

**Microchip****Filter specification****TFS 150****1/5****Measurement condition**

Ambient temperature $T_A$ :	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	930 $\Omega$	-1.6 pF
Output:	930 $\Omega$	-1.6 pF

**Characteristics**

## Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS 150 is the maximum attenuation in the pass band. The maximum attenuation in the pass band is defined as the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 150.05 MHz without any tolerance or limit. 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.

<b>D a t a</b>		<b>typ. value</b>		<b>tolerance / limit</b>		
<b>Insertion loss</b> (reference level)	$a_e = a_{max}$	2.8	dB	max.	5	dB
<b>Nominal frequency</b>	$f_N$	-			150.05	kHz
<b>Passband</b>	PB	-		$f_N$	$\pm$ 10	kHz
<b>Bandwidth</b> 3 dB	BW	107	kHz			-
<b>Relative attenuation</b> $f_N + 910$ kHz	$a_{rel}$	65	dB	min.	60	dB
<b>Operating temperature range</b>	OTR	-			- 20 °C ... + 70 °C	
<b>Storage temperature range</b>		-			- 55 °C ... + 125 °C	
<b>Frequency inversion temperature</b>		+ 30 °C				-
<b>Temperature coefficient of frequency</b>	$TC_f$ *	- 0.036	ppm/K <sup>2</sup>			-

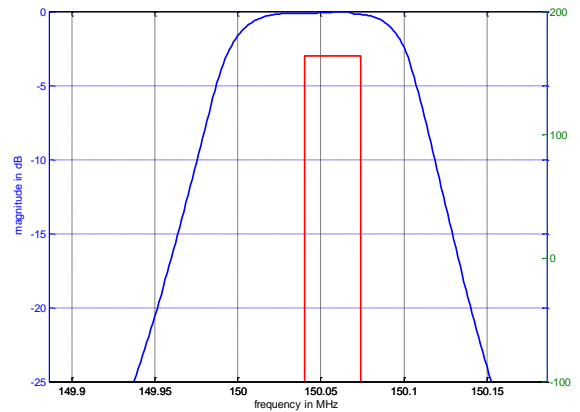
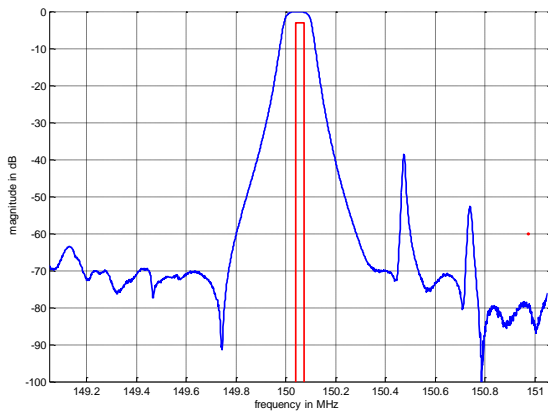
$$*) \Delta f = TC_f(T - T_0)^2 f_N$$

**Generated:****Checked / Approved:**

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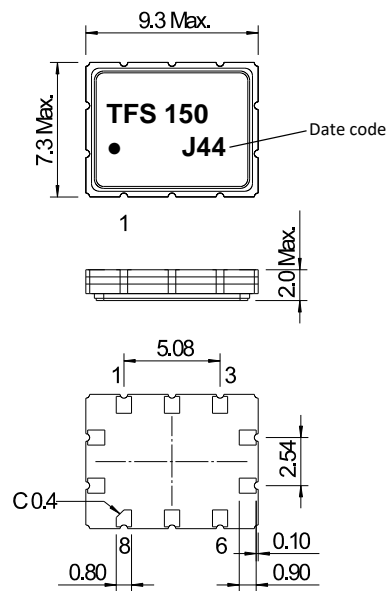
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**Filter characteristic**



**Construction and pin connection**

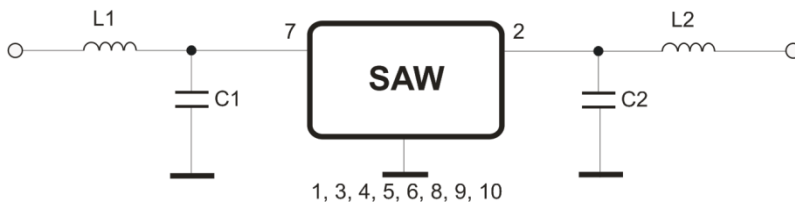
(All dimensions in mm)



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

Date code: Year + week  
 J 2017  
 K 2018  
 L 2019  
 ...

