Specification for CS Connector

Rev 1.0 September 18, 2017

Abstract:

This specification defines the fiber optic connector interface, a single position plug connector set of plug/adapter configuration that is characterized by two 1.25 mm nominal diameter ferrules.

This document provides a specification for systems manufacturers, system integrators, and suppliers. It summarizes the receptacle interface into a clearly defined solution for users.

Limitations of the use of this information: This specification is being provided under and subject to the provisions of the QSFP-DD Multi Source Agreement.

Points of Contact:

SENKO Advanced Components(original components offer)
3C-LINK OPTO CO.,LTD Manufatcure

Change History:

Revision	Date	Changes
0.1	3/13/2017	First Release
1.0	9/18/2017	Receptacle and connector dimensions updated

Definitions

QSFP-DD

The QSFP-DD MSA is a multi-company industry group. The QSFP-DD MSA has defined a high density 8-channel (8x) module, cage, and connector system. QSFP-DD supports up to 400 Gb/s in aggregate over an 8 x 50 Gb/s electrical interface. The cage and connector design provides backwards compatibility to QSFP28 modules which can be inserted into a QSFP-DD port and connected to 4 of the 8 electrical channels.

LC Connector

LC Connector is a small form factor fiber optic connector. The LC connector has been standardized as FOCIS 10 (Fiber Optic Connector Intermateability Standards) in EIA/TIA-604-10. The LC connector uses a 1.25 mm ferrule. A single pair of LC connectors (dual LC connector) fit in the form-factor of a QSFP transceiver module.

Hooks

Adapter hooks are required in the CS receptacle and allow the plug connector to latch (lock in place) on to the receptacle. For clarity, the drawings are provided with and without hooks.

The drawings of the receptacle interface with hooks shows the completed assembly for the CS connector. The connector plug frame mates with a receptacle with hooks.

The drawings without hooks are for reference only to allow transceiver vendors to design their module housing. A module housing, designed to the receptacle drawings without hooks, will allow the CS hooks to be subsequently installed into the module housing.

Foreword

The QSFP-DD MSA specification defines an 8-channel module, cage and connector system. The cage and connector system provides backward compatibility to the 4-channel QSFP28 modules. Doubling the number of duplex optical links with the QSFP-DD specification requires a new smaller optical interconnect to fit in the same physical cage form factor. The CS connector provides the characteristics and simplicity of the duplex LC connector into a smaller footprint to allow 2 pairs of CS connectors to fit within the physical constraints of the QSFP-DD form factor.

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1. SCOPE

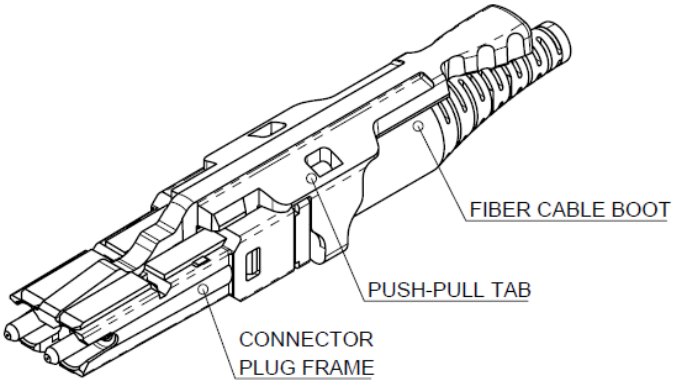
This specification defines the standard interface dimensions for the CS Connector.

2. INTRODUCTION

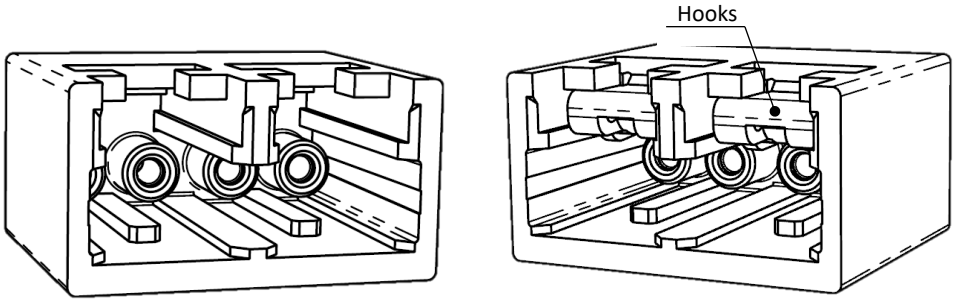
2.1 Overview

The CS connector is a miniature single-position plug which is characterized by duo cylindrical, spring-loaded butting ferrule(s) of a 1.25 mm typical diameter, and a push-pull coupling mechanism. The optical alignment mechanism of the connectors is a rigid bore sleeve or a resilient sleeve.

The document also defines the standard interface dimensions of active device receptacles for dual CS connectors. The receptacles are used to retain the connector plugs and mechanically maintain the optical datum target of the plugs at a defined position within the receptacle housings.



