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SL6700C

IF AMPLIFIER AND AM DETECTOR

The SL6700C 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 SL6700C 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, an AGC generator with optional delayed output and a noise blanker monostable.

FEATURES

- High Sensitivity: 10 μ V minimum
- Low Power: 8mA Typical at 6V
- Linear Detector

APPLICATIONS

- Low Power AM/SSB Receivers

QUICK REFERENCE DATA

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

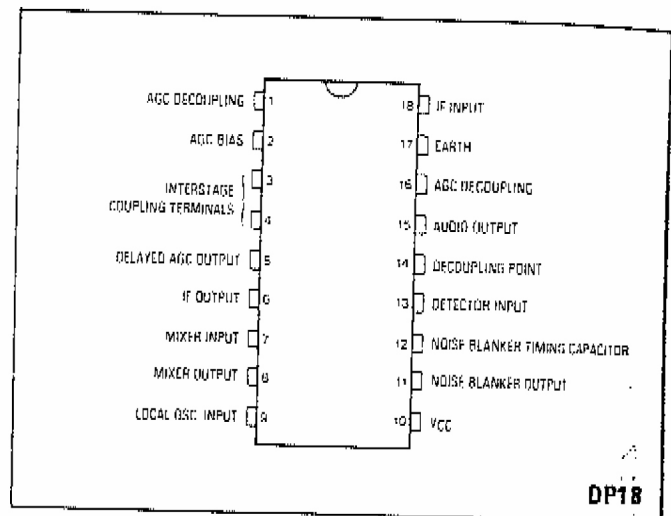


Fig. 1 Pin connections (top view)

ABSOLUTE MAXIMUM RATINGS

Supply voltage: 7.5V
Storage temperature: -55 C to +125 C

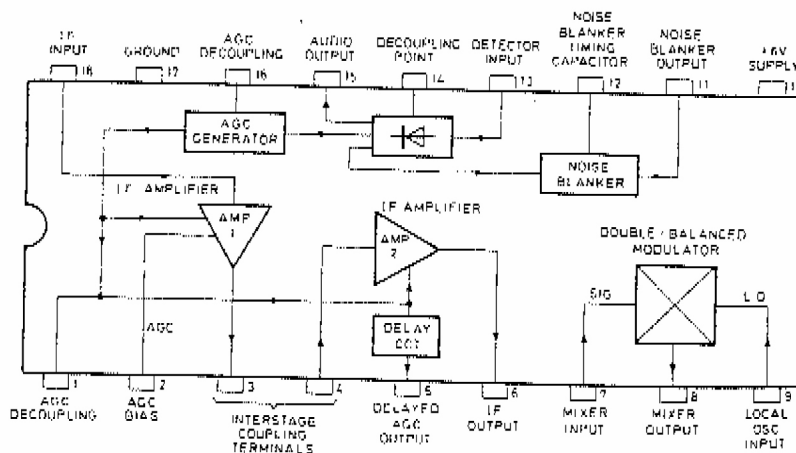


Fig. 2 SL6700C block diagram

ELECTRICAL CHARACTERISTICS

Test conditions (unless otherwise stated):

Supply voltage 4.5V

T_{Amb} -30°C to +85°C

Characteristic	Value			Units	Conditions
	Min.	Typ.	Max.		
Supply voltage	4		7	V	Optimum performance at 4.5V
Supply current		4.5	6	mA	
S/N ratio		40		dB	1mV input 80 % mod @ 1kHz
TH distortion		1	5	%	1mV input 80 % mod @ 1kHz
Sensitivity	10	5		μV	10dB S + n/N ratio, 30 % mod 1kHz
Audio output level change		6	10	dB	10μV to 50mV input 80 % mod 1kHz
AGC threshold		5		μV	
AGC range		80		dB	
AF output level		25		mV rms	30 % modulation 1kHz
Delayed AGC threshold		10		mV rms	80 % modulation
Dynamic range		100		dB	Noise floor to overload
IF frequency response	40	50		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 1kHz
Detector Z _{in} pin 13	2	4	6.8	kΩ	
IF amplifier Z _{in} pin 18	1.8	3	4.5	kΩ	
Noise blank level	2.7			V	Logic 1
			0.6	V	Logic 0
Noise blank duration		300		μs	C pin 12 = 30nF
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	20	50	150	mV rms	f _c = 10.245MHz
Detector output voltage change	6	8	8.2	dB	1mV rms input, 1kHz modulation increased from 30 % to 80 %

OPERATING NOTES

The noise blank duration can be varied from the suggested value of 300μs using the formula: Duration time = 0.7CR, where R is value of resistor between pins 11 and 12 and C is value of capacitor from pin 12 to ground.

There is no squelch in the SL6700C 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 in Application Note AN1001.

