

## DUAL VERY LOW NOISE PREAMPLIFIER

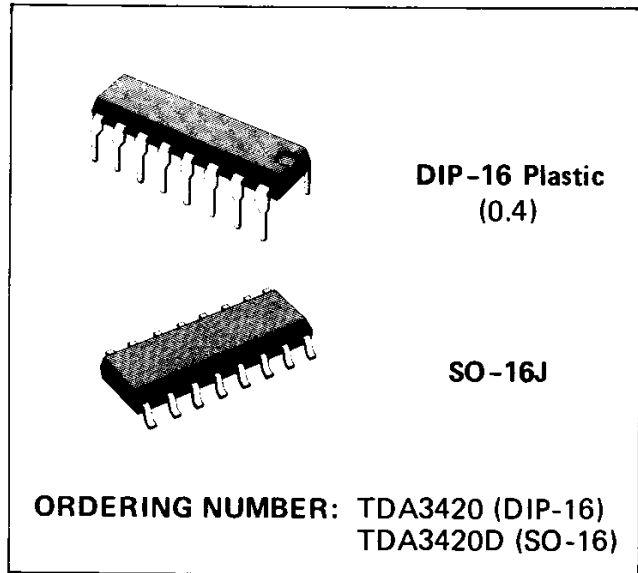
The TDA 3420D is a dual preamplifier for applications requiring very low noise performance, as **stereo cassette players** and quality audio systems. Each channel consists of two independent amplifiers.

The first one has a fixed gain while the second one is an operational amplifier for audio application.

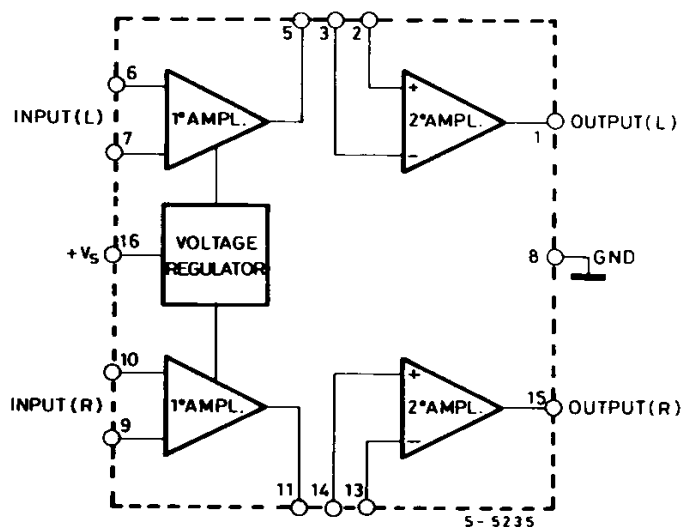
The TDA 3420D is available in two packages: 16-lead dual in-line plastic and 16 lead micro-package.

Its main features are:

- Very low noise
- High gain
- Low distortion
- Single supply operation
- Large output voltage swing
- Short circuit protection



