

VI TELEFILTER

Filter specification

TFS 225E

1/5

Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedances at f_C *: input: 940 Ω // -5,7 pF
output: 940 Ω // -5,7 pF

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of TFS 225E is the minimum of the pass band attenuation a_{min} . This value 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 1 dB filter attenuation level relative to the insertion loss a_e . The given values for the relative attenuation a_{rel} and the group delay ripple have to be reached at the frequencies given below, even 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 .

D a t a		typ. value		limit	
Insertion loss	$a_e = a_{min}$	6,5	dB	min. 4,5 max. 8	dB
Nominal frequency	f_N	-		225	MHz
Centre frequency	f_C	225	MHz	-	
Relative attenuation a_{rel}					
$f_N - 0,2$ MHz ... $f_N + 0,2$ MHz		0,5	dB	max. 1	dB
$f_N \pm 0,6$ kHz ... $f_N \pm 1,2$ MHz		15	dB	min. 8	dB
$f_N \pm 1,2$ MHz ... $f_N \pm 1,8$ MHz		27	dB	min. 20	dB
$f_N \pm 1$ MHz ... $f_N - 1,8$ MHz		35	dB	min. 30	dB
$f_N + 1,8$ MHz ... $f_N + 7$ MHz		35	dB	min. 30	dB
$f_N + 7$ MHz ... $f_N + 1$ GHz		52	dB	min. 45	dB
Group delay ripple	in $f_N - 200$ kHz ... $f_N + 200$ kHz	85	ns	max. 350	ns
Operating temperature range		-		- 20 °C...+ 80 °C	
Storage temperature range		-		- 35 °C... + 85 °C	
Temperature coefficient	TC **	- 0,04	ppm/K ²	-	
Frequency inversion temperature	T_0	35	°C	-	
Input power level		-		max. + 10	dBm

*) 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

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

generated:

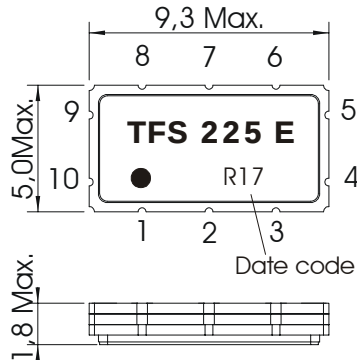
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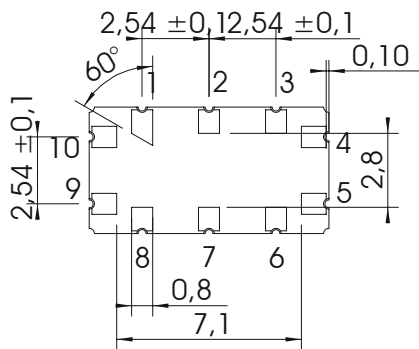
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Construction and pin connection

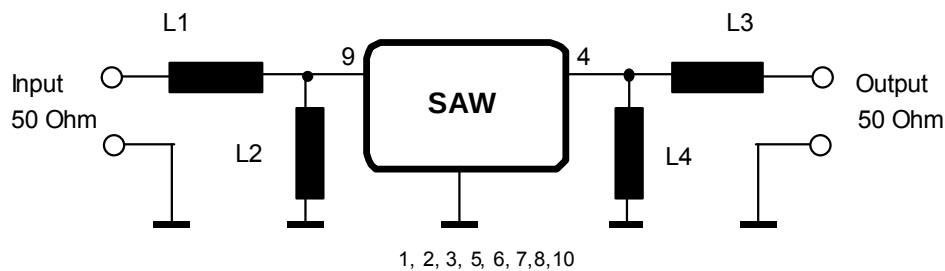
(All dimensions in mm)



1	ground
2	ground
3	ground
4	output
5	output rf return
6	ground
7	ground
8	ground
9	input
10	input rf return



date code	year + week
N	2001
P	2002
R	2003
...	

