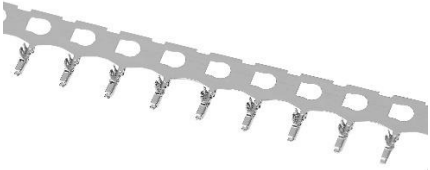



Zero-Hachi 0.8

WIRE TO BOARD CONNECTOR SYSTEM (SINGLE ROW TIN-PLATING)

Crimp Terminal	Crimp Housing
	
Series: 214720	Series: 214719

Header Assembly (Right Angle)

Series: 214721

[Zero-Hachi 0.8 WTB Connector System](#)

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1.0 SCOPE

This product specification covers the performance requirements for Zero-Hachi 0.8 WIRE TO BOARD CONNECTOR SINGLE ROW WITH TIN PLATING series.

2.0 PRODUCTS DESCRIPTION

2.1 DESCRIPTIONS, SERIES NUMBER, AND LINKS

DESCRIPTIONS	PART NUMBER	DRAWING NUMBER
Crimp terminal	214720 500*	2147200000-SD PSD 000
Crimp housing	214719 2**0	2147190000-SD PSD 000
Header Assembly Right Angle	214721 0**0	2147210000-SD PSD 000

2.2 DIMENSIONS, MATERIALS, PLATINGS

See sales drawings for details on dimensions, materials, platings, and markings.

2.3 ENVIRONMENTAL CONFORMANCE:

- [Go to molex.com](http://molex.com)
- Enter the part number in the search field.
- At the bottom of the page go to “Environmental” to see compliance status.

2.4 SAFETY AGENCY LISTINGS

UL / cUL File Number: E29179

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3.0 REFERENCE DOCUMENTS

3.1 MOLEX DOCUMENTS

[Zero-Hachi 0.8 w-t-b Connector System Application Specification 2166940000-AS PS 000](#)

ATS – Application Tooling Specification*

*Application Tooling Specification for terminals is not provided in this document. ATS for terminals can be available from respective terminal part number page in Molex.com

4.0 ELECTRICAL PERFORMANCE RATINGS

4.1 VOLTAGE

30 V AC rms / DC

4.2 RATED CURRENT AND APPLICABLE WIRES

Wire Size	Rated Current (MAX.)	Insulation O.D. φ 0.44~φ 0.6mm
AWG #28	1.0 A	
AWG #30	0.8 A	
AWG #32	0.6 A	

4.3 CURRENT DERATING

AWG	2-circuits	6-circuits	10-circuits	20-circuits
	Current (A)	Current (A)	Current (A)	Current (A)
28	2.5	1.5	1.5	1.0
30	2.0	1.2	1.0	0.8
32	2.0	1.0	1.0	0.6

1. Values are for REFERENCE ONLY.
2. Current deratings are based on not exceeding 30 °C Temperature Rise
3. Temperature Rise is measured in barrel area of crimp terminal.
4. PCB trace design can greatly affect temperature rise results.
5. Data is for all circuits powered.

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4.4 TEMPERATURE

Ambient Temperature Range*1*2*3	:- 40 °C ~ + 85 °C Not freeze to low temperature
<u>Recommended storage condition</u>	
Temperature	:-10 °C ~ +50 °C
Humidity	:85% RH MAX No Condensation permitted
Term of Storage	:12 months after the product is stocked. (Unopened package)

NOTE:

- *1. Non-operating connectors after reflow must follow the operating temperature range condition.
- *2. Including terminal temperature rise.
- *3. Applicable wires must also meet the specified temperature range.
- *4. Refer to [11. NOTE] how product should treat after opening package.

4.5 DURABILITY

Plating Type	Number of Cycles
Tin Plated	20 cycles

5.0 QUALIFICATION

Sample selection is in accordance with EIA-364-1000.

