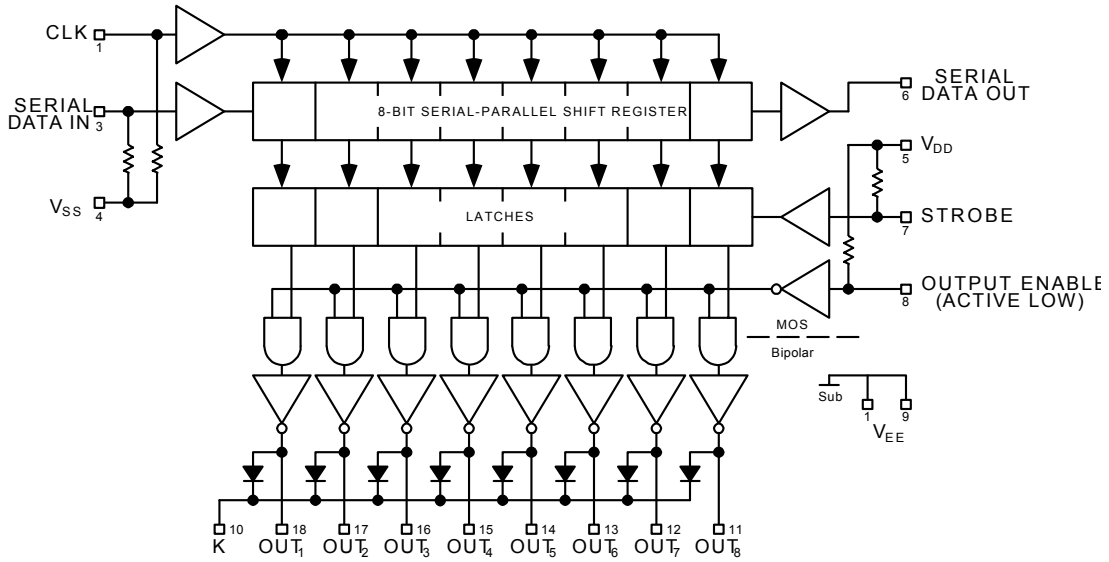
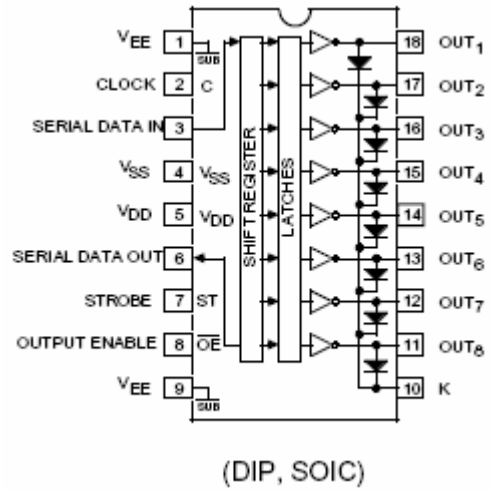
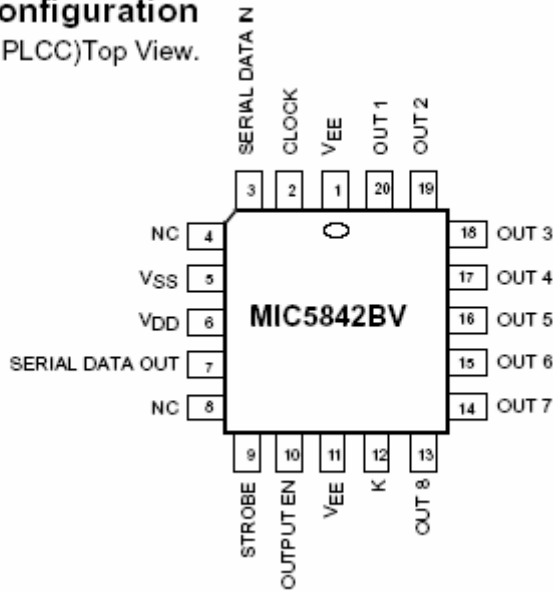


# Functional Diagram



# Pin Configuration

(20-Pin PLCC) Top View.



