

Microchip**Filter specification****TFS 1516****1/5****Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	200 Ω	-0,46 pF
Output:	75 Ω	

Characteristics

Remark:

The nominal frequency f_N is fixed at 1516,0 MHz. The insertion loss a_e is defined as loss value determined at f_N . Reference level for the relative attenuation a_{rel} of the TFS 1516 is the insertion loss a_e . All specified data are met within the operating temperature range.

D a t a					typ. value		tolerance / limit			
Insertion loss (reference level)					a _e	2,0	dB	max.	3,0	dB
Nominal frequency					f _N	-			1516,0	MHz
Passband					PB	-		f _N ±	20,0	MHz
Pass band variation						1,0	dB	max.	2,0	dB
Relative attenuation					a _{rel}					
0,3	MHz	...	860	MHz		61	dB	min.	55	dB
860	MHz	...	1100	MHz		55	dB	min.	46	dB
1100	MHz	...	1423,9	MHz		47	dB	min.	43	dB
1608,4	MHz	...	1724,6	MHz		50	dB	min.	33	dB
1724,6	MHz	...	2000	MHz		46	dB	min.	40	dB
2000	MHz	...	2250	MHz		45	dB	min.	36	dB
2250	MHz	...	6000	MHz		30	dB	min.	15	dB
Group delay ripple										
1497,4	MHz	...	1534,5	MHz		7	ns	max.	15	ns
Input VSWR within PB						2,0:1		max.	2,4 : 1	
Output VSWR within PB						2,1:1		max.	2,4 : 1	
CMRR *** within PB						26	dB	min.	20	dB
Input power level								max.	10	dBm
Permissible DC voltage								max.	0	V
Operable temperature range						-		- 30 °C ... + 80 °C		
Operating temperature range					OTR	-		- 20 °C ... + 50 °C		
Storage temperature range						-		- 50 °C ... +125 °C		
Temperature coefficient of frequency					TC _f **	-46	ppm/K			

*) 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.

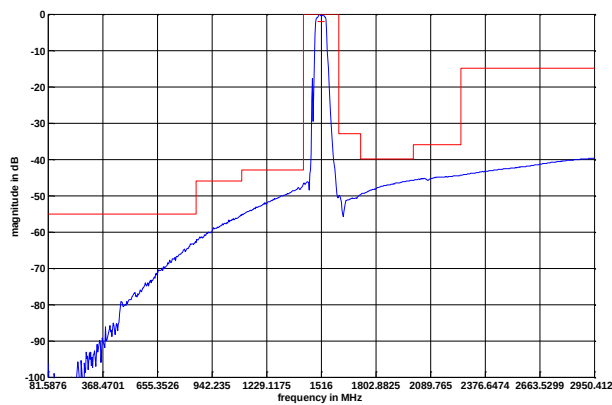
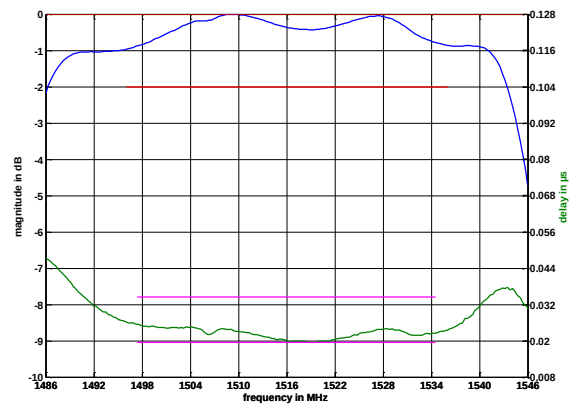
**) $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}) \times (T - T_0) \times f_{T0}(\text{MHz})$

***) CMRR: Common Mode Rejection Ratio

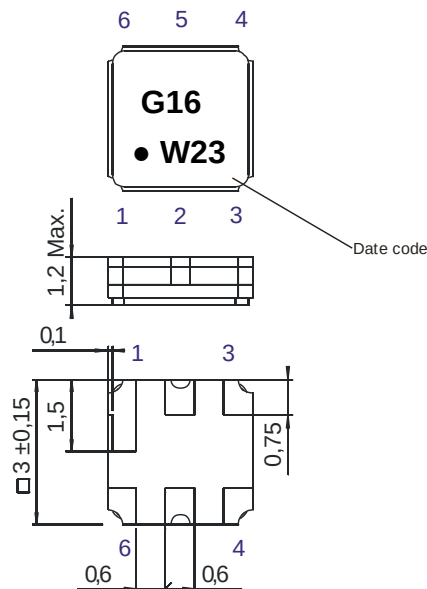
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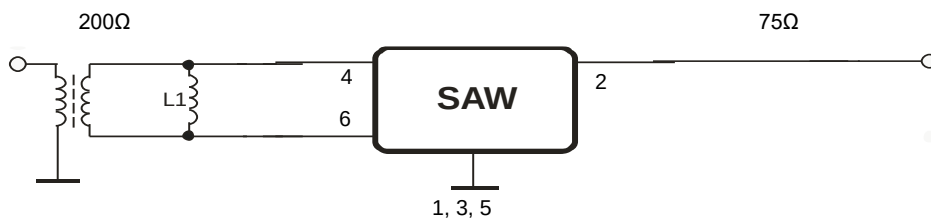
Filter characteristic**Construction and pin connection**

(All dimensions in mm)



1	Ground
2	Output
3	Ground
4	Input
5	Ground
6	Input

Date code: Year + week
W 2008
X 2009
A 2010
...

