File E28476
Project 4788894143

July 15, 2019

REPORT

on

COMPONENT - Connectors for Use in Data, Signal, Control and Power Applications - Component

Tyco Electronics Corp
PA Dauphin 17057-3170, United States

DESCRIPTION

PRODUCT COVERED:

USR, CNR Component Connector,

Series. HMN-HD3-10-M, Cat. No. 2312733-2;
Series. HMN-HD3-10-F, Cat. No. 2312734-2;
Series. HMN-HD4-6-M, Cat. No. 2312735-2;
Series. HMN-HD4-6-F, Cat. No. 2312736-2;
Series. HMN-HD5-3-M, Cat. No. 2312737-2;
Series. HMN-HD5-3-F, Cat. No. 2312738-2;
Series. HMN-HDW5/3-4/4-M, Cat. No. 2312739-2;
Series. HMN-HDW5/3-4/4-F, Cat. No. 2312740-2.

GENERAL:

These devices are multi-pole connectors intended for factory assembly on where the acceptability of combinations is determined by UL LLC. The devices are identified as follows:

USR indicates investigation to United States Standards, UL 1977.

CNR indicates investigation to Canadian National Standards, C22.2 No. 182.3.

RATINGS:

Cat. Nos.	Voltage Vac/Vdc	USR Ampere (A)	CNR Ampere (A)	Conductor Sizes, AWG Str
2312733-2; 2312734-2	600	11.5	7.5	14
		Not assigned	Not assigned	16-28
2312735-2; 2312736-2	600	17.5	12	12
		Not assigned	Not assigned	22-14
2312737-2; 2312738-2	600	43	27.5	8
		Not assigned	Not assigned	16-10
2312739-2; 2312740-2	600	Power: 43	Power: 27.5	8
		Not assigned	Not assigned	16-10
		Signal: 11.9	Signal: 7.5	14
		Not assigned	Not assigned	28-16

Disconnecting Use - see Sec Gen for required marking

TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

Use - For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC.

Conditions of Acceptability - The following are among the considerations to be made when evaluating the device in the end-use product.

Interruption of Current

1. These devices are not suitable for interrupting the flow of current by connecting or disconnecting the mating connector.

Current-Carrying Capability and Current Ratings

2. These devices have been subjected to the Temperature test with the rated USR currents and maximum temperature rise and recorded temperature (adjusted to 25°C ambient) values tabulated below:

Cat Nos.	Wire Size AWG	Current, A	Maximum Temperature °C	
			Rise	Recorded Temperature
2312733-2	14	11.5	20.7	45.7
2312734-2	14	11.5	21.5	46.5
2312735-2	12	17.5	19.1	44.1
2312736-2	12	17.5	19.1	44.1
2312737-2	8	43	26.1	51.1
2312738-2	8	43	26.2	51.2
2312739-2	8	Power:43	28.2	53.2
	14	Signal:11.9	52.2	27.2
2312740-2	8	Power:43	50.8	25.8
	14	Signal:11.9	49.9	24.9

2A. These devices have been subjected to the Temperature test with the rated CNR currents and maximum temperature rise and recorded temperature (adjusted to 25°C ambient) values tabulated below:

Cat Nos.	Wire Size AWG	Current, A	Maximum Temperature °C	
			Rise	Recorded Temperature
2312733-2	14	7.5	8.5	33.7
2312734-2	14	7.5	7.8	33.0
2312735-2	12	12	11.3	35.6
2312736-2	12	12	10.4	34.6
2312737-2	8	27.5	11.5	36.5
2312738-2	8	27.5	10.6	35.8
2312739-2	8	Power:27.5	15.2	39.8
	14	Signal:7.5	11.8	36.7
2312740-2	8	Power:27.5	14.7	39.5
	14	Signal:7.5	13.0	37.8

Insulating Materials

3. These devices employ insulating materials with properties as tabulated below at the minimum thickness employed in the connector housing, the suitability of the insulating materials based on the documented values shall be determined in the end-use application. Please note the values specified in the table when multiple materials are indicated represent the minimum values for the group of materials.

Mold Stress testing was performed at 140˚C for 7 hours.

Cat. No.	Insulating Material (#)	Measured Minimum Thickness	Flame Class	HWI	HAI	RTI Elec Temperature,˚C (++)
2312733-2	A	0.35	+	-	-	130
2312734-2	A	0.40	+	-	-	130
2312735-2	A	0.42	+	-	-	130
2312736-2	A	0.59	+	-	-	130
2312737-2	A	0.35	+	-	-	130
2312738-2	A	0.67	+	-	-	130
2312739-2	A	0.55	+	-	-	130
2312740-2	A	0.55	+	-	-	130

Note:

(#) – Code for Insulating Body Material.

(+): Thickness is less than the minimum Recognized material thickness, as such no assigned Flame class. UL 746C (12mm) Flammability test conducted.
(++): These PLCs are based on the minimum Recognized material thickness.

