

Microchip	Filter specification	TFS700A	1/5
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Measurement condition

Ambient temperature T_A : 23 °C
 Input power level: 0 dBm

Terminating impedance:

Source: 50 Ω
 Load: 50 Ω

 Input: 147.7 Ω || -1.6 pF
 Output: 147.7 Ω || -1.6 pF

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of the TFS700A is the minimum of the passband attenuation a_{min} . The minimum of the passband 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 3 dB filter attenuation level relative to the insertion loss a_e . The nominal frequency f_N is fixed at 700 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 in the operating temperature range and due to a production tolerance for the centre frequency f_C .

D a t a		typ. value		tolerance / limit		
Insertion loss	a_e	2	dB	max.	6	dB
Nominal frequency	f_N	-			700	MHz
Centre frequency	f_C	700	MHz		-	
Passband	PB	-		$f_N \pm$	37.5	kHz
Passband ripple	p-p	0.3	dB	max.	2	dB
Relative attenuation	a_{rel}					
$f_N \pm 1.4$ MHz ... $f_N \pm 5$ MHz		17	dB	min.	6	dB
$f_N \pm 5$ MHz ... $f_N \pm 20$ MHz		28	dB	min.	12	dB
$f_N + 20$ MHz ... $f_N + 180$ MHz		36	dB	min.	30	dB
$f_N - 20$ MHz ... $f_N - 590$ MHz		40	dB	min.	30	dB
Group delay ripple within PB		20	ns	max.	100	ns
Input power level		-		max.	18	dBm
Operating temperature range	OTR	-			-40 °C ... +91 °C	
Storage temperature range		-			-55 °C ... +125 °C	
Frequency inversion temperature	T_0	0	°C		-	
Temperature coefficient of frequency	TC_f *)	-0.040	ppm/K ²		-	

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

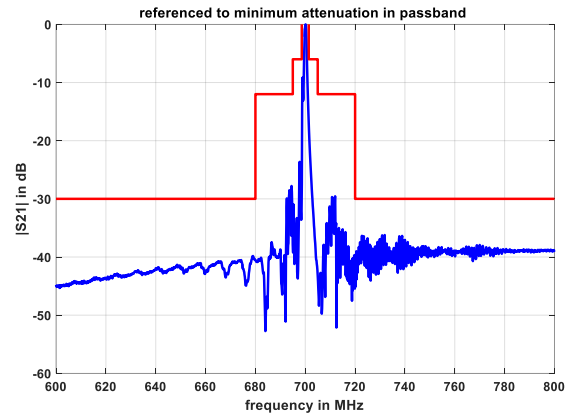
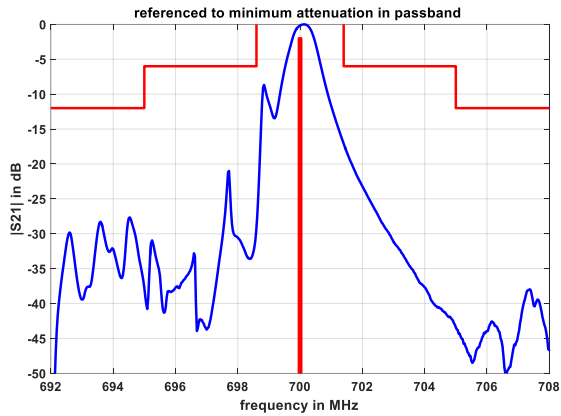
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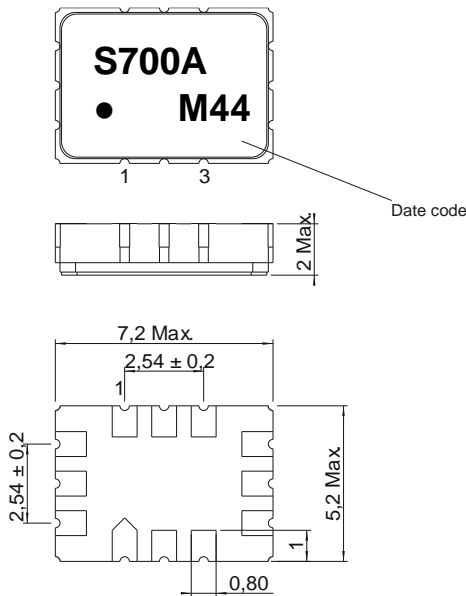
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Filter characteristic



Construction and pin connection

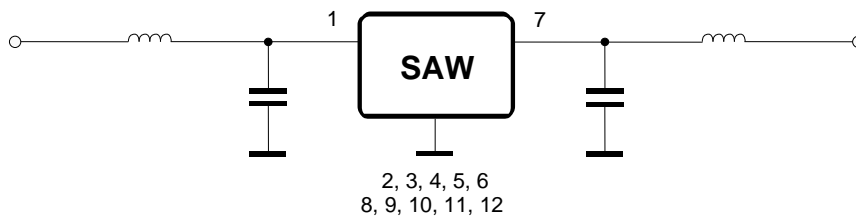
(All dimensions in mm)



