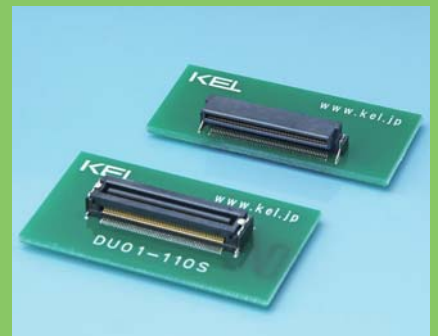


KEL

FLOATING CONNECTORS HANDBOOK



Floating Connectors

Connecting trust, the industry leading floating connector

As many devices has evolved to become more compact and high-functioning. The "floating connector" has been contributing to reduce the stress which occurs to connecting parts when screwing fastening to the PCB, as well as when having multiple connectors mounted on one single PCB.

KEL floating connector series has started from 0.5mm pitch DY series. Then it has progressed to 0.635mm pitch connector DW series and 0.4mm pitch connector DU series.

Now it also has evolved to the next generation 0.5mm pitch floating connector DT series with 3 dimensional mounting, multi-pin count and high-speed transmission features.

In KEL products, not only state of the art technology is realized but countless ideas are also embodied.



Floating Connector Features

Manufactured in clean area

DY, DU, DT series are manufacturing by automated production lines in 100,000 class clean area.

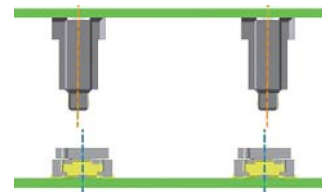


Automated production in clean area

Multiple connectors on one single PCB

By absorbing the misalignment with the floating structure, It is possible to mount multiple floating connectors on one single PCB.

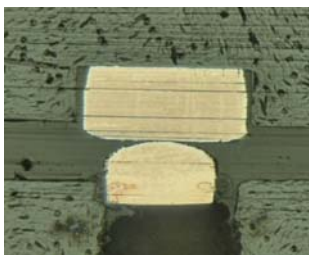
By allowing multiple floating connectors to be mounted, it has opened doors for new designing and innovative designs.



Absorb the misalignment with the floating structure

Roll surface one point contact

The contact has been designed to be arc shaped to reduce the contact area. It improves wipingness by increasing the contact pressure for area per unit. It secures an escape path for foreign matter upon wiping and also prevents jamming caused by foreign matter.







Arc Shaped Plug Side Contact



Roll Surface

The contact area is a smooth surface with low friction coefficient, because it uses a roll surface for the contact area.

Product Line up

		DY	DT	DU	DW
Series					
Pitch		0.5 mm	0.5 mm	0.4 mm	0.635 mm
Number of Contacts		30 ~ 140	30 ~ 240	80 ~ 200	40 ~ 60
Options		8	7	5	3
Connection Type	Stacking	○ 5 ~ 14 mm	○ 10 ~ 20 mm	—	○ 6.3, 10, 15 mm
	Horizontal	—	○	—	—
	Vertical	○	○	○	○
Current Rating *1		0.4 A L Type: 0.3 A	0.4 A	0.4 A	0.5 A
Mounting Type		SMT	SMT	SMT	SMT
Packaging		Reel - Tray	Reel - Tray	Reel	Reel
Floating Tolerance		± 0.5 mm	± 0.5 mm	± 0.4 mm	± 0.7 mm
Standard		—	Equivalent to SATA Rev3.0	—	—

* It is possible to design a current capacity exceeding the standard current rating depending on pin count & mating type. Please contact your local KEL sales office.

Application

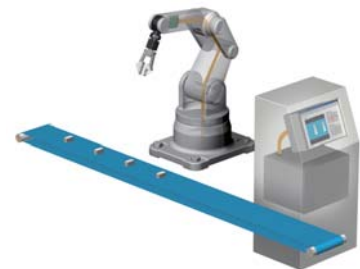
Floating connectors have been used in wide range of applications from car infotainment systems for automotive applications as well as medical, manufacturing, regardless of industrial or consumer applications. Abundant options for number of pins and height variations make it possible for the floating connector to be flexible to use regardless of application.



