

## FLAT FLEXIBLE CABLE (FFC) CONNECTORS

TE Connectivity's (TE) family of FFC connectors includes a variety of high density cable-to-board and cable-to-cable connectors designed for automated assembly. The family is composed of wire-to-board products on .100 in [2.54 mm] and 0.050 in [1.27 mm] centerlines and wire-to-wire products on 0.100 in [2.54 mm] centerlines. Receptacle housings not only mate with the pin housings, but also with an array of printed circuit board (PCB) headers from other TE product families, including AMPMODU and AMP-LATCH connectors. The FFC family also includes the higher performance FLEXPAC connector system, the specialized TRIO-MATE connector system and a ZIF (zero insertion force) connector family.

### Key Features

- .050" and .100" centerlines
- ZIF options available for higher mating cycles
- TRIO-MATE is available for high retention force LIF applications
- Single and dual row options available
- Latching and polarizing options available
- Terminates FFC, FPC and FEC cable

### Key Benefits

- Space savings over other wire-to-board connectors
- High-speed sequential application of multiple crimp contacts
- Field testable
- In-line manufacturing testable

### Applications

- Membrane switches
- 3D, laser and inkjet printers
- Disk drives
- Data systems
- Business and retail equipment
- Industrial controls
- Test equipment
- Appliances
- Medical devices

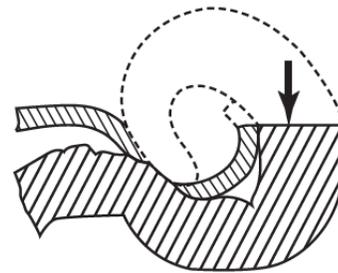
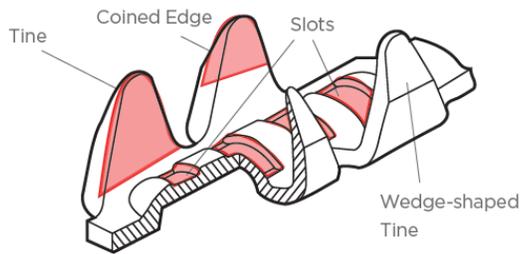
# Flat Flexible Cable (FFC) Connectors

## Contacts

Our FFC contacts are one of the most important components of an FFC connection and are well proven within the industry. These products can accommodate many combinations of applied centerline, contact gender, cable thickness and plating requirements.

Our FFC contact is crimped onto FFC cables in a unique way:

- Four separate tines on a TE FFC contact pierce through the cable insulation and curl back into the metal conductor, as seen in the cross section below.
- The combination of the tines' tapered design and the crimping operation produces maximum stored energy.
- This design creates a residual force system with multiple points of redundancy, creating higher reliability in your electrical connection.
- Each contact tine also has coined edges which assist in insulation piercing a greater surface area contact with the metal conductor, as well as the four slots in the wire barrel area to accept the contact tines and develop a gas tight connection.



Base Number	Image	Centerline	Cable Type	Contact Type	Mating Area Plating	Crimp Area Plating	Packaging Method	Wire Range	Wire Insulation Diameter	Product Spec	Application Spec
487923		.050" [1.27mm]	FFC	Pin/Solder Tab	Tin, Tin-Lead	Gold, Tin-Lead	Strip	N/A	N/A	108-16022	114-16008
487940		.050" [1.27mm]	FFC	Pin/Solder Tab	Tin	Gold, Tin	Strip	N/A	N/A	108-16022	114-16008
487547		.050" [1.27mm]	FFC	Socket	Gold*	Gold, Tin-Lead	Strip	N/A	N/A	108-16022	114-16008
88976		.100" [2.54mm]	FFC	Pin	Gold*, Tin, Tin-Lead	Gold	Strip	N/A	N/A	108-9024	114-16015
88117		.100" [2.54mm]	FFC	Pin	Gold*, Tin, Tin-Lead	Gold, Tin-Lead	Strip	N/A	N/A	108-9024	114-16015
487561		.100" [2.54mm]	FFC	Pin/Solder Tab	Gold, Tin-Lead	Tin, Tin-Lead	Strip	N/A	N/A	108-16022	114-16008
88997		.100" [2.54mm]	FFC	Pin/Solder Tab	Gold, Tin-Lead	Gold, Tin-Lead	Strip	N/A	N/A	108-9024	114-16015
487137		.100" [2.54mm]	FFC	Pin/Solder Tab	Tin-Lead	Nickel	Strip	N/A	N/A	108-9024	114-16015
485800		.100" [2.54mm]	FFC	Socket	Gold	Gold, Tin-Lead	Strip	N/A	N/A	108-9024	114-16015
487117		.100" [2.54mm]	FFC	Socket	Gold, Tin, Tin-Lead	Gold, Tin-Lead	Strip	N/A	N/A	108-9024	114-16015
788143		.100" [2.54mm]	FFC	Socket	Gold	Gold	Strip	N/A	N/A	108-9024	114-16015
487406		.100" [2.54mm]	FFC	Socket	Gold*, Tin, Tin-Lead	Gold, Tin, Tin-Lead	Strip	N/A	N/A	108-9024	114-16015

