



FCC RF Test Report

(U-NII)

Applicant: Realsee(Beijing) Technology Co., Ltd.

Address of Applicant: Room 7-261, 7th Floor, Building 1, No. 158, Xisihuan North Road, Haidian District, Beijing City, P. R. China

Equipment Under Test (EUT)

Product Name: 3D SMART CAMERA

Model No.: RS42050, RS42025

Trade Mark: REALSEE

FCC ID: 2A67J-RS42050

Applicable Standards: FCC CFR Title 47 Part 15E (§15.407)

Date of Sample Receipt: 13 Sep., 2022

Date of Test: 14 Sep., to 16 Oct., 2022

Date of Report Issued: 28 Mar., 2023

Test Result: PASS

Tested by: Mike OU **Date:** 28 Mar., 2023

Reviewed by: Wenwen Zhang **Date:** 28 Mar., 2023

Approved by: Manager **Date:** 28 Mar., 2023

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in above the application standard version. Test results reported herein relate only to the item(s) tested.

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1 Version

Version No.	Date	Description
00	28 Mar., 2023	Original

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3 General Information

3.1 Client Information

Applicant:	Realsee(Beijing) Technology Co., Ltd.
Address:	Room 7-261, 7th Floor, Building 1, No. 158, Xisihuan North Road, Haidian District, Beijing City, P. R. China
Manufacturer:	Realsee(Beijing) Technology Co., Ltd.
Address:	Room 7-261, 7th Floor, Building 1, No. 158, Xisihuan North Road, Haidian District, Beijing City, P. R. China
Factory:	Hong Fu Tai Precision Electrons (Yantai) Co., Ltd.
Address:	No. 8 Jiaxing Road, Yantai Economic & Technological Development Area, Shandong, P.R. China

3.2 General Description of E.U.T.

Product Name:	3D SMART CAMERA	
Model No.:	RS42050, RS42025	
Operation Frequency:	Band 1: 5150 MHz - 5250 MHz	
	Band 4: 5725 MHz - 5850 MHz	
Channel Numbers:	Band 1: 4 , Band 4: 5 (802.11a, n-HT20, ac-VHT20)	
	Band 1, 4: 2 (802.11n-HT40, ac-VHT40)	
	Band 1, 4: 1 (802.11ac-VHT80)	
Modulation Technology: (IEEE 802.11a/802.11n)	OFDM-BPSK, QPSK, 16QAM, 64QAM	
Modulation Technology: (IEEE 802.11ac)	OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM	
Antenna Type:	FPC Antenna	
Antenna Gain:	5.2GWIFI	ANT1: 2.79 dBi , ANT2: 2.51 dBi , Direction gain for MIMO mode: 5.66dBi.
	5.8GWIFI	ANT1: 4.21 dBi , ANT2: 1.61 dBi , Direction gain for MIMO mode: 6.02dBi.
Antenna Transmit Mode:	MIMO (2TX, 2RX)	
Power Supply:	Rechargeable Li-ion Battery DC14.4V, 6400mAh	
AC Adapter:	Model: ADP-65SD B Input: AC100-240V, 50/60Hz, 1.5A Output: DC 20V --- 3.25A or 15V--- 3A or 9V--- 3A or 5V--- 3A	
Remark:	Model No.: RS42050, RS42025 were identical inside, the electrical circuit design, layout, components used and internal wiring, with only difference being the detection range of LIDAR.	
Test Sample Condition:	The test samples were provided in good working order with no visible defects.	

3.3 Test Mode and Environment

Test Mode:	
Transmitting mode:	Keep the EUT in continuous transmitting with modulation
Per-scan all kind of data rate, the follow list were the worst case:	
Mode	Data rate
802.11a	6.0 Mbps
802.11n-HT20	6.5 Mbps
802.11n-HT40	13.5 Mbps
802.11ac-VHT20	6.5 Mbps
802.11ac-VHT40	13.5 Mbps
802.11ac-VHT80	29.3 Mbps
Remark: For AC power line conducted emission and radiated spurious emission (below 1GHz), pre-scan 802.11a, n, ac modulation mode, found 802.11a modulation mode was worse case mode. The report only reflects the test data of worst mode.	
Operating Environment:	
Temperature:	15℃ ~ 35℃
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1008 mbar
Voltage:	Nominal: 14.4Vdc, Extreme: Low 12.24 Vdc, High 16.56 Vdc

3.4 Description of Test Auxiliary Equipment

The EUT has been tested as an independent unit.

