

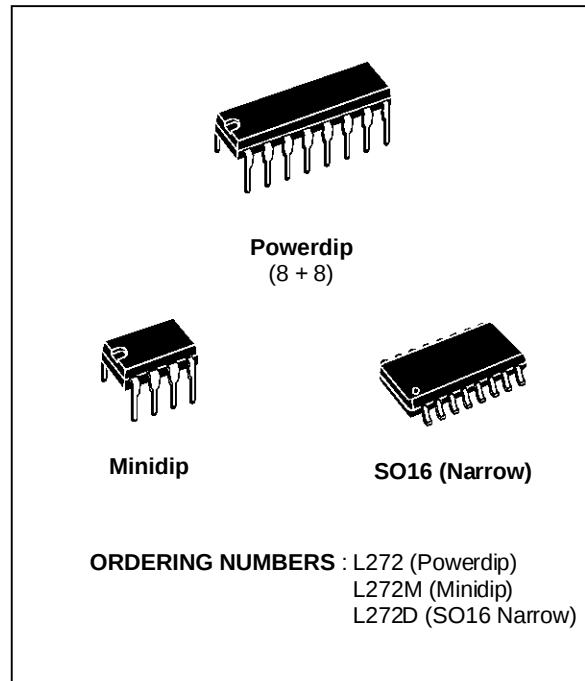
DUAL POWER OPERATIONAL AMPLIFIERS

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

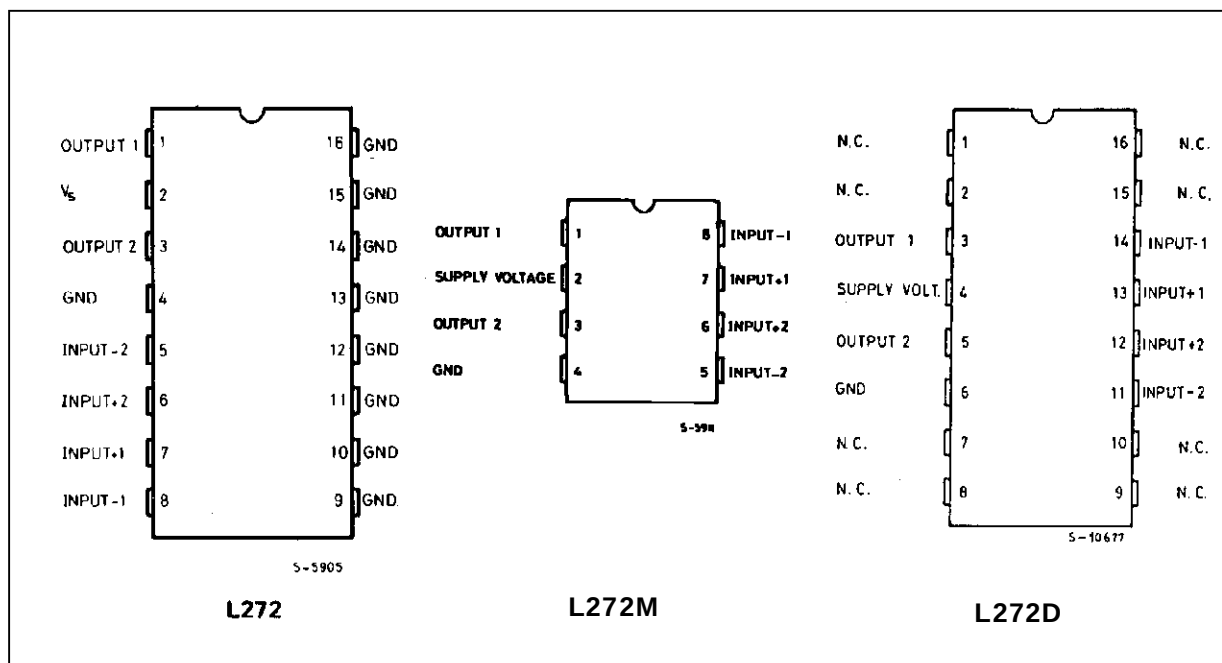
DESCRIPTION

The L272 is a monolithic integrated circuits in Powerdip, Minidip and SO packages intended for use as power operational amplifiers in a wide range of applications including servo amplifiers and power supplies, compact disc, VCR, etc.

