PRODUCT CATALOG

HIROSE ELECTRIC CO.,LTD.

IT-P Series

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

High-Current

Floating

Wide Variation



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Product Page
https://www.hirose.com/en/product/series/IT-P

Oct. 2024

Overview

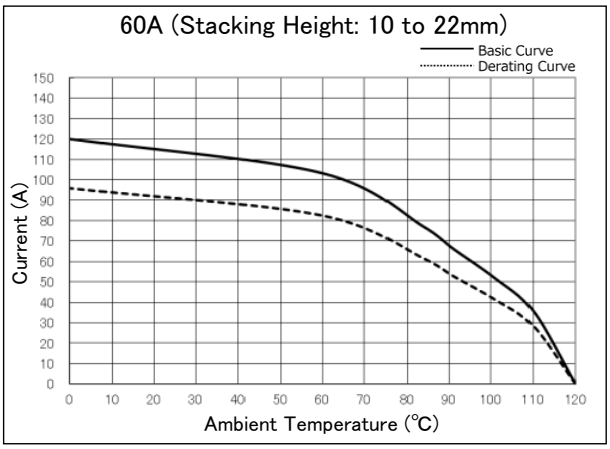
IT-P was developed as a connector for powerful high current power supplies for all mezzanine applications. The current is 60A or 70A depending on the height.
The IT-P, combined with the IT series, provides the most reliable and flexible solution for high-speed system design needs.

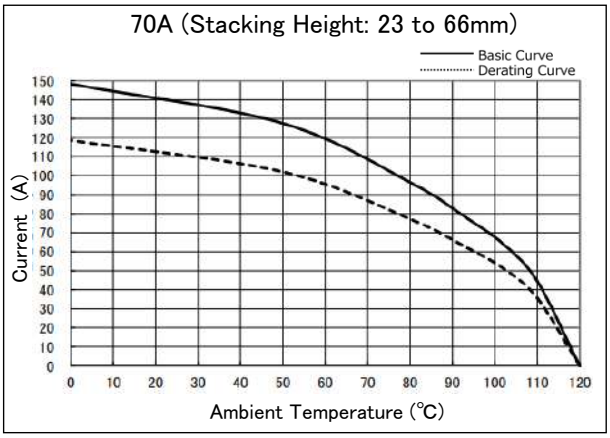
Features

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

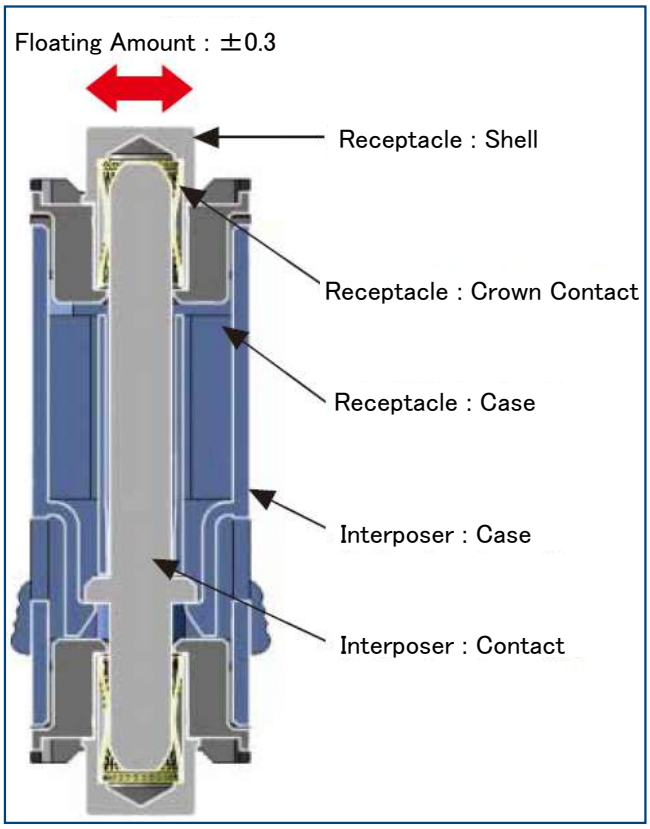
Unit : mm

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

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3. 3-piece Design

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

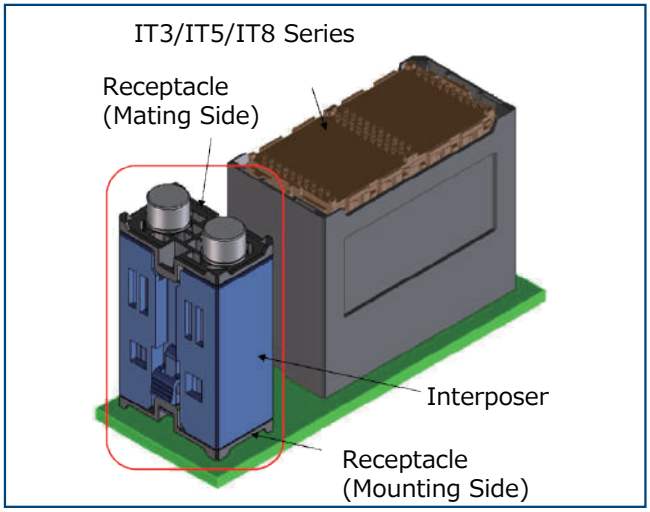


4. Pitch: 10.8mm & 12mm Pin Paste in Hole (PIH)

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.



