U2329B–AFL

TV-Tuner-IC with Two Separate Oscillators and Mixers, SAW-Driver and Dual-State Band Switch

Features

- 9 V supply voltage
- Frequency range from 48 to 860 MHz
- Band A: balanced high impedance mixer input and amplitude controlled oscillator
- Band B: balanced low impedance mixer input and symmetrical oscillator
- SAW filter driver with low impedance output
- Voltage regulator for stable operating characteristics
- ESD protection on all pins except oscillator pins and RF-inputs

Package: SO20

Block Diagram

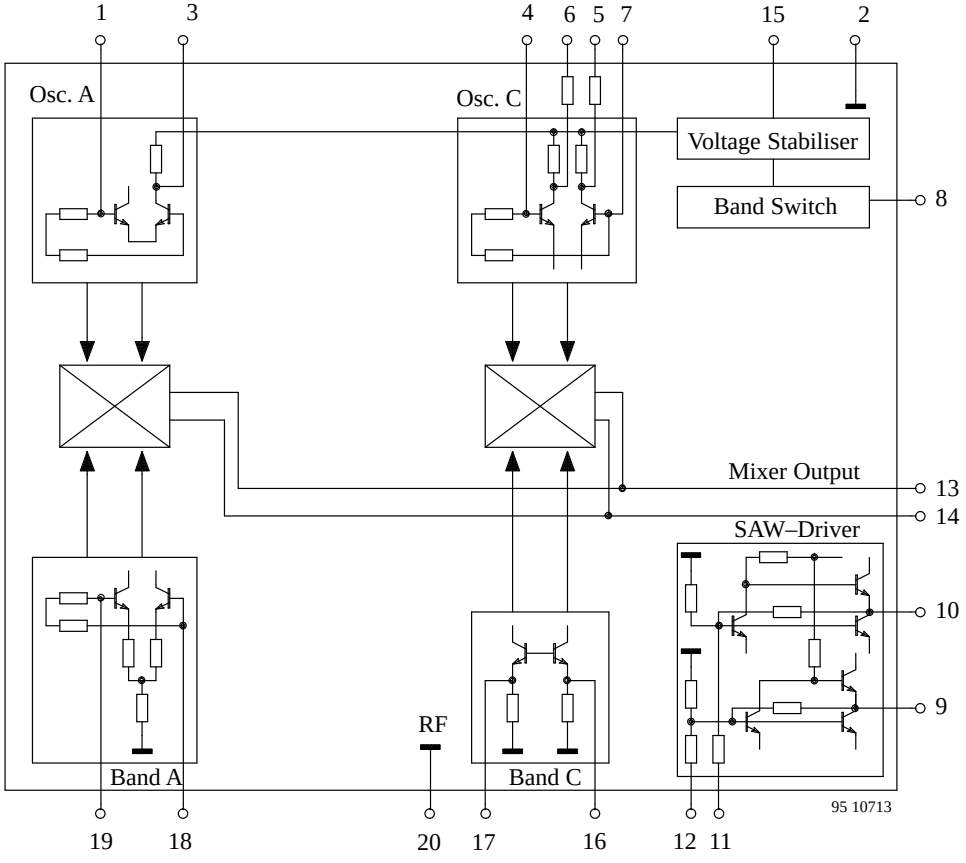

Figure 1. Block diagram pinning of U2329B

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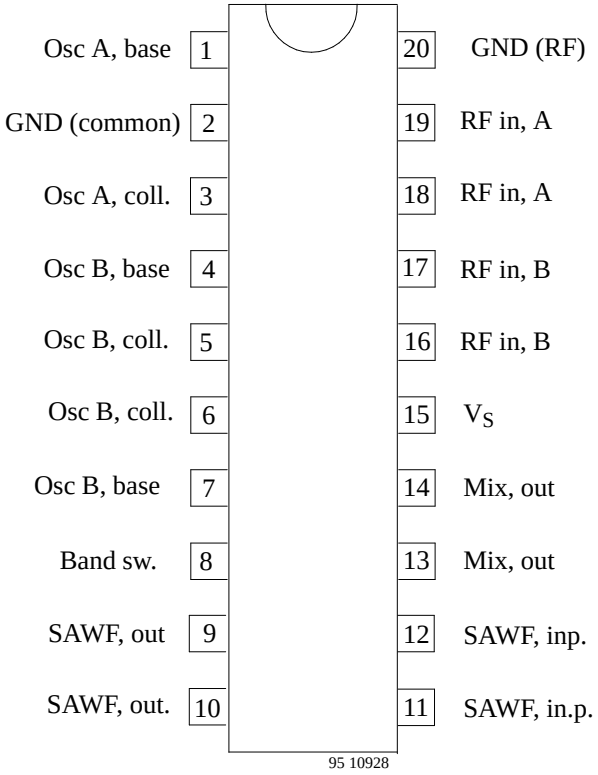
Pin Configuration



