


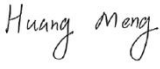

Test Report No.:  
TELECSZ2023-0001-RF1

## RF Test Report

EUT : AI Care Sensor  
MODEL : HC2?\*(see section 2.1)  
BRAND NAME : N/A  
CLIENT : TsingLan Technology (Shenzhen) Co., Ltd  
Classification of Test : N/A

CVC Testing Technology (Shenzhen) Co., Ltd.



<b>Applicant</b>	Name : TsingLan Technology (Shenzhen) Co., Ltd Address : 602, Block A, Wanhai Building, No. 1031, Nanhai Avenue, Yanshan Community, Zhaoshang Street, Nanshan District, Shenzhen ,China		
<b>Manufacturer</b>	Name : TsingLan Technology (Shenzhen) Co., Ltd Address : 602, Block A, Wanhai Building, No. 1031, Nanhai Avenue, Yanshan Community, Zhaoshang Street, Nanshan District, Shenzhen ,China		
<b>Factory</b>	Name : CHINA DRAGON TECHNOLOGY LIMITED Address :Floor3, Buiding1, Xiangjiang Kunpeng Industrial Park, No.67, Ziyuan Road, Xueshi Street, Yuelu District, Changsha, Hunan		
<b>Equipment Under Test</b>	Name :AI Care Sensor Model/Type: HC2?*(see section 2.1) Trade mark : N/A Serial NO.:N/A Sampe NO.:3-1		
Date of Receipt.	2023.12.06	Date of Testing	2023.12.06~2023.12.15
<b>Test Specification</b>		<b>Test Result</b>	
Article 2 Section 1 Item 8		PASS	
<b>Evaluation of Test Result</b>	The equipment under test was found to comply with the requirements of the standards applied.  <b>Issue Date: 2023.12.18</b>		
Tested by:  <b>Liang JiaTong</b> Name Signature	Reviewed by:  <b>Huang Meng</b> Name Signature	Approved by:  <b>Dong Sanbi</b> Name Signature	
<b>Other Aspects: NONE.</b>			
Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested			

This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.



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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
TELECSZ2023-0001-RF1	Original release	2023.12.18



## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

REPORT SECTION	TEST TYPE AND LIMIT	RESULT (PASS/FAIL)
3.1	Transmission Time Restriction	Pass
3.2	Frequency Tolerance	Pass
3.3	Occupied Bandwidth	Pass
3.4	Unwanted Emission Intensity	Pass
3.5	RF Output Power / Tolerance and EIRP Power	Pass
3.6	Limitation of Collateral Emission of Receiver	Not applicable(Note)
3.7	Interference Prevention Function	Pass
3.8	Radio Emission Stop Function	Pass
3.9	Construction Protection Confirmation	Pass

Note:The EUT can't not operate in receive only mode.





## 1.1 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial Number	Cal. interval	Cal. Due
Signal&Spectrum Analyzer	Rohde&Schwarz	FSV 40	101898	1 year	2024.5.21
EMI Test Receiver	Rohde&Schwarz	ESR3	102693	1 year	2024.5.25
Antenna(30MHz~1001MHz)	SCHWARZBECK	VULB 9168	1133	1 year	2024.2.21
Horn antenna(1GHz-18GHz)	ETS	3117	227611	1 year	2024.3.25
Horn antenna(18GHz-40GHz)	QMS	QMS-00880	22051	1 year	2024.3.25
3m anechoic chamber	MORI	966	CS0300011	3 year	2026.5.18
Filter group(RSE-BT/WiFi)	Rohde&Schwarz	WiFi /BT Variant 1	100820	1 year	2024.5.21
Filter group(RSE-Cellular)	Rohde&Schwarz	Cellular Variant 1	100768	1 year	2024.5.21
Preamplifier(10kHz-1GHz)	Rohde&Schwarz	SCU-01F	100299	1 year	2024.5.21
Preamplifier(1GHz-18GHz)	Rohde&Schwarz	SCU-18F	100799	1 year	2024.5.21
Preamplifier(1GHz-18GHz)	Rohde&Schwarz	SCU-18F	100801	1 year	2024.5.21
Preamplifier(18Gz-40GHz)	Rohde&Schwarz	SCU-40A	101209	1 year	2024.5.21
#2 control room	MORI	433	CS0300028	3 year	2024.5.21
Temperature and humidity meter	/	C193561517	C193561517	1 year	2024.5.21
Signal&Spectrum Analyzer	keysight	N9040B	CS0300074	1 year	2024.9.24
SA Expansion Module(40-60GHz)	VDI	N9029AV19	CS0300075	3 year	2025.9.14
SA Expansion Module(60-90GHz)	VDI	N9029AV12	CS0300076	3 year	2025.9.14
SA Expansion Module(90-140GHz)	VDI	N9029AV08	CS0300077	3 year	2025.9.14
SA Expansion Module(140-220GHz)	VDI	N9029AV05	CS0300078	3 year	2025.9.14
SA Expansion Module(220-330GHz)	VDI	N9029AV03	CS0300079	3 year	2025.9.14
Horn antenna(40-60GHz)	CMI	HO19R	CS0300086	Verified and corresponding antenna/Active multiplier combination (Standard Gain Horn Antenna)	
Horn antenna(60-90GHz)	CMI	HO12R	CS0300088		
Horn antenna(90-140GHz)	CMI	HO08R	CS0300090		
Horn antenna(140-220GHz)	CMI	HO05R	CS0300092		
Horn antenna(220-330GHz)	CMI	HO03R	CS0300094		



## 1.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement Uncertainty		
No.	Item	Measurement Uncertainty
1	Occupied Channel Bandwidth	±1.86%
2	Radiated Emissions(30MHz-1GHz)	±5.0dB
3	Radiated Emissions(1GHz-18GHz)	±4.8dB
4	Radiated Emissions(18GHz-40GHz)	±5.1dB
5	Radiated Emissions(40GHz-60GHz)	±4.8dB
6	Radiated Emissions(60GHz-90GHz)	±4.8dB
7	Radiated Emissions(90GHz-140GHz)	±5.0dB
8	Radiated Emissions(140GHz-220GHz)	±5.1dB
9	Radiated Emissions(220GHz-300GHz)	±4.8dB
10	Temperature	±0.73°C
11	Supply voltages	±0.37 %
12	Humidity	±3.9 %
Remark: 95% Confidence Levels, k=2.		

## 1.3 TEST LOCATION

The tests and measurements refer to this report were performed by EMC testing Lab. of CVC Testing Technology (Shenzhen) Co., Ltd.

