

## STEREO/DUAL TV SOUND PROCESSING CIRCUITS

## GENERAL DESCRIPTION

The TDA3800G; GS are stereo/dual TV sound decoder circuits for processing an a.f. and a sound i.f. signal in TV and VCR equipment, using active filters in selective frequency processing.

In deviation of our standard terms and conditions of sale the supply of the TDA3800 (ABS) does not imply any patent indemnity whatsoever with respect to the stereo-tone patent rights of I.G.R. Germany.

## Features

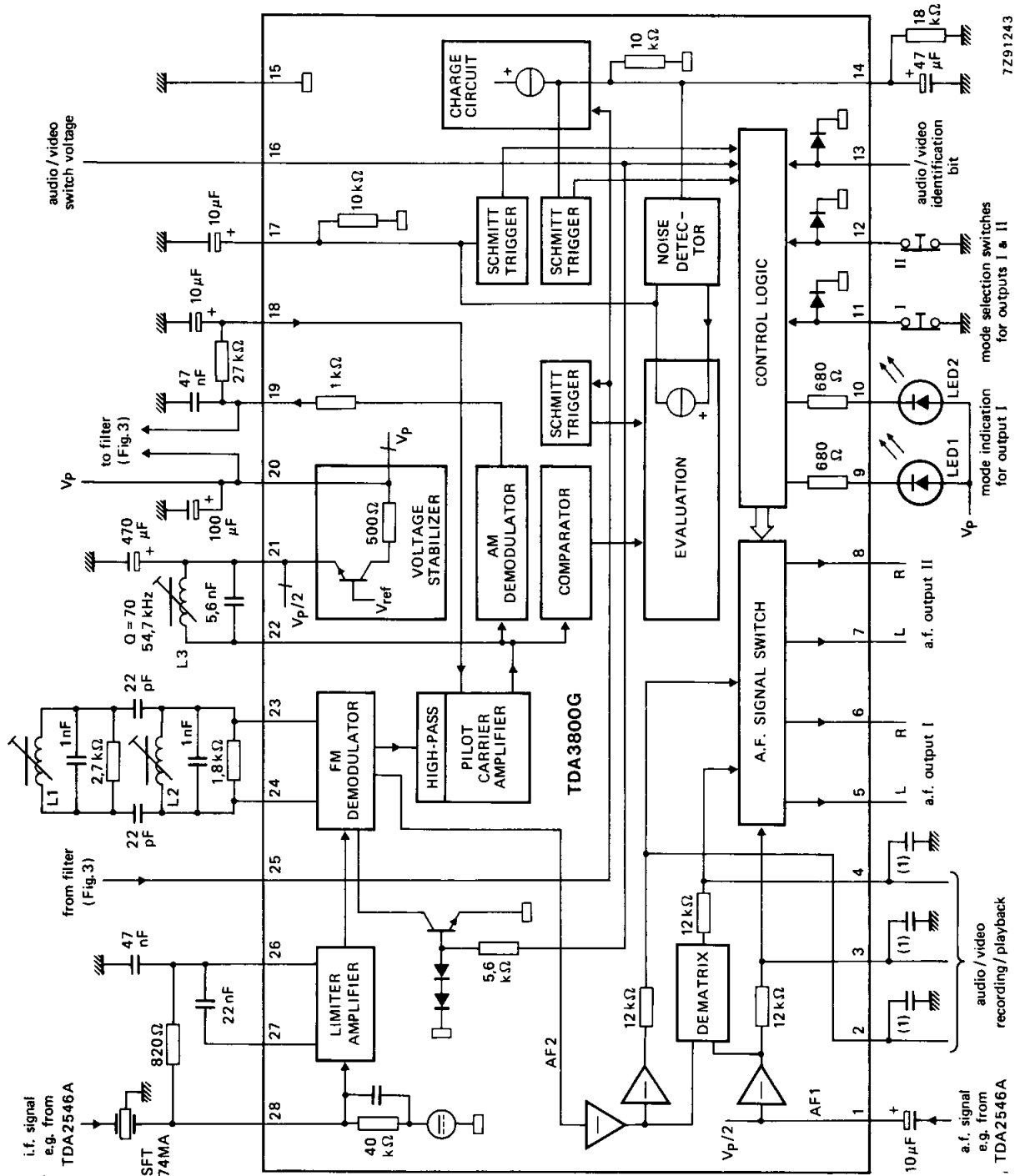
- Signal processing of one a.f. signal and one i.f. signal
- 2nd i.f. limiter/amplifier and FM demodulator (5,742 MHz) for the second sound channel
- Pilot carrier processing with digital identification, hysteresis and short switching times
- De-matrixing of the signals for the two audio channels
- De-emphasis
- Two dual channel, independently controllable a.f. outputs
- Low-resistance a.f. outputs (short-circuit protected); can be used for headphone
- Standardized switched output for controlling external audio/video equipment
- Signal path control by an identification bit (also in audio/video mode)
- LED indication of selected mode (also in audio/video mode)
- Possibility to apply a.f. signals from external equipment via the de-emphasis inputs (audio/video mode)
- Mode selection of stereo/mono or sound I/sound II
  - TDA3800G dynamic selection with internal storage
  - TDA3800GS static selection

