

**VI TELEFILTER****Filter specification****TFS 70AS****1/5****Measurement condition :**

Ambient temperature  $T_A$ : 23 °C  
 Input power level: 0 dBm  
 Terminating impedances at  $f_C$  \*) :  
 for input: 144  $\Omega$  || -19,8 pF  
 for output: 200  $\Omega$  || -23,1 pF

**Characteristics**

## Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS 70AS 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 nominal frequency  $f_N$  is fixed at 70 MHz. The values for relative attenuation are guaranteed at ambient temperature. The frequency shift of the filter over temperature defined by the temperature coefficient of frequency  $T_{Cf}$  is not included in the production tolerance scheme.

<b>D a t a</b>		<b>typ. value</b>		<b>tolerance / limit</b>	
<b>Insertion loss :</b> ( reference level )	<b><math>a_e</math></b>	10	dB	max. 11	dB
<b>Nominal frequency :</b>	<b><math>f_N</math></b>	-		70	MHz
<b>Centre frequency :</b>	<b><math>f_C</math> at ambient temperature (<math>f_{CTA}</math>)</b>	70	MHz		
<b>Pass band :</b>	<b>PB</b>	-		$f_N \pm 4,5$	MHz
<b>Relative attenuation :</b>	<b><math>a_{rel}</math></b>				
$f_N$ ... $f_N \pm 3,5$ MHz		1,0	dB	max. 1,5	dB **
$f_N \pm 3,5$ MHz ... $f_N \pm 4,0$ MHz		1,8	dB	max. 3	dB
$f_N \pm 5,0$ MHz ... $f_N \pm 8,0$ MHz		25	dB	min. 20	dB
$f_N \pm 8,0$ MHz ... $f_N \pm 50$ MHz		38	dB	min. 35	dB
<b>Group delay ( mean value in PB ) : **/***</b>		2,0	$\mu$ s	max. 2,2	$\mu$ s
<b>Group delay ripple (p-p) in PB : **/***</b>		150	ns	max. 300	ns
<b>Temperature coefficient of frequency ( <math>T_{Cf}</math> )</b>		- 72	ppm/K	-	
<b>Frequency deviation of <math>f_C</math> over temperature</b>		$\Delta f_C(\text{Hz}) = T_{Cf}(\text{ppm/K}) \times (T - T_{CTA}) \times f_{CTA}(\text{MHz})$			
<b>Operating temperature range</b>	<b>OTR</b>			- 40 °C ... + 80 °C	
<b>Storage temperature range</b>				- 40 °C ... + 85 °C	

\*) 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.

\*\*) A cascade of TFS70AR and TFS70AS will have triple transit signal cancellation offering reduced group delay and amplitude ripple of the cascade.

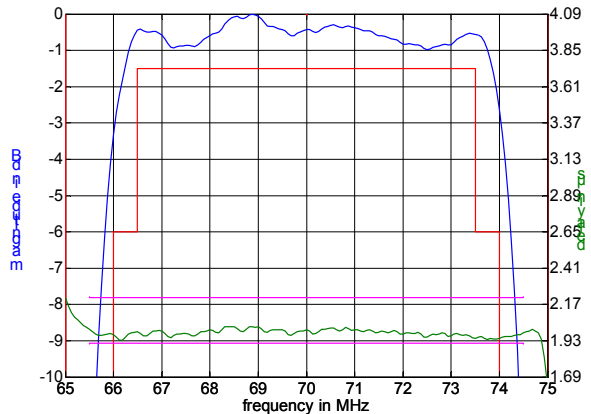
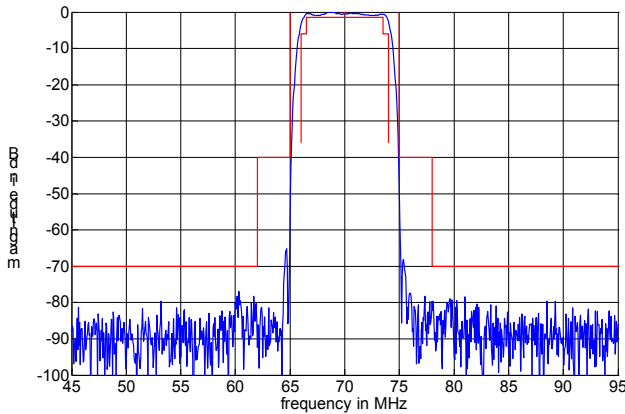
\*\*\*\*) for a cascade of TFS 70AR and TFS70AS

**Generated:****Checked / Approved:**

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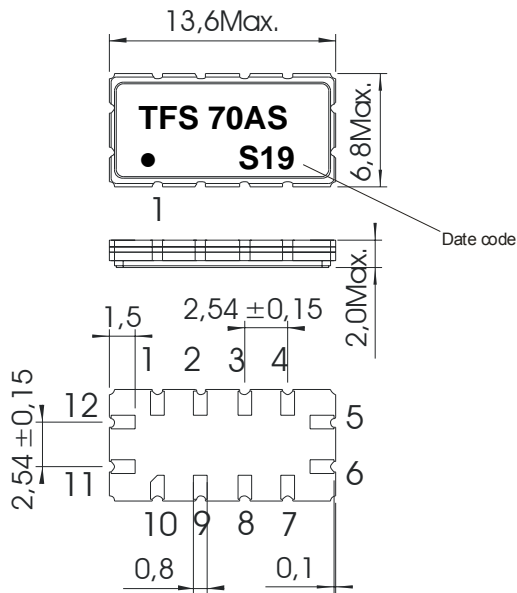
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**Filter characteristic cascade of TFS70AR and TFS70AS**



