



VISION



AI



CLOUD



SECURITY

# Embedded Vision Camera Platform

## iVS-CV28P

**Unlock the full potential of vision data for your application.**

Embedded, modular, cloud-connected, and secure – iENSO develops and delivers vision systems for any application.



### Key features:

- Dual-core Arm® Cortex®-A53 up to 1 GHz
- Up to 4Kp30 maximum encoding performance
- CNN / DNN inference acceleration for detection, classification, and more
- +320 MPixel/s input rate
- Multi exposure HDR and 3-axis image stabilization
- 180° fisheye lens distortion correction
- Single, dual or triple sensor input with independent ISP configuration
- H.265/HVEC, H.264, MJPEG encoding
- Support for 16-bit LPDDR4(x) / DDR4 Secure boot with TrustZone® and secure memory
- Broad image sensor support
- Based on 10nm low-power CMOS process

Block Diagram																													
Sensor 1 Connector	<table border="1"> <tr> <td>Image Signal Processor (ISP)</td> <td>Dual-Core ARM® CORTEX A53 NEON FPU Extension</td> <td>Computer Vision Processor CVFlow™</td> <td>Wi-Fi + BLE Module</td> </tr> <tr> <td>Sensor 2 Connector</td> <td>System Peripherals Timers, UART, JTAG, SPI, RTC, I2C, I2S, GPIO, PWM, ADC</td> <td>Memory LPDDR4 / DDR4 16-Bit SPI NAND</td> <td>Video CODEC AVC/HVEC/MJPEG Multi-CH, Encode</td> </tr> <tr> <td>ALS/IRC Connector</td> <td>Interfaces/Inputs MIPI CSI-2, PIR, ALS, Mic</td> <td>Security Features Secure Boot – Trust Zone®, TRNG, OTP, DRAM Scrambling and DRAM Virtualization</td> <td>Connectivity USB 2.0, SDI/SDIO, Ethernet, LED Illumination, Speaker</td> </tr> <tr> <td>PIR/Motion Connector</td> <td></td> <td></td> <td>POE Module Connector</td> </tr> <tr> <td>MIC Connector</td> <td></td> <td></td> <td>LTE Module Connector</td> </tr> <tr> <td></td> <td></td> <td></td> <td>Micro SD Connector</td> </tr> <tr> <td></td> <td></td> <td></td> <td>Speaker Conn LED Out Conn</td> </tr> </table>	Image Signal Processor (ISP)	Dual-Core ARM® CORTEX A53 NEON FPU Extension	Computer Vision Processor CVFlow™	Wi-Fi + BLE Module	Sensor 2 Connector	System Peripherals Timers, UART, JTAG, SPI, RTC, I2C, I2S, GPIO, PWM, ADC	Memory LPDDR4 / DDR4 16-Bit SPI NAND	Video CODEC AVC/HVEC/MJPEG Multi-CH, Encode	ALS/IRC Connector	Interfaces/Inputs MIPI CSI-2, PIR, ALS, Mic	Security Features Secure Boot – Trust Zone®, TRNG, OTP, DRAM Scrambling and DRAM Virtualization	Connectivity USB 2.0, SDI/SDIO, Ethernet, LED Illumination, Speaker	PIR/Motion Connector			POE Module Connector	MIC Connector			LTE Module Connector				Micro SD Connector				Speaker Conn LED Out Conn
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# iENSO

**Give your vision the edge**

- Application-based turnkey embedded vision solutions
- Edge AI for powerful on-device decision-making
- Flexible Cloud platform and end-to-end security

