

VI TELEFILTER

Filter specification

TFS 71M

Measurement condition

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	1640 Ω -13,9 pF	
Output:	1250 Ω -12,8 pF	

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} is the pass band attenuation at the nominal frequency f_N . This value 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 given values for the centre frequency, the relative attenuation a_{rel} and 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 .

Data

		typ. value	tolerance / limit
Insertion loss (reference level)	a_e	6,6 dB	max. 8,0 dB
Nominal frequency	f_N	-	71 MHz
Centre frequency	f_C	-	71,0 MHz ± 20 kHz
Passband		-	$f_N \pm 100$ kHz
Relative attenuation	a_{rel}		
f_N	... $f_N \pm 100$ kHz	1,6 dB	max. 3 dB
$f_N \pm 200$ kHz	... $f_N \pm 400$ kHz	5 dB	min. 3 dB
$f_N \pm 400$ kHz	... $f_N \pm 600$ kHz	33 dB	min. 25 dB
$f_N + 600$ kHz	... $f_N + 1,0$ MHz	43 dB	min. 35 dB
$f_N - 600$ kHz	... $f_N - 800$ kHz	43 dB	min. 38 dB
$f_N - 800$ kHz	... $f_N - 1,0$ MHz	45 dB	min. 35 dB
$f_N \pm 1,0$ MHz	... $f_N \pm 1,2$ MHz	50 dB	min. 42 dB
$f_N - 1,2$ MHz	... $f_N - 20$ MHz	50 dB	min. 40 dB
$f_N + 1,2$ MHz	... $f_N + 3,0$ MHz	48 dB	min. 39 dB
$f_N + 3,0$ MHz	... $f_N + 20$ MHz	55 dB	min. 35 dB
Group delay	mean value in PB	3,3 µs	min. 3,1 µs
Group delay	mean value in PB	3,3 µs	max. 5,0 µs
Group delay ripple within PB		270 ns	max. 500 ns
Operating temperature range	OTR	-	0 °C ... + 85 °C
Storage temperature range		-	- 40°C ... + 85 °C
Frequency inversion temperature		40 °C	-
Temperature coefficient of frequency	TC_f (***)	-0,04 ppm/K ²	-
Intermodulation	**)	-105 dBm	max. -81 dBm
Input power level		-	max. 20 dBm

*) 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.

***) first measurement: f_{in1} = 70,2 MHz; f_{in2} = 69,4 MHz; P_{in} =-5 dBm $f_{measurement}$ = 71,0 MHz
 second measurement: f_{in1} = 71,8 MHz; f_{in2} = 72,6 MHz; P_{in} =-5 dBm $f_{measurement}$ = 71,0 MHz.

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

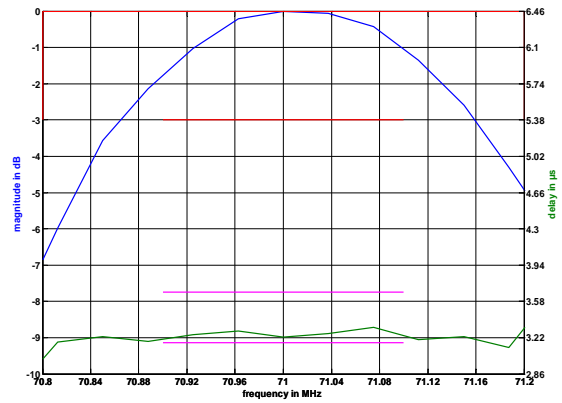
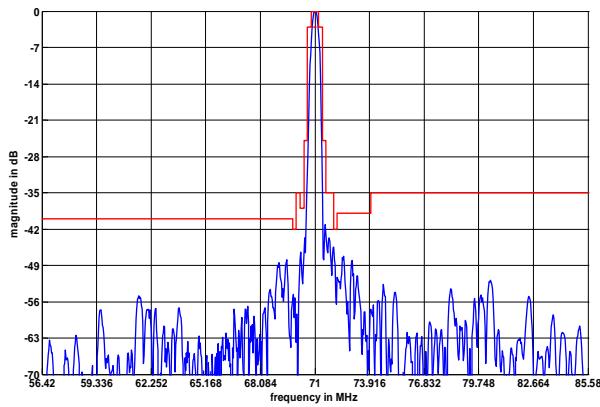
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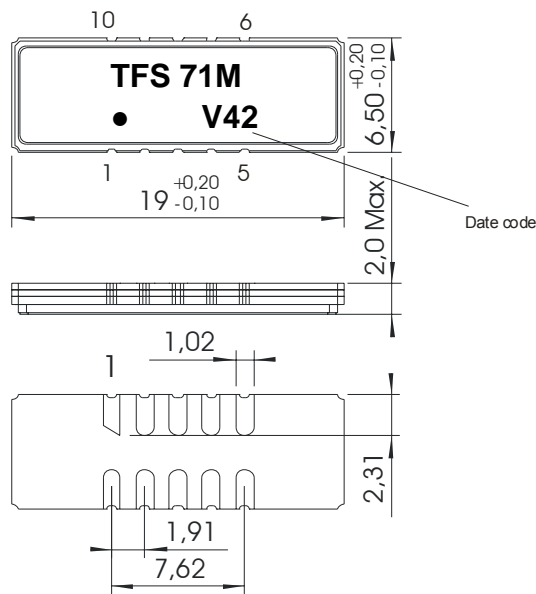
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Filter characteristic



Construction and pin connection

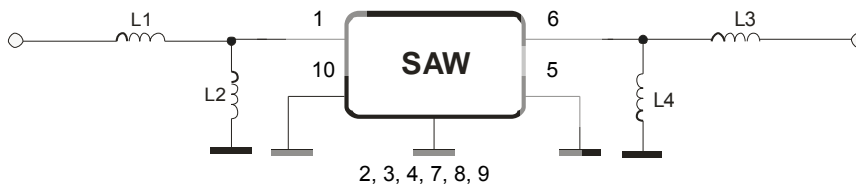
(All dimensions in mm)



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

Date code: Year + week
 V 2007
 W 2008
 X 2009
 ...

