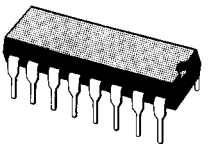
SGS-THOMSON MICROELECTRONICS

TDA3410

DUAL LOW NOISE TAPE PREAMPLIFIER WITH AUTOREVERSE

- VERY LOW NOISE
- HIGH GAIN
- LOW DISTORTION
- SINGLE SUPPLY OPERATION
- WIDE SUPPLY RANGE
- SVR = 120 dB
- LARGE OUTPUT VOLTAGE SWING
- TAPE AUTOREVERSE FACILITY
- SHORT-CIRCUIT PROTECTION



DIP-16
(Plastic 0.4)

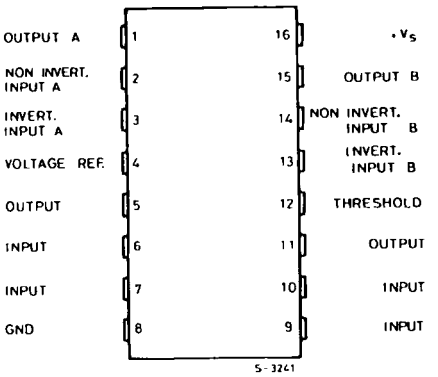
ORDER CODE : TDA3410

DESCRIPTION

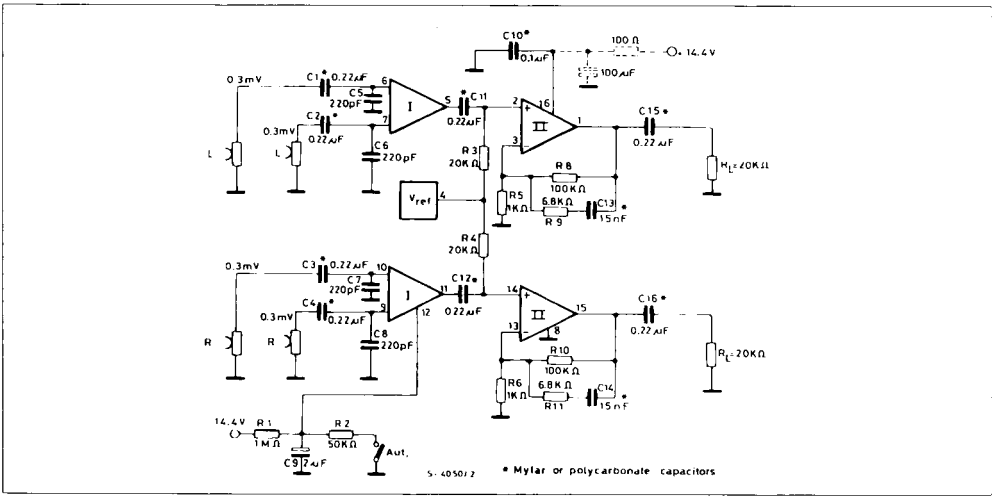
The TDA3410 is a dual preamplifier with tape autoreverse facility for the amplification of low level signals in applications requiring very low noise performance, as stereo cassette players. Each channel consists of two independent amplifiers. The first has a fixed gain of 30 dB while the second one is an operational amplifier optimized for high quality audio application.

The TDA3410 is a monolithic integrated circuit in a 16-lead dual in-line plastic package.

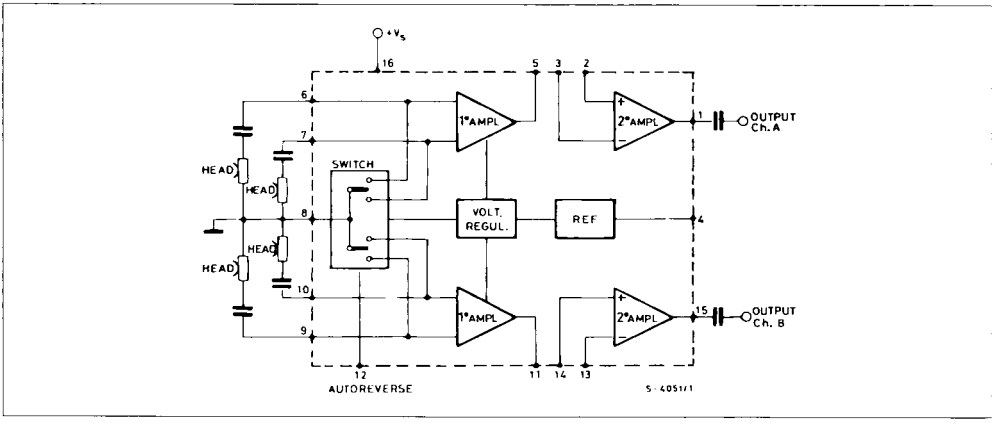
PIN CONNECTION (top view)



