

**VI TELEFILTER****SAW Resonator Specification****TFR 868****1/5****Measurement condition**

Ambient temperature: 23 °C  
 Input power level: 10 dBm  
 Terminating impedances :  
     for input: 50 Ω || 0 pF  
     for output: 50 Ω || 0 pF

**Characteristics****Remark:**

The minimum of the pass band attenuation  $a_{\min}$  is defined as the insertion loss  $a_e$ . The centre frequency  $f_c$  is the frequency of the minimum of the passband attenuation  $a_{\min}$ . The tolerance for the resonant frequency also includes a centre frequency shift due to the temperature coefficient of frequency  $TC_f$  in the operating temperature range and a production tolerance for the resonant frequency  $f_R$ .

<b>D a t a</b>		<b>typ. value</b>	<b>tolerance / limit</b>
<b>Insertion loss</b> (Reference level)	$a_e = a_{\min}$	1,4 dB	max. 2,2 dB
<b>Resonant frequency</b>	$f_R$	868,35 MHz	± 150 kHz
<b>Parallel capacitance</b>	$C_0$	2,6 pF	-
<b>Motional resistance</b>	$R_1$	17 Ω	-
<b>Motional inductance</b>	$L_1$	24 μH	-
<b>Motional capacitance</b>	$C_1$	1,4 fF	-
<b>Unloaded quality factor</b>	$Q_u$	7580	-
<b>Operating temperature range</b>		-	- 10°C... + 70 °C
<b>Storage temperature range</b>		-	- 30°C... + 85 °C
<b>Temperature coefficient *</b>	TC	- 0,036 ppm/K <sup>2</sup>	
<b>Frequency inversion temperature</b>	$T_o$	25 °C	
<b>Frequency aging **</b>	$ f_{\Delta} $	10 ppm/yr	
<b>Phase</b>	$\varphi$		-20 ..... + 20 °

\*\*) Frequency aging is the change in  $f_R$  with time. Typically aging is greatest first year after manufacture, decreasing in subsequent years.

\*)  $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T - T_o)^2 \times f_{T_o}(\text{MHz})$

**generated:** \_\_\_\_\_

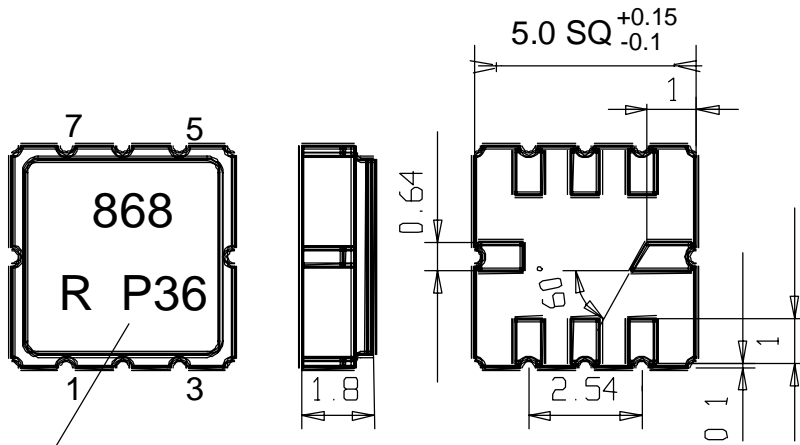
**checked / approved:** \_\_\_\_\_

**VI TELEFILTER**  
**Potsdamer Straße 18**  
**D 14 513 TELTOW / Germany**  
**Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30**  
**E-Mail: [tft@telefilter.com](mailto:tft@telefilter.com)**

VI TELEFILTER reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

**Construction, pin configuration and 50 Ω - matching network**

(All dimensions in mm)

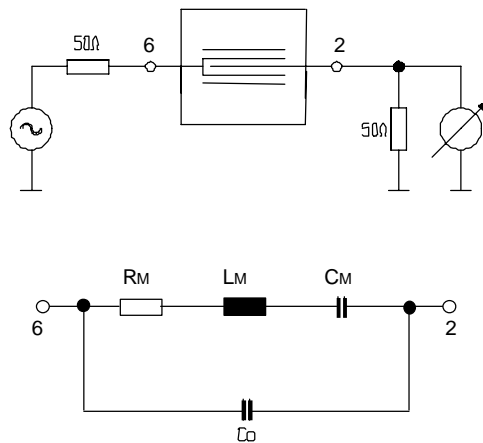


Date code

pin 1	ground	pin 5	ground
pin 2	output	pin 6	input
pin 3	ground	pin 7	ground
pin 4	package ground	pin 8	package ground

date code:	year + week
M	2000
N	2001
P	2002
....	

