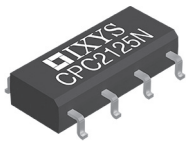
IXYS
INTEGRATED CIRCUITS DIVISION



CPC2125N
400V Dual Normally-Closed Single-Pole 8-Pin SOIC OptoMOS® Relay

Parameter	Rating	Units
Blocking Voltage	400	V_P
Load Current	100	mA_{rms} / mA_{DC}
On-Resistance (max)	35	Ω
LED Forward Current (to Activate)	2	mA

Features
- 1500V_{rms} Input/Output Isolation
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Immune to Radiated EM Fields
- Tape & Reel Version Available
- Small 8-Pin SOIC Package
- Flammability Rating UL 94 V-0

Applications
- Telecommunications
  - Telecom Switching
  - Tip/Ring Circuits
  - Modem Switching (Laptop, Notebook, Pocket Size)
  - Hook Switch
  - Dial Pulsing
  - Ground Start
  - Ringing Injection
- Security
  - Passive Infrared Detectors (PIR)
  - Data Signaling
  - Sensor Circuitry
- Instrumentation
- Multiplexers
- Data Acquisition
- Electronic Switching
- I/O Subsystems
- Medical Equipment—Patient/Equipment Isolation
- Aerospace
- Industrial Controls

Description
The CPC2125N is a miniature device with two independent normally-closed (1-Form-B) solid state relays in an 8-pin SOIC package that employs optically coupled MOSFET technology to provide 1500V_{rms} of input to output isolation.

Optically coupled outputs, using the patented OptoMOS architecture, are controlled by a highly efficient infrared LED.

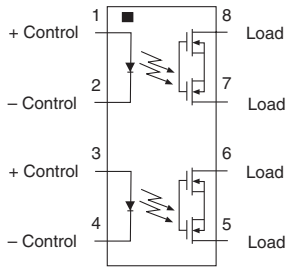
Constructed using IXYS Integrated Circuits' state of the art double-molded, vertical construction packaging, this device is one of the world's smallest relays. It offers substantial board space savings over the competitor's larger 8-pin SOIC relay.

Approvals
- UL Recognized Component: File E76270
- CSA Approval Pending
- EN/IEC 60950-1 Certified Component: Certificate available on our website

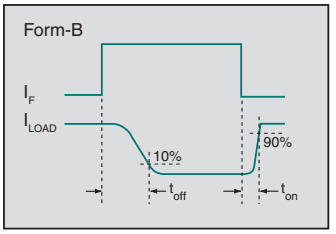
Ordering Information

Part #	Description
CPC2125N	8-Pin SOIC (50/tube)
CPC2125NTR	8-Pin SOIC (2000/reel)

Pin Configuration



Switching Characteristics of Normally-Closed (Form-B) Devices



ПРОМЭЛЕКТРОНИКА / sales@prom-elec.com

Absolute Maximum Ratings @ 25ºC

Parameter	Ratings	Units
Blocking Voltage	400	V_P
Reverse Input Voltage	5	V
LED Forward Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation	70	mW
Total Power Dissipation [1]	600	mW
Isolation Voltage, Input to Output (60 Seconds)	1500	V_{rms}
ESD Rating, Human Body Model	8	kV
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

[1] Derate linearly 5mW / °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.

