

CERTIFICATE OF COMPLIANCE

Certificate Number 20130926-E28476
Report Reference E28476-20130925
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Issued to: TYCO ELECTRONICS CORP
2901 FULLING MILL RD, MIDDLETOWN PA 17057



This is to certify that representative samples of COMPONENT - CONNECTORS FOR USE IN DATA, SIGNAL, CONTROL AND POWER APPLICATIONS
Component Connector, Series No. HYB 20P

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 1977 - Component Connectors for Use in Data, Signal, Control and Power Applications
CAN/CSA C22.2 No. 182.3-M1987 - Special Use Attachment Plugs, Receptacles and Connectors

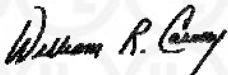
Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Recognized Component Marks for the U.S. and Canada should be considered as being covered by UL's Recognition and Follow-Up Service and meeting the appropriate U.S. and Canadian requirements.

The UL Recognized Component Mark for the U.S. generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark: , may be used in conjunction with the required Recognized Marks. The Recognized Component Mark is required when specified in the UL Directory preceding the recognitions or under "Markings" for the individual recognitions. The UL Recognized Component Mark for Canada consists of the UL Recognized Mark for Canada:  and the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory.

Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.

Look for the UL Recognized Component Mark on the product.



William R. Carney, Director, North American Certification Programs

UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at www.ul.com/contactus



DESCRIPTION

PRODUCT COVERED:

USR, CNR Component Connector, Series No. HYB 20P.

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.

| | | | | | | | | | | | |
|------------------|--|----|----|----|----|-----|--------------|---------|------|----|-------------------|
| Series No. | HYB 20P | | | | | | | | | | |
| Header Connector | CAP HSG(2R) P/M (P/N: 2188646-1, -2, -4, -6) | | | | | | | | | | |
| Plug Connector | PLUG HSG(2R) (P/N:2188645-1, -2, -4, -6) | | | | | | | | | | |
| | Inside Pole | | | | | | Outside Pole | | | | |
| Contact Number | Rated Current, A | | | | | | | | | | |
| | 16 Poles | | | | | | | 4 Poles | | | |
| Wire AWG | 26 | 24 | 22 | 20 | 18 | 16 | 2*24 | 2*20 | 2*18 | 20 | 18, 16 |
| Rated Current, A | 1.5 | 2 | 2 | 4 | 5 | 7.0 | 3 | 5.6 | 7 | 4 | 5 |
| Rated Voltage | 300 Vac/dc | | | | | | | | | | |

RATINGS:

Disconnecting Use - see Sec Gen for required marking

NOMENCLATURE:

The Series is designated as follows:

Example:

$$\frac{2188645}{A} - \frac{1}{B}$$

A - Series Name, may be 2188645, 2188646, 2888647.

B - Color Code, 1 means NATURAL, 2 means RED, 4 means YELLOW and 6 means BLUE.

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 currents and maximum temperature rise values tabulated below.

| Cat Nos. | Inside Poles (12 poles) Current, A | Maximum Temperature Rise, °C | Outside Poles (4 poles) Current, A | Maximum Temperature Rise, °C | Represent Series |
|---------------------------------|------------------------------------|------------------------------|------------------------------------|------------------------------|------------------|
| 2188645-1 mating with 2188646-1 | 1.5A (26 #AWG) | 5.3 | 4.0A (2*20 #AWG) | 8.7 | HYB 20P |
| | 2.0A (22 #AWG) | 4.1 | 5.0A (2*18 #AWG) | 5.9 | |
| | 2.8A (20 #AWG) | 4.6 | 2.8A (20 #AWG) | 6.5 | |
| | 3.5A (18 #AWG) | 6.2 | 3.5A (18 #AWG) | 6.9 | |
| | 7.0A (16 #AWG) | 6.5 | 5.0A (2*18 #AWG) | 13.2 | |
| | 2.0A (2*24 #AWG) | 3.3 | 4.0A (2*20 #AWG) | 4.4 | |
| | 2A (24 #AWG) | 9.4 | 4A (20 #AWG) | 7.7 | |
| | 4A (20 #AWG) | 14.2 | 5A (18 #AWG) | 11.6 | |
| | 5A (18 #AWG) | 13.1 | 7A (2*18 #AWG) | 11.7 | |
| | 3A (2*24 #AWG) | 9.3 | 5.6A (2*20 #AWG) | 8.9 | |

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.

| Cat. No. | Insulating Material (#) | Measured Minimum Thickness | Flame Class | HWI | HAI | RTI Elec | Max Operating Temp, °C |
|---------------------------------|-------------------------|----------------------------|-------------|-----|-----|----------|------------------------|
| CAP HSG (2R) P/M (P/N: 2188646) | A | 0.5 mm | V-0 | - | - | 75 | 75 |
| PLUG HSG (2R) (P/N:2188645) | | 0.5 mm | | | | | |

(#) - Code for Insulating Body Material.

A. Tyco Raw Material P/M 2136084

2. CTI: 0

Terminations

4. These devices are not suitable for use other than the wire as tabulated below.

| | | | | | | | | | | | |
|------------------|--------------------------------|----|----|----|----|----|------|--------------|------|----|---------------|
| Series No. | HYB 20P | | | | | | | | | | |
| Header Connector | CAP HSG(2R) P/M (P/N: 2188646) | | | | | | | | | | |
| Plug Connector | PLUG HSG(2R) (P/N:2188645) | | | | | | | | | | |
| | Inside Pole | | | | | | | Outside Pole | | | |
| Contact Number | 16 Poles | | | | | | | 4 Poles | | | |
| Wire AWG | 26 | 24 | 22 | 20 | 18 | 16 | 2*24 | 2*20 | 2*18 | 20 | 18, 16 |

Mating Connectors

5. 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.

| | |
|--------------------------------|-----------------------------|
| Cat No. | Mating Connector Cat No. |
| CAP HSG(2R) P/M (P/N: 2188646) | PLUG HSG(2R) (P/N:2188645) |

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.