



91/471/NP

NEW WORK ITEM PROPOSAL

Classification according to IEC Directives Supplement, Table 1 D2	Proposer JAPAN	Date of proposal 2004-06
	TC/SC 91	Secretariat JAPAN
	Date of circulation 2004-07-02	Closing date for voting 2004-10-01* * or as soon a

A proposal for a new work item within the scope of an existing technical committee or subcommittee shall be submitted to the Central Office. The proposal will be distributed to the P-members of the technical committee or subcommittee for voting, and to the O-members for information. The proposer may be a National Committee of the IEC, the secretariat itself, another technical committee or subcommittee, an organization in liaison, the Standardization Management Board or one of the advisory committees, or the General Secretary. Guidelines for proposing and justifying a new work item are given in ISO/IEC Directives, Part 1, Annex C (see extract overleaf). **This form is not to be used for amendments or revisions to existing publications.**

**The proposal** (to be completed by the proposer)

<b>Title of proposal</b> Specification for optical board connector type SF using glass fibre		
<input checked="" type="checkbox"/> Standard	<input type="checkbox"/> Technical Specification	<input type="checkbox"/> Publicly Available Specification
<b>Scope</b> (as defined in ISO/IEC Directives, Part 2, 6.2.1) Scope: This standard specifies the detailed specification for optical board connector type SF using glass fibre by means of physical contact technique to connect flexible optical board and ribbon fibres. The purpose of this standard is to provide the information of required characteristics of the connector and the methods to evaluate them, and to clarify the conditions to assemble the connector to optical board.		
<b>Purpose and justification</b> , including the market relevance and relationship to Safety (Guide 104), EMC (Guide 107), Environmental aspects (Guide 109) and Quality assurance (Guide 102) . (attach a separate page as annex, if necessary) The optoelectronics assembly technology has been in progress and the need of standardization is high. Some components are available in the market for production and/or development of various systems requiring very high speed signal processing. TC91 made a resolution that it would work on the optoelectronic assembly in 2002 in its Helsinki meeting, and agreed at the Singapore meeting In the 2003 several proposals shortly. The ACET/Area1 meeting held in 2004-04-20 agreed to have six proposals to TC91, four of them originally prepared by JPCA. This NP is the third of the four.		
<b>Target date</b>	for first CD ..2004-12.....	for IS ...2006-06.....
Estimated number of meetings 6	Frequency of meetings: 2 per year	Date and place of first meeting: . 2004-09. San Jose, CA, USA..
Proposed working methods	<input checked="" type="checkbox"/> E-mail	<input type="checkbox"/> ftp
<b>Relevant documents to be considered</b> See the attached document		
<b>Relationship of project to activities of other international bodies</b>		
<b>Liaison organizations</b> IPC, JPCA	<b>Need for coordination within ISO or IEC</b> TC86, SC86B, SC86C, TC48	
<b>Preparatory work</b> Ensure that all copyright issues are identified. Check one of the two following boxes <input checked="" type="checkbox"/> A draft is attached for vote and comment <input type="checkbox"/> An outline is attached We nominate a project leader as follows in accordance with ISO/IEC Directives, Part 1, 2.3.4 (name, address, fax and e-mail): Mr. Akikazu Shibata: JPCA, 3-12-2 Nishiogikita, Sugunami, Tokyo 167-0042 Japan E-mail: shibata@jpc.org		
<b>Concerns known patented items</b> (see ISO/IEC Directives, Part 2)		<b>Name and/or signature of the proposer</b>

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<input type="checkbox"/> yes If yes, provide full information as an annex	<input checked="" type="checkbox"/> no	JAPANESE N.C.
<b>Comments and recommendations from the TC/SC officers</b>		
1) Work allocation <input type="checkbox"/> Project team <input checked="" type="checkbox"/> New working group <input type="checkbox"/> Existing working group no:		
2) Draft suitable for direct submission as <input checked="" type="checkbox"/> CD <input type="checkbox"/> CDV <input type="checkbox"/> Publication as a PAS		
3) General quality of the draft (conformity to ISO/IEC Directives, Part 2) <input checked="" type="checkbox"/> Little redrafting needed <input type="checkbox"/> Substantial redrafting needed <input type="checkbox"/> no draft (outline only)		
4) Relationship with other activities In IEC TC86, SC86B, SC86C, TC48  In other organizations JPCA, IPC		
<b>Remarks from the TC/SC officers</b> This proposed new work item is for new technology introduced recently in the industry. The work needs coordination with IEC TC86.		
<b>Remarks from the Central Office</b> The attention from the National Committees is drawn to the <b>SMB decision 116/3 from 2003-02-12: National Committees are requested to carefully check the market relevance of all future new proposals proposed by TC 91, before approving.</b>		

### Elements to be clarified when proposing a new work item

#### Title

Indicate the subject matter of the proposed new standard.

Indicate whether it is intended to prepare a standard, a technical report or an amendment to an existing standard.

#### Scope

Give a clear indication of the coverage of the proposed new work item and, if necessary for clarity, exclusions.

Indicate whether the subject proposed relates to one or more of the fields of safety, EMC, the environment or quality assurance.

#### Purpose and justification

Give details based on a critical study of the following elements wherever practicable.

