



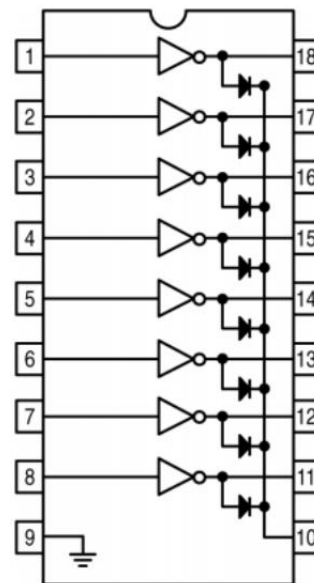
ULN2803A

8-Channel NPN Darlington Transistor Array

Description

ULN2803A integrates 8 NPN Darlington transistors in an array configuration. It is ideal for interfacing logic-level digital circuits (such as TTL, CMOS, PMOS/NMOS) with higher current/voltage loads like electric lights, solenoid valves, relays, printers, or other similar loads. The device is widely used in computers, industrial, and consumer products. All functions are protected by collector outputs and clamp diodes for transient suppression.

EULN2803A is specifically designed to be compatible with standard TTL circuits and is available in an SOP-18 package.



Ordering Information

Device	characteristic		
ULN2803	Input Compatibility	$V_{CE(Max)}/I_{C(Max)}$	Operating Temperature Range
	TTL,5.0V COMS 6 to 15V CMOS,PMOS	50V/500mA	$T_A=-20$ to $+85^{\circ}C$

Pin Description

Pin 1-8	Input Terminals
Pin 11-18	Output Terminals
Pin 9	GND
Pin 10	Power Supply

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Output Voltage	V_O	50	V
Input Voltage	V_I	30	V
Continuous Collector Current	I_C	500	mA
Continuous Base Current	I_B	25	mA
Operating Ambient Temperature Range	T_A	$-25\sim+85$	$^{\circ}C$
Storage Temperature Range	T_{STG}	$-55\sim+150$	$^{\circ}C$
Junction Temperature	T_J	125	$^{\circ}C$



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Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Test Diagram	Condition	Min	Typ	Max	Unit
Output Leakage Current	I _{CEX}	Figure 1	V _O =50V, T _A =25°C			50	μA
			V _O =50V, T _A =70°C			100	
Collector Emitter Saturation Voltage	V _{CE(SAT)}	Figure 2	I _C =350mA, I _B =500μA		1.1	1.6	V
			I _C =200mA, I _B =350μA		0.95	1.3	
			I _C =100mA, I _B =250μA		0.85	1.1	
Input Current On State	I _{I(ON)}	Figure 4	V _I =3.85V		0.93	1.35	mA
Input Voltage On State	V _{I(ON)}	Figure 5	V _{CE} =2V, I _C =200mA			2.4	V
			V _{CE} =2V, I _C =250mA			2.7	
			V _{CE} =2V, I _C =300mA			3.0	
Input Current Off State	I _{I(OFF)}	Figure 3	I _C =500mA, T _A =70°C	50	100		μA
Input Capacitance	C _I				15	25	pF
Turn On Delay Time	t _{on}		50% EI to 50% EO		0.25	1.0	μs
Turn Off Delay Time	t _{off}		50% EI to 50% EO		0.25	1.0	μs
Clamp Diode Leakage Current	I _R	Figure 6	V _R =40V, T _A =25°C			50	μA
			V _R =40V, T _A =70°C			100	
Clamp Diode Forward Voltage	V _F	Figure 7	I _F =350mA		1.5	2.0	V



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Parameter Test Schematic Diagram

