Order Placement Recommendations and Considerations

The products and specifications listed in this document are subject to change (including changes made to specifications and the suspension of production) as occasioned by the improvements that we introduce into our products. Consequently, when you review the mass-production design for the products listed or when you place orders for these products, we ask you to contact one of our customer service representatives and check that the details listed in the document are commensurate with the most up-to-date information.

Although it has always been our policy to make a continual effort to improve quality and reliability, the fact remains that electrical components and devices do fail at a given statistical probability. In this respect, we ask you to take adequate steps to ensure safety design by, for instance, introducing redundancy design, taking measures in design to prevent fires from spreading, and preventing incorrect operation also in design so that no bodily injury, fire accidents or any social damage will be caused by the failure of any of our products.

Our quality standards fall into the following three categories depending on the applications of the products: Reference Standards, Special Standards, and Specified Standards that meet the quality assurance program designated by the customer. These quality standards have been established so that our products will be used for the applications listed below.

Reference Standards: Computers, office automation equipment, communications equipment, audio-video products, home electrical appliances, machine tools, personal devices, industrial robots

Special Standards: Transportation equipment (automobiles, trains, ships, etc.), traffic signal equipment, crime and disaster prevention devices, electric power equipment, various safety devices, and medical equipment not directly targeted for life support

Specified Standards: Aircraft equipment, aeronautical and space equipment, seabed relay equipment, nuclear power control systems, and medical equipment, devices and system for life support

Before studying the use of our products under the following conditions, you must contact one of our customer service representatives without fail and exchange written specifications.

(1) When our products are to be used in any of the applications listed for the Special Standards or Specified Standards

(2) When, even for any of the applications listed for the Reference Standards, our products may possibly be used beyond the range of the specifications, environment or conditions listed in the document or when you are studying the use of our products in any conditions or an environment that is not listed in the document

[Acceptance inspection]

In connection with the products you have purchased from us or with the products delivered to your premises, we ask that you perform an acceptance inspection with all due speed and, in connection with the handling of our products both before and during the acceptance inspection, we ask that you give full consideration to the control and preservation of our products.

[Warranty period]

Unless otherwise stipulated by both parties, the warranty period of our products is one year after their purchase by you or after their delivery to the location specified by you.

[Scope of warranty]

In the event that we are found to blame for any failures or defects in our products during the warranty period, we will provide replacements or supply the necessary spare parts or replace and/or repair the defective sections free of charge and with all due speed at the location where the products concerned were purchased or delivered.

However, the following failures and defects are not covered by the warranty:

(1) When the failure or defect was caused by a specification, s tandard, handling method, etc. which was specified by you

(2) When the failure or defect was caused after purchase by you or delivery to your premises by an alteration in construction, performance, specification, etc. which did not involve us

(3) When the failure or defect was caused by a phenomenon that could not be predicted by the technology that was being applied in practice either after purchase by you or at the time when the contract was signed

(4) When the use of our products deviated from the scope of the conditions and environment set forth in the catalog and specifications

(5) When, after our products were incorporated into your products or equipment for use, damage resulted which could have been avoided if your products or equipment had been equipped with the functions, construction, etc. the provision of which is accepted practice in the industry

(6) When the failure or defect was caused by a natural disaster or other force majeure

The terms and conditions of the warranty here set forth apply solely to the warranty of the discrete products which were purchased by you or delivered to your premises, and they do not cover any damage induced by their failure or defects.

Connector Division
Matsushita Electric Works, Ltd.

SPECIFICATIONS

NARROW-PITCH CONNECTORS

AXK7L00207G/AXK8L00105BG

1. Name : Narrow-pitch connectors for PC board to FPC board
2. Type : F4 (Terminal spacing 0.4 mm 2 rows)
   Stacking height 0.9 mm
3. Part No.

3-1) Part No. Socket : AXK7L○○2○7G
Header : AXK8L○○1○5BG

3-2) Product drawing Socket : AXK7L80217 (With positioning projections)
: AXK7L80227 (No positioning projections)
Header : AXK8L80115B (With positioning projections)
: AXK8L80125B (No positioning projections)

Package drawing Socket : AXK7L80227G (Embossed packaging)
Header : AXK8L80125G (Embossed packaging)

[Package drawing is commonly used for products no positioning projections and with positioning projections.]

3-3) Ordering information

AXK○○ ○○ ○ ○ ○ ○ ○

- 7L : F4 socket
- 8L : F4 header

- Number of contacts (2 digits)
  10:10 contacts 12:12 contacts 14:14 contacts 16:16 contacts
  20:20 contacts 22:22 contacts 24:24 contacts 26:26 contacts
  28:28 contacts 30:30 contacts 32:32 contacts 34:34 contacts
  36:36 contacts 38:38 contacts 40:40 contacts 44:44 contacts
  48:48 contacts 50:50 contacts 54:54 contacts 60:60 contacts
  66:66 contacts 70:70 contacts 80:80 contacts
- Stacking height

Socket	Header
2 : 0.9 mm	1 : 0.9 mm

- Function
  1 : With positioning projections
  2 : No positioning projections
- Plating (contact/terminal)

Socket	Header
7 : (Au / Au+Ni Barrier)	5 : (Au / Au)

- Metal bracket tarminal shape (Header only)

Header
B : Forked type

- Package
  G : Embossed packaging [Reel : Plastic; Packing quantity : 3000 pcs/reel, 2 reels/carton]

Note) Regarding size and shape of mounting pad and window of metalmasking for soldering metal bracket, the header which part No. is "AXK8L*****BJ or V or G" differs from the product which part No. is "AXK8L*****J or V or G" by having not added "B" to the 11th figure. Therefore, there is no compatibility in mounting.

