Solid State Relay
G3MC

Compact, Thin-profile, Low-cost SSR with Reinforced Insulation
• Small bottom surface area (approx. 80% of the conventional G3MB’s), ideal for close PCB mounting.
• DC input and AC output for an applicable load of 1A at 40°C.
• Compact, thin-profile SSR of monoblock construction with an all-in-one frame incorporates a PCB, terminals, and a heatsink.
• Approved by UL and CSA. VDE certified models available.
• Models with reinforced insulation are available.

Ordering Information
To Order: Select the part number and add the desired coil voltage rating, (e.g., G3MC-101P-DC12).

<table>
<thead>
<tr>
<th>Isolation</th>
<th>Zero-cross function</th>
<th>Built-in snubber circuit</th>
<th>Rated output load</th>
<th>Rated input voltage</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phototriac</td>
<td>Yes</td>
<td>Yes</td>
<td>1 A at 100 to 120 VAC (75 to 132 VAC)</td>
<td>5 VDC</td>
<td>G3MC-101P</td>
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<td></td>
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<td></td>
<td>12 VDC</td>
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<td>24 VDC</td>
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<td></td>
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<td></td>
<td></td>
<td>5 VDC</td>
<td>G3MC-101PL</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>12 VDC</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>24 VDC</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
<td>2 A at 100 to 240 VAC (75 to 264 VAC)</td>
<td>5 VDC</td>
<td>G3MC-202P</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12 VDC</td>
<td></td>
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<td>24 VDC</td>
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<td></td>
<td>5 VDC</td>
<td>G3MC-202PL</td>
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<td>12 VDC</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>24 VDC</td>
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</tr>
</tbody>
</table>

Note: 1. All models meet UL and CSA standards. In order to obtain VDE approved versions with UL, CSA and VDE Logos, add “-VD” to the part number. Example: G3MC-101P-VD-DC12
2. 2A models are available with reinforced insulation. Add “-1” to the part number to obtain 2A models with reinforced insulation. Examples: G3MC-202PL-1-DC5 G3MC-202P-VD-1-DC24
Specifications

■ Ratings (Ambient temperature 25°C)

Input

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>Operating voltage</th>
<th>Impedance</th>
<th>Voltage levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Must operate voltage</td>
</tr>
<tr>
<td>5 VDC</td>
<td>4 to 6 VDC</td>
<td>300Ω ±20%</td>
<td>4 VDC max.</td>
</tr>
<tr>
<td>12 VDC</td>
<td>9.6 to 14.4 VDC</td>
<td>800Ω ±20%</td>
<td>9.6 VDC max.</td>
</tr>
<tr>
<td>24 VDC</td>
<td>19.2 to 28.8 VDC</td>
<td>1.6kΩ ±20%</td>
<td>19.2 VDC max.</td>
</tr>
</tbody>
</table>

Note: Each model has 5-VDC, 12-VDC, and 24-VDC input versions.

Output

<table>
<thead>
<tr>
<th>Part number</th>
<th>Applicable load</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated load voltage</td>
<td>Load voltage range</td>
<td>Load current</td>
<td>Surge current</td>
<td></td>
</tr>
<tr>
<td>G3MC-101P(L)(-VD)</td>
<td>100 to 120 VAC, 50/60 Hz</td>
<td>75 to 132 VAC, 50/60 Hz</td>
<td>0.1 to 1 A</td>
<td>8 A (60 Hz, 1 cycle)</td>
</tr>
<tr>
<td>G3MC-202P(L)(-VD)(-1)</td>
<td>100 to 240 VAC, 50/60 Hz</td>
<td>75 to 264 VAC, 50/60 Hz</td>
<td>0.1 to 2 A</td>
<td>30 A (60 Hz, 1 cycle)</td>
</tr>
</tbody>
</table>

