

PennEngineering®

FASTENERS FOR USE
WITH PC BOARDS



BULLETIN

K



107
REV. 509A

FASTENERS FOR USE WITH PC BOARDS

Can satisfy component-to-board, board-to-board, and board-to-chassis production fastening needs using less attachment hardware.

BROACHING FASTENERS

PEM broaching fasteners can be utilized with all types of PC boards, as well as with aluminum, acrylic, and polycarbonate components. They install simply, quickly, and permanently for secure and reliable attachment. Their use eliminates the need for washers, lock washers, nuts, and other excess hardware.

The PEM family of broaching fasteners includes broaching nuts (Types KF2 and KFS2) with permanent threads for board mounting or component attachment; threaded or unthreaded standoffs (Types KFE and KFSE) for stacking or spacing and flare mounted standoffs (Type KFB3) for greater pullout performance; threaded studs (Type KFH) for use as solderable connectors or as permanently mounted mechanical fasteners with external threads; all-metal standoffs (Type KSSB) featuring a spring action to hold a PC board securely without screws or threaded hardware; self-expanding FOILGARD® fasteners (Type KPS6) used in plated thru-holes in multi-layer PC Boards; and one-piece board-mount screw assemblies (Type PFK) with captive screws for easy mounting and removal of PC boards.

GROUNDING STANDOFFS

Grounding standoffs (Types SOAG and SOSG) are designed for clinching into steel or aluminum chassis. The opposite end of the standoff has “gripping teeth” to firmly contact mating PC board.

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BROACHING FASTENERS

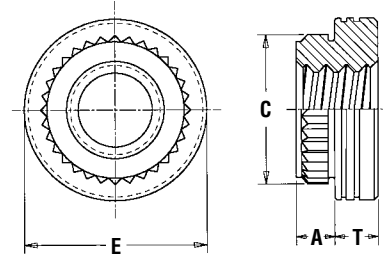
TYPES KF2 AND KFS2 BROACHING NUTS



PART NUMBER DESIGNATION

KF2 - 832 - ET

↓ ↓ ↓
 Type and Thread Finish
 Material Size Code
 KF = carbon steel Code
 KFS = stainless steel



All dimensions are in inches.

UNIFIED	Thread Size	Type		Thread Code	A (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +.003 - .000 (1)	C ±.003	E ±.005	T ±.005	Min. Dist. Hole C/L To Edge
		Carbon Steel	Stainless Steel								
	.086-56 (#2-56)	KF2	KFS2	256	.060	.060	.147	.165	.219	.065	0.16
	.112-40 (#4-40)	KF2	KFS2	440	.060	.060	.166	.184	.219	.065	0.17
	.138-32 (#6-32)	KF2	KFS2	632	.060	.060	.213	.231	.281	.065	0.22
	.164-32 (#8-32)	KF2	KFS2	832	.060	.060	.250	.268	.344	.096	0.25
	.190-32 (#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 (Shank) Max.	Min. Sheet Thickness	Hole Size In Sheet +0.08 (1)	C ±0.08	E ±0.13	T ±0.13	Min. Dist. Hole C/L 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	6.86	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

(1) Types KF2 and KFS2 are designed for unplated thru-hole applications. When used in plated thru-hole applications, a tolerance of +.005" -.001"/+0.13mm -0.03mm should be used. However, performance values may be reduced and knurl may damage plating. We recommend using Type KPS6 for plated thru-hole applications.

BROACHING FASTENERS

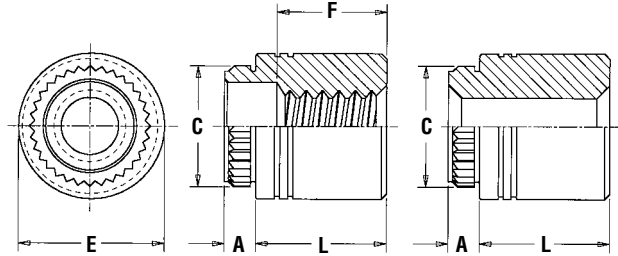
TYPES KFE AND KFSE BROACHING STANDOFFS



PART NUMBER DESIGNATION

KFE - 632 - 12 ET

↓ ↓ ↓ ↓
Type and Thread Length Finish
Material or Thru Code Code
KFE = carbon steel Hole
KFSE = stainless steel Code



All dimensions are in inches.