## QUICK REFERENCE DATA

Supply voltage (pin 20)	$V_P = V_{20-15}$	typ.	12 V
2nd sound i.f. input voltage for start of limiting (r.m.s. value)	$V_{i(rms)}$	typ.	50 $\mu$ V
Pilot carrier amplifier control range	$\Delta G_V$	min.	20 dB
A.F. input voltage (r.m.s. value)	$V_{i(rms)}$	typ.	1 V
A.F. demodulator output voltage (r.m.s. value)	$V_{o(rms)}$	typ.	0,6 V
LED output current	$I_{LED}$	typ.	15 mA
Signal-to-noise ratio of the a.f. signal switches	S/N	typ.	80 dB
Crosstalk in stereo mode	$\alpha_S$	min.	40 dB
Crosstalk in dual sound mode	$\alpha_{DS}$	min.	60 dB

## PACKAGE OUTLINES

28-lead DIL; plastic (SOT117).

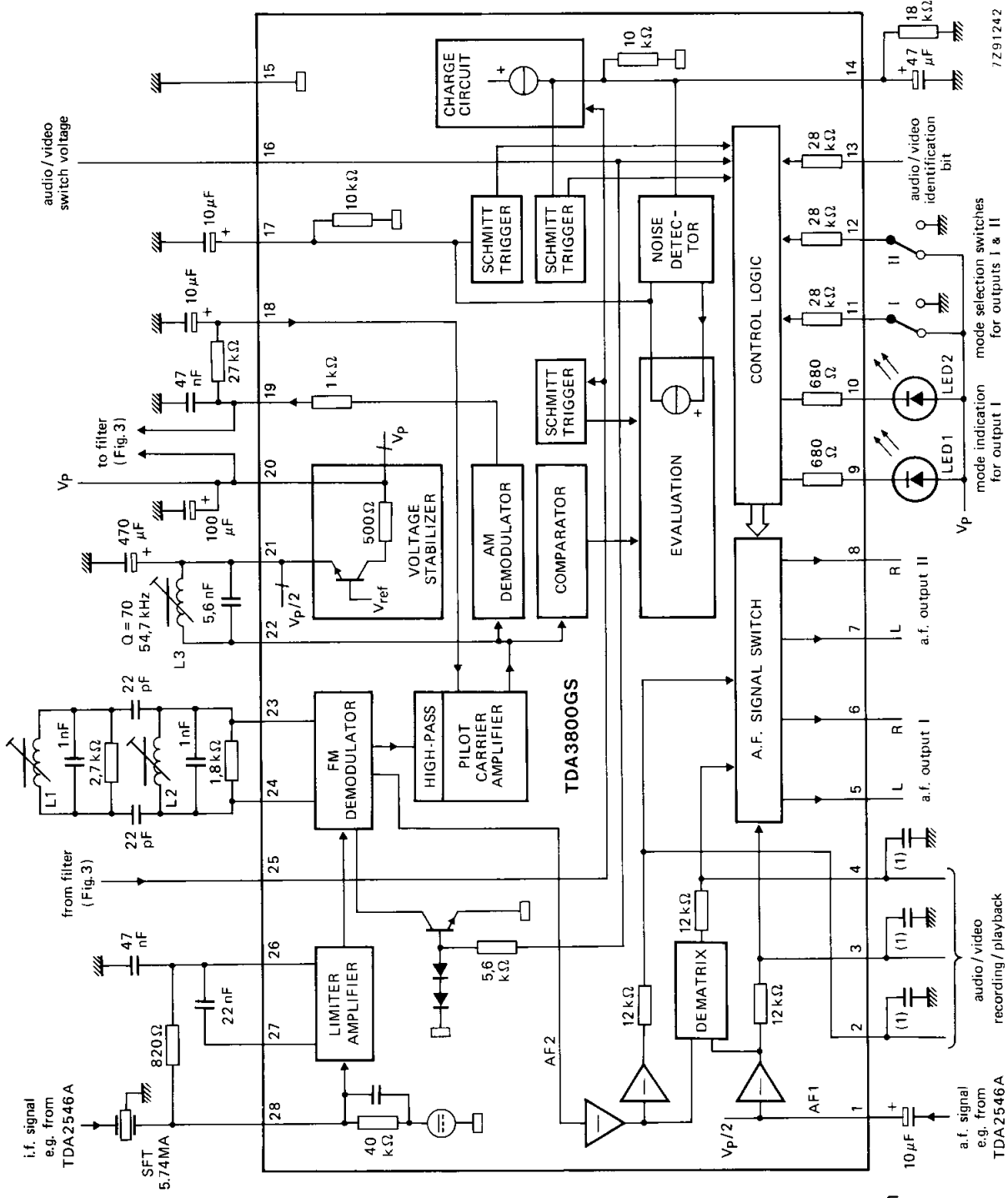


