



### FEATURES

- Improved Replacement for ULN2803.
- Fast Turn-on and Turn-off.
- TTL/CMOS Compatible.

### APPLICATIONS

- Stepping Motor Driver.
- Relay Driver.
- LED Driver.
- Solenoid Driver.

### DESCRIPTION

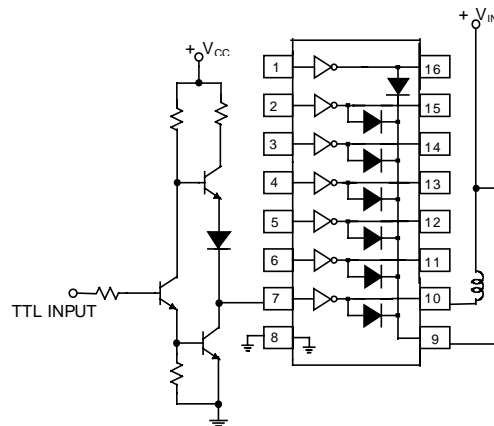
Manufactured with the standard bipolar process, the AIC2003 is a high-voltage, high-current 7-channel Darlington array, with each of the output transistors capable of sinking peak load current of 700mA and capable of withstanding at least 35V in the OFF state.

The AIC2003 has a 2.7KΩ series base resistor to each Darlington pair and thus allows operation directly with TTL or CMOS logic circuitry operating at a supply voltage of 5V. Outputs of the drivers can be paralleled for higher load current capability.

These make the AIC2003 ideally suited for numerous interfaces between low-level logic circuitry and high-power peripheral loads, particularly those beyond the capabilities of standard logic buffers. Typical loads include relays, solenoids, stepping motors, heaters, multiplexed LED, and incandescent displays.

The AIC2003 features open collector outputs and integral diodes for inductive load transient suppression.

### TYPICAL APPLICATION CIRCUIT



### ORDERING INFORMATION

AIC2003XX  
 PACKAGE TYPE  
 N: PLASTIC DIP  
 TEMPERATURE RANGE  
 C= 0°C~70°C

ORDER NUMBER	PIN CONFIGURATION
AIC2003CN (PLASTIC DIP)	<p>TOP VIEW</p> <p>IN1 1 16 C1          IN2 2 15 C2          IN3 3 14 C3          IN4 4 13 C4          IN5 5 12 C5          IN6 6 11 C6          IN7 7 10 C7          GND 8 9 COM</p>



## ■ ABSOLUTE MAXIMUM RATINGS (at Ta=25°C)

Output Voltage, $V_{CE}$ .....	35V
Input Voltage, $V_{IN}$ .....	30V
Continuous Collector Current, $I_C$ .....	500mA
Continuous Base Current, $I_B$ .....	25mA
Power Dissipation, PD (one Darlington pair) .....	1.0W
(total package) .....	2.25W
Operating Ambient Temperature Range, $T_A$ .....	-20°C to +85°C
Storage Temperature Range, $T_S$ .....	-55°C to +150°C

## ■ ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise specified.)

PARAMETERS	SYMBOL	TEST FIG	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Leakage Current	$I_{CEX}$	1	$V_{CE}=35V, T_A=25^\circ C$			3	$\mu A$
			$V_{CE}=35V, T_A=70^\circ C$			50	$\mu A$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	2	$I_C=100mA, I_B=250\mu A$		0.8	1.1	V
			$I_C=200mA, I_B=350\mu A$		0.9	1.3	V
			$I_C=350mA, I_B=500\mu A$		1.0	1.5	V
Input Current	$I_{IN(ON)}$ $I_{IN(OFF)}$	3 4	$V_{IN}=3.85V$		0.93	1.35	mA
			$I_C=500\mu A, T_A=70^\circ C$	50	65		$\mu A$
Input voltage	$V_{IN(ON)}$	5	$V_{CE}=2.0V, I_C=200mA$			2.3	V
			$V_{CE}=2.0V, I_C=250mA$			2.4	V
			$V_{CE}=2.0V, I_C=300mA$			2.5	V
Input Capacitance	$C_{IN}$				15	25	pF
Turn-On Delay	$t_{ON}$		0.5 $E_{IN}$ to 0.5 $E_{OUT}$		0.25	1.0	$\mu S$
Turn-off Delay	$t_{OFF}$		0.5 $E_{IN}$ to 0.5 $E_{OUT}$		0.25	1.0	$\mu S$
Clamp Diode Leakage Current	$I_R$	6	$V_R=35V, T_A=25^\circ C$			3	$\mu A$
			$V_R=35V, T_A=70^\circ C$			50	$\mu A$
Clamp Diode Forward Voltage	$V_F$	7	$I_F=350mA$		1.4	1.8	V



