CPC1965G
AC Solid State Relay

	CPC1965G	Units
AC Operating Voltage	260	V_{RMS}
Load Current	1.0	A
On-State Voltage Drop	1.6	V_{RMS} (at I_L=1.0A)

Features
- Load Current up to 1A
- Blocking Voltage to 600V
- 5mA Sensitivity
- Zero-Crossing Detection
- DC Control, AC Output
- Optically Isolated
- TTL and CMOS Compatible
- Low EMI and RFI Generation
- High Noise Immunity
- Machine Insertable, Wave Solderable
- Flammability classification rating V-0

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

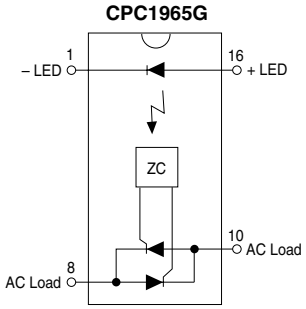
Description
The CPC1965G is an AC Solid State Switch using patented waveguide coupling with dual power SCR outputs to produce an alternative to optocoupler and Triac circuits. The CPC1965G switches are robust enough to provide a blocking voltage of up to 600V. In addition, tightly controlled zero cross 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 CPC1965G is well suited for industrial environments where electromagnetic interference would disrupt the operation of electromechanical relays.

Approvals
- UL recognized to UL508, file #: E69938
- CSA certified to CSA14, File #: LR43639

Ordering Information

Part #	Description
CPC1965G	16 Pin DIP (25/Tube)

Pin Configuration



Absolute Maximum Ratings (@ 25˚ C)

Parameter	Min	Typ	Max	Units
Input Power Dissipation	-	-	150[1]	mW
Input Control Current	-	-	100	mA
Peak (10ms)	-	-	1	A
Reverse Input Voltage	-	-	5	V
Total Package Dissipation PD	-	-	1600[2]	mW
Isolation Voltage Input to Output	3750	-	-	V_{RMS}
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature (10 Seconds Max.) DIP Package	-	-	+260	°C

[1] Derate Linearly 1.33 mW/˚C

[2] 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 conditions beyond those indicated in the operational sections of this data sheet is not implied.

Electrical Characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Operating Voltage Range	V_T		20	-	260	V_{RMS}
Peak Blocking Voltage	-	V_{DRM}	-		600	V
Load Current (Continuous)	V_L=120-260V_{AC}	I_L	0.005	-	1.0	A_{RMS}
Non-repetitive Single Cycle Surge Current	-	I_{TSM}	-	-	10	A
Off State Leakage Current	V_{DRM}	I_{LEAK}	-	-	1	mA
On-State Voltage Drop	I_L=1.0A		-	-	1.6	V_{RMS}
Critical Rate of Rise[3]		dv/dt	1000	-	-	V/µs
Switching Speeds Turn-on	I_F=5 mA	T_{ON}	-	-	0.5	Cycles
Turn-off	I_F=5 mA	T_{OFF}	-	-	0.5	Cycles
Zero-Cross Turn-On Voltage Sub. half cycle	1st half cycle	-	- -	2 1	10 V	V
Operating Frequency[1]	-		20	-	400	Hz
Load Power Factor for Guaranteed Turn-On[2]	-	PF	0.25	-	-	-
Capacitance Input to Output	-	-	-	3	-	pF
Input Characteristics @ 25°C						
Input Control Current For Normal Environment	-	I_F	5	-	50	mA
For High Noise Environment	-	I_F	10	-	100	mA
Input Voltage Drop	I_F=5mA	V_F	0.9	1.2	1.4	V
Input Drop-out Voltage	-		0.8	-	-	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA

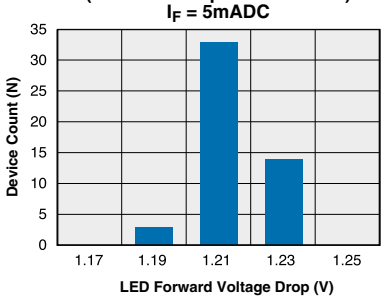
1 Zero cross 1st 1/2 cycle @ <100Hz

2 Snubber circuits may be required at low power factors.

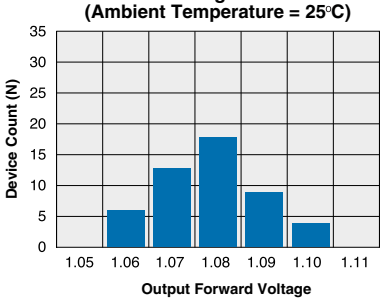
3 Tested in accordance with EIA/NARM Standard RS-443.

