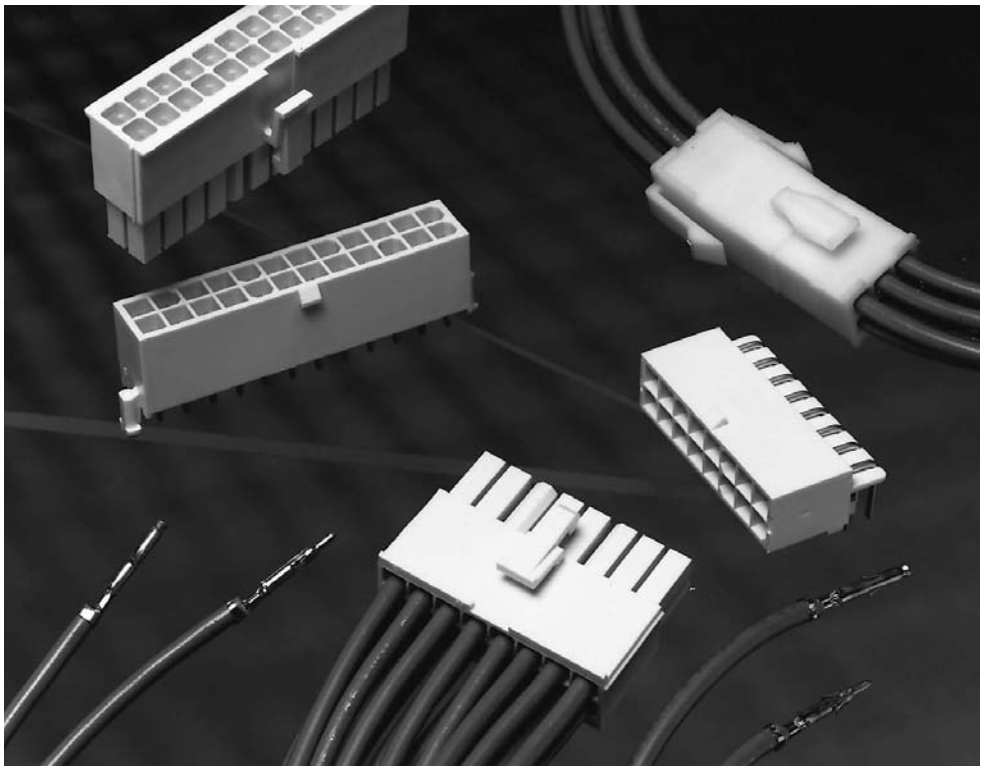
Mini-Universal MATE-N-LOK Connectors

Product Facts

- **Compact, durable housings**
- **Pins and sockets can be accommodated in the same housings**
- **Contacts fully protected in the housings. Both pins and sockets can be used on the power supply wiring**
- **Fully polarized to provide proper plug-to-cap mating incorporating a positive locking mechanism to help prevent accidental disengagement of mated connectors. Also facilitates panel mounting**
- **Free-hanging or panel mount**
- **Housings available in 1, 2, 3, 4, 6, 9, 12 and 15 circuit configuration for wire-to-wire connection**
- **Connectors can be mounted to .031-.079 [0.79-2.00] thick panels**
- **Printed circuit board pin headers are available in 2 thru 24 circuit vertical and right-angle configurations**
- **Hermaphroditic housings available in 2, 3 and 4 circuits for free-hanging applications**
- **Low insertion/extraction forces**
- **Contacts accept wire size range 30-16 AWG [.05-1.2 mm^2]**
- **Test probe contacts available**
- **.163 [4.14] centerline spacing**
- **Not for interrupting current**
- **Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476**
- **Certified by Canadian Standards Association, File No. LR 7189**



Performance Characteristics

The Mini-Universal MATE-N-LOK Connector performance characteristics found on pages 83-84 are based on free-hanging and panel mount connectors, loaded with contacts crimped on stranded wire.