3.5 Measurement Uncertainty

Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.

3.6 Additions to, Deviations, or Exclusions from the Method

No

3.7 Laboratory Facility

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

- **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

- **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber and 10m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L15527**

JianYan Testing Group Shenzhen Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L15527.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

3.8 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info-JYTee@lets.com, Website: <http://jyt.lets.com>

3.9 Test Instruments List

Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.

4 Measurement Setup and Procedure

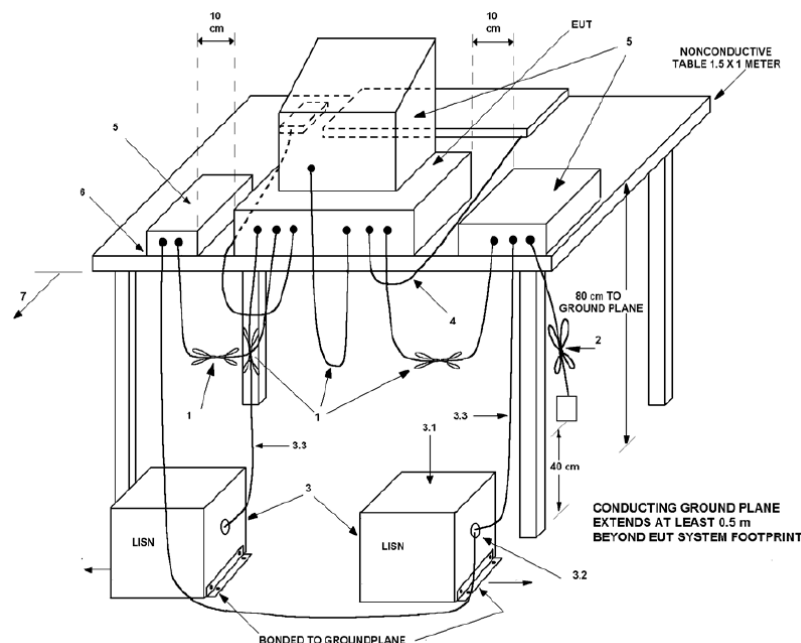
4.1 Test Channel

According to ANSI C63.10-2013 chapter 5.6.1 Table 4 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows:

Operation frequency: 5150 MHz – 5250 MHz						
Modulation mode	Lowest channel		Middle channel		Highest channel	
	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
802.11a, n-HT20, ac-VHT20	36	5180	40	5200	48	5240
802.11n-HT40, ac-VHT40	38	5190	/	/	46	5230
802.11ac-VHT80	/	/	42	5210	/	/
Operation frequency: 5725 MHz – 5850 MHz						
Modulation mode	Lowest channel		Middle channel		Highest channel	
	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
802.11a, n-HT20, ac-VHT20	149	5745	157	5785	165	5825
802.11n-HT40, ac-VHT40	151	5755	/	/	159	5795
802.11ac-VHT80	/	/	155	5775	/	/

4.2 Test Setup

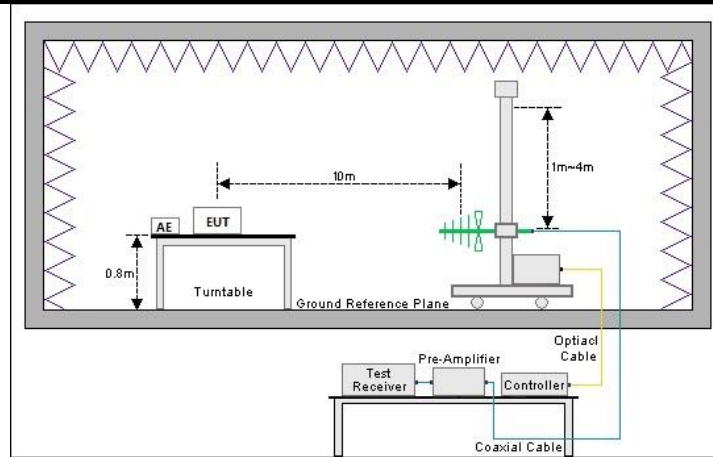
1) Conducted emission measurement:



