

Panasonic

ideas for life

NARROW-PITCH
CONNECTORS FOR
BOARD-TO-BOARD
CONNECTION

NARROW PITCH
(0.5mm) CONNECTORS
P5 SERIES — P5K, P5KS —

• P5K



Socket and header are mated



Socket



Header

• P5KS



Socket and header are mated



Socket



Header

Note) The external appearance and PC board pattern differs for the P5K and P5KS series.

FEATURES

1. The product lineup consists of 3 mm, 3.5 mm, 4 mm, 4.5 mm, 5 mm, 5.5 mm, 6 mm, 6.5 mm, 7 mm, 8 mm, and 9 mm.

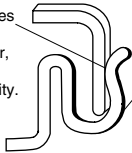
Type	Mated height	Notes
P5K	3 mm, 3.5 mm	The external appearance and PC board pattern differs for the P5K and P5KS series.
P5KS	4 mm, 4.5 mm, 5 mm, 5.5 mm, 6 mm, 6.5 mm, 7 mm, 8 mm, 9 mm	

2. Using a bellows-type contact construction gives the product the dropping shock and torsion resistance required particularly for portable equipments.

• What is meant by “bellows type” contact?

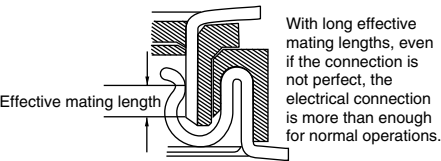
Rather than two broken-out surfaces, the contact is formed by the surfaces of two rolled plates. This helps the contact hold up better to repeated insertions and removals, while at the same time achieving highly reliable contact.

The roll surfaces are in contact with each other, providing high contact reliability.



Since the contact is formed by bending thin plate, it has a spring-like quality. This construction helps make it resistant to dropping and twisting.

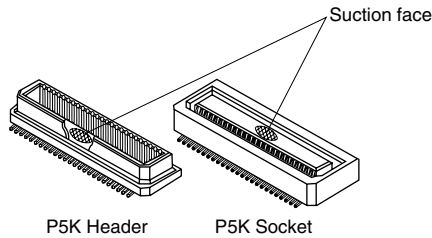
3. Even with the low profile, the mating length has been extended to ensure that there is some latitude in the mating.



Type	Effective mating length
P5K	0.75 mm
P5KS	1.1 mm

4. Automatic mounting

- 1) Suction area for suction-type automatic mounting machines is employed.
- 2) Embossed tape packaging is standard.
- 3) Terminal construction which is virtually resistant to solder bridging.

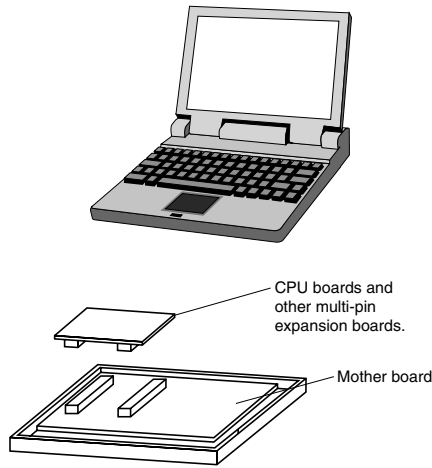


APPLICATIONS

1. Mobile phones, PHS, mobile info-communications terminals, and other small portable devices

2. The 160-contacts connector:

This connector is particularly suited to the motherboard, CPU board, and other multi-pin expansion boards on notebook PCs and other info-communications applications.



