



Quality



Flexibility



Originality



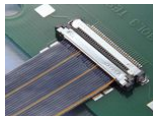
Workability



Reliability



Technology

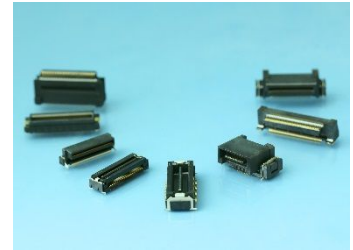


Micro Coaxial Cable Connector
Floating Connector
Drawer Connector
Half Pitch Connector
Discrete Wire Cable Connector
Fine Pitch Connector
Interface Connector
Battery Connector
Card Connector
IC Socket
Switches
Backplane Connector
Terminal Block
Backplane

 **KEL CORPORATION**

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Company Outline



Head Office (R&D Division)

Established : July 23, 1962
Total Capital : 1,617 Billion Yen
Total Turnover : 9,671 Billion Yen*
Employees : 307*
President : Etsuro Doi
Head Office Address : 6-17-7 Nagayama,
Tama-shi, Tokyo
206-0025 Japan
URL : <http://www.kel.jp>
(* As of March 2017)



Nagano factory



Minami-Alps factory



Yamanashi factory

[Domestic Locations]

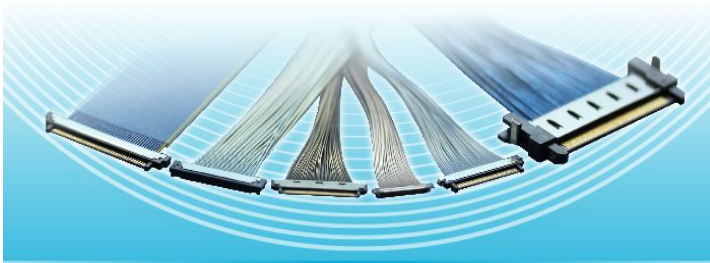
- Tokyo Head Office
- Utsunomiya Sales Office
- Mito Sales Office
- Nagoya Sales Office
- Osaka Sales Office
- Yamanashi Factory
- Nagano Factory
- Minami-Alps Factory

[Overseas Subsidiaries]

- KEL Europe GmbH (Duesseldorf, Germany)
- North American Representative Office (California, USA)
- KEL Taiwan Co., Ltd (Taipei Hsien, Taiwan)
- KEL Shanghai Co., Ltd (Shanghai, China)
- KEL Electronics(Hong Kong) Ltd (Kowloon, Hong Kong)

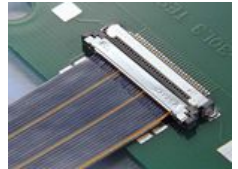
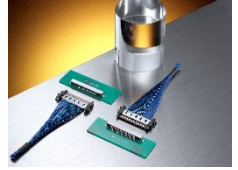


Micro Coaxial Cable Connector



A very narrow cable with high resistance against twisting and bending which is as well as perfect for high speed transmission. It is also applicable as a countermeasure against noise.
We offer various micro coaxial cable connectors.

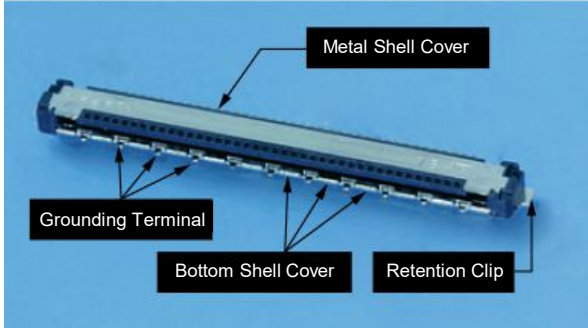
Application examples



Micro Coaxial Cable Connector

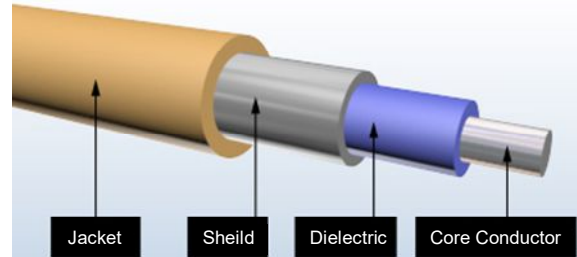
Grounding of PCB Side Connector

- All series have a grounding terminal.
- Receptacle surrounded by metal shell covers.
- Ensures noise protection and product stability.



