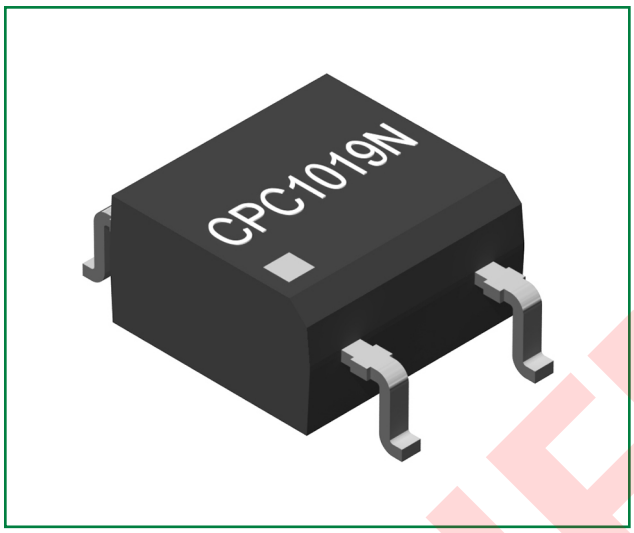
CPC1019N

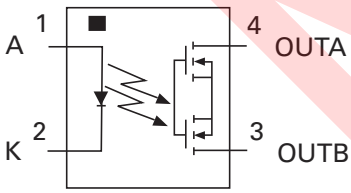
60V, 750 mA 1-Form-A SSR

Key Attributes

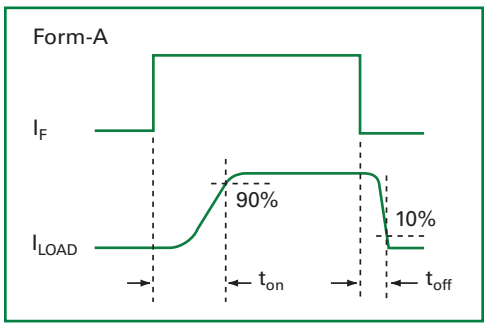
Characteristic	Rating	Unit
Blocking Voltage	60	V_P
Load Current	750	mA_{DC}
Load Current, Peak AC	1	A_P
On-resistance (max)	0.6	Ω
LED Current to Operate	2	mA



Pin Configuration



Switching Characteristics of Normally Open Devices



Description

CPC1019N is a miniature, low-voltage, low on-resistance, single-pole, normally-open (1-Form-A) solid state relay in a small 4-pin SOP package.

Embodying Littelfuse's patented OptoMOS technology, the CPC1019N comprises a highly efficient infrared LED that is optically coupled to efficient MOSFET output switches to provide $1500V_{RMS}$ of input-to-output isolation.

Littelfuse's state of the art double-molded vertical construction packaging produces a very compact solid state relay that is ideal for replacing larger, less-reliable reed and electromechanical relays.

Features

- Low On-Resistance: 0.6Ω
- Low Drive Current: 2 mA
- High Load Current: 750 mA
- $1500V_{RMS}$ Input/Output Isolation
- Compact 4-Pin SOP Package
- No EMI/RFI Generation
- Immune to Radiated EM Fields
- Tape & Reel Version

Applications

- Security
  - Passive Infrared Detectors (PIR)
  - Data Signalling
  - Sensor Circuitry
- Instrumentation
  - Multiplexers
  - Data Acquisition
  - Electronic Switching
  - I/O Subsystems
- Utility Meters (gas, oil, electric and water)
- Medical Equipment—Patient/Equipment Isolation
- Industrial Controls
- ATE

Approvals

- UL Recognized Component: File E76270
- CSA Certified Component: Certificate 1172007
- IEC EN 62368-1: TUV Certificate B 082667 0008

Ordering Information

Part Number	Description
CPC1019N	4-Pin SOP (100/tube)
CPC1019NTR	4-Pin SOP (2000/Reel)

©Littelfuse, Inc.
Specifications are subject to change without notice

Downloaded from Arrow.com.