Pin	Symbol	Function
1	Osc A, base	Oscillator band A, base
2	GND (common)	Ground, common
3	Osc A, coll.	Oscillator band A, collector
4, 7	Osc B, base	Oscillator band B, bases
5, 6	Osc B, coll.	Oscillator band B, collectors
8	Band sw.	Dual-state band switch
9, 10	SAWF, out	SAW filter driver outputs
11, 12	SAWF, inp.	SAW filter driver input
13, 14	Mix, out	Mixer outputs, open collector
15	V_S	Supply voltage V_s
16, 17	RF in, B	RF inputs, band B
18, 19	RF in, A	RF inputs, band A
20	GND (RF)	Ground, RF part

Absolute Maximum Ratings

All voltages are referred to GND, pin 2 (pin 19). Pin numbers in brackets for the mirrored version.

Parameters		Symbol	Min.	Typ.	Max.	Unit
Supply voltage	Pin 15	V_S			10.5	V
RF inputs	Pin 16-19				5.0	V
IF outputs	Pin 13-14				10.5	V
Dual-state switch voltage	Pin 8	ViDSW			10.5	V
Junction temperature		T_{jmax}			125	°C
Storage temperature		T_{stg}	–40		125	°C

Operating Range

All voltages are referred to GND, pin 2 (pin 19). Pin numbers in brackets for the mirrored version.

Parameters	Test Conditions / Pins	Symbol	Min	Typ	Max	Unit
Supply voltage	Pin 13-15	V_S	8.1	9	9.9	V
Ambient temperature		T_{amb}	–25		75	°C
Thermal resistance	Test conditions page ...	R_{thJA}		90		K/W

Electrical Characteristics

Test conditions (unless otherwise specified): V_s = 9 V. T_{amb} = 25 °C. Reference point Pin 2

Parameters	Test Conditions / Pins	Symbol	Min	Typ	Max	Unit
Supply voltage	Pin 13-15	V_S	8.1	9.0	9.9	V
Supply current	Pin 13-15	I_S		42		mA
Band switch						
Voltage Band A	Pin 8	VSWA	0	0	1.0	V
Voltage Band C	Pin 8	VSWC	3.4	4.0	5.0	V
Switching current	VSW = 5 V Pin 8	ISW			100	µA
SAW filter driver fi = 36 MHz						
Input impedance	Pin 11, 12	ZiSAW		450		Ω
Output impedance	Pin 9, 10	ZoSAW		70		
Voltage gain	11, 12 → Pin 9, 10	GvSAW		17		dB
Band A (note 1)						
Input frequency range	Pin 18	fiA	48		470	MHz
Input impedance	Figure 3 Pin 18	S11A				
Gain (note 4)	Pin I/P to O/P	GA		28		dB
Noise figure DSB (note 2):	Pin I/P to O/P fiA = 50 MHz fiA = 150 MHz	 NF NF		 11.5 12		 dB dB
Input level for (note 3):	Each carrier					
IM3 (interm. of 3rd order	fiA = 71 MHz Pin I/P	ViA		–23		dBm
IM2 (interm. of 2nd order)	fiA = 71 MHz Pin I/P	ViA		–22		dBm
Band B (note 1)						
Input frequency range	Pin 16, 17	fiB	470		860	MHz
Input impedance	Figure 3 Pin 16, 17	S11B			8	
Gain (note 4)	Pin I/P to O/P	GB		32		dB
Noise figure DSB (note 2)	Pin I/P to O/P fiB = 500 MHZ fiB = 800 MHz	 NF NF		 10.5 11.5		 dB dB
Input level for (note 3):	Each carrier					
IM3 (interm. of 3rd order)	fiC = 600 MHz Pin I/P	ViB		–25		dBm

