SUPERSEDES DATA SHEET SAB1009A AUGUST 1978

WIDE-BAND LIMITING AMPLIFIER

The SAB1009B is a three-stage differential amplifier in the range 70 to 900 MHz with inherent limiting action. The differential inputs are internally biased to permit capacitive coupling and asymmetrical drive. For asymmetrical drive pin 3 should be used as an input and pin 4 should be grounded via a 56 Ω resistor and a d.c. blocking capacitor. The outputs are complementary with non-standard levels. The device is specified for a nominal supply voltage of 5 V; it may also be operated with a supply voltage of 5,2 V ± 5%. The voltage dropping resistor R_{CC} has then to be increased to 82 Ω.

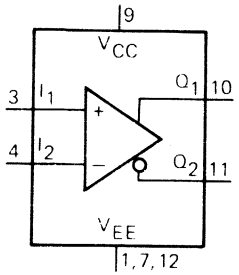


Fig. 1 Block diagram.

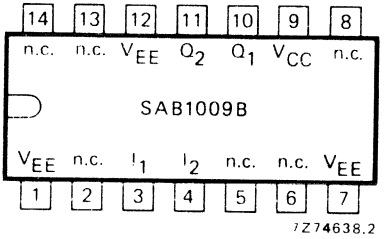


Fig. 2 Pins marked n.c. should preferably be grounded or connected to supply.
V_{CC} via 75 Ω to 5 V.
V_{EE} = 0 V (ground).

QUICK REFERENCE DATA

Supply voltage	V_{CC}		5 ± 5% V
Supply voltage dropping resistor	R_{CC}		75 Ω
Frequency range	f_i		70 to 900 MHz
Differential clipped output voltage R_L = 50 Ω at each output	$V_{o(p-p)}$	typ.	550 mV
Power consumption per package (no load)	P_{av}	typ.	75 mW
Operating ambient temperature	T_{amb}		0 to + 70 °C

PACKAGE OUTLINE

14-lead DIL; plastic (SOT-27S, T, V).

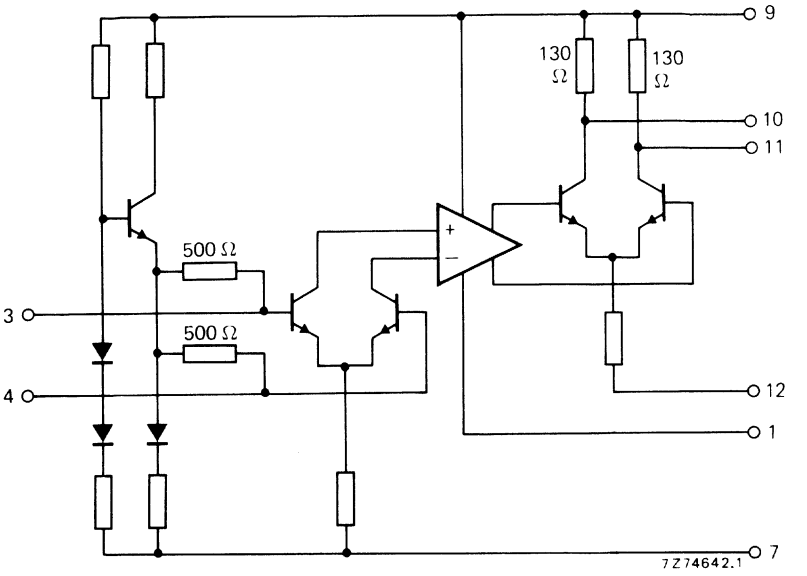


Fig. 3 Circuit diagram.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Supply voltage (d.c.)	V_{CC}	max.	7 V
Input voltage	V_I	0 to + 5	V
Storage temperature	T_{stg}	−55 to + 125	°C
Junction temperature	T_j	max. 125	°C

DEVELOPMENT SAMPLE DATA

D.C. CHARACTERISTICS

V_{CC} via 75 Ω to 5 V

The circuit has been designed to meet the d.c. specifications shown in the table below after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed-circuit board.

	symbol	pin under test	T_{amb} (°C) 0	25	70		conditions
Supply current	I_{CC} typ.	9	–	23	–	mA	pins 3 and 4 open, no d.c. load.
	I_{CC} max.		–	30	–	mA	

A.C. CHARACTERISTICS

V_{CC} via 75 Ω to 5 V ± 5%; T_{amb} = 0 to + 70 °C

	symbol	pin under test	min.	typ.	max.		conditions
Frequency range	f_i		70	–	900	MHz	
Gain *	G		26	–	–	dB	f_i = 70 MHz
			26	–	–	dB	f_i = 100 MHz
			23	–	–	dB	f_i = 200 MHz
			19	–	–	dB	f_i = 500 MHz
			16	–	–	dB	f_i = 900 MHz
Gain variation versus temperature	ΔG		–	–	1,5	dB	
Input voltage standing-wave ratio	VSWR	3	–	–	5		$V_{i(rms)}$ = 25 mV; $Z_{i\,nom}$ = 75 Ω Source connected to pin 3; pin 4 grounded via 56 Ω in series with 10 nF.
Input voltage	$V_{i(rms)}$	3	–	–	150	mV	

* For gain definition see Fig. 6 ($G = 20 \log \frac{V_2}{V_1}$).