A. Tyco RM 704654-1
1. Dielectric strength (kV/mm): -
2. CTI: 3

Mating Connectors

4. These devices have only been assessed for use with specific types of connectors within their product family. They have not been assessed to operate with any other similar devices from any other manufacturer. These devices have been assessed with the mating connectors as tabulated below.

Cat Nos.	Mating Connector Cat Nos.
2312733-2	2312734-2
2312735-2	2312736-2
2312737-2	2312738-2
2312739-2	2312740-2

Termination -

5. The crimp contacts as tabulated below are intended for crimp termination on stranded copper conductor using the automatic crimp machine and the hand tool showing in below two tables (for information purposes only).

Contact	Wire Size, AWG	Automatic Tool No.	Crimp Width (mm)	Crimp Height (mm)	Crimp Tensile Strength (Kg MIN)
2316815-1	28	2836130-1	1.40	0.92+/-0.03	1.2
	26	2836130-1	1.40	0.95+/-0.03	2.0
	24	2836130-1	1.40	1.00+/-0.03	3.0
2316815-2	24	2151080-1	1.57	1.04+/-0.05	3.0
	22	2151080-1	1.57	1.11+/-0.05	4.5
	20	2151080-1	1.57	1.20+/-0.05	7.5
2316815-3	20	2151018-1	2.29	1.18+/-0.05	7.5
1-2316815-8	18	2151018-1	2.29	1.30+/-0.05	12.0
	16	2151018-1	2.29	1.46+/-0.05	19.0
2316815-4	16	2151119-1	2.54	1.45+/-0.05	19.0
1-2316815-9	14	2151119-1	2.54	1.68+/-0.05	19.0
2316815-5	16	2151073-1	2.54	1.45+/-0.05	19.0
	14	2151073-1	2.54	1.68+/-0.05	19.0

Contact	Wire Size, AWG	Hand Tool No.	Crimp Width (mm)	Crimp Height (mm)	Crimp Tensile Strength (Kg MIN)
2316817-1	28	91565-1	1.40	0.92+0.04/-0.25	1.2
	26	91565-1	1.40	0.95+0.03/-0.28	2.0
	24	91565-1	1.40	1.00+0.03/-0.16	3.0
2316817-2	24	91559-1	1.57	1.04+0.05/-0.14	3.0
	22	91559-1	1.57	1.11+0.05/-0.14	4.5
	20	91559-1	1.57	1.20+0.05/-0.22	7.5
2316817-3	20	91558-1	2.29	1.18+0.05/-0.13	7.5
	18	91558-1	2.29	1.30+0.05/-0.25	12.0
	16	91558-1	2.29	1.46+0.06/-0.11	19.0
2316817-4	16	91560-1	2.54	1.45+0.07/-0.11	19.0
	14	91560-1	2.54	1.68+0.08-/0.11	19.0
2316817-5	16	91561-1	2.54	1.45+0.07/-0.11	19.0
	14	91561-1	2.54	1.68+0.08/-0.11	19.0

Contact	Wire Size, AWG	Automatic Tool No.	Crimp Width (mm)	Crimp Height (mm)	Crimp Tensile Strength (Kg MIN)
2298107-1	28	2836130-1	1.40	0.92+/-0.03	1.2
	26	2836130-1	1.40	0.95+/-0.03	2.0
	24	2836130-1	1.40	1.00+/-0.03	3.0
2298107-2	24	2151080-1	1.57	1.04+/-0.05	3.0
	22	2151080-1	1.57	1.11+/-0.05	4.5
	20	2151080-1	1.57	1.20+/-0.05	7.5
2298107-3	20	2151018-1	2.29	1.18+/-0.05	7.5
2298107-8	18	2151018-1	2.29	1.30+/-0.05	12.0
	16	2151018-1	2.29	1.46+/-0.05	19.0
2298107-4	16	2151119-1	2.54	1.45+/-0.05	19.0
2298107-9	14	2151119-1	2.54	1.68+/-0.05	19.0
2298107-5	16	2151073-1	2.54	1.45+/-0.05	19.0
	14	2151073-1	2.54	1.68+/-0.05	19.0

Contact	Wire Size, AWG	Hand Tool No.	Crimp Width (mm)	Crimp Height (mm)	Crimp Tensile Strength (Kg MIN)
2311162-1	28	91565-1	1.40	0.92+0.04/-0.25	1.2
	26	91565-1	1.40	0.95+0.03/-0.28	2.0
	24	91565-1	1.40	1.00+0.03/-0.16	3.0
2311162-2	24	91559-1	1.57	1.04+0.05/-0.14	3.0
	22	91559-1	1.57	1.11+0.05/-0.14	4.5
	20	91559-1	1.57	1.20+0.05/-0.22	7.5
2311162-3	20	91558-1	2.29	1.18+0.05/-0.13	7.5
	18	91558-1	2.29	1.30+0.05/-0.25	12.0
	16	91558-1	2.29	1.46+0.06/-0.11	19.0
2311162-4	16	91560-1	2.54	1.45+0.07/-0.11	19.0
	14	91560-1	2.54	1.68+0.08-/0.11	19.0
2311162-5	16	91561-1	2.54	1.45+0.07/-0.11	19.0
	14	91561-1	2.54	1.68+0.08/-0.11	19.0

