

**Monolithic Integrated Circuit**

**Applications:** FM-front end for HI-Fi and car-radios, mixer modulator and phase-sensitive detectors up to 250 MHz.

**Features:**

- Excellent large signal behavior
- High oscillator frequency stability, even by large input signals
- Low external power level of the oscillator
- Low radiation
- Low noise figure
- Built-in AGC amplifier for external PIN-diode
- High overall amplification
- Specially recommende for varactor tuned front ends
- Buffered oscillator output Pinning and function fully compatible with TDA 1062

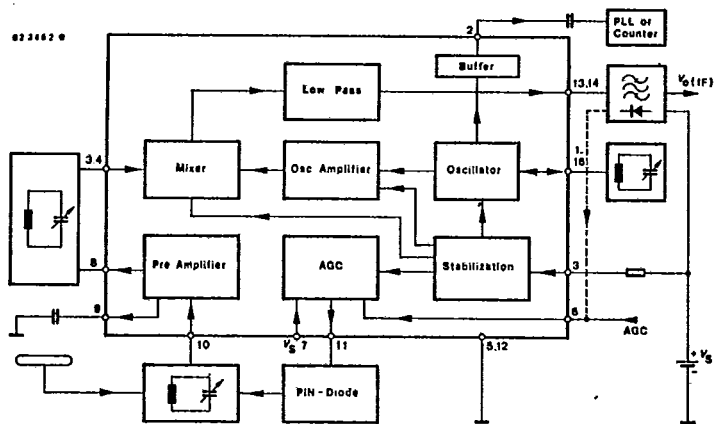


Fig. 1 Block diagram

**Absolute maximum ratings**

Supply voltage	Pin 6	$V_0$	16	V
Power dissipation $T_{amb} = 85^\circ\text{C}$		$P_{tot}$	400	mW
Junction temperature		$T_j$	125	$^\circ\text{C}$
Ambient temperature range		$T_{amb}$	-25...+85	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-55...+125	$^\circ\text{C}$

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Thermal resistance		Min.	Typ.	Max.	
Junction ambient	$R_{thJA}$			100	K/W

**Electrical characteristics**

$V_S = 10\text{ V}$ , reference point Pin 5, 12,  $f_i = 50.3\text{ MHz}$ ,  $f_{osc} = 100\text{ MHz}$ ,  $P_i = -40\text{ dBm}$ ,  
 $V_{AGC} = 0$ ,  $R_G = R_L = 50\ \Omega$ ,  $T_{amb} = 25^\circ\text{C}$ , see test circuit Fig. 3, unless otherwise specified

Supply voltage range	Pin 6	$V_S$		8	16	V	
Total supply current		$I_S$		28		mA	
Mixer current	Pin 13/14			10	16.5	mA	
Stabilized base voltage	Pin 3		3.8	4.2	4.8	V	
RF stage collector voltage	Pin 8	$V_{CE}$	4.4	5	6.6	V	
$V_{AGC} = 5\text{ V}$	Pin 8	$V_{CE}$		1.2	1.8	V	
RF stage base voltage	Pin 9	$V_{BE}$		0.7		V	
Oscillator stage collector voltage	Pin 1/16	$V_{CE}$	1.7	2.3	2.6	V	
Power gain							
$f_{if} = f_{osc} - f_i$	Fig. 4	Pin 13/14	$G_p$	13	17	20.5	dB
RF rejection	Fig. 4	Pin 13/14	$d_{RF}$	17	30		dB
3 <sup>rd</sup> order distortion	Fig. 4	Pin 13/14	$d_{3rd}$		48		dB
Oscillator output							
$R_L = 50\ \Omega$		Pin 2	$V_{oosc}$	25	40		mV

**Electrical characteristics**

$V_S = 10\text{ V}$ ,  $T_{amb} = 25^\circ\text{C}$ , reference point Pin 5, 12,  $f_i = 95\text{ MHz}$ ,  $R_G = R_L = 50\ \Omega$ , Fig. 5