PERFORMANCE DATA*

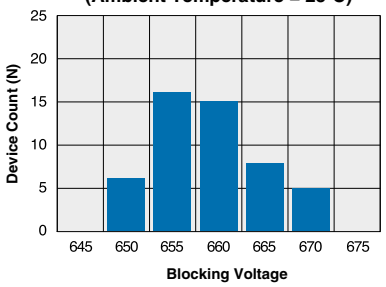
CPC1965G
Typical LED Forward Voltage Drop
(Ambient Temperature = 25°C)
I_F = 5mADC



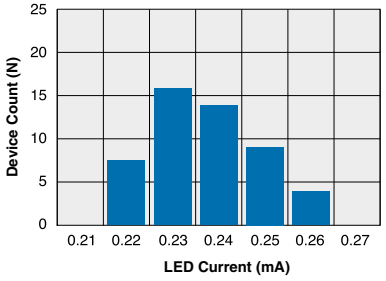
CPC1965G
Typical On-State Output
Forward Voltage Distribution
(Ambient Temperature = 25°C)



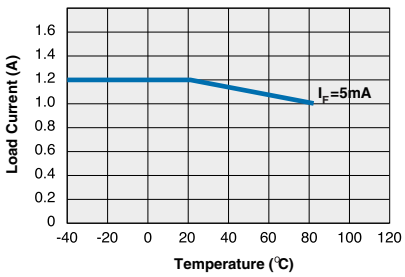
CPC1965G
Typical Blocking Voltage Distribution
(Ambient Temperature = 25˚C)



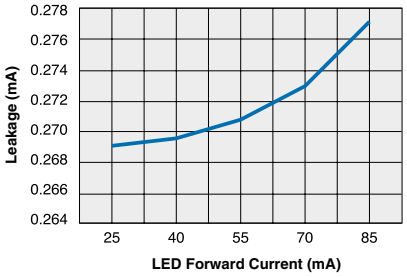
CPC1965G
Typical I_F for Switch Operation
(Ambient Temperature = 25˚C)



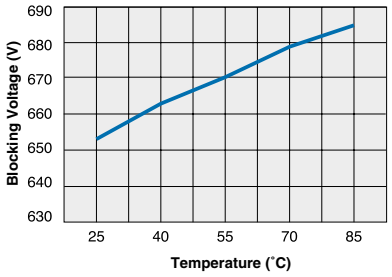
CPC1965G
Typical Maximum Load
Current vs. Temperature



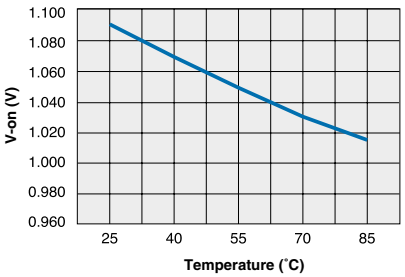
CPC1965G
Typical Leakage vs. Temperature
@ Maximum Rated Load Voltage



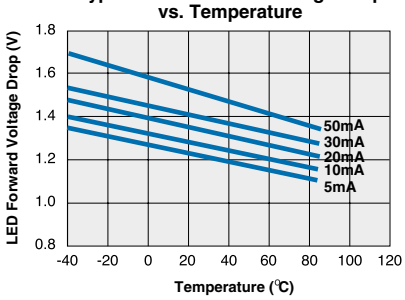
CPC1965G
Typical Blocking Voltage
vs. Temperature



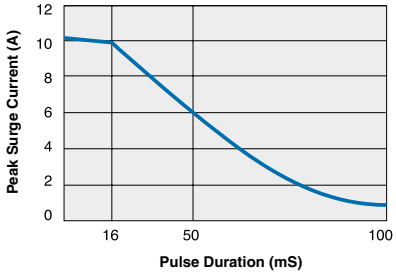
CPC1965G
Typical Output V_F vs. Temperature



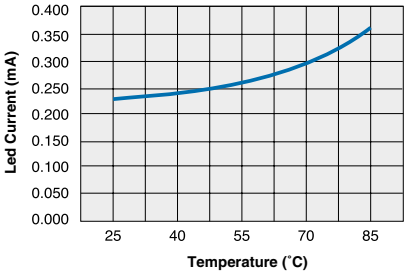
CPC1965G
Typical LED Forward Voltage Drop
vs. Temperature



CPC1965G
Maximum Surge Current (non-repetitive)
(T_J=50˚C max)



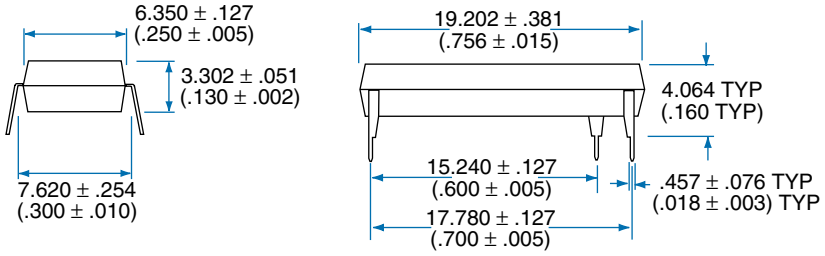
CPC1965G
Typical I_F for Switch Operation
Over Temperature



*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)

CLARE

For additional information please visit our website at: www.clare.com

Specification: DS-CPC1965G-R3.0

12/19/02