

## MICROWAVE SAPPHIRE PISTONCAP® TRIMMER CAPACITORS

### FEATURES

- Sapphire dielectric
- Very high Q at UHF and microwave frequencies
- Subminiature – smallest PISTONCAP® types
- Choice of 2 configurations and 6 mounting styles to suit all RF structures
- Designed to meet MIL-C-14409D
- Precision high resolution adjustment:
  - 127 threads per inch for GU series, GW series and GN\_1R2\_ \_
  - 169 threads per inch for GN\_2R5\_ \_ to GN\_8R0\_ \_
- Extremely stable over temperature, frequency, voltage, etc.

### APPLICATIONS

Stable oscillators, frequency multipliers, filters, tuning cavities, coupling, etc.

### SPECIFICATIONS

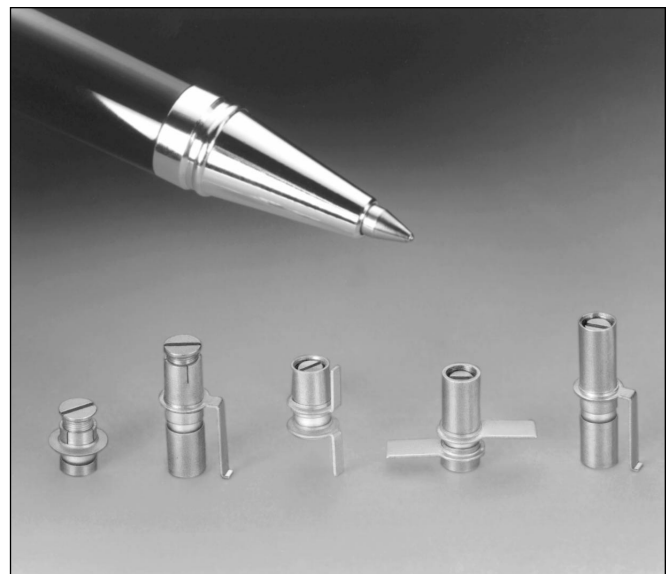
Operating temperature: -55°C to +125°C

Rated voltage: 500 VDC

Dielectric withstanding voltage: 1000 VDC

Contact resistance: 0.01 Ohms

Insulation resistance: 10<sup>6</sup> Megohms min at 500 VDC



Torque: 0.1 to 1.0 oz-in (7.2 to 72 g-cm) for GU series and GN\_1R2\_ \_  
0.2 to 2.0 oz-in (14.4 to 144 g-cm) for GW and GN\_2R5\_ \_ to GN\_8R0\_ \_

### PART NUMBERING SYSTEM

| <b>GU</b><br><b>Sapphire Dielectric</b> | <b>C</b><br><b>Mount Type</b>         | <b>Capacitance Code</b><br><b>Industry Standard, i.e.</b> | <b>00</b><br><b>Modification Suffix</b>                                                 |
|-----------------------------------------|---------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------|
| GN                                      | C = PC Mount                          | 1R2 = 1.2 pF                                              | 00 = +350 ±100 ppm/°C (no marking)                                                      |
| GU                                      | F = Flange Mount                      | 100 = 10 pF                                               | 01 = as above, with PTFE protective cap                                                 |
| GW                                      | L = Horizontal Surface Mount          |                                                           | 50 = NPO ± 50 ppm/°C (± 75 for 8 pF models) (dimple or red ID mark on adjustment screw) |
|                                         | N = Leadless                          |                                                           | 51 = as above, with PTFE protective cap                                                 |
|                                         | R = Reverse Lead Mount                |                                                           |                                                                                         |
|                                         | V = Vertical Surface Mount            |                                                           |                                                                                         |
|                                         | Y = Vertical Surface Mount, Wide Lead |                                                           |                                                                                         |



