Features

- 5V Supply Voltage
- Active Carrier Generation by FPLL (Frequency-Phase-Locked Loop) Principle for True Synchronous Demodulation
- VCO Circuit Operates at Picture Carrier Frequency, the VCO frequency is Switchable for L'-mode
- Alignment-free AFC without External Reference Circuit, Polarity of the AFC Curve is Switchable
- VIF-AGC for Negatively Modulated Signals (Peak Synchronous Detection) and for Positive Modulation (Peak White/Black Level Detector)
- Tuner AGC with Adjustable Take-over Point
- Alignment-free Quasi Parallel Sound (QPS) Mixer for FM/NICAM Sound IF Signals
- Intercarrier Output Signal is Gain Controlled (Necessary for Digital Sound Processing)
- Complete Alignment-free AM Demodulator with Gain Controlled AF Output
- Separate SIF-AGC with Average Detection
- Two Independent SIF Inputs
- Parallel Operation of the AM Demodulator and QPS Mixer (for NICAM-L Stereo Sound)
- Pb-free Package, which is Compliant with Requirements of RoHS

Benefits

- Linear Video Demodulation
- Good Pulse Response
- Excellent Intermodulation Figures

1. Description

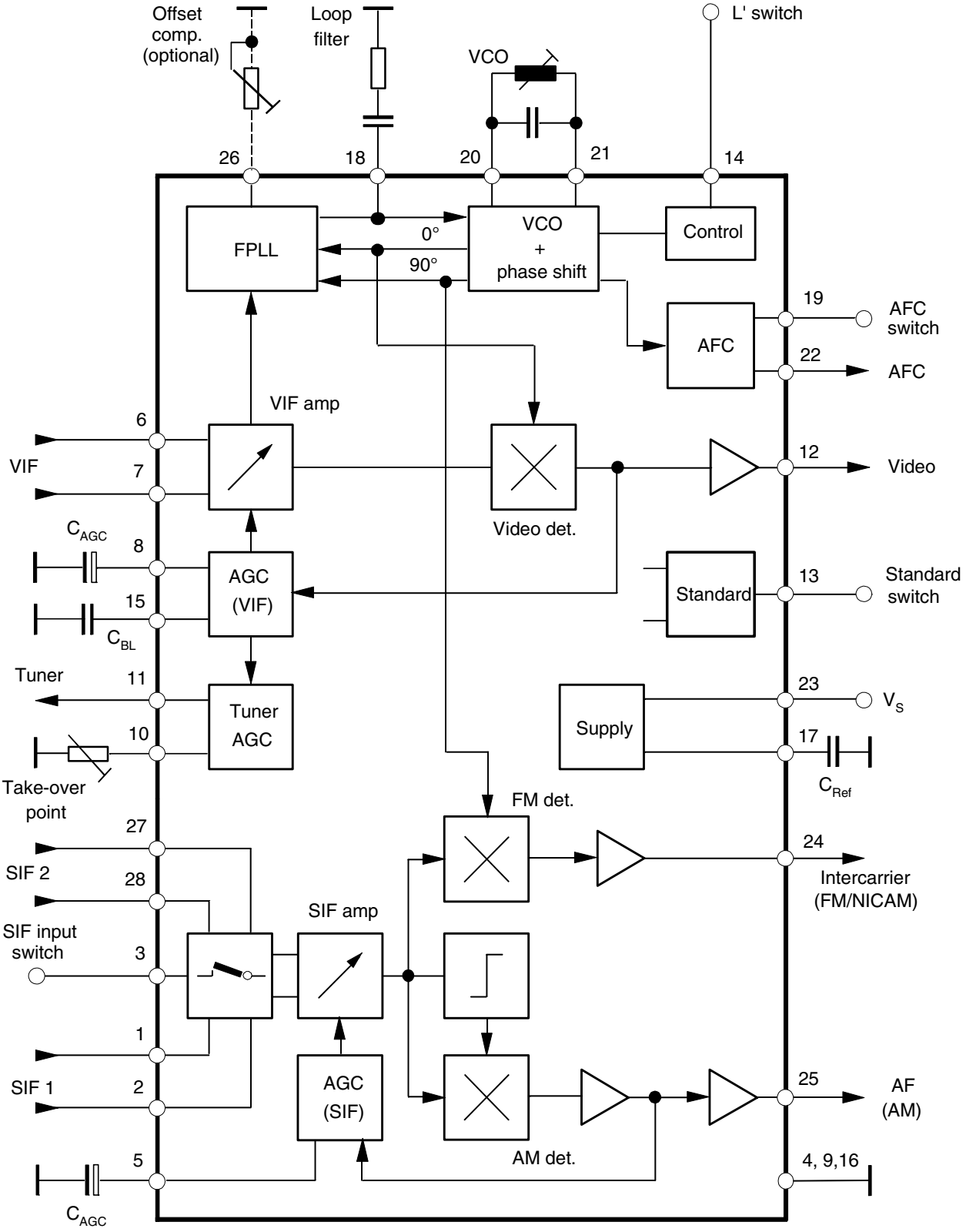
The TDA4470 is an integrated bipolar circuit for multistandard video/sound IF (VIF/SIF) signal processing in TV/VCR and multimedia applications. The circuit processes all TV video IF signals with negative modulation (e.g., B/G standard), and the FM/NICAM sound IF signals.

Multistandard Video-IF and Quasi Parallel Sound Processing IC

TDA4470

Rev. 4803C–TVVCR–10/05

Figure 1-1. Block Diagram



2. Circuit Description

2.1 Vision IF Amplifier

The video IF signal (VIF) is fed through a SAW filter to the differential input (pins 6-7) of the VIF amplifier. This amplifier consists of three AC-coupled amplifier stages. Each differential amplifier is gain controlled by the automatic gain control (VIF-AGC). The output signal of the VIF amplifier is applied to the FPLL carrier generation and the video demodulator.

2.2 Tuner-and VIF-AGC

At pin 8, the VIF-AGC charges/discharges the AGC capacitor to generate a control voltage for setting the gain of the VIF amplifier and tuner in order to keep the video output signal at a constant level. Therefore, the synchronous level of the demodulated video signal is the criterion for a fast charge/discharge of the AGC capacitor. For positive modulation (e.g., L standard) the peak white level of the video signal controls the charge current. In order to reduce the reaction time for positive modulation, where a large time constant is needed, an additional black level detector controls the discharge current in the event of decreasing VIF input signal. The control voltage (AGC voltage at pin 8) is transferred to an internal control signal, and is fed to the tuner AGC to generate the tuner AGC current at pin 11 (open collector output). The take-over point of the tuner AGC can be adjusted at pin 10 by a potentiometer or an external DC voltage (from an interface circuit or microprocessor).

