

DUAL VERY LOW NOISE PREAMPLIFIER

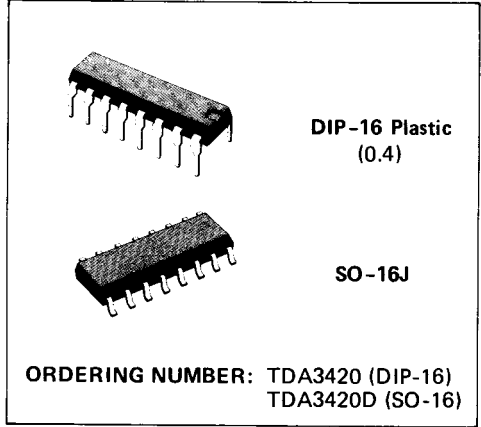
The TDA 3420D is a dual preamplifier for applications requiring very low noise performance, as **stereo cassette players** and quality audio systems. Each channel consists of two independent amplifiers.

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

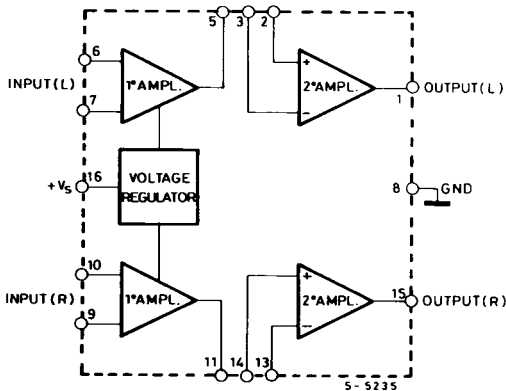
The TDA 3420D is available in two packages: 16-lead dual in-line plastic and 16 lead micro-package.

Its main features are:

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



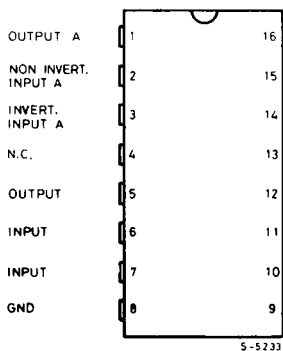
BLOCK DIAGRAM(Pin numbers refer to the DIP)



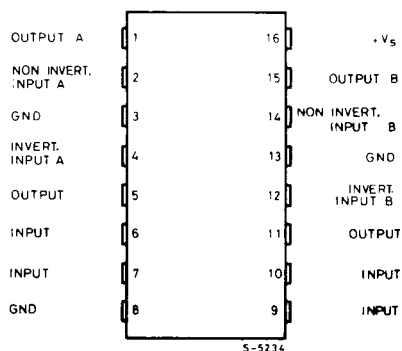
ABSOLUTE MAXIMUM RATINGS

V_s	Supply voltage	20	V
P_{tot}	Total power dissipation at $T_{amb} = 70^\circ\text{C}$ Dip-16 SO-16	550 400	mW
$T_j, T_{stg.}$	Storage and junction temperature	-40 to 150	$^\circ\text{C}$

