# U 893 BSE / U 893 BSE–FP
# U 893 BSE–SP

## 1.3 GHz Prescaler for PLL's in TV, CATV and SAT TV Tuners

**Technology:** Bipolar

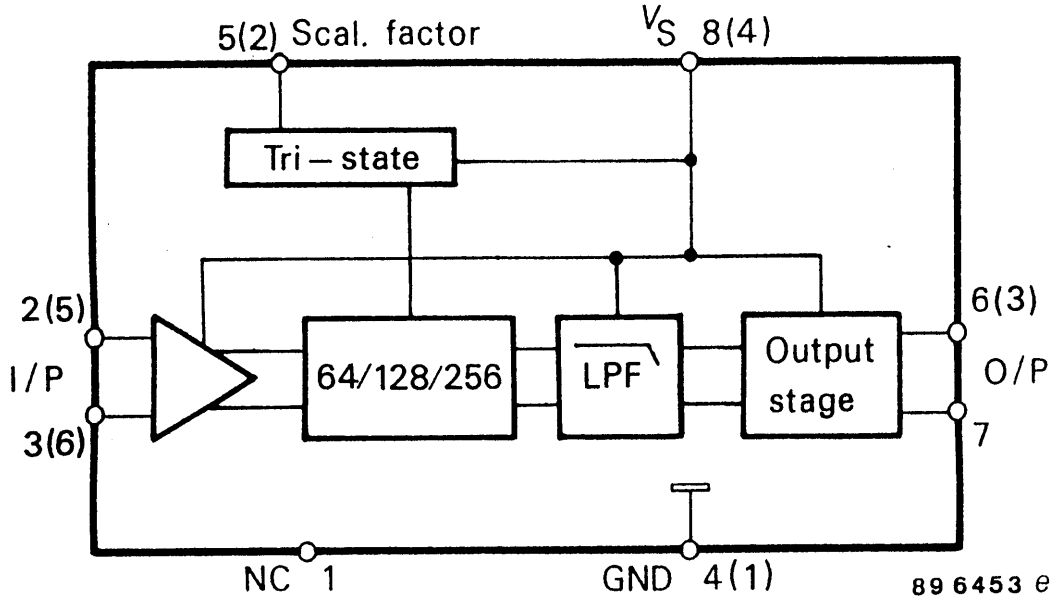
### Features

- Extrem low current consumption (typ. 18 mA)
- Output harmonics strongly reduced
- 3 scaling factors 64/128/256 programmable at pin 5
- High input sensitivity
- Emitter follower output stage
- Electrostatic protection according to MIL–STD. 883
- Pin compatible to U 833 BSE

### Case

| | |
|---|---|
| 8 pin dual inline plastic | (U 893 BSE) |
| 8 pin SO plastic | (U 893 BSE–FP) |
| 6 pin SIP plastic | (U 893 BSE–SP) |

### Block Diagram



## Pin Configuration

| Pin | Function (DIP 8, SO 8) |
|---|---|
| 1 | n.c. |
| 2, 3 | Input |
| 4 | Ground |
| 5 | Switch 64/128/256 |
| 6, 7 | Output |
| 8 | $V_S$ |

| Pin | Function (SIP 6) |
|---|---|
| 1 | Ground |
| 2 | Switch 64/128/256 |
| 3 | Output |
| 4 | $V_S$ |
| 5, 6 | Input |

## Absolute Maximum Ratings

Reference point pin 4 (1), unless otherwise specified

| Parameters | | Symbol | Value | Unit |
|---|---|---|---|---|
| Supply voltage | Pin 8 (4) | $V_S$ | 6 | V |
| Input voltage range | Pin 2, 3, 5 (2, 5, 6) | $V_i$ | 0 ... $V_S$ | V |
| Junction temperature | | $T_j$ | 125 | °C |
| Ambient temperature range | | $T_{amb}$ | –25 ... +85 | °C |
| Storage temperature range | | $T_{stg}$ | –40 ... +125 | °C |

## Thermal Resistance

| Parameters | | Symbol | Maximum | Unit |
|---|---|---|---|---|
| Junction ambient | DIP 8 | $R_{thJA}$ | 100 | K/W |
| | SIP 6 | $R_{thJA}$ | 100 | K/W |
| | SO 8 | $R_{thJA}$ | 175 | K/W |

