

**VI TELEFILTER**

**Filter specification**

**TFS 160G**

**1/5**

**Measurement condition**

Ambient temperature:	25	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	29 Ω	-6,0 pF
Output:	78 Ω	0 pF

**Characteristics**

Remark:

The nominal frequency  $f_N$  is fixed at 160 MHz. The insertion loss  $a_e$  is defined as loss value determined at  $f_N$ . Reference level for the relative attenuation  $a_{rel}$  of the TFS 160G is the insertion loss  $a_e$ . The centre frequency  $f_C$  is the arithmetic mean value of the upper and lower frequencies at the 35 dB filter attenuation level relative to the insertion loss  $a_e$ . All specified data are met within the operating temperature range.

<b>D a t a</b>		<b>typ. value</b>		<b>tolerance / limit</b>		
<b>Insertion loss</b> (reference level)	$a_e$	22,8	dB	max.	24	dB
<b>Nominal frequency</b>	$f_N$	-			160,0	MHz
<b>Centre frequency</b>	$f_C^{**}$	160,0	MHz	max.	± 120	kHz
<b>Passband</b>	PB	-		$f_C$	± 9,4	MHz
<b>Pass band ripple (p-p)</b>		0,5	dB	max.	1	dB
<b>Bandwidth</b>	BW					
1 dB		19,2	MHz	min.	18,8	MHz
3 dB		19,7	MHz	min.	19,5	MHz
35 dB		21,6	MHz	max.	21,7	MHz
50 dB		21,9	MHz	max.	22,0	MHz
<b>Relative attenuation</b>	$a_{rel}$					
$f_C$	$f_C \pm 9,4$ MHz	0,5	dB	max.	1	dB
$f_C \pm 9,4$ MHz	$f_C \pm 9,7$ MHz	2	dB	max.	3	dB
$f_C \pm 10,8$ MHz	$f_C \pm 11$ MHz	38	dB	min.	35	dB
$f_C - 140$ MHz	$f_C - 11$ MHz	54	dB	min.	50	dB
$f_C + 11$ MHz	$f_C + 400$ MHz	52	dB	min.	48	dB
<b>Group delay ripple within PB (p-p)</b>		40	ns	max.	200	ns
<b>Operating temperature range</b>	OTR	-			- 25 °C ... + 80 °C	
<b>Storage temperature range</b>		-			- 40 °C ... + 85 °C	
<b>Temperature coefficient of frequency</b>	$TC_f^{***}$	-75	ppm/K		-	

\*) 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.

\*\*) at ambient temperature

\*\*\*)  $\Delta f_C(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_A) \times f_{CAT}(\text{MHz})$

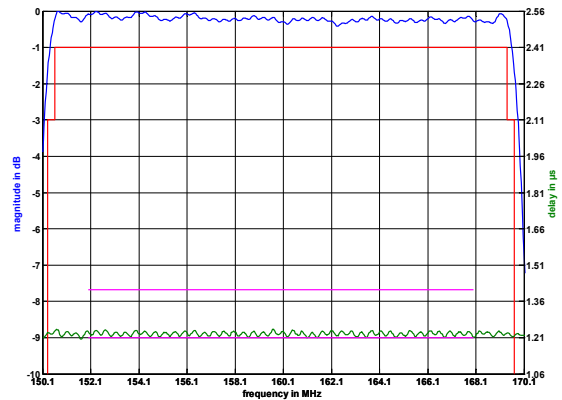
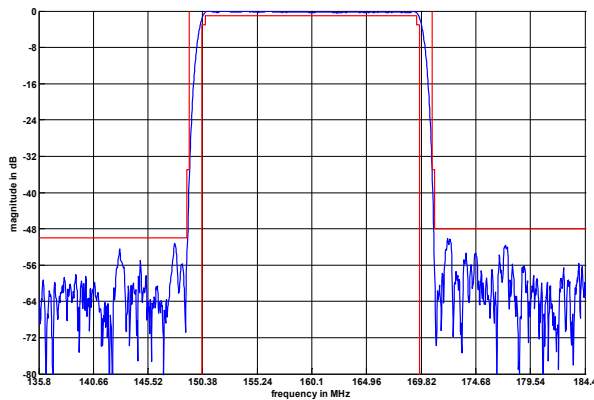
**Generated:**

**Checked / Approved:**

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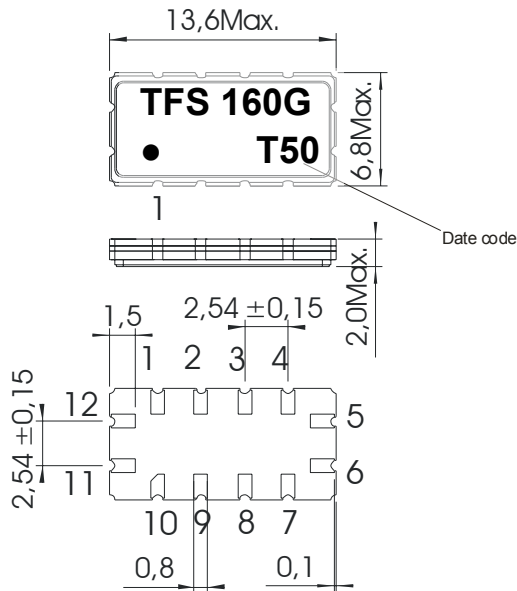
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**Filter characteristic**



