

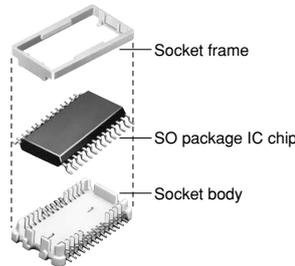


**μSOCKET SERIES  
IC SOCKETS FOR  
SMALL OUTLINE  
PACKAGE**

**SOP IC  
SOCKETS  
(AXS6)**



initial production, and during actual production the IC chips can be directly mounted to the PC board without any changes to the PC board patterns.



**2. Achieves a mounting height of 5mm or less including the IC's height**

The maximum height is 5mm, even when taking into consideration the rise in cream solder and the IC's maximum height. Ideal for low-profile requirements.  
Socket height: 4.5mm (28, 32 and 40 contact)  
Socket height: 4.2mm (8, 20 and 24 contact)

**3. Space saving**

The socket occupies an area only 1.25 times the size of the IC. High density mounting is possible even if the socket is used.

**4. Automated mounting compatible**

The socket has an open flat construction on its top surface so that it can be picked up by an automated mounting machine using suction for automated mounting.

**FEATURES**

**1. Requires no pattern changes when directly mounting an IC**

The foot patterns of SO package IC chips and of the socket are identical. Thus, the sockets can be used from prototyping to

**APPLICATIONS**

1. For initial production (prototyping to initial production stages, which use sockets for fast production of a new product)
2. For functional upgrades (situations requiring ROM replacement or LSI chip replacement)

**VENDOR-CLASSIFIED COMPATIBILITY LIST FOR SOP IC SOCKETS**

Please consult us for compatibility with other IC models.

No. of contacts	Nominal dimensions		Applicable Ics (IC maker: Part No.)	
8	300 mil		• FUJITSU: FPT-8P-M01	• TI: PS008
14	300 mil		• NEC: P14GM-50-300B-2 • MITSUBISHI: 14P2W • TOSHIBA: SOP14-P-300 • TI: PS014	• HITACHI: FP-14D, FP-14DA • FUJITSU: FPT-14P-M04 • MOTOROLA: 751A-02
20	300 mil		• NEC: P20GM-50-300B, P20GM-50-300C-2 • MEC: SONF-20D	• HITACHI: FP-20DA, FP-20DN
	375 mil		• NEC: P20GM-50-375B-3, P20GT-50-375B-2 • MOTOROLA: 751D-03	• FUJITSU: FPT-20P-M02 • ATMEL: 20S
24	300 mil		• NEC: P24GM-50-300B-2	
28	375 mil		• NEC: P28GM-50-375B-2, P28GT-50-375B-2 • MITSUBISHI: 28P2V-A	• FUJITSU: FPT-28P-M01 • MOTOROLA: 751F-02
	450 mil	Standard frame	• TOSHIBA: SOP28-P-450 • OKI IC: SOP28-P-430-K	ATMEL: 28R
		Centering frame	• NEC: P28GM-50-450A1-2, P28GM-50-450A2-2 • HITACHI: FP-28D, FP-28DA • MITSUBISHI: 28P2W-A, 28P2W-C	• MEC: SOP028-P-0425 • SHARP: SOP28-P-450
32	450 mil		• FUJITSU: FPT-32P-M02	• TOSHIBA: SOP32-P-450
	525 mil		• NEC: S32GM-50-525A-2 • MITSUBISHI: 32P2M-A • TOSHIBA: SOP32-P-525 • MACRONIX: MX27C1000MC-90	• HITACHI: FP-32D • FUJITSU: FPT-32P-M03 • SANYO: 3205
40	525 mil		• HITACHI: FP-40D	• MITSUBISHI: 40P2M-A
44	600 mil		• NEC: P44GX-50-600A	• INTEL: 231369-80

Notes) 1. The centering frame is used to secure ICs which are too small to be secured with the standard frame. The centering frame has inward projections in the center portion. For easy identification, the centering frame is a sky gray color, whereas the standard frame is a creamy gray color.

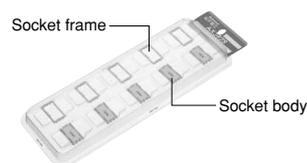
2. The contents of this compatibility list are valid as of July, 2002.