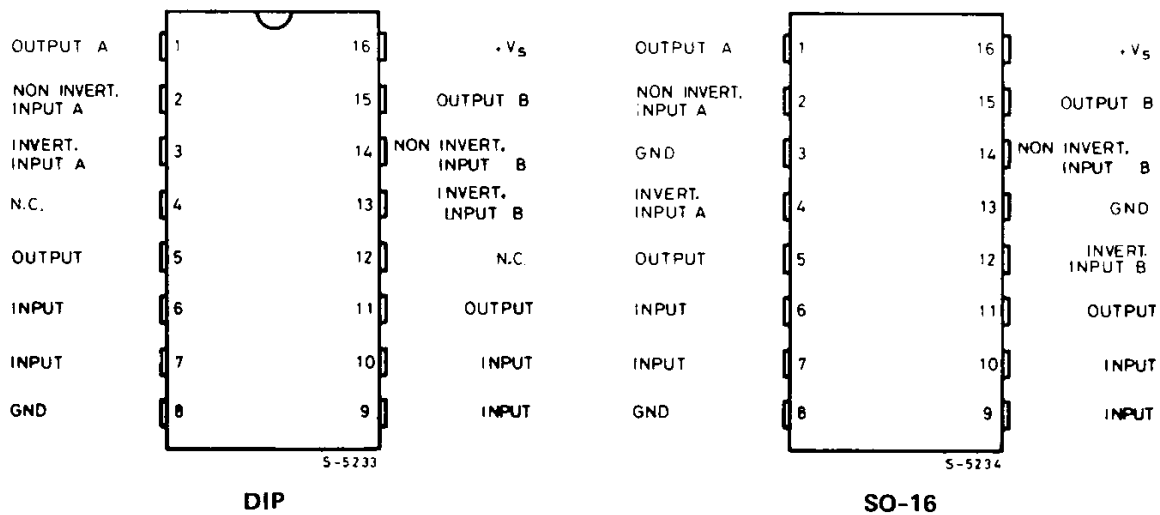
### BLOCK DIAGRAM (Pin numbers refer to the DIP)



**ABSOLUTE MAXIMUM RATINGS**

$V_s$	Supply voltage	20	V
$P_{tot}$	Total power dissipation at $T_{amb} = 70^\circ\text{C}$	550	mW
		400	mW
$T_j, T_{stg.}$	Storage and junction temperature	-40 to 150	$^\circ\text{C}$

**CONNECTION DIAGRAMS**

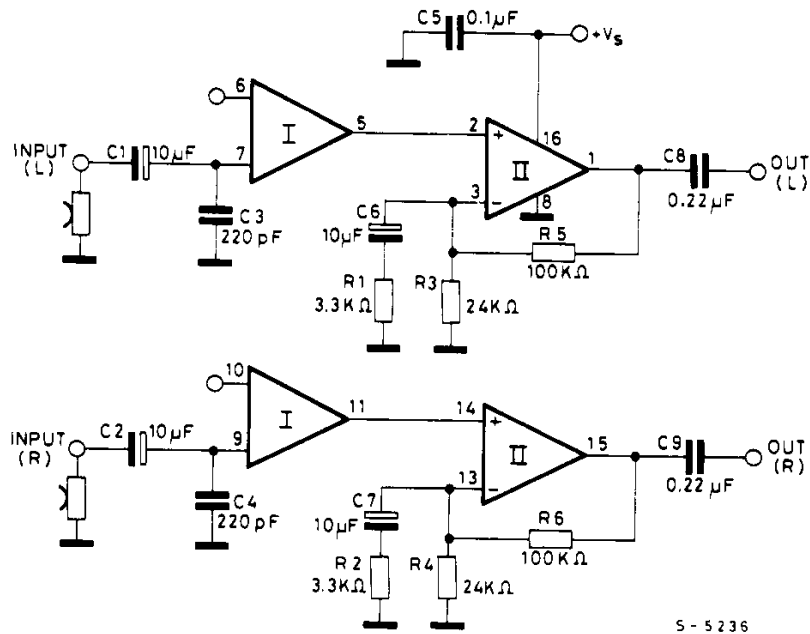


**THERMAL DATA**

			DIP	SO-16
$R_{th\ j-amb}$	Thermal resistance junction-ambient	max	150 $^\circ\text{C/W}$	200 $^\circ\text{C/W} (*)$

