General description

The epc670-BC (Board-to-Board Connector) Chip Carrier is a compact, easy-to-use module featuring the epc670 – a fully integrated 3D Time-of-Flight (ToF) imager with a resolution of 320 × 240 pixels (QVGA). It enables straightforward mechanical mounting and electrical interconnection to a carrier PCB that provides the required illumination and application-specific circuitry. Standard lenses can be easily mounted using common lens holders.

Features

- epc670 chip assembled on carrier for easy-to-use application
- Easy lens mounting by using standard lens mounts and lenses
- Well suited for small and medium volume production

Applications

- Chip evaluation

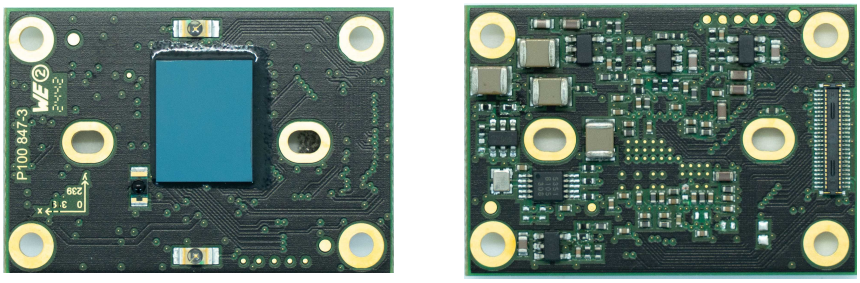

Figure 1: epc670 Board-to-Board Connector Chip Carrier

1. Ordering information

Part #	Part Name	Description	RoHS
P101 130	epc670-004-BC-001 Chip Carrier	epc670 on chip carrier, board-to-board connector	yes
P100 527	epc-bp860-8.0 × 8.0 × 0.3 mm	Optical IR bandpass filter 860 nm, for epc670	n/a
P100 530	epc-bp955-8.0 × 8.0 × 0.3 mm	Optical IR bandpass filter 955 nm, for epc670	n/a
P301 276	Lens Holder 26 × 20 × 10 mm	Lens holder without filter, M12 S-Mount, 22 mm pitch	n/a
P100 506	Lens 149°, 1/2", M12 S-Mount	FOV 108° × 77° on epc670	n/a
P100 843	Lens 88°, 1/2", M12 S-Mount	FOV 70° × 52° on epc670	n/a
P100 596	Lens 38°, 1/2°, M12 S-Mount	FOV 31° × 24° on epc670	n/a

Table 1: Ordering Information

2. Operation

This module integrates the epc670 chip along with all required passive components that must be placed in close proximity to the chip. It is designed to connect via a Hirose DF40GB-48DS board-to-board connector, through which all signals necessary for operating the epc670 are accessible. For mechanical integration, M2 SMD solderable standoffs (3.0 mm height) are recommended to maintain proper spacing between the main PCB and the epc670-BC chip carrier. To mount a standard lens holder, M2 × 5 mm Philips screws (steel grade 4.8, in accordance with ISO 7048) can be used. Detailed information on the operation of the epc670 chip can be found in the epc670 datasheet.

