

Automotive connectors  
【For board-to-wire】

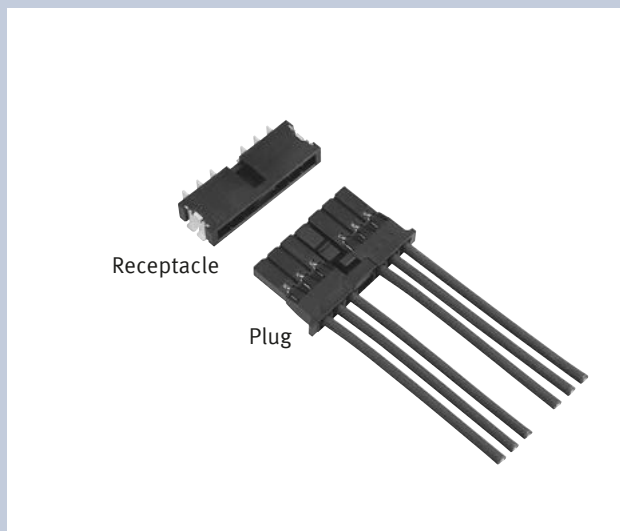
**CW1**

Product Catalog

**IN Your  
Future**

# CW1

For Automotive Application with 125 °C heat resistance 3.4 mm low profile design.



## FEATURES

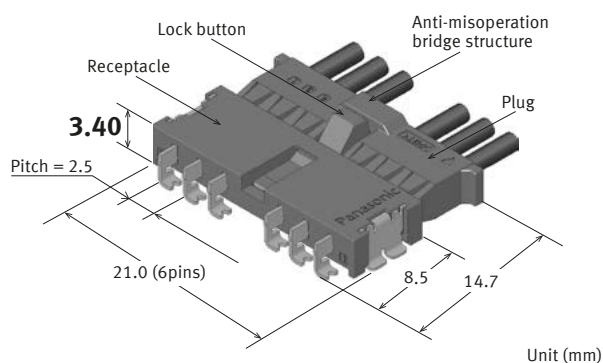
- 3.4 mm low profile design.
- Suitable for automotive applications that require vibration and heat resistance ( 125 °C ) characteristics.
- " Anti-misoperation bridge structure " prevents unintended operation of mating lock.

## TYPICAL APPLICATIONS

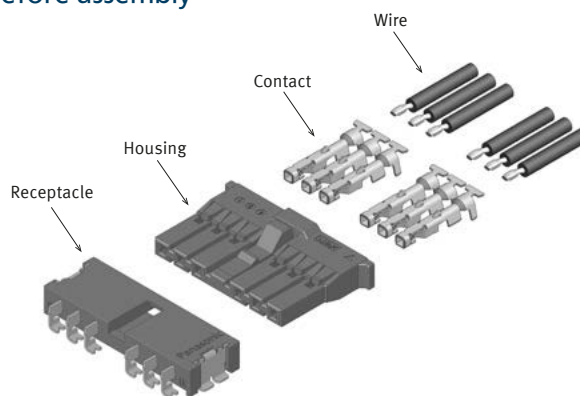
- LED module connection in automotive head lamps

## PARTS STRUCTURE

### ■ Mating state



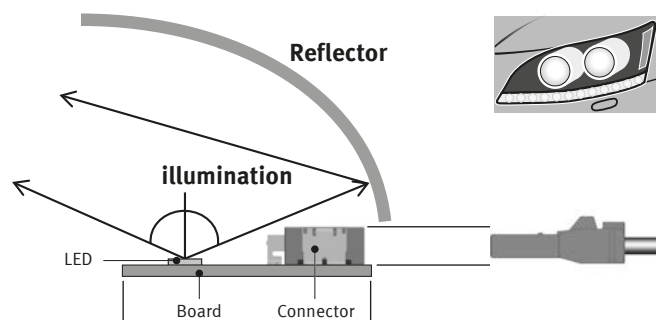
### ■ Before assembly



## MAIN APPLICATION

### ■ LED module connection in head lamps

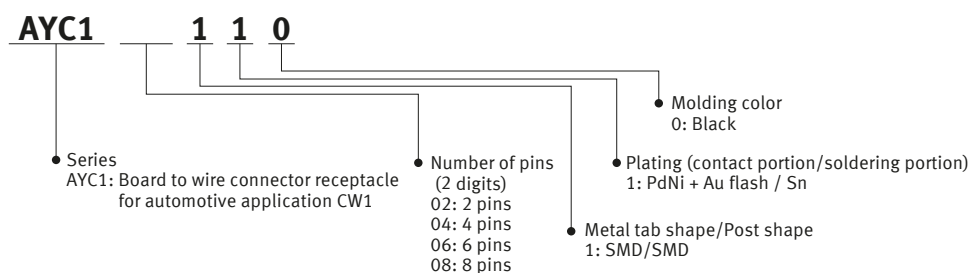
With little influence on the LED illumination angle, board downsizing is possible.



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## RECEPTACLE

### Ordering Information ( Part No. )



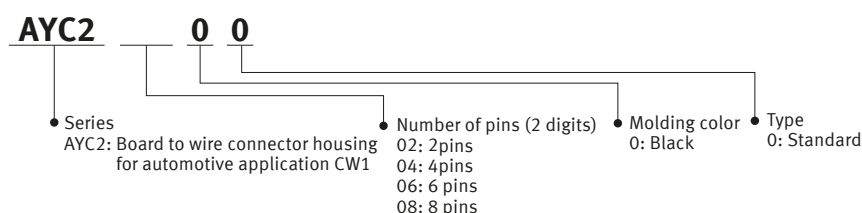
### Types

Number of pins	Part No.	Standard packing	
		Inner carton ( 1-reel )	Outer carton
2 pins	AYC102110	1,600 pcs.	3,200 pcs.
4 pins	AYC104110		
6 pins	AYC106110		
8 pins	AYC108110		

Note) Order unit: For volume production: 1-inner carton ( 1-reel ) units. For samples, please contact our sales representative.

