

VI TELEFILTER**Filter specification****TFS 190C****1/5****Measurement condition**

Ambient temperature T_A :	23	°C
Input power level:	0	dBm
Terminating impedance*: input	610 Ω //	-10.4 pF
output	560 Ω //	-10.3 pF

Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the TFS 190 C is the minimum of the pass band attenuation a_{min} . The minimum of the pass band attenuation a_{min} is defined as the insertion loss a_e . The nominal frequency f_N is fixed at 190,0 MHz without tolerance. The values of the pass band ripple and the relative attenuation a_{rel} are guaranteed in the whole operating temperature range. The frequency shift of the filter in the operating temperature range is included in the measurement tolerance scheme.

D a t a		typ. value		tolerance / limit		
Insertion loss (Reference level)	$a_e = a_{min}$	8,2	dB	max	12	dB
Nominal frequency	f_N	-			190	MHz
Pass band	PB			$f_N \pm$	2	MHz
Relative attenuation	a_{rel}					
f_N $f_N \pm 2$ MHz		1	dB	max	2	dB
$f_N \pm 2,0$ MHz ... $f_N \pm 2,5$ MHz		-		max	5	dB
$f_N \pm 5,0$ MHz ... $f_N \pm 12$ MHz		36	dB	min	32	dB
$f_N - 12,0$ MHz ... $f_N - 190$ MHz		40	dB	min	36	dB
$f_N + 12,0$ MHz ... $f_N + 270$ MHz		45	dB	min	36	dB
Phase variation						
$f_N \pm 2,5$ MHz		1,2	°rms	max	4	°rms
Input power level		-		max	10	dBm
Operating temperature range					- 40 °C ... + 85 °C	
Storage temperature range					- 55 °C ... + 125 °C	
Temperature coefficient of frequency	TC_f^{**}	-25	ppm/K		-	

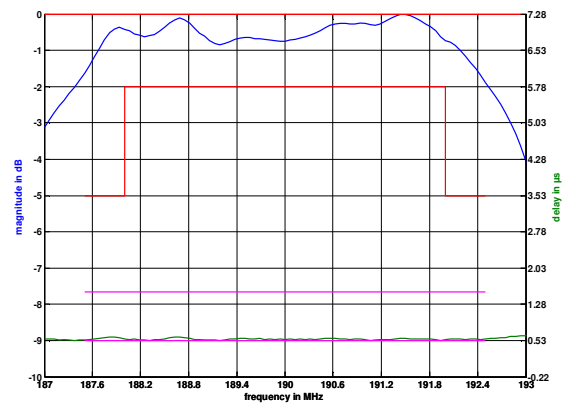
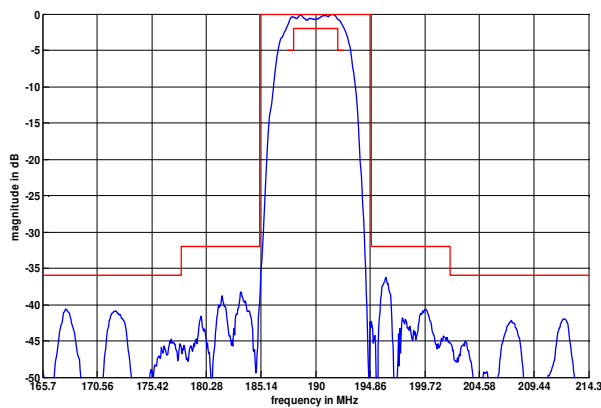
*) The terminating impedances depend on parasitics and q-values of matching elements and the board used, and are to be understood as reference values only. Should there be additional questions do not hesitate to ask for an application note or contact our design team.

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

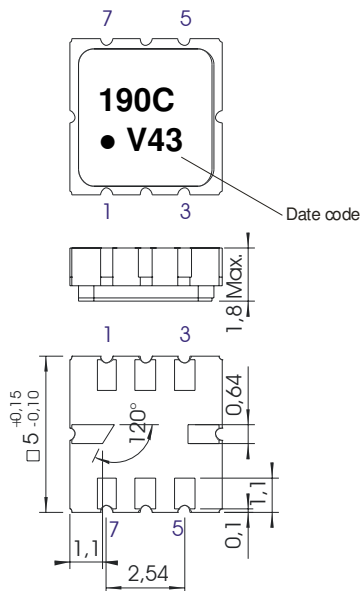
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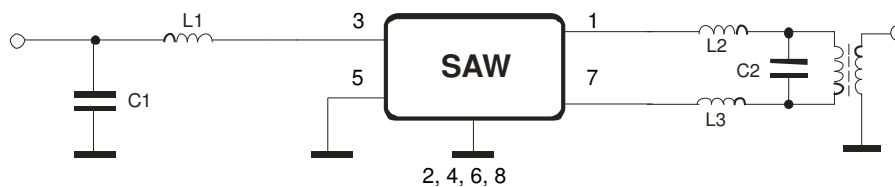
VI TELEFILTER**Filter specification****TFS 190C****2/5****Filter characteristic****Construction and pin connection**

(All dimensions in mm)



1	Output
2	Ground
3	Input
4	Ground
5	Input RF Return
6	Ground
7	Output
8	Ground

Date code: Year + week
 V 2007
 W 2008
 X 2009
 ...

