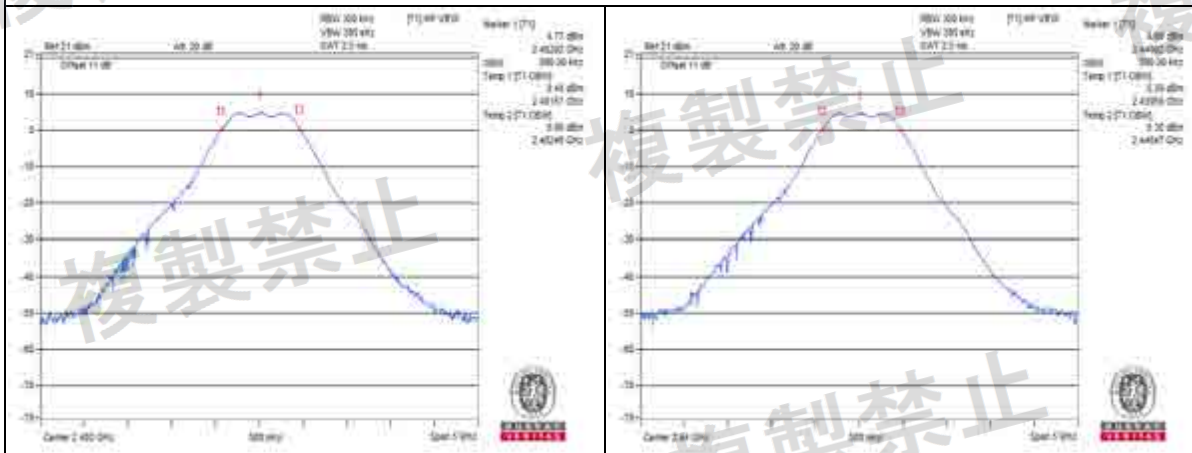
Channel 19



Channel 39

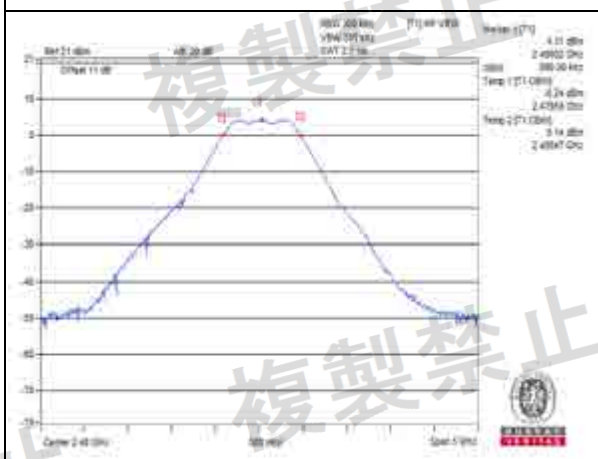
Measurement uncertainty: ± 206.50 Hz

V_{max}.



Channel 0

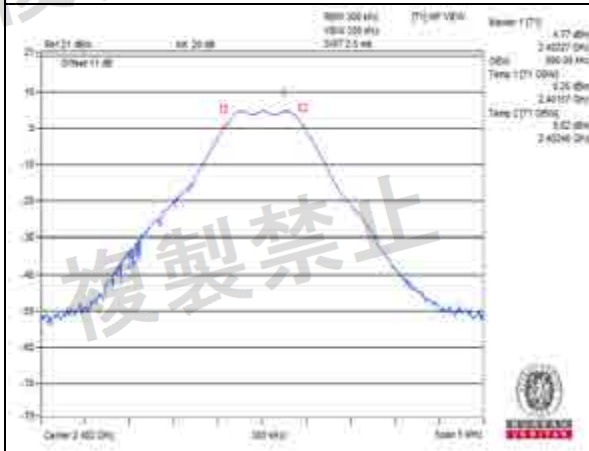
Channel 19



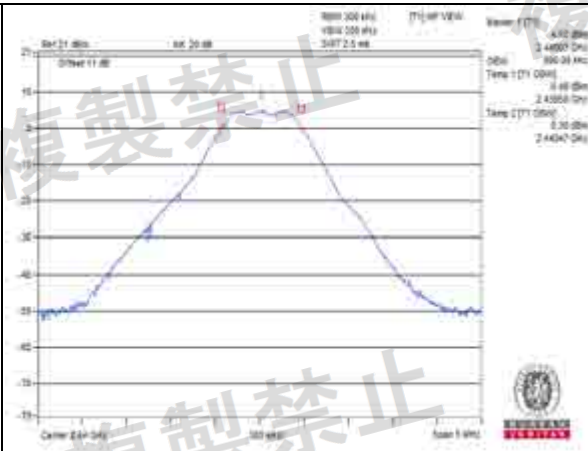
Channel 39

Measurement uncertainty: ± 206.50 Hz

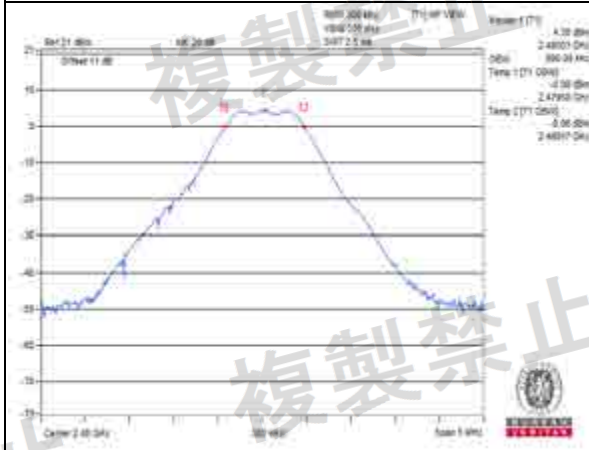
V_{min}.



Channel 0



Channel 19



Channel 39

Measurement uncertainty: ± 206.50 Hz



4.4 Spurious Emissions for Transmitter Measurement

4.4.1 Limits of Spurious Emissions

Frequencies (MHz)	Limit
Operating frequency 2400 to 2483.5MHz	
30.0MHz to 1000.0MHz	$\leq 0.25 \text{ uW/100kHz}$
1000.0MHz to 2387MHz	$\leq 2.5 \text{ uW/MHz}$
2387.0MHz to 2400.0MHz	$\leq 25 \text{ uW/MHz}$
2483.5MHz to 2496.5MHz	$\leq 25 \text{ uW/MHz}$
2496.5MHz to 12500.0MHz	$\leq 2.5 \text{ uW/MHz}$

4.4.2 Test Setup





4.4.3 Test Results

Environmental Conditions		25 deg.C, 68% RH					
Test Channel		CH 0 (2402MHz)		CH 19 (2440MHz)		Limit	Result
Test Condition	Frequency Range	Frequency (MHz)	Measured Value (uW)	Frequency (MHz)	Measured Value (uW)		
V _{normal}	30.0MHz to 1000.0MHz	697.360	0.019588uW	390.840	0.022182uW	0.25uW/100 kHz	PASS
	1000.0MHz to 2387MHz	2270.490	0.007447uW	2267.710	0.007464uW	2.5uW/MHz	PASS
	2387.0MHz to 2400.0MHz	2400.000	15.848932uW	2398.070	0.00743uW	25uW/MHz	PASS
	2483.5MHz to 2496.5MHz	2484.770	0.007447uW	2484.560	0.007798uW	25uW/MHz	PASS
	2496.5MHz to 12500.0MHz	3076.700	0.052481uW	9318.880	0.069502uW	2.5uW/MHz	PASS
V _{max.}	30.0MHz to 1000.0MHz	852.560	0.019099uW	123.120	0.019679uW	0.25uW/100 kHz	PASS
	1000.0MHz to 2387MHz	2239.970	0.00778uW	2273.260	0.009162uW	2.5uW/MHz	PASS
	2387.0MHz to 2400.0MHz	2400.000	15.885467uW	2397.790	0.007079uW	25uW/MHz	PASS
	2483.5MHz to 2496.5MHz	2489.740	0.010162uW	2495.480	0.008091uW	25uW/MHz	PASS
	2496.5MHz to 12500.0MHz	3056.690	0.064714uW	3036.680	0.054075uW	2.5uW/MHz	PASS
V _{min.}	30.0MHz to 1000.0MHz	951.500	0.02037uW	866.140	0.01762uW	0.25uW/100 kHz	PASS
	1000.0MHz to 2387MHz	2267.710	0.008017uW	2276.040	0.009057uW	2.5uW/MHz	PASS
	2387.0MHz to 2400.0MHz	2400.000	15.99558uW	2391.260	0.00859uW	25uW/MHz	PASS
	2483.5MHz to 2496.5MHz	2490.800	0.007962uW	2491.500	0.009506uW	25uW/MHz	PASS
	2496.5MHz to 12500.0MHz	3016.680	0.046989uW	3556.870	0.05224uW	2.5uW/MHz	PASS

Note: 1. The worst value in each frequency range v.s. each channel has been marked by boldface.