UNIFIED	Thread Size	Thru Hole +.004 -.003	Type		Thread or Thru Hole Code	Length "L" ±.005 (Length Code is in 32nds of an inch)								A (Shank) Max.	Min. Sheet Thick- ness	Hole Size In Sheet +.003 - .000 (1)	C ±.003	E ±.005	Min. Dist. Hole C/L To Edge
			Carbon Steel	Stainless Steel		.125	.250	.375	.500	.625	.750	.875	1.00						
	.112-40 (#4-40)	(3)	KFE	KFSE	440	4	8	12	16	20	24 ^{NS}	NA	NA	.060	.060	.166	.184	.219	.17
	.138-32 (#6-32)	(3)	KFE	KFSE	632	4	8	12	16	20	24 ^{NS}	28 ^{NS}	32 ^{NS}	.060	.060	.213	.231	.281	.22
	(3)	.116	KFE	KFSE	116	4	8	12	16	20	24 ^{NS}	NA	NA	.060	.060	.166	.184	.219	.17
	(3)	.143	KFE	KFSE	143	4	8	12	16	20	24 ^{NS}	28 ^{NS}	32 ^{NS}	.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 +0.10 -0.08	Type		Thread or Thru Hole Code	Length "L" ±0.13 (Length Code is in millimeters)								A (Shank) Max.	Min. Sheet Thick- ness	Hole Size In Sheet +0.08 (1)	C ±0.08	E ±0.13	Min. Dist. Hole C/L To Edge
			Carbon Steel	Stainless Steel															
	M3 x 0.5	(3)	KFE	KFSE	M3	3	4	6	8	10	12	14	16 ^{NS}	1.53	1.53	4.22	4.68	5.56	4.4
	(3)	3.6	KFE	KFSE	3.6	3	4	6 ^{NS}	8 ^{NS}	10 ^{NS}	12 ^{NS}	14 ^{NS}	16 ^{NS}	1.53	1.53	5.41	5.87	7.14	5.5
	(3)	4.2	KFE	KFSE	4.2 ^{NS}	3	4	6	8	10	12	14	16	1.53	1.53	6.4	6.86	8.74	7.1
"F" Minimum Thread Length (Where Applicable)						Full				9.5 ± 0.4									

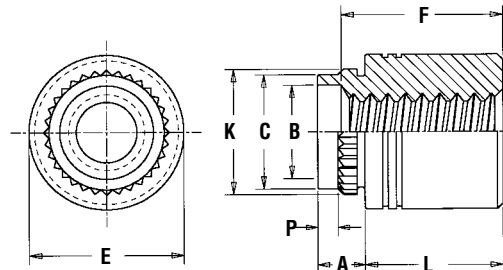
TYPE KFB3 FLARE-MOUNTED STANDOFFS



PART NUMBER DESIGNATION

KFB3 - 632 - 12 ET

↓ ↓ ↓ ↓
Type and Thread Length Finish
Material Code Code Code



All dimensions are in inches.

UNIFIED	Thread Size	Type	Thread Code	Length "L" ±.005 (Length Code is in 32nds of an inch)										A (Shank) Max.	Sheet Thickness	Hole Size in Sheet +.005 -.001 (1)	B ±.003	C Max.	E ±.005	K ±.003	P ±.010	Min. Dist. Hole C/L To Edge
				.062	.125	.187	.250	.312	.375	.500	.625	(2) .750	(2) 1.00									
	.112-40 (#4-40)	KFB3	440	2	4	6	8	10	12	16	20 ^{NS}	NA	NA	.09	.050-.065	.166	.122	.165	.220	.179	.040	.17
	.138-32 (#6-32)	KFB3	632	2	4	6	8	10	12	16	20 ^{NS}	24	32	.09	.050-.065	.213	.171	.212	.280	.226	.040	.22
	"F" Min. Thread Length			Full								.375 Blind										

All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type	Thread Code	Length "L" ±0.13 (Length Code is in millimeters)								A (Shank) Max.	Sheet Thickness	Hole Size in Sheet +0.13 -0.03 (1)	B ±0.08	C Max.	E ±0.13	K ±0.08	P ±0.25	Min. Dist. Hole C/L To Edge	
	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			Full						9.5 ±0.4											

(1) Types KFE, KFSE, and KFB3 are designed for unplated thru-hole applications. When used in plated thru-hole applications, a tolerance of +.005" - .001"/+0.13mm - 0.03mm should be used. However, performance values may be reduced and knurl may damage plating. We recommend using Type KPS6 for plated thru-hole applications.

