

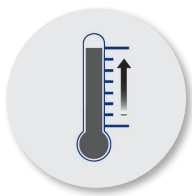
**SENSOR SIGNAL CONDITIONING ICs  
FOR INDUSTRIAL, MEDICAL, AND  
CONSUMER APPLICATIONS**



# EASY-TO-USE SENSOR SIGNAL CONDITIONER ICS

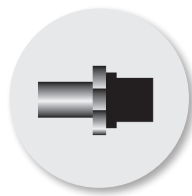
Designing sensor interfaces can be quite challenging and time consuming, and producing them in volume is often expensive due to long test cycles on costly production test equipment. Renesas Sensor Signal Conditioner (SSC) ICs facilitate both design and production of sensor interfaces by providing programmable, highly accurate, wide gain and quantization functions combined with powerful, high-order digital correction and linearization algorithms.

## SENSOR SIGNAL CONDITIONING BASICS



### SENSOR SIGNAL

- Physical measure
  - Pressure
  - Torque
  - Temperature
  - Force
  - Weight/load



### SIGNAL CONDITIONING

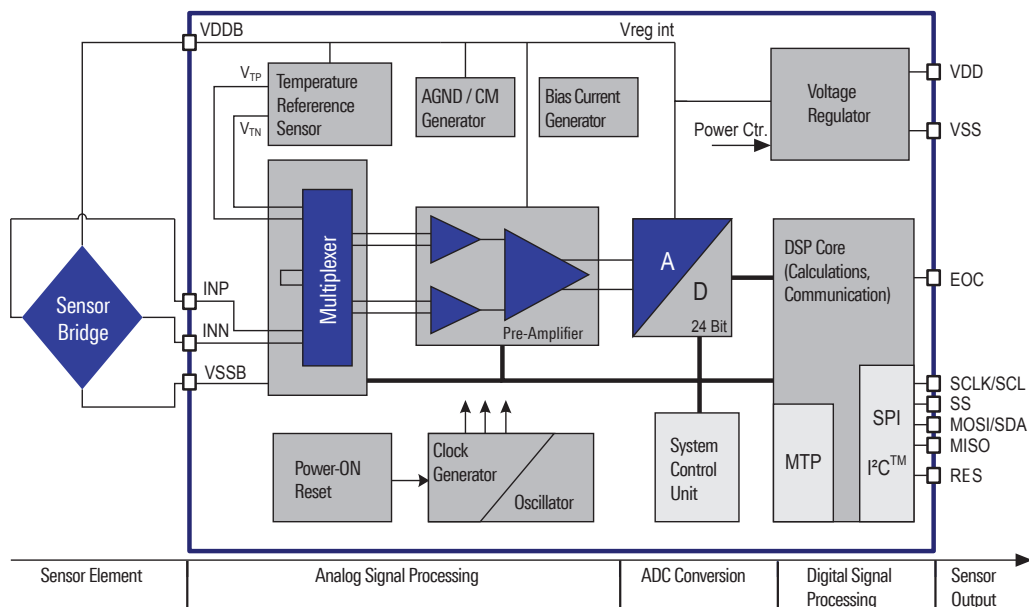
- Signal transducing
- Signal amplification
- Signal conditioning (compensation of offset, non-linearity and temperature dependency)



### CONDITIONED OUTPUT

- Linear analog ratiometric voltage, current loop
- Digital PWM, I<sup>2</sup>C, SPI and OWI output

### TYPICAL SSC BLOCK DIAGRAM





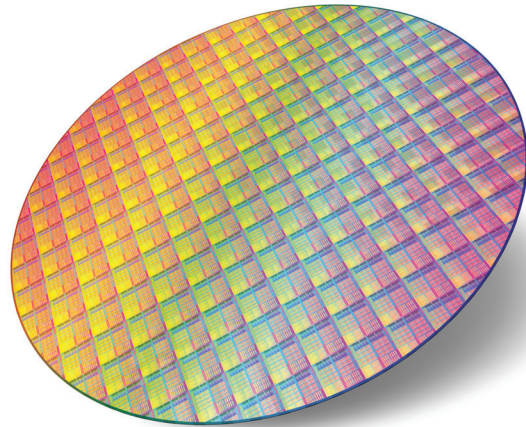
# SSC PRODUCT PORTFOLIO

Renesas' Sensor Signal Conditioner ICs typically interface with following main sensor types: resistive bridges, thermopile and differential or absolute capacitors. For each sensor type, further specialization allows selecting the optimal balance between price and performance for the required operating voltage and temperature range, gain, resolution, input/output format, and qualification level.

