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BiMOS II 8-BIT LATCHED SOURCE DRIVERS

Designed primarily for use with high-voltage vacuum-fluorescent displays, the UCN5815A and UCN5815EP BiMOS II integrated circuits consist of eight npn Darlington source drivers with output pull-down resistors, a CMOS latch for each driver, and common STROBE, BLANKING, and ENABLE functions.

BiMOS II devices have considerably better data-input rates than the original BiMOS circuits. With a 5 V logic supply, they will operate to at least 4.4 MHz. With a 12 V supply, significantly higher speeds are obtained. The CMOS inputs cause minimum loading and are compatible with standard CMOS and NMOS logic commonly found in microprocessor designs. TTL circuits may require the use of appropriate pull-up resistors.

The bipolar outputs may be used as segment, dot (matrix), bar, or digit drivers in vacuum-fluorescent displays. All eight outputs can be activated simultaneously at ambient temperatures in excess of 75°C. To simplify printed wiring board layout, output connections are opposite the inputs. A minimum component display subsystem, requiring few or no discrete components, can be assembled using the UCN5815A/EP with the UCN5810AF/EPF/LWF, UCN5812AF/EPF, or UCN5818AF/EPF serial-to-parallel latched drivers.

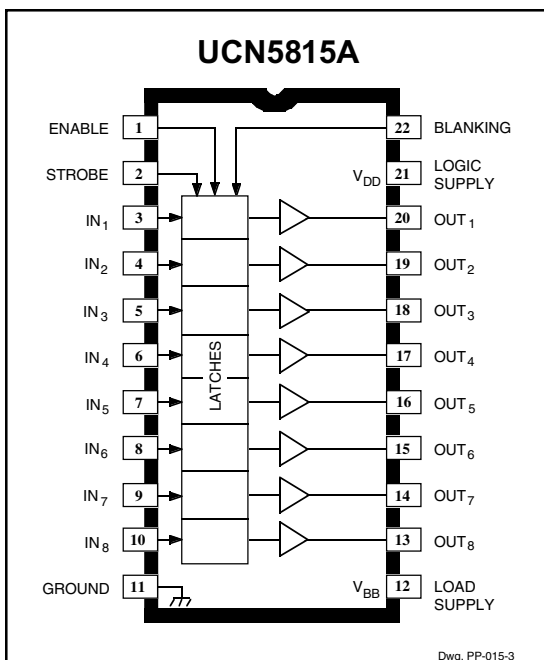
Suffix 'A' devices are furnished in a standard 22-pin plastic DIP; suffix 'EP' indicates a 28-lead PLCC.

FEATURES

- To 4.4 MHz Date-Input Rate
- High-Voltage Source Outputs
- CMOS, NMOS, TTL Compatible Inputs
- Low-Power CMOS Latches
- Internal Pull-Down Resistors
- Wide Supply-Voltage Range

Always order by complete part number:

| Part Number | Package |
|-------------|--------------|
| UCN5815A | 22-Pin DIP |
| UCN5815EP | 28-Lead PLCC |



Dwg. PP-015-3

ABSOLUTE MAXIMUM RATINGS at +25°C Free-Air Temperature

- Output Voltage, V_{OUT} 60 V
- Logic Supply Voltage Range,
 V_{DD} 4.5 V to 15 V
- Load Supply Voltage Range,
 V_{BB} 5.0 V to 60 V
- Input Voltage Range,
 V_{IN} -0.3 V to $V_{DD} + 0.3$ V
- Continuous Output Current,
 I_{OUT} -40 mA
- Package Power Dissipation, P_D
(UCN5815A) 2.5 W*
- (UCN5815EP) 2.27 W*
- Operating Temperature Range,
 T_A -20°C to +85°C
- Storage Temperature Range,
 T_S -55°C to +150°C

* Derate linearly to 0 W at +150°C.

Caution: CMOS devices have input static protection but are susceptible to damage when exposed to extremely high static electrical charges.

