

Microchip**Filter specification****TFS367B****1/5****Measurement condition**

Ambient temperature T_A :	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	529 Ω	-4.9 pF
Output:	434 Ω	-4.9 pF

Characteristics**Remark:**

The reference level for the relative attenuation a_{rel} of the TFS367B 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 367.5 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.

D a t a		typ. value		tolerance / limit		
Insertion loss (reference level)		a_e	7.3	dB	max.	9 dB
Nominal frequency		f_N				367.5 MHz
Passband		PB			$f_N \pm$	0.09 MHz
Passband ripple within PB		PBR	0.4	dB	max.	1 dB
Relative attenuation		a_{rel}				
f_N	... $f_N \pm$	0.09 MHz	0.4	dB	max.	1 dB
$f_N \pm$	0.5 MHz ... $f_N \pm$	1 MHz	18	dB	min.	10 dB
$f_N \pm$	1 MHz ... $f_N \pm$	4 MHz	37	dB	min.	33 dB
$f_N \pm$	4 MHz ... $f_N \pm$	20 MHz	44	dB	min.	40 dB
$f_N -$	20 MHz ... $f_N -$	75 MHz	54	dB	min.	50 dB
$f_N -$	75 MHz ... $f_N -$	260 MHz	59	dB	min.	30 dB
$f_N +$	20 MHz ... $f_N +$	32.5 MHz	54	dB	min.	45 dB
$f_N +$	32.5 MHz ... $f_N +$	75 MHz	53	dB	min.	50 dB
$f_N +$	75 MHz ... $f_N +$	1019 MHz	60	dB	min.	30 dB
$f_N +$	1019 MHz ... $f_N +$	1717.5 MHz	100	dB	min.	45 dB
$f_N +$	1717.5 MHz ... $f_N +$	1834 MHz	100	dB	min.	30 dB
Group delay ripple within $f_N \pm 0.06$ MHz			30	ns	max.	125 ns
Group delay ripple within $f_N \pm 0.06$ MHz ... $f_N \pm 0.09$ MHz			60	ns	max.	250 ns
Average group delay within PB			1.31	μ s	max.	1.5 μ s
Return loss within PB		RL	19		min.	10 dB
Input power operational					max.	15 dBm
Input power without damage **)					max.	20 dBm
Input power with duty cycle 1:16 over 10 years lifetime					max.	23 dBm
Operating temperature range		OTR				-40 °C ... +85 °C
Operable temperature range						-40 °C ... +105 °C
Storage temperature range						-55 °C ... +125 °C
Frequency inversion temperature		T_o	30	°C		-
Temperature coefficient of frequency		TC_f ***)	-0.036	ppm/K ²		-

*) 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.

*) up to 4.000 hours maximum

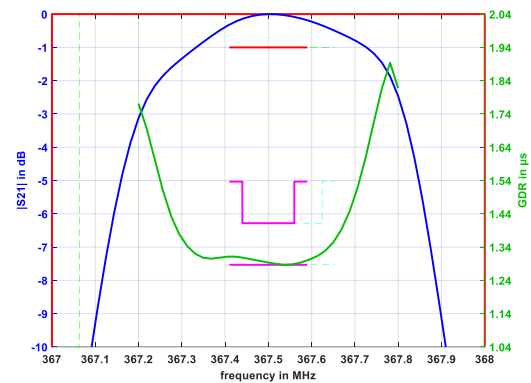
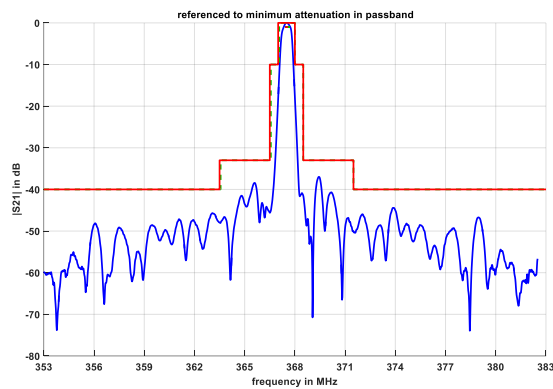
***) $\Delta f = TC_f(T - T_o)^2 f_N$

Generated:**Checked / Approved:**

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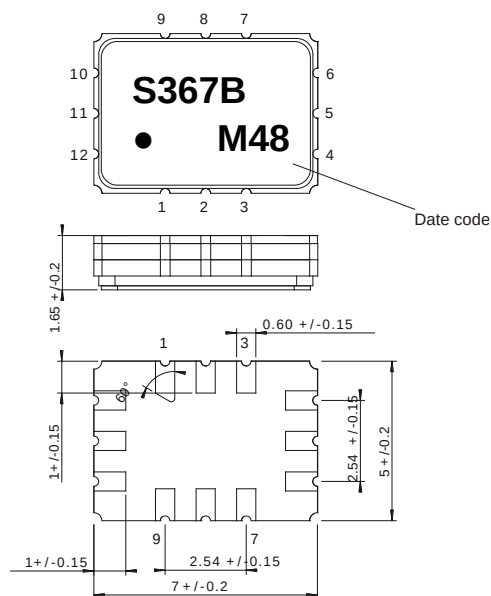
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Filter characteristic



