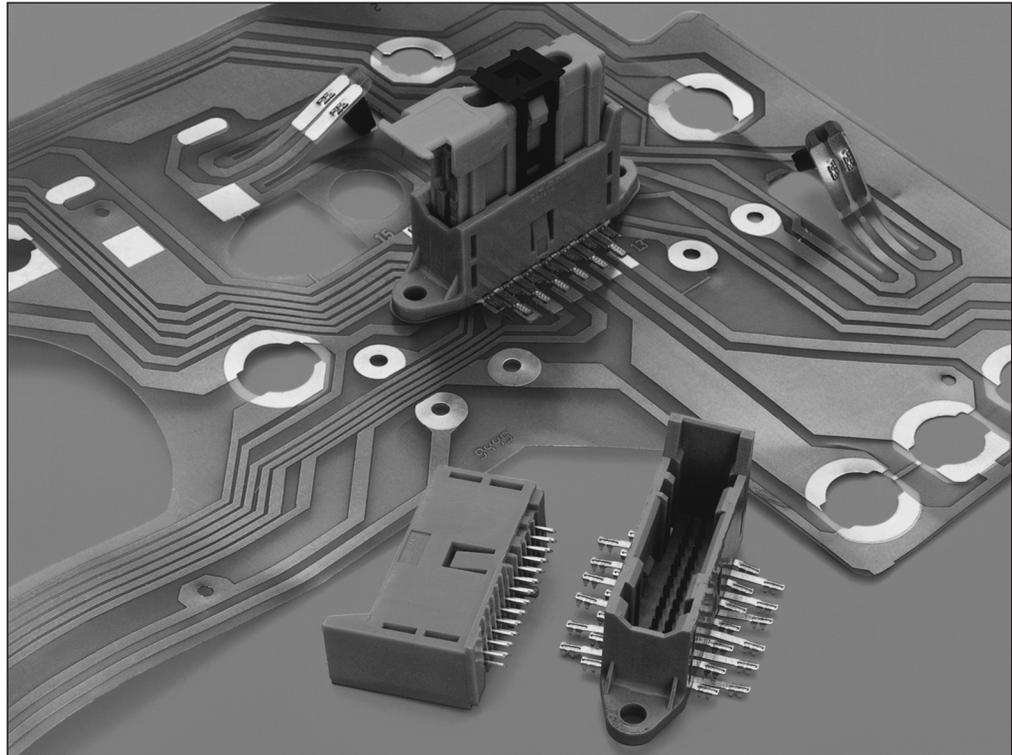


Introduction



**TE Connectivity 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, TE Connectivity 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:  $\leq 3 \text{ m}\Omega$

**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  $\mu\text{m}$

**Extraction Tools:**

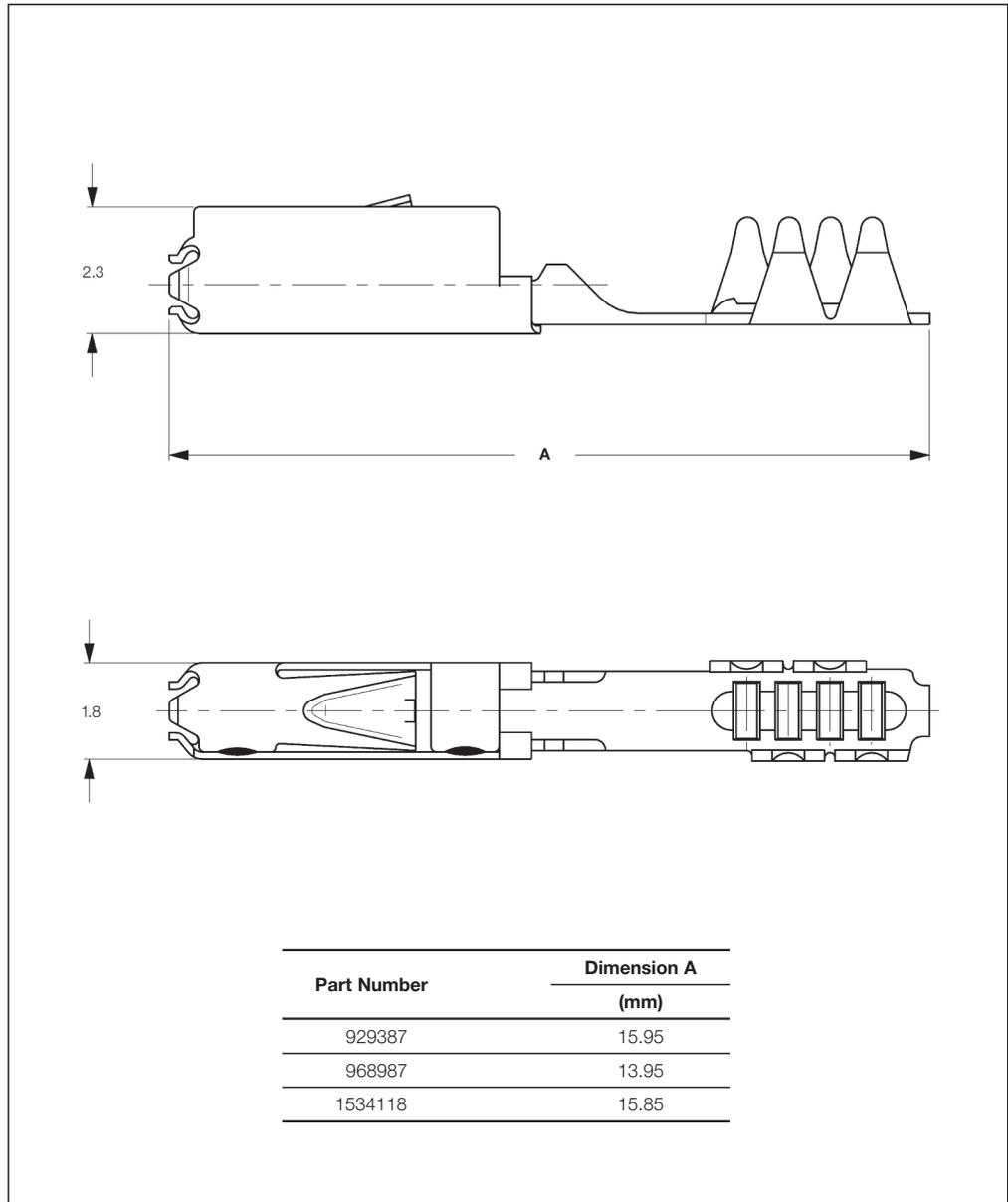
Part Nos. **91092-1,**  
**91093-1,**  
**91047-x**

