

Multi Standard Quasi Parallel-Sound Processor for TV-Sets

Technology: Bipolar

Features

- High signal sensitivity
- Simple filter configuration and few external components
- Processing of two carrier stereo signals
- Low intercarrier distortions
- AF output level matched to SIMAVELEC condition
- Alignment free AM demodulator for the standard L
- VCO controlled mixer stage converts intercarrier frequencies of different standards into a preferred sound IF
- Optimum tuning characteristic
- ESD protected

Case: DIP20

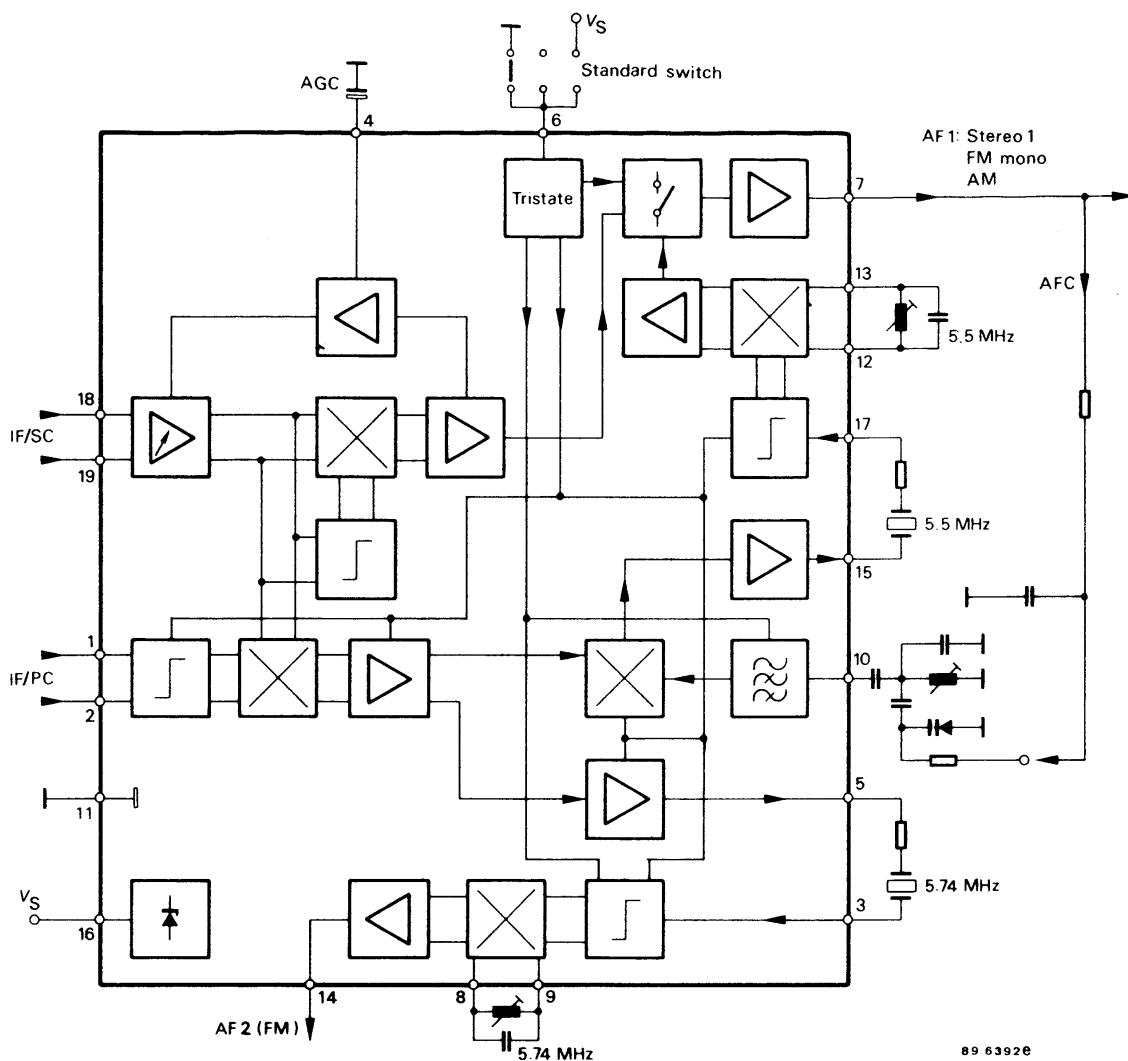


Figure 1. Block diagram

Pin Description

Pin	Symbol	Function
1-2		Vision-IF-carrier input
3		Inter-carrier input 5.74 MHz
4		AGC time constant
5		Inter-carrier output 5.74 MHz
6		Standard switch
7		AF output 1
8-9		Phase tank circuit 5.74 MHz
10		VC0 tank circuit

