Measurement condition

Ambient temperature: 25 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 260 Ω || -14,33 pF
Output: 180 Ω || -17,53 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of TFS 70L9 is the minimum of the pass band attenuation a_{min}. 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 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.

D a t a		**typ. value**		**tolerance / limit**		
Insertion loss (reference level)	a_e	9,5	dB	max.	10,5	dB
Centre frequency at ambient temperature	f_c	70,0	MHz	±	0,10	MHz
Passband	PB	-		f_c ±	4,2	MHz
Pass band ripple p-p		0,4	dB	max.	1	dB
Bandwidth at ambient temperature	BW					
1 dB		8,75	MHz	min.	8,4	MHz
3 dB		9,46	MHz	min.	9,0	MHz
40 dB		13,44	MHz	max.	14,5	MHz
Relative attenuation	a_{rel}					
f_c ... f_c ± 4,2 MHz		-		max.	1	dB
f_c ± 4,2 MHz ... f_c ± 4,5 MHz		-		max.	3	dB
f_c - 20,0 MHz ... f_c - 7,25 MHz		47...43	dB	min.	40	dB
f_c + 7,25 MHz ... f_c + 20,0 MHz		43...45	dB	min.	40	dB
Group delay	mean value in PB	1,1	µs	max.	1,5	µs
Group delay ripple in f_c ... f_c ± 4,1 MHz (p-p)		70	ns	max.	100	ns
Deviation from linear phase in f_c ... f_c ± 4,1 MHz (p-p)		5,5	degree	max.	10	degree
Triple transit attenuation compared to main signal		44	dB		-	
Crosstalk attenuation compared to main signal		50	dB		-	
Operating temperature range	OTR	-		- 30 °C ... + 65 °C		
Storage temperature range		-		- 40 °C ... + 85 °C		
Temperature coefficient of frequency	TC_f **	-87	ppm/K		-94	ppm/K

*) 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.
**) $\Delta f_C(Hz) = Tc_f(ppm/K) \times (T - T_A) \times f_{CTA}$ (MHz)

Generated:

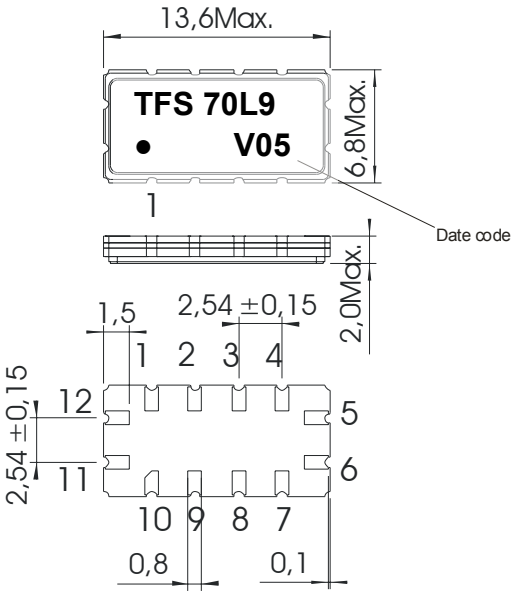
Checked / Approved:

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Construction and pin connection

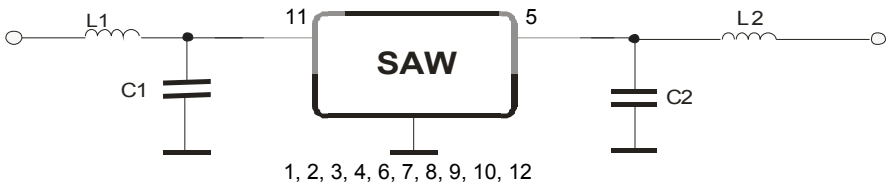
(All dimensions in mm)



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
V	2007
W	2008
X	2009
...	