CS Connector appearance



Receptacle interface without hooks Receptacle interface with hooks

Dual CS Receptacle appearances

DUAL CS RECEPTACLE (WITHOUT HOOKS) DIMENSIONAL SPECIFICATION

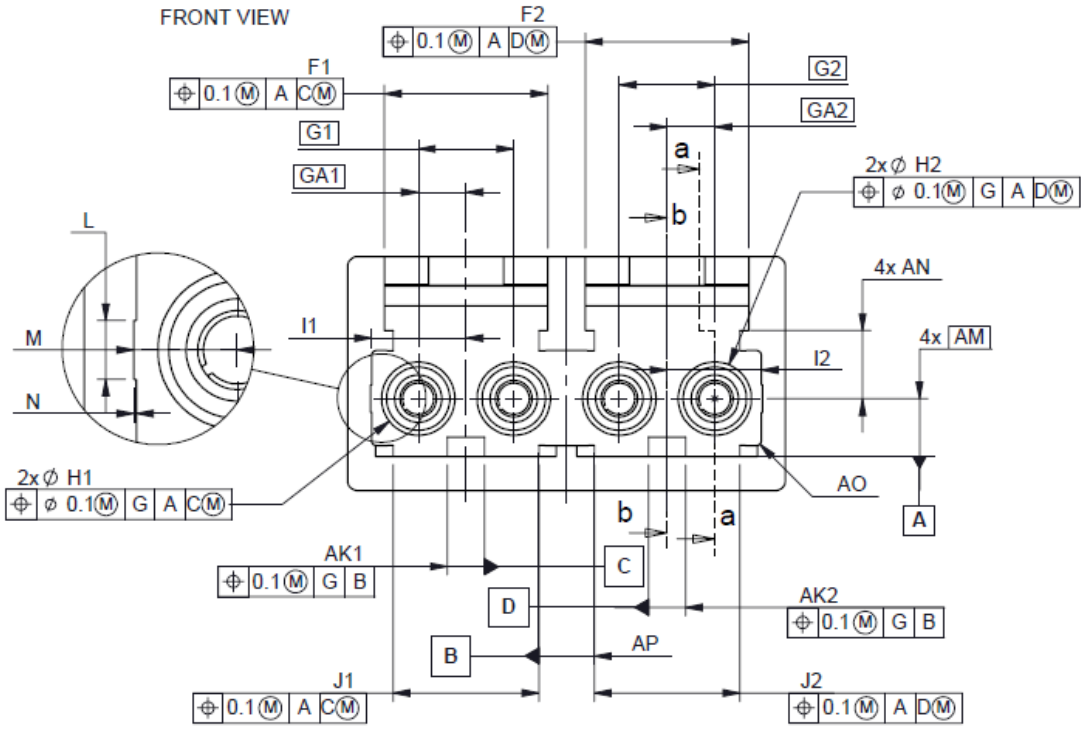


Figure 1a – Dual CS Receptacle interface (without hooks)

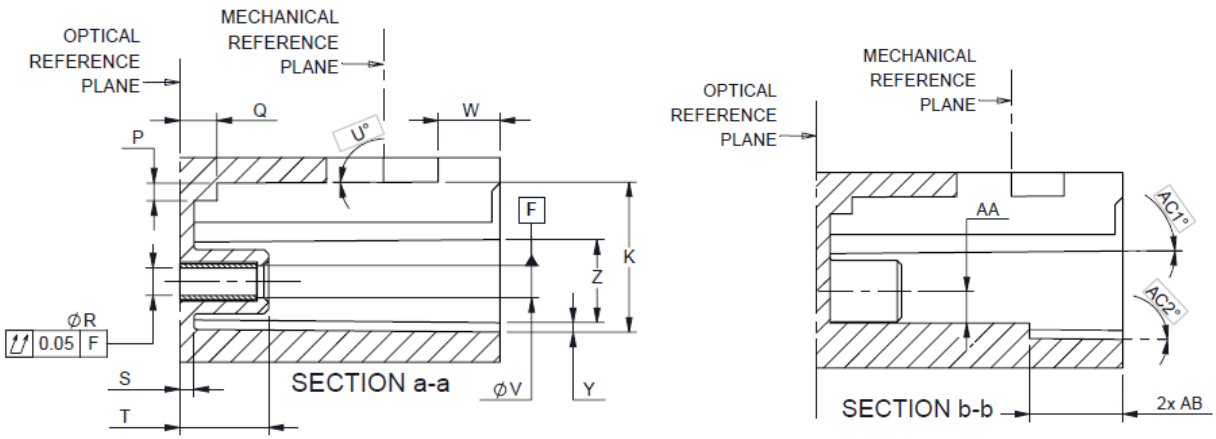


Figure 1b – Cross sections of dual CS Receptacle (without hooks)

