

## Quasi Parallel Sound Processing with Quadrature Intercarrier Demodulator

**Technology:** Bipolar

### Features

- Very high input sensitivity
- Excellent signal to noise ratio
- Fast averaged AGC
- IF amplifier can be switched off for VTR mode
- Output signal stabilized against  $V_S$  variations
- Very few external components

### TDA4445B additional

- Targeting bistandard applications (B/G and L)
- Alignment free AM demodulator
- Low AM distortion

**Case:** DIP16

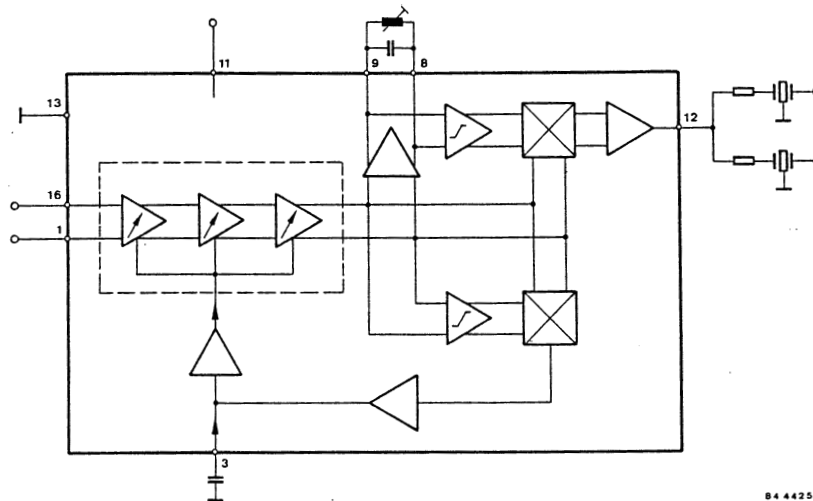


Figure 1. Block diagram TDA4445A

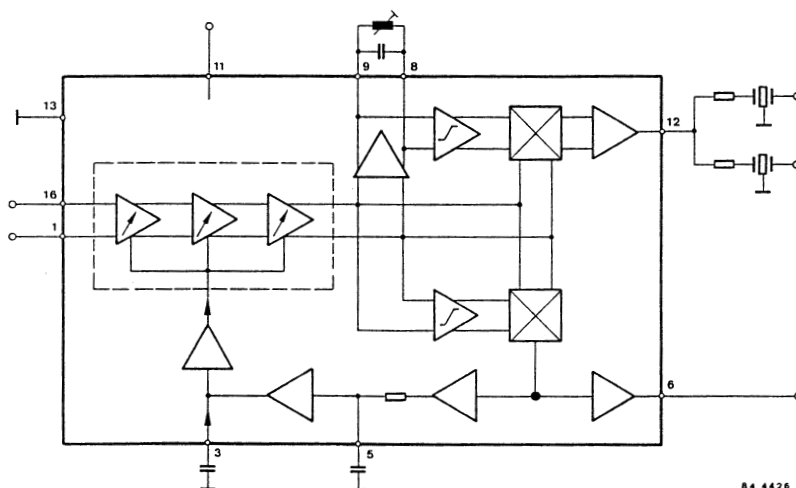


Figure 2. Block diagram TDA4445B

## Pin Description

Pin	Symbol	Function
1–16		IF input
3		If AGC time constant
8–9		Tuned circuit
11		Supply voltage
12		Sound-IF-output
13		Ground
2, 4, 7, 10, 14, 15		not connected

## TDA4445B additional

Pin	Symbol	Function
5		Average capacitor
6		AF output

## Circuit Description

### This circuit includes the following functions

- Three symmetrical and gain controlled wide band amplifier stages, which are extremely stable by quasi DC coupling without feedback
- Averaged AGC with discharge control circuit
- AGC voltage generator

### Quasi parallel sound operation

- High phase accuracy of the carrier signal processing, independent from AM
- Linear quadrature demodulator
- Sound-IF-amplifier stage with impedance converter

### AM-Demodulation (TDA4445B only)

- Carrier controlled demodulator
- Audio frequency stage with impedance converter
- Averaged low pass AGC

## Absolute Maximum Ratings

Reference point pin 3, unless otherwise specified

Parameters	Symbol	Value	Unit
Supply voltage range	Pin 11 $V_S$	10 ... 15	V
Supply current	Pin 11 $I_S$	70	mA
External voltages TDA4445A, B	Pin 3 $V_{ext}$	12	V
	Pin 12	8	
TDA4445B only	Pin 5, 6	8	
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 13, unless otherwise specified

