Japan Radio Test Report

Project No.	:	1709C080J
Equipment	:	Pluggable Computer
Model Name	:	ASPC-21
Applicant	:	Anshi Japan Company Limited
Address	:	2-62-7 SHIMOISHIWARA, CHOFU, TOKYO, JAPAN, 182-0034

Date of Receipt	:	Mar. 12, 2018
Date of Test	:	Mar. 14, 2018 ~ Mar. 27, 2018
Issued Date	:	May 24, 2018
Tested by	:	BTL Inc.

Testing Engineer : Chay Cai
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For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-JPAP-2-1709C080J	Original report.	Apr. 25, 2018
MDG1805043	Updated the datas.	May 24, 2018

1. CERTIFICATION

Equipment	:	Pluggable Computer
Trade Name	:	Anshi
Model Name	:	ASPC-21
Applicant	:	Anshi Japan Company Limited
Manufacturer	:	Anshi Japan Company Limited
Address	:	2-62-7 SHIMOISHIWARA, CHOFU, TOKYO, JAPAN, 182-0034
Date of Test	:	Mar. 14, 2018 ~ Mar. 27, 2018
Test Sample	:	Engineering Sample NO. D180302156
Technical Standard(s)	:	Article 49-20 and the relevant articles of the Ordinance Regulating Radio Equipment
Test Procedure		MIC Notice No.88 Appendix No.43 Test method

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-JPAP-2-1709C080J) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of CNAS according to the ISO-17025 quality assessment standard and technical standard(s).

Test result included in this report is only for the LE part.

2. SUMMARY OF TEST RESULTS

Section Number	Description of Test	Article of ORRE[(1)]	Result
4.1	Frequency Error/ Frequency Tolerance	Article 5, Table 1	Pass
4.2	Occupied Bandwidth (99%) and Spread-spectrum Bandwidth (90%) / Spreading Factor (diffusion rate)	Article 6, Table 2 & Article 49-20, Item1-h & 1-i	Pass
4.3	Unwanted Emission Intensity	Article 7, Table 3	Pass
4.4	Antenna Power Error/Tolerance	Article 14	Pass
4.5	Limitation of Collateral Emission of Receiver	Article 24, Paragraph 2	Pass
4.6	Transmission Antenna Gain (EIRP Antenna Power)	Article 49-20, Item 1-e & 1-f	Pass
4.7	Transmission Radiation Angle Width (3dB Beamwidth)	Article 49-20, Item 1-f	Pass
4.8	Radio Interference Prevention Capability	Article 9-4, Item 9-C Article 6-2, Item 3 of the Regulation for Enforcement of the Radio Law	Pass
4.9	Carrier Sense Capability	Article 49-20, Item1-k	N/A
4.10	Construction Protection Confirmation	Article 49-20, Item1-a	Pass

Method of measurement:	MIC Notice No.88 Appendix No.43
Test condition:	Conductive, RF test program provided by the customer was used to control the operating channel as well as the output power level.

Abbreviations used in this test report are as follows;

NC:	Normal Condition
EC:	Extreme Condition
EUT:	Equipment Under Test
DS:	Direct spreading
FH:	Frequency hopping
OFDM:	Orthogonal frequency division multiplexing

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **TR13** at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

2.2 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Frequency Error / 99% & 90% Bandwidth	$\pm 6.25\times10^{-7}$	Confidence levels of 95%
Antenna Power / TX-RX Emission	±0.5dB	Confidence levels of 95%
Transmission Antenna Gain	±3.72dB	Confidence levels of 95%
Carrier Sense Capability	±0.76dB	Confidence levels of 95%

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Pluggable Computer
Trade Name	Anshi
Model Name	ASPC-21
Model Difference	N/A
Power Source	AC Mains.
Power Rating	100V~ 50/60Hz 1.0A
Operation Frequency	2402-2480MHz
Data Rate	1Mbps
Modulation Type	GFSK
Occupied Bandwidth	1.32 MHz
Spread Bandwidth	0.86MHz
Software version	V10.1.1.32
Hardware version	V1.0
Antenna Power (Rated Power)	2.60 mW (1Mbps)
Antenna Power (Max. Conducted Power)	2.5823 mW (1Mbps)

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

3. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	seewo	N/A	Dipole	N/A	3

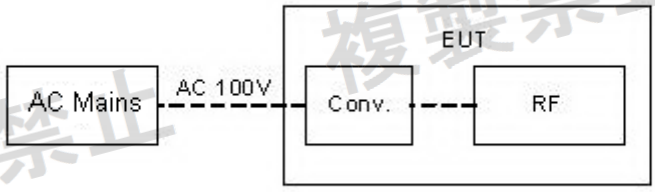
3.2 DESCRIPTION OF TEST MODES

The EUT was tested while in a continuous transmitter / receiver mode
The EUT was tuned to a low, middle and high channel for all tests. The EUT continuously transmitted a modulated packet with payload, while transmitting the EUT was setup to operate at the intended maximum power output available to the end user. For all test case pre/scans were completed in all modes to determine worst case levels

Pretest Mode	Description
Mode 1	CH00/19/39 TX & RX mode

For Conducted	
Final Test Mode	Description
Mode 1	CH00/19/39 TX & RX mode

Power Supply Voltage Fluctuation Test



Voltage Fluctuation Test	Normal Voltage	High Voltage + 10% of Normal Voltage	Low Voltage - 10% of Normal Voltage
AC Power	100V	110V	90V
Voltage Variation（%）	-	+ 10%	- 10%
Power supply to the RF circuit of EUT	18.93	18.93	18.93

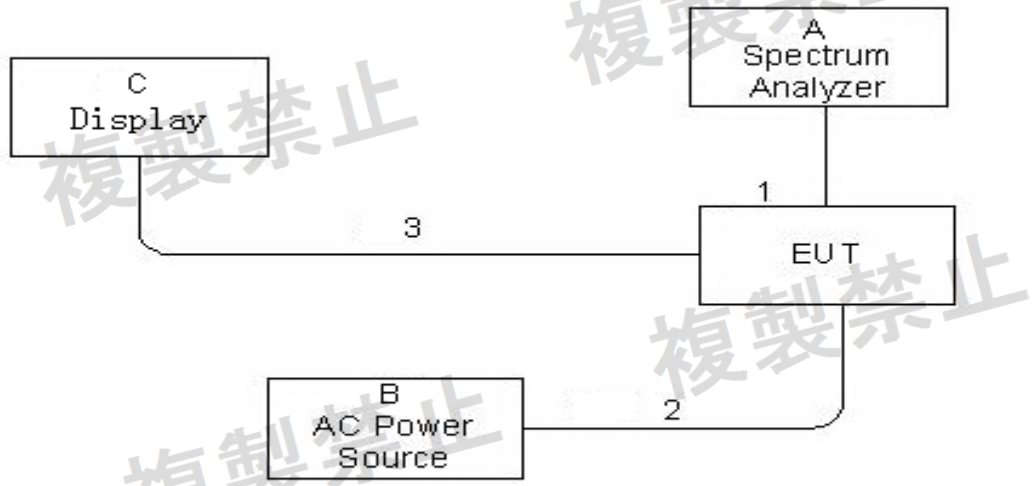
Measurement point

Note:

Voltage Variation (%)
= (Output Low or Low Voltage - Output Normal Voltage)/Output Normal Voltage * 100

During the input supply voltage to the EUT from the external power source is varied by +/- 10%, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/- 1%.Exempt extremely high and low supply voltage condition tests, EUT only operated in normal voltage to test all regulations.

3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.
A	Spectrum Analyzer	R&S	FSP40	N/A	100185
B	AC power source	APC	AFC-11003	N/A	F303081067(A1)
C	Display	DELL	N/A	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	0.1m	RF Cable
2	NO	NO	1.5m	AC Power Cable
3	NO	NO	1.5m	HDMI Cable

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

3.5 TABLE FOR PARAMETERS OF TEST SOFTWARE SETTING

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Test Software Version	DRTU		
Frequency (MHz)	2402	2440	2480
Parameters(1Mbps)	N/A	N/A	N/A

4. TEST RESULTS

4.1 FREQUENCY TOLERANCE MEASUREMENT

4.1.1 LIMIT

Item	Limits (See Article 5, Table1 of the Ordinance Regulating Radio Equipment)
Frequency Tolerance	≦50ppm

4.1.2 SETTING

The following table is the setting of the spectrum.

Spectrum Parameter	Setting
Span	200 kHz
RBW / VBW	10 kHz / 10 kHz

4.1.3 TEST PROCEDURES

Test method which surpass to Claus 3 of Annex No.43 of MIC Notification No.88.

1. Frequency accuracy of SA shall be less than 10% of limits tolerance (5ppm)
2. Setting of SA is following as: RBW:10 kHz / VBW:10 kHz / SPAN: 200 KHz / AT: 30dB / Ref: 20dBm
3. Center Frequency: The center frequency of testing for EUT
4. Sweep time: Auto
5. Sweep mode: Continuous sweep
6. Detect mode: Positive peak
7. Mark function: Frequency Counter (Resolution 100Hz)
8. EUT have transmitted absence of modulation signal and fixed channelize. f is using the mark cursor to mark the peak frequency value，fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc×106 ppm and the limit is less than ±50ppm

4.1.4 TEST SETUP LAYOUT

4.1.5 TEST DEVIATION

There is no deviation with the original standard.

4.1.6 EUT OPERATION DURING TEST

The EUT was placed on the test table and programmed in un-modulation function.

Temperature: 25°C Relative Humidity: 55% Test Pressure: 1010 hPa

4.1.7 RESULTS OF FREQUENCY ERROR

Please refer to the Appendix A.

4.2 OCCUPIED BANDWIDTH AND SPREAD-SPECTRUM BANDWIDTH MEASUREMENT

4.2.1 LIMIT

Item	Limits (See Article 6, Table2 and Article 49-20, Item1-h,i of the Ordinance Regulating Radio Equipment)
Occupied Bandwidth	FHSS≦83.5MHz; OFDM,DSSS≦26MHz; Others≦26MHz HT40≦38 MHz
Spreading Bandwidth	≧500 kHz (FHSS, DSSS)

4.2.2 SETTING

The following table is the setting of the spectrum.

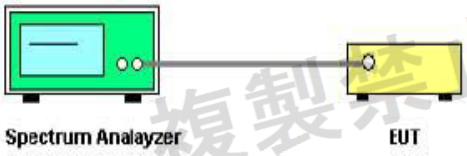
Power Meter Parameter	Setting
Span	2MHz
RBW / VBW	300 kHz

4.2.3 TEST PROCEDURES

Test method which surpass to Clause 4 of Annex No.43 of MIC Notification No.88.

1. Setting of SA is following as: RBW:300kHz / VBW:300kHz / SPAN: 2MHz / AT: 30dB Ref: 20dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
2. EUT have transmitted the maximum modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping mode(For FHSS Device). SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz(For DSSS or OFDM Device) or 83.5MHz(For FHSS Device).
3. SA set to 90% of occupied bandwidth to measure Spread Spectrum Bandwidth and must greater than 500kHz.

4.2.4 TEST SETUP LAYOUT



4.2.5 TEST DEVIATION

There is no deviation with the original standard.

4.2.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

Temperature: 25°C Relative Humidity: 55% Test Pressure: 1010 hPa

4.2.7 RESULTS OF OCCUPIED BANDWIDTH AND SPREAD-SPECTRUM BANDWIDTH

Please refer to the Appendix B.

4.3 UNWANTED EMISSION INTENSITY MEASUREMENT

4.3.1 LIMIT

Item	Limits (See Article 7, Table 3 of the Ordinance Regulating Radio Equipment)
TX Spurious Emission	≦ 0.25μW/MHz (30MHz≦f≦1000MHz)
	≦2.5 μW/MHz (1000MHz≦f<2387MHz ;2496.5MHz<f)
	≦25 μW/MHz (2387MHz≦f<2400MHz) and (2483.5MHz<f≦2496.5MHz)
Measurement range: 30MHz - 5th harmonics	

4.3.2 SETTING

The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RBW / VBW	100kHz / 100kHz (30-100MHz) 1 MHz / 1 MHz (Above100MHz)
Detector	RMS
Trace	Max Hold
Sweep Time	Auto

4.3.3 TEST PROCEDURES

Test method which surpass to Clause 5 of Annex No.43 of MIC Notification No.88.

1. EUT have transmitted the maximum modulation signal and fixed channelize.
2. Setting of SA is following as: RBW/VBW: 100kHz / 100kHz (30-100MHz) 1 MHz / 1 MHz (Above100MHz) / AT: 20dB / Ref: 10dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive RMS / Trace mode: Max hold
3. Setting of SA is following as 30MHz and stop frequency 1000MHz Then to mark peak reading value + cable loss shall be less than0.25μW.
4. Setting of SA is following as 1000MHz and stop frequency 2387MHz Then to mark peak reading value + cable loss shall be less than 2.5μW.
5. SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25μW.
6. SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz Then to mark peak reading value + cable loss shall be less than 25μW
7. SA adjusted to start frequency 2496.5MHz and stop frequency 12500MHz Then to mark peak reading value + cable loss shall be less than 2.5μW

4.3.4 TEST SETUP LAYOUT

4.3.5 TEST DEVIATION

There is no deviation with the original standard.