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

(3) Not applicable. NA - Not Available.

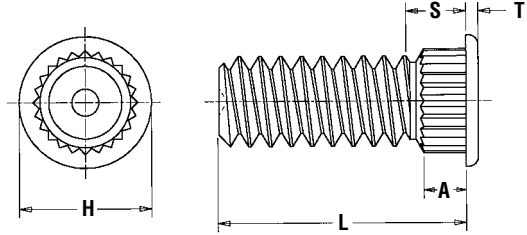
NS - Not Stocked. Available on special order.

BROACHING FASTENERS

TYPE KFH BROACHING STUDS



PART NUMBER DESIGNATION
KFH - 632 - 8 ET
 ↓ ↓ ↓ ↓
 Type and Material Thread Code Length Code Finish Code



All dimensions are in inches.

UNIFIED

Thread Size	Type	Thread Code	Length "L" ±.010 (Length Code is in 16ths of an inch)						A (Shank) Max.	Min. Sheet Thickness	Hole Size in Sheet +.003 −.000 (1)	Max. Hole Size in Attached Parts	H ±.010	S Max.	T ±.005	Min. Dist. Hole C/L To Edge	D Anvil Hole +.003 −.000
			.250	.312	.375	.500	.625	.750									
.112-40 (#4-40)	KFH	440	4	5	6	8	10	12	.065	.060	.120	.145	.180	.09	.020	.15	.113
.138-32 (#6-32)	KFH	632	4	5	6	8	10	12	.065	.060	.140	.170	.200	.09	.020	.19	.140
.164-32 (#8-32)	KFH	832	4 ^{NS}	5 ^{NS}	6	8	10	12	.065	.060	.166	.195	.225	.09	.020	.20	.166
.190-32 (#10-32)	KFH	032	4 ^{NS}	5 ^{NS}	6	8	10	12	.065	.060	.189	.220	.250	.09	.020	.20	.191

All dimensions are in millimeters.

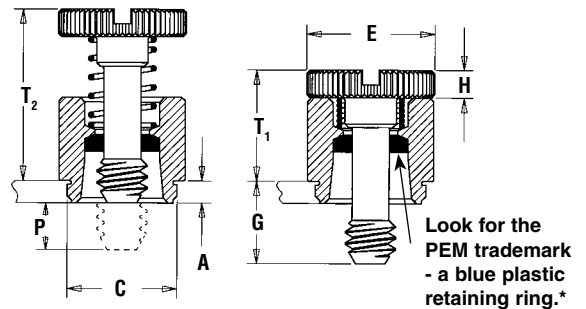
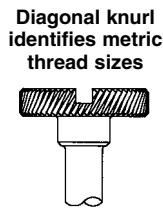
METRIC	Thread Size x Pitch	Type	Thread Code	Length "L" ±0.25 (Length Code is in millimeters)						A (Shank) Max.	Min. Sheet Thickness	Hole Size in Sheet +0.08 (1)	Max. Hole Size in Attached Parts	H ±0.25	S Max.	T ±0.13	Min. Dist. Hole C/L To Edge	D Anvil Hole +0.08
	M3 x 0.5	KFH	M3	6	8	10	12	15	18	1.65	1.53	3	3.7	4.58	2.3	0.51	3.8	3.1
	M4 x 0.7	KFH	M4	6 ^{NS}	8	10	12	15	18	1.65	1.53	4.2	4.8	5.74	2.3	0.51	5.1	4.1
	M5 x 0.8	KFH	M5	6 ^{NS}	8 ^{NS}	10 ^{NS}	12 ^{NS}	15	18	1.65	1.53	5	5.8	6.6	2.3	0.51	5.3	5.1

(1) Type KFH studs are designed for unplated thru-hole applications. When used in plated thru-hole applications, a tolerance of +.005" -.001" / +0.13mm -0.03mm should be used. However, performance values may be reduced and knurl may damage plating.
 NA - Not Available. NS - Not Stocked. Available on special order.