Pin	Symbol	Function
11		Ground
12-13		Phase tank circuit 5.5 MHz
14		AF output 2
15		Inter-carrier output 5.5 MHz
16		Supply voltage
17		Inter-carrier input 5.5 MHz
18-19		Sound-IF-carrier input
20		NC

Circuit Description

The integrated circuit allows the high quality processing of sound carrier for different TV standards. The circuit requires separate vision and audio carrier inputs. It delivers the output audio signal for mono, two channels or stereo applications.

Audio carrier signal (simple or double carrier, FM and AM) is applied via three stage AGC controlled broad band amplifier which delivers regulated output signal for two mixing stages. One mixer works for AM-demodulation and AGC-function whereas the second mixer produces the sound inter-carrier IF-frequencies (5.5/5.74 MHz).

Vision carrier signal for the inter-carrier generation is delivered from the demodulator tank of the video IF circuit (TDA 4439, TDA 4453). It is then matched via a limiter stage to the FM inter-carrier mixer. FM-sound-IF-carrier

reaches the quadrature demodulator via the selection circuit and the following limiter amplifier. The final audio signal is supplied to the low ohmic output (Pins 7 and 14) with low pass filter character.

There is a switchable converter for different audio standards (4.5, 6.00 and 6.5 MHz), which mixes the sound IF-signal properly e.g. at 5.5 MHz. The VCO (Pin 10) must be controlled across the sound output (Pin 7) which includes AFC-function.

Sound signal at the AM-modulation is introduced via standard switch in the first sound channel, whereas the inter-carrier, converter section and both FM demodulators are switched off. In case of sound IF converter operation, the second sound channel and the AM-section are switched off. The standard mode is controlled by a tri-state signal on Pin 6.

Absolute Maximum Ratings

Reference point Pin 11, unless otherwise specified.

Parameters	Symbol	Value	Unit
Supply voltage Pin 16	V_S	10 to 13.5	V
Supply current Pin 16	I_S	80	mA
External voltages Pin 6 Pins 1, 2, 3, 4, 5, 7, 8, 9, 12, 13, 14, 15, 17, 18 and 19	V_{ext}	V_S 6	V
Power dissipation (in soldered position)	P_{tot}	1	W
Junction temperature	T_j	125	°C
Ambient temperature range	T_{amb}	-25 to +70	°C
Storage temperature range	T_{stg}	-25 to +125	°C

Thermal Resistance

Parameters	Symbol	Value	Unit
Junction ambient	R_{thJA}	60	K/W

Electrical Characteristics

$V_S = 12\text{ V}$, $T_{\text{amb}} = 25^\circ\text{C}$, reference point Pin 11, $f_{\text{PC}} = 38.9\text{ MHz}$, $f_{\text{SC1}} = 33.4\text{ MHz}$, $f_{\text{SC2}} = 33.1578\text{ MHz}$, $\text{SC1/SC2} = -7\text{ dB}$, unless otherwise specified

