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REPORT

on

COMPONENT - CONNECTORS FOR USE IN DATA, SIGNAL, CONTROL AND POWER APPLICATIONS

Tyco Electronics Corp.
Harrisburg, PA

DESCRIPTION

PRODUCT COVERED:

USR Component Connectors, Series Multi-Beam XL and Multi-Beam XLE Connectors.

Cat. Nos. SK-44146, SK-44146-001, SK-44146-002, SK-44146-003, SK-44146-011, SK-44146-012, SK-44146-013, SK-44147, SK-44147-002, SK-44147-003, SK-44147-011, SK-44147-012, SK-44147-013, SK-44147-001, 1450909, 1450909-1, 1450909-2, 1450909-3, 1450909-4, 1450909-5, 1450909-6, 1450909-7, 1450909-8, 1450909-9, 1-1450909-0, 1-1450909-1, 1-1450909-2, 9-1450909-0, 9-1450909-1, 9-1450909-2, 9-1450909-3, 9-1450909-4, 9-1450909-5, 9-1450909-6, 9-1450909-7, 1450916, 1450916-1, 1450916-2, 1450916-3, 1450916-4, 1450916-5, 1450916-6, 1450916-7, 1450916-8, 1450916-9, 1-1450916-0, 1-1450916-1, 8-1450916-0, 8-1450916-1, 8-1450916-2, 8-1450916-3, 8-1450916-4, 8-1450916-5, 8-1450916-6, 8-1450916-7, 8-1450916-8, 8-1450916-9, 9-1450916-0, 6450806, 1450900, 1450900-1, 1450900-2, 1450900-3, 1450900-5, 1450900-6, 2-6600330-6, 3-6450140-7

USR, CNR - Component Connectors, Series Multi-Beam Plus.

Cat. Nos. 2334531-2, 1450900-1, 2334506-9, 1-2321801-1, 1-2321802-1, 2321800-4, 2321801, 2323801-1, 2323801-2, 1-2323801-1, 1-2323801-2, 2321802, 2321802-1, 2321802-2, 1-2321802-1, 1-2321802-2, 2321800, 2334571-1, 2334508-8, 1-2321797-1, 1-2321798-1, 2321799-4, 2321797, 2321797-1, 2321797-2, 1-2321797-2, 2321797-3, 1-2321797-3, 2321797-4, 1-2321797-4, 2321798-1, 2321798-2, 1-2321798-2, 2321798-3, 1-2321798-3, 2321798-4, 1-2321798-4, 2321798, 2321799, 2321799-1, 2321799-2, 2321799-3, 2334549-2, 2334569-2, 1-2334532-1, 2334572-9, 2385033-1, 2387228-1

USR Component Connectors, Series Multi-Beam Plus.

Cat. Nos. 2449955-X, 2334543-X.

GENERAL:

For Series Multi-Beam XL and XLE, these devices are multi-pole connectors having a max of 27 power contacts and 84 signal contacts, intended for factory assembly onto printed wiring boards.

For Series Multi-Beam Plus, these devices are multi-pole connectors intended for factory assembly on printed wiring boards where the acceptability of combinations is determined by UL LLC. The devices are identified as follows:

USR - Products designated USR have been investigated using US requirements as noted in the Test Record.

CNR - Products designated CNR have been investigated using Canadian requirements as noted in the Test Record.

ELECTRICAL RATING (Current Interrupting)for Multi-Beam XL Series Only:

Contact Type	Power Contact	Signal Contact
Multi beam	20 A, 12 VDC	1 A, 12 V
Multi beam	50 A, 60 Vac	-
Multi beam	8 A, 265 V ac	-
Dual beam	20 A, 12 V dc	-
Dual Beam	8 A, 265 V ac	-
Disconnect Only	Power Contact	
Multi Beam	60 A 600 V ac	

For Series Multi beam XL and Multi beam XLE Only, disconnect use only:

Connector		Number of Power contact	USR Ratings for Power contact	Number of Signal contact	USR Ratings for Signal contact
			Voltage V AC/ Current A		Voltage V AC/ Current A
*Multi beam XL	Male Connector	Up to 4	250V AC/60A	Up to 24	-/-
	Female Connector				
Multi beam XLE(not extend to low power)	Male Connector	Up to 8	250V AC/60A	Up to 24	-/-
	Female Connector				

For Series Multi beam XL and Multi beam XLE Only, disconnect use only:

