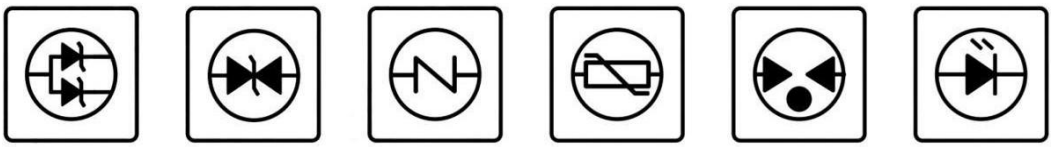
MSKSEMI 美森科
SEMICONDUCTOR



L293DN(MS)

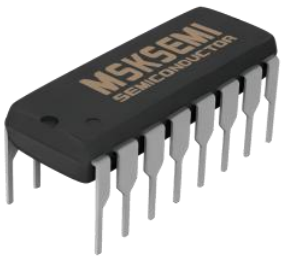
Product specification

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 L293DN(MS) is assembled in a 16 lead plastic packaage 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

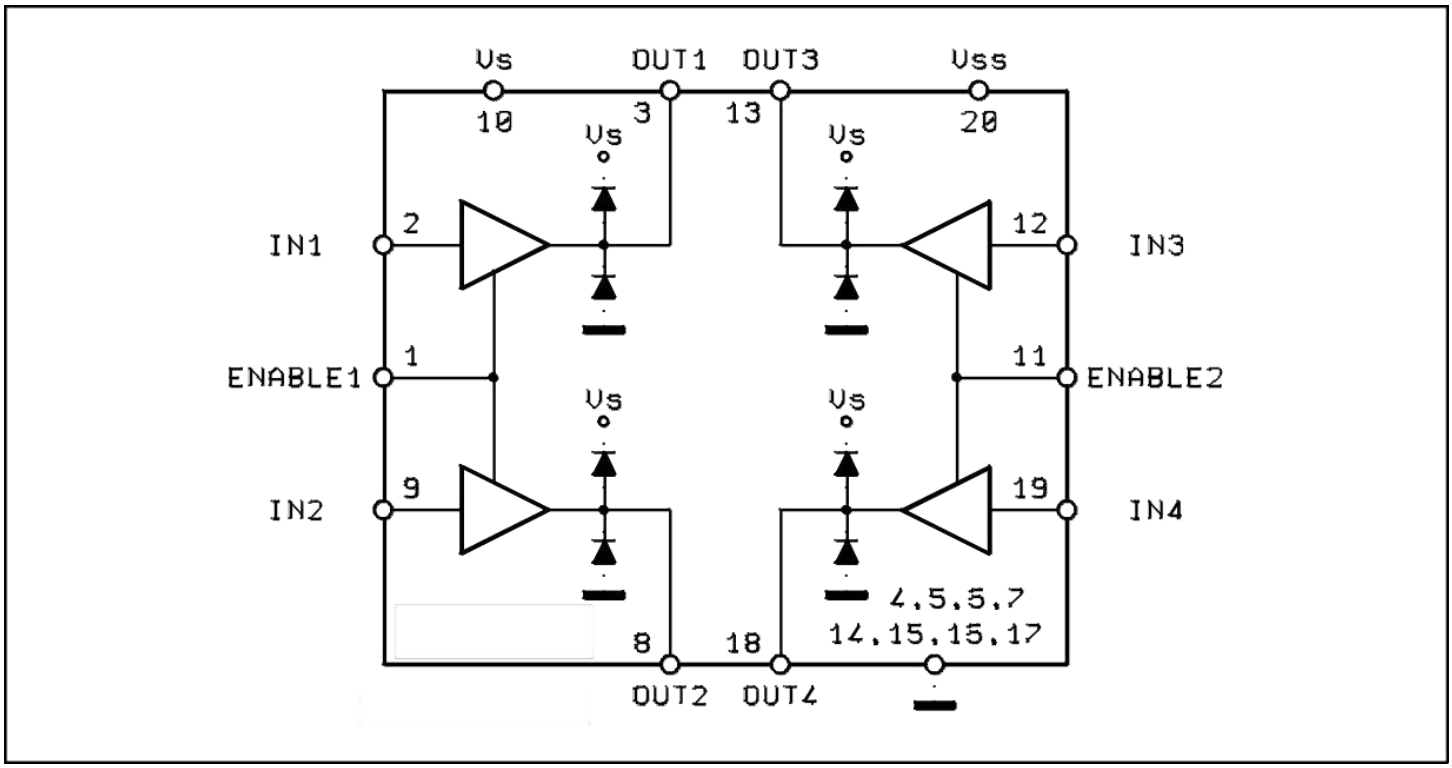
Reference News

PACKAGE OUTLINE	Marking
	
DIP-16	

ordering information

P/N	PKG	QTY
L293DN(MS)	DIP-16	25/One tube 1000/a box of

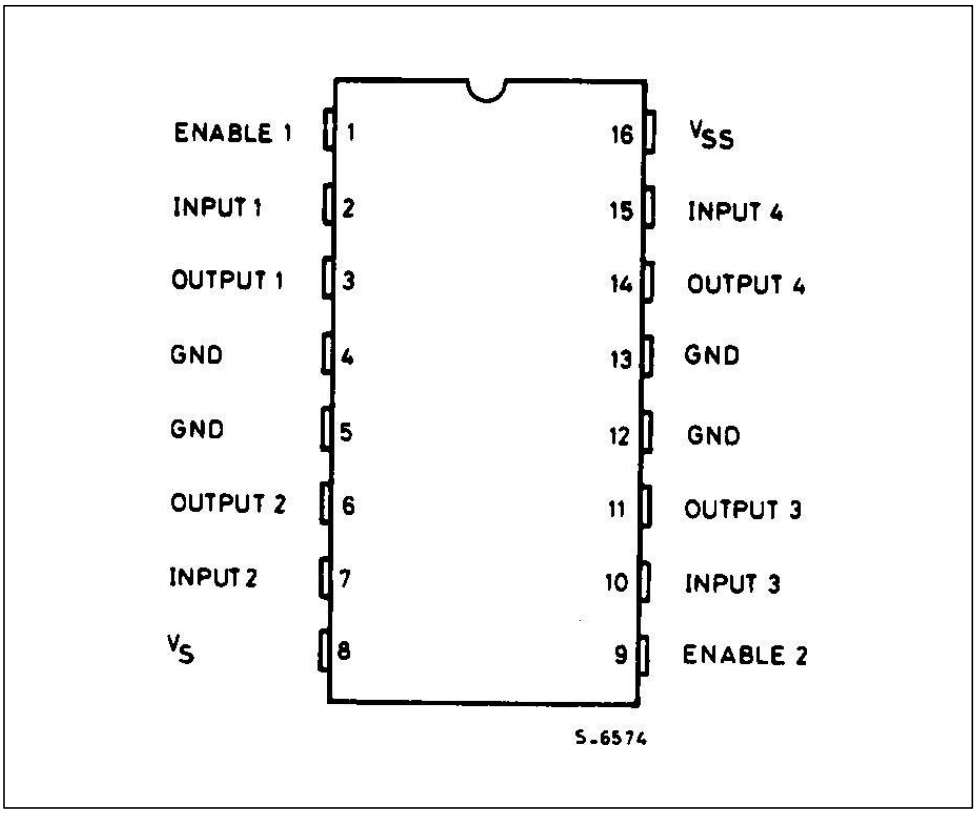
BLOCK DIAGRAM



ABSOLUTEMAXIMUMRATINGS

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 µs non repetitive)	1.2	A
P_{tot}	Total Power Dissipation at T_{pins} = 90℃	4	W
T_{stg}, T_j	Storage and Junction Temperature	– 40 to 150	℃

PIN CONNECTIONS (Top view)



THERMAL DATA

Symbol	Decription	DIP	Unit
$R_{th\ j\text{-}pins}$	Thermal Resistance Junction-pins max.	–	℃/W
$R_{th\ j\text{-}amb}$	Thermal Resistance junction-ambient max.	80	℃/W
$R_{th\ j\text{-}case}$	Thermal Resistance Junction-case max.	14	

