Measurement condition

Ambient temperature: 25 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 70 Ω || -95,6 pF
Output: 60 Ω || -106,9 pF

Characteristics

Remark:
The reference level for the relative attenuation a_{rel} of the TFS 77C 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 77,8 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	6,6	dB	max.	11,0	dB
Nominal frequency	f_N	77,8	MHz		77,8	MHz
Passband	PB	10,4	MHz	f_N	± 4,62	MHz
Amplitude ripple in PB	p-p	0,6	dB	max.	1	dB
Relative attenuation	a_{rel}					
f_N - 4,62 MHz … f_N + 4,62 MHz		0,6	dB	max.	1	dB
f_N ± 6,3 MHz		7	dB	min.	3	dB
f_N ± 7,1 MHz		24	dB	min.	16	dB
f_N - 77,5 MHz ... f_N - 22,8 MHz		65	dB	min.	45	dB
f_N - 22,8 MHz ... f_N - 9,8 MHz		43	dB	min.	30	dB
f_N + 10,2 MHz ... f_N + 22,2 MHz		41	dB	min.	30	dB
f_N + 22,2 MHz ... f_N + 50 MHz		50	dB	min.	40	dB
Absolute group delay in PB		1,04	µs		-	
Group delay ripple in PB	p-p	92	ns	max.	130	ns
Phase linearity in PB	p-p	13	deg	max.	15	deg
Triple transit response suppression		40	dB	min.	35	dB
Input / Output return loss		20	dB	min.	10	dB
Input power level		-		max.	23	dBm
Operating temperature range	OTR	-		-10 °C ... + 75 °C		
Storage temperature range		-		-35 °C ... + 85 °C		
Temperature coefficient of frequency	TC_f ***	-90	ppm/K		-	

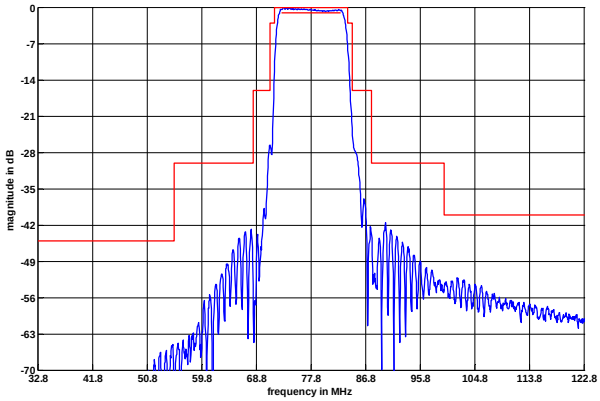
*) The terminating impedances depend on parasitics and q-values of matching elements and the board used, and are to be understood as reference values only. Should there be additional questions do not hesitate to ask for an application note or contact our design team.
**) Target is 10 dB min. using resistive matching.
***) $\Delta f_C(Hz) = TC_f(ppm/K) \times (T - T_o) \times f_{To}$ (MHz).

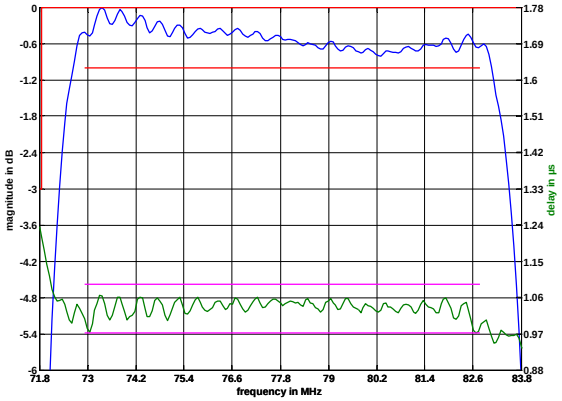
Generated:

Checked / Approved:

Tele Filter GmbH
Potsdamer Straße 18
D 14 513 TELTOW / Germany
Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30
E-Mail: tft@telefilter.com

