

# DHI-TPC-BF5641-T-V1

## Thermal Network Hybrid Bullet Camera



- Vanadium oxide uncooled focal plane detector.
- 1/1.8" 4Megapixel progressive scan CMOS.
- Heat detection and alarm, tripwire, intrusion, and target filtering.
- Junction box optional.
- Illumination distance is up to 80 m.
- IP67 rated.
- Wide input voltage 12–24 VDC ( $\pm 10\%$ ), and PoE power supply.
- Smart linkage of white light and audio.
- Temperature measurement range of  $-20^{\circ}\text{C}$  to  $+550^{\circ}\text{C}$ .

Featuring thermal and visible channels, Thermal Network Hybrid Bullet Camera measures temperature through the thermal channel, with high accuracy Max ( $\pm 2^{\circ}\text{C}$ ,  $\pm 2\%$ ), the camera supports multiple temperature measurement rules of spot, line and region at the same time, and generates alarm when the temperature is abnormal, which can help user find potential hazard. The image details can be confirmed by the visible channel.

### Technical Specification

#### Thermal

|                                  |                                                                                                                                                                                                    |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Detector Type                    | Vanadium oxide uncooled focal plane detector                                                                                                                                                       |
| Effective Pixels                 | 640 (H) $\times$ 512 (V)                                                                                                                                                                           |
| Pixel Pitch                      | 12 $\mu\text{m}$                                                                                                                                                                                   |
| Spectral Range                   | 8 $\mu\text{m}$ –14 $\mu\text{m}$                                                                                                                                                                  |
| Sensitivity (NETD)               | $\leq 20\text{ mK}$ (@f/1.0)                                                                                                                                                                       |
| Field of View                    | 5 mm: H: 90.0°; V: 70.7°<br>9 mm: H: 50.0°; V: 39.6°<br>13 mm: H: 32.0°; V: 25.7°<br>19 mm: H: 22.9°; V: 18.4°<br>25 mm: H: 17.6°; V: 14.1°<br>35 mm: H: 11.1°; V: 8.3°<br>50 mm: H: 8.8°; V: 7.0° |
| Thermal Focus Control            | Fixed-focal                                                                                                                                                                                        |
| Close Focus Distance             | 5 mm: 0.6 m (1.97 ft)<br>9 mm: 1.8 m (5.91 ft)<br>13 mm: 4 m (13.12 ft)<br>19 mm: 8 m (26.25 ft)<br>25 mm: 15 m (49.21 ft)<br>35 mm: 28 m (91.86 ft)<br>50 mm: 55 m (180.45 ft)                    |
| Digital Detail Enhancement (DDE) | Yes                                                                                                                                                                                                |
| Digital Zoom                     | 24 levels                                                                                                                                                                                          |
| Thermal AGC                      | Auto/Manual                                                                                                                                                                                        |
| Thermal Noise Reduction          | 2D NR/3D NR                                                                                                                                                                                        |
| Image Flip                       | 180°; Mirror                                                                                                                                                                                       |

|                                  |                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Color Palettes                   | 18 (white hot/black hot/fusion/rainbow/golden autumn/midday/iron red/amber/jade/sunset/icefire/painting/pomegranate/emerald /spring/summer/autumn/winter)                                                                                                                                                                                                                     |
| Temperature Measurement Range    | Low temperature mode: $-20^{\circ}\text{C}$ ( $-4^{\circ}\text{F}$ ) to $+150^{\circ}\text{C}$ ( $+302^{\circ}\text{F}$ )<br>High temperature mode: $100^{\circ}\text{C}$ ( $+212^{\circ}\text{F}$ ) to $+550^{\circ}\text{C}$ ( $+1022^{\circ}\text{F}$ )<br>Auto mode: $-20^{\circ}\text{C}$ ( $-4^{\circ}\text{F}$ ) to $+550^{\circ}\text{C}$ ( $+1022^{\circ}\text{F}$ ) |
| Temperature Measurement Accuracy | Max. ( $\pm 2^{\circ}\text{C}$ , $\pm 2\%$ )<br>Operating temperature: $-20^{\circ}\text{C}$ ( $-4^{\circ}\text{F}$ ) to $+60^{\circ}\text{C}$ ( $+140^{\circ}\text{F}$ )                                                                                                                                                                                                     |
| Temperature Measurement Mode     | Spot: 12<br>Line: 12<br>Area: 12<br>Supports 12 rules simultaneously                                                                                                                                                                                                                                                                                                          |