Specifications

Absolute Maximum Ratings

Parameter	Ratings	Units
Blocking Voltage	60	V_P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10 ms)	1	A
Input Power Dissipation	70	mW
Total Power Dissipation [1]	400	
Isolation Voltage, Input to Output (60 s)	1500	V_{RMS}
Operating Temperature, Ambient	–40 to +85	°C
Storage Temperature	–40 to +125	

[1] Derate output power 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	Value			Units
			Minimum	Typical	Maximum	
Output Characteristics						
Blocking voltage	$I_L = 1\,\mu A$	V_{DRM}	60	-	-	V
Load current:						
Continuous	$I_F = 2$ mA	I_L	-	-	750	mA_{DC}
Continuous, AC Peak			-	-	1	A
Peak	$t \le 10$ ms	I_{LPK}	-	-	3	A_P
On-resistance [1]	$I_F = 2$ mA, $I_L = 750$ mA	R_{ON}	-	0.35	0.6	Ω
Off-state leakage current	$V_L = 60$V	I_{LEAK}	-	-	1	µA
Switching speeds:						
Turn-on	$I_F = 5$ mA, $V_L = 10$V	t_{on}	-	0.4	3	ms
Turn-off		t_{off}	-	0.4	3	
Output capacitance	$I_F = 0$ mA, $V_L = 50$V, f = 1 MHz	C_{OUT}	-	60	-	pF
Input Characteristics						
Input control current to activate [2]	$I_L = 750$ mA	I_F	-	0.15	2	mA
Input control current to deactivate	-	I_F	0.1	0.14	-	
Input voltage drop	$I_F = 5$ mA	V_F	0.9	1.36	1.5	V
Reverse input current	$V_R = 5$V	I_R	-	-	10	µA
Input/Output Characteristics						
Capacitance, input to output	$V_{IO} = 0$V, f = 1 MHz	C_{IO}	-	1	-	pF

[1] Measurement taken within 1 second of on-time.
[2] For applications requiring operation greater than 60 °C, a minimum LED drive current of 4 mA is recommended.

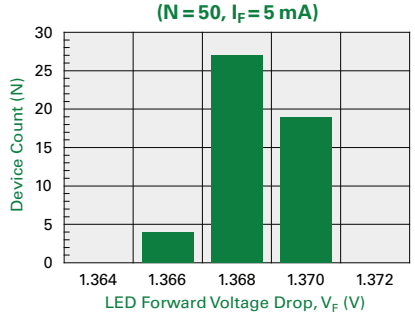
NTND

©Littelfuse, Inc.
Specifications are subject to change without notice

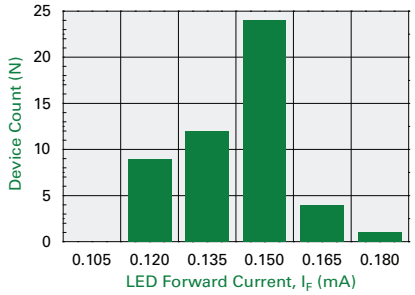
Downloaded from Arrow.com.

Characteristic Curves

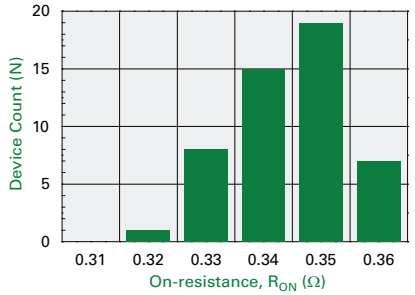
Typical LED Forward Voltage Drop (N = 50, I_F = 5 mA)



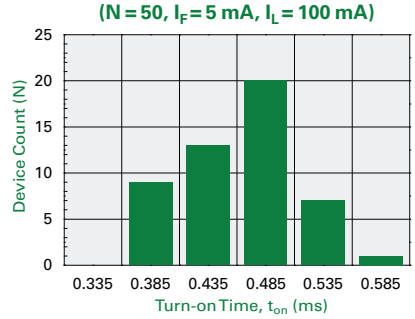
Typical I_F for Switch Operation (N = 50, I_L = 100 mA)



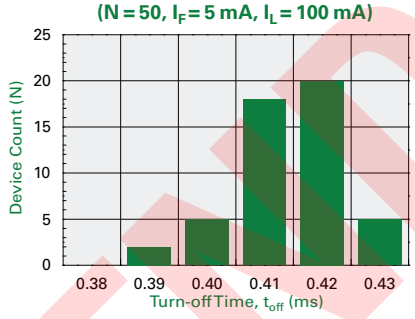
Typical On-resistance Distribution (N = 50, I_F = 2 mA, I_L = 0.75 A)



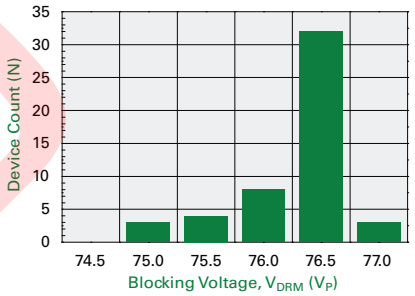
Typical Turn-on Time Distribution (N = 50, I_F = 5 mA, I_L = 100 mA)