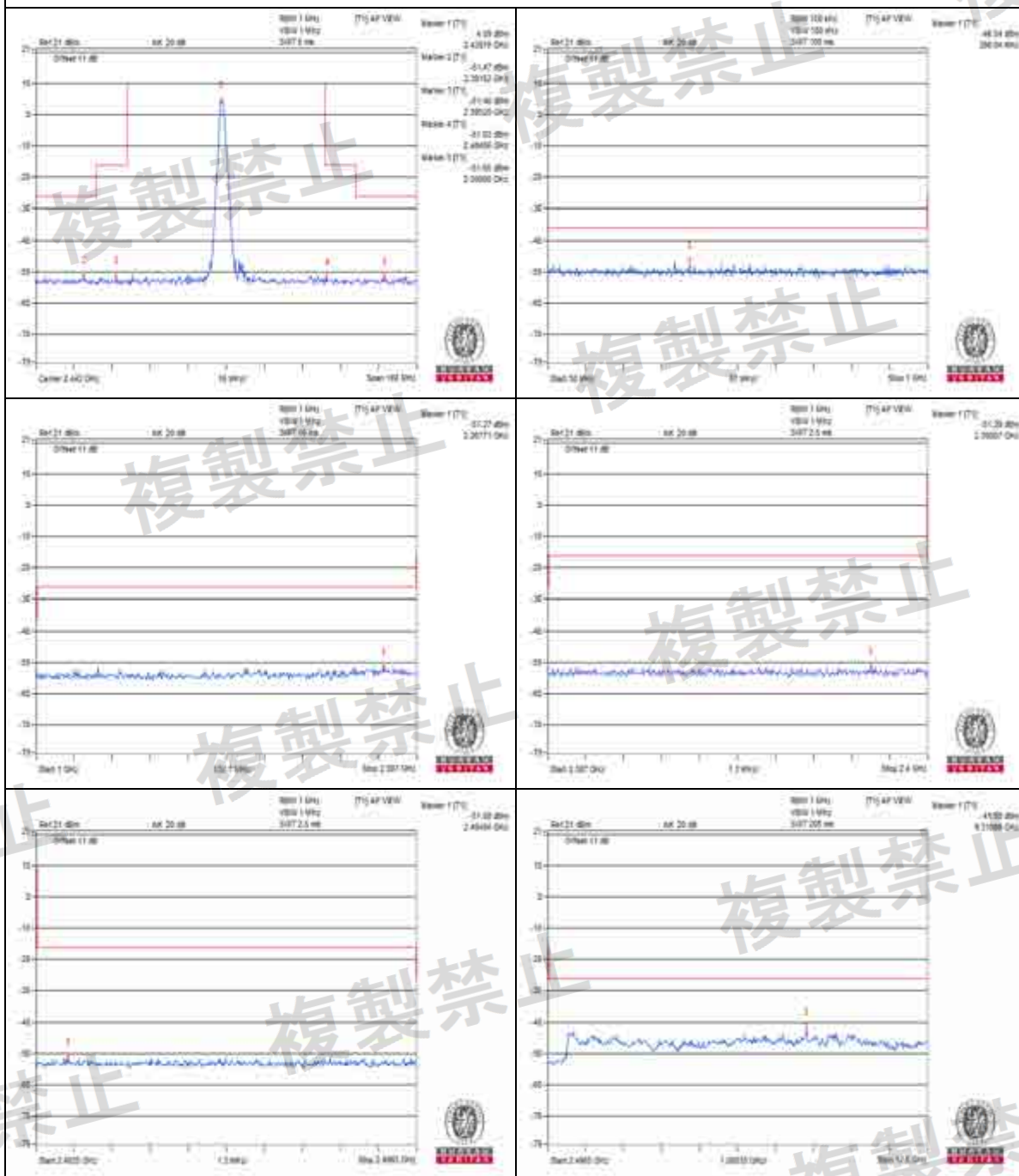
Environmental Conditions		25 deg.C, 68% RH			
Test Channel		CH 39 (2480MHz)		Limit	Result
Test Condition	Frequency Range	Frequency (MHz)	Measured Value (uW)		
V _{normal}	30.0MHz to 1000.0MHz	943.740	0.017179uW	0.25uW/100kHz	PASS
	1000.0MHz to 2387MHz	2325.970	0.008072uW	2.5uW/MHz	PASS
	2387.0MHz to 2400.0MHz	2388.660	0.007691uW	25uW/MHz	PASS
	2483.5MHz to 2496.5MHz	2483.500	0.41783uW	25uW/MHz	PASS
	2496.5MHz to 12500.0MHz	3016.680	0.043954uW	2.5uW/MHz	PASS
V _{max.}	30.0MHz to 1000.0MHz	873.900	0.020989uW	0.25uW/100kHz	PASS
	1000.0MHz to 2387MHz	2153.980	0.006902uW	2.5uW/MHz	PASS
	2387.0MHz to 2400.0MHz	2387.330	0.008913uW	25uW/MHz	PASS
	2483.5MHz to 2496.5MHz	2483.500	0.415911uW	25uW/MHz	PASS
	2496.5MHz to 12500.0MHz	9879.080	0.044157uW	2.5uW/MHz	PASS
V _{min.}	30.0MHz to 1000.0MHz	499.480	0.021184uW	0.25uW/100kHz	PASS
	1000.0MHz to 2387MHz	2195.590	0.007063uW	2.5uW/MHz	PASS
	2387.0MHz to 2400.0MHz	2390.840	0.007709uW	25uW/MHz	PASS
	2483.5MHz to 2496.5MHz	2483.500	0.413048uW	25uW/MHz	PASS
	2496.5MHz to 12500.0MHz	3136.720	0.063096uW	2.5uW/MHz	PASS

NOTE:

1. The worst value in each frequency range v.s. each channel has been marked by boldface.
2. The spectrum plots are attached on the following pages.

