

SL1610, SL1611, SL1612

RF/IF AMPLIFIERS

The SL1610C, SL1611C and SL1612C 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

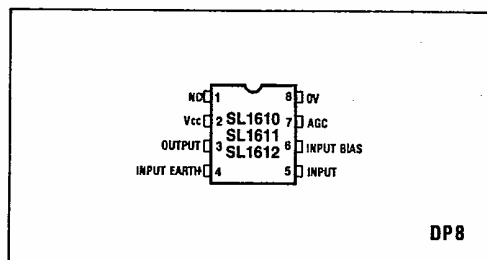


Fig. 1 Pin connections (top view)

ABSOLUTE MAXIMUM RATINGS

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

ORDERING INFORMATION

SL1610/1/2 C DP

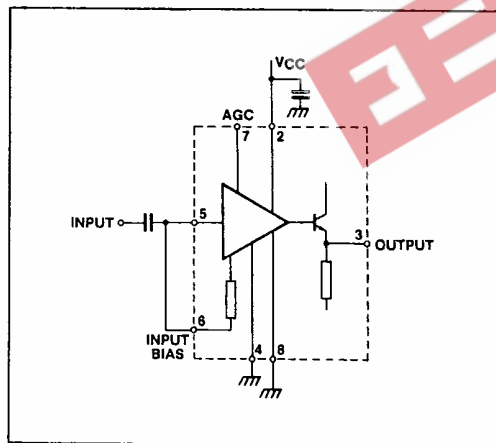


Fig. 2 Block diagram

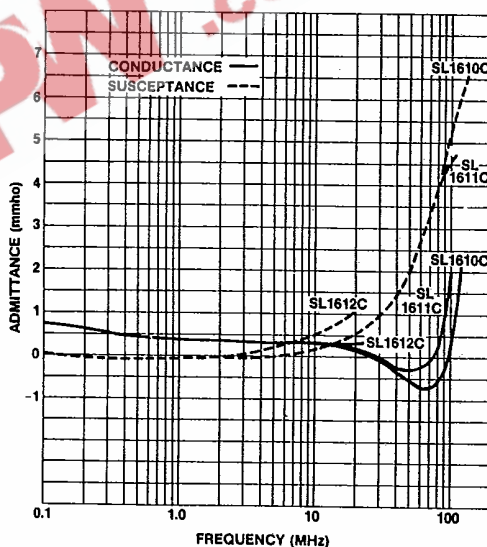


Fig. 3 Input admittance with o/c output (G_{11})

ELECTRICAL CHARACTERISTICS

Test conditions (unless otherwise stated):

Supply voltage V_{CC} : 6V
 Ambient temperature: -30°C to $+85^{\circ}\text{C}$
 Test frequency: SL1610C 30MHz
 SL1611C 30MHz
 SL1612C 1.75MHz

Characteristics	Circuit	Value			Units	Conditions
		Min.	Typ.	Max.		
Supply current	SL1610C SL1611C SL1612C		15 15 3.3	24 24 6	mA	No signal, pin 3 open circuit
Voltage gain	SL1610C SL1611C SL1612C	17 23 31	20 26 34	24 30 38	dB	
Cut-off frequency (-3dB)	SL1610C SL1611C SL1612C		120 80 15		MHz	
Max.output signal (max.AGC)			1.0		V rms	$R_L = 150\Omega$ (SL1610C/1611C) $R_L = 1.2k\Omega$ (SL1612C)
Max.input signal (max.AGC)			250		mV rms	
AGC range	SL1610C SL1611C SL1612C	40 40 60	50 50 70		dB	Pin 7 0V to 5.1V
AGC current			0.15	0.6	mA	

APPLICATION NOTES

Input circuit

The SL1610C, SL1611C and SL1612C 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 (SL1610C, SL1611C only) and is shown in Fig. 3. 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.