50 Ω test circuit

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 refer to the attached "Air reflow temperature conditions" on page 4;

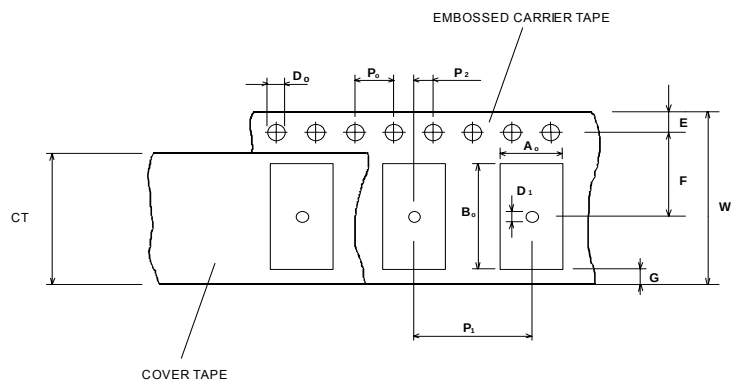
Packing

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;

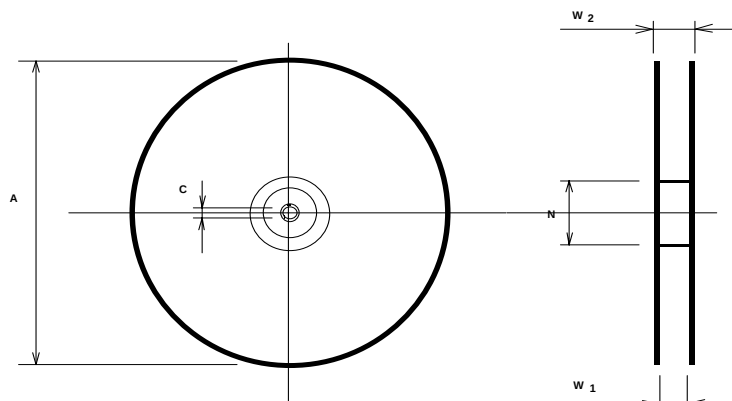
max. pieces of filters per reel: 3000
reel of empty components at start: min 300 mm
reel of empty components at start including leader: min 500 mm
trailer: min 300 mm

Tape (all dimensions in mm)

W : 16 ± 0,3
Po : 4 ± 0,1
Do : 1,5 ± 0,1
E : 1,75 ± 0,1
F : 7,5 ± 0,1
G (min) : 0,60
P2 : 2 ± 0,1
P1 : 8 ± 0,1
D1(min) : 1,5
Ao : 5,30 ± 0,1
Bo : 9,70 ± 0,1
CT : 13,5 ± 0,1

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

A : 330
W1 : 16,40 ± 2,0
W2 (max) : 22,4
N (min) : 50
C : 13,0 ± 0,5/-0,2



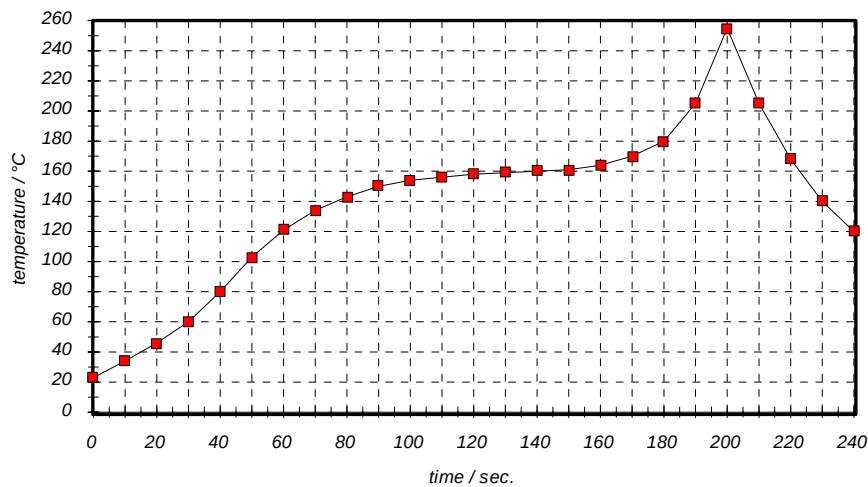
The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. Markings on the filters can be read if the upper side of the carrier tape is regarded with the sprocket holes on its right.

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Air reflow temperature conditions**1st and 2nd air reflow profile**

Name:	pre-heating periods	main-heating periods	peak temperature
Temperature:	150 °C - 170 °C	over 200 °C	255 °C ± 5 °C
Time:	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

VI TELEFILTER**Filter specification****TFS 225E****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- generate specification	Pfeiffer	13.09.2002
1.1	- terminating impedance added (preliminary values) - typical values added	Pfeiffer	07.02.2003
1.2	- terminating impedance fixed	Pfeiffer	25.04.2003

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