A.C. CHARACTERISTICS (continued)

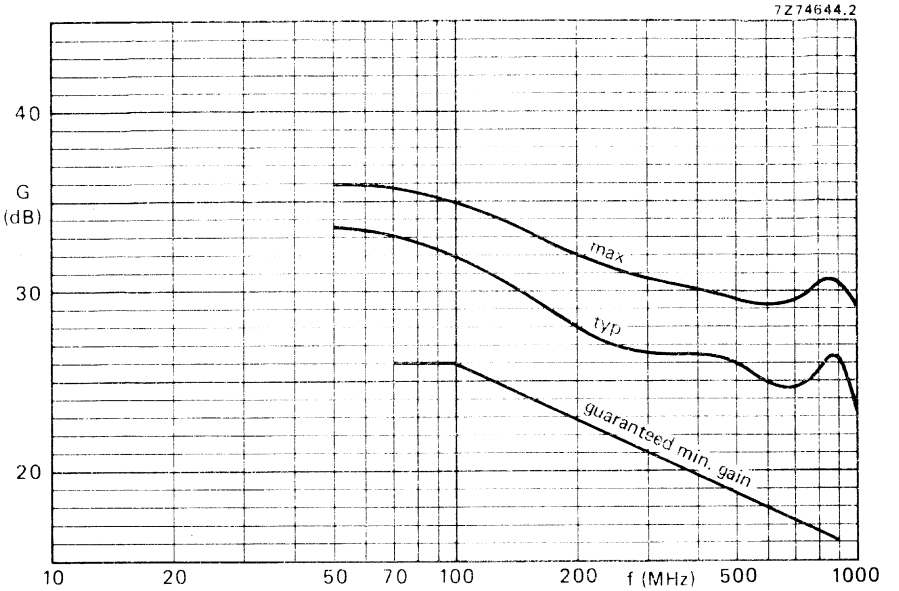
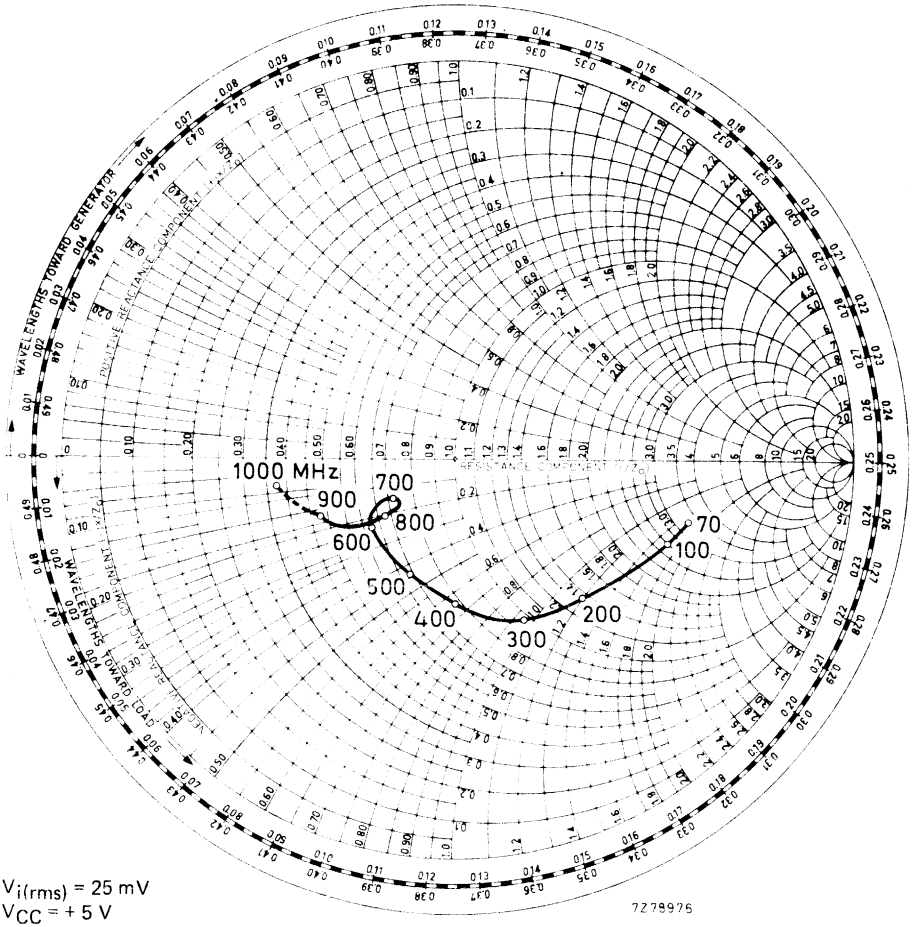


Fig. 4 Gain as a function of frequency. V_{CC} = 5 V; T_{amb} = 25 °C.

