

## Microbridge February 2008 eNewsletter

### Vote For Microbridge

Now in its 18th year, *EDN's* Innovation Awards program recognizes and honors outstanding engineering professionals and products. The 2007 Finalists have been announced - voting has begun and will continue through the month of February. We're very pleased to be included with the array of products and technologies!.

Please be sure to visit this link and vote for Microbridge  
[Innovation Awards](#) (listed under Passives, half-way down the page)

Vote here:  
[EDN Ballot](#)

They will then send you an email to confirm your votes. The email should arrive soon from [elletters@reedbusiness.com](mailto:elletters@reedbusiness.com). Make sure it doesn't get trapped in your spam filter. You **MUST** click the link at the bottom of the email in order for your vote to count! This response confirms that you are using a valid email address and protects the integrity of the vote. Thank you.

### Microbridge Enters Analog IC Market with CMOS and Rejistor-based Application-Specific Analog Signal Conditioning Chip

This single-chip analog bridge sensor conditioner connects directly to the piezo-resistive sensor to provide analog calibration, temperature compensation and amplification. The MBSTC-02 can be considered as an amplifier with four stages, as described below.

- **Stage 0:** Offset and TC-Offset adjustment stage with eTC Rejutors
  - Passive Compensation, typical adjustment ranges for 3-6kohm sensors are +/- 10mV/V Offset and +/-30uV/V/K TC-Offset
- **Stage 1:** Fixed positive TC-Gain stage [+1600ppm/K (MBSTC-02A) or +2400ppm/K (MBSTC-02B)]
  - Active Amplification for coarse compensation of typical negative TC-sensitivity of piezo-resistive sensors
- **Stage 2:** TC-Gain fine adjustment stage in a range of +/-500ppm/K
  - Active amplification for fine compensating residual TC-Sensitivity remaining after Stage 1
- **Stage 3:** Absolute Gain adjustment stage (+/-50% of initial Gain Value)
  - Overall amplification approximately 40V/V
- **Stage 4:** Level Shifting Stage (Optional)
  - Level shifting stage to center the output around 2.5V for differential sensors

You can view the datasheet [here](#). To view the technical paper presented at ISSCC in San Francisco at the beginning of the month, check [here](#)

## LM335 Temperature Sensor Calibration Using Rejutors

The LM335 is a well-known temperature sensor, part of a series of precision, easily-calibrated temperature sensors from National Semiconductor. The Rejutor is ideally suited for the resistive adjustment required to set the absolute voltage output of the LM335. One key differentiation achieved using Rejutors in temperature sensors is the ability to change the compensation resistor after final assembly. Check out the white paper [here](#).

## NEW PRODUCTS

### High Temperature Family

Microbridge is developing discrete Rejutors (singles, duals, dividers) specifically suited for high-temperature applications. The thermally-adjusted polysilicon's long-term resistance drift at high temperatures is predictable and under 1%.

Two different types of high-temperature performance are being targeted:

- Type-1: Hi Temp Rejutors will feature an overall resistance tolerance (including long-term drift) of better than +/-2.5% over an extended temperature range of -55C to +250C, with an ~20% resistance adjustment range. These HT-Rejutors will be designed such that, at a specific elevated temperature (e.g. 200C), the resistance returns to its room-temperature value, within +/-1.0%. Pairs of these HT-Rejutors (unadjusted and adjusted) will maintain their ratio-matching within better than 1% over the entire temperature and adjustment ranges.
- Type -2 Special-purpose Hi Temp-Rejutors will feature a tighter resistance tolerance of better than 0.7% over narrower temperature ranges (e.g. 150C to 200C, 175C to 225C, 200C to 250C). This is intended for high temperature applications where a fine tolerance is desired within a specific "focus-range" of temperatures. These Hi Temp Rejutors will be designed such that their high-temperature resistance values are a specific percentage (e.g. 4.5% +/-0.7%) below their room-temperature value. Pairs of these HT-Rejutors (unadjusted and adjusted) will maintain their ratio-matching within better than 1% over the entire -55C to +250C temperature range, throughout the 20% adjustment range, AND within better than 0.4% within the specific focus-range