3. Schematic diagram

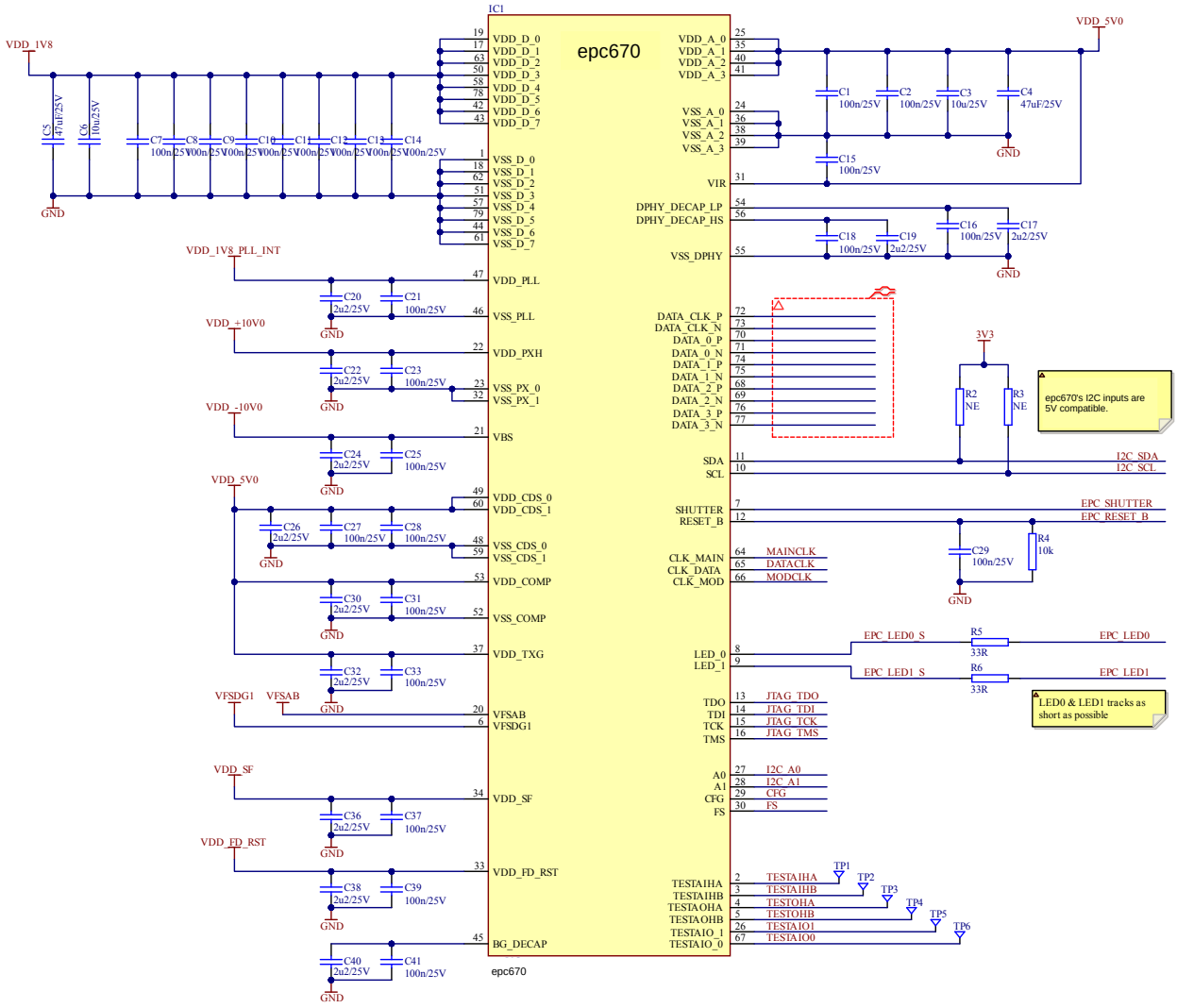

Figure 2: Schematic diagram – TOF imager epc670

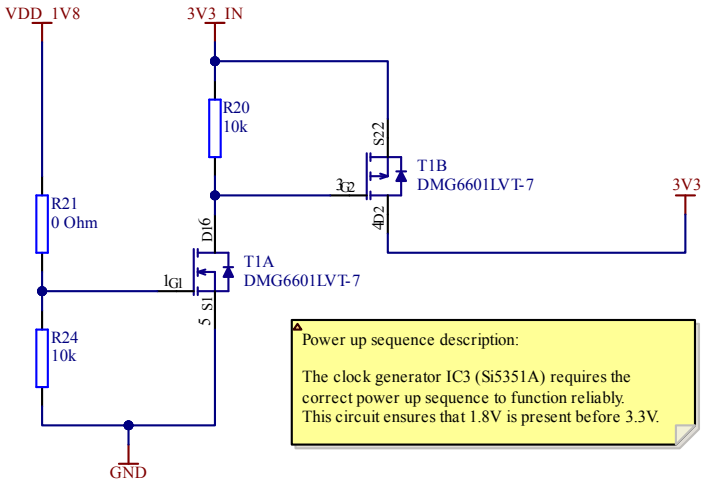

Figure 3: Schematic diagram – power-up sequencing

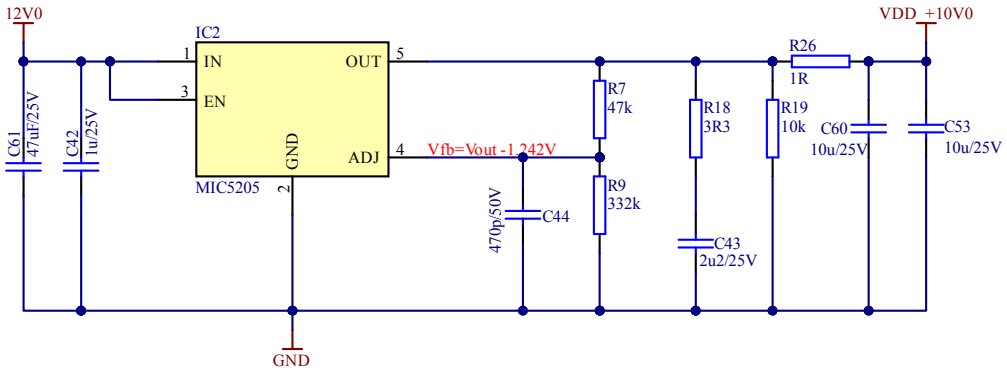

Figure 4: Schematic diagram – LDO for storage gate driver supply voltage

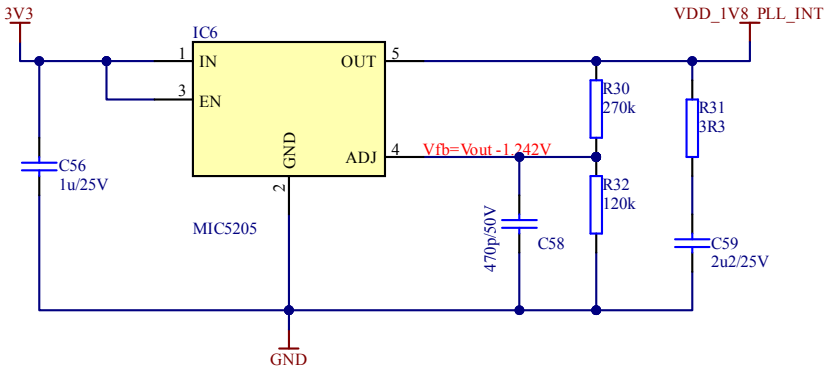

Figure 5: Schematic diagram – LDO for PLL supply voltage