Micro Coaxial Cable Structure

- Extremely narrow cable.
- Coaxial structure provides excellent transmission characteristics.
- High resistance and durability against twisting and bending.



Micro Coaxial Cable Connector

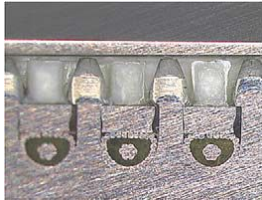
Benefits of Using KEL Products

(1) High Performance and Reliability

-First successful implementation of Micro Coaxial Cables in Mobile phones.

(2) Lead Free IDC Technology

-First ever implementation of IDC in Micro Coaxial Cable Connectors.



- IDC (Insulation Displacement Contact) technology is used for the cable connection.

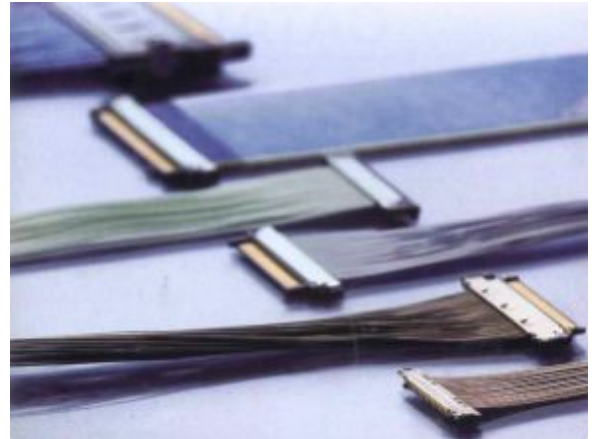


< The Advantage of IDC >

- (1) Ensures uniform and stable connection quality.
- (2) No Solder Connection – Lead Free.
- (3) No Ground Bars – No need for sub-assemblies.
(Minimal assembly process)
- (4) Compact product design.

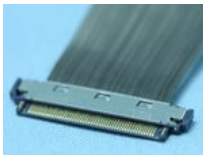
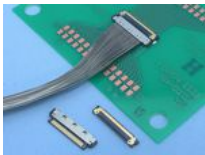
(3) Harness Assembly Technology

-KEL is among a handful of connector manufactures who has a significant harness assembly operation.



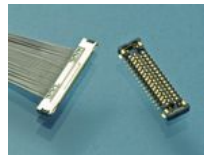
Micro Coaxial Cable Connector

XSL Series



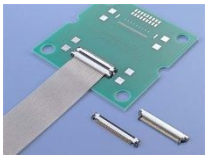
0,25mm Pitch Connector
for Micro Coaxial Cable
(#44/46 AWG)

XSLS Series



0,25mm Pitch Connector
for Micro Coaxial Cable
(#42/44/46 AWG),
Stacking Type

USL Series



0,4mm Pitch
I.D.C. Connector
for Micro Coaxial Cable
(#42 AWG)

USLS Series



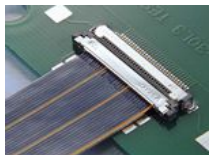
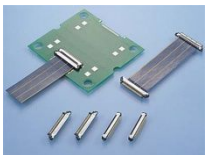
0,4mm Pitch
I.D.C. Connector
for Micro Coaxial Cable
(#42 AWG),
Stacking type

USLS21 Series



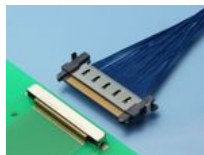
0,4mm Pitch Connector
for Micro Coaxial Cable
/ Soldered Connection
(#40/42/44/46 AWG),
Stacking Type

SSL Series



0,5mm Pitch
2-Piece Connector
for Micro Coaxial Cable
(#40 AWG)