\*Gold performance plating ie. gold over palladium nickel

# Flat Flexible Cable (FFC) Connectors

## Contacts Continued

Base Number	Image	Centerline	Cable Type	Contact Type	Mating Area Plating	Crimp Area Plating	Packaging Method	Wire Range	Wire Insulation Diameter	Product Spec	Application Spec
494034		.100" [2.54mm]	Round Wire	Pin	Gold	Tin	Loose Piece	.20-.40mm <sup>2</sup> [24-22 AWG]	.040-.056" [1.02-1.42mm]	108-9024	114-16015
494033		.100" [2.54mm]	Round Wire	Pin	Gold	Tin, Tin-Lead	Strip	.20-.40mm <sup>2</sup> [24-22 AWG]	.040-.056" [1.02-1.42mm]	108-9024	114-16015
86658		.100" [2.54mm]	Round Wire	Pin	Gold*	Gold	Loose Piece	.20-.40mm <sup>2</sup> [24-22 AWG]	.040-.056" [1.02-1.42mm]	108-9024	114-16015
88048		.100" [2.54mm]	Round Wire	Pin	Gold*	Gold	Strip	.03-.15mm <sup>2</sup> [32-26 AWG]	.025-.048" [.64-1.22mm]	108-9024	114-16015
86656		.100" [2.54mm]	Round Wire	Pin	Gold*	Gold	Strip	.20-.40mm <sup>2</sup> [24-22 AWG]	.040-.056" [1.02-1.42mm]	108-9024	114-16015
86561		.100" [2.54mm]	Round Wire	Pin	Gold, Tin, Tin-Lead	Gold, Tin, Tin-Lead	Loose Piece	.12-.40mm <sup>2</sup> [26-22 AWG]	.040-.056" [1.02-1.42mm]	108-9024	114-16015
86557		.100" [2.54mm]	Round Wire	Pin	Gold, Tin, Tin-Lead	Gold, Tin, Tin-Lead	Strip	.12-.40mm <sup>2</sup> [26-22 AWG]	.040-.056" [1.02-1.42mm]	108-9024	114-16015
86566		.100" [2.54mm]	Round Wire	Socket	Gold, Gold*, Tin, Tin-Lead	Gold, Tin, Tin-Lead	Strip	.12-.40mm <sup>2</sup> [26-22 AWG]	.040-.056" [1.02-1.42mm]	108-9024	114-16015
86571		.100" [2.54mm]	Round Wire	Socket	Gold*	Gold, Tin	Loose Piece	.12-.40mm <sup>2</sup> [26-22 AWG]	.040-.056" [1.02-1.42mm]	108-9024	114-16015
86657		.100" [2.54mm]	Round Wire	Socket	Gold*	Gold	Loose Piece	.20-.40mm <sup>2</sup> [24-22 AWG]	.040-.056" [1.02-1.42mm]	108-9024	114-16015
88017		.100" [2.54mm]	Round Wire	Socket	Gold*	Gold	Strip	.03-.15mm <sup>2</sup> [32-26 AWG]	.025-.048" [.64-1.22mm]	108-9024	114-16015
86655		.100" [2.54mm]	Round Wire	Socket	Gold*	Gold	Strip	.20-.40mm <sup>2</sup> [24-22 AWG]	.040-.056" [1.02-1.42mm]	108-9024	114-16015

