



|                       | CPC1945G | Units                            |
|-----------------------|----------|----------------------------------|
| AC Operating Voltage  | 120      | V <sub>RMS</sub>                 |
| Load Current          | 1.0      | A                                |
| On-State Voltage Drop | 1.6      | V <sub>RMS</sub><br>(at IL=1.0A) |

### Features

- Load Current up to 1A
- Blocking Voltage to 400V
- 5mA Sensitivity
- Zero-Crossing Detection
- DC Control, AC Output
- Optically Isolated
- TTL and CMOS Compatible
- Low EMI and RFI Generation
- High Noise Immunity
- VDE compatible
- Machine Insertable, Wave Solderable

### Applications

- Programmable Control
- Process Control
- Power Control Panels
- Remote Switching
- Gas Pump Electronics
- Contractors
- Large Relays
- Solenoids
- Motors
- Heaters

### Description

The CPC1945G is a AC Solid State Switch using patented waveguide coupling with dual power SCR outputs to produce an alternative to optocoupler and Triac circuits. The CPC1945G switches are robust enough to provide a blocking voltage of up to 400V. In addition, tightly controlled zero cross circuitry ensures switching of AC loads without the generation of transients. The input and output circuits are optically coupled to provide 3750V of isolation and noise immunity between control and load circuits. As a result the CPC1945G is well suited for industrial environments where electromagnetic interference would disrupt the operation of electromechanical relays.

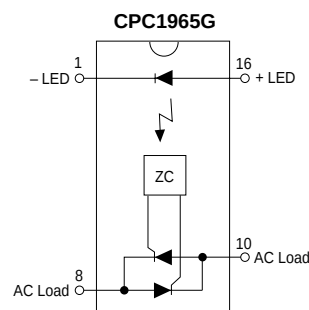
### Approvals

- UL recognized file #: Pending

### Ordering Information

| Part #   | Description          |
|----------|----------------------|
| CPC1945G | 16 Pin DIP (25/Tube) |

### Pin Configuration



**Absolute Maximum Ratings (@ 25° C)**

| Parameter                 | Min  | Typ | Max               | Units            |
|---------------------------|------|-----|-------------------|------------------|
| Input Power Dissipation   | -    | -   | 150 <sup>1</sup>  | mW               |
| Input Control Current     | -    | -   | 50                | mA               |
| Peak (10ms)               | -    | -   | 1                 | A                |
| Reverse Input Voltage     | -    | -   | 5                 | V                |
| Total Package Dissipation | -    | -   | 1600 <sup>2</sup> | mW               |
| PD                        | -    | -   | -                 | -                |
| Isolation Voltage         |      |     |                   |                  |
| Input to Output           | 3750 | -   | -                 | V <sub>RMS</sub> |
| Operational Temperature   | -40  | -   | +85               | °C               |
| Storage Temperature       | -40  | -   | +125              | °C               |
| Soldering Temperature     |      |     |                   |                  |
| (10 Seconds Max.)         |      |     |                   |                  |
| DIP Package               | -    | -   | +260              | °C               |

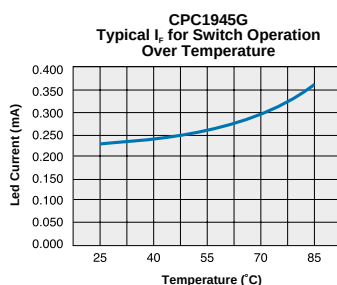
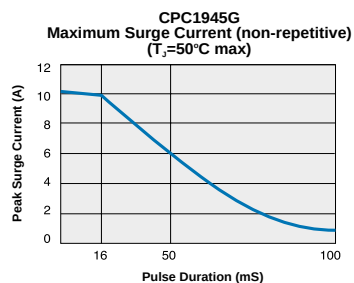
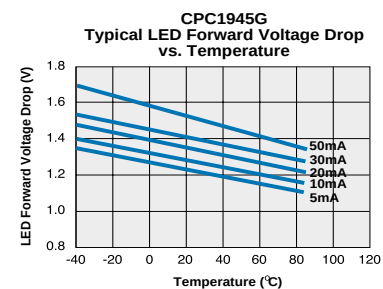
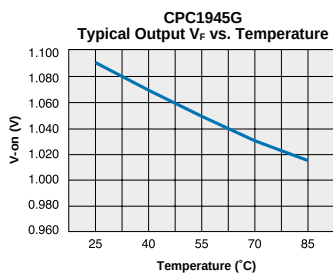
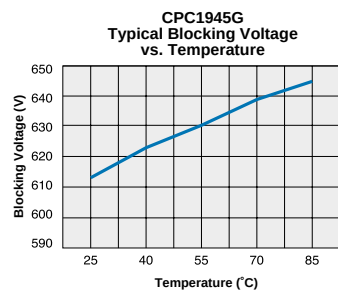
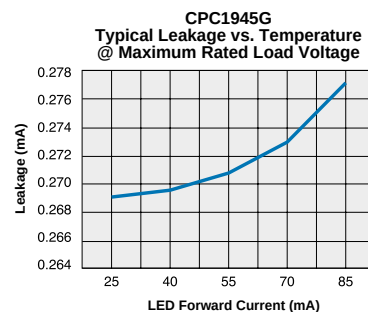
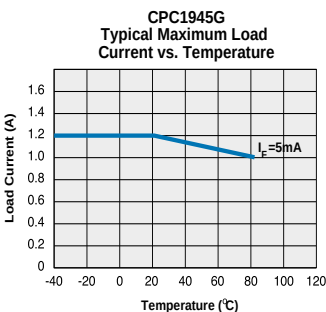
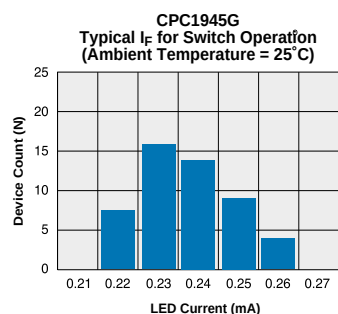
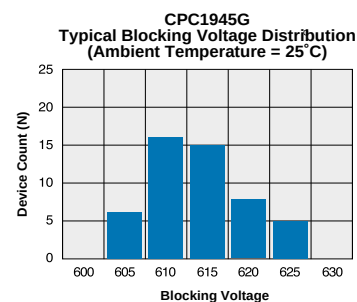
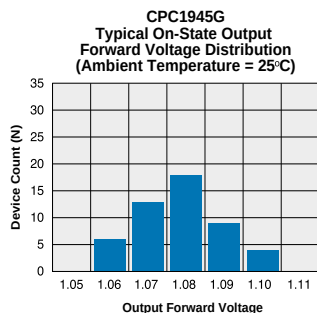
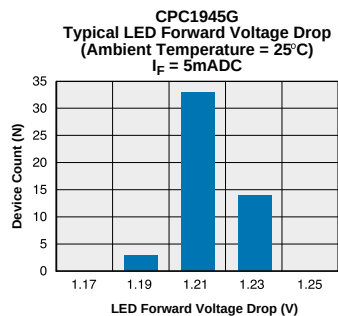
<sup>1</sup> Derate Linearly 1.33 mW/°C<sup>2</sup> Derate Linearly 16.6 mW/°C

*Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device to the absolute maximum ratings for an extended period may degrade the device and effect its reliability.*

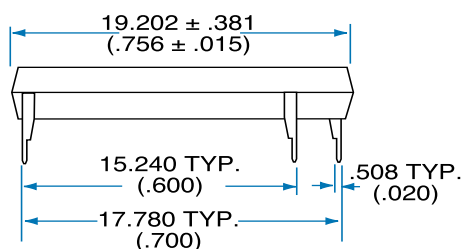
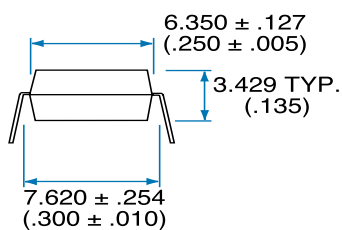
**Electrical Characteristics**

| Parameter                                             | Conditions             | Symbol            | Min   | Typ | Max | Units              |
|-------------------------------------------------------|------------------------|-------------------|-------|-----|-----|--------------------|
| <b>Output Characteristics @ 25°C</b>                  |                        |                   |       |     |     |                    |
| Operating Voltage Range                               | V <sub>T</sub>         |                   | 20    | -   | 120 | V <sub>RMS</sub>   |
| Peak Blocking Voltage                                 | -                      | V <sub>DRM</sub>  | -     | -   | 400 | V                  |
| Load Current (Continuous)                             | V <sub>L</sub> =120VAC | I <sub>L</sub>    | 0.005 | -   | 1.0 | I <sub>A,RMS</sub> |
| Non-repetitive Single Cycle Surge Current             | -                      | I <sub>TSM</sub>  | -     | -   | 10  | A                  |
| Off State Leakage Current                             | V <sub>DRM</sub>       | I <sub>LEAK</sub> | -     | -   | 1   | mA                 |
| On-State Voltage Drop                                 | I <sub>L</sub> =1.0A   |                   | -     | -   | 1.6 | V <sub>RMS</sub>   |
| Critical Rate of Rise <sup>3</sup>                    |                        | dv/dt             | 500   | -   | -   | V/μS               |
| Switching Speeds                                      |                        |                   |       |     |     |                    |
| Turn-on                                               | I <sub>F</sub> =5 mA   | T <sub>ON</sub>   | -     | -   | 0.5 | Cycles             |
| Turn-off                                              | I <sub>F</sub> =5 mA   | T <sub>OFF</sub>  | -     | -   | 0.5 | Cycles             |
| Zero-Cross Turn-On Voltage                            | 1st half cycle         |                   | -     | 2   | 10  | V                  |
|                                                       | Sub. half cycle        |                   | -     | -   | 1   | V                  |
| Operating Frequency <sup>1</sup>                      | -                      |                   | 20    | -   | 400 | Hz                 |
| Load Power Factor for Guaranteed Turn-On <sup>2</sup> | -                      | PF                | 0.25  | -   | -   | -                  |
| Capacitance                                           |                        |                   |       |     |     |                    |
| Input to Output                                       | -                      | -                 | -     | 3   | -   | pF                 |
| <b>Input Characteristics @ 25°C</b>                   |                        |                   |       |     |     |                    |
| Input Control Current                                 |                        |                   |       |     |     |                    |
| For Normal Environment                                | -                      | I <sub>F</sub>    | 5     | -   | 50  | mA                 |
| For High Noise Environment                            | -                      | I <sub>F</sub>    | 10    | -   | 100 | mA                 |
| Input Voltage Drop                                    | I <sub>F</sub> =5mA    | V <sub>F</sub>    | 0.9   | 1.2 | 1.4 | V                  |
| Input Drop-out Voltage                                | -                      |                   | 0.8   | -   | -   | V                  |
| Reverse Input Current                                 | V <sub>R</sub> =5V     | I <sub>R</sub>    | -     | -   | 10  | uA                 |

<sup>1</sup> Zero cross 1st 1/2 cycle @ <100Hz<sup>2</sup> Snubber circuits may be required at low power factors.<sup>3</sup> Tested in accordance with EIA/NARM Standard RS-443.

**PERFORMANCE DATA\***


The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

**Mechanical Dimensions**
**16 Pin DIP**


Dimensions  
mm  
(inches)

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