■ Characteristics

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Operate time</td>
<td>1/2 of load power source cycle + 1 ms</td>
<td>1 ms max.</td>
<td>1/2 of load power source cycle + 1 ms</td>
<td>1 ms max.</td>
</tr>
<tr>
<td>Release time</td>
<td>1/2 of load power source cycle + 1 ms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output ON voltage drop</td>
<td>1.6 V (RMS) max.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Leakage current</td>
<td>1 mA max. (at 100 VAC)</td>
<td>1.5 mA max. (at 200 VAC)</td>
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<td></td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>1,000 MΩ min. (at 500 VDC)</td>
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<td></td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>2,500 VAC, 50/60 Hz for 1 min (3,000 VAC, 50/60 Hz for 1 min. for G3MC-202P(-VD)(-1))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>Malfunction: 10 to 55 Hz, 0.75-mm double amplitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock resistance</td>
<td>Malfunction: 1,000 m/s² (approx. 100G)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>Operating: −30°C to 80°C (with no icing or condensation)</td>
<td>Storage: −30°C to 100°C (with no icing or condensation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approved standards</td>
<td>UL File No. E64562, CSA File No. LR35535</td>
<td>EN60950 File No. 5925UG (“-VD(-1)” type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 2.5g (Approx. 5g for G3MC-202P(L)-VD-1)</td>
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</tr>
</tbody>
</table>
Engineering Data

- **G3MC-101P(L)(-VD)**
  - Load Current vs. Ambient Temperature Characteristics
  - Inrush Current Resistivity
    One cycle, non-repetitive (Keep the inrush current to half the rated value if it occurs repeatedly.)

- **G3MC-202P(L)(-VD)(-1)**
  - Load Current vs. Ambient Temperature Characteristics
  - Inrush Current Resistivity
    One cycle, non-repetitive (Keep the inrush current to half the rated value if it occurs repeatedly.)
Dimensions

Units: mm (inch)

G3MC-101P(L)(-VD)

PCB Dimensions (Bottom View)

Terminal Arrangement (Bottom View)

G3MC-202P(L)(-VD)(-1)

PCB Dimensions (Bottom View)

Terminal Arrangement (Bottom View)
Precautions

■ General Precautions

Do not touch the terminals of the SSR while power is being supplied to the SSR. The terminals are charged with the power, and an electric shock may be received by touching the terminals.

The built-in capacitor may have a residual voltage after the SSR is turned off. Be sure to discharge the residual voltage before touching the terminals of the SSR, otherwise an electric shock may be received.

■ Mounting

1. Make sure that no excessive voltage or current is imposed on or flows to the input or output circuit of the SSR, otherwise the SSR may malfunction or burn.
2. Solder the terminals of the SSR properly under the required soldering conditions. The SSR may be abnormally heated and burn if power is supplied to the terminals soldered incorrectly.
3. Do not short-circuit the load of the SSR while power is supplied to the SSR. Do not short-circuit the power supply through the SSR. The SSR may be damaged, malfunction, or burn if the load or power supply is short-circuited.

■ Correct use

The terminals of the SSR are highly heat-conductive. Each terminal must be soldered within 10 s at 260°C or within 5 s at 350°C.

The SSR is of a thin-profile construction. To maintain the vibration resistance of the SSR, make sure that the space between the SSR and PCB is 0.1 mm maximum. Lifting of the PCB can be prevented by setting the hole diameter of the PCBs on both sides slightly smaller than the actual terminal dimension.

Select the model without the zero-cross function when using the Unit for phase control output.

The casing works as a heat sink. When mounting two or more Units closely, make sure that the Units are properly ventilated by taking ambient temperature rises into consideration. If Units are closely mounted and used in places with no ventilation, the load current of each Unit must be 1/2 of the rated load current.

■ Protective element

No overvoltage absorption element is built in. Therefore, if the G3MC is connected to an inductive load, be sure to connect the overvoltage absorption element.

G3MC-□□□PL (without Zero cross function)

G3MC-□□□P (with Zero cross function)
Omron Electronic Components, LLC

Terms and Conditions of Sales

I. GENERAL

1. Definitions: The words used herein are defined as follows.

(a) Terms: These terms and conditions
(b) Seller: Omron Electronic Components LLC and its subsidiaries
(c) Buyer: The buyer of Products, including any end user in section III through VI
(d) Products: Products and/or services of Seller
(e) including: Including without limitation

2. Offer; Acceptance: These Terms are deemed part of all quotations, acknowledgments, invoices, purchase orders and other documents, whether electronic or in writing, relating to the sale of Products by Seller. Seller hereby objects to any Terms proposed in Buyer’s purchase order or other documents which are inconsistent with, or in addition to, these Terms.

