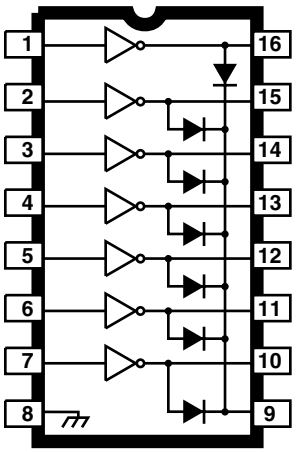
LR2001A/L

HIGH-VOLTAGE, HIGH-CURRENT DARLINGTON ARRAYS



Note that the LR2001A series (dual in-line package) and LR2001L series (small-outline IC package) are electrically identical and share a common terminal number assignment.

ABSOLUTE MAXIMUM RATINGS

Output Voltage, V_{CE} ..... **50 V**

Input Voltage, V_{IN} ..... **30 V**

Continuous Output Current,
I_C ..... **500 mA**

Continuous Input Current, I_{IN} ..... **25 mA**

Power Dissipation, P_D
(one Darlington pair) ..... **1.0 W**
(total package) ..... **See Graph**

Operating Temperature Range,
T_A ..... **-40°C to +85°C**

Storage Temperature Range,
T_S ..... **-55°C to +150°C**

FEATURES

- TTL, DTL, PMOS, or CMOS-Compatible Inputs
- Output Current to 500 mA
- Output Voltage to 50 V
- Transient-Protected Outputs
- Dual In-Line Plastic Package or Small-Outline IC Package

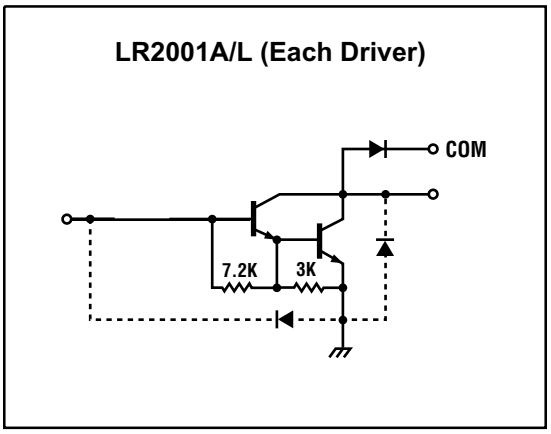
Ideally suited for interfacing between low-level logic circuitry and multiple peripheral power loads, the Series LR2001A/L high-voltage, high-current Darlington arrays feature continuous load current ratings to 500 mA for each of the seven drivers. At an appropriate duty cycle depending on ambient temperature and number of drivers turned ON simultaneously, typical power loads totaling over 120 W (350 mA x 7, 50 V) can be controlled. Typical loads include relays, solenoids, stepping motors, magnetic print hammers, multiplexed LED and incandescent displays, and heaters. All devices feature open-collector outputs with integral clamp diodes.

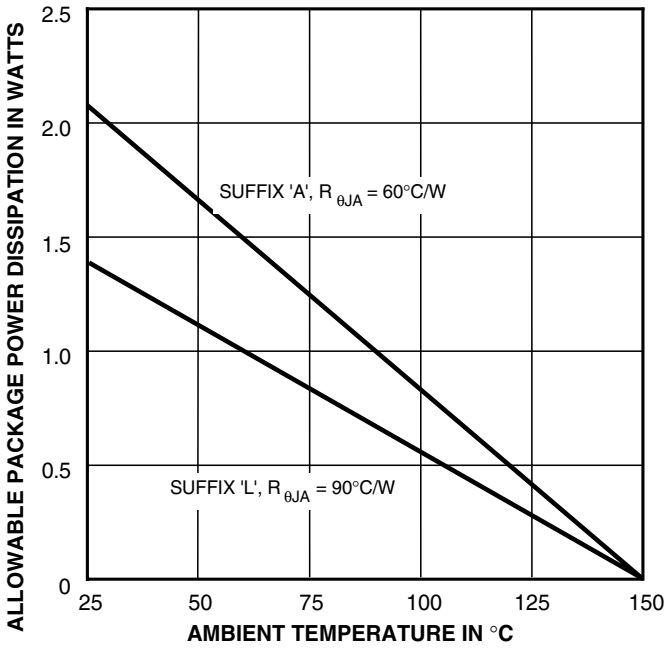
The LR2001A/L have series input resistors selected for operation directly with DTL TTL PMOS or CMOS. These devices will handle numerous interface needs - particularly those beyond the capabilities of standard logic buffers.