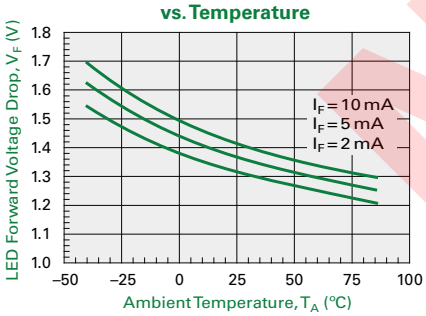
Typical Turn-off Time Distribution (N = 50, I_F = 5 mA, I_L = 100 mA)



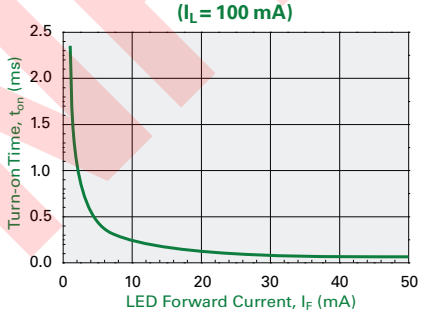
Typical Blocking Voltage Distribution (N = 50)



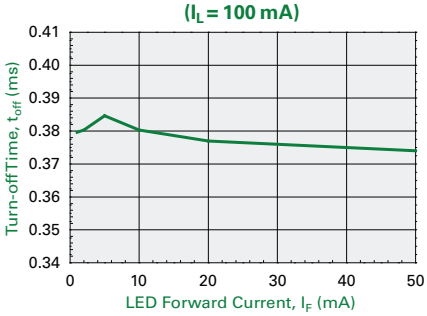
Typical LED Forward Voltage Drop vs. Temperature



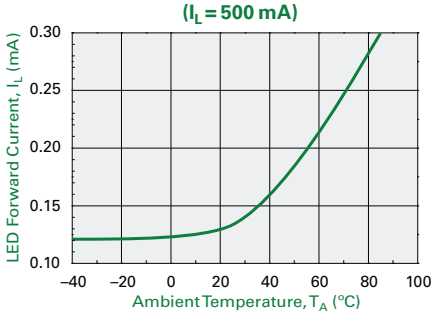
Typical Turn-on Time vs. LED Forward Current (I_L = 100 mA)



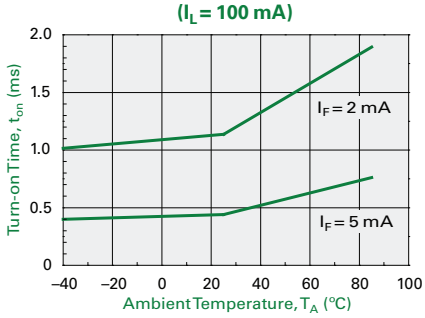
Typical Turn-off Time vs. LED Forward Current (I_L = 100 mA)



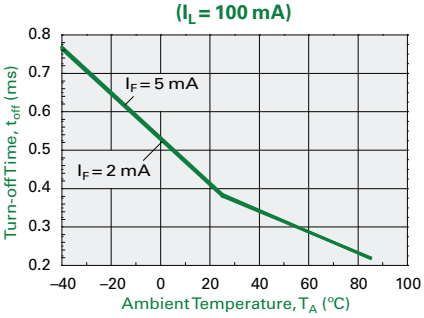
Typical LED Forward Current to Operate vs. Temperature (I_L = 500 mA)



Typical Turn-on Time vs. Temperature (I_L = 100 mA)



Typical Turn-off Time vs. Temperature (I_L = 100 mA)



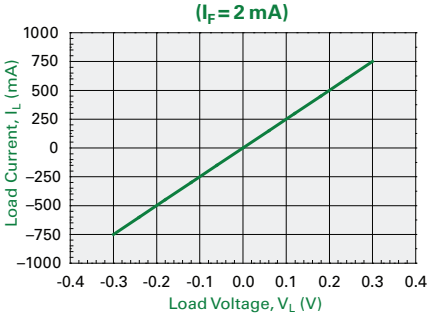
*Unless otherwise noted, data presented in these graphs is typical of device operation at T_A = 25°C.

©Littelfuse, Inc.
Specifications are subject to change without notice

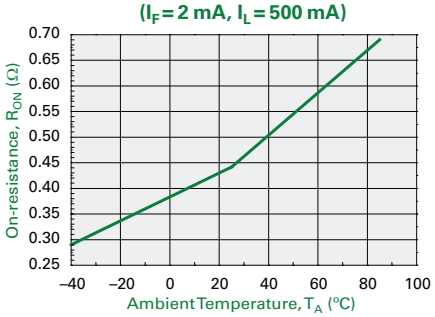
Downloaded from Arrow.com.

