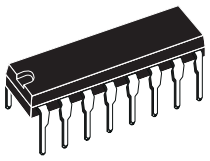
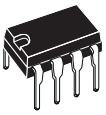
L2720/2/4

LOW DROP DUAL POWER OPERATIONAL AMPLIFIERS

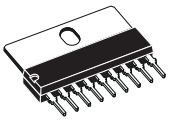
- OUTPUT CURRENT TO 1 A
- OPERATES AT LOW VOLTAGES
- SINGLE OR SPLIT SUPPLY
- LARGE COMMON-MODE AND DIFFERENTIAL MODE RANGE
- LOW INPUT OFFSET VOLTAGE
- GROUND COMPATIBLE INPUTS
- LOW SATURATION VOLTAGE
- THERMAL SHUTDOWN
- CLAMP DIODE



POWERDIP
(8 + 8)



MINIDIP
(Plastic)



SIP9

ORDERING NUMBERS : L2720 (Powerdip)
L2722 (Minidip)
L2724 (SIP9)

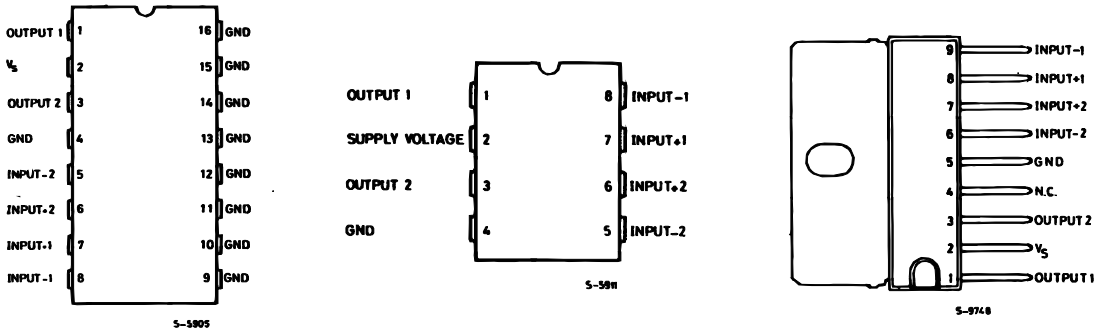
DESCRIPTION

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.

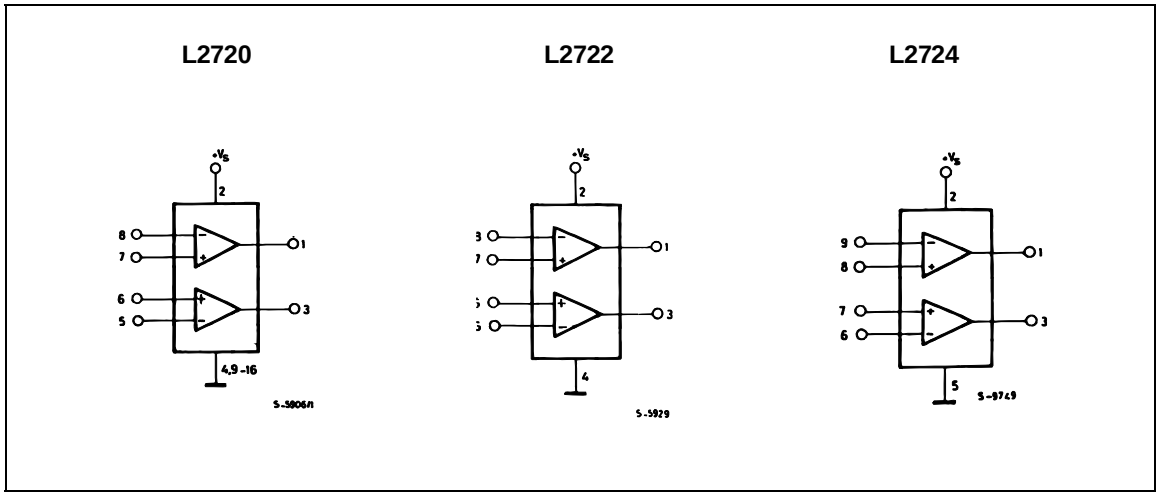
PIN CONNECTIONS (top views)



