Measurement condition

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance:		
Input:	50	Ω
Output:	50	Ω

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS 156B is the maximum of the pass band attenuation. This value is defined as the insertion loss a_e. The nominal frequency f_N is fixed at 156,65 MHz without any tolerance. The values of relative attenuation a_{rel} are guaranteed for the whole operating temperature range. The frequency shift of the filter in the operating temperature range is included in the production tolerance scheme.

D a t a		**typ. value**		**tolerance / limit**		
Insertion loss (reference level)	$a_e = a_{max}$	1,25	dB	max.	2,5	dB
Nominal frequency	f_N	-			156,65	MHz
Passband	PB1			156,525	± 0,025	MHz
	PB2			156,800	± 0,025	MHz
Pass band ripple		-		max.	± 0,5	dB
Bandwidth	BW					
0,5 dB		-		min. 156,525	± 0,025	MHz
0,5 dB		-		min. 156,800	± 0,025	MHz
3 dB		3,7	MHz		-	
Relative attenuation	a_{rel}					
f_N ± 3,00 MHz … f_N ± 5,00 MHz		18	dB	min.	10	dB
f_N ± 5,00 MHz … f_N ± 8,00 MHz		25	dB	min.	20	dB
f_N ± 8,00 MHz … f_N ± 9,00 MHz		40	dB	min.	25	dB
f_N ± 9,00 MHz … f_N ± 20,00 MHz		50	dB	min.	40	dB
Input power level		-		max.	15	dBm
Operating temperature range	OTR	-		- 40 °C ... + 85°C		
Storage temperature range		-		- 45 °C ... + 90°C		
Temperature coefficient of frequency	TC_f *	- 32	ppm/K			

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

Generated:

Checked / Approved:

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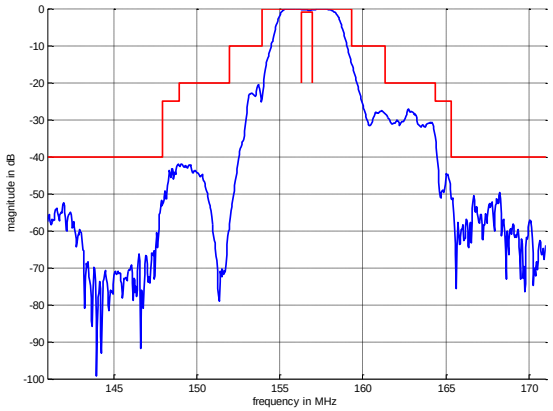
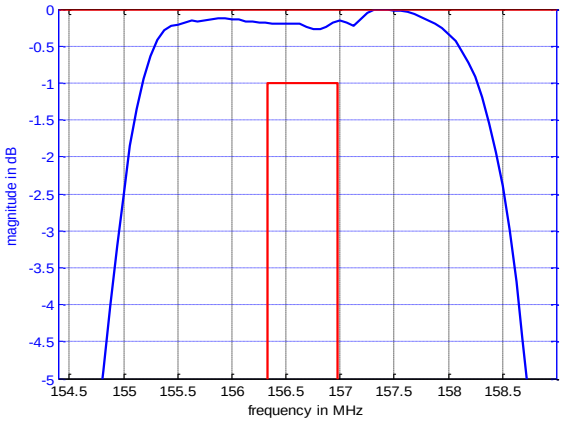
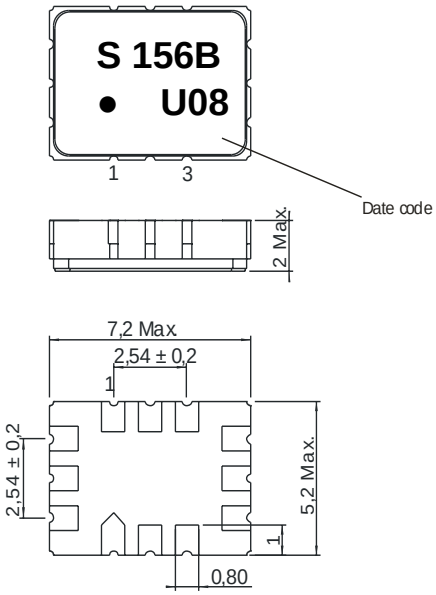
Filter characteristic





Construction and pin connection

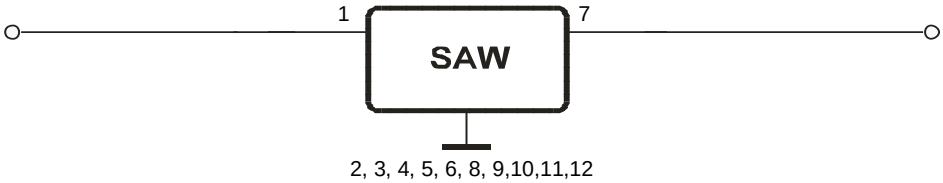
(All dimensions in mm)