200 Ohm / 75 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 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)

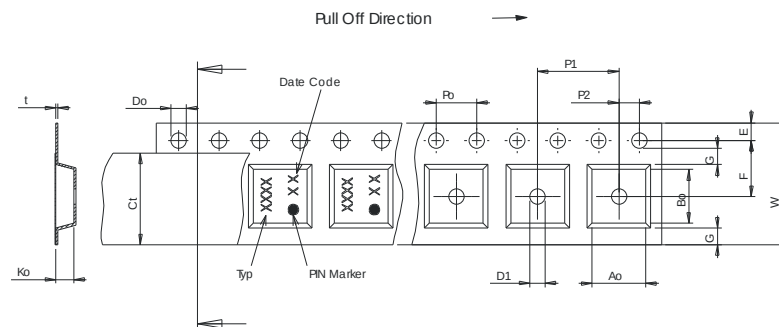
Packing

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;

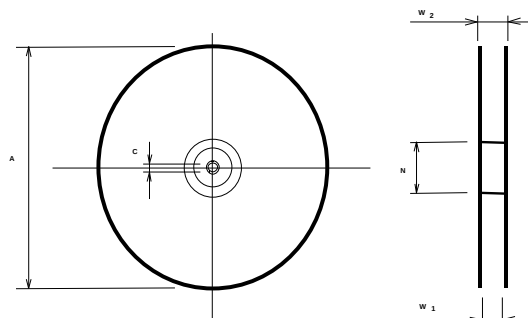
max. pieces of filters per reel:	9000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

W	: 8,00 ± 0,3
Po	: 4,00 ± 0,1
Do	: 1,50 +0,1/-0
E	: 1,75 ± 0,1
F	: 3,50 ± 0,05
G(min)	: 0,75
P2	: 2,00 ± 0,05
P1	: 4,00 ± 0,1
D1(min)	: 1,50
Ao	: 3,25 ± 0,1
Bo	: 3,25 ± 0,1
Ct	: 5,5 ± 0,1

**Reel (all dimensions in mm)**

A	: 330
W1	: 8,4 +1,5/-0
W2(max)	: 14,4
N(min)	: 50
C	: 13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

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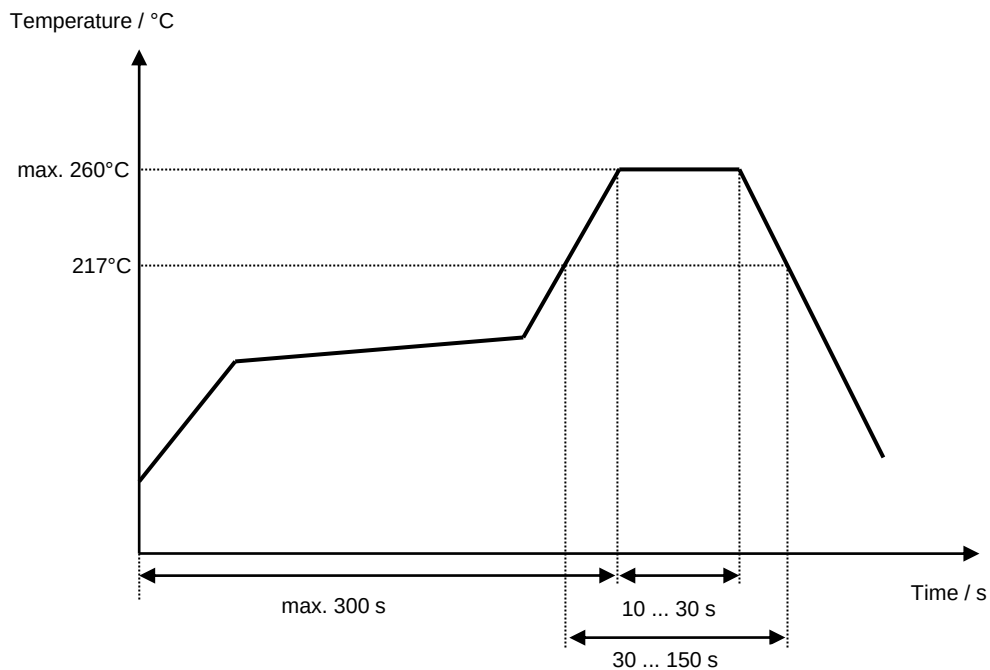
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Air reflow temperature conditions

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

Microchip**Filter specification****TFS 1516****5/5****History**

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Strehl	19.06.2007
1.1	- Change and add data	Strehl	18.07.2007
1.2	- Change passband, passband variation - Change insertion loss, attenuation and OTR	S. Channaa	08.02.2008
1.3	- Change attenuation, group delay ripple and vswr - Add typical values, filter characteristic, generation of filter specification	S. Channaa	06.05.2008
1.4	- Correct construction	Strehl	09.06.2008

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