2.3 FPLL, VCO and AFC

The FPLL (Frequency-Phase-Locked Loop) circuit consists of a frequency and phase detector to generate the control voltage for the VCO tuning. In locked mode, the VCO is controlled by the phase detector, in unlocked mode, the frequency detector is superimposed. The VCO operates with an external resonance circuit (L and C in parallel) and is controlled by internal varicaps. The VCO control voltage is also converted to a current and represents the AFC output signal at pin 22. At the AFC switch (pin 19) three operating conditions of the AFC are possible: the AFC curve “rising” or “falling” and AFC “off”.

A practicable VCO alignment of the external coil is the adjustment to zero AFC output current at pin 22. At the center frequency, the AFC output current is equal to zero. Furthermore, at pin 14, the VCO center frequency can be switched to set it to the required L’ value (L’ standard).

The optional potentiometer at pin 26 allows an offset compensation of the VCO phase for improved sound quality (fine adjustment). Without a potentiometer (open circuit at pin 26), this offset compensation is not active.

The oscillator signal passes a phase shifter and supplies the in-phase signal (0°) and the quadrature signal (90°) of the generated picture carrier.

2.4 Video Demodulation and Amplifier

The video IF signal, which is applied from the gain-controlled IF amplifier, is multiplied with the in-phase component of the VCO signal. The video demodulator is designed for low distortion and large bandwidth. The demodulator output signal passes an integrated low-pass filter for attenuation of the residual vision carrier and is fed to the video amplifier. The video amplifier is realized by an operational amplifier with internal feedback and 8 MHz bandwidth (–3 dB). A standard dependent DC level shift in this stage delivers the same synchronous level for positive and negative modulation. An additional noise clipping is provided. The video signal is fed to the VIF-AGC and to the video output buffer. This amplifier with a gain of 6 dB offers easy adoption of the sound trap. For a nominal video IF modulation, the video output signal at pin 12 is 2 V_{PP}.

2.5 Sound IF Amplifier and SIF-AGC

The SIF amplifier is nearly identical with the 3-stage VIF amplifier, except that the first amplifier stage exists twice and is switchable by a control voltage at pin 3. Therefore, it is possible to switch between two different SAW filters with minimal external expense. Both SIF inputs features excellent cross-talk attenuation and an input impedance which is independent from the switching condition.

The SIF-AGC is related to the average level of the AM or FM carrier and controls the SIF amplifier to provide a constant SIF signal to the AM demodulator and QPS mixer.

2.6 AM Demodulator

The alignment-free AM demodulator is realized by a synchronous detector. The modulated SIF signal from the SIF amplifier output is multiplied in phase with the limited SIF signal (AM is removed). The AF signal of the demodulator output is fed to the output amplifier and to the SIF-AGC. For all TV standards with negative video modulation (e.g., B/G standard), the AF output signal (pin 25) is switched off by the standard switch.

2.7 Quasi Parallel Sound (QPS) Mixer

The QPS mixer is realized by a multiplier. The SIF signal (FM or NICAM carrier) is converted to the intercarrier frequency by the regenerated picture carrier (quadrature signal) which is provided from the VCO. The intercarrier signal is fed via an output amplifier to pin 24.

2.8 Standard Switch

To have equal polarity of the video output signal the polarity can be switched in the demodulation stage in accordance with the TV standard. Additionally a standard dependent DC level shift in the video amplifier delivers the same sync. level. In parallel to this, the correct VIF-AGC is selected for positively or negatively modulated VIF signals. In the case of negative modulation (e.g., B/G standard) the AM output signal is switched off. For positive modulation (L standard) the AM demodulator and QPS mixer is active. This condition allows a parallel operation of the AM sound signal and the NICAM-L stereo sound.

2.9 L' Switch

With a control voltage at pin 14 the VCO frequency can be switched in order to set required L' value (L' standard). Also a fine adjustment of the L'-VCO center frequency is possible via a potentiometer. The L' switch is only active for positively modulated video IF-signals (standard switch in L mode).

2.10 AFC Switch

The AFC output signal at pin 22 can be controlled by a switching voltage at pin 19. It is possible to select an AFC output signal with a rising- or falling AFC curve and to switch off the AFC.

2.11 VCR Mode

For VCR mode in a TV set (external video source selected), it is recommended to switch off the IF circuit. With an external switching voltage at pin 6 or 7, the IF amplifiers are switched off and all signal output levels at pins 12, 24, and 25 are according to the internal DC voltage.

2.12 Internal Voltage Stabilizer

The internal bandgap reference ensures constant performance independent of supply voltage and temperature.

3. Pin Configuration

Figure 3-1. Pinning SO28/SSO28

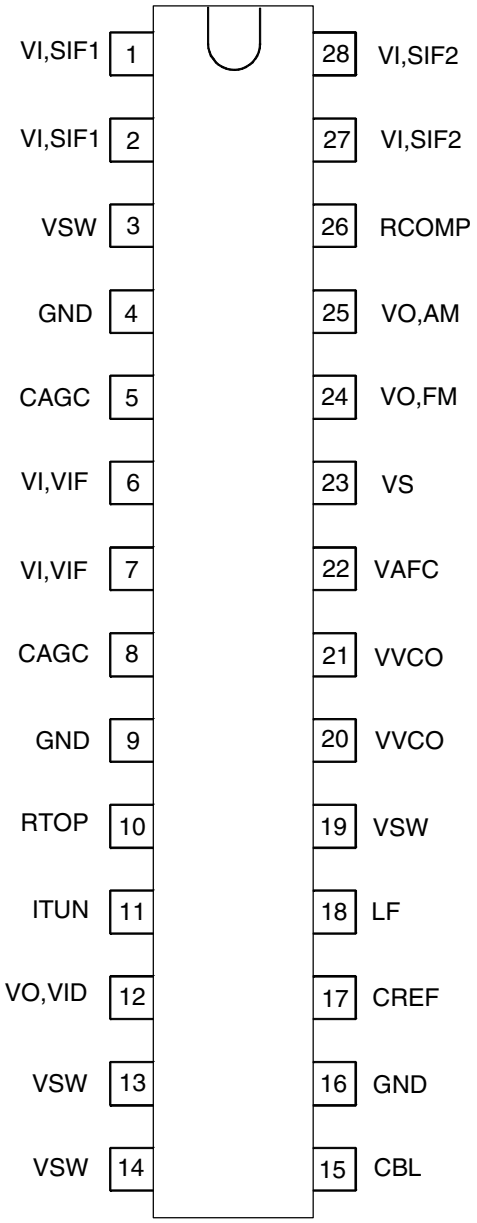


Table 3-1. Pin Description

Pin	Symbol	Function
1, 2	VI,SF1	SIF1 input (symmetrical)
3	VSW	Input selector switch
4, 9, 16	GND	Ground
5	CAGC	SIF-AGC (time constant)
6, 7	VI,VIF	VIF input (symmetrical)
8	CAGC	VIF-AGC (time constant)
10	RTOP	Take-over point, tuner AGC
11	ITUN	Tuner AGC output current
12	VO,VID	Video output
13	VSW	Standard switch
14	VSW	L' switch
15	CBL	Black level capacitor
17	CREF	Internal reference voltage
18	LF	Loop filter
19	VSW	AFC switch
20, 21	VVCO	VCO circuit
22	VAFC	AFC output
23	VS	Supply voltage
24	VO,FM	Intercarrier output
25	VO,AM	AF output - AM sound
26	RCOMP	Offset compensation
27, 28	VI,SIF2	SIF 2 input (symmetrical)