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Product Specifications

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

Items	Specifications	Conditions
Insulation Resistance	1,000MΩ Min.	Measured at 500V DC
Withstanding Voltage	No flashover and insulation breakdown	1,000V AC for 1 min.
Contact Resistance	2mΩ Max. (Note 5)	Measured at 100mA DC
Vibration Resistance	No electrical interruption of 1μs 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 : 2mΩ 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 : 2mΩ 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℃ 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.

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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 ## (##)
❶ ❷ ❸ ❹ ❺ ❻ ❼

■ Interposer

IT-P ## - 2 P - ## H ## (##)
❶ ❷ ❸ ❹ ❽ ❻ ❼

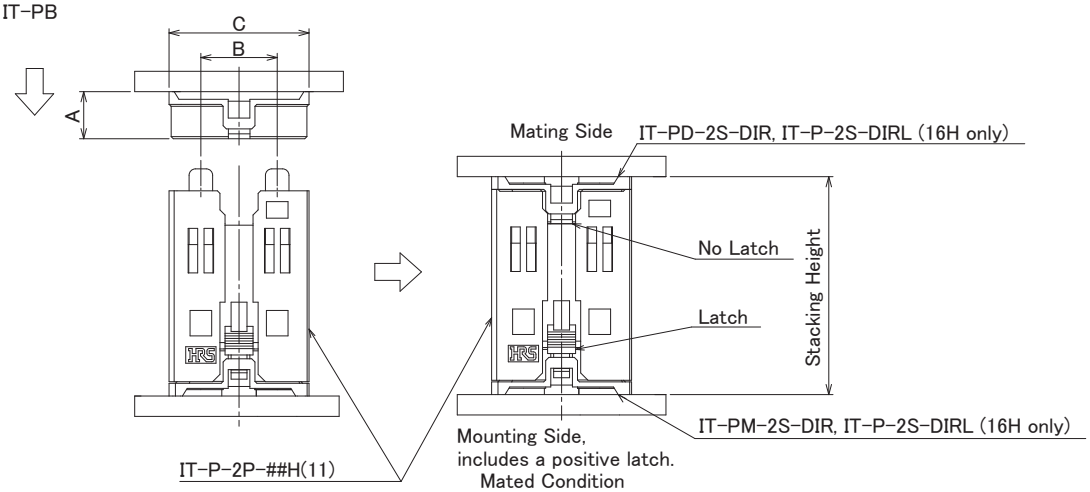
❶ Series Name	IT-P
❷ Type	-Receptacle A : Narrow Type B : Narrow and Low Profile Type D : Insertion/Removal Side D# : Insertion/Removal Side (Customized) M : Mounting Side M# : Mounting Side (Customized) -Interposer A : Narrow Type B : Narrow and Low Profile Type Blank : Standard ## : Customized
❸ No. of Pos.	2
❹ Connector Type	S : Receptacle P : Interposer
❺ DIR	Paste in Hole (PIH)
❻ Packaging or Other Specification	-Receptacle Blank : Standard L : Low Profile ## : Customized -Interposer Blank : Standard ## : Customized
❼ 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
❽ 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

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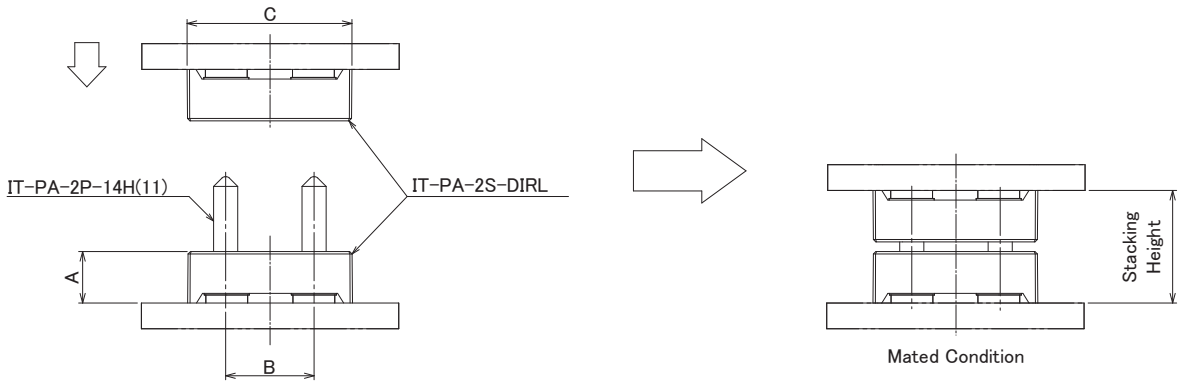
Mating Combinations

