

**VI TELEFILTER****Filter specification****TFS 230****1/5****Measurement Condition**

Ambient Temperature:	23 °C
Input Power Level:	0 dBm
Source impedance:	50 Ω
Load impedance:	50 Ω
Terminating impedances:	
input:	2,0 kΩ    -4,7 pF
output:	1,4 kΩ    -4.9 pF

**Characteristics****Remark:**

Reference level for the relative attenuation  $a_{rel}$  is the minimum pass band attenuation  $a_{min}$ . It is defined as the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed to 230,0 MHz. The centre frequency  $f_C$  is the arithmetic mean value of the upper and lower frequencies at the 1,2 dB filter attenuation level relative to the insertion loss  $a_e$ . The given values for the insertion loss, the relative attenuation  $a_{rel}$  and the group delay ripple have to be reached at the frequencies given below also if the centre frequency  $f_C$  is shifted due to the temperature coefficient of frequency  $TC_f$  in the operating temperature range and due to a production tolerance for the centre frequency  $f_C$ .

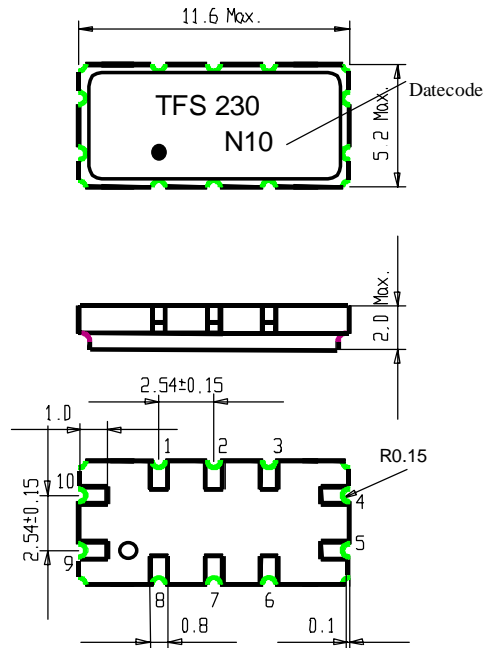
<b>D a t a</b>		<b>typ. Value</b>	<b>Limit</b>
<b>Insertion Loss</b> (Reference level)	$a_e = a_{min}$	13,0 dB	max. 14,5 dB
<b>Nominal Frequency</b>	$f_N$	-	230,0 MHz
<b>1.2 dB - Bandwidth</b>	BW	4,2 dB	min. 3,9 MHz
<b>Pass Band Ripple</b> $f_N \pm 1,950$ MHz		0,7 dB	max. 1,2 dB
<b>Relative Attenuation</b>	$a_{rel}$		
$f_N \pm 3,0$ MHz ... $f_N \pm 5,0$ MHz		30 dB	min. 18 dB
$f_N \pm 5,0$ MHz ... $f_N \pm 10,0$ MHz		47 dB	min. 45 dB
$f_N \pm 10,0$ MHz ... $f_N \pm 100,0$ MHz		57 dB	min. 50 dB
<b>Group delay ripple</b> $f_N \pm 1,950$ MHz	$\varphi$	100 ns	max. 150 ns
<b>VSWR</b> $f_N \pm 1,950$ MHz		1,8:1	max. 2:1
<b>Operating Temperature Range</b>			- 30 °C ... + 80 °C

**Generated:** \_\_\_\_\_**Checked / approved:** \_\_\_\_\_

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**VI TELEFILTER****Filter specification****TFS 230****2/5****Construction and pin connection**

1	Ground
2	Ground
3	Ground
4	Output RF Return
5	Output
6	Ground
7	Ground
8	Ground
9	Input RF- Return
10	Input

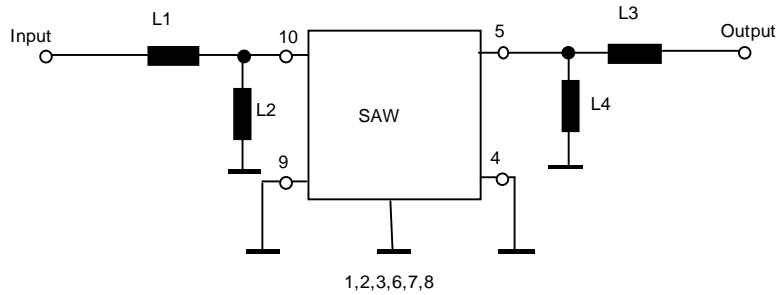
Datecode: Year+week

L 1999

M 2000

N 2001

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**50 Ω test circuit**

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**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. Damp heat: 25 °C to 55°C / 95% r.H. / 10 cycles  
(cycle) DIN IEC 68 - 2 – 30 Db
4. Resistance to solder heat (reflow): max. 2 times reflow process;  
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

