1. DESCRIPTION

The Device is a monolithic integrated high voltage, high current four channel driver designed to accept standard DTL or TTL logic levels and drive inductive loads (such as relays solenoides, DC and stepping motors) and switching power transistors.

To simplify use as two bridges each pair of channels is equipped with an enable input. A separate supply input is provided for the logic, allowing operation at a lower voltage and internal clamp diodes are included.

This device is suitable for use in switching applications at frequencies up to 5 kHz.

The XD293-16 is assembled in a 16 lead plastic package which has 4 center pins connected together and used for heatsinking

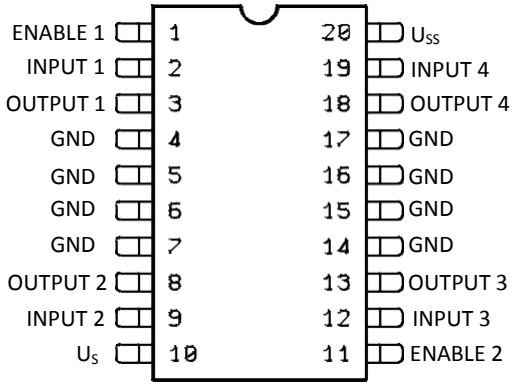
The XL293-20 is assembled in a 20 lead surface mount which has 8 center pins connected together and used for heatsinking.

2. FEATURES

- 500mA OUTPUT CURRENT CAPABILITY PER CHANNEL
- 1A PEAK OUTPUT CURRENT (non repetitive) PER CHANNEL
- ENABLE FACILITY OVERTEMPERATURE PROTECTION
- LOGICAL "0" INPUT VOLTAGE UP TO 1.5 V (HIGH NOISE IMMUNITY)
- INTERNAL CLAMP DIODES

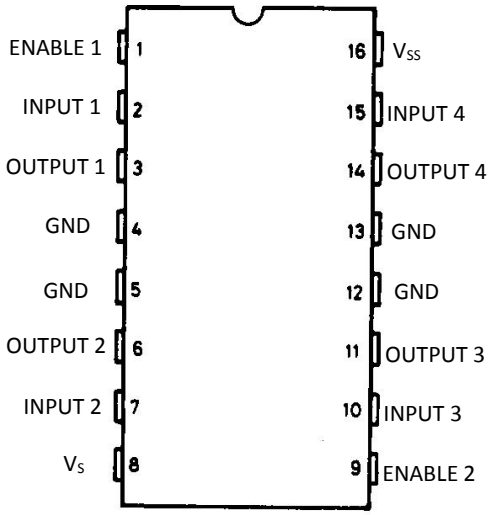
3. PIN CONFIGURATIONS AND FUNCTIONS

XL293-20



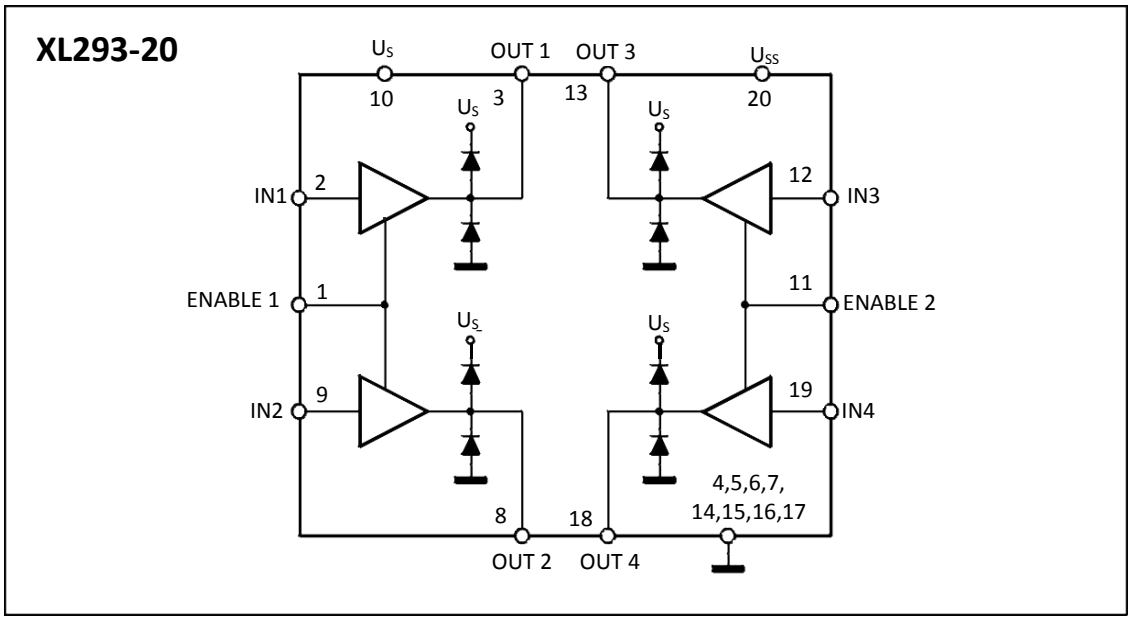
(TOP VIEW)

