Micron Instruments offers a wide range of semiconductor backed half and full bridge strain gages. Backed bridges are installed on a flexible high temperature insulator that can be bent around a one half inch radius without hurting the gage.

Our Half-Bridge Backed Gages are constructed using two thermally matched gages bonded onto a backing which allows them to track each other. When used as one side of the bridge, they compensate each other thermally even when bonded since they both see the same thermal expansion and temperature. When both gages have a gage factor (GF) of 140 the transverse gage will normally see the Poisson’s effect, which for most steels is 0.3. This reduces the transverse gage factor to 42. The average GF for the half bridge would be 91.

Our Full-Bridge Gages are constructed using four thermally matched gages bonded onto a backing.

### SPECIFICATIONS

- Bar gages ranges available 120 ohm up to 1000 ohms
- Czochralski pulled boron doped silicon
- Base material FR4 TG-250
- Tinned Copper Solder Pads and Traces

Gages with Low resistance down to 10 ohm up to 10k ohms are also available, call (805) 522-4676 for details.
ORDERING GUIDELINES

Example

A. Model (SSGH)  SSGH-080-050-120PB-B-M2 is a Backed Semiconductor Strain gage with a Total Length of 080 and an Active Length of 050. The gage has a nominal resistance of 120 at 78 degrees F. The gage is further defined as P Dopant and is configured for Bending applications. M2 denotes two backings.

B. Total Length

C. Active Length

D. Nominal Resistance at 78°F

E. Dopant

Micron offers several matching options. M1 is a single backing with two semiconductor gages that have been resistance matched to each other from 0 to 272 degrees F. M2 is two backings with two semiconductor gages on each backing, all gages are resistance matched to each other from 0 to 272 degrees F. M3 is three backings with two semiconductor gages on each backing, all gages are resistance matched to each other from 0 to 272 degrees F. M4 is four backings with two semiconductor gages on each backing, all gages are resistance matched to each other from 0 to 272 degrees F.

F. Style (L) load (B) Bending (T) Torque T1 or T2

Note: For sets greater than M4 contact us for pricing and delivery.

G. Matched Set (M1) (M2) etc.

Note: Backings are packaged with resistance vs. temperature test data.
1. MATERIAL:
.OO5 THK, Fr-4, Tg 250 MIN.
1Oz Cu TIN EMMERSION FINISH (BOTTOM SIDE NO COPPER).

2. GAGES ARE "BAR".

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<th>UNLESS OTHERWISE SPECIFIED:</th>
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<tr>
<td>DIMENSIONS ARE IN INCHES</td>
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<td>TOLERANCES:</td>
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<td>TWO PLACE DECIMAL .010</td>
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</table>
1. MATERIAL:
.005 THK, Fr-4, Tg 250 MIN.
1Oz Cu TIN EMMERSION FINISH (BOTTOM SIDE NO COPPER).

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
- ANGULAR: ONE DECIMAL
  - ONE PLACE DECIMAL: ±.030
  - TWO PLACE DECIMAL: ±.010
  - THREE PLACE DECIMAL: ±.005
- ALL DIA: .005 TR. RAD. .005 MAX
- SURFACE FINISH
- INTERPRET GEOMETRIC TOLERANCING PER:

MATERIAL
SEE NOTES

MICRON INSTRUMENTS
4509 RUNWAY STREET
SIMI VALLEY, CA. 93063
(805) 522-4676 FAX (805) 522-4982
e-mail sensors@microninstruments.com

TITLE: PCB, SSGH-BENDING
SIZE A
DWG. NO. MI-WEB
REVISION -
SCALE: 12:1
WEIGHT:
SHEET 1 OF 1
1. MATERIAL:
.005 THK, Fr-4, Tg 250 MIN.
1Oz Cu TIN EMMERSION FINISH (BOTTOM SIDE NO COPPER).