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Fig. 1

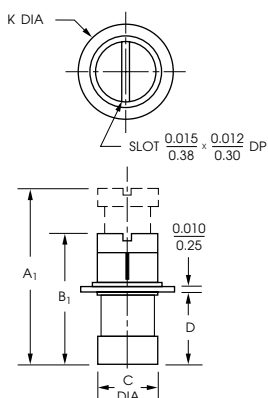
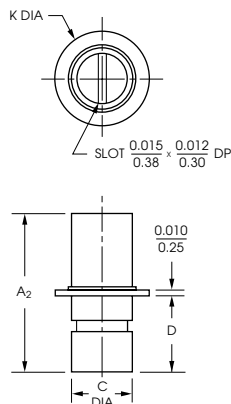
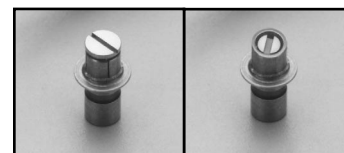


Fig. 2



## Type F - Flange Mount



| Capacitance (pF) |     | Q min<br>(250 MHz) | A <sub>1</sub>     | B <sub>1</sub>     | C<br>$\pm \frac{0.005}{0.1}$ | D                  | K<br>$\pm \frac{0.005}{0.1}$ | A <sub>2</sub>     | Model No.<br>Fig. 1  | Model No.<br>Fig. 2  |
|------------------|-----|--------------------|--------------------|--------------------|------------------------------|--------------------|------------------------------|--------------------|----------------------|----------------------|
| min              | max |                    |                    |                    |                              |                    |                              |                    |                      |                      |
| 0.3              | 1.2 | 4000               | $\frac{0.20}{5.2}$ | $\frac{0.17}{4.4}$ | $\frac{0.075}{1.9}$          | $\frac{0.09}{2.3}$ | $\frac{0.145}{3.68}$         | $\frac{0.23}{5.8}$ | GUF1R200<br>GUF1R250 | GNF1R200<br>GNF1R250 |
| 0.4              | 2.5 | 3000               | $\frac{0.20}{5.2}$ | $\frac{0.17}{4.4}$ | $\frac{0.118}{3.00}$         | $\frac{0.09}{2.3}$ | $\frac{0.185}{4.70}$         | $\frac{0.23}{5.8}$ | GWF2R500<br>GWF2R550 | GNF2R500<br>GNF2R550 |
| 0.6              | 4.5 | 2000               | $\frac{0.33}{8.4}$ | $\frac{0.25}{6.5}$ | $\frac{0.118}{3.00}$         | $\frac{0.15}{3.8}$ | $\frac{0.185}{4.70}$         | $\frac{0.31}{7.9}$ | GWF4R500<br>GWF4R550 | GNF4R500<br>GNF4R550 |
| 0.8              | 8.0 | 1000               | $\frac{0.57}{14}$  | $\frac{0.41}{11}$  | $\frac{0.118}{3.00}$         | $\frac{0.25}{6.4}$ | $\frac{0.185}{4.70}$         | $\frac{0.47}{12}$  | GWF8R000<br>GWF8R050 | GNF8R000<br>GNF8R050 |

Fig. 1

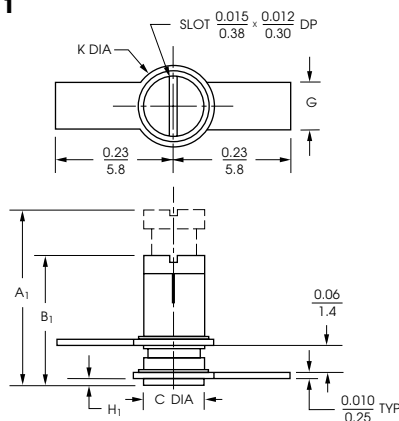
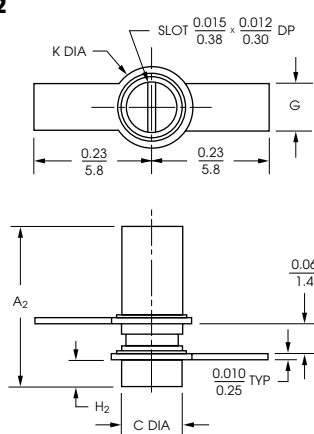
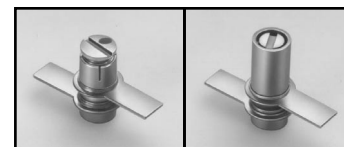