## HOUSING

### Ordering Information ( Part No. )



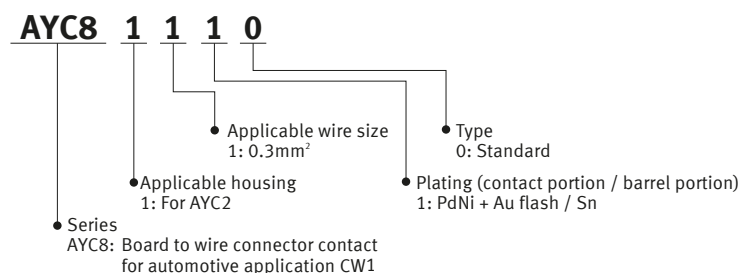
### Types

Number of pins	Part No.	Standard packing	
		Inner carton	Outer carton
2 pins	AYC20200	1,000 pcs.	2,000 pcs.
4 pins	AYC20400		
6 pins	AYC20600		
8 pins	AYC20800		

Note) Order unit: For volume production: Outer carton units. For samples, please contact our sales representative.

## CONTACT

### Ordering Information ( Part No. )



### Product types

Part No.	Standard packing
	Outer carton ( 1-reel )
AYC81110	14,000 pcs.

Note) Order unit: For volume production: Outer carton ( 1-reel ) units. For samples, please contact our sales representative.

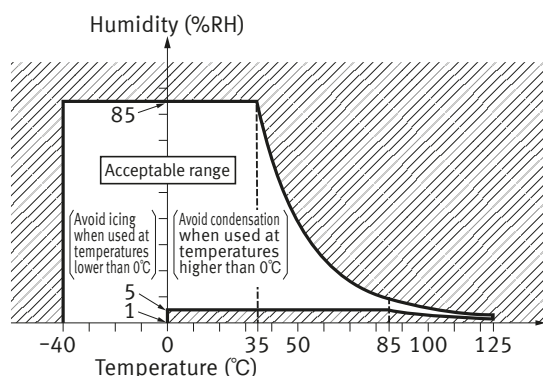
## SPECIFICATIONS

### ■ Characteristics

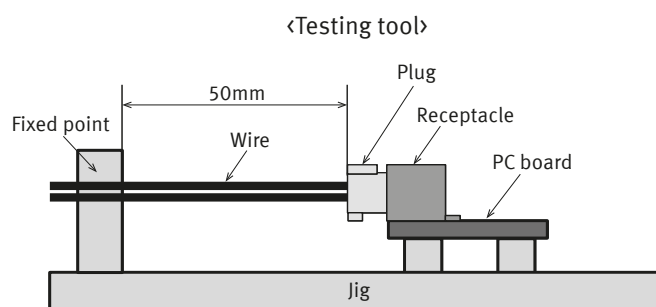
Characteristics	Item	Specifications	Conditions																		
Electrical characteristics	Rated current	Each pin: 3.0 A	Maximum current can be applied to one contact. ( Except for the capacity of wire. )																		
	Rated voltage	50 V DC																			
	Dielectric strength	1,000 V AC for 1 min	Detection current: 1 mA ( No short or damage )																		
	Insulation resistance	Min. 100 MΩ	Using 500 V DC megger ( applied for 1 min )																		
	Contact resistance	Max. 10 mΩ ( initial ) Max. 20 mΩ ( after test )	Except wire conductor resistance. Measured at DC 10 mA																		
Mechanical characteristics	Insertion force	Max. 13.0 N ( initial • 2 pins ) Max. 18.0 N ( initial • 4 pins ) Max. 23.0 N ( initial • 6 pins ) Max. 28.0 N ( initial • 8 pins )																			
	Removal force	Max. 13.0 N ( initial • 2 pins ) Max. 18.0 N ( initial • 4 pins ) Max. 23.0 N ( initial • 6 pins ) Max. 28.0 N ( initial • 8 pins )	Measured by removal of housing lock.																		
	Housing lock force	Min. 30 N ( initial )																			
Environmental characteristics	Temperature and humidity of ambient, storage and transportation	−40 to +125 °C ( Including temperature rise when applying current ) ( Storage and transportation temperature is −40 to +50 °C in a packing state. ) *1	No icing. No condensation.																		
	Soldering heat resistance	The initial specification must be satisfied electrically and mechanically	Max. peak temperature of 260 °C Reflow soldering: Max. 2 times ( PC board surface temperature near the receptacle ) Soldering iron: 300 °C within 5 sec., 350 °C within 3 sec.																		
	Thermal shock resistance ( receptacle and plug mated )	500 cycles, contact resistance: Max. 20 mΩ	<table><tr><th>Order</th><th>Temperature (°C)</th><th>Time (minutes)</th></tr><tr><td>1</td><td>−40<sup>+0</sup><sub>−3</sub></td><td>30</td></tr><tr><td>2</td><td>∅</td><td>Max. 5</td></tr><tr><td>3</td><td>125<sup>+3</sup><sub>0</sub></td><td>30</td></tr><tr><td>4</td><td>∅</td><td>Max. 5</td></tr><tr><td></td><td>−40<sup>+0</sup><sub>−3</sub></td><td></td></tr></table> * Vapor phase	Order	Temperature (°C)	Time (minutes)	1	−40 <sup>+0</sup> <sub>−3</sub>	30	2	∅	Max. 5	3	125 <sup>+3</sup> <sub>0</sub>	30	4	∅	Max. 5		−40 <sup>+0</sup> <sub>−3</sub>	
	Order	Temperature (°C)	Time (minutes)																		
	1	−40 <sup>+0</sup> <sub>−3</sub>	30																		
	2	∅	Max. 5																		
	3	125 <sup>+3</sup> <sub>0</sub>	30																		
	4	∅	Max. 5																		
	−40 <sup>+0</sup> <sub>−3</sub>																				
Humidity resistance ( receptacle and plug mated )	96 hours, contact resistance : Max. 20 mΩ insulation resistance: Min. 100 MΩ	Bath temperature 60 ±2 °C Humidity 90 % RH																			
Heat resistance ( receptacle and plug mated )	120 hours, contact resistance: Max. 20 mΩ	Bath temperature 125 ±2 °C																			
Vibration resistance ( receptacle and plug mated )	Current shut off should not exceed 1 μs during vibration test. ( contact resistance: Max. 20 mΩ )	Acceleration: 44.0 m/s <sup>2</sup> Frequency: 20 to 200 Hz Sweep time: 3 min/cycle Testing tool: Refer to Fig. 1*2 Direction: 3 axes ( X, Y, Z ) ( Different samples are used for each axis. ) Time: 3 h Detection current: 10 mA																			
Shock resistance ( receptacle and plug mated )	Current shut off should not exceed 1 μs during shock test.	Acceleration: 981 m/s <sup>2</sup> Operation time: 6 ms Testing tool: Refer to Fig. 1*2 Direction: 6 direction ( ±X, ±Y, ±Z ) ( Different samples are used for each direction. ) Number: 3 times Detection current: 10 mA																			
Lifetime characteristics	Insertion and removal life	30 times ( contact resistance: Max. 20 mΩ )	Speed: 25 mm/min																		
Solder paste thickness		The initial specification must be satisfied electrically and mechanically	Recommendation t = 0.15 mm																		

