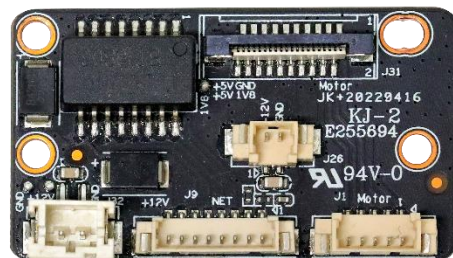
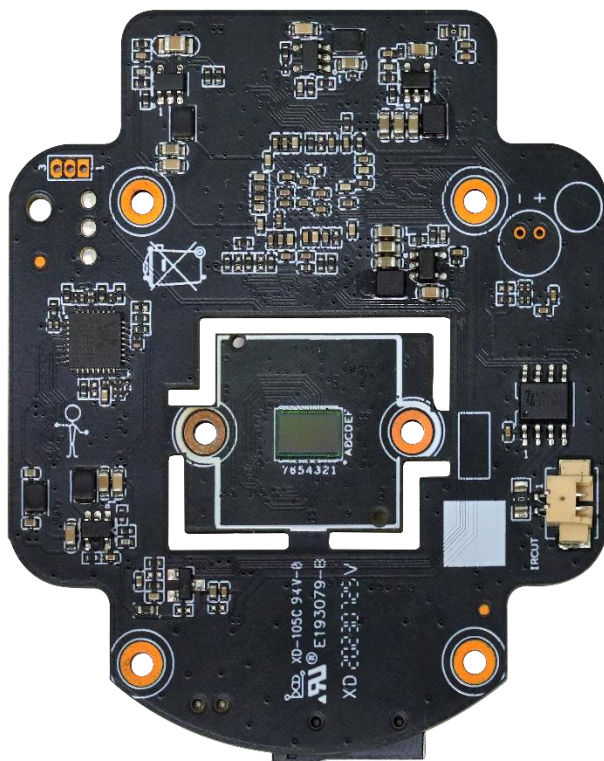


# IPG-A4-WQ Module Specification

Document Version : 20231211



## Introduction

IPG-A4-WQ is a 4MP black light Wi-Fi PT camera module developed by our company, which supports Bluetooth network configuration, and is mainly used in high-definition video surveillance cameras.

