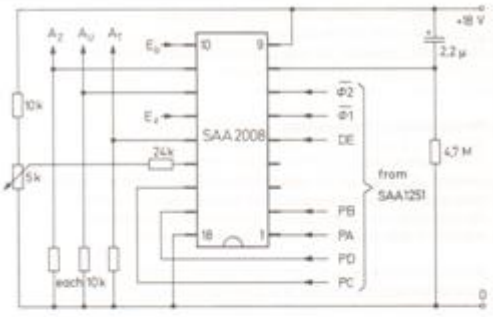
## SAA2008 TV Character Generator for TV Receivers with Infrared Remote Control (18-Pin Plastic Package)

The SAA2008 is an MOS circuit in P-channel silicon-gate technology for displaying the program number (1...16) on the screen of color television receivers, especially in combination with the infrared remote-control system SAA1250/SAA1251.

The fading-in of the program number occurs automatically with every program command, with the display recall command, and with the command "sequential program change". The duration of the display is determined by an RC network connected to pin 8. The numbers are displayed in the shape of a 5 × 7 dot matrix (ones) or a 2 × 7 dot matrix (tens) within a darkened field constituted by 7 × 9 (4 × 9) dots. Each dot is approximately square and consists of six line sections equivalent to approximately 0.45 µs. The field area commences at a distance of 114 lines from the upper edge of the picture area and at a distance of approximately 96 dots (two-digit number) or 100 dots (one-digit number) from the left margin of the picture. The shape of the digits can be adapted to comply with customer's wishes by varying the IC-masks.

The SAA2008 is capable of processing signals from the infrared remote-control receiver SAA1251 without any interface. The program outputs PA...PD of the SAA1251, which supply the information of the program number to be displayed, are directly connected to the program inputs PA...PD of the SAA2008. The data output DA of the SAA1251 feeds its signals via the data bus to the directly connected data input DE of the SAA2008. The SAA2008 recognizes the display command out of the serial ten bit word, consisting of four address bits and six control bits, which is issued to the data bus on every command and the programm number appears on the TV screen. The current consumption of the SAA2008 is about 28 mA.



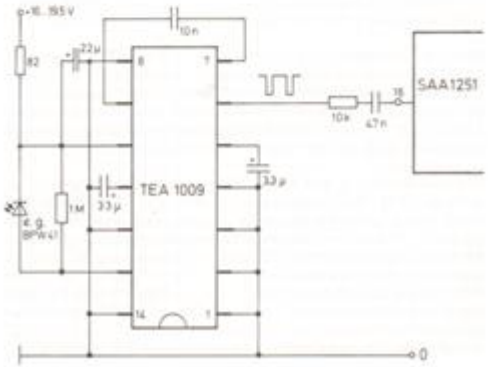

**SAA2008 Application Circuit**

## TEA1009 Preamplifier for Infrared Remote Control Systems (14-Pin Plastic Package TO-116)

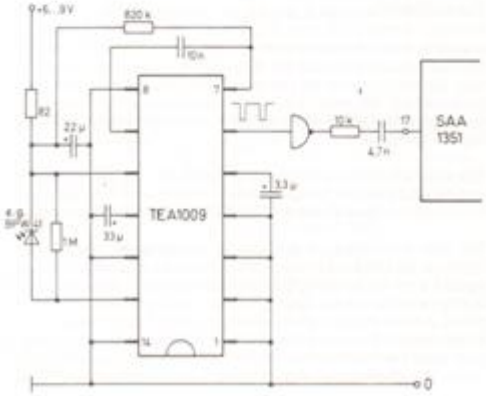
This bipolar integrated circuit is a preamplifier for the infrared remote control systems SAA1250/SAA1251 and SAA1350/SAA1351.

The TEA1009 comprises a multistage gain-controlled amplifier with high dynamic range and a separation stage which separates the pulse-shaped intelligent signal from the noise and spurious signals, thus achieving a high interference immunity. The infrared detector is an external photo-pin-diode.

Only few external components are needed. The current consumption is about 1.5 mA at $V_B$ = 18 V. When used for the SAA1350/SAA1351 system, the inverter shown in the figure below must be provided.




**TEA1009 Application Circuit for SAA1251**




**TEA1009 Application Circuit for SAA1351**

## SAA1174, SAA1274, SAA1075, SAA1276 IC Kit for Digital Tuning of TV Receivers (Frequency Synthesizer)

**SAA1174:** Control IC (U.K.) in MOS-P-Channel Si-Gate Technology (24-Pin Plastic Package)
**SAA1274:** Control IC in MOS-P-Channel Si-Gate Technology (24-Pin Plastic Package)
**SAA1075:** Memory in P-Channel MNOS Technology (18-Pin Plastic Package)
**SAA1276:** Character Generator in MOS-P-Channel Si-Gate Technology (16-Pin Plastic Package)

This IC kit is intended for assembling a frequency synthesizer operating on the PLL principle, for digital tuning, program storage, station searching and display of the program's number on the TV screen. In conjunction with the infrared remote control system SAA1250/1251, an expandable future-oriented control concept for color television receivers is achieved which caters also for such applications as teletext and TV games. The diagram shows the combination of these integrated circuits into a PLL frequency synthesizer.

