SGS-THOMSON MICROELECTRONICS

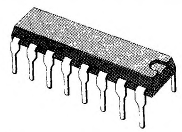
L272
L272M

DUAL POWER OPERATIONAL AMPLIFIERS

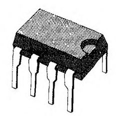
- OUTPUT CURRENT TO 1A
- OPERATES AT LOW VOLTAGES
- SINGLE OR SPLIT SUPPLY
- LARGE COMMON-MODE AND DIFFERENTIAL MODE RANGE
- GROUND COMPATIBLE INPUTS
- LOW SATURATION VOLTAGE
- THERMAL SHUTDOWN

The L272 and L272M are monolithic integrated circuits in powerdip and minidip 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.



Powerdip (8 + 8)



Minidip Plastic

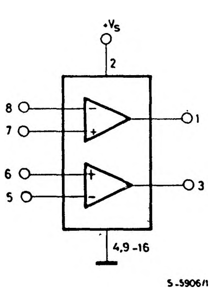
ORDERING NUMBERS:

L272 L272M

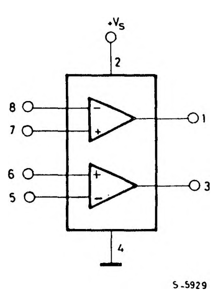
ABSOLUTE MAXIMUM RATINGS

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 $T_{amb} = 80°C$ (**L272**), $T_{amb} = 50°C$ (**L272M**)	1	W
	$T_{case} = 75°C$ (**L272**)	5	W
T_{stg}, T_j	Storage and junction temperature	-40 to 150	°C

BLOCK DIAGRAM

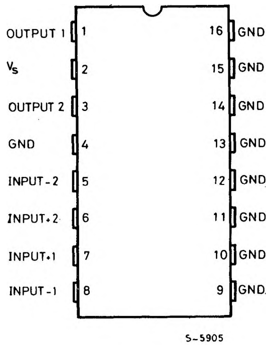


L272

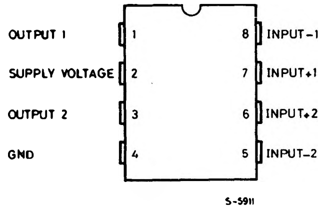


L272M

CONNECTION DIAGRAM
(Top view)

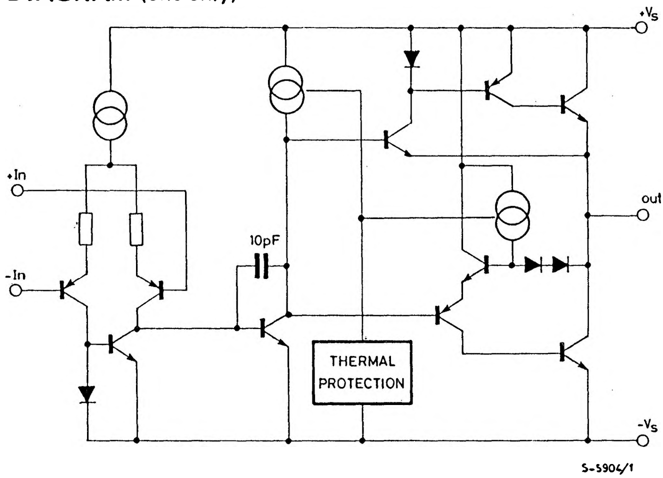


L272



L272M

SCHEMATIC DIAGRAM (one only)



THERMAL DATA			Powerdip	Minidip
$R_{th\ j\text{-}case}$	Thermal resistance junction-pins	max	15°C/W	* 70°C/W
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	70°C/W	100°C/W

* Thermal resistance junction-pin 4

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

Parameter		Test Conditions		Min.	Typ.	Max.	Unit
V_s	Supply voltage			4		28	V
I_s	Quiescent drain current	$V_o = \frac{V_s}{2}$	$V_s = 24V$		8	12	mA
			$V_s = 12V$		7.5	11	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			KΩ
G_v	O.L. voltage gain	f = 100Hz		60	70		dB
		f = 1KHz			50		dB
e_N	Input noise voltage	B = 20KHz			10		μV
I_N	Input noise current	B = 20KHz			200		pA
CRR	Common Mode rejection	f = 1KHz		60	75		dB
SVR	Supply voltage rejection	f = 100Hz R_G = 10KΩ V_R = 0.5V	V_s = 24V V_s = ±12V V_s = ± 6V	54	70 62 56		dB dB dB
V_o	Output voltage swing		I_p = 0.1A I_p = 0.5A	21	23 22.5		V V
C_s	Channel separation	f = 1KHz; R_L = 10Ω; G_v = 30dB	V_s = 24V V_s = ± 6V		60 60		dB dB
d	Distortion	f = 1KHz V_s = 24V	G_v = 30dB R_L = ∞		0.5		%
T_{sd}	Thermal shutdown junction temperature				145		°C

