Measurement condition

Ambient temperature T_A: 25 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 150 Ω || -33 pF
Output: 100 Ω || -42 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS 92G is the minimum of the pass band attenuation. This value is defined as the insertion loss a_e. The nominal frequency f_N is fixed at 92 MHz without any tolerance. The values of relative attenuation a_{rel} are guaranteed for the whole operating temperature range. The frequency shift of the filter in the operating temperature range is included in the production tolerance scheme.

D a t a		**typ. value**		**tolerance / limit**		
Insertion loss (reference level)	a_e	7.5	dB	max.	13	dB
Nominal frequency	f_N				92	MHz
Passband	PB	12	MHz	f_N ±	5	MHz
Amplitude ripple in PB		0.3	dB	max.	1	dB
Relative attenuation	a_{rel}					
f_N - 5 MHz …	f_N + 5 MHz	0.3	dB	max.	1	dB
f_N - 90 MHz ...	f_N - 40 MHz	68	dB	min.	45	dB
f_N ± 7.5 MHz	f_N ± 15 MHz	19	dB	min.	10	dB
f_N ± 15 MHz	f_N ± 40 MHz	48	dB	min.	35	dB
f_N + 40 MHz	f_N + 200 MHz	52	dB	min.	45	dB
Group delay ripple in PB	GDR	70	ns	max.	125	ns
Return loss in PB		11	dB	min.	8	dB
Input power level				max.	10	dB
Operating temperature range	OTR			-40 °C ... + 85°C		
Storage temperature				- 45 °C ... + 85°C		
Temperature coefficient of frequency	TC_f ****)**	-85	ppm/K			

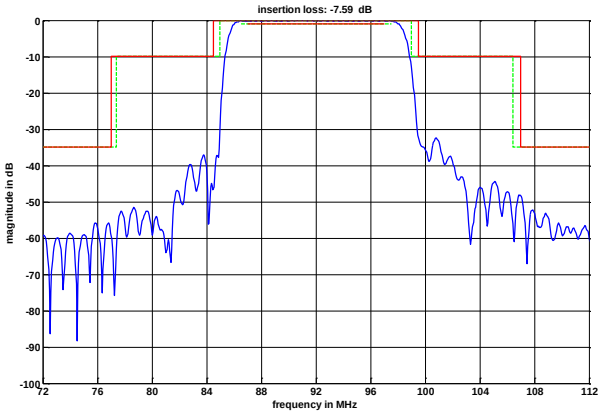
*) The terminating impedances depend on parasitics and q-values of matching elements and the board used, and are to be understood as reference values only. Should there be additional questions, do not hesitate to ask for an application note or contact our design team.
**) $\Delta f = TC_f(T - T_A)f_N$

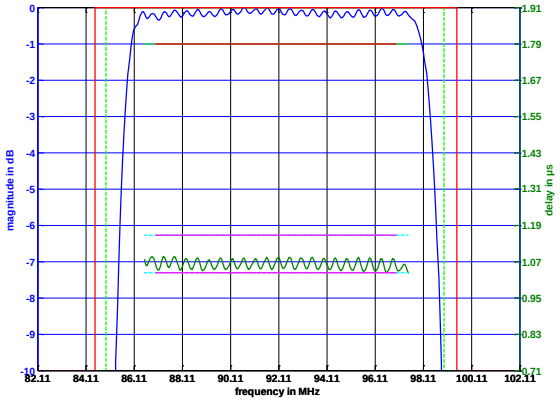
Generated:

Checked / Approved:

Microchip Frequency Technology GmbH
Potsdamer Straße 18
D 14 513 TELTOW / Germany
Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30

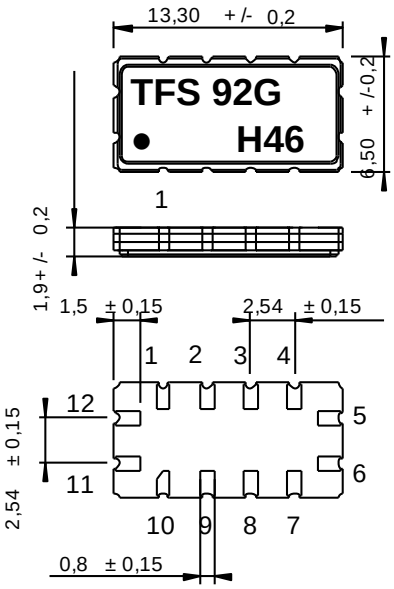
Filter characteristic





Construction and pin connection

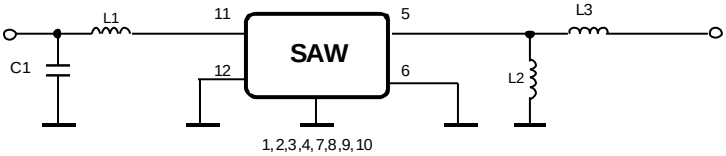
(All dimensions in mm)



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 / Ground

Date code:	Year + week
H	2016
J	2017
K	2018
...	

