

**Microchip****Filter specification****TFS 256A****1/5****Measurement condition**

Ambient temperature: 23 °C  
 Input power level: 0 dBm

source impedance (single ended): 50 Ω  
 load impedance (single ended): 50 Ω

Terminating impedance: \*

Input: 160 Ω || -6.4 pF  
 Output: 160 Ω || -6.6 pF

**Characteristics**

Remark:

The reference level for the relative attenuation  $a_{rel}$  of the TFS256A is the minimum of the pass band attenuation. This value is defined as the insertion loss  $a_e$ . The nominal frequency  $f_N$  is fixed at 256 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		
<b>Insertion loss</b> (reference level)		$a_e$	15 dB	max.	17	dB
<b>Nominal frequency</b>		$f_N$			256	MHz
<b>Passband</b>		PB	90 MHz	$f_N \pm$	42,5	MHz
<b>Pass band ripple</b>			0,5 dB	max.	1	dB
<b>Relative attenuation</b>		$a_{rel}$				
$f_N$	... $f_N \pm$	42,5 MHz	0,5 dB	max.	1	dB
$f_N - 170$	MHz ... $f_N - 120$	MHz	48 dB	min.	45	dB
$f_N - 120$	MHz ... $f_N - 65$	MHz	43 dB	min.	40	dB
$f_N - 65$	MHz ... $f_N - 59,9$	MHz	42 dB	min.	40	dB
$f_N - 59,9$	MHz ... $f_N - 57,4$	MHz	39 dB	min.	35	dB
$f_N + 57,4$	MHz ... $f_N + 59,9$	MHz	42 dB	min.	35	dB
$f_N + 59,9$	MHz ... $f_N + 65$	MHz	42 dB	min.	40	dB
$f_N + 65$	MHz ... $f_N + 90$	MHz	43 dB	min.	40	dB
$f_N + 90$	MHz ... $f_N + 170$	MHz	48 dB	min.	45	dB
<b>Input power level</b>				max.	10	dBm
<b>Operating temperature range</b>		OTR		- 30 °C ... + 80 °C		
<b>Storage temperature range</b>				- 45 °C ... + 85 °C		
<b>Temperature coefficient of frequency</b>		$TC_f$ *	-92 ppm/K			

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

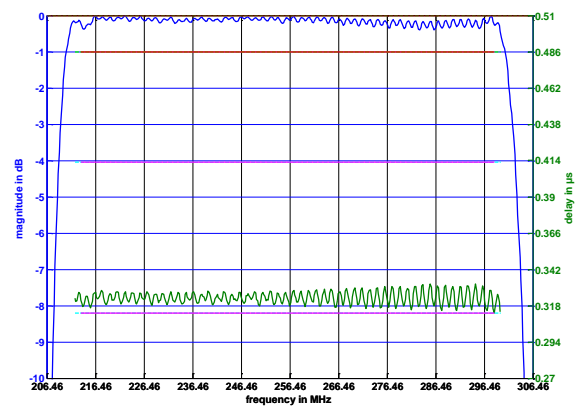
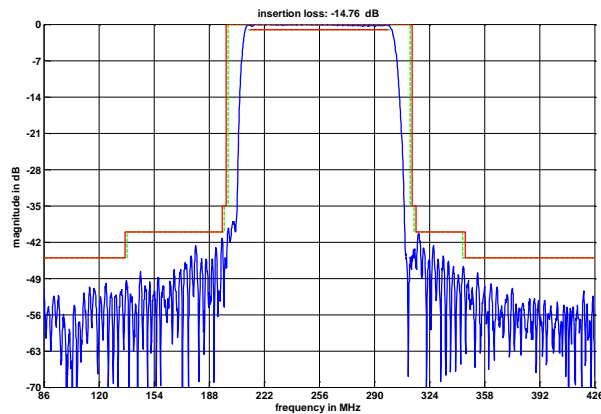
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**Checked / Approved:**

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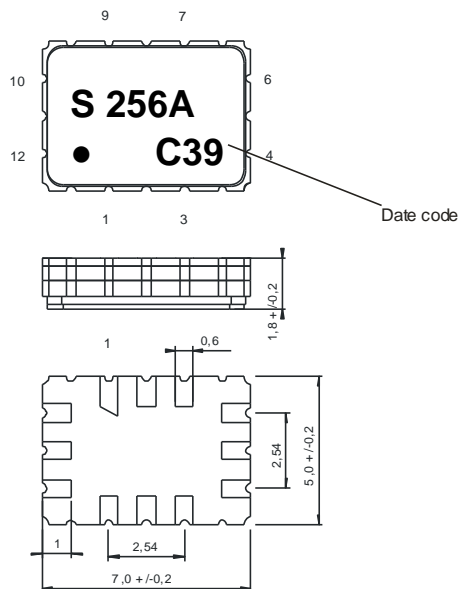
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## Filter characteristic



## Construction and pin connection

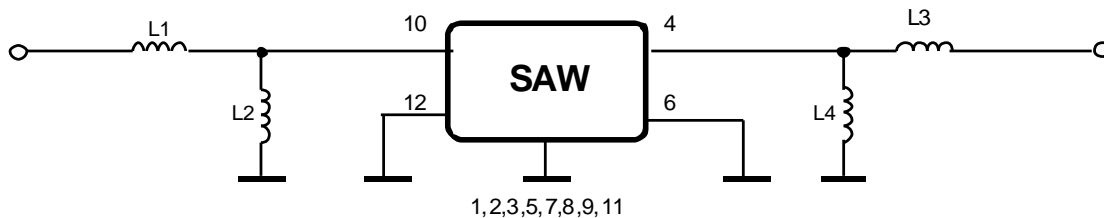
(All dimensions in mm)



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

Date code: Year + week  
 C 2012  
 D 2013  
 E 2014  
 ...

