

## ZH05 Series

# 0.5mm Size, 2mm Pitch, Wire-to-Board Connector with Short-Circuit/Electric Shock Prevention Design



Finger Protect



Space Saving



Contact Reliability



## Features

### 1. Compact and narrow width

0.5mm terminal tab size, 2mm pitch.  
Contributes to end product size reduction.

### 2. Short-circuit/electric shock prevention design

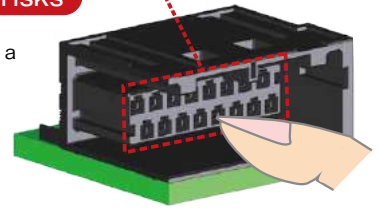
Female terminals are used on the board side receptacle, and live parts are completely covered with resin, enhancing assembly safety.

Receptacle/Cross-Section

**The female terminals are enclosed in highly insulating resin.**

**Eliminates two risks**

- Board damage due to a short circuit between adjacent terminals
- Operator electric shock from touching the contacts



### 3. High Heat Resistance up to 125°C

- Up to 125°C
- Suitable for automotive and other high-heat applications

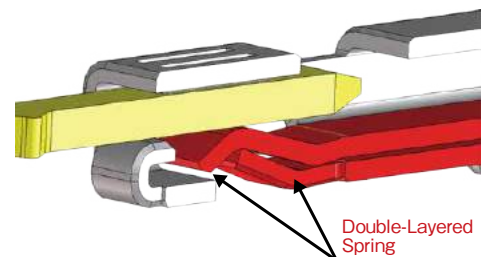
Note : Includes the temperature rise due to current flow.

### 4. High Vibration Resistance

- Female terminal with original 3-point contact design
- Double-layered spring for stability
- Maintains contact under intense vibration, enhancing reliability

#### ① Double-Layered Spring Design

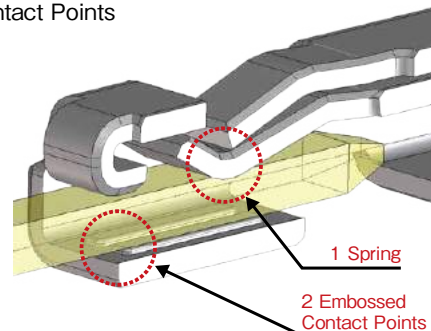
Increases contact force and prevents vibration from outside.



#### ② 3-point Contact Design

Enhanced contact reliability for use under severe vibration.

1 Spring+2 Embossed Contact Points= 3 Contact Points

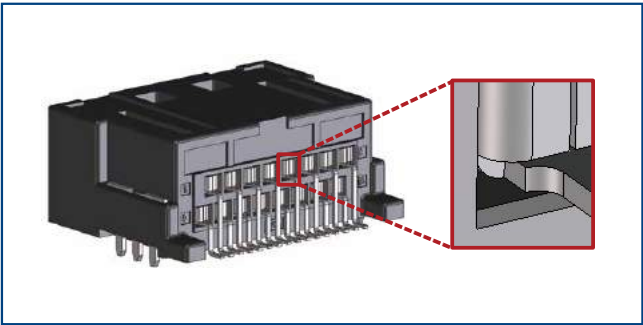


\* The terminal is flipped upside down so the embossed contact points are easier to see.

High Vibration Resistance Terminal Design

5. Suitable for Potting

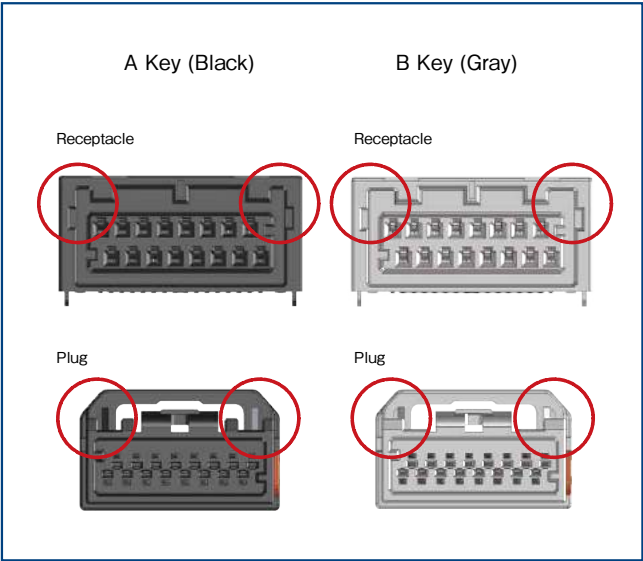
The receptacle minimizes clearance of the press-fit contact area and prevents potting from flowing to the contact point.



