

SL610C, SL611C & SL612C

RF/IF AMPLIFIERS

The SL610C, SL611C and SL612C are RF voltage amplifiers with AGC facilities. The voltage gains are 10, 20 and 50 times respectively and the upper frequency response varies from 15 MHz to 120 MHz according to type.

FEATURES

- Wide AGC Range: 50dB
- Easy Interfacing
- Integral Power Supply RF Decoupling

APPLICATIONS

- RF Amplifiers
- IF Amplifiers

QUICK REFERENCE DATA

- Supply Voltage: 6V
- Voltage Gain: 20dB to 34dB

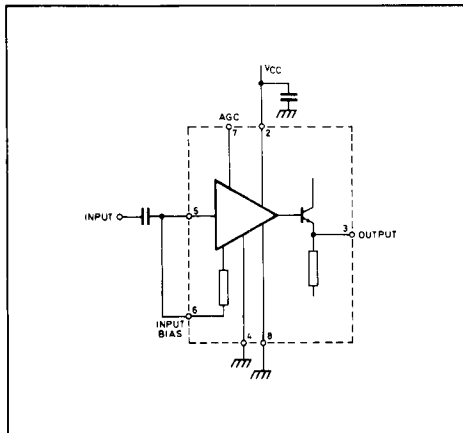


Fig. 2 Block diagram

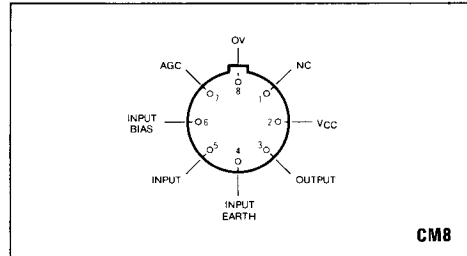


Fig. 1 Pin connections (bottom view)

ABSOLUTE MAXIMUM RATINGS

Supply voltage: 12V
Storage temperature: -55°C to $+125^{\circ}\text{C}$

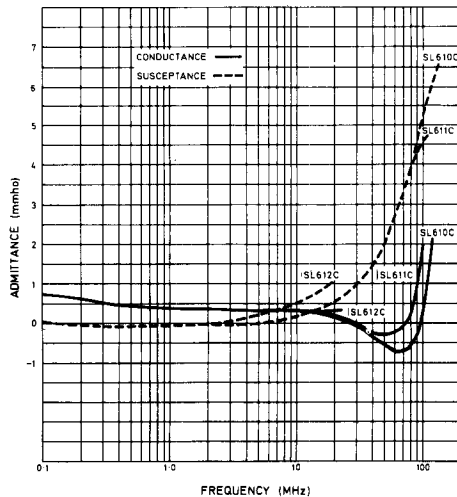


Fig. 3 Input admittance with o/c output (G_{11})

ELECTRICAL CHARACTERISTICS

Test conditions (unless otherwise stated):

Supply voltage V_{CC} : 6V
 Ambient temperature: -30°C to $+85^{\circ}\text{C}$
 Test frequency: SL610C 30MHz
 SL611C 30MHz
 SL612C 1.75MHz

Characteristic	Circuit	Value			Units	Conditions	
		Min.	Typ.	Max.			
Supply current	SL610C SL611C SL612C		15 15 3.3	20 20 5	mA	} No signal, pin 3 open circuit	
Voltage gain	SL610C SL611C SL612C	18 24 32	20 26 34	22 28 36	dB		} $R_S = 50\Omega$ $R_L = 500\Omega$ $T_{amb} = 22^{\circ}\text{C}$
Cut-off frequency (-3dB)	SL610C SL611C SL612C	85 50 10	120 80 15		MHz		
Noise figure	SL610C SL611C SL612C		4 4 3		dB	} $R_S = 300\Omega$ $R_S = 300\Omega$ $R_S = 800\Omega$ } at test frequency $R_L = 150\Omega$ (SL610C/611C) $R_L = 1.2k\Omega$ (SL612C)	
Max. output signal (max. AGC)			1.0		Vrms		
Max. input signal (max. AGC)	SL610C		250		mVrms	} Pin 7 0V to 5.1V	
AGC range	SL611C SL612C	40 60	50 70		dB		
AGC current			0.15	0.6	mA		Current into pin 7 at 5.1V

APPLICATION NOTES

Input circuit

The SL610C, SL611C and SL612C are normally used with pins 5 and 6 connected together and with the input connected via a capacitor as shown in Fig. 2.