4. Absolute Maximum Ratings

Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Reference point pin 4 (9, 16), unless otherwise specified

Parameters	Symbol	Value	Unit
Supply voltage, pin 23 SO28 and SSO28 package	V_S	6.0	V
Supply current, pin 23	I_S	93	mA
Power dissipation SO28 and SSO28 package	P	560	mW
Output currents, pins 12, 24 and 25	I_{OUT}	5	mA
External voltages Pins 1, 2, 5 to 8, 10, 12, 18 and 24 to 28 Pins 15, 20 and 21 Pin 11 Pins 3, 13, 19 and 22	V_{ext}	 +4.5 +3.5 +13.5 V_S	 V V V V
Junction temperature	T_j	+125	°C
Storage temperature	T_{stg}	–25 to +125	°C
Electrostatic handling[1], all pins	V_{ESD}	±300	V

Note: 1. Equivalent to discharging a 200 pF capacitor through a 0Ω resistor.

5. Thermal Resistance

Parameters	Symbol	Value	Unit
Junction ambient, when soldered to PCB SO28 package SSO28 package	 R_{thJA} R_{thJA}	 75 130	 K/W K/W

6. Operating Range

Parameters	Symbol	Value	Unit
Supply voltage range, pin 23 SO28 and SSO28 package	V_S	4.5 to 6.0	V
Ambient temperature	T_{amb}	–10 to +85	°C

7. Electrical Characteristics

V_S = +5V, T_{amb} = +25°C; reference point pin 4 (9, 16), unless otherwise specified.

Parameters	Test Conditions	Pin	Symbol	Min.	Typ.	Max.	Unit
DC-supply		**23**					
Supply voltage, SO28, SSO28			V_S	4.5	5.0	5.5	V
Supply current			I_S		85	93	mA
VIF-input		**6-7**					
Input sensitivity (RMS value)	For FPLL locked		V_{IN}		80	120	μV_{RMS}
Input impedance	(1)		R_{IN}		1.2		kΩ
Input capacitance	(1)		C_{IN}		2		pF
VIF-AGC		**8 and 15**					
IF gain control range			G_V	60	65		dB
AGC capacitor		8	C_{AGC}		2.2		µF
Black level capacitor		15	C_{BL}		100		nF
Switching voltage: VCR mode	(2)		V_{SW}		4.0		V
Switching current: VCR mode	(2)		I_{SW}		50		µA
Tuner-AGC		**10 and 11(3)**					
Available tuner-AGC current			I_{tun}	1	2	4	mA
Allowable output voltage			V_{11}	0.3		13.5	V
IF slip - tuner AGC	Current I_{TUN}: 10% to 90%		ΔG_{IF}		8	10	dB
IF input signal for minimum take-over point	R_{TOP} = 10 kΩ (V_{TOP} = 4.5V)		V_{IN}			4	mV
IF input signal for maximum take-over point	R_{TOP} = 0, (V_{TOP} = 0.8V)		V_{IN}	40			mV
Variation of the take-over point by temperature	ΔT_{amb} = 55°C VIF-AGC: G_V = 46 dB		ΔV_{IN}		2	3	dB

Notes:
1. This parameter is given as an application information and has not been tested during production.
2. In VCR mode, the VIF- and SIF path is switched off.
3. The adjustment of the turn over point (delayed tuner AGC) with the external resistor R_{TOP} or external voltage V_{TOP} is possible.
4. Resonance circuit of VCO (f_o = 38.9 MHz): CVCO = 8.2 - 10 pF,
   Coil LVCO with unloaded Q-factor $Q_o \geq 60$ for an oscillator voltage ≥ 100 mV_{RMS} at pin 20 - 21
   (e.g., TOKO® coil 7 KM, 292 XNS - 4051Z).
5. The oscillator drift is related to the picture carrier frequency, given that the external LC circuit is temperature-compensated.
6. α (1.07) = 20 log (4.43 MHz component/1.07 MHz component); α (1.07) value related to black-white signal input signal conditions: picture carrier = 0 dB, colour carrier = –6 dB, sound carrier = –24 dB.
7. Without external control at pin 13 the IC automatically operates in mode 1:
   ⇒negatively modulated video-IF signals and FM/NICAM sound signals.
8. Without a control voltage at pin 19 the falling AFC curve is automatically selected.
9. With an open circuit at pin 14 the L' switch is not active.
10. Picture carrier PC = 38.9 MHz; sound carrier SC_1 = 33.4 MHz, SC_2 = 33.16 MHz;
    PC/SC_1 =13 dB; PC/SC_2 = 20 dB; PC unmodulated (equivalent to synchronous peak level).
11. Sound carrier SC = 32.4 MHz, modulated with f_{mod} = 1 kHz, m = 54%; V_{IN} =10 mV
12. Without a control voltage at pin 3 the SIF input 1 is automatically selected.

7. Electrical Characteristics (Continued)

V_S = +5V, T_{amb} = +25°C; reference point pin 4 (9, 16), unless otherwise specified.

Parameters	Test Conditions	Pin	Symbol	Min.	Typ.	Max.	Unit
FPLL and VCO		**18, 20, 21 and 26(4)**					
Maximum oscillator frequency	For carrier generation		f_{VCO}	70			MHz
Vision carrier capture range	f_{VCO} = 38.9 MHz, C_{VCO} = 8.2 pF		Δf_{cap}	±1.5	±2		MHz
Oscillator drift (free running) as function of temperature	(5) ΔT_{amb} = 55°C, C_{vco} = 8.2 pF, f_{vco} = 38.9 MHz		$\Delta f/_{\Delta t}$			–0.3	%
Video Output		**12**					
Output current - source - sink			$\pm I_{12}$	 2		 5 3	 mA mA
Output resistance	(1)		R_{out}			100	Ω
Video output signal	Peak-to-peak value		$V_{O,VID}$	1.8	2.0	2.2	V_{pp}
Difference of the video signals	Between B/G and L		$\Delta V_{O,VID}$			10	%
Synchronous level			V_{SYNC}		1.2		V
Zero carrier level for negative modulation, ultra white level	$V_{13} = V_S$ V_8 = 3V		V_{DC}		3.4		V
Zero carrier level for positive modulation, ultra black level	V_{13} = 0 V_8 = 3V		V_{DC}		1.15		V
Supply voltage influence on the ultra white and ultra black level			$\Delta V/_V$		1		%/V
Video bandwidth (–3 dB)	$R_L \geq 1$ kΩ, $C_L \leq$50 pF		B	6	8		MHz
Video frequency response over the AGC range			ΔB			2.0	dB
Differential gain error			ΔG		2	5	%