SPECIFICATIONS

1. Characteristics

Item		Specifications			Conditions														
		3mm, 3.5mm type	4mm, 4.5mm, 5mm, 5.5mm, 6mm, 6.5mm type	7mm, 8mm, 9mm type															
Electrical characteristics	Rated current	0.5A/terminal (Max. 10A) 0.5A/terminal (Max. 16A)																	
	Rated voltage	60V AC/DC																	
	Breakdown voltage	150V AC for 1 min.			Detection current: 1mA														
	Insulation resistance	Min. 1000MΩ			Using 500V DC megger														
	Contact resistance	Max. 60mΩ		Max. 80mΩ	Measured based on the HP4338B measurement method of JIS C 5402														
Mechanical characteristics	Composite insertion force	Max. 0.785N {80gf} × no. of contacts (initial)																	
	Composite removal force	Min. 0.0588N {6gf} × no. of contacts																	
	Post holding force	Min. 0.98N {100gf}/contacts			Measures the maximum load in the post axial direction until removal														
Environmental characteristics	Ambient temperature	-55°C to +85°C			No freezing at low temperatures														
	Soldering heat resistance	Max. peak temperature of 245°C			Infrared reflow soldering														
		300°C within 5 sec.			Soldering iron														
	Thermal shock resistance (header and socket mated)	5 cycles, insulation resistance min. 100MΩ, contact resistance max. 60mΩ	5 cycles, insulation resistance min. 100MΩ, contact resistance max. 80mΩ	<table><tr><td>Sequence</td><td>Temperature (°C)</td><td>Time (minutes)</td></tr><tr><td>1</td><td>-55⁺⁰₋₃</td><td>30</td></tr><tr><td>2</td><td>25⁺¹⁰₋₅</td><td>Max. 5</td></tr><tr><td>3</td><td>85⁺³₋₀</td><td>30</td></tr><tr><td>4</td><td>25⁺¹⁰₋₅</td><td>Max. 5</td></tr></table>	Sequence	Temperature (°C)	Time (minutes)	1	-55 ⁺⁰ ₋₃	30	2	25 ⁺¹⁰ ₋₅	Max. 5	3	85 ⁺³ ₋₀	30	4	25 ⁺¹⁰ ₋₅	Max. 5
	Sequence	Temperature (°C)	Time (minutes)																
	1	-55 ⁺⁰ ₋₃	30																
	2	25 ⁺¹⁰ ₋₅	Max. 5																
3	85 ⁺³ ₋₀	30																	
4	25 ⁺¹⁰ ₋₅	Max. 5																	
Humidity resistance (header and socket mated)	120 hours, insulation resistance min. 100MΩ, contact resistance max. 60mΩ	120 hours, insulation resistance min. 100MΩ, contact resistance max. 80mΩ	Bath temperature 40±2°C, humidity 90 to 95% R.H.																
Saltwater spray resistance (header and socket mated)	24 hours, insulation resistance min. 100MΩ, contact resistance max. 60mΩ	24 hours, insulation resistance min. 100MΩ, contact resistance max. 80mΩ	Bath temperature 35±2°C, saltwater concentration 5±1%																
H ₂ S resistance (header and socket mated)	48 hours, contact resistance max. 60mΩ	48 hours, contact resistance max. 80mΩ	Bath temperature 40±2°C, gas concentration 3±1 ppm, humidity 75 to 80% R.H.																
Lifetime characteristics	Insertion and removal life	50 times			Repeated insertion and removal speed of max. 200 times/hours														
Unit weight		P5K 3mm 30 contacts P5KS 4mm 30 contacts	Socket: 0.17g Header: 0.09g Socket: 0.18g Header: 0.16g																

2. Material and surface treatment

Part name	Mated height 3mm, 3.5mm, 4mm, 4.5mm, 5mm, 5.5mm, 6mm, 6.5mm		Mated height 7mm, 8mm, 9mm	
	Material	Surface treatment	Material	Surface treatment
Molded portion	Heat-resistant resin (UL94V-0)	—	Heat-resistant resin (UL94V-0)	—
Contact	Copper alloy	Contact portion: Au plating over Ni Terminal portion: Au plating over Ni (Except for thick of terminal)	Copper alloy	Contact portion: Au plating over Ni Terminal portion: Au plating over Ni (Except for thick of terminal)

AXK(5(S)/6(S))

