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

Technology: Bipolar

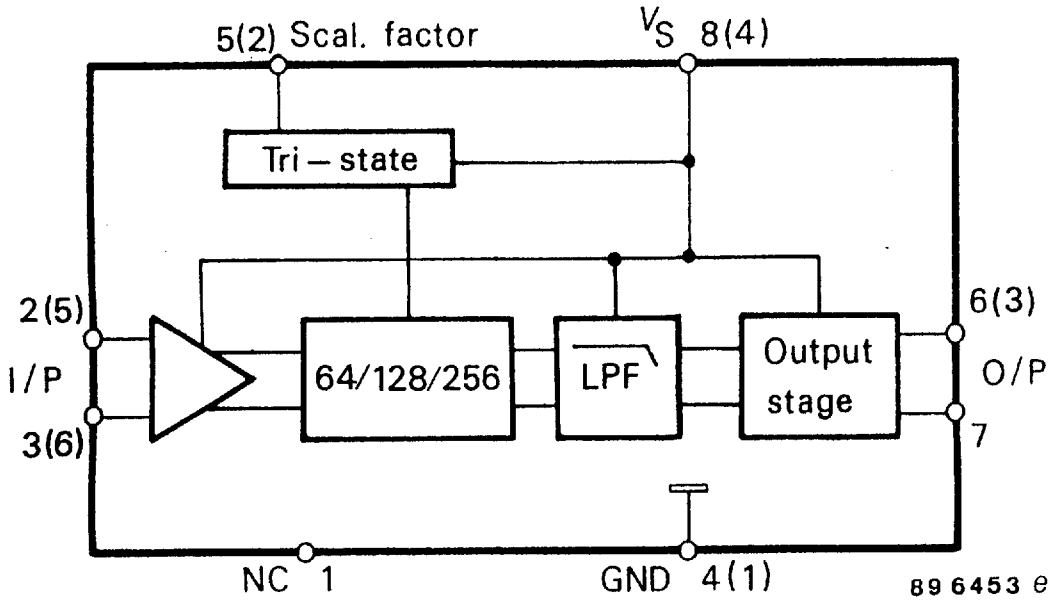
Features

- 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 U833BSE

Case

8 pin dual inline plastic	(U893BSE)
8 pin SO plastic	(U893BSE-FP)
6 pin SIP plastic	(U893BSE-SP)

Block Diagram



Pin Configuration

Pin	Function (DIP8, SO8)
1	n.c.
2, 3	Input
4	Ground
5	Switch 64/128/256
6, 7	Output
8	V_S

Pin	Function (SIP6)
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 to V_S	V
Junction temperature		T_j	125	°C
Ambient temperature range		T_{amb}	–25 to +85	°C
Storage temperature range		T_{stg}	–40 to +125	°C

Thermal Resistance

Parameters		Symbol	Maximum	Unit
Junction ambient	DIP8	R_{thJA}	100	K/W
	SIP6	R_{thJA}	100	K/W
	SO8	R_{thJA}	175	K/W

Electrical Characteristics

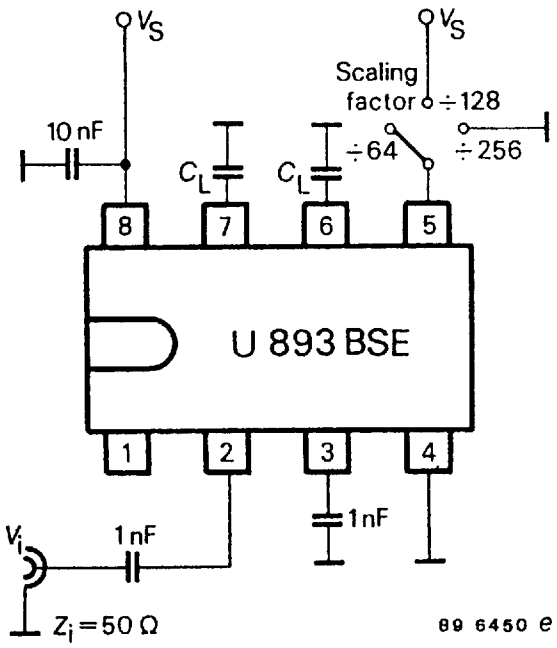
V_S = 4.5 to 5.5 V, T_{amb} = 0 to 70 °C, referred to test circuit, unless otherwise specified

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 f_i = 70 to 1100 MHz Pin 2, 3 (5, 6)	v_i			10	mV
	f_i = 1100 to 1200 MHz Pin 2, 3 (5, 6)	v_i			15	mV
	f_i = 1200 to 1300 MHz 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

