

VI TELEFILTER**Filter Specification****TFS 400 F****1/5****Measurement condition**

Ambient temperature: 23 °C
 Input power level: 0 dBm
 Terminating impedances
 for input: 570 Ohm // -1,2 pF
 for output: 570 Ohm // -1,2 pF
 Coupling coil: 97 nH

Characteristics**Remark:**

Reference level for the relative attenuation a_{rel} of the TFS 400 F 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 400 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)	$a_e = a_{min}$	4,5 dB	max. 6,5 dB
Nominal frequency	f_N	-	400,000 MHz
Centre frequency	f_c	400,008 MHz	
Guaranteed 1,5 dB signal band width	BW	270 kHz	min. 160 kHz
Relative attenuation $f_N \pm 80$ kHz	a_{rel}	0,5 dB	max. 1,5 dB
$f_N \pm 200$ kHz ... $f_N \pm 400$ kHz		5 dB	min. 2 dB
$f_N \pm 400$ kHz ... $f_N \pm 600$ kHz		30 dB	min. 25 dB
$f_N \pm 600$ kHz ... $f_N \pm 1$ MHz		50...70 dB	min. 40 dB
$f_N - 1$ MHz ... $f_N - 13$ MHz		57 dB	min. 50 dB
$f_N + 1$ MHz ... $f_N + 2$ MHz		65 dB	min. 50 dB
$f_N + 2$ MHz ... $f_N + 5$ MHz		53 dB	min. 47 dB
$f_N \pm 5$ MHz ... $f_N \pm 13$ MHz		56 dB	min. 50 dB
Group delay ripple $f_N \pm 70$ kHz	GD	0,5 μ s	max. 2 μ s
Operating temperature range			- 10 °C ... + 55 °C
Temperature coefficient of frequency	TC	ca. - 0.036 ppm/K ²	
Frequency inversion temperature		+ 20 °C	

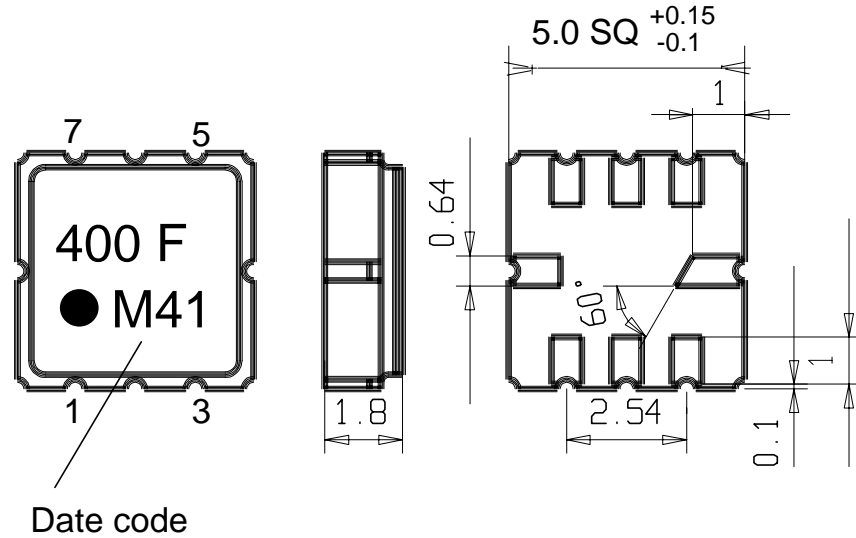
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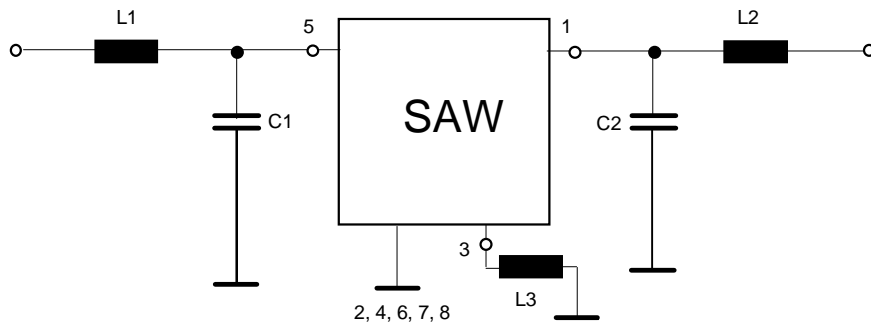
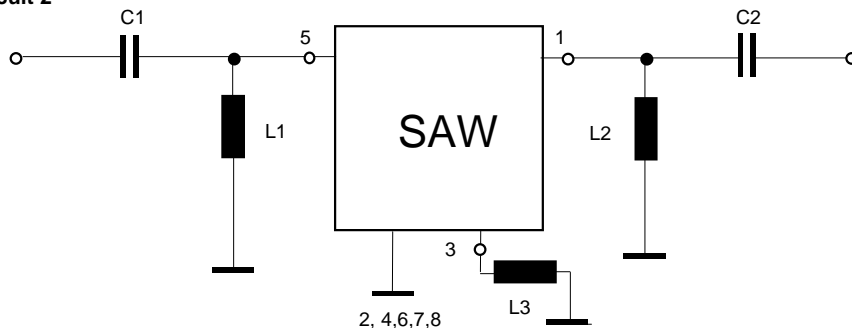
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VI TELEFILTER**Filter Specification****TFS 400 F****2/5****Construction, pin configuration and 50 Ω - matching network**

(All dimensions in mm)



Pin 1	Output	Pin 5	Input	Date code:	Year + week
Pin 2	Output RF Return	Pin 6	Input RF Return	K	1998
Pin 3	External Coil	Pin 7	Ground	L	1999
Pin 4,8	Package Ground			M	2000
				...	

