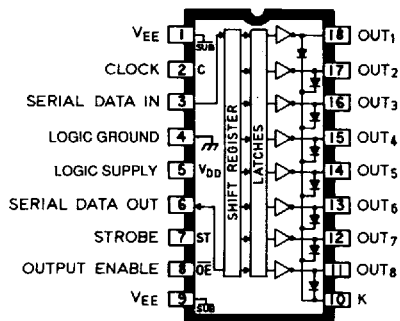


5841 THRU 5843

T-52-13-90

BiMOS II 8-BIT SERIAL-INPUT, LATCHED DRIVERS

UCN5841A - UCN5843A



Dwg. No. A-12.659

ABSOLUTE MAXIMUM RATINGS at 25°C Free-Air Temperature

Output Voltage, V_{CE}	
(UCN5841A/LW)	50 V
(UCN5842A/LW)	80 V
(UCN5843A/LW)	100 V
Output Voltage, $V_{CE(sus)}$	
(UCN5841A/LW)	35 V†
(UCN5842A/LW)	50 V†
(UCN5843A/LW)	50 V†
Logic Supply Voltage Range,	
V_{DD}	4.5 V to 15 V
V_{DD} with Reference to V_{EE}	25 V
Emitter Supply Voltage, V_{EE}	-20 V
Input Voltage Range,	
V_{IN}	-0.3 V to $V_{DD} + 0.3$ V
Continuous Output Current,	
I_{OUT}	500 mA
Package Power Dissipation,	
P_D	See Graph
Operating Temperature Range,	
T_A	-20°C to +85°C
Storage Temperature Range,	
T_S	-55°C to +150°C

†For inductive load applications.

Note that the Series UCN5840A (dual in-line package) and Series UCN5840LW (small-outline IC package) are electrically identical and share a common pin number assignment.

The merging of low-power CMOS logic and bipolar output power drivers permit Series UCN5840A/LW integrated circuits to be used in a wide variety of peripheral power driver applications. The three basic devices in this series each have an eight-bit CMOS shift register and CMOS control circuitry, eight CMOS data latches, and eight bipolar current-sinking Darlington output drivers. The 500 mA NPN Darlington outputs, with integral transient-suppression diodes, are suitable for use with relays, solenoids, and other inductive loads. Except for the maximum driver output voltage ratings, the UCN5841A/LW, UCN5842A/LW, and UCN5843A/LW are identical. The UCN5843A/LW offers premium performance with a minimum output-breakdown voltage rating of 100 V (50 V sustaining). All drivers can be operated with a split supply where the negative supply is up to -20 V.

BiMOS II devices have higher data-input rates than the earlier BiMOS circuits. With a 5 V logic supply, they will typically operate at better than 5 MHz. With a 12 V supply, significantly higher speeds are obtained. The CMOS inputs are compatible with standard CMOS and NMOS logic levels. TTL circuits may require the use of appropriate pull-up resistors. By using the serial data output, drivers can be cascaded for interface applications requiring additional drive lines.

Suffix 'A' devices are furnished in a standard 18-pin plastic DIP; suffix 'LW' indicates an 18-lead wide-body SOIC.

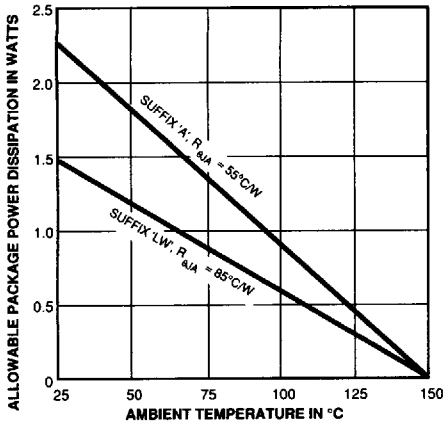
FEATURES

- 3.3 MHz Minimum Data-Input Rate
- CMOS, NMOS, TTL Compatible Inputs
- Internal Pull-Up/Pull-Down Resistors
- Low-Power CMOS Logic and Latches,
- High-Voltage Current-Sink Outputs
- Output Transient-Protection Diodes
- Single or Split Supply Operation
- DIP, PLCC, or SOIC Packaging

Always order by complete part number, e.g., **UCN5842LW**.