TO :			DATE: Dec., 11, 2006
MATSUSHITA ELECTRIC WORKS, LTD. CONNECTOR DIVISION	DRAWN BY T. Harano	REVIEWED BY	
	CHECKED BY T. Kuninaka	APPROVED BY M. Arita	

SPECIFICATIONS

4. Material : Molded portion : Heat resistant plastic (UL 94V-0), Black
: Contact / Post : Copper Alloy
: metal bracket : Copper Alloy

5. Plating : Contact / Post : Contact portion : Au plating over nickel (Min. 0.1 μm)
: Terminal portion : Au plating over nickel
(except for top of the terminal)
: metal bracket : Sn plating over nickel
(socket : except for top of the terminal)

6. Characteristics
The followings show specifications, when mated with Socket and Header.

Item	Specification	Test condition
6-1. Electrical characteristics		
1) Rated current	Each pin ; Max 0.3 A All pins can carry ; Max. 5 A	
2) Rated voltage	AC, DC 60 V	
3) Insulation resistance	Min. 1000 MΩ (Initial stage)	Using 250 V DC megger (1 minute)
4) Breakdown voltage	150 V AC for 1 minute	Detection current : 1 mA
5) Contact resistance	Max. 90 mΩ	Measured with HP4338B According to the method of JIS C 5402
6-2. Mechanical characteristics		
1) Composite insertion force	Max. 1.70 N/contact × Number of contacts. (Initial stage)	
2) Composite removal force	Min. 0.098 N/contact × Number of contacts.	
3) Contact holding force (Socket contact)	Min. 0.49 N/contact.	Measuring the maximum force. As the contact is axially pull out.
4) metal bracket holding force (Header metal bracket)	Min. 0.49 N	Measuring the maximum force. As the metal bracket is axially pull out.

TO :			DATE: Dec., 11, 2006
MATSUSHITA ELECTRIC WORKS, LTD. CONNECTOR DIVISION	DRAWN BY T. Harano		REVIEWED BY
	CHECKED BY T. Kuninaka		APPROVED BY M. Okita

Item	Specification	Test condition
6-3. Environmental characteristics		
1) Ambient temperature (Operating temperature)	-55 ℃～+85 ℃	No freezing or condensation
2) Storage temperature	-55 ℃～+85 ℃ (Products only) -40 ℃～+50 ℃ (Packaging structure)	No freezing or condensation
3) Thermal shock resistance (Header and socket mated)	After 5 cycles Contact resistance Max. 90 mΩ Insulation resistance Min. 100 MΩ	Conformed to MIL-STD-202F, method 107G Order / Temperature (℃) / Time (minutes) 1: $-55^{\ 0}_{-3}$ — 30 2: ↓ — Max. 5 3: $85^{\ +3}_{\ 0}$ — 30 4: ↓ $-55^{\ 0}_{-3}$ — Max. 5
4) Humidity resistance (Header and socket mated)	After 120 hours Contact resistance Max. 90 mΩ Insulation resistance Min. 100 MΩ	Conformed to MIL-STD-1344A, method 1002 Bath temperature 40 ℃±2 ℃ Humidity 90 % to 95 %RH
5) Salt water spray resistance (Header and socket mated)	After 24 hours Contact resistance Max. 90 mΩ Insulation resistance Min. 100 MΩ	Conformed to MIL-STD-1344A, method 1001 Bath temperature 35 ℃±2 ℃ Salt water concentration : 5 %±1 %
6) H_2S resistance (Header and socket mated)	After 48 hours Contact resistance Max. 90 mΩ	Conformed to JEIDA-38-1984 Bath temperature 40 ℃±2 ℃ Gas concentration 3 ppm±1 ppm Humidity 75 % to 80 %RH
6-4. Life characteristics Insertion and removal life with no load	50 times ・Contact resistance Max. 90 mΩ ・Composite removal force Min. 0.098 N/contact × Number of contacts.	Repeated insertion and removal cycles of max. 200 times/hour

TO :			DATE: Dec., 11, 2006
MATSUSHITA ELECTRIC WORKS, LTD. CONNECTOR DIVISION	DRAWN BY T. Harano	REVIEWED BY	
	CHECKED BY T. Hamanaka	APPROVED BY M. Arita	

Item	Specification	Test condition
6-5. Soldering temperature resistance	The initial specification must be satisfied electrically and mechanically	Max. peak temperature of 260 ℃ Infrared reflow soldering (PC board surface temperature near connector terminals) Soldering iron 300 ℃ within 5 s 350 ℃ within 3 s
6-6. Solder paste thickness	The initial specification must be satisfied electrically and mechanically	Recommendation t=0.12 mm, t=0.15 mm (Refer to attached drawing about recommended dimension of screen open window area.)