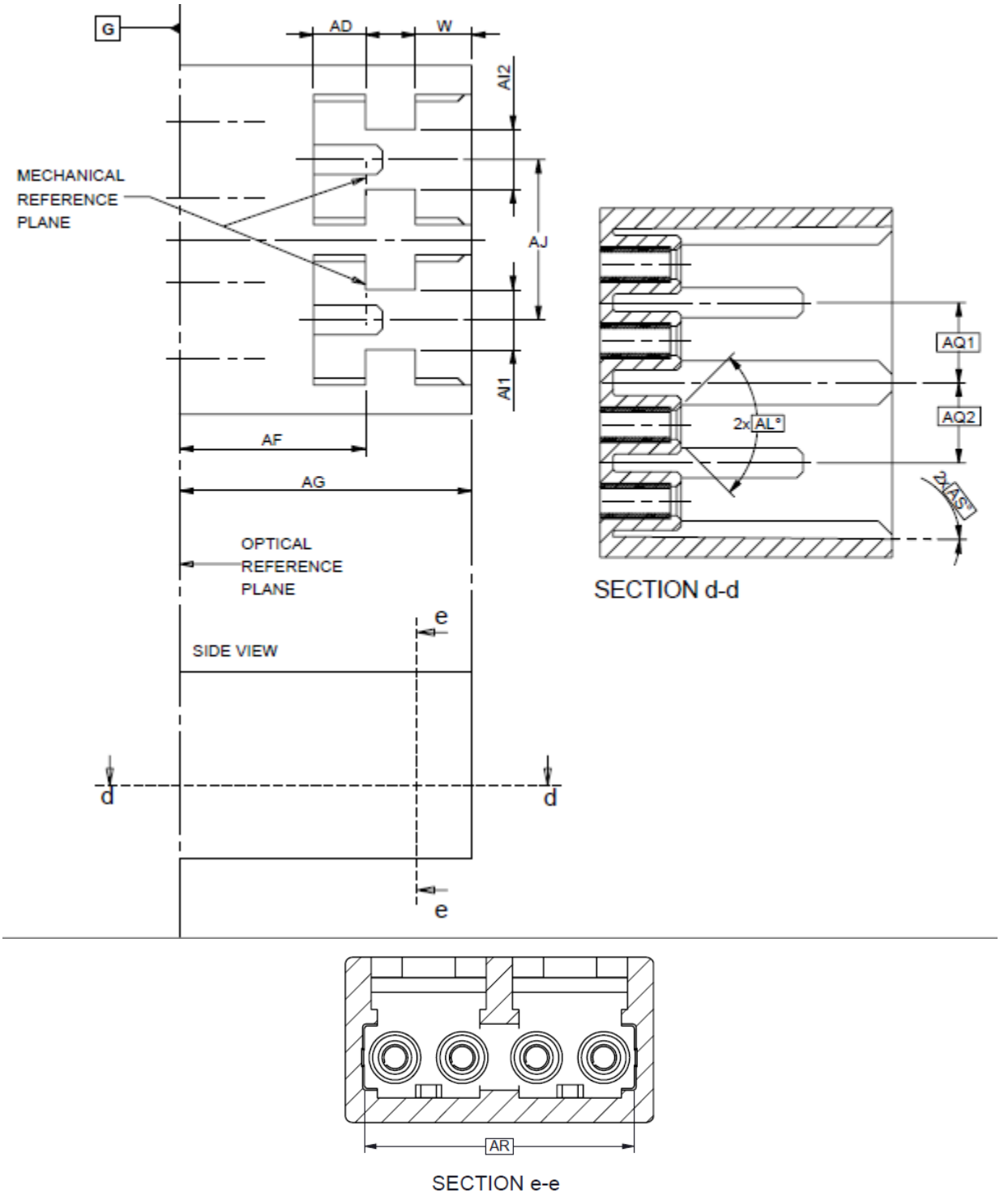


Figure 1c – Cross sections of dual CS Receptacle (without hooks)