XD293-16



(TOP VIEW)

4. BLOCK DIAGRAM



Block Diagram

5. SPECIFICATIONS

5.1. Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_S	Supply Voltage	32	V
V_{SS}	Logic Supply Voltage	32	V
V_i	Input Voltage	7	V
V_{en}	Enable Voltage	7	V
I_o	Peak Output Current (100 µs non repetitive)	1	A
P_{tot}	Total Power Dissipation at T_{pins} = 90 °C	3.5	W
T_{stg}, T_j	Storage and Junction Temperature	– 40 to 150	°C

5.2. Thermal Data

Symbol	Description		DIP16	SO-20	Unit
$R_{th\ j\text{-}pins}$	Thermal Resistance Junction-pins	max.	–	14	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance junction-ambient	max.	80	50 (*)	°C/W
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case	max.	14	–	

[1] With 6sq. cm on board heatsink.

5.3. Electrical Characteristics (for each channel, VS = 24 V, VSS = 5 V, Tamb = 25 C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_S	Supply Voltage (pin 10)		V_{SS}		32	V
V_{SS}	Logic Supply Voltage (pin 20)		4.5		32	V
I_S	Total Quiescent Supply Current (pin 10)	V_i = L ; I_O = 0 ; V_{en} = H		3	10	mA
		V_i = H ; I_O = 0 ; V_{en} = H		18	30	mA
		V_{en} = L			6	mA
I_{SS}	Total Quiescent Logic Supply Current (pin 20)	V_i = L ; I_O = 0 ; V_{en} = H		47	65	mA
		V_i = H ; I_O = 0 ; V_{en} = H		20	25	mA
		V_{en} = L		20	27	mA
V_{IL}	Input Low Voltage (pin 2, 9, 12, 19)		– 0.3		1.5	V
V_{IH}	Input High Voltage (pin 2, 9, 12, 19)	$V_{SS} \leq 7$ V	2.3		V_{SS}	V
		$V_{SS} > 7$ V	2.3		7	V
I_{IL}	Low Voltage Input Current (pin 2, 9, 12, 19)	V_{IL} = 1.5 V			– 10	µA
I_{IH}	High Voltage Input Current (pin 2, 9, 12, 19)	2.3 V ≤ V_{IH} ≤ V_{SS} – 0.6 V		30	100	µA
$V_{en\ L}$	Enable Low Voltage (pin 1, 11)		– 0.3		1.5	V
$V_{en\ H}$	Enable High Voltage (pin 1, 11)	$V_{SS} \leq 7$ V	2.3		V_{SS}	V
		$V_{SS} > 7$ V	2.3		7	V
$I_{en\ L}$	Low Voltage Enable Current (pin 1, 11)	$V_{en\ L}$ = 1.5 V		– 30	– 100	µA
$I_{en\ H}$	High Voltage Enable Current (pin 1, 11)	2.3 V ≤ $V_{en\ H}$ ≤ V_{SS} – 0.6 V			± 10	µA
$V_{CE(sat)H}$	Source Output Saturation Voltage (pins 3, 8, 13, 18)	I_O = – 0.5 A		1.4	2	V
$V_{CE(sat)L}$	Sink Output Saturation Voltage (pins 3, 8, 13, 18)	I_O = + 0.5 A		1.2	2	V
V_F	Clamp Diode Forward Voltage	I_O = 600nA		1.3		V
t_r	Rise Time (*)	0.1 to 0.9 V_O		250		ns
t_f	Fall Time (*)	0.9 to 0.1 V_O		250		ns
t_{on}	Turn-on Delay (*)	0.5 V_i to 0.5 V_O		750		ns
t_{off}	Turn-off Delay (*)	0.5 V_i to 0.5 V_O		200		ns

[1] See fig. 5-2.