Lab Address: No. 1301, Guanguang Road, Xinlan Community, Guanlan Street, Longhua District, Shenzhen City, Guangdong Province 518110 P.R.China

Post Code: 518110 Tel: 0755-23763060-8805

Fax: 0755-23763060 E-mail: sz-kf@cvc.org.cn

FCC(Test firm designation number: CN1363)

IC(Test firm CAB identifier number: CN0137)

CNAS(Test firm designation number: L16091)



## 2 GENERAL INFORMATION

### 2.1 GENERAL PRODUCT INFORMATION

PRODUCT	AI Care Sensor
BRAND	N/A
MODEL	HC2?*(Note 4)
ADDITIONAL MODEL	N/A
POWER SUPPLY	DC 5V From USB Host Unit
TYPE OF EQUIPMENT	62GHz
MODULATION TYPE	FMCW
RATED POWER	2.00mw
CONDUCTED POWER DENSITY	1.03mw
EIRP	2.12dBm
HW-RELEASE NO	TLR60G44S RD V2.11
SW-RELEASE NO	Nov 29 2023
I/O PORTS	Refer to user's manual
NOTE: 1. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual. 2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report. 3. Please refer to the EUT photo document (Reference No.:TELECSZ2023-0001-EUT) for detailed product photo. 4. "?" and "*" are wildcard. "?" and "*" is a single letter from A to Z or a number from 1 to 9, representing different versions. 5. The product have 4 antennas for Radar chipset, only support 4T4R mode.	





## 2.2 ANTENNA SPECIFICATIONS

### 2.2.1 ANTENNA GAIN

MODULATION MODE	ANT.array	Ant. Type	Connector Type	Highest Peak Gain (dBi) 57-64GHz
FMCW	1	Embedded Antennas in the Package	N/A	2.0

The product have 4 antennas for Radar chipset, only support 4T4R mode.

### 2.2.2 ANTENNA PATTERN

Please refer to the attached file (Antenna report).

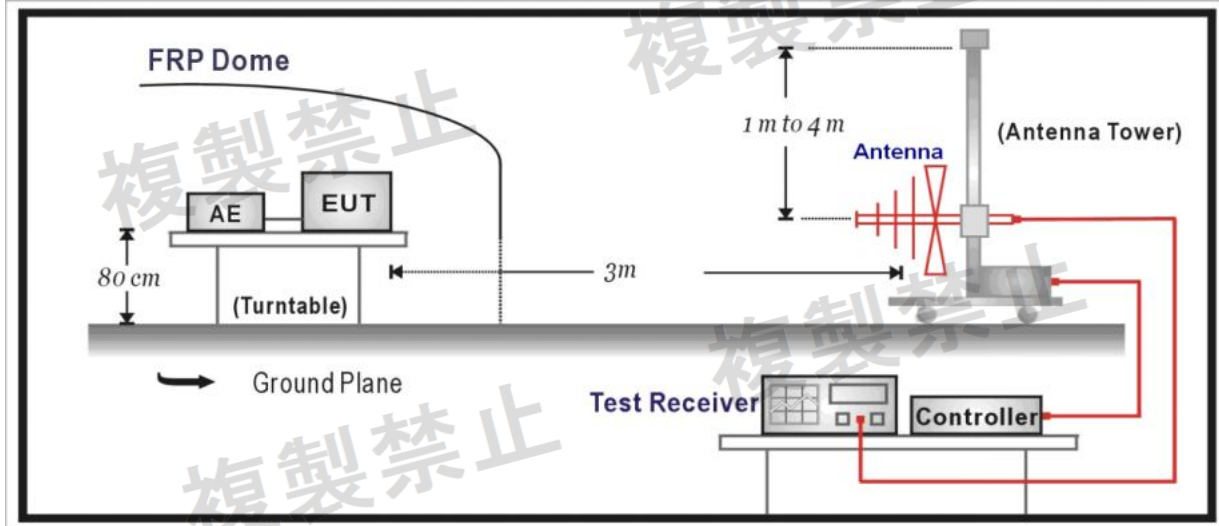
## 2.3 FAR FIELD CONDITION FOR FREQUENCY ABOVE 18GHZ

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable. The measurement antenna is in the far field of the EUT per formula  $2D^2/\lambda$  where D is the larger between the dimension of the measurement antenna and the transmitting antenna of the EUT. In this case, "D" is the largest dimension of the measurement antenna. The EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

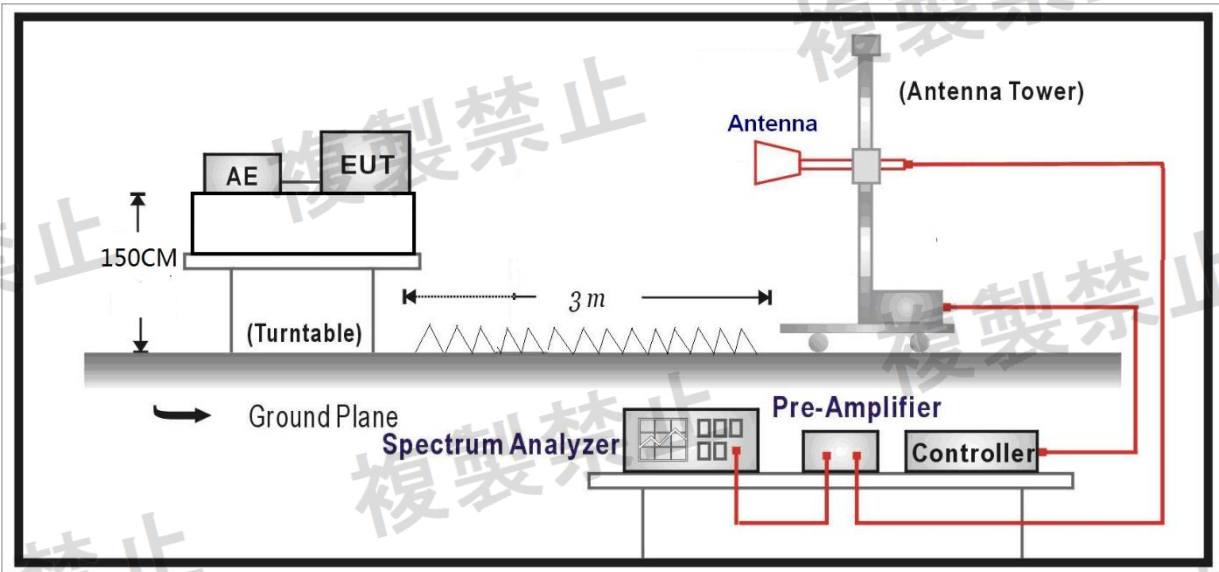
HornAntenna	Frequency (GHz)	Antenna Dimension A(mm)	Wavelength (λ)(m)	Farfield R(m) $\geq 2D^2/\lambda$	Measurement Distance(D)(m)
QMS-00880	18	0.08	0.0167	0.77	2
	40	0.08	0.0075	1.71	
HO19R	40	0.046	0.0075	0.56	1
	60	0.046	0.005	0.85	
HO12R	60	0.03	0.005	0.36	1
	90	0.03	0.0033	0.55	
HO8R	90	0.019	0.0033	0.22	1
	140	0.019	0.0021	0.34	
HO5R	140	0.012	0.0021	0.14	1
	220	0.012	0.0014	0.21	
HO3R	220	0.008	0.0014	0.09	1
	330	0.008	0.0009	0.14	

