

## INTRODUCTION

### HIGH VOLTAGE, HIGH CURRENT DARLINGTON ARRAYS

The S1P2655A01, S1P2655A02, S1P2655A03, S1P2655A04 and S1P2655A05 are comprised of seven high voltage, high current NPN darlington transistors arrays with common emitter, open collector outputs. Suppression diodes are included for inductive load driving and the inputs are pinned opposite the outputs to simplify board layout. Peak inrush currents to 600mA permit them to drive incandescent lamps.

The S1P2655A01 is a general purpose array for use with DTL, TTL, PMOS or CMOS logic directly.

The S1P2655A02 version does away with the need for any external discrete resistors, since each unit has a resistor and a zener diode in series with the input. The S1P2655A02 is designed for use with 14 to 25V PMOS devices. The zener diode also gives these devices excellent noise immunity.

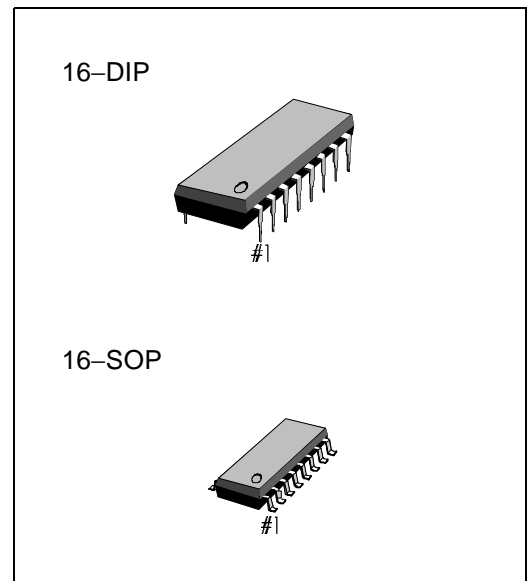
The S1P2655A03 has a series base resistor to each darlington pair, and thus allows operation directly with TTL or CMOS operating at supply voltages of 5V. The S1P2655A03 will handle numerous interfaces needs-particularly those beyond the capabilities of standard logic buffers.

The S1P2655A04 has an appropriate input resistor to allow direct operation from CMOS or PMOS outputs operating supply voltage of 6V to 15V.

The S1P2655A05 is designed for use with standard TTL and Schottky TTL, with which hinger output currents are required and loading of the logic output is not a concern.

These devices will sink a minimum of 350mA when driven from a "totempole" logic output.

These versatile devices are useful for driving a wide range of loads including Solenoids, Relays, DC motors, LED displays, Filament lamps, thermal printheads and high power buffer. Applications requiring sink currents beyond the capability of a single output may be accomodated by paralleling the outputs.



## APPLICATIONS

- Relay driver
- DC motor driver
- Solenoids driver
- LED display driver
- Filament lamp driver
- High power buffer
- Thermal print head driver

**OPERATING INFORMATION**

Device	Package	Input Level	Operating Temperature
S1P2655A01-D0B0	16-DIP	DTL, TTL, PMOS, CMOS	-20 – +85°C
S1P2655A01-S0B0	16-SOP		
S1P2655A02-D0B0	16-DIP	PMOS	
S1P2655A02-S0B0	16-SOP		
S1P2655A03-D0B0	16-DIP	TTL, CMOS	
S1P2655A03-S0B0	16-SOP		
S1P2655A04-D0B0	16-DIP	CMOS, PMOS	
S1P2655A04-S0B0	16-SOP		
S1P2655A05-D0B0	16-DIP	TTL	
S1P2655A05-S0B0	16-SOP		

**ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)**

Characteristic	Symbol	Value	Unit
Output Voltage	V <sub>O</sub>	50	V
Input Voltage (S1P2655A02/03/04) (S1P2655A05)	V <sub>IN</sub>	30	V
		15	
Continuous Collector Current	I <sub>C</sub>	500	mA
Continuous Input Current	I <sub>IN</sub>	25	mA
Power Dissipation	P <sub>D</sub>	1.0	W
Operating Temperature	T <sub>opr</sub>	- 20 – + 85	°C
Storage Temperature	T <sub>stg</sub>	- 55 – + 150	°C