TYPES PFK BOARD-MOUNT PANEL FASTENER ASSEMBLIES



PART NUMBER DESIGNATION
PFK - 632 - 62
 ↓ ↓ ↓
 Type and Material 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 +.015 - .005	G ±.016	H ±.005	P Nom. (2)	T ₁ Max.	T ₂ Nom.	Min. Dist. Hole C/L To Edge	D Anvil Hole +.003 - .000
	.112-40 (#4-40)	PFK	440	40	.060	.060	.265	.283	.310	.250	.072	.000	.36	.54	.20	.173
				62 ^{NS}						.375		.125				
				84 ^{NS}						.500		.250				
	.138-32 (#6-32)	PFK	632	40	.060	.060	.281	.299	.340	.250	.072	.000	.36	.54	.26	.190
				62						.375		.125				
				84 ^{NS}						.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 +0.4 -0.13	G ±0.4	H ±0.13	P Nom. (2)	T ₁ Max.	T ₂ Nom.	Min. Dist. Hole C/L To Edge	D Anvil Hole +0.08
	M3 x 0.5	PFK	M3	40	1.53	1.53	6.75	7.19	7.87	6.4	1.83	0	9.15	13.72	5.1	4.5
				62 ^{NS}						9.5		3.2				
				84 ^{NS}						12.7		6.4				

*Retaining rings are plastic with normal 250°F / 120°C temperature limit. (2) Screw may protrude .005"/0.13mm beyond nominal dimensions.

BROACHING FASTENERS

TYPE KSSB BROACHING SNAP-TOP® STANDOFFS

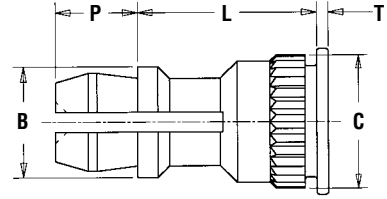
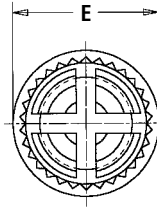


PART NUMBER DESIGNATION

KSSB - 156 - 12

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Type and Top Board Screw
Material Mounting Length
 Hole Code
 Diameter Code



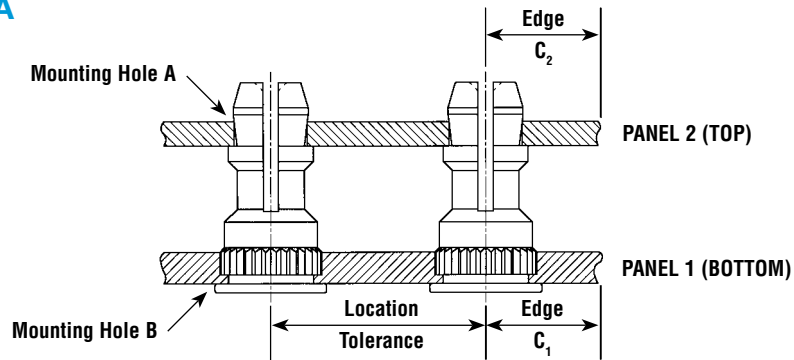
All dimensions are in inches.

UNIFIED	Type	Top Board Mounting Hole Diameter Code	Length "L" $\pm .005$ (Length Code is in 32nds of an inch)										B $\pm .005$	C $\pm .003$	E $\pm .005$	P $\pm .005$	T $\pm .005$	D Anvil Hole $+.003 - .000$
			.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	.216

All dimensions are in millimeters.

METRIC	Type	Top Board Mounting Hole Diameter Code	Length "L" ± 0.13 (Length Code is in millimeters)										B ± 0.13	C ± 0.08	E ± 0.13	P ± 0.13	T ± 0.13	D Anvil Hole $+0.08$
	KSSB	4mm	8	10	12	14	16	18	20	22	25		4.8	5.74	6.35	3.58	0.51	5.49

TYPE KSSB APPLICATION DATA



All dimensions are in inches.

UNIFIED	Type	PANEL 1 (Bottom)					PANEL 2 (Top)				
		Bottom Mounting Hole B +.003 –.000	Material	Hardness Max.	Thickness Min.	Edge Distance C ₁ Min.	Location Tolerance Max.	Top Mounting Hole A +.003 –.000	Material	Hardness Max.	Thickness Range
	KSSB	.213	PC Board	HRB 65	.050	.220	±.005	.156	PC Board or Metal	No Limit	.040 - .070

All dimensions are in millimeters.