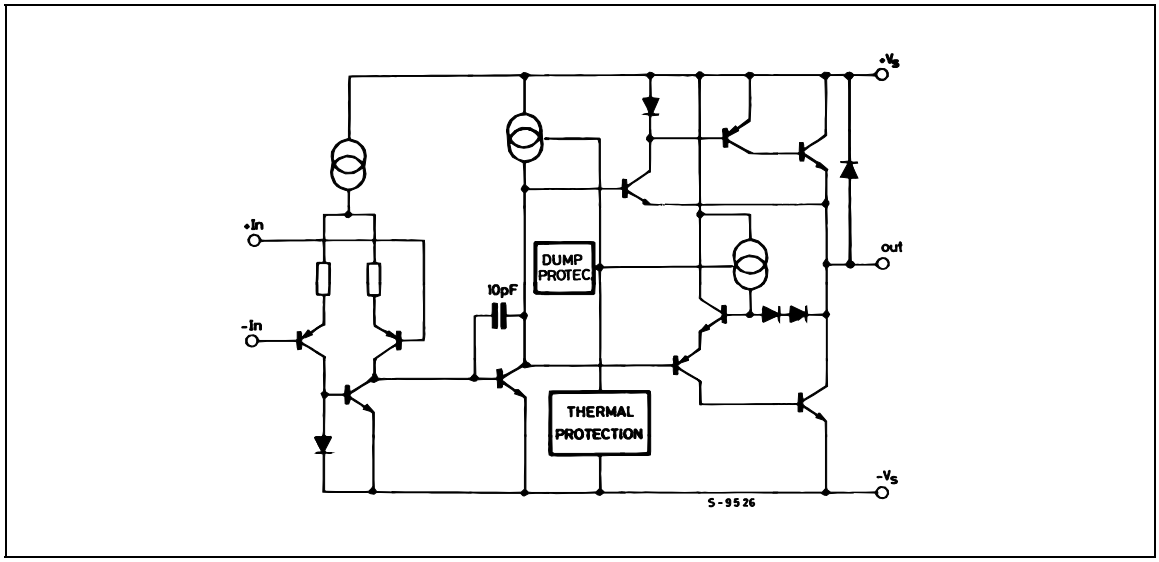
L2720 **L2722** **L2724**

Downloaded from Elcodis.com electronic components distributor

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°C (L2720), T_{amb} = 50°C (L2722) T_{case} = 75°C (L2720) T_{case} = 50°C (L2724)	1 5 10	W
T_{stg}, T_j	Storage and Junction Temperature	–40 to 150	°C

Downloaded from Elcodis.com electronic components distributor

THERMAL DATA

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

ELECTRICAL CHARACTERISTICS

V_S = 24V, T_{amb} = 25°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			kΩ
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 Voltage			200		pA
CMR	Common Mode Rejection	f = 1kHz	66	84		dB
SVR	Supply Voltage Rejection	f = 100Hz V_S = 24V R_G = 10kΩ V_S = ±12V V_R = 0.5V V_S = ±6V	60	70 75 80		dB
$V_{DROP(HIGH)}$		V_S = ±2.5V to ±12V I_p = 100mA I_p = 500mA		0.7 1	 1.5	V
$V_{DROP(LOW)}$		V_S = ±2.5V to ±12V I_p = 100mA I_p = 500mA		0.3 0.5	 1	V
C_S	Channel Separation	f = 1KHz V_S = 24V R_L = 10Ω V_S = 6V G_V = 30dB		60 60		dB
T_{sd}	Thermal Shutdown Junction Temperature			145		°C

