

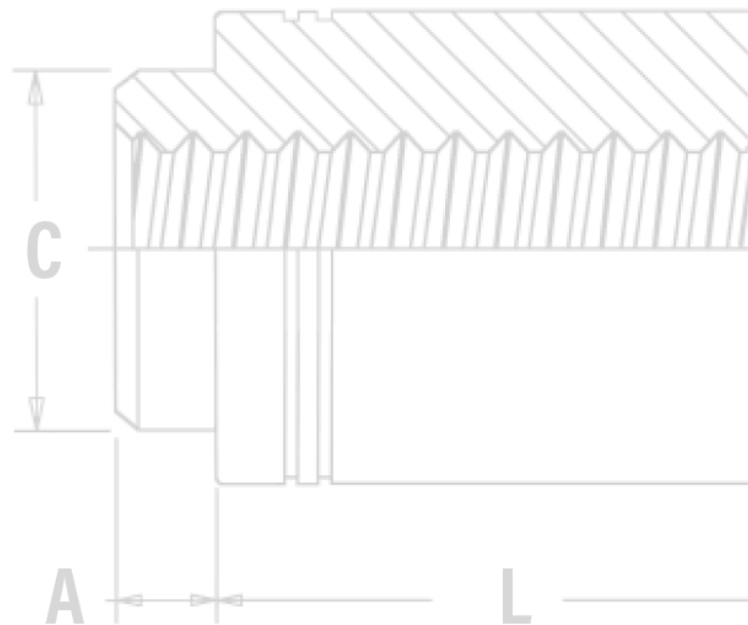
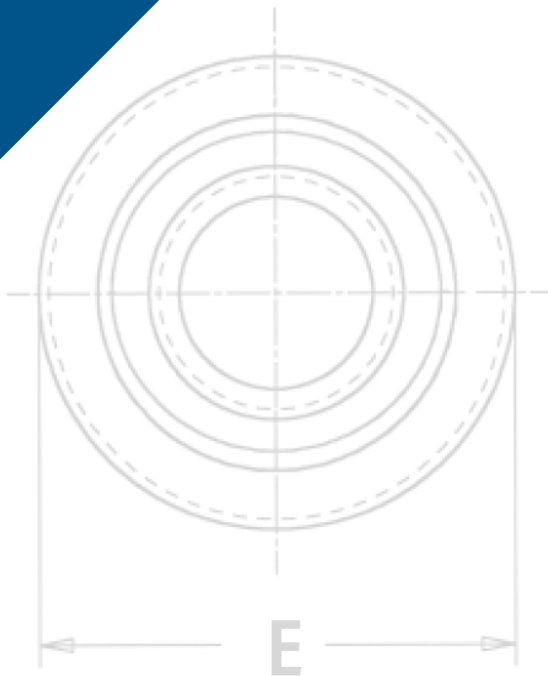


PEM® brand fasteners that utilize,  
surface-mount, broaching and flaring  
technology for use with PC boards



**K**<sup>TM</sup>

## FASTENERS FOR USE WITH PC BOARDS








# FASTENERS FOR USE WITH PC BOARDS

No matter how sophisticated or advanced, electronic components must be attached reliably and securely if they are to deliver optimum performance. We offer several fastener products for use with PC boards to satisfy component-to-board, board-to-board, and board-to-chassis attachment needs.

**ReelFast® surface mount fasteners** mount on PC boards in the same manner and at the same time as other surface mount components prior to the automated reflow solder process. The fasteners simply become another board component. This alleviates concerns about potential damage to PC boards due to improper secondary installation operations. The fasteners are provided on tape and reel compatible with existing SMT automated installation equipment. The benefits of using ReelFast® SMT fasteners are: faster assembly; reduced scrap; reduced handling; and reduced risk of board damage.

**Broaching fasteners** can also offer practical alternatives to “loose” hardware. A broaching fastener is a knurled-shank fastening device that can be pressed into a hole to provide a permanent, strong, threaded or unthreaded attachment point in PC boards. They can also be used in aluminum, acrylic, casting and polycarbonate components. Specially formed axial grooves around the shank of the fastener “broach” or cut into the material, creating a firm, interference-type fit resistant to rotation. In PC boards, broaching fasteners are recommended for use in non-plated holes.

**Broach/flare-mount standoffs** (KFB3™) offer a combined broach/flare feature for even greater pullout performance in PC board materials.

|  |  |
|--|--|
| <p><b>NUTS AND SPACERS/STANDOFFS</b></p> <p><b>SMTSO™/SMTSOB™</b> - ReelFast® surface mount nuts and standoffs are available threaded and unthreaded - <b>PAGE 4</b></p>  | <p><b>PFK™</b> - Broaching panel fastener assemblies for mounting on PC boards - <b>PAGE 12</b></p>   |
| <p><b>SMTSS™</b> - ReelFast® SNAP-TOP® standoffs feature a spring action to hold PC board securely without screws or threaded hardware - <b>PAGE 5</b></p>               | <p><b>STUDS</b></p> <p><b>KFH™</b> - Threaded broaching studs for use as solderable connectors or as permanently mounted studs on PC boards - <b>PAGE 12</b></p>                       |
| <p><b>SMTSK™</b> - <b>NEW</b> ReelFast® KEYHOLE® standoffs eliminate the need for attaching screws - <b>PAGE 6</b></p>    | <p><b>RIGHT ANGLE FASTENERS</b></p> <p><b>SMTRA™</b> - ReelFast® R'ANGLE® surface mount fasteners provide strong re-usable threads at right angles to PC boards - <b>PAGE 13</b></p>  |
| <p><b>KF2™/KFS2™</b> - Broaching nuts, internally threaded for mounting on PC boards - <b>PAGE 7</b></p>    | <p><b>SHEET JOINING FASTENERS</b></p> <p><b>SFK™</b> - SpotFast® clinch/broach mount fasteners for joining metal to PCB/plastic panels - <b>PAGE 14</b></p>                           |
| <p><b>KFE™/KFSE™</b> - Broaching standoffs, threaded or unthreaded for stacking or spacing - <b>PAGE 8</b></p>    | <p><b>MATERIAL AND FINISH SPECIFICATIONS - PAGE 15</b></p>   |
| <p><b>KFB3™</b> - Broach/flare-mount standoffs with greater pullout performance - <b>PAGE 8</b></p>   | <p><b>INSTALLATION - PAGES 16-18</b></p>   |
| <p><b>KSSB™</b> - Broaching, SNAP-TOP® standoffs feature a spring action to hold PC board securely without screws or threaded hardware - <b>PAGE 9</b></p>              | <p><b>PERFORMANCE DATA - PAGES 19-20</b></p>   |
| <p><b>CAPTIVE PANEL SCREWS</b></p> <p><b>SMTPF™</b> - ReelFast® surface mount spring-loaded captive panel screws - <b>PAGE 10</b></p>                                   | <p><b>OTHER FASTENERS FOR USE WITH PC BOARDS - PAGE 21</b></p>   |
| <p><b>SMTPF™</b> - ReelFast® surface mount captive panel screws - <b>PAGE 11</b></p>    |  |

## QUICK REFERENCE CHART

| PEM® Fastener | Page No. | Mounting Types |               |               |                | Primary Use |                  |                 |      |               |              |                        |                        |
|---------------|----------|----------------|---------------|---------------|----------------|-------------|------------------|-----------------|------|---------------|--------------|------------------------|------------------------|
|               |          | Broach         | Broach/ Flare | Surface Mount | Clinch/ Broach | Nut         | Spacer/ Standoff | Snap Attachment | Stud | Captive Screw | Color Coding | Right Angle Attachment | Sheet to Sheet Joining |
| SMTSO/SMTSOB  | 4        |                |               | ▪             |                | ▪           | ▪                |                 |      |               |              |                        |                        |
| SMTSS         | 5        |                |               | ▪             |                |             | ▪                | ▪               |      |               |              |                        |                        |
| SMTSK         | 6        |                |               | ▪             |                |             | ▪                |                 |      |               |              |                        |                        |
| KF2/KFS2      | 7        | ▪              |               |               |                | ▪           |                  |                 |      |               |              |                        |                        |
| KFE/KFSE      | 8        | ▪              |               |               |                |             | ▪                |                 |      |               |              |                        |                        |
| KFB3          | 8        |                | ▪             |               |                |             | ▪                |                 |      |               |              |                        |                        |
| KSSB          | 9        | ▪              |               |               |                |             | ▪                | ▪               |      |               |              |                        |                        |
| SMTPLSM       | 10       |                |               | ▪             |                |             |                  |                 |      | ▪             |              |                        |                        |
| SMPF          | 11       |                |               | ▪             |                |             |                  |                 |      | ▪             | ▪            |                        |                        |
| PFK           | 12       | ▪              |               |               |                |             |                  |                 |      | ▪             |              |                        |                        |
| KFH           | 12       | ▪              |               |               |                |             |                  |                 | ▪    |               |              |                        |                        |
| SMTRA         | 13       |                |               | ▪             |                |             |                  |                 |      |               |              | ▪                      |                        |
| SFK           | 14       |                |               |               | ▪              |             |                  |                 |      |               |              |                        | ▪                      |

**PEM® Dimple (Registered Trademark)**



**PEM® TRADEMARKS**

**PEM® Double Notch (Registered Trademark)**



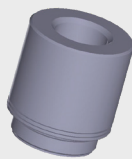
**PEM® "Two Groove" (Registered Trademark)**



**PEM® Blue Nylon Ring (Trademark)**



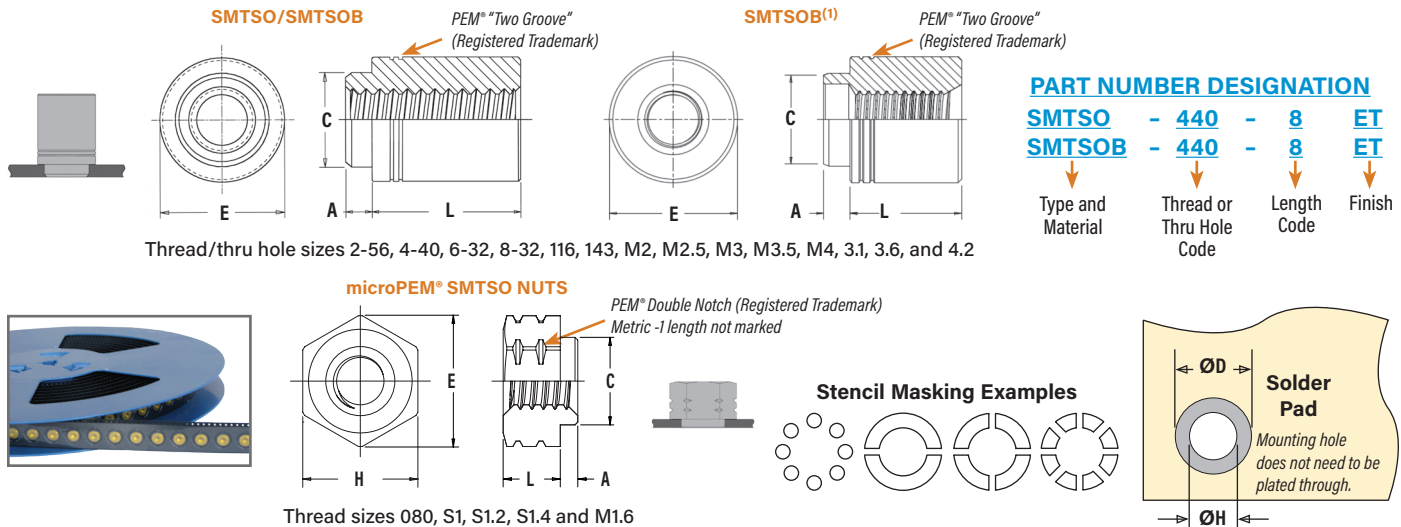
To be sure that you are getting genuine PEM® brand fasteners, look for the unique PEM® product markings and identifiers.



Fastener drawings and models are available at [www.pemnet.com](http://www.pemnet.com)

# FASTENERS FOR USE WITH PC BOARDS

## SMTSO™/SMTSOB™ ReelFast® SURFACE MOUNT NUTS AND SPACERS/STANDOFFS



Thread/thru hole sizes 2-56, 4-40, 6-32, 8-32, 116, 143, M2, M2.5, M3, M3.5, M4, 3.1, 3.6, and 4.2

Thread sizes 080, S1, S1.2, S1.4 and M1.6

All dimensions are in inches.

| UNIFIED | Thread Size     | Thru Hole<br>+.004 -.003 | Type              |        | Thread or Thru Hole Code | Length Code "L" ±.005<br>(Length code in 32nds of an inch) |      |       |        | Min. Sheet Thickness | A Max. | C Max. | E    |       | H Nom. | ØH Hole Size<br>In Sheet<br>+.003 -.000 | ØD Min. Solder Pad |
|---------|-----------------|--------------------------|-------------------|--------|--------------------------|--|------|-------|--------|----------------------|--------|--------|------|-------|--------|---|--------------------|
|         |                 |                          | Fastener Material |        |                          | .062   | .125 | .250  | .375   |                      |        |        | Ref. | ±.005 |        |   |                    |
|         |                 |                          | Steel             | Brass  |                          |  |      |       |        |                      |        |        |      |       |        |   |                    |
|         | .060-80 (#0-80) | —                        | SMTSO             | —      | 080                      | 2  | 4    | —     | —      | .020                 | .019   | .095   | .144 |       | .125   | .098                                    | .165               |
|         | .086-56 (#2-56) | —                        | SMTSO             | SMTSOB | 256                      | 2  | 4    | 8 (1) | 12 (1) | .060                 | .060   | .142   | —    | .219  | —      | .147                                    | .244               |
|         | .112-40 (#4-40) | —                        | SMTSO             | SMTSOB | 440                      | 2  | 4    | 8 (1) | 12 (1) | .060                 | .060   | .161   | —    | .219  | —      | .166                                    | .244               |
|         | .138-32 (#6-32) | —                        | SMTSO             | SMTSOB | 632                      | 2  | 4    | 8 (1) | 12 (1) | .060                 | .060   | .208   | —    | .281  | —      | .213                                    | .306               |
|         | .164-32 (#8-32) | —                        | SMTSO             | SMTSOB | 832                      | 2  | 4    | 8 (1) | 12 (1) | .060                 | .060   | .245   | —    | .344  | —      | .250                                    | .369               |
|         | —               | .116                     | SMTSO             | SMTSOB | 116                      | 2  | 4    | 8     | 12     | .060                 | .060   | .161   | —    | .219  | —      | .166                                    | .244               |
|         | —               | .143                     | SMTSO             | SMTSOB | 143                      | 2  | 4    | 8     | 12     | .060                 | .060   | .208   | —    | .281  | —      | .213                                    | .306               |

All dimensions are in millimeters.

