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REPORT

on

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

Tyco Electronics Corp.  
Harrisburg, PA

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## DESCRIPTION

## PRODUCT COVERED:

USR/CNR - Component Connectors: Standard Timer Series Connectors Cat. Nos. 3-1241965-2, 4-1241965-2, 3-1241965-5, 6-1241965-5, 3-1241965-7, 8-1241965-2, 2-1241965-2, 1-1241965-4, 4-1241965-7, 2-1241965-4, 3-1241965-4, 5-1241965-5, 5-1241965-7, x-2295787-x, 0-2178600-2, 3-2178600-2, 4-2178600-2, 5-2178600-2 and 1241983 with prefixes 0- to 8- and suffixes -2 to -3.

USR/CNR - Component Connectors: Standard Timer Series Connectors, Cat. Nos. 2345754-1, 2345753-1.

USR - Component Connectors: Standard Timer Series Connectors  
Cat. Nos. x-1241959-x, x-2178571-x, 2322917-x, x-2322912-x, 4-1241965-4, 5-1241965-4, 9-1241961-7, x-1241961-x, x-1241964-x, 2298443-x, x-1241981-x, and x-927742-x.

USR/CNR - Component Connectors: Standard Timer Series Connector, Cat. No. 9-1241961-8.

USR/CNR - Component Connectors: Standard Timer Series Connector, Cat. No. X-1241961-X(only for the terminal 927833-2).

USR, CNR - Component Connectors: Standard Timer Series Connectors, Cat. Nos. 1-964768-2, 2364739-2, 2364739-3, 2364739-4, 2364739-5, 1-2364739-2, 2-2364739-2, 3-2364739-2, 1-2364739-3, 2364736-7, 2364737-2, 2364737-5, 2364737-9, 1-2364737-1, 1-2364737-2, 6-927742-2, 6-1241965-4, 0-2178561-2, x-2315717-x, x-2364000-x (x=0-9, means different position numbers, Keycode or latch **location**), **2178930-3**, **x-2407487-Y**.

USR/CNR - Component Connector: Standard Timer Series Connectors, Cat. No. 1-2178029-3

USR/CNR - Component Connector: Standard Timer Series Connectors, Cat. Nos. 928309-7, 928309-8

## OBSOLETE:

The following Cat. No's. are not Recognized Connectors but are included in this list for reference purposes only:  
x-928343-x, x-928344-x, and x-964768-x.

## GENERAL:

These devices are multi-pole connectors employing contacts of the crimp termination type for use in electrical equipment where the acceptability of the combinations is determined by Underwriters Laboratories Inc. For specific catalog numbers see Pages 2A and 2B.

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.

## ENGINEERING CONSIDERATIONS (NOT FOR INSPECTOR USE):

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

RATINGS:

Table 1:

Housing	Contact	USR&CNR Rating			Positions number
		Voltage V	Ampere A	Wire Size AWG or mm <sup>2</sup>	
1-964768-2, 2364739-2, 2364739-3, 2364739-4, 2364739-5, 1- 2364739-2, 2- 2364739-2, 3- 2364739-2, 1- 2364739-3, 2364736-7, 2364737-2, 2364737-5, 2364737-9, 1- 2364737-1, 1- 2364737-2, 0- 2178561-2, x-2315717-x	926984-1	≤600	3	22	2 thru 11
	964201-1		5	20	
	964202-1		5	20	
	927831-1		6	18-14	
	964203-1		5	20	
	1862006-1		7	18	
	1862006-5		12	16	
	928820-1		12	16	
	926973-1		8	18	
	964203-5		8	16	
	964204-1		12	16	
	964204-5		12	16	
	927837-1		12	16	
	3-927837-1		12	16	
	2378282-1		3	22	
	2378282-1		5	20	
	<b>2178930-3, X-2407487-Y</b>		<b>926984-1</b>		
<b>3</b>		<b>22</b>			
<b>5</b>		<b>20</b>			
<b>5</b>		<b>20</b>			
<b>8</b>		<b>18</b>			
<b>12</b>		<b>16</b>			
6-927742-2	160691-2		5	20	2
	42460-2		12	16	
928309-7, 928309-8	160691-2	600	N/A	20	7, 8
5-1241965-5 6-1241965-4	926984-1	≤250	3	22	4 thru 5
	964201-1		5	20	
	964202-1		5	20	
	927831-1		6	18-14	
	964203-1		5	20	
	1862006-1		7	18	
	1862006-5		12	16	
	928820-1		12	16	
	926973-1		8	18	
	964203-5		8	16	
	964204-1		12	16	
	964204-5		12	16	
	927837-1		12	16	
	3-927837-1		12	16	
2378282-1	3	22			
2378282-1	5	20			