Figure 1 : Quiescent Current vs. Supply Voltage

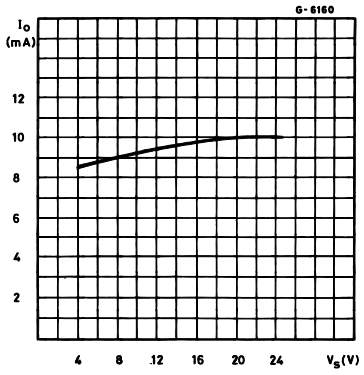
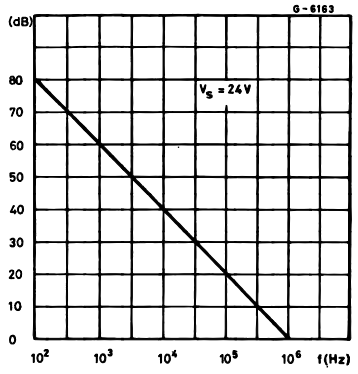


FIgure 2 : Open Loop Gain vs. Frequency



Downloaded from Elcodis.com electronic components distributor

Figure 3 : Common Mode Rejection vs. Frequency

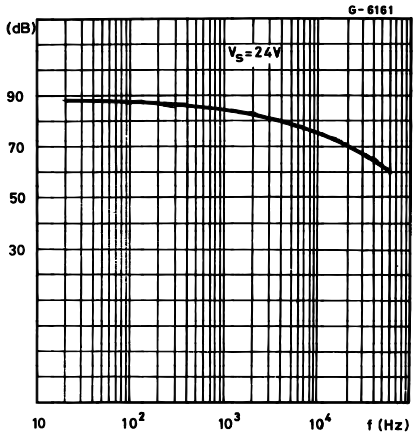


Figure 4 : Output Swing vs. Load Current ($V_S = \pm 5$ V.

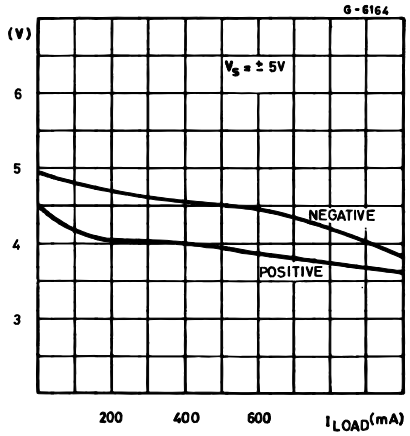


Figure 5 : Output Swing vs. Load Current ($V_S = \pm 12$ V.

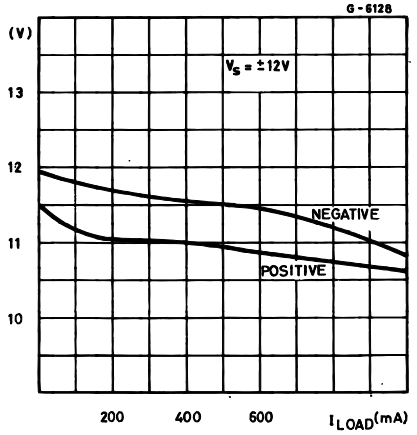


Figure 6 : Supply Voltage rejection vs. Frequency

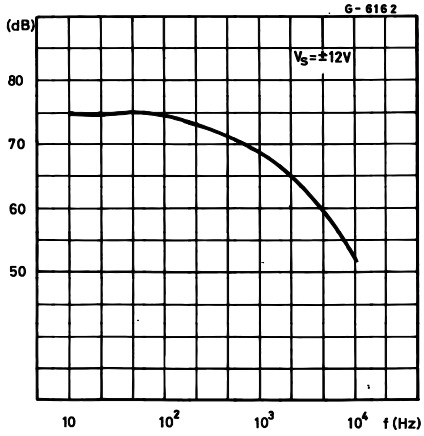
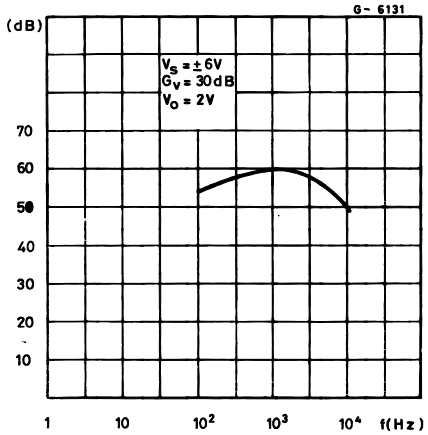


Figure 7 : Channel Separation vs. Frequency



Downloaded from Elcodis.com electronic components distributor

APPLICATION SUGGESTION

In order to avoid possible instability occuring 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 + 1Ω series) between outputs and ground or across the load. With single supply operation, a resistor (1kΩ) between the output and supply pin can be necessary for stability.

