

## FEATURES

- Ultra high dynamic range with logarithmic response: 170dB
- Resolution: 750 x 496 (372,000 pixels)
- 10 bit Digital Output
- SPI control interface
- Infrared sensitivity
- Constant contrast resolution in logarithmic response region
- Operating temperature -10 to 50°C

## APPLICATIONS

- Machine Vision
- Night Vision
- HDTV
- Security Cameras

## GENERAL DESCRIPTION

The HDRC<sup>®</sup> VGA36 is a High Dynamic Range CMOS imager, which compresses a wide range of light intensity instantaneously and within each pixel with a logarithmic response like human eyes, but exceeding their spontaneous range by orders of magnitude. The ultra-high dynamic range, leads to saturation-free images.

The on-chip A/D-Converter delivers 10 bit digital video output

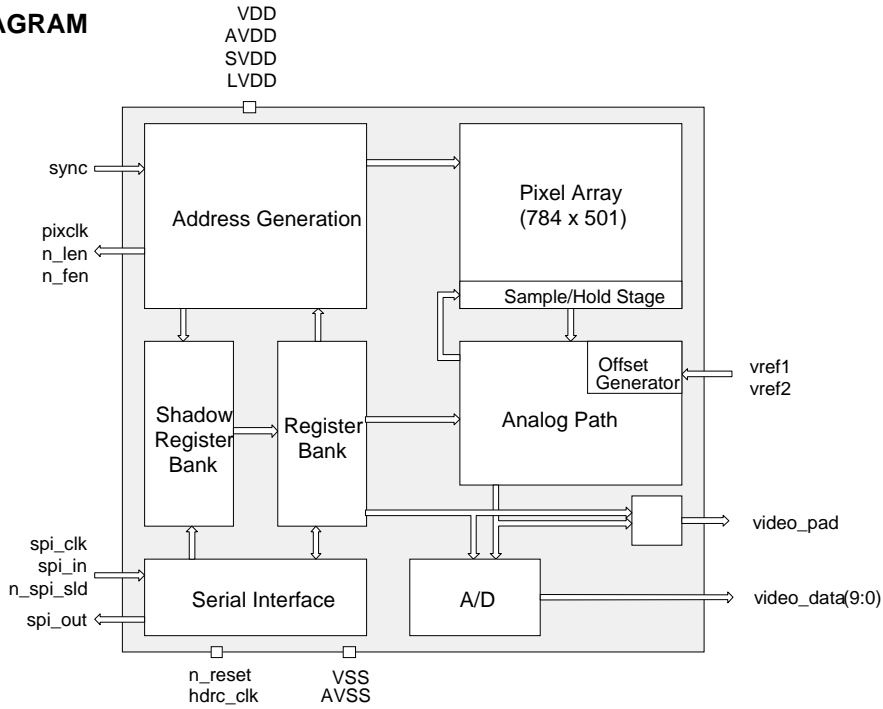
The imager is controlled by a serial programming interface, suited for micro-controller based vision systems.

As the imager is also sensitive to infrared radiation, the imager is extremely suited for night vision applications.