DUAL CS RECEPTACLE (WITH HOOKS) DIMENSIONAL SPECIFICATION

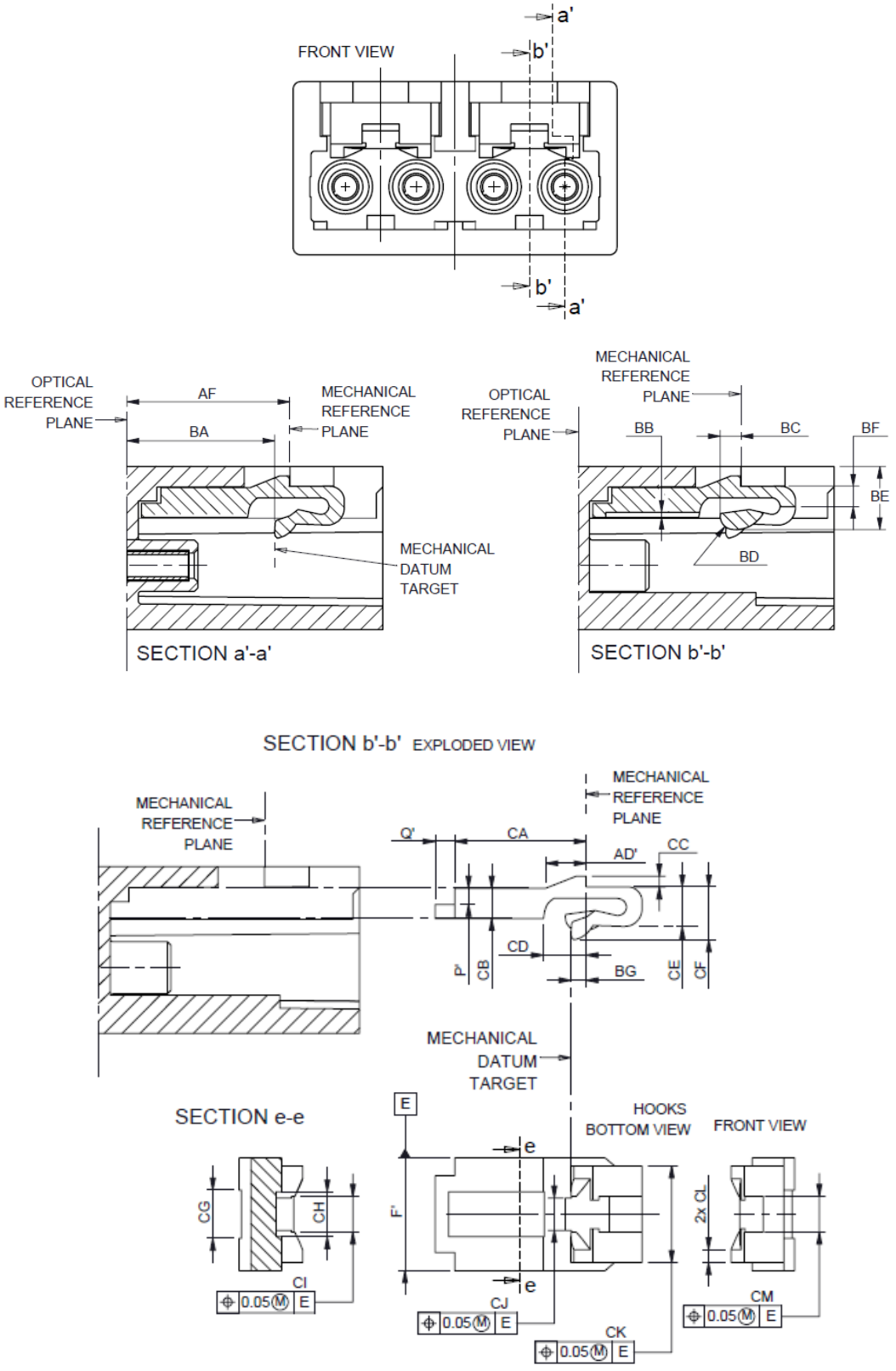


Figure 2a – Cross sections of dual CS Receptacle (with hooks)

