

VI TELEFILTER**Filter specification****TFS 240L****1/5****Measurement condition**

Ambient temperature T_A : 25 °C
 Input power level: 0 dBm
 Terminating impedances at f_C^* : input: 360 Ω // -9,6 pF
 output: 360 Ω // -10,0 pF

Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the TFS240L 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 25 dB filter attenuation level relative to the insertion loss a_e . The temperature coefficient of frequency TC_f 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 a_e	5,2 dB	max. 9 dB
Centre frequency f_C (reference frequency at ambient temperature)	-	240 MHz $\pm$ 25 kHz
Passband Ripple (p-p) $f_C \pm 100$ kHz	0,2 dB	max. 0,5 dB
Relative attenuation a_{rel}		
f_C $f_C \pm 0,1$ MHz	0,2 dB	max. 0,5 dB
$f_C \pm 0,1$ MHz $f_C \pm 0,15$ MHz	0,5 dB	max. 1 dB
$f_C \pm 0,375$ MHz $f_C \pm 0,575$ MHz	35 dB	min. 25 dB
$f_C \pm 0,575$ MHz $f_C \pm 0,975$ MHz	40 dB	min. 30 dB
$f_C \pm 0,975$ MHz $f_C \pm 5$ MHz	40 dB	min. 35 dB
10 MHz $f_C - 5$ MHz	48 dB	min. 38 dB
$f_C + 5$ MHz $f_C + 360$ MHz	48 dB	min. 38 dB
Triple transit response suppression	18 dB	min. 15 dB
Group delay ripple in $f_C \pm 100$ kHz	250 ns	max. 400 ns
Average group delay in $f_C \pm 100$ kHz	1,8 μ s	max. 2,4 μ s
Return loss in $f_C \pm 150$ kHz	12 dB	min. 7 dB
Input Power Level	-	max. 20 dBm****)
Operating temperature range	-	- 30 °C..... + 80 °C
Storage temperature range	-	- 40 °C..... + 85 °C
Temperature coefficient of frequency TC_f **	-0,04 ppm/K ²	-
Frequency inversion temperature T_0	28 °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.

**) $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T - T_0)^2 \times f_{T0}(\text{MHz})$

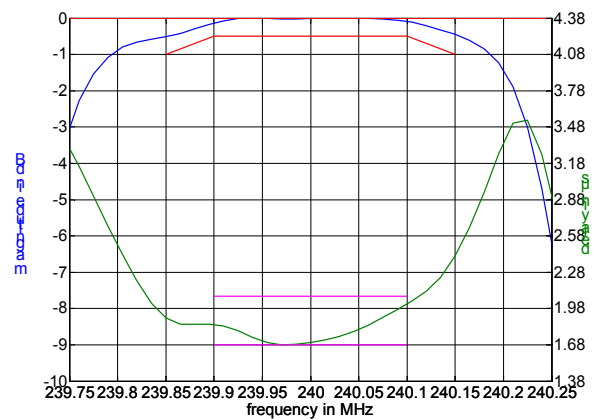
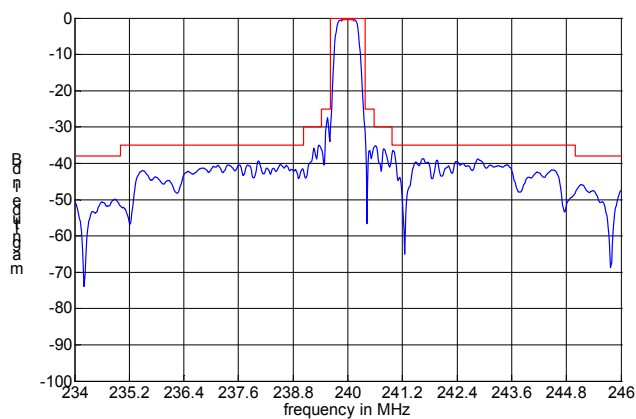
****) This power level is allowed for short term operation (10% of life time) only, the max. input power for continuous operation is 15 dBm

