Descriptions

The HULN2803A device is a 50 V, 500 mA Darlington transistor array. The device consists of eight NPN Darlington pairs that feature high-voltage outputs with common-cathode clamp diodes for switching inductive loads. The collector-current rating of each Darlington pair is 500 mA. The Darlington pairs may be connected in parallel for higher current capability.

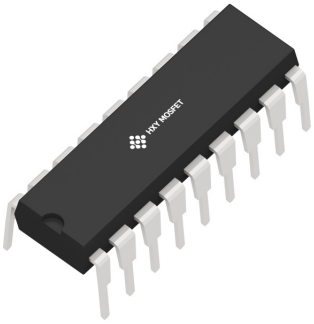
Applications include relay drivers, hammer drivers, lamp drivers, display drivers (LED and gas discharge), line drivers, and logic buffers. The HULN2803A device has a 2.7-kΩ series base resistor for each Darlington pair for operation directly with TTL or 5-V CMOS devices.

Features

- 500-mA-Rated Collector Current (Single Output)
- High-Voltage Outputs: 50 V
- Output Clamp Diodes
- Inputs Compatible With Various Types of Logic

Applications

- Relay Drivers
- Hammer Drivers
- Lamp Drivers
- Line Drivers
- Logic Buffers
- Stepper Motors
- IP Camera
- HVAC Valve and LED Dot Matrix



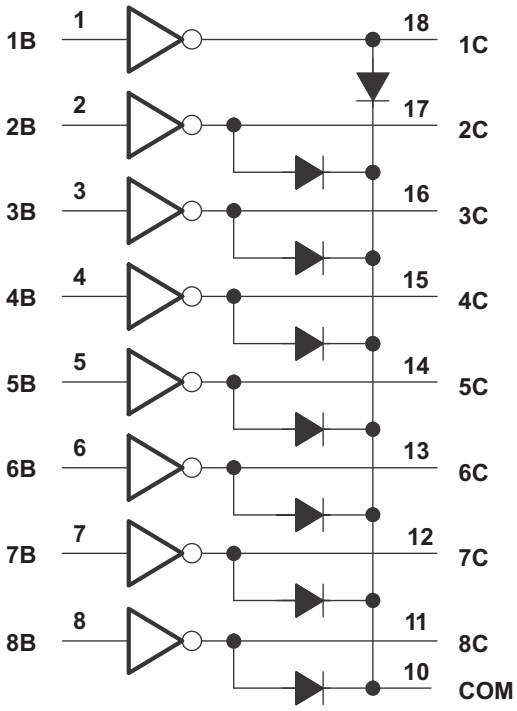
DIP-18

SOP-18

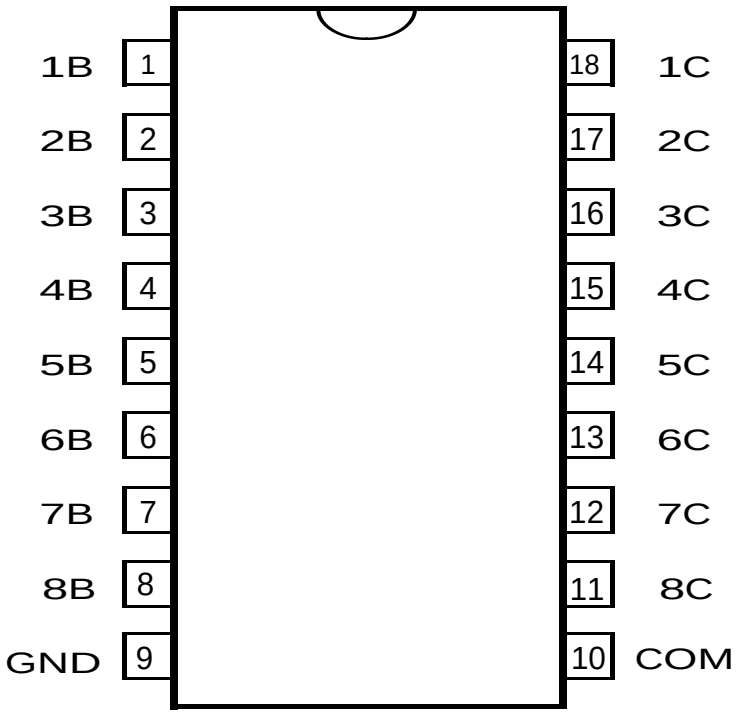
Ordering Information

Product Model	Package Type	Packing	Packing Qty
HULN2803A	SOP-18	Tape	2000Pcs/Reel
HULN2803ALN	DIP-18	Tube	1000Pcs/Box

Logic Diagram



Pin Configuration and Functions



Absolute Maximum Rating

(T A = 25°C and rating apply to any one device in the package, unless otherwise noted.)