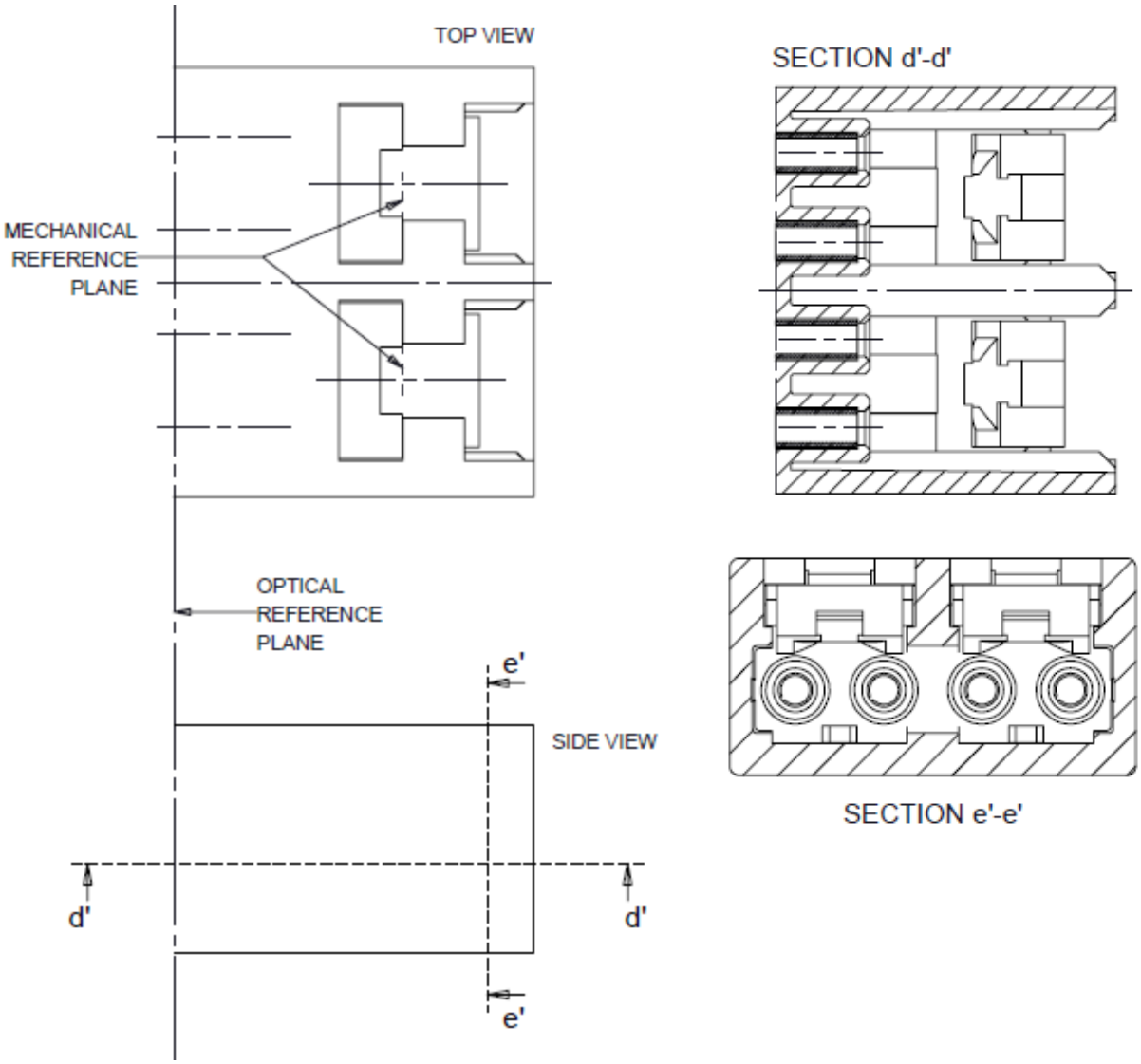


Figure 2b – Cross sections of dual CS Receptacle (with hooks)

Table 1 – Dimensions of dual CS RECEPTACLE

Reference	Dimensions (mm)		Remarks
	Minimum	Maximum	
F1	6.5	6.7	
F2	6.5	6.7	
G1	3.8		PITCH DISTANCE, BASIC DIMENSION
G2	3.8		PITCH DISTANCE, BASIC DIMENSION
GA1	1.90		BASIC DIMENSION
GA2	1.90		BASIC DIMENSION
H1 [a,b]	2.87	2.97	DIAMETER
H2 [a,b]	2.87	2.97	DIAMETER
I1	3.7	3.8	
I2	3.7	3.8	
J1	5.75	5.85	
J2	5.75	5.85	
K	6.79	6.89	
L	1.03	1.13	
M	1.90		REFERENCE DIMENSION
N	0.05	-	
P	-	0.8	OPTIONAL
Q	-	1.7	OPTIONAL
R[a]	-	1.25	SLEEVE I.D. , WHEN FERRULE INSERTED
S	0.55	0.75	
T	4.0	4.1	
U	0.3		DEGREE, DRAFT ANGLE, BASIC DIMENSION
V	1.4	1.5	DIAMETER
W	2.7		OPTIONAL
Y	0.4	0.5	
Z	3.7	3.8	
AA	1.44	1.54	
AB	4.35	4.55	
AC1	0.5		DEGREE, DRAFT ANGLE, BASIC DIMENSION
AC2	0.5		DEGREE, DRAFT ANGLE, BASIC DIMENSION
AD	2.55	2.65	
AF	9.24	9.38	DISTANCE BETWEEN OPTICAL & MECH. REF. PLANES
AG	14.55	14.65	
AI1	3.0	3.2	
AI2	3.0	3.2	

AJ	7.9	8.1	
AK1	1.43	1.53	
AK2	1.43	1.53	
AL	90		DEGREE, BASIC DIMENSION
AM	2.24		BASIC DIMENSION, THROUGHOUT DIM# AC2 (0.5^{o} DRAFT)
AN	2.65	2.75	
AO	0	0.2	ROUND CORNER RADIUS
AP	2.1	2.3	
AQ1	4.0		BASIC DIMENSION
AQ2	4.0		BASIC DIMENSION
AR	15.38		BASIC DIMENSION, THOUGHOUT DIM# AS (0.5^{o} DRAFT)
AS	0.5		DEGREE, DRAFT ANGLE, BASIC DIMENSION
BA	8.22	8.62	DISTANCE BETWEEN OPTICAL REF. & MECH. DATUM TARGET
BB	0.2	0.4	
BC	1.1	1.3	WHEN LATCHING WITH CONNECTOR
BD	(0.75)		RADIUS, TO BE CONFIRMED
BE	3.5	3.7	WHEN LATCHING WITH CONNECTOR
BF	(1.2)		TO BE CONFIRMED
BG	0.8	1.0	WHEN LATCHING WITH CONNECTOR
P’	0.75	-	DIM. POSITION MATCHES WITH DIM# P
Q’	-	1.15	DIM. POSITION MATCHES WITH DIM# Q
AD’	-	2.3	DIM. POSITION MATCHES WITH DIM# AD
CA	7.29	7.39	
CB	1.65	1.75	
CC	0.3	-	
CD	2.3	-	
CE	*(2.2)*		WHEN LATCHING WITH CONNECTOR, *TO BE CONFIRMED*
CF	*(2.95)*		WHEN LATCHING WITH CONNECTOR, *TO BE CONFIRMED*
CG	2.6	2.8	
CH	2.45	2.55	
CI	1.95	2.05	
F’	6.25	6.35	DIM. POSITION MATCHES WITH DIM# F1 OR F2
CJ	1.75	1.85	
CK	5.35	5.45	
CL	0.67	0.77	
CM	1.95	2.05	

Notes:

a. The connector alignment feature is a resilient (split) alignment sleeve, and the sleeve may be either fixed or floating. For a fixed sleeve the positional tolerance of dimension H applies to both R and H dimensions. For a floating sleeve, a gauge pin inserted in the sleeve must be capable of moving freely into a position such that it is coincident with datum F. Dimension R defines the inner diameter of the alignment feature.

b. The connector alignment feature is a resilient (split) alignment sleeve. The feature must accept a pin gauge to the center of the adaptor with a force of 1.0 N to 2.5 N under the condition that another pin gauge is inserted into the feature from the other side until both pin gauges butt against each other. The pin gauge shall be 1.2490 mm.

