GW4100

Automotive Analog Camera Video Processor

GW4100 Features

- eWARP Geometric Processor
- AutoCal®
- Graphics Overlay Engine
- Low latency
- AEC-Q100 Grade 2

Applications

- Automotive Cameras
- Rear view
- Blind spot camera
- Front view
- Mirror replacement
- Active safety camera
- DVR

The GW4100 Automotive Analog Camera Video Processor integrates indie's patented Geometric processor eWARP® with an advanced High Dynamic Range (HDR) Image Signal Processor (ISP), On-screen Display (OSD) engine, Parallel, MIPI, and NTSC/PAL interfaces. The device incorporates a Tensilica® Xtensa processor along with peripheral and serial device interfaces for complete system integration.

The eWARP® processor is indie's fourth-generation version of the unique and powerful geometric processor. The fully programmable geometric processor provides the flexibility and performance to correct complex lens distortion, enable electronic Pan/Tilt/Zoom, and manipulate viewing perspective in real time with sub-frame time latency. The eWARP® technology can generate a video stream with multiple virtual camera views. The eWARP® core also supports complex digital alignment and camera calibration extrinsic calibration using AutoCal®.

The ISP provides High Dynamic Range (HDR) processing, spatial noise reduction, color processing, sharpening, and advanced 3A algorithms. The HDR technology applies different processing to each pixel of each video frame to pull out hidden detail in shadows and highlights while preserving color, local contrast, and natural appearance. The ISP supports HDR sensors that provide a dynamic range of up to 120dB revealing detail in both high-light and low-light areas of the scene simultaneously.
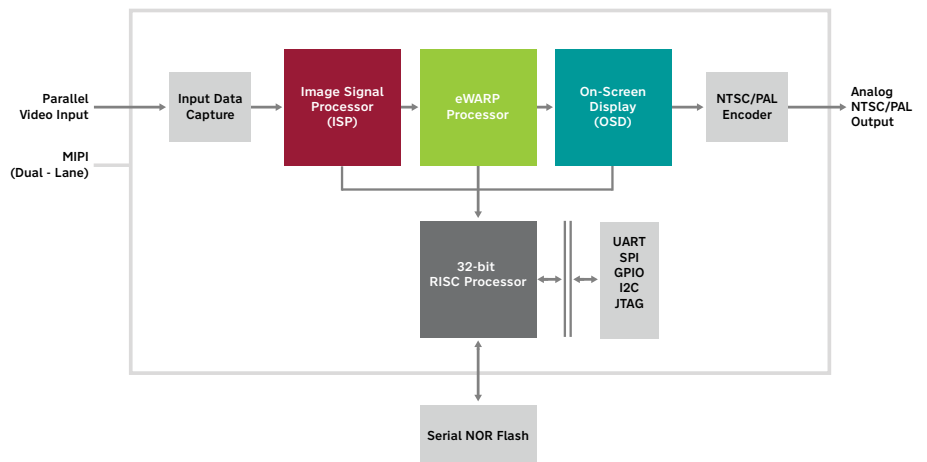
Ordering Information

Device Name	RoHS Compliant	Package	Pins
GW4100	Yes / Lead-free	109 TFBGA	6x6X1.2mm 0.5mm pitch

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The On-screen Display (OSD) engine blends up to four layers of graphics with the video. The four layers can be a combination of both static and dynamic overlays. The static overlays enable text and logos while dynamic overlays are used for dynamic parking lines, active text, and animations. The OSD can support either RGB or YUV format.

Camera Processor

- Ultra-wide field of view (FOV) lens distortion correction
- Dynamic Electronic Pan/Tilt/Zoom (ePTZ)
- Digital calibration for single and multiple camera systems
- Parallel geometric processing to generate multiple views in a single pass
- Full alignment, perspective correction, and blending for bird's eye view or surround view camera systems
- Very low latency mode (typically 1/6th of a frame)

Advanced Geometric Processor

- indie's proprietary eWARP® geometric processor
- Highly flexible programmable warp maps for distortion correction
- Real-time on-the-fly generation of warp maps
- Support for custom lens design
- AutoCal® digital calibration for extrinsic camera calibration

Image Signal Processor

- HDR ISP with 2MP, 1080p60 sensor support
- Space variant HDR processing
- HDR decompanding for high bit-depth image sensors
- Advanced spatial (2D) noise reduction
- Zone-based statistics for Auto White Balance and Auto Exposure
- Non-linear two-dimensional sharpening
- Dynamic defect correction
- Lens shading correction

On-screen Display (OSD)

- Four layers of graphics, one static, three dynamic
- 256 colors selectable from 24 bpp true color range
- OSD overlay maximum resolution: 1920 x 1080
- Anti-aliasing support using color by color alpha
- Dynamic overlay support using animated static image
- Refresh rate: 30 fps for dynamic overlay update
- Lossless compressed bitmaps for high speed reads and reduced storage requirements

Inputs/Outputs, Video Formats

Inputs
- Input Interfaces: Dual lane MIPI and 12-bit Parallel
- Input resolution up to 1920 x 1080 at 60fps
- Input Data Formats:
- 8/10-bit YUV 4:2:2 over 8/10-bit interface
- 8/10/12-bit Bayer RGB

Outputs
- Output Interfaces: Analog NTSC/PAL
- Output Data Formats:
- Analog NTSC/PAL

System Connectivity

- SPI Master, I2C
- UART, JTAG, GPIOs, GPOs

Electrical Specifications

- Power Supplies: 1.1V ±5%, 1.8V ±5%, 2.5V ±5%
- Typical power consumption: 262mW for 720p30
- Automotive Grade Operating Temp.: -40°C to 105°C
- AEC Q100 Grade 2