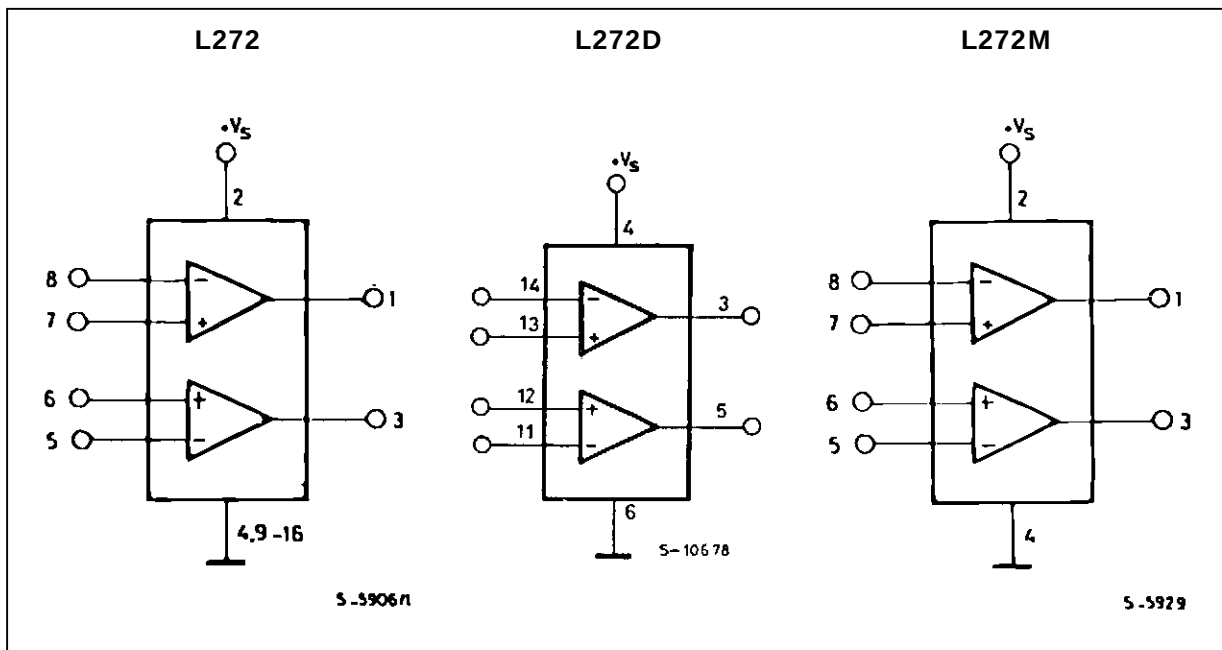
The high gain and high output power capability provide superior performance whatever an operational amplifier/power booster combination is required.



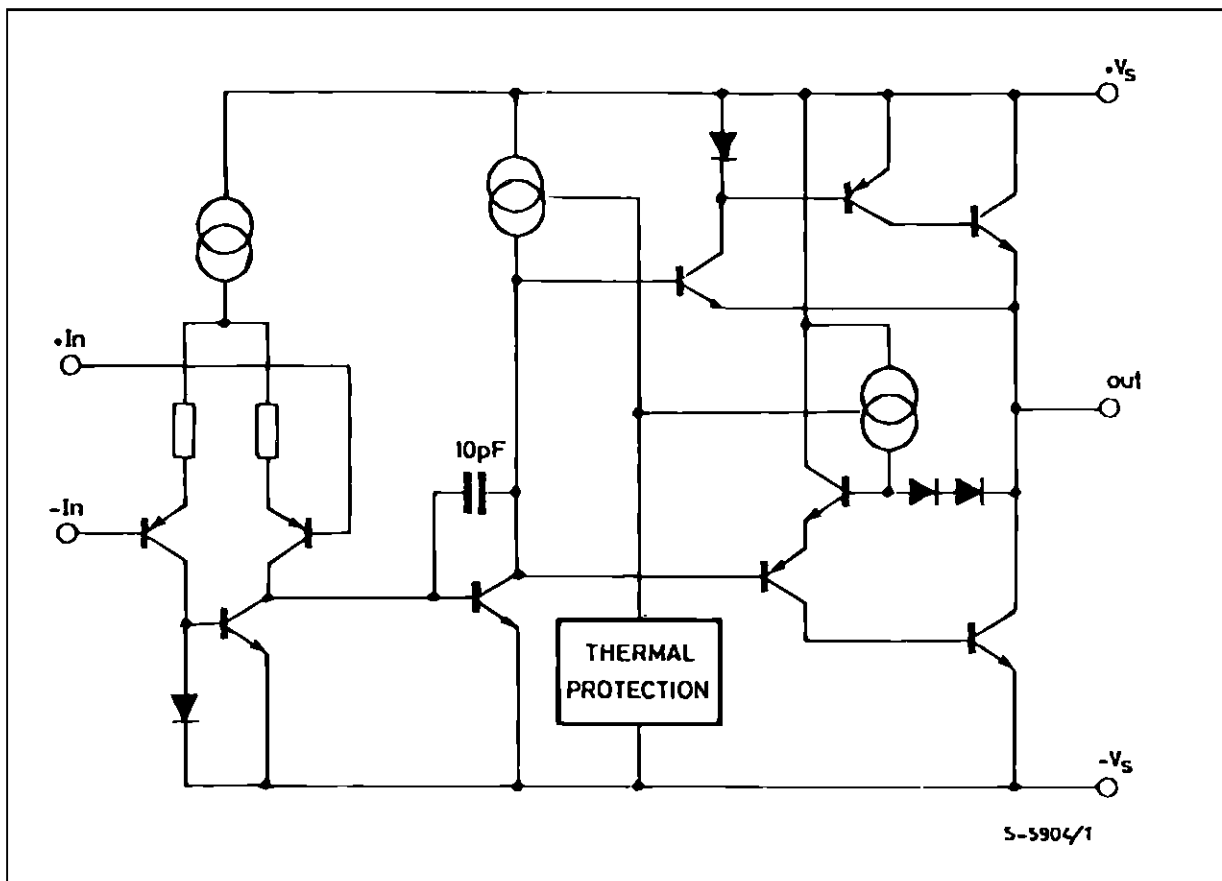
PIN CONNECTIONS (top view)