50 Ohm Test circuit

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VI TELEFILTER**Filter specification****TFS 190C****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 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;
5. ESD ANSI/ESD S20.20-1999, class 1A for HBM

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

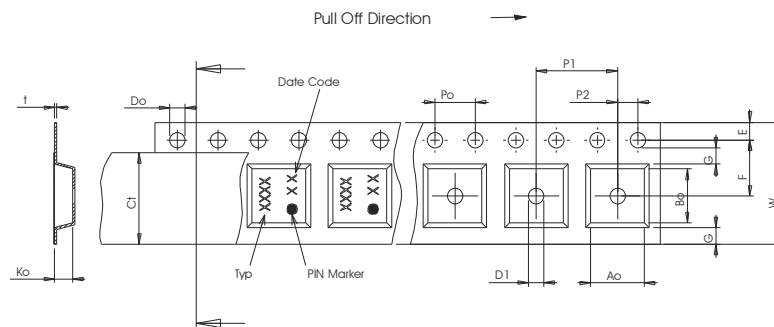
Packing

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;

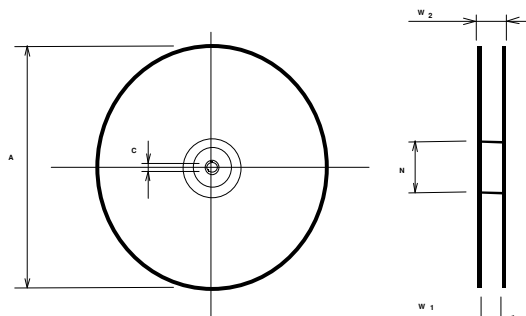
max. pieces of filters per reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

W	: 12,00
Po	: 4,00
Do	: 1,50
E	: 1,75
F	: 5,50
G(min)	: 0,75
P2	: 2,00
P1	: 8,00
D1(min)	: 1,50
Ao	: 5,30
Bo	: 5,30
Ct	: 9,5

**Reel (all dimensions in mm)**

A	: 330
W1	: 12,4
W2(max)	: 18,4
N(min)	: 50
C	: 13,0



The minimum bending radius is 45 mm.

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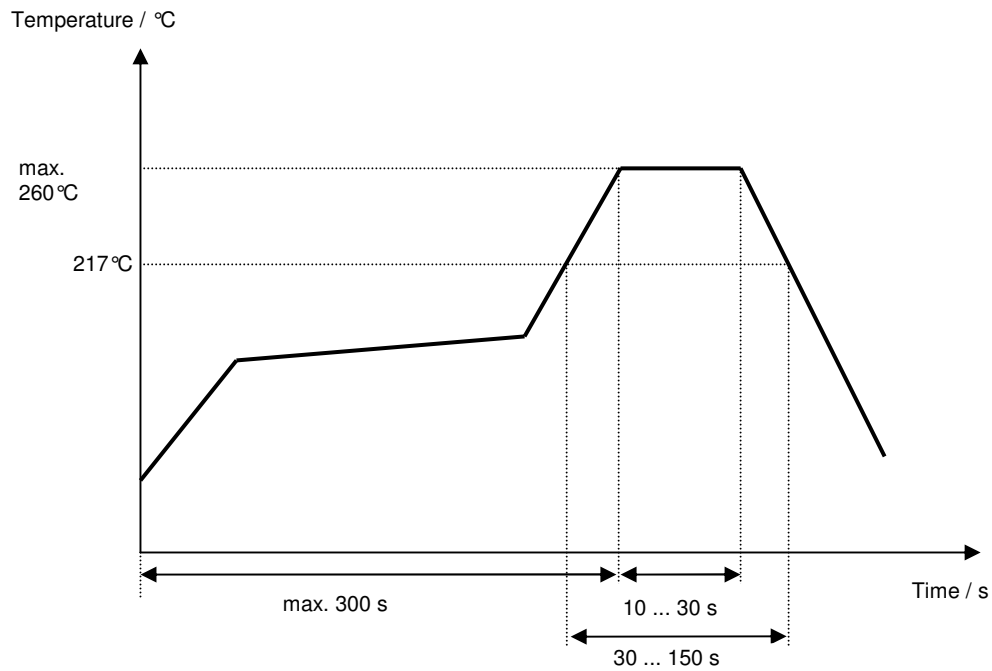
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VI TELEFILTER**Filter specification****TFS 190C****4/5****Air reflow temperature conditions**

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 190C****5/5****History**

Version	Reason of Changes	Name	Date
1.0	Generation of specification according to customer requirements	Herrler	25.07.2001
1.1	change of pinning according to customer proposal	Steiner	20.09.2001
1.2	new Development specification Change of relative rejection and phase variation in pass band	Dr. Sabah	08.03.2002
1.3	Add of rejection typical values	Dr. Sabah	15.03.2002
1.4	Add of typical values and change to filter specification	Dr. Sabah	26.04.2002
1.5	correct relative attenuation	Dr. Sabah	29.05.2002
1.6	changing typical values of insertion loss, relative attenuation and temperature coefficient of frequency	Pfeiffer	07.08.2002
1.7	- operating temperature range changed according customer requirements - add of filter characteristics - air reflow temperature conditions modified	Pfeiffer	23.10.2007