



# MIC2803/2804

## High-Voltage High-Current Darlington Array

Not Recommended for New Designs

### General

The MIC2803 and MIC2804 are high-voltage, high-current Darlington arrays ideal for switching high-power loads from logic-level TTL, CMOS, or PMOS control signals.

The MIC2803/4 Darlington transistor array can be used to manage multiple loads of up to 50V and 500mA, limited by package power dissipation.

The MIC2803 features inputs compatible with 5V TTL and CMOS logic while the MIC2804 features inputs compatible with 6V to 15V CMOS or PMOS logic outputs.

The MIC2803/4 is available in 18-pin plastic DIP and wide SOIC packages in the  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  temperature range.

### Features

- Output voltage to 50V
- Output current to 500mA
- Open-collector outputs
- Integral clamp diodes
- TTL, CMOS, or PMOS compatible inputs

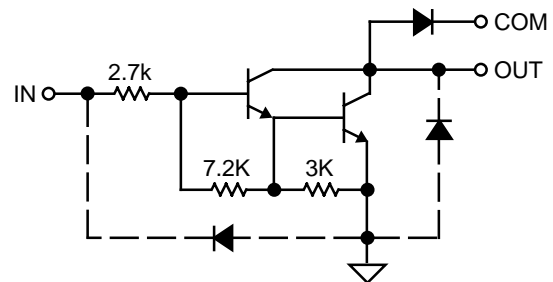
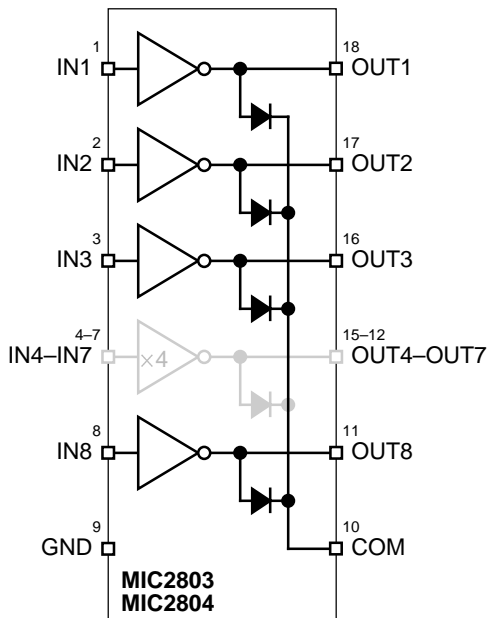
### Applications

- Relay and solenoid switching
- Stepping motor
- LED and incandescent displays

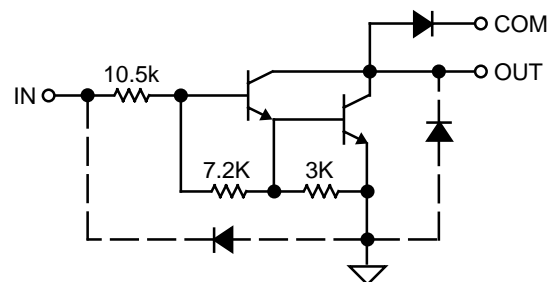
### Ordering Information

Part Number	Temperature Range	Package
MIC2803BN	$-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$	18-pin DIP
MIC2803BWM	$-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$	18-pin wide SOIC
MIC2804BN	$-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$	18-pin DIP
MIC2804BWM	$-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$	18-pin wide SOIC