**Product Specification:**

108-18030

**Application Specification:**

114-18287



**Socket Contacts**

Wire Size Range* (mm <sup>2</sup> )	Insulation Diameter*		Material and Finish	Part Numbers				Machines* and Applicators	Hand Tool only Loose-Piece
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity		
-	-	-	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 TE Connectivity 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:  $\leq 3 \text{ m}\Omega$

**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  $\mu\text{m}$

**Extraction Tools:**

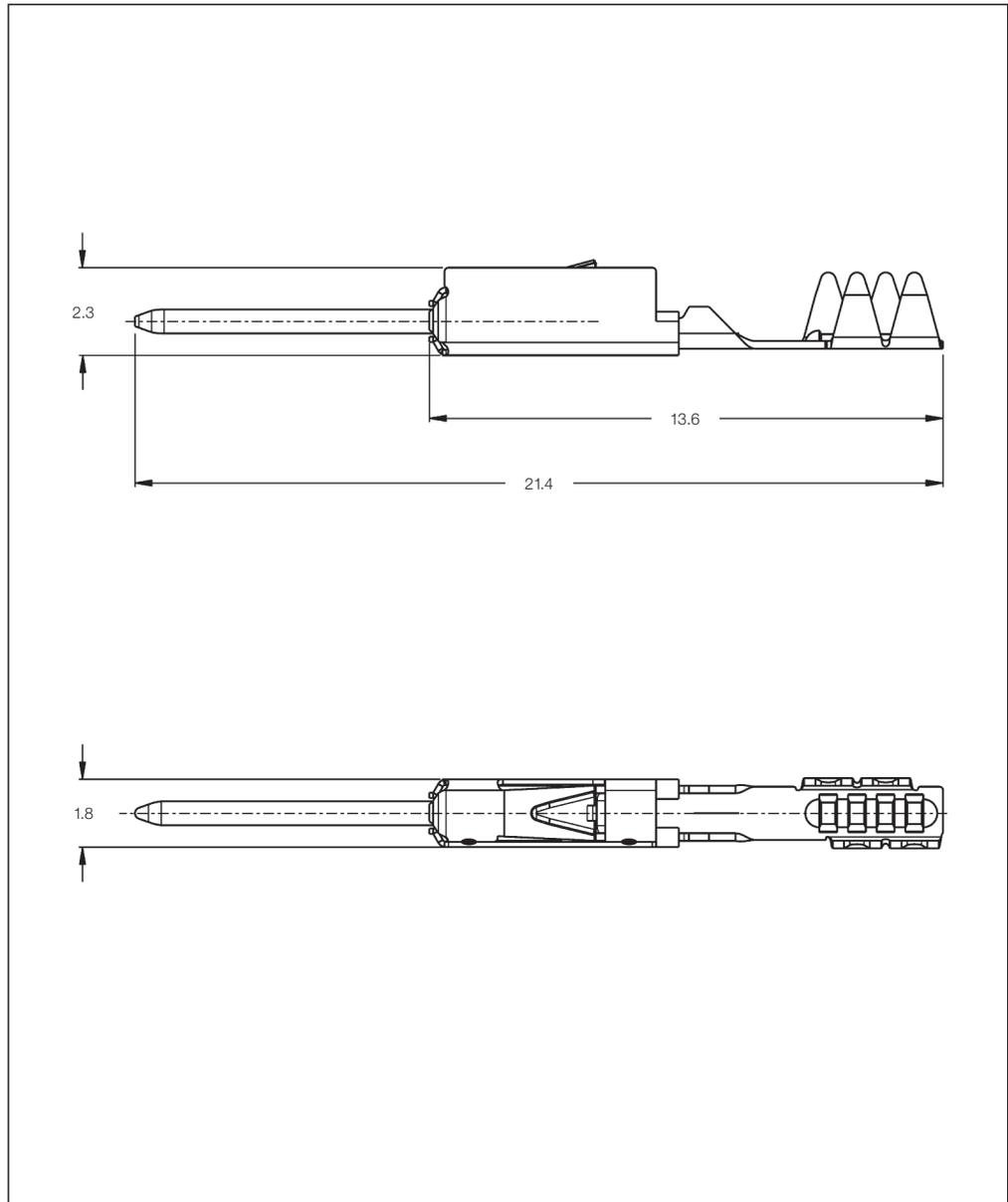
Part Nos. **91092-1,**  
**91093-1,**  
**91047-x**