# AXS6

## PRODUCT TYPES

- Mounted on a PCB, these sockets are constructed with the IC placed on the socket and secured with a frame. Accordingly, when placing your order, please order the socket and frame as a set.
- SOP IC sockets, which require strict dimensional accuracy for SMD terminals, should be ordered in units of single packages to prevent terminal damage during transit.

### 1. Small lot, 5-set pack (standard)



### Quantities when ordering

If you order, for example, five of AXS608609C, one pack will be delivered (with five sockets and 5 frames).

### • Pack Package Containing 5 pieces (Standard)

No. of contacts	Nominal dimension	Part No.	Packing quantity		
			Pack	Outer carton	
8	300 mil (7.62mm)	AXS608309C	Socket: 5 pcs. Frame: 5 pcs.	Socket: 500 pcs. Frame: 500 pcs. (100 packs)	
14	300 mil (7.62mm)	AXS614309C			
20	300 mil (7.62mm)	AXS620309C			
	375 mil (9.53mm)	AXS620319C			
24	300 mil (7.62mm)	AXS624309C			
	375 mil (9.53mm)	AXS628319C			
28	Standard frame	450 mil (11.43mm)			AXS628329C
		Centering frame			450 mil (11.43mm)
32	Standard frame	450 mil (11.43mm)			AXS632329C
		525 mil (13.34mm)			AXS632339C
40	525 mil (13.34mm)	AXS640339C			
44	600 mil (15.24mm)	AXS644349C			

### • Stick Package (Standard)

No. of contacts	Nominal dimension	Part No.	Packing quantity	
			Stick	Outer carton
8	300 mil (7.62mm)	AXS608309S	50 pcs.	300 pcs.
14	300 mil (7.62mm)	AXS614309S	25 pcs.	300 pcs.
20	300 mil (7.62mm)	AXS620309S	25 pcs.	300 pcs.
	375 mil (9.53mm)	AXS620319S	25 pcs.	300 pcs.
24	300 mil (7.62mm)	AXS624309S	25 pcs.	300 pcs.
	375 mil (9.53mm)	AXS628319S	20 pcs.	300 pcs.
28	Standard frame	450 mil (11.43mm)	20 pcs.	300 pcs.
		Centering frame	450 mil (11.43mm)	20 pcs.
32	Standard frame	450 mil (11.43mm)	20 pcs.	300 pcs.
		525 mil (13.34mm)	20 pcs.	300 pcs.
40	525 mil (13.34mm)	AXS640339S	15 pcs.	300 pcs.
44	600 mil (15.24mm)	AXS644349S	15 pcs.	300 pcs.

### • Frame

No. of contacts	Nominal dimension	Stick package			Vinyl bag		
		Part No.	Packing quantity		Part No.	Packing quantity	
			Stick	Outer carton		Vinyl package	Outer carton
8	300 mil (7.62mm)	AXS60820	50 pcs.	300 pcs.	AXS60820V	500 pcs.	2,000 pcs.
14	300 mil (7.62mm)	AXS61420	25 pcs.	300 pcs.	AXS61420V	500 pcs.	2,000 pcs.
20	300 mil (7.62mm)	AXS62020	25 pcs.	300 pcs.	AXS62020V	500 pcs.	2,000 pcs.
	375 mil (9.53mm)	AXS62021	25 pcs.	300 pcs.	AXS62021V	500 pcs.	2,000 pcs.
24	300 mil (7.62mm)	AXS62420	25 pcs.	300 pcs.	AXS62420V	500 pcs.	2,000 pcs.
	375 mil (9.53mm)	AXS62821	25 pcs.	300 pcs.	AXS62821V	500 pcs.	2,000 pcs.
28	Standard frame	450 mil (11.43mm)	20 pcs.	300 pcs.	AXS62822V	500 pcs.	2,000 pcs.
		Centering frame	450 mil (11.43mm)	20 pcs.	300 pcs.	AXS628C22V	500 pcs.
32	Standard frame	450 mil (11.43mm)	25 pcs.	300 pcs.	AXS63222V	500 pcs.	2,000 pcs.
		525 mil (13.34mm)	20 pcs.	300 pcs.	AXS63223V	500 pcs.	2,000 pcs.
40	525 mil (13.34mm)	AXS64023	15 pcs.	300 pcs.	AXS64023V	500 pcs.	2,000 pcs.
44	600 mil (15.24mm)	AXS64424	15 pcs.	300 pcs.	AXS64424V	500 pcs.	2,000 pcs.

