

SL6701

AM IF AND DETECTOR (DOUBLE CONVERSION)

The SL6701A is a single or double conversion IF amplifier and detector for AM radio applications. Its low power consumption makes it ideal for hand held applications. Normally the SL6701A will be fed with a first IF signal of 10.7MHz or 21.4MHz; there is a mixer for conversion to the first or second IF, a detector and an AGC generator with optional delayed output. This device is characterised for operation from -55°C to $+125^{\circ}\text{C}$.

FEATURES

- High Sensitivity: 10 μV Minimum
- Low Power: 8mA Typical at 6V
- Linear Detector
- Full MIL Temperature Range

APPLICATIONS

- Low Power AM/SSB Receivers

QUICK REFERENCE DATA

- Supply Voltage: 4.5V
- Input Dynamic Range: 100dB Typical

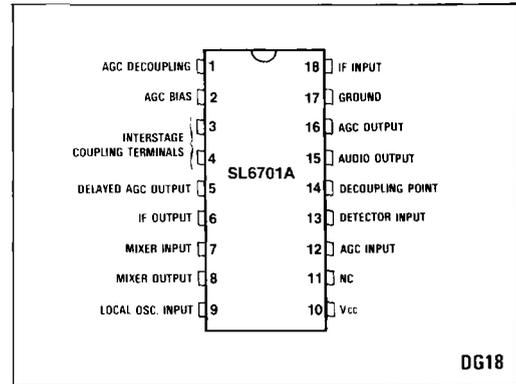


Fig.1 Pin connections - top view

ORDERING INFORMATION

SL6701 A DG
SL6701 AB DG

ABSOLUTE MAXIMUM RATINGS

| | |
|-----------------------|---|
| Supply voltage | 7.5V |
| Storage temperature | -55°C to $+150^{\circ}\text{C}$ |
| Operating temperature | -55°C to $+125^{\circ}\text{C}$ |

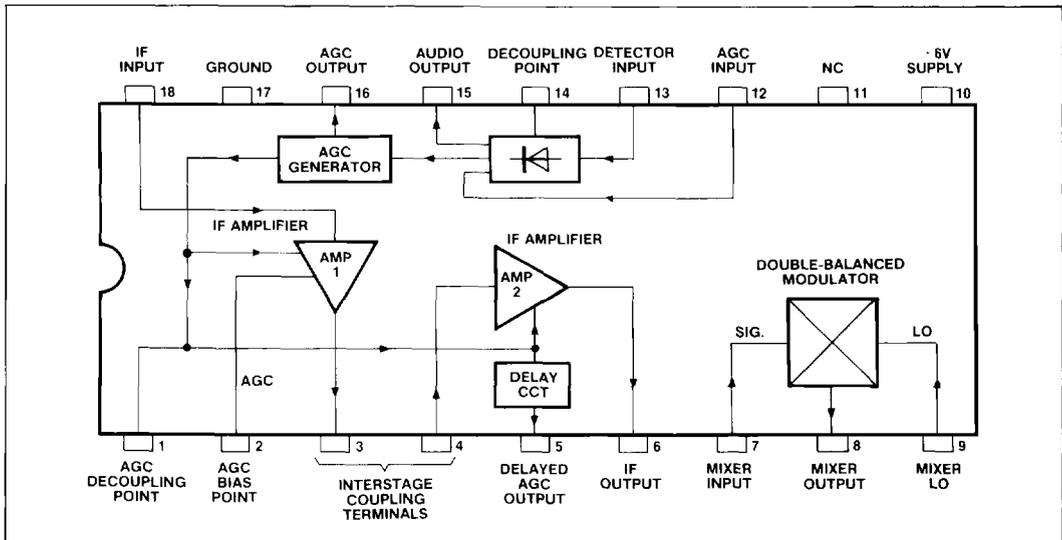


Fig.2 SL6701A block diagram

SL6701

ELECTRICAL CHARACTERISTICS

Test conditions (unless otherwise stated)

T_{amb} = -55°C to +125°C Test circuit Fig.6. Modulation frequency 1kHz

| Characteristic | Value | | | Units | Conditions |
|-------------------------------------|-------|------|------|--------|---|
| | Min. | Typ. | Max. | | |
| Supply voltage | 4 | | 7 | V | Optimum performance at 4.5V |
| Supply current | | 3.5 | 7 | mA | |
| S/N ratio | | 40 | | dB | 1mV input 80% modulation |
| TH distortion | | 3 | 5 | % | 1mV input 30% modulation |
| Sensitivity | 10 | 5 | | μV | 10dB S + N/N ratio, 30% |
| Audio output level change | | 6 | 10 | dB | 10μV to 50mV input 80% |
| AGC threshold | | 5 | | μV | |
| AGC range | | 80 | | dB | |
| AF output level | 20 | 40 | | mV rms | 30% modulation 1mV input |
| Delayed AGC threshold | | 10 | | mV rms | 80% modulation |
| Dynamic range | | 100 | | dB | Noise floor to overload |
| IF frequency response | 15 | 25 | | MHz | 3dB gain reduction |
| IF amplifier gain | 40 | 50 | 60 | dB | 10.7MHz (both amplifiers cascaded) |
| Detector gain | 40 | 46 | 55 | dB | 455kHz 80% AM |
| Detector Z _{in} pin 13 | 2 | 4 | 6.8 | kΩ | |
| IF amplifier Z _{in} pin 18 | 1.8 | 3 | 4.5 | kΩ | |
| Mixer conversion gain | 1.0R | 1.2R | 1.5R | kΩ | R is load resistor in kΩ |
| Mixer Z _{in} (Signal) | 2 | 3 | 5 | kΩ | |
| Mixer Z _{in} (LO) | 3 | 5 | 8 | kΩ | |
| Mixer LO injection | 50 | 100 | 150 | mV rms | f _c = 10.245MHz |
| Detector output voltage change | 6 | 8 | 8.2 | dB | 1mV rms input, modulation increased from 30% to 80% |