**Product Specification:**

108-18030

**Application Specification:**

114-18287



**Pin Contacts**

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

\*) Depending on Foil

♦) Applicators are application specific, consult TE Connectivity 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:  $\leq 3 \text{ m}\Omega$

**Total Temperature max.:\***

-40 °C to +120 °C (tin plated)

**Conductor Thickness:**

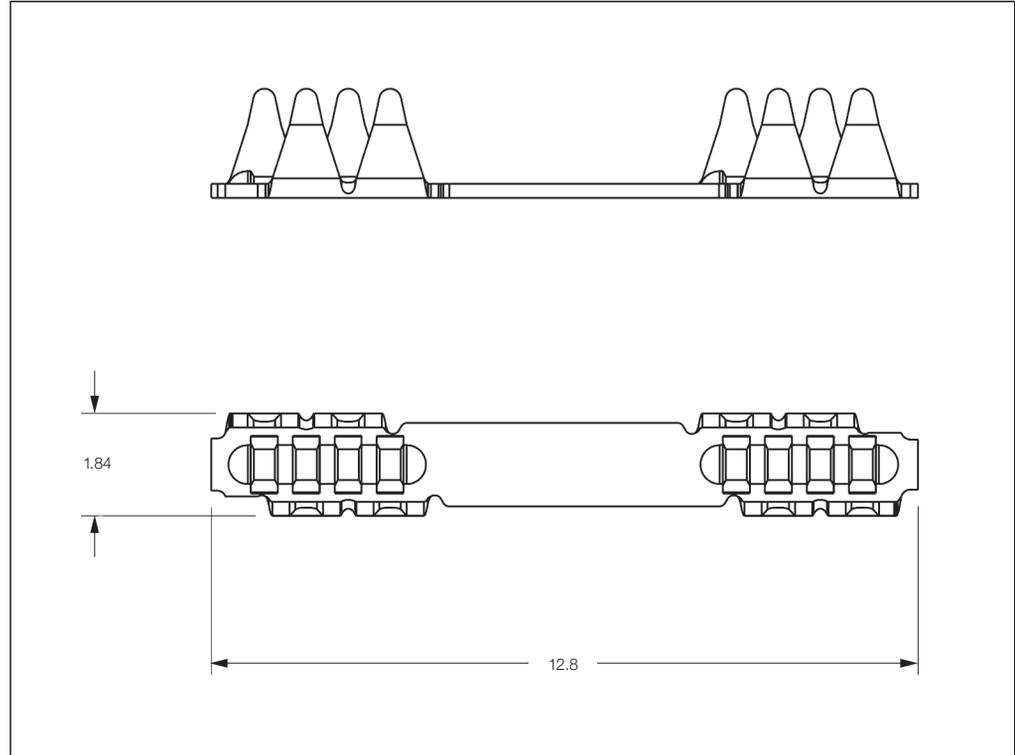
4–200  $\mu\text{m}$

**Product Specification:**

108-18030

**Application Specification:**

114-16015



**Multiple Crimp**

Wire Size Range* (mm <sup>2</sup> )	Insulation Diameter*		Material and Finish	Part Numbers				Machines* and Applicators	Hand Tool
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity		
–	–	–	CuSn4, pre-tin plated	1452078-1	28,000	1452479-1	500	1372000-x	90273-5

\*) Depending on Foil

♦) Applicators are application specific, consult TE Connectivity for details.

FFC-Wire 0.2–0.5 mm<sup>2</sup> 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:  $\leq 3 \text{ m}\Omega$

**Total Temperature max.:\***

–40 °C to +120 °C (tin plated)

**Conductor Thickness:**

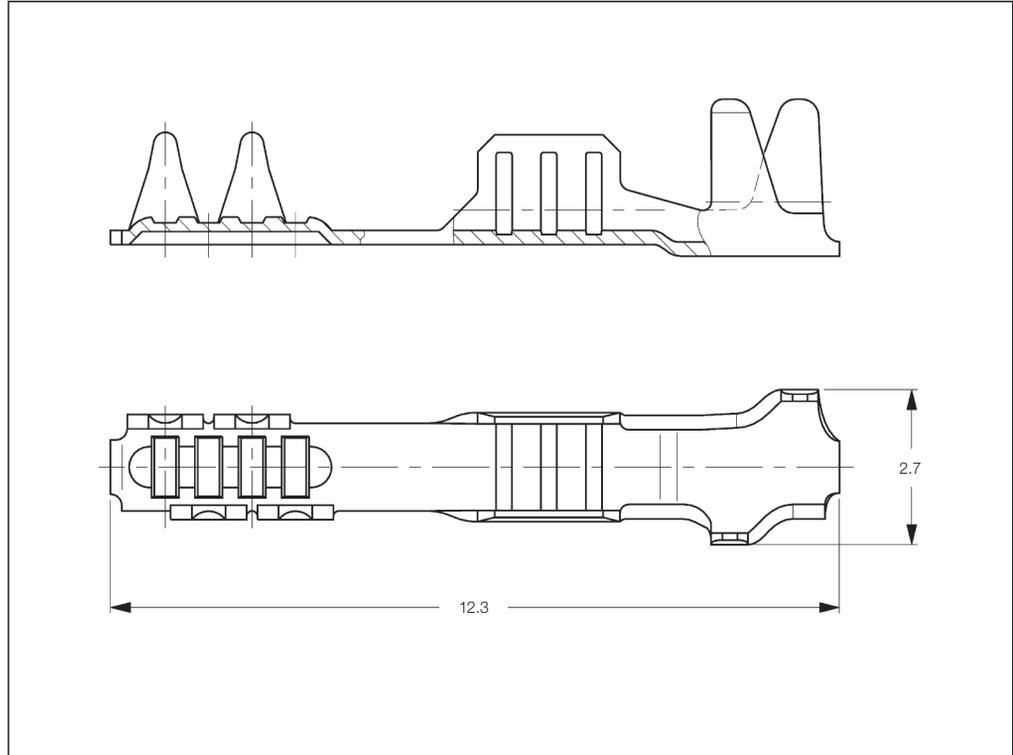
4–200  $\mu\text{m}$

**Product Specification:**

108-18030

**Application Specification:**

114-16015



**Multiple Crimp**

Wire Size Range* (mm <sup>2</sup> )	Insulation Diameter*		Material and Finish	Part Numbers				Machines* and Applicators	Hand Tool
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity		
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 TE Connectivity 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:  $\leq 3 \text{ m}\Omega$