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6.0 PERFORMANCE

6.1 ELECTRICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
6.1.1	Contact Resistance	Mate connectors and measured by dry circuit, 20mV MAX., 10 mA MAX. and subtract wire conductor resistance. Refer to paragraph 8 Contact resistance measuring point. (JIS C5402-2-1)	10 milliohms MAX.	
6.1.2	Insulation Resistance	Mate connectors and apply 500 V DC between adjacent terminals or between terminal and ground. (JIS C5402-3-1 / MIL-STD-202 Method 302)	100 Megohms MIN.	
6.1.3	Dielectric Strength	Mate connectors, apply 200V AC rms for 1 minute between adjacent terminals or between terminal and ground. (JIS C5402-4-1/MIL-STD-202 Method 301)	No Damage on function	
6.1.4	Contact Resistance on crimped portion	Crimp the applicable wire to the terminal, measured by dry circuit, 20 mV MAX., 10 mA. MAX.	5 milliohms MAX.	
6.1.5	Temperature Rise	Mate connectors and all crimp terminals shall be connected in a direct series. The temperature rise shall be measured when maximum rated current is flowed and thermal equilibrium reaches. (UL498)	Temperature Rise	30 °C MAX.

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6.2 MECHANICAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION		REQUIREMENT
6.2.1	Insertion and Withdrawal Force	Insert and withdraw connectors at the speed rate of 25±3 mm/minute.		Refer to paragraph 7
6.2.2	Crimping Pull out Force	Fix the crimped terminal to the jig, apply axial pull out force on the wire at the speed rate of 25±3 mm/minute. (JIS C5402-16-4)	AWG #28	9.8 N {1.0 kgf} MIN.
			AWG #30	4.9 N {0.5 kgf} MIN.
			AWG #32	3.0 N {0.3 kgf} MIN.
6.2.3	Crimp Terminal Insertion Force	Insert a crimped terminal into the housing		14.7 N {1.5 kgf} MAX.
6.2.4	Crimp Terminal Retention Force	Apply axial pull out force at the speed rate of 25±3 mm/minute on a crimped terminal assembled in the housing.		3.5 N {0.36 kgf} MIN.
6.2.5	Header Terminal Retention Force	Apply axial pull out force at the speed rate of 25±3 mm/minute on a header pin assembled in the header housing.		0.5 N {0.05 kgf} MIN.

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6.2 MECHANICAL PERFORMANCE CONTINUED

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
6.2.6	Repeated Insertion / Withdrawal	Insert and withdraw connectors up to 20 cycles repeatedly at speed rate of 10 cycles per minute maximum.	Contact Resistance	20 milliohms MAX.
6.2.7	Vibration	Mate connectors and conduct test subject to the following vibration conditions, for a period of 2 hours in each of 3 mutually perpendicular axes, passing DC 1mA during the test. Cables should be fixed during the test. Amplitude : 1.5mm P-P Frequency : 10~55~10 Hz in 1 minute. Duration : 2 hours in each X.Y.Z.axes. (JIS C 60068-2-6/ MIL-STD-202 Method 201)	Appearance	No Damage on function
			Contact Resistance	20 milliohms MAX.
			Discontinuity	1.0 microsecond MAX.
6.2.8	Mechanical Shock	Mate connectors and conduct test subject to the following shock conditions. 3 shocks shall be applied 6 directions along 3 mutually perpendicular axes [$\pm x$, $\pm y$, $\pm z$, each], passing DC 1 mA current during the test. [Total of 18 shocks] Test pulse : Half Sine Peak value : 490 m/s ² {50 G} Duration : 11 ms (JIS C60068-2-27/ MIL-STD-202 Method 213)	Appearance	No Damage on function
			Contact Resistance	20 milliohms MAX.
			Discontinuity	1.0 microsecond MAX.