Report Format Version: 6.1.1

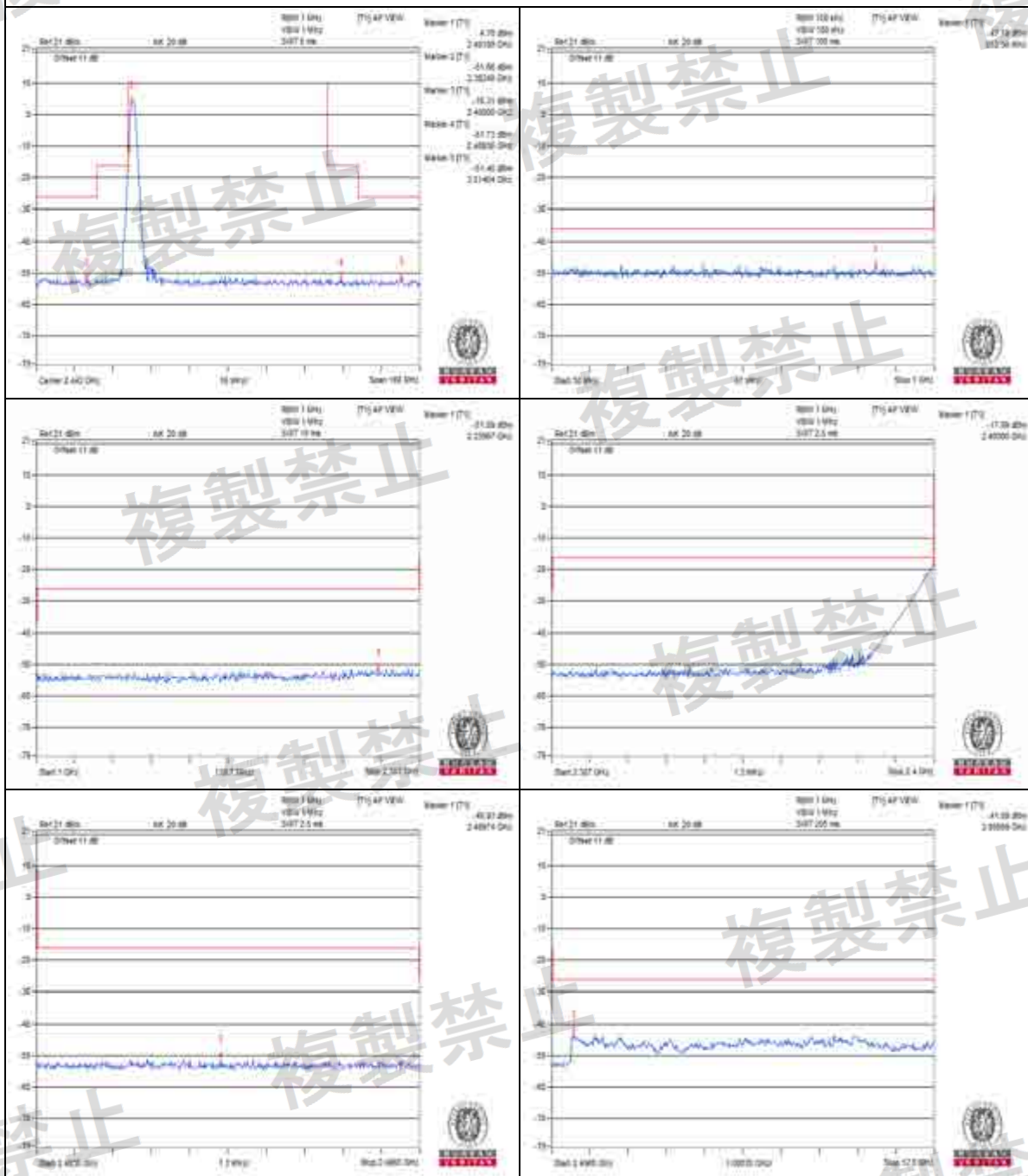
Vnormal Channel 19



Measurement uncertainty: $\pm 3.93\text{dB}$

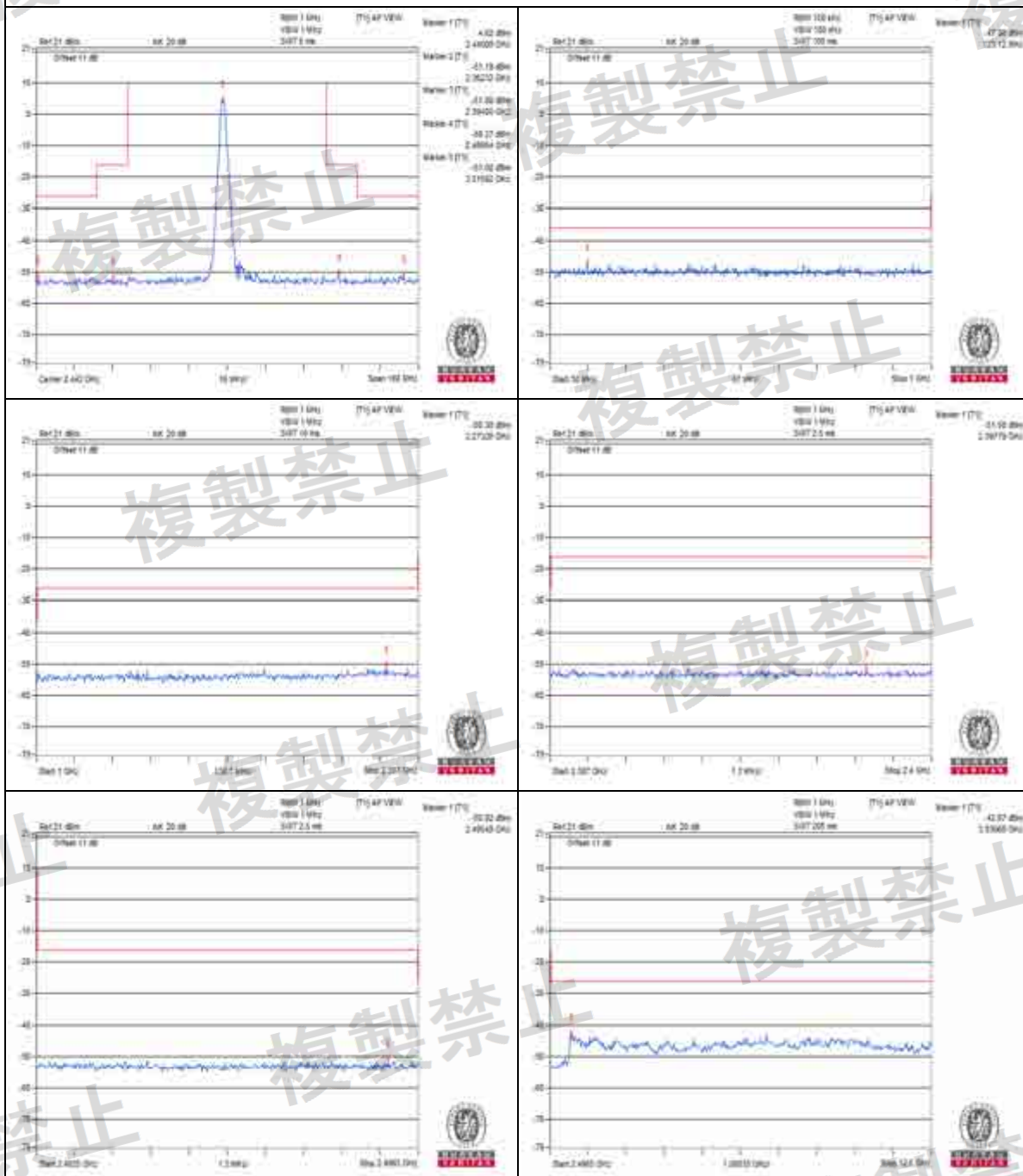
Report Format Version: 6.1.1

