

# TEST REPORT

<b>Product Name</b>	:	PilotPano Panoramic Camera
<b>Brand Mark</b>	:	Labpano
<b>Model No.</b>	:	PIP221
<b>Extension Model</b>	:	PIP221+
<b>Report Number</b>	:	BLA-EMC-202207-A1505
<b>FCC ID</b>	:	2ARZ2 -PIP221
<b>Date of Sample Receipt</b>	:	2022/8/1
<b>Date of Test</b>	:	2022/8/1 to 2022/9/5
<b>Date of Issue</b>	:	2022/9/5
<b>Test Standard</b>	:	47 CFR Part 15, Subpart E 15.407
<b>Test Result</b>	:	Pass

Prepared for:

**Shenzhen Pisoftware Technology Co., Ltd.  
C11-B, TCL International E City, 1001 Zhongshanyuan Road, Nanshan  
District, Shenzhen City, 518057, P.R.China**

Prepared by:

**BlueAsia of Technical Services(Shenzhen) Co.,Ltd.  
Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District,  
Shenzhen, Guangdong Province, China  
TEL: +86-755-23059481**

Compiled by: Charlie

Approved by: Blue zhong

Review by:

Swee



Date:

2022/9/5



**REPORT REVISE RECORD**

Version No.	Date	Description
00	2022/9/5	Original

BlueAsia

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## 1 TEST SUMMARY

Test item	Test Requirement	Test Method	Class/Severity	Result
Frequency Stability	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.8	47 CFR Part 15, Subpart C 15.407 (g)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Pass
Radiated Emissions	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Pass
DFS: Channel Closing Transmission Time	47 CFR Part 15, Subpart E 15.407	KDB 905462 D02 Section 7.8.3	KDB 905462 D02 Section 5.1	N/A
DFS: Non-occupancy period	47 CFR Part 15, Subpart E 15.407	KDB 905462 D02 Section 7.8.3	KDB 905462 D02 Section 5.1	N/A
Peak Power spectrum density	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II F	47 CFR Part 15, Subpart C 15.407 (a)	Pass
Transmitter Power Control	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II E	47 CFR Part 15, Subpart C 15.407 (h)(1)	N/A
Maximum Conducted output power	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II E	47 CFR Part 15, Subpart C 15.407 (a)	Pass
Minimum 6 dB bandwidth (5.725-5.85 GHz band)	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II C 2	47 CFR Part 15, Subpart C 15.407 (e)	Pass
26dB Emission bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II C 1	47 CFR Part 15, Subpart C 15.407 (a)	Pass
99% Bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 II D	N/A	Pass
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207 & 15.407 b(6)	Pass
Antenna Requirement	47 CFR Part 15, Subpart E 15.407	N/A	47 CFR Part 15, Subpart C 15.203	Pass

Remark:

N/A: not support

## 2 GENERAL INFORMATION

<b>Applicant</b>	Shenzhen Pisoftware Technology Co., Ltd.
<b>Address</b>	C11-B, TCL International E City, 1001 Zhongshanyuan Road,,Nanshan District, Shenzhen City, 518057, P.R.China
<b>Manufacturer</b>	Shenzhen Pisoftware Technology Co., Ltd.
<b>Address</b>	C11-B, TCL International E City, 1001 Zhongshanyuan Road, Nanshan District, Shenzhen City, 518057, P.R.China
<b>Factory</b>	SHENZHEN AONI ELECTRONIC CO,LTD
<b>Address</b>	2F、3F、6F、7F、The half laye of 8F 、9F,Honghui Industrial Park,2nd Liuxian Road,Xinan street,Baoan District,Shenzhen
<b>Product Name</b>	PilotPano Panoramic Camera
<b>Test Model No.</b>	PIP221
<b>Extension Model</b>	PIP221+
<b>Remark</b>	All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are model name for commercial purpose.

### 3 GENERAL DESCRIPTION OF E.U.T.

<b>Hardware Version</b>	N/A
<b>Software Version</b>	N/A
<b>Operation Frequency:</b>	Band 1 : 5180MHz-5240MHz; Band 4 : 5745MHz-5825MHz
<b>Channel numbers:</b>	Band 1: 802.11a/802.11n(HT20)/802.11ac(HT20): 4, 802.11n(HT40)/802.11ac(HT40): 2, 802.11ac(HT80): 1 Band 4: 802.11a/802.11(HT20)/802.11ac(HT20): 5, 802.11n(HT40)/802.11ac(HT40): 2, 802.11ac(HT80): 1
<b>Channel separation:</b>	802.11a/n/ac(HT20): 20MHz, 802.11n/ac(HT40): 40MHz, 802.11ac(HT80): 80MHz
<b>Modulation technology: (IEEE 802.11a/n/ac)</b>	BPSK, QPSK, 16-QAM, 64-QAM, 256QAM
<b>Data speed(IEEE 802.11a)</b>	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps
<b>Data speed (IEEE 802.11n/ac):</b>	Up to 866.7Mbps
<b>Antenna Type:</b>	External antenna
<b>Antenna gain:</b>	Antenna 1: 2.32dBi, Antenna 2: 2.32dBi (Provided by the applicant)
<b>Note:</b>	Antenna number : 2 SISO mode: 802.11a MIMO mode: 802.11n(HT20)/ 802.11n(HT40)/ 802.11ac(HT20)/ 802.11ac(HT40)/ 802.11ac(HT80) Directional gain of MIMO mode: $2.32 + 10\log_2 = 5.33$ dBi
Remark: The Antenna Gain is supplied by the customer. BlueAsia is not responsible for this data	

#### 4 TEST ENVIRONMENT

Environment	Temperature	Voltage
Normal	25°C	DC5V

#### 5 TEST MODE

TEST MODE	TEST MODE DESCRIPTION
Transmitting mode	Keep the EUT in continuously transmitting mode with modulation. (Duty cycle>98%)

Remark: Only the data of the worst mode would be recorded in this report.

#### 6 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)
Radiated Emission(9kHz-30MHz)	±4.34dB
Radiated Emission(30Mz-1000MHz)	±4.24dB
Radiated Emission(1GHz-18GHz)	±4.68dB
AC Power Line Conducted Emission(150kHz-30MHz)	±3.45dB

## 7 DESCRIPTION OF SUPPORT UNIT

Device Type	Manufacturer	Model Name	Serial No.	Remark
PC	N/A	N/A	N/A	N/A

## 8 LABORATORY LOCATION

All tests were performed at:

BlueAsia of Technical Services(Shenzhen) Co., Ltd.

Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China

Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673

No tests were sub-contracted.

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## 9 TEST INSTRUMENTS LIST

Test Equipment Of Frequency Stability					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

Test Equipment Of Radiated Emissions which fall in the restricted bands					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Chamber	SKET	966	N/A	2020/11/10	2023/11/9
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Receiver	R&S	ESR7	101199	2021/10/12	2022/10/11
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2020/9/26	2022/9/25
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	2020/9/26	2022/9/25
Amplifier	SKET	PA-000318G-45	N/A	2021/10/16	2022/10/15
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2020/9/26	2022/9/25
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

Test Equipment Of Radiated Emissions					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due

Chamber	SKET	966	N/A	2020/11/10	2023/11/9
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Receiver	R&S	ESR7	101199	2021/10/12	2022/10/11
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2020/9/26	2022/9/25
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	2020/9/26	2022/9/25
Amplifier	SKET	PA-000318G-45	N/A	2021/10/16	2022/10/15
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2020/9/26	2022/9/25
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

<b>Test Equipment Of DFS: Channel Closing Transmission Time</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>S/N</b>	<b>Cal.Date</b>	<b>Cal.Due</b>
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

<b>Test Equipment Of DFS: Non-occupancy period</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>S/N</b>	<b>Cal.Date</b>	<b>Cal.Due</b>
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11

Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

**Test Equipment Of Peak Power spectrum density**

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

**Test Equipment Of Transmitter Power Control**

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

**Test Equipment Of Maximum Conducted output power**

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

**Test Equipment Of Minimum 6 dB bandwidth (5.725-5.85 GHz band )**

<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>S/N</b>	<b>Cal.Date</b>	<b>Cal.Due</b>
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

<b>Test Equipment Of 26dB Emission bandwidth</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>S/N</b>	<b>Cal.Date</b>	<b>Cal.Due</b>
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

<b>Test Equipment Of 99% Bandwidth</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>S/N</b>	<b>Cal.Date</b>	<b>Cal.Due</b>
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11
Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

<b>Test Equipment Of Duty Cycle</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>S/N</b>	<b>Cal.Date</b>	<b>Cal.Due</b>
Spectrum	R&S	FSP40	100817	2021/10/12	2022/10/11
Spectrum	Agilent	N9020A	MY49100060	2021/10/12	2022/10/11

Signal Generator	Agilent	N5182A	MY49060650	2021/10/12	2022/10/11
Signal Generator	Agilent	E8257D	MY44320250	2021/10/12	2022/10/11

**Test Equipment Of Conducted Emissions at AC Power Line (150kHz-30MHz)**

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Shield room	SKET	833	N/A	2020/11/25	2023/11/24
Receiver	R&S	ESPI3	101082	2021/10/12	2022/10/11
LISN	R&S	ENV216	3560.6550.15	2021/10/12	2022/10/11
LISN	AT	AT166-2	AKK1806000003	2021/10/12	2022/10/11
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A