Potting Resin Inflow Prevention Design

6. Two types of mating keys :  
A and B

Prevents misfitting when using multiple devices.



Product Specifications

|               |                            |                                         |                            |
|---------------|----------------------------|-----------------------------------------|----------------------------|
| Rated Current | 2A (All pins power supply) | Operating Temperature (Note 1)          | -40 to + 125℃              |
| Rated Voltage | 60V AC/DC                  | Storage Temperature Range (Note 2)      | -10 to + 60℃               |
|               |                            | Storage Humidity Range (Note 2)(Note 3) | Relative humidity 85% Max. |

| Items                        | Specifications                                                                   | Conditions                                                                                                                     |
|------------------------------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Contact Resistance           | 10m Ω Max.                                                                       | Measured at 1A DC                                                                                                              |
| Insulation Resistance        | 100M Ω Min.                                                                      | Measured at 500V DC                                                                                                            |
| Withstanding Voltage         | There shall be no dielectric breakdown.                                          | 1000V AC for 1 min.                                                                                                            |
| Mating Durability            | Contact Resistance : 20m Ω Max.                                                  | 30 Insertion/Extraction cycles                                                                                                 |
| Vibration Resistance         | No electrical discontinuity of 1 μ s or more.<br>Contact Resistance : 20m Ω Max. | Frequency : 20 to 200Hz (Constant Acceleration of 44m/s <sup>2</sup> )<br>1 Cycle 3 min. (round trip), 3 hours in 3 directions |
| Lock Strength                | 100N Min.                                                                        | Lock breaking strength measured when pulling in mating axis direction                                                          |
| Humidity Resistance          | Contact Resistance : 20m Ω Max.<br>Insulation Resistance : 100M Ω Min.           | Left for 96 hours at a temperature of 60℃ and a relative humidity humidity 90 to 95%                                           |
| Thermal Shock                | Contact Resistance : 20m Ω Max.                                                  | Temperature : -4℃ → Room temperature → +125℃ → Room temperature<br>Time : 30 → 5 → 30 → 5 minutes for 1000 cycles              |
| Heat Resistance              | Contact Resistance : 20m Ω Max.                                                  | Left at 140℃ for 120 hours                                                                                                     |
| Cold Resistance              | Contact Resistance : 20m Ω Max.                                                  | Left at -40℃ for 120 hours                                                                                                     |
| Sulfuric Acid Gas Resistance | Contact Resistance : 20m Ω Max.                                                  | Left in sulfuric acid gas at room temperature with a concentration of 25ppm and 75% or more RH for 96 hours while unmated      |

Note 1 : Includes temperature rise caused by current flow.  
Note 2 : Storage refers to long-term storage of unused items before they are mounted on the PCB.  
Operating temperature and humidity range apply when the product is not powered after PCB mounting and when temporarily stored during transportation.  
Note 3 : Use without condensation.

Materials / Finish

| Component           | Part            | Material     | Color / Finish | UL Standard |
|---------------------|-----------------|--------------|----------------|-------------|
| Receptacle          | Housing         | PA           | Black, Gray    | UL94V-0     |
|                     | Female Terminal | Copper Alloy | Tin Plating    | -           |
|                     | Retention Tabs  | Brass        | Tin Plating    | -           |
| Plug                | Housing         | PA           | Black, Gray    | UL94V-0     |
|                     | Retainer        | PBT          | Dark Gray      | UL94V-0     |
| Male Crimp Terminal |                 | Brass        | Tin Plating    | -           |