Characteristic Curves

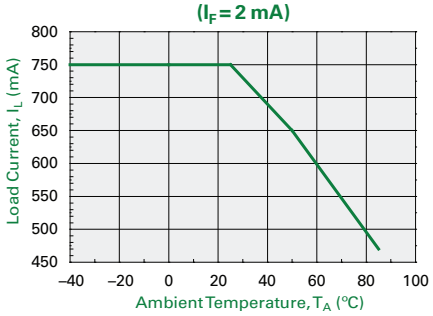
Typical Load Current vs. Load Voltage (I_F = 2 mA)



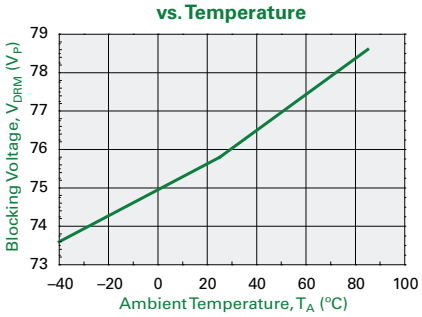
Typical On-resistance vs. Temperature (I_F = 2 mA, I_L = 500 mA)



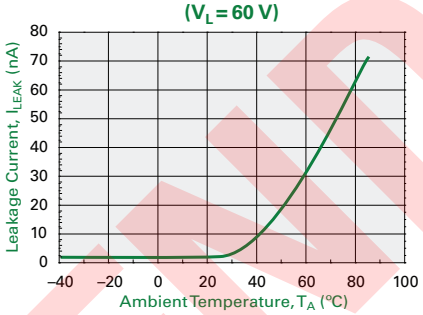
Maximum Load Current vs. Temperature (I_F = 2 mA)



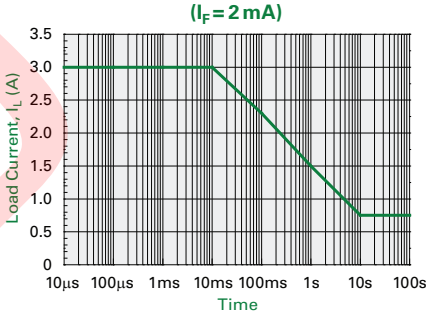
Typical Blocking Voltage vs. Temperature



Typical Leakage Current vs. Temperature (V_L = 60 V)



Energy Rating Curve (I_F = 2 mA)



NFND

*Unless otherwise noted, data presented in these graphs is typical of device operation at T_A = 25°C.

©Littelfuse, Inc.
Specifications are subject to change without notice

Downloaded from Arrow.com.

Manufacturing Information

Moisture Sensitivity

All plastic encapsulated semiconductor packages are susceptible to moisture ingression. Littelfuse classifies its plastic encapsulated devices for moisture sensitivity according to the latest revision 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)** classification as shown below, and should be handled according to the requirements of the latest revision of the joint industry standard **IPC/JEDEC J-STD-033**.

Device	Moisture Sensitivity Level (MSL) Classification
CPC1019N	MSL 3

ESD Sensitivity

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

Soldering Profile

Provided in the table below is the **IPC/JEDEC J-STD-020** Classification Temperature (T_c) and the maximum dwell time the body temperature of these surface mount devices may be (T_c - 5)°C or greater. The Classification Temperature sets the Maximum Body Temperature allowed for these devices during reflow soldering processes.

Device	Classification Temperature (T_c)	Dwell Time (T_p)	Max Reflow Cycles
CPC1019N	260°C	30 seconds	3

Board Wash

Littelfuse recommends the use of no-clean flux formulations. Board washing to reduce or remove flux residue following the solder reflow process is acceptable provided proper precautions are taken to prevent damage to the device. These precautions include but are not limited to: using a low pressure wash and providing a follow up bake cycle sufficient to remove any moisture trapped within the device due to the washing process. Due to the variability of the wash parameters used to clean the board, determination of the bake temperature and duration necessary to remove the moisture trapped within the package is the responsibility of the user (assembler). Cleaning or drying methods that employ ultrasonic energy may damage the device and should not be used. Additionally, the device must not be exposed to halide flux or solvents.

