System Factsheet

Qorivva MPC5604EKIT

Reduce your system costs by using Ethernet for transmission of video

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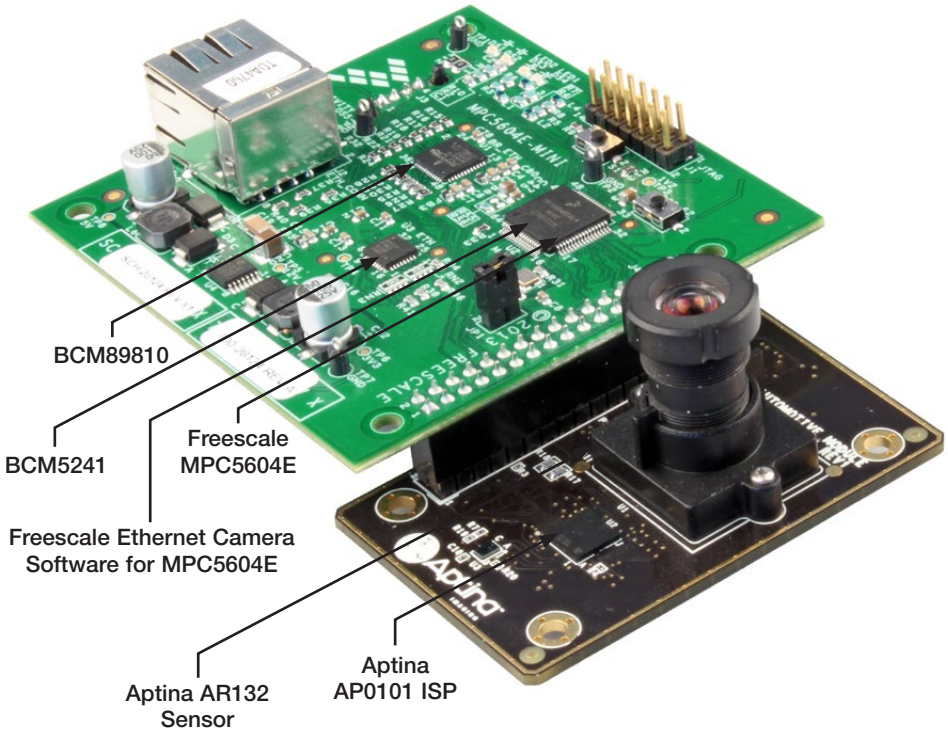
The Freescale Qorivva MPC5604EKIT: Let's get creative with cameras.

Overview

Using Ethernet for transmission of video over twisted pair cables allows the removal of expensive LVDS coaxial cables from the next generation of camera systems. The Qorivva MPC5604E microcontroller (MCU) from Freescale enables customers to realise this cost saving, along with a very small form factor, the Qorivva MPC5604E MCU provides the capability to place camera sensors in a range of new applications both from within the automotive and general markets.

Figure 1: Qorivva MPC5604EKIT



To support customers being creative in exploring new and different application areas for utilising camera sensors, Freescale has produced the Qorivva MPC5604EKIT kit that contains a camera sensor and image signal processor. The Qorivva MPC5604EKIT provides a complete development platform for next-generation general market and automotive camera applications; the kit includes the Freescale Qorivva MPC5604E MCU that delivers the capability for video compression and transmission over Ethernet, Freescale software for Ethernet based camera systems using the Qorivva MPC5604E, the AP0132AT image sensor and AP0101 image signal processor (ISP) from Aptina™. The Qorivva MPC5604E board is populated with two Ethernet Physical Interfaces (PHYs) from Broadcom®, supporting both BroadR-Reach® and standard 100Mbps; BCM89810 and BCM5241 PHYs.

Freescale MPC5604E MCU

The MCP5604E MCU is part of the Qorivva family of microcontrollers.

The Qorivva MPC5604E MCU is a gateway system designed to move data from different sources via Ethernet to a receiving system and vice versa.

