

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, standard, 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.

S P E C I F I C A T I O N S

NARROW-PITCH CONNECTORS

AXT300104 / AXT400104

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1. Name : Narrow-pitch connectors
2. Type : P4S (Terminal spacing 0.4 mm 2 rows)
Stacking height 1.5 mm
3. Part No.
- 3-1) Part No. Socket : AXT300104
 Header : AXT400104
- 3-2) Product drawing Socket : AXT350114
 (With positioning projections, without cover for mounting)
 : AXT350124
 (No positioning projections, without cover for mounting)
 : AXT350154
 (With positioning projections, with cover for mounting)
 : AXT350164
 (No positioning projections, with cover for mounting)
 Header : AXT450114
 (With positioning projections)
 : AXT450124
 (No positioning projections)
- Package drawing Socket : AXT350164H (Embossed packaging)
 Header : AXT450124H (Embossed packaging)

(Package drawing is commonly used for products
no positioning projections, with positioning projections,
without cover for mounting and with cover for mounting)

TO :			DATE: Dec. 22, 2004
MATSUSHITA ELECTRIC WORKS, LTD. CONNECTOR DIVISION	DRAWN BY <i>M. Kishi</i>	REVIEWED BY <i>M. Onkita</i>	
	CHECKED BY <i>K. Okura</i>	APPROVED BY <i>H. Masui</i>	

S P E C I F I C A T I O N S

NARROW-PITCH CONNECTORS

AXT300104 / AXT400104

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3-3) Ordering information

AXT : Narrow-pitch connectors
for PC board to PC board

AXT ○ ○ ○ ○ ○ ○

- 3 : P4S socket
- 4 : P4S header

• Number of contacts (2 digits)

10:10 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 42:42 contacts 44:44 contacts 50:50 contacts
54:54 contacts 56:56 contacts 60:60 contacts 64:64 contacts
70:70 contacts 80:80 contacts 90:90 contacts 00:100 contacts

• Stacking height

Socket

1 : 1.5 mm

Header

1 : 1.5 mm

• Function

- 1 : With positioning projections, without cover for mounting
- 2 : No positioning projections, without cover for mounting
- 5 : With positioning projections, with cover for mounting
- 6 : No positioning projections, with cover for mounting

• Plating (contact / terminal)

Socket

4 : (Au / Au+Ni Barrier)

Header

4 : (Au / Au)

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 (socket) : Pd + Au flash plating over nickel
 (except for top of the terminal)
 : Metal bracket (header) : Au plating over nickel
 (except for top of the terminal)

6. Characteristics

TO :			DATE: Dec. 22, 2004
MATSUSHITA ELECTRIC WORKS, LTD. CONNECTOR DIVISION	DRAWN BY <i>M. Kishi</i>	REVIEWED BY <i>M. Okita</i>	
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S P E C I F I C A T I O N S

NARROW-PITCH CONNECTORS

AXT300104 / AXT400104

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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 HP4333B According to the method of JIS C 5402
6-2. Mechanical characteristics		
1) Composite insertion force	Max. 0.981 N/contact × Number of contacts. (Initial stage)	
2) Composite removal force	Min. 0.0588 N/contact × Number of contacts.	
3) Contact holding force (Socket contact)	Min. 0.981 N/contact.	Measuring the maximum force. As the contact is axially pull out.
6-3. Environmental characteristics		
1) Ambient temperature (Operating temperature)	-55 °C ~ +85 °C	No freezing or condensation
2) Storage temperature	-55 °C ~ +85 °C (Products only) -40 °C ~ +50 °C (Packaging structure)	No freezing or condensation

TO :