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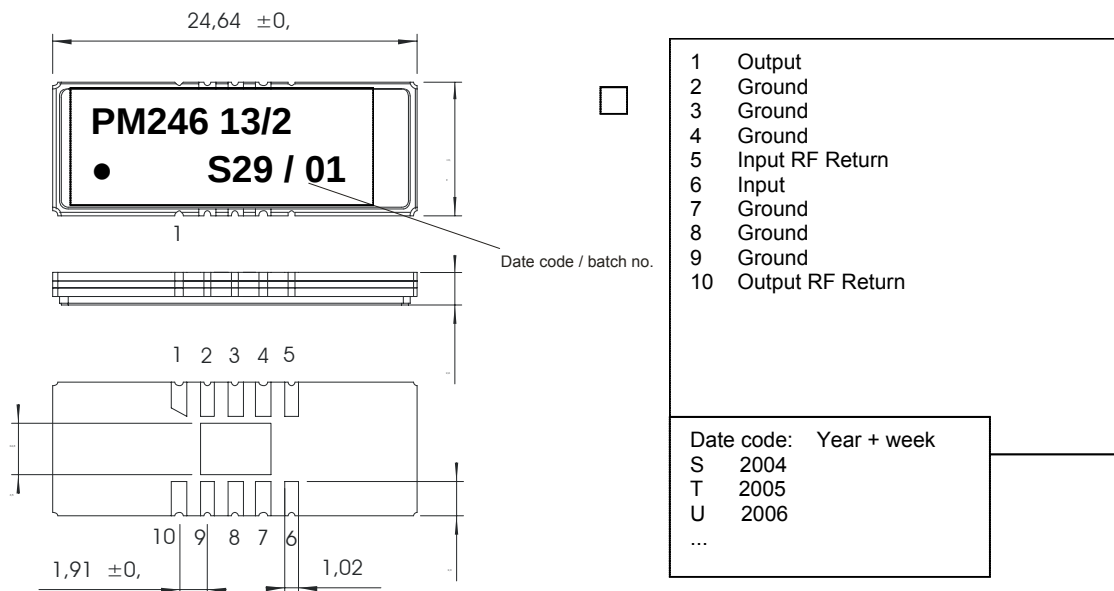
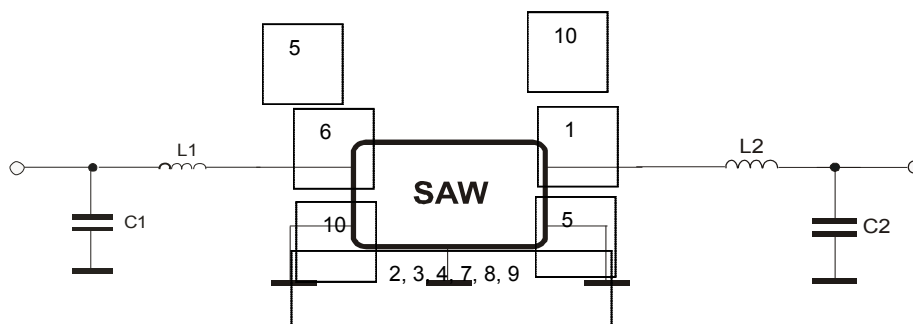
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VI TELEFILTER**Filter specification****TFS 240L****2/5****Filter characteristic****Construction and pin connection**

(All dimensions in mm)

**50 Ohm Test circuit****Stability characteristics**

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VI TELEFILTER**Filter specification****TFS 240L****3/5**

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;

Packing

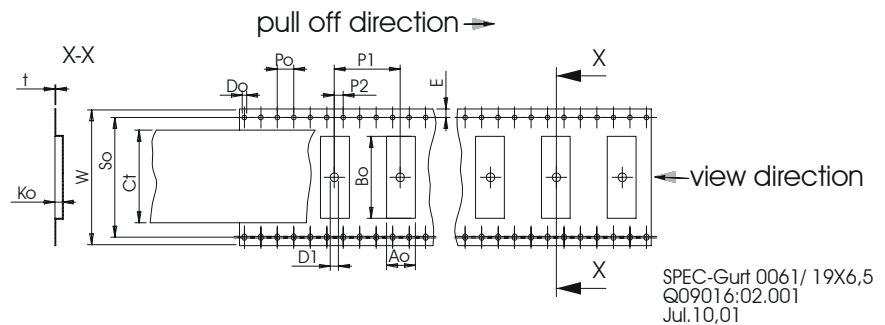
Tape & Reel: DIN IEC 286 – 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

max. pieces of filters per reel:
reel of empty components at start:
reel of empty components at start including leader:
trailer