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6.3 ENVIRONMENTAL PERFORMANCE

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
6.3.1	Temperature Cycling	Mate connectors and conduct test subject to the following conditions for 5 cycles. Upon completion of the exposure period, the test specimens shall be left at ambient room temperature for 1 to 2 hours. After that, the measurements shall be performed. 5 cycles of : a) - 55±3 °C 30 minutes b) + 85±2 °C 30 minutes Shifting time: within 5 minutes (JIS C60068-2-14)	Appearance	No Damage on function
			Contact Resistance	20 milliohms MAX.
6.3.2	Heat Resistance	Mate connectors and expose to 85±2 °C for 96 hours. Upon completion of the exposure period, the test specimens shall be left at ambient room temperature for 1 to 2 hours. After that, the measurements shall be performed. (JIS C60068-2-2/ MIL-STD-202 Method 108)	Appearance	No Damage on function
			Contact Resistance	20 milliohms MAX.
6.3.3	Cold Resistance	Mate connectors and expose to -40±3 °C for 96 hours. Upon completion of the exposure period, the test specimens shall be left at ambient room temperature for 1 to 2 hours. After that, the measurements shall be performed. (JIS C60068-2-1)	Appearance	No Damage on function
			Contact Resistance	20 milliohms MAX.
6.3.4	Humidity	Mate connectors and expose to 60±2 °C, relative humidity 90 to 95 % for 96 hours. Upon completion of the exposure period, the test specimens shall be left at ambient room temperature for 1 to 2 hours. After that, the measurements shall be performed. (JIS C60068-2-78/ MIL-STD-202 Method 103)	Appearance	No Damage on function
			Contact Resistance	20 milliohms MAX.
			Insulation Resistance	Must meet 6.1.2
			Dielectric Strength	Must meet 6.1.3

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6.3 ENVIRONMENTAL PERFORMANCE CONTINUED

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT	
6.3.5	Salt Spray	Mate connectors and expose to the following salt mist conditions. Upon completion of the exposure period, salt deposits shall be removed by a gentle water wash or dip in running water. After that, the measurements shall be performed. NaCl solution Concentration: 5±1 % Spray time: 48±4 hours Ambient temperature: 35±2 °C (JIS 60068-2-11/ MIL-STD-202 Method 101)	Appearance	No Damage
			Contact Resistance	20 milliohms MAX.
6.3.6	SO ₂ Gas	Mate connectors and expose to the conditions of 50±5 ppm SO ₂ gas at ambient temperature 40±2 °C for 24 hours.	Appearance	No Damage on function
			Contact Resistance	20 milliohms MAX.
6.3.7	NH ₃ Gas	Mate connectors and expose to the conditions of 28 % concentration NH ₃ solution for 40 minutes. [The ratio is 25 ml per 1L]	Appearance	No Damage on function
			Contact Resistance	20 milliohms MAX.
6.3.8	Solderability	Dip terminal or pin into flux, and immerse the area up to 0.5 mm from the product mounted surface on PCB into molten solder pot at 245±3 °C for 3±0.5 sec.	Solder Wetting	95% MIN of immersed area and there are no pin holes and no gap.
6.3.9	Resistance to Soldering Heat	<u>Soldered by IR Reflow Machine</u> Using the reflow profile condition below paragraph 7, the product shall be reflowed.	Appearance	No Damage
		<u>Soldered by Manual Soldering iron</u> Using a manual soldering iron [350±5 °C for 5 seconds MAX.], the product shall be heated up. However, do not apply excessive pressure to either the terminals or fitting nails.		

() : Reference Standard
 { } : Reference Unit

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7.0 INSERTION / WITHDRAWAL FORCE

