

# HUAXUANYANG ULN2003 Darlington Transistor Array Instructions

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HUAXUANYANG HXY  
ELECTRONICS CO.,LTD  
ULN2003  
Darlington transistor array

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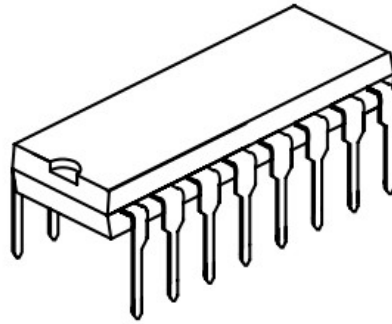
## Product features:

ULN2003 is a 7-way Darlington structure circuit.

The output current of each channel is 500mA, the peak current is 600mA, and the output voltage is 50V.

Emitter structure, each channel can be output independently. Should Circuits are often used to drive various loads, such as DC motors, LED display lights, high-power buffers and 5V TTL, CMOS and other general logic circuits, etc.

DIP- 16



SOP-16

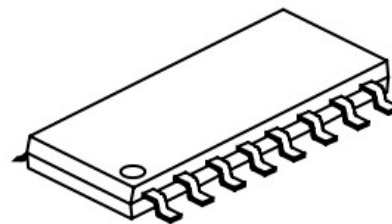


Figure 1 ULN2003 circuit outline diagram

## Package form and pin definition

SOP16/DIP16 dual row package form:

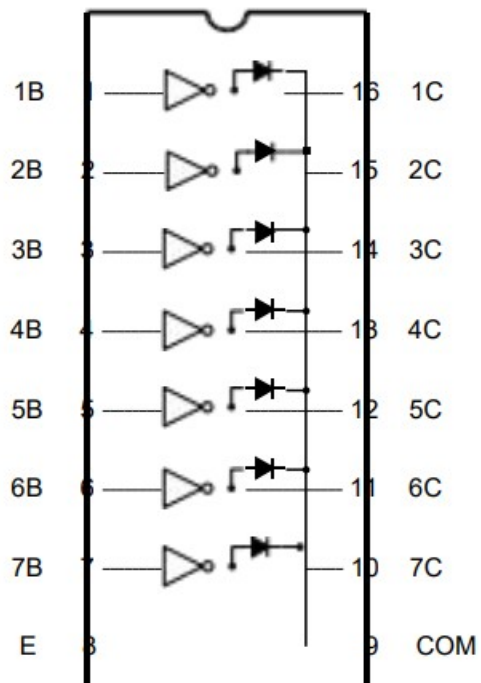


Figure 2ULN2003 pin definition diagram

## Maximum rating

Table 1 Maximum Ratings

symbol	parameters	maximum rating	unit
Vo	The output voltage	50	V
Vin	Input voltage	30	V
Ic	Output current	500	mA
Ib	Input Current	25	mA

