Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 2900 Ω || -3,8 pF
Output: 2900 Ω || -3,8 pF
External Coil: 820 nH

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS 70BA 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 70,0 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	3,7	dB	max.	6,0	dB
Nominal frequency	f_N	-			70,0	MHz
Centre frequency at ambient temperature	f_C	70,002	MHz	70,0	± 0,015	MHz
Passband	PB	-		f_N	± 35	kHz
Pass band ripple		0,5	dB	max.	1,0	dB
Relative attenuation	a_{rel}					
f_N … f_N ± 35	kHz	0,5	dB	max.	1,0	dB
f_N ± 35 kHz … f_N ± 47	kHz	2,0	dB	max.	3,0	dB
f_N ± 60 kHz … f_N ± 90	kHz	2,5	dB	min.	1,0	dB
f_N ± 90 kHz … f_N ± 450	kHz	10	dB	min.	3,0	dB
f_N ± 450 kHz … f_N ± 500	kHz	45	dB	min.	35	dB
f_N ± 500 kHz … f_N ± 10	MHz	43	dB	min.	40	dB
Input power level				max.	8	dBm
Operating temperature range	OTR	-		- 5 °C ... + 70°C		
Storage temperature range		-		- 30 °C ... + 90°C		
Frequency inversion temperature		25	°C			
Temperature coefficient of frequency	TC_f **	-0.043	ppm/K²			

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

Generated:

Checked / Approved:

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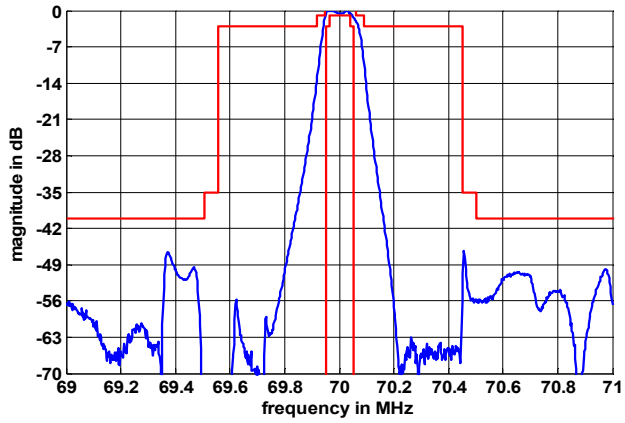
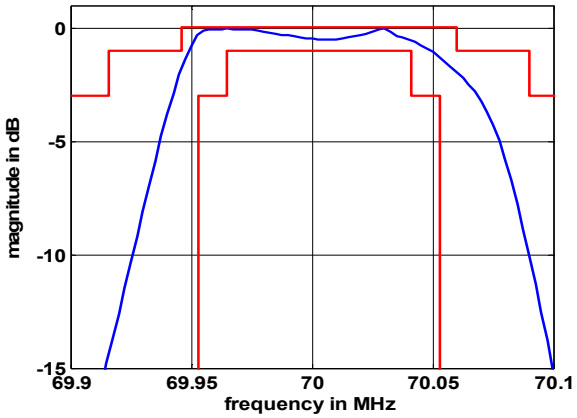
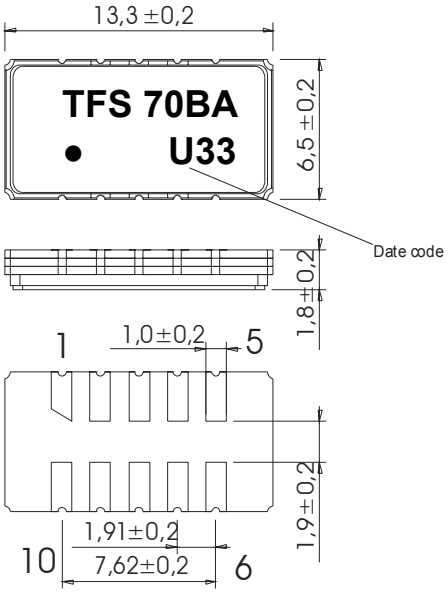
Filter characteristic





Construction and pin connection

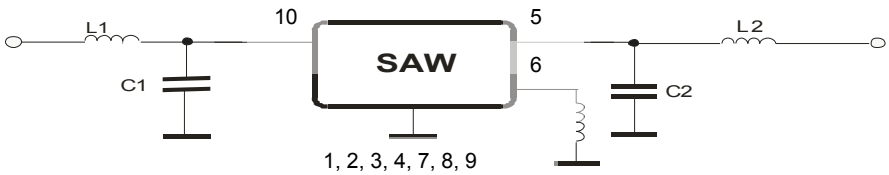
(All dimensions in mm)



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

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

50 Ω Test circuit



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Stability characteristics, reliability

100% Screening Tests :

After the following tests the filter shall meet the whole specification. Electrical tests after test 4, test 5 and 7.

