

VI TELEFILTER**Filter specification****TFS 120E****1/5****Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	1080 Ω	-7,4 pF
Output:	1250 Ω	-6,7 pF

Characteristics**Remark:**

The reference level for the relative attenuation a_{rel} of the TFS 120E 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 3 dB filter attenuation level relative to the insertion loss a_e . The nominal frequency f_N is fixed at 120 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 (reference level)		a_e	6 dB	max.	7 dB
Nominal frequency		f_N	-	120	MHz
Centre frequency		f_c	120 MHz	-	
1 dB Passband		PB	290 kHz	$f_N \pm 100$	kHz
Relative attenuation		a_{rel}			
f_N	... $f_N \pm 0,1$ MHz	0,5 dB	max.	1	dB
$f_N \pm 0,3$ MHz	... $f_N \pm 0,5$ MHz	15 dB	min.	10	dB
$f_N \pm 0,5$ MHz	... $f_N \pm 0,7$ MHz	32 dB	min.	25	dB
$f_N \pm 0,7$ MHz	... $f_N \pm 1$ MHz	39 dB	min.	35	dB
$f_N \pm 1$ MHz	... $f_N \pm 80$ MHz	48 dB	min.	45	dB
Group delay ripple within PB		650 ns	max.	1000	ns
Input power level **			max.	18	dBm
Permissible DC voltage between any two terminals			max.	10	V
Operating temperature range		OTR	-	- 35 °C ... + 85	°C
Storage temperature range			-	- 40 °C ... + 85	°C
Frequency inversion temperature		29 °C			
Temperature coefficient of frequency		TC_f ***	-0,04 ppm/K ²	-	

*) 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

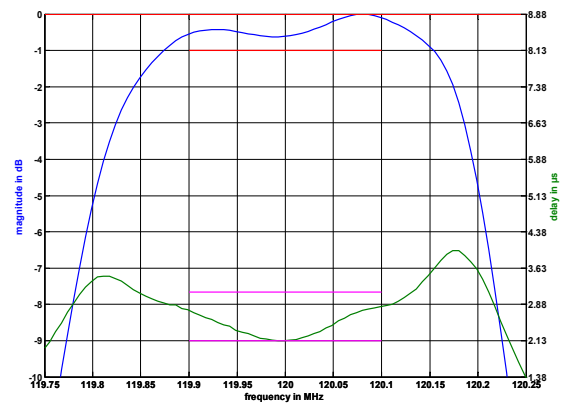
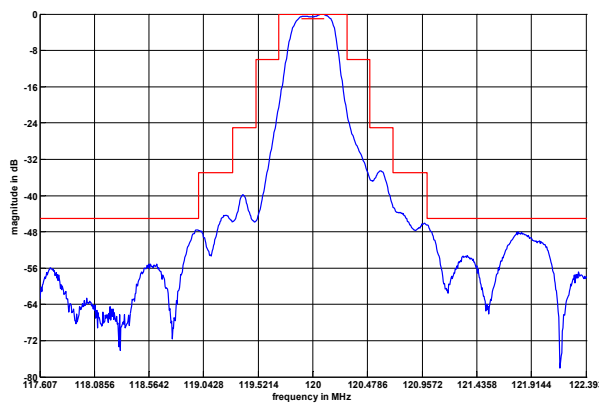
**) This power level is only allowed for short term operation (10% of the life time), the max. input power for continuous operation is max.10dBm only

***) $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T - T_0)^2 \times f_{T0}(\text{MHz})$

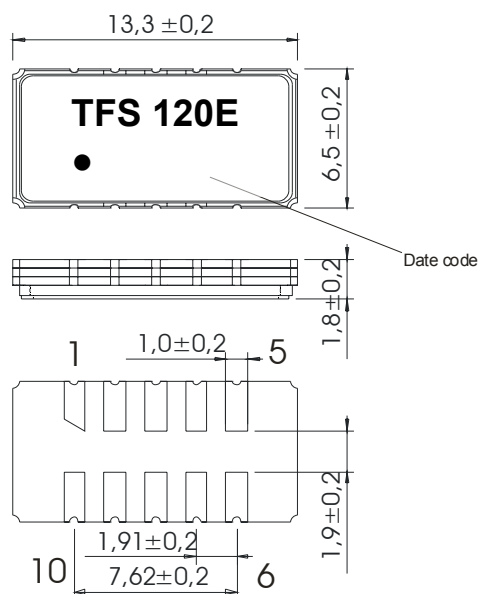
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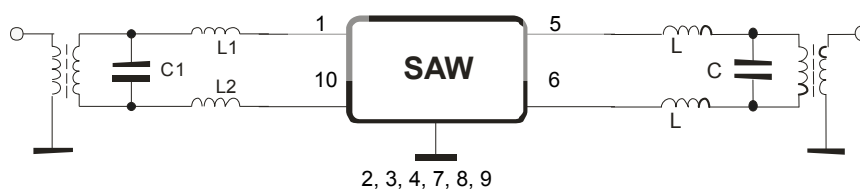
VI TELEFILTER**Filter specification****TFS 120E****2/5****Filter characteristic****Construction and pin connection**

