

**VI TELEFILTER**

**Filter specification**

**TFS 1220B**

**1/5**

**Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	200	Ω
Output:	200	Ω

**Characteristics**

**Remark:**

The reference level for the relative attenuation  $a_{rel}$  of the TFS 1220B 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 1220,0 MHz without any tolerance. The centre frequency  $f_C$  is the arithmetic mean value of the upper and lower frequencies at the 3 dB filter attenuation level relative to the insertion loss  $a_e$ . 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)	$a_e = a_{min}$	2,1	dB	max.	4,0 dB
<b>Nominal frequency</b>	$f_N$	-		1220,0	MHz
<b>Centre frequency *****</b>	$f_C$	1220,0	MHz	± 2,0	MHz
<b>Passband</b>				$f_N ± 4,0$	MHz
				$f_N - 10$ MHz ... $f_N + 9,0$	MHz ****
<b>Pass band ripple</b>		1,3	dB	1,5	dB
		1,1	dB	3,0	dB
<b>Bandwidth</b>	BW				
1,5 dB		25,0	MHz	min.	8,0 MHz
3,0 dB		28,0	MHz	min.	19,0 MHz
<b>Relative attenuation</b>	$a_{rel}$				
$f_N - 4,0$ MHz ... $f_N + 4,0$ MHz		-		max.	1,5 dB
$f_N - 10,0$ MHz ... $f_N + 9,0$ MHz		-		max.	3,0 dB ****
$f_N - 36,0$ MHz		53,0	dB	min.	40,0 dB
$f_N - 44,0$ MHz		53,0	dB	min.	46,0 dB
$f_N - 72,0$ MHz		61,0	dB	min.	46,0 dB
$f_N - 88,0$ MHz		57,0	dB	min.	46,0 dB
$f_N - 68,0$ MHz ... $f_N - 76,0$ MHz		66,0	dB	min.	46,0 dB
$f_N - 76,0$ MHz ... $f_N - 85,0$ MHz		58,0	dB	min.	46,0 dB
$f_N - 85,0$ MHz ... $f_N - 91,0$ MHz		57,0	dB	min.	46,0 dB
$f_N - 91,0$ MHz ... $f_N - 720,0$ MHz		51,0	dB	min.	46,0 dB
$f_N + 70,0$ MHz ... $f_N + 780,0$ MHz		59,0	dB	min.	46,0 dB
<b>Group delay ripple **</b>					
$f_N - 4,0$ MHz ... $f_N + 4,0$ MHz		11	ns	-	
$f_N - 10,0$ MHz ... $f_N + 9,0$ MHz		38	ns	-	
<b>Operating temperature range</b>	OTR	-		- 40 °C ... + 85 °C	
<b>Reduced operating temperature range</b>		-		+ 20 °C ... + 70 °C	
<b>Storage temperature range</b>		-		- 45 °C ... + 85 °C	
<b>Temperature coefficient of frequency</b>	$TC_f$ **	- 43	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.

\*\*) Aperture 500 KHz

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

\*\*\*\*) Within reduced operating temperature range

\*\*\*\*\*) At ambient temperature

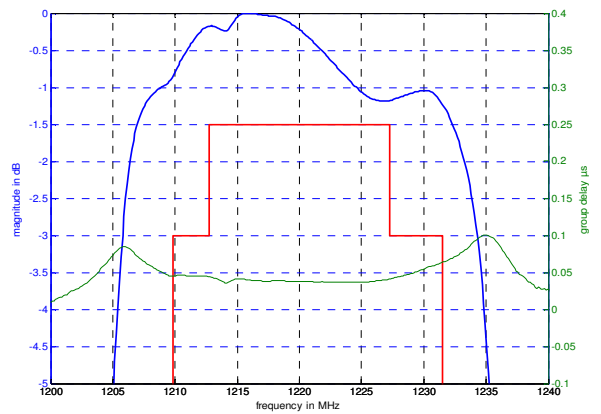
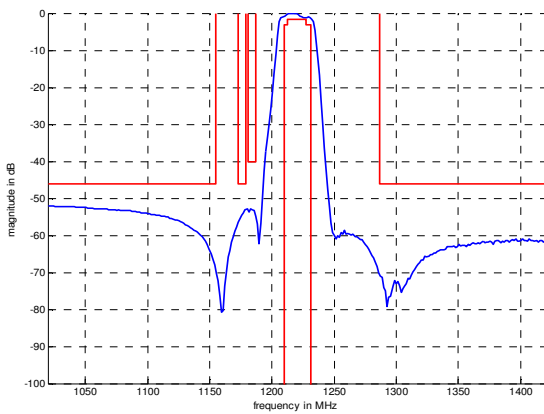
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**Checked / Approved:**

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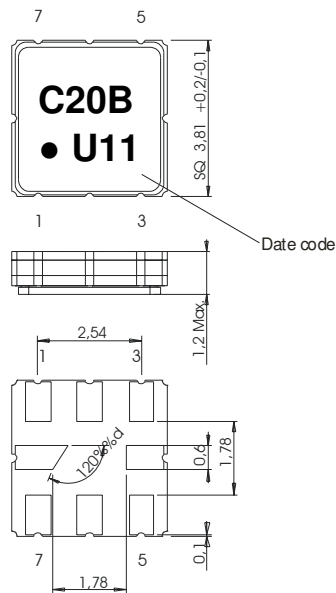
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**Filter characteristic**



**Construction and pin connection**

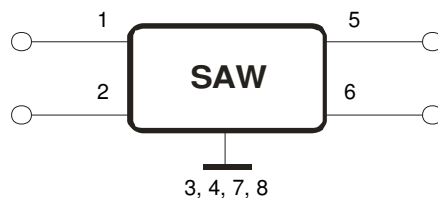
(All dimensions in mm)



- 1 Input
- 2 Input
- 3 Ground
- 4 Ground
- 5 Output
- 6 Output
- 7 Ground
- 8 Ground

Date code: Year + week  
 U 2006  
 V 2007  
 W 2008  
 ...

