



# Solid State Relays

SELECTION GUIDE



**OMRON**

*Giving you every advantage.*



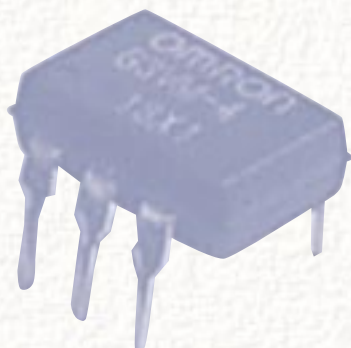
# THE SOLID STATE ADVANTAGE

Omron has been leading the world in relay technology for more than 50 years, maintaining the industry's broadest relay product line. Our large, dedicated relay R & D budget allows us to produce a steady stream of innovative relays that perform in different operating environments and industries. Companies around the world depend on Omron to provide ingenious solutions to their most challenging applications, including applications ideal for solid state relays.

Our line of solid state relays includes more than 20 different models with hundreds of variations and options. These relays have flexible input and output ranges and multiple footprints providing a reliable solution to any application.

## Benefits of Solid State Relays

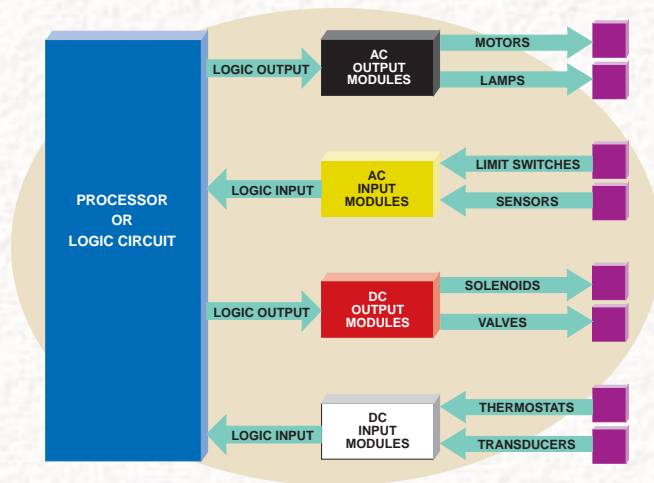
- Have a life expectancy significantly greater than electromechanical relays
- Have no moving parts or contacts to wear out
- Are immune to contact bounce and arcing
- No audible clicking
- Generate very little electromagnetic interference, providing clean switching for virtually any load
- Have up to 10 times the shock resistance of electromechanical relays
- Have high I/O isolation that is crucial for isolating sensitive equipment from the load
- Can be switched ON with very little input current
- Have internal circuitry that lengthens load life



## When should I use a Solid State Relay?

- When long life is required
- When the relay must operate in a harsh environment (i.e. dust, humidity, or a combustible environment)
- When silent operation is necessary
- When high speed switching is required
- When limited source current is available to drive the input
- When compatibility with digital logic is required, such as with microprocessor or computer controlled applications
- If reduced electromagnetic interference is required
- When the application requires a high number of operations