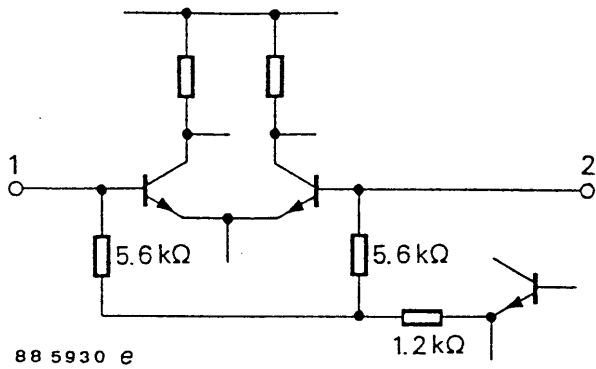
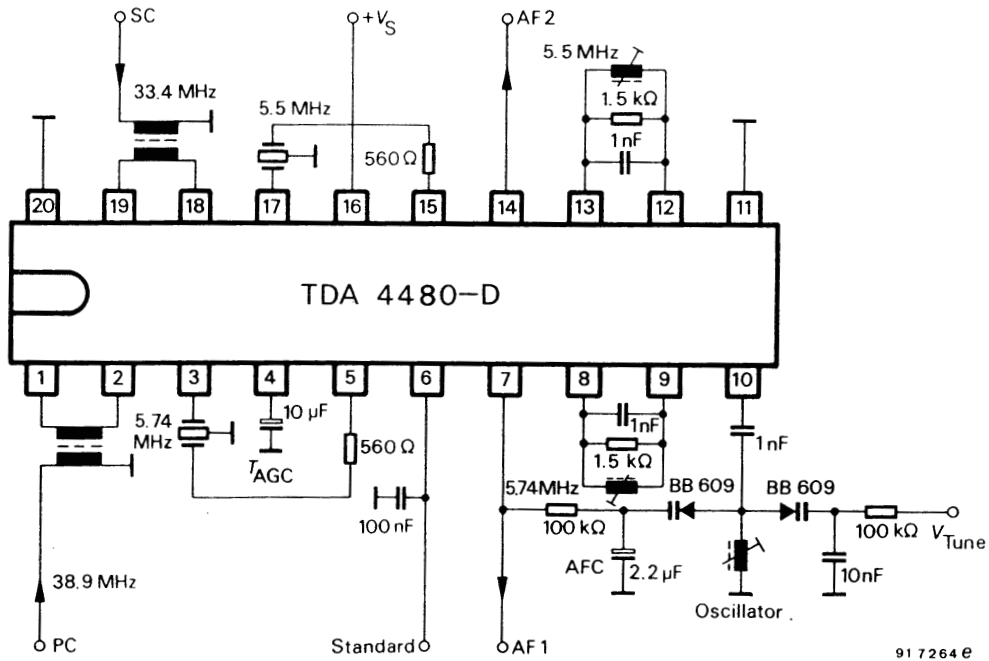
Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	Pin 16	V_S	10		13.5	V
Supply current	FM-operation Pin 16 AM-operation	I_S		65 40		mA
DC output voltage	Pins 7 and 14	V_0		3.5		V
Standard switching voltage	Standard B/G Pin 6 Standard L Converter operation	V	1.7 0 3.5	2.2	2.7 1.5 V_S	V
Standard switching current	$V_6 \leq 5\text{ V}$ Pin 6	I			20	μA
Picture carrier input voltage	Pin 1 – 2	v	5	10	20	mV
Min. sound carrier input voltage SC1	5.5-MHz output signal –3 dB Pin 18 – 19	v		50		μV
Max. sound carrier input voltage SC1	Pin 18 – 19	v		100		mV
AGC range				65		dB
Audio output voltage	$f_{\text{mod}} = 1\text{ kHz}$, $V_{18-19} = 10\text{ mV}$ FM: deviation = 27 kHz Pin 7, 14 AM: m = 54 % Pin 7	v		500 500		mV
Audio voltage difference between both outputs	Pin 7,14	v			± 1	dB
Harmonic distortion: FM-operation	$f_{\text{mod}} = 1\text{ kHz}$ Pin 7, 14 FM-deviation = 30 kHz	d		0.5		%
Harmonic distortion: AM-operation	$f_{\text{mod}} = 1\text{ kHz}$, m = 80 %, $V_{18-19} = 10\text{ mV}$ Pin 7	d		1.5	3.0	%
Minimum output load	Pin 7, 14	R	3			$\text{k}\Omega$
Signal to noise ratio (Standard B/G) according to CCIR 468-2 specifications: SC1: $v_{18-19} = 10\text{ mV}$; PC: $v_{1-2} = 10\text{ mV}$ prelimited demodulator, picture carrier signal from TDA 4453, reference signal: $f_{\text{mod}} = 1\text{ kHz}$, FM-deviation = 30 kHz						
Black burst	1. channel/2. channel ¹⁾ Pin 7, 14	(S+N)/N		62/60		dB
Grid test signal	1. channel/2. channel ¹⁾ Pin 7, 14	(S+N)/N		50/48		dB
Converter Pin 10						
DC voltage	$V_6 \geq 3.5\text{ V}$	V_{10}		2.7		V
Tuning range		f	9		13	MHz
Input resistance		R_i		100		$\text{k}\Omega$
Input capacity		C_i		12		pF