The supported data sources and sinks are:

- Video data (with 8/10/12 bits per data word)
- Audio* data (6 x stereo channels)
- RADAR data (2 x 12-bit with <1 us per sample, digitized externally and read in via DSPI)
- Other serial communication interfaces, including FlexCAN, LINFlex and DSPI Ethernet has a bandwidth of 10/100 Mbps supporting precision time stamping (IEEE®1588)
- 64MHz e200 zen0h core
- 512k byte Program Flash with ECC
- 4 x 16k bytes Data Flash with ECC
- 96k byte SRAM with ECC
- 3.3 V single supply
- 64 pin LQFP package

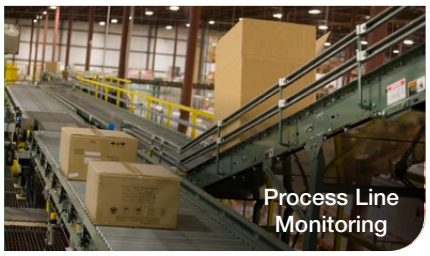
The Qorivva MPC5604E MCU, with its embedded Motion J-PEG compression engine, which operates without loading the CPU, precision time stamping hardware (IEEE 1588) and fast Ethernet controller (FEC), enables real-time broadcast of video and audio* data over Ethernet.

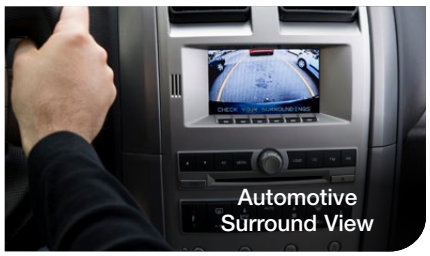
*The MPC5604EKIT does not have the Audio features supported.

AR0132AT Mega Pixel HDR (High Dynamic Range) Sensor

Aptina's AR0132AT is a 1/3-inch CMOS digital image sensor with an active-pixel array of 1280H x 960V. It captures images in either linear or high dynamic range modes, with a rolling-shutter readout. It includes sophisticated camera functions such as auto exposure control, windowing, and both video and single framemodes. It is designed for both low light and high dynamic range scene performance. It is programmable through a simple two-wire serial interface. The AR0132AT produces extraordinarily clear, sharp digital pictures, and its ability to capture both continuous video and single frames makes it the perfect choice for a wide range of applications, including ADAS and surround view cameras.

Some Application Opportunities





AP0101 HDR ISP (Image Signal Processor)

- Supports up to 1.2Mp (1280x960) Aptina sensors
- 45 fps at 1.2Mp, 60 fps at 720p
- Optimized for operation with HDR sensors.
- Color and gamma correction
- Auto exposure, auto white balance, 50/60 Hz flicker avoidance
- Adaptive Local Tone Mapping (ALTM)
- Test Pattern Generator
- Two-wire serial programming interface (Slave)
- Interface to low-cost Flash or EPROM through SPI bus (to configure and load patches etc)
- High-level host command interface
- Standalone operation supported
- Up to 5 GPIO
- Fail-safe I/O
- Multi-Camera synchronization support

Freescale Ethernet Camera Software for the Qorivva MPC5604E

The software provided with the Qorivva MPC5604EKIT is the following;

1. Ethernet Streaming software (binary code)
2. Camera Application software (binary code)
3. Autosar OS* (binary code)

No software support, maintenance, or other services, or rights to use the software in production systems, are included in the purchase price of the Qorivva MPC5604EKIT.

Production License

Freescale provides the option of having the production license for the Ethernet Camera software for the Qorivva MPC5604E included in the sale price of the Qorivva MPC5604E MCU.

This license model is denoted in the orderable MCU part number having the letter “S” present after the “E” character of SPC5604E i.e. SPC5604ES

*Use of Autosar OS for non-automotive applications might be restricted by Autosar agreements.

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For more information, visit freescale.com/MPC5604EKIT

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