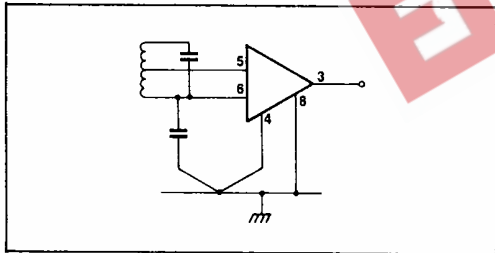


Fig. 4 Alternative input circuit

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 with temperature.

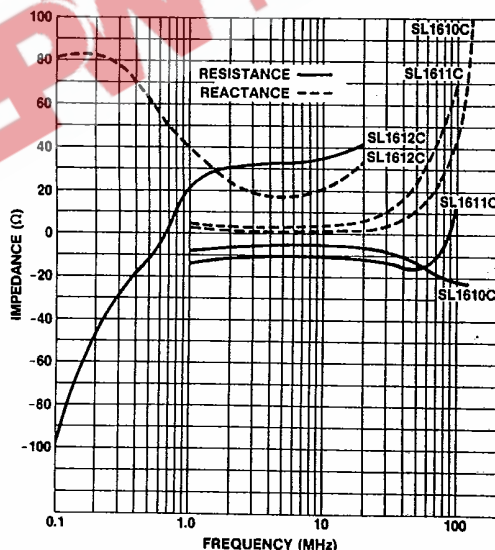


Fig. 5 Typical output impedance with s/c input (G22)

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.

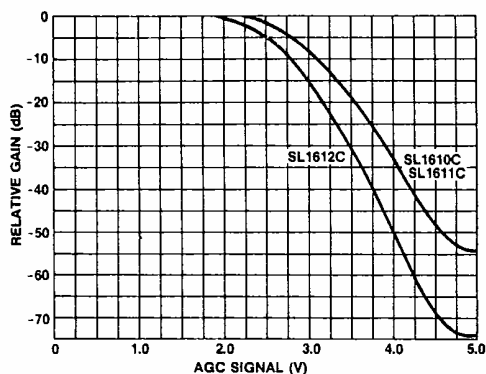


Fig. 6 AGC characteristics (typical)

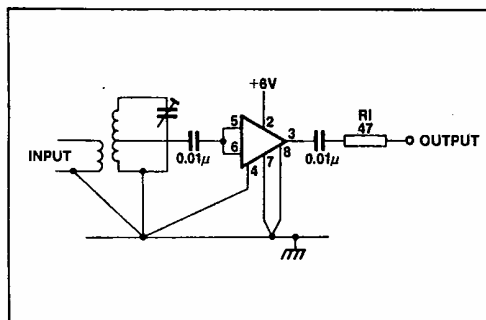


Fig. 7 RF preamplifier

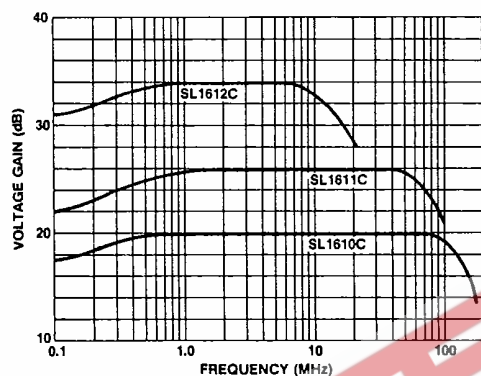


Fig. 8 Typical voltage gain ($R_S=50\Omega$)

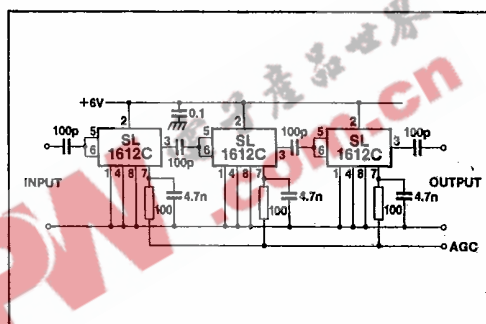


Fig. 9 IF amplifier using SL1612