1	Input
2	Ground
3	Ground
4	Ground
5	Ground
6	Ground
7	Output
8	Ground
9	Ground
10	Ground
11	Ground
12	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 2000 Hz, 0.35 mm or 5 g respectively, 1 octave per min, 10 cycles per plane, 3 planes; DIN IEC 68 T2 - 6
3. Change of temperature: -55 °C to 125°C / 15 min. each / 100 cycles
DIN IEC 68 part 2 – 14 Test N
4. Resistance to solder heat (reflow): reflow possible: three times max.;
for temperature conditions, see page 4: "Air reflow temperature conditions"

5. SAW devices are Electrostatic Discharge (ESD) sensitive devices.

ESD SIMULATION MODEL	CLASSIFICATION LEVEL	CRITERIA
Human Body Model (HBM) acc. to ANSI/ESDA/JEDEC JS-001-2014	Class 1A	1 positive + 1 negative pulse 125 ... 250 Volts

This filter is RoHS compliant (2011/65/EU+2015/863/EU)

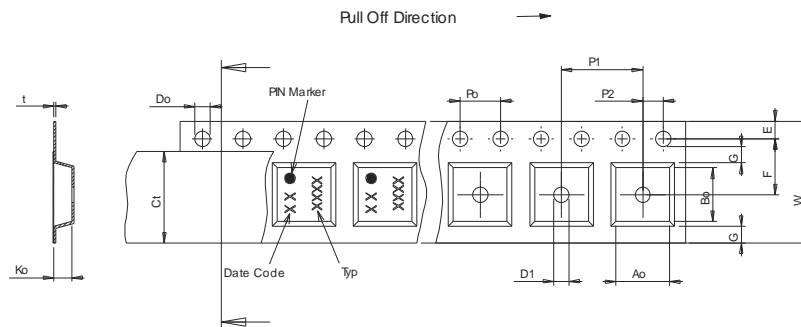
Packing

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

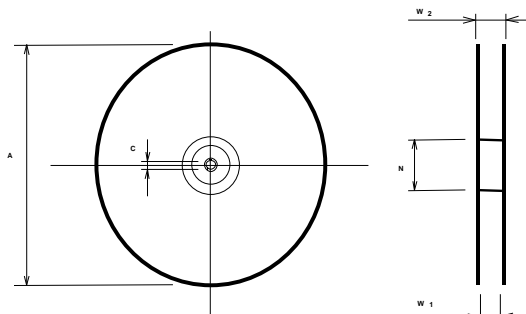
Tape (all dimensions in mm)

- 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.

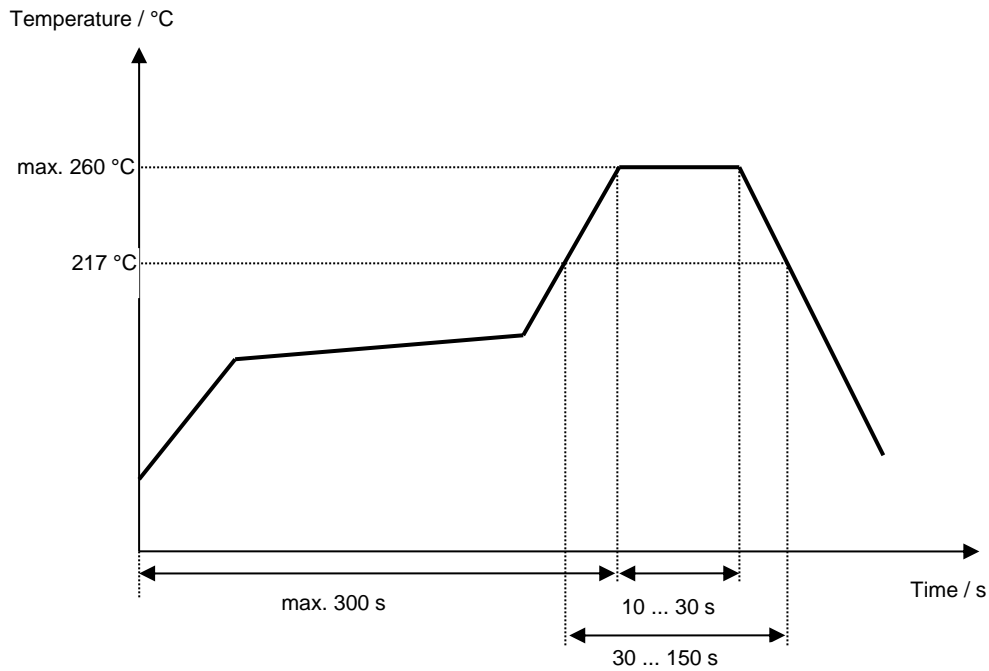
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Air reflow temperature conditions

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****TFS700A****5/5**

History

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Bonnen	17.12.2019
2.0	- Corrected typo in data section	Bonnen	18.12.2019
3.0	- Change of pin connection	Molke	21.08.2020
3.1	- Update of theoretical matching circuits - Change from development spec to filter spec - Typical values added - Filter characteristic added	Molke	27.10.2020

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