Note) The centering frame is used to secure small IC chips which cannot be secured with the standard frame (it has projections in the center). The standard frame is colored creamy gray and the centering frame is colored sky gray for easy identification.

# SPECIFICATIONS

## 1. Characteristics

Item		Specifications	Conditions															
Electrical characteristics	Rated current	0.5A	—															
	Insulation resistance	Min. 1,000MΩ	Using 500V DC megger															
	Breakdown voltage	500V AC for 1 minute	Detection current: 1mA															
	Contact resistance	Max. 30mΩ	Measured based on the HP4338B measurement method of JIS C 5402. Does not include conductor resistance of IC leads.															
Mechanical characteristics	Shock resistance	981m/s <sup>2</sup> {100G}	No interruption of current longer than 1μs															
Environmental characteristics	H <sub>2</sub> S	After test, contact resistance max. 30mΩ	After 48 hours of exposure to humidity 75 to 80% R.H., temperature 40°C±2°C, concentration 3±1ppm															
	SO <sub>2</sub>	After test, contact resistance max. 30mΩ	After 48 hours of exposure to humidity 90 to 95% R.H., temperature 40°C±2°C, concentration 10±3ppm															
	Humidity	After test, contact resistance max. 30mΩ, insulation resistance min. 100MΩ	After 96 hours of exposure to humidity 90 to 95% R.H., temperature 40°C±2°C															
	Thermal shock resistance	After test, contact resistance max. 30mΩ, insulation resistance min. 100MΩ	After 5 cycles where 1 cycle consists of steps 1 to 4 <table border="1"> <thead> <tr> <th>Sequence</th> <th>Temperature (°C)</th> <th>Time (minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55<sup>+0</sup><sub>-3</sub></td> <td>30</td> </tr> <tr> <td>2</td> <td>25<sup>+10</sup><sub>-5</sub></td> <td>Max. 5</td> </tr> <tr> <td>3</td> <td>85<sup>+3</sup><sub>-0</sub></td> <td>30</td> </tr> <tr> <td>4</td> <td>25<sup>+10</sup><sub>-5</sub></td> <td>Max. 5</td> </tr> </tbody> </table>	Sequence	Temperature (°C)	Time (minutes)	1	-55 <sup>+0</sup> <sub>-3</sub>	30	2	25 <sup>+10</sup> <sub>-5</sub>	Max. 5	3	85 <sup>+3</sup> <sub>-0</sub>	30	4	25 <sup>+10</sup> <sub>-5</sub>	Max. 5
	Sequence	Temperature (°C)	Time (minutes)															
	1	-55 <sup>+0</sup> <sub>-3</sub>	30															
	2	25 <sup>+10</sup> <sub>-5</sub>	Max. 5															
3	85 <sup>+3</sup> <sub>-0</sub>	30																
4	25 <sup>+10</sup> <sub>-5</sub>	Max. 5																
Operating temperature	-55°C to +85°C	No freezing at low temperatures																
Soldering heat resistance	Peak temperature of 245°C	Infrared reflow soldering																
Soldering heat resistance	300°C within 5 seconds	Soldering iron																
Suitable IC package (See page 169.)	8, 14, 20, 24 contacts: SO package IC with nominal dimension 300 mil and 1.27mm pitch 20, 28 contacts: SO package IC with nominal dimension 375 mil and 1.27mm pitch 28, 32 contacts: SO package IC with nominal dimension 450 mil and 1.27mm pitch 32, 40 contacts: SO package IC with nominal dimension 525 mil and 1.27mm pitch 44 contacts: SO package IC with nominal dimension 600 mil and 1.27mm pitch																	

## 2. Materials and surface treatment

Part name		Material	Surface treatment
Molded portion	Body	Glass reinforced PPS (UL94V-0)	—
	Frame	Glass reinforced PPS (UL94V-0)	—
Contact	Copper alloy		Contact portion: Sn plating over Ni, Terminal portion: Sn plating over Ni (except for top of the terminal)