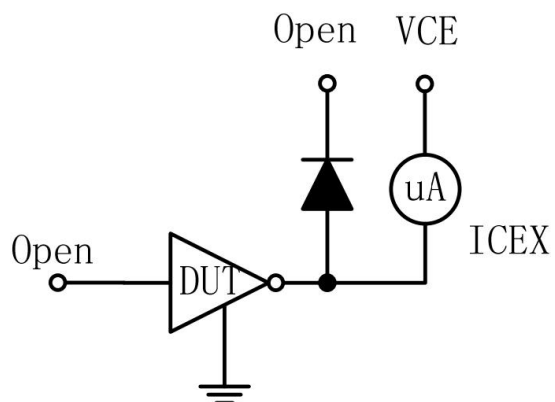


Figure 1. ICEX Test Circuit

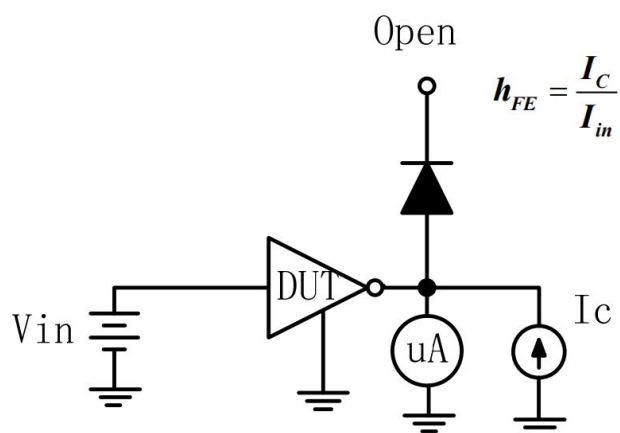


Figure 2. $V_{CE(sat)}$ Test Circuit

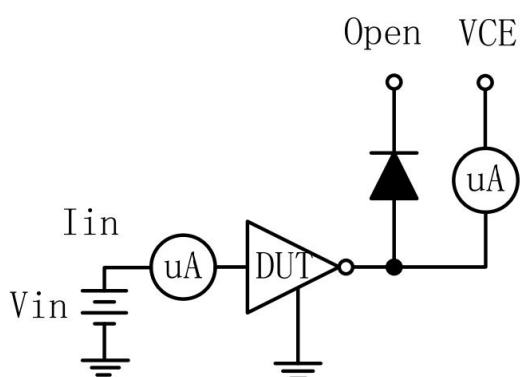


Figure 3. $I_{I(off)}$ Test Circuit

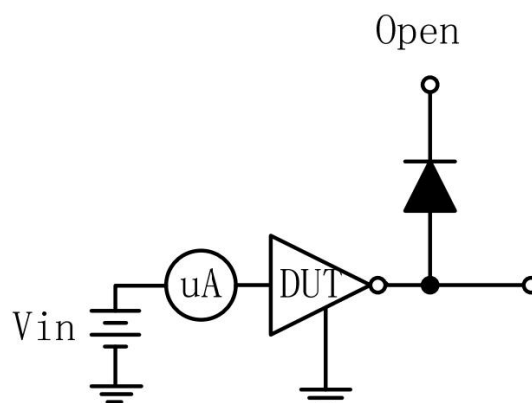


Figure 4. $I_{I(on)}$ Test Circuit