## 2.4 TEST SETUP

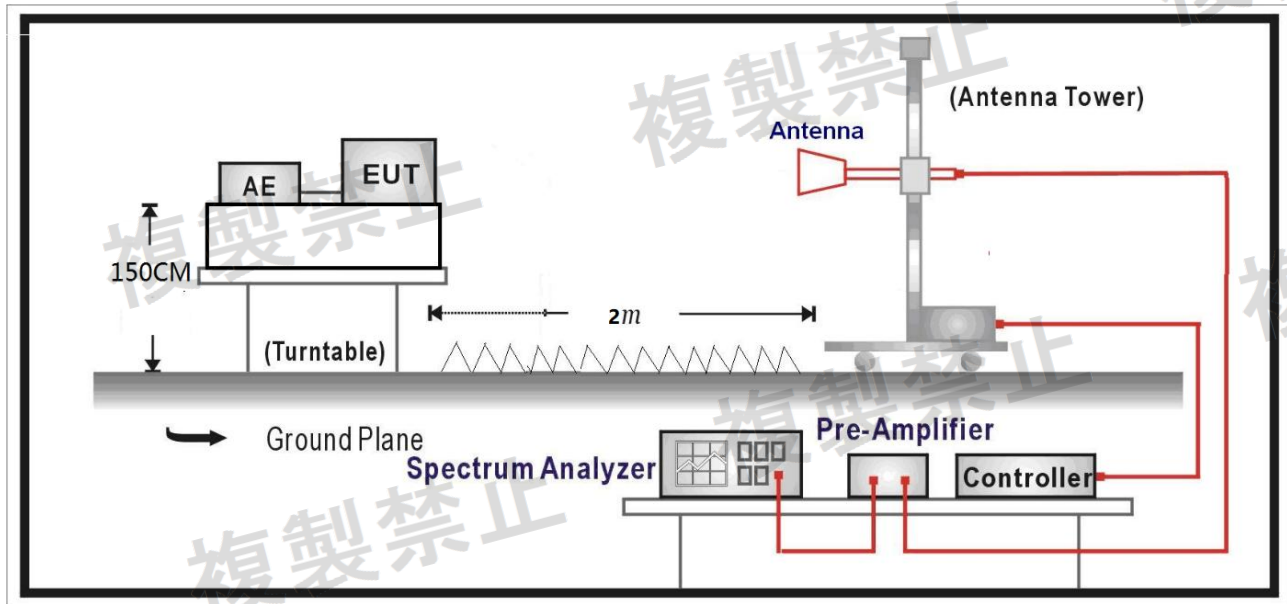
30MHz-1GHz Test Setup:



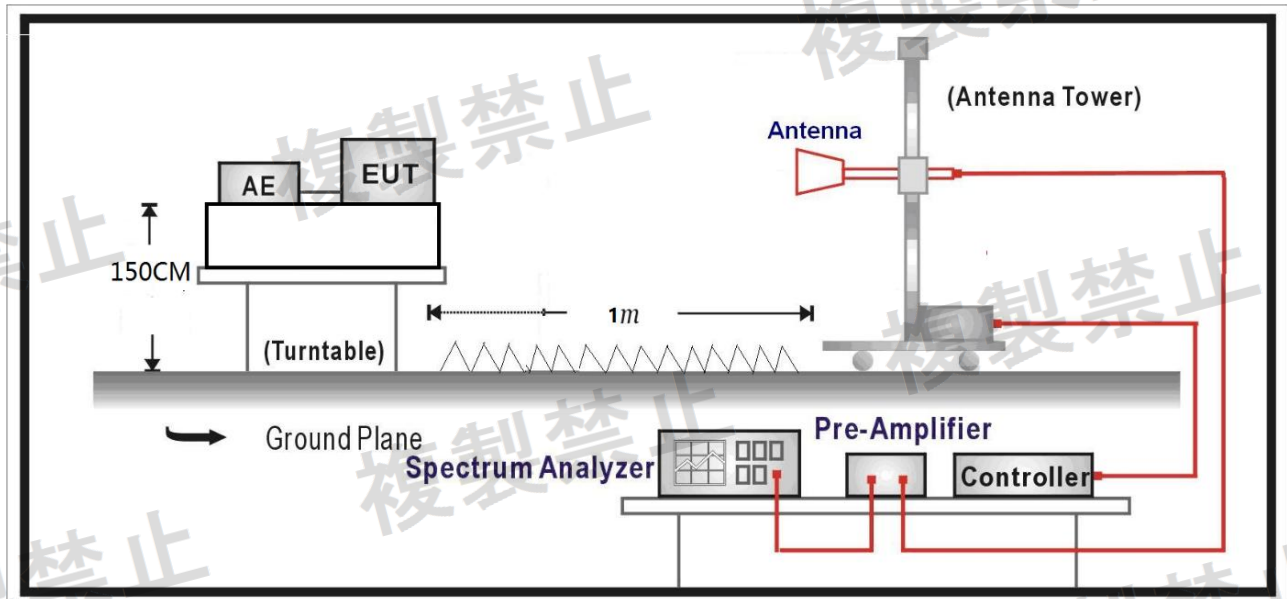
1GHz -18GHz Test Setup:



## 18GHz-40GHz Test Setup:



## Above 40GHz Test Setup:





## 2.5 ENVIRONMENTAL CONDITIONS

During the measurement the environmental conditions were within the listed ranges:

Battery Voltage	Normal Voltage / NV	-
	Low Voltage /LV	-
	High Voltage /HV	-
RF Chip Voltage	Normal Voltage / NV	3.3V
	Low Voltage /LV	3.3V
	High Voltage /HV	3.3V
Adapter Voltage	Normal Voltage / NV	DC 5.0V
	Low Voltage /LV	DC 4.5V
	High Voltage /HV	DC 5.5V
Other	Normal Temperature/T <sub>nor</sub> :	25°C
	lative Humidity	55 %
	Air Pressure	989 hPa

Note: After checking the fluctuation of input voltage to the circuit of the radio part (excluding the power supply) of the equipment to be tested, the fluctuation less than +/- 1 % when input voltage from an external supply into the equipment fluctuates +/- 10%, therefore, the test is carried out only at the normal voltage.