## Main Features



Bluetooth Network Configuration



Black Light In Full Color



PT Control



Human Detection



Two-way Talk



Mobile Remote



Human tracking



H.265AI



TF Card Storage



Cloud Storage

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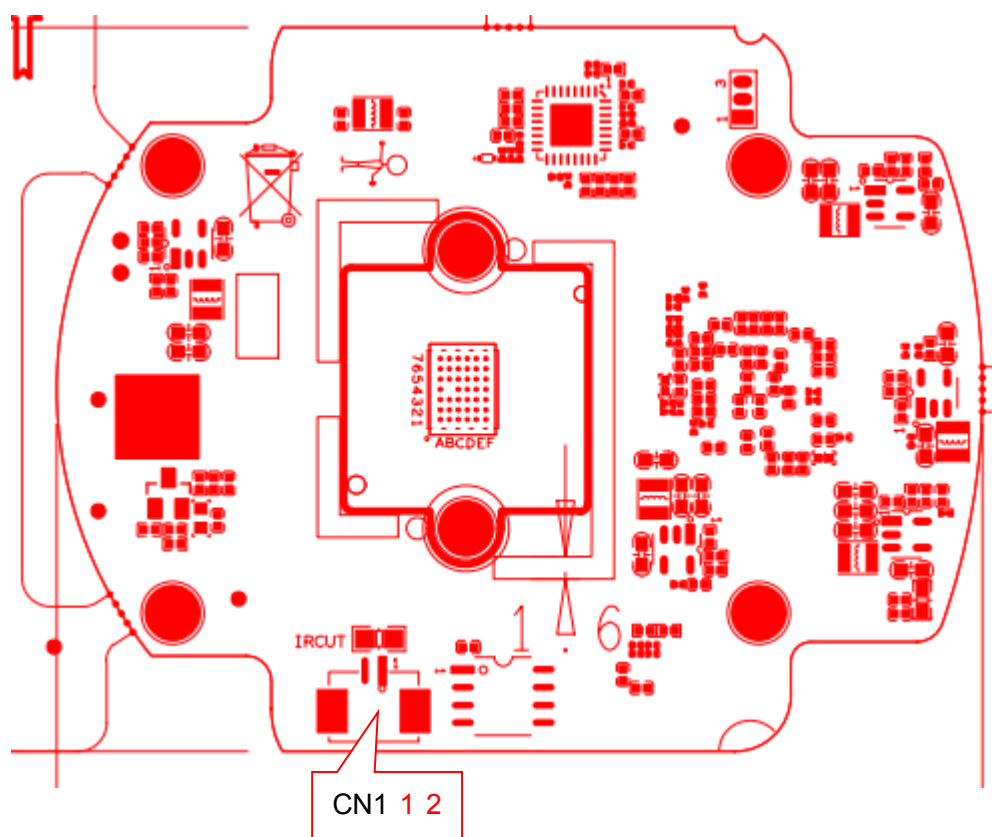
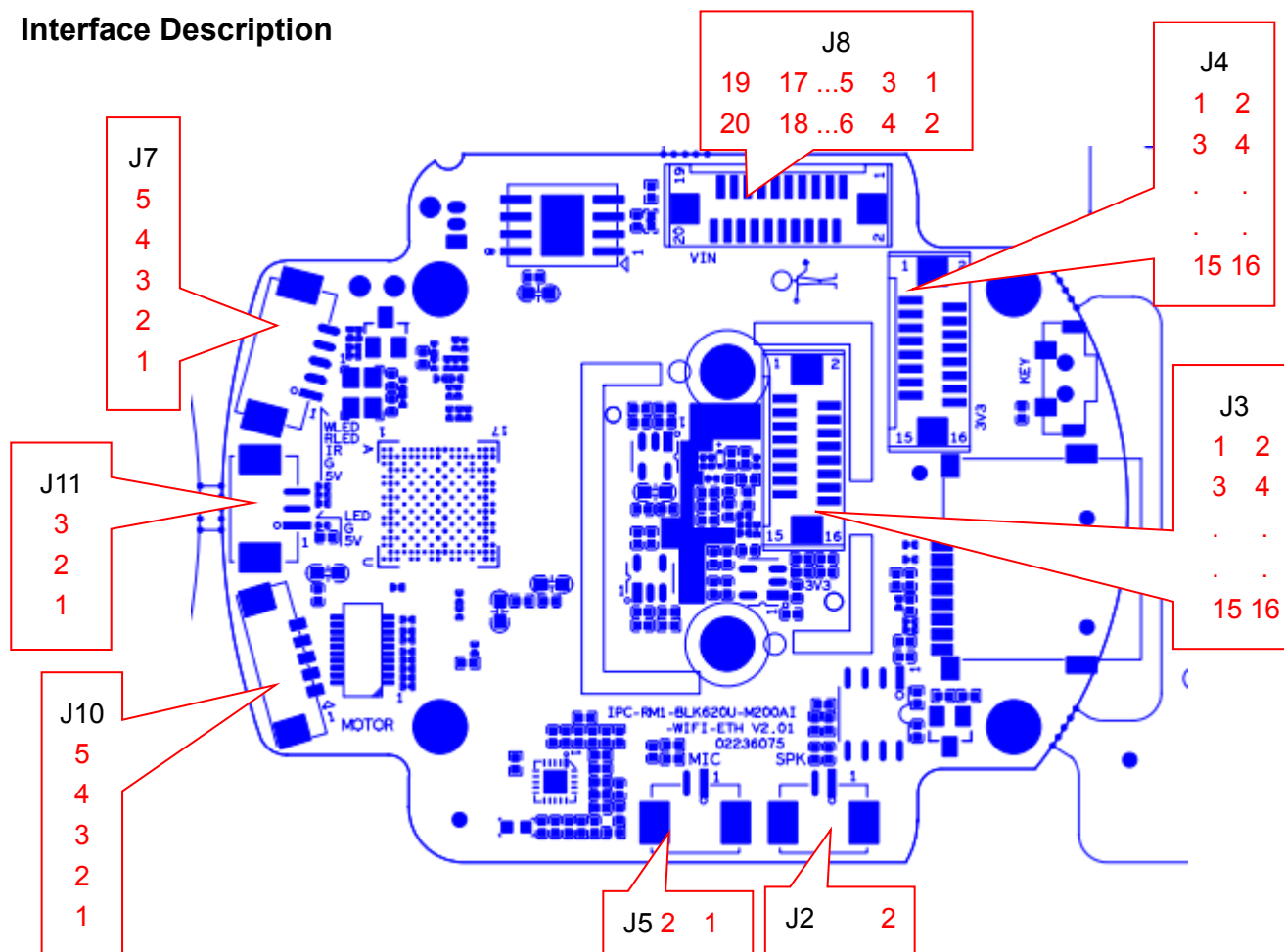
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## 1. Product Parameters

