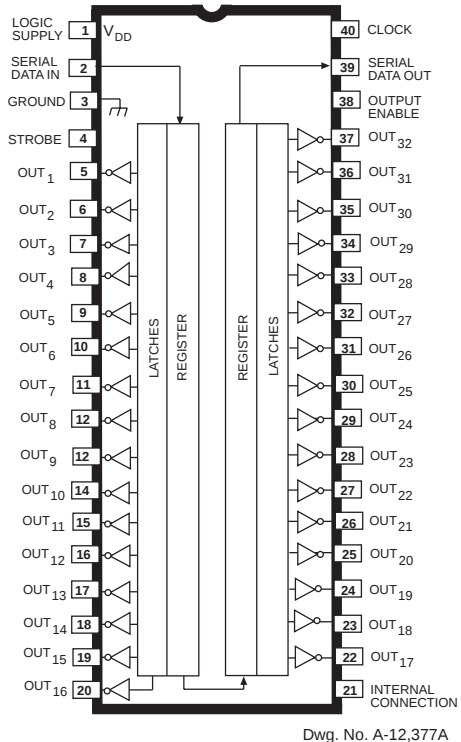


## BiMOS II 32-BIT SERIAL-INPUT, LATCHED DRIVERS

**UCN5832A**



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

|                                               |                            |
|-----------------------------------------------|----------------------------|
| Output Voltage, $V_{OUT}$ .....               | 40 V                       |
| Logic Supply Voltage, $V_{DD}$ .....          | 15 V                       |
| Input Voltage Range,<br>$V_{IN}$ .....        | -0.3 V to $V_{DD} + 0.3$ V |
| Continuous Output Current,<br>$I_{OUT}$ ..... | 150 mA                     |
| Package Power Dissipation,<br>$P_D$ .....     | See Graph                  |
| Operating Temperature Range,<br>$T_A$ .....   | -20°C to +85°C             |
| Storage Temperature Range,<br>$T_S$ .....     | -55°C to +150°C            |

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

Intended originally to drive thermal printheads, the UCN5832A and UCN5832EP have been optimized for low output-saturation voltage, high-speed operation, and pin configurations most convenient for the tight space requirements of high-resolution printheads. These integrated circuits can also be used to drive multiplexed LED displays or incandescent lamps at up to 150 mA peak current. The combination of bipolar and MOS technologies gives BiMOS II arrays an interface flexibility beyond the reach of standard buffers and power driver circuits.

The devices each have 32 bipolar NPN open-collector saturated drivers, a CMOS data latch for each of the drivers, two 16-bit CMOS shift registers, and CMOS control circuitry. The high-speed CMOS shift registers and latches allow operation with most microprocessor based systems. Use of these drivers with TTL may require input pull-up resistors to ensure an input logic high. MOS serial data outputs permit cascading for interface applications requiring additional drive lines.

The UCN5832A is supplied in a 40-pin dual in-line plastic package with 0.600" (15.24 mm) row spacing. Under normal operating conditions, this device will allow all outputs to sustain 100 mA continuously without derating. The UCN5832EP is supplied in a 44-lead plastic leaded chip carrier for minimum area, surface-mount applications. Both devices are also available for operation from -40°C to +85°C. To order, change the prefix from 'UCN' to 'UCQ'.

Similar 32-bit serial-input latched source drivers are available as the UCN5818AF/EPF. Other high-voltage, high-current 8-bit devices are available as the UCN5821A, UCN5841A/LW, and UCN5842A.

### FEATURES

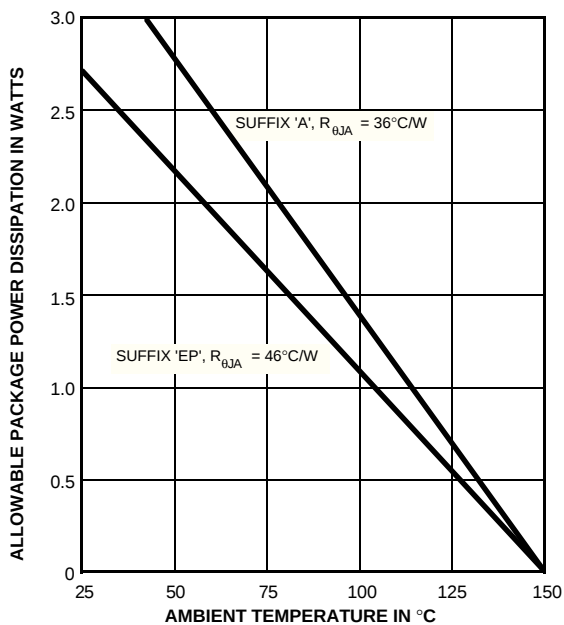
- To 3.3 MHz Data Input Rate
- Low-Power CMOS Logic and Latches
- 40 V Current Sink Outputs
- Low Saturation Voltage
- Automotive Capable

