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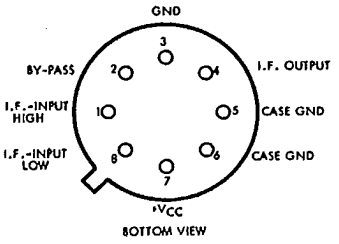
ECG781

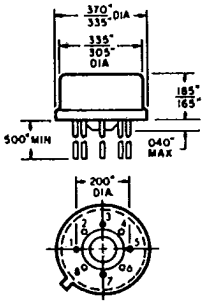
HIGH-GAIN WIDE-BAND IF AMPLIFIER-LIMITER

For FM IF Amplifier Applications
in Communications Receivers



Features:

- Exceptionally Good Sensitivity: Input Limiting Voltage (Knee) = 50 μV typ at 10.7 MHz
- High Gain: 80 dB with 2-Kilohm Load
- Internal Voltage Supply Regulator
- Wide Frequency Capability: >20 MHz



ECG781, monolithic integrated circuit, is a high-gain wide-band amplifier-limiter for use in the IF sections of Communications and High-Fidelity FM Receivers. The ECG781 shown in the schematic diagram (Fig. 2), consists of a four stage IF amplifier-limiter section with a voltage regulator section. A typical application of the ECG781 in FM receiver circuits is shown in the block diagram (Fig. 1).

The four-stage emitter-follower-coupled IF amplifier section provides an 80-dB voltage gain with a 2-kilohm load at a frequency of 10.7 MHz. The output stage has exceptionally good limiting characteristics because of its transistor constant-current sink. The voltage regulator section provides zener-regulated, decoupled voltages for the IF amplifier.

The ECG781 utilizes an hermetically-sealed 8-lead TO-5 package.

MAXIMUM RATINGS, *Absolute Maximum-Values at* T_A = 25°C

DC Supply Voltage [between Terminals 7 (V^+) and 3 (V^-)]	15	V
DC Current (into Terminal 7)	35	mA
Device Dissipation:		
Up to T_A = 50°C	500	mW
Above T_A = 50°C	derate linearly 5	mW/°C
Ambient Temperature Range:		
Operating	−55 to +125	°C
Storage	−65 to +150	°C
Lead Temperature (During Soldering):		
At distance 1/32 in (3.17 mm) from seating plane for 10 s max	+260	°C

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ELECTRICAL CHARACTERISTICS at T_A = 25°C

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS MIN.	LIMITS TYP.	LIMITS MAX.	UNITS	TEST CIRCUIT FIG. NO.
Static Characteristics – V^+ = 8.5 V							
DC Current (into Term. 7)	I_7	–	10	15	24	mA	3
Quiescent Operating Current (into Term. 4)	I_4	–	–	0.65	–	mA	3
Dynamic Characteristics – V^+ = 8.5 V, f_O = 10.7 MHz							
Input Limiting Voltage (knee, –3 dB point)	V_I (lim.)	–	–	50	200	μV	–
Output Voltage	V_O	V_I = 20 μV	4	12	–	mV	5
Output Noise Voltage	V_N	V_I = 0	–	1	–	mV	5
Forward Transfer Admittance: Magnitude Phase	$\lvert Y_{21} \rvert$ θ_{21}	V_I = 10 μV	– –	6 80	– –	mho degrees	4
Reverse Transfer Admittance: Magnitude Phase	$\lvert Y_{12} \rvert$ θ_{12}	–	– –	0.1 – 90	– –	μmho degrees	–
Input-Impedance Components: Parallel Resistance Parallel Capacitance	R_I C_I	–	– –	7.5 4	– –	kΩ pF	–
Output-Impedance Components: Parallel Resistance Parallel Capacitance	R_O C_O	–	50 –	– 1.7	– –	kΩ pF	–

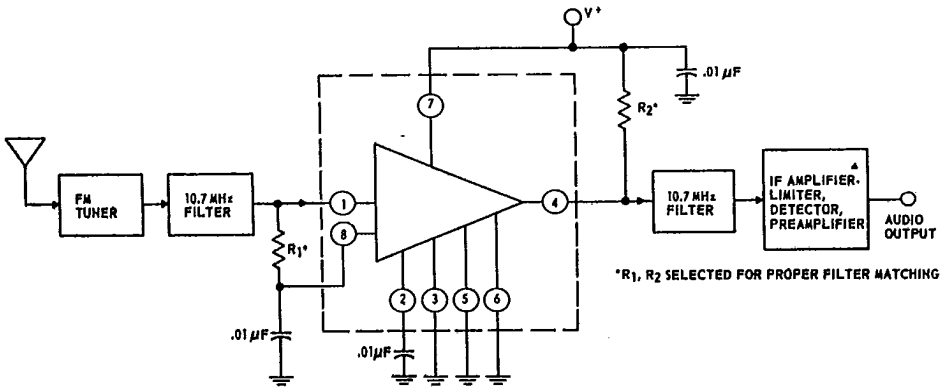

Fig. 1 - Block diagram of typical FM receiver utilizing the ECG781.

