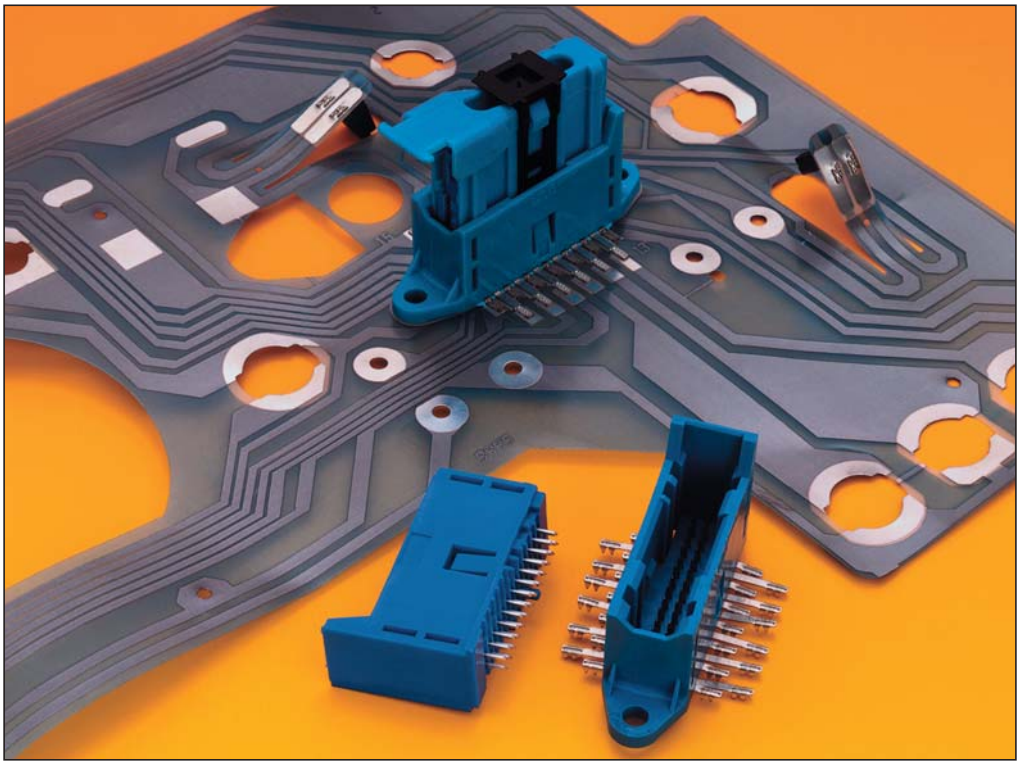
Introduction

Tyco Electronics offers an Extensive Range of Flexcircuit Contact Systems



For decades, the automobile industry has used flexible foil circuits, among other applications, for instrument clusters and driver-side airbags.
In order to implement these internal and external electrical connections, Tyco Electronics has an extensive range of contact systems in its repertoire.

Further development of these systems, contacts, housings and processing machines, to meet current quality and technical requirements, makes it possible to use the flexible circuits in other automobile applications as well.

A clear tendency towards replacing the conventional cable harnesses with foil circuits is recognizable among the automobile manufacturers. This is driven by the ability to reduce the weight and volume of harnesses resulting in reduced fuel consumption.

The flexible foil connectors cover up to now mainly the following system applications:

- Steering wheel clock springs
- Airbags
- Seat occupation recognition
- Instrument cluster
- Dash board
- Roof harness

The connectors are very reliable, but not always robust enough for handling on the car assembly line in the main harness.

Therefore, it became Tyco Electronics' assignment to develop new solutions for these applications, i. e. solutions for contacting the foil circuits with corresponding processing machines, but also solutions for completely new contact types.

We differentiate fundamentally between "indirect connection" and "direct connection", independent of the foil type.

With the "indirect connection", contacts are connected with the foil circuit. With "direct connection", the bare copper conductor of the foil circuit is used directly as contact.

Micro Quadlok System – Foil, Multiple Crimp Socket Contact

Technical Features

Contact Material:
CuNiSi,
Cantilever Spring: Stainless Steel

Contact Finish:
pre-tin plated,
selective gold plated on request

Contact Resistance (New State):
CuNiSi: ≤3 mΩ

Total Temperature max.:*
–40 °C to +120 °C (tin plated)

Mating Cycles:
20 (tin plated)

Insertion Force:
max. 5 N

Extraction Force:
min. 1 N

Retention Force (from Housing):
– without second locking device
>60 N
– second locking device only
>60 N
depends on housing material

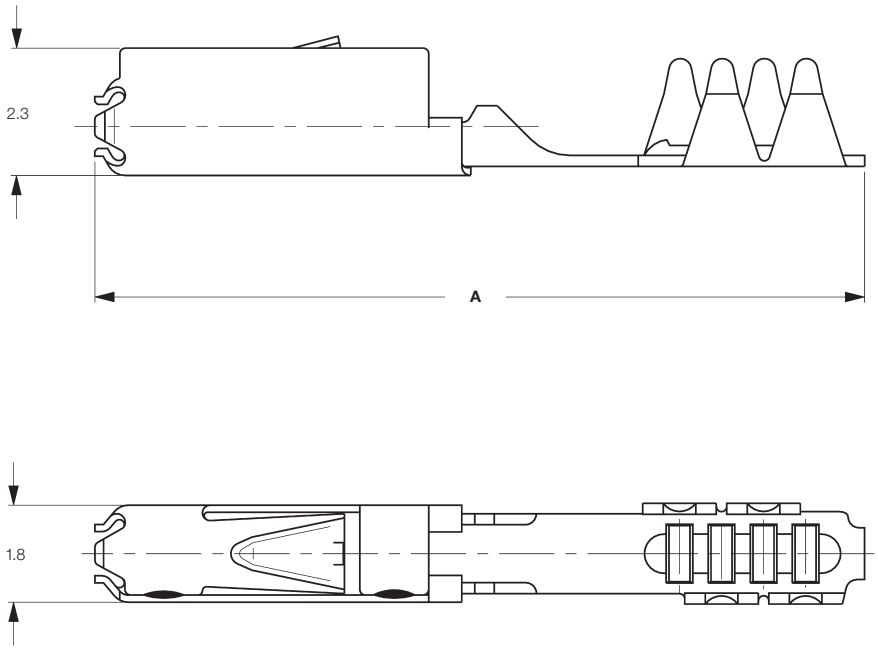
Dimensions of Male Contacts:
0.63 x 0.63 mm