Always order by complete part number:

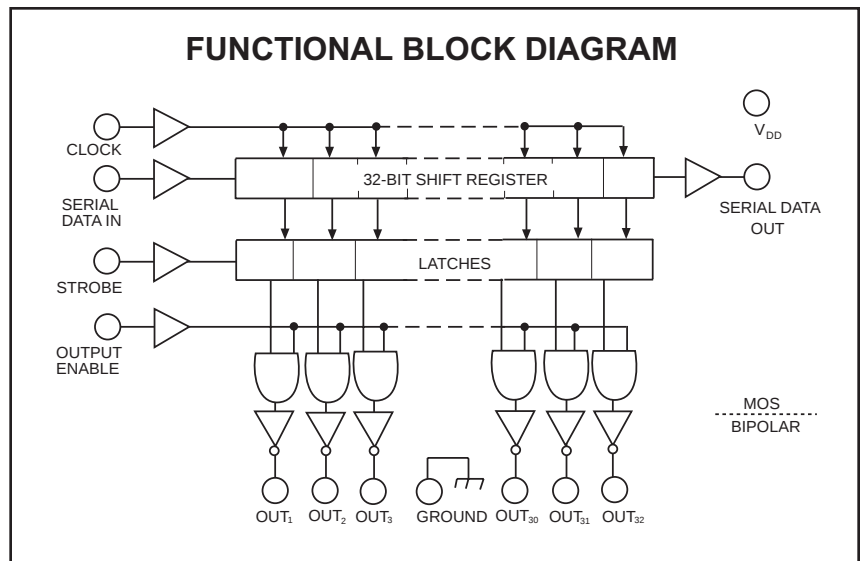
| Part Number | Package      |
|-------------|--------------|
| UCN5832A    | 40-Pin DIP   |
| UCN5832EP   | 44-Lead PLCC |

# 5832

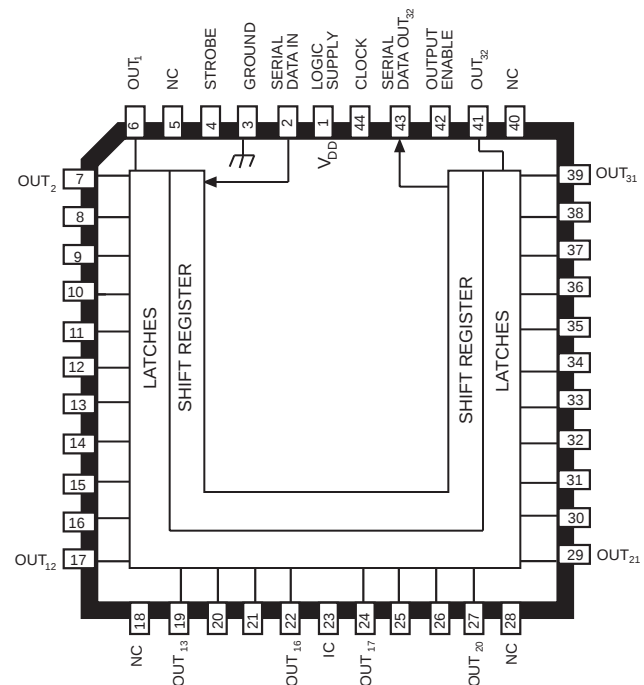
## BiMOS II 32-BIT SERIAL-INPUT, LATCHED DRIVERS



Dwg. GP-025A



## UCN5832EP



Dwg. No. A-14,360

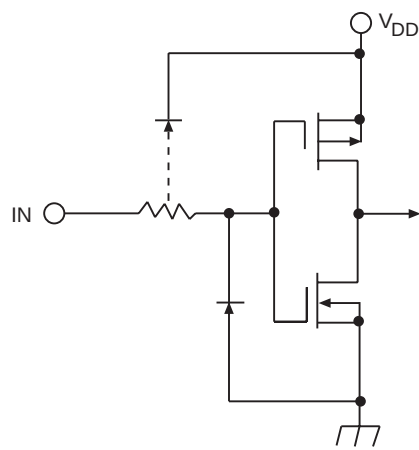
5832  
BiMOS II 32-BIT  
SERIAL-INPUT,  
LATCHED DRIVERS