50 Ohm Test circuit



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Stability characteristics, reliability

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

1. Shock: 500 g, 1 ms, half sine wave, 3 shocks each plane;
   DIN IEC 60068 T2 - 27

2. Vibration: 10 Hz to 2000 Hz, 0.35 mm or 5 g respectively, 1 octave per min, 10 cycles per plane, 3 planes; DIN IEC 60068 T2 - 6

3. Change of temperature: -55 °C to 125 °C / 15 min. each / 100 cycles
   DIN IEC 60068 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;

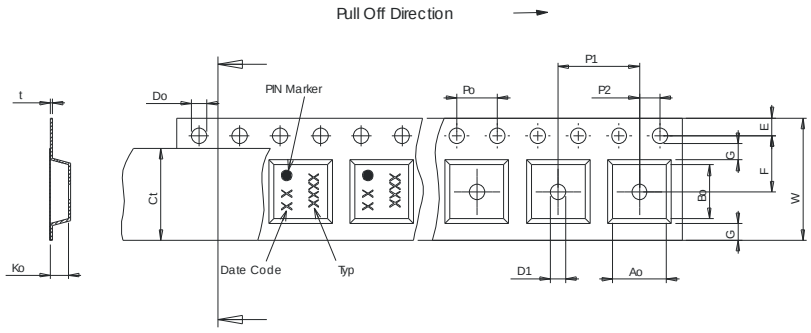
5. SAW devices are Electrostatic Discharge (ESD) sensitive devices.

This filter is RoHS compliant (2011/65/EU)

Packing

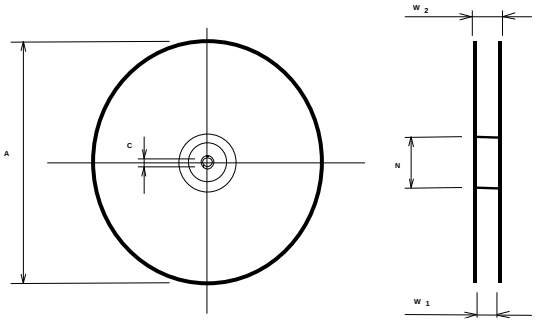
Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

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	:	7.00	±0.10
Bo	:	13.80	±0.10
Ct	:	21.00	±0.1
Ko	:	2.10	±0.10
t	:	0.30	±0.05



Reel (all dimensions in mm)

A	:	330	or 180
W1	:	24.4	+2/-0
W2(max)	:	30.40	
N(min)	:	60.00	
C	:	13.0	+0.5/-0.2

The minimum bending radius is 45 mm.

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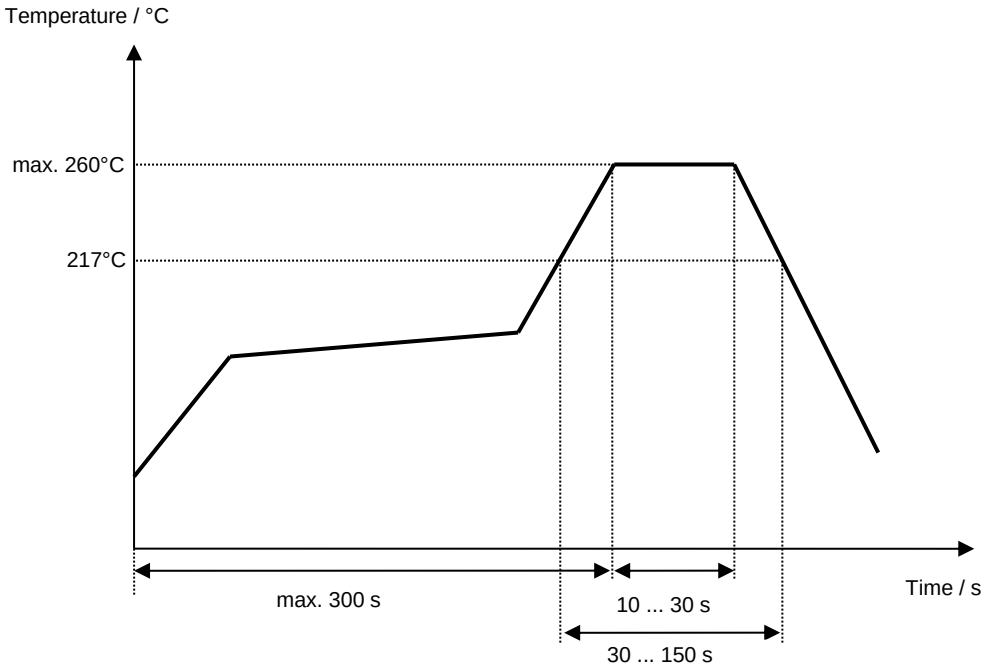
Air reflow temperature conditions

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	generating specification according to customer requirements	Chilla	30.04.2013
1.1	changed insertion loss changed relative attenuation	Chilla	08.05.2013
1.2	changed relative attenuation	Chilla	30.05.2013
2.0	created filter specification added terminating impedances added typical values added temperature coefficient of frequency added filter characteristic added test circuit	Chilla	27.08.2013
3.0	changed tape & reel dimensions updated header and footer sections updated data section updated stability characteristics, reliability	Chilla	14.11.2016

Microchip Frequency Technology GmbH
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