TDA4445A/TDA4445B

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

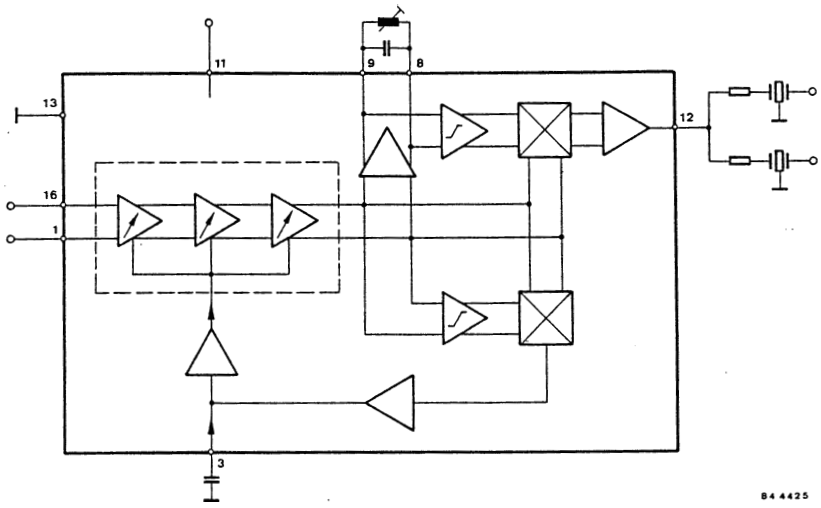


Figure 1. Block diagram TDA4445A

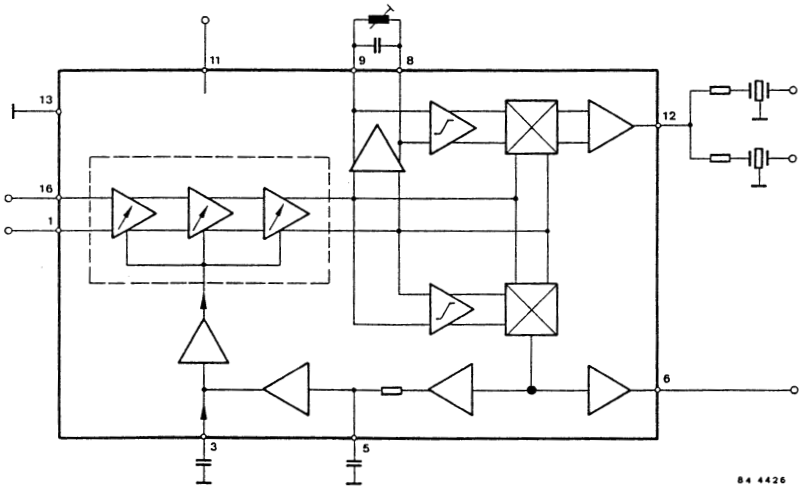


Figure 2. Block diagram TDA4445B

TDA4445A/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 TDA4445B only	 Pin 3 Pin 12 Pin 5, 6	V_{ext}	 12 8 8	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 V, T_{amb} = + 25°C, reference point pin 13, unless otherwise specified

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

Quasi Parallel Sound Operation

f_{PC} = 38.9 MHz, f_{SC1} = 33.4 MHz, f_{SC2} = 33.16 MHz, PC/SC = 13 dB, PC/SC2 = 20 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		µV
Maximum input voltage	5.5 MHz output signal +1 dB Pin 1–16	v_i		80		mV
IF AGC range		ΔG_{IF}		64		dB
AGC capacitor	control time constant, Pin 3	C_3	0.33		10	µF
Sound-IF-output voltage V_{1-16}= 10 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 mV, FM-frequency deviation = +30 kHz f_{mod} = 1 kHz, measured at audio-output sound IF demodulator U2829B						
1. Channel/ 2. Channel Standard B/G modulated IF signal (residual carrier 10%)	Black screen Pin 12 Grid pattern	$\frac{S+N}{N}$		62/58 52/49		dB

Bistandard Operation

Parameters	Test Conditions / Pins	Symbol	Min.	Typ.	Max.	Unit
IF AGC range		ΔG_{IF}		64		dB
AGC capacitor (control time constant)	Pin 3 Pin 5	C_3 C_5		10 4.7		µF