Conductor Thickness:
4–200 µm

Extraction Tools:
Part Nos. **91092-1,**
91093-1,
91047-x

Product Specification:
108-18030

Application Specification:
114-18287



Part Number	Dimension A (mm)
929387	15.95
968987	13.95
1534118	15.85

Socket Contacts

Wire Size Range* (mm²)	Insulation Diameter*		Material and Finish	Part Numbers					
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity	Machines◆ and Applicators	Hand Tool only Loose-Piece
–	–	–	CuNiSi, pre-tin plated	929387-1	12,500	929388-1	500	318619-x	90273-5
–	–	–	CuNiSi, pre-tin plated	968987-1	14,000	968988-1	500	528000-7 with 5-528441-3	2-1579004-9 3-1579004-0
–	–	–	CuNiSi, pre-tin plated	1534118-1**	12,500	1534119-1**	500	1372000-x	1-528013-1

*) Depending on Foil
**) Two Contact Points
◆) Applicators are application specific, consult Tyco Electronics for details.

Micro Quadlok System – Foil, Multiple Crimp Pin Contact

Technical Features

Contact Material:
CuNiSi,
Cantilever Spring: Stainless Steel

Contact Finish:
pre-tin plated,
selective gold plated on request

Contact Resistance (New State):
CuNiSi: ≤3 mΩ

Total Temperature max.:*
–40 °C to +120 °C (tin plated)

Mating Cycles:
20 (tin plated)

Insertion Force:
max. 5 N

Extraction Force:
min. 1 N

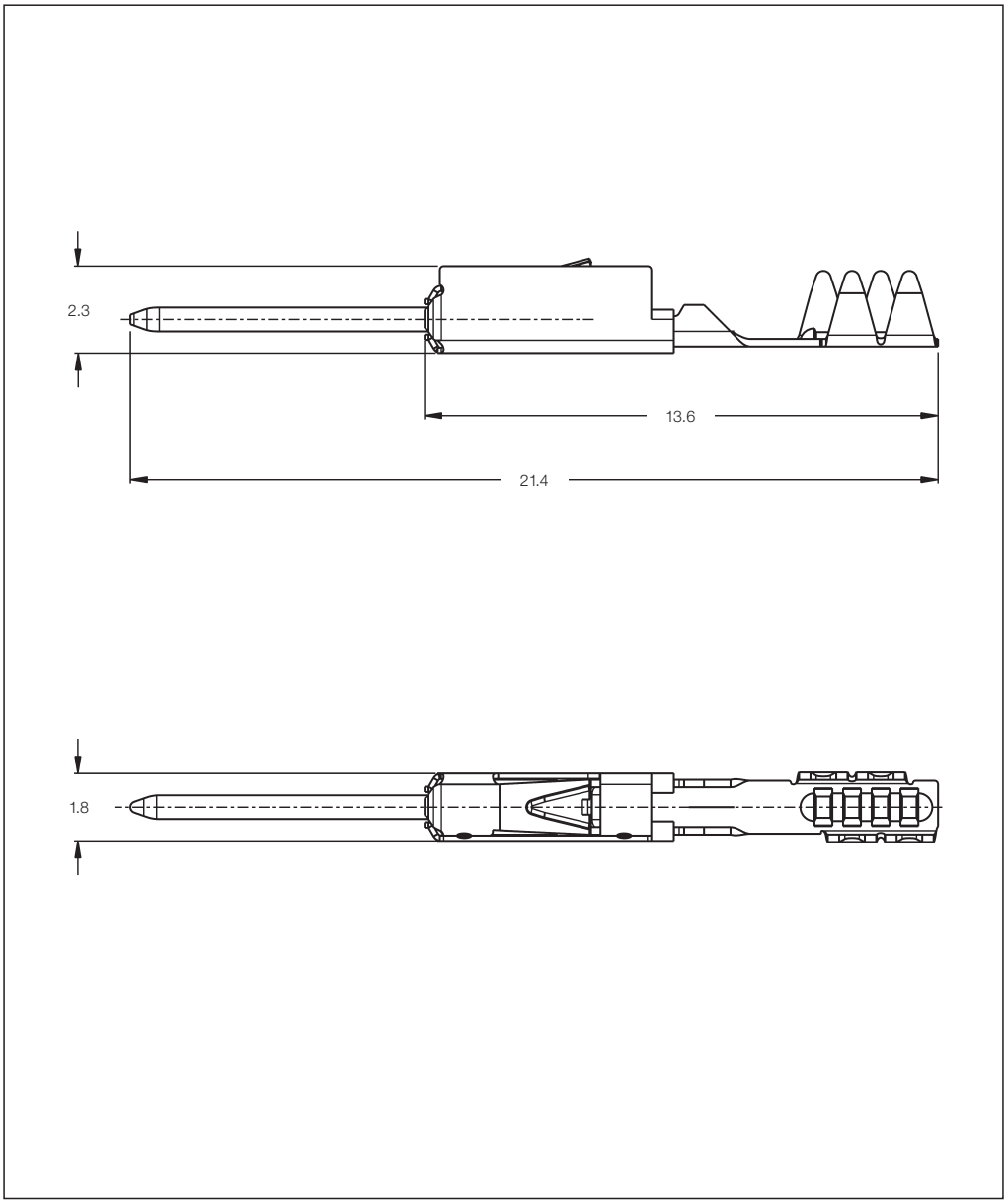
Retention Force (from Housing):
– without second locking device
>60 N
– second locking device only
>60 N
depends on housing material

