

LINEAR INTEGRATED CIRCUITS

ADVANCE DATA

HIGH EFFICIENCY POWER OPERATIONAL AMPLIFIER

- OUTPUT CURRENT TO 4A
- SUPPLY VOLTAGE TO $\pm 20V$
- LARGE COMMON-MODE RANGE
- LARGE DIFFERENTIAL MODE RANGE
- LARGE BANDWIDTH
- LOW SATURATION
- SOA PROTECTION
- SHORT CIRCUIT PROTECTION
- THERMAL PROTECTION

The L465A is a monolithic integrated circuit in PENTAWATT package, intended for use as power operational amplifier in a wide range of applications, including servo amplifiers and power supplies. The high gain and high output power capability provide superior performance wherever an operational amplifier/power booster combination is required.

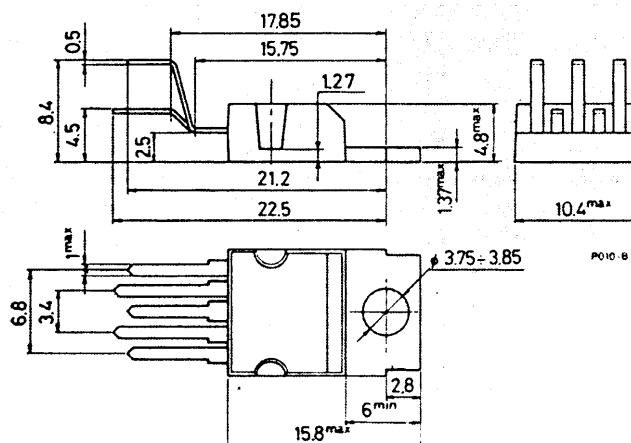
ABSOLUTE MAXIMUM RATINGS

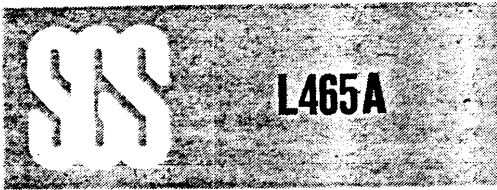
V_s	Supply voltage	± 20	V
V_i	Input voltage	V_s	
V_i	Differential input voltage	± 15	V
I_o	Peak output current (internally limited)	4	A
P_{tot}	Power dissipation at $T_{case} = 90^\circ C$	20	W
T_{stg}, T_j	Storage and junction temperature	-40 to 150	$^\circ C$

ORDERING NUMBER: L465

MECHANICAL DATA

Dimensions in mm





CONNECTION DIAGRAM
(top view)

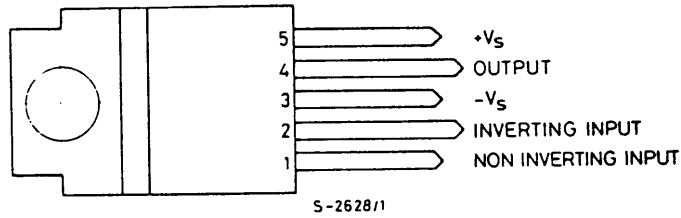


Fig. 1 - Application circuit ($G_V > 20$ dB)

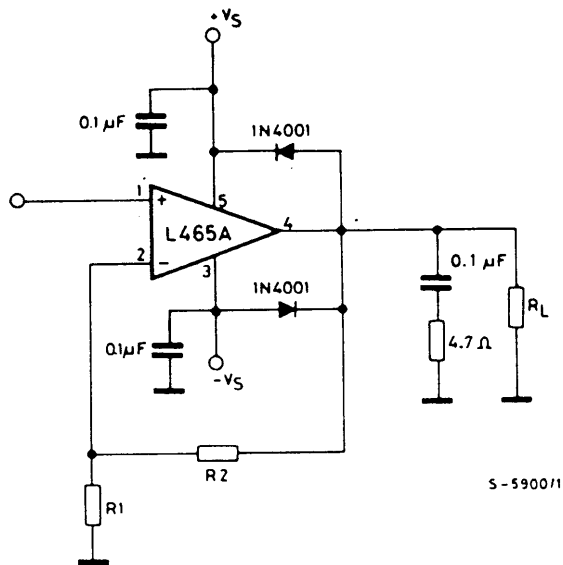
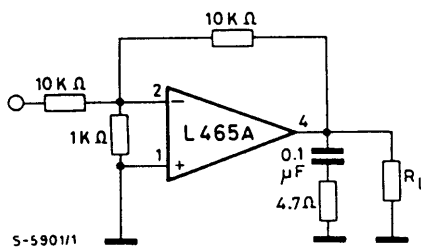
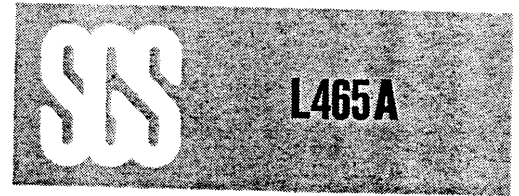


Fig. 2 - Application circuit (Unity gain)



