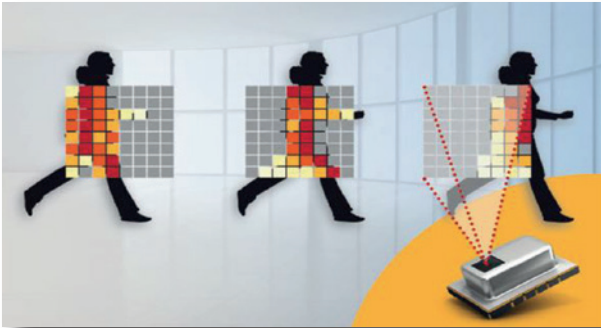


# INFRARED-ARRAY-SENSOR – GRID-EYE



**GRID-EYE** is a thermopile array sensor that features 64 thermopile elements in an 8x8 grid format. Contrary to conventional thermal sensors that only measure temperature of a certain point-of-contact, Grid-EYE, based on Panasonic's MEMS technology, can measure temperature of the entire specified area without any contact; in other words, it is a "contactless thermopile array sensor". 64 pixels yield accurate temperature measurement over a viewing angle of 60° provided by a silicon lens. Grid-EYE uses an I<sup>2</sup>C communication interface, enabling temperature measurements at speeds of 1 or 10 frames/sec. An interrupt function is also available.

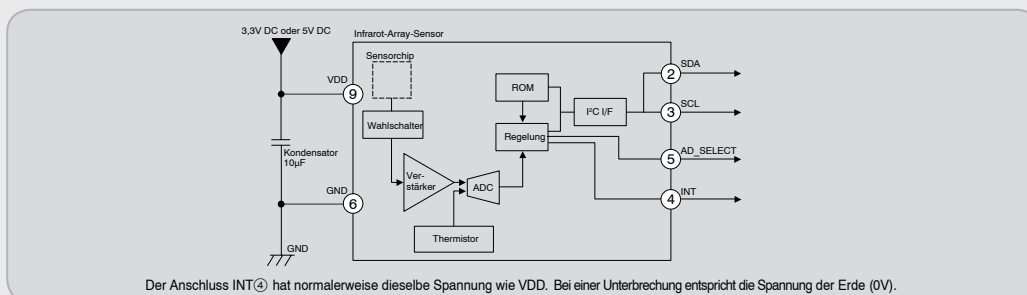
With an array of detection elements Grid-EYE can use passive infrared detection to determine temperature differentiation allowing it to detect multiple objects simultaneously. Grid-EYE is able to measure actual temperature and temperature gradients, providing thermal images and identifying direction of movement. Compared to single thermopile sensors or pyroelectric sensors, Grid-EYE offers immense benefits:

## FEATURES

- » Dimensions: 11,6 mm×4,3 mm×8,0 mm (L×H×W)
- » Operating voltage: 3,3V or 5,0V
- » Current consumption: Typ. 4,5 mA (Normal mode); 0,8 mA (Stand-by mode), 0,2 mA (Sleep mode)
- » Temperature range of measuring object:  
With amplification factor High gain: 0°C up to 80°C,  
Low gain: -20°C up to 100°C
- » Field of view: 60° (vertical and horizontal)
- » Number of thermopiles: 64 (vertical 8 x horizontal 8)
- » External interface: I<sup>2</sup>C (Fast mode)
- » Frame rate: 1 or 10 Bilder/s
- » Absolute temperature accuracy: Typ. ±2,5 °C

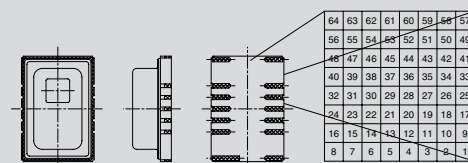
- » Digital output (I<sup>2</sup>C)
- » SMD package (reflow compatible)
- » 8×8 (64) pixel range
- » Frame rate: 10 frames/s or 1 frame/s

## INTERNAL CIRCUIT



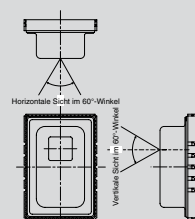
### 1. Pixelbereich

Der Pixelbereich von 1 bis 64 ist nachstehend dargestellt.