IT-P Series

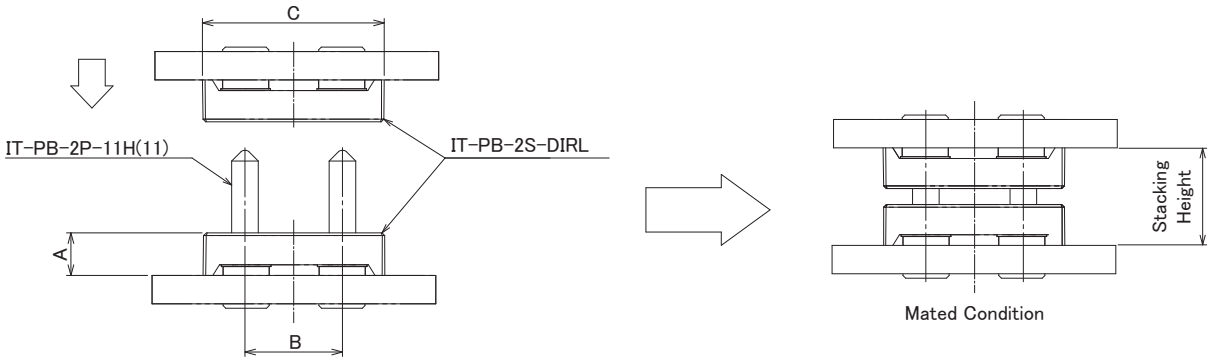
*16H is without housing case,
like IT-PA and IT-PB



IT-PA Series



IT-PB Series



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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	70A	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.

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Receptacle (Paste in Hole (PIH))

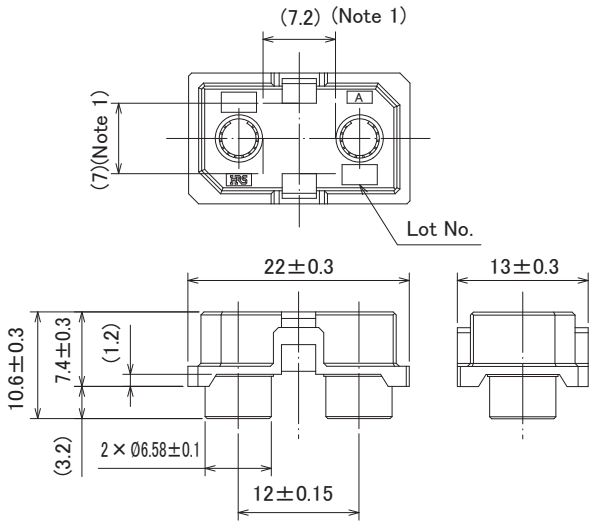
●IT-P Series



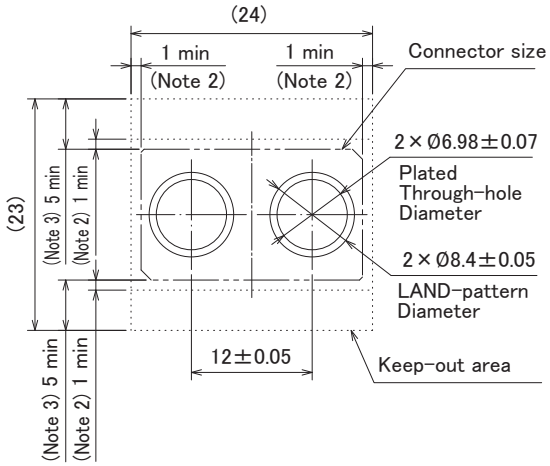
IT-PD-2S-DIR(##)



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

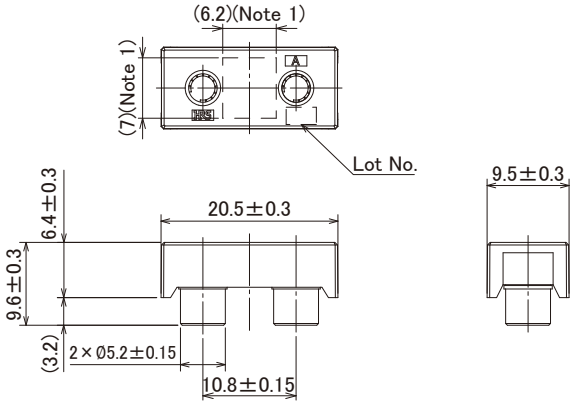
Note 1 : This area is a vacuum pickup area.
Note 2 : Minimum clearance area.
Note 3 : Recommended clearance area for insertion / extraction.
Note 4 : Please see the Mating Combinations table for applicable Interposers.