TMC Series

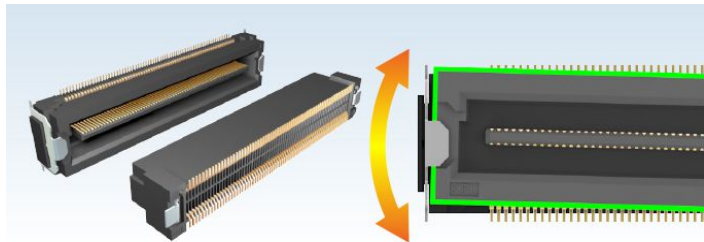


0,5mm Pitch
High Speed Transmission
Connector for Micro Coaxial Cable
(#40 AWG)

Micro Coaxial Cable Connector

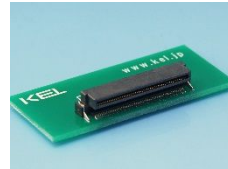
Series	Pitch	Cable Assembly Method	No. of Contacts	Recommended Cable	Mating Height	Mating Width	Current Rating
XSL Series	0,25mm	Soldering	48	AWG #44/46	1,00mm	6,00mm	0,25A
XSLS Series	0,25mm	Soldering	30/40	AWG #42/44/46	1,44mm	3,05mm	0,3A
USL Series	0,4mm	IDC	20/30/40	AWG #42	1,00mm	5,60mm	0,25A
USLS Series	0,4mm	IDC	20/30/40	AWG #42	1,65mm	3,05mm	0,25A
USLS21 Series	0,4mm	Soldering	34	AWG #40/42/44/46	1,65mm	3,05mm	0,25A
SSL Series	0,5mm	IDC	10/20/30/40	AWG #40	1,40mm	6,08mm	0,3A
TMC Series	0,5mm	Soldering	51	AWG #40	3,50mm	16,3mm	0,3A

Floating Connector



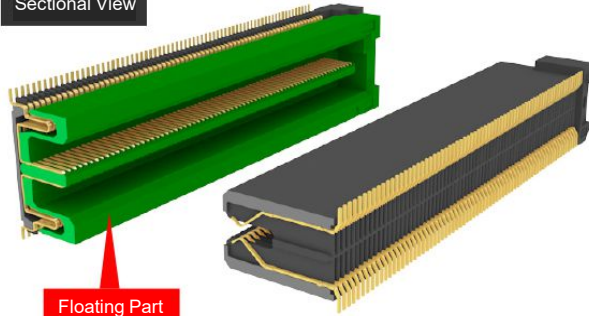
The Floating Connector is a connector that can absorb the stress caused by deviation error by a movable connector upon mating. As a result, it reduces stress applied to the connector and PCB.

Application examples



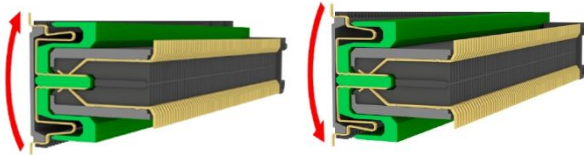
Floating Connector

Sectional View

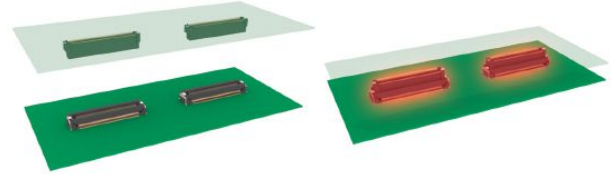


Floating Part

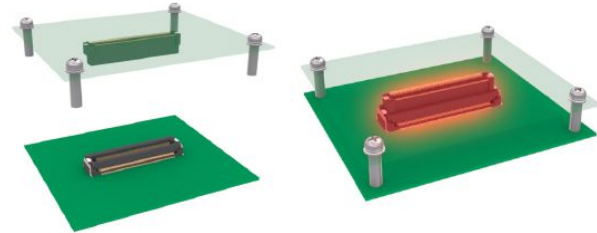
Floating Connector movable (floating) direction



Absorbs stress from multiple connector mounting



Absorbs stress from screw fastening



Floating Connector

DY Series



Wide variations applicable for various pin counts and stacking heights.

- 0,5mm Pitch Floating Connector
- Stacked / Vertical mating
- Floating $\pm 0,5\text{mm}$ in both X and Y directions

DU Series



Compact size with smaller footprint, meeting the needs for high pin count (up to 200) applications.