Fig. 2



## Type R - Reverse Lead Mount



| Capacitance (pF) |     | Q min<br>(250 MHz) | A <sub>1</sub>     | B <sub>1</sub>     | C<br>$\pm \frac{0.005}{0.1}$ | G                  | H <sub>1</sub>     | K<br>$\pm \frac{0.005}{0.1}$ | A <sub>2</sub>     | H <sub>2</sub>       | Model No.<br>Fig. 1  | Model No.<br>Fig. 2  |
|------------------|-----|--------------------|--------------------|--------------------|------------------------------|--------------------|--------------------|------------------------------|--------------------|----------------------|----------------------|----------------------|
| min              | max |                    |                    |                    |                              |                    |                    |                              |                    |                      |                      |                      |
| 0.3              | 1.2 | 4000               | $\frac{0.20}{5.2}$ | $\frac{0.17}{4.4}$ | $\frac{0.075}{1.9}$          | $\frac{0.04}{1.0}$ | -                  | $\frac{0.114}{2.90}$         | $\frac{0.23}{5.8}$ | $\frac{0.015}{0.38}$ | GUR1R200<br>GUR1R250 | GNR1R200<br>GNR1R250 |
| 0.4              | 2.5 | 3000               | $\frac{0.20}{5.2}$ | $\frac{0.17}{4.4}$ | $\frac{0.118}{3.00}$         | $\frac{0.09}{2.4}$ | -                  | $\frac{0.16}{4.0}$           | $\frac{0.23}{5.8}$ | $\frac{0.015}{0.38}$ | GWR2R500<br>GWR2R550 | GNR2R500<br>GNR2R550 |
| 0.6              | 4.5 | 2000               | $\frac{0.33}{8.4}$ | $\frac{0.25}{6.5}$ | $\frac{0.118}{3.00}$         | $\frac{0.09}{2.4}$ | -                  | $\frac{0.16}{4.0}$           | $\frac{0.31}{7.9}$ | $\frac{0.050}{1.3}$  | GWR4R500<br>GWR4R550 | GNR4R500<br>GNR4R550 |
| 0.8              | 8.0 | 1000               | $\frac{0.57}{14}$  | $\frac{0.41}{11}$  | $\frac{0.118}{3.00}$         | $\frac{0.09}{2.4}$ | $\frac{0.14}{3.5}$ | $\frac{0.16}{4.0}$           | $\frac{0.47}{12}$  | $\frac{0.14}{3.5}$   | GWR8R000<br>GWR8R050 | GNR8R000<br>GNR8R050 |

Dimensions are in/mm. Unless otherwise specified, tolerance is  $\pm 0.01/0.3$ , except slot tolerance is  $+0.001/0.03$ ,  $-0.002/0.05$  and lead thickness tolerance is  $\pm 0.002/0.05$ .

Fig. 1

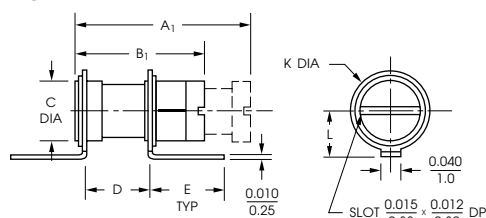
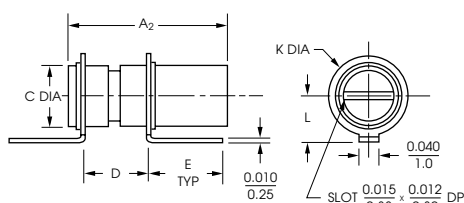
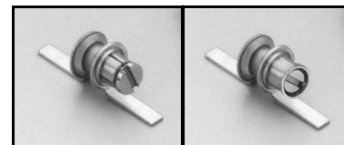