METRIC	Type	PANEL 1 (Bottom)					PANEL 2 (Top)				
		Bottom Mounting Hole B +0.08	Material	Hardness Max.	Thickness Min.	Edge Distance C ₁ Min.	Location Tolerance Max.	Top Mounting Hole A +0.08	Material	Hardness Max.	Thickness Range
	KSSB	5.4	PC Board	HRB 65	1.25	5.6	±0.13	4	PC Board or Metal	No Limit	1 - 1.8

BROACHING FASTENERS

TYPE KPS6 SELF-EXPANDING, FOILGARD® FASTENERS (For plated thru-holes)



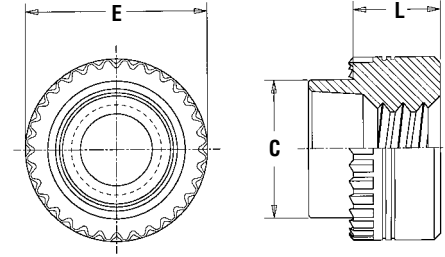
PART NUMBER DESIGNATION

KPS6 – **440** – **12**

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Type and Thread Length

Material Code Code



All dimensions are in inches.

UNIFIED	Thread Size	Type	Thread Code	Length "L" ±.005 (Length Code is in 32nds of an inch)				Board Thickness (1)	Plated Hole Size In Board +.004 – .003	C Max.	E ±.005
				.125	.250	.375	.500				
	.112-40 (#4-40)	KPS6	440	4	8	12	16	.056 - .065	.166	.163	.219
	.138-32 (#6-32)	KPS6	632	4	8	12	16	.056 - .065	.213	.210	.281
	.164-32 (#8-32)	KPS6	832	4	8	12	16	.056 - .065	.250	.247	.344
	.190-32 (#10-32)	KPS6	032	4	8	12	16	.056 - .065	.272	.269	.375

All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type	Thread Code	Length "L" ±0.13 (Length Code is in millimeters)						Board Thickness (1)	Plated Hole Size In Board +0.1 – 0.08	C Max.	E ±0.13
				3	4	6	8	10	12				
	M3 x 0.5	KPS6	M3	3	4	6	8	10	12	1.42 - 1.65	4.22	4.14	5.56
	M4 x 0.7	KPS6	M4	3	4	6	8	10	12	1.42 - 1.65	6.4	6.32	8.74
	M5 x 0.8	KPS6	M5	3	4	6	8	10	12	1.42 - 1.65	6.91	6.84	9.52

(1) Fasteners for other board thicknesses available on special order.

MATERIAL AND FINISH SPECIFICATIONS

Type	Threads (1)		Fastener Materials				Standard Finishes			Optional Finish	For Use in Sheet Hardness:				
	Internal, ANSI B1.1 2B/ ANSI/ASME B1.13M 6H	External, ANSI B1.1 2A/ ANSI/ASME B1.13M 6g	Carbon Steel	300 Series Stainless Steel	CDA-510 Phosphor Bronze	CDA-353 Brass	Passivated and/or Tested Per ASTM A380	Electro-Plated Bright Tin ASTM B 545, Class B With Clear Preservative Coating	No Finish	Electro-Plated Matte Tin ASTM B 545, Class A With Clear Preservative Coating, Annealed	70 or less on the Rockwell "B" Scale	65 or less on the Rockwell "B" Scale	60 or less on the Rockwell "B" Scale	55 or less on the Rockwell "B" Scale	PC Board
KF2	•		•					•		•			•		•
KFS2	•			•			•				•				•
KFE	•		•					•		•			•		•
KFSE	•			•			•				•				•
KFB3	•					•		•		•		•			•
KFH		•			•			•		•				•	•
KSSB						•			•			•			•
PKF		•		•			•				•				•
KPS6	•			•			•								•
Part Number Codes For Finishes							None	ET	X	DT					

