

Microchip	Filter specification	TFS407A	1/5
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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 407.5 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 -	407.5 MHz
Passband	PB -	$f_N \pm 2.5$ MHz
Passband variation	0.4 dB	max. 1.5 dB
Passband variation at T_A	0.4 dB	max. 0.8 dB
Absolute attenuation	a_{abs}	
10.0 MHz ... f_N - 212.5 MHz	32 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	60 dB	min. 30 dB
f_N + 7.5 MHz ... f_N + 12.5 MHz	60 dB	min. 20 dB
f_N + 57.5 MHz ... f_N + 102.5 MHz	32 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	32 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 ** -43 ppm/K	

*) 20 dBm over 1000 h

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

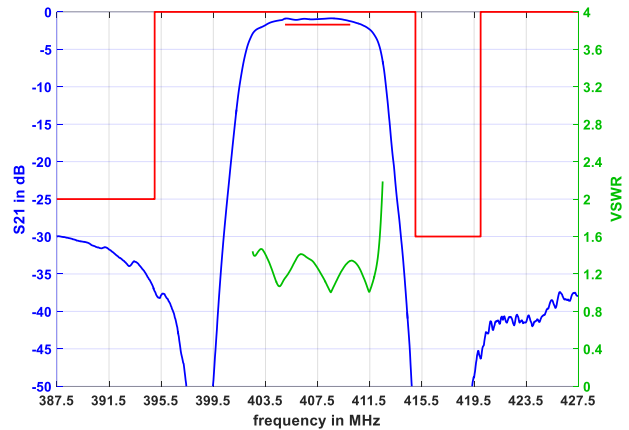
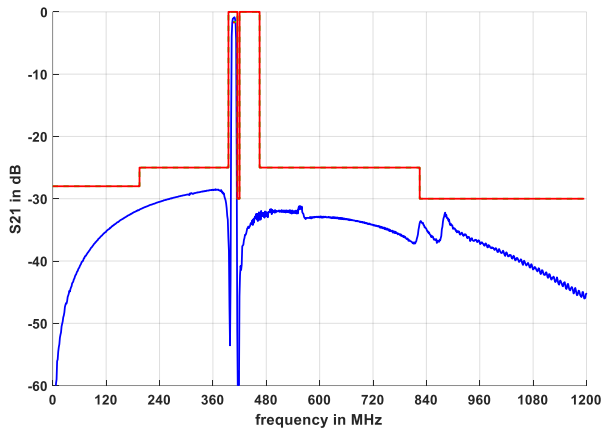
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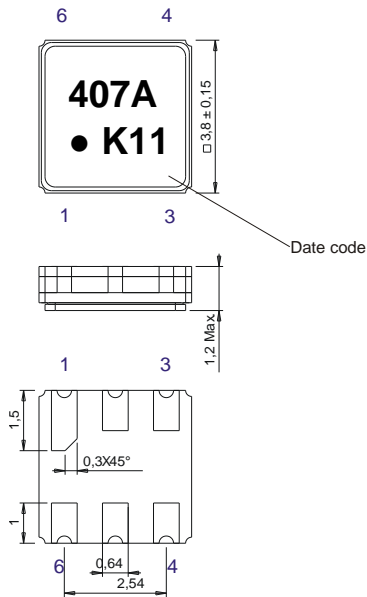
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Filter characteristic



Construction and pin connection

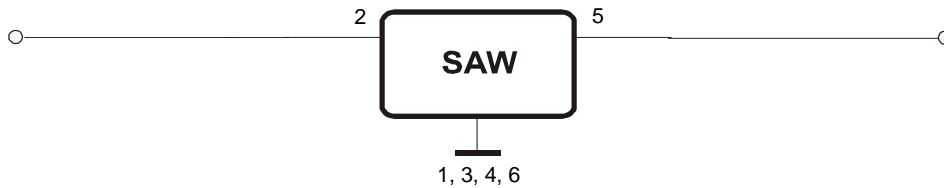
(All dimensions in mm)



- 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)

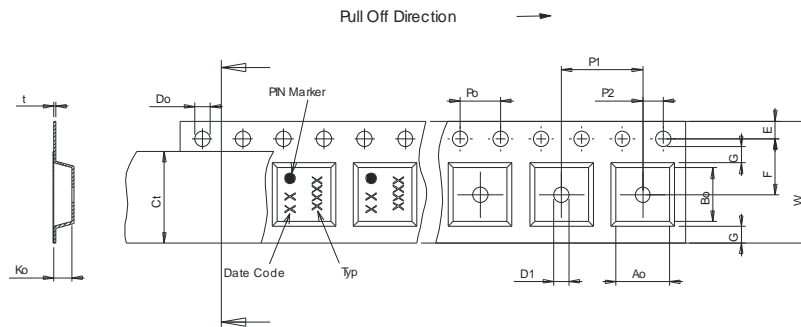
Packing

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

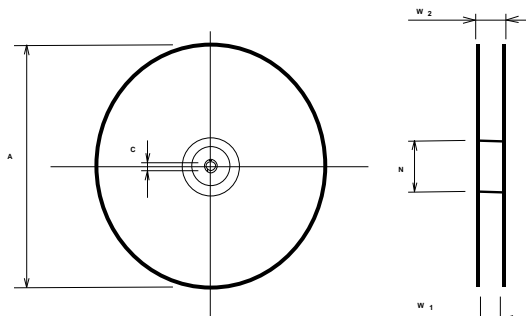
Tape (all dimensions in mm)

- 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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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



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Microchip**Filter specification****TFS407A****5/5**

History

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	S. Springfeldt	18.01.2018
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	14.03.2018

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