- The specific aims and reason for the standardization activity, with particular emphasis on the aspects of standardization to be covered, the problems it is expected to solve or the difficulties it is intended to overcome.
- The main interests that might benefit from or be affected by the activity, such as industry, consumers, trade, governments, distributors.
- Feasibility of the activity: Are there factors that could hinder the successful establishment or general application of the standard?
- Timeliness of the standard to be produced: Is the technology reasonably stabilized? If not, how much time is likely to be available before advances in technology may render the proposed standard outdated? Is the proposed standard required as a basis for the future development of the technology in question?
- Urgency of the activity, considering the needs of the market (industry, consumers, trade, governments etc.) as well as other fields or organizations. Indicate target date and, when a series of standards is proposed, suggest priorities.
- The benefits to be gained by the implementation of the proposed standard; alternatively, the loss or disadvantage(s) if no standard is established within a reasonable time. Data such as product volume or value of trade should be included and quantified.
- If the standardization activity is, or is likely to be, the subject of regulations or to require the harmonization of existing regulations, this should be indicated.

If a series of new work items is proposed, the purpose and justification of which is common, a common proposal may be drafted including all elements to be clarified and enumerating the titles and scopes of each individual item.

#### Relevant documents

List any known relevant documents (such as standards and regulations), regardless of their source. When the proposer considers that an existing well-established document may be acceptable as a standard (with or without amendments), indicate this with appropriate justification and attach a copy to the proposal.

#### Cooperation and liaison

List relevant organizations or bodies with which cooperation and liaison should exist.

#### Preparatory work

Indicate the name of the project leader nominated by the proposer.



ASSOCIATION CONNECTING  
ELECTRONICS INDUSTRIES

**JPCA**



# IPC/JPCA-8435- 1

## Detail Specification for Optical Board Connector type SF using glass Fibers

Based on JPCA-PE03-01-01S-2003

First Working Draft

**IPC/JPCA-8435-  
1  
January 2004**

A joint standard developed by IPC and JPCA

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# Detail Specification for Optical Board Connector type SF using glass Fibers

1. Scope: This standard specifies the detailed specification for optical board connector type SF using glass fiber by means of physical contact technique to connect flexible optical board and ribbon fibers.

The purpose of this standard is to provide the information of required characteristics of the connector and the methods to evaluate them, and to clarify the conditions to assemble the connector to optical board.

## 2. Normative references

IPC-0040 Optoelectronics Assembly and Packaging Technology

IEC 60793-2-10 Optical Fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibres.

IEC 60793-2-50 Optical Fibres - Part 2-50: Product specifications - Sectional specification for class B singlemode.”

IEC 60874-1 Connectors for optical fibres and cables - Part1:Generic specification

JPCA-PE02S General rules of optical boards

JPCA-PE02-01-01S Detail specification for flexible optical board using glass fiber

IEC 61753-1-1 Fibre optic interconnecting devices and passive components performance standard – Part1-1: General and guidance - Interconnecting devices

IEC 61300 “Fibre optic interconnecting devices and passive components - Basic test and measurement procedures” Series

JIS C 5961 Test methods for optical fiber connectors

3. Terms and Definitions Terms not specified in this section may be referred to IPC-0040, IEC 60874-1, JPCA-PE02S, JPCA-PE02-01-01S and JIS C 5961.

(1) SF Connector Sagged Fiber connector

(2) Fiber Physical Contact The method to connect optical fibers seated on a plug and held through a micro-hole or a v-groove by hitting each other to realize physical contact by means of an appreciable pressing force. The two fibers are in close contact and realize a low loss cable connection without using connecting mechanism using a ferrule.

(3) Buckling Bending of a fiber at fiber physical contact at a compressive pressure to the fiber above the elastic limit of the fiber.. The minimum compressive force to generate this bending, or buckling, is the buckling force.

- (4) Plug A The plug structure in the SF optical connector in which the optical fiber buckles within the plug.
- (5) Plug B The plug structure in the SF optical connector in which the optical fiber does not buckles within the plug.
- (6) Clamp Spring A piece usually made of metal to hold plug A and plug B to an adaptor.

#### 4. Classification

4.1 Components of SF connector: The SF connector is comprised of the components stated in Table 4.1. The connection scheme is illustrated in Figure 4.1.

Table 4.1 Components

Component	Shape and dimension
Plug A	Figure 5.1.1, Table 5.1.1
Plug B	Figure 5.1.2, Table 5.1.2
Adaptor	Figure 5.1.4, Table 5.1.4

4.2 Optical fibers: The optical fibers suitable for the SF connector are specified in Table 4.2.

Table 4.2 Optical fibers

Fiber	Specification
Quartz type single mode optical fiber	IEC 60793-2-50
Quartz type multi mode optical fiber	IEC 60793-2-10

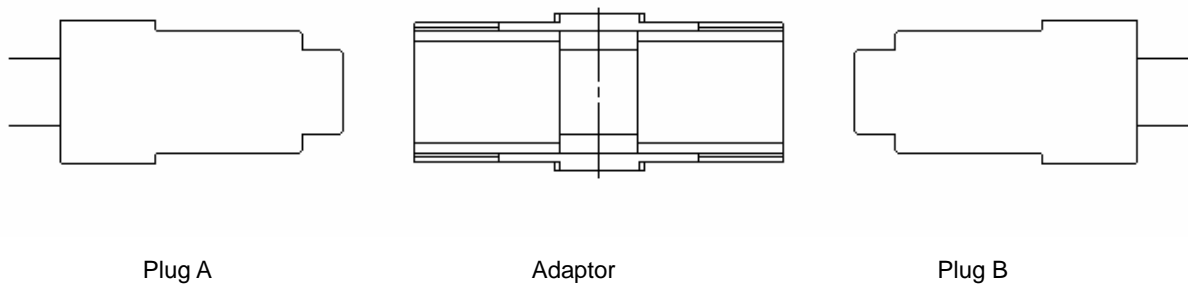


Figure 4.1 Construction of the Optical fiber connector

## 5. Requirements

### 5.1 Structure and dimension

5.1.1 Plug A: The structure, shape and dimensions of the connecting section of Plug A are specified in Figure 5.1.1 and Table 5.1.1. The structure and shape of the part of the plug are shown for information only where dimensions are not specified.