7. Package : Embossed packaging

8. About safety Remarks

8-1. Do not use these connectors outside the specification ranges for the rated current, breakdown voltage and other environmental conditions, or the connectors may make damages to the circuit by generating an abnormal level of heat, giving off smoke or catching fire.

8-2. To prevent an accident, please refer the specifications and / or the operation manuals before start using connectors. In the case the connector has to be used outside the specification, please consult us.

9. Remarks

9-1. Regarding PC board design
Refer the recommended PC board pattern for keeping the strength of soldering.

9-2. Connector placement
When the placement machine has excessive keeping force.
The housing will be transformation. Please check the placement machine.

TO :			DATE: Dec., 11, 2006
MATSUSHITA ELECTRIC WORKS, LTD. CONNECTOR DIVISION	DRAWN BY T. Harano		REVIEWED BY
	CHECKED BY T. Kuminaka		APPROVED BY M. Arita

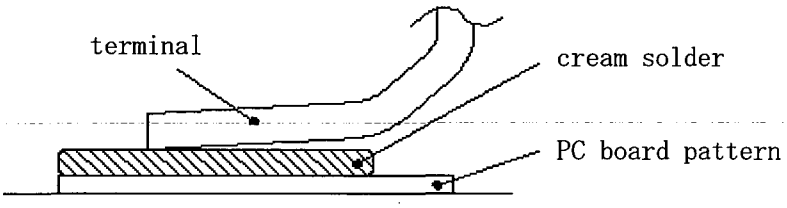
9-3. Soldering

1) Manual soldering.

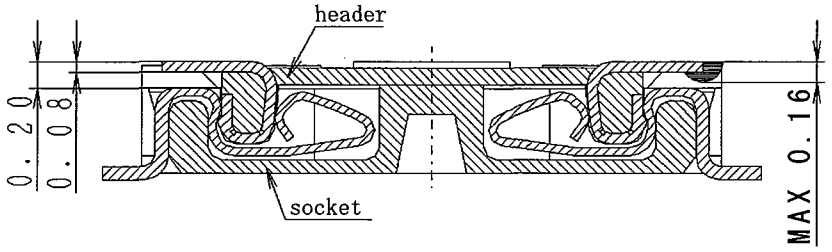
- These connectors are low profile type. If too much solder is supplied for hand soldering, It makes miss mating because of interference at soldering portion. Please pay attentions.
- Please use the soldering iron under specification's temperature and times.
- In case of exercise care not to contaminate the contacts with solder flux from the soldering iron tip. And make sure that the contacts are not contaminated to dispersed solder flux with a magnifying glass and so on. When the contact portion is contaminated, please clean it by washing or so.
- Please pay attentions. Not to deform terminals when mating or unmating connectors without mounting to PC boards. Don't apply an excessive force to terminals, or the connection between terminals and a housing may lose.
- Please soldering iron is cleaning.

2) Reflow soldering.

- Please use screen soldering regarding cream solder printing.
- PC board and metalmasking drawing show the relationship between screen open window area and PC board foot pattern area. The side of terminal tip is base.
- Please pay attentions not to provide too much solder. It makes miss mating because of interference at soldering portion when mating.



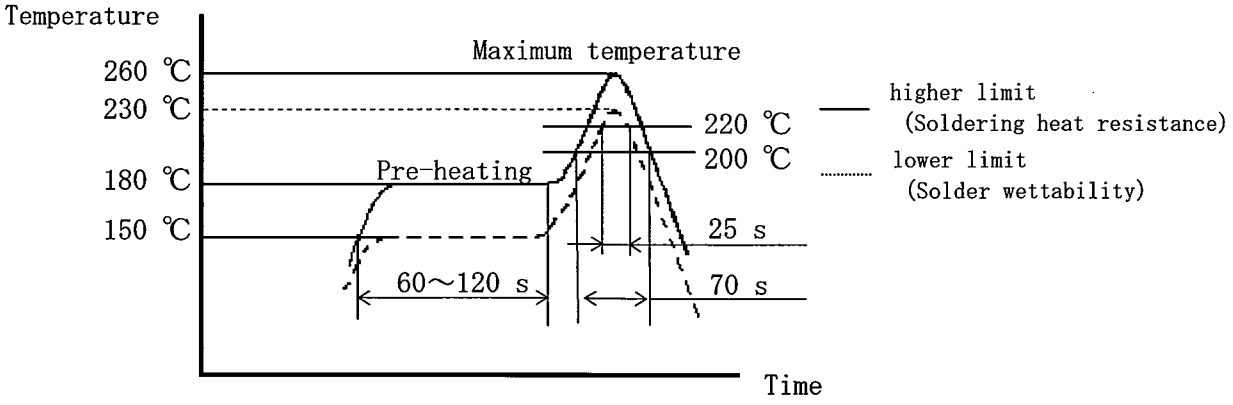
- In order to avoid any interference when mating, please check the soldering state as followings.



- For the terminal portion of post, it must be MAX. 0.16 between terminal undersurface and the top of soldering portion.