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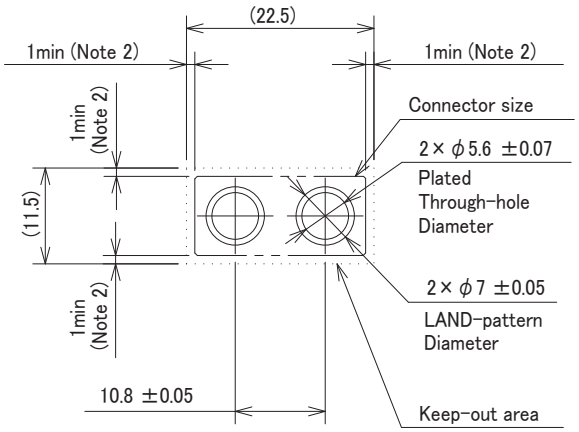
Receptacle (Paste in Hole (PIH))

●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

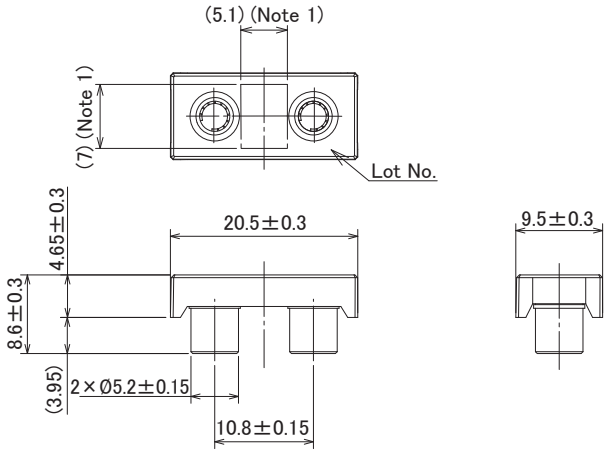
Note 1 : This area is a vacuum pickup area.
Note 2 : Minimum clearance area.
Note 3 : This product is designed to mate with IT-PA-2P-14H(##) only.
Note 4 : IT-PA series is narrow type of IT-P.
Note 5 : There is no latch for this receptacle.

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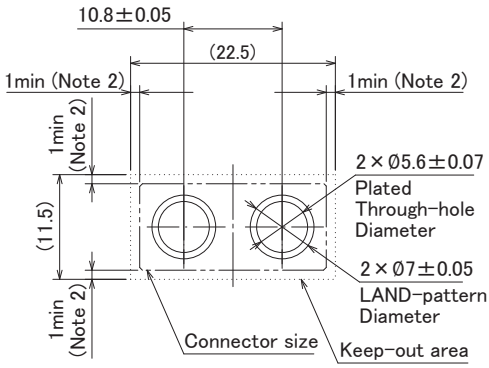
Receptacle (Paste in Hole (PIH))

●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.

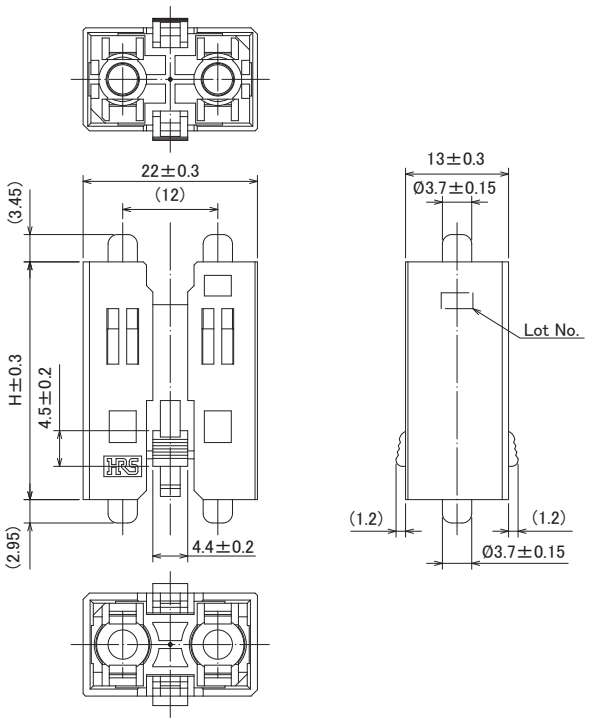
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Interposer with Housing

●IT-P Series



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



Unit : mm

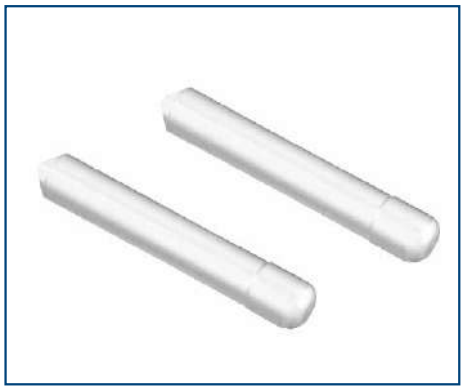
Part No.	HRS No.	Stacking Height		H	Purchase Unit	Pitch
IT-P-2P-16H(11)	CL0636-0644-0-11	16	17	11	50pair per tray	12
IT-P-2P-23H(11)	CL0636-0610-0-11	23	24	18	50pcs per tray	
IT-P-2P-25H(11)	CL0636-0607-6-11	25	26	20		
IT-P-2P-27H(11)	CL0636-0624-5-11	27	28	22		
IT-P-2P-29H(11)	CL0636-0615-4-11	29	30	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		
IT-P-2P-65H(11)	CL0636-0643-0-11	65	66	60	28pcs per tray	

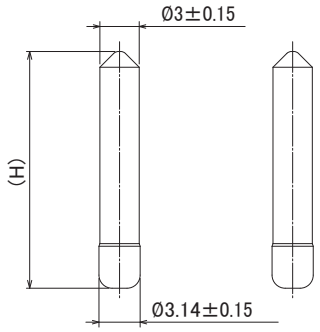
Note 1 : IT-P-2P-16H(11) does not have a housing like IT-PA and IT-PB series.

