

Aptina™ MT9V034 camera module with FFC connection

- **WVGA (752 x 480) CMOS image sensor**
- **Wide dynamic range up to 110dB**
- **Global shutter TrueSNAP™**
- **Context switching**
- **Monochrome or Color**
- **Low power, small size, low weight**
- **M12x0.5 lens mount**
- **Digital parallel interface with FFC 30 pins**

General description

MBSV034M/C camera modules include Aptina™'s latest sensors for automotive and surveillance applications featuring DigitalClarity® CMOS imaging technology - Aptina's breakthrough **low-noise CMOS imaging** technology that achieves CCD image quality (based on signal-to-noise ratio and low-light sensitivity) while maintaining the inherent size, cost and integration advantages of CMOS. This sensor brings superior performance for robotics vision with **global shutter** enabling fast-moving object capture without image tearing and **wide dynamic range (HDR)** for high-contrast imaging.

MT9V034 sensor features

- Wide dynamic range
- Real-time exposure context-switching; dual register
- TrueSNAP™ global shutter with simultaneous integrate and readout
- Monochrome or RGB Bayer color filter available
- Enhanced near-IR performance
- Programmable to any window size: QVGA, CIF, QCIF, etc.
- Progressive or interlaced readout modes
- 2x2 and 4x4 binning at full resolution
- Simple two-wire serial interface
- Automatic and programmable functions: regionally weighted exposure, black level offset correction, horizontal blanking, vertical blanking, lighting control, windowing, left-right and top-bottom image reversal, regional gain, image decimation, manual or automatic high dynamic.

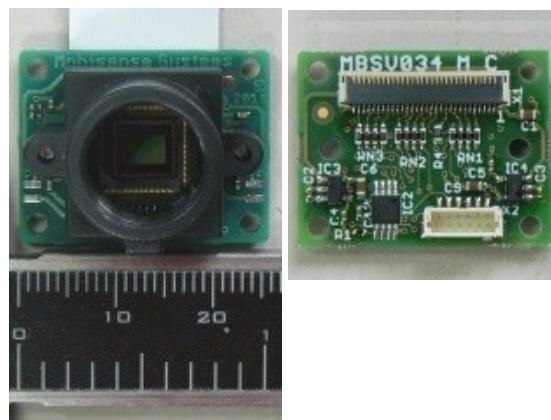
MBSV034 features

- Parallel output, power and I2C on FFC 30 pins 0.5mm pitch: DOUT<9:0>, LINE_VALID, FRAME_VALID, PIXCLK, SYSCLK, SDATA, SCLK
- Alternate signal and ground lines and series resistors on parallel output preserve signal integrity over "long" FFC.
- High retention FFC connector (FCI VLL series)
- I2C GPIO expander for sensor hardware reset, standby, and I2C address selection
- Extra wire to board connector with synchronization signals: exposure start, LED strobe output, master/slave line and frame sync.
- Single 4.0 ... 5.5V supply.
- M12x0.5 lens mount for wide lens choice.
- **Full Video for Linux Two (V4L2) support on MBS270 XScale boards.**

Applications

- Vision guidance
- Machine vision
- Video surveillance

MBSV034M-FFC MBSV034C-FFC



Actual size 26 x 20mm (1 x 0.8")

Key specifications

MT9V034 Sensor

Optical format	1/3-inch
Active imager size	4.51mm(H) x 2.88mm(V) 5.35mm diagonal
Active pixels	752H x 480V
Pixel size	6.0 x 6.0µm
Color filter array	Monochrome or color RGB Bayer pattern
Shutter type	TrueSNAP™ Global shutter
Maximum data rate master clock	27 Mp/s 27 MHz
Full resolution	752 x 480
Frame rate	60 fps (at full resolution)
ADC resolution	10-bit column-parallel
Responsivity	4.8 V/lux-sec (550nm)
Dynamic range	>55dB linear; >110dB in HDR mode
Operating temperature	-30°C to +70°C ambient

Connectivity

FFC 30pins	Power, 10 bits parallel video data out, I2C, sensor clock
Harwin 6 pins	STLN_OUT, EXPOSURE STFRM_OUT, LED_OUT

Power

Supply	4.0 ... 5.5V
Consumption	<160mW at maximum data rate
Standby	120µW

Mechanical

PCB dimensions	26 x 20mm (1 x 0.8")
Height without lens	28mm (1.1")
Weight without lens	5g

Ordering Information
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Aptina™ MT9V034 camera module

MBSV034M-FFC

MBSV034C-FFC

X1 connector pinout (FCI 10051922-3010ELF)

