# CPC1035N
## 4-Pin SOP OptoMOS® Relay

| Parameter | Rating | Units |
|---|---|---|
| Blocking Voltage | 350 | $V_P$ |
| Load Current | 100 | mA |
| Max On-resistance | 35 | Ω |

### Features
- Small 4-Pin SOP Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- $1500V_{rms}$ Input/Output Isolation
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Tape & Reel Version Available

### Applications
- Telecommunications
  - Telecom Switching
  - Tip/Ring Circuits
  - Modem Switching (Laptop, Notebook, Pocket Size)
  - Hook Switch
  - Dial Pulsing
  - Ground Start
  - Ringing Injection
- Instrumentation
  - Multiplexers
  - Data Acquisition
  - Electronic Switching
  - I/O Subsystems
  - Meters (Watt-Hour, Water, Gas)
- Medical Equipment—Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls

### Description
The CPC1035N is a miniature 1-Form-A solid state relay in a 4-Pin SOP package that employs optically coupled MOSFET technology to provide $1500V_{rms}$ of input/output isolation. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS architecture. The optically coupled output is controlled by a highly efficient GaAlAs infrared LED. The CPC1035N uses Clare's state of the art double-molded vertical construction packaging to produce one of the world's smallest relays. The CPC1035N offers board space savings of at least 20% over the competitor's larger 4-Pin SOP relay.

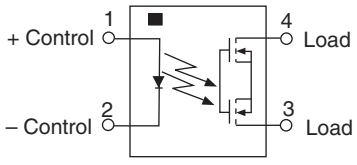
### Approvals
- UL Recognized Component: File # E76270
- EN/IEC 60950-1 Compliant
- CSA Certified Component: Certificate # 1172007

### Ordering Information

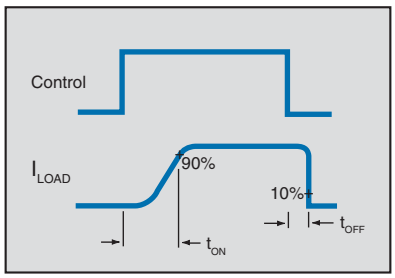
| Part # | Description |
|---|---|
| CPC1035N | 4-Pin SOP (100/tube) |
| CPC1035NTR | 4-Pin SOP (2000/reel) |

* For other packaging options consult factory.

### Pin Configuration




### Switching Characteristics of Normally Open (Form A) Devices



## Absolute Maximum Ratings (@ 25˚C)

| Parameter | Ratings | Units |
|---|---|---|
| Blocking Voltage | 350 | $V_P$ |
| Reverse Input Voltage | 5 | V |
| Input control Current | 50 | mA |
| Peak (10ms) | 1 | A |
| Input Power Dissipation | 70 | mW |
| Total Power Dissipation [1] | 400 | mW |
| Isolation voltage, Input to Output | 1500 | $V_{rms}$ |
| Operational Temperature | -40 to +85 | °C |
| Storage Temperature | -40 to +125 | °C |