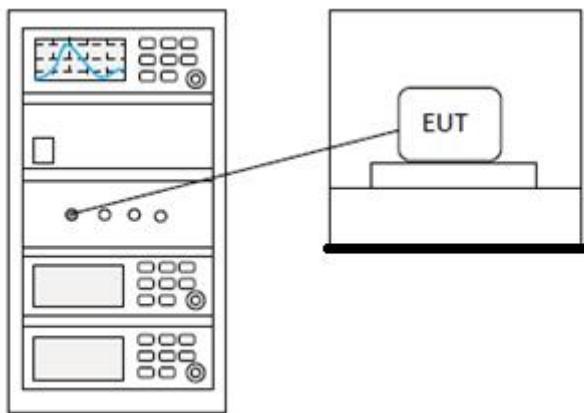
## 10 FREQUENCY STABILITY

<b>Test Standard</b>	47 CFR Part 15, Subpart E 15.407
<b>Test Method</b>	ANSI C63.10 (2013) Section 6.8
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX
<b>Tester</b>	Charlie
<b>Temperature</b>	25 °C
<b>Humidity</b>	60%

### 10.1 LIMITS

<b>Limit:</b>	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.
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### 10.2 BLOCK DIAGRAM OF TEST SETUP



### 10.3 TEST DATA

<b>Pass: Please Refer To Appendix: Appendix1 For Details</b>
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## 11 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

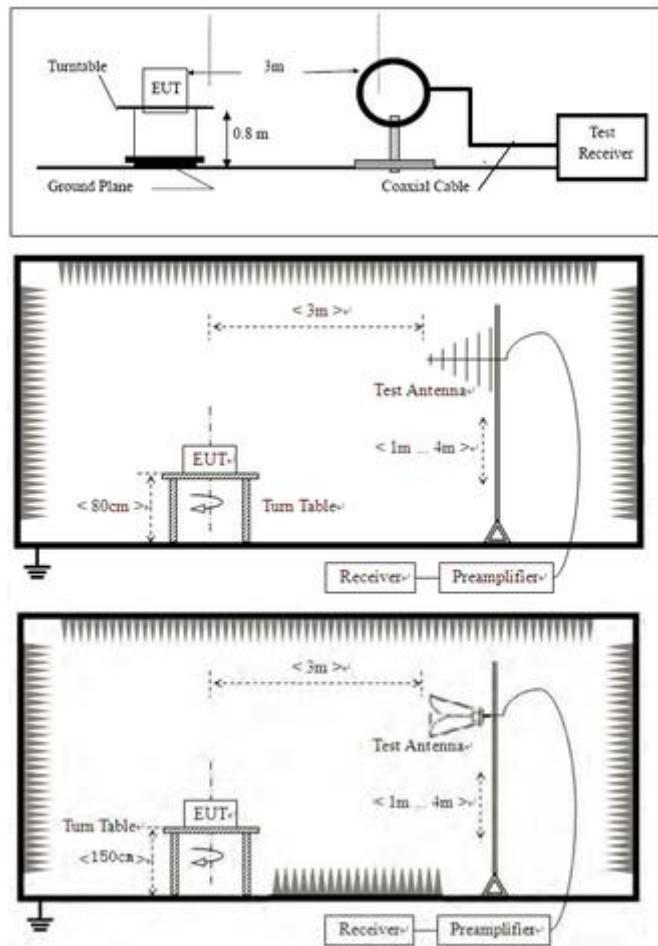
<b>Test Standard</b>	47 CFR Part 15, Subpart E 15.407
<b>Test Method</b>	KDB 789033 D02 II G
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX
<b>Tester</b>	Charlie
<b>Temperature</b>	25 °C
<b>Humidity</b>	60%

### 11.1 LIMITS

<b>Frequency(MHz)</b>	<b>Field strength(microvolts/meter)</b>	<b>Measurement distance(meters)</b>
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

## 11.2 BLOCK DIAGRAM OF TEST SETUP



## 11.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

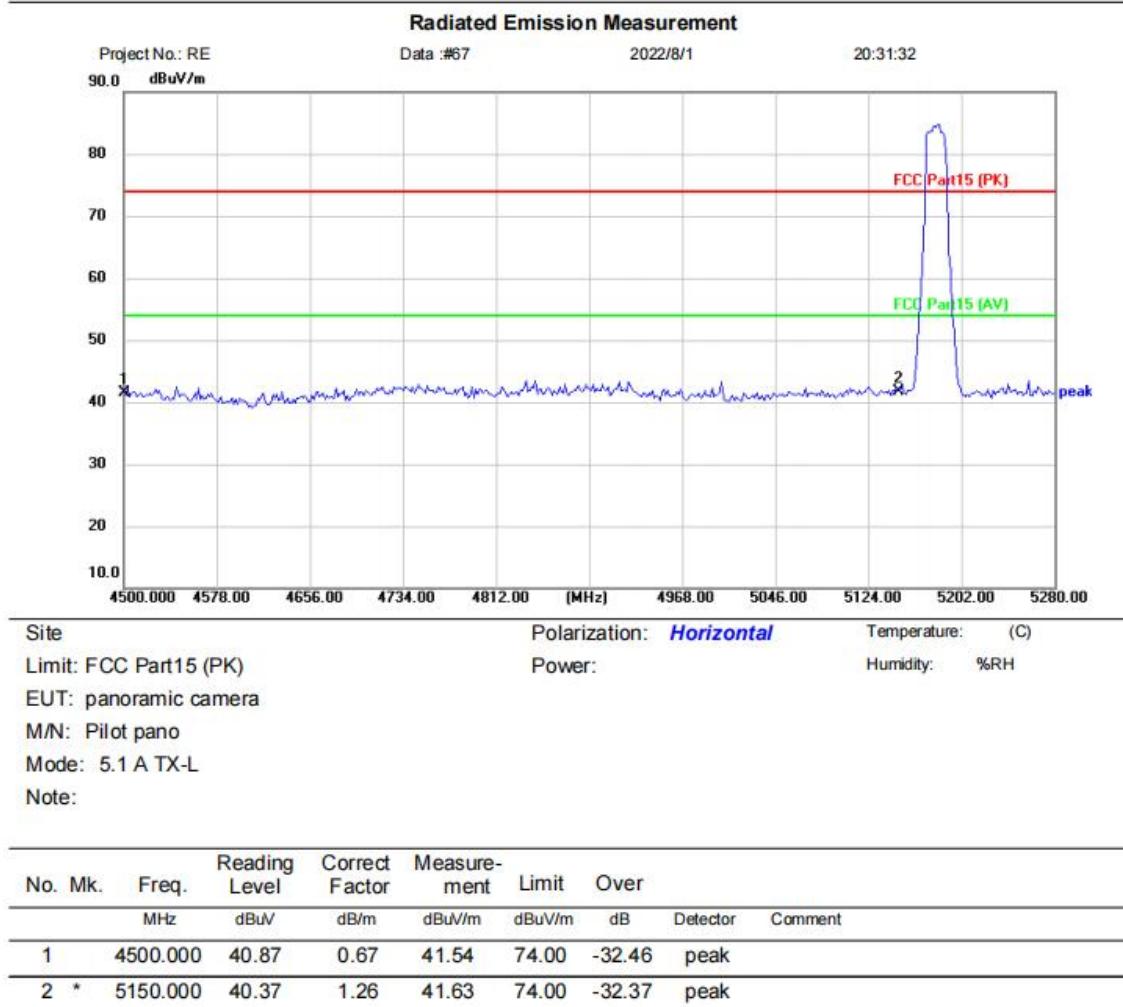
Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

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## 11.4 TEST DATA

*Remark: During the test, pre-scan the 802.11a/n/ac mode, and found the 802.11a mode which it is worse case.*

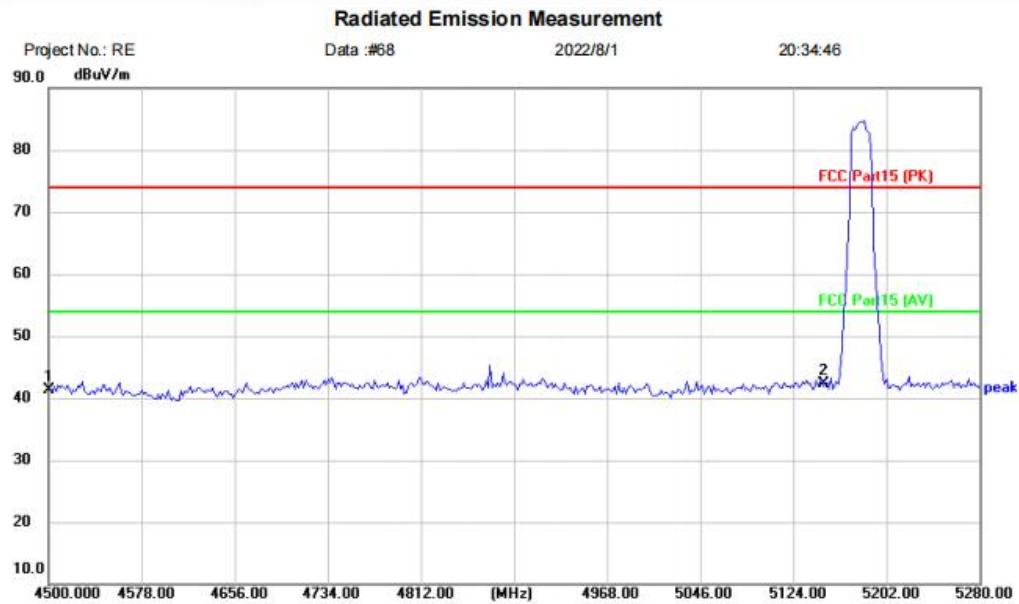
[TestMode: TX band 1 a 5180 channel]; [Polarity: Horizontal]