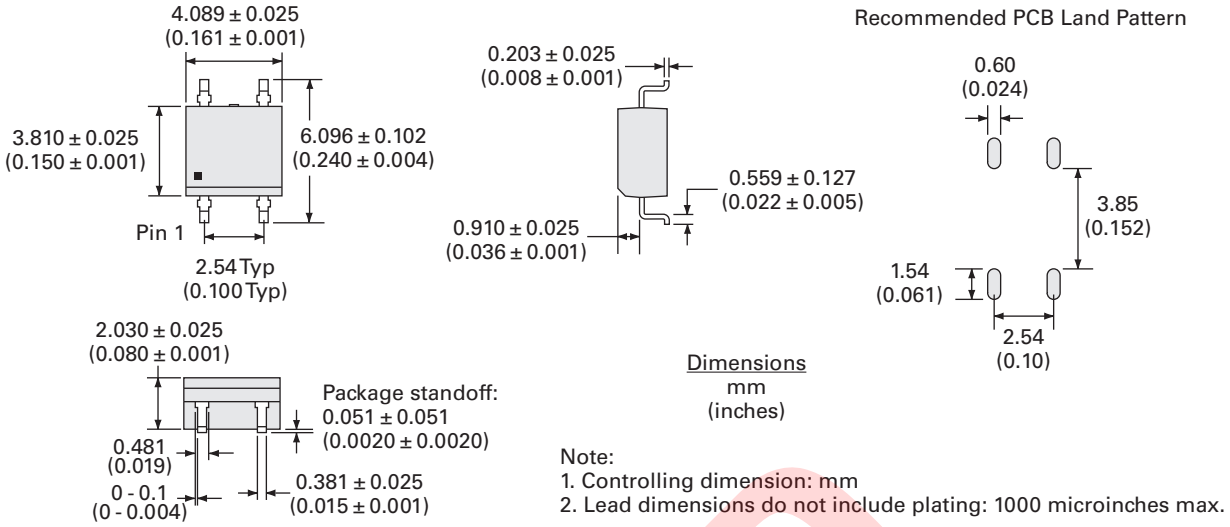
NFND

©Littelfuse, Inc.
Specifications are subject to change without notice

Downloaded from Arrow.com.

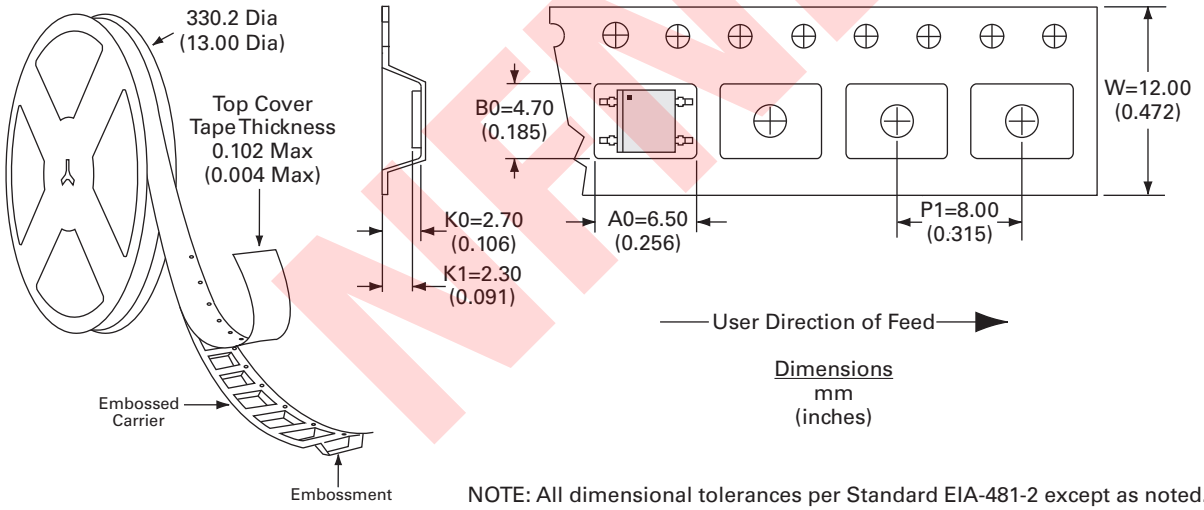
Mechanical Dimensions

CPC1019N



Note:
1. Controlling dimension: mm
2. Lead dimensions do not include plating: 1000 microinches max.

CPC1010NTR Tape & Reel



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

NRND

Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at **https://www.littelfuse.com/disclaimer-electronics**

©Littelfuse, Inc.
Specifications are subject to change without notice

Downloaded from Arrow.com.