TO :			DATE: Dec., 11, 2006
MATSUSHITA ELECTRIC WORKS, LTD. CONNECTOR DIVISION	DRAWN BY T. Havano		REVIEWED BY
	CHECKED BY T. Kuninaka		APPROVED BY M. Ohbita

・When applying the different thickness of a screen, please consult us.
・There may be a case of difficult self-alignment depending on the connector size. In that case, please pay attentions to align terminals and solder pads.
・The following diagram shows the recommended reflow soldering temperature profile.



・Infrared reflow soldering is able to passed two times.
・The temperature measured on the PC board surface near connector terminals.
・Please set the reflow condition in consideration of the characteristic of solder and flux used.
・After reflow soldering, In case of PC board surface the reverse side using reflow soldering, for example an adhesive and so on connector of fixed disposition.

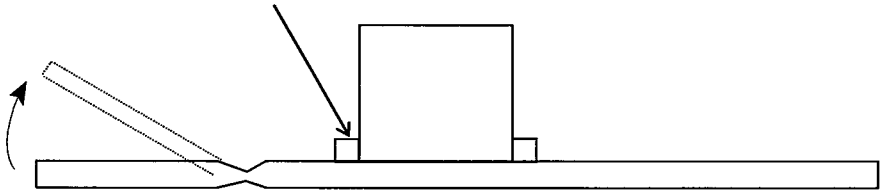
3) Rework of soldering portion.
・Rework is one time.
・In case of soldering rework of bridges. Please use a flat-head soldering iron and don't use supplementary solder flux. Doing so may cause contact problems by flux.
・Please use the soldering iron under specification's temperature.

9-4. Since excessive force on the terminals will cause deformation and the integrity of the soldering will be lost during reflow soldering, avoid dropping or rough handing of the product.

9-5. Be careful not to deform the terminals or brackets when inserting or removing the connector before soldering. Do not put excessive force to terminals. Doing so may loosen the fixation of terminals and molding parts.

9-6. Applied the connector with positioning projection.
Though this connector has positioning tab for outline setting,
Please recommend to assemble by an automatic placement machine.

9-7. When cutting the PC board after mounting the connector, please assure soldered terminals aren't affected by the stress.
The stress should not affect the terminals soldered.



9-8. When mounting connectors on a FPC board : Due to it's flexibility, a FPC board may make the connector terminal soldering connection weak. In order to strengthen the connection and prevent the peeling off of terminal soldering, a stiffener is strongly recommended to be attached to the backside of the connector area.
The size of stiffener should be bigger than the recommended PC board pattern area shown in the drawing. (Outward dimension + approximate 1 mm)
Recommended material of reinforcement is Glass-Fiber board or Polyimide board which have 0.2 to 0.3 mm thickness.
This connector have temporary lock structure. However connecter would be taken off due to size, weight or bending force of FPC at dropping condition.
Please check the connector not to be taken off at real equipment.
In order to secure connector's connection even when a shock applied, please take measures against taking off of the connector.

9-9. Other cautions.
- After soldering is no coating. In case of using coating. Please don't stick to the terminal.
- Connector doesn't have switching fundamentally.

10. Caution for connector mating

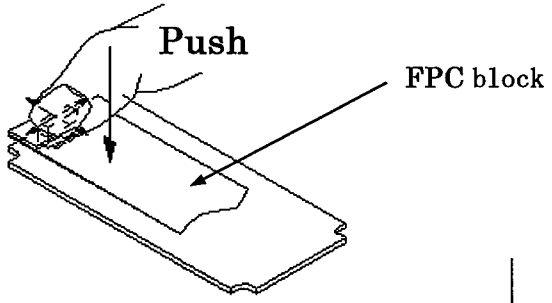
—— Mating procedure ——

① Set the FPC block's position roughly.

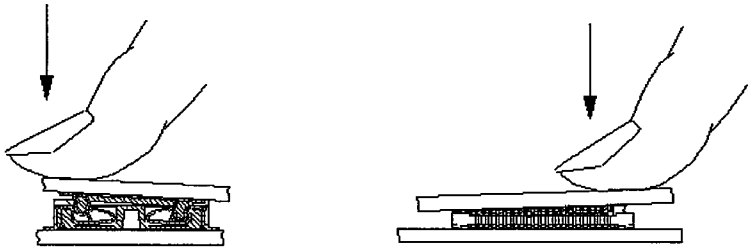
② Check the position of FPC block, moving it slightly.

③ Mate the connector until it becomes flat. (Don't push by too much force)

④ Check the mating state by pushing every corner of connector to prevent from miss mating.



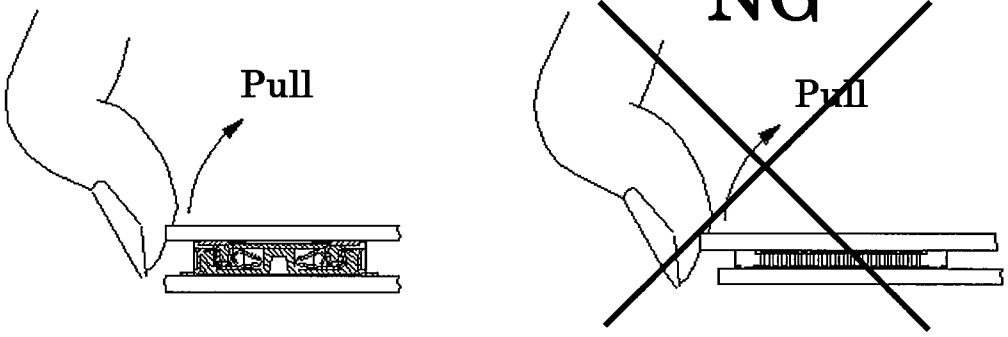
Check the mating condition



Setting and Checking of the position → mating

—— Unmating procedure ——

Pull the connector from terminal side to prevent the terminal from solder cracking. Pulling the connector from the other side causes concentration of pulling force to the edge terminal.