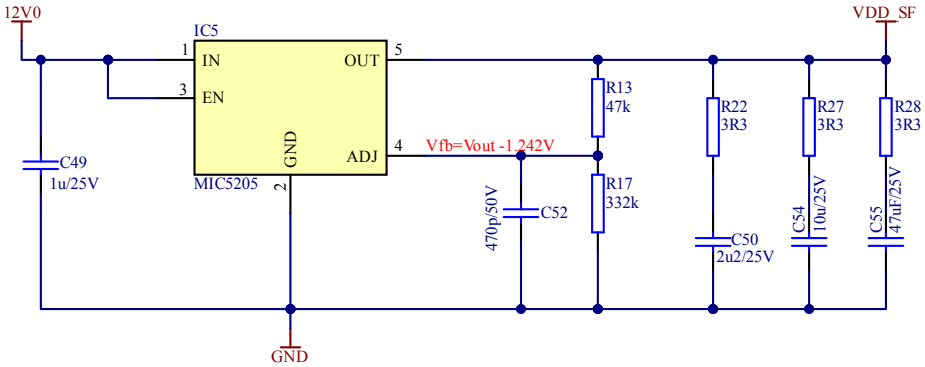

Figure 6: Schematic diagram – LDO for source follower supply voltage

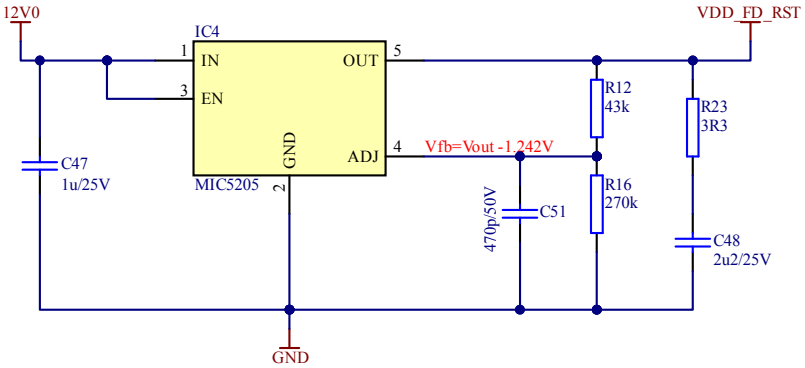

Figure 7: Schematic diagram – LDO for floating diffusion reset supply voltage

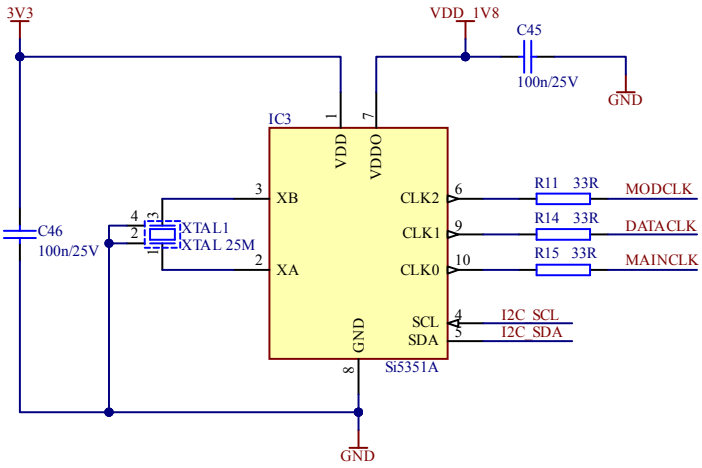

Figure 8: Schematic diagram – clock source

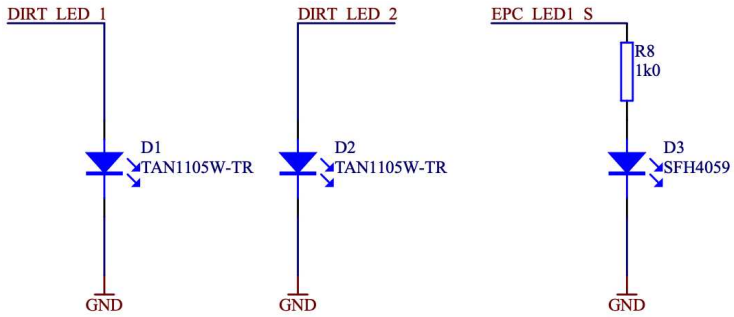

