

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

Ambient temperature T_A : 23 °C
 Input power level: 0 dBm
 Terminating impedances at f_C *) :
 for input: 238 Ω | - 4,97 pF.
 for output: 284 Ω | - 3,75 pF.

2. Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the **TFS 70AA** 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 **70 MHz** without tolerance. The given values for the relative attenuation a_{rel} and for the group delay ripple have to be reached at the frequencies given below even if the centre frequency f_C is shifted due to the temperature coefficient of frequency T_{Cf} in the operating temperature range and due to a production tolerance for the centre frequency f_C .

Data	typ. value	tolerance / limit
Insertion loss (reference level) : a_e	20,5 dB	max. 22 dB
Nominal frequency : f_N	-	70 MHz
Centre frequency : f_C at ambient temperature (f_{CTA})	70 MHz	
Pass band : PB		$f_N \dots f_N \pm 9,5$ MHz
Bandwidth at ambient temperature : BW		
3 dB	20,10 MHz	min. 19,63 MHz
40 dB	30,20 MHz	max. 39,37 MHz
Relative attenuation : a_{rel}		
$f_N \dots f_N \pm 9,5$ MHz	-	max. 3 dB
$f_N \pm 20$ MHz ... $f_N \pm 50$ MHz	50 dB	min. 40 dB
Group delay (mean value in PB):	0,49 μ s	max. 1 μ s
Group delay ripple (p-p) in PB :	22 ns	max. 30 ns
Deviation from linear phase (p-p) in PB :	6° (r.m.s. 1,7°)	
Triple transit attenuation compared to main signal	47 dB	-
Crosstalk	50 dB	
Temperature coefficient of frequency (T_{Cf})	- 72 ppm/K	
Frequency deviation of f_C over temperature	$\Delta f_C(\text{Hz}) = T_{Cf}(\text{ppm/K}) \times (T - T_{CTA}) \times f_{CTA} (\text{MHz})$	
Operating temperature range OTR		- 40 °C ... + 85 °C
Storage temperature range		- 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.

Generated: Dunzow W.

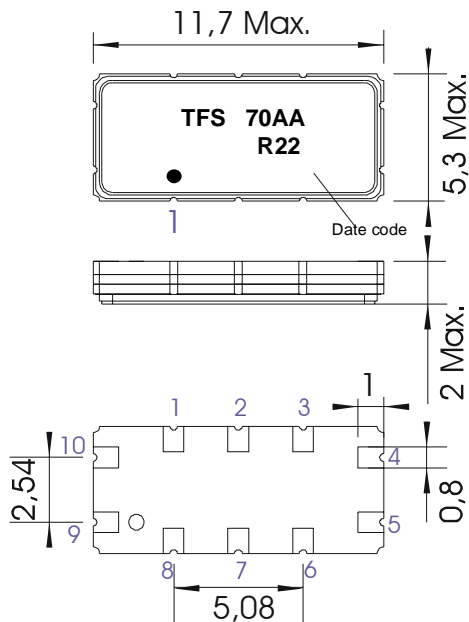
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3. Construction and pin connection :

(All dimensions in mm, pin grid 2,54 mm)



Date code: Year+week

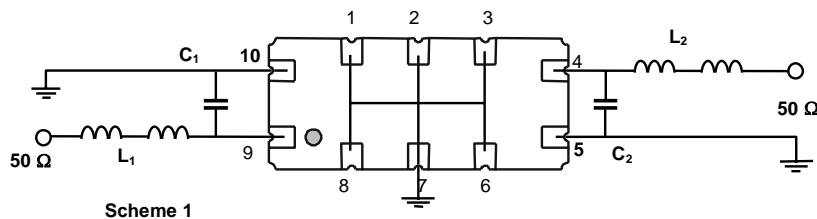
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Pin 9 Input.
Pin 10 Input RF Return.
Pin 4 Output.
Pin 5 Output RF Return.
Pin 1, 2, 3, 6, 7, 8 – Package Ground.