¹⁾ Standard B/G IF-modulated FBAS-signal

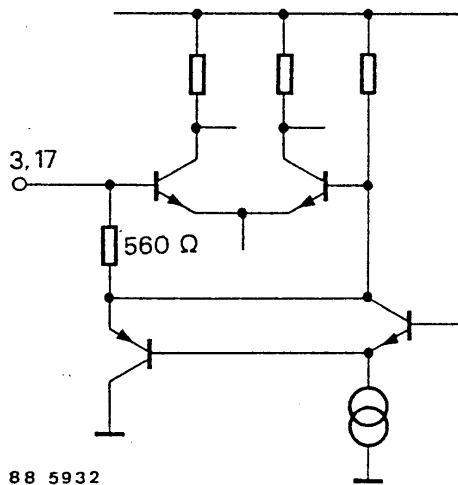
TDA4480-D

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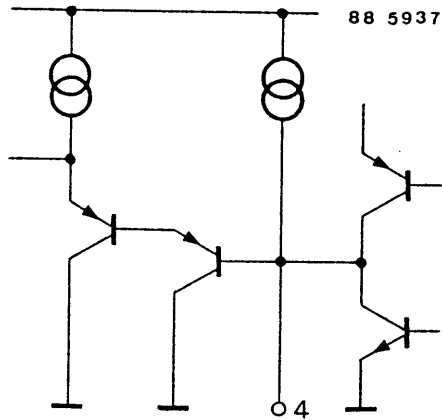
TELEFUNKEN Semiconductors



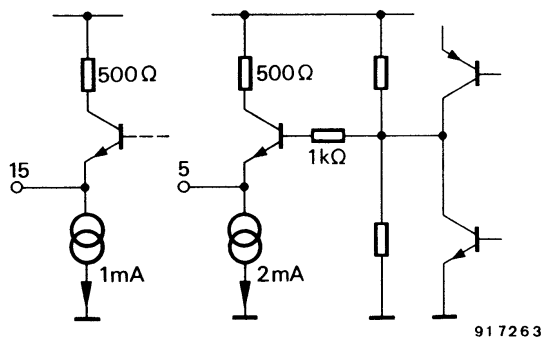
Pin 1, 2
IF-input
vision carrier



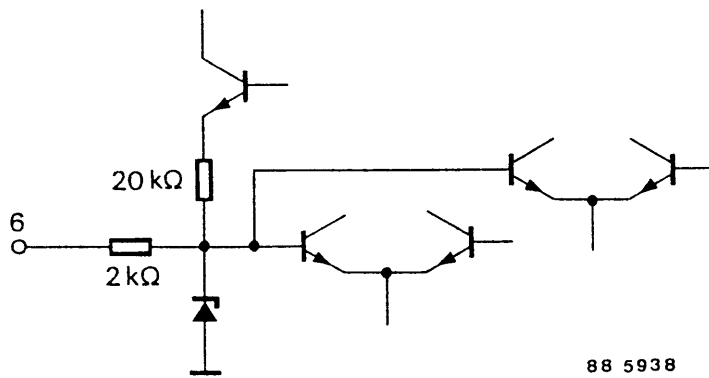
Pin 3 (17)
Intercarrier input
Pin 3: 5.74 MHz
Pin 17: 5.5 MHz