CONNECTION DIAGRAMS



DIP



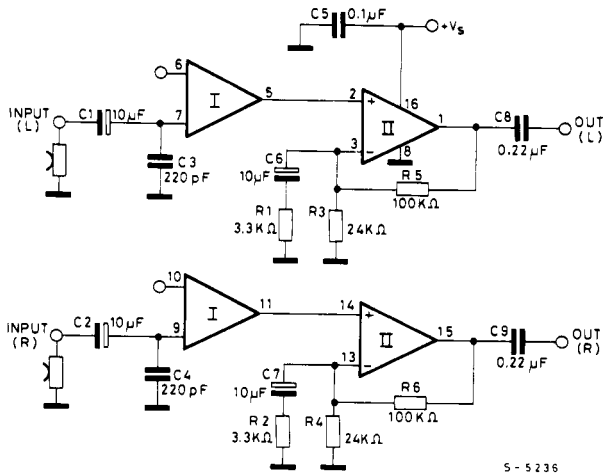
SO-16

THERMAL DATA

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

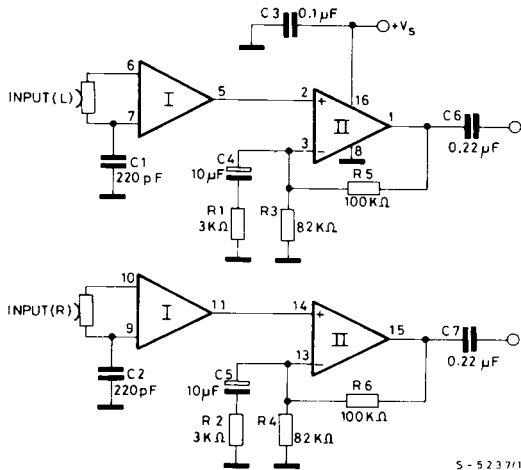
* The thermal resistance is measured with the device mounted on a ceramic substrate (25 x 16 x 0.6 mm).

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		Ω
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 ($^{\circ}$)	$R_s = 50\ \Omega$			0.25	0.7	μV
	$R_s = 600\ \Omega$			0.4		μV
	$R_s = 5\ \text{K}\Omega$			1.3		μV
S/N Signal to noise ratio ($^{\circ}$)	$V_{in} = 0.3\text{ mV}$	$R_s = 600\ \Omega$		57		dB
	$V_{in} = 1\text{ mV}$	$R_s = 0$		73		
	$V_{in} = 0.3\text{ mV}$	$R_s = 600\ \Omega$		55		dB
	$V_{in} = 1\text{ mV}$	$R_s = 0$		71		
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	$V_o = 300\text{ mV}$	$f = 1\text{ KHz}$	0.05	0.05	%
		$f = 10\text{ KHz}$			
e_n Total input noise ($^{\circ}$)	$R_s = 600\ \Omega$			0.4	μV
Z_o Output impedance (pin 5)	$f = 1\text{ KHz}$			100	Ω
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
-----------	-----------------	------	------	------	------

AMPLIFIER N° 2

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

- ($^{\circ}$) Weighting filter : curve A.
- ($^{\circ\circ}$) Weighting filter : Dolby CCIR/ARM.
- ($^{\circ\circ\circ}$) Referred to the input.

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

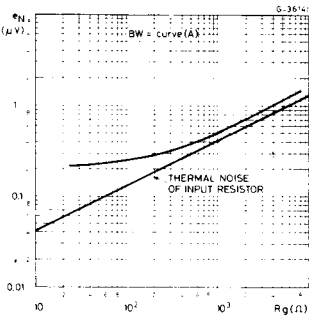


Fig. 4 - Total input noise vs. source resistance (BW=22 Hz to 22 KHz)

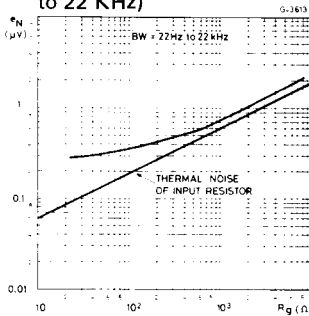


Fig. 5 - Total harmonic distortion vs. output voltage

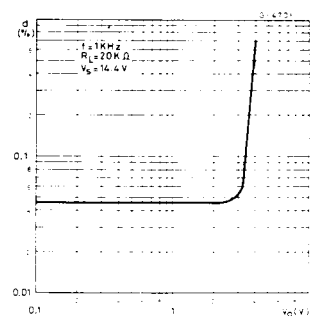


Fig. 6 - Output voltage vs. frequency

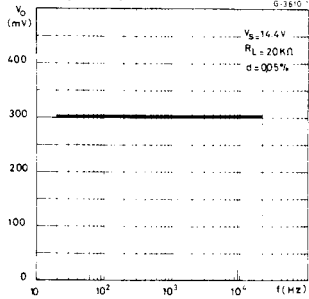


Fig. 7 - Distortion vs. input level (test circuit of fig. 1)

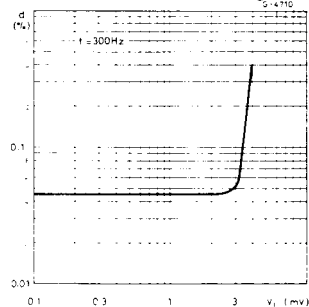


Fig. 8 - Frequency response of the circuit of fig. 10

