



# TBA120C

## FM IF AMPLIFIER, LIMITER AND DETECTOR

An integrated circuit specifically designed for use in the sound section of TV receivers and the FM/IF portion of radio receivers.

The TBA120C is pin for pin and function compatible with the proelectron type TBA120S but includes an improved dc volume control, which makes "grouping" or selection unnecessary.

- Excellent 3.0 dB Limiting
- High A.M. Rejection
- Wide Supply Voltage Range
- Auxiliary Zener Diode and Transistor
- Minimum Number of External Components Required

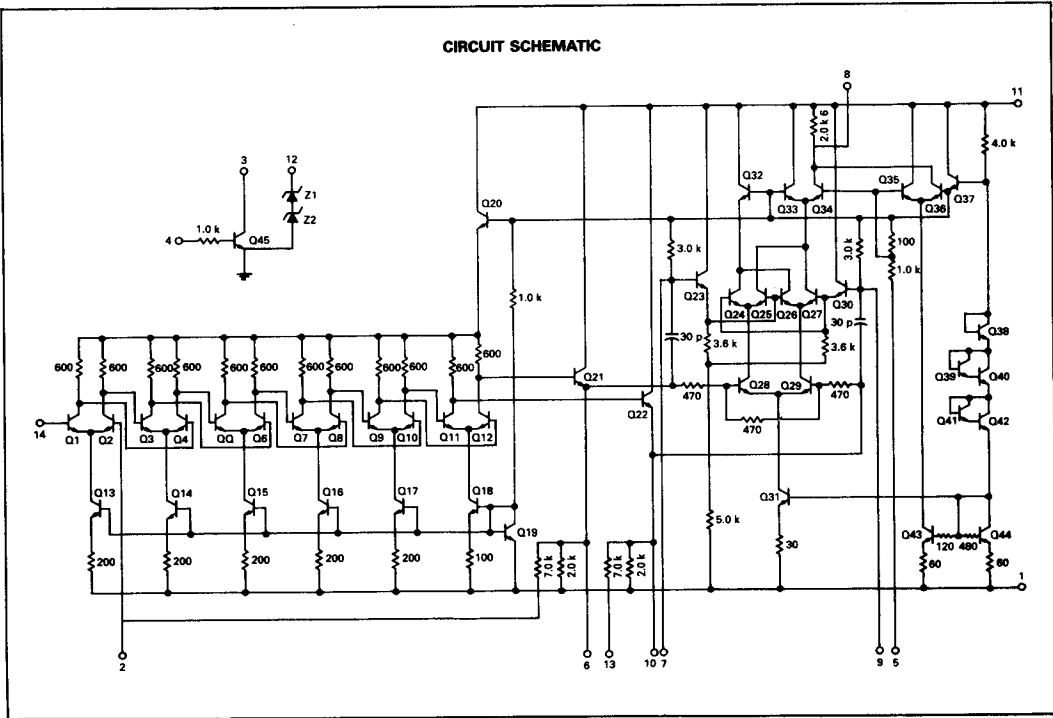
## FM IF AMPLIFIER, LIMITER, FM DETECTOR AND AUDIO PREAMPLIFIER

SILICON MONOLITHIC  
INTEGRATED CIRCUIT



PLASTIC PACKAGE  
CASE 646-06

### CIRCUIT SCHEMATIC



**MAXIMUM RATINGS** ( $T_A = +25^\circ\text{C}$  unless otherwise noted)

Rating	Value	Unit
Power Supply Voltage	+18	Vdc
Power Dissipation (Package Limitation) Plastic Package Derate above $T_A = +25^\circ\text{C}$	625 5.0	mW mW/°C
Operating Temperature Range	0 to +75	°C
Storage Temperature Range	-65 to +150	°C

**ELECTRICAL CHARACTERISTICS** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = 12\text{ V}$ ,  $R = 20\text{ k}$ , Test circuit: Figure 1)

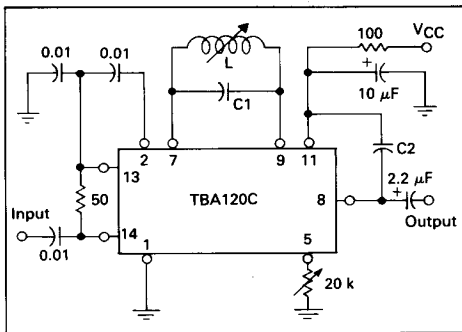
Characteristic	Min	Typ	Max	Unit
Supply Voltage Range	6.0	—	18	Volts
Supply Current	10	14	18	mA
Audio Output ( $f_O = 5.5\text{ MHz}$ , $\Delta f = 50\text{ kHz}$ , $Q = 45$ )	—	1.0	—	Volts RMS
Audio Output ( $f_O = 10.7\text{ MHz}$ , $\Delta f = 75\text{ kHz}$ , $Q = 35$ )	—	0.38	—	Volts RMS
3.0 dB Limiting ( $f_O = 5.5\text{ MHz}$ , $\Delta f = 50\text{ kHz}$ , $Q = 45$ )	—	30	60	$\mu\text{VRMS}$
3.0 dB Limiting ( $f_O = 10.7\text{ MHz}$ , $\Delta f = 75\text{ kHz}$ , $Q = 35$ )	—	40	—	$\mu\text{VRMS}$
A.M. Rejection ( $f_O = 5.5\text{ MHz}$ , RF Input: $500\ \mu\text{V}$ )	45	—	—	dB
A.M. Rejection ( $f_O = 10.7\text{ MHz}$ , RF Input: $500\ \mu\text{V}$ )	40	—	—	dB
Volume Control Range	65	75	—	dB
Output Impedance	—	2.6	—	k $\Omega$