### Circuit schematic diagram

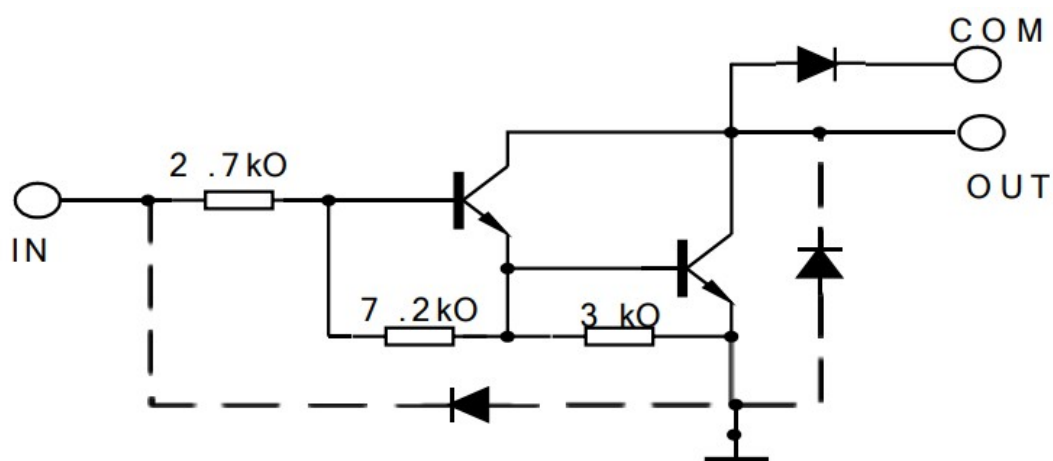


Figure 3 ULN2003 circuit schematic diagram

### Electrical parameters

Table 2 Test electrical parameters

Symbol	Parameter Description	Test Conditions	Min.	Typ.	Max.	unit	Test chart
ICEX	Output leakage current	$V_{CE}=50V$	—	—	50.0	$\mu A$	Figure 1a.
VCE(sat)	Collector-emitter saturation voltage drop	$I_C=100mA$ $I_B=250\mu A$	—	0.9	1.1	V	Figure 2.
		$I_C=200mA$ $I_B=350\mu A$	—	1.1	1.3		
		$I_C=350mA$ $I_B=500\mu A$	—	1.3	1.6		
Ii(on)	Input turn-on current	$V_i=3.85V$	—	0.93	1.35	mA	Figure 3.
you(he)	Input turn-on voltage	$V_{CE}=2.0V$ $I_C=200mA$ $V_{CE}=2.0V$ $I_C=250mA$ $V_{CE}=2.0V$ $I_C=300mA$	—	—	2.4 2.7 3.0	V	Figure 5.
I <sub>R</sub>	Diode leakage current	$V_R=50V$	-4.0	—	50.0	$\mu A$	Figure 6.
V <sub>F</sub>	Diode forward voltage drop	$I_F=350mA$	—	1.7	2	V	Figure 7.
ICEX- 1V	Output leakage current	$V_{CE}=50V$ $V_i=1V$	-5	—	80	$\mu A$	Figure 1b.

## Test circuit diagram

Figure 1a.

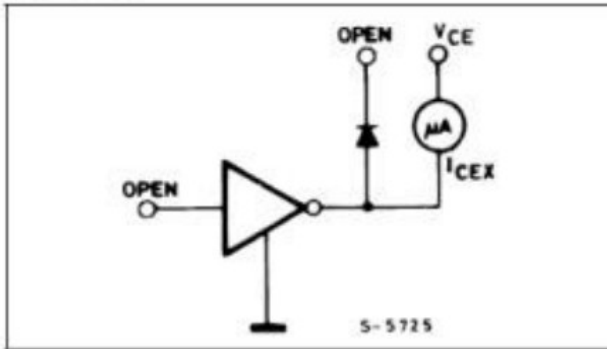


Figure 1b.

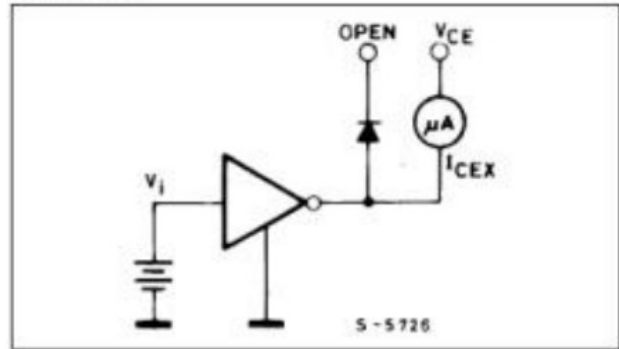


Figure 2.

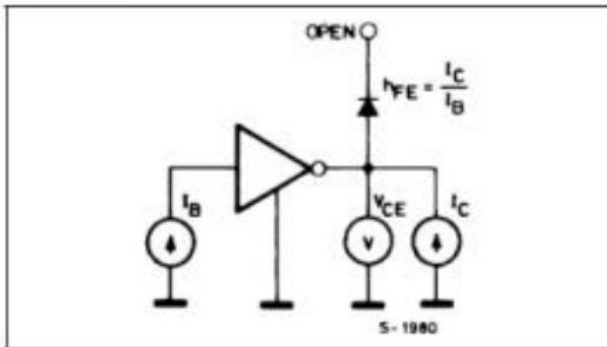


Figure 3.

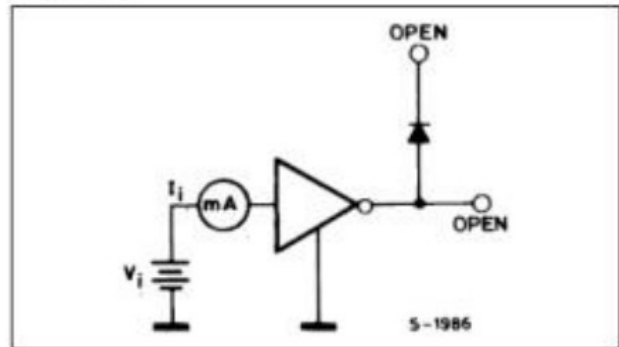


Figure 4.