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\*1: As the humidity range differs depending on the ambient temperature, the humidity range indicated below should be used.  
This temperature and humidity range does not guarantee permanent performance.



\*2: Fig. 1



## Material and surface treatment

### ● Receptacle

Name	Material	Color	Surface treatment
Body	LCP ( UL94 V-0 )	Black	—
Post	Copper alloy	—	Contact portion : PdNi + Au flash plating over nickel Soldering portion: Sn plating over nickel
Metal tab	Copper alloy	—	Soldering portion: Sn plating over nickel

### ● Housing

Name	Material	Color	Surface treatment
Housing	PBT ( UL94 HB )	Black	—

### ● Contact

Name	Material	Color	Surface treatment
Contact	Copper alloy	—	Contact portion: PdNi + Au flash plating over nickel Barrel portion : Sn plating over nickel

## Applicable wires

Wire range	Wire specifications		
	Number of strands/Strand diameter ( pcs/mm )	Conductor sectional area ( mm <sup>2</sup> )	Insulation diameter ( mm )
AWG#24	11/0.16	0.2210	φ 1.22 to φ 1.52
AWG#22	17/0.16	0.3416	
AVSS0.3	7/0.26	0.3715	
Tinned annealed copper wire Furukawa Electric Co., Ltd. BEAMEX ER500	12/0.18	0.3	φ 1.52

# Automotive connectors CW1

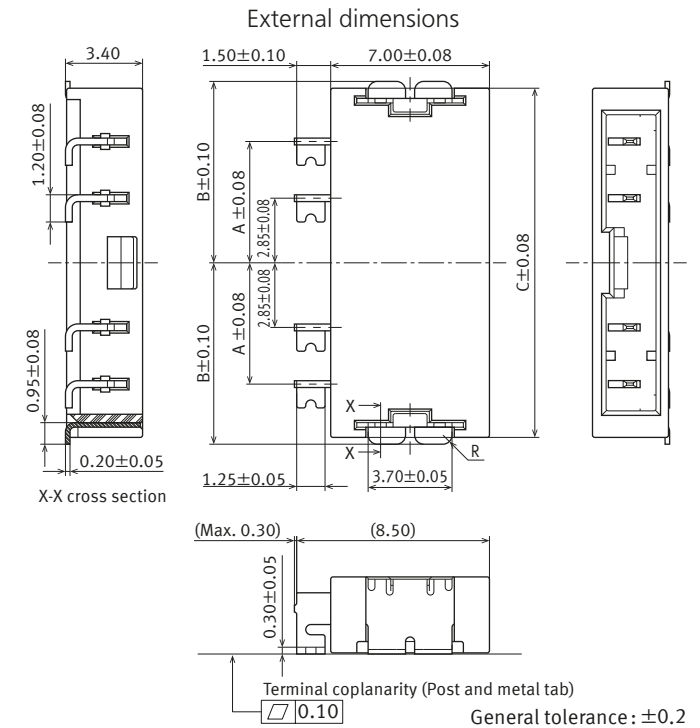
## DIMENSIONS ( Unit: mm )

