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Kevin Yee
Samsung and Chair of MIPI Marketing Steering Group

Ian Smith
IoT Specialist and Author of MIPI Alliance IoT White Paper

MIPI ALLIANCE DEVELOPERS CONFERENCE
22-23 SEPTEMBER 2020

MIPI Alliance: Enabling the IoT Opportunity

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What is the Internet of Things?

*"The **Internet of Things (IoT)** is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment."*

Source: Gartner 2020

In Plain English, IoT is…

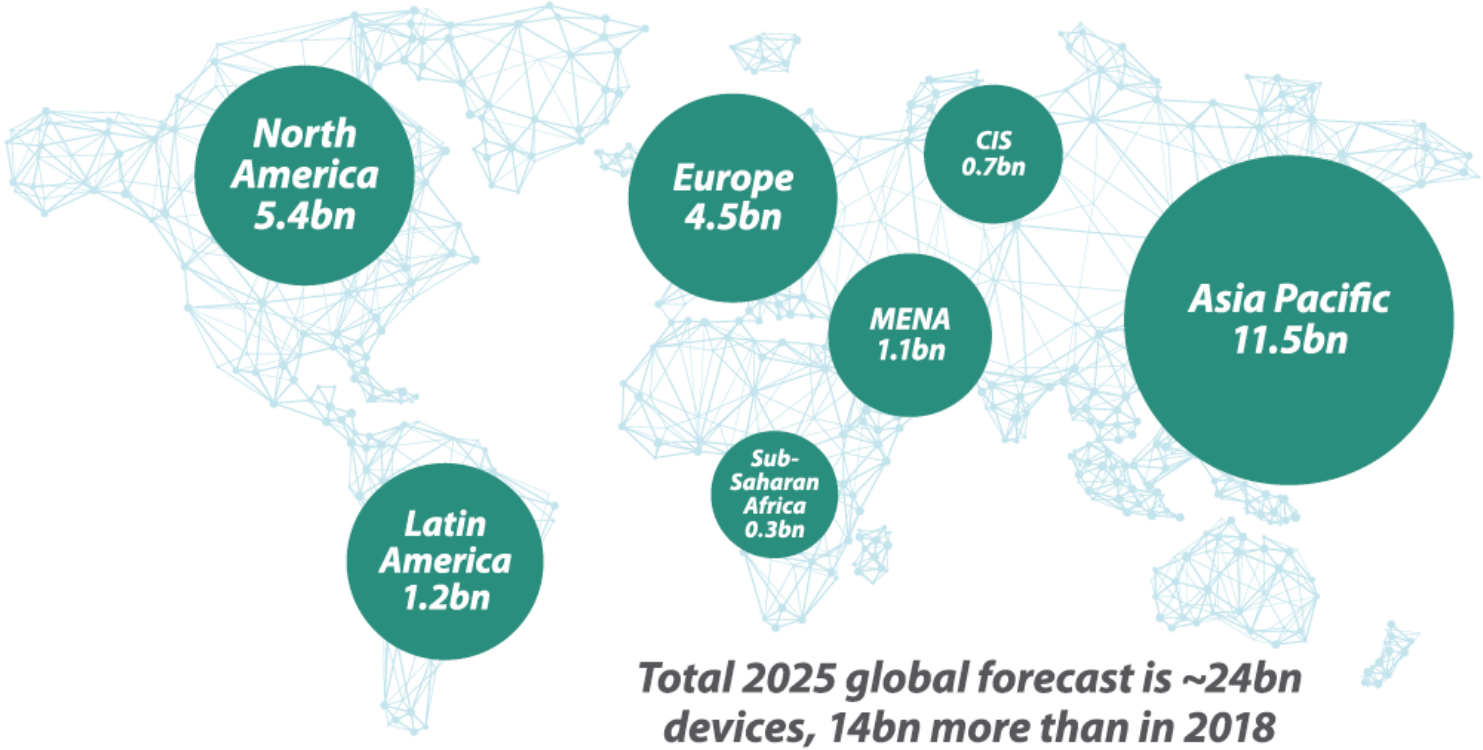
Wearables

Robotics/ Smart City

Home/ Medical

Agriculture/ Industrial

Forecast IoT Connections by 2025



Source: GSMA Intelligence IoT connections forecast: rise of enterprise, December 2019

