# L149

# LINEAR INTEGRATED CIRCUIT

## MONOLITHIC HIGH GAIN POWER OUTPUT STAGE

The L149 is a general purpose power booster in Pentawatt® package consisting of a quasi-complementary darlingtons output stage with the associated biasing system and inhibit facility.
The circuit features are:

- High output current (4A peak)
- High current gain (10 000 typ.)
- Operation up to ± 20V
- Thermal protection
- Short circuit protection
- Operation within SOA
- High slew-rate

The device is particularly suited for use with an operational amplifier inside a closed loop configuration to increase output current ($P_o$= 20W, d = 0.5%, $R_L$= 4Ω, $V_s$= ± 16V).

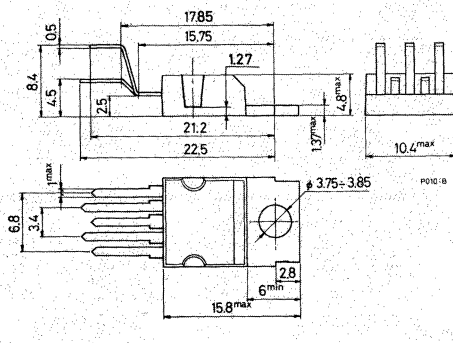
## ABSOLUTE MAXIMUM RATINGS

| | | | |
|---|---|---|---|
| $V_s$ | Supply voltage | ±20 | V |
| $V_i$ | Input voltage | $V_s$ | |
| $I_o$ | DC output current | 3 | A |
| $I_o$ | Peak output current (internally limited) | 4 | A |
| $V_{INH}$ | Input inhibit voltage | $-V_s$ +5 | V |
| | | $-V_s$ -1.5 | V |
| $P_{tot}$ | Power dissipation at $T_{case}$= 75°C | 25 | W |
| $T_{stg}$, $T_j$ | Storage and junction temperature | -40 to 150 | °C |

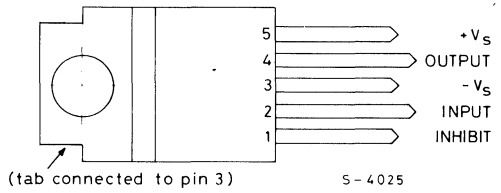
**ORDERING NUMBER:** L149V

## MECHANICAL DATA

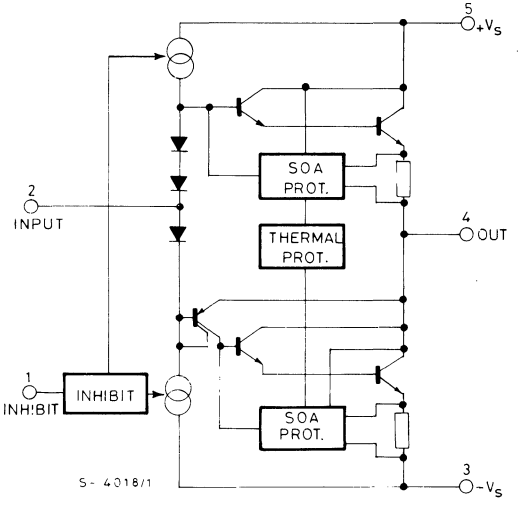
Dimensions in mm



## CONNECTION DIAGRAM (top view)




## SCHEMATIC DIAGRAM



## THERMAL DATA

| | | | | |
|---|---|---|---|---|
| $R_{th\ j\text{-}case}$ | Thermal resistance junction-case | max | 3 | °C/W |

## ELECTRICAL CHARACTERISTICS ($T_{amb}$ = 25°C)

| Parameter | | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_s$ | Supply voltage | | | | ± 20 | V |
| $I_d$ | Quiescent drain current | $V_s$ = ± 16V | | 30 | | mA |
| $I_{in}$ | Input current | $V_s$ = ± 16V $V_i$ = 0V | | 200 | 400 | μA |
| $h_{FE}$ | DC current gain | $V_s$ = ± 16V $I_o$ = 3A | 6000 | 10000 | | – |
| $G_v$ | Voltage gain | $V_s$ = ± 16V $I_o$ = 1.5A | | 1 | | – |
| $V_{CEsat}$ | Saturation voltage (for each transistor) | $I_o$ = 3A | | | 3.5 | V |
| $V_{os}$ | Input offset voltage | $V_s$ = ± 16V | | | 0.3 | V |
| $V_{INH}$ | Inhibit input voltage (pins 1–3) | ON condition | | | ± 0.3 | V |
| | | OFF condition | ± 1.2 | | | |
| $R_{INH}$ | Inhibit input resistance | f = 1 KHz | | 2.0 | | KΩ |
| SR | Slew rate | | | 30 | | V/μs |
| B | Power bandwidth | $V_s$= ±18V, d = 1%, $R_L$= 8Ω | | 200 | | KHz |

