

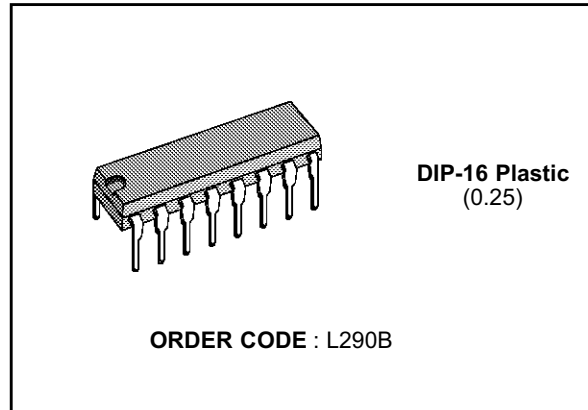
TACHOMETER CONVERTER

DESCRIPTION

The L290, a monolithic LSI circuit in 16-lead inline plastic package, is intended for user with the L291 and L292 which together form a complete **3-chip DC motor positioning system** for applications such as carriage/daisy-wheel position control in typewriters.

The L290/1/2 system can be directly controlled by a microprocessor. The L290 integrates the following functions:

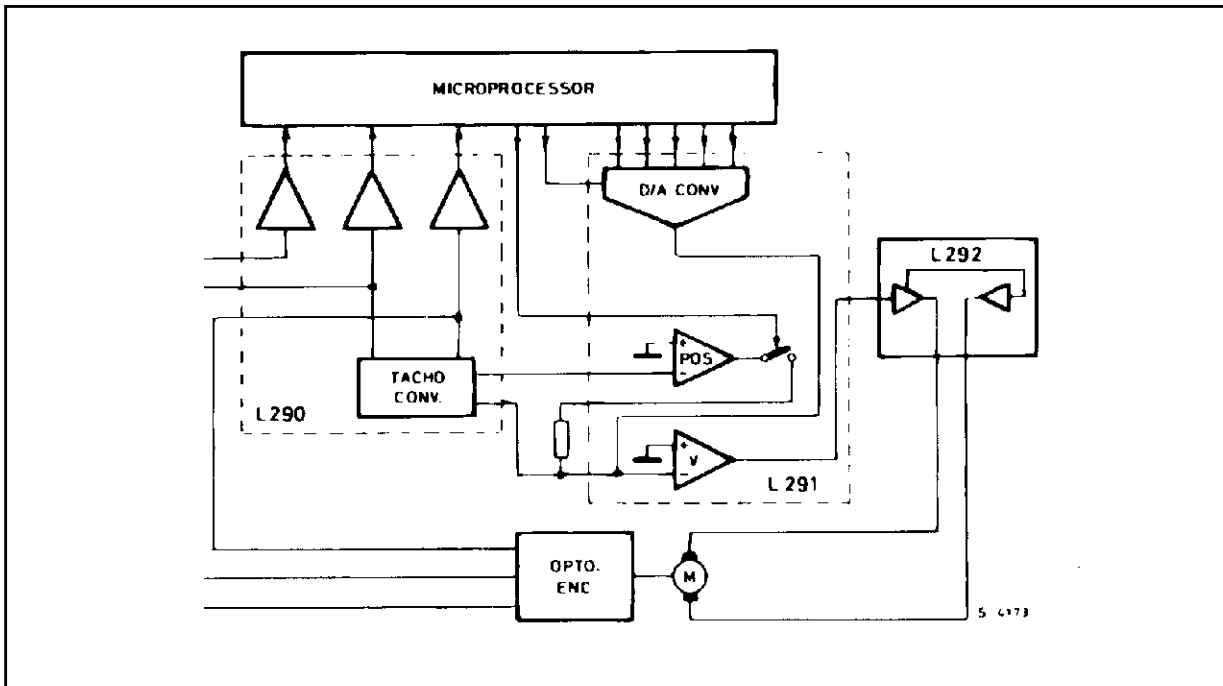
- tacho voltage generator (F/V converter)
- reference voltage generator
- position pulse generator