## HARDWARE SPECIFICATIONS - iVS-CV28P

### Ambarella CV28 Based Vision SoC

<b>Processor</b>	<ul style="list-style-type: none"> <li>Dual-core Arm® Cortex®-A53 up to 1 GHz</li> <li>NEON™ SIMD and FPU acceleration</li> <li>10 nm low-power CMOS</li> </ul>
<b>Sensor I/O</b>	<ul style="list-style-type: none"> <li>MIPI CSI-2, sLVDS, SLVS</li> <li>2 sensor inputs</li> <li>Supports up to 8MP CMOS image sensor</li> </ul>
<b>Advanced Image Signal Processing</b>	<ul style="list-style-type: none"> <li>Up to 320 Mpixel/s maximum pixel rate</li> <li>Lens shading correction</li> <li>Multi-exposure HDR</li> <li>3D motion compensated noise reduction (MCTF)</li> <li>3-Axis Electronic Image Stabilization (EIS)</li> <li>Digital PTZ and Virtual Cameras</li> <li>OSD engine, overlays, privacy mask</li> <li>Crop, mirror, flip, rotation</li> <li>On-chip stitching</li> <li>Geometric lens distortion correction</li> <li>Gamma compensation and color enhancement</li> <li>WDR with local tone mapping</li> </ul>
<b>Video Processing</b>	<ul style="list-style-type: none"> <li>H.265 / HEVC, H.264, MJPEG</li> <li>Up to 4KP30 encoding performance</li> <li>Dynamic region of interest (ROI)</li> <li>Multiple CBR and VBR rate control modules</li> </ul>
<b>AI Power Intelligence Video Analytics</b>	<ul style="list-style-type: none"> <li>CVFlow® vision processor for CNN / DNN edge analytics</li> <li>Pre-integrated AI Detectors or provide your own</li> <li>Can utilize models trained with industry-standard tools such as Caffe, TensorFlow or PyTorch</li> </ul>
<b>Networking &amp; Connectivity</b>	<ul style="list-style-type: none"> <li>Wi-Fi 802.11 (optional)</li> <li>BT / BLE (optional)</li> <li>LTE Module (optional)</li> <li>Ethernet PoE Module (optional)</li> </ul>
<b>Audio</b>	<ul style="list-style-type: none"> <li>Audio Codec</li> <li>Line In and Line Out</li> </ul>
<b>Memory</b>	<ul style="list-style-type: none"> <li>16Gb LPDDR4 DRAM</li> <li>4Gb SLC NAND Flash</li> <li>Optional eMMC</li> </ul>
<b>Interfaces</b>	<ul style="list-style-type: none"> <li>USB 2.0 (Device / Host)</li> <li>Micro SD</li> <li>SPI, I2C, JTAG, UART, GPIO, PWM, ADC</li> <li>LED Flash Control</li> <li>Expansion I/O Port: MIPI-DSI, HDMI, GPIO</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>AES / SHA1 / SHA2-256 crypto acceleration</li> <li>Secure boot with TrustZone® and secure memory, TRNG, OTP, DRAM scrambling and virtualization</li> <li>Optional SOC monitoring</li> </ul>
<b>Power In</b>	<ul style="list-style-type: none"> <li>12 VDC</li> </ul>
<b>Physical</b>	<ul style="list-style-type: none"> <li>Standard Board size - 2.5 x 2.5 (inch)</li> <li>Custom board size available</li> </ul>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>Operating temperature: -20°C to 70°C</li> <li>Operating humidity: 5% to 90%</li> </ul>
<b>OS</b>	<ul style="list-style-type: none"> <li>Linux</li> </ul>
<b>Camera Modules</b>	<ul style="list-style-type: none"> <li>Sensor Modules up to 8MP/4K</li> <li>Multiple lens options</li> <li>IR or white LED illumination options</li> <li>IR Filter for night vision options</li> </ul>



SECURITY



PRECISION FARMING



HOME AUTOMATION



SMART APPLIANCES



IoT



### Additional information:

- Compatible sensor modules (iSM): [iENSO.com/iism](https://www.ienso.com/iism)

- Custom module versions available upon request

Contact [iENSO.com](https://www.ienso.com) to discuss your specific needs



[www.ienso.com](https://www.ienso.com)



Established in 2003, iENSO provides embedded vision data systems that help global brands turn their products into vision data devices. iENSO provides fully secure end-to-end solutions that capture vision data and process it at the Edge and in the Cloud, giving product companies the opportunity to unlock the business benefits of recurring revenue and data monetization.

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