## RATINGS, CONTD:

Table 1:

Housing	Contact	USR&CNR Rating			Positions number
		Voltage V	Ampere A	Wire Size AWG or mm <sup>2</sup>	
X-1241961-X	927833-2	600	10	1.0mm <sup>2</sup>	2 thru 3
			16	1.5mm <sup>2</sup>	
			16	2.5mm <sup>2</sup>	
x-2364000-x	2364003-1	≤600	30	10	2 thru 4
	964203-1		25	12	
			16	14	
			10	16	
1862006-1	8	18			
1-2178029-3	964203 or 964204	250	-	16-18	-

NOMENCLATURE: The Cat No. X-2407487-Y is designated as follows:

Example:  $\frac{X}{I}$      $\frac{Y}{II}$

I: - X can be equal to 0-1, and represents polarization.

II: - Y can be equal to 2-3, and represents different positions.

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

1. These devices should be used only where they will not interrupt the current.

2. Only the following devices have been tested for current-carrying capability. Cat. No. 3-1241965-2, 4-1241965-2, 0-2178600-2, 3-2178600-2, 4-2178600-2, 5-2178600-2, 1241983 with prefixes 0- to 8- and suffixes -2 to -3, 1-964768-2, 6-927742-2, **1-1241965-1, 2178930-3, X-2407487-Y** with contacts as described in the following table.

Contact	Conductor AWG	Current A
<b>926984-1</b>	<b>24</b>	<b>2</b>
	22	3
	20	5
964201-1	20	5
	<b>18</b>	<b>8</b>
964202-1	18-14	6
927831-1	20	5
964203-1	18	7
1862006-1	16	12
1862006-5	16	12
928820-1	18	8
926973-1	16	8
160691-2	20	5
42460-2	16	12
964203-5	16	12
	16	12
964204-1	<b>14</b>	<b>16</b>
	<b>12</b>	<b>25</b>
	16	12
964204-5	16	12
927837-1	16	12
3-927837-1	16	12

Cat. No. 2825197-1 has been evaluated for the current carrying capability in housing 1241959-x with the following conductors and current.

Housing	Contact	Conductor Size	Current A	Temp. Rise
1241959-x	2825197-1	0.5mm <sup>2</sup>	5	10.1°C
1241959-x	2825197-1	0.8mm <sup>2</sup>	7	14.0°C
1241959-x	2825197-1	1.0 mm <sup>2</sup>	10	26.4°C

2A. Contact Cat. No. 2825197-1 assembled with housing 2315717-x, x-2178571-x, 2322917-x, 2322912-2, 1-2322912-2, 2-2322912-2, 2322912-3, 4-1241965-4, 5-1241965-4, 9-1241961-7 has rating with the following conductors and current.

Contact	Conductor Size	Current A
2825197-1	0.5mm <sup>2</sup>	5
2825197-1	0.8mm <sup>2</sup>	7
2825197-1	1.0 mm <sup>2</sup>	10

2B. Contact Cat. No. 964203 assembled with housing 2345754-1, 2345753-1, 9-1241961-8 has rating with the following conductors and current.

Contact	Conductor Size	Current A
964203	1.0mm <sup>2</sup>	10
964203	1.5mm <sup>2</sup>	16
964203	2.5mm <sup>2</sup>	16

2B1. Contact Cat. No. 927833-2 assembled with housing x-1241961-x has rating with the following conductors and current.

Contact	Conductor Size	Current A
927833-2	1.0mm <sup>2</sup>	10
927833-2	1.5mm <sup>2</sup>	16
927833-2	2.5mm <sup>2</sup>	16

2C. Contact Cat. No. 964204 assembled with housing 2345754-1, 2345753-1 has rating with the following conductors and current.

Contact	Conductor Size	Current A
964204	1.5mm <sup>2</sup>	16
964204	2.5mm <sup>2</sup>	16
964204	(2) 1.5mm <sup>2</sup>	16

\*

2D. 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:

Housing	Contact	Current A	Wire Size AWG	Maximum Temperature °C		Representative for Cat. No.
				Rise	Recorded Temperature	
1-964768-2	926984-1	5	20	6.8	31.8	NA
1-964768-2	928820-1	8	18	15.4	40.4	NA
1-964768-2	964203-5	12	16	15.1	40.1	NA
6-927742-2	10691-2	5	22	7.1	32.1	NA
6-927742-2	42460-2	12	18	19.6	44.6	NA
1-1241965-1	926984-1	5	20	10.8	35.8	All combination in RATINGS Table 1
1-1241965-1	928820-1	8	18	19.3	44.3	
1-1241965-1	964203-5	12	16	28.5	53.5	
x-2364000-x	2364003-1	30	10	29.5	54.5	NA
		25	12	24.5	49.5	NA
	964203-1	16	14	13.3	38.3	NA
		10	16	7.1	32.1	NA
		1862006-1	8	18	6.1	31.1