Notes:
1. This parameter is given as an application information and has not been tested during production.
2. In VCR mode, the VIF- and SIF path is switched off.
3. The adjustment of the turn over point (delayed tuner AGC) with the external resistor R_{TOP} or external voltage V_{TOP} is possible.
4. Resonance circuit of VCO (f_o = 38.9 MHz): CVCO = 8.2 - 10 pF,
   Coil LVCO with unloaded Q-factor $Q_o \geq 60$ for an oscillator voltage ≥ 100 mV_{RMS} at pin 20 - 21
   (e.g., TOKO® coil 7 KM, 292 XNS - 4051Z).
5. The oscillator drift is related to the picture carrier frequency, given that the external LC circuit is temperature-compensated.
6. α (1.07) = 20 log (4.43 MHz component/1.07 MHz component); α (1.07) value related to black-white signal input signal conditions: picture carrier = 0 dB, colour carrier = –6 dB, sound carrier = –24 dB.
7. Without external control at pin 13 the IC automatically operates in mode 1:
   ⇒negatively modulated video-IF signals and FM/NICAM sound signals.
8. Without a control voltage at pin 19 the falling AFC curve is automatically selected.
9. With an open circuit at pin 14 the L' switch is not active.
10. Picture carrier PC = 38.9 MHz; sound carrier SC_1 = 33.4 MHz, SC_2 = 33.16 MHz;
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11. Sound carrier SC = 32.4 MHz, modulated with f_{mod} = 1 kHz, m = 54%; V_{IN} =10 mV
12. Without a control voltage at pin 3 the SIF input 1 is automatically selected.

7. Electrical Characteristics (Continued)

V_S = +5V, T_{amb} = +25°C; reference point pin 4 (9, 16), unless otherwise specified.

Parameters	Test Conditions	Pin	Symbol	Min.	Typ.	Max.	Unit
Differential phase error			ΔP		2	5	deg
Intermodulation 1.07 MHz	(6)		α_{IM}	52	60		dB
Video signal-to-noise ratio	Weighted, CCIR-567		$S/_N$	56	60		dB
Residual vision carrier fundamental wave 38.9 MHz and second harmonic 77.8 MHz			V_{res1}		2	10	mV
Lower limiting level	Below synchronous level		ΔV_{lim1}		400		mV
Upper limiting level	Above ultra white level		ΔV_{lim2}		600		mV
Ripple rejection	Pin 23/pin 12(1)		RR	35			dB
Standard Switch		**13**					
Control voltage for mode 1: negatively modulated video-IF signals and AM/NICAM sound	(7)		V_{SW}	2.0		V_S	V
Control voltage for mode 2: positively modulated video-IF signals and AM/L-NICAM sound			V_{SW}	0		0.8	V
Switching current			I_{SW}		±100		µA
AFC Output		**22**					
Control slope			$\Delta I/_{\Delta f}$		0.7		µA/kHz
Frequency drift by temperature	Related to the picture carrier frequency				0.25	0.6	%
Output voltage - upper limit - lower limit			V_{AFC}	V_S – 0.4		 0.4	 V V
Output current			I_{AFC}		±0.2		mA

Notes:
1. This parameter is given as an application information and has not been tested during production.
2. In VCR mode, the VIF- and SIF path is switched off.
3. The adjustment of the turn over point (delayed tuner AGC) with the external resistor R_{TOP} or external voltage V_{TOP} is possible.
4. Resonance circuit of VCO (f_o = 38.9 MHz): CVCO = 8.2 - 10 pF,
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9. With an open circuit at pin 14 the L' switch is not active.
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11. Sound carrier SC = 32.4 MHz, modulated with f_{mod} = 1 kHz, m = 54%; V_{IN} =10 mV
12. Without a control voltage at pin 3 the SIF input 1 is automatically selected.

7. Electrical Characteristics (Continued)

V_S = +5V, T_{amb} = +25°C; reference point pin 4 (9, 16), unless otherwise specified.

Parameters	Test Conditions	Pin	Symbol	Min.	Typ.	Max.	Unit
AFC Switch		**19**					
Control voltage: AFC "off" AFC curve rising AFC curve falling	(8)		V_{SW}	 0 1.5 3.5		 0.8 2.5 V_S	 V V V
Switching current			I_{SW}		±100		µA
L' switch		**14**					
Control voltage: L' frequency + L'-VCO alignment			V_{SW}	0		3.0	V
L standard	(9)			3.4		V_S	V
Switching current	V_{SW} = 0		I_{SW}		700		µA
SIF Inputs		**1-2, 27-28**					
Input sensitivity (RMS value)	Output signal at pin 24/25: –3 dB		V_{IN}		80	120	μV_{RMS}
Input impedance	(1)		R_{IN}		1.2		kΩ
Input capacitance	(1)		C_{IN}		2		pF
SIF-AGC		**5**					
IF gain control range			G_V	60	65		dB
AGC capacitor			C_{AGC}		10		µF
Intercarrier Output-FM		**24(10)**					
DC output voltage			V_{DC}		2		V
Output resistance	(1)		R_{OUT}		150		Ω
Sound IF output voltage (5.5 MHz output voltage)	V_{IN} = 10 mV		V_{OUT}	180	250	350	mV_{RMS}

Notes:
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2. In VCR mode, the VIF- and SIF path is switched off.
3. The adjustment of the turn over point (delayed tuner AGC) with the external resistor R_{TOP} or external voltage V_{TOP} is possible.
4. Resonance circuit of VCO (f_o = 38.9 MHz): CVCO = 8.2 - 10 pF,
   Coil LVCO with unloaded Q-factor $Q_o \geq 60$ for an oscillator voltage ≥ 100 mV_{RMS} at pin 20 - 21
   (e.g., TOKO® coil 7 KM, 292 XNS - 4051Z).
5. The oscillator drift is related to the picture carrier frequency, given that the external LC circuit is temperature-compensated.
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11. Sound carrier SC = 32.4 MHz, modulated with f_{mod} = 1 kHz, m = 54%; V_{IN} =10 mV
12. Without a control voltage at pin 3 the SIF input 1 is automatically selected.

7. Electrical Characteristics (Continued)

V_S = +5V, T_{amb} = +25°C; reference point pin 4 (9, 16), unless otherwise specified.