# I/O MODULES

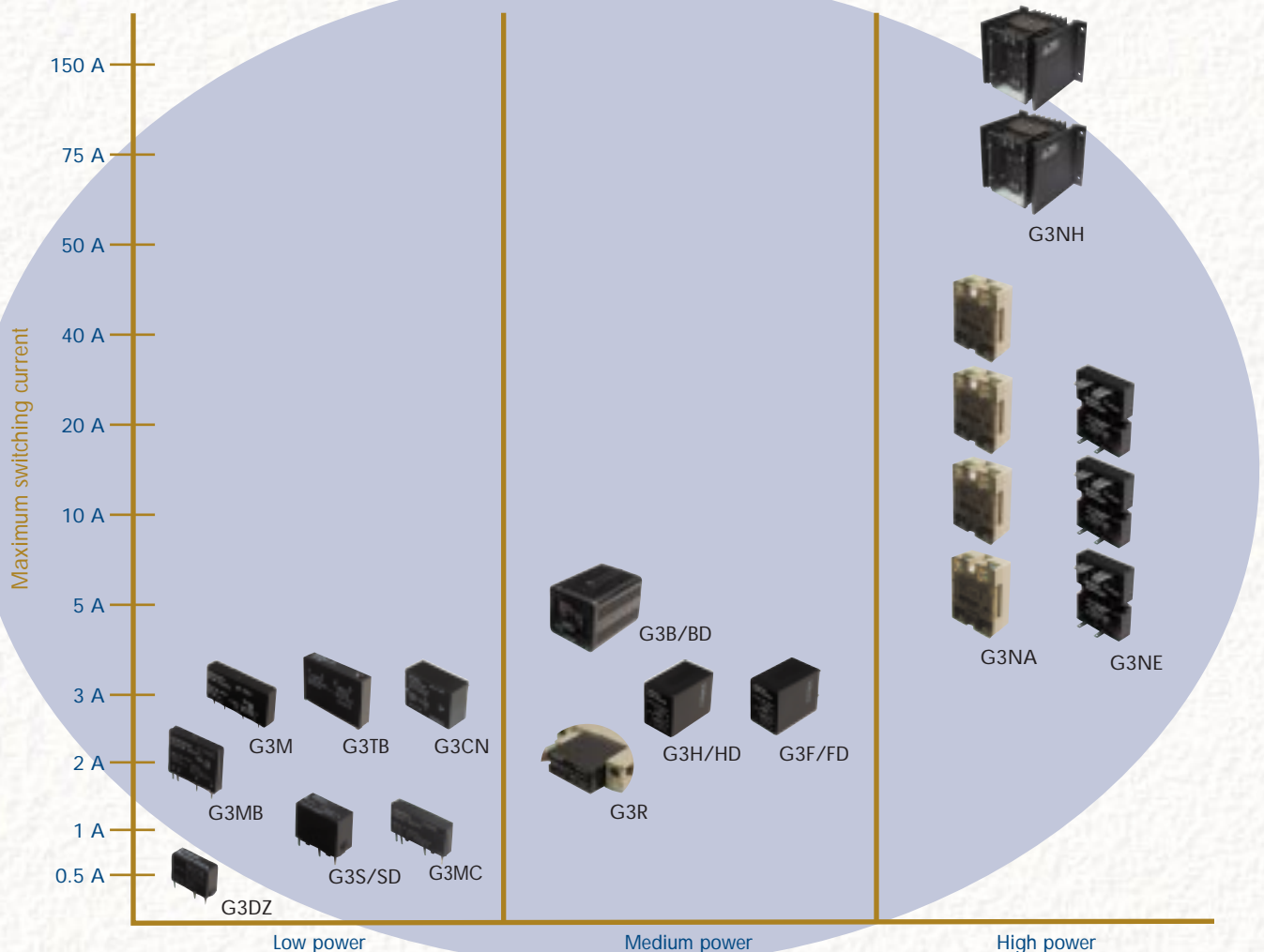


Omron's G3TB's industry standard color-coding system

Omron's Solid State I/O modules are electronic devices providing an interface between a logic circuit and external devices. These devices are compatible with many microprocessors, TTL and MOS type logic systems. Input modules convert AC or DC inputs from external devices like switches or sensors into acceptable DC current and voltage for the logic circuit. Output modules use the output of the processor to switch external AC and DC loads like motors or solenoids on and off.

Omron's G3TB uses the industry standard color-coding system, ensuring easy differentiation among inputs and outputs and is perfect for PCB mounting applications. Omron's G3R I/O module is ideal for industrial applications with space constraints. It shares the G2R's footprint, is clearly marked per input/output function and can be mounted side-by-side on a DIN rail or panel using the P2RF socket.

## MAXIMUM LOAD

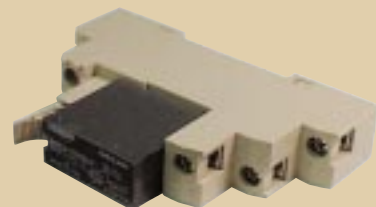






|                                   | <b>G3NH</b>  | <b>G3NA</b>  | <b>G3NE</b>   | <b>G3B/BD</b>   |
|-----------------------------------|--|--|---|---|
| Dimensions<br>(L x W x H) mm      | 186 x 156 x 156 mm<br>7.3 x 6.1 x 6.1 in                                     | 58 x 43 x 27 mm<br>2.3 x 1.7 x 1.1 in  | 47 x 37.5 x 11.5 mm<br>1.9 x 1.5 x 0.45 in  | 35 x 35 x 52.5 mm<br>1.4 x 1.4 x 2.1 in                             |
| Features                          | Controls high power loads. Replaceable power cartridge. Integrated heatsink. | Hockey puck design. Ideal for industrial controls. Standard operation indicator. | Ideal for panel mount applications. Compact aluminum PCB and power elements used. | Operation indicator provided. Compatible with Omron's MK footprint. |
| Operating input                   | 4-30 VDC<br>75-264 VAC   | 4-32 VDC<br>75-132 VAC<br>150-264 VAC  | 5, 12, 24 VDC   | 4-30 VDC  |
| Output ranges                     |  |  |   |   |
| voltage                           | 75-264 VAC<br>150-484 VAC  | 19-528 VAC<br>4-220 VDC  | 75-264 VAC  | 75-264 VAC<br>3-125 VDC   |
| load (max.)                       | <b>75-150 A</b>  | <b>5-40 A</b>  | <b>5-20 A</b>   | <b>5 A</b>  |
| Isolation                         | Photocoupler   | Phototriac,<br>Photocoupler  | Phototriac  | Photocoupler  |
| Dielectric                        | 2500 VAC   | 2500 VAC   | 2000 VAC  | 1500 VAC  |
| Zero crossing                     | Yes  | Yes  | Yes   | Yes   |
| Snubber circuit                   | Yes  | Yes  | Yes   | Yes   |
| Life (MTTF)                       | 100,000 hours  | 100,000 hours  | 100,000 hours   | 100,000 hours   |
| Mounting                          | Panel mount  | Panel mount  | Panel mount   | Plug-in/Socket  |
| Terminal                          | Screw  | Screw  | Quick connect   | Plug-in   |
| Approvals                         | —  | UL, CSA, TUV   | UL, CSA, TUV  | —   |
| Equivalent Omron<br>EMR footprint | N/A  | N/A  | N/A   | MK  |
| Optional heat sink                | Built-in   | Y92B-A100, -A150,<br>-A250   | Y92B-N50, -N100   | N/A   |
| Socket                            | N/A  | N/A  | N/A   | PF083A; PL08; PL08-Q;<br>PLE08-O                                    |
| Control fax number                | 13504  | 13502  | 13503   | 13512   |