Total supply current		$I_S$		30		mA	
Tuning range		$\Delta f$	88		108	MHz	
IF-frequency		$f_{IF}$		10.7		MHz	
Tuning voltage range		$V_{tun}$	2		7.5	V	
Power gain		$G_p$		30		dB	
Noise figure		$F$		5.5		dB	
IF bandwidth		$B_{IF}$		0.5		MHz	
RF-bandwidth		$B_{RF}$		1.7		MHz	
Image rejection		$S_{IR}$		80		dB	
IF-rejection		$IFR$	100			dB	
Ultimate quieting							
-40 dBm, $\Delta f = \pm 75\text{ kHz}$ , $f = 1\text{ kHz}$							
$B_{AF} = 30\text{ Hz} \dots 15\text{ kHz}$		$\alpha_{for}$		70		dB	
Oscillator pulling							
$P_i = 0\text{ dBm}$		$\Delta f_{osc}$		10		kHz	
with AGC		$\Delta f_{osc}$		2		kHz	
AGC threshold		$P_{IAGC}$		-30		dBm	
Radiation at antenna input		$P_{ri}$		-60		dBm	
Gain difference							
$f = 88 \dots 108\text{ MHz}$		$\Delta G_p$		1.5		dB	
Oscillator output							
$R_L = 50\ \Omega$		Pin 2	$V_{oosc}$	40		mV	

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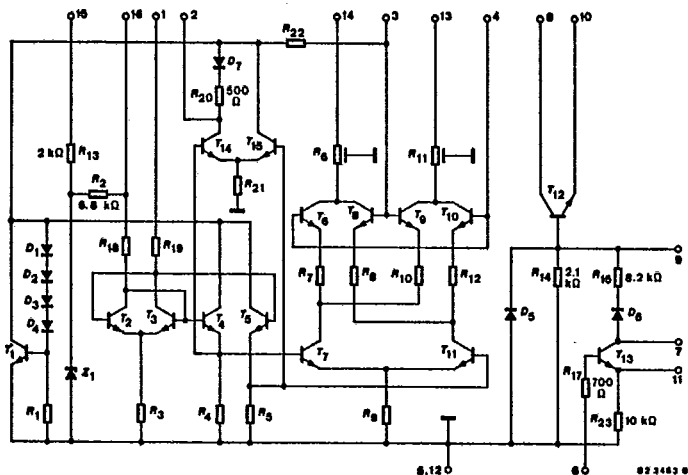
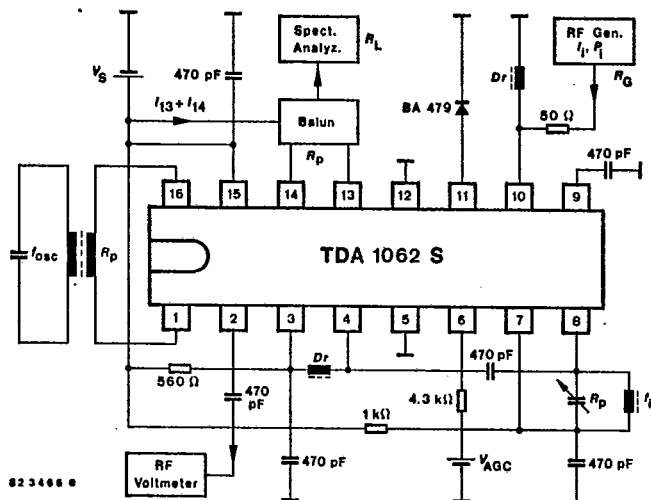