DATE: Dec. 22, 2004

MATSUSHITA ELECTRIC WORKS, LTD.
CONNECTOR DIVISION

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S P E C I F I C A T I O N S

NARROW-PITCH CONNECTORS

AXT300104 / AXT400104

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Item	Specification	Test condition																		
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 <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Order</th> <th style="width: 20%;">Temperature (°C)</th> <th style="width: 10%;">Time (minutes)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">-55₋₃⁰</td> <td style="text-align: center;">30</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">}</td> <td style="text-align: center;">Max. 5</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">85⁺³</td> <td style="text-align: center;">30</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">}</td> <td style="text-align: center;">Max. 5</td> </tr> <tr> <td></td> <td style="text-align: center;">-55₋₃⁰</td> <td></td> </tr> </tbody> </table>	Order	Temperature (°C)	Time (minutes)	1	-55 ₋₃ ⁰	30	2	}	Max. 5	3	85 ⁺³	30	4	}	Max. 5		-55 ₋₃ ⁰	
Order	Temperature (°C)	Time (minutes)																		
1	-55 ₋₃ ⁰	30																		
2	}	Max. 5																		
3	85 ⁺³	30																		
4	}	Max. 5																		
	-55 ₋₃ ⁰																			
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 °C ± 2 °C 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 °C ± 2 °C Salt water concentration : 5 % ± 1 %																		
6) H ₂ S resistance (Header and socket mated)	After 48 hours Contact resistance Max. 90 mΩ	Conformed to JEIDA-38-1984 Bath temperature 40 °C ± 2 °C 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. 0.0588 N/contact × Number of contacts.	Repeated insertion and removal cycles of max. 200 times/hour																		
6-5. Soldering temperature resistance	The initial specification must be satisfied electrically and mechanically	Max. peak temperature of 260 °C Infrared reflow soldering [PC board surface temperature near connector terminals] Soldering iron 300 °C within 5 s 350 °C within 3 s																		

TO :

DATE: Dec. 22, 2004

MATSUSHITA ELECTRIC WORKS, LTD.
 CONNECTOR DIVISION

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S P E C I F I C A T I O N S

NARROW-PITCH CONNECTORS

AXT3000104 / AXT4000104

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Item	Specification	Test condition
6-6. Solder paste thickness	The initial specification must be satisfied electrically and mechanically	Recommendation $t=0.12\text{ mm}$, $t=0.15\text{ mm}$ (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.

9-3. Soldering

1) Manual soldering.

- These connector is low profile type. When too many solder is provided by hand, solder goes up to contact area. Please pay attentions.
- Please use the soldering iron under specification' s temperature and times.
- In case of exercise care not to contaminate the card contacts with solder flux from the soldering iron tip. And make sure that the card 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.

TO :

