

**Microchip**

**Filter specification**

**TFS150BC**

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**Measurement condition**

Ambient temperature $T_A$ :	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	67 $\Omega$	-3 pF
Output:	56 $\Omega$	-22 pF

**Characteristics**

Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS150BC is the minimum of the pass band attenuation  $a_{min}$ . The minimum of the pass band attenuation  $a_{min}$  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 22.5 dB filter attenuation level relative to the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 150.25 MHz without any tolerance. The given values for both the relative attenuation  $a_{rel}$  and the group delay ripple have to be achieved at the frequencies given below even if the centre frequency  $f_C$  is shifted due to the temperature coefficient of frequency  $TC_f$  within the operating temperature range and due to a production tolerance for the centre frequency  $f_C$ .

D a t a		typ. value		tolerance / limit	
<b>Insertion loss</b> (reference level)	$a_e$	28	dB	max.	31 dB
<b>Nominal frequency</b>	$f_N$				150.25 MHz
<b>Centre frequency at ambient temperature</b>	$f_C$	150.25	MHz	$\pm$	0.15 MHz
<b>Passband at ambient temperature</b>	PB			$f_C \dots f_C \pm$	14.80 MHz
<b>Pass band ripple at <math>T_A</math></b>	p-p	0.9	dB	max.	1.2 dB
<b>Pass band ripple</b>	p-p	1.4	dB	max.	1.8 dB
<b>Relative attenuation</b>	$a_{rel}$				
$f_C$	$\dots f_C \pm$	14.8	MHz	1.4	dB
$f_C \pm$	15.6 MHz	$\dots f_C \pm$	16.0 MHz	24	dB
$f_C +$	16 MHz	$\dots f_C +$	150 MHz	40...45	dB
$f_C -$	16 MHz	$\dots f_C -$	120 MHz	45...50	dB
$f_C -$	120 MHz	$\dots f_C -$	145 MHz	55...70	dB
<b>Group delay</b>	mean value in PB	2.5	$\mu$ s	max	3 $\mu$ s
<b>Group delay ripple within PB</b>	p-p	80	ns	max.	180 ns
<b>Deviation from linear phase within PB</b>		8°	p-p	(1,5° r.m.s)	-
<b>Triple transit attenuation compared to main signal</b>		62	dB		-
<b>Crosstalk</b>		57	dB		-
<b>Operating temperature range</b>	OTR	-		- 33 °C ...	+ 85 °C
<b>Storage temperature range</b>		-		- 55 °C ...	+ 125 °C
<b>Temperature coefficient of frequency</b>	$TC_f$ **	-87	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.

\*\*)  $\Delta f = TC_f(T - T_A)f_N$

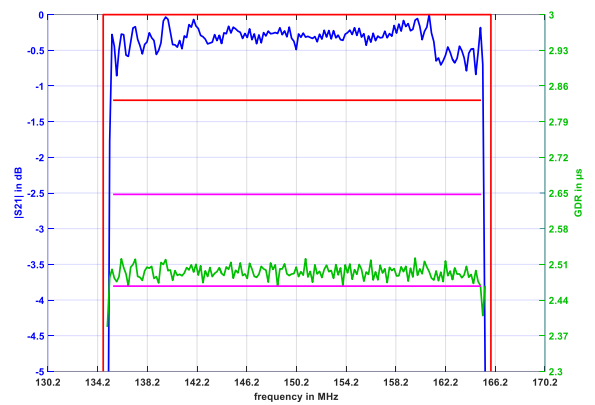
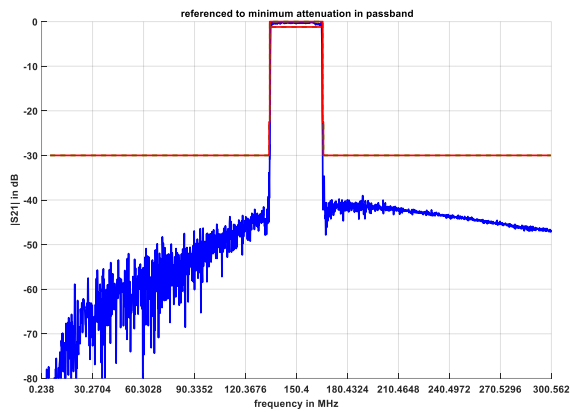
**Generated:** \_\_\_\_\_