**Absolute Maximum Ratings<sup>(1,2,3)</sup>**

At 25°C Free-Air Temperature and $V_{SS}$ .....	0V
Output Voltage, $V_{CE}$ (MIC5841) .....	50V
(MIC5842) .....	80V
Output Voltage, $V_{CE(SUS)}$ (MIC5841) <sup>(1)</sup> .....	35V
(MIC5842) .....	50V
Logic Supply Voltage, $V_{DD}$ .....	15V
VDD with Reference to $V_{EE}$ .....	25V

Emitter Supply Voltage, $V_{EE}$ .....	-20V
Input Voltage Range, $V_{IN}$ .....	-0.3V to $V_{DD} + 0.3V$
Continuous Output Current, $I_{OUT}$ .....	500mA
Package Power Dissipation, $P_D$ <sup>(2)</sup> .....	1.82W
Operating Temperature Range, $T_A$ .....	-55°C to +85°C
Storage Temperature Range, $T_S$ .....	-65°C to +150°C

**Electrical Characteristics**At  $T_A = 25^\circ\text{C}$   $V_{DD} = 5V$ ,  $V_{SS} = V_{EE} = 0V$  (unless otherwise noted)

Characteristic	Symbol	Applicable Devices	Test Conditions	Limits		
				Min	Max	Unit
Output Leakage Current	$I_{CEX}$	MIC5841	$V_{OUT} = 50V$		50	$\mu\text{A}$
			$V_{OUT} = 50V, T_A = +70^\circ\text{C}$		100	
		MIC5842	$V_{OUT} = 80V$		50	
			$V_{OUT} = 80V, T_A = +70^\circ\text{C}$		100	
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	Both	$I_{OUT} = 100\text{mA}$		1.1	V
			$I_{OUT} = 200\text{mA}$		1.3	
			$I_{OUT} = 350\text{mA}, V_{DD} = 7.0V$		1.6	
Collector-Emitter Saturation Voltage	$V_{CE(SUS)}^{(5)}$	MIC5841	$I_{OUT} = 350\text{mA}, L = 2\text{mH}$	35		V
		MIC5842	$I_{OUT} = 350\text{mA}, L = 2\text{mH}$	50		
Input Voltage	$V_{IN(0)}$	Both			0.8	V
	$V_{IN(1)}$	Both	$V_{DD} = 12V$	10.5		
			$V_{DD} = 10V$	8.5		
Input Resistance	$R_{IN}$	Both	$V_{DD} = 12V$	50		$\text{k}\Omega$
			$V_{DD} = 10V$	50		
			$V_{DD} = 5.0V$	50		
Supply Current	$I_{DD(ON)}$	Both	All Drivers ON, $V_{DD} = 12V$		16	1.6
			All Drivers ON, $V_{DD} = 10V$		14	
			All Drivers ON, $V_{DD} = 5.0V$		8.0	
	$I_{DD(OFF)}$	Both	All Drivers OFF, $V_{DD} = 12V$		2.9	
			All Drivers OFF, $V_{DD} = 10V$		2.5	
			All Drivers OFF, $V_{DD} = 5.0V$		1.6	
Clamp Diode Leakage Current	$I_R$	MIC5841	$V_R = 50V$		50	$\mu\text{A}$
		MIC5842	$V_R = 80V$		50	
Clamp Diode Forward Voltage	$V_F$	Both	$I_F = 350\text{mA}$		2.0	V

## Electrical Characteristics

At  $T_A = -55^\circ\text{C}$   $V_{DD} = 5\text{V}$ ,  $V_{SS} = V_{EE} = 0\text{V}$  (unless otherwise noted)

