

IT-P Series

60A/70A Rated Current, Board-to-Board Power Pin Connectors



High-Current



Floating



Wide Variation



Overview

IT-P was developed as a connector for powerful high current power supplies for all mezzanine applications. The current is 60A or 70A depending on the height.

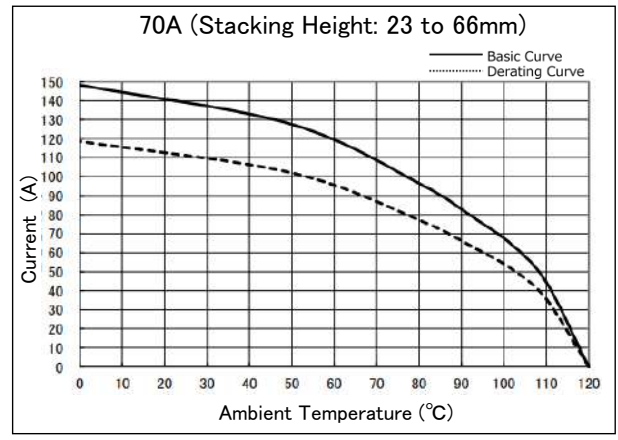
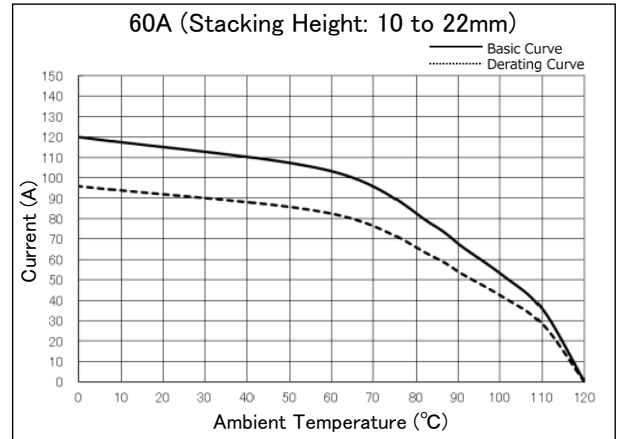
The IT-P, combined with the IT series, provides the most reliable and flexible solution for high-speed system design needs.

Features

1. 60/70A per Pin Current Rating

- Test condition: EIA-364-70
- IT-PA/IT-PB, IT-P-2P-16H: 60A
- IT-P: 70A

Electric Capacity Test (Derating Curve)



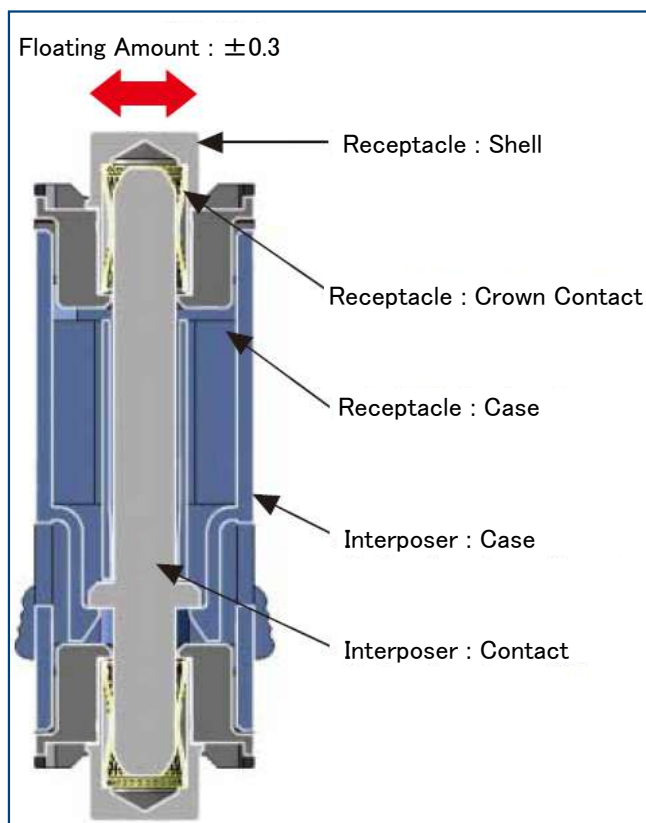
2. Stacking Height Variation : 10 to 66mm

Unit : mm

| | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|
| 10 | 11 | 12 | 14 | 15 | 16 | 17 |
| Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 29 | 30 | 35 | 36 | 37 | 38 | 39 |
| Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 40 | 41 | 42 | 43 | 44 | 65 | 66 |
| Yes | Yes | Yes | Yes | Yes | Yes | Yes |

3. 3-piece Design

- Multiple connectors can be mounted on a single board. (Floating Amount : ± 0.3 mm)
- Low-profile receptacle allows for easy mounting.

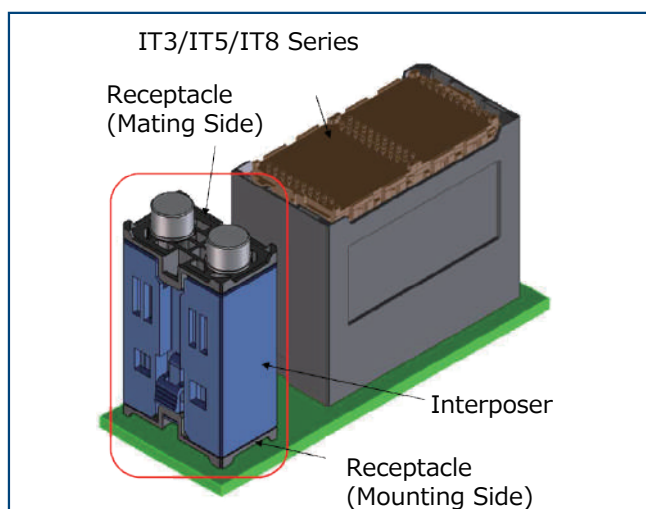


4. Pitch: 10.8mm & 12mm Pin Paste in Hole (PIH)

- The advantage of PIH is that it saves welding labor by avoiding unstable processes such as manual welding. PIH also improves weld quality and reduces the possibility of weld shorts and non-wetting.

5. Suitable for use with high speed transmission mezzanine connectors IT3, IT5 and IT8.

- The IT-P can be used for high current, while the IT8 and others can be used for high-speed signals.



