



Parameter	Rating	Units
Blocking Voltage	30	V _P
Load Current	1.2	A _{DC}
On-Resistance (max)	0.25	Ω

Features

- 1500V_{rms} Input/Output Isolation
- Small 4-Pin SOP Package
- Low Drive Power Requirements
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Wave Solderable
- Tape & Reel Version Available

Applications

- Sensor Circuitry
- Instrumentation
- Multiplexers
- Data Acquisition
- Electronic Switching
- I/O Subsystems
- Meters (Watt-Hour, Water, Gas)
- Medical Equipment—Patient/Equipment Isolation
- Aerospace
- Industrial Controls

Description

The CPC1020N is a 30V, single-pole, normally-open (1-Form-A) Solid State Relay. The ultra-low on-resistance, 0.25Ω, of this relay allows for high-current operation.

IXYS Integrated Circuits Division's patented OptoMOS architecture makes available the optically coupled technology necessary to activate the output's efficient MOSFET switches while providing 1500V_{rms} input to output isolation. Control of the isolated output is accomplished by means of the highly efficient infrared LED at the input.

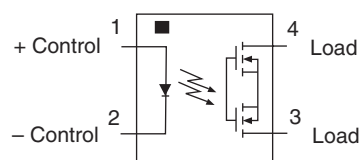
Approvals

- UL Recognized Component: File E76270
- CSA Certified Component: Certificate 1172007
- EN/IEC 60950-1 Certified Component:
Certificate B 13 12 82667 003

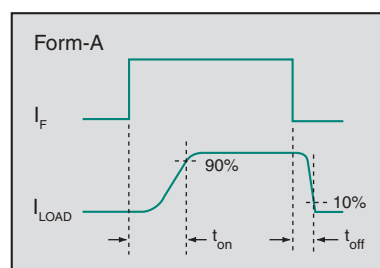
Ordering Information

Part #	Description
CPC1020N	4-Pin SOP (100/tube)
CPC1020NTR	4-Pin SOP (2000/reel)

Pin Configuration



Switching Characteristics of Normally-Open Devices



Absolute Maximum Ratings @ 25°C

Parameter	Ratings	Units
Blocking Voltage	30	V _p
Input Power Dissipation ¹	75	mW
Input Control Current	50	mA
Peak (10ms)	1	A
Reverse Input Voltage	5	V
Total Power Dissipation ²	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 1.33 mW / °C

² 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.

Typical values are characteristic of the device at +25°C, and are the result of engineering evaluations. They are provided for information purposes only, and are not part of the manufacturing testing requirements.

Electrical Characteristics @ 25°C

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current						
Continuous ¹	I _F =2mA	I _L	-	-	1.2	A _{DC}
Peak	t ≤ 10ms	I _{LPK}	-	-	3	A
On-Resistance ²	I _L =1A	R _{ON}	-	0.116	0.25	Ω
Off-State Leakage Current	V _L =30V _p	I _{LEAK}	-	-	1	μA
Switching Speeds						
Turn-On	I _F =5mA, V _L =10V	t _{on}	-	0.48	3	ms
Turn-Off		t _{off}	-	0.65	3	
Output Capacitance	I _F =0mA, V _L =25V, f=1MHz	C _{OUT}	-	33	-	pF
Input Characteristics						
Input Control Current to Activate	I _L =1A	I _F	-	0.13	2	mA
Input Control Current to Deactivate	-	I _F	0.1	-	-	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/Output Characteristics						
Capacitance, Input to Output	V _{IO} =0V, f=1MHz	C _{IO}	-	3	-	pF

¹ Load current derates linearly from 1.2A @ 25°C to 0.58A @ 85°C.

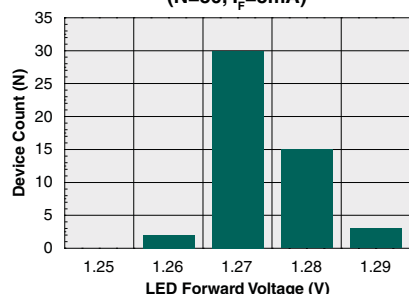
² Measurement taken within 1 second of on-time.