STEREO PREAMPLIFIER FOR AUTOREVERSE CASSETTE PLAYERS



BLOCK DIAGRAM



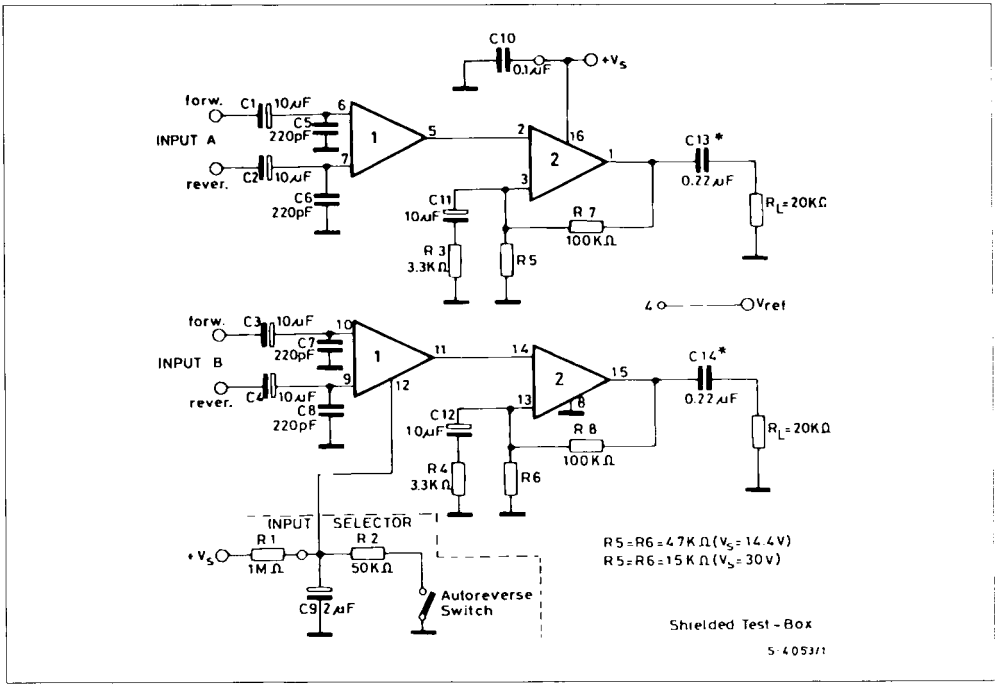
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_S	Supply Voltage	36	V
P_{tot}	Total Power Dissipation at T_{amb} = 60°C	600	mW
T_j, T_{stg}	Storage and Junction Temperature	– 40 to 150	°C

THERMAL DATA

$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	150	°C/W

TEST CIRCUIT (Flat Gain - G_v = 60 dB)



ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C, V_s = 14.4V, G_v = 60dB, refer to the test circuit, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_s	Supply Current	V_s = 8V to 30V		10		mA
I_o	Output Current (pins 1-15)	Source Sink V_s = 8V to 30V		10 1		mA mA
G_v	Closed Loop Gain	f = 20Hz to 20KHz		60		dB
R_i	Input Resistance	f = 1KHz	50	80		kΩ
R_o	Output Resistance (pins 1-15)	f = 1KHz		50		Ω
THD	Total Harmonic Distortion	V_o = 300mV f = 1KHz f = 10KHz		0.05 0.05		% %
V_o	Output Voltage Swing (pins 1-15)	Peak to Peak V_s = 14.4V V_s = 30V		12 28		V V
V_o	Output Voltage (pins 1-15)	d = 0.5% V_s = 14.4V f = 1KHz V_s = 30V		4 8		V_{rms} V_{rms}
e_n	Total Input Noise (°)	R_g = 50Ω R_g = 600Ω R_g = 5kΩ		0.25 0.4 1.3	 0.6 	µV µV µV
S/N	Signal to Noise Ratio (°)	V_{in} = 0.3mV R_g = 600Ω V_{in} = 1mV R_g = 0		57 73		dB dB

ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
CS	Channel Separation	f = 1KHz		60		dB
CT(°°°)	Cross-talk (differential input)	f = 1KHz		80		dB
SVR	Supply Voltage Rejection (°°)	f = 1KHz R_g = 600Ω		120		dB
SVR (°°)	Of Reference Voltage (pin 4)	f = 1KHz R_g = 600Ω		100		dB
V_{ref}	Reference Voltage (pin 4)			55		mV
R_{ref}	Ref. Voltage Output Resistance (pin 4)			100		Ω
$\frac{\Delta V_{ref}}{\Delta T}$	Voltage Temperature Coefficient			10		µV/°C

(*) The weighting filter used for the noise measurement has a curve A frequency response.
(**) Referred to the input.
(***) Between a disabled input and an input ON.

ELECTRICAL CHARACTERISTICS (refer test circuit, V_s = 30V)

AMPLIFIER N° 1

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
G_v	Gain (pins 6 to 5)		29	30	30.5	dB
d	Distortion	V_o = 300mV f = 1KHz f = 10KHz		0.05 0.05		%
e_n	Total Input Noise (°)	R_g = 600Ω		0.4		µV
Z_o	Output Impedance (pin 5)	f = 1KHz		100		Ω
I_o	Output Current (pin 5)			1		mA
V_5	DC Output Voltage (pin 5)	V_s = 10V	1.3	2	2.7	V

AMPLIFIER N° 2

G_v	Open Loop Voltage Gain (pins 2 to 1)			100		dB
I_B	Input Bias Current			0.2		µA
V_{os}	Input Offset Voltage			2		mV
I_{os}	Input Offset Current			0.05		µA
BW	Small Signal Bandwidth	G_v = 30dB		150		KHz
e_n	Total Input Noise (°)	R_g = 600Ω		2		µV
R_i	Input Impedance	f = 1KHz (open loop)	150	500		kΩ

AUTOREVERSE

P_{in}	V_{12} < 2V	V_{12} > 4.5V
6 – 10	OFF	ON
7 – 9	ON	OFF

(*) The weighting filter used for the noise measurement has a curve A frequency response.

Figure 1 : Total Input Noise vs. Source Resistance (curve A).

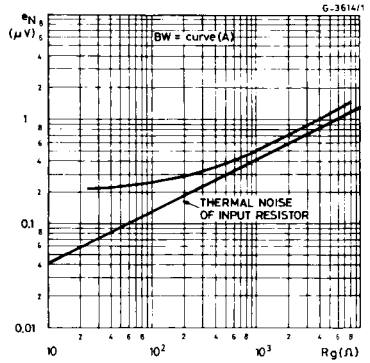


Figure 2 : Total Input Noise vs. Source Resistance (BW = 22 Hz to 22 KHz).

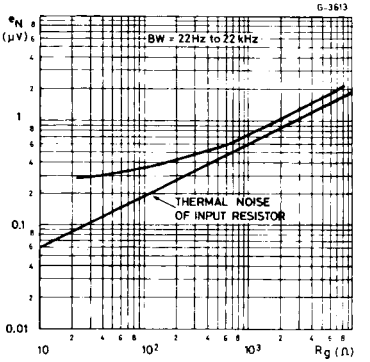


Figure 3 : Total Harmonic Distorsion vs. Output Voltage.

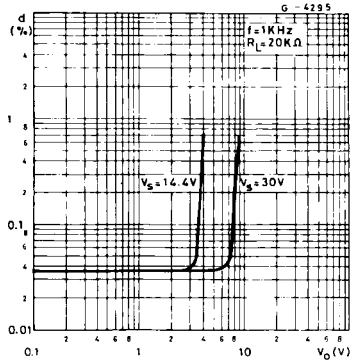


Figure 4 : Very Low Noise Stereo Preamplifier for Car Cassette Players (with Gap Loss Correction and autoreverse function).