BLOCK DIAGRAMS



SCHEMATIC DIAGRAM (one only)



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_S	Supply Voltage	28	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: $T_{amb} = 80^\circ\text{C}$ (L272), $T_{amb} = 50^\circ\text{C}$ (L272M), $T_{case} = 90^\circ\text{C}$ (L272D) $T_{case} = 75^\circ\text{C}$ (L272)	1.2 5	W W
T_{op}	Operating Temperature Range (L272D)	- 40 to 85	$^\circ\text{C}$
T_{stg}, T_j	Storage and Junction Temperature	- 40 to 150	$^\circ\text{C}$

THERMAL DATA

Symbol	Parameter	Powerdip	SO16	Minidip	Unit
$R_{th\ j-case}$	Thermal Resistance Junction-pins Max.	15	—	* 70	$^\circ\text{C/W}$
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient Max.	70	—	100	$^\circ\text{C/W}$
$R_{th\ j-alumina}$	Thermal Resistance Junction-alumina Max.	—	** 50	—	$^\circ\text{C/W}$

* Thermal resistance junction-pin 4

** Thermal resistance junctions-pins with the chip soldered on the middle of an alumina supporting substrate measuring 15x 20mm; 0.65mm thickness and infinite heatsink.

ELECTRICAL CHARACTERISTICS ($V_S = 24\text{V}$, $T_{amb} = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_S	Supply Voltage		4		28	V
I_S	Quiescent Drain Current	$V_O = \frac{V_S}{2}$ $V_S = 24\text{V}$ $V_S = 12\text{V}$		8 7.5	12 11	mA mA
I_b	Input Bias Current			0.3	2.5	μA
V_{OS}	Input Offset Voltage			15	60	mV
I_{OS}	Input Offset Current			50	250	nA
SR	Slew Rate			1		V/ μs
B	Gain-bandwidth Product			350		kHz
R_i	Input Resistance		500			k Ω
G_v	O. L. Voltage Gain	$f = 100\text{Hz}$ $f = 1\text{kHz}$	60	70 50		dB dB
e_N	Input Noise Voltage	$B = 20\text{kHz}$		10		μV
I_N	Input Noise Current	$B = 20\text{kHz}$		200		pA
CRR	Common Mode Rejection	$f = 1\text{kHz}$	60	75		dB
SVR	Supply Voltage Rejection	$f = 100\text{Hz}$, $R_G = 10\text{k}\Omega$, $V_R = 0.5\text{V}$ $V_S = 24\text{V}$ $V_S = \pm 12\text{V}$ $V_S = \pm 6\text{V}$	54	70 62 56		dB
V_O	Output Voltage Swing	$I_p = 0.1\text{A}$ $I_p = 0.5\text{A}$	21	23 22.5		V V
C_s	Channel Separation	$f = 1\text{kHz}$; $R_L = 10\Omega$, $G_v = 30\text{dB}$ $V_S = 24\text{V}$ $V_S = \pm 6\text{V}$		60 60		dB
d	Distortion	$f = 1\text{kHz}$, $G_v = 3\text{dB}$, $V_S = 24\text{V}$, $R_L = \infty$		0.5		%
T_{sd}	Thermal Shutdown Junction Temperature			145		$^\circ\text{C}$