TO :			DATE: Dec., 11, 2006
MATSUSHITA ELECTRIC WORKS, LTD. CONNECTOR DIVISION	DRAWN BY T. Harano		REVIEWED BY ——
	CHECKED BY T. Hiraiwa		APPROVED BY M. Mikita

11. We declare the following ;
In the manufacturing process for the products being provided to your company, the following materials are not used at all.

- Ozone-depleting materials ;
  CFC- 11, 12, 13, 111, 112, 113, 114, 115, 211, 212, 213, 214, 215, 216, 217
  Halon 1211, 1301, 2402
  Carbon tetrachloride
  Methyl chloroform
- Polybrominated flame retardans ;
  $PBBO_S$, PBDO, PBDPO, PBDPE, DBDO, OBDO, TBDO, PBB_S, PBDE
- Specified chemical substances (Impurities are excepted) ;
  Mercury, Cadmium, Hexahydric chromium, Lead
- Other toxic substances ;
  Asbestos
  Organic tin compounds (Tributyl tin compounds, Triphenyl tin compounds)
  Polychlorinated biphenyls
  Polychlorinated naphthalenes
  Azo compounds

12. Note
Although the best attention will be paid for the quality controls of the products, please consider the followings :

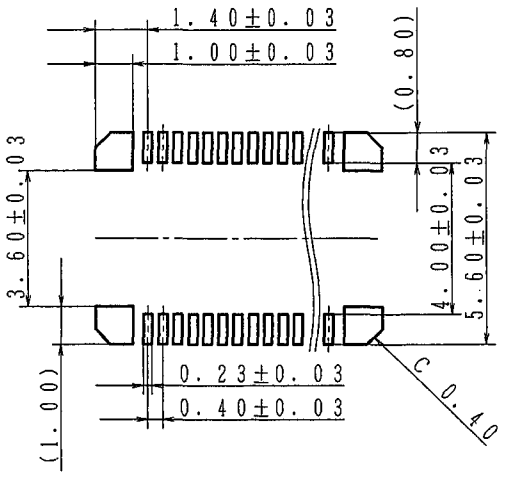
1) To prevent unexpected failures as much as possible under the conditions not shown in this specifications, please let us know the detailed information on the application, such as the environmental, operational and mounting condition.
2) By any chance, if the failure of the product is considered to cause a personal injury or death or property damage, the safety rate should be added to the specified values shown in this specifications and the dual safety structure or circuit is recommended to be taken from the stand point of the Product Liability Indemnity.
3) We will either repair or replace any products or parts thereof which prove to be defective against only the items written in this specifications within 1 year from the date of products acceptance at the site of delivery.
4) The following cases are exclusive from the indemnity.
   ① The case of other damage caused by the failure or defect of the product.
   ② The case that the product condition changed by handling, storage and / or transportation after delivery.
   ③ The case caused by the phenomenon which has never been discovered and is impossible to be foreknown with the existing technologies.
   ④ The case of force majeure, such as acts of Got, public enemy or war, fires, floods and any other causes beyond the control of the people concerned.

TO :			DATE: Dec., 11, 2006
MATSUSHITA ELECTRIC WORKS, LTD. CONNECTOR DIVISION	DRAWN BY T. Harano		REVIEWED BY ———
	CHECKED BY T. Kuninaka		APPROVED BY

Recommended specification of mounting pattern on PC board and window size of metalmasking

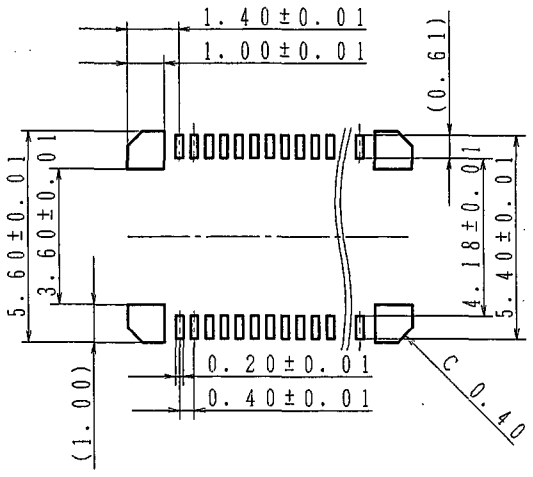
Product:Narrow-pich connector F4 socket
(Part No.:AXK7L○○○○○)

Recommended mounting pattern on PC board (Top view)