- (1) De-emphasis 3,9 nF.
- (2) TDA3800G application using active filters.

**Coil data**

L1 and L2: TOKO 7 k;  
Q = 25, f<sub>0</sub> = 5,74 MHz.

Fig. 1 TDA3800G block diagram and test circuit in accordance with Fig. 3.



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Fig. 2 TDA3800GS block diagram and test circuit in accordance with Fig. 3.

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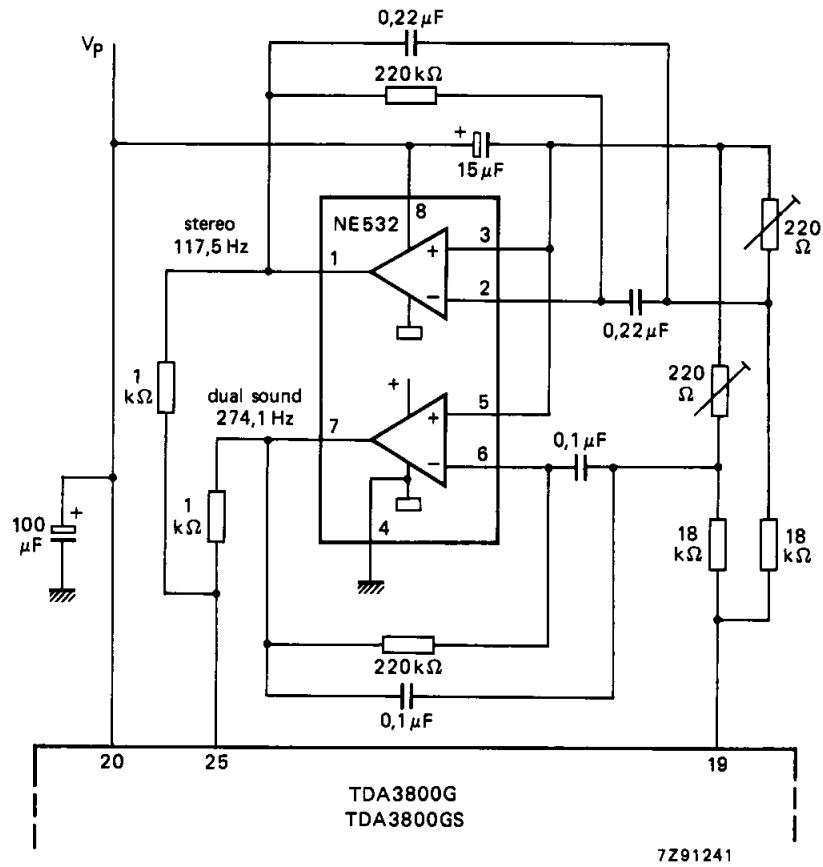


Fig. 3 External filter circuit for the identification frequencies 117,5 Hz and 247,1 Hz.

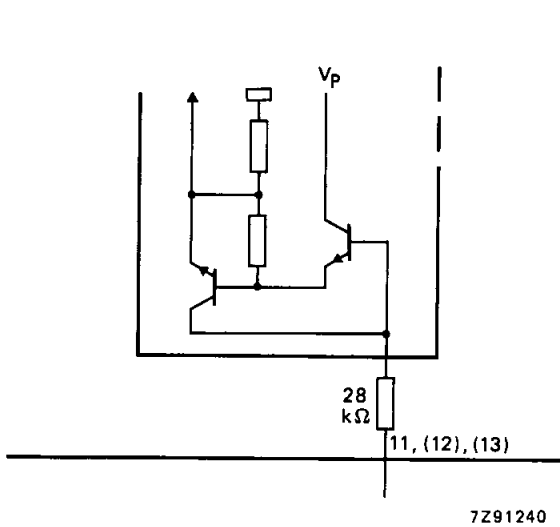


Fig. 4 TDA3800GS internal circuit for the control input leads 11, 12 and 13.