The input impedance is negative between 30MHz and 100MHz (SL610C, SL611C only) and is shown in Fig. 3. If the source is inductive it should be shunted by a $1k\Omega$ resistor to prevent oscillation.

An alternative input circuit with improved noise figure is shown in Fig. 4.

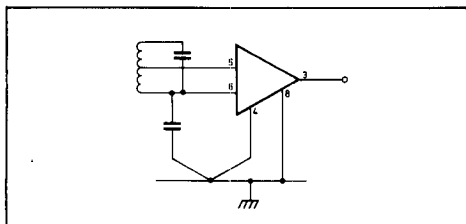


Fig. 4 Alternative input circuit

Output circuit

The output stage is an emitter follower and has a negative output impedance at certain frequencies as shown in Fig. 5.

To prevent oscillation when the load is capacitive a 47Ω resistor should be connected in series with the output.

AGC

When pin 7 is open circuit or connected to a voltage less than 2V the voltage gain is normal. As the AGC voltage is

increased there is a reduction in gain as shown in Fig. 6. This reduction varies a little with temperature.

Typical applications

The circuit of Fig. 7 is a general purpose RF preamplifier. The voltage gain (from pin 5 to pin 3) is shown in Fig. 8. Fig. 9 is the IF section of a simple SSB transceiver. At 9MHz it has a gain of 100dB.

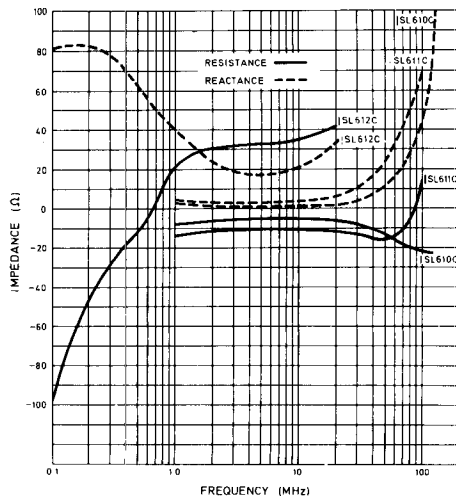


Fig. 5 Typical output impedance with s/c input (G22)

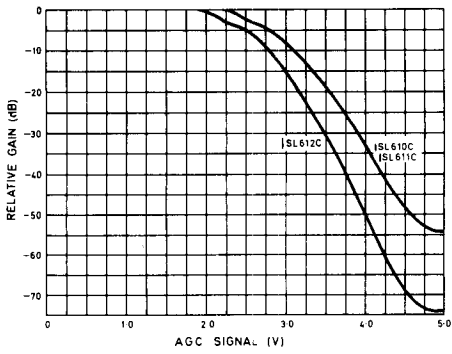


Fig. 6 AGC characteristics (typical)

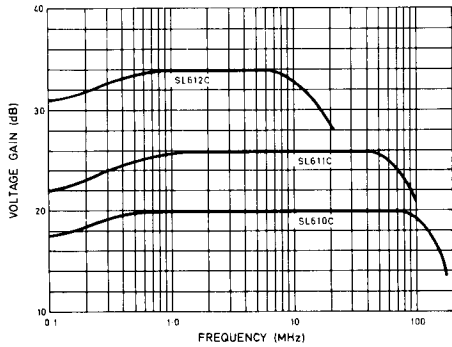


Fig. 8 Typical voltage gain ($R_G=50\ \Omega$)

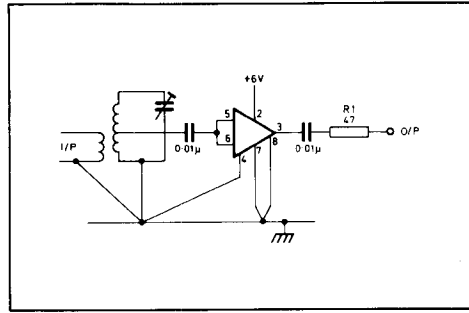


Fig. 7 RF preamplifier

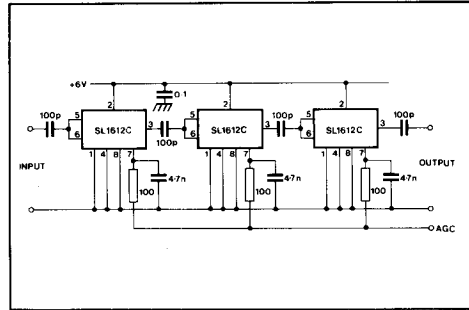


Fig. 9 IF amplifier using SL612