

**3 CHANNEL, LARGE BAND
 HEAD AMPLIFIER FOR VCR**

ADVANCE DATA

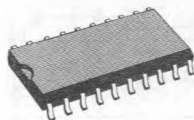
THE TEA5701 IS AN ADVANCED ONE CHIP
 3 HEADS RECORD AND PLAY-BACK AMPLIFIER
 FOR VCR

PLAY-BACK MODE

- LOW NOISE PERFORMANCE
- LARGE BANDWIDTH (SVHS PROCESSING CAPABILITY)
- AUTOMATIC OFFSET CANCELLER BETWEEN TWO SELECTED HEADS
- RECORD AMPLIFIER INHIBITION DURING PLAY-BACK
- DIRECT DRIVE OF COAXIAL CABLE (500 Ω - 100 pF) OF PLAY-BACK OUTPUT

RECORD MODE

- INTEGRATED I/I CONVERTER WITH AUTOMATIC CONTROL OF TRANSCONDUCTANCE
- AUTOMATIC RECORD PLAY-BACK SWITCHING
- PLAY-BACK INHIBITION DURING RECORD MODE
- AUTOMATIC PROTECTION OF RECORD AMPLIFIER AGAINST SHORT CIRCUIT

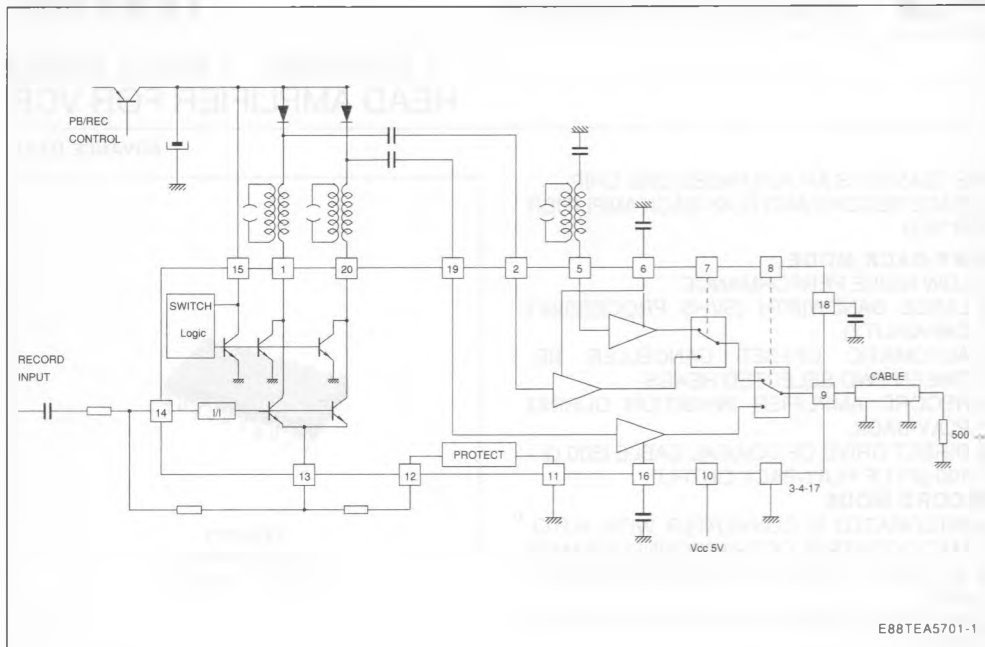


TEA5701
SO20 LARGE
 (Plastic Micropackage)

PIN CONNECTION

N°	Function	N°	Function
1	Recording Output Channel 2	11	Ground
2	Play-back Input Channel 2	12	Current Limitation Input
3	Ground	13	Feed-back Output for Recording Mode
4	Ground	14	Recording Input
5	Play-back Input Channel 3	15	Voltage Supply for Recording Mode
6	DC Offset Canceller Channel 2 and 3	16	DC Offset Canceller Channel 1
7	CH2 - CH3 Switch Control	17	Ground
8	CH1 - CH2 or 3 Switch Control	18	Cascode Input Decoupling
9	Play-back Output	19	Play-back Input Channel 1
10	V _{CC} = 5 V	20	Recording Output Channel 1

BLOCK DIAGRAM



DESCRIPTION

TEA5701 is intended for 3 heads VCR applications. It includes all the electrical functions necessary to achieve play-back and record processing for VHS and SVHS applications (9 MHz).