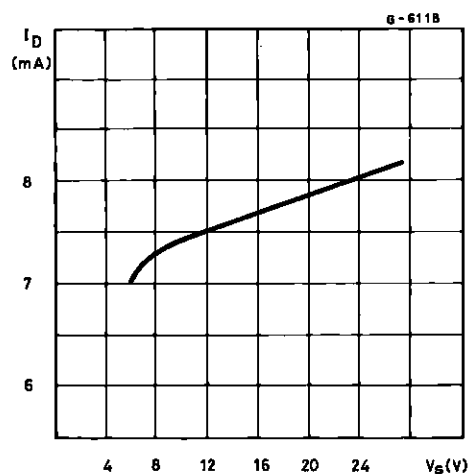
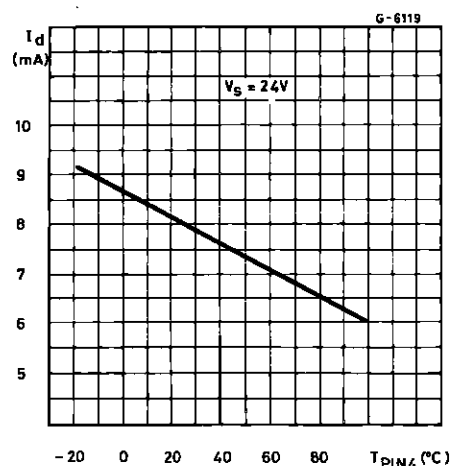
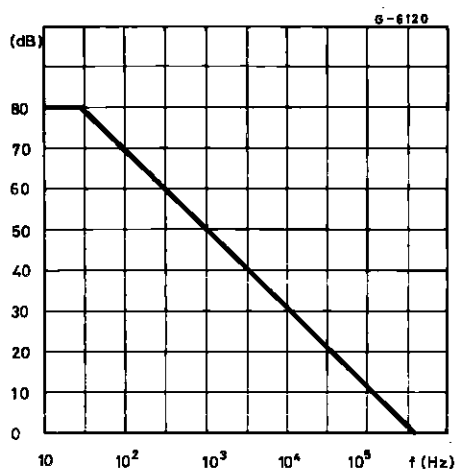
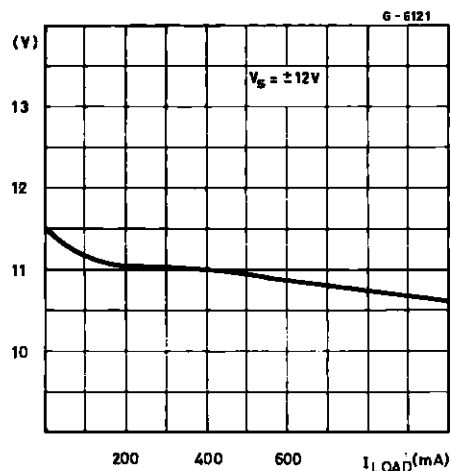
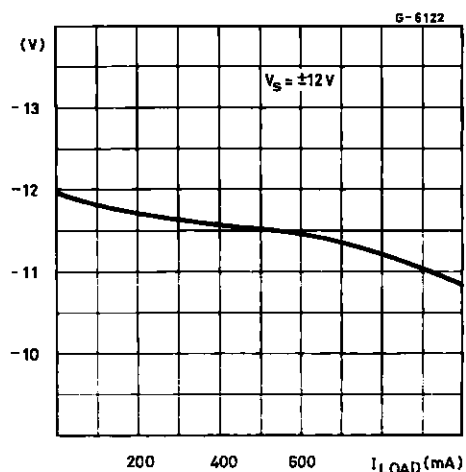
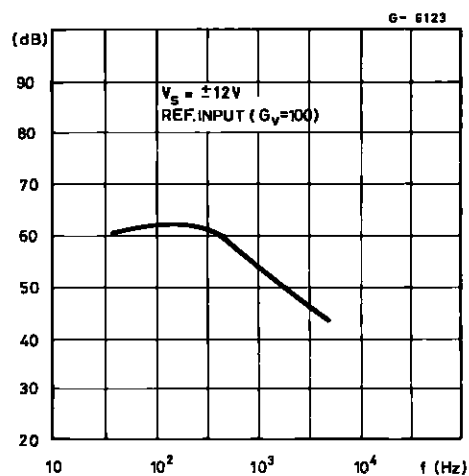
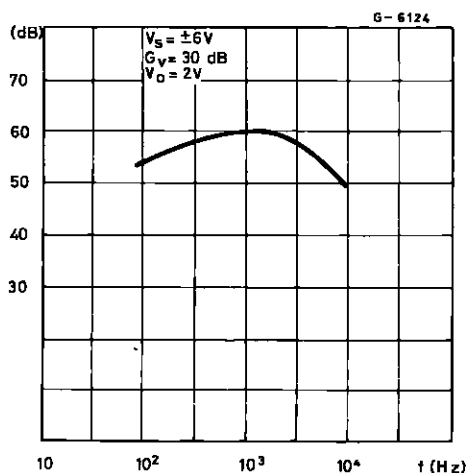
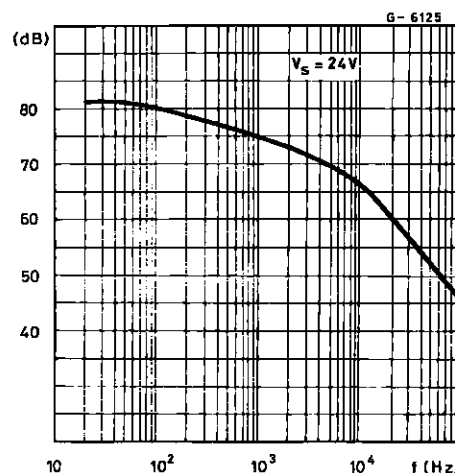
Figure 1 : Quiescent Current versus Supply Voltage**Figure 2 :** Quiescent Drain Current versus Temperature**Figure 3 :** Open Loop Voltage Gain**Figure 4 :** Output Voltage Swing versus Load Current**Figure 5 :** Output Voltage Swing versus Load Current**Figure 6 :** Supply Voltage Rejection versus Frequency

Figure 7 : Channel Separation versus Frequency**Figure 8 :** Common Mode Rejection versus Frequency**APPLICATION SUGGESTION****NOTE**

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.