**Total Temperature max.:\***

-40 °C to +120 °C (tin plated)

**Conductor Thickness:**

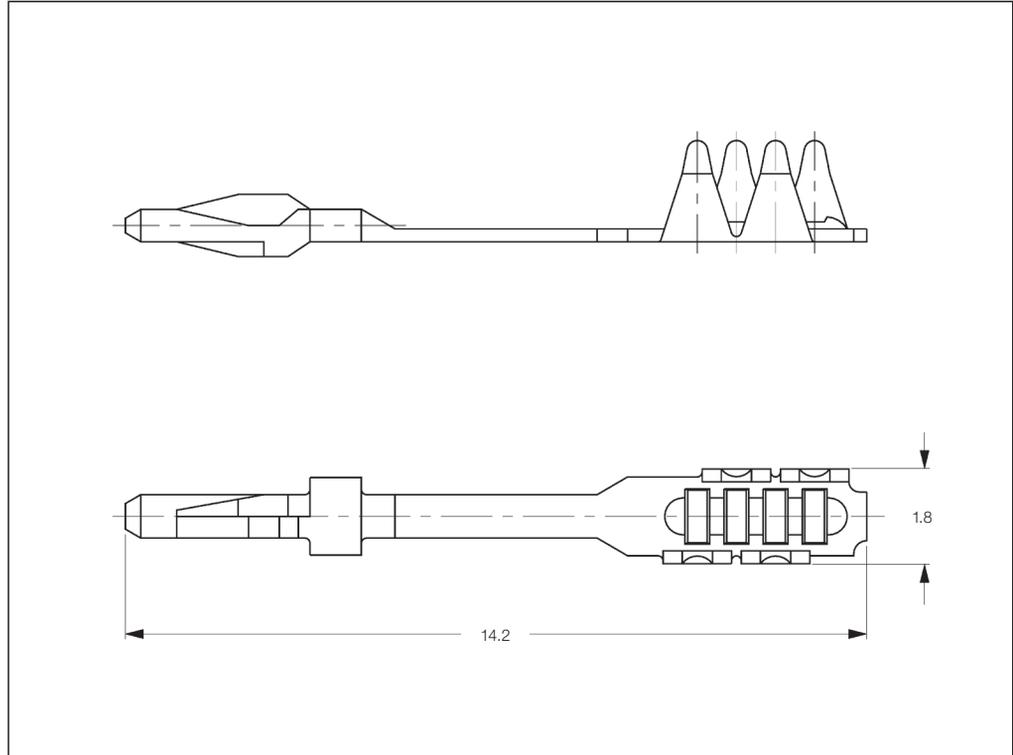
4–200  $\mu\text{m}$

**Product Specification:**

108-18587-1

**Application Specification:**

114-18210



**Multiple Crimp**

Wire Size Range* (mm <sup>2</sup> )	Insulation Diameter*		Material and Finish	Part Numbers				Machines* and Applicators	Hand Tool
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity		
-	-	-	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 TE Connectivity for details.