4. 50 Ω matching network (please refer to the application note for further details) :

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5. 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 refer to the attached "Air reflow temperature conditions" on page 4;

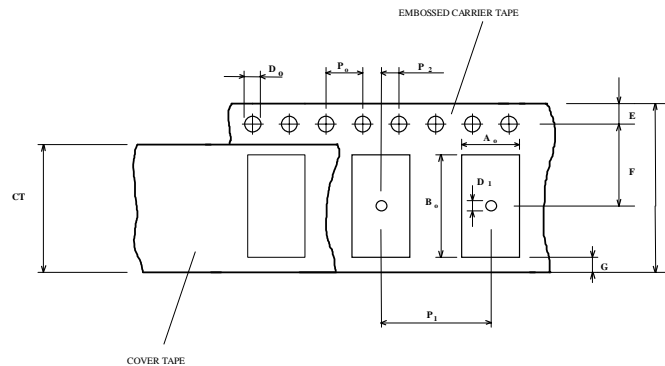
6. Packing :

Tape & Reel: DIN 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;

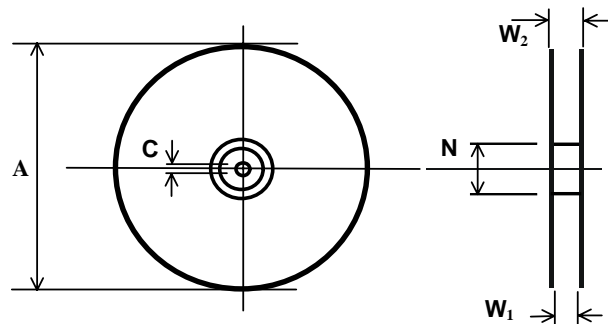
max. pieces of filters per reel:	3000
reel of empty components at start:	min 300 mm
reel of empty components at start including leader:	min 500 mm
trailer	min 300 mm

Tape (all dimensions in mm)

W	: 24± 0,3
Po	: 4 ± 0,1
Do	: 1,5 ± 0,1
E	: 1,75 ± 0,1
F	: 7,5 ± 0,1
G (min)	: 0,6
P2	: 2 ± 0,1
P1	: 8 ± 0,1
D1 (min)	: 1,5
Ao	: 5,6 ± 0,1
Bo	: 11,8 ± 0,
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 +0,5/-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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7. 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.	

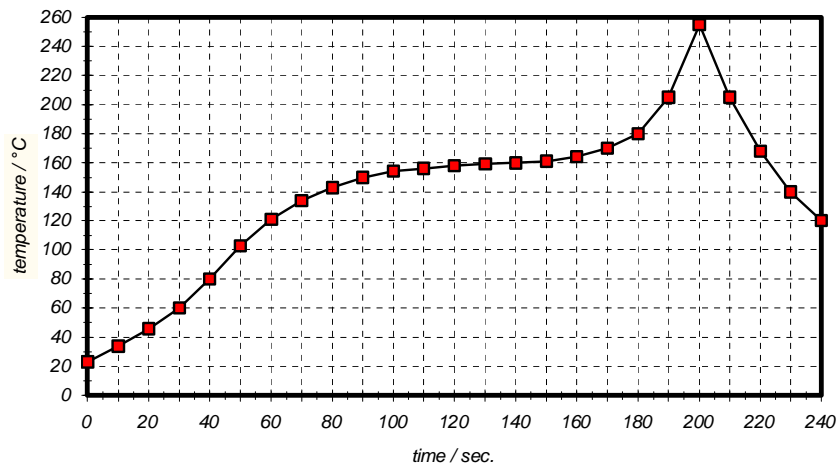
Chip-mount air reflow profile

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

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History :

Version	Reason of Changes	Name	Date
1.0	Generate development specification according to customer requirements	Dunzow W.	15.01.2003
1.1	Generate filter specification after measurements.	Dunzow W.	17.03.2003

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