

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

Technology: Bipolar

Features

- U 813 BS ECL output stage
- U 813 BSE emitter follower output stage
- 3 scaling factors 64/128/256 programmable at pin 5
- High input sensitivity
- Low output impedance
- Low power consumption
- Pin compatible to the U 6.. B-series except pin 5
- Electrostatic protection according to MIL-STD. 883

Case

8-pin dual inline plastic	(U 813 BS, U 813 BSE)
8-pin SO plastic	(U 813 BS-FP, U 813 BSE-FP)
6-pin SIP plastic	(U 813 BS-SP, U 813 BSE-SP)

Absolute Maximum Ratings

Reference point pin 4 (1) ¹⁾

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
Storage temperature range	T_{stg}	-40 ... +125	°C
Ambient temperature range	T_{amb}	-25 ... +70	°C

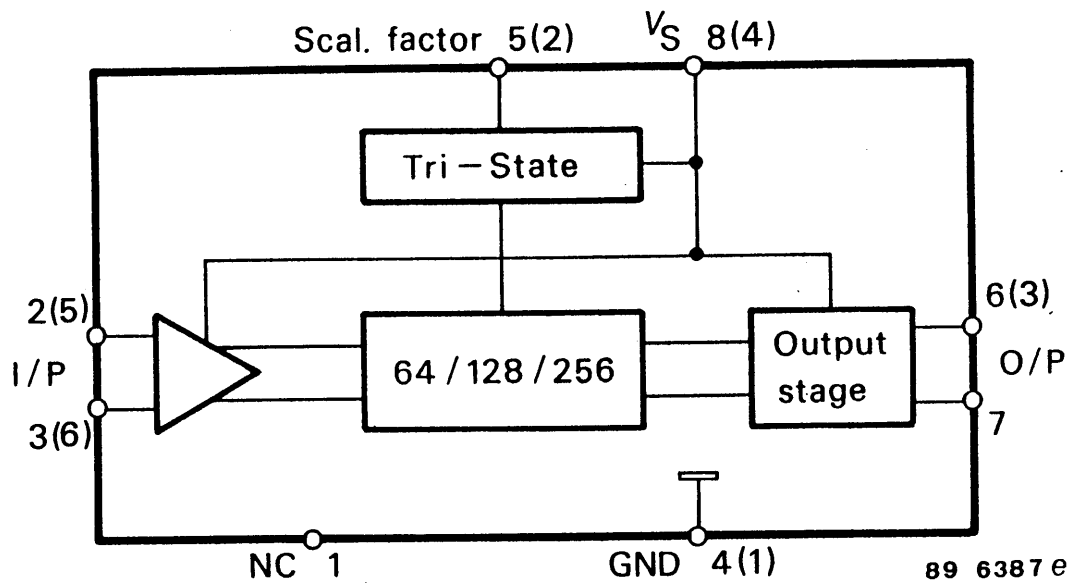
Thermal Resistance

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

Note

The device is self oscillating without input signal

Block Diagram



Pin Connection (Dip 8, SO 8)

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

Pin Connection (SIP 6)

Pin	Function
1	Ground
2	Switch 64/128/256
3	Output
4	V_S
5,6	Input

Notes

- 1) Pin numbers without brackets apply to DIP 8 and SO 8 package
Pin numbers with brackets to SIP 6
- 2) RMS-voltage calculated from the measured available power

Electrical Characteristics

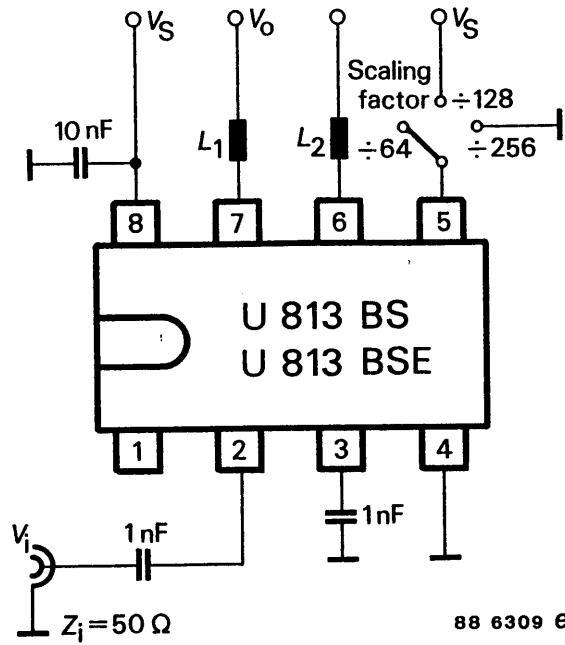
$V_S = 4.5 \dots 5.5 \text{ V}$, $T_{\text{amb}} = 0 \dots +70 \text{ }^\circ\text{C}$, referred to test circuit, unless otherwise specified