- 0,4mm Pitch Floating Connector
- Vertical mating
- Floating $\pm 0,4\text{mm}$ in both X and Y directions

DT Series



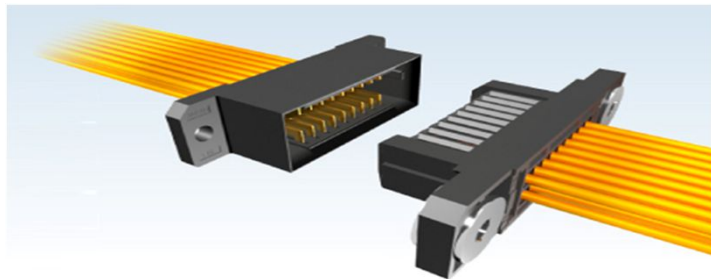
High-speed serial transmission in the SATA standard level is supported.

- 0,5mm Pitch Floating Connector
- Stacked / Horizontal / Vertical mating
- Floating $\pm 0,5\text{mm}$ in both X and Y directions

Floating Connector

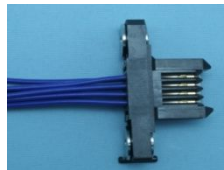
Series	Pitch	Mounting Type	No. of Contacts	Contact Variations	Mating Type	Stacking Height	Current Rating
DY Series	0,5mm	SMT	30/40/50 60/80/100 120/140	8	Stack Vertical	5,00-14,00mm	0,4A 0,3A (L Type)
DU Series	0,4mm	SMT	80/100 120/200	4	Vertical	7,00mm	0,4A
DT Series	0,5mm	SMT	30/40/60 80/100/140 240	7	Stack Vertical Horizontal	10,00mm 17,00-20,00mm	0,4A

Drawer Connector



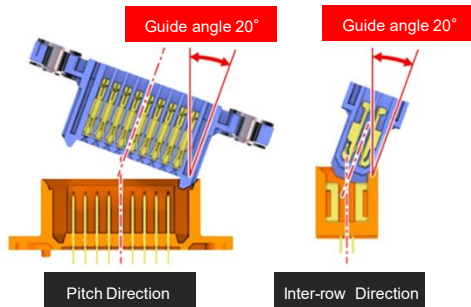
The Drawer Connector is a connector that offers wide guide angle, long wiping length, effective mating guide and sufficient amount of floating.

Application examples



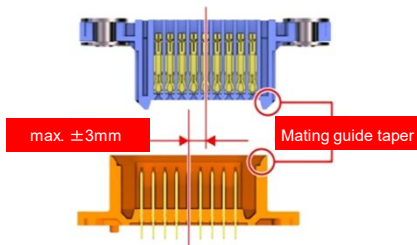
Drawer Connector*

Guide angle is 20° which assures smooth mating.



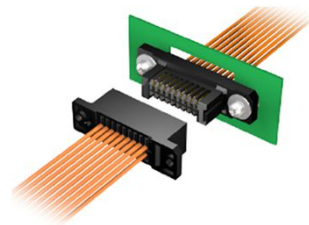
Pins come into contact after connectors are aligned in guide action.

Absorbs $\pm 3\text{mm}$ gap when mating.



Mating guide utilizing the floating structure.

Specialized ring floating structure when mating.



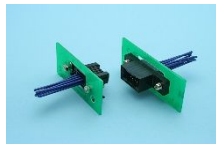
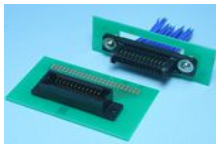
Floating amount $\pm 1,4\text{mm}$



*For FA and FAS Series

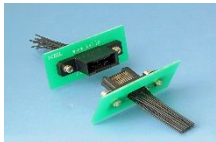
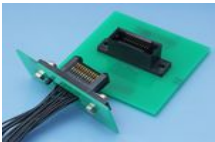
Drawer Connector

FA Series



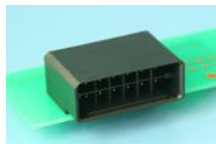
- 2,5mm Pitch Drawer Connector.
- Crimping termination for assembly.
- Absorbs $\pm 3\text{mm}$ gap in X and Y directions when mating.
- Option for Hot swapping available.

