

SINGLE IC CMOS MONOCHROME CAMERA WITH ANALOG OUTPUT

Features

- Single chip 1/3 inch format video image sensor
- Selectable EIA or CCIR Output (OV5016)
- Mirror image - On/Off, EIA (OV5026)
- Auto gain control - On/Off (+ 18 dB)
- High I.R. sensitivity for nighttime applications
- Backlight compensation mode
- Gamma correction (0.45)-On/Off
- External frame sync capability
- Low Power CMOS design
- External data acquisition support
- Selectable for indoor or outdoor operation

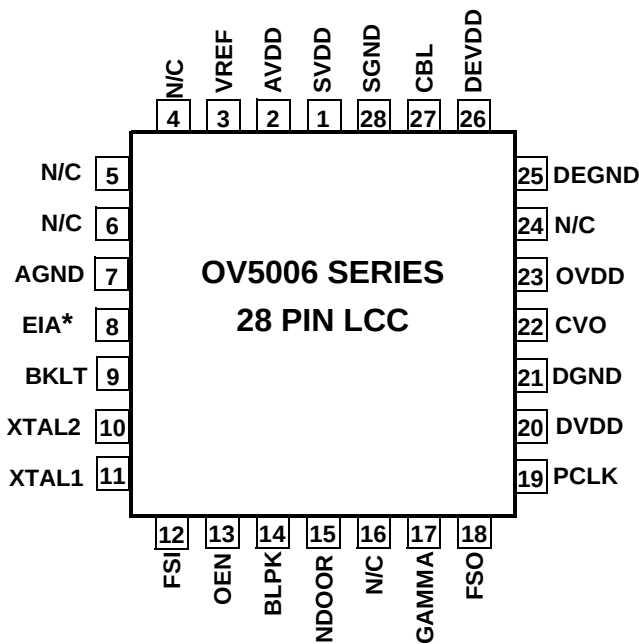
General Description

The OV5006 is a complete black and white CMOS Video Camera chip. It conforms to EIA (60 Hz) and CCIR (50 Hz) standards and outputs composite video capable of directly driving a 75Ω display device. The OV5006 also offers built-in video output switching, allowing several OV50X6 chips to share the same display without the need for external video multiplexing units.

The on-chip auto exposure allows for a wide range of lighting conditions, eliminating the need for external mechanical shutter components. This, along with its single supply, low power consumption makes the OV50X6 an incredibly versatile and

cost-effective video camera perfect for the following types of applications:

- Security
- Surveillance
- Machine Vision
- Process control
- CCTV
- Infant monitoring
- Toys



Array Size	EIA: 320 x 240 pixels CCIR: 352 x 288 pixels
Effective Image Area	4.8 x 3.6mm
Auto Electronic Exposure	1/50-1/6000 sec.
Minimum Illumination	1 lux @ f 1.4
S/N Ratio	46 dB
Power Supply	5VDC, ±5%
Power Requirements	100 mW
Package Type	28 pin LCC

OV5016 PIN ASSIGNMENTS

*Pin 8 is EIA on the OV5016 only. See Table 1 for pin 8's function for the other members of the OV5006 family.

OV5006 Series

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1. Introduction

This section describes the features and functions of the OV5006, a monochrome CMOS video camera integrated circuit, for engineers designing video camera applications.

2. Pin Assignments:**Table 1. Pin Descriptions**

Pin #	Name	Class	Function
1, 2, 20, 23, 26	SVDD, AVDD, DVDD, OVDD DEVDD	Bias	Power (+5V) connections.
3	VREF	Output	Internal voltage reference. Connect to AGND with a 0.1uF capacitor.
4-6, 16, 24	N/C	FT	Leave open.
7, 21, 25, 28	AGND, DGND, SGND, DEGN	Bias	Ground connections. Connect to supply common.
8	EIA OV5016	I-1	Mode select input. Logic high=EIA mode; low=CCIR mode.
8	MIRROR OV5026	I-1	Logic high=mirror image; low=normal image. EIA mode output only.
8	N50 OV5036	I-1	Logic high=N50 mode; low=normal mode. EIA mode output only.
9	BKLT	I-0	Backlight. Logic high for backlight compensation, low for normal (frontlighted scene) operation.
10	XTAL2	OD	Oscillator clock output or crystal input.
11	XTAL1	I	External oscillator input or crystal input. Use 12.288MHz for EIA mode, 13.5MHz for CCIR mode
12	FSI	I-0	External frame sync input. A rising edge on FSI sets the chip timing to vertical sync. Leave open if unused.
13	OEN	I-0	A logic level input to enable or tri-state CVO. Logic high=tri-state;low=enabled.
14	BLPK	I-0	A logic level input which when high places the sensor circuitry in Black Level calibration mode. When high the sensor is in Peak Follower mode.
15	INDOOR	I	A logic level input to enable/disable AGC. High enables AGC, providing up to 18dB of gain. Low disables AGC, which provides 0dB gain.
17	GAMMA	I-1	A logic level pin to select the transfer characteristic of output voltage versus light input. Logic high for g=0.45; low for g=1.
18	FSO	OD	Frame Sync Output. Digital frame sync output pin. Positive pulse occurs during the CVO vertical sync period.
19	PCLK	OD	Digital pixel clock output. Provides 2 functions: When high a valid pixel is present at CVO and in sync with PCLK.
22	CVO	Q	The composite video output signal. The output is a source follower capable of directly driving a 2V p-p signal into a 150 ohm load.
27	CBL	OA	Clamped black level output. Connect to AGND with a 0.1uF capacitor.

Pin Type and Default Level:

I-1: digital input, with 100k pull up, I-0: digital input, with 100k pull down, I: digital input, K: analog input

OD: digital CMOS level output, OA: analog CMOS level output, Q: 75Ω output

XI/XO: crystal input/output

Bias: power supply bias, FT: factory test

OV5006 Series

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3. Electrical Characteristics**Table 2. Electrical Parameters**

PARAMETER	CONDITIONS	MIN	TYP	MAX	Units
VDD	Power supply voltage	4.75	5.00	5.25	volts
Vpeak	CVO output peak voltage		2.0		volts
Vblink	CVO output blank voltage		0.6		volts
Vsync	CVO output sync voltage		0		volts
IDD1	Functioning with 150Ω load on CVO			20	mA
IDD2	Functioning with 10k load on CVO			6	mA
Cin	Maximum pin capacitor			10	pF
f _{osc}	crystal/ceramic resonator frequency: EIA - 60Hz CCIR - 50Hz		12.288 13.5		MHz MHz
t _{cyc}	pixel clock cycle time: EIA - 60Hz CCIR - 50Hz		163 148		ns ns
t _r , t _f	Maximum digital input rise/fall time			20	ns

Table 3. OV5006 TV Timing Specification

	Parameters	CCIR	EIA	Unit
1	number of lines per frame	625	525	lines
2	field frequency	50.00	60.01	Hz
3	line period	64.0	63.476	μsec
4	line blanking interval	11.84	11.41	μsec
5	line synchronizing pulse	4.73	4.56	μsec
6	field blanking interval	24/25	22/23	line
7	first equalizing pulse width	3/2.5	3/2.5	line
8	field synchronizing pulse width	2.5	3	line
9	second equalizing pulse width	2.5/3	2.5/3	line
10	line synchronizing pulse width	0.5	0.5	line

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Part Number	Description	Package
OV5016	EIA 60Hz/CCIR 50Hz Standard Image	28 pin LCC
OV5026	EIA 60Hz Mirror Image	28 pin LCC
OV5036	EIA 60Hz TV with 50Hz A.C. Ambient Lighting	28 pin LCC

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