| METRIC | Thread Size x Pitch | Thru Hole<br>+0.10<br>-0.08 | Type              |        | Thread or Thru Hole Code | Length Code "L" ±0.13<br>(Length code in millimeters) |   |   |       |       | Min. Sheet Thickness | A Max. | C Max. | E    |      | H Nom. | ØH Hole Size<br>In Sheet<br>+0.08 | ØD Min. Solder Pad |      |       |
|--------|---------------------|-----------------------------|-------------------|--------|--------------------------|---|---|---|-------|-------|----------------------|--------|--------|------|------|--------|-----------------------------------|--------------------|------|-------|
|        |                     |                             | Fastener Material |        |                          | 1   | 2 | 3 | 4     | 6     |                      |        |        | 8    | 10   |        |                                   |                    | Ref. | ±0.13 |
|        |                     |                             | Steel             | Brass  |                          |   |   |   |       |       |                      |        |        |      |      |        |                                   |                    |      |       |
|        | S1                  | —                           | SMTSO             | —      | M1                       | 1   | 2 | 3 | —     | —     | —                    | 0.5    | 0.48   | 2.41 | 3.66 | —      | 3.18                              | 2.5                | 4.19 |       |
|        | S1.2                | —                           | SMTSO             | —      | M1.2                     | 1   | 2 | 3 | —     | —     | —                    | 0.5    | 0.48   | 2.41 | 3.66 | —      | 3.18                              | 2.5                | 4.19 |       |
|        | S1.4                | —                           | SMTSO             | —      | M1.4                     | 1   | 2 | 3 | —     | —     | —                    | 0.5    | 0.48   | 2.41 | 3.66 | —      | 3.18                              | 2.5                | 4.19 |       |
|        | M1.6 x 0.35         | —                           | SMTSO             | —      | M1.6                     | 1   | 2 | 3 | —     | —     | —                    | 0.5    | 0.48   | 2.41 | 3.66 | —      | 3.18                              | 2.5                | 4.19 |       |
|        | M2 x 0.4            | —                           | SMTSO             | SMTSOB | M2                       | —   | 2 | 3 | 4 (1) | 6 (1) | 8 (1)                | 10 (1) | 1.53   | 1.53 | 3.6  | —      | 5.56                              | —                  | 3.73 | 6.2   |
|        | M2.5 x 0.45         | —                           | SMTSO             | SMTSOB | M2.5                     | —   | 2 | 3 | 4 (1) | 6 (1) | 8 (1)                | 10 (1) | 1.53   | 1.53 | 4.09 | —      | 5.56                              | —                  | 4.22 | 6.2   |
|        | M3 x 0.5            | —                           | SMTSO             | SMTSOB | M3                       | —   | 2 | 3 | 4 (1) | 6 (1) | 8 (1)                | 10 (1) | 1.53   | 1.53 | 4.09 | —      | 5.56                              | —                  | 4.22 | 6.2   |
|        | M3.5 x 0.6          | —                           | SMTSO             | SMTSOB | M3.5                     | —   | 2 | 3 | 4 (1) | 6 (1) | 8 (1)                | 10 (1) | 1.53   | 1.53 | 5.28 | —      | 7.14                              | —                  | 5.41 | 7.77  |
|        | M4 x 0.7            | —                           | SMTSO             | SMTSOB | M4                       | —   | 2 | 3 | 4     | 6 (1) | 8 (1)                | 10 (1) | 1.53   | 1.53 | 6.22 | —      | 8.74                              | —                  | 6.35 | 9.37  |
|        | —                   | 3.1                         | SMTSO             | SMTSOB | 3.1                      | —   | 2 | 3 | 4     | 6     | 8                    | 10     | 1.53   | 1.53 | 4.09 | —      | 5.56                              | —                  | 4.22 | 6.2   |
|        | —                   | 3.6                         | SMTSO             | SMTSOB | 3.6                      | —   | 2 | 3 | 4     | 6     | 8                    | 10     | 1.53   | 1.53 | 5.28 | —      | 7.14                              | —                  | 5.41 | 7.77  |
|        | —                   | 4.2                         | SMTSO             | SMTSOB | 4.2                      | —   | 2 | 3 | 4     | 6     | 8                    | 10     | 1.53   | 1.53 | 6.22 | —      | 8.74                              | —                  | 6.35 | 9.37  |

(1) SMTSOB fasteners with this length code have a shank counterbore.

### NUMBER OF PARTS PER REEL / PITCH (MM) FOR EACH SIZE

| Thread/Thru-Hole Size        | Length Code |           |           |           |          |          |          |          |
|------------------------------|-------------|-----------|-----------|-----------|----------|----------|----------|----------|
|                              | 1           | 2         | 3         | 4         | 6        | 8        | 10       | 12       |
| 080                          | —           | 3500 / 8  | —         | 2000 / 8  | —        | —        | —        | —        |
| 256, 440, 632, 116, 143      | —           | 1500 / 12 | —         | 1000 / 12 | —        | 650 / 12 | —        | 300 / 16 |
| 832                          | —           | 1100 / 16 | —         | 800 / 16  | —        | 500 / 16 | —        | 300 / 16 |
| M1, M1.2, M1.4, M1.6         | 3500 / 8    | 2500 / 8  | 2000 / 8  | —         | —        | —        | —        | —        |
| M2, M2.5, M3, M3.5, 3.1, 3.6 | —           | 1500 / 12 | 1000 / 12 | 900 / 12  | 650 / 12 | 375 / 16 | 300 / 16 | —        |
| M4, 4.2                      | —           | 1100 / 16 | 800 / 16  | 675 / 16  | 500 / 16 | 375 / 16 | 300 / 16 | —        |

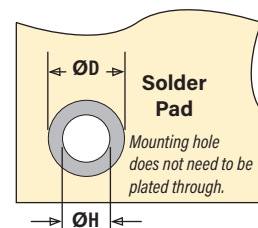
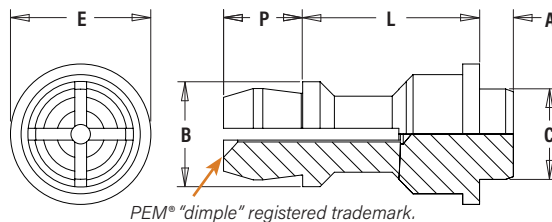
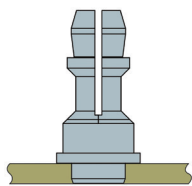
A polyimide patch is supplied to allow for reliable vacuum pickup. Fasteners are also available without a patch which may provide a lower cost alternative, depending on your installation methods/requirements.

Packaged on 330 mm recyclable reels. Tape width is 24 mm. Reels conform to EIA-481.

# FASTENERS FOR USE WITH PC BOARDS

## SMTSS™ REELFAST® SNAP-TOP® STANDOFFS

**NOTE:** REELFAST® SNAP-TOP® SMTSS™ standoff is for on-only applications. For removal applications, mounting hole A can be increased to reduce removal force.



### PART NUMBER DESIGNATION

**SMTSS** - **S** - **156** - **12** - **ET**  
 Type Material Top Board Mounting Hole A Diameter Code Length Code Finish Code

### Stencil Masking Examples



All dimensions are in inches.

| UNIFIED | Top Board Mounting Hole A Diameter Code | Type and Material | Length Code "L" ±.005 (Length Code in 32nds of an inch) |      | Min. Sheet Thickness | A Max. | C Max. | E ±.005 | B ±.005 | P ±.005 | ØH Hole Size in Sheet +.003 -.000 | ØD Min. Solder Pad |
|---------|---|-------------------|---|------|----------------------|--------|--------|---------|---------|---------|-----------------------------------|--------------------|
|         |   |                   | .250  | .375 |                      |        |        |         |         |         |                                   |                    |
|         | 156                                     | SMTSSS            | 8   | 12   | .060                 | .060   | .161   | .250    | .188    | .141    | .166                              | .276               |

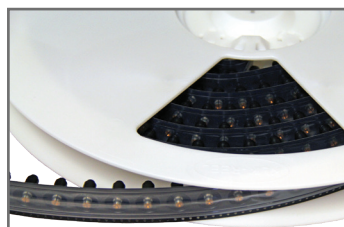
All dimensions are in millimeters.

| METRIC | Top Board Mounting Hole A Diameter Code | Type and Material | Length Code "L" ±0.13 (Length Code in millimeters) |   |    | Min. Sheet Thickness | A Max. | C Max. | E ±0.13 | B ±0.13 | P ±0.13 | ØH Hole Size in Sheet +0.08 | ØD Min. Solder Pad |
|--------|---|-------------------|--|---|----|----------------------|--------|--------|---------|---------|---------|-----------------------------|--------------------|
|        |   |                   | 6  | 8 | 10 |                      |        |        |         |         |         |                             |                    |
|        | 4MM                                     | SMTSSS            | 6  | 8 | 10 | 1.53                 | 1.53   | 4.09   | 6.35    | 4.8     | 3.58    | 4.22                        | 7                  |

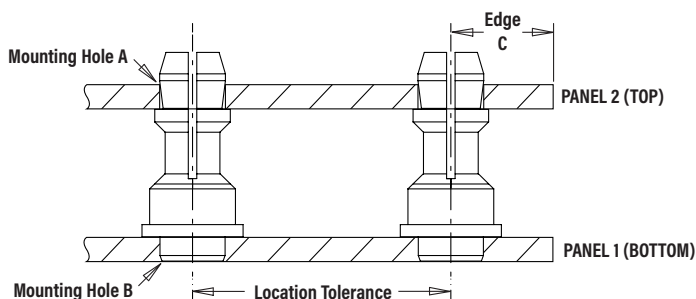
### NUMBER OF PARTS PER REEL

| Type, Material and Size | Length Code / Number of Parts per Reel |           |           |
|-------------------------|--|-----------|-----------|
| SMTSSS-156              | -8 / 280                               | -12 / 220 |           |
| SMTSSS-4MM              | -6 / 300                               | -8 / 250  | -10 / 200 |

Packaged on 330 mm recyclable reels. Tape width is 24 mm. Supplied with polyimide patch for vacuum pick up. Reels conform to EIA-481.



### SMTSS™ APPLICATION DATA



All dimensions are in inches.

| UNIFIED | Type  | Panel 1       |                                    |                |                | Panel 2            |               |                                 |                   |                 |                      |
|---------|-------|---------------|------------------------------------|----------------|----------------|--------------------|---------------|---------------------------------|-------------------|-----------------|----------------------|
|         |       | Hardness Max. | Bottom Mounting Hole B +.003 -.000 | Panel Material | Thickness Min. | Location Tolerance | Hardness Max. | Top Mounting Hole A +.003 -.000 | Panel Material    | Thickness Range | Edge Distance C Min. |
|         | SMTSS | No Limit      | .166                               | PC board       | .060           | ±.005              | No Limit      | .156                            | PC board or Metal | .040 - .070     | .100                 |

All dimensions are in millimeters.

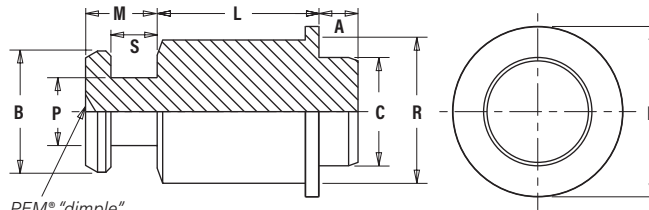
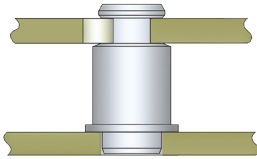
| METRIC | Type  | Panel 1       |                              |                |                | Panel 2            |               |                           |                   |                 |                      |
|--------|-------|---------------|------------------------------|----------------|----------------|--------------------|---------------|---------------------------|-------------------|-----------------|----------------------|
|        |       | Hardness Max. | Bottom Mounting Hole B +0.08 | Panel Material | Thickness Min. | Location Tolerance | Hardness Max. | Top Mounting Hole A +0.08 | Panel Material    | Thickness Range | Edge Distance C Min. |
|        | SMTSS | No Limit      | 4.22                         | PC board       | 1.53           | ±0.13              | No Limit      | 4                         | PC board or Metal | 1 - 1.8         | 2.54                 |



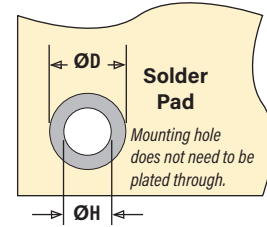
**NEW**

## SMTSK™ REELFAST® KEYHOLE® STANDOFFS

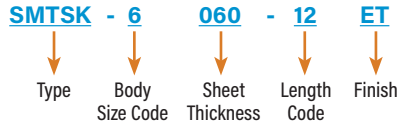
- Unique barrel design allows for quick attachment and detachment.
- Makes horizontal or vertical component mounting possible.



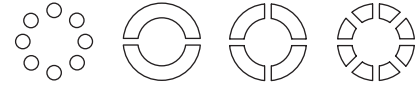
PEM® "dimple" registered trademark.



### PART NUMBER DESIGNATION



### Stencil Masking Examples



All dimensions are in inches.

| UNIFIED | Type | Body Size - Sheet Code | Length "L" ± .005<br>(Length Code in 32nds of an inch) |      |      | Min. Sheet Thickness | A Max. | C Max. | E ±.005 | B ±.003 | P ±.003 | R Max. | S ±.003 | M Max. | ØH Hole Size in Sheet +.003 -.000 | ØD Min. Solder Pad |
|---------|------|------------------------|--|------|------|----------------------|--------|--------|---------|---------|---------|--------|---------|--------|-----------------------------------|--------------------|
|         |      |                        | .125   | .250 | .375 |                      |        |        |         |         |         |        |         |        |                                   |                    |
|         |      |                        |  |      |      |                      |        |        |         |         |         |        |         |        |                                   |                    |
| SMTSK   | 6060 | 4                      | 8  | 12   | .060 | .060                 | .161   | .250   | .177    | .099    | .212    | .068   | .108    | .166   | .276                              |                    |

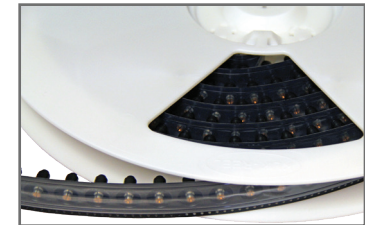
All dimensions are in millimeters.

| METRIC | Type | Body Size - Sheet Code | Length "L" ± 0.13<br>(Length Code in millimeters) |   |   |    |      | Min. Sheet Thickness | A Max. | C Max. | E ±0.13 | B ±0.08 | P ±0.08 | R Max. | S ±0.08 | M Max. | ØH Hole Size in Sheet +0.08 | ØD Min. Solder Pad |
|--------|------|------------------------|---|---|---|----|------|----------------------|--------|--------|---------|---------|---------|--------|---------|--------|-----------------------------|--------------------|
|        |      |                        | 3   | 4 | 6 | 8  | 10   |                      |        |        |         |         |         |        |         |        |                             |                    |
|        |      |                        |   |   |   |    |      |                      |        |        |         |         |         |        |         |        |                             |                    |
| SMTSK  | 61.5 | 3                      | 4   | 6 | 8 | 10 | 1.53 | 1.53                 | 4.09   | 6.35   | 4.5     | 2.51    | 5.39    | 1.73   | 2.75    | 4.22   | 7                           |                    |

### NUMBER OF PARTS PER REEL

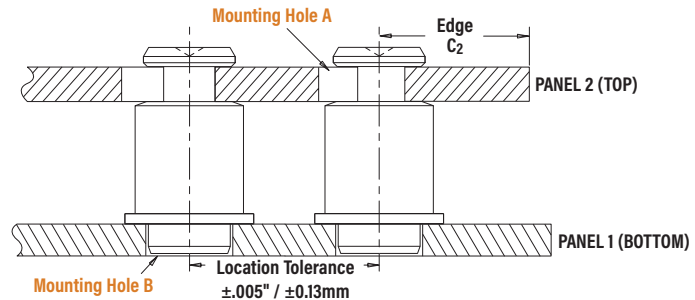
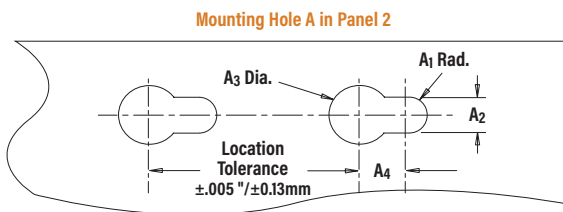
| Part Number | Length Code "L" |      |      |
|-------------|-----------------|------|------|
|             | .125            | .250 | .375 |
| SMTSK-6060  | 4               | 8    | 12   |
|             | 630             | 440  | 230  |

| Part Number | Length Code "L" |     |     |     |     |
|-------------|-----------------|-----|-----|-----|-----|
|             | 3               | 4   | 6   | 8   | 10  |
| SMTSK-61.5  | 640             | 540 | 440 | 260 | 220 |



Packaged on 13" recyclable reels. Tape width is 24mm and 16mm. Pitch is 16mm and 12mm. Reels conform to EIA-481.