Base Number	Image	Centerline	Cable Type	Contact Type	Mating Area Plating	Crimp Area Plating	Packaging Method	Wire Range	Wire Insulation Diameter	Product Spec	Application Spec
86773		.100" [2.54mm]	FFC and Round Wire	FFC to Round Wire	Gold	Tin	Strip	.12-.40mm <sup>2</sup> [26-22 AWG]	.035-.060" [.89-1.52mm]	108-9024	114-16015
86774		.100" [2.54mm]	FFC and Round Wire	FFC to Round Wire	Gold	Gold	Loose Piece	.12-.40mm <sup>2</sup> [26-22 AWG]	.035-.060" [.89-1.52mm]	108-9024	114-16015
87941		.100" [2.54mm]	FFC and Round Wire	FFC to Round Wire	Tin-Lead	Gold, Tin-Lead	Strip	N/A	N/A	108-16022	114-16008

\*Gold performance plating ie. gold over palladium nickel

## Flat Flexible Cable (FFC) Connectors

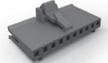
### Housings

The cable with contacts applied is loaded directly into a cable side housing to create a complete FFC cable assembly. Standard FFC housings are loaded with the prepared FFC cable assembly before it is mated with a board side header or another FFC cable assembly.

TE FFC connector housings are available in:

- Standard or slimline for low-profile applications
- Single or dual-row for increased density
- With or without latching for increased retention
- With or without mounting ears for increased cable or PCB retention

Please note: In some cases, certain housing/header combinations will not be compatible with all contacts. To confirm compatibility of housing/header/contact combinations, please contact TE at TE.com or at the phone numbers listed on page 8.

Base Number	Image	Centerline	Contact Type	Housing Size	Gender	Number of Rows	Mounting Ears	Number of Positions	Headers	Contacts
487973*		.050" [1.25mm]	Socket	Slimline	Rec	Single	Without	10	N/A	487547
88190		.100" [2.54mm]	Pin	Standard	Plug	Dual	With	6-40	88637	86557, 86561, 86656, 86658, 88048, 494033, 494034
88189		.100" [2.54mm]	Pin	Standard	Plug	Dual	Without	6-26	88179, 879631	88117, 86557, 86561, 86656, 86658, 88048, 494033, 494034
485893		.100" [2.54mm]	Pin	Standard	Plug	Single	Without	3-20	88859-3	86557, 86561, 86656, 86658, 88048, 494033, 494034
487378		.100" [2.54mm]	Socket	Slimline	Rec	Single	Without	2-34	103329, 102974, 103323, 102976, 102972, 103321	487117, 487406
487526		.100" [2.54mm]	Socket	Slimline	Rec	Single	Without	2-25	103634, 103635, 103906, 103672, 103673, 103904, 103639, 103638, 103735, 103669, 103670, 103908	487117, 487406
487769		.100" [2.54mm]	Socket	Slimline	Rec	Single	Without	3-24	102203, 102523, 103361, 102202, 103080, 103414	487117, 487406
88637		.100" [2.54mm]	Socket	Standard	Rec	Dual	With	16-70	88190	487117, 487137, 487406, 487547, 487561, 487923, 487940, 494033, 494034, 788143, 86566, 86571, 86655, 86657, 88017
88179		.100" [2.54mm]	Socket	Standard	Rec	Dual	Without	6-50	88189, 102619, 103619	487117, 487137, 487406, 487547, 487561, 487923, 487940, 494033, 494034, 788143, 86566, 86571, 86655, 86657, 88017
487223		.100" [2.54mm]	Socket	Standard	Rec	Dual	Without	10-60	102153, 102154, 102154, 102155, 102156, 102159, 102160, 102162, 111446, 103308, 103309, 103310, 103311	487117, 487137, 487406, 487547, 487561, 487923, 487940, 494033, 494034, 788143, 86566, 86571, 86655, 86657, 88017
88859		.100" [2.54mm]	Socket	Standard	Rec	Single	Without	3-35	485893-8	487117, 487137, 487406, 487547, 487561, 487923, 487940, 494033, 494034, 788143, 86566, 86571, 86655, 86657, 88017
925430		.100" [2.54mm]	Socket	Standard	Rec	Single	Without	2-33	N/A	N/A