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

| Characteristic                       | Symbol        | Test Conditions                                      | Limits |      | Units            |
|--------------------------------------|---------------|------------------------------------------------------|--------|------|------------------|
|                                      |               |                                                      | Min.   | Max. |                  |
| Output Leakage Current               | $I_{CEX}$     | $V_{OUT} = 40\text{ V}$ , $T_A = 70^{\circ}\text{C}$ | —      | 10   | $\mu\text{A}$    |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_{OUT} = 50\text{ mA}$                             | —      | 275  | mV               |
|                                      |               | $I_{OUT} = 100\text{ mA}$ , "A" package              | 150    | 550  | mV               |
|                                      |               | $I_{OUT} = 100\text{ mA}$ , "EP" package             | —      | 550  | mV               |
| Input Voltage                        | $V_{IN(1)}$   |                                                      | 3.5    | 5.3  | V                |
|                                      | $V_{IN(0)}$   |                                                      | -0.3   | +0.8 | V                |
| Input Current                        | $I_{IN(1)}$   | $V_{IN} = 3.5\text{ V}$                              | —      | 1.0  | $\mu\text{A}$    |
|                                      | $I_{IN(0)}$   | $V_{IN} = 0.8\text{ V}$                              | —      | -1.0 | $\mu\text{A}$    |
| Input Impedance                      | $Z_{IN}$      | $V_{IN} = 3.5\text{ V}$                              | 3.5    | —    | $\text{M}\Omega$ |
| Serial Data Output Resistance        | $R_{OUT}$     |                                                      | —      | 20   | $\text{k}\Omega$ |
| Supply Current                       | $I_{DD}$      | One output ON, $I_{OUT} = 100\text{ mA}$             | —      | 5.0  | mA               |
|                                      |               | All outputs OFF                                      | —      | 50   | $\mu\text{A}$    |
| Output Rise Time                     | $t_r$         | $I_{OUT} = 100\text{ mA}$ , 10% to 90%               | —      | 1.0  | $\mu\text{s}$    |
| Output Fall Time                     | $t_f$         | $I_{OUT} = 100\text{ mA}$ , 90% to 10%               | —      | 1.0  | $\mu\text{s}$    |

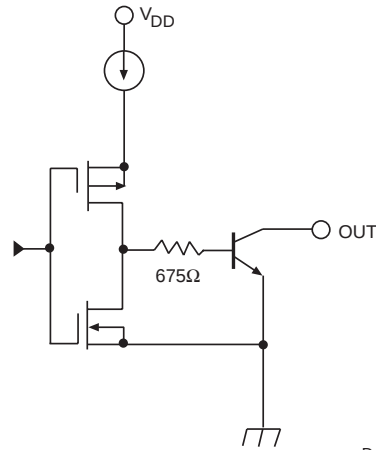
NOTE: Positive (negative) current is defined as going into (coming out of) the specified device pin.

TYPICAL INPUT CIRCUIT



Dwg. No. A-12,379A

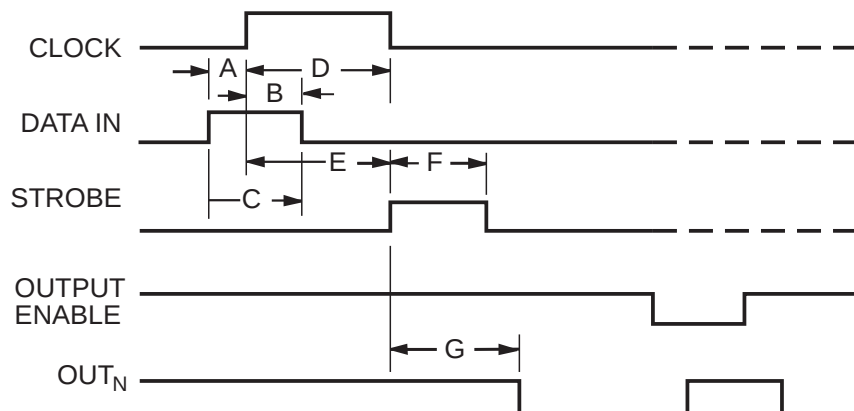
TYPICAL OUTPUT DRIVER



Dwg. No. A-12,380A

# 5832

## BiMOS II 32-BIT SERIAL-INPUT, LATCHED DRIVERS



Dwg. No. A-12,276A

### TIMING CONDITIONS

( $V_{DD} = 5.0$  V, Logic Levels are  $V_{DD}$  and Ground)