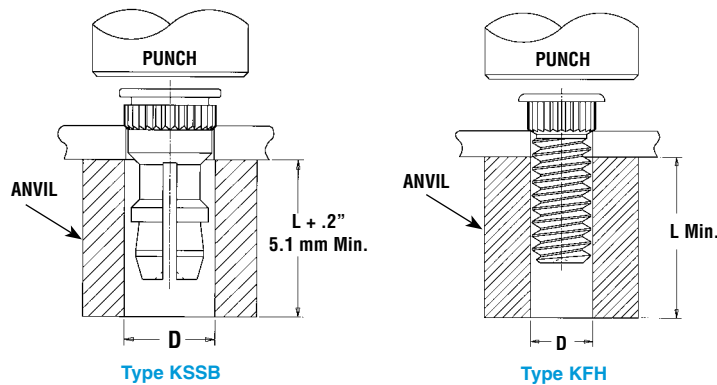
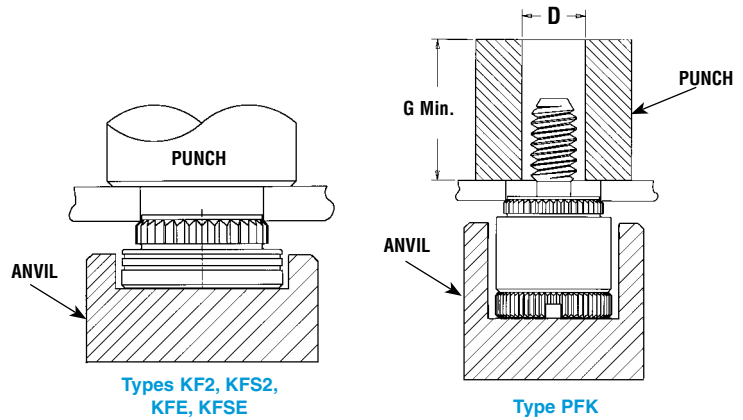
(1) For plated studs, Class 2A/6g, the maximum major and pitch diameter, after plating, may equal basic sizes and can be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

BROACHING FASTENERS

INSTALLATION

For Types KF2, KFS2, KFE, KFSE, and PFK

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 punch and anvil surfaces parallel, apply squeezing force until shoulder contacts the board.

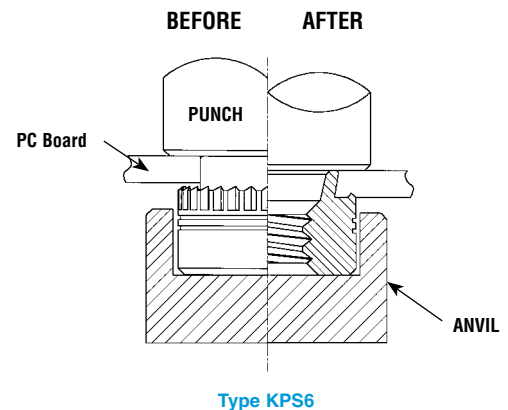


For Types KSSB and KFH

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

For Type KPS6

1. Prepare a hole of suitable diameter so that after plating the "plated hole size in board" is as specified in the tabulation on page K-7.
2. Place fastener into the anvil hole and place the mounting hole over the shank of the fastener as shown in drawing.
3. Using a flat punch and anvil, squeeze the fastener with sufficient force so that the tips of the projecting knurl teeth are embedded and the inside shoulder of the knurl contacts the board (most of the knurl will remain visible). As the fastener seats itself in the proper position, the shank will expand outward to complete the installation. Punch and anvil surfaces must be parallel.



BROACHING FASTENERS

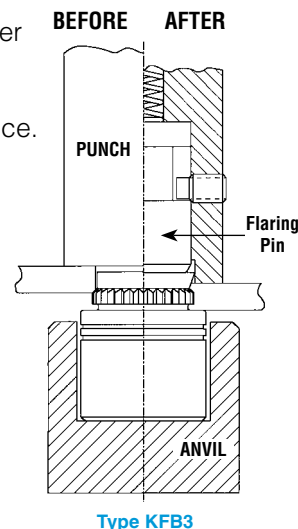
For Type KFB3⁽¹⁾

1. Punch or drill properly sized round 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.

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

Thread Code	Length Code	Anvil	Punch (Flaring Tool)
#4-40	-2	975201213300	975200791400
#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	975200790400
#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	975200791400
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	



PERFORMANCE DATA⁽¹⁾

UNIFIED	Type	Thread Code	Max. Nut Tightening Torque (in. lbs.)	Test Sheet Thickness & Test Sheet Material	Installation (lbs.)	Pushout (lbs.) (2)	Torque-out (in. lbs.)
	KF2	256	(3)	.060" FR-4 Fiberglass	400	60	6
		KFS2	440	(3)	.060" FR-4 Fiberglass	400	65
	KFE		632	(3)	.060" FR-4 Fiberglass	500	80
		KFSE	832	(3)	.060" FR-4 Fiberglass	700	95
			032	(3)	.060" FR-4 Fiberglass	700	100
		KFB3	440	(3)	.060" FR-4 Fiberglass	1,000	140
			632	(3)	.060" FR-4 Fiberglass	1,500	170
		KFH	440	4	.060" FR-4 Fiberglass	400	65
	632		8	.060" FR-4 Fiberglass	400	70	11
	832		15	.060" FR-4 Fiberglass	400	80	16
	032		18	.060" FR-4 Fiberglass	400	90	17
	PFK	440	(3)	.060" FR-4 Fiberglass	250	55	(3)
		632	(3)	.060" FR-4 Fiberglass	400	60	(3)
	KPS6	440	(3)	.060" FR-4 Fiberglass (5)	2,500	40	5
		632	(3)	.060" FR-4 Fiberglass (5)	3,300	50	7
832		(3)	.060" FR-4 Fiberglass (5)	5,000	70	12	
032		(3)	.060" FR-4 Fiberglass (5)	6,000	80	15	

