

LOW DROP DUAL POWER OPERATIONAL AMPLIFIERS

ADVANCE DATA

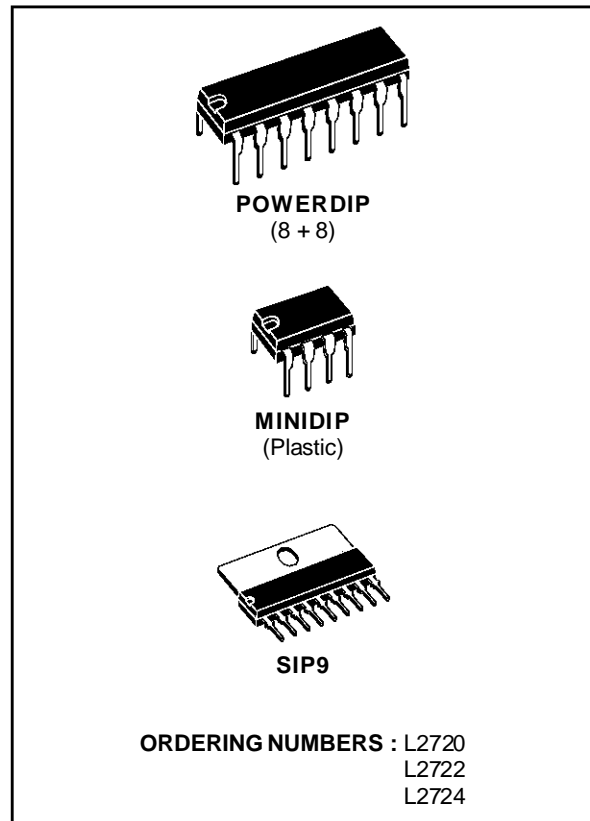
- OUTPUT CURRENT TO 1 A
- OPERATES AT LOW VOLTAGES
- SINGLE OR SPLIT SUPPLY
- LARGE COMMON-MODE AND DIFFERENTIAL MODE RANGE
- LOW INPUT OFFSET VOLTAGE
- GROUND COMPATIBLE INPUTS
- LOW SATURATION VOLTAGE
- THERMAL SHUTDOWN
- CLAMP DIODE

DESCRIPTION

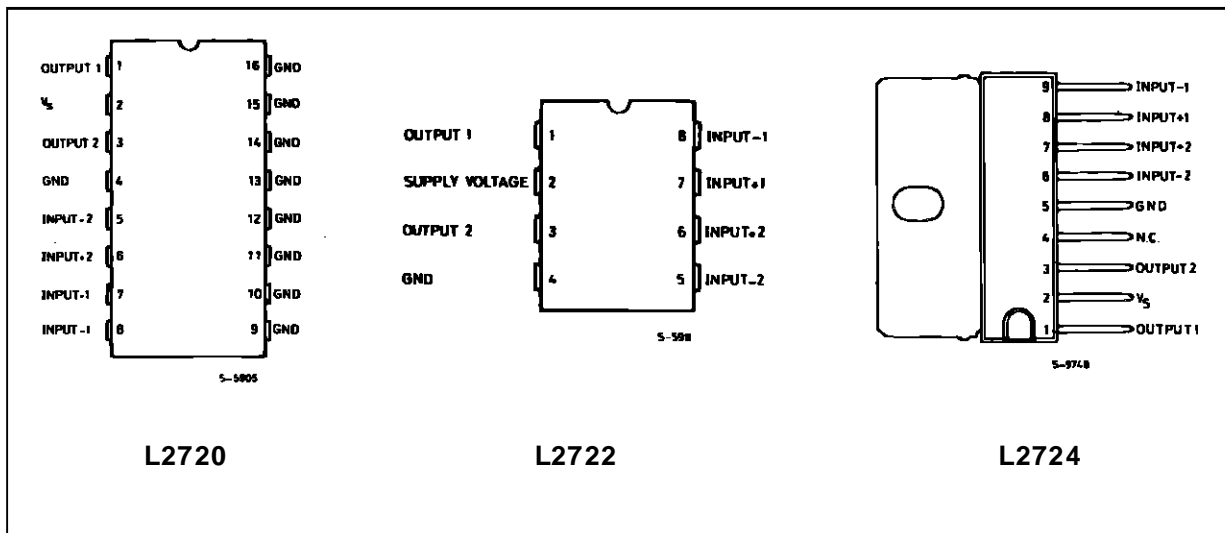
The L2720, L2722 and L2724 are monolithic integrated circuits in powerdip, minidip and SIP-9 packages, intended for use as power operational amplifiers in a wide range of applications including servo amplifiers and power supplies.

