CPC1943G
AC Power Switch

	CPC1943G	Units
AC Operating Voltage	120	V
Load Current	500	mA
On State Voltage Drop	1.2	V_{RMS} (at I_L = 500 mA)

Features
- Load Current up to 0.5A
- 400V Blocking Voltage
- 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 of V-0

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

Description
The CPC1943G is an AC Solid State Switch using optical coupling with dual power SCR outputs to produce an alternative to optocoupler and Triac circuits. The CPC1943G 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 CPC1943G is well suited for industrial environments where electromagnetic interference could disrupt the operation of electromechanical relays.

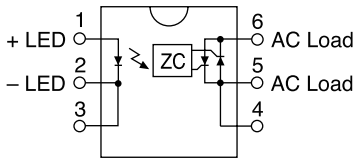
Approvals
- UL recognized file #: E69938
- CSA certified to CSA 14, file #: LR43639

Ordering Information

Part #	Description
CPC1943G	6 Pin Dip (50/Tube)
CPC1943GS	6 Pin Surface Mount (50/Tube)
CPC1943GSTR	6 Pin Surface Mount (1000/Reel)

Pin Configuration

CPC1943G Pinout



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 PM	-	-	800[2]	mW
Isolation Voltage Input to Output	3750	-	-	V_{RMS}
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature DIP Package	-	-	+260	°C
Surface Mount Package (10 Seconds Max.)	-	-	+220	°C

[1] Derate Linearly 1.33 mW/˚C

[2] Derate Linearly 6.67 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

Parameters	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Operating Voltage Range	V_T	-	20	-	120	V_{RMS}
Peak Blocking Voltage	-	V_{DRM}	-	-	400	V
Load Current (Continuous)	V_L=120-240VAC	I_L	0.005	-	0.5	A
Off State Leakage Current	V_{DRM}	I_{LEAK}	-	-	1	mA
On-State Voltage Drop	-		-	-	1.2	V_{RMS}
Critical Rate of Rise	-	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	1st half cycle		-	2	10	V
Sub. half cycle		-	-	1	V	
Operating Frequency[1]	-		20	-	500	Hz
Load Power Factor for Guaranteed Turn-On[2]	-	PF	0.25	-	-	-
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
Common Characteristics @ 25°C						
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	$_pF$
Input to Output Isolation	-	$V_{I/O}$	3750	-	-	V_{RMS}

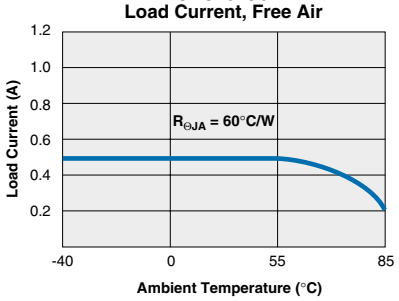
[1] Zero Cross 1st half cycle @ <100Hz

[2] Snubber circuits may be required at low power factors.

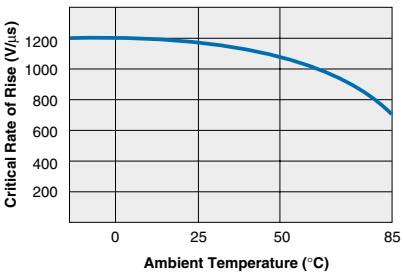
[3] Tested in accordance with EIA/NARM standard RS -443.