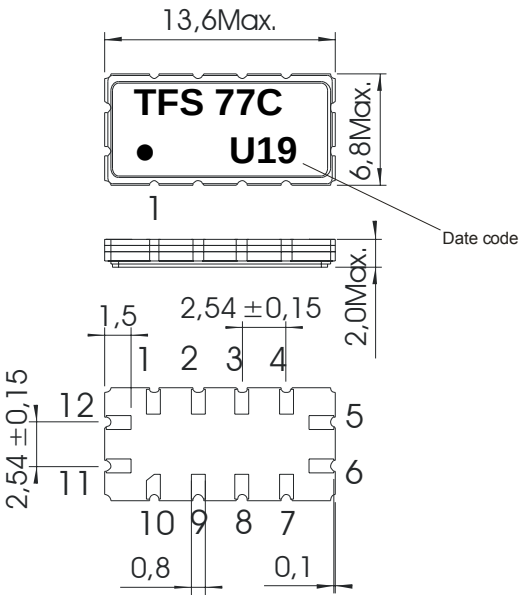
Filter characteristic





Construction and pin connection

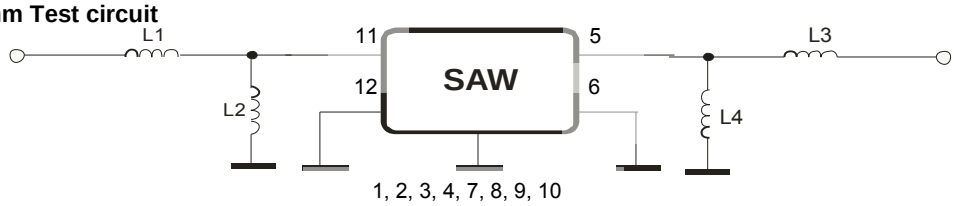
(All dimensions in mm)



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

Date code:	Year + week
U	2006
V	2007
W	2008
...	

50 Ohm Test circuit



Tele Filter GmbH
Potsdamer Straße 18
D 14 513 TELTOW / Germany
Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30
E-Mail: tft@telefilter.com

Stability characteristics

After the following tests the filter shall meet the whole specification:

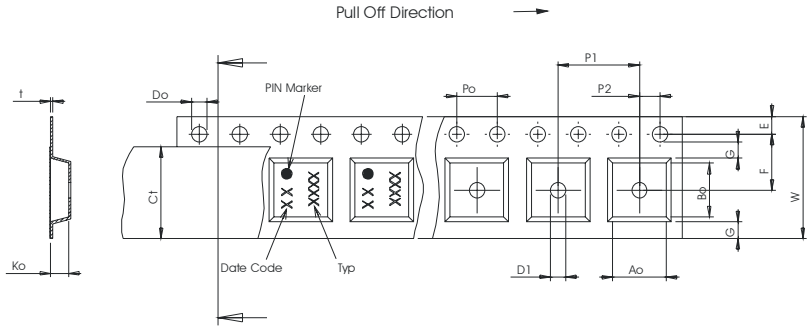
1. Shock:	500g, 1 ms, half sine wave, 3 shocks each plane; DIN IEC 68 T2 - 27
2. Vibration:	10 Hz to 500 Hz, 0,35 mm or 5 g respectively, 1 octave per min, 10 cycles per plan, 3 plans; DIN IEC 68 T2 - 6
3. Change of temperature:	-55 °C to 125°C / 30 min. each / 10 cycles DIN IEC 68 part 2 – 14 Test N
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