Car Navigation



Semiconductor Manufacturing Machine



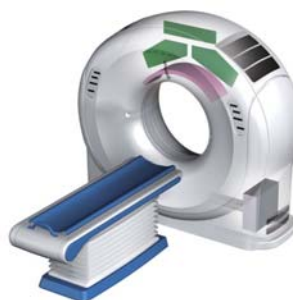
FA System



Digital Camera



Endoscope



CT



ATM

High-Speed Transmission 0.5 mm pitch Floating Connector

DT Series High-speed transmission, Three mating combinations, Available up to 240 pins !

In spite of its functionality for a 0.5 mm pitch floating connector, DT series can achieve high-speed serial transmission in the SATA standard level. From small to large number of pins, it realizes smooth mating. The multi pin type is also available up to 240 pins.

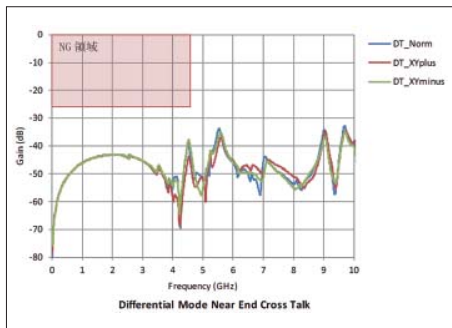


Insulator material	Glass-filled LCP(UL94V-0), Black
Contact material	Copper alloy
Contact plating	Gold over Nickel
Retention clip material	Copper alloy
Retention clip plating	Tin over Nickel
Current rating *	0.4 A per contact (Simultaneous energization is limited to under 140 pins)
Contact resistance	80 mΩ max.
Dielectric Withstanding Voltage	200 V AC for 1 minute
Insulation resistance	100 MΩ min. at 250 V DC
Operating temperature	-40°C to +105°C

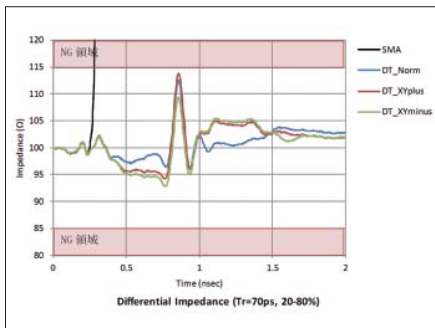
* It is possible to design current capacity exceeding standard current rating depending on the pin count & the mating type. (i.e. 0.5A/pin) Please contact your local KEL sales office.

High Speed Transmission Characteristics

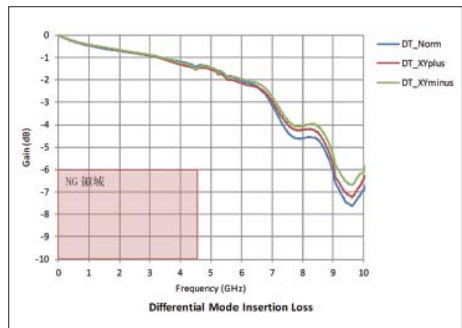
Transmission characteristics meet all of the necessary requirements for SATA Rev3.0 standard.



