

**VI TELEFILTER**

**Filter specification**

**TFS 70E**

**1/5**

**Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	50 Ω	matching network
Output:	50 Ω	matching network

**Characteristics**

Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS 70E is the minimum of the pass band attenuation. This value is defined as the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 70,2 MHz without any tolerance. The values of relative attenuation  $a_{rel}$  are guaranteed for the whole operating temperature range. The frequency shift of the filter in the operating temperature range is 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)	$a_e$	5,0	dB	max.	7,0	dB
<b>Nominal frequency</b>	$f_N$	-			70,2	MHz
<b>Centre frequency</b>	$f_c$	70,2	MHz	70,2	± 0,1	MHz
<b>Passband</b>	PB	-		$f_N$	± 350	kHz
<b>Bandwidth</b>						
3 dB		900	kHz	min.	700	kHz
<b>Relative attenuation</b>	$a_{rel}$					
$f_c \pm 350,0$ kHz		2	dB	max.	3	dB
$f_c + 1,15$ MHz ... $f_c + 1,65$ MHz		26	dB	min.	20	dB
$f_c - 1,20$ MHz ... $f_c - 1,65$ MHz		26	dB	min.	20	dB
$f_c + 1,65$ MHz ... $f_c + 2,00$ MHz		38	dB	min.	35	dB
$f_c - 1,65$ MHz ... $f_c - 3,00$ MHz		38	dB	min.	35	dB
<b>Group delay</b> at $f_N$		1,35	µs		-	
<b>Group delay ripple</b> in PB	p-p	250	ns	max.	350	ns
<b>Input power level</b>		-		max.	0	dBm
<b>Permissible DC voltage</b>		-		max.	12	V
<b>Operating temperature range</b>	OTR	-			0 °C ... + 70 °C	
<b>Storage temperature range</b>		-			-40 °C ... + 85 °C	
<b>Temperature coefficient of frequency</b>	$TC_f^{**}$	-72	ppm/K		-	

\*) Please refer to the application another more details. Should there be additional questions do not hesitate to ask for an application note or contact our design team.

\*\*\*)  $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_0) \times f_{T_0}(\text{MHz})$ .

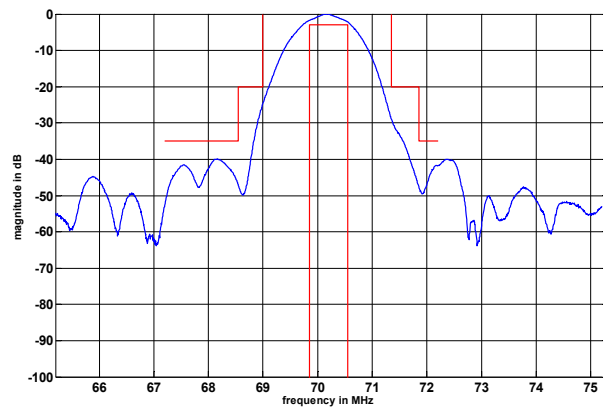
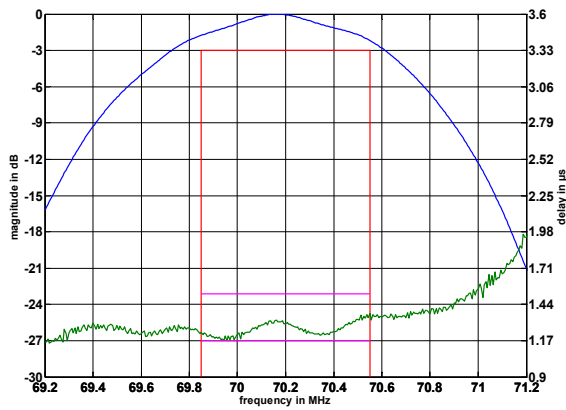
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**Checked / Approved:**

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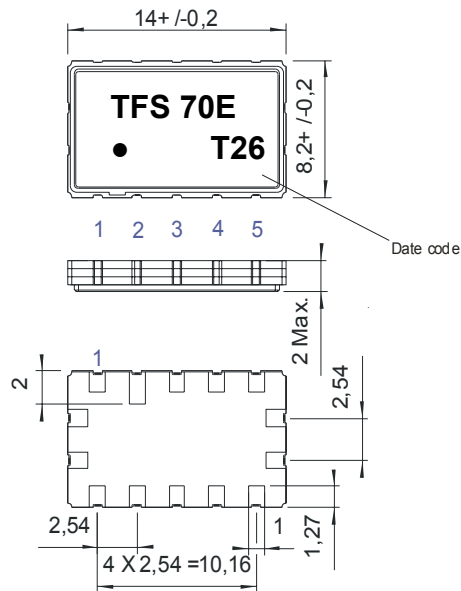
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**Filter characteristic**



**Construction and pin connection**

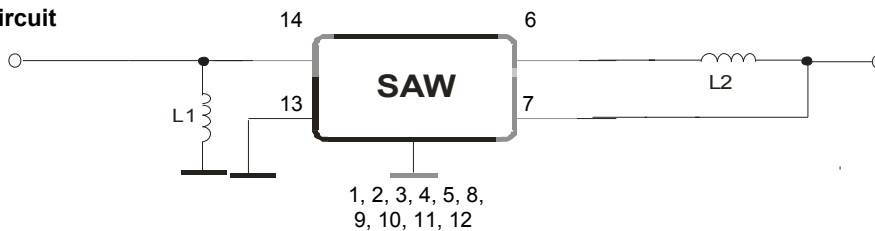
(All dimensions in mm)



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

Date code: Year + week  
 T 2005  
 U 2006  
 V 2007  
 ...