DATE: Dec. 22, 2004

MATSUSHITA ELECTRIC WORKS, LTD.
CONNECTOR DIVISION

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SPECIFICATIONS

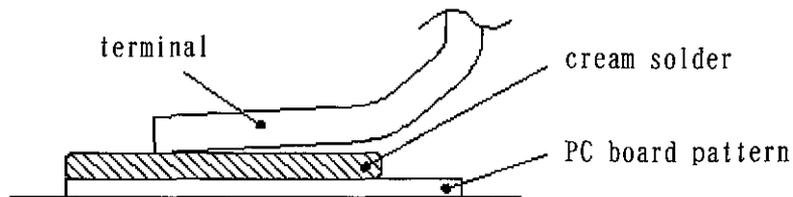
NARROW-PITCH CONNECTORS

AXT300104 / AXT400104

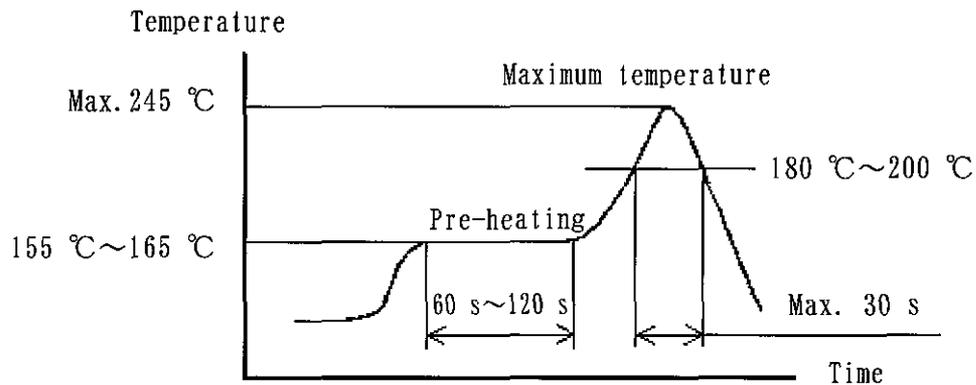
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2) Reflow soldering.

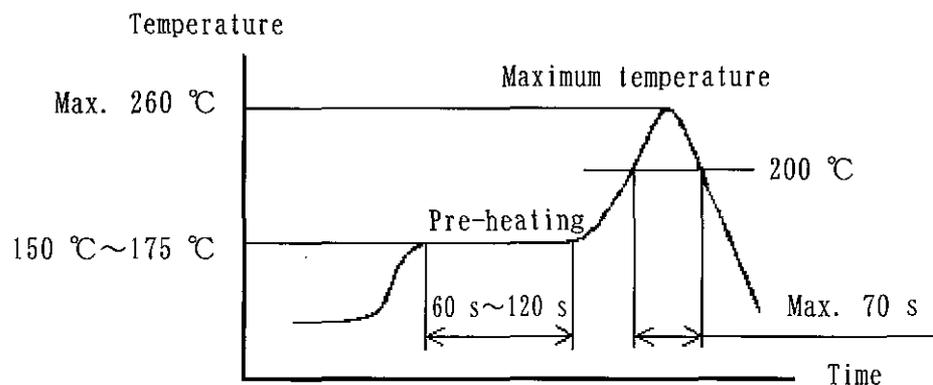
- Please use screen soldering regarding cream solder printing.
- PC board and metalmasking drawing show the relationship between screen open window area and PC board foot pattern area. The side of terminal tip is base.



- 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.



The recommended conditions for the reflow temperature profile (Sn-Pb solder)



The recommended conditions for the reflow temperature profile (lead-free solder)

TO :

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MATSUSHITA ELECTRIC WORKS, LTD.
CONNECTOR DIVISION

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SPECIFICATIONS

NARROW-PITCH CONNECTORS

AXT300104 / AXT400104

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- Infrared reflow soldering is able to passed two times.
 - The temperature measured on the PC board surface near connector terminals.
 - 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. Preventing vibration and shock

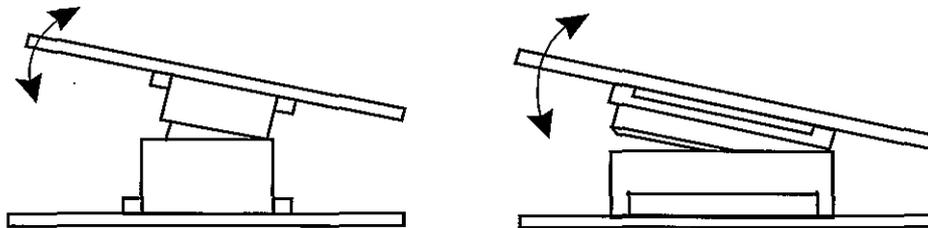
In order to secure the PC board connection even when a shock applied, please keep a connector away from the influence of the shock by fixing the PC board to the enclosure or any other means.

9-5. 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 handling of the product.

9-6. 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.

9-7. These models are made very thin so that they may be smaller in size and light in weight than before.

Take care not to give then excessive force and insert by sliding when mating them together or unmating them; otherwise, breakage may result. To prevent damage from incorrect insertions, please confirm the correct position before mating connectors.