**CAD** The CAD data of the products with a " CAD " mark can be downloaded from our Website.

**■ Receptacle**

- 2 pins, 4 pins

**CAD**

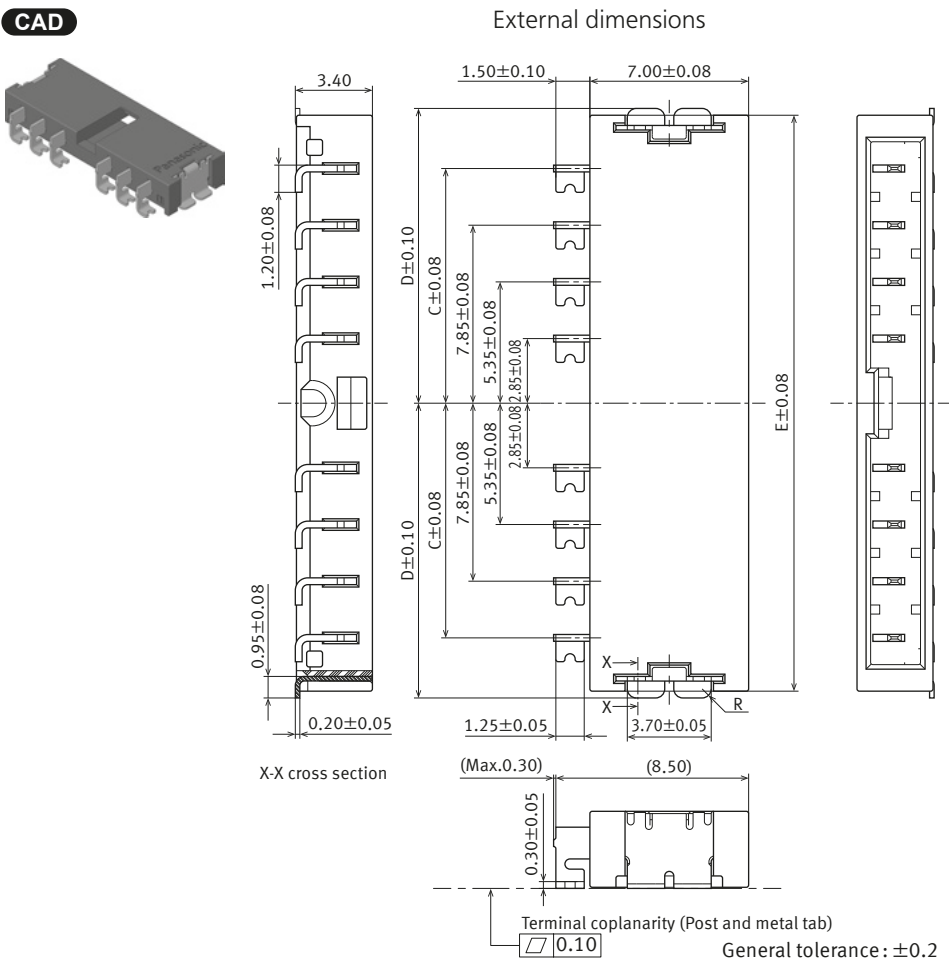


Dimension table

Dimensions Number of pins	A	B	C
2	—	5.50	10.40
4	5.35	8.00	15.40

- 6 pins, 8 pins

**CAD**



Dimension table

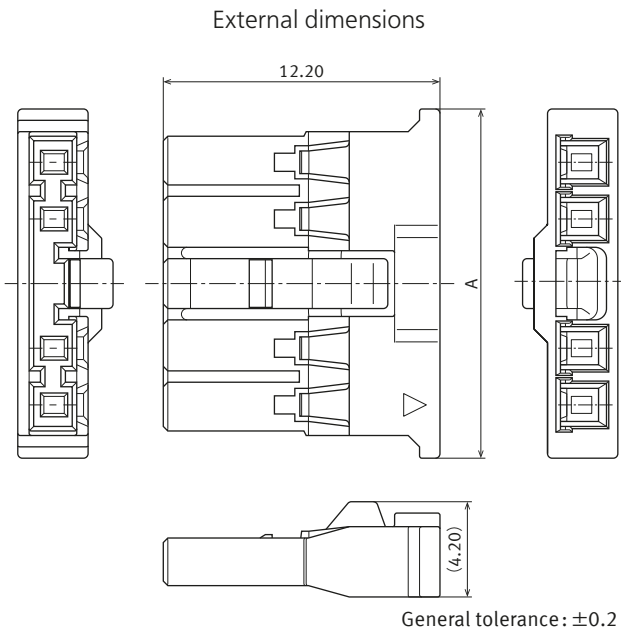
Dimensions Number of pins	C	D	E
6	—	10.50	20.40
8	10.35	13.00	25.40

