

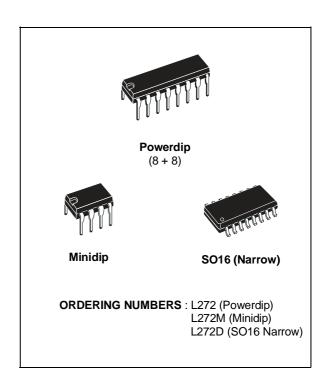
DUAL POWER OPERATIONAL AMPLIFIERS

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

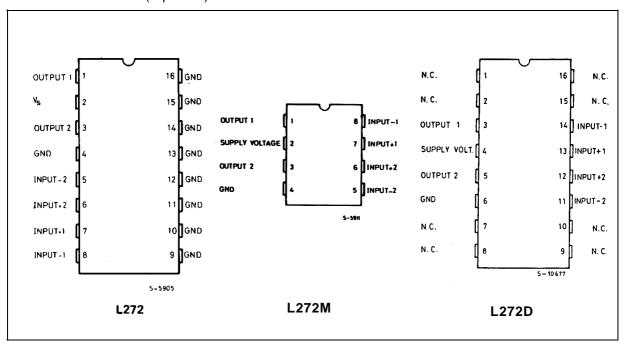


The L272 is a monolithic integrated circuits in Powerdip, Minidip and SO packages intended for use as power operational amplifiers in a wide range of applications including servo amplifiers and power supplies, compacts disc, VCR, etc.

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

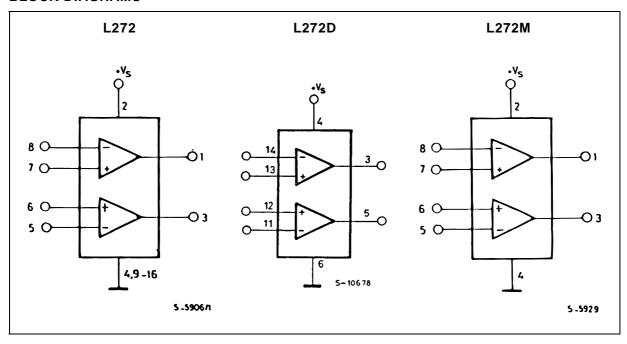


PIN CONNECTIONS (top view)

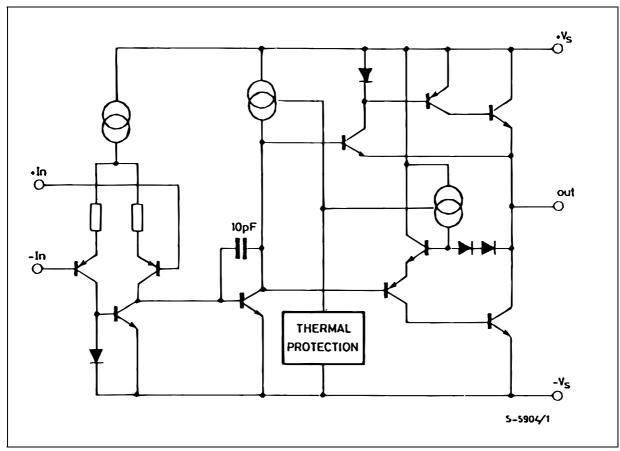


July 2003 1/10

BLOCK DIAGRAMS



SCHEMATIC DIAGRAM (one only)



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
Vs	Supply Voltage	28	V
Vi	Input Voltage	Vs	
Vi	Differential Input Voltage	± V _s	
Io	DC Output Current	1	Α
Ip	Peak Output Current (non repetitive)	1.5	Α
P _{tot}	Power Dissipation at: $T_{amb} = 80^{\circ}C$ (L272), $T_{amb} = 50^{\circ}C$ (L272M), $T_{case} = 90^{\circ}C$ (L272D) $T_{case} = 75^{\circ}C$ (L272)	1.2 5	W W
T _{op}	Operating Temperature Range (L272D)	- 40 to 85	°C
T _{stg} , T _j	Storage and Junction Temperature	- 40 to 150	°C