3. Distributor: Any distributor shall inform its customer of the contents after and including section III of these Terms.

II. SALES

1. Prices; Payment: All prices stated are current, subject to change without notice by Seller. Buyer agrees to pay the price in effect at the time the purchase order is accepted by Seller. Payments for Products received are due net 30 days unless otherwise stated in the invoice. Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice.

2. Discounts: Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (a) the invoice is paid according to Seller’s payment terms and (b) Buyer has no past due amounts owing to Seller.

3. Interest: Seller, at its option, may charge Buyer 1.5% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.

4. Orders: Seller will accept no order less than 200 U.S. dollars net billed.

5. Cancellation: If the prices included herein are in U.S. dollars, Buyer shall make remittance to Seller at the then current exchange rate most favorable to Seller; provided that if remittance is not made when due, Buyer will convert the amount to U.S. dollars at the then current exchange rate most favorable to Seller available on the due date and state remittance is made.

6. Governmental Approvals: Buyer shall be responsible for all costs involved in obtaining any government approvals regarding the importation or sale of the Products.

7. Taxes: All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest penalties thereon, imposed directly or indirectly on or in respect of the sale of Products to Buyer, shall be the sole responsibility of Buyer.

8. Financial: If the financial position of Buyer at any time becomes unsatisfactory to Seller, Seller’s sole obligation hereunder shall be to replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product or, at Seller’s election, to repay or credit Buyer an amount equal to the purchase price of the Product; provided that there shall be no liability for Seller or its affiliates unless Seller’s analysis confirms that the Products were correctly handled, stored, maintained and not subjected to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Seller before shipment.

9. Limitation on Liability: Seller and its Affiliates shall not be liable for indirect, special, or consequential damages, loss of profits or production or commercial loss in any way connected with the Products, whether such claim is based in contract, warranty, negligence or strict liability. Further, in no event shall Liability or Its Affiliates exceed the individual price of the Product on which Liability is asserted.

10. Indemnities: Buyer shall indemnify and hold harmless Seller, its affiliates and its employees from and against all liabilities, losses, claims, costs and expenses (including attorney’s fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Seller is a party) which arises or is alleged to arise from Buyer’s acts or omissions under these Terms or in any way with respect to the Products.

III. PRECAUTIONS

1. Suitability: IT IS THE BUYER’S SOLE RESPONSIBILITY TO ENSURE THAT ANY OTHER PRODUCT IS FIT AND SUITABLE FOR USE IN A MOTORIZED VEHICLE APPLICATION. BUYER SHALL BE SOLELY RESPONSIBLE FOR DETERMINING APPROPRIATENESS OF THE PARTICULAR PRODUCT WITH RESPECT TO THE BUYER’S APPLICATION INCLUDING (A) ELECTRICAL OR ELECTRONIC COMPONENTS, (B) SYSTEM ASSEMBLIES, (C) END PRODUCT, (D) SYSTEM, (E) MATERIALS OR SUBSTANCES OR (G) OPERATING ENVIRONMENT.

2. Use with Attention: The followings are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible use of any Product, nor to imply that any use listed may be suitable for any Product:

(a) Outdoor use, involving potential chemical contamination or electrical interference.

(b) Use in consumer Products or any use in significant quantities.

(c) Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.

(d) Systems, machines, and equipment that could present a risk to life or property.

3. Prohibited Use: NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

4. Motorized Vehicle Application: USE OF ANY PRODUCT(S) FOR A MOTORIZED VEHICLE APPLICATION MUST BE EXPRESSLY STATED IN THE SPECIFICATION BY SELLER.