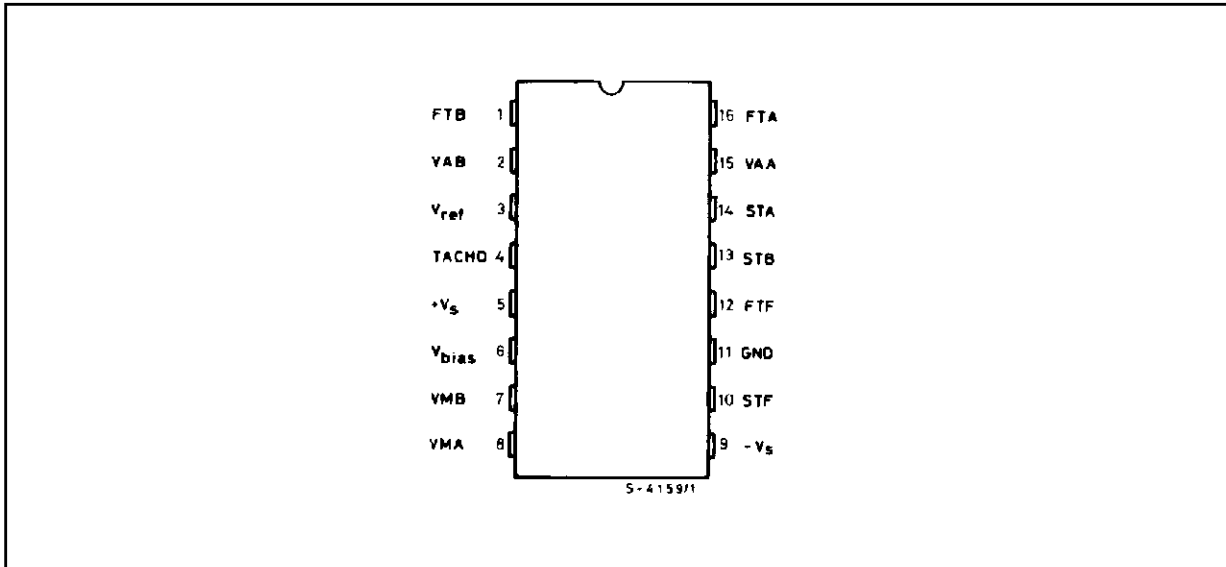
ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Unit
V_s	Supply Voltage	± 15	V
V_i (FTA, FTB, FTF)	Input Signals	± 7	V
P_{tot}	Total Power Dissipation ($T_{amb} = 70^\circ\text{C}$)	1	W
T_{stg}, T_j	Storage and Junction Temperature	- 40 to + 150	$^\circ\text{C}$