Connector		Number of Power pins	Number of Low Power pins	USR Ratings for Power contact and Low Power	Number of Signal pins	USR Ratings for Signal contact
				Voltage V AC/ Current A		Voltage V AC/ Current A
Multi beam XL	Male Connector	Up to 12	-	250V AC/60A	Up to 48	-/-
	Female Connector					
Multi beam XLE	Male Connector	Up to 12	Up to 8	250V AC/60A	Up to 48	-/-
	Female Connector					

for Series Multi-Beam Plus Only:

Connector	Number of pins	USR and CNR Ratings	
		Voltage V	Current A
2385033-1 @, 2387228-1 @	20 signal pins	60	1.5
	2 high-power pins	380	115
	5 low-power pins	566	35

Note:
@ - Ratings are not mutually exclusive.

Connector	**Number of pins**	**USR Ratings**	
		Voltage (V)	**Current (A)**
2449955-X, 2334543-X	**8 power pins**	**400**	**300**

Connector	Condition (1)	Number of pins (2)	USR and CNR Ratings	
			Voltage V	Current A
Male Connector, Conditions 1-6 1-2334532-1, Conditions 7-12	1	1 signal pin	60	8
	2	20 signal pins	60	2
	7	25 signal pins	60	4
	8	30 signal pins	60	3.7
	9	50 signal pins	60	3
	3	1 power pin	200	140
	4	4 power pins	200	95
	5	6 power pins	200	90
	6	16 power pins	283	75
	10	3 power pins	566	57.5
	11	5 power pins	566	50.5
	12	7 power pins	566	45.5
Female Connector, Conditions 1-6 2334572-9, Conditions 7-12	1	1 signal pin	60	8
	2	20 signal pins	60	2
	7	25 signal pins	60	4
	8	30 signal pins	60	3.7
	9	50 signal pins	60	3
	3	1 power pin	200	140
	4	4 power pins	200	95
	5	6 power pins	200	90
	6	16 power pins	283	75
	10	3 power pins	566	57.5
	11	5 power pins	566	50.5
	12	7 power pins	566	45.5

Note:
(1) These conditions are mutually-exclusive.
(2) The pins which will be electrically connected are determined by the external circuits.

Disconnecting Use - see Sec Gen for required marking

NOMENCLATURE: The Cat No. 2449955-X is designated as follows:

Example: ___X__
I

I: - X = 1-8, where X corresponds with the number of power pins and positions.

The Cat No. 2334543-X is designated as follows:

Example: ___X__
I

I: - X = 3, where X corresponds with the number of power pins and positions (X = 3 means 8 positions).

ENGINEERING CONSIDERATIONS (NOT FOR UL REPRESENTATIVE USE):

Use - For use only with complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Conditions of Acceptability - In order to be judged acceptable as a component of electrical equipment, the following conditions should be met.

TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE): (For Series Multi-Beam Plus)

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. The power multi beam contacts and dual beam contacts for the Multi-Beam XL Series devices have been investigated for the interruption of current by connecting and disconnecting the mating plug in accordance with the Overload, Temperature and Resistance to Arcing Test sequence in UL 1977, the Standard for Component Connectors for Use in Data, Signal, Control and Power Applications, First Edition at a test potential of 12 V dc, 30 A (representing 12 V dc, 20 A rating), and at a test potential of 265 V ac, 12A (representing 265 V ac, 8 A rating).

The signal contacts for these devices have not been tested for interrupting the flow of current by connecting or disconnecting the mating connector.

The Multi-Beam XLE Series devices have not been tested for interrupting the flow of current by connecting or disconnecting the mating connector.

Current-Carrying Capability and Current Ratings:

The Multi-Beam XLE Series devices have not been investigated for current carrying capability.

Series Multi-Beam Plus, these devices are not suitable for interrupting the flow of current by connecting or disconnecting the mating connector.

For disconnect use only. Series Multi-Beam XL and XLE are mold of Tyco RW 1573878, only current carrying capability for 4 power pin, are not suitable for interrupting the flow of current by connecting or disconnecting the mating connector.

Series Multi-Beam XL are mold of (Tyco Raw Material #1573428 and #2136745), only current carrying capability for 12 power pin, are not suitable for interrupting the flow of current by connecting or disconnecting the mating connector.

