

**Measurement condition**

Ambient temperature: 23 °C  
 Input power level: 0 dBm  
 Terminating impedances  
   for input: 360 Ω // - 1,05 pF  
   for output: 360 Ω // - 1,05 pF  
 Coupling coil: 91 nH

**Characteristics****Remark:**

Reference level for the relative attenuation  $a_{rel}$  of the TFS 360 A 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  $f_0$  is the arithmetic mean value of the upper and lower frequencies at the 1.5 dB filter attenuation level relative to the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed on 360 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  $f_0$  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  $f_0$ .

<b>D a t a</b>		<b>typ. value</b>	<b>tolerance/limit</b>		
<b>Insertion loss</b> (Reference level)	$a_e = a_{min}$	-	max.	5,0	dB
<b>Nominal frequency</b>	$f_N$	-		360,00	MHz
<b>Pass band ripple</b>	$f_N \pm 67,7\text{kHz}$ BW	-	max.	1,5	dB
<b>Relative attenuation</b>	$a_{rel}$				
$f_N \pm 0,4$ MHz... $f_N \pm 0,6$ MHz		-	min.	29dB	
$f_N \pm 0,6$ MHz... $f_N \pm 0,8$ MHz		-	min.	42dB	
$f_N \pm 0,8$ MHz... $f_N \pm 1,6$ MHz		-	min.	50dB	
$f_N \pm 1,6$ MHz... $f_N \pm 3,0$ MHz		-	min.	45dB	
$f_N \pm 3,0$ MHz... $f_N \pm 115$ MHz		-	min.	52dB	
<b>Group delay ripple</b>	GD				
$f_N \pm 67,76$ kHz		-	max.	2,0	µs
<b>Input power level</b>		-	max.	3	dBm
<b>Operating temperature range</b>		- 20 °C ... + 75 °C			
<b>Storage temperature</b>		-35 °C ...+ 85 °C			
<b>Temperature coefficient of frequency</b>	TC	ca. - 0.036 ppm/K <sup>2</sup>			
<b>Frequency inversion temperature</b>		+ 20 °C			

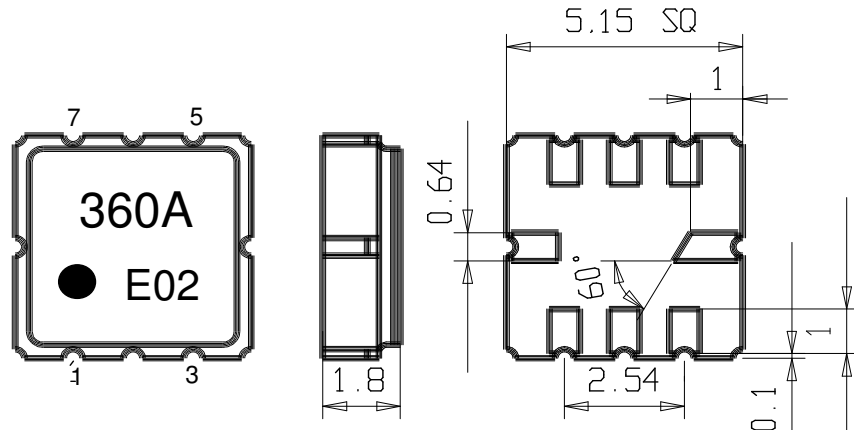
**Generated:****Checked / approved:**

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

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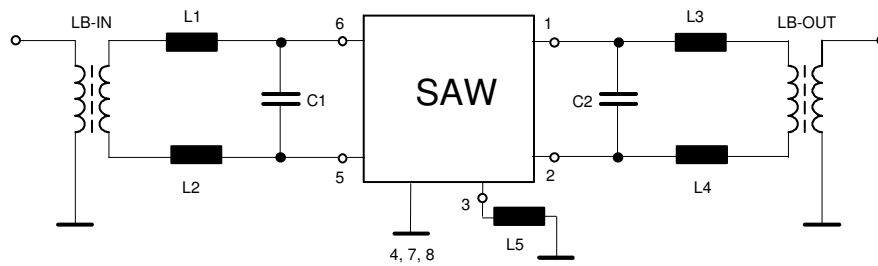
**Construction, pin configuration and 50 Ω - matching network**