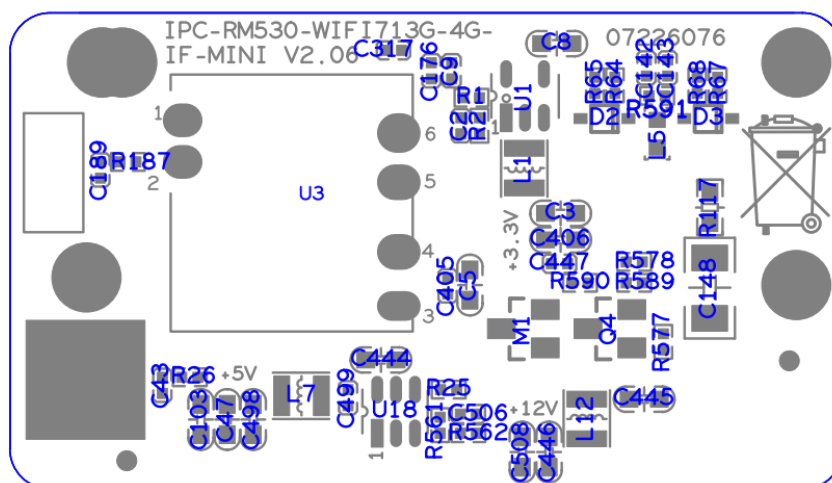
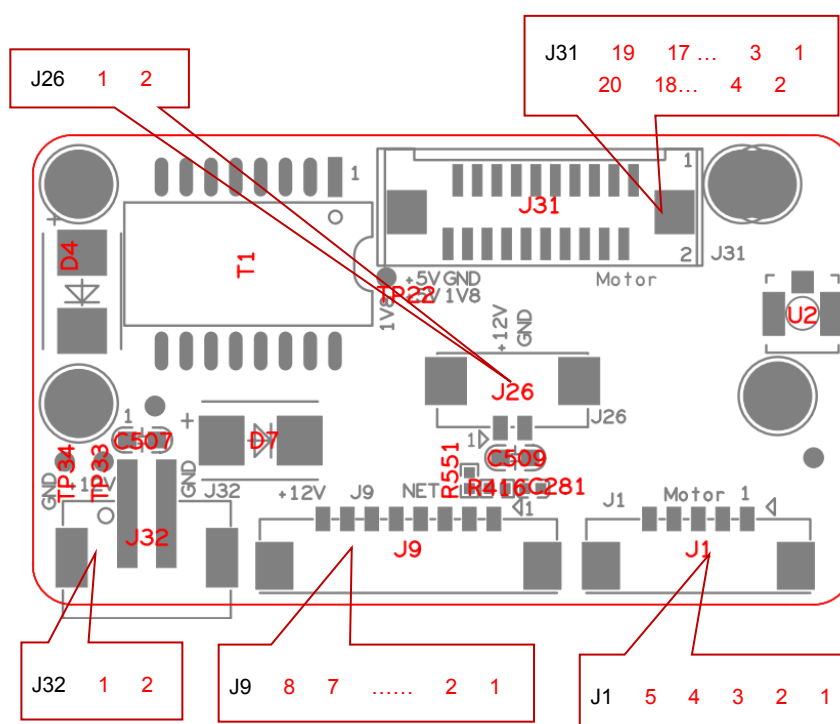
|                   |                                                                                                                                                                                                             |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Model             | IPG-A4-WQ                                                                                                                                                                                                   |
| System Structure  | Quad-core Cortex A7 1.0GHz CPU, pure hard compression, watchdog                                                                                                                                             |
| Sensor            | 1/2.8" High performance CMOS sensor                                                                                                                                                                         |
| Min. Illumination | Color : 0.01Lux @(F1.2,AGC ON); 0 Lux with IR<br>Black/White: 0.001 Lux @ (F1.2,AGC ON),0 Lux with IR                                                                                                       |
| Video Compression | H.265AI                                                                                                                                                                                                     |
| Image Output      | Main stream: 2560*1440@12fps; sub-stream: 800*448@12fps                                                                                                                                                     |
| Shutter           | 1/50(1/60)s to 1/10,000s                                                                                                                                                                                    |
| Day&Night         | Support IR-CUT                                                                                                                                                                                              |
| DNR               | Support 2D/3D noise reduction                                                                                                                                                                               |
| WDR               | Support                                                                                                                                                                                                     |
| Audio Compression | G.711A codec standard, support dual voice talkback, audio and video synchronization                                                                                                                         |
| Audio Interface   | 1 channel input, support microphone input(MIC: selection range -28dB~-36dB, -33dB specification recommended); 1 channel output, support speaker output playback(speaker: 8Ω 1.5W specification recommended) |
| Network Interface | 1 RJ45 Ethernet interface, 10/100M adaptive                                                                                                                                                                 |
|                   | 1*Wi-Fi antenna interface to support wireless network connection                                                                                                                                            |
| Signal Interface  | 1*photoresistor interface, 1*IR-CUT driver interface, support photoresistor input signal and IR-CUT, IR lamp linkage                                                                                        |
| Reset Interface   | 1*reset interface                                                                                                                                                                                           |
| Storage Mode      | Local TF card(up to 128G); cloud storage                                                                                                                                                                    |
| Reliability       | Comprehensive lightning protection, in line with national and international standards;<br>3*24 hours high-temperature test stability and reliability                                                        |
| Smart Alarm       | Support human detection, support to customizing other intelligent functions                                                                                                                                 |
| Functions         | It supports remote monitoring of mobile client, push message after alarm of human detection, and supports MJPEG capture;                                                                                    |
| ONVIF             | support                                                                                                                                                                                                     |
| Mobile Monitoring | Support (iOS, Android)                                                                                                                                                                                      |
| Power Supply      | DC12V                                                                                                                                                                                                       |
| Dimension         | 52mm*67mm+24mm*42mm                                                                                                                                                                                         |

