

# GW52x0

## Camera Video Processor

### GW52x0 Features

- eWARP Geometric Processor
- 120dB HDR ISP
- Graphics Overlay Engine
- AEC-Q100 Grade 2
- ASIL-B

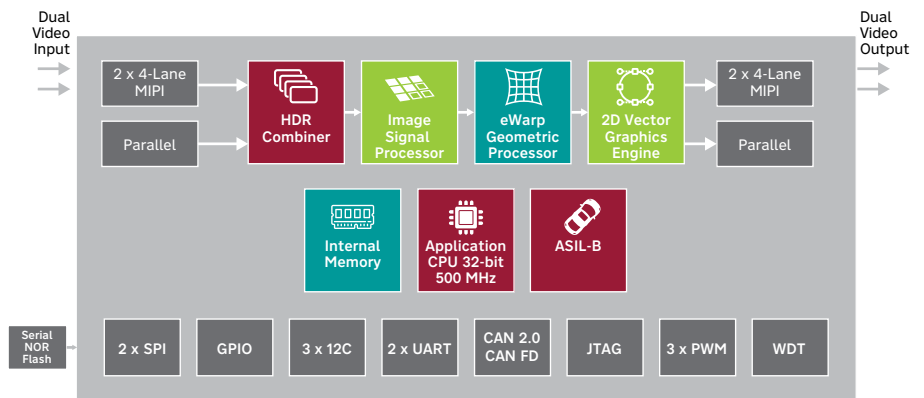
### Applications

- Backup cameras
- Rear view eMirror
- Side view eMirror
- Surround view monitoring
- Car Digital Video Recorder
- Head up display (HUD)

The GW52x0 is an advanced Camera Video Processor (CVP) System-on-Chip (SoC) designed for advanced driver assistance systems (ADAS). The GW52x0 includes indie’s innovative High Dynamic Range (HDR) Image Signal processor (ISP), proprietary 5th-generation eWARP® geometric processor, and 2D graphics functionality. Designed in a 28nm process to enable small, low power automotive cameras on-the-edge, the GW52x0 supports ASIL-B and AEC Q100 Grade 2.

The HDR ISP supports up to 2.5MP image sensors, the most advanced HDR, and LED Flicker Mitigation (LFM) techniques available on the latest automotive sensors. The Vector Graphics Engine renders high resolution real-time graphics to overlay on the video stream enabling compelling user interfaces.

The GW52x0 reduces system component count by requiring no external DDR memory and incorporating dual camera inputs. GW52x0 based designs can be rapidly brought to market by leveraging indie’s software design and evaluation kits.



### Ordering Information

Device Name	RoHS Compliant	MIPI Output	Package	Pins
GW5200	Yes	1x	169-ball TFBGA	7x7mm 0.50mm pitch
GW5210	Yes	2x	196-ball TFBGA	10x10mm 0.65mm pitch

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**Preliminary** – Features and specifications are subject to change at the discretion of indie Semiconductor.  
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## Camera Video Processor

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### eWarp® Geometric Processor

- 5th-gen eWARP® geometric processor
- Ultra-wide field of view (FOV) lens distortion correction
- Dynamic Electronic Pan/Tilt/Zoom (ePTZ)
- Digital calibration for single and multiple camera systems
- Ultra-low latency (typically 1/6th of a frame)
- Highly flexible programmable warp maps

### HDR Image Signal Processor

- ISP supporting the following modes:
  - Up to 2048x1280 @ 60fps single image sensor input
  - Up to 2048x1280 @ 60fps each dual image sensor input
- High Dynamic Range (HDR) processing
  - 2, 3 & 4 exposure on-chip combining
  - Up to 20-bit HDR processing
  - Advanced Local Tone Mapping
- Advanced spatial (2D) noise reduction
- Zone-based statistics for AE and AWB
- Non-linear two-dimensional sharpening
- Dynamic defect and lens shading correction
- Color Noise Reduction
- Defog support

### 32-bit Xtensa® Processor

- Operation up to 500MHz
- 32kB Instruction and Data Caches
- Single precision FPU

### Graphics Overlay Engine

- 2D-Vector Graphics Accelerator
  - 1920x1080 at 60fps
  - On-the-fly rendering support
  - Tessellation Engine for lines, quadratic and cubic Bezier curves
  - Imaging and Pixel Engines for rendering and compositing image

- Animated bitmap support
  - Up to 4096x2048 OSD resolution
  - Eight layers of graphics
  - 256 colors selectable from 24bpp true color range
  - Anti-aliasing support using color by color alpha

### Video I/O Interfaces

- Input: 2x MIPI CSI-2 4-lane (1.5Gbps/lane)
- GW5400 Output: 1x MIPI CSI-2 4-lane (1.5Gbps/lane)
- GW5410 Output: 2x MIPI CSI-2 4-lane (1.5Gbps/lane)
- Input: 16-bit Parallel interface (150MHz Interface Clock)
- Output: 16-bit Parallel (150MHz Interface Clock)

### System Features

- CAN 2.0B and FD controller interface
- 3xI2C, 2xSPI, 2x UART, 15x GPIO, 3x PWM
- JTAG Debug
- eFuse (128 bits)

### Automotive Safety

- Supports ASIL-B Systems
- ECC support for all processor code spaces
- Built-in robustness support on the host control interface
- Watch Dog Timer
- Embedded video and system statistics in output stream
- Process, Voltage and Temperature Sensors

### Electrical Specifications

- Core supply voltage: 0.9V ±5%
- I/O supply voltages: 1.8V or 2.5V or 3.3V ±5% (Only one required)
- PLL supply voltage: 1.8V ±5%
- MIPI supply voltage: 1.8V ±5%
- Automotive grade: AEC Q100 Grade 2