Optimization for Camera modules

Contribution to 802.3dm Task Force

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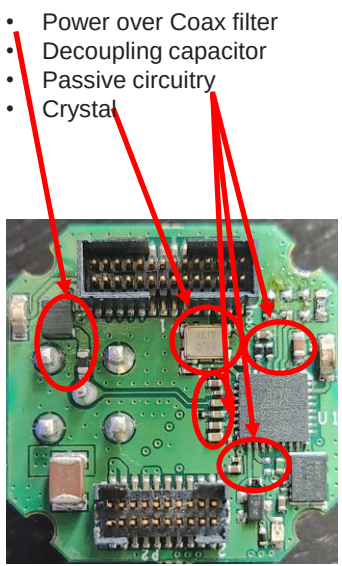
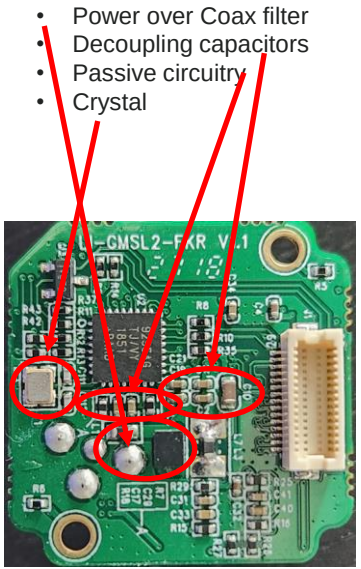
Introduction

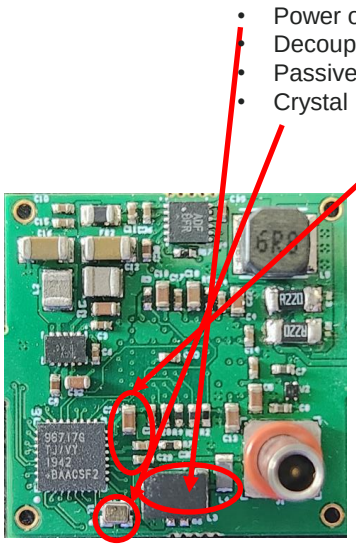
- Size and Power dissipation are top issues for customers manufacturing and purchasing camera modules.
- In this presentation, we share ways to optimize 802.3dm solutions to provide size, power, and BOM reduction(s) that current market solutions do not offer today.
- We propose the Task Force to consider:
  - Crystal-less operation
  - PoC impedance
  - Passive circuitry reduction

