

3 mm Micro MATE-N-LOK* Connectors x Molex Connectors

1. INTRODUCTION

1.1. Purpose

Testing was performed on the TE Connectivity (TE) product line 3 mm Micro MATE-N-LOK Connectors assembled with counterpart of competitor to determine its conformance to the requirements of product specification 108-1836 Rev E.

1.2. Scope

This report covers the electrical and environmental performance of 3 mm Micro MATE-N-LOK Connectors. Testing was performed at the Shanghai Electrical Components Test Laboratory between the following date ranges December 27th, 2019 and February 24th, 2020. The test file number for this testing is TP-19-03189.

1.3. Conclusion

All part numbers listed in Paragraph 1.4 conformed to the electrical and environmental performance requirements of the specification 108-1836 revision E and met its requirements, except for test Low Level Contact Resistance listed in the figure 3 as rejected.

1.4. Test Specimens

The specimens listed in figure 1 were subjected to the sequences listed in figure 2.

Number	Male					Female				QTY
	Housing		Wire			Housing		Wire		
3P	1	TE header	2-1445055-3	---	---	Molex Rec.	43645-0300	43030-0001	---	8
	2	Molex Header	43650-0302	---	---	TE Rec.	1445022-3	794606-1	794607-1	8
8P	1	Molex Header	43650-0815	---	---	TE Rec.	1445022-8	794606-1	794607-1	6
	2	TE Plug	1445049-8	1-794608-0	1-794609-0	Molex Rec.	43645-0800	43030-0001	---	6
	3	TE Header	2-1445050-8	---	---	Molex Rec.	43645-0800	43030-0001	43030-0004	6
	4	Molex Plug	43640-0801	43031-0004	43031-0004	TE Rec.	1445022-8	794606-1	---	5

Figure 1

1.5. Test Sequence

Test or Examination	Test Groups (a)	
	1	2
	Test Sequence (b)	
Examination of Product	1	1
Low Level Contact Resistance	2, 6	
Temperature Rise	3, 7	
Humidity and Temperature Cycling	4	5
Temperature Life	5	
Insulation Resistance		2, 6
Dielectric Withstanding Voltage		3, 7
Thermal Shock		4


NOTE

- a) See Paragraph 1.4.
 b) Numbers indicate sequence in which tests shall be performed.

Figure 2

1.6. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

- Temperature: 15°C to 35°C
- Relative Humidity: 20% to 80%

2. SUMMARY OF TESTING

2.1.

Test Group	Specimen	Data Points	Condition				Requirement	Judge
				Min	Max	Mean		
1	TE Rec + Molex Plug (8P)		Examination of Product	No Damage			No Damage	Approved
		24	Low Level Contact Resistance Initial	4.70	34.81	10.90	20 mΩ max.	Rejected
		6	Temperature Rise Initial	4.0	15.8	7.7	30° C max.	Approved
		20	Humidity and Temperature Cycling	No Damage			No Damage	Approved
		20	Temperature Life	No Damage			No Damage	Approved
		24	Low Level Contact Resistance Final	5.09	33.44	13.10	20 mΩ max.	Rejected
		6	Temperature Rise Final	3.9	14.0	9.3	30° C max.	Approved
1	TE Plug + Molex Rec. (8P)		Examination of Product	No Damage			No Damage	Approved
		24	Low Level Contact Resistance Initial	3.57	5.46	4.58	20 mΩ max.	Approved
		6	Temperature Rise Initial	1.9	2.9	2.4	30° C max.	Approved
		20	Humidity and Temperature Cycling	No Damage			No Damage	Approved
		20	Temperature Life	No Damage			No Damage	Approved
		24	Low Level Contact Resistance Final	3.39	6.50	4.72	20 mΩ max.	Approved
		6	Temperature Rise Final	2.7	3.9	3.1	30° C max.	Approved