Figure 8 : Bidirectional DC Motor Control with µP Compatible Inputs

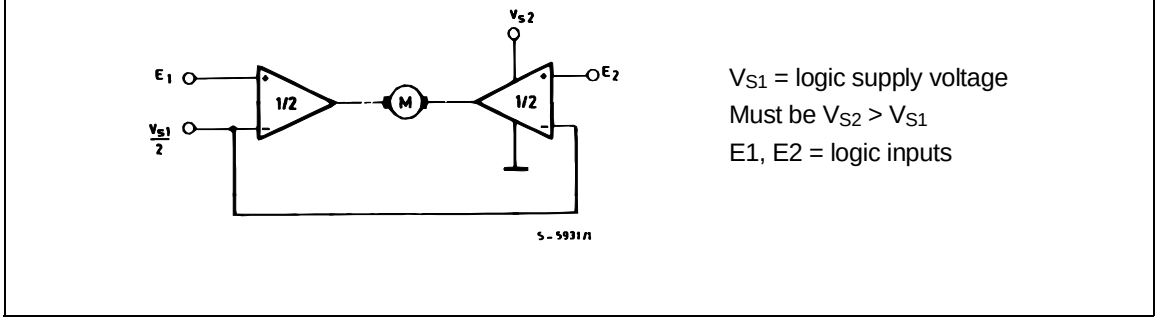


Figure 9 : Servocontrol for Compact-disc

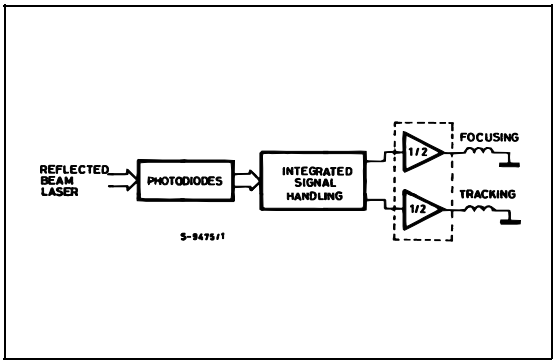


Figure 10 : Capstan Motor Control in Video Recorders

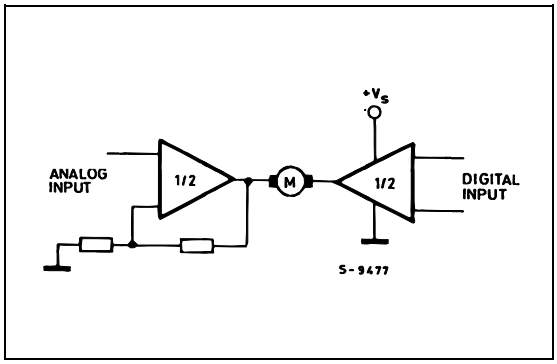
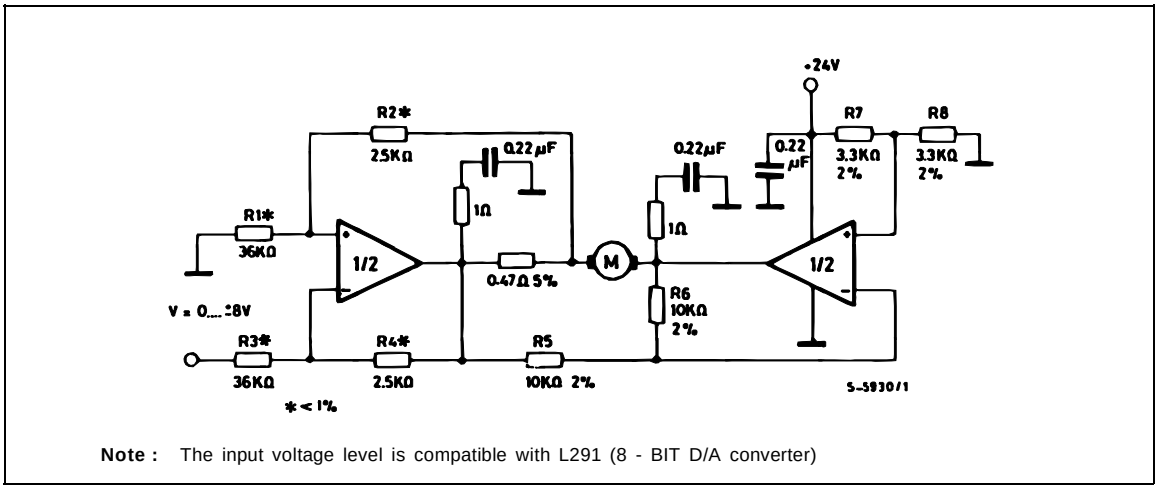


Figure 11 : Motor Current Control Circuit



Note : The input voltage level is compatible with L291 (8 - BIT D/A converter)

Downloaded from Elcodis.com electronic components distributor

Figure 12 : Bidirectional Speed Control of DC Motors

For circuit stability ensure that $R_X > \frac{2R3 \cdot R1}{RM}$ where R_M = internal resistance of motor.

The voltage available at the terminals of the motor is $V_M = 2 (V_I - \frac{V_S}{2}) + |R_O|. I_M$ where $|R_O| = \frac{2R3 \cdot R1}{R_X}$ and I_M is the motor current.