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BiMOS II

8-BIT LATCHED

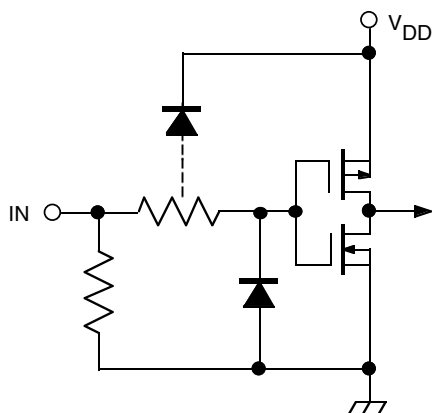
SOURCE DRIVERS

ELECTRICAL CHARACTERISTICS at $T_A = +25^\circ\text{C}$, $V_{BB} = 60\text{ V}$, $V_{DD} = 5\text{ V}$ and 12 V
(unless otherwise noted).

| Characteristic | Symbol | Test Conditions | Limits | | |
|--------------------------|-------------|---|--------|------|------------------|
| | | | Min. | Max. | Units |
| Output Off Voltage | V_{OUT} | | — | 1.0 | V |
| Output On Voltage | V_{OUT} | $I_{OUT} = -25\text{ mA}$, $V_{BB} = 60\text{ V}$ | 57.5 | — | V |
| Output Pull-Down Current | I_{OUT} | $V_{OUT} = V_{BB}$ | 400 | 850 | μA |
| Output Leakage Current | I_{OUT} | $T_A = 70^\circ\text{C}$ | — | -15 | μA |
| Input Voltage | $V_{IN(1)}$ | $V_{DD} = 5.0\text{ V}$ | 3.5 | 5.3 | V |
| | | $V_{DD} = 12\text{ V}$ | 10.5 | 12.3 | V |
| | $V_{IN(0)}$ | | -0.3 | +0.8 | V |
| Input Current | $I_{IN(1)}$ | $V_{DD} = V_{IN} = 5.0\text{ V}$ | — | 100 | μA |
| | | $V_{DD} = V_{IN} = 12\text{ V}$ | — | 240 | μA |
| Input Impedance | Z_{IN} | $V_{DD} = 5.0\text{ V}$ | 50 | — | $\text{k}\Omega$ |
| Supply Current | I_{BB} | All outputs on, All outputs open | — | 10.5 | mA |
| | | All outputs off, All outputs open | — | 100 | μA |
| | I_{DD} | $V_{DD} = 5.0\text{ V}$, All outputs off, All inputs = 0 V | — | 100 | μA |
| | | $V_{DD} = 12\text{ V}$, All outputs off, All inputs = 0 V | — | 200 | μA |
| | | $V_{DD} = 5.0\text{ V}$, One output on, All inputs = 0 V | — | 1.0 | mA |
| | | $V_{DD} = 12\text{ V}$, One output on, All inputs = 0 V | — | 3.0 | mA |

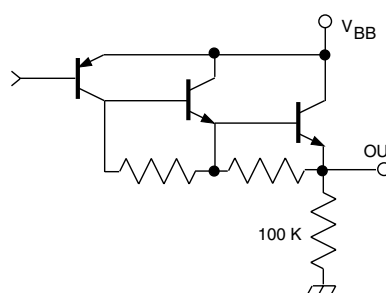
NOTE: Positive (negative) current is defined as going into (coming out of) the specified device pin.

**TYPICAL INPUT
CIRCUIT**



Dwg. No. EP-010-4A

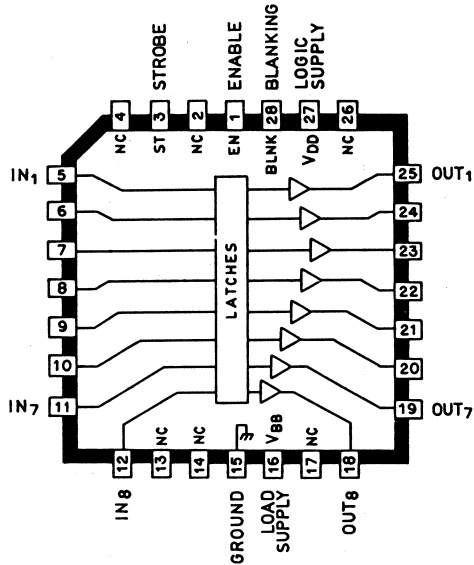
**TYPICAL OUTPUT
DRIVER**



Dwg. No. EP-021-3

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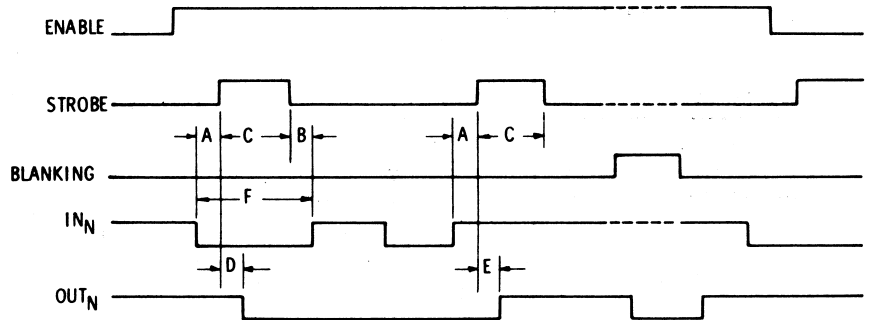
UCN5815EP



Dwg. No. A-14,357

Information present at an input is transferred to its latch when the STROBE and ENABLE are high. The latches will continue to accept new data as long as both STROBE and ENABLE are held high. With either STROBE or ENABLE in the low state, no information can be loaded into the latches.

