

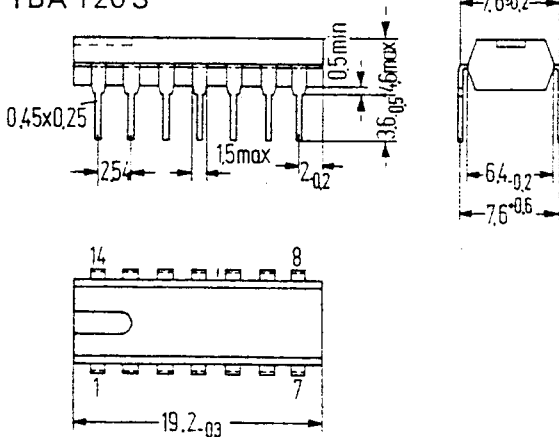
Symmetrical 8-stage amplifier with symmetrical coincidence demodulator for amplification, limiting and demodulation of frequency-modulated signals, especially suited for the sound IF units in TV sets and FM IF amplifiers in radio sets. The circuit is directly interchangeable with TBA 120/A (pin-compatible).

- Outstanding limiting qualities
- Very good frequency stability of converter characteristic
- Wide range of operation (6 to 18 V)
- Very low external component requirement
- Voltage for AFT

Type	Ordering codes
TBA 120 S	Q67000-A490
TBA 120 AS	Q67000-A525

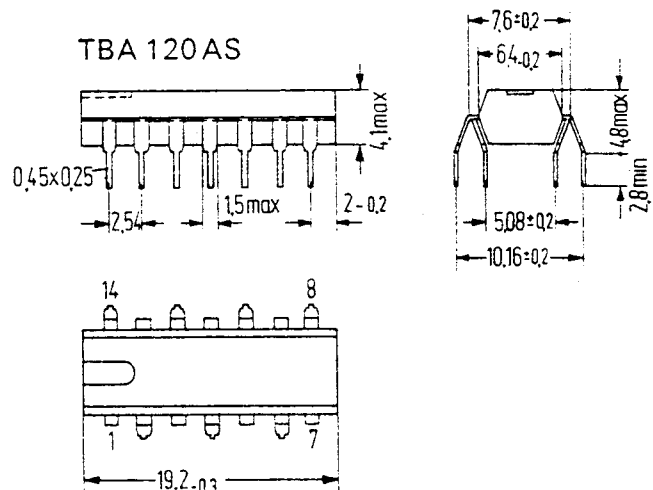
### Package outlines

TBA 120 S



Plastic plug-in package  
20 A 14 DIN 41866 14 pins, dual-in-line,  
weight approx. 1.1 g  
Dimensions in mm

TBA 120 AS



Plastic plug-in package  
20 A 14 DIN4186 (similar) 14 pins,  
quad-in-line weight approx. 1.1 g  
Dimensions in mm

### Absolute maximum ratings

Supply voltage <sup>1)</sup>	$V_{CC}$	18	V
Ambient temperature in operation	$T_{amb}$	-15 to +70	°C
Storage temperature	$T_s$	-40 to +125	°C
Total power dissipation	$P_{tot}$	400	mW
	$P_{tot}$	500	mW
Z current	$I_{12}$	15	mA
	$I_{12}$	20	mA
Voltage	$V_5$	4	V
Current	$I_3$	5	mA
Current	$I_4$	2	mA
Shunt resistance	$R_{13-14}$	≤ 1	kΩ
Thermal resistance (system-air)	$R_{thSA}$	≤ 120	K/W
Range for operation	$V_{CC}$	6 to 18	V
Frequency range	$f$	0 to 12	MHz

<sup>1)</sup> The circuit must not be plugged in or out when supply voltage is switched on.

**TBA 120 S**  
**TBA 120 AS**

Electrical characteristics ( $V_{CC} = 12\text{ V}$ ,  $T_{amb} = 25\text{ }^\circ\text{C}$ )