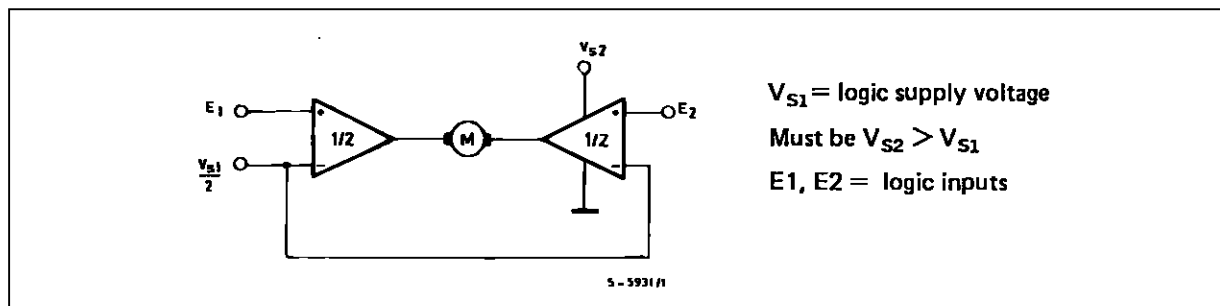
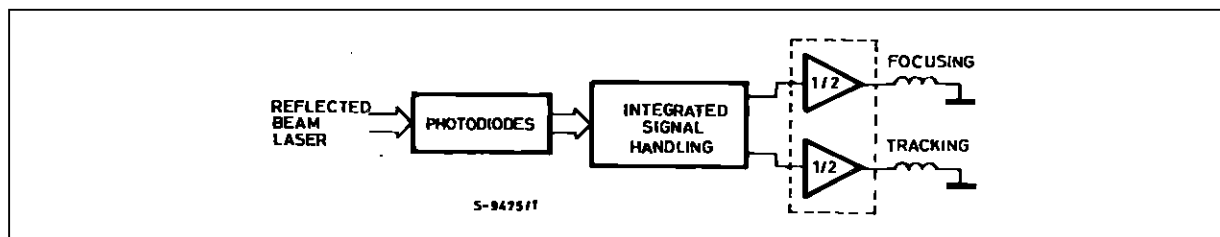
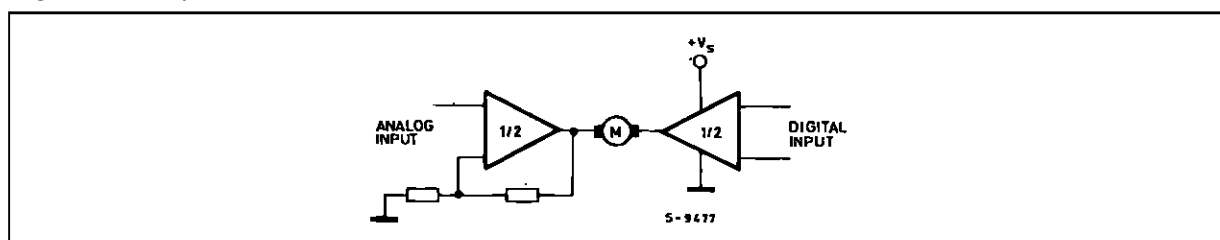
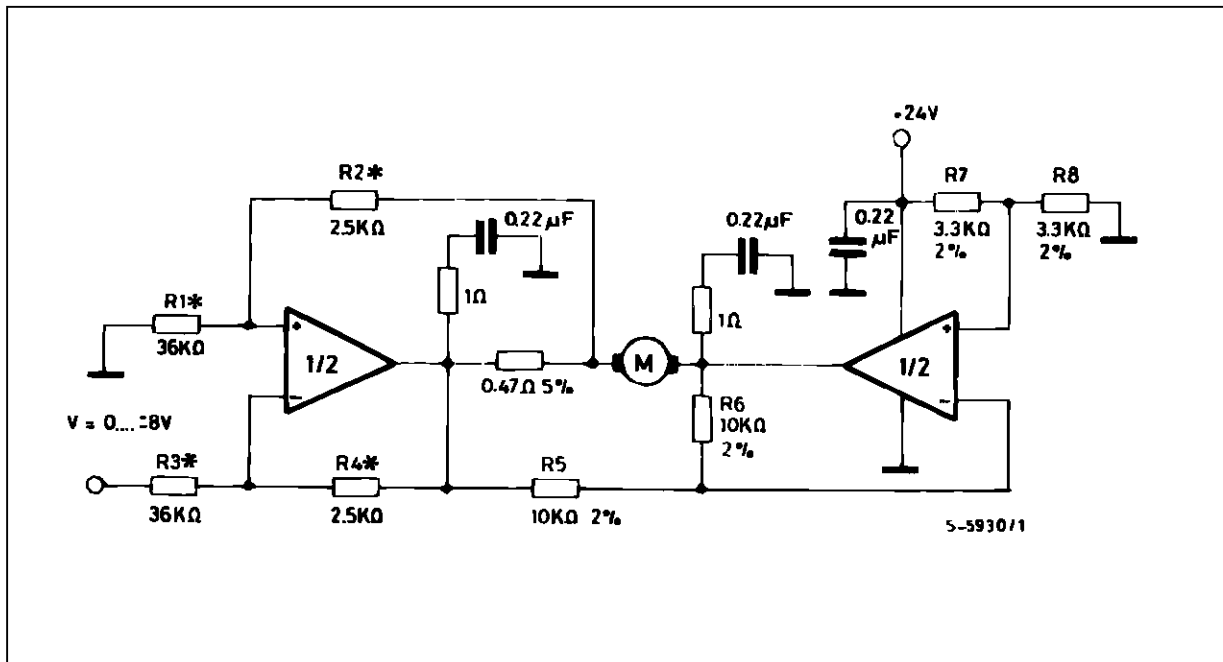
Figure 9 : Bidirectional DC Motor Control with μP Compatible Inputs**Figure 10 :** Servocontrol for Compact-disc**Figure 11 :** Capstan Motor Control in Video Recorders