4.3.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.
Temperature: 25°C Relative Humidity: 55% Test Pressure: 1010 hPa

Note:
※1: Frequency Band 1 (30 MHz ≦ f ≦ 1000 MHz)
※2: Frequency Band 2 (1000 MHz < f ≦ 2387 MHz)
※3: Frequency Band 3 (2387 MHz ≦ f < 2400 MHz)
※4: Frequency Band 4 (2483.5 MHz ≦ f < 2496.5 MHz)
※5: Frequency Band 5 (2496.5 MHz ≦ f < 12.5 GHz)

Band	1	2	3	4	5
Cable Loss	1.5dB	1.5dB	1.5dB	1.5dB	1.5dB

4.3.7 TEST RESULT OF UNWANTED EMISSION INTENSITY

Please refer to the Appendix C.

4.4 ANTENNA POWER ERROR MEASUREMENT

4.4.1 LIMIT

Item	Limits (See Article 14 and 49-20 Item1-e of the Ordinance Regulating Radio Equipment)
Antenna Power Density	≦3mW/MHz (FHSS 2427 - 2470.75 MHz) ≦10mW/MHz (OFDM,DSSS 2400~2483.5MHz) ≦10mW (Other modulation method 2400~2483.5MHz)
Antenna Power Error	+20%, -80% (Base on manufacturer declare antenna power density)

4.4.2 SETTING

The following table is the setting of the power meter and spectrum analyzer.

Spectrum Analyzer	Setting
Attenuation	30dB
Span	2 MHz
RBW	3 MHz
VBW	3 MHz
Detector	RMS
Trace	Max Hold
Sweep Time	60s

4.4.3 TEST PROCEDURES

Test method which surpass to Clause 6 of Annex No.43 of MIC Notification No.88.

Step 1:

Connect the EUT to the spectrum analyser and use the following settings:

- Centre Frequency: The centre frequency of the channel under test.
- Resolution BW: 3 MHz.
- Video BW: 3 MHz.
- Span: 2 MHz
- Detector: RMS
- Trace Mode: Max Hold.

Step 2:

When the trace is complete, find the peak value of the power envelope and record the frequency.

Step 3:

Make the following changes to the settings of the spectrum analyser:

- Centre Frequency: Equal to the frequency recorded in step 2.
- Span: 3 MHz.
- Resolution BW: 1 MHz.
- Video BW: 1 MHz.
- Sweep time: 1 minute.
- Detector: Average (see note).
- Trace Mode: Max Hold.

NOTE: The detector mode "Average" is often referred to as "RMS Average" or "Sample" but do not use Video Average.

Step 4:

When the trace is complete, capture the trace, for example using the "View" option on the spectrum analyser.

Find the peak value of the trace and place the analyser marker on this peak. This level is recorded as the highest mean power (spectral power density) D in a 1 MHz band.

Step 5:

The maximum e.i.r.p. spectral density is calculated from the above measured power density (D), the observed duty

cycle x (see clause 5.7.2.2, step 1), and the applicable antenna assembly gain "G" in dBi, according to the formula below. If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the

highest gain shall be used.

- PD = D + G + 10 log (1/x);

4.4.4 TEST SETUP LAYOUT

4.4.5 EST DEVIATION

There is no deviation with the original standard.

4.4.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

Temperature: 25°C Relative Humidity: 55% Test Pressure: 1010 hPa

4.4.7 TEST RESULT OF ANTENNA POWER ERROR

Please refer to the Appendix D.

4.5 LIMITATION OF COLLATERAL EMISSION OF RECEIVER MEASUREMENT

4.5.1 LIMIT

Item	Limits (See Article 24, Paragraph 2 of the Ordinance Regulating Radio Equipment)
RX Spurious Emission:	≦4 nW (-54 dBm) (f<1GHz)
	≦20 nW (-47 dBm) (1GHz≦f)
Measurement range: 30MHz - 5th harmonics	

4.5.2 AND SETTING

The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RBW / VBW	100kHz / 100kHz (30-100MHz) 1 MHz / 1 MHz (Above100MHz)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.5.3 TEST PROCEDURES

Test method which surpass to Clause 7 of Annex No.43 of MIC Notification No.88.

1. EUT have the continuous reception mode and fixed only one channelize.
2. Setting of SA is following as RBW / VBW: 100 kHz (below 1GHz emissions) / 1 MHz (above 1GHz emissions)
   AT: 10dB / Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
3. SA set RBW: 100kHz and VBW: 100kHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW
4. SA set RBW: 1MHz and VBW: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12500MHz. Search to mark peak reading value + cable loss shall be less than 20nW
5. If power level of lower emissions are more than 1/10 of limit (.0.4nW for f < 1GHz, 2nW for f >= 1GHz), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

4.5.4 TEST SETUP LAYOUT

4.5.6 TEST DEVIATION

There is no deviation with the original standard.

4.5.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously reception mode.

Temperature: 25°C Relative Humidity: 55% Test Pressure: 1010 hPa

Note:

※6: Frequency Band 6 (30 MHz ≦ f < 1000 MHz)

※7: Frequency Band 7 (1000 MHz ≦ f < 12.5 GHz)

Band	6	7
Cable Loss	1.5dB	1.5dB

4.5.7 TEST RESULT OF LIMITATION OF COLLATERAL EMISSION OF RECEIVER

Please refer to the Appendix E.

4.6 TRANSMISSION ANTENNA GAIN (EIRP ANTENNA POWER) MEASUREMENT

4.6.1 LIMIT

Item	Limits (See Article 49-20, Item1-f of the Ordinance Regulating Radio Equipment)
EIRP Power Density	≦16.91dBm/MHz (FHSS 2427 - 2470.75 MHz) ≦22.14dBm/MHz (OFDM, DSSS 2400~2483.5MHz) ≦22.14dBm (Other modulation method 2400~2483.5MHz)
Note: This test item will not be applied to the transmission antenna which has a gain of 2.14dBi or less	

4.6.2 MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. The following table is the setting of spectrum analyzer.

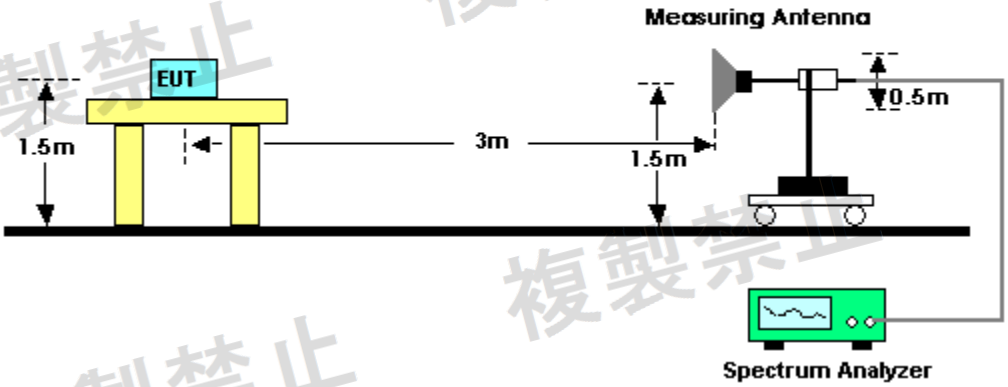
Spectrum Analyzer	Setting
Attenuation	30dB
Span	2 MHz
RBW	3 MHz
VBW	3 MHz
Detector	RMS
Trace	Max Hold
Sweep Time	60s

4.6.3 TEST PROCEDURES

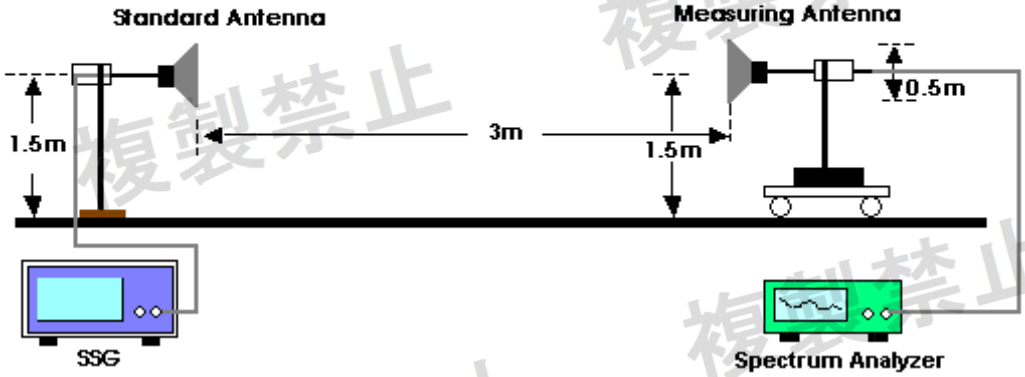
Please refer to 4.4.2 and the EIRP=PD+Gain

4.6.4 TEST SETUP LAYOUT

For EUT radiation measurement



For standard antenna measurement



4.6.5 TEST DEVIATION

There is no deviation with the original standard.

4.6.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

Temperature: 25°C Relative Humidity: 55% Test Pressure: 1010 hPa

4.6.7 RESULTS OF TRANSMISSION ANTENNA GAIN (EIRP ANTENNA POWER)

Method of measurement:	See MIC Notice No.88 Appendix No.43 Clause 10
Results:	Pleaser refer to section 4.4

4.7 TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH) MEASUREMENT

4.7.1 LIMIT

Item	Limits (See Article 49-20, Item1-f of the Ordinance Regulating Radio Equipment)
3dB antenna beam width	360/A (if A<1; then A=1) A= {EIRP Power [mW]/16.36 for DS, OFDM}

4.7.2 SETTING

The following table is the setting of the spectrum analyzer.

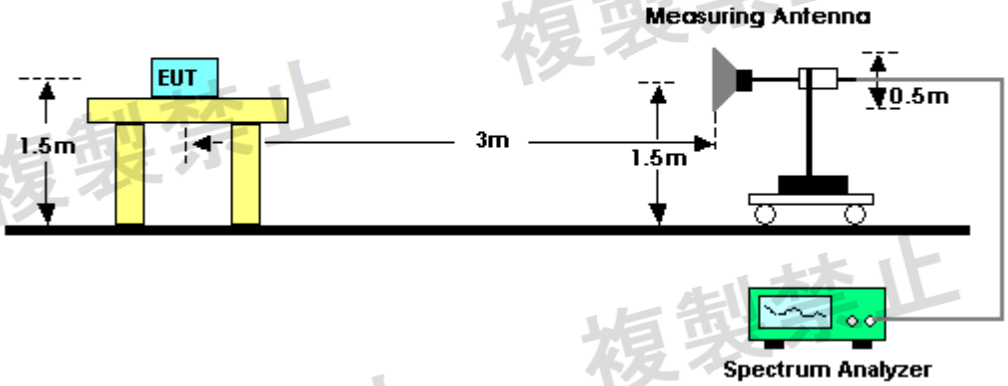
Spectrum Parameter	Setting
Attenuation	Auto
Span	0 MHz
RBW	1 MHz
VBW	1 kHz
Y scale	5 dB
Detector	Peak
Trace	Max Hold

4.7.3 TEST PROCEDURES

Test method which surpass to Clause 22 of Annex No.43 of MIC Notification No.88.

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 4.7.2 and tune reference level to observe receving signal position.
3. Rotate directions of the EUT horizontally and ertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within ± 50cm of EUT height and swing it to find the maximum output of measuing antenna. The output level at the spectrum analyzer is read as “E”
5. Caluate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below 360/A (If A<1; then A=1).
   A = {EIRP Power [mW] / 16.36 for DS, OFDM} or
   A = {EIRP Power [mW] / 4.9 for FH}

4.7.4 TEST SETUP LAYOUT



4.7.5 TEST DEVIATION

There is no deviation with the original standard.

4.7.6 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

Temperature: 25°C Relative Humidity: 55% Test Pressure: 1010 hPa

Note:

C : Cable loss 0 dB

4.7.7 TEST RESULT OF TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH)

Method of measurement:	See MIC Notice No.88 Appendix No.43 Clause 22
Results:	Pass

Antenna Power	Antenna			
A (dBm)	Type	Gain B (dBi)	3dB Beam-width Horizontal (Degree)	3dB Beam-width Vertical (Degree)
2.28	Dipole	3	-	-

Total Gain D=B-C (dBi)	EIRP F=A+D (dBm)	Permitted Angle (Degree)	Judgment
3	5.28	360.00	Good

4.8 RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT

4.8.1 LIMIT

Item	Limits (See Article 9-4, Item9-C of the Ordinance Regulating Radio Equipment)
Identification code	≧48 bits

4.8.2 MEASURING ID CODE SOFTWARE

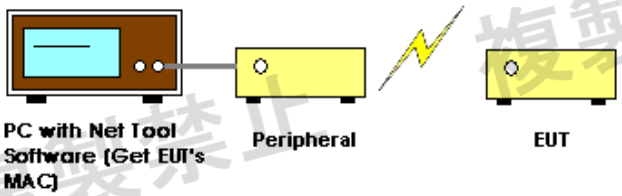
PC with NetTool	Setting
MAC IP List	MAC Scan

4.8.3 TEST PROCEDURES

Test method which surpass to Clause 23 of Annex No.43 of MIC Notification No.88.

1. In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes form EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification ocde: a. Transmit the predetermined identification codes form the counterpart. b . Check if communication is normal. c. Transmit the signals other than predetermined ID codes form the counterpart. d. check if the EUT stops the transmission, or if it displays that idnetification codes are different from the predetermined ones.