**ELECTRICAL CHARACTERISTICS**

(Ta = 25°C, unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Output Leakage Current	I <sub>LK</sub>	V <sub>CE</sub> = 50V, Ta = 25°C, V <sub>IN</sub> = open	–	–	50	μA
		V <sub>CE</sub> = 50V, Ta = 70°C, V <sub>IN</sub> = open		–	100	
		V <sub>CE</sub> = 50V, Ta = 70°C, V <sub>IN</sub> = 6.0V (S1P2655A02)	–	–	500	
		V <sub>CE</sub> = 50V, Ta = 70°C, V <sub>IN</sub> = 1.0V (S1P2655A04)	–	–	500	
Output Saturation Voltage	V <sub>sat</sub>	I <sub>C</sub> = 100mA, I <sub>IN</sub> = 250μA	–	0.9	1.1	V
		I <sub>C</sub> = 200mA, I <sub>IN</sub> = 350μA	–	1.1	1.3	
		I <sub>C</sub> = 350mA, I <sub>IN</sub> = 500μA		1.25	1.6	
Input Current 1 (Off Condition)	I <sub>IN 1</sub>	I <sub>C</sub> = 500mA, Ta = 70°C	50	65	–	μA
Input Current 2 (On Condition)	I <sub>IN 2</sub>	V <sub>IN</sub> = 17V (S1P2655A02), Vo = open	–	0.85	1.3	mA
		V <sub>IN</sub> = 3.85V (S1P2655A03), Vo = open	–	0.93	1.35	
		V <sub>IN</sub> = 5V (S1P2655A04), Vo = open	–	0.35	0.5	
		V <sub>IN</sub> = 12V (S1P2655A04), Vo = open	–	1.0	1.45	
		V <sub>IN</sub> = 3.0V (S1P2655A05), Vo = open	–	1.5	2.4	
Input Voltage	V <sub>IN</sub>	V <sub>CE</sub> = 2.0V, I <sub>C</sub> = 300mA (S1P2655A02)	–	–	13	V
		V <sub>CE</sub> = 2.0V, I <sub>C</sub> = 200mA (S1P2655A03)	–	–	2.4	
		V <sub>CE</sub> = 2.0V, I <sub>C</sub> = 250mA (S1P2655A03)	–	–	2.7	
		V <sub>CE</sub> = 2.0V, I <sub>C</sub> = 300mA (S1P2655A03)	–	–	3.0	
		V <sub>CE</sub> = 2.0V, I <sub>C</sub> = 125mA (S1P2655A04)	–	–	5.0	
		V <sub>CE</sub> = 2.0V, I <sub>C</sub> = 200mA (S1P2655A04)	–	–	6.0	
		V <sub>CE</sub> = 2.0V, I <sub>C</sub> = 275mA (S1P2655A04)	–	–	7.0	
		V <sub>CE</sub> = 2.0V, I <sub>C</sub> = 350mA (S1P2655A04)	–	–	8.0	
V <sub>CE</sub> = 2.0V, I <sub>C</sub> = 350mA (S1P2655A05)	–	–	2.4			
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> = 2.0V, I <sub>C</sub> = 350mA (S1P2655A05)	1000	–	–	–
Input Capacitance	C <sub>IN</sub>	–	–	15	30	pF
Preparation Delay Time	t <sub>ON</sub>	0.5 V <sub>IN</sub> to 0.5 V <sub>O</sub>	–	0.25	1.0	μs
	t <sub>OFF</sub>	0.5 V <sub>IN</sub> to 0.5 V <sub>O</sub>	–	0.25	1.0	μs
Clamp Diode Leakage Current	I <sub>R</sub>	V <sub>IN</sub> = open, V <sub>O</sub> = GND, V <sub>R</sub> = 50V, Ta = 25°C	–	–	50	μA
		V <sub>IN</sub> = open, V <sub>O</sub> = GND, V <sub>R</sub> = 50V, Ta = 70°C	–	–	100	μA
Clamp Diode Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 350mA	–	1.7	2.0	V