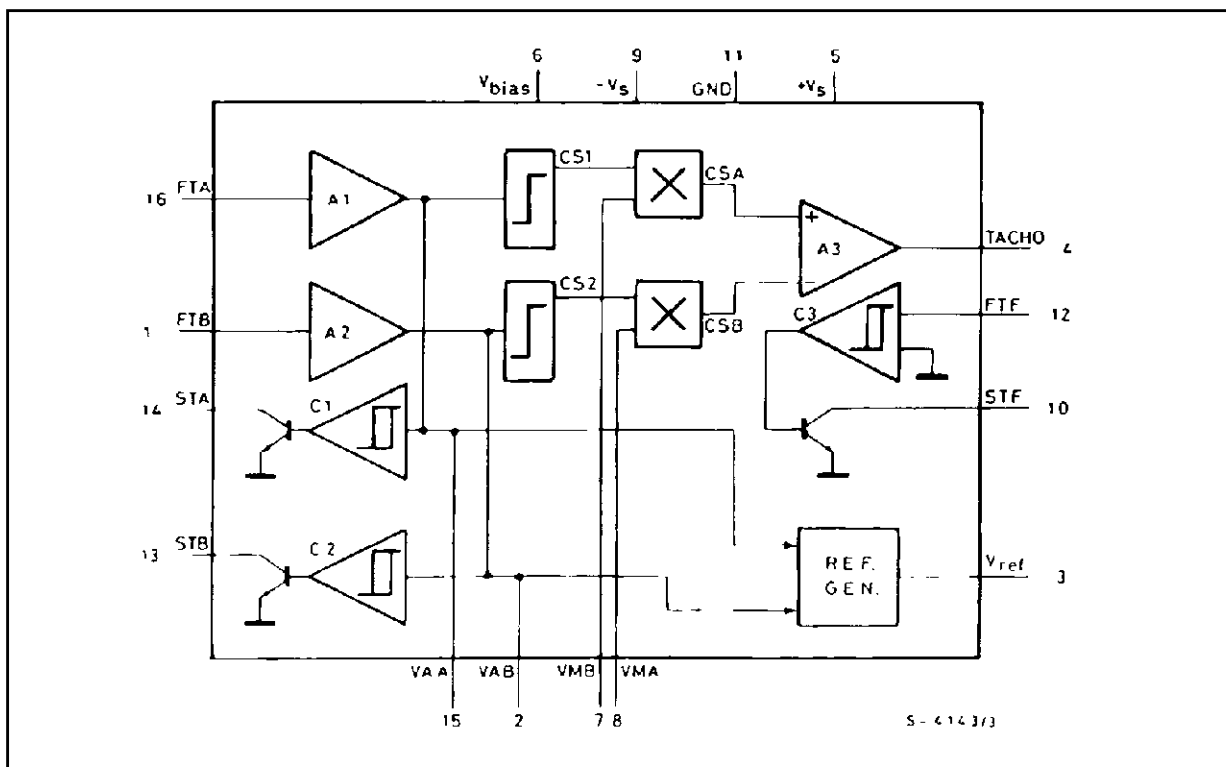
SYSTEM BLOCK DIAGRAM



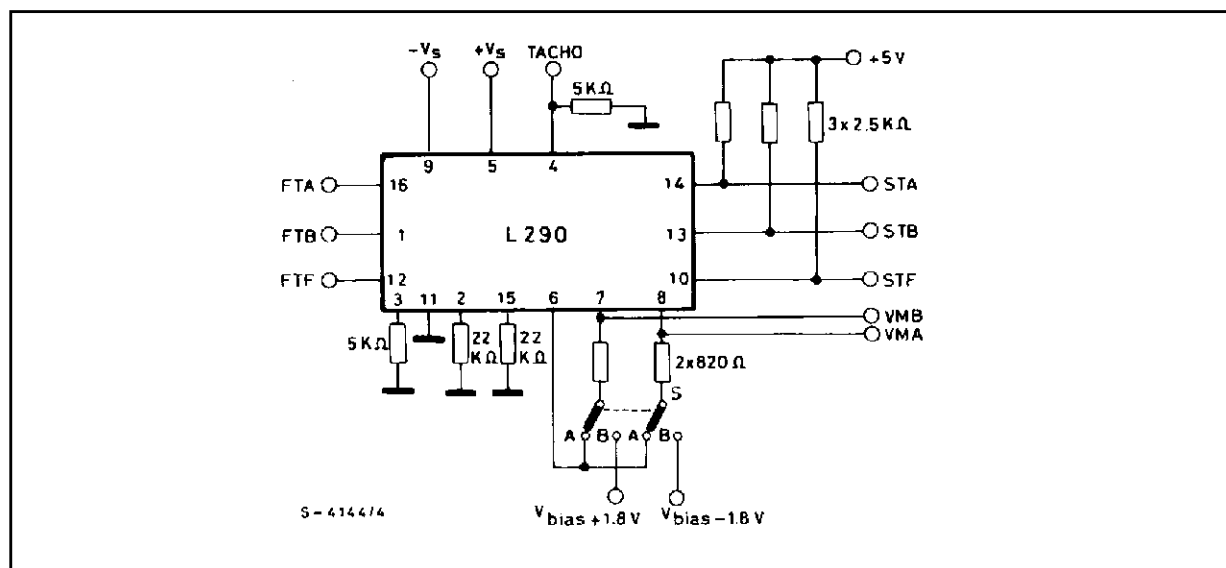
CONNECTION DIAGRAM (top view)



BLOCK DIAGRAM



TEST CIRCUIT



THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th-j-amb}$	Thermal resistance junction-case	Max 80	$^{\circ}\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS (Refer to the test circuit, S in (A), $V_s = \pm 12\text{ V}$, $T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_s	Supply Voltage		± 10		± 15	V
I_d	Quiescent Drain Current	$V_s = \pm 15\text{ V}$		13	20	mA

INPUT AMPLIFIERS (A_1 and A_2)

FTA, FTB	Input Signal from Encoder (pin 1, 16)	$f_{max} = 20\text{ KHz}$	± 0.4		± 0.6	V_p
V_{os}	Output Offset Voltage (pin 2, 15)	FTA = FTB = 0 V			± 55	mV
I_b	Input Bias Current (pin 1, 16)			0.15		μA
G_v	Voltage Gain	$f = 10\text{ KHz}$ FTA = FTB = $\pm 0.6 V_p$	22	23	24	dB
V_o	Output Voltage Swing (pin 2, 15)	FTA = FTB = $\pm 1V_p$	± 9.5			V