ESD Rating

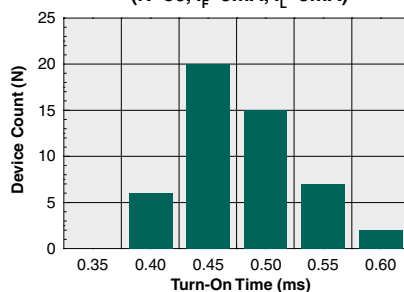
ESD Rating (Human Body Model)
1000 Volts

PERFORMANCE DATA @ 25°C (Unless Otherwise Noted)*

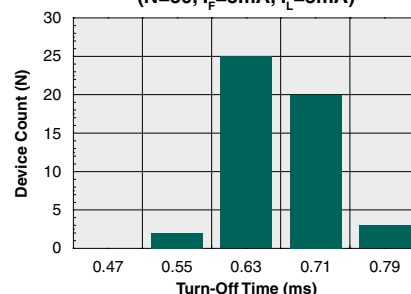
Typical LED Forward Voltage Drop
(N=50, $I_F=5\text{mA}$)



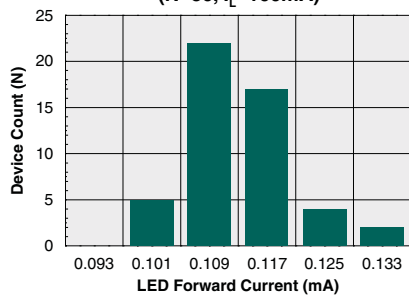
Typical Turn-On Time Distribution
(N=50, $I_F=5\text{mA}$, $I_L=5\text{mA}$)



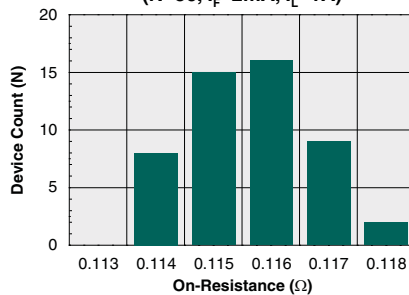
Typical Turn-Off Time Distribution
(N=50, $I_F=5\text{mA}$, $I_L=5\text{mA}$)



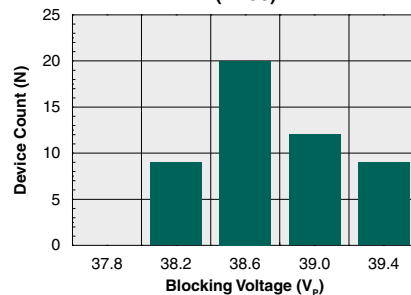
Typical I_F for Switch Operation
(N=50, $I_L=100\text{mA}$)



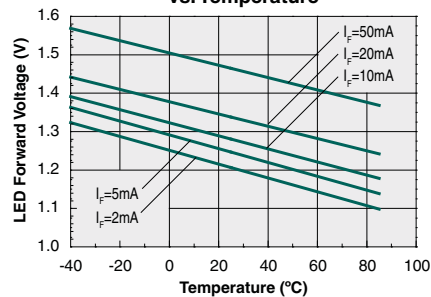
Typical On-Resistance Distribution
(N=50, $I_F=2\text{mA}$, $I_L=1\text{A}$)



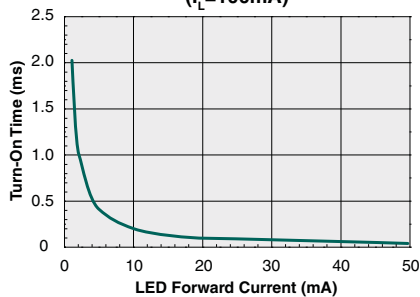
Typical Blocking Voltage Distribution
(N=50)



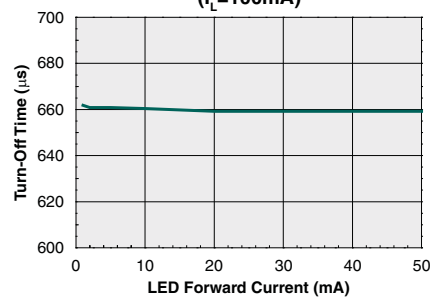
Typical LED Forward Voltage Drop
vs. Temperature



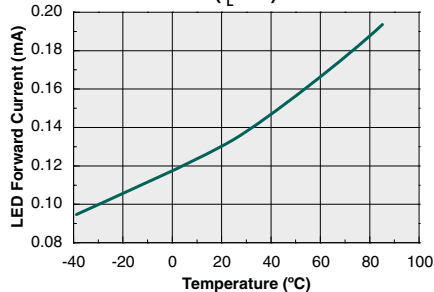
Typical Turn-On Time
vs. LED Forward Current
($I_L=100\text{mA}$)



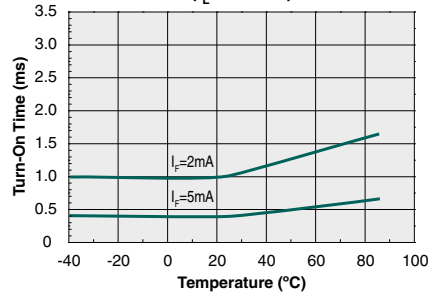
Typical Turn-Off Time
vs. LED Forward Current
($I_L=100\text{mA}$)