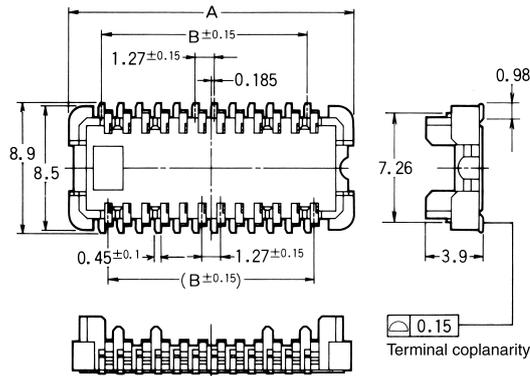
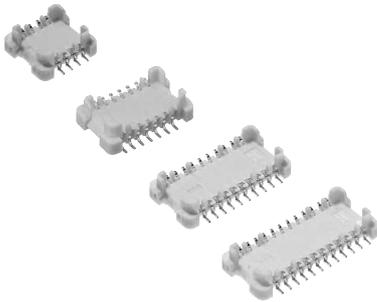
# AXS6

## DIMENSIONS

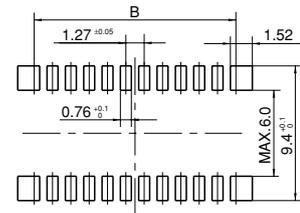
mm General tolerance:  $\pm 0.3$

Socket body

- Nominal dimension: 300 mil (7.62mm)  
8, 14, 20 and 24 contacts



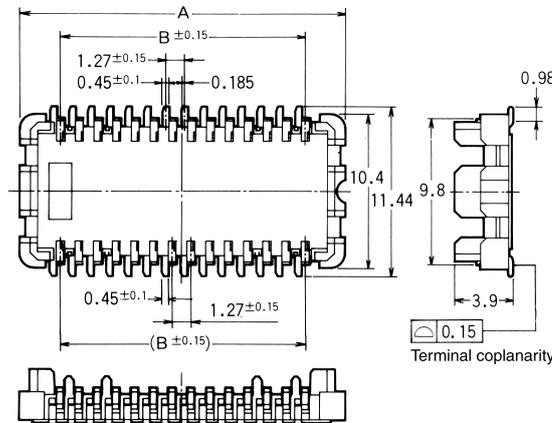
Recommended PC board pattern (TOP VIEW)



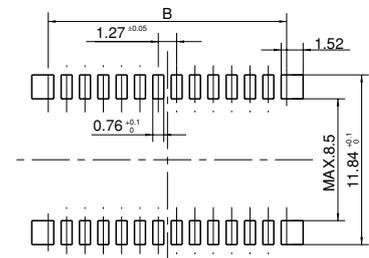
Dimension table (mm)

No. of contacts	A	B
8	9.15	3.81
14	12.96	7.62
20	16.77	11.43
24	19.31	13.97

- Nominal dimension: 375 mil (9.53mm)  
20 and 28 contacts



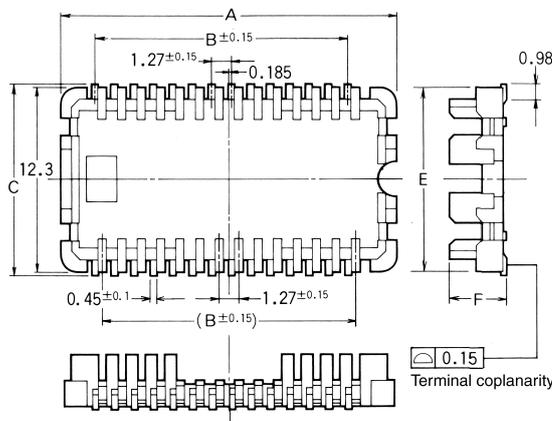
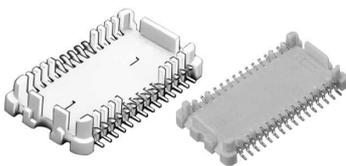
Recommended PC board pattern (TOP VIEW)



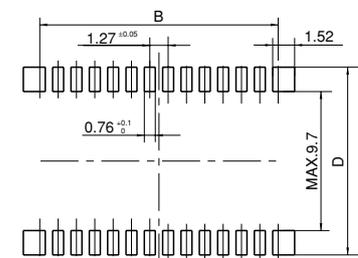
Dimension table (mm)

