VD640 Uncooled Thermal Imaging Core

640×512 VOx Microbolometer | USB / CVBS / MIPI Multifunction Thermal Module

Customer	
Product Number	HJTI-640-V1.0
Version	01
Date	



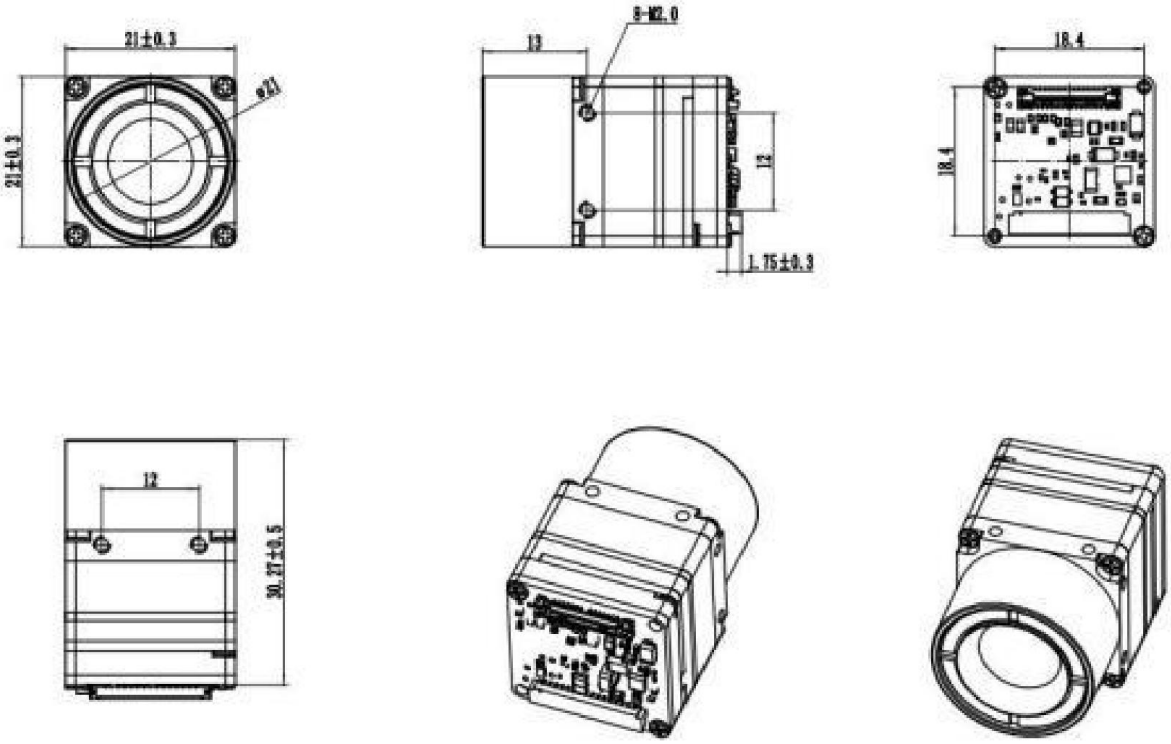
HJTI-640-V1.0 thermal imaging core with 9 mm lens

The HJTI-640-V1.0 is a compact 640×512 uncooled thermal imaging core built around a VOx microbolometer detector with 8–14 µm spectral response and 60 Hz frame rate. Video output is available over USB 2.0 and CVBS (PAL), with a 26-pin DVP/MIPI interface for embedded integration. Multiple pseudo-color palettes, 1–8× electronic zoom, automatic shutter-based calibration and a Windows/Linux SDK make it a drop-in choice for handheld thermal devices, drones, security and industrial inspection.