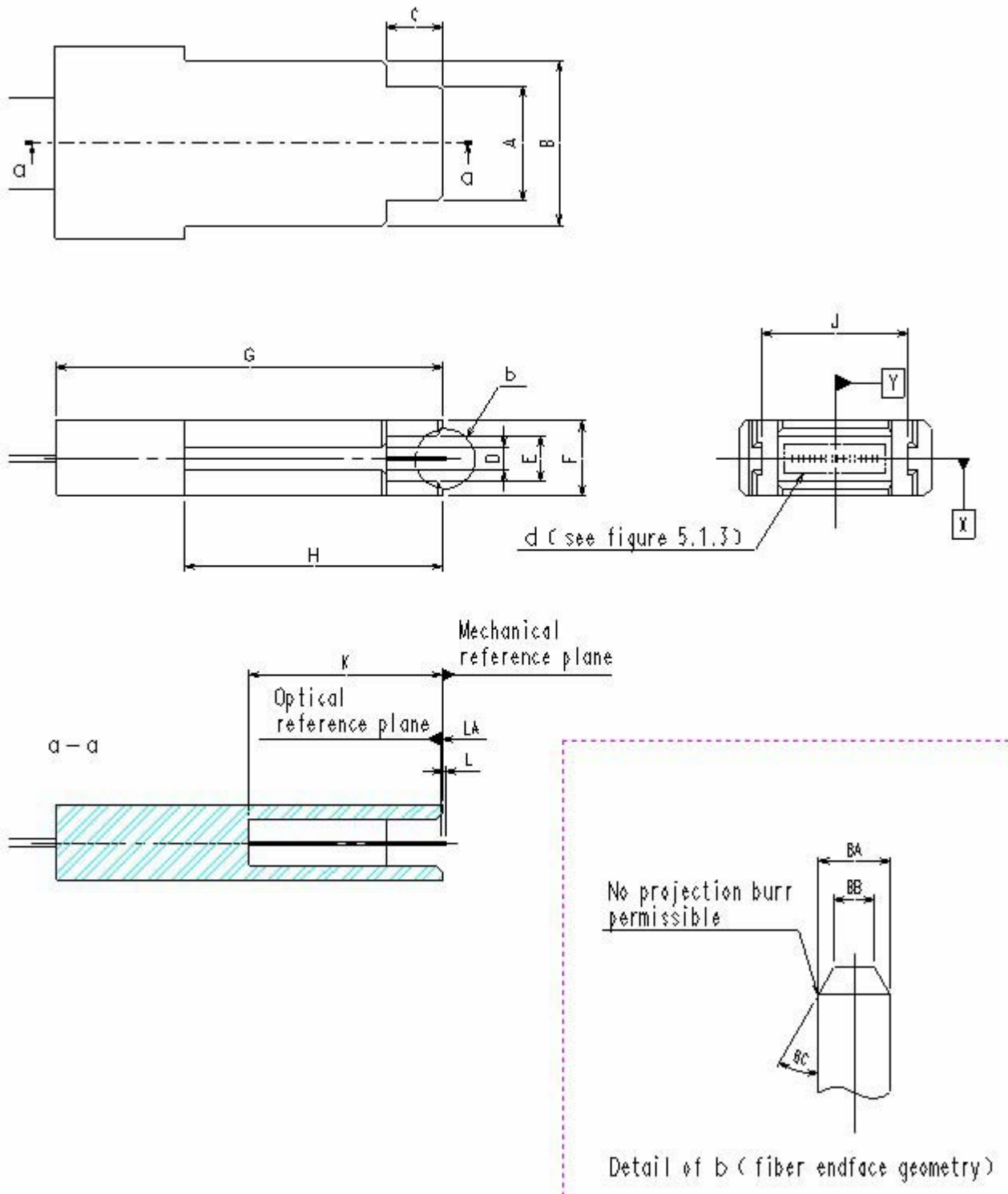


Figure 5.1.1 Plug A

Table 5.1.1 Dimensions for Plug A

Item	Dimension		Remarks
	Minimum	Maximum	
A	3mm	—	
B	7mm	—	
C	2.5mm	—	
D	1.005mm	1.03mm	
E	2mm	—	
F	—	3.3mm	
G	(16.9mm)		Dimension for information only
H	11.3mm	—	
J	6.37mm	6.4mm	
K	8.5mm	—	
L	—	0.1mm	
L A	(0.1mm)		Dimension for information only
B A	( $\phi$ 0.125mm)		See dimension of optical fiber
B B	—	$\phi$ 0.08mm	Note 1
B C	25 degree	65 degree	
Note 1 The minimum dimension of BB shall be larger than the core of the optical fiber.			

5.1.2 Plug B: The structure, shape and dimensions of the connecting section of Plug B are specified in Figure 5.1.2 and Table 5.1.2. The structure and shape of the part of the plug are shown for information only where dimensions are not specified.