They are particularly indicated for driving, inductive loads, as motor and finds applications in compact-disc VCR automotive, etc.

The high gain and high output power capability provide superior performance whatever an operational amplifier/power booster combination is required.

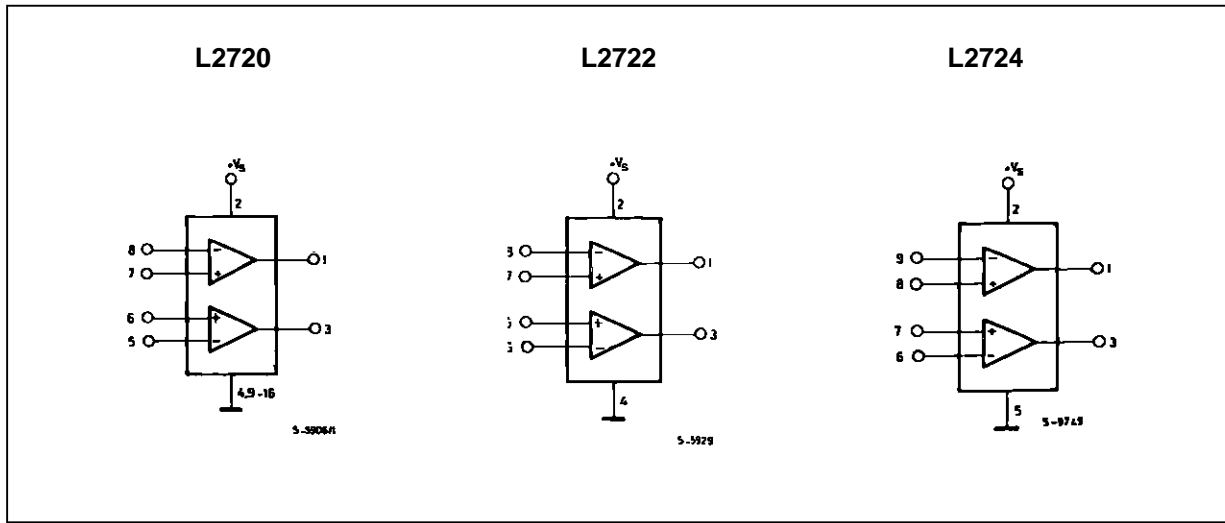


PIN CONNECTIONS (top views)

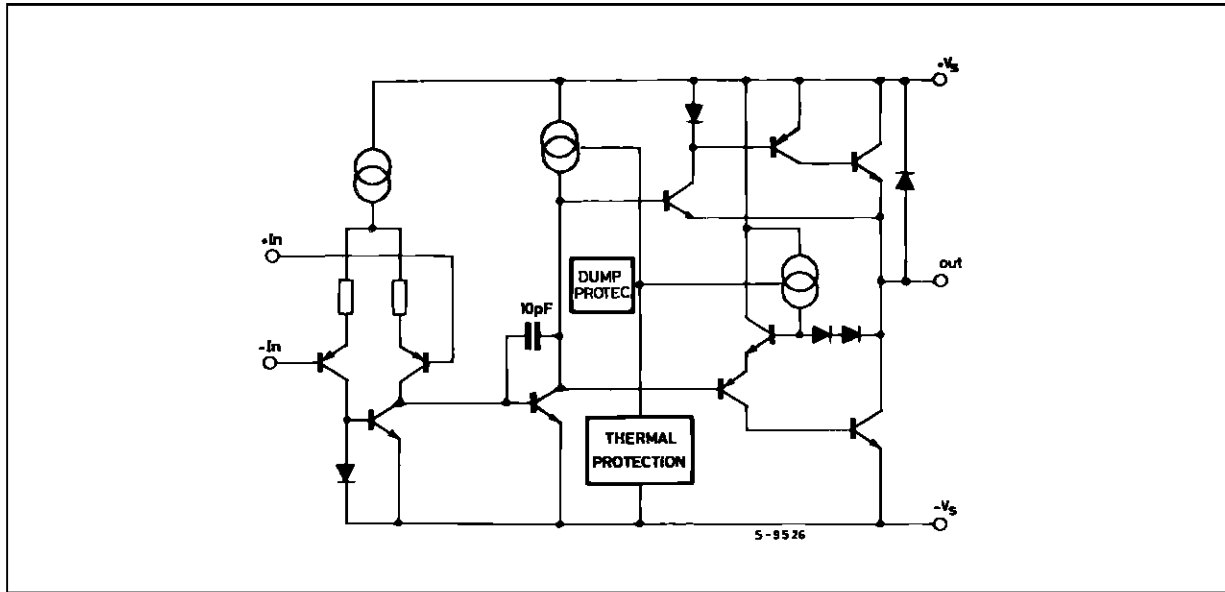


L2720/2/4

BLOCK DIAGRAM



SCHEMATIC DIAGRAM (one section)