## 2.6 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

### ARTICLE 2 SECTION 1 ITEM 8

All test items have been performed and recorded as per the above standard

## 2.7 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.

Support Equipment							
NO	Description	Brand	Model No.	Serial Number	Supplied by		
1	N/A	N/A	N/A	N/A	N/A		
Support Cable							
NO	Description	Quantity (Number)	Length (m)	Detachable (Yes/ No)	Shielded (Yes/ No)	Cores (Number)	Supplied by
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A



### 3 TEST TYPES AND RESULTS

#### 3.1 TRANSMISSION TIME RESTRICTION MEASUREMENT

##### 3.1.1 Limit

Item	Limit
Transmission Time Restriction	3.3ms or less per 33ms

##### 3.1.2 Test Procedure

1. Find worst angle of EUT and measure the transmitted signal of EUT.
2. Calculate total on time in any 33ms period.

##### 3.1.3 Test setup

See section 2.4 of this report.

##### 3.1.4 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.



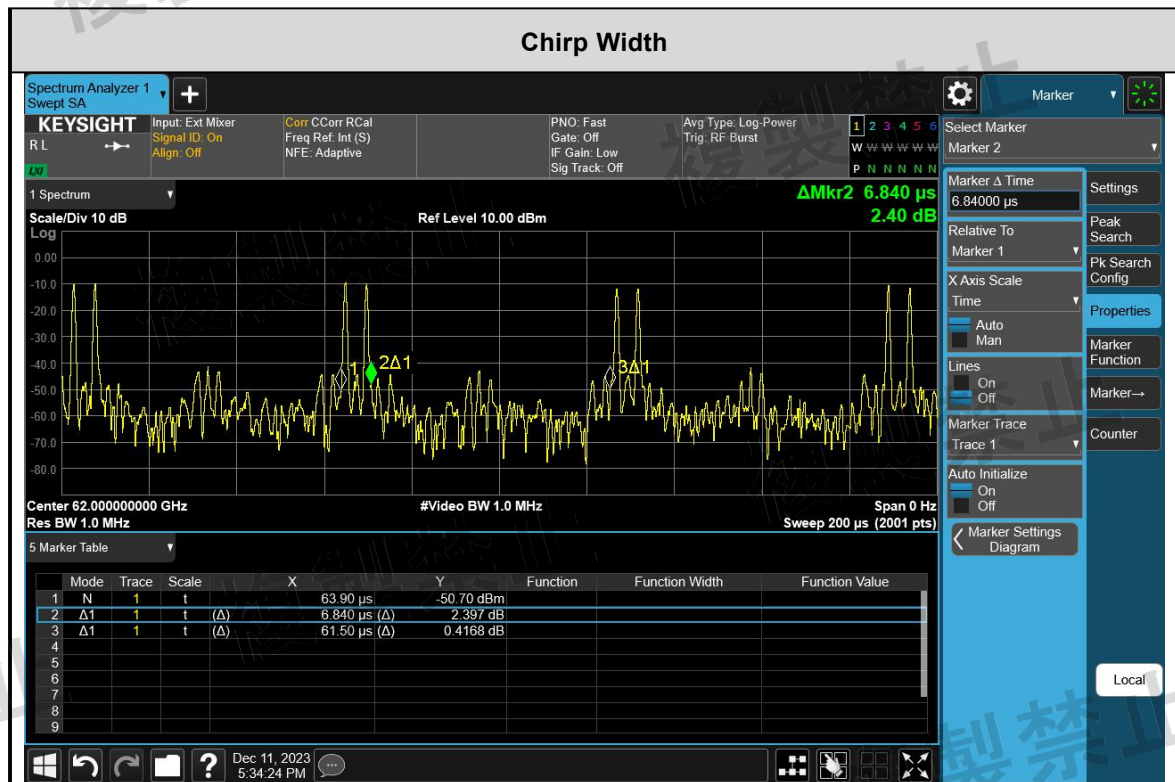


## 3.1.5 Test results

Chirp Width(us)	Chirp number in 2ms period	Chirp number in 33ms period	Transmission Time (ms)	Limit	Verdict
6.84	32	359.84	2.461	3.3ms	PASS

Chirp number in 33ms period = Chirp number in 2ms period \*(33 ms/ 2ms)

Transmission Time = Chirp number in 33ms period \* Chirp Width







## 3.2 FREQUENCY TOLERANCE MEASUREMENT

### 3.2.1 Limit

Item	Limit
Frequency Tolerance	Within 57 ~ 64GHz

### 3.2.2 Test Procedure

1. Setting of SA is following as: RBW:1MHz / VBW:3MHz.
2. The frequency tolerance test case is directly measured using spectrum analyzer.
3. Calculate occupied frequency range within specific frequency range.

### 3.2.3 Test setup

See section 2.4 of this report.