- A. Minimum Data Active Time Before Clock Pulse  
(Data Set-Up Time) ..... **75 ns**
- B. Minimum Data Active Time After Clock Pulse  
(Data Hold Time) ..... **75 ns**
- C. Minimum Data Pulse Width ..... **150 ns**
- D. Minimum Clock Pulse Width ..... **150 ns**
- E. Minimum Time Between Clock Activation and Strobe ..... **300 ns**
- F. Minimum Strobe Pulse Width ..... **100 ns**
- G. Typical Time Between Strobe Activation and  
Output Transition ..... **500 ns**

Serial Data present at the input is transferred to the shift register on the logic "0" to logic "1" transition of the CLOCK input pulse. On succeeding CLOCK pulses, the registers shift data information towards the SERIAL DATA OUTPUT. The SERIAL DATA must appear at the input prior to the rising edge of the CLOCK input waveform.

Information present at any register is transferred to its respective latch when the STROBE is high (serial-to-parallel conversion). The latches will continue to accept new data as long as the STROBE is held high. Applications where the latches are bypassed (STROBE tied high) will require that the OUTPUT ENABLE input be low during serial data entry.

When the OUTPUT ENABLE input is low, all of the output buffers are disabled (OFF) without affecting the information stored in the latches or shift register. With the OUTPUT ENABLE input high, the outputs are controlled by the state of the latches.

### TRUTH TABLE

| Serial Data Input | Clock Input | Shift Register Contents |                |                |     |                  |                  | Serial Data Output | Strobe Input | Latch Contents |                |                |     |                  |                | Output Enable Input | Output Contents |                |                |     |                  |                |
|-------------------|-------------|-------------------------|----------------|----------------|-----|------------------|------------------|--------------------|--------------|----------------|----------------|----------------|-----|------------------|----------------|---------------------|-----------------|----------------|----------------|-----|------------------|----------------|
|                   |             | I <sub>1</sub>          | I <sub>2</sub> | I <sub>3</sub> | ... | I <sub>N-1</sub> | I <sub>N</sub>   |                    |              | I <sub>1</sub> | I <sub>2</sub> | I <sub>3</sub> | ... | I <sub>N-1</sub> | I <sub>N</sub> |                     | O <sub>1</sub>  | O <sub>2</sub> | O <sub>3</sub> | ... | O <sub>N-1</sub> | O <sub>N</sub> |
| H                 | ┌           | H                       | R <sub>1</sub> | R <sub>2</sub> | ... | R <sub>N-2</sub> | R <sub>N-1</sub> | R <sub>N-1</sub>   |              |                |                |                |     |                  |                |                     |                 |                |                |     |                  |                |
| L                 | ┐           | L                       | R <sub>1</sub> | R <sub>2</sub> | ... | R <sub>N-2</sub> | R <sub>N-1</sub> | R <sub>N-1</sub>   |              |                |                |                |     |                  |                |                     |                 |                |                |     |                  |                |
| X                 | ┐           | R <sub>1</sub>          | R <sub>2</sub> | R <sub>3</sub> | ... | R <sub>N-1</sub> | R <sub>N</sub>   | R <sub>N</sub>     |              |                |                |                |     |                  |                |                     |                 |                |                |     |                  |                |
|                   |             | X                       | X              | X              | ... | X                | X                | X                  | L            | R <sub>1</sub> | R <sub>2</sub> | R <sub>3</sub> | ... | R <sub>N-1</sub> | R <sub>N</sub> |                     |                 |                |                |     |                  |                |
|                   |             | P <sub>1</sub>          | P <sub>2</sub> | P <sub>3</sub> | ... | P <sub>N-1</sub> | P <sub>N</sub>   | P <sub>N</sub>     | H            | P <sub>1</sub> | P <sub>2</sub> | P <sub>3</sub> | ... | P <sub>N-1</sub> | P <sub>N</sub> |                     | P <sub>1</sub>  | P <sub>2</sub> | P <sub>3</sub> | ... | P <sub>N-1</sub> | P <sub>N</sub> |
|                   |             |                         |                |                |     |                  |                  |                    |              | X              | X              | X              | ... | X                | X              |                     | H               | H              | H              | ... | H                | H              |