PRODUCT TYPES

Product name	Mated height	No. of contacts	Part No.	
			Socket	Header
P5K	3.0 mm	20	AXK520145J	AXK620345J
		22	AXK522145J	AXK622345J
		30	AXK530145J	AXK630345J
		40	AXK540145J	AXK640345J
		50	AXK550145J	AXK650345J
		60	AXK560145J	AXK660345J
		70	AXK570145J	AXK670345J
		80	AXK580145J	AXK680345J
		100	AXK500145J	AXK600345J
		120	AXK5A2145J	AXK6A2345J
	3.5 mm	20	AXK520145J	AXK620245J
		22	AXK522145J	AXK622245J
		30	AXK530145J	AXK630245J
		40	AXK540145J	AXK640245J
		50	AXK550145J	AXK650245J
		60	AXK560145J	AXK660245J
		70	AXK570145J	AXK670245J
		80	AXK580145J	AXK680245J
		100	AXK500145J	AXK600245J
		120	AXK5A2145J	AXK6A2245J
P5KS	4.0 mm	20	AXK5S20045*	AXK6S20445*
		24	AXK5S24045*	AXK6S24445*
		30	AXK5S30045*	AXK6S30445*
		40	AXK5S40045*	AXK6S40445*
		50	AXK5S50045*	AXK6S50445*
		60	AXK5S60045*	AXK6S60445*
		70	AXK5S70045*	AXK6S70445*
		80	AXK5S80045*	AXK6S80445*
		100	AXK5S00045*	AXK6S00445*
		120	AXK5SA2075*	AXK6SA2475*
		160	AXK5SA6075*	AXK6SA6475*
	4.5 mm	20	AXK5S20245*	AXK6S20445*
		24	AXK5S24245*	AXK6S24445*
		30	AXK5S30245*	AXK6S30445*
		36	AXK5S36245*	AXK6S36445*
		40	AXK5S40245*	AXK6S40445*
		50	AXK5S50245*	AXK6S50445*
		60	AXK5S60245*	AXK6S60445*
		70	AXK5S70245*	AXK6S70445*
		80	AXK5S80245*	AXK6S80445*
		100	AXK5S00245*	AXK6S00445*
		120	AXK5SA2275*	AXK6SA2475*
		160	AXK5SA6275*	AXK6SA6475*
	5.0 mm	20	AXK5S20045*	AXK6S20545P
		30	AXK5S30045*	AXK6S30545P
		40	AXK5S40045*	AXK6S40545P
		50	AXK5S50045*	AXK6S50545P
		60	AXK5S60045*	AXK6S60545P
		70	AXK5S70045*	AXK6S70545P
		80	AXK5S80045*	AXK6S80545P
		100	AXK5S00045*	AXK6S00545P
	5.5 mm	20	AXK5S20245*	AXK6S20545P
		30	AXK5S30245*	AXK6S30545P
		40	AXK5S40245*	AXK6S40545P
		50	AXK5S50245*	AXK6S50545P
		60	AXK5S60245*	AXK6S60545P
		70	AXK5S70245*	AXK6S70545P
		80	AXK5S80245*	AXK6S80545P
		100	AXK5S00245*	AXK6S00545P

Notes) 1. For the protection of our environment, orders of J: Inner carton (1 reel) 1,500 pcs. units are recommended to reduce packaging materials.
In addition, orders of P: Inner carton (1 reel) 1,000 pcs. units with embossed tape packaging are also available; to order change the suffix “J” to the suffix “P”
2. Please add following suffix at * marked positions.
P: Inner carton (1 reel) 1,000 pcs. (Outer carton: 2,000 pcs.)
J: Inner carton (1 reel) 1,500 pcs. (Outer carton: 3,000 pcs.)
As for the part No. P is suffixed, only 1,000 pcs. reel is available.
3. Regarding ordering units: During production: Please make orders in 1 reel units.
Samples for mounting confirmation: Please consult us. (See “Regarding sample orders to confirm proper mounting” on page 9.)
Samples: Small lot orders are possible. Change the suffix “J” to the suffix “P”, or place a “P” where the “*” is located.
4. The standard type comes with no positioning bosses (However, the mated heights of 4 mm or higher and 120 pins or more comes standard with bosses).
Connectors with positioning bosses are available for on-demand production. For P5K type of 8th digit of the part no. changes from 4 to 3, and P5KS type of 9th digit of the part no. changes from 4 to 3.
e.g. AXK520135P AXK5S20035P

Product name	Mated height	No. of contacts	Part No.	
			Socket	Header
P5KS	6.0 mm	20	AXK5S20045*	AXK6S20645P
		30	AXK5S30045*	AXK6S30645P
		40	AXK5S40045*	AXK6S40645P
		50	AXK5S50045*	AXK6S50645P
		60	AXK5S60045*	AXK6S60645P
		70	AXK5S70045*	AXK6S70645P
		80	AXK5S80045*	AXK6S80645P
		100	AXK5S00045*	AXK6S00645P
	6.5 mm	20	AXK5S20245*	AXK6S20645P
		30	AXK5S30245*	AXK6S30645P
		40	AXK5S40245*	AXK6S40645P
		50	AXK5S50245*	AXK6S50645P
		60	AXK5S60245*	AXK6S60645P
		70	AXK5S70245*	AXK6S70645P
		80	AXK5S80245*	AXK6S80645P
		100	AXK5S00245*	AXK6S00645P
	7.0 mm	130	AXK5SA3275*	AXK6SA3675P
		20	AXK5S20340P	AXK6S20445*
		30	AXK5S30340P	AXK6S30445*
		40	AXK5S40340P	AXK6S40445*
		50	AXK5S50340P	AXK6S50445*
		60	AXK5S60340P	AXK6S60445*
		70	AXK5S70340P	AXK6S70445*
		80	AXK5S80340P	AXK6S80445*
P5KS	8.0 mm	100	AXK5S00340P	AXK6S00445*
		20	AXK5S20340P	AXK6S20545P
		30	AXK5S30340P	AXK6S30545P
		40	AXK5S40340P	AXK6S40545P
		50	AXK5S50340P	AXK6S50545P
		60	AXK5S60340P	AXK6S60545P
		70	AXK5S70340P	AXK6S70545P
		80	AXK5S80340P	AXK6S80545P
	9.0 mm	100	AXK5S00340P	AXK6S00545P
		20	AXK5S20340P	AXK6S20645P
		30	AXK5S30340P	AXK6S30645P
		40	AXK5S40340P	AXK6S40645P
		50	AXK5S50340P	AXK6S50645P
		60	AXK5S60340P	AXK6S60645P
		70	AXK5S70340P	AXK6S70645P
		80	AXK5S80340P	AXK6S80645P
		100	AXK5S00340P	AXK6S00645P