Characteristic	Symbol	Test Conditions	Limits		
			Min	Max	Unit
Output Leakage Current	$I_{CEX}$	$V_{OUT} = 80\text{V}$		50	$\mu\text{A}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_{OUT} = 100\text{mA}$		1.3	V
		$I_{OUT} = 200\text{mA}$		1.5	
		$I_{OUT} = 350\text{mA}$ , $V_{DD} = 7.0\text{V}$		1.8	
Input Voltage	$V_{IN(0)}$			0.8	V
	$V_{IN(1)}$	$V_{DD} = 12\text{V}$	10.5		
		$V_{DD} = 5.0\text{V}$	3.5		
Input Resistance	$R_{IN}$	$V_{DD} = 12\text{V}$	35		$\text{k}\Omega$
		$V_{DD} = 10\text{V}$	35		
		$V_{DD} = 5.0\text{V}$	35		
Supply Current	$I_{DD(ON)}$	All Drivers ON, $V_{DD} = 12\text{V}$		16	mA
		All Drivers ON, $V_{DD} = 10\text{V}$		14	
		All Drivers ON, $V_{DD} = 5.0\text{V}$		10	
	$I_{DD(OFF)}$	All Drivers OFF, $V_{DD} = 12\text{V}$		3.5	
		All Drivers OFF, $V_{DD} = 5.0\text{V}$		2.0	

## Electrical Characteristics

At  $T_A = +125^\circ\text{C}$   $V_{DD} = 5\text{V}$ ,  $V_{SS} = V_{EE} = 0\text{V}$  (unless otherwise noted)

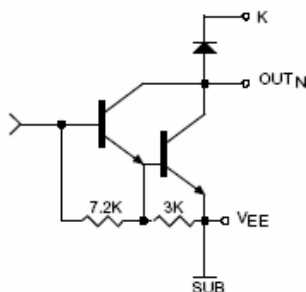
Characteristic	Symbol	Test Conditions	Limits		
			Min	Max	Unit
Output Leakage Current	$I_{CEX}$	$V_{OUT} = 80\text{V}$		500	$\mu\text{A}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_{OUT} = 100\text{mA}$		1.3	V
		$I_{OUT} = 200\text{mA}$		1.5	
		$I_{OUT} = 350\text{mA}$ , $V_{DD} = 7.0\text{V}$		1.8	
Input Voltage	$V_{IN(0)}$			0.8	V
	$V_{IN(1)}$	$V_{DD} = 12\text{V}$	10.5		
		$V_{DD} = 5.0\text{V}$	3.5		
Input Resistance	$R_{IN}$	$V_{DD} = 12\text{V}$	50		$\text{k}\Omega$
		$V_{DD} = 10\text{V}$	50		
		$V_{DD} = 5.0\text{V}$	50		
Supply Current	$I_{DD(ON)}$	All Drivers ON, $V_{DD} = 12\text{V}$		16	mA
		All Drivers ON, $V_{DD} = 10\text{V}$		14	
		All Drivers ON, $V_{DD} = 5.0\text{V}$		8	
	$I_{DD(OFF)}$	All Drivers OFF, $V_{DD} = 12\text{V}$		2.9	
		All Drivers OFF, $V_{DD} = 5.0\text{V}$		2.1.6	
Clamp Diode Leakage Current	$I_R$	MIC5841A $V_R = 50\text{V}$		1.6	$\mu\text{A}$
		MIC5842A $V_R = 80\text{V}$		100	

### Notes:

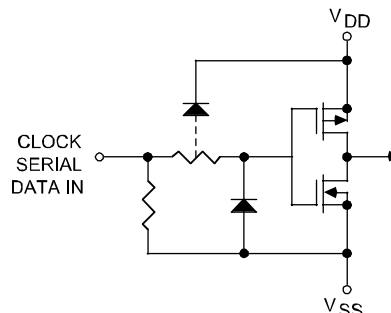
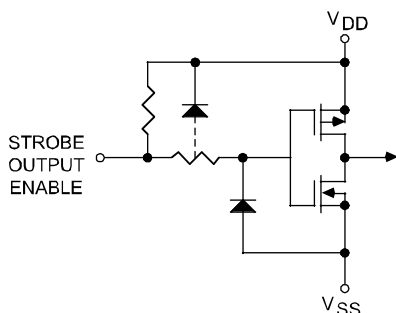
1. For Inductive load applications.
2. Derate at the rate of  $18.2\text{mW}/^\circ\text{C}$  above  $T_A = 25^\circ\text{C}$  (Plastic DIP)
3. CMOS devices have input-static protection but are susceptible to damage when exposed to extremely high static electrical charges.
4. Operation of these devices with standard TTL may require the use of appropriate pull-up resistors to insure an input logic HIGH.
5. Not 100% tested. Guaranteed by design.



