

VI TELEFILTER**Filter specification****TFS 86A****1/5****Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	850 Ω	-2 pF
Output:	850 Ω	-2 pF

Characteristics**Remark:**

The reference level for the relative attenuation a_{rel} of TFS 86A is the minimum of the pass band attenuation a_{min} . This minimum is defined as the insertion loss a_e . The nominal frequency f_N is fixed at 86,85 MHz without any tolerance. The given values for the relative attenuation a_{rel} and the group delay ripple 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		tolerance / limit	
Insertion loss (Reference level)	$a_e = a_{min}$	2,7	dB	max. 4	dB
Nominal frequency	f_N	-		86,85	MHz
Pass band	PB	-		$f_N \pm 13$	kHz
Pass band ripple		1,0	dB	max.	1,5 dB
Relative attenuation	a_{rel}				
f_N ... $f_N \pm 15$ kHz		1,5	dB	max. 3	dB
$f_N \pm 60$ kHz ... $f_N \pm 120$ kHz		26	dB	min. 20	dB
$f_N + 120$ kHz ... $f_N + 150$ kHz		58	dB	min. 40	dB
$f_N + 150$ kHz ... $f_N + 400$ kHz		59	dB	min. 30	dB
$f_N + 400$ kHz ... $f_N + 1000$ kHz		60	dB	min. 40	dB
$f_N - 1000$ kHz ... $f_N - 940$ kHz		71	dB	min. 50	dB
$f_N - 940$ kHz ... $f_N - 880$ kHz		71	dB	min. 70	dB
$f_N - 880$ kHz ... $f_N - 400$ kHz		63	dB	min. 50	dB
$f_N - 400$ kHz ... $f_N - 120$ kHz		55	dB	min. 40	dB
Group delay ripple in $f_N \pm 11$ kHz		5	μs	max. 10	μs
Intermodulation Intermodulation in the composite signal by $f_N \pm 60$ kHz and $f_N \pm 120$ kHz each of -20 dBm		-		max. -90	dBm
Operating temperature range				- 20 °C ... + 70	°C
Storage temperature range				- 40 °C ... + 85	°C
Temperature coefficient of frequency TC		- 0,036	ppm/K ²		
Frequency inversion temperature		25	°C		

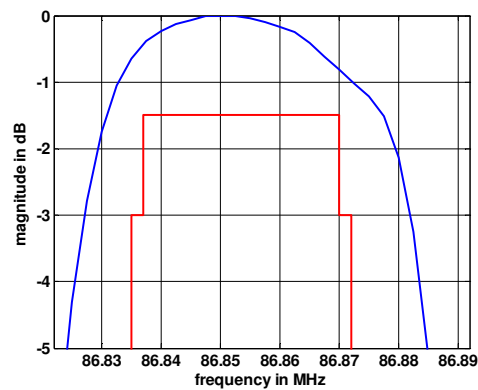
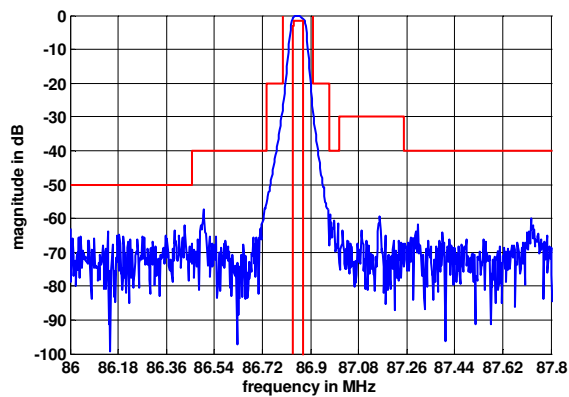
No DC voltage permitted

*) 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.

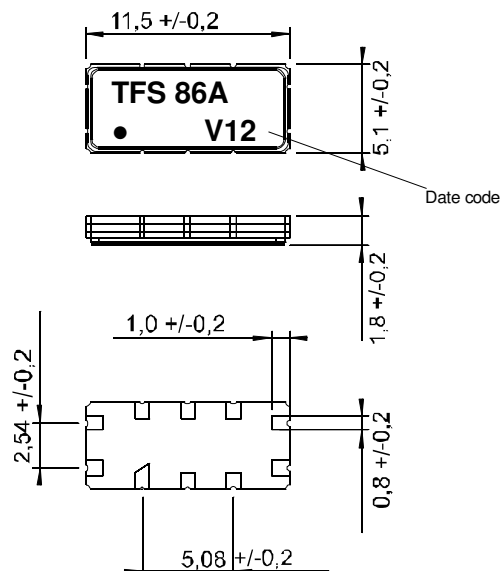
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VI TELEFILTER**Filter specification****TFS 86A****2/5****Filter characteristic****Construction and pin connection**

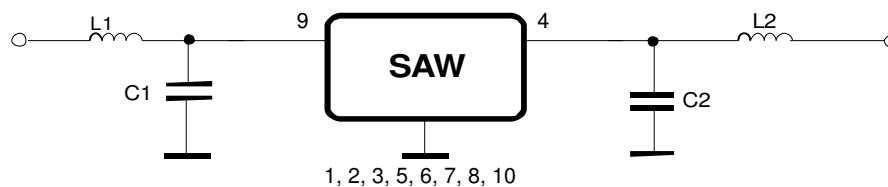
(All dimensions in mm)



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

Date code: Year + week
 V 2007
 W 2008
 X 2009
 ...