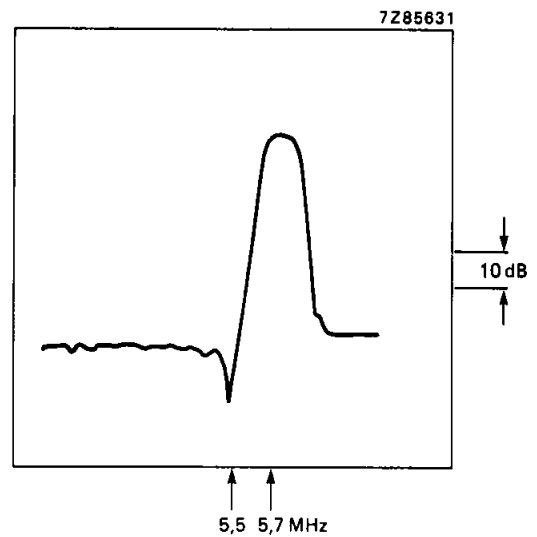


Fig. 5 IF2 filter selection.

**RATINGS**

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Supply voltage (pin 20)	$V_P = V_{20-15}$	max.	14 V
Voltage			
at pins 1; 9; 10; 16 and 25	$V_{n-15}$	max.	$V_P$
at pins 11; 12 and 13*	$V_{11;12;13-15}$	max.	$V_P$
Current			
at pins 11; 12 and 13**	$I_{11;12;13}$	max.	1 mA
at pin 21	short-circuit protected		
Total power dissipation	$P_{tot}$	max.	1,5 W
Storage temperature range	$T_{stg}$	-25 to +150 °C	
Operating ambient temperature range	$T_{amb}$	0 to +70 °C	

\* TDA3800GS only.

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**CHARACTERISTICS**

$V_P = 12\text{ V}$ ;  $T_{amb} = 25\text{ }^\circ\text{C}$ ; measured in Fig. 1/Fig. 2 with a 1 kHz signal.  $V_{1-15(rms)} = 0,5\text{ V}$ , an i.f. signal  $V_{28-15(rms)} = 5\text{ mV}$  ( $VC/2SC = 20\text{ dB}$ ,  $\Delta f = \pm 50\text{ kHz}$ ,  $f_m = 400\text{ Hz}$ ) and with adjusted de-matrix circuit; i.f. filter selection at input pin 28 as in Fig. 5; unless otherwise specified.

parameter	symbol	min.	typ.	max.	unit
<b>Supply (pin 20)</b>					
Supply voltage range	$V_P = V_{20-15}$	10,8	12	13,2	V
Supply current (without LED current; mono)	$I_P = I_{20}$	40	—	87	mA
<b>FM limiter/amplifier and demodulator</b>					
Start of limiting	$V_{28-15(rms)}$	—	—	60	$\mu\text{V}$
Input resistance	$R_{28-15}$	—	40	—	$\text{k}\Omega$
Input capacitance (Fig. 5)	$C_{28-15}$	—	4,5	—	pF
AM suppression at $V_i = 0,5\text{ mV}$ ; $\Delta f = \pm 30\text{ kHz}$	$\alpha_{AMS}$	50	—	—	dB
<b>Pilot carrier processing</b>					
D.C. input voltage	$V_{18-15}$	—	7,2	—	V
D.C. voltage (reference via tuning coil)	$V_{22-15}$	—	6,0	—	V
AM demodulator output voltage	$V_{19-15}$	—	7,3	—	V
Controlled pilot carrier output voltage (peak-to-peak value)	$V_{22-21(p-p)}$	—	250	—	mV
Output resistance	$R_{22-15}$	50	—	—	$\text{k}\Omega$
<b>Identification frequency evaluation</b>					
No identification signal (lower threshold)	$V_{14-15}$	—	—	2	V
Identification signal (upper threshold)	$V_{14-15}$	4	—	—	V
Stereo transmission	$V_{17-15}$	—	—	2	V
Dual sound transmission	$V_{17-15}$	4	—	—	V
<b>De-matrixing</b>					
Output voltages	$V_{2;3;4-15}$	—	5,3	—	V
De-emphasis output resistances	$R_{2;3;4-15}$	—	12	—	$\text{k}\Omega$
A.F. output signal of 2nd i.f. (r.m.s. value)	$V_{2-15(rms)}$	—	0,6	—	V
Attenuation of the demodulator output signal AF2 at audio/video mode	$\alpha_{AF2}$	75	—	—	dB
Distortion of the AF2 signal $V_{O2-15}$	$d_{tot}$	—	0,4	—	%