**50 Ohm test circuit 1**



**VI TELEFILTER**  
 Potsdamer Straße 18  
 D 14 513 TELTOW / Germany  
 Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30  
 E-Mail: [tft@telefilter.com](mailto:tft@telefilter.com)

VI TELEFILTER reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

**Stability characteristics**

After the following tests the resonator 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;

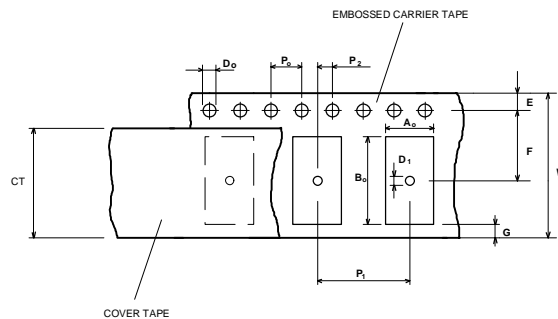
**Packing**

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;

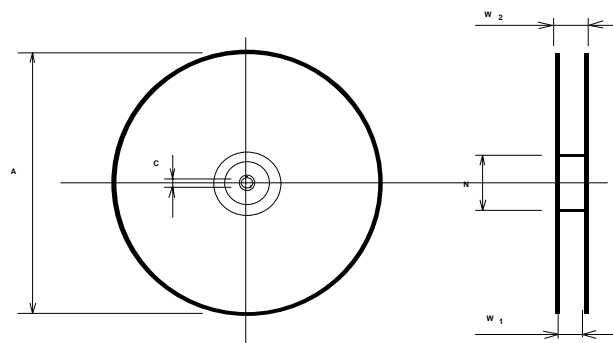
max. pieces of filters per reel:	3000
reel of empty components at start:	min 300 mm
reel of empty components at start including leader:	min 500 mm
trailer	min 300 mm

**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 ± 0,10
D1(min)	: 1,5
Ao	: 5,30 ± 0,1
Bo	: 5,30 ± 0,1
CT	: 13,0 ± 0,2

**Reel (all dimensions in mm)**

A	: 330
W1	: 12,4 + 2
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.

**VI TELEFILTER**

**Potsdamer Straße 18**

**D 14 513 TELTOW / Germany**

**Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30**

**E-Mail: [tft@telefilter.com](mailto:tft@telefilter.com)**

VI TELEFILTER reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

**Air reflow temperature conditions**

1st and 2nd air reflow profile

<b>Name:</b>	pre-heating periods	main-heating periods	peak temperature
<b>Temperature:</b>	150 °C - 170 °C	over 200 °C	255 °C ± 5 °C
<b>Time:</b>	60 sec. - 90 sec.	20 sec. - 25 sec.	

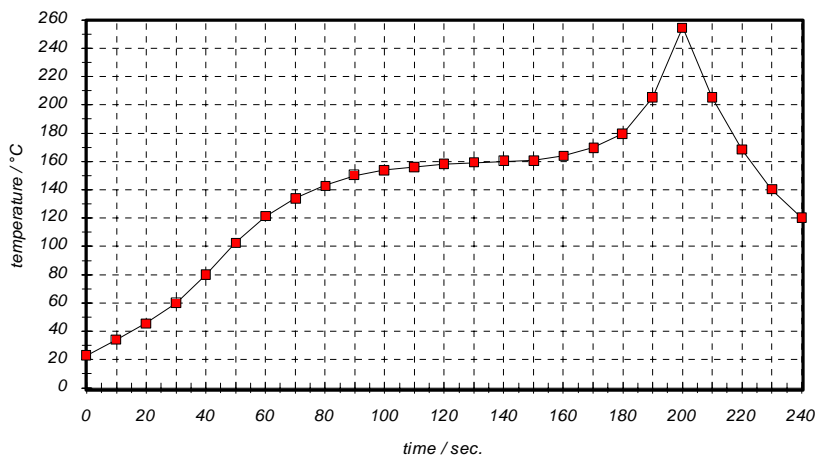
**Chip-mount air reflow profile**

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

VI TELEFILTER  
 Potsdamer Straße 18  
 D 14 513 TELTOW / Germany  
 Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30  
 E-Mail: [tft@telefilter.com](mailto:tft@telefilter.com)

VI TELEFILTER reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.

**VI TELEFILTER****SAW Resonator Specification****TFR 868****5/5****History**

<b>version</b>	<b>reason of changes</b>	<b>name</b>	<b>date</b>
1.0	generate specification	Pfeiffer	02.04.2001
1.1	typical values of equivalent circuit elements added	Pfeiffer	04.09.2002
1.2	typical values of frequency inversion temperature added typing error of centre frequency corrected	Pfeiffer	09.09.2002

---

**VI TELEFILTER**  
**Potsdamer Straße 18**  
**D 14 513 TELTOW / Germany**  
**Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30**  
**E-Mail: [tft@telefilter.com](mailto:tft@telefilter.com)**

VI TELEFILTER reserves the right to make changes to the product(s) and/or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information.