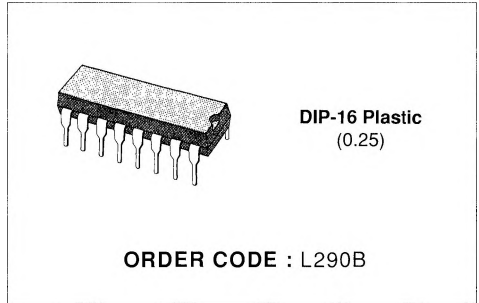


TACHOMETER CONVERTER

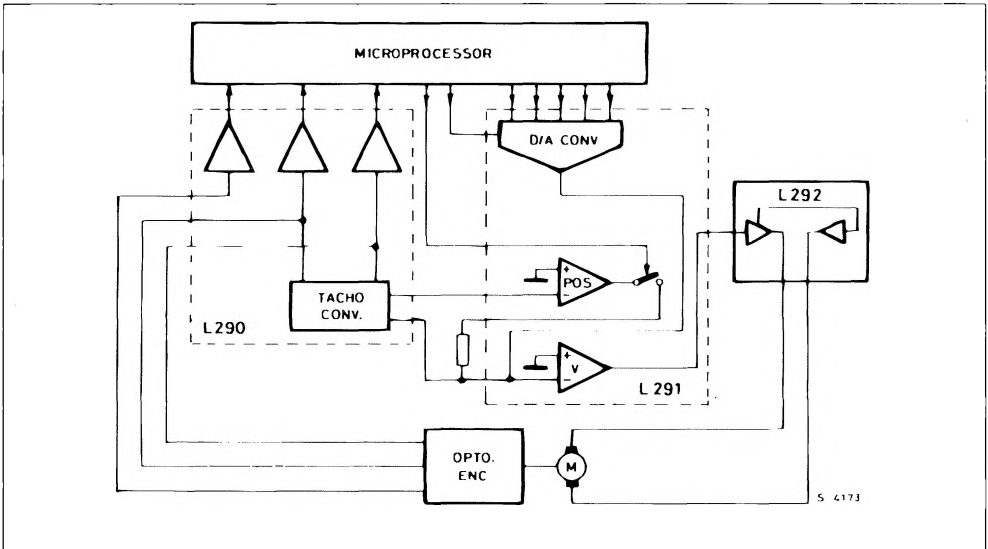
The L290, a monolithic LSI circuit in a 16-lead dual inline plastic package, is intended for use with the L291 and L292 which together form a complete **3-chip DC motor positioning system** for applications such as carriage/daisy-wheel position control in typewriters.

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

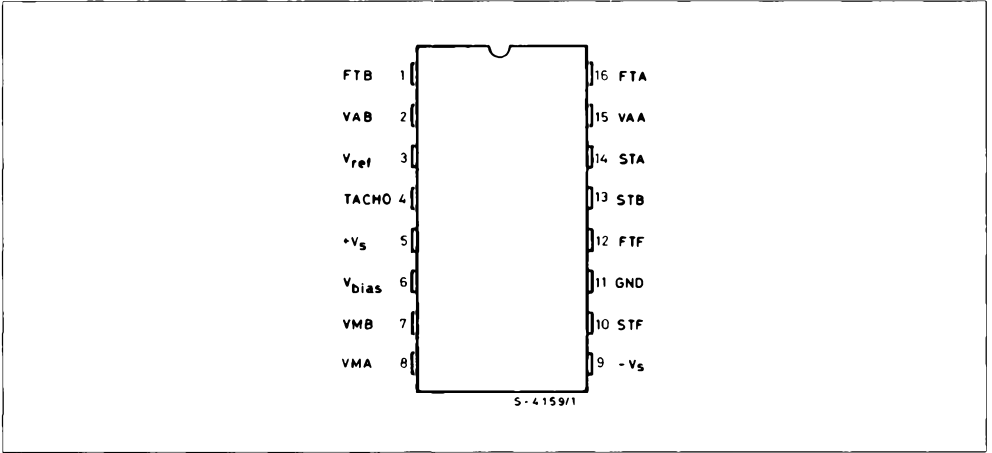
- tacho voltage generator (F/V converter)
- reference voltage generator
- position pulse generator