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_S	Supply Voltage	28	V
V_S	Peak Supply Voltage (50ms)	50	V
V_i	Input Voltage	V_S	
V_i	Differential Input Voltage	$\pm V_S$	
I_o	DC Output Current	1	A
I_p	Peak Output Current (non repetitive)	1.5	A
P_{tot}	Power Dissipation at $T_{amb} = 80^\circ\text{C}$ (L2720), $T_{amb} = 50^\circ\text{C}$ (L2722) $T_{case} = 75^\circ\text{C}$ (L2720) $T_{case} = 50^\circ\text{C}$ (L2724)	1 5 10	W
T_{stg}, T_j	Storage and Junction Temperature	-40 to 150	$^\circ\text{C}$

THERMAL DATA

			SIP-9	Powerdip	Minidip
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max.	10°C/W	15°C/W	70°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max.	70°C/W	70°C/W	100°C/W

ELECTRICAL CHARACTERISTICS

$V_s = 24V$, $T_{amb} = 25^\circ C$ unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_s	Single Supply Voltage		4		28	V
V_s	Split Supply Voltage		± 2		± 14	V
I_s	Quiescent Drain Current	$V_o = \frac{V_s}{2}$ $V_s = 24V$ $V_s = 8V$		10 9	15 15	mA
I_b	Input Bias Current			0.2	1	μA
V_{os}	Input Offset Voltage				10	mV
I_{os}	Input Offset Current				100	nA
SR	Slew Rate			2		V/ μs
B	Gain-bandwidth Product			1.2		MHz
R_i	Input Resistance		500			k Ω
G_v	O.L. Voltage Gain	$f = 100Hz$ $f = 1kHz$	70	80 60		dB
e_N	Input Noise Voltage	$B = 22Hz$ to 22kHz		10		μV
I_N	Input Noise Current			200		pA
CMR	Common Mode Rejection	$f = 1kHz$	66	84		dB
SVR	Supply Voltage Rejection	$f = 100Hz$ $R_G = 10k\Omega$ $V_R = 0.5V$ $V_s = 24V$ $V_s = \pm 12V$ $V_s = \pm 6V$	60	70 75 80		dB
$V_{DROP(HIGH)}$		$V_s = \pm 2.5V$ to $\pm 12V$ $I_p = 100mA$ $I_p = 500mA$		0.7 1	1.5	V
$V_{DROP(LOW)}$		$V_s = \pm 2.5V$ to $\pm 12V$ $I_p = 100mA$ $I_p = 500mA$		0.3 0.5	1	V
C_s	Channel Separation	$f = 1KHz$ $R_L = 10\Omega$ $G_v = 30dB$ $V_s = 24V$ $V_s = 6V$		60 60		dB
T_{sd}	Thermal Shutdown Junction Temperature			145		$^\circ C$

