Measurement condition

Ambient temperature:	23	°C
Input power level:	0	dBm
Input terminating impedance:	263 Ω || -0,45 pF	
Output terminating impedance:	263 Ω || -0,45 pF	

Characteristics

Remark:
Reference level for the relative attenuation a_{rel} of the TFS 460 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 2dB filter attenuation level relative to the insertion loss a_e. The nominal frequency f_N is fixed on 460 MHz without tolerance. The given values for the relative attenuation a_{rel} and for the group delay ripple have to be reached at the frequencies given below also 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 (Reference level)	$a_e = a_{min}$	3	dB	max. 5	dB
Nominal frequency	f_N	-		460	MHz
Centre frequency	f_0	460	MHz	-	
Pass band ripple f_N ± 10 MHz		1	dB	max. 2	dB
Relative attenuation	a_{rel}				
f_N - 35 MHz ... f_N - 55 MHz		-		min. 40,0	dB
f_N - 80 MHz ... f_N - 100 MHz		-		min. 60,0	dB
Intermodulation IP_3 ***)**		40	dB	min. 20	dB
Permissible DC voltage	V_{DC}			max. 12	V
Input power level				max. 10	dBm
Operating temperature range				- 25 °C ... + 75 °C	
Storage temperature range				- 40 °C ... + 85 °C	
Temperature coefficient of frequency	TC_f	- 72	ppm/K	-	

***)** modulation signals: f_N + 1 MHz and f_N + 2 MHz, each of 10 dBm

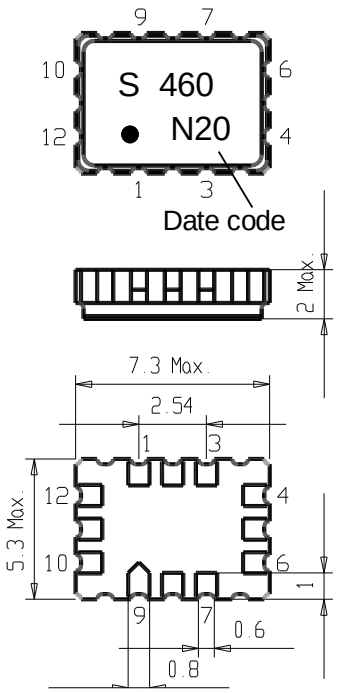
Generated:

Checked / approved:

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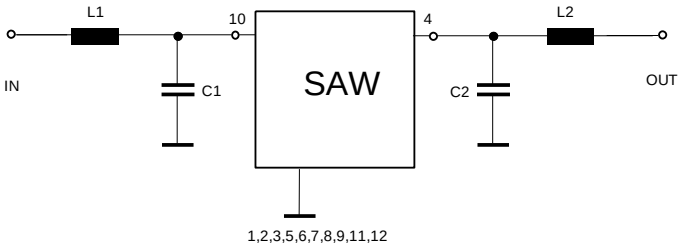
Construction and pin connection



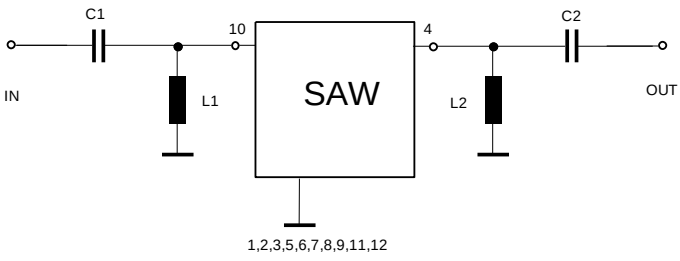
1	Ground
2	Ground
3	Output RF Return
4	Output
5	Package Ground
6	Ground
7	Ground
8	Ground
9	Input RF Return
10	Input
11	Package Ground
12	Ground

Datecode:	Year+week
L	1999
M	2000
N	2001
....	