\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX band 1 a 5180 channel]; [Polarity: Vertical]


Site

Polarization: **Vertical**

Temperature: (C)

Limit: FCC Part15 (PK)

Power:

Humidity: %RH

EUT: panoramic camera

M/N: Pilot pano

Mode: 5.1 A TX-L

Note:

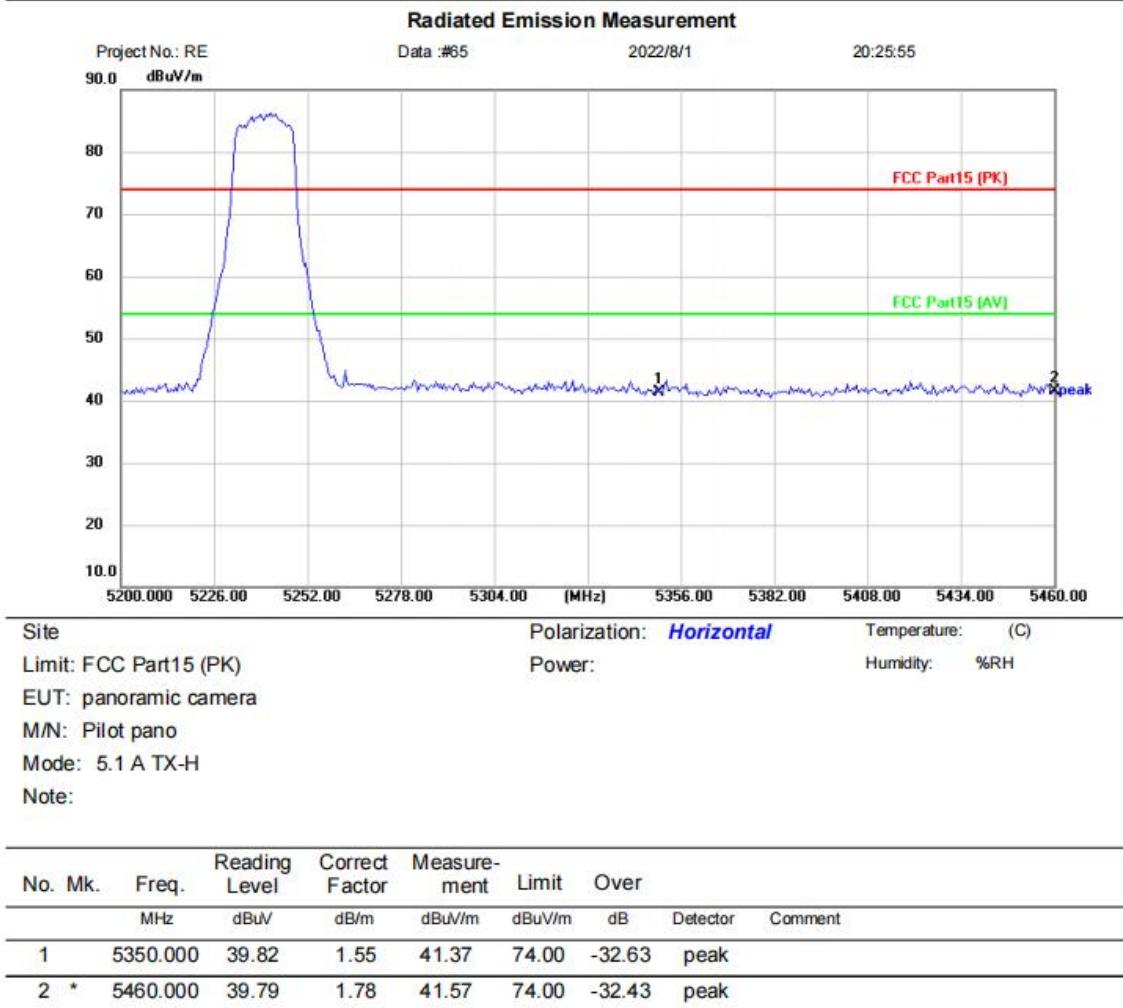
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB/m	dBuV/m	dB	Detector	Comment
1		4500.000	40.54	0.67	41.21	74.00	-32.79	peak
2 *		5150.000	41.02	1.26	42.28	74.00	-31.72	peak

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMethod: TX band1 a 5240 channel]; [Polarity: Horizontal]

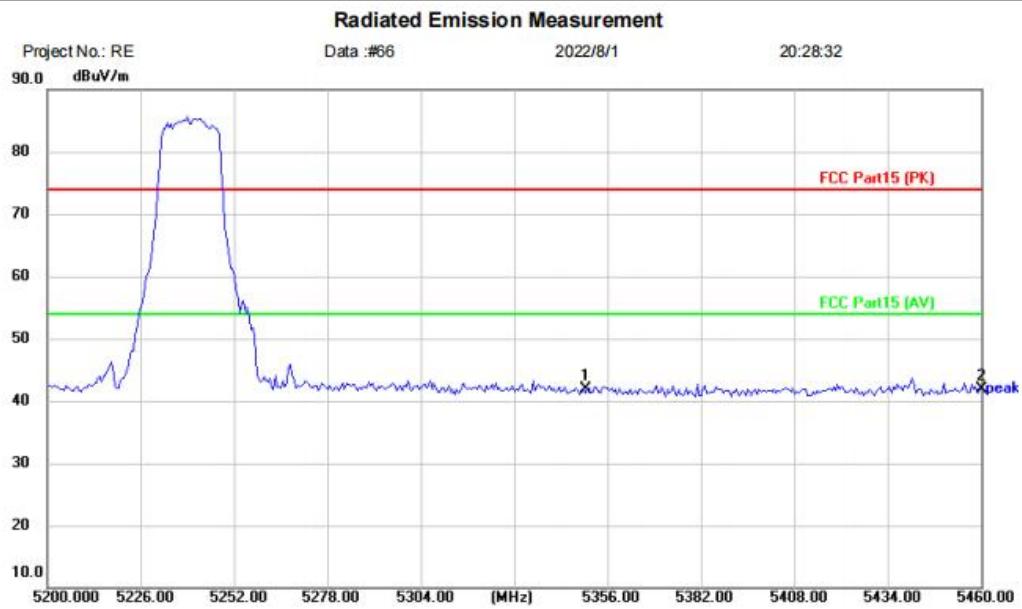


\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX band1 a 5240 channel]; [Polarity: Vertical]


Site: Polarization: **Vertical**      Temperature: (C)

Limit: FCC Part15 (PK)      Power:      Humidity: %RH

EUT: panoramic camera

M/N: Pilot pano

Mode: 5.1 A TX-H

Note:

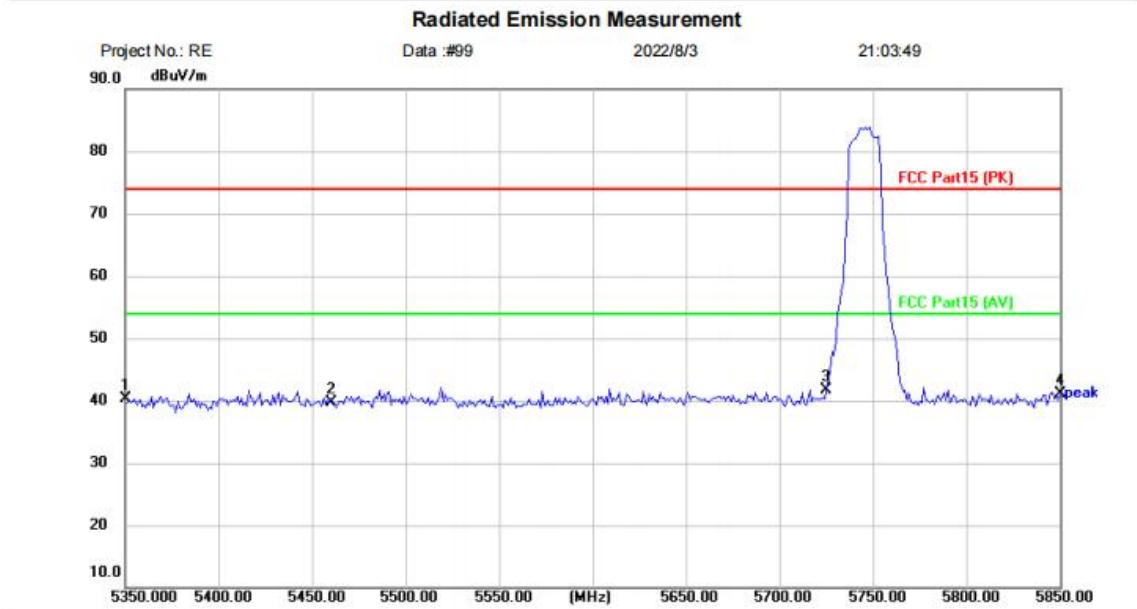
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dB	Over	Detector	Comment
1	*	5350.000	40.45	1.55	42.00	74.00	-32.00	peak	
2		5460.000	40.16	1.78	41.94	74.00	-32.06	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX band4 a 5745 channel]; [Polarity: Horizontal]



Site	Polarization: <b>Horizontal</b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: panoramic camera		
M/N: Pilot pano		
Mode: 5.4 A TX-L		
Note:		