High performance technology allows very low noise levels (current and voltage). In play-back mode a special feature suppresses the DC offset when switching two channels. Optimized play-back output stage gives to the TEA5701 large capability to drive directly a coaxial cable in order to reduce number of external components.

An automatic scanning of recording supply voltage permits that TEA5701 switches automatically in play-back or in record mode. The switching threshold voltage from play-back to record and record to play-back is fixed to a value which forbids high current peaking through the heads.

The recording amplifier includes a protection system which protects the IC and the application board against overheating in case of short circuit on the recording transconductance components.

The TEA5701 is fully protected against ESD.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	6	V
V_{REC}	Supply Voltage	15	V
T_{stg}	Storage Temperature Range	- 40 to + 150	°C

THERMAL DATA

$R_{th(j-a)}$	Junction-ambient Thermal Resistance	70	°C/W
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ELECTRICAL OPERATING CHARACTERISTICS

All the operating characteristics are given for ambient temperature 25 °C unless otherwise specified.

PLAY-BACK MODE

General conditions for play-back : VCC = 5 V, no load on play-back output.

Symbol	Parameter		Min.	Typ.	Max.	Unit
V _{CC}	Supply Voltage		4.75	5	5.25	V
I _{CC}	Current Supply			45	60	mA
G _{PB}	Play-back Gain	Sine Wave 400 mVpp at 600 khz on Pin 9	56	60	63	dB
Δ G _{PB}	Gain Difference Between Three Play-back Channels	Sine Wave 3.8 MHz, 0.4 mVpp on Pins 2 - 5 - 19		0.3		dB
e _n	Equivalent Input Voltage Noise Level	Measured at 500 KHz - CH1 Via Switching Transistor Pin 20 - CH2 Via Switching Transistor Pin 1 - CH3 Grounded		0.4		nV/ $\sqrt{\text{Hz}}$
i _n	Equivalent Input Current Noise Level	Measured at 500 kHz - PB Inputs Pins 2 - 5 - 19 not Connected		3		pA/ $\sqrt{\text{Hz}}$
CRT	Crosstalk	Sine Wave 3.8 MHz 400 mVpp on Pin 9 For selected channel : - CH1 input, between pins 19 and 20 - CH2 input, between pins 1 and 2 - CH3 input, between pin 5 and ground.			- 40	dB
FLCPB	Play-back Bandwidth Low Cut Off Frequency	Reference Signal Level : Sine Wave 3.8 MHz 400 mVpp - Play-back Input Capacitors 22 nF (pins 2 - 6 - 19) - DC Offset Canceller Capacitor (pins 6 - 16-) 47 nF		20	100	KHz

ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter		Min.	Typ.	Max.	Unit
FHCPB	Play-back Bandwidth High Cut Off Frequency	Same Conditions as Above	8	9.5		MHz
C _{in}	Play-back Input Capacitance	Pins 2 - 5 - 19		50		pF
R _{in}	Play-back Input Resistance	Pins 2 - 5 - 19		600		Ω
VDCPB	DC Level on Play-back Output Pin 9 during Play-back	With 500 Ω Load Resistor Between Pin 9 and Ground	1.9	2.4	2.9	V
ΔVDC	Head Switch Offset Pin 9 (all switches combinations)				50	mV
SM	Second Harmonic on Play-back Output Sine Wave Pin 9	3.8 MHz 400 mVpp with 500 Ω load Resistor		- 43	- 38	dB
V _{sat}	Maximum Voltage on Pins 1 and 20 at Play-back Mode	Input Current Pins 1 and 20 20 mADC			100	mV

RECORDING MODE

General conditions for recording mode : V_{REC} = 12 V
V_{CC} = 5 V
Load resistor 100 Ω on pins 1 and 20
No load on play-back output pin 9

Transconductance network defined by : R1 = 5.1 Ω 1 % pins 12-13
R2 = 1 kΩ 1 % pins 13-14
R3 = 750 Ω 1 % pin 14