Conductor Thickness:
4–200 µm

Extraction Tools:
Part Nos. **91092-1,**
91093-1,
91047-x

Product Specification:
108-18030

Application Specification:
114-18287



Pin Contacts

Wire Size Range* (mm²)	Insulation Diameter*		Material and Finish	Part Numbers					
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity	Machines◆ and Applicators	Hand Tool
–	–	–	CuNiSi, pre-tin plated	1452128-1	13,000	1452129-1	500	318619-x 528000-7 with 5-528441-3 1372000-x	90273-5 2-1579004-9 3-1579004-0 1-528013-1

*) Depending on Foil
◆) Applicators are application specific, consult Tyco Electronics for details.

FFC-FFC Splice System – Foil / Multiple Crimp

Technical Features

Contact Material:
CuSn4

Contact Finish:
pre-tin plated,
selective gold plated on request

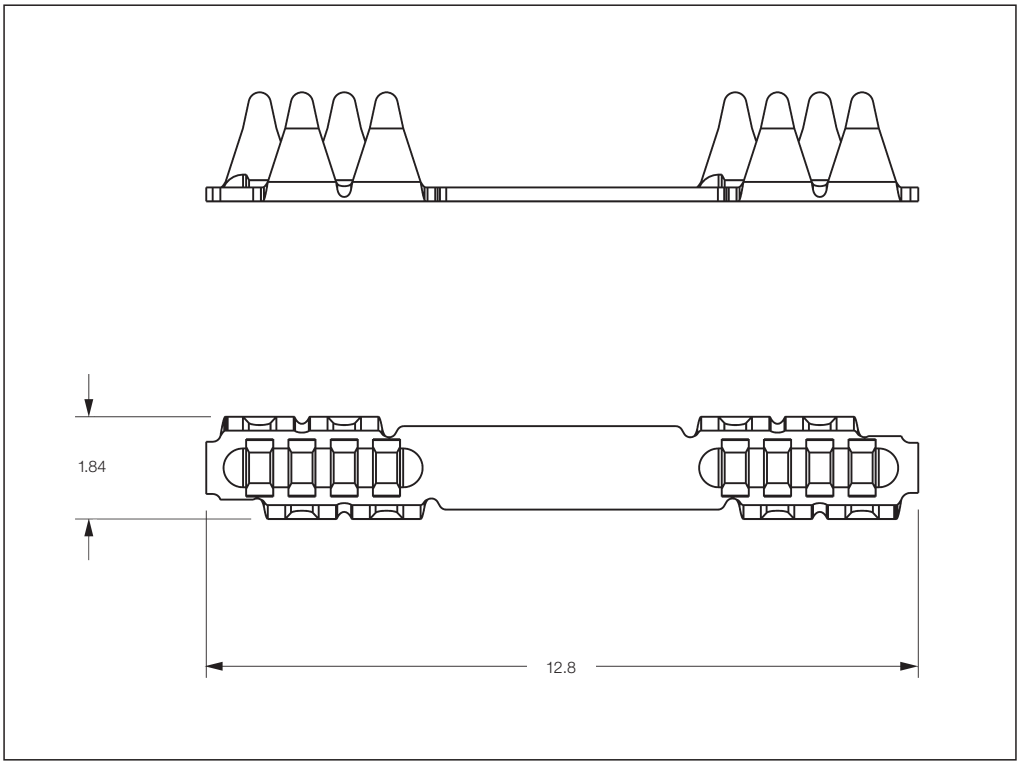
Contact Resistance (New State):
CuSn4: ≤3 mΩ

Total Temperature max.:*
–40 °C to +120 °C (tin plated)

Conductor Thickness:
4–200 µm

Product Specification:
108-18030

Application Specification:
114-16015



Multiple Crimp

Wire Size Range* (mm²)	Insulation Diameter*		Material and Finish	Part Numbers					
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity	Machines◆ and Applicators	Hand Tool
–	–	–	CuSn4, pre-tin plated	1452078-1	28,000	1452479-1	500	1372000-x	90273-5

*) Depending on Foil
◆) Applicators are application specific, consult Tyco Electronics for details.