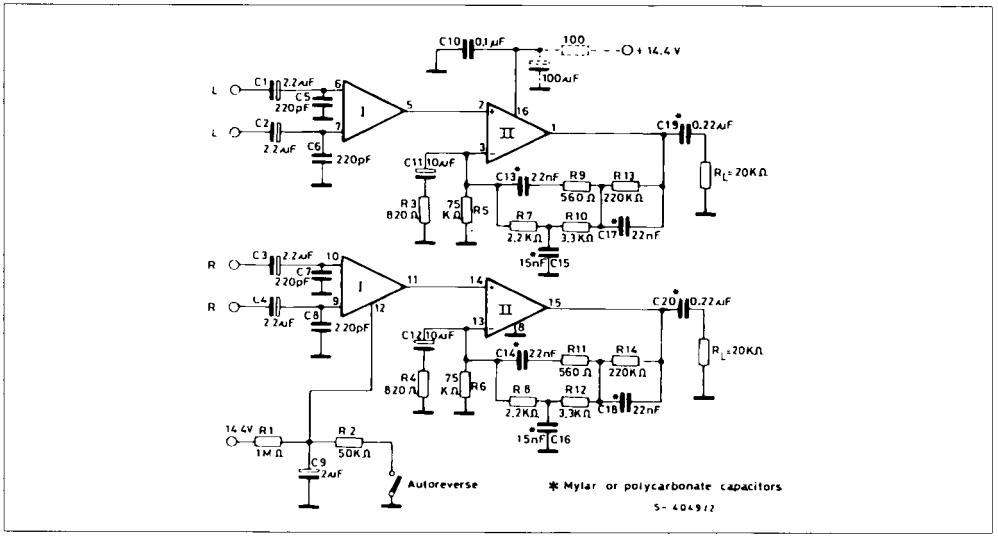


Figure 5 : Frequency Response.

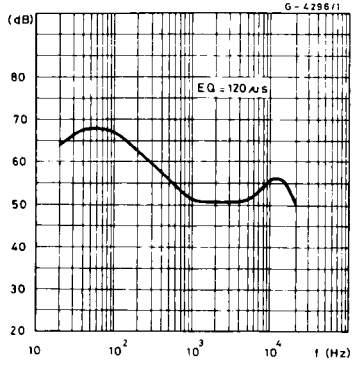


Figure 6 : P.C. Board and Component Lay-out for the Circuit of Figure 4.

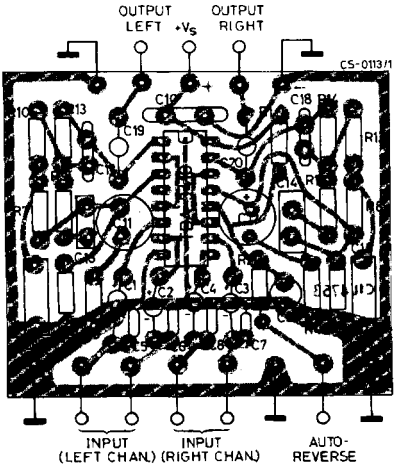


Figure 7 : Stereo Preamplifier for Car Cassette Players, with Low Value Capacitors (Autoreverse function).

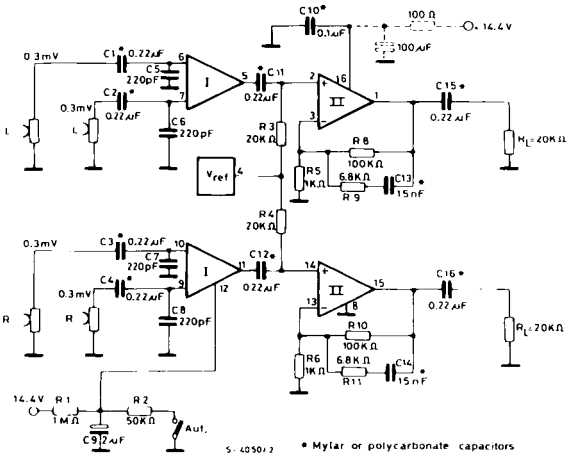


Figure 8 : Frequency Response.