50 Ω 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)

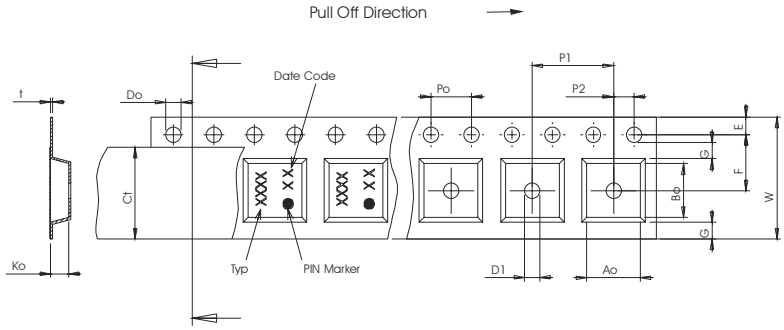
Packing

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:	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

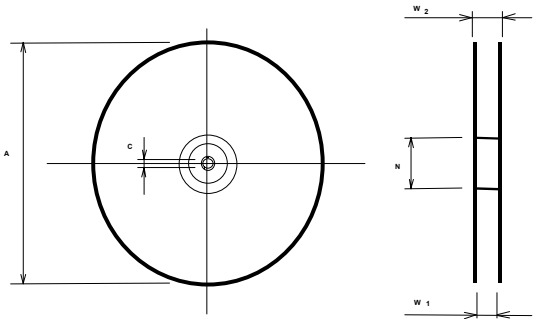
Tape (all dimensions in mm)

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.

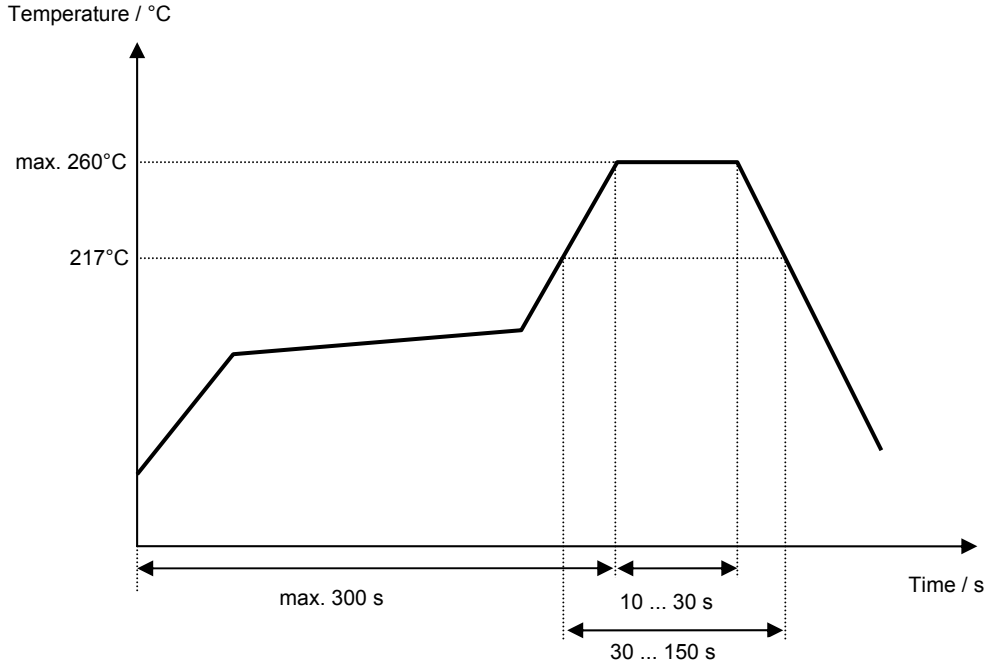
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Air reflow temperature conditions

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



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History

Version	Reason of Changes	Name	Date
1.0	Generate Filter specification.	Dunzow W.	10.09.2001
1.1	Change operating temperature range and stability characteristics	Strehl	30.01.2007

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