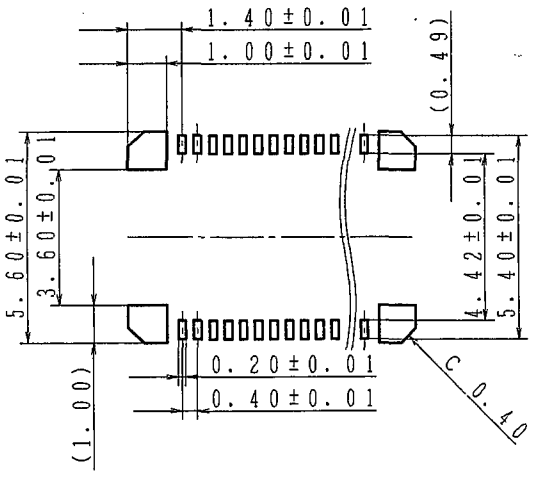


Recommended window size of metalmasking (Top view)

Thickness of metalmasking:120μm
(Terminal part window ratio:66%)
(Metal bracket part window ratio:100%)

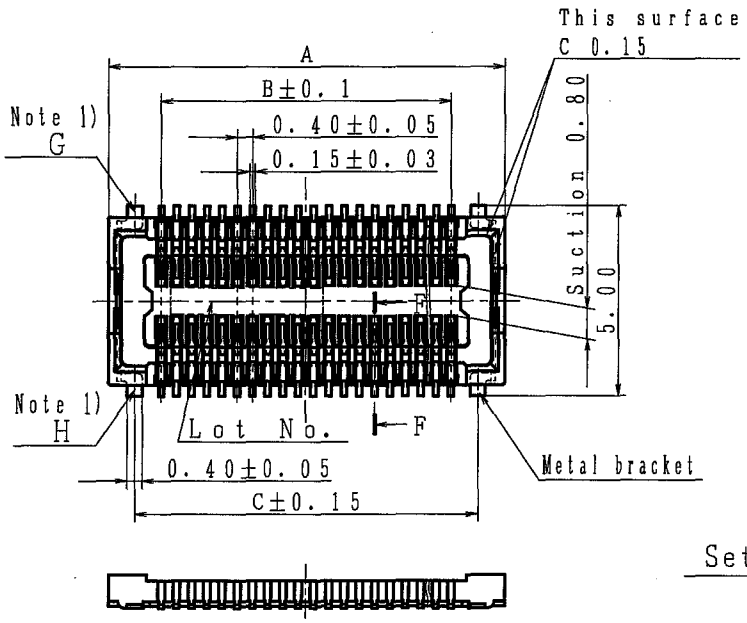


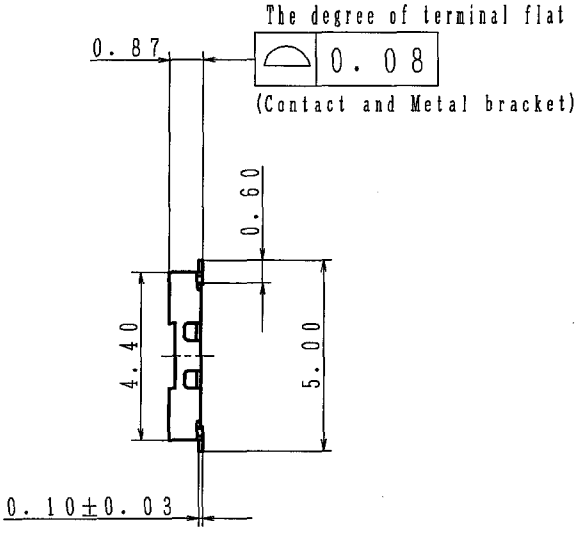
Thickness of metalmasking:150μm
(Terminal part window ratio:53%)
(Metal bracket part window ratio:100%)



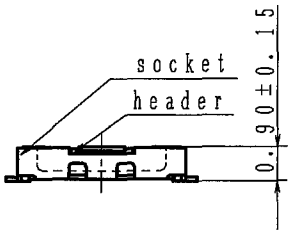
Window ratio is calculated by dividing window size of metalmasking by the original mounting pad.

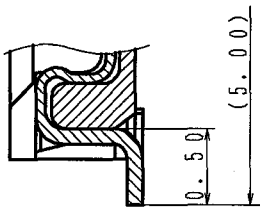
Sym	Item or Code No	Material & Size	qt.	Process	Remark
Catalog No			Drawing Name		
Name	Narrow-pitch connector F4 socket		Drawing No		
Remark			Scale 5 : 1	Unit: mm	Date Apr., 14.'03
Drawn K. Sakaguchi	Reviewed H. Ono		MATSUSHITA ELECTRIC WORKS. LTD. CONNECTOR DIVISION.		
Designed K. Okuza	Approved H. Inoue				
Checked M. Fujimoto					





Setting drawing

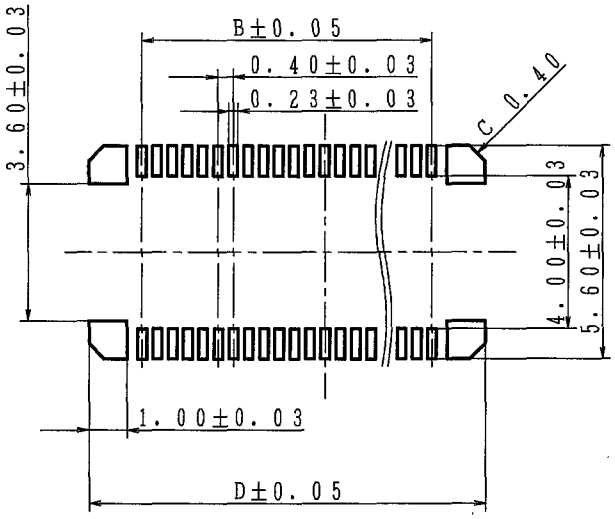




F-F cross section

Recommended PC board pattern
(mounting pad layout)

(TOP VIEW)



Note 1) Because the metal bracket G and H are the unified structure, they are connected electrically.

