Vehicle Infotainment Controller based on MPC574xB/C/G Series Microcontrollers

Power Architecture®-based MCU for Automotive and Industrial Applications

The MPC574x MCU family provides a highly integrated, safe and secure single-chip solution to securely connect to various subsystems and manage the data flow across various end-nodes.

Application One-Sheet

Overview

The in-vehicle infotainment (IVI) controller gateway is a single-point of contact for the infotainment processor to get all the control information. In addition to providing connectivity to the vehicle, the vehicle infotainment controller gateway provides automotive compliant security (SHE & EVITA) and functional safety (ISO 26262) within the infotainment ECU.

Typically, the IVI controller gateway connects:

▶ To the body controller module (e.g., get speed input or volume adjust)
▶ To the multi-purpose steering wheel to obtain control input (volume, HVAC, phone, etc.) for infotainment processor
▶ Securely to the central gateway for diagnostic purposes and Firmware Over-the-Air Update (FOTA)
▶ To the rear seat control panel for user inputs
▶ The various sensors (e.g., brightness sensor, fuel tank and temperature sensor)
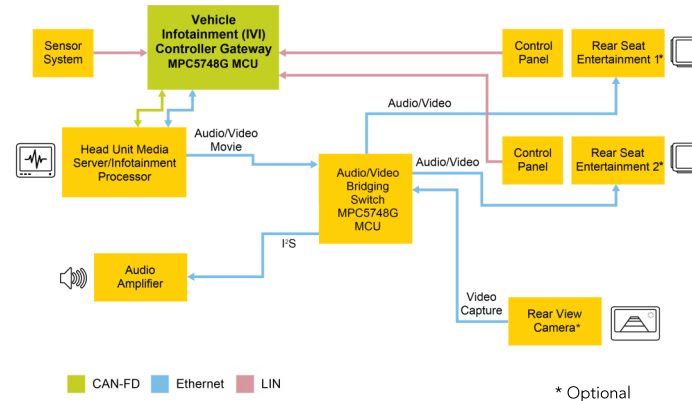▶ To the battery management system for battery health related information for cluster

MPC574xB/C/G Specifications

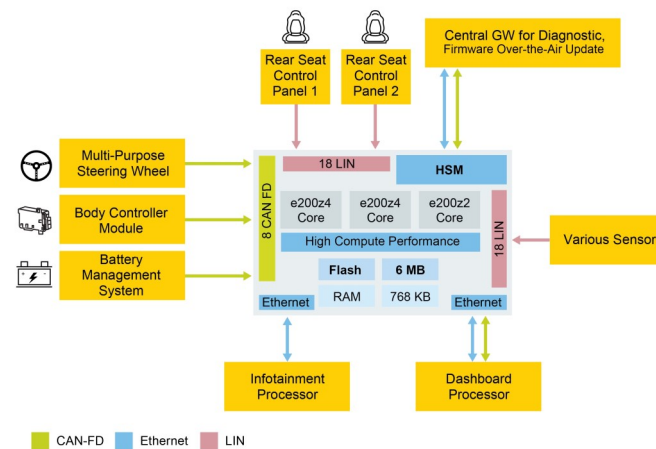| Flash	Up to 6 MB	Timer/PWM	Up to 96 ch., eMIOS
RAM	Up to 768 KB	Other Timer	Up to 16 PIT, 3 STM, 4 SWT
Core	Up to 2 x Z4, 1 x Z2	Analog	Up to 2 ADC (10 & 12 bit), 3 Comparators, CTU
Speed	2 x 160 MHz 1 x 80 MHz	Communications	Up to 4 DSPI, 6 SPI, 18 LIN, 8 CAN FD, 4 I²C, 1xUSB, 2 x ENET, 1xSDHC
Op Range	3.3 to 5.5 V	Safety & Security	HSM, PASS and TDM, FCCU
Temp	-40 to 125 °C		
Package	176LQFP 256/324BGA	Low Power	LPU_SLEEP, LPU_STOP, LPU_STANDBY mode supported

System Block Diagram

CAN-FD · Ethernet · LIN

* Optional

Application Block Diagram

CAN-FD · Ethernet · LIN

Features

▶ A multi-core architecture provides high compute power and flexibility
▶ Peripherals:
— LIN (connect to slaves, up to 18 avail)
— CAN FD
— Ethernet
— DSPI
— USB
— MMC
— I2S (SAI)
— MLB
▶ Functional Safety support - ASIL-B (use of dual core to achieve higher ASIL levels on system)
▶ HSM hardware-based security features allow hardware accelerated secure boot, secure message handling, and general purpose crypto, compliant with SHE & EVITA-M.
▶ High Flash/SRAM ratio to support buffering needs for the application

Enablement Tools

▶ Development hardware:
— MPC574XG-MB family motherboard
— MPC574XG-256DS, MPC574XG-176DS or MPC574XG-324DS daughterboard
— DEVKIT-MPC5748G
▶ Runtime software: Flash and EEPROM driver
▶ Compiler: Green Hills®, Wind River®, HighTec®
▶ Debugger: Lauterbach®, iSystem®, PLS®, Green Hills®, P&E®
▶ Software Enablement:
— S32 Design Studio with SDK
— AUTOSAR 4.0 MCAL + OS

www.nxp.com/MPC5748G