FAS Series



- 1,5mm Pitch Drawer Connector.
- Crimping termination for assembly.
- Absorbs $\pm 3\text{mm}$ gap in X and Y directions when mating.
- Option for Hot swapping available.

FTC Series



- 5,08mm Pitch Drawer Connector.
- Possible to crimp 2 cables for 1 contact.
- Crimping termination for assembly.
- Absorbs $\pm 3\text{mm}$ gap in X and Y directions when mating.

Drawer Connector

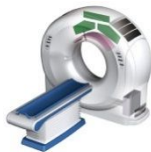
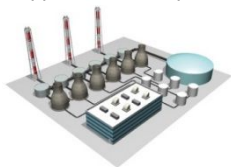
Series	Pitch	Mounting Type	No. of Contacts	Recommended Cable	Connection Type	Termination Type	Current Rating
FA Series	2,5mm	DIP	4/6/8/10/12/14/16 18,20/22/24/26/28 30/32/34/38/40	Discrete Cable AWG#22/24/26/28	Harness	Crimp	3,0A
FAS Series	1,5mm	DIP	4/6/8/10/12/14/16 18/20/22/24/26/28 30/32/34/36/38/40	Discrete Cable AWG#24/26/28	Harness	Crimp	1,5A-3,0A
FTC Series	5,08mm	DIP	12	Discrete Cable AWG#14/16/18/20	Harness	Crimp	8,5A 7,5A 7,0A

Half Pitch (1,27mm) Connector



Since its release, the Half Pitch Connectors from KEL have been used by our customers for over 30 years and is still one of the most established connectors in electronics applications.

Application examples



Half Pitch (1,27mm) Connector

8800 Series Contact Concept

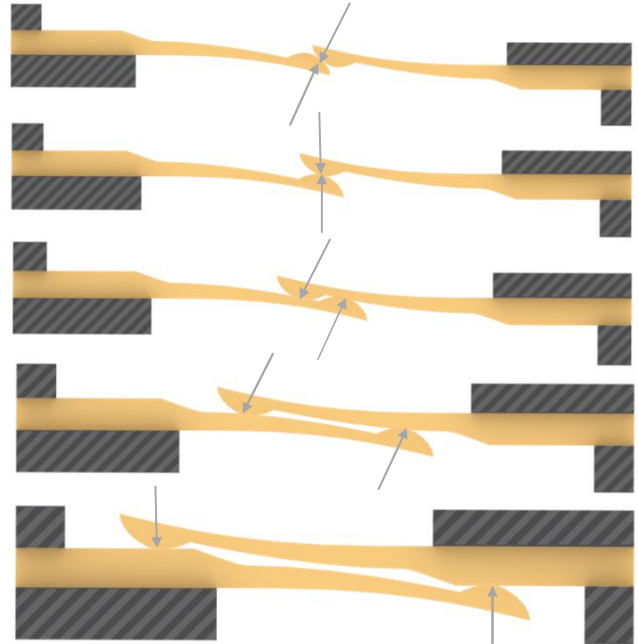
- Hermaphroditic plug and receptacle
- Two-point contact system



<Features>

- (1) Highly reliable 2-point connection.
- (2) The design of 2 mating points and straight beam method allows low insertion force and high reliability.
- (3) The design creates long wiping action for both contacts upon insertion.
- (4) The mating process of contacts has self-cleaning mechanism.

Movement of Contact Points



Half Pitch (1,27mm) Connector

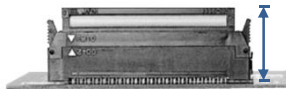
8900 Series Contact Concept

- Highly reliable design even with one-point contact
- New concept using Independent and Synchronized Spring



<New Features compared to 8800 Series>

Miniaturization: Compact and Low Profile



8825E/8830E

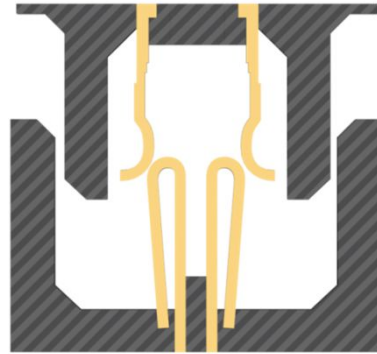
22,7mm



8925R/8931E

11,8mm

One-point contact using Independent and Synchronized Spring



Half Pitch (1,27mm) Connector

8800 Series



- 1,27mm Pitch 2-Piece Connector
- Hermaphroditic Plug and Receptacle
- Self-cleaning mating process