FFC-Wire 0.2–0.5 mm² Splice System – Foil / Multiple Crimp

Technical Features

Contact Material:
CuSn4

Contact Finish:
pre-tin plated,
selective gold plated on request

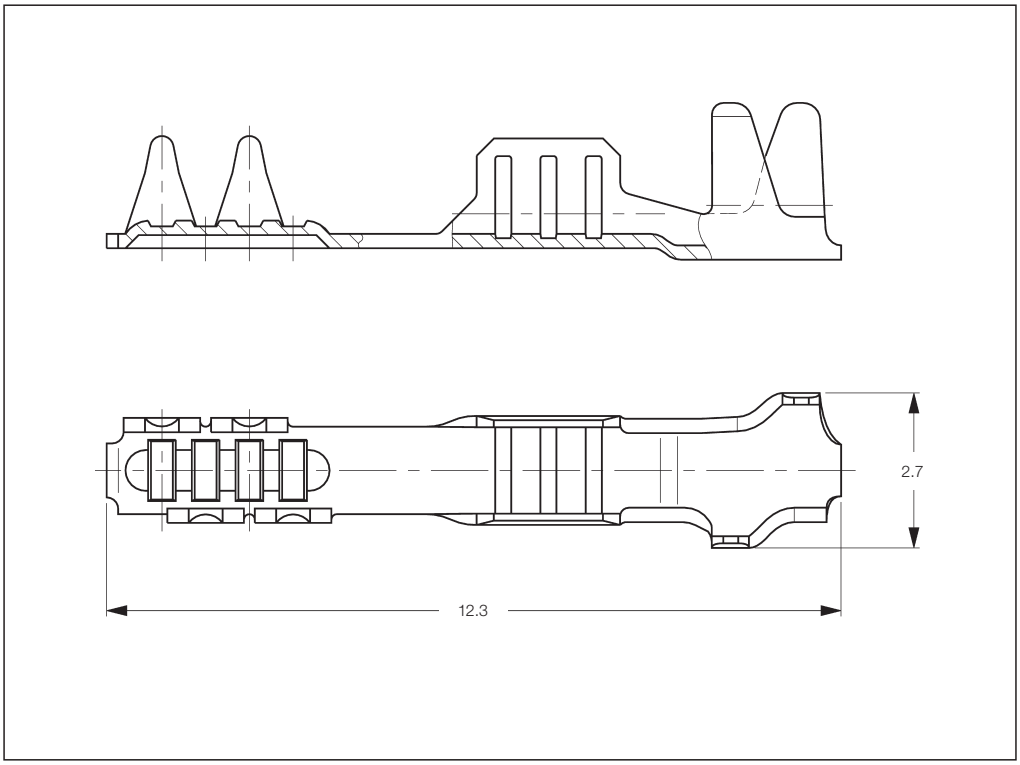
Contact Resistance (New State):
CuSn4: ≤3 mΩ

Total Temperature max.:*
–40 °C to +120 °C (tin plated)

Conductor Thickness:
4–200 µm

Product Specification:
108-18030

Application Specification:
114-16015



Multiple Crimp

Wire Size Range* (mm²)	Insulation Diameter*		Material and Finish	Part Numbers					
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity	Machines◆ and Applicators	Hand Tool
0.2–0.5	–	1.15–1.60	CuSn4, pre-tin plated	965927-1	14,000	1452575-1	500	on request	90273-5 1-528013-1

*) Depending on Foil
◆) Applicators are application specific, consult Tyco Electronics for details.

ACTION-PIN System – Foil-PC Board – Multiple Crimp

Technical Features

Contact Material:
CuNiSi

Contact Finish:
pre-tin plated,
selective gold plated on request

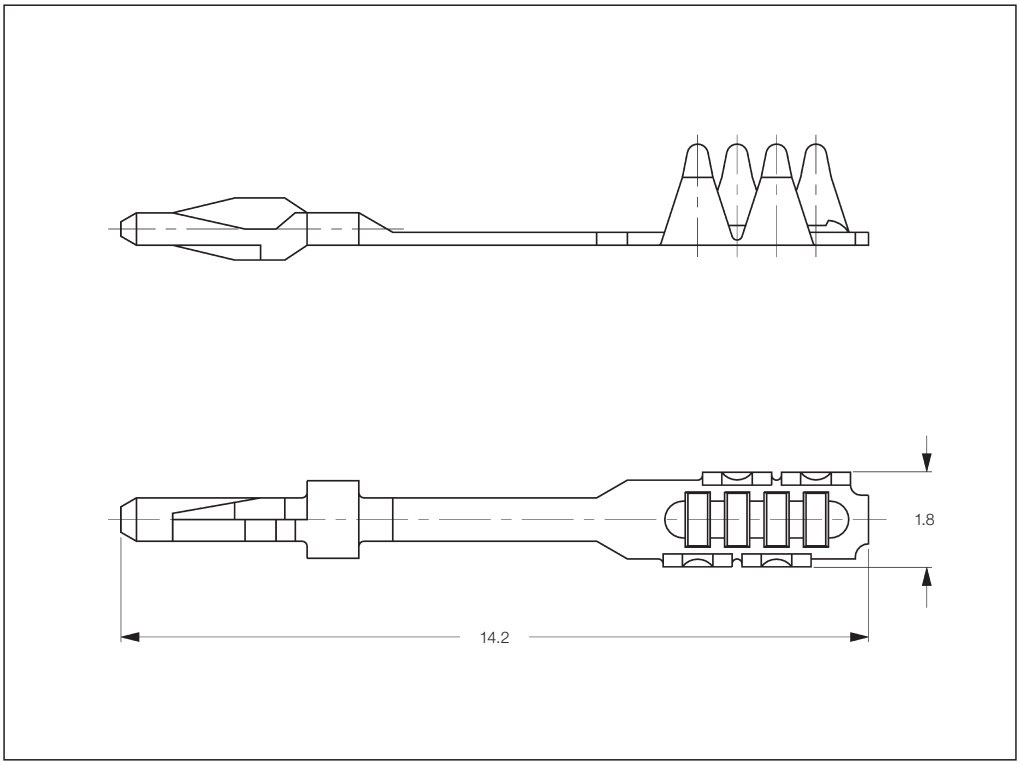
Contact Resistance (New State):
CuNiSi: ≤3 mΩ

Total Temperature max.:*
–40 °C to +120 °C (tin plated)

Conductor Thickness:
4–200 µm

Product Specification:
108-18587-1

Application Specification:
114-18210



Multiple Crimp

Wire Size Range* (mm²)	Insulation Diameter*		Material and Finish	Part Numbers					
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity	Machines◆ and Applicators	Hand Tool
–	–	–	CuNiSi, pre-tin plated	968429-2	18,000	–	–	318619-x 528000-7 with 5-528441-6 539570-x	90273-5 1-528013-1

*) Depending on Foil
◆) Applicators are application specific, consult Tyco Electronics for details.