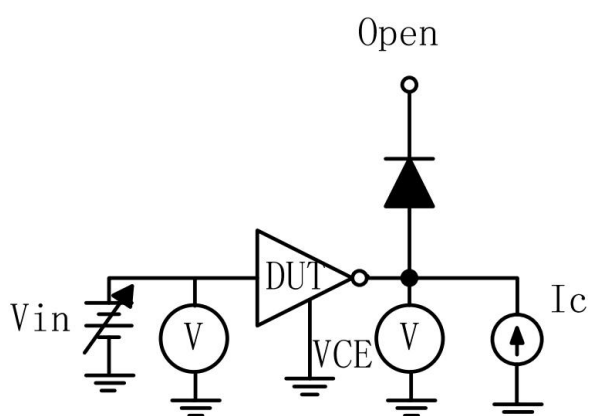


Figure 5. $V_{I(on)}$ Test Circuit

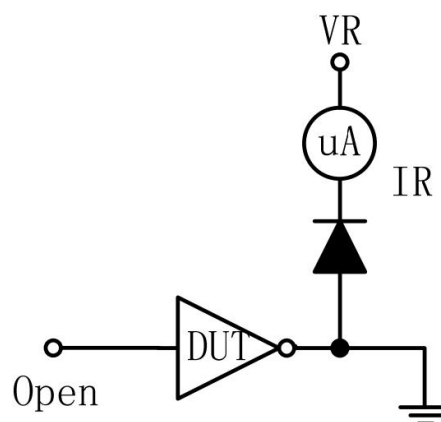


Figure 6. I_R Test Circuit



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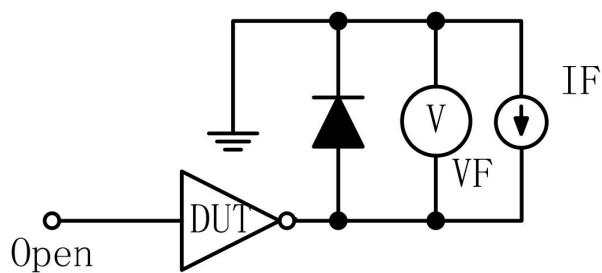
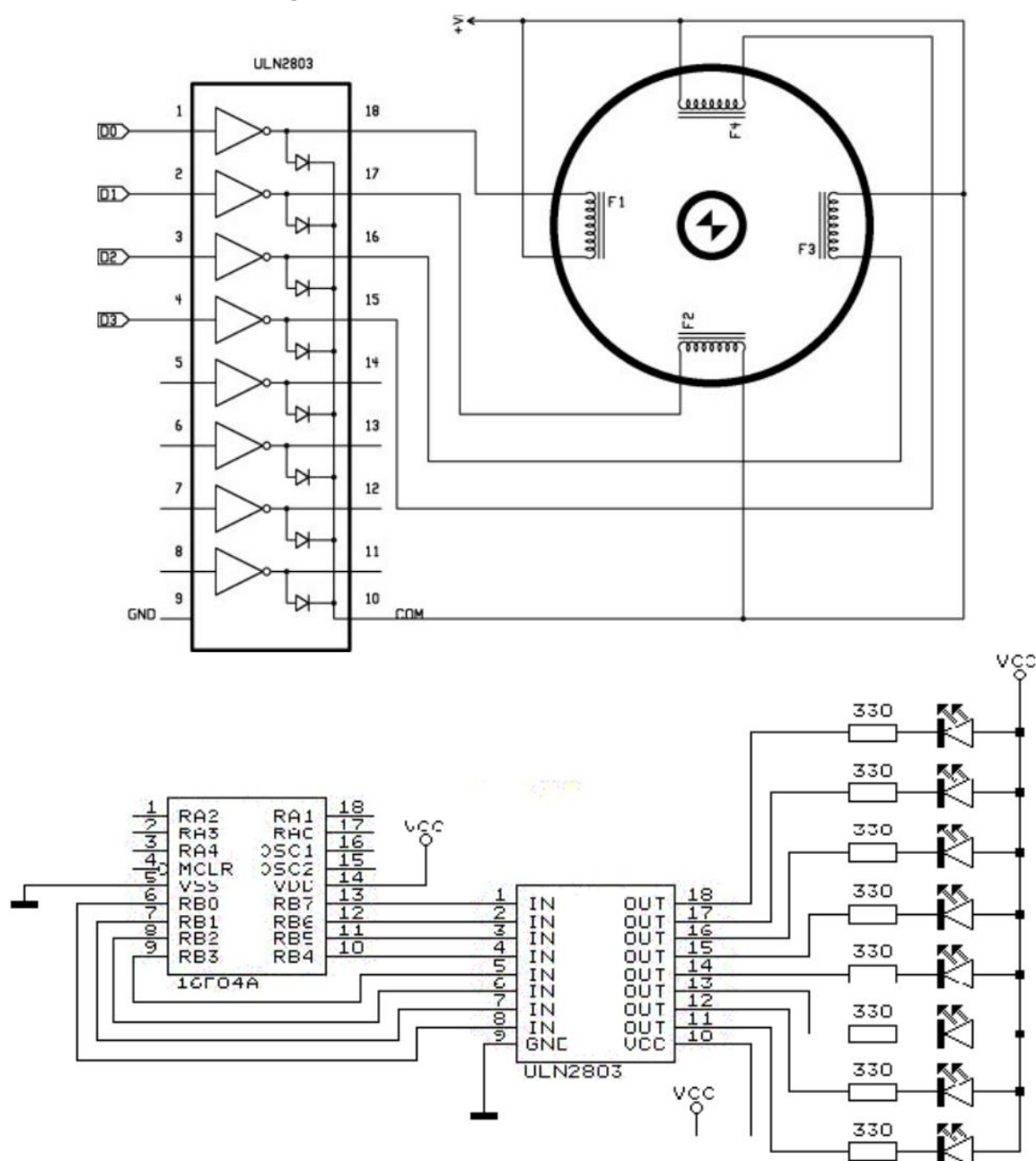


