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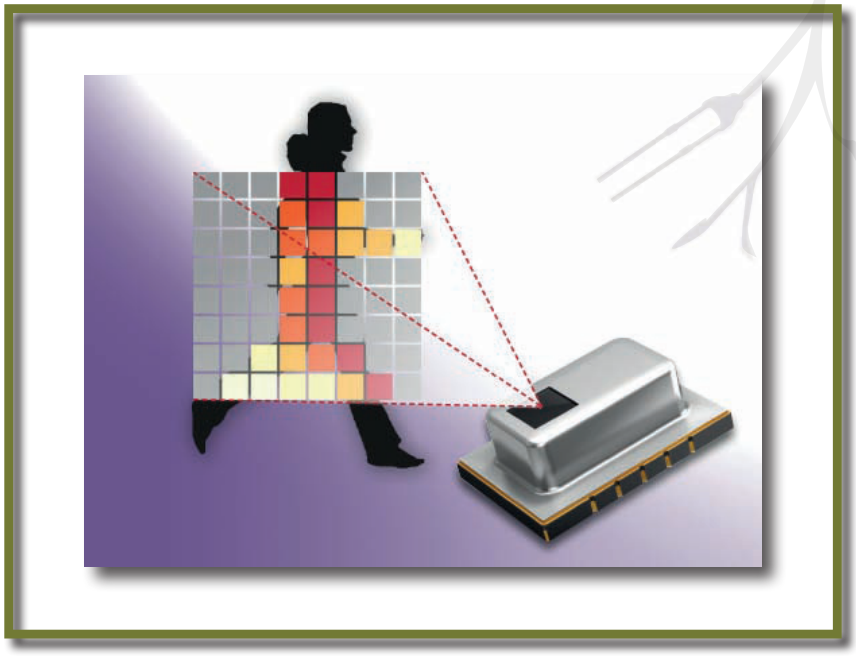
Our Product of the Month

Infrared-Array-Sensor

GRID-EYE



- GRID-EYE – sensor array for contactless temperature measurement
- 8 × 8 element thermopile array
- Temperature and shape measurement of static and moving objects
- Up to 10 images/s via I^2C-output

Panasonic

Innovative Sensor Technologies

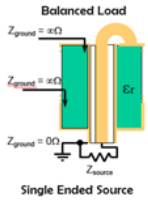
GPS & IRIDIUM ANTENNAS WITH BROAD BEAM WIDTH

MARUWA offer a unique class of dielectric-loaded multi-filar antennas which provide unrivalled performance in applications which:

The most important detail: A Pattern with Broad Beam-Width

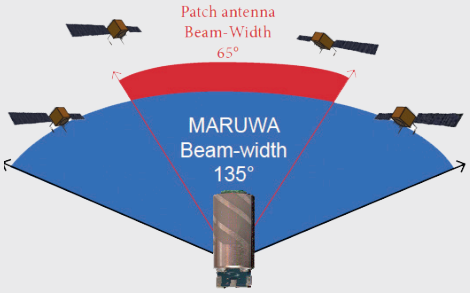
MARUWA's multi-filar antennas offer a broader angle of reception than patch antennas. This enables the antenna to track more satellite signals even when the device is tilted from the upright angle of use. The device provides faster and more robust position fixes and an overall better user experience. The device is handheld, body-worn, or otherwise surrounded by materials of high relative dielectric constant which would de-tune other antennas.
The antenna is installed in close proximity to other antennas sharing the same device housing and ground plane and it is necessary to avoid cross-interference. For example if a MARUWA GPS receiving antenna is co-sited with Bluetooth, Wifi, LTE, WiMax, or cellular radio antennas, there should be no impairment of performance. The antenna must fit into a very small installation volume with close proximity to other components and little or no space available for a ground plane. The orientation of the device may not be ideal so that the antenna's omni-directional broad beam-width is required.

The lower metallised part of the structure functions as a sleeve balun (un-balanced to balanced transition). This structure isolates the antenna's radiating section from the device ground-plane so that the antenna's resonance is independent from the housing. The device configuration can easily be designed so that human-body loading does not detune or significantly reduce the efficiency of the antenna. Also as a balanced structure incorporating a balun, the antenna does not pass common-mode ground noise to the receiver input.