A.C. CHARACTERISTICS (continued)



$V_{i(rms)}$ = 25 mV
V_{CC} = + 5 V
R_{CC} = 75 Ω

Fig. 5 Smith chart of typical input impedance at pin 3 with pin 4 terminated to ground.

Test circuit

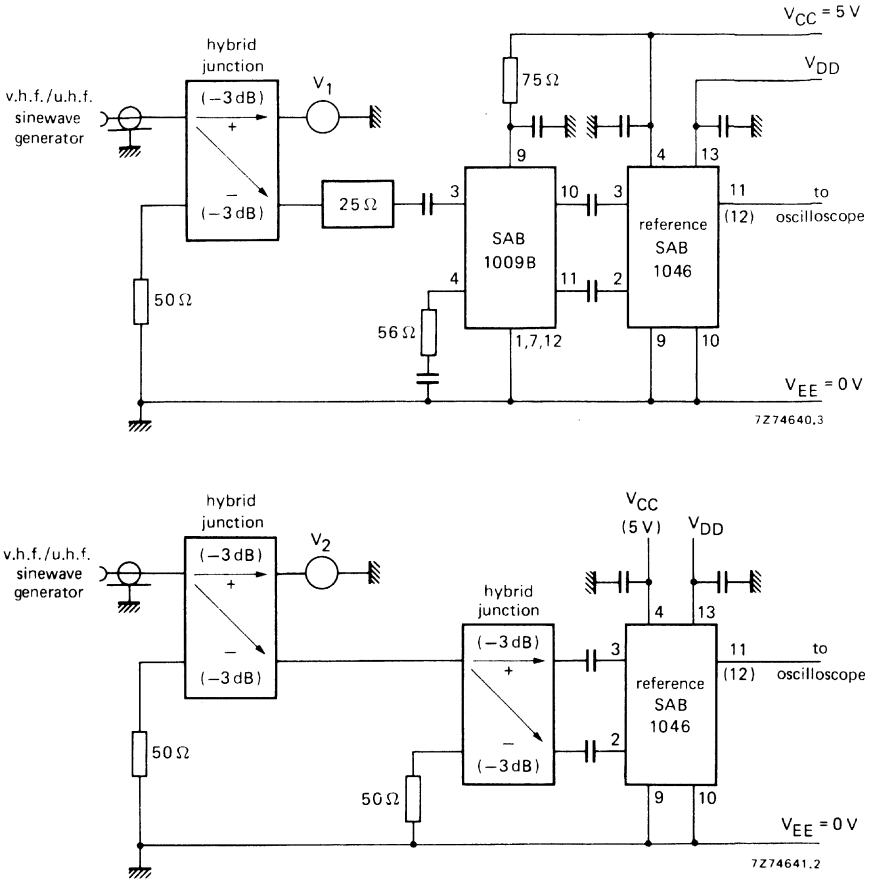


Fig. 6 Test circuits for defining gain.

V_1 and V_2 are minimum input levels for correct operation.

Gain defined as $G = 20 \log \frac{V_2}{V_1}$.

Capacitors must be leadless ceramic (value 10 nF).
Hybrid junctions are Anzac H-183-4 or similar.
Connections to the device must be kept short for proper tests.
Cables are 50 Ω coaxial cables.