Base material ceramic; plating Au 0,75µm over Ni 1,27µm ... 8,89µm

50 Ω Test circuit

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VI TELEFILTER**Filter specification****TFS 86A****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)

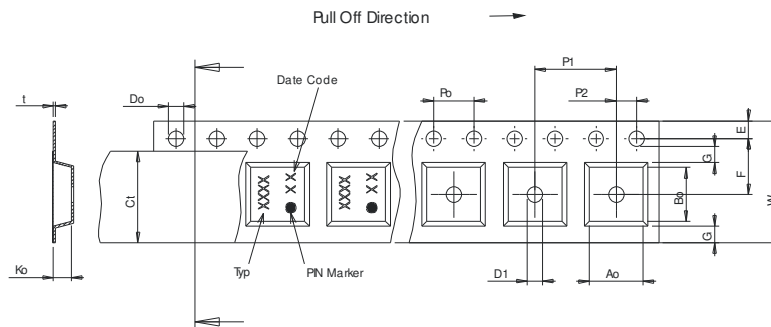
Packing

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;

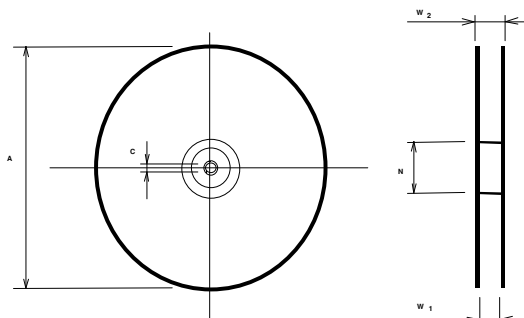
max. pieces of filters per reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

W	: 24,00 ± 0,3
Po	: 4,00 ± 0,1
Do	: 1,50 +0,1/-0
E	: 1,75 ± 0,1
F	: 11,50 ± 0,1
G(min)	: 0,60
P2	: 2,00 ± 0,1
P1	: 8,00 ± 0,1
D1(min)	: 1,50
Ao	: 5,60 ± 0,1
Bo	: 11,80 ± 0,1
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



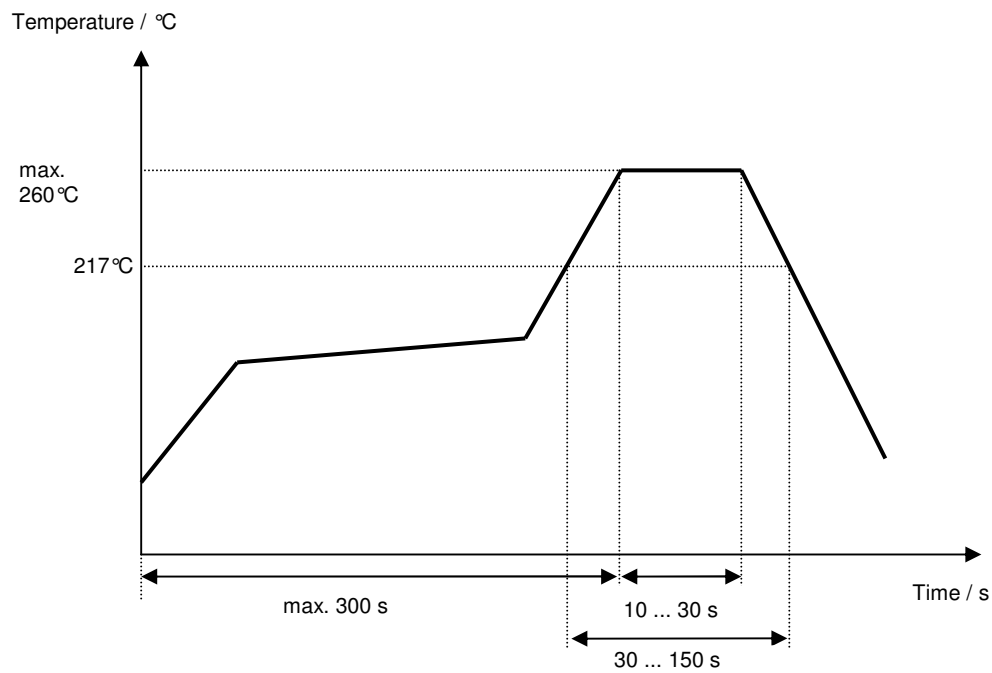
The minimum bending radius is 45 mm.

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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 86A****5/5****History**

Version	Reason of Changes	Name	Date
1.2	changing DC voltage changing label	Pfeiffer	13.02.2002
1.3	changing of construction	M.Springfeldt	13.05.2004
1.4	reworked construction reworked matching circuit reworked air reflow temperature conditions added plating information added filter characteristic added typical values added RoHS information	Martens	22.03.2007

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