4.8.4 TEST SETUP LAYOUT



4.8.5 TEST DEVIATION

There is no deviation with the original standard.

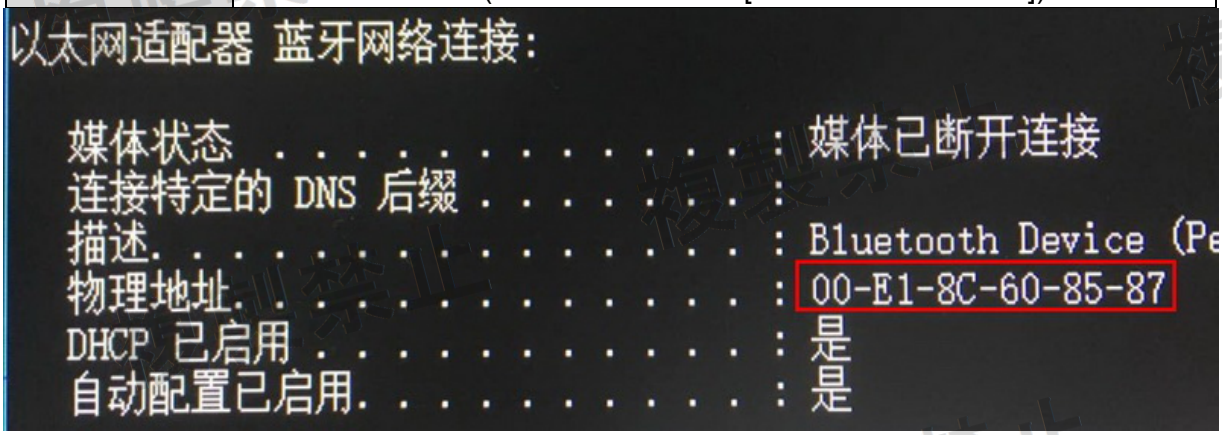
4.8.6 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.

Temperature: 25°C Relative Humidity: 55% Test Pressure: 1010 hPa

4.8.7 TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILIT

Test Power:	Normal Voltage
Test Mode:	TX CH00/19/39-1Mbps
Test Result:	Good (identification code: [00-E1-8C-60-85-87])



4.9 CARRIER SENSE CAPABILITY MEASUREMENT

4.9.1 LIMIT

Item	Limits (See Article 49-20, Item1-k of the Ordinance Regulating Radio Equipment)
Carrier Sense	Good – EUT stop RF transmission signal after carrier inject to EUT. (On 22.79+Gr-20*log(f)[dBm] (Gr: dBi; f: MHz) or 100mV/m)
Remarks	This test item will be applied to OFDM, 26MHz<BW≦ 38MHz

4.9.2 SETTING

The following table is the setting of the spectrum analyzer.

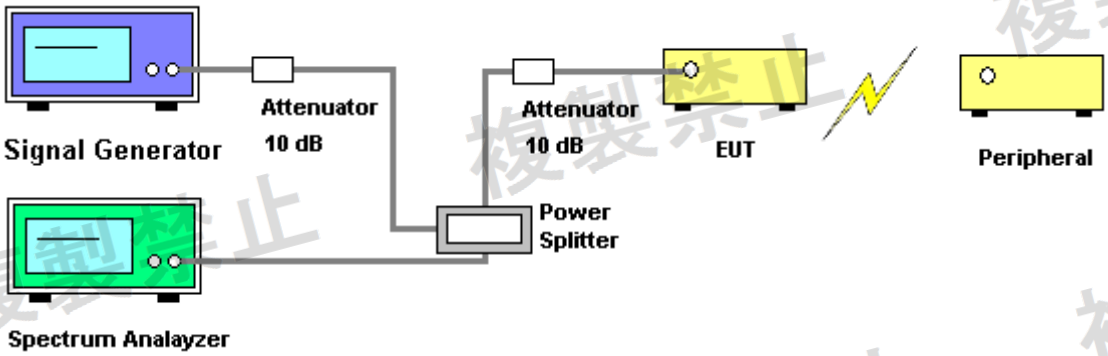
Spectrum Parameter	Setting
Attenuation	Auto
RBW / VBW	1 MHz
Span	0 MHz
Sweep	Continuous
Detector	Peak
Trigger mode	Video

4.9.3 TEST PROCEDURES

Test method which surpass to Clause 8,9 of Annex No.43 of MIC Notification No.88.

1. SSG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SSG and power level is (On 22.79+Gr-20*log(f) [dBm] (Gr: dBi; f: MHz). Then turn off the RF signal of SSG.
2. EUT have transmitted the maximum modulation signal and fixed channelize.
3. Setting of SA is following as: RBW:1MHz / VBW:1MHz / SPAN: 50MHz / AT: 10dB /Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak.
4. SSG RF Signal On.
5. EUT shall be stop the transmitted any signal and SSG RF Signal Off. Then EUT will be continuous transmitted signal.

4.9.4 TEST SETUP LAYOUT



4.9.5 TEST DEVIATION

There is no deviation with the original standard.

4.9.6 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.

Temperature: 25°C Relative Humidity: 55% Test Pressure: 1010 hPa

4.9.7 TEST RESULT OF CARRIER SENSE CAPABILITY

Test Power:	Normal Voltage
Test Mode:	TX CH00/19/39-1Mbps
Test Result:	N/A

4.10 CONSTRUCTION PROTECTION CONFIRMATION METHOD

4.10.1 LIMIT

(See Article 49-20, Item1-a of the Ordinance Regulating Radio Equipment)

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

4.10.2 CONFIRMATION METHOD

The RF and modulation portions are protected against illegal modification as following method:

Tick the appropriate box	
	1. Sealed with special screws.
	2. Plastic chassis is being welded using ultrasonic waves.
	3. Chassis is glued using a special adhesive.
	4. Metal covers are spot-fused.
	5. Cover is specially interlocked.
√	6. RF and Modulation components are covered with shielding case and this shielding case is soldered.
	7. Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
	8. Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive
	9. Shield case is welded at RF and modulation parts, and ID-ROM is guled with a non-transparent laminating agent.
	10. RF and Modulation parts are mounted on PCB with surface mount technology, and there is no any adjustable part on PCB or adjustable parts are not exposed.

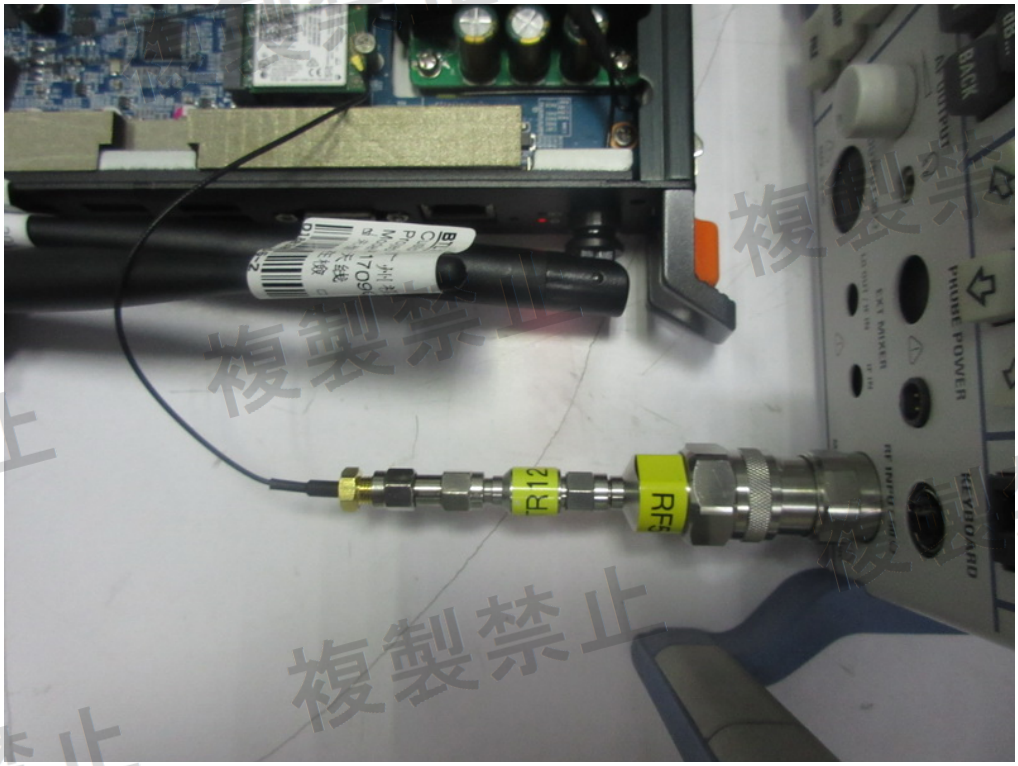
5. LIST OF MEASURING EQUIPMENTS

Kind of Equipment	Manufacturer	Model No.	Serial No.	Calibrated Date	Validity Date	Calibration Agency
Spectrum Analyzer	R&S	FSP40	100185	Aug. 21, 2017	Aug. 20, 2018	CHINA CEPREI LABORATORY
Signal Generator	R&S	SMR40	100504	Mar. 12, 2018	Mar. 11, 2019	CEPREI Calibration and Testing Center
Multi-output DC Power Supply	GW Instek	GPC-3030DN	EK880675	Sep. 25, 2017	Sep. 26, 2020	CEPREI Calibration and Testing Center
Attenuator	WOKEN	6SM3502	VAS1214NL	Feb. 15, 2018	Feb. 14, 2019	CEPREI Calibration and Testing Center
power Meter	ANRITSU	ML2495A	1128009	Mar. 12, 2018	Mar. 11, 2019	CEPREI Calibration and Testing Center
Pulse Power Sensor	ANRITSU	MA 2411B	1027500	Mar. 12, 2018	Mar. 11, 2019	CEPREI Calibration and Testing Center
Cable	emci	EMC104-SM-SM-9000(0.01GHz-26.5GHz)	N/A	N/A	N/A	N/A
Cable	emci	EMC80-NM-NM-12000(9KHz-1GHz)	N/A	N/A	N/A	N/A
AC power source	APC	AFC-11003	F303081067(A1)	N/A	N/A	N/A

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

6. EUT TEST PHOTO



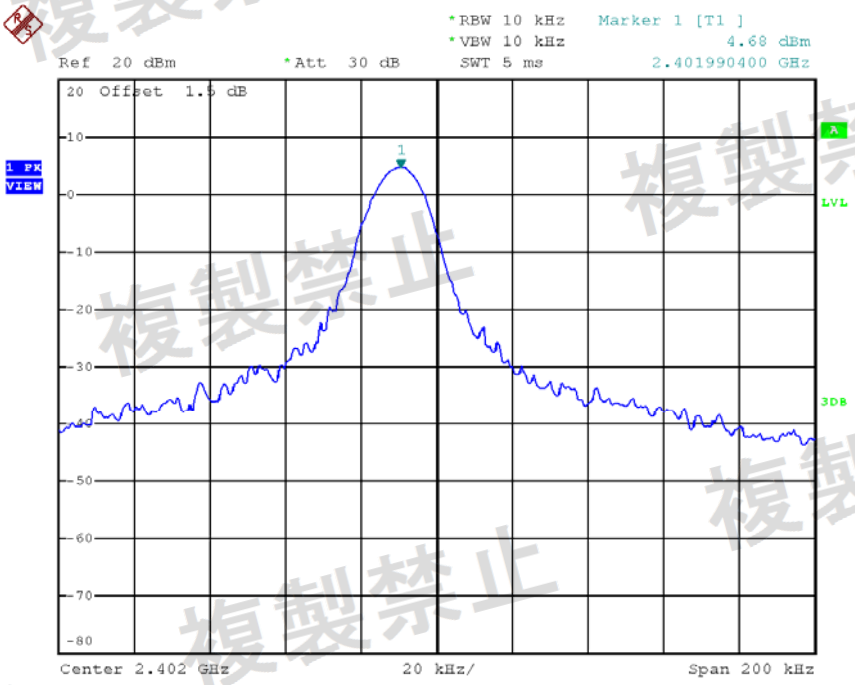
APPENDIX A - FREQUENCY TOLERANCE

Test Mode:	TX CH00/19/39-1Mbps

Test Voltage (V)	Normal Voltage			Remarks
Test Frequency (MHz)	2402	2440	2480	Low/Mid/High of test frequency range
Measured Frequency (MHz)	2401.9904	2439.9900	2479.9896	-
Frequency Tolerance (ppm)	-4.00	-4.10	-4.19	Limit ≦ 50 ppm