PIN CONFIGURATION

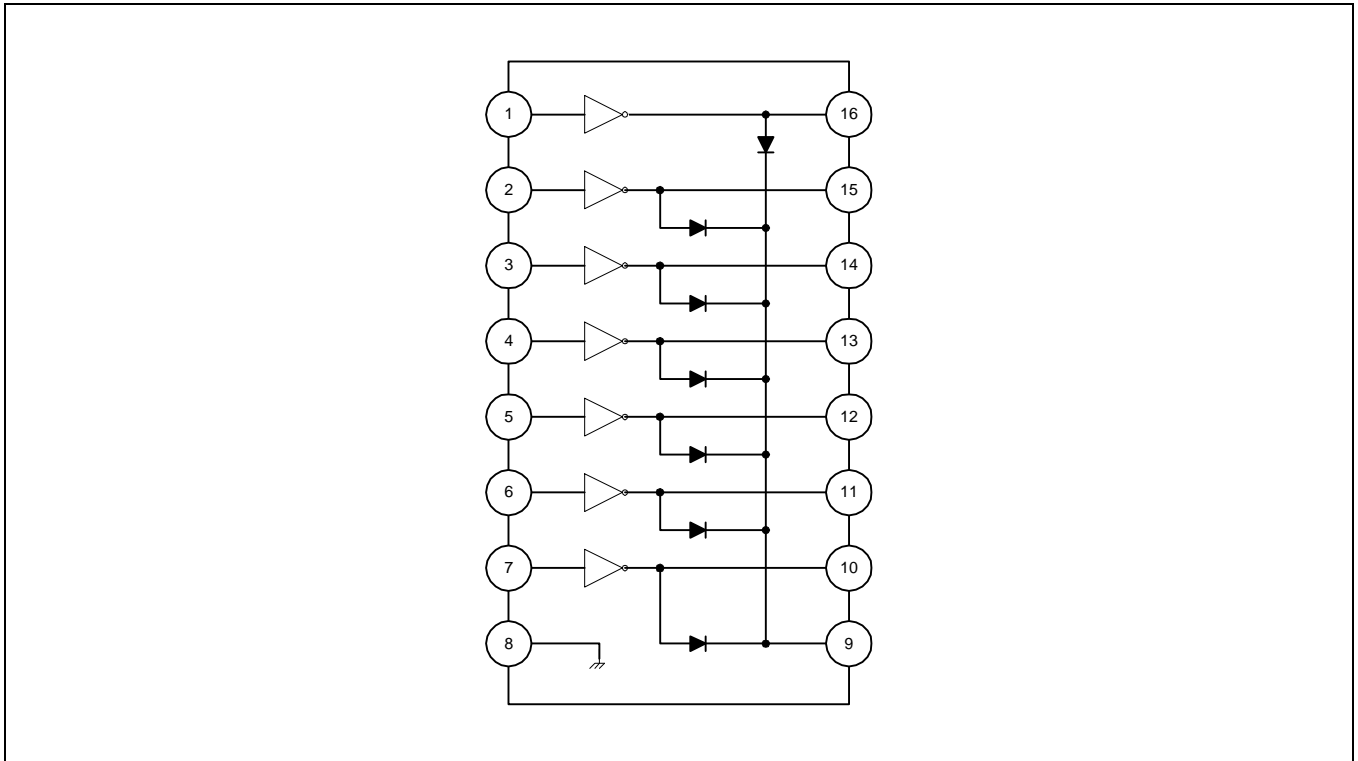
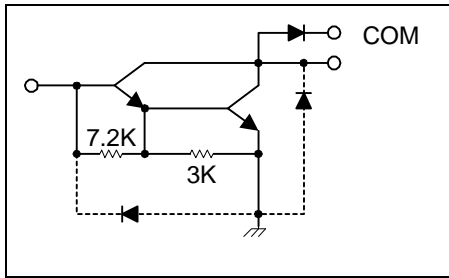


Figure 1.