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

ELECTRICAL CHARACTERISTICS (for each channel, VS =24V, VSS =5 V, Tamb = 25℃, 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} < 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} < 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 = – 0.6 A		1.4	1.8	V
$V_{CE(sat)L}$	Sink Output Saturation Voltage (pins 3, 8, 13, 18)	I_O = + 0.6 A		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

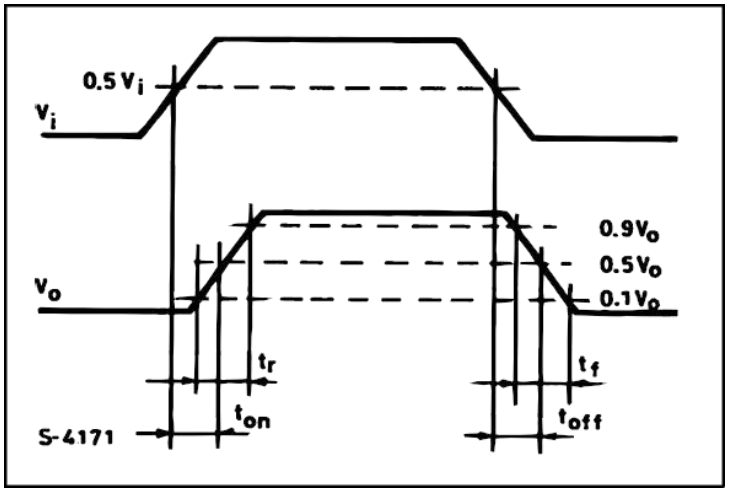
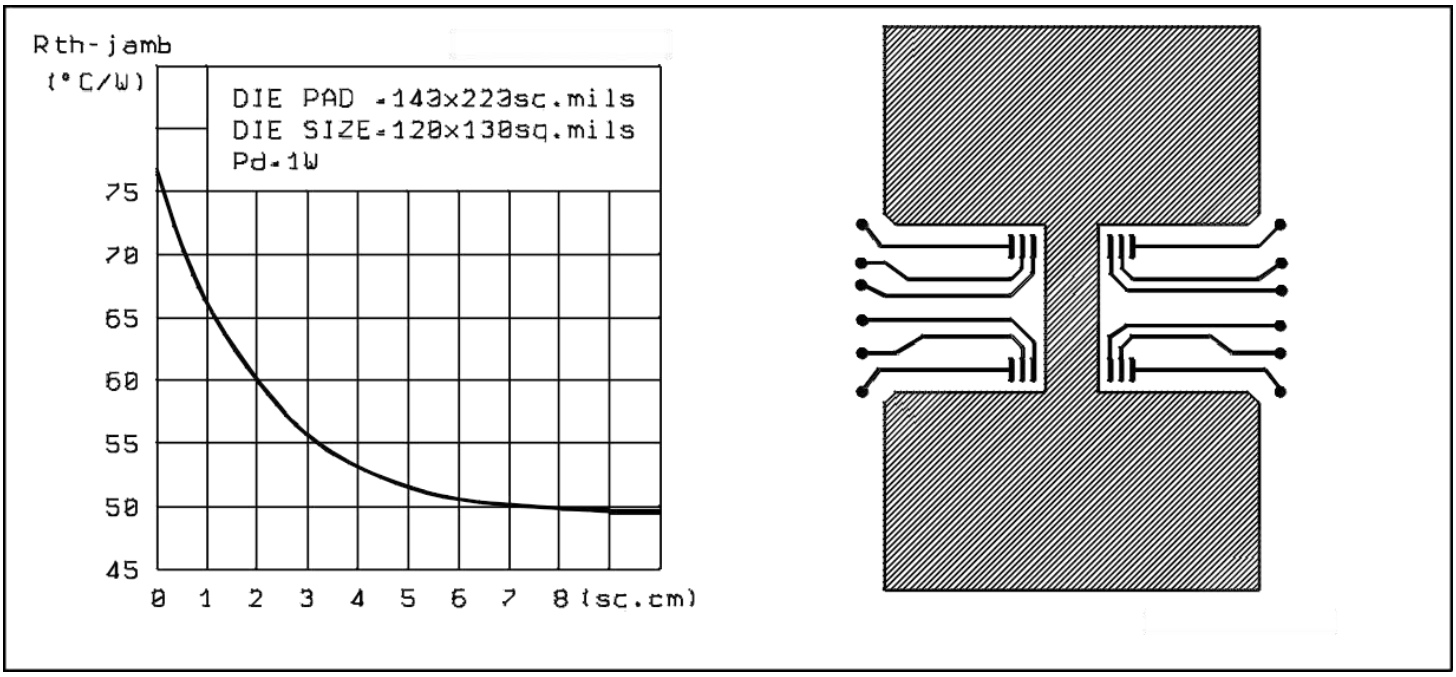
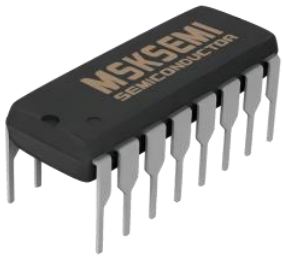