## KEY PARAMETERS

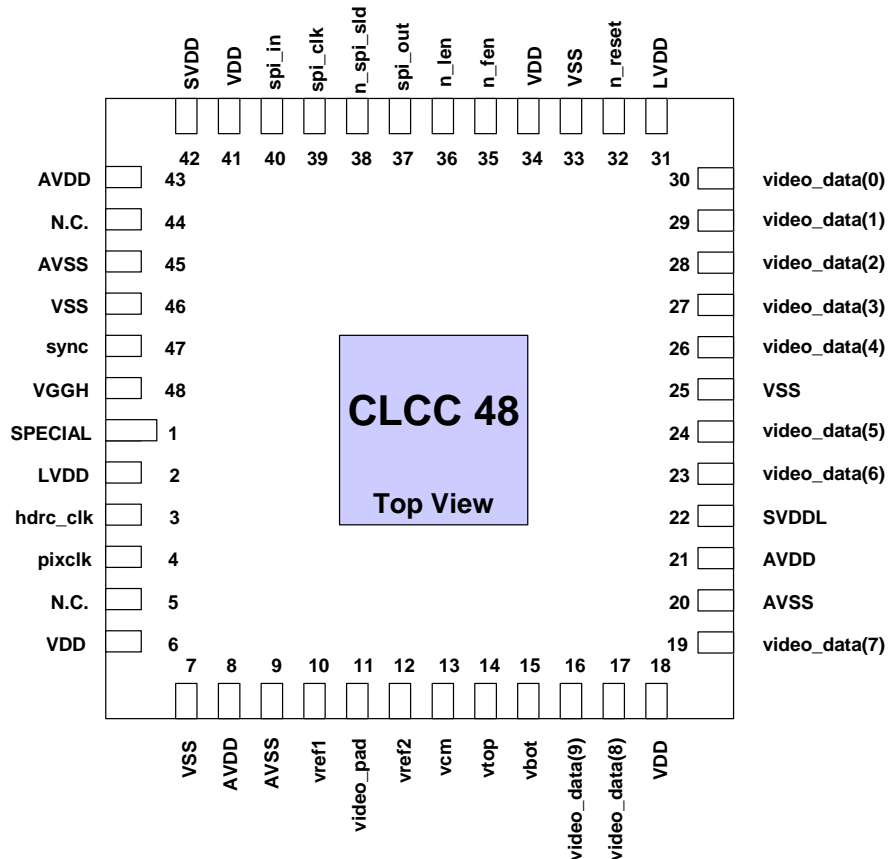
Optical Format	1/3 inch
Active Image Size	5.74mm(H) x 3.69mm (V) 6.82 mm(Diagonal)
Active Pixels	750 H x 496 V
Pixel Size	7.44 $\mu$ m x 7.44 $\mu$ m
Shutter Type	Rolling Shutter
Data Rate	12 M pixels / sec
Frame Rate (640 x 480)	38 frame / sec
ADC Resolution	10 bits
Dynamic Range	170dB
Sensitivity	100 digit / decade(lux)
Supply Voltages	VDD/AVDD/SVDD = 3.3+/-0.3 V LVDD = 2.5+/-0.2 V
Power Consumption	150 mW
Operating Temperature	-10°C to +50°C
Package	CLCC 48 pin

**BLOCK DIAGRAM**



**Figure 1: Block Diagram**

**PINOUT**



**Figure 2: Pinout**

## CHARACTERISTICS

Unless otherwise specified, the following conditions are used for typical values:

VDD:	3.3 V
AVDD:	3.3 V
SVDD:	3.3 V
LVDD:	2.5 V
Temperature:	25 °C
Clock Frequency:	24 MHz (main clock) / 12MHz (pixel clock)
Illumination:	Dark
Resolution:	VGA size (640 x 480)

### Absolute Maximum Ratings

Parameter	Value
VDD	4.0 V
AVDD	4.0 V
SVDD	4.0 V
LVDD	3.0 V
V <sub>IN</sub>	-0.3V to 4.0V

Parameter	Value
T <sub>OPERATING</sub>	Ta = -10 to 50 °C
T <sub>STORAGE</sub>	Ta = -40 to 125 °C

Stresses above those listed in this table may result into irreversible damages to the device. The above values are stress values only, functional operation should be below these values, as an exposure to these stresses for longer periods will affect device reliability negatively.

### Sensor Characteristics

Parameter	Value	Unit	Conditions/Remarks
Sensitivity per Decade(Lux)	100	DN/Decade	DN: Digital Number
Maximum illuminance	500,000	Lux	
Dynamic Range	170	dB	
Contrast Resolution	tbd	%	10 bit output, 120 dB
Dark Fixed Pattern Noise	2.7	%	std. dev. / Maximum DN
Bright FPN @100 Lux	2.6	%	std. dev. / Maximum DN
Response Time	tbd	ms	10 kLux to 1 Lux
Photo Response Non-Uniformity	tbd	%	10 Lux to 10kLux, 20°C
Deviation from Ideal Log. Curve	tbd	%	20°C, 10 Lux to 10 kLux
Dark Random Noise	tbd	mV <sub>RMS</sub>	
Pixel Rate (maximum)	14	MHz	hdrc_clk=28MHz, VGA resolution
Frame rate (maximum)	44	fps	hdrc_clk=28MHz, VGA resolution
Spectral Sensitivity @650nm	0.30	A/W	
@850nm	0.20	A/W	



**DOCUMENT HISTORY**

Version	Changes	Date	Approved
1.0	First release	11.09.2006	

**DISCLAIMER**

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