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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	

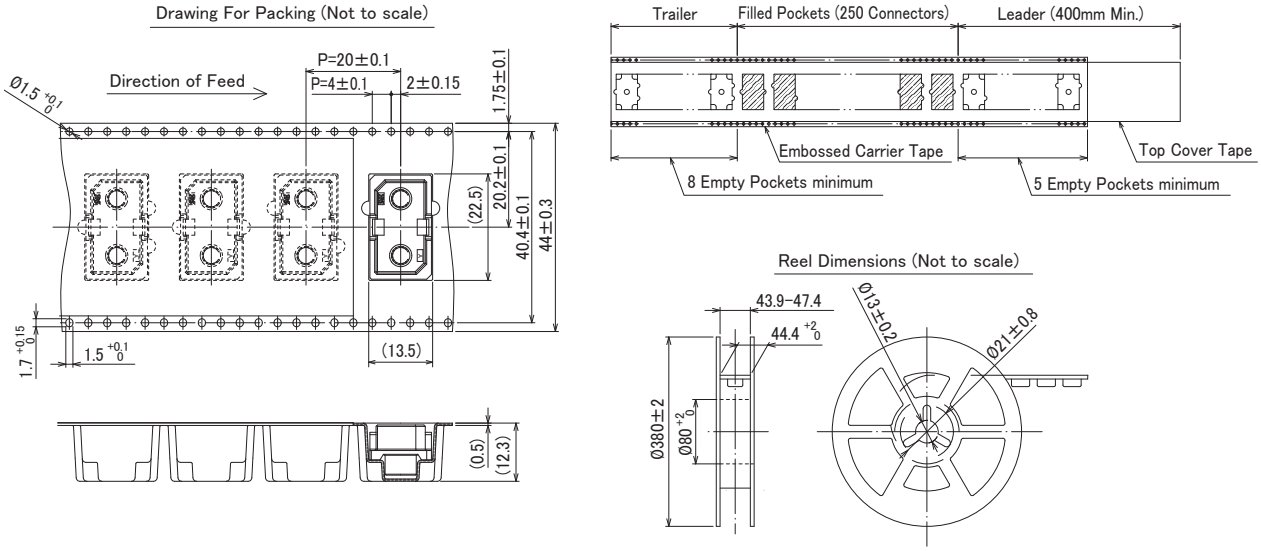
Note 1 : The lager side (ϕ 3.14) or (ϕ 3.79) of the pin should be inserted to mother board side since it has a locking mechanism.
You can remove the pin if you pull strongly.
Note 2 : The thinner side (ϕ 3) does not have any locking mechanism.