Pin 4
AGC time constant



Pin 5 (15)
Intercarrier output
Pin 5: 5.74 MHz
Pin 15: 5.5 MHz

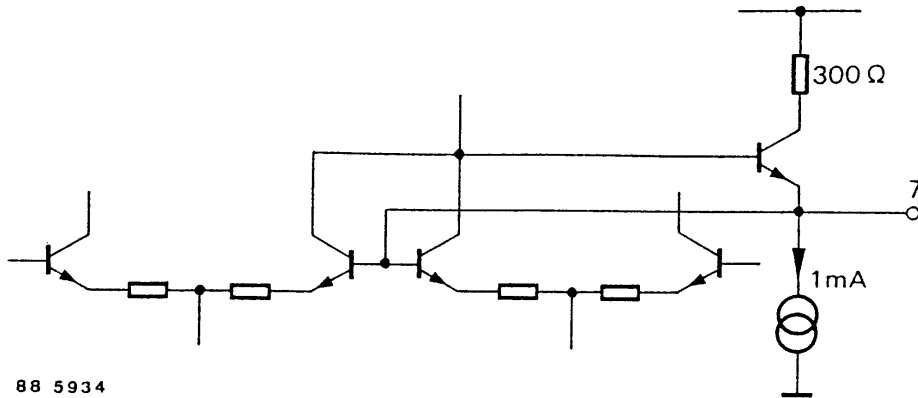


Pin 6
Standard switch

TDA4480-D

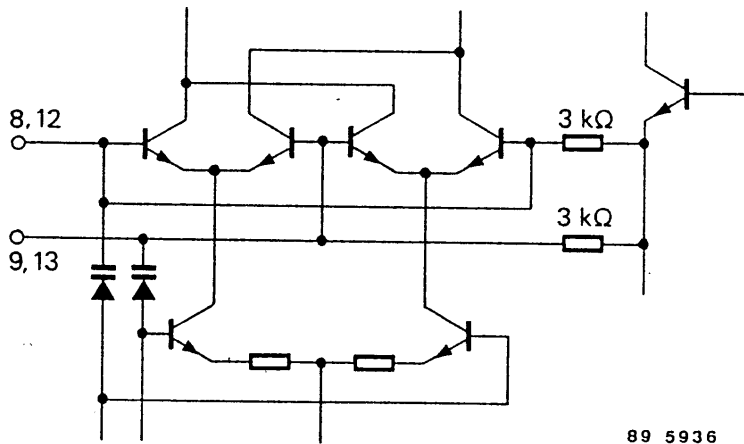
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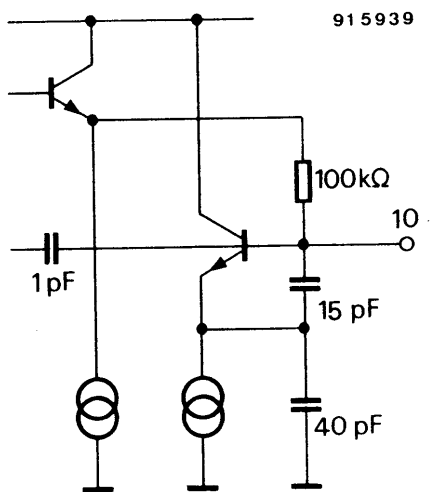
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Pin 7
AF-output AM/FM
(channel 1, 5.5 MHz)



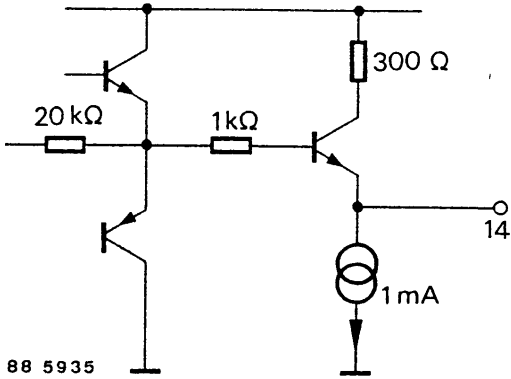
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Pin 8, 9 (12, 13)
Phase tank circuit
Pin 8, 9 : 5.74 MHz
Pin 12, 13 : 5.5 MHz

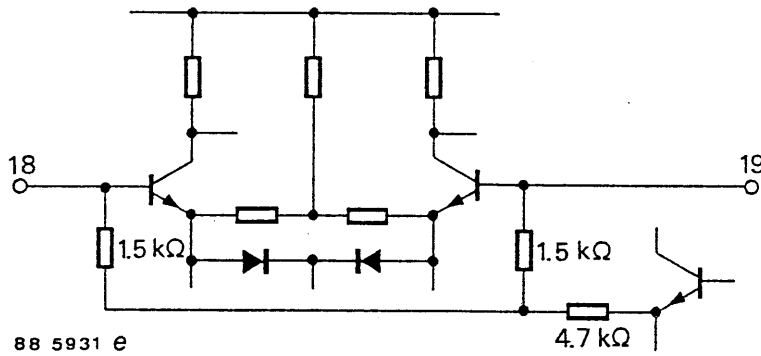


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Pin 10
VCO tank circuit



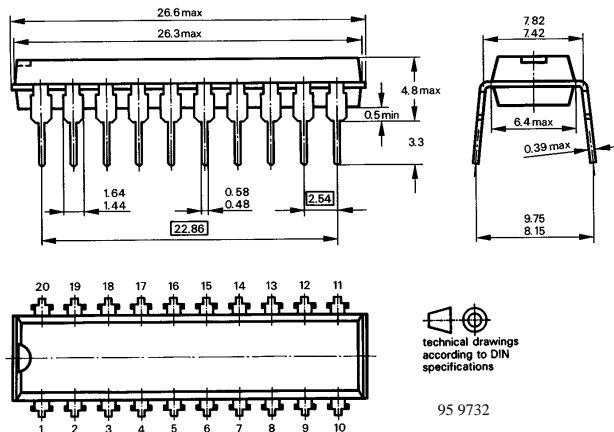
Pin 14
AF-output FM
(channel 2, 5.74 MHz)



Pin 18, 19
IF-input
sound carrier

Dimensions in mm

Package:DIP 20



Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

TEMIC TELEFUNKEN microelectronic GmbH semiconductor division has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

TEMIC can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

We reserve the right to make changes to improve technical design and may do so without further notice.

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