

**VI TELEFILTER****Filter Specification****TFS 208C****1/5****Measurement condition**

Ambient temperature $T_A$ :	23 °C	
Input power level:	0 dBm	
Terminating impedances at $f_c$ :	input:	540 $\Omega$    -5.88 pF
	output:	578 $\Omega$    -6.6 pF

**Characteristics**

Remark:

Reference level for the relative attenuation  $a_{rel}$  of the **TFS 208C** is the maximum of the pass band attenuation  $a_{max}$ . The maximum of the pass band attenuation  $a_{max}$  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 1 dB filter attenuation level relative to the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed on 208 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  $f_c$ .

Data	typ. value	tolerance / limit
<b>Insertion loss</b> (Reference level) $a_e$		max. 7,0 dB min. 5,0 dB
<b>Nominal frequency</b> $f_N$	-	208,0 MHz
<b>Centre frequency</b> $f_c$	208,0 MHz	
<b>Passband width</b>		min. 300,0 kHz
<b>Relative attenuation</b> $a_{rel}$		
$f_N \dots$	$f_N \pm 0,15$ MHz	max. 1,25 dB
$f_N \pm 0,4$ MHz	$f_N \pm 0,6$ MHz	min. 2,0 dB
$f_N \pm 0,6$ MHz	$f_N \pm 1,2$ MHz	min. 8,0 dB
$f_N \pm 1,2$ MHz	$f_N \pm 1,8$ MHz	min. 20,0 dB
$f_N \pm 1,8$ MHz	$f_N \pm 3,4$ MHz	min. 25,0 dB
$f_N \pm 3,4$ MHz	$f_N \pm 9,5$ MHz	min. 30,0 dB
$f_N \pm 9,5$ MHz	$f_N \pm 13$ MHz	min. 43,0 dB
$f_N \pm 13$ MHz	$f_N + 450$ MHz	min. 55,0 dB
<b>Group delay *)</b>		max. 1,7 $\mu$ s min. 0,7 $\mu$ s
<b>Group delay rippel *)</b> within $\pm 150$ kHz		max. 150,0 ns
<b>VSWR:</b>		max. 2,3: 1
<b>IP3 **)</b>		min. 60,0 dB
<b>Operating temperature range</b>		- 10 °C ... + 85 °C
<b>Temperature coefficient of frequency ( <math>TC_f</math> ) ***)</b>		-0,029 ppm/ K <sup>2</sup>
<b>Frequency inversion temperature <math>T_o</math></b>		30 C °
<b>Input power level:</b>		max. 10,0 dBm

\*) measured with smoothing; smoothing aperture  $\leq 30$  KHz\*\*) modulation signals:  $f_N$  and  $f_N \pm 28$  MHz each of 10 dBm\*\*\*)  $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T_o - T_A)^2 \times f_{T_o}(\text{MHz})$  $f_{T_o}$  is reference frequency  $f_c$  at frequency inversion temperature ( $T_o$ )

Generated: Sabah

Checked/Approved:

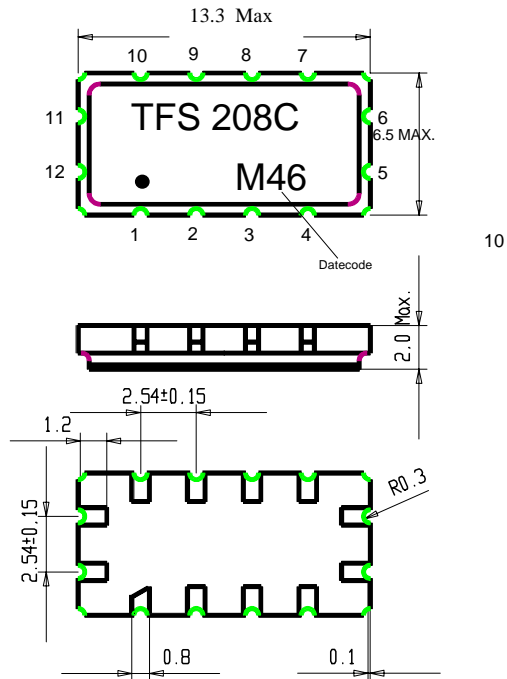
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**VI TELEFILTER****Filter Specification****TFS 208C****2/5****Construction and pin connection**

(All dimensions in mm)



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

Date code: Year+week

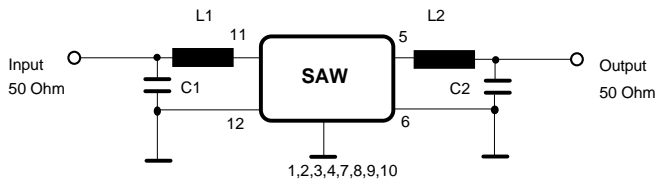
K 1998

L 1999

M 2000

N 2001

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**50 Ω matching network:**

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**VI TELEFILTER****Filter Specification****TFS 208C****3/5****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;