TYPICAL DC PIN VOLTAGES
(Supply 4.5V, Input 1mV)

Pin	Voltage	Pin	Voltage
1	2.25V	10	4.5V
2	2.09V	11	3.7V
3	3.68V	12	0V
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

Graph showing Output Signal & Noise to Noise Ratio (dB) versus Input (dBμV RMS) for a 100 MHz receiver. The curve indicates a linear relationship between input and output SNR, leveling off at higher input levels.

Input (dBμV RMS)	Output Signal & Noise to Noise Ratio (dB)
-30	8
-20	18
+10	30
+60	40
+100	45

PIN 5 1KΩ LOAD

Input (dBμV RMS)	Delayed AGC Output (V)
-70	0.0
-60	0.0
-50	0.0
-40	0.0
-30	0.0
-20	0.0
-10	0.4
0	0.8
-10	1.2
-20	1.5

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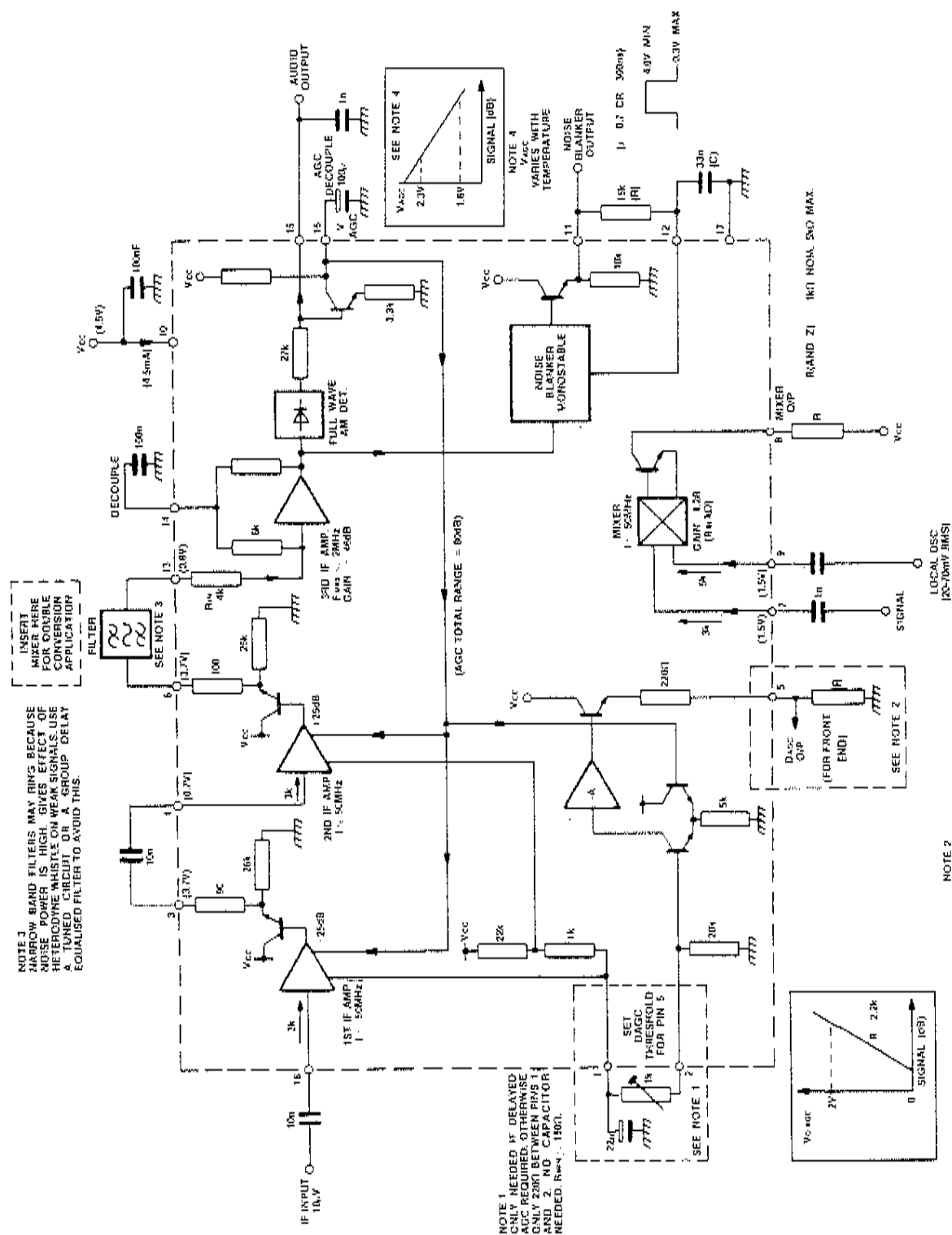


Fig.6 SL6700C Typical application circuit showing interfacing