

Design Challenge 2008?

Did you miss the Rejistor Design Challenge last year? ...Here's your second chance to achieve recognition and earn a little spending money. Submit your original ideas for design incorporating Microbridge Rejistors and we'll pay you \$250 for each one that gets published in 2008 in a recognized technical publication (print or online) with a circulation greater than 30,000 such as: Electronic Design, Electronic Products, EDN, Planet Analog, EETimes, Machine Design, Design News, Chips Design, eeProduct Center, Sensors Magazine, Appliance Magazine, Sensors & Transducers. There's plenty of time so put those pencils to the paper...or perhaps we should say "fingers to the keyboard".

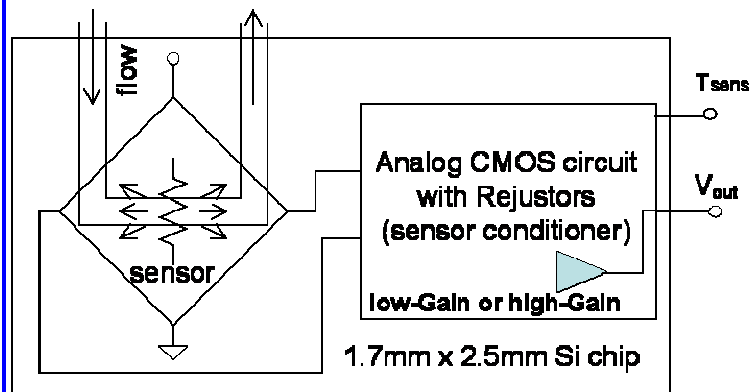


Micro-Flow Based Differential Pressure Sensor

Microbridge Technologies has developed a micro-air-flow sensor, integrated on-chip with analog CMOS signal conditioning circuitry. The chip provides for analog adjustability using Microbridge's patented Rejistor technology. The thermo-anemometer flow sensing principle, combined with a micro-flow channel having very high flow-impedance, allows accurate sensing of low differential pressures. Because the flow-impedance is pre-defined at the die-level, it dramatically relaxes demands on subsequent packaging operations. Individual units require only simple offset and gain compensation accomplished with the on chip rejistors, leaving barometric pressure correction and temperature correction to be implemented in "standard" post-sensor lookup tables. This facilitates field-replacement of micro-air-flow sensors because they do not require field calibration. The high flow impedance improves robustness vis-a-vis variability of connection hoses, changing gas filter properties, and humidified air. The technology enables substantial price-reductions with performance and ease-of-use improvements over present solutions.

Microbridge's Integrated Micro-Air-Flow Sensor:

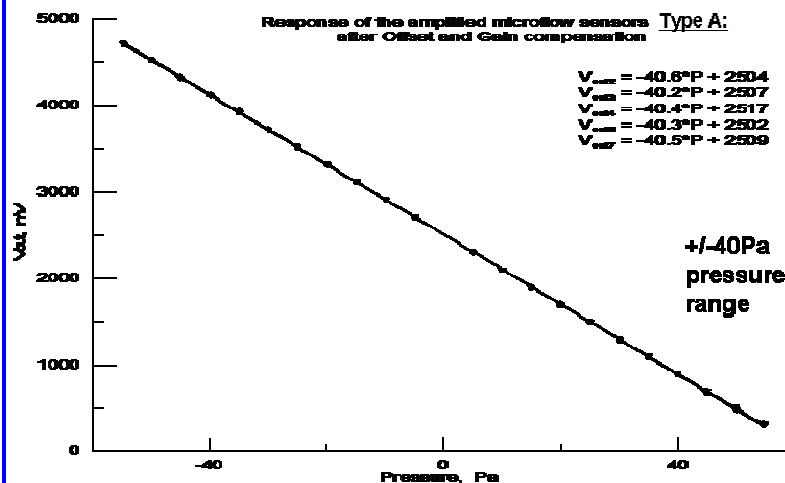
Fig. 1 conceptually summarizes Microbridge's integrated micro-air-flow sensor. As shown in the diagram, the chip consists of the thermo-anemometer-type sensing element with integrated flow-channel, and a rejistor based trimmable CMOS analog sensor conditioning circuit. The chip is approximately 1.7mm x 2.5mm. It is powered by 5VDC and provides an analog output. Fine-calibration of manufacturing variations such as offset and gain is done using Rejistors embedded within the analog CMOS circuit. An on-chip-sensed ambient temperature pin is also available