parameter	symbol	min.	typ.	max.	unit
<b>AF1 input</b>					
D.C. input voltage	V <sub>1-15</sub>	—	6	—	V
Input resistance	R <sub>1-15</sub>	—	14	—	kΩ
Maximum input signal (r.m.s. value)	V <sub>1-15(rms)</sub>	—	2	—	V
<b>A.F. signal switches</b>					
D.C. output voltages	V <sub>5;6;7;8-15</sub>	—	5,3	—	V
Output resistances	R <sub>5;6;7;8-15</sub>	—	200	—	Ω*
Maximum a.f. output signals (r.m.s. value)					
for V <sub>AFI(rms)</sub>	V <sub>5;6-15(rms)</sub>	—	2	—	V
for V <sub>AFII(rms)</sub>	V <sub>7;8-15(rms)</sub>	—	2	—	V
Total distortion when applying a signal at V <sub>2;3;4-15(rms)</sub> = 0,5 V	d <sub>tot</sub>	—	—	0,1	%
Signal plus noise-to-noise ratio	S + S/N	—	80	—	dB
Crosstalk attenuation					
in stereo mode (f = 1 kHz at pin 2)	α <sub>S</sub>	40	—	—	dB
in dual sound mode (f = 20 Hz to 20 kHz)	α <sub>DS</sub>	60	—	—	dB
<b>Audio/video switch</b>					
Audio/video switch voltage					
for playback (HIGH)	V <sub>16-15</sub>	7	—	V <sub>p</sub>	V
for recording (LOW)	V <sub>16-15</sub>	0	—	2,5	V
Audio/video identification bit (TDA3800G)					
for stereo mode (LOW)	V <sub>13-15</sub>	0	—	0,2	V
for dual sound mode (HIGH)					
at V <sub>13-15</sub> ≈ 0,7 V	I <sub>13</sub>	—	0	—	mA
Audio/video switch voltage (TDA3800GS)					
(stereo/dual sound)					
for stereo mode (LOW)	V <sub>13-15</sub>	—	—	0,8	V
for dual sound mode (HIGH)	V <sub>13-15</sub>	2,4	—	—	V
<b>Mode selection switches for outputs I and II</b>					
Active LOW (TDA3800G)					
input voltage LOW	V <sub>11;12-15</sub>	0	—	0,2	V
switch open condition					
at V <sub>11;12-15</sub> ≈ 0,7 V	I <sub>11;12</sub>	—	0	—	mA
Pulse duration	t <sub>p</sub>	1	—	—	μs

\* Connection of high-impedance headphones is possible.

**CHARACTERISTICS** (continued)

parameter	symbol	min.	typ.	max.	unit
<b>Switching voltage (TDA3800GS)</b>					
Mono transmission both equals I and II mono					
Dual sound transmission					
switching voltage to pin 11 (pin 12 not affected)					
a.f. output II sound I and a.f. output I sound II	V <sub>11-15</sub>	—	—	0,8	V
a.f. output I sound I and a.f. output II and II	V <sub>11-15</sub>	2,4	—	—	V
Stereo transmission					
switching voltage to pin 12 (pin 11 not affected)					
a.f. outputs I and II mono	V <sub>12-15</sub>	—	—	0,8	V
a.f. outputs I and II stereo	V <sub>12-15</sub>	2,4	—	—	V
<b>Mode indication (pins 9 and 10; see also Table 1)</b>					
Only the mode for output I is indicated					
Maximum output current	I <sub>9;10</sub>	—	15	—	mA
<b>Voltage stabilizer (pin 21)</b>					
Output voltage	V <sub>21-15</sub>	—	6	—	V
Maximum d.c. output current short-circuit protected	± I <sub>21</sub>	—	0,5	—	mA

**Notes to the characteristics (TDA3800G only)**

1. Serial commands for stereo/mono or sound I/sound II selection are determined by the identification bit of the transmission.
2. The pushbuttons at pins 11 and 12 are assigned to the a.f. outputs I and II respectively.
3. When a transmitter changes its identification from dual sound to stereo and then back to dual sound again, the last selected dual sound signal is available automatically because of the internal storage of the choice. This is also applicable for mono/stereo selection.
4. Power-on reset: when applying the supply voltage, the stereo or the AF1 signal appears at both outputs I and II depending on the type of transmission.

**Table 1** Mode indication possibilities

LED 1	LED 2	selected reception mode
OFF	OFF	mono at mono or stereo transmission
ON	ON	stereo at stereo transmission
OFF	ON	AF1 signal at dual sound transmission
ON	OFF	AF2 signal at dual sound transmission