

# MR301 Series

Document No. ER0046EJAV3SG00 (WWW-MR301)  
© NEC Corporation 1998



The MR301 series, which has a low profile package and light weight, is suited for various kinds of consumer equipments, industrial machines and automobiles.

## FEATURES

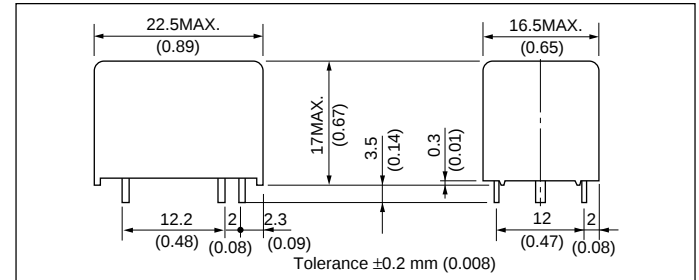
- Low profile, light weight.
- Two types of contact  
(General type: 5A switching, High power type; 10A switching)
- Fluxtight or washable package is available.
- UL recognized (E 73266), CSA certified (LR46266)

## SAFETY STANDARD AND RATING

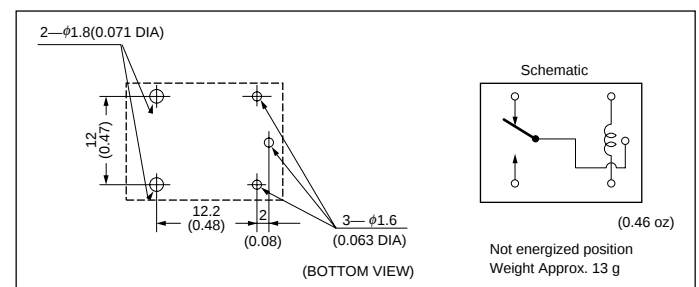
|                                                                                                                                                                                                                                     |                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ULRecognized (UL508)*<br>File No. E73266                                                                                                                                                                                            | CSA Certified<br>(CSA C22.2 No.14)<br>File No. LR46266                                                                                                                                                              |
| <b>MR301-**HU</b><br><br>1/2HP 240VAC<br>1/4HP 125VAC<br>30VDC, 7 A (Resistive)<br>60VDC, 1.0 A (Resistive)<br>277VDC, 5 A (Resistive)<br>120VDC, 10 A (Resistive)<br>360 W, 120VAC Tungsten<br>120VAC, 2 A Ballast<br>TV-2, 120VAC | <b>MR301-**HU</b><br><br>1/2HP 240VAC<br>1/4HP 125VAC<br>30VDC, 7 A (Resistive)<br>60VDC, 1.0 A (Resistive)<br>277VDC, 5 A (Resistive)<br>120VDC, 10 A (Resistive)<br>360 W, 120VAC Tungsten<br>120VAC, 2 A Ballast |
| <b>MR301-**U</b><br>1/4HP 240VAC<br>1/8HP 125VAC<br>30VDC, 5 A (Resistive)<br>277VDC, 2.5 A (Resistive)<br>120VDC, 5 A (Resistive)<br>130 W, 120VAC Tungsten<br>120VAC, 2 A Ballast                                                 |                                                                                                                                                                                                                     |

\* Spacing : UL114, UL478

## DIMENSIONS mm(inch)



## RECOMMENDED PCB PAD LAYOUT and SCHEMATICS mm (inch)



## PART NUMBER SYSTEM

|                                                      |                                                              |
|------------------------------------------------------|--------------------------------------------------------------|
| <b>MR301-3HUSL</b>                                   |                                                              |
| Nominal coil voltage<br>3, 5, 6, 9, 12, 24 Vdc       | Nil : 0.3 mm Standoff<br>L : 0.8 mm Standoff                 |
| Nil : General type (5A)<br>H : High power type (10A) | Nil : Fluxtight<br>S : Washtight                             |
|                                                      | Nil : Standard type<br>U : UL recognized, CSA certified type |