CS CONNECTOR DIMENSIONAL SPECIFICATION

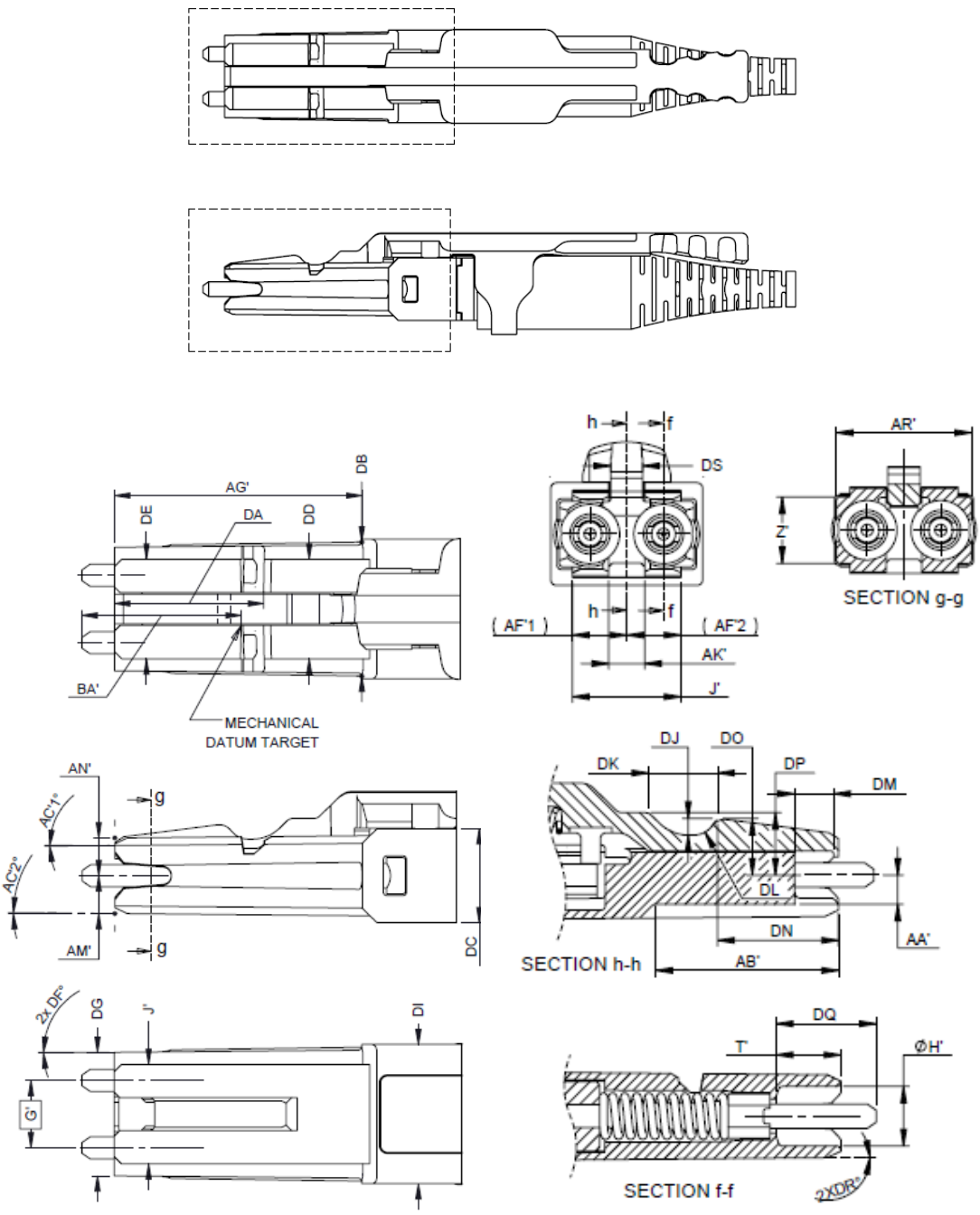


Figure 3 – Cross sections of CS Connector

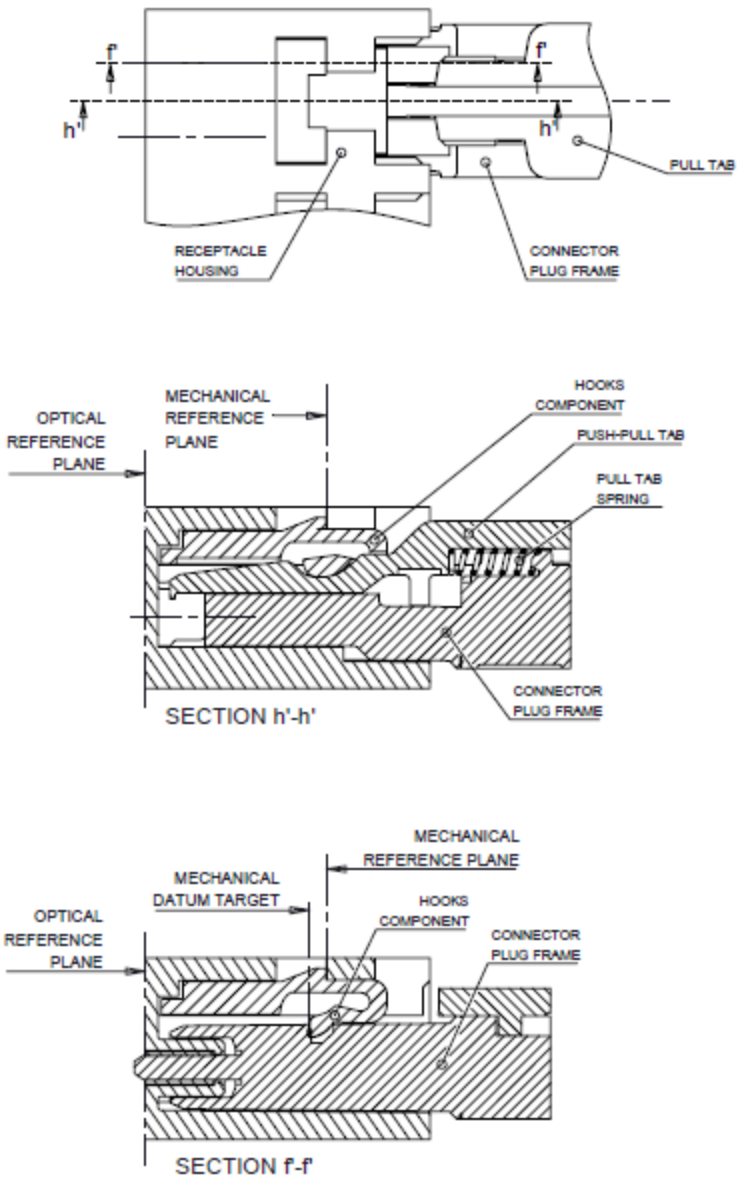


Figure 4 – CS Connector installed into receptacle

Table 2 – Dimensions of CS CONNECTOR

Reference	Dimensions (mm)		Remarks
	Minimum	Maximum	
BA' [a]	8.7	8.9	DISTANCE BETWEEN FERRULE END FACE & MECH. DATUM TARGET, POSITION MATCHES WITH DIM# BA (TABLE 1)
DA	8.28	8.48	
DB	7.45	7.6	
DC	5.2	5.4	
DD	5.5	5.7	
DE	5.5	5.7	
AG'	13.75	14.05	REGION FITS WITH DIM# AG
AM'	2.08	2.18	DIM. POSITION MATCHES WITH DIM# AM' (TABLE 1)
AN'	2.08	2.18	DIM. POSITION MATCHES WITH DIM# AN' (TABLE 1)
AC'1 [b]	-	0.5	DEGREE, DRAFT ANGLE, FITS WITH DIM# AC1 (TABLE 1)
AC'2 [b]	-	0.5	DEGREE, DRAFT ANGLE, FITS WITH DIM# AC2 (TABLE 1)
Z' [b]	3.32	3.72	
AR' [c]	6.88	7.28	DIM. POSITION MATCHES WITH DIM# AR (TABLE 1)
DF [c]	-	0.5	DEGREE, DRAFT ANGLE
