1. Measurement condition :

Ambient temperature T_A:	25 °C		
Input power level:	0 dBm		
Terminating impedances at f_C *) :	for input:	176 Ω	- 6,19 pF.
	for output:	775 Ω	- 3,52 pF.

2. Characteristics

Remark: Reference level for the relative attenuation a_{rel} of the **TFS 300C** 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 on **300 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 also if the centre frequency f_C is shifted due to the temperature coefficient of frequency TC_f 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	17	dB	max.	20	dB
Nominal frequency f_N	-			300	MHz
Centre frequency f_C at ambient temperature (f_{CTA})	300,02	MHz			
Pass band (PB) :			f_N - 2,05 MHz ... f_N + 2,05 MHz		
Amplitude ripple in PB (p-p) :	0,8	dB	max.	1	dB
Bandwidth :					
1 dB	4,55	MHz	min.	4,1	MHz
3 dB	5,25	MHz	min.	5,0	MHz
3 dB	5,25	MHz	max.	5,5	MHz
20 dB	6,96	MHz			
40 dB	9,30	MHz	max.	10	MHz
Relative attenuation a_{rel}					
f_N ..... f_N ± 2,05 MHz		-	max.	1	dB
f_N ± 2,05 MHz .... f_N ± 2,5 MHz		-	max.	3	dB
f_N ± 2,75 MHz .... f_N ± 5 MHz		-	min.	3	dB
f_N ± 5 MHz .... f_N ± 7 MHz	43...45	dB	min.	40	dB
f_N - 25 MHz .... f_N - 7 MHz	49...54	dB	min.	45	dB
f_N + 7 MHz .... f_N + 25 MHz	49...54	dB	min.	43	dB
f_N ± 25 MHz .... f_N ± 100 MHz	55...70	dB	min.	50	dB
f_N - 290 MHz .... f_N - 100 MHz	90	dB			
f_N +100 MHz .... f_N + 700 MHz	90	dB			
Group delay (mean value in PB):	1,1	µs	max.	1,5	µs
Group delay ripple (p-p) in : f_N ... f_N ± 2,2 MHz	60	ns	max.	100	ns
Deviation from linear phase (p-p) f_N ... f_N ± 1,8 (2,5) MHz	2° (2,6°)				
Triple transit attenuation compared to main signal	39	dB			
Crosstalk	60...65	dB			
Substrate material	Quartz				
Frequency inversion temperature (T_o)	30	°C			
Temperature coefficient of frequency (Tc_f)	-0,030	ppm/K²			
Frequency deviation of f_C over temperature: **)	Δf_C(Hz) = Tc_f(ppm/K) x (T - T_o)² x f_{To} (MHz)				
Operating temperature range			- 20 °C ... + 70 °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.

**) $f_O = f_{To}$ is reference frequence f_C at frequency inversion temperature (T_o)

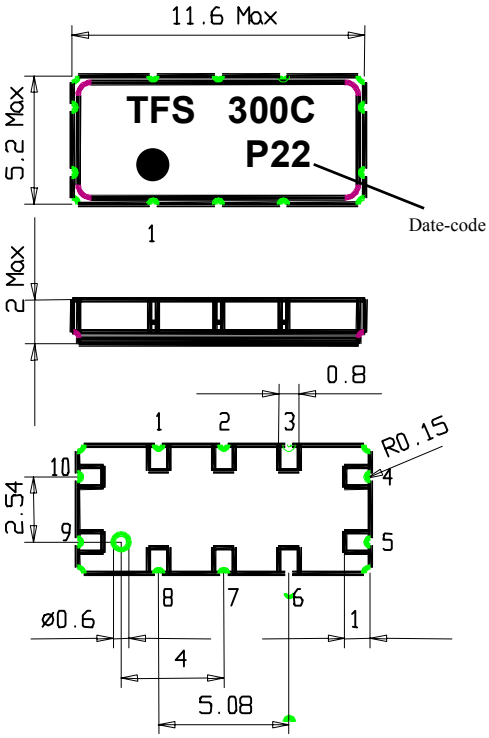
Generated: **Dunzow W.**

Checked / approved: **Dr. Bert Wall**

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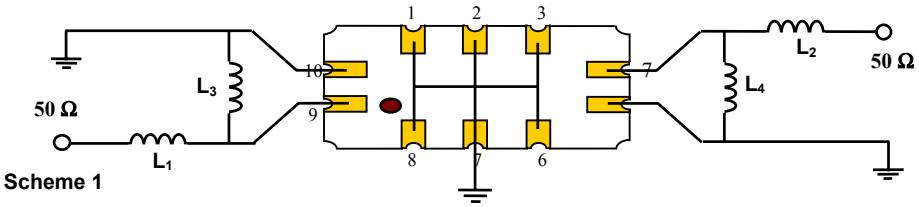
3. Package, pin grid 2,54 mm



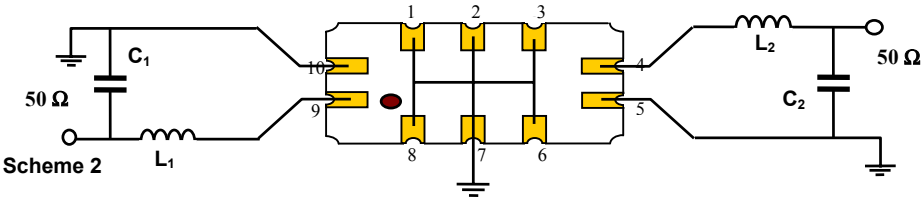
Date-code:	Year+week
M	2000
N	2001
P	2002
...	...