Normal Voltage

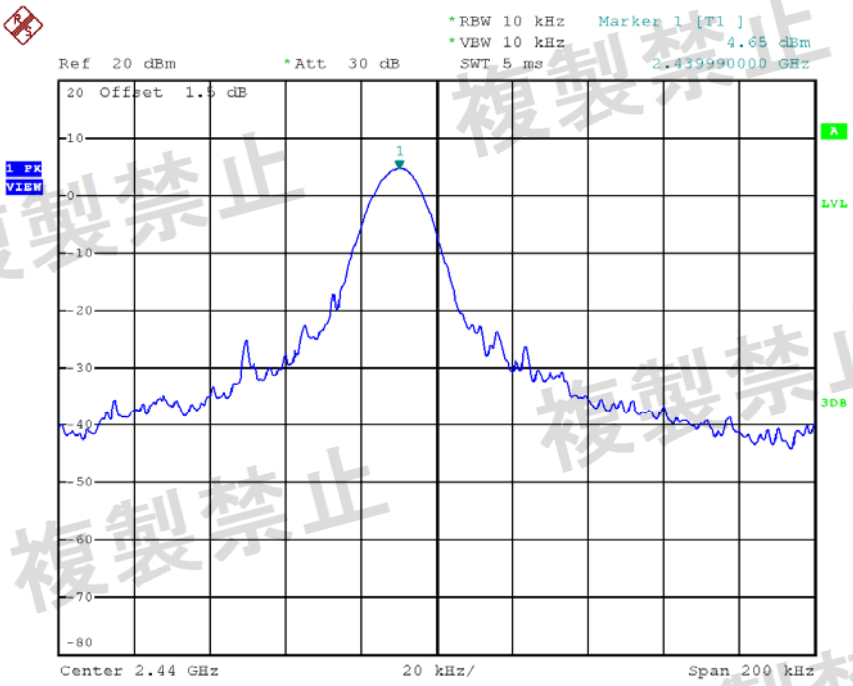
CH00



Date: 17.MAR.2018 09:33:38

Normal Voltage

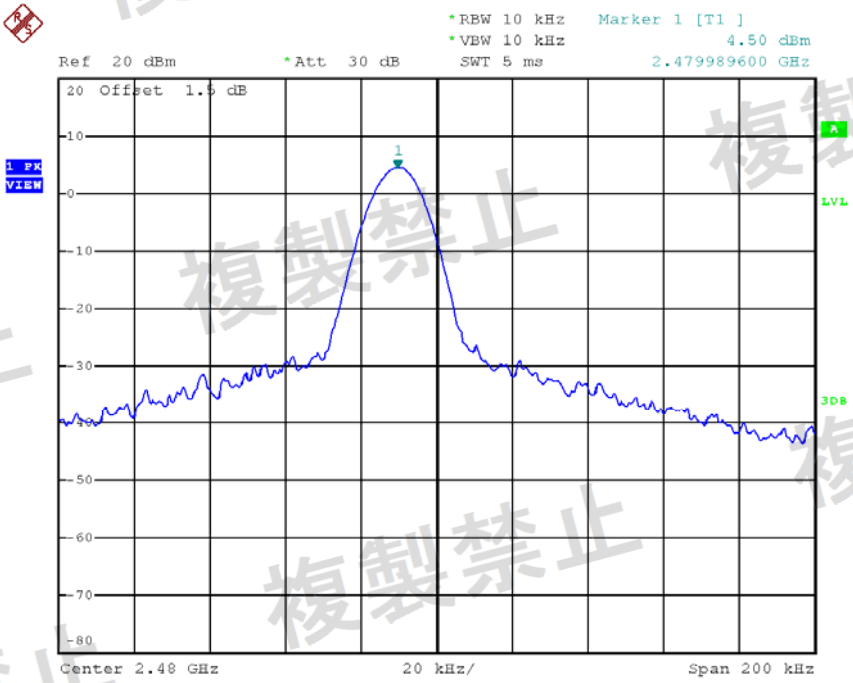
CH19



Date: 17.MAR.2018 09:33:54

Normal Voltage

CH39



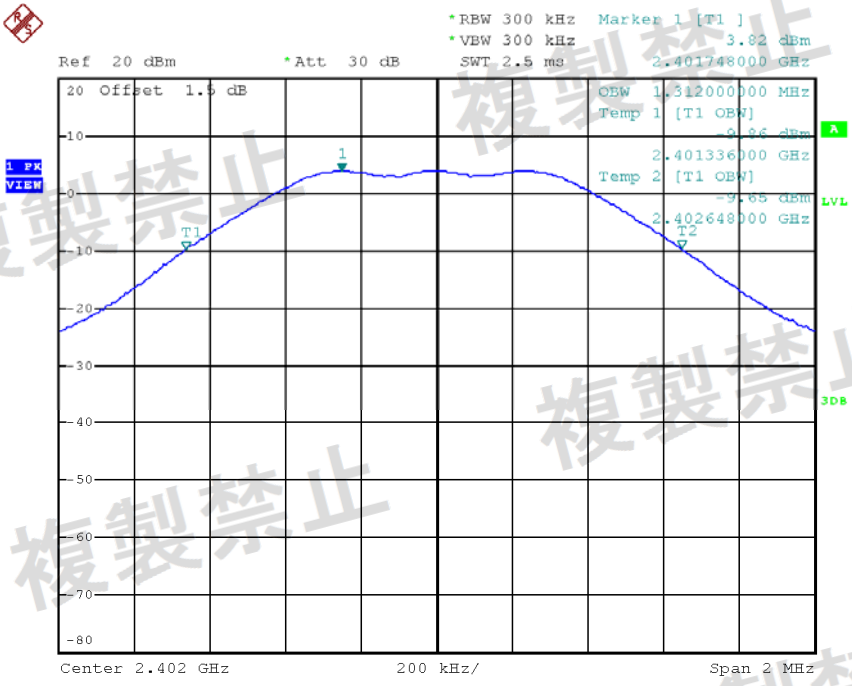
Date: 17.MAR.2018 09:34:12

APPENDIX B - OCCUPIED BANDWIDTH AND SPREAD-SPECTRUM BANDWIDTH

Test Mode:	TX CH00/19/39-1Mbps

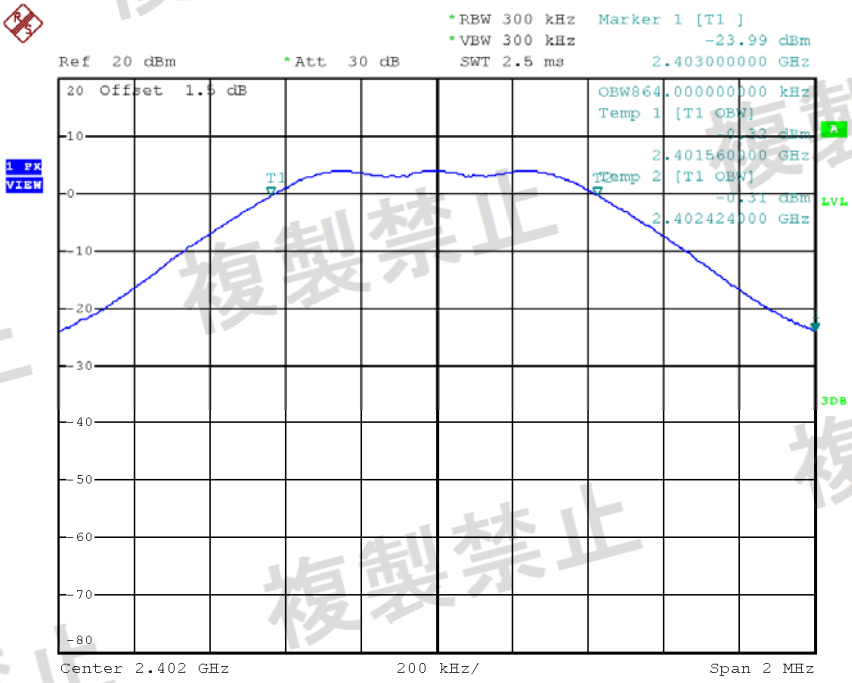
Test Voltage (V)	Normal Voltage			Remarks
Test Frequency (MHz)	2402	2440	2480	Low/Mid/High of test frequency range
Occupied bandwidth (MHz)	1.31	1.32	1.32	Limit ≦ 26 MHz (RBW/VBW :300kHz)
Spreading Bandwidth (MHz)	0.86	0.86	0.87	≧500 kHz (FHSS, DSSS)