G'	3.8		PITCH DISTANCE, BASIC DIMENSION POSITION MATCHES DIM# G1 & G2 (TABLE1)
DG	6.86	7.06	
J'	5.5	5.7	DIM. POSITION MATCHES WITH DIM# J1, J2 (TABLE 1)
DI	7.75	7.95	
DJ	*(0.81)*		*TO BE CONFIRMED*
DK	*(3.57)*		*TO BE CONFIRMED*
DL	*(1.3)*		RADIUS, *TO BE CONFIRMED*
DM [d]	1.45	-	WHEN LATCHING WITH RECEPTACLE HOOKS
DN	*(6.24)*		*TO BE CONFIRMED*
AA'	1.4	1.6	DIM. POSITION MATCHES WITH DIM# AA (TABLE 1)
AB'	9.33	9.53	DIM. POSITION MATCHES WITH DIM# AB (TABLE 1)
DO	*(2.92)*		*TO BE CONFIRMED*
DP	*(3.22)*		*TO BE CONFIRMED*
DQ [a]	5.14	5.26	FERRULE EXTENSION
T'	3.3	3.4	DIM. POSITION MATCHES WITH DIM# T (TABLE 1)
H'	3.0	3.2	DIAMETER, REGION FITS WITH DIM# H (TABLE 1)
AF'1	(2.80)		REF. DIMENSION, POSITION MATCHES WITH DIM# AF1 (TABLE 1)
AF'2	(2.80)		REF. DIMENSION, POSITION MATCHES WITH DIM# AF2 (TABLE 1)
AK'	1.78	1.94	REGION FITS WITH DIM# AK (TABLE 1)