# Automotive connectors CW1

**Housing**

- 2 pins, 4 pins

CAD

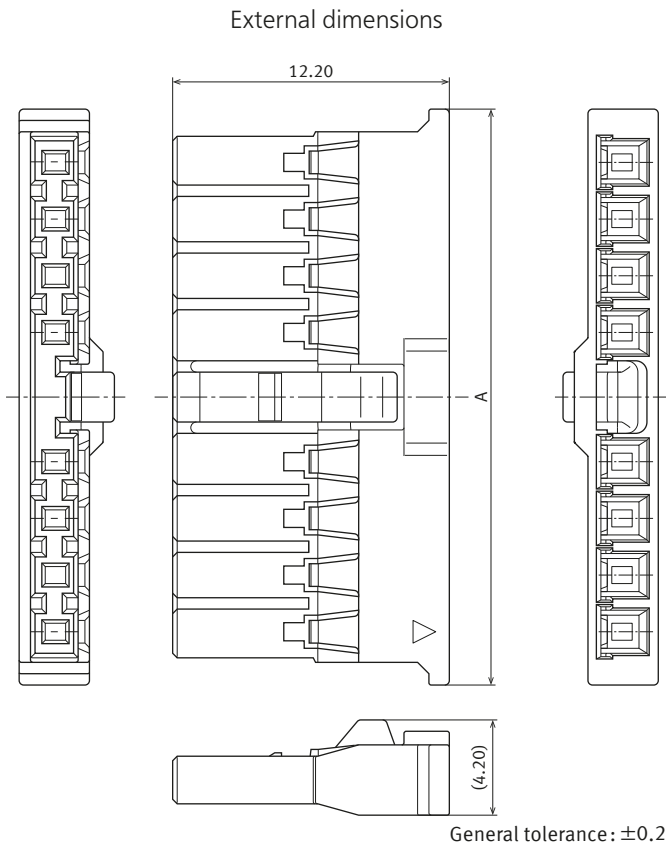
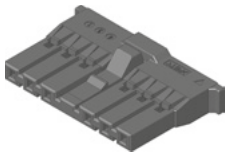


Dimension table

Dimensions	A
Number of pins	
2	10.40
4	15.40

- 6 pins, 8 pins

CAD



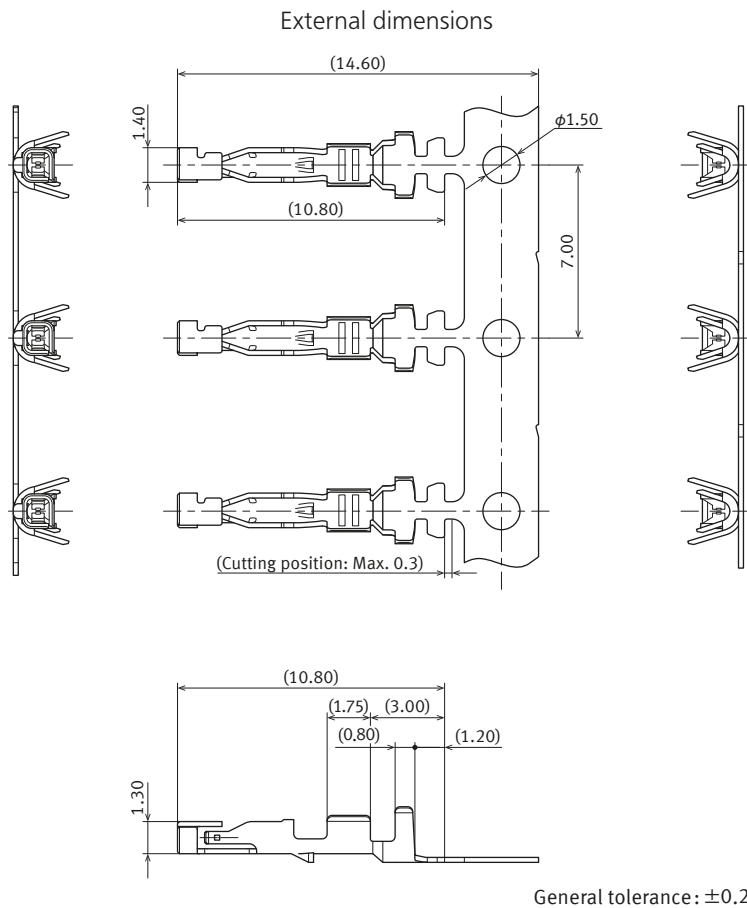
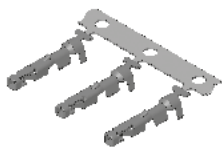
Dimension table