No. of CKT	UNIT	Insertion (MAX.)			Withdrawal (MIN.)		
		1st	6th	20th	1st	6th	20th
2	N {kgf}	19.6 { 2.0 }	19.6 { 2.0 }	19.6 { 2.0 }	2.8 { 0.29 }	1.9 { 0.19 }	1.9 { 0.19 }
3	N {kgf}	20.6 { 2.1 }	20.6 { 2.1 }	20.6 { 2.1 }	3.0 { 0.31 }	2.1 { 0.21 }	2.1 { 0.21 }
4	N {kgf}	22.5 { 2.3 }	22.5 { 2.3 }	22.5 { 2.3 }	3.2 { 0.33 }	2.3 { 0.23 }	2.3 { 0.23 }
5	N {kgf}	23.5 { 2.4 }	23.5 { 2.4 }	23.5 { 2.4 }	3.4 { 0.35 }	2.5 { 0.26 }	2.5 { 0.26 }
6	N {kgf}	25.5 { 2.6 }	25.5 { 2.6 }	25.5 { 2.6 }	3.6 { 0.37 }	2.7 { 0.28 }	2.7 { 0.28 }
7	N {kgf}	26.5 { 2.7 }	26.5 { 2.7 }	26.5 { 2.7 }	3.8 { 0.39 }	2.9 { 0.30 }	2.9 { 0.30 }
8	N {kgf}	28.4 { 2.9 }	28.4 { 2.9 }	28.4 { 2.9 }	4.0 { 0.41 }	3.1 { 0.32 }	3.1 { 0.32 }
9	N {kgf}	29.4 { 3.0 }	29.4 { 3.0 }	29.4 { 3.0 }	4.2 { 0.43 }	3.3 { 0.34 }	3.3 { 0.34 }
10	N {kgf}	31.4 { 3.2 }	31.4 { 3.2 }	31.4 { 3.2 }	4.4 { 0.45 }	3.5 { 0.36 }	3.5 { 0.36 }
11	N {kgf}	32.3 { 3.3 }	32.3 { 3.3 }	32.3 { 3.3 }	4.6 { 0.47 }	3.7 { 0.38 }	3.7 { 0.38 }
12	N {kgf}	34.3 { 3.5 }	34.3 { 3.5 }	34.3 { 3.5 }	4.8 { 0.49 }	3.9 { 0.40 }	3.9 { 0.40 }
13	N {kgf}	35.3 { 3.6 }	35.3 { 3.6 }	35.3 { 3.6 }	5.0 { 0.51 }	4.1 { 0.42 }	4.1 { 0.42 }
14	N {kgf}	37.2 { 3.8 }	37.2 { 3.8 }	37.2 { 3.8 }	5.2 { 0.53 }	4.3 { 0.44 }	4.3 { 0.44 }
15	N {kgf}	38.2 { 3.9 }	38.2 { 3.9 }	38.2 { 3.9 }	5.4 { 0.55 }	4.5 { 0.46 }	4.5 { 0.46 }
16	N {kgf}	40.2 { 4.1 }	40.2 { 4.1 }	40.2 { 4.1 }	5.6 { 0.57 }	4.7 { 0.48 }	4.7 { 0.48 }
17	N {kgf}	41.2 { 4.2 }	41.2 { 4.2 }	41.2 { 4.2 }	5.8 { 0.59 }	4.9 { 0.50 }	4.9 { 0.50 }
18	N {kgf}	43.1 { 4.4 }	43.1 { 4.4 }	43.1 { 4.4 }	6.0 { 0.61 }	5.1 { 0.51 }	5.1 { 0.51 }
19	N {kgf}	44.1 { 4.5 }	44.1 { 4.5 }	44.1 { 4.5 }	6.2 { 0.63 }	5.3 { 0.54 }	5.3 { 0.54 }
20	N {kgf}	46.1 { 4.7 }	46.1 { 4.7 }	46.1 { 4.7 }	6.4 { 0.65 }	5.5 { 0.56 }	5.5 { 0.56 }

※Release the positive lock, and measure.

{ } : Reference Unit

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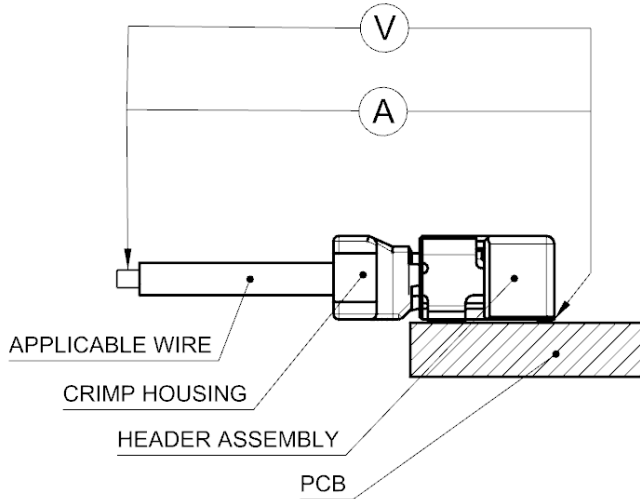
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8.0 CONTACT RESISTANCE MEASURING POINT