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
Supply current	$V_{1-16} = 10\text{ mV}$ or $V_3 = 3.5\text{ V}$ Pin 11	$I_S$		60		mA
DC output voltage	$V_{1-16} = 10\text{ mV}$ , unmodulated Pin 12	$V_O$		5.0		V
DC output current	$V_{11} = 7.5\text{ V}$ , $V_3 = 3.5\text{ V}$ Pin 12	$I_{\text{max}}$		1.8		V
Input impedance	Pin 1–16 Pin 1–16	$R$		1.6		k $\Omega$
		$C$		2.0		PF
Switch off control voltage	VTR mode Pin 3	$V$	8		10	V
Switch off control current	VTR mode Pin 3	$I$	50		150	$\mu\text{A}$

## Quasi Parallel Sound Operation

$f_{\text{PC}} = 38.9\text{ MHz}$ ,  $f_{\text{SC1}} = 33.4\text{ MHz}$ ,  $f_{\text{SC2}} = 33.16\text{ MHz}$ ,  $\text{PC/SC} = 13\text{ dB}$ ,  $\text{PC/SC2} = 20\text{ dB}$ ,  
PC unmodulated (equivalent to sync. peak current)

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
Minimum input voltage	5.5 MHz output signal –3dB Pin 1–16	$v_i$		50		$\mu\text{V}$
Maximum input voltage	5.5 MHz output signal +1 dB Pin 1–16	$v_i$		80		mV
IF AGC range		$\Delta G_{\text{IF}}$		64		dB
AGC capacitor	control time constant, Pin 3	$C_3$	0.33		10	$\mu\text{F}$
<b>Sound-IF-output voltage</b> $V_{1-16} = 10\text{ mV}$ , SC unmodulated						
5.5 MHz output voltage	Pin 12	$v_i$		250		mV
5.74 MHz output voltage				110		
Signal to noise ratio: measured according to CCIR 468–2 reference signal: $v_{1-16} = 10\text{ mV}$ , FM-frequency deviation = +30 kHz $f_{\text{mod}} = 1\text{ kHz}$ , measured at audio-output sound IF demodulator U2829B						
1. Channel/ 2. Channel Standard B/G modulated IF signal (residual carrier 10%)	Black screen Grid pattern Pin 12	$\frac{S+N}{N}$		62/58 52/49		dB

## Bistandard Operation

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
IF AGC range		$\Delta G_{\text{IF}}$		64		dB
AGC capacitor (control time constant)	Pin 3	$C_3$		10		$\mu\text{F}$
	Pin 5	$C_5$		4.7		