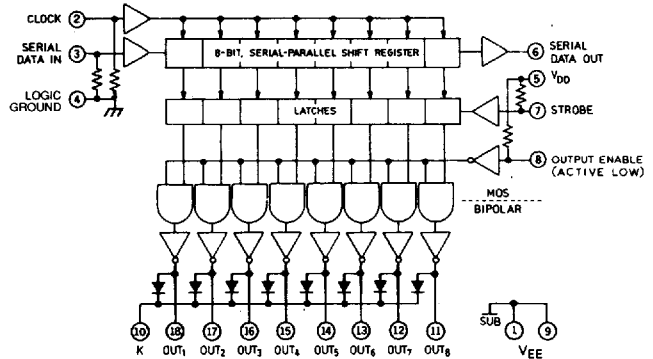
5841 THRU 5843

BiMOS II 8-BIT SERIAL-INPUT, LATCHED DRIVERS



Dwg. No. GP-018A

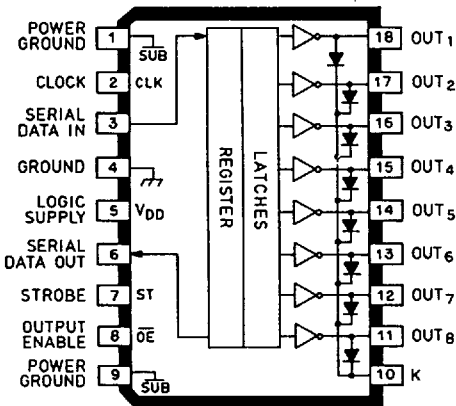
FUNCTIONAL BLOCK DIAGRAM (‘A’ & ‘LW’ Package Shown)



Dwg. No. A-12,661A

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

UCN5841LW - UCN5843LW



Dwg. No. A-14,438

Note that the Series UCN5840A (dual in-line package) and Series UCN5840LW (small-outline IC package) are electrically identical and share a common pin number assignment.

5841 THRU 5843

BIMOS II 8-BIT SERIAL-INPUT, LATCHED DRIVERS

ELECTRICAL CHARACTERISTICS at $T_A = +25^\circ\text{C}$, $V_{DD} = 5\text{ V}$, $V_{EE} = 0\text{ V}$ (unless otherwise specified).

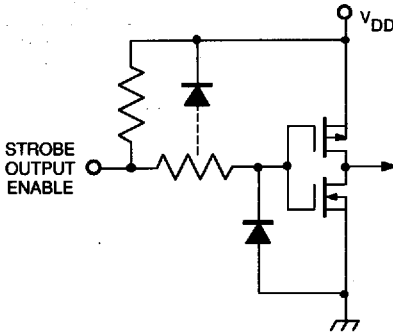
Characteristic	Symbol	Applicable Devices*	Test Conditions	Limits		
				Min.	Max.	Unit
Output Leakage Current	I_{CEX}	UCN5841	$V_{OUT} = 50\text{ V}$	—	50	μA
			$V_{OUT} = 50\text{ V}, T_A = +70^\circ\text{C}$	—	100	μA
		UCN5842	$V_{OUT} = 80\text{ V}$	—	50	μA
			$V_{OUT} = 80\text{ V}, T_A = +70^\circ\text{C}$	—	100	μA
		UCN5843	$V_{OUT} = 100\text{ V}$	—	50	μA
			$V_{OUT} = 100\text{ V}, T_A = +70^\circ\text{C}$	—	100	μA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	ALL	$I_{OUT} = 100\text{ mA}$	—	1.1	V
			$I_{OUT} = 200\text{ mA}$	—	1.3	V
			$I_{OUT} = 350\text{ mA}, V_{DD} = 7.0\text{ V}$	—	1.6	V
Collector-Emitter Sustaining Voltage	$V_{CE(SUS)}$	UCN5841	$I_{OUT} = 350\text{ mA}, L = 2\text{ mH}$	35	—	V
		UCN5842	$I_{OUT} = 350\text{ mA}, L = 2\text{ mH}$	50	—	V
		UCN5843	$I_{OUT} = 350\text{ mA}, L = 2\text{ mH}$	50	—	V
Input Voltage	$V_{IN(0)}$	ALL		—	0.8	V
	$V_{IN(1)}$	ALL	$V_{DD} = 12\text{ V}$	10.5	—	V
			$V_{DD} = 10\text{ V}$	8.5	—	V
			$V_{DD} = 5.0\text{ V}$	3.5	—	V
Input Resistance	R_{IN}	ALL	$V_{DD} = 12\text{ V}$	50	—	$\text{k}\Omega$
			$V_{DD} = 10\text{ V}$	50	—	$\text{k}\Omega$
			$V_{DD} = 5.0\text{ V}$	50	—	$\text{k}\Omega$
Supply Current	$I_{DD(ON)}$	ALL	All Drivers ON, $V_{DD} = 12\text{ V}$	—	16	mA
			All Drivers ON, $V_{DD} = 10\text{ V}$	—	14	mA
			All Drivers ON, $V_{DD} = 5.0\text{ V}$	—	8.0	mA
	$I_{DD(OFF)}$	ALL	All Drivers OFF, $V_{DD} = 12\text{ V}$	—	2.9	mA
			All Drivers OFF, $V_{DD} = 10\text{ V}$	—	2.5	mA
			All Drivers OFF, $V_{DD} = 5.0\text{ V}$	—	1.6	mA
Clamp Diode Leakage Current	I_R	UCN5841	$V_R = 50\text{ V}$	—	50	μA
		UCN5842	$V_R = 80\text{ V}$	—	50	μA
		UCN5843	$V_R = 100\text{ V}$	—	50	μA
Clamp Diode Forward Voltage	V_F	ALL	$I_F = 350\text{ mA}$	—	2.0	V

* Complete part number includes a suffix to identify package style: A = DIP, LW = SOIC.