Product Specifications

| | |
|-----------------------|--|
| Rated Current | 60/70A per pin (Note 6) (Temperature rise 30° Max.) |
| Rated Voltage | 300V AC/DC |
| Operating Temperature | -55 to +85°C (Note 1,2) 90% RH Max. (Note 2,4) |
| Storage Temperature | -10 to +60°C (Note 3) 70% RH Max. (Note 2,4) |

| Items | Specifications | Conditions |
|---------------------------------|--|---|
| Insulation Resistance | 1,000M Ω Min. | Measured at 500V DC |
| Withstanding Voltage | No flashover and insulation breakdown | 1,000V AC for 1 min. |
| Contact Resistance | 2m Ω Max. (Note 5) | Measured at 100mA DC |
| Vibration Resistance | No electrical interruption of 1 μ s or more. No damage, cracks or loose parts | Frequency : 50 to 2,000Hz, Power Spectral Density : 0.1gs ² /Hz for 90 min. in three directions |
| Cyclic Temperature and Humidity | Contact resistance : 2m Ω Max. (Note 5) No damage, cracks or loose parts | 25° , 80% RH : 60 min. dwell time, 30 min. ramp time 65° , 50% RH : 60 min. dwell time for 24 cycles |
| Mating Durability | Contact resistance : 2m Ω Max. (Note 5) No damage, cracks or loose parts | 100 times |

Note 1 : Includes the temperature rise due to current flow.

Note 2 : Operating temperature should be -55 to 55°C when humidity exceeds 80% RH.

Note 3 : "Storage" means a long-term storage state for the unused product in sealed packages before assembly to PCB.

Note 4 : No dew condensation is permitted.

Note 5 : The value of contact resistance includes 2 contact points and the bulk resistance.

Note 6 : Rated current of stacking height: 10 to 22mm is 60A. (See the Mating Combinations table.)

Materials / Finish

| Series | Product | Component | Material | Finish / Remarks |
|----------------|------------|--------------------|--------------|------------------|
| IT-P | Receptacle | Housing (Mounting) | LCP | Black/UL94V-0 |
| | | Housing (Mating) | LCP | Gray/UL94V-0 |
| | | Contact | Copper Alloy | Gold Plating |
| | | Shell | Brass | Silver Plating |
| | Interposer | Housing | PBT | Black/UL94V-0 |
| | | Contact | Copper Alloy | Silver Plating |
| IT-PA IT-PB | Receptacle | Housing | LCP | Black/UL94V-0 |
| | | Contact | Copper Alloy | Gold Plating |
| | | Shell | Brass | Silver Plating |
| | Interposer | Contact | Copper Alloy | Silver Plating |

Note 1 : IT-PA and IT-PB series use the same receptacle housing for the mounting and mating sides.

Note 2 : There is no interposer housing for IT-PA and IT-PB series.

Product Number Structure

Refer to the chart below when determining the product specifications from the product number.
Please select from the product numbers listed in this catalog when placing orders.

■ Receptacle

IT-P ## - 2 S - DIR ## (##)

① ② ③ ④ ⑤ ⑥ ⑦

■ Interposer

IT-P ## - 2 P - ## H ## (##)

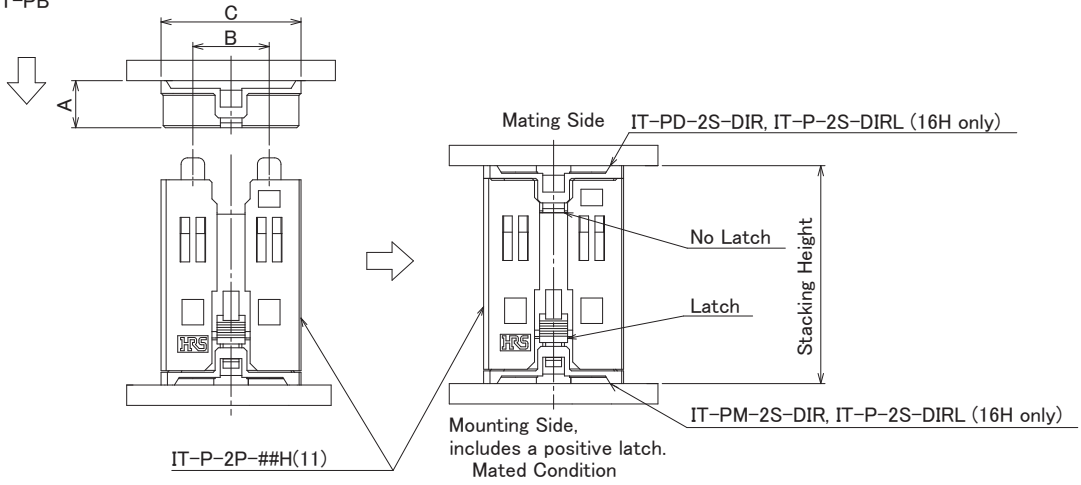
① ② ③ ④ ⑤ ⑥ ⑦

| | |
|--------------------------------------|---|
| ① Series Name | IT-P |
| ② Type | -Receptacle A : Narrow Type B : Narrow and Low Profile Type D : Insertion/Removal Side D# : Insertion/Removal Side (Customized) M : Mounting Side M# : Mounting Side (Customized) -Interposer A : Narrow Type B : Narrow and Low Profile Type Blank : Standard ## : Customized |
| ③ No. of Pos. | 2 |
| ④ Connector Type | S : Receptacle P : Interposer |
| ⑤ DIR | Paste in Hole (PIH) |
| ⑥ Packaging or Other Specification | -Receptacle Blank : Standard L : Low Profile ## : Customized -Interposer Blank : Standard ## : Customized |
| ⑦ Material and Plating Specification | -Receptacle Blank : Standard ## : Customized -Interposer Blank : Brass, Contact Plating (Silver 5.1um + Nickel 1.5um) (11) : ETP Copper, Contact Plating (Silver 5.1um + Nickel 1.5um) ## : Customized |
| ⑧ Stacking Height (mm) | 10, 11, 14, 16, 22, 23, 25, 27, 29, 35, 37, 39, 41, 43, 65 *All products are designed for +1mm height use. for example IT-P-2P-65H(11) is applicable to 65-66mm height application |

