

# SL6640C

## LOW POWER IF AMPLIFIER, FM DETECTOR AND AUDIO POWER AMPLIFIER

The 6640C performs the IF/AF function of a low power FM receiver. The circuit consists of a pre-amplifier, main limiting amplifier, quadrature detector, carrier squelch system, DC volume control and power audio output stage. With the SL6640C the demodulator and audio amplifier are muted by the squelch output.

### FEATURES

- Carrier Squelch System
- High Sensitivity:  $10\mu\text{V}$  rms Minimum
- Low Power: 12 mA Typical at 6V
- High Power Output: 200mW Typical

### APPLICATIONS

- Broadcast FM Radio
- Low Power NBFM Receivers

### QUICK REFERENCE DATA

- Supply Voltage: 6V
- IF Frequency: 4.5MHz to 21.4MHz

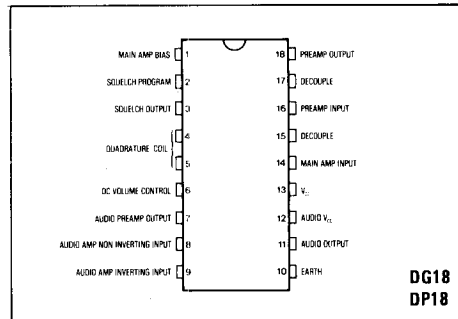


Fig. 1 Pin connections

### ABSOLUTE MAXIMUM RATINGS

Supply voltage: 12V  
Storage temperature:  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$

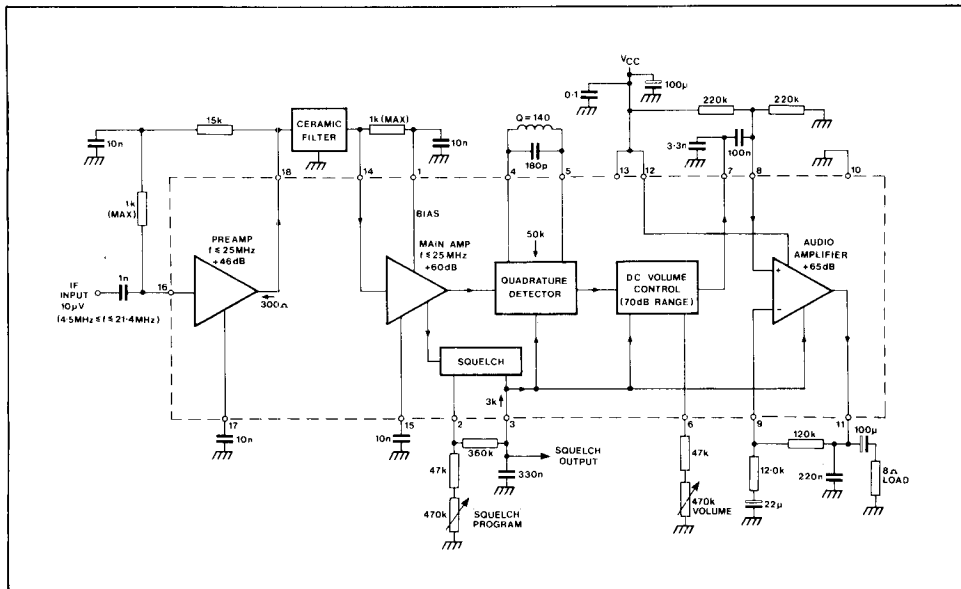


Fig. 2 SL6640 block diagram

**ELECTRICAL CHARACTERISTICS SL6640C**

**Test conditions (unless otherwise stated):**

Supply voltage,  $V_{CC} = 6V$ ,  $R_L = 8\Omega$

Ambient temperature,  $T_A = -30^\circ C$  to  $+85^\circ C$

IF = 10.7MHz, frequency modulated with 1kHz tone with  $\pm 5kHz$  frequency deviation

Characteristic	Value			Units	Conditions
	Min.	Typ.	Max.		
Supply current		4.5	8.0	mA	Muted
Supply current		12	16	mA	Unmuted
Pre-amp gain		46		dB	
Main amp. gain		60		dB	
Combined 3dB bandwidth		25		MHz	
S/N ratio	30	50		dB	1mV rms input
Sensitivity	10			$\mu V$ rms	20dB S+N/N ratio @ 25°C
AM rejection	25	35		dB	input 30% AM 100 $\mu V$ rms input
Audio O/P power	150	250		mW rms	1mV rms input
Total harmonic distortion		2	5	%	150mW rms output power
Squelch range		45		dB	
Squelch law		2		$\mu A/dB$	
Squelch hysteresis		10		dB	Hysteresis resistor = 360k $\Omega$
DC volume control range	50	70		dB	
DC volume control law		2		$\mu A/dB$	
Squelch O/P low level		1	1.5	V	100 $\mu V$ rms input
Squelch O/P high level	4.5	5		V	No input

**APPLICATION NOTES**

**IF Amplifiers**

The SL6640C is intended for use at frequencies between 4.5MHz and 21.4MHz and will not operate at 455kHz. It should be preceded by a filter to determine the primary selectivity of the receiver. The input impedance is set by an external resistor connected to pin 16 as shown in Fig.2.

An interstage ceramic filter between the preamplifier and main amplifier provides some limitation of the noise bandwidth. The input impedance at Pin 14 is again determined by the choice of external resistance.

**Quadrature Detector**

The quadrature circuit is connected between Pins 4 and 5. Normally this consists of a resonant LC circuit and the high impedance level allows Q factors of over 100 if needed. A DC path should be provided between the pins if possible.

**Squelch Facility**

The integral carrier squelch system is driven by detectors in the main amplifier and contains a comparator which requires an input to set the squelch level. A resistor between Pins 2 and 3 provides hysteresis; the value depends on the supply voltage but a 360k $\Omega$  resistor gives 10dB hysteresis with a 6V supply.

A squelch output (high when squelched) is available from pin 3 and is used to mute the detector, volume control and audio amplifier.

**Audio Amplifier**

The audio output stage is similar in design to the SL6310 and is arranged as an operational amplifier. The input signal is applied to the non-inverting input and gain is set to 20dB externally.

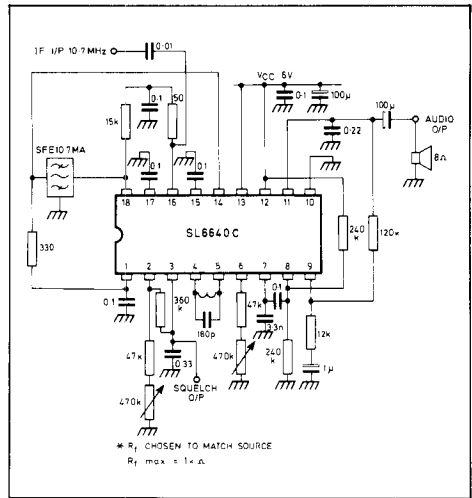


Fig.3 SL6640C test circuit