

# TBA 2800 Infrared Preamplifier

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6251-203-6DS

# TBA 2800

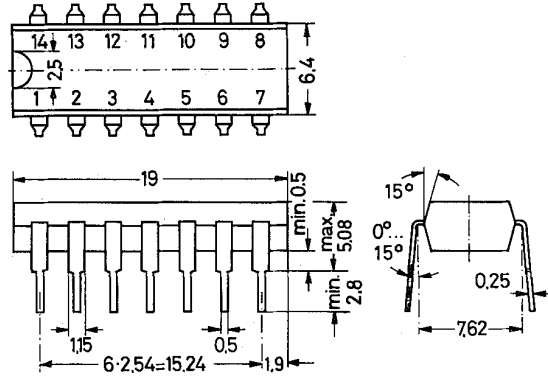
## Infrared Preamplifier IC

Bipolar integrated circuit, intended as a receiver preamplifier for Central Control Unit for the infrared remote-control systems designed with integrated circuits of ITT.

The TBA 2800 preamplifier IC contains four main parts: the gain-controlled amplifier I, the amplifier II, the pulse-separating amplifier III, and the inverter IV, as shown in Fig. 1. The amplifier I has a wide dynamic range and thus ensures interference-free operation, also at bright ambient light, 50-Hz-modulated light originating from fluorescent lamps, or at intensive infrared light, e. g. produced by infrared sound transmission. It is also possible, to approach almost directly the remote-control transmitter to the receiver without producing malfunction by overdriving the receiver.

The amplifier II further amplifies the signal, and amplifier III separates the pulse-shaped intelligence signal from noise and other unwanted parts. The inverter IV provided additionally inverts the output signal available at pin 7 as negative pulse, and thus delivers positive output pulses at pin 8. If an additional resistor is inserted between pin 6 and GND, the noise-immunity is increased, but the input sensitivity decreased. Pin 10 serves as test pin and must not be connected.

The capacitor connected from pin 2 to ground influences the automatic gain control of amplifier I contained in the TBA 2800. A capacitance of less than  $1 \mu\text{F}$  will cause malfunction in the distance range of 0.2 m to 2 m. Fig. 3 shows the dependence of the transmission range on the capacitor at pin 2. Due to tolerances of the TBA 2800 itself, the transmitter diodes' efficiency and the receiver diode's sensitivity, the curves of Fig. 3 must be considered with a tolerance of  $\pm 50\%$ . The curves have been established by simulation of the distance between transmitter and receiver by means of infrared filter glass with specified attenuation inserted between transmitter and receiver.

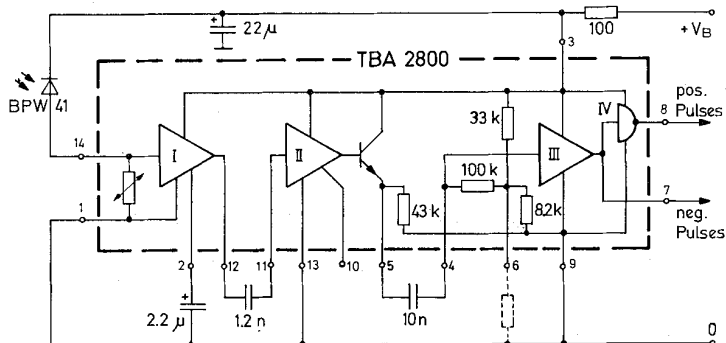


**Fig. 2:**  
TBA 2800 in a 14-pin DIL  
Plastic Package TO-116,  
20 A 14 according to  
DIN 41 866

Weight approx. 1.2 g  
Dimensions in mm

### Pin Connections

- 1 Input's Ground, 0
- 2 Capacitor Pin Amplifier I
- 3 Supply Voltage  $V_B$
- 4 Input Amplifier III
- 5 Output Amplifier II
- 6 Pin for Adjusting the Separation Threshold
- 7 Negative Pulse Output
- 8 Positive Pulse Output
- 9 Output's Ground, 0
- 10 Test Pin, leave vacant
- 11 Input Amplifier II
- 12 Output Amplifier I
- 13 Ground, 0, of Amplifier II
- 14 Input



**Fig. 1:** TBA 2800 block diagram and application circuit

All voltages are referred to GND (pins 1, 9, and 13).

**Absolute Maximum Ratings**

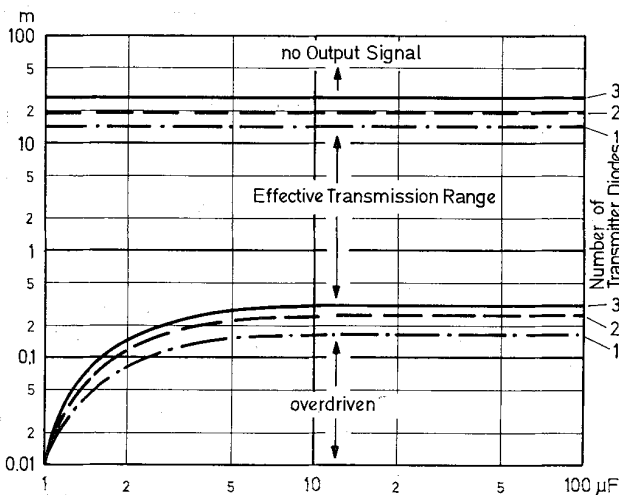
|                                     | Symbol | Value       | Unit |
|-------------------------------------|--------|-------------|------|
| Supply Voltage                      | $V_3$  | 6           | V    |
| Ambient Operating Temperature Range | $T_A$  | 0 to +65    | °C   |
| Storage Temperature Range           | $T_S$  | -30 to +125 | °C   |

**Recommended Operating Conditions**

|                | Symbol | Min. | Typ. | Max. | Unit |
|----------------|--------|------|------|------|------|
| Supply Voltage | $V_3$  | 4.5  | 5    | 5.5  | V    |

**Characteristics** at  $V_3 = 5\text{ V}$ ,  $T_A = 25\text{ °C}$ , photo diode BPW 41, in the circuit Fig. 1

|  | Symbol   | Min. | Typ. | Max. | Unit |
|--|----------|------|------|------|------|
| Current Consumption  | $I_2$    | –    | 1    | 2    | mA   |
| Gain between pins 14 and 7   | G        | 70   | –    | –    | dB   |
| Output Resistance pins 7 and 8,<br>formed by the pull-up resistor of an NPN transistor   | $R_O$    | –    | 20   | –    | kΩ   |
| Output Low Voltage pins 7 and 8 at $I_{OL} = 1.6\text{ mA}$  | $V_{OL}$ | –    | 0.4  | 0.8  | V    |
| IR Transmission Range using the SAA 1250 IR Transmitter IC and<br>a Transmission Current Amplitude of 1.5 A, and<br>one Transmitter Diode CQY 99 | L1       | –    | 12   | –    | m    |
| two Transmitter Diodes CQY 99  | L2       | –    | 19   | –    | m    |
| three Transmitter Diodes CQY 99  | L3       | –    | 26   | –    | m    |



**Fig. 3:** Transmission range depending on capacitor at pin 2

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## Data Sheet History

- page 3: Absolute Maximum Ratings  
Ambient Operating Temperature Range ( $T_A$ ) changed  
from           (–20 to +65°C)  
to               (0 to +65 °C)

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