Figure 1 : Quiescent Current vs. Supply Voltage

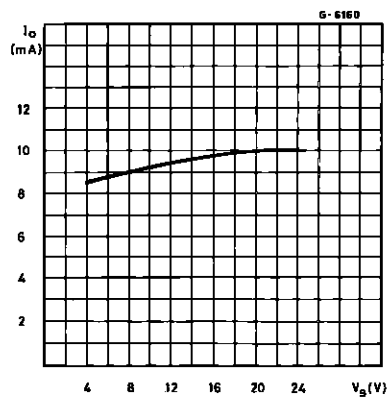


Figure 2 : Open Loop Gain vs. Frequency

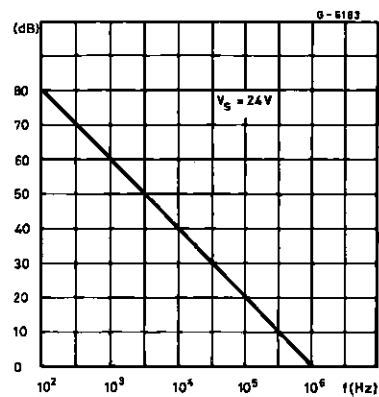


Figure 3 : Common Mode Rejection vs. Frequency

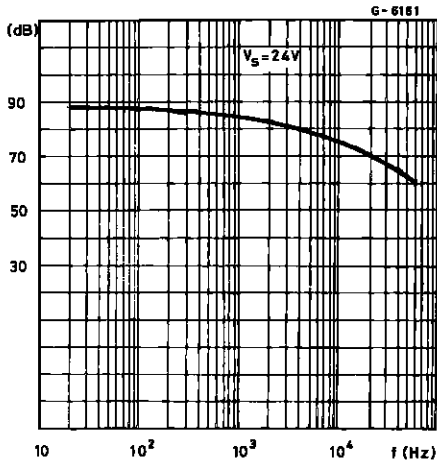


Figure 4 : Output Swing vs. Load Current ($V_S = \pm 5V$.)

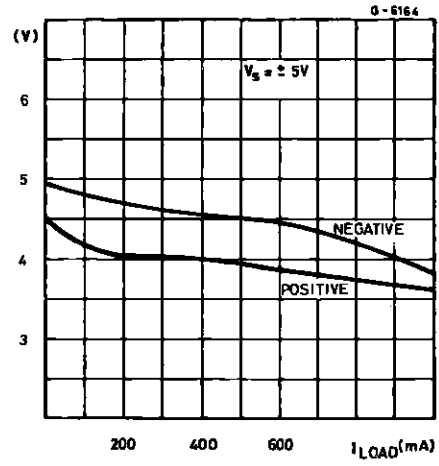


Figure 5 : Output Swing vs. Load Current ($V_S = \pm 12V$.)

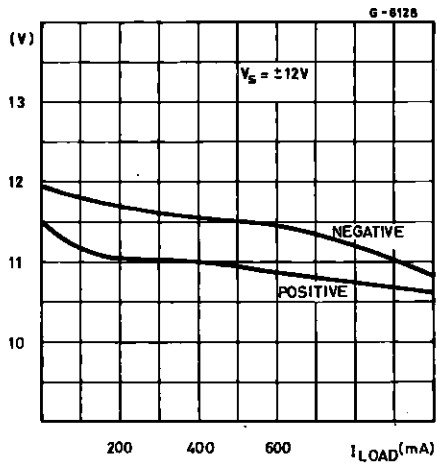


Figure 6 : Supply Voltage rejection vs. Frequency

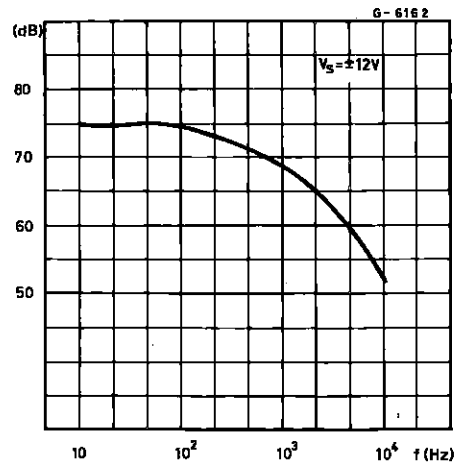
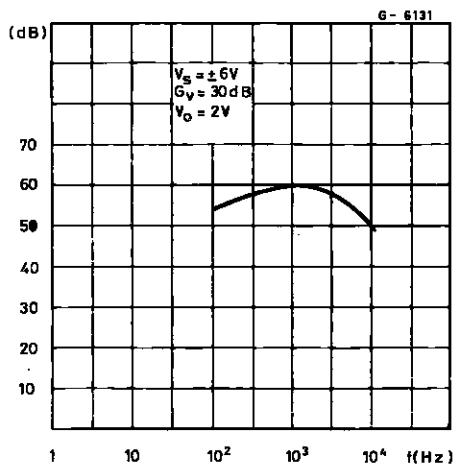


Figure 7 : Channel Separation vs. Frequency



APPLICATION SUGGESTION

In order to avoid possible instability occurring into final stage the usual suggestions for the linear power stages are useful, as for instance :

- layout accuracy ;
- A 100nF capacitor connected between supply pins and ground ;
- boucherot cell (0.1 to 0.2 μF + 1 Ω series) between outputs and ground or across the load. With single supply operation, a resistor (1k Ω) between the output and supply pin can be necessary for stability.