Parameters	Test Conditions	Pin	Symbol	Min.	Typ.	Max.	Unit
Weighted signal-to-noise ratio: (CCIR 468)	Reference signal: V_{IN} = 10 mV FM deviation = ±27 kHz f_{mod} = 1 kHz tested with the double FM demodulated U2860B B/G modulated VIF signal Black screen: Channel 1/2 Grid pattern: Channel 1/2 Grey screen 50%: Channel 1/2		 S/N S/N S/N		 60/58 54/52 60/57		 dB dB dB
Ripple rejection	(1)	23, 24	RR	35			dB
AF Output-AM		**25(11)**					
DC output voltage			V_{DC}		2.2		V
Output resistance	(1)		R_{OUT}		150		Ω
AF output voltage			V_{OAF}	400	500	630	mV_{RMS}
Total harmonic distortion	m = 54% f_{mod} = 1 kHz and 12.5 kHz		THD		1	2	%
Signal to noise ratio	Reference: m = 54%, f_{mod} = 1 kHz, 22 kHz low-pass filter		S/N		65		dB
Ripple rejection	Pin 23/pin 25(1)		RR	28			dB
SIF Input Selector Switch		**3**					
Control voltage: - input 1 active - input 2 active	(12)		V_{SW}	 2.0 0		 V_S 0.8	 V V
Switching current			I_{SW}		±100		µA

Notes:
1. This parameter is given as an application information and has not been tested during production.
2. In VCR mode, the VIF- and SIF path is switched off.
3. The adjustment of the turn over point (delayed tuner AGC) with the external resistor R_{TOP} or external voltage V_{TOP} is possible.
4. Resonance circuit of VCO (f_o = 38.9 MHz): CVCO = 8.2 - 10 pF, Coil LVCO with unloaded Q-factor $Q_o \geq 60$ for an oscillator voltage ≥ 100 mV_{RMS} at pin 20 - 21 (e.g., TOKO® coil 7 KM, 292 XNS - 4051Z).
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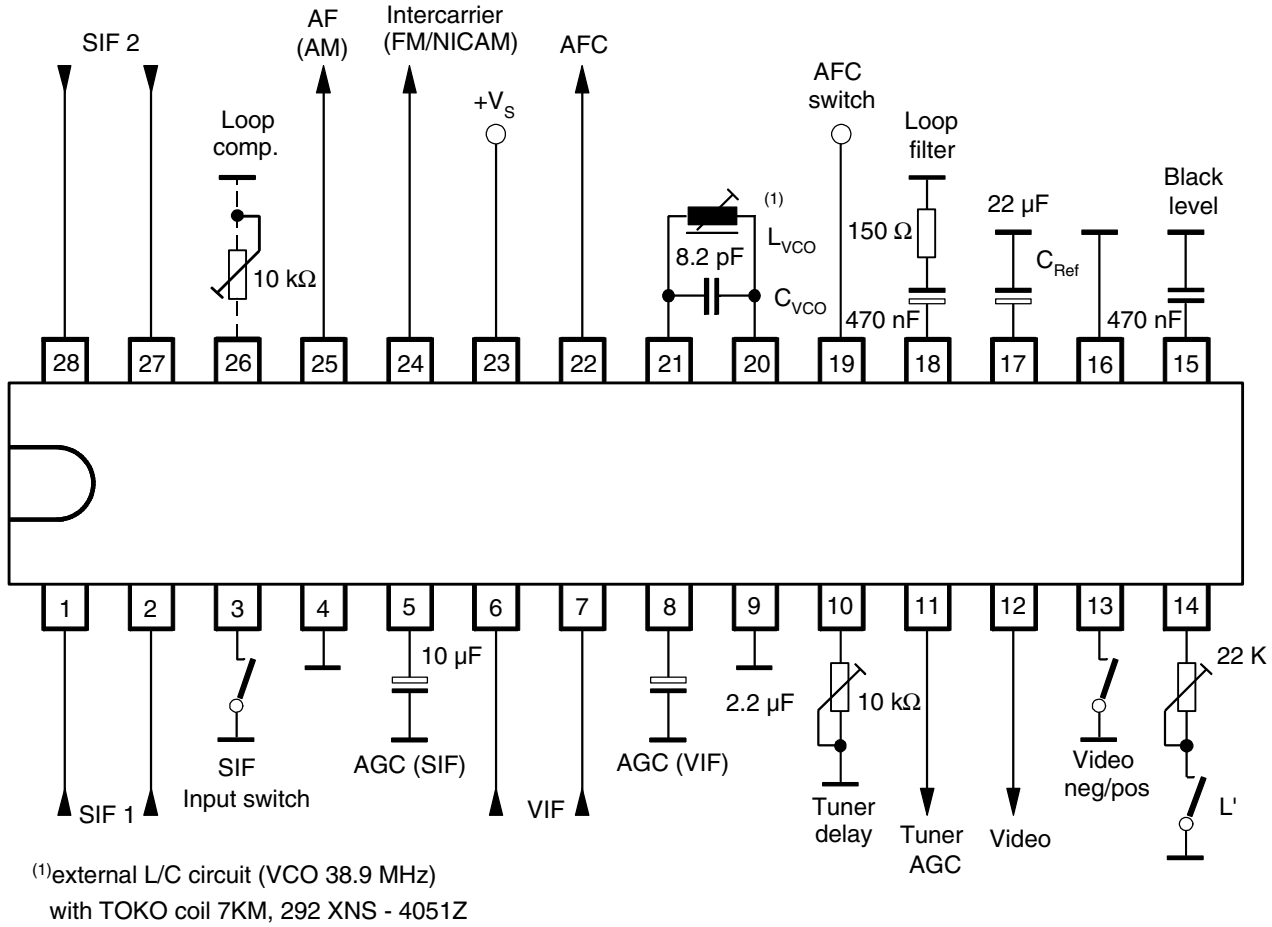
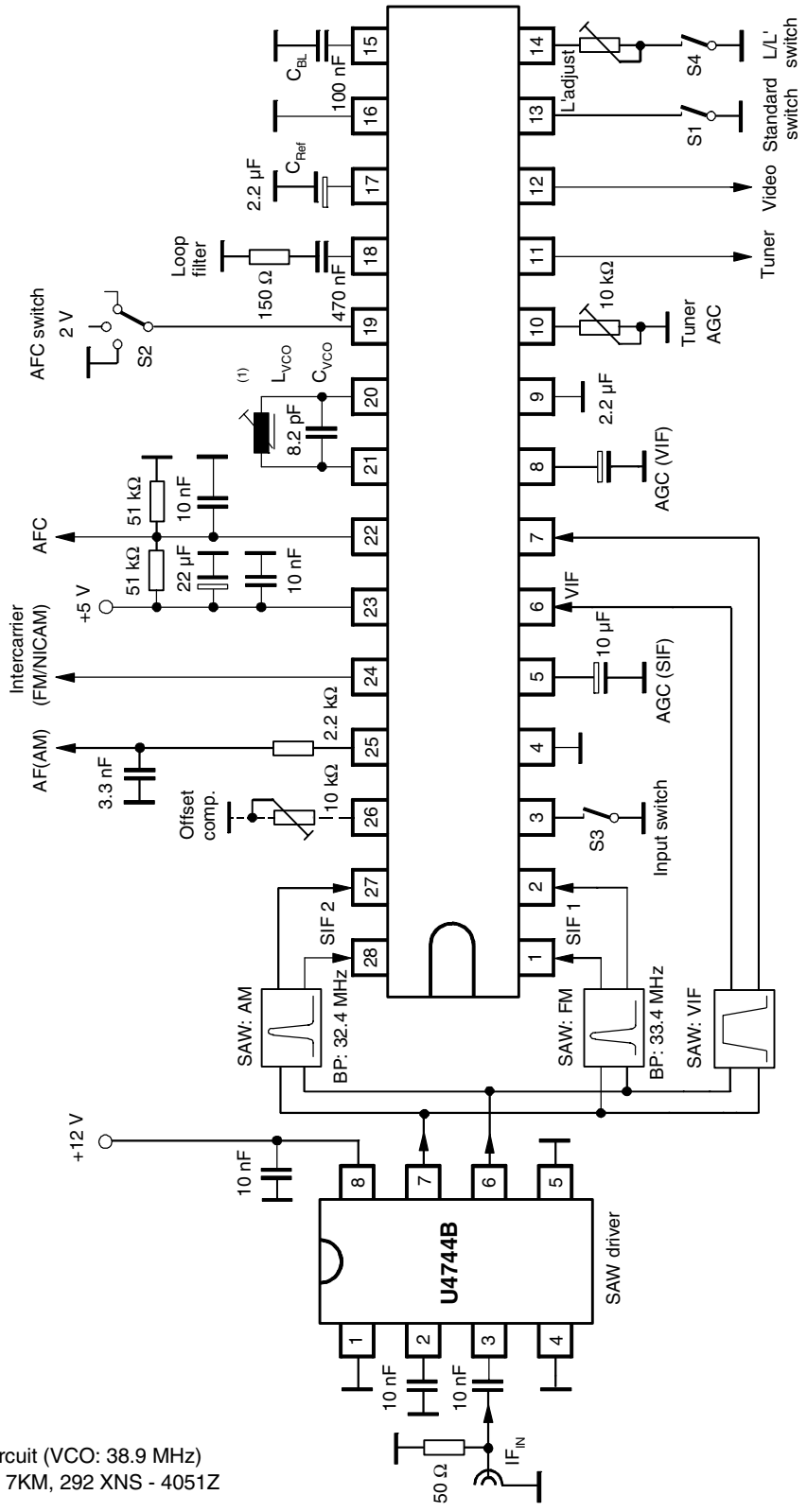
11. Sound carrier SC = 32.4 MHz, modulated with f_{mod} = 1 kHz, m = 54%; V_{IN} =10 mV
12. Without a control voltage at pin 3 the SIF input 1 is automatically selected.