## ■ SPECIFICATIONS

at 20°C

| Items                           |                                            | Types (Contact Rating) | MR301<br>(5A)                                                                                                                       | MR301-H<br>(10A)                                    |
|---------------------------------|--------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
|                                 |                                            | Contact Form           | 1 Form c                                                                                                                            |                                                     |
| Contact Ratings                 | Maximum Switching Power (Resistive Load)   |                        | 150 W, 600 VA                                                                                                                       | 300 W, 1200 VA                                      |
|                                 | Maximum Switching Voltage (Resistive Load) |                        | 250 Vac, 30 Vdc                                                                                                                     |                                                     |
|                                 | Maximum Switching Current (Resistive Load) |                        | 5 A                                                                                                                                 | 10 A                                                |
|                                 | Minimum Switching Voltage and Current      |                        | 5 Vdc, 0.1 A                                                                                                                        | 5 Vdc, 1 A                                          |
|                                 | Initial Contact Resistance                 |                        | 8.8 mΩ typ. (measured by voltage drop at 5 Vdc, 0.5A)                                                                               | 8.8 mΩ typ. (measured by voltage drop at 5 Vdc, 2A) |
| Contact Material                |                                            |                        | Silver nickel alloy                                                                                                                 | Silver oxide complex alloy                          |
| Operate Time (Excluding bounce) |                                            |                        | Approx. 5 ms (at nominal voltage)                                                                                                   |                                                     |
| Release Time (Excluding bounce) |                                            |                        | Approx. 2 ms (at nominal voltage) without diode                                                                                     |                                                     |
| Nominal Operate Power           |                                            |                        | 360 mW                                                                                                                              |                                                     |
| Insulation Resistance           |                                            |                        | 1000 MΩ at 500 Vdc                                                                                                                  |                                                     |
| Breakdown Voltage               | Between open contacts                      |                        | 750 Vac (for one minute)                                                                                                            |                                                     |
|                                 | Between contacts and coil                  |                        | 1500Vac (for one minute)                                                                                                            |                                                     |
| Electrostatic Capacitance       | Between open contacts                      |                        | Approx. 1 pF                                                                                                                        |                                                     |
|                                 | Between contacts and coil                  |                        | Approx. 10 pF                                                                                                                       |                                                     |
| Shock Resistance                |                                            |                        | 98 m/s <sup>2</sup> (10G) (misoperating), 980 m/s <sup>2</sup> (100G) (destructive failure)                                         |                                                     |
| Vibration Resistance            |                                            |                        | 10 to 300 Hz, 43 m/s <sup>2</sup> (4.4G)(misoperating),<br>10 to 500 Hz, 43 m/s <sup>2</sup> (4.4G), 200 hours destructive failure) |                                                     |
| Ambient Temperature             |                                            |                        | -40 to +85 °C (-40 to +185 °F)                                                                                                      |                                                     |
| Coil Temperature Rise           |                                            |                        | 50 °C / W (122 °F/W)                                                                                                                |                                                     |
| Running Specifications          | Non load                                   |                        | 10 × 10 <sup>6</sup> operations                                                                                                     |                                                     |
|                                 | Load                                       |                        | 100 × 10 <sup>3</sup> operations                                                                                                    |                                                     |
| Weight                          |                                            |                        | Approx. 13g(0.46 oz)                                                                                                                |                                                     |

## ■ COIL RATING

at 20°C

| Nominal Voltage | Coil Resistance (Ω) ± 10 % | Must Operate Voltage* (Vdc) | Must Release Voltage* (Vdc) |
|-----------------|----------------------------|-----------------------------|-----------------------------|
| Vdc             | 3                          | 2.1                         | 0.3                         |
|                 | 5                          | 3.5                         | 0.5                         |
|                 | 6                          | 4.2                         | 0.6                         |
|                 | 9                          | 6.3                         | 0.9                         |
|                 | 12                         | 8.4                         | 1.2                         |
|                 | 24                         | 16.8                        | 2.4                         |

\* Test by pulse voltage

**The information in this document is based on documents issued in April, 1998 at the latest. The information is subject to change without notice. For actual design-in, refer to the latest publications of data sheet, etc., for the most up-date specifications of the device.**

No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Corporation. NEC Corporation assumes no responsibility for any errors which may appear in this document.

NEC Corporation does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from use of a device described herein or any other liability arising from use of such device. No license, either express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Corporation or others.

While NEC Corporation has been making continuous effort to enhance the reliability of its electronic components, the possibility of defects cannot be eliminated entirely. To minimize risks of damage or injury to persons or property arising from a defect in an NEC electronic component, customer must incorporate sufficient safety measures in its design, such as redundancy, fire-containment, and anti-failure features.

NEC devices are classified into the following three quality grades:

"Standard", "Special", and "Specific". The Specific quality grade applies only to devices developed based on a customer designated "quality assurance program" for a specific application. The recommended applications of a device depend on its quality grade, as indicated below. Customers must check the quality grade of each device before using it in a particular application.

Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

The quality grade of NEC devices is "Standard" unless otherwise specified in NEC's Data Sheets or Data Books. If customers intend to use NEC devices for applications other than those specified for Standard quality grade, they should contact NEC sales representative in advance.

Anti-radioactive design is not implemented in this product.