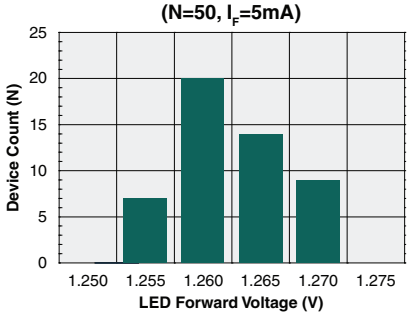
Electrical Characteristics @ 25ºC

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current						
Continuous [1]	I_F=0mA	I_L	-	-	100	mA_{rms} / mA_{DC}
Peak	t =10ms	I_{LPK}	-	-	±350	mA_P
On-Resistance [2]	I_L=100mA	R_{ON}	-	26	35	Ω
Switching Speeds						
Turn-On	I_F=5mA, V_L=10V	t_{on}	-	0.31	2	ms
Turn-Off		t_{off}	-	0.30	2	
Off-State Leakage Current	V_L=400V, I_F=2mA	I_{LEAK}	-	-	5	µA
Output Capacitance	I_F=2mA, V_L= 50V, f=1MHz	C_{OUT}	-	6	-	pF
Input Characteristics						
LED Forward Current						
To Activate [3]	I_L=100mA	I_F	-	-	2	mA
To Deactivate	-		0.1	-	-	
Input Voltage Drop	I_F=5mA	V_F	0.9	1.2	1.5	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA
Common Characteristics						
Capacitance, Input to Output	V_{IO}=0V, f=1MHz	C_{IO}	-	1	-	pF

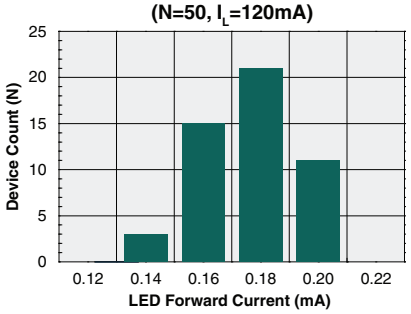
[1] Load current derates linearly from 100mA @ 25ºC to 60mA @ 85ºC, and must be derated if both poles are operating simultaneously.
[2] Measurement taken within 1 second of on-time.
[3] For applications requiring high temperature operation (greater than 60°C) a minimum LED forward current of 4mA is recommended.

PERFORMANCE DATA*

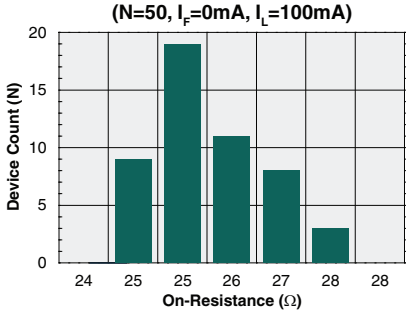
Typical LED Forward Voltage Drop (N=50, I_F=5mA)



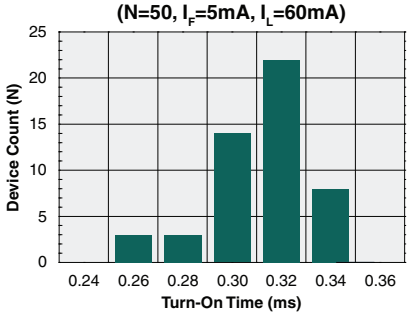
Typical LED Forward Current to Activate (N=50, I_L=120mA)



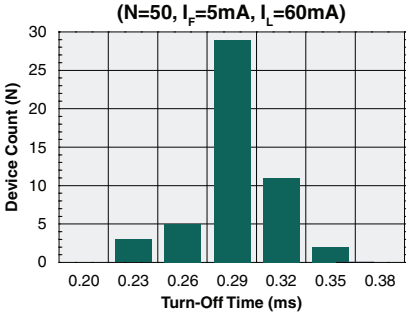
Typical On-Resistance Distribution (N=50, I_F=0mA, I_L=100mA)



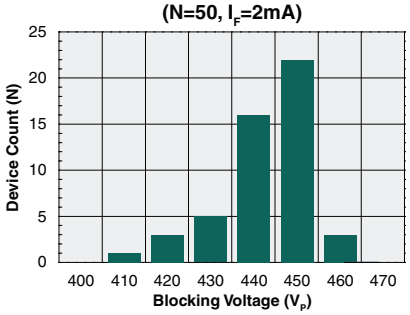
Typical Turn-On Time (N=50, I_F=5mA, I_L=60mA)



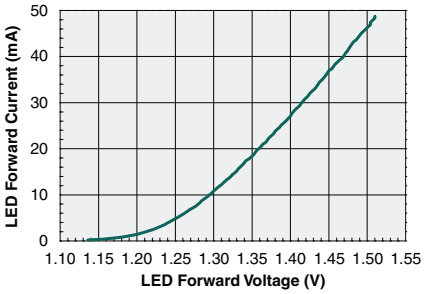
Typical Turn-Off Time (N=50, I_F=5mA, I_L=60mA)