When the BLANKING input is high, all of the output buffers are disabled (off) without affecting the information stored in the latches. With the BLANKING input low, the outputs are controlled by the state of the latches.



Dwg. No. A-10,991

TIMING CONDITIONS

($V_{DD} = 5\text{ V}$, $T_A = +25^\circ\text{C}$, Logic Levels are V_{DD} and Ground)

- A. Minimum Data Active Time Before Strobe Enabled (Data Set-Up Time) **50 ns**
- B. Minimum Data Active Time After Strobe Disabled (Data Hold Time) **50 ns**
- C. Minimum Strobe Pulse Width **125 ns**
- D. Typical Time Between Strobe Activation and Output ON to OFF Transition **5.0 μs**
- E. Typical Time Between Strobe Activation and Output OFF to ON Transition **500 ns**
- F. Minimum Data Pulse Width **225 ns**

Timing is representative of a 4.4 MHz data input rate. Higher speeds may be attainable with increased supply voltage; operation at high temperatures will reduce the specified maximum clock frequency.

TRUTH TABLE

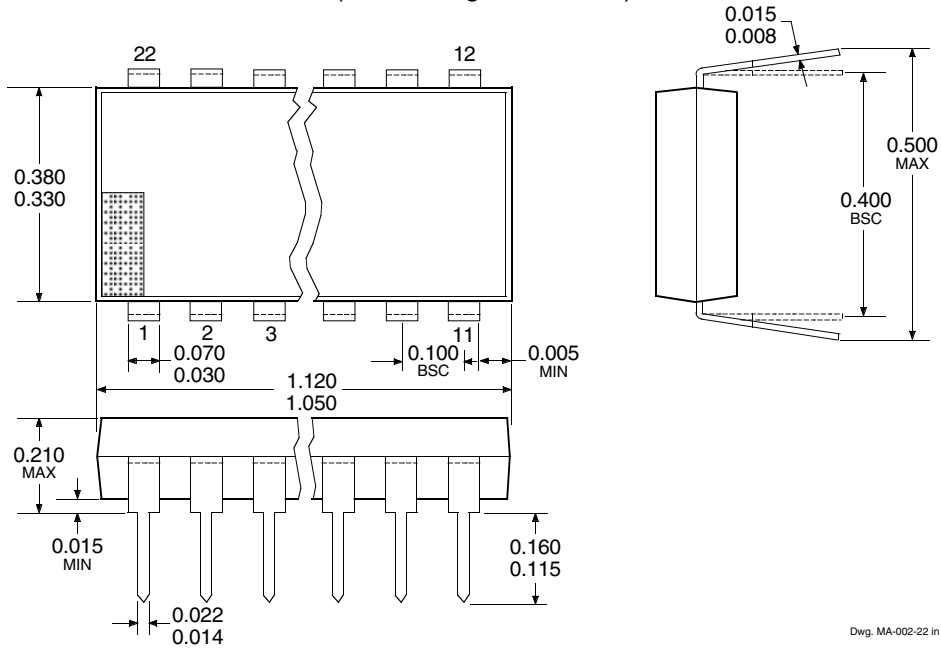
| INPUTS | | | | OUT _N | |
|-----------------|--------|--------|-------|------------------|---|
| IN _N | STROBE | ENABLE | BLANK | T-1 | T |
| 0 | 1 | 1 | 0 | X | 0 |
| 1 | 1 | 1 | 0 | X | 1 |
| X | X | X | 1 | X | 0 |
| X | 0 | X | 0 | 1 | 1 |
| X | 0 | X | 0 | 0 | 0 |
| X | X | 0 | 0 | 1 | 1 |
| X | X | 0 | 0 | 0 | 0 |