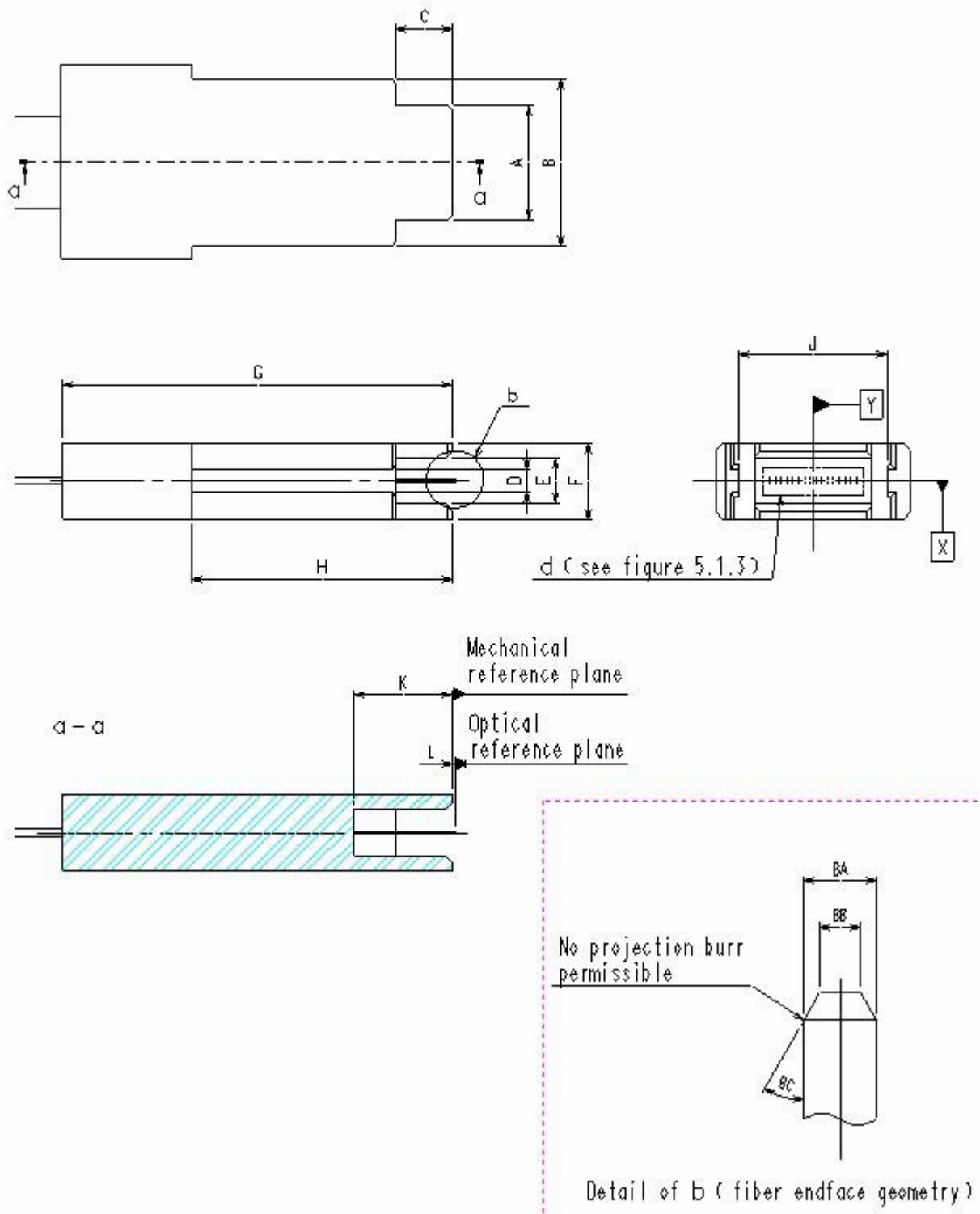


Figure 5.1.2 Plug B



Table Dimensions of Plub B

Item	Dimension		Remarks考
	Minimum	Maximum	
A	3mm	—	
B	7mm	—	
C	2.5mm	—	
D	1.005mm	1.03mm	
E	2mm	—	
F	—	3.3mm	
G	(16.9mm)		Dimension for information only
H	11.3mm	—	
J	6.37mm	6.4mm	
K	4.3mm	—	
L	—	0.1mm	
B A	( $\phi$ 0.125mm)		See dimension of optical fiber
B B	—	$\phi$ 0.08mm	Note 1
B C	25 degree	65 degree	
Note 1 The minimum dimension of BB shall be larger than the core of the optical fiber.			