## 50 Ohm 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 plane, 3 planes;  
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;
5. ESD MIL-STD-883E using coupling network of ISO 10605 and EN 6100-4-2  
HBM:250V;

This filter is RoHS compliant (2002/95/EG, 2005/618/EG)

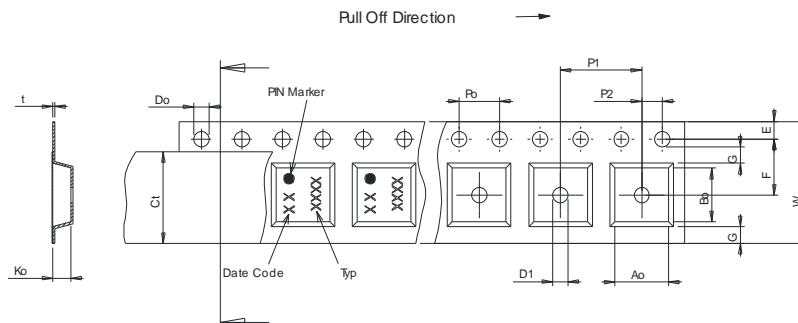
**Packing**

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;

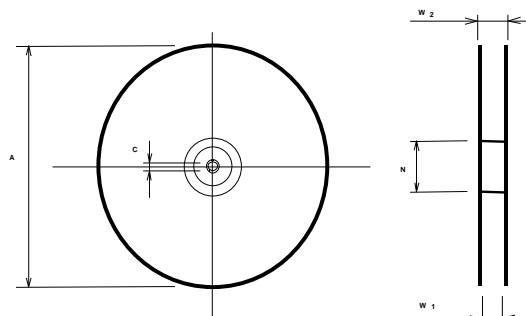
max. pieces of filters per reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

**Tape (all dimensions in mm)**

W	: 16,00 +0,3/-0,1
Po	: 4,00 ± 0,1
Do	: 1,50 +0,1/-0
E	: 1,75 ± 0,1
F	: 7,50 ± 0,1
G(min)	: 0,75
P2	: 2,00 ± 0,1
P1	: 8,00 ± 0,1
D1(min)	: 1,50
Ao	: 5,40 ± 0,1
Bo	: 7,60 ± 0,1
Ct	: 13,3 ± 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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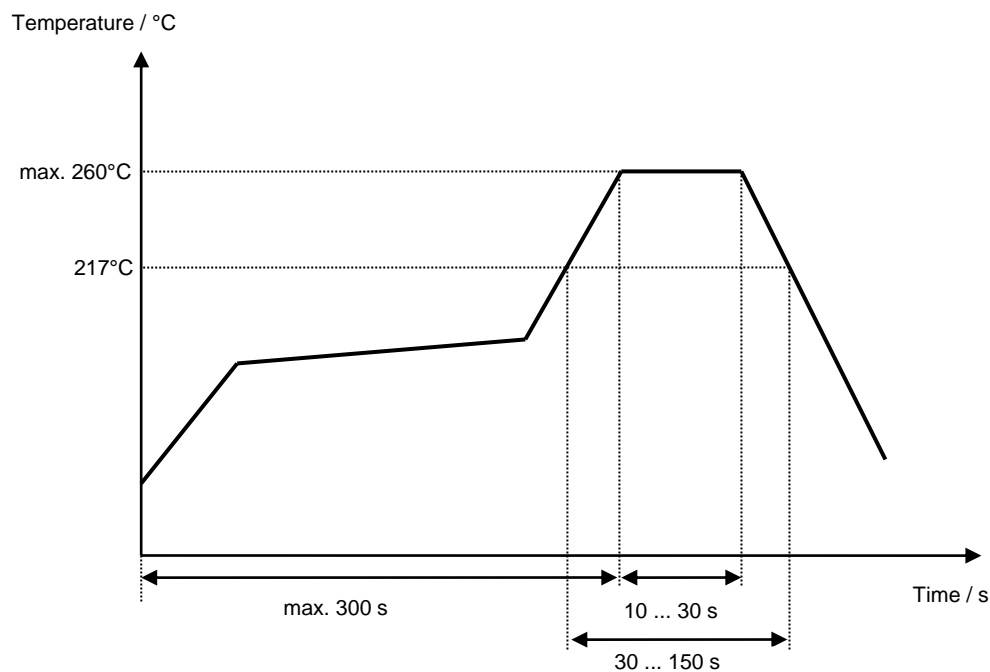
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**Air reflow temperature conditions**

<b>Conditions</b>	<b>Exposure</b>
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****Microchip Frequency Technology GmbH****Potsdamer Straße 18****D 14 513 TELTOW / Germany****Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30**

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**Microchip****Filter specification****TFS 256A****5/5****History**

<b>Version</b>	<b>Reason of Changes</b>	<b>Name</b>	<b>Date</b>
1.0	- Generation of development specification	Chilla	03.04.2012
2.0	- Created filter specification - Added terminating impedance - Added typical values - Added filter characteristics - Added test circuit	Chilla	27.09.2012

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