Dimensions	A
Number of pins	
6	20.40
8	25.40

# Automotive connectors CW1

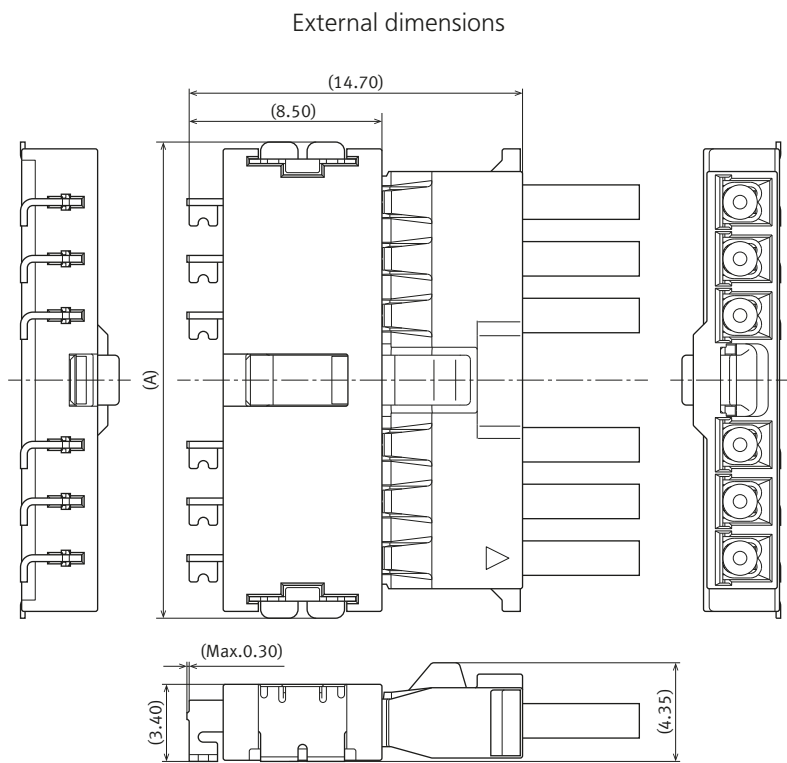
## Contact

CAD



## Mating state

CAD



Dimension table

Dimensions	A
Number of pins	
2	11.00
4	16.00
6	21.00
8	26.00



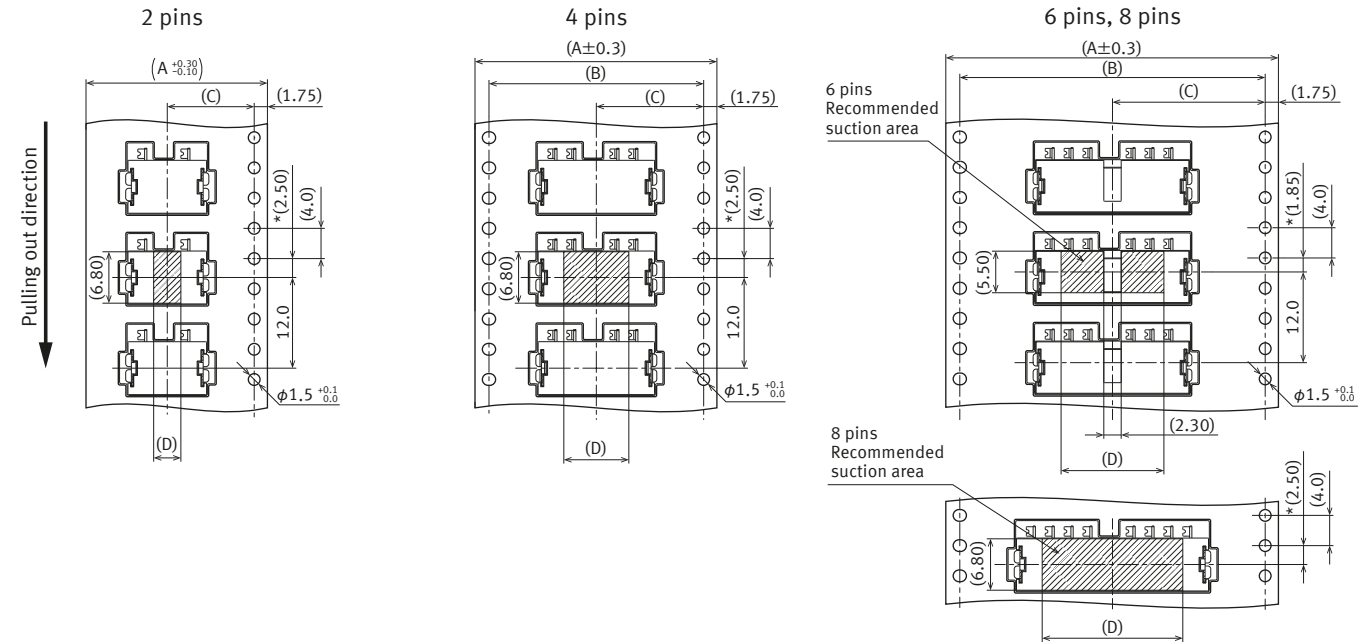
PACKING SPECIFICATION ( Unit: mm )

Receptacle

Tape packed status

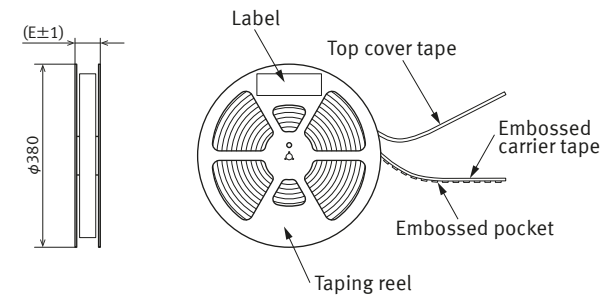
JIS C 0806-3: 1999 except the dimension from the center of the feed hole to the center of the embossed pocket.

\* : the dimension from the center of the feed holes to the center of the recommended suction area.



Specifications for the plastic reel

In accordance with EIAJ ET-7200B.



Dimension table

Number of pins	A	B	C	D	E
2	24.0	—	11.5	3.6	25.4
4	32.0	28.4	14.2	8.6	33.4
6	44.0	40.4	20.2	13.6	45.4
8	44.0	40.4	20.2	18.6	45.4