Symbol	Parameter		Min.	Typ.	Max.	Unit
V _{REC}	Recording Supply Voltage		9	12	12.6	V
ICCREC	Current Supply from V _{REC}			50	60	mA
ICCI	Current Supply from V _{CC}			30	37.5	mA
VDCREC	DC Level on Play-back Output Pin 9	With 500 Ω Load Resistor Between Pin 9 and Ground	3.1	3.6	4.1	V
	Maximum Recording Current on Each Channel	f = 1.6 MHz	40			mApp
	Maximum Recording Current on Each Channel	f = 3.8 MHz	35			mApp
g	Transconductance	R1 = 5.1 Ω 0 % R2 = 1000 Ω 0 % R3 = 750 Ω 0 % V _{in} = 300 mVpp Measured at 500 KHz		132		mA/V
Δ g	Recording Current Difference Between Pins 1 and 20	Sine Wave 3.8 MHz I _{recording} = 30 mA _{PP}			0.5	dB
REREC	Equivalent Input Resistance			660		Ω

ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter		Min.	Typ.	Max.	Unit
R _s	Output Resistance Pins 1 and 20	R1 = 5.1 Ω		100		kΩ
SHREC	Second Harmonic Pins 1 and 20	Output Current on Each Output : 30 mApp at 3.8 MHz			- 38	dB
FLCREC	Recording Bandwidth Low Cut Off Frequency	Reference Output Current 30 mApp at 3.8 MHz for - 3 dB		20	100	kHz
FHCREC	Recording Bandwidth High Cut Off Frequency	Reference Output Current 30 mApp at 500 KHz for - 3 dB	8	9.5		MHz
	Maximum Input Current Pin 12	Pin 12 Connected to VREC = 12 V			100	mA
	Maximum Saturation Voltage on Pin12	Input Current Pin 12 : 50 mA		100	150	mV
IM	Intermodulation	I Luminance = 30 mApp 3.8 MHz I Chrominance = 7.5 mApp, 600 KHz Measured at 3.8 MHz ± 600 KHz		- 50		dB

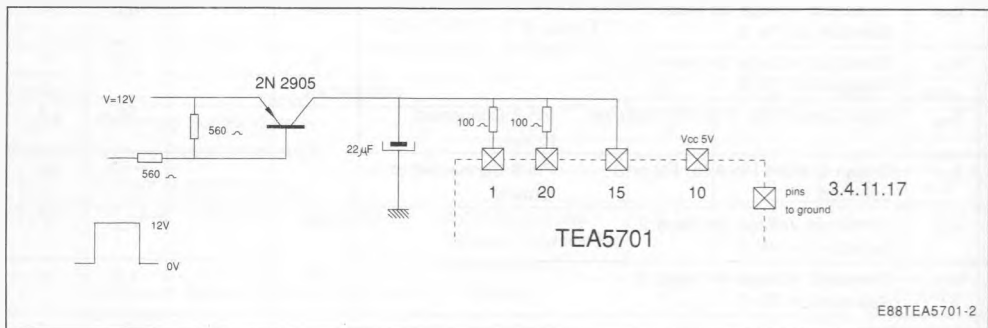
SWITCHING LEVELS

Symbol	Parameter		Min.	Typ.	Max.	Unit
V _{H8}	Threshold Voltage for Head 1 Selection on Pin 8		2.4		V _{CC}	V
V _{L8}	Threshold Voltage for Head 2 or 3 Selection on Pin 8		0		1.5	V
I _{H8}	Input Current Pin 8 for H1 Selected	Pin 8 Connected to V _{CC}			50	μA
I _{L8}	Output Current Pin 8 for H2 or 3 Selected	Pin 8 Connected to Ground			- 50	μA
V _{H7}	Threshold Voltage for Head 2 Selection on Pin 7		2.4		V _{CC}	V
V _{L7}	Threshold Voltage for Head 3 Selection on Pin 7		0		1.5	V
I _{H7}	Input Current Pin 7 for Head 2 Selected	Pin 7 Connected to V _{CC}			50	μA
I _{L7}	Output Current Pin 7 for Head 3 Selected	Pin 7 Connected to Ground			- 50	μA
	Switching Time from H1 Selected to H2 Selected	Switching Pulse from 5 to 0 V Applied Pin 8		250	500	ns
	Switching Time from H2 Selected to H1 Selected	Switching Pulse from 0 to 5 V Applied Pin 8		250	500	ns