AMPMODU System – Foil, Multiple Crimp Socket Contact

Technical Features

Contact Material:
Phosphor Bronze

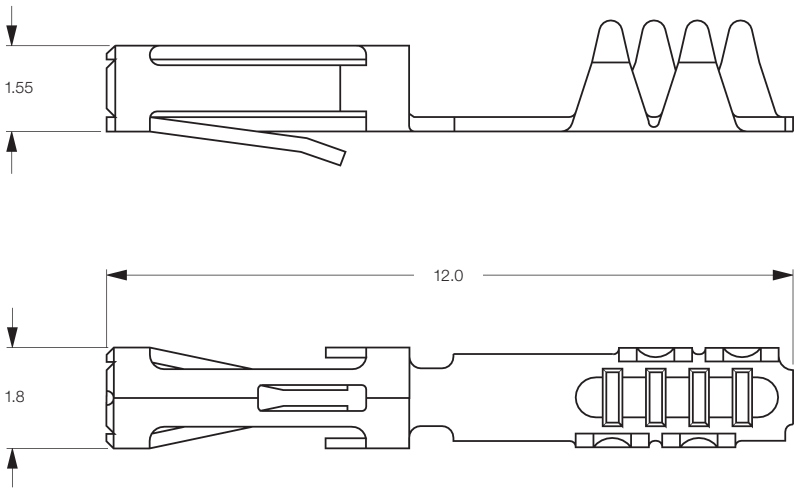
Contact Finish:
pre-tin plated,
selective gold plated on request

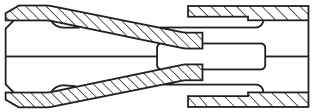
Total Temperature max.:*
–65 °C to +105 °C

Mating Cycles:
dependant of plating thicknesses,
see product specification

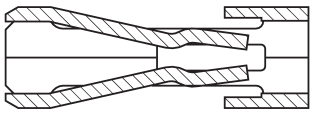
Product Specification:
108-9024

Application Specification:
114-16015





Part No. **487406** (Standard)



Part No. **487117** (High Pressure)

Socket Contacts

Wire Size Range* (mm²)	Insulation Diameter*		Material and Finish**	Part Numbers					
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity	Machines◆ and Applicators	Hand Tool
–	–	–	2	2-487406-2	14,000	–	–	318619-x	1-528013-1
			3	2-487406-3	14,000				
			5	2-487406-6	14,000				
			1	2-487406-4	14,000				
			6	487406-9	14,000			528000-7 with 5-528441-5	90273-5
–	–	–	2	1-487117-0	10,000	–	–		
			3	1-487117-1	10,000				
			1	487117-9	10,000				

*) Depending on Foil

) **Material and Finish:
1 = Tin on mating area, crimp area tin plated
2 = 0.38 µm gold on mating area, crimp area tin plated
3 = 0.76 µm gold on mating area, crimp area tin plated
5 = 1.27 µm gold on mating area, crimp area tin plated
6 = 1.27 µm gold on mating area, crimp area gold plated

◆) Applicators are application specific, consult Tyco Electronics for details.

AMPMODU System – Foil, Multiple Crimp Pin Contact

Technical Features

Contact Material:
Phosphor Bronze

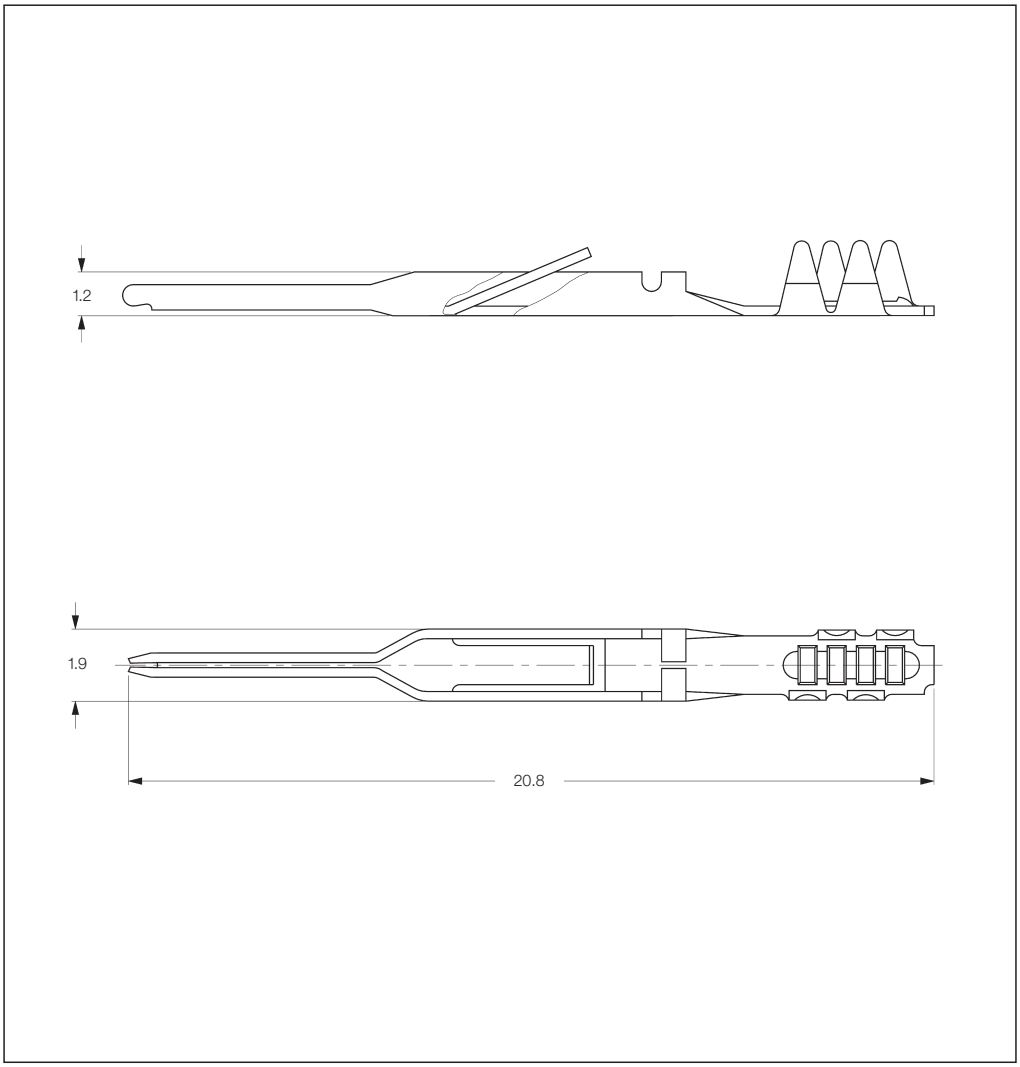
Contact Finish:
pre-tin plated,
selective gold plated on request