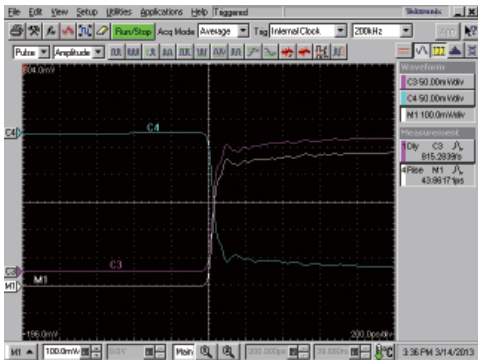
Proximal Crosstalk



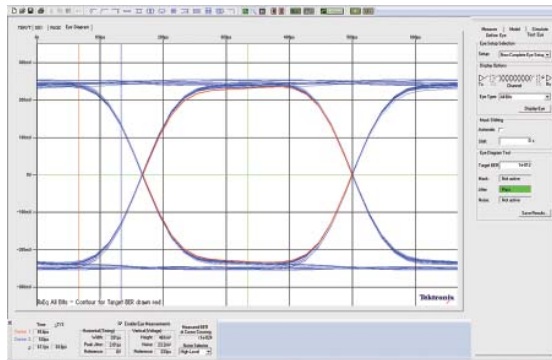
Differential Impedance (Tr=70ps, 20-80%)



Differential insertion loss



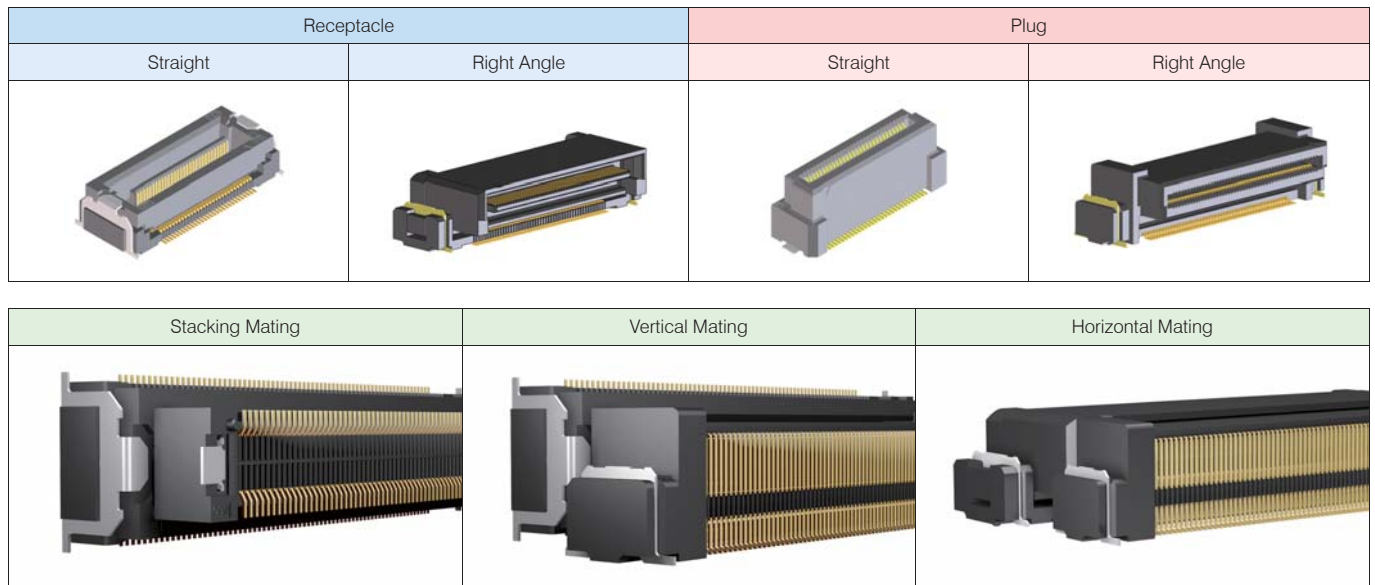
Scew



(3.0 Gbit/s) Intersymbol interference

Three Dimensional Mounting

DT series has stacked, vertical and horizontal mating types for realizing 3 dimensional mounting.



Variations

As a new variations, DT series develops four types of high stacking type with a stack height of 17 to 20 mm, and plans to add a stack height of 25 mm. DT series stacking type with metal shell is also developed.