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**ELECTRICAL CHARACTERISTICS OF AUXILIARY Z DIODE AND TRANSISTOR Q45** ( $T_A = +25^\circ$ )

Characteristic	Min	Typ	Max	Unit
Z-Voltage @ 5.0 mA (Pin 12)	11.2	—	13.2	Volts
Z-Resistance (Pin 12) @ 1.0 kHz, 5.0 mA	—	15	—	$\Omega$
Q45 Breakdown Voltage $V_{CEO}$	13	—	—	Volts
Q45 Current Gain @ $I_C = 1.0\text{ mA}$ , $V_{CE} = 5.0\text{ V}$	40	100	—	—

FIGURE 1 — TEST CIRCUIT



COMPONENT VALUES:

	L	C <sub>1</sub>	Q
5.5 MHz	0.55 μH	1.5 nF	45
6.0 MHz	0.55 μH	1.2 nF	45
10.7 MHz	2.2 μH	100 pF	35

C<sub>2</sub> = 0.022 μF, together with the integrated resistor of 2.6 kΩ (Pin 8) gives the deemphasis and can be reduced if required. For stereo 470 pF should be used to provide H.F. decoupling.

FIGURE 2 — AUDIO OUTPUT AND S/N versus INPUT SIGNAL LEVEL AT 5.5 AND 6.0 MHz

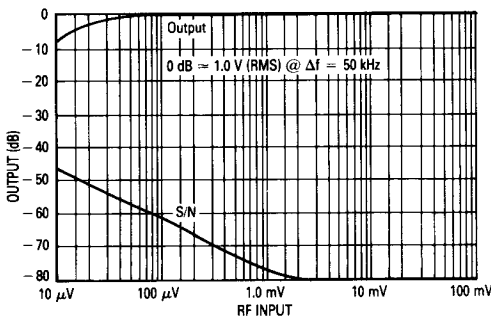


FIGURE 3 — AUDIO OUTPUT AND S/N versus INPUT SIGNAL LEVEL AT 10.7 MHz

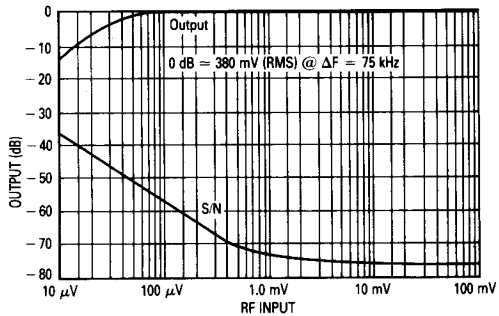


FIGURE 4 — A.M. REJECTION versus INPUT SIGNAL LEVEL AT 5.5 AND 6.0 MHz (30% A.M., 50 kHz F.M.)

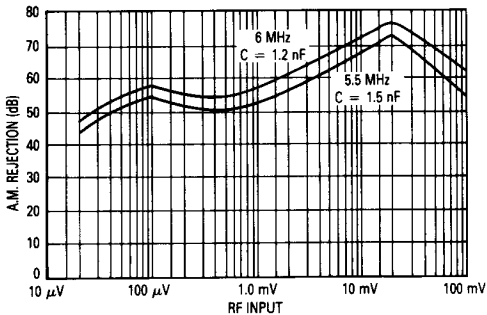


FIGURE 5 — A.M. REJECTION versus INPUT SIGNAL LEVEL AT 10.7 MHz (30% A.M., 75 kHz FM)

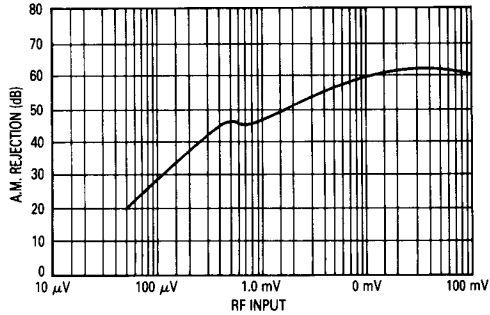


FIGURE 6 — OUTPUT VOLTAGE versus SUPPLY VOLTAGE

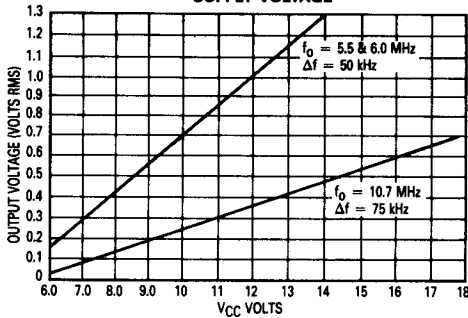


FIGURE 7 — T.H.D. + NOISE versus ATTENUATION (D.C. VOLUME CONTROL)