5.4. TRUTH TABLE (one channel)

Input	Enable (*)	Output
H	H	H
L	H	L
H	L	Z
L	L	Z

Z = High output impedance

[1] (*) Relative to the considered channel

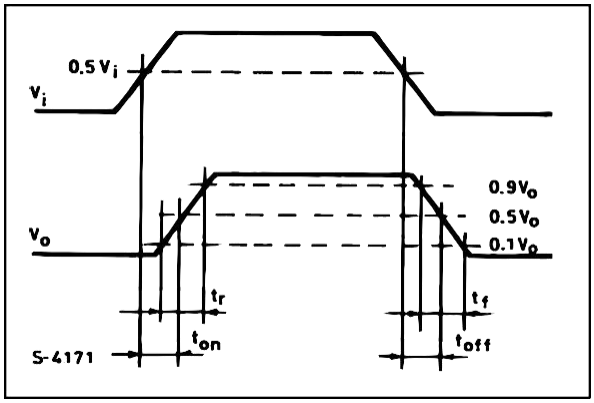


Figure 5-1: Switching Times

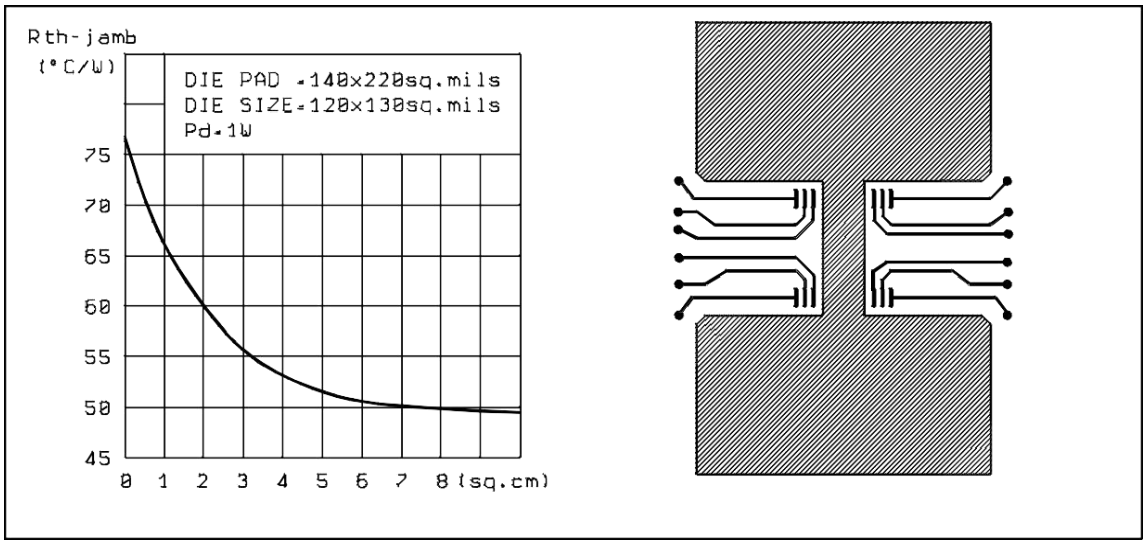


Figure5- 2: Junction to ambient thermal resistance vs. area on board heatsink

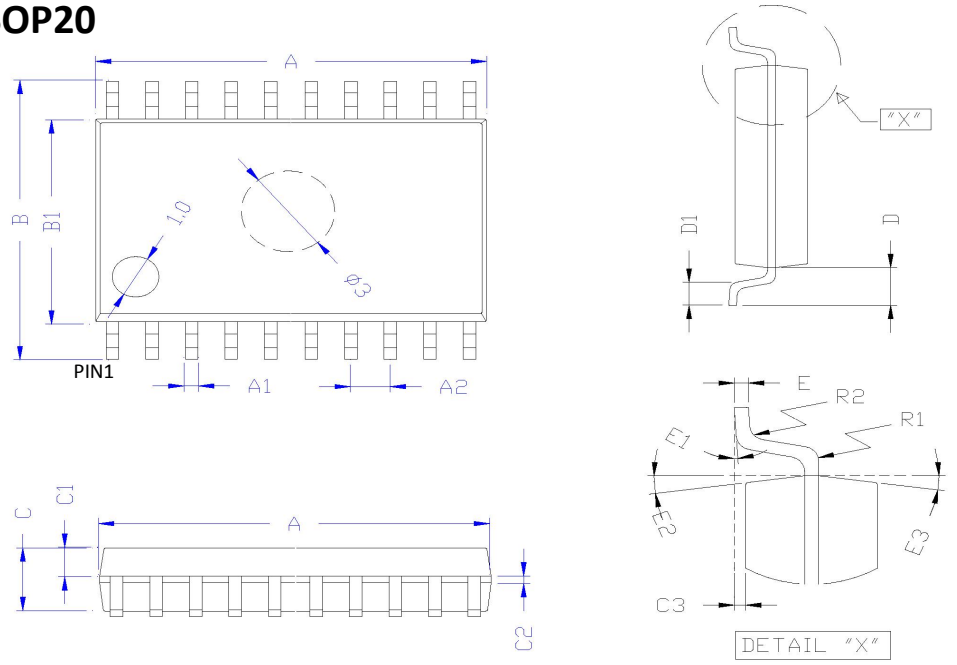
6. ORDERING INFORMATION

Ordering Information

Part Number	Device Marking	Package Type	Body size (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XL293-20	XL293-20	SOP20	12.90 * 7.5	- 40 to 85	MSL3	T&R	1000
XD293-16	XD293-16	DIP16	19.05 * 6.35	- 40 to 85	MSL3	Tube 25	1000

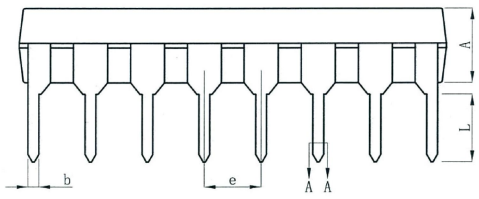
7. DIMENSIONAL DRAWINGS

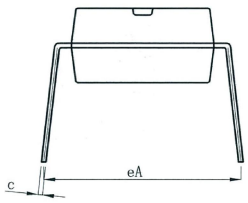
