

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.

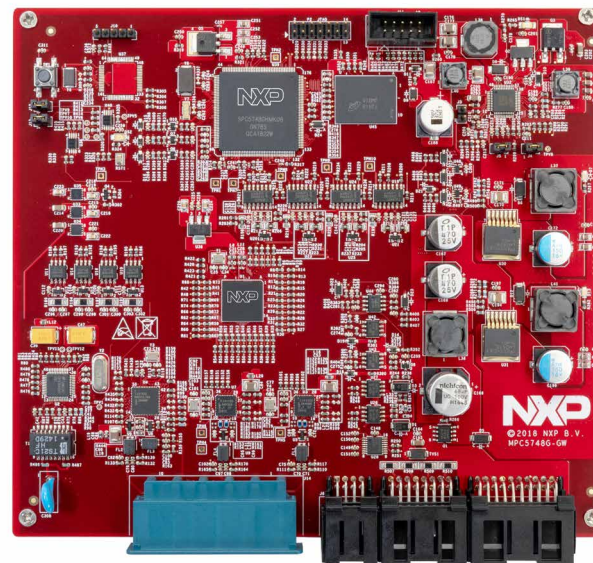
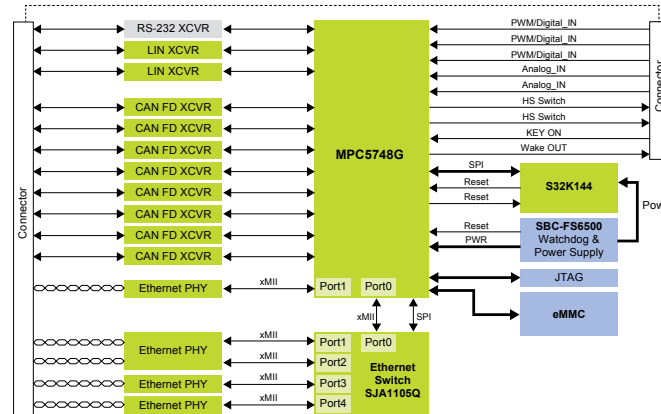
Technical Highlights

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

Flash	Up to 6 MB	Timer/PWM	Up to 96-ch, eMIOS
SCI/SPI	Up to 768 KB	Other Timer	Up to 16 PIT, 3 STM, 4 SWT
Core	2 x Z4 @ 160 MHz 1 x Z2 @ 80 MHz	Analog	Up to 2 ADC (10 & 12-bit), 3 Comparators, CTU
Op Range	3.3 to 5.5 V	Communications	2 x ENET, 8 CAN FD 1 x SDHC, 1 x USB Up to 4 DSPI, 6 SPI, 18 LIN
Temp	-40 to 125 °C	Safety and Security	HSM (EVITA Medium), PASS, TDM, FCCU, ASIL B
Package	176 LQFP 256/324 BGA	Low Power	LPU_SLEEP, LPU_STOP LPU_STANDBY

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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Document Number: MPC5748GGWFS44 REV 1



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