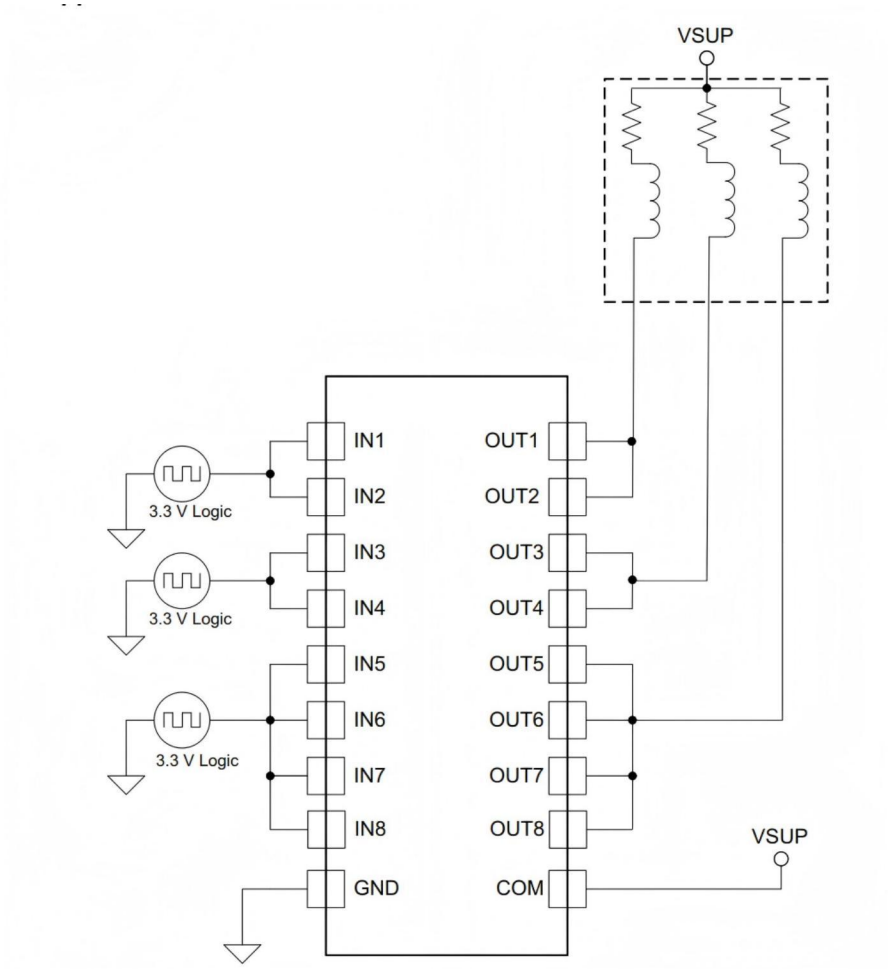
Characteristic	Symbol	PARAMETER		Unit
		Min	Max	
Collector-emitter voltage	V_{CE}	-	50	V
Input voltage	V_i		30	V
Collector current- continuous	Ic	-	500	mA
Base current- continuous	IB		25	mA
Junction temperature	T_j		125	℃
Operating temperature	Tamb	-20	85	℃
Storage temperature	Tstg	-55	150	℃

Electrical Characteristics

(unless otherwise specified: T A =25°C)