### Functional Diagrams

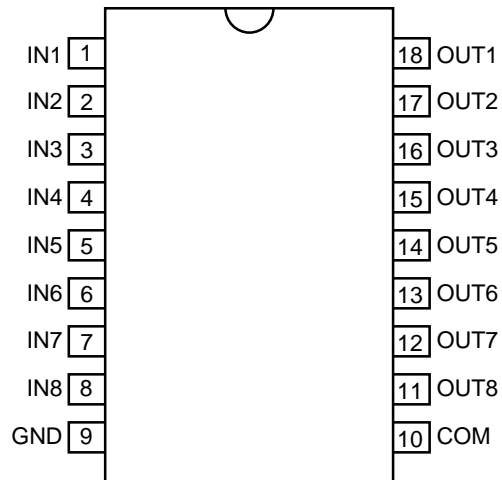


Typical MIC2803 Darlington Driver



Typical MIC2804 Darlington Driver

## Pin Configuration



**18-Pin DIP (N)**  
**18-Pin Wide SOIC (WM)**

## Pin Description

Pin Number	Pin Name	Pin Function
1–8	IN1–IN8	Input 1 through Input 8: Base drive to Darlington transistor via current limiting resistor.
9	GND	Ground
10	COM	Clamp Diode Common
11–18	OUT8–OUT1	Output 8 through Output 1: Open collector output of Darlington transistor.

**Absolute Maximum Ratings**

Output Voltage ( $V_{CE}$ ) .....	50V
Continuous Output Current ( $I_C$ ) .....	500mA
Input Voltage ( $V_{IN}$ ) .....	30V
Continuous Input Current ( $I_{IN}$ ) .....	25mA
Storage Temperature ( $T_S$ ) .....	-65°C to +150°C

**Operating Ratings**

Ambient Temperature ( $T_A$ ) .....	-40°C to +85°C
Package Thermal Resistance	
PDIP $\theta_{JA}$ .....	56°C/W
SOIC $\theta_{JA}$ .....	84°C/W

**Electrical Characteristics**

$V_{CC} = 50V$ ,  $T_A = 25^\circ C$ , unless noted.

Symbol	Parameter	Condition	Min	Typ	Max	Units
$I_{CEX}$	Output Leakage Current	$T_A = +25^\circ C$			50	$\mu A$
		$T_A = +70^\circ C$			100	$\mu A$
		MIC2804 $T_A = +85^\circ C, V_{IN} = 1.0V$			500	$\mu A$
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 100mA, I_{IN} = 250\mu A$		0.9	1.1	V
		$I_C = 200mA, I_{IN} = 350\mu A$		1.1	1.3	V
		$I_C = 350mA, I_{IN} = 500\mu A$		1.3	1.6	V
$I_{IN(on)}$	Input Current	MIC2803 $V_{IN} = 3.85V$		0.93	1.35	mA
		MIC2804 $V_{IN} = 5.0V$ $V_{IN} = 12V$		0.35 1.0	0.5 1.45	mA mA
$I_{IN(off)}$		$I_C = 500\mu A, T_A = +85^\circ C$	50	65		$\mu A$
$V_{IN(on)}$	Input Voltage	MIC2803 $V_{CE} = 2.0V, I_C = 200mA$ $V_{CE} = 2.0V, I_C = 250mA$ $V_{CE} = 2.0V, I_C = 300mA$			2.4	V
					2.7	V
					3.0	V
		MIC2804 $V_{CE} = 2.0V, I_C = 125mA$ $V_{CE} = 2.0V, I_C = 200mA$ $V_{CE} = 2.0V, I_C = 275mA$ $V_{CE} = 2.0V, I_C = 350mA$			5.0	V
			6.0	V		
			7.0	V		
			8.0	V		
$C_{IN}$	Input Capacitance			15	25	pF
$t_{ON}$	Turn-On Delay	$0.5E_{IN}$ to $0.5E_{OUT}$		0.15	1.0	$\mu s$
$t_{OFF}$	Turn-Off Delay	$0.5E_{IN}$ to $0.5E_{OUT}$		0.05	1.0	$\mu s$
$I_R$	Clamp Diode Leakage Current	$V_R = 50V, T_A = +25^\circ C$			50	$\mu A$
		$V_R = 50V, T_A = +85^\circ C$			100	$\mu A$
$V_F$	Clamp Diode Forward Voltage	$I_F = 350mA$		1.7	2.0	V

**General Note:** Devices are ESD protected; however, handling precautions are recommended.