## Typical Output Driver



## Typical Input Circuits



## Maximum Allowable Duty Cycle (Plastic DIP)

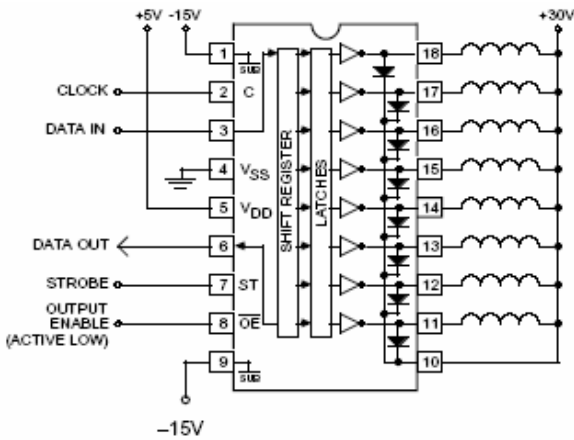
$V_{DD} = 5.0V$

Number of Outputs ON ( $I_{OUT} = 200mA$ $V_{DD} = 5.0V$ )	Max. Allowable Duty Cycle at Ambient Temperature of				
	25°C	40°C	50°C	60°C	70°C
8	85%	72%	64%	55%	46%
7	97%	82%	73%	63%	53%
6	100%	96%	85%	73%	62%
5	100%	100%	100%	88%	75%
4	100%	100%	100%	100%	93%
3	100%	100%	100%	100%	100%
2	100%	100%	100%	100%	100%
1	100%	100%	100%	100%	100%

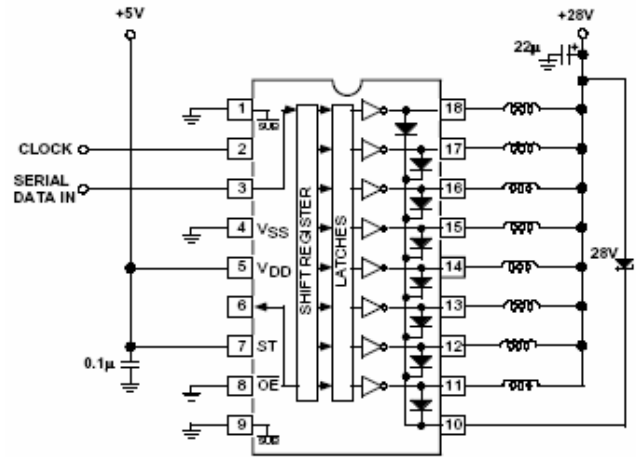
$V_{DD} = 12V$

Number of Outputs ON ( $I_{OUT} = 200mA$ $V_{DD} = 12V$ )	Max. Allowable Duty Cycle at Ambient Temperature of				
	25°C	40°C	50°C	60°C	70°C
8	80%	68%	60%	52%	44%
7	91%	77%	68%	59%	50%
6	100%	90%	79%	69%	58%
5	100%	100%	95%	82%	69%
4	100%	100%	100%	100%	86%
3	100%	100%	100%	100%	100%
2	100%	100%	100%	100%	100%
1	100%	100%	100%	100%	100%

