

SL6691C

IF SYSTEM FOR PAGING RECEIVERS

The SL6691C is an IF system for paging receivers, consisting of a limiting IF amplifier, quadrature demodulator, voltage regulator and audio tone amplifier with Schmitt trigger.

The voltage regulator requires an external PNP transistor as the series pass transistor. The frequency response of the tone audio amplifier is externally defined.

The SL6691C operates over the temperature range -30°C to $+85^{\circ}\text{C}$.

FEATURES

- Very Low Standby Current
- Fast Turn-on
- Wide Dynamic Range
- Minimum External Components

APPLICATIONS

- Pagers
- Portable FM Broadcast Receivers

ABSOLUTE MAXIMUM RATINGS

Storage temperature -65°C to $+150^{\circ}\text{C}$
 Supply voltage 6V

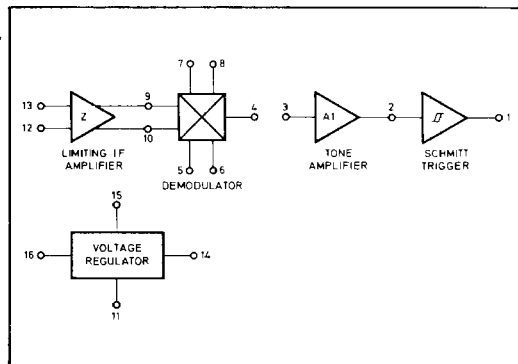
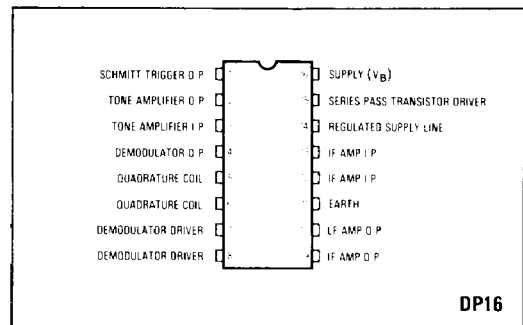


Fig.2 SL6691C block diagram



DP16

Fig.1 Pin connections (top view)

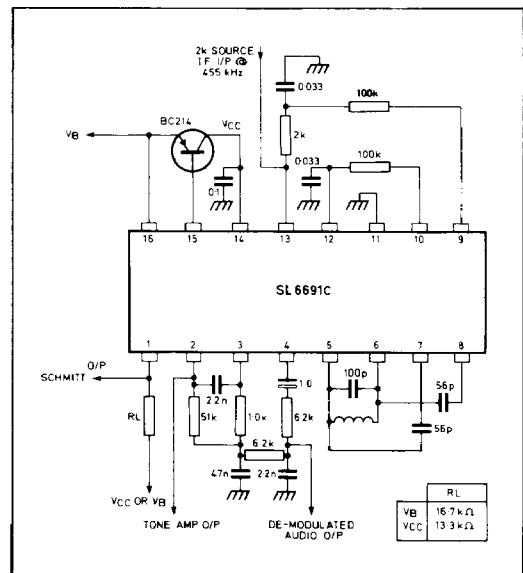


Fig.3 SL6691C test circuit

ELECTRICAL CHARACTERISTICS

Test conditions (unless otherwise stated):

Temperature	-30°C to +85°C
Supply voltage (V _C)	2.5V
IF frequency	455kHz (nominal)
Modulation frequency	500Hz
Deviation	+4.5kHz

Characteristic	Value			Units	Conditions
	Min.	Typ.	Max.		
Quiescent current		1.0	1.4	mA	V _B = 3V Pins 2 and 3 S/C Pins 1 and 4 O/C
Switch on time		12	18	ms	Note 1
Voltage regulator					
Regulated voltage	1.9		2.1	V	V _B > 2.2V
Supply line rejection		40		dB	V _B > 2.2V 200mV p-p square wave @ 500 Hz injected
Current sink capability pin 15	100			μA	
IF amplifier					
Input impedance		20//2		k Ω//pF	
Output impedance		2		k Ω	
Dynamic range		100		dB	
Output voltage swing		600		mV p-p	
Amplifier gain		90		dB	
Sensitivity	20	16		μV rms	Audio 20dB S+N/N ratio
AM rejection		40		dB	100μV rms I/P @ 30% AM modulation
Amplifier 3dB bandwidth		1.5		MHz	
Demodulator					
Audio output	8	15		mV rms	Quadrature element L-C tuned circuit : Q = 30
Distortion, THD		1.5	3	%	
Output impedance		1	3	k Ω	
Signal-to-noise ratio		40		dB	100μV rms I/P 3kHz audio bandwidth
Tone amplifier					
Open loop gain		54		dB	
Peak output current		20		μA	
Schmitt trigger					
Mark space ratio		45/55	38/62		20μV rms I/P
Output current				μA	

NOTES

1. The 'Switch On' time is the time to the zero crossing point of the centre of the first occurrence of a 30/70 or 70/30 mark space wave on the output of the Schmitt trigger after the supply voltage has been switched on. Conditions: V_B = 2V, Tone filter connected (See Fig.3), IF input = 100μV rms, Modulation 500Hz @ 2kHz deviation.

CIRCUIT DESCRIPTION

IF Amplifier and Detector

The IF amplifier consists of five identical differential amplifier/emitter follower stages with outputs at the fourth (pins 9 and 10) and fifth (pins 7 and 8) stages. The outputs from the fourth stage are used when the lowest turn-on time is required. Coupling to the quadrature network of the detector is via external capacitors; otherwise the design is conventional. The audio output is taken from pin 4 and filtered externally.

Tone (Audio) Amplifier

The tone amplifier is a simple inverting audio amplifier with voltage gain determined by the ratio of feedback resistor to input resistor. The frequency response can readily be controlled by suitable selection of feedback components.

Schmitt Trigger

The Schmitt trigger has an open collector output stage which saturates when the input at pin 2 is high. A 20μV rms input is sufficient.

NOMINAL DC PIN VOLTAGES(DP16)

Function	Pin	Voltage
Supply	16	Battery voltage
Series pass transistor driver	15	Battery voltage -0.7V
Regulated supply line	14	2V
Earth	11	0V
IF amp I/P	13	1V
IF amp I/P	12	1V
IF amp O/P	10	1V
IF amp O/P	9	1V
Demodulator O/P	4	1V
Quadrature coil	6	1V
Quadrature coil	5	1V
Tone amplifier I/P	3	1.4V
Schmitt trigger O/P	1	0V or pin 16 or pin 14
Tone amplifier O/P	2	1.4V
Demodulator driver	7	1V
Demodulator driver	8	1V