Fig. 2



### Type L - Horizontal Surface Mount



| Capacitance<br>(pF) |     | Q min<br>(250 MHz) | A <sub>1</sub>     | B <sub>1</sub>     | C<br>$\pm \frac{0.005}{0.1}$ | D                  | E                    | K<br>$\pm \frac{0.005}{0.1}$ | L                  | A <sub>2</sub>     | Model No.<br>Fig. 1  | Model No.<br>Fig.2   |
|---------------------|-----|--------------------|--------------------|--------------------|------------------------------|--------------------|----------------------|------------------------------|--------------------|--------------------|----------------------|----------------------|
| min                 | max |                    |                    |                    |                              |                    |                      |                              |                    |                    |                      |                      |
| 0.3                 | 1.2 | 4000               | $\frac{0.20}{5.2}$ | $\frac{0.17}{4.4}$ | $\frac{0.075}{1.9}$          | $\frac{0.08}{2.1}$ | $\frac{0.171}{4.34}$ | $\frac{0.114}{2.90}$         | $\frac{0.07}{1.8}$ | $\frac{0.23}{5.8}$ | GUL1R200<br>GUL1R250 | GNL1R200<br>GNL1R250 |
| 0.4                 | 2.5 | 3000               | $\frac{0.20}{5.2}$ | $\frac{0.17}{4.4}$ | $\frac{0.118}{3.00}$         | $\frac{0.08}{2.1}$ | $\frac{0.147}{3.73}$ | $\frac{0.158}{4.01}$         | $\frac{0.09}{2.4}$ | $\frac{0.23}{5.8}$ | GWL2R500<br>GWL2R550 | GNL2R500<br>GNL2R550 |
| 0.6                 | 4.5 | 2000               | $\frac{0.33}{8.4}$ | $\frac{0.25}{6.5}$ | $\frac{0.118}{3.00}$         | $\frac{0.13}{3.3}$ | $\frac{0.147}{3.73}$ | $\frac{0.158}{4.01}$         | $\frac{0.09}{2.4}$ | $\frac{0.31}{7.9}$ | GWL4R500<br>GWL4R550 | GNL4R500<br>GNL4R550 |
| 0.8                 | 8.0 | 1000               | $\frac{0.57}{14}$  | $\frac{0.41}{11}$  | $\frac{0.118}{3.00}$         | $\frac{0.25}{6.4}$ | $\frac{0.147}{3.73}$ | $\frac{0.158}{4.01}$         | $\frac{0.09}{2.4}$ | $\frac{0.47}{12}$  | GWL8R000<br>GWL8R050 | GNL8R000<br>GNL8R050 |

Fig. 1

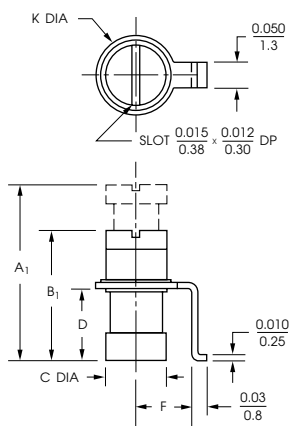
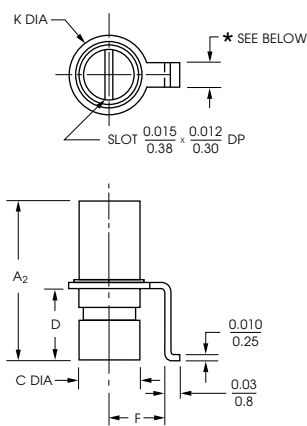