Characteristics	Test conditions		Symbol	PARAMETER			Unit
				Min	Typ	Max	
Output leakage current	Vo=50V， T_{amb}= +85℃		I_{CEX}			100	μA
	Vo=50V， T_{amb}= +25℃					50	μA
Collector-Emitter saturation voltage	Ic=350mA， I_B=500μA		V_{CES}		1.5	1.7	V
	Ic=200mA， I_B=350μA				1.15	1.3	V
	Ic=100mA， I_B=250μA				0.85	1.1	V
Input current - on condition	VI=3.85V		$I_{I(ON)}$		1.15	1.35	mA
Input voltage - on condition	V_{CE}=2.0V， Ic=200mA		$V_{I(ON)}$			2.4	V
	V_{CE}=2.0V， Ic=250mA					2.7	
	V_{CE}=2.0V， Ic=300mA					3.0	
Input current - off condition	V_{CE}=2.0V， Ic=300mA		$I_{I(OFF)}$	50	100		μA
Input capacitance			C_I		15	30	pF
Turn-on delay time (50% E_I to 50% E_O)	50%E_I to 50% Eo		t_{ON}		0.25	1	μs
Turn-off delay time (50% E_I to 50% E_O)	50%E_I to 50% Eo		t_{OFF}		0.25	1	μs
Clamp diode leakage current (V_R =50V)	V_R=50V	T_{amb}= +25℃	I_R			50	μA
		T_{amb}= +85℃				100	
Clamp diode forward Voltage	I_F=350mA		V_F		1.5	2	V

Typical Application



Typical Characteristics

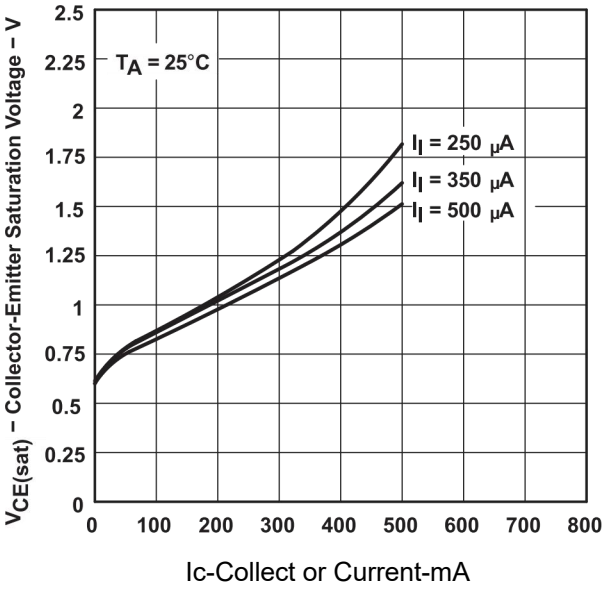


Figure 1.Collector-Emitter Saturation Voltage vs Collector Current(One Darlington)

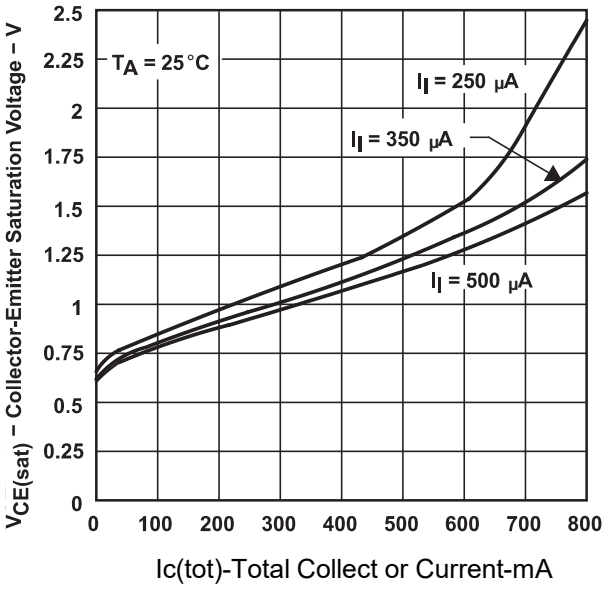


Figure 2.Collector-Emitter Saturation Voltage vs Total Collector Current(Two Darlingtons in Parallel)

