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Project 97ME17936

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REPORT

on

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

AMP Incorporated  
Harrisburg, PA

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## DESCRIPTION

## PRODUCT COVERED:

Component - USR, CNR Series AMP MONO-SHAPE Connectors.

Cat. Nos. 282002, 282002-1, 1-282002-1, 282002-2, 1-282002-2, 282002-3, 1-282002-3, 282003-1, 1-282003-1, 282003-2, 1-282003-2, 282003-3, 1-282003-3, 282233-1, 282233-2, 1-282003-4, 1-282003-5, 282004-1, 1-282004-1, 282004-2, 1-282004-2, 282004-3, 1-282004-3, 282005-1, 1-282005-1, 282006-1, 282006-2, 1-282006-2, 282007-1, 1-282006-1, 282010-1, 1-282010-1, 282042, 282042-1, 1-282042-1, 282042-2, 1-282042-2, 282042-3, 1-282042-3, 282042-4, 1-282042-4, 282042-5, 1-282042-5, 282043-2, 1-282043-2, 282235-1, 282235-2, 282044-1, 1-282044-1, 282045-1, 1-282045-1, 282045-2, 1-282045-2, 1-282045-3, 282046-1, 1-282046-1, 282047-1, 1-282047-1, 282099, 282099-1, 1-282099-1, 284974, 284482, 1-284484-4, 1-284482-1, 1-284486-3, 1-284486-4, 1-284486-5, 1-284488-3, 1-284488-4, 1-484489-1, 1-484489-4, 1-284491-3, 1-284492-3, 3-284482-1, 3-284482-2, 3-284482-3, 3-284482-4, 3-284482-5, 3-284482-6, 3-284483-1, 3-284483-2, 3-284483-3, 3-284484-1, 3-284484-2, 3-284484-3, 3-284484-4, 3-284485-1, 3-284485-2, 3-284485-3, 3-284485-4, 3-284486-1, 3-284486-2, 3-284486-3, 3-284486-4, 3-284486-5, 3-284487-1, 3-284487-2, 3-284487-3, 3-284488-1, 3-284488-2, 3-284488-3, 3-284488-4, 3-284489-1, 3-284489-3, 3-284489-4, 3-284490-1, 3-284490-2, 3-284491-1, 3-284491-2, 3-284491-3, 3-284482-1, 3-284482-2, 3-284482-3, 4-284482-1, 4-284482-2, 4-284482-3, 4-284482-4, 4-284482-5, 4-284482-6, 4-284483-1, 4-284483-2, 4-284483-3, 4-284483-4, 4-284484-1, 4-284484-2, 4-284484-3, 4-284484-4, 4-284485-1, 4-284485-2, 4-284485-3, 4-284485-4, 4-284486-1, 4-284486-2, 4-284486-3, 4-284486-4, 4-284486-5, 4-284487-1, 4-284487-2, 4-284487-3, 4-284488-1, 4-284488-2, 4-284488-3, 4-284488-4, 4-284489-1, 4-284489-2, 4-284489-3, 4-284489-4, 4-284490-1, 4-284490-2, 4-284491-1, 4-284491-2, 4-284491-3, 4-284492-1, 4-284492-2, 4-284492-3, 284338, 1-284338-1, 1-284338-2, 1-284338-3, 1-284338-4, 1-284338-7, 1-284339-1, 1-284339-2, 1-284339-3, 1-284339-4, 1-284339-5, 0-293141-2, 0-293142-1, 0-293143-1, 0-293143-2, 1-284685-1, 1-284686-1, 2-284865-1, 1-284561-1, 1-282042-6, 1-284561-2, 1-284546-1, 3-282044-1, 1-284734-1, 0-284208-1, 1-284049-1, 1-284050-1, 1-284401-1, 1-282051-1, 1-282052-1, 2-282042-1, 2-282042-2, 2-282042-3, 2-282042-4, 2-282042-5, 2-282043-2, 2-282044-1, 2-282045-1, 2-282045-2, 2-282045-3, 2-282045-4, 2-282046-1, 2-282049-1, 2-282050-1, 2-282052-1, 282040, 282040-1, 282040-2, 282040-3, 284337-2, 1-282022-5, 1-282022-6, 1-282022-7, 2-282022-4,

## PRODUCT COVERED (Cont'd):

Component - USR, CNR Series AMP MONO-SHAPE Connectors.