OPERATING NOTES

There is no squelch in the SL6701A and the delay in the delayed AGC is too large to make this output suitable. Squelch is best obtained from a comparator on the AGC decoupling point, pin 16.

The IF amplifiers may be operated at 455kHz giving a single conversion system.

The mixer may also be used as a product detector. Further application information is available on request.

TYPICAL DC PIN VOLTAGES

(Supply 4.5V, Input 1mV)

| Pin | Voltage | Pin | Voltage |
|-----|---------|-----|---------|
| 1 | 2.25V | 10 | 4.5V |
| 2 | 2.09V | 11 | } 2.5V* |
| 3 | 3.68V | 12 | |
| 4 | 0.7V | 13 | 0.77V |
| 5 | 0.6V | 14 | 1.5V |
| 6 | 3.7V | 15 | 1.0V |
| 7 | 1.5V | 16 | 0.7V |
| 8 | 4.3V | 17 | 0V |
| 9 | 1.5V | 18 | 0.7V |

* Pins 11 and 12 connected together

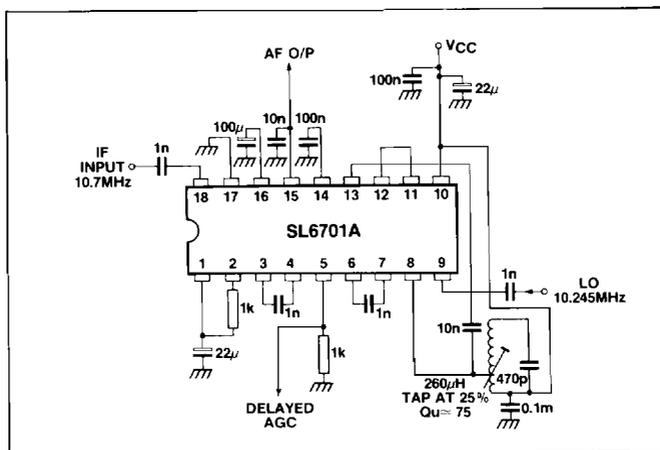


Fig.3 SL6701A AM double conversion receiver with noise blanker

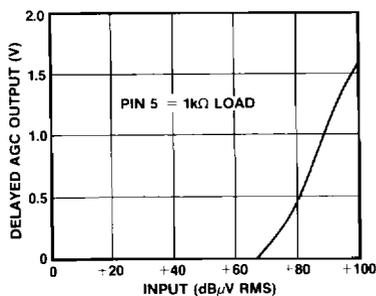


Fig.4 Typical delayed AGC output variation with input signal (f = 10.7MHz, 30% modulation)

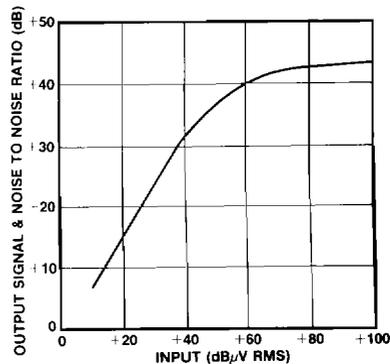


Fig.5 Typical signal to noise ratio (S + N/N) with input signal (f = 10.7MHz, 30% modulation)

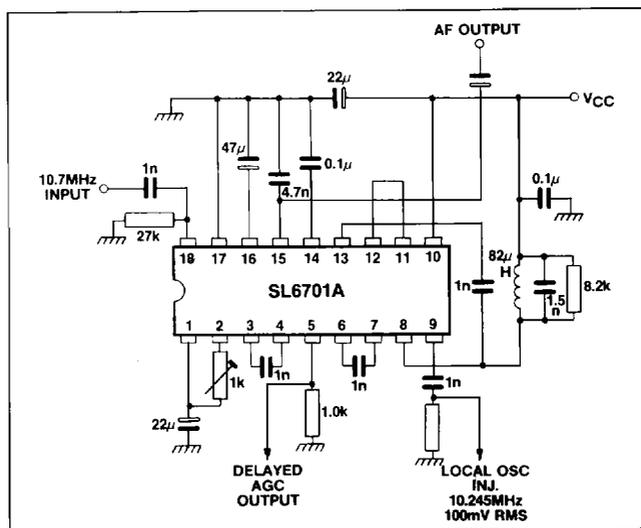


Fig.6 Test circuit