Connector orientation with respect to embossed tape feeding direction

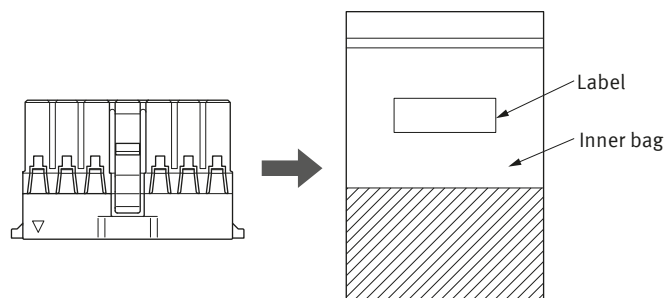
Type	CW1
Direction of tape progress	

# Automotive connectors CW1

## Housing

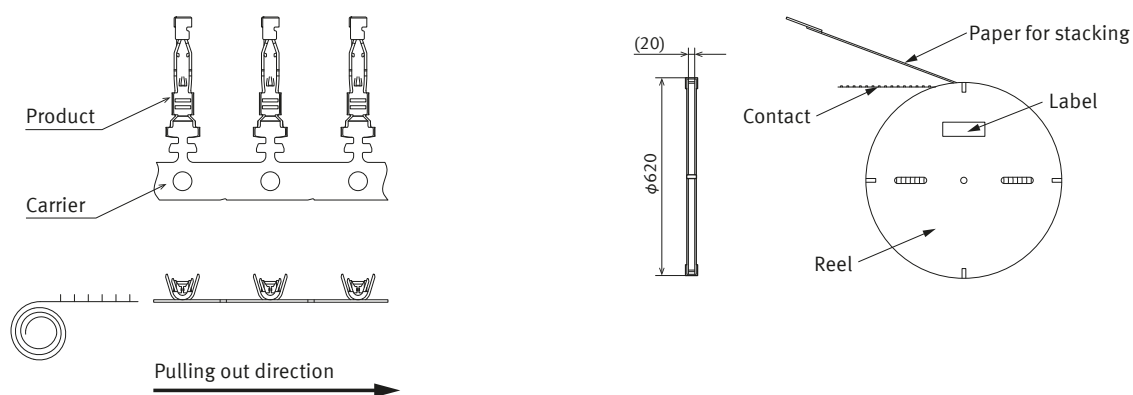
### ● Inner bag package

Put 1,000 housings into the inner bag.



## Contact

### ● Specifications for the cardboard reel



NOTES ( Unit: mm )

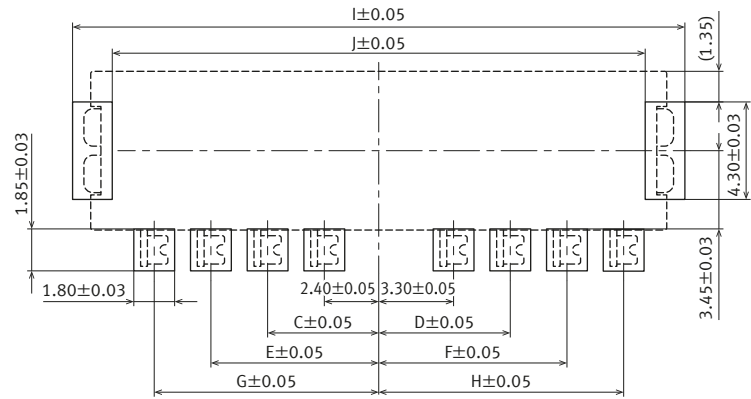
■ Design of PC board patterns

Conduct the recommended foot pattern design, in order to preserve the mechanical strength of terminal solder areas.

■ Recommended PC board and metal mask patterns

In order to reduce solder and flux rise, solder bridges and other issues make sure the proper levels of solder is used. The figures are recommended patterns. Please use them as a reference.

● Recommended PC board pattern ( Mounting pad layout, TOP VIEW )

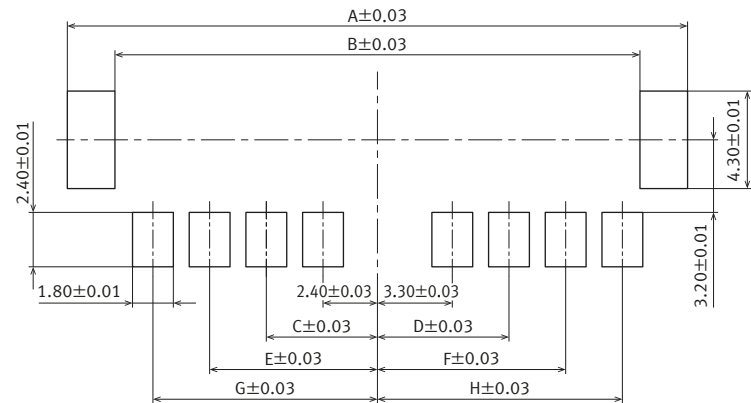


● Recommended metal mask pattern

Metal mask thickness: When 150 μm

( Post opening ratio : 130 % )

( Metal tab opening ratio: 120 % )



● Dimension table

Dimensions Number of pins	A	B	C	D	E	F	G	H	I	J
2	12.35	8.15	—	—	—	—	—	—	12.00	8.50
4	17.35	13.15	4.90	5.80	—	—	—	—	17.00	13.50
6	22.35	18.15	4.90	5.80	7.40	8.30	—	—	22.00	18.50
8	27.35	23.15	4.90	5.80	7.40	8.30	9.90	10.80	27.00	23.50

## ABOUT SAFETY REMARKS

Observe the following safety precautions to prevent accidents and injuries.

- Do not use these connectors beyond the specification sheets. The usage outside of specified rated current, dielectric strength, and environmental conditions and so on may cause circuitry damage via abnormal heating, smoke, and fire.
- In order to avoid accidents, your thorough specification review is appreciated. Please contact us if your usage is out of the specifications. Otherwise, Panasonic Industry Co., Ltd. cannot guarantee the quality and reliability.
- Panasonic Industry Co., Ltd. is consistently striving to improve quality and reliability.  
However, the fact remains that electrical components and devices generally cause failures at a given statistical probability. Furthermore, their durability varies with use environments or use conditions.  
In this respect, please check for actual automobile under actual conditions before use.  
Continued usage in a state of degraded condition may cause the deteriorated insulation, thus result in abnormal heat, smoke or firing. Please carry out safety design and periodic maintenance including redundancy design, design for fire spread prevention, and design for malfunction prevention so that no accidents resulting in injury or death, fire accidents, or social damage will be caused as a result of failure of the products or ending life of the products.

