

SI-6600-M & **RGB MegaCamera™** 6.6 Megapixel (2210 x 3002), 10-Bit, 50MHz Ultra-High Resolution Portrait Camera



Silicon Imaging is proud to continue its innovation in ultra-high resolution machine vision camera. Driven by the growing demand for consumer Digital Still Cameras, CMOS sensors are continuing to break technical barriers and surpass the performance characteristics of CCD's in many photonic, imaging and consumer applications. By utilizing a single highly integrated CMOS device, which incorporates Megapixel sensing areas, timing generation, signal processing and high bandwidth outputs, Silicon Imaging has developed a very compact, low-power, ultra high speed Megapixel digital camera system.

2210 x 3002 Megapixel Imaging - Ultra Resolution

The SI-6600 is an all-digital CMOS camera that delivers 6.6 Million pixels of resolution and is capable of running at 6 frames/second at its full 2210 x 3012 resolution and over 500 frames/per second at 320 x 240 resolution. The entire package is only 45 x 52 x 50mm (33 x 40mm x 22mm in PCB) and is small enough to placed on a robot for semiconductor machine vision inspection or placed in an outdoor housing for remote surveillance. It is ideal for live visualization of documents or films and scanning of biometrics for handprint or facial recognition.

10-Bit Pixel Clock Sampling – Sub-Pixel Accuracy

The SI-6600 MegaCamera™ uses 10-Bit digitizers to sample the pixel data. Converting the pixel data directly to digital at the sensor head eliminates pixel-sampling jitter and enables accurate sub-pixel metrology, image analysis and improved live video reconstruction. A programmable clock which ranges from 20~60MHz allows for trade-offs in speed versus exposure time and lower noise.

1000 FPS - Windowing & Subsampling

Ideal for object tracking and high-speed Motion analysis, the SI-6600 is capable of generating imagery at over 1000 frames per second by reducing the size of the readout image (ex. 100x100). This windowed Region-of-Interest (ROI) can be moved dynamically, creating an entirely electronic pan/tilt/zoom function within the camera field-of-view.

CameraLink™ Digital Interface

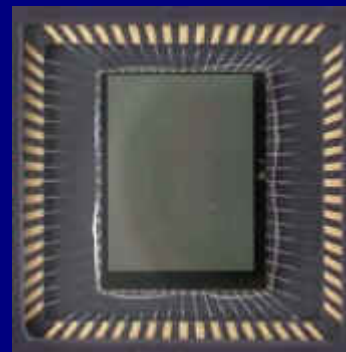
An industry standard forum has adopted Camera Link, for low cost connectivity and cabling of cameras and frame grabbers at very high speeds. The SI-6600-CL utilizes the high speed CameraLink interface to output 2210 x 3002, 10 bit data at up to 50MHz continuously to a frame grabber and directly into PC memory for further processing. The single cable includes image data, vertical and horizontal synch, LVDS Triggering and 9600 baud Serial communication. As this camera complies with the standard, it is compatible with many popular frame grabber and image processing hardware devices and fiber-optic extender for extended distance transmission.

10/100/1000 Gigabit Ethernet using GigE-Link

Silicon Imaging GigE-Link removes the distance limitations and eliminates the need for a frame grabber. Using the GigE-Link MegaCamera you send the image data directly to PC memory over Gigabit Ethernet connections, at rates of up to 100 MB/s. Each MegaCamera is defined and supported as a distinct IP network device. These high-speed camera-to-PC links operate reliably over 100 meters of standard, inexpensive Cat-5 LAN cable. And by using low-cost Gigabit Ethernet switches, you can extend the reach much further.

USB2.0 Low-Power & Portable Connectivity

For low-cost and portable connectivity, with data rates up to 40MB/sec, the SI-6600-U provide convenient capture using the integrated USB 2.0 interface, integrated cable and bus-powered connection.



FEATURES

- 6.6 Million Pixels – Portrait Image
- 2210 x 3002 Resolution
- 1" Optical Format
- 3.5um Square Pixel
- 10 Bits per Pixel Sampling
- 20~60MHz Programmable Clock
- Rolling Shutter, Progressive scan
- High Speed Windowing (8 ~ 1000FPS)
- 1usec~4sec Progressive Rolling Shutter Mode
- Programmable Gain, Offset, Clock, Shutter & ROI
- External Clock Synchronization (optional)
- Monochrome & Color Bayer RGB Models
- 5VDC Low Power, Small Package
- Custom PCB Version
- Cameralink, USB2.0 & Gigabit Ethernet
- C-Mount Precision Machined Housing