**50 Ω Test circuit**



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**Stability characteristics**

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

1. Shock: 500g, 1 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;

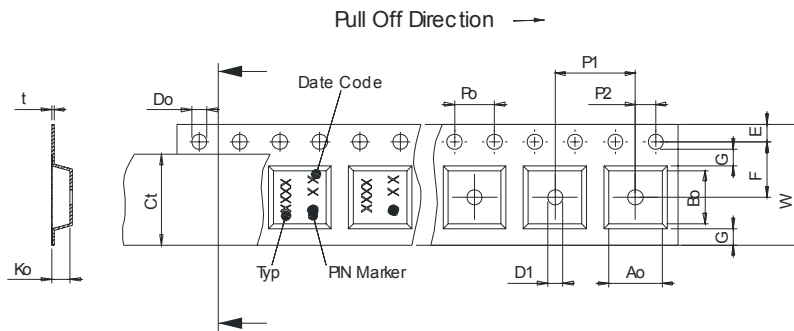
**Packing**

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:	1500
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

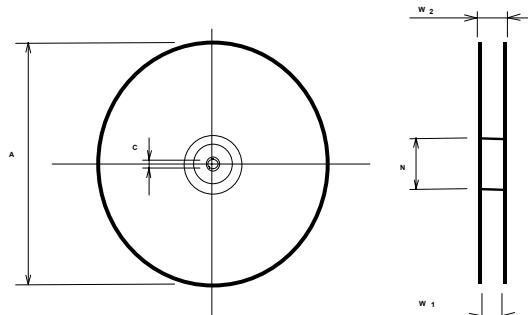
**Tape (all dimensions in mm)**

- W : 24,00
- Po : 4,00
- Do : 1,50
- E : 1,75
- F : 11,50
- G(min) : 0,60
- P2 : 2,00
- P1 : 12,00
- D1(min) : 1,50
- Ao : 8,80
- Bo : 14,60
- Ct : 21,5



**Reel (all dimensions in mm)**

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



The minimum bending radius is 45 mm.

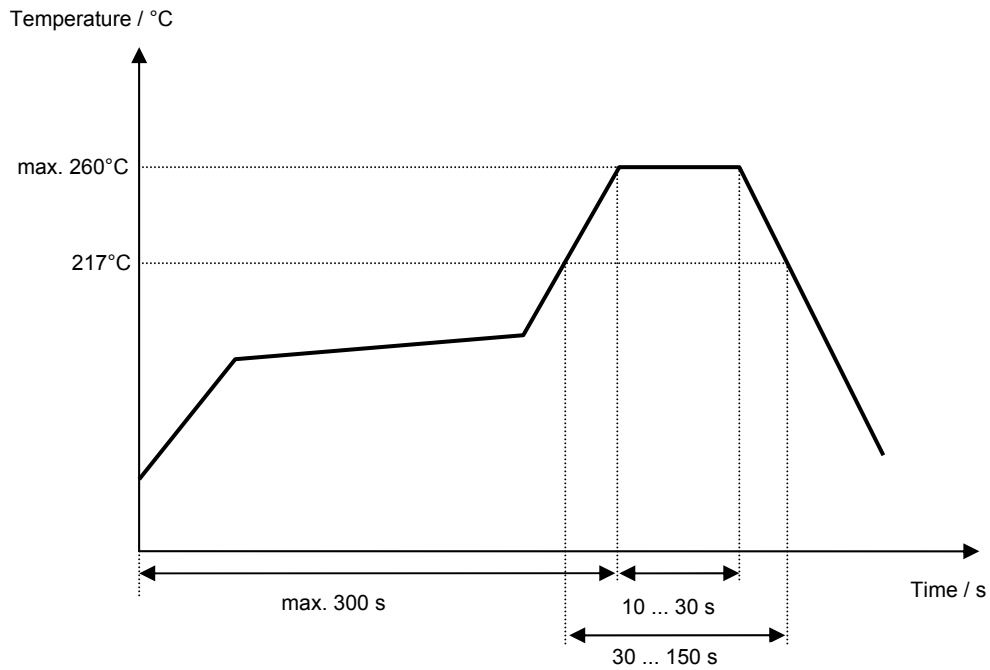
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**Air reflow temperature conditions**

Conditions	Exposure
Average ramp-up rate (30°C to 217°C)	less than 3°C/second
> 100°C	between 300 and 600 seconds
> 150°C	between 240 and 500 seconds
> 217°C	between 30 and 150 seconds
Peak temperature	max. 260°C
Time within 5°C of actual peak temperature	between 10 and 30 seconds
Cool-down rate (Peak to 50°C)	less than 6°C/second
Time from 30°C to Peak temperature	no greater than 300 seconds

**Chip-mount air reflow profile**



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**VI TELEFILTER****Filter specification****TFS 70E****5/5****History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
2.1	- change date code - add terminating impedance	Strehl	29.06.2005

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