- Notes) 1. For the protection of our environment, orders of J: Inner carton (1 reel) 1,500 pcs. units are recommended to reduce packaging materials.
In addition, orders of P: Inner carton (1 reel) 1,000 pcs. units with embossed tape packaging are also available; to order change the suffix "J" to the suffix "P".
2. Please add following suffix at * marked positions.
P: Inner carton (1 reel) 1,000 pcs. (Outer carton: 2,000 pcs.)
J: Inner carton (1 reel) 1,500 pcs. (Outer carton: 3,000 pcs.)
As for the part No. P is suffixed, only 1,000 pcs. reel is available.
3. Regarding ordering units: During production: Please make orders in 1 reel units.
Samples for mounting confirmation: Please consult us. (See "Regarding sample orders to confirm proper mounting" on page 9.)
Samples: Small lot orders are possible. Change the suffix "J" to the suffix "P" or place a "P" where the "*" is located.
4. The standard type comes with no positioning bosses (However, mated heights of 4 mm or higher and 120 pins or more comes standard with bosses). Connectors with positioning bosses are available for on-demand production. For P5KS type of 9th digit of the part no. changes from 4 to 3.
e.g. AXK5S20035P

DIMENSIONS

mm General tolerance: ± 0.2

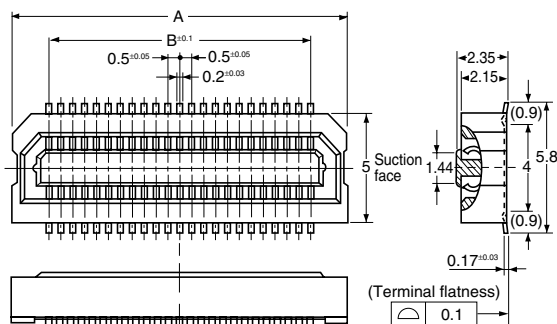
P5K: Mated height 3mm, 3.5mm type

• Socket



Dimension table (mm)

No. of contacts	A	B
20	8.20	4.50
22	8.70	5.00
30	10.70	7.00
40	13.20	9.50
50	15.70	12.00
60	18.20	14.50
70	20.70	17.00
80	23.20	19.50
100	28.20	24.50
120	33.20	29.50



AXK(5(S)/6(S))

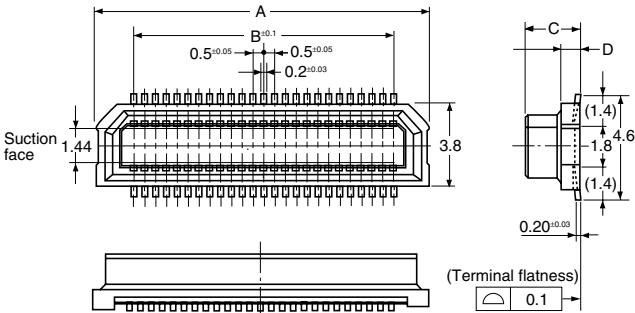
• Header

mm General tolerance: ±0.2



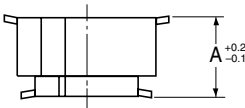
Dimension table (mm)

No. of contacts	A	B
20	8.20	4.50
22	8.70	5.00
30	10.70	7.00
40	13.20	9.50
50	15.70	12.00
60	18.20	14.50
70	20.70	17.00
80	23.20	19.50
100	28.20	24.50
120	33.20	29.50



Mated height	C	D
3.0 mm	2.4	0.85
3.5 mm	2.9	1.35

• Socket and header are mated



Mated height	A
3.0 mm	3.0
3.5 mm	3.5

Note) P5KS series (mated heights 4mm, 4.5mm, 5mm, 5.5mm, 6mm, 6.5mm, 7mm, 8mm, and 9mm) and the P5KF series (mated heights 1.5mm, 2.0mm and 2.5mm) cannot be mated to this type.