DT Series Product Line up

		Connector Type	30	40	60	80	100	140	240
Receptacle	Straight Type		○	○	○	○	○	○	○
	Straight Type (With shell type)		○	○	—	—	○	—	—
	Right Angle Type		○	○	○	○	○	○	—
Plug	Straight Type: Stacking Height 10 mm		○	○	○	○	○	○	○
	Straight Type: Stacking Height 10 mm (With shell type)		○	○	—	—	○	—	—
	Straight Type: Stacking Height 17 mm		○	○	○	○	○	○	—
	Straight Type: Stacking Height 18 mm		○	○	○	○	○	○	—
	Straight Type: Stacking Height 19 mm		○	○	○	○	○	○	—
	Straight Type: Stacking Height 20 mm		○	○	○	○	○	○	—
	Right Angle Type		○	○	○	○	○	○	—

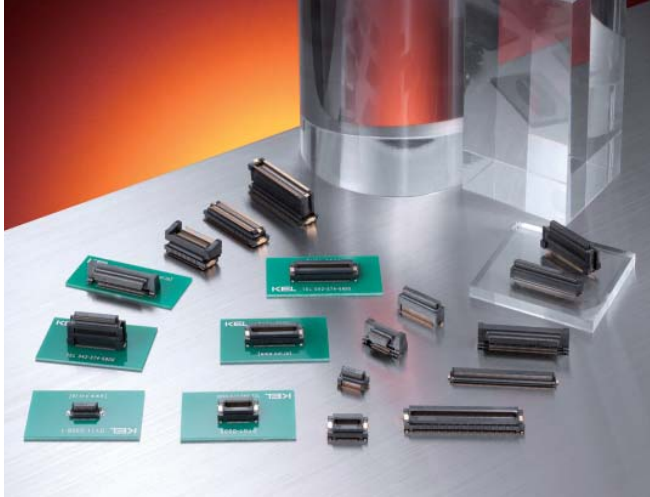
DT series will continue to spread variations. If you have any requests, please contact your local KEL sales office.

0.5 mm pitch Floating Connector

DY Series

Wide variations in the number of contacts & stacking height !

In spite of 0.5 mm pitch, DY series has the floating amount ± 0.5 mm in X and Y directions with effective contact displacement of 1.25 mm. DY series has wide variations such as vertical mating and stacking mating, 8 variations for number of contacts, and stacking height is available in 10 variations.



Insulator material	Glass-filled LCP(UL94V-0), Black
Contact material	Copper alloy
Contact plating	Gold over Nickel
Retention clip material	Copper alloy
Retention clip plating	Gold over Nickel
Current rating *	0.4 A per contact [L Type] 0.3 A per contact
Contact resistance	80 mΩ max. [L Type] 100 mΩ max.
Dielectric Withstanding Voltage	200 V AC for 1 minute
Insulation resistance	100 MΩ min. at 250 V DC
Operating temperature	-40°C to +85°C

* It is possible to increase a current capacity exceeding the standard current rating depending on pin count & mating type. Please contact your local KEL sales office.

DY Series Product Line up

DY series has been as long run product, since its release over 10 years ago. Its features include a proven track record and its wide range of variations. Pin count is available in 8 variations from 30 to 140 pins, stacking height is available in 10 variations, from 5 to 14 mm increments of 1 mm. It is also available for stacking mating and vertical mating and its wide range of variations. Since it is already used in automotive devices, we have sufficient evaluation data.