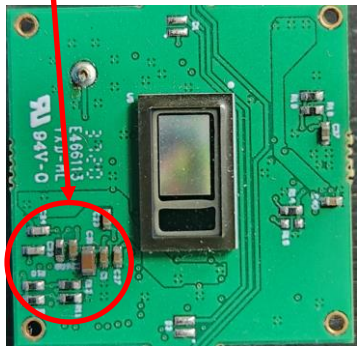
Reduction Techniques

- Options under 802.3dm control for module size reduction



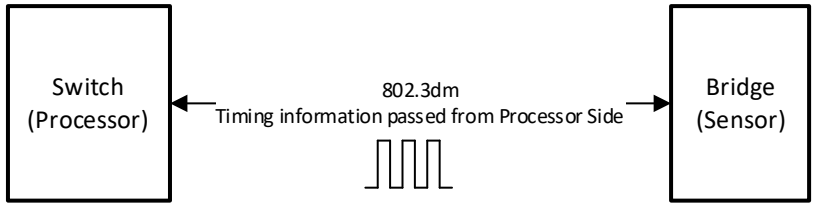






Crystal-less operation

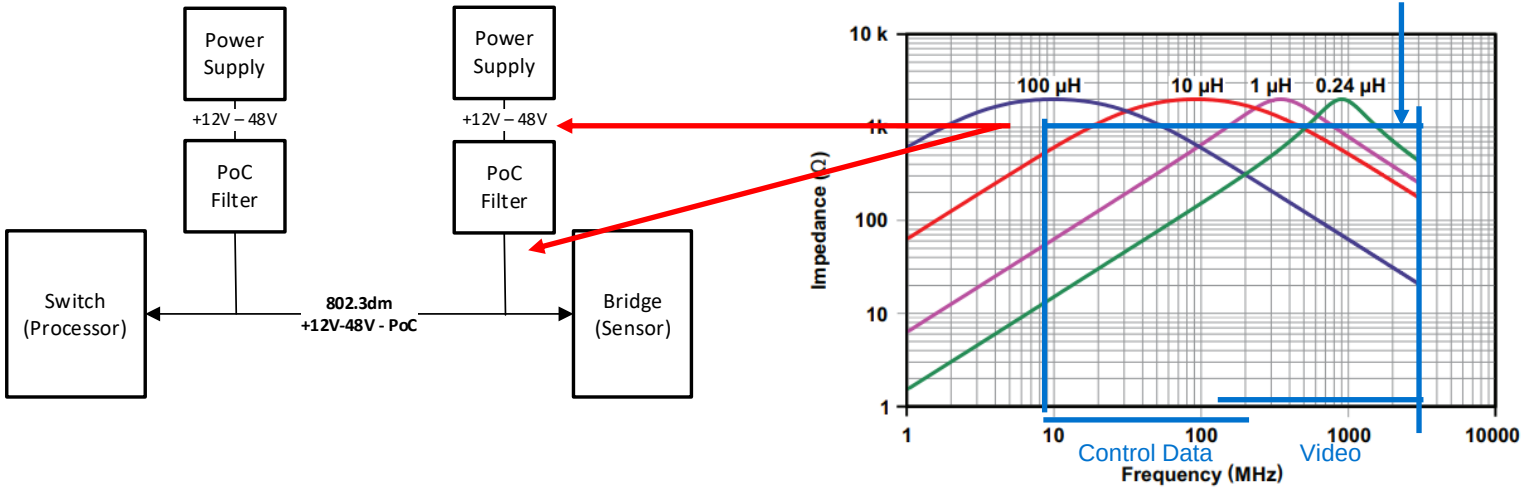
- Impacts of Crystal-less operation
  - Removal of crystal
  - PCB area savings
  - Reduction of Jitter specification
  - 2-pin package reduction



PoC Optimization and Requirements

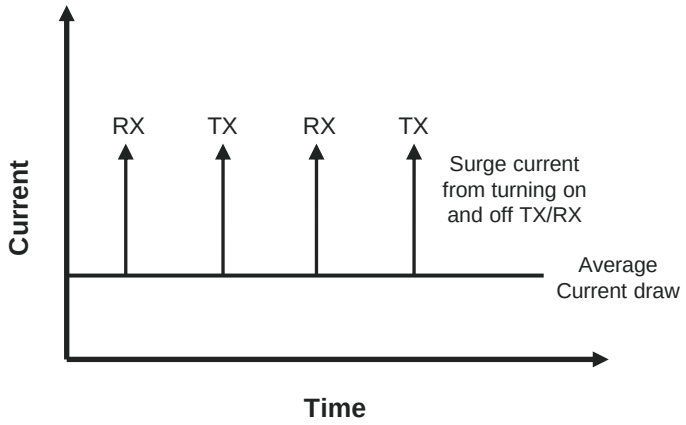
- PoC filters are critical to block any noise coupling into the RF signal to deteriorate the SNR.
  - PoC filters attenuate any noise and ripple coming from the power supply or external environment
- 802.3dm needs to establish an Impedance standard to offer competitive small form factor PoC solutions
- This allows customers to effective design and innovate PoC filter components

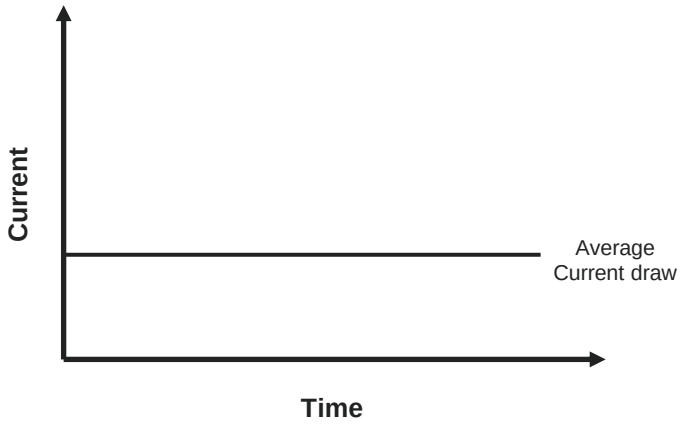
Existing SERDES solution requires = 1kΩ Impedance across 10MHz – 3GHz
This requires a 2 component Power over Coax (PoC) solution to cover the desired frequency



Decoupling reduction

- Reducing the amount of surge and average current consumption will reduce the decoupling circuitry and switch mode power supply (SMPS) circuitry/design.





- References: https://www.analog.com/en/resources/analog-dialogue/articles/transceiver-with-scalable-power-and-performance.html

Summary

- It is essential to remove as much support circuity as possible to provide low power, small form factor sensor module.
- It is proposed to enable crystal-less operation.
- It is proposed introduce PoC specifications to limit the size of the components needed to provide power to the sensor module and allow customers to innovate
- It is proposed to minimize the surge currents to minimize passive components and power supply

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