\*Product Specification 108-16022 | Application Specification 114-16008

All others: Product Specification 108-9024 | Application Specification 114-6015

## Flat Flexible Cable (FFC) Connectors

### FLEXPAC Connectors

Our FLEXPAC interconnect system is a multi-piece connector solution, consisting of a contact crimped to an FFC cable, a plastic housing and a board side header. The FLEXPAC connector system is designed for high quality and reliability and offers an array of locking and latching housing and header combinations, as well as many polarization options to ensure proper mating.

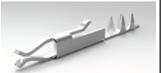
#### Headers

Base Number	Image	PCB Mounting Orientation	Gender	Contact Type	Number of Rows	Number of Positions	Termination Method to PCB	Mating Area Contact Plating	Termination Area Contact Plating
1437254		Right Angle	Plug	Pin	Dual	16	Through Hole	Gold	Tin-Lead
1658548		Right Angle	Plug	Pin	Single	4-32	Through Hole	Gold, Tin	Tin
1658549		Vertical	Plug	Pin	Dual	8-64	Through Hole	Gold, Tin	Tin
1888291		Vertical	Plug	Pin	Single	4-40	Through Hole	Gold, Tin	Tin
1888292		Right Angle	Plug	Pin	Dual	8-64	Through Hole	Gold, Tin	Gold, Tin
1888290		Right Angle	Receptacle	Socket	Single	8-24	Through Hole	Tin	Tin

#### Receptacles

Base Number	Image	Number of Rows	Style	Gender	Polarized	Number of Positions
1437250		Dual	Straight	Female	Yes	4-62
				Female	No	4-62
				Male	No	20
1437251		Single	Straight	Female	Yes	4-32
					No	10-31
				Male	No	4-18
1437252			Right Angle	Female	Yes	4-26
					No	5-31

#### Contacts

Base Number	Image	Centerline	Contact Type	Plating
1437249		.100"	Socket	Gold
1658665		.100"	Socket	Tin

## Flat Flexible Cable (FFC) Connectors

### TRIO-MATE Connectors

TRIO-MATE is a one piece FFC connector system where the board side TRIO-MATE connector mates directly to a prepared FFC cable. This connection requires that the FFC cable have prepared contact pads already in place.

The unique TRIO-MATE contact design provides distinctive advantages for this connector type. As shown in these cross sectional views, TRIO-MATE connectors use a sequential contact layout. This means the connector makes contact with each sequential contact in three different locations (three different insertion depths). As you insert the FFC cable, you first mate with contacts in position one. Then, as the cable is inserted further, you also mate with contacts in position two and then in position three. This design allows for reduced cable insertion force, while maintaining the same high extraction force.



Base Number	Image	Centerline (mm)	Orientation	Solder Tail Style	Solder Tail Length (mm)	Number of Positions	Product Spec	Application Specification
120628*		2.54	Vertical	Kinked Legs	3.56	8-20	108-2038	114-2062
520315		2.54	Vertical	Kinked Legs	3.56	2-20	108-2038	114-2062
487509		2.54	Vertical	Kinked Legs	4.06	2-20	108-2038	114-2062
520415		2.54	Vertical	Straight Legs	2.79	2-19	108-2038	114-2062
520355		2.54	Vertical	Straight Legs	3.81	16-20	108-2038	114-2062
520314		2.54	Right Angle	Kinked Legs	2.54	2-19	108-2038	114-2062
487508		2.54	Right Angle	Kinked Legs	3.18	4-19	108-2038	114-2062
520353		2.54	Right Angle	Straight Legs	2.54	4-12	108-2038	114-2062
176982		2.54	Right Angle	Straight Legs	3.05	2-10	108-2038	114-2062

