

SHS-2K2G4E-M/F

2-FIBER + 4-CONTACT HYBRID CONNECTOR

Document No.	SHS-DS-2FO4E-001	Version	V1
Company	Suzhou SHS Technology Co., Ltd.	Date	2026-07-30

		SHS-2K2G4E-M PLUG		
		SHS-2K2G4E-F RECEPTACLE		
2 OPTICAL CHANNELS	4 ELECTRICAL CONTACTS	98.1 mm PLUG LENGTH	100.8 mm RECEPTACLE LENGTH	15 / 24.86 mm ILLUSTRATED PROFILE

PRODUCT HIGHLIGHTS

01 2F + 4E HYBRID INTERFACE One circular interface integrates 2 optical channels and 4 electrical contacts.	02 NON-CONTACT EXPANDED-BEAM PATH Reduces direct optical end-face contact, wear, and localized contamination effects.
03 SEQUENTIAL MATING Electrical contacts mate first; optical termini mate second.	04 PUSH-PULL LOCKING & CUSTOM CABLES Plug, receptacle, and custom hybrid cable assemblies available.

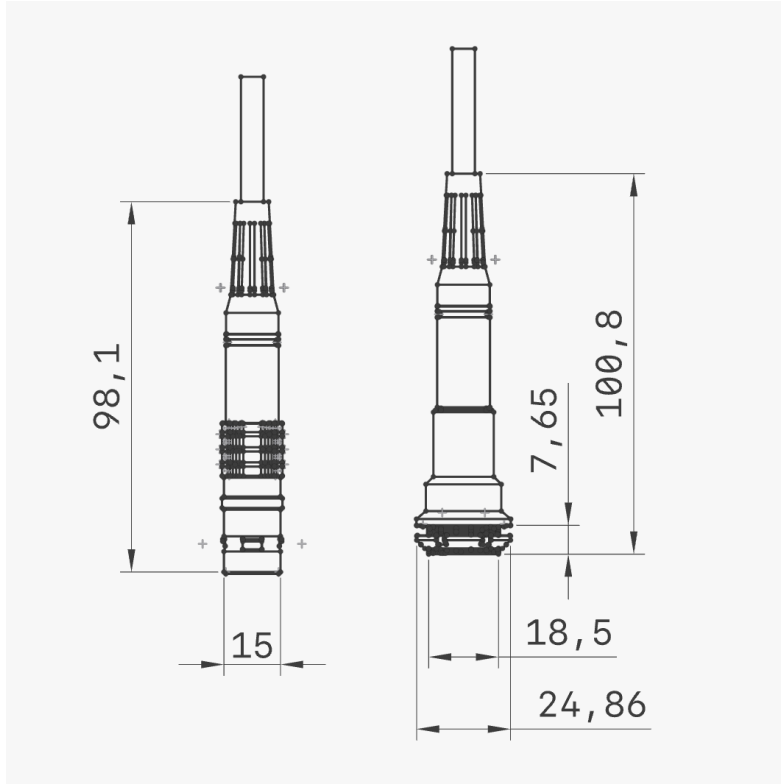
TECHNICAL DATA

Items marked "TBC" shall be governed by SHS controlled drawings, material specifications, and validation reports.

HYBRID CONFIGURATION	
Model	SHS-2K2G4E-M/F
Product type	2-fiber + 4-contact circular hybrid connector
Optical channels	2
Electrical contacts	4
Fiber type	Multimode fiber OM1 / OM2 / OM3
Operating wavelength	850 nm
Insertion loss	≤0.50 dB
Return loss	≥35.0 dB
ELECTRICAL PERFORMANCE	
Contact arrangement	Plug: 4 socket contacts; receptacle: 4 pin contacts
Rated current & voltage	Rated current 12 A; rated voltage TBC
Contact resistance	≤3.6 mΩ
Insulator material	PPS
Dielectric withstand	Contact-to-contact: 2 kV DC; contact-to-shell: 2 kV DC
Electrical termination	Solder; AWG 28-20; max. conductor cross-section 0.5 mm ² (AWG 20)
MECHANICAL	
Mating & locking	Keyed circular interface; push-pull self-locking
Mating sequence	Electrical contacts mate first; optical termini mate second
Illustrated plug dimensions	Overall length 98.1 mm; overall width 15 mm
Illustrated receptacle dimensions	Overall length 100.8 mm; body 18.5 mm; max. profile 24.86 mm; mounting section 7.65 mm
Panel interface	Mounting thread, panel cutout, keying, and tolerances per controlled drawing
Mating force	≤25 N
ENVIRONMENT & CABLE	
Mating endurance	≥10,000 cycles
IP rating & temperature	IP67; -40°C to +150°C; maximum temperature for short-term use only
Vibration, shock & cable	Vibration 15 g (10 Hz-2,000 Hz); shock 100 g (6 ms); cable OD 6 mm