2. GAGES ARE "BAR".

NOTE:
GAGES DEPICTED ARE "BAR"

DIMENSIONS ARE IN INCHES
TOLERANCES:
ANGULAR: MACH 14 .030
ONE PLACE DECIMAL .050
TWO PLACE DECIMAL .010
THREE PLACE DECIMAL .005
ALL DIA .005 TR. RADI .005 MAX
SURFACE FINISH

UNLESS OTHERWISE SPECIFIED:

MICRON INSTRUMENTS
4509 RUNWAY STREET
SIMI VALLEY, CA. 93063
(805)522-4676 FAX (805) 522-4982
e-mail sensors@microninstruments.com

TITLE: SSGH LOAD (GAGED)

PROPERTY OF MICRON INSTRUMENTS (805) 522-4676

SCALE: 16:1 WEIGHT: SHEET 1 OF 1
1. MATERIAL:

.005 THK, Fr-4, Tg 250 MIN.
1Oz Cu TiN EMMERSION FINISH (BOTTOM SIDE NO COPPER).

DIMENSIONS ARE IN INCHES
TOLERANCES:
ANGULAR: .030
ONE PLACE DECIMAL ± .050
TWO PLACE DECIMAL ± .010
THREE PLACE DECIMAL ± .005
ALL DIA .005 TIR. BACK .005 MAX TIR.
SURFACE FINISH

INTERPRET GEOMETRIC TOLERANCING PER:

MATERIAL

SEE NOTES

MICRON INSTRUMENTS
4509 RUNWAY STREET
SIMI VALLEY, CA. 93063
(805)522-4676 FAX (805) 522-4982
e-mail sensors@microninstruments.com

TITLE: PCB, SSGH-LOAD

A MI-WEB

SCALE: 12:1 WEIGHT: SHEET 1 OF 1
1. MATERIAL:
.005 THK, Fr-4, Tg 250 MIN.
1Oz Cu Tin EMERSION FINISH (BOTTOM SIDE NO COPPER).

GAGES ARE "BAR".

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
ANGULAR: MAX .030
ONE PLACE DECIMAL .030
TWO PLACE DECIMAL .010
THREE PLACE DECIMAL .005
ALL DIA .005 TR ROUND .005 MAX .010

SURFACE FINISH

INTERPRET GEOMETRIC
TOLERANCING PER:

DIMENSIONS ARE IN INCHES
TOLERANCES:
ANGULAR: MAX .030
ONE PLACE DECIMAL .030
TWO PLACE DECIMAL .010
THREE PLACE DECIMAL .005
ALL DIA .005 TR ROUND .005 MAX .010

SURFACE FINISH

INTERPRET GEOMETRIC
TOLERANCING PER:

MATERIAL

FINISH

APPLICATION

DO NOT SCALE DRAWING

PROPERTY OF MICRON INSTRUMENTS (805) 522-4676
1. MATERIAL:
.005 THK, Fr-4, Tg 250 MIN.
1Oz Cu TIN EMMERSION FINISH (BOTTOM SIDE NO COPPER).

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
ANGULAR: MAX .000025, .000030
ONE PLACE DECIMAL = .003
TWO PLACE DECIMAL = .005
THREE PLACE DECIMAL = .007
ALL DIA .005 TR. BEND .005 MAX
SURFACE FINISH V
INTERPRET GEOMETRIC TOLERANCING PER:
MATERIAL
SEE NOTES
FINISH

MICRON INSTRUMENTS
4509 RUNWAY STREET
SIMI VALLEY, CA. 93063
(805)522-4676 FAX (805) 522-4982
e-mail sensors@microninstruments.com

PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MICRON INSTRUMENTS.
REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MICRON INSTRUMENTS IS PROHIBITED.
NOTE:
GAGES DEPICTED ARE "BAR"

1. MATERIAL:
  .005 THK, Fr-4, Tg 250 MIN.
  1Oz Cu Tin EMMERSION FINISH (BOTTOM SIDE NO COPPER).

2. GAGES ARE "BAR".
1. MATERIAL:
0.005 THK, Fr-4, Tg 250 MIN.
1 Oz Cu TIN EMMERSION FINISH (BOTTOM SIDE NO COPPER).
1. MATERIAL:
.005 THK, Fr-4, Tg 250 MIN.
1Oz Cu TIN EMMERSION FINISH (BOTTOM SIDE NO COPPER).