APPLICATION INFORMATION

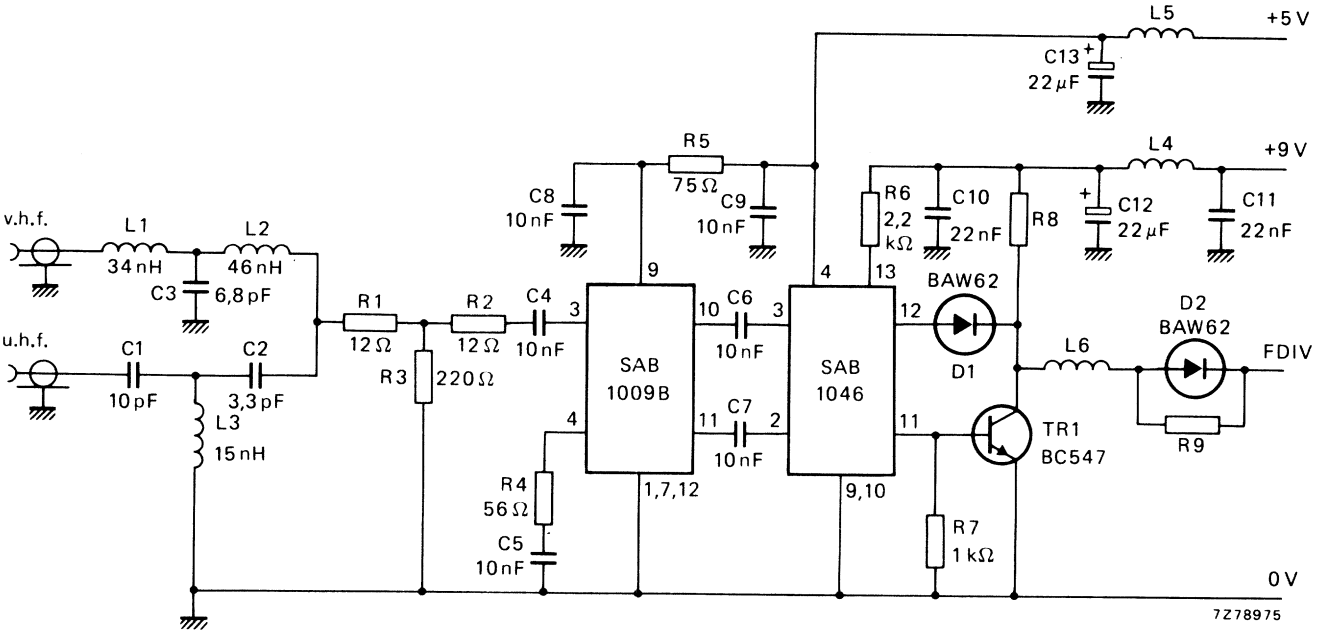


Fig. 7 H.F. divider for DICS in television receivers (prescaler module). The pins not mentioned are connected to ground except pin 5 of SAB1046 which is connected to V_{CC}. Values of R8, R9 and L6 have to be chosen in accordance with the load capacitance.

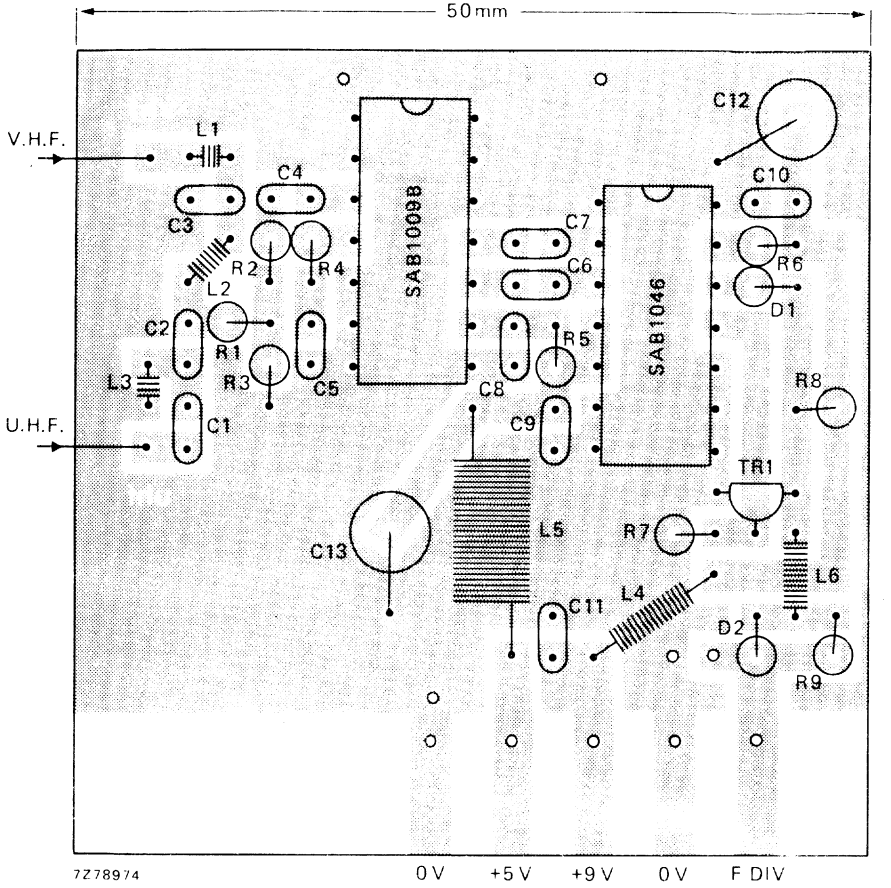


Fig. 8 Component layout of circuit shown in Fig. 7.