

**BACKED SEMICONDUCTOR STRAIN GAGES**

- Easy to install
- Ideal for prototyping
- Linearity compensation for foil gage load cells and bridges

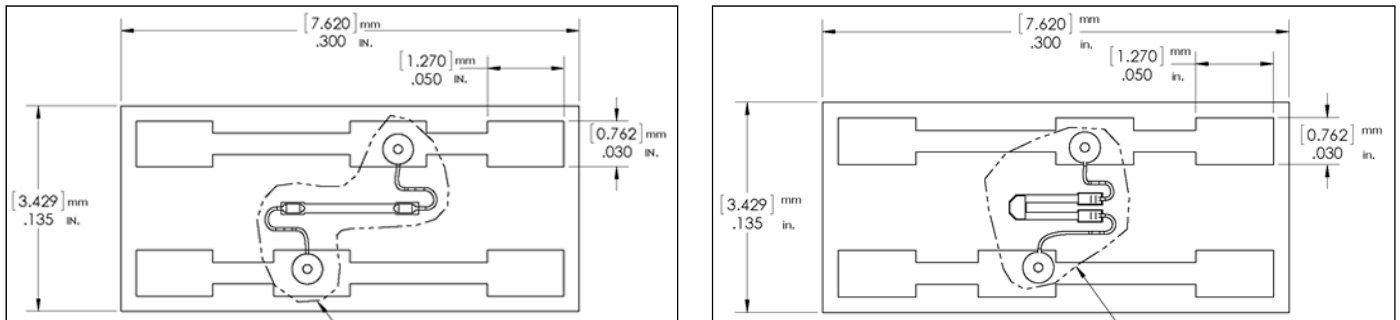
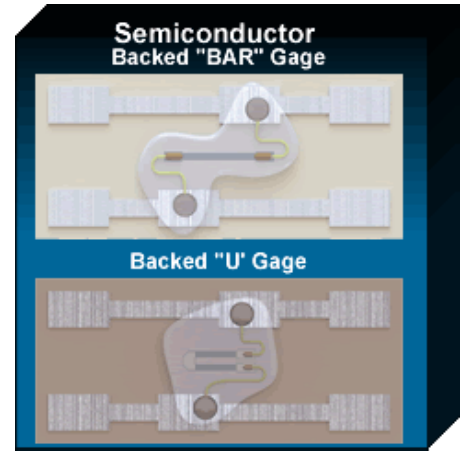
Mounted on a flexible insulated circuit with versatile solder pads makes them easy to install. They can be bent without hurting the gage and will perform like a foil gage except that the sensitivity change is 50 to 75 times greater.

On load cells and foil bridges, when it is used as a linearity corrector, a non-linearity of 0.125 % FS can be corrected to within .01 % of full scale. Long-term stability is not compromised.

Backed gages are suggested for use in prototyping for proof of concept and for transient or high frequency measurements.

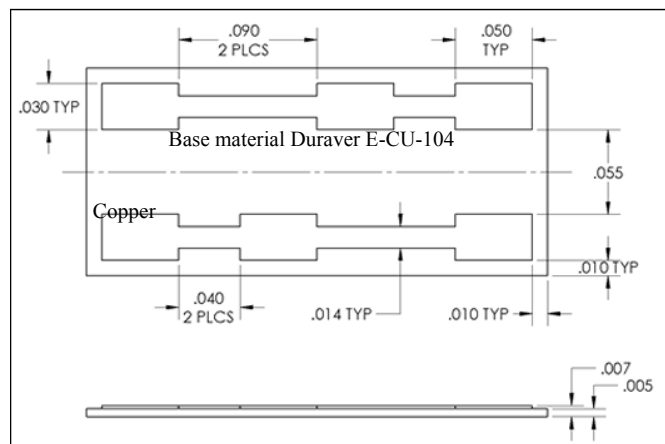
Backed gages are not suggested for use when used in a full or half bridge or when precision long term stability is a requirement.

Un-backed gages that are closely matched are suggested for these applications.