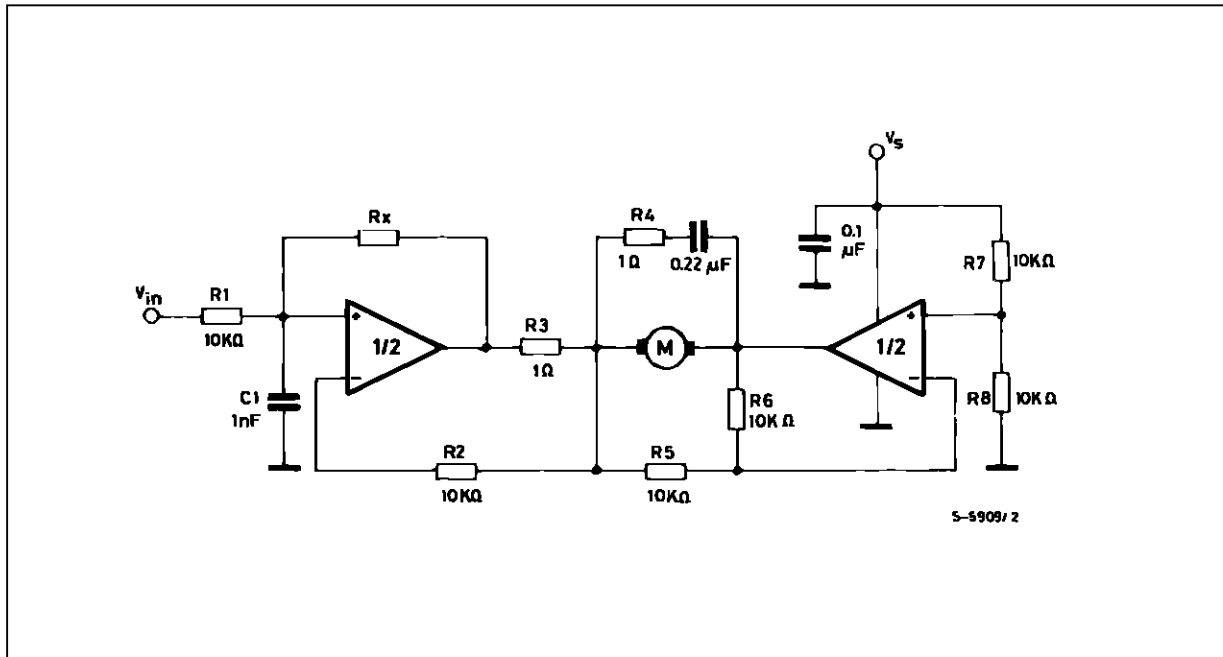
Figure 12 : Motor Current Control Circuit.

Note : The input voltage level is compatible with L291 (5-BIT D/A converter).

Figure 13 : Bidirectional Speed Control of DC Motors.