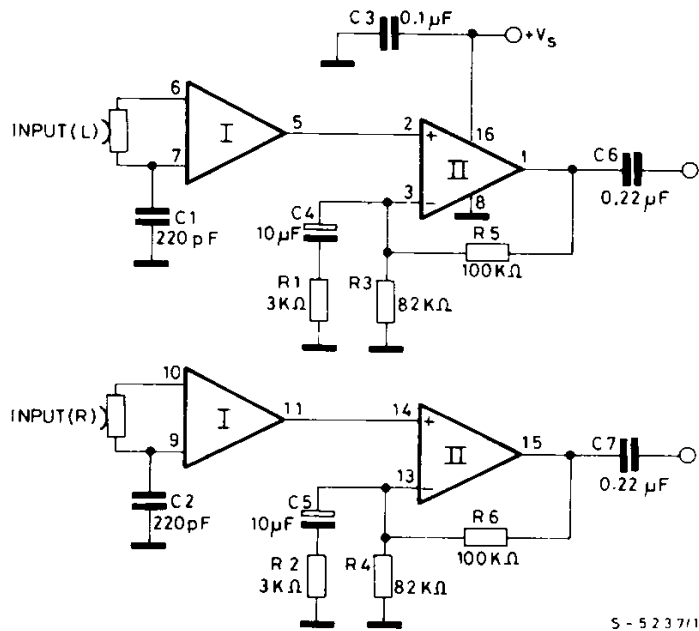
\* The thermal resistance is measured with the device mounted on a ceramic substrate (25 x 16 x 0.6 mm).

Fig. 1 - Test circuit



**Note:** Pin numbers refer to DIP.

Fig. 2 - Test circuit without input capacitors



**Note:** Pin numbers refer to the DIP.

**ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25^{\circ}\text{C}$ ,  $V_s = 14.4\text{V}$ ,  $G_v = 60\text{ dB}$  refer to the test circuit of fig. 1, unless otherwise specified)

Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_s$ Supply current	$V_s = 8\text{V to } 20\text{V}$			8		mA
$I_o$ Output current	Source	$V_s = 8\text{V to } 20\text{V}$		10		mA
	Sink			1		mA
$G_v$ Gain				60		dB
$R_i$ Input resistance	$f = 1\text{ KHz}$		50	100		$\text{K}\Omega$
$R_o$ Output resistance				50		$\Omega$
THD Total harmonic distortion without noise	$V_o = 300\text{ mV}$	$f = 1\text{ KHz}$		0.05		%
		$f = 10\text{ KHz}$		0.05		%
$V_o$ Peak to peak output voltage	$f = 40\text{ Hz to } 15\text{ KHz}$			12		V
$e_n$ Total input noise ( $^{\circ}$ )	$R_s = 50\ \Omega$ $R_s = 600\ \Omega$ $R_s = 5\ \text{K}\Omega$			0.25 0.4 1.3	0.7	$\mu\text{V}$ $\mu\text{V}$ $\mu\text{V}$
S/N Signal to noise ratio ( $^{\circ}$ )	$V_{in} = 0.3\text{ mV}$ $V_{in} = 1\text{ mV}$	$R_s = 600\ \Omega$ $R_s = 0$		57 73		dB
	$V_{in} = 0.3\text{ mV}$ $V_{in} = 1\text{ mV}$	$R_s = 600\ \Omega$ $R_s = 0$		55 71		dB
CS Channel separation	$f = 1\text{ KHz}$			60		dB
SVR Supply voltage rejection ( $^{\circ\circ\circ}$ )	$f = 1\text{ KHz}$	$R_s = 600\ \Omega$		110		dB

### AMPLIFIER N° 1

$G_v$ Gain (pin 6 to pin 5)		27.5	28.5	29	dB
d Distortion	$V_o = 300\text{ mV}$	$f = 1\text{ KHz}$ $f = 10\text{ KHz}$		0.05 0.05	%
$e_n$ Total input noise ( $^{\circ}$ )	$R_s = 600\ \Omega$			0.4	$\mu\text{V}$
$Z_o$ Output impedance (pin 5)	$f = 1\text{ KHz}$			100	$\Omega$
$I_o$ Output current (pin 5)				1	mA
V5 DC output voltage (pin 5)	Test circuit fig. 2			2.8	V
	Test circuit fig. 1		1.0	1.5	

ELECTRICAL CHARACTERISTICS (continued)

Parameter	Test conditions	Min.	Typ.	Max.	Unit
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AMPLIFIER N° 2

$G_V$	Open loop voltage gain		100		dB
$I_B$	Input bias current		0.2		$\mu A$
$V_{OS}$	Input offset voltage		2		mV
$I_{OS}$	Input offset current		50		nA
$e_n$	Total input noise (°)	$R_S = 600\Omega$	2		$\mu V$
$R_i$	Input impedance	$f = 1 \text{ KHz (open loop)}$	150	500	$K\Omega$

- (°) Weighting filter : curve A.
- (°°) Weighting filter : Dolby CCIR/ARM.
- (°°°) Referred to the input.