AMPMODU System – Foil, Multiple Crimp Socket Contact

**Technical Features**

**Contact Material:**  
Phosphor Bronze

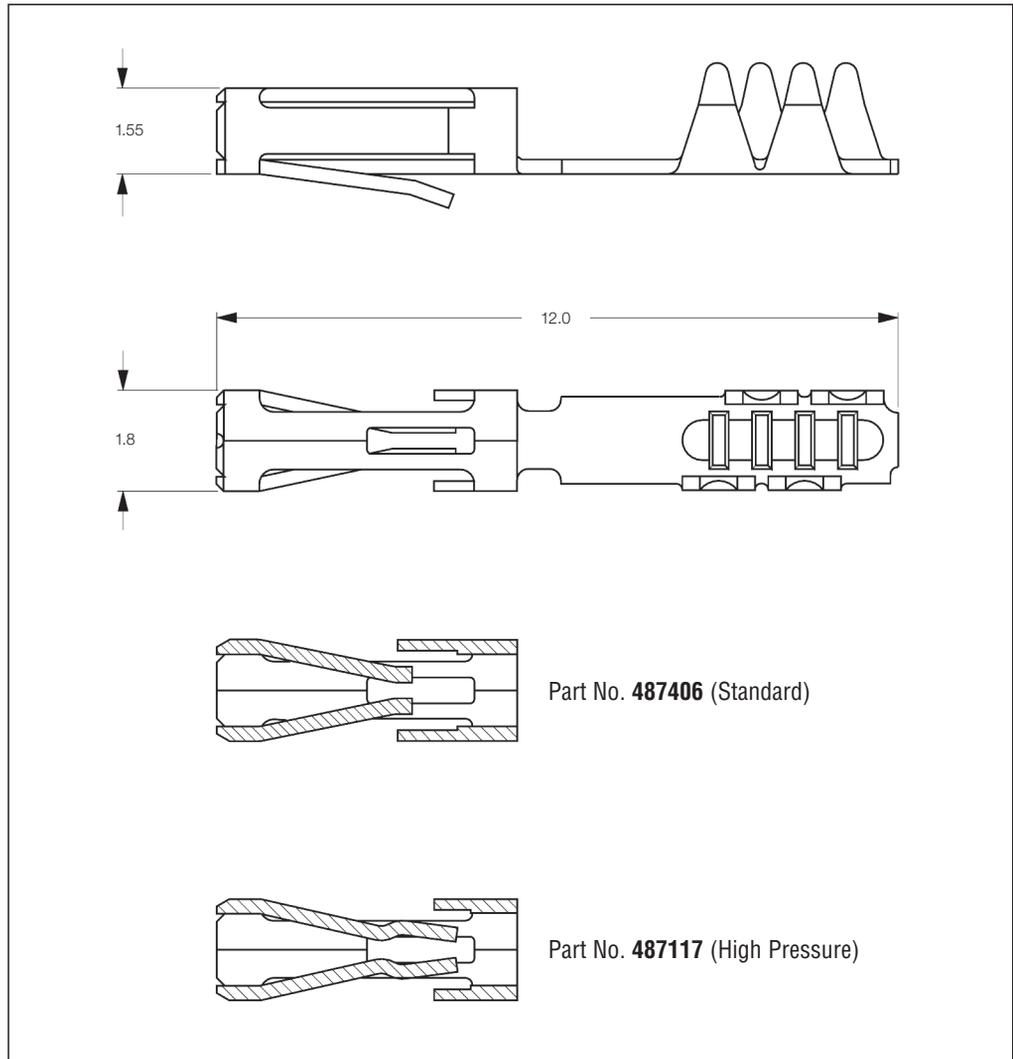
**Contact Finish:**  
pre-tin plated,  
selective gold plated on request

**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



**Socket Contacts**

Wire Size Range* (mm <sup>2</sup> )	Insulation Diameter*		Material and Finish**	Part Numbers					Hand Tool
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity	Machines* and Applicators	
-	-	-	2	2-487406-2	14,000				
			3	2-487406-3	14,000				
			5	2-487406-6	14,000	-	-	318619-x	1-528013-1
			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 TE Connectivity 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:**

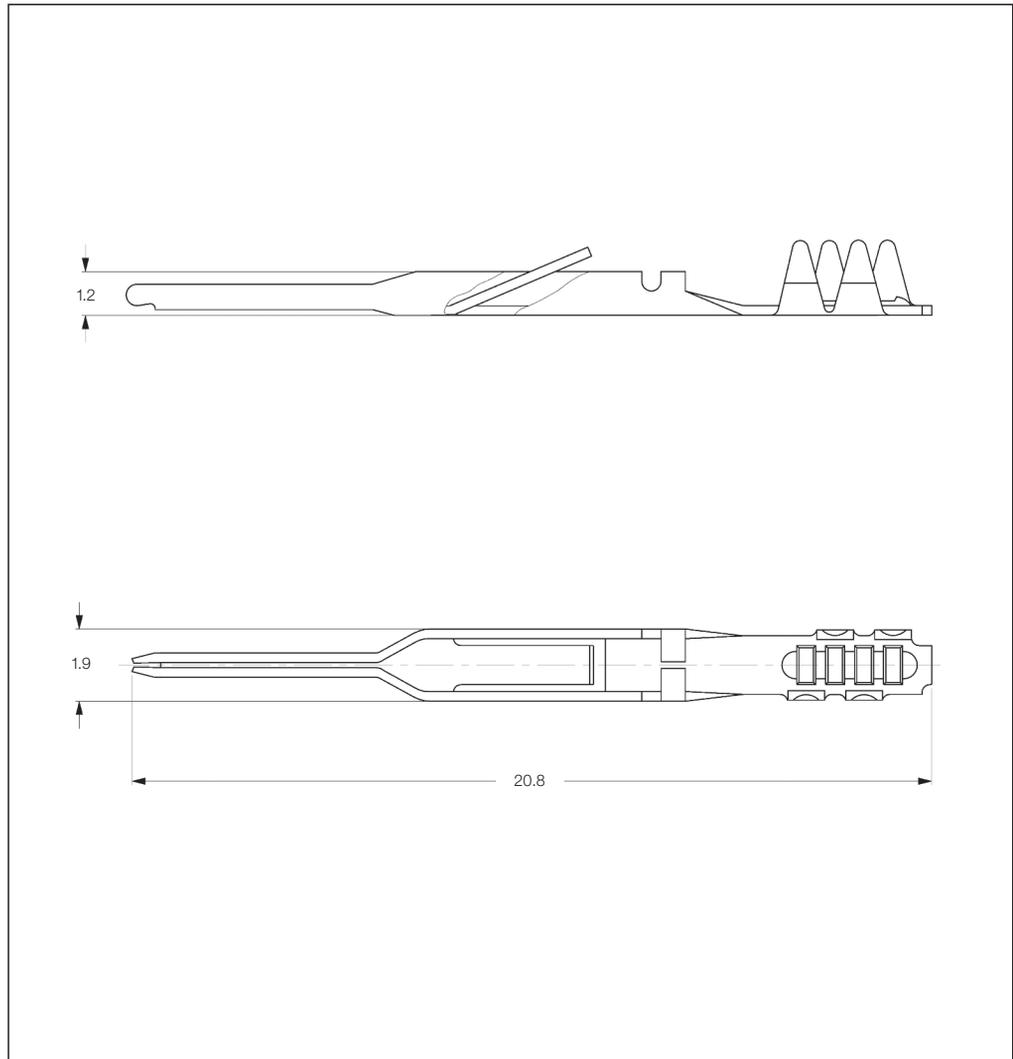
dependant of plating thicknesses,  
see product specification

