



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

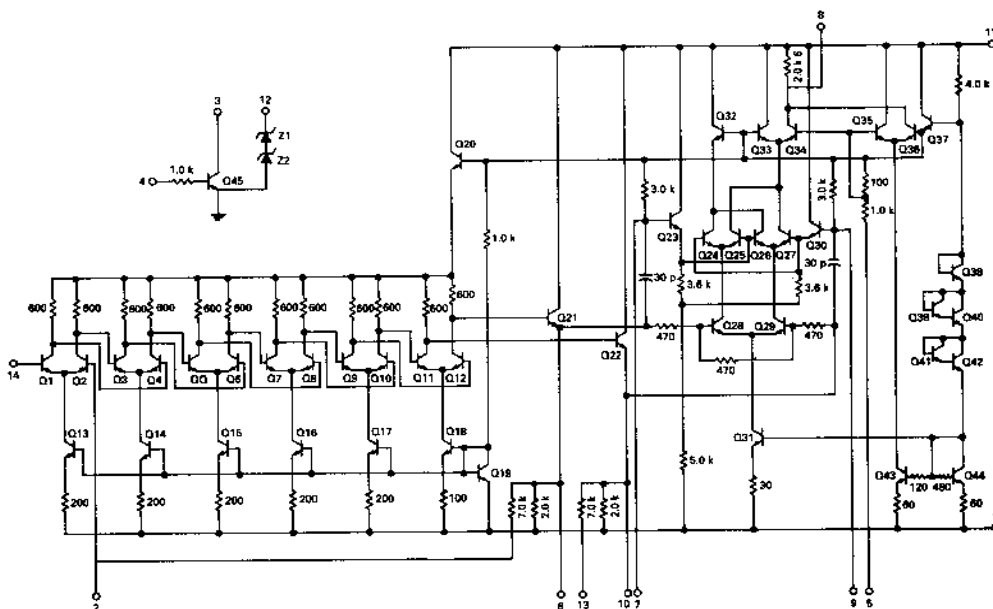
FM IF AMPLIFIER, LIMITER, FM DETECTOR AND AUDIO PREAMPLIFIER

SILICON MONOLITHIC
INTEGRATED CIRCUIT



PLASTIC PACKAGE
CASE 646-06

CIRCUIT SCHEMATIC



MOTOROLA LINEAR/INTERFACE DEVICES

9-137

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

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

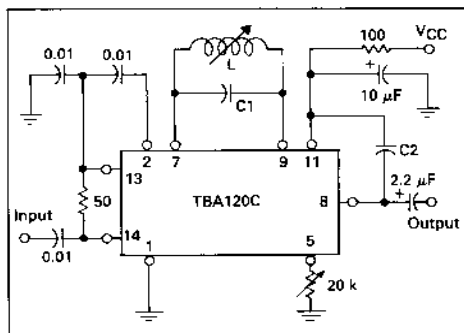
ELECTRICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, $V_{CC} = 12\text{ V}$, $R = 20\text{ k}$, Test circuit: Figure 1)

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	μVRMS
3.0 dB Limiting ($f_O = 10.7\text{ MHz}$, $\Delta f = 75\text{ kHz}$, $Q = 35$)	—	40	—	μVRMS
A.M. Rejection ($f_O = 5.5\text{ MHz}$, RF Input: $500\text{ }\mu\text{V}$)	45	—	—	dB
A.M. Rejection ($f_O = 10.7\text{ MHz}$, RF Input: $500\text{ }\mu\text{V}$)	40	—	—	dB
Volume Control Range	65	75	—	dB
Output Impedance	—	2.6	—	k Ω

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	—	Ω
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 ₁	Q
5.5 MHz	0.55 μ H	1.5 nF	45
6.0 MHz	0.55 μ H	1.2 nF	45
10.7 MHz	2.2 μ H	100 pF	35