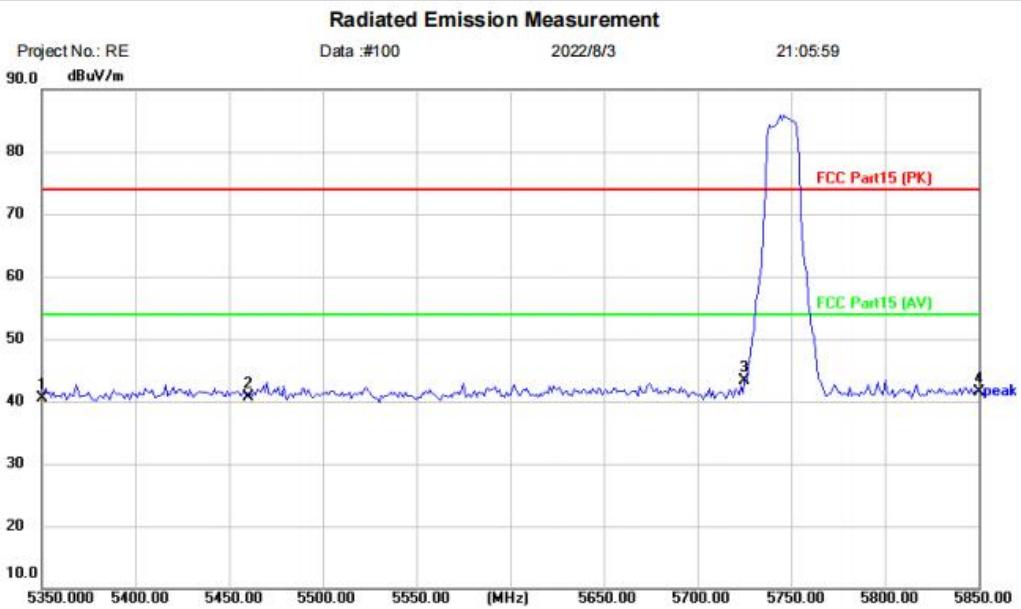
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
			Level	Factor	ment				
			MHz	dBuV	dB/m	dBuV/m	dB	Detector	Comment
1		5350.000	38.71	1.55	40.26	74.00	-33.74	peak	
2		5460.000	38.02	1.78	39.80	74.00	-34.20	peak	
3	*	5725.000	39.82	1.80	41.62	74.00	-32.38	peak	
4		5850.000	39.36	1.78	41.14	74.00	-32.86	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

## Test Result: Pass

[TestMode: TX band4 a 5745 channel]; [Polarity: Vertical]



Site	Polarization: <b>Vertical</b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: panoramic camera		
M/N: Pilot pano		
Mode: 5.4 A TX-L		
Note:		

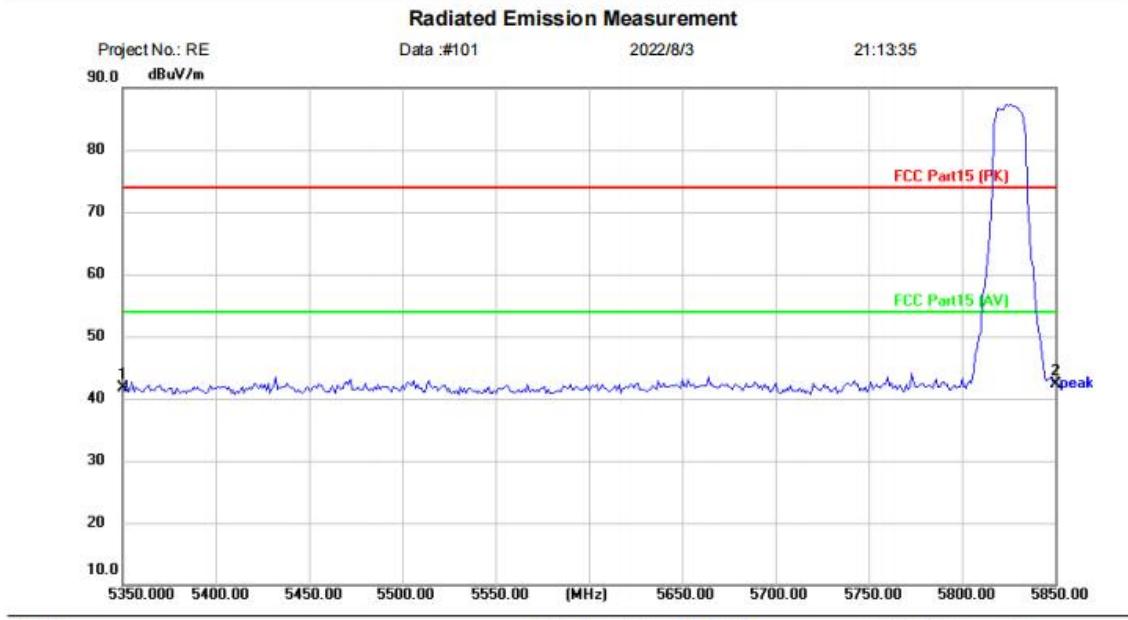
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement Limit	Over					
						MHz	dBuV	dB/m	dBuV/m	dB	Detector
1		5350.000	38.87	1.55	40.42	74.00	-33.58			peak	
2		5460.000	38.91	1.78	40.69	74.00	-33.31			peak	
3	*	5725.000	41.45	1.80	43.25	74.00	-30.75			peak	
4		5850.000	39.71	1.78	41.49	74.00	-32.51			peak	

\*:Maximum data    x:Over limit    !:over margin

### (Reference Only

# Test Result: Pass

[TestMode: TX band4 a 5825 channel]; [Polarity: Vertical]



Site	Polarization: <b>Vertical</b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: panoramic camera		
M/N: Pilot pano		
Mode: 5.4 A TX-H		
Note:		

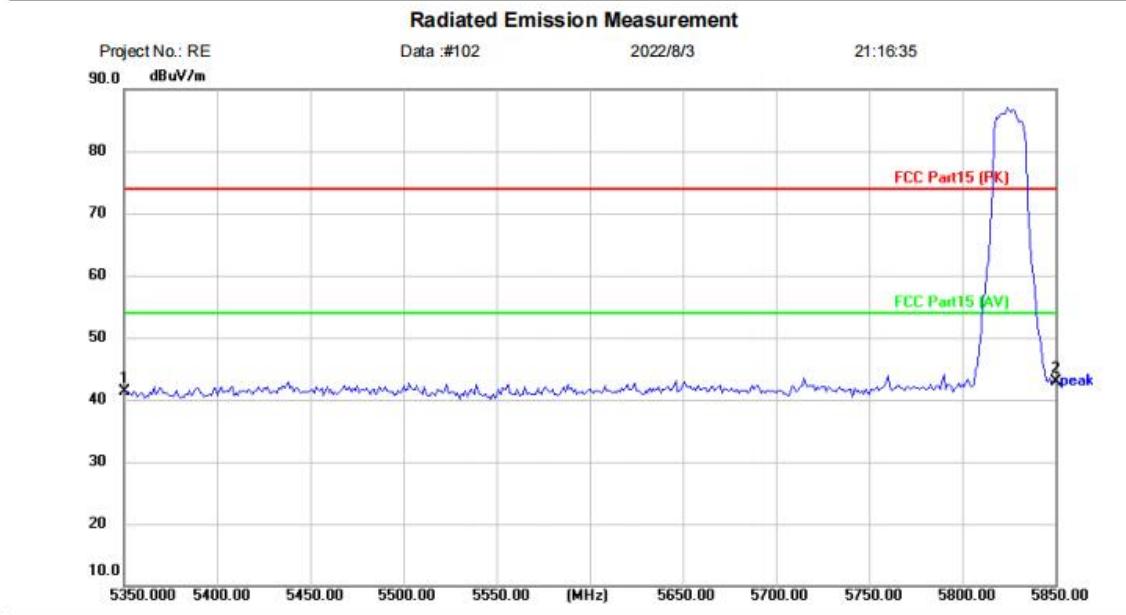
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over					
							MHz	dBuV	dB/m	dBuV/m	dB	Detector
1		5350.000	40.21	1.55	41.76	74.00	-32.24	peak				
2	*	5850.000	40.52	1.78	42.30	74.00	-31.70	peak				

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

# Test Result: Pass

[TestMode: TX band4 a 5825 channel]; [Polarity: Horizontal]



Site	Polarization: <b><i>Horizontal</i></b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: panoramic camera		
M/N: Pilot pano		
Mode: 5.4 A TX-H		
Note:		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over							
							MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		5350.000	39.81	1.55	41.36	74.00	-32.64	peak						
2	*	5850.000	41.06	1.78	42.84	74.00	-31.16	peak						