SI-6600 MegaCamera CameraLink Specifications

Image Sensor

Active Pixels	2210 H x 3002 V
Pixel Size (pitch)	3.5µm x 3.5µm
Optical Format	1" (7.7 x 10.5 mm)
Pixel Type	CMOS, 3-T
Aspect Ratio	1 : 1
Spectral Response	400 ~ 1000 nm
Fill Factor	35% (Peak QE x FF = 20% @ 630nm)
Responsivity	250 V per Ws/m 0.1 A/W (Spectral Response * FF)
Conversion Gain	33 uV/e-
Dark Current	30 mV/sec @ 21C
Temporal Noise	24 e- @ 40MHz
SNR	45dB
Saturation Charge	26,500 e ⁻
Output swing	0.8V at Unity Gain
Dynamic range	61 dB (1100:1)
PRNU	1.5%rms Photoresponse nonuniformity
Windowing (ROI)	H & V. Vertical speed increase only
Sub-sampling	Full, 1/4, 1/9, 1/16, 1/36 (COLOR)
Gain MAX	1 ~ 14.67X
Readout Method	Progressive Scan
Black Level	Programmable
Min Row Time	142 clocks (Horizontal Blanking)
Vertical Blanking	1 Row

A/D Conversion & Pixel Clock Synthesizer

A/D Conversion	Nominal 40Mhz (5.3fps @ 6.6MP)
Vertical Resolution	10 Bit (Format = 12bit-CL 1-Tap)
Clock Frequency	20 ~ 60 Mhz Programmable
Adjustments	Black Level, Column Balance, Gamma Curve

Digital Video Output

Readout Rate	20 ~ 60Mhz x 12bit format	
Readout Format	CL-12 Bit, 1-Tap	
	40MHz	60MHz
Frame Rate		
2200 x 3000	5	8
1106 x 1502	21	32
738 x 1002	45	68
2048 x 1536	12	18
1280 x 1024	27	41
640 x 480	104	155
320 x 240	344	517
160 x 120	1029	1543
Frame Time	2210 x 3002 @ 40MHz = 187.5msec	

CameraLink Frame Grabber Control:

Serial Communication	RS-232 Protocol 9600bps (57.6k)
Signaling	TX & RX (LVDS)
Asynchronous Triggers	LVDS – CC1 (-CL) TTL Trigger-In / Strobe-Out(option)
Region-of-Interest	Programmable Horiz & Vertical
Programmable Modes	Gain, Windowing, Clock rates, Exposure, Subsampling, black level, Column Balance, NDR.
Gains	Range: 1~14.67X
Setting Timing	Next top of Frame
Ext Clock Sync	Clock in or Clock Out (-X Option)

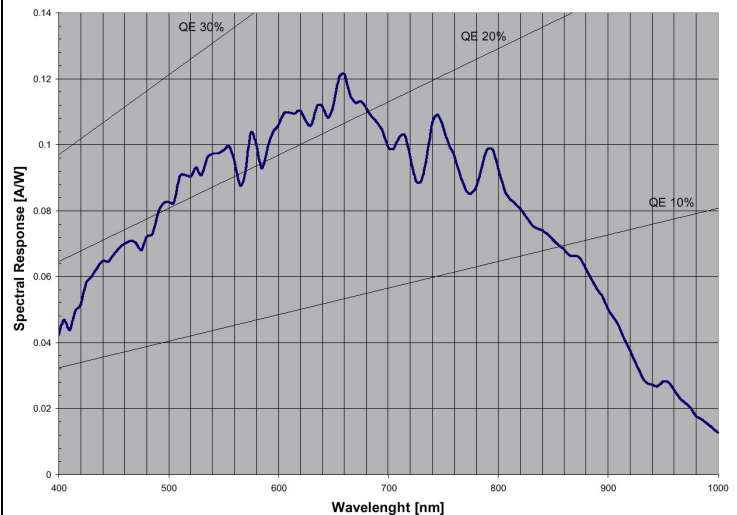
Power

Input Voltage	+5 VDC +/- 10%
Power	2.5 Watts
Power/Trigger Connection	Tajimi RO3-PB3M 3Pin (-CL) Tajimi RO3-PB5M 5Pin (-X)

Mechanical

Lens Mount	C-Mount, 7mm Back focus Adj.
Enclosure Size	45mm W x 52mm H x 50mm L
Weight	12 oz.
Camera Mount	1/4" x 20 standard tripod mount
Cable Connector	Cameralink MDR-26

Spectral Response Curve (Monochrome)



SI-6600- M,RGB -CL	6.6 Megapixel Cameralink Camera, M=Monochrome, RGB= Bayer Color
SI-6600- M,RGB -USB	6.6 Megapixel USB2.0 Camera, M=Monochrome, RGB= Bayer Color
SI-6600- M,RGB -S	6.6 Megapixel Cameralink Camera, 32-bit PCI Frame Grabber, 2M cameralink, Power Supply & Cables
SI-6600- M,RGB -GR	6.6 Megapixel Cameralink Camera, Gig-ELink Interface, 2M cameralink, Power Supply & Cables
CL-2,3,5,10	Cameralink Cables, 2-meter, 3-meter, 5-meter, 10-meter
PS-5	5VDC Power Supply
PC-2	Power Cable, 2-Meter
CBL-3PT	Cable, 3Pin Tajimi to TTL Trigger-In & Power Input Plug