GEC PLESSEY

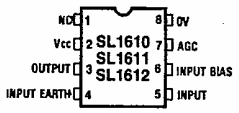
SEMICONDUCTORS

SL1611 IS FOR MAINTENANCE PURPOSES ONLY AND IS NOT RECOMMENDED FOR NEW DESIGNS

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.



DP8

Fig. 1 Pin connections (top view)

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

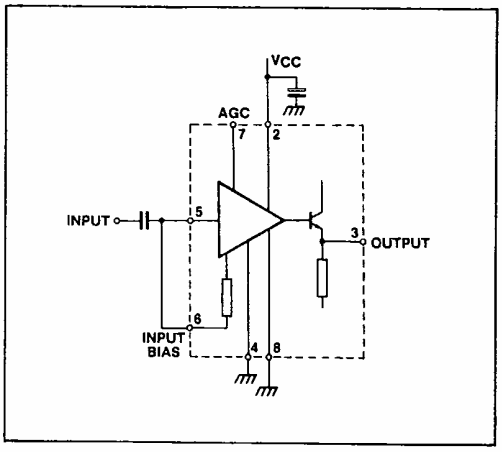


Fig. 2 Block diagram

ABSOLUTE MAXIMUM RATINGS

Supply voltage: 12V
Storage temperature: −55°C to|+|125°C

ORDERING INFORMATION

SL1610/1/2 C DP

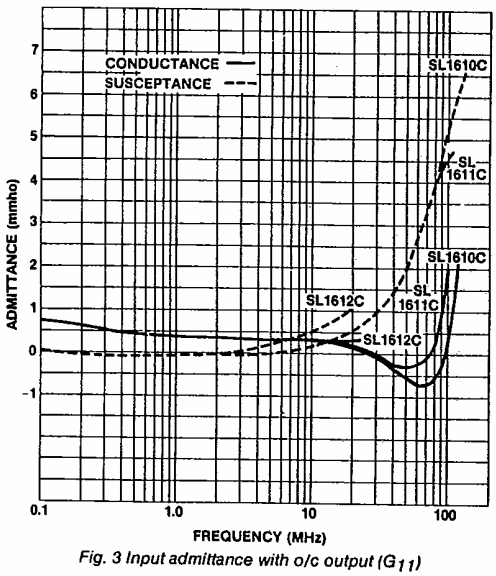


Fig. 3 Input admittance with o/c output (G_{11})

ELECTRICAL CHARACTERISTICS

Test conditions (unless otherwise stated):

Supply voltage V_{CC}: 6V
Ambient temperature: −30°C to +85°C
Test frequency: SL1610C 30MHz
SL1611C 30MHz
SL1612C 1.75MHz

Characteristics	Circuit	Value			Units	Conditions
		Min.	Typ.	Max.		
Supply current	SL1610C		15	24	mA	
	SL1611C		15	24	mA	No signal, pin 3 open circuit
	SL1612C		3.3	6	mA	
Voltage gain	SL1610C	17	20	24	dB	R_s = 50Ω
	SL1611C	23	26	30	dB	RL = 500Ω
	SL1612C	31	34	38	dB	T_{amb} = 22°C
Cut-off frequency (-3dB)	SL1610C		120		MHz	
	SL1611C		80		MHz	
	SL1612C		15		MHz	
Max.output signal (max.AGC)			1.0		V rms	RL = 150Ω (SL1610C/1611C)
						RL = 1.2kΩ (SL1612C)
Max.input signal (max.AGC)			250		mV rms	
AGC range	SL1610C	40	50		dB	
	SL1611C	40	50		dB	Pin 7 0V to 5.1V
	SL1612C	60	70		dB	
AGC current			0.15	0.6	mA	Current into pin 7 at 5.1V

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 1kΩ resistor to prevent oscillation.