5. Programmable Products: Seller shall not be responsible for the Buyer’s programming of a programmable Product.

IV. WARRANTY AND LIMITATION

1. Warranty: Seller’s exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Seller (or such other period expressed in writing by Seller). SELLER MAKES NO WARRANTY OR REPRESENTATION, EXCEPT AS EXPRESSLY SET FORTH ABOVE OR IN WRITING BY SELLER, REGARDING THE PRODUCTS, WHETHER OR NOT THEY ARE SPECIFIED IN THE SPECIFICATIONS.

2. Buyer Remedy: Seller’s sole obligation hereunder shall be to replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product or, at Seller’s election, to repay or credit Buyer an amount equal to the purchase price of the Product; provided that there shall be no liability for Seller or its affiliates unless Seller’s analysis confirms that the Products were correctly handled, stored, maintained and not subjected to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Seller before shipment.

3. Limitation on Liability: SELLER AND ITS AFFILIATES SHALL NOT BE LIABLE FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. FURTHER, IN NO EVENT SHALL LIABILITY OR ITS AFFILIATES EXCEED THE INDIVIDUAL PRICE OF THE PRODUCT ON WHICH LIABILITY IS ASSERTED.

4. Indemnities: Buyer shall indemnify and hold harmless Seller, its affiliates and its employees from and against all liabilities, losses, claims, costs and expenses (including attorney’s fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Seller is a party) which arises or is alleged to arise from Buyer’s acts or omissions under these Terms or in any way with respect to the Products.

V. INFORMATION, ETC.

1. Intellectual Property: The intellectual property embodied in the Products is the exclusive property of Seller and its affiliates and Buyer shall not attempt to duplicate it in any way without the written permission of Seller. Buyer (at its own expense) shall indemnify and hold harmless Seller and defend or settle any action brought against Seller to the extent that it is based on a claim that any Product made by Buyer specifications infringed intellectual property rights of another party.

2. Property; Confidentiality: Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Seller. All information and materials supplied by Seller to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.

3. Performance Data: Performance data is provided as a guide in determining suitability for a particular application. Performance data may represent the result of Seller’s test conditions, and the users must correlate it to actual application requirements.

4. Change in Specifications: Product specifications and descriptions may be changed at any time based on improvements or other reasons. It is Seller’s practice to change part numbers when published ratings or features are changed, or when significant engineering changes are made. However, some specifications of the Product may be changed without any notice.

5. Errors And Omissions: The information on Seller’s website or in other documentation has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

6. Export Controls: Buyer shall comply with all applicable laws, regulations and licenses regarding (a) export of the Products or information provided by Seller; (b) sale of Products to forbidden or otherwise prohibited persons or organizations; (c) disclosure to non-citizens of regulated technology or information.

VI. MISCELLANEOUS

1. Waiver: No failure or delay by Seller in exercising any right and no course of dealing between Buyer and Seller shall operate as a waiver of rights by Seller.

2. Assignment: Buyer may not assign its rights hereunder without Seller’s written consent.

3. Law: These Terms are governed by Illinois law (without regard to conflict of laws).

4. Amendment: These Terms constitute the entire agreement between Buyer and Seller relating to the Products, and no provision may be changed or waived unless in writing and signed by the parties.

5. Severability: If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision.
1. **Suitability for Use.** Seller shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in Buyer's application or use of the Product. At Buyer's request, Seller will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given:
   (i) Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
   (ii) Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
   (iii) Use in consumer products or any use in significant quantities.
   (iv) Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this product.

   NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

2. **Programmable Products.** Seller shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

3. **Performance Data.** Performance data given in this publication is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Seller's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to Seller's Warranty and Limitations of Liability.

4. **Change in Specifications.** Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Seller representative at any time to confirm actual specifications of purchased Product.

5. **Errors and Omissions.** The information in this publication has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors, or omissions.

6. **RoHS Compliance.** Where indicated, our products currently comply, to the best of our knowledge as of the date of this publication, with the requirements of the European Union's Directive on the Restriction of certain Hazardous Substances ("RoHS"), although the requirements of RoHS do not take effect until July 2006. These requirements may be subject to change. Please consult our website for current information.