2. GAGES ARE "BAR".

NOTE:
GAGES DEPICTED ARE "BAR"

OVERCOAT
M-BOND 610

DIMENSIONS ARE IN INCHES

TOLERANCES:
ANGULAR: HACH 14 .010
ONE PLACE DECIMAL .030
TWO PLACE DECIMAL .010
THREE PLACE DECIMAL .005
ALL DIA .005 TIR. RADIUS .005 MAX
SURFACE FINISH

INTERPRET GEOMETRIC TOLERANCING PER:

MATERIAL
FINISH

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1. MATERIAL:
.005 THK, Fr-4, Tg 250 MIN, 1Oz Cu TIN EMMERSION FINISH (BOTTOM SIDE NO COPPER).
Semiconductor Strain Gages have large temperature coefficients of resistance making single gage strain measurements difficult unless used at a constant temperature. For this reason, gages are predominantly used in a half bridge or full bridge circuits and carefully matched for slope and intercept.

**PART NUMBER DETAILS**

SS-060-033-500P-S2  
SS designates Semiconductor Strain Gage  
060 designates that the gage is 0.060 long.  
033 designates the gage has an active area in the center of 0.033.  
500P designates 500 ohms nominally at room temperature and it is P-doped.  
S2 indicates these two gages are resistance versus temperature matched to each other.

**STANDARD PACKAGING**

Gages are packaged in clear plastic boxes measuring approximately one inch square.  
Each clear box lid is labeled with information about the gage.

- Temperature °F is noted along with the corresponding resistance in Ω.
  
<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>Resistance (Ω)</th>
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<tbody>
<tr>
<td>0</td>
<td>477</td>
</tr>
<tr>
<td>78</td>
<td>517</td>
</tr>
<tr>
<td>278</td>
<td>674</td>
</tr>
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</table>

- Gage lot number is marked as Lt.  
- Computer System number used to measure the resistance over temperature.  
- Gage Position Number identifies the position of the gage on the board in the temperature chamber.

**Note:**  
The computer system also measures and records reverse current and TCR (Thermal Coefficient of Resistance). This data is used to detect non-performing gages allowing them to be removed from production.
**THERMAL MATCHING CONSIDERATIONS**

### MATCHED GAGE INFORMATION

There are many uses for semiconductor strain gages and to accommodate these applications, Micron offers a number of matching options.

**SS-060-033-500P-xx**  
S1 is a single gage, tested and with data.  
S2 is a thermally matched set of two gages, tested with data.  
S4 is a thermally matched set of four gages, tested with data.

We recommend a spare gage be purchased in the event that a gage is damaged during installation. **An S3 or S5** at the end of the part number should be designated for this request.

For double bridges requiring eight gages you would specify an **S8** at the end of the gage number or **S9** for a Spare.

### STANDARD MATCHING

Standard Matching is at Three Temperatures and adhere to the following tolerances.

- **0°F**: +/- 3 ohms  
- **78°F**: +/- 2 ohms  
- **278°F**: +/- 2 ohms

### CUSTOM MATCHING

In general, tighter matching permits better performance especially with respect to bridge temperature compensation. When gages are to be used below **0°F**, additional testing is required. Micron does offer special matching upon request. (Examples Below)

#### 500 Ohms Matched

- **0°F**: +/- 2 ohms  
- **78°F**: +/- 1 ohm  
- **278°F**: +/- 1 ohm

#### 1000 Ohms Matched

- **-65°F**: +/- 6 ohms  
- **0°F**: +/- 6 ohms  
- **78°F**: +/- 4 ohms  
- **278°F**: +/- 4 ohms

Since the options for matching and temperature are numerous, please consult with our engineers who will advise if more accurate matching is required for your application. 1-800-638-3770

### GAGE DESIGNS

- **"Bar" Shaped Gage** - Lead Wires Exit the ends of each side of gage.
- **"U" Shaped Gage** - Lead Wires Exit the same side of gage. These gages are also useful since the length is less and for the same length and resistivity, we can offer twice the resistance.
- **"M" Shaped Gage** - Lead Wires Exit the same side of gage.

Gages are available between 10 ohms and 10,000 ohms.

Special gages are available for up to **800°F** operation.