Package Information

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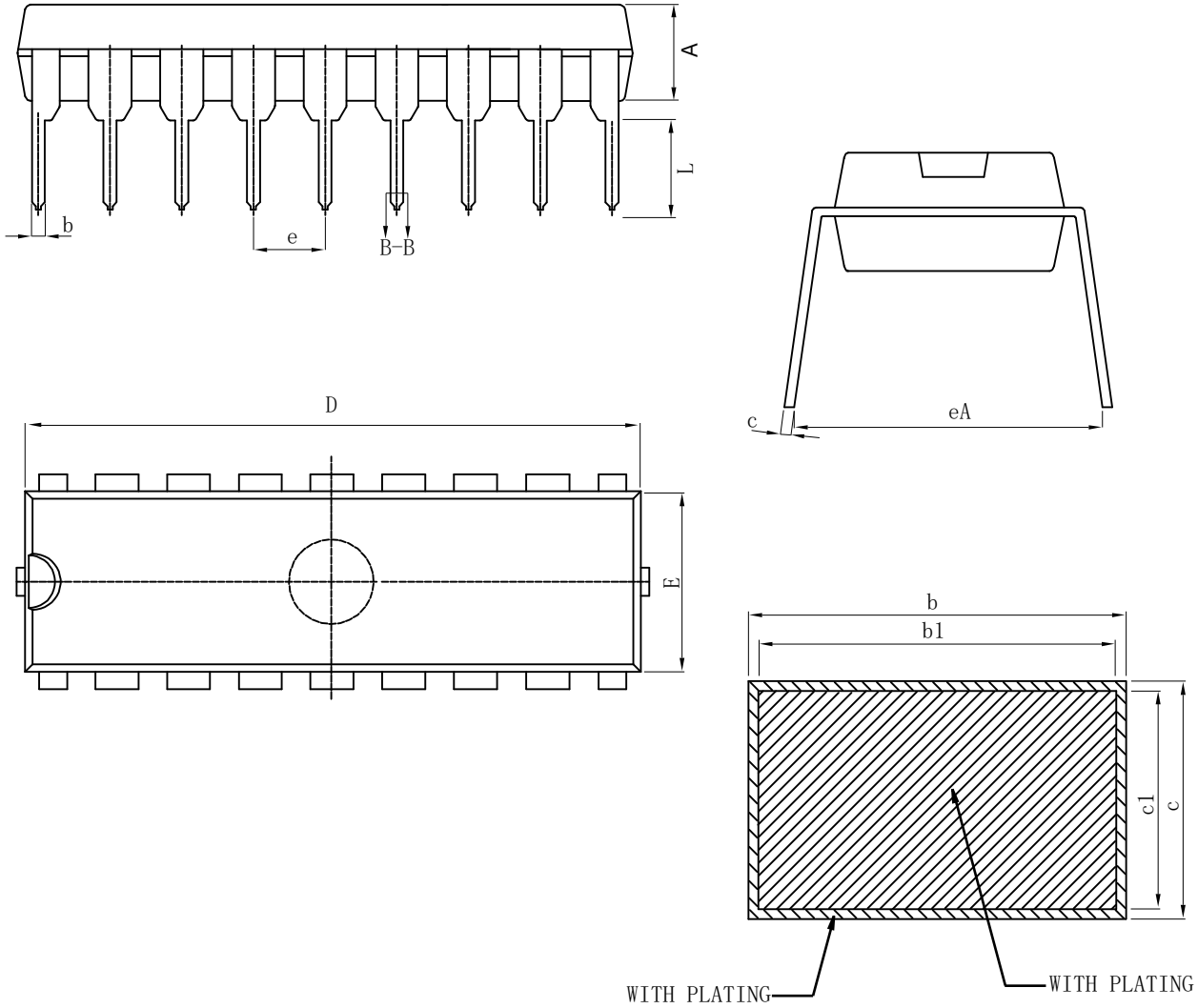

SECTION B-B

Size / Symbol	Dimensions In Millimeters			Size / Symbol	Dimensions In Inches		
	Min(mm)	Nom(mm)	Max(mm)		Min(in)	Nom(in)	Max(in)
A	3.200	3.300	3.400	A	0.126	0.130	0.134
b	0.440		0.530	b	0.017		0.021
b1	0.430	0.460	0.490	b1	0.017	0.018	0.019
c	0.250		0.300	c	0.010		0.012
c1	0.240	0.250	0.260	c1	0.009	0.010	0.010
D	22.80	22.90	23.00	D	0.898	0.902	0.906
E	6.400	6.500	6.600	E	0.252	0.256	0.260
e	2.54(BSC)			e	0.1(BSC)		
eA	7.620		9.500	eA	0.300		0.374
L	3.000			L	0.118		