Total Temperature max.:*
–65 °C to +105 °C

Mating Cycles:
dependant of plating thicknesses,
see product specification

Product Specification:
108-9024

Application Specification:
114-16015



Pin Contacts

Wire Size Range* (mm²)	Insulation Diameter*		Material and Finish**	Part Numbers					
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity	Machines◆ and Applicators	Hand Tool
–	–	–	5	88117-8	15,000	–	–	318619-x 528000-7 with 5-528441-5	1-528013-1 90273-5
			2	88117-9	15,000				
			3	1-88117-0	15,000				
			1	88117-7	15,000				

*) Depending on Foil

) **Material and Finish:
1 = Tin on mating area, crimp area tin plated
2 = 0.38 µm gold on mating area, crimp area tin plated
3 = 0.76 µm gold on mating area, crimp area tin plated
5 = 1.27 µm gold on mating area, crimp area tin plated

◆) Applicators are application specific, consult Tyco Electronics for details.

Junior Timer System – Foil Multiple Crimp – Receptacle Contact

Technical Features

Contact Material:
CuNiSi

Contact Finish:
pre-tin plated

Contact Resistance (New State):
CuNiSi: ≤3 mΩ

Total Temperature max.:*
–40 °C to +120 °C (tin plated)
–40 °C to +140 °C (gold plated)

Mating Cycles:
10 (tin plated)

Insertion Force:
14 N max.

Extraction Force:
5 N min.

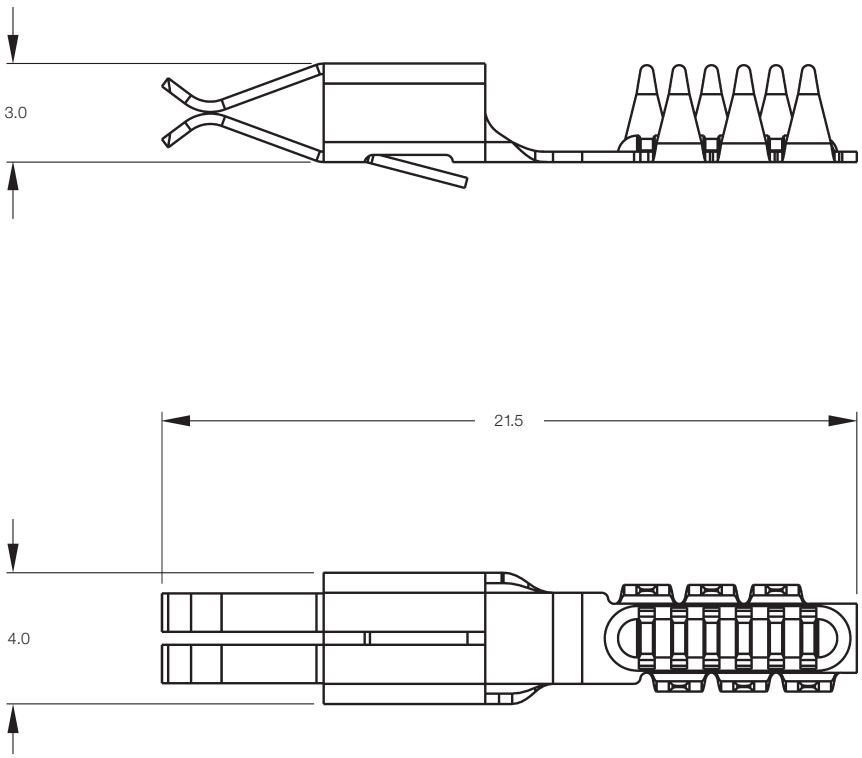
Retention Force (from Housing):
– without second locking device
>90 N
– second locking device only
>60 N
depends on housing material

Fit to Tabs:
2.8 x 0.8 mm, 3.0 x 0.8 mm

Conductor Thickness:
4–200 µm

Product Specification:
108-18053

Application Specification:
114-18409



Receptacle Contacts

Wire Size Range* (mm²)	Insulation Diameter*		Material and Finish	Part Numbers					
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity	Machines◆ and Applicators	Hand Tool
–	–	–	CuNiSi, pre-tin plated	1241783-1	4,000	–	–	528000-7 with 3-528441-7 1372000-x with Conversion Kit 539984-2	–

*) Depending on Foil
◆) Applicators are application specific, consult Tyco Electronics for details.

