

VI TELEFILTER

Filter Specification

TFS 86 C

1/5

Measurement condition

Ambient temperature: 23°
 Input power level: 0 dBm
 Terminating impedance: *)
 Input: 825 Ω || -1,75 pF
 Output: 825 Ω || -1,75 pF

Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the TFS 86 C 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 3dB filter attenuation level relative to the insertion loss a_e . The nominal frequency f_N is fixed at 86,46 MHz without any 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 TC_f in the operating temperature range and due to a production tolerance for the centre frequency f_c .

D a t a		typ. value	tolerance / limit
Insertion loss (Reference level)	$a_e = a_{min}$	3,7 dB	max. 5 dB
Nominal frequency	f_N	-	86,46 MHz
Centre frequency	f_c	86,463 MHz	-
Pass band ripple $f_N \pm 13$ kHz		0,7 dB	max. 2,0 dB
Relative attenuation $f_N \pm 14$ kHz	a_{rel}	0,9 dB	max. 3 dB
$f_N - 1000$ kHz ... $f_N - 880$ kHz		64 dB	min. 50 dB
$f_N - 880$ kHz ... $f_N - 120$ kHz		51 - 60 dB	min. 40 dB
$f_N - 120$ kHz ... $f_N - 60$ kHz		24 dB	min. 20 dB
$f_N + 60$ kHz ... $f_N + 120$ kHz		24 dB	min. 20 dB
$f_N + 120$ kHz ... $f_N + 1000$ kHz		45 - 60 dB	min. 40 dB
Group delay distortion $f_N \pm 11$ kHz	GDD	3,8 μs	max. 10 μs
Intermodulation **)		-	max. - 80 dBm
Operating temperature range			- 20 °C ... + 70 °C
Storage temperature range			- 40 °C ... + 85 °C
Temperature coefficient of frequency ***) TC_f		- 0,036 ppm/K ²	
Frequency inversion temperature T_0		25 °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.

**) Intermodulation in the composite signal by $f_N \pm 60$ kHz and $f_N \pm 120$ kHz each of -20 dBm

***) $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_0)^2 \times f_{r0}(\text{MHz})$

Generated: _____

Checked / approved: _____

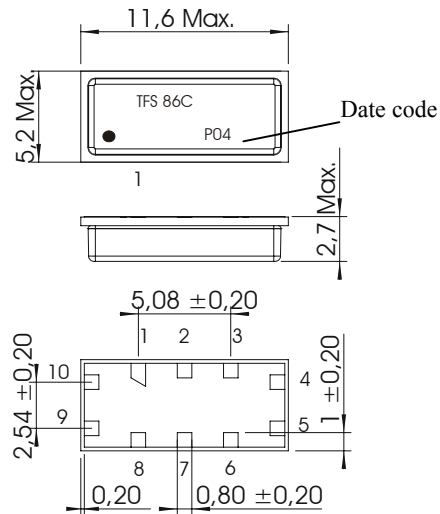
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Construction, pin configuration and 50 Ω - matching network

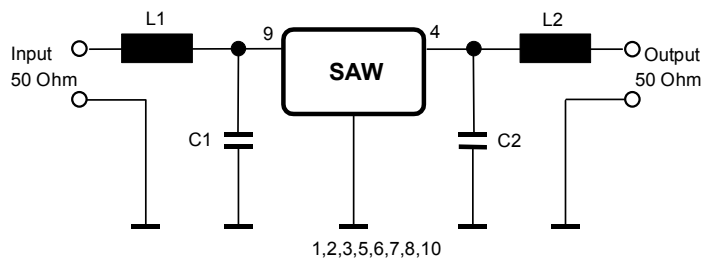
(All dimensions in mm)



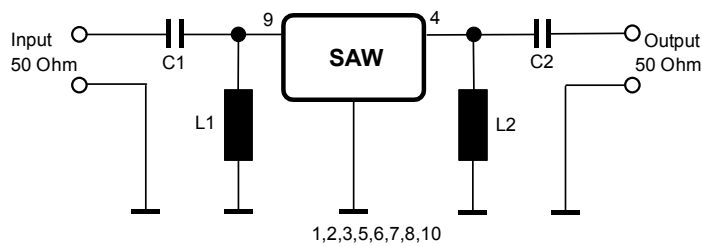
Pin 9	Input
Pin 10	Input RF return
Pin 4	Output
Pin 5	Output RF return
Pin 1	Ground
Pin 2	Ground
Pin 3	Ground
Pin 6	Ground
Pin 7	Ground
Pin 8	Ground

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

50 Ω matching network 1



50 Ω matching network 2



Note: The filter operates in the matching network in the same manner if the filter is inserted with a rotation of 180 °.