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Packaging

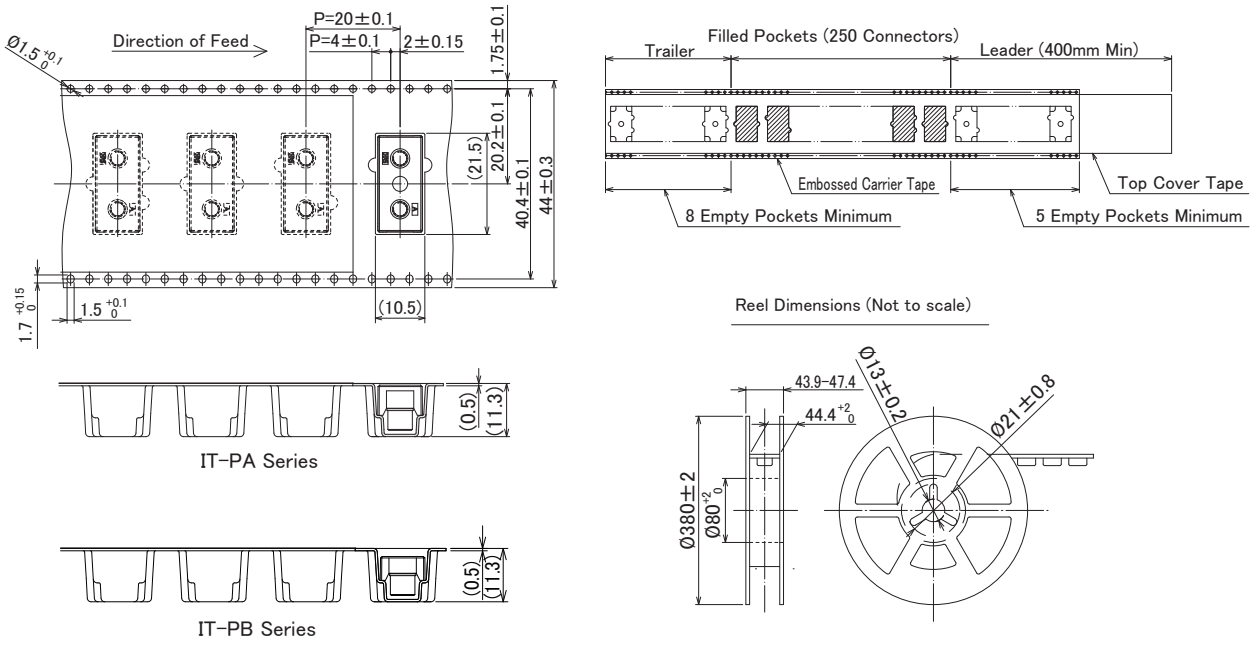
Embossed Carrier Tape Dimensions

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

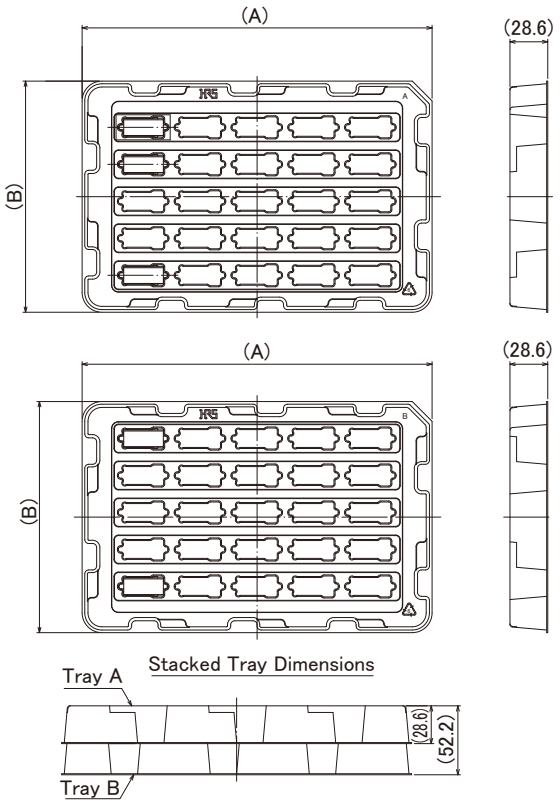


Note : This embossed carrier tape is for IT-PA-2S-DIR and IT-PB-2S-DIR.

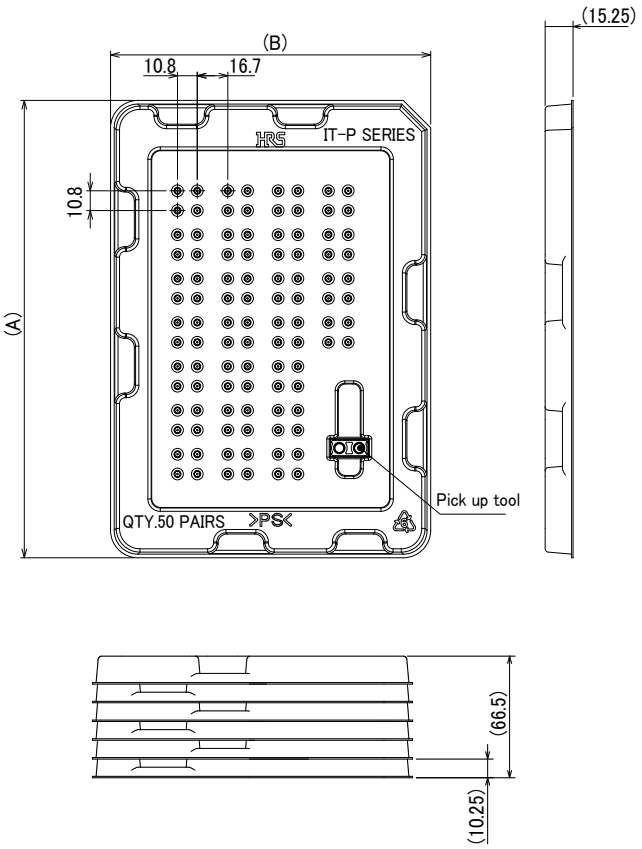
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Dimensions of Interposer Tray

