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

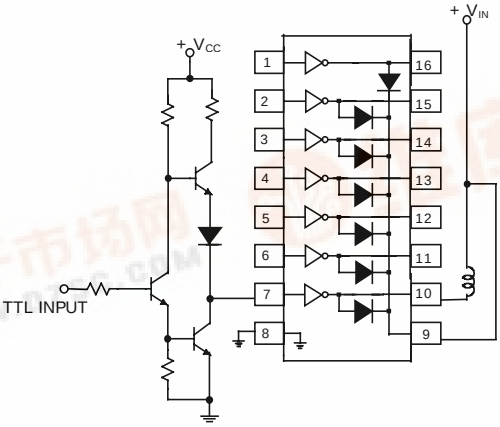
Manufactured with the standard bipolar process, the AIC2003 is a high-voltage, high-current 7-channel Darlington array, with each of the output transistors capable of sinking peak load current of 700mA and capable of withstanding at least 35V in the OFF state.

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

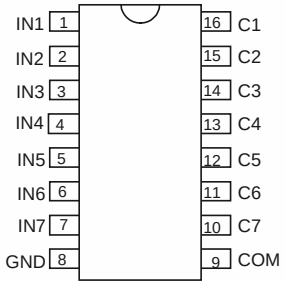


ORDERING INFORMATION

AIC2003XX

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

ORDER NUMBER	PIN CONFIGURATION
AIC2003CN (PLASTIC DIP)	TOP VIEW



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°C			3	µA
			V_{CE}=35V,T_A=70°C			50	µA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	2	I_C=100mA,I_B=250µA		0.8	1.1	V
			I_C=200mA,I_B=350µA		0.9	1.3	V
			I_C=350mA,I_B=500µA		1.0	1.5	V
Input Current	$I_{IN(ON)}$	3	V_{IN}=3.85V		0.93	1.35	mA
	$I_{IN(OFF)}$	4	I_C=500µA,T_A=70°C	50	65		µA
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	µS
Turn-off Delay	t_{OFF}		0.5 E_{IN} to 0.5 E_{OUT}		0.25	1.0	µS
Clamp Diode Leakage Current	I_R	6	V_R=35V, T_A=25°C			3	µA
			V_R=35V, T_A=70°C			50	µA
Clamp Diode Forward Voltage	V_F	7	I_F=350mA		1.4	1.8	V

TEST CIRCUITS

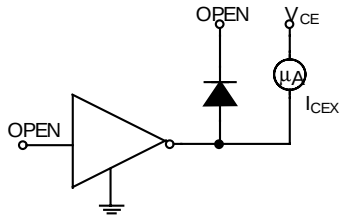


Fig. 1

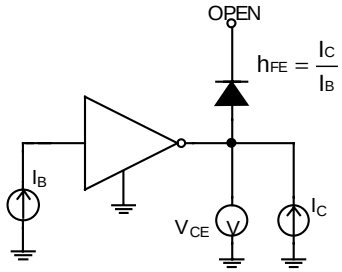


Fig. 2

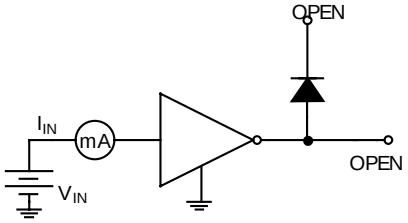


Fig. 3

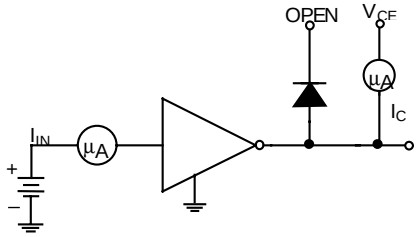


Fig. 4

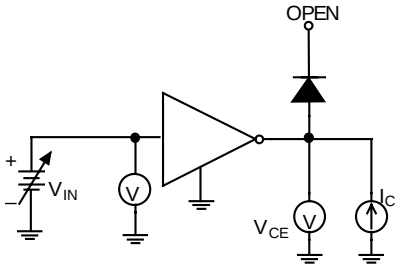


Fig. 5

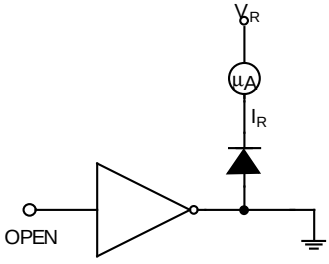


Fig. 6

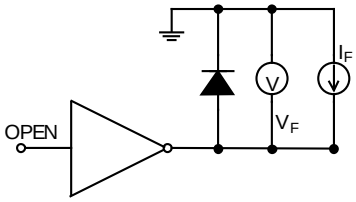
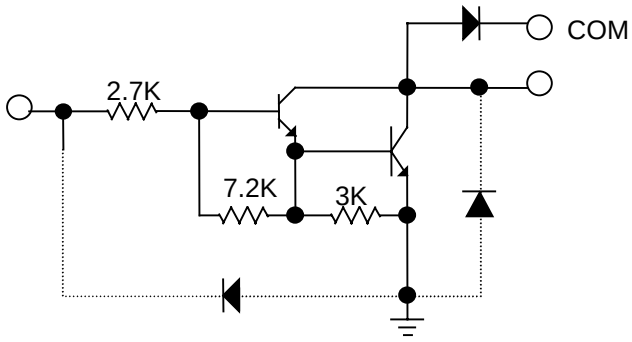
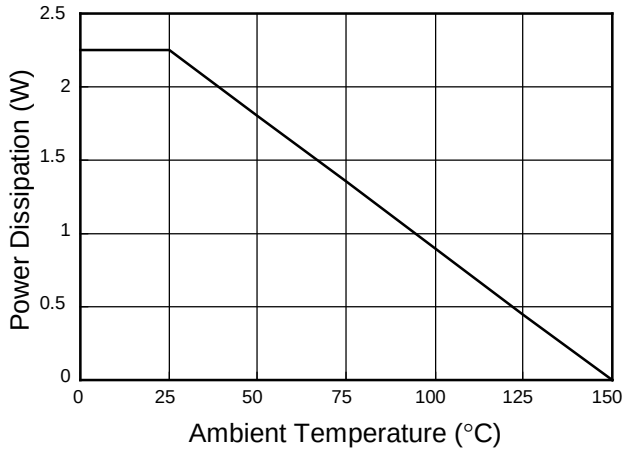


Fig. 7

DRIVER CIRCUIT

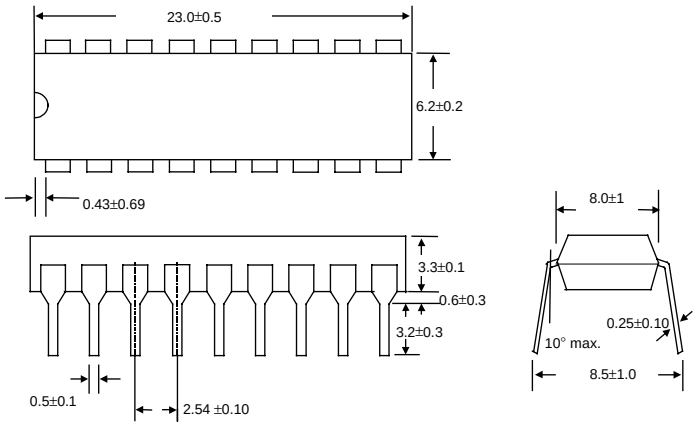


ALLOWABLE AVERAGE POWER DISSIPATION



PHYSICAL DIMENSIONS

- **18 LEAD PLASTIC DIP**



unit: mm