5.1.3 Positions of fibers: The positions of fibers of Plug A and Plug B are given in Figure 5.1.3 and Table 5.1.3.

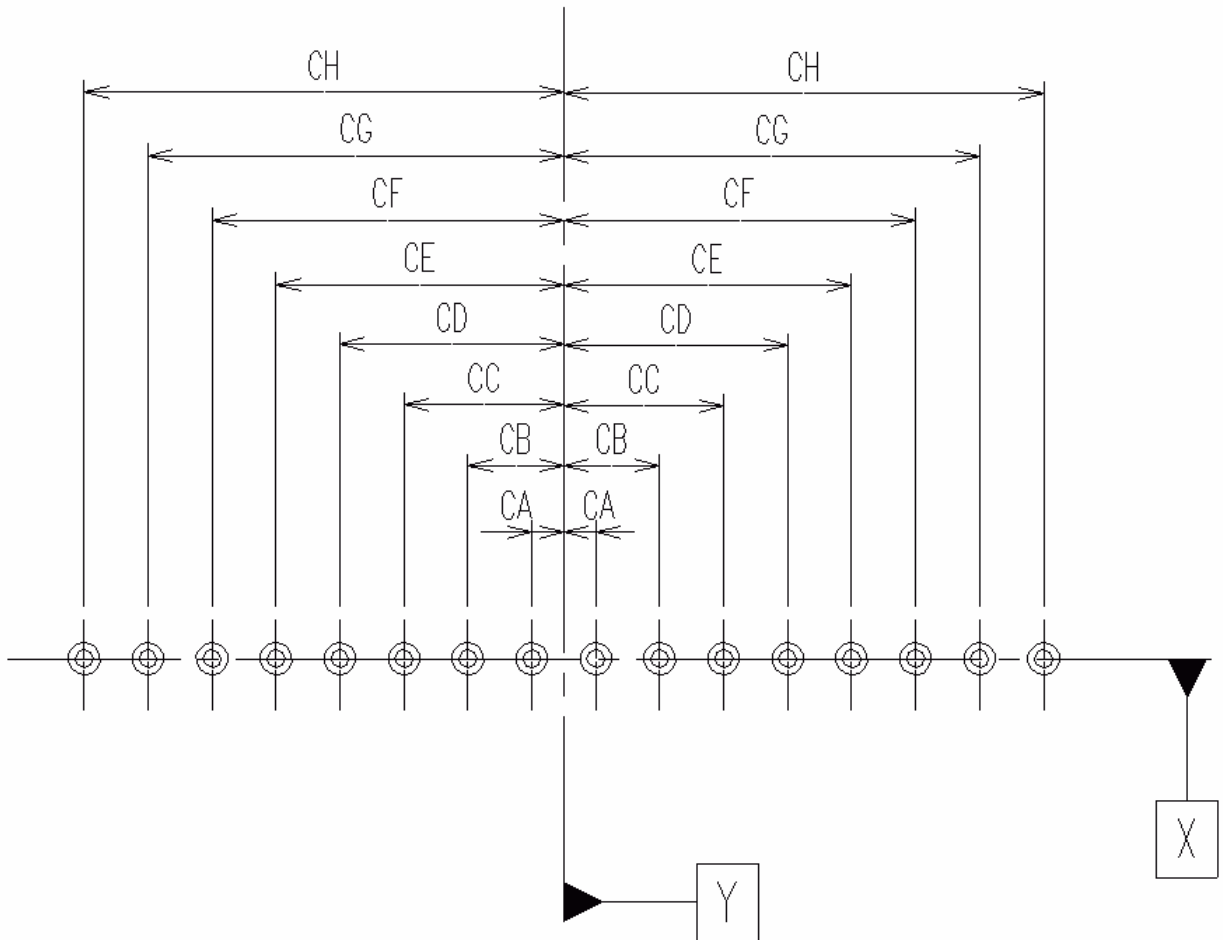


Table 5.1.3 Enlarged view of section d.

Table Positions of fibers

Item	Dimension		Remarks
	Minimum	Maximum	
C A	0.115mm	0.135mm	Note 2
C B	0.365mm	0.385mm	Note 2
C C	0.615mm	0.635mm	Note 2
C D	0.865mm	0.885mm	Note 2
C E	1.115mm	1.135mm	Note 2
C F	1.365mm	1.385mm	Note 2
C G	1.615mm	1.635mm	Note 2
C H	1.865mm	1.885mm	Note 2
Note 1: The symmetry of cables relative to the X axis shall be within 0.02mm. Note 2: Each dimension is specified at the end of a fiber. Note 3: The Datum X is the X axis of the dimension D at the center. Note 4: The Datum Y is the Y axis of the dimension J at the center.			

5.1.4 Adaptor: The structure, shape and dimensions of the connecting section of Adaptor are specified in Figure 5.1.4 and Table 5.1.4. The structure and shape of the part of the adaptor are shown for information only where dimensions are not specified.