PERFORMANCE DATA*

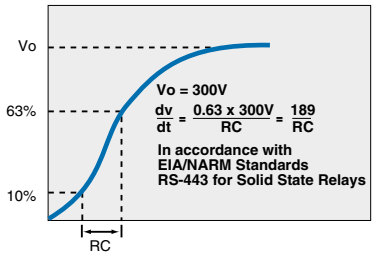
CPC1943G
Load Current, Free Air



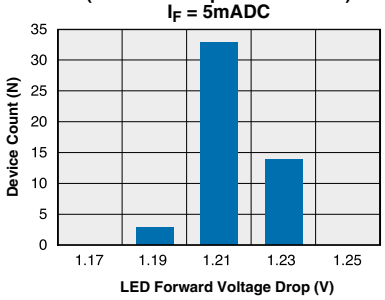
CPC1943G
Typical dv/dt vs. Temperature



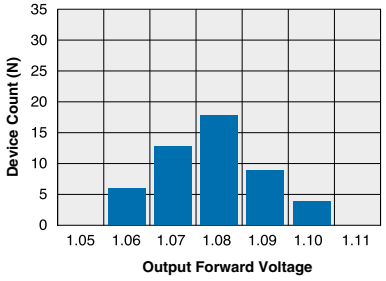
CPC1943G
dv/dt Method



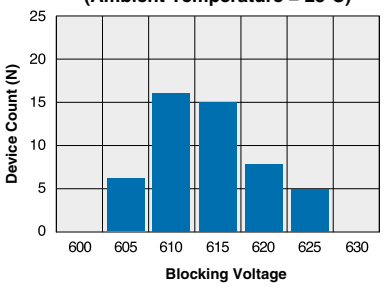
CPC1943G
Typical LED Forward Voltage Drop
(Ambient Temperature = 25°C)
I_F = 5mADC



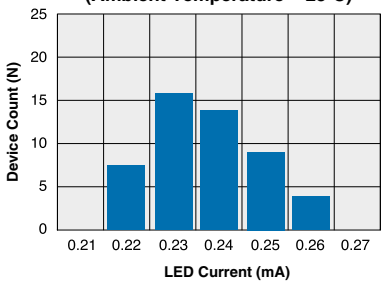
CPC1943G
Typical On-State Output
Forward Voltage Distribution
(Ambient Temperature = 25°C)



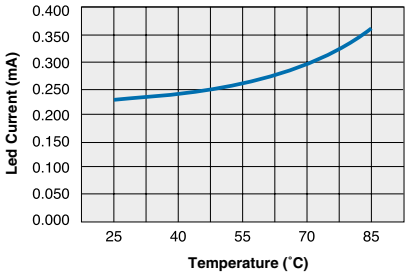
CPC1943G
Typical Blocking Voltage Distribution
(Ambient Temperature = 25°C)



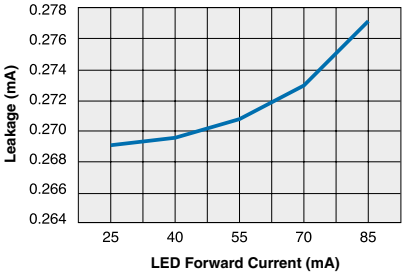
CPC1943G
Typical I_F for Switch Operation
(Ambient Temperature = 25°C)



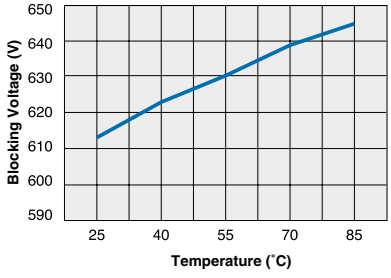
CPC1943G
Typical I_F for Switch Operation
Over Temperature



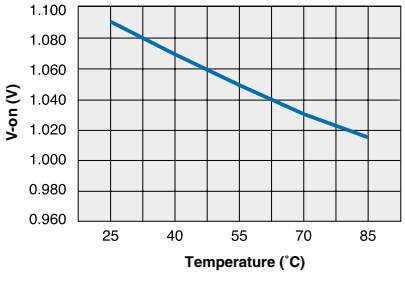
CPC1943G
Typical Leakage vs. Temperature
@ Maximum Rated Load Voltage



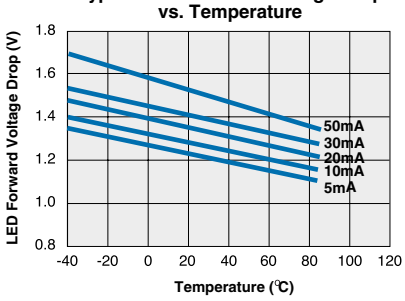
CPC1943G
Typical Blocking Voltage
vs. Temperature