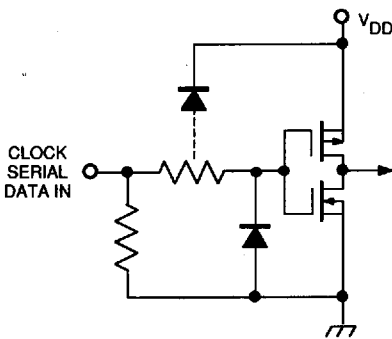
5841 THRU 5843

BiMOS II 8-BIT SERIAL-INPUT, LATCHED DRIVERS

TYPICAL INPUT CIRCUITS

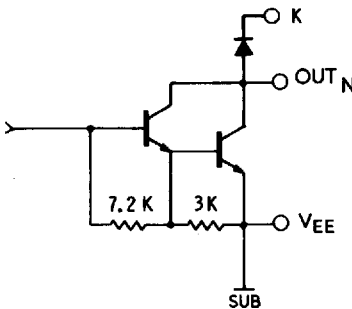


Dwg. No. EP-010-3

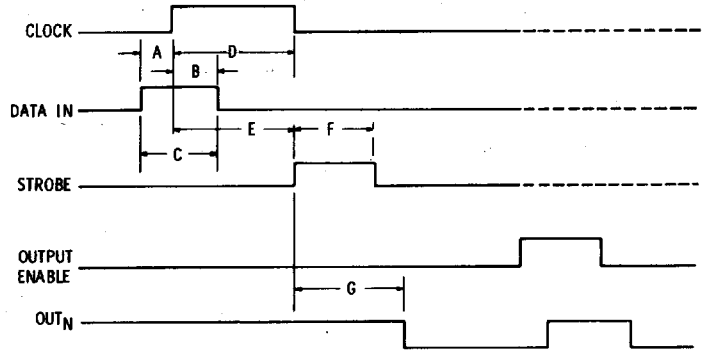


Dwg. No. EP-010-4A

TYPICAL OUTPUT DRIVER



Dwg. No. A-12,660



Dwg. No. A-12,627

TIMING CONDITIONS

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

$V_{DD} = 5.0 \text{ V}$

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

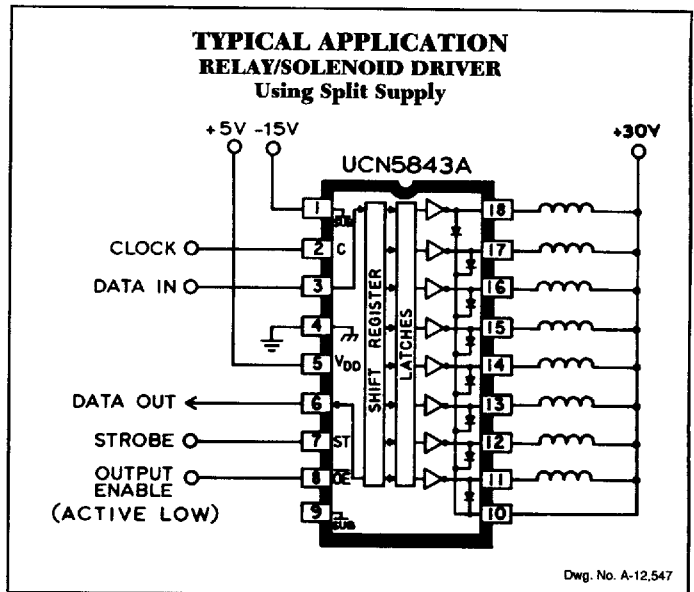
Serial Data present at the input is transferred to the shift register on the logic "0" to logic "1" transition of the CLOCK input pulse. On succeeding CLOCK pulses, the registers shift data information towards the SERIAL DATA OUTPUT. The SERIAL DATA must appear at the input prior to the rising edge of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

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

5841 THRU 5843

BiMOS II 8-BIT SERIAL-INPUT, LATCHED DRIVERS



TRUTH TABLE

Serial Data Input	Clock Input	Shift Register Contents						Serial Data Output	Strobe Input	Latch Contents						Output Enable	Output Contents					
		I ₁	I ₂	I ₃	I ₈	O ₁			O ₂	O ₃	O ₈	L ₁	L ₂		L ₃	L ₈	P ₁	P ₂	P ₃	.....	P_{8}
H	┌	H	R ₁	R ₂	.....	R ₇	R ₇															
L	┐	L	R ₁	R ₂	.....	R ₇	R ₇															
X	└	R ₁	R ₂	R ₃	.....	R ₈	R ₈															
		X	X	X	.....	X	X	L	R ₁	R ₂	R ₃	.....	R ₈									
		P ₁	P ₂	P ₃	.....	P ₈	P ₈	H	P ₁	P ₂	P ₃	.....	P ₈	L								
								X	X	X	.....	X	H								

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