Series Multi-Beam XLE are mold of Tyco RW 1573428 and 2136745, only current carrying capability for 12 power pin and 8 low power, are not suitable for interrupting the flow of current by connecting or disconnecting the mating connector.

2. The Multi-Beam XL series devices have been subjected to the Temperature Test with the rated currents and maximum temperature rise values tabulated below. The conductors terminated by the device and other associated components are to be reviewed in the end-use to determine whether the temperature rise from the connector exceeds their maximum operating temperature ratings.

Contact	Current (Amps)	Maximum Temperature Rise (°C)	Maximum Temperature, °C Recorded
Power Multi beam (20 position)	30	18.5	-
Signal Multi beam	1	14.8	-
Power Multi beam (1 position)	48	11	-
Signal Multi beam (1 position)	3	20	-
Power Multi beam (5 position)	30	29.8	-
Power Multi beam (6 position)	15	36.8	-
Power Multi beam (6 position)	30	56.2	-
Power Multi beam (6 position)	45	83	-
Dual beam	20	19.5	-
Dual beam	8	5.1	-
Power Multi beam (4 position)	60	23.7	-
Power Multi beam (12 positions)	50	-	111.7

For Series Multi-Beam Plus, these devices have been subjected to the USR and CNR Temperature test with the rated currents and maximum temperature rise and recorded temperature (adjusted to 25°C ambient) values tabulated below:

Testing Group(1)	Multi-Beam Plus	Circuit	Current A	Wire Size AWG	Maximum Temperature °C	
					Recorded Temperature	Rise
1	Male Connector	1 signal pin	8	18	39.2	14.2
	Female Connector				37.0	12.0
2	Male Connector	20 signal pins	2	26	30.0	5.0
	Female Connector				29.9	4.9
3	Male Connector	1 power pin	140	0	50.2	25.2
	Female Connector				51.4	26.4
4	Male Connector	4 power pins	95	2	53.8	28.8
	Female Connector				54.9	29.9
5	Male Connector	6 power pins	90	2	54.1	29.1
	Female Connector				54.8	29.8
6	Male Connector	16 power pins	75	4	47.0	22.0
	Female Connector				46.6	21.6
7	Male Connector	25 signal pins	4	30	54.1	29.1
	Female Connector				53.7	28.7
8	Male Connector	30 signal pins	3.7	30	51.7	26.7
	Female Connector				54.5	29.5
9	Male Connector	50 signal pins	3	30	53.7	28.7
	Female Connector				53.4	28.5
10	Male Connector	3 power pins	57.5	10	51.5	26.5
	Female Connector				54.4	29.4
11	Male Connector	5 power pins	50.5	10	53.9	28.9
	Female Connector				53.6	28.6
12	Male Connector	7 power pins	45.5	10	54.4	29.4
	Female Connector				52.5	27.5

Note: (1) – The 12 groups are tested individually, not at the same time.

Cat No.	Circuit	Current A	Mounting or Wire Size	Maximum Temperature °C	
				Recorded Temperature	Rise
2385033-1	20 Signal Pins	1.5	Press-Fit on PWB	50.1	25.1
	5 Low-Power Pins	35		48.9	23.9
	2 High Power Pins	115		52.7	27.7
2387228-1	20 Signal Pins	1.5	Soldiered onto PWB	50.8	25.8
	5 Low-Power Pins	35		48.9	23.9
	2 High Power Pins	115		54.3	29.3

Cat No.	**Circuit**	**Current (A)**	**Mounting or Wire Size**	**Maximum Temperature °C**	
				Recorded Temperature	**Rise**
2449955-X	**8 Power Pins**	**300**	**Soldered onto PWB**	**77.8**	**52.8**
2334543-X	**8 Power Pins**	**300**	**Soldered onto PWB**	**84.1**	**59.1**

SPACING AND VOLTAGE RATINGS:

3. The Multi-Beam XL Series devices may be used at potentials not exceeding 250 V for the signal contacts and 600 V for the power contacts. Dielectric Withstand testing has not been conducted.

Dielectric Withstand testing at 1200Vac was conducted on the Multi Beam XL Series 4 pole (power) device.

Dielectric Withstand testing at 1120Vac was conducted on the Multi Beam XL Series (12 position) connector.

Dielectric Withstand testing at 1500Vac(Tyco Raw Material #1573428 and #2136745) was conducted on the Multi Beam XL (12 position) connector.