[1] Derate Linearly 3.33 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.*

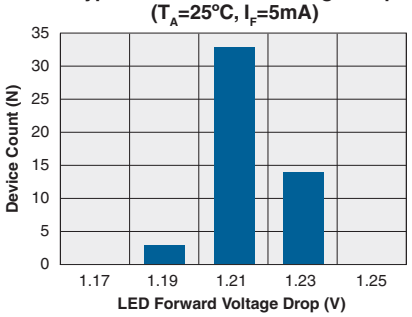
## Electrical Characteristics

| Parameter | Conditions | Symbol | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Output Characteristics @ 25°C** | | | | | | |
| Load Current | | | | | | |
| Continuous [1] | - | $I_L$ | - | - | 100 | mA |
| Peak | t=10ms | $I_{LPK}$ | - | - | 350 | |
| On-Resistance [2] | $I_L$=100mA | $R_{ON}$ | - | 30 | 35 | Ω |
| Off-State Leakage Current | $V_L$=350V | $I_{LEAK}$ | - | - | 1 | µA |
| Switching Speeds | | | | | | |
| Turn-On | $I_F$=5mA, $V_L$=10V | $t_{ON}$ | - | - | 2 | ms |
| Turn-Off | | $t_{OFF}$ | - | - | 1 | |
| Output Capacitance | 50V; f=1MHz | $C_{OUT}$ | - | 25 | - | pF |
| **Input Characteristics @ 25°C** | | | | | | |
| Input Control Current [3] | $I_L$=100mA | $I_F$ | - | 0.8 | 2 | mA |
| Input Dropout Current | - | $I_F$ | 0.3 | 0.7 | - | mA |
| Input Voltage Drop | $I_F$=5mA | $V_F$ | 0.9 | 1.2 | 1.4 | V |
| Reverse Input Current | $V_R$=5V | $I_R$ | - | - | 10 | µA |
| **Input to Output Characteristics @ 25°C** | | | | | | |
| Capacitance Input to Output | - | - | - | 1 | - | pF |

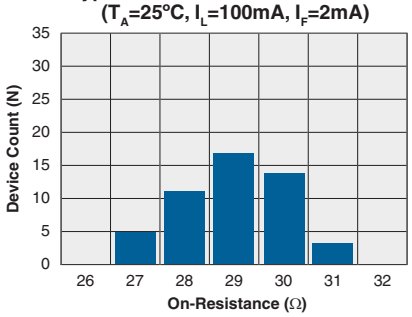
[1] Load current derates linearly from 100mA @ 25ºC to 70mA @85ºC.
[2] Measurement taken within 1 second of on time.
[3] For applications requiring high temperature operation (greater than 60ºC) an LED drive current of 4mA is recommended.

## PERFORMANCE DATA*

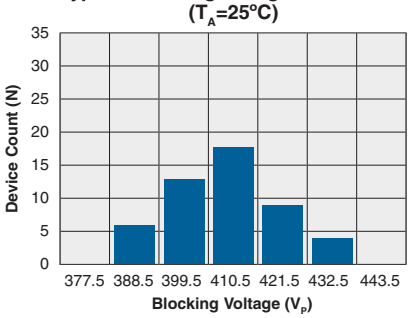
CPC1035N
Typical LED Forward Voltage Drop
($T_A$=25°C, $I_F$=5mA)



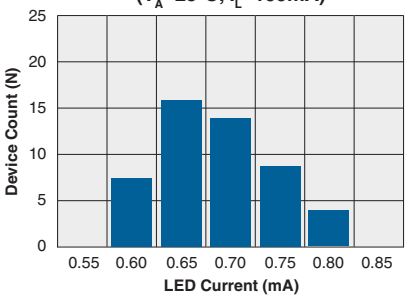

CPC1035N
Typical On-Resistance Distribution
($T_A$=25°C, $I_L$=100mA, $I_F$=2mA)



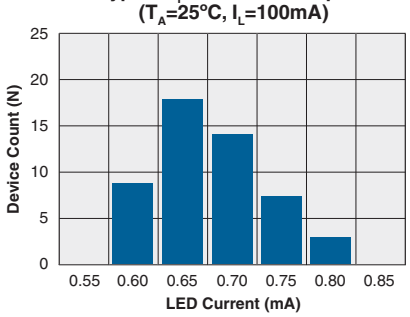

CPC1035N
Typical Blocking Voltage Distribution
($T_A$=25°C)



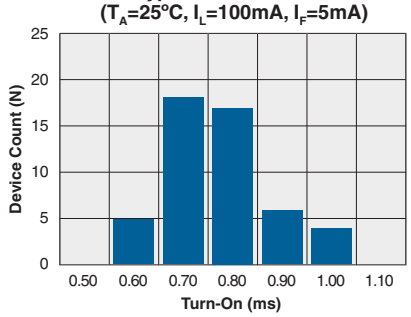

CPC1035N
Typical $I_F$ for Switch Operation
($T_A$=25°C, $I_L$=100mA)



