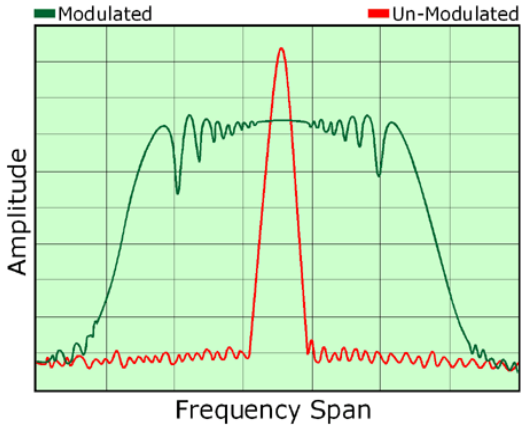
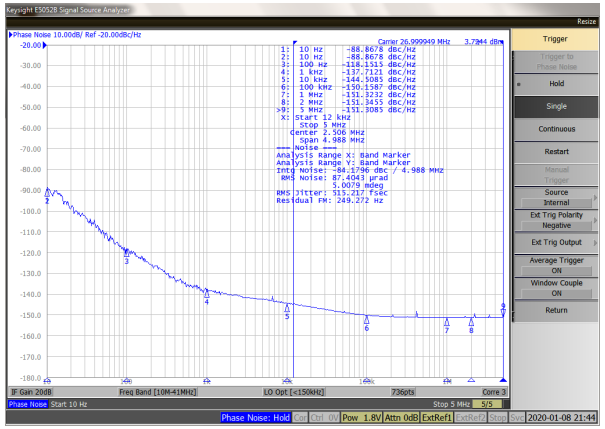
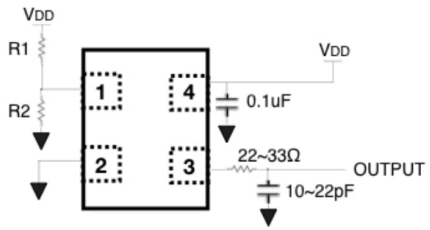
Dual Mode OSC