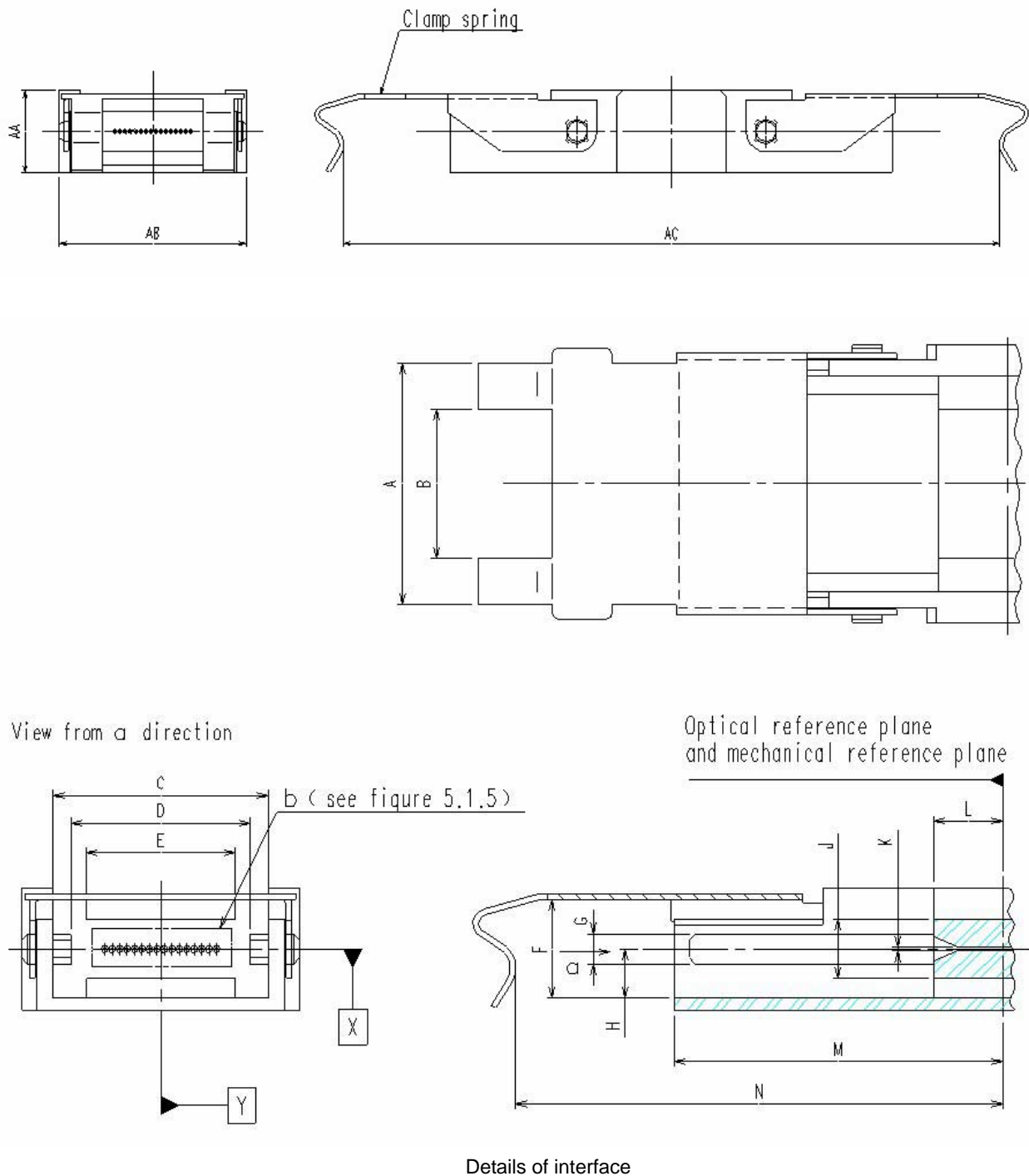


Figure 5.1.4 Adaptor

Table 5.1.4 Adaptor

Item	Dimension		Remarks
	Minimum	Maximum	
A	—	8.3mm	
B	6.7mm	—	
C	7.2mm	—	
D	6.405mm	6.43mm	
E	5mm	—	
F	(3.3mm)		Dimension for information only
G	0.97mm	1mm	
H	1.65mm	—	
J	—	2mm	
K	( $\phi$ 0.125mm)		Note 1
L	—	4.25mm	
M	—	11.3mm	
N	(16.9mm)		Dimension for information only
A A	(4.1mm)		Dimension for information only
A B	(9.3mm)		Dimension for information only
A C	(35mm)		Dimension for information only
Note 1: K should be able to align an optical fiber ( $\phi$ 0.125) at the center.			