C2 = 0.022 μ F, together with the integrated resistor of 2.6 k Ω (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

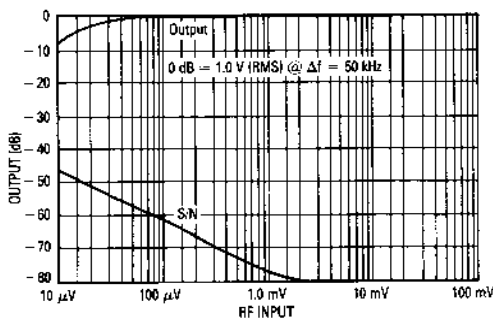


FIGURE 3 — AUDIO OUTPUT AND S/N versus INPUT SIGNAL LEVEL AT 10.7 MHz

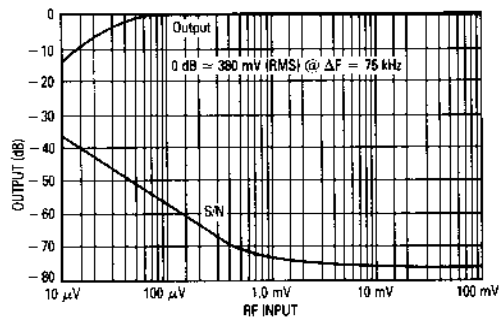


FIGURE 4 — A.M. REJECTION versus INPUT SIGNAL LEVEL AT 5.5 AND 6.0 MHz (30% A.M., 50 kHz F.M.)

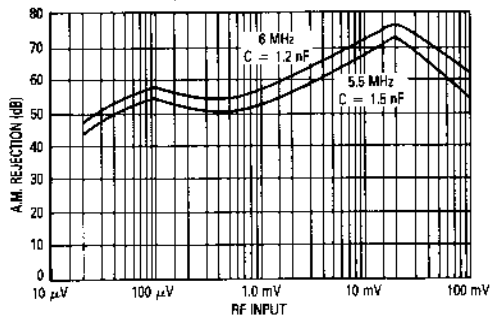


FIGURE 5 — A.M. REJECTION versus INPUT SIGNAL LEVEL AT 10.7 MHz (30% A.M., 75 kHz FM)

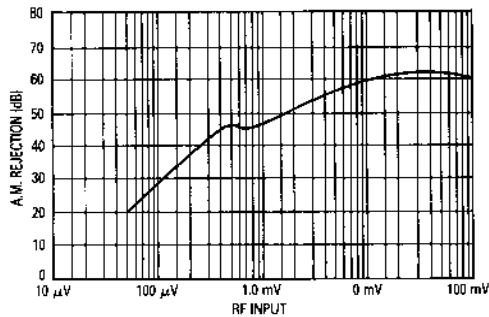


FIGURE 6 — OUTPUT VOLTAGE versus SUPPLY VOLTAGE

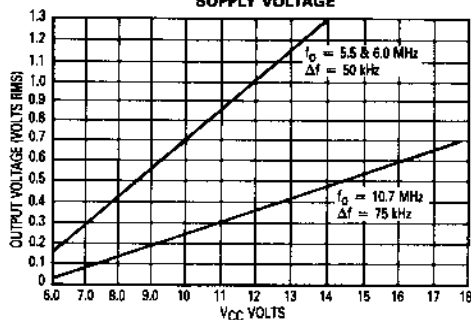


FIGURE 7 — T.H.D. + NOISE versus ATTENUATION (D.C. VOLUME CONTROL)