### APPLICATION DATA



All dimensions are in inches.

| UNIFIED | Type     | Panel 1       |                                    |                |                | Panel 2            |                     |          |          |         |                |                 |                       |
|---------|----------|---------------|------------------------------------|----------------|----------------|--------------------|---------------------|----------|----------|---------|----------------|-----------------|-----------------------|
|         |          | Hardness Max. | Bottom Mounting Hole B +.003 -.000 | Panel Material | Thickness Min. | Location Tolerance | Top Mounting Hole A |          |          |         | Panel Material | Thickness Range | Edge Distance C2 Min. |
|         |          |               |                                    |                |                |                    | A1 Nom.             | A2 ±.003 | A3 ±.003 | A4 Min. |                |                 |                       |
| SMTSK   | No Limit | .166          | PC board                           | .060           | ±.005          | .059               | .118                | .197     | .148     | ANY     | .057 -.064     | .160            |                       |

All dimensions are in millimeters.

| METRIC | Type     | Panel 1       |                              |                |                | Panel 2            |                     |          |          |         |                |                 |                       |
|--------|----------|---------------|------------------------------|----------------|----------------|--------------------|---------------------|----------|----------|---------|----------------|-----------------|-----------------------|
|        |          | Hardness Max. | Bottom Mounting Hole B +0.08 | Panel Material | Thickness Min. | Location Tolerance | Top Mounting Hole A |          |          |         | Panel Material | Thickness Range | Edge Distance C2 Min. |
|        |          |               |                              |                |                |                    | A1 Nom.             | A2 ±0.08 | A3 ±0.08 | A4 Min. |                |                 |                       |
| SMTSK  | No Limit | 4.22          | PC board                     | 1.53           | ±0.13          | 1.5                | 3                   | 5        | 3.75     | ANY     | 1.45 - 1.62    | 4.1             |                       |



# FASTENERS FOR USE WITH PC BOARDS

## NOTE ABOUT PLATED AND UNPLATED MOUNTING HOLES FOR BROACHING FASTENERS

Broaching and broach/flare types are designed for unplated mounting hole applications. If used in plated mounting holes, the stresses involved can damage the plating, push out the plating entirely, or break any traces inside the board that might be connected to the plated hole. When installing into non-plated mounting holes there may even be issues with delamination, measeling or crazing in some instances.

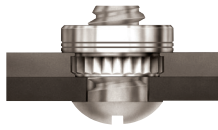
Increasing the mounting hole size  $+0.005''$  to  $+0.008''$  /  $+0.13$  mm to  $+0.2$  mm may relieve these conditions. If increasing the mounting hole does not correct the issue then we recommend our surface-mount type fasteners.

It is always recommended that you try the fasteners in your specific application before full production begins. We are happy to provide samples for this purpose.

General recommendations for "Keep Out" areas are the same as our "Min. Distance Hole C/L to Edge" dimensions stated in the dimensional charts of our bulletin.

## KF2™/KFS2™ BROACHING NUTS

- Can be used in aluminum, acrylic, casting and polycarbonate components

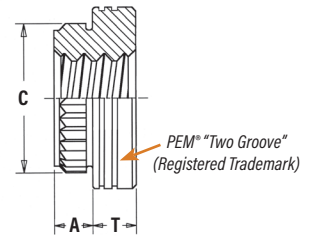
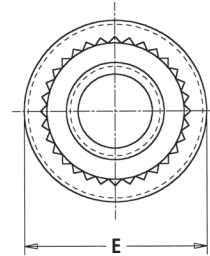


### PART NUMBER DESIGNATION

**KFS2** - **832**

**KF2** - **832** - **ET**

↓                      ↓                      ↓  
 Type and            Thread            Finish  
 Material            Code



All dimensions are in inches.

| UNIFIED | Thread Size<br>(#2-56) | Type         |                 | Thread Code | A<br>(Shank)<br>Max. | Min.<br>Sheet<br>Thickness | Hole Size<br>In Sheet<br>+.003 -.000 | C<br>±.003 | E<br>±.005 | T<br>±.005 | Min. Dist.<br>Hole $\odot$<br>To Edge |
|---------|------------------------|--------------|-----------------|-------------|----------------------|----------------------------|--------------------------------------|------------|------------|------------|---------------------------------------|
|         |                        | Carbon Steel | Stainless Steel |             |                      |                            |                                      |            |            |            |                                       |
|         | .086-56<br>(#2-56)     | KF2          | KFS2            | 256         | .060                 | .060                       | .147                                 | .165       | .219       | .065       | 0.16                                  |
|         | .112-40<br>(#4-40)     | KF2          | KFS2            | 440         | .060                 | .060                       | .166                                 | .184       | .219       | .065       | 0.17                                  |
|         | .138-32<br>(#6-32)     | KF2          | KFS2            | 632         | .060                 | .060                       | .213                                 | .231       | .281       | .065       | 0.22                                  |
|         | .164-32<br>(#8-32)     | KF2          | KFS2            | 832         | .060                 | .060                       | .250                                 | .268       | .344       | .096       | 0.25                                  |
|         | .190-32<br>(#10-32)    | KF2          | KFS2            | 032         | .060                 | .060                       | .272                                 | .290       | .375       | .127       | 0.28                                  |

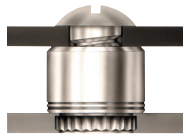
All dimensions are in millimeters.

| METRIC | Thread Size x Pitch | Type         |                 | Thread Code | A<br>(Shank)<br>Max. | Min.<br>Sheet<br>Thickness | Hole Size<br>In Sheet<br>+0.08 | C<br>±0.08 | E<br>±0.13 | T<br>±0.13 | Min. Dist.<br>Hole $\odot$<br>To Edge |
|--------|---------------------|--------------|-----------------|-------------|----------------------|----------------------------|--------------------------------|------------|------------|------------|---------------------------------------|
|        |                     | Carbon Steel | Stainless Steel |             |                      |                            |                                |            |            |            |                                       |
|        | M2 x 0.4            | KF2          | KFS2            | M2          | 1.53                 | 1.53                       | 3.73                           | 4.19       | 5.56       | 1.5        | 4.2                                   |
|        | M2.5 x 0.45         | KF2          | KFS2            | M2.5        | 1.53                 | 1.53                       | 4.22                           | 4.68       | 5.56       | 1.5        | 4.4                                   |
|        | M3 x 0.5            | KF2          | KFS2            | M3          | 1.53                 | 1.53                       | 4.22                           | 4.68       | 5.56       | 1.5        | 4.4                                   |
|        | M4 x 0.7            | KF2          | KFS2            | M4          | 1.53                 | 1.53                       | 6.4                            | 6.81       | 8.74       | 2          | 6.4                                   |
|        | M5 x 0.8            | KF2          | KFS2            | M5          | 1.53                 | 1.53                       | 6.9                            | 7.37       | 9.53       | 3          | 7.1                                   |



# FASTENERS FOR USE WITH PC BOARDS

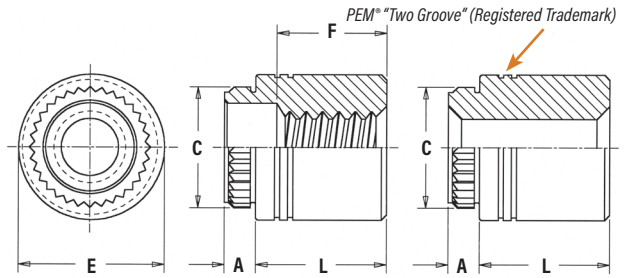
## KFE™/KFSE™ BROACHING STANDOFFS



### PART NUMBER DESIGNATION

**KFSE** - **632** - **12**  
**KFE** - **632** - **12**      **ET**

↓                      ↓                      ↓                      ↓  
 Type and          Thread          Length          Finish  
 Material          or Thru Hole      Code



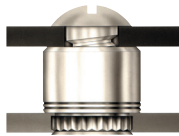
All dimensions are in inches.

| UNIFIED                                      | Thread Size     | Thru Hole<br>+.004<br>-.003 | Type         |                 | Thread or Thru Hole Code | Length "L" ±.005<br>(Length Code is in 32nds of an inch) |      |      |            |      |      |            |      | A (Shank) Max. | Min. Sheet Thickness | Hole Size in Sheet<br>+.003 -.000 | C ±.003 | E ±.005 | Min. Dist. Hole To Edge |
|--|-----------------|-----------------------------|--------------|-----------------|--------------------------|--|------|------|------------|------|------|------------|------|----------------|----------------------|-----------------------------------|---------|---------|-------------------------|
|  |                 |                             | Carbon Steel | Stainless Steel |                          | .125   | .250 | .375 | .500       | .625 | .750 | .875       | 1.00 |                |                      |                                   |         |         |                         |
|  |                 |                             | (1)          | (1)             |                          | (1)  | (1)  | (1)  | (1)        | (1)  | (1)  | (1)        |      |                |                      |                                   |         |         |                         |
|  | .112-40 (#4-40) | —                           | KFE          | KFSE            | 440                      | 4  | 8    | 12   | 16         | 20   | 24   | —          | —    | .060           | .060                 | .166                              | .184    | .219    | .17                     |
|  | .138-32 (#6-32) | —                           | KFE          | KFSE            | 632                      | 4  | 8    | 12   | 16         | 20   | 24   | 28         | 32   | .060           | .060                 | .213                              | .231    | .281    | .22                     |
|  | —               | .116                        | KFE          | KFSE            | 116                      | 4  | 8    | 12   | 16         | 20   | 24   | —          | —    | .060           | .060                 | .166                              | .184    | .219    | .17                     |
|  | —               | .143                        | KFE          | KFSE            | 143                      | 4  | 8    | 12   | 16         | 20   | 24   | 28         | 32   | .060           | .060                 | .213                              | .231    | .281    | .22                     |
| "F" Minimum Thread Length (Where Applicable) |                 |                             |              |                 |                          | Full   |      |      | .375 ±.016 |      |      | .375 Blind |      |                |                      |                                   |         |         |                         |

All dimensions are in millimeters.

| METRIC                                       | Thread Size x Pitch | Thru Hole<br>+0.10<br>-0.08 | Type         |                 | Thread or Thru Hole Code | Length "L" ±0.13<br>(Length Code is in millimeters) |     |     |           |     |     |     |     | A (Shank) Max. | Min. Sheet Thickness | Hole Size in Sheet<br>+0.08 | C ±0.08 | E ±0.13 | Min. Dist. Hole To Edge |
|--|---------------------|-----------------------------|--------------|-----------------|--------------------------|---|-----|-----|-----------|-----|-----|-----|-----|----------------|----------------------|-----------------------------|---------|---------|-------------------------|
|  |                     |                             | Carbon Steel | Stainless Steel |                          | 3   | 4   | 6   | 8         | 10  | 12  | 14  | 16  |                |                      |                             |         |         |                         |
|  |                     |                             | (1)          | (1)             |                          | (1)   | (1) | (1) | (1)       | (1) | (1) | (1) | (1) |                |                      |                             |         |         |                         |
|  | M3 x 0.5            | —                           | KFE          | KFSE            | M3                       | 3   | 4   | 6   | 8         | 10  | 12  | 14  | 16  | 1.53           | 1.53                 | 4.22                        | 4.68    | 5.56    | 4.4                     |
|  | —                   | 3.6                         | KFE          | KFSE            | 3.6                      | 3   | 4   | 6   | 8         | 10  | 12  | 14  | 16  | 1.53           | 1.53                 | 5.41                        | 5.87    | 7.14    | 5.5                     |
|  | —                   | 4.2                         | KFE          | KFSE            | 4.2                      | 3   | 4   | 6   | 8         | 10  | 12  | 14  | 16  | 1.53           | 1.53                 | 6.4                         | 6.81    | 8.74    | 7.1                     |
| "F" Minimum Thread Length (Where Applicable) |                     |                             |              |                 |                          | Full  |     |     | 9.5 ± 0.4 |     |     |     |     |                |                      |                             |         |         |                         |

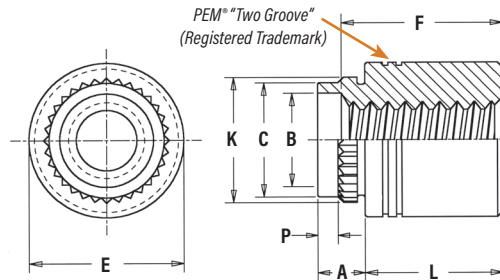
## KFB3™ BROACH/FLARE-MOUNT STANDOFFS



### PART NUMBER DESIGNATION

**KFB3** - **632** - **12**      **ET**

↓                      ↓                      ↓                      ↓  
 Type and          Thread          Length          Finish  
 Material          Code



All dimensions are in inches.

| UNIFIED                                   | Thread Size     | Type | Thread Code | Length "L" ±.005<br>(Length Code is in 32nds of an inch) |      |      |            |      |      |      |      |      |      | A (Shank) Max. | Sheet Thickness | Hole Size in Sheet<br>+.005<br>-.001 | B ±.003 | C Max. | E ±.005 | K ±.003 | P ±.010 | Min. Dist. Hole To Edge |
|---|-----------------|------|-------------|--|------|------|------------|------|------|------|------|------|------|----------------|-----------------|--------------------------------------|---------|--------|---------|---------|---------|-------------------------|
|   |                 |      |             | .062   | .125 | .187 | .250       | .312 | .375 | .500 | .625 | .750 | 1.00 |                |                 |                                      |         |        |         |         |         |                         |
|   |                 |      |             | (1)  | (1)  | (1)  | (1)        | (1)  | (1)  | (1)  | (1)  | (1)  | (1)  |                |                 |                                      |         |        |         |         |         |                         |
|   | .112-40 (#4-40) | KFB3 | 440         | 2  | 4    | 6    | 8          | 10   | 12   | 16   | 20   | —    | —    | .09            | .050-.065       | .166                                 | .122    | .165   | .219    | .179    | .040    | .17                     |
|   | .138-32 (#6-32) | KFB3 | 632         | 2  | 4    | 6    | 8          | 10   | 12   | 16   | 20   | 24   | 32   | .09            | .050-.065       | .213                                 | .171    | .212   | .280    | .226    | .040    | .22                     |
| "F" Min. Thread Length (Where Applicable) |                 |      |             | Full   |      |      | .375 Blind |      |      |      |      |      |      |                |                 |                                      |         |        |         |         |         |                         |

All dimensions are in millimeters.

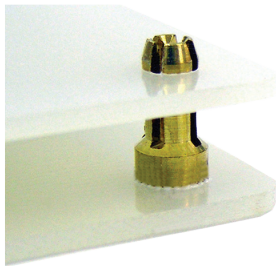
| METRIC                                    | Thread Size x Pitch | Type | Thread Code | Length "L" ±0.13<br>(Length Code is in millimeters) |     |     |           |     |     |     |     |     |      | A (Shank) Max. | Sheet Thickness | Hole Size in Sheet<br>+0.13<br>-0.03 | B ±0.08 | C Max. | E ±0.13 | K ±0.08 | P ±0.25 | Min. Dist. Hole To Edge |
|---|---------------------|------|-------------|---|-----|-----|-----------|-----|-----|-----|-----|-----|------|----------------|-----------------|--------------------------------------|---------|--------|---------|---------|---------|-------------------------|
|   |                     |      |             | 2   | 3   | 4   | 6         | 8   | 10  | 12  | 14  | 16  |      |                |                 |                                      |         |        |         |         |         |                         |
|   |                     |      |             | (1)   | (1) | (1) | (1)       | (1) | (1) | (1) | (1) | (1) |      |                |                 |                                      |         |        |         |         |         |                         |
|   | M3 x 0.5            | KFB3 | M3          | 2   | 3   | 4   | 6         | 8   | 10  | 12  | 14  | 16  | 2.29 | 1.27-1.65      | 4.22            | 3.23                                 | 4.2     | 5.56   | 4.55    | 1       | 4.33    |                         |
|   | M4 x 0.7            | KFB3 | M4          | 2   | 3   | 4   | 6         | 8   | 10  | 12  | 14  | 16  | 2.29 | 1.27-1.65      | 6.4             | 5.23                                 | 6.33    | 8.74   | 6.68    | 1       | 6.36    |                         |
| "F" Min. Thread Length (Where Applicable) |                     |      |             | Full  |     |     | 9.5 ± 0.4 |     |     |     |     |     |      |                |                 |                                      |         |        |         |         |         |                         |

(1) Blind at shank end with .375" minimum thread length from head end.





