

Microchip**Filter specification****TFS 2533****1/5****Measurement condition**

Ambient temperature:	23	°C
Input power level:	0	dBm
Terminating impedance: *		
Input:	27,22 Ω	-0,32 pF
Output:	27,22 Ω	-0,32 pF
Source:	50	Ω
Load:	50	Ω

Characteristics**Remark:**

The maximum attenuation in the pass band is defined as the insertion loss. The nominal frequency f_N is fixed at 2533 MHz without any tolerance or limit. The values of absolute attenuation a_{abs} 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	a_{max}	2,9	dB	max.	3,5	dB
Nominal frequency	f_N	-			2533,0	MHz
Passband	PB	-		f_N	$\pm$ 33,0	MHz
Pass band ripple	in an arbitrary 1,25 MHz segment within PB	0,05	dB	max.	0,5	dB
Absolute attenuation	a_{abs}					
0,3 MHz ... 2400 MHz		32	dB	min.	25	dB
2400 MHz ... 2440 MHz		21	dB	min.	10	dB
2620 MHz ... 2630 MHz		37	dB	min.	23	dB
2630 MHz ... 2686 MHz		37	dB	min.	35	dB
2686 MHz ... 3250 MHz		29	dB	min.	25	dB
3250 MHz ... 5132 MHz		11	dB	min.	5	dB
VSWR within PB		1,6 : 1		max.	1,9 : 1	
Input power level within PB		-		max.	5	dBm
Operating temperature range	OTR	-		- 30 °C ... + 85 °C		
Storage temperature range		-		- 40 °C ... + 85 °C		
Temperature coefficient of frequency	TC_f **	- 44	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.

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

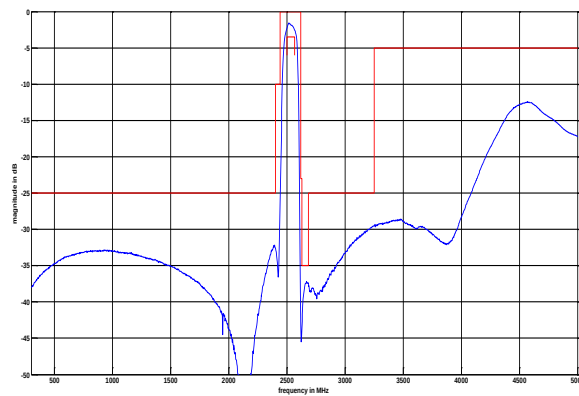
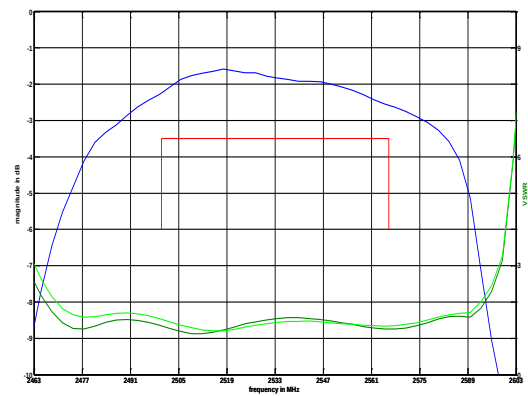
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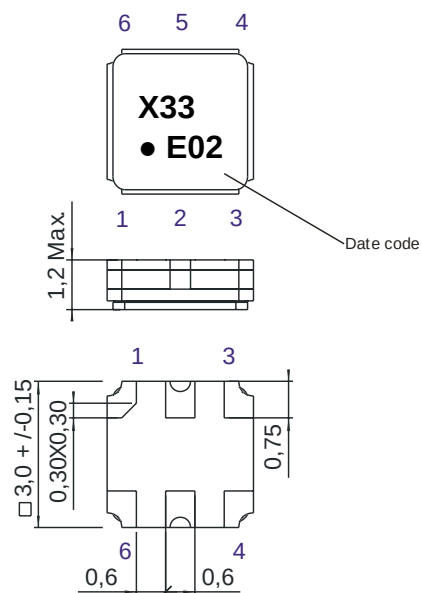
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Filter characteristic



Construction and pin connection

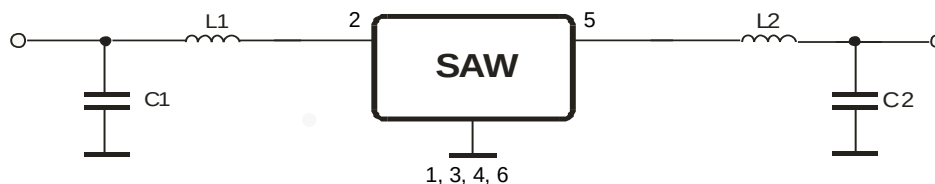
(All dimensions in mm)



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

Date code: Year + week
 E 2014
 F 2015
 G 2016
 ...