## RECEPTACLE

### 1) Regarding PC board design

- Refer to the recommended PC board pattern for keeping the strength of soldering.

### 2) Receptacle placement

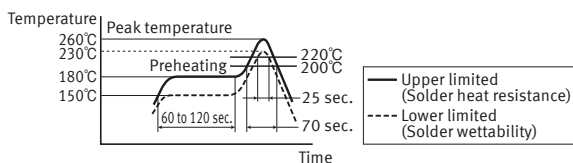
- In case of dry condition, please note the occurrence of static electricity. The product may be adhered to the embossed carrier tape or the cover tape in dry condition. Recommended humidity is from 40 % RH to 60 % RH and please remove static electricity by ionizer in manufacturing process.

### 3) Soldering

#### ( 1 ) Reflow soldering.

- When cream solder printing is used, screen method is recommended.
- The relation between the screen opening area and PC board foot pattern area should be referred to " Recommended PC board pattern " drawings and " Recommended metal mask pattern " drawings.
- If it is used with a thickness different from the recommended metal mask thickness, it may not be mounted, or the mounting strength may decrease. Please be careful to metal mask thickness.

- Please be careful to align terminals and solder pads, because this product does not have self-alignment features.
- The following diagram shows the recommended reflow soldering temperature profile.



- Infrared reflow soldering is able to passed two times.
- The temperature is measured on the PC board surface near connector terminals.
- The condition of solder or flux creepage and wettability depend on the type of solder and flux. Please set the reflow temperature and oxygen level by considering the solder and flux characteristics

#### ( 2 ) Manual soldering.

- As this product is low profile type, please avoid the excessive solder. Because the excessive solder makes creepage at contact portion.
- Please use the soldering iron under specified temperature and times.
- As excessive force to terminal by manual soldering has some possibilities of terminal portion deformation, please be careful to the force by hand.
- Please clean soldering iron tip.

#### ( 3 ) Rework of soldering portion.

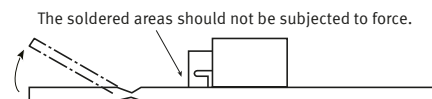
- Rework shall be only one time.
- Please avoid the supplementary flux in case of rework for soldering bridge, as this may cause flux creepage to contact portion.
- Please use the soldering iron under specified temperature.

4) As the excessive force on the terminals may cause the deformation and the integrity of solderability will be lost during reflow soldering, please avoid dropping or rough handling of the product.

5) When the soldering is not completed, do not mate nor unmate the connectors.

And the external compulsory force to the terminal may cause the fixing force lowering between the terminal and the molding or the coplanarity failures.

6) When cutting the PC board after mounting the receptacle, please avoid the stress at the soldering portion.



### 7) Cleaning treatment

- Cleaning this product is not needed basically. Please note the following points to prevent the negative effect to the product when cleaning is necessary.
- Please keep the cleanliness of the cleaning fluid to make sure that the contact surfaces are not contaminated by the cleaning fluid itself.
- Semi-aqueous cleaning solvent is recommended as some powerful solvent may dissolve the molding portion or the marked letters. Please contact us when other solvent is used.

## PLUG

### 1) Wire processing, plug assembly

- Plug of this product is a connection method by crimped contact.  
To crimp the contact, use the crimping machine ( applicator ) specified by us.  
Use of an unspecified crimping machine ( applicator ) is likely to result in contact failure, disconnection, and other faults.  
\* Specified crimping machine ( applicator )  
Union Machinery Co., Ltd. : RA12-N5500 ( 812-J76-2200 )

### 2) Precaution of wire handling and designing

- In mating operation, tensile load of the wire is max. 12.0 N / wire.

## INSERTION, REMOVAL AND RETENTION OF MATING

- This product is designed with ease of handling. However, in order to prevent the deformation or damage of contacts and molding, do not mate the connectors such as the following
  - Insertion or removal while prying from right to left or up and down.
  - Insertion of upside-down state.
- Inserting the plug with excessive force may break the products. Please be careful as excessive force is not applied.
- This product has lock structure for mating. However, the lock may be broken depending on the wire weight or reaction force due to wire routing. Please confirm sufficiently at usage.
- When remove the connector, please hold the housing while pushing the latch-lock. Pulling the wire only, will cause the product is damaged.
- Please avoid wiring, such as continue to apply stress to the base of the wire. It may cause breaking of the wire or failure of the products.

## PRECAUTIONS FOR OPERATING ENVIRONMENT AND STORAGE ENVIRONMENT

- Panasonic Industry Co., Ltd. does not guarantee the failures caused by condensation.
- Please use our products within six months from the date of products acceptance.  
Please confirm solderability, when using after the recommended storage period.

## OTHER PRECAUTIONS

- When the coating material is used for preventing PC board isolation deterioration after soldering, please assure the coating material is not adhered on any part of connector.
- Please avoid the usage of connector as electric switching basically.

Please refer to "the latest product specifications" when designing your product.

- Requests to customers:

<https://industrial.panasonic.com/ac/e/salespolicies/>

■ Global Sales Network Information: [industrial.panasonic.com/ac/e/salesnetwork](https://industrial.panasonic.com/ac/e/salesnetwork)

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**Panasonic**  
INDUSTRY

**Panasonic Industry Co., Ltd.**

Electromechanical Control Business Division

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