

VI TELE FILTER	Filter Specification	TFS 326A	1/5
Measurement condition			
Ambient temperature:	23 °C		
Input power level:	0 dBm		
Terminating impedance:	Input: 237 Ω -0.30 pF		
	Output: 237 Ω -0.30 pF		

Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the **TFS 326A** is the minimum of the pass band attenuation a_{min} . The minimum of the pass band 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 on **326,4** MHz without tolerance.

D a t a	typ. Value	tolerance /limit
Insertion loss (Reference level)	$a_e = a_{min}$	2,6 dB max. 4,5 dB
Nominal frequency	f_N	- 326,4 MHz
Centre frequency	f_c	326,4 MHz -
Pass band ripple	within $f_N \pm 2,50$ MHz	- max. 0,8 dB
3 dB Bandwidth		- min. 14,0 MHz
Relative attenuation	a_{rel}	
f_N	$f_N \pm 2,5$ MHz	- max. 0,8 dB
$f_N \pm 2,5$ MHz	$f_N \pm 7,0$ MHz	- max. 3,0 dB
$f_N + 12,5$ MHz	$f_N + 13,28$ MHz	- min. 11,0 dB
$f_N + 13,28$ MHz	$f_N + 14,85$ MHz	- min. 15,0 dB
$f_N + 14,85$ MHz	$f_N + 18,9$ MHz	- min. 13,0 dB
$f_N + 18,9$ MHz	$f_N + 40,0$ MHz	- min. 15,0 dB
$f_N - 12,5$ MHz	$f_N - 13,75$ MHz	- min. 11,0 dB
$f_N - 13,75$ MHz	$f_N - 30,0$ MHz	- min. 15,0 dB
$f_N - 30,0$ MHz	$f_N - 316,4$ MHz	- min. 25,0 dB
$f_N + 40,0$ MHz	$f_N + 123,6$ MHz	- min. 25,0 dB
Group delay ripple	within $\pm 2,50$ MHz	- max 40,0 ns
Group delay ripple	within $\pm 7,0$ MHz	- max.100,0 ns
Return loss	within $\pm 2,50$ MHz	- min. 12,0 dB
Return loss	within $\pm 7,0$ MHz	- min. 8,0 dB
Input power level		- max. 15,0 dBm *
Operating temperature range		- 10 °C ... + 80 °C
Storage temperature range		- 40 °C ... + 85 °C
Temperature coefficient of frequency	TC_f	T.B.D.(ca. - 72 ppm/K) -

*) peaks with 20 dBm allowed for 1:100 duty cycle

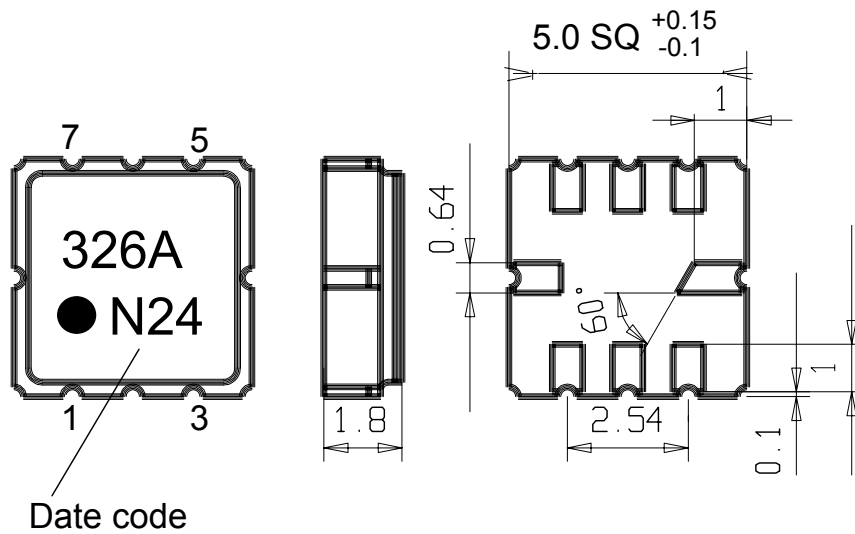
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Construction and pin connection