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/Plug/Retainer

**ZH05 - 16 DS - 2 H (A)**

①      ②      ③      ④ ⑤ ⑥

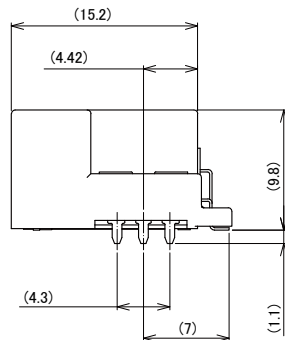
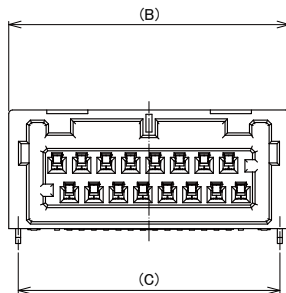
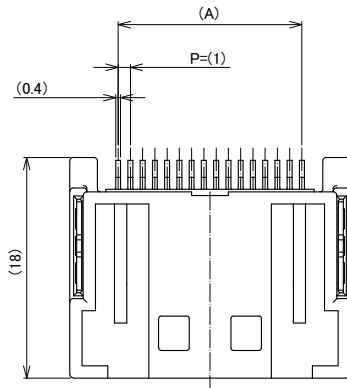
●Male Crimp Terminal

**ZH05 - 2224 PCF**

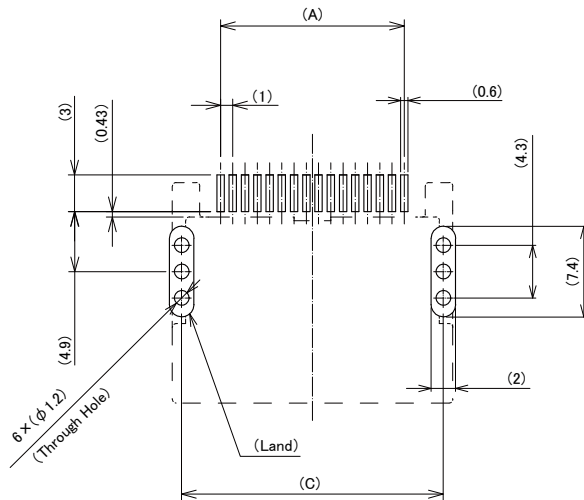
①      ⑦      ⑧

|                  |                                                |                        |                                                                     |
|------------------|------------------------------------------------|------------------------|---------------------------------------------------------------------|
| ① Series Name    | ZH05                                           | ⑤ Product Type         | H : Horizontal Mounting Type<br>HU : Socket Housing<br>R : Retainer |
| ② No. of Pos.    | 16, 20, 24, 28, 32pos.                         | ⑥ Mating Key           | (A) : A Key<br>(B) : B Key                                          |
| ③ Connector Type | DS : Receptacle (Female Terminal)<br>DP : Plug | ⑦ Applicable Cable     | 22-24 AWG                                                           |
| ④ Pitch          | 2mm                                            | ⑧ Type /Packaging Type | Plug Contact / Reel                                                 |

Receptacle [SMT+THR (Through Hole Reflow) Type]



- Recommended PCB Layout  
(Board thickness :  $t=1.6\text{mm}$ , Metal mask thickness :  $t=0.1\text{mm}$ )

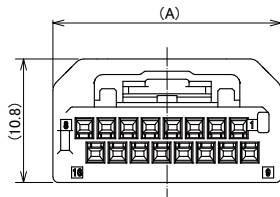
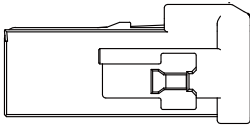
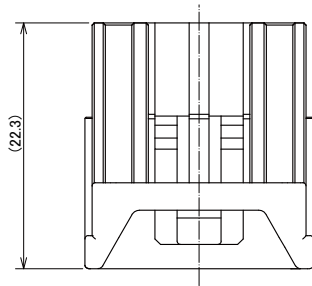