V_{max}
Channel 0



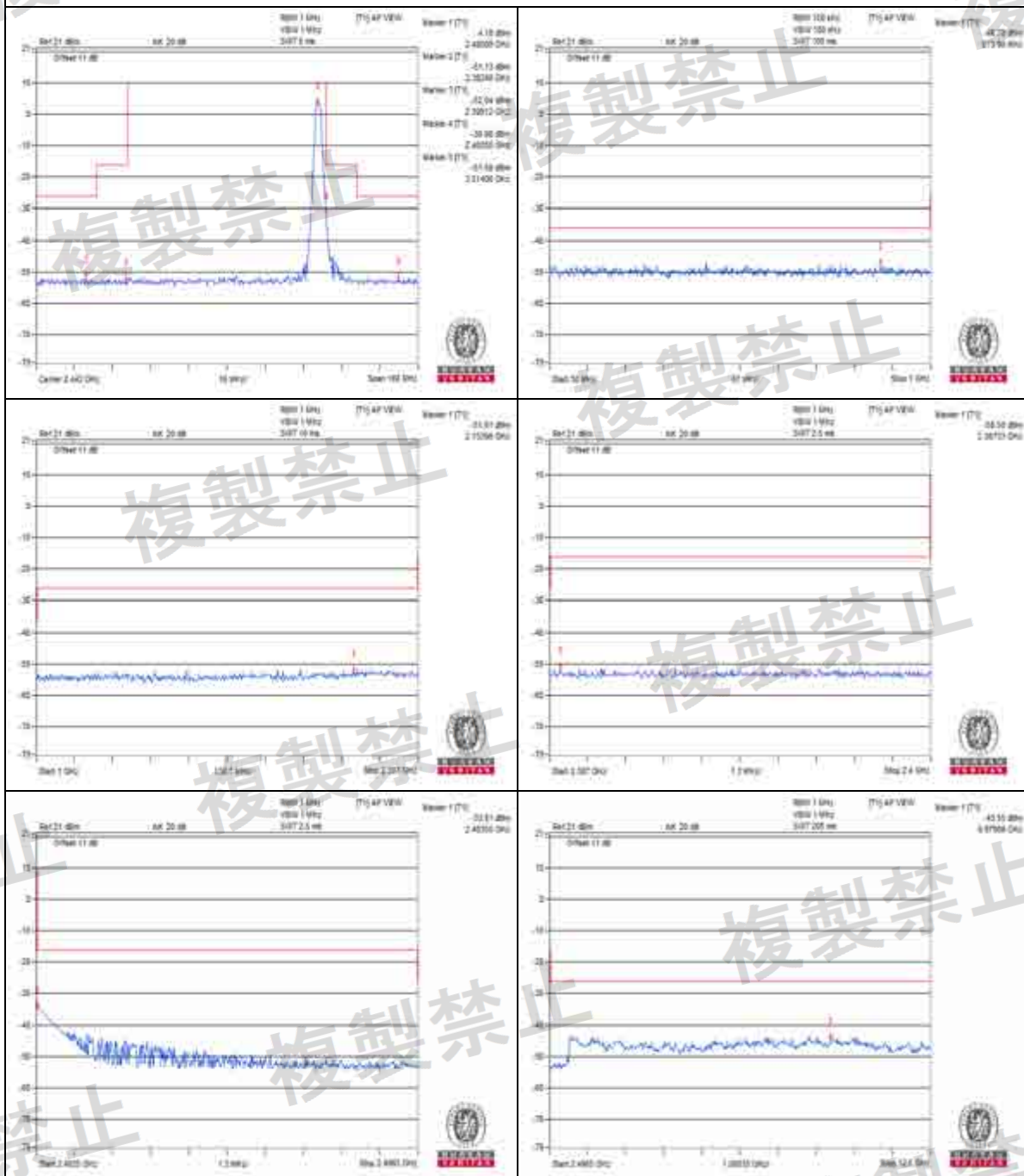
Measurement uncertainty: $\pm 3.93\text{dB}$

V_{max}
Channel 19



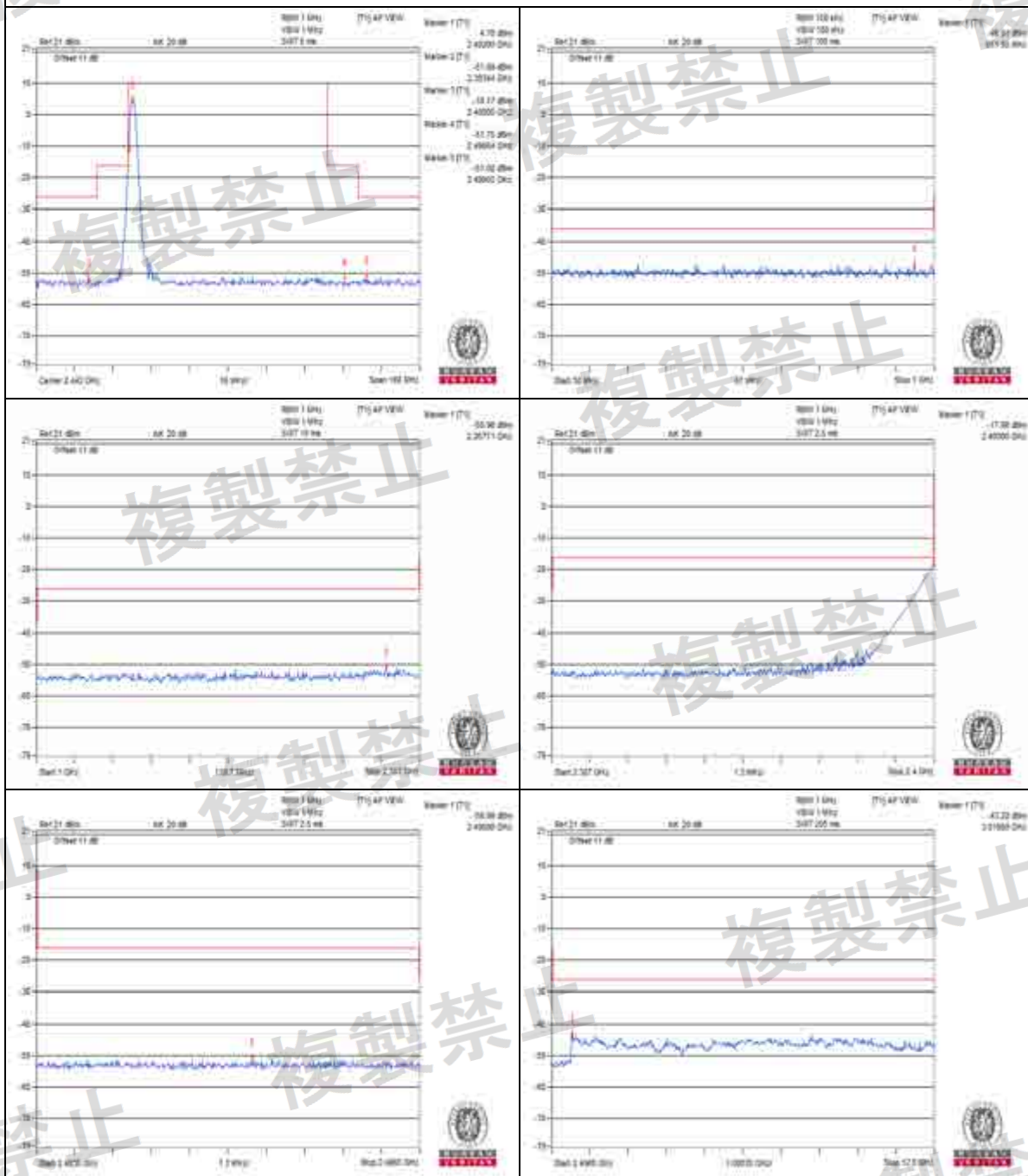
Measurement uncertainty: $\pm 3.93\text{dB}$