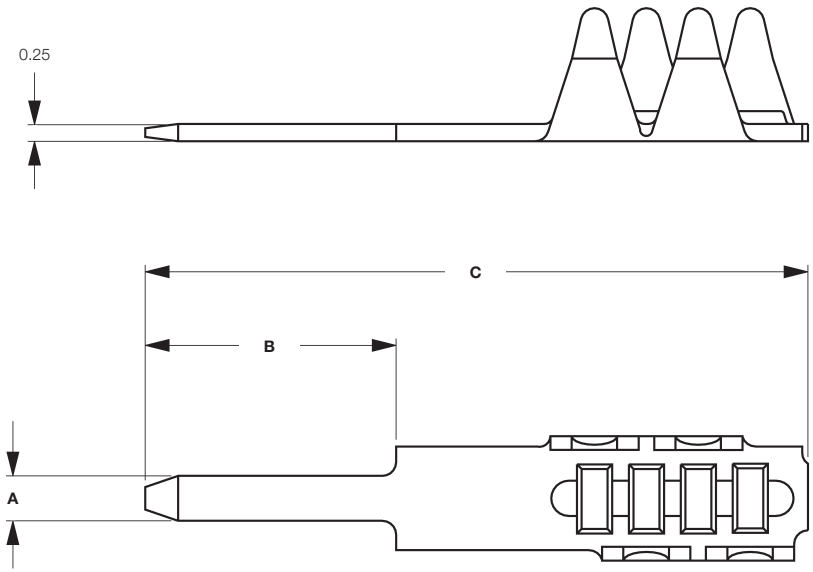
Solder Pin – Foil – Multiple Crimp

Technical Features

Contact Material:
Phosphor Bronze

Contact Finish:
pre-tin plated,
selective gold plated on request

Application Specification:
114-16015



Part Number	Dimensions (mm)		
	A	B	C
1-88997-2	0.66	3.68	9.53
1-88997-3			
1-88997-4			
1-487136-4	0.97	15.88	19.94
1-487136-5	0.69	5.71	9.78
1-487137-1	0.64	5.33	11.18

Multiple Crimp

Wire Size Range* (mm^2)	Insulation Diameter*		Material and Finish**	Part Numbers					
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity	Machines◆ and Applicators	Hand Tool
–	–	–	1	1-88997-2	15,000	–	–	318619-x 528000-7 with 5-528441-7	90273-5 1-528013-1
			2	1-88997-3	15,000				
			3	1-88997-4	15,000				
–	–	–	1	1-487136-4	15,000	–	–		
			1	1-487136-5	15,000				
–	–	–	1	1-487137-1	15,000	–	–		

*) Depending on Foil

) **Material and Finish:
1 = Tin on solder area, crimp area tin plated
2 = 0.38 µm gold on solder area, crimp area tin plated
3 = 0.76 µm gold on solder area, crimp area tin plated
4 = Unplated on solder area, crimp area tin plated

◆) Applicators are application specific, consult Tyco Electronics for details.

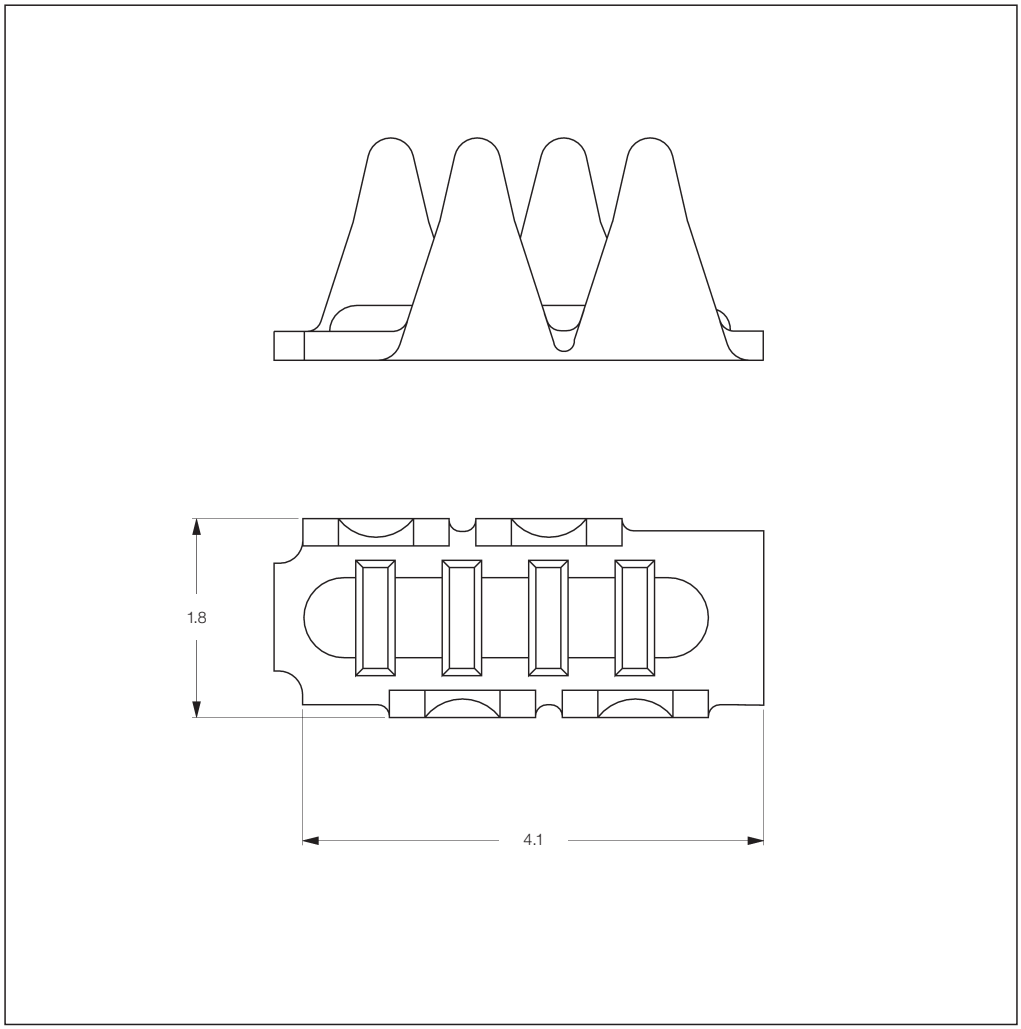
Splice System – Foil – Multiple Crimp

Technical Features

Contact Material:
Phosphor Bronze

Contact Finish:
pre-tin plated,
selective gold plated on request

Application Specification:
114-16015



Multiple Crimp

Wire Size Range* (mm^2)	Insulation Diameter*		Material and Finish	Part Numbers					
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity	Applicator	Hand Tool
–	–	–	CuSn4, pre-tin plated	494060-3	16,000	–	–	318619-x	90273-5