### 3.2.4 EUT Operation during Test

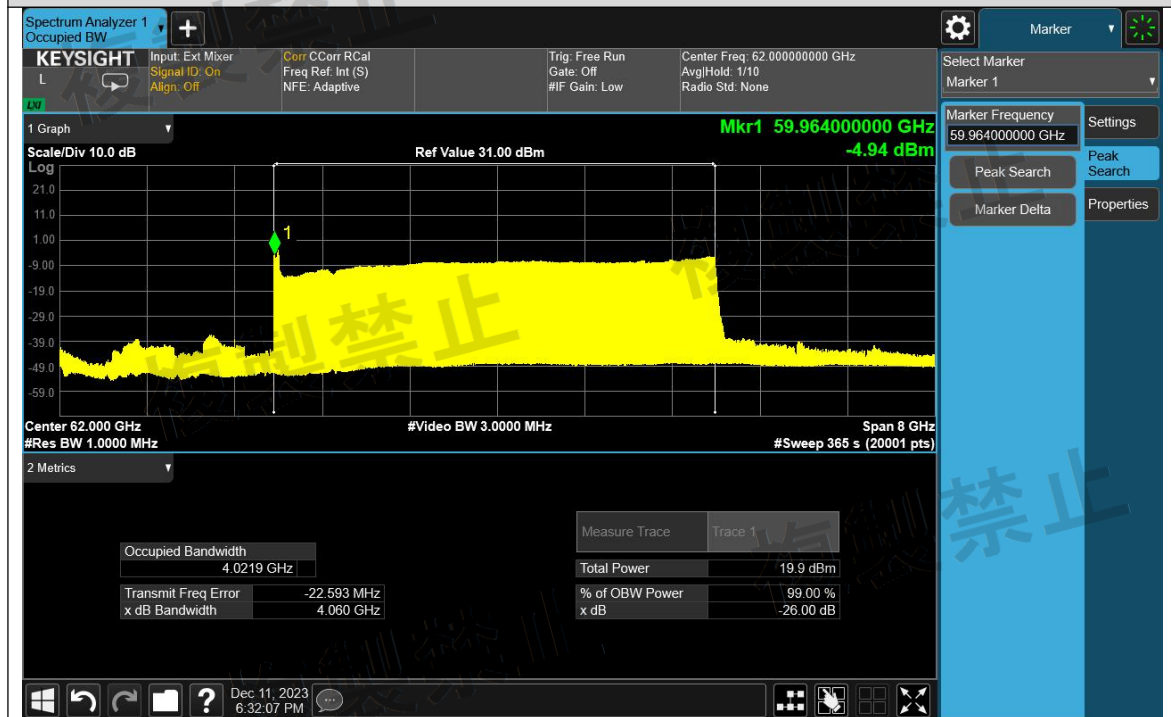
The EUT was programmed to be in continuously transmitting mode.



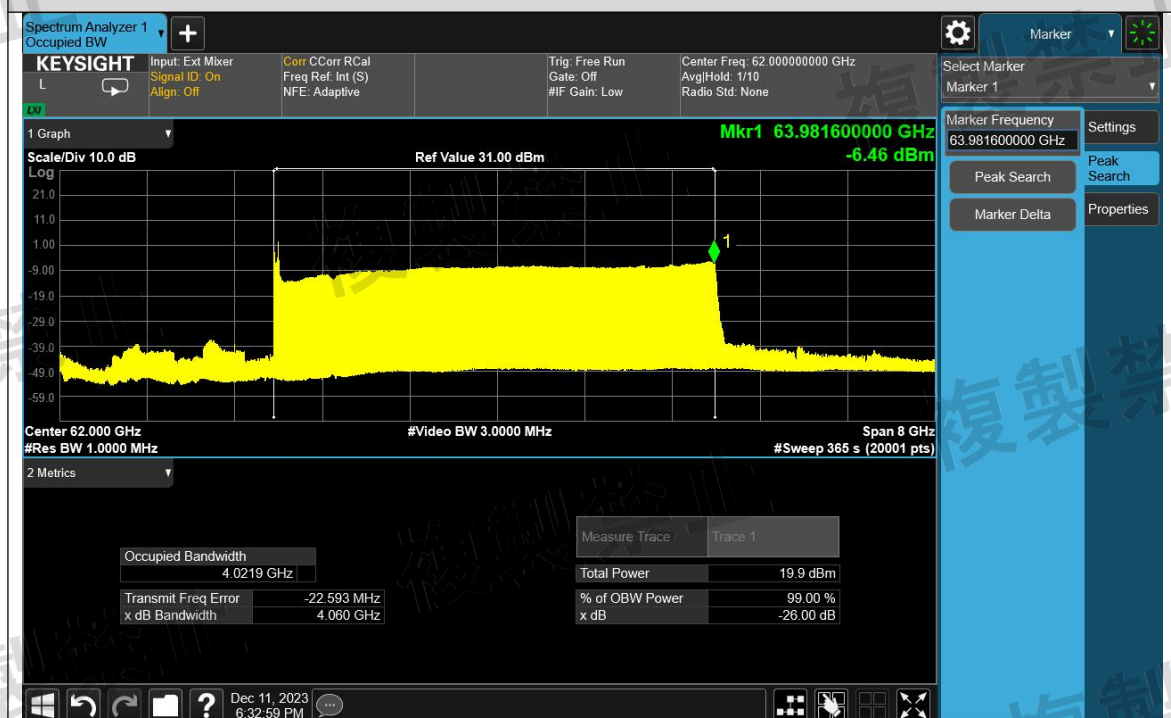
## 3.2.5 Test results

Low Operating Band Edge	High Operating Band Edge	Limit (kHz)	Verdict
59.964GHz	63.981GHz	Within 57 ~ 64GHz	PASS

### Low Operating Band Edge



### High Operating Band Edge







## 3.3 OCCUPIED BANDWIDTH MEASUREMENT (99% POWER BANDWIDTH)

### 3.3.1 Limit

Item	Limit
Occupied Bandwidth	$\leq 7\text{GHz}$

### 3.3.2 Test Procedure

1. Setting of SA is following as: RBW: 1MHz / VBW:3MHz / Sweep Mode: Single sweep / Detect

mode: Positive peak / Trace mode: Clear write.

2. EUT have transmitted each modulation signal and fixed channelize. SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 7GHz.

### 3.3.3 Test setup

See section 2.4 of this report.

### 3.3.4 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 3.3.5 Test result





### 3.4 SPURIOUS EMISSIONS FOR TRANSMITTER MEASUREMENT

#### 3.4.1 Limits

Item	Frequency	Limits
Tx Spurious Emission	$f \leq 55.62\text{GHz}$	-30dBm/MHz
	$55.62\text{GHz} < f \leq 57\text{GHz}$	-26dBm/MHz
	$64\text{GHz} < f \leq 67.5\text{GHz}$	-26dBm/MHz
	$67.5\text{GHz} < f \leq 2 \text{ times of operational frequency}$	-30dBm/MHz

#### 3.4.2 Test Procedure

1. EUT have transmitted the maximum power.
2. Setting of SA is following as: RBW:1MHz / VBW:3MHz between 30MHz to 2 times of operational frequency, Sweep time: 34ms per point / Sweep points: 1 point per MHz / SweepMode: single sweep / Detect mode: RMS / Trace mode: Max hold.
3. Any mark peak reading value + cable loss shall be less than the limits.