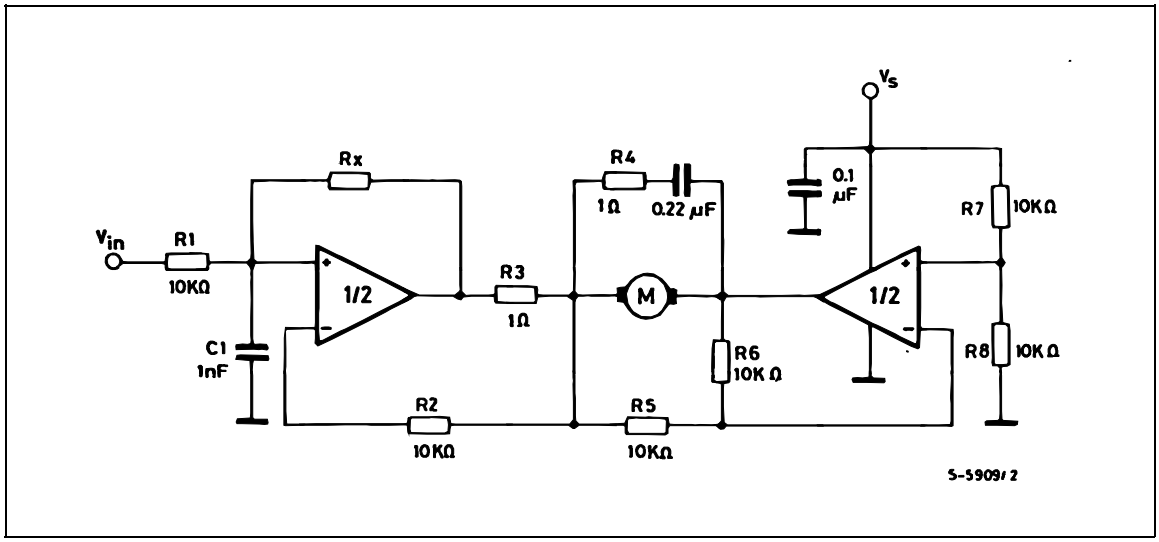
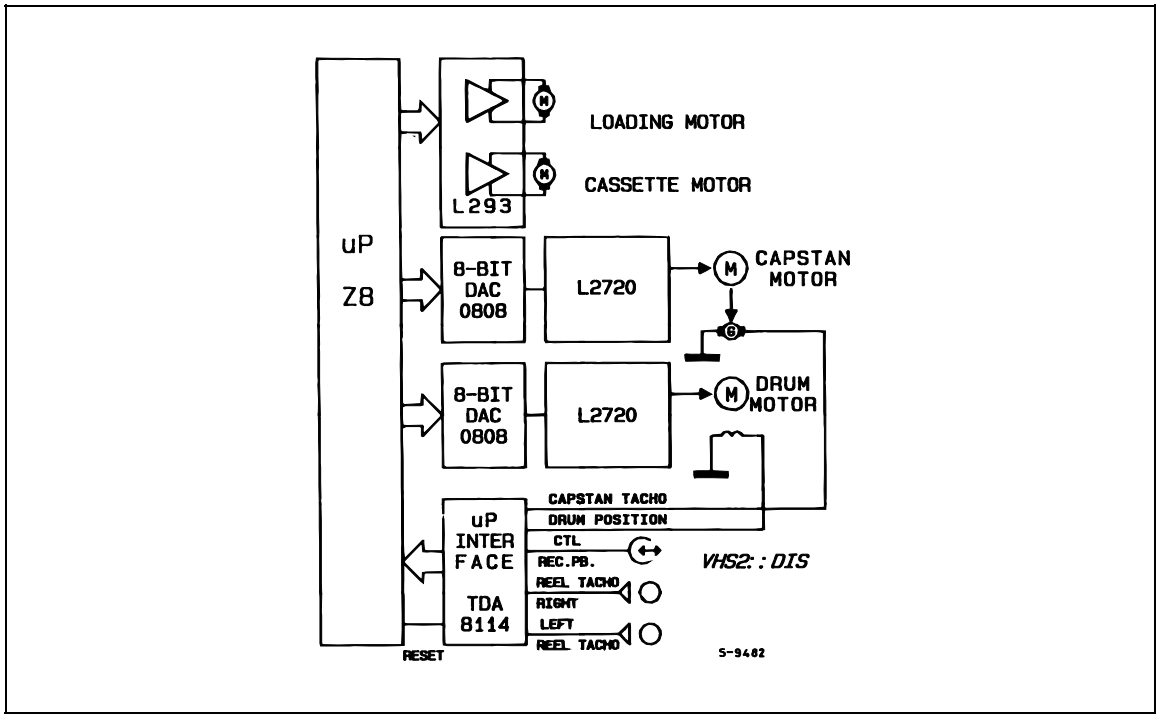


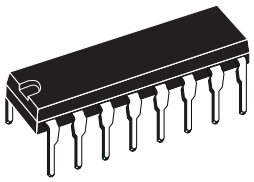
Figure 13 : VHS-VCR Motor Control Circuit