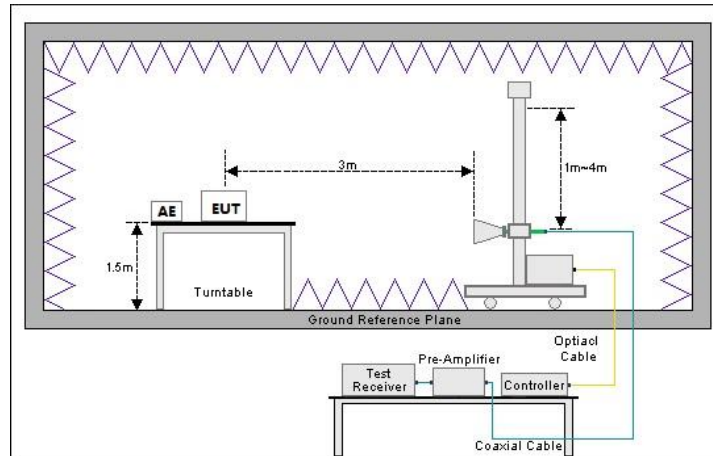
Note: The detailed descriptions please refer to Figure 8 of ANSI C63.4:2014.

2) Radiated emission measurement:

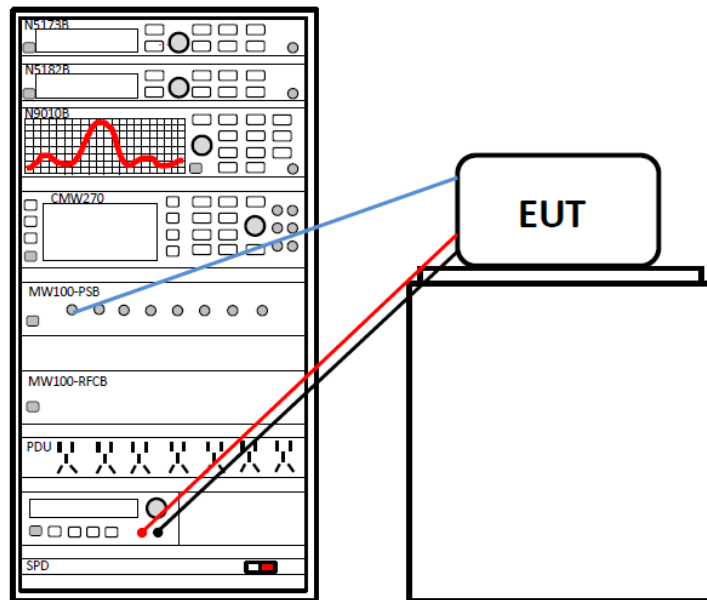
Below 1GHz (10m SAC)



Above 1GHz (3m SAC)



3) Conducted test method



4.3 Test Procedure

Test method	Test step
Conducted emission	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
Radiated emission	For below 1GHz: 1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 10 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 10 m. 2. EUT works in each mode of operation that needs to be tested , and having the EUT continuously working, respectively on 3 axis (X, Y & Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations. 3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data. For above 1GHz: 1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m. 2. EUT works in each mode of operation that needs to be tested , and having the EUT continuously working, respectively on 3 axis (X, Y & Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations. 3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
Conducted test method	1. The Wi-Fi antenna port of EUT was connected to the test port of the test system through an RF cable. 2. The EUT is keeping in continuous transmission mode and tested in all modulation modes. 3. Open the test software, prepare a test plan, and control the system through the software. After the test is completed, the test report is exported through the test software.

5 Test Results

5.1 Summary

5.1.1 Clause and Data Summary

This report is revised according to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766 issued by JianYan Testing Group Shenzhen Co., Ltd, follow the Change ID allow change principle. Differences: Update addresses of applicant and applicant, and update addresses of manufacturer and manufacturer, update product name and model and FCC ID, so no need to retest.