Low Level Termination Resistance
20 milliohms max. total resistance between wire crimps of a mated pin and socket

Dielectric Withstanding Voltage—
1.5 KVAC between adjacent circuits

Insulation Resistance—
1000 megohms minimum between adjacent circuits

Voltage Rating—600 V AC or DC

Contact Retention—8 lb. min. per contact

Durability—20 cycles, mating and unmating

Technical Documents

Product Specifications

108-1542 Mini-Universal MATE-N-LOK Connectors

108-1543 Mini-Universal MATE-N-LOK Headers

108-5151 Mini-Universal MATE-N-LOK Connectors (UL94V-2)

108-5138 Mini-Universal MATE-N-LOK Connectors (UL94V-0)

Application Specification

114-16017 Mini-Universal MATE-N-LOK Connectors

Instruction Sheets

408-3234 Mini-Universal MATE-N-LOK Connectors

411-5105 Mini-Universal MATE-N-LOK Connectors

Catalog 82181
Revised 4-08
www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803
South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

Mini-Universal MATE-N-LOK Connectors (Continued)

Performance Characteristics (Continued)

Maximum Current—Maximum current rating of Mini-Universal MATE-N-LOK connectors is limited by the maximum operating temperature of the housings which is 105°C including the temperature rise of the contacts which is a maximum of 30°C. There are several variables which have a direct effect on this maximum current-carrying capability for a given connector and must be considered for each application. These variables are:

Wire Size—Larger diameter wire will carry more current since it has less internal resistance to current flow and thus generates less heat. Longer wire lengths also enhance current-carrying capabilities since the wire conducts heat away from the connector.

Connector Size—In general, the more circuits in a connector, the less current can be carried.

Ambient Temperature—The higher the ambient temperature, the less current can be carried in any given connector.

Printed Wiring Board Conductor Size—The finished trace conductor width and thickness should be maximized to allow for the greatest current-carrying capacity and heat dissipation.

Mini-Universal MATE-N-LOK connectors also will withstand the following tests:

Housing Panel Retention—26 lb. min.

Housing Lock Strength—9 lb. min.

Thermal Shock— –55°C to +105°C

Temperature-Humidity Cycling—25°C to 65°C at 95 RH

Vibration—10-55-10 cycles per minute at .06 inch total excursion

Physical Shock—18 drops, 50 G half-sine at 11 milliseconds

Current Rating Verification for 30°C Maximum Temperature Rise 100% Energized

Wire-to-Wire
Mini-Universal MATE-N-LOK Connectors — Calculated Current Table

Number of Circuits	Wire AWG						
	16	18	20	22	24	26	30
2	9.50	9.00	7.50	6.00	5.00	4.00	3.00
3	8.50	8.00	7.00	5.50	4.50	4.00	3.00
4	8.00	7.00	6.00	5.00	4.50	3.50	2.50
6	7.00	6.50	5.50	4.50	4.00	3.00	2.50
9	6.00	5.50	4.50	4.00	3.50	3.00	2.00
12	6.00	5.50	4.50	3.50	3.00	2.50	2.00
15	5.50	5.00	4.00	3.50	3.00	2.50	2.00

Values are based on initial Temperature Rise versus Current Testing and are intended to be a guide in the selection of a connector family. All applications should be tested by the end user. The values listed are per circuit, for fully loaded housings being 100% energized. **Note:** All combinations above were not tested and this chart contains interpolated and extrapolated values.

Minimum Wire Lengths for T-Rise vs. Current Testing

AWG	Min. Length (in.)	AWG	Min. Length (in.)
30	2.6	18	9.4
28	3.2	16	11.3
26	4.1	14	13.7
24	5.1	12	16.4
20	7.8	10	19.3

Note: If wire lengths used are less than those listed above, the current-carrying ability of the system will be reduced due to less heat being conducted away from the connector. The customer should fully test all applications.

Wire-to-Board

Due to the vast differences in trace geometry and printed circuit board configurations, we are unable to provide a separate current carrying chart for our printed circuit board header products. However, the above Wire-to-Wire charts may be used as a guideline for headers if the trace width and thickness is equal to the listed wire gauge. For vertical headers, only 95% of the Wire-to-Wire value should be used. For right-angle headers, only 75% of the Wire-to-Wire value should be used. The chart values are only a tool for connector selection and will require the customer to fully test their application.