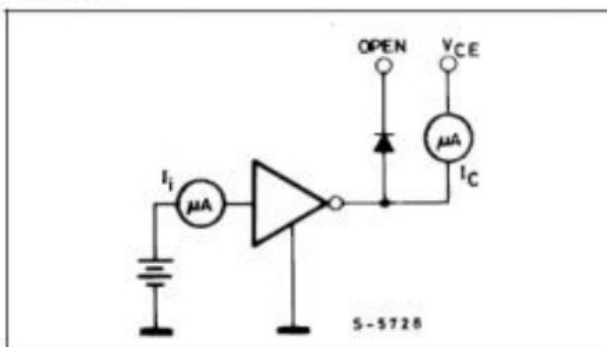


Figure 5.

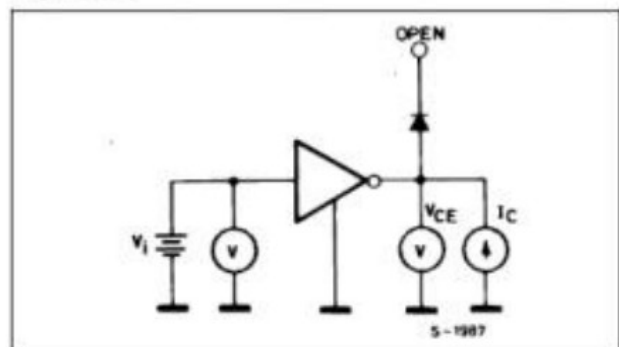


Figure 6.

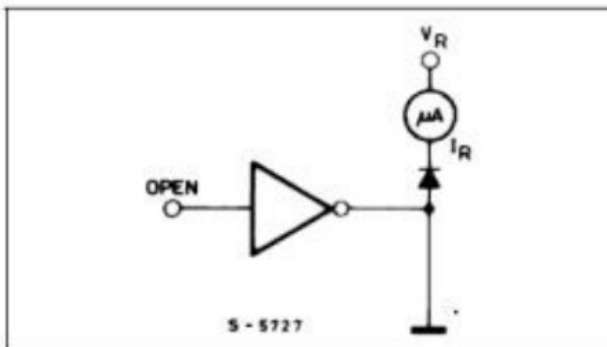
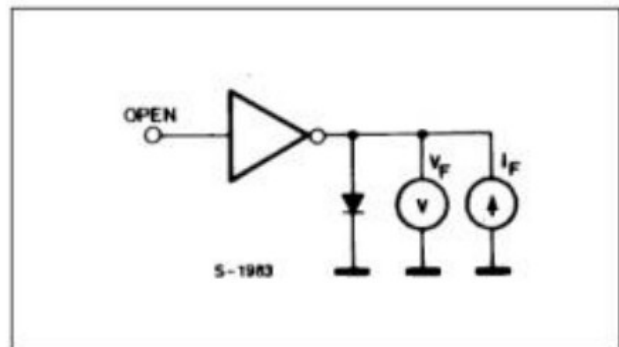
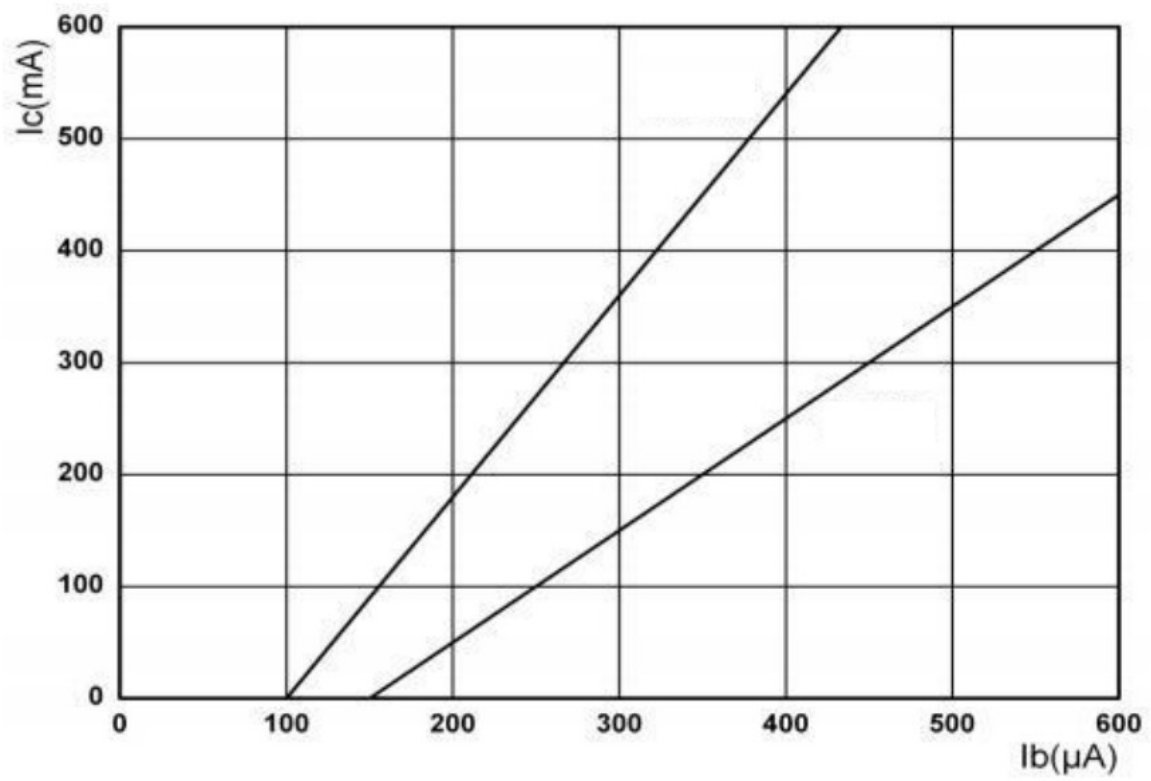