The LR2001A/L are the standard Darlington Array. The outputs are capable of sinking 500 mA and will withstand at least 50V in the OFF state.Outputs may be paralleled for higher load current capability.

These Darlington arrays are furnished in 16-pin dual in-line plastic packages (suffix “A”) and 16-lead surface-mountable SOICs (suffix “L”). All devices are pinned with outputs opposite inputs to facilitate ease of circuit board layout. All devices are rated for operation over the temperature range of -40°C to +85°C.

PARTIAL SCHEMATICS





Recommended Operating Conditions (Ta = –40 to 85°C)

Characteristic		Symbol	Test Condition		Min	Typ.	Max	Unit
Output voltage		V_{CE}			0	—	50	V
Output current	A	I_C	T_{pw} = 25 ms 7 Circuits Ta = 85°C T_j = 120°C	Duty = 10%	0	—	350	mA/ch
				Duty = 50%	0	—	100	
	L			Duty = 10%	0	—	300	
				Duty = 50%	0	—	90	
Input voltage		V_{IN}			0	—	24	V
Input voltage (output on)		$V_{IN\,(ON)}$	I_{OUT} = 400 mA h_{FE} = 800		2.8	—	24	V
Input voltage (output off)		$V_{IN\,(OFF)}$			0	—	0.7	V
Clamp diode reverse voltage		V_R			—	—	50	V
Clamp diode forward current		I_F			—	—	350	mA
Power dissipation	A	P_D	Ta = 85°C		—	—	0.76	W
	L		Ta = 85°C		—	—	0.65	

LR2001A/L
ELECTRICAL CHARACTERISTICS at +25°C (unless otherwise noted).

Characteristic	Symbol	Test Fig.	Applicable Devices	Test Conditions	Limits			
					Min.	Typ.	Max.	Units
Output Leakage Current	I_{CEX}	1		V_{CE} = 50 V, T_A = 25°C	—	< 1	50	µA
				V_{CE} = 50 V, T_A = 70°C	—	< 1	100	µA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	2		I_C = 100 mA, I_B = 250 µA	—	0.9	1.1	V
				I_C = 200 mA, I_B = 350 µA	—	1.1	1.3	V
				I_C = 350 mA, I_B = 500 µA	—	1.3	1.6	V
Input Current	$I_{IN(ON)}$	3		V_{IN} = 12V	—	1	1.45	mA
	$I_{IN(OFF)}$	4		I_C = 500 µA, T_A = 70°C	50	65	—	µA
DC Forward Current gain	HFE			I_C= 350 mA, V_{CE} = 2 V	1000			
Input Capacitance	C_{IN}	—	All		—	15	25	pF
Turn-On Delay	t_{PLH}	8	All	0.5 E_{IN} to 0.5 E_{OUT}	—	0.25	1.0	µs
Turn-Off Delay	t_{PHL}	8	All	0.5 E_{IN} to 0.5 E_{OUT}	—	0.25	1.0	µs
Clamp Diode Leakage Current	I_R	6	All	V_R = 50 V, T_A = 25°C	—	—	50	µA
				V_R = 50 V, T_A = 70°C	—	—	100	µA
Clamp Diode Forward Voltage	V_F	7	All	I_F = 350 mA	—	1.7	2.0	V