**Construction and pin connection**

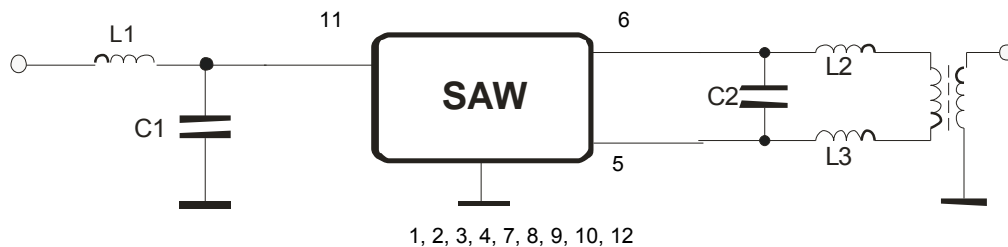
(All dimensions in mm)



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

Date code: Year + week  
 S 2004  
 T 2005  
 U 2006  
 ...

**50 Ohm Test circuit**



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**Stability characteristics**

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

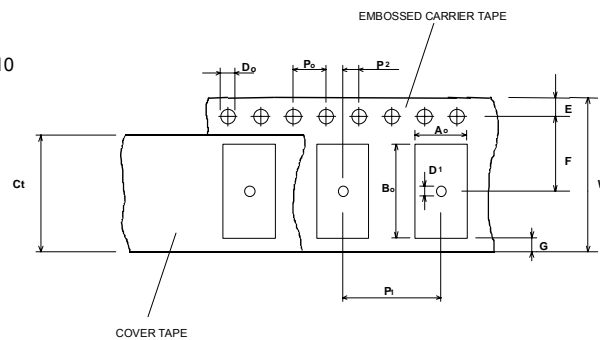
1. Shock: 500g, 18 ms, half sine wave, 3 shocks each plane;  
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 500 Hz, 0,35 mm or 5 g respectively, 1 octave per min, 10 cycles per plan, 3 plans;  
DIN IEC 68 T2 - 6
3. Change of temperature: -55 °C to 125°C / 30 min. each / 10 cycles  
DIN IEC 68 part 2 – 14 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 peer reel:                   | 1700        |
| reel of empty components at start:                  | min. 300 mm |
| reel of empty components at start including leader: | min. 500 mm |
| trailer:  | min. 300 mm |

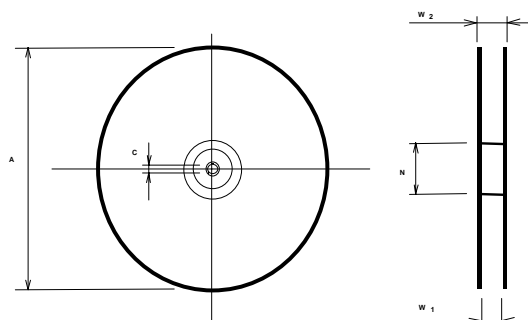
**Tape (all dimensions in mm)**

- W : 24,00 +0,30/-0,10
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,10
- F : 11,50 ± 0,10
- G(min) : 0,60
- P2 : 2,00 ± 0,1
- P1 : 12,00 ± 0,1
- D1(min) : 1,50
- Ao : 7,10 ± 0,10
- Bo : 13,90 ± 0,10
- Ct : 21,5 ± 0,1



**Reel (all dimensions in mm)**

- A : 330
- W1 : 24,4 +2/-0
- W2(max) : 30,4
- N(min) : 60
- 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. Marking of the filters can be read if the upper side of the carrier tape is regarded with the sprocket holes on the 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.	

**Chip-mount air reflow profile**

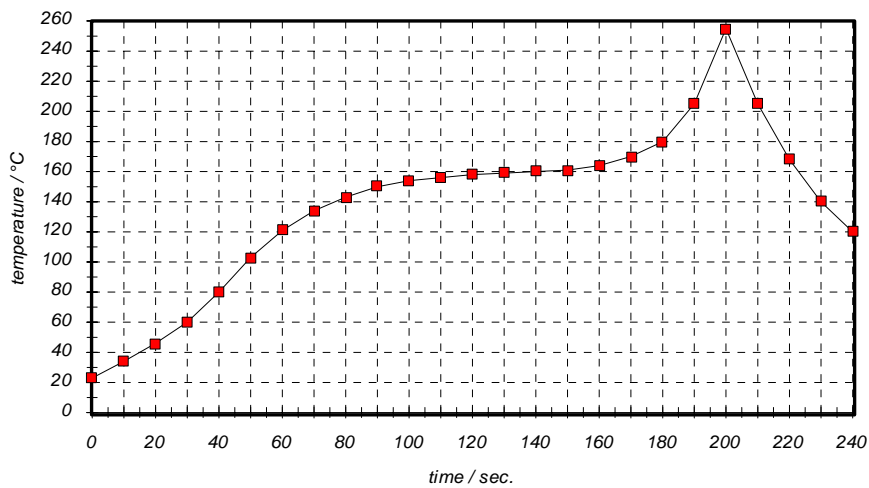


Table for temperature vs. time during the air reflow process

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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**VI TELEFILTER****Filter specification****TFS 70AS****5/5**

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**History :**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	generating specification according to customer requirements	Pfeiffer	03.05.2004

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