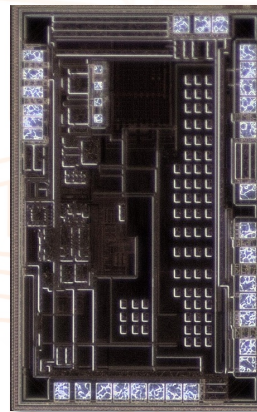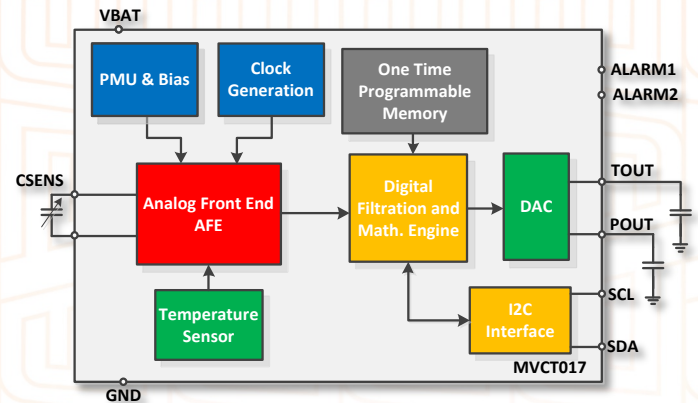# MEMS Vision
YOUR SMART SENSORS EXPERTS

# Digital Capacitive Sensor Interface

- Trimmable input capacitance range, for flexibility and dynamic range optimization
- Internal high-accuracy and low-drift temperature sensor
- On-chip processing engine for linearization and temperature compensation – provides end user with a fully calibrated output
- Programmable resolution settings for each measurement mode:
    - 8 to 14-Bit for the temperature sensor and the capacitance interface
- Update mode with programmable update rates from 5ms to 5s
- Calibrated analog output features, for both the capacitance and temperature sensors
- Ultra-low operating and sleep currents



Die size: 1.7 x 1.04 mm$^2$



# Applications:

- Pressure, Humidity, and Temperature Monitoring
- Home Automation Control
- HVAC / VAV
- Pressure Transmitters
- IoT Environmental Sensing
- Level Sensing

*The Infinite Possibilities of the Infinitely Small ™*

# Digital Capacitive Sensor Interface MVCT017

The MVCT017 is a programmable capacitance-to-digital converter interface, designed to be easily integrated with capacitive sensors. The chip features very fast measurement times, low operating power, and very low standby currents, making it very suitable for low power and portable applications. Also, the ASIC includes a high-accuracy temperature sensor and a DAC to convert the calibrated measurements into an analog voltage that is proportional to the supply voltage.

| | |
|---|---|
| Temperature Range | -40 to 125°C |
| Input Capacitance Range | 2 to 7pF |
| Temperature RMS Noise | 0.01°C @ 14-Bit res. |
| Capacitance RMS Noise @ 1pF Input Range | 0.4fF @ 14-Bit res. |
| Average Current for One Measurement/sec | 0.6µA @14-Bit Temp. & Capacitance meas. |
| Power Supply Voltage | 1.71 to 3.6V |
| Ultra-low Standby Current | 10nA |
| Output | Digital I²C & Analog |

**\* Customization is available. Talk to us!**

## MEMS VISION INTERNATIONAL

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## GENERAL INQUIRIES

Phone: +1 438-558-2940
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## ADDITIONAL SALES OFFICES