Quasi Parallel Sound Operation

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

AM-Demodulation

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

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

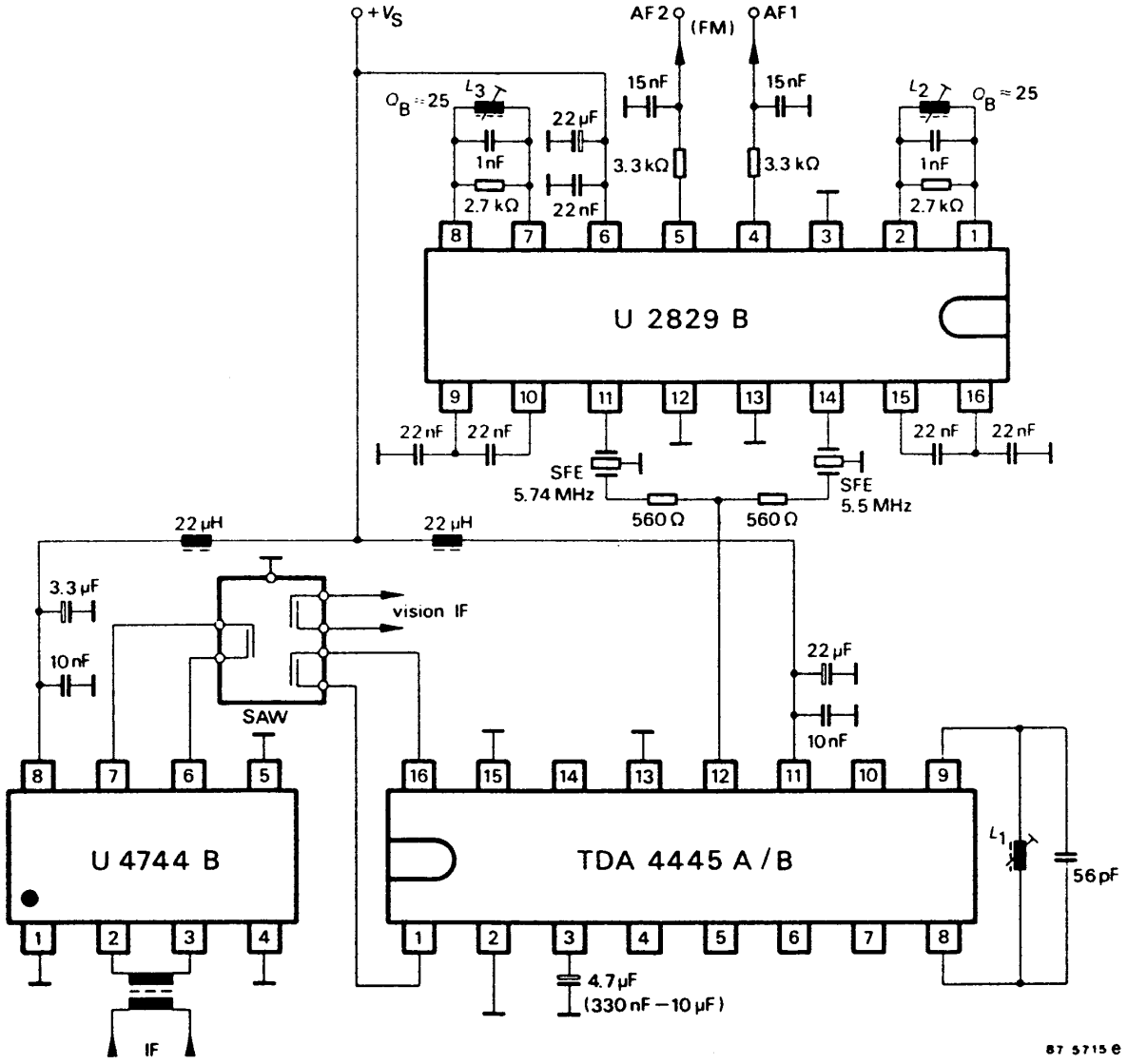