TO :

DATE: Dec. 22, 2004

MATSUSHITA ELECTRIC WORKS, LTD.
CONNECTOR DIVISION

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APPROVED BY *A. Inoue*

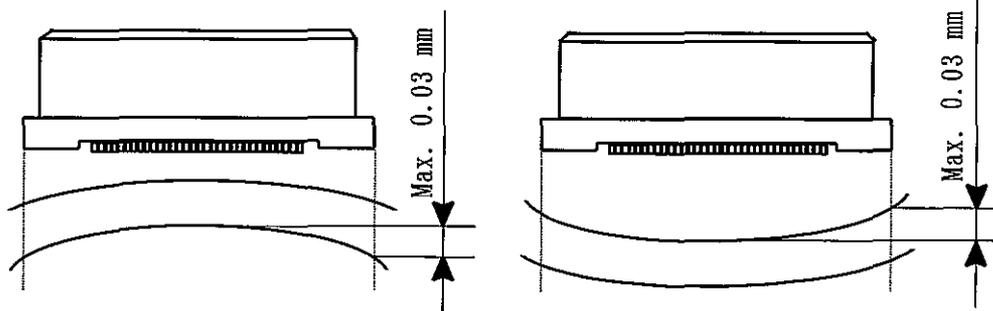
SPECIFICATIONS

NARROW-PITCH CONNECTORS

AXT300104 / AXT400104

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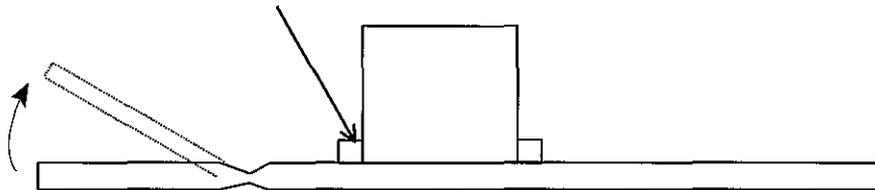
9-8. Keep the PC board warp 0.03 mm or below as against the overall length of the connector.



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

9-10. When cutting the PC board after mounting the connector, please assure soldered terminals aren't affected by the stress.

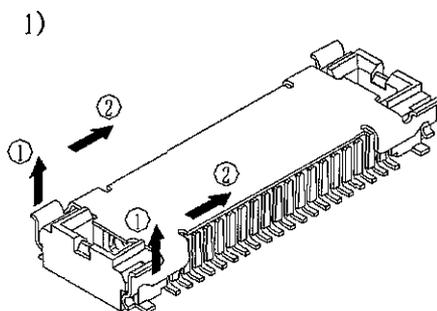
The stress should not affect the terminals soldered.



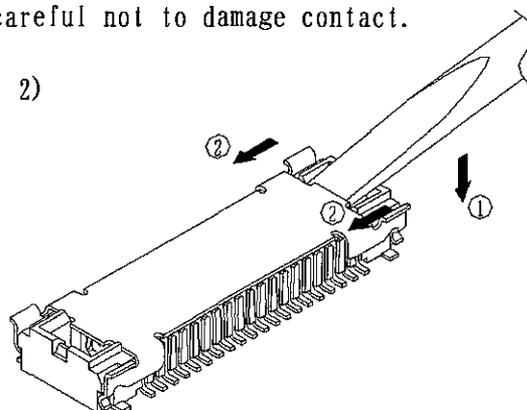
9-11. In case of with cover for mounting.

After mounting, cover for mounting should be removed as shown below.

In case of removing the cover, be careful not to damage contact.



Pull up the one side of the cover in the direction of ①.
Afterwards, slide the cover in the direction of ②.



Pull up the one side of the cover by moving tweezers or the screwdriver, etc. in the direction of ①.
Afterwards, slide the cover in the direction of ②.