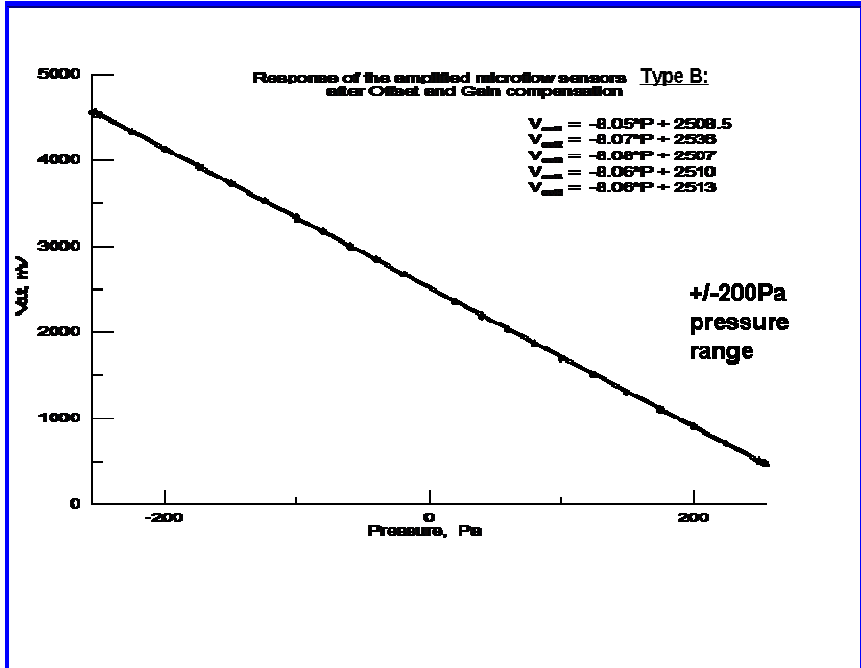


High Flow-Impedances à Benefits:

The flow-impedance of Microbridge's sensor-die can be designed to be anywhere in a range ~1kPa/(ml/s) to ~200kPa/(ml/s). The initial products to be offered in the family called Type-A (25kPa/(ml/s)), and Type-B (60kPa/(ml/s)) are currently being selectively sampled. These flow-impedances substantially exceed the presently-available ranges in the market today.

Typical performance charts are shown below.





Performance Comparison Table:

Parameter	Microbridge		Competitor #1		Competitor #2
	Un-amplified micro-flow sensor Type A (B)	Amplified micro-flow sensor Type A (B)			
Pressure range	+/-2000Pa (+/-4000Pa)	+/-50Pa (+/-250Pa)	5 .. 125Pa	-100 .. 3500Pa	+/-1000Pa
Output voltage (FSO)	+/-200mV	4.3V	4V	4V	20mV@600Pa
Resolution	0.1Pa (0.5Pa)	0.1Pa (0.5Pa)	0.1Pa	0.5Pa	NA
Response time	-1ms	-1ms	40ms	40ms	1 - 3ms
Pneumatic impedance	25kPa/(ml/s) (60kPa/(ml/s))	25kPa/(ml/s) (60kPa/(ml/s))	0.06kPa/(ml/s)	1.75kPa/(ml/s)	0.5kPa/(ml/s)
Excitation (VDC)	5V	5V	5V	5V	10V

To learn more about these new products view our brief white paper at <http://www.mbridgetech.com/pdfs/microflow1008.pdf>

