

VI TELEFILTER**Filter Specification****TFS 1220B****1/6****1. Measurement condition**

Ambient temperature: 23 °C
 Input power level: 0 dBm
 Terminating impedances*

for input: 200 Ω
 for input: 200 Ω

2. Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the TFS 1220B 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 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 nominal frequency f_N is fixed at 1220,0 MHz without tolerance. The temperature coefficient of frequency T_{cf} is valid both for the frequency f_c and the frequency response of the filter in the operating temperature rang.

D a t a		typ. value		tolerance/limit		
Insertion loss (Reference level)	$a_e = a_{min}$	3,50	dB	max.	5,8	dB
Nominal frequency	f_N	-		max.	1220,0	MHz
Centre frequency	f_c	1220,0	MHz		1220,0 ±2,0	MHz
1,5 dB Bandwidth	BW	19,0	MHz	min.	8,0	MHz
Pass band ripple		1,0	dB	max.	1,5	dB
Relative attenuation $f_c \dots f_c \pm 4,0$ MHz	a_{rel}	-		max.	1,5	dB
$f_c - 36,0$ MHz		58	dB	min.	40,2	dB
$f_c - 44,0$ MHz		54	dB	min.	44,2	dB
$f_c - 72,0$ MHz		55	dB	min.	42,0	dB
$f_c - 88,0$ MHz		54	dB	min.	44,2	dB
$f_c - 68,0$ MHz ... $f_c - 76,0$ MHz		55	dB	min.	40,2	dB
$f_c - 76,0$ MHz ... $f_c - 85,0$ MHz		57	dB	min.	44,2	dB
$f_c - 85,0$ MHz ... $f_c - 91,0$ MHz		57	dB	min.	44,2	dB
$f_c - 91,0$ MHz ... $f_c - 720,0$ MHz		58	dB	min.	44,2	dB
$f_c + 70,0$ MHz ... $f_c + 780,0$ MHz		56	dB	min.	44,2	dB
Group delay ripple GD** $f_c - 4,0$ MHz ... $f_c + 4,0$ MHz		15	ns	-		
Temperature coefficient of frequency (T_{cf})		-32	ppm/K	-		
Operating temperature range				- 40 °C ... + 85 °C		
Storage temperature range				- 30 °C ... + 80 °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.

**) Aperture 500 KHz

Generated:

Checked / approved:

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VI TELEFILTER**Filter Specification****TFS 1220B****2/6****3. Characteristics****Remark:**

Reference level for the relative attenuation a_{rel} of the TFS 1220B 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 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 nominal frequency f_N is fixed at 1220,0 MHz without tolerance. The temperature coefficient of frequency Tcf is valid both for the frequency f_c and the frequency response of the filter in the operating temperature rang.

D a t a		typ. value		tolerance/limit		
Insertion loss (Reference level)	$a_e = a_{min}$	3,50	dB	max.	5,8	dB
Nominal frequency	f_N	-		max.	1220,0	MHz
Centre frequency	f_c	1220,0	MHz		1220,0	MHz
3 dB Bandwidth	BW	25,0	MHz	min.	19,0	MHz
Pass band ripple		1,5	dB	max.	3,0	dB
Relative attenuation $f_c - 10,0 \text{ MHz} \dots f_c + 9,0 \text{ MHz}$	a_{rel} MHz	-		max.	3,0	dB
$f_c - 36,0 \text{ MHz}$		58	dB	min.	40,0	dB
$f_c - 44,0 \text{ MHz}$		54	dB	min.	46,0	dB
$f_c - 72,0 \text{ MHz}$		55	dB	min.	44,0	dB
$f_c - 88,0 \text{ MHz}$		54	dB	min.	46,0	dB
$f_c - 68,0 \text{ MHz} \dots f_c - 76,0 \text{ MHz}$		55	dB	min.	42,0	dB
$f_c - 76,0 \text{ MHz} \dots f_c - 85,0 \text{ MHz}$		57	dB	min.	46,0	dB
$f_c - 85,0 \text{ MHz} \dots f_c - 91,0 \text{ MHz}$		57	dB	min.	46,0	dB
$f_c - 91,0 \text{ MHz} \dots f_c - 720,0 \text{ MHz}$		58	dB	min.	46,0	dB
$f_c + 70,0 \text{ MHz} \dots f_c + 780,0 \text{ MHz}$		56	dB	min.	46,0	dB
Group delay ripple GD**		40		ns	-	
$f_c - 10,0 \text{ MHz} \dots f_c + 9,0 \text{ MHz}$						
Temperature coefficient of frequency (T_c)		-32	ppm/K		-	
Operating temperature range					+20 °C ... + 70 °C	
Storage temperature range					- 30 °C ... + 80 °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.