## TEST CIRCUIT

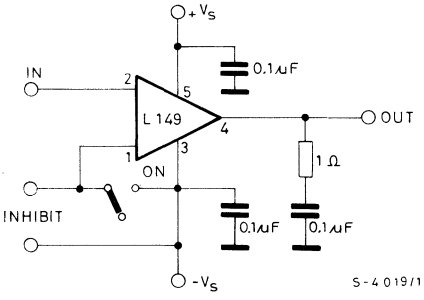


Fig. 1 - Maximum saturation voltage vs. output current

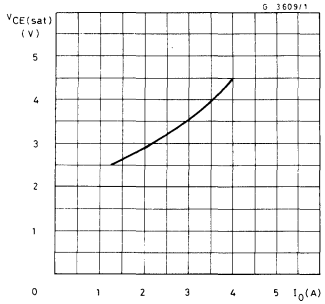



Fig. 2 - Current limiting characteristics

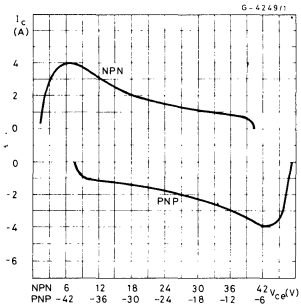
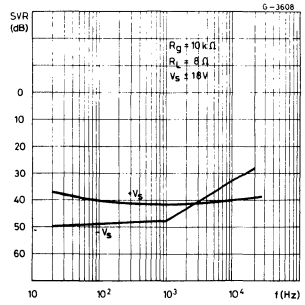



Fig. 3 - Supply voltage rejection vs. frequency




## APPLICATION INFORMATION

Fig. 4 - High power amplifier with single power supply ($G_v$ = 30 dB)

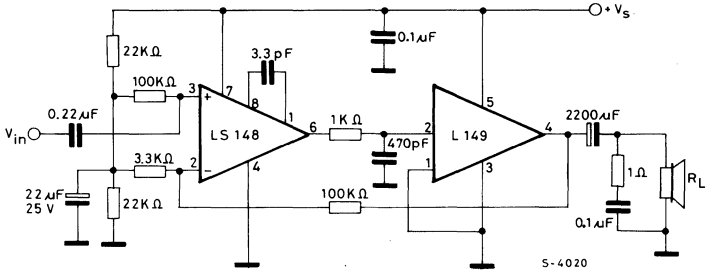



Fig. 5 - Distortion vs. output power (f = 1 KHz)

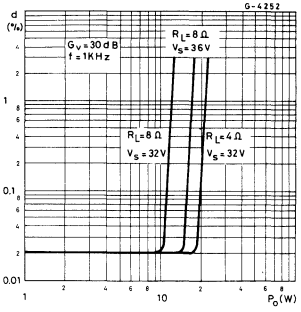



Fig. 6 - Distortion vs. output power (f= 10 KHz)

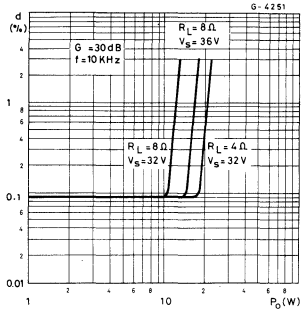
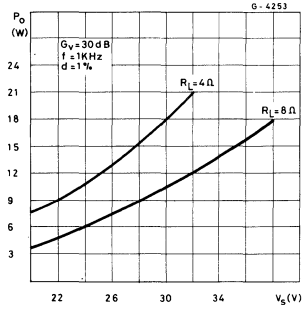



Fig. 7 - Output power vs. supply voltage



## APPLICATION INFORMATION (continued)

Fig. 8 - High slew-rate power operational amplifier

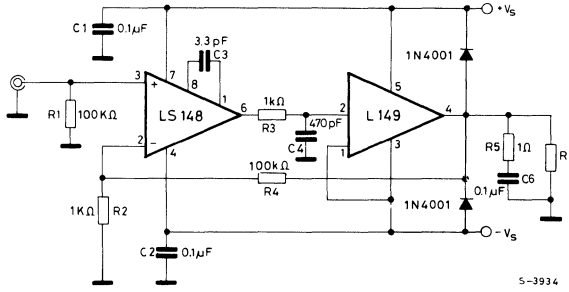



Fig. 9 - Electronic potentiometer (short-circuit protected)

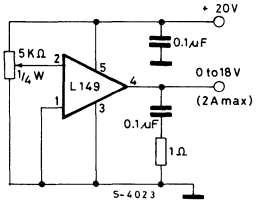
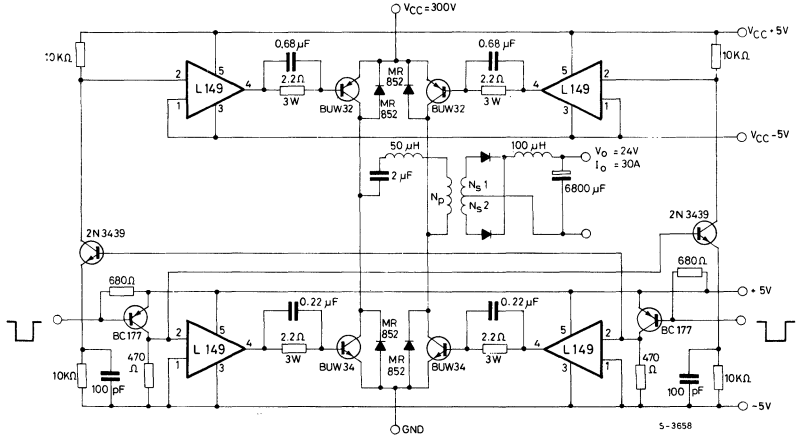



Fig. 10 - 720W Switch-Mode Power Supply using the L149 as driver stage for the power transistors




*NOTE - For a more detailed description of the L149 and its applications, refer to SGS-TECHNICAL NOTE TN.150.*