X = irrelevant
T-1 = previous output state
T = present output state

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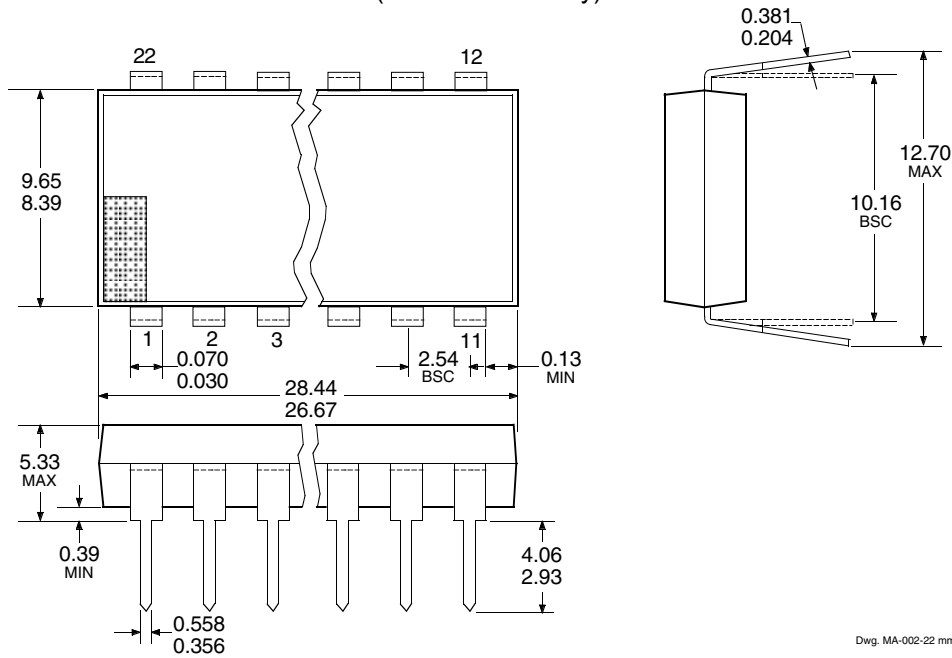
UCN5815A

Dimensions in Inches
 (controlling dimensions)



Dwg. MA-002-22 in

Dimensions in Millimeters
 (for reference only)

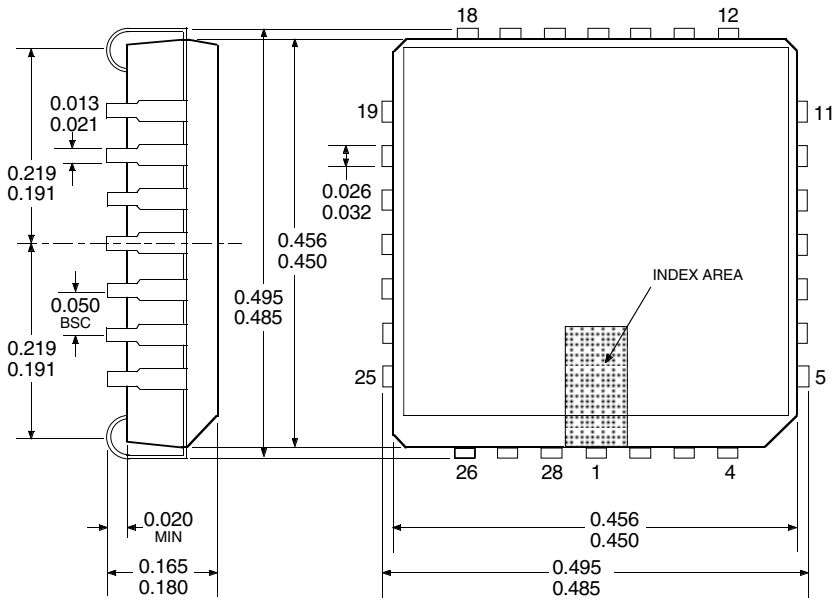


Dwg. MA-002-22 mm

- NOTES: 1. Exact body and lead configuration at vendor's option within limits shown.
 2. Lead spacing tolerance is non-cumulative.
 3. Lead thickness is measured at seating plane or below.
 4. Supplied in standard sticks/tubes of 17 devices.