ELECTRICAL CHARACTERISTICS (continued)

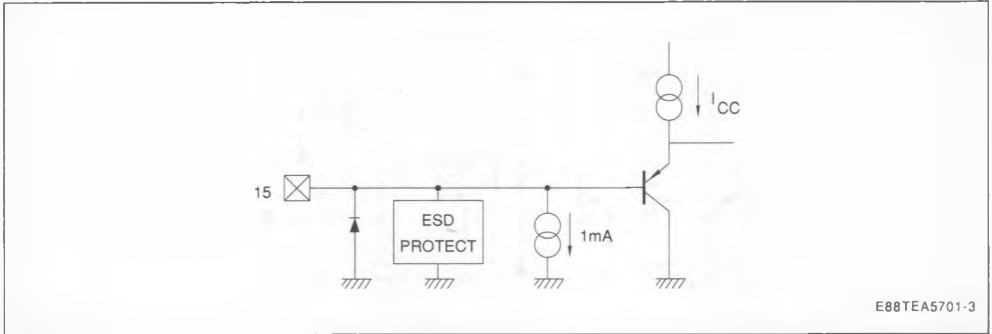
Symbol	Parameter	Min.	Typ.	Max.	Unit
VRPB	Recording Supply Voltage Threshold (pin 15) for Switching from Record to Play-back	0.15	0.3	0.5	V
VPBR	Recording Supply Voltage Threshold (pin 15) for Switching from Play-back to record	0.25	0.4	0.6	V
	Delay Time for Suppression of Play-back Output Signal on Pin 9 (play-back to record)		30		μ s
	Delay Time for Presence of Play-back Output Signal on Pin 9 (record to play-back)		20		ms
	Delay Time for Suppression of Recording Signals Pins 1 and 20 (record to play-back)		4		ms
	Delay Time for Suppression of Recording Signals Pin 1 and 20 (play-back to record)		200		μ s
SVR	Supply Voltage Rejection	15	20	25	dB

Test Conditions for Measuring Delay Times (play-back to record and vice versa)

