

OV5116N SINGLE IC CMOS MONOCHROME CAMERA WITH NTSC ANALOG OUTPUT

Features

- Single chip 1/4 inch format video image sensor
- EIA/NTSC output
- Selectable mirror image
- Auto gain control (maximum + 18 dB)
- High I.R. sensitivity for nighttime applications
- Auto and manual backlight compensation mode
- Gamma correction -On/Off
- External frame sync capability
- 40mw on-chip power consumption
- External data acquisition support
- Smear free
- Auto level expanding
- Optional edge enhancement

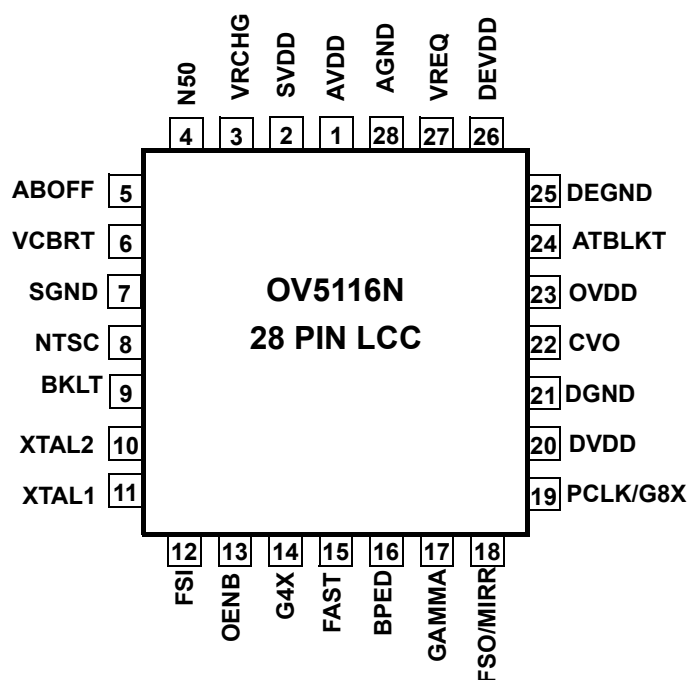
General Description

The OV5116N is a complete black and white CMOS Video Camera chip. It conforms to EIA/NTSC (60 Hz) standards and outputs composite video capable of directly driving a 75Ω display device.

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 OV5116N an incredibly versatile and cost-effective video camera perfect for the following types of applications:

Applications

- Security
- Surveillance
- Machine Vision
- Process Control
- CCTV
- Infant Monitoring
- Toys



Key Specifications	
Array Size	320 x 240 pixels
Effective Image Area	3.2 x 2.5mm
Auto Electronic Exposure (seconds)	1/60-1/6000
Minimum Illumination	0.5 lux @ f 1.4 (3000k)
S/N Ratio	46 dB (AGC=1x)
Power Supply	5VDC, ±5%
Power Requirements	(40 mw before-loading), 70mw standard loading
Package Type	28 pin LCC

OV5116N PIN ASSIGNMENT

OV5116N

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1. Introduction

This section describes the features and functions of the OV5116N, a monochrome CMOS video camera integrated circuit.

2. Pin Assignments:

Table 1. Pin Descriptions

Pin #	Name	Class	Function
1, 2, 20, 23, 26	AVDD, SVDD, DVDD, OVDD, DEVDD	Bias	Power (+5V) connections.
3	VRCHG	OA	Internal voltage reference. Connect to AGND with a 0.1uF capacitor.
4	N50	I-Ø	Set low(Ø)=standard NTSC. Set high (1)=50hz light (For use in Japan Only);
5	ABOFF	I-Ø	Auto brightness level descending function off
6	VCBRT	OA	Video DC Output Black level, leave it open in usual case
7, 21, 25, 28	SGND, DGND, DEGND, AGND	Bias	Ground connections. Connect to supply common.
8	NTSC	I-1	Set high(1)=EIA/NTSC mode
*9	BKLT	I-Ø	Backlight mode 1
10	XTAL2	XO	Oscillator clock output or crystal output.
11	XTAL1	XI	External oscillator input or crystal input: 12.288MHz
12	FSI	I-Ø	External frame sync input. A rising edge on FSI sets the chip timing to vertical sync. Leave open if unused.
13	OENB	I-Ø	A logic level input to enable or tri-state CVO. Logic high(1)=tri-state;low(Ø)=enabled.
14	G4X	I-Ø	A logic level input which when high places the maximum AGC gain to 4x. When low the sensor AGC gain is 2x.
15	FAST	I-Ø	A logic level input to enable/disable AGC/AEC FAST mode. High enables, low disables, which provides slow and smooth AGC/AEC mode.
16	BPED	I-Ø	A logic level input to disable on chip edge enhancement. High disable, low enable.
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/MIRR	I/O Ø/Ø	In/out pin. Frame Sync Output. Digital frame sync output pin. Positive pulse occurs during the CVO vertical sync period. Input is a logic level input to enable mirror function. Low(Ø)=Standard, High(1)=Mirror.
19	PCLK/G8X	I/O Ø/Ø	Digital pixel clock output. Provides 2 functions: When high a valid pixel is present at CVO and in sync with PCLK. Input is a logic level input to enable maximum AGC gain to 8x (only effective when pin 14 is set to high(1))
22	CVO	Q	The composite video output signal. The output is a source follower capable of directly driving a 1V p-p signal into a 108 Ω load.(75Ω external and 33Ω internal)
*24	ATBLKT	I-Ø	Backlight mode 2
27	VREQ	OA	Internal voltage reference level. Connect to AGND with a 0.1uF capacitor.

* Pin 9 and Pin 24 must be used in a logical combination as per the following table:

ATBLK(Pin 24)	BLKT(Pin 9)	Mode
Ø	Ø	Normal Mode
Ø	1	Mode 1 - Manual Back light
1	Ø	Mode 2 - Automatic Back light (Chip determination)
1	1	Future Use

Class	Default Level
I-1	digital input, with 100k pull up
I-Ø	digital input, with 100k pull down
I/O	digital CMOS level input and output
OA	analog CMOS reference voltage
Q	75 ohm output
XI/XO	crystal input/output
Bias	power supply bias

Ø: Low; 0: Output

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*		1.0		volts
Vblink	CVO output blank voltage*		0.4		volts
Vsync	CVO output sync voltage*		0		volts
IDD1	Functioning with 108Ω load on CVO			15	mA
IDD2	Functioning with 10k load on CVO			6	mA
Cin	Maximum pin capacitor			10	pF
f _{osc}	Crystal/ceramic resonator frequency: 60Hz		12.288		MHz
t _{cyc}	Pixel clock cycle time: 60Hz		163		ns
t _r , t _f	Maximum digital input rise/fall time			20	ns

* assuming standard loading of 108Ω (33Ω internal+75Ω external).

Table 3. OV5116 TV Timing Specification

	Parameters		Units
1	Number of lines per frame	525	lines
2	Field frequency	60.01	Hz
3	Line period	63.476	μsec
4	Line blanking interval	11.41	μsec
5	Line synchronizing pulse	4.56	μsec
6	Field blanking interval	22/23	line
7	First equalizing pulse width	3/2.5	line
8	Field synchronizing pulse width	3	line
9	Second equalizing pulse width	2.5/3	line
10	FSO width	3	line



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