L290

ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
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COMPARATORS WITH HYSTERESIS (C₁, C₂, and C₃)

V _{THP} (°)	Positive Threshold Voltage (pin 2, 12, 15)	C ₁ and C ₂	550		850	mV
		C ₃	700		900	mV
V _{THN} (° °)	Negative Threshold Voltage (pin 2, 12, 15)	C ₁ and C ₂	55		175	mV
		C ₃	570		830	mV
ΔFTF	Threshold Hysteresis	C ₃	72		120	mV
V _L	Output Voltage (low level) (pin 10, 13, 14)	I ₀ = 2 mA FTA = FTB = FTF = 0 V		0.2	0.4	V
I _{leak}	(pins 10, 13, 14)	FTA = FTB = 0.5 V V _{CE} = 5 V FTF = 1 V			1	μA

REFERENCE GENERATOR

V _{ref}	DC Reference Voltage (pin 3)	FTA = FTB = ± 0.5 V _p (*) I _{ref} = 1 mA	4.5	5	5.5	V
I _{ref}	Output Current (pin 3)				1.4	mA

"TACHO" AMPLIFIER (A3)

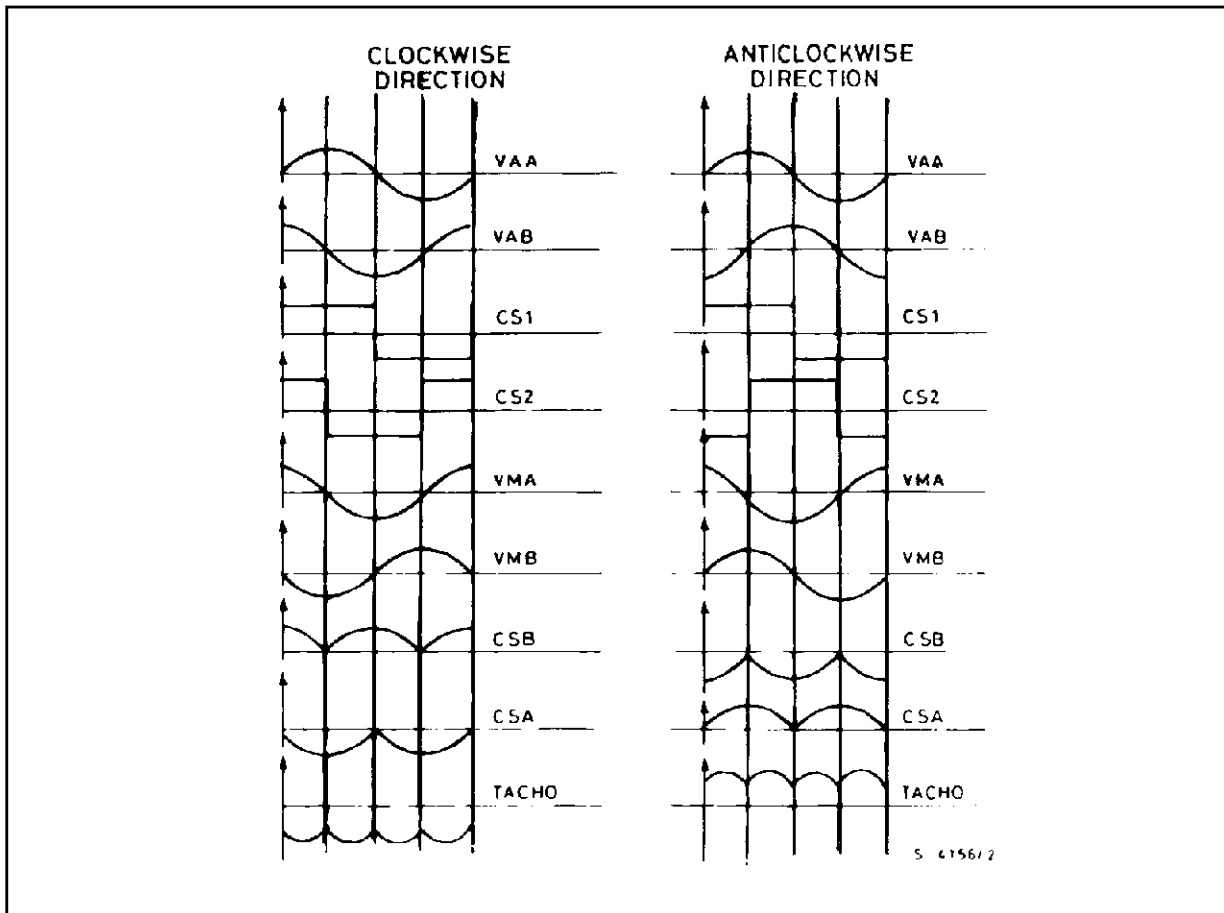
V _{os}	Output Offset Voltage (pin 4)	FTA = ± 15 mV FTB = 0.5V			± 80	mV	
V _o	DC Output Voltage (pin 4)	FTA = FTB = ± 0.5 V _p	(**) V ₀₁	5.4	6	6.6	V
		V _{MA} = V _{MB} = ± 1.25 V _p	(***) V ₀₂	- 5.4	- 6	- 6.6	
ΔV ₀		V ₀₁ + V ₀₂		- 150		+ 150	mV
V ₀	Output Voltage Swing (pin 4)		FTA = FTB = 0.5V	9			V
		Sin (B)	FTA = FTB = -0.5 V	- 9			
V _{MA} V _{MB}	Multiplier Input Voltage (pin 7, 8)				± 1.25	± 1.7	V _p
V _{bias}	Bias Voltage (pin 6)	FTA and FTB Floating	- 6.5		- 8		V

