



We create cameras that
make machine vision better

CAMELS Vision Technologies

Company Overview

Introduction

Company Name	CAMELS Vision Technologies, Inc
Factory Space	700 square meters (Factory License No. 95-A00819-00)
Address (Office & Factory)	1F, 9 R&D Rd. I, Hsinchu Science Park (HSP), Hsinchu City, Taiwan 30076
Date of Establishment	June 23th, 2004
Capital	67.6 Million NTD
Certification	ISO 9001, 14001 Certified by AFAQ/BestCERT
Lines of Business	1. Machine-vision cameras (area & linescan) ODM 2. Vision modules for the photovoltaic industry 3. DSP/FPGA video boards for demanding aerospace/defense market



ODM/OEM Camera Solution

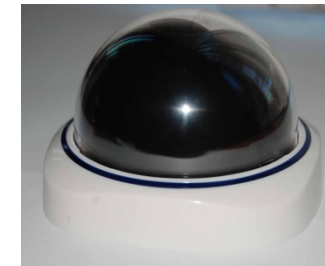
ODM/OEM camera with large variety of sensors

Choice of 23 different sensors:

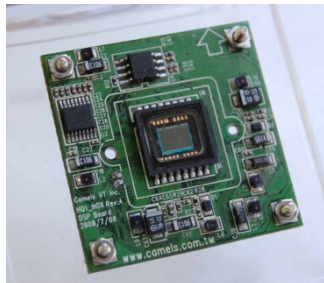
- Kodak® – 1.2" CCD (4.2MP), 1/3" CMOS (330KP), Linear CCD (1K, 2K, 4K, 8K)
 - Aptina Imaging® – 1/2" CMOS (1.3MP, 2MP, 3MP), 1/2.5" CMOS (5MP)
 - NEC® – Linear CCD (7.5K)
 - Sony® – 2/3" CCD (1.4MP), 1/3" CCD (1.3MP), 1/3" CCD (250~380KP, CCTV), 1/4" CCD (330KP)
 - Sensors by ODM/OEM customers
-
- Infrared LED boards
 - Vandal alarm circuit
 - Cooled cameras
 - GigE Vision™ cameras
 - Infrared camera modules



Bullet Camera



Dome Camera



Camera Board



LED Board

Industrial Linescan Camera

Machine-vision CCD linescan cameras

- Up to 8,160 pixels linear CCD sensor
- Camera Link® BASE interface
- Maximum 14kHz line rate
- High image quality with up to 10-bit data output
- Environmentally controlled with a temperature sensor
- Electronic exposure time control
- Auto tap balancing
- Built-in spatial correction (color series)
- Built-in flat field correction
- Built-in configurable LUT
- FPGA-based camera DSP/controller



Application Example:
Web Inspection

Industrial Area Scan Camera

Industrial USB 2.0 cameras

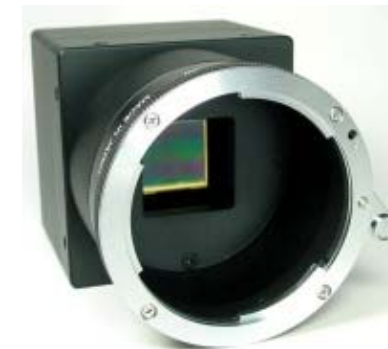
- 1/2-inch CMOS active-pixel digital image sensor
- Up to 3 Mega Pixels resolution
- USB 2.0 interface with 480Mb/s throughput
- Adjustable back-focus design
- FPGA-based camera DSP/controller
- Built for tough industrial environments
- Full-featured Windows camera SDK (APIs)
- Class 100 clean-room assembly



Application Example:
Digital Microscopy

Machine-vision CCD cameras

- 1.2-inch progressive scan IT CCD sensor
- 2,048 x 2,048 resolution @ 15fps
- Camera Link® BASE interface
- 8/10/12-bit output per pixel
- Auto tap balancing
- FPGA-based camera DSP/controller
- Sensor bad pixel correction
- Overlapped pattern for camera setup alignment