Housing	Contact	Current A	Wire Size mm <sup>2</sup>	Maximum Temperature °C		Representative for Cat. No.
				Rise	Recorded Temperature	
1-1241961-9	927833-2	10	1.0	13.8	38.8	X-1241961- X(with the terminal 927833-2)
1-1241961-9	927833-2	16	1.5	24.1	49.1	X-1241961- X(with the terminal 927833-2)

Housing	Contact	Current A	Wire Size mm <sup>2</sup>	Maximum Temperature °C		Representative for Cat. No.
				Rise	Recorded Temperature	
1- 2407487-3	926984-1	2	24 AWG	2.6	27.6	2178930-3,  X-2407487-Y
	926984-1	3	22 AWG	4.1	29.1	
	964201-1	8	18 AWG	11.9	36.9	
	964204-1	16	14 AWG	17.3	42.3	
	964204-1	25	12 AWG	26.8	51.8	



3. The suitability of the mounting means shall be determined in the end use.

4. The acceptability of the grounding connection shall be determined by the end product use engineer.

5. The electrical and mechanical suitability of the wiring terminals shall be determined in the end use.

6. The factory assembled contacts have been investigated for the following wire sizes and maximum tensile forces.

<u>Part No.</u>	<u>Wire Range (AWG)</u>	<u>Tensile Force (lb)</u>
927837	16	20
964201	20-18	8/20
964202	18-14	20
964203	18-14	20
964204	16-12	20
926984	24-20	8
1241174	16	20
1241834	18	20
927831-1	20	8
2825197-1	0.5mm <sup>2</sup>	8
2825197-1	0.8mm <sup>2</sup>	20
2825197-1	1.0mm <sup>2</sup>	20
964203	1.0mm <sup>2</sup>	20
	1.5mm <sup>2</sup>	25
	2.5mm <sup>2</sup>	35
927833-2	1.0mm <sup>2</sup>	20
	1.5mm <sup>2</sup>	25
	2.5mm <sup>2</sup>	35
964204	1.5mm <sup>2</sup>	25
	2.5mm <sup>2</sup>	35
	<b>12</b>	<b>35</b>
	(2) 1.5mm <sup>2</sup>	25
1862006-1	18	20
	16	20
928820-1	18	20
	16	20
964203-5	16	20
926973-1	16	20
160691-2	22	8
	20	10
	18	20
42460-2	22	8
	20	10
	18	20
2364003	10	40
	12	35
964203-1	14	25
	16	20
1862006-1	18	20

7. The placement of these devices within the equipment enclosure should be such that spacings between the live parts and the equipment are suitable for the particular application.

8. The adjacent poles of all devices except Series 1241965, 2295787 and Series 1241983 may be used at potentials not exceeding 600 V based on the spacings requirements of Paragraph 12.1 of UL 498. Dielectric testing has not been performed.

Cat. Nos. 0-2178600-2, 3-2178600-2, 4-2178600-2 and 5-2178600-2 and Series 1241983 may be used at potentials not exceeding 250V AC as Dielectric testing has only been performed on Cat. No. 1-1241965-1 at 1500 V AC.

Series 1241965, 2295787 may be used at potentials not exceeding 250V AC as Dielectric testing has only been performed on Cat. No. 1-1241965-1 at 1500 V AC.

Cat. No. 1241959-5 may be used at potentials not exceeding 250V. A dielectric withstand test has been conducted at 1500 Vac.

Cat. Nos. x-2178571-x, 2322917-x, x-2322912-x, 4-1241965-4, 5-1241965-4, 9-1241961-7, 9-1241961-8 may be used at potentials not exceeding 250V. A dielectric withstand test has been performed on Cat. Nos. 2315717-4, 2322917-4, 2322912-8 at 1500 Vac.

Cat. Nos. 2345754-1, 2345753-1, 1-2178029-3 may be used at potentials not exceeding 250V. A dielectric withstand test has been performed on Cat. No. 2345753-1 at 1500 Vac.

Cat. Nos. 1-964768-2, 0-2178561-2 may be used at potentials not exceeding 600V. A dielectric withstand test has been performed on Cat. No. 1-964768-2 at 2200 Vac.

Cat. No. 6-927742-2 may be used at potentials not exceeding 600V. A dielectric withstand test has been performed on Cat. No. 6-927742-2 at 2200 Vac.