UNIFIED	Type	Panel 1 (.060" FR-4 Fiberglass) (4)		Panel 2 (Removable) (4)		
		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

- (1) The installation, pushout and torque-out values reported are averages when all installation specifications and procedures are followed. Variations in mounting hole size, sheet material and installation procedure will affect this data. Performance testing of this product in your application is recommended. We will be happy to provide 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 K-6. (5) 1 Mil Cu, .5 Mil Sn/Pb plated thru-hole.

BROACHING FASTENERS

PERFORMANCE DATA⁽¹⁾

METRIC	Type	Thread Code	Max. Nut Tightening Torque (N•m)	Test Sheet Thickness & Test Sheet Material	Installation (kN)	Pushout (N) (2)	Torque-out (N•m)
	KF2	M3	(3)	1.5 mm FR-4 Fiberglass	2.2	290	1.7
	KFS2	M4	(3)	1.5 mm FR-4 Fiberglass	2.2	420	3.4
	KFE	M5	(3)	1.5 mm FR-4 Fiberglass	2.9	440	4.5
	KFB3	M3	(3)	1.5 mm FR-4 Fiberglass	4.4	560	2.03
		M4	(3)	1.5 mm FR-4 Fiberglass	6	680	3.2
	KFH	M3	0.45	1.5 mm FR-4 Fiberglass	1.8	285	0.79
		M4	1.6	1.5 mm FR-4 Fiberglass	1.8	355	1.8
		M5	2.1	1.5 mm FR-4 Fiberglass	1.8	400	1.92
	PKF	M3	(3)	1.5 mm FR-4 Fiberglass	1.1	245	(3)
	KPS6	M3	(3)	1.5 mm FR-4 Fiberglass (5)	9.8	178	.56
		M4	(3)	1.5 mm FR-4 Fiberglass (5)	22.2	312	1.36
		M5	(3)	1.5 mm FR-4 Fiberglass (5)	26.7	356	1.7

METRIC	Type	Panel 1 (1.5 mm FR-4 Fiberglass) (4)		Panel 2 (Removable) (4)		
		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) The installation, pushout and torque-out values reported are averages when all installation specifications and procedures are followed. Variations in mounting hole size, sheet material and installation procedure will affect this data. Performance testing of this product in your application is recommended. We will be happy to provide 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 K-6.
- (5) 1 Mil Cu, .5 Mil Sn/Pb plated thru-hole.

PEMSERTER® PRESSES

For best results we recommend using a PEMSERTER® press for installation of PEM Type KF2, KFS2, KFH, AND KPS6 fasteners. For more information on our line of presses call 1-800-523-5321 or check our web site.

GROUNDING STANDOFFS

TYPES SOSG AND SOAG (For installation into metal sheets)



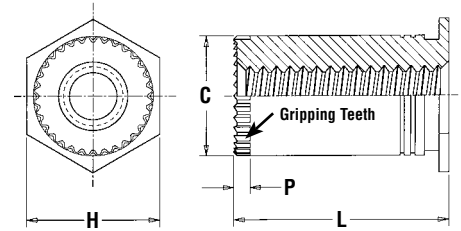
All dimensions are in inches.

PART NUMBER DESIGNATION

SOSG - 6440 - 10

↓ ↓ ↓

Type and Material Thread Length
 SOSG = stainless steel Code Code
 SOAG = aluminum



UNIFIED	Thread Size	Type		Thread Code	Length "L" +.010 -.000 (1) (Length Code is in 32nds of an inch)						Min. Sheet Thickness	Hole Size In Sheet +.003 -.000	C +.000 -.005	H ±.005	P Nom.	Min. Dist. Hole C/L To Edge	D Anvil Hole +.003 -.000	
		Stainless Steel	Aluminum		.125	.187	.250	.312	.375	.437								.500
	.112-40 (#4-40)	SOSG	SOAG	6440	4 ^{NS}	6	8	10	12	14	16	.040	.213	.212	.250	.030	.27	.216
	.138-32 (#6-32)	SOSG	SOAG	8632	4 ^{NS}	6 ^{NS}	8	10	12	14	16	.050	.281	.280	.312	.030	.31	.284

All dimensions are in millimeters.

