

SL610, SL611 & SL612

RF/IF AMPLIFIER

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

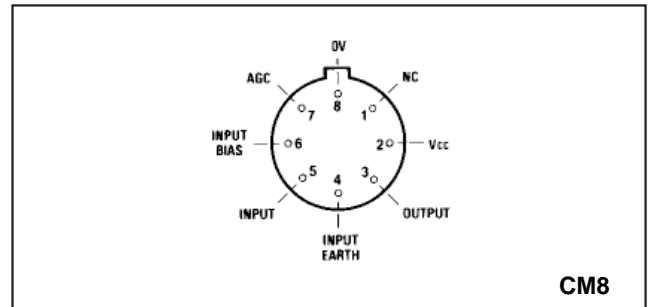


Fig.1 Pin connections (top view)

ABSOLUTE MAXIMUM RATINGS

| | |
|------------------------------|-----------------|
| Supply voltage: | 12V |
| Storage temperature: | -65°C to +150°C |
| Operating temperature range: | -30°C to +85°C |
| Chip-to-ambient: | 225°C/W |
| Chip-to-case: | 65°C/W |

ORDERING INFORMATION

- SL610/1/2 C CM
- SL610 NA 1C
- SL612 NA 1C

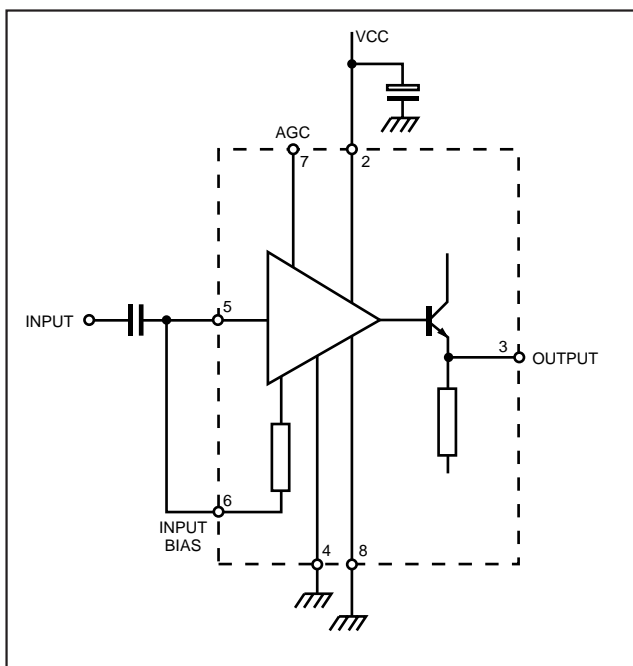


Fig.2 Block diagram

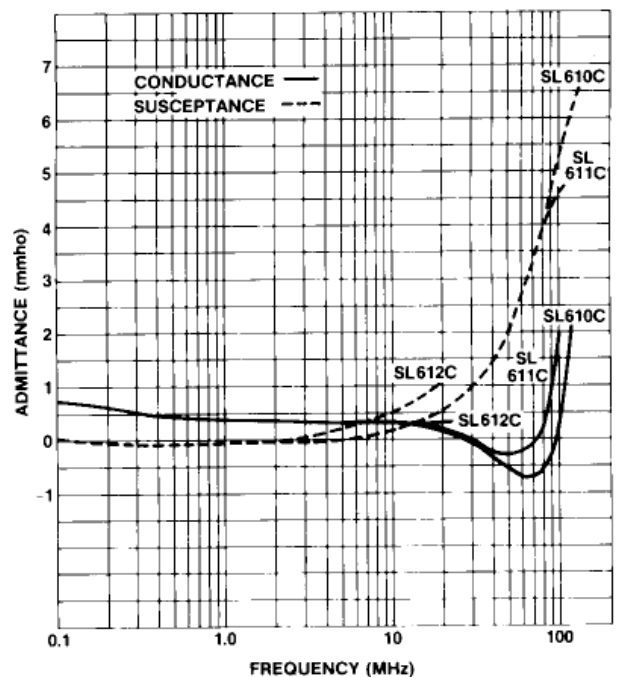


Fig.3 Input admittance with o/c output (G_{11})