IT-P Series



IT-P (16H only), IT-PA and IT-PB Series



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

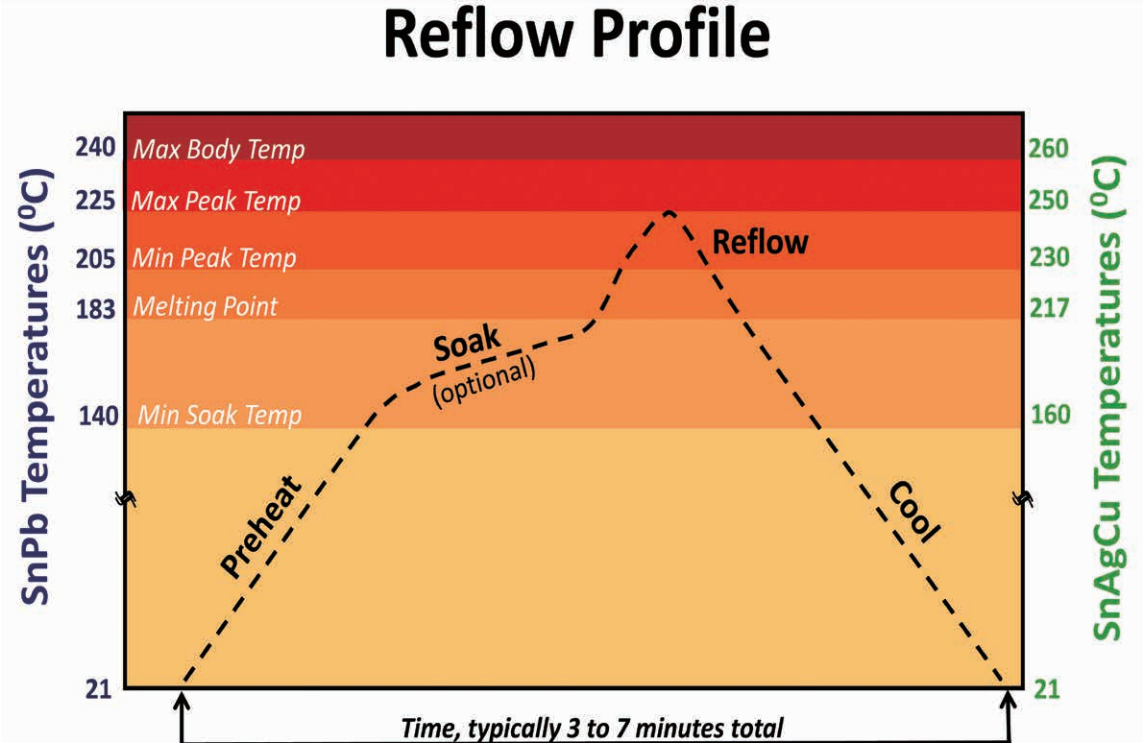
Part No.	HRS No.	Parts per Tray	Qty per Box	A	B
IT-PB-2P-10H(11)	CL0636-0632-0-11	*50 pairs	500	250	175
IT-PB-2P-11H(11)	CL0636-0633-0-11				
IT-PA-2P-14H(11)	CL0636-0613-9-11		300		
IT-P-2P-16H(11)	CL0636-0644-0-11				
IT-PA-2P-22H(11)	CL0636-0628-0-11		200		
IT-P-2P-23H(11)	CL0636-0610-0-11	50pcs	150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

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Safety Precautions

1. Recommended Temperature Profile



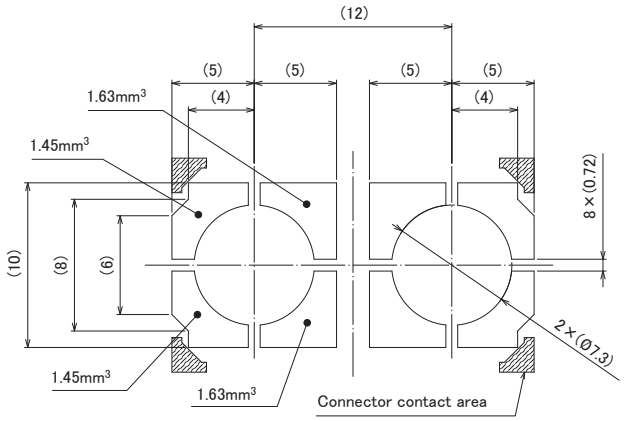
Parameters	Eutectic (SnPb)	Pb-Free	Comment
Preheat 1 Temperature Rise Gradient	2-3℃ /sec	2-3℃ /sec	Other parts may be 2℃ /sec Max.
Preheat 2 Time	0-120 sec	0-120 sec	Varies depending on board, reflow and solder specifications.
Preheat 2 Temperature	140-180℃	160-215℃	Excessive preheat adversely affects the mounting condition.
Reflow Temperature	205-225℃	230-250℃	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℃ /sec Max.	6℃ /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℃ 10℃ Max.	260℃ 10℃ 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 Remperature 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.

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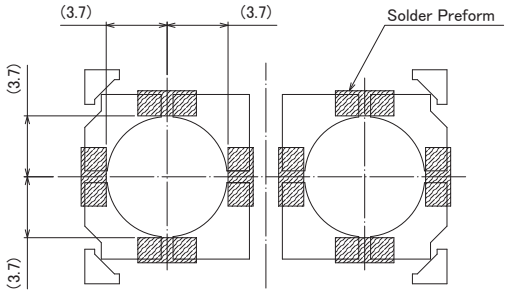
2-1. Recommended Net Solder Paste Amount for IT-P Series.