General tolerance ±0.2

Dimension / No. of contacts	A	B	C	D
10	4.4	1.6	3.0	4.4
12	4.8	2.0	3.4	4.8
14	5.2	2.4	3.8	5.2
16	5.6	2.8	4.2	5.6
20	6.4	3.6	5.0	6.4
22	6.8	4.0	5.4	6.8
24	7.2	4.4	5.8	7.2
26	7.6	4.8	6.2	7.6
28	8.0	5.2	6.6	8.0
30	8.4	5.6	7.0	8.4
32	8.8	6.0	7.4	8.8
34	9.2	6.4	7.8	9.2
36	9.6	6.8	8.2	9.6
38	10.0	7.2	8.6	10.0
40	10.4	7.6	9.0	10.4
44	11.2	8.4	9.8	11.2
48	12.0	9.2	10.6	12.0
50	12.4	9.6	11.0	12.4
54	13.2	10.4	11.8	13.2
60	14.4	11.6	13.0	14.4
66	15.6	12.8	14.2	15.6
70	16.4	13.6	15.0	16.4
80	18.4	15.6	17.0	18.4

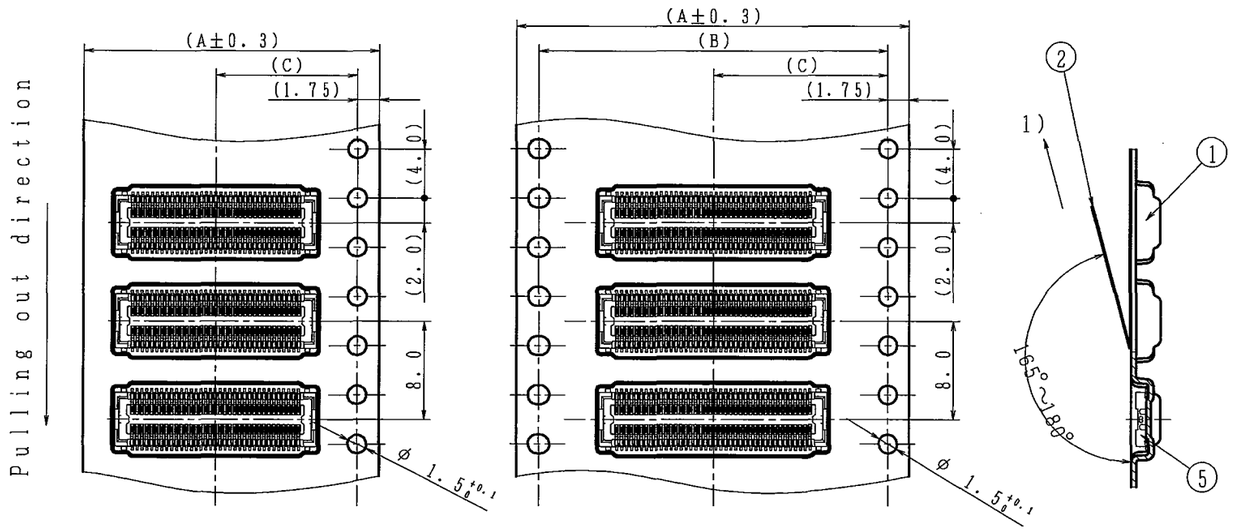
Sym	Item or Code No	Material & Size	qt.	Process	Remark
Catalog No			Drawing Name		
Name	Narrow-pitch connectors F4 socket		Drawing No	AXK7L80227	
Remark			Scale 5:1	Unit: mm	Date Feb., 8,'06
Drawn	Y. Sakaji	Reviewed	MATSUSHITA ELECTRIC WORKS. LTD.		
Designed	Y. Sakaji	Approved	CONNECTOR DIVISION.		
Checked	Y. Ishida				

Tape packed status (JIS C 0806-1990)

The mounting pitch may not be conformed to the JIS.