Notes

1) The RF input B is symmetrical driven by means of a hybrid for 180° phase shifting, consequently the source impedance is 100 Ω. All other impedance for RF tests is 50 Ω.
2) The noise figure (NF) is the value for double-side-band measurement.
3) The intermodulation test (2-carrier-method) which is made on IF-centre is in reference to a signal-to-IM ratio of 60 dB.
4) Gain is the ratio of the voltage at the primary coil of L5 to the available voltage at the input.

Test and Principle Application Circuit

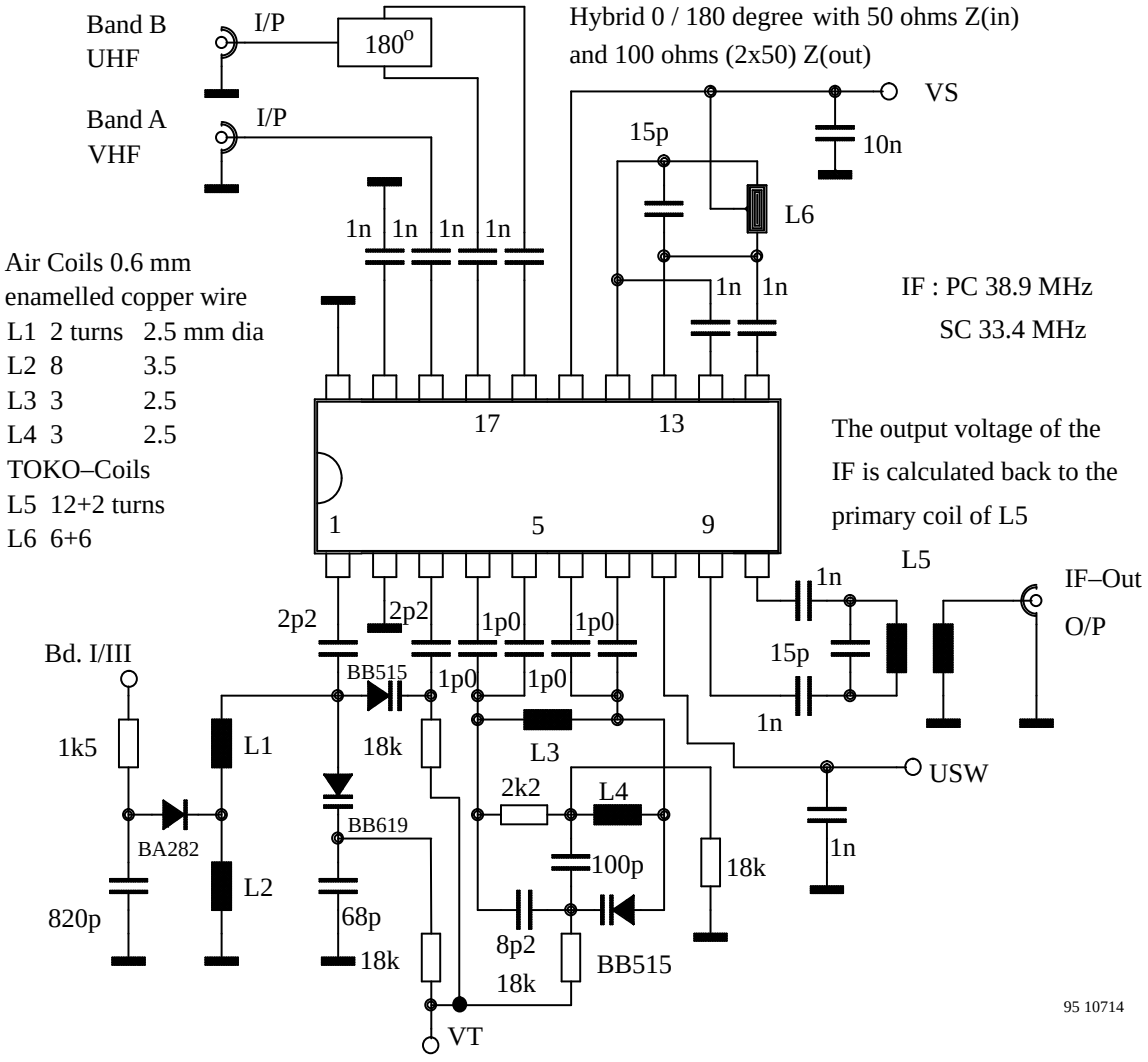


Figure 1. Test and principle application circuit

PCB for the R_{thJA}-Measurement

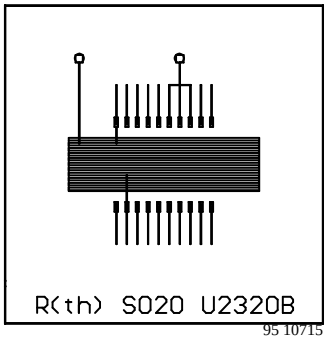


Figure 2. PCB for the R_{thja}-measurement

Input Impedance Mixer Band A (S11A) and B (S11B)