|  |                   |       |                |  |
|---|--|--|--|---|
| G3H/HD  | G3F/FD   | G3CN   | G3M  | G3MB  |
| 21.5 x 28 x 36.5 mm<br>0.85 x 1.1 x 1.4 in  | 28 x 21.5 x 36.5 mm<br>1.1 x 0.85 x 1.4 in   | 33 x 25 x 14.5 mm<br>1.3 x 0.98 x 0.57 in  | 40 x 9 x 20 mm<br>1.57 x 0.35 x 0.79 in  | 24.5 x 5.5 x 20.5 mm<br>0.86 x 0.19 x 0.81 in                                       |
| Operation indicator available. Compatible with Omron's LY footprint.              | Standard footprint. Snubber circuit absorbs external surges. Compatible with Omron's MY footprint. | Operation indicator available. Flat and vertical models for a variety of applications. | Multi-input solid state relay. Space-saving SIP design. Ideal for high density PCB applications. | Space-saving SIP design. Ideal for high density PCB applications.                   |
| 3-28.8 VDC<br>5, 12, 24 VDC   | 75-125 VAC<br>150-250 VAC<br>3-28 VDC  | 3-28.8 VDC<br>5, 12, 24 VDC  | 5, 12, 24 VDC  | 5, 12, 24 VDC   |
| 75-264 VAC<br>3-52.8 VDC  | 75-264 VAC<br>3-125 VDC  | 75-264 VAC<br>3-52.8 VDC   | 75-132 VAC<br>100-240 VAC  | 75-132 VAC<br>75-264 VAC  |
| 3 A   | 3 A  | 3 A  | 3 A  | 2 A   |
| Phototriac, Photocoupler  | Phototriac, Photocoupler   | Phototriac, Photocoupler   | Phototriac   | Phototriac  |
| 1500 VAC  | 1500 VAC   | 2500 VAC   | 2500 VAC   | 2500 VAC  |
| Yes   | Yes  | Yes  | Yes  | Yes   |
| Yes   | Yes  | Yes  | Yes  | Yes   |
| 100,000 hours   | 100,000 hours  | 100,000 hours  | 100,000 hours  | 100,000 hours   |
| Plug-in/Socket  | Plug-in/Socket   | PCB  | PCB  | PCB   |
| Plug-in   | Plug-in  | PCB  | PCB  | PCB   |
| —   | —  | UL, CSA  | UL, CSA  | UL, CSA, TUV  |
| LY  | MY   | N/A  | N/A  | N/A   |
| N/A   | N/A  | N/A  | N/A  | N/A   |
| PTF08A; PT08;<br>PT08-O   | PYF08; PY08;<br>PY08-02  | N/A  | N/A  | N/A   |
| 13518   | 13511  | 13508  | 13500  | 13501   |