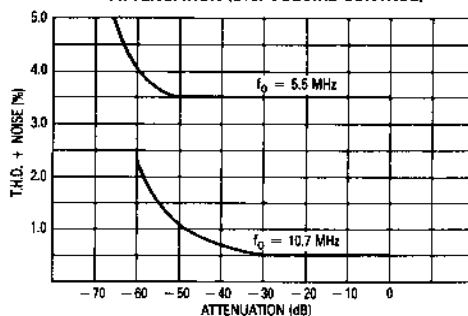


FIGURE 8 — OUTPUT SIGNAL ATTENUATION versus VOLUME CONTROL RESISTANCE

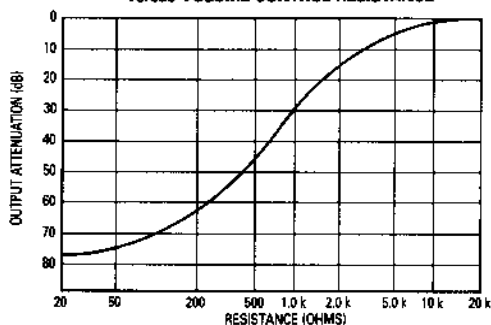


FIGURE 9 — OUTPUT SIGNAL ATTENUATION versus D.C. VOLTAGE AT PIN 5

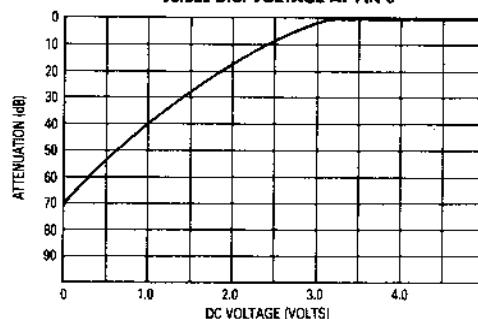


FIGURE 10 — AUDIO PREAMPLIFIER TEST CIRCUIT

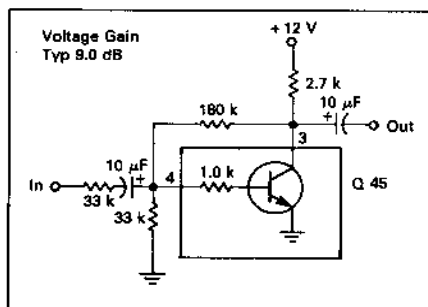
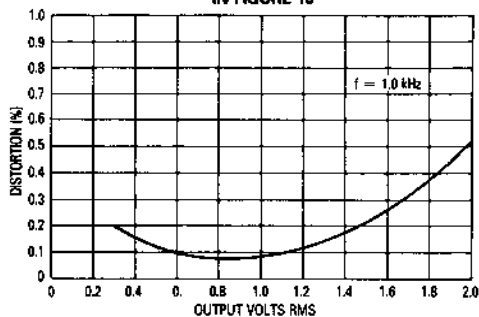


FIGURE 11 — T.H.D. versus OUTPUT VOLTAGE FOR AUDIO PREAMPLIFIER SHOWN IN FIGURE 10



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

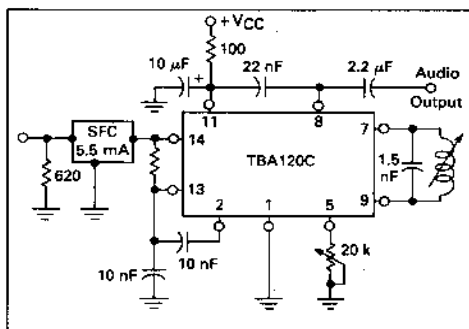
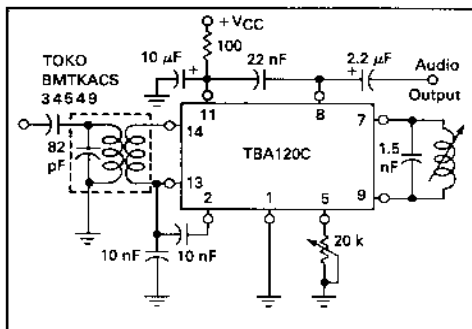


FIGURE 14 — TYPICAL APPLICATION FOR 10.7 MHz WITH CERAMIC FILTER