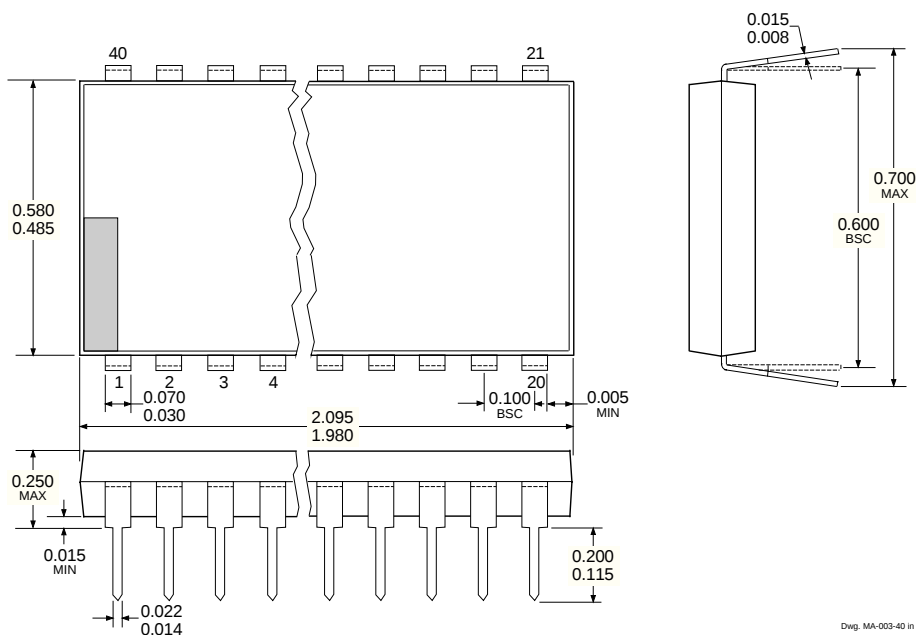
L = Low Logic Level H = High Logic Level X = Irrelevant P = Present State R = Previous State

# 5832

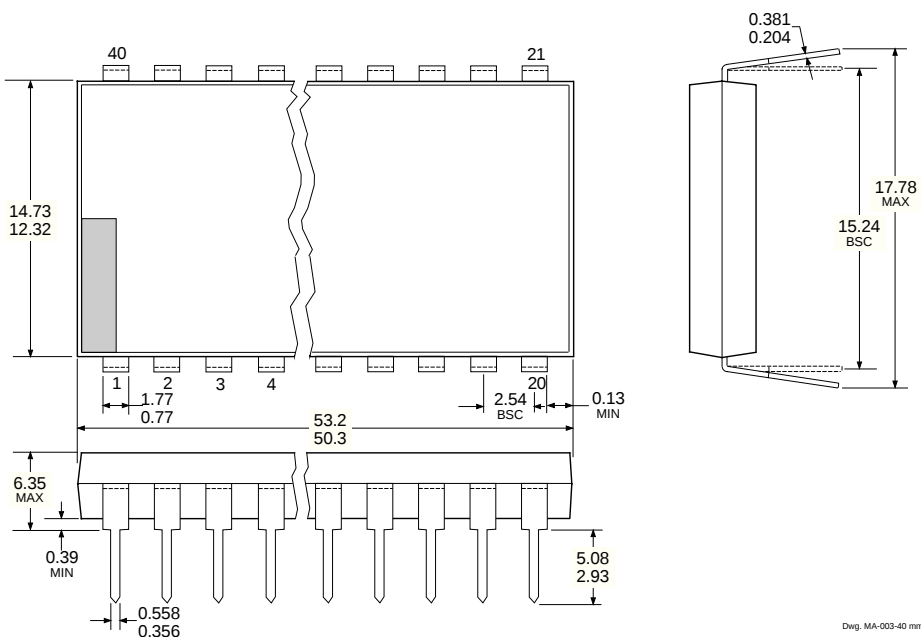
## BiMOS II 32-BIT SERIAL-INPUT, LATCHED DRIVERS

### UCN5832A

Dimensions in Inches  
(controlling dimensions)



Dimensions in Millimeters  
(for reference only)