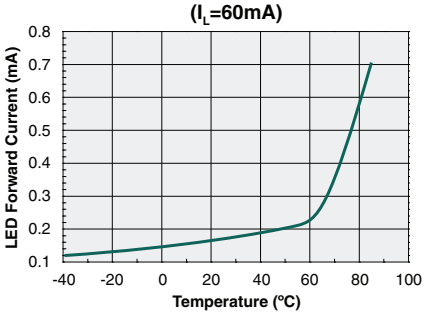
Typical Blocking Voltage Distribution (N=50, I_F=2mA)



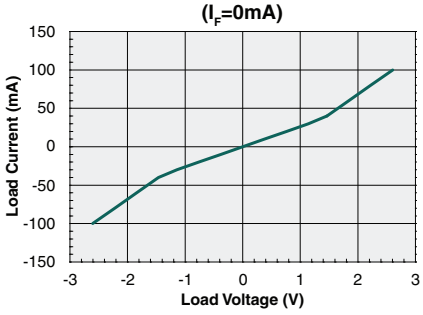
Typical LED Forward Voltage vs. LED Forward Current



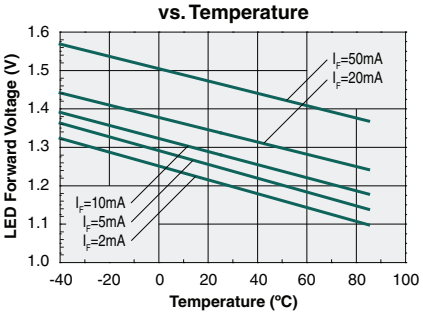
Typical LED Forward Current to Activate (I_L=60mA)



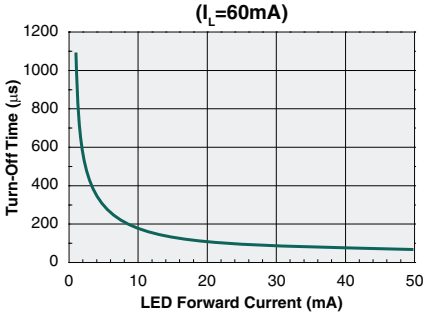
Typical Load Current vs. Load Voltage (I_F=0mA)



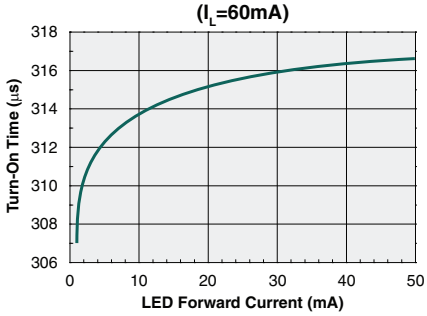
Typical LED Forward Voltage Drop vs. Temperature



Typical Turn-Off Time vs. LED Forward Current (I_L=60mA)



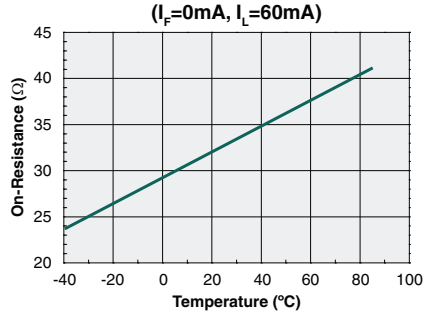
Typical Turn-On Time vs. LED Forward Current (I_L=60mA)



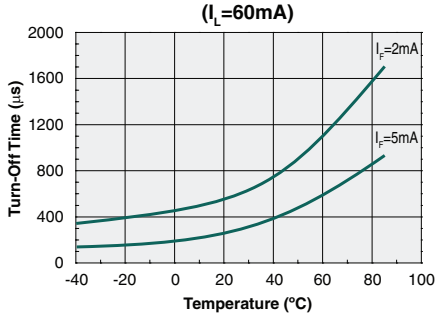
*Unless otherwise noted, data presented in these graphs is typical of device operation at 25ºC.
For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