## KSSB™ BROACHING SNAP-TOP® STANDOFFS

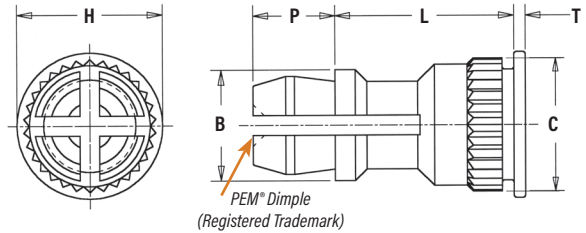


### PART NUMBER DESIGNATION

**KSSB** - **156** - **12** **X**

↓                      ↓                      ↓                      ↓

Type and Material    Top Board Mounting Hole A Diameter Code    Length Code    Finish



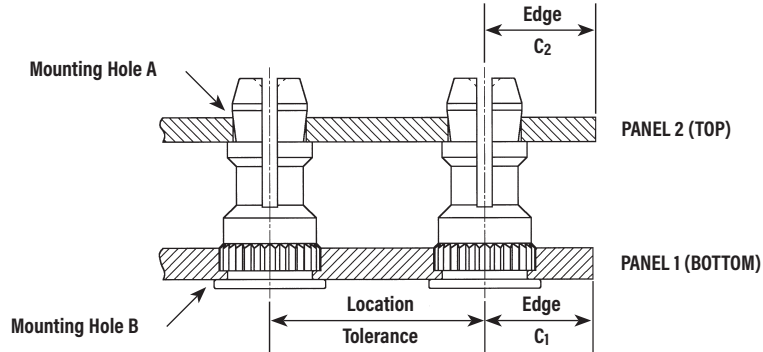
All dimensions are in inches.

| UNIFIED | Type | Top Board Mounting Hole A Diameter Code | Length "L" ±.005<br>(Length Code is in 32nds of an inch) |      |      |      |      |      |      |      |      |      | B ±.005 | C ±.003 | H ±.005 | P ±.005 | T ±.005 |
|---------|------|---|--|------|------|------|------|------|------|------|------|------|---------|---------|---------|---------|---------|
|         |      |   | .250   | .312 | .375 | .437 | .500 | .562 | .625 | .750 | .875 | 1.00 |         |         |         |         |         |
|         | KSSB | 156                                     | 8  | 10   | 12   | 14   | 16   | 18   | 20   | 24   | 28   | 32   | .188    | .226    | .250    | .141    | .020    |

All dimensions are in millimeters.

| METRIC | Type | Top Board Mounting Hole A Diameter Code | Length "L" ±0.13<br>(Length Code is in millimeters) |    |    |    |    |    |    |    |    |     | B ±0.13 | C ±0.08 | H ±0.13 | P ±0.13 | T ±0.13 |
|--------|------|---|---|----|----|----|----|----|----|----|----|-----|---------|---------|---------|---------|---------|
|        |      |   | 8   | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 25 |     |         |         |         |         |         |
|        | KSSB | 4MM                                     | 8   | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 25 | 4.8 | 5.74    | 6.35    | 3.58    | 0.51    |         |

## KSSB™ APPLICATION DATA



All dimensions are in inches.

| UNIFIED | Type | Panel 1           |                                       |                |                |                                   | Panel 2            |               |                                    |                   |                     |                                   |
|---------|------|-------------------|---------------------------------------|----------------|----------------|-----------------------------------|--------------------|---------------|------------------------------------|-------------------|---------------------|-----------------------------------|
|         |      | Hardness Max. (1) | Bottom Mounting Hole B<br>+.003 -.000 | Panel Material | Thickness Min. | Edge Distance C <sub>1</sub> Min. | Location Tolerance | Hardness Max. | Top Mounting Hole A<br>+.003 -.000 | Panel Material    | Thickness Range (2) | Edge Distance C <sub>2</sub> Min. |
|         | KSSB | HRB 65 / HB 116   | .213                                  | PC board       | .050           | .220                              | ±.005              | No Limit      | .156                               | PC board or Metal | .040 - .070         | .100                              |

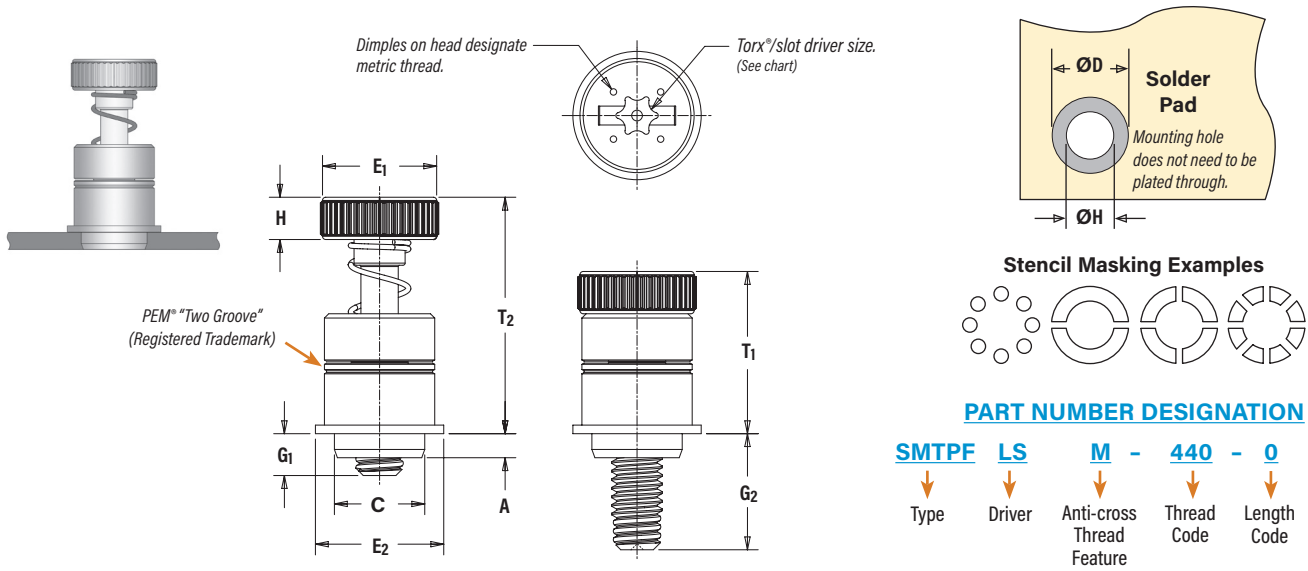
All dimensions are in millimeters.

| METRIC | Type | Panel 1           |                                 |                |                |                                   | Panel 2            |               |                              |                   |                     |                                   |
|--------|------|-------------------|---------------------------------|----------------|----------------|-----------------------------------|--------------------|---------------|------------------------------|-------------------|---------------------|-----------------------------------|
|        |      | Hardness Max. (1) | Bottom Mounting Hole B<br>+0.08 | Panel Material | Thickness Min. | Edge Distance C <sub>1</sub> Min. | Location Tolerance | Hardness Max. | Top Mounting Hole A<br>+0.08 | Panel Material    | Thickness Range (2) | Edge Distance C <sub>2</sub> Min. |
|        | KSSB | HRB 65 / HB 116   | 5.41                            | PC board       | 1.27           | 5.59                              | ±0.13              | No Limit      | 4                            | PC board or Metal | 1 - 1.8             | 2.54                              |

(1) HRB - Hardness Rockwell "B" Scale. HB - Hardness Brinell.

(2) Available for thicker boards on special order.

## SMTPF LSM™ ReelFast® SURFACE MOUNT CAPTIVE PANEL SCREWS



All dimensions are in inches.

| UNIFIED         | Thread Size     | Type      | Thread Code | Screw Length Code | A (Shank) Max. | Min. Sheet Thickness | C Max. | E1 ±.010 | E2 Nom | G1 ±.025 | G2 ±.025 | H ±.010 | T1 Nom. | T2 Nom. | ØK Hole Size in Sheet +.003 -.000 | ØD Min. Solder Pad | Driver Size |
|-----------------|-----------------|-----------|-------------|-------------------|----------------|----------------------|--------|----------|--------|----------|----------|---------|---------|---------|-----------------------------------|--------------------|-------------|
|                 | .112-40 (#4-40) | SMTPF LSM | 440         | 0                 | .063           | .063                 | .215   | .280     | .300   | .040     | .210     | .100    | .38     | .55     | .220                              | .340               | T15         |
|                 |                 |           |             | 1                 |                |                      |        |          |        |          |          |         |         |         |                                   |                    |             |
| .138-32 (#6-32) | SMTPF LSM       | 632       | 0           | .063              | .063           | .247                 | .310   | .320     | .040   | .240     | .100     | .42     | .62     | .252    | .400                              | T15                |             |
|                 |                 |           | 1           |                   |                |                      |        |          |        |          |          |         |         |         |                                   |                    |             |

All dimensions are in millimeters.

| METRIC     | Thread Size | Type      | Thread Code | Screw Length Code | A (Shank) Max. | Min. Sheet Thickness | C Max. | E1 ±0.25 | E2 Nom | G1 ±0.64 | G2 ±0.64 | H ±0.25 | T1 Nom. | T2 Nom. | ØK Hole Size in Sheet +0.08 | ØD Min. Solder Pad | Driver Size |
|------------|-------------|-----------|-------------|-------------------|----------------|----------------------|--------|----------|--------|----------|----------|---------|---------|---------|-----------------------------|--------------------|-------------|
|            | M3 x 0.5    | SMTPF LSM | M3          | 0                 | 1.6            | 1.6                  | 5.46   | 7        | 7.6    | 1        | 5.3      | 2.5     | 9.6     | 14      | 5.6                         | 8.6                | T15         |
|            |             |           |             | 1                 |                |                      |        |          |        |          |          |         |         |         |                             |                    |             |
| M3.5 x 0.6 | SMTPF LSM   | M3.5      | 0           | 1.6               | 1.6            | 6.27                 | 7.9    | 8.13     | 1      | 6.1      | 2.5      | 10.7    | 15.7    | 6.4     | 10.2                        | T15                |             |
|            |             |           | 1           |                   |                |                      |        |          |        |          |          |         |         |         |                             |                    |             |

### NUMBER OF PARTS PER REEL

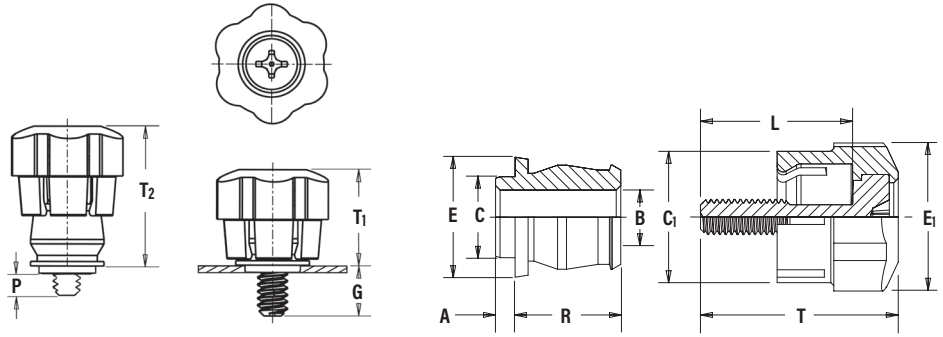
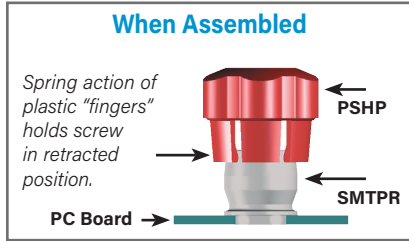
| Thread Size | Parts Per Reel |
|-------------|----------------|
| 440         | 200            |
| 632         | 150            |
| M3          | 200            |
| M3.5        | 150            |



Packaged on 330 mm recyclable reels. Tape width is 24 mm. Supplied with polyimide patch for vacuum pick up. Reels conform to EIA-481.

## SMTPF™ ReelFast® SURFACE MOUNT CAPTIVE PANEL SCREWS

Patented.



All dimensions are in inches.

| UNIFIED         | Screw Part Number |      |             |                   | Retainer Part Number | Assembly Dimensions |       |                |                |                    | Screw Dimensions |                |       |      | Retainer Dimensions |                   |         |        |        |         |
|-----------------|-------------------|------|-------------|-------------------|----------------------|---------------------|-------|----------------|----------------|--------------------|------------------|----------------|-------|------|---------------------|-------------------|---------|--------|--------|---------|
|                 | Thread Size       | Type | Thread Code | Screw Length Code |                      | G                   | P     | T <sub>1</sub> | T <sub>2</sub> | Total Radial Float | C <sub>1</sub>   | E <sub>1</sub> | L     | T    | A (Shank) Max.      | Min. Sheet Thick. | B ±.003 | C Max. | E Nom. | R ±.005 |
|                 |                   |      |             |                   |                      | ±.025               | ±.025 | Nom.           | Nom.           |                    | ±.010            | ±.010          | ±.015 | Nom. |                     |                   |         |        |        |         |
| .112-40 (#4-40) | PSHP              | 440  | 0           | SMTPR-6-1         | .188                 | .000                | .478  | .646           | .015           | .440               | .542             | .510           | .663  | .060 | .060                | .167              | .249    | .375   | .325   |         |
|                 |                   |      | 1           |                   | .248                 | .026                |       |                |                |                    |                  | .570           | .723  |      |                     |                   |         |        |        |         |
| .138-32 (#6-32) | PSHP              | 632  | 0           | SMTPR-6-1         | .188                 | .000                | .478  | .646           | .020           | .440               | .542             | .510           | .663  | .060 | .060                | .167              | .249    | .375   | .325   |         |
|                 |                   |      | 1           |                   | .248                 | .026                |       |                |                |                    |                  | .570           | .723  |      |                     |                   |         |        |        |         |

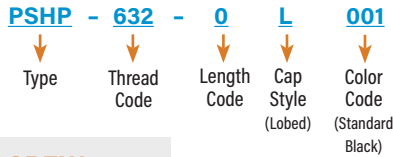
All dimensions are in millimeters.

| METRIC     | Screw Part Number   |      |             |                   | Retainer Part Number | Assembly Dimensions |       |                |                |                    | Screw Dimensions |                |       |      | Retainer Dimensions |                   |         |        |        |         |
|------------|---------------------|------|-------------|-------------------|----------------------|---------------------|-------|----------------|----------------|--------------------|------------------|----------------|-------|------|---------------------|-------------------|---------|--------|--------|---------|
|            | Thread Size x Pitch | Type | Thread Code | Screw Length Code |                      | G                   | P     | T <sub>1</sub> | T <sub>2</sub> | Total Radial Float | C <sub>1</sub>   | E <sub>1</sub> | L     | T    | A (Shank) Max.      | Min. Sheet Thick. | B ±.008 | C Max. | E Nom. | R ±.013 |
|            |                     |      |             |                   |                      | ±.064               | ±.064 | Nom.           | Nom.           |                    | ±.025            | ±.025          | ±.038 | Nom. |                     |                   |         |        |        |         |
| M3 x 0.5   | PSHP                | M3   | 0           | SMTPR-6-1         | 4.78                 | 0                   | 12.14 | 16.41          | .38            | 11.18              | 13.77            | 12.95          | 16.84 | 1.53 | 1.53                | 4.24              | 6.33    | 9.53   | 8.26   |         |
|            |                     |      | 1           |                   | 6.3                  | .66                 |       |                |                |                    |                  | 14.48          | 18.36 |      |                     |                   |         |        |        |         |
| M3.5 x 0.6 | PSHP                | M3.5 | 0           | SMTPR-6-1         | 4.78                 | 0                   | 12.14 | 16.41          | .51            | 11.18              | 13.77            | 12.95          | 16.84 | 1.53 | 1.53                | 4.24              | 6.33    | 9.53   | 8.26   |         |
|            |                     |      | 1           |                   | 6.3                  | .66                 |       |                |                |                    |                  | 14.48          | 18.36 |      |                     |                   |         |        |        |         |

**RETAINER** - Packaged on 330 mm recyclable reels of 465 pieces. Tape width is 24 mm. Supplied with Kapton® patch for vacuum pick up. Reels conform to EIA-481.

**SCREW** - Packaged in bags. Retainers and screws are sold separately.

### PART NUMBER DESIGNATION FOR SCREW



### PART NUMBER DESIGNATION FOR RETAINER



### COLOR CAPABILITIES FOR TYPE PSHP SCREW

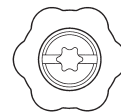
The colors shown here (codes #002 thru #007) are non-stocked standards and available on special order. Since actual cap colors may vary slightly from those shown here, we recommend that you request samples for color verification. If you require a custom color or you need a "color matched" cap, please contact us.