Termination Resistance/Contact Crimp Tensile Force

Wire Size		Termination Resistance		Contact Crimp Tensile Force	
AWG	mm²	Test Current (Amps)	Resistance Milliohms (Max. Init.)	Force (Min.) lbs.	Force (Min.) N
30	.05	—	—	—	—
28	.08	—	—	—	—
26	.12	—	—	4	18
24	.2	—	—	7	31
22	.3	—	—	11	49
20	.5	—	—	13	58
18	.8	—	—	15	67
16	1.2	—	—	18	80

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803
South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

Mini-Universal MATE-N-LOK Connectors (Continued)

Mini-Universal MATE-N-LOK Connector Mating Combinations

Connector Part Number				Mating Connector Part Number					
					PC Board Pin Headers				
						Vertical			Right-Angle
Number of Circuits	Flammability Rating	Style	Plug[1] Housing Part No.	Cap[1] Housing Part No.	Plating	With Drain Holes	Without Drain Holes	Blindmate	With Board Lock
1	UL94V-2	In-Line	172335-1	172327-1[4]	—	—	—	—	—
	UL94V-0	In-Line	172164-1	172156-1[4]	Tin[6]	—	—	—	1-794374-0
					Duplex[5]	—	—	—	1-794374-1
2	UL94V-2	In-Line	172336-1	172328-1[2]	—	—	—	—	—
				172343-1[4]	—	—	—	—	—
			172807-1[3]	172807-1[3]	—	—	—	—	—
	UL94V-0	In-Line	173956-1[3]	173956-1[3]	—	—	—	—	—
			172165-1	172157-1[2]	Tin[6]	1-770166-0	1-770872-0	—	1-770966-0
				172233-1[4]	Duplex[5]	1-770166-1	1-770872-1	—	1-770966-1
			794894-1[7]	794896-1[2,7]	Tin/Duplex	1-770166-1	1-770872-1	—	1-770966-1
3	UL94V-2	In-Line	172808-1[3]	172808-1[3]	—	—	—	—	—
			172337-1	172329-1[2]	Tin	—	—	—	—
				172344-1[4]	Duplex[5]	—	—	—	—
	UL94V-0	In-Line	173957-1[3]	173957-1[3]	—	—	—	—	—
			172166-1	172158-1[2]	Tin	1-770170-0	1-770873-0	—	1-770967-0
				172234-1[4]	Duplex[5]	1-770170-1	1-770873-1	—	1-770967-1
4	UL94V-2	Dual Row	172809-1[3]	172809-1[3]	—	—	—	—	—
			172338-1	172330-1[2]	—	—	—	—	—
	UL94V-0	Dual Row	173958-1[3]	173958-1[3]	—	—	—	—	—
			172167-1	172159-1[2]	Tin	1-770174-0	1-770874-0	1-794325-0	1-770968-0
					Duplex[5]	1-770174-1	1-770874-1	1-794325-1	1-770968-1
			794805-1[7]	794939-1[2,7]	Tin/Duplex	1-770174-1	1-770874-1	—	1-770968-1
6	UL94V-2	Dual Row	172339-1	172331-1[2]	—	—	—	—	—
	UL94V-0	Dual Row	172168-1	172160-1[2]	Tin	1-770178-0	1-770875-0	1-794326-0	1-770969-0
					Duplex[5]	1-770178-1	1-770875-1	1-794326-1	1-770969-1
			794895-1[7]	794940-1[2,7]	Tin/Duplex	1-770178-1	1-770875-1	—	1-770969-1
8	UL94V-0	Dual Row	770579-1	—	Tin	1-794065-0	1-794073-0	1-794327-0	1-770970-0
					Duplex[5]	1-794065-1	1-794073-1	1-794327-1	1-770970-1
			794821-1[7]	794941-1[2,7]	Tin/Duplex	1-794065-1	1-794073-1	—	1-770970-1
9	UL94V-2	Matrix	172340-1	172332-1[2]	—	—	—	—	—
	UL94V-0	Matrix	172169-1	172161-1[2]	Tin	1-770182-0	1-770876-0	1-794432-0	—
					Duplex[5]	1-770182-1	1-770876-1	1-794432-1	—
10	UL94V-0	Dual Row	770580-1	—	Tin	1-770743-0	1-770858-0	1-794328-0	1-770971-0
					Duplex[5]	1-770743-1	1-770858-1	1-794328-1	1-770971-1
			794781-1[7]	794942-1[2,7]	Tin/Duplex	1-770743-1	1-770858-1	—	1-770971-1
12	UL94V-2	Matrix	172341-1	172333-1[2]	—	—	—	—	—
	UL94V-0	Matrix	172170-1	172162-1[2]	Tin	1-770186-0	1-794040-0	1-794329-0	—
					Duplex[5]	1-770186-1	1-794040-1	1-794329-1	—
		Dual Row	770581-1	—	Tin	1-794066-0	1-770621-0	—	1-770972-0
					Duplex[5]	1-794066-1	1-770621-1	—	1-770972-1
14	UL94V-0	Dual Row	770582-1	—	Tin	1-794067-0	1-794074-0	—	1-770973-0
					Duplex[5]	1-794067-1	1-794074-1	—	1-770973-1
15	UL94V-2	Matrix	172342-1	172334-1[2]	—	—	—	—	—
	UL94V-0	Matrix	172171-1	172163-1[2]	Tin	1-770190-0	1-770859-0	1-794330-0	—
					Duplex[5]	1-770190-1	1-770859-1	1-794330-1	—
16	UL94V-0	Dual Row	770583-1	—	Tin	1-794068-0	1-794075-0	—	1-770974-0
					Duplex[5]	1-794068-1	1-794075-1	—	1-770974-1
18	UL94V-0	Dual Row	770584-1	—	Tin	1-794069-0	1-794076-0	—	1-794105-0
					Duplex[5]	1-794069-1	1-794076-1	—	1-794105-1
20	UL94V-0	Dual Row	770585-1	—	Tin	1-794070-0	1-794077-0	—	1-794106-0
					Duplex[5]	1-794070-1	1-794077-1	—	1-794106-1
22	UL94V-0	Dual Row	770586-1	—	Tin	1-794071-0	1-794078-0	—	1-794107-0
					Duplex[5]	1-794071-1	1-794078-1	—	1-794107-1
24	UL94V-0	Dual Row	770587-1	—	Tin	1-794072-0	1-794079-0	—	1-794108-0
					Duplex[5]	1-794072-1	1-794079-1	—	1-794108-1