Figure 8 : Bidirectional DC Motor Control with μP Compatible Inputs

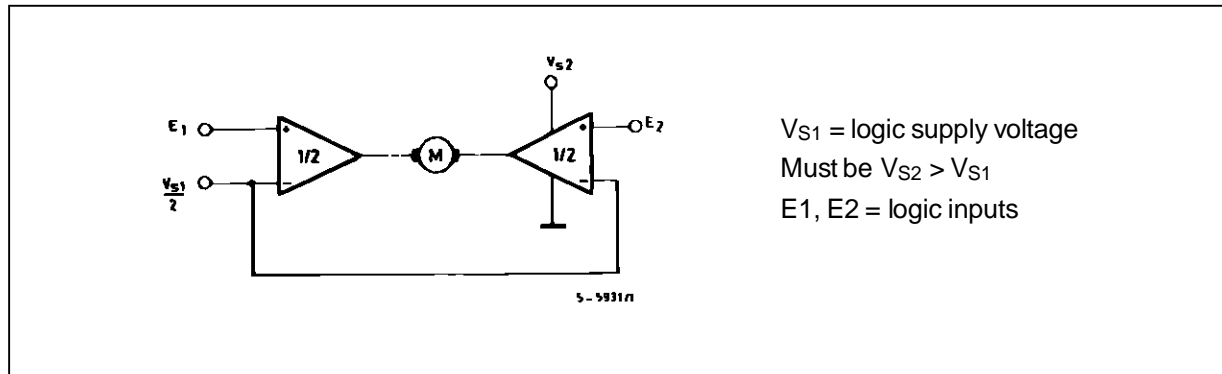


Figure 9 : Servocontrol for Compact-disc

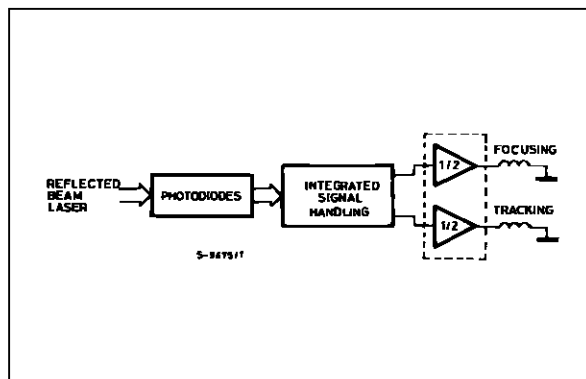


Figure 10 : Capstan Motor Control in Video Recorders

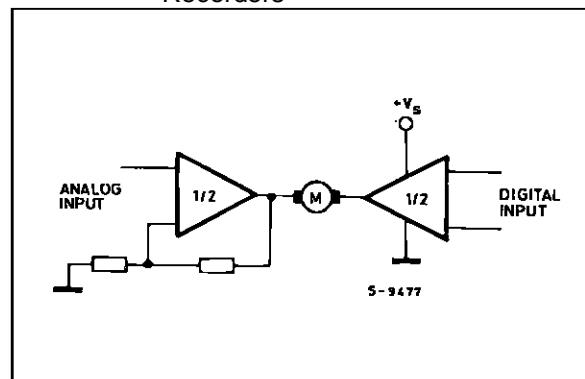


Figure 11 : Motor Current Control Circuit

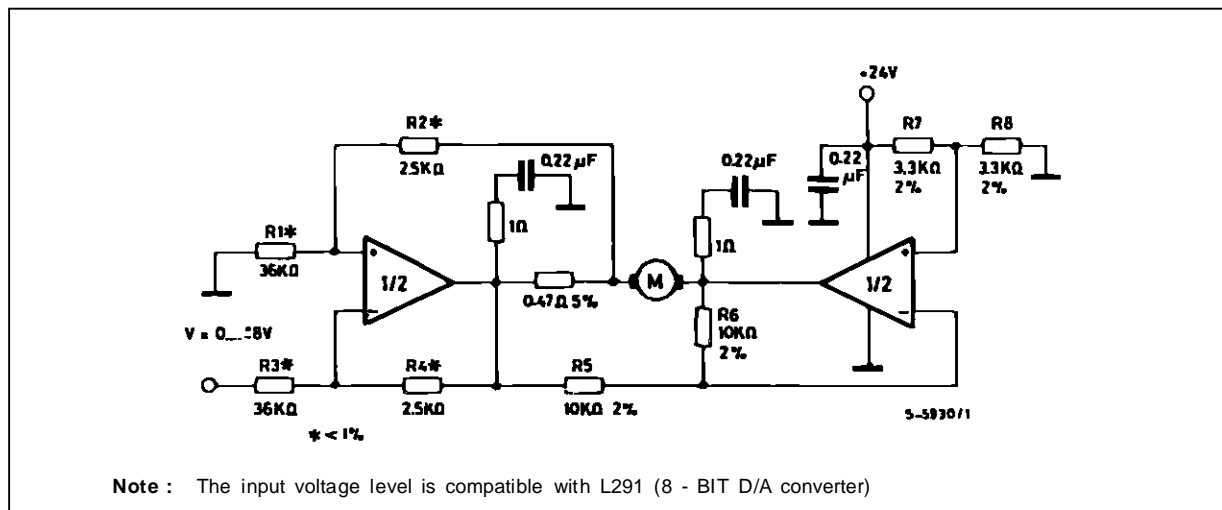


Figure 12 : Bidirectional Speed Control of DC Motors

For circuit stability ensure that $R_x > \frac{2R_3 \cdot R_1}{R_M}$ where R_M = internal resistance of motor.

The voltage available at the terminals of the motor is $V_M = 2 \left(V_1 - \frac{V_s}{2} \right) + |R_O| \cdot I_M$ where $|R_O| = \frac{2R_3 \cdot R_1}{R_x}$ and I_M is the motor current.

