

VI TELEFILTER

Filter specification

TFS 87

1/5

Measurement condition

Ambient temperature: 23 °C
 Input power level: 0 dBm
 Terminating impedance: *
 Input: 606 Ω || -15,7 pF
 Output: 430 Ω || -18,9 pF

Characteristics

Remark:

The reference level for the relative attenuation a_{rel} of TFS 87 is the minimum of the pass band attenuation a_{min} . This value is defined as the insertion loss a_e . The centre frequency f_c is the arithmetic mean value of the upper and lower frequencies at the 20 dB filter attenuation level relative to the insertion loss a_e . The given values for the relative attenuation a_{rel} and the group delay ripple have to be reached at the frequencies given below, even if the centre frequency f_c is shifted due to the temperature coefficient of frequency TC_f in the operating temperature range and due to a production tolerance for the centre frequency f_c .

D a t a		typ. value		tolerance / limit		
Insertion loss (reference level)	a_e	20,5	dB	max.	25,0	dB
Centre frequency	f_c	87,1	MHz	87,1	± 0,10	MHz
Passband	PB	-		$f_c \dots f_c + 1,1$		MHz
Pass band ripple (p-p)		0,5	dB	max.	1	dB
Bandwidth						
1	dB	2,35	MHz	min.	2,2	MHz
3	dB	2,46	MHz	min.	2,4	MHz
40	dB	2,90	MHz	max.	3,0	MHz
Relative attenuation						
		a_{rel}				
f_c		$f_c \pm 1,1$	MHz	0,5	dB	max. 1 dB
$f_c \pm 1,1$	MHz	$f_c \pm 1,2$	MHz	1,5	dB	max. 3 dB
$f_c \pm 1,5$	MHz			47	dB	min. 40 dB
in the frequency range $f_c \pm 1,5$ MHz ... $f_c \pm 25$ MHz the limit line is of type SLOPING LINE						
$f_c \pm 25$	MHz			60	dB	min. 50 dB
$f_c \pm 25$	MHz	$f_c \pm 50$	MHz	65	dB	min. 50 dB
Group delay	mean value in PB	4,8	µs	max.	5	µs
Group delay ripple (p-p) in $f_c \dots f_c + 1,2$ MHz		120	ns	max.	300	ns
Operating temperature range	OTR	-		- 25 °C	... + 80	°C
Storage temperature range		-		- 40 °C	... + 85	°C
Frequency inversion temperature		39	°C			-
Temperature coefficient of frequency	TC_f **)	-0,04	ppm/K ²			-

*) 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.

**) $\Delta f(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T - T_0)^2 \times f_{T_0}(\text{MHz})$

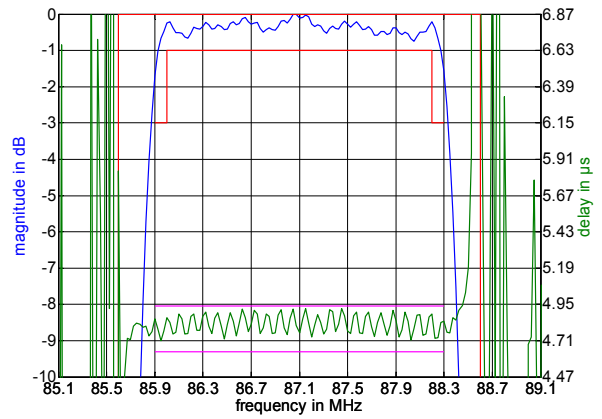
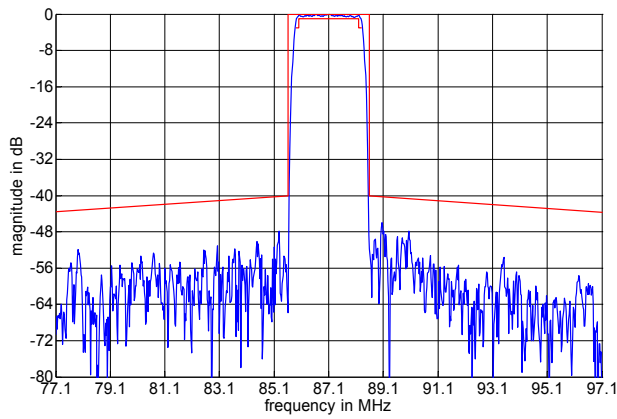
Generated:

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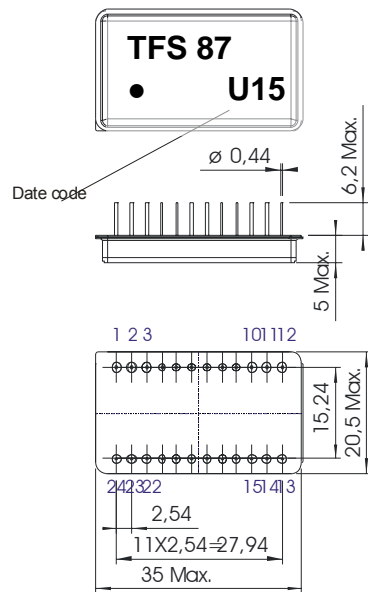
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Filter characteristic



Construction and pin connection

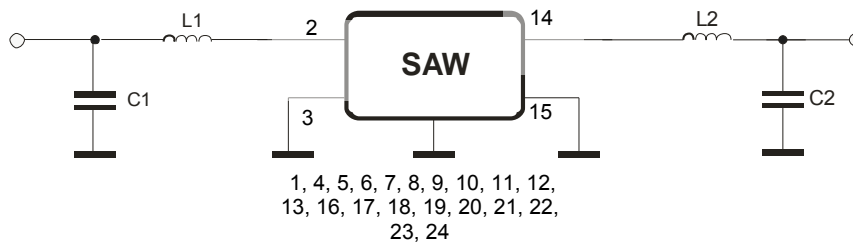
(All dimensions in mm)



- 1 Ground
- 2 Input
- 3 Input RF Return
- 4,5,6,7 Ground
- 8,9,10,11 Ground
- 12,13 Ground
- 14 Output
- 15 Output RF Return
- 16,17,18,19 Ground
- 20,21,22,23 Ground
- 24 Ground

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

50 Ohm Test circuit



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Stability characteristics

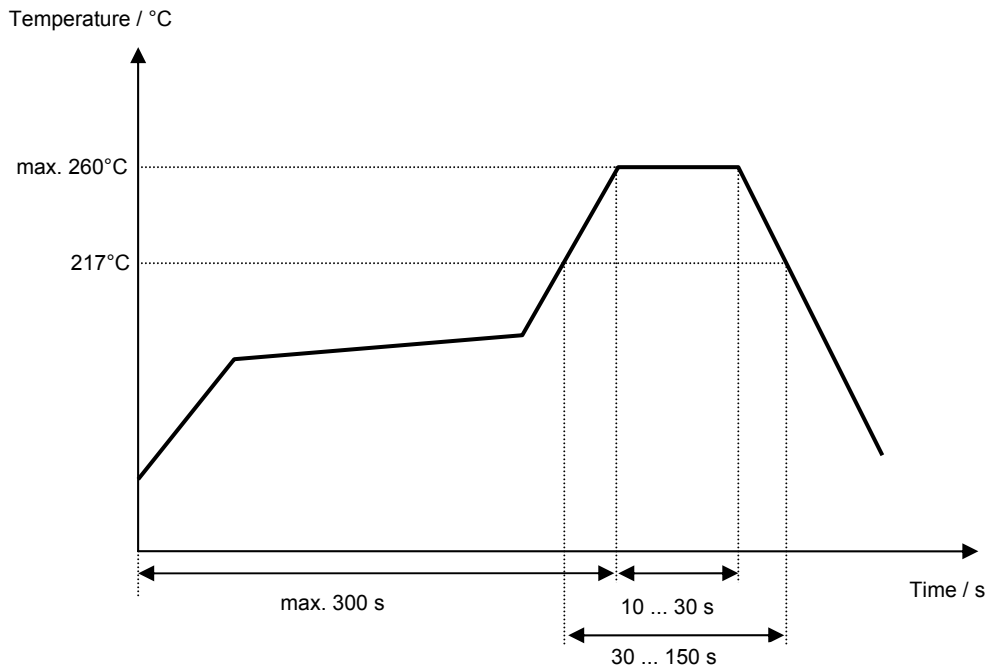
After the following tests the filter shall meet the whole specification:

1. Shock: 500g, 18 ms, half sine wave, 3 shocks each plane;
DIN IEC 68 T2 - 27
2. Vibration: 10 Hz to 500 Hz, 0,35 mm or 5g 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;

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 87****5/5****History**

Version	Reason of changes	Name	Date
1.0...1.2	- generate filter specification for 1 st iteration.	Dunzow W.	1999...2000
1.3	- generate filter specification for new revision. - change termination impedance. - add matching scheme 1.	Dunzow W.	15.10.2002
1.4	- add of filter characteristics - air reflow temperature conditions modified - terminating impedances and typical values corrected	Pfeiffer	15.12.2006

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