**200 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)

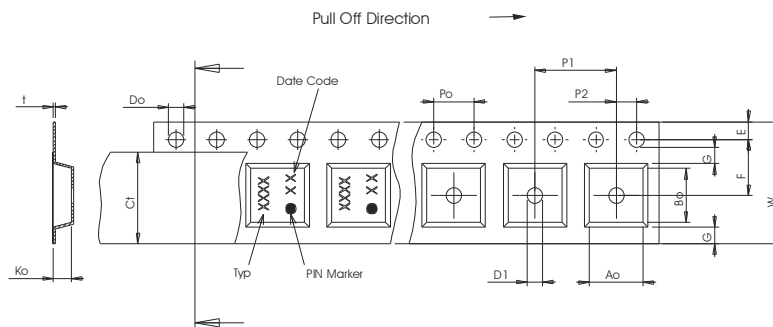
**Packing**

Tape & Reel: IEC 286 – 3, with 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

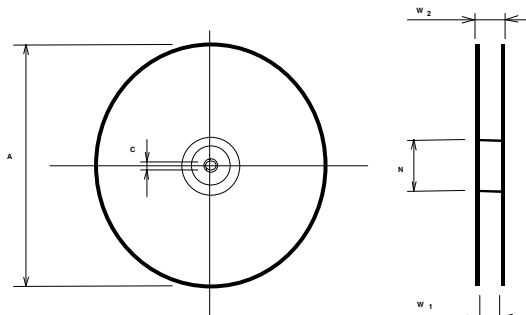
**Tape (all dimensions in mm)**

- W : 12,00 ± 0,3
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,1
- F : 5,50 ± 0,05
- G(min) : 0,75
- P2 : 2,00 ± 0,05
- P1 : 8,00 ± 0,1
- D1(min) : 1,50
- Ao : 4,30 ± 0,1
- Bo : 4,30 ± 0,1
- Ct : 9,5 ± 0,1



**Reel (all dimensions in mm)**

- A : 330
- W1 : 12,4 +2/-0
- W2(max) : 18,4
- N(min) : 50
- C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

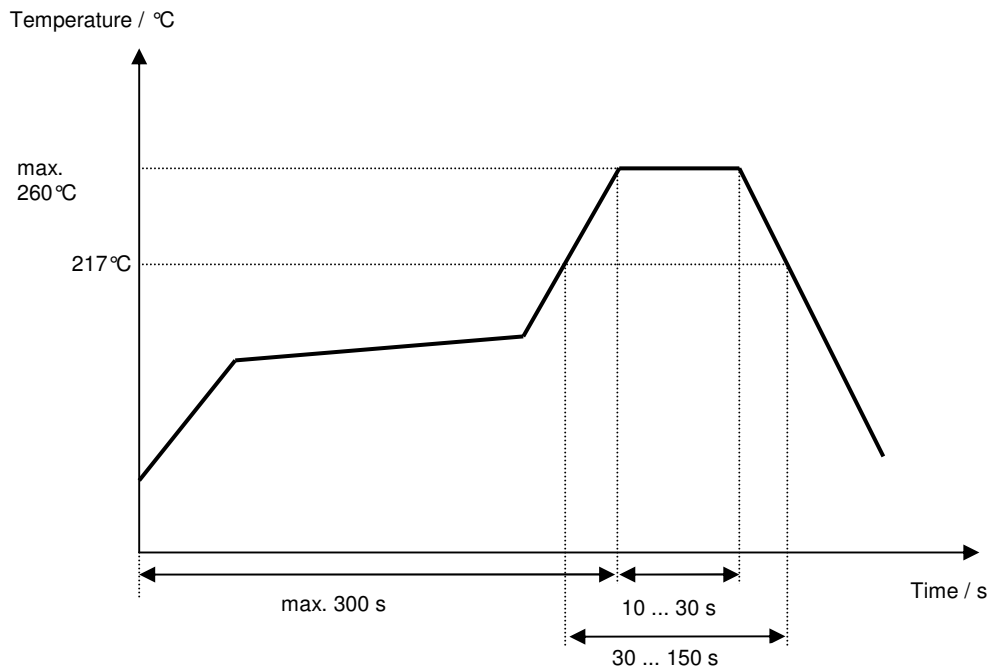
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**Air reflow temperature conditions**

<b>Conditions</b>	<b>Exposure</b>
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 1220B****5/5****History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	- Generation of development specification according to customer specification	Dr. Sabah	05.11.2002
1.1	- Change of stamp from TFS1220 to TFS1220B	Dr. Sabah	10.12.2002
1.2	- Filter specification, add of typical values	Dr. Sabah	04.08.2003
1.3	- Add of second specification data sheet	Dr. Sabah	18.08.2003
1.4	- Change construction, add Test circuit - Add filter characteristic	Channaa	01.11.2005
1.5	- Change from a specification with floating tolerance scheme ( $f_C$ based) to a specification with fixed tolerance scheme ( $f_N$ based) - Correct stability characteristics	Alawneh	15.03.2006

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