MIPI – Our Core Values

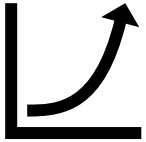
High Bandwidth
High Flexibility

Low Power
Consumption

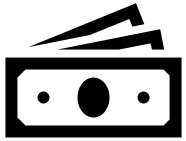
Low EMI

Key: Leveraging Value for IoT

MIPI Benefits – Meeting Key IoT Needs

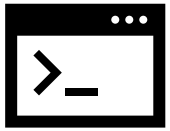


Economies of Scale



Low Cost of Ownership

Reduced Design Complexity



Software Development

5G Ready

Security

The MIPI IoT Opportunity is Gigantic

Consumer IoT


Smart Home


Consumer Electronics


Wearables

Enterprise IoT


Smart Factory


Smart City


Healthcare


Utilities


Drones


Agriculture

plus many more....

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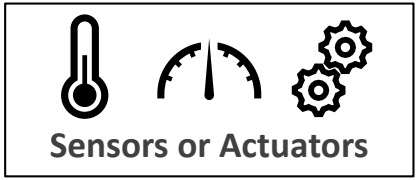
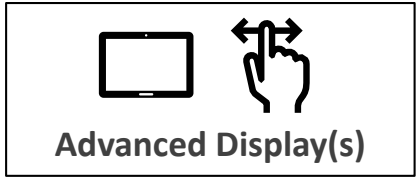
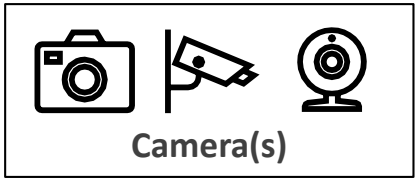
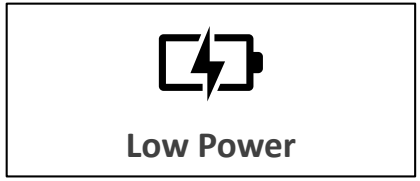
Is MIPI Relevant to Your IoT Device?

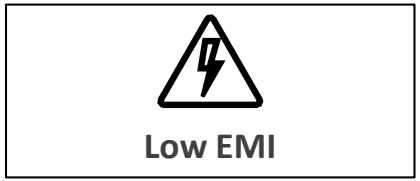
Does your IoT device require....