No. of contacts	A	B
20	16.77	11.43
28	21.85	16.51

- Nominal dimension: 450 mil (11.43mm)  
28 and 32 contacts



Recommended PC board pattern (TOP VIEW)

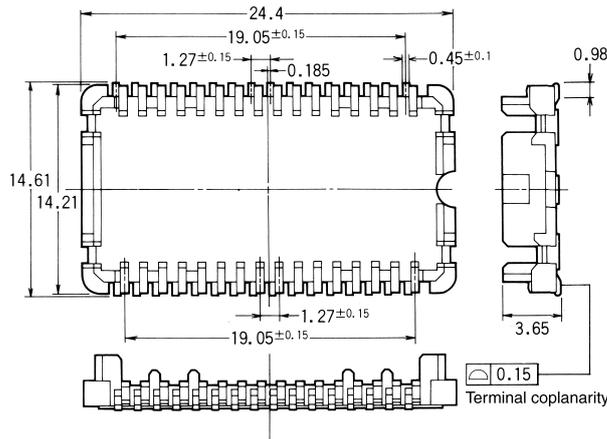


Dimension table (mm)

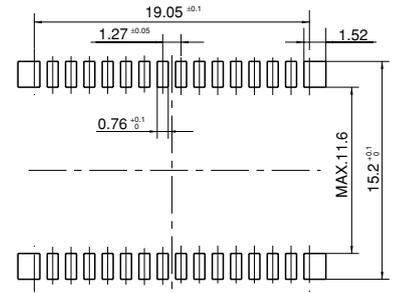
No. of contacts	A	B	C	D	E	F
28	21.85	16.51	12.70	13.10	11.02	3.65
32	24.39	19.05	12.89	13.30	11.25	3.90

- Nominal dimension: 525 mil (13.34mm)  
32 contacts

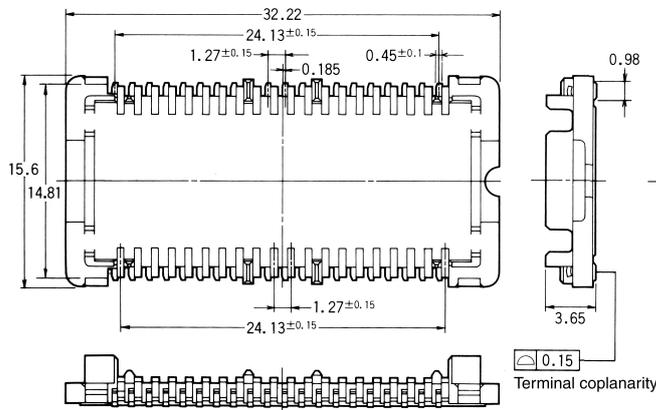
mm General tolerance:  $\pm 0.3$



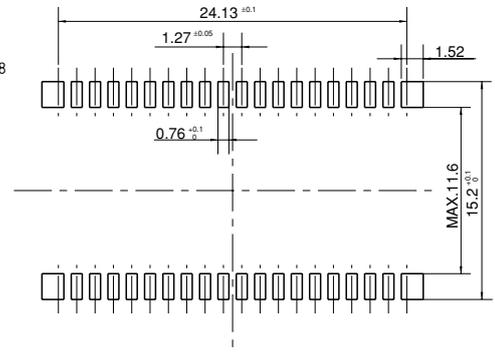
Recommended PC board pattern (TOP VIEW)



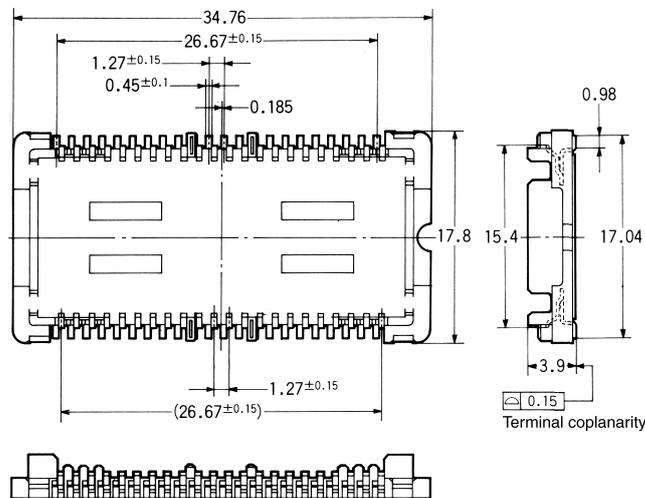
- Nominal dimension: 525 mil (13.34mm)  
40 contacts