(°) : FTA = FTB = FTF  1V (° °) : FTA = FTB = FTF =  1V

Note : Phase relationship between the signals :

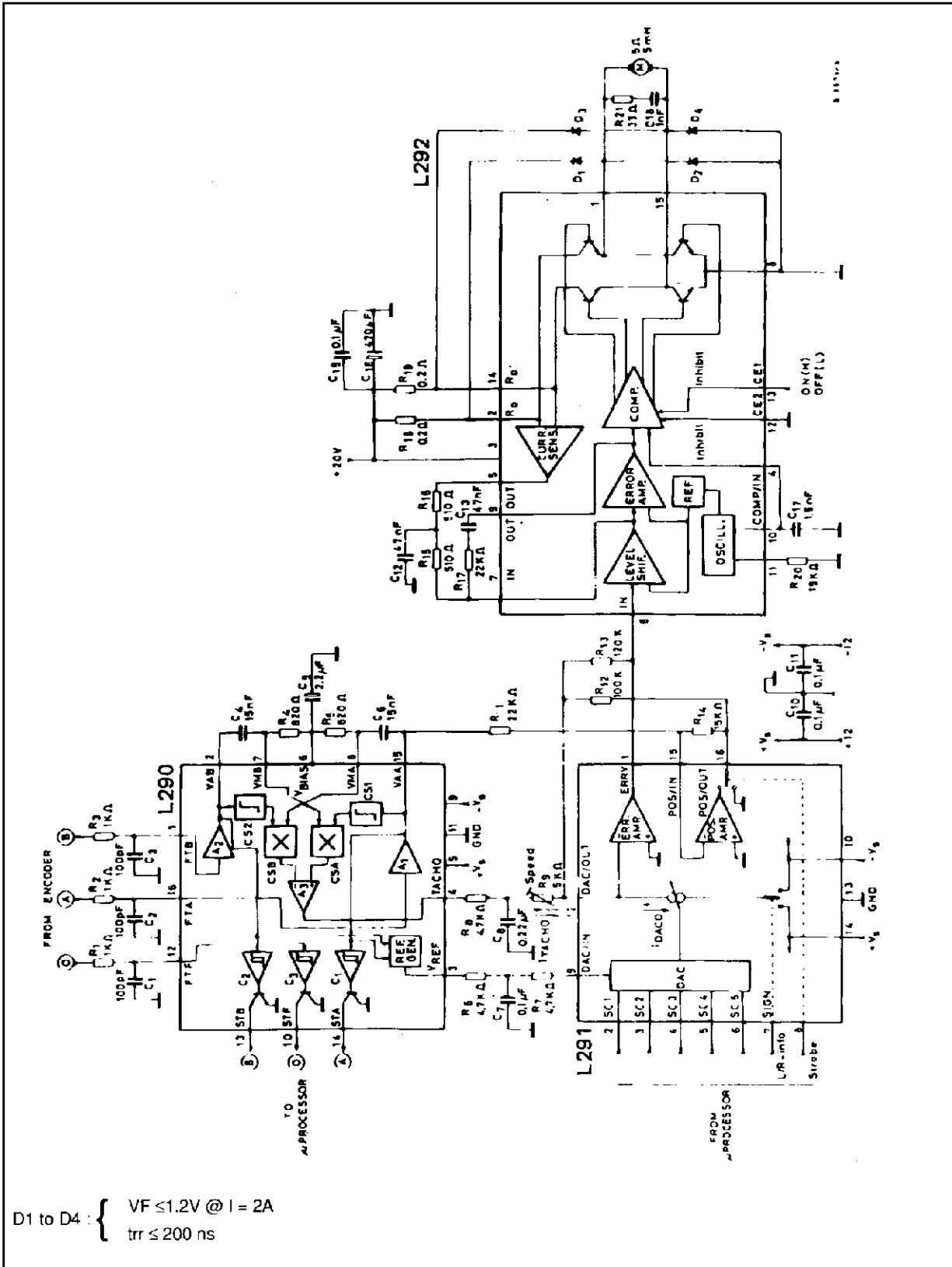
* FTA : 0° FTB : 90°
 ** FTA : 0° FTB : -90° V_{MA} = 90° V_{MB} = 0°
 *** FTA : 0° FTB : 90° V_{MA} = 90° V_{MB} = 180°