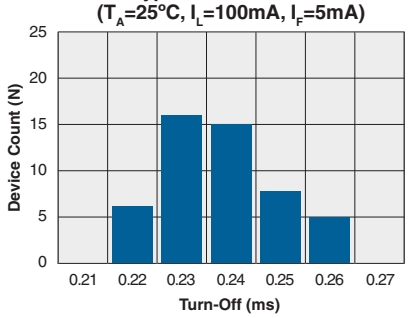

CPC1035N
Typical $I_F$ for Switch Dropout
($T_A$=25°C, $I_L$=100mA)



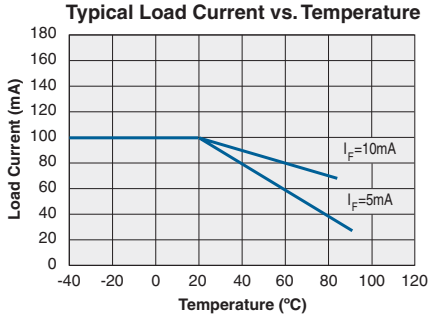

CPC1035N
Typical Turn-On Time
($T_A$=25°C, $I_L$=100mA, $I_F$=5mA)



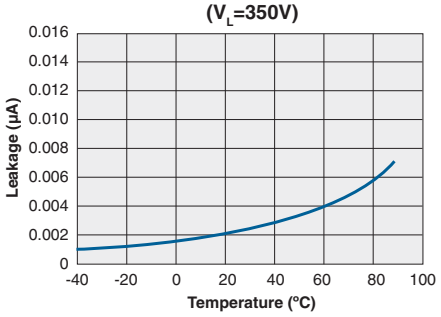

CPC1035N
Typical Turn-Off Time
($T_A$=25°C, $I_L$=100mA, $I_F$=5mA)



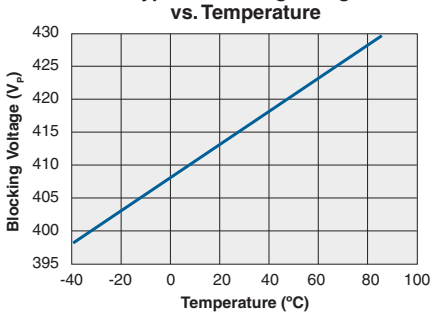

CPC1035N
Typical Load Current vs. Temperature



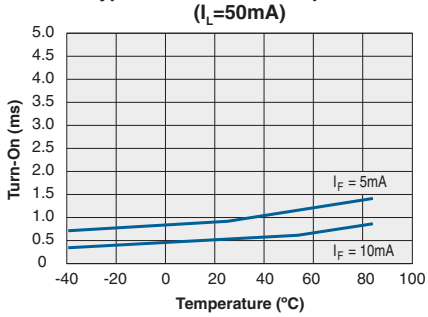

CPC1035N
Typical Leakage vs. Temperature
Measured Across Pins 3 & 4
($V_L$=350V)



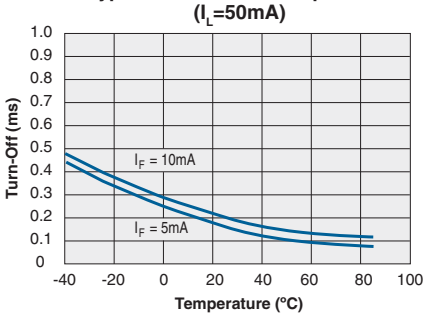

CPC1035N
Typical Blocking Voltage
vs. Temperature




CPC1035N
Typical Turn-On vs. Temperature
($I_L$=50mA)