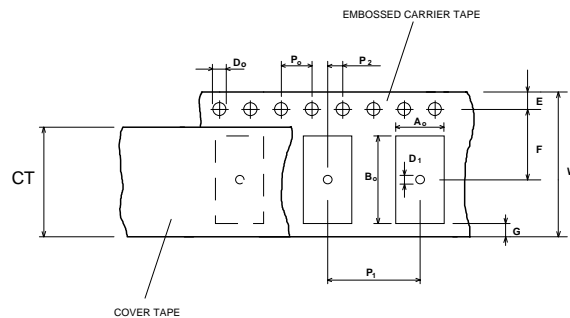
**Packing**

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;

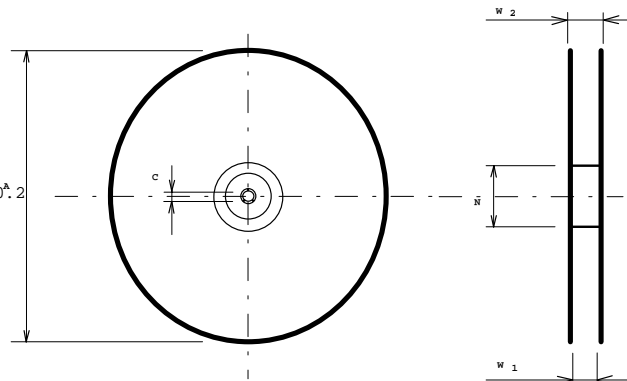
max. pieces of filters per reel: 1700  
Reel of empty components at start: min 300 mm  
Reel of empty components at start including leader: min 500 mm  
Trailer: min 300 mm

**Tape (all dimensions in mm)**

W : 24 ± 0,3  
Po : 4 ± 0,1  
Do : 1,5 + 0,1  
E : 1,75 ± 0,1  
F : 11,5 ± 0,1  
G (min) : 0,60  
P2 : 2 ± 0,1  
P1 : 12 ± 0,1  
D1(min) : 1,5  
Ao : 7,1 ± 0,2  
Bo : 13,9 ± 0,2  
CT : 21,5 ± 0,1

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

A : 330  
W1 : 24,40 + 2,0  
W2 (max) : 30,4  
N (min) : 60  
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 left 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.	

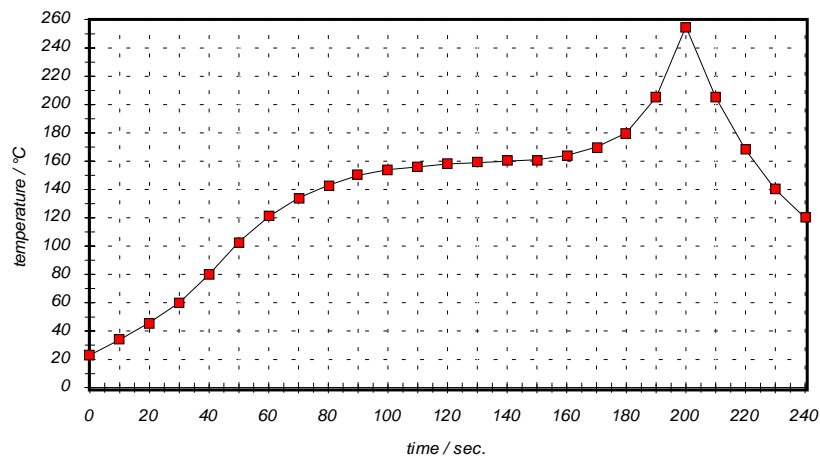
**Chip-mount air reflow profile**

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

**History**

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<b>VI TELEFILTER</b>		<b>Filter Specification</b>	<b>TFS 208C</b>	<b>5/5</b>
<b>Version</b>	<b>Reason of Changes</b>		<b>Name</b>	<b>Date</b>
1.0	- generation of specification according to hudson specification		Sabah	07.10.1999
1.1	- correction according to customer specification (Nokia) - IP3: instead of 'No statement' is $\geq 60$ dBm - VSWR (max): instead of $\leq 2.0:1$ is $\leq 2.3:1$ - Rejection ( $f \geq f_N \pm 13000$ KHz): instead of min. 60 dB is min. 55 dB - Operational temperature range changed from $-10 \dots 80$ °C to $-10 \dots 85$ °C		Sabah	27.03.2000
1.2	- The sprocket holes: instead of the right side of the tape is on the left side of the tape (according to customer requirement, e mail from: 7. Juli.00)		Sabah	12.07.2000

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