SONY

Ver.1.0

IMX636-AAMR-C

Diagonal 7.1 mm (Type 1/2.5) Event-based Vision Sensor with approx. 0.92 M Effective Pixels

Description

The IMX636-AAMR-C is a diagonal 7.1 mm (Type 1/2.5) approx. 0.92 M effective pixels (1280 (H) × 720 (V)) event-based vision sensor. This sensor detects brightness changes that exceed the set thresholds independently for each pixel, and asynchronously outputs the coordinates (X, Y) of detected pixels, the detected times (timestamp), and the brightness change polarity information in the order detected. This enables high-speed, low-latency (100 μs or less at 1000 lx) output. Output of only brightness changes enables to swiftly capture moving subjects, and areas without brightness changes are not output, realizing a sensor that enables efficient data extraction. The sensor also features pixel characteristics where the output voltage is output logarithmically relative to the input light intensity, which enables event output with a high dynamic range. This chip operates with analog 3.0 V, digital 1.1 V, and 1.8 V triple power supply.
(Applications: Industry, Security, Robotics, Scientific measurement, Gaming)

Features

◆ Number of effective pixels: 1280 (H) × 720 (V) approx. 0.92 M pixels

◆ Built-in logarithmic I/V converter circuit, Illuminance-change detection unit, and Arbiter circuit

◆ Pixel ROI

　Analog ROI Arbitrary Row Column Specification Mode, Analog ROI Window Mode, Digital Crop

◆ External trigger

◆ Pixel reset

◆ I/O interface

　MIPI (1 Lane / 2 Lane switching) output, SLVS (2 ch / 4 ch switching) output

◆ Event output formats (Event compression)

　EVT 2.1 (64-bit based event output format), EVT 3.0 (16-bit encoding event output format)

This sensor has the function as below. About detail, refer to the application note.

◆ Characteristics adjustment setting function

　Contrast threshold adjustment function, Latency adjustment function, Dead time adjustment function,

　Analog noise filter function

◆ Thermometer, Illuminometer (absolute Illuminometer, relative Illuminometer)

◆ Readout wait function

◆ Number of vectors count function

◆ Region number of vectors count function

◆ Event signal processing functions

　Anti-flicker function, Event filter function, Event rate function

◆ Multi-sensor synchronization function (master / slave)

◆ Digital event mask function (pixel mask)

◆ Event polarity inversion function

◆ Input frequency setting

Device Structure

◆ Event-based Vision Sensor

◆ Image size   Diagonal 7.1 mm (Type 1/2.5)

◆ Total number of pixels   1280 (H) × 720 (V)   Approx.0.92M pixels

◆ Number of effective pixels   1280 (H) × 720 (V)   Approx.0.92M pixels

◆ Number of active pixels   1280 (H) × 720 (V)   Approx.0.92M pixels

◆ Unit cell size   4.86 μm (H) × 4.86 μm (V)

◆Package   156 pin LGA   13 mm (H) × 13 mm (V)

Event-based Vision Sensor Characteristics

(VADD = 3.3 V, VDDD1 = 1.98 V, VDDD2 = 1.21 V, Tj = 60 °C)

Item	Symbol	Min.	Typ.	Max.	Unit.	Remarks
Contrast Threshold	C.T.	—	25	—	%	LN (Natural logarithm), LC = 1000 lx, Under standard setting
Contrast Threshold Non-Uniformity	CTNU	—	—	6	%	LN (Natural logarithm), LC = 1000 lx
Latency	L_B	—	—	100	μs	LC = 1000 lx 9x9 pixels
	L_{PB}	—	—	50	μs	Peak, LC = 1000 lx 9x9 pixels
	L_{DB}	—	—	1000	μs	LC = 5 lx 9x9 pixels
	L_C	—	—	220	μs	LC = 1000 lx 1/5 subsampling
	L_{PC}	—	—	100	μs	Peak, LC = 1000 lx 1/5 subsampling
	L_{DC}	—	—	1000	μs	LC = 5 lx 1/5 subsampling
Background Rate	BGR	—	—	0.1	Hz	LC = 1000 lx
	BGR_D	—	—	10	Hz	LC = 5lx

Note) LC: Light condition

Image Sensors for Industrial Applications:
https://www.sony.net/cis-industry