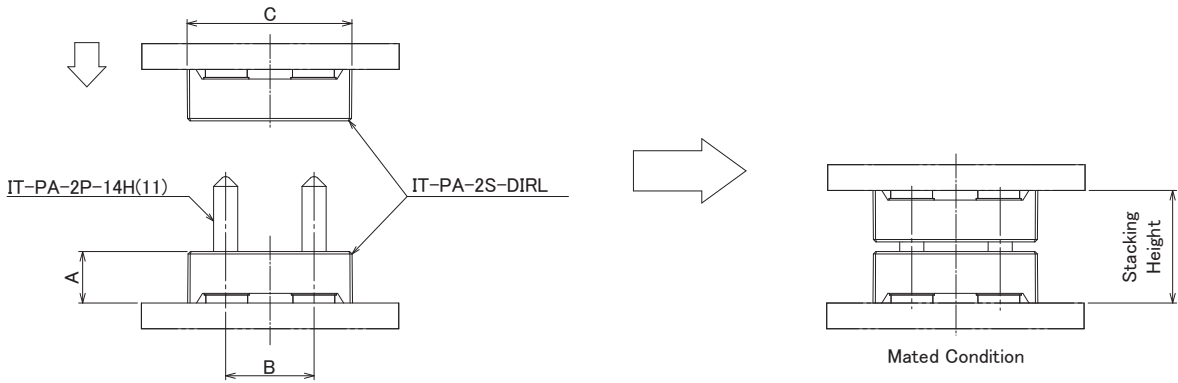
Mating Combinations

IT-P Series

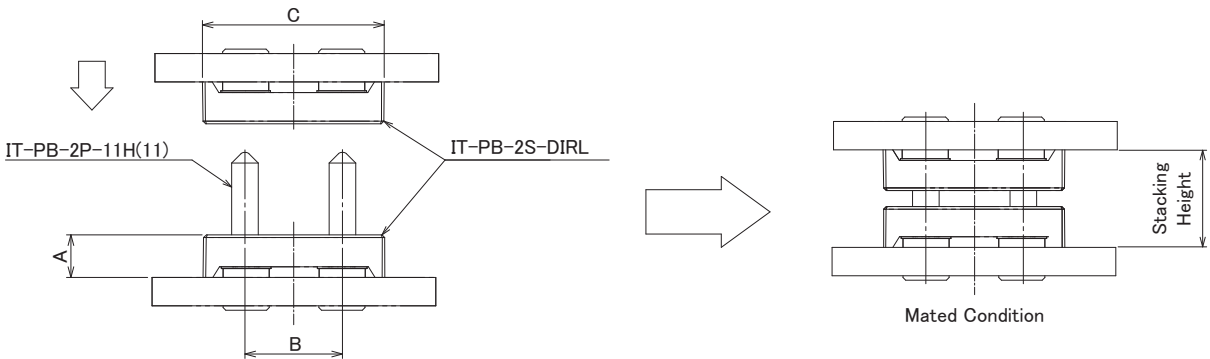
*16H is without housing case, like IT-PA and IT-PB



IT-PA Series



IT-PB Series



Unit : mm

| Stacking Height | Height Range | Rated Current | Interposer | | Receptacle | | Dimension | | | |
|-----------------|--------------|---------------|------------------|------------------|------------------------------|--------------------------------------|------------------|------|------|------|
| | | | Part No. | HRS No. | Part No. | HRS No. | A | B | C | |
| 10 | 9.873-10.127 | 60A | IT-PB-2P-10H(11) | CL0636-0632-0-11 | IT-PB-2S-DIRL | CL0636-0631-0-00 | 4.65 | 10.8 | 20.5 | |
| 11 | 12 | | 10.8-11.2 | IT-PB-2P-11H(11) | CL0636-0633-0-11 | IT-PB-2S-DIRL | CL0636-0631-0-00 | 4.65 | 10.8 | 20.5 |
| 14 | 15 | | 13.5-15 | IT-PA-2P-14H(11) | CL0636-0613-9-11 | IT-PA-2S-DIRL | CL0636-0614-1-00 | 6.4 | 10.8 | 20.5 |
| 16 | 17 | | 15.5-17 | IT-P-2P-16H(11) | CL0636-0644-0-11 | IT-P-2S-DIRL | CL0636-0611-3-00 | 9.8 | 12 | 22 |
| 22 | 21.5-22.5 | | IT-PA-2P-22H(11) | CL0636-0628-0-11 | IT-PA-2S-DIRL | CL0636-0614-1-00 | 6.4 | 10.8 | 20.5 | |
| 23 | 24 | 22.5-24 | IT-P-2P-23H(11) | CL0636-0610-0-11 | IT-PD-2S-DIR IT-PM-2S-DIR | CL0636-0601-0-00 CL0636-0600-7-00 | 7.4 | 12 | 22 | |
| 25 | 26 | 24.5-26 | IT-P-2P-25H(11) | CL0636-0607-6-11 | | | | | | |
| 27 | 28 | 26.5-28 | IT-P-2P-27H(11) | CL0636-0624-5-11 | | | | | | |
| 29 | 30 | 28.5-30 | IT-P-2P-29H(11) | CL0636-0615-4-11 | | | | | | |
| 35 | 36 | 34.5-36 | IT-P-2P-35H(11) | CL0636-0602-2-11 | | | | | | |
| 37 | 38 | 36.5-38 | IT-P-2P-37H(11) | CL0636-0620-4-11 | | | | | | |
| 39 | 40 | 38.5-40 | IT-P-2P-39H(11) | CL0636-0606-3-11 | | | | | | |
| 41 | 42 | 40.7-42.2 | IT-P-2P-41H(11) | CL0636-0619-5-11 | | | | | | |
| 43 | 44 | 42.5-44 | IT-P-2P-43H(11) | CL0636-0621-7-11 | | | | | | |
| 65 | 66 | 64.5-66.2 | IT-P-2P-65H(11) | CL0636-0643-0-11 | | | | | | |

Note 1 : IT-PA and IT-PB series, IT-P-2P-16H(11) do not have a housing.

Note 2 : IT-PA-2P-##H(##) is designed to mated only IT-PA-2S-DIRL.

Note 3 : IT-PB-2P-##H(##) is designed to mated only IT-PB-2S-DIRL.