#### Visible

|                         |                                                                            |
|-------------------------|----------------------------------------------------------------------------|
| Image Sensor            | 1/1.8" CMOS                                                                |
| Max. Resolution         | 2688 (H) $\times$ 1520 (V)                                                 |
| Pixel                   | 4 MP                                                                       |
| Horizontal Definition   | Center $\geq 1200\text{ TVL}$<br>Edge $\geq 900\text{ TVL}$                |
| Min. Illumination       | Color: 0.01 lux<br>Black & white: 0.001 lux<br>0 lux (IR on)               |
| Visible AGC             | Auto/Manual                                                                |
| Visible Noise Reduction | 2D NR/3D NR                                                                |
| S/N Ratio               | $>55\text{ dB}$                                                            |
| White Balance           | Auto; manual; indoor; outdoor; tracking; sodium lamp; street lamp; natural |
| Defog                   | Electronic defog                                                           |

|                            |                                                                                                                         |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Electronic Shutter Speed   | 1 s–1/30,000 s (auto/manual)                                                                                            |
| BLC                        | Yes                                                                                                                     |
| WDR                        | Yes                                                                                                                     |
| HLC                        | Yes                                                                                                                     |
| Day/Night                  | Auto (ICR); Color; B/W                                                                                                  |
| Iris Control               | Manual/Auto                                                                                                             |
| Image Flip                 | 180°; Mirror                                                                                                            |
| Field of View              | 4 mm: H: 87.0°; V: 47.3°<br>6 mm: H: 55.3°; V: 30.0°<br>12 mm: H: 37.3°; V: 21.4°<br>8–32 mm: H: 42°–15°; V: 22.8°–8.4° |
| Close Focus Distance       | 4 mm: 1.2 m (3.94 ft)<br>6 mm: 2.5 m (8.20 ft)<br>12 mm: 7.4 m (24.28 ft)<br>8–32 mm: 9 m (29.53 ft)                    |
| Aperture                   | 4 mm: F1.6<br>6 mm: F1.6<br>12 mm: F1.7<br>8–32 mm: F1.7                                                                |
| Illuminator On/Off Control | Auto; manual                                                                                                            |
| Illumination Distance      | 80 m (262.47 ft)                                                                                                        |

Audio and Video

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Video Compression     | H.265; H.264M; H.264H; H.264B                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Resolution            | Thermal:<br>Main stream: 1280 × 1024; 1280 × 720; 640 × 512; 1280 × 1024 (default);<br>Sub stream: 640 × 512; 320 × 256; 640 × 512 (default)<br>Visible:<br>Main stream: 2688 × 1520; 1920 × 1080; 1280 × 720; 704 × 576; 2688 × 1520 (default);<br>Sub stream: 704 × 576; 352 × 288; 352 × 288 (default)                                                                                                                                                                |
| Video Frame Rate      | Thermal (50 Hz):<br>Main stream: 1 fps–25 fps, 25 fps by default<br>Sub stream: 1 fps–25 fps, 15 fps by default<br>Visible (50 Hz):<br>Main stream: 1 fps–25 fps, 25 fps by default<br>Sub stream: 1 fps–25 fps, 15 fps by default<br>Thermal (60 Hz):<br>Main stream: 1 fps–30 fps, 30 fps by default<br>Sub stream: 1 fps–30 fps, 15 fps by default<br>Visible (60 Hz):<br>Main stream: 1 fps–30 fps, 30 fps by default<br>Sub stream: 1 fps–30 fps, 15 fps by default |
| Audio Compression     | G.711a; G.711mu; PCM; AAC                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Image Encoding Format | JPEG                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Function