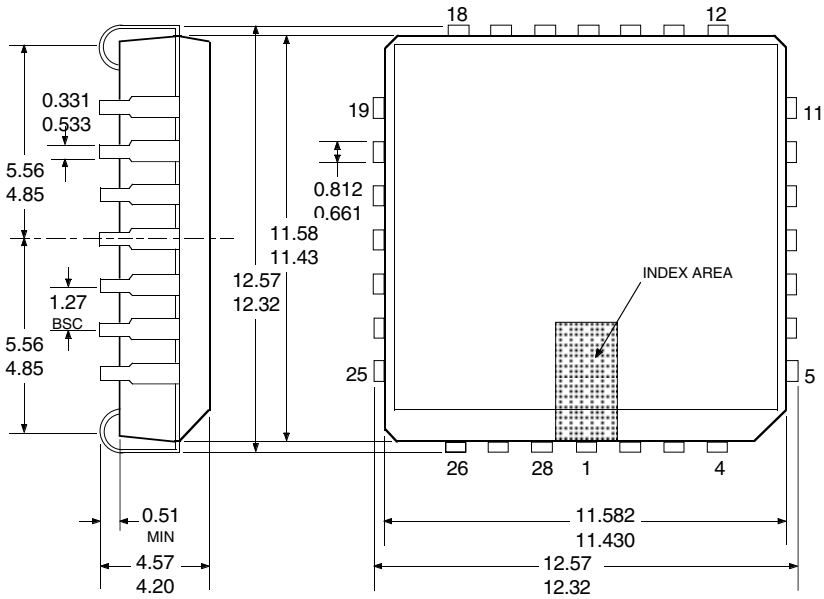
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SOURCE DRIVERS

UCN5815EP
 Dimensions in Inches
 (controlling dimensions)



Dwg. MA-005-28A in

Dimensions in Millimeters
 (for reference only)



Dwg. MA-005-28A mm

- NOTES: 1. Exact body and lead configuration at vendor's option within limits shown.
 2. Lead spacing tolerance is non-cumulative.
 3. Supplied in standard sticks/tubes of 38 devices or add "TR" to part number for tape and reel.

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POWER
INTERFACE DRIVERS

| Function | Output Ratings* | | Part Number† |
|--|-----------------|-------|--------------------|
| SERIAL-INPUT LATCHED DRIVERS | | | |
| 8-Bit (saturated drivers) | -120 mA | 50 V‡ | 5895 |
| 8-Bit | 350 mA | 50 V | 5821 |
| 8-Bit | 350 mA | 80 V | 5822 |
| 8-Bit | 350 mA | 50 V‡ | 5841 |
| 8-Bit | 350 mA | 80 V‡ | 5842 |
| 8-Bit (constant-current LED driver) | 75 mA | 17 V | 6275 |
| 8-Bit (DMOS drivers) | 250 mA | 50 V | 6595 |
| 8-Bit (DMOS drivers) | 350 mA | 50 V‡ | 6A595 |
| 8-Bit (DMOS drivers) | 100 mA | 50 V | 6B595 |
| 10-Bit (active pull-downs) | -25 mA | 60 V | 5810-F and 6809/10 |
| 12-Bit (active pull-downs) | -25 mA | 60 V | 5811 and 6811 |
| 16-Bit (constant-current LED driver) | 75 mA | 17 V | 6276 |
| 20-Bit (active pull-downs) | -25 mA | 60 V | 5812-F and 6812 |
| 32-Bit (active pull-downs) | -25 mA | 60 V | 5818-F and 6818 |
| 32-Bit | 100 mA | 30 V | 5833 |
| 32-Bit (saturated drivers) | 100 mA | 40 V | 5832 |
| PARALLEL-INPUT LATCHED DRIVERS | | | |
| 4-Bit | 350 mA | 50 V‡ | 5800 |
| 8-Bit | -25 mA | 60 V | 5815 |
| 8-Bit | 350 mA | 50 V‡ | 5801 |
| 8-Bit (DMOS drivers) | 100 mA | 50 V | 6B273 |
| 8-Bit (DMOS drivers) | 250 mA | 50 V | 6273 |
| SPECIAL-PURPOSE DEVICES | | | |
| Unipolar Stepper Motor Translator/Driver | 1.25 A | 50 V‡ | 5804 |
| Addressable 8-Bit Decoder/DMOS Driver | 250 mA | 50 V | 6259 |
| Addressable 8-Bit Decoder/DMOS Driver | 350 mA | 50 V‡ | 6A259 |
| Addressable 8-Bit Decoder/DMOS Driver | 100 mA | 50 V | 6B259 |
| Addressable 28-Line Decoder/Driver | 450 mA | 30 V | 6817 |

* Current is maximum specified test condition, voltage is maximum rating. See specification for sustaining voltage limits. Negative current is defined as coming out of (sourcing) the output.

† Complete part number includes additional characters to indicate operating temperature range and package style.

‡ Internal transient-suppression diodes included for inductive-load protection.