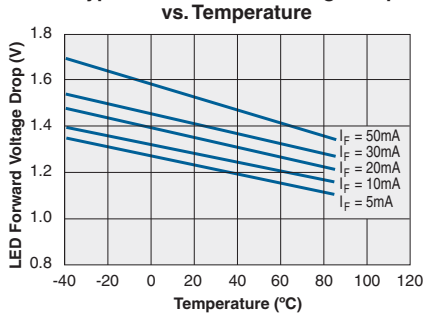

CPC1035N
Typical Turn-Off vs. Temperature
($I_L$=50mA)



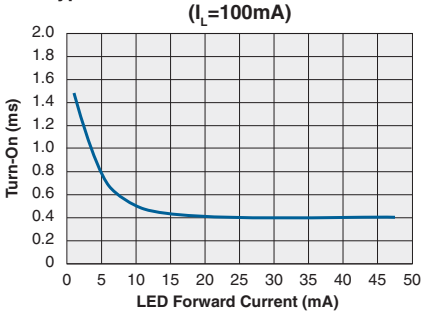

*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

## PERFORMANCE DATA*

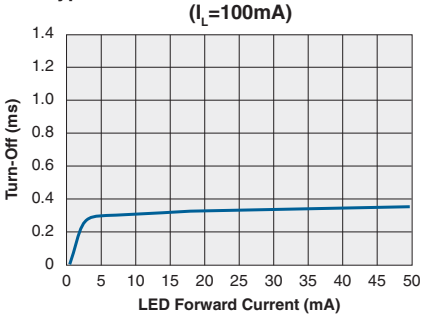
**CPC1035N**
**Typical LED Forward Voltage Drop vs. Temperature**