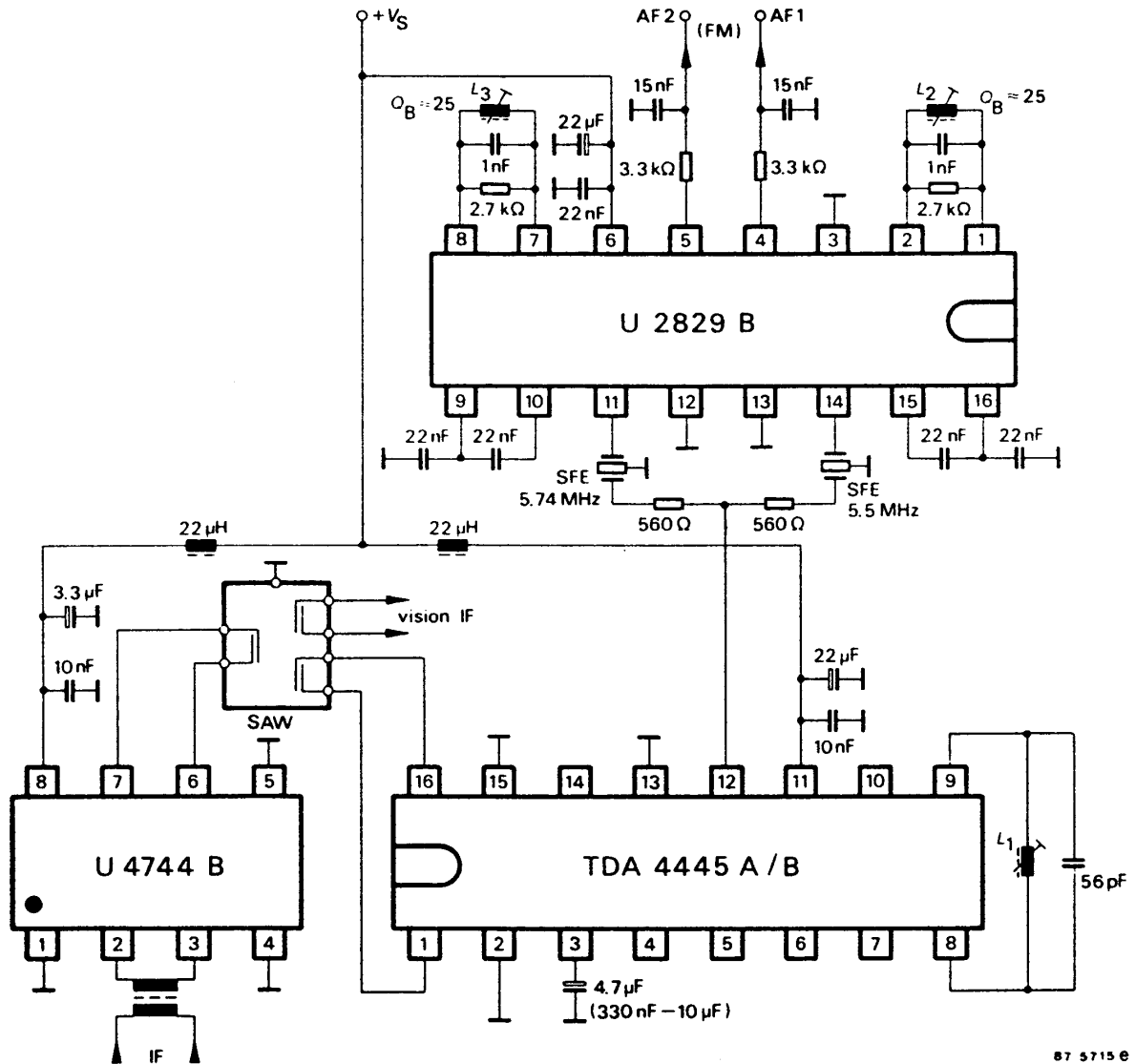
## Quasi Parallel Sound Operation

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
$f_{PC} = 38.9 \text{ MHz}$ , $f_{SCI} = 33.4 \text{ MHz}$ , $f_{SC2} = 33.16 \text{ MHz}$ , $PC/SC = 13 \text{ dB}$ , $PC/SC2 = 20 \text{ dB}$ , PC unmodulated (equivalent to sync. peak current)						
Minimum input voltage	5.5 MHz output signal -3dB Pin 1-16	$v_i$		50		$\mu\text{V}$
Maximum input voltage	+1dB Pin 1-16	$v_i$		80		mV
Sound-IF-output voltage	$v_{1-16} = 10 \text{ mV}$ , Pin 12 SC unmodulated, 5.5 MHz signal 5.74 MHz signal	$v$		250 110		mV

## AM-Demodulation

$f_{SC} = 39.2 \text{ MHz}$ ,  $m = 80 \%$ ,  $f_{mod} = 1 \text{ kHz}$

Parameters	Test Conditions / Pin	Symbol	Min.	Typ.	Max.	Unit
Minimum input voltage	Audio output signal -3dB Pin 1-16	$v$		50		$\mu\text{V}$
DC output voltage	$v_{1-16} = 10 \text{ mV}$ , unmodulated Pin 6	$V$		4.1		V
DC output current	$V_6 = 7.5 \text{ V}$ , $V_3 = 3.5 \text{ V}$ Pin 6	$I_{max}$		0.65		mA
Distortion	$v_{1-16} = 10 \text{ mV}$ , $m = 80 \%$ , $f_{mod} = 1 \text{ kHz}$ Pin 6	$d$		1.5	3.0	%
AF output voltage	$v_{1-16} = 10 \text{ mV}$ , $m = 80 \%$ , $f_{mod} = 1 \text{ kHz}$ Pin 6	$v$		850		mV