Contact Resistance: $m\Omega = V/A$

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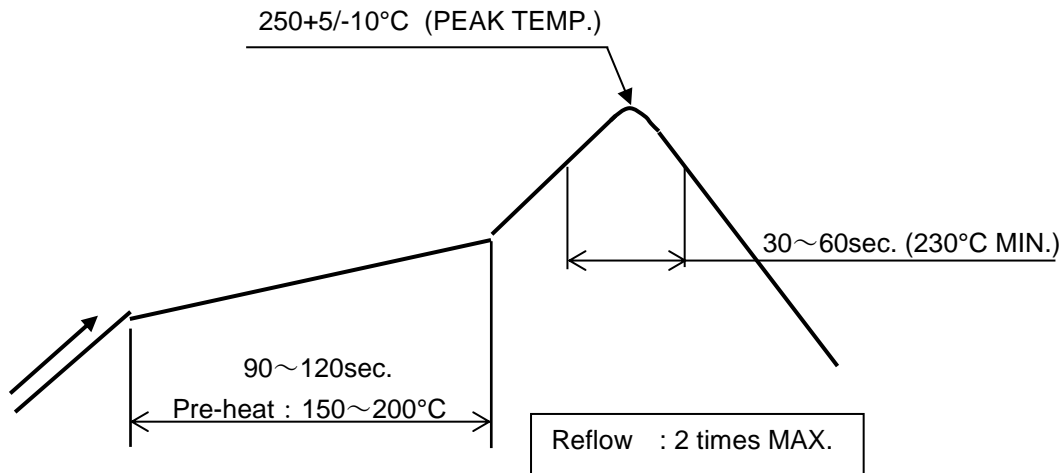
9.0 SOLDER INFORMATION

These specifications establish standard solderability test methods used to evaluate a products ability to accept molten solder. Solder Process Temperatures and Reflow Solder Profiles will vary based on application, equipment, solder paste, PCB thickness, **ETC.**

9.1 SOLDER PROCESS TEMPERATURES

Reflow Solder Temperature: 250 °C MAX.

9.2 SOLDERING PROFILE



TEMPERATURE CONDITION GRAPH

(Temperature is measured at the soldering area on the surface of PCB)

NOTE : Please check the mount condition (reflow soldering condition) by your own devices beforehand, because each condition varies by the reflow machine, printed circuit boards (PCB), and so on. Although tail of terminal and nail might be discolored, it does not affect solderability.

10.0 PACKAGING

Parts shall be packaging to protect the parts from damage during standard shipping, storage, and handling. Refer Molex.com specific part number webpage to get the exact packaging document for that item.

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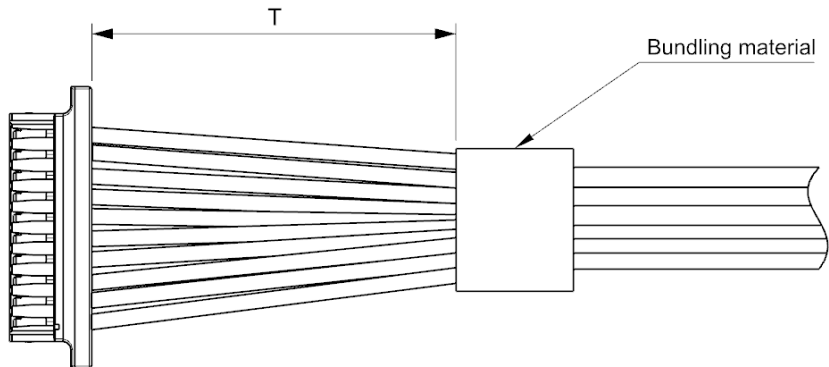


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11.0 CABLE TIE AND / OR TWIST TIE LOCATION

CKT Size	Dim T Min.
2 -20 ckt	30 mm



The “T” dimension defines a “free” length of wire, or a length of wire that is not subject to significant bias by external factors such as a wire tie, wire twisting, or other means of bending or deforming of the wires that repositions them from their natural relaxed state or location where they enter the housing. Wires are to be dressed in such a manner to allow the terminals to float freely in the pocket. This dimension is general recommendation and may need to be adjusted for different wire gauges and wire type and insulation thickness and insulation material.

