

**VI TELEFILTER****Filter specification****TFS 520A****1/5****Measurement condition**

|                          |              |         |
|--------------------------|--------------|---------|
| Ambient temperature:     | 23           | °C      |
| Input power level:       | 0            | dBm     |
| Terminating impedance: * |              |         |
| Input:                   | 750 $\Omega$ | -3,4 pF |
| Output:                  | 700 $\Omega$ | -3,6 pF |

**Characteristics****Remark:**

The reference level for the relative attenuation  $a_{rel}$  of the TFS 520A 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 1 dB filter attenuation level relative to the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 520 MHz without any tolerance. The given values for both the relative attenuation  $a_{rel}$  and the group delay ripple have to be achieved 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                       |    | tolerance / limit |       |                   |       |     |
|--------------------------------------|--|------|-----|------------------|--|------|-----|----------------------------------|----|-------------------|-------|-------------------|-------|-----|
| Insertion loss<br>(reference level)  |  |      |     |                  |  |      |     | a <sub>e</sub> =a <sub>min</sub> |    | 10,6              | dB    | max.              | 12,0  | dB  |
| Nominal frequency                    |  |      |     |                  |  |      |     | f <sub>N</sub>                   |    | -                 |       |                   | 520,0 | MHz |
| Passband                             |  |      |     |                  |  |      |     | PB                               |    | -                 |       | f <sub>N</sub> ±  | 5,5   | MHz |
| Pass band ripple                     |  |      |     |                  |  |      |     | p-p                              |    | 0,8               | dB    | max.              | 1,5   | dB  |
| Relative attenuation                 |  |      |     |                  |  |      |     | a <sub>rel</sub>                 |    |                   |       |                   |       |     |
| f <sub>N</sub>                       |  | ...  |     | f <sub>N</sub> ± |  | 5,5  | MHz | 0,8                              | dB | max.              | 1,5   | dB                |       |     |
| f <sub>N</sub> -                     |  | 50,0 | MHz | f <sub>N</sub> - |  | 11,0 | MHz | 42                               | dB | min.              | 40    | dB                |       |     |
| f <sub>N</sub> +                     |  | 11,0 | MHz | f <sub>N</sub> + |  | 50,0 | MHz | 44                               | dB | min.              | 40    | dB                |       |     |
| Operating temperature range          |  |      |     |                  |  |      |     | OTR                              |    | -                 |       | -40 °C ... +80 °C |       |     |
| Storage temperature range            |  |      |     |                  |  |      |     |                                  |    | -                 |       | -45 °C ... +85 °C |       |     |
| Temperature coefficient of frequency |  |      |     |                  |  |      |     | TC <sub>f</sub> **               |    | -19               | ppm/K | -                 |       |     |

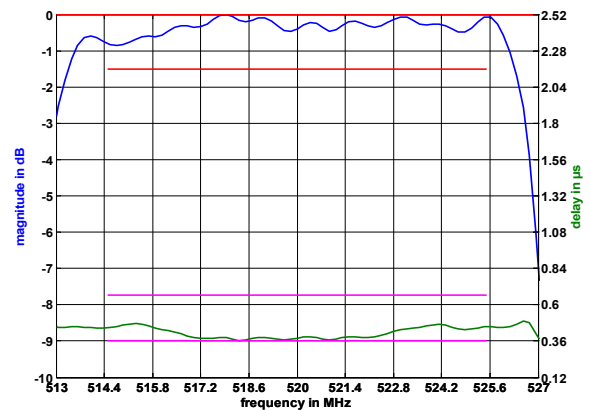
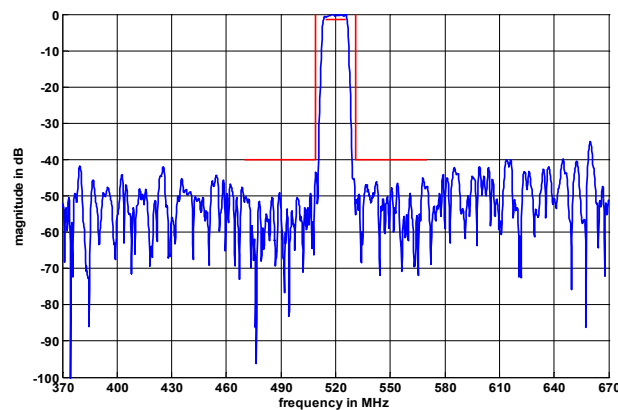
\*) The terminating impedances depend on parasitics and q-values of matching elements and the board used, and are to be understood as reference values only. Should there be additional questions do not hesitate to ask for an application note or contact our design team.