Parameters 200	Test Conditions / Pin	Symbol	Min	Typ	Max	Unit
Supply current ¹⁾	$V_S = 5 \text{ V}$ U 813 BS Pin 8 (4)	I_S		35	45	mA
	U 813 BSE Pin 8 (4)	I_S		38	50	mA
Input sensitivity ²⁾	$R_G = 50 \text{ } \Omega$ $f_i = 70 \dots 1000 \text{ MHz}$ Pin 2, 3 (5, 6)	V_i			10	mV
	$f_i = 1000 \dots 1100 \text{ MHz}$ Pin 2, 3 (5, 6)	V_i			15	mV
Large signal compatibility	$R_G = 50 \text{ } \Omega$ Pin 2, 3 (5, 6)	V_i	300			mV
Frequency range		f_{imin}			70	MHz
		f_{imax}	1100			MHz
Output stage						
a. Balanced ECL output						
Voltage swing each output	$R_L = 10 \text{ k}/13 \text{ pF}$ Pin 6, 7 (3)	V_O	0.8			V_{pp}
Output impedance	Pin 6, 7 (3)	Z_O		500		Ω
b. Emitter follower						
Voltage swing each output	$R_L = 10 \text{ k}/13 \text{ pF}$ Pin 6, 7 (3)	V_O	1			V_{pp}
Output impedance	Pin 6, 7 (3)	Z_O		200		Ω
Switching voltage for	$\therefore 64$ Pin 5 (2)	V_{SF}		open		
	$\therefore 128$ Pin 5 (2)	V_{SF}	$V_S - 0.5$			V
	$\therefore 256$ Pin 5 (2)	V_{SF}		0	0.5	V