Pin	Signal name	Type	Level
1	Module supply	Power	4.0 .. 5.5V
2	SDATA	Open Drain ²	0V / 3.3V
3	SCLK	Open Drain ²	0V / 3.3V
4	GND	Power	0V
5	DOUT3	Output ⁴	0V / 3.3V
6	GND	Power	0V
7	DOUT5	Output ⁴	0V / 3.3V
8	GND	Power	0V
9	DOUT4	Output ⁴	0V / 3.3V
10	GND	Power	0V
11	PIXCLK	Output	0V / 3.3V
12	GND	Power	0V
13	DOUT7	Output ⁴	0V / 3.3V
14	LINE_VALID	Output	0V / 3.3V
15	GND	Power	0V
16	DOUT0	Output ⁴	0V / 3.3V
17	GND	Power	0V
18	FRAME_VALID	Output	0V / 3.3V
19	DOUT6	Output ⁴	0V / 3.3V
20	GND	Power	0V
21	SYSCLK	Input ³	0V / 3.3V
22	GND	Power	0V
23	DOUT2	Output ⁴	0V / 3.3V
24	GND	Power	0V
25	DOUT8	Output ⁴	0V / 3.3V
26	GND	Power	0V
27	DOUT1	Output ⁴	0V / 3.3V
28	GND	Power	0V
29	DOUT9	Output ⁴	0V / 3.3V
30	-	No Connect ¹	-

¹ When connected to MBS270, this pin level is 3.3V but nothing is connected to it on this module. This is only for compatibility with old MBS034 modules.

² When connected to MBS270, pull up resistors are provided. Pull-up resistors must be provided when connecting to alternate host.

³ There is no oscillator on-board. User must provide clock. When connected to MBS270, this pin is connected to CIF_MCLK pin.

⁴ When connected to MBS270, 8 MSBs (DOUT<9:2>) are connected to CIF_DD<7:0> for 8 bits operation. DOUT1 (resp. DOUT0) is connected to CIF_DD9 (resp. CIF_DD8) for 10 bits operation.

X2 connector pinout (Harwin M40-3010646R)

Pin	Signal name	Type	Level
1	GND	Power	0V
2	STLN_OUT	Input/Output ⁵	0V / 3.3V
3	EXPOSURE	Input	0V / 3.3V
4	STFRM_OUT	Input/Output ⁵	0V / 3.3V
5	LED_OUT	Output	0V / 3.3V
6	GND	Power	0V

⁵ Pin is input when MT9V034 is slave, output when master.

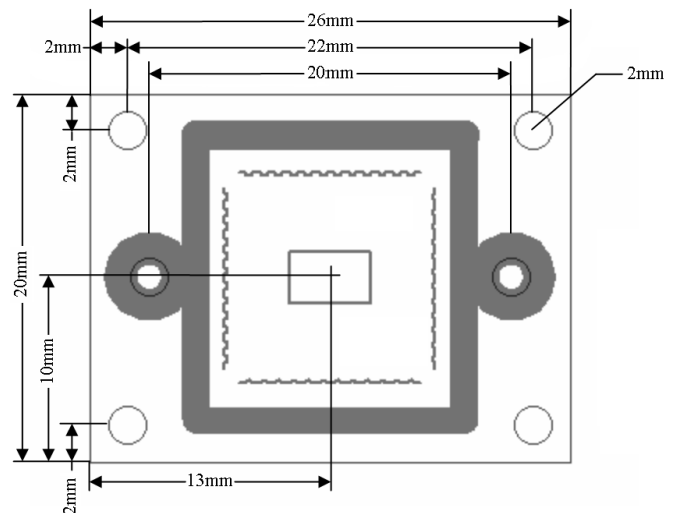
I2C 4bits GPIO expander (NXP PCA9536)

PCA9536 I2C address is 41h.

After power up, IO0-3 are inputs, host must configure them as outputs to control MT9V034 pins.

PCA9536 pin	MT9V034 pin	Function
0	S_CTRL_ADR0	MT9V034 I2C address
1	S_CTRL_ADR1	selection
2	nRESET	Active low reset
3	STANDBY	Active high standby

Mechanical drawing



Ordering information

Reference	Description
MBSV034M-FFC	Camera module with MT9V034 monochrome sensor, 30-pin FFC connection and M12x0.5 lens holder.
MBSV034C-FFC	Camera module with MT9V034 color sensor (Bayer pattern), 30-pin FFC connection and M12x0.5 lens holder.
MBSV034WK	2 receptacle housings (Harwin M40-1100600) with 6 pre-crimped contacts (Harwin M40-9000099, single ended, 150mm long)

Append -3V3 option for old MBS034 compatible module.

FFC cables and lenses can be purchased separately at www.mobisensesystems.com/pages_en/accessories.html.

Custom design, special request:

Mobisense Systems design and produce its modules. Customization is possible through our design service. Please contact sales@mobisensesystems.com for this purpose.

Ask your **technical questions** at: support@mobisensesystems.com