Contact	Wire Size, AWG	Automatic Tool No.	Crimp Width (mm)	Crimp Height (mm)	Crimp Tensile Strength (Kg MIN)
1318985	~~20~~				
	~~18~~				
	~~16~~				
179955 917802 84696	16	2266273-2	2.79	1.90+/-0.05	19.0
	14	2266273-2	2.79	2.11+/-0.05	25.0
179956 917803 84695	12	2151086-2	4.06	2.32+/-0.05	32.0
	10	2151086-2	4.06	2.63+/-0.05	41.0
1318696 2174021 1981690 2316819	8	2266274-2	4.57	3.21+/-0.05	41.0
	8	2266274-2	4.57	3.33+/-0.05	41.0

Contact	Wire Size, AWG	Hand Tool No.	Crimp Width (mm)	Crimp Height (mm)	Crimp Tensile Strength (Kg MIN)
1318986	~~20~~				
	~~18~~				
	~~16~~				
316040 917804 2013594	16	234170-1	2.79	1.90+0.10/-0.09	19.0
	14	234170-1	2.79	2.11+0.12/-0.30	25.0
316041 917805 2013593	12	234171-1	4.06	2.32+0.11/-0.06	32.0
	10	234171-1	4.06	2.63+0.12/-0.37	41.0
1318697 1747443 2174022 1981691 2316820	8	1366044-1	4.57	3.21+0.08/-0.12	41.0

Contact	Wire Size, AWG	Automatic Tool No.	Crimp Width (mm)	Crimp Height (mm)	Crimp Tensile Strength (Kg MIN)
84696-1	16	2266273-2	2.79	1.90+/-0.05	19.0
	14	2266273-2	2.79	2.11+/-0.05	25.0
84695-1	12	2151086-2	4.06	2.32+/-0.05	32.0
	10	2151086-2	4.06	2.63+/-0.05	41.0

Contact	Wire Size, AWG	Hand Tool No.	Crimp Width (mm)	Crimp Height (mm)	Crimp Tensile Strength (Kg MIN)
2013594	16	234170-1	2.79	1.90+0.10/-0.09	19.0
	14	234170-1	2.79	2.11+0.12/-0.30	25.0
2013593	12	234171-1	4.06	2.32+0.11/-0.06	32.0
	10	234171-1	4.06	2.63+0.12/-0.37	41.0

Contact	Wire Size, AWG	Automatic Tool No.	Crimp Width (mm)	Crimp Height (mm)	Crimp Tensile Strength (Kg MIN)
1747415-2 1747416-2 1-1747416-2	14	1762119-2	3.05	1.90+/-0.05	21.8
	12	1762119-2	3.05	2.17+/-0.05	25.0
1747418-2	16	1762120-2	2.79	1.54+/-0.05	19.0
1747419-2 1-1747419-2	14	1762120-2	2.79	1.79+/-0.05	21.8
2040016-2	20	2266289-X	2.79	1.18+/-0.05	7.4
1-2040016-2	18	2266289-X	2.79	1.28+/-0.05	11.9
2040015-2	16	2266289-X	2.79	1.41+/-0.05	19.0

Contact	Wire Size, AWG	Hand Tool No.	Crimp Width (mm)	Crimp Height (mm)	Crimp Tensile Strength (Kg MIN)
1747498-2	14	1762129-1	3.05	1.90+0.07/-0.08	21.8
1747500-2 1-1747500-2	12	1762129-1	3.05	2.17+0.08/-0.07	25.0
1747499-2	16	1762130-1	2.79	1.54+0.06/-0.10	19.0
1747501-2 1-1747501-2	14	1762130-1	2.79	1.79+0.05/-0.11	21.8
2040586-1	20	2047670-1	2.79	1.18+0.11/-0.05	7.4
1-2040586-1	18	2047670-1	2.79	1.28+0.05/-0.09	11.9
2040587-1	16	2047670-1	2.79	1.41+0.05/-0.06	19.0
2288019-1	22	2255300-1	2.03	1.06+/-0.05	4.5
1-2288019-1 2288020-1	20	2255300-1	2.03	1.13+/-0.05	7.4

Miscellaneous

6. The enclosure of the device has live parts that may be exposed to user contact when the connector is energized. The device is suitable for use only within an acceptable enclosure.