Receptacle (Paste in Hole (PIH))

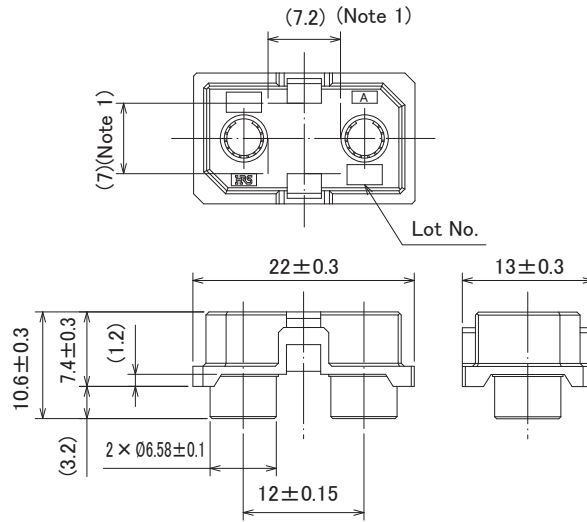
● IT-P Series



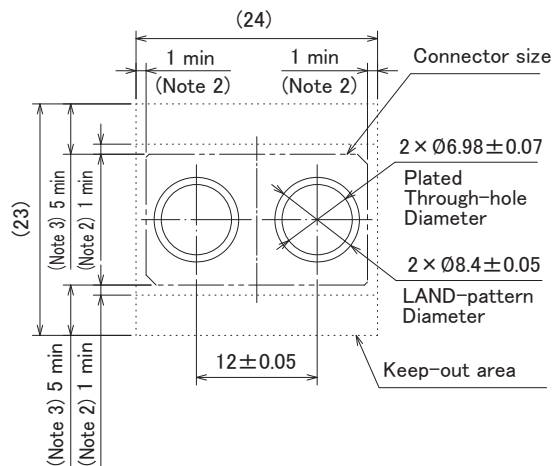
IT-PD-2S-DIR(##)



IT-PM-2S-DIR(##)



● Recommended PCB Layout



Unit : mm

| Part No. | HRS No. | Type | No. of Pos. | Pitch | Color | Purchase Unit |
|--------------|------------------|---------------|-------------|-------|-------|-----------------|
| IT-PD-2S-DIR | CL0636-0601-0-00 | Mating Side | 2 | 12 | Grey | 250pcs per reel |
| IT-PM-2S-DIR | CL0636-0600-7-00 | Mounting Side | 2 | 12 | Black | 250pcs per reel |

Note 1 : This area is a vacuum pickup area.

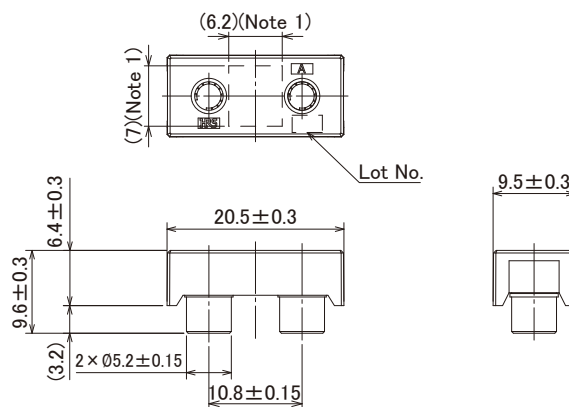
Note 2 : Minimum clearance area.

Note 3 : Recommended clearance area for insertion / extraction.

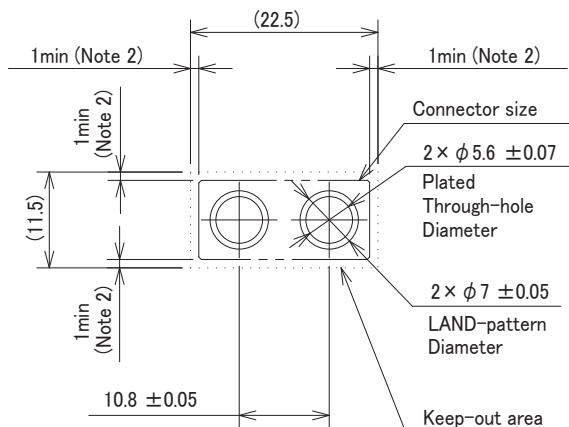
Note 4 : Please see the Mating Combinations table for applicable Interposers.

Receptacle (Paste in Hole (PIH))

●IT-PA Series (Narrow Type)



●Recommended PCB Layout



Unit : mm

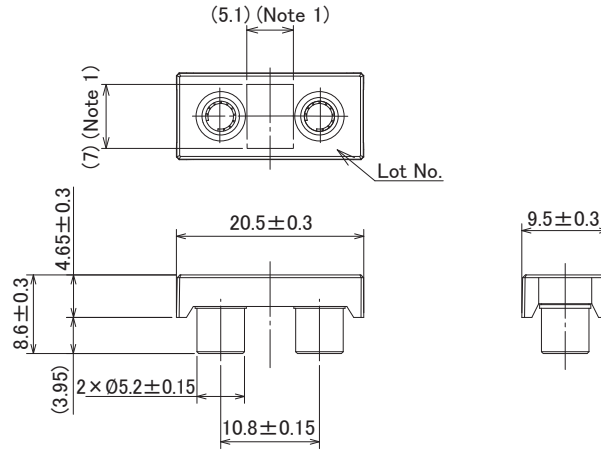
| Part No. | HRS No. | No. of Pos. | Pitch | Purchase Unit |
|---------------|------------------|-------------|-------|-----------------|
| IT-PA-2S-DIRL | CL0636-0614-1-00 | 2 | 10.8 | 250pcs per reel |

- Note 1 : This area is a vacuum pickup area.
- Note 2 : Minimum clearance area.
- Note 3 : This product is designed to mate with IT-PA-2P-14H(##) only.
- Note 4 : IT-PA series is narrow type of IT-P.
- Note 5 : There is no latch for this receptacle.

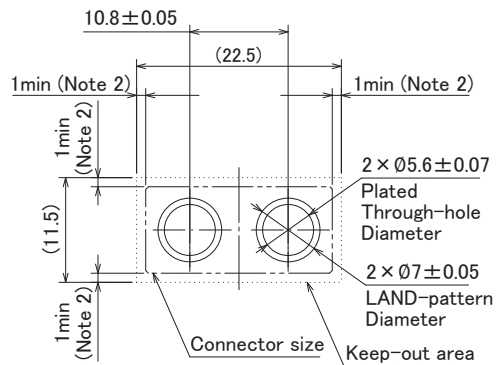
Receptacle (Paste in Hole (PIH))

● IT-PB Series

Narrow and Low Profile Type



● Recommended PCB Layout



| Part No. | HRS No. | No. of Pos. | Pitch | Purchase Unit |
|---------------|------------------|-------------|-------|-----------------|
| IT-PB-2S-DIRL | CL0636-0631-0-00 | 2 | 10.8 | 250pcs per reel |

Note 1 : This area is a vacuum pickup area.

Note 2 : Minimum clearance area for non-precision parts.

Note 3 : Minimum clearance area for precision parts.

Note 4 : This product is designed to mate with IT-PB-2P-10H(##) and IT-PB-2P-11H(##) only.

Note 5 : IT-PB series is narrow and low profile type of IT-P.

