

Handling Instructions and Safety Precautions for Connectors, Cables, Terminals and any other product of GSN*.

This manual is to describe basic precautions for use of terminal and connector in the following. Make use of this manual when wire connection processing is conducted in appliance designing and harness process. When there are doubtful points in use, contact GSN. In case of any deviating handling, any liability of GSN ceases immediately.

1. Common Instructions and Precautions

GSN's terminal and connector are designed to connect electricity and electrical signal, and not aimed to be used as structure or a part of structure premising that mechanical force loads to connection part (contact part) of GSN's terminal and connector.

GSN's terminal and connector are designed for wiring in electrical appliances or between electrical appliances. GSN's terminal and connector are designed only for usage of "domestic wiring of electrical appliance" in Electrical Appliance and Material Safety Law. Appropriate provision is required for electrical appliances so that general person does not touch terminal and connector.

GSN's terminal and connector are designed to aim electrical connection in electrical appliances or between electrical appliances. They are not "connection appliance" conformed to Electric Appliance and Material Safety Law, so that they cannot use for wiring inside building material and cable wiring for indoor and outdoor.

Use GSN's terminal and connector within the range of rated value of product specification and performance specification. This rated value and performance specification are specified as parts themselves, when using in actual use, use them after checking to satisfy regulation and design standard about appliances to be used.

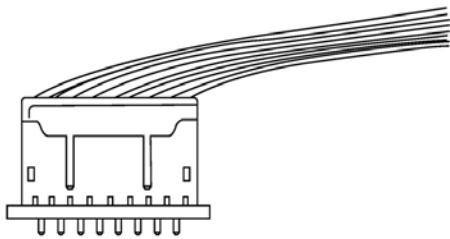
Do not expose GSN's terminal and connector, processing process product and processing product (harness, etc.) to corrosive substance, corrosive gas, high temperature and high humidity and direct sunshine. It causes corrosion of contact and deterioration of insulation performance of housing, etc., so that it causes motion defect of appliances.

Do not apply external load to GSN's terminal and connector, processing process product and processing product (harness, etc.). Deformation and breakage etc. Occur, and it causes performance defect of connector.

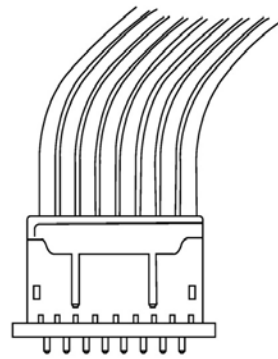
* GSN means GSN Electronics Incorporation Pte Ltd/Singapore (GSN Singapore), any sister or daughter company of GSN Singapore or any company being authorised by GSN Singapore to act as official representation, sales office or manufacturing site of GSN Singapore.

When checking circuit of harness with terminal and connector, handling wire harness, etc. in assembly of appliances or after wiring is fixed or applying load, due to tensile strength, to joint part of GSN's terminal and connector, joint part of contact contacting part and wire is damaged and causes of contact defect. When handling and wiring wire harness, etc., provision such as an appropriate slack to wire is required in order not to apply abnormal load to joint part of GSN's terminal and connector. See examples 1 and 2.

Example 1: Wire to Board connectors

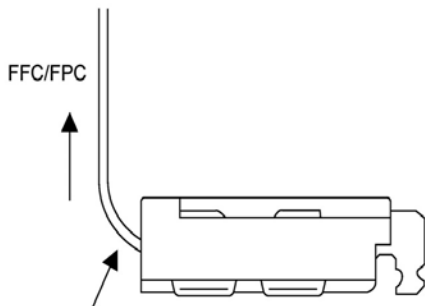


× Wire length is not sufficient to handle.



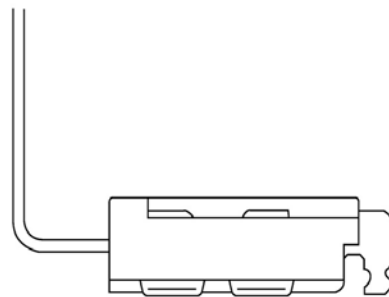
○ Wire length is sufficient to handle.

Example 2: FFC/FPC connectors

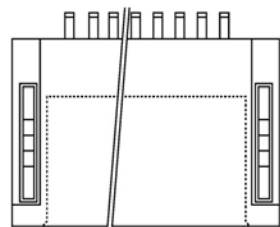


Force is loaded to FFC/FPC.

