

VI TELEFILTER**Filter specification****TFS 156B****1/5****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.

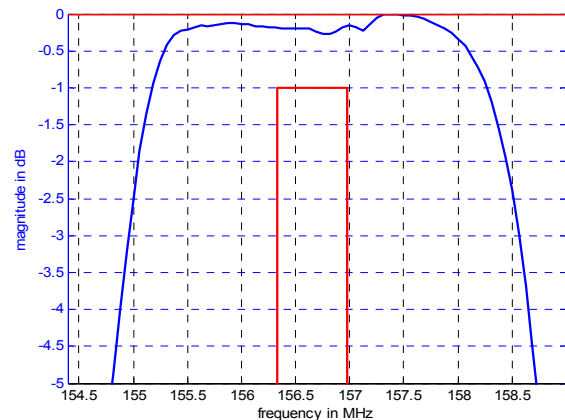
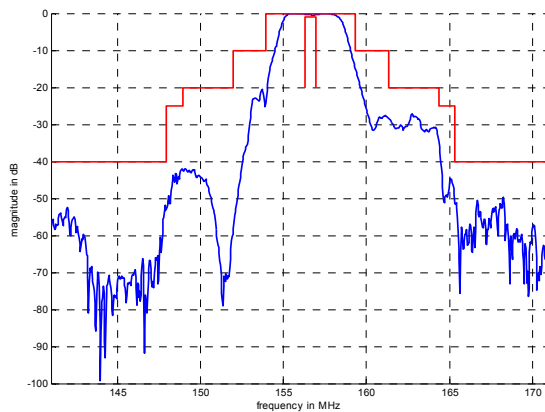
D a t a		typ. value		tolerance / limit	
Insertion loss (reference level)	$a_e = a_{max}$	1,25	dB	max.	2,5 dB
Nominal frequency	f_N	-		156,65	MHz
Passband	PB1			156,525	± 0,025 MHz
	PB2			156,800	± 0,025 MHz
Pass band ripple		-		max.	± 0,5 dB
Bandwidth	BW				
0,5 dB		-		min. 156,525	± 0,025 MHz
0,5 dB		-		min. 156,800	± 0,025 MHz
3 dB		3,7	MHz		-
Relative attenuation	a_{rel}				
$f_N \pm 3,00$ MHz ... $f_N \pm 5,00$ MHz		18	dB	min.	10 dB
$f_N \pm 5,00$ MHz ... $f_N \pm 8,00$ MHz		25	dB	min.	20 dB
$f_N \pm 8,00$ MHz ... $f_N \pm 9,00$ MHz		40	dB	min.	25 dB
$f_N \pm 9,00$ MHz ... $f_N \pm 20,00$ 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		

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

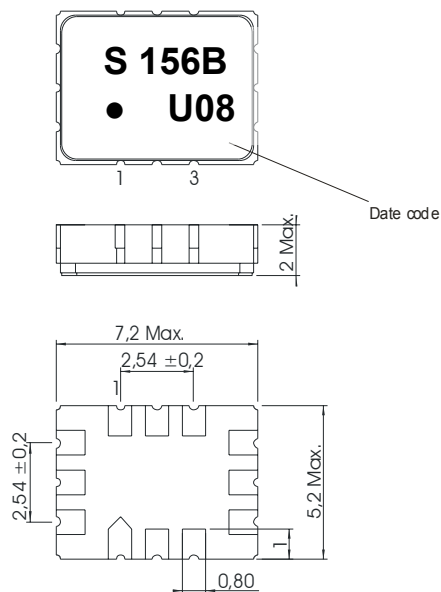
Generated:**Checked / Approved:**

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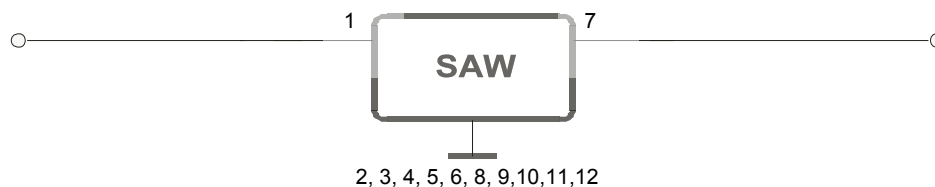
VI TELEFILTER**Filter specification****TFS 156B****2/5****Filter characteristic****Construction and pin connection**