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

TEST FIGURES

FIGURE 1

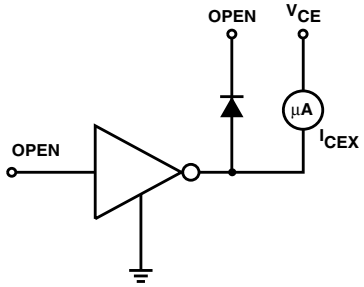


FIGURE 2

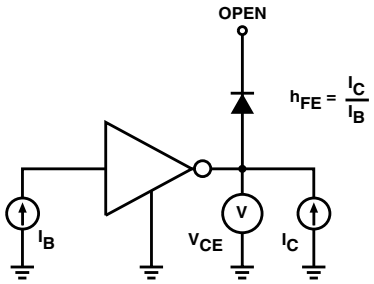


FIGURE 3

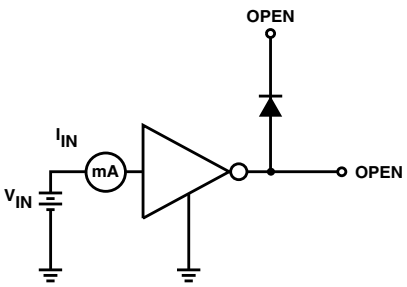


FIGURE 4

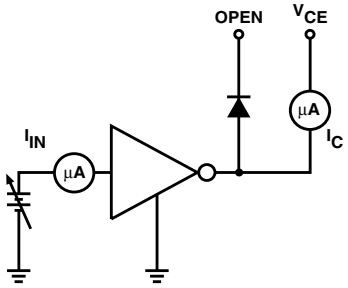


FIGURE 5

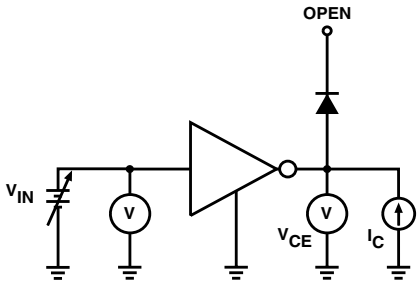


FIGURE 6

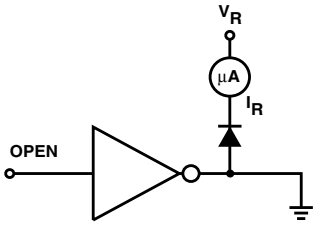


FIGURE 7

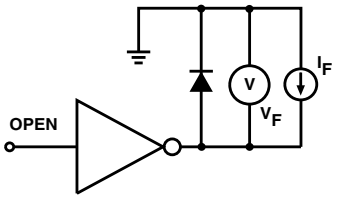
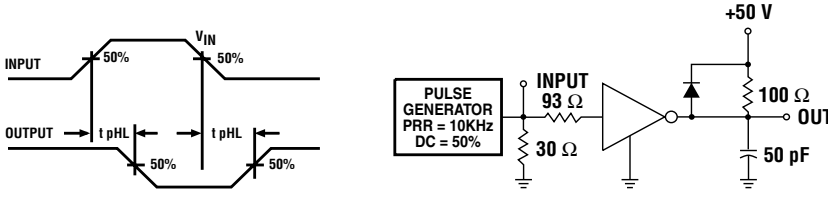
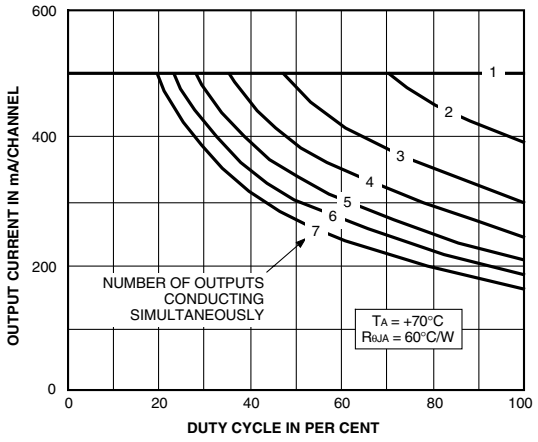