Std. Black #001    Red #002    Orange #003    Yellow #004

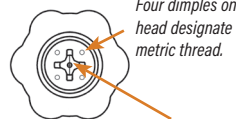


Green #005    Blue #006    Violet #007

Non-flammable UL 94-V0 plastic caps are available on special order.

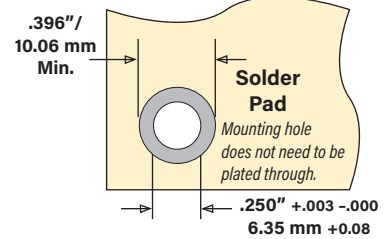


Available with Torx® recess on special order.



Four dimples on head designate metric thread.

Metal Phillips Recess  
#4-40 & M3 = #1  
#6-32 & M3.5 = #2

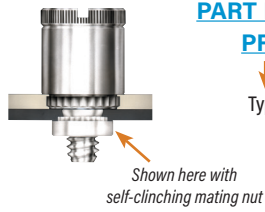


### Stencil Masking Examples



# FASTENERS FOR USE WITH PC BOARDS

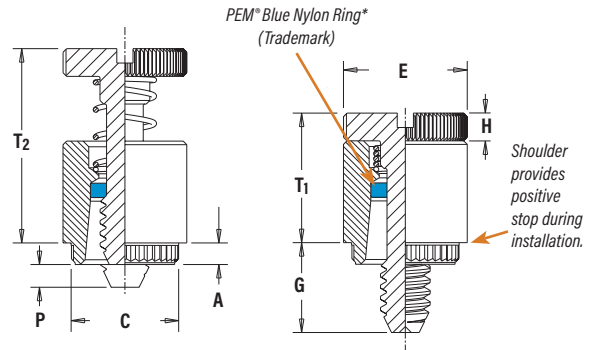
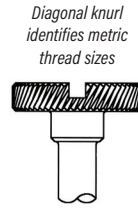
## PFK™ BROACHING CAPTIVE PANEL SCREWS



### PART NUMBER DESIGNATION

**PFK** - **632** - **62**

Type                      Thread Code                      Screw Length Code



All dimensions are in inches.

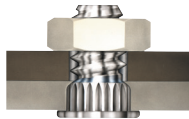
| UNIFIED         | Thread Size     | Type | Thread Code | Screw Length Code | A (Shank) Max. | Min. Sheet Thickness | Hole Size In Sheet +.003 -.000 | C ±.003 | E ±.010 | G ±.016 | H ±.005 | P ±.025 | T1 Max. | T2 Nom. | Min. Dist. Hole $\varnothing$ To Edge |
|-----------------|-----------------|------|-------------|-------------------|----------------|----------------------|--------------------------------|---------|---------|---------|---------|---------|---------|---------|---------------------------------------|
|                 | .112-40 (#4-40) | PFK  | 440         |                   | 40             | .060                 | .060                           | .265    | .283    | .312    | .250    | .072    | .000    | .36     | .54                                   |
| 62              |                 |      |             |                   | .375           |                      |                                |         |         |         | .125    |         |         |         |                                       |
| 84              |                 |      |             |                   | .500           |                      |                                |         |         |         | .250    |         |         |         |                                       |
| .138-32 (#6-32) | PFK             | 632  |             | 40                | .060           | .060                 | .281                           | .299    | .344    | .250    | .072    | .000    | .36     | .54     | .26                                   |
|                 |                 |      |             | 62                |                |                      |                                |         |         | .375    |         | .125    |         |         |                                       |
|                 |                 |      |             | 84                |                |                      |                                |         |         | .500    |         | .250    |         |         |                                       |

All dimensions are in millimeters.

| METRIC | Thread Size x Pitch | Type | Thread Code | Screw Length Code | A (Shank) Max. | Min. Sheet Thickness | Hole Size In Sheet +0.08 | C ±0.08 | E ±0.25 | G ±0.4 | H ±0.13 | P ±0.64 | T1 Max. | T2 Nom. | Min. Dist. Hole $\varnothing$ To Edge |
|--------|---------------------|------|-------------|-------------------|----------------|----------------------|--------------------------|---------|---------|--------|---------|---------|---------|---------|---------------------------------------|
|        | M3 x 0.5            | PFK  | M3          | M3                | 40             | 1.53                 | 1.53                     | 6.73    | 7.19    | 7.92   | 6.4     | 1.83    | 0       | 9.14    | 13.72                                 |
| 62     |                     |      |             |                   | 9.5            |                      |                          |         |         |        | 3.2     |         |         |         |                                       |
| 84     |                     |      |             |                   | 12.7           |                      |                          |         |         |        | 6.4     |         |         |         |                                       |

\*Retaining rings are plastic with normal 250°F / 120°C temperature limit.

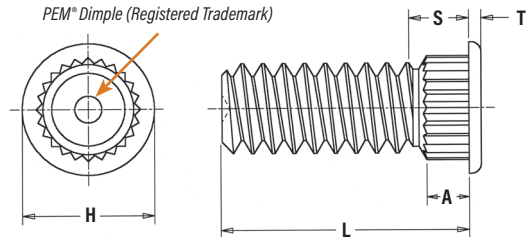
## KFH™ BROACHING STUDS



### PART NUMBER DESIGNATION

**KFH** - **632** - **8** **ET**

Type and Material                      Thread Code                      Length Code                      Finish



All dimensions are in inches.

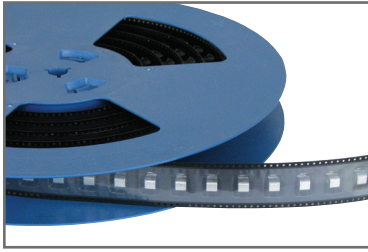
| UNIFIED          | Thread Size | Type | Thread Code | Length "L" ±.010<br>(Length Code is in 16ths of an inch) |      |      |      |      | A (Shank) Max. | Min. Sheet Thickness | Hole Size in Sheet +.003 -.000 | Max. Hole Size in Attached Parts | H ±.010 | S Max. (t) | T ±.005 | Min. Dist. Hole $\varnothing$ To Edge |     |  |
|------------------|-------------|------|-------------|--|------|------|------|------|----------------|----------------------|--------------------------------|----------------------------------|---------|------------|---------|---------------------------------------|-----|--|
|                  |             |      |             | .250   | .312 | .375 | .500 | .625 | .750           |                      |                                |                                  |         |            |         |                                       |     |  |
| .112-40 (#4-40)  | KFH         | 440  | 440         | 4  | 5    | 6    | 8    | 10   | 12             | .065                 | .060                           | .120                             | .145    | .180       | .09     | .020                                  | .15 |  |
|                  |             |      |             | 5  | 6    | 8    | 10   | 12   |                |                      |                                |                                  |         |            |         |                                       |     |  |
|                  |             |      |             | 6  | 8    | 10   | 12   |      |                |                      |                                |                                  |         |            |         |                                       |     |  |
|                  |             |      |             | 8  | 10   | 12   |      |      |                |                      |                                |                                  |         |            |         |                                       |     |  |
| .138-32 (#6-32)  | KFH         | 632  | 632         | 4  | 5    | 6    | 8    | 10   | 12             | .065                 | .060                           | .140                             | .170    | .200       | .09     | .020                                  | .19 |  |
|                  |             |      |             | 5  | 6    | 8    | 10   | 12   |                |                      |                                |                                  |         |            |         |                                       |     |  |
|                  |             |      |             | 6  | 8    | 10   | 12   |      |                |                      |                                |                                  |         |            |         |                                       |     |  |
|                  |             |      |             | 8  | 10   | 12   |      |      |                |                      |                                |                                  |         |            |         |                                       |     |  |
| .164-32 (#8-32)  | KFH         | 832  | 832         | 4  | 5    | 6    | 8    | 10   | 12             | .065                 | .060                           | .166                             | .195    | .225       | .09     | .020                                  | .20 |  |
|                  |             |      |             | 5  | 6    | 8    | 10   | 12   |                |                      |                                |                                  |         |            |         |                                       |     |  |
|                  |             |      |             | 6  | 8    | 10   | 12   |      |                |                      |                                |                                  |         |            |         |                                       |     |  |
|                  |             |      |             | 8  | 10   | 12   |      |      |                |                      |                                |                                  |         |            |         |                                       |     |  |
| .190-32 (#10-32) | KFH         | 032  | 032         | 4  | 5    | 6    | 8    | 10   | 12             | .065                 | .060                           | .189                             | .220    | .250       | .09     | .020                                  | .20 |  |
|                  |             |      |             | 5  | 6    | 8    | 10   | 12   |                |                      |                                |                                  |         |            |         |                                       |     |  |
|                  |             |      |             | 6  | 8    | 10   | 12   |      |                |                      |                                |                                  |         |            |         |                                       |     |  |
|                  |             |      |             | 8  | 10   | 12   |      |      |                |                      |                                |                                  |         |            |         |                                       |     |  |

All dimensions are in millimeters.

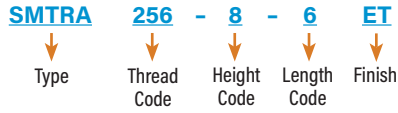
| METRIC   | Thread Size x Pitch | Type | Thread Code | Length "L" ±0.25<br>(Length Code is in millimeters) |    |    |    |    | A (Shank) Max. | Min. Sheet Thickness | Hole Size in Sheet +0.08 | Max. Hole Size in Attached Parts | H ±0.25 | S Max. (t) | T ±0.13 | Min. Dist. Hole $\varnothing$ To Edge |     |
|----------|---------------------|------|-------------|---|----|----|----|----|----------------|----------------------|--------------------------|----------------------------------|---------|------------|---------|---------------------------------------|-----|
|          |                     |      |             | 6   | 8  | 10 | 12 | 15 | 18             |                      |                          |                                  |         |            |         |                                       |     |
| M3 x 0.5 | KFH                 | M3   | M3          | 6   | 8  | 10 | 12 | 15 | 18             | 1.65                 | 1.53                     | 3                                | 3.7     | 4.58       | 2.3     | 0.51                                  | 3.8 |
|          |                     |      |             | 8   | 10 | 12 | 15 | 18 |                |                      |                          |                                  |         |            |         |                                       |     |
|          |                     |      |             | 10  | 12 | 15 | 18 |    |                |                      |                          |                                  |         |            |         |                                       |     |
| M4 x 0.7 | KFH                 | M4   | M4          | 6   | 8  | 10 | 12 | 15 | 18             | 1.65                 | 1.53                     | 4.2                              | 4.8     | 5.74       | 2.3     | 0.51                                  | 5.1 |
|          |                     |      |             | 8   | 10 | 12 | 15 | 18 |                |                      |                          |                                  |         |            |         |                                       |     |
|          |                     |      |             | 10  | 12 | 15 | 18 |    |                |                      |                          |                                  |         |            |         |                                       |     |
| M5 x 0.8 | KFH                 | M5   | M5          | 6   | 8  | 10 | 12 | 15 | 18             | 1.65                 | 1.53                     | 5                                | 5.8     | 6.6        | 2.3     | 0.51                                  | 5.3 |
|          |                     |      |             | 8   | 10 | 12 | 15 | 18 |                |                      |                          |                                  |         |            |         |                                       |     |
|          |                     |      |             | 10  | 12 | 15 | 18 |    |                |                      |                          |                                  |         |            |         |                                       |     |

(1) Threads are gaugeable to within 2 pitches of the "S" Max. dimension. A class 3B/5H maximum material commercial nut shall pass up to the "S" Max. dimension.

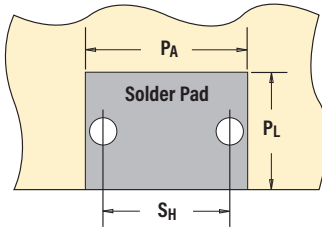
## SMTRA™ ReelFast® SURFACE MOUNT RIGHT ANGLE (R'ANGLE®) FASTENERS



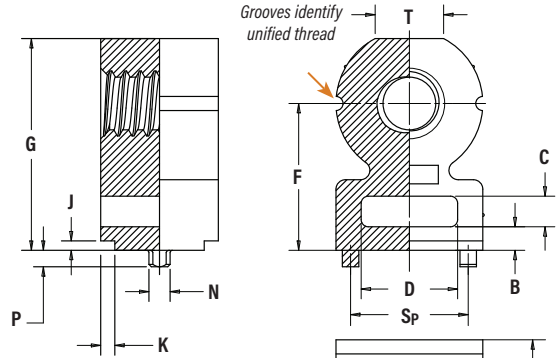
### PART NUMBER DESIGNATION



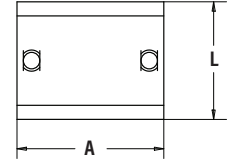
Patented.



Solder pad can be flush to edge.  
Mounting holes do not need to be plated through.



### Stencil Masking Examples



All dimensions are in inches.

| UNIFIED | Thread Size     | Type  | Thread Code | Height Code | Length Code | Length L<br>±.005 | Min. Sheet Thickness | Hole Size In Sheet<br>+.003 -.000 | A<br>±.006 | B<br>±.006 | C<br>±.006 | D<br>±.006 | Height F<br>±.006 | G<br>±.006 | J<br>Nom. | K<br>Nom. | N<br>Max. | P<br>Max. | Sp<br>±.003 | T<br>Nom. |
|---------|-----------------|-------|-------------|-------------|-------------|-------------------|----------------------|-----------------------------------|------------|------------|------------|------------|-------------------|------------|-----------|-----------|-----------|-----------|-------------|-----------|
|         | .086-56 (#2-56) | SMTRA | 256         | 8           | 6           | .188              | .040                 | .053                              | .218       | .040       | .060       | .140       | .250              | .345       | .020      | .030      | .048      | .040      | .157        | .105      |
|         | .112-40 (#4-40) | SMTRA | 440         | 9           | 6           | .188              | .040                 | .053                              | .250       | .050       | .065       | .160       | .281              | .390       | .020      | .030      | .048      | .040      | .188        | .125      |
|         | .138-32 (#6-32) | SMTRA | 632         | 10          | 8           | .250              | .040                 | .053                              | .312       | .050       | .065       | .205       | .312              | .450       | .020      | .030      | .048      | .040      | .250        | .145      |
|         | .164-32 (#8-32) | SMTRA | 832         | 12          | 9           | .281              | .040                 | .053                              | .375       | .050       | .075       | .250       | .375              | .535       | .020      | .030      | .048      | .040      | .312        | .195      |

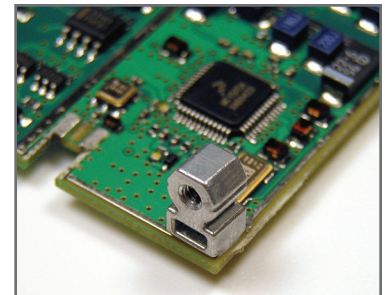
All dimensions are in millimeters.

| METRIC | Thread Size x Pitch | Type  | Thread Code | Height Code | Length Code | Length L<br>±0.13 | Min. Sheet Thickness | Hole Size In Sheet<br>+0.08 | A<br>±0.15 | B<br>±0.15 | C<br>±0.15 | D<br>±0.15 | Height F<br>±0.15 | G<br>±0.15 | J<br>Nom. | K<br>Nom. | N<br>Max. | P<br>Max. | Sp<br>±0.08 | T<br>Nom. |
|--------|---------------------|-------|-------------|-------------|-------------|-------------------|----------------------|-----------------------------|------------|------------|------------|------------|-------------------|------------|-----------|-----------|-----------|-----------|-------------|-----------|
|        | M2 x 0.4            | SMTRA | M2          | 6           | 5           | 5                 | 1                    | 1.35                        | 5.5        | 1          | 1.5        | 3.5        | 6                 | 8.4        | 0.5       | 0.75      | 1.22      | 1         | 4           | 2.65      |
|        | M2.5 x 0.45         | SMTRA | M25         | 6           | 5           | 5                 | 1                    | 1.35                        | 5.5        | 1          | 1.5        | 3.5        | 6                 | 8.4        | 0.5       | 0.75      | 1.22      | 1         | 4           | 2.65      |
|        | M3 x 0.5            | SMTRA | M3          | 7           | 5           | 5                 | 1                    | 1.35                        | 6.35       | 1.25       | 1.65       | 4          | 7                 | 9.75       | 0.5       | 0.75      | 1.22      | 1         | 4.75        | 3.2       |
|        | M4 x 0.7            | SMTRA | M4          | 9           | 7           | 7                 | 1                    | 1.35                        | 9.53       | 1.25       | 1.65       | 6.35       | 9                 | 13.1       | 0.5       | 0.75      | 1.22      | 1         | 7.9         | 4.8       |