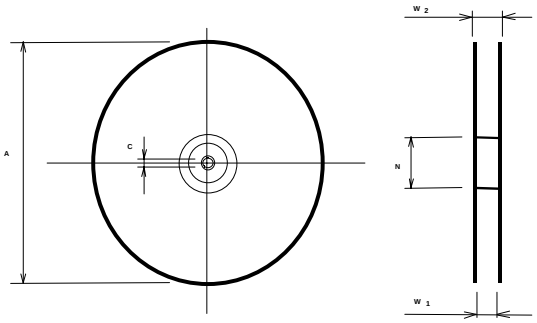
Tape & Reel: IEC 286 – 3, with exception of value for N and minimum bending radius;
tape type II, embossed carrier tape with top cover tape on the upper side;

max. pieces of filters per reel:	1700
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	: 24,00	+0,30/-0,10
Po	: 4,00	± 0,1
Do	: 1,50	+0,1/-0
E	: 1,75	± 0,10
F	: 11,50	± 0,10
G(min)	: 0,60	
P2	: 2,00	± 0,1
P1	: 12,00	± 0,1
D1(min)	: 1,50	
Ao	: 7,10	± 0,10
Bo	: 13,90	± 0,10
Ct	: 21,5	± 0,1



Reel (all dimensions in mm)

A	:330	
W1	: 24,4	+2/-0
W2(max)	: 30,4	
N(min)	: 60	
C	: 13,0	+0,5/-0,2

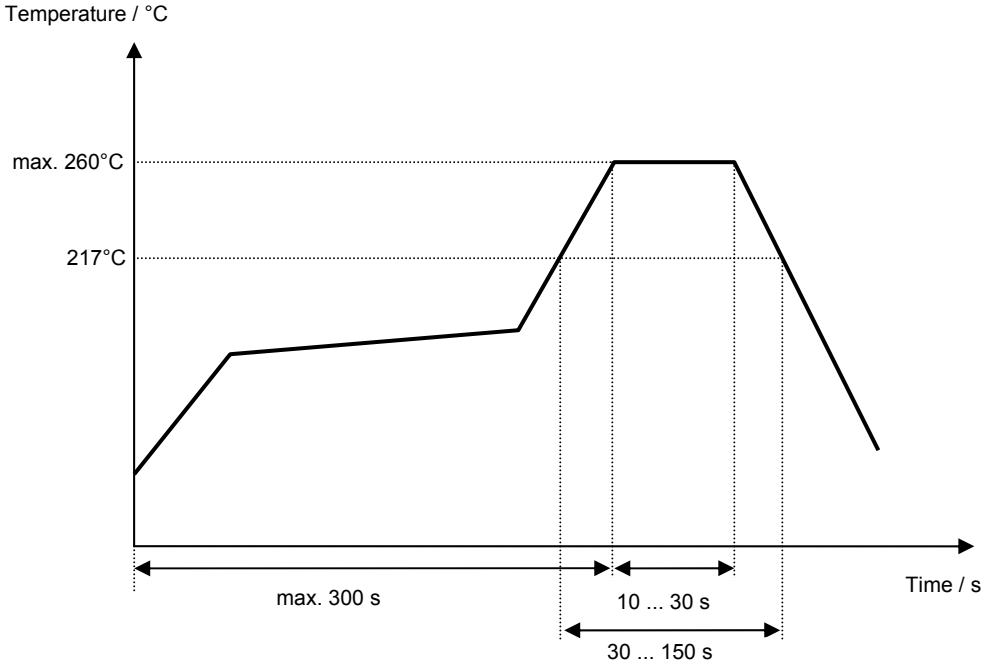
The minimum bending radius is 45 mm.

Tele Filter GmbH
Potsdamer Straße 18
D 14 513 TELTOW / Germany
Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30
E-Mail: tft@telefilter.com

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



Tele Filter GmbH
Potsdamer Straße 18
D 14 513 TELTOW / Germany
Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30
E-Mail: tft@telefilter.com

History

Version	Reason of Changes	Name	Date
1.0	- Generation of development specification	Strehl	23.08.2005
1.1	- changed insertion loss - changed relative attenuation - changed return loss - changed operating temperature range	Chilla	08.11.2005
1.2	- created filter specification - changed relative attenuation - added termination impedances - added typical values - added filter characteristics - added test circuit	Chilla	12.05.2006

Tele Filter GmbH
Potsdamer Straße 18
D 14 513 TELTOW / Germany
Tel: (+49) 3328 4784-0 / Fax: (+49) 3328 4784-30
E-Mail: tft@telefilter.com