

**VI TELEFILTER****Filter Specification****TFS 323****1/5****Measurement condition**

Ambient temperature  $T_A$ : 23 °C  
 Input power level: 0 dBm  
 Terminating impedances at  $f_C$  \*):  
   input: 310  $\Omega$ // -4,6 pF  
   output: 330  $\Omega$ // -4,5 pF

**Characteristics**

Remark: Reference level for the relative attenuation  $a_{rel}$  of the **TFS 323** is the minimum of the pass band attenuation  $a_{min}$ . The minimum of the pass band attenuation  $a_{min}$  is defined as the insertion loss  $a_e$ . The centre frequency  $f_C$  is the arithmetic mean value of the upper and lower frequencies at the 3 dB filter attenuation level relative to the insertion loss  $a_e$ . The temperature coefficient of frequency  $TC_f$  is valid for both the reference frequency  $f_C$  and the frequency response of the filter in the operating temperature range.

Data		typ. value	tolerance / limit
<b>Insertion loss</b> (reference level)	$a_e$	10 dB	max. 12 dB
<b>Nominal frequency</b>	$f_N$	-	323 MHz
<b>Centre frequency at ambient temperature</b>	$f_C$	323 MHz	-
<b>Pass band</b>	PB	-	$f_N \pm 0,5$ MHz
<b>Amplitude ripple within PB</b>		0,4 dB	max. 0,8 dB
<b>In band ripple</b> (in any 112,5 kHz increment within the PB)		0,1 dB	max. 0,5 dB p-p
<b>Relative attenuation</b>	$a_{rel}$		
$f_N$ ..... $f_N \pm 0,5$ MHz		0,4 dB	max. 0,8 dB
$f_N \pm 3$ MHz ..... $f_N \pm 20$ MHz		35 dB	min. 30 dB
$f_N \pm 20$ MHz ..... $f_N \pm 40$ MHz		45 dB	min. 40 dB
<b>Group delay at <math>f_N</math></b>		425 ns	max. 500 ns
<b>Group delay ripple</b> in PB (in any 112,5 kHz increment within the PB)		20 ns	max. 120 ns
<b>Phase linearity</b> in PB (in any 112,5 kHz increment within the PB)		0,5 deg p-p	max. 5 deg p-p
<b>Input power level</b>		-	max. 23 dBm**)
<b>Operating temperature range</b>		-	- 40 °C ... + 70 °C
<b>Storage temperature range</b>		-	- 40 °C ... + 100 °C
<b>Turnover temperature <math>T_o</math></b>		21 °C	-
<b>Temperature coefficient of frequency <math>TC_f</math>***</b>		- 0,04 ppm / K <sup>2</sup>	-

\*) The terminating impedances depend on parasitics and q-values of matching elements and the board used, and are to be understood as reference values only. Should there be additional questions, do not hesitate to ask for an application note or contact our design team.

\*\*\*) This power level is only allowed for short term operation (10% of the life time), the max. input power for continuous operation is only max. 15dBm

\*\*\*\*)  $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T-T_0)^2 \times f_{T0}(\text{MHz})$

**generated:**

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**checked / approved:**

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**VI TELEFILTER**

**Potsdamer Straße 18**

**D 14 513 TELTOW / Germany**

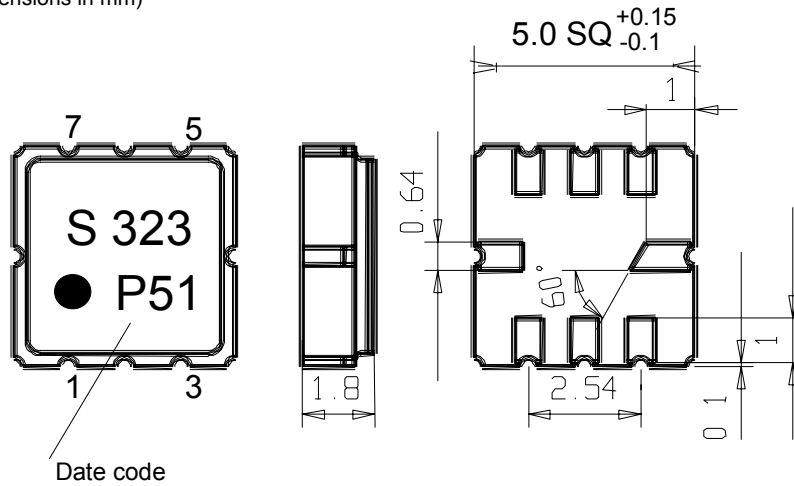
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**Construction and pin connection**