Figure 7-1. Test Circuit



(1)external L/C circuit (VCO 38.9 MHz)
with TOKO coil 7KM, 292 XNS - 4051Z

Figure 7-2. Basic Application Circuit



(1)External L/C circuit (VCO: 38.9 MHz)
with TOKO coil 7KM, 292 XNS - 4051Z

8. Internal Pin Configuration

Figure 8-1. Sound IF Inputs (Pins 1-2, 27-28)

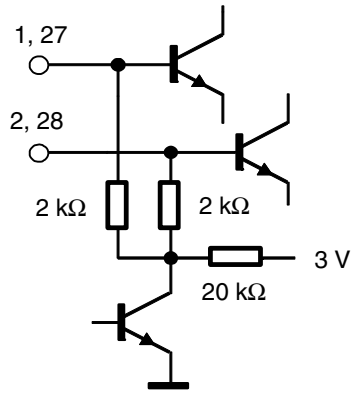


Figure 8-2. Input Selector Switch (Pin 3)

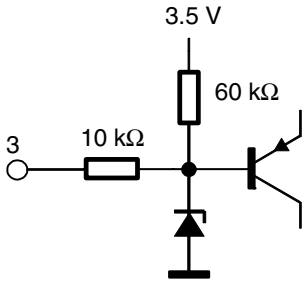


Figure 8-3. SIF-AGC Time Constant (Pin 5)

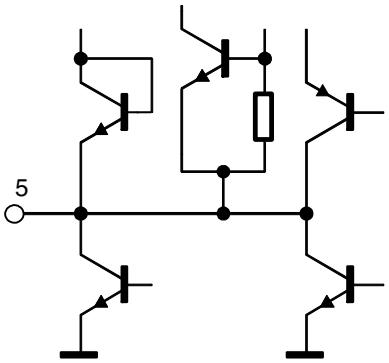


Figure 8-4. Video IF Input (Pins 6-7)

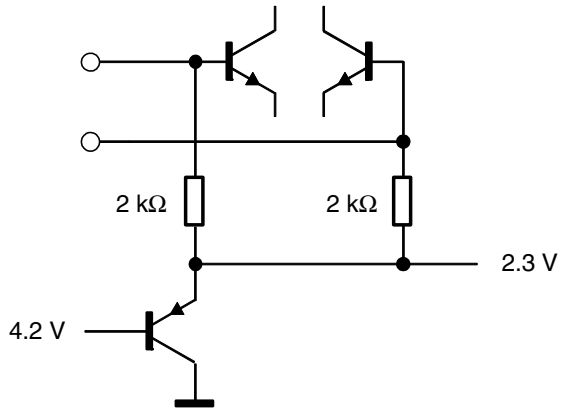


Figure 8-5. VIF-AGC Time Constant (Pin 8)

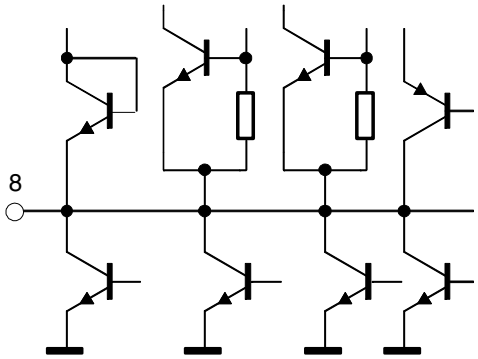


Figure 8-6. Tuner AGC - Take-over Point (Pin 10)

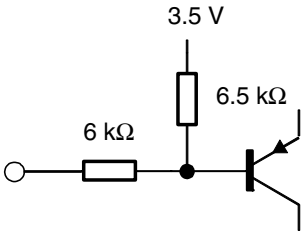


Figure 8-7. Tuner AGC - Output (Pin 11)