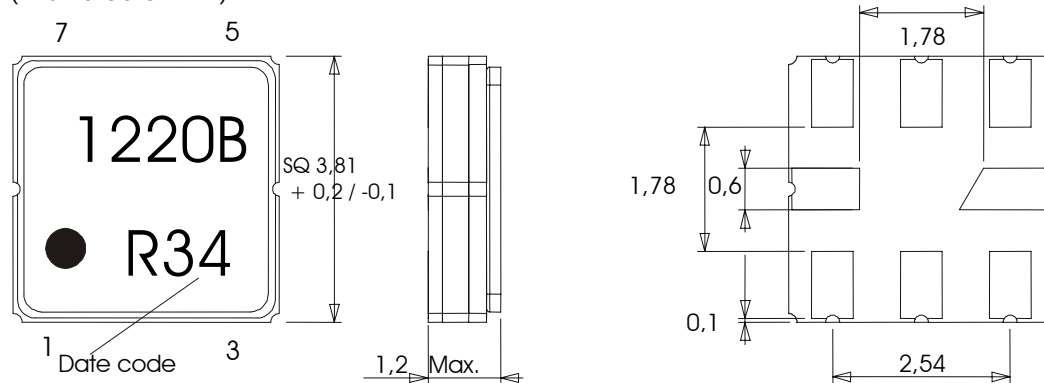
**) Aperture 500 KHz

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Construction, pin configuration and 50 Ω - matching network

(All dimensions in mm)



Pin 1	Input	Pin 5	Output
Pin 2	Input	Pin 6	Output
Pin 3	Ground	Pin 7	Ground
Pin 4	Package Ground	Pin 8	Package ground

Date code: Year + week

N	2001
P	2002
R	2003
...	

Stability Characteristics

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

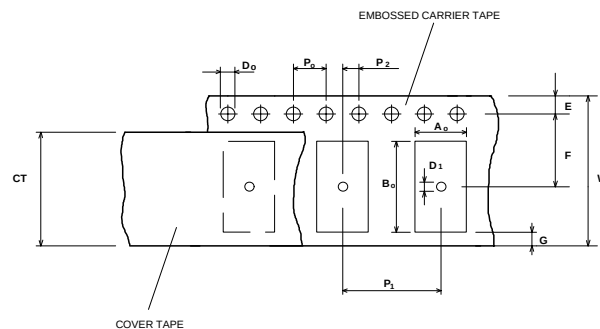
1. Shock: 500g, 18 ms, half sine wave, 3 shocks each plane;
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 500 Hz, 0,35 mm or 5g respectively, 1 octave per min, 10 cycles per plan, 3 plans;
DIN IEC 68 T2 - 6
3. Change of temperature: -55 °C to 125°C / 30 min. each / 10 cycles
DIN IEC 68 part 2 – 14 Test N
4. Resistance to solder heat (reflow): reflow possible: twice max.;
for temperature conditions, please refer to the attached "Air reflow temperature conditions" on page 4

Packing

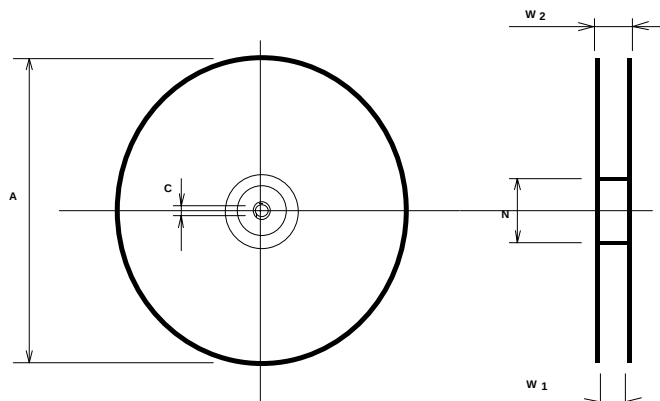
Tape & Reel: IEC 286 - 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;
max. pieces of filters per reel: 3000
reel of empty components at start: min 300 mm
reel of empty components at start including leader: min 500 mm
trailer min 300 mm

Tape (all dimensions in mm)

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

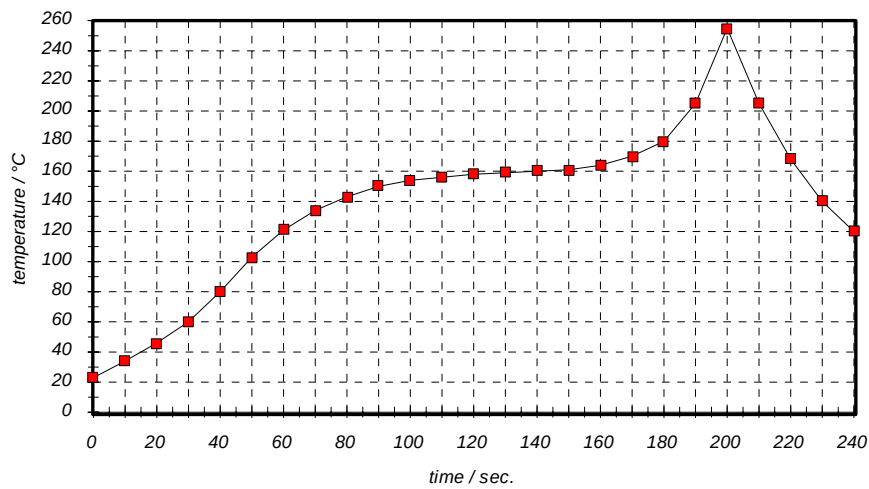
Chip-mount air reflow profile

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 1220B****6/6**

History

Version	Reason of Changes	Name	Date
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 typ. values	Dr. Sabah	04.08.2003
1.3	- Add of second specification data sheet	Dr. Sabah	18.08.2003