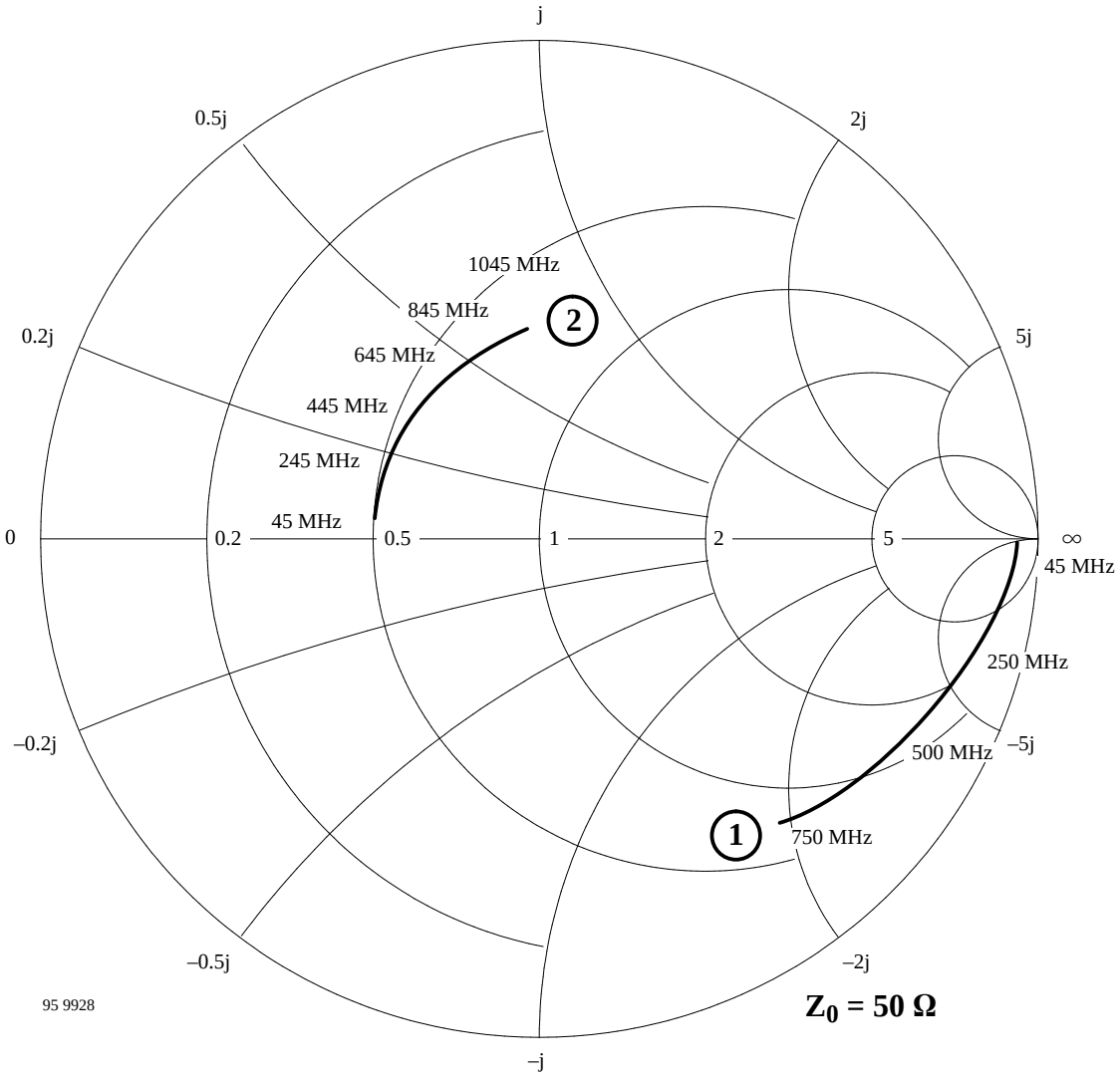


Figure 3. Input impedance mixer band A (S11A) and B (S11B)

1) **VHF-Low**
Normalised to 50 Ω, measuring range 45 MHz to 750 MHz.

2) **VHF-High and UHF**
Normalised to 50 Ω, measuring range 45 MHz to 1045 MHz. Input is driven symmetrical. The output impedance of hybrid is 100 Ω, the measured level is then calculated in reference to 50 Ω.

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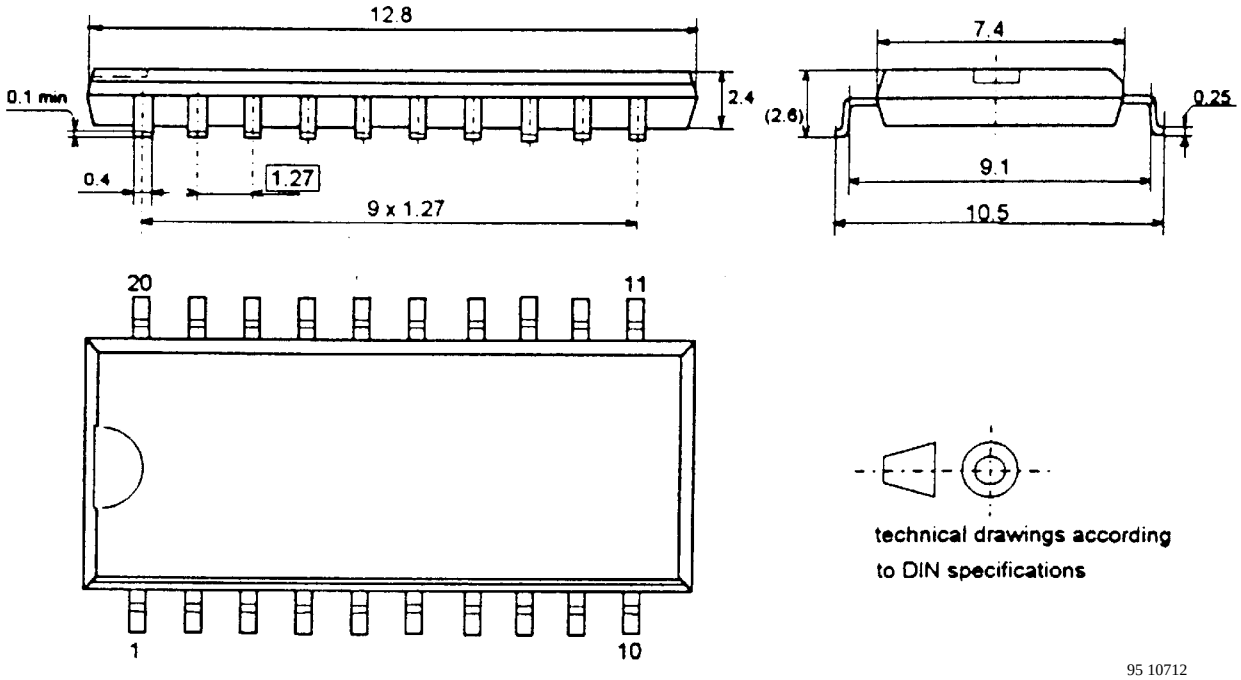
Dimensions in mm:

Package: SO20



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.

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.

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

The Montreal Protocol (1987) and its London Amendments (1990) intend to 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 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

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 ozone depleting substances and do not contain such substances.

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