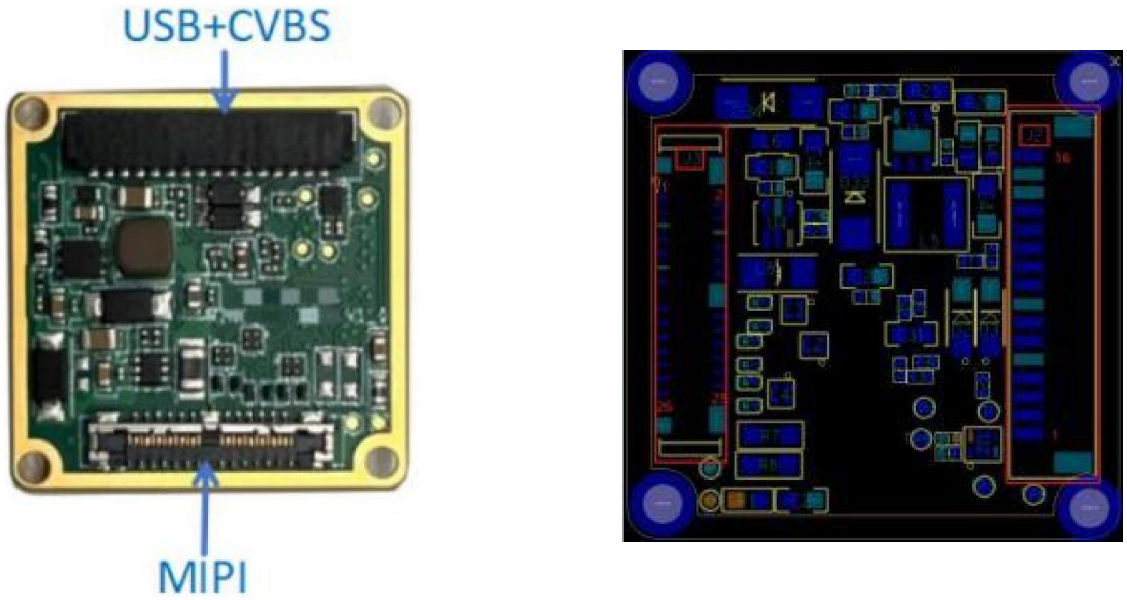
1 Specifications

Parameter	Specification
LENS	
Focal length	9 mm
Field of view	46.2° × 37.7°
Detection range	900 m
Recognition range	225 m
Identification range	113 m
DETECTOR	
Sensor type	VOx (vanadium oxide) uncooled focal plane array
Spectral response	8–14 μm
Array format	640 × 512 (effective)
NETD	≤ 35 mK @ 25°C, F#1.0, 25 Hz
Frame rate	60 Hz
INTERFACE	
Video interface	USB 2.0, CVBS (PAL)
Control interface	USB, RS232 (UART)
Connector	DF52-16S-0.8H (16-pin)
Extended interface	26-pin DVP / MIPI (DF56C, see Section 4)
FUNCTIONS	
Pseudo-color palettes	White Hot (default), Black Hot, Red Hot, Ironbow and more
Image enhancement	Supported, adjustable
Brightness / Contrast	Supported, adjustable
Electronic zoom	1× – 8×
Shutter	Built-in mechanical shutter, automatic calibration
Shutter calibration	Via USB host software or UART protocol
NUC (non-uniformity correction)	Via USB host software or UART protocol
PHYSICAL	
Power input	USB (5 V)
Operating temperature	-20°C ~ +60°C
Power consumption	≤ 0.8 W
Shock	80 g @ 4 ms
Weight	24 g
Dimensions	21 × 21 × 30.2 mm
SOFTWARE	
SDK / Development	Windows / Linux SDK with full control protocol for secondary development

2 Dimensions & Interfaces



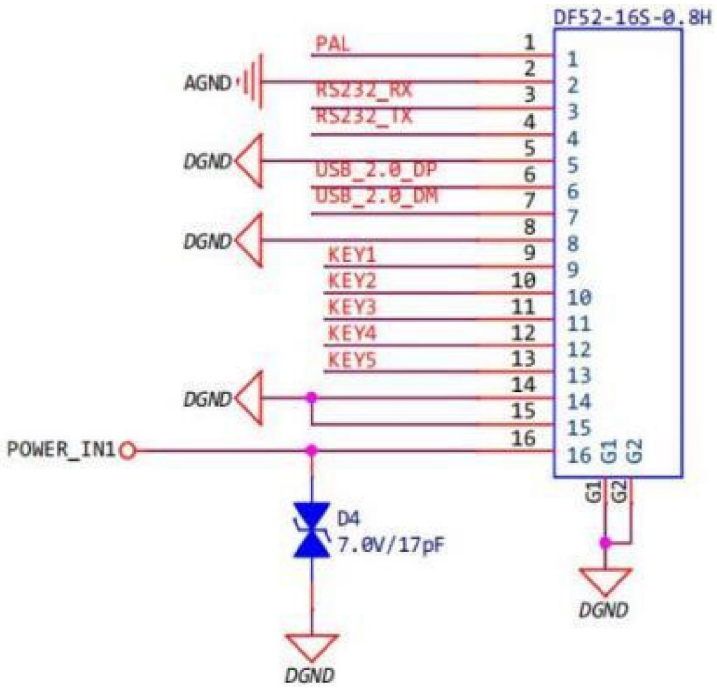
Mechanical drawing (all dimensions in mm). Dimensions may vary slightly between product versions.



Left: board interface side - USB+CVBS connector (top) and MIPI/DVP connector (bottom). Right: PCB layout top view.