Our SSC ICs offer digital compensation of sensor offset, sensitivity, temperature drift, and nonlinearity in wide operational temperature ranges:  $-50^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$  (maximum range).

## RENESAS SSC ICs ENABLE EASY SENSOR PLATFORM DEVELOPMENT

- Analog and One-Wire interface
- Digital I<sup>2</sup>C & SPI output
- Resistive and capacitive sensor interface
- High analog gain for sophisticated sensors
- Industrial and consumer applications
- Low-power and battery-powered applications
- Single-pass calibration
- High ADC resolution up to 24 bit
- Wafer and packaged delivery forms



## RENESAS SENSOR SIGNAL CONDITIONERS

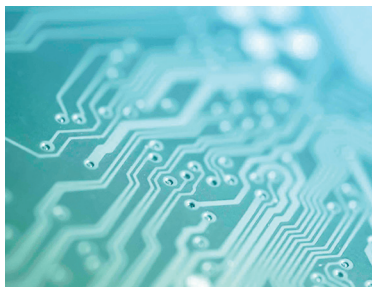
Renesas' SSCs provide an advantage to our customers' sensor modules both in performance as well as in the test and calibration process.

### HIGH ACCURACY



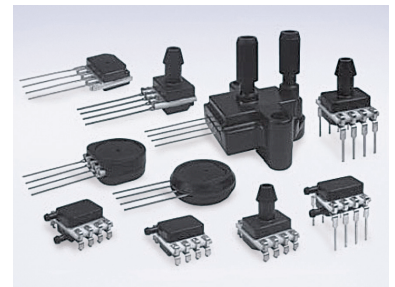
Real resolution – not inflated claims

### INTEGRATED SOLUTIONS



No external trimming and single-pass calibration

### BREADTH OF PRODUCT



Resistive and capacitive solutions with a variety of output options

# INDUSTRIAL AND CONSUMER SSC PORTFOLIO

Part Number	Type	Voltage	Output	ADC	Package	Typical Application/Features
ZSC31010	Resistive	2.7 to 30 V	Analog/Digital	14 bit	SOIC, Wafer	Industrial/Analog Sensors
ZSC31014	Resistive	2.7 to 5.5 V	Digital	14 bit	SOIC, Wafer	Industrial/I <sup>2</sup> C Sensors
ZSC31015	Resistive	2.7 to 30 V	Analog/Digital	14 bit	SOIC, Wafer	Industrial/Analog Sensors
ZSC31050	Resistive	2.7 to 40 V	Analog/Digital	15 bit	SSOP, Wafer	Industrial/Current Loop
ZSSC3026	Resistive	1.8 to 3.6 V	Digital	16 bit	Wafer	Consumer, White Goods
ZSSC3036	Resistive	1.8 to 3.6 V	Digital	16 bit	Wafer	Industrial
ZSSC3027	Resistive	1.7 to 3.6 V	Digital	16 bit	Wafer	Stacked Die Assemblies
ZSSC3018	Resistive	1.68 to 3.6 V	Digital	18 bit	QFPN, Wafer	Industrial/White Goods
ZSSC3218	Resistive	1.68 to 3.6 V	Digital	18 bit	QFPN, Wafer	Consumer/White Goods
ZSSC3224	Resistive	1.68 to 3.6 V	Digital	24 bit	QFPN, Wafer	Industrial/Consumer
ZSSC3240	Resistive	2.7 to 48 V	Analog/Digital	24 bit	QFPN, Wafer	Industrial/Current Loop
ZSSC3281	Resistive	1.8 to 48V	Analog/Digital	2 x 24 bit	PQFN, Wafer	Industrial, Dual Channel
ZSSC3286	Resistive	1.8 to 5.5V	IO-Link/Analog	2 x 24 bit	PQFN, WLCSP	Industrial, IO-Link
ZSSC3123	Capacitive	2.3 to 5.5 V	Digital, PDM	14 bit	TSSOP, Wafer	Industrial
ZSSC3230	Capacitive	1.68 to 3.6 V	Digital, PDM	18 bit	PQFN, Wafer	Industrial/Consumer

## SENSOR APPLICATION REFERENCE DESIGNS



Oil pressure and temperature sensor



Pressure sensing in consumer electronics



Industrial pressure sensor



Sensors for white goods

## WHY CHOOSE RENESAS SSCS?

Renesas SSC ICs are all-in-one, energy-efficient products that are easy-to-use and are supported by advanced software and expert technical support staff.



Decades of sensor design experience



Excellent evaluation and support tools



Unmatched technical support



Continued investment



Reduced time to market



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