



M series infrared thermal imager module Technical Specifications



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M13A25 Infrared Thermal Imager Core Specifications

1 Product Description

The M series infrared thermal imager adopts a 17 μm uncooled infrared focal plane detector, a high-performance infrared lens, an excellent imaging processing circuit, and is embedded with advanced image processing algorithms. It has the characteristics of small size, low power consumption, fast startup, excellent imaging quality, and accurate temperature measurement.

the M series infrared thermal imager movement fully considers the requirements of high and low temperature working performance to ensure that the whole machine has excellent environmental adaptability.

M series infrared thermal imager movement features:

1. It has all-weather passive thermal imaging function, has strong smoke penetration performance, and can be used in a wide range of ambient temperature.
2. The high frame rate design enables the operator to observe fast-moving targets.
3. The full-frame temperature measurement infrared thermal imager movement is used to achieve full-frame temperature measurement. Through front-end processing, the highest temperature, lowest temperature, center temperature and average temperature can be superimposed on the thermal imaging video. At the same time, multiple areas can be selected for local temperature measurement.

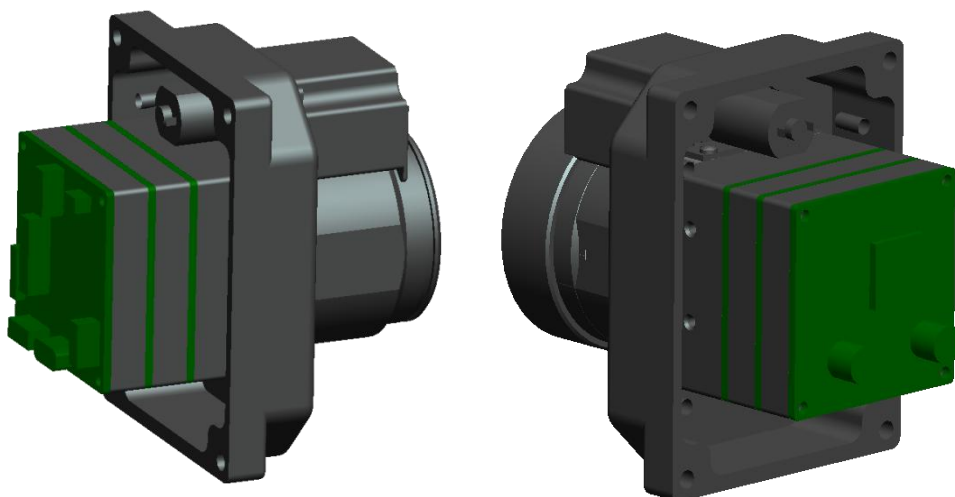


Figure 1 M series infrared thermal imager movement renderings

2 Product Specifications

Detector	
Detector Type	Uncooled focal plane microbolometer
Number of pixels	384 × 288
Pixel spacing	17μm
Wavelength range	8~14μm
Thermal sensitivity (NETD)	≤50mk@30°C
Frame rate	25Hz
Image processing and display	
Imaging time	≤15S
Image Optimization	support
Non-uniformity correction	support
Image Noise Reduction	support
Digital detail enhancement	support
Electronic zoom	1.0~4.0 times infinite magnification
Polarity control	support
Color Palette	Multiple color palettes including white hot, black hot, iron red,
Analog video output	CVBS(PAL)
Grayscale range adjustment	Automatic/Manual
Contrast, brightness	Automatic/Manual
Image Mode	HDR wide dynamic mode
Temperature measurement analysis	
Temperature measurement accuracy	±2°C or ±2%
Temperature measurement range	Normal temperature: -20°C~200°C
Highest temperature point tracking	support
Minimum temperature point tracking	support
Global maximum temperature display	support
Global minimum temperature display	support
Center point temperature display	support
Average temperature display	support
Custom temperature measurement frame	support