Normal Voltage
CH00 -99 % OBW



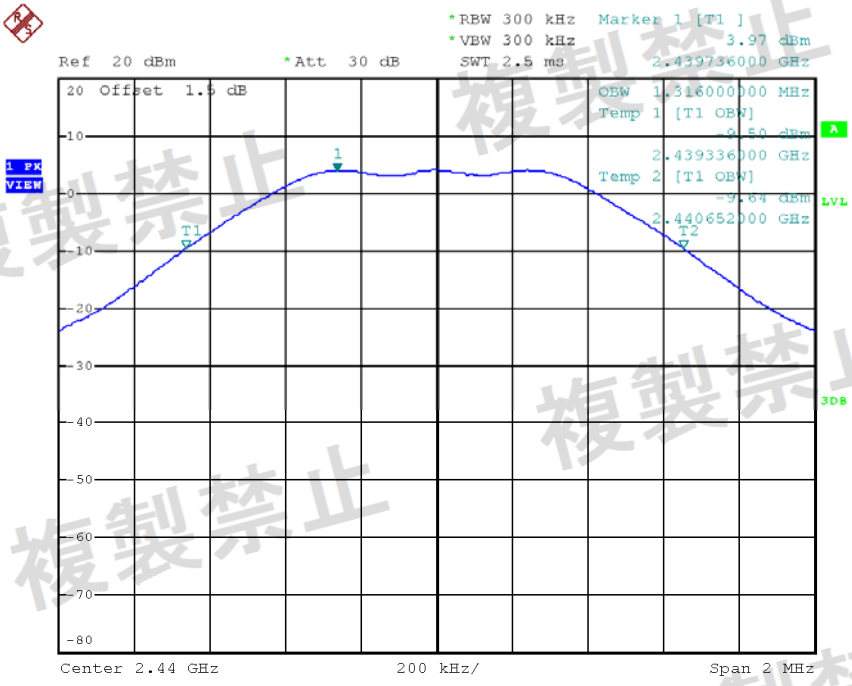
Date: 17.MAR.2018 09:24:36

Normal Voltage
CH00 -90 % OBW



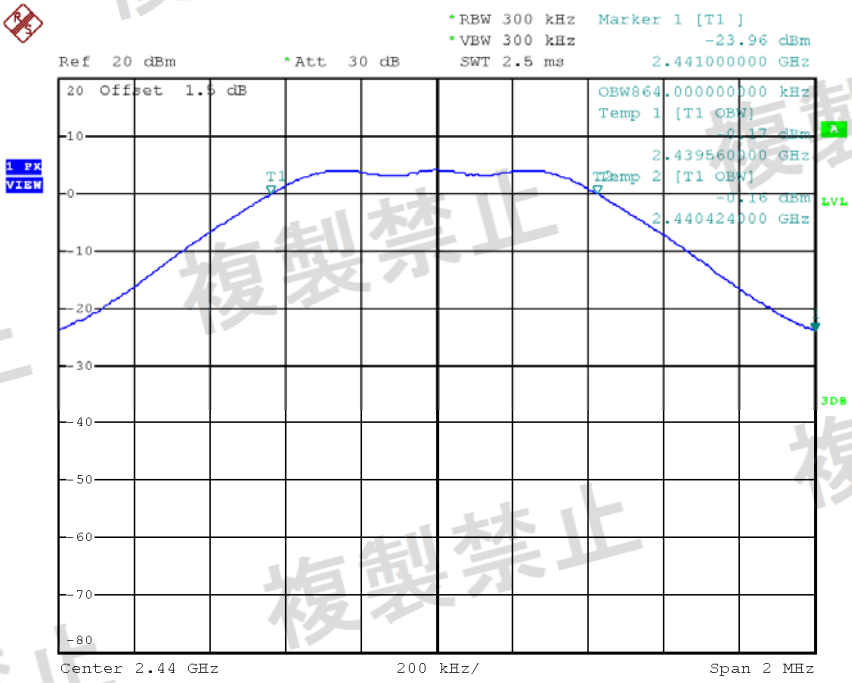
Date: 17.MAR.2018 09:24:30

Normal Voltage
CH19 -99 % OBW



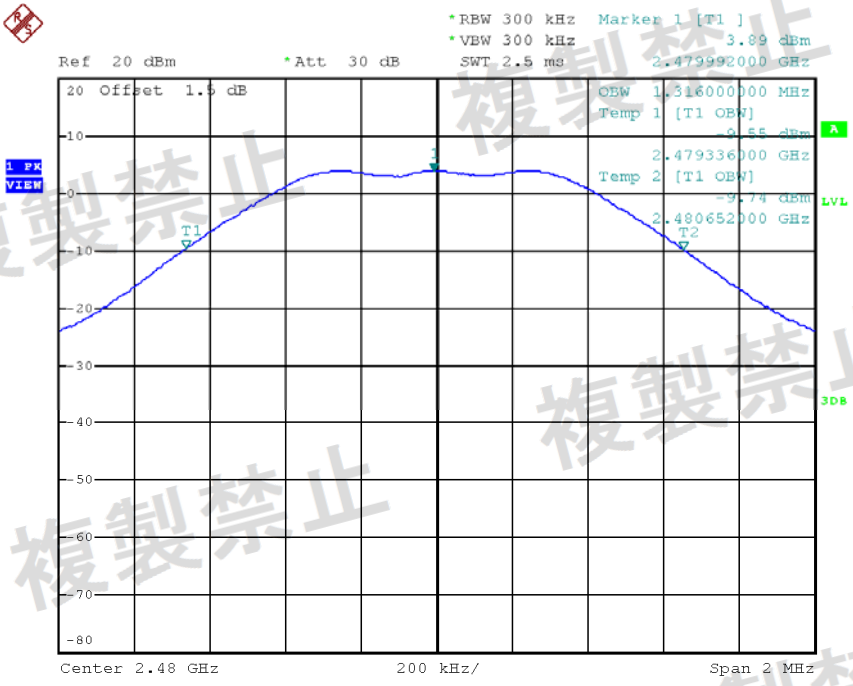
Date: 17.MAR.2018 09:28:05

Normal Voltage
CH19 -90 % OBW



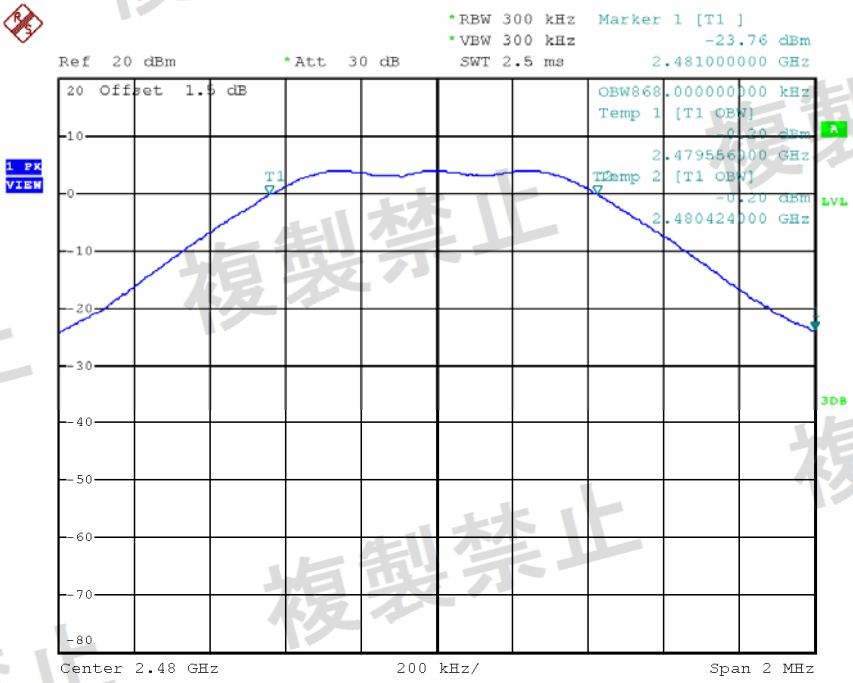
Date: 17.MAR.2018 09:27:59

Normal Voltage
CH39 -99 % OBW



Date: 17.MAR.2018 09:31:24

Normal Voltage
CH39 -90 % OBW



Date: 17.MAR.2018 09:31:17

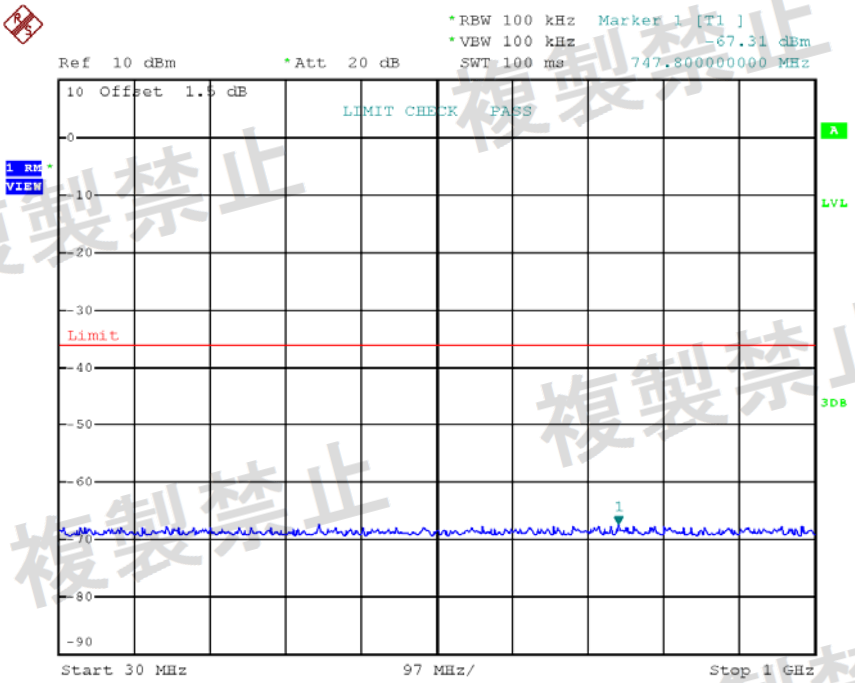
APPENDIX C - UNWANTED EMISSION INTENSITY

Test Mode:	TX CH00/19/39-1Mbps

Test Voltage		V	Normal Voltage			Remarks
Test Frequency		MHz	2402	2440	2480	Low/Mid/High of test frequency range
Unwanted Emission Intensity (Power emission within1MHz bandwidth) (units: μW)	※ 1	μW/MHz	0.0002	0.0002	0.0002	Limit ≦ 0.25 μW/MHz (-26 dBm/MHz)
	※ 2	μW/MHz	0.0006	0.0011	0.0018	Limit ≦ 2.5 μW/MHz (-26 dBm/MHz)
	※ 3	μW/MHz	13.5519	0.0016	0.0051	Limit ≦ 25 μW/MHz (-16 dBm/MHz)
	※ 4	μW/MHz	0.0006	0.0003	0.3090	Limit ≦ 25 μW/MHz (-16 dBm/MHz)
	※ 5	μW/MHz	0.0007	0.0008	0.0011	Limit ≦ 2.5 μW/MHz (-26 dBm/MHz)

Normal Voltage

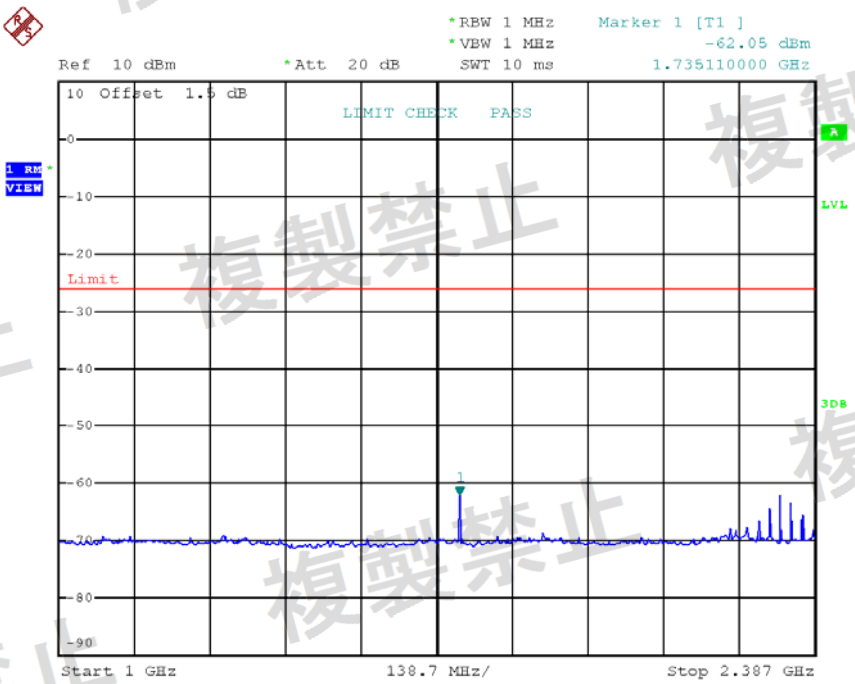
CH00 Frequency Band 1 (30 MHz ≦ f ≦ 1000 MHz)



Date: 17.MAR.2018 09:23:41

Normal Voltage

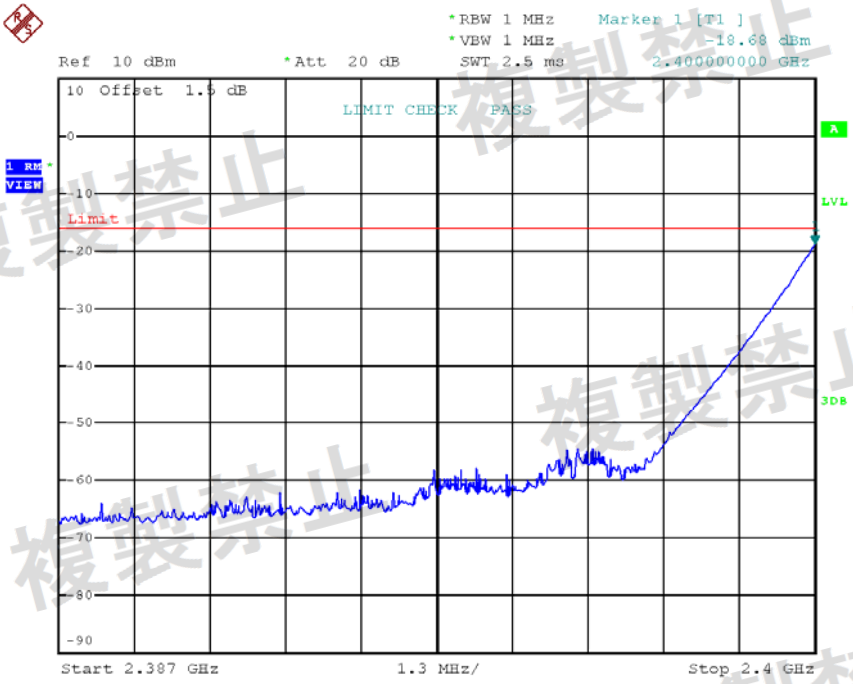
CH00 Frequency Band 2 (1000 MHz < f ≦ 2387 MHz)



Date: 17.MAR.2018 09:23:50

Normal Voltage

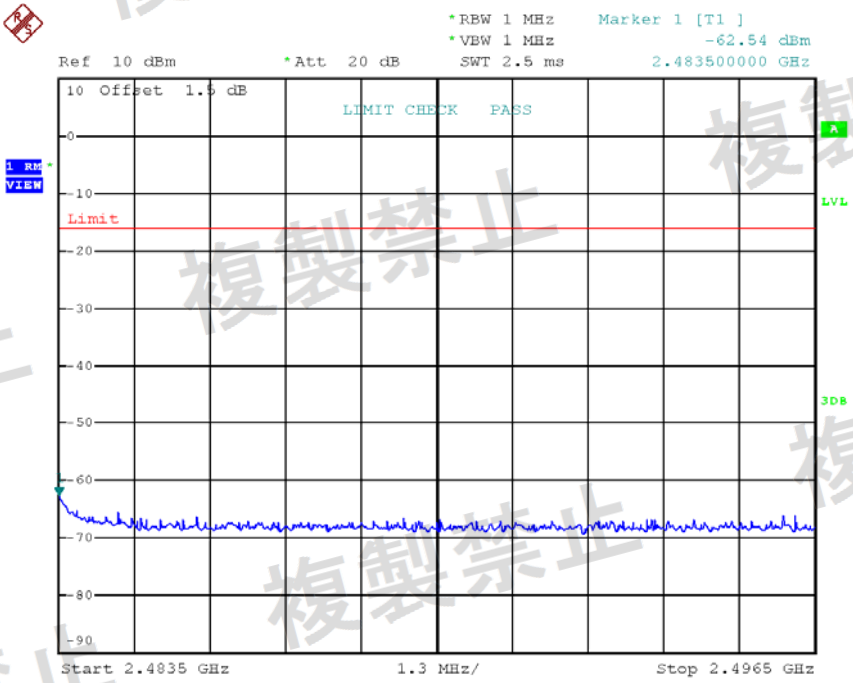
CH00 Frequency Band 3 (2387 MHz ≦ f < 2400 MHz)



Date: 17.MAR.2018 09:24:00

Normal Voltage

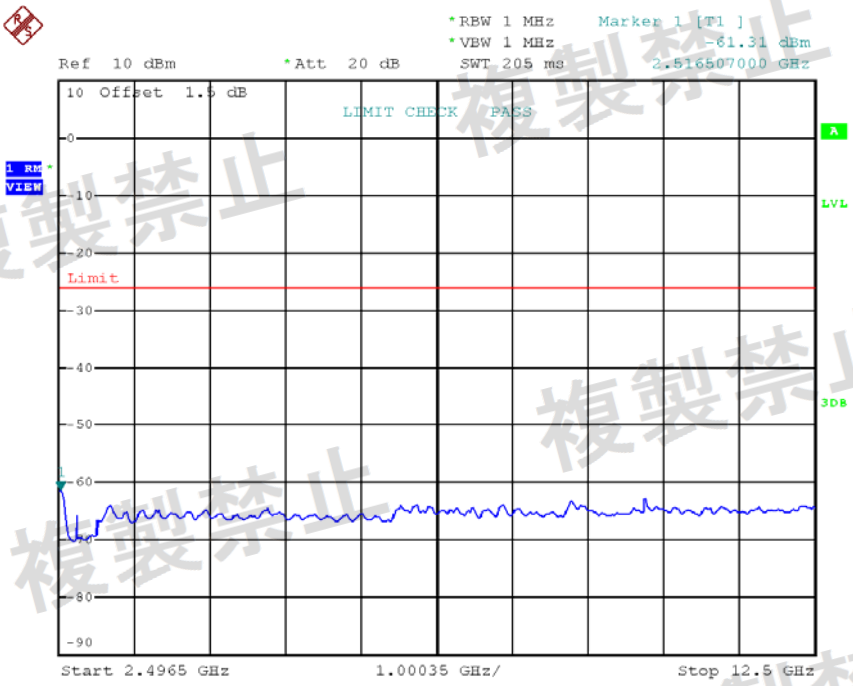
CH00 Frequency Band 4 (2483.5 MHz ≦ f < 2496.5 MHz)



