Plessey Semiconductors

SL600 SERIES
COMMUNICATIONS CIRCUITS

SL622C
AF AMPLIFIER, VOGAD & SIDETONE AMPLIFIER

The SL622C is a silicon integrated circuit combining the functions of audio amplifier with voice operated gain adjusting device (VOGAD).

It is designed to accept signals from a low-sensitivity microphone and to provide an essentially constant output signal for a 60 dB range of input.

Additionally, a constant gain amplifier is incorporated which provides an amplitude-limited output for sidetone in mobile transmitter/receiver applications.

The encapsulation is a 10 lead TO-5 package and the device is designed to operate from a 6 to 12 volt supply, over a temperature range of -55°C to +125°C.

A voltage regulator produces an independent supply line at 4.7 Volts stabilised

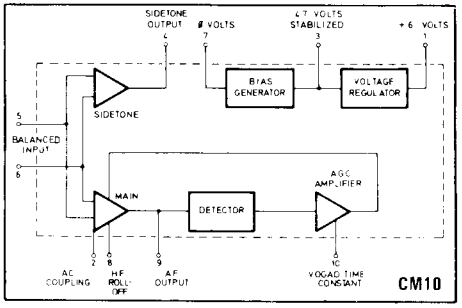

Fig. 1 Block Diagram

ELECTRICAL CHARACTERISTICS

Test Conditions: Input frequency 1KHz
Supply voltage +6V
Temperature +25°C

Characteristic	Value Min.	Value Typ.	Value Max.	Units	Test Conditions
VOGAD output level	55	90	110	mV rms	Balanced signal input 18mV rms
Sidetone output level	600	800	900	mV p-p	
AF amplifier voltage gain	49	52	55	dB	Balanced signal input 72μV rms
Sidetone voltage gain	24.5	29	30.5	dB	
Current consumption		14	16	mA	6V supply, input 1mV rms
consumption		24		mA	12V supply, input 1mV rms
Decay time – time for VOGAD output to return to within 10% of original absolute level when signal input voltage is switched down 20dB.		1.0		s	Original balanced signal input 18mV rms; R1 = 1 MΩ C3 = 47μF Test cct. as Fig.2
Attack time – time for VOGAD output to return to within 10% of original absolute level when signal input voltage is switched up 20dB.		20		ms	Original balanced signal input 1.8mV rms; R1 = 1 MΩ C3 = 47μF Test cct. as Fig.2
Total harmonic distortion at VOGAD output.		2		%	Balanced signal input 90mV rms
Differential input impedance.		200		Ω	
Single-ended input impedance.		180		Ω	
Sidetone output impedance		200		Ω	
AF amplifier output resistance		50		Ω	
VOGAD operating threshold (Whisper threshold)		100		μV rms @ I/P	

T5▷

OPERATING NOTES

The SL622C incorporates a series regulator which will accept supply voltages between 6V and 12V and provides a supply line rejection of approximately 26 dB when operated from a 6V supply The supply line immunity increases with supply voltage.

The input stage is a differential class A-B stage with an AGC terminal. The accurate balance of the input stage give an overall common-mode rejection ratio of greater than 30 dB.

Typically the amplifier will handle differential input signals of up to 375mV p-p and unbalanced signals of up to 50mV p-p. When used in the unbalanced mode either pin 5 or pin 6 may be used as the input, the other being decoupled to earth.

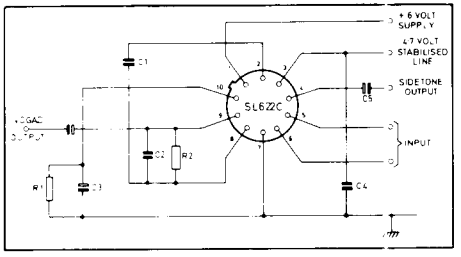

Fig. 2 Connection diagram for SL622C used as a microphone amplifier.

Fig. 2 shows the SL622C when used as a balanced microphone amplifier. The LF cut-off of the amplifier is set by C1 – and also by the values of coupling capacitors to the input pins (pin 5 and pin 6); coupling capacitors should be used if the d.c. potential of the input is not floating with respect to earth.

The HF cut-off is set by C2. The VOGAD threshold may be increased by connecting an external conductance between pins 8 and 9. The threshold is increased by approximately 20 dB for 1 millimho of conductance, the value of C2 should be adjusted in conjunction with any threshold alteration in order to obtain the desired bandwidth.

C3 and R1 set the attack and decay rates of the VOGAD. C3 = 47μF and R1 = 1Mohm gives an attack time constant (gain increasing) of 20 millisecs and a decay rate of 20 dB/sec. C1 = 2.2μF and C2 = 4.7nF give a 3 dB bandwidth of approximately 300Hz to 3kHz.

The amplifier can be muted by applying +4V to pin 10, but when the voltage is removed either C3 must be discharged or there will be an appreciable delay before the circuit functions normally again.

C4 is used for RF decoupling of the stabilised line. AF decoupling may be applied to improve supply line rejection and sidetone linearity.

The VOGAD and sidetone steady-state transfer characteristics are shown in Figs. 3 and 4.

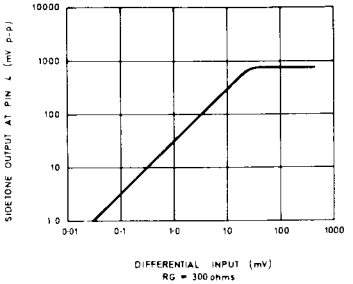

Fig. 3 Sidetone output characteristics.

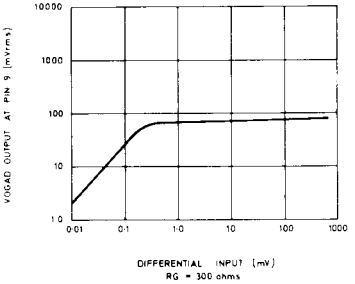

Fig. 4 VOGAD – output characteristics (1kHz sinewave input).

Pin	Function
1	+6 volts supply
2	A.C. coupling
3	+4.7V decoupling
4	Sidetone o/p
5, 6	Balanced signal input
7	OV
8	HF Roll off
9	AF o/p
10	VOGAD time constant.

ABSOLUTE MAXIMUM RATINGS

Continuous supply voltage (positive)		12V ± 0.5V
Storage temperature		−55°C to + 175°C
Ambient temperature	(6V operating)	−55°C to + 125°C
	(12V operating)	−55°C to + 100°C