50 Ohm Test circuit 1**50 Ohm Test circuit 2**

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Stability Characteristics

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

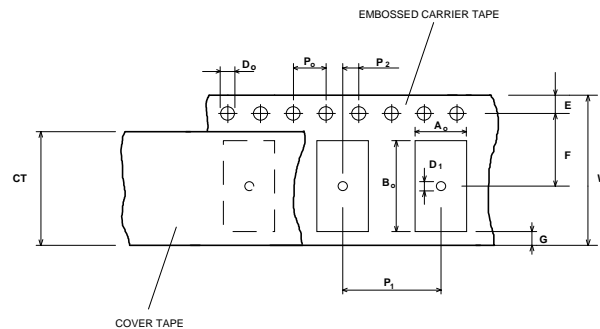
1. Shock: 500g, 18 ms, half sine wave, 3 shocks each plane;
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 500 Hz, 0,35 mm or 5g respectively, 1 octave per min, 10 cycles per plan, 3 plans;
DIN IEC 68 T2 - 6
3. Damp heat: 25 °C to 55°C / 95% r.H. / 10 cycles
(cycle) DIN IEC 68 - 2 – 30 Db
4. Resistance to solder heat (reflow): max. 2 times reflow process;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

Packing

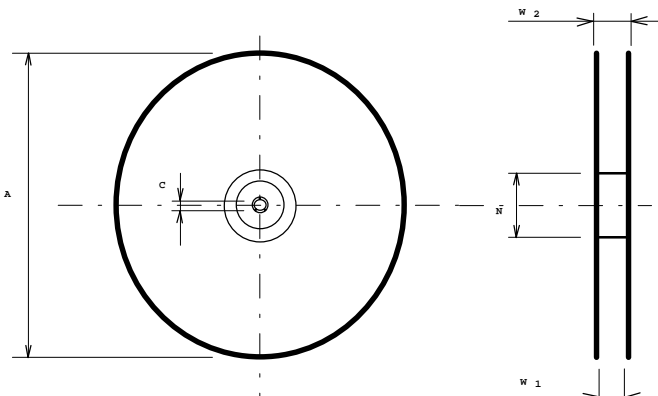
Tape & Reel:	IEC 286 - 3, with exception of value for N and minimum bending radius; tape type II, embossed carrier tape with top cover tape on the upper side;	
	max. pieces of filters per reel:	3000
	Reel of empty components at start:	min 300 mm
	Reel of empty components at start including leader:	min 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	: 5,3 ± 0,1
Bo	: 5,3 ± 0,1
CT	: 9,5 ± 0,1

**Reel (all dimensions in mm):**

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



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. The marking of the filters is able to read if the view is directed on the upper side of the carrier tape with the sprocket holes on the right side of the tape.

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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.	

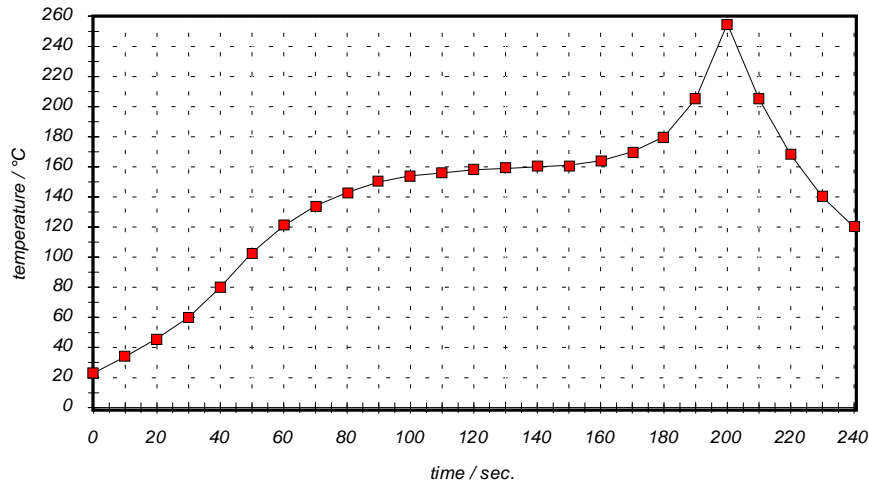
Chip-mount air reflow profile

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 400 F****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of specification	Dr. Wall	28.07.2000
1.1	- Add values for termination impedance and coupling coil - Add typical filter data - Change relative attenuation in stop band - Correct pinning and matching information	Dr. Wall	11.10.2000
1.2	- Header of page one and page two corrected	Dr. Wall	02.11.2000

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