Plug (Straight Type: Stacking Mating)

Connector Type	30	40	50	60	80	100	120	140
Straight: 5 mm	○	○	○	○	○	○	○	○
Straight: 6 mm	○	○	○	○	○	○	○	○
Straight: 7 mm	○	○	○	○	○	○	○	○
Straight: 8 mm	—	—	—	○	○	○	○	○
Straight: 9 mm	—	—	—	○	○	○	○	○
Straight: 10 mm	—	—	—	○	○	○	○	○
Straight: 11 mm	—	—	—	○	○	○	○	○
Straight: 12 mm	—	—	—	○	○	○	○	○
Straight: 13 mm	—	—	—	○	○	○	○	○
Straight: 14 mm	—	—	—	○	○	○	○	○

Plug (Right Angle Type: Vertical Mating)

Connector Type	30	40	50	60	80	100	120	140
Right Angle Type	○	○	○	○	○	○	○	○

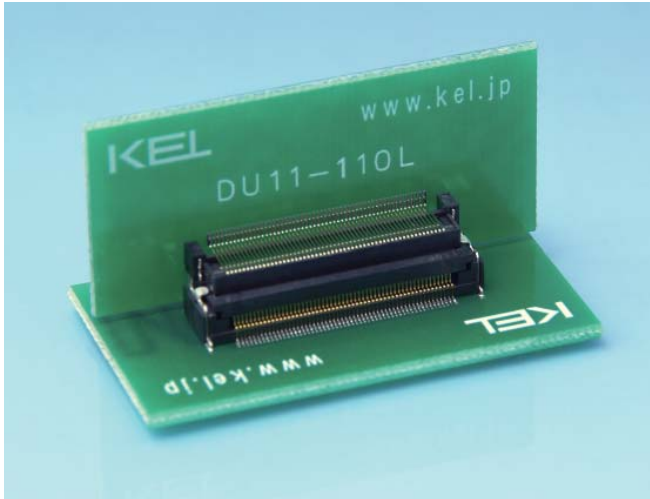
Receptacle (Straight Type: Stacked Mating / Vertical Mating)

Connector Type	30	40	50	60	80	100	120	140
Straight Type	○	○	○	○	○	○	○	○

0.4 mm pitch Floating Connector

DU Series Compact size with smaller footprint, Available up to Max 200 pins !

In spite of 0.4 mm pitch, DU series has the floating amount ± 0.4 mm in X and Y directions with effective contact displacement of 1.2 mm. In comparison to DY series, it saves over 31% of mounting footprint realizing miniaturization. It also has variations up to 200 pins for pin count.



Insulator material	Glass-filled LCP(UL94V-0), Black
Contact material	Copper alloy
Contact plating	Gold over Nickel
Retention clip material	Copper alloy
Retention clip plating	Tin over Nickel
Current rating *	0.4 A per contact (Simultaneous energization is limited to 110 pins)
Contact resistance	100 mΩ max.
Dielectric Withstanding Voltage	200 V AC for 1 minute
Insulation resistance	100 MΩ min. at 250 V DC
Operating temperature	-40°C to +85°C

* It is possible to design a current capacity exceeding the standard current rating depending on pin count & mating type. Please contact your local KEL sales office.