Fig. 1 - Quiescent current vs. supply voltage

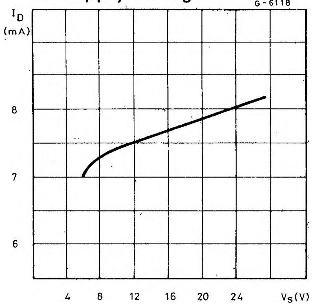


Fig. 2 -- Quiescent drain current vs. temperature

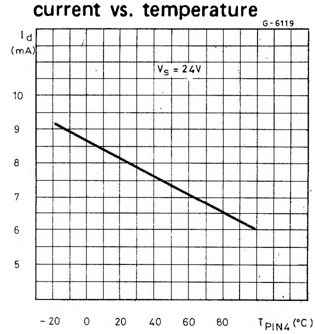


Fig. 3 - Open loop voltage gain

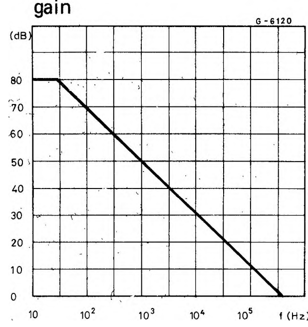


Fig. 4 - Output voltage swing vs. load current

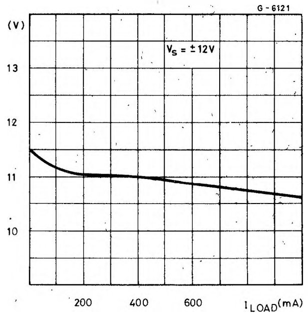


Fig. 5 -- Output voltage swing vs. load current

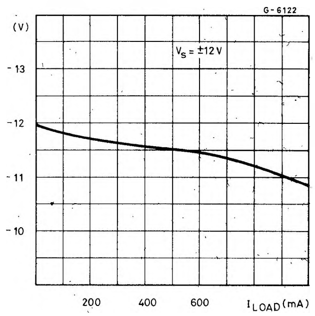


Fig. 6 - Supply voltage rejection vs. frequency

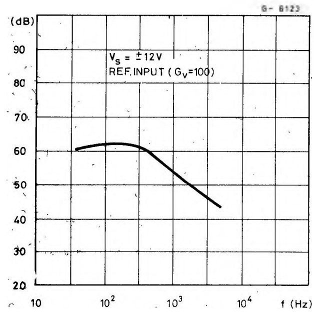


Fig. 7 - Channel separation vs. frequency

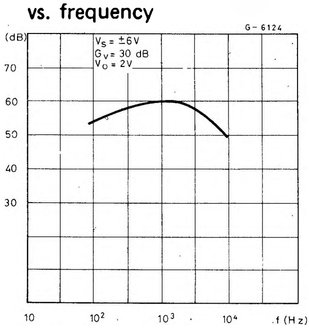
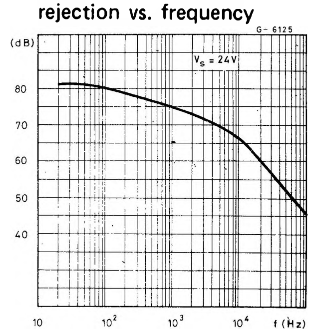


Fig. 8 - Common mode rejection vs. frequency



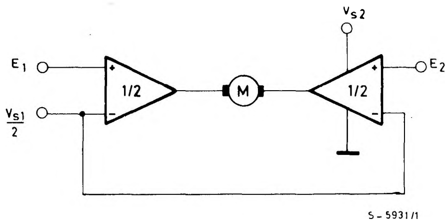
APPLICATION SUGGESTION

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 corrected between supply pins and ground;
- boucherot cell (0.1 to 0.2μF + 1Ω series) between outputs and ground or across the load.

Fig. 9 - Bidirectional DC motor control with μP compatible inputs



V_{S1} = logic supply voltage

Must be $V_{S2} > V_{S1}$

E1, E2 = logic inputs

Fig. 10 - Servocontrol for compact-disc

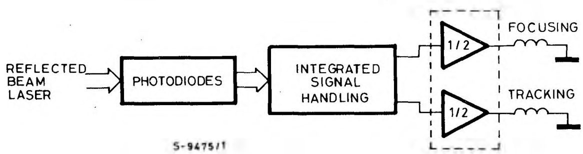


Fig. 11 - Capstan motor control in video recorders

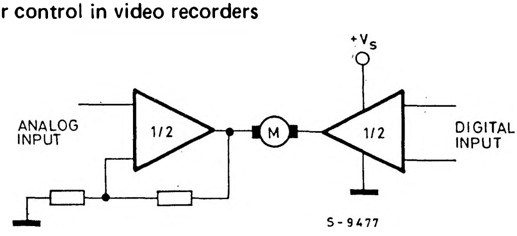
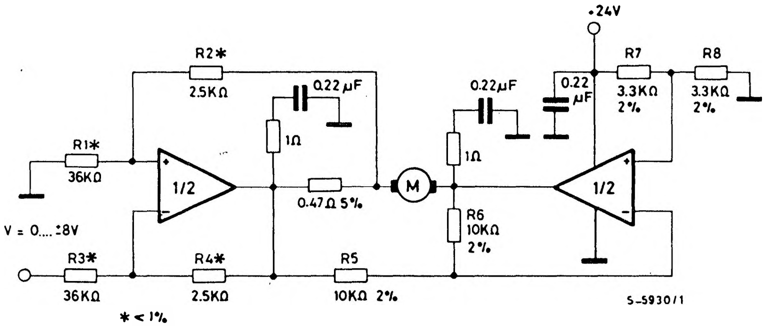


Fig. 12 - Motor current control circuit



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

Fig. 13 - Bidirectional speed control of DC motors.

For circuit stability ensure that $R_X > \frac{2R3 \cdot R1}{R_M}$ where R_M = internal resistance of motor. The voltage available at the terminals of the motor is $V_M = 2\left(V_i - \frac{V_s}{2}\right) + |R_o| \cdot I_M$ where $|R_o| = \frac{2R3 \cdot R1}{R_X}$ and I_M is the motor current.