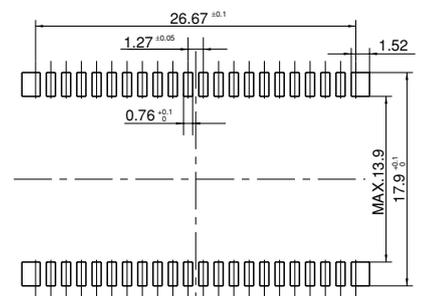
Recommended PC board pattern (TOP VIEW)



- Nominal dimension: 600 mil (15.24mm)  
44 contacts



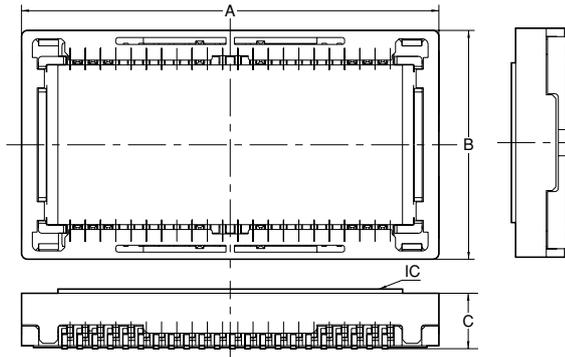
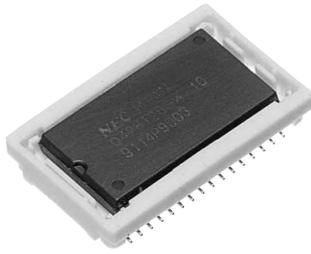
Recommended PC board pattern (TOP VIEW)



# AXS6

• IC chip and frame mounted on socket body

mm General tolerance: ±0.3



Dimension table (mm)

No. of contacts	Nominal dimension	A	B	C
8	300mil (7.62mm)	9.95	9.02	4.2
14	300mil (7.62mm)	13.76	9.02	4.2
20	300mil (7.62mm)	17.57	9.02	4.2
	375mil (9.53mm)	17.87	12.16	4.3
24	300mil (7.62mm)	20.11	9.02	4.2
	375mil (9.53mm)	22.95	12.16	4.5
28	450mil (11.43mm)	22.65	12.83	4.15
	450mil (11.43mm)	25.49	13.92	4.58
32	525mil (13.34mm)	25.19	15.54	4.5
	525mil (13.34mm)	32.22	17.00	4.5
40	525mil (13.34mm)	32.22	17.00	4.5
44	600mil (15.24mm)	34.76	19.20	4.7

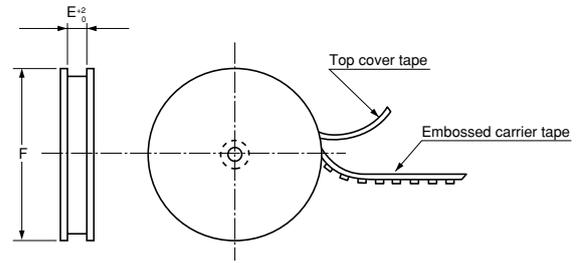
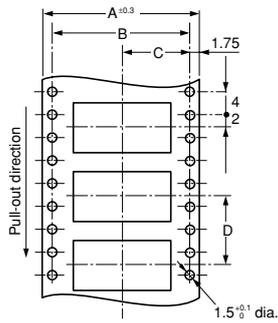
Note) The 28 contacts centering frame is the same as the 28 contacts 450mil type on the above table.