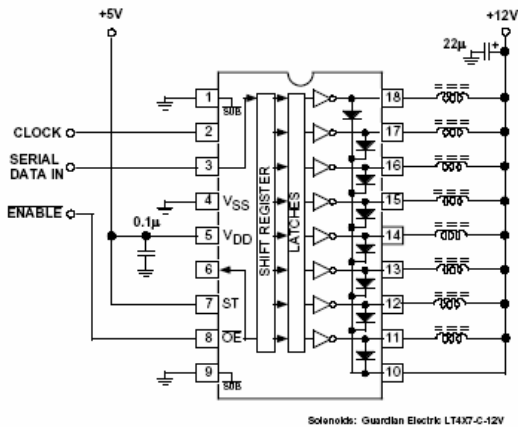
# Typical Applications



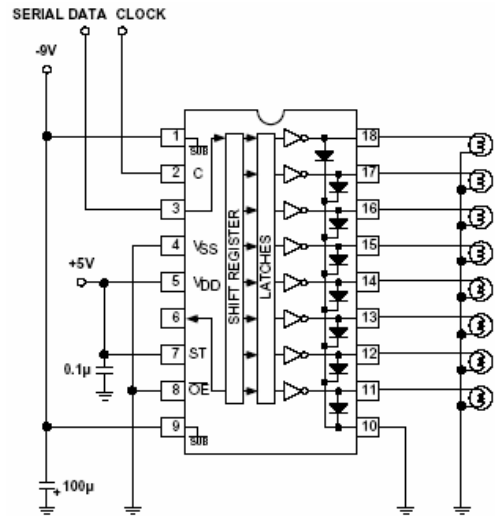
Relay/Solenoid Driver MIC5842



MIC5841 Hammer Driver

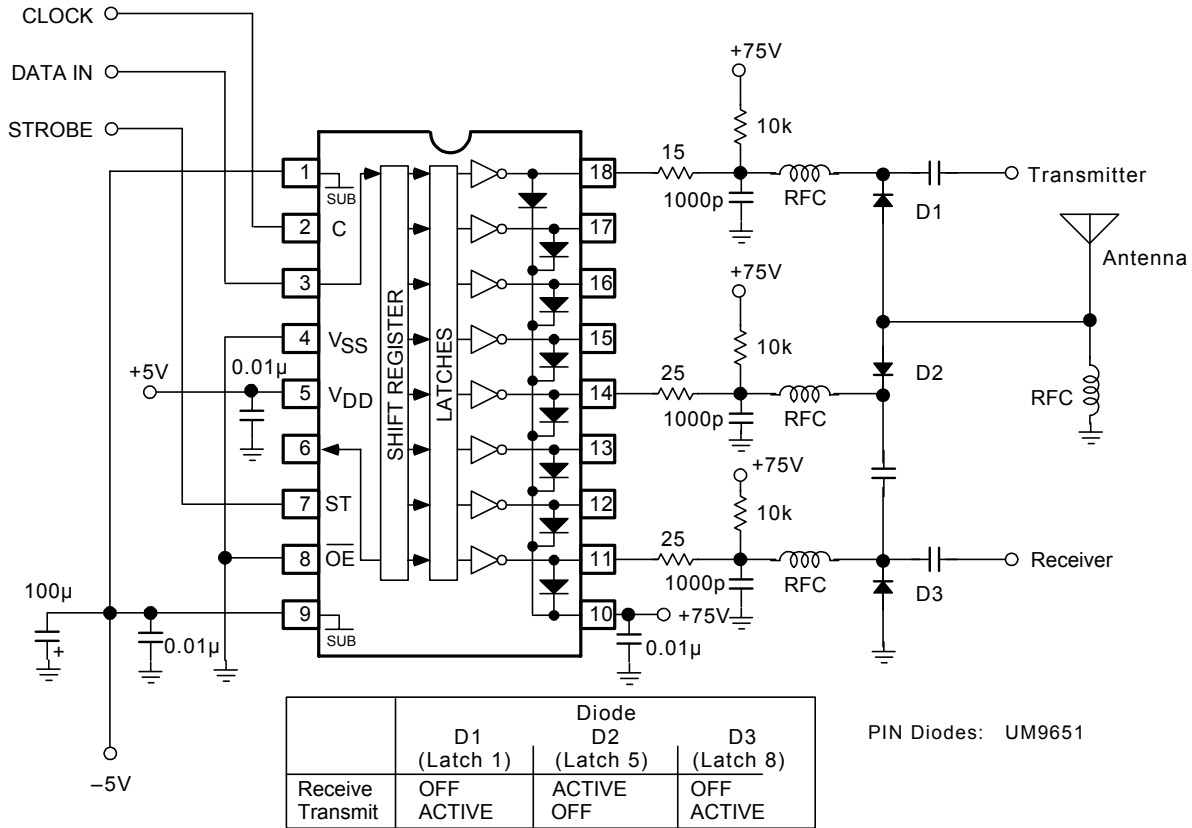


MIC5841 Solenoid Driver with Output Enable



MIC5841 Level Shifting Lamp Driver with Darlington Emitters Tied to a Negative Supply

### Typical Applications, Continued



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