Figure 9: Schematic diagram – dirt detection and functional safety LEDs

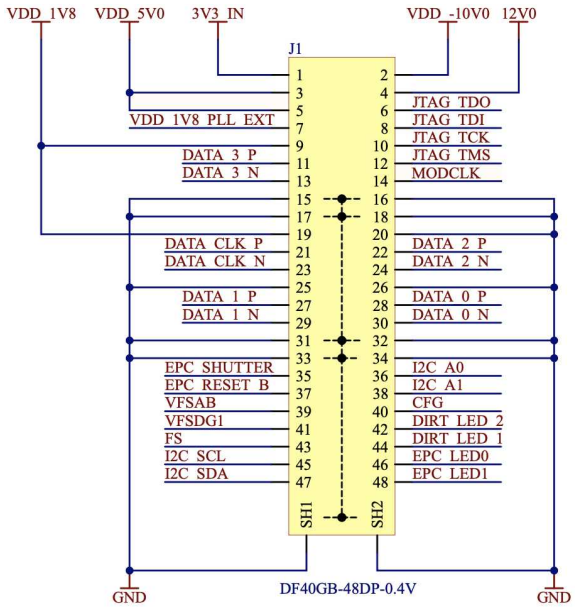

Figure 10: Schematic diagram – interface connector

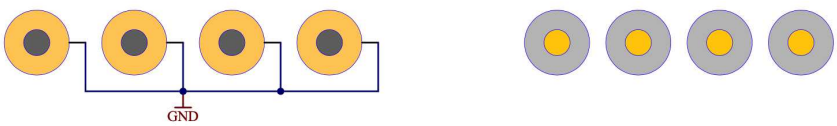

Figure 11: Schematic diagram – mounting holes and fiducials

4. Board layout

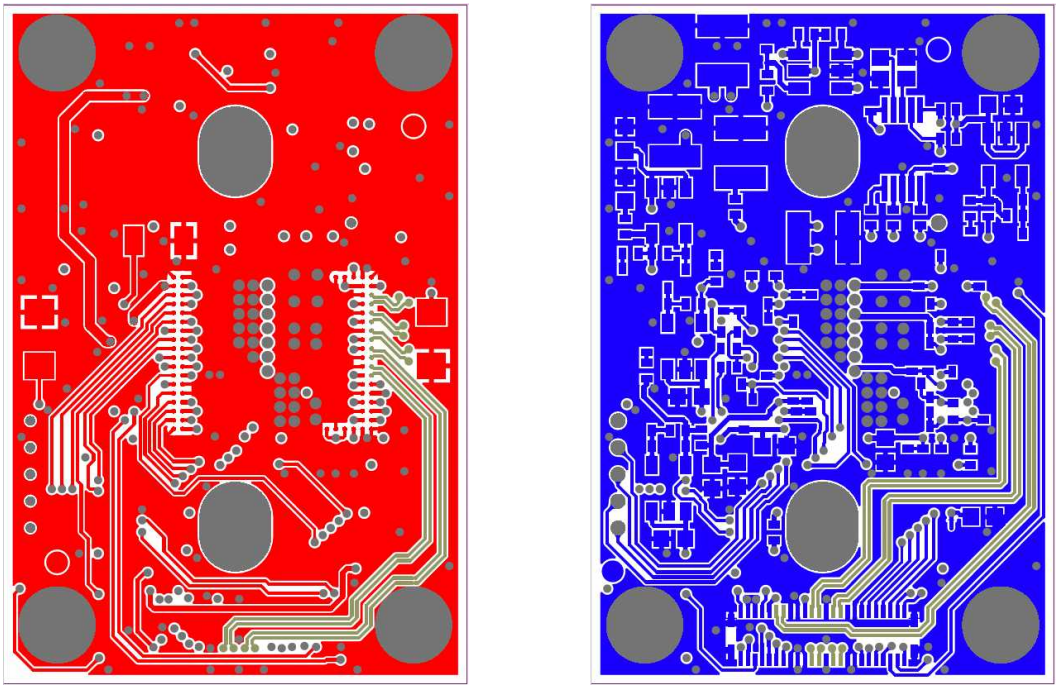

Figure 12: Layout top and bottom

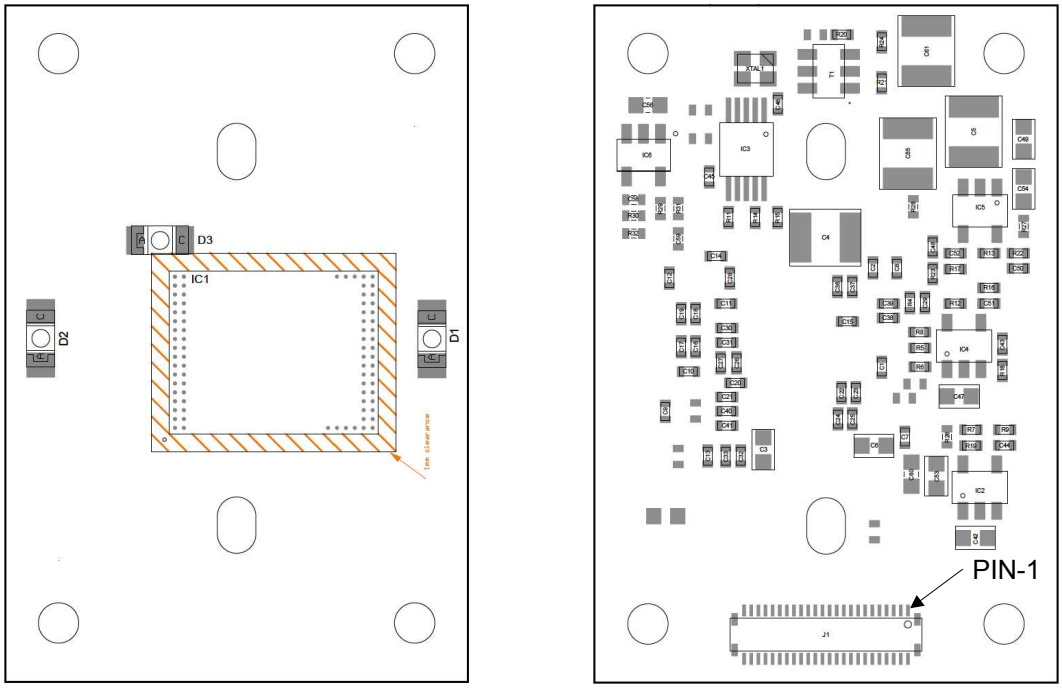

Figure 13: Assembly top and bottom