**50 Ω 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)

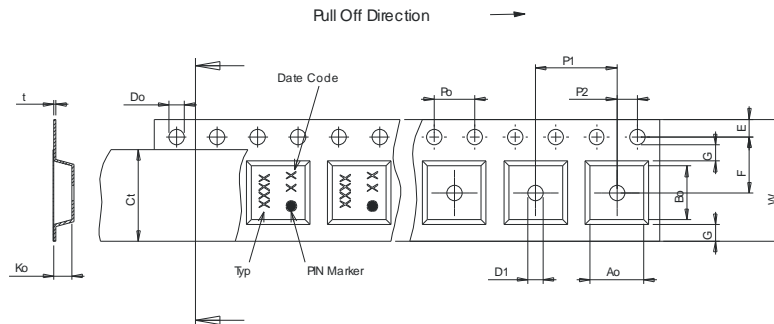
**Packing**

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;

reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

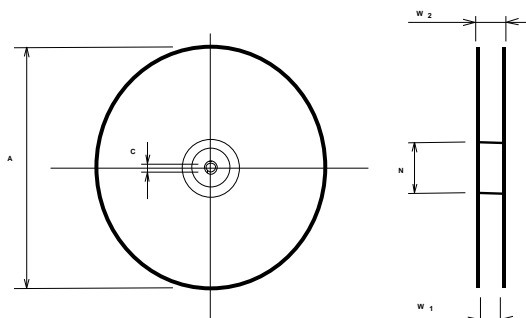
**Tape (all dimensions in mm)**

- W : 16.00 ±0.3
- Po : 4.00 ±0.1
- Do : 1.50 +0.1/-0
- E : 1.75 ±0.10
- F : 7.50 ±0.10
- G(min) : 0.60
- P2 : 2.00 ±0.1
- P1 : 12.00 ±0.1
- D1(min) : 1.50
- Ao : 7.60 ±0.10
- Bo : 9.60 ±0.10
- Ct : 13.30
- Ko : 2.50 ±0.10
- t : 0.30 ±0.05



**Reel (all dimensions in mm)**

- A : 330 or 180
- W1 : 16.4
- W2(max) : 22.40
- N(min) : 50.00
- C : 13.0



The minimum bending radius is 45 mm.

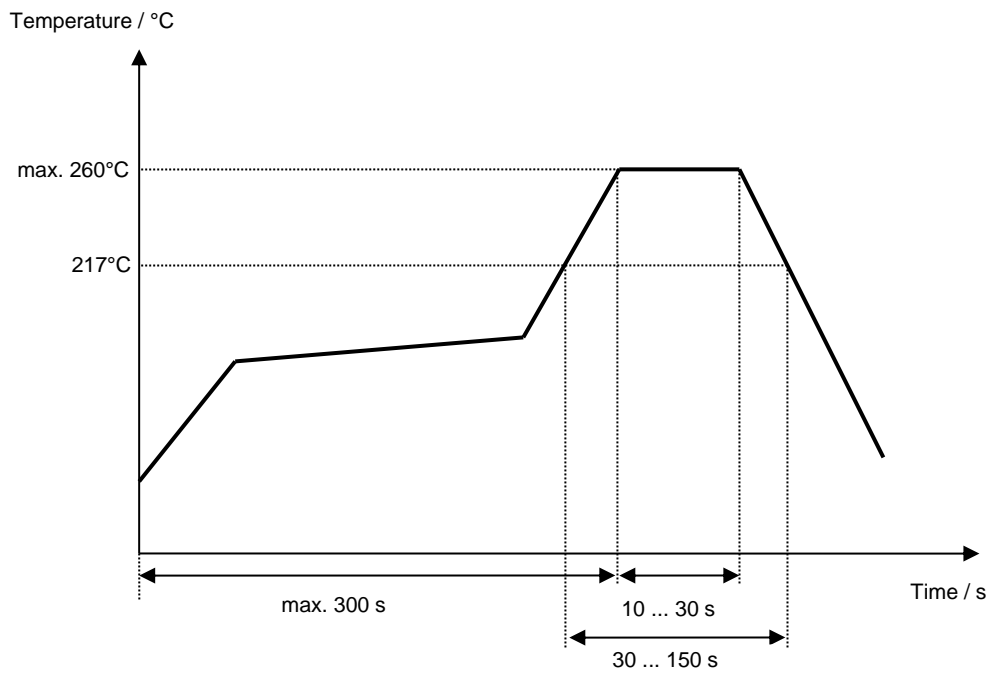
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**Air reflow temperature conditions**

<b>Conditions</b>	<b>Exposure</b>
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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**Microchip****Filter specification****TFS 150****5/5**

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**History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.2	- Add history, add filter characteristic	Channaa	11.11.2005
2.0	- Changed matching topology - Corrected typos - Updated storage temperature range	Bonnen	02.11.2017

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