### 2. Blickwinkel

Der normale Blickwinkel des Sensors ist nachstehend dargestellt.

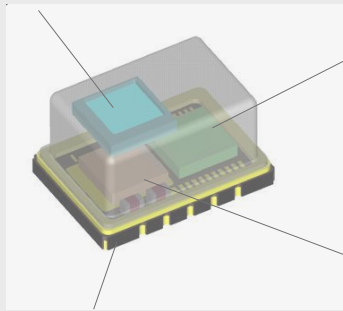


## INFRARED-ARRAY-SENSOR – GRID-EYE

### COMPONENTS AND FUNCTIONS

#### Silicon lens

- image formation



#### Ceramic package

- Air tightness
- Radio shielding
- Reflow solderable

#### Mixed signal processing IC

- 64-Pixels signal readout
- Analog amplification
- Analog to Digital conversion
- Sensitivity correction
- Correction for temperature effects
- Digital communication

#### IR detector

- 8 × 8 pixels
- Thermal insulation structure using MEMS technology
- Infrared absorption
- Thermoelectric conversion

### APPLICATIONS

Grid-EYE opens the door to a whole world of applications, ranging from energy savings in the lighting industry (commercial and public places as well as residential spaces) to household applications (air conditioners, microwave ovens, etc.), from security systems (automatic doors, elevators, ATMs, kiosks, etc.) to the medical industry (patient detection and positioning), and many more.

- » **Security:** Occupancy detection, People counting, multiple person detection
- » **Household:** Cooking stoves, Microwave ovens, Air conditioners, Heating systems
- » **Medical:** Patient detection, Movement detection, Thermal imaging, Position detection
- » **Lighting control:** Energy savings, Detection without movement
- » **Industrial temperature measurement:** Industrial process management and control, Preserving maintenance, Contact-less temperature measurement

**Are you interested in an evaluation-board? Please contact us!**

**Available at Endrich from now!**

### DESCRIPTION OF THE GRID-EYE EVALUATION-KIT

Panasonic Automotive & Industrial Systems is launching a Grid-EYE Infrared (IR) Array sensor Evaluation Kit this autumn that combines its "nanopower" PAN1740 Bluetooth Smart module and a microcontroller on one PCB. By combining its new IR sensor technology with Bluetooth technology and software for IR detection of people and objects on one board, Panasonic enables customers to develop rapid prototypes and quickly build their own wireless sensor "Internet of Things" applications.

With the launch of Grid-EYE evaluation kit Panasonic make the state-of-the-art Grid-EYE sensor along with an innovative IR people detection software (including basic API and image processing) available for the first time to the end customer. They have developed a PC software and a smartphone app to be provided to the customers to test our sensor in different ways with various applications. This paves the way for designers to use the advantages of Grid-EYE in combination with Bluetooth Technology and we are expecting to see some very innovative wireless IoT applications being developed by our customer base, thanks to the speed and simplicity offered by our new evaluation kit.

Compared to pyroelectric sensors, it is not only possible to detect

moving people and objects but also the position and presence of motionless people and objects, the direction of movements and the accurate surface temperature from -20°C up to +100°C. With this wide range of temperature measurement Panasonic is able to reach a NETD (Noise equivalent temperature difference) of  $\pm 0.5^\circ\text{C}$  at room temperature.

Grid-EYE is also able to detect people and effectively differentiate them from other heat sources such as displays or heaters. Moreover as Grid-EYE is an infrared sensor, detection of people is measured almost independent of ambient light conditions. Another significant advantage of Grid-EYE sensor is that its use does not intrude on personal privacy, unlike cameras. The integrated Bluetooth module in the evaluation kit, PAN1740 is a single-mode Bluetooth Smart system-on-chip module optimized for low power (only 4.9 mA in transmit or receive) and small size (only 9.0 mm × 9.5 mm × 1.8 mm). The SMD component benefits from a fully shielded case, chip antenna, and integrated crystal oscillators. The low 4.9 mA power consumption allows the use of coin cell batteries and decreases battery requirements by up to 50% when compared to other BLE devices currently on the market.