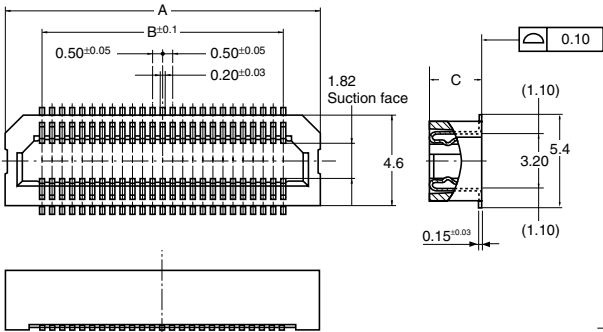
P5KS: Mated height 4mm, 4.5mm, 5mm, 5.5mm, 6mm, 6.5mm, 7mm, 8mm, 9mm type

• Socket



Dimension table (mm)

No. of contacts	A	B
20	8.20	4.50
24	9.20	5.50
30	10.70	7.00
36	12.20	8.50
40	13.20	9.50
50	15.70	12.00
60	18.20	14.50
70	20.70	17.00
80	23.20	19.50
100	28.20	24.50



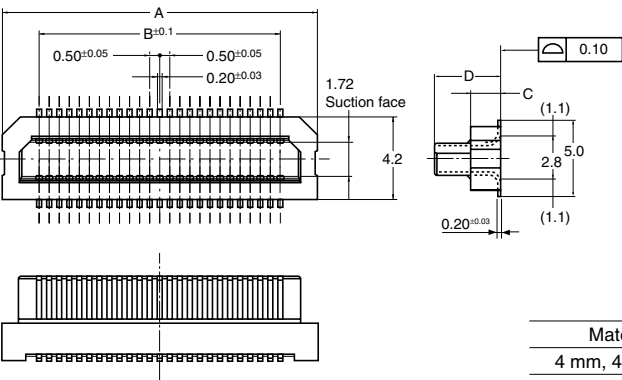
Mated height	C
4 mm, 5 mm, 6 mm	3.05
4.5 mm, 5.5 mm, 6.5 mm	3.55
7 mm, 8 mm, 9 mm	6.05

• Header



Dimension table (mm)

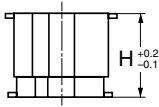
No. of contacts	A	B
20	8.20	4.50
24	9.20	5.50
30	10.70	7.00
36	12.20	8.50
40	13.20	9.50
50	15.70	12.00
60	18.20	14.50
70	20.70	17.00
80	23.20	19.50
100	28.20	24.50



Mated height	C	D
4 mm, 4.5 mm, 7 mm	0.95	3.3
5 mm, 5.5 mm, 8 mm	1.95	4.3
6 mm, 6.5 mm, 9 mm	2.95	5.3

• Socket and header are mated

mm General tolerance: ±0.2

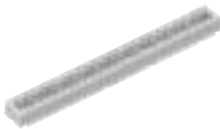


Mated height	H
4 mm	4.0
4.5 mm	4.5
5 mm	5.0
5.5 mm	5.5
6 mm	6.0
6.5 mm	6.5
7 mm	7.0
8 mm	8.0
9 mm	9.0

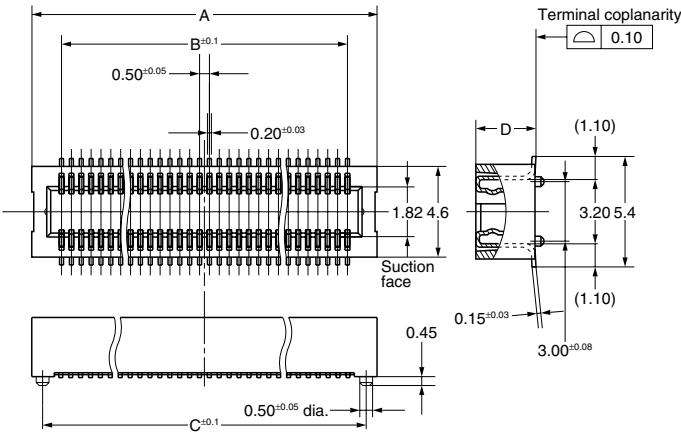
Note) P5K series (mated heights 3mm, 3.5mm) and P5KF series (mated heights 1.5mm, 2.0mm, 2.5mm) cannot be mated to this type.