\*:Maximum data    x:Over limit    !:over margin

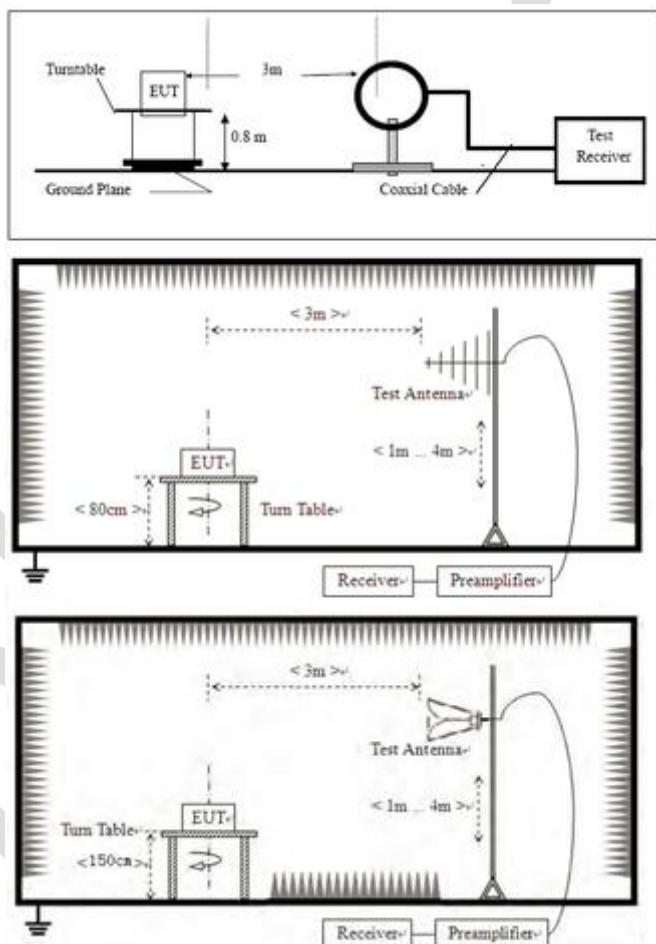
(Reference Only)

# Test Result: Pass

## 12 RADIATED EMISSIONS

<b>Test Standard</b>	47 CFR Part 15, Subpart E 15.407
<b>Test Method</b>	KDB 789033 D02 II G
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX
<b>Tester</b>	Charlie
<b>Temperature</b>	25 °C
<b>Humidity</b>	60%

### 12.1 BLOCK DIAGRAM OF TEST SETUP



### 12.2 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

highest radiation.

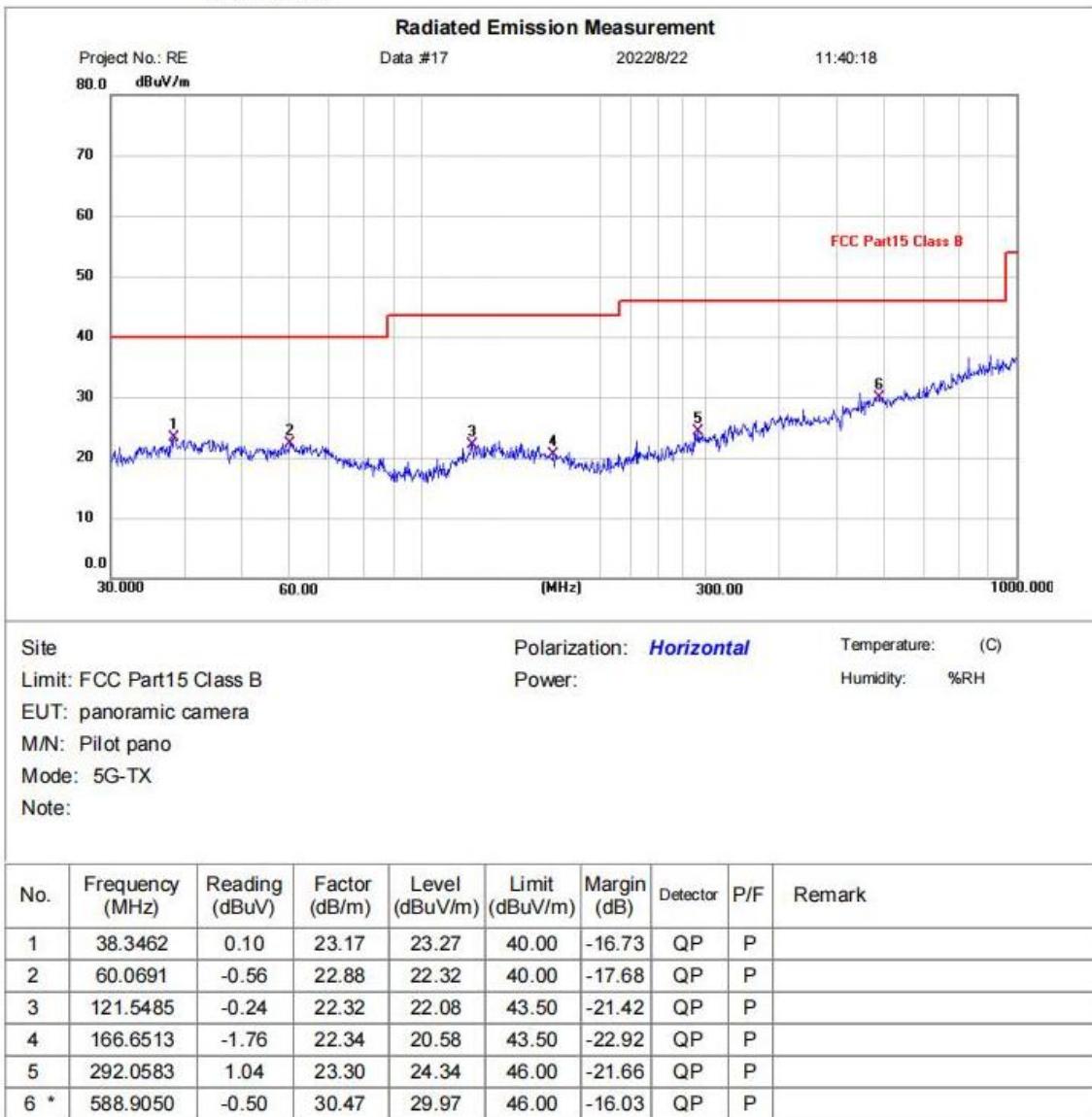
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured were complete.

Remark:

- 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- 2. For emission below 1GHz, through the pre-scan found the worst case is the lowest channel of 802.11a. Only the worst case is recorded in the report.
- 3. Scan from 9kHz to 40GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. fundamental frequency is blocked by filter, and only spurious emission is shown.
- 4. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

### 12.3 TEST DATA

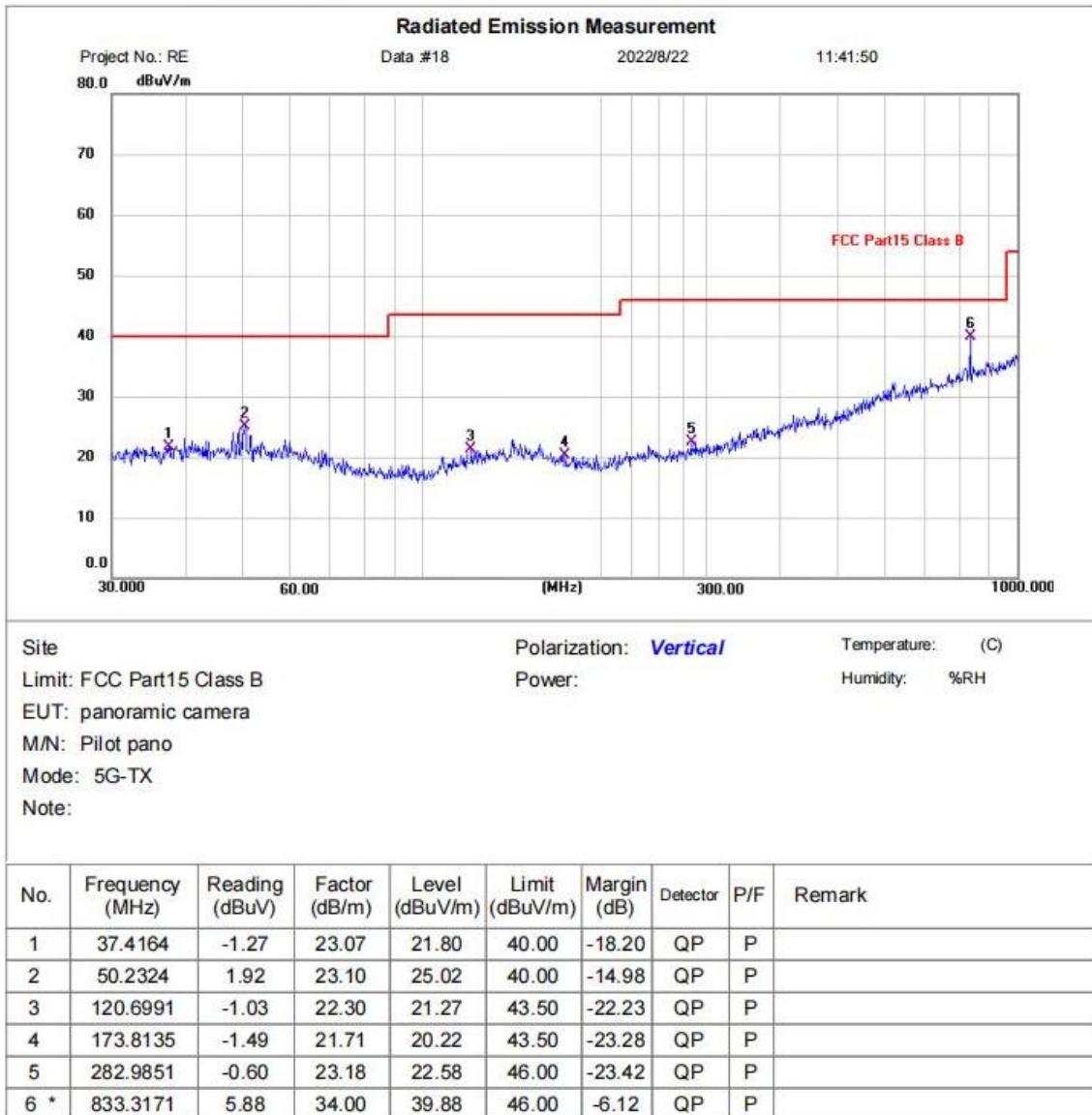
[TestMode: TX band1 below 1G]; [Polarity: Horizontal]