5.1.5 Positions of microholes: The dimensions of positions of microholes are given in Figure 5.1.5 and Table 5.1.5.

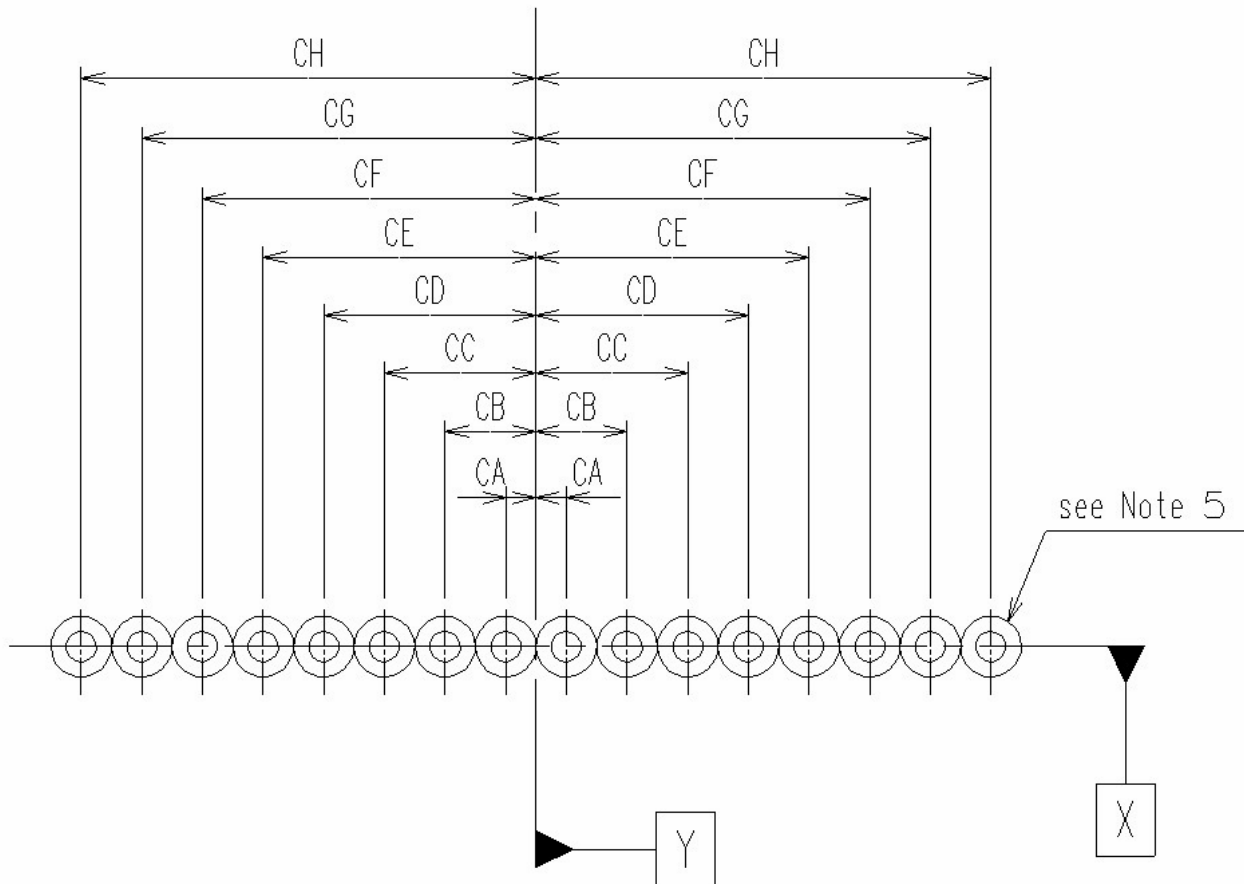


図5.1.5 b部拡大図(マイクロホール位置)

表5.1.5 マイクロホール位置寸法

Item	Dimension		Remarks
	Minimum	Maximum	
C A	0.115mm	0.135mm	Note 2
C B	0.365mm	0.385mm	Note 2
C C	0.615mm	0.635mm	Note 2
C D	0.865mm	0.885mm	Note 2
C E	1.115mm	1.135mm	Note 2
C F	1.365mm	1.385mm	Note 2
C G	1.615mm	1.635mm	Note 2
C H	1.865mm	1.885mm	Note 2

Note 1: The symmetry of cables relative to the X axis shall be within 0.02mm. The symmetry may be agreed between users and supplier when the symmetry includes the guide area of the fiber.

Note 2: Each dimension is specified at the end of a fiber.

Note 3: The Datum X is the X axis of the dimension G at the center.

Note 4: The Datum Y is the Y axis of the dimension D at the center.

Note 5: The guide area of a fiber shall be more than 0.045mm from the center of a microhole.

5.2 Interface requirement to the flexible optical board of quartz type optical fiber: The interface requirements for assembling the connector to the flexible optical board of quartz type optical fiber are given in Figure 5.2 and Table 5.2. The structure and shape of the part of the optical board are shown for information only where dimensions are not specified.

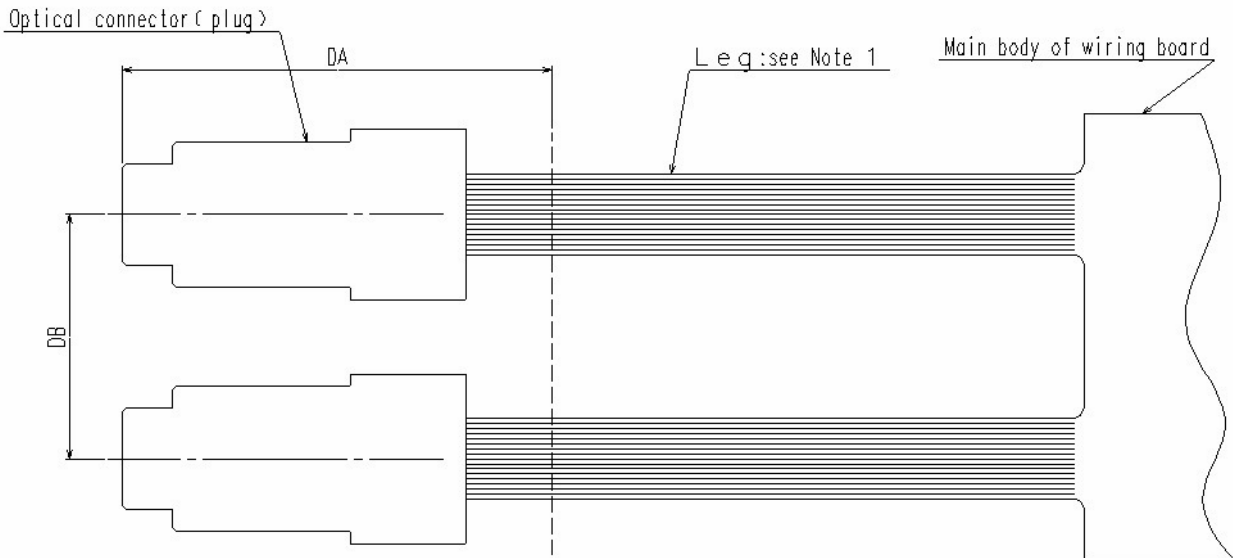


Figure 5.2 Flexible optical board

Table 5.2 Assembly of connector to optical board

Item	Dimension		Remarks
	Minimum	Maximum	
DA	20mm	—	Note 2
DB	10mm	—	
Note 1: The maximum number of fibers in a leg shall be 16. Note 2: DA gives the space necessary to assemble a connector to an optical board.			

