Measurement condition

Ambient temperature: 23 °C
Input power level: 0. dBm
Terminating impedance: *
Input: 100 Ω || -9.9 pF
Output: 100 Ω || -11.9 pF

Characteristics

Remark:
Reference level for the relative attenuation a_{rel} of the TFS 159A 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 reference frequency f_C is the arithmetic mean value of the upper and lower frequencies at the 1 dB filter attenuation level relative to the insertion loss a_e. The temperature coefficient of frequency Tc_f is valid both for the reference frequency f_C and the frequency response of the filter in the operating temperature range. The frequency shift of the filter in the operating temperature range is not included in the production tolerance scheme.

D a t a		**typ. value**		**tolerance / limit**	
Insertion loss	$a_e = a_{min}$	21.3	dB	max. 23	dB
Insertion loss variation (25° to 70° C)		0.6	dB	1	dB
Nominal frequency	f_N	-		159.8	MHz
Pass band	PB	-		f_N ± 13	MHz
Pass band ripple	(p - p)	0.5	dB	max. 1	dB
Relative attenuation	a_{rel}				
f_N ... f_N ± 13.0	MHz	0.5	dB	max. 1	dB
f_N -158.4 MHz ... f_N - 151.8	MHz	47	dB	min. 25	dB
f_N -151.8 MHz ... f_N - 18.1	MHz	55	dB	min. 40	dB
f_N + 18.2 MHz ... f_N + 90.2	MHz	55	dB	min. 40	dB
Phase linearity					
low freq. ripple	< 3 cycles	4	deg	max. 5	deg p-p
high freq.ripple	> 3 cycles	2	deg	max. 3	deg p-p
VSWR		12	dB	max. 2:1	
Triple transit response suppression		43	dB	min. 38	dB
Temperature coefficient of frequency	Tc_f **	-87	ppm/K	-	
Operable temperature range		-		0 °C ... + 70 °C	
Operating temperature range	OTR	-		+ 50 °C ... + 60 °C	
Storage temperature range		-		- 55 °C ... + 105 °C	

*)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.

**) $\Delta f_C(Hz) = Tc_f(ppm/K) \times (T - T_A) \times f_C\ (MHz)$

generated:

checked / approved:

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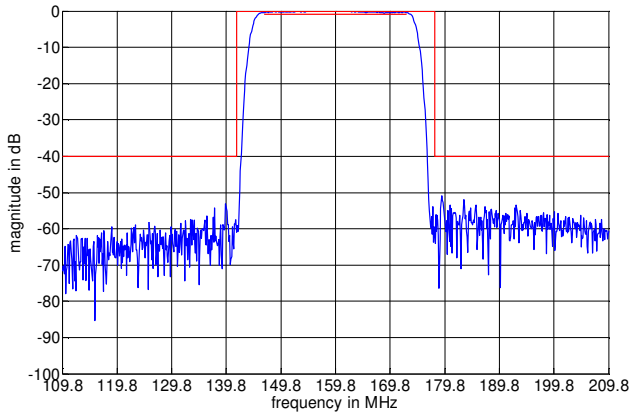
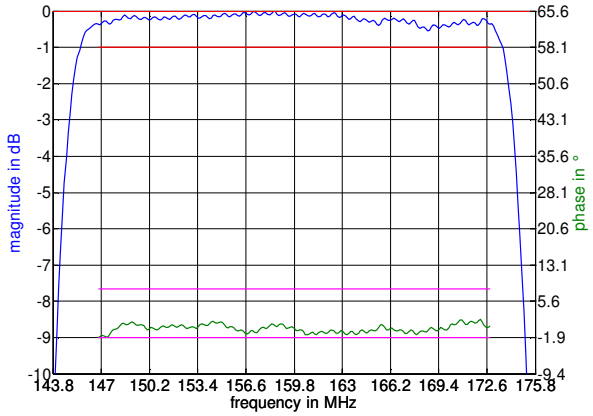
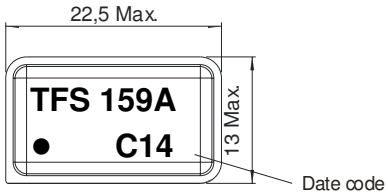
Filter characteristic

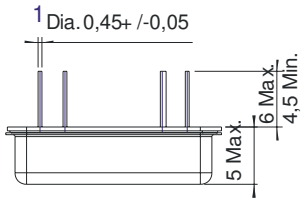


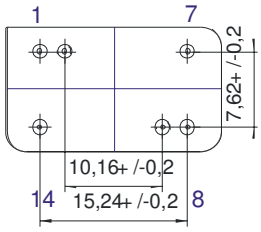


(All dimensions in mm)



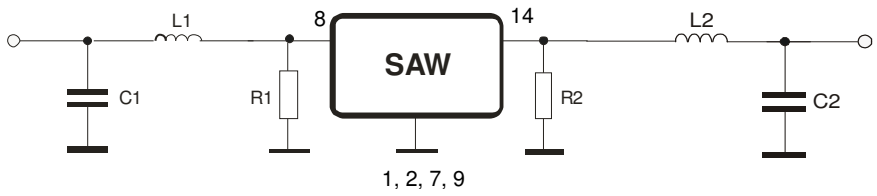
1	Output RF Return
2	Ground
7	Intput RF Return
8	Input
9	Ground
14	Output





Date code:	Year + week
C	2012
D	2013
E	2014
.....	

50 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 plane, 3 planes; 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)

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