|                          |                                                                                                                                        |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Two-way Audio            | Yes                                                                                                                                    |
| Sound and Light Alarm    | Yes                                                                                                                                    |
| Network Protocol         | HTTP; HTTPS; TCP; ARP; RTSP; RTP; UDP; RTCP; SMTP; FTP; DHCP; DNS; DDNS; PPPOE; IPv4/v6; SNMP; QoS; UPnP; NTP; Multicast; SFTP; 802.1x |
| Region of Interest (RoI) | Yes                                                                                                                                    |
| Storage                  | FTP; Micro SD card (optional)                                                                                                          |
| Interoperability         | ONVIF; CGI; DaHua SDK                                                                                                                  |

|                       |                                                                                                                                                   |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Browser               | IE: IE8 and later (including the browsers with IE kernel, such as 360 Explorer, Sougou Explorer); Chrome: 42 and earlier; Firefox: 42 and earlier |
| User/Host             | Up to 12 (total bandwidth: 64 MB)                                                                                                                 |
| Security              | Authorized username and password; attached MAC address; encrypted HTTPS; IEEE 802.1x; controlled network access                                   |
| User Management       | Up to 20 users; supports multi-level user permissions (2 levels): management group and user group                                                 |
| Malfunction Detection | Network disconnection detection; IP conflict detection; memory card state detection; memory space detection                                       |
| Fusion Mode           | Yes                                                                                                                                               |
| PIP                   | Yes                                                                                                                                               |
| Micro SD Card (Max.)  | 512 GB                                                                                                                                            |

Intelligence

|                            |                                       |
|----------------------------|---------------------------------------|
| Heat Detection             | Yes                                   |
| Cold/Hot Spot Trace        | Yes                                   |
| IVS (Perimeter Protection) | Yes. Supports tripwire and intrusion. |
| Target Distinction         | Human/Vehicle Classification          |
| Target Filtering           | Yes (by pixel)                        |

Port

|               |                                                                                                                                                           |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Analog Output | 1 × CVBS output; BNC port                                                                                                                                 |
| Network Port  | 1 × RJ-45 (10/100 Base-T)                                                                                                                                 |
| Alarm Input   | 2                                                                                                                                                         |
| Alarm Output  | 2                                                                                                                                                         |
| Alarm Linkage | Recordings on SD card; digital output; email; snapshot                                                                                                    |
| Alarm Event   | No SD card; low SD card space; SD card error; network disconnection; IP conflict; motion detection; video tampering; intrusion; tripwire; audio detection |
| Audio Input   | 1                                                                                                                                                         |
| Audio Output  | 1                                                                                                                                                         |
| RS-485        | 1                                                                                                                                                         |

Power

|                   |                                                                                                                 |
|-------------------|-----------------------------------------------------------------------------------------------------------------|
| Power Supply      | 12-24 VDC (±10%), PoE (802.3af)                                                                                 |
| Power Consumption | Basic: 5.2 W (illuminator off, heater off, speaker off);<br>Max: 16.2 W (illuminator on, heater on, speaker on) |
| ePoE              | Yes                                                                                                             |

Environment

|                       |                                      |
|-----------------------|--------------------------------------|
| Operating Temperature | –40 °C to +70 °C (–40 °F to +158 °F) |
| Operating Humidity    | ≤95%                                 |
| Storage Temperature   | –40 °C to +70 °C (–40 °F to +158 °F) |