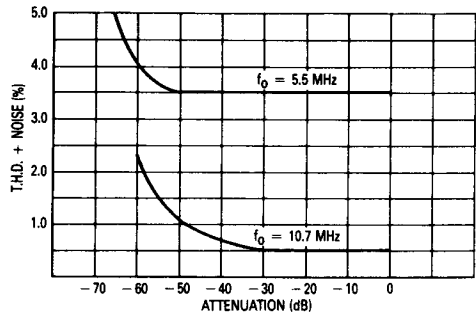


FIGURE 8 — OUTPUT SIGNAL ATTENUATION versus VOLUME CONTROL RESISTANCE

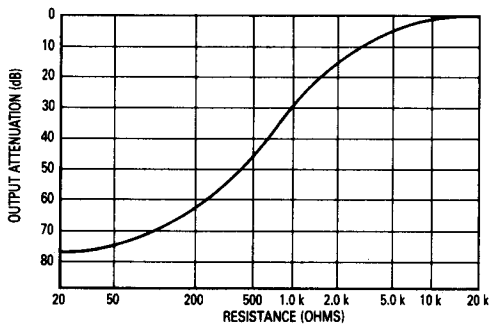


FIGURE 9 — OUTPUT SIGNAL ATTENUATION versus D.C. VOLTAGE AT PIN 5

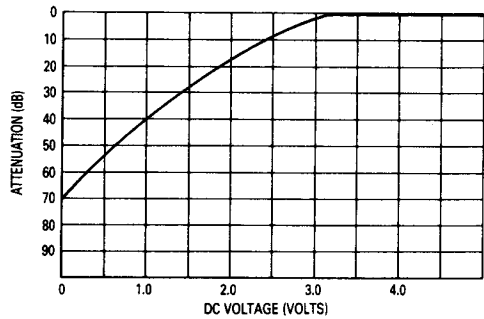


FIGURE 10 — AUDIO PREAMPLIFIER TEST CIRCUIT

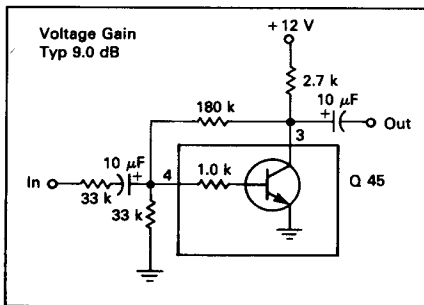
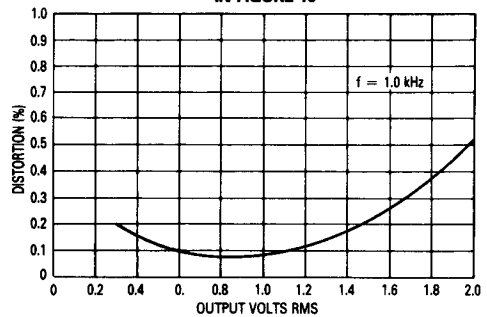
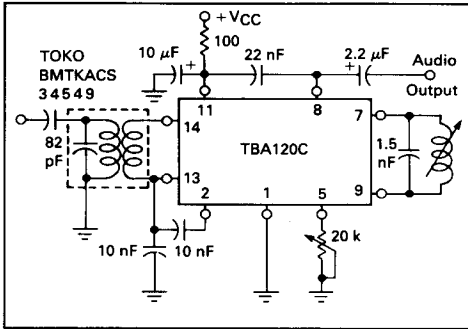


FIGURE 11 — T.H.D. versus OUTPUT VOLTAGE FOR AUDIO PREAMPLIFIER SHOWN IN FIGURE 10

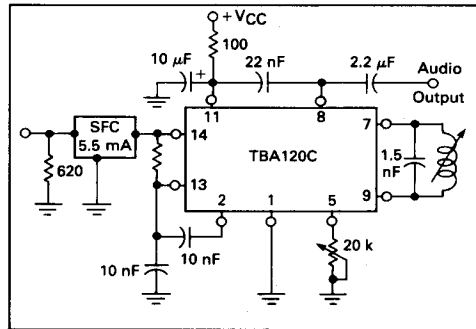


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**FIGURE 12 — TYPICAL APPLICATION FOR 5.5 MHz WITH L-C INPUT FILTER**



**FIGURE 13 — TYPICAL APPLICATION FOR 5.5 MHz WITH CERAMIC INPUT FILTER**



**FIGURE 14 — TYPICAL APPLICATION FOR 10.7 MHz WITH CERAMIC FILTER**