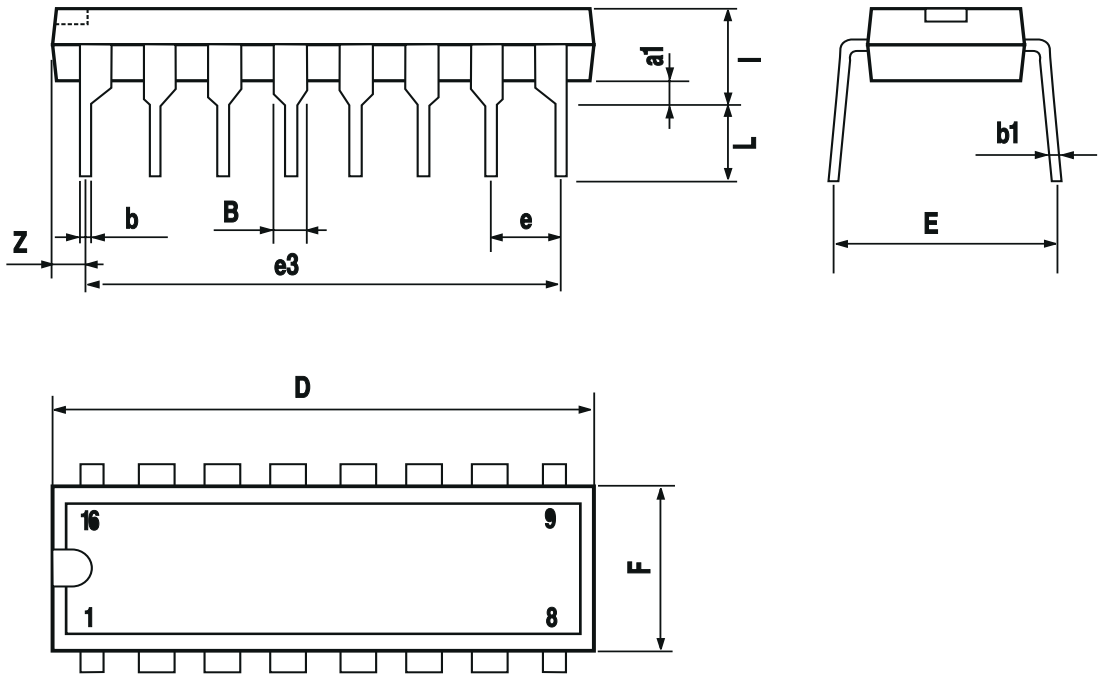
Downloaded from Elcodis.com electronic components distributor

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

OUTLINE AND MECHANICAL DATA



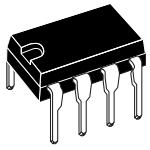
Powerdip 16



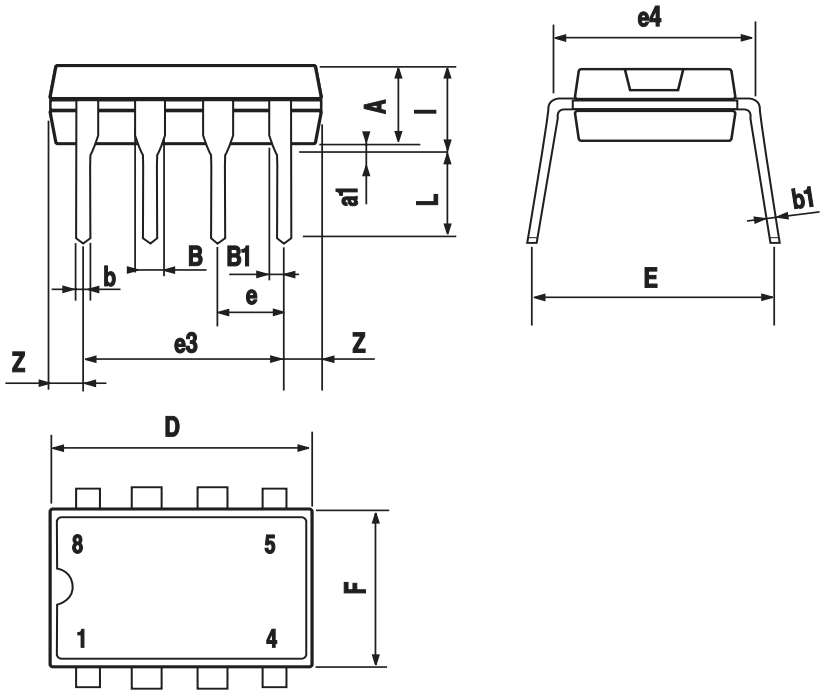
Downloaded from Elcodis.com electronic components distributor

