

VI TELEFILTER

Filter specification

TFS57

1/5

Measurement condition

Ambient temperature: 23 °C
 Input power level: 0 dBm
 Terminating impedance: *)
 Input: 260 Ω || -19,5 pF
 Output: 260 Ω || -19,5 pF

Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the TFS 57 is the maximum of the pass band attenuation a_{max} . The maximum of the pass band attenuation a_{max} 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 1,5 dB filter attenuation level relative to the insertion loss a_e . The nominal frequency f_N is fixed at 57.6 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 .

D a t a		typ. value	tolerance / limit
Insertion loss (reference level)	a_e	13,5 -	max. 15 -
Nominal frequency	f_N	-	57,6 MHz
Centre frequency	f_c	57,6 MHz	
Pass band			
$f_N - 10,6$ MHz ... $f_N + 10,6$ MHz			
Pass band ripple		0,7 dB	max. 1,5 dB
Relative attenuation			
$f_N - 10,6$ MHz ... $f_N + 10,6$ MHz	a_{rel}	0,7 dB	max. 1,5 dB
$f_N - 56,6$ MHz ... $f_N - 27,8$ MHz		55 dB	min. 45 dB
$f_N + 27,8$ MHz ... $f_N + 192,4$ MHz		48 dB	min. 45 dB
$f_N + 192,4$ MHz ... $f_N + 942,4$ MHz		55 dB	min. 35 dB
Group delay ripple within PB	***)	100 ns	max. 110 ns
Intermodulation IP3	****)	-	min. 30 dBm
1 dB compression point		-	min. 12 dBm
Input power level		-	max. 13 dBm
Temperature coefficient of frequency	TC_f **)	-72 ppm/K	
Operating temperature range	OTR	-	- 25 °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.

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

***) to be fulfilled in any 5 MHz segment of the passband; measurement conditions are: 5MHz span, 1601 points, 10 x averaging

****) $f_{in1} = 56,0$ MHz; $f_{in2} = 59,2$ MHz; $P_{in} = 0$ dBm $f_{measurement1} = 2 \times f_{in1} - f_{in2} = 52,8$ MHz; $f_{measurement2} = 2 \times f_{in2} - f_{in1} = 62,4$ MHz

Generated:

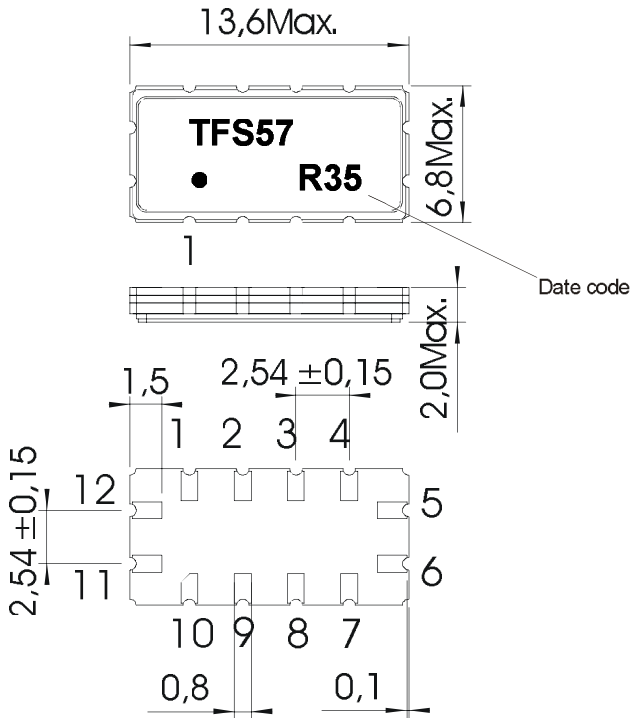
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Construction and pin connection

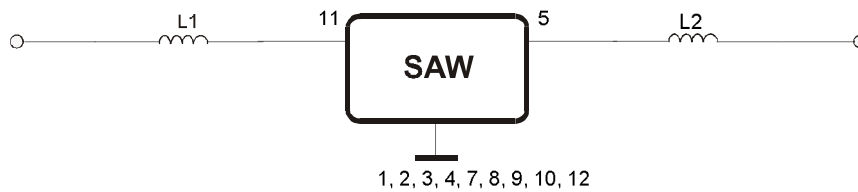
(All dimensions in mm)



1	Ground
2	Ground
3	Ground
4	Ground
5	Output
6	Output RF-Return
7	Ground
8	Ground
9	Ground
10	Ground
11	Input
12	Input RF-Return

Date code: Year + week
 N 2001
 P 2002
 R 2003
 ...