Test items	Standard clause	Test data	Result
Antenna Requirement	15.203	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.
AC Power Line Conducted Emission	15.207 15.407 (b)(9)	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.
Duty Cycle	ANSI C63.10-2013	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.
Conducted Peak Output Power Power Spectral Density	15.407 (a)(1)(iv), (a)(3)(i)	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.
26dB Emission Bandwidth 99% Occupied Bandwidth	15.407 (a)(12)	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.
6dB Emission Bandwidth	15.407 (e)	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.
Unwanted Emissions	15.205 15.209 15.407 (b)(1), (4), (9), (10)	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.
Frequency Stability	15.407 (g)	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.	Please refer to FCC ID: 2A26V-RS41010, report No.: JYTSZ-R12-2201766.
Dynamic frequency selection	15.407 (h)(2)	N/A	N/A
Remark: 1. Please refer to report JYTSZ-R12-2201766, FCC ID: 2A26V-RS41010 issue by JianYan Testing Group Shenzhen Co., Ltd. 2. N/A: Not Applicable.			
Test Method:	ANSI C63.10-2013 KDB 789033 D02 General U-NII Test Procedures New Rules v02r01		

5.1.2 Test Limit

Test items	Limit														
AC Power Line Conducted Emission	<table><tr><th rowspan="2">Frequency (MHz)</th><th colspan="2">Limit (dBμV)</th></tr><tr><th>Quasi-Peak</th><th>Average</th></tr><tr><td>0.15 – 0.5</td><td>66 to 56 Note 1</td><td>56 to 46 Note 1</td></tr><tr><td>0.5 – 5</td><td>56</td><td>46</td></tr><tr><td>5 – 30</td><td>60</td><td>50</td></tr></table> Note 1: The limit level in dBμV decreases linearly with the logarithm of frequency. Note 2: The more stringent limit applies at transition frequencies.	Frequency (MHz)	Limit (dBμV)		Quasi-Peak	Average	0.15 – 0.5	66 to 56 Note 1	56 to 46 Note 1	0.5 – 5	56	46	5 – 30	60	50
Frequency (MHz)	Limit (dBμV)														
	Quasi-Peak	Average													
0.15 – 0.5	66 to 56 Note 1	56 to 46 Note 1													
0.5 – 5	56	46													
5 – 30	60	50													
Conducted Peak Output Power Power Spectral Density	For the 5.15-5.25 GHz band: For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For the band 5.725-5.895 GHz: For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, Fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.														
26dB Emission Bandwidth 99% Occupied Bandwidth	N/A														
6dB Emission Bandwidth	Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.														

Unwanted Emissions	(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz. (4) For transmitters operating solely in the 5.725-5.850 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. (5) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. The provisions of § 15.205 apply to intentional radiators operating under this section: <table><tr><th rowspan="2">Frequency (MHz)</th><th colspan="2">Limit (dBµV/m)</th><th rowspan="2">Detector</th></tr><tr><th>@ 3m</th><th>@ 10m</th></tr><tr><td>30 – 88</td><td>40.0</td><td>30.0</td><td>Quasi-peak</td></tr><tr><td>88 – 216</td><td>43.5</td><td>33.5</td><td>Quasi-peak</td></tr><tr><td>216 – 960</td><td>46.0</td><td>36.0</td><td>Quasi-peak</td></tr><tr><td>960 – 1000</td><td>54.0</td><td>44.0</td><td>Quasi-peak</td></tr></table> Note: The more stringent limit applies at transition frequencies. <table><tr><th rowspan="2">Frequency</th><th colspan="2">Limit (dBµV/m) @ 3m</th></tr><tr><th>Average</th><th>Peake</th></tr><tr><td>Above 1 GHz</td><td>54.0</td><td>74.0</td></tr></table> Note: The measurement bandwidth shall be 1 MHz or greater.	Frequency (MHz)	Limit (dBµV/m)		Detector	@ 3m	@ 10m	30 – 88	40.0	30.0	Quasi-peak	88 – 216	43.5	33.5	Quasi-peak	216 – 960	46.0	36.0	Quasi-peak	960 – 1000	54.0	44.0	Quasi-peak	Frequency	Limit (dBµV/m) @ 3m		Average	Peake	Above 1 GHz	54.0	74.0
Frequency (MHz)	Limit (dBµV/m)		Detector																												
	@ 3m	@ 10m																													
30 – 88	40.0	30.0	Quasi-peak																												
88 – 216	43.5	33.5	Quasi-peak																												
216 – 960	46.0	36.0	Quasi-peak																												
960 – 1000	54.0	44.0	Quasi-peak																												
Frequency	Limit (dBµV/m) @ 3m																														
	Average	Peake																													
Above 1 GHz	54.0	74.0																													
Frequency Stability	Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.																														

-----End of report-----