Electrical Characteristics	
Digital electrical interface	DF12(5.0)-50DP-0.5(86)
Analog electrical interface	BM06B-SRSS-TB
Input power voltage	5V~12VDC
Steady-state power consumption	<1.5W
Peak power consumption	<2.0W
Reverse polarity protection	have
Over-voltage and under-voltage protection	have
Communication interface	One UART@TTL(3.3V) ; One UART (RS232)
Digital Video Interface	8bit parallel data @ TTL (3.3V)
Environmental parameters	
Operating temperature	-40°C~60°C
Storage temperature	-50°C~70°C
Temperature shock resistance	5°C/min (-40°C~60°C)
Vibration resistance	4.3g, 2 hours for each of x, y and z axes
Shock resistance	Acceleration 30g, half sine wave, pulse width 6ms, impact 3 times in the installation direction
humidity	≤95% (non-condensing)
Lenses	
Focus mode	electric
Auto Focus	support
Physical properties	
Dimensions	76.0mm × 57.2mm × 75.0mm
weight	<310g
Mounting holes	Two M3×4 on each side

3 Electrical interface

This section introduces the user interface definition of the infrared thermal imager core interface board. The default interface includes an expansion interface board, which mainly provides 6-pin connectors and 50-pin connectors.

3.1 Default interface diagram

The expansion interface board provides 6-pin and 50-pin connectors, as shown in the following figure.

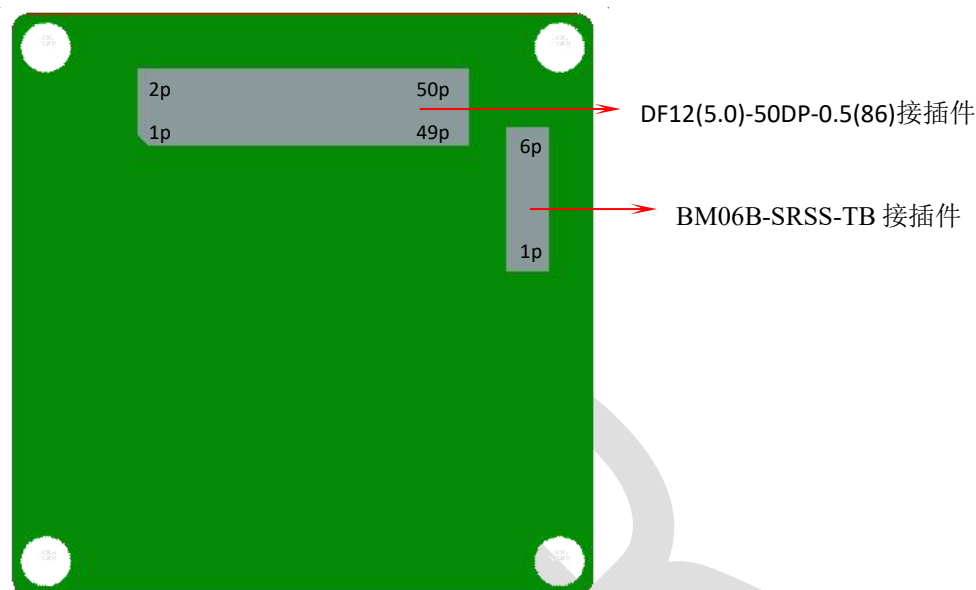


Figure 2 Interface board connector diagram

- The model of the 6-pin connector is BM06B-SRSS-TB , which can output analog images through the PAL interface, provide a 5V~12V power interface, and provide an RS232 communication interface. The specific definitions are shown in Table 1.
- The model of the 50-pin connector is DF12(5.0)-50DP-0.5(86) , which provides a 5V~12V power interface, a UART @ TTL (3.3V) communication interface, and outputs 8-bit parallel digital video (with line and field clocks). The specific definitions are shown in Table 2.

Table 1 BM06B-SRSS-TB connector signal definition

Pin	Signal Name	Function	Description
1	VCC_IN	Power	5V ~ 12V Input
2	DGND	Power	Digital Ground
3	RS232_TX	Output	RS232 transmit
4	RS232_RX	Input	RS232 receive
5	AGND	Power	Analog Ground
6	EXT_CVBS	Output	Analog video

Table 2 DF12(5.0)-50DP-0.5(86) connector signal definition

Pin	Signal Name	Function	Description
1	TTL_TX	Output	Uart transmit
2	TTL_RX	Input	Uart receive
3	HD	Output	HSYNC
4	VD	Output	VSYNC