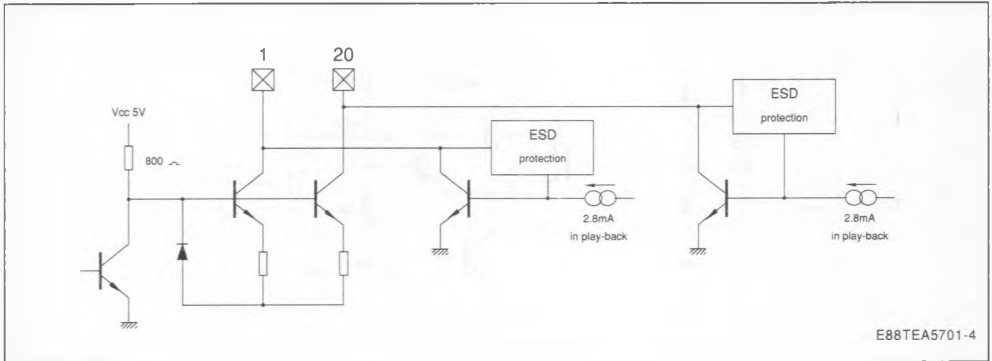


INPUTS/OUTPUTS EQUIVALENT INTERNAL DIAGRAM

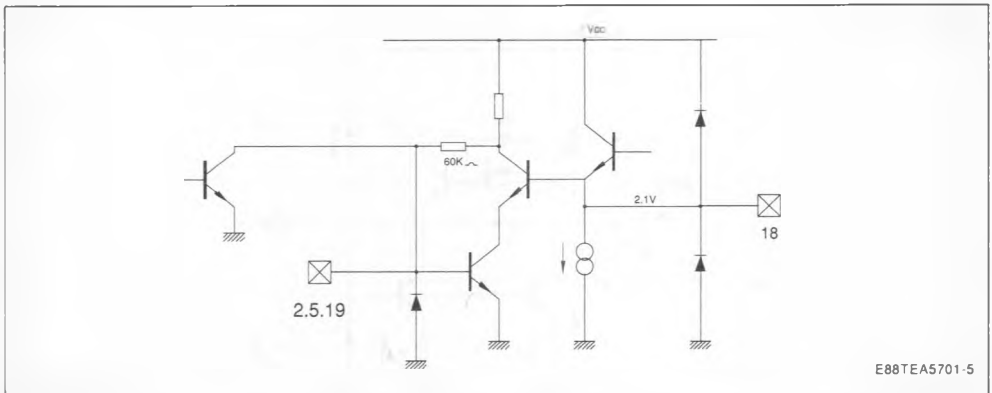
PIN 15



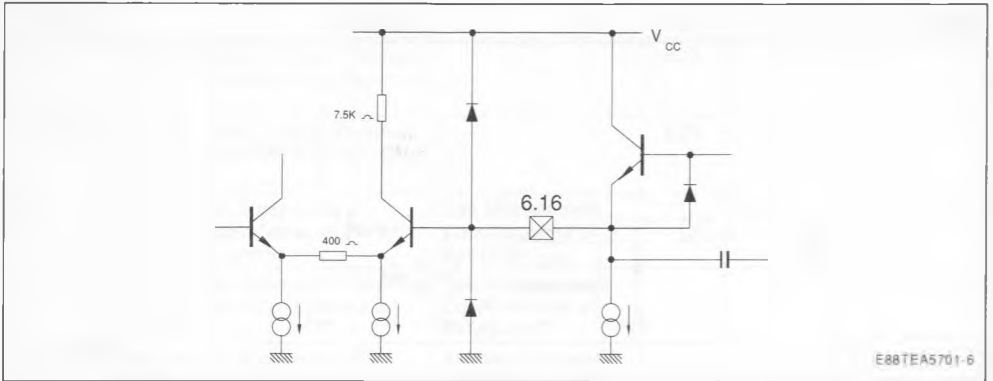
PIN 1 AND 20