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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, 1,5 mm or 20g 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;

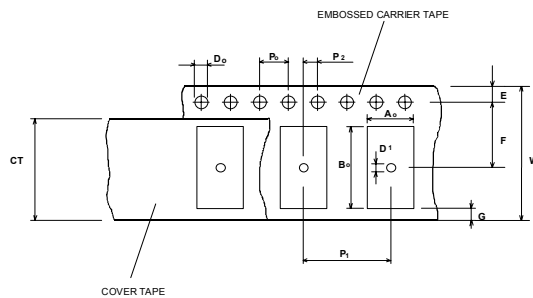
Packing

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: 2500
reel of empty components at start: min 300 mm
reel of empty components at start including leader: min 500 mm
trailer: min 300 mm

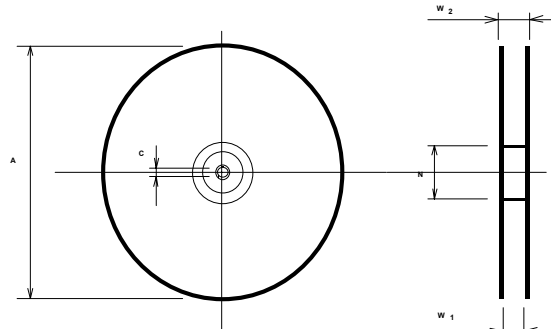
Tape (all dimensions in mm)

- W : 24 ± 0,3
- Po : 4 ± 0,1
- Do : 1,5 + 0,1
- E : 1,75 ± 0,1
- F : 11,5 ± 0,1
- G (min) : 0,6
- P2 : 2 ± 0,1
- P1 : 8 ± 0,1
- D1(min) : 1,5
- Ao : 5,5 ± 0,1
- Bo : 11,9 ± 0,1
- CT : 21,5 ± 0,1



Reel (all dimensions in mm):

- A : 330
- W1 : 24,4 +2
- 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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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

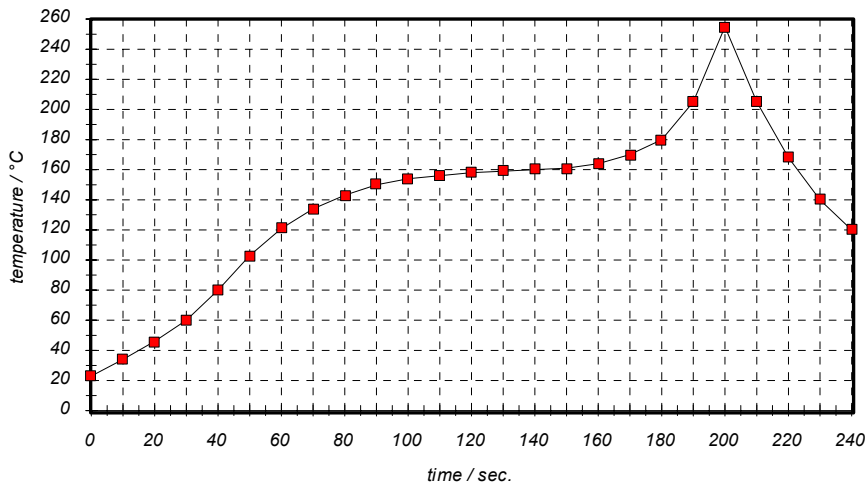


Table for temperature vs. time during the air reflow process

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 86 C****5/5****History**

Version	Reason of Changes	Name	Date
1.0	Generation of specification according to customer requirements.	Du Hamél	20.07.2001
1.1	Correct "package" drawing Correct "50 Ω matching network"	Herrler	03.08.2001
1.2	Add "tape and reel" information	Herrler	07.08.2001
1.3	Change of construction drawing. Adjust termination impedance.	Dr. Sabah	13.11.2001
1.4	Add typical values. Add commentary for termination impedances. Change number of pieces per reel.	Dr. Wall	21.01.2001

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