Fig. 3 - Total input noise vs. source resistance (curve A)

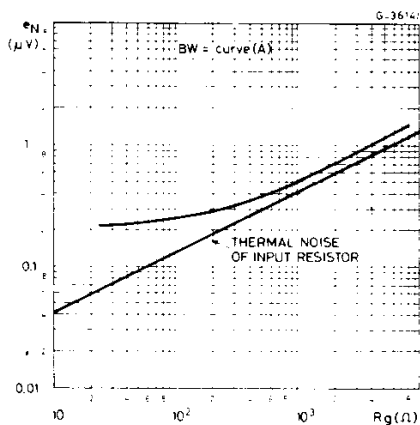


Fig. 4 - Total input noise vs. source resistance (BW=22 Hz to 22 KHz)

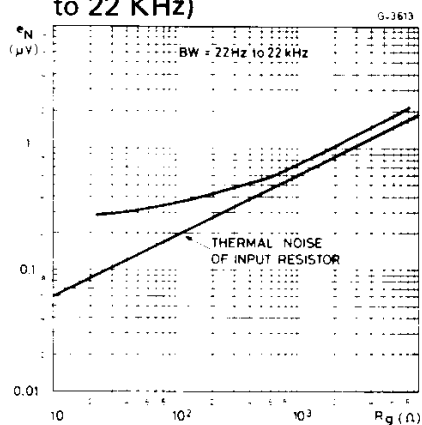


Fig. 5 - Total harmonic distortion vs. output voltage

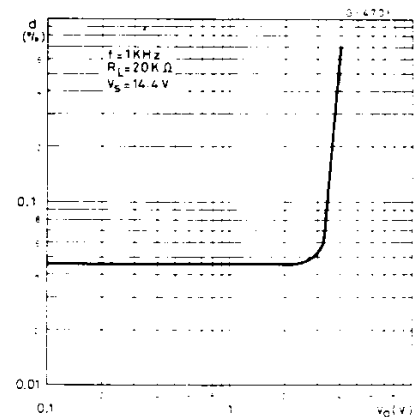


Fig. 6 - Output voltage vs. frequency

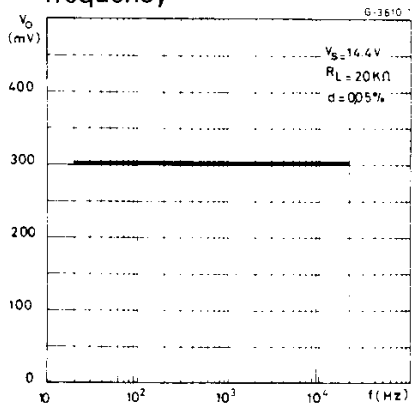


Fig. 7 - Distortion vs. input level (test circuit of fig. 1)

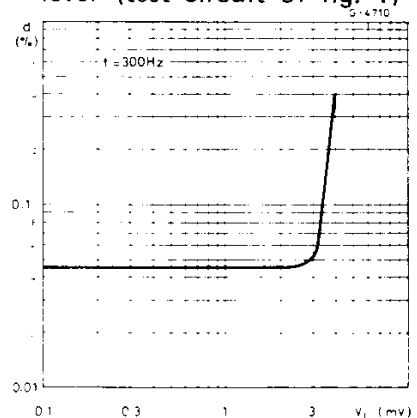


Fig. 8 - Frequency response of the circuit of fig. 10