Figure 2: Junction to ambient thermal resistance vs. area on board heatsink (SO12+4+4 package)

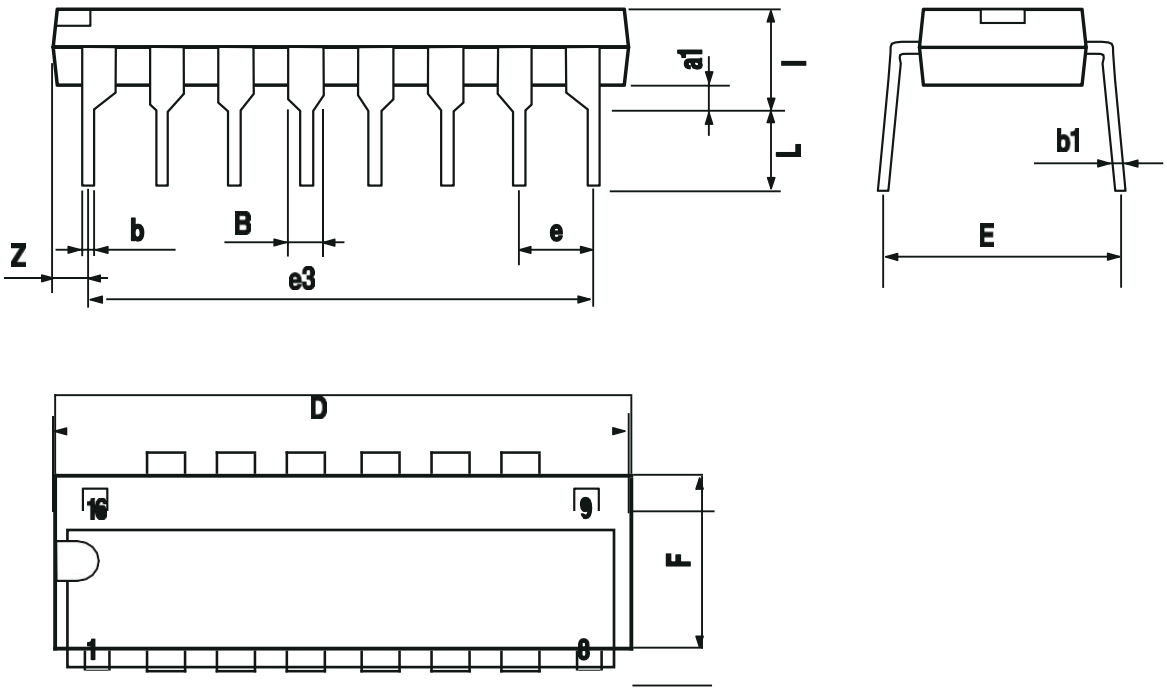


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.85		1.40	0.033		0.055
b		0.50			0.020	
b1	0.38		0.50	0.015		0.020
D			20.0			0.787
E		8.80			0.346	
e		2.54			0.100	
e3		17.78			0.700	
F			7.10			0.280
I			5.10			0.201
L		3.30			0.130	
Z			1.27			0.050

OUTLINE AND MECHANICAL DATA



DIP-16



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