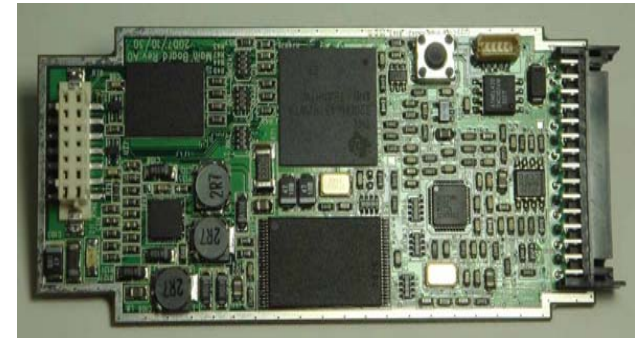


Application Example:
Flat Panel Display Inspection

Automotive Video DSP Engine

Automotive video DSP engine boards (ODM)

- Texas Instruments (TI) 600MHz Video DSP with 4.8K MMACs
- Automotive grade PCB design
- 2 x video in, 1 x video out
- 128-Mbyte DDR2 SDRAM, 256-Mbyte NAND flash
- 1 x CAN bus board configuration
- 8 x GPIO, 1 x JTAG port
- 1 x daughter board expansion connector (30-pin)
- 12VDC power in, 2 x 5VDC power out, 3 x 12VDC power out
- 90.5 x 40 mm PCB size

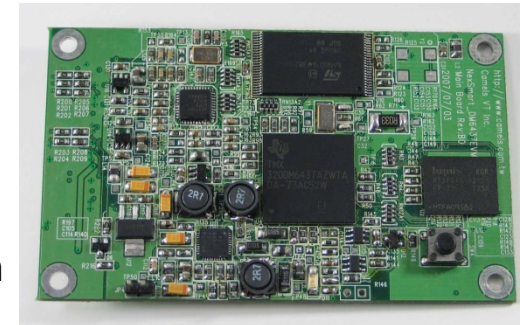


Application Example:
Lane Departure Warning System
(LDWS)

Surveillance Video DSP Engine

Surveillance video DSP engine boards

- TI 600MHz Video DSP with 4.8K MMACs
- Industrial grade PCB design
- 1 x video in, 1 x video out
- 64-Mbyte DDR2 SDRAM, 128-Mbyte NAND flash
- 1 x RS-232 UART port, 1 x CAN bus board configuration
- 11 x GPIO, 1 x JTAG port, and 1 x I2C
- 1 x daughter board expansion connector (50-pin)
- 12VDC power in
- 80 x 50 mm PCB size



Application Example 1:
Lens Distortion Correction

Application Example 2:
Embedded Video Analytics



Distorted Image



Corrected Image

Industrial Video DSP Engine

High-end video DSP engine boards (ODM)

- TI 600MHz Video DSP with 4.8K MMACs
- Video FPGA with 2 million system gates
- Mpeg4/M-jpeg DSP-based codec
- Industrial grade PCB design, IEC 68-2-14 Thermal Cycling Test compliant
- 1 x composite, 1 x compressed video in (RS-422)
- 1 x composite, 1 x compressed video out (RS-422)
- 256-Mbyte SDRAM, 16-Mbyte NOR flash
- 2 x RS-232 UART port, 7 x RS-422 in, 5 x RS-422 out, 1 x USB port, 1 x ATA/IDE, and 1 x Ethernet interface
- MIL-STD-83513/17 receptacle 51-pin connector
- 7~40VDC power in
- 120 x 130 mm PCB size