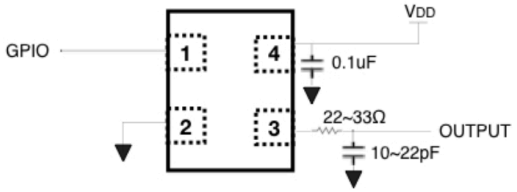


Schematics



Non-modulated clock output when R1 = NC or 4.7KΩ

Modulated clock output when R1 = NC & R2 = 0Ω



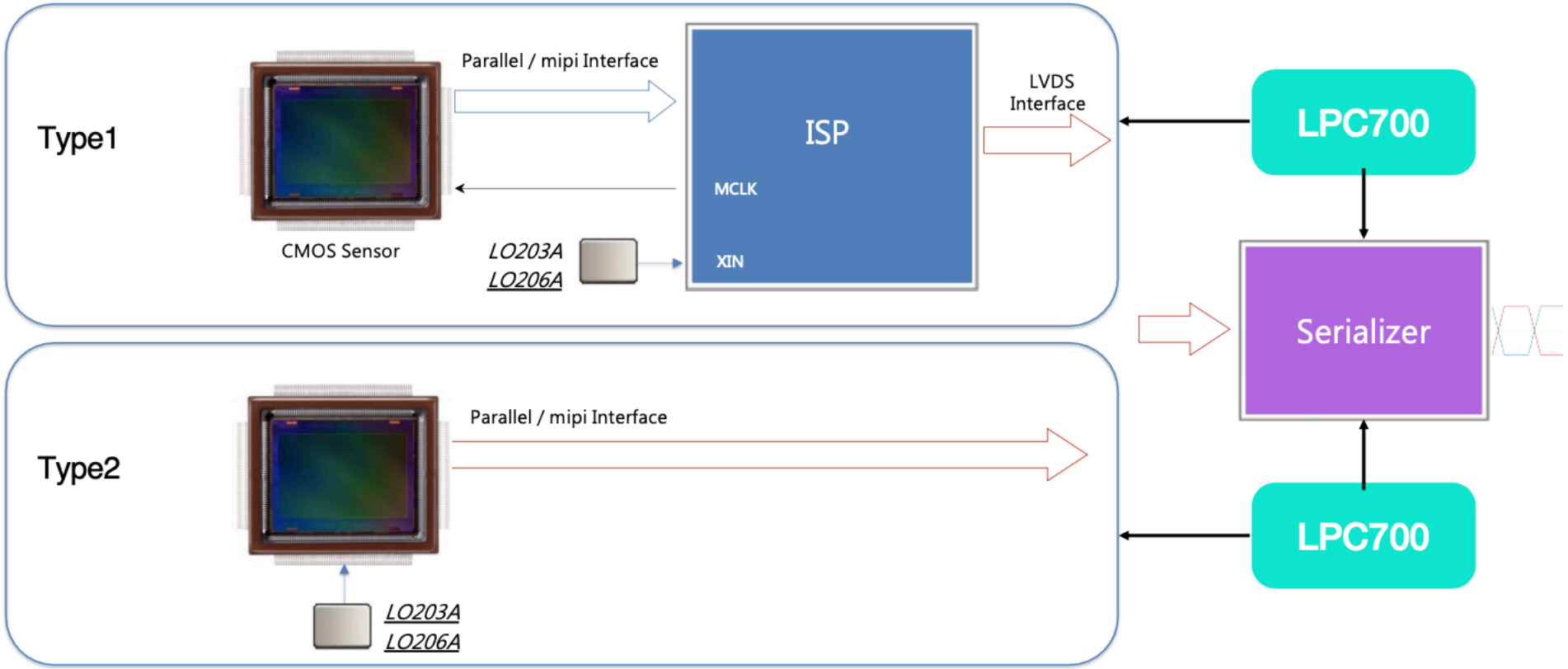
Non-modulated clock output when GPIO = High

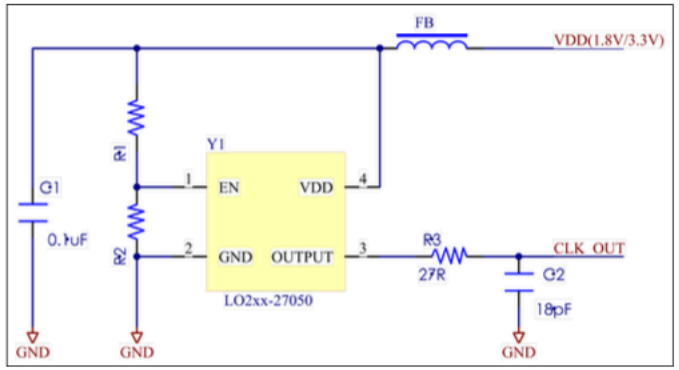
Modulated clock output when GPIO = Low

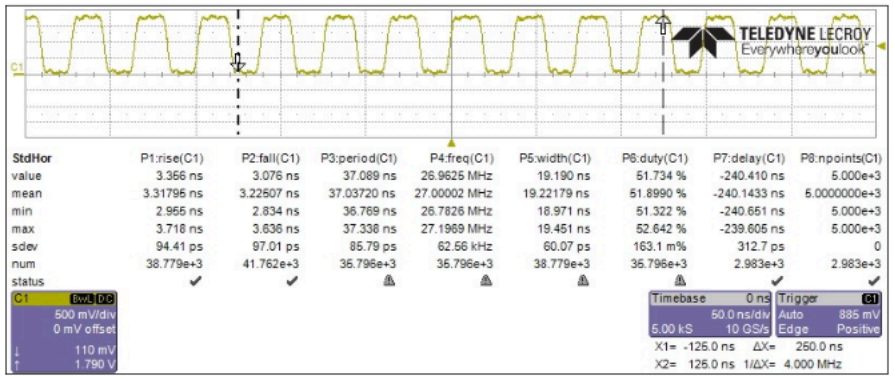
LO203/6/7A The world's only dual-mode Low EMI & high-precision crystal oscillator