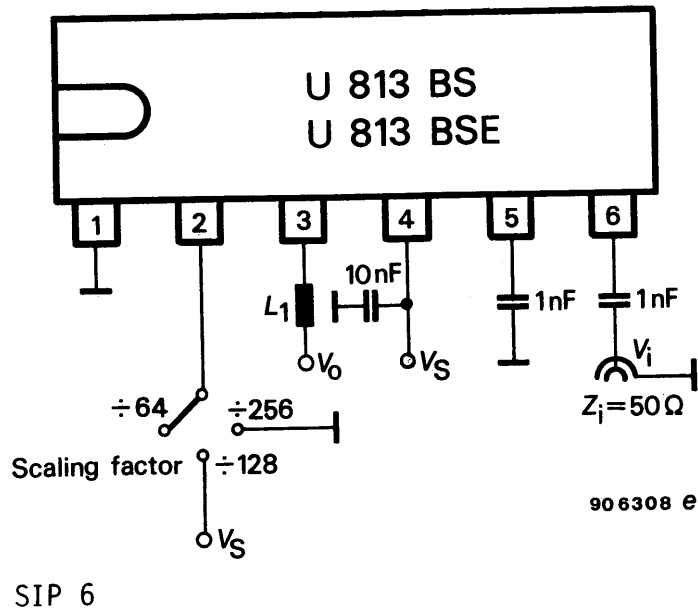
U 813 BS / U 813 BSE

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Test circuits

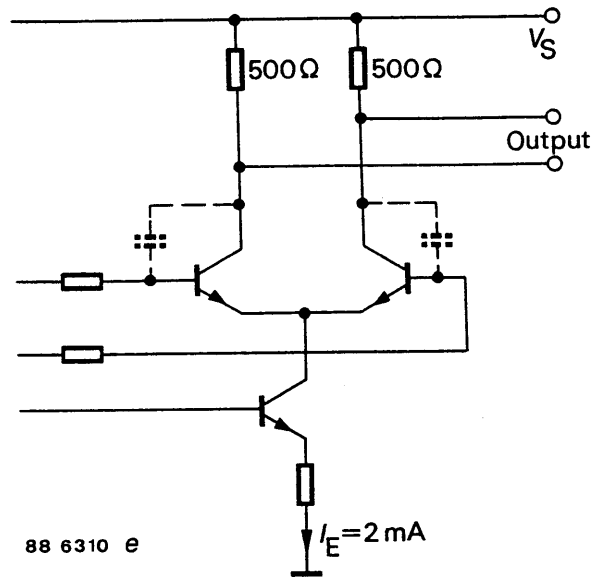


DIP 8/SO 8

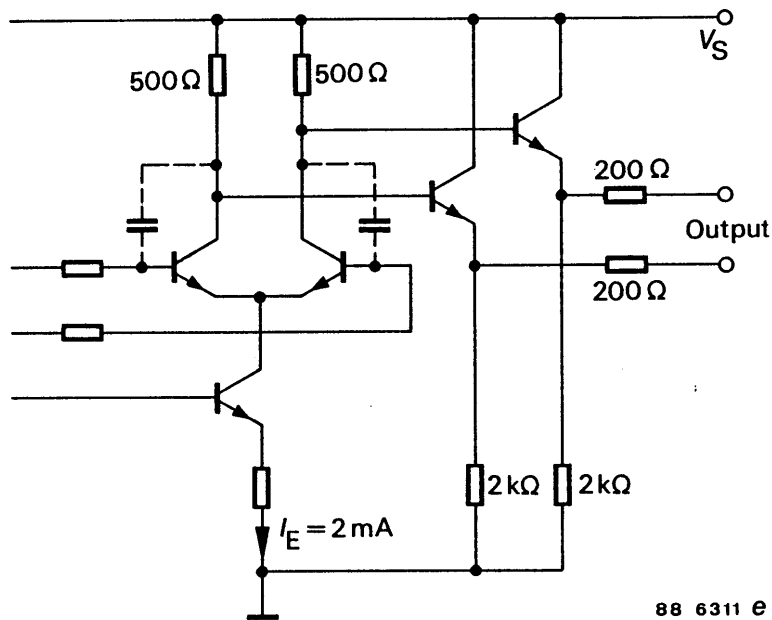


$L_1 = L_2 = 150 \text{ nH}$ (6 turns CuL 0.45 mm \varnothing on 4 mm \varnothing)

Output circuits



ECL output (U 813 BS)

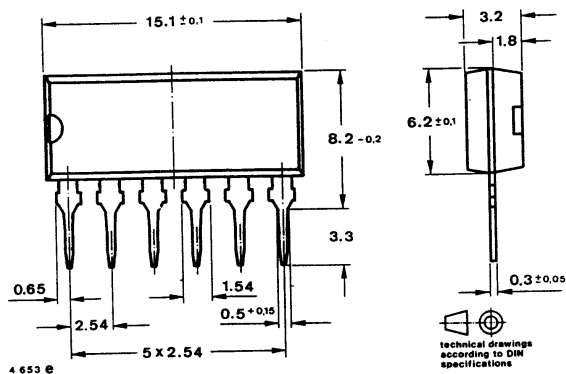
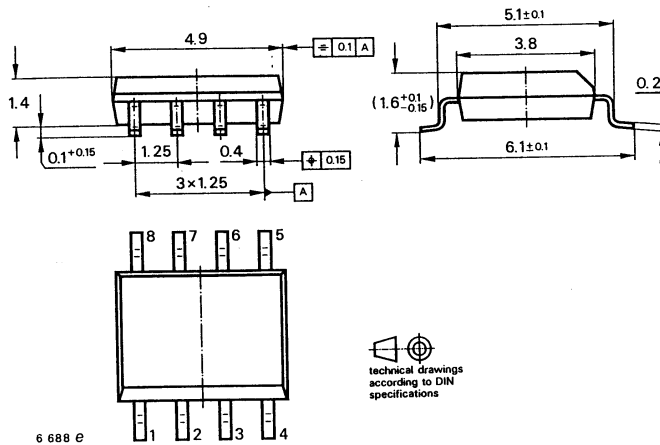
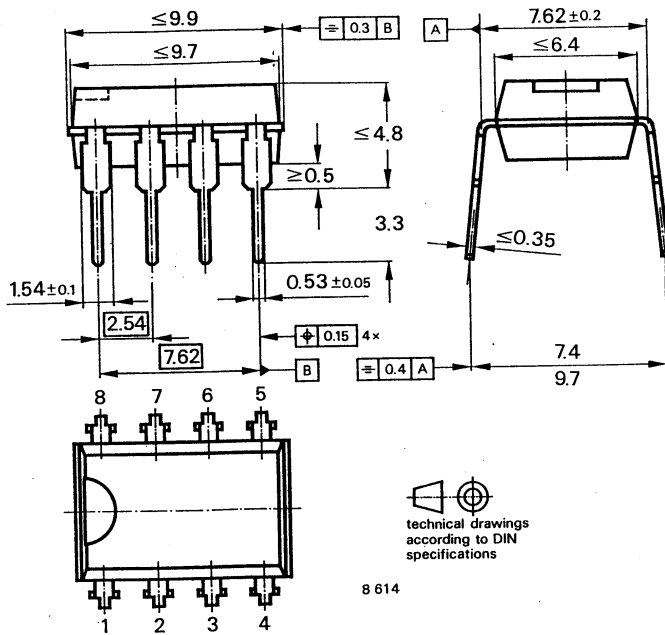


Emitter follower output (U 813 BSE)

U 813 BS / U 813 BSE

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Dimensions in mm



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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.

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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.

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