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12.0 NOTE

1. There is no influence in the product performance in the case that the black spot or bubble might be appeared on the plastic part of this product and the color shade might be different (including discoloration by aging etc.).
2. The sliding surface marking might be shown on the appearance because the tin plating is used for the tail and nail, however, there is no influence in the product performance.
3. A few scratches may be seen on the surface of the housing and the plating of this product, however, there is no issue in the product performance.
4. Discoloration of the plastic part of this product can be appeared by the exposure to ultraviolet light, however, there is no issue in the product performance.
5. Please store the products under the recommended storage condition.
6. When this product is used at a place where the water exposure could be expected, please provide the appropriate care to avoid the damage from water. There is a possibility of causing insulated malfunction between the circuits by condensation and water leakage.
7. Please do not conduct any washing process on the connectors because it may damage the functionality.
8. Please avoid the situation which the contact area of connector always moves around. For example, the contact area is experiencing a constant movement by the sympathetic vibration of wires and PCB, rotating construction of devices, and action of moveable area. This may cause a defect in the conductivity due to the contact area being worn down. Therefore, please fix wires and PCB on the chassis, and reduces sympathetic vibration.
9. Please do not apply the extra pressure on the connector. For example, do not carry around the substrate which has mated hanging connector on board. There is a case where it causes the damage of connector.
10. After mating the connectors, please do not apply the pressure on the connectors in either the pitch direction, the span direction or rotational direction. It may cause the damage of connector and may crack the soldering.
11. Please ensure to prevent from applying any external forces or shock to the connector when connector or the cable assembly in process or cable assembly is under being packaged, or under transportation. This may cause deformation and damage to the connector and may cause a defect in product performance.
12. When using this product, please ensure to follow within its rated current per circuit. Please ensure not to apply the sum of the rated current separated in several circuits to exceed the maximum allowable rated current.
13. This product is not designed for mating and un-mating of the connector under the condition of an active electrical circuit. It may cause a risk of electric spark and the defect in product performance. Please do not conduct the hot plug and hot unplug.
14. The applicable wire for this connector, in principle, is tin-plated copper stranded wire. Please contact molex in advance when using other kind of wires.
15. Please ensure to keep enough clearance between the connector and chassis of your device in order not to apply pressure on the connector.

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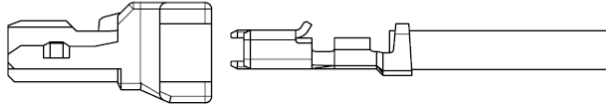


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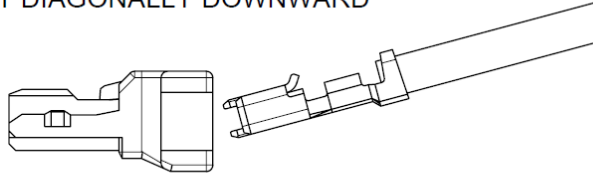
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16. To maintain the product function, do not insert the crimp terminal diagonally upward.

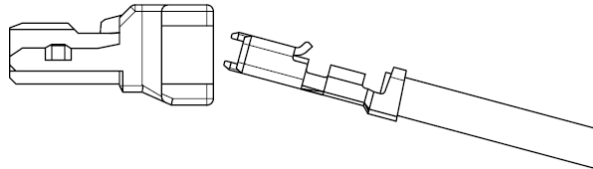
○ Good 水平方向
INSERT STRAIGHT



○ Good 斜め下方向
INSERT DIAGONALLY DOWNWARD



× Not good 斜め上方向
INSERT DIAGONALLY UPWARD



17. Please make sure that the terminal lance is caught by the mold lance of housing.

18. Please tie the cables at least 30 mm away from the edge of the connector housing and ensure that the forces on all of the wires are applied evenly.