To see a demonstration, visit Microbridge at Electronica 2008 November 10-11 at Hall A4 Booth 547

Please help us to define the right products by answering the following survey questions:

- What full scale output pressure for the Micro-Flow Differential Pressure Sensor would be of greatest interest to you?
 - 0.01" H2O
 - 0.10" H2O
 - 0.25" H2O
 - 1" H2O
 - 10" H2O
 - 20" H2O
 - Other: Please add a short note in your answer to Survey Question #4 to indicate what other full scale output you would like to see. Please include your contact information.
- If you were to use this Micro-Flow Differential Pressure Sensor, would you prefer it in die form for you to assemble into your own proprietary package or would you prefer to buy it in a package defined by Microbridge?
 - Die form
 - Let Microbridge define the package
 - I want to define the package. My contact information is in Survey question #4
- At what price point do these sensors become a compelling solution? Please indicate a specific volume and price range

4. May we contact you? If yes, please enter your email address or a phone number below

Submit

If you do not receive a confirmation page after clicking submit, please click [here](#).

THE FOLLOWING DEVICES ARE NOW AVAILABLE FOR LIMITED SAMPLING. AS A READER OF OUR NEWSLETTER YOU HAVE THE OPPORTUNITY TO REQUEST EARLY EVALUATION SAMPLES OF THE FOLLOWING TWO ABSOLUTE AND RELATIVE PRESSURE SENSORS.

The MB-APS and MB-RPS series piezoresistive transducers are monolithic silicon pressure sensors designed to sense absolute/relative air pressure for a wide range of applications. These transducers combine patented Rejistor technology with CMOS circuitry to provide a pressure sensor die with analog-only compensation electronics.

Features

- 1% maximum error (compensated) over 0°C to +85°C
- 2% maximum error (compensated) over -50°C to +125°C
- Electronics to fully compensate (Offset, TC-Offset, Span, TC-Span)
- Patented Rejistor-based analog-only on-chip signal conditioning
- Temperature compensation over -40°C to +125°C
- Enables compensation after packaging/assembly
- Enables compensation during final test

Characteristics	Specification	Specification
Pressure type:	Relative (RPS)	Absolute (APS)
Pressure range:	100PSI	100PSI*
Excitation voltage:	5V +/-0.5VDC	5V +/-0.5VDC
Current consumption:	less than 4mA (No load)	less than 4mA (No load)
Minimum output load resistance:	5kOhm (less than 1 mA output drive current)	5kOhm (less than 1 mA output drive current)
Nominal output voltage:	0.5V (at -100PSI); 2.5V (at 0 PSI); 4.5V (at +100 PSI)	0.5V (at 0 PSI); 4.5V (at 100 PSI)
Nominal full-scale voltage span:	2V	4V
Type of output voltage:	Ratiometric to Excitation voltage	Ratiometric to Excitation voltage
Accuracy:	+/-1% in temperature range 0C to +85C +/-2% in temperature range -50 to +125C	+/-1% in temperature range 0C to +85C +/-2% in temperature range -50 to +125C
ESD protection:	2000V HMB	2000V HMB
Bandwidth:	1kHz	1kHz
Minimum bondpad dimensions:	90um x 90um	90um x 90um
Minimum bondpad pitch:	150um	150um
Functional pins:	3 (Supply, GND, Output)	3 (Supply, GND, Output)
Heater pins:	8 (Heater-GND is shared with main Functional GND)	8 (Heater-GND is shared with main Functional GND)
Total pins:	11 (Functional and Heater)	11 (Functional and Heater)

To request samples, contact Microbridge Sales at +1 (781)-856-0364

**Visit Microbridge at Electronica 2008
November 10-11
Hall A4 Booth 547**

High Ratio Rejistor Dividers

By continuing to innovate our line of standard product Rejistor Dividers, Microbridge has been able to reach new heights in precision analog design. The Micro-Flow Pressure Sensor featured in this issue is another example of how we've integrated MEMS based sensor elements with Rejistor technology with CMOS Analog functions to bring about new levels of performance not previously achievable at competitive prices.

