Video-based driver assistance systems

Multi purpose camera, generation 2

PRODUCT BENEFITS

- Realization of multiple safety and comfort functions, including predictive pedestrian protection, lane assist systems and road sign recognition
- Meets all NCAP safety standards (ASIL-A) in fusion systems with radar
- Hardware concept allows components to be optimally configured to required level of functionality
- Easy vehicle integration (CAN, FlexRay)
- Housing can be adapted to fit the space available
- Highly flexible connector design
- AUTOSAR conformity enables integration of customer-specific object codes
**TASK**
The multi purpose camera (MPC2) offers manufacturers a flexible, monocular camera platform for driver assistance systems. All MPC2 variants are based on a re-programmable image processing consisting of a powerful FPGA semiconductor with built-in microprocessor. High performance image processing algorithms run in parallel on dedicated hardware structures. Still, project-relevant adaptations and optimizations can be done.

**FUNCTION**
The MPC2 optics focuses incoming light onto a highly dynamic CMOS color imager (with a resolution of 1280 × 960 pixels). The converted signals are then processed by a high-performance computer integrated into the camera housing—without the need for a separate controller. With a high level of accuracy and reliability, the system processes the image, recognizing, classifying and locating objects (e.g., pedestrians, road markings, vehicles, light sources and road signs).

The variants of the MPC2 allow manufacturers to integrate a wide range of functions that make driving safer and more comfortable:

- Pedestrian warning
- Forward collision warning
- Lane departure warning
- Lane keeping and lane guidance support
- Road sign recognition
- Intelligent headlight control
- Simultaneous detection of vehicles and pedestrians for fusion systems with radar
- Automatic emergency braking

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
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<tbody>
<tr>
<td>Image size</td>
<td>1280 × 960 pixels</td>
</tr>
<tr>
<td>Field of view</td>
<td>50° horizontal</td>
</tr>
<tr>
<td></td>
<td>28° vertical</td>
</tr>
<tr>
<td>Resolution</td>
<td>25 pixels/°</td>
</tr>
<tr>
<td>Frame rate</td>
<td>30 images/second</td>
</tr>
<tr>
<td>Exposure dynamic</td>
<td>110 dB</td>
</tr>
<tr>
<td>Wavelength</td>
<td>400…750 nm</td>
</tr>
<tr>
<td>Current consumption</td>
<td>&lt;5.0W (0.35A at 14V)</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>−40 to +85 °C</td>
</tr>
<tr>
<td>Interfaces</td>
<td>2 × CAN or optional: FlexRay</td>
</tr>
<tr>
<td></td>
<td>2 × digital in/out, windscreen heating</td>
</tr>
<tr>
<td>Safety standards</td>
<td>ASIL-A (e.g. AEB City and AEB Inter-Urban/New in 2016: AEB Vulnerable Road Users – Prevention or mitigation of frontal collisions with pedestrians, thus significantly reducing injury risk)</td>
</tr>
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**Lane assist systems**
Detect unintended departure from the lane, and warn the driver at an early stage, actively help to keep the vehicle in the lane or help changing lanes.

**Road sign recognition**
Evaluates road sign recognition data and displays relevant information in the instrument cluster, enabling a range of warning functions for the driver.

**Automatic emergency braking**
Can avoid collisions with other vehicles as well as with vulnerable road users. If an accident is not avoidable, the system at least reduces the speed of the vehicle and the risk of injury.

**high flexibility**

to adjust the video algorithm (FPGA-based image processing).

**high safety and comfort**
thanks to multiple functions which meet all NCAP safety standards.