**Construction and pin connection**

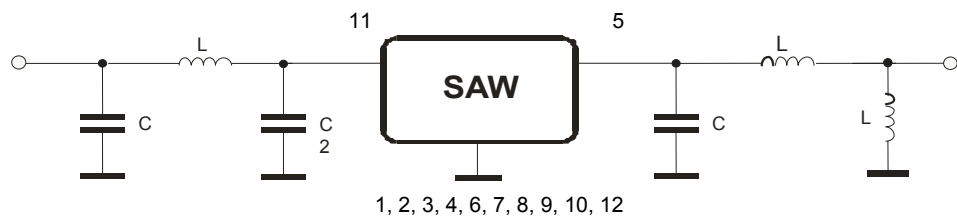
(All dimensions in mm)



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

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

**50 Ω Test circuit**



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**Stability characteristics, reliability**

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;

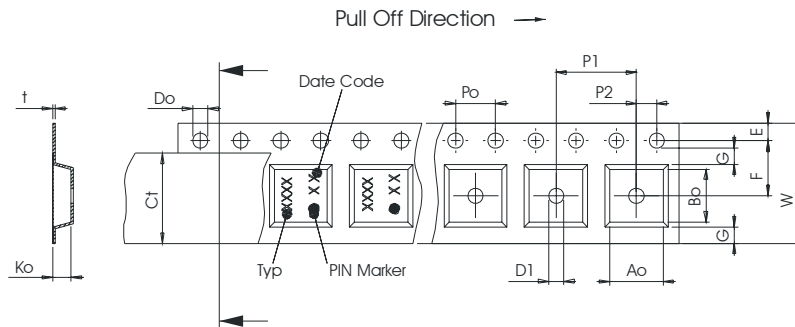
This filter is RoHS compliant (2002/95/EG, 2005/618/EG)

**Packing**

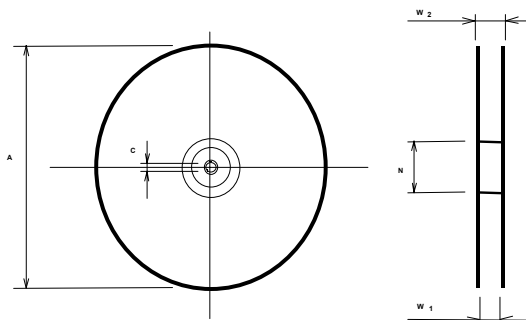
Tape & Reel: IEC 286 – 3, with exeption of value for N and minimum bending radius;  
tape type II, embossed carrier tape with top cover tape on the upper side;

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.

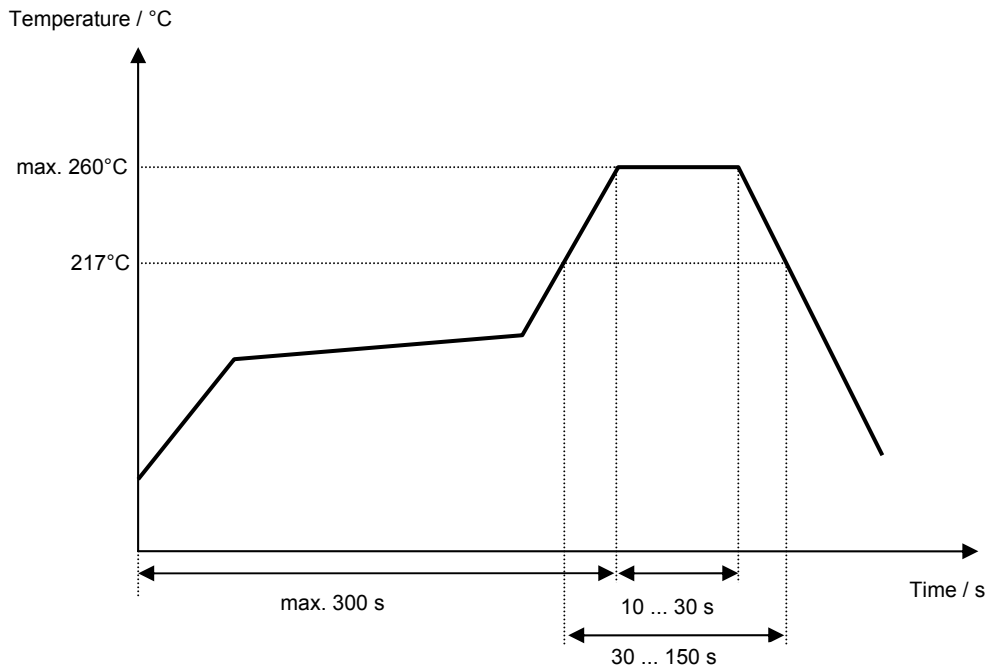
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**Air reflow temperature conditions**

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 160G****5/5****History**

<b>Version</b>	<b>Reason of changes</b>	<b>Name</b>	<b>Date</b>
1.0	- Generation of development specification	Strehl	24.05.2005
1.1	- terminating impedance, typical values, filter characteristic and matching configuration added - limits for relative attenuation in $f_c + 11$ MHz... $f_c + 400$ MHz changed to 48dB	Pfeiffer	28.10.2005
1.2	- limits of insertion loss, centre frequency and relative attenuation changed - stability characteristics modified	Pfeiffer	09.12.2005

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