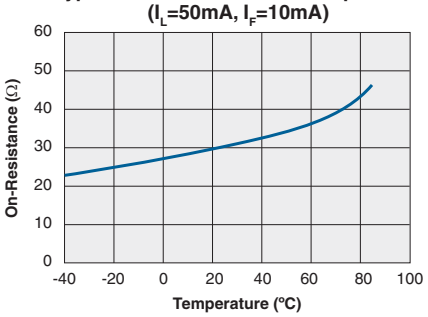

**CPC1035N**
**Typical Turn-On vs. LED Forward Current ($I_L$=100mA)**



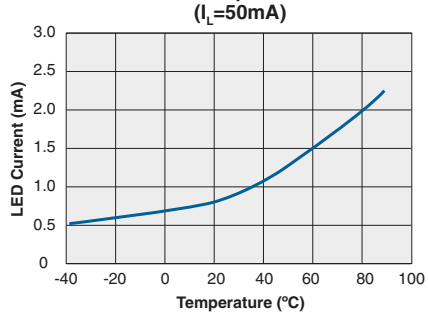

**CPC1035N**
**Typical Turn-Off vs. LED Forward Current ($I_L$=100mA)**



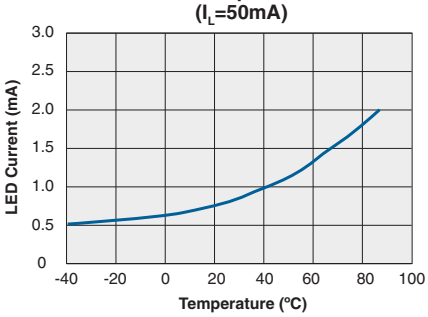

**CPC1035N**
**Typical On-Resistance vs. Temperature ($I_L$=50mA, $I_F$=10mA)**



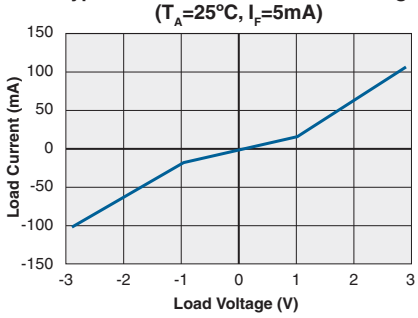

**CPC1035N**
**Typical $I_F$ for Switch Operation vs. Temperature ($I_L$=50mA)**



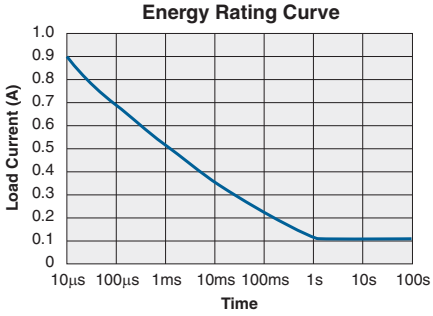

**CPC1035N**
**Typical $I_F$ for Switch Dropout vs. Temperature ($I_L$=50mA)**




**CPC1035N**
**Typical Load Current vs. Load Voltage ($T_A$=25°C, $I_F$=5mA)**




**CPC1035N**
**Energy Rating Curve**

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## MANUFACTURING INFORMATION

### Moisture Sensitivity

Clare has characterized the moisture reflow sensitivity of this package, and has determined that this component must be handled in accordance with IPC/JEDEC standard J-STD-033 moisture sensitivity level (MSL), level 3 classification.

### Soldering Reflow Profile

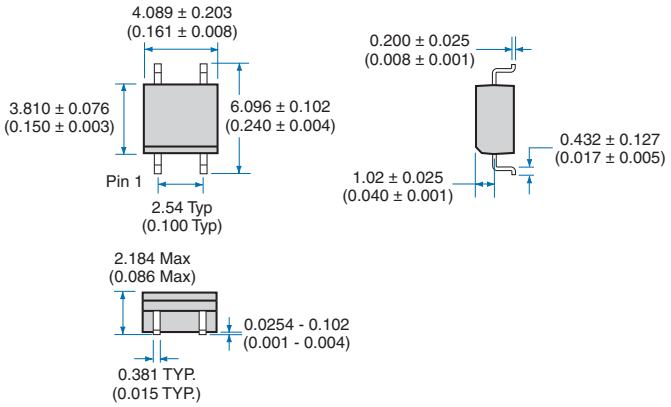
For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

### Washing

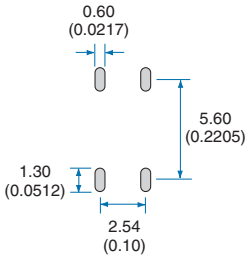
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

## MECHANICAL DIMENSIONS

**4-Pin SOP Package**

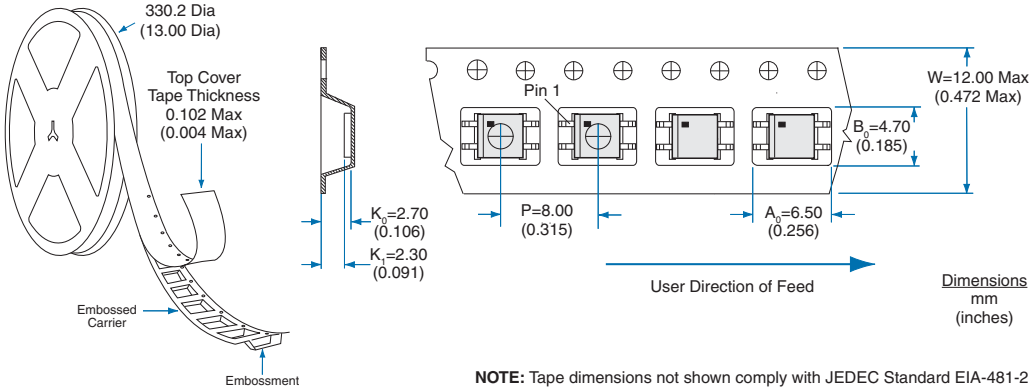



**Recommended PCB Land Pattern**




Dimensions
mm
(inches)

**Tape and Reel Packaging for 4-Pin SOP Package**




Dimensions
mm
(inches)

**NOTE:** Tape dimensions not shown comply with JEDEC Standard EIA-481-2

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



Specification: DS-CPC1035N-R11

9/16/08