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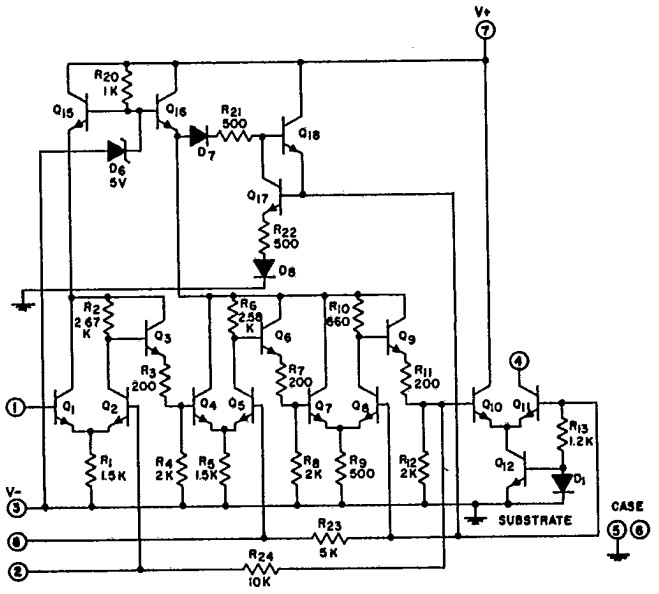

Fig. 2 - Schematic diagram of ECG781.

Notes:

Terminal No. 5 wire-connected to the case.

Terminals No. 3 and 6 which are connected to the substrate should be connected to the most negative point in the circuit.

The resistance values included on the schematic diagram have been supplied as a convenience to assist Equipment Manufacturer's in optimizing the selection of "outboard" components of equipment designs. The values shown may vary as much as ±30%.

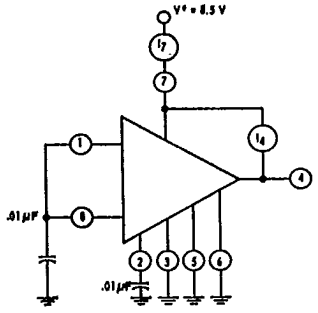

Fig. 3 - Test circuit for DC current (Terminal 7) and operating current (Terminal 4).

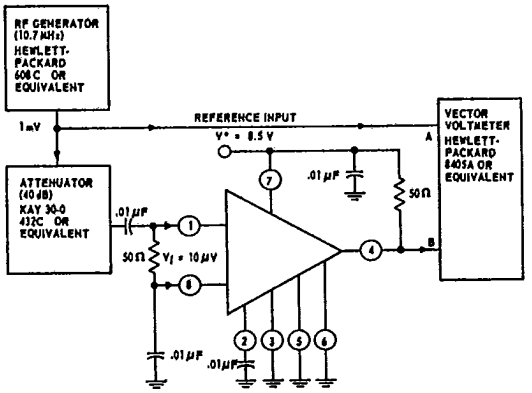

Fig. 4 - Forward transfer admittance (Y_{21}) test circuit

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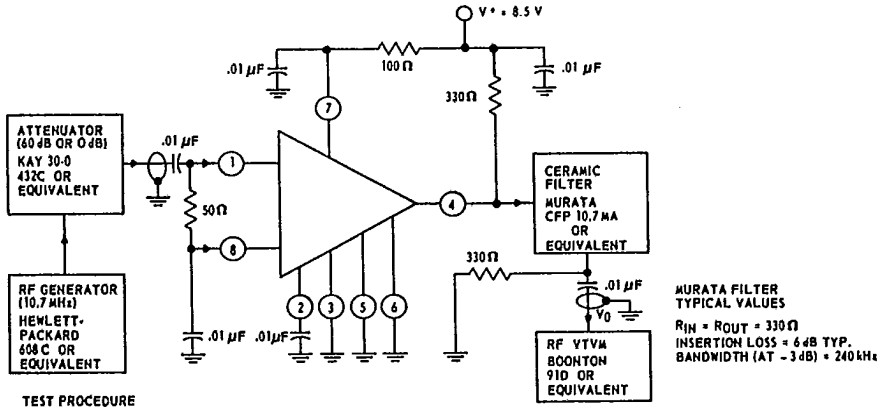

TEST PROCEDURE

OUTPUT VOLTAGE:

1. SET ATTENUATOR TO 0 dB
2. SET RF GENERATOR TO 20 μV CW
3. READ V_0 IN mV

OUTPUT NOISE VOLTAGE:

1. SET ATTENUATOR TO 60 dB
2. READ V_0 IN mV

Fig. 5 - 10.7 MHz voltage gain and noise test circuit