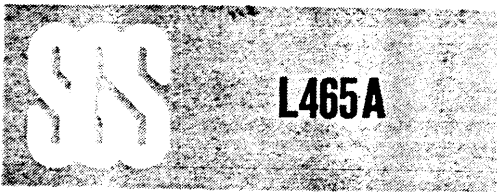


THERMAL DATA

$R_{th\ j-case}$ Thermal resistance junction-case	max 3 °C/W
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ELECTRICAL CHARACTERISTICS ($V_s = \pm 15V$, $T_{amb} = 25^\circ C$ unless otherwise specified)

Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_s Supply voltage		± 3		± 20	V
I_d Quiescent drain current	$V_s \pm 18V$		45		mA
I_b Input bias current			0.3	1	μA
V_{os} Input offset voltage			± 2	± 20	mV
I_{os} Input offset current				± 200	nA
SR Slew-Rate			14		V/ μs
V_o Output voltage swing	$f = 1\ kHz$ $I_p = 0.5A$ $I_p = 4A$	26	27 25		Vpp
	$f = 10\ kHz$ $I_p = 0.5A$ $I_p = 4A$		27 24		Vpp
BW Power bandwidth	$P_o = 1V$ $R_L = 4\ \Omega$		100		kHz
R_i Input resistance (pin 1)	$f = 1\ KHz$	100	500		K Ω
G_v Voltage gain (open loop)				80	
e_N Input noise voltage	$B = 10\ to\ 10\ 000\ Hz$		2	6	μV
i_N Input noise current				100	
CMR Common mode rejection	$R_g \leq 10\ K\Omega$ $G_v = 30\ dB$		70		dB
SVR Supply voltage rejection	$R_g = 22\ k\Omega$ $V_{ripple} = 0.5\ V_{rms}$ $f_{ripple} = 100\ Hz$ $G_v = 10$		60		dB
	$G_v = 100$		40		dB
η Efficiency	$f = 1\ kHz$ $R_L = 4\ \Omega$ $I_p = 3A$		66		%
T_{sd} Thermal shutdown junction temperature			145		$^\circ C$



APPLICATION INFORMATION

This circuit carries out bidirectional speed control of DC motors (fig. 3). The motor runs in one direction or in another according to whether the input voltage is higher or lower than $V_s/2$. The output impedance of the circuit seen by the motor is $R_o = \frac{-2 R_4 R_1}{R_x}$ so by imposing that the equation $R_M = R_o$ ($R_M =$ internal resistance of motor) is checked the maximum load regulation condition is obtained. For circuit stability it should be $R_M > |R_o|$ hence we get

$$R_x > \frac{2 R_4 \cdot R_1}{R_M}$$

The voltage available at the terminals of the motor is

$$V_M = 2 \left(V_{in} - \frac{V_s}{2} \right) + |R_o| \cdot I$$

Fig. 3 - Bidirectional speed control of DC motors

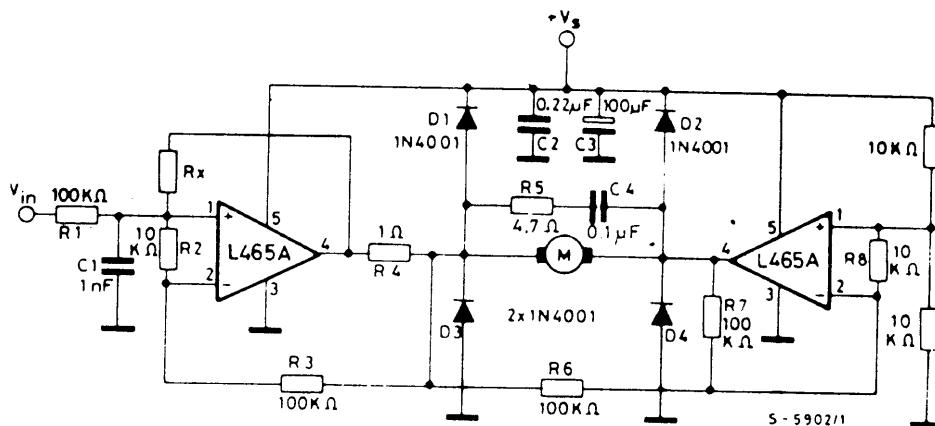
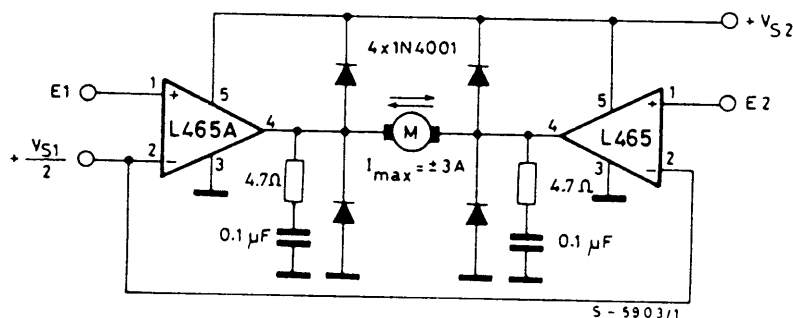


Fig. 4 - Bidirectional DC motor control with TTL/C-MOS/ μ P compatible inputs



V_{S1} = logic supply voltage

Must be $V_{S2} \geq V_{S1}$

E1, E2 = logic inputs