**Product Specification:**

108-9024

**Application Specification:**

114-16015



**Pin Contacts**

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

\*) 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 TE Connectivity 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:  $\leq 3 \text{ m}\Omega$

**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:**

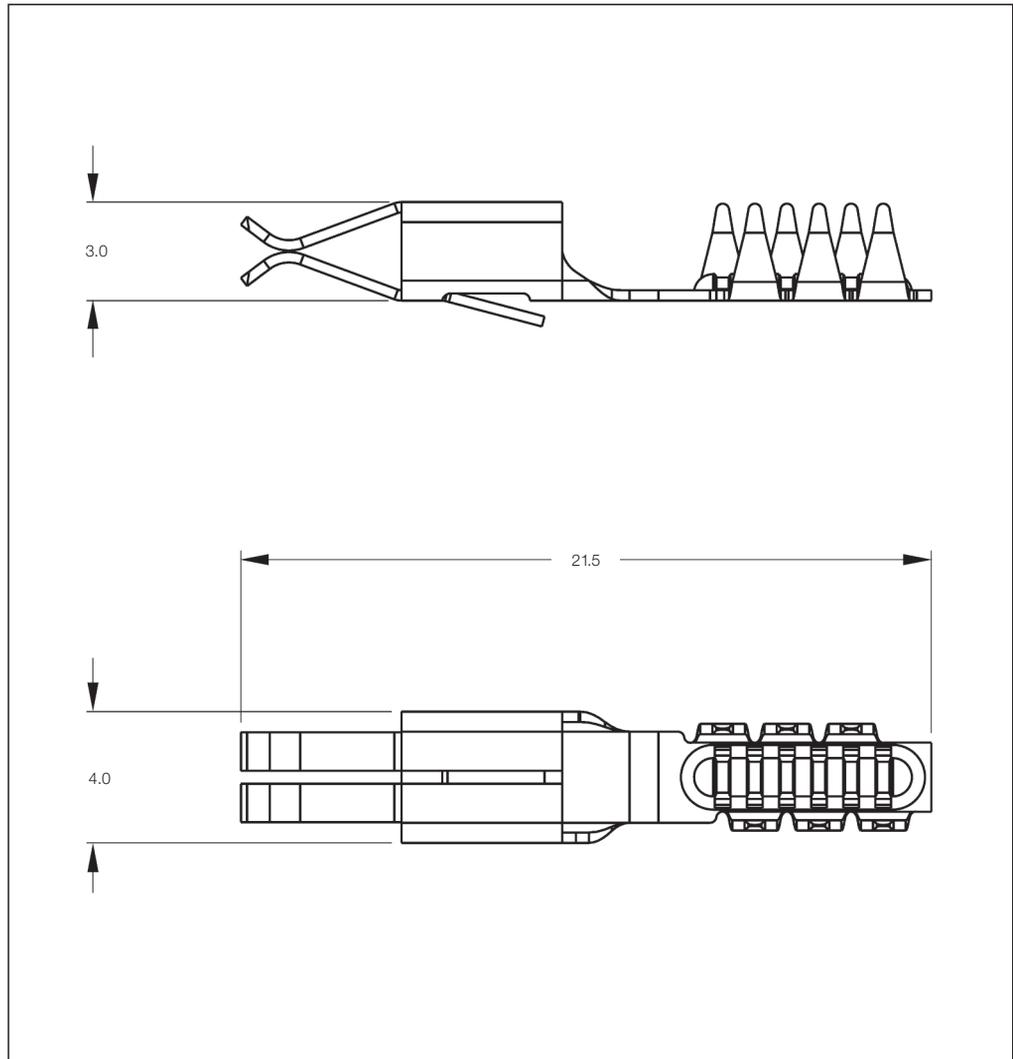
4–200  $\mu\text{m}$

**Product Specification:**

108-18053

**Application Specification:**

114-18409



**Receptacle Contacts**

Wire Size Range* (mm <sup>2</sup> )	Insulation Diameter*		Material and Finish	Part Numbers				Machines* and Applicators	Hand Tool
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity		
–	–	–	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 TE Connectivity for details.