V_{max}
Channel 39



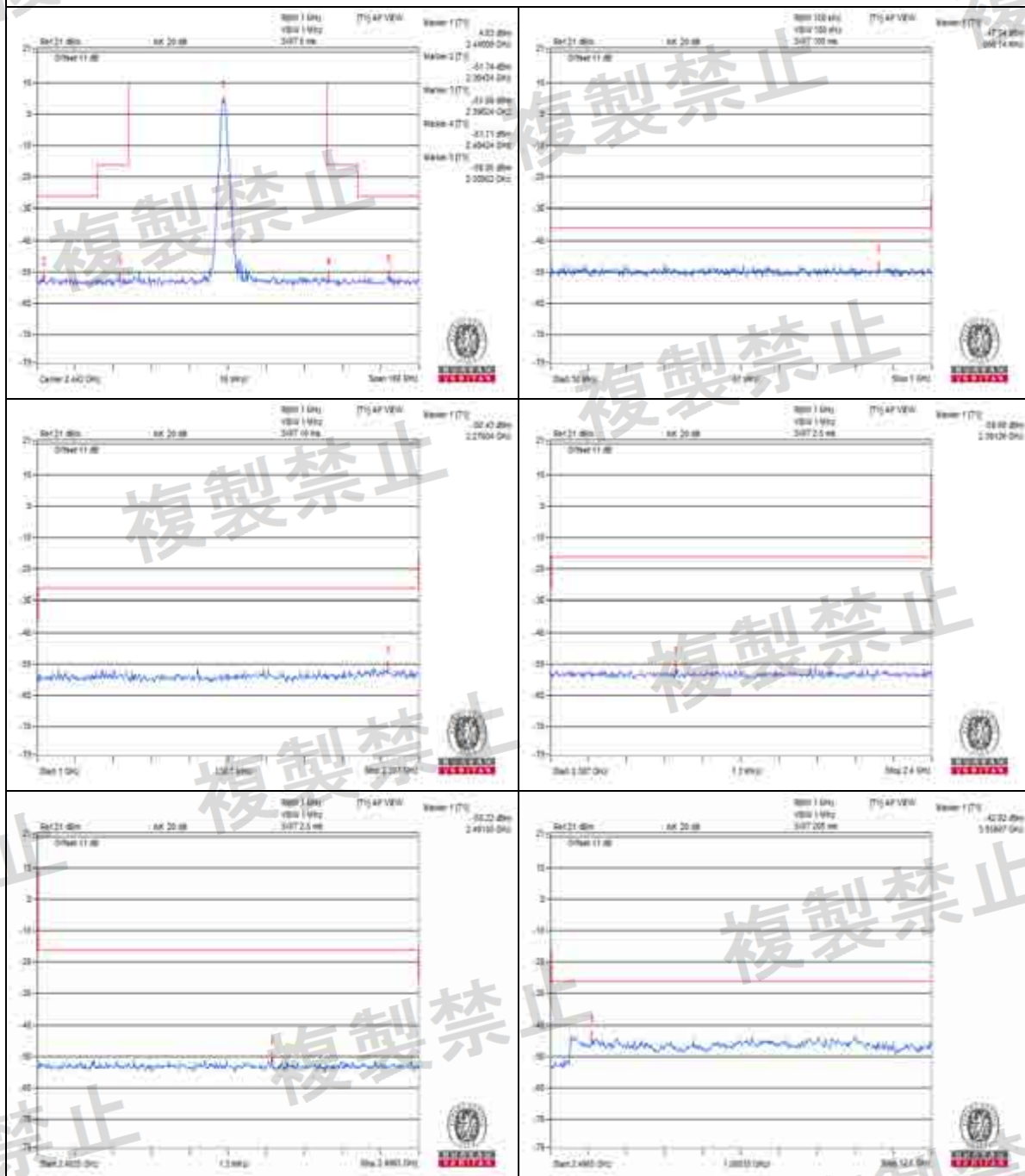
Measurement uncertainty: $\pm 3.93\text{dB}$

V_{min}.
Channel 0



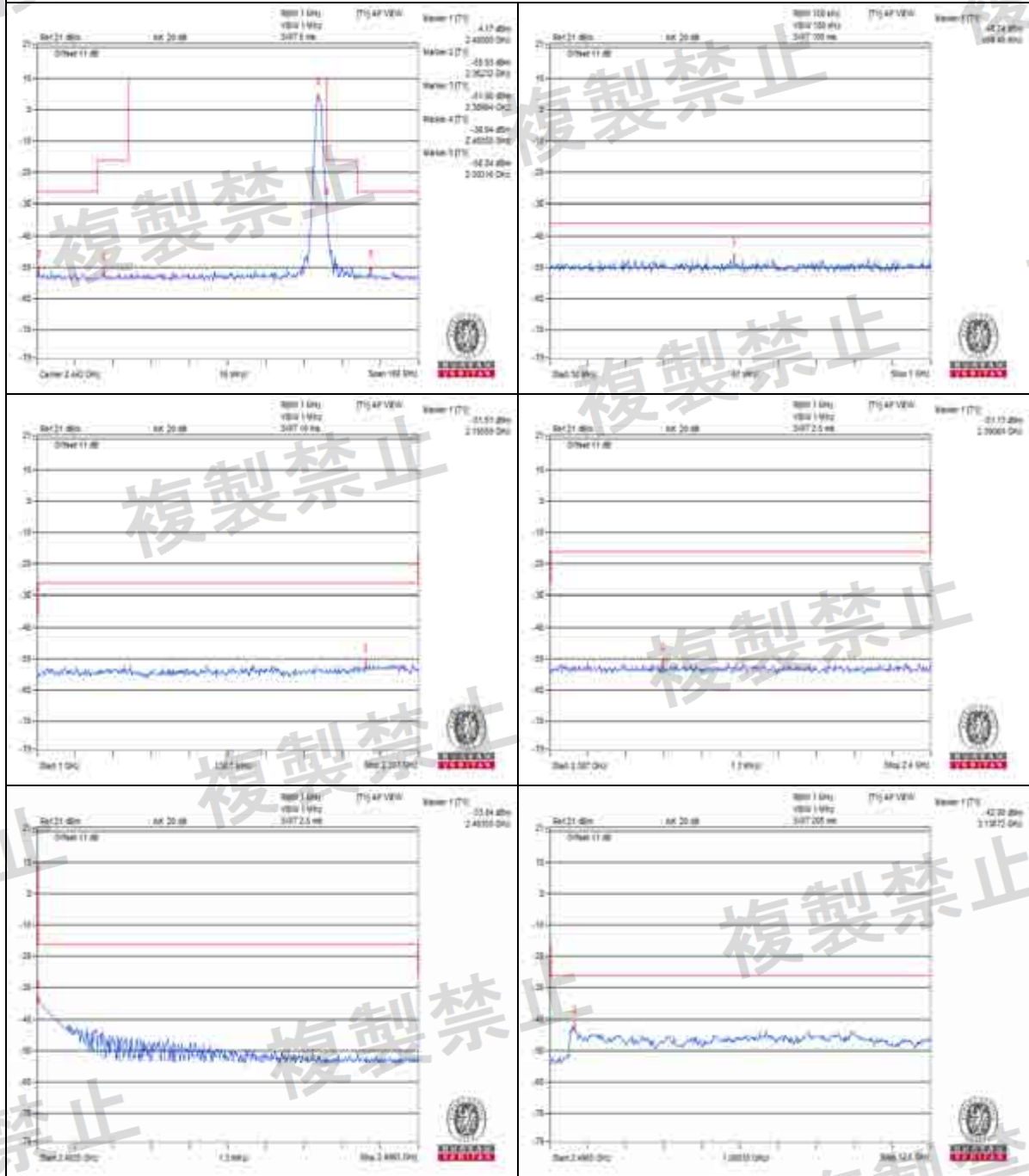
Measurement uncertainty: $\pm 3.93\text{dB}$

V_{min}.
Channel 19



Measurement uncertainty: $\pm 3.93\text{dB}$

V_{min}.
Channel 39



Measurement uncertainty: $\pm 3.93\text{dB}$

4.5 Antenna Power Measurement

4.5.1 Limits of Antenna Power

Modulation System	Frequency Band Used	Antenna Power (Max.)	EIRP (Max.)	
			Omni-Directional Case	Directional Case
DS	2400 – 2483.5 MHz	10 mW/MHz	12.14 dBm/MHz (16.368 mW/MHz)	22.14 dBm/MHz (163.68 mW/MHz)
OFDM (Note 1)	2400 – 2483.5 MHz	10 mW/MHz	12.14 dBm/MHz (16.368 mW/MHz)	22.14 dBm/MHz (163.68 mW/MHz)
OFDM (Note 2)	2400 – 2483.5 MHz	5 mW/MHz	9.14 dBm/MHz (8.20 mW/MHz)	19.14 dBm/MHz (82.03 mW/MHz)
Other than the above	2400 – 2483.5 MHz	10 mW	12.14 dBm	22.14 dBm

Note:

1. Occupied bandwidth is less than 26MHz
2. Occupied bandwidth is more than 26MHz and less than 38MHz
3. The half-power beam width for directional antenna shall be $360/A$ degrees or less, where A is a ratio which causes the EIRP concerned to exceed the omnidirectional EIRP upper limit.
4. Tolerance of antenna power shall be +20% (upper value) and -80% (lower value).