1. Internal Visual Inspection: according to MIL-STD-883 method 2017
2. Stabilization Bake: 16 hrs at 125°C under Vacuum according to MIL-STD-883 Method 1008 Condition B
3. Temperature Cycling: -55 °C to 125°C / 30 min. each / 10 cycles
   DIN IEC 68 part 2 – 14 Test N equivalent MIL-STD-202 Method 107
4. Burn-in: 160hrs at 125°C (no input power) according to MIL-STD-883 Method 1015
5. Seal test: gross leak bubble test – Fluorocarbon liquid at 125°C ± 5°C
   MIL-STD-202 Method 112 Condition D
   Fine leak spot test – Helium detector according to MIL-STD-202 Method 112 Condition C
6. External Visual Inspection: according to MIL-STD-883 method 2009

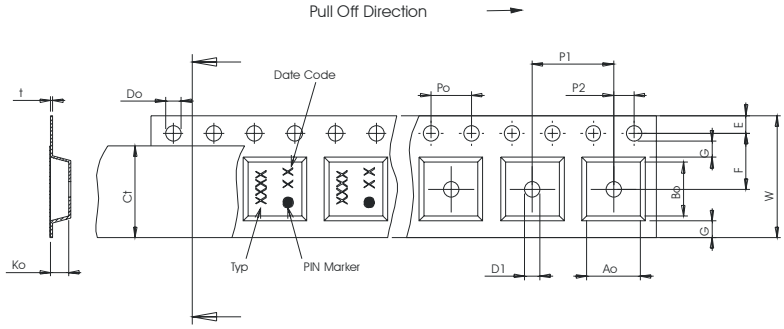
Qualification Tests :

1. Resistance to solder heat (reflow): reflow possible: three times max.;
   for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;
2. Vibration: 10 Hz to 2000 Hz, 1,5 mm or max 20g respectively, 1 octave per min, 10 cycles per plan, 3 plans;
   DIN IEC 68 2 – 6
3. Shock: 500g, 1 ms, half sine wave, 3 shocks each plane;
   DIN IEC 68 T2 - 27 ,
7. Radiation: 100 krad , ESCC Detail Specification No.22900

Packing

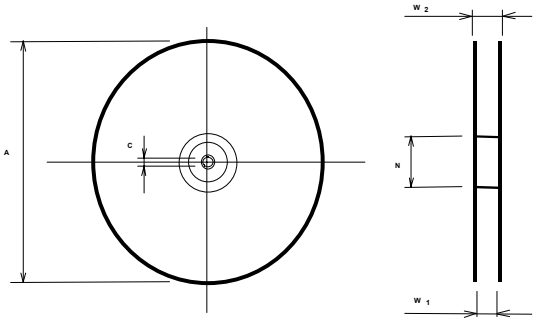
Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

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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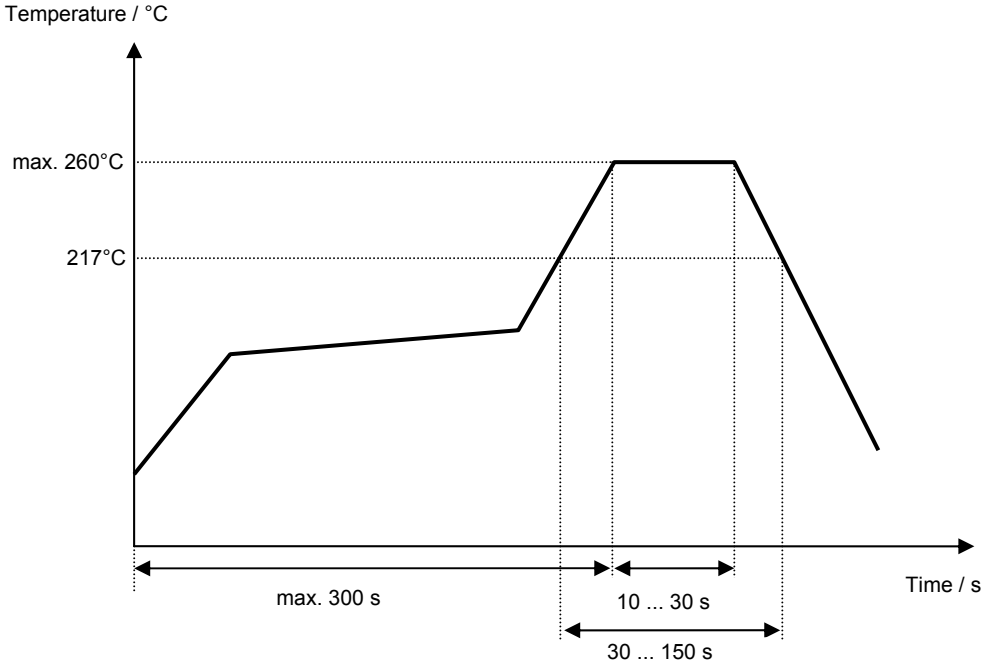
Air reflow temperature conditions

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



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History

Version	Reason of Changes	Name	Date
1.0	- Generation of filter specification	Strehl	18.08.2006

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