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

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

50 Ω Test circuit



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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 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)

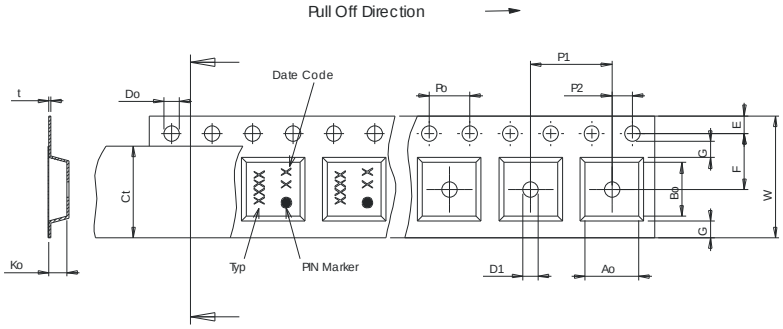
Packing

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

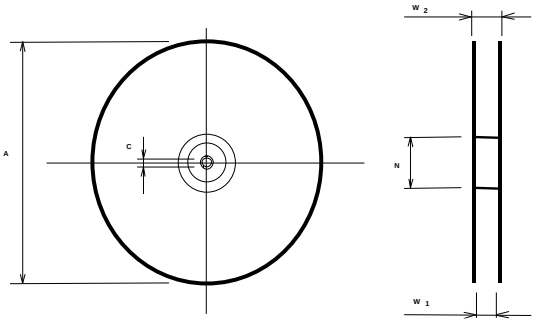
Tape (all dimensions in mm)

W	:	16,00	± 0,3
Po	:	4,00	± 0,1
Do	:	1,50	+0,1/-0
E	:	1,75	± 0,1
F	:	7,50	± 0,1
G(min)	:	0,60	
P2	:	2,00	± 0,1
P1	:	8,00	± 0,1
D1(min)	:	1,50	
Ao	:	5,50	± 0,1
Bo	:	7,50	± 0,1
Ct	:	13,5	± 0,1



Reel (all dimensions in mm)

A	:	330	
W1	:	16,4	+2/-0
W2(max)	:	22,4	
N(min)	:	50	
C	:	13,0	+0,5/-0,2



The minimum bending radius is 45 mm.

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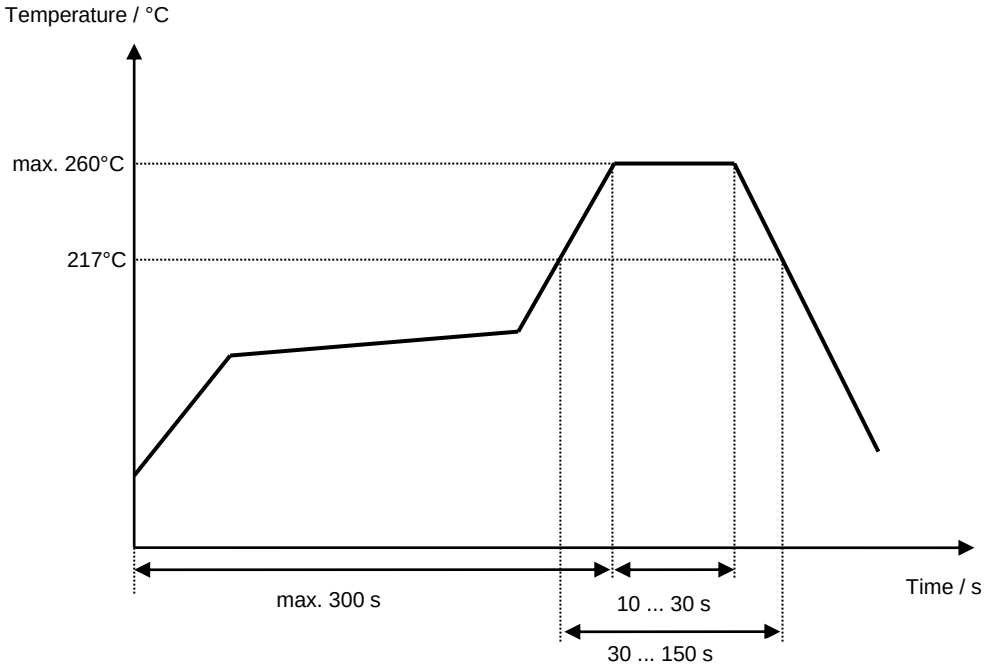
Air reflow temperature conditions

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 development specification	Strehl	28.07.2005
1.1	- Add bandwidth@1dB	Strehl	30.08.2005
1.2	- Change teminating impedance	Sabah	26.09.2005
1.3	- Change construction, add filter characteristic - Change relative attenuation, generation of filter specification	Channaa	28.10.2005
1.4	- Change insertion loss, bandwidth and relative attenuation - Change stability characteristics	Strehl	08.02.2006
1.5	- Correct filter characteristics	Strehl	21.02.2006

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