SOP20

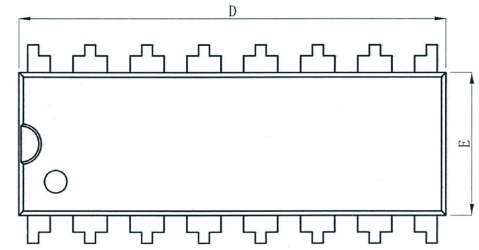


Symbol	Indicate	MIN	NOM	MAX
A	Overall length	12.50	12.60	12.70
A1	Foot width		0.44TYP	
A2	Foot spacing		1.27TYP	
B	Span	10.20	10.35	10.50
B1	Colloid width	7.45	7.50	7.55
C	Colloid thickness	2.20	2.30	2.40
C1	Thickness of upper colloid		1.043TYP	
C2		0.20	0.26	0.33
C3	Stand height	0.10	0.15	0.25
D	Fingle-sided Factory	1.30	1.40	1.50
D1	Foot length	0.70	0.80	0.90
E	Foot Thickness	0.20	0.25	0.30
E1	Foot Angle	0°	4°	8°
E2			7°TYP	
E3			5°TYP	
R1				
R2				

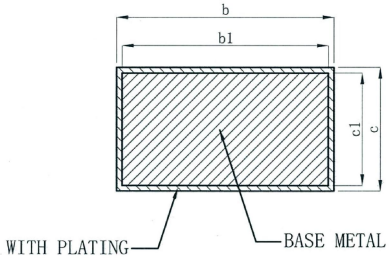
DIP16







PIN1



symbol	millimeter		
	Min	Nom	Max
A	3.20	3.30	3.40
b	0.44	---	0.53
b1	0.43	0.46	0.49
c	0.25	---	0.30
c1	0.24	0.25	0.26
D	18.95	19.05	19.15
E	6.25	6.35	6.45
e	2.54BSC		
eA	8.30	8.80	9.30
L	3.00	---	---