4.5.2 Test Setup





4.5.3 Test Results

Environmental Conditions		25 deg.C, 68% RH			
Channel Number	Frequency (MHz)	Conducted RF Output Power (mW)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW)
		5Vdc	5.5Vdc	4.5Vdc	
0	2402	2.070	2.061	2.023	10
19	2440	2.099	2.056	2.023	10
39	2480	2.113	2.188	2.023	10
Rated power		3mW			
Tolerance of antenna power		0.6mW ~ 3.6mW			

Dipole antenna with 5.03dBi gain

Environmental Conditions		25 deg.C, 68% RH			
Channel Number	Frequency (MHz)	Radiated RF Output Power (mW)			
		Normal Voltage	Max. Voltage	Min. Voltage	Max. Limit (mW)
		5Vdc	5.5Vdc	4.5Vdc	
0	2402	6.591	6.563	6.442	16.368
19	2440	6.684	6.547	6.442	16.368
39	2480	6.728	6.967	6.442	16.368

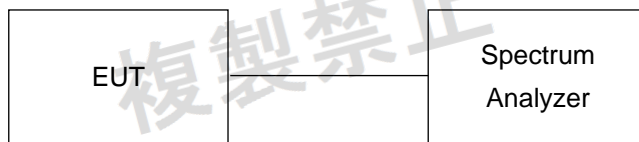
Note: The value of radiated RF output densities are "calculated" values.

4.6 Spurious Emissions for Receiver

4.6.1 Limits of Spurious Emissions for Receiver

Frequencies (MHz)	Limit
Below 1GHz	$\leq 4\text{nW}$ (-54dBm)
Above 1GHz	$\leq 20\text{nW}$ (-47dBm)

4.6.2 Test Setup

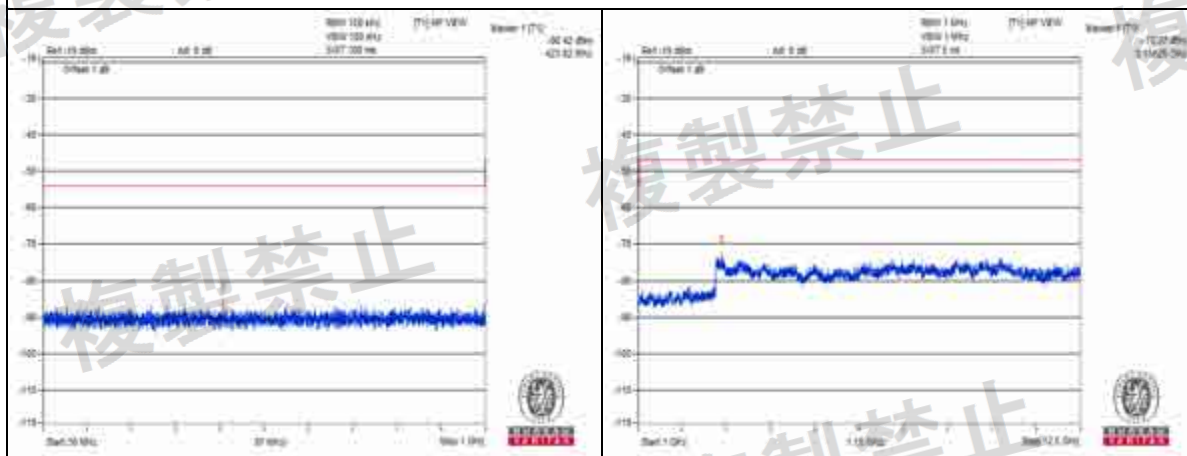


4.6.3 Test Result

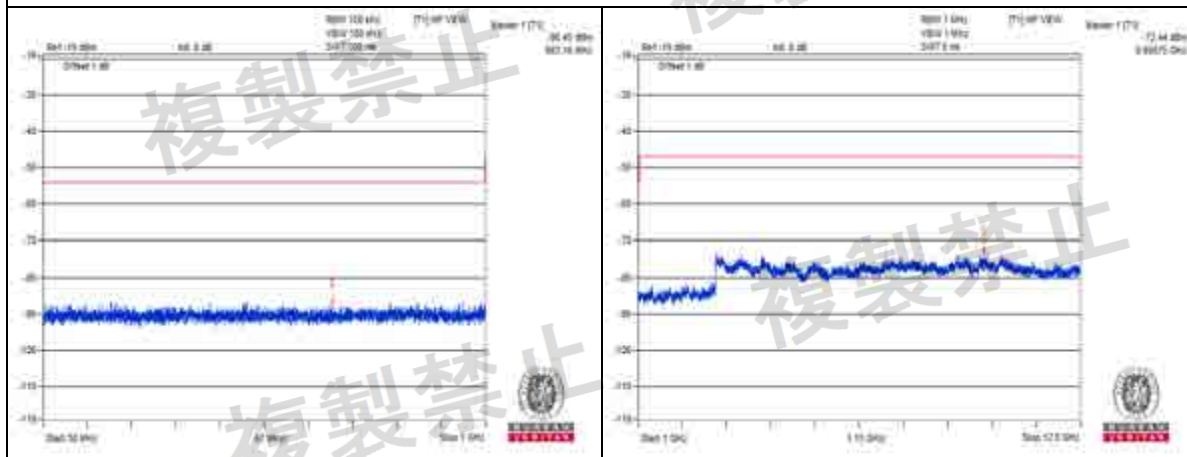
Environmental Conditions		25 deg.C, 68% RH					
Test Channel		CH0 (2402MHz)		CH19 (2440MHz)		Limit	Result
Test Condition	Frequency Range	Frequency (MHz)	Measured Value(nW)	Frequency (MHz)	Measured Value(nW)		
V _{normal}	Below 1GHz	423.820	0.00228nW	663.160	0.002265nW	4nW/100kHz	PASS
	Above 1GHz	3156.250	0.046026nW	9998.750	0.057016nW	20nW/MHz	PASS
V _{max.}	Below 1GHz	48.910	0.002529nW	448.790	0.002477nW	4nW/100kHz	PASS
	Above 1GHz	3018.250	0.058479nW	3009.620	0.052119nW	20nW/MHz	PASS
V _{min.}	Below 1GHz	299.170	0.00263nW	605.210	0.002685nW	4nW/100kHz	PASS
	Above 1GHz	3052.750	0.056885nW	9300.120	0.051286nW	20nW/MHz	PASS
Test Channel		CH39(2480MHz)				Limit	Result
Test Condition	Frequency Range	Frequency (MHz)		Measured Value(nW)			
V _{normal}	Below 1GHz	870.260		0.002265nW		4nW/100kHz	PASS
	Above 1GHz	3124.620		0.052481nW		20nW/MHz	PASS
V _{max.}	Below 1GHz	386.230		0.002438nW		4nW/100kHz	PASS
	Above 1GHz	3820.370		0.044463nW		20nW/MHz	PASS
V _{min.}	Below 1GHz	385.740		0.002748nW		4nW/100kHz	PASS
	Above 1GHz	3041.250		0.051168nW		20nW/MHz	PASS

- Note: 1. The worst value in each frequency range v.s. each channel has been marked by boldface.
2. The spectrum plots are attached on the following pages.