[1] RMS-voltage calculated from the measured available power

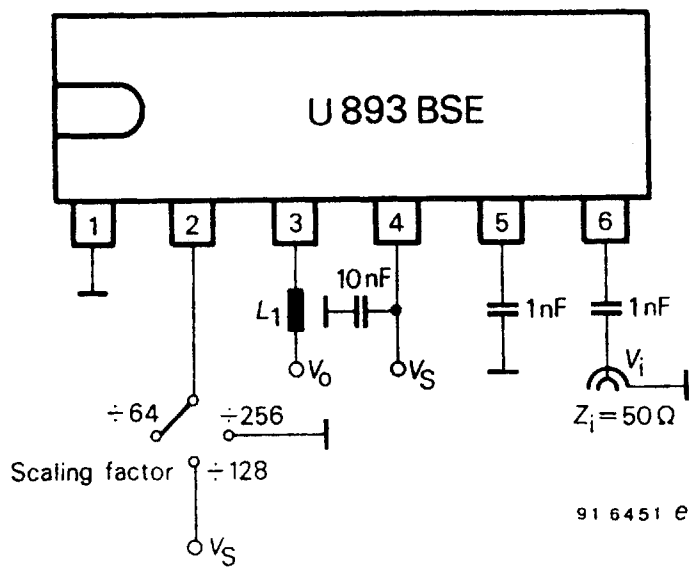
Parameters	Test Conditions / Pin	Symbol	Min	Typ	Max	Unit
Frequency range		f_{imin}			70	MHz
		f_{imax}	1300			MHz
Emitter follower output Voltage swing each output	$f_i \leq 1000$ MHz, C_L = 13 pF, SF = 1:64 Pin 6, 7 (3)	V_O	0.6	0.7		V_{pp}
Output impedance	Pin 6, 7 (3)	Z_O		200		Ω
3rd order harmonics suppression	f_i = 700 to 900 MHz, C_L = 13 pF, SF = 1:64 Pin 6, 7 (3)	$20 \times \log \frac{V_{O3f}}{V_{O1f}}$		–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