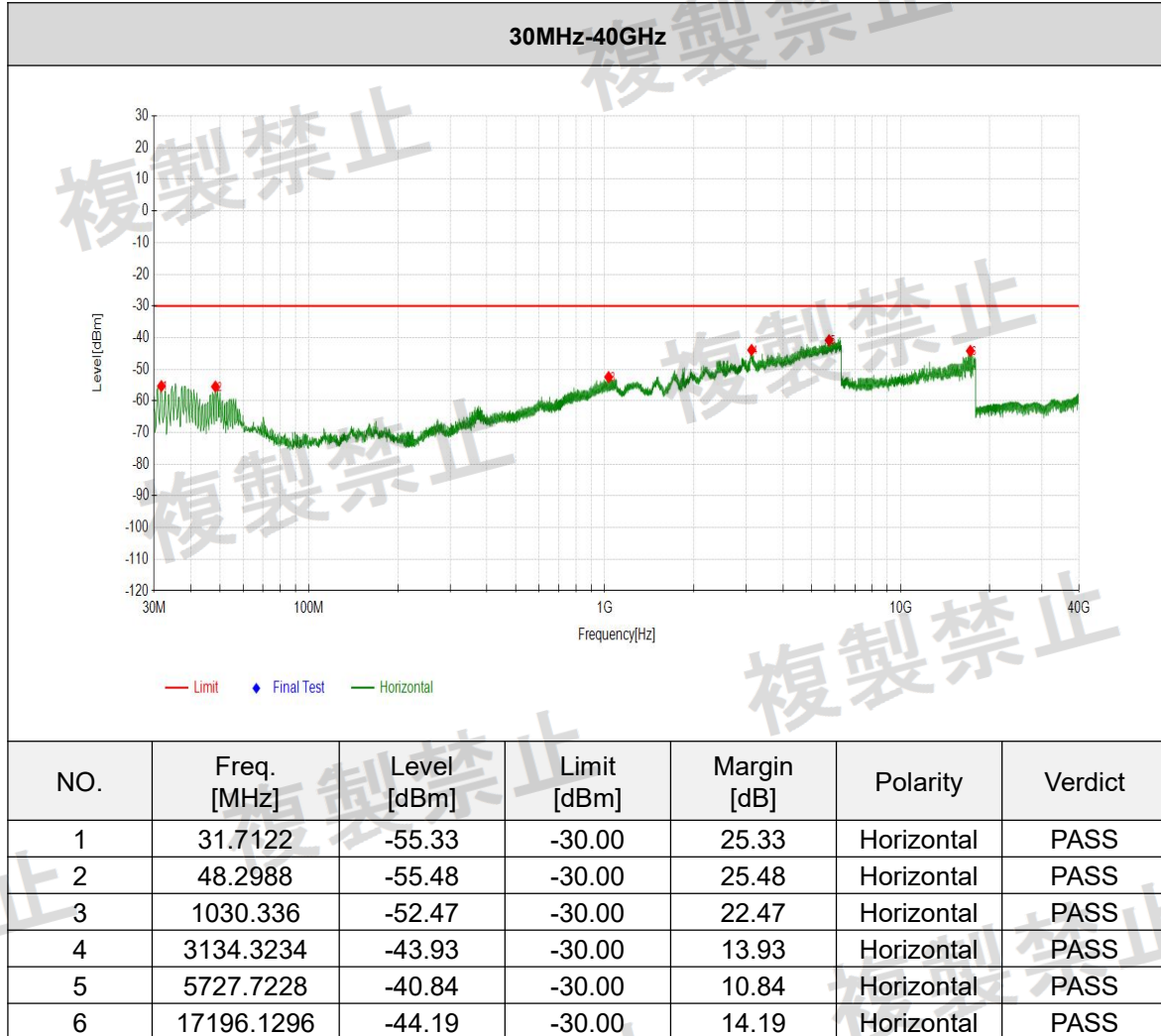
#### 3.4.3 Test setup

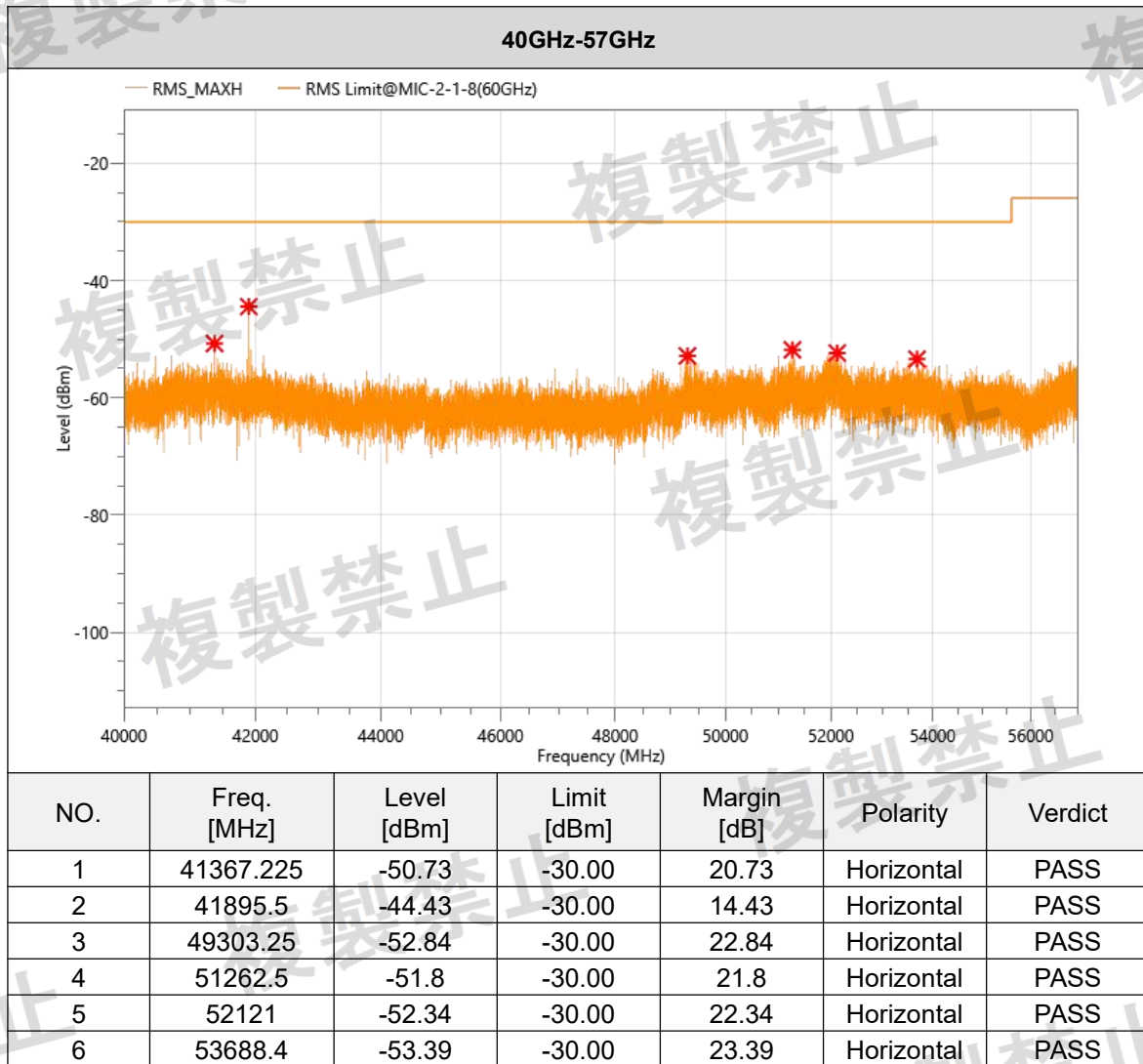
See section 2.4 of this report.