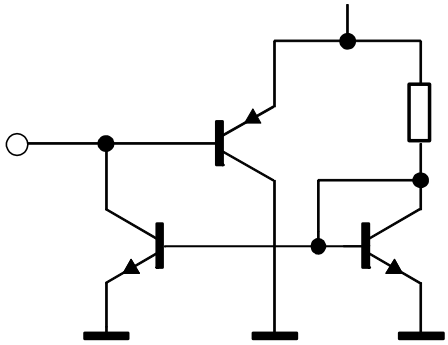


Figure 8-8. Video Output (Pin 12)

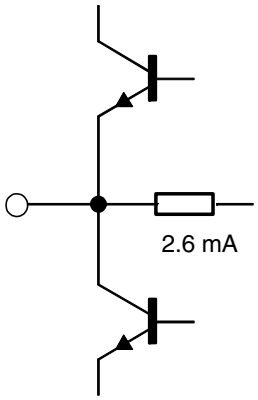


Figure 8-9. Standard Switch (Pin 13)

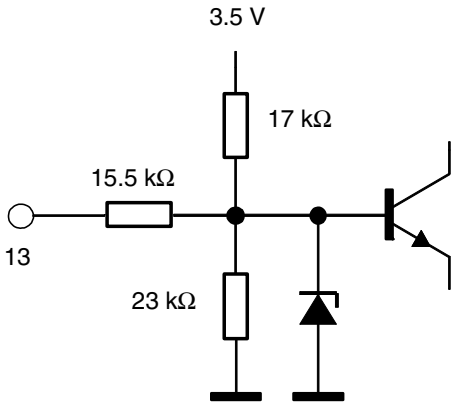


Figure 8-10. Black Level Capacitor (Pin 15)

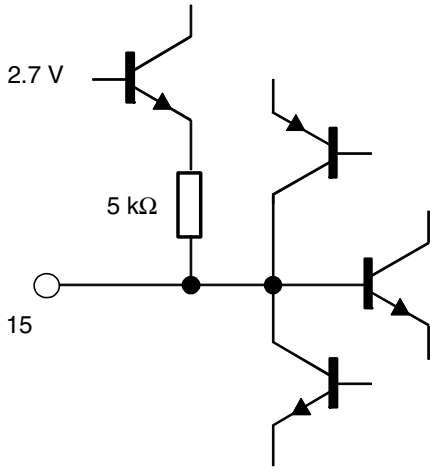


Figure 8-11. Internal Reference Voltage (Pin 17)

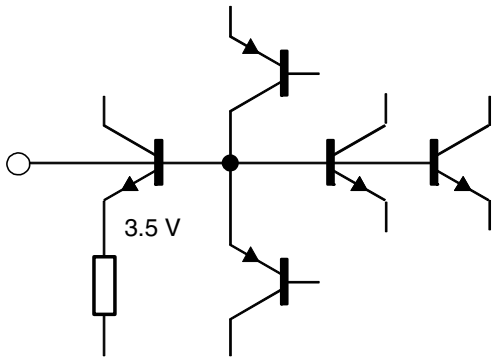


Figure 8-12. Loop Filter (Pin 18)

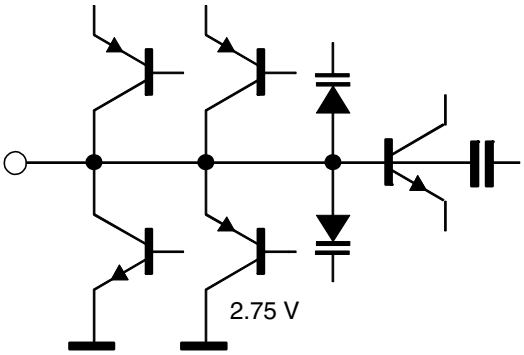


Figure 8-13. AFC Switch (Pin 19)

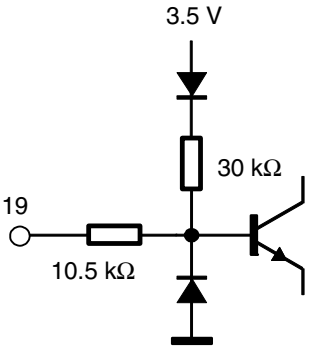


Figure 8-14. VCO (Pins 20-21)

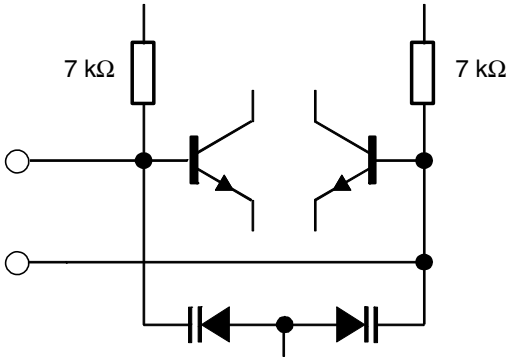


Figure 8-15. AFC Output (Pin 22)

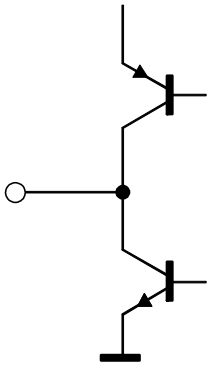


Figure 8-16. Intercarrier Output (Pin 24)

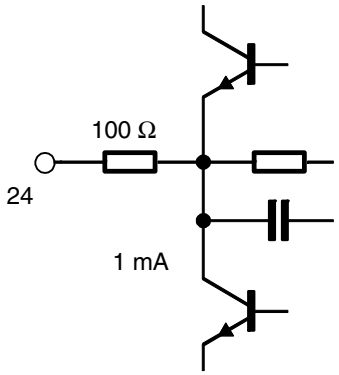


Figure 8-17. AF Output AM Sound (Pin 25)

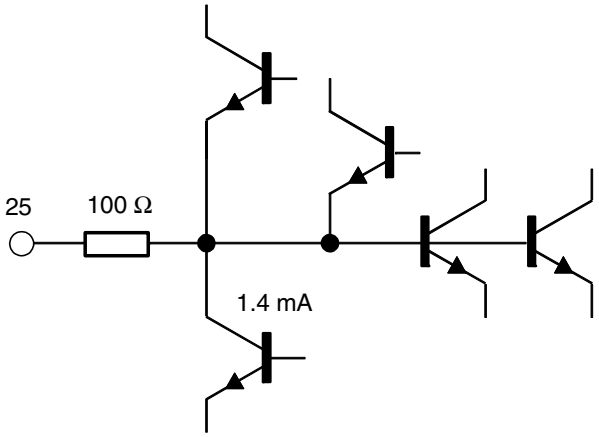
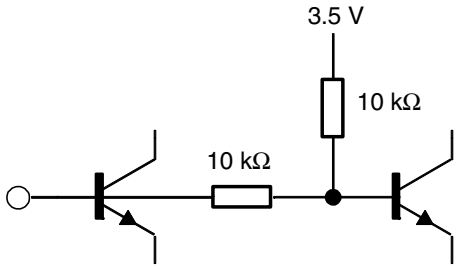