Pin 1	Ground	Pin 5	Ground
Pin 2	Ground	Pin 6	Ground
Pin 3	Output	Pin 7	Input
Pin 4	Ground	Pin 8	Ground (pin with slanted edge)

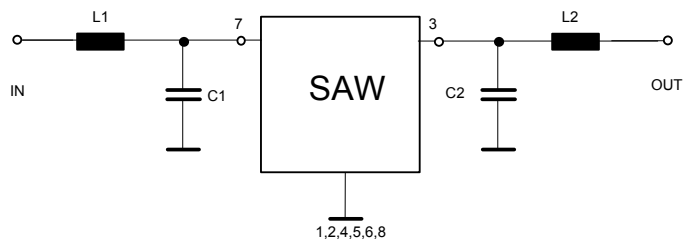
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50 Ω test circuit 1

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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. Damp heat: 25 °C to 55°C / 95% r.H. / 10 cycles
(cycle) DIN IEC 68 - 2 – 30 Db
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;

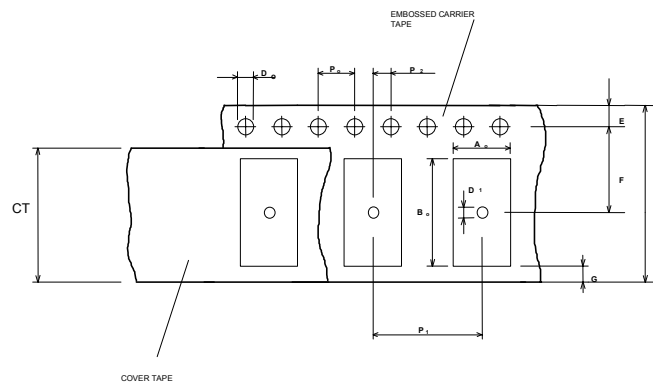
Packing

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

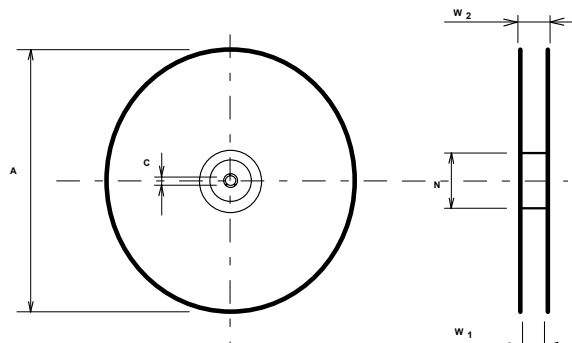
max. pieces of filters per reel: 3000
reel of empty components at start: min 300 mm
reel of empty components at start including leader: min 500 mm
trailer: min 300 mm

Tape (all dimensions in mm)

W	: 12 ± 0,3
Po	: 4 ± 0,1
Do	: 1,5 + 0,5
E	: 1,75 ± 0,1
F	: 5,5 ± 0,1
G (min)	: 0,75
P2	: 2 ± 0,05
P1	: 8 ± 0,1
D1(min)	: 1,5
Ao	: 5,3 ± 0,1
Bo	: 5,3 ± 0,1
CT	: 9,5 ± 0,1

**Reel (all dimensions in mm):**

A	: 330
W1	: 12,4 ± 2,0
W2 (max)	: 18,4
N (min)	: 50
C	: 13 ± 0,2



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. The marking of the filters is able to read if the view is directed on the upper side of the carrier tape with the sprocket holes on the right side of the tape.

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Air reflow temperature conditions

1st and 2nd air reflow profile

Name:	pre-heating periods	main-heating periods	peak temperature
Temperature:	150 °C - 170 °C	over 200 °C	230 °C ± 5 °C
Time:	110 sec. - 140 sec.	60 sec. - 65 sec.	

