



AF104/AF105 DTMF AGC Amplifier

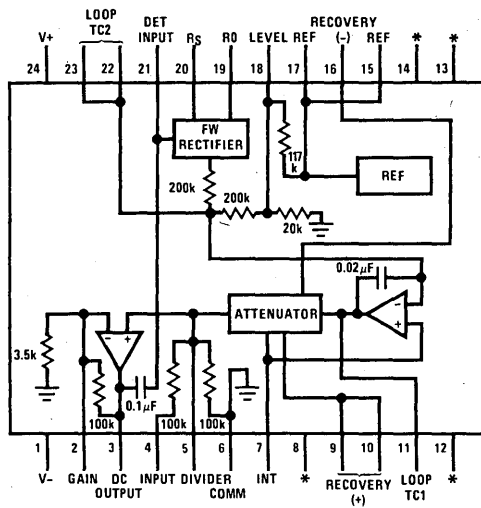
General Description

The AF104 AGC Amplifier is a direct coupled amplifier whose voltage gain is internally controlled by the output signal. The gain control feedback system is AC coupled so that DC signals do not affect the gain.

Features

- Optional gain adjustment
- High input impedance 100k
- 0dBm output level
- Internal reference
- Wide supply voltage range $\pm 9.0V$ to $\pm 18V$
- Input level range $+30\text{ dBm}$ ($2.45V_{\text{rms}}$)
- Frequency range 500 Hz to 10 kHz

Connection Diagram



Ceramic Dual-In-Line Package HY24A
 AF104CJ
 AF105CJ

*Internally connected. DO NOT USE.

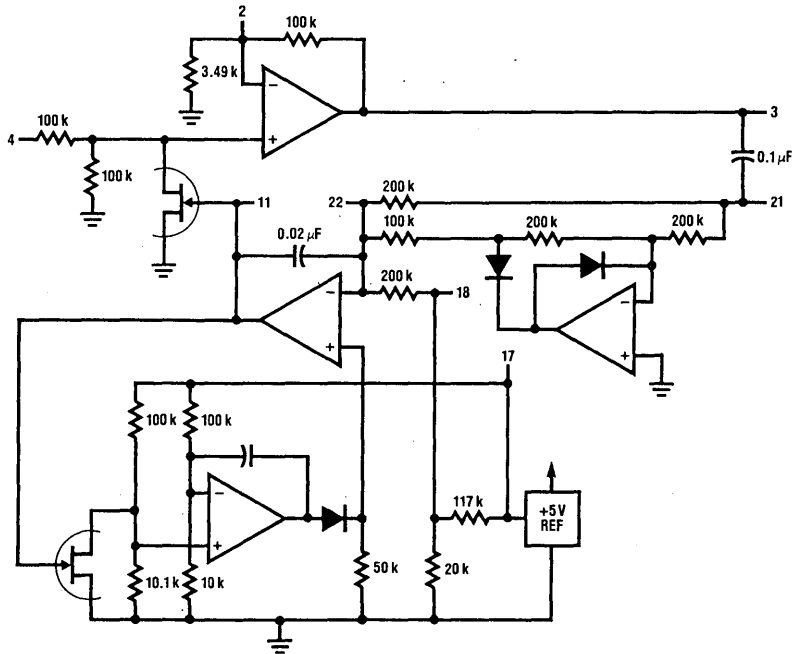
Absolute Maximum Ratings

Supply Voltage	±18V
Power Dissipation	1W
Input Voltage	±36V
Output Short Circuit Duration	Infinite
Lead Temperature (soldering, 10 sec.)	300°C
Operating Temperature Range	0°C to +70°C
Storage Temperature Range	-25°C to +100°C

Electrical Characteristics $V_S = \pm 12V$ to $\pm 15V$, $T_A = 0^\circ C$ to $70^\circ C$, unless otherwise specified.

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Level	V_O	Single 1 kHz tone of $-22 \leq A \leq +10$ dBm	-0.35	0	0.35	dBm
Input Level	V_{IN}		-20		+10	dBm
Input Impedance	Z_{IN}			100		k Ω
Open Loop Gain	A_O	AF104	21.4	22	22.6	dB
		AF105	22.4	23	23.6	dB
Output Impedance	Z_O			< 1		Ω
Recovery Time		Input step from no signal, 0 dBm, 1 kHz tone		5		ms
Power Supply Voltage	V_S		±9		±18	V
Power Supply Current V^+	I_S^+			5.5	11	mA
V^-	I_S^-			2.5	5	mA
Operating Frequency Range			0.5	0.3 To 12	10	kHz

Schematic Diagram



OPEN LOOP GAIN ADJUSTMENT

The open loop gain is internally set to 21 dB but can be externally adjusted by adding one external resistor. The practical limits are 0dB to 40dB. When the gain is increased the bandwidth is decreased.

OUTPUT LEVEL ADJUSTMENT

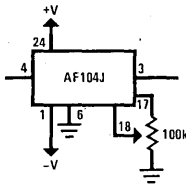
The output level can be adjusted by connecting a 100k pot between pin 17 and ground with the wiper arm connected to pin 18. Output level can be adjusted

± 10 dB without affecting other parameters such as loop time constant and recovery time.

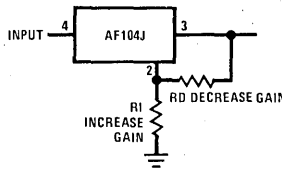
EXTENDING LOW FREQUENCY RESPONSE

An external capacitor in parallel with the internal loop time constant capacitor will extend the low frequency response and lower the distortion through the AGC. It has the effect of slowing the response time due to the longer loop time constant. To maintain amplitude stability at low frequencies an external capacitor should be added in parallel with the loop coupling capacitor.

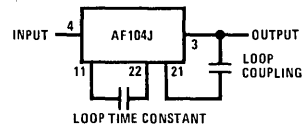
Test Circuits



Output Level Adjust

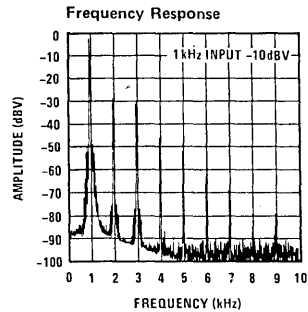
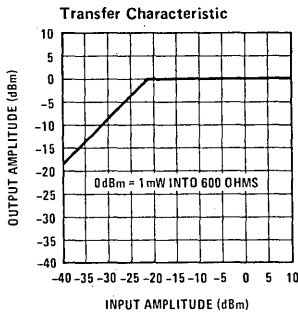


Open Loop Gain Adjust



AGC Loop Response

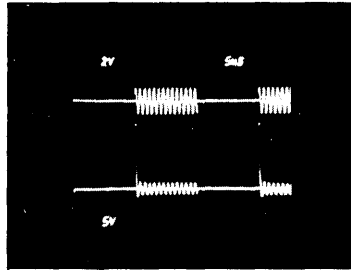
Typical Performance Characteristics



Transient Response

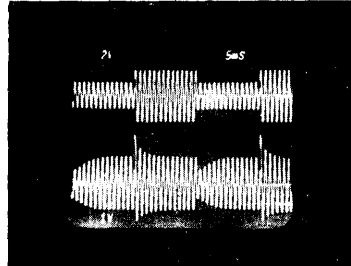
Input
0, 0.77V Step (1 kHz)

Output



Input
0dBm, +6.0 dBm (1 kHz)

Output



Input
-10dBm, -4.0 dBm (1 kHz)

Output

