5.1 MIPI—In the Smart Home

USE CASES

MIPI specifications are also applicable to many other Smart Home use cases including:

- Home Automation
- Heating, Ventilation and Air Conditioning
- Home Security

Example Home Hub Schematic

In Home Hubs:

- SoundWire to provide a shared, two-wire interface to drive codecs, microphones and speakers. Enables noise cancellation, beam steering and low-power audio 'keyword' activation
- DSI-2 over C/D-PHY to drive a low-power, high-resolution display enabling display partitioning when device is in a low-power standby mode and a touchscreen user interface using MIPI Touch over I3C
- CSI-2 over C/D-PHY as a highly scalable interface to connect high-resolution cameras, enabling low-power vision inferencing and camera control using CCI over the same connector using USL
- I3C to provide a shared, two-wire interface to connect sensors and simple UI components
- UFS over UniPro/M-PHY for fast boot and to read and write high-resolution images
- RFFE within radio communications module

In Smart Doors:

- I3C to provide a shared, two-wire interface to connect fingerprint sensor, an actuator for the door lock and simple UI components such as dot matrix LED display. In-band interrupts can be used to enable low-power standby mode
- CSI-2 as a highly scalable interface to connect a high-resolution camera, enabling facial recognition using low-power machine vision inferencing
- SoundWire to provide a shared, two-wire interface to drive microphone and speaker, enabling low-power audio 'keyword' activation
- RFFE within radio communications module

In Smart Home Appliances:

- I3C to provide a shared, two-wire interface to connect all internal sensors and actuators, and to connect and drive simple UI components, such as LEDs and buzzers
- DSI-2 over C/D/A-PHY to drive a low-power, high-resolution display using display partitioning when the device is in standby mode and touchscreen user interface using MIPI Touch
- A-PHY can be used in large appliances as a long-reach (≤15m) physical interface, ensuring reliable connectivity in a noisy EMI environments, reducing the need for internal EMC shielding
- RFFE within radio communications module
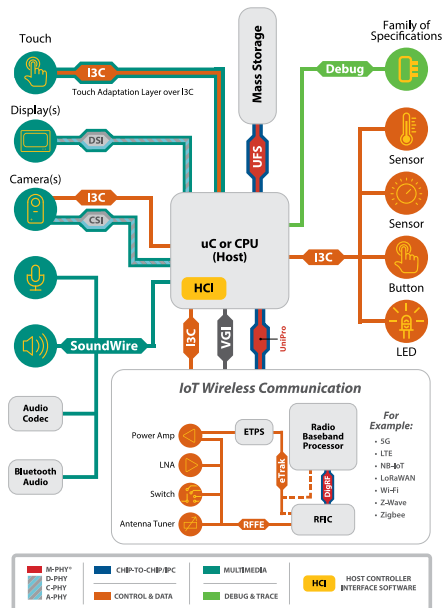
Associated MIPI SOFTWARE and DEBUG specifications also available to accelerate design process

LEGEND

Functionally safe and secure IoT device that will benefit from MIPI's focus on safety and security

IoT device with constrained power supply that will benefit from use of MIPI low-power interfaces

IoT device with wide-area cellular connectivity that will benefit from MIPI's 5G preparedness

Size-constrained, tightly packaged IoT device, benefiting from MIPI's low pin count, low wire count, low EMI interfaces