Dimensions for Recommended Net Solder Paste Amount



(1) Net Solder Paste Amount : 10.9mm³ =12.32mm³ x (100−11.5)%
〈Calculation Conditions〉
・Stencil Thickness : 0.12mm
・Flux Content : 11.5%

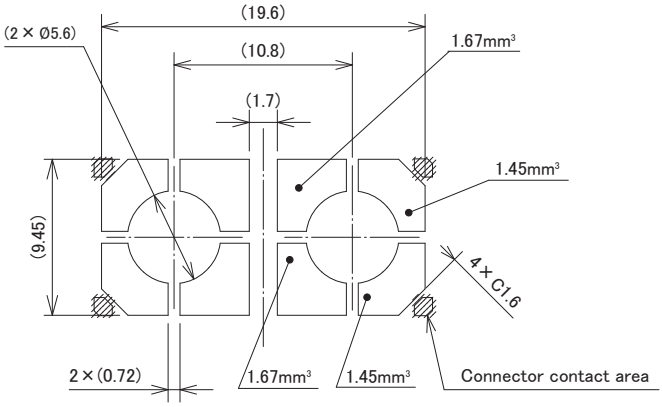
Dimensions For Recommended Solder Preform Amount



(2) Solder Preform Amount : 32.768mm³
〈Calculation Conditions〉
・Recommended Preform Solder : SMIC Chip Solder S M705
・Size : 3.2 × 1.6 × 0.8= 4.096mm³
・Quantity : 8 pcs

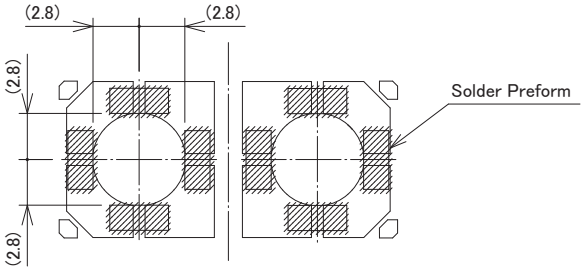
2-2. Recommended Net Solder Paste Amount for IT-PA and IT-PB Series.

Dimensions for Recommended Net Solder Paste Amount



(1) NET Solder Paste Amount : 11.05mm³ =12.48mm³ x (100−11.5)%
〈Calculation Conditions〉
・Stencil Thickness : 0.12mm
・Flux Content : 11.5%

Dimensions For Recommended Solder Preform Amount



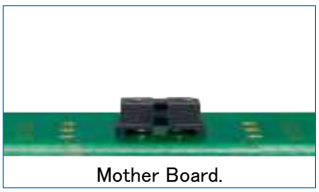
(2) Solder Preform Amount : 32.768mm³
〈Calculation Conditions〉
・Recommended Preform Solder : SMIC Chip Solder S M705
・Size : 3.2 × 1.6 × 0.8 = 4.096mm³
・Quantity : 8 pcs

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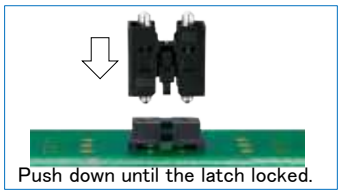
Installation

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

(1) Solder the Receptacle



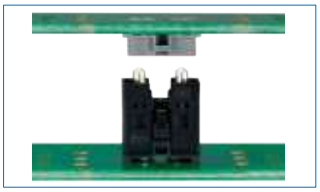
(2) Install Interposer



(3) Interposer Installed



(4) Install Daughter Card

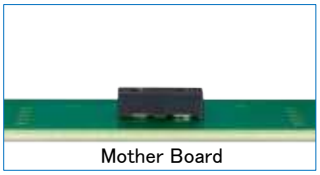


(5) Mated

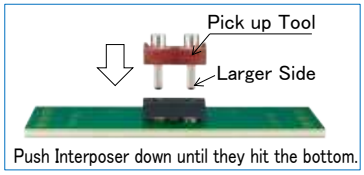


<IT-P/IT-PB Series & IT-P-2P-16H>

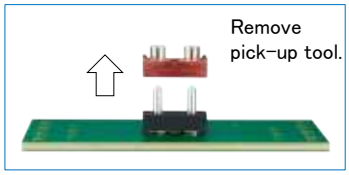
(1) Solder the Receptacle



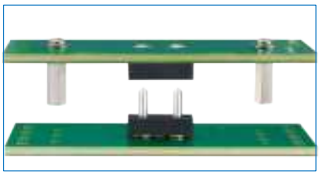
(2) Pick up the Interposer and install into the receptacle



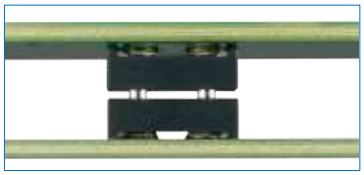
(3) Interposer Installed



(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.

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Guideline

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

Design Guideline : ETAD-F0804-00

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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.

HIROSE ELECTRIC CO.,LTD. 2-6-3,Nakagawa Chuoh,Tsuzuki-Ku,Yokohama-Shi 224-8540,JAPAN
https://www.hirose.com

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