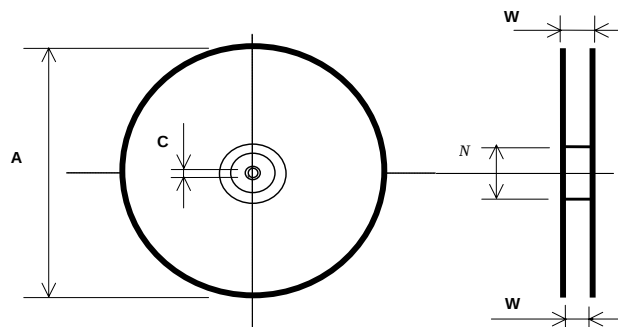
1000
min 300 mm
min 500 mm
min 300 mm

Tape (all dimensions in mm)

W	:	44	± 0,3
Po	:	4	± 0,1
Do	:	1,5	± 0,1
E	:	1,75	± 0,1
F	:	20,25	± 0,05
G (min)	:	0,75	
P2	:	2	± 0,05
P1	:	16	± 0,1
D1(min)	:	2,0	
Ao	:	9,3	± 0,1
Bo	:	24,9	± 0,1
CT	:	38	± 0,2

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

A	:	330
W1	:	44,4 +2,0 / -
0	:	
W2 (max)	:	50,4
N (min)	:	100



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 in the above shown direction.

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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 °	Cover 200 °C	255 °C ± 5 °C
Time:		60 sec. - 90 sec.	20 sec. - 25 sec.

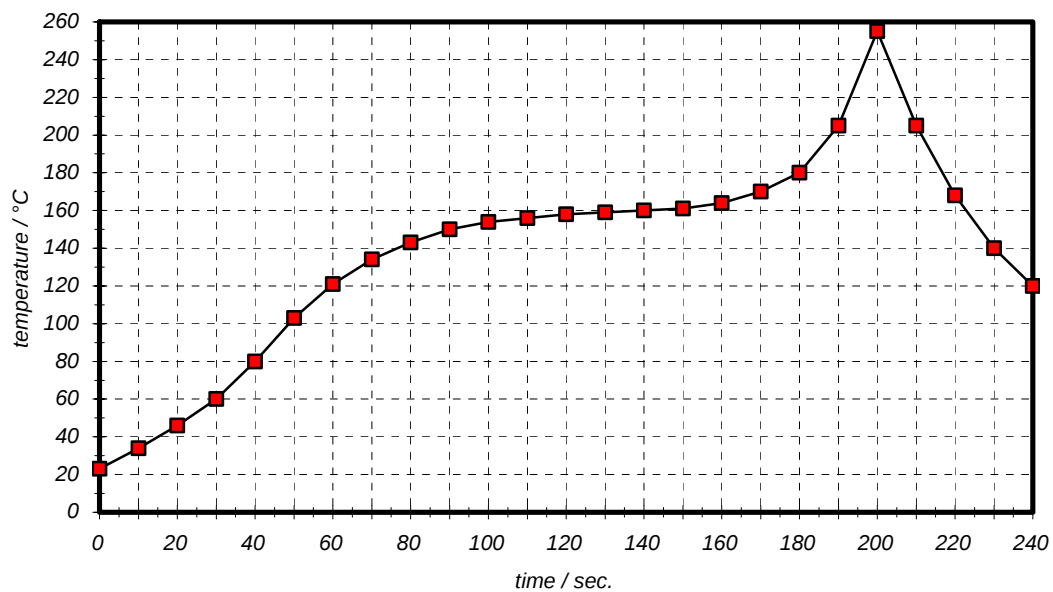
Air reflow profile

Table for temperature vs. time during the air reflow process

Tolerance of temperatures: ± 5 °C

<u>time / sec.</u>	<u>temperature / °C</u>	<u>time / sec.</u>	<u>temperature / °C</u>
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 240L****5/5****History**

Version	Reason of Changes	Name	Date
1.0	generation of specification	Pfeiffer	02.04.2004
1.1	filter characteristic added labelling changed (no. of batch included)	Pfeiffer	15.07.2004

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