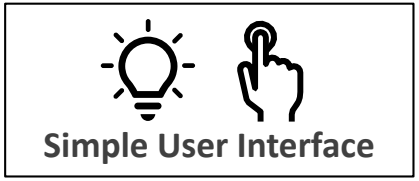


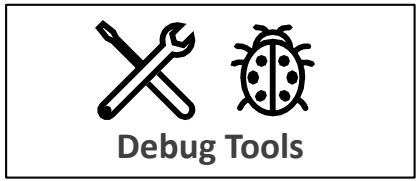


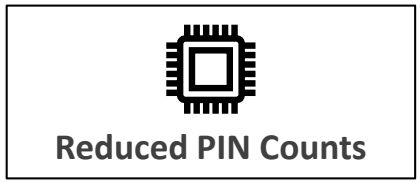










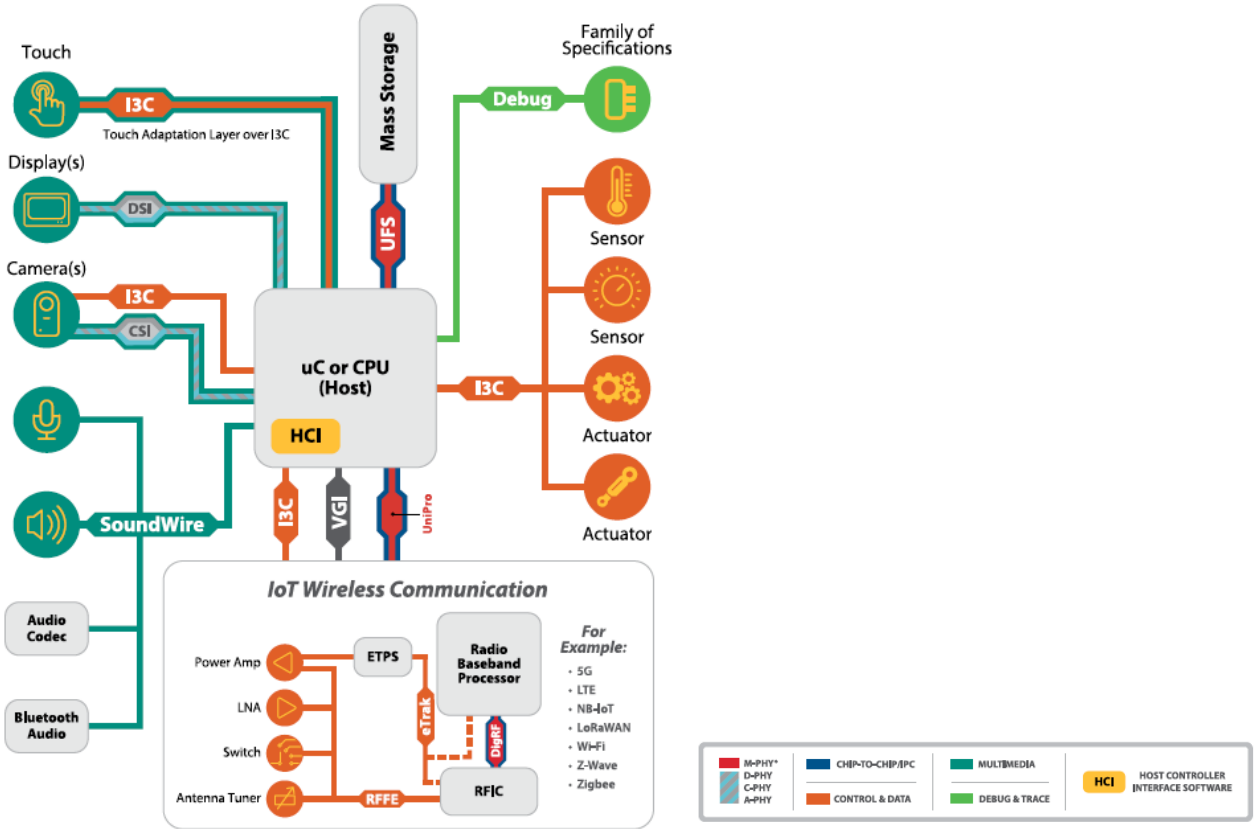


If the answer is ”Yes” you should check out the relevant MIPI specifications

Example IoT Device Requirements

Example Device Type	Sensor(s)	Actuators and Control	Camera	Simple User Interface	Advanced Displays	Advanced Audio	Debug
Security Camera	Yes	-	Yes	-	-	Yes	Yes
Smart Door	Yes	Yes	Yes	Yes	-	Yes	Yes
Washing Machine	Yes	Yes	-	Yes	Yes		Yes
Home Hub	Yes	-	Yes	Yes	Yes	Yes	Yes
Smart Speaker	-	-	Yes	Yes	-	Yes	Yes
Portable Gaming Device	Yes	Yes	Yes	-	Yes	Yes	Yes
Smart Watch	Yes	-	-	-	Yes	Yes	Yes
Fitness Tracker	Yes	-	-	Yes	-	-	Yes
Quality Control	Yes	Yes	-	-	-	-	Yes
Environmental Monitor	Yes	Yes	Yes	-	-	Yes	Yes
Traffic Monitor	Yes	-	Yes	-	-	-	Yes
Senior Living Monitor	Yes	-	Yes	Yes	-	Yes	Yes
Smart Meter	Yes	-	-	Yes	-	-	Yes
Commercial Drone	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Greenhouse Monitor	Yes	Yes	-	Yes	-	-	Yes

Example use of MIPI specifications in a generic IoT device



Relevant MIPI Protocol Specifications

MIPI Protocol Specification	Sensor	Actuator	Camera	Simple UI	Advanced Display	Advanced Audio	Inter-Processor Comms	Flash Storage
CSI-2℠	Yes	-	Yes	-	-	-	-	-
DSI-2℠	-	-	-	-	Yes	-	-	-
I3C℠	Yes	Yes	-	Yes	-	-	Yes	-
SoundWire®	Yes	-	-	-	-	Yes	-	-
Touch℠	-	-	-	-	Yes	-	-	-
UniPro®	-	-	-	-	-	-	Yes	Yes

Relevant MIPI Physical Layer Specifications

MIPI Specification	Specification Description
C-PHY℠ / D-PHY℠	High-speed, low-cost, low-power serial interfaces for cameras, displays and other sensors that have high bandwidth and bursty data requirements.
A-PHY℠	Long-reach serializer-deserializer interface providing a high-speed, low-latency, high-reliability physical layer interface for use in harsh EMI environments.
M-PHY®	Short-reach serial interface for data-intensive applications requiring fast communications channels. Applications include connecting flash memory, RF front-ends and inter-processor communications.