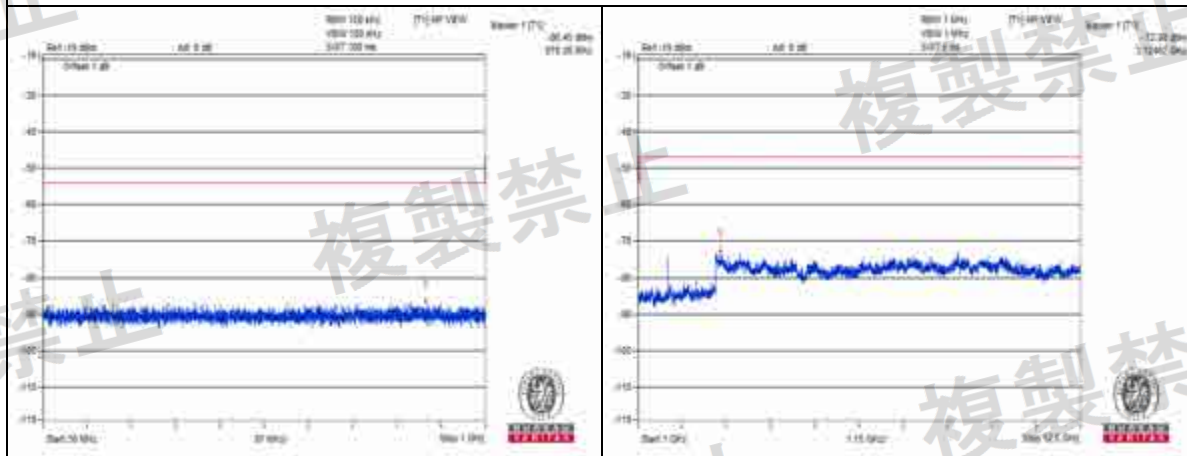
Vnormal



Channel 0



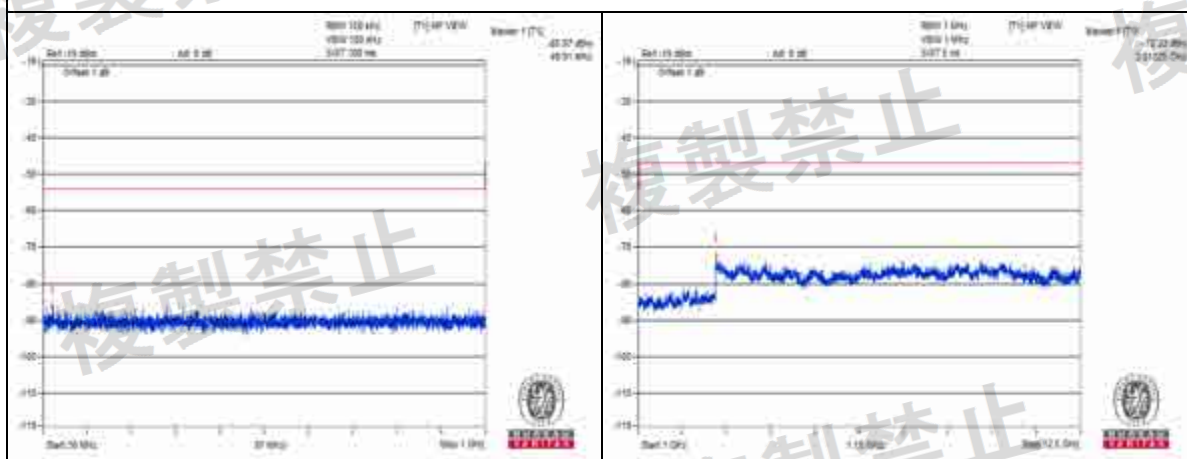
Channel 19



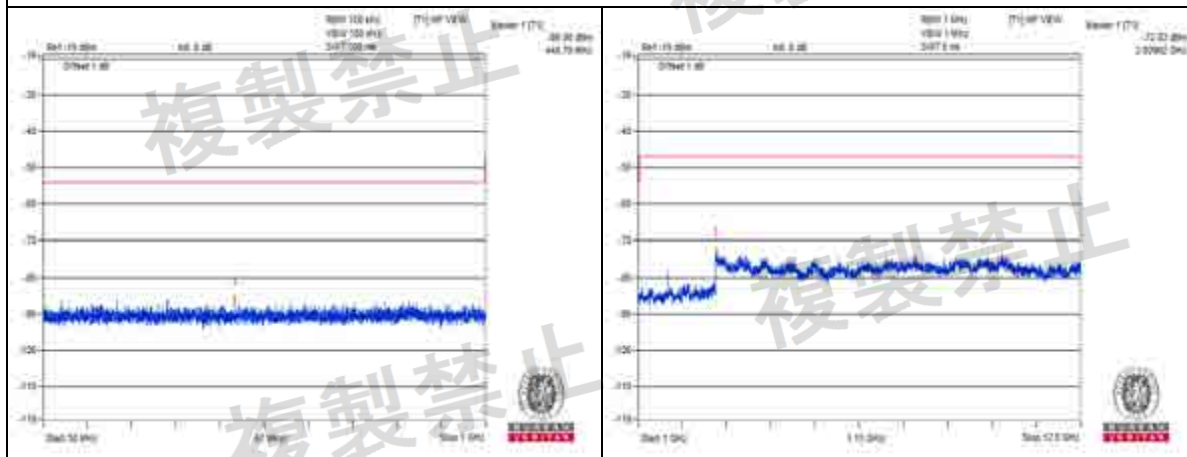
Channel 39

Measurement uncertainty: $\pm 3.93\text{dB}$

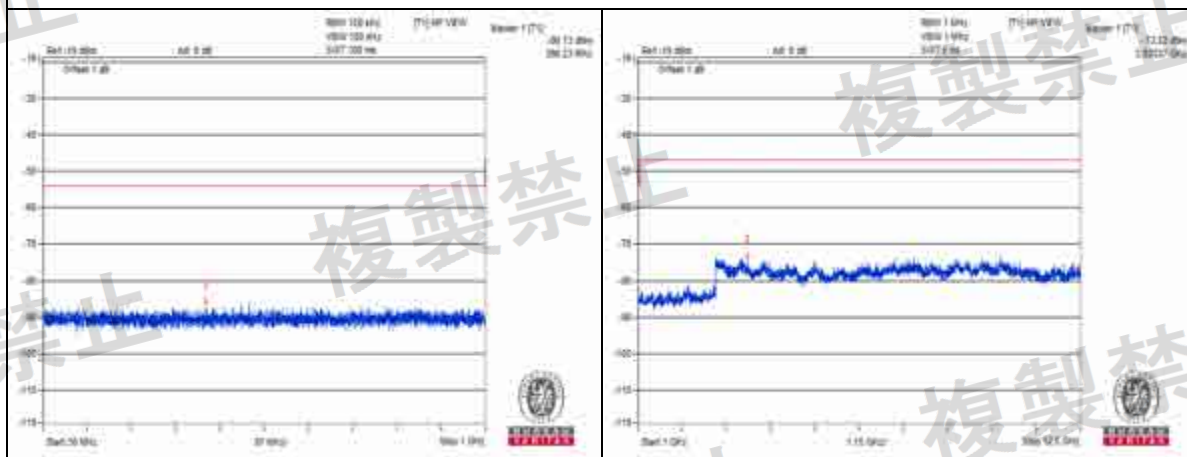
Vmax.