METRIC	Thread Size x Pitch	Type		Thread Code	Length "L" +0.25 (Length Code is in millimeters) (1)						Min. Sheet Thickness	Hole Size In Sheet +0.08	C -0.13	H ±0.25	P Nom.	Min. Dist. Hole C/L To Edge	D Anvil Hole +0.08
		Stainless Steel	Aluminum														
	M3 x 0.5	SOSG	SOAG	3.5M3	3 ^{NS}	4 ^{NS}	6	8	10	12	1	5.4	5.39	6.4	0.76	6.8	5.5

(1) For special lengths greater than .500" / 12 mm, Types SOSG and SOAG are blind threaded.

MATERIAL AND FINISH SPECIFICATIONS

	Threads (2)	Fastener Materials		Standard Finishes		For Use in Sheet Hardness:	
Type	Internal, ANSI B1.1 2B/ANSI/ASME B1.13M 6H	7075-T6 Aluminum	300 Series Stainless Steel	Passivated and/or Tested Per ASTM A380	No Finish	70 or less on the Rockwell "B" Scale	50 or less on the Rockwell "B" Scale
SOAG	•	•			(3)		•
SOSG	•		•	•		•	
Part Number Codes For Finishes				None	X		

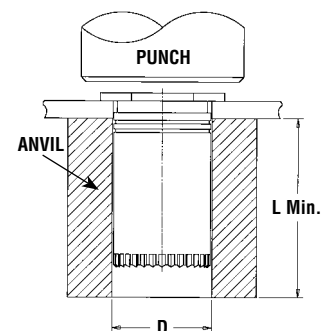
(2) For plated studs, Class 2A/6g, the maximum major and pitch diameter, after plating, may equal basic sizes and can be gauged to Class 3A/4h, per ANSI B1.1, Section 8, Table 3A and ANSI B1.13M, Section 8, Paragraph 8.2.

(3) Aluminum parts have no finish suffix.

INSTALLATION

For Types SOAG and SOSG

1. Prepare properly sized round mounting hole in sheet.
2. Place barrel end of fastener into mounting hole as shown in drawing.
3. With punch and anvil surfaces parallel, apply squeezing force until the head is embedded and flush with the surface.



Types SOAG and SOSG

PERFORMANCE DATA⁽⁴⁾

UNIFIED	Type	Thread Code	Max. Nut Tightening Torque (in. lbs.)	Test Sheet Thickness & Test Sheet Material	Installation (lbs.)	Pushout (lbs.) (5)	Torque-out (in. lbs.)
	SOAG/SOSG	6440	(6)	.064" 5052-H34 Aluminum	1700	300	25
		8632	(6)	.064" 5052-H34 Aluminum	1700	400	45
METRIC	Type	Thread Code	Max. Nut Tightening Torque (N•m)	Test Sheet Thickness & Test Sheet Material	Installation (kN)	Pushout (N) (5)	Torque-out (N•m)
	SOAG/SOSG	3.5M3	(6)	1.6 mm 5052-H34 Aluminum	7.6	1330	2.82

(4) The installation, pushout and torque-out values reported are averages when all installation specifications and procedures are followed.

Variations in mounting hole size, sheet material and installation procedure will affect this data. Performance testing of this product in your application is recommended. We will be happy to provide samples for this purpose.

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

(6) Not applicable.

OTHER FASTENERS FOR USE WITH PC BOARDS

SURFACE MOUNT FASTENERS

(See PEM® Bulletin SMT)

PEM® ReelFast® SMT surface mount fasteners mount to 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 are provided on tape and reel compatible with existing SMT automated installation equipment. The benefits are:

- Faster assembly
- Reduced scrap
- Reduced handling
- Reduced risk of board damage that may occur when fasteners are improperly installed with off-line equipment
- Reduced loose hardware.



TYPE PF11MW™ FLOATING ACCESS HARDWARE

(See PEM® Bulletin PF)

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

- Compensates for up to .060”/1.52mm mating thread misalignment.
- Installs into any panel material.
- Appropriate for close center-line-to-edge applications.



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