**Checked / Approved:** \_\_\_\_\_

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

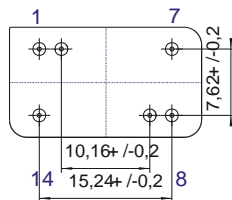
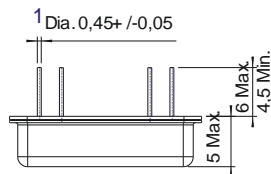
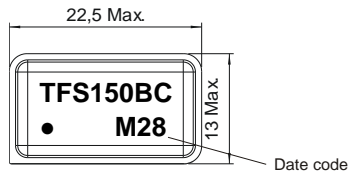
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**Filter characteristic**



**Construction and pin connection**

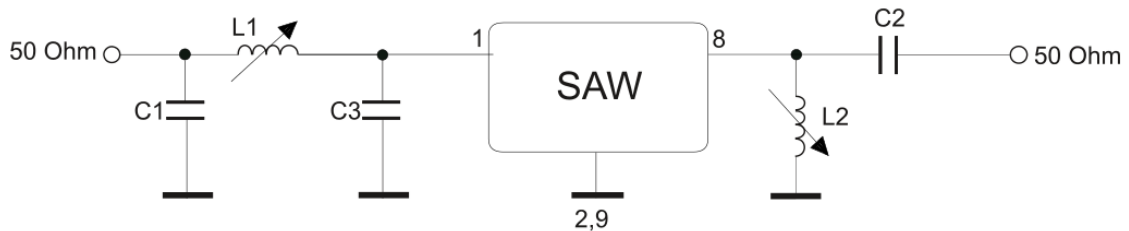
(All dimensions in mm)



1	Input
2	Ground
7	Ground
8	Output
9	Ground
14	Ground

Date code: Year + week  
 M 2020  
 N 2021  
 P 2022  
 ...

**50 Ω test circuit**



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**Stability characteristics, reliability**

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

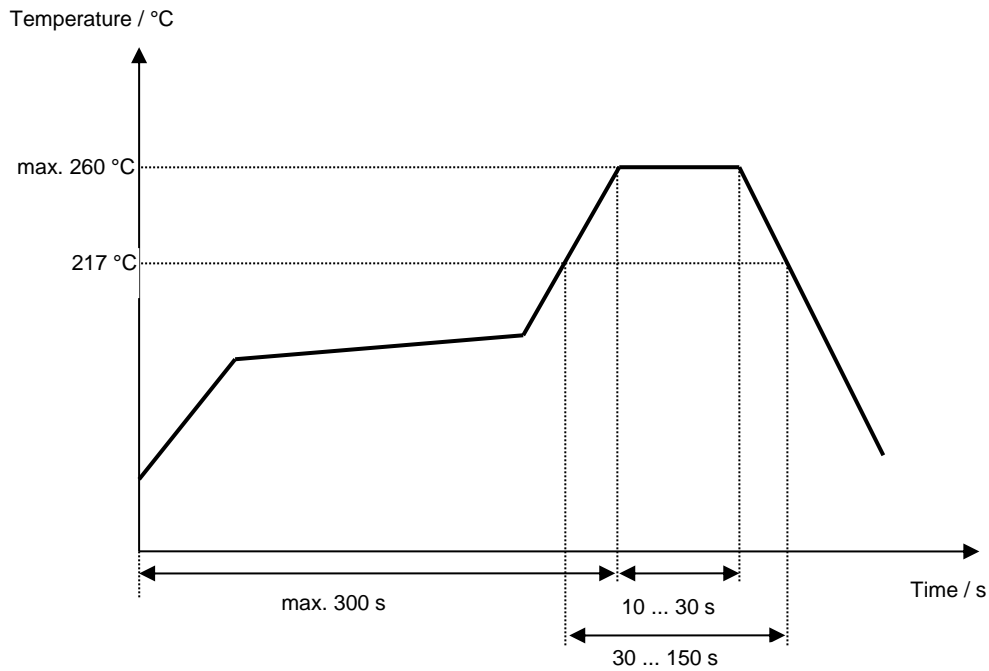
1. Shock: 500g, 1 ms, half sine wave, 3 shocks each plane;  
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 500 Hz, 0,35 mm or 5 g respectively, 1 octave per min, 10 cycles per plan, 3 plans;  
DIN IEC 68 T2 - 6
3. Change of temperature: -55 °C to 125°C / 30 min. each / 10 cycles  
DIN IEC 68 part 2 – 14 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)

**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****TFS150BC****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 filter specification according to TFS150G3	Bonnen	06.07.2020
2.0	- Change PBR requirements, change operating temperature range	Bonnen	10.12.2020

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