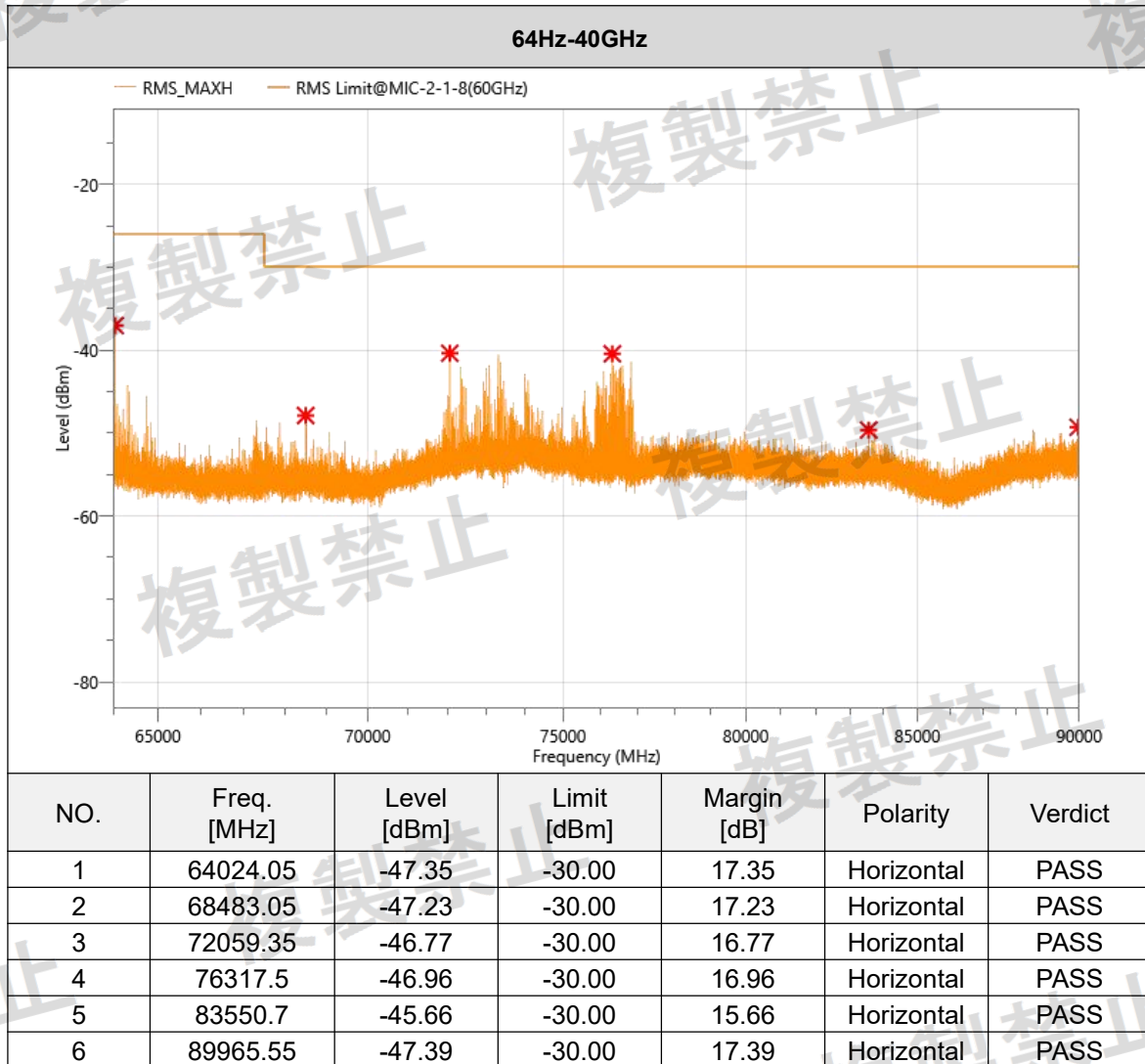
#### 3.4.4 EUT Operation during Test

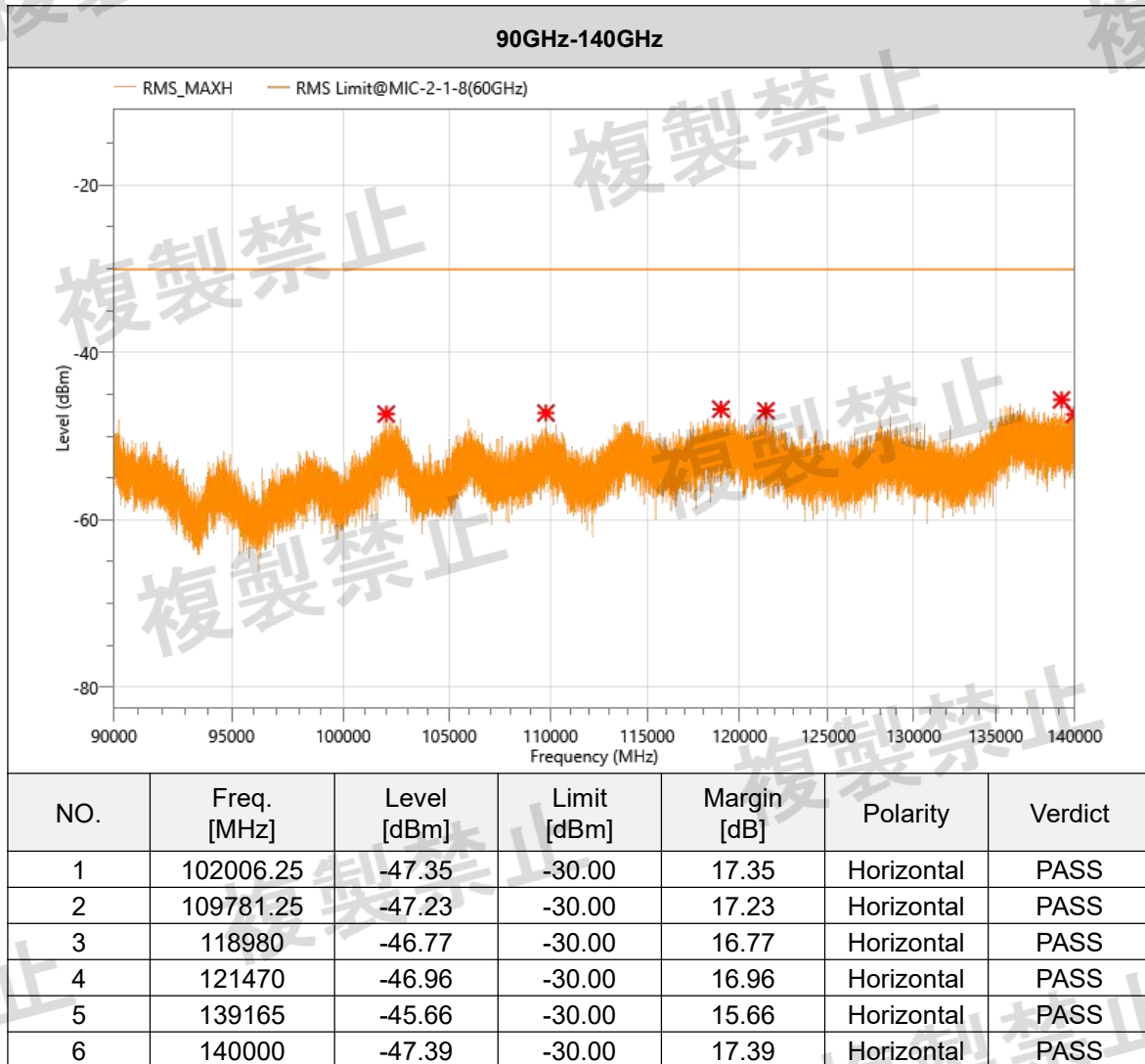
The EUT was programmed to be in continuously transmitting mode.

## 3.4.5 Test result













## 3.5 ANTENNA POWER MEASUREMENT

### 3.5.1 Limits

Frequency band used	Antenna power	Antenna Power Error	EIRP
57 ~ 64GHz	10mW	+50% (upper value) and -70% (lower value).	13dBm

### 3.5.2 Test Procedure

1. Connect RF detector to the Oscilloscope, and find worst angle of EUT.
2. Record the worst peak voltage reading on the Oscilloscope.
3. Replace EUT with a signal generator. Set the generator at the same frequency as the EUT.
4. Place an adjustable attenuator at the output of signal generator.
5. Adjust the attenuator until the peak voltage reading on the Oscilloscope is same as the value recorded in step 2.
6. Measure the power with power meter after the adjusting is done.
7. The measured power + horn antenna gain is the EIRP power of EUT.
8.  $EIRP - \text{Declared antenna gain of EUT} = \text{Antenna Power}$

### 3.5.3 Test setup

See section 2.4 of this report.

### 3.5.4 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 3.5.5 Test result

Item	Result	Limit	Verdict
Antenna power	1.03mw	10mw	PASS
Antenna Power Error	-48.5%	+50%to -70%	PASS
EIRP	2.12dBm	13dBm	PASS
Rated Power :2mW			



## 3.6 SPURIOUS EMISSIONS FOR RECEIVER

### 3.6.1 Limits

Frequencies (MHz)	Limit	
(MHz)	nW	dBm
Below 1GHz	≤4	≤-54
Above 1GHz	≤20	≤-47

### 3.6.2 Test Procedure

1. EUT have the continuous reception mode and fixed only one channelize.
2. 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 4 nW.
3. SA set RBW: 1MHz and VBW: 1MHz. Then adjust to start frequency 1GHz and stop frequency 2 times of operation frequency. Search to mark peak reading value + cable loss shall be less than 20 nW.

### 3.6.3 Test setup

See section 2.4 of this report.

### 3.6.4 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 3.6.5 Test result

The EUT can't not operate in receive only mode.



### 3.7 INTERFERENCE PREVENTION FUNCTION

#### 3.7.1 Limits

N/A

#### 3.7.2 Test setup

See section 2.4 of this report.

#### 3.7.3 Test result

Item	Limit	Verdict
Interference Prevention Function	GOOD	PASS