Fig. 2



### Type V - Vertical Surface Mount



| Capacitance (pF) |     | Q min<br>(250 MHz) | A <sub>1</sub>     | B <sub>1</sub>     | C<br>$\pm \frac{0.005}{0.1}$ | D                  | F                  | K<br>$\pm \frac{0.005}{0.1}$ | A <sub>2</sub>     | Model No.<br>Fig. 1  | Model No.<br>Fig.2*  |
|------------------|-----|--------------------|--------------------|--------------------|------------------------------|--------------------|--------------------|------------------------------|--------------------|----------------------|----------------------|
| min              | max |                    |                    |                    |                              |                    |                    |                              |                    |                      |                      |
| 0.3              | 1.2 | 4000               | $\frac{0.20}{5.2}$ | $\frac{0.17}{4.4}$ | $\frac{0.075}{1.9}$          | $\frac{0.09}{2.3}$ | $\frac{0.08}{1.9}$ | $\frac{0.114}{2.90}$         | $\frac{0.23}{5.8}$ | GUV1R200<br>GUV1R250 | GNV1R200<br>GNV1R250 |
| 0.4              | 2.5 | 3000               | $\frac{0.20}{5.2}$ | $\frac{0.17}{4.4}$ | $\frac{0.118}{3.00}$         | $\frac{0.09}{2.3}$ | $\frac{0.11}{2.8}$ | $\frac{0.158}{4.01}$         | $\frac{0.23}{5.8}$ | GWV2R500<br>GWV2R550 | GN_2R500<br>GN_2R550 |
| 0.6              | 4.5 | 2000               | $\frac{0.33}{8.4}$ | $\frac{0.25}{6.5}$ | $\frac{0.118}{3.00}$         | $\frac{0.15}{3.8}$ | $\frac{0.11}{2.8}$ | $\frac{0.158}{4.01}$         | $\frac{0.31}{7.9}$ | GWV4R500<br>GWV4R550 | GN_4R500<br>GN_4R550 |
| 0.8              | 8.0 | 1000               | $\frac{0.57}{14}$  | $\frac{0.41}{11}$  | $\frac{0.118}{3.00}$         | $\frac{0.25}{6.4}$ | $\frac{0.11}{2.8}$ | $\frac{0.158}{4.01}$         | $\frac{0.47}{12}$  | GWV8R000<br>GWV8R050 | GN_8R000<br>GN_8R050 |

\* Insert letter "V" or "Y" to select lead width.

GNV series has a lead width of 0.050/1.3

GNV series has a lead width of 0.093/2.4

Dimensions are in/mm. Unless otherwise specified, tolerance is  $\pm 0.01/0.3$ , except slot tolerance is  $+0.001/0.03$ ,  $-0.002/0.05$  and lead thickness tolerance is  $\pm 0.002/0.05$ .

Fig. 1

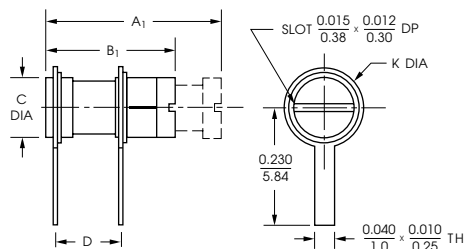
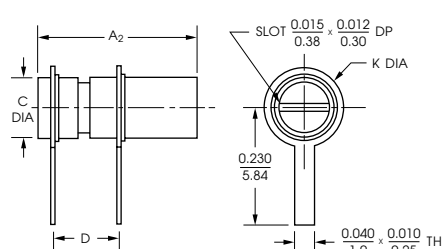


