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SEMICONDUCTOR



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L293DNE(MS)

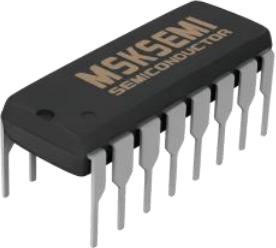
Product specification

DESCRIPTION

The Device is a monolithic integrated high volt-age, 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 tran- sistors. To simplify use as two bridges each pair of chan-nels is equipped with an enable input. A separate supply input is provided for the logic, allowing op-eration at a lower voltage and internal clamp di-odes are included. This device is suitable for use in switching appli-cations at frequencies up to 5 kHz. The L293DNE(MS) is assembled in a 16 lead plastic package which has 4 center pins connected to- gether and used for heatsinking.

- 600mA OUTPUT CURRENT CAPABILITY PER CHANNEL
- 1.2A PEAK OUTPUT CURRENT (non repeti- tive) PER CHANNEL
- ENABLE FACILITY
- OVERTEMPERATURE PROTECTION
- LOGICAL "0" INPUT VOLTAGE UP TO 1.5 V (HIGH NOISE IMMUNITY)
- INTERNAL CLAMP DIODES

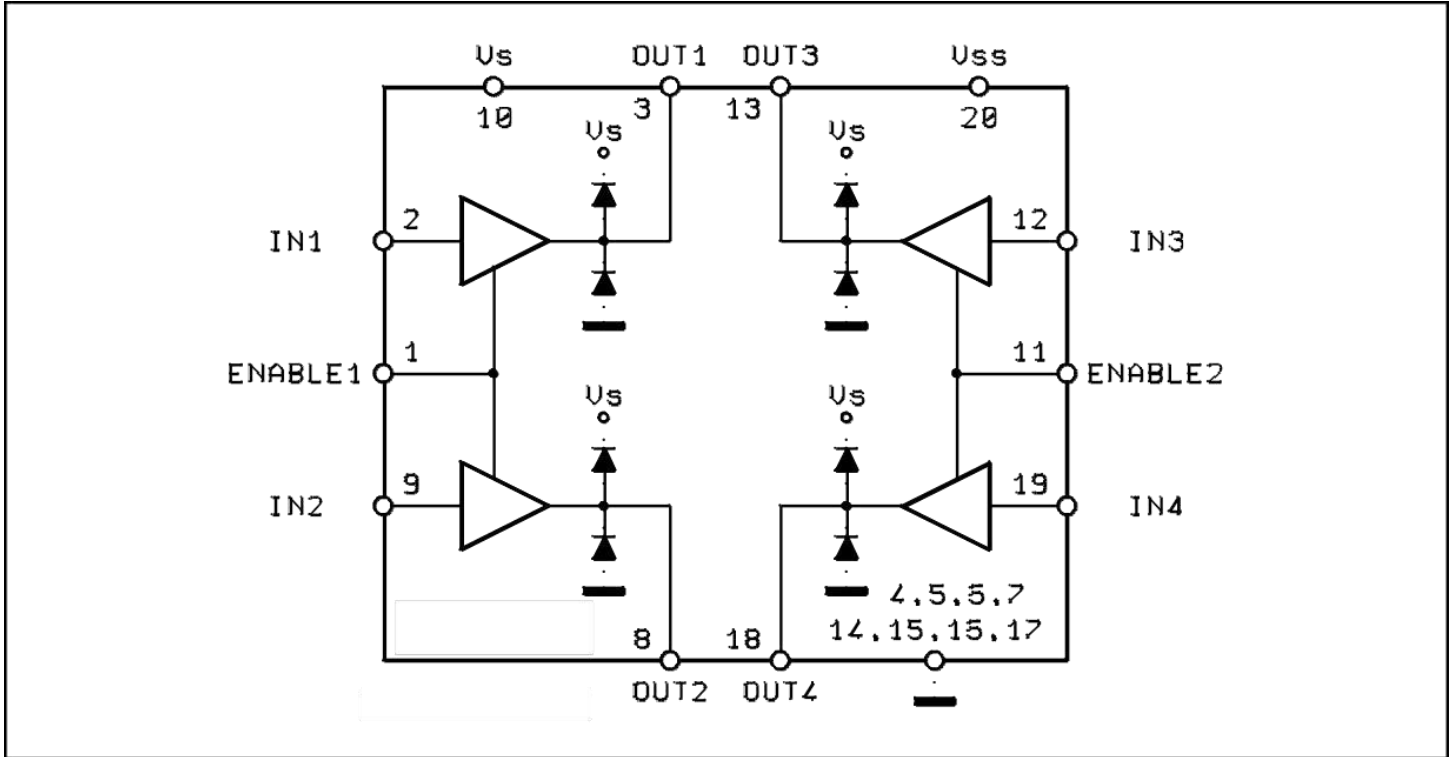
Reference News

PACKAGE OUTLINE	Marking
	
DIP-16	

ordering information

P/N	PKG	QTY
L293DNE(MS)	DIP-16	25/One tube 1000/a box of

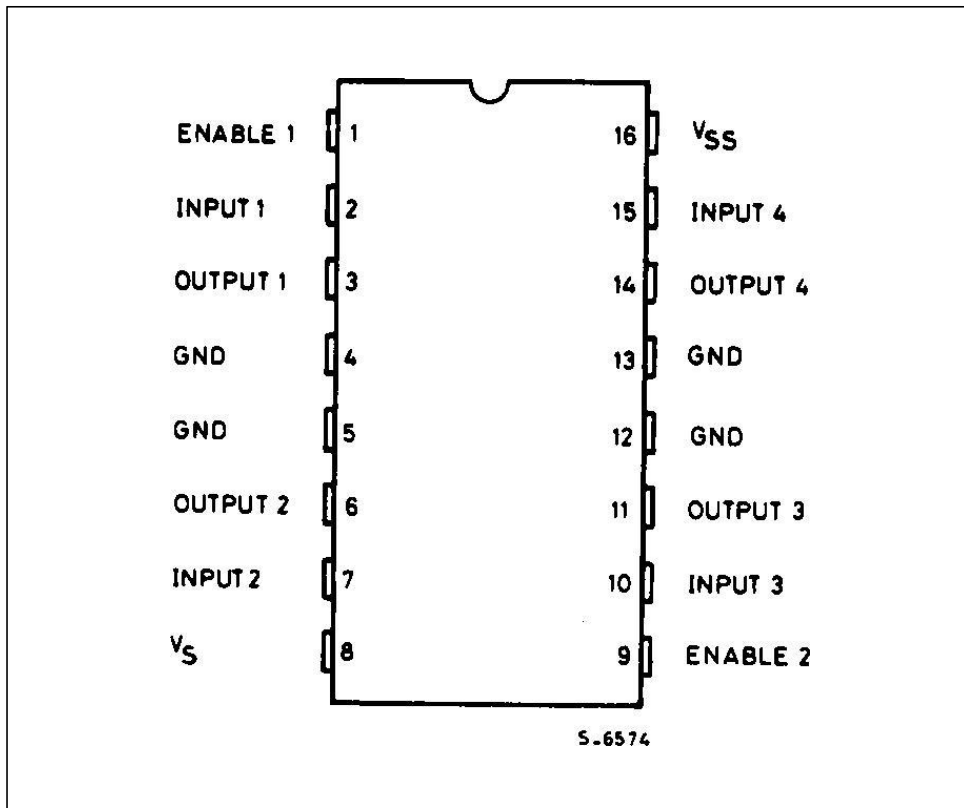
BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_s	Supply Voltage	36	V
V_{SS}	Logic Supply Voltage	36	V
V_i	Input Voltage	7	V
V_{en}	Enable Voltage	7	V
I_o	Peak Output Current (100 μ s non repetitive)	1.2	A
P_{tot}	Total Power Dissipation at $T_{pins} = 90^\circ C$	4	W
T_{stg}, T_j	Storage and Junction Temperature	- 40 to 150	$^\circ C$

PIN CONNECTIONS (Top view)



THERMAL DATA

Symbol	Description	DIP	Unit
R _{th j-pins}	Thermal Resistance Junction-pins max.	–	°C/W
R _{th j-amb}	Thermal Resistance junction-ambient max.	80	°C/W
R _{th j-case}	Thermal Resistance Junction-case max.	14	

(*) With 6sq. cm on board heatsink.