THERMAL DATA

Symbol	Parameter		Powerdip	SO16	Minidip	Unit
R _{th j-case}	Thermal Resistance Junction-pins	Max.	15	-	* 70	°C/W
R _{th j-amb}	Thermal Resistance Junction-ambient	Max.	70	_	100	°C/W
R _{th j-alumina}	Thermal Resistance Junction-alumina	Max.	_	** 50	_	°C/W

ELECTRICAL CHARACTERISTICS (V_S = 24V, T_{amb} = 25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
Vs	Supply Voltage		4		28	V
Is	Quiescent Drain Current	$V_{O} = \frac{V_{S}}{2}$ $V_{S} = 24V$ $V_{S} = 12V$		8 7.5	12 11	mA mA
I _b	Input Bias Current			0.3	2.5	μΑ
Vos	Input Offset Voltage			15	60	mV
I _{os}	Input Offset Current			50	250	nA
SR	Slew Rate			1		V/μs
В	Gain-bandwidth Product			350		kHz
R _i	Input Resistance		500			kΩ
Gv	O. L. Voltage Gain	f = 100Hz f = 1kHz	60	70 50		dB dB
en	Input Noise Voltage	B = 20kHz		10		μV
I _N	Input Noise Current	B = 20kHz		200		pА
CRR	Common Mode Rejection	f = 1kHz	60	75		dB
SVR	Supply Voltage Rejection	$ \begin{cases} f = 100 Hz, \ R_G = 10 k\Omega, \ V_R = 0.5V \\ V_s = 24V \\ V_s = \pm 12V \\ V_s = \pm 6V \\ \end{cases} $	54	70 62 56		dB
Vo	Output Voltage Swing	$I_p = 0.1A$ $I_p = 0.5A$	21	23 22.5		V
Cs	Channel Separation	$ f = 1 \text{ kHz; } R_L = 10\Omega, \ G_v = 30 \text{dB} \\ V_s = 24V \\ V_s = \pm 6V $		60 60		dB
d	Distortion	$f = 1kHz$, $G_V = 3 dB$, $V_S = 24V$, $R_L = \infty$		0.5		%
T _{sd}	Thermal Shutdown Junction Temperature			145		°C



^{*} 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.

Figure 1 : Quiescent Current versus Supply Voltage

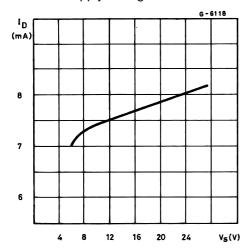


Figure 3: Open Loop Voltage Gain

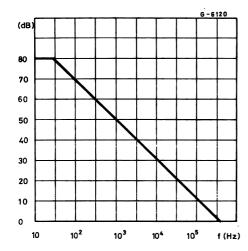


Figure 5 : Output Voltage Swing versus Load Current

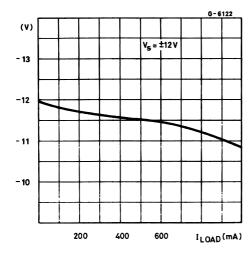


Figure 2 : Quiescent Drain Current versus Temperature

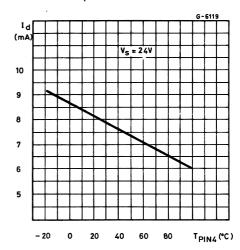


Figure 4 : Output Voltage Swing versus Load Current

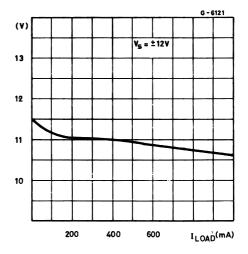
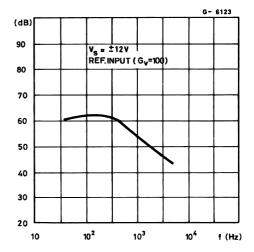


Figure 6 : Supply Voltage Rejection versus Frequency



4

Figure 7 : Channel Separation versus Frequency

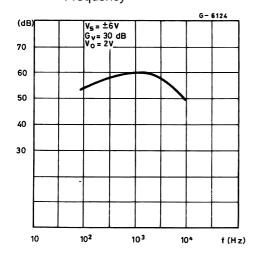
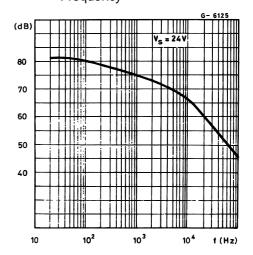