P5KS: Mated height 4mm, 4.5mm for 120 contacts and 160 contacts types, 6.5mm for 130 contacts type

• Socket



No. of contacts	A	B	C
120	32.50	29.50	32.00
130	35.00	32.00	34.50
160	42.50	39.50	42.00

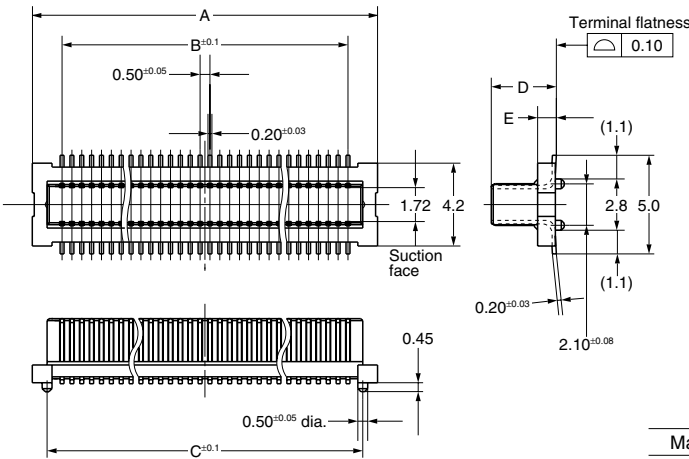


Mated height	D
4 mm	3.05
4.5 mm, 6.5 mm	3.55

• Header

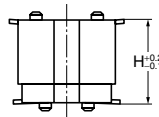


No. of contacts	A	B	C
120	32.50	29.50	31.00
130	35.00	32.00	33.50
160	42.50	39.50	41.00



Mated height	D	E
4 mm, 4.5 mm	3.30	0.95
6.5 mm	5.30	2.95

• Socket and header are mated



Mated height	H
4 mm	4.0
4.5 mm	4.5
6.5 mm	6.5

Notes) 1. Inquiry separately for diagrams of the embossed tape and cautions for use.
2. Be sure to ask for proper specifications and drawings before actual use.

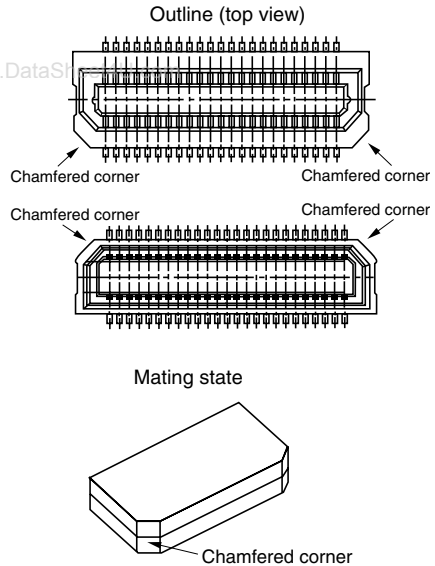
EMBOSSED TAPE DIMENSIONS

Please refer to page 64.

NOTES

1. Prevention of reverse mating

Other than 120, 130, 160 contacts type, the socket and header are protected from reverse mating by a molded resin key. Excessive mating force may damage the key, so be sure to match chamfered corners when mating.

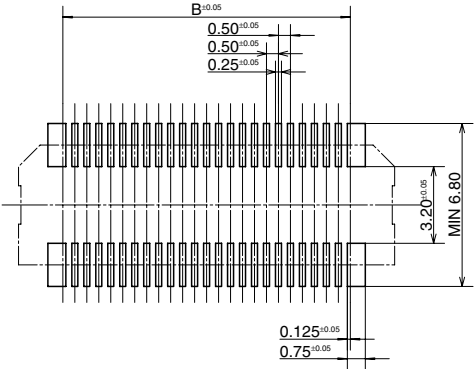


2. PC Boards and Recommended Metal Mask Patterns

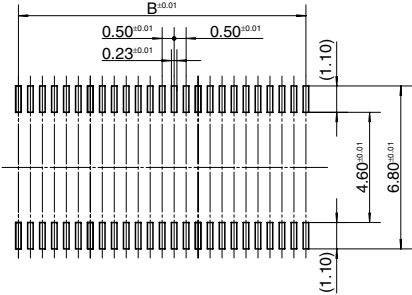
Connectors are mounted with high density, with a pitch interval of 0.4 to 0.5 mm. It is therefore necessary to make sure that the right levels of solder are used, in order to reduce solder bridge and other issues. The figures to the right are recommended metal mask patterns. Please use them as a reference.