### **3.8 RADIO EMISSION STOP FUNCTION**

#### **3.8.1 Requirement**

User can easily switch On/Off of transmitting radio power.

#### **3.8.2 Test Result of Radio Emission Stop Function**

The EUT has the capability



## 3.9 CONSTRUCTION PROTECTION CONFIRMATION METHOD

### 3.9.1 Requirement

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

### 3.9.2 Confirmation Method

<input type="checkbox"/> Sealed with special screws.
<input type="checkbox"/> Plastic chassis is being welded using ultrasonic waves.
<input type="checkbox"/> Chassis is glued using a special adhesive.
<input type="checkbox"/> Metal covers are spot-fused.
<input type="checkbox"/> Cover is specially interlocked.
<input type="checkbox"/> RF and Modulation components are covered with shielding case and this shielding case is soldered.
<input type="checkbox"/> Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.
<input type="checkbox"/> Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.
<input type="checkbox"/> Shield case is welded at RF and modulation parts, and ID-ROM is glued with a non-transparent laminating agent.
<input checked="" type="checkbox"/> Other : a declaration letter is provided by manufacturer





#### 4 PHOTOGRAPHS OF TEST SETUP

Please refer to the attached file (Test Setup Photo).



## 5 PHOTOGRAPHS OF THE EUT

Please refer to the attached file (External Photos report and Internal Photos).

----- End of the Report -----



## Important

- (1) The test report is valid without the official stamp of CVC;
- (2) Any part photocopies of the test report are forbidden without the written permission from CVC;
- (3) The test report is invalid without the signatures of Approval and Reviewer;
- (4) The test report is invalid if altered;
- (5) Objections to the test report must be submitted to CVC within 15 days.
- (6) Generally, commission test is responsible for the tested samples only.
- (7) As for the test result “-” or “N” means “not applicable”, “/” means “not test”, “P” means “pass” and “F” means “fail”

*Address of the laboratory:*

*CVC Testing Technology (Shenzhen) Co., Ltd.*

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Longhua District, Shenzhen, Guangdong, 518110, P. R. China

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