5.3 Environmental conditions: The environmental tests for the connectors specified in this specifications shall be made by the test methods specified in IEC 61753-1-1. Connector shall have the required mechanical and optical characteristics after the environmental tests.

Environmental requirement: A connector shall have a long time reliability in an environment of 0°C~+60°C, and shall have the capability of insertion and pulling out of the connector to the adaptor within 0°C~+50°C. Other environmental requirements may be agreed between user and supplier.

5.4 Performance: Performance requirements are given below. Other requirements not stated here may be agreed between user and supplier as special performance.

#### 5.4.1 Appearance

Test methods : IEC 61300-3-1

Requirement : a) Plugs shall fit to the counter part without any mechanical difficulty

b) No damage that may affect performance such as diformation, crack, or loose fitting.

#### 5.4.2 Initial optical characteristics

##### 5.4.2.1 Insertion loss

Test method : IEC 61300-3-4

Requirements : a) Single mode optical fiber: < 1dB

b) Multi mode optical fiber: < 1dB

##### 5.4.2.2 Reflection loss

Test method : IEC 61300-3-6

Requirements : a) Single mode optical fiber: > 40dB

b) Multi mode optical fiber: > 25dB

#### 5.4.3 Mechanical characteritics

##### 5.4.3.1 Vibration

Test method : IEC 61300-2-1

Test conditions : a) Vibration: 10Hz~55Hz

b) Amplitude (half magnitude) : 0.75mm

c) Sweep cycle : 15 (for each direction)

d) Items for initial measurement : Insertion loss and Reflection loss

e) Items for final measurement : Insertion loss, Reflection loss and Mechanical damages

Requirements: a) Insertion loss: Less than 1.2 dB for the final measurement after the test

b) Reflection loss: Reflection loss shall satisfy 5.4.2.2.

c) Mechanical damages: Mechanical damages shall satisfy 5.4.1.

##### 5.4.3.2 Shock

Test method : IEC 61300-2-12

Test conditions: a) Fall height: 1.5m

b) Number of shocks: 5

c) Initial measurement: Insertion loss and reflection loss

e) Final measurement: Insertion loss, reflection loss and mechanical damages

Requirements: a) Insertion loss: Less than 1.2 dB for the final measurement after the test

b) Reflection loss: Reflection loss shall satisfy 5.4.2.2.

c) Mechanical damages: Mechanical damages shall satisfy 5.4.1.

#### 5.4.3.3 Repeated handling

Test method: IEC 61300-2-2

Test condition: a) Number of repetition: 50

b) Initial measurement: Insertion loss and reflection loss

c) Final measurement: Insertion loss, reflection loss and mechanical damages

Requirements: a) Insertion loss: Less than 1.2 dB for the final measurement after the test

b) Reflection loss: Reflection loss shall satisfy 5.4.2.2.

c) Mechanical damages: Mechanical damages shall satisfy 5.4.1.

#### 5.4.3.4 Pressing force of clamp spring

Test method: 6.1 of this specification

Item of measurement: Reflection loss

Test condition: Pressing force of the clamp spring: 7.2N~12.8N

### 5.4.4 Environmental tests

#### 5.4.4.1 High temperature

Test method: IEC 61300-2-18

Test condition: a) Temperature : 60°C

b) Duration : 96 h

c) Initial measurement: Insertion loss and reflection loss

d) Final measurement: Insertion loss, reflection loss and mechanical damages

Requirements: a) Insertion loss: Less than 1.2 dB for the final measurement after the test

b) Reflection loss: Reflection loss shall satisfy 5.4.2.2.

c) Mechanical damages: Mechanical damages shall satisfy 5.4.1.

#### 5.4.4.2 High humidity

Test method : IEC 61300-2-19

Test condition : a) Temperature : 40°C

b) Humidity : 93%

c) Duration : 96 h

d) Initial measurement: Insertion loss and reflection loss

e) Final measurement: Insertion loss, reflection loss and mechanical damages

Requirements: a) Insertion loss: Less than 1.2 dB for the final measurement after the test

b) Reflection loss: Reflection loss shall satisfy 5.4.2.2.

c) Mechanical damages: Mechanical damages shall satisfy 5.4.1.



#### 5.4.4.3 Temperature cycle

Test method : IEC 61300-2-22

Test condition : a) High temperature : 60°C

b) Low temperature : -10°C

c) Maintain at each temperature : 60分

d) Rise and fall of temperature : 1 °C/min

e) Numver of temperature cycles : 5

f) Initial measurement: Insertion loss and reflection loss

g) Final measurement: Insertion loss, reflection loss and mechanical damages

Requirements: a) Insertion loss: Less than 1.2 dB for the final measurement after the test

b) Reflection loss: Reflection loss shall satisfy 5.4.2.2.

c) Mechanical damages: Mechanical damages shall satisfy 5.4.1.

5.5 Indication: An indication shall be made to identify the polymer material used for the optical connector at the connector or on the optical board near the connector.

## 6. Test methods

### 6.1 Pressing force of the clamp spring

a) Equipment: The equipment used for this test is a testing machine or a gauge that is capable to perform the test stated in c).

b) Preparation: Plug-in Plag A and Plug B to the adaptor to be tested.

c) Test: Apply a tensile to the block to push up the clamp spring. Measure the tensile strength at which the reflection loss satisfy the specification given in 5.4.2.2.