1	Molex Header + TE Rec. (8P)		Examination of Product	No Damage			No Damage	Approved
		24	Low Level Contact Resistance Initial	2.97	4.32	3.56	20 mΩ max.	Approved
		6	Temperature Rise Initial	2,4	3,2	2,8	30° C max.	Approved
		20	Humidity and Temperature Cycling	No Damage			No Damage	Approved
		20	Temperature Life	No Damage			No Damage	Approved
		24	Low Level Contact Resistance Final	3.52	40.81	7.59	20 mΩ max.	Rejected
		6	Temperature Rise Final	3.9	5.4	4.6	30° C max.	Approved
1	TE Header + Molex Rec. (8P)		Examination of Product	No Damage			No Damage	Approved
		24	Low Level Contact Resistance Initial	3.01	7.93	4.50	20 mΩ max.	Approved
		6	Temperature Rise Initial	2.9	4.3	3.5	30° C max.	Approved
		20	Humidity and Temperature Cycling	No Damage			No Damage	Approved
		20	Temperature Life	No Damage			No Damage	Approved
		24	Low Level Contact Resistance Final	2.55	25.81	9.08	20 mΩ max.	Rejected
		6	Temperature Rise Final	3.1	6.4	4.4	30° C max.	Approved
1	Molex Header + TE Rec. (3P)		Examination of Product	No Damage			No Damage	Approved
		12	Low Level Contact Resistance Initial	2.16	3.78	3.06	20 mΩ max.	Approved
		6	Temperature Rise Initial	1.4	2.0	1.7	30° C max.	Approved
		20	Humidity and Temperature Cycling	No Damage			No Damage	Approved
		12	Temperature Life	No Damage			No Damage	Approved
		12	Low Level Contact Resistance Final	2.26	15.48	5.51	20 mΩ max.	Approved
		6	Temperature Rise Final	2.4	6.3	3.7	30° C max.	Approved
1	TE Header + Molex Rec. (3P)		Examination of Product	No Damage			No Damage	Approved
		12	Low Level Contact Resistance Initial	2.67	3.79	3.00	20 mΩ max.	Approved
		6	Temperature Rise Initial	1.4	1.8	1.7	30° C max.	Approved
		20	Humidity and Temperature Cycling	No Damage			No Damage	Approved
		12	Temperature Life	No Damage			No Damage	Approved
		12	Low Level Contact Resistance Final	2.57	19.19	4.38	20 mΩ max.	Approved
		6	Temperature Rise Final	1.4	3.3	2.6	30° C max.	Approved
2	TE Rec + Molex Plug (8P)		Examination of Product	No Damage			No Damage	Approved
		15	Insulation Resistance Initial ($\times 10^{11}\Omega$)	0.96	24.16	15.74	1000 MΩ min.	Approved
		10	Dielectric Withstanding Voltage Initial	No breakdown			No breakdown	Approved
		15	Thermal Shock	No damage			No damage	Approved
		20	Humidity and Temperature Cycling	No damage			No damage	Approved
		15	Insulation Resistance Final ($\times 10^{11}\Omega$)	0.42	2.20	0.94	1000 MΩ min.	Approved
		10	Dielectric Withstanding Voltage Final	No breakdown			No breakdown	Approved