Physical Characteristics

|                    |                                                                     |
|--------------------|---------------------------------------------------------------------|
| Protection         | IP67                                                                |
| Product Dimensions | 300.9 mm × 130.2 mm × 120.1 mm (11.85" × 5.13" × 4.73") (L × W × H) |

|                      |                                                                                                                                                              |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Packaging Dimensions | 423 mm × 180 mm × 178 mm (16.65" × 7.09" × 7.01") (L × W × H)                                                                                                |
| Net Weight           | ≤2.35 kg (5.18 lb)                                                                                                                                           |
| Gross Weight         | ≤2.7 kg (5.95 lb)                                                                                                                                            |
| Lens                 | Included                                                                                                                                                     |
| Reliability          | Surge protection: 6 kV<br>Contact discharge: 8 kV<br>Air discharge: 15 kV                                                                                    |
| Vandal-proof Rating  | Enclosure: IK10                                                                                                                                              |
| Anti-corrosion Level | Basic Protection<br>*The products are designed for general use and are applicable even in areas with no specific requirements for anti-corrosion protection. |

Certification

|                |    |
|----------------|----|
| Certifications | CE |
|----------------|----|

Heat Detection Distance

|                |                     |
|----------------|---------------------|
| Certifications | Max. Distance       |
| 5 mm           | 61 m (200.13 ft)    |
| 9 mm           | 110 m (360.89 ft)   |
| 13 mm          | 156 m (511.81 ft)   |
| 19 mm          | 230 m (754.59 ft)   |
| 25 mm          | 300 m (984.25 ft)   |
| 35 mm          | 420 m (1,377.95 ft) |
| 50 mm          | 600 m (1,968.50 ft) |

**Note:**  
The table displays the measured distances obtained from using the target size 0.2 m × 0.2 m for testing in an environment where the temperature is 23 °C and the relative humidity is below 60%.  
The table is for reference only. The distances within it are subject to actual conditions including atmospheric conditions, target size, the installation site, and more.

Temperature Measurement Distance

|              |                                         |                                         |
|--------------|-----------------------------------------|-----------------------------------------|
| Focal Length | Temperature Measurement Distance (Min.) | Temperature Measurement Distance (Max.) |
| 5 mm         | 1 m (3.28 ft)                           | 5 m (16.40 ft)                          |
| 9 mm         | 2 m (6.56 ft)                           | 8 m (26.25ft)                           |
| 13 mm        | 2 m (6.56 ft)                           | 11 m (36.09 ft)                         |
| 19 mm        | 3 m (9.84 ft)                           | 16 m (52.49 ft)                         |
| 25 mm        | 4 m (13.12 ft)                          | 21 m (68.90 ft)                         |
| 35 mm        | 6 m (19.69 ft)                          | 29.4 m (96.46 ft)                       |
| 50 mm        | 9 m (29.53 ft)                          | 42 m (137.80 ft)                        |

**Note:**  
The table displays the measured distances obtained from using the target size 0.1 m × 0.1 m for testing in an environment where the temperature is 23 °C and the relative humidity is below 60%.  
The table is for reference only. The distances within it are subject to actual conditions including atmospheric conditions, target size, the installation site, and more.