## Electrical Characteristics

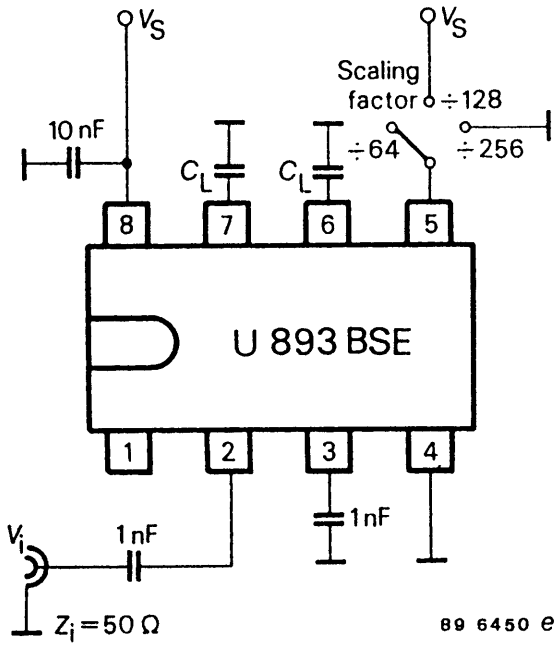
$V_S$ = 4.5 ... 5.5 V, $T_{amb}$ = 0 ... 70 °C, referred to test circuit, unless otherwise specified

| Parameters | Test Conditions / Pin | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Supply voltage range | Pin 8 (4) | $V_S$ | 4.5 | | 5.5 | V |
| Supply current | $V_S$ = 5 V Pin 8 (4) | $I_S$ | | 21 | 25 | mA |
| Input sensitivity [1)] | $R_G$ = 50 Ω<br>$f_i$ = 70 ... 1100 MHz<br>Pin 2, 3 (5, 6) | $v_i$ | | | 10 | mV |
| | $f_i$ = 1100 ... 1200 MHz<br>Pin 2, 3 (5, 6) | $v_i$ | | | 15 | mV |
| | $f_i$ = 1200 ... 1300 MHz<br>Pin 2, 3 (5, 6) | $v_i$ | | | 20 | mV |
| Large signal compatibility | $R_G$ = 50 Ω Pin 2, 3 (5, 6) | $V_i$ | 300 | | | mV |

| Parameters | Test Conditions / Pin | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Frequency range | | $f_{imin}$ | | | 70 | MHz |
| | | $f_{imax}$ | 1300 | | | MHz |
| Emitter follower output Voltage swing each output | $f_i \leq 1000$ MHz, $C_L$ = 13 pF, SF = 1:64 Pin 6, 7 (3) | $V_O$ | 0.6 | 0.7 | | $V_{pp}$ |
| Output impedance | Pin 6, 7 (3) | $Z_O$ | | 200 | | Ω |
| 3rd order harmonics suppression | $f_i$ = 700 ... 900 MHz, $C_L$ = 13 pF, SF = 1:64 Pin 6, 7 (3) | $20 \cdot log \frac{V_{O3f}}{V_{O1f}}$ | | –30 | | dB |
| Switching voltage for scaling factor (SF) | 1:64 Pin 5 (2) | $V_{SF}$ | | open | | |
| | 1:128 | $V_{SF}$ | $V_S$ – 0.5 | | | V |
| | 1:256 | $V_{SF}$ | | 0 | 0.3 | V |
| Switching current | $V_S$ = 5 V Pin 5 (2) | | | | | |
| | 1:128 $V_{SF}$ = 5 V | $I_{SF}$ | | 150 | | µA |
| | 1:256 $V_{SF}$ = 0 V | $I_{SF}$ | | –150 | | µA |

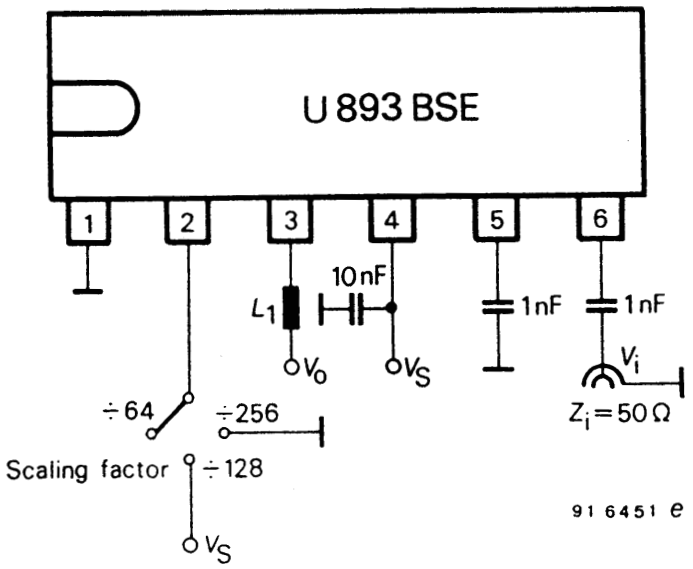
1) RMS-voltage calculated from the measured available power