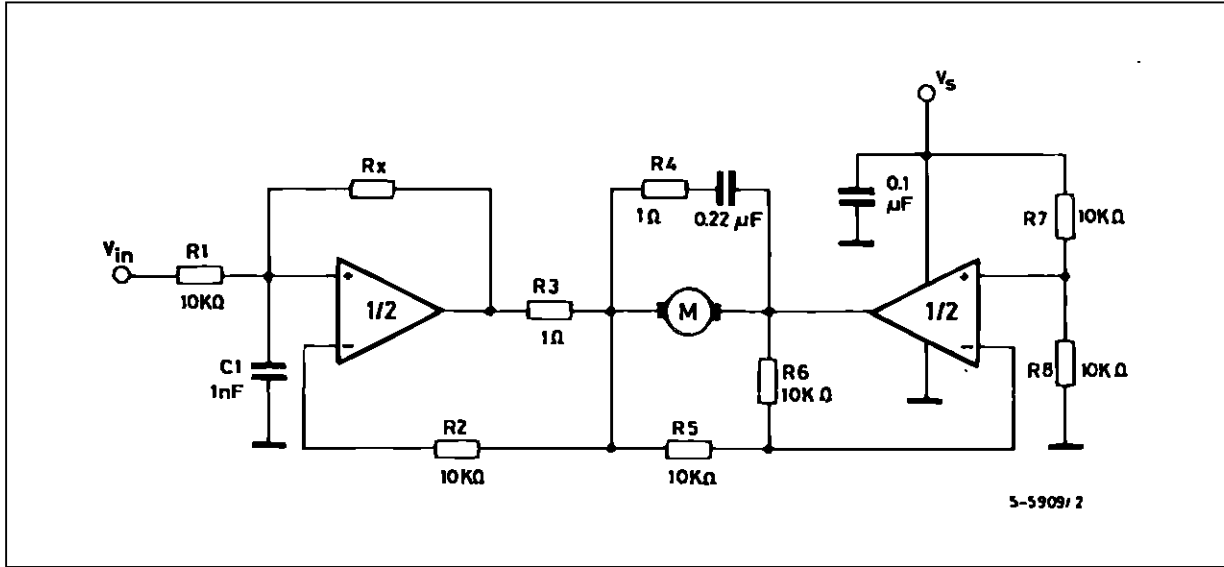
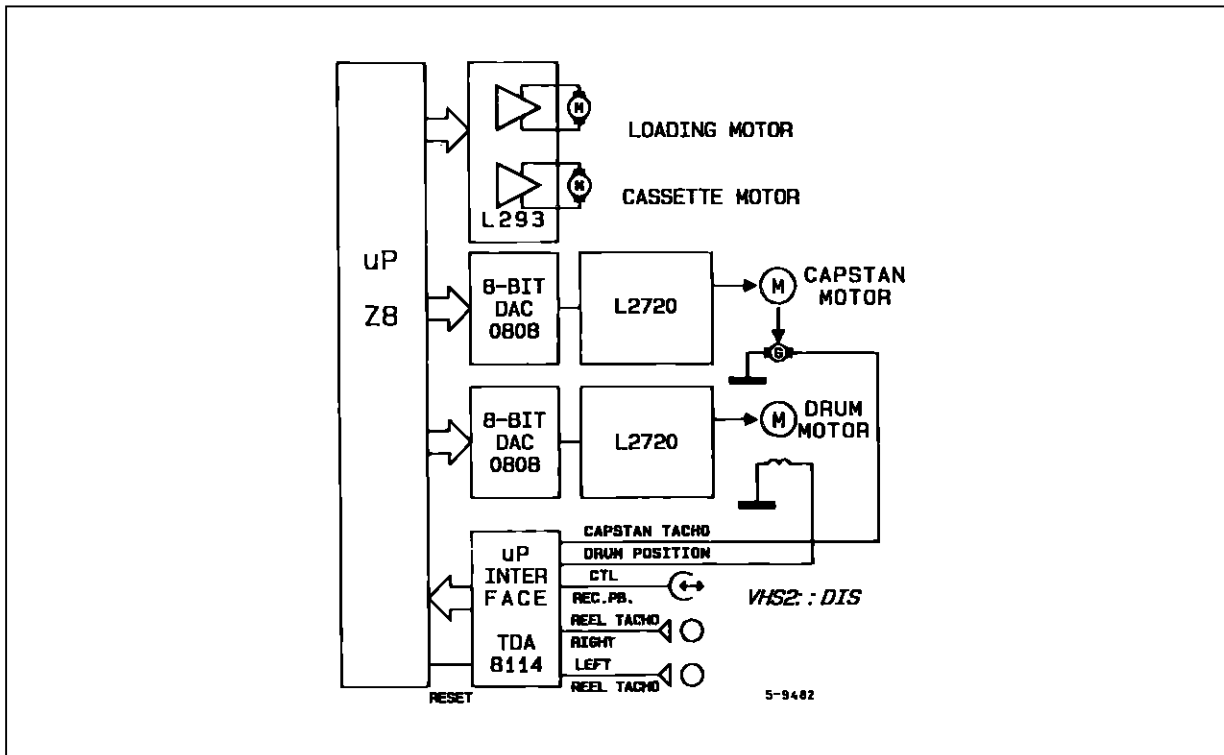
