

Microchip**Filter specification****TFS452F****1/5****Measurement condition**

Ambient temperature T_A :	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	50	Ω
Output:	50	Ω

Characteristics

Remark:

The maximum attenuation in the pass band is defined as the insertion loss a_e . The nominal frequency f_N is fixed at 452.5 MHz without any tolerance or limit. The values of absolute attenuation a_{abs} are guaranteed for the whole operating temperature range OTR₁. 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	a_e	1.3	dB	max.	2.5	dB
Insertion loss at T_A		1.3	dB	max.	1.7	dB
Nominal frequency	f_N	-			452.5	MHz
Passband	PB	-		$f_N \pm$	2.5	MHz
Passband variation		0.5	dB	max.	1.5	dB
Passband variation at T_A		0.5	dB	max.	0.8	dB
Absolute attenuation	a_{abs}					
10.0 MHz ... f_N - 212.5 MHz		31	dB	min.	28	dB
f_N - 212.5 MHz ... f_N - 12.5 MHz		28	dB	min.	25	dB
f_N + 7.5 MHz ... f_N + 12.5 MHz	in OTR ₂	45	dB	min.	30	dB
f_N + 7.5 MHz ... f_N + 12.5 MHz		45	dB	min.	20	dB
f_N + 57.5 MHz ... f_N + 102.5 MHz		45	dB	min.	25	dB
f_N + 102.5 MHz ... f_N + 417.5 MHz		31	dB	min.	25	dB
f_N + 417.5 MHz ... 1200.0 MHz		33	dB	min.	30	dB
VSWR within PB		1.4 : 1		max.	2 : 1	
Input power level		-		max.	20 *	dBm
Operating temperature range 1	OTR ₁				-40 °C ... +85 °C	
Operating temperature range 2	OTR ₂				T_A ... +85 °C	
Storage temperature range					-55 °C ... +125 °C	
Temperature coefficient of frequency	TC_f^{**}	-36	ppm/K			

*) 20 dBm over 1000 h

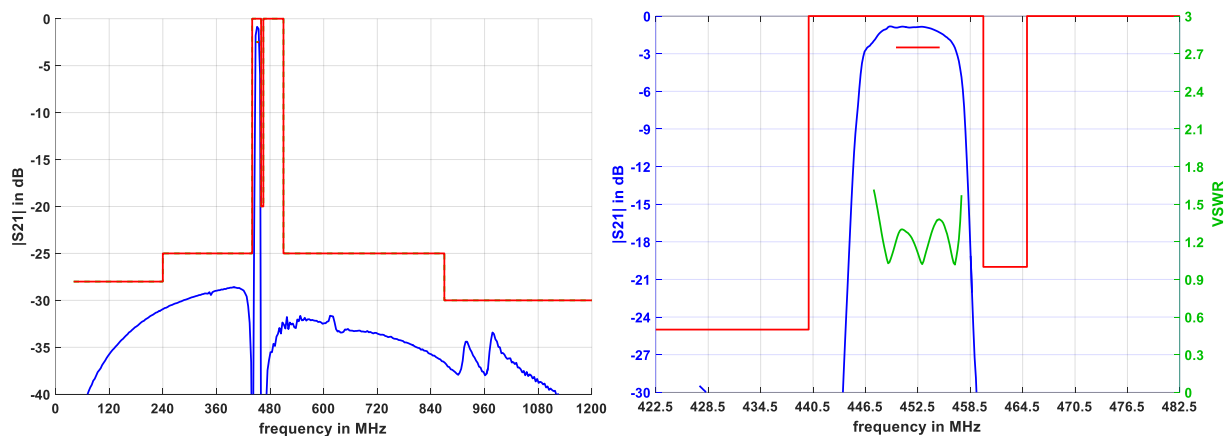
**) $\Delta f = TC_f(T - T_A)f_N$

Generated:**Checked / Approved:**

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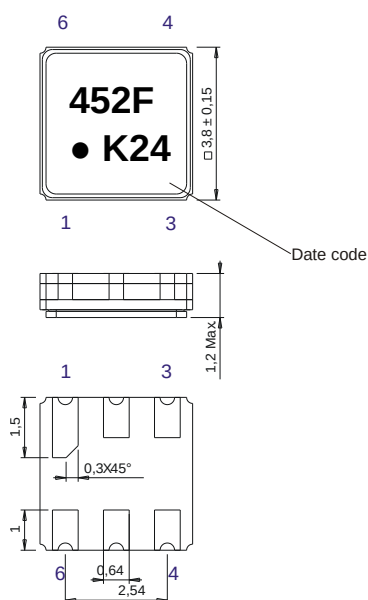
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Filter characteristic



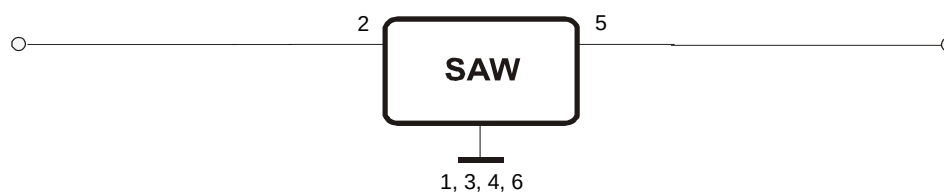
Construction and pin connection

(All dimensions in mm)



1	Ground
2	Input
3	Ground
4	Ground
5	Output
6	Ground

Date code:	Year + week
K	2018
L	2019
M	2020
...	