Fig. 2 Diagram and pin connections



Electrical characteristics of the test circuit without IC in the socket

RF-input Pin 10 with  $R_G = 50 \Omega$  terminated

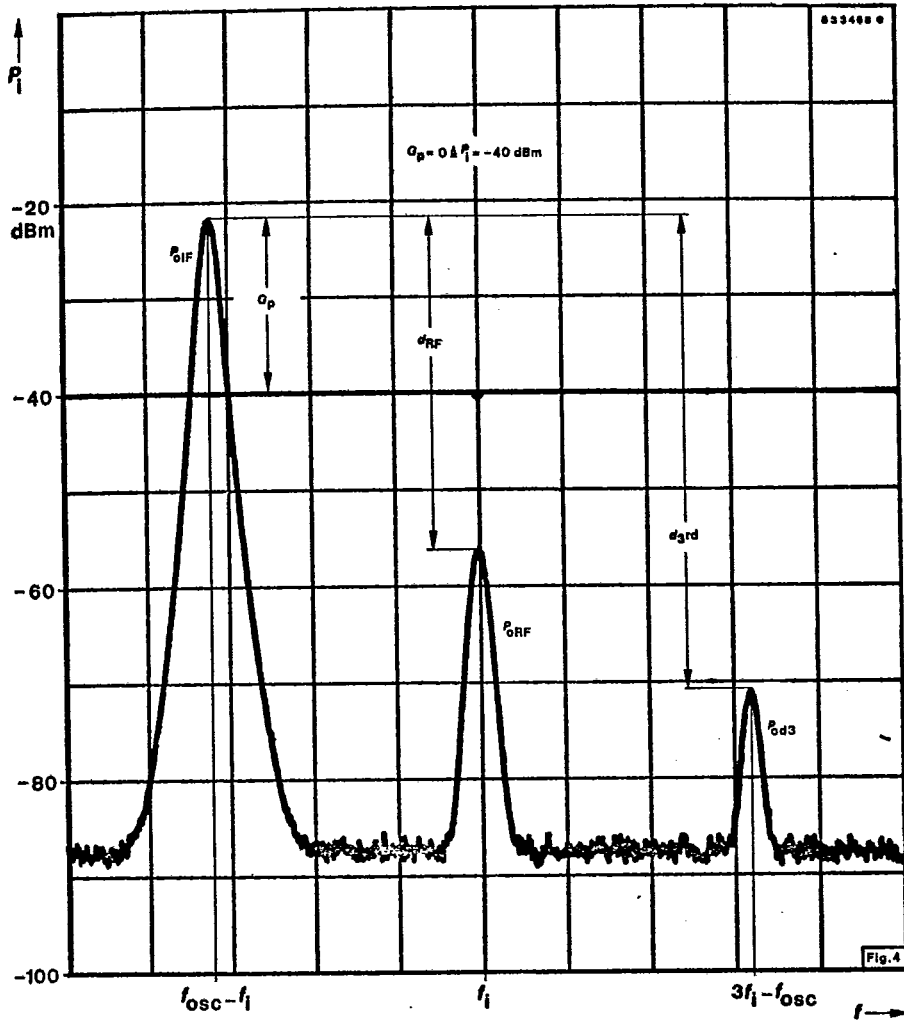
RF-circuit Pin 8/5 at  $f = 50.3 \text{ MHz}$ :  $B = 5.6 \text{ MHz}$ ,  $C_p = 5.5 \text{ pF}$ ,  $R_p = 1 \Omega$

IF-circuit Pin 13/14 with  $R_L = 50 \Omega$  terminated: at  $f = 50 \text{ MHz}$ ,  $R_p = 200 \Omega$

Oscillator circuit Pin 1/16 at  $f = 100 \text{ MHz}$ :  $B = 2.3 \text{ MHz}$ ,  $C_p = 3 \text{ pF}$ ,  $R_p = 800 \Omega$