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

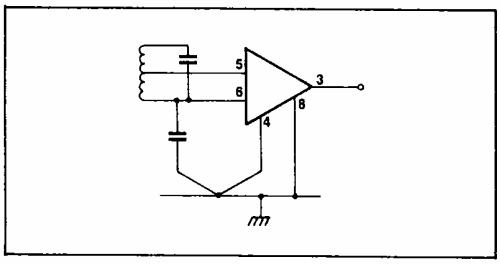


Fig. 4 Alternative input circuit

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.

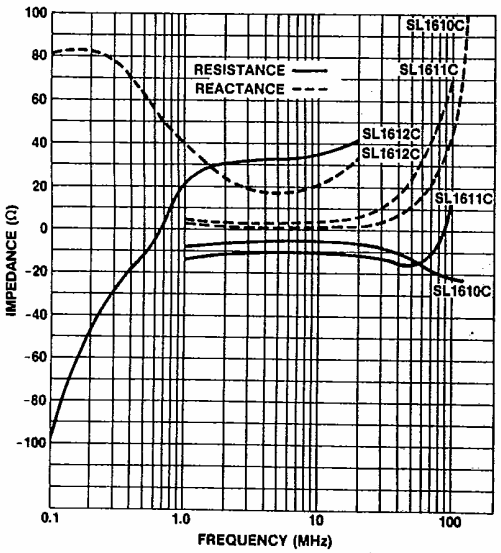


Fig. 5 Typical output impedance with s/c input (G22)

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.

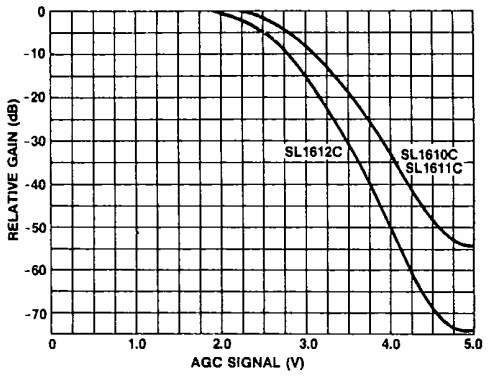


Fig. 6 AGC characteristics (typical)

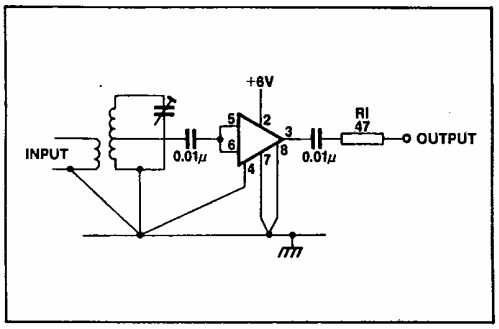


Fig. 7 RF preamplifier

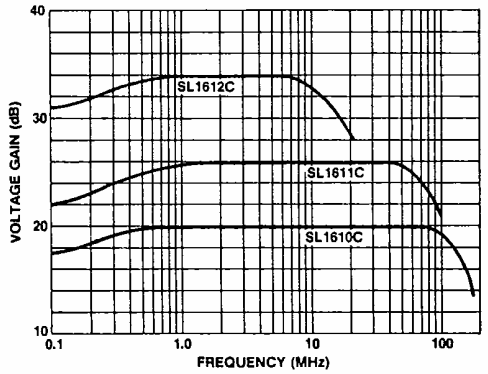


Fig. 8 Typical voltage gain (R_S=50Ω)

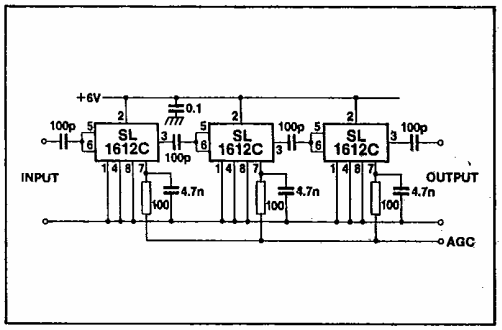


Fig. 9 IF amplifier using SL1612