Dielectric Withstand testing at 1500Vac(Tyco Raw Material #1573428 and #2136745) was conducted on the Multi Beam XLE (12 position) for power and (8 position) low power connector.

INSULATING MATERIALS:

4. The operating temperature of these devices should not exceed the temperature rating of the insulating material, 120°C.

Product	Temperature	Raw Material Number
Multi-Beam XL, Multi-Beam XLE	120°C	704968 1573878 1573428 2136745

For Series Multi-Beam Plus, 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. Nos. 6450840-3 and Cat. No. 6450860-3, Mold Stress testing was performed at 160°C for 7 hours for Tyco RW 1573428.

Cat. Nos. 6450840-3 and Cat. No. 6450860-3, Mold Stress testing was performed at 165°C for 7 hours for Tyco RW 2136745.

Cat. Nos. 2334549-2 and 2334569-2, Mold Stress testing was performed at 250°C for 7 hours for R/C (QMFZ2) Polyplastics Co Ltd Laperos E130i(dd)(e)(f1).

Cat. Nos. 2385033-1 and 2387228-1, Mold Stress testing was performed at 150°C for 7 hours for Tyco Raw Material # 704968.

Cat. No. 2449955-X, Mold Stress testing was performed at 165°C for 7 hours for Tyco Raw Material # 2136867 (Grade: Vicnyl R61(f)NH)

Cat. No. 2334543-X, Mold Stress testing was performed at 140°C for 7 hours for Tyco Raw Material # 1573878 (Grade: E130i(dd)(e)(f2))

Multi-Beam Plus	Part	Insulating Material (#)	Measured Minimum Thickness	Flame Class	HWI	HAI	RTI Elec Temperature, °C
Male Connector, 1-2334532-1	Housing	A	0.3	V-0	4	0	130
	Terminal Insulation	A					
Female Connector, 2334572-9	Housing	A	0.3	V-0	4	0	130
	Terminal Insulation	A					
2334543-X	**Housing**	**A**	**0.51**	**V-0**	**4**	**0**	**130**
	Terminal Insulation						
2334549-2 and 2334569-2	Housing	E	0.75	V-0	2	0	240
	Terminal Insulation	E					
2385033-1 and 2387228-1	Housing	D	0.75	V-0	0	0	140
	Terminal Insulation	D					
2449955-X	**Housing**	**F**	**0.50**	**V-0**	**4**	**0**	**155**
	Terminal Insulation						

Multi-Beam XL Multi-Beam XLE	Insulating Material (#)	Measured Minimum Thickness	Flame Class	HWI	HAI	RTI Elec Temperature, °C
Male Connector	A or B or C or D	0.85 mm	V-0	4	0	140
Female Connector	A or B or C or D	0.5 mm	(+)	(++)	(++)	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.

(-): Refer to The report of the Issued: 2010-11-12 of the Cat. No. 2-6450870-3

*

A. Tyco RW 1573878
1. Dielectric strength (kV/mm): 39
2. CTI: 4

B. Tyco RW 1573428(color: black)
1. Dielectric strength (kV/mm): 34
2. CTI: 0

C. Tyco RW 2136745
1. Dielectric strength (kV/mm): 44
2. CTI: 0

D. Tyco RW 704968(color: black)
1. Dielectric strength (kV/mm): -
2. CTI: 1

E. Polyplastics Co Ltd Laperos E130i(dd)(e)(f1) (E106764)
1. Dielectric strength (kV/mm): 39
2. CTI: 4

F. Tyco RM No. 2136867
1. Dielectric strength (kV/mm): 44
2. CTI: 0

TERMINATIONS:

5. The printed-wiring-board terminals have not been evaluated for mechanical secureness. The construction of the container is to be reviewed when it is assembled to the particular printed wiring board used in the end-use application.

CONTACT:

6. The electrical and mechanical contact between the connector and the printed wiring board is to be judged in the end-use equipment.

MOUNTING:

7. The need to provide additional mounting hardware to mechanically secure the connector to the printed wiring board is to be determined in the end-use.

OPERATING TEMPERATURE:

8. The operating temperature of these devices should not exceed the temperature rating of the insulating materials employed.

Mating Connectors

9. For Series Multi-Beam Plus, 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.

Series	Mating Connector Series	Mating Connector Manufacturer
Multi-Beam Plus, Male Connector	Multi-Beam Plus, Female Connector	TYCO Electronics Corp

Miscellaneous

10. For Series Multi-Beam Plus, 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.