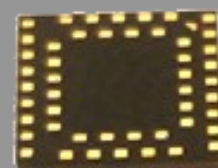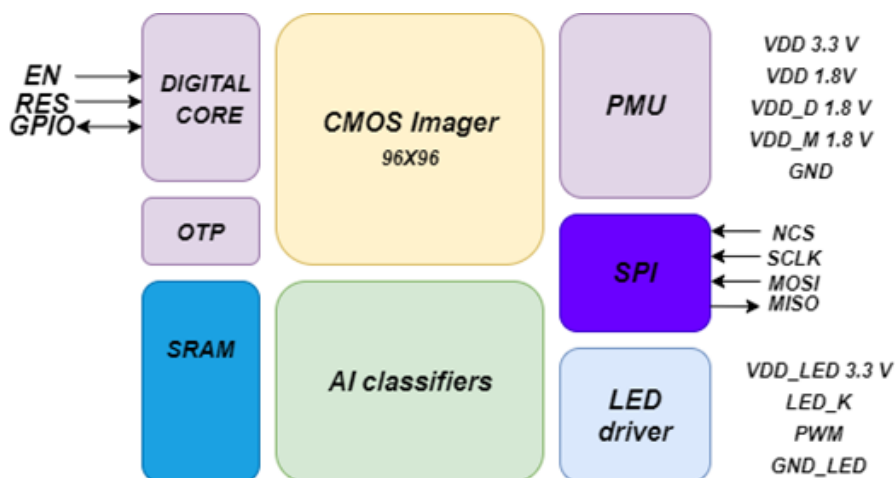# AIS-C100A

Mantis

96x96 Intelligent Image Sensor (AI-In-Sensor)

PRODUCT BRIEF

The AIS-C100A Mantis is a 96x96 AI-in-Sensor machine learning SoC especially suited for classification tasks. It includes a programmable "always on" wake-up CNN engine which can be used to turn on external microcontrollers when an object of interest is detected, as well as powerful post wake-up ML capability. All supporting circuitry is provided including power management, timing, AI, and communications as well as an (up to) 40mA LED driver offering both linear and PWM control on a single monolithic die with a minimum of external components. Communication is through an SPI port. Mantis can process images/videos taken by the on board camera or those downloaded through the SPI port. The exposure time can be internally or externally controlled to reach best possible contrast for AI calculations. The AIS-C100A is packaged in a 6.4x6.4mm OLGA package.

BLOCK DIAGRAM

KEY FEATURES

- ⊕ **On board Camera**
  - 96x96 pixel Imager
  - 4.5ux4.5u pixels

- ⊕ Low power sensor pixel imager with on-chip integrated AI processing
  - as low as 2µA shutdown

- ⊕ **"Always On"**
  - < 80µW programmable "always on" CNN monitoring when waiting for an object

- ⊕ True "always on" where the pixels are part of the neural network

- ⊕ 6.4x6.4mm OLGA Package

- ⊕ **SPI Interface**
  - load weights & configuration
  - upload or download an image
  - read system status

- ⊕ On board power management with on chip wakeup sequencer for external system wakeup

- ⊕ Programmable GPIOs

- ⊕ LED Driver: Current and PWM programmable up to 40mA

- ⊕ Single 3.3V supply or optional external 1.8V supply input

- ⊕ Digital control I/O lines configurable for 1.8V or 3.3V operation

- ⊕ **On chip oscillator**

- ⊕ **Powerful AI Engine**
  - Built in programmable AI functionality for both "always on" and post wakeup

- ⊕ **Multiple starter models:**
  - face detect
  - people counting
  - male vs. female
  - classification
  - occupancy detection
  - animal vs. person
  - age

APPLICATIONS

The AIS-C100A is a smart AI sensor with 96x96 grayscale pixel imager, based on a programmable AI structure. It can be optimized for various AI-based classification applications.

Occupancy Detection **Face Detection** **Intelligent Wake-Up** **Human or Animal Detection** **Intrusion Detection** **Access Point Wake-up**