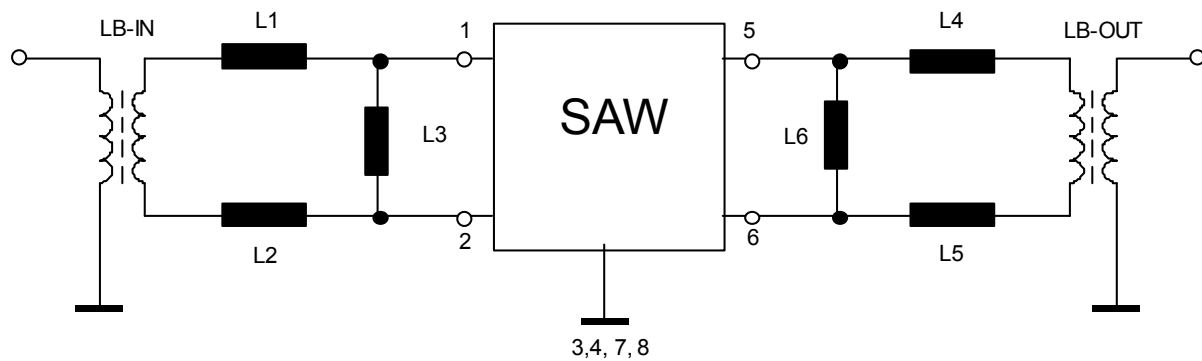
(All dimensions in mm)



Date code

Pin 1	input	Pin 5	output
Pin 2	input	Pin 6	output
Pin 3	ground	Pin 7	ground
Pin 4	package ground	Pin 8	package ground

date code:	year + week
M	2000
N	2001
P	2002
.....	

**50 Ω matching network :****VI TELEFILTER**

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**VI TELEFILTER****Filter Specification****TFS 323****3/5****Stability Characteristics**

After the following tests the filter shall meet the whole specification:

1. Shock: 500g, 18 ms, half sine wave, 3 shocks each plane;  
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 500 Hz, 0,35 mm or 5g respectively, 1 octave per min, 10 cycles per plan, 3 plans;  
DIN IEC 68 T2 - 6
3. Change of temperature: -55 °C to 125°C / 30 min. each / 10 cycles  
DIN IEC 68 part 2 – 14 Test N
4. Resistance to solder heat (reflow): reflow possible: twice max.;  
for temperature conditions, please refer to the attached "Air reflow temperature conditions" on page 4;

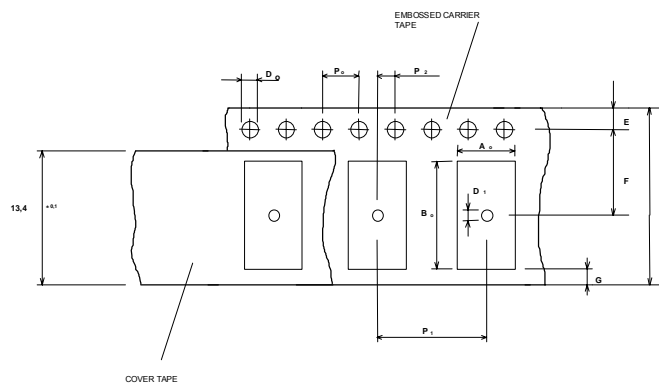
**Packing**

Tape & Reel: DIN IEC 286 – 3, with exception of value for N and minimum bending radius;  
tape type II, embossed carrier tape with top cover tape on the upper side;

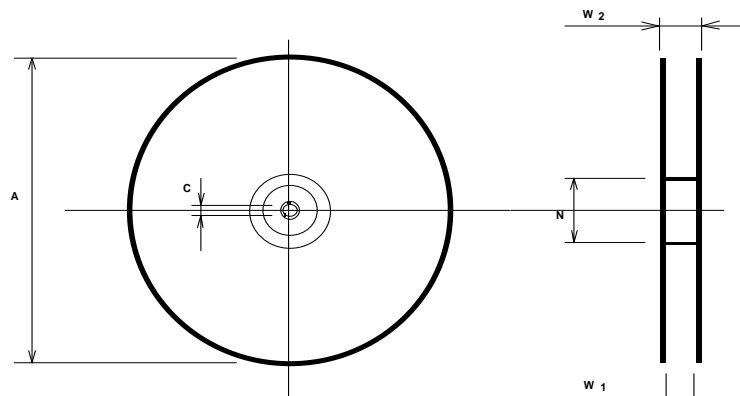
max. pieces of filters per reel:	3000
reel of empty components at start:	min 300 mm
reel of empty components at start including leader:	min 500 mm
trailer	min 300 mm