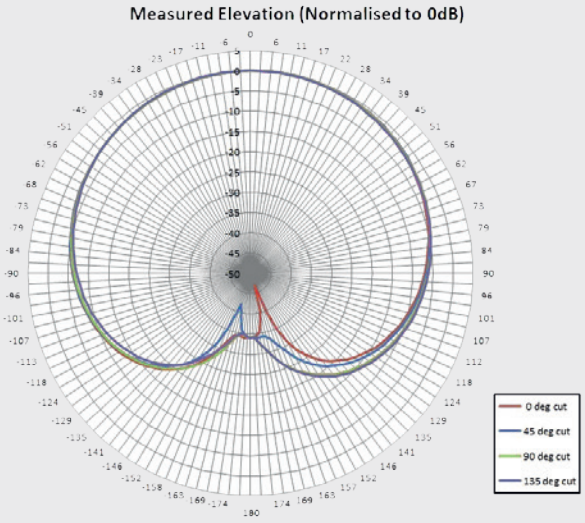


The effect of incorporating an isolating structure (balun) together with the high-quality design of the antenna provides excellent performance. The use of distinctive dielectric materials technology concentrates resonance fields into the dielectric core (across which fields are balanced at all times). Therefore the antenna can provide excellent pattern performance when tightly integrated into the device even when close to cluttering objects (LCD, switches, connectors etc).

BEAM CHARACTERISTICS



Broad angle of reception:
- more freedom in angles of use
- More information, high accuracy



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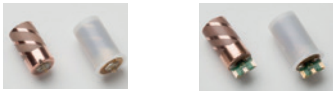
Electronic Ceramics MARUWA

GPS & IRIDIUM ANTENNAS WITH BROAD BEAM WIDTH

PRODUCT/SIZE [mm]	IMAGE	ANTENNA TYPE	APPLICATION/REMARKS
GPS & IRIDIUM ANTENNAS – LINE UP			
MWSL1203C 15 (D1) × 19 (D2) × 32.9 (L)		PASSIVE	Handheld, body worn products Industrial GPS Waterproof, dust proof
MWSL1203D 15 (D1) × 32.9 (L)		PASSIVE	Handheld, body worn products Industrial GPS Waterproof, dust proof
MWSL1204 11.3 (W) × 32.45 (L)		ACTIVE GPS L1	Handheld, mobile GPS requiring an active antenna Excellent amplifier performance with low current (~3 mA)
MWSL1206 14.75 (W) × 42.57 (L)		ACTIVE GPS L1	All applications requiring a high level active antenna. High gain option with higher current (~13 mA)
MWSL1205/1252 10 (W) × 17.75 (L) (excluding connector)	 **MWSL1205** **MWSL1252**	PASSIVE: for moderate degree of embedding. Free-space Frequency = 1593.5MHz. Embedded Frequency = GPS L1	GPS enabled UMPC/MID devices, tracking devices. DSC/ SLR cameras for Geo-Tagging. For embedded use
MWSL1208/1251 10 (W) × 17.75 (L) (excluding connector)	 **MWSL1208** **MWSL1251**	PASSIVE: for tighter degree of embedding. Free-space Frequency = 1603.5MHz Embedded Frequency = GPS L1	GPS enabled UMPC/MID devices, tracking devices. DSC/ SLR cameras for Geo-Tagging
MWSL1300 7.55 (W) × 15.6 (L) (excluding connector)		PASSIVE: Frequency = 1582.5MHz. Embedded Frequency = GPS L1	Small handheld products and tightly integrated GPS devices, cameras, mobile phones, UMPC's
MWSL1350 7.60 (W) × 16.46 (L) (excluding connector)		PASSIVE: Frequency = 1582.5MHz. Embedded Frequency = GPS L1	Small handheld products and tightly integrated GPS devices, cameras, mobile phones, UMPC's
MWSL3105 14 (W) × 33 (L)		PASSIVE: Frequency = 1616.0 MHz ... 1626.0 MHz	Iridium applications, Waterproof, dust proof

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Panasonic

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 I²C communication interface, enabling temperature measurements at speeds of 1 or 10 frames/sec. An interrupt function is also available.

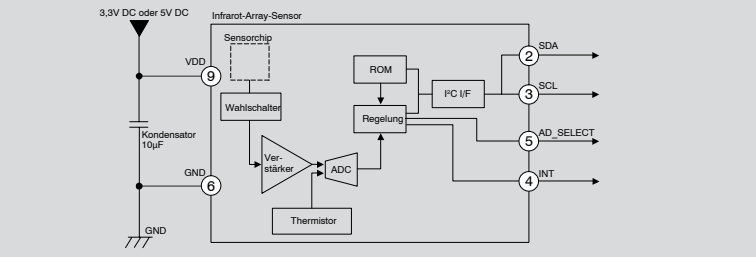
With an array of detection elements Grid-EYE can use passive infrared detection to determine temperature differentiation allowing it to detect multiple objects simultaneously. Grid-EYE is able to measure actual temperature and temperature gradients, providing thermal images and identifying direction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