• P5K Socket

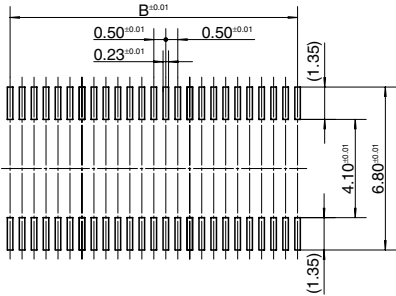
Recommended PC board pattern (TOP VIEW)



Recommended metal mask pattern
Metal mask thickness: Here, 150 μm
(Opening area ratio: 56%)

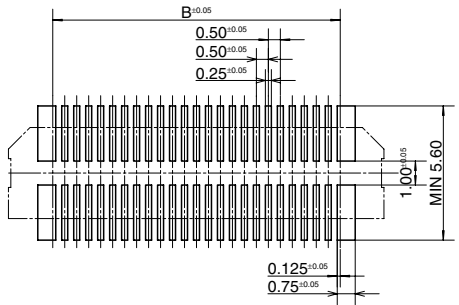


Recommended metal mask pattern
Metal mask thickness: Here, 120 μm
(Opening area ratio: 69%)

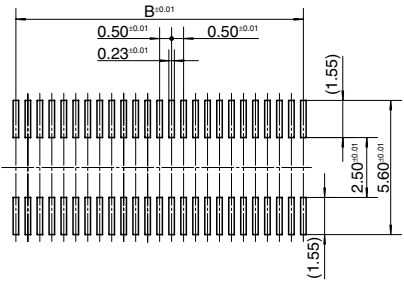


• P5K Header

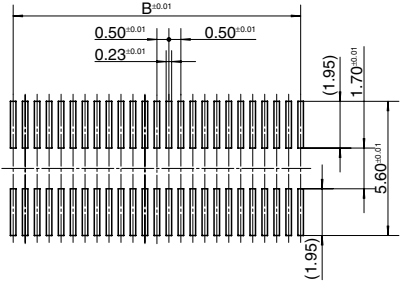
Recommended PC board pattern (TOP VIEW)



Recommended metal mask pattern
Metal mask thickness: Here, 150 μm
(Opening area ratio: 62%)



Recommended metal mask pattern
Metal mask thickness: Here, 120 μm
(Opening area ratio: 78%)

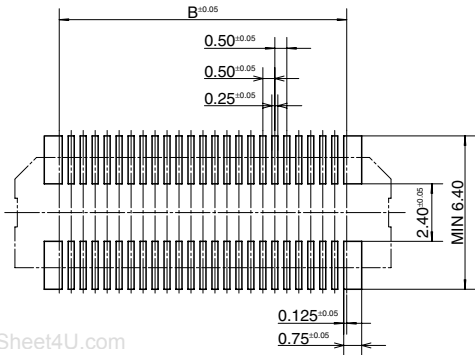


* See the dimension table on page 31 for more information on the B dimension of the socket and header.

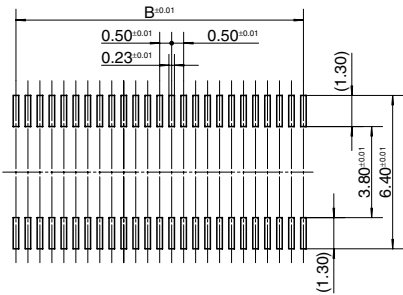
P5KS: Mated height 4mm, 4.5mm, 5mm, 5.5mm, 6mm, 6.5mm, 7mm, 8mm, 9mm type

• Socket

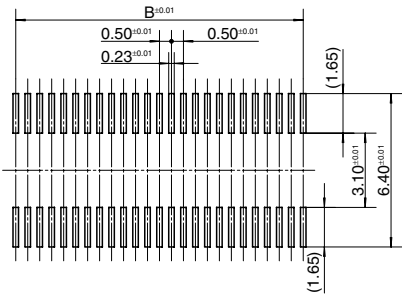
Recommended PC board pattern
(TOP VIEW)



Recommended metal mask pattern
Metal mask thickness: Here, 150 µm
(Opening area ratio: 60%)



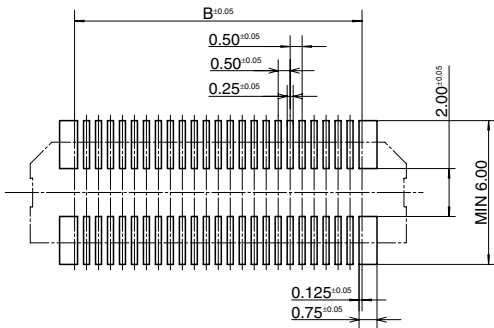
Recommended metal mask pattern
Metal mask thickness: Here, 120 µm
(Opening area ratio: 76%)



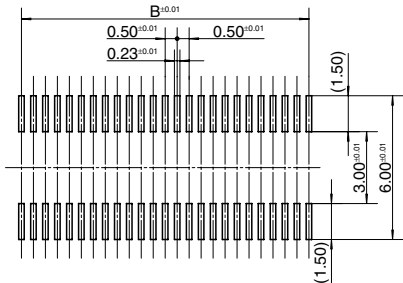
* See the dimension table on page 32 for more information on the B dimension.