Pin 9- Input.
Pin 10 - Input RF Return.
Pin 4 - Output.
Pin 5 - Output RF Return.
Pin 1-3, 6-8-PackageGround.

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



Scheme 1



Scheme 2

For final test we use scheme 2.

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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, please refer to the attached "Air reflow temperature conditions" on page 4;

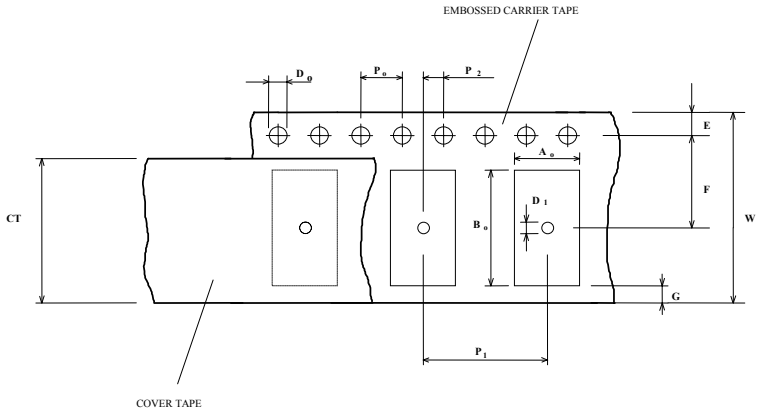
6. Packing

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:	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

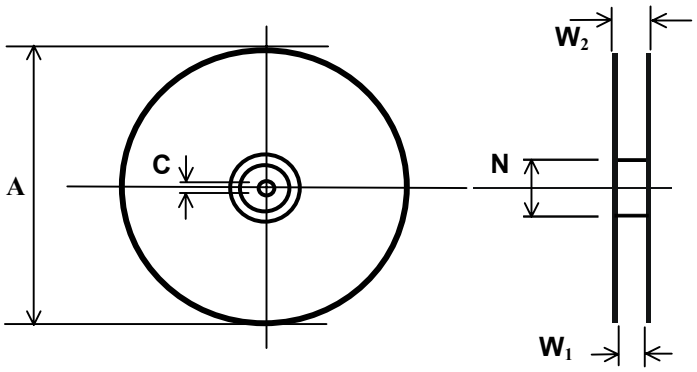
Tape (all dimensions in mm)

W	:	24± 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 +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

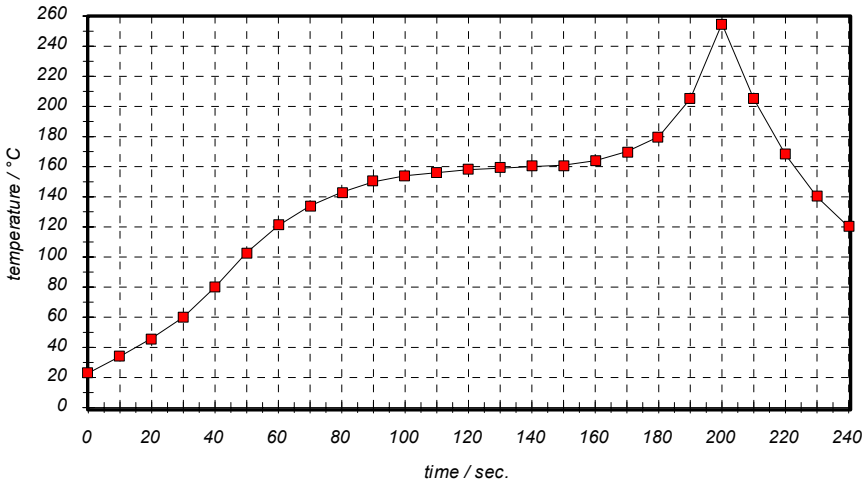


Table for temperature vs. time during the air reflow process

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 preliminary specification according to customer requirements	Dunzow W.	18.06.2001
1.1	- change " Relative attenuation (a_{rel}) " from f_N ± 7 MHz ... f_N ±25 MHz min. 47 dB to f_N – 25 MHz ... f_N – 7 MHz min. 45 dB f_N + 7 MHz ... f_N + 25 MHz min. 43 dB - change termination impedance from : from for input: 215 Ω ‖ - 6,1 pF. for output: 1190 Ω ‖ - 3,3 pF. to for input: 176 Ω ‖ - 6,19 pF. for output: 775 Ω ‖ - 3,52 pF.	Dunzow W.	08.04.2002

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