ABSOLUTE MAXIMUM RATING

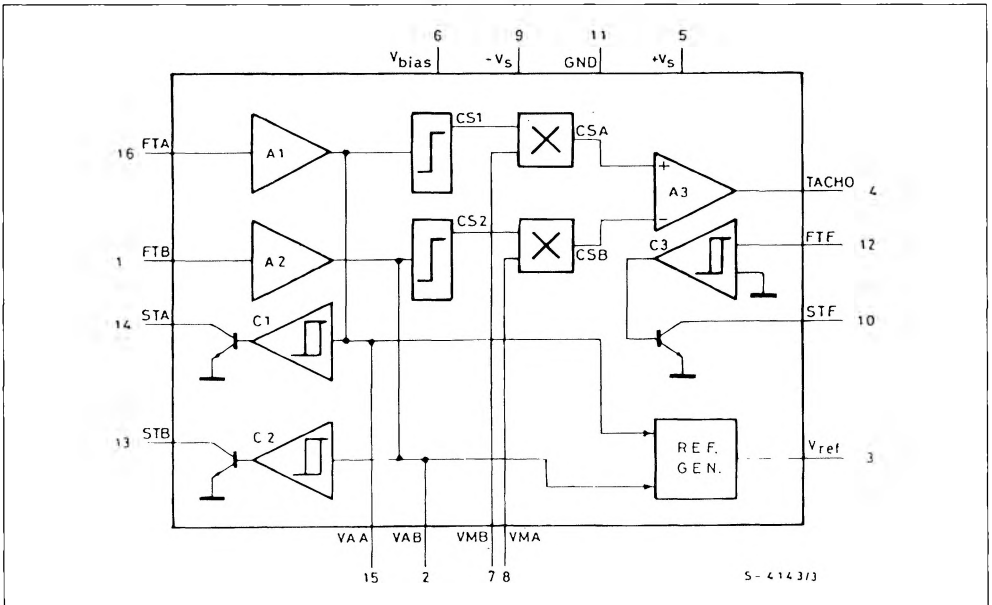
Symbol	Parameter	Value	Unit
V_s	Supply Voltage	± 15	V
V_i (FTA, FTB, FTF)	Input Signals	± 7	V
P_{tot}	Total Power Dissipation $T_{amb} = 70^\circ\text{C}$	1	W
T_{stg}, T_j	Storage and Junction Temperature	- 40 to + 150	$^\circ\text{C}$

SYSTEM BLOCK DIAGRAM


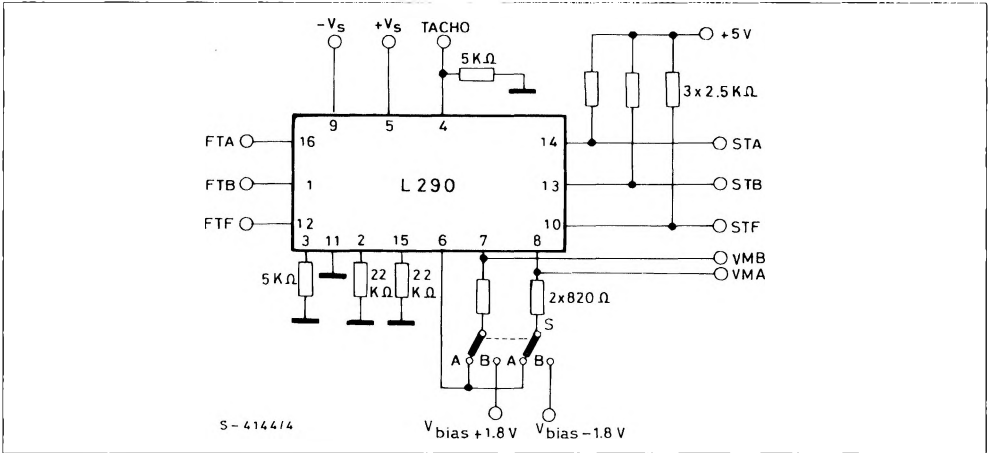
CONNECTION DIAGRAM (top view)