3 Pin Definition - J1 (DF52-16S-0.8H, USB / CVBS / Control)

No.	Name	Voltage	Description	Notes
1	**PAL**	/	PAL CVBS video output	
2	**AGND**	/	Analog ground	
3	**RS232_RX**	/	RS232 receive	
4	**RS232_TX**	/	RS232 transmit	
5	**DGND**	/	Digital ground	
6	**USB_2.0_DP**	/	USB 2.0 data signal (positive)	Differential impedance 90 Ω
7	**USB_2.0_DM**	/	USB 2.0 data signal (negative)	Differential impedance 90 Ω
8	**DGND**	/	Digital ground	
9	**KEY1**	3.3 V	Key input 1	Reserved
10	**KEY2**	3.3 V	Key input 2	Reserved
11	**KEY3**	3.3 V	Key input 3	Reserved
12	**KEY4**	3.3 V	Key input 4	Reserved
13	**KEY5**	3.3 V	Key input 5	Reserved
14	**DGND**	/	Digital ground	
15	**DGND**	/	Digital ground	
16	**POWER_IN1**	5 V	Power supply input (USB 5 V)	

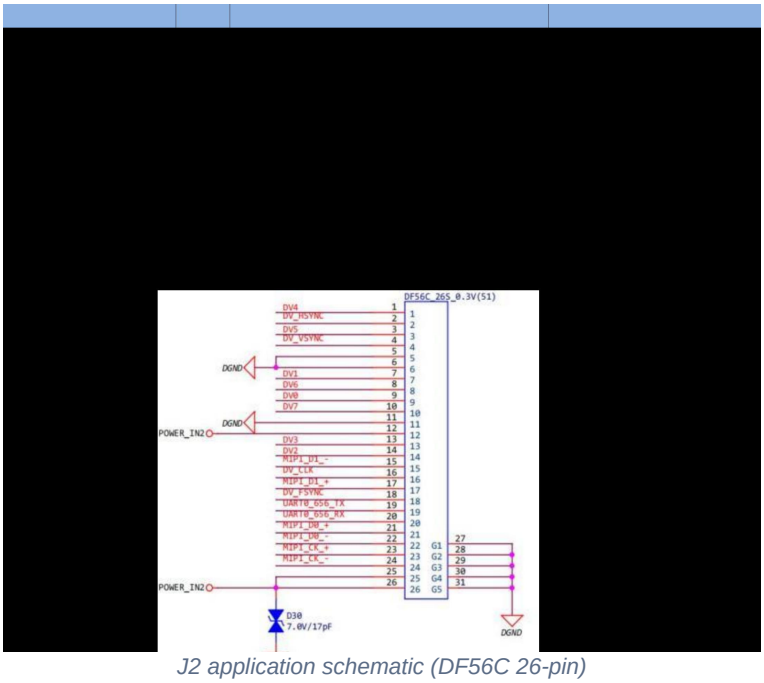


J1 application schematic (DF52-16S-0.8H)

4 Pin Definition - J2 (DF56C 26S, DVP / MIPI)

No.	Name	Voltage	Description	Notes
1	**DV4**	3.3/1.8 V	DVP video output: DATA4	
2	**DV_HSYNC**	3.3/1.8 V	DVP video output: HSYNC	
3	**DV5**	3.3/1.8 V	DVP video output: DATA5	
4	**DV_VSYNC**	3.3/1.8 V	DVP video output: VSYNC	
5	**DGND**	/	Digital ground	
6	**DGND**	/	Digital ground	
7	**DV1**	3.3/1.8 V	DVP video output: DATA1	
8	**DV6**	3.3/1.8 V	DVP video output: DATA6	
9	**DV0**	3.3/1.8 V	DVP video output: DATA0	
10	**DV7**	3.3/1.8 V	DVP video output: DATA7	
11	**DGND**	/	Digital ground	
12	**POWER_IN2**	5 V	Digital power supply	
13	**DV3**	3.3/1.8 V	DVP video output: DATA3	
14	**DV2**	3.3/1.8 V	DVP video output: DATA2	
15	**MIPI_D1-**	/	MIPI video output: D1N	Differential impedance 100 Ω
16	**DV_CLK**	3.3/1.8 V	DVP video output: CLK	
17	**MIPI_D1+**	/	MIPI video output: D1P	Differential impedance 100 Ω
18	**DV_SYNC**	3.3/1.8 V	DVP video output: FSYNC	
19	**UART0_656TX**	3.3 V	UART0 TX	
20	**UART0_656RX**	3.3 V	UART0 RX	
21	**MIPI_D0+**	/	MIPI video output: D0P	Differential impedance 100 Ω
22	**MIPI_D0-**	/	MIPI video output: D0N	Differential impedance 100 Ω
23	**MIPI_CK+**	/	MIPI video output: CKP	Differential impedance 100 Ω
24	**MIPI_CK-**	/	MIPI video output: CKN	Differential impedance 100 Ω
25	**POWER_IN2**	5 V	Digital power supply	
26	**POWER_IN2**	5 V	Digital power supply	

Note: all DVP signals default to 1.8 V at power-on and are configurable to 3.3 V or 1.8 V after boot. MIPI pairs use 100 Ω differential impedance.



J2 application schematic (DF56C 26-pin)