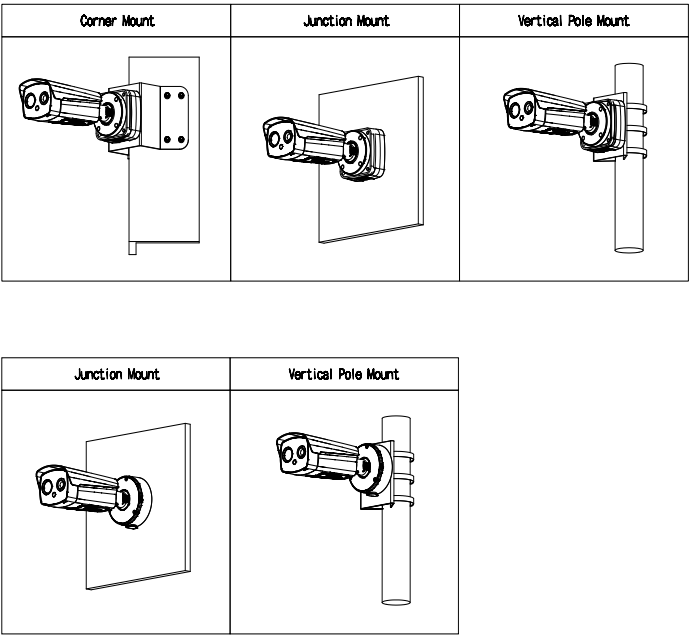
DRI Distance

| Focal Length | Detection Distance <sup>①</sup>                                  | Recognition Distance <sup>②</sup>                             | Identification Distance <sup>③</sup>                      |
|--------------|------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------|
| 5 mm         | Vehicle: 639 m (2,096.46 ft);<br>Human: 208 m (682.41 ft)        | Vehicle: 160 m (524.93 ft);<br>Human: 52 m (170.60 ft)        | Vehicle: 80 m (262.47 ft);<br>Human: 26 m (85.30 ft)      |
| 9 mm         | Vehicle: 1,150 m (3,772.97 ft);<br>Human: 375 m (1,230.31)       | Vehicle: 288 m (944.88 ft);<br>Human: 94 m (308.40 ft)        | Vehicle: 144 m (472.44 ft);<br>Human: 47 m (154.20 ft)    |
| 13 mm        | Vehicle: 1,661 m (5,449.48 ft);<br>Human: 542 m (1,778.22 ft)    | Vehicle: 415 m (1,361.55 ft);<br>Human: 135 m (442.91 ft)     | Vehicle: 208 m (682.41 ft);<br>Human: 68 m (223.10 ft)    |
| 19 mm        | Vehicle: 2,428 m (7,965.88 ft);<br>Human: 792 m (2,598.43 ft)    | Vehicle: 607 m (1,991.47 ft);<br>Human: 198 m (649.61 ft)     | Vehicle: 303 m (994.09 ft);<br>Human: 99 m (324.80 ft)    |
| 25 mm        | Vehicle: 3,194 m (10,479.00 ft);<br>Human: 1,042 m (3,418.64 ft) | Vehicle: 799 m (2,578.74 ft);<br>Human: 260 m (857.98 ft)     | Vehicle: 399 m (1,309.06 ft);<br>Human: 130 m (426.51 ft) |
| 35 mm        | Vehicle: 4,472 m (14,671.92 ft);<br>Human: 1,458 m (4,783.46 ft) | Vehicle: 1,118 m (3,667.98 ft);<br>Human: 365 m (1,197.51 ft) | Vehicle: 559 m (1,833.99 ft);<br>Human: 182 m (597.11 ft) |
| 50 mm        | Vehicle: 6,389 m (20,961.29 ft);<br>Human: 2,083 m (6,833.99 ft) | Vehicle: 1,597 m (5,239.50 ft);<br>Human: 521 m (1,709.32 ft) | Vehicle: 799 m (2,621.39 ft);<br>Human: 260 m (853.02 ft) |

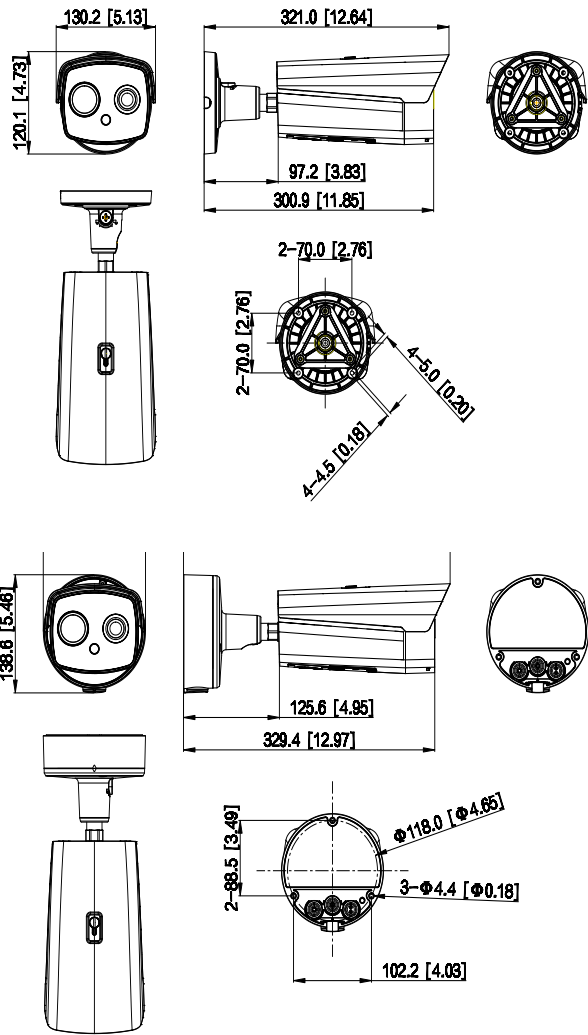
- ① Detection Distance: Detects objects, but cannot recognize their characteristics (objects must cover more than 1.5 pixels of the image).
- ② Recognition Distance: Classifies objects into general categories, such as human, vehicle (the object must cover more than 6 pixels of the image).
- ③ Identification Distance: Classifies objects into specific categories based on their characteristics, such as engineering truck, car (the object must cover more than 12 pixels of the image).