[1]Mini-Universal MATE-N-LOK plug and cap housings accept pin or socket contacts. Use the appropriate contacts in the plug housing as required by the mating connector. All **Plugs** are **free-hanging** and **Caps** are **free-hanging** or **panel mount,** unless otherwise noted.
[2]Panel mount only.
[3]Hermaphroditic: Mates to itself.
[4]Free-hanging only.
[5]Duplex Finish — Plated with .000030 [.000762] min. gold in mating area and matte tin on solder tail end over .000050 [.00127] min. nickel underplate on entire contact.
[6]Tin Finish — Plated with .000150 [.00381] min. tin over .000050 [.00127] min. nickel underplate on entire contact.
[7]For Splash-Proof Sealing.
Note: All part numbers are RoHS Compliant.

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803
South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

Mini-Universal MATE-N-LOK Connectors (Continued)

Contacts

Pin diameter .039 [0.99]

Material

Brass or Phosphor bronze

Stock Thickness .008 [0.20]

These contacts are to be used in Mini-Universal MATE-N-LOK Plug or Cap housings only.

Related Product Data

Product Specifications

108-1542 Mini-Universal MATE-N-LOK Connectors

108-1543 Mini-Universal MATE-N-LOK Headers

Application Specification

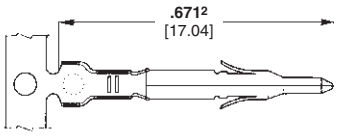
114-16017 Mini-Universal MATE-N-LOK Connectors