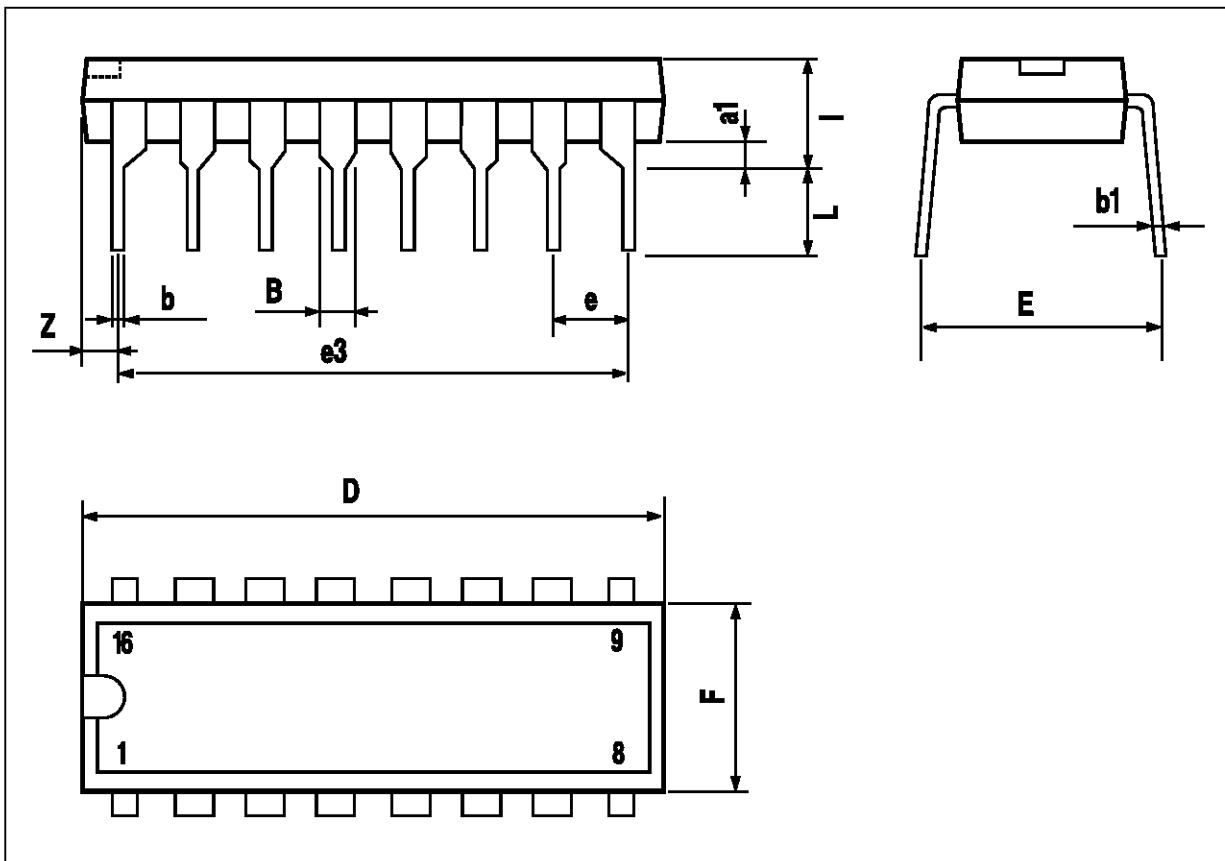