(All dimensions in mm)



1	Input
2	Ground
3	Ground
4	Ground
5	Output
6	Output
7	Ground
8	Ground
9	Ground
10	Input

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

200 Ω Test circuit

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VI TELEFILTER**Filter specification****TFS 120E****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: three times 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)

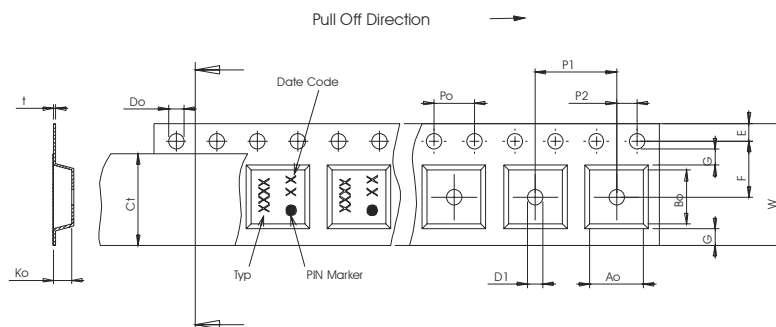
Packing

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;

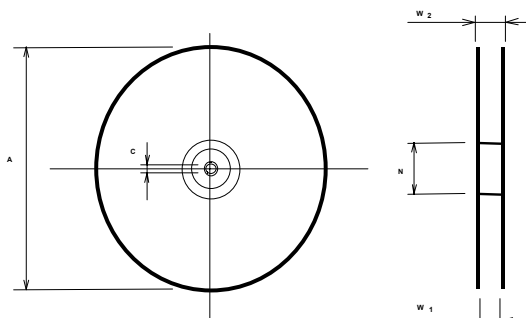
max. pieces of filters per reel:	1700
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

W	: 24,00 +0,30/-0,10
Po	: 4,00 ± 0,1
Do	: 1,50 +0,1/-0
E	: 1,75 ± 0,10
F	: 11,50 ± 0,10
G(min)	: 0,60
P2	: 2,00 ± 0,1
P1	: 12,00 ± 0,1
D1(min)	: 1,50
Ao	: 7,10 ± 0,10
Bo	: 13,90 ± 0,10
Ct	: 21,5 ± 0,1

**Reel (all dimensions in mm)**

A	: 330
W1	: 24,4 +2/-0
W2(max)	: 30,4
N(min)	: 60
C	: 13,0 +0,5/-0,2



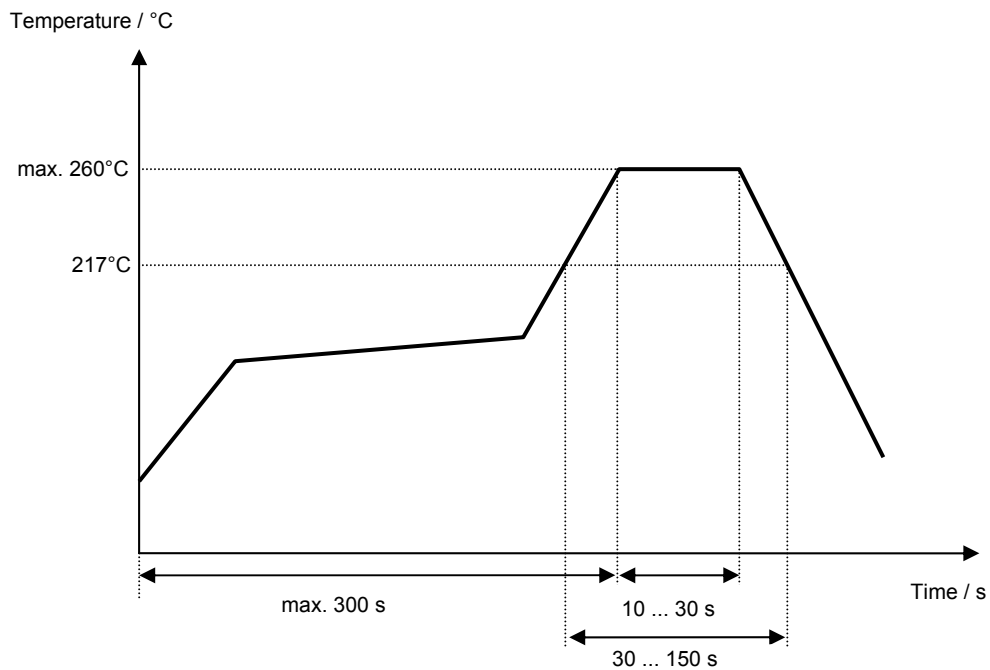
The minimum bending radius is 45 mm.

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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

VI TELEFILTER**Filter specification****TFS 120E****5/5****History**

Version	Reason of Changes	Name	Date
1.0	generate development specification	Martens	27.10.2004
1.1	change stability characteristics and correct relative attenuation	Strehl	18.05.2006
1.2	-terminating impedances, typical values, filter characteristics and matching configuration added	Pfeiffer	27.07.2006