



VA6320 Sensor Datasheet

Direct Time-of-Flight sensor

1. Overview

1.1 General description

VA6320 is a 1/18" ToF (Time-of-Fight) imaging sensor integrated with a global-shuttered 40x30 SPAD (single-photon avalanche photodiode) pixel array, front-end time to digital converters, and a depth DSP processor. With combination of pulsed laser emitter, this sensor can return a 40x30 depth image. The sensor offers MIPI CSI-2 interface supporting both histogram mode and DSP mode data format. The sensor is capable of streaming full resolution imaging up to 30 fps using CSI-2 single lane interface.

The sensor contains a micro-processor (MCU) to enable software patch and enhance system programmability. Also, it integrated an illumination controller and a SPI interface that allows to configure down-stream LDD (laser diode driver) in ToF module, allowing sensor to access module calibration data and firmware code directly on module memory such as EEPROM or Flash.

VA6320 requires a 1.1V/1.8V/3.3V for logic power supply, and a negative VSPAD supply for SPAD Geiger-mode operating. The sensor embedded break-down voltage detection module is to adapt VSPAD voltage level with combination of an external VSPAD boost circuit.

The sensor has an embedded 2Kbit one-time-programmable (OTP) memory to support storing information related to module-to-module identification and calibration data.

Functions and Features

- 1/18" time-of-flight imaging sensor
- Pixel pitch 19.98x19.98 μm^2
- 40x30 SPAD pixels
- I2C slave interface for sensor configuration
- SPI master for LDD and module memory access
- Laser repetition rate up to 10MHz with interference suppression modulator (ITS)
- Adaptive breakdown voltage detection (BVD)
- Depth DSP for depth calculation
- Full histogram readout

Applications

- Mobile phone camera enhancement
- 3D machine vision
- Security and surveillance
- Gesture controls
- Augmented reality (AR) and virtual reality (VR)
- Collisions avoidance for UAV (Unmanned Aerial Vehicle) & AGV (Automated Guided Vehicle)