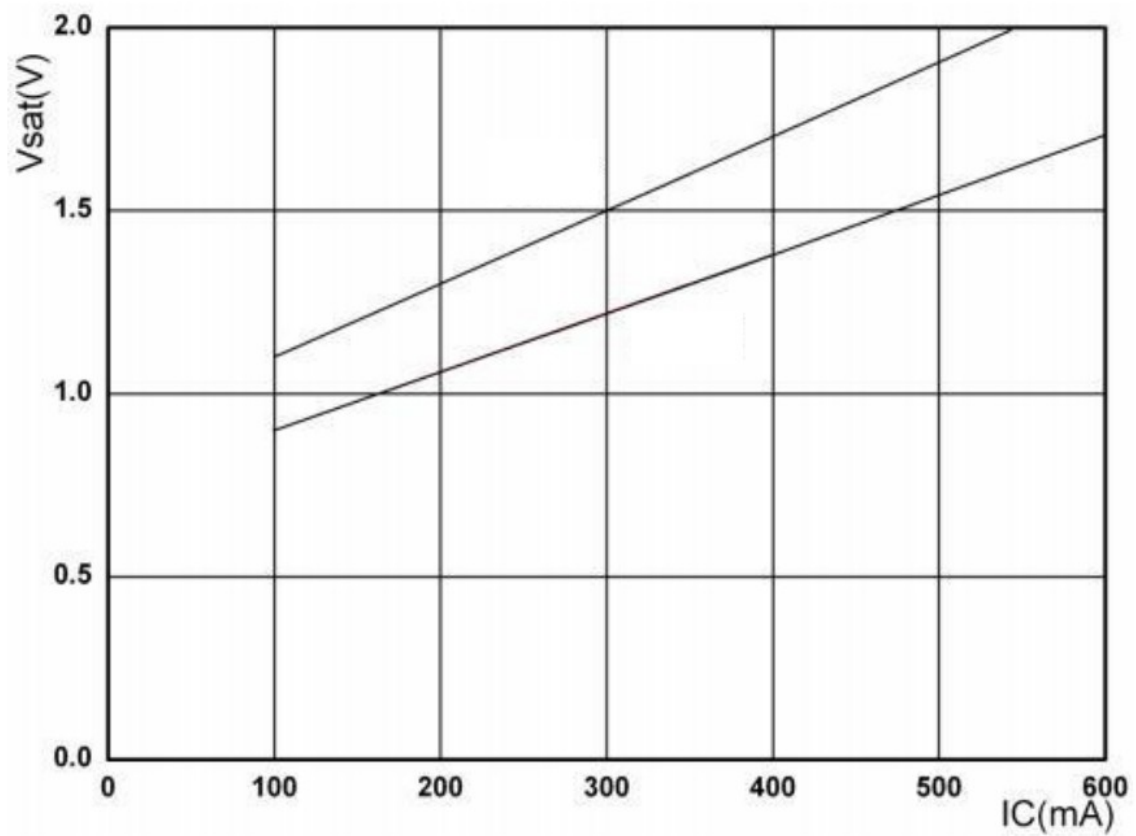
Figure 7.