CPC1943G
Typical Output V_F vs. Temperature



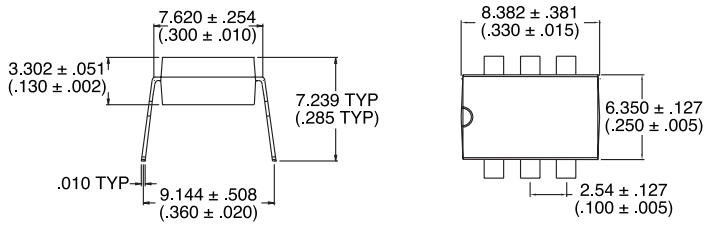
CPC1943G
Typical LED Forward Voltage Drop
vs. Temperature



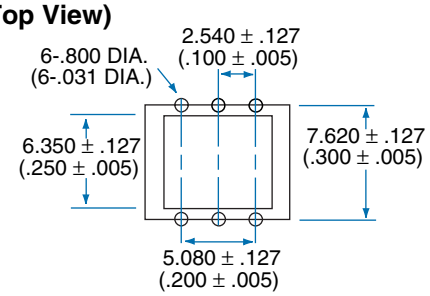
* The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

MECHANICAL DIMENSIONS

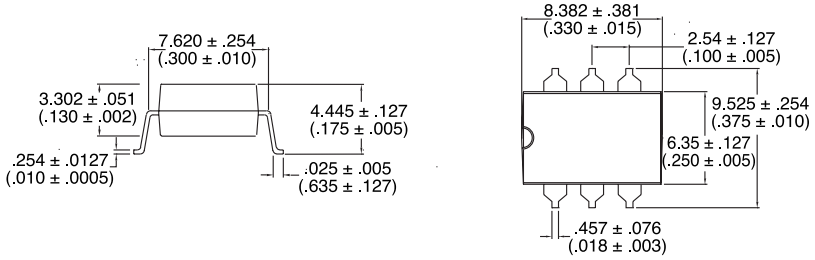
6 Pin Power DIP Through Hole (Standard)



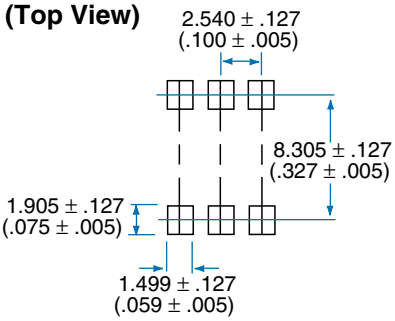
PC Board Pattern (Top View)



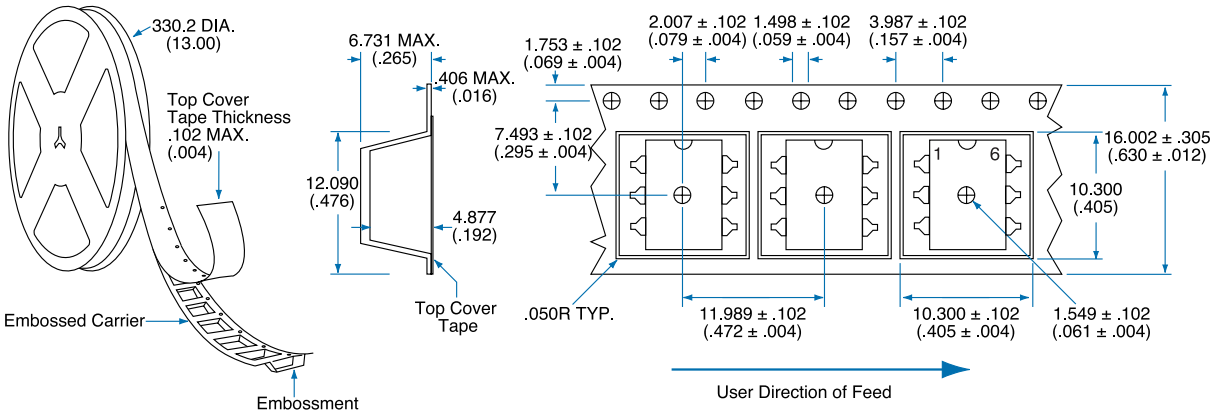
6 Pin Power DIP Surface Mount ("S" Suffix)



PC Board Pattern (Top View)



Tape and Reel Packaging for 6 Pin Power DIP Surface Mount Package



Dimensions
mm
(inches)

CLARE

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

Specification: DS-CPC1943G-R3.0

12/18/02