\*\*)  $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_0) \times f_{r0}(\text{MHz})$ .

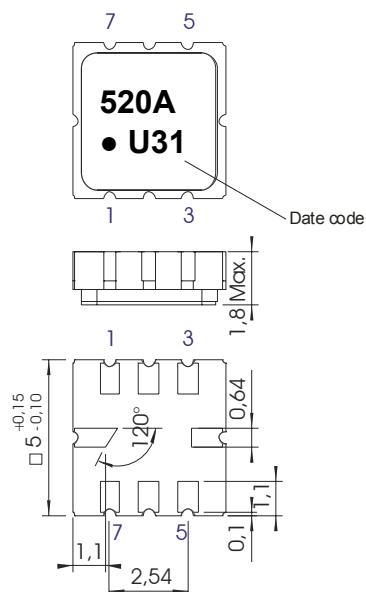
**Generated:****Checked / Approved:**

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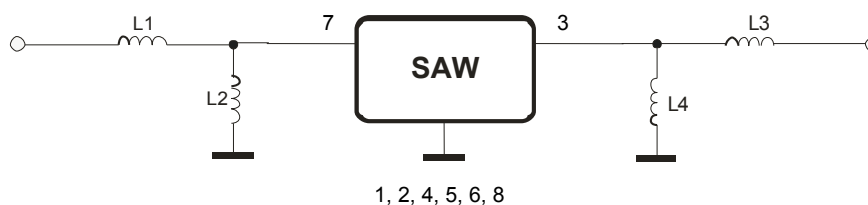
**VI TELEFILTER****Filter specification****TFS 520A****2/5****Filter characteristic****Construction and pin connection**

(All dimensions in mm)



|   |        |
|---|--------|
| 1 | Ground |
| 2 | Ground |
| 3 | Output |
| 4 | Ground |
| 5 | Ground |
| 6 | Ground |
| 7 | Input  |
| 8 | Ground |

Date code: Year + week  
 U 2006  
 V 2007  
 W 2008  
 ...

**50  $\Omega$  Test circuit**

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**VI TELEFILTER****Filter specification****TFS 520A****3/5****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 5 g 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 refer to the attached "Air reflow temperature conditions" on page 4;

This filter is RoHS compliant (2002/95/EG, 2005/618/EG)

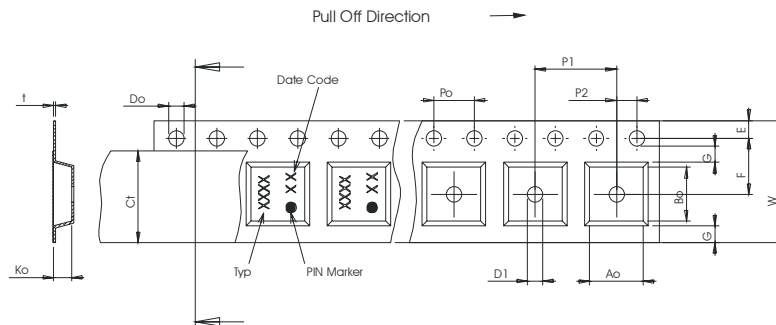
**Packing**

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;

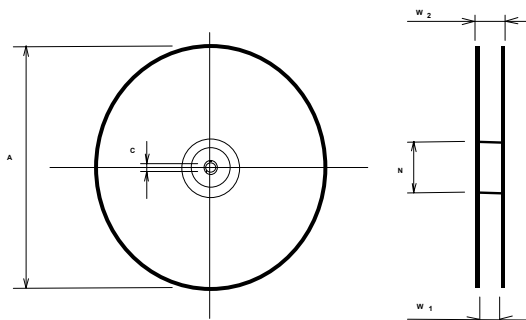
|                                                     |             |
|-----------------------------------------------------|-------------|
| max. pieces of filters per reel:                    | 3000        |
| reel of empty components at start:                  | min. 300 mm |
| reel of empty components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