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;

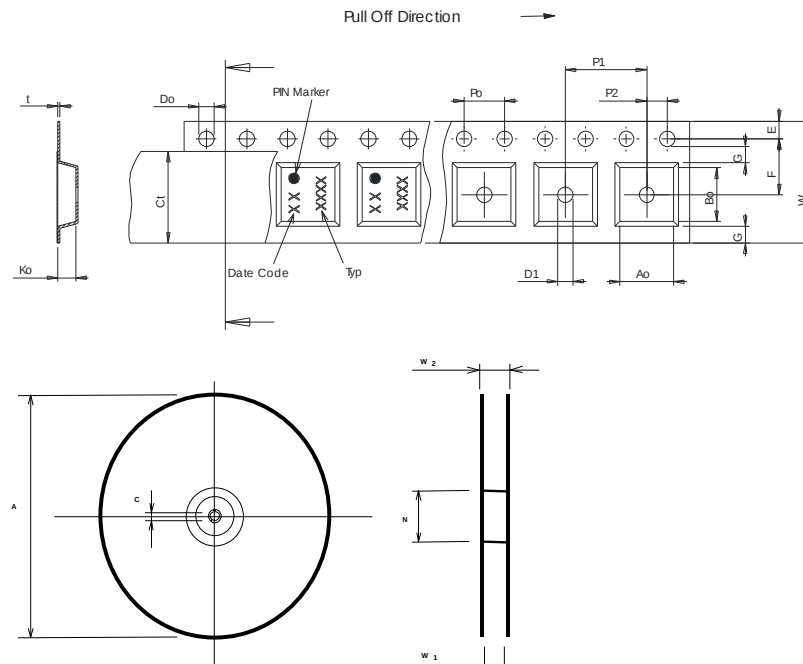
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

W	: 12.00 ±0.3
Po	: 4.00 ±0.1
Do	: 1.50 +0.1/-0
E	: 1.75 ±0.1
F	: 5.50 ±0.05
G(min)	: 0.75
P2	: 2.00 ±0.05
P1	: 8.00 ±0.1
D1(min)	: 1.50
Ao	: 4.30 ±0.1
Bo	: 4.30 ±0.1
Ct	: 9.2 ±0.1
Ko	: 1.80 ±0.1
t	: 0.30 ±0.05

Reel (all dimensions in mm)

A	: 330 or 180
W1	: 12.4 +2/-0
W2(max)	: 18.40
N(min)	: 50.00
C	: 13.0 +0.5/-0.2



The minimum bending radius is 45 mm.

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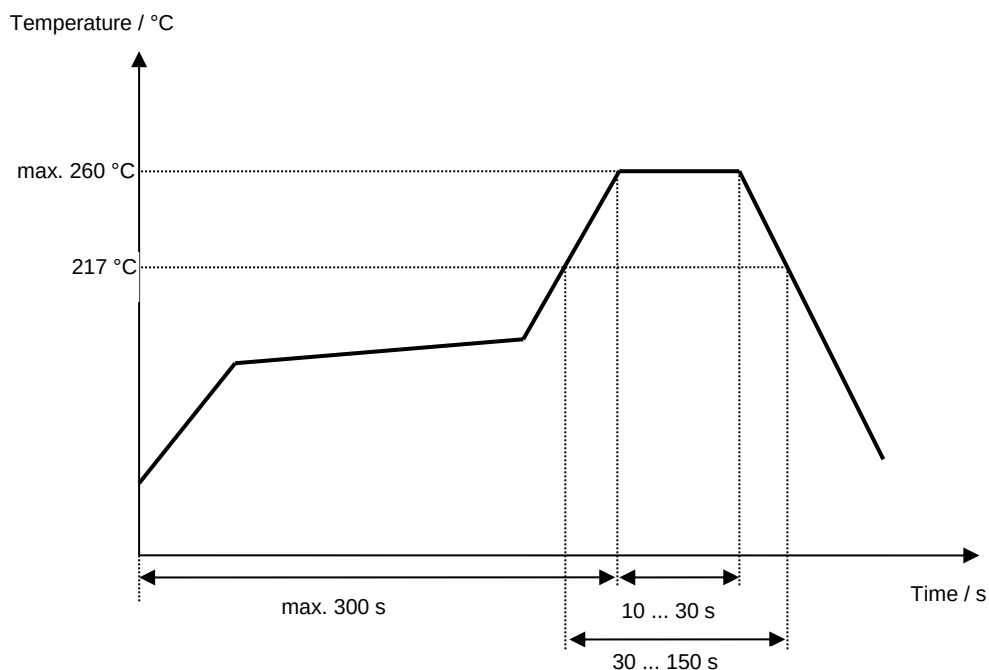
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Air reflow temperature conditions

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****TFS452F****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	S. Springfeldt	10.11.2017
2.0	- Update data table (changed TC_i , loss and attenuation goals)	S. Springfeldt	24.01.2018
2.1	- Generation of filter specification	S. Springfeldt	20.06.2018

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