*) Depending on Foil

Micro Quadlok System – Foil – **Extruded**

Technical Features

Contact Material:
CuNiSi,
Cantilever Spring: Stainless Steel

Contact Finish:
pre-tin plated

Contact Resistance (New State):
CuNiSi: ≤3 mΩ

Total Temperature max.:*
–40 °C to +150 °C (tin plated)

Mating Cycles:
20 (tin plated)

Insertion Force:
5 N max.

Extraction Force:
1 N min.

Retention Force (from Housing):
– without second locking device
>60 N
– second locking device only
>60 N
depends on housing material

Dimensions of Male Contacts:
0.63 x 0.63 mm

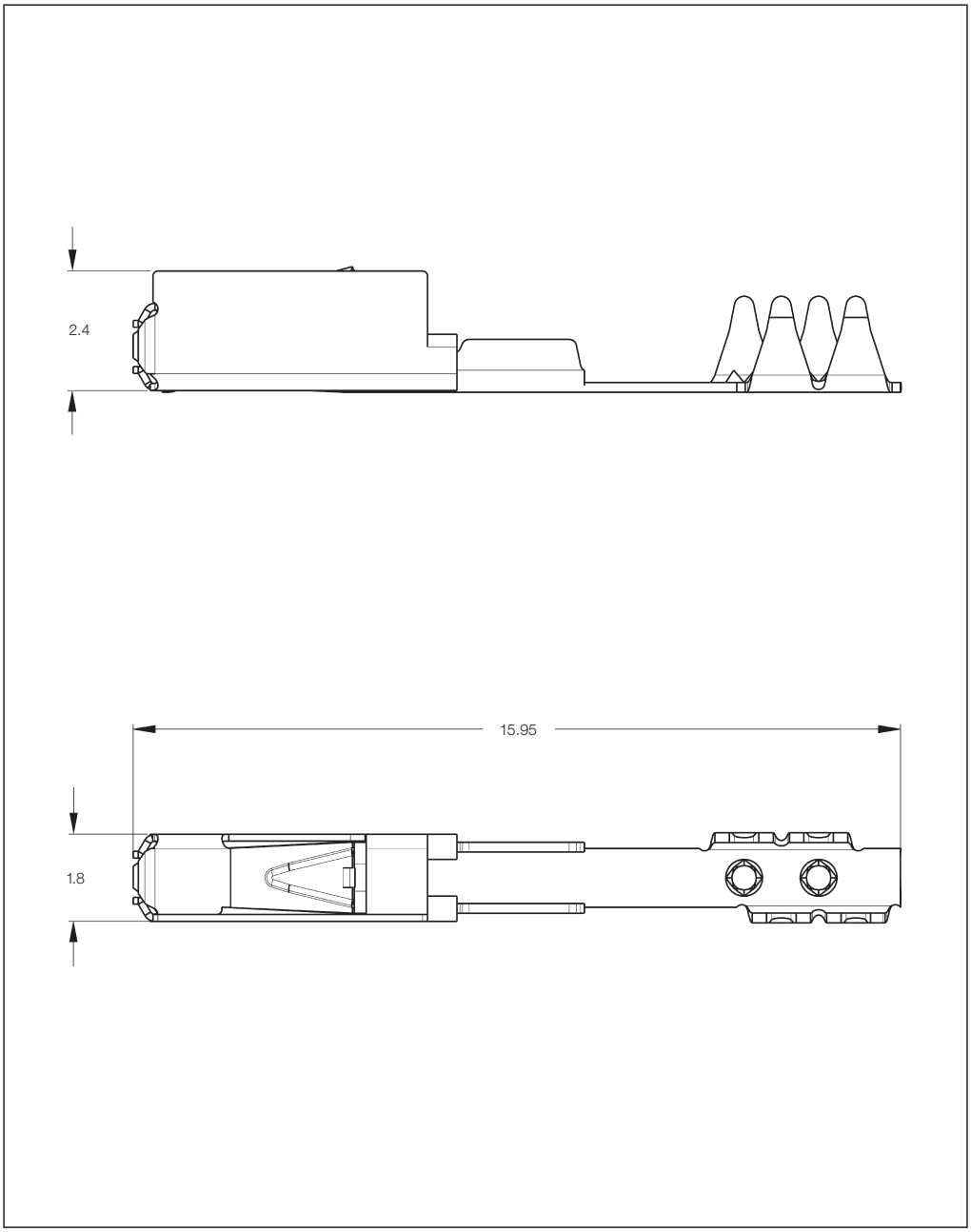
Conductor Thickness:
100–200 µm

Extruded Foil Thickness:
>600 µm

Extraction Tools:
Part Nos. **91092-1,**
91093-1,
91047-x

Product Specification:
108-18030

Application Specification:
114-18287



Extruded Foil

Wire Size Range* (mm²)	Insulation Diameter*		Material and Finish	Part Numbers					
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity	Machines◆ and Applicators	Hand Tool
–	–	–	CuNiSi, pre-tin plated	1418887-1	12,500	1418930-1	500	528000-7 with 5-528441-3	1-528013-1 90273-5

*) Depending on Foil
◆) Applicators are application specific, consult Tyco Electronics for details.