Channel 0



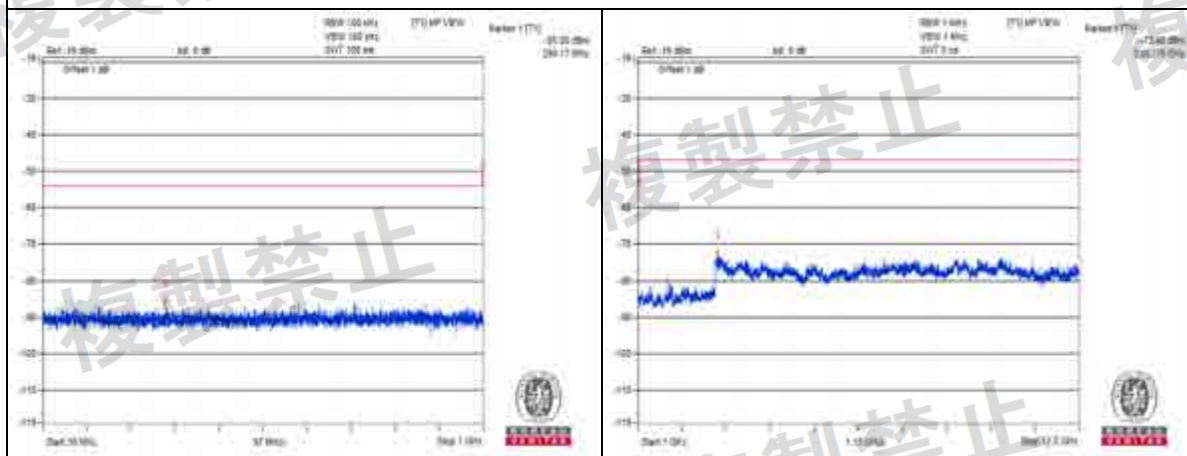
Channel 19



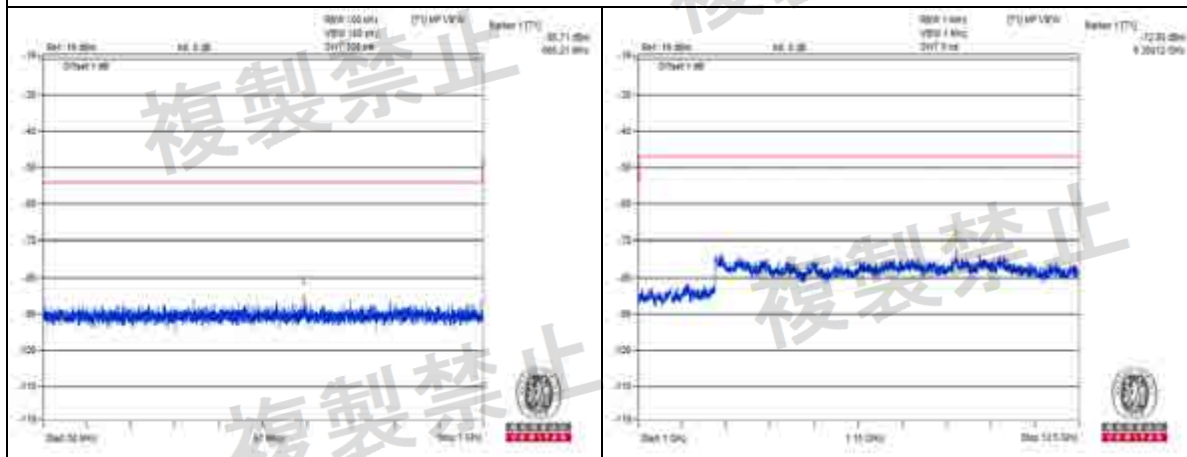
Channel 39

Measurement uncertainty: $\pm 3.93\text{dB}$

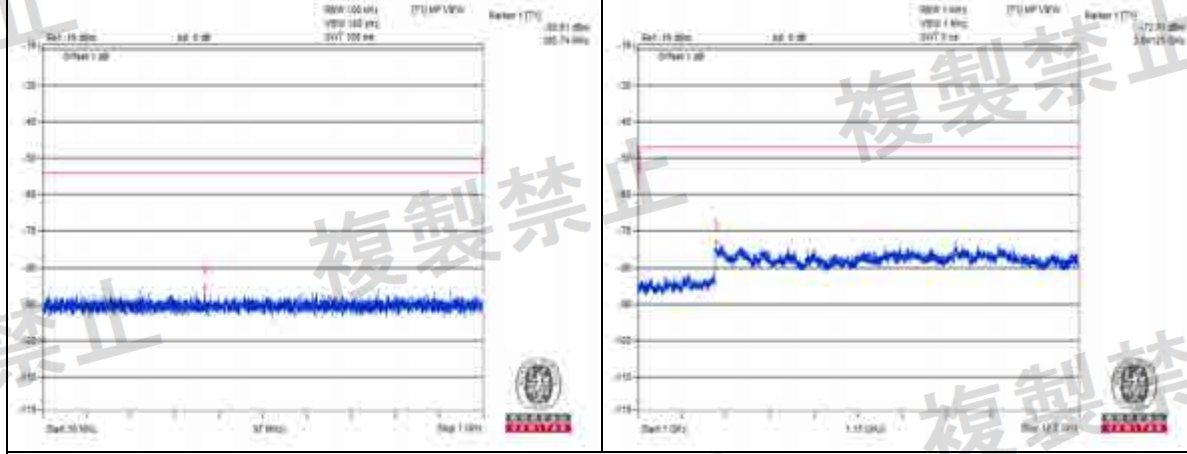
V_{min}.



Channel 0



Channel 19



Channel 39

Measurement uncertainty: $\pm 3.93\text{dB}$

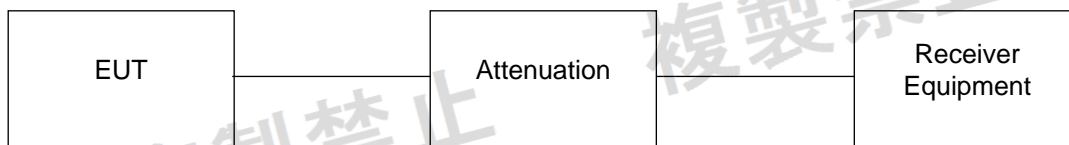


4.7 Interference Prevention Function

4.7.1 Limits of Interference Prevention Function

Radio equipment used mainly on the same premises and automatically transmits or receives identification code.

4.7.2 Test Setup



4.7.3 Test Results

ENVIRONMENTAL CONDITIONS	25 deg.C, 68% RH
Link Mode	Test Result
Bluetooth LE	Pass



5 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration	Calibration Authority	Cal. Method
Spectrum Analyzer / Rohde & Schwarz	FSP40	100040	Sep. 25, 2018	Sep. 24, 2019	Electronics Testing Center, Taiwan	c)
Signal Generator / Anritsu	E4438C	MY49071692	Oct. 15, 2018	Oct. 14, 2019	Electronics Testing Center, Taiwan	c)
Power Meter / Anritsu	ML2495A	1232003	Dec. 25, 2018	Dec. 24, 2019	Electronics Testing Center, Taiwan	c)
Power Sensor / Anritsu	MA2411B	1207333	Dec. 25, 2018	Dec. 24, 2019	Electronics Testing Center, Taiwan	c)
DC Power Supply / Keysight	U8002A	MY56330015	NA	NA	NA	d)
True RMS Clamp Meter / Fluke	325	31130711WS	May 21, 2019	May 20, 2020	Electronics Testing Center Taiwan	c)
Bluetooth Tester / Rohde & Schwarz	CBT	100946	Aug. 07, 2018	Aug. 06, 2019	Electronics Testing Center Taiwan	c)

NOTE: Calibration Method

a) : Calibration conducted by the National Institute of Information and Communications Technology~NICT~ or a designated calibration agency under Article 102-18 paragraph (1)~ TELEC EngineeringCenter, Intertek Japan K.K., Keysight Technologies, Inc~.

b) : Correction conducted pursuant to the provisions of Article 135 or Article 144 of the MeasurementLaw (Law No. 51 of 1992)~Japan Calibration Service Syste~

c) : Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted bythe NICT or a designated calibration agency under Article 102-18 paragraph (1)~ TELEC EngineeringCenter, Intertek Japan K.K., Keysight Technologies, Inc~.

d) : Calibration conducted by using other equipment that listed above from a) to c)

6 Photographs of the Test Configuration





Appendix - Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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