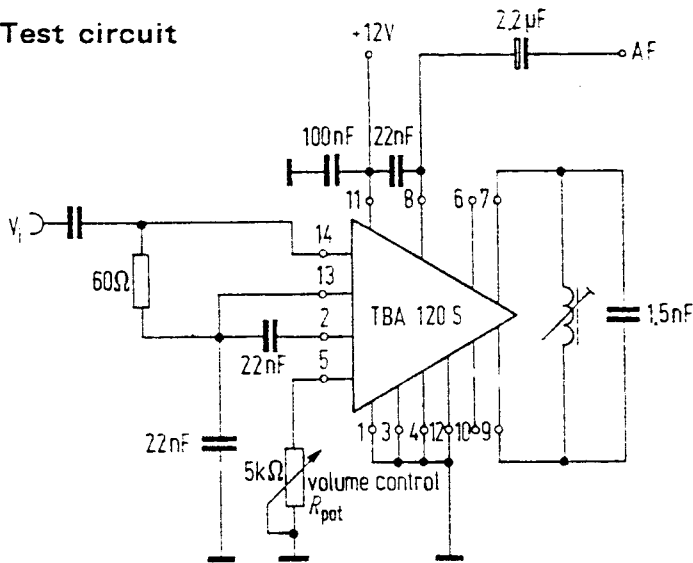
		min	typ	max	
Total current consumption ( $R_5 = \infty$ )	$I_{CC}$	10	14	18	mA
Total current consumption ( $R_5 = 0$ )	$I_{CC}$	11	15.2	20	mA
IF voltage gain ( $f_{IF} = 5.5\text{ MHz}$ )	$G_V$		68		dB
IF output voltage at limiting (each output)	$V_{qpp}$	170	250		mV
AF output voltage ( $f_{IF} = 5.5\text{ MHz}$ , $\Delta f = \pm 50\text{ kHz}$ , $V_i = 10\text{ mV}$ , $f_{mod} = 1\text{ kHz}$ , $Q_B \approx 45$ )	$V_{AF\text{ eff}}$	.7	1.0		V
Harmonic distortion ( $f_{IF} = 5.5\text{ MHz}$ , $\Delta f = \pm 25\text{ kHz}$ , $V_i = 10\text{ mV}$ , $f_{mod} = 1\text{ kHz}$ , $Q_B \approx 45$ )	$k$	1.3	2.5		%
Input voltage for -3 dB limiting ( $f_{IF} = 5.5\text{ MHz}$ , $\Delta f = \pm 50\text{ kHz}$ , $f_{mod} = 1\text{ kHz}$ , $Q_B \approx 45$ )	$V_{ilim}$		30	60	$\mu\text{V}$
Input impedance $f_{IF} = 5.5\text{ MHz}$	$Z_i$		40/4.5		k $\Omega$ /pF
$f_{IF} = 10.7\text{ MHz}$	$Z_i$		20/4		k $\Omega$ /pF
Output resistance (pin 8)	$R_o$	1.9	2.6	3.3	k $\Omega$
Range of volume control	$\frac{V_{AF\text{ max}}}{V_{AF\text{ min}}}$	70	75		dB
DC level of output signal	$V_B$	6.2	7.4	8.5	V
AM suppression ( $V_i = 500\text{ }\mu\text{V}$ , $f_{IF} = 5.5\text{ MHz}$ , $\Delta f = \pm 50\text{ kHz}$ , $f_{mod} = 1\text{ kHz}$ , $m = 30\%$ )	$a_{AM}$	45	55		dB
AM suppression ( $V_i = 10\text{ mV}$ , $f_{IF} = 5.5\text{ MHz}$ , $\Delta f = \pm 50\text{ kHz}$ , $f_{mod} = 1\text{ kHz}$ , $m = 30\%$ )		60	68		dB
Potentiometer resistance (-1 dB down)	$R_5$		3.7	4.7	k $\Omega$
Voltage (-1 dB down)	$V_5$		2.4		V
Potentiometer resistance (-70 dB down)	$R_5$	1.0	1.4		k $\Omega$
Voltage (-70 dB down)	$V_5$		1.3		V
Signal-to-noise distance ( $V_i = 10\text{ mV}$ , $\Delta f = \pm 50\text{ kHz}$ )	$a_{S/N}$		85		dB