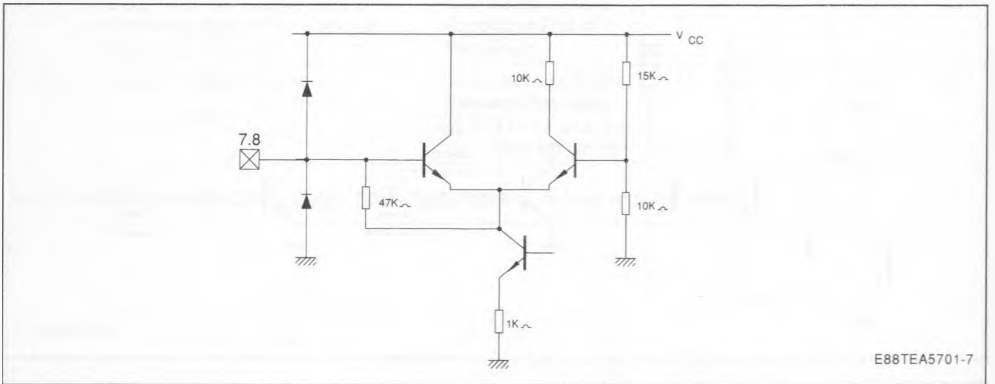
PINS 2 - 5 - 19 - 18



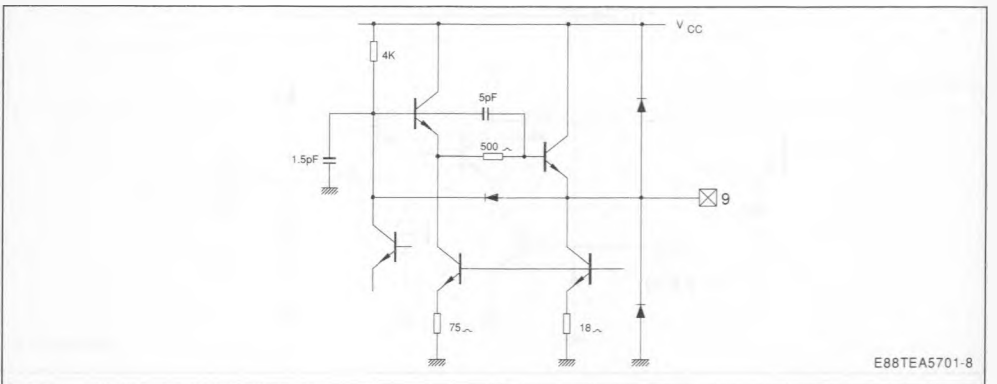
PINS 6 - 16



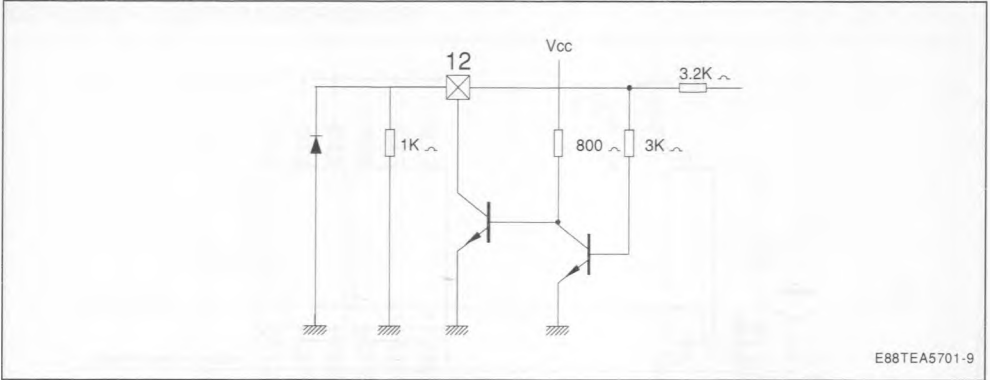
PINS 7 - 8



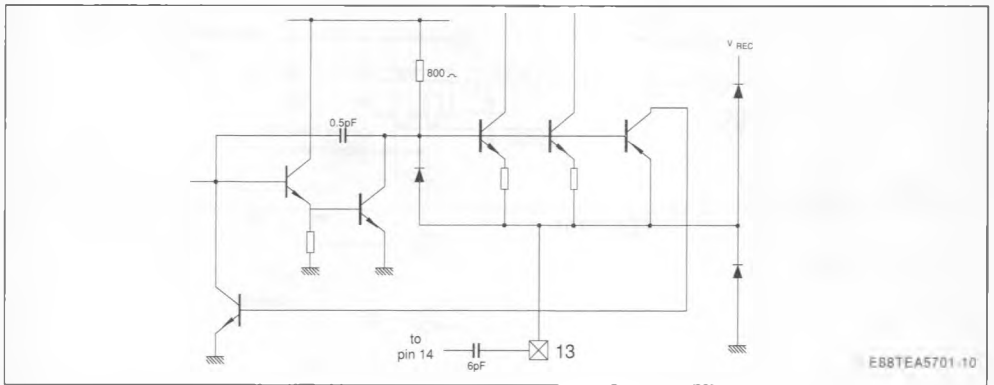
PIN 9



