

**Microchip****Filter specification****TFS100M****1/5****Measurement condition**

Ambient temperature $T_A$ :	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	337 $\Omega$	- 21.3 pF
Output:	291 $\Omega$	- 28.3 pF

**Characteristics**

## Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS100M 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 100 MHz without any tolerance. The values of relative attenuation  $a_{rel}$  are guaranteed over the whole operating temperature range. The frequency shift of the filter within 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)	$a_e$	30.7 dB	max.	32	dB
<b>Nominal frequency</b>	$f_N$			100	MHz
<b>Passband 1</b>	PB1	- MHz	$f_N$ ±	2.5	MHz
<b>Passband 2</b>	PB2	- MHz	$f_N$ ±	2.3	MHz
<b>Pass band ripple</b> within PB1		0.6 dB	max.	1	dB
<b>Relative attenuation ***</b>	$a_{rel}$				
$f_N$ MHz ... $f_N$ ± 2.5 MHz		0.6 dB	max.	1	dB
$f_N$ ± 2.625 MHz ... $f_N$ ± 2.75 MHz		11 dB	min.	5	dB
$f_N$ ± 2.75 MHz ... $f_N$ ± 50 MHz		47 dB	min.	40	dB
<b>Group delay ripple</b> within PB1		130 ns	max.	300	ns
<b>Group delay ripple</b> within PB2		100 ns	max.	200	ns
<b>Return loss</b> within PB1		11.4 dB	min.	8	dB
<b>Input power level</b>			max.	10	dBm
<b>Operating temperature range</b>	OTR			0 °C ... + 50 °C	
<b>Operable temperature range</b>				- 40 °C ... + 85 °C	
<b>Storage temperature range</b>				- 55 °C ... + 125 °C	
<b>Frequency inversion temperature</b>	$T_0$	25 °C			
<b>Temperature coefficient of frequency</b>	$TC_f$ **	-0.036 ppm/K <sup>2</sup>			

\*) 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.

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

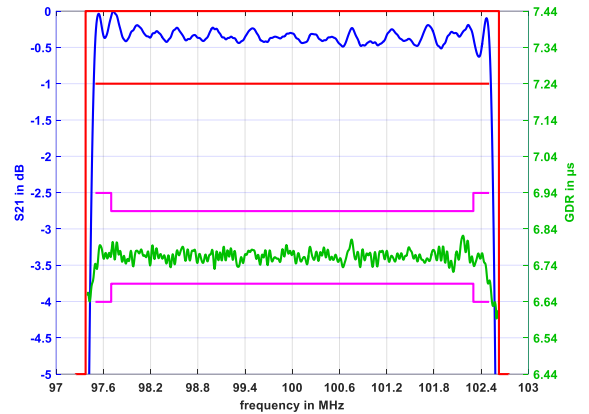
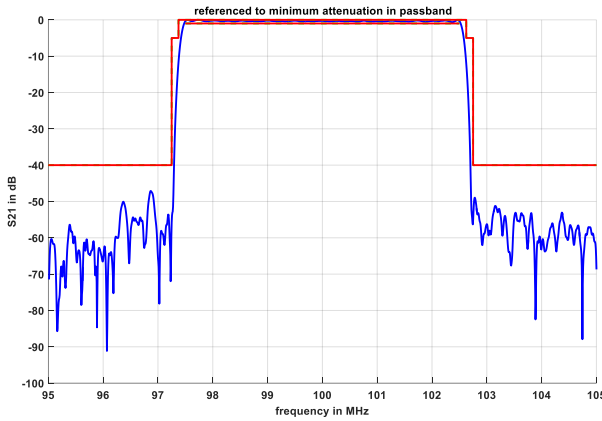
\*\*\*\*) The package to be soldered to PCB ground plane.

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

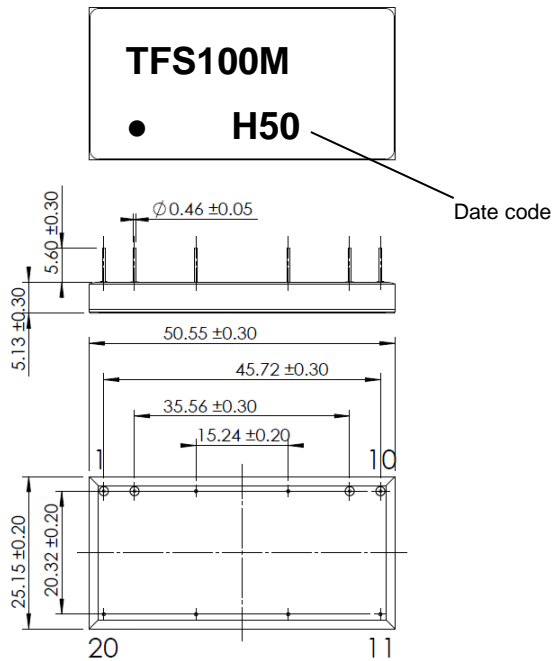
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Filter characteristic