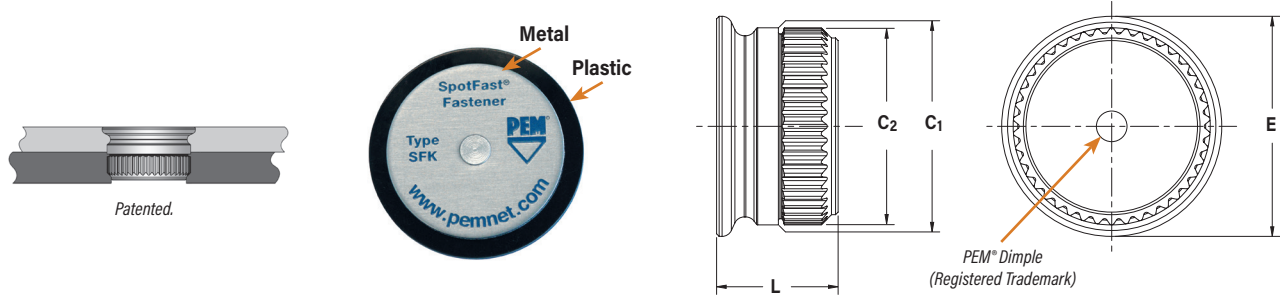
| UNIFIED | Thread Code | Pad Width PA<br>Min. | Pad Length PL<br>Min. | Hole Spacing SH<br>±.002 | Hole Size In Sheet<br>+.003 -.000 |
|---------|-------------|----------------------|-----------------------|--------------------------|-----------------------------------|
|         | 256         | .262                 | .171                  | .157                     | .053                              |
|         | 440         | .294                 | .171                  | .188                     | .053                              |
|         | 632         | .356                 | .233                  | .250                     | .053                              |
|         | 832         | .419                 | .264                  | .312                     | .053                              |

| METRIC | Thread Code | Pad Width PA<br>Min. | Pad Length PL<br>Min. | Hole Spacing SH<br>±0.05 | Hole Size In Sheet<br>+0.08 |
|--------|-------------|----------------------|-----------------------|--------------------------|-----------------------------|
|        | M2          | 6.62                 | 4.57                  | 4                        | 1.35                        |
|        | M25         | 6.62                 | 4.57                  | 4                        | 1.35                        |
|        | M3          | 7.47                 | 4.57                  | 4.75                     | 1.35                        |
|        | M4          | 10.65                | 6.57                  | 7.9                      | 1.35                        |

| Part Number   | Parts Per Reel | Pitch (mm) | Tape Width (mm) |
|---------------|----------------|------------|-----------------|
| SMTRA256-8-6  | 375            | 16         | 24              |
| SMTRA440-9-6  | 300            | 16         | 24              |
| SMTRA632-10-8 | 200            | 20         | 32              |
| SMTRA832-12-9 | 200            | 20         | 32              |
| SMTRAM2-6-5   | 375            | 16         | 24              |
| SMTRAM25-6-5  | 375            | 16         | 24              |
| SMTRAM3-7-5   | 300            | 16         | 24              |
| SMTRAM4-9-7   | 200            | 20         | 32              |

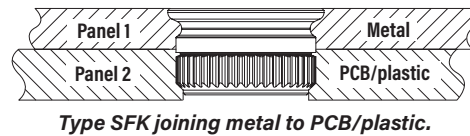


## SFK™ SpotFast® CLINCH/BROACH MOUNT FASTENERS



| Type and Size | Thickness Code | Panel 1                     |      |   |      | Panel 2            |      |   |      | C <sub>1</sub> Max. |      | C <sub>2</sub> ±0.08 mm / ±.003" |      | E Max. |      | L Max. |      | Min. Dist Hole To Edge |      |
|---------------|----------------|-----------------------------|------|---|------|--------------------|------|---|------|---------------------|------|----------------------------------|------|--------|------|--------|------|------------------------|------|
|               |                | Thickness ±0.08 mm / ±.003" |      | Mounting Hole +0.08 mm / +.003" - .000" |      | Thickness Min. (1) |      | Mounting Hole +0.08 mm / +.003" - .000" |      |                     |      |                                  |      |        |      |        |      |                        |      |
|               |                | mm                          | in.  | mm                                      | in.  | mm                 | in.  | mm                                      | in.  | mm                  | in.  | mm                               | in.  | mm     | in.  | mm     | in.  | mm                     | in.  |
| SFK-3         | 0.8            | 0.8                         | .031 | 3                                       | .118 | 1.6                | .063 | 2.5                                     | .098 | 2.98                | .117 | 2.9                              | .114 | 3.53   | .139 | 2.31   | .091 | 3                      | 0.12 |
| SFK-3         | 1.0            | 1                           | .039 | 3                                       | .118 | 1.6                | .063 | 2.5                                     | .098 | 2.98                | .117 | 2.9                              | .114 | 3.76   | .148 | 2.51   | .099 | 3                      | 0.12 |
| SFK-3         | 1.2            | 1.2                         | .047 | 3                                       | .118 | 1.6                | .063 | 2.5                                     | .098 | 2.98                | .117 | 2.9                              | .114 | 3.76   | .148 | 2.72   | .107 | 3                      | 0.12 |
| SFK-3         | 1.6            | 1.6                         | .063 | 3                                       | .118 | 1.6                | .063 | 2.5                                     | .098 | 2.98                | .117 | 2.9                              | .114 | 3.76   | .148 | 3.12   | .123 | 3                      | 0.12 |
| SFK-5         | 0.8            | 0.8                         | .031 | 5                                       | .197 | 1.6                | .063 | 4.5                                     | .177 | 4.98                | .196 | 4.9                              | .193 | 5.56   | .219 | 2.31   | .091 | 5.1                    | 0.20 |
| SFK-5         | 1.0            | 1                           | .039 | 5                                       | .197 | 1.6                | .063 | 4.5                                     | .177 | 4.98                | .196 | 4.9                              | .193 | 5.56   | .219 | 2.51   | .099 | 5.1                    | 0.20 |
| SFK-5         | 1.2            | 1.2                         | .047 | 5                                       | .197 | 1.6                | .063 | 4.5                                     | .177 | 4.98                | .196 | 4.9                              | .193 | 5.56   | .219 | 2.72   | .107 | 5.1                    | 0.20 |
| SFK-5         | 1.6            | 1.6                         | .063 | 5                                       | .197 | 1.6                | .063 | 4.5                                     | .177 | 4.98                | .196 | 4.9                              | .193 | 5.56   | .219 | 3.12   | .123 | 5.1                    | 0.20 |

(1) Fastener will provide flush application at minimum sheet thickness.



### PART NUMBER DESIGNATION

**SFK** - **3** - **0.8** - **ZI**

↓                      ↓                      ↓                      ↓

Type                      Panel 1 Mounting Hole Code                      Thickness Code                      Finish

# FASTENERS FOR USE WITH PC BOARDS

## MATERIAL AND FINISH SPECIFICATIONS

| Type                           | Threads <sup>(1)</sup>                 |  | Fastener Materials     |                            |                         |       |                                  | Standard Finishes                      |   |           | Optional Finish   |               | For Use in Sheet Hardness: <sup>(3)</sup> |                         |                         |                        |  |
|--------------------------------|--|--|------------------------|----------------------------|-------------------------|-------|----------------------------------|--|---|-----------|---|---------------|---|-------------------------|-------------------------|------------------------|--|
|                                | Internal, ASME B1.1 2B/ ASME B1.13M 6H | External, ASME B1.1 2A/ ASME B1.13M 6g | Lead-Free Carbon Steel | 300 Series Stainless Steel | CDA-510 Phosphor Bronze | Brass | Nylon, Temp. Limit 200° F/ 93° C | Passivated and/or Tested Per ASTM A380 | Electro-Plated Tin ASTM B 545, Class B With Clear Preservative Coating, annealed <sup>(4)</sup> | No Finish | Electro-Plated Tin ASTM B 545, Class B With Clear Preservative Coating, annealed <sup>(4)</sup> | Black Nitride | HRB 70 / HB 125 or Less                   | HRB 65 / HB 116 or Less | HRB 60 / HB 107 or Less | HRB 55 / HB 96 or Less | Aluminum, Acrylic, Castings, Polycarbonate, and PC board |
| KF2                            | •                                      |  | •                      |                            |                         |       |                                  | •                                      |   |           |   |               |   |                         | •                       |                        | •  |
| KFS2                           | •                                      |  |                        | •                          |                         |       |                                  | •                                      |   |           |   | •             |   |                         |                         |                        | •  |
| KFE                            | •                                      |  | •                      |                            |                         |       |                                  | •                                      |   |           |   |               |   |                         | •                       |                        | •  |
| KFSE                           | •                                      |  |                        | •                          |                         |       |                                  | •                                      |   |           |   | •             |   |                         |                         |                        | •  |
| KFB3                           | •                                      |  |                        |                            |                         |       | •                                | •                                      |   |           |   |               | •   |                         |                         |                        | •  |
| KSSB                           |  |  |                        |                            |                         |       | •                                |  | •   |           |   |               | •   |                         |                         |                        | •  |
| KFH                            |  | •                                      |                        |                            | •                       |       |                                  |  |   | •         |   |               |   |                         |                         | •                      | •  |
| PFK Retainer                   |  |  |                        | •                          |                         |       |                                  | •                                      |   |           | •   |               |   |                         |                         | •                      | •  |
| Screw                          |  | •                                      |                        | •                          |                         |       |                                  | •                                      |   |           | •   |               |   |                         |                         |                        | •  |
| Spring                         |  |  |                        | •                          |                         |       |                                  |  |   |           |   |               |   |                         |                         |                        | •  |
| Retaining Ring                 |  |  |                        |                            |                         |       | •                                |  |   |           |   |               |   |                         |                         |                        | •  |
| Part Number Codes For Finishes |  |  |                        |                            |                         |       | None                             | ET                                     | X   | ET        | BN  |               |   |                         |                         |                        |  |

| Type                           | Threads <sup>(1)</sup>  |  | Fastener Materials                     |                        |                       |                            |       | Standard Finishes <sup>(2)</sup> |   |   | For Use in Sheet Hardness: <sup>(3)</sup> |                         |          |
|--------------------------------|-------------------------|--|--|------------------------|-----------------------|----------------------------|-------|----------------------------------|---|---|---|-------------------------|----------|
|                                | Miniature ISO 1501, 4H6 | Internal, ASME B1.1 2B/ ASME B1.13M 6H | External, ASME B1.1 2A/ ASME B1.13M 6g | Lead-Free Carbon Steel | Hardened Carbon Steel | 300 Series Stainless Steel | Brass | Zinc Diecast                     | Zinc Plated per ASTM B633, SC1 (5µm), Type III, Colorless | Electro-Plated Tin ASTM B 545, Class A With Clear Preservative Coating, annealed <sup>(4)</sup> | Bright Nickel Over Copper Flash           | HRB 80 / HB 150 or less | PC board |
| SMTSO                          | • S1 to S1.4            | • 0-80 to 8-32/ M1.6 to M4             |  | •                      |                       |                            |       |                                  | •   |   |   |                         | •        |
| SMTSOB                         |                         | •                                      |  |                        |                       |                            | •     |                                  | (6)   |   |   |                         | •        |
| SMTRA                          |                         | •                                      |  |                        |                       |                            |       | •                                |   |   |   |                         | •        |
| SMTPLSM Retainer               |                         |  |  | •                      |                       |                            |       |                                  | •   |   |   |                         | •        |
| Screw                          |                         |  | •                                      |                        | •                     |                            |       | •                                |   |   |   |                         | •        |
| Spring                         |                         |  |  |                        |                       | •                          |       |                                  |   |   |   |                         | •        |
| PSHP <sup>(5)</sup>            |                         |  |  | •                      |                       |                            |       |                                  |   | •   |   |                         | •        |
| SMTPR                          |                         |  |  | •                      |                       |                            |       |                                  | •   |   |   |                         | •        |
| SFK                            |                         |  |  | •                      |                       |                            |       |                                  | •   |   |   | •                       | •        |
| SMTSSS                         |                         |  |  | •                      |                       |                            |       |                                  | •   |   |   |                         | •        |
| SMTSK                          |                         |  |  | •                      |                       |                            |       |                                  | •   |   |   |                         | •        |
| Part Number Codes For Finishes |                         |  |  |                        |                       |                            |       | ZI                               | ET  | CN  |   |                         |          |

- (1) For plated studs, Class 2A/6g, the maximum major and pitch diameter, after plating, may equal basic sizes and can be gauged to Class 3A/6h, per ASME B1.1 Section 7, Paragraph 2 and ASME B1.13M, Section 8, Paragraph 8.2.
- (2) See PEM Technical Support section of our web site for related plating standards and specifications.
- (3) HRB - Hardness Rockwell "B" Scale. HB - Hardness Brinell.
- (4) Optimal solderability life noted on packaging.
- (5) ABS cap on PSHP screw has a temperature limit of 200° F / 93° C.
- (6) The tin deposit on type SMTSOB meets the requirements of ASTM B545, Class A and although the copper and nickel barrier layers used under the tin do not strictly comply with ASTM B545 thickness requirements they have proven effective at preventing zinc migration and providing the specified solderable shelf life.

## INSTALLATION

### KF2™/KFS2™/KFE™/KFSE™ / PFK™ FASTENERS

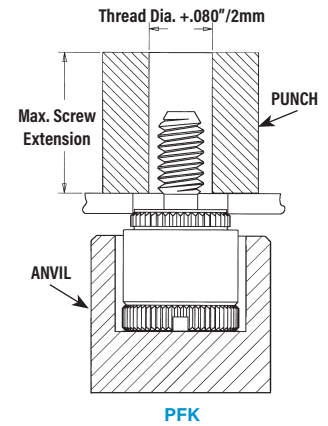
1. Prepare properly sized mounting hole in board.
2. Place fastener into the anvil hole and place the mounting hole over the shank of the fastener as shown in drawing.
3. With installation punch and anvil surfaces parallel, apply squeezing force until shoulder contacts the board.