19. When extracting a crimp terminal from the housing by using a jig, it may deform the housing lance, and it causes to reduce the terminal retention force enormously after re-inserting the terminal. Therefore, please ensure to use a new housing after repairing the crimp terminals.

20. When positioning cable assembly and cable assembly after mating connectors in the device, it should not have a constant stress or a pulling force applied on it. This phenomenon may damage the contact area, crimping area, or terminal lock area, and it causes the defect in conductivity. Therefore, when designing the wire positioning in the device, please ensure that there is enough wire length not to stress on the connector.

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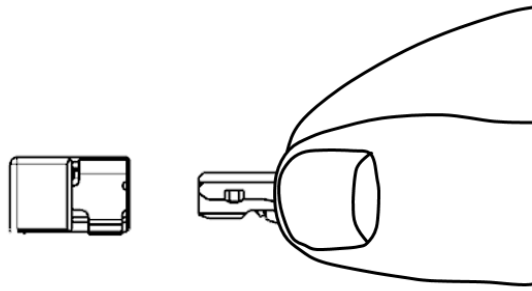
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21. When un-mating connector, please hold wires all together lightly, and withdraw receptacle housing slowly, axially and straightly. Please avoid withdrawing them with an angle and roughly. That might cause damage to connector.



22. Please do not deliberately deform the movable portion (the lock area and lance of plug housing) and terminals. It would lead to product failure.

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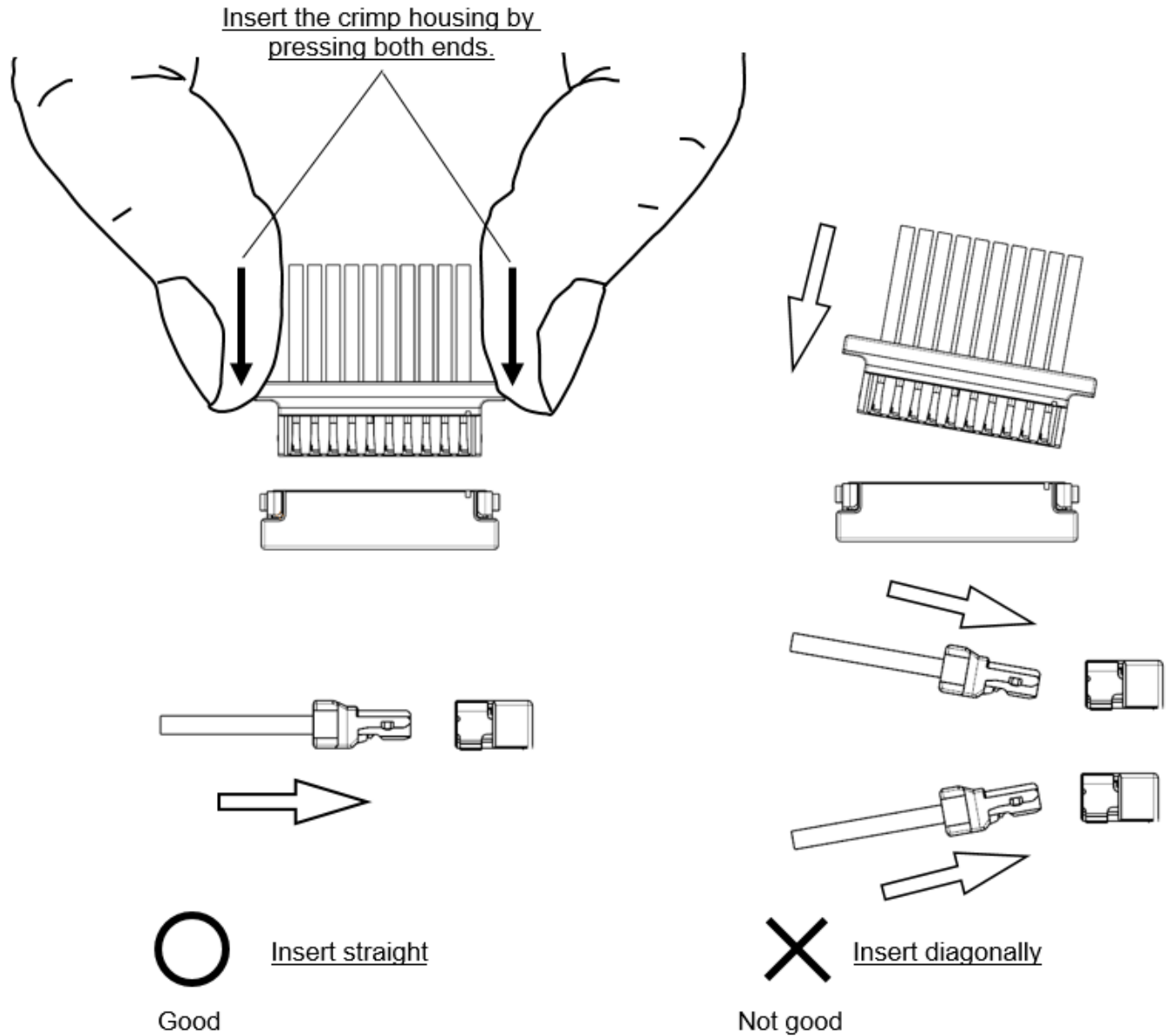
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23. Please mate the connector in parallel with the mating axis as much as possible. At this time, after positioning and facing each external wall of both receptacle and plug housing, push the connector to mate straight until both plug and receptacle housings strike each other. (This is the complete connector mating position.) In the case of the diagonal mating, position and face lightly each external wall of both receptacle and plug housings less than angle of 10°, and then push to mate. When mating connector in the diagonal angle excessively, it may damage the connector.