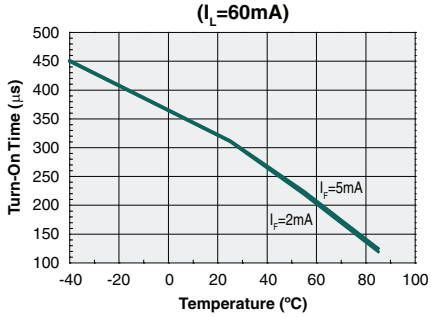
Typical On-Resistance vs. Temperature (I_F=0mA, I_L=60mA)



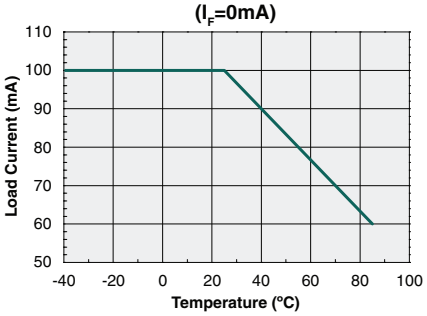
Typical Turn-Off Time vs. Temperature (I_L=60mA)



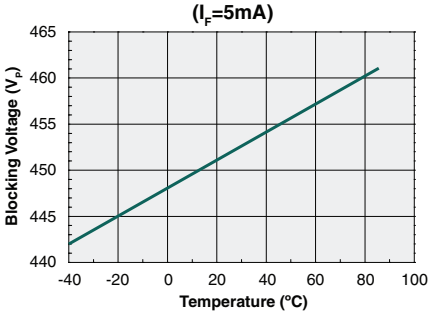
Typical Turn-On Time vs. Temperature (I_L=60mA)



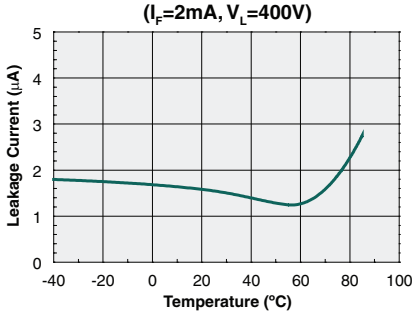
Maximum Load Current vs. Temperature (I_F=0mA)



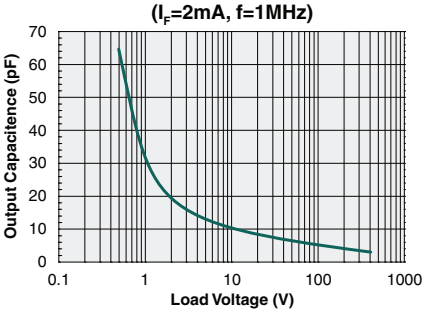
Typical Blocking Voltage vs. Temperature (I_F=5mA)



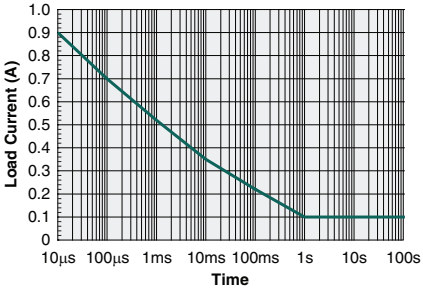
Leakage Current vs. Temperature Measured Across Pins 5&6, 7&8 (I_F=2mA, V_L=400V)



Output Capacitance vs. Load Voltage (I_F=2mA, f=1MHz)



Energy Rating Curve



*Unless otherwise noted, data presented in these graphs is typical of device operation at 25°C.
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 ingression. IXYS Integrated Circuits classifies 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) classification 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) Classification
CPC2125N	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 Classification Temperature (T_C) of this product and the maximum dwell time the body temperature of this device may be (T_C - 5)ºC or greater. The classification temperature sets the Maximum Body Temperature allowed for this device during lead-free reflow processes. For through-hole devices, and any other processes, the guidelines of **J-STD-020** must be observed.