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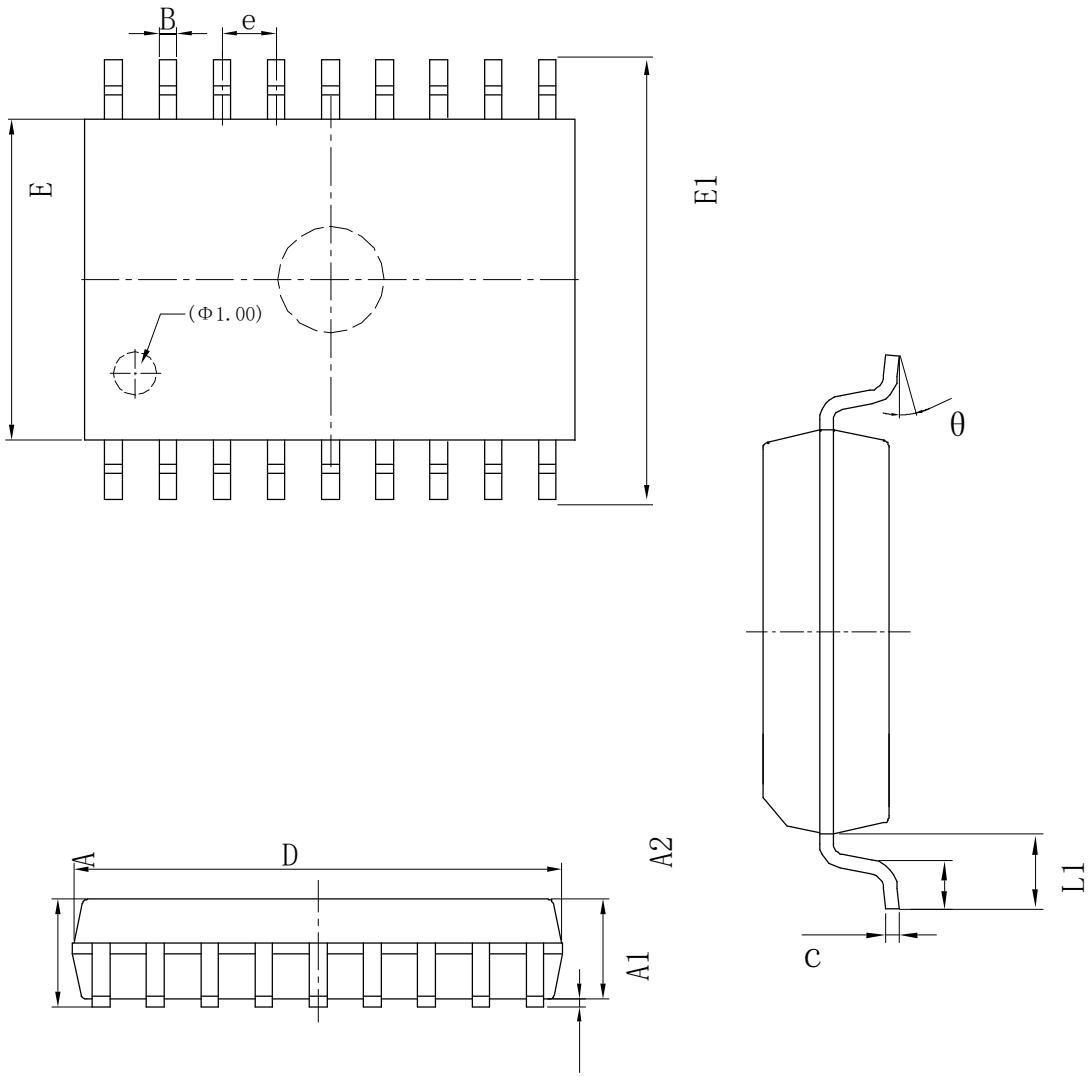

Size / Symbol	Dimensions In Millimeters			Size / Symbol	Dimensions In Inches		
	Min(mm)	Nom(mm)	Max(mm)		Min(in)	Nom(in)	Max(in)
D	11.25	11.45	11.65	D	0.443	0.451	0.459
E	7.300	7.500	7.700	E	0.287	0.295	0.303
E1	10.10	10.30	10.50	E1	0.398	0.406	0.413
B	0.4(TYP)			B	0.016(TYP)		
e	1.27(TYP)			e	0.050(TYP)		
c	0.200	0.250	0.300	c	0.008	0.010	0.012
A2	2.240	2.340	2.440	A2	0.088	0.092	0.096
A1	0.100	0.150	0.250	A1	0.004	0.006	0.010
A			2.590	A			0.102
L1	1.300	1.400	1.500	L1	0.051	0.055	0.059
L	0.700	0.800	1.000	L	0.028	0.031	0.039
θ		4°	8°	θ		4°	8°

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