## 2. Interface Description



| Silk Screen Number | Pin Number | Pin Definition | Function                         |
|--------------------|------------|----------------|----------------------------------|
| J10                | 1          | +5V_M1         | Vertical motor power supply      |
|                    | 2          | OUT1           | Vertical motor signal            |
|                    | 3          | OUT2           | Vertical motor signal            |
|                    | 4          | OUT3           | Vertical motor signal            |
|                    | 5          | OUT4           | Vertical motor signal            |
| J5                 | 1          | MIC_N1         | Microphone positive signal       |
|                    | 2          | MIC_P1         | Microphone negative signal       |
| J7                 | 1          | 5V             | 5V power supply                  |
|                    | 2          | GND            | GND                              |
|                    | 3          | ADC1_IN        | Hard photosensitive signal       |
|                    | 4          | RLED           | Soft light sensitive red light   |
|                    | 5          | WLED           | Soft light-sensitive white light |
| J8                 | 1          | OUT1           | Horizontal motor signal          |
|                    | 2          | OU2            | Horizontal motor signal          |
|                    | 3          | OU3            | Horizontal motor signal          |
|                    | 4          | OU4            | Horizontal motor signal          |
|                    | 5          | GND            | GND                              |
|                    | 6          | KEY_SET        | Reset button                     |
|                    | 7          | GND            | GND                              |
|                    | 8          | WIFI_PDN       | WIFI power control signal        |
|                    | 9          | WIFI_DN        | WIFI Signal-                     |
|                    | 10         | WIFI_DP        | WIFI SIGNAL +                    |
|                    | 11         | GND            | GND                              |
|                    | 12         | TPTX-          | Network Data Transmission-       |
|                    | 13         | TPTX+          | Network data sending+            |
|                    | 14         | GND            | GND                              |
|                    | 15         | TPRX+          | Network data sending+            |
|                    | 16         | TPRX-          | Network Data Transmission-       |
|                    | 17         | GND            | GND                              |
|                    | 18         | NC             | NC                               |
|                    | 19         | +5V            | 5V power supply                  |
|                    | 20         | +5V            | 5V power supply                  |
| J3,J4              | 1          | I_MIP1_DATA0P  | MIPI signal                      |
|                    | 2          | I_MIP1_DATA0N  | MIPI signal                      |
|                    | 3          | GND            | GND                              |
|                    | 4          | I_MIP1_DATA1P  | MIPI signal                      |
|                    | 5          | I_MIP1_DATA1N  | MIPI signal                      |
|                    | 6          | GND            | GND                              |
|                    | 7          | I_MIP1_CLKP    | MIPI signal                      |
|                    | 8          | I_MIP1_CLKN    | MIPI signal                      |
|                    | 9          | GND            | GND                              |
|                    | 10         | SEN1_MCLK      | Sensor clock signal              |

|     |    |            |                     |
|-----|----|------------|---------------------|
|     | 11 | GND        | GND                 |
|     | 12 | SENSOR_RST | Sensor reset signal |
|     | 13 | SENSOR_SCL | IIC signal          |
|     | 14 | SENSOR_SDA | IIC signal          |
|     | 15 | GND        | GND                 |
|     | 16 | 3.3v       | 3.3v                |
| J11 | 1  | 5V         | 5V                  |
|     | 2  | GND        | GND                 |
|     | 3  | LED        | Alarm light signal  |
| CN1 | 1  | IRCUTB     | IRCUT signal        |
|     | 2  | IRCUTA     | IRCUT signal        |
| J2  | 1  | SPKN       | Horn Signal-        |
|     | 2  | SPKP       | Horn signal +       |



| Silk Screen Number | Pin Number | Pin Definition | Function                          |
|--------------------|------------|----------------|-----------------------------------|
| J1                 | 1          | +5V_M2         | Horizontal motor interface        |
|                    | 2          | OUT1           |                                   |
|                    | 3          | OUT2           |                                   |
|                    | 4          | OUT3           |                                   |
|                    | 5          | OUT4           |                                   |
| J9                 | 1          | KEY_SET        | Reset                             |
|                    | 2          | +3.3V          | 3.3V                              |
|                    | 3          | ETHTX+         | Wired network                     |
|                    | 4          | ETHTX-         |                                   |
|                    | 5          | ETHRX+         |                                   |
|                    | 6          | ETHRX-         |                                   |
|                    | 7          | GND            | GND                               |
|                    | 8          | 12V            | 12V power supply                  |
| J26                | 1          | 12V            | Warning lights are powered        |
|                    | 2          | GND            |                                   |
| J31                | 1          | OUT1           | Dock the motherboard              |
|                    | 2          | OUT2           |                                   |
|                    | 3          | OUT3           |                                   |
|                    | 4          | OUT4           |                                   |
|                    | 5          | GND            |                                   |
|                    | 6          | KEY_SET        |                                   |
|                    | 7          | GND            |                                   |
|                    | 8          | WIFI_PDN       |                                   |
|                    | 9          | WIFI_DN        |                                   |
|                    | 10         | WIFI_DP        |                                   |
|                    | 11         | GND            |                                   |
|                    | 12         | TPTX-          |                                   |
|                    | 13         | TPTX+          |                                   |
|                    | 14         | GND            |                                   |
|                    | 15         | TPRX+          |                                   |
|                    | 16         | TPRX-          |                                   |
|                    | 17         | GND            |                                   |
|                    | 18         | 1V8            |                                   |
|                    | 19         | +5V            |                                   |
|                    | 20         | +5V            |                                   |
| J32                | 1          | 12V            | Power supply from the light panel |
|                    | 2          | GND            |                                   |