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24. Please ensure to solder all the terminal tails and fitting nails on the PCB. When you leave any soldering area open, it may cause the short circuit between pins, terminal buckling or connector's coming off the PCB.
25. Please evaluate the connector on your mounter in advance. When the mounter applies the extra pressure on the connector, it may cause the deformation or damage of connector.
26. Please ensure to check appearance and solderability of connector when the recommended storage condition for package is not followed.
27. Please do not directly touch the terminal and fitting nail area before and after mounting the connector on the PCB.
28. Please do not stack the PCB directly after mounted the connectors on it.
29. Please ensure to conduct the manual soldering under the condition of the product specifications when repairing by manual soldering iron. In the case of practicing beyond the soldering condition, it may cause terminal fallout issue, the contact gap change issue, and the deformation/dissolution of the mold.
30. When conducting manual repairing by using a soldering iron, please do not use more solder and flux than needed. This may cause a solder wicking and flux wicking issues, and it will eventually lead to a contact defect and functional issues.
31. Please do not use the connector alone to provide mechanical support for the PCB. Please ensure that PCB is supported by a fixed structure on the chassis except the connector.
32. In the case of changing Molex recommended board layout pattern size on your PCB, please contact Molex in advance because it may cause a fatal defect.
33. Please contact Molex surely when using a special PCB or FPC (flexible printed circuit), because we evaluated connector by using Glass epoxy PCB based on our product specification.
34. There is no influence in the product performance though the twist appearance in the terminal plating area might be generated by some reflow conditions.
35. There is no influence in the product performance though the discoloration in the resin area might be seen by some reflow conditions.
36. There is no influence in the product performance though the discoloration in the soldering area might be seen after reflow.
37. This product is designed for using IR (Infrared) reflow machine. When using Nitrogen reflow machine, it might generate the solder wicking issue. Please evaluate the mounting condition (reflow soldering condition) beforehand when using Nitrogen reflow machine. The mounting conditions may change due to the soldering temperature, soldering paste, IR reflow machine, Nitrogen reflow machine, and the type of PCB. The different mounting conditions may influence in the product performance.
38. The stencil (thickness 0.1 mm / aperture ratio 100 %) is used in this product specification evaluation.
39. The connector mounting specification for coplanarity does not include the influence of the PCB warpage. The warpage of the PCB should be a less than 0.02 mm at the center of connector when setting both edges of connector as the datum.
40. The coplanarity of this product is assured only before mounting/reflowing condition. There is no product guarantee in terms of coplanarity during and after mounting/reflowing.

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