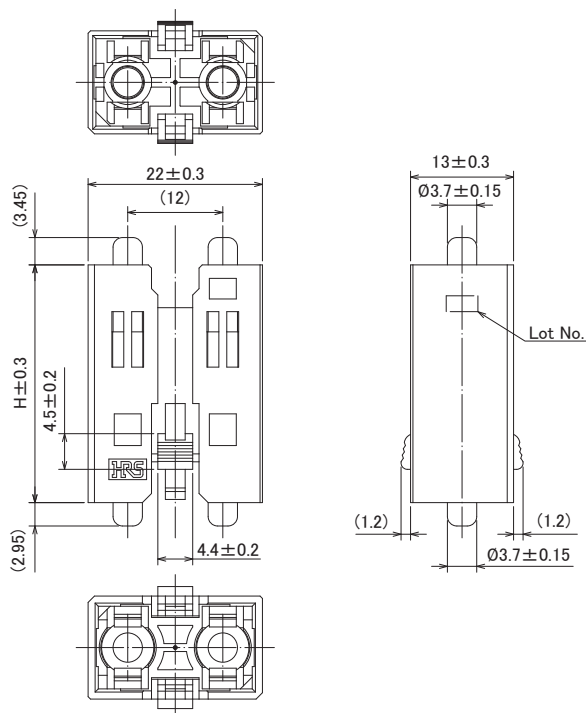
Note 6 : There is no latch for this receptacle.

Interposer with Housing

● IT-P Series



IT-P-2P-35H(##)



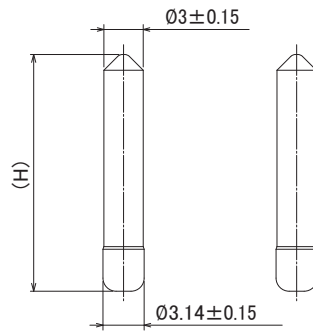
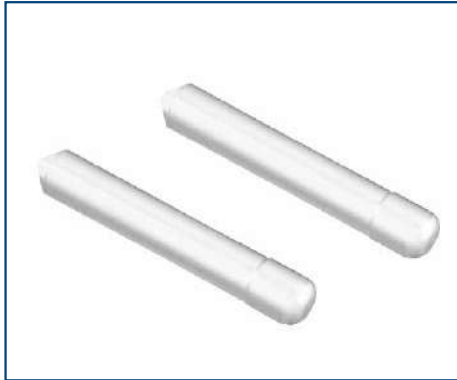
Unit : mm

| Part No. | HRS No. | Stacking Height | | H | Purchase Unit | Pitch |
|-----------------|------------------|-----------------|----|----|-----------------|-------|
| IT-P-2P-16H(11) | CL0636-0644-0-11 | 16 | 17 | 11 | 50pair per tray | 12 |
| IT-P-2P-23H(11) | CL0636-0610-0-11 | 23 | 24 | 18 | 50pcs per tray | |
| IT-P-2P-25H(11) | CL0636-0607-6-11 | 25 | 26 | 20 | | |
| IT-P-2P-27H(11) | CL0636-0624-5-11 | 27 | 28 | 22 | | |
| IT-P-2P-29H(11) | CL0636-0615-4-11 | 29 | 30 | 24 | 29pcs per tray | |
| IT-P-2P-35H(11) | CL0636-0602-2-11 | 35 | 36 | 30 | 25pcs per tray | |
| IT-P-2P-37H(11) | CL0636-0620-4-11 | 37 | 38 | 32 | 40pcs per tray | |
| IT-P-2P-39H(11) | CL0636-0606-3-11 | 39 | 40 | 34 | | |
| IT-P-2P-41H(11) | CL0636-0619-5-11 | 41 | 42 | 36 | | |
| IT-P-2P-43H(11) | CL0636-0621-7-11 | 43 | 44 | 38 | 28pcs per tray | |
| IT-P-2P-65H(11) | CL0636-0643-0-11 | 65 | 66 | 60 | | |

Note 1 : IT-P-2P-16H(11) does not have a housing like IT-PA and IT-PB series.

Interposer without Housing

● IT-PA and IT-PB Series



IT-PA-2P-14H(##)

Unit : mm

| Part No. | HRS No. | Stacking Height | H | Purchase Unit |
|------------------|------------------|-----------------|-------|-----------------|
| IT-PB-2P-10H(11) | CL0636-0632-0-11 | 10 | 16.5 | 50pair per tray |
| IT-PB-2P-11H(11) | CL0636-0633-0-11 | 11 | 17.5 | |
| IT-PA-2P-14H(11) | CL0636-0613-9-11 | 14 | 18 | |
| IT-PA-2P-22H(11) | CL0636-0628-0-11 | 22 | 25.95 | |

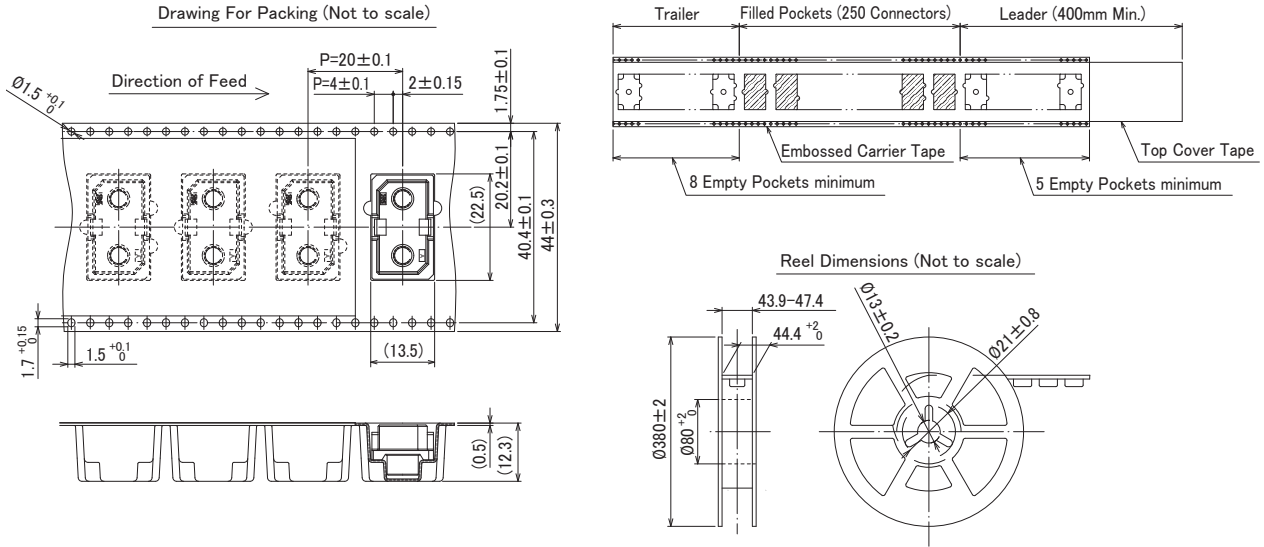
Note 1 : The larger side ($\phi 3.14$) or ($\phi 3.79$) of the pin should be inserted to mother board side since it has a locking mechanism.
You can remove the pin if you pull strongly.