5/6/17/18	DGND	Power	Digital Ground
19	D15(Reserved)	Output	Digital Data15 Output
20	D14(Reserved)	Output	Digital Data14 Output
21	D13(Reserved)	Output	Digital Data13 Output
22	D12(Reserved)	Output	Digital Data12 Output
23	D11(Reserved)	Output	Digital Data11 Output
24	D10(Reserved)	Output	Digital Data10 Output
25	D9(Reserved)	Output	Digital Data9 Output
26	D8(Reserved)	Output	Digital Data8 Output
27/28	DGND	Power	Digital Ground
29	D7	Output	Digital Data7 Output
30	D6	Output	Digital Data6 Output
31	D5	Output	Digital Data5 Output
32	D4	Output	Digital Data4 Output
33	D3	Output	Digital Data3 Output
34	D2	Output	Digital Data2 Output
35	D1	Output	Digital Data1 Output
36	D0	Output	Digital Data0 Output
37/38	DGND	Power	Digital Ground
39	Clk	Output	Digital Clk Output
47/49	DGND	Power	Digital Ground
48/50	VCC_IN	Power	5V~12V Input
Other pins	I/O	Output	/

Note: Both the 6-pin connector and the 50-pin connector have power interfaces and cannot be powered at the same time .

3.2 Digital Video Timing

The output digital video line and field timing is shown in the figure below.

