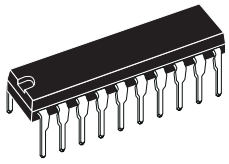
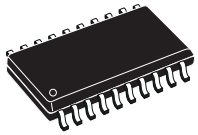
L297

STEPPER MOTOR CONTROLLERS

- NORMAL/WAVE DRIVE
- HALF/FULL STEP MODES
- CLOCKWISE/ANTICLOCKWISE DIRECTION
- SWITCHMODE LOAD CURRENT REGULATION
- PROGRAMMABLE LOAD CURRENT
- FEW EXTERNAL COMPONENTS
- RESET INPUT & HOME OUTPUT
- ENABLE INPUT



DIP20



SO20

ORDERING NUMBERS : L297/1 (DIP20)
L297D (SO20)

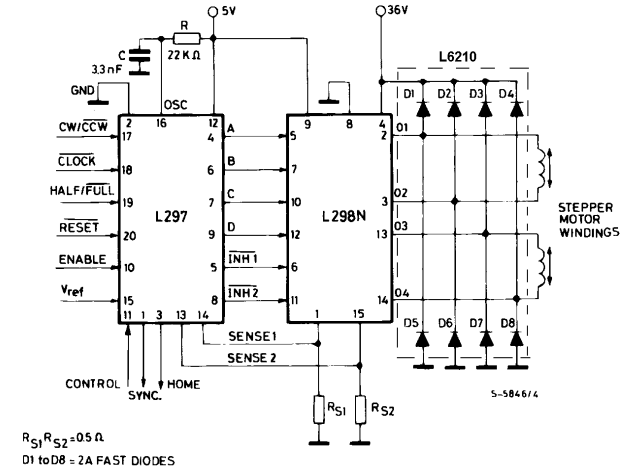
DESCRIPTION

The L297 Stepper Motor Controller IC generates four phase drive signals for two phase bipolar and four phase unipolar step motors in microcomputer-controlled applications. The motor can be driven in half step, normal and wawe drive modes and on-chip PWM chopper circuits permit switch-mode control of the current in the windings. A feature of this device is that it requires only clock, direction and mode input signals. Since the phase are generated internally the burden on the microprocessor, and the programmer, is greatly reduced. Mounted in DIP20 and SO20 packages, the L297 can be used with monolithic bridge drives such as the L298N or L293E, or with discrete transistors and darlingtons.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_S	Supply voltage	10	V
V_i	Input signals	7	V
P_{tot}	Total power dissipation (T_{amb} = 70°C)	1	W
T_{stg}, T_j	Storage and junction temperature	-40 to + 150	°C

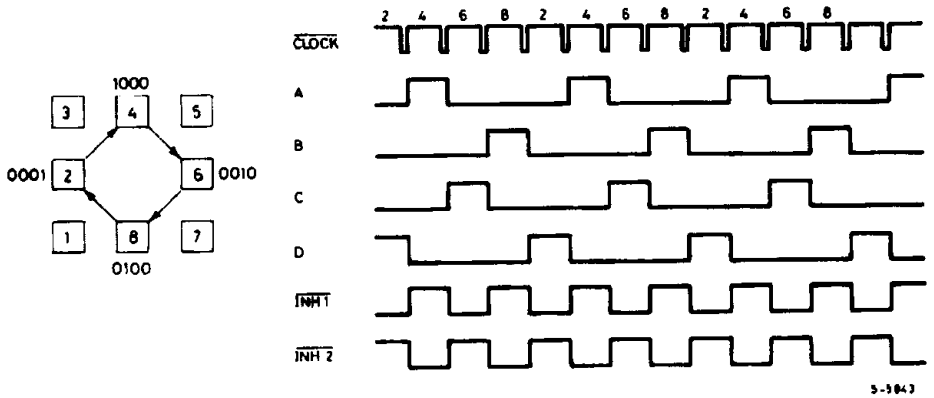
TWO PHASE BIPOLAR STEPPER MOTOR CONTROL CIRCUIT



MOTOR DRIVING PHASE SEQUENCES (continued)

WAVE DRIVE MODE

Wave drive mode (also called "one-phase-on" drive) is selected by a low level on the HALF/$\overline{FULL}$ input when the translator is at an even numbered state (2, 4, 6 or 8).