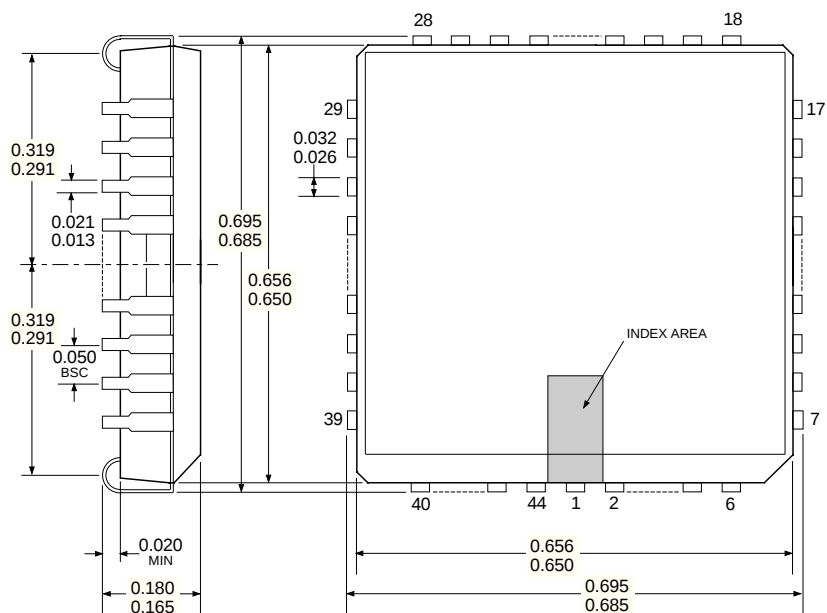
- NOTES:
1. Lead thickness is measured at seating plane or below.
  2. Lead spacing tolerance is non-cumulative.
  3. Exact body and lead configuration at vendor's option within limits shown.

# 5832

## BiMOS II 32-BIT SERIAL-INPUT, LATCHED DRIVERS

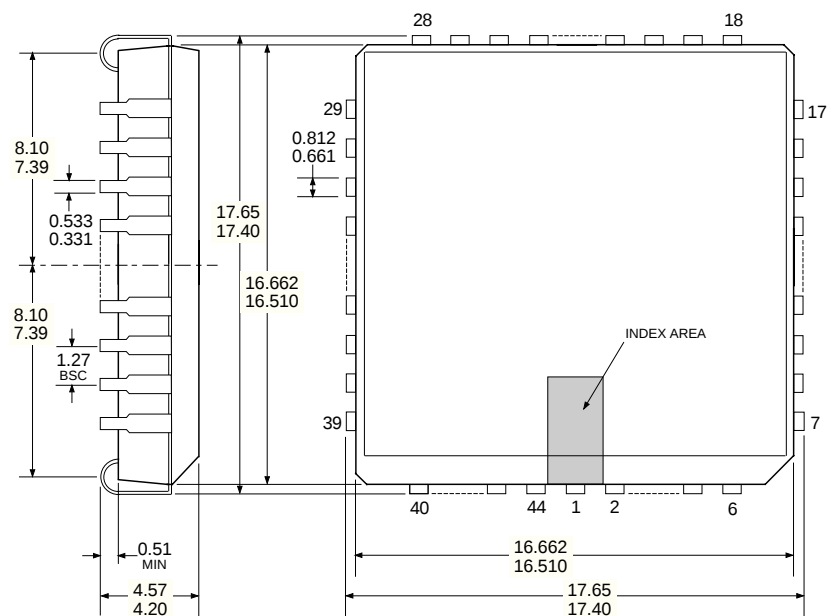
### UCN5832EP

Dimensions in Inches  
(controlling dimensions)



Dwg. MA-005-44A in

Dimensions in Millimeters  
(for reference only)



Dwg. MA-005-44A mm

- NOTES: 1. Exact body and lead configuration at vendor's option within limits shown.  
2. Lead spacing tolerance is non-cumulative.

**5832**

***BiMOS II 32-BIT  
SERIAL-INPUT,  
LATCHED DRIVERS***

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# 5832

## BiMOS II 32-BIT SERIAL-INPUT, LATCHED DRIVERS

# BiMOS II (Series 5800) & DABiC IV (Series 6800) INTELLIGENT POWER INTERFACE DRIVERS SELECTION GUIDE

| 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               |
| 9-Bit                                    | 1.6 A            | 50 V  | 5829               |
| 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      |
| 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               |
| SPECIAL-PURPOSE FUNCTIONS                |                  |       |                    |
| Unipolar Stepper Motor Translator/Driver | 1.25 A           | 50 V‡ | 5804               |
| 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.

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