## Characteristic curve diagram



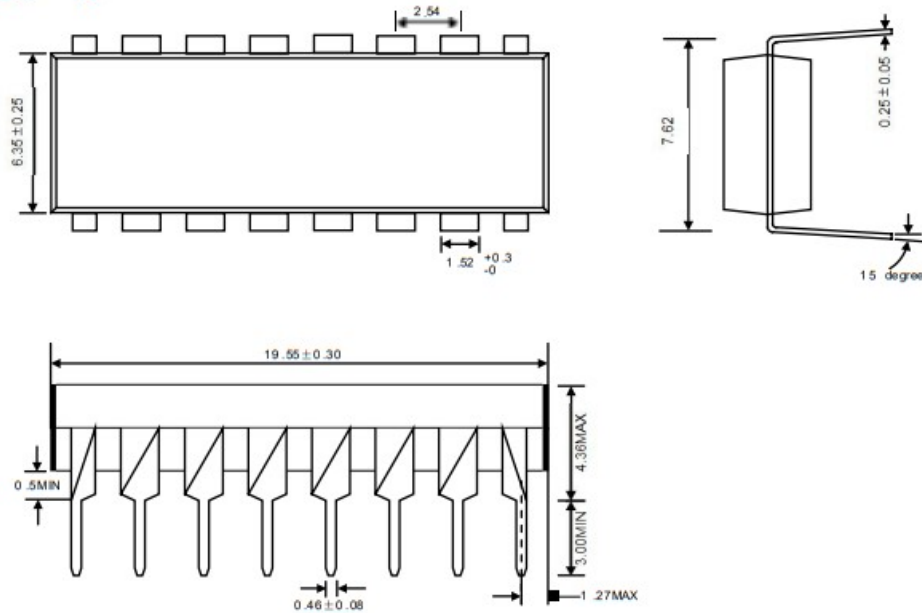
**Figure 4** Output voltage and input current characteristic curve chart



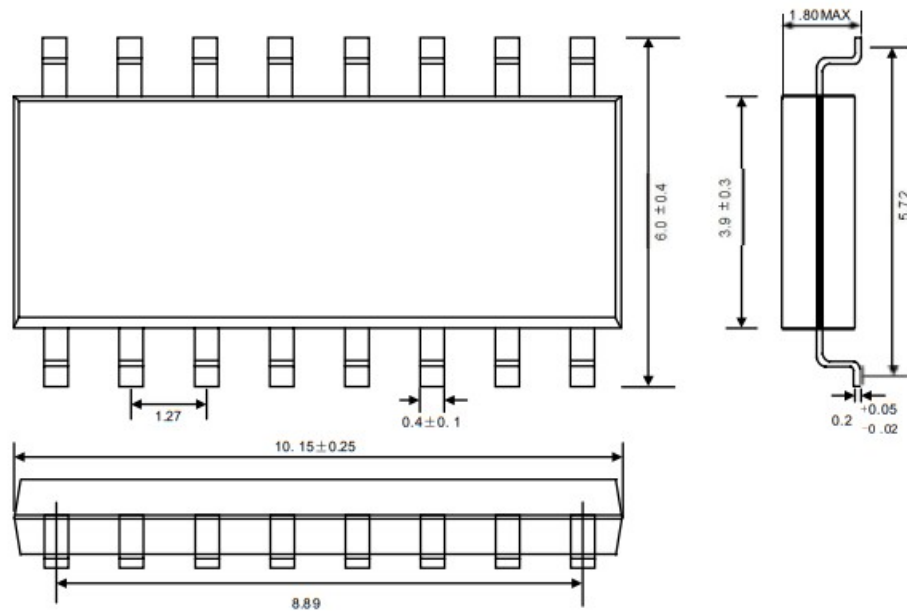
**Figure 5** Saturation voltage drop and output voltage characteristic curve chart

### Package information and dimensions

## DIP-16



## SOP- 16



**Note:** Dimensions are in MM

**Figure 6** ULN2003 package and size diagram

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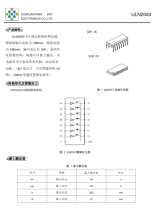
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## Documents / Resources

	<p><a href="#">HUAXUANYANG ULN2003 Darlington Transistor Array</a> [pdf] Instructions JSMICRO, ULN2003 Darlington Transistor Array, ULN2003, Darlington Transistor Array, Transistor Array, Array</p>
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## References

-  [MOS ESD TVS,](#)
- [User Manual](#)

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