#### PEMSERTER® Installation Tooling

| Type     | Thread Code        | Anvil Part Number | Punch Part Number |
|----------|--------------------|-------------------|-------------------|
| KFE/KFSE | 440/116 -4 to -8   | 975200846300      | 975200048         |
| KFE/KFSE | 440/116 -10 to -12 | 975200847300      |                   |
| KFE/KFSE | 440/116 -16 to -20 | 975200848300      |                   |
| KFE/KFSE | 440/116 -20 to -24 | 975200882300      |                   |
| KFE/KFSE | M3 -3 to -6        | 975200846300      |                   |
| KFE/KFSE | M3 -8 to -10       | 975200847300      |                   |
| KFE/KFSE | M3 -12 to -14      | 975201222300      |                   |
| KFE/KFSE | M3 -14 to -16      | 975200848300      |                   |
| KFE/KFSE | 632/143 -4 to -8   | 975200849300      |                   |
| KFE/KFSE | 632/143 -10 to -12 | 975200850300      |                   |
| KFE/KFSE | 632/143 -16 to -20 | 975200851300      |                   |
| KFE/KFSE | 632/143 -22 to -24 | 975200883300      |                   |
| KFE/KFSE | 632/143 -28 to -32 | 975200884300      |                   |
| KFE/KFSE | 3.6 -3 to -6       | 975200849300      | 975200048         |
| KFE/KFSE | 3.6 -8 to -10      | 975200850300      |                   |
| KFE/KFSE | 3.6 -12 to -16     | 975200851300      |                   |
| KFE/KFSE | 4.2 -2             | 975201216300      |                   |
| KFE/KFSE | 4.2 -3 to -6       | 975201217300      |                   |
| KFE/KFSE | 4.2 -8 to -10      | 975201218300      |                   |
| KFE/KFSE | 4.2 -12 to -14     | 975201220300      |                   |
| KFE/KFSE | 4.2 -14 to -16     | 975201219300      |                   |

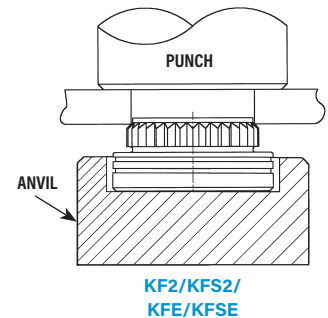
#### PEMSERTER® Installation Tooling

| Type | Thread Code | Anvil Part Number | Punch Part Number |
|------|-------------|-------------------|-------------------|
| PFK  | 440/M3      | 975200026         | 975200060         |
| PFK  | 632         | 975200027         | 975200061         |



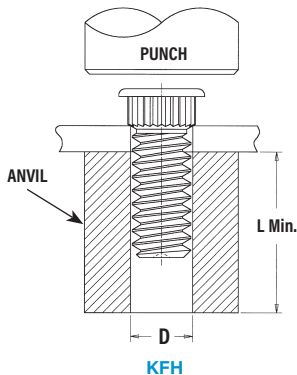
#### PEMSERTER® Installation Tooling

| Type     | Thread Code        | Anvil Part Number | Punch Part Number |
|----------|--------------------|-------------------|-------------------|
| KF2/KFS2 | 080                | 8015899           | 975200048         |
| KF2/KFS2 | 256/440/M2/M2.5/M3 | 975200904300      |                   |
| KF2/KFS2 | 632/M3.5           | 975200035         |                   |
| KF2/KFS2 | 832/M4             | 975200037         |                   |
| KF2/KFS2 | 032/M5             | 975200905300      |                   |



### KSSB™/KFH™ FASTENERS

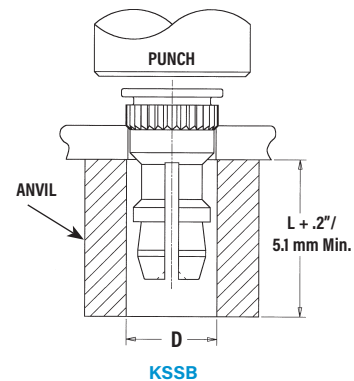
1. Prepare properly sized mounting hole in board.
2. Place fastener into mounting hole as shown.
3. With installation punch and anvil surfaces parallel, apply squeezing force until head contacts the board.



#### PEMSERTER® Installation Tooling

| Part Number | D<br>+.003" -.000" | Punch Part No. | Anvil Part No.* |
|-------------|--------------------|----------------|-----------------|
| KFH-440-L   | .113"              | 975200048      | 970200006300    |
| KFH-632-L   | .140"              |                | 970200007300    |
| KFH-832-L   | .166"              |                | 970200008300    |
| KFH-032-L   | .191"              |                | 970200009300    |

| Part Number | D<br>+0.08mm | Punch Part No. | Anvil Part No.* |
|-------------|--------------|----------------|-----------------|
| KFH-M3-L    | 3.1mm        | 975200048      | 970200229300    |
| KFH-M4-L    | 4.1mm        |                | 970200019300    |
| KFH-M5-L    | 5.1mm        |                | 970200008300    |



#### PEMSERTER® Installation Tooling

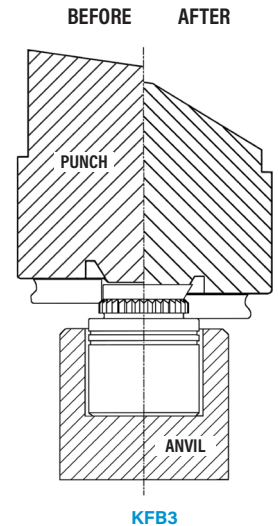
| Part Number | D<br>+.003" -.000"/<br>+0.08mm | Punch Part No. | Anvil for material<br>.050" / 1.27mm to<br>.065" / 1.65mm | Anvil for material<br>greater than<br>.065" / 1.65mm |
|-------------|--------------------------------|----------------|---|--|
| KSSB-156-L  | .216"                          | 975200048      | 8022167   | 970200015300   |
| KSSB-4mm-L  | 5.49mm                         |                |   |  |



# FASTENERS FOR USE WITH PC BOARDS

## KFB3™ FASTENERS

1. Prepare properly sized mounting hole in board.
2. Place fastener into the anvil hole and place the mounting hole over the shank of the fastener as shown in diagram to the left.
3. Using a punch flaring tool and a recessed anvil, apply squeezing force until the shoulder of the fastener contacts the board. As the fastener seats itself in the proper position, the punch tool will flare the extended portion of the shank outward to complete the installation. The combination of broaching and flaring provides high pushout performance.



## PEMSERTER® Installation Tooling<sup>(1)</sup>

| Thread Code | Length Code | Anvil        | Punch (Flaring Tool) |
|-------------|-------------|--------------|----------------------|
| #4-40       | -2          | 975201213300 | 975201231400         |
| #4-40       | -4 to -8    | 975200846300 |                      |
| #4-40       | -10 to -12  | 975200847300 |                      |
| #4-40       | -16 to -20  | 975200848300 |                      |
| #4-40       | -20 to -24  | 975200882300 |                      |
| #6-32       | -2          | 975201215300 | 975201232400         |
| #6-32       | -4 to -8    | 975200849300 |                      |
| #6-32       | -10 to -12  | 975200850300 |                      |
| #6-32       | -16 to -20  | 975200851300 |                      |
| #6-32       | -22 to -24  | 975200883300 |                      |
| #6-32       | -28 to -32  | 975200884300 |                      |

| Thread Code | Length Code | Anvil        | Punch (Flaring Tool) |
|-------------|-------------|--------------|----------------------|
| M3          | -2          | 975201213300 | 975201231400         |
| M3          | -3 to -6    | 975200846300 |                      |
| M3          | -8 to -10   | 975200847300 |                      |
| M3          | -12 to -14  | 975201222300 |                      |
| M3          | -14 to -16  | 975200848300 |                      |
| M4          | -2          | 975201216300 | 975201221400         |
| M4          | -3 to -6    | 975201217300 |                      |
| M4          | -8 to -10   | 975201218300 |                      |
| M4          | -12 to -14  | 975201220300 |                      |
| M4          | -14 to -16  | 975201219300 |                      |

(1) PennEngineering manufactures and stocks the installation tooling for KFB3 fasteners.

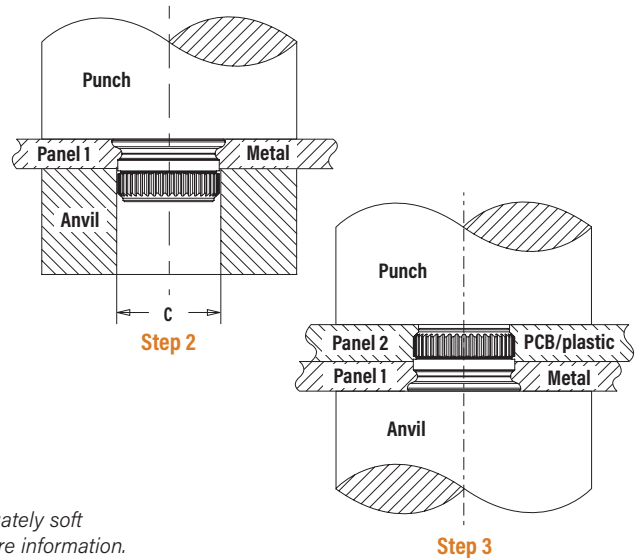
## SFK™ FASTENERS

- Step 1.** Prepare properly sized mounting hole in both panels.
- Step 2.** Using only Panel 1, with the punch and anvil surfaces parallel, apply squeezing force until the fastener is flush with the top of Panel 1.
- Step 3.** Place Panel 2 over fastener and apply squeezing force.

## PEMSERTER® Installation Tooling<sup>(1)</sup>

| Size  | C<br>±0.13/±.003<br>(mm) / (in.) | Punch<br>Part No. | Anvil<br>Part No.* |
|-------|----------------------------------|-------------------|--------------------|
| SFK-3 | 3.05 / .120                      | 975200048         | 970200229300       |
| SFK-5 | 5.05 / .199                      | 975200048         | 970200020300       |

\* Part number for anvil used in Step 2



**NOTE:** Fastener can be installed in both sheets at once when metal panel is adequately soft compared to the non-metal panel. E-mail [techsupport@pemnet.com](mailto:techsupport@pemnet.com) for more information.

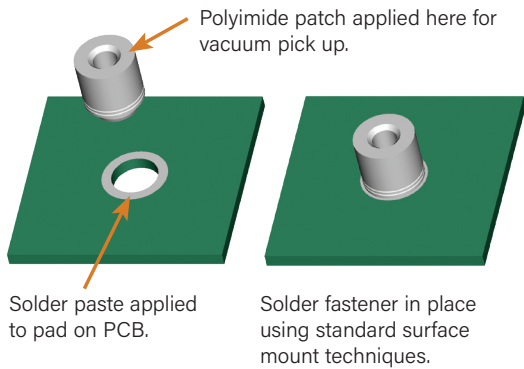
### INSTALLATION NOTES

- For best results we recommend using a Haeger® or PEMSERTER® machine for installation of PEM® self-clinching fasteners. Please check our website for more information.
- Visit the Animation Library on our website to view the installation process [for select products](#).

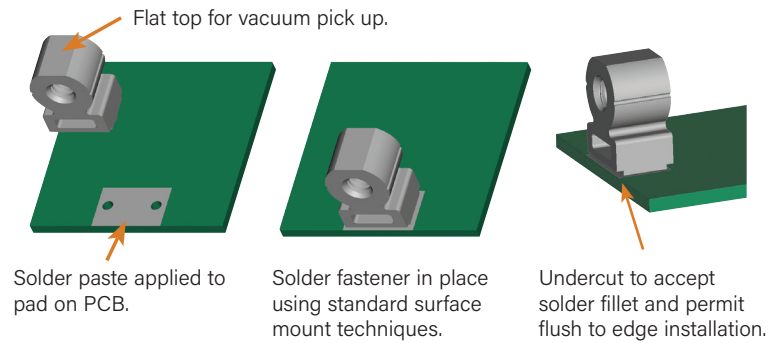


## INSTALLATION

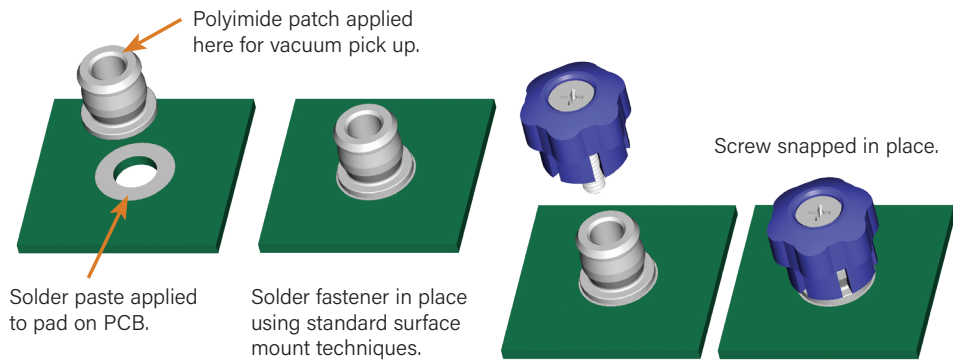
### SMTSO™ NUTS AND STANDOFFS



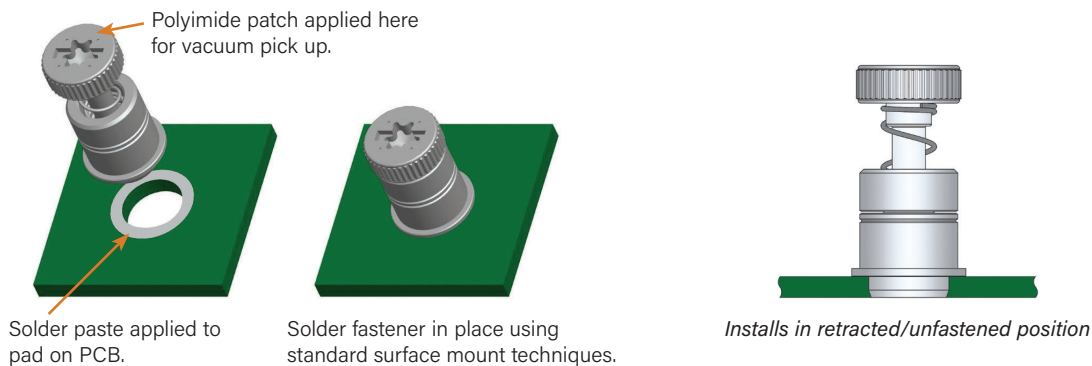
### SMTRA™ R'ANGLE® FASTENERS



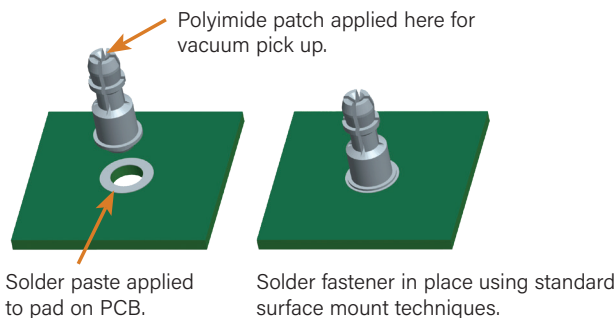
### SMTPF™ CAPTIVE PANEL SCREWS



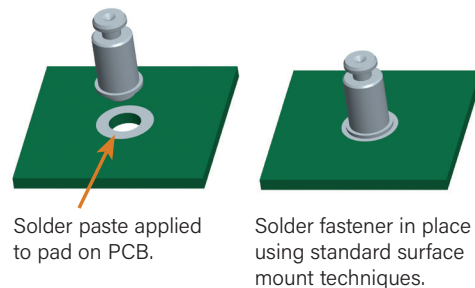
### SMTPLSM™ CAPTIVE PANEL SCREWS



### SMTSS™ STANDOFFS



### SMTSK™ STANDOFFS



# FASTENERS FOR USE WITH PC BOARDS

## PERFORMANCE DATA<sup>(1)</sup>

### KF2™/KFS2™/KFE™/KFSE™/KFB3™/KFH™/PFK™ BROACHING AND BROACH/FLARE MOUNT FASTENERS

| UNIFIED | Type                   | Thread Code | Max. Nut Tightening Torque (in. lbs.) | Test Sheet Thickness & Test Sheet Material | Installation (lbs.) | Pushout <sup>(2)</sup> (lbs.) | Torque-out (in. lbs.) |
|---------|------------------------|-------------|---------------------------------------|--|---------------------|-------------------------------|-----------------------|
|         | KF2, KFS2<br>KFE, KFSE | 256         | (3)                                   | .060" FR-4 Panel                           | 400                 | 60                            | 6                     |
|         |                        | 440         | (3)                                   | .060" FR-4 Panel                           | 400                 | 65                            | 15                    |
|         |                        | 632         | (3)                                   | .060" FR-4 Panel                           | 500                 | 80                            | 30                    |
|         |                        | 832         | (3)                                   | .060" FR-4 Panel                           | 700                 | 95                            | 35                    |
|         |                        | 032         | (3)                                   | .060" FR-4 Panel                           | 700                 | 100                           | 40                    |
|         | KFB3                   | 440         | (3)                                   | .060" FR-4 Panel                           | 1,000               | 140                           | 18                    |
|         |                        | 632         | (3)                                   | .060" FR-4 Panel                           | 1,500               | 170                           | 28                    |
|         | KFH                    | 440         | 4                                     | .060" FR-4 Panel                           | 400                 | 65                            | 7                     |
|         |                        | 632         | 8                                     | .060" FR-4 Panel                           | 400                 | 70                            | 11                    |
| 832     |                        | 15          | .060" FR-4 Panel                      | 400  | 80                  | 16                            |                       |
| 032     |                        | 18          | .060" FR-4 Panel                      | 400  | 90                  | 17                            |                       |
| PFK     | 440                    | (3)         | .060" FR-4 Panel                      | 250  | 55                  | (3)                           |                       |
|         | 632                    | (3)         | .060" FR-4 Panel                      | 400  | 60                  | (3)                           |                       |

| METRIC | Type                   | Thread Code | Max. Nut Tightening Torque (N-m) | Test Sheet Thickness & Test Sheet Material | Installation (kN) | Pushout <sup>(2)</sup> (N) | Torque-out (N-m) |
|--------|------------------------|-------------|----------------------------------|--|-------------------|----------------------------|------------------|
|        | KF2, KFS2<br>KFE, KFSE | M2          | (3)                              | 1.5 mm FR-4 Panel                          | 2.2               | 267                        | 0.68             |
|        |                        | M3          | (3)                              | 1.5 mm FR-4 Panel                          | 2.2               | 290                        | 1.7              |
|        |                        | M4          | (3)                              | 1.5 mm FR-4 Panel                          | 2.2               | 420                        | 3.4              |
|        |                        | M5          | (3)                              | 1.5 mm FR-4 Panel                          | 2.9               | 440                        | 4.5              |
|        | KFB3                   | M3          | (3)                              | 1.5 mm FR-4 Panel                          | 4.4               | 560                        | 2.03             |
|        |                        | M4          | (3)                              | 1.5 mm FR-4 Panel                          | 6                 | 680                        | 3.2              |
|        | KFH                    | M3          | 0.45                             | 1.5 mm FR-4 Panel                          | 1.8               | 285                        | 0.79             |
|        |                        | M4          | 1.6                              | 1.5 mm FR-4 Panel                          | 1.8               | 355                        | 1.8              |
|        |                        | M5          | 2.1                              | 1.5 mm FR-4 Panel                          | 1.8               | 400                        | 1.92             |
| PFK    | M3                     | (3)         | 1.5 mm FR-4 Panel                | 1.1  | 245               | (3)                        |                  |

