

VI TELEFILTER**Filter specification****TFS 411 1/5****Measurement condition**

Ambient temperature: 23 °C
 Input power level: 0 dBm
 Terminating impedances: input: 50 Ω
 output: 50 Ω

Characteristics**Remark:**

The maximum of the pass band attenuation a_{\max} is defined as the insertion loss a_e . The nominal frequency f_N is fixed at 411,0 MHz without tolerance. The given values for the absolute attenuation a_e 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	Variation/ Limitation
Insertion loss (within PB)	$a_e = a_{\min}$	2,36 dB	max. 4,8 dB
Nominal frequency	f_N	-	411 MHz
Passband	PB	8,90 MHz	$f_N \pm 2,5$ MHz
Absolute attenuation in OTR			
$f_N - 464,7$ MHz	$f_N - 12,5$ MHz	55 dB	min. 43 dB
$f_N - 12,5$ MHz	$f_N - 7,5$ MHz	50 dB	min. 33 dB
$f_N + 20$ MHz	$f_N + 735$ MHz	62 dB	min. 40 dB
$f_N + 735$ MHz	$f_N + 1235$ MHz	40 dB	min. 30 dB
$f_N + 1235$ MHz	$f_N + 1535$ MHz	35 dB	min. 15 dB
Temperature coefficient of frequency	TC_f^*	- 32 ppm/K	-
Operating temperature range OTR			-10 °C ... + 85 °C
Storage temperature range			-30 °C ... + 85 °C

*) $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_A) \times f_c(\text{MHz})$

generated :

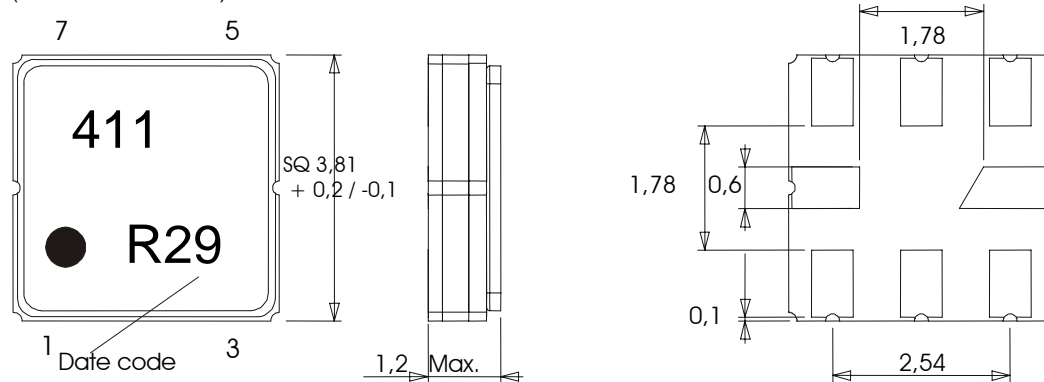
checked / approved :

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Construction, pin configuration and 50 Ω - matching network

(All dimensions in mm)



Pin 1 Ground
 Pin 2 Input
 Pin 3 Ground
 Pin 4 Package Ground

Pin 5 Ground
 Pin 6 Output
 Pin 7 Ground
 Pin 8 Package ground

date code: year + week
 N 2001
 P 2002
 R 2003
 ...

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): reflow possible: twice max.;;
for temperature conditions, please refer to the attached "Air reflow temperature conditions" on page 4;

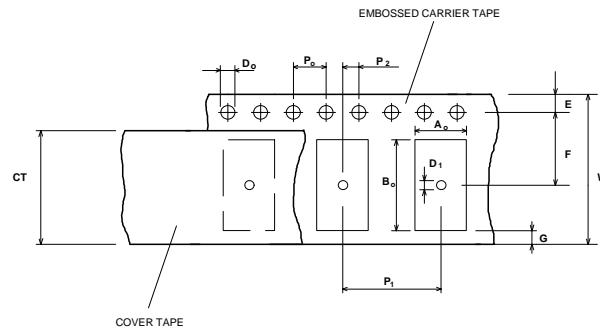
Packing

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;

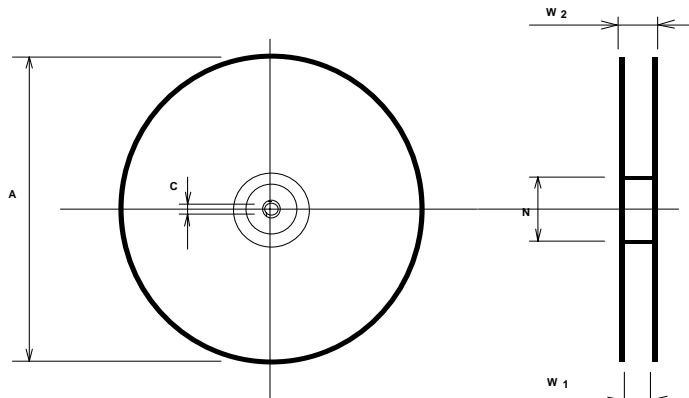
max. pieces of filters per reel: 3000
reel of empty components at start: min 300 mm
reel of empty components at start including leader: min 500 mm
trailer: min 300 mm

Tape (all dimensions in mm)

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



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. Markings on the filters can be read if the upper side of the carrier tape is regarded with the sprocket holes on its right.

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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

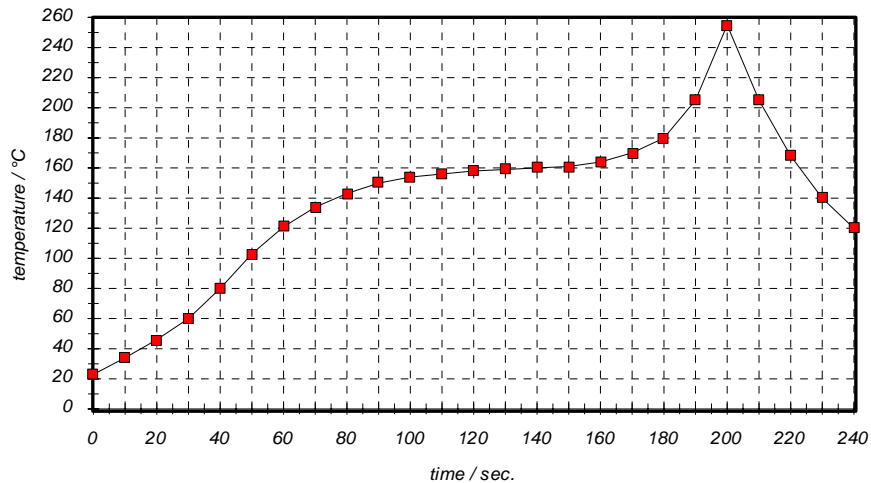


Table for temperature vs. time during the air reflow process

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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History

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Dr. Sabah	17.07.2003

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