WAVEFORMS (Neglecting threshold voltage level of the comparators).



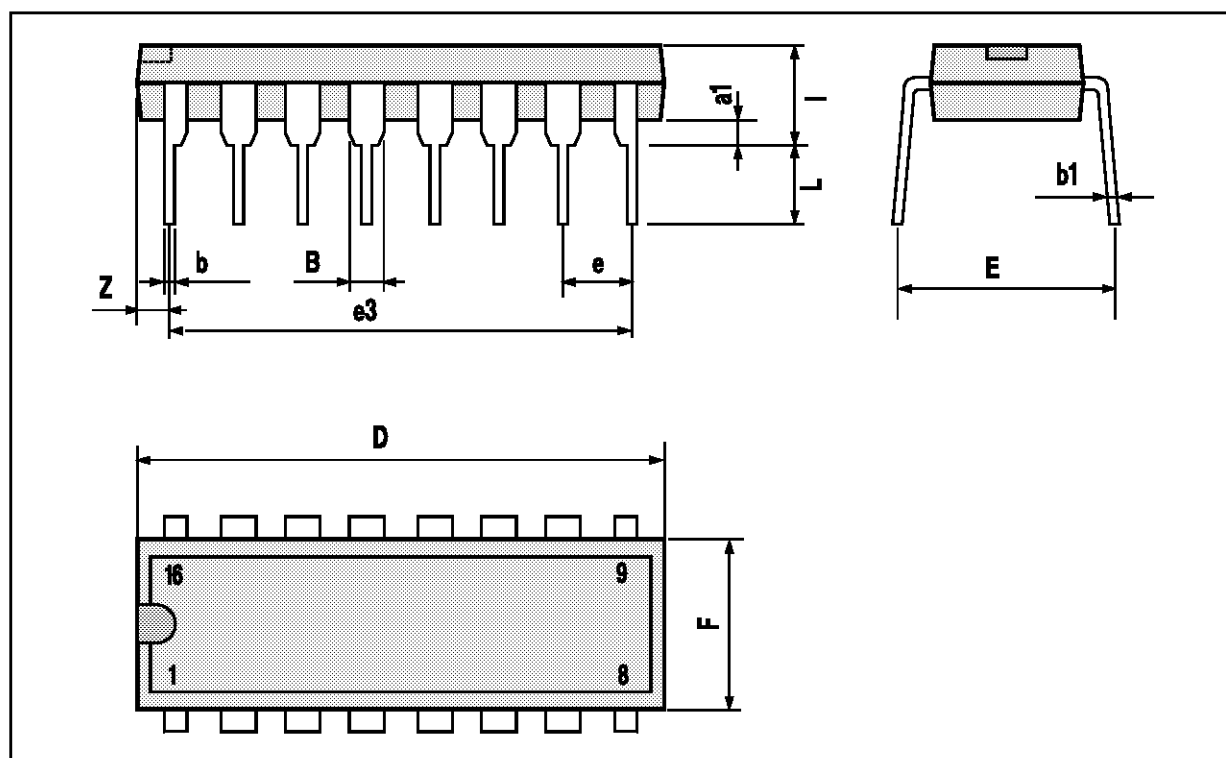
SYSTEM DESCRIPTION : refer to the L292 data sheet.

Figure 1. Complete application circuit.



DIP-16 PLASTIC PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050



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