Date: 17.MAR.2018 09:24:09

Normal Voltage

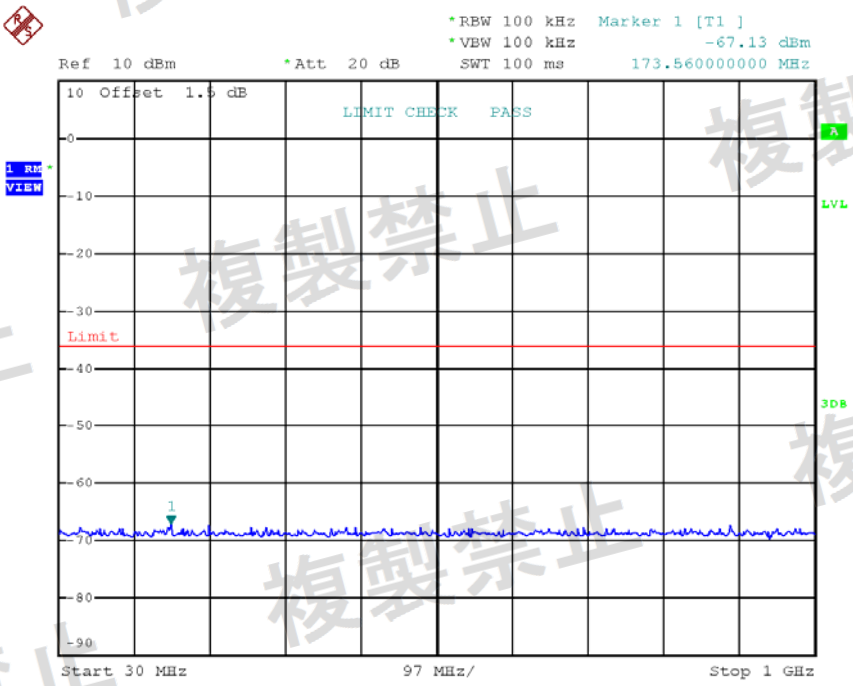
CH00 Frequency Band 5 (2496.5 MHz ≦ f <12.5 GHz)



Date: 17.MAR.2018 09:24:19

Normal Voltage

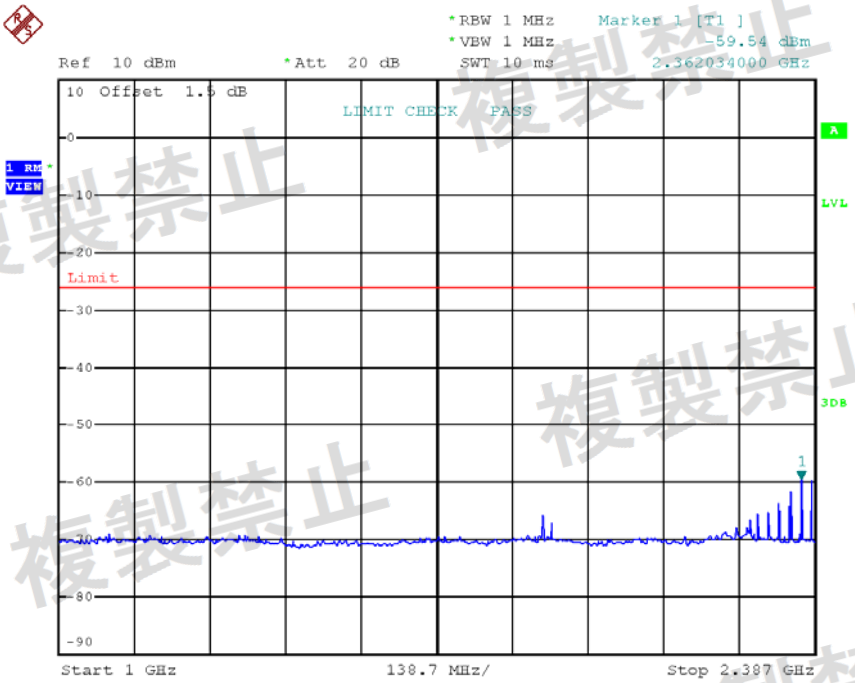
CH19 Frequency Band 1 (30 MHz ≦ f ≦ 1000 MHz)



Date: 17.MAR.2018 09:27:15

Normal Voltage

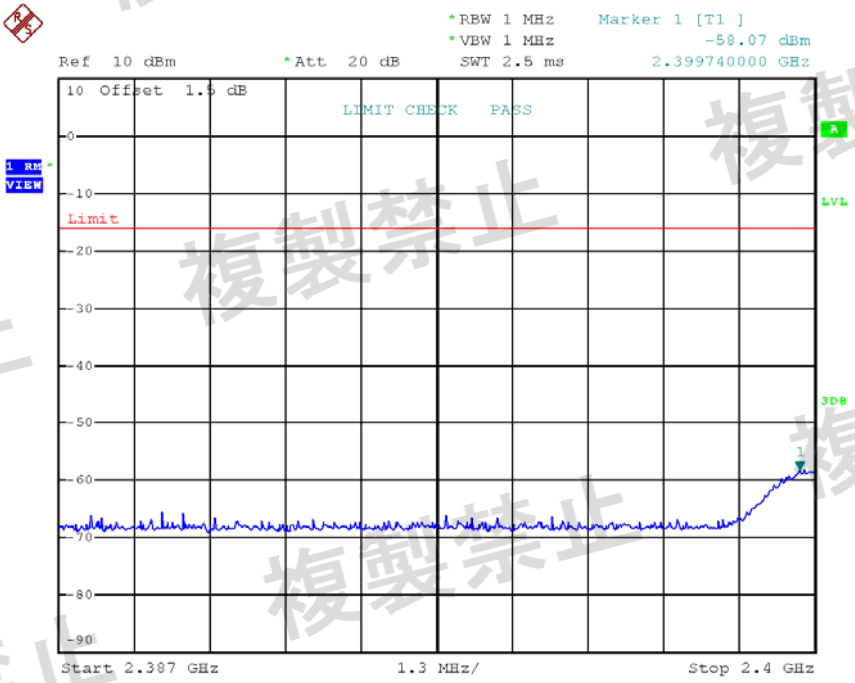
CH19 Frequency Band 2 (1000 MHz < f ≦ 2387 MHz)



Date: 17.MAR.2018 09:27:24

Normal Voltage

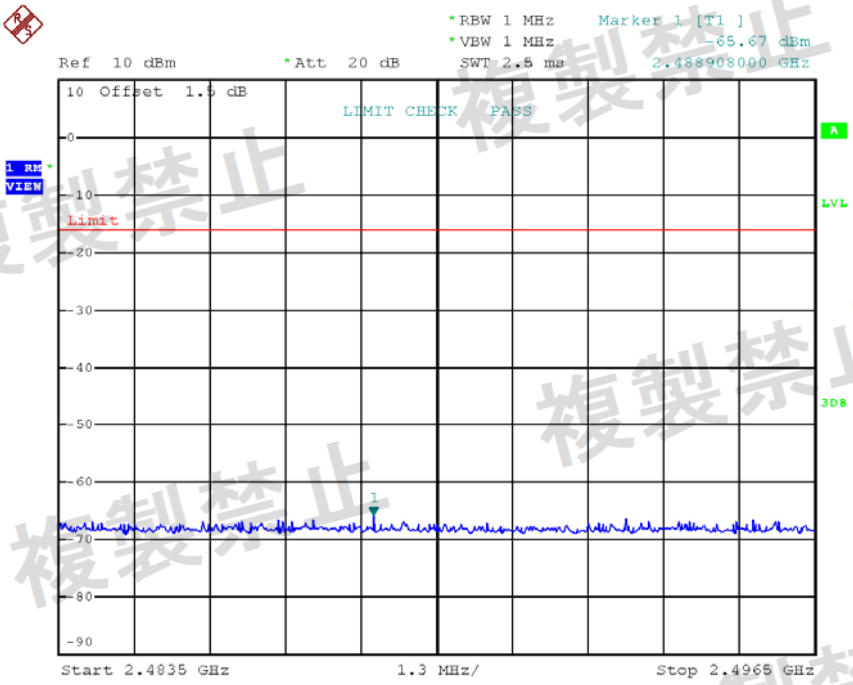
CH19 Frequency Band 3 (2387 MHz ≦ f < 2400 MHz)



Date: 17.MAR.2018 09:27:34

Normal Voltage

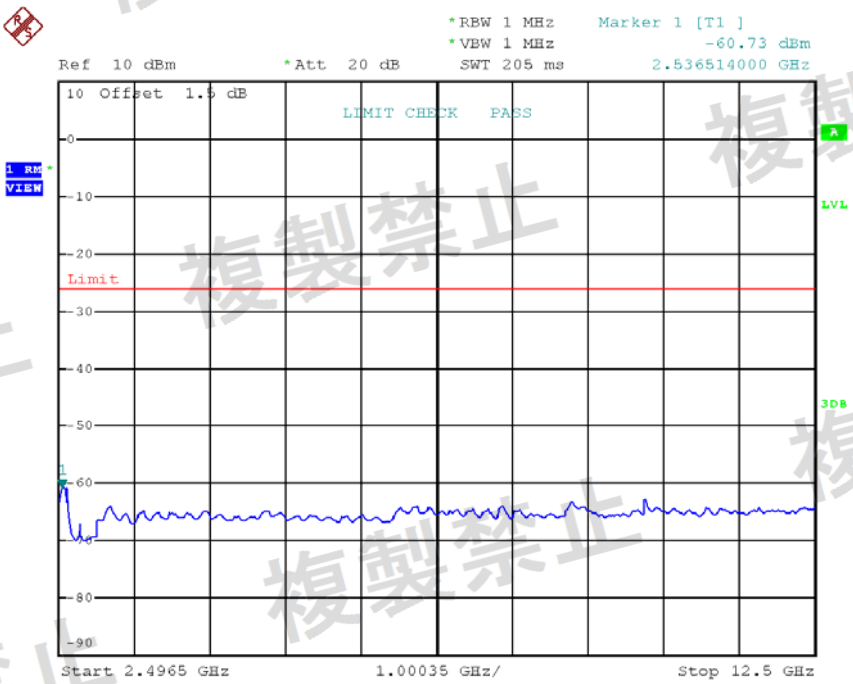
CH19 Frequency Band 4 (2483.5 MHz ≦ f < 2496.5 MHz)



Date: 17.MAR.2018 09:27:43

Normal Voltage

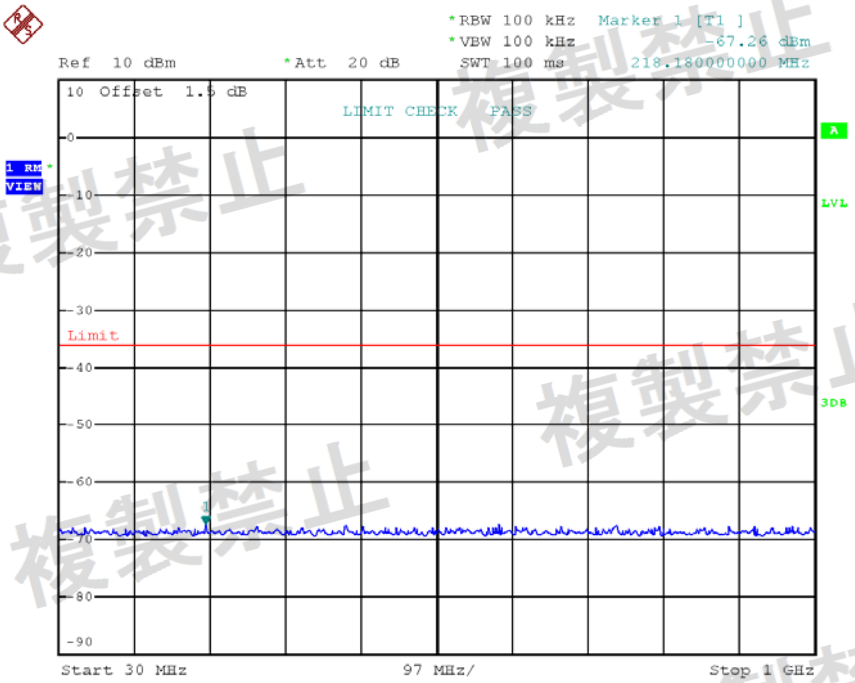
CH19 Frequency Band 5 (2496.5 MHz ≦ f <12.5 GHz)