Fig. 2


Type C -  
PC Mount

| Capacitance (pF) |     | Q min<br>(250 MHz) | A <sub>1</sub> | B <sub>1</sub> | C<br>± 0.005<br>0.1 | D           | K<br>± 0.005<br>0.1 | A <sub>2</sub> | Model No.<br>Fig. 1 | Model No.<br>Fig.2 |
|------------------|-----|--------------------|----------------|----------------|---------------------|-------------|---------------------|----------------|---------------------|--------------------|
| min              | max |                    |                |                |                     |             |                     |                |                     |                    |
| 0.3              | 1.2 | 4000               | 0.20<br>5.2    | 0.17<br>4.4    | 0.075<br>1.9        | 0.08<br>2.1 | 0.114<br>2.90       | 0.23<br>5.8    | GUC1R200            | GNC1R200           |
|                  |     |                    |                |                |                     |             |                     |                | GUC1R250            | GNC1R250           |
| 0.4              | 2.5 | 3000               | 0.20<br>5.2    | 0.17<br>4.4    | 0.12<br>3.0         | 0.08<br>2.1 | 0.158<br>4.01       | 0.23<br>5.8    | GWC2R500            | GNC2R500           |
|                  |     |                    |                |                |                     |             |                     |                | GWC2R550            | GNC2R550           |
| 0.6              | 4.5 | 2000               | 0.33<br>8.4    | 0.25<br>6.5    | 0.12<br>3.0         | 0.13<br>3.3 | 0.158<br>4.01       | 0.31<br>7.9    | GWC4R500            | GNC4R500           |
|                  |     |                    |                |                |                     |             |                     |                | GWC4R550            | GNC4R550           |
| 0.8              | 8.0 | 1000               | 0.57<br>14     | 0.41<br>11     | 0.12<br>3.0         | 0.25<br>6.4 | 0.158<br>4.01       | 0.47<br>12     | GWC8R000            | GNC8R000           |
|                  |     |                    |                |                |                     |             |                     |                | GWC8R050            | GNC8R050           |

Fig. 1

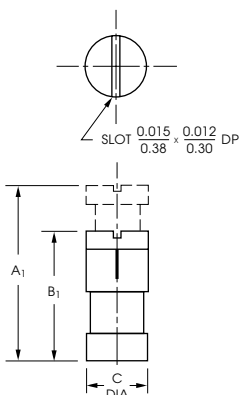
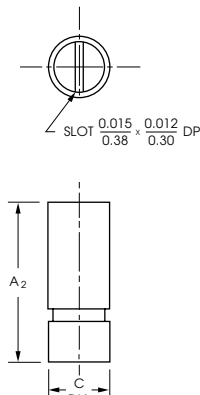


Fig. 2


Type N -  
Leadless

| Capacitance (pF) |     | Q min<br>(250 MHz) | A <sub>1</sub> | B <sub>1</sub> | C<br>± 0.005<br>0.1 | A <sub>2</sub> | Model No.<br>Fig. 1 | Model No.<br>Fig.2 |
|------------------|-----|--------------------|----------------|----------------|---------------------|----------------|---------------------|--------------------|
| min              | max |                    |                |                |                     |                |                     |                    |
| 0.3              | 1.2 | 4000               | 0.20<br>5.2    | 0.17<br>4.4    | 0.075<br>1.9        | 0.23<br>5.8    | GUN1R200            | GNN1R200           |
|                  |     |                    |                |                |                     |                | GUN1R250            | GNN1R250           |
| 0.4              | 2.5 | 3000               | 0.20<br>5.2    | 0.17<br>4.4    | 0.12<br>3.0         | 0.23<br>5.8    | GWN2R500            | GNN2R500           |
|                  |     |                    |                |                |                     |                | GWN2R550            | GNN2R550           |
| 0.6              | 4.5 | 2000               | 0.33<br>8.4    | 0.25<br>6.5    | 0.12<br>3.0         | 0.31<br>7.9    | GWN4R500            | GNN4R500           |
|                  |     |                    |                |                |                     |                | GWN4R550            | GNN4R550           |
| 0.8              | 8.0 | 1000               | 0.57<br>14     | 0.41<br>11     | 0.12<br>3.0         | 0.47<br>12     | GWN8R000            | GNN8R000           |
|                  |     |                    |                |                |                     |                | GWN8R050            | GNN8R050           |

Dimensions are in/mm. Unless otherwise specified, tolerance is ±0.01/0.3, except slot tolerance is +0.001/0.03, -0.002/0.05 and lead thickness tolerance is ±0.002/0.05.