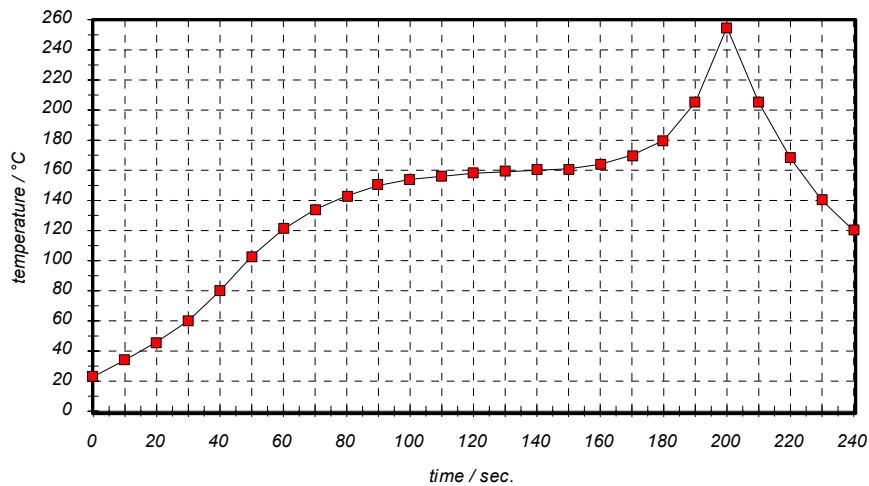
Chip-mount air reflow profile

Table for temperature vs. time for the given air reflow profile

Tolerance of temperatures: ± 5 °C

time / sec.	temperature / °C	time / sec.	temperature / °C	time / sec.	temperature / °C
0	21	140	153	280	182
10	21	150	155	290	189
20	25	160	157	300	200
30	41	170	159	310	205
40	80	180	161	320	208
50	109	190	162	330	211
60	124	200	163	340	213
70	134	210	164	350	213
80	141	220	166	360	210
90	147	230	168	370	203
100	150	240	171	380	188
110	153	250	173	390	168
120	153	260	176		
130	153	270	178		

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Version	Reason of Changes	Name	Date
1.0	- generate according customer requirement specification	Dr. Sabah	10.08.2000
1.1	- Groupe delay ripple within: $\pm 7,50$ MHz Max. 90 ns	Dr. Sabah	21.08.2000
1.2	- Return loss within: $\pm 2,50$ MHz Max. 10 dB - Return loss within: $\pm 7,50$ MHz Max. 6,5 dB	Dr. Sabah	31.08.2000
1.3	- Pin connection changed : pin 9 input; pin 3 output	Dr. Sabah	31.08.2000
1.4	- Add preliminary values for terminating impedance	Dr. Sabah	11.10.2000
1.5	- changing of 3dB bandwidth to $\pm 7,0$ MHz - changing of package to 5X5	Dr. Sabah	06.11.2000
1.6	- changing of Return loss to -12 dB (within: $\pm 2,50$ MHz) - changing of stopband between: 342,5 MHz .. 344,5 MHz to $- 13$ dB - changing of -15 dB stopband to $f_N - 13,75$ MHz - changing of group delay ripple within : $\pm 2,50$ MHz to 40 ns - changing of group delay ripple within : $\pm 7,0$ MHz to 100 ns		Dr. S. Sabah
	28.02.2001		
1.7	- changing of relative attenuation between: $f_N - 15,6$ MHz to $f_N + 18,60$ MHz - changing of filter name to TFS326A - changing of input power specification - changing of matching circuit	Dr. S. Sabah	15.03.2001
1.8	- with customer agreed modification of stopband attenuation - $f_N + 14,85$ MHz... $f_N + 18,9$ MHz to min. 13,0 dB - $f_N - 13,75$ MHz... $f_N - 30,0$ MHz to min. 11,0 dB	Dr. S. Sabah	14.05.2001