Figure 8 : Common Mode Rejection versus Frequency



APPLICATION SUGGESTION

NOTE

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 corrected between supply pins and ground;
- boucherot cell (0.1 to 0.2 μ F + 1 Ω series) between

Figure 9 : Bidirectional DC Motor Control with μP Compatible Inputs

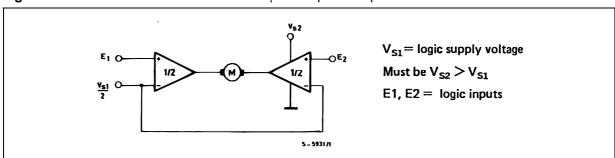


Figure 10: Servocontrol for Compact-disc

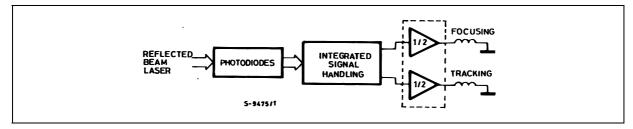


Figure 11: Capstan Motor Control in Video Recorders

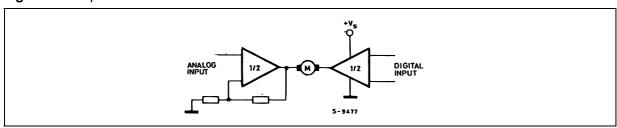
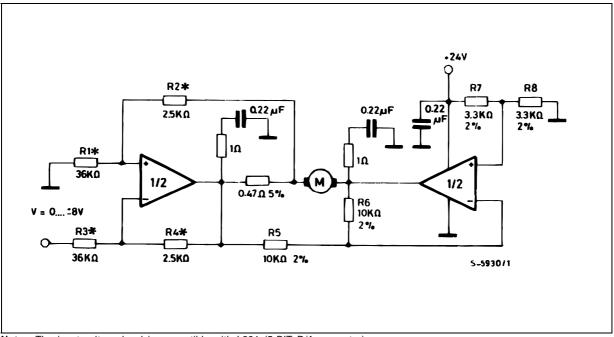


Figure 12: Motor Current Control Circuit.

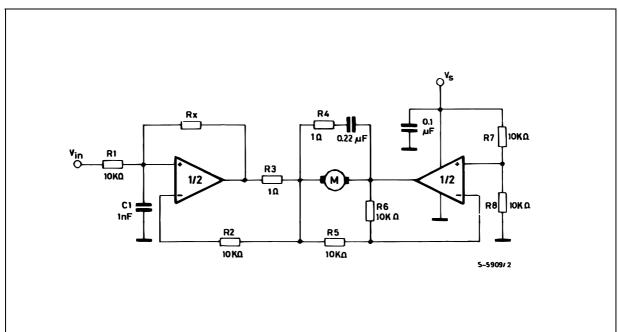


Note: The input voltage level is compatible with L291 (5-BIT D/A converter).

Figure 13: Bidirectional Speed Control of DC Motors.

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

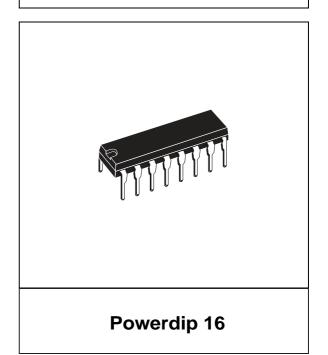
The voltage available at the terminals of the motor is $V_M = 2 \left(V_i \cdot \frac{V_s}{2} \right) + \left| R_o \right| \cdot \left| I_M \right| = \frac{2R \circ R1}{R_X}$ and I_M is the motor current.