• Header

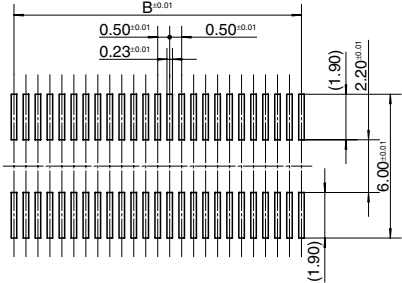
Recommended PC board pattern
(TOP VIEW)



Recommended metal mask pattern
Metal mask thickness: Here, 150 µm
(Opening area ratio: 69%)



Recommended metal mask pattern
Metal mask thickness: Here, 120 µm
(Opening area ratio: 87%)

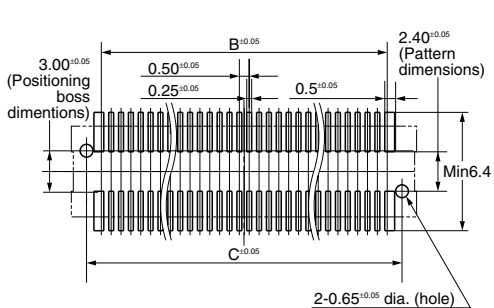


* See the dimension table on page 32 for more information on the B dimension.

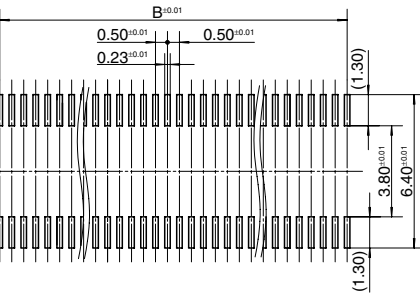
P5KS: Mated height 4mm, 4.5mm for 120 contacts and 160 contacts types, 6.5mm for 130 contacts type

• Socket

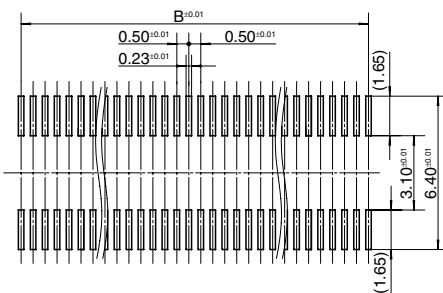
Recommended PC board pattern
(TOP VIEW)



Recommended metal mask pattern
Metal mask thickness: Here, 150 µm
(Opening area ratio: 60%)



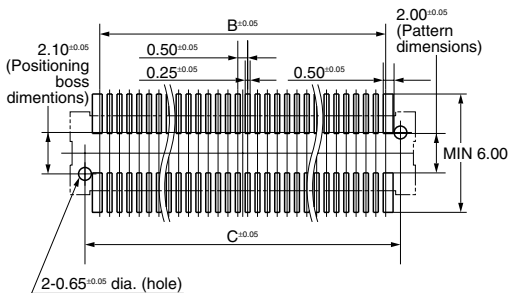
Recommended metal mask pattern
Metal mask thickness: Here, 120 µm
(Opening area ratio: 76%)



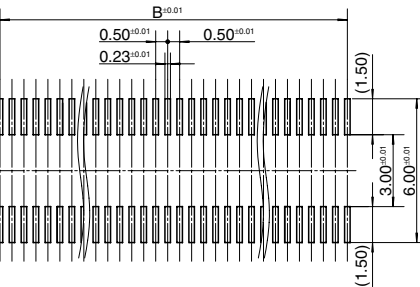
* See the dimension table on page 33 for more information on the B and C dimensions.

• Header

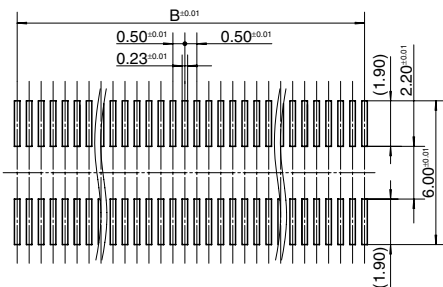
Recommended PC board pattern
(TOP VIEW)



Recommended metal mask pattern
Metal mask thickness: Here, 150 µm
(Opening area ratio: 69%)



Recommended metal mask pattern
Metal mask thickness: Here, 120 µm
(Opening area ratio: 87%)



* See the dimension table on page 33 for more information on the B and C dimensions.

Regarding general notes please refer to page 8.