Measurement condition

Ambient temperature: 22 °C
Input power level: 02 dBm
Terminating impedance: *
Input: 196 Ω || -8.2 pF
Output: 209 Ω || -11.3 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of TFS240K is the minimum of the pass band attenuation a_{min}. This value 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 given values for the relative attenuation a_{rel} and the group delay ripple have to be reached 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	$a_e = a_{min}$	6,5	dB	max.	± 1,5	dB
Nominal frequency	f_N	-			240,0	MHz
Centre frequency	f_c	240,0	MHz			
Relative attenuation	a_{rel}					
f_N - 7 MHz ... f_N + 7 MHz		0,5	dB	max.	1,4	dB
any 3,5 MHz interval within f_N - 7 MHz... f_N + 7 MHz		0,5	dB	max.	1	dB
f_N - 90 MHz ... f_N - 30 MHz		54	dB	min.	45	dB
f_N - 30 MHz ... f_N - 22 MHz		47	dB	min.	45	dB
f_N - 22 MHz ... f_N - 16 MHz		45	dB	min.	40	dB
@ f_N - 16 MHz **)		55	dB	min.	43	dB
f_N + 16 MHz ... f_N + 18 MHz		44	dB	min.	40	dB
f_N + 18 MHz ... f_N + 22 MHz		44	dB	min.	40	dB
f_N + 22 MHz ... f_N + 90 MHz		47	dB	min.	45	dB
Phase linearity (p-p) within f_N ± 6,3 MHz		3	deg	max.	15	deg
Group delay GD***) within f_N ± 7 MHz		0,45	µs	max.	1	µs
Group delay ripple GDR ***) within f_N ± 7 MHz		45	ns	max.	100	ns
Return loss at Input and Output within f_N ± 6,3 MHz		15	dB	min.	9,5	dB
Triple transit suppression TTS		80	dB	min.	45	dB
Input power level		-			20	dBm
Operating temperature range		-		- 40 °C ... + 80 °C		
Storage temperature range		-		- 40 °C ... + 85 °C		
Temperature coefficient of frequency	TCf	-94	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.
**) valid for 22 °C, in the operating temperature range a relative attenuation of 41 dB is specified
***) measured with smoothing; smoothing aperture ≤ 50 kHz

Generated:

Checked / Approved:

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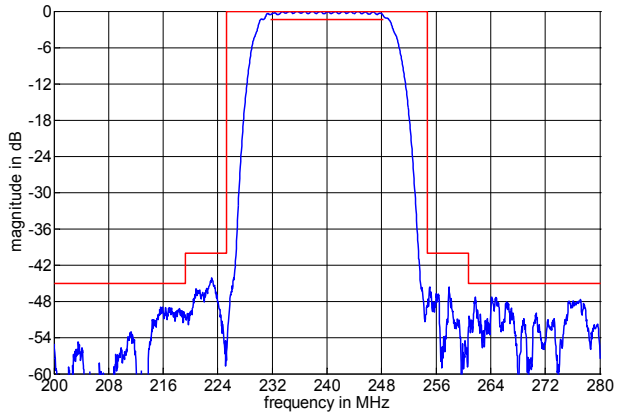
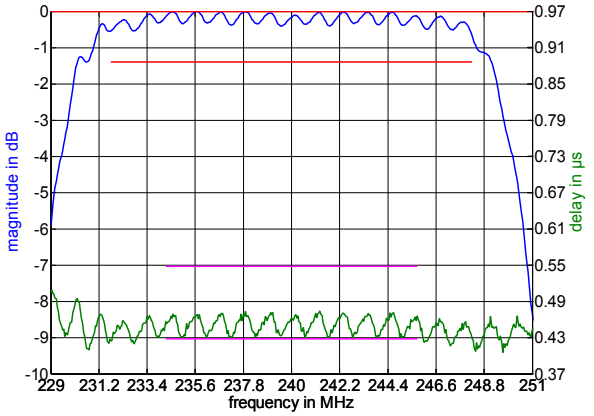
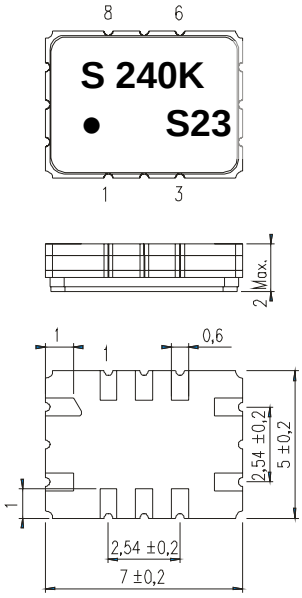
Filter characteristic





Construction and pin connection

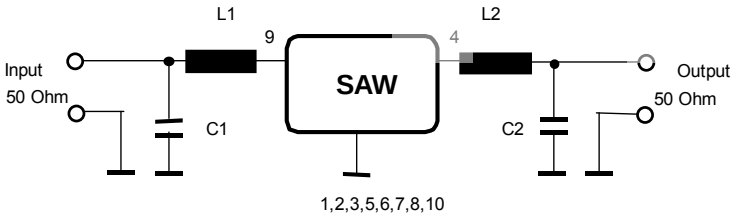
(All dimensions in mm)



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

Date code:	Year + week
S	2004
T	2005
U	2006
...	