**Characteristics of the additive circuit**

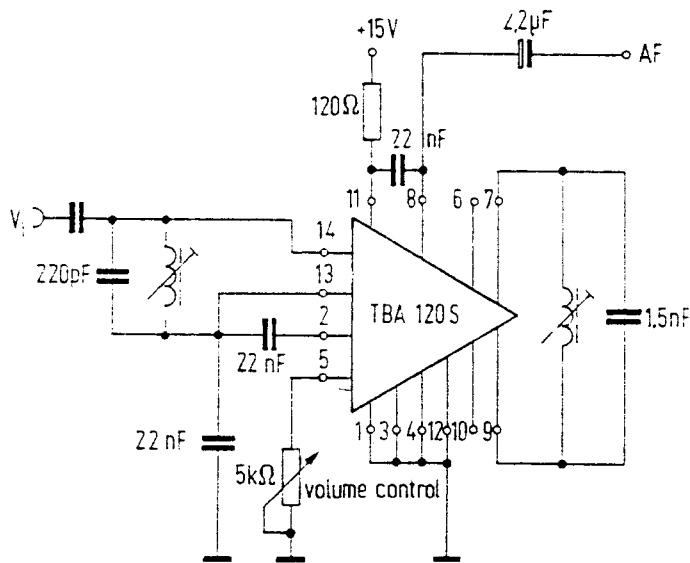
		min	typ	max	
Z-voltage ( $I_{12} = 5\text{ mA}$ )	$V_{12}$	11.2	12	13.2	V
Z-resistance	$R_Z$		30	55	$\Omega$
Breakdown voltage	$V_{CBO}$	26	40		V
Breakdown voltage ( $I_3 = 500\text{ }\mu\text{A}$ )	$V_{CEO}$	13			V
Current gain ( $V_{CE} = 5\text{ V}$ , $I_c = 1\text{ mA}$ )	$G_c$	25	80		

# TBA 120 S TBA 120 AS

## Test circuit



## Recommended application circuit (5.5 MHz)



Pins 3 and 4 are connected to collector and base of a transistor, respectively, which may be used as an AF preamplifier ( $I_c \leq 5 \text{ mA}$ ) or as a bass/treble switch (dc on- or off-switching of a RC-circuit).

At pin 12 a Z diode (12 V) is accessible which can be used to stabilize the supply voltage of this integrated circuit or the voltage of other circuit elements in the set ( $I_Z \leq 15 \text{ mA}$ ).

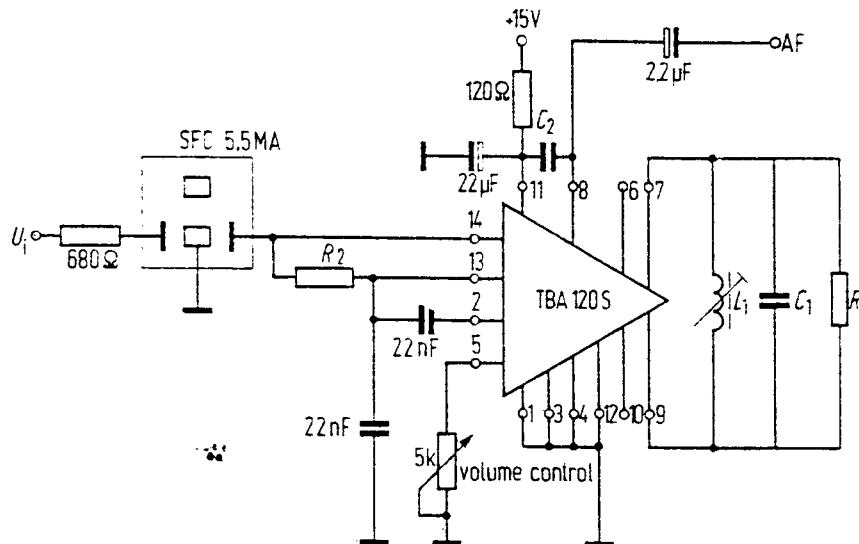
The integrated circuit TBA 120 S is supplied in different groups. Parameter is the volume. A decrease of 30 dB requires a resistor between pin 5 and ground with a resistance value depending on the group number as shown below. The group number is imprinted on the plastic package.

Group	II	III	IV	V	
R 5	1.9 to 2.2	2.1 to 2.5	2.4 to 2.9	2.8 to 3.3	kΩ

# TBA 120 S TBA 120 AS

## TBA 120S with ceramic filter (Murata)

For a good far-away-selectivity the ceramic filter should be combined with a LC circuit



	Sound IF in TV sets	Sound IF in TV sets of American Std.	FM-IF in radio mono sets	FM-IF in radio stereo sets
$C_1$	1.5 nF	2.2 nF	470 pF	330 pF
$C_2$	22 nF	22 nF	22 nF	470 pF
$L_1$	8 turns	8 turns	8 turns	12 turns
$R_1$	$\infty$	$\infty$	$\infty$	1 k $\Omega$
$R_2$	680 $\Omega$	1 k $\Omega$	330 $\Omega$	330 $\Omega$
Filter (Murata)	SFE 5.5 MA	SFE 4.5 MA	SFE 10.7 MA	SFE 10.7 MA