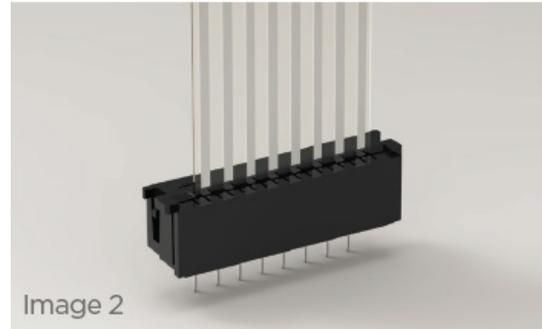
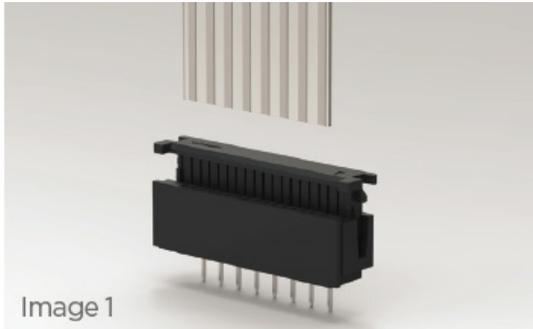
\*Includes special locking feature

# Flat Flexible Cable (FFC) Connectors

## ZIF Connectors

Our zero insertion force (ZIF) solution is a one piece FFC connector system where the board side ZIF connector mates directly to a prepared FFC cable. This connection requires that the FFC cable have prepared contact pads already in place.

ZIF connectors utilize a moving actuator to create a zero insertion force connection capable of achieving high mating cycles and providing a high level of cable retention and reliability. To use a ZIF style connector, slide the actuator to an open position (image 1), insert the cable and slide the actuator to a closed position (image 2). Closing the actuator creates the force required to make contact between the cable and the connector.



Base Number	Image	Centerline (mm)	Orientation	Number of Positions	Product Spec	Application Spec
487925		2.54	Vertical	3-18	108-16025	114-16014
487576		1.27	Vertical	9-40	108-16025	114-16009

## Application Tooling

We also offer a full range of tooling products for the termination of FFC contacts onto FFC cables, ranging from hand tools to semi-automated bench tools.

The fully programmable, semi-automated FFC bench tool is a key differentiator for TE's FFC product and allows for ease of use when terminating FFC contacts. This machine is an electrical driven semi-automatic assembly tool that uses different die sets to terminate reel-fed FFC contacts to manually supplied FFC cables. It terminates a predefined number of contacts to the supplied cable end and also allows individual wire positions to be skipped during the assembly sequence.

### Features

- Alignment of the cable is effected in the machine
- The number of pins can be programmed
- Pitches between 1.27mm and 5.08mm can be programmed
- Individual wire positions can be skipped
- Operator friendly interface via touch screen
- Interchangeable applicators available for different products
- Quick change of the applicator

For more information TE's FFC tooling, please contact TE at TE.com or at the phone numbers listed on page 8.

## Frequently Asked Questions

### Question 1:

Are you looking for a crimp solution or a direct cable mating solution?

### Answer 1:

Our FFC products can accommodate both termination styles. Our standard FFC and FLEXPAC offerings can accommodate crimp termination, while our TRIO-MATE and ZIF offerings can accommodate direct cable mating.

### Question 2:

Do you need to terminate FFC, FPC or FEC cable?

### Answer 2:

Our FFC offering, along with its sister product, Flexible Printed Circuit (FPC) connectors can solve your cable termination needs.

### Question 3:

What centerline (pitch) is required for your applications?

### Answer 3:

The standard FFC centerlines are .05" (1.25mm) and .100" (2.54mm). However, we can accommodate smaller centerlines if needed with our FPC product family.

### Question 4:

Do you require any application tooling?

### Answer 4:

We offer a full range of application tooling associated with our FFC products. Please review the tooling section to learn more.

### Question 5:

Does your application require latching?

### Answer 5:

Our standard FFC offering and the FLEXPAC product family have latching options available

### Question 6:

Does your application require any agency approvals?

### Answer 6:

Many of our FFC products carry UL and CSA agency approvals.

## te.com

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