**Tape (all dimensions in mm)**

|         |                |
|---------|----------------|
| W       | : 12,00 ± 0,3  |
| Po      | : 4,00 ± 0,1   |
| Do      | : 1,50 +0,1/-0 |
| E       | : 1,75 ± 0,1   |
| F       | : 5,50 ± 0,05  |
| G(min)  | : 0,75         |
| P2      | : 2,00 ± 0,05  |
| P1      | : 8,00 ± 0,1   |
| D1(min) | : 1,50         |
| Ao      | : 5,30 ± 0,1   |
| Bo      | : 5,30 ± 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 +0,5/-0,2 |



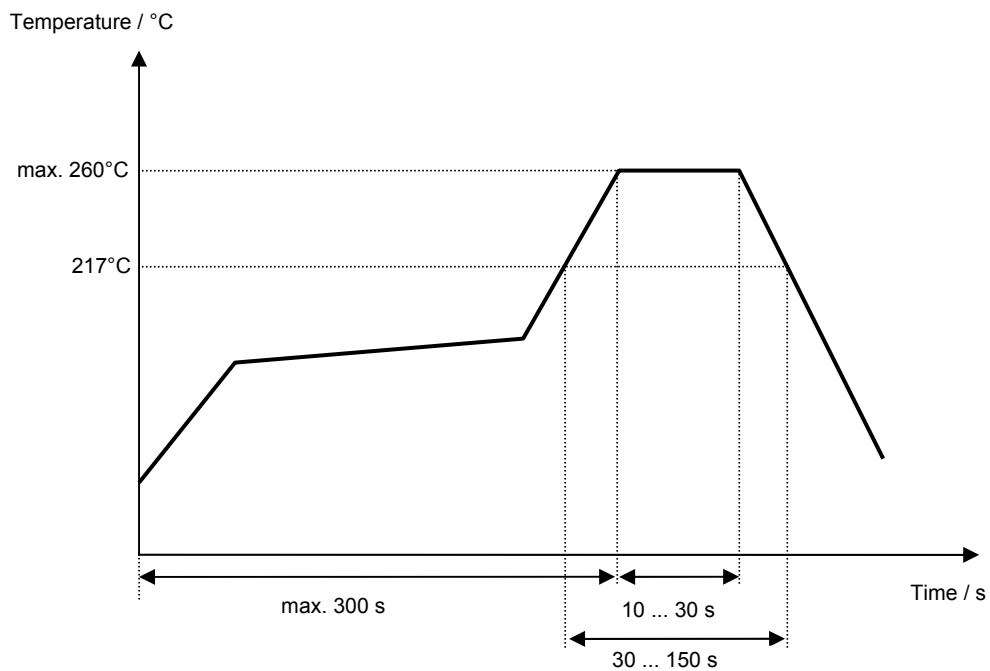
The minimum bending radius is 45 mm.

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**Air reflow temperature conditions**

| <b>Conditions</b>                          | <b>Exposure</b>             |
|--------------------------------------------|-----------------------------|
| 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**

**VI TELEFILTER****Filter specification****TFS 520A****5/5****History**

| <b>Version</b> | <b>Reason of Changes</b>                                      | <b>Name</b> | <b>Date</b> |
|----------------|---------------------------------------------------------------|-------------|-------------|
| 1.0            | Generate of development specification                         | Strehl      | 22.03.2006  |
| 1.1            | Change operating temperature range and pin connection         | Strehl      | 27.03.2006  |
| 1.2            | Change from development specification to filter specification | Alawneh     | 04.08.2006  |
|                | Change pass band ripple                                       |             |             |
|                | Add typical values                                            |             |             |
|                | Add filter characteristics                                    |             |             |
|                | Add matching circuit                                          |             |             |
|                | Add terminating impedance values                              |             |             |