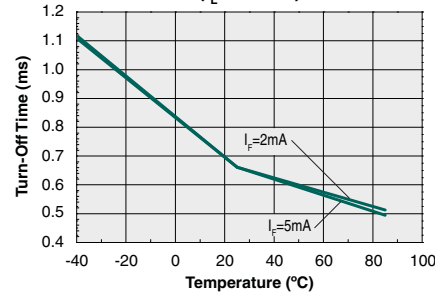
Typical I_F for Switch Operation
vs. Temperature
($I_L=1\text{A}$)



Typical Turn-On Time vs. Temperature
($I_L=100\text{mA}$)

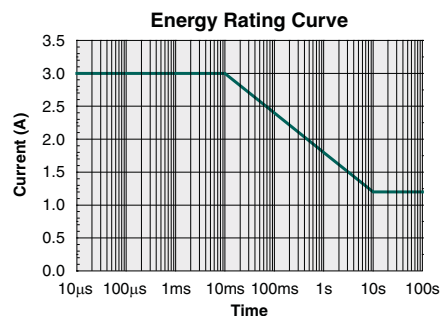
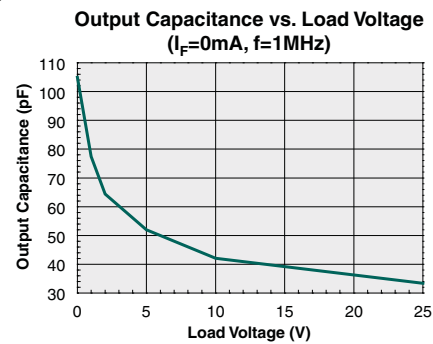
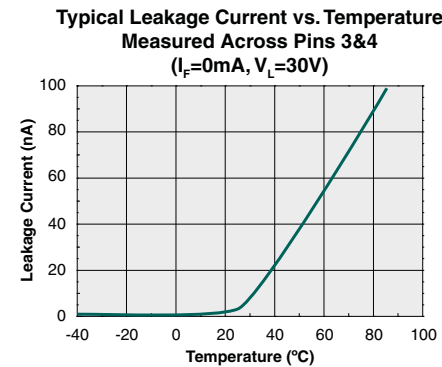
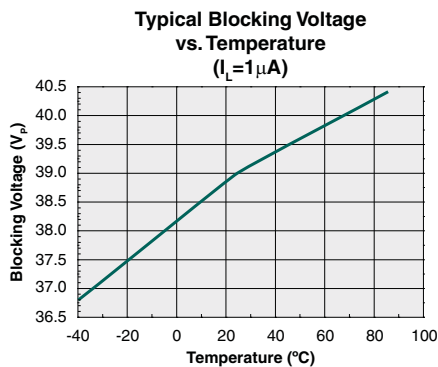
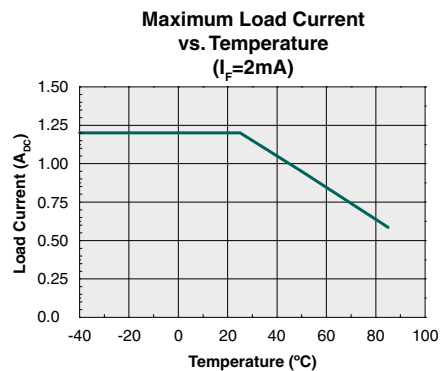
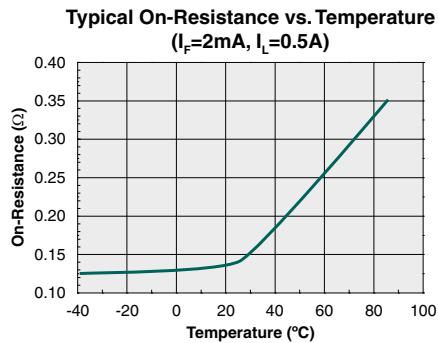
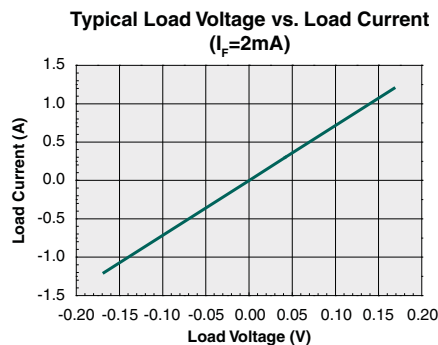


Typical Turn-Off Time vs. Temperature
($I_L=100\text{mA}$)



*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 @ 25°C (Unless Otherwise Noted)*



*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.