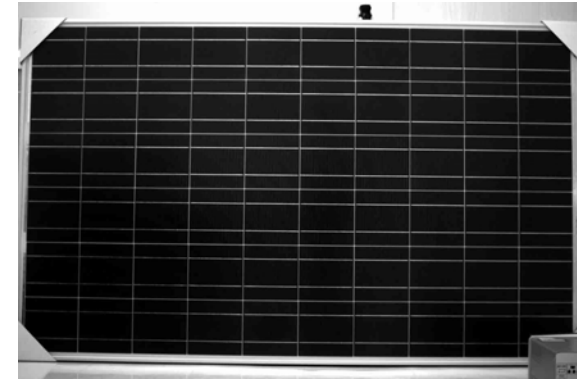


Application Example:
Aviation Video Engine

Photovoltaic EL Imaging Subsystem

Photovoltaic EL imaging subsystem

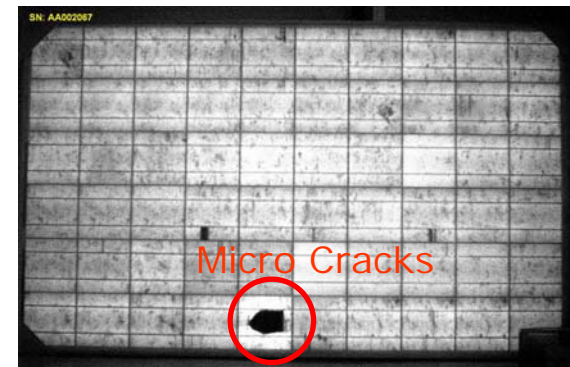
- Electro-luminescence (EL) imaging solution
- Inspects 100% of the solar cells, strings & modules
- Analysis of shunts and micro-cracks
- Staged Peltier cooled mega-pixel camera
- Lens coated for EL emitting spectrum
- Histogram stretching & lens distortion correction



Module Visual Imaging



EL Cameras (Responsivity Optimized for EL Emitting Spectrum)



Module EL Imaging (1s Exposure)

Embedded Image IP Cores

Platform

- Xilinx® FPGA
- TI DaVinci™ Digital Media Processors and TMS320™ DSPs

Camera/Optics Corrections

- Non-uniformity correction (NUC)
- Bad pixel correction (BPR)
- Distortion correction

Image Enhancement

- Wide dynamic range (WDR)
- Histogram equalization, stretching
- Laplacian filter
- Auto exposure, auto gain
- De-interlace filtering
- Video resolution scaling

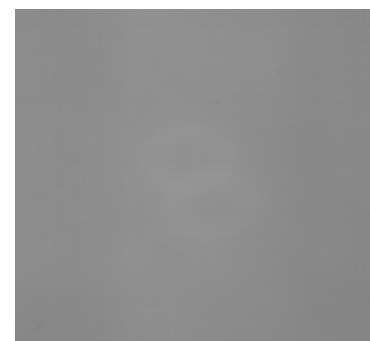
Intelligent Video Surveillance (IVS)

- Object classification
- “Inside of” event notification
- Tripwire event detection

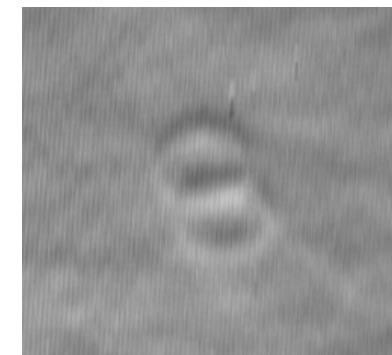
Panel Mura Detection:

Gray level of background: 140-150DN

Gray level of Mura: 147-151DN



Original Image (with Coin Mura)



Enhanced Image (Mask size: 12)

Laboratory & Plant Equipment

Laboratory Equipment

- Color Viewer light box and charts (USAF 1951, Q-14, Q-60, Color-bar, EIAJ Test Chart A, ITE Grayscale Chart, ColorChecker)
- Integrating sphere-based auto camera tester
- Vector scope & waveform monitor
- Linescan camera test bench (metal-halide lamp)
- Web inspection test bench (linear LED lighting)
- Light lux meter
- Y/C color monitor
- Dark room

Plant Machinery

- Burn-in room 4m x 2m x 3m (heat-damp)
- Truck for camera-under-test
- Temperature test chamber
- Class 100 assembly bench (HEPA filter)
- Metallurgical microscope
- Lens focus measure station



Auto Camera Tester



Burn-in Room

Assembly & Test Lines



Capacity: 2KU/month

Certification, Patents & Projects

- CE (EMC DIRECTIVE 89/336/EEC, 2004/108/EC)
- IEC 68-2-14 Thermal Cycling Test
 - -40°C (1hr)~95°C (1hr), 20 cycles
- ISO 9001:2000, 14001:2004
 - Certified by AFAQ/BestCERT
- Official member of TI DSP Third Party
- Invention Patents
 - I 297575
 - I 299475
- SBIR Projects
 - Embedded vision processor (04-05)
 - High-end industrial area scan camera (06-07)
- Environmentally friendly commitment

CE(EN55022/EN55024)

CE

VERIFICATION OF COMPLIANCE

This Verification of Compliance is hereby issued to the below named company. The test results of this report relate only to the tested sample identified in this report.