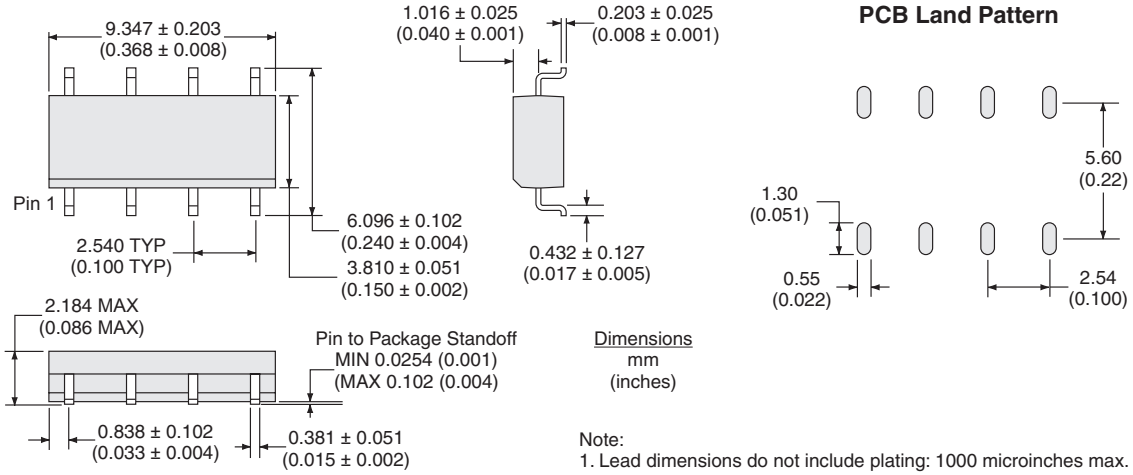
Device	Classification Temperature (T_c)	Dwell Time (t_p)	Max Reflow Cycles
CPC2125N	260ºC	30 seconds	3

Board Wash

IXYS Integrated Circuits 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 flux or solvents that are Chlorine- or Fluorine-based.

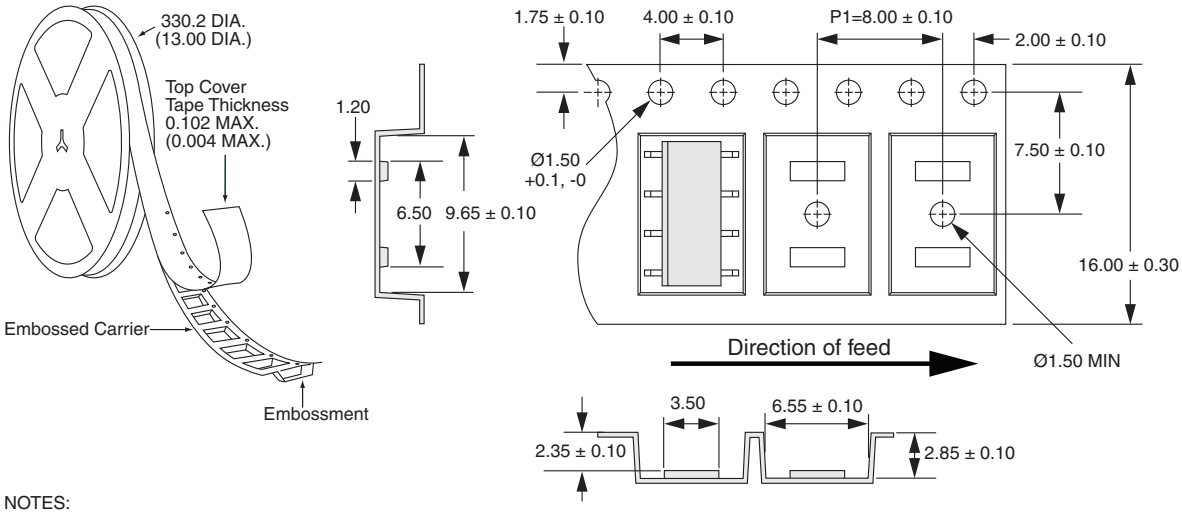
MECHANICAL DIMENSIONS

CPC2125N



Note:
1. Lead dimensions do not include plating: 1000 microinches max.

CPC2125NTR Tape & Reel



NOTES:
1. All dimensions in millimeters
2. 10 sprocket hole pitch cumulative tolerance ± 0.20.
3. Carrier camber is within 1mm in 250mm.
4. Tape material : Black Conductive Polystyrene Alloy.
5. All dimensions meet EIA-481-C requirements.
6. Thickness : 0.30 ± 0.05mm.

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

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Specification: DS-CPC2125N-R05
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