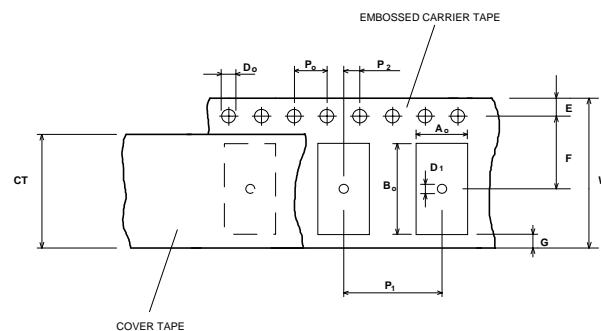
**Packing**

Tape & Reel: 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;

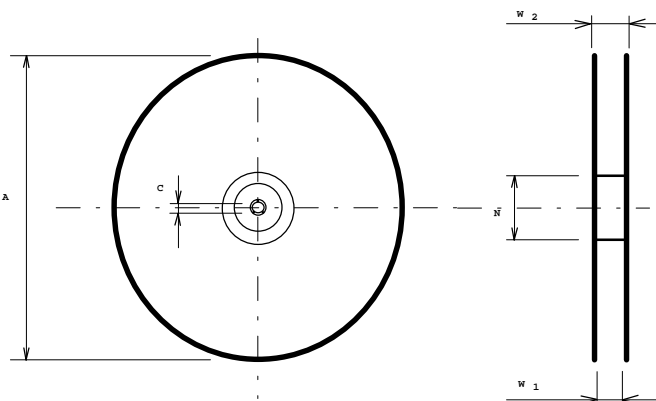
max. pieces of filters per reel: 3000  
reel of empty components at start: min 300 mm  
reel of empty components at start including leader: min 500 mm  
trailer: min 300 mm

**Tape (all dimensions in mm)**

W : 24 ± 0,3  
Po : 4 ± 0,1  
Do : 1,5 + 0,1  
E : 1,75 ± 0,1  
F : 7,5 ± 0,1  
G (min) : 0,6  
P2 : 2 ± 0,1  
P1 : 8 ± 0,1  
D1(min) : 1,5  
Ao : 5,6 ± 0,1  
Bo : 11,8 ± 0,1  
CT : 21,5 ± 0,1

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

A : 330  
W1 : 24,4 +2  
W2 (max) : 30,4  
N (min) : 60  
C : 13 +0,5/-0,2



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. The marking of the filters is able to read if the view is directed on the upper side of the carrier tape with the sprocket holes on the right side of the tape.

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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.	

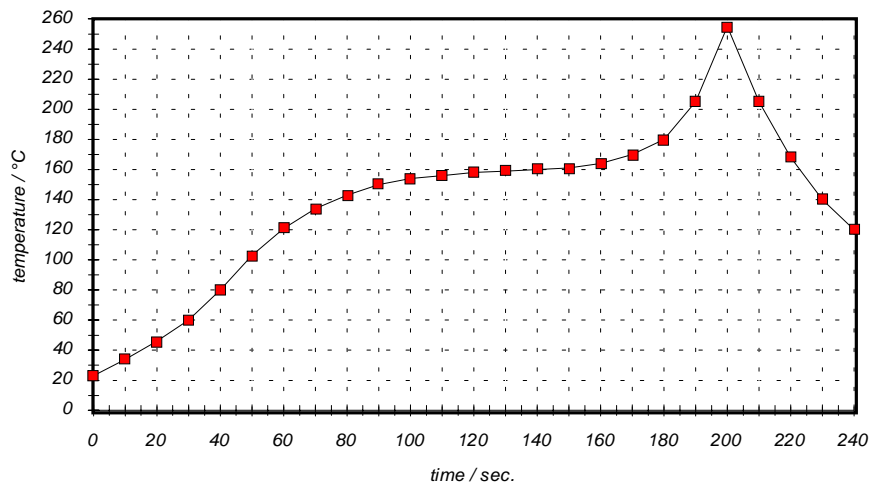
**Chip-mount air reflow profile**

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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**History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.2	- modified package	Steiner	07.04.2000
1.3	loss changed from 17dB to 14,5 dB package changed from 13x6mm to 11x5mm	Steiner	23.05.2000
2.0	extended specification - tape and reel information added - airflow profile information added - terminating impedances added - loss definition corrected	Steiner	08.03.2001

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