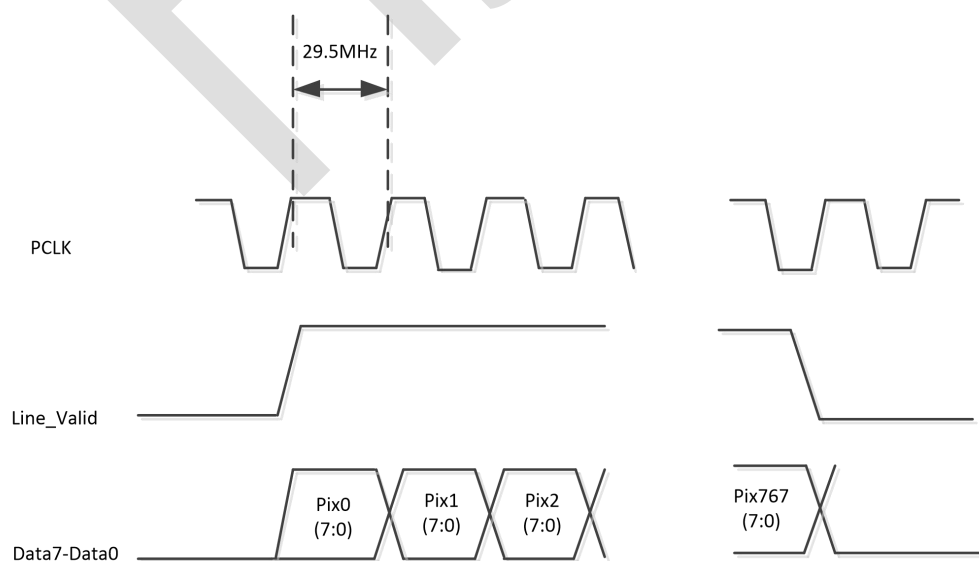




Figure 3 Row timing diagram

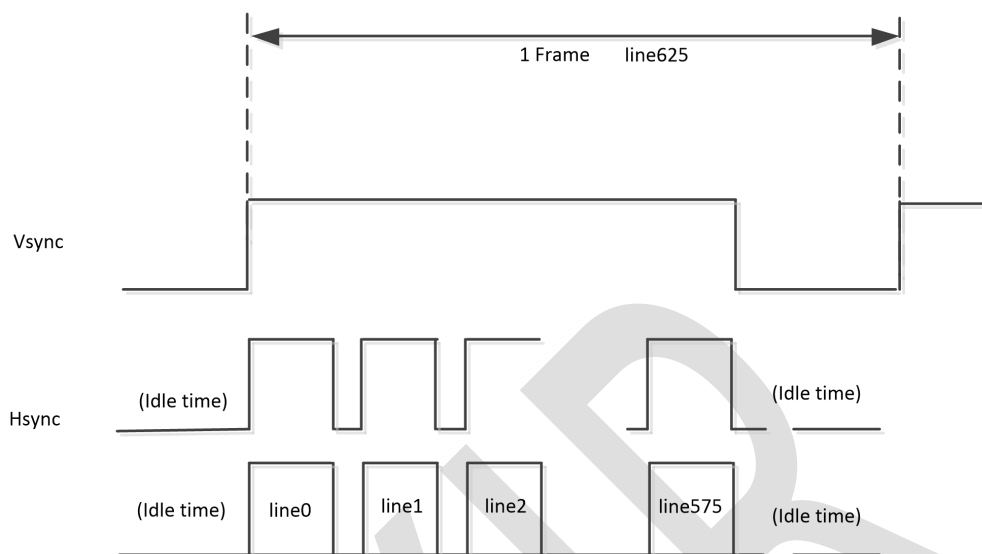


Figure 4 Field timing diagram

As shown in the figure above, the total number of pixels in a row is 1888, of which the effective number of pixels is 768. The total number of rows in a frame of image is 625, of which the effective number of rows is 576.

4 Communication interface protocol

4.1 Physical Interface

Communication interface: one is UART @ TTL (3.3V) , one is UART @ RS232 .

Note: For 16-bit data, the low byte comes first and the high byte comes last.

4.2 Communication Format

Baud rate: 115200bps (default)

Start bit: 1 bit

Data bit: 8bit

Check digit: NONE

Stop bit: 1 bit

4.3 Data Format

The specific data format is as follows:

Table 3 Data format

Frame Header	length	Command word	Data Area	Check digit	Frame end
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1 byte	1 byte	2 bytes	Multibyte	1 byte	2 bytes
CC	1-255	Annex Agreement	Annex Agreement	(from frame header to data and check)%256	EB AA

Note: Length = the sum of (command word + data area + check bit),

$$\text{Check bit} = (\text{from frame header to data for checksum}) \% 256.$$

5 Mechanical interface

5.1 Overall size

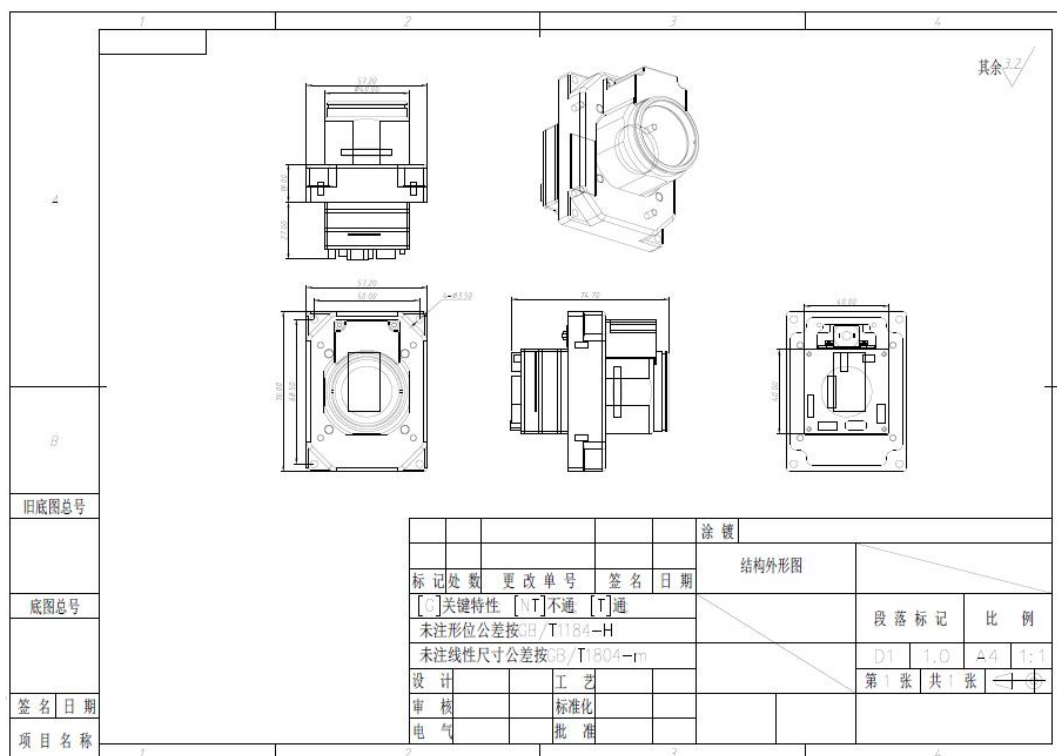


Figure 5 Structural dimensions