- SAΦIX™ Proprietary non-PLL phase modulation technology
- Dual Mode: Low phase jitter(<0.5ps)clock or low EMI clock (+/-0.35%, 0.5%, 0.7%)
- Wide VDD Range 1.65V~3.65V
- Low power consumption 27MHz @1.8V SSEN 3.78 mA
- AEC-Q100 G1/G2
- 2.0mm x 1.6mm Ceramic Package

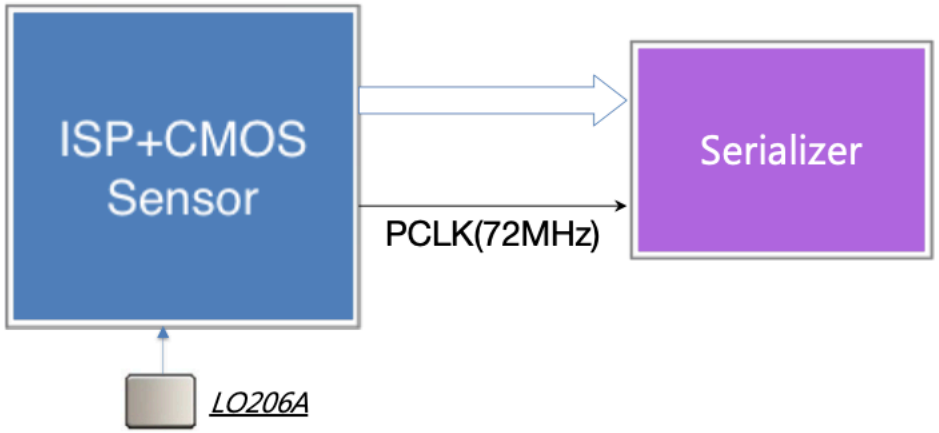
Automotive Camera Module





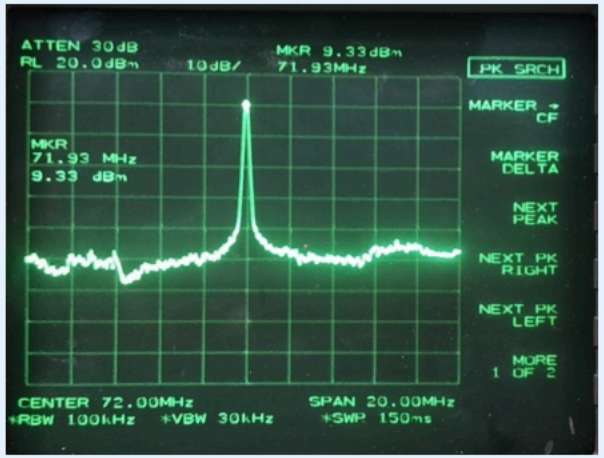


A Case Study



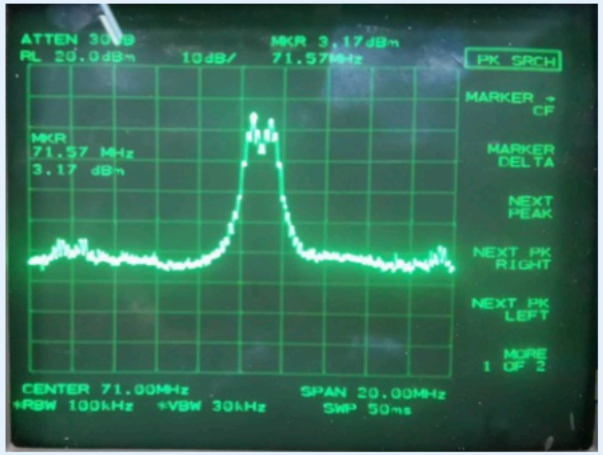
In the camera module design, there is high speed pixel clock and it could case EMI emission. By adopting LO203/6, it will be easy to solve this EMI problem and save the time and cost during developing