8822 / 8822E / 8825E / 8830 / 8831 / 8830E / 8831E Series



- 1,27mm Pitch 2-Piece Connector
- Equipped with Eject-Lock mechanism

8832E-FS Series



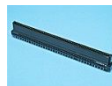
- 1,27mm Pitch 2-Piece Connector
- Flexible Stack Height Type

8840 / 8850 / 8855 Series



- 1,27mm Pitch 2-Piece Interface Connector

8806 / 8807 / 8816 / 8817 Series



- 1,27mm Pitch 2-Piece Multi-Pin Connector

8900 Series



- 1,27mm Pitch 2-Piece Low Profile Connector
- Highly reliable contact design with independent and synchronized spring

8925E / 8925R / 8925 / 8930E / 8931E Series



- 1,27mm Pitch Low Profile Connector for 0,635mm Pitch Flat Cable

8900MS Series



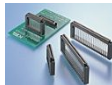
- 1,27mm Pitch 2-Piece Low Profile SMT Connector

8929E / 8930E / 8931E Series



- 1,27mm Pitch 2-Piece Connector for Discrete Cable
- Crimp Type

8903N-FS Series



- 1,27mm Pitch 2-Piece Low Profile Connector
- Flexible Stack Type

Half Pitch (1,27mm) Connector

8800 Series Mating Matrix		Receptacle							
		Board to Board				Board to Cable			Interface
		With Flanges 8800/01-□□□-170S□-F 8800/01-□□□-170L□-F	Without Flanges 8802-□□□-170S□-F 8802-□□□-170L□-F	With Power Contacts 8803-□□□-170S□-F 8803-□□□-170L□-F	Multi-Pin Type 8806-□□□-170□□-F 8807-□□□-170□□-F	Cable Side (One-Touch-Lock Type) 8822-□□□-171□-F	Cable Side (Eject -Lock Type) 8822E-□□□-171□-F	Cable Side (Eject -Lock Type) 8825E/8825R-□□□-175□-F	Cable Side 8840-□□□-174□D-F
Plug	Board to Board	With Flanges 8810/11-□□□-170S□-F 8810/11-□□□-170L□-F	Stack, Horizontal, Vertical (Stack : 14,1mm)	Stack, Horizontal, Vertical (Stack : 14,1mm)	-	-	-	-	-
		Without Flanges 8812-□□□-170S□-F 8812-□□□-170L□-F	Stack, Horizontal, Vertical (Stack : 14,1mm)	Stack, Horizontal, Vertical (Stack : 14,1mm)	-	-	Stack, Vertical (Mating Height : 25mm)	-	-
		With Power Contacts 8813-□□□-170S□-F 8813-□□□-170L□-F	-	Stack, Horizontal, Vertical (Stack : 14,1mm)	Stack, Horizontal, Vertical (Stack : 14,1mm)	-	-	-	-
		Flexible Stack 8832E-□□□FS□-□-F	Stack, Vertical (Stack : 18-30mm)	Stack, Vertical (Stack : 18-30mm)	-	-	-	-	-
		Multi-Pin type 8816-□□□-170□□-F 8817-□□□-170□□-F	-	-	-	Stack, Horizontal, Vertical (Stack : 17,1mm)	-	-	-
	Board to Cable	PCB Side (One-Touch-Lock Type) 8830-□□□-170S□-F 8830/8831-□□□-170L□-F	Stack, Horizontal, Vertical (Stack : 14,1mm)	Stack, Horizontal, Vertical (Stack : 14,1mm)	-	-	Stack, Vertical (Mating Height : 25mm)	-	-
		PCB Side (Eject-Lock Type) 8830E-□□□-170S□-F 8830E/8831E-□□□-170L□-F	Stack, Horizontal, Vertical (Stack : 14,1mm)	Stack, Horizontal, Vertical (Stack : 14,1mm)	-	-	Stack, Vertical (Mating Height : 25mm)	Stack, Vertical (Mating Height : 19,5-22,7mm)	-
Interface	Interface	PCB Side (Cable-Plug Type) 8850-□□□-170□D-F 8855-□□□-174□D-F	-	-	-	-	-	-	Horizontal, Vertical

