

1. Measurement condition

Ambient temperature T_A :	23 °C	
Input power level:	0 dBm	
Terminating impedances at f_C :	for input:	50 Ω -19,2 pF
	for output:	50 Ω -16,4 pF

2. Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the TFS 135C is the insertion loss. 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 temperature coefficient of frequency T_C is valid both for the reference frequency f_C and the frequency response of the filter in the operating temperature range.

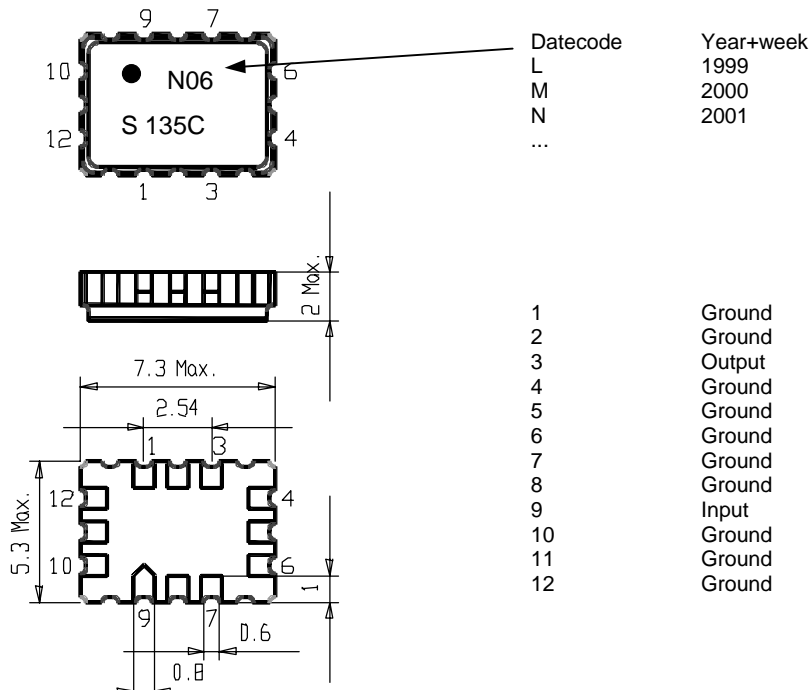
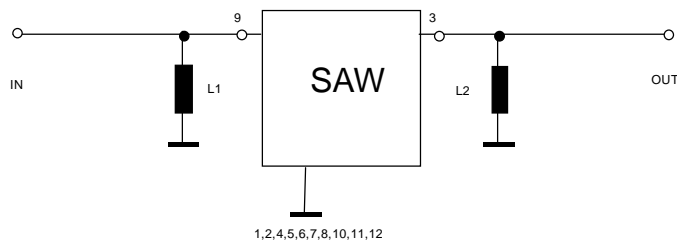
Data		typ. value	tolerance / limit
Insertion loss (Reference level)	a_e	14,6 dB	max 15,5 dB
Centre frequency	f_C	-	135,420 MHz \pm 60 kHz
Relative attenuation	a_{rel}		
$f_C \pm 1,25$ MHz		-	max 3 dB
$f_C \pm 4$ MHz	$f_C \pm 15$ MHz	45...48 dB	min 40 dB
$f_C \pm 15$ MHz	$f_C \pm 25$ MHz	50...60 dB	min 38 dB
Group delay ripple:	$f_C \pm 1,0$ MHz		80 ns
Temperature coefficient of frequency (T_C)			-19 ppm/K
Frequency deviation of f_C over temperature T:			$\Delta f_C(\text{Hz}) = T_C(\text{ppm/K}) \times (T - T_A) \times f_{CAT}(\text{MHz})$
Operating Temperature Range			- 10 °C ... + 85 °C

Generated: _____

Checked/Approved: _____

3. Construction, pin configuration and 50 Ω - matching network

(All dimensions in mm)

**50 Ω test circuit**

4. 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;

5. Packing

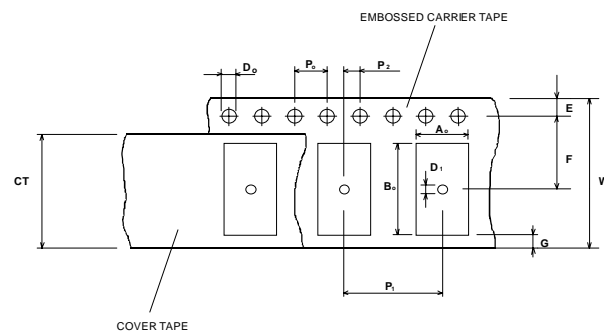
Tape & Reel:

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: 2000
Reel of empty components at start: min 300 mm
Reel of empty components at start including leader: min 500 mm
Trailer min 300 mm

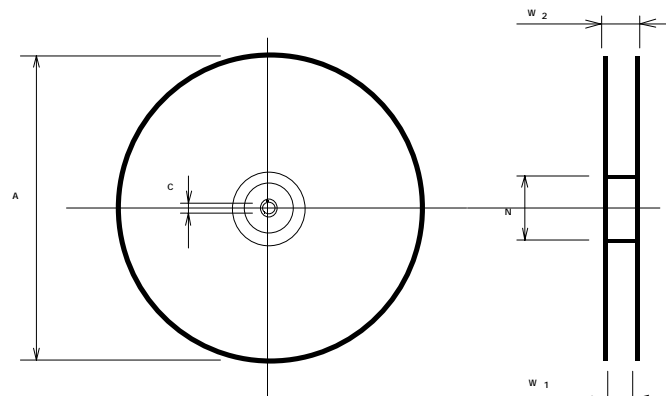
Tape (all dimensions in mm)

W : 16 ± 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 : 5,5 ± 0,1
Bo : 7,5 ± 0,1
CT : 13,5 + 0,1



Reel (all dimensions in mm):

A : 330
W1 : 16,4 +2
W2 (max) : 22,4
N (min) : 50
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. The marking of the filters is readable if the sprocket holes are on the left side of the tape, i.e. pin 1 identifier is close to the sprocket holes.

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6. Air reflow temperature conditions

1st and 2nd air reflow profile

Name:	pre-heating periods	main-heating periods	peak temperature
Temperature:	150 °C - 170 °	Cover 200 °C	255 °C ± 5 °C
Time:		60 sec. - 90 sec.	20 sec. - 25 sec.

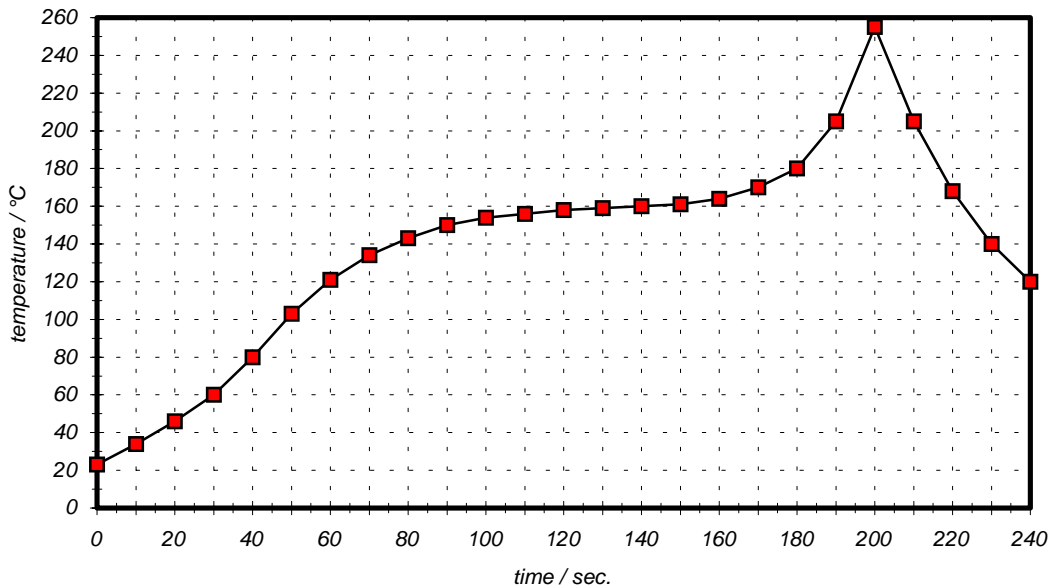
Air reflow profile

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

7. History

Version	Reason of Changes	Name	Date
1.0	- generate specification	Pfeiffer	09.02.01
2.0	- new definition of insertion loss (minimum of the passband attenuation) - new terminating impedances at f_c - $f_c = 135,420 \text{ MHz} \pm 60 \text{ kHz}$ - change from nominal frequency to centre frequency as basis for relative attenuation - $a_e = 15,5 \text{ dB}$ - group delay ripple = 80 ns	Pfeiffer	22.03.01