5. Mechanical dimensions

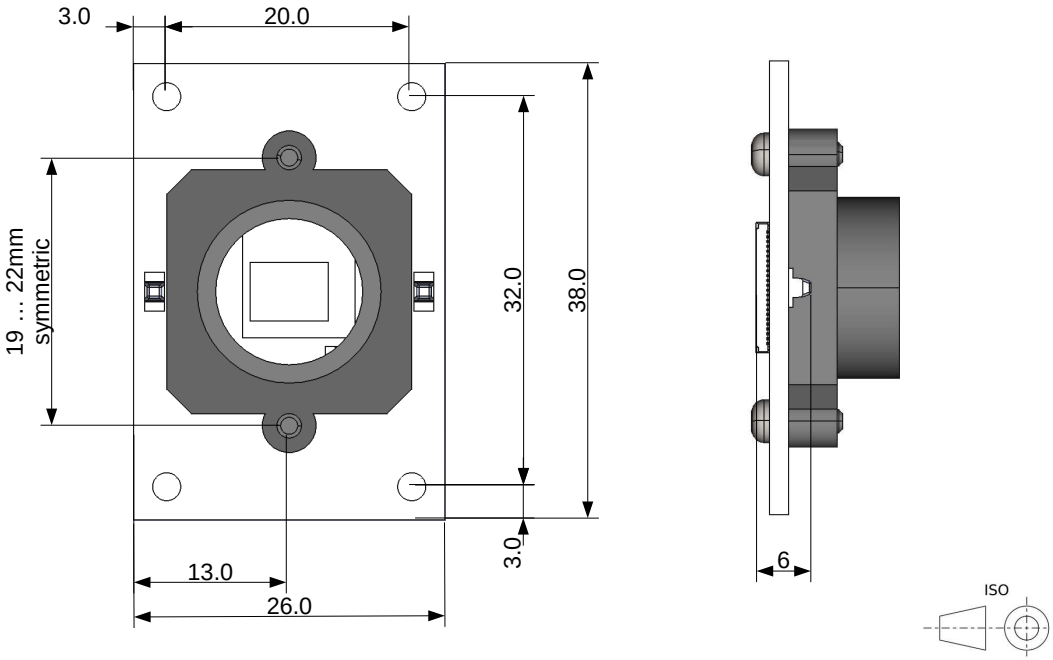

Figure 14: Dimensions
(in mm, PCB material is glass epoxy FR-4, thickness 1.6 mm)

Figure 15: Assembly with lens holder and lens

6. Socket

Figure 16 shows the Hirose Electric J board-to-board connectors of the DF40 series.

The plug DF40GB-48DP-0.4V(58) with outer shroud contacts is assembled on the chip carrier.

A mating receptacle of the DF40 series such as DF40GB(3.0)-48DS-0.4V(51) must be used on the main PCBA. For detailed information, please refer to the DF40GB(3.0)-48DS-0.4V(51) datasheet.

Figure 16: Hirose Electric J vertical board-to-board connector

7. Packaging

The parts are delivered in a 56 mm wide carrier tape sealed with an appropriate cover tape.

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