**The control IC SAA1274** operates as a PLL (phase-locked loop) circuit. It compares the oscillator frequency of the tuner with a crystal-controlled reference frequency of 4 MHz, whereas the frequency/phase comparator operates with a frequency of approximately 1 kHz and the output signals being supplied to a pair of current sources. The latter charge or discharge the storage capacitor, both when frequencies are switched and in the stationary condition when control deviations occur. The potential of the storage capacitor is fed to the tuner via a low-pass filter. The system may either be controlled directly or via the data-bus of the infrared remote-control receiver SAA1251. Tuning is carried out in steps of 62.5 kHz each.

A ROM integrated in the SAA1274 serves the allocation of the band data to the tuning frequency:

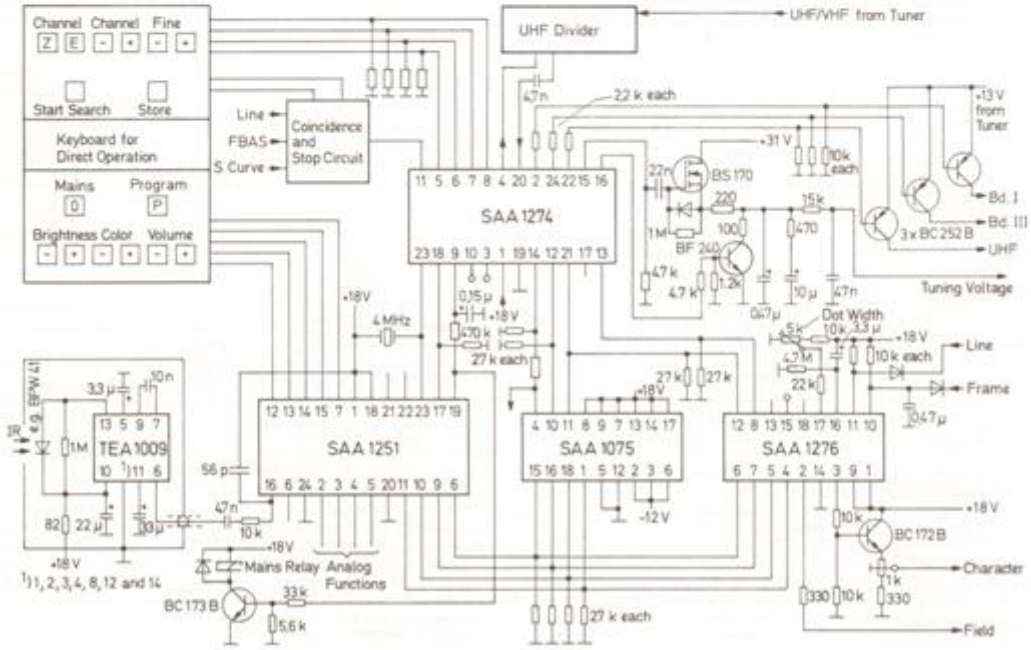
| | | |
|---|---|---|
| Band I | 40...108 MHz | Channel 1 to Channel 4 and 6 Special Channels |
| Band III | 109...305 MHz | Channel 5 to Channel 12 and 28 Special Channels |
| Band IV/V | 470...895 MHz | Channels 21 to 74 |

**The memory SAA1075** is a non-volatile RAM in MNOS technology. It has a capacity of 16 words of 15 bits each and is controlled via nine pins: Chip Enable – activation of the memory, p.ex. when two memories are connected in parallel
Clock 125 kHz
R/W – read and write commands
Data – serial transport of tuning data in both directions
Program – four program inputs PA to PD

**The Character Generator IC SAA1276** serves for the display of channel and program indications on the screen. It receives the following signals from the control IC SAA1274:
A clock burst of 8 pulses at a frequency of 125 kHz
2 × 4 bits BCD data for the channel number

Besides, the SAA1251 supplies the SAA1276 with the signals PA to PD. The simultaneous application of clock and data information causes the SAA1276 to display channel and program numbers. If the SAA1276 receives only the clock signal (all data bits low), then only the program number will be displayed. A "program number suppression" terminal allows the display of the program number to be suppressed, should a LED display be preferred.

**The control IC SAA1174** is designed for application in Great Britain instead of the SAA1274 control IC. It is designed for the CCIR channels 21 to 69, based on an IF of 39.5 MHz.




**Combining the ICs SAA1274, SAA1075, SAA1276 and SAA1251 in an Infrared Remote-Controlled CTV Receiver**