■ TEST CIRCUITS

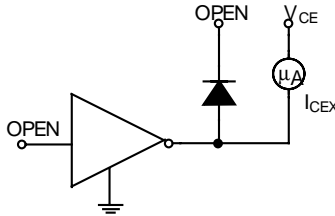


Fig. 1

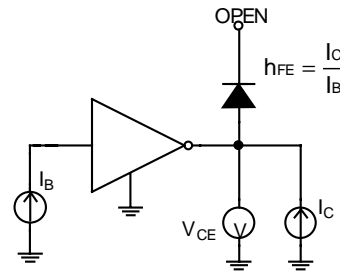


Fig. 2

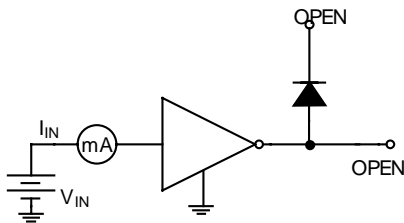


Fig. 3

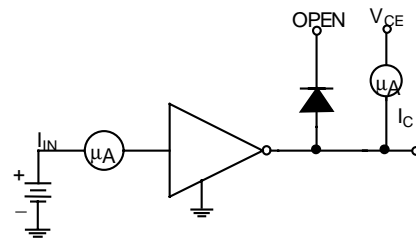


Fig. 4

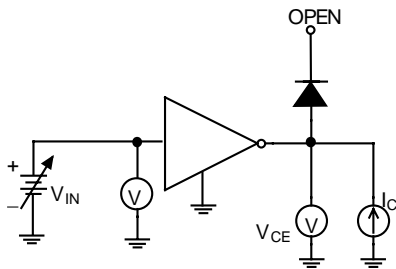


Fig. 5

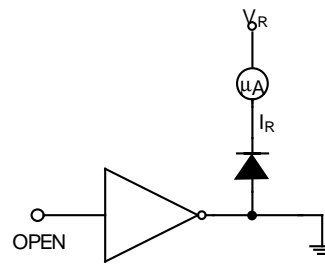


Fig. 6

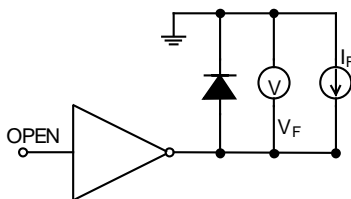
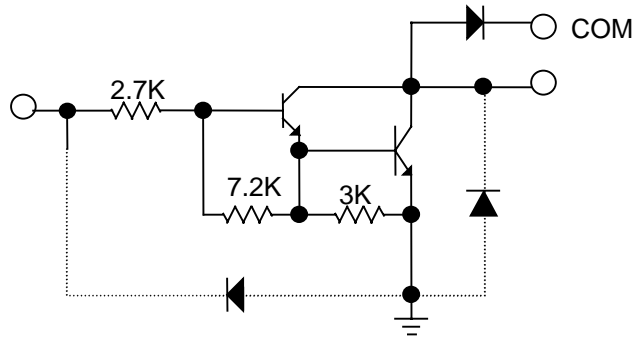


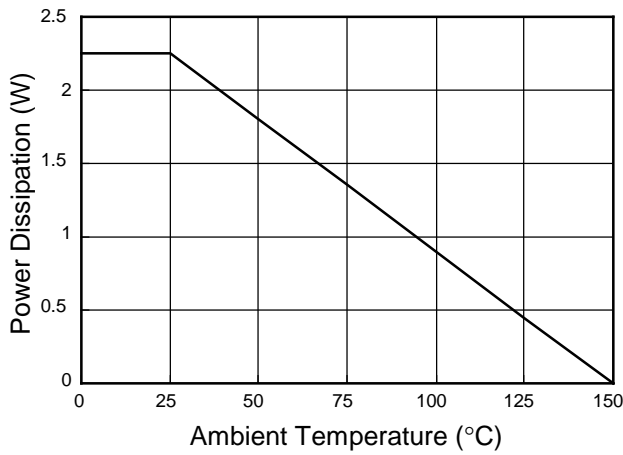
Fig. 7



### DRIVER CIRCUIT

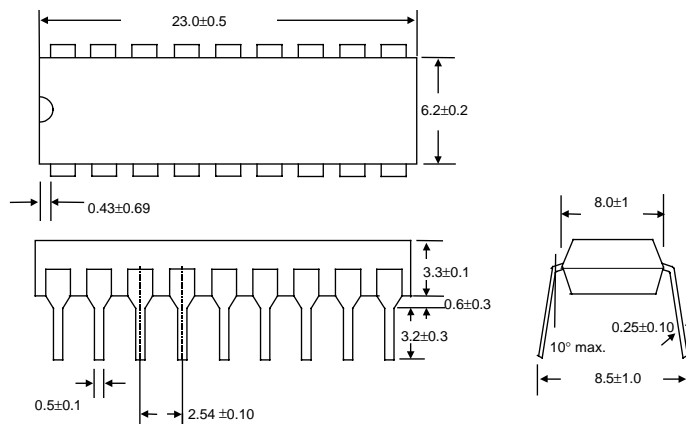


### ALLOWABLE AVERAGE POWER DISSIPATION



### PHYSICAL DIMENSIONS

- 18 LEAD PLASTIC DIP



unit: mm