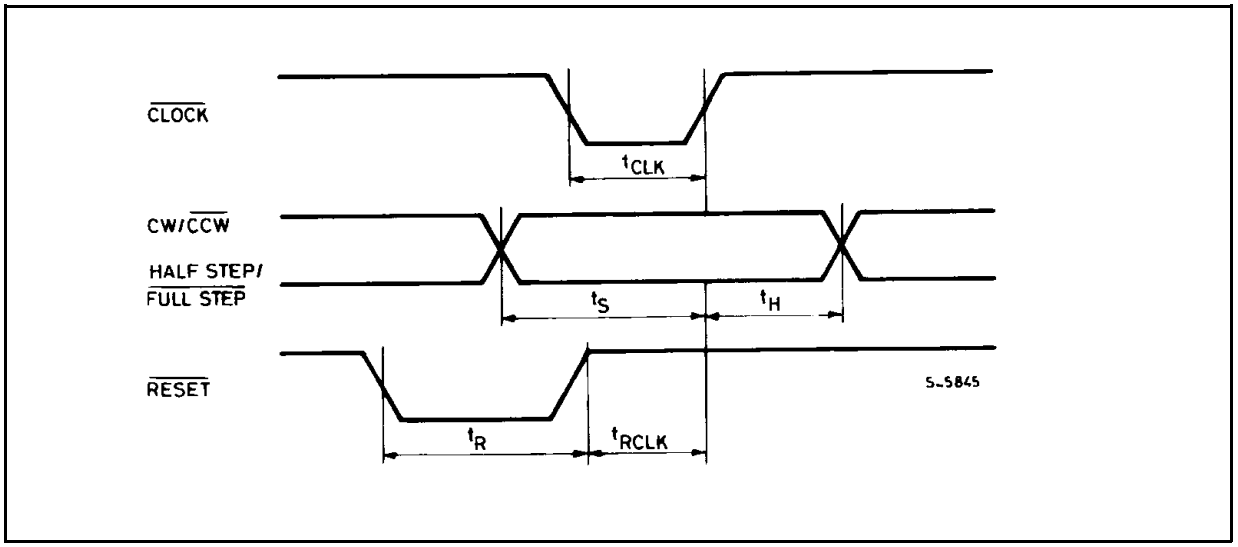
ELECTRICAL CHARACTERISTICS (Refer to the block diagram T_{amb} = 25°C, V_s = 5V unless otherwise specified)

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
V_s	Supply voltage (pin 12)			4.75		7	V
I_s	Quiescent supply current (pin 12)	Outputs floating			50	80	mA
V_i	Input voltage (pin 11, 17, 18, 19, 20)		Low			0.6	V
			High	2		V_s	V
I_i	Input current (pin 11, 17, 18, 19, 20)		V_i = L		100	µA	
			V_i = H			10	µA
V_{en}	Enable input voltage (pin 10)		Low			1.3	V
			High	2		V_s	V
I_{en}	Enable input current (pin 10)		V_{en} = L			100	µA
			V_{en} = H			10	µA
V_o	Phase output voltage (pins 4, 6, 7, 9)	I_o = 10mA	V_{OL}			0.4	V
		I_o = 5mA	V_{OH}	3.9			V
V_{inh}	Inhibit output voltage (pins 5, 8)	I_o = 10mA	$V_{inh\ L}$			0.4	V
		I_o = 5mA	$V_{inh\ H}$	3.9			V
V_{SYNC}	Sync Output Voltage	I_o = 5mA	$V_{SYNC\ H}$	3.3			V
		I_o = 5mA	$V_{SYNC\ V}$			0.8	

ELECTRICAL CHARACTERISTICS (continued)

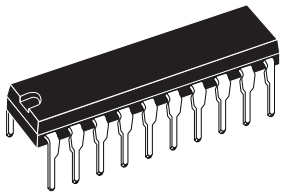
Symbol	Parameter	Test conditions	Min.	Typ	Max.	Unit
I_{leak}	Leakage current (pin 3)	V_{CE} = 7 V			1	µA
V_{sat}	Saturation voltage (pin 3)	I = 5 mA			0.4	V
V_{off}	Comparators offset voltage (pins 13, 14, 15)	V_{ref} = 1 V			5	mV
I_o	Comparator bias current (pins 13, 14, 15)		-100		10	µA
V_{ref}	Input reference voltage (pin 15)		0		3	V
t_{CLK}	Clock time		0.5			µs
t_S	Set up time		1			µs
t_H	Hold time		4			µs
t_R	Reset time		1			µs
t_{RCLK}	Reset to clock delay		1			µs

Figure 1.