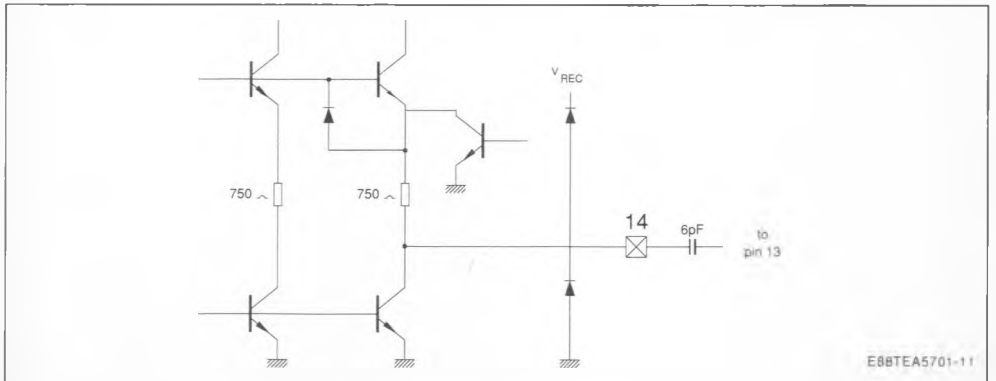
PIN 12



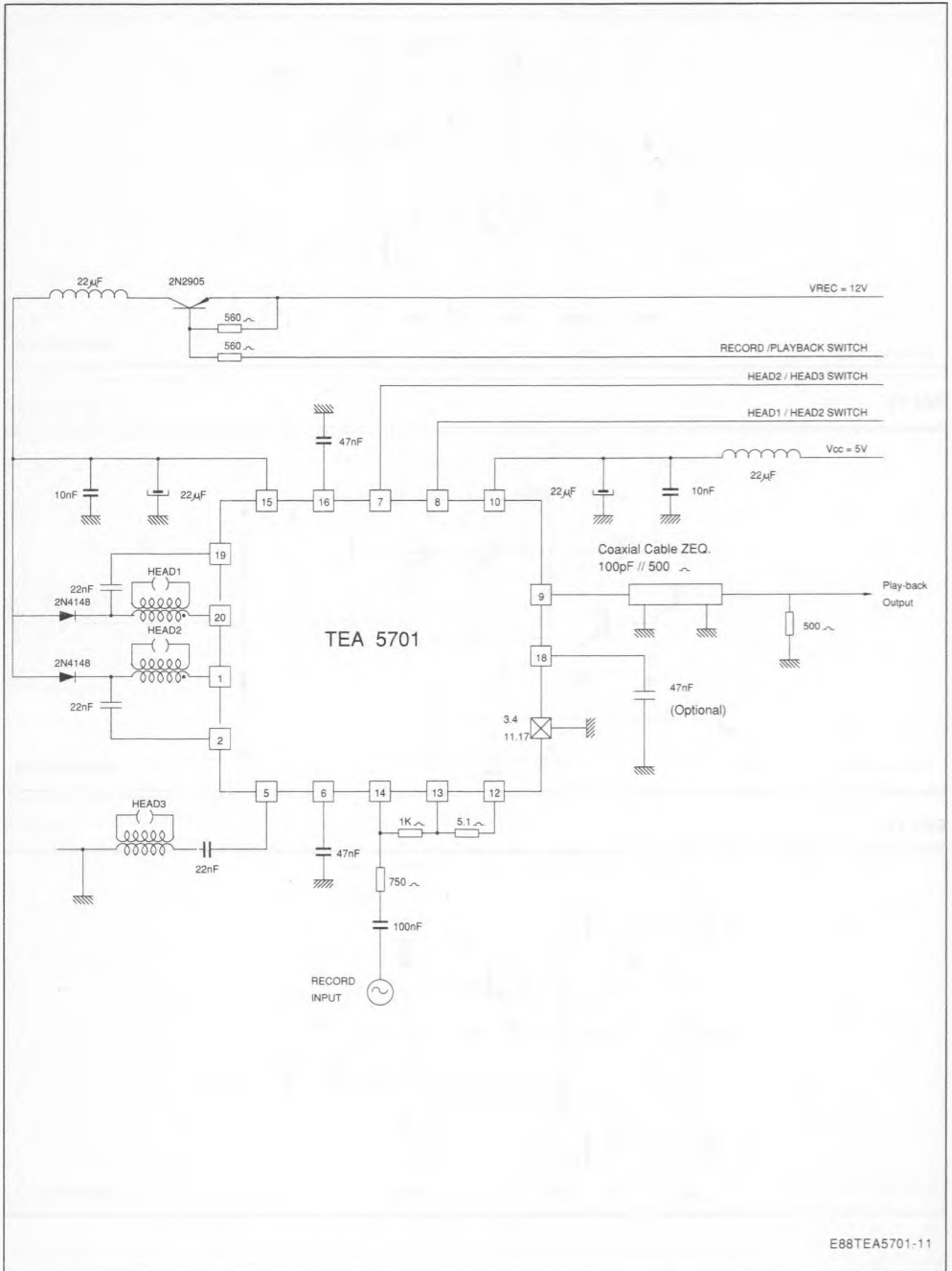
PIN 13



PIN 14



TYPICAL APPLICATION



E88TEA5701-11

PACKAGE MECHANICAL DATA

SO20 LARGE – PLASTIC MICROPACKAGE