SL610/611 & 612

ELECTRICAL CHARACTERISTICS

These characteristics are guaranteed over the following conditions (unless otherwise stated)

Supply voltage VCC: 6V
 Ambient temperature: 22°C ± 2°C
 Test frequency: SL610C 30MHz
 SL611C 30MHz
 SL612C 1.75MHz

| Characteristics | Circuit | Value | | | Units | Conditions |
|---|---------|-------|------|------|--------|--|
| | | Min. | Typ. | Max. | | |
| Supply current | SL610C | | 15 | 20 | mA | No signal, Pin 3 open circuit |
| | SL611C | | 15 | 20 | mA | |
| | SL612C | | 3.3 | 5 | mA | |
| Voltage gain | SL610C | 18 | 20 | 22 | dB | Rs = 50Ω RL = 22°C Tamb = 22°C |
| | SL611C | 24 | 26 | 28 | dB | |
| | SL612C | 32 | 34 | 36 | dB | |
| Cut-off frequency (-3dB) | SL610C | 85 | 120 | | MHz | |
| | SL611C | 50 | 80 | | MHz | |
| | SL612C | 10 | 15 | | MHz | |
| Max. output signal (max. AGC) | | | 1.0 | | V rms | RL = 150Ω (SL610C/611C) RL = 1.2kΩ (SL612C) |
| Max. input signal (max. AGC) AGC range | | | 250 | | mV rms | Pin 7 0V to 5.1V |
| | SL610C | 40 | 50 | | dB | |
| | SL611C | 40 | 50 | | dB | |
| | SL612C | 60 | 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. The source and inductive is should be shunted by a 1kΩ resistor to prevent oscillation.

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

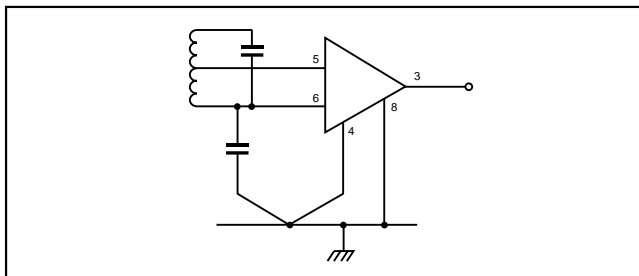


Fig.4 Alternative input circuit

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 with temperature.

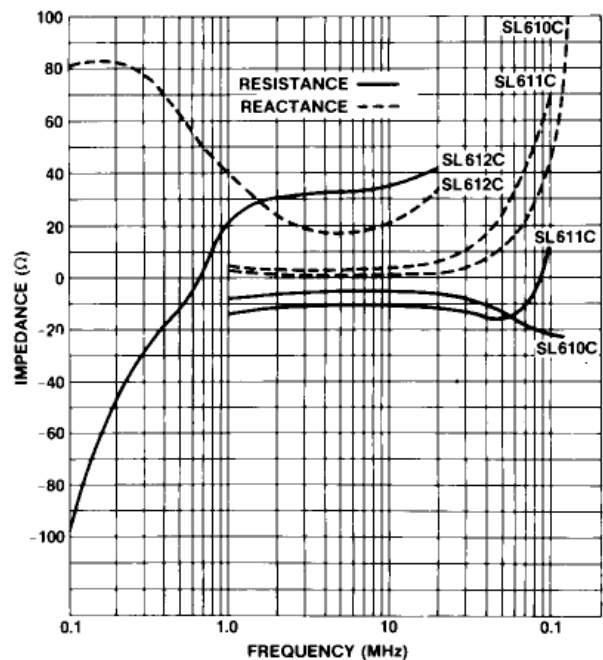


Fig.5 Typical output impedance with s/c input (G22)

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.