Manufacturing Information

Moisture Sensitivity



All plastic encapsulated semiconductor packages are susceptible to moisture ingress. IXYS Integrated Circuits Division classified all of its plastic encapsulated devices for moisture sensitivity according to the latest version of the joint industry standard, **IPC/JEDEC J-STD-020**, in force at the time of product evaluation. We test all of our products to the maximum conditions set forth in the standard, and guarantee proper operation of our devices when handled according to the limitations and information in that standard as well as to any limitations set forth in the information or standards referenced below.

Failure to adhere to the warnings or limitations as established by the listed specifications could result in reduced product performance, reduction of operable life, and/or reduction of overall reliability.

This product carries a **Moisture Sensitivity Level (MSL) rating** as shown below, and should be handled according to the requirements of the latest version of the joint industry standard **IPC/JEDEC J-STD-033**.

Device	Moisture Sensitivity Level (MSL) Rating
CPC1020N	MSL 3

ESD Sensitivity



This product is **ESD Sensitive**, and should be handled according to the industry standard **JESD-625**.

Soldering Profile

This product has a maximum body temperature and time rating as shown below. All other guidelines of **J-STD-020** must be observed.

Device	Maximum Temperature x Time	Maximum Reflow Cycles
CPC1020N	260°C for 30 seconds	3

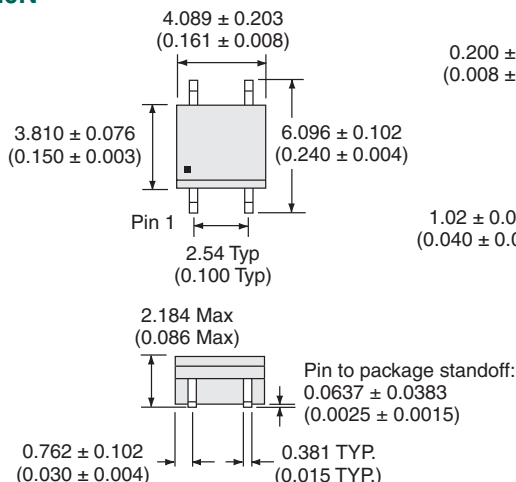
Board Wash

IXYS Integrated Circuits Division recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since IXYS Integrated Circuits Division employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a short drying bake could be necessary if a wash is used after solder reflow processes. Chlorine- or Fluorine-based solvents or fluxes should not be used. Cleaning methods that employ ultrasonic energy should not be used.

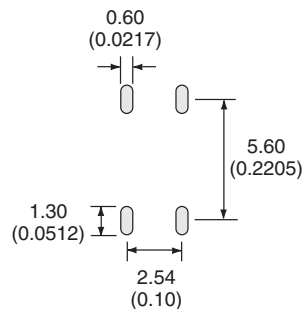


MECHANICAL DIMENSIONS

CPC1020N

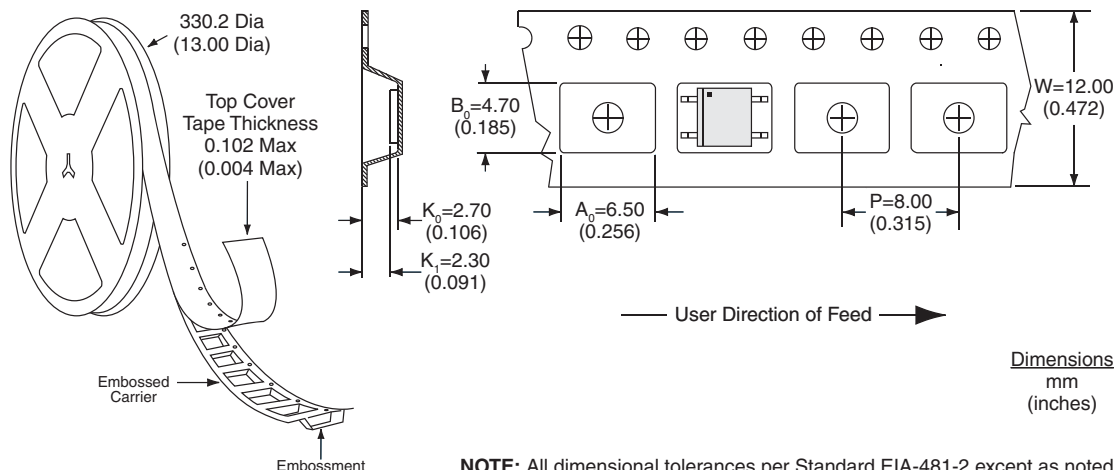


Recommended PCB Land Pattern



Dimensions
mm
(inches)

CPC1020NTR Tape & Reel



NOTE: All dimensional tolerances per Standard EIA-481-2 except as noted

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

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