Figure 13 : VHS-VCR Motor Control Circuit



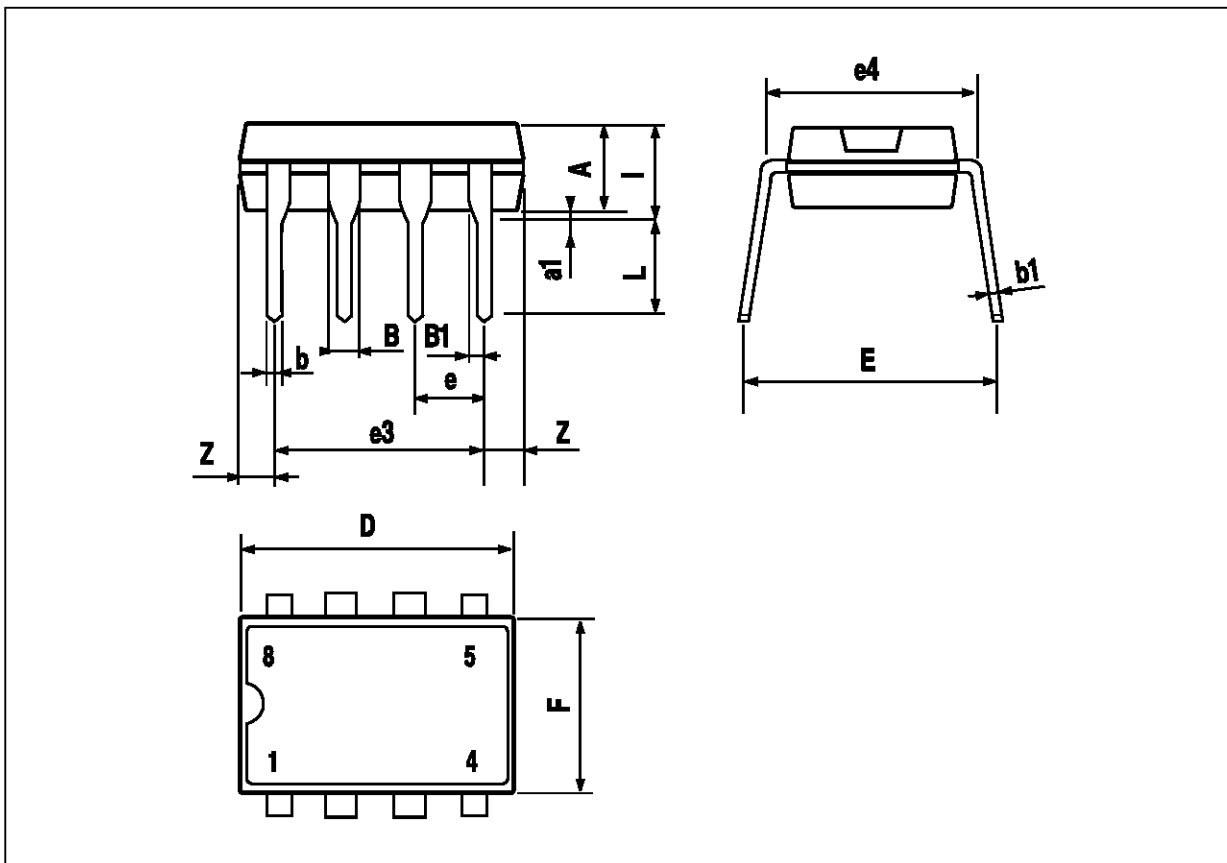
POWERDIP 16 PACKAGE MECHANICAL DATA

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



MINIDIP PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
I			5.08			0.200
L	3.18		3.81	0.125		0.150
Z			1.52			0.060



Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.