FIGURE 8

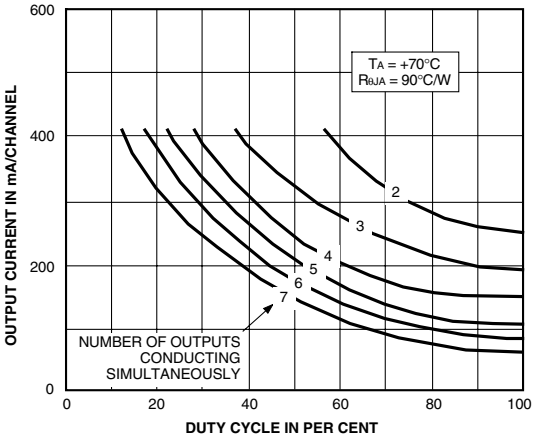


ALLOWABLE COLLECTOR CURRENT AS A FUNCTION OF DUTY CYCLE

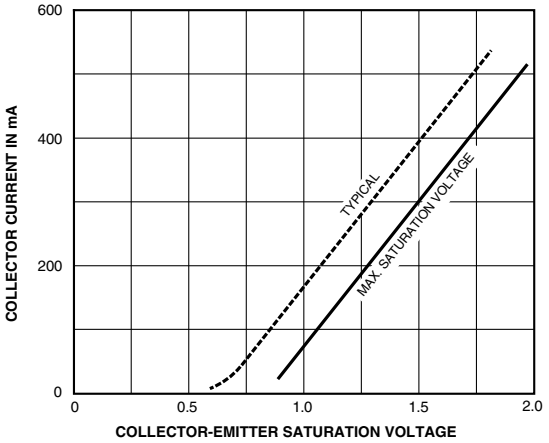
(Dual In-line-Packaged Devices, Suffix 'A')



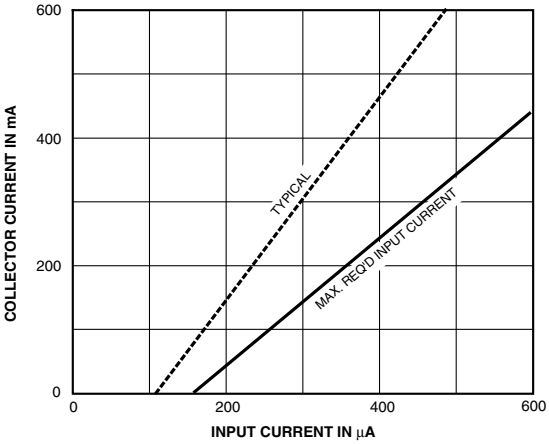
(Small-Outline-Packaged Devices, Suffix 'L')



