

# **Thermal Module (Mini Series)**

## **User's Manual**



V2.0.1

# 1 Performance Parameters

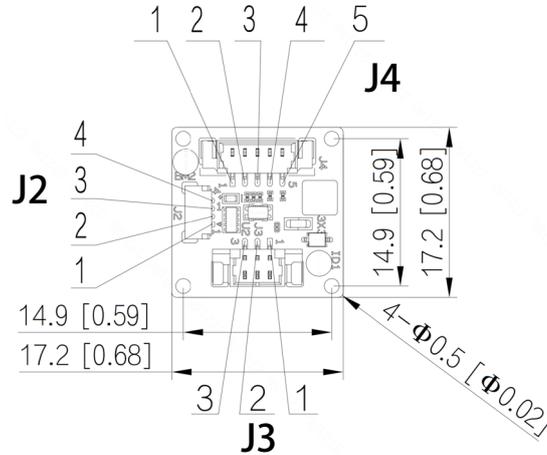
Thermal Model	Mini-640-CVBS	Mini-384-CVBS	Mini-256-CVBS
Detector Type	Vanadium oxide, uncooled, focal plane array detector		
Effective Pixels	640 (H) × 512 (V)	384 (H) × 288 (V)	256 (H) × 192 (V)
Pixel Pitch	12 μm		
Frame Rate (fps)	50		
Spectral Range	8 μm–14 μm		
Net noise equivalent temperature difference (NETD)	≤40mK@f/1.0		
<b>Physical Characteristics</b>			
Focal Length (mm)	9.1/13	9.1/13	4/7/10
	F1.0	F1.0	F1.0
Field of view	45.9° × 36.9°/32.9° × 26.6°	28.7° × 21.7°/20.1° × 15.1°	46.8°×34.1°/24.6°×18.59° /16.9°×12.8°
Dimension	17.3 mm × 17.3 mm × 35.6 mm		
Net Weight (lens excluded)	21 g		
<b>Image</b>			
Brightness, Contrast, Sharpness Adjustment	Yes		
Gain Control	Auto/Manual		
Noise Reduction	2D NR/3D NR		
Image Flip, Mirror	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)		
Reticle	Display/Disappear/Hide		
Image Processing	UVC/Digital filtering noise reduction /Digital detail enhancement		
<b>Interface</b>			
Expansion Interfaces	CVBS /USB (2.0)		
Serial Communication	UART (3.3V) /USB serial interface		
<b>Power</b>			
Power Supply	4.5–20 VDC		
Typical Power Consumption@25°C	< 0.75 W	< 0.7 W	
<b>Environment</b>			
Operating Temperature	–40 °C to +70 °C (–40 °F to +158 °F)		
Storage Temperature	–40 °C to +80 °C (–40 °F to +176 °F)		
Operating Humidity	95% (no condensation)		
Vibrate	6.06 g (0.01 lb), random vibration, all axial directions		

# Mainboard Interfaces

## CVBS Expansion Board

The CVBS expansion board supports two CVBS and USB interfaces, including module power interface and CVBS analog video interface.

Figure 3-3 Mini-CVBS expansion board (mm [inch])



### J2 : 4-Pin USB interface

Table 3-2 Definition of J2 0.8T-WT-NP connector interface

Pin No.	Pin Name	Type	Description
1	GND	Power	Grounded
2	USB_DP	Data positive signal	USB2.0
3	USB_DM	Data negative signal	
4	+5 V	Power	Power input (5 VDC $\pm$ 10%)

### J3 : 3-Pin CVBS interface

Table 3-3 Definition of J3 1.25T-7-LT-3A connector interface

Pin No.	Pin Name	Type	Description
1	+4.5–20 V	Power	Power input (4.5–20 VDC)
2	GND		Grounded
3	CVBS	Output	CVBS video signal

### J4: 5-Pin CVBS interface

Table 3-4 Definition of J4 1.25T-1-LT-5A connector interface

Pin No.	Pin Name	Type	Description
1	+4.5–20 V	Power	Power input (4.5–20 VDC)
2	GND		Grounded
3	CVBS	Output	CVBS video signal
4	UART1_TXD_3V3	Input/Output	Serial communication interface (3.3 V)
5	UART1_RXD_3V3		