Furthering our rejistor development, we have created several new, high ratio dividers, permitting precision gain adjustment for those more difficult instrumentation amplifiers as well as other applications.

Here is a sampling of what's on the horizon:

Hi Ratio Rejistor-dividers with relative TCR +/-25ppm/C	
MBD321QR	1:1000 à (325ohm : 325kohm), ~2mW
MBD501MR	1:500 à (500ohm : 250kohm), ~2mW
MBD401JR	1:250 à (400ohm : 100kohm), ~2mW
Prototypes to be tested in Oct/Nov 2008	
MBD331SR	1:300 à (330ohm : 100kohm), ~1mW
MBD501PR	1:200 à (500ohm : 100kohm), ~1mW
MBD102NR	1:100 à (1kohm : 100kohm), ~1mW
Hi Ratio Rejistor-dividers with relative TCR +/-25ppm/C and enhanced (4x) adjustment resolution, with reduced (10%-down) adjustment range	
Prototypes to be tested in Oct/Nov 2008	
MBD641Q3R	1:1000 à (640ohm : 640kohm), ~8mW
MBD132S3R	1:300 à (1.3kohm : 390kohm), ~4mW
MBD202P3R	1:200 à (2kohm : 400kohm), ~4mW
MBD402N3R	1:100 à (4kohm : 400kohm), ~4mW
MBD501FR	1:20 à (500ohm : 10kohm), ~4mW
Hi Ratio Standard eTC Rejistor-dividers	
Prototypes to be tested in Oct/Nov 2008	
MBT102N	1:100 à (1kohm : 100kohm), ~1mW
MBT152V	1:50 à (1.5kohm : 75kohm), ~1mW
MBT152H	1:30 à (1.5kohm : 45kohm), ~1mW
MBT103F	1:20 à (10kohm : 200kohm), ~2mW
MBT153E	1:9 à (15kohm : 135kohm), ~2mW
Hi Ratio eTC Rejistor-dividers with enhanced adjustment resolution and with reduced adjustment range	
Prototypes to be tested in Oct/Nov 2008	
MBT122Q3	1:1000 à (1.2kohm : 1.2Mohm) (4x, 10%-down), ~8mW
MBT402N3	1:100 à (4kohm : 400kohm) (4x, 10%-down), ~4mW
MBT602V3	1:50 à (6kohm : 300kohm) (4x, 10%-down), ~4mW
MBT602H3	1:30 à (6kohm : 180kohm) (4x, 10%-down), ~4mW
MBT153E4	1:9 à (15kohm : 135kohm) (5x, 8%-down), ~8mW
MBT153E9	1:9 à (15kohm : 135kohm) (10x, 4%-down), ~12mW
MBT333A4	1:1 à (33kohm : 33kohm) (5x, 8%-down), ~10mW
MBT333A9	1:1 à (33kohm : 33kohm) (10x, 4%-down), ~20mW

ABOUT MICROBRIDGE

Microbridge is the leading manufacturer and licensor of next step electronic calibration products and solutions in the consumer, automotive, medical and other industries that need to improve manufacturing yields and productivity, and enter new markets. Microbridge's resistor calibration products (Rejistor) and enabling technology are the first integrated calibration and temperature compensation systems for analog electronics design and production. The firm enables manufacturers to: cut scrap up to 50%; reduce in-line manufacturing process steps; eliminate binning, work-arounds, laser trimming, hand-sorting and trim-pots; decrease calibration costs by a factor of 10 without sacrificing performance; and return millions of dollars in production savings.

Microbridge's technology enables product designers to achieve one-step calibration and passive adjustment, is adaptive and adjustable in circuit, and it allows calibration in the analog domain to improve the design of current and future products.

For more information, visit www.mbridgetech.com. Companies with product inquiries can contact Microbridge at sales@mbridgetech.com and licensing inquiries can be answered at license@mbridgetech.com

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