TO :

DATE: Dec. 22, 2004

MATSUSHITA ELECTRIC WORKS, LTD.
CONNECTOR DIVISION

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APPROVED BY *A. Mori*

S P E C I F I C A T I O N S

NARROW-PITCH CONNECTORS

AXT300104 / AXT400104

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9-12. 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 + 3 mm Min.)
 Recommended material of reinforcement is Glass-Fiber board or Polyimide board which have Min. 0.3 mm thickness.
 The force to the connector occurred by drop, shock or wiring of FPC may make the connector disconnected.
 Please secure the connection by screw fixing or any other means.

- 9-13. 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. 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
- Heavy metal ;
 Mercury, Cadmium, Hexahydric chromium, Lead
- Other toxic substances
 Asbestos
 Organic tin compounds (Tributyl tin compounds, Triphenyl tin compounds)
 Polychlorinated biphenyls
 Polychlorinated naphthalenes
 Azo compounds

TO :			DATE: Dec. 22, 2004
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SPECIFICATIONS

NARROW-PITCH CONNECTORS

AXT300104 / AXT400104

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1 1. 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 God, public enemy or war, fires, floods and any other causes beyond the control of the people concerned.

TO :

DATE: Dec. 22, 2004

MATSUSHITA ELECTRIC WORKS, LTD.
CONNECTOR DIVISION

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REVIEWED BY *M. Okamoto*

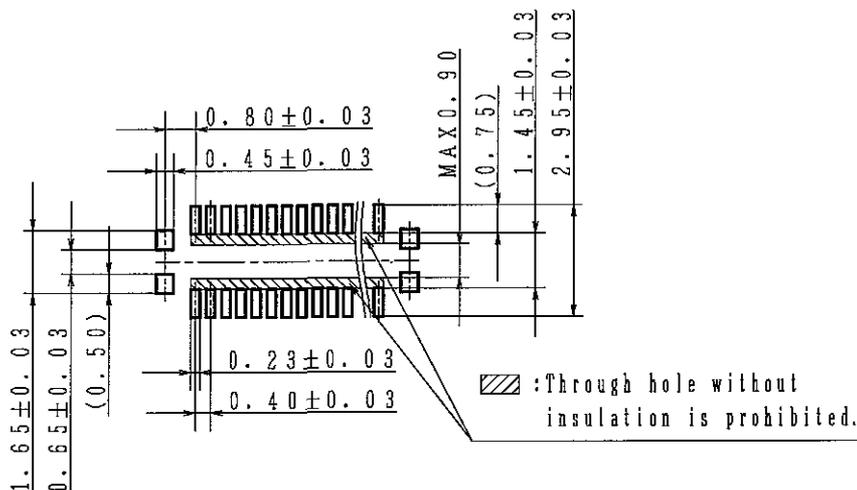
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APPROVED BY *H. Mori*

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

Product: Narrow-pitch connector P4S header

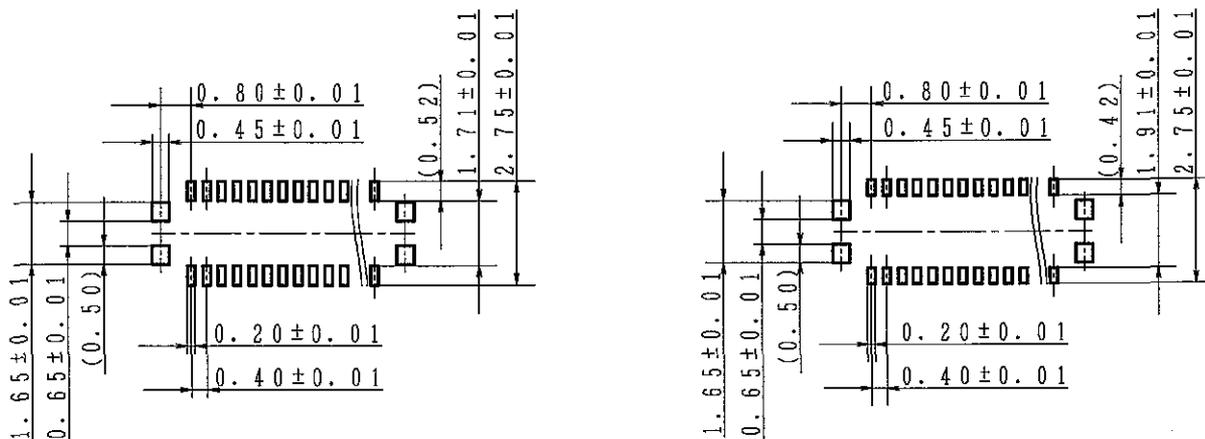
Recommended mounting pattern on PC board (Top view)