50 Ohm Test circuit



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Stability Characteristics

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

1. Shock:	500g, 18 ms, half sine wave, 3 shocks each plane; DIN IEC 68 T2 - 27
2. Vibration:	10 Hz to 500 Hz, 0,35 mm or 5g 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):	max. 2 times reflow process; for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

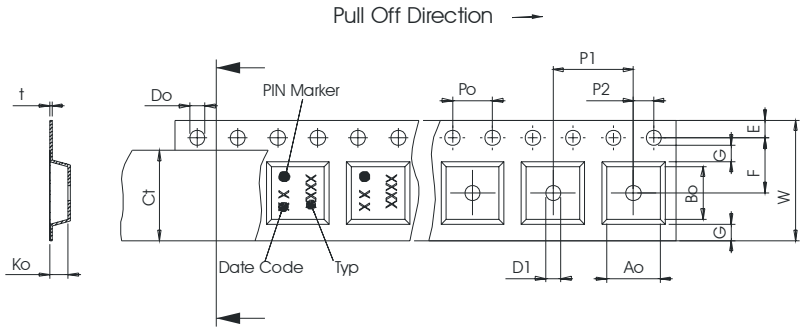
Packing

Tape & Reel: IEC 286 – 3, with exeption of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

max. pieces of filters peer reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

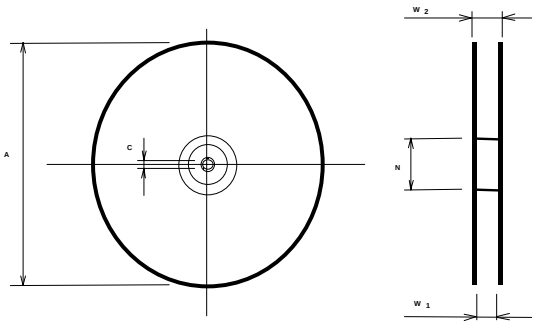
Tape (all dimensions in mm)

W	:	16,00	± 0,3
Po	:	4,00	± 0,1
Do	:	1,50	+0,1/-0
E	:	1,75	± 0,1
F	:	7,50	± 0,1
G(min)	:	0,60	
P2	:	2,00	± 0,1
P1	:	8,00	± 0,1
D1(min)	:	1,50	
Ao	:	5,50	± 0,1
Bo	:	7,50	± 0,1
Ct	:	13,5	± 0,1



Reel (all dimensions in mm)

A	:	330	
W1	:	16,4	+2/-0
W2(max)	:	22,4	
N(min)	:	50	
C	:	13,0	+0,5/-0,2



The minimum bending radius is 45 mm.

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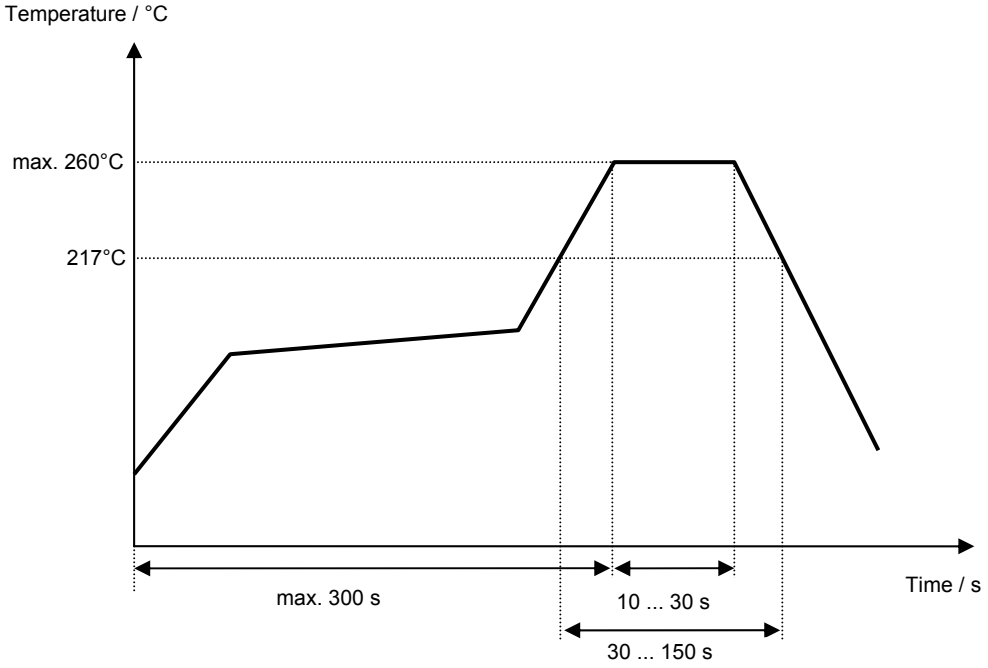
Air reflow temperature conditions

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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History

Version	Reason of Changes	Name	Date
1.0	Generation of specification according to customer requirements	E. Chilla	28.03.2003
1.1	added additional limit line at f_N – 30 MHz to f_N – 20 MHz	E. Chilla	16.07.2003
1.2	changed limit line value at f_N – 16 MHz	E. Chilla	01.08.2003
1.3	changed construction and pin connection	E. Chilla	22.09.2003
1.4	created Filter specification added terminating impedance reduced max. insertion loss increased low frequency range for 45 dB stop band attenuation increased bandwidth for 45 dB stop band attenuation increased high frequency near stop band attenuation increased magnitude for triple transit suppression added filter characteristic changed pin 10 to ground changed packing	E. Chilla	02.06.2004
1.5	added min. insertion loss, changed max. insertion loss added typ. input power level, changed max. input power level changed temperature coefficient of frequency changed air reflow temperature conditions changed pin 5 to ground	E. Chilla	16.12.2004

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