\*:Maximum data    x:Over limit    !:over margin

**Test Result: Pass**

[TestMethod: TX band1 below 1G]; [Polarity: Vertical]

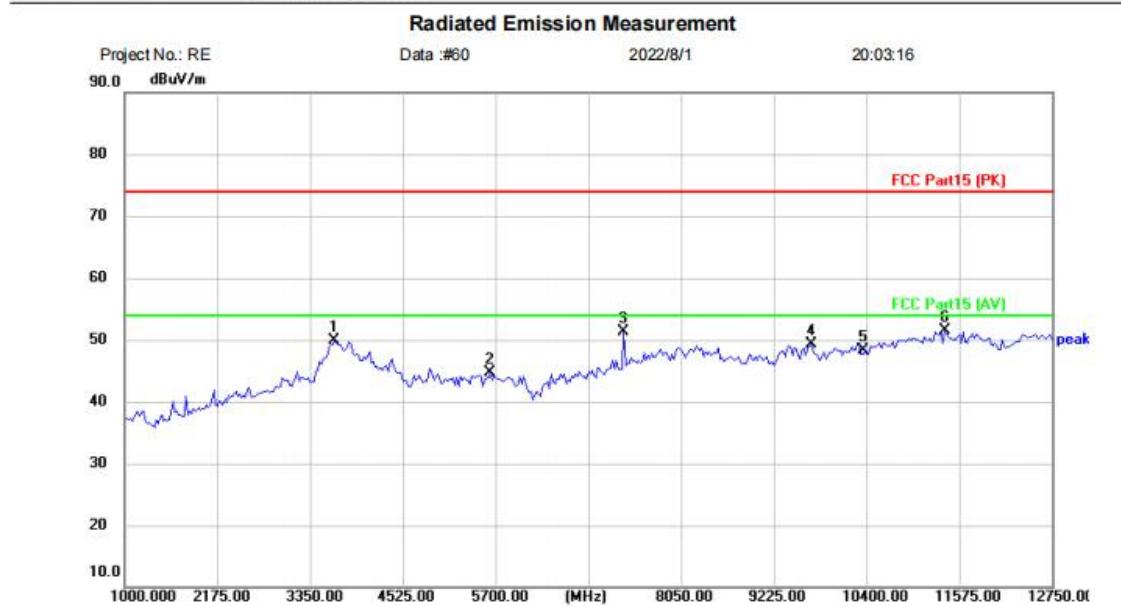


\*:Maximum data    x:Over limit    !:over margin

**Test Result: Pass**

*Remark: During the test, pre-scan the 802.11a/n/ac mode, and found the 802.11a mode which it is worse case.*

[TestMode: TX a 5180 channel]; [Polarity: Vertical]



Site	Polarization: <b>Vertical</b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: panoramic camera		
M/N: Pilot pano		
Mode: 5.1 A TX-L		
Note:		

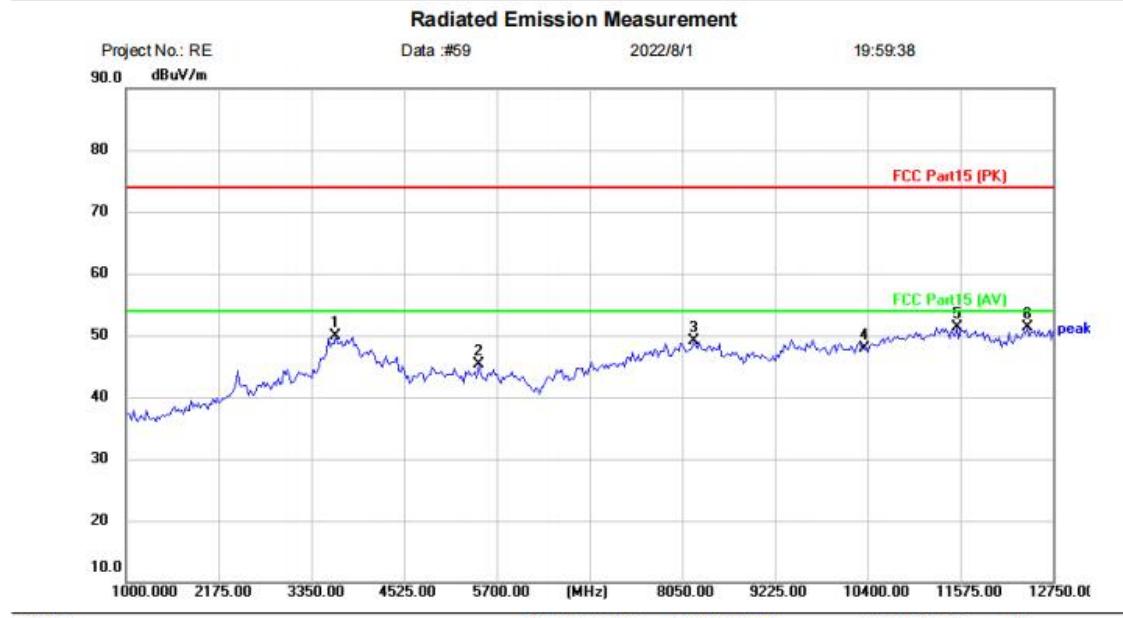
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over			
			Level	Factor	ment					
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		3655.500	42.07	7.76	49.83	74.00	-24.17	peak		
2		5629.500	40.80	3.92	44.72	74.00	-29.28	peak		
3		7321.500	44.86	6.42	51.28	74.00	-22.72	peak		
4		9695.000	39.86	9.48	49.34	74.00	-24.66	peak		
5		10360.000	37.22	11.09	48.31	74.00	-25.69	peak		
6	*	11387.000	39.71	11.78	51.49	74.00	-22.51	peak		

\*:Maximum data x:Over limit !:over margin

(Reference Only)

## Test Result: Pass

[TestMode: TX a 5180 channel]; [Polarity: Horizontal]



Site	Polarization: <b>Horizontal</b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: panoramic camera		
M/N: Pilot pano		
Mode: 5.1 A TX-L		
Note:		

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
			Level	Factor	ment				
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		3655.500	42.11	7.76	49.87	74.00	-24.13	peak	
2		5465.000	41.16	4.17	45.33	74.00	-28.67	peak	
3		8191.000	40.82	8.20	49.02	74.00	-24.98	peak	
4		10360.000	36.79	11.09	47.88	74.00	-26.12	peak	
5		11528.000	39.36	11.95	51.31	74.00	-22.69	peak	
6	*	12421.000	39.56	11.79	51.35	74.00	-22.65	peak	

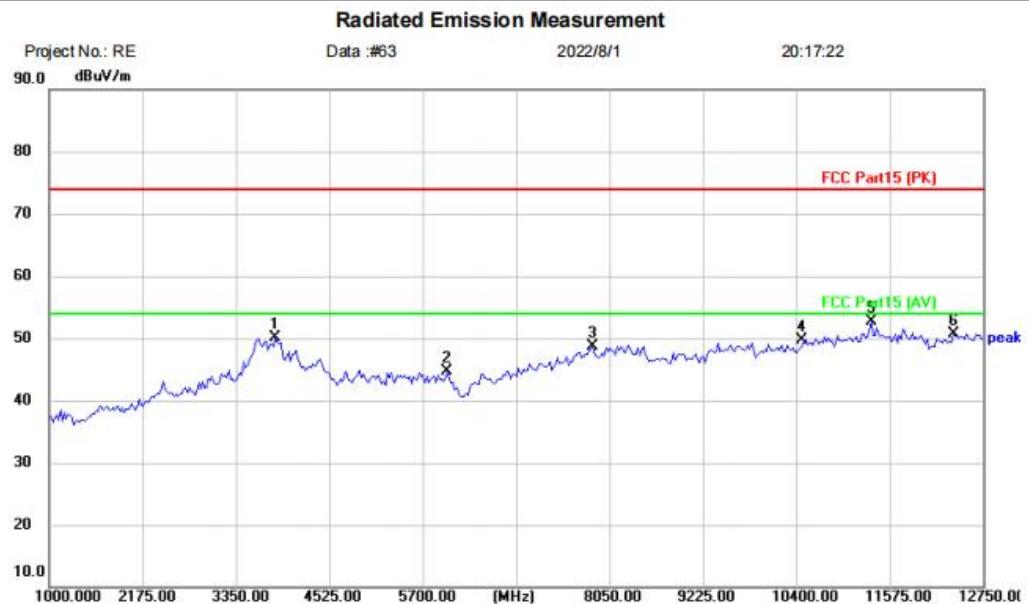
\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

## Test Result: Pass



[TestMode: TX a 5240 channel]; [Polarity: Vertical]



Site: Limit: FCC Part15 (PK) Polarization: **Vertical** Temperature: (C)  
EUT: panoramic camera Power: Humidity: %RH  
M/N: Pilot pano  
Mode: 5.1 A TX-H  
Note:

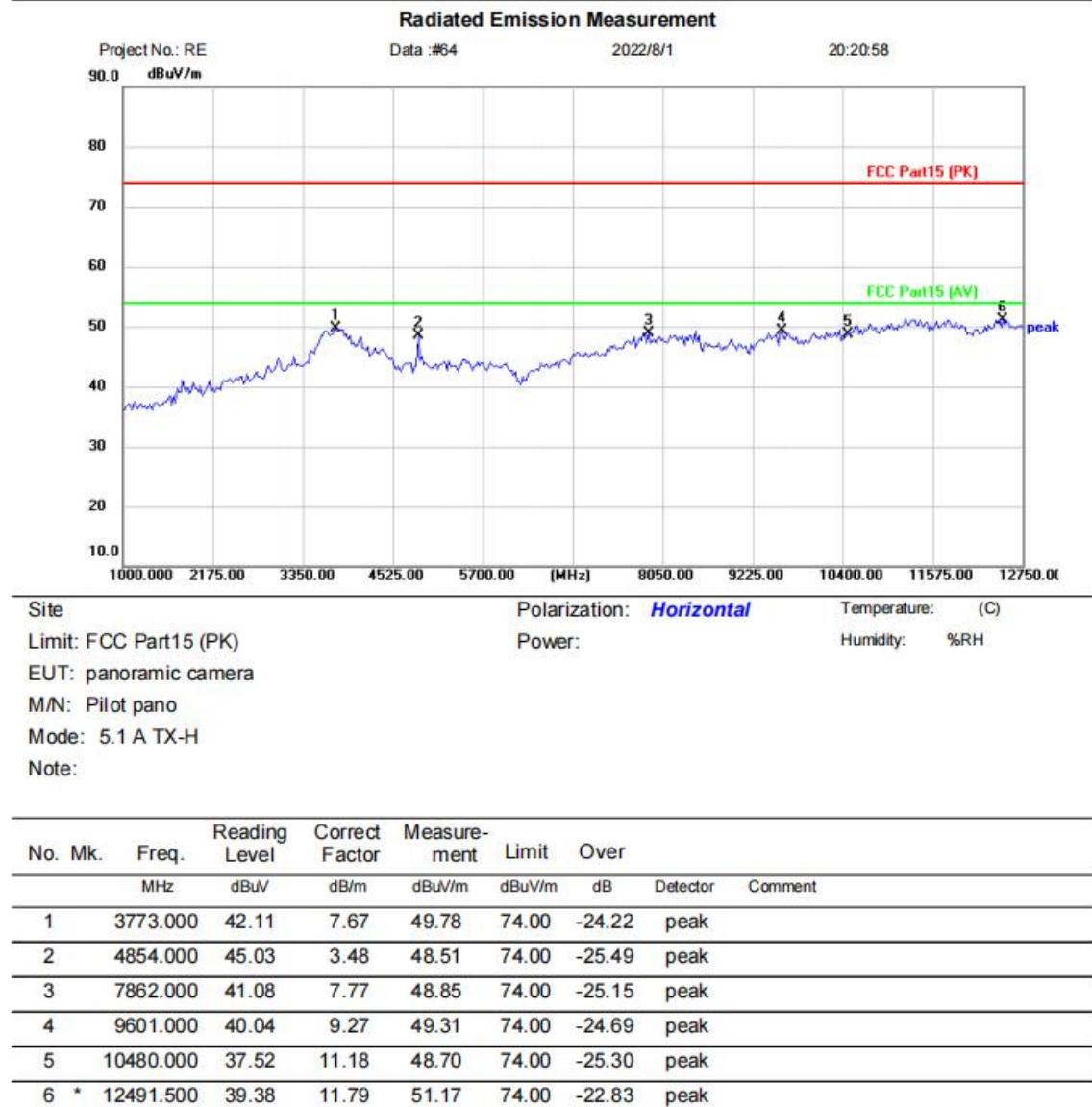
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over			
			Level	Factor	ment					
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		3843.500	42.92	7.12	50.04	74.00	-23.96	peak		
2		6005.500	43.66	0.98	44.64	74.00	-29.36	peak		
3		7838.500	40.88	7.75	48.63	74.00	-25.37	peak		
4		10480.000	38.54	11.18	49.72	74.00	-24.28	peak		
5 *		11340.000	40.82	11.85	52.67	74.00	-21.33	peak		
6		12374.000	39.03	11.72	50.75	74.00	-23.25	peak		

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

## Test Result: Pass

[TestMethod: TX a 5240 channel]; [Polarity: Horizontal]

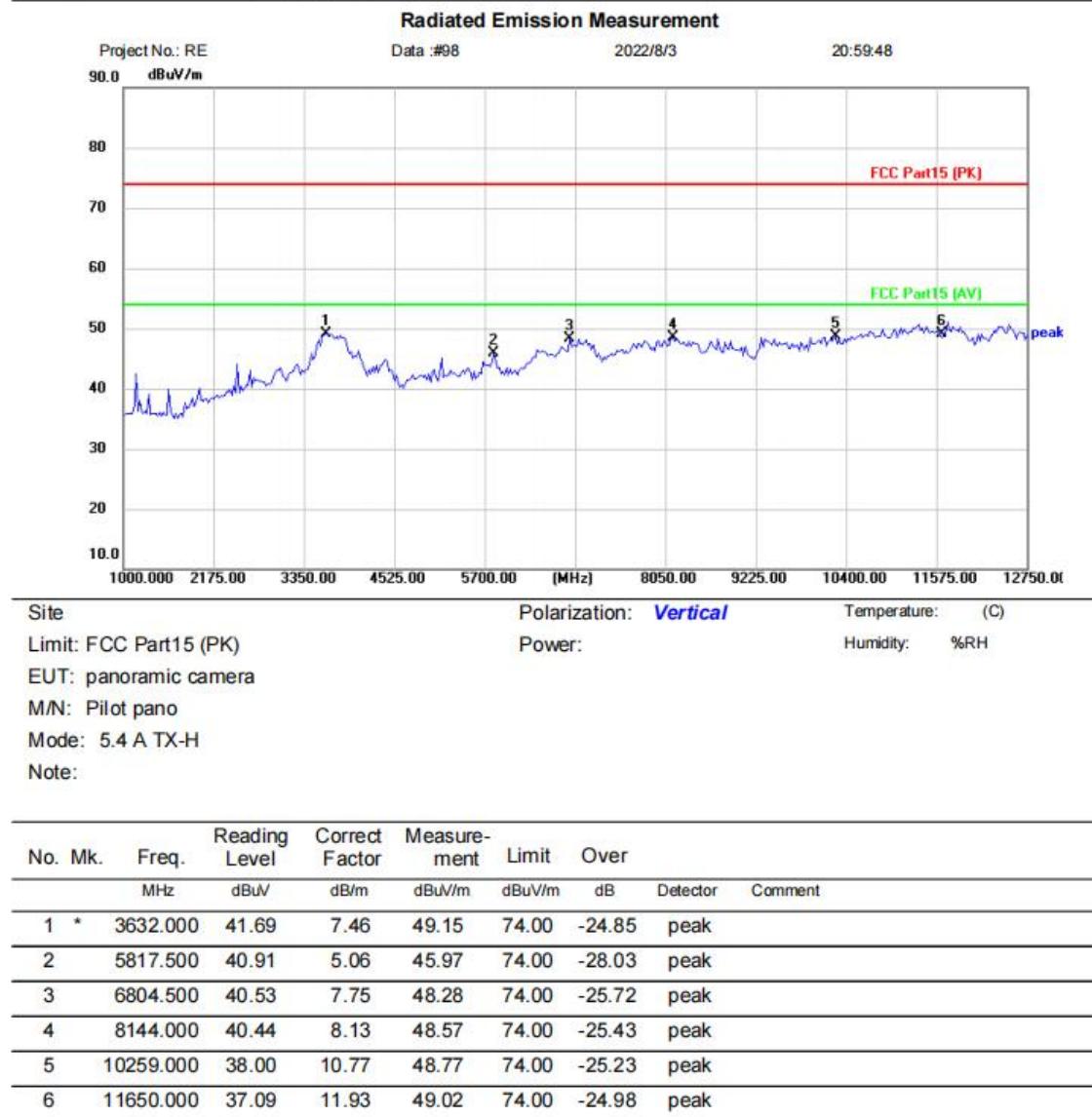


\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

## Test Result: Pass

[TestMethod: TX a 5825 channel]; [Polarity: Vertical]