Performance Characteristics— pages 83-84

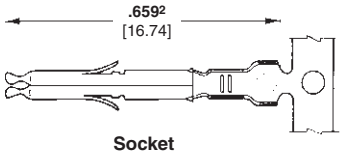
Housings — pages 87-89

Technical Documents— pages 83 and 205-206

Application Tooling— pages 207-210



Pin



Socket

Wire Size Range AWG [mm²]	Ins. Dia. Range	Material and Finish	Contact Part Numbers: Pin, Strip Form	Pin, Loose Pieces	Socket, Strip Form	Socket, Loose Pieces	HDM Applicator Part No.	Hand Tool Part No.
30-26 [.05-.12]	.035-.050 .889-1.27	Brass, Pre-tin	770835-1	794059-1	770834-1	794058-1	567418-1[3] 567418-2[3] 567418-3[3]	90717-2
		Phos. Brz., Pre-tin	—	—	770834-4	—		
		Brass, Duplex[1]	1-770835-0	1-794059-0	1-770834-0	1-794058-0		
		Phos. Brz., Duplex[1]	—	—	1-770834-1	—		
26-22 [.12-.3]	.047-.069 1.19-1.75	Brass, Pre-tin	770901-1	770985-1	770902-1	770986-1	567066-3[4] 567066-4[4] 567066-5[4]	91529-1
		Phos. Brz., Pre-tin	—	—	770902-4	—		
		Brass, Duplex[1]	1-770901-0	1-770985-0	1-770902-0	1-770986-0		
		Phos. Brz., Duplex[1]	—	—	1-770902-1	—		
22-18 [.3-.8] or 22 x (2) [.3]	.059-.094 1.50-2.39 or .067 x (2) 3.38	Brass, Pre-tin	770903-1	770987-1	770904-1	770988-1	567067-1[3] 567067-2[3] 567067-3[3]	91522-1
		Phos. Brz., Pre-tin	—	—	770904-4	—		
		Brass, Duplex[1]	1-770903-0	1-770987-0	1-770904-0	1-770988-0		
		Phos. Brz., Duplex[1]	—	—	1-770904-1	—		
20-16 [.5-1.2] or 20 x (2) [.5]	.079-.126 2.01-3.20 or .075 x (2) 1.91	Brass, Pre-tin	794406-1[2]	171638-1[2]	794407-1[2]	171639-1[2]	680582-2[3] 680582-3[3]	91536-1
		Phos. Brz., Pre-tin	—	—	794407-4[2]	—		
		Brass, Duplex[1]	1-794406-0[2]	—	1-794407-0[2]	—		
		Phos. Brz., Duplex[1]	—	—	1-794407-1[2]	—		

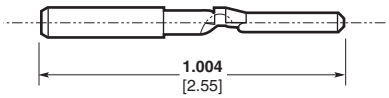
[1] Duplex Finish — Plated with .000030 [.000762] min. gold in mating area and .000100 [.00254] min. tin in crimping area over .000050 [.00127] min. nickel underplate on entire contact.
[2] .671 [17.04] and .659 [16.74] dimensions are .689 [17.50] for indicated part numbers.
[3] HDM Applicator part number ending in -1 is used on AMPOMATOR CLS Machine with T or G Terminators, -2 is used on AMP-O-LECTRIC Model K Machine, -3 is used on AMP-O-ELECTRIC Model G Machine. See pages 207-210 for further information.
[4] HDM Applicator part number ending in -3 is used on AMPOMATOR CLS Machine with T or G Terminators, -4 is used on AMP-O-LECTRIC Model K Machine, -5 is used on AMP-O-LECTRIC Model G Machine. See pages 207-210 for further information.

Note: All part numbers are RoHS Compliant.

Keying Plug

Material

UL94V-0 Nylon, white color

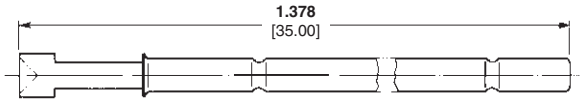


Part Number
174670-1

Test Probe Contact

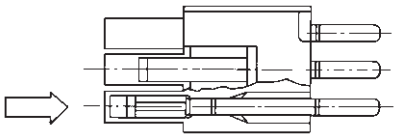
Material and Finish

Phosphor bronze, nickel plated



Part Number
172971-1

Notes:
1. The test probe is inserted into the housing in the same direction as indicated by the **arrow** shown to the right.
2. The test probe can be used in the Cap or Plug Housing.
3. Test probes are supplied unassembled.



Contact Extraction Tool
No. 189727-1
IS 408-4118

Contact Insertion Tool
(For inserting contacts applied to small diameter wire)
No. 91002-1
IS 408-7347

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803
South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208