**Technical Standard: EMC DIRECTIVE 2004/108/EC
(EN 55022 / EN 55024)**

General Information

Applicant: Camels Vision Technology Inc.
1F,NO.9,R&D RD 1, Hsinchu Science Park, Hsinchu City,
Taiwan 30076

Product Description

EUT Description: Industry camera
Model Number: EV50YLM2CLxxxx-BAO
Data Applies To: EV50YLM2CL4010-BAO : EV50YLM2CL1014-BAO ;
EV50YLM2CL1010-BAO : EV50YLM2CL2010-BAO ;
EV50YLM2CL2014-BAO


Measurement Standard


EN 55022:2006
EN 61000-3-2:2006
EN 61000-3-3:1995 + A1:2001 + A2:2005
EN 55024:1998 + A1:2001 + A2:2003
IEC 61000-4-2:1995 + A1:1998 + A2:2000 ; IEC 61000-4-3:2006 ;
IEC 61000-4-4:2004 ; IEC 61000-4-5:2005 ; IEC 61000-4-6:2007 ;
IEC 61000-4-8:1993 + A1:2000 ; IEC 61000-4-11:2004

Measurement Facilities


Laboratory Name: Compliance Certification Services Inc. (Hsin-Chu Lab).
NO. 989-A Wen Shan Rd., Shang Shan Village,
Donglin Shiang Hsinchu County 30741, Taiwan, R.O.C
Tel: +886-3-5921698 / Fax: +886-3-5921108

This device has been shown to be in compliance with and was tested in accordance with the measurement procedures specified in the Standards & Specifications listed above and as indicated in the measurement report number: SJ216504-E


Jason Chang / Team Leader



Date: January 13, 2008

 Compliance Certification Services Inc.

CE

VERIFICATION OF COMPLIANCE

This Verification of Compliance is hereby issued to the below named company. The test results of this report relate only to the tested sample identified in this report.

**Technical Standard: EMC DIRECTIVE 2004/108/EC
(EN 55022 / EN 55024)**

General Information

Applicant: Camels Vision Technology Inc.
Rm. 437, Bldg. 52, 195, Sec. 4, Chung Hsing Rd.,
Chutung, Hsinchu, Taiwan 310

Product Description

EUT Description: Industry Camera
Model Number: NexShot3M-4M

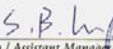
Measurement Standard


EN 55022:1998 + A1:2000 + A2:2003
EN 61000-3-2:2006
EN 61000-3-3:1995 + A1:2001
EN 55024:1998 + A1:2001 + A2:2003
IEC 61000-4-2:1995 + A1:1998 + A2:2000 ; IEC 61000-4-3:2002 + A1:2002 ;
IEC 61000-4-4:1995 + A1:2000 + A2:2001 ; IEC 61000-4-5:1995 + A1:2000 ;
IEC 61000-4-6:1998 + A1:2000 ; IEC 61000-4-8:1993 + A1:2000 ;
IEC 61000-4-11:1994 + A1:2000

Measurement Facilities


Laboratory Name: Compliance Certification Services Inc. (Hsin-Chu Lab).
Rm. 258, Bldg. 17, NO.195, Sec. 4 Chung Hsing Rd.,
Chutung Chen, Hsinchu, Taiwan 310, R.O.C
Tel: +886-3-5910068 / Fax: +886-3-5825720

This device has been shown to be in compliance with and was tested in accordance with the measurement procedures specified in the Standards & Specifications listed above and as indicated in the measurement report number: 70413304-E


S. B. Lu / Assistant Manager



Date: July 16, 2007

 Compliance Certification Services Inc.

ISO Certification



19F-2, No. 102, Chung-Ping Road, Taoyuan City, Taiwan, R.O.C.

ISO 9001:2000



19F-2, No. 102, Chung-Ping Road, Taoyuan City, Taiwan, R.O.C.

ISO 14001:2004

Patent



I 297575



I 299475

Contact Us

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Email	info@camels.com.tw

Many Thanks for Your Interest!