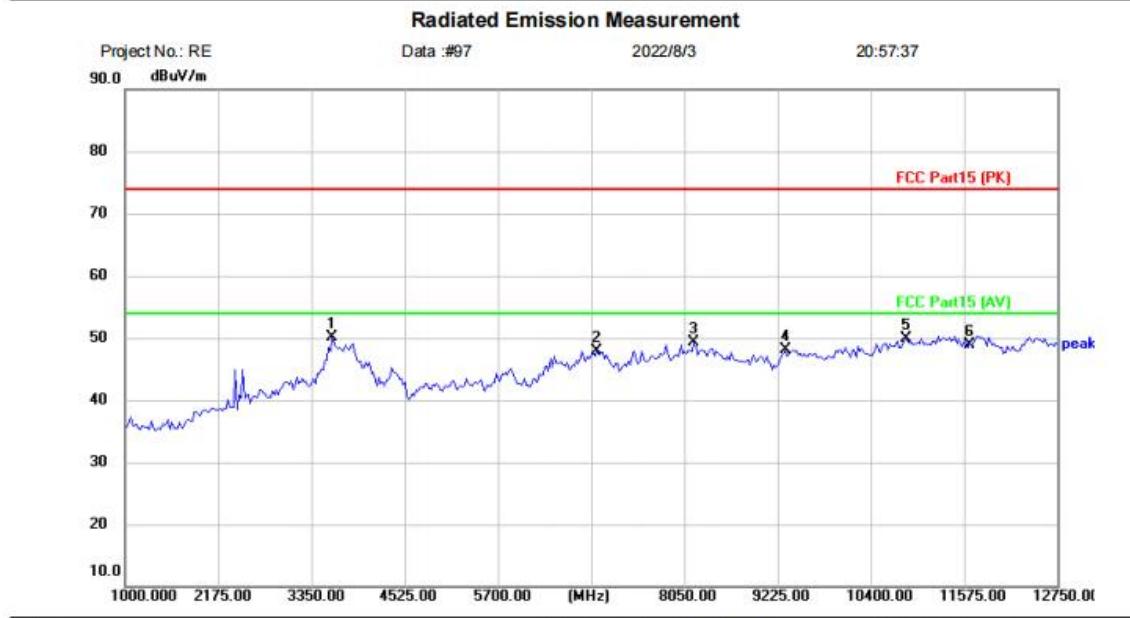


\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX a 5825 channel]; [Polarity: Horizontal]



Site	Polarization: <i>Horizontal</i>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: panoramic camera		
M/N: Pilot pano		
Mode: 5.4 A TX-H		
Note:		

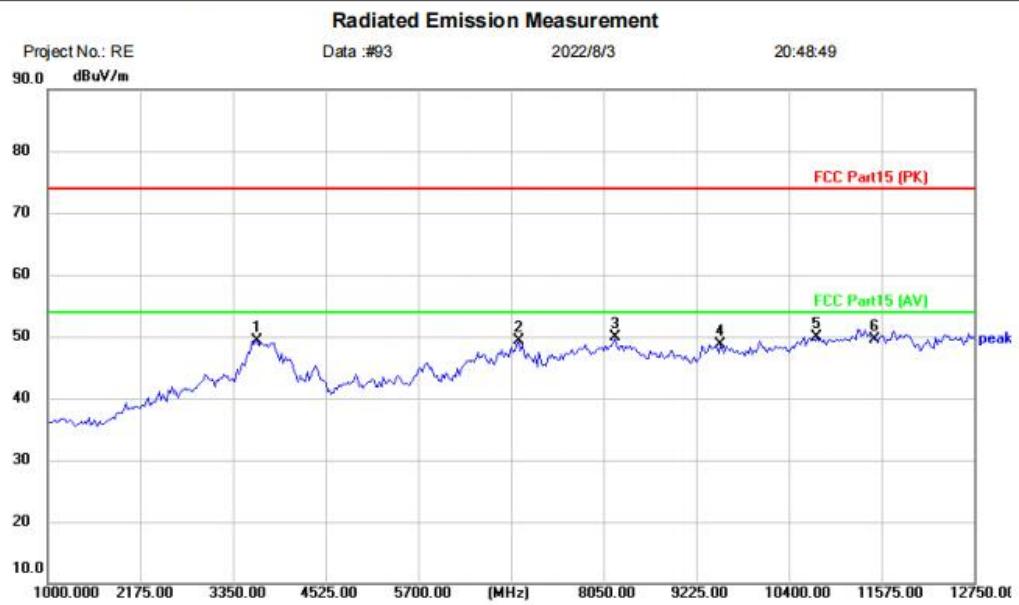
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
			Level	Factor	ment				
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	3608.500	42.57	7.53	50.10	74.00	-23.90	peak	
2		6945.500	39.96	8.02	47.98	74.00	-26.02	peak	
3		8167.500	41.16	8.17	49.33	74.00	-24.67	peak	
4		9319.000	39.42	8.72	48.14	74.00	-25.86	peak	
5		10846.500	37.99	11.84	49.83	74.00	-24.17	peak	
6		11650.000	36.88	11.93	48.81	74.00	-25.19	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

## Test Result: Pass

[TestMode: TX a 5745 channel]; [Polarity: Horizontal]



Site	Polarization: <b>Horizontal</b>	Temperature: (C)
Limit: FCC Part15 (PK)	Power:	Humidity: %RH
EUT: panoramic camera		
M/N: Pilot pano		
Mode: 5.4 A TX-L		
Note:		

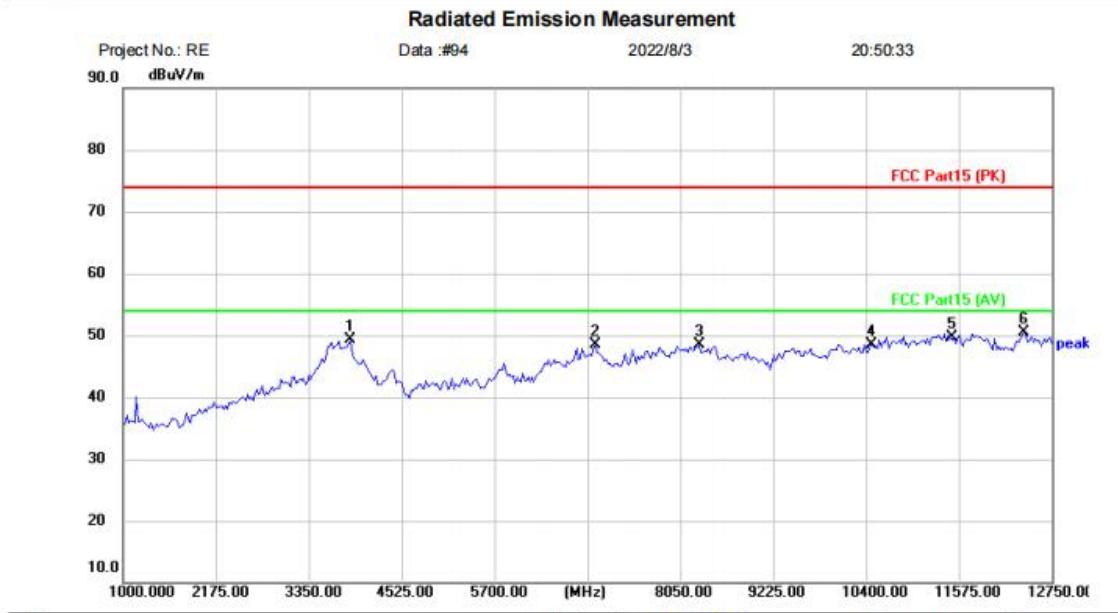
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
			Level	Factor	ment				
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		3655.500	41.91	7.42	49.33	74.00	-24.67	peak	
2		6969.000	41.22	8.05	49.27	74.00	-24.73	peak	
3	*	8191.000	41.76	8.20	49.96	74.00	-24.04	peak	
4		9530.500	39.55	9.12	48.67	74.00	-25.33	peak	
5		10752.500	38.33	11.62	49.95	74.00	-24.05	peak	
6		11490.000	37.69	11.89	49.58	74.00	-24.42	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

## Test Result: Pass

[TestMode: TX a 5745 channel]; [Polarity: Vertical]



Site: Polarization: **Vertical** Temperature: (C)  
Limit: FCC Part15 (PK) Power: Humidity: %RH  
EUT: panoramic camera  
M/N: Pilot pano  
Mode: 5.4 A TX-L  
Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
			Level	Factor	ment				
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		3867.000	42.88	6.39	49.27	74.00	-24.73	peak	
2		6969.000	40.49	8.05	48.54	74.00	-25.46	peak	
3		8285.000	40.27	8.24	48.51	74.00	-25.49	peak	
4		10470.500	37.32	11.18	48.50	74.00	-25.50	peak	
5		11490.000	37.75	11.89	49.64	74.00	-24.36	peak	
6	*	12397.500	38.67	11.78	50.45	74.00	-23.55	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

## Test Result: Pass

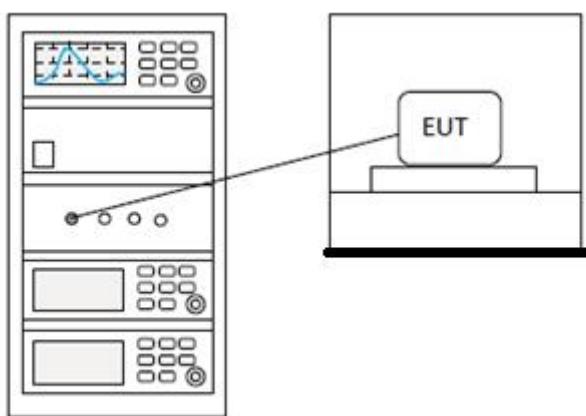
## 13 PEAK POWER SPECTRUM DENSITY

<b>Test Standard</b>	47 CFR Part 15, Subpart E 15.407
<b>Test Method</b>	KDB 789033 D02 II F
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX
<b>Tester</b>	Charlie
<b>Temperature</b>	25°C
<b>Humidity</b>	60%

### 13.1 LIMITS

Frequency band(MHz)	Limit
5150-5250	≤17dBm in 1MHz for master device
	≤11dBm in 1MHz for client device
5250-5350	≤11dBm in 1MHz for client device
5470-5725	≤11dBm in 1MHz for client device
5725-5850	≤30dBm in 500 kHz
Remark:	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.

### 13.2 BLOCK DIAGRAM OF TEST SETUP



### 13.3 TEST DATA

**Pass: Please Refer To Appendix: Appendix1 For Details**

BlueAsia