DR	-	0.5	DEGREE, DRAFT ANGLE
DS	1.60	1.72	

Notes:

a. Dim# BA' & DQ' are given for a plug end-face that was terminated with optical fiber (after polish) when not mated. The ferrules is movable by a certain axial compression force, with direct contacting end-face, and therefore dimension BA' is variable. Ferrule compress force shall be 5.0 N to 6.0 N when the position of the optical datum target, dimension BA' is moved to range 8.4 mm to 8.15 mm. Force for buffered fiber only, different cord constructions can result in higher force.

b. Taper, (angle) Dim# AC'1, AC'2 are applied to the surface associated with Dim# Z'.

c. Taper, (angle) Dim# DF is applied to the surface associated with Dim# F'.

d. Dimension DM is vary in condition during pulling "Pull-tab" to release CS Connector from Receptacle interface. Value mentioned is in stationary (latched) condition.

MODULE HANDLE SPACING DIMENSIONAL SPECIFICATION

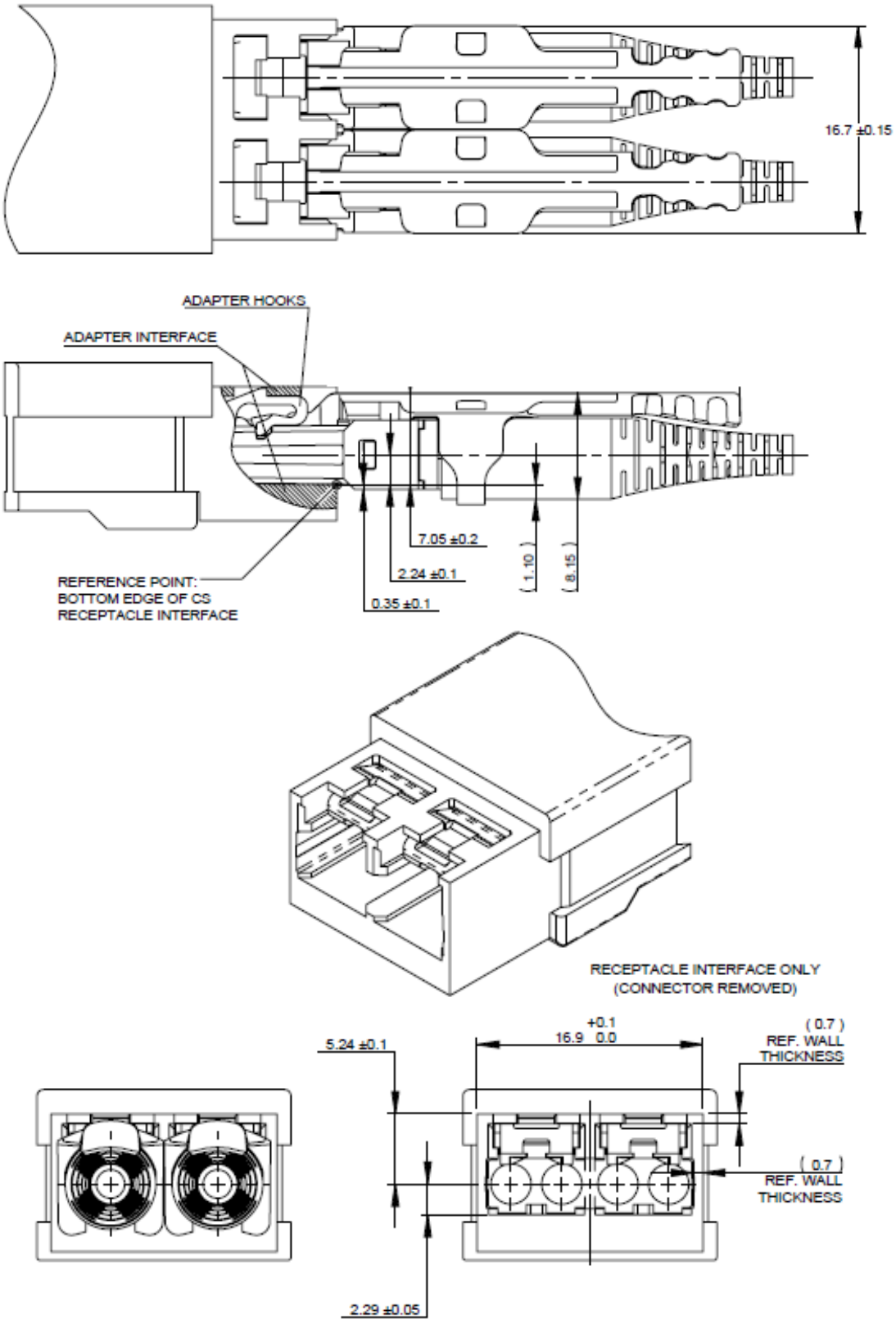


Figure 4 – Module Handle Spacing CS Connector