- Digital output (I²C)
- SMD package (reflow compatible)
- 8×8 (64) pixel range
- Frame rate: 10 frames/s or 1 frame/s

FEATURES

- Dimensions: 11,6 mm×4,3 mm×8,0 mm (L×H×W)
- Operating voltage: 3,3 V or 5,0 V
- 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: I²C (Fast mode)
- Frame rate: 1 or 10 Bilder/s
- Absolute temperature accuracy: Typ. ±2,5 °C

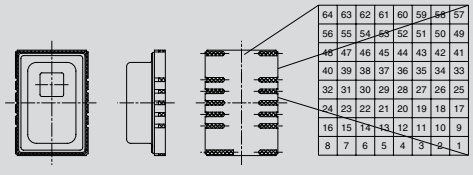
INTERNAL CIRCUIT



Der Anschluss INT④ hat normalerweise dieselbe Spannung wie VDD. Bei einer Unterbrechung entspricht die Spannung der Erde (0V).

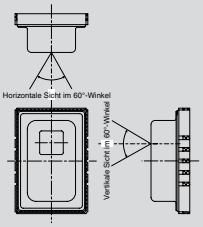
1. Pixelbereich

Der Pixelbereich von 1 bis 64 ist nachstehend dargestellt.



2. Blickwinkel

Der normale Blickwinkel des Sensors ist nachstehend dargestellt.



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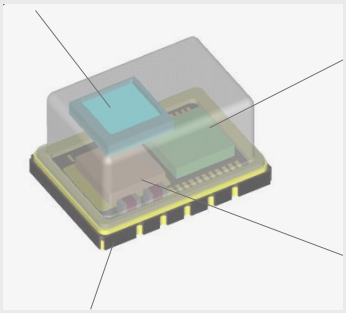
Panasonic

INFRARED-ARRAY-SENSOR – GRID-EYE

COMPONENTS AND FUNCTIONS

Silicon lens
- image formation

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

Ceramic package
- Air tightness
- Radio shielding
- Reflow solderable

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 ±0.5°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 9.0mm × 9.5mm × 1.8mm). 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.

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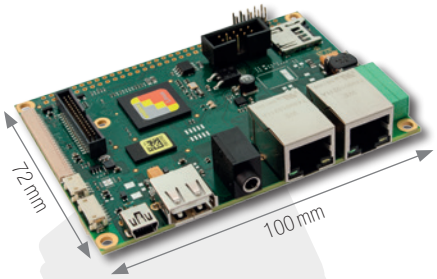
EMBEDDED BOARDS – SBC/COM-BOARDS

F&S Elektronik Systeme GmbH is specialized in Embedded Boards with WindowsCE and Linux (Android). The boards enable to connect simple and cost-optimized displays as well as further peripheral devices via various interfaces. Several form factors (including Q7) are available for CoM-Boards and PicoITX for SBC. The boards are equipped with Freescale Cortex-A5/Cortex-A9 CPUs up to Quad-Core which are available for 10 years. Also F&S has their own assembly production, produced with modern production facilities in Stuttgart, Germany. Furthermore, many years of experience in the Embedded Market result in innovative and up to date customer solutions, completed by an extensive soft- and hardware support.



Single Board Computer (SBC) – SPECIFICATIONS

PARAMETERS	armStoneA5	armStoneA9	armStoneA9r2 NEW With WLAN & Bluetooth
Processing power	++	++++	++++
Windows/Linux	WCE 6.0, WEC 7 / 2013 / Linux Buildroot/MQX	WCE 6.0, WEC 7 / 2013 / Linux Buildroot/Yocto	WEC7 / WEC 2013 / Linux Buildroot/Yocto
CPU	Freescale Vybrid Single-/Dual-Core ARM Cortex-A5 & -M4	Freescale i.MX 6 Solo/Dual/Quad-Core ARM Cortex-A9	Freescale i.MX 6 Single/DualLite/QuadPlus ARM Cortex-A9
Flash (up to)/ RAM (up to)	1 GB + 32 GB (µSD Card)/ 512 MB	1 GB + 32 GB (µSD Card)/ 4 GB	1 GB+32 GB eMMC+32 GB (µSD Card) 4 GB
Ethernet	2x 10/100 Mb	1x 10/100/1000 Mb	1x 10/100/1000 Mb
UART	3x	3x	5x
USB Host/Device/SD-Card	1-2x/1x/1x on-board	4x/1x/1x on-board	3x/1x/1x on-board
SATA/mPCIe		1x/1x	1x/1x
Audio	Line In/Out/Mic	Line In/Out/Mic	Line In/Out/Mic
CAN/I²C/SPI	1-2x/1-2x/1x	1x/1x/1x	2x/1x/2x
Digital I/O	max. 66	max. 66	max. 66
Touch Panel	4-wire analog resistive, PCAP-Touch via I²C	4-wire analog resistive, PCAP-Touch via I²C	ext. via I²C
LVDS/RGB	18 Bit/18 Bit	18 Bit /24 Bit/18 Bit	18 Bit/24 Bit/-
CRT/DVI		0/DVI	0/DVI
Temperature range	0°C ... +70°C [-25°C ... +85°C]	0°C ... +70°C [-25°C ... +85°C]	0°C ... +70°C [-25°C ... +85°C]
Specials			Camera digital, WLAN, Bluetooth
Min. availability	2023	2029	2029