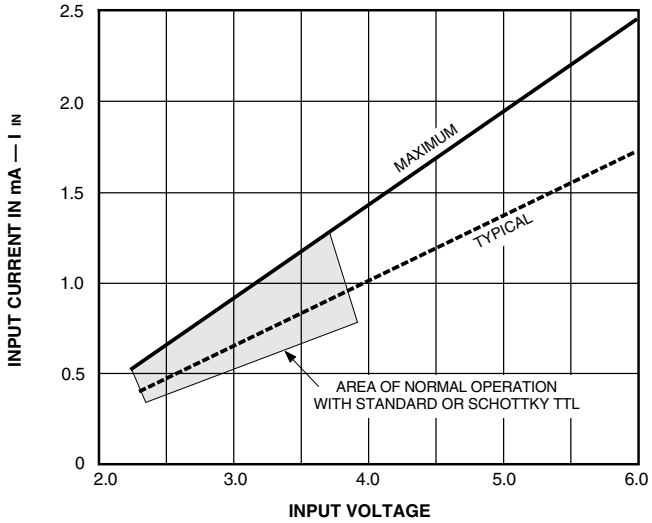
SATURATION VOLTAGE AS A FUNCTION OF COLLECTOR CURRENT



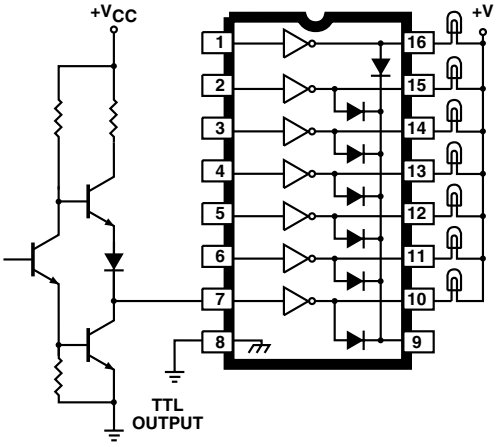
COLLECTOR CURRENT AS A FUNCTION OF INPUT CURRENT

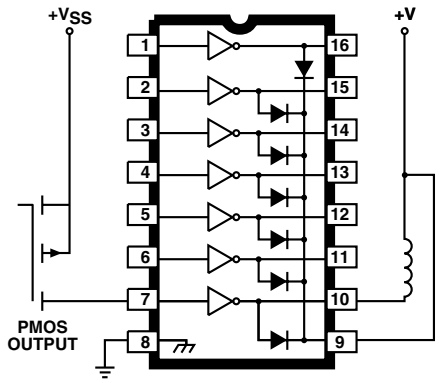


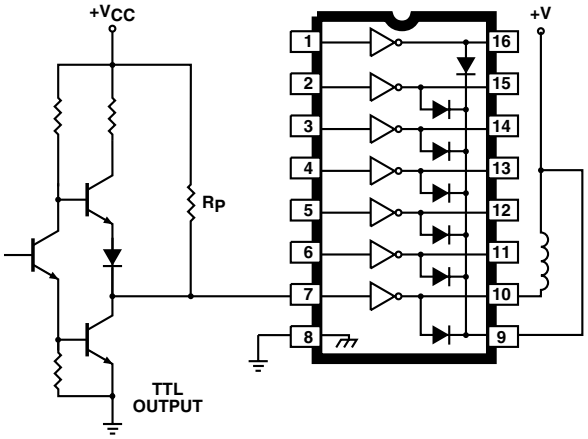
INPUT CURRENT AS A FUNCTION OF INPUT VOLTAGE

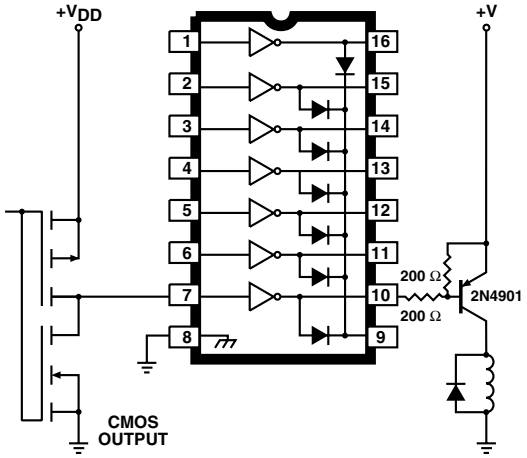


TYPICAL APPLICATIONS