Figure 8-18. VCO Offset Compensation (Pin 26)



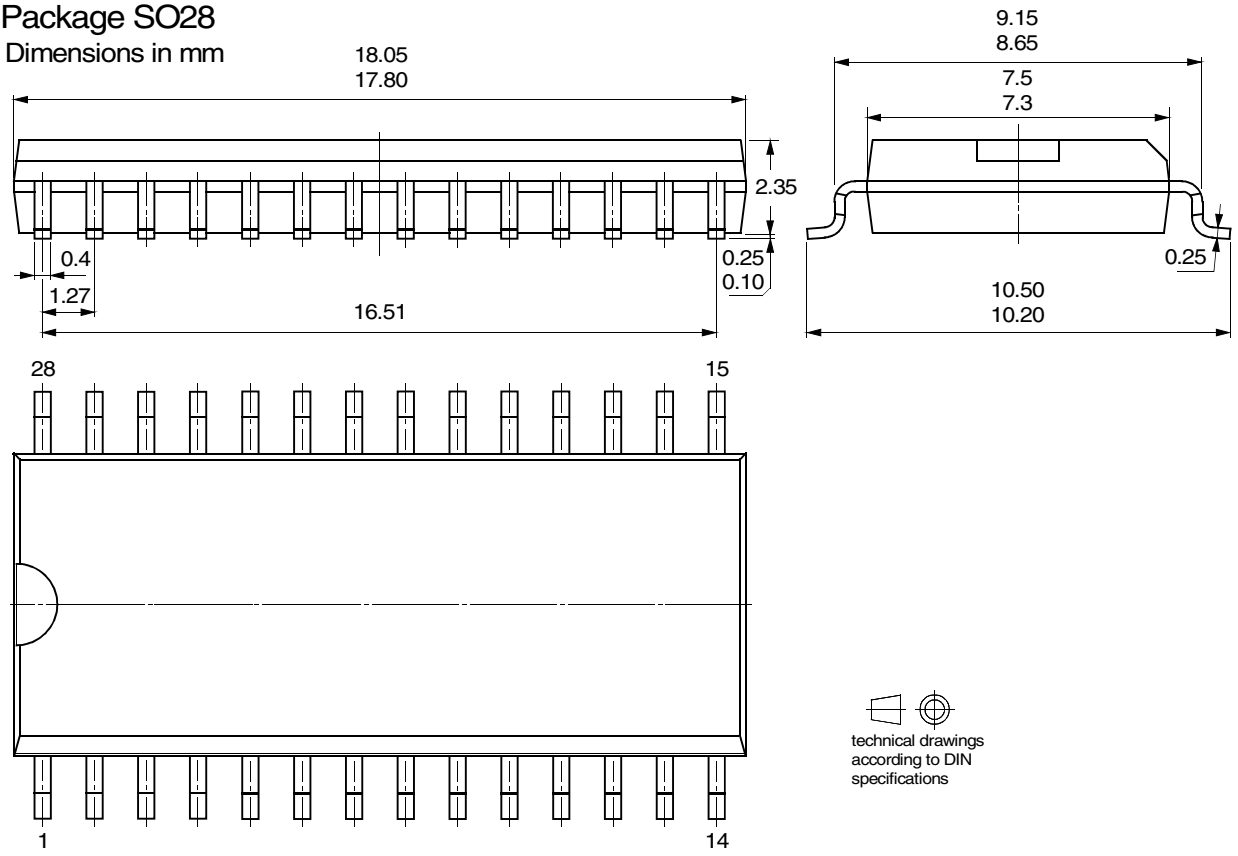
9. Ordering Information

Extended Type Number	Package	Remarks	Standard Package Quantitiy
TDA4470-MFLY	SO28, Pb-free	Delivery in Tubes	1,500
TDA4470-MFLG3Y	SO28, Pb-free	Delivery in taped form	2,000
TDA4470-MFSY	SSO28, Pb-free	Delivery in Tubes	3,000
TDA4470-MFSG3Y	SSO28, Pb-free	Delivery in taped form	4,000

10. Package Information

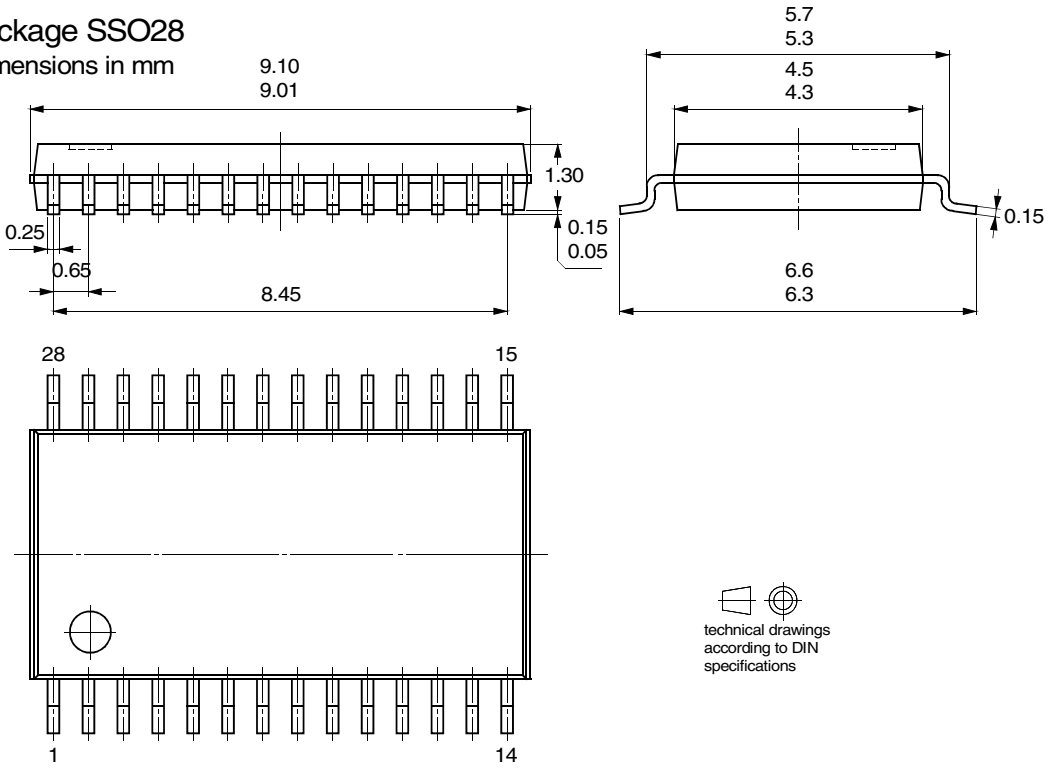
Package SO28

Dimensions in mm



Package SSO28

Dimensions in mm



technical drawings
according to DIN
specifications

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