Half Pitch (1,27mm) Connector

8900 Series Mating Matrix		Receptacle						
		Board to Board				Board to Cable		
		With Flanges 8901-□□□-177S□-□- 8901-□□□-177L□-F	Without Flanges 8903-□□□-177S□-□-F	Flexible-Straight Type 8903N-□□□FS□-□-F	SMT Type 8903-□□□-177MS□-□-F	Cable Side 8925-□□□-179-F	Cable Side 8925□-□□□-179-F	Cable Side 8929E-□□□
Plug	Board to Board	With Flanges 8911-□□□-178S□-□- 8911-□□□-178L□-F	Stack, Horizontal, Vertical (Stack : 7-12mm)	Stack, Vertical (Stack : 7-12mm)	-	-	-	-
		Without Flanges 8913-□□□-178S□-□-F	Stack, Vertical (Stack : 7-12mm)	Stack (Stack : 7-12mm)	Stack (Stack : 20-32mm)	Stack (Stack : 7-10mm)	Stack (Mating : 15-17mm)	-
		SMT Type 8913-□□□-178MS□-A-F	Stack, Vertical (Stack : 7-10mm)	Stack (Stack : 7-10mm)	Stack (Stack : 20-32mm)	Stack (Stack : 7-8mm)	Stack (Mating : 15mm)	-
	Board to Cable	PCB Side 8931E-□□□-178S-F 8931E-□□□-178L-F	-	Stack, Vertical (Stack : 7-10mm)	Stack (Stack : 20-30mm)	Stack, Vertical (Stack : 7-8mm)	Stack, Vertical (Mating : 15mm)	Stack, Vertical (Mating: 11,8-15mm)
		PCB Side (SMT Type) 8930E-□□□-178MS-F	-	Stack (Stack : 7-10mm)	Stack (Stack : 20-30mm)	Stack (Stack : 7-8mm)	Stack, Vertical (Mating : 15,1mm)	Stack (Mating: 11,9-15,1mm)

KEL Custom Harness Assembly Examples



Shielding
(Drain Wire)



Noise Suppression
(Ferrite Core)



Noise Suppression
(Metal Shell)



Shielding
(Removal of Sheath)



Cable Bundling
(PTFE Tape)



Cable Bundling
(Shrinkable Tube)



Cable Bundling
(Tape)



Cable Protection
(Braided Sleeve)



Cable Bundling
(Shrinkable Tube)



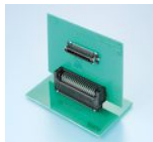
Cable Bundling
(Spiral Tube)

KEL Products

1mm Pitch Connectors



[87 Series]
- 1mm Pitch
- 2-Piece Connector
- SMT Type



[DJ Series]
- 1mm Pitch
- 2-Piece Connector
- For Removable Media Devices

0,635mm Pitch Connector



[8600 Series]
- 0,635mm Pitch 2-Piece Connector
- SMT Type

Crimp Connector



[FBC Series]
- 2mm Pitch Connector for Discrete Cable
- Crimp Type

Battery Connectors



[GC/GD Series]
- Battery Connector
(GC: 5mm Pitch,
GD: 3mm Pitch)



[GF Series]
- 2mm Pitch
- 2-Piece Battery Connector

Card Connectors



[ISC3 Series]
- ISO IC Card Connector
(Smart Card Connector)
- Landing Contact Type (SMT)
*Long Guide.