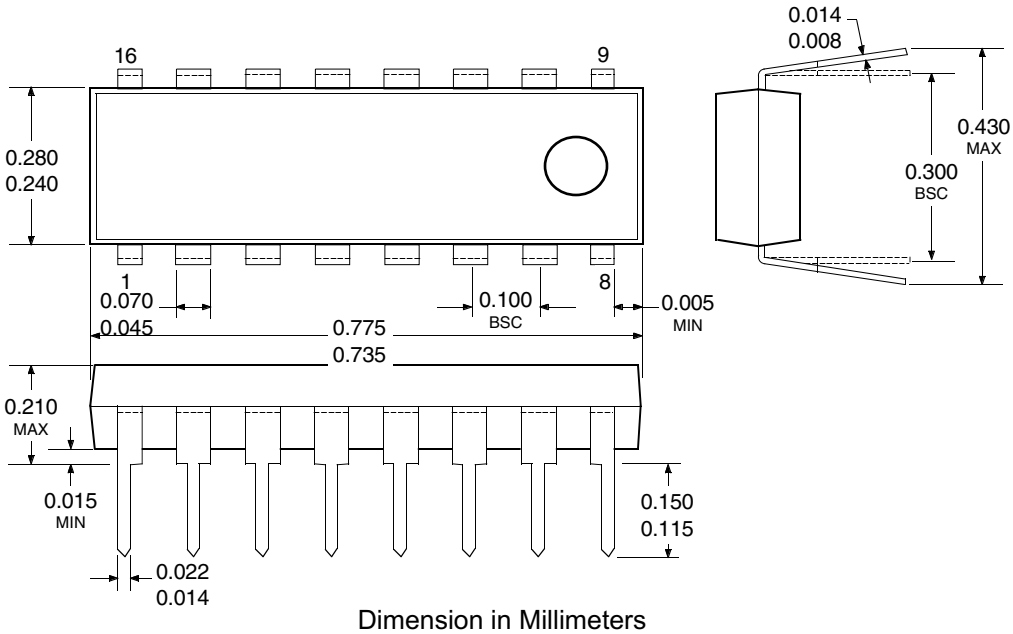




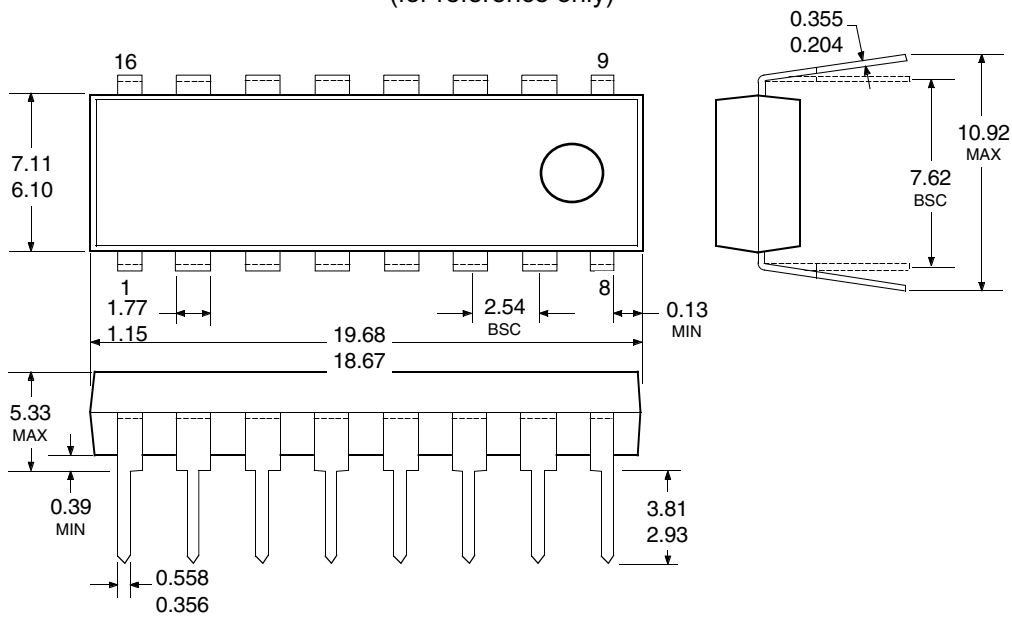


PACKAGE DESIGNATOR "A"

Dimensions in Inches
(controlling dimensions)

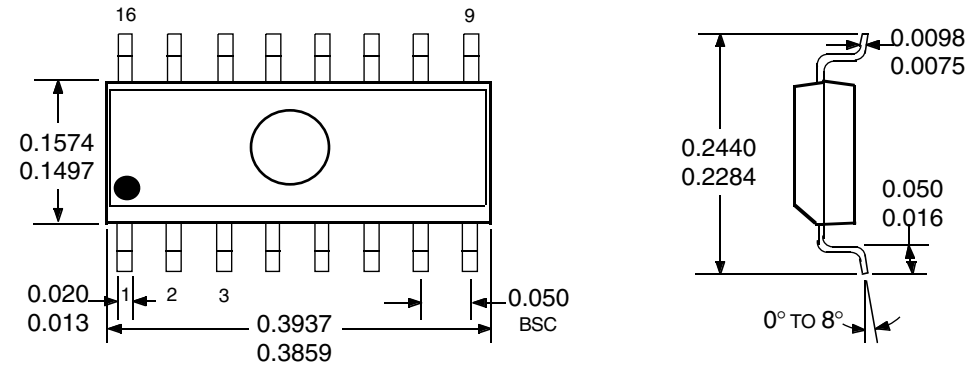


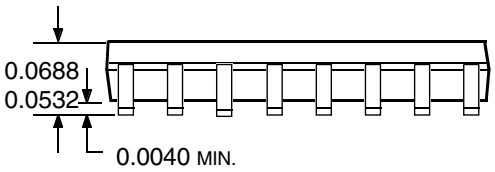
Dimension in Millimeters
(for reference only)



PACKAGE DESIGNATOR "L"

Dimensions in Inches
(for reference only)





Dimension in Millimeters
(controlling dimensions)