ELECTRICAL CHARACTERISTICS (for each channel, $V_S = 24V$, $V_{SS} = 5V$, $T_{amb} = 25^\circ C$, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_S	Supply Voltage (pin 10)		V_{SS}		36	V
V_{SS}	Logic Supply Voltage (pin 20)		4.5		36	V
I_S	Total Quiescent Supply Current (pin 10)	$V_i = L ; I_o = 0 ; V_{en} = H$		2	6	mA
		$V_i = H ; I_o = 0 ; V_{en} = H$		16	24	mA
		$V_{en} = L$			4	mA
I_{SS}	Total Quiescent Logic Supply Current (pin 20)	$V_i = L ; I_o = 0 ; V_{en} = H$		44	60	mA
		$V_i = H ; I_o = 0 ; V_{en} = H$		16	22	mA
		$V_{en} = L$		16	24	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)	$V_{SS} < 7V$	2.3		V_{SS}	V
		$V_{SS} > 7V$	2.3		7	V
I_{IL}	Low Voltage Input Current (pin 2, 9, 12, 19)	$V_{IL} = 1.5V$			- 10	μA
I_{IH}	High Voltage Input Current (pin 2, 9, 12, 19)	$2.3V < V_{IH} < V_{SS} - 0.6V$		30	100	μA
V_{enL}	Enable Low Voltage (pin 1, 11)		- 0.3		1.5	V
V_{enH}	Enable High Voltage (pin 1, 11)	$V_{SS} < 7V$	2.3		V_{SS}	V
		$V_{SS} > 7V$	2.3		7	V
I_{enL}	Low Voltage Enable Current (pin 1, 11)	$V_{enL} = 1.5V$		- 30	- 100	μA
I_{enH}	High Voltage Enable Current (pin 1, 11)	$2.3V < V_{enH} < V_{SS} - 0.6V$			± 10	μA
$V_{CE(sat)H}$	Source Output Saturation Voltage (pins 3, 8, 13, 18)	$I_o = - 0.6A$		1.4	1.8	V
$V_{CE(sat)L}$	Sink Output Saturation Voltage (pins 3, 8, 13, 18)	$I_o = + 0.6A$		1.2	1.8	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

(*) See fig. 1.

TRUTH TABLE (one channel)

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

Z = High output impedance

(*) Relative to the considered channel

Figure 1: Switching Times

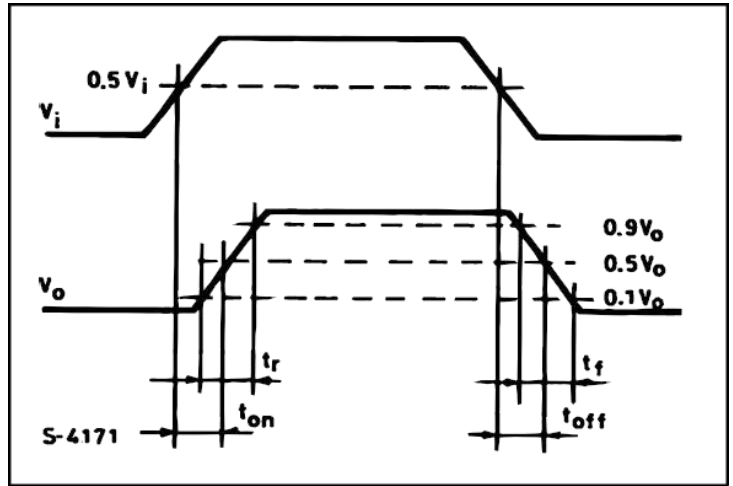
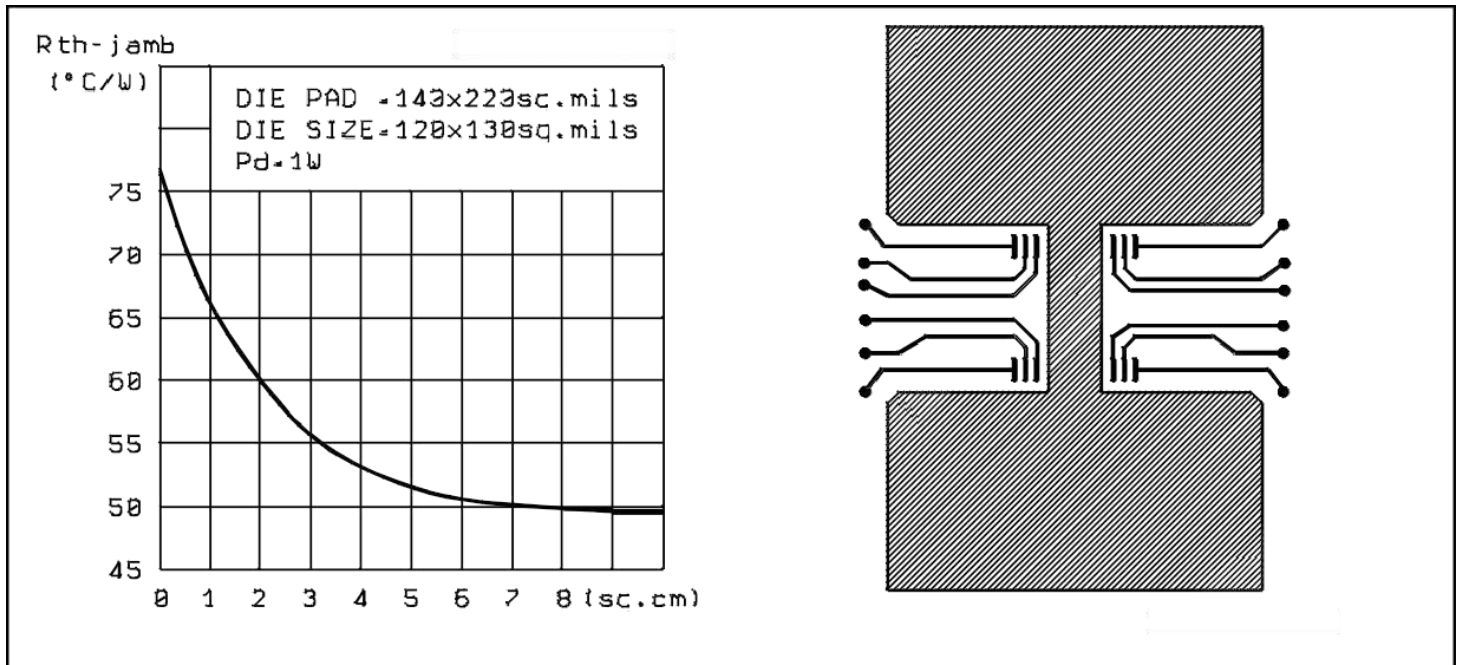
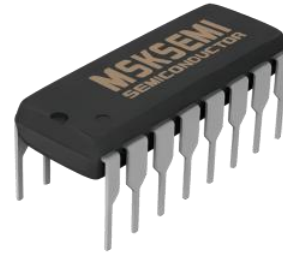