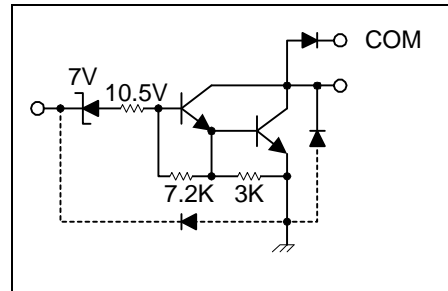
**SCHEMATIC DIAGRAMS**

**S1P2655A01 (each driver)**



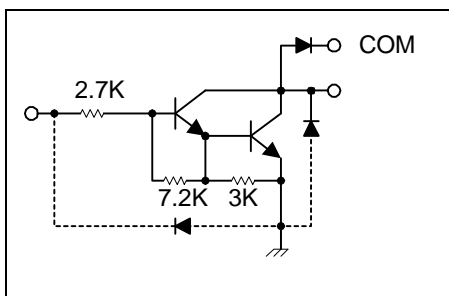
**Figure 2.**

**S1P2655A02 (each driver)**



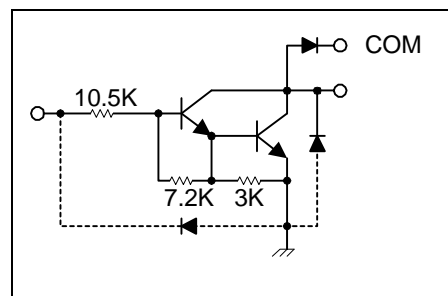
**Figure 3.**

**S1P2655A03 (each driver)**



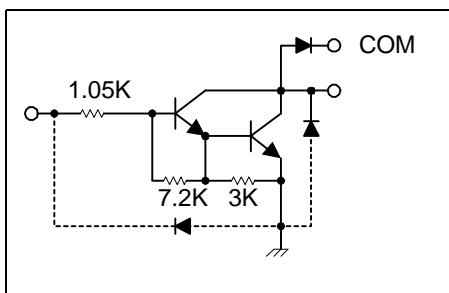
**Figure 4.**

**S1P2655A04 (each driver)**



**Figure 5.**

**S1P2655A05 (each driver)**



**Figure 6.**

TYPICAL APPLICATIONS

**PMOS TO LOAD**  
S1P2655A02

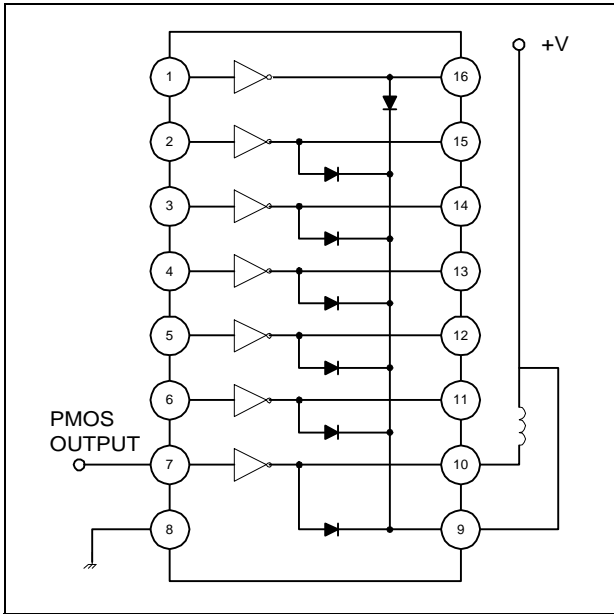


Figure 7.