Date: 17.MAR.2018 09:27:52

Normal Voltage

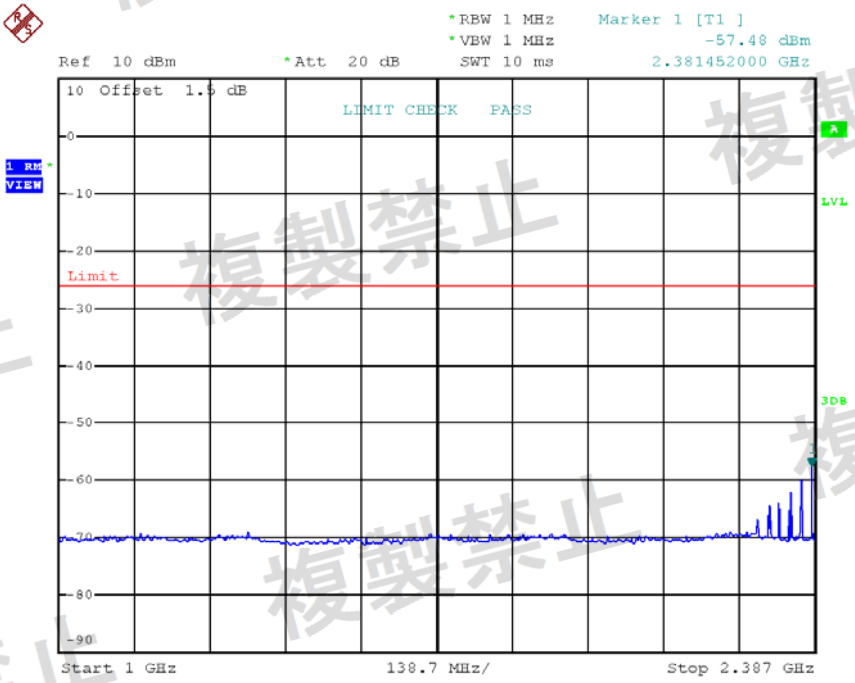
CH39 Frequency Band 1 (30 MHz ≦ f ≦ 1000 MHz)



Date: 17.MAR.2018 09:30:33

Normal Voltage

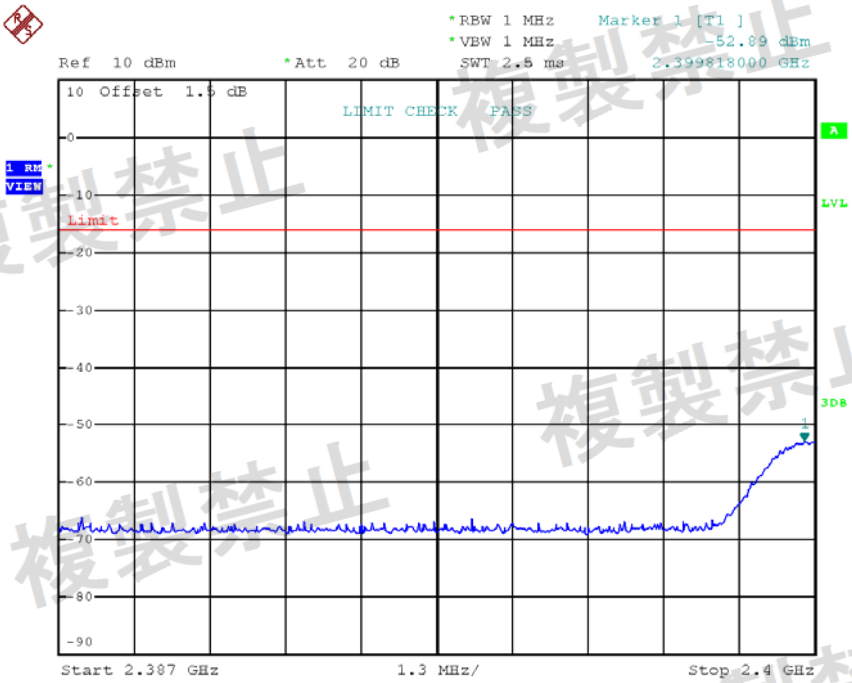
CH39 Frequency Band 2 (1000 MHz < f ≦ 2387 MHz)



Date: 17.MAR.2018 09:30:42

Normal Voltage

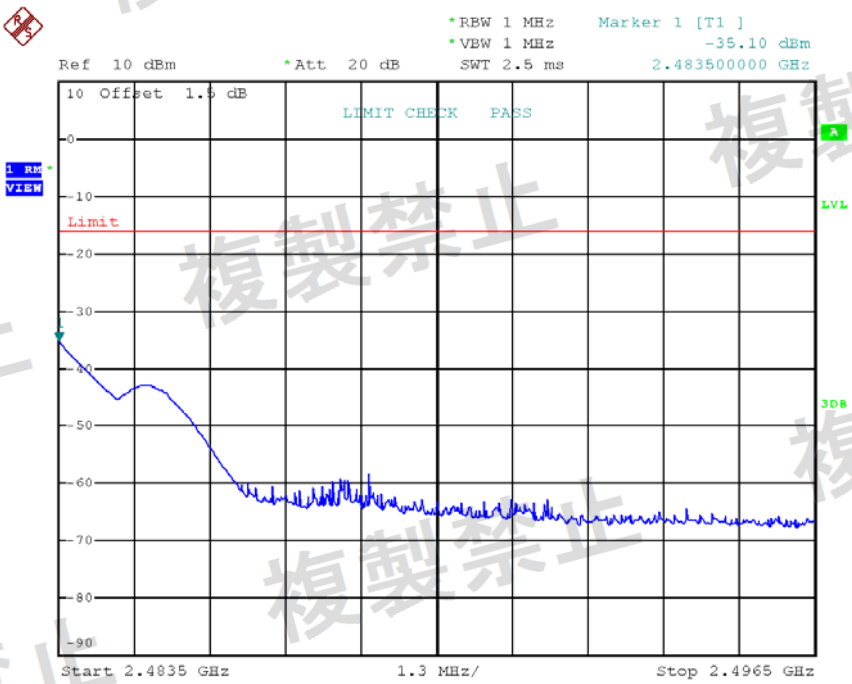
CH39 Frequency Band 3 (2387 MHz ≦ f < 2400 MHz)



Date: 17.MAR.2018 09:30:52

Normal Voltage

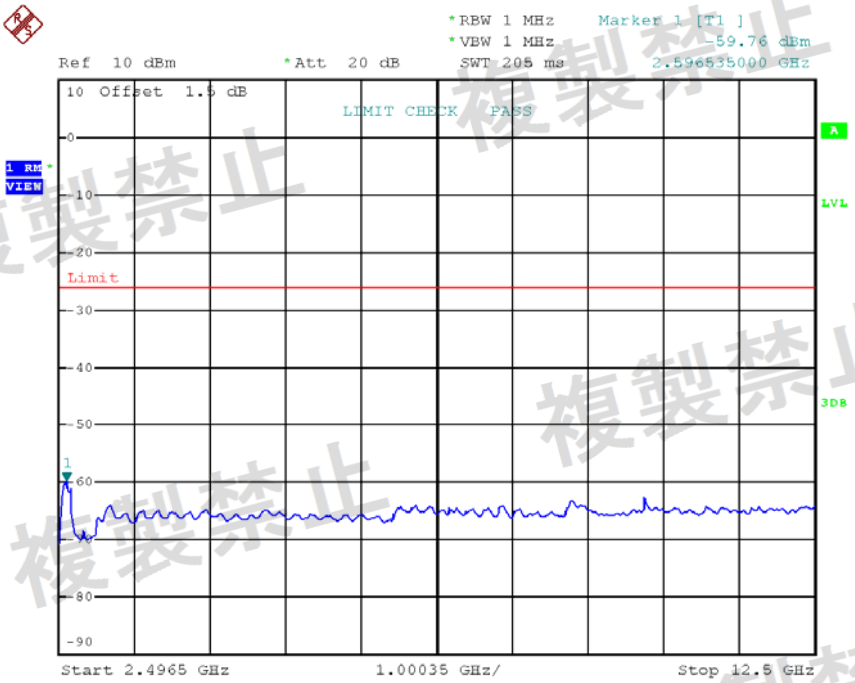
CH39 Frequency Band 4 (2483.5 MHz ≦ f < 2496.5 MHz)



Date: 17.MAR.2018 09:31:01

Normal Voltage

CH39 Frequency Band 5 (2496.5 MHz ≦ f <12.5 GHz)



Date: 17.MAR.2018 09:31:10

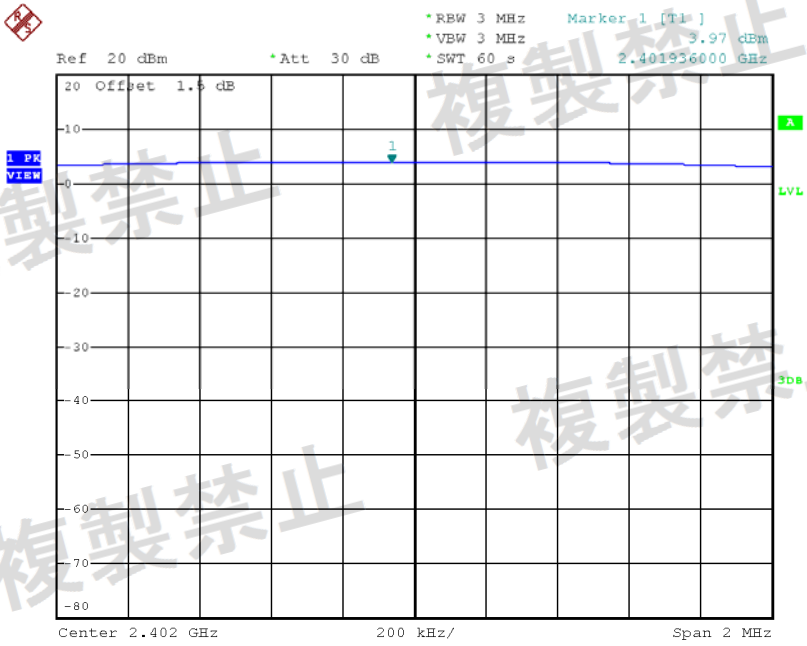
APPENDIX D – ANTENNA POWER ERROR

Test Mode:	TX CH00/19/39-1Mbps

Test Voltage (V)	Normal Voltage			Remarks
Test Frequency (MHz)	2402	2440	2480	Low/Mid/High of test frequency range
Antenna Power (mW)	2.4946	2.5823	2.4946	-
Antenna Power Error (mW)	-0.10541	-0.01774	-0.10541	-
Antenna Power Error (%)	-4.05	-0.68	-4.05	Limit + 20% ~ - 80%
EIRP Antenna Power (mW)	4.9774	5.1523	4.9774	