(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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VI TELEFILTER**Filter specification****TFS 156B****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)

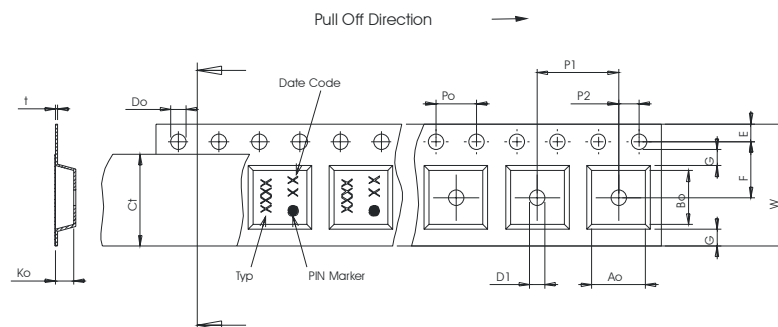
Packing

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;

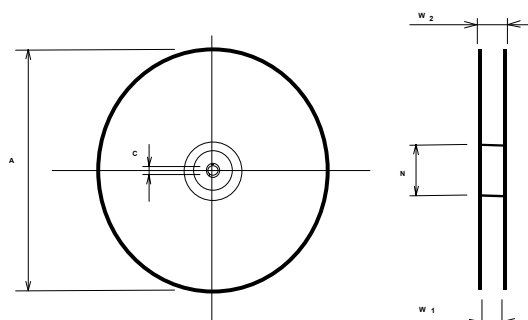
max. pieces of filters per reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

W	: 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



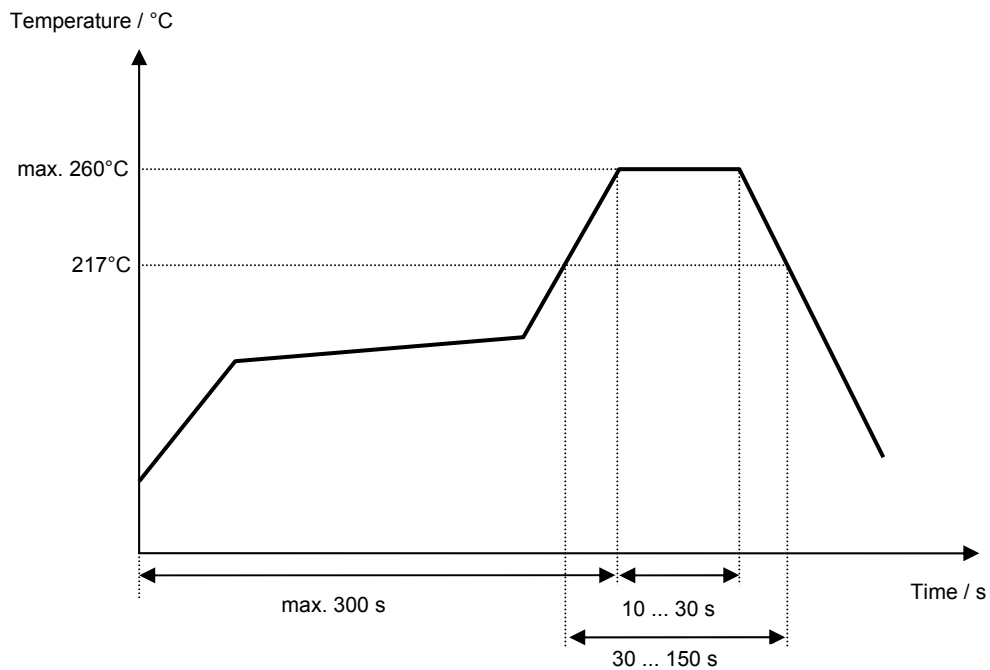
The minimum bending radius is 45 mm.

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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

VI TELEFILTER**Filter specification****TFS 156B****5/5****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 terminating 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