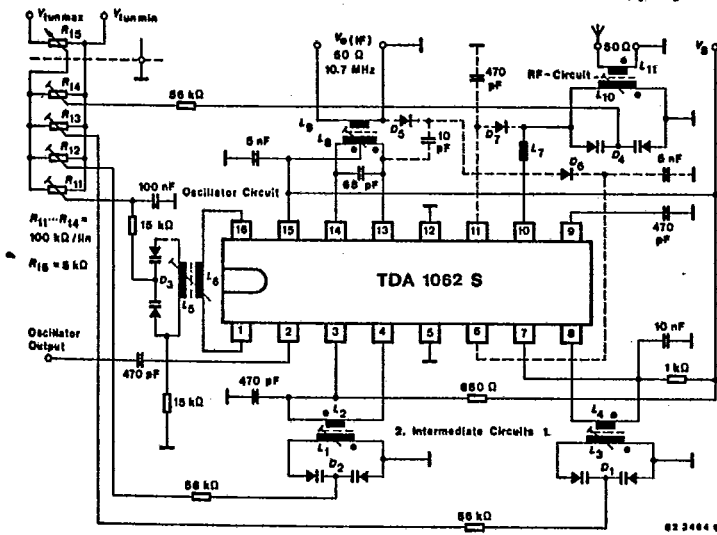
Fig. 3 Test circuit

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- $D_1, D_2, D_3, D_4$  = BB 304 blue (BB 204 blue)
  - $D_5, D_6$  = 1 N 4151 all resistors  $\pm 10\%$
  - $D_7$  = PIN Diode BA 479
  - $L_1, L_3, L_5, L_{10}$  = on 4 mm bobbin Fa. Kaschke, Göttingen, core 3/7.5x0.5 Mat. K 3/12/100
  - $L_4, L_9$  = Vogt Filter D 4, core 3/7.5x0.5 Mat. FI 05 F7
  - $L_1 = 5 \frac{3}{4}$  WdG  $\phi$  0.8 mm CuAg at the cold end of  $L_1$
  - $L_2 = 2 \frac{3}{4}$  WdG  $\phi$  0.4 mm CuLs
  - $L_3 = 5 \frac{3}{4}$  WdG  $\phi$  0.8 mm CuAg at the cold end of  $L_3$
  - $L_4 = 4 \frac{3}{4}$  WdG  $\phi$  0.4 mm CuLs
  - $L_5 = 6 \frac{3}{4}$  WdG  $\phi$  0.8 mm CuAg wound in  $L_5$
  - $L_6 = 3 \frac{3}{4}$  WdG  $\phi$  0.4 mm CuLs
  - $L_7 = 19$  WdG  $\phi$  0.15 mm Culs  $\phi$  3.5 mm air-core coil
  - $L_8 = 2 \times 15$  WdG  $\phi$  0.15 mm CuLs double wound
  - $L_9 = 2$  WdG  $\phi$  0.2 mm Culs wound on  $L_9$
  - $L_{10} = 6$  WdG  $\phi$  0.8 mm CuAG at the cold end of  $L_{10}$
  - $L_{11} = 1$  WdG  $\phi$  0.4 mm CuLs
- Culs  $\hat{=}$  single-nylon enamelled wire

Alignment: 88 MHz ( $V_{tunmin}$ ) Inductors, 108 MHz ( $V_{tunmax}$ )  $R_{11} \dots R_{14}$

No iteration of the alignment is necessary. The dotted line shows the external circuit for the AGC.

Fig. 5 Test circuit and application note

Supply voltage must be disconnected before inserting the integrated circuit in the socket.