INTERFACE & DIMENSIONS

PLUG & RECEPTACLE DIMENSIONS



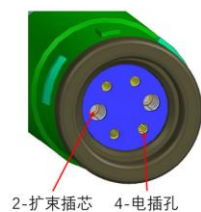
PLUG

L 98.1 mm • OVERALL WIDTH 15 mm

RECEPTACLE

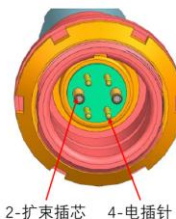
L 100.8 mm • BODY 18.5 mm • MAX. PROFILE 24.86 mm • MOUNTING SECTION 7.65 mm

HYBRID MATING FACE



2-扩束插芯 4-电插孔

插头端面图 (插孔)



2-扩束插芯 4-电插针

插头端面图 (插针)

01	Units: mm; illustrated dimensions per controlled engineering drawing.
02	Plug: 2 expanded-beam optical termini + 4 socket contacts; receptacle: 2 optical termini + 4 pin contacts.
03	Panel cutout, keying, mounting thread, and tolerances per controlled engineering drawing.

SEQUENTIAL OPTICAL-ELECTRICAL MATING

ELECTRICAL CONTACTS MATE FIRST | OPTICAL TERMINI MATE SECOND

HYBRID & EXPANDED-BEAM ADVANTAGES

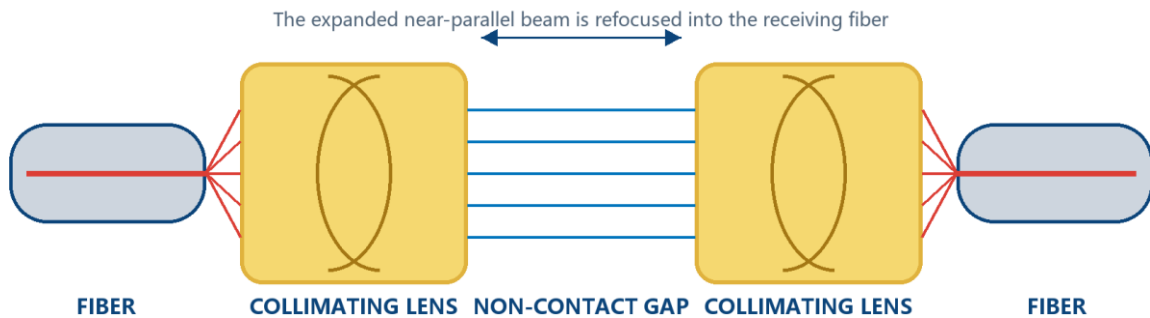
01 ELECTRICAL FIRST During mating, electrical contacts engage before the optical termini.	02 NON-CONTACT EXPANDED BEAM Optical end faces remain non-contact after mating, reducing wear from repeated mating.
03 LOCAL CONTAMINATION TOLERANCE The expanded beam spot area approaches 100 times its original area, reducing the relative effect of localized dust.	04 PUSH-PULL & CUSTOMIZATION Keyed self-locking interface with custom hybrid cable assembly capability.

VALIDATION SUMMARY

Optical validation	850 nm; insertion loss ≤ 0.50 dB; return loss ≥ 35.0 dB. Samples measured IL 0.13-0.36 dB and RL 36.2-42.0 dB.
Mechanical validation	Mating force requirement ≤ 25 N; measured insertion force 18.43-21.57 N; release force 7.94-10.39 N; mating endurance $\geq 10,000$ cycles.

EXPANDED-BEAM LENS PRINCIPLE & ADVANTAGES

A collimating lens expands the light emitted by the fiber into a near-parallel beam. After crossing the non-contact gap, the opposing lens refocuses the light into the receiving fiber.



FOUR ADVANTAGES OF THE COLLIMATING LENS

01 NEAR-100x BEAM AREA

Lens expansion increases the beam area to nearly 100 times the original area, so the same contaminant blocks a much smaller proportion of the transmitted light.

02 NON-CONTACT, LOW WEAR

Fiber end faces do not touch after mating, reducing wear caused by vibration and repeated mating while protecting the precision fiber interface.

03 GAP TOLERANCE & RELIABILITY

In principle, optical signal transmission can be maintained at an approximately 5 mm lens-face gap; actual gap and loss remain subject to 12-channel sample validation.

04 SIMPLE CLEANING

Contamination is exposed on the outer lens surface and can be removed by gentle wiping without directly handling the fiber end face.

A larger beam spot reduces the blocked-area ratio for the same contaminant (schematic, not to scale)