[ISC5 Series]
- ISO IC Card Connector
(Smart Card Connector)
- Landing Contact Type (DIP)
*Short Guide

IC Sockets



[DM03/04 Series]
- IC Socket
- 144 Pin
- SO-DIMM Socket



[ICC05 Series]
- IC Socket
- Dual Inline
Socket



[SIC01 Series]
- IC Socket
- Shrink Dual
Inline Socket

KEL Products

Switches



[KDS Series]

- Rotary DIP Code Switch



[DSP Series]

- DIP Shorting Plug/Socket
- Strip Header and Shunt

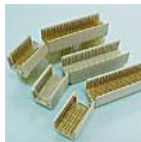
Card Edge Connectors



[4640/4820/1168/1258N Series]

- Card Edge Connector
(4640 : 2,54mm Pitch, 4820 : 3,175mm Pitch,
1168 : 3,96mm Pitch, 1258N : 3,96mm Pitch)

Backplane Connectors



[CP Series]

- 2mm Pitch Hard Metric
2-Piece Connector

Connectors for CompactPCI Bus



[8300/8400 Series]

- 2,54mm Pitch
2 Piece Connector
(Complies with DIN Standard)

Flat Ribbon Cable Connectors



[6100/6200/6200S/6230 Series]

- 1,27mm Pitch Flat Ribbon Cable Connectors
(MIL Standard : 6200/6200S)

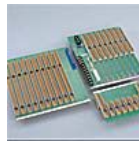
Terminal Blocks



[7010/7030/7011/7040 Series]

- Terminal Block
(7010/7030/7011 : 10,16mm Pitch, 7040 : 9mm Pitch)
[CPCI

Backplane



[CPCI Series]

- CompactPCI Bus Backplane

KEL Business Fields

Ultra-precise, high-performance connectors are KEL's specialty.
Customers in all industries value KEL highly for the ultimate reliability.



KEL's History

1962 Established in Shibuya-ku, Tokyo

1964 Succeeded in first domestic production of cross-contact connectors

1967 Head Office and factory moved to Nishi-Gotanda, Shinagawa-ku, Tokyo
Commercialized KEL racks

1972 Osaka Sales Office opened

1975 Nagoya Sales Office opened

1976 Commercialized IC sockets

1980 Utsunomiya Sales Office opened

1982 Yamanashi Factory (currently Minami-Alps Factory) started operations

1984 Commercialized half-pitch connectors

1987 Head Office moved to Tama-shi, Tokyo

1988 Mito Sales Office opened

1989 *North American Branch Office* opened

1990 Shares registered on the OTC market of the Japan Securities Dealers Association
(currently Tokyo Stock Exchange, Inc., JASDAQ Market)
Parts processing line completed at the Yamanashi Factory

Commercialized low profile half-pitch connectors

1992 Nagano Factory started operations

1993 Commercialized battery connectors

1995 Commercialized 0,5 mm pitch connectors

1996 Assessment and registration of international quality management system standard ISO9001
(obtained certification)

Commercialized 1mm pitch removable connectors

1997 Commercialized motherboards for CompactPCI

1998 Commercialized micro coaxial cable connectors

1999 Commercialized connectors for CompactPCI

Commercialized electro-magnetic compatible racks

Commercialized connectors for ISO cards



2001 Commercialized SOP sockets

Commercialized SD card connectors

2002 Built and started operating the Environment Test Center in Nagayama, Tama-shi, Tokyo

Commercialized insulation displacement connectors for 0,5 mm pitch micro coaxial cables

Assessment and registration of international environment management system standard ISO14001
(obtained certification)

2003 Commercialized SSOP sockets

2004 Established subsidiary *KEL Taiwan Co., Ltd.* in Taiwan

Commercialized 0,4 mm pitch I.D.C. connectors for micro coaxial cables

Commercialized 0,5 mm pitch small-type I.D.C. connectors for discrete wire cables

2005 Commercialized 0,635 mm pitch board-to-board connectors

Commercialized 0,5 mm pitch floating connectors

Commercialized half-pitch connectors for discrete cables

2006 Commercialized 0,635 mm pitch board-to-cable connectors

2007 Commercialized LGA sockets

2008 Established subsidiary *KEL Shanghai Co., Ltd.* in Shanghai, China

Commercialized 0,25mm pitch connector for micro coaxial cable

2009 Commercialized 2,5 mm pitch drawer connectors

2010 Awarded the Management System Registration Secular Award

2012 KEL Corporation 50th Anniversary

2013 Yamanashi Factory started operations

Commercialized 0,4 mm pitch floating connectors

2015 Assessment and registration of ISO/TS16949 (obtained certification)

2017 Established subsidiary *KEL Europe GmbH* in Germany

Established subsidiary *KEL ELECTRONICS(HONG KONG) LTD* in Hong Kong



IKEL



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