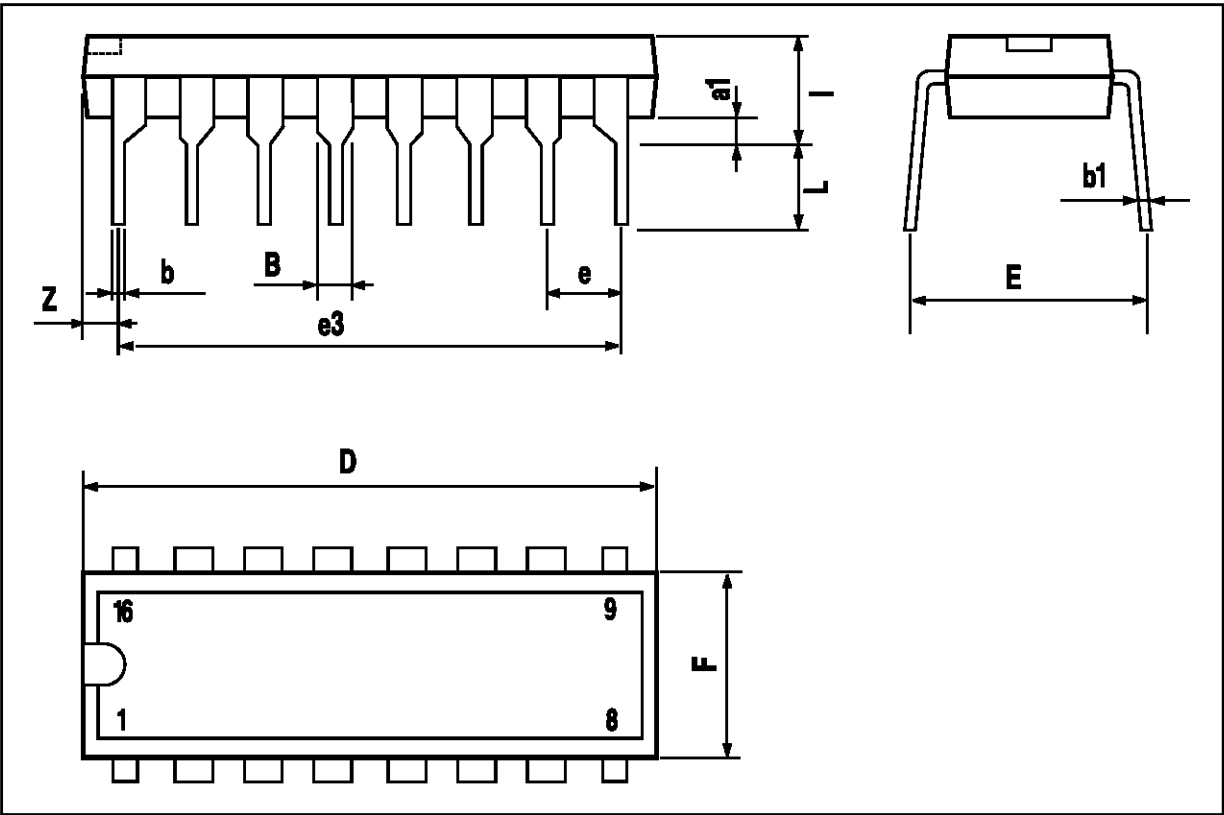
For circuit stability ensure that $R_X > \frac{2R_3 \cdot R_1}{R_M}$ where R_M = internal resistance of motor.

The voltage available at the terminals of the motor is $V_M = 2 \left(V_i \cdot \frac{V_s}{2} \right) + |R_0| \cdot I_M$ where $|R_0| = \frac{2R \cdot R_1}{R_X}$ and I_M is the motor current.