87 5715 E

Figure 3. Quasi parallel sound operation

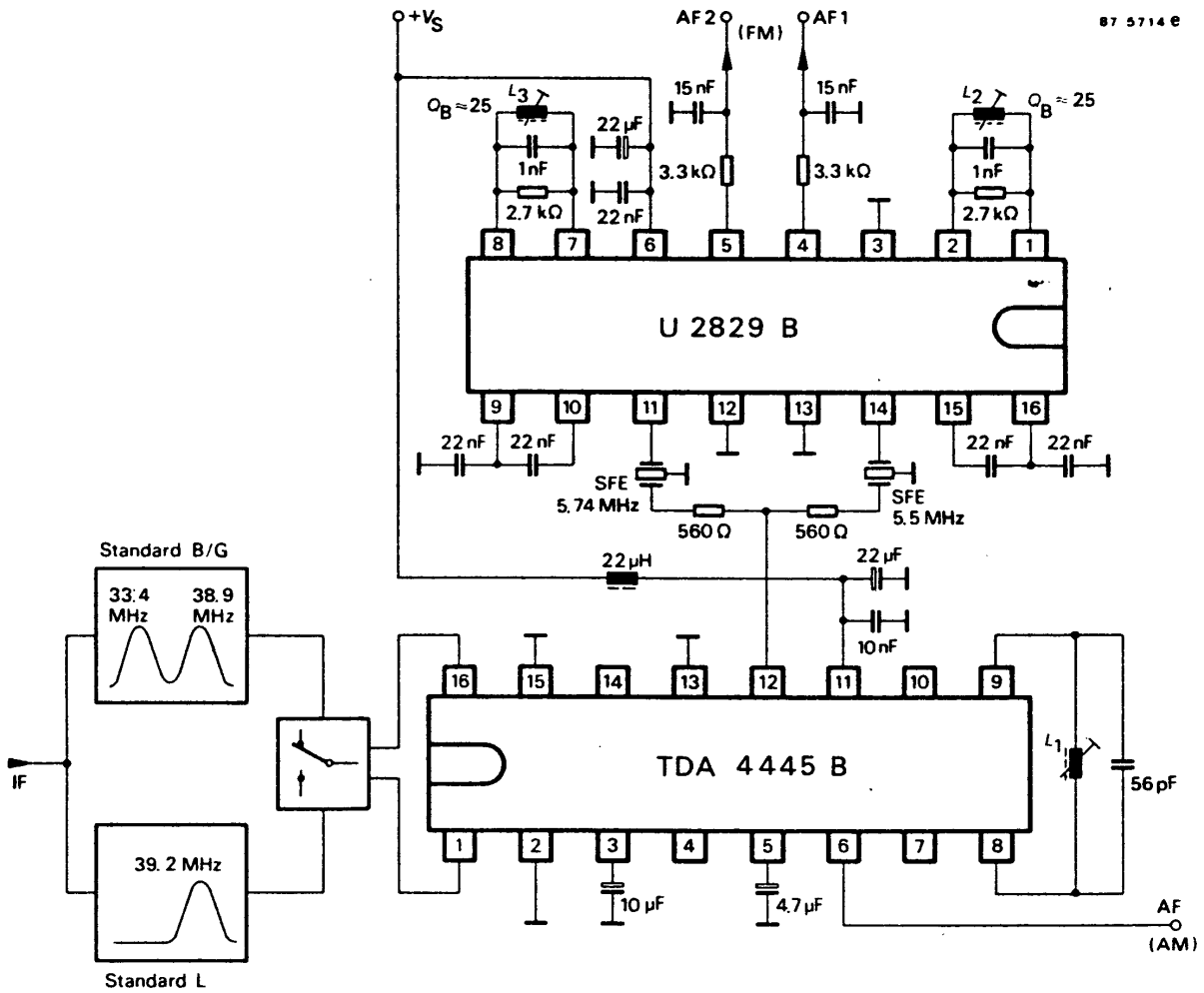
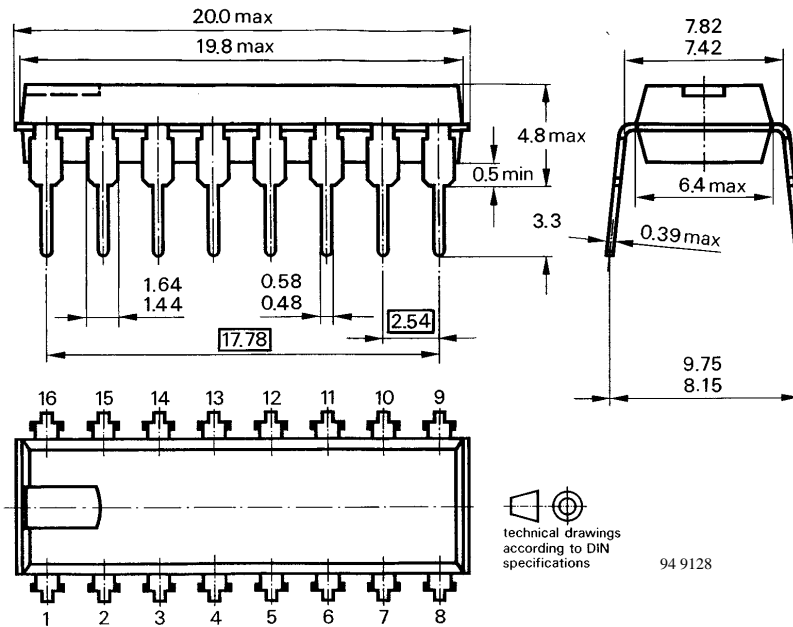


Figure 4. Bistandard operation

## Dimensions in mm

Package: DIP16



## 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.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use TEMIC products for any unintended or unauthorized application, the buyer shall indemnify TEMIC against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

TEMIC TELEFUNKEN microelectronic GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany  
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423