Enterprise IoT Examples

Smart Street Lighting using:
I3C
RFFE

Environmental Monitoring using:
I3C
RFFE

Surveillance Camera using:
CSI-2 over C/D/A-PHY
SoundWire
RFFE

Associated MIPI SOFTWARE and DEBUG specifications to accelerate design process

Smart Parking Sensors using:
I3C
RFFE

Smart Waste Bin using:
I3C
RFFE

Smart Tram using:
CSI-2 over A-PHY
DSI-2 over A-PHY
Touch
RFFE

Consumer IoT Examples

Associated MIPI SOFTWARE and DEBUG specifications to accelerate design process

Home Hubs using:

- SoundWire to drive codecs, microphones and speakers
- DSI-2 over C/D-PHY to drive a low-power, high-resolution display
- CSI-2 over C/D-PHY to connect high-resolution cameras
- I3C to connect sensors and simple UI components
- UFS over UniPro/M-PHY for local multimedia storage
- RFFE within radio communications module

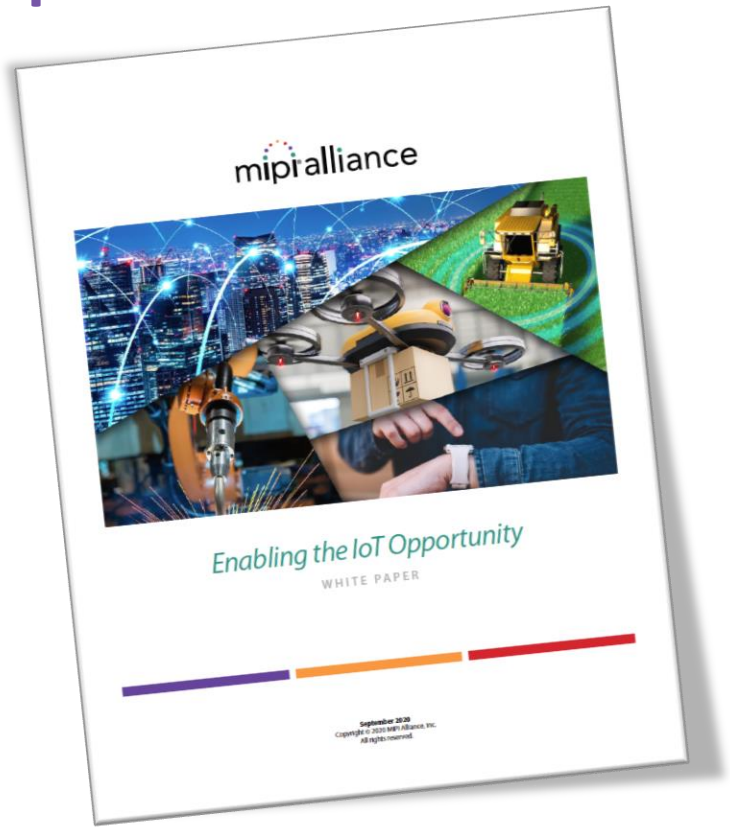
Smart Doors using:

- I3C connect fingerprint sensor, an actuator for the door lock and simple UI components such as dot matrix LED display;
- CSI-2 as a highly scalable interface to connect a high-resolution camera,
- SoundWire to drive microphone and speaker
- RFFE within radio communications module

Home Appliances using:

- I3C 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
- A-PHY, in large appliances, as a long-reach (≤15m) physical interface
- RFFE within cellular communications module

MIPI IoT White Paper



Now Available for Download

ADDITIONAL RESOURCES

MIPI DevCon 2020 Closing Session: The Internet of Things – Transitioning from Hype to Reality

23rd September @ 10:30 PDT

Link to Agenda

MIPI IoT White Paper: Enabling the IoT Opportunity

Download Here

MIPI Blog Post: Developer Kits with MIPI Camera And Display Support Provide a Fast Track for Designs

Read the Blog Here

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THANK YOU

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