### KSSB™ BROACHING SNAP-TOP® STANDOFFS

| UNIFIED | Type | Panel 1 (.060" FR-4 Fiberglass) <sup>(4)</sup> |                | Panel 2 (Removable) <sup>(4)</sup> |                             |                            |
|---------|------|--|----------------|------------------------------------|-----------------------------|----------------------------|
|         |      | Installation (lbs.)                            | Pushout (lbs.) | Max. First On Force (lbs.)         | Min. First Off Force (lbs.) | Min. 15th Off Force (lbs.) |
|         | KSSB | 500  | 110            | 13                                 | 3.0                         | 1.0                        |

| METRIC | Type | Panel 1 (1.5 mm FR-4 Fiberglass) <sup>(4)</sup> |             | Panel 2 (Removable) <sup>(4)</sup> |                          |                         |
|--------|------|---|-------------|------------------------------------|--------------------------|-------------------------|
|        |      | Installation (kN)                               | Pushout (N) | Max. First On Force (N)            | Min. First Off Force (N) | Min. 15th Off Force (N) |
|        | KSSB | 2.2   | 484         | 57.7                               | 13.3                     | 4.4                     |

(1) Published installation forces are for general reference. Actual set-up and confirmation of complete installation should be made by observing proper seating of fastener as described in the installation steps. Other performance values reported are averages when all proper installation parameters and procedures are followed. Variations in mounting hole size, sheet material, and installation procedure may affect performance. Performance testing this product in your application is recommended. We will be happy to provide technical assistance and/or samples for this purpose.

(2) These are typical values for parts installed in drilled mounting holes. Punched mounting holes yield values approximately 15% less.

(3) Not applicable.

(4) See Application Data drawing on page 8.



# FASTENERS FOR USE WITH PC BOARDS

## SFK™ SpotFast® CLINCH/BROACH MOUNT FASTENERS

| Type and Size | Thick-ness Code | Installation into Panel 1 |      | Installation into Panel 2 |      | Pushout of Panel 2 <sup>(3)</sup> |      |
|---------------|-----------------|---------------------------|------|---------------------------|------|-----------------------------------|------|
|               |                 | Cold-rolled Steel         |      | FR-4 Fiberglass           |      |                                   |      |
|               |                 | kN                        | lbs. | kN                        | lbs. | N                                 | lbs. |
| SFK-3         | 0.8             | 6.2                       | 1400 | 1.8                       | 400  | 200                               | 45   |
| SFK-3         | 1.0             | 8                         | 1800 | 1.8                       | 400  | 200                               | 45   |
| SFK-3         | 1.2             | 8.9                       | 2000 | 1.8                       | 400  | 200                               | 45   |
| SFK-3         | 1.6             | 10.2                      | 2300 | 1.8                       | 400  | 200                               | 45   |
| SFK-5         | 0.8             | 11.1                      | 2500 | 1.8                       | 400  | 400                               | 90   |
| SFK-5         | 1.0             | 13.5                      | 3000 | 1.8                       | 400  | 400                               | 90   |
| SFK-5         | 1.2             | 15.6                      | 3500 | 1.8                       | 400  | 400                               | 90   |
| SFK-5         | 1.6             | 17.8                      | 4000 | 1.8                       | 400  | 400                               | 90   |

## SMTSO™/SMTSOB™ FASTENERS<sup>(1)(2)</sup>

| Type   | Thread/Thru-hole Code | Test Sheet Material - .062" Single Layer FR-4 |             |                       |                  | Rated Current Amps <sup>(6)</sup> |
|--------|-----------------------|---|-------------|-----------------------|------------------|-----------------------------------|
|        |                       | Pushout (lbs.)                                | Pushout (N) | Torque-out (in. lbs.) | Torque-out (N-m) |                                   |
| SMTSO  | 080                   | 85.1  | 378.7       | 4.94                  | 0.56             | 11                                |
| SMTSOB |                       |   |             |                       |                  | —                                 |
| SMTSO  | 256                   | 56.5  | 251         | 8.56                  | 1                | 25                                |
| SMTSOB |                       |   |             |                       |                  | 40                                |
| SMTSO  | 440                   | 56.5  | 251         | 8.56                  | 1                | 22                                |
| SMTSOB |                       |   |             |                       |                  | 36                                |
| SMTSO  | 632                   | 93.5  | 416         | 13.83                 | 1.6              | 34                                |
| SMTSOB |                       |   |             |                       |                  | 55                                |
| SMTSO  | 832                   | 151.1   | 672         | 26.96                 | 3                | 47                                |
| SMTSOB |                       |   |             |                       |                  | 76                                |
| SMTSO  | 116                   | —   | —           | —                     | —                | 22                                |
| SMTSOB |                       |   |             |                       |                  | 37                                |
| SMTSO  | 143                   | —   | —           | —                     | —                | 33                                |
| SMTSOB |                       |   |             |                       |                  | 55                                |
| SMTSO  | M1                    | 85.1  | 378.7       | 4.94                  | 0.56             | 11                                |
| SMTSOB |                       |   |             |                       |                  | —                                 |
| SMTSO  | M1.2                  | 85.1  | 378.7       | 4.94                  | 0.56             | 10                                |
| SMTSOB |                       |   |             |                       |                  | —                                 |
| SMTSO  | M1.4                  | 85.1  | 378.7       | 4.94                  | 0.56             | 10                                |
| SMTSOB |                       |   |             |                       |                  | —                                 |
| SMTSO  | M1.6                  | 85.1  | 378.7       | 4.94                  | 0.56             | 10                                |
| SMTSOB |                       |   |             |                       |                  | —                                 |
| SMTSO  | M3                    | 56.5  | 251         | 8.56                  | 1                | 22                                |
| SMTSOB |                       |   |             |                       |                  | 36                                |
| SMTSO  | M3.5                  | 93.5  | 416         | 13.83                 | 1.6              | 34                                |
| SMTSOB |                       |   |             |                       |                  | 55                                |
| SMTSO  | M4                    | 151.1   | 672         | 26.96                 | 3                | 47                                |
| SMTSOB |                       |   |             |                       |                  | 76                                |
| SMTSO  | 3.1                   | —   | —           | —                     | —                | 22                                |
| SMTSOB |                       |   |             |                       |                  | 36                                |
| SMTSO  | 3.6                   | —   | —           | —                     | —                | 33                                |
| SMTSOB |                       |   |             |                       |                  | 55                                |
| SMTSO  | 4.2                   | —   | —           | —                     | —                | 46                                |
| SMTSOB |                       |   |             |                       |                  | 75                                |

## TESTING CONDITIONS FOR SURFACE MOUNTED FASTENERS

**Oven** Quad ZCR convection oven w/ 4 zones  
**High Temp** 473° F / 245° C  
**Board Finish** 62% Sn, 38% Pb  
**Screen Printer** Ragin Manual Printer  
**Vias** None

**Spokes** 2 Spoke Pattern  
**Paste** Amtech NC559LF Sn96.5/3.0Ag/0.5Cu (SAC305) (SMTSO, SMTRA, SMTPR)  
 Alpha CVP-390 Sn96.5/3.0Ag/0.5Cu (SAC305) (SMTPLFSM, SMTSS, SMTSK)  
**Stencil** .0067" / 0.17 mm thick (SMTSO, SMTRA, SMTPR, SMTSS, SMTSK)  
 .005" / 0.13 mm thick (SMTPLFSM)

- (1) With lead-free paste. Average values of 30 test points. The data presented here is for general comparison purposes only. Actual performance is dependent upon application variables. We will be happy to provide samples for you to install. If required, we can also test your installed hardware and provide you with the performance data specific to your application.
- (2) Further testing details can be found in our website's literature section.
- (3) In most applications, pullout strength of the SFK fastener in Panel 1 exceeds pushout strength of Panel 2.
- (4) Torque values shown will produce a preload of 70% minimum tensile with a nut factor "k" equal to .1.
- (5) Failure occurred at the solder joint. Screw retention strength is greater than the retainer.
- (6) The maximum carrying current for each of the above fasteners is calculated based on a heat transfer coefficient of 20 W/m<sup>2</sup> °K and a maximum temperature rise of 15°C / 27°F above ambient.

## SMTSS™ ReelFast® SNAP-TOP® STANDOFFS<sup>(1)(2)</sup>

| Type, Material and Size | Panel 1 (Bottom)          |                         | Panel 2 (Top)      |
|-------------------------|---------------------------|-------------------------|--------------------|
|                         | Test Sheet Material       | Pushout                 | Max. Snap-on Force |
|                         | SMTSS-156                 | .062" Single Layer FR-4 | 113 lbs.           |
| SMTSS-4MM               | 1.58 mm Single Layer FR-4 | 500 N                   | 89 N               |

## SMTSK™ KEYHOLE® STANDOFFS<sup>(1)(2)</sup>

| Type and Size | Panel 1 (Bottom)          |                         |
|---------------|---------------------------|-------------------------|
|               | Test Sheet Material       | Pushout                 |
|               | SMTSK-6060                | .062" Single Layer FR-4 |
| SMTSK-61.5    | 1.58 mm Single Layer FR-4 | 500 N                   |

## SMTRA™ R'ANGLE® FASTENERS<sup>(1)(2)</sup>

| UNIFIED       | Part Number  | Test Sheet Material - .062" Single Layer FR-4 |                  |
|---------------|--------------|---|------------------|
|               |              | Pushout (lbs.)                                | Side Load (lbs.) |
|               | SMTRA256-8-6 | 51.7  | 71               |
| SMTRA440-9-6  | 89.5         | 10.8  |                  |
| SMTRA632-10-8 | 110.3        | 8.4   |                  |
| SMTRA832-12-9 | 137.2        | 21.2  |                  |

| METRIC       | Part Number | Test Sheet Material - 1.58 mm Single Layer FR-4 |               |
|--------------|-------------|---|---------------|
|              |             | Pushout (N)                                     | Side Load (N) |
|              | SMTRAM2-6-5 | 418.2   | 56.8          |
| SMTRAM25-6-5 | 216.5       | 36.9  |               |
| SMTRAM3-7-5  | 257.6       | 41.3  |               |
| SMTRAM4-9-7  | 369.3       | 73.3  |               |

## SMTPLFSM™ FASTENERS<sup>(1)</sup>

| UNIFIED      | Type and Thread Size | Min. Tensile Strength (lbs.) | Rec. Tightening Torque (in. lbs.) <sup>(4)</sup> | Test Sheet Material |                                |
|--------------|----------------------|------------------------------|--|---------------------|--------------------------------|
|              |                      |                              |  | .060" P.C. Board    | Pull-off (lbs.) <sup>(5)</sup> |
|              | SMTPLFSM-440         | 556                          | 4.4  | 100                 |                                |
| SMTPLFSM-632 | 724                  | 7.0                          | 105  |                     |                                |

| METRIC        | Type and Thread Size | Min. Tensile Strength (N) | Rec. Tightening Torque (N-m) <sup>(4)</sup> | Test Sheet Material |                             |
|---------------|----------------------|---------------------------|---|---------------------|-----------------------------|
|               |                      |                           |   | 1.5 mm P.C. Board   | Pull-off (N) <sup>(5)</sup> |
|               | SMTPLFSM-M3          | 2900                      | 0.61  | 445                 |                             |
| SMTPLFSM-M3.5 | 3269                 | 0.8                       | 465   |                     |                             |

## SMTPR™ RETAINERS<sup>(1)</sup>

| Part Number | Test Sheet Material - .062" Single Layer FR-4 |             |
|-------------|---|-------------|
|             | Pushout (lbs.)                                | Pushout (N) |
| SMTPR-6-1ET | 161.4   | 718         |

## OTHER FASTENERS FOR CONSIDERATION TO USE WITH PC BOARDS

### PF11MW™ FLOATING CAPTIVE PANEL SCREWS

(See PEM® Bulletin PF)

Unique flare mount feature allow fasteners to “float” in mounting hole.

- Compensates for mating thread misalignment.
- Installs into any panel material.
- Appropriate for close center-line-to-edge applications.
- Color coded knobs available.



Can install into PC Board, plastic or metal

### PF11MF™ FLARE-MOUNTED CAPTIVE PANEL SCREWS

(See PEM® Bulletin PF)

- Appropriate for close centerline-to-edge applications.
- Doesn't require high installation force.
- Installs into any panel material.
- Installs flush on back side of panel.
- Color coded knobs available.

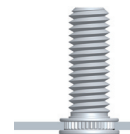


Can install into PC Board, plastic or metal

### SGPC™ SWAGING COLLAR STUDS

(See PEM® Bulletin FH)

- Can be installed into most materials, including stainless steel and rigid non-metallic panels.
- Can be used to attach dissimilar materials.
- Can accommodate multiple panels as long as the total thickness does not exceed the maximum sheet thickness.
- Appropriate for close center-line-to-edge applications.

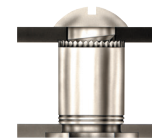


Can install into PC Board, plastic or metal

### SOAG™/SOSG™ GROUNDING STANDOFFS

(See PEM® Bulletin SO)

- Designed for clinching into steel or aluminum chassis.
- “Gripping teeth” on opposite side of standoff makes firm electrical contact with mating PC Board.



PC Board plastic or metal  
Metal

### SKC™ KEYHOLE® STANDOFFS

(See PEM® Bulletin SK)

- Clinch feature mounts fastener permanently into metal sheet.
- Allows for quick attachment and detachment of PC Board.
- Head is flush or sub-flush in metal sheet.
- Makes horizontal or vertical component mounting possible.



PC Board plastic or metal  
Metal

### SSA™/SSC™/SSS™ SNAP-TOP® STANDOFFS

(See PEM® Bulletin SSA)

- Spring action holds PC Boards and subassemblies securely, while allowing for quick removal.
- Screws and other threaded hardware are eliminated.



PC Board plastic or metal  
Metal

For more information on these and other PEM products, visit our PEMNET™ Resource Center at [www.pemnet.com](http://www.pemnet.com)





All PEM® products meet our stringent quality standards. If you require additional industry or other specific [quality certifications](#), special procedures and/or part numbers are required. Please contact your local sales office or representative for further information.

Regulatory [compliance information](#) is available in Technical Support section of our website. Specifications subject to change without notice. See our website for the most current version of this bulletin.

**PennEngineering®**



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