new

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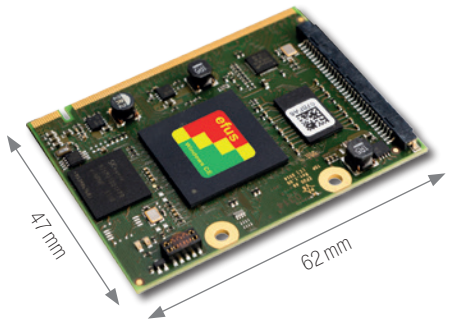
EMBEDDED BOARDS – SBC/COM-BOARDS



Short description of efus (Computer on Module-Board)

- With Freescale i.MX6 CPU
- Single voltage: 5 V
- RGB, LVDS, DVI
- Goldfinger connector MXM2, 230 Pins

CoM-BOARDS – SPECIFICATIONS

PARAMETERS	efusA9	efusA9X	efusA7UL (NEW With WLAN & Bluetooth)
Processing power	++++	+++	+
Windows/Linux	WEC 7/2013/Linux Buildroot/ Yocto	WEC 2013/Linux Buildroot/Yocto	WEC 2013/Linux Buildroot/Yocto
CPU	Freescale i.MX 6 Solo/DualLite/Quad-Core ARM Cortex-A9	Freescale i.MX 6 SoloX ARM Cortex-A9 & -M4	Freescale i.MX 6 UltraLite ARM Cortex-A7
Flash (up to)/ RAM (up to)	1GB + 32GB eMMC/ 2GB	1GB + 32GB eMMC/ 2GB	1GB + 32GB eMMC/ 1GB
Ethernet	1x 10/100/1000Mb	2x 10/100/1000Mb	2x 10/100Mb
UART	4x	4x	4x
USB Host/Device/SD-Card	1x/1x/2x extern	1x/1x/2x extern	1x/1x/2x extern
SATA/mPCIe	1x/1x	-/1x	
Audio	I²S	I²S	I²S
CAN/I²C/SPI	2x/2x/2x	2x/2x/2x	2x/2x/2x
Digital I/O	max. 66	max. 66	max. 66
Touch Panel	external via I²C	external via I²C	external via I²C
LVDS/RGB	2x 24bit/18bit	24bit/18bit	-/18bit
CRT/DVI	0/DVI		
Temperature range	0°C ... +70°C [-20°C ... +85°C]	0°C ... +70°C [-20°C ... +85°C]	0°C ... +70°C [-20°C ... +85°C]
Specials	Camera digital	Camera analog/dig., WLAN, Bluetooth	WLAN, Bluetooth
Min. availability	2027	2025	2030

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GENERAL MEMORY OVERVIEW

MEMORY						
SRAM	64 kb ... 64 Mb					
pSRAM			2 Mb ... 16 Mb	4 Mb ... 32 Mb		
nvSRAM		64 kb ... 1 Mb				
SDRAM	16 Mb ... 512 Mb		16 Mb ... 256 Mb	LP 32 Mb...512 Mb		
DDR SDRAM	64 Mb ... 1 Gb		32 Mb ... 512 Mb	LP 16 Mb ... 1 Gb		
DDR2 SDRAM	256 Mb ... 2 Gb		128Mb ...1Gb			
DDR3 SDRAM	1 Gb ... 8 Gb		1 Gb ... 2 Gb			
Mobile SDRAM			16 Mb ... 512 Mb	16 Mb ... 512 Mb		
Mobile DDR	256 Mb ... 2 Gb		64 Mb ... 512 Mb	16 Mb ... 1 Gb		
NOR Flash				8 Mb ... 64 Mb	512 kb ... 512 Mb	
NAND Flash			1 Gb ... 4 Gb	1 Gb	1 Gb ... 4 Gb	
MCP			×	×	×	
eMMC						4 GB ... 64 GB
SSD (S(P)ATA)						8 GB ... 1 TB

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