× FFC/FPC length is not sufficient to handle.



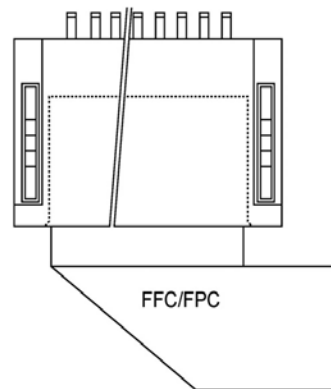
○ FFC/FPC length is sufficient to handle.



FFC/FPC

Force is loaded to FFC/FPC.

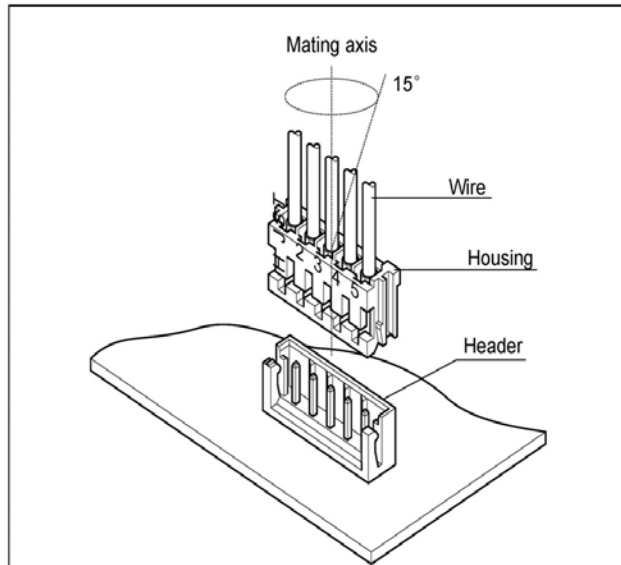
× Force is loaded to FPC.



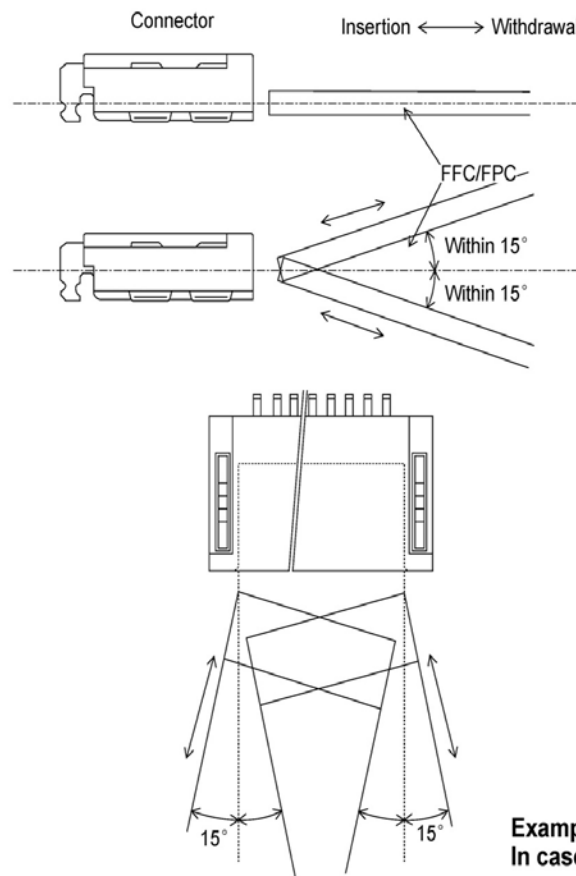
FFC/FPC

○ Forming processing is conducted to FPC so as not to load force to connector.

When GSN's terminals and connectors are mated or unmated (hereafter referred to as operation), hold wire in a bundle and operate it in an angle within maximum 15 degrees in any direction (see example 3 and 4). As for deviating operation angles specified in GSN product specification, the specified one is prior. After assembly, the above mentioned maximum angle (in doubt 15° in any direction) applies for permanent fixation as well. **Operation and/or permanent fixation beyond specified angle leads to damages and any liability ceases immediately.**



Example 3: In case of wire to board connector



**Example 4:
In case of connectors for FFC/FPC**

When electrical continuity of circuit and miss-wiring are checked, do not insert others than the applicable mating (shrouded header and header, etc.). It leads to deformation of contact, etc., and causes of contact defect.