Unit : mm

| Part No.        | HRS No.               | Mating Key | No. of Pos. | A    | B    | C     | Purchase Unit   |
|-----------------|-----------------------|------------|-------------|------|------|-------|-----------------|
| ZH05-16DS-2H(A) | CL0756-2101-0-80      | A Key      | 16          | 15.0 | 22.9 | 21.36 | 250pcs per reel |
| ZH05-16DS-2H(B) | CL0756-2104-0-80      | B Key      |             |      |      |       |                 |
| ZH05-20DS-2H(A) | CL0756-2102-0-80      | A Key      | 20          | 19.0 | 26.9 | 25.36 |                 |
| ZH05-20DS-2H(B) | CL0756-2105-0-80      | B Key      |             |      |      |       |                 |
| ZH05-24DS-2H(A) | CL0756-2108-0-00      | A Key      | 24          | 23.0 | 30.9 | 29.36 |                 |
| ZH05-24DS-2H(B) | CL0756-2109-0-00      | B Key      |             |      |      |       |                 |
| ZH05-28DS-2H(A) | Under Planning (Note) | A Key      | 28          | 27.0 | 34.9 | 33.36 |                 |
| ZH05-28DS-2H(B) | Under Planning (Note) | B Key      |             |      |      |       |                 |
| ZH05-32DS-2H(A) | CL0756-2110-0-00      | A Key      | 32          | 31.0 | 38.9 | 37.36 |                 |
| ZH05-32DS-2H(B) | CL0756-2111-0-00      | B Key      |             |      |      |       |                 |

Note : Products without HRS No. are currently being planned for development. Please contact a Hirose representative regarding questions on pin count variation development.

Plug



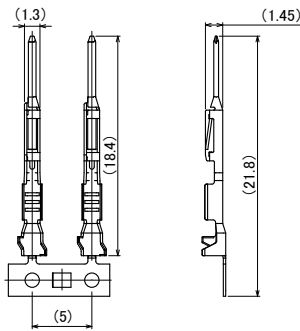
Unit : mm

| Part No.        | HRS No.                 | Mating Key | No. of Pos. | A    | Purchase Unit    |
|-----------------|-------------------------|------------|-------------|------|------------------|
| ZH05-16DP-HU(A) | CL0756-2201-0-00        | A Key      | 16          | 20.7 | 500pcs per box   |
| ZH05-16DP-HU(B) | CL0756-2207-0-00        | B Key      |             |      |                  |
| ZH05-20DP-HU(A) | CL0756-2204-0-00        | A Key      | 20          | 24.7 | 1,500pcs per box |
| ZH05-20DP-HU(B) | CL0756-2208-0-00        | B Key      |             |      |                  |
| ZH05-24DP-HU(A) | CL0756-2212-0-00        | A Key      | 24          | 28.7 | 1,250pcs per box |
| ZH05-24DP-HU(B) | CL0756-2217-0-00        | B Key      |             |      |                  |
| ZH05-28DP-HU(A) | Under Planning (Note 1) | A Key      | 28          | 32.7 | 500pcs per box   |
| ZH05-28DP-HU(B) | Under Planning (Note 1) | B Key      |             |      |                  |
| ZH05-32DP-HU(A) | CL0756-2218-0-00        | A Key      | 32          | 36.7 | 500pcs per box   |
| ZH05-32DP-HU(B) | CL0756-2219-0-00        | B Key      |             |      |                  |

Note 1 : Products without HRS No. are currently being planned for development. Please contact a Hirose representative regarding questions on pin count variation development.

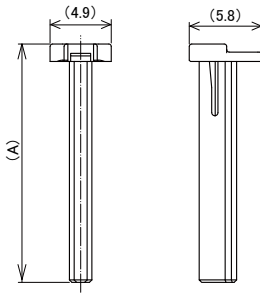
Note 2 : Use with the retainer (ZH05-#DP-R), sold separately.