**Tape (all dimensions in mm)**

W : 12 ± 0,3  
 Po : 4 ± 0,1  
 Do : 1,5 + 0,5  
 D1 : 1,5 + 0,5  
 E : 1,75 ± 0,1  
 F : 7,5 ± 0,1  
 G (min) : 0,75  
 P2 : 2 ± 0,05  
 P1 : 8 ± 0,1  
 D1 (min) : 1,5  
 Ao : 5,3 ± 0,1  
 Bo : 5,3 ± 0,1

**Reel (all dimensions in mm):**

A : 330  
 W1 : 12,4 + 2  
 W2 (max) : 18,4  
 N (min) : 50  
 C : 13 + 0,2 / -0,5



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. Markings on the filters can be read if the upper side of the carrier tape is regarded with the sprocket holes on its right.

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## Air reflow temperature conditions

1st and 2nd air reflow profile

<b>Name:</b>	pre-heating periods	main-heating periods	peak temperature
<b>Temperature:</b>	150 °C - 170 °C	over 200 °C	255 °C ± 5 °C
<b>Time:</b>	60 sec. - 90 sec.	20 sec. - 25 sec.	

## Air reflow profile

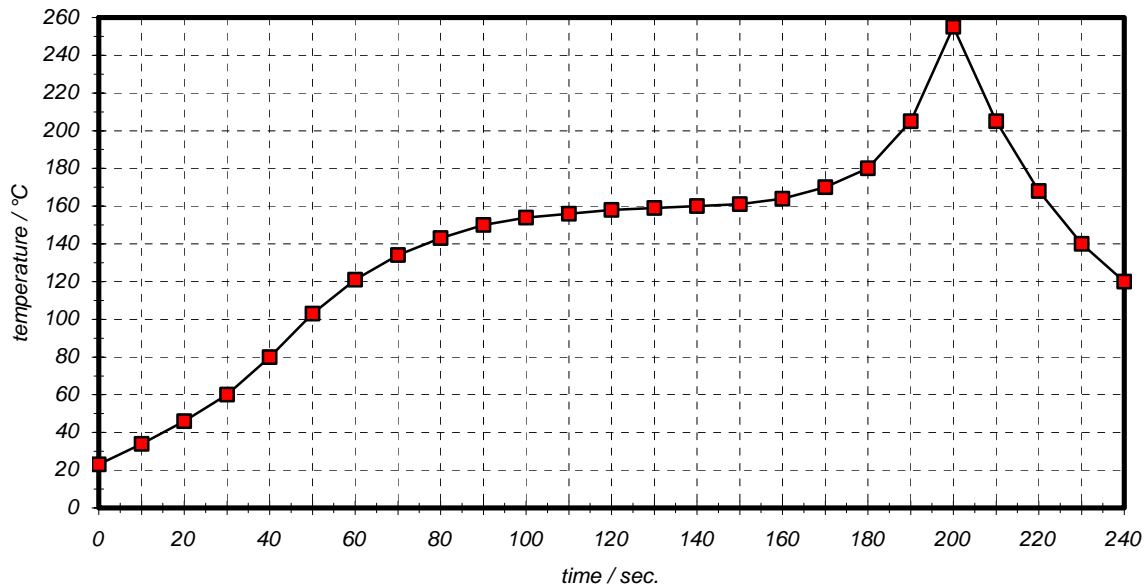


Table for temperature vs. time during the air reflow process

Tolerance of temperatures: ± 5 °C

time / sec.	temperature / °C	time / sec.	temperature / °C
0	23	140	160
10	34	150	161
20	46	160	164
30	60	170	170
40	80	180	180
50	103	190	205
60	121	195	230
70	134	200	255
80	143	205	230
90	150	210	205
100	154	215	180
110	156	220	165
120	158	230	140
130	159	240	120

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**VI TELEFILTER****Filter Specification****TFS 323****5/5**

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**History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	- generate specification according to customer requirements	Pfeiffer	16.10.2002
1.1	- change limit of insertion loss	Pfeiffer	17.10.2002
1.2	- typical values added - terminated impedance added - triple transit suppression removed	Pfeiffer	19.12.2002

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