Figure 7. V_F Test Circuit

Application Circuit Diagram



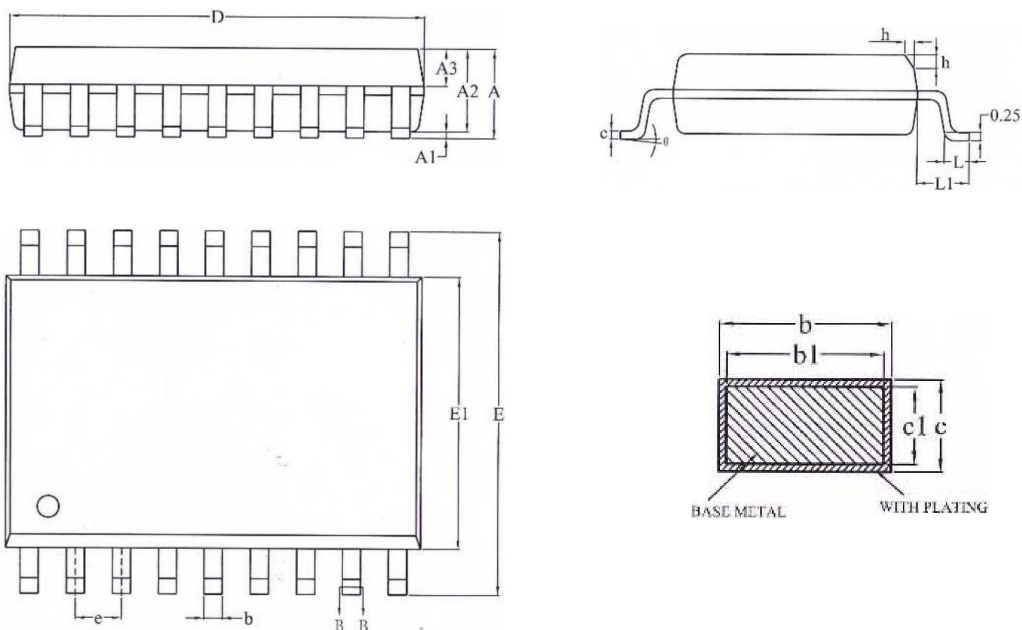


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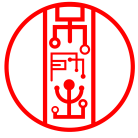
Package Information

SOP-18

Dimensions in mm



Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	-	-	2.65	D	11.35	11.45	11.55
A1	0.10	-	0.30	E	10.10	10.30	10.50
A2	2.20	2.30	2.40	E1	7.40	7.50	7.60
A3	0.97	1.02	1.07	e	1.27 BSC		
b	0.35	-	0.43	L	0.70	-	1.00
b1	0.34	0.37	0.40	L1	1.40 REF		
c	0.25	-	0.29	h	0.25	-	0.75
c1	0.24	0.25	0.26	θ	0°	-	8°



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