PCLK : 9.33 dB @72MHz



LO206 (PIN1=High)

PCLK : 3.17 dB @72MHz



LO206 (PIN1=Low)

EMI peak reduction 6.16 dB

Crystal

Crystal

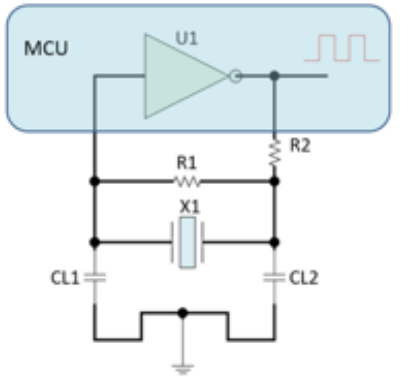


图1

- R1 is a feedback resistor (generally ≥ 1M Ω) that keeps the inverter in a linear operating region at the beginning of oscillation.
- R2 forms a network with matching capacitors, providing a 180 degree phase shift while limiting the oscillation amplitude and preventing the output of the inverter from over driving the crystal oscillator and causing lifespan issues. At the same time, R2 plays a role in adjusting the matching between U1 and Crystal.
- CL is the total effective capacitance across the two ends of the crystal in the circuit (not the matching capacitance externally connected to the crystal oscillator), which mainly affects the load resonance frequency and together with the crystal determines the operating frequency of the oscillator circuit.
- If the crystal scheme is adopted, the load capacitance and actual PCB wiring, chip pin parasitic capacitance, and additional load capacitance will vary with temperature, causing clock changes. If there is a slight mistake in the matching between the crystal and MCU in practical applications, such as R2 selection, it can easily cause the crystal to not oscillate or the crystal to be over driven, resulting in a shortened lifespan.
- The factors that actually affect frequency accuracy and the stability of Crystal oscillation systems are far more than that. Differences in PCB versions and batch parameters, high and low temperature and capacitance errors of load capacitors, problems with oscillation loop routing, noise interference, and so on can all cause clock stability issues.
- Crystal's biggest advantage is its affordable price

OSC

OSC

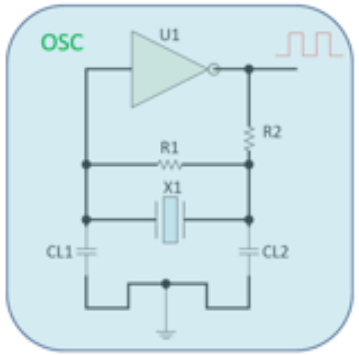


图2

- The active crystal oscillator encapsulates all the oscillation circuits related to the passive crystal oscillator in a "box", which is actually the wafer inside the OSC as shown in Figure 2.
- OSC integrates all the peripheral circuits required for crystals into the wafer, and can generate a stable clock by simply providing power,OSC integrates all oscillation feedback loop devices into an IC, which is sealed with ceramic packaging and metal shielding cover to protect the internal oscillation circuit from external electromagnetic radiation interference.
- Throughout the entire process of OSC, internal integrated circuits are selected strictly in accordance with the latest technology conditions of Crystal, enhancing the compatibility between Crystal and IC.
- LFC EMI OSC addresses the EMI issue caused by OSC by incorporating EMI noise reduction algorithms into the internal integrated circuit of OSC to solve the EMI problem caused by clock.
- In addition, the application of OSC in the automotive market must meet the testing requirements of AEC-Q100 G1/2, which means that Crystal and the actual internal wafer responsible for vibration must undergo rigorous AEC-Q100 reliability testing to fully verify the matching between Crystal and Wafer and ensure stable clock output.

Note: Crystal has been increasingly developing miniaturization technology in the past 20 years, and MCU design often overlooks Crystal's technological development, resulting in poor matching between Crystal and MCU oscillator modules. OSC's internal integrated circuits have been upgraded in response to technological developments, providing reliable and stable clocks.