Cat. Nos. 2-282022-5, 1-282023-4, 1-282023-5, 1-282023-6, 1-282024-3, 1-282025-3, 1-282025-5, 1-282026-6, 1-282027-3, 1-293006-7, 0-284086-3, 1-282030-2, 293491, 0-293491-2, 1-293491-2, 2-293491-2, 0-293491-3, 1-293491-3, 0-193491-4, 0-293491-8, 2297762-2, 1-2297762-2, 2297762-3, 2297762-4, 2297762-8, 1-282002-4, 1-282002-5, 3-282002-5, 1-282002-6, 1-282002-7, 1-282002-8, 2-282002-9, 3-282002-0, 3-282002-4, 5-282002-4, 6-282002-0, 4-282003-1, 1-282003-6, 1-282003-7, 3-282003-3, 3-282003-4, 3-282003-5, 3-282003-6, 1-284396-1, 2-282002-1, 2-282002-2, 2-282002-5, 2-282002-6, 2-282003-5, 2-282003-6, 1-282004-4, 3-282004-4, 4-282004-4, 1-284545-1, 1-284545-2, 1-284545-3, 1-293003-5, 1-282006-3, 2-282006-4, 1-284745-1, 1-284745-2, 1-284745-3, 1-284745-4, 1-282007-1, 2-282007-2, 2-282007-3, 3-282007-2, 1-284397-1, 1-293004-7, 2-293004-7, 0-284085-1, 0-284085-2, 2-282004-2, 2-282005-1, 1-282010-1, 0-284004-1, 2-282010-1, 2293382-2, 1-2293382-2, 2-2293382-2, 3-2293382-2, 4-2293382-2, 5-2293382-2, 2293382-3, 1-2293382-3, 2-2293382-3, 3-2293382-3, 4-2293382-3, 5-2293382-3, 6-2293382-3, 7-2293382-3, 2293382-4, 1-2293382-4, 2-2293382-4, 2293382-5, 1-2293382-5, 2293382-6, 2293382-7, 2-2293382-7, 2293382-8, 2293382-9, 1-2293382-0, **8-2293382-3, 7-2293382-2, 5-2293382-4**, 1-284561-3, 284546-2, 1-284733-1, 3-282045-4, 4-282046-1, 5-282046-1, 2-282047-1, 2-282047-3, 1-282049-1, 1-282050-1, 2293372-2, 2293372-3, 2293372-4, 2293372-5, 2293372-6, 2293372-7, 2293372-8, 2293372-9, 1-2293372-0, 2297072-1, 2297072-2, 2298752-2, 1-2298752-2, 2298752-3, 2298752-4, 2298752-5, 1-2298752-5, 2298752-6, 2298752-7, 2298752-8, 2298752-9, 1-2298752-0, 2298552-1, 2298552-2, 2333039-2, 1-2333039-2, 2333039-3, 2333039-4, 2333039-5, 2333039-6, 2333039-7, 2333039-8, 293143-3, 1-284685-2, 2-284685-1, 2293392-2, 2293392-3, 2293392-4, 2293392-5, 2293392-6, 2293392-7, 1-2293392-7, 2293392-8, 2293392-9, 1-2293392-0, 293141-2, 293143-1, 5-2301868-3, 5-2301868-4, 5-2301868-5, 5-2301868-0, 282086, 2293382-1, 4-282086-1, 4-282086-2, 4-282086-3, 1-282086-1, 1-282086-2, 1-282086-3, 1-282086-4, 1-282086-5, 1-282086-6, 1-282086-7, 1-282086-8, 1-282086-9, X-282046-X where X can be 0-6

## GENERAL:

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 above series may be identified as follows:

Type	Wire Size (AWG-str)	Rating	Ill.
Tab Connector	20	3 A, 380 V ac	1, 9, 10
	14	14 A, 380 V ac	
Single Way	20	3 A, 380 V ac	1, 9, 10
Tab Connector	14	16 A, 380 V ac	
PCB Connector	20	3 A, 380 V ac	2, 9, 11
	18	6 A, 380 V ac	
Satellite Conn.	20	3 A, 380 V ac	3
	14	16 A, 380 V ac	
Tab Connector (MKII)	16	16 A, 240 V ac	4
	18	10 A, 240 V ac	
	20	3 A, 240 V ac	
PCB Connector (MKII)	18	10 A, 240 V ac	5
	20	3 A, 240 V ac	
Tab Connector (MONO-SHAPE)	20	6 A, 240 V ac	6, 12
PCB Connector (MONO-SHAPE)	20	6 A, 240 V ac	6, 11, 14
Part Number	Wire Size (AWG-str)	Rating	Ill.
1-282086-2	20	6 A, 380 V ac	13
	18	6 A, 380 V ac	
	16	16A, 380 V ac	

\*USR - Indicates investigation to United States Standard **as referenced in the Test Record.**

\*CNR - Indicates investigation to Canadian National Standard **as referenced in the Test Record.**

## ENGINEERING CONSIDERATIONS (NOT FOR UL REPRESENTATIVE USE):

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

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. These devices have been investigated for the current ratings indicated above with the maximum temperature rises not exceeding 30°C.
3. The suitability of the mounting means shall be determined in the end use.
4. 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.
5. The electrical and mechanical contact between the connector and the printed circuit board is to be judged in the end-use equipment.
6. The suitability of the insulating materials used in the molded bodies shall be judged in the end-use equipment.
7. 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 65°C.
8. The following devices have been subjected to the Temperature test with the rated currents and maximum temperature rise and recorded temperature (adjusted to 25°C ambient) values tabulated below:

Series	Current, A	Maximum Temperature °C	
		Rise	Recorded Temperature
MONO-SHAPE Tab Connector	6	20.8	45.4
MONO-SHAPE PCB Connector	6	14.5	39.5

\*

9. The following 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
MONO-SHAPE Tab and PCB Connector	A	0.4 mm	(+)	--(++)	--(++)	65(++)	65
MONO-SHAPE Tab and PCB Connector	B	0.4 mm	V-0	--(++)	0(++)	140(++)	130
MONO-SHAPE Tab and PCB Connector(##)	C	0.4 mm	V-2	0	0	65	65
1-282086-2	C	0.4 mm	V-2	0	0	65	65

Note:

(#) - Code for Insulating Body Material.

- A. RM No. 704052; TAB - gray color, PCB - white color  
 1. Dielectric strength (kV/mm): --  
 2. CTI: 2
- B. RM No. 2136512; TAB - natural color, PCB - natural color  
 1. Dielectric strength (kV/mm): 6  
 2. CTI: 1
- \*C. RM No. 1573322-1  
 1. Dielectric strength (kV/mm): -  
 2. CTI: 2

(##) - Only for the models in ILL.1, ILL. 10 and ILL.11 with yellow background color, and the models in ILL.12 with green background color.

(+): 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.

#### Mating Connectors

10. 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.