50 Ohm Test circuit



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Stability characteristics, reliability

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

- 1. Shock: 500g, 1 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: three times max.;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

This filter is RoHS compliant (2002/95/EG, 2005/618/EG)

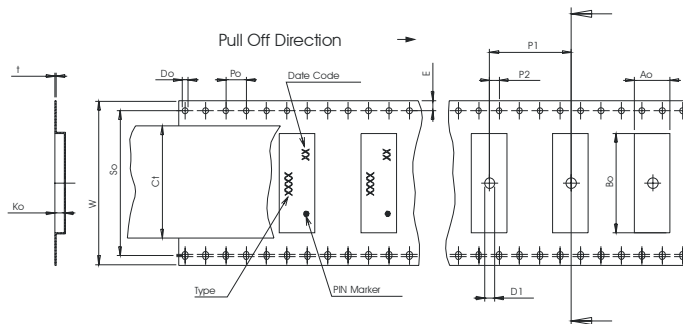
Packing

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

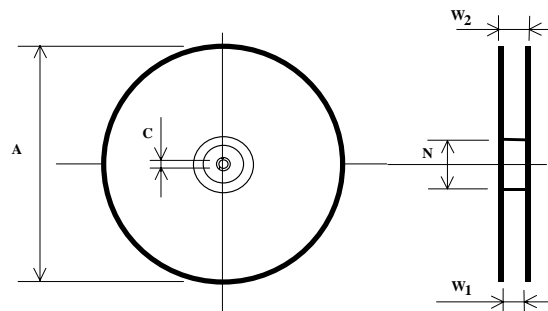
Tape (all dimensions in mm)

- W : 32,00 ± 0,3
- Po : 4,00 ± 0,1
- Do : 1,50 +0,1/-0
- E : 1,75 ± 0,1
- F : 14,20 ± 0,1
- P2 : 2,00 ± 0,1
- P1 : 12,00 ± 0,1
- D1(min) : 2,00
- Ao : 7,10 ± 0,1
- Bo : 19,60 ± 0,1
- So : 28,40 ± 0,1
- Ct : 25,5 ± 0,1



Reel (all dimensions in mm)

- A : 330
- W1 : 32,4 +2/-0
- W2(max) : 38,4
- N(min) : 100
- C : 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

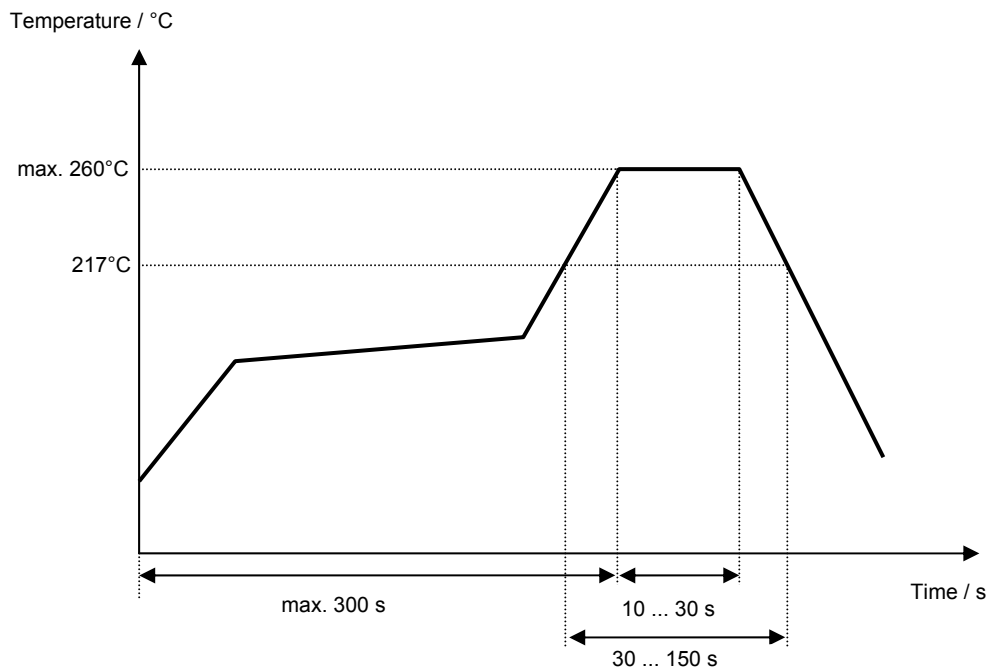
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Air reflow temperature conditions

Conditions	Exposure
Average ramp-up rate (30°C to 217°C)	less than 3°C/second
> 100°C	between 300 and 600 seconds
> 150°C	between 240 and 500 seconds
> 217°C	between 30 and 150 seconds
Peak temperature	max. 260°C
Time within 5°C of actual peak temperature	between 10 and 30 seconds
Cool-down rate (Peak to 50°C)	less than 6°C/second
Time from 30°C to Peak temperature	no greater than 300 seconds

Chip-mount air reflow profile



VI TELEFILTER**Filter specification****TFS 71M****5/5****History**

Version	Reason of Changes	Name	Date
Filter specification			
1.0	-generation of development specification	Roizengaft	16.01.2004
1.1	- typical values and terminating impedance added	Pfeiffer	15.04.2004
1.2	- change air reflow temperature conditions - change stability characteristics - change packing	Alawneh	30.11.2006
1.3	- matching configuration corrected according application note	Pfeiffer	19.10.2007

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