**SPECIFICATION**

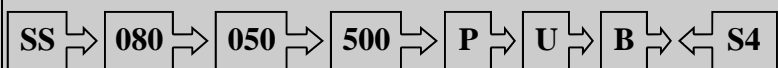
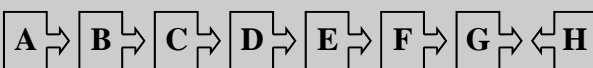
Base material Duraver E-CU-104  
 Dimensions Base .30 x .13  
 Copper Solder Pads



Backed Bar Semiconductor Strain Gages							
PART NUMBER	Width	Lead Attachment	Thickness	Resistance Ohms@ 78° F	Gage Factor	TCGF	TCR
SS-060-033-500 PB	.008	WL	.0004	540 ±50	140 ±10	-13%	15%
SS-060-033-500 PUB	.016	WL	.0004	540 ±50	140 ±10	-12%	14%
SS-060-033-1000PB	.008	WL	.0004	1050 ±75	155 ±10	-18%	24%
SS-080-050-120PB	.008	WL	.0004	120 ±20	120 ±10	-9%	5%
SS-080-050-230PB	.008	WL	.0004	230 ±30	120 ±10	-9%	5%
SS-080-050-345PB	.008	WL	.0004	345 ±40	140 ±10	-13%	16%
SS-080-050-500PB	.008	WL	.0004	540 ±50	140 ±10	-13%	16%
SS-095-060-350PUB	.016	WL	.0004	350 ±50	120 ±10	-9%	5%
SS-090-060-1150PB	.008	WL	.0004	1125 ±75	155 ±10	-18%	24%
SS-150-124-15PB	.009	WL	.0010	15 ±2	100 ±10	-10%	6%
SS-150-124-25PB	.008	WL	.0008	25 ±3	100 ±10	-10%	6%
SS-150-124-30PB	.008	WL	.0008	30 ±4	100 ±10	-10%	6%
SS-150-124-40PB	.008	WL	.0008	40 ±5	100 ±10	-10%	6%
SS-250-225-120PB	.009	WL	.0004	120 ±20	100 ±10	-10%	6%

**Standard Gage Specifications**

<b>Material</b>	Czochralski pulled boron doped silicon.
<b>Leads</b>	.002 dia. gold x 0.5 inch long. Some gages have .0015 dia. leads.
<b>Contact Pad</b>	Gold nickel fused, aluminum, or Hi-Temp.
<b>Lead Attachment</b>	Parallel gap welded with epoxy reinforcement or ball bonded.
<b>Operating Strain</b>	±2000 μ inch/inch ( 3000 μ inch/inch max.)
<b>Linearity</b>	Better than ±0.25% to 600 μ inch/inch Better than ±1.5% to 1500 μ inch/inch
<b>Max. Oper. Temperature</b>	+278°F Bonded.

**Ordering Guidelines**
**Example**


A. Model (SS)

B. Total Length

C. Active Length

D. Nominal Resistance at 78°F

E. Dopant

F. U Gage\*

G. Backed Gage

H. Specifies Matched or Single Gages

**SS-080-050-500P U B S4** is a Semiconductor Strain gage with a total length of **080** and an active length of **050**. The gage has a nominal resistance of **500** at 78 degrees F. The gage is further defined as Dopant **P** and Configured as a "**U**"\* Backed Gage. **S4** specifies a matched set of 4 gages.

\*Specify U for U-Gage or Leave Blank for Straight Gage

**Note:**

- S4 Matched set of 4 gages
- S2 Matched set of 2 gages.
- S1 Single gages with data.

**Standard Bridge Matching**

<b>Temperature °F</b>	<b>0°</b>	<b>78°</b>	<b>278°</b>	
<b>Standard Matching</b>	<b>±0.6%</b>	<b>±0.4%</b>	<b>±0.4%</b>	<b>Percent of Base Resistance</b>

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.

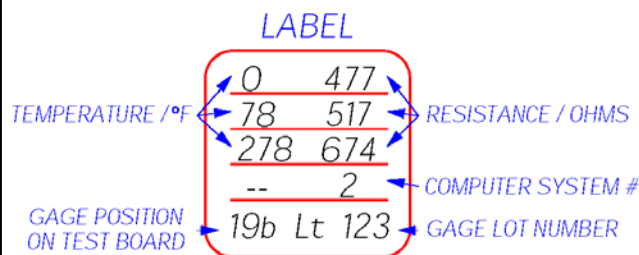
**S2** indicates these two gages are resistance versus temperature matched to each other.