(All dimensions in mm)

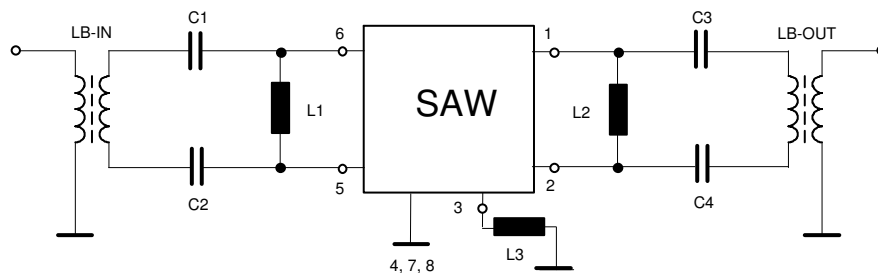


Pin 1	Sym. Output	Pin 5	Sym. Input	Date code:	Year + week
Pin 2	Sym. Output	Pin 6	Sym. Input	E	2014
Pin 3	External Coil	Pin 7	Ground	F	2015
Pin 4	Package Ground	Pin 8	Package ground	G	2016 ...

**50 Ω Test circuit 1**



**50 Ω Test circuit 2**



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**Stability characteristics, reliability**

After the following tests the filter shall meet the whole specification:

- 1. Shock: 500g, 1 ms, half sine wave, 3 shocks each plane;  
DIN IEC 68 T2 - 27
- 2. Vibration: 10 Hz to 500 Hz, 0.35 mm or g respectively, 1 octave per min, 10 cycles per plane, 3 planes; DIN IEC 68 T2 - 6
- 3. Change of temperature: -55 °C to 125°C / 15 min. each / 100 cycles  
DIN IEC 68 part 2 – 14 Test N
- 4. Resistance to solder heat (reflow): reflow possible: three times max.;  
for temperature conditions, see page 4: "Air reflow temperature conditions"

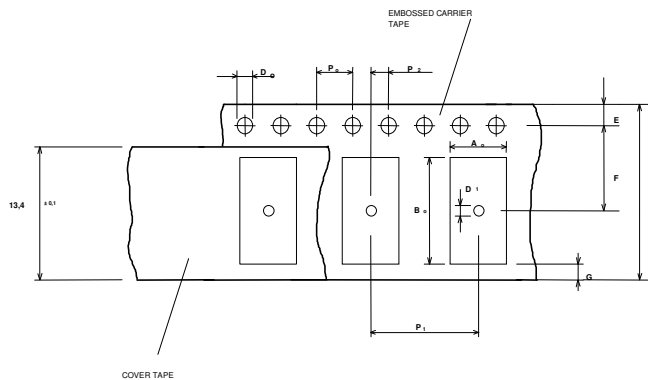
This filter is RoHS compliant (2011/65/EU)