2. Handling Precaution for Terminal and Connector in Electrical Appliances

GSN's terminal and connector are not designed so that they may disconnect in live electrical circuit. Do not disconnect GSN's terminal and connector in the live electrical condition in order to prevent damage and performance defect by spark, etc.

In case that condensation and water leak occurred on GSN's terminal and connector, there is a risk that insulation defect may occur between circuits. When it is estimated that condensation and water leak occur, appropriate countermeasure to prevent waterdrop is required.

When using GSN's terminal and connector, avoid using to branch and apply electricity more than rated value to some circuits. Even if electricity per a circuit is set not to exceed rated value on calculation, electricity per a circuit is not shared equally due to variation of circuit pattern and contact resistance, so that performance deterioration makes progress by current continuity more than rated value, and abnormality occurs.

When connectors are used at parts that wire and printed circuit board with connectors resonate or mating part (connection part) of connector always moves whenever appliance has rotation structure or moving part, that causes contact defect by fretting corrosion of contact part. Appropriate provision such as fixing of wire and printed circuit board in appliances or support of printed circuit board and suppression of resonation, etc.

When contact material of GSN's terminal and connector is brass, breakdown and cracking (stress corrosion cracking) occur in the existence of corrosive gas and moisture (condensation, etc.) of ammonia and sulfur gas, etc., and that causes of contact defect of connector. When effect of corrosive gas of ammonia and sulfur gas, etc. aforementioned condition is expected in use place of terminal, connector and its electrical appliances to use, use copper-alloy material (phosphor bronze material, etc.) except for brass material as a contact material. Contact GSN for products.

After connector was connected to printed circuit board with solder, when printed circuit board is stacked on connector, deformation of mating part of connector and adhesion of foreign matter occur, and that causes of contact defect of connector. Do not stack printed circuit board after connection with solder.

3. Note for Wire Connection Processing of Harness Processing, etc.

When GSN's terminal, chain terminal and connector are crimped or terminated with wire, use tools specified in GSN. If connection is conducted by other tools than the specified one, it causes of contact defect and breakage. Besides, after checking processing operation condition, etc., process harness.

As defect control of important control point on wire connection processing of GSN's terminal and connector such as applicable wires and crimp height, etc. causes contact defect, check control point before processing.

As a rule, applicable wires for crimping connector and insulation displacement connector are tin-plated annealed copper wire (stranded wire). It is necessary to check when using bare copper wire, solid wire, tinfoated wire and shielding wire. However, wires of terminal and connector specified individually are decided depending on each specification. When wire is used in insulation displacement connector, use wire checked in GSN.

4. Note for PCB assembly (Soldering and Press-Fit)

If a product of GSN has to be assembled into/onto a PCB, the customer must intensively test the intended way of connecting any product of GSN with the PCB and prove that is working without any defects, problems or anything that might be regarded as unsatisfactory by the customer. All specification by GSN is a recommendation by GSN only and it does not contain any warranty, as there are many criteria beyond responsibility of GSN that lead or lead not to a well working assembly. GSN does not always specify all possible criteria (e.g. humidity, temperature, type and quality of solder paste and many more) and thus customers must verify the functionality of any system according to the respective mass production conditions by themselves.

5. Note for the storage of any GSN product

If a product of GSN is not processed immediately after arrival at the customer, the storage conditions inside the warehouse must be a temperature of 20°C ±5°C and a humidity of less than 50%. The maximum storage time is 3 month.

In packaging and storage of a GSN product, do not apply load by stack, etc.. It leads to deformation of GSN's products and may cause a performance defect.

6. Note for the quality of a connection

If a product of GSN is connected with another product, the customer must intensively test the intended way of connecting any product of GSN with any other product and prove that is working without any defects, problems or anything that might be regarded as unsatisfactory by the customer. All specification by GSN is a recommendation by GSN only and it does not contain any warranty, as there are many criteria beyond responsibility of GSN that lead or lead not to a well working connection. GSN does not always specify all possible criteria (e.g. mating angle, mating force, mating frequency, mating speed, humidity, temperature and many more) and thus customers must verify the functionality of any connector system according to the respective mass production conditions by themselves.

In case of any doubt/question, please contact GSN immediately.

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