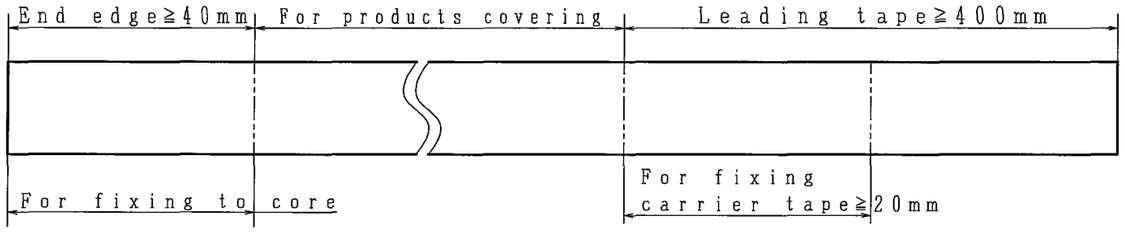
A≦24 mm

A≧32 mm

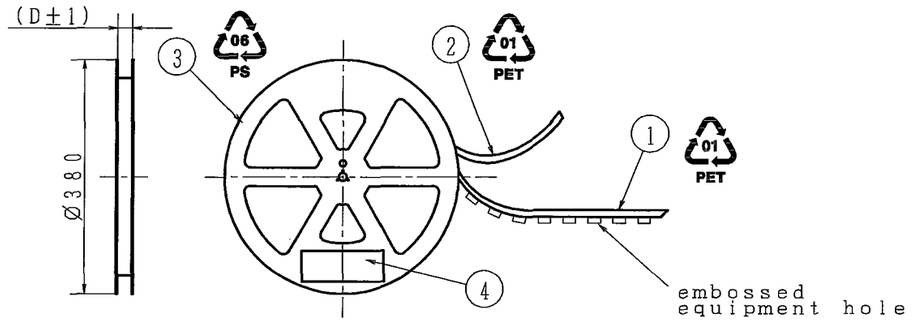


No. of contacts \ Dimension	A	B	C	D
Max:24	16.0	——	7.5	17.4
26~70	24.0	——	11.5	25.4
80	32.0	28.4	14.2	33.4

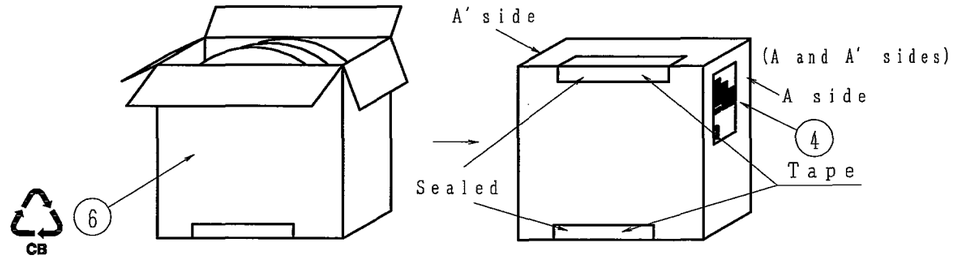
Cover Tape



Reel Package (EIAJ ET-7200B)

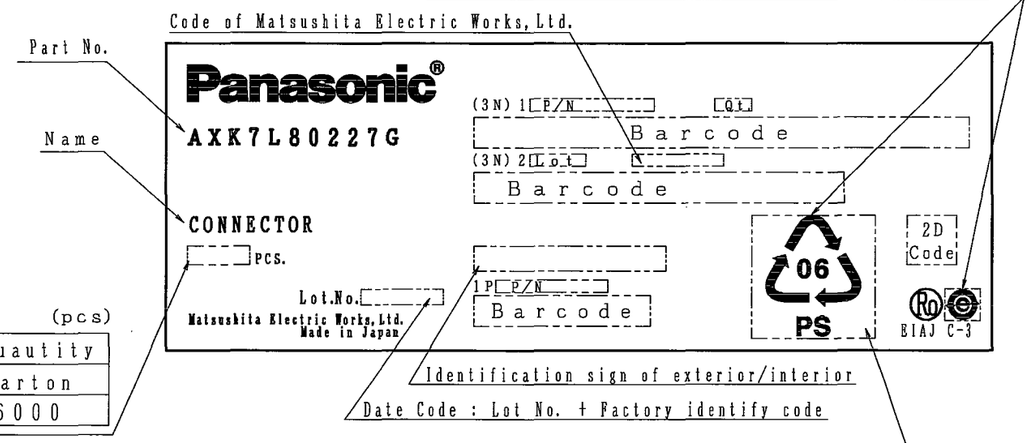


Carton containing 2 reels



Label attached

Display for China RoHS will be added from February, 2007



(pcs)

Packing quautity	
Reel	Carton
3000	6000

China RoHS Recycle Mark

Reel	Carton
06 PS	CB

2) The beginning of the carrier tape and the end edge is fixed by tapeing up.

Note 1) In case of stripping off the cover tape, the tape itself must not be torn.

Sym	Item or Code No	Material & Size	qt.	Process	Remark
6	Carton	Corrugated fiberboard			
5	Narrow-pitch connectors	——			
4	Label	Coat Paper			
3	Reel	PS			Color : Black
2	Cover tape	PET			
1	Embossed Carrier tape	PET			

Catalog No ——		Drawing Name	Embossed tape packaging
Name	Narrow-pitch connectors F4 socket	Drawing No	AXK7L80227G
Remark ——		Scale ——	Unit: mm / Date Jan.,22.'07
Drawn S.Matsushita	Reviewed ——	MATSUSHITA ELECTRIC WORKS. LTD.	
Designed T.Hayano	Approved M.Daibita	CONNECTOR DIVISION.	
Checked T.Kunimoto			

(3rd Angle System) (JIS A-3)

(図面) No. 22