DU Series Product Line up

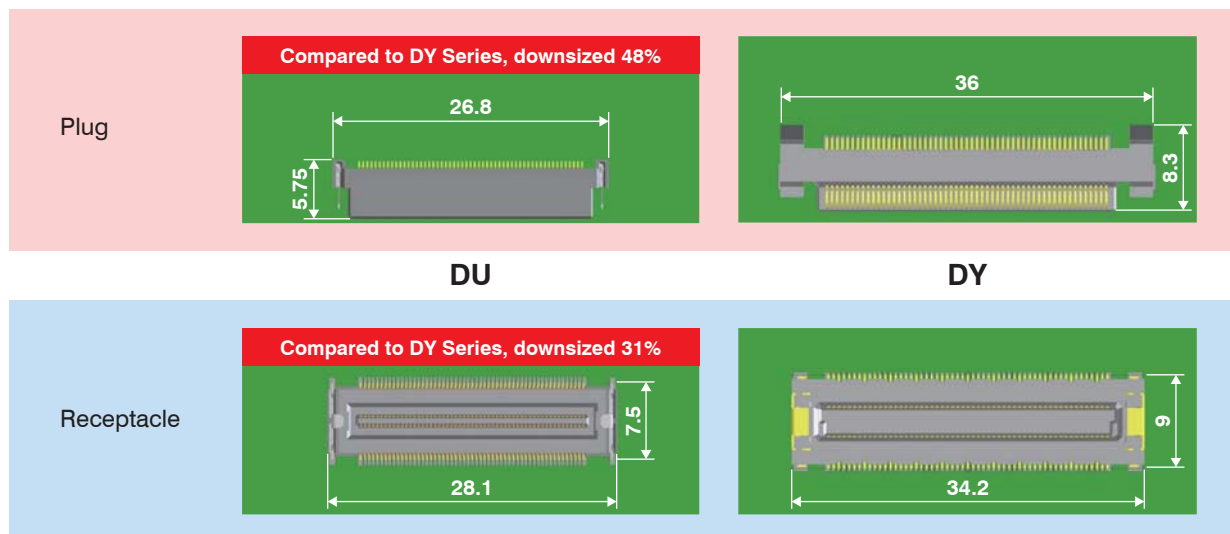
Connector Type		80	110	120	140	200
Receptacle	Straight Type	○	○	○	○	○
Plug	Right Angle Type	○	○	○	○	○

Stacking Mating is under development. Please contact your local KEL sales office.

Compact Floating Connector

The highlight of DU series feature is its compactness. Compared to the 0.5 mm pitch floating connector DY series, it saves over 48% at the plug side and 31% at the receptacle side for mounting footprint realizing miniaturization.

Unit: mm



* Pin count: 110pin

0.635 mm pitch Floating Connector

DW Series The floating amount is ± 0.7 mm in both X and Y directions !

0.635 mm pitch floating connector DW series has the floating amount ± 0.7 mm in both X and Y directions with effective contact displacement is 1.4 mm. Stacking mating and vertical mating is also possible.



Insulator material	Glass-filled LCP(UL94-V0), Black
Contact material	Copper alloy
Contact plating	Gold over Nickel
Retention clip material	Copper alloy
Retention clip plating	Tin over Nickel
Current rating *	0.5 A per contact
Contact resistance	120 mΩ max.
Dielectric Withstanding Voltage	200 V AC for 1 minute
Insulation resistance	500 MΩ min. at 250 V DC
Operating temperature	-40°C to +105°C

* It is possible to design a current capacity exceeding the standard current rating depending on pin count & mating type. Please contact your local KEL sales office.

DW Series Product Line up

		Contact Type	40	50	60
Receptacle	Straight Type		○	○	○
	Plug	Straight Type: Stacking Height 6.3 mm	—	—	○
		Straight Type: Stacking Height 10 mm	○	—	—
		Straight Type: Stacking Height 15 mm	—	—	○
		Right Angle Type	○	○	○

For DW series purchasing, special conditions will apply such as ordering lot. Please contact your local KEL sales office.

KEL Company Profile

Trade Name : KEL CORPORATION
 Established : July 23, 1962
 Total Capital : 1,617 Million Yen
 President : Etsuro Doi
 Head Office : 6-17-7 Nagayama, Tama,
 Address Tokyo 206-0025, Japan
 URL : www.kel.jp

Sales Offices

- Head Office (Tama, Tokyo)
- Utsunomiya Sales Office (Utsunomiya, Tochigi)
- Mito Sales Office (Hitachinaka, Ibaraki)
- Nagoya Sales Office (Nagoya, Aichi)
- Osaka Sales Office (Osaka, Osaka)

Factories

- Yamanashi Factory (Nishi-Yatsushiro, Yamanashi)
- Nagano Factory (Kita-azumi, Nagano)
- Minami-Alps Factory (Minami-Alps, Yamanashi)

www.kel.jp/english/

KEL serves systems from connectors to racks.

KEL CORPORATION

Global Network



More Information
https://www.kel.jp/english/feature/floating_lp_2