## Test Circuits




$C_L$ = Total capacitive output load including test fixture and test epuipment capacitance

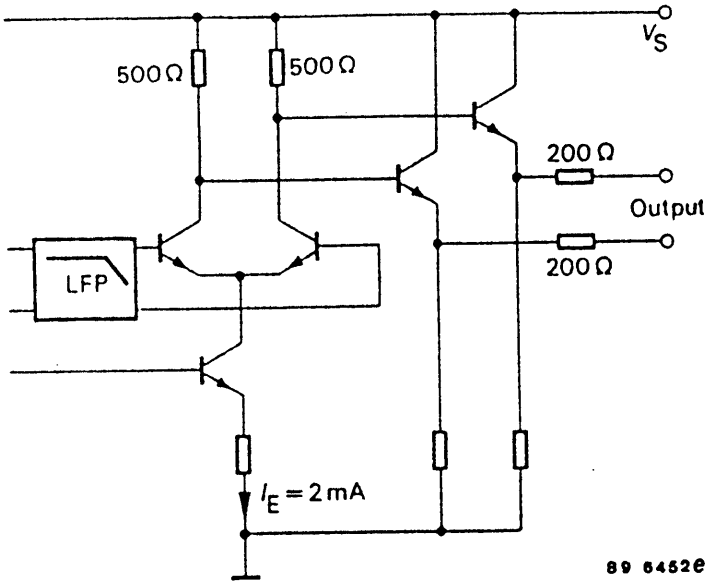
DIP 8/SO 8



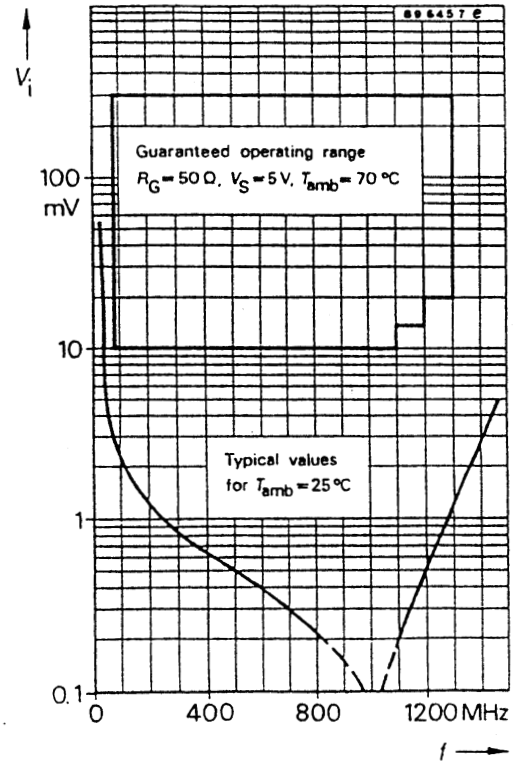

SIP 6

## Output Circuit

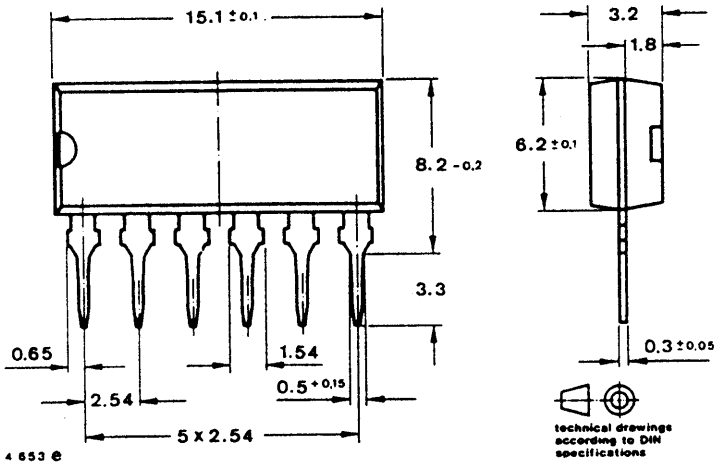
Emitter follower output



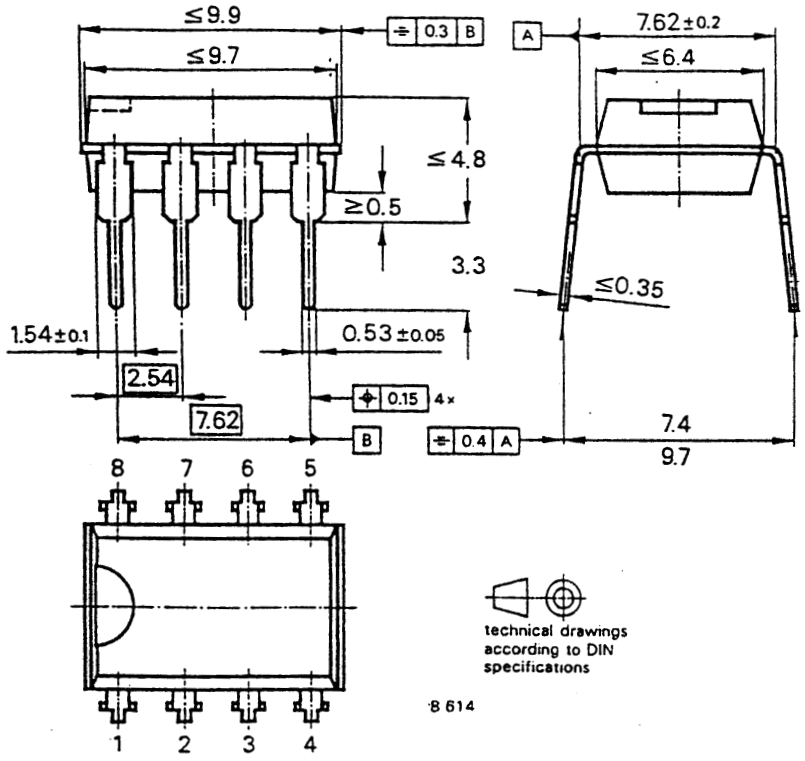
## Input Sensitivity



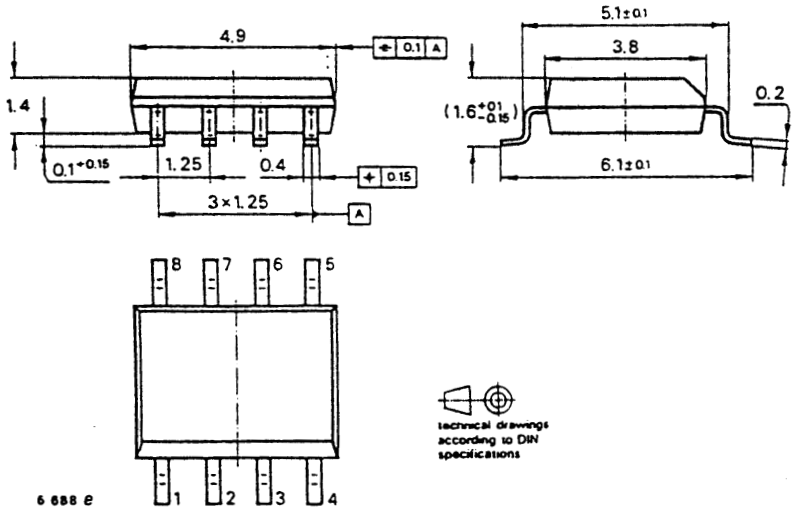

## Dimensions in mm




Case
SIP 6
6-leads




Case
DIP 8-leads




Case
SO 8
(SOT 96 A)

## OZONE DEPLETING SUBSTANCES POLICY STATEMENT

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

1. Meet all present and future national and international statutory requirements and

2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

Of particular concern is the control or elimination of releases into the atmosphere of those substances which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) will soon severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

**TEMIC TELEFUNKEN microelectronic GmbH** semiconductor division has been able to use its policy of continuous improvements to eliminate the use of any ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively

2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA and

3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

**TEMIC** can certify that our semiconductors are not manufactured with and do not contain ozone depleting substances.



TEMIC TELEFUNKEN microelectronic GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany
Telephone: 49 (0)7131 67 2831, Fax Number: 49 (0)7131 67 2423