Figure 2: Junction to ambient thermal resistance vs. area on board heatsink (SO12+4+4 package)

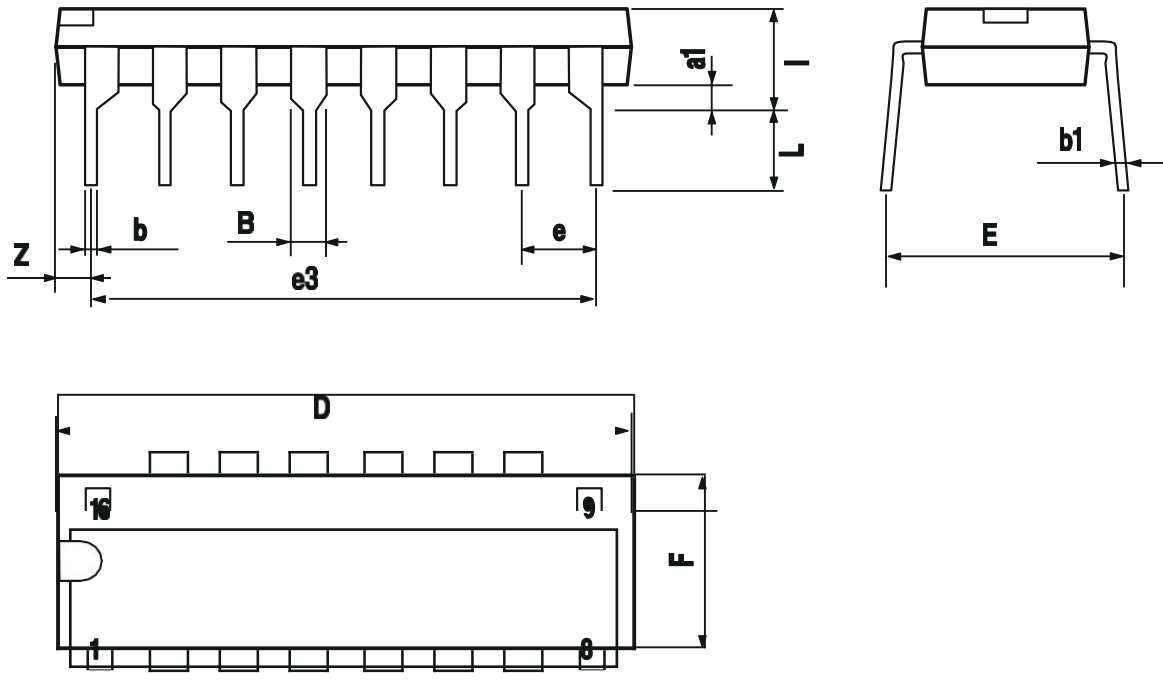


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.85		1.40	0.033		0.055
b		0.50			0.020	
b1	0.38		0.50	0.015		0.020
D			20.0			0.787
E		8.80			0.346	
e		2.54			0.100	
e3		17.78			0.700	
F			7.10			0.280
I			5.10			0.201
L		3.30			0.130	
Z			1.27			0.050

OUTLINE AND MECHANICAL DATA



DIP-16



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