Construction and pin connection

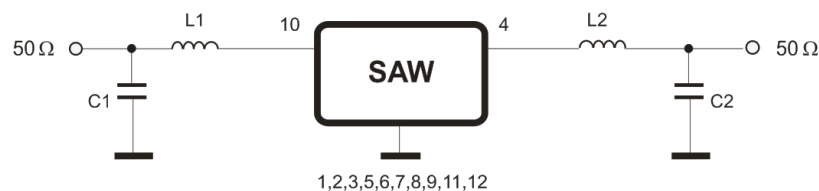
(All dimensions in mm)



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

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

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 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+2015/863/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;

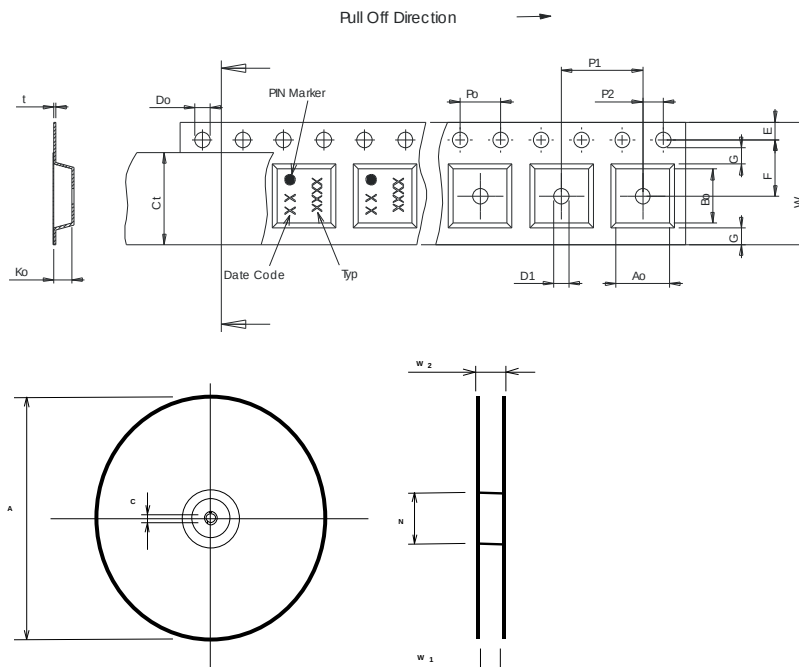
reel of empty components at start: min. 300 mm
reel of empty components at start including leader: min. 500 mm
trailer: min. 300 mm

Tape (all dimensions in mm)

W	: 16.00 +0.3/-0.1
Po	: 4.00 ±0.1
Do	: 1.50 +0.1/-0
E	: 1.75 ±0.1
F	: 7.50 ±0.1
G(min)	: 0.75
P2	: 2.00 ±0.1
P1	: 8.00 ±0.1
D1(min)	: 1.50
Ao	: 5.40 ±0.1
Bo	: 7.60 ±0.1
Ct	: 13.30 ±0.1
Ko	: 2.00 ±0.1
t	: 0.30 ±0.05

Reel (all dimensions in mm)

A	: 330 or 180
W1	: 16.4 +2/-0
W2(max)	: 22.40
N(min)	: 50.00
C	: 13.0 +0.5/-0.2



The minimum bending radius is 45 mm.

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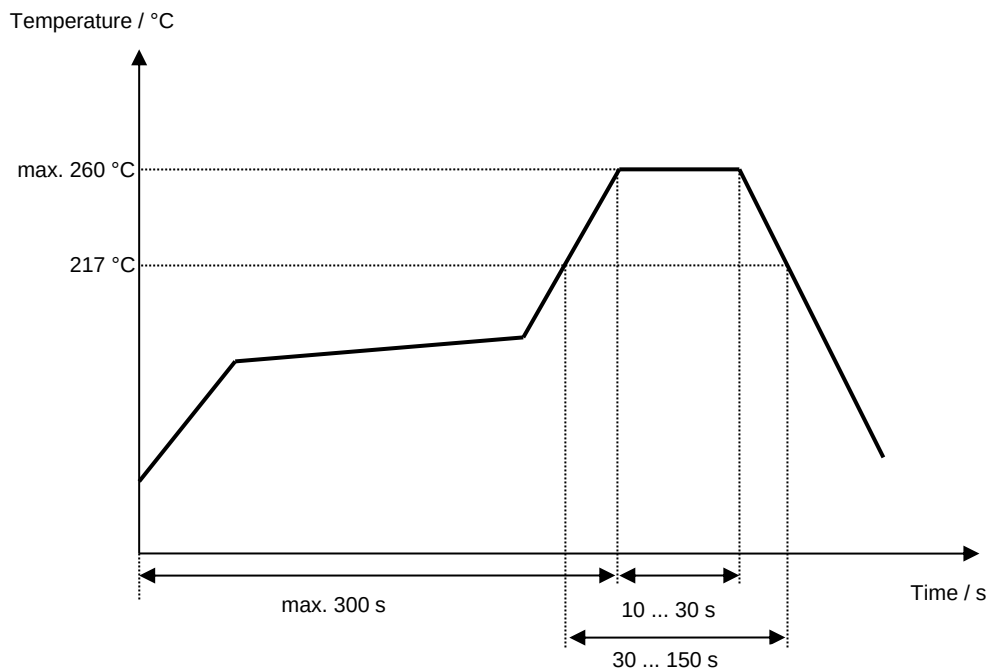
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Air reflow temperature conditions

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

Microchip**Filter specification****TFS367B****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	P. Jaster	25.11.2019
2.0	- Change typo in construction and pin connection	Bonnen	28.11.2019
2.1	- Add typ. value, plots and move to filter spec.	Jaffer	24.06.2020

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