Solder Pin – Foil – Multiple Crimp

**Technical Features**

**Contact Material:**

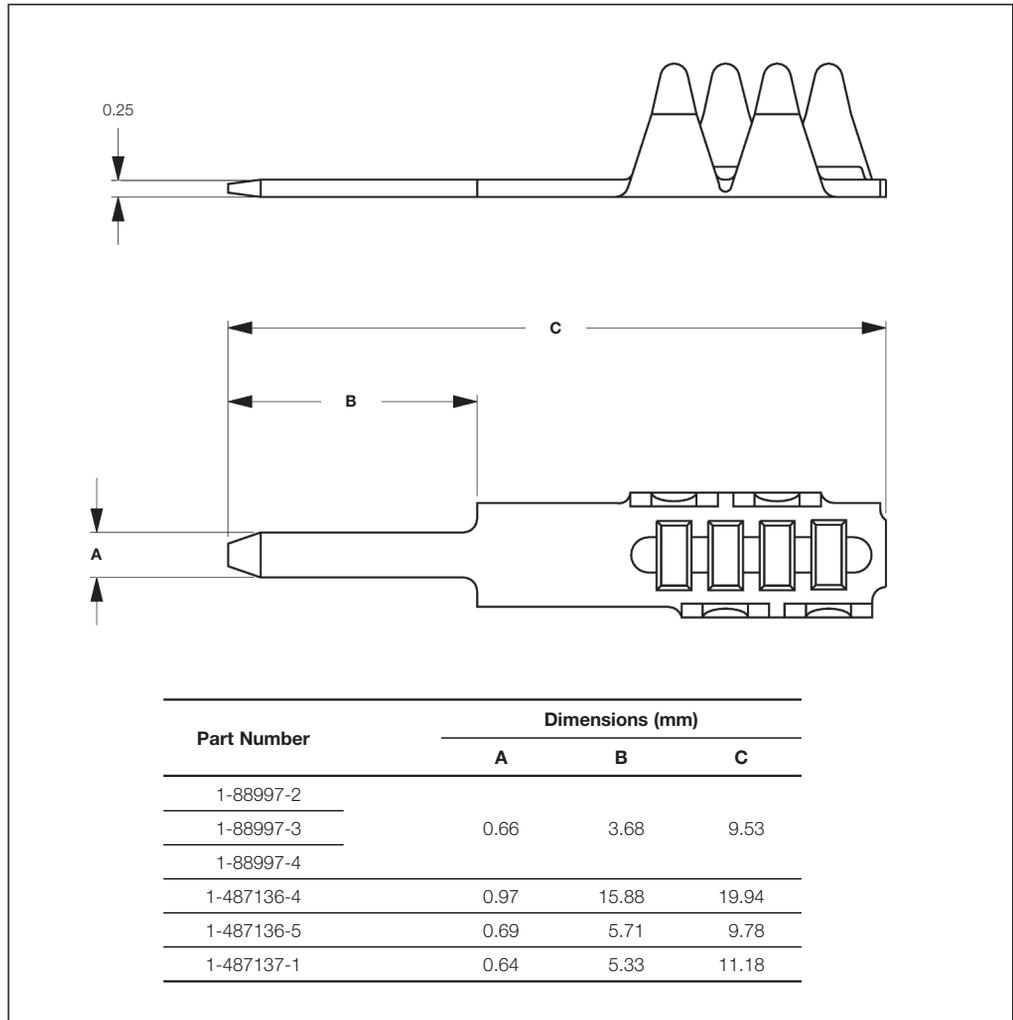
Phosphor Bronze

**Contact Finish:**

pre-tin plated,  
selective gold plated on request

**Application Specification:**

114-16015



**Multiple Crimp**

Wire Size Range* (mm <sup>2</sup> )	Insulation Diameter*		Material and Finish**	Part Numbers				Machines* and Applicators	Hand Tool
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity		
			1	1-88997-2	15,000				
			2	1-88997-3	15,000	-	-	318619-x	90273-5
			3	1-88997-4	15,000			528000-7 with 5-528441-7	1-528013-1
			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 TE Connectivity for details.