2	TE Plug + Molex Rec. (8P)		Examination of Product	No Damage			No Damage	Approved
		15	Insulation Resistance Initial ($\times 10^{11}\Omega$)	0.99	26.11	18.26	1000 M Ω min.	Approved
		15	Dielectric Withstanding Voltage Initial	No breakdown			No breakdown	Approved
		15	Thermal Shock	No damage			No damage	Approved
		20	Humidity and Temperature Cycling	No damage			No damage	Approved
		15	Insulation Resistance Final ($\times 10^{11}\Omega$)	0.45	3.21	1.46	1000 M Ω min.	Approved
		10	Dielectric Withstanding Voltage Final	No breakdown			No breakdown	Approved
2	Molex Header + TE Rec. (8P)		Examination of Product	No Damage			No Damage	Approved
		15	Insulation Resistance Initial ($\times 10^{11}\Omega$)	11.65	27.01	18.63	1000 M Ω min.	Approved
		15	Dielectric Withstanding Voltage Initial	No breakdown			No breakdown	Approved
		15	Thermal Shock	No damage			No damage	Approved
		20	Humidity and Temperature Cycling	No damage			No damage	Approved
		15	Insulation Resistance Final ($\times 10^{11}\Omega$)	0.80	2.38	1.37	1000 M Ω min.	Approved
		10	Dielectric Withstanding Voltage Final	No breakdown			No breakdown	Approved
2	TE Header + Molex Rec. (8P)		Examination of Product	No Damage			No Damage	Approved
		15	Insulation Resistance Initial ($\times 10^{11}\Omega$)	10.12	24.65	16.93	1000 M Ω min.	Approved
		15	Dielectric Withstanding Voltage Initial	No breakdown			No breakdown	Approved
		15	Thermal Shock	No damage			No damage	Approved
		20	Humidity and Temperature Cycling	No damage			No damage	Approved
		15	Insulation Resistance Final ($\times 10^{11}\Omega$)	0.73	7.98	2.35	1000 M Ω min.	Approved
		10	Dielectric Withstanding Voltage Final	No breakdown			No breakdown	Approved
2	Molex Header + TE Rec. (3P)		Examination of Product	No Damage			No Damage	Approved
		8	Insulation Resistance Initial ($\times 10^{11}\Omega$)	11.83	19.32	15.81	1000 M Ω min.	Approved
		8	Dielectric Withstanding Voltage Initial	No breakdown			No breakdown	Approved
		8	Thermal Shock	No damage			No damage	Approved
		20	Humidity and Temperature Cycling	No damage			No damage	Approved
		8	Insulation Resistance Final ($\times 10^{11}\Omega$)	0.56	1.74	0.90	1000 M Ω min.	Approved
		8	Dielectric Withstanding Voltage Final	No breakdown			No breakdown	Approved
2	TE Header + Molex Rec. (3P)		Examination of Product	No Damage			No Damage	Approved
		8	Insulation Resistance Initial ($\times 10^{11}\Omega$)	0.82	19.48	13.41	1000 M Ω min.	Approved
		8	Dielectric Withstanding Voltage Initial	No breakdown			No breakdown	Approved
		8	Thermal Shock	No damage			No damage	Approved
		20	Humidity and Temperature Cycling	No damage			No damage	Approved
		8	Insulation Resistance Final ($\times 10^{11}\Omega$)	0.76	3.48	1.38	1000 M Ω min.	Approved
		8	Dielectric Withstanding Voltage Final	No breakdown			No breakdown	Approved

Figure 3

3. TEST METHODS

3.1. Examination of Product

Visual Inspection: appearance, and function of specimens pursuant to the applicable inspection plan.

Requirements: Meets requirements of product drawing and no physical damage.

Test Method: EIA-364-18 B.

3.2. Low Level Contact Resistance

Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage.

Requirements: 20 m Ω Max.

Test Method: EIA-364-23C.

3.3. Temperature Rise

Stabilize at a single current level until 3 readings at 5 minutes intervals are within 1°C. Test current shall be maintained for a period approximately of 1 hour after thermal stability.

Requirements: 30 °C Max.

Test Method: EIA-364-70C.

3.4. Humidity and Temperature Cycling

Subject mated specimen to 10 cycles between 25°C and 65°C at 80-100% RH. Measurements to be recorded after specimens are held for 3 hours at ambient temperature and humidity. One cycle is 24 hours.

Requirement: No physical damage that would impair product performance.

Test Method: EIA-364-31F.

3.5. Temperature life

Subject mated specimens to 105°C for 500 hours.

Requirements: No visible defects or deviations, no cracks on the isolating parts.

Test Method: EIA-364-17C.

3.6. Insulation Resistance

Test between adjacent contacts of mated specimens with 500 v DC for 1 minute.

Requirements: 1000M Ω . Min.

Test Method: EIA-364-21E.

3.7. Dielectric Withstanding Voltage

Test between adjacent contacts of mated specimens with 1500 v AC. Remains 1 minute hold with no breakdown, flashover, or 0.5 milliampere maximum leakage.

Requirements: No breakdown or flashover.

Test Method: EIA-364-20F.

3.8. Thermal shock

Mated connector -40°C/30 min., 105°C/30 min. Making this a cycle, repeat 5 cycles.

Requirements: No physical damage.

Test Method: EIA-364-32G.