### 3. Electrical Parameters

#### 3.1 Absolute Electrical Parameters

| Parameter                                         | Description          | Min | Max  | Unit |
|---------------------------------------------------|----------------------|-----|------|------|
| Ts                                                | Storage temperature  | -40 | 150  | °C   |
| VCC                                               | Power supply voltage | 9.6 | 14.4 | V    |
| Static electricity discharge voltage<br>(Air)     | TAMB-25°C            | -6  | 6    | KV   |
| Static electricity discharge voltage<br>(Contact) | TAMB-25°C            | -3  | 3    | KV   |

#### 3.2 Working Conditions

| Parameter | Description           | Min | Max  | Unit |
|-----------|-----------------------|-----|------|------|
| Ta        | Working temperature   | -20 | 65   | °C   |
| VCC       | Power supply voltage  | 9.6 | 14.4 | V    |
| VOL       | I/O low-level output  | 0   | 0.7  | V    |
| VOH       | I/O high-level output | 2.6 | 3.3  | V    |

### 3. RF Parameters

#### 4.1 Basic Wi-Fi Performance

| Parameter          | Description                              |
|--------------------|------------------------------------------|
| Wi-Fi standard     | IEEE 802.11 b/g/n/ax                     |
| Frequency Range    | 2.412 GHz ~ 2.484 GHz (2.4 GHz ISM Band) |
| Number of Channels | 2.4GHz: Ch1 ~ Ch14                       |
| Antenna Type       | External IPEX interface                  |

#### 4.2 Basic Bluetooth Performance

##### 4.2.1 General Performance

| Parameter          | Description         |
|--------------------|---------------------|
| Bluetooth standard | BLE 5.0 of 1Mbps    |
| Frequency Range    | 2402 MHz ~ 2480 MHz |
| Number of Channels | 39 channels         |

##### 4.2.2 RF Performance

| Parameter                                  | Min(dBm) | Typical(dBm) | Max(dBm) |
|--------------------------------------------|----------|--------------|----------|
| Transmit power (Class 1)                   | 2        | 5            | 8        |
| Sensitivity @ BER=0.1%<br>for GFSK (1Mbps) | /        | -90          | -70      |

## 4.3 Wi-Fi RF Performance

### 4.3.1 Wi-Fi TX Performance

| Mode     | Rate       | Power | EVM   |
|----------|------------|-------|-------|
| 802.11b  | 1Mbps      | 19dBm | -25dB |
|          | 11Mbps     | 19dBm | -25dB |
| 802.11g  | 6Mbps      | 18dBm | -25dB |
|          | 54Mbps     | 16dBm | -30dB |
| 802.11n  | HT20/MCS7  | 16Bm  | -30dB |
|          | HT40/MCS7  | 16Bm  | -30dB |
| 802.11ax | HE20/MCS0  | 18dBm | -25dB |
|          | HE40/MCS0  | 18dBm | -25dB |
|          | HE20/MCS11 | 13dBm | -35dB |
|          | HE40/MCS11 | 13dBm | -35dB |

### 4.3.2 Wi-Fi RX Performance

| Working State              | Rate       | RX Sensitivity |
|----------------------------|------------|----------------|
| (802.11b, 20MHz) @8% PER   | 1Mbps      | -97.5dBm       |
|                            | 11Mbps     | -90dBm         |
| (802.11g, 20MHz) @10% PER  | 6Mbps      | -93.5dBm       |
|                            | 54Mbps     | -76.5dBm       |
| (802.11n, 20MHz) @10% PER  | HT20/MCS7  | -74dBm         |
|                            | HT40/MCS7  | -71dBm         |
| (802.11ax, 20MHz) @10% PER | HE20/MCS11 | -64dBm         |
|                            | HT40/MCS11 | -60.5dBm       |