50 Ω test circut 1



50 Ω test circut 2



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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: (cycle)	25 °C to 55°C / 95% r.H. / 10 cycles 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;

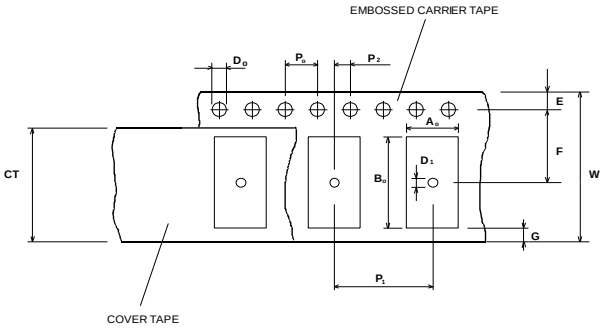
Packing

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

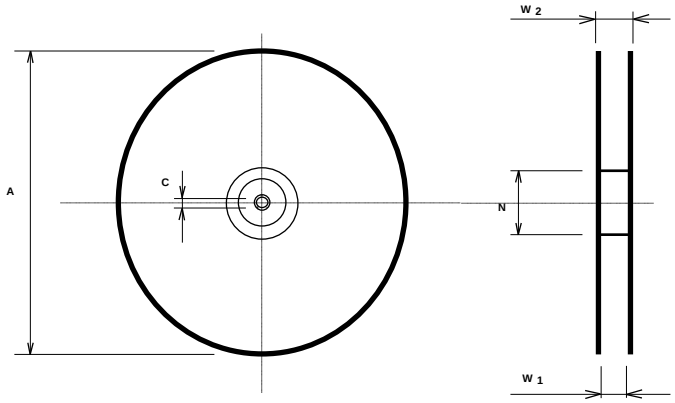
Tape (all dimensions in mm)

W	:	16	± 0,3
Po	:	4	± 0,1
Do	:	1,5	+ 0,1
E	:	1,75	± 0,1
F	:	7,5	± 0,1
G (min)	:	0,6	
P2	:	2	± 0,1
P1	:	8	± 0,1
D1(min)	:	1,5	
Ao	:	5,5	± 0,1
Bo	:	7,5	± 0,1
CT	:	13,5	± 0,1



Reel (all dimensions in mm):

A	:	330
W1	:	16,4 +2
W2 (max)	:	22,4
N (min)	:	50
C	:	13 +0,5 / -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	255 °C ± 5 °C
Time:	60 sec. - 90 sec.	20 sec. - 25 sec.	

Chip-mount air reflow profile

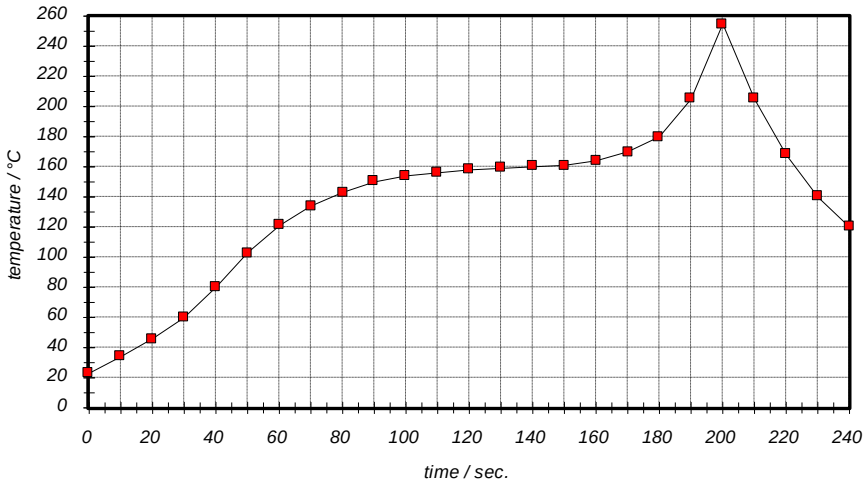


Table for temperature vs. time during the air reflow process

Tolerance of temperatures: ± 5 °C

time / sec.	temperature / °C	time / sec.	temperature / °C
0	23	140	160
10	34	150	161
20	46	160	164
30	60	170	170
40	80	180	180
50	103	190	205
60	121	195	230
70	134	200	255
80	143	205	230
90	150	210	205
100	154	215	180
110	156	220	165
120	158	230	140
130	159	240	120

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Version	Reason of Changes	Name	Date
2.0	- filter specification updating	Dr. Sabah	17.05.2001

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