**Note:**  
The table is the standard theoretical calculation and is for reference only. The distances within it are subject to actual conditions including atmospheric conditions, target size, the installation site, and more. For the intelligent detection distance, refer to the table of Perimeter Protection Distance (IVS Distance) above.

| Ordering Information                |                                                                      |                                        |
|-------------------------------------|----------------------------------------------------------------------|----------------------------------------|
| Type                                | Model                                                                | Description                            |
| Thermal Camera                      | DHI-TPC-BF5641-TB5F4-DC-S5-V1<br>DHI-TPC-BF5641-TB5F4-DC-J-S5-V1     | Thermal: 5 mm;<br>Visible: 4 mm        |
|                                     | DHI-TPC-BF5641-TB9F4-DC-S5-V1<br>DHI-TPC-BF5641-TB9F4-DC-J-S5-V1     | Thermal: 9 mm;<br>Visible: 4 mm        |
|                                     | DHI-TPC-BF5641-TB13F6-DC-S5-V1<br>DHI-TPC-BF5641-TB13F6-DC-J-S5-V1   | Thermal: 13 mm;<br>Visible: 6 mm       |
|                                     | DHI-TPC-BF5641-TB19F12-DC-S5-V1<br>DHI-TPC-BF5641-TB19F12-DC-J-S5-V1 | Thermal: 19 mm;<br>Visible: 12 mm      |
|                                     | HI-TPC-BF5641-TB25F12-DC-S5-V1<br>DHI-TPC-BF5641-TB25F12-DC-J-S5-V1  | Thermal: 25 mm;<br>Visible: 12 mm      |
|                                     | HI-TPC-BF5641-TB35Z3-DC-S5-V1<br>DHI-TPC-BF5641-TB35Z3-DC-J-S5-V1    | Thermal: 35 mm;<br>Visible: 8 mm-32 mm |
|                                     | DHI-TPC-BF5641-TB50Z3-DC-S5-V1<br>DHI-TPC-BF5641-TB50Z3-DC-J-S5-V1   | Thermal: 50 mm;<br>Visible: 8 mm-32 mm |
| Accessories (Optional)              | PFA151 + PFA121                                                      | Corner Mount Bracket                   |
|                                     | PFA121                                                               | Junction Mount                         |
|                                     | PFA150+PFA121                                                        | Vertical Pole Mount Bracket            |
| Accessories (Optional for -J model) | PFM320D                                                              | Power Adapter                          |
|                                     | PFA154                                                               | Vertical Pole Mount Bracket            |



Dimensions (mm[inch])



Accessories

Optional:



PFA151 + PFA121  
Corner Mount Bracket

PFA121  
Junction Mount

PFA150 + PFA121  
Vertical Pole Mount Bracket



PFM320D  
Power Adapter

For Junction box model (-J):



PFA154  
Vertical Pole Mount Bracket