Note 2 : The thinner side ($\phi 3$) does not have any locking mechanism.

Packaging

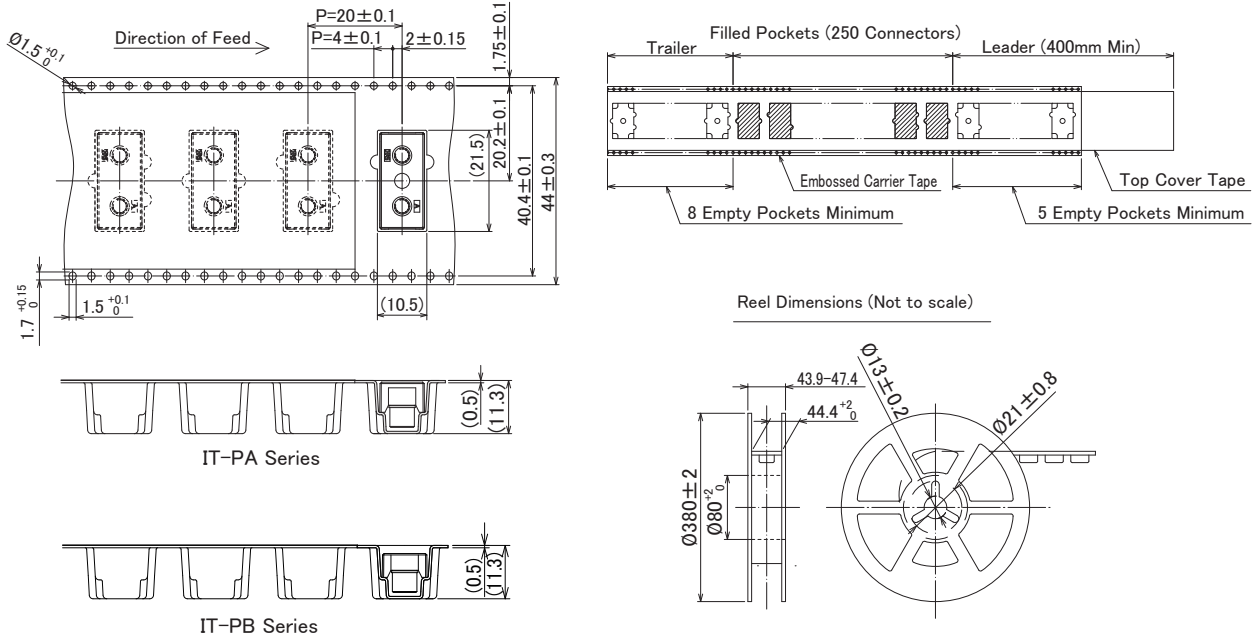
Embossed Carrier Tape Dimensions

IT-P Series



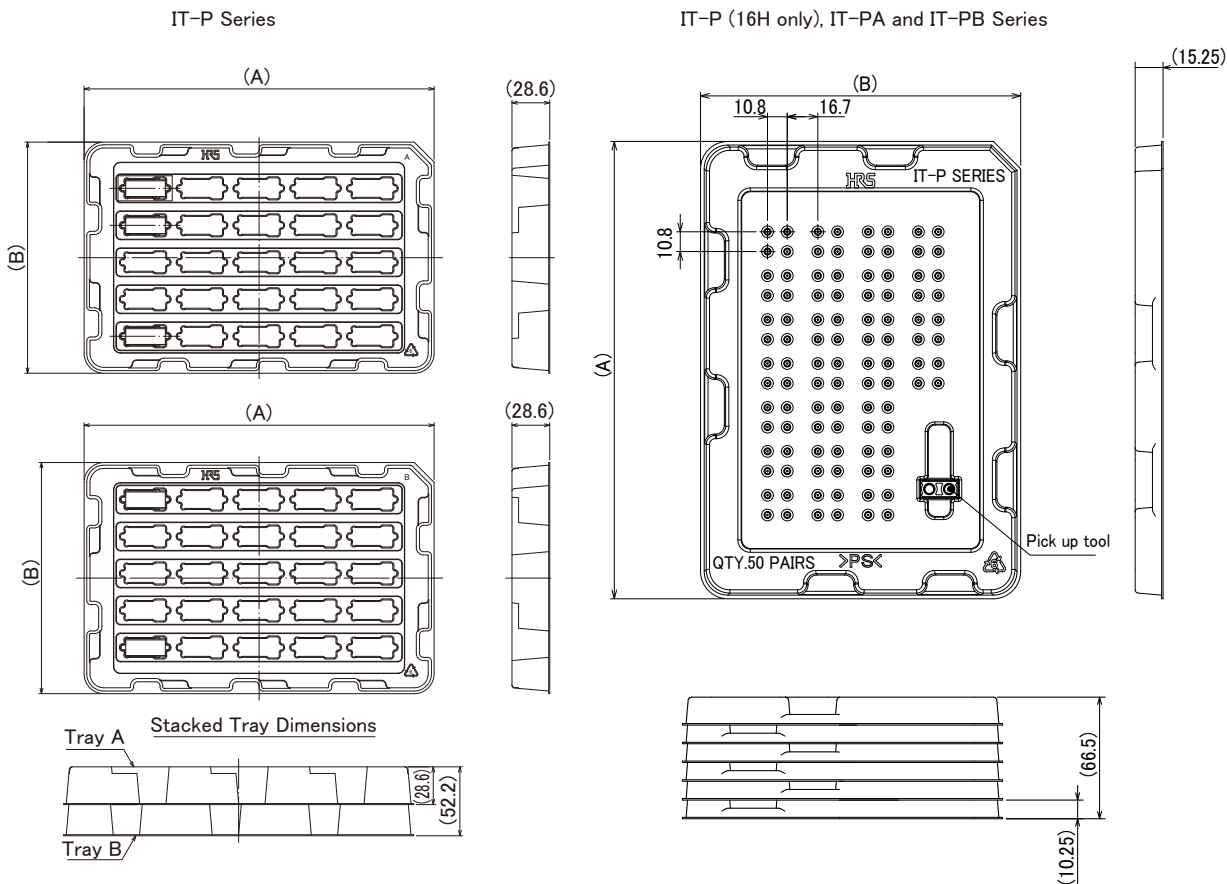
Note : This embossed carrier tape is for IT-PD-2S-DIR and IT-PM-2S-DIR.