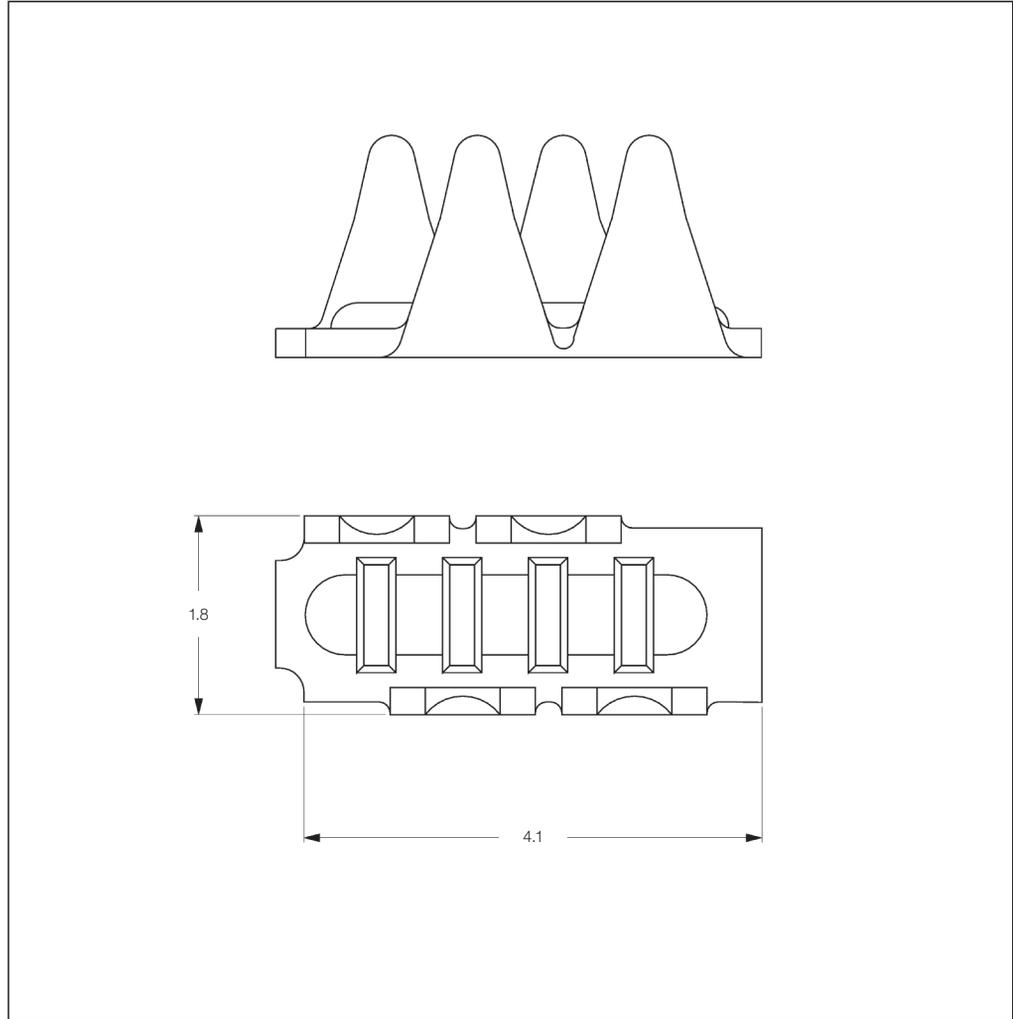
Splice System – Foil – Multiple Crimp

**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 <sup>2</sup> )	Insulation Diameter*		Material and Finish	Part Numbers				Applicator	Hand Tool
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity		
–	–	–	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:  $\leq 3 \text{ m}\Omega$

**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  $\mu\text{m}$

**Extruded Foil Thickness:**

> 600  $\mu\text{m}$

**Extraction Tools:**

Part Nos. **91092-1,**

**91093-1,**

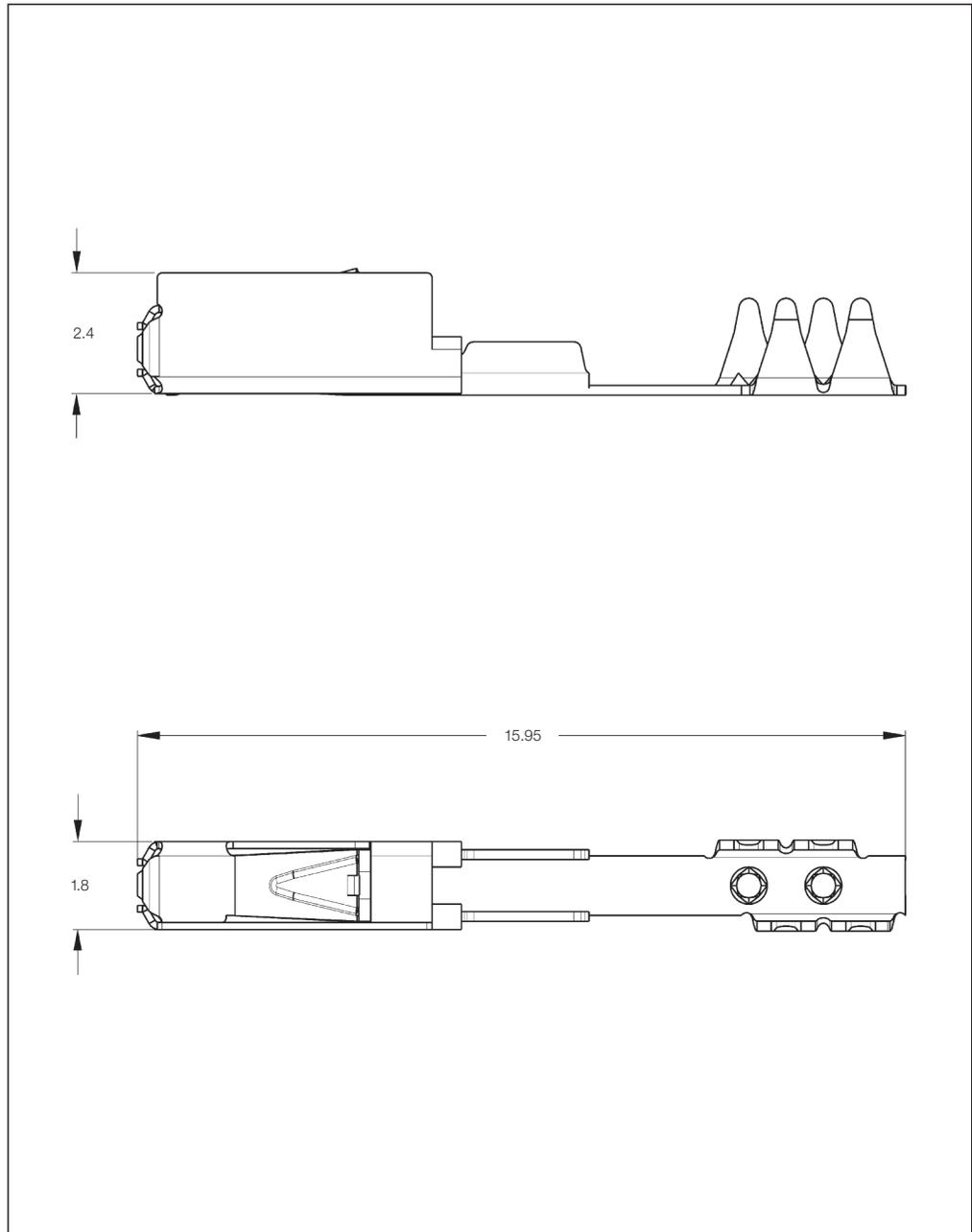
**91047-x**

**Product Specification:**

108-18030

**Application Specification:**

114-18287



**Extruded Foil**

Wire Size Range* (mm <sup>2</sup> )	Insulation Diameter*		Material and Finish	Part Numbers				Machines* and Applicators	Hand Tool
	FLK (mm)	FLR (mm)		Strip Form	Package Quantity	Loose-Piece	Package Quantity		
–	–	–	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 TE Connectivity for details.