Recommended window size of metalmasking (Top view)

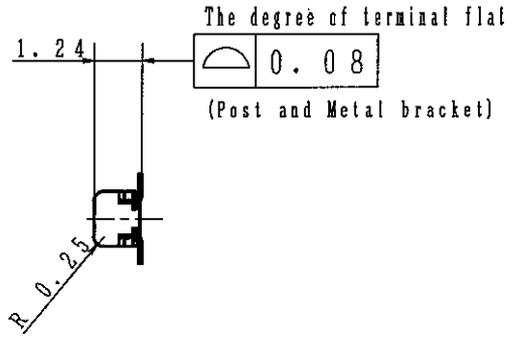
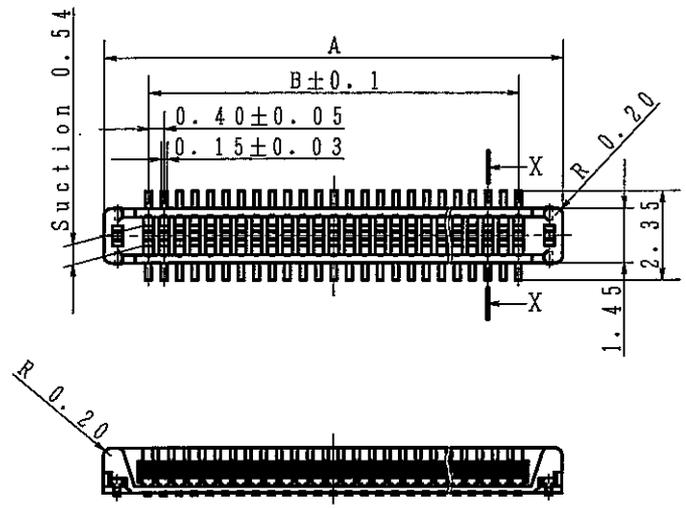
Thickness of metalmasking: 120 μm (Terminal part window ratio: 60%) (Metal bracket part window ratio: 100%)

Thickness of metalmasking: 150 μm (Terminal part window ratio: 49%) (Metal bracket part window ratio: 100%)

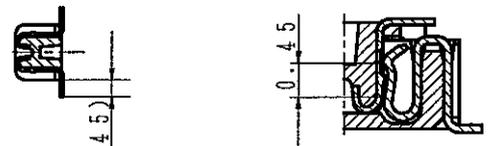


Window ratio is calculated by dividing window size of metalmasking by the original mounting pad.