Male Crimp Terminal



| Part No.     | HRS No.          | Applicable Cable                                                                        | Packaging Specification                                               | Purchase Unit        |
|--------------|------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------|
| ZH05-2224PCF | CL0756-2001-0-00 | Applicable Cable : 22-24 AWG (0.2-0.35sq),<br>Coated Outer Diameter $\phi$ 1.4mm (FLRY) | 15,000pcs per reel<br>5 reels per box<br>(Total of 75,000pcs per box) | 75,000pcs<br>per box |

Retainer



Unit : mm

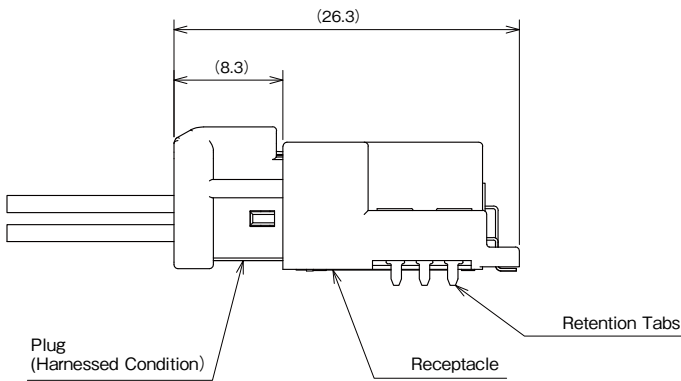
| Part No.    | HRS No.                 | No. of Pos. | A    | Purchase Unit     |
|-------------|-------------------------|-------------|------|-------------------|
| ZH05-16DP-R | CL0756-2215-0-00        | 16          | 19.1 | 10,000pcs per box |
| ZH05-20DP-R | CL0756-2216-0-00        | 20          | 23.1 |                   |
| ZH05-24DP-R | CL0756-2213-0-00        | 24          | 27.1 | 12,000pcs per box |
| ZH05-28DP-R | Under Planning (Note 1) | 28          | 31.1 |                   |
| ZH05-32DP-R | CL0756-2220-0-00        | 32          | 35.1 |                   |

Note 1 : Products without HRS No. are currently being planned for development. Please contact a Hirose representative regarding questions on pin count variation development.

Note 2 : Attach to the plug (ZH05-#DP-HU(#)), sold separately.



Mated Diagram

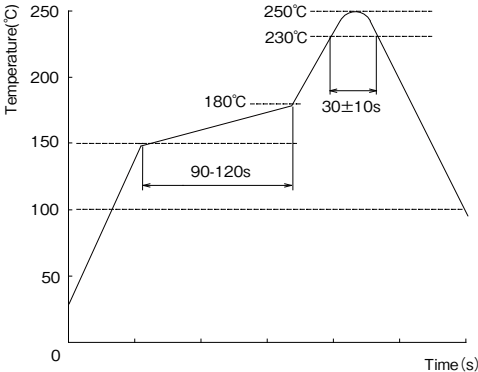


Applicable Tools

| Type                     | Part No.         | HRS No.          | Compatible Crimp Terminal |
|--------------------------|------------------|------------------|---------------------------|
| Crimping Tool            | CM-105C          | CL0901-0001-0-00 | -                         |
| Applicator               | AP105-ZH05-2224P | CL0901-5253-0-00 | ZH05-2224PCF              |
| Retainer Release Tool    | ZH05/R/RE-MD     | CL0902-5162-0-00 | -                         |
| Terminal Extraction Tool | ZH05/RE-MD       | CL0902-5161-0-00 | -                         |

Note 1 : Conduct crimping based on the "Crimping Standards" and "Crimping Conditions Table".  
Note 2 : Problems with tools not specified by Hirose are outside the scope of warranty.

## Usage Precautions

|                                         |                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recommended Temperature Profile         | <div><div><b>【Conditions】</b><br/>1. Reflow Heating Method Used :<br/>Far infrared, air atmosphere or nitrogen<br/>2. Peak Temperature 250°C Peak<br/>3. Heated part 230°C Min. 20-40 sec.<br/>4. Preheat Temperature 150 to 180°C 90-120 sec.<br/>5. Cycles 2 times Max.</div></div>        |
| Recommended Manual Soldering Conditions | Soldering iron temperature : 280 to 300°C , Soldering time : within 2 seconds                                                                                                                                                                                                                                                                                                 |
| Precautions                             | <div>1. Forcing the connector out might cause damage.<br/>If challenging to remove, gently press down once and then release the lock.<br/>2. Always disconnect the power before reseating the connector.<br/>3. Avoid touching the terminal area when the power is active, as it's hazardous.<br/>4. For harnessing guidelines, please consult a Hirose representative.</div> |

## 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.

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