## EMBOSSED TAPE AND REEL

mm

• Tape dimensions (Conforming to JIS C 0806-1995)

• Reel dimensions (Conforming to JIS C 0806-1995)

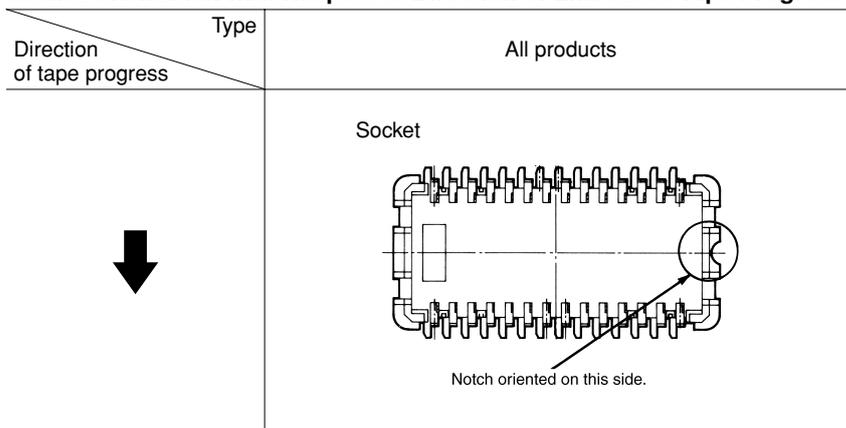


Dimension Table (mm)

No. of contacts	Nominal dimensions	Part No.	A	B	C	D	E	F	Quantity per reel
8	300 mil (7.62mm)	AXS608109P	32.0	28.4	14.2	12.0	32.4	330 dia.	1,000 pcs.
28	450 mil (11.43mm)	AXS628129P	32.0	28.4	14.2	16.0	32.4	330 dia.	1,000 pcs.
32	525 mil (13.34mm)	AXS632139P	44.0	40.4	20.2	24.0	44.4	380 dia.	1,000 pcs.
44	600 mil (15.24mm)	AXS644149P	56.0	52.4	26.2	24.0	56.4	370 dia.	750 pcs.

Notes) 1. The above table only describes the main types. Please contact us regarding other types.  
2. Dimensional figures supplied upon request.

### Socket Orientation with Respect to Direction of Embossed Tape Progress



**NOTES**

**1. As this construction stresses the PC board's contact ability, you should take the PC board thickness into account when studying creating a socket.**

The recommended PC board (made from FR-4) thickness is at least 1.0 mm for an SOP IC socket.

**2. Reflow soldering**

In order to ensure solder strength, cream solder used should have a strength equivalent to Sparkle Solder Paste 63-101F (Senju Metal Industry Co., Ltd.).

**3. Manual soldering the SO packages**

(1) Soldering iron and solder  
Use a small capacity soldering iron with a narrow tip and thin wire solder.

Example)

Capacity: 100V AC 15W

Tip diameter: 1.0 to 1.2mm

Wire solder diameter: 0.6 to 0.8mm

(2) Soldering time

Perform soldering quickly. Solder within 5 seconds using the soldering iron specified above.

(3) Soldering

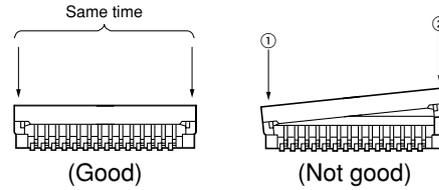
See "2. Hand soldering" on pages 8 and 9.

**4. If the IC's pin pitch is uneven, it might not fit into the socket or the IC may become damaged. Check the IC's pin pitch before insertion.**

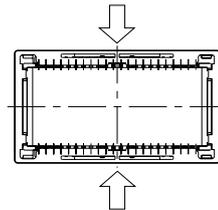
**5. When setting the frame, please use one of our specialized tools, and make sure that all frame tabs are securely inserted.**

If setting an IC embedded in a frame on the main unit, press in the frame until both tabs are firmly snapped into the main unit. When the frame is full inserted, there will be an audible snapping sound.

**6. When setting the frame by hand, lock all arms (24 contacts or less: 2 points, 28 and 32 contacts: 4 points, 40 and 42 contacts: 6 points) to the socket body at the same time.**



In case of 40, 44 contacts, there is a possibility that the frame is not firmly locked because of its swell in the middle. Please press by finger into the → marked direction shown in the following figure.



**7. When removing the frame, use the special tool available from us designed for that purpose.**

When replacing an IC, be sure to use the special frame removal tool available from us. Do not apply excessive displacement to the arms on the frame. Doing so may result in damage.

**8. Do not bend the pins. Doing so may result in damage.**

**9. Do not pull the pins with excessive force. Doing so may cause them to come off.**

**Regarding general notes, please refer to pages 8 and 9.**