Different temperature characteristics and/or focus-ranges may also be feasible. If you would like to know more about these products, please contact Bob Frosthalm, Vice President Marketing, Tel: 408-524-1551, Mobile: 650-222-6937, email: [bfrosthalm@mbridgetech.com](mailto:bfrosthalm@mbridgetech.com)

We'd like to hear your ideas. Do you like this product concept? Would you like something similar, yet slightly different? Let us know..contact [bfrosthalm@mbridgetech.com](mailto:bfrosthalm@mbridgetech.com) or call 408-524-1551 and tell us what would be interesting

### Design Challenge Update

Wow...so many great ideas.but it's taking us longer that we expected to thoroughly review them all, so please be patient

## TRADE SHOWS

### Tokyo Sensor Show 2008 - April 23-25, 2008

Microbridge will be present at the 2008 edition of the [Tokyo Sensor show](#). Visit us at booth No. S-44. This is a great opportunity to learn more about our award winning technology

### International Conference on High Temperature Electronics (HiTEC 2008) - May 13-15, 2008

Microbridge will present **Thermally-Adjusted Resistors for Fine-Tuning High-Temperature Electronic Circuits** at the 2008 HiTEC Conference at the Hotel Albuquerque Old Town, Albuquerque, New Mexico, USA. [HiTEC Show](#)

## REJUSTORS IN THE NEWS . . . Here's a sampling

### Electronic Design

2/14/08

Don Tuit

Sensor-Conditioning Amps Use Rejustors For Precision Compensation

<http://electronicdesign.com/Articles/ArticleID/18080/18080.html>

### EE Times

2/4/08

MEMS enables electrically trimmable passive resistor

<http://www.eetimes.com/showArticle.jhtml;jsessionid=5VEI2KFH3DRGMQSNdLOSdKH0CJUNN2JVN?articleID=206103606>

### Sensors and Transducers Magazine

CMOS and Rejutor Based Application-Specific Analog Signal Conditioning Chip

ISSN 1726-5479, Vol.88, Issue 2, February 2008

[http://www.sensorsportal.com/HTML/DIGEST/New\\_Digest.htm](http://www.sensorsportal.com/HTML/DIGEST/New_Digest.htm)

### Sensors Magazine

2/4/08

Microbridge Offers Rejutor-Based Signal-Conditioning Chip

<http://www.sensorsmag.com/sensors/Sensor+News/Microbridge-Offers-Rejutor-Based-Signal-Condition/ArticleStandard/Article/detail/488804?contextCategoryId=34296>

### Analog and DSP

2/4/08

Microbridge Enters Analog IC Market with CMOS and Rejutor Based Application-Specific Analog Signal Conditioning Chip

<http://www.analoganddsp.com/results.asp?entryid=11434>

### EDN

2/4/08

Microbridge Enters Analog IC Market With CMOS and Rejutor Based Application-Specific Analog Signal Conditioning Chip

<http://www.edn.com/pressRelease/2140154280.html>

### ElectronicsTalk

2/5/08

Analog IC takes adjustable resistors onboard

<http://www.electronicstalk.com/news/moz/moz108.html>

### **Sensors Automotive**

2/4/08

Microbridge Offers Rejutor-Based Signal-Conditioning Chip

<http://auto.sensorsmag.com/sensorsauto/Automotive+News/Microbridge-Offers-Rejutor-Based-Signal-Condition/ArticleStandard/Article/detail/488982?contextCategoryId=25964>

### **EE Product Center**

2/4/08

Analog IC incorporates adjustable resistor technology

Gina Roos

<http://www.eeproductcenter.com/showArticle.jhtml?articleID=206103779>

### **Embedded.com**

2/4/08

Analog IC incorporates adjustable resistor technology

<http://www.embedded.com/products/integratedcircuits/206103934?requestid=185334>

### **EE Times Asia**

2/6/08

Analog IC integrates adjustable resistor tech

[http://www.eetasia.com/ART\\_8800503269\\_765245\\_NP\\_97ad8276.HTM](http://www.eetasia.com/ART_8800503269_765245_NP_97ad8276.HTM)

## **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 (Rejutor) 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](http://www.mbridgetech.com). Companies with product inquiries can contact Microbridge at [sales@mbridgetech.com](mailto:sales@mbridgetech.com) and licensing inquiries can be answered at [license@mbridgetech.com](mailto:license@mbridgetech.com)

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