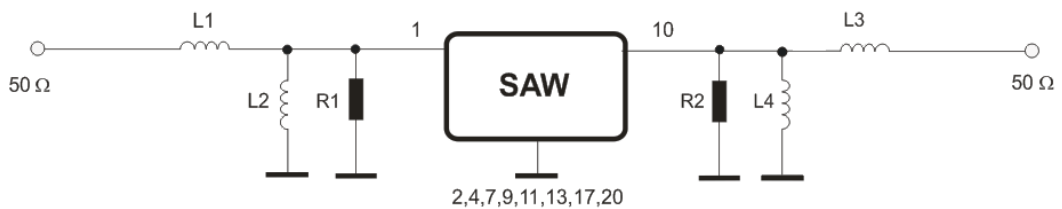
Construction and pin connection  
(All dimensions in mm)



- 1 Input
- 2 Ground
- 4 Ground
- 7 Ground
- 9 Ground
- 10 Output
- 11 Ground
- 13 Ground
- 17 Ground
- 20 Ground

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

50Ω Test circuit



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**Stability characteristics, reliability**

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

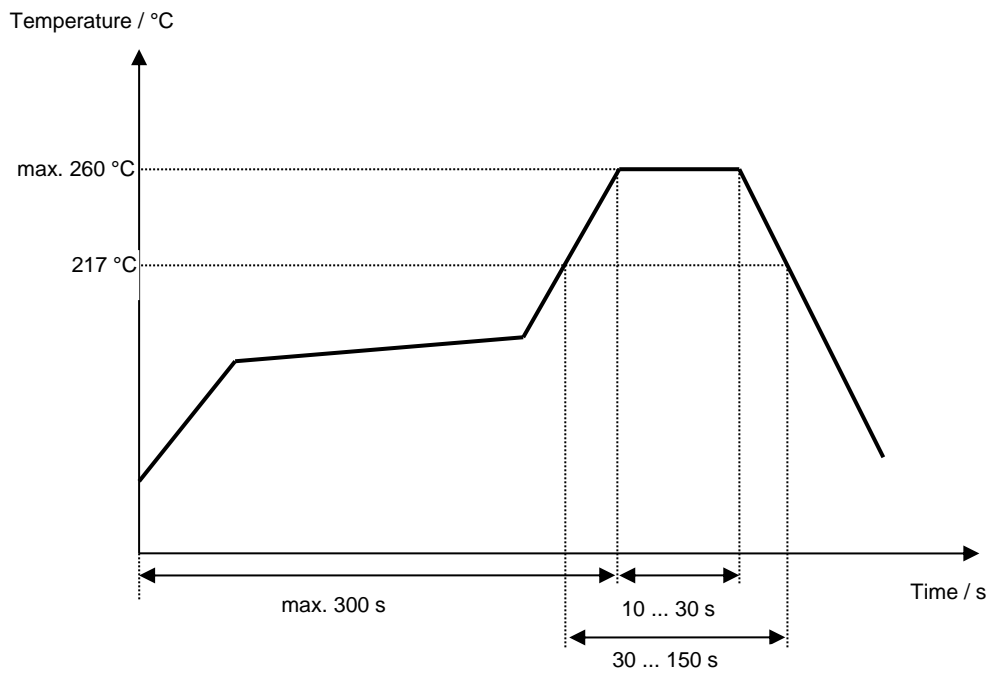
1. Shock: 500 g, 1 ms, half sine wave, 3 shocks each plane;  
DIN IEC 60068 T2 - 27
2. Vibration: 10 Hz to 2000 Hz, 0.35 mm or 5 g respectively, 1 octave per min, 10 cycles per  
plane, 3 planes; DIN IEC 60068 T2 - 6
3. Change of  
temperature: -55 °C to 125 °C / 15 min. each / 100 cycles  
DIN IEC 60068 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)

**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****TFS100M****5/5**

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**History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	- Generation of development specification	Jaffer	08.12.2016
1.1	- Add typ values, plots and move to filter specification.	Jaffer	31.05.2017
2.0	- Correct typo, 5dB rejection levels begin from $f_N \pm 2.625\text{MHz}$ and not $f_N \pm 2.65\text{MHz}$ .	Jaffer	31.05.2017
2.1	- Customer request to add footnote → ""the package to be soldered to PCB ground plane to ...".	Jaffer	06.10.2017

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