**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

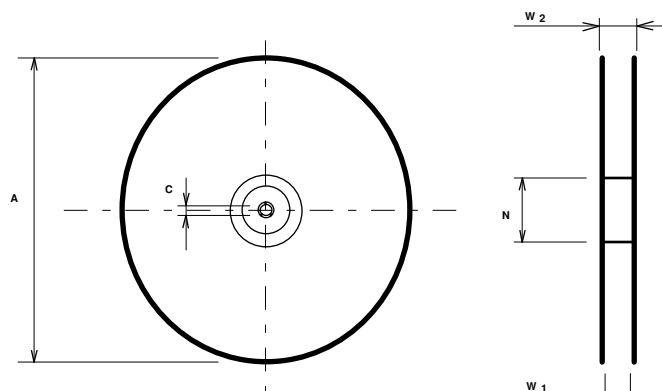
**Tape (all dimensions in mm)**

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



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

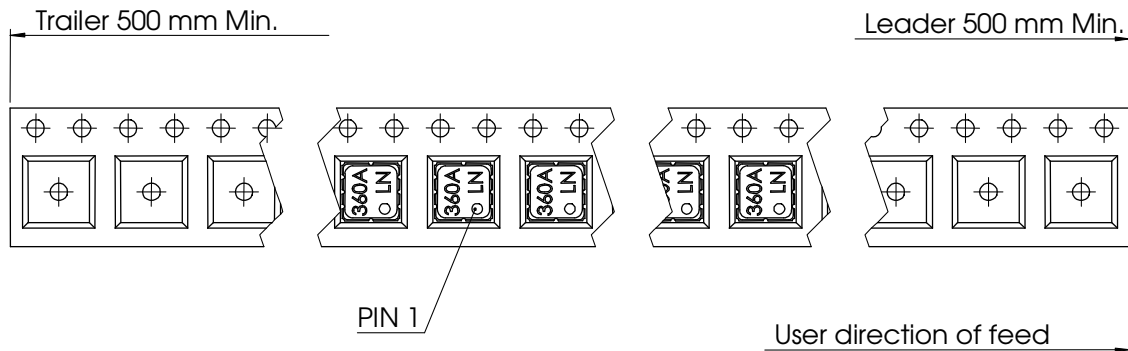
- A : 330
- W1 : 12,4 +2
- W2 (max) : 18,4
- N (min) : 50
- C : 13 ± 0,25



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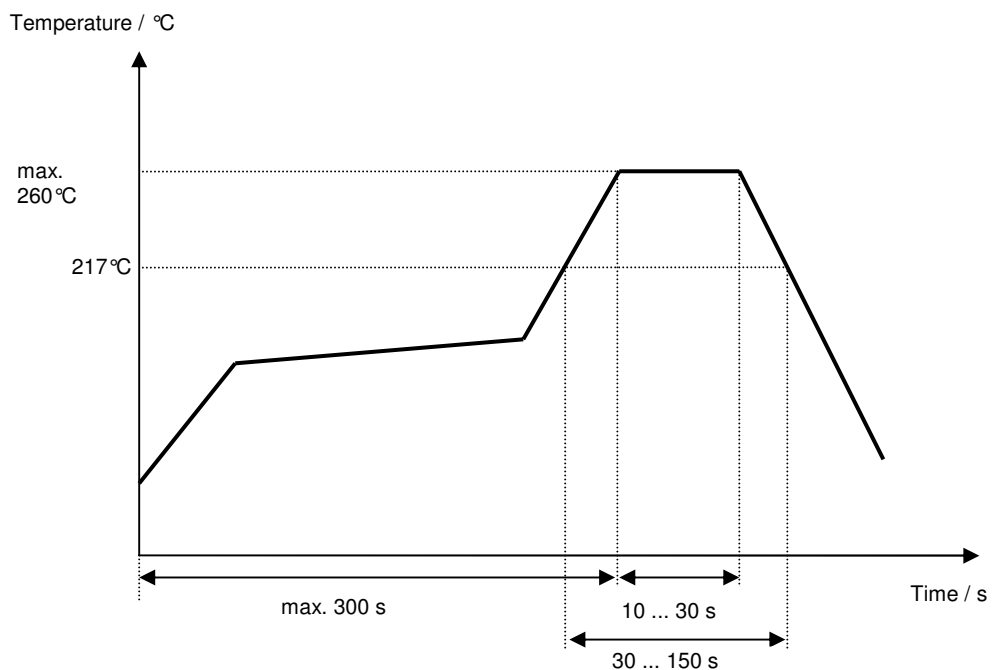
The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. The marking of the filters is able to read if the view is directed on the upper side of the carrier tape with the sprocket holes on the right side of the tape



**Air reflow temperature conditions**

Conditions	Exposure
Average ramp-up rate (30°C to 217°C)	less than 3°C/second
> 100°C	between 300 and 600 seconds
> 150°C	between 240 and 500 seconds
> 217°C	between 30 and 150 seconds
Peak temperature	max. 260°C
Time within 5°C of actual peak temperature	between 10 and 30 seconds
Cool-down rate (Peak to 50°C)	less than 6°C/second
Time from 30°C to Peak temperature	no greater than 300 seconds

**Chip-mount air reflow profile**



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**History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.5	Change date code from month to week Change errors in tape an reel information Remove 'Construction and Pin Connection' from page 1 Guarantee better values for stability characteristic	Dr. Wall	17.03.2000
1.6	Tape drawing with part position added.	André du Hamél	12.04.2001
1.7	maximum input power updated	Kortenbeutel	06.01.2014