Test Circuits



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

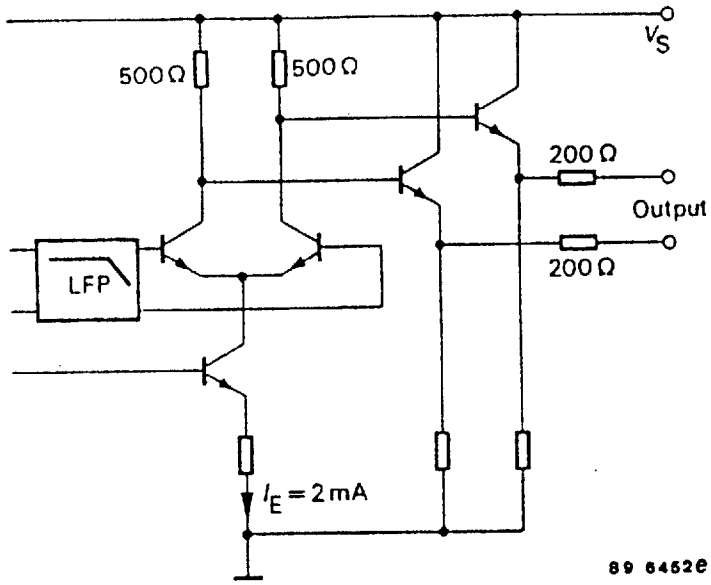
DIP 8/SO 8



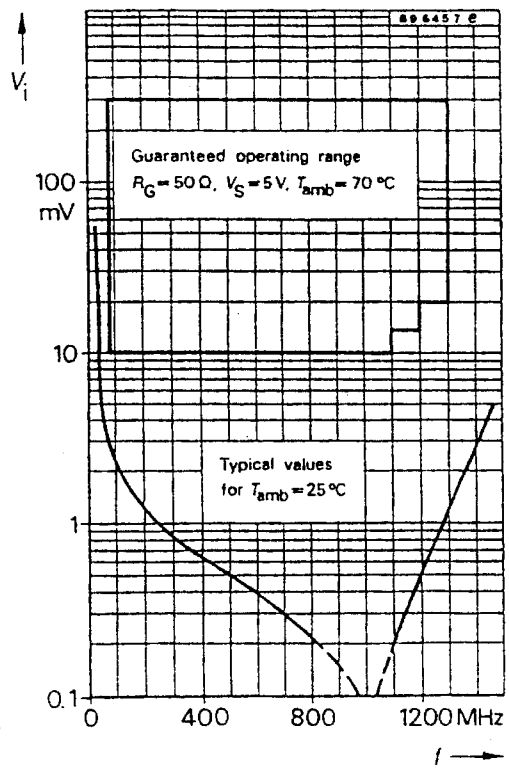
SIP 6

Output Circuit

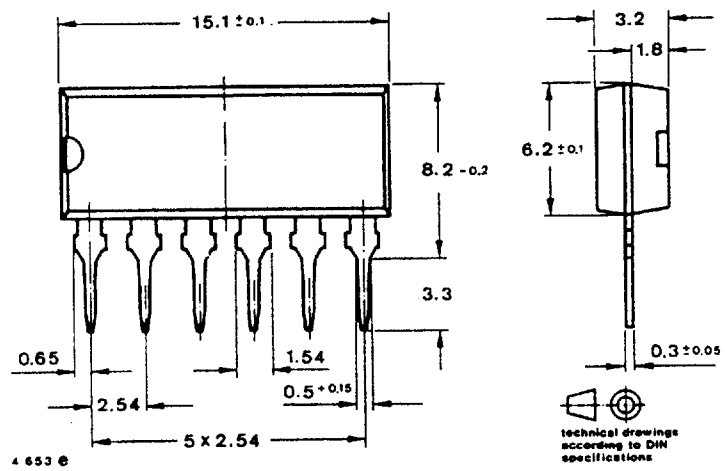
Emitter follower output



Input Sensitivity

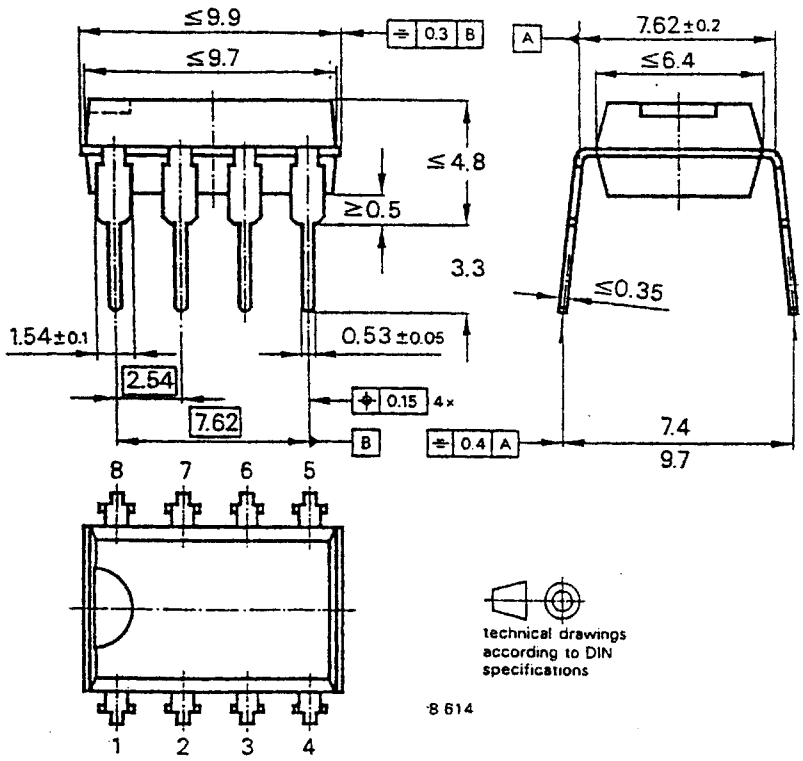


Dimensions in mm

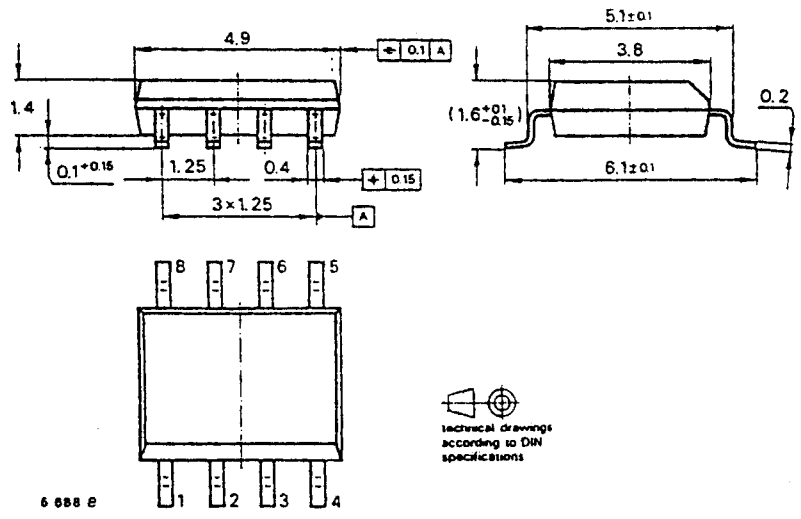


Case
SIP 6
6-leads

Dimensions in mm



Case
DIP 8-leads



Case
SO 8
(SOT 96 A)