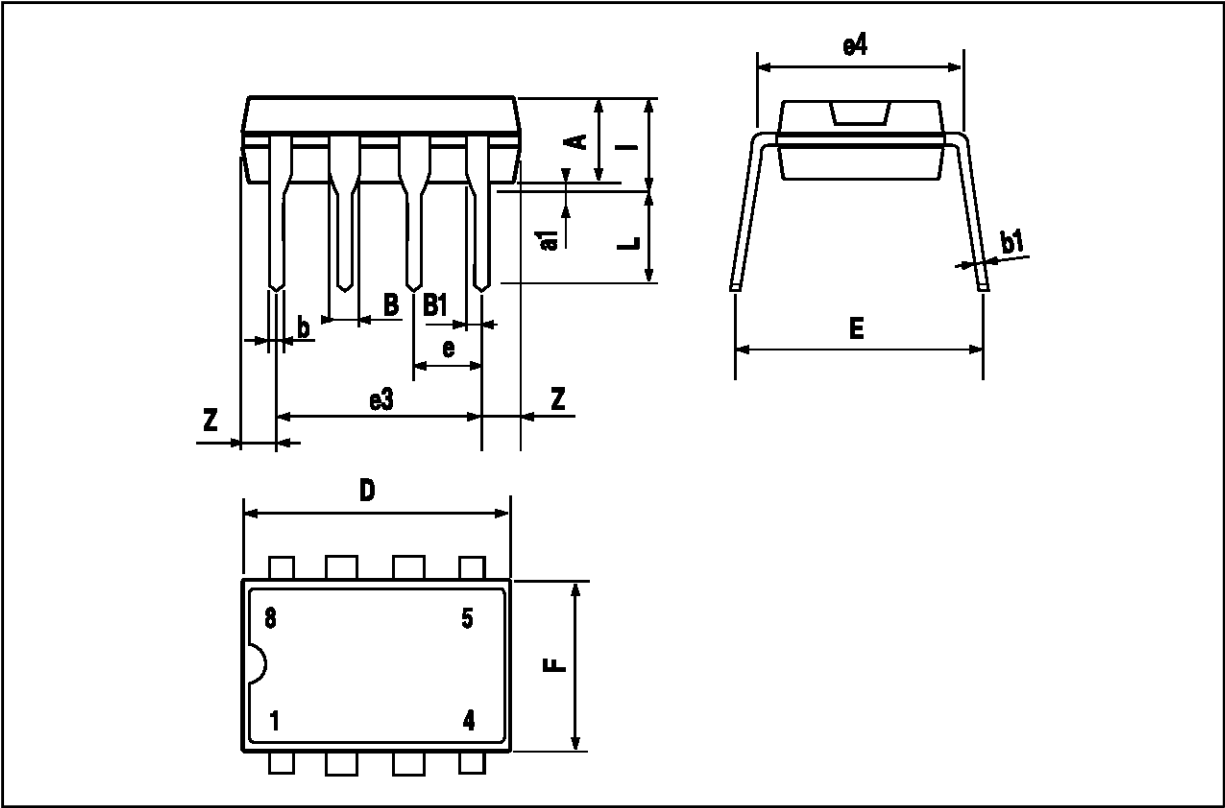
POWERDIP 16 PACKAGE MECHANICAL DATA

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



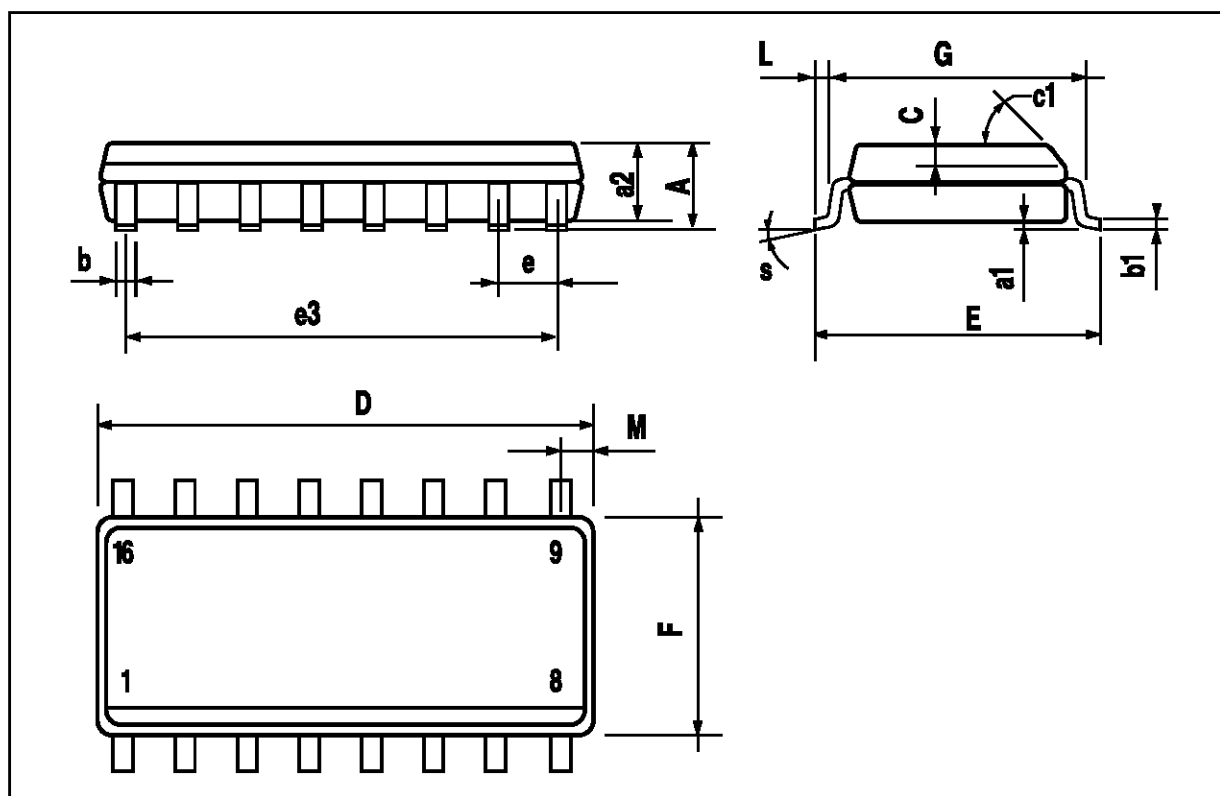
MINIDIP PACKAGE MECHANICAL DATA

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



SO16 NARROW PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.069
a1	0.1		0.25	0.004		0.009
a2			1.6			0.063
b	0.35		0.46	0.014		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.020	
c1	45° (typ.)					
D	9.8		10	0.386		0.394
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		8.89			0.350	
F	3.8		4.0	0.150		0.157
L	0.4		1.27	0.150		0.050
M			0.62			0.024
S	8° (max.)					



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