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

OUTLINE AND MECHANICAL DATA



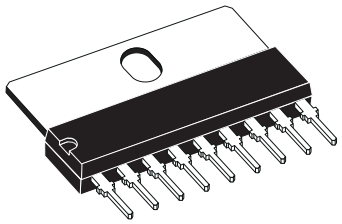
Minidip



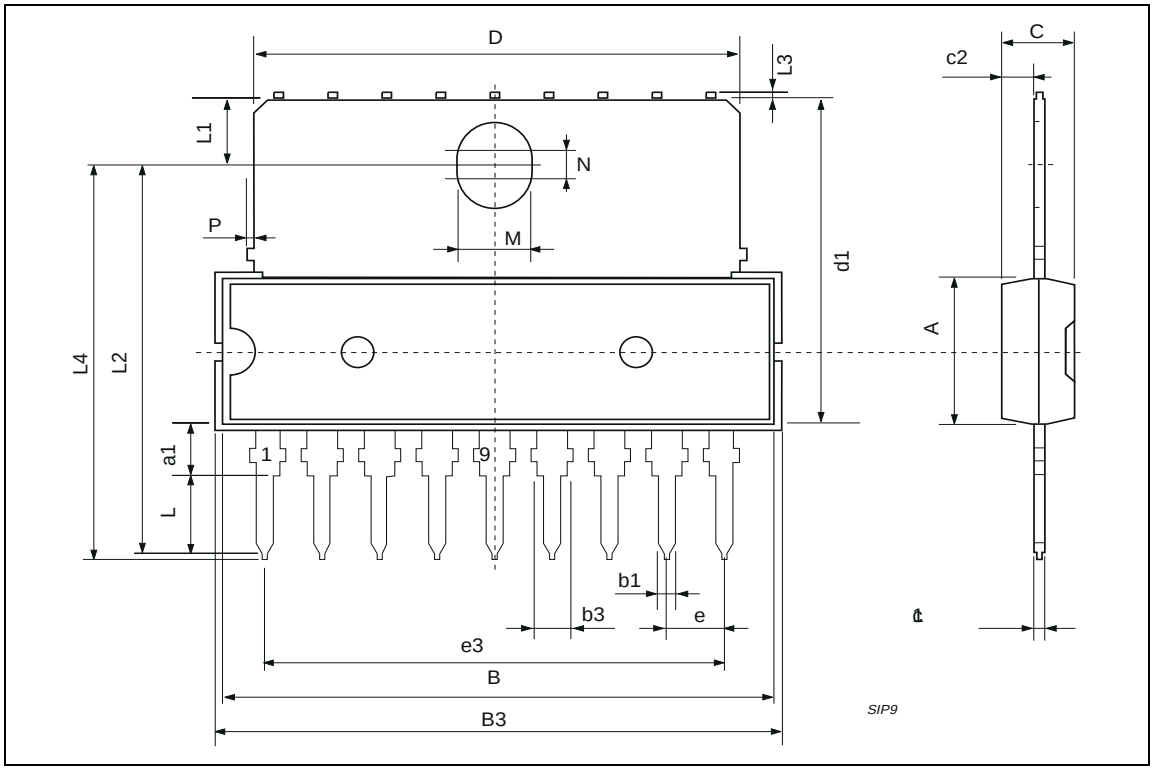
Downloaded from Elcodis.com electronic components distributor

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			7.1			0.280
a1	2.7		3	0.106		0.118
B			23			0.90
B3			24.8			0.976
b1		0.5			0.020	
b3	0.85		1.6	0.033		0.063
C		3.3			0.130	
c1		0.43			0.017	
c2		1.32			0.052	
D			21.2			0.835
d1		14.5			0.571	
e		2.54			0.100	
e3		20.32			0.800	
L	3.1			0.122		
L1		3			0.118	
L2		17.6			0.693	
L3			0.25			0.010
L4	17.4		17.85	0.685		0,702
M		3.2			0.126	
N		1			0.039	
P			0.15			0.006

OUTLINE AND MECHANICAL DATA



SIP9



Downloaded from Elcodis.com electronic components distributor

Information furnished is believed to be accurate and reliable. However, STMicroelectronics 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 STMicroelectronics. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 2003 STMicroelectronics – Printed in Italy – All Rights Reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States.

http://www.st.com

Downloaded from Elcodis.com electronic components distributor