IT-PA and IT-PB Series



Note : This embossed carrier tape is for IT-PA-2S-DIR and IT-PB-2S-DIR.

Dimensions of Interposer Tray



Note 1 : These drawings show a standard tray.

The size of the pocket and the stacking height vary depending on the size of the product.

Note 2 : The provided pickup jig prevents direct contact with the terminals.

Note 3 : Discard the pickup jig after use.

Note 4 : IT-PA and IT-PB series interposers are placed on the tray so that the larger diameter side is located on the lower side.

Product List

Unit : mm

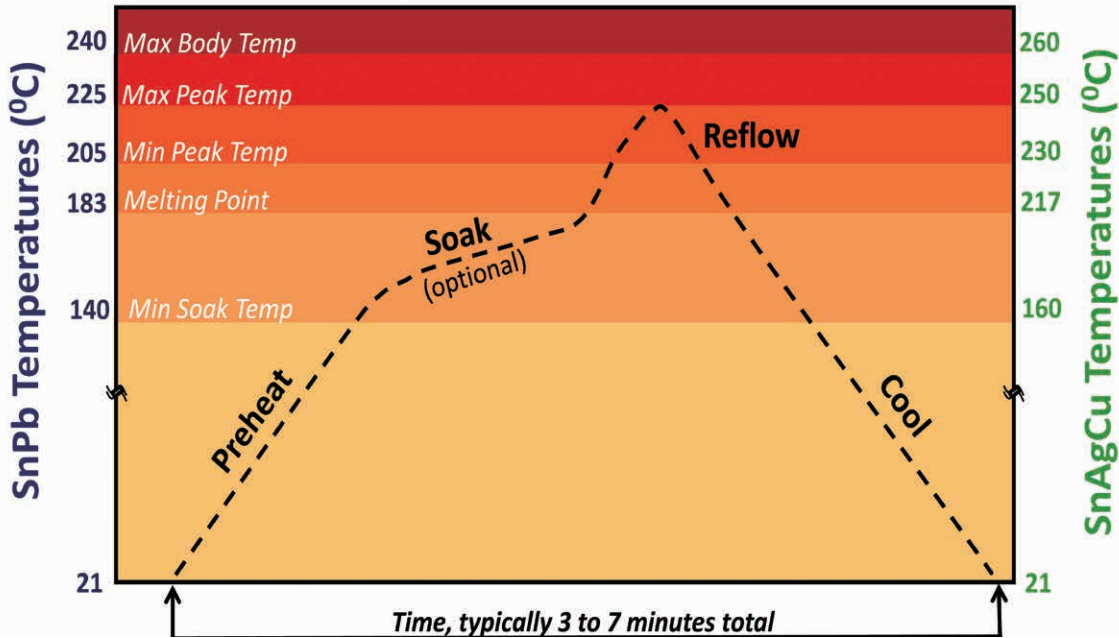
| Part No. | HRS No. | Parts per Tray | Qty per Box | A | B |
|------------------|------------------|----------------|-------------|-----|-----|
| IT-PB-2P-10H(11) | CL0636-0632-0-11 | *50 pairs | 500 | 250 | 175 |
| IT-PB-2P-11H(11) | CL0636-0633-0-11 | | | | |
| IT-PA-2P-14H(11) | CL0636-0613-9-11 | | 300 | | |
| IT-P-2P-16H(11) | CL0636-0644-0-11 | | 200 | 355 | 255 |
| IT-PA-2P-22H(11) | CL0636-0628-0-11 | | | | |
| IT-P-2P-23H(11) | CL0636-0610-0-11 | | | | |
| IT-P-2P-25H(11) | CL0636-0607-6-11 | 50pcs | 150 | | |
| IT-P-2P-27H(11) | CL0636-0624-5-11 | | | | |
| IT-P-2P-29H(11) | CL0636-0615-4-11 | 56pcs | 112 | 265 | 175 |
| IT-P-2P-35H(11) | CL0636-0602-2-11 | 25pcs | 75 | | |
| IT-P-2P-37H(11) | CL0636-0620-4-11 | | | | |
| IT-P-2P-39H(11) | CL0636-0606-3-11 | 40pcs | 120 | 355 | 255 |
| IT-P-2P-41H(11) | CL0636-0619-5-11 | | | | |
| IT-P-2P-43H(11) | CL0636-0621-7-11 | | 80 | | |
| IT-P-2P-65H(11) | CL0636-0643-0-11 | 28pcs | 56 | | |

Note : 1 pair = 2 contact pins

Safety Precautions

1. Recommended Temperature Profile

Reflow Profile



| Parameters | Eutectic (SnPb) | Pb-Free | Comment |
|--|--------------------|--------------------|---|
| Preheat 1 Temperature Rise Gradient | 2-3°C /sec | 2-3°C /sec | Other parts may be 2°C /sec Max. |
| Preheat 2 Time | 0-120 sec | 0-120 sec | Varies depending on board, reflow and solder specifications. |
| Preheat 2 Temperature | 140-180°C | 160-215°C | Excessive preheat adversely affects the mounting condition. |
| Reflow Temperature | 205-225°C | 230-250°C | If the peak temperature is low, it is recommended to increase the reflow time. |
| Solder Time | 30-90 sec | 45-120 sec | When the reflow time is short, it is recommended to increase the peak temperature. |
| Cooling Temperature Gradient | 6°C /sec Max. | 6°C /sec Max. | If the cooling time gradient is too fast, the mounting condition will be adversely affected. |
| Reflow Peak Temperature Temperature Difference between Connector and PCB | 240°C 10°C Max. | 260°C 10°C Max. | The open solder ball structure makes it possible to reduce the temperature difference between the PCB and the connector, thereby lowering the peak temperature. |
| Peak Temperature Time | 5 sec Max. | 5 sec Max. | If it exceeds 5 seconds, adjust the reflow condition. |

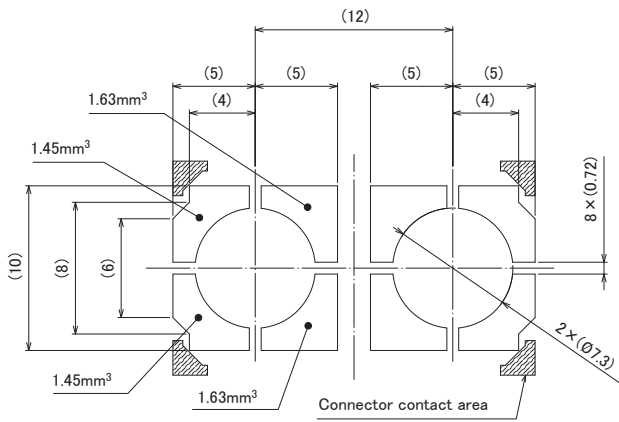
Note 1 : The values are the recommended values. Use the sewing machine after carefully checking the mounting state.