**TTL TO LOAD**  
S1P2655A03/05

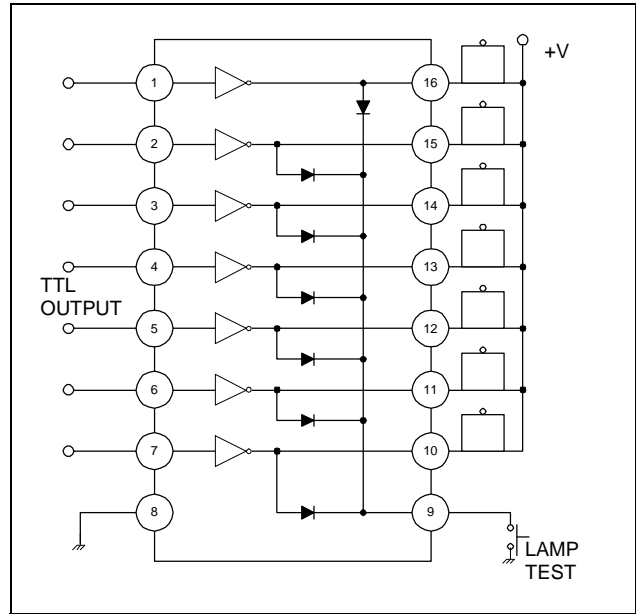


Figure 8.

**Buffer for High-current Load**  
S1P2655A04

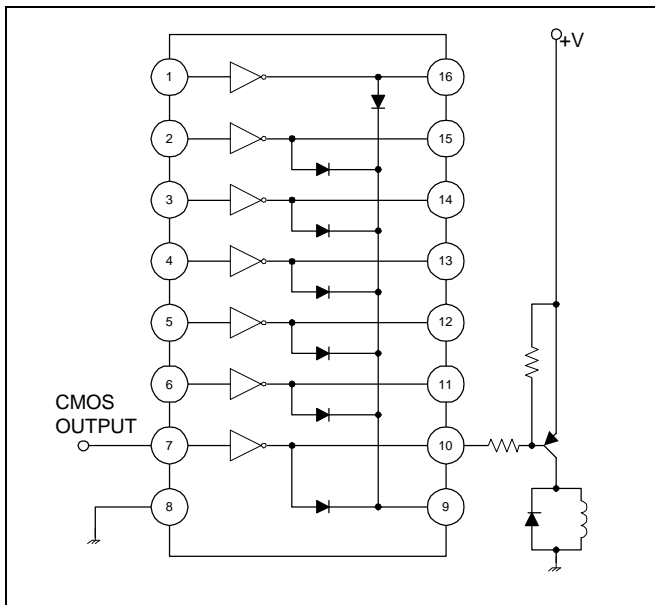


Figure 9.

**USE of Pull-up Resistors to Increase Drive Current**  
S1P2655A03

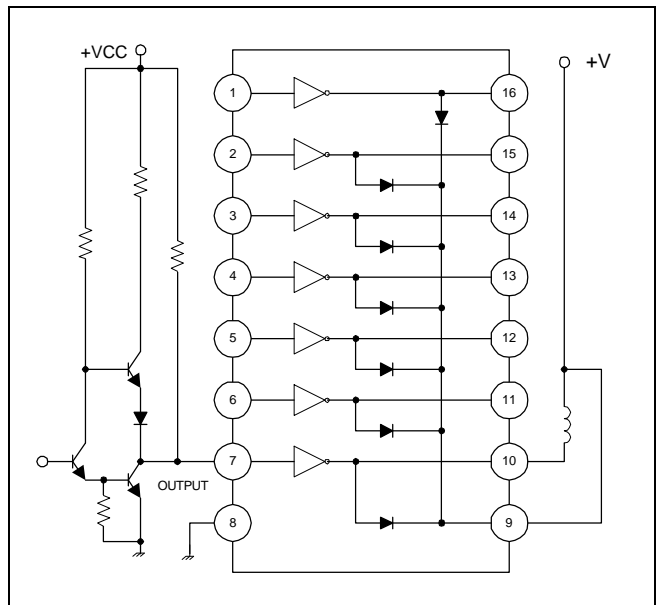


Figure 10.