Figure 3. Quasi parallel sound operation

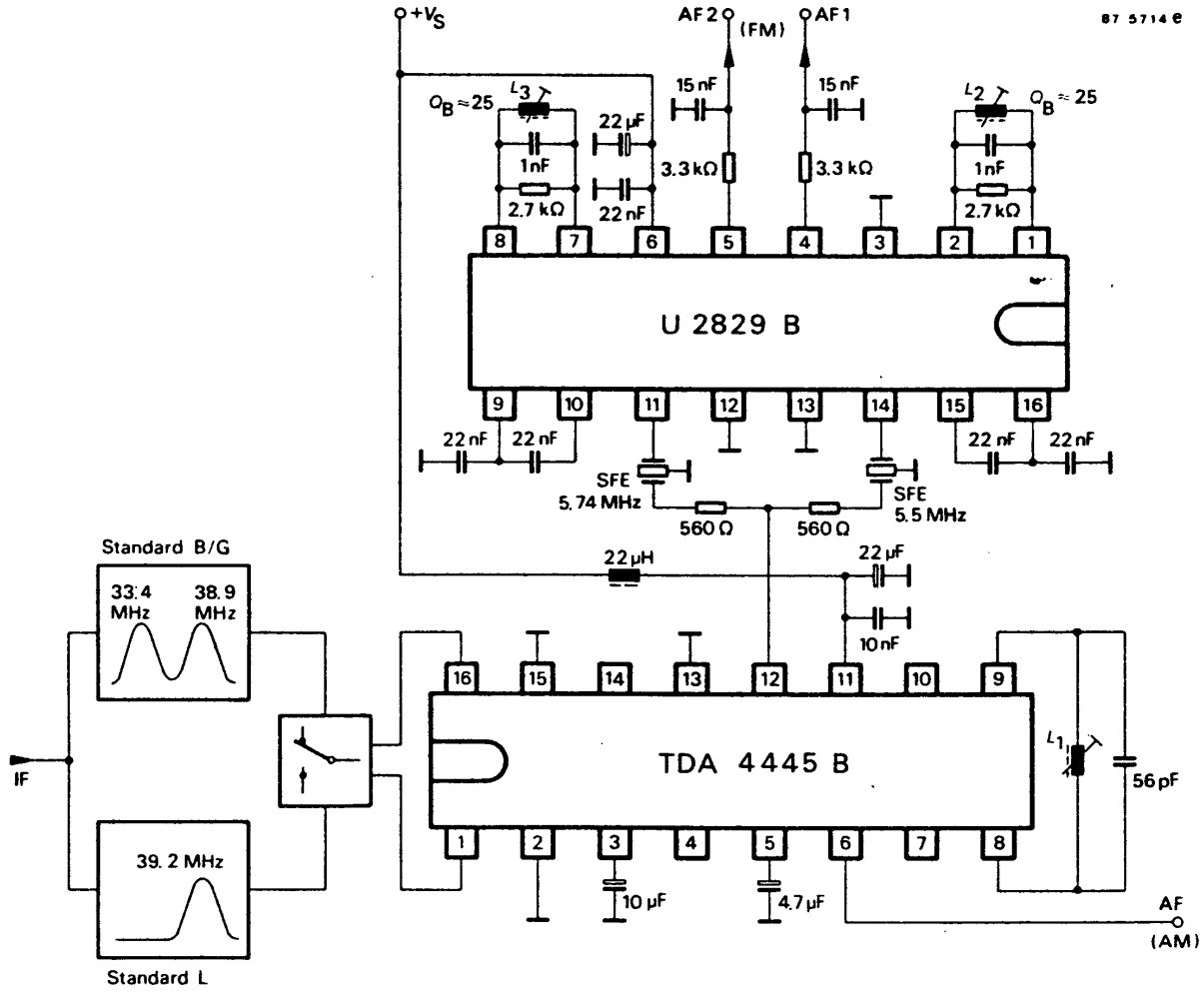
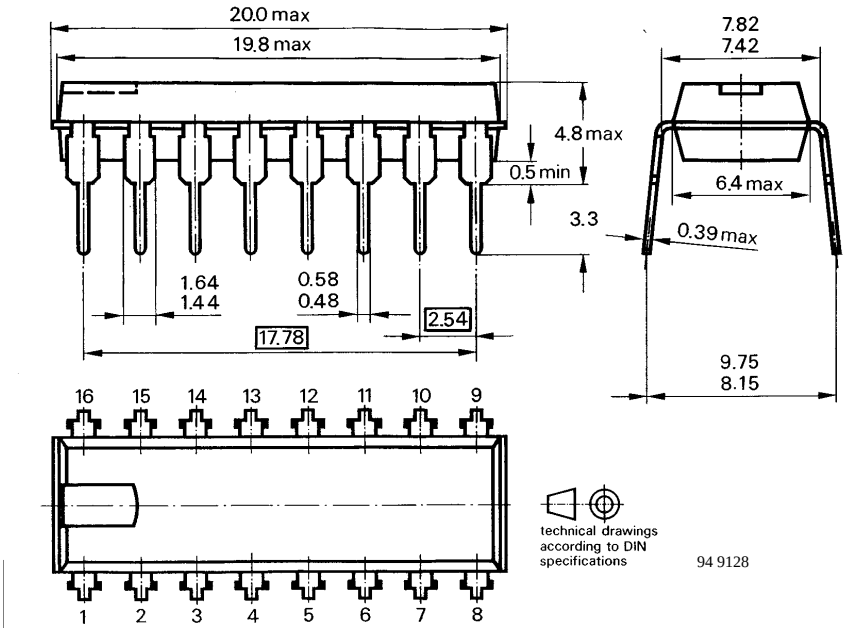


Figure 4. Bistandard operation

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.

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