50 Ω Test circuit



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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 5 g 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;

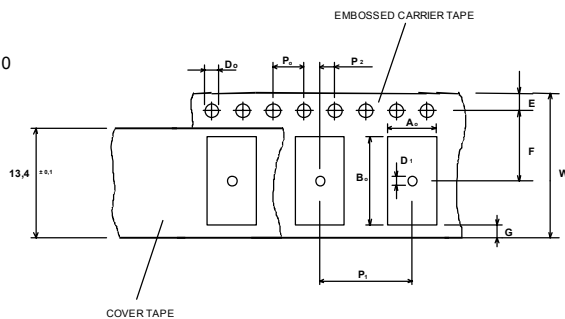
Packing

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 peer 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

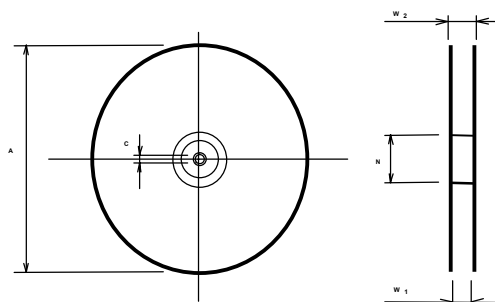
Tape (all dimensions in mm)

- W : 24,00 +0,30/-0,10
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,10
- F : 11,50 ± 0,10
- G(min) : 0,60
- P2 : 2,00 ± 0,1
- P1 : 12,00 ± 0,1
- D1(min) : 1,50
- Ao : 7,10 ± 0,10
- Bo : 13,90 ± 0,10
- 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. Marking of the filters can be read if the upper side of the carrier tape is regarded with the sprocket holes on the 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

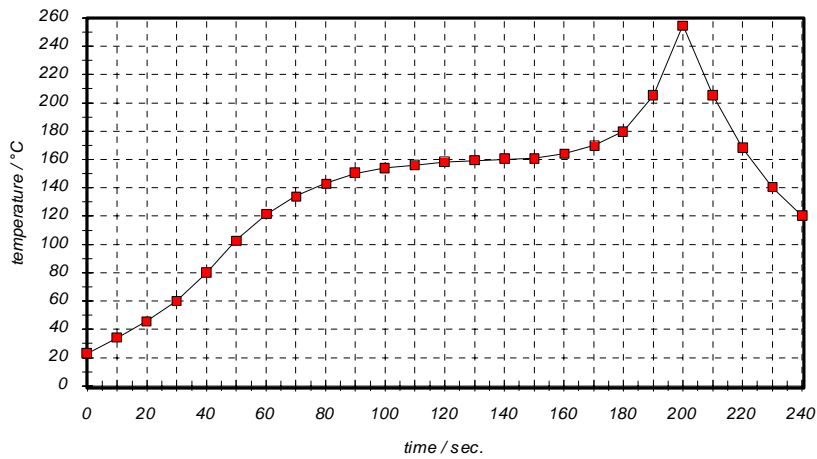


Table for temperature vs. time during the air reflow process

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****TFS57****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- new generation	Steiner	17.11.2000
2.0	- extend specification to filter specification - adjust loss and group delay ripple to the final customer specification	Steiner	29.08.2003
2.1	- intermodulation and compression parameter adjusted to customer requirement	Steiner	05.09.2003
2.2	- package and reel dimensions corrected - terminating impedance adjusted to final samples	Steiner	18.09.2003

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