| <b>G3S/SD</b>  | <b>G3DZ</b>   | <b>G3TB</b>  |                         | <b>G3R</b>   |                         |
|--|---|--|-------------------------|--|-------------------------|
|  |   | input  | output                  | input  | output                  |
| 20 x 10 x 16.5 mm<br>0.79 x 0.39 x 0.65 in                                       | 17.5 x 6.5 x 12.5 mm<br>0.69 x 0.26 x 0.49 in   | 43.5 x 10 x 20.5/30.5 (in/out) mm<br>1.7 x 0.39 x 0.81/1.2 (in/out) in   |                         | 29 x 13 x 28 mm<br>1.02 x 0.46 x 0.99 in   |                         |
| Miniature dual in-line package dip relay. Compatible with Omron's G6B footprint. | Maximum 10 $\mu$ A current leakage max. between open output terminals. Input resistor and varistor incorporated. Compatible with Omron's G6D footprint. | Noise free interface between processor based control systems and external equipment. Color-coded modules. Industry standard footprint. Compact relay with operation indicator. |                         | I/O module with 4 KV isolation. Operation indicator standard. Ideal for DIN rail mount I/O applications. Interchangeable with G2R electromechanical relay. |                         |
| 5, 12, 24 VDC  | 5, 12, 24 VDC   | 80-264 VAC<br>3-32 VDC   | 3-32 VDC                | 5 VDC<br>6.6-32 VDC<br>60-264 VAC  | 4-32 VDC                |
| 75-264 VAC<br>3-26 VDC   | 3-264 VAC   | 4-32 VDC   | 75-264 VAC<br>4-200 VDC | 4-32 VDC   | 75-264 VAC<br>4-200 VDC |
| 1.2 A  | 0.6 A   | 25 mA  | 3A                      | 100 mA   | 2A                      |
| Phototriac,<br>Photocoupler,   | Photodiode  | Photocoupler   |                         | Phototriac,<br>Photocoupler  |                         |
| 2500 VAC   | 2500 VAC  | 4000 VAC   |                         | 4000 VAC   |                         |
| No   | No  | No   | Yes                     | Yes  |                         |
| Yes  | —   | No   | Yes                     | Yes  |                         |
| 100,000 hours  | 100,000 hours   | 100,000 hours  |                         | 100,000 hours  |                         |
| Socket   | PCB   | PCB  |                         | Socket/DIN rail  |                         |
| Plug-in  | PCB   | PCB  |                         | Plug-in  |                         |
| UL, CSA  | —   | UL, CSA, TUV   |                         | UL, CSA  |                         |
| G6B  | G6D   | N/A  |                         | G2R  |                         |
| Y92B-S08N  | N/A   | N/A  |                         | N/A  |                         |
| PP6BF-4B; PP6BF-4BN;<br>P6B-04P  | P6D-04P   | N/A  |                         | P2RF-05E   |                         |
| 13506  | 13514   | 13507  |                         | 13509  |                         |



# PRECISE, ENDURING SWITCHING CONTROL

## G3J



The G3J is ideal for applications requiring soft starts and stops (i.e., conveyor belts). This solid state relay contactor controls each phase of 3-phase motors independently.

## G3TA



Simplify wiring using these color-coded I/O modules. These models have an optional LED indicator and are compatible with P7TF I/O blocks.

## G3PB



The G3PB is CE marked and DIN or panel mountable. It features an innovative compact radiator design and robust construction with slim models available. The G3PB is available as a single or three-phase power solid state relay.

## G3MC



This miniature PCB mount SIP style solid state relay is ideal for space constrained applications. Its 1A load switching (2A version is available) abilities are compacted into a small footprint with a low profile.

## G3VM



This model's high-speed operation is ideal for high frequency switching applications typically found in telecommunications, data communications and office automation. It has a cost-effective photocoupled MOSFET construction and a DIP style package.

## G3PA



The slim profile, replaceable power cartridge and integrated heat sink make the G3PA solid state relay series ideal for dense mounting on DIN rails or panels. Use them to link terminals, control industrial heaters or control single or 3-phase loads.

Omron makes it easy to integrate solid state performance into your machines by producing a wide variety of solid state relays that share the same footprints as select SPST electromechanical relays.

| Omron EMR Series | Equivalent SSR Model | Max Load | Socket                        |
|------------------|----------------------|----------|-------------------------------|
| G2R              | G3R/G3RD             | 2A       | P2RF-05, P2R-05A, P2R-05P     |
| MK               | G3B/G3BD             | 5A       | PF083A, PL08, PLE08-0         |
| MY               | G3F/G3FD/G3FM        | 3A       | PYF08A, PY08, PY08-02         |
| LY               | G3H/G3HD             | 3A       | PTF08A, PT08, PT08-0          |
| G6D              | G3DZ                 | 0.6A     | P6D-04P                       |
| G6B              | G3S/G3SD             | 1.2A     | P6B-04P, P6BF-4BN, P6BF-4B    |
| G7T              | G3TA                 | 2A       | P7TF-IS16, P7TF-OS16, P7TF-05 |

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Source: The World Electromechanical and Solid State Relay Industry. 4th edition by Venture Development Corp.

## Relays

- Low Signal
- Power PCB
- General Purpose
- Solid State



## Switches

- Basic
- Lighted Pushbutton
- Thumbwheel
- In-line and Rotary Dip
- Mechanical Keyswitches
- Rocker



## Photomicrosensors

- Microphotonic
- Amplified
- Non-amplified



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