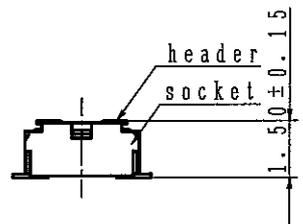
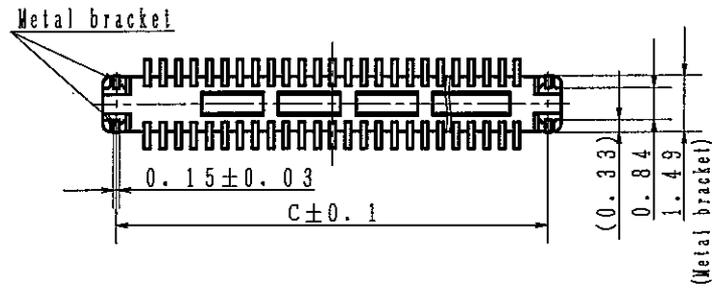
Sym	Item or Code No	Material & Size	qt.	Process	Remark
Catalog No			Drawing Name		
Name Narrow-pitch connector P4S header			Drawing No		
Remark			Scale 5 : 1	Unit: mm	Date Jul. 1, '04
Drawn <i>K. Sakaguchi</i>	Reviewed <i>M. Ankita</i>	MATSUSHITA ELECTRIC WORKS. LTD. CONNECTOR DIVISION.			
Designed <i>M. Kishi</i>	Approved <i>A. Masuda</i>				
Checked <i>K. Ohara</i>					



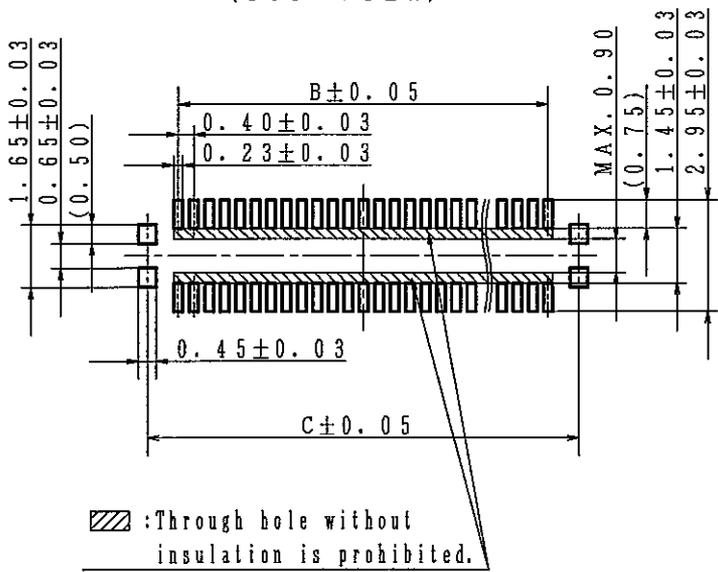
X-X cross section Mating area



Setting drawing



Recommended PC board pattern (mounting pad layout) (TOP VIEW)



Dimension No. of contacts	A	B	C
10	3.9	1.6	3.2
16	5.1	2.8	4.4
20	5.9	3.6	5.2
22	6.3	4.0	5.6
24	6.7	4.4	6.0
26	7.1	4.8	6.4
28	7.5	5.2	6.8
30	7.9	5.6	7.2
32	8.3	6.0	7.6
34	8.7	6.4	8.0
36	9.1	6.8	8.4
38	9.5	7.2	8.8
40	9.9	7.6	9.2
42	10.3	8.0	9.6
44	10.7	8.4	10.0
50	11.9	9.6	11.2
54	12.7	10.4	12.0
56	13.1	10.8	12.4
60	13.9	11.6	13.2
64	14.7	12.4	14.0
70	15.9	13.6	15.2
80	17.9	15.6	17.2
90	19.9	17.6	19.2
100	21.9	19.6	21.2

General tolerance ±0.2

Sym	Item or Code No	Material & Size	qt.	Process	Remark
Catalog No			Drawing Name		
Name Narrow-pitch connectors P4S header			Drawing No AXT450124		
Remark			Scale 5:1	Unit: mm	Date Dec. 22, '04
Drawn <i>K. Sakaguchi</i>	Reviewed <i>M. Ouketa</i>		MATSUSHITA ELECTRIC WORKS. LTD. CONNECTOR DIVISION.		
Designed <i>M. Kishi</i>	Approved <i>H. Imai</i>				
Checked <i>K. Okura</i>					