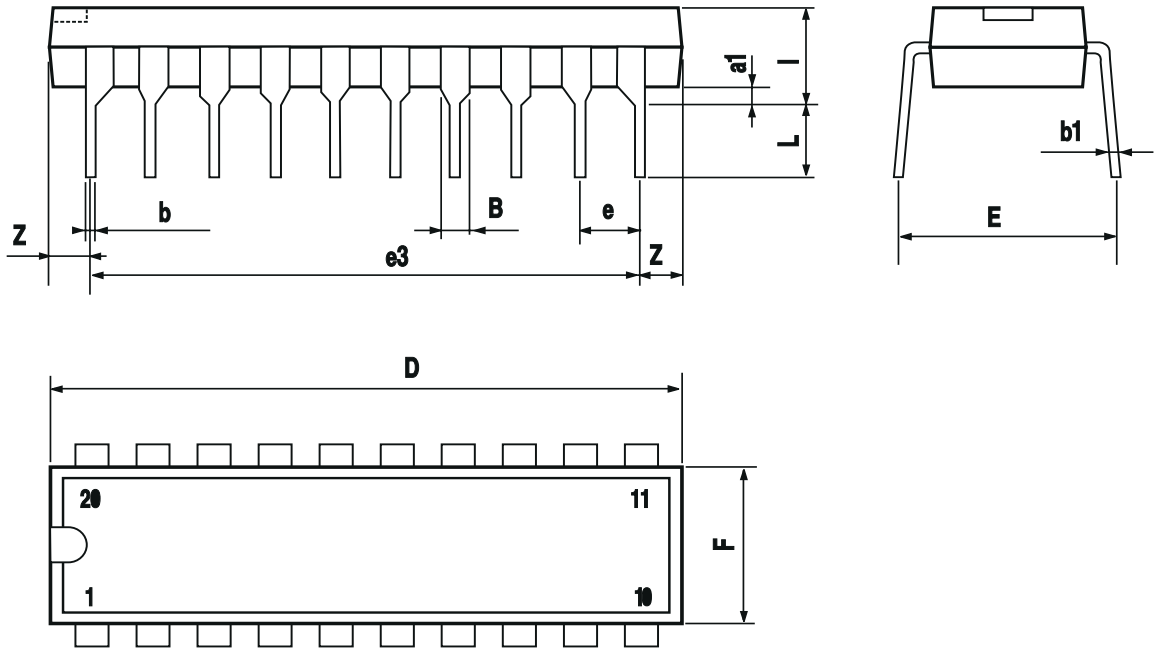


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.254			0.010		
B	1.39		1.65	0.055		0.065
b		0.45			0.018	
b1		0.25			0.010	
D			25.4			1.000
E		8.5			0.335	
e		2.54			0.100	
e3		22.86			0.900	
F			7.1			0.280
I			3.93			0.155
L		3.3			0.130	
Z			1.34			0.053

OUTLINE AND MECHANICAL DATA

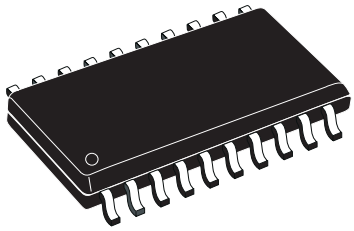


DIP20

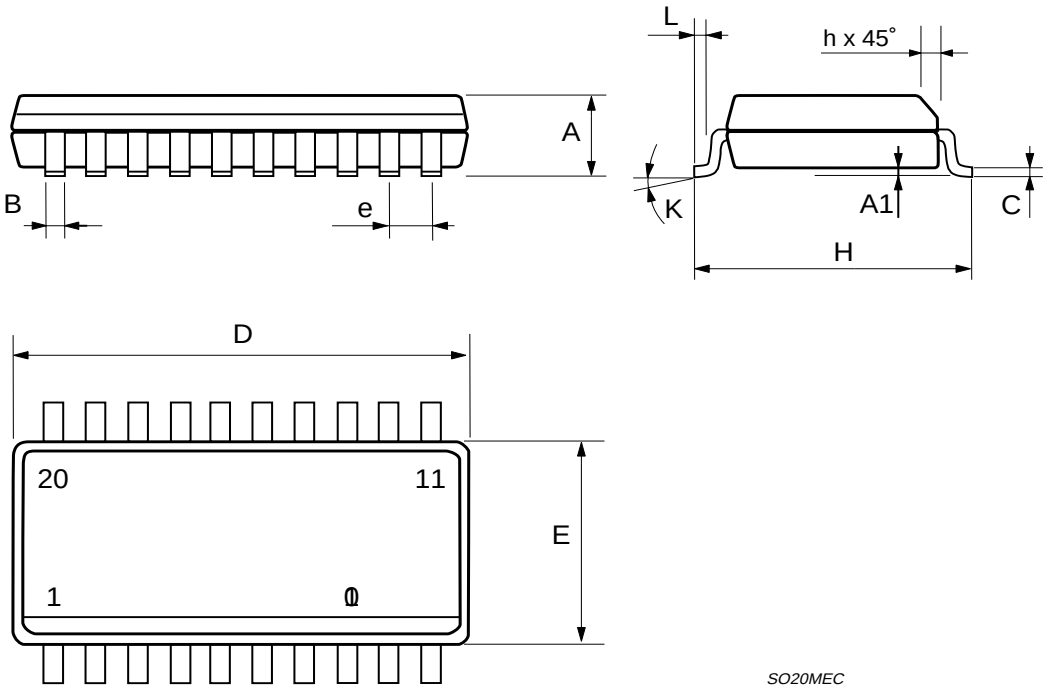


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.35		2.65	0.093		0.104
A1	0.1		0.3	0.004		0.012
B	0.33		0.51	0.013		0.020
C	0.23		0.32	0.009		0.013
D	12.6		13	0.496		0.512
E	7.4		7.6	0.291		0.299
e		1.27			0.050	
H	10		10.65	0.394		0.419
h	0.25		0.75	0.010		0.030
L	0.4		1.27	0.016		0.050
K	0˚ (min.)8˚ (max.)					

OUTLINE AND MECHANICAL DATA



SO20



SO20MEC