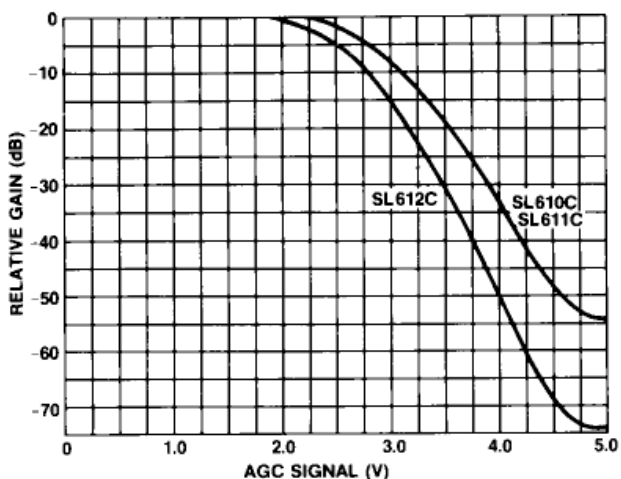


Fig.6 AGC characteristics (typical)

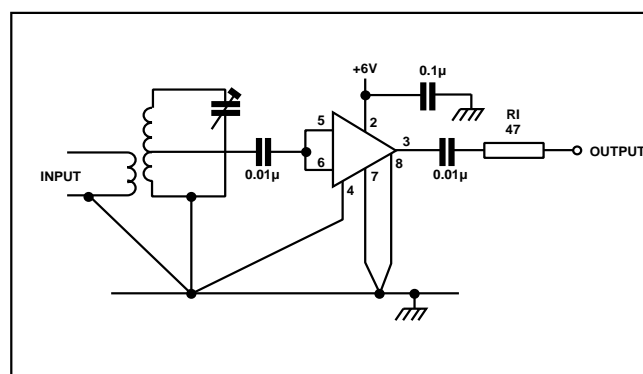


Fig.7 RF preamplifier

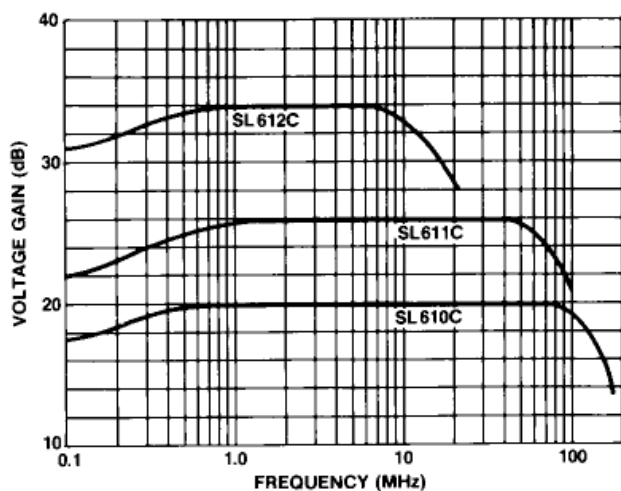


Fig.8 Typical voltage gain (RS = 50Ω)

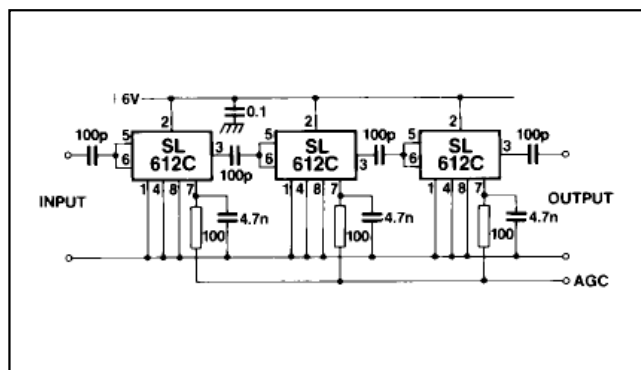


Fig.9 IF amplifier using SL612C



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