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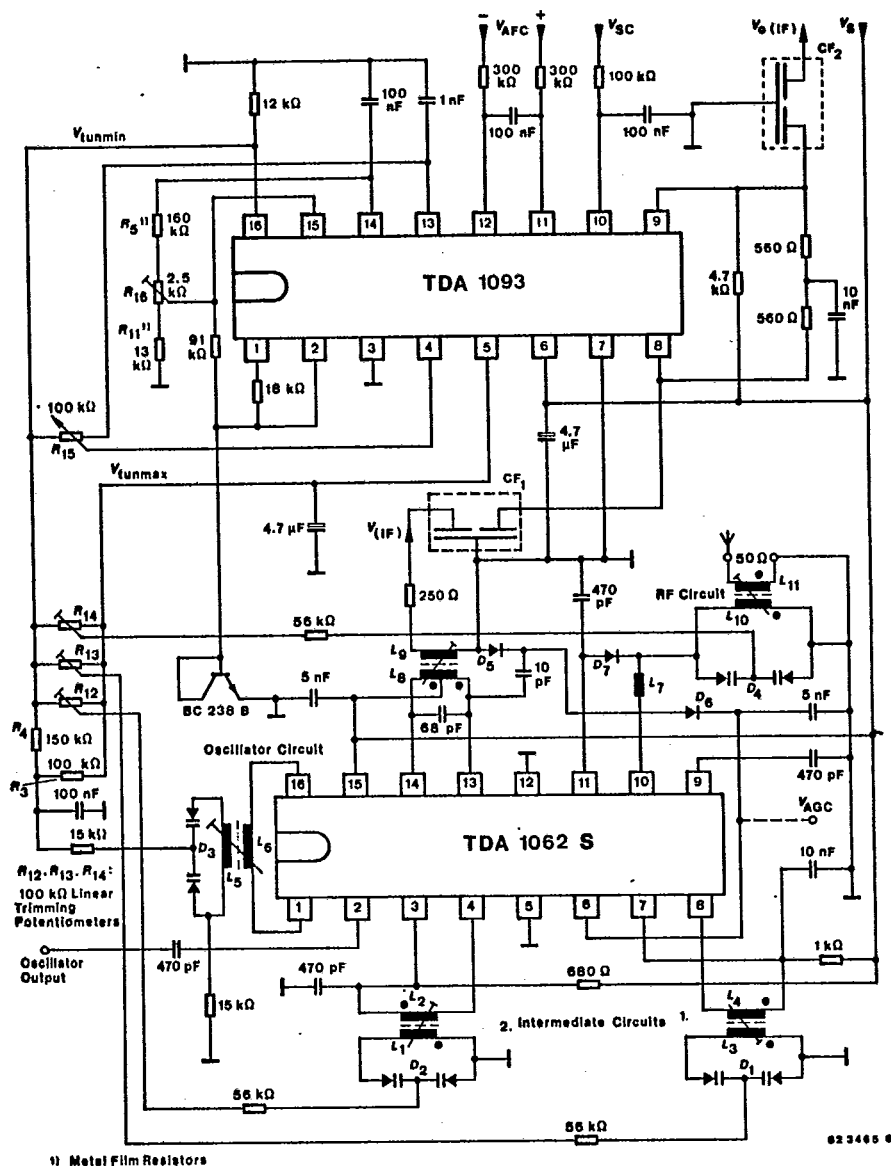
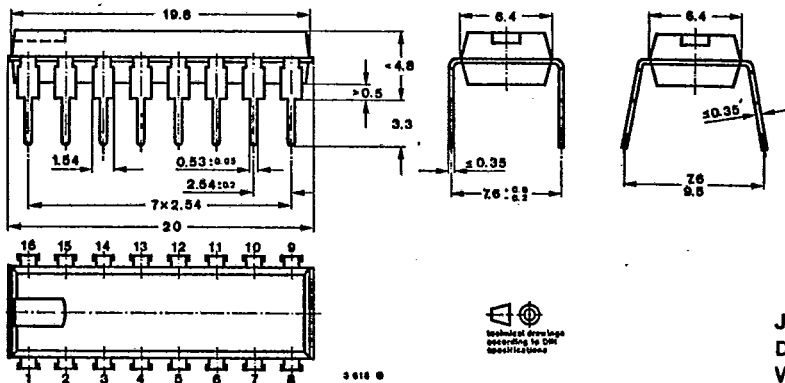


Fig. 6 FM-front end with tuning interface integrated circuit TDA 1093

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Dimensions in mm



JEDEC MO 001  
DIP 16  
Weight max. 1.5 g