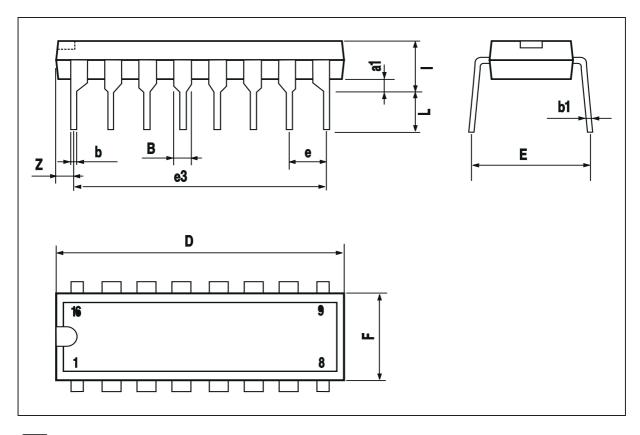


4

DIM.	mm			inch			
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
a1	0.51			0.020			
В	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		
е		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	

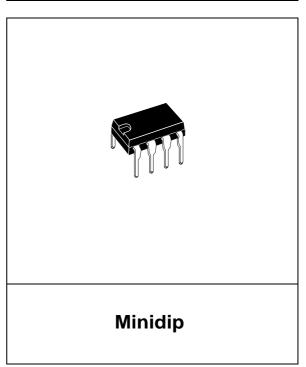
OUTLINE AND MECHANICAL DATA

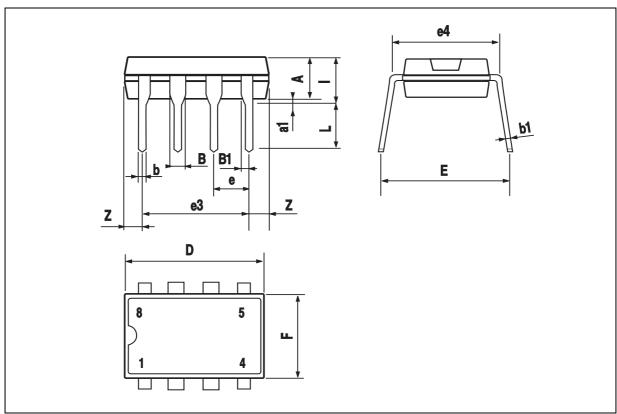




DIM.	mm			inch			
DIWI.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
Α		3.32			0.131		
a1	0.51			0.020			
В	1.15		1.65	0.045		0.065	
b	0.356		0.55	0.014		0.022	
b1	0.204		0.304	0.008		0.012	
D			10.92			0.430	
E	7.95		9.75	0.313		0.384	
е		2.54			0.100		
e3		7.62			0.300		
e4		7.62			0.300		
F			6.6			0.260	
I			5.08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

OUTLINE AND MECHANICAL DATA



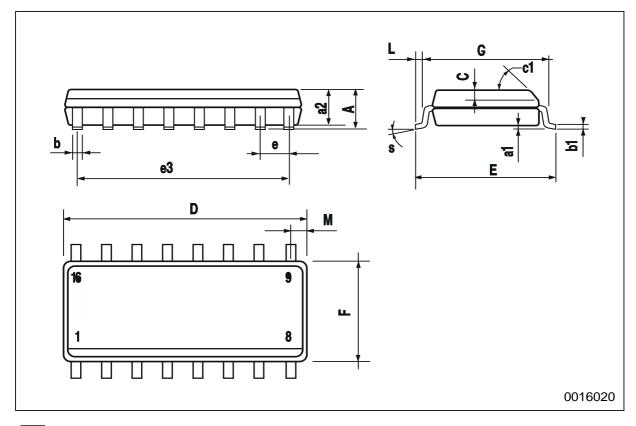


DIM.	mm			inch		
Diwi.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
Α			1.75			0.069
a1	0.1		0.25	0.004		0.009
a2			1.6			0.063
b	0.35		0.46	0.014		0.018
b1	0.19		0.25	0.007		0.010
С		0.5			0.020	
c1			45° (typ.)		
D (1)	9.8		10	0.386		0.394
E	5.8		6.2	0.228		0.244
е		1.27			0.050	
еЗ		8.89			0.350	
F (1)	3.8		4	0.150		0.157
G	4.6		5.3	0.181		0.209
L	0.4		1.27	0.016		0.050
М			0.62			0.024
S	8°(max.)					

OUTLINE AND MECHANICAL DATA



(1) D and F do not include mold flash or protrusions. Mold flash or potrusions shall not exceed 0.15mm (.006inch).



47/

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.

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