Note 2 : IT-P receptacles are not compatible with rear mounting.

Note 3 : IT-P interposers are not compatible with reflow mounting.

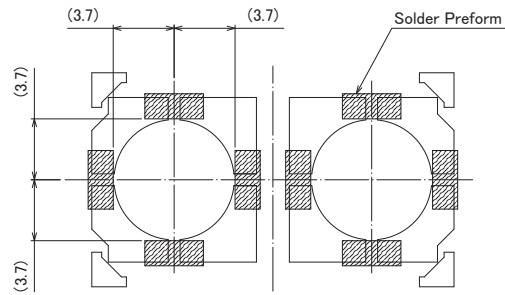
2-1. Recommended Net Solder Paste Amount for IT-P Series.

Dimensions for Recommended Net Solder Paste Amount



- (1) Net Solder Paste Amount : $10.9\text{mm}^3 = 12.32\text{mm}^3 \times (100-11.5)\%$
 <Calculation Conditions>
 • Stencil Thickness : 0.12mm
 • Flux Content : 11.5%

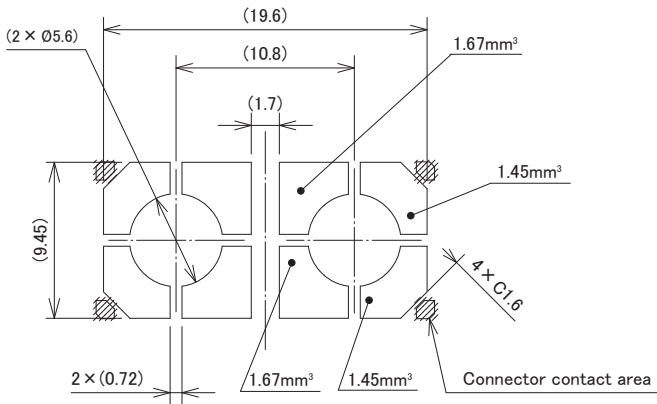
Dimensions For Recommended Solder Preform Amount



- (2) Solder Preform Amount : 32.768mm^3
 <Calculation Conditions>
 • Recommended Preform Solder : SMIC Chip Solder S M705
 • Size : $3.2 \times 1.6 \times 0.8 = 4.096\text{mm}^3$
 • Quantity : 8 pcs

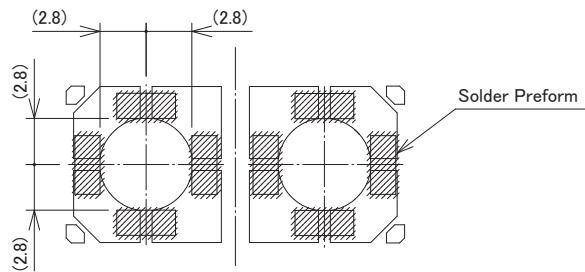
2-2. Recommended Net Solder Paste Amount for IT-PA and IT-PB Series.

Dimensions for Recommended Net Solder Paste Amount



- (1) NET Solder Paste Amount : $11.05\text{mm}^3 = 12.48\text{mm}^3 \times (100-11.5)\%$
 <Calculation Conditions>
 • Stencil Thickness : 0.12mm
 • Flux Content : 11.5%

Dimensions For Recommended Solder Preform Amount



- (2) Solder Preform Amount : 32.768mm^3
 <Calculation Conditions>
 • Recommended Preform Solder : SMIC Chip Solder S M705
 • Size : $3.2 \times 1.6 \times 0.8 = 4.096\text{mm}^3$
 • Quantity : 8 pcs

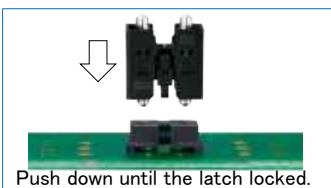
Installation

<IT-P Series except IT-P-2P-16H>

(1) Solder the Receptacle



(2) Install Interposer



(3) Interposer Installed



(4) Install Daughter Card

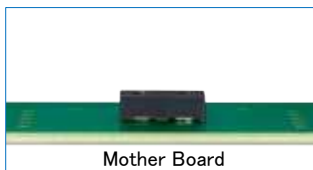


(5) Mated

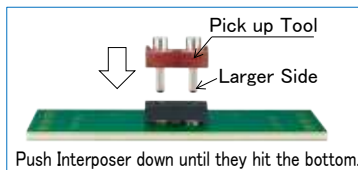


<IT-P/IT-PB Series & IT-P-2P-16H>

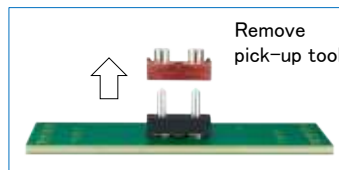
(1) Solder the Receptacle



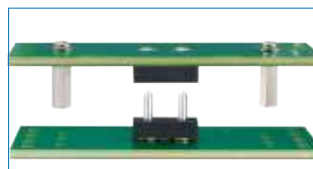
(2) Pick up the Interposer and install into the receptacle



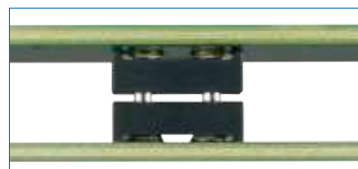
(3) Interposer Installed



(4) Install Daughter Card



(5) Mated



Note 1 : To prevent silver tarnish, do not touch the contacts with your bare hands.

Use the mating receptacle that has been provided as a pick up tool.

Note 2 : The pick up tool is intended to be used to pick up the contacts in tray and then be discarded.

Guideline

Please refer to the materials listed below when handling this product.

Design Guideline : ETAD-F0804-00

While Taking into Consideration

Specifications mentioned in this catalog are reference values.

When considering to order or use this product, please review the Drawing and Product Specifications sheets.

Use an appropriate cable when using the connector in combination with cables.

If considering usage of a non-specified cable, please contact your sales representative.

If assembly process is done by jigs & tools which are not identified by Hirose, the warranty of the product may be affected.

If considering usage for below mentioned applications, please contact your sales representative.

In cases where the application will demand a high level of reliability, such as automotive, medical instruments, public infrastructure, aerospace/defense etc. Hirose must review before assurance of reliability can be given.