Normal Voltage

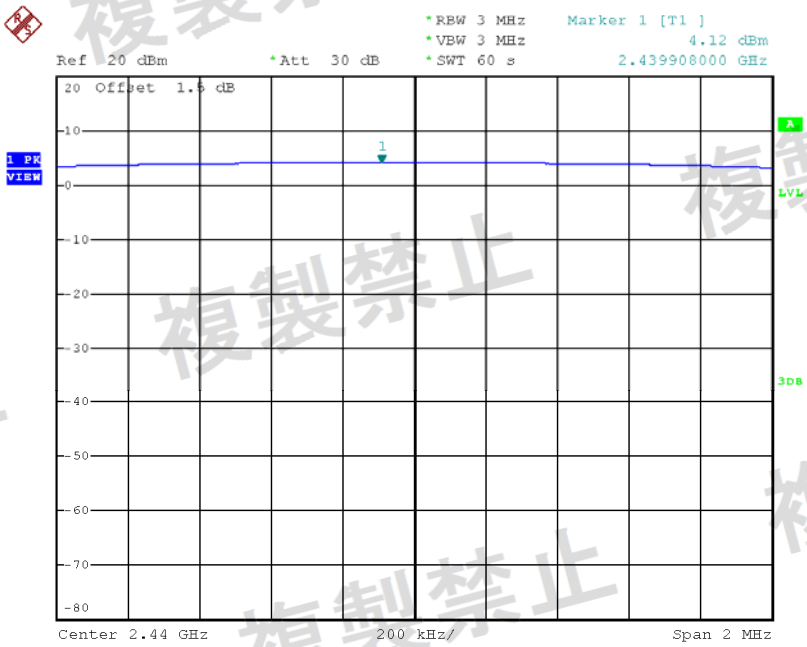
CH00



Date: 17.MAR.2018 09:23:31

Normal Voltage

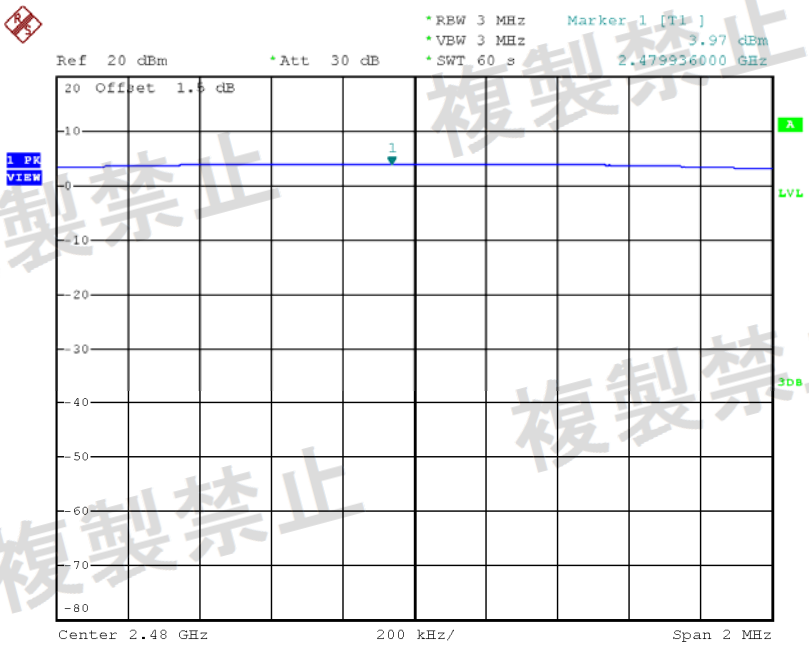
CH19



Date: 17.MAR.2018 09:27:05

Normal Voltage

CH39



Date: 17.MAR.2018 09:30:23

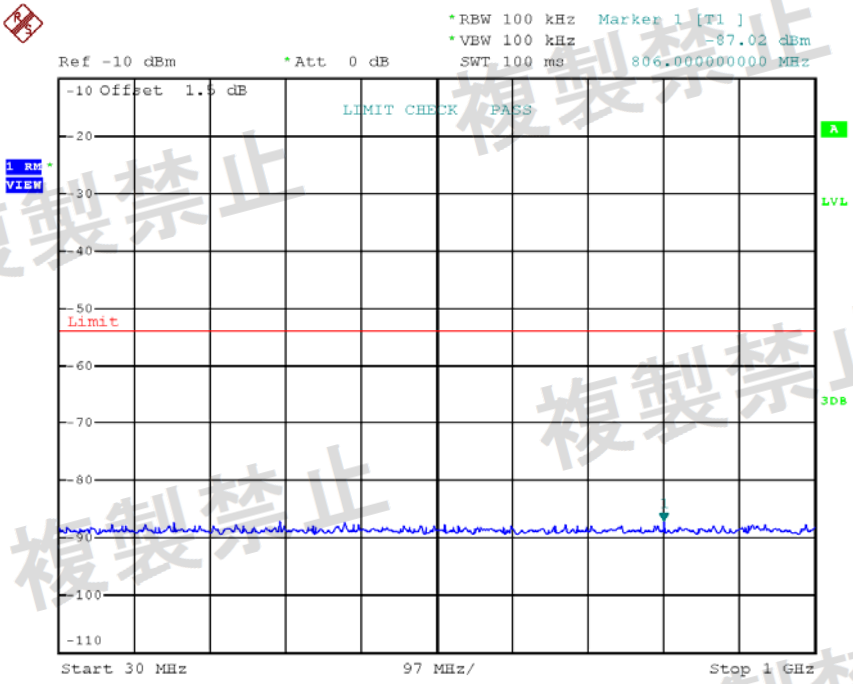
APPENDIX E - LIMITATION OF COLLATERAL EMISSION OF RECEIVER

Test Mode:	TX CH00/19/39-1Mbps

Test Voltage		V	Normal Voltage			Remarks
Test Frequency		MHz	2402	2440	2480	Low/Mid/Low of test frequency range
Limitation of Collateral Emission of Receiver	※6	nW	0.0020	0.0020	0.0021	Limit ≦ 4 nW (-54 dBm)
	※7	nW	0.0165	0.0050	0.0052	Limit ≦ 20 nW (-47 dBm)

Normal Voltage

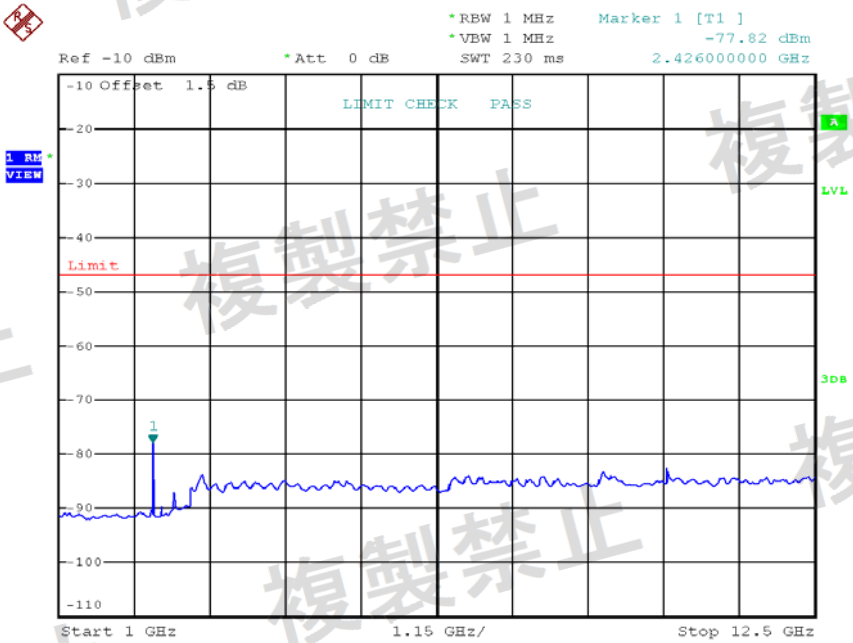
CH00- Frequency Band 6 (10 MHz ≦ f < 1000 MHz)



Date: 17.MAR.2018 09:32:04

Normal Voltage

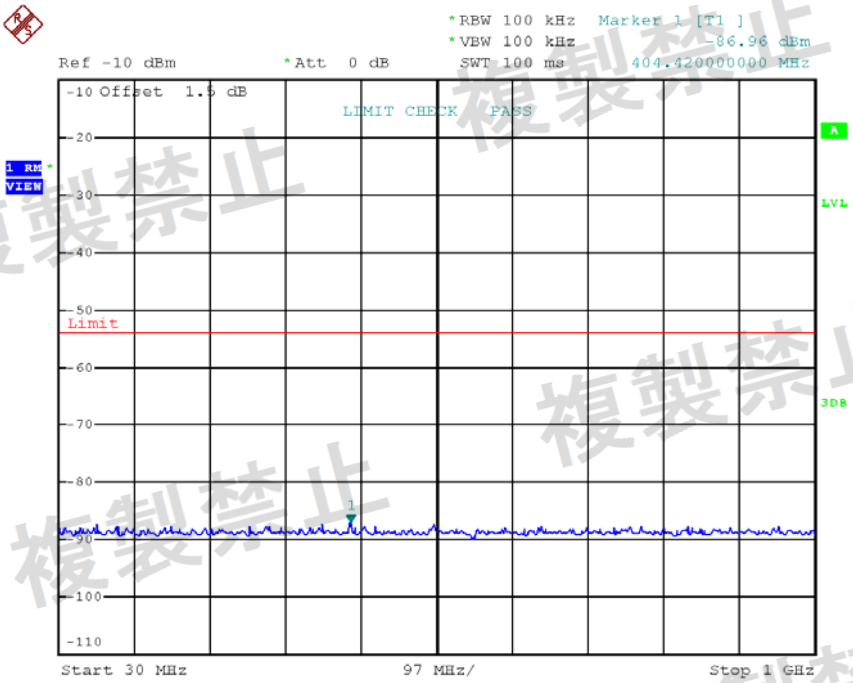
CH00- Frequency Band 7 (1000 MHz ≦ f < 12.5 GHz)



Date: 17.MAR.2018 09:32:14

Normal Voltage

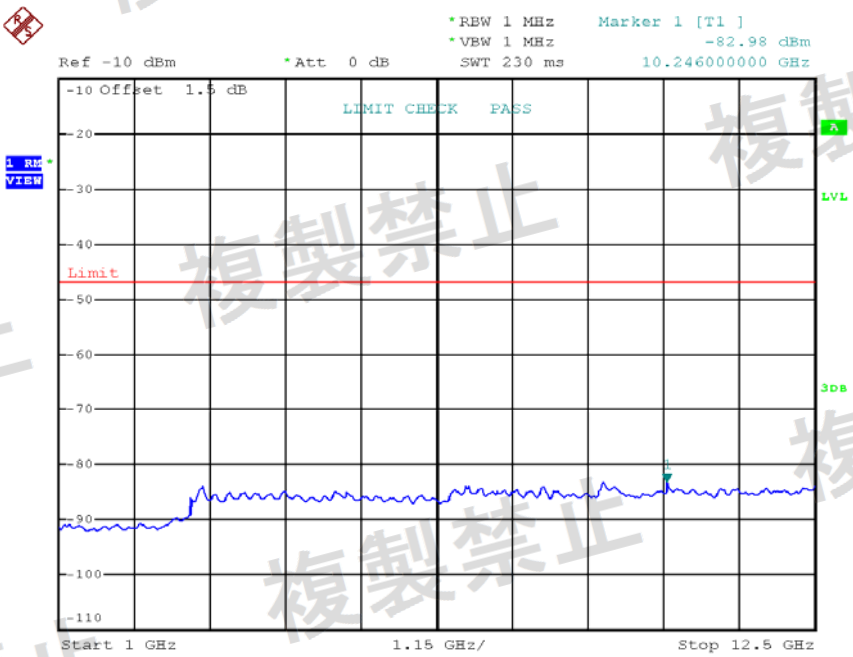
CH19- Frequency Band 6 (10 MHz ≦ f < 1000 MHz)



Date: 17.MAR.2018 09:32:45

Normal Voltage

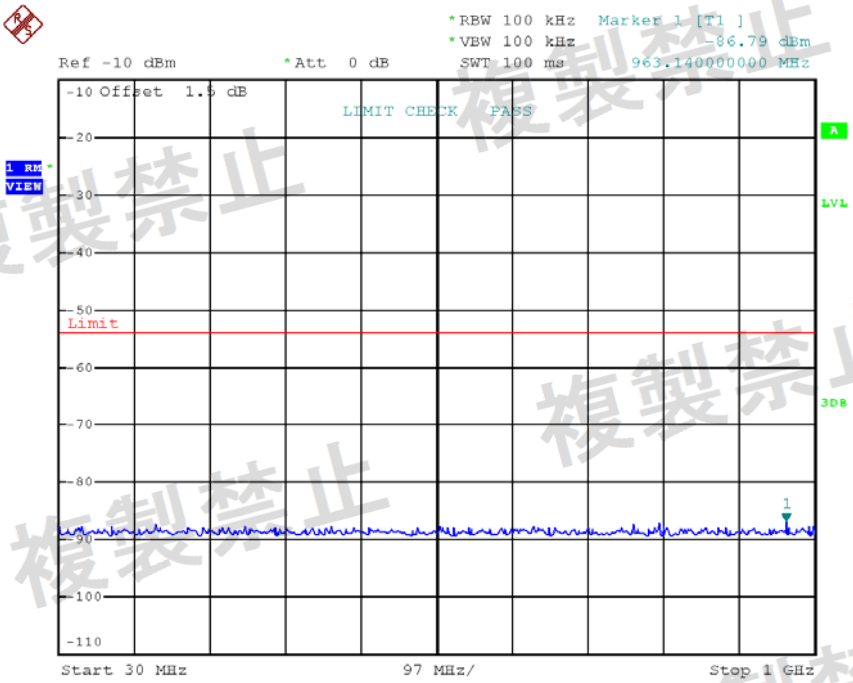
CH19- Frequency Band 7 (1000 MHz ≦ f < 12.5 GHz)



Date: 17.MAR.2018 09:32:55

Normal Voltage

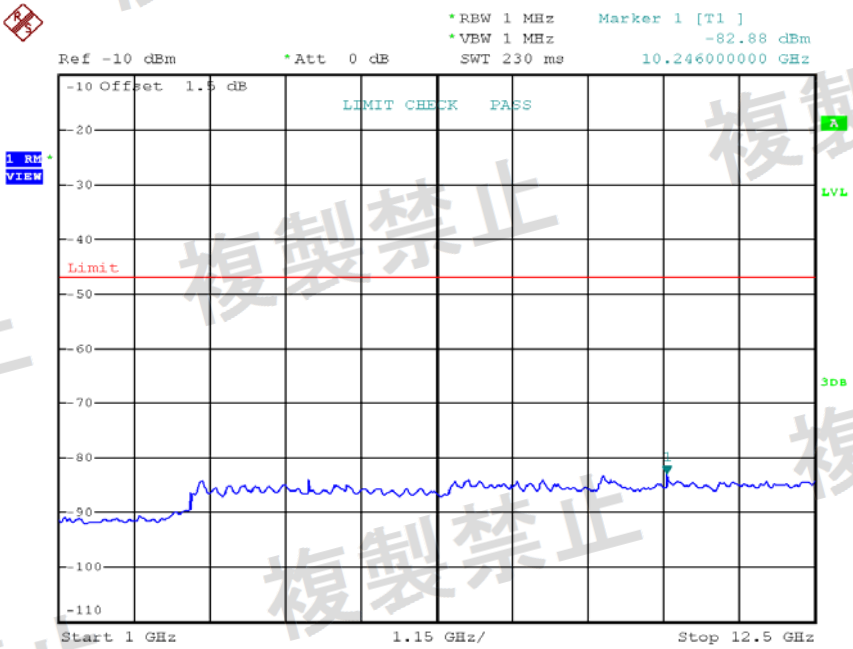
CH39- Frequency Band 6 (10 MHz ≦ f < 1000 MHz)



Date: 17.MAR.2018 09:33:06

Normal Voltage

CH39- Frequency Band 7 (1000 MHz ≦ f < 12.5 GHz)



Date: 17.MAR.2018 09:33:16