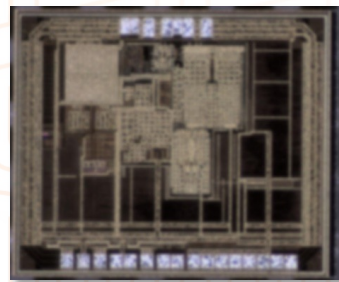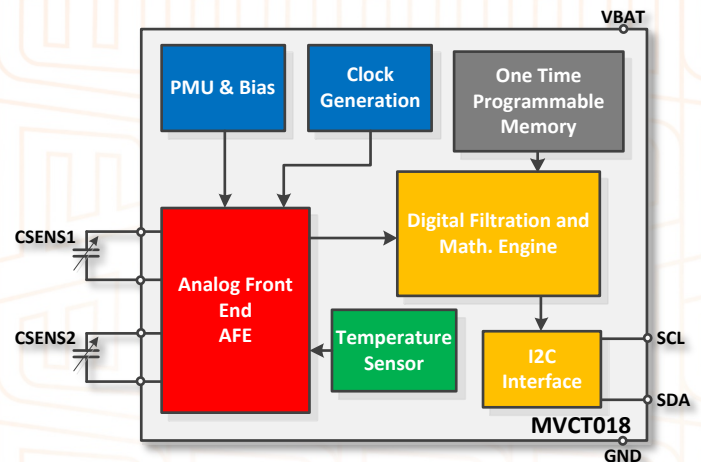China | china@mems-vision.com
Korea | david.suh@mems-vision.com

## ABOUT MEMS VISION

Headquartered in Montreal, Canada, with offices around the world, MEMS VISION INTL. capitalizes on a strong portfolio of patents and intellectual property on MEMS and ASICs (integrated circuits), and a team of highly qualified personnel, to offer hardware and software smart sensing solutions to its customers and partners serving the Consumer, Industrial, Medical, and Automotive markets. Our products include sensors for humidity, temperature, absolute pressure, differential pressure, particulate matter, as well as ultrasonic sensors.

Our expertise in developing and manufacturing smart sensors, based on our proprietary MEMS, ASICs, and calibration technologies, enables us to deliver sensor solutions with very low power consumption, very small form factor, and a world class performance, all at competitive pricing.

# MEMS Vision
## YOUR SMART SENSORS EXPERTS

# Two-Channel Digital Capacitive Sensor Interface

- Each channel has an independent trimmable input capacitance range, for flexibility and dynamic range optimization
- On-chip processing engine for linearization and temperature compensation – provides end user with a fully calibrated output
- Internal high-accuracy and low-drift temperature sensor
- Programmable resolution settings for each mode
  - Up to 21-Bit resolution
- On-chip IIR filter for ultra low noise measurements
- Programmable alarm and clipping functions
- Supports 3-wire, 4-wire SPI, and I²C communication protocols



Die Size: 1.67 x 1.395 mm²



# Applications:

- Pressure, Humidity, and Temperature Monitoring
- Home Automation Control
- HVAC / VAV
- Pressure Transmitters
- IoT Environmental Sensing
- Level Sensing

*The **Infinite** Possibilities of the **Infinitely** Small ™*

# MEMS Vision
## YOUR SMART SENSORS EXPERTS

## Two-Channel Digital Capacitive Sensor Interface MVCT018

The MVCT018 is a programmable and very accurate capacitance-to-digital converter interface, designed to be easily integrated with capacitive sensors. The chip features fast measurement times, very low operating power and standby current, making it most suitable for low power and portable applications. The ASIC includes a high-accuracy integrated temperature sensor that enables the user to compensate for temperature dependencies of sensor elements, as needed.

| | |
|---|---|
| Temperature Range | -40 to 125°C |
| Input Capacitance Range | 0.3 to 13pF |
| Temperature RMS Noise | 0.01°C @ 14-Bit res. |
| Capacitance RMS Noise (1pF Input Range) | 17aF @ 21-Bit res. with IIR filter turned OFF |
| | 4aF @ 21-Bit res. With IIR filter turned ON |
| Average Current for One measurement/sec | 15-Bit Capacitance: 0.72µA |
| | 14-Bit Temperature: 0.75µA |
| Power Supply Voltage | 1.71 to 3.6V |
| Ultra-low Standby Current | 15nA |
| Output | Digital I²C & 3-wire/4-wire SPI interfaces |

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