BLOCK DIAGRAM



TEST CIRCUIT



THERMAL DATA

$R_{th\ j-amb}$	Thermal Resistance junction-ambient	Max	80	°C/W
-----------------	-------------------------------------	-----	----	------

ELECTRICAL CHARACTERISTICS (Refer to the test circuit, S in (A), $V_s = \pm 12\text{ V}$, $T_{amb} = 25\text{ °C}$ 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 = $\pm 0.6\text{ V}_p$	22	23	24	dB
V_o	Output Voltage Swing (pin 2, 15)	FTA = FTB = $\pm 1V_p$	± 9.5			V

ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
--------	-----------	-----------------	------	------	------	------

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 = 0.5 V				± 80	mV
V _o	DC Output Voltage (pin 4)	FTA = FTB = ± 0.5 V _p	(**)	5.4	6	6.6	V
		V ₀₁					
ΔV ₀	Output Voltage Swing (pin 4)	VMA = VMB = ± 1.25 V _p	(***)	- 5.4	- 6	- 6.6	mV
		V ₀₁ + V ₀₂		- 150		+ 150	
V ₀	Output Voltage Swing (pin 4)	FTA = FTB = 0.5 V		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

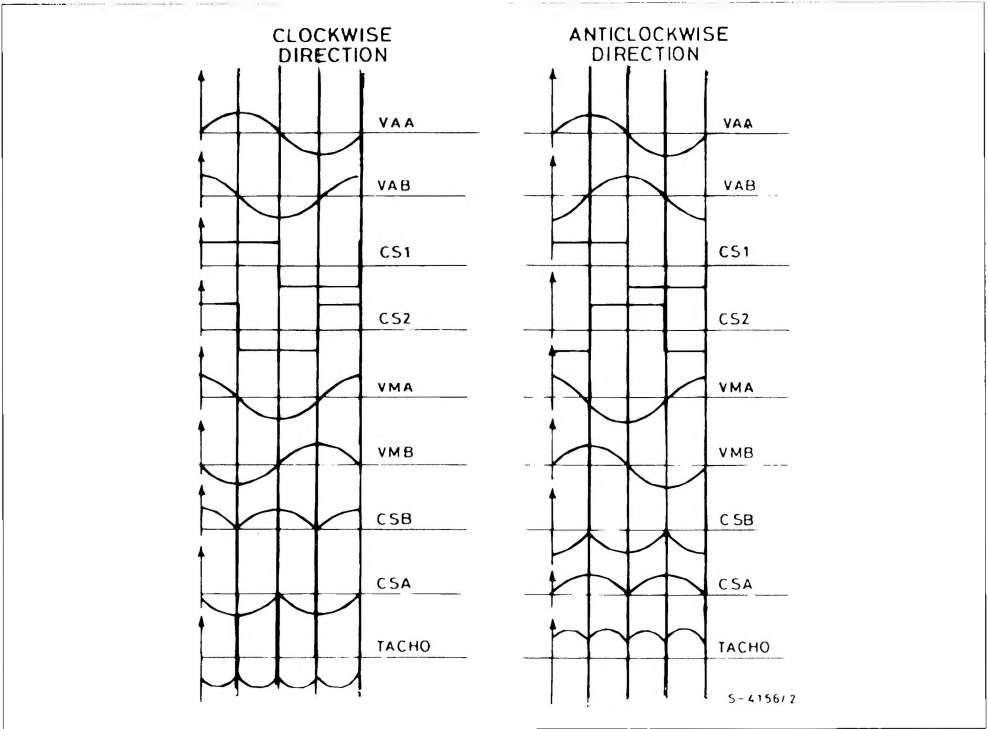
(°) : FTA = FTB = FTF = 

(°°) : FTA = FTB = FTF = 

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.