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 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 / 15 min. each / 100 cycles
DIN IEC 68 part 2 – 14 Test N
4. Resistance to solder heat (reflow): reflow possible: three times max.;
for temperature conditions, see page 4: "Air reflow temperature conditions"

This filter is RoHS compliant (2011/65/EU)

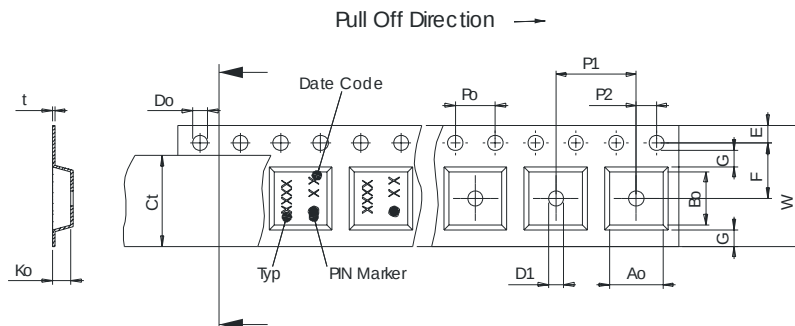
Packing

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

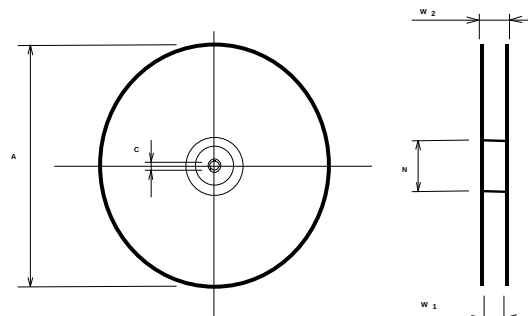
max. pieces of filters peer reel:	9000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

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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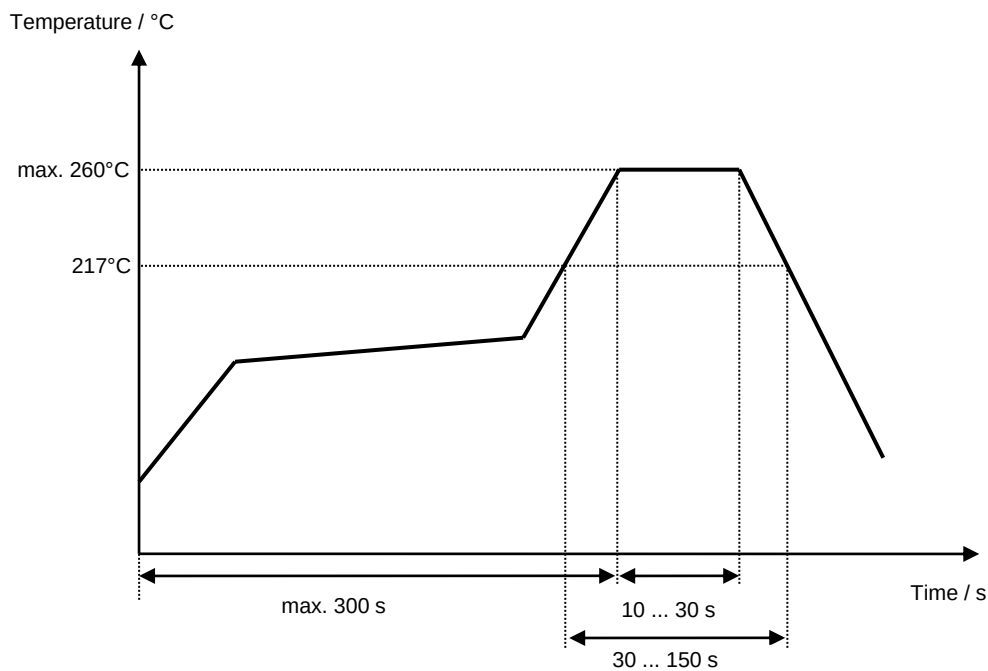
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Air reflow temperature conditions

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 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 2533****5/5****History**

Version	Reason of changes	Name	Date
1.0	- Generation of development specification	Roizengaft	12.12.2003
1.1	- change package (length of pin 1) - change matching circuit configuration - change packing (tape and reel)	Noack	04.06.2004
1.2	- changing absolute attenuation - changing VSWR	Noack	24.06.2004
1.3	- Add typical values, terminating impedances and filter characteristic - Changed test circuit and generation of filter specification - Generation of filter specification	Channaa	25.10.2005
1.4	- Changed absolute attenuation because of new customer requirement (0.3 ...2400MHz & 2620 ...2686MHz)	Noack	10.11.2008
2.0	- Change of input power requirement - Relaxation of the outer limit line (@3250MHz...5132MHz) - Updating typical values	S.Springfeldt	23.04.2010
2.1	- Maximum input power updated	Kortenbeutel	07.01.2014

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