### 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.

Gages are package one gage to a clear box with each box having its own label. Matched sets will be joined together with clear plastic tape on the bottom of the boxes.



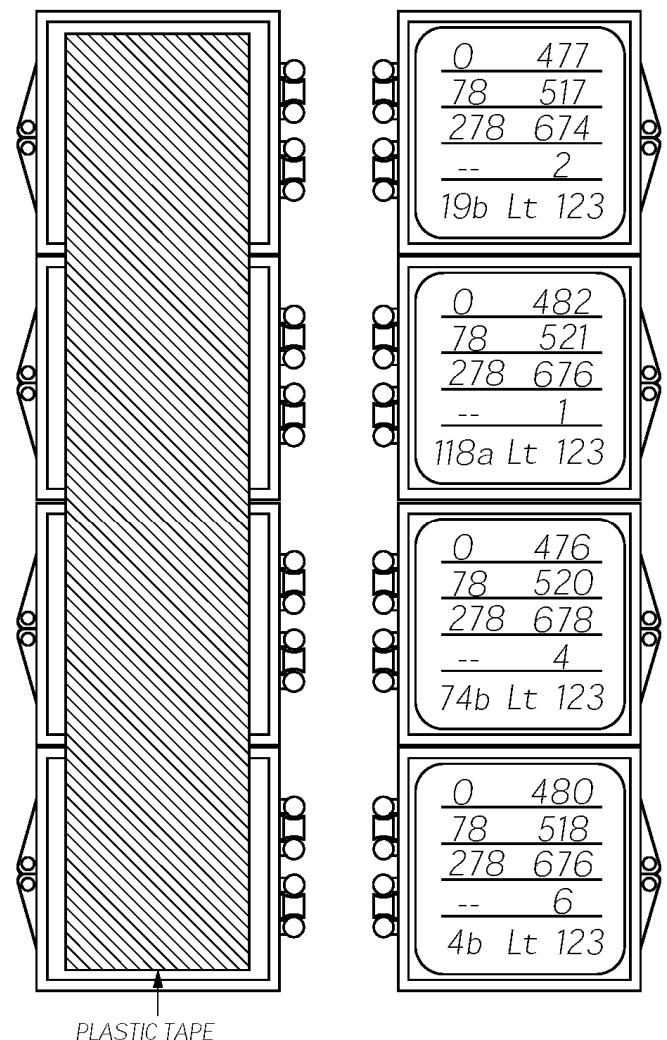
- Temperature  $^{\circ}\text{F}$  is noted along with the Corresponding Resistance in Ohms  $\Omega$ .
 

$0^{\circ}\text{F}$	477
$78^{\circ}\text{F}$	517
$278^{\circ}\text{F}$	674
- 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.

**See Reverse Side for Additional Information**



**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.

<b>0<sup>o</sup>F</b>	<b>+/- 3 ohms</b>
<b>78<sup>o</sup>F</b>	<b>+/- 2 ohms</b>
<b>278<sup>o</sup>F</b>	<b>+/- 2 ohms</b>

**CUSTOM MATCHING**

In general, tighter matching permits better performance especially with respect to bridge temperature compensation.

When gages are to be used below 0<sup>o</sup>F, additional testing is required.

Micron does offer special matching upon request. (**Examples Below**)

**500 Ohms Matched**

<b>0<sup>o</sup>F</b>	<b>+/- 2 ohms</b>
<b>78<sup>o</sup>F</b>	<b>+/- 1 ohm</b>
<b>278<sup>o</sup>F</b>	<b>+/- 1 ohm</b>

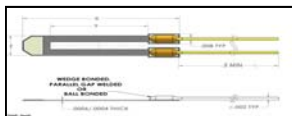
**1000 Ohms Matched**

<b>-65<sup>o</sup>F</b>	<b>+/- 6 ohms</b>
<b>0<sup>o</sup>F</b>	<b>+/- 6 ohms</b>
<b>78<sup>o</sup>F</b>	<b>+/- 4 ohms</b>
<b>278<sup>o</sup>F</b>	<b>+/- 4 ohms</b>

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

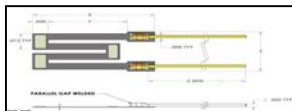
**GAGE DESIGNS**


"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<sup>o</sup>F operation.