Cat. Nos. 2364739-2, 2364739-3, 2364739-4, 2364739-5, 1-2364739-2, 2-2364739-2, 3-2364739-2, 1-2364739-3, 2364736-7, 2364737-2, 2364737-5, 2364737-9, 1-2364737-1, 1-2364737-2, 928309-7, **928309-8**, **2178930-3**, **X-2407487-Y** may be used at potentials not exceeding 600V. A dielectric withstand test has been performed on Cat. No. 1-2364737-1 at 2200 Vac.

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

10. The suitability of the insulating materials used in the molded bodies shall be judged in the end-use equipment.

11. The operating temperature of these devices should not exceed the temperature ratings of the insulating materials. These materials may be used interchangeably at a maximum temperature of 90°C except for Housing Series 2178029 with or without Prefix and Suffix which can be used at a maximum temperature of 120°C.

12. Housing Series 2178029 with or without Prefix and Suffix are molded in a thickness no less than 0.75mm and can employ any contact contained in this report. There are no assigned electrical ratings for this Housing.

12A. Series 1-2178029-3 can employ only contact 964203 or 964204

\* 13. Part Nos. 928309-7, 928309-8 use contact 160691-2, but have not been tested for current capability and do not have any assigned current rating.

Cat. No.	Description	Illustration No.
927740	Housing	1, 7, 8
928151	Housing	1, 10
928423	Housing	1, 19
*0-2178561-2	Housing	14A
*927742	Housing	1
6-927742-2	Housing	1A
928309	Housing	1
293267	Housing	59
928230	Housing	1
*927717	Housing	6
929043	Housing	9
928154	Housing	11
928345	Housing	18
928492	Housing	20, 21
964016	Contact	22
964017	Contact	23
964663	Housing	24
*1-964768-2	Housing	25A
964829	Housing	26
966307	Housing	27
966308	Housing	28
966664	Housing	29
927837	Contact	31
927837-1	Contact	31
3-927837-1	Contact	55
964204	Contact	33
964204-1	Contact	33
964204-5	Contact	33
1241174	Contact	34
1241834	Contact	35
*1241983	Housing	38, 50
1241959	Housing	40, 50
1241981	Housing	41, 42
964951	Housing	46

Cat. No.	Description	Illustration No.
1241964	Housing	47
2364736-7	Housing	47
2298443	Housing	60
1987456	Housing	48
1241965	Housing	49, 57
2364737-2, 2364737-5, 2364737-9, 1- 2364737-1, 1- 2364737-2	Housing	49A
1241980	Housing	49
964702	Housing	49
964983	Housing	49
964247	Housing	49
1703150	Housing	49
2178600	Housing	49

Cat. No.	Description	Illustration No.
1955422	Housing	49
*1241961	Housing	50, 58
*926984	Contact	51
926984-1	Contact	51
2378282-1	Contact	51A
964201	Contact	52
964202	Contact	53
1355048	Contact	54
964203	Contact	55
964203-1	Contact	55
964203-5	Contact	55
5-2178029-5, 4-2178029-4, 2-2178029-5, 9-2178029-3, 2178029-3, 2-2178029-2, -2178029-2, 1-2178029-3	Housing	56
2295787	Housing	61
2825197-1	Contact	62
2315717	Housing	63
x-2178571-x,	Housing	74
2322917	Housing	63
9-1241961-7	Housing	63
2322912	Housing	64
4-1241965-4	Housing	64
5-1241965-4		
5-1241965-5	Housing	64A
6-1241965-4	Housing	64A
2345754-1	Housing	65
2345753-1	Housing	66
9-1241961-8	Housing	67
927833-2	Contact	75
2364739-2, 2364739-3, 2364739-4, 2364739-5, 1-2364739-2, 2-2364739-2, 3-2364739-2, 1-2364739-3	Housing	68

Cat. No.	Description	Illustration No.
1862006-1	Contact	69
1862006-5	Contact	69
928820-1	Contact	70
926973-1	Contact	71
160691-2	Contact	72
42460-2	Contact	73
x-2364000-x	Housing	74
2364003-1	Contact	75
964203-1	Contact	76
1862006-1	Contact	77
928309-x	Housing	78
6-1241965-5	Housing	79
<b>2178930-3</b>	<b>Housing</b>	<b>80</b>
<b>X-2407487-Y</b>	<b>Housing</b>	<b>81</b>

The following illustrations are of connectors no longer Recognized in this report. They are included in this list for reference purposes only:

Cat. No.	Description	Illustration No.
928343	Housing	1, 14, 15
928344	Housing	1, 16, 17
928247	Housing	2, 12, 13
969484	Housing	5
964768	Housing	25
969484	Housing	36, 37
1241817	Housing	50
969484	Housing	50