Secure Automotive Ethernet Gateway Reference Design based on the MPC574xB/C/G Microcontrollers

For rapid prototyping and development of Automotive and Industrial Gateway Applications

Overview
The MPC5748G-GW-RDB is a reference design that provides A-sample like Ethernet Gateway ECU development system including board hardware and software enablement.

It features the 32-bit MPC5748G automotive MCU based on Power Architecture® technology. It offers up to three e200 Cores, Hardware Security Module, vast number of communication interfaces and flexible memory options.

The MPC5748G-GW-RDB reference design combines advanced NXP products to help accelerate customers’ gateway product development and time to market.

Technical Highlights
1. Supports domain-based networking architectures
2. Multi-channels of 100BASE-T1 Ethernet and CAN FD (up to 5 Mbps)
3. HSM and secure Over-The-Air updates support
4. ISO 26262 support by using safety components and architecture.

MPC5748G MCU Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash</td>
<td>Up to 6 MB</td>
</tr>
<tr>
<td>SCI/SPI</td>
<td>Up to 768 KB</td>
</tr>
<tr>
<td>Core</td>
<td>2 x 24 @ 160 MHz, 1 x 22 @ 80 MHz</td>
</tr>
<tr>
<td>Op Range</td>
<td>3.3 to 5.5 V</td>
</tr>
<tr>
<td>Temp</td>
<td>-40 to 125 °C</td>
</tr>
<tr>
<td>Package</td>
<td>176 LQFP 256/324 BGA</td>
</tr>
</tbody>
</table>

System Block Diagram

Features
- A-sample like central gateway ECU with MPC5748G (176 LQFP) onboard
- Supports multi-channels of automotive Ethernet and CAN FD
- Supports secure Over-The-Air updates with 4 GB eMMC onboard
- Hardware features:
  - 4 x 100BASE-T1 Ethernet
  - 1 x 100BASE-TX Ethernet for DoIP
  - 8 x CAN/CAN FD (up to 5 Mbps)
  - 2 x FlexLIN / 1 x RS-232
  - 3 x PWM / 2 x ADC / 2 x High-side switch out
  - JTAG debug
- Support functional safety features onboard:
  - ASIL D safety power SBC
  - ASIL B S32K144 as sub-MCU
  - ASIL A SJA1105Q 5-ports Ethernet switch
  - Fault management and reset logics circuits

Software and Tools
- S32 Design Studio and Software Development Kit
- AUTOSAR OS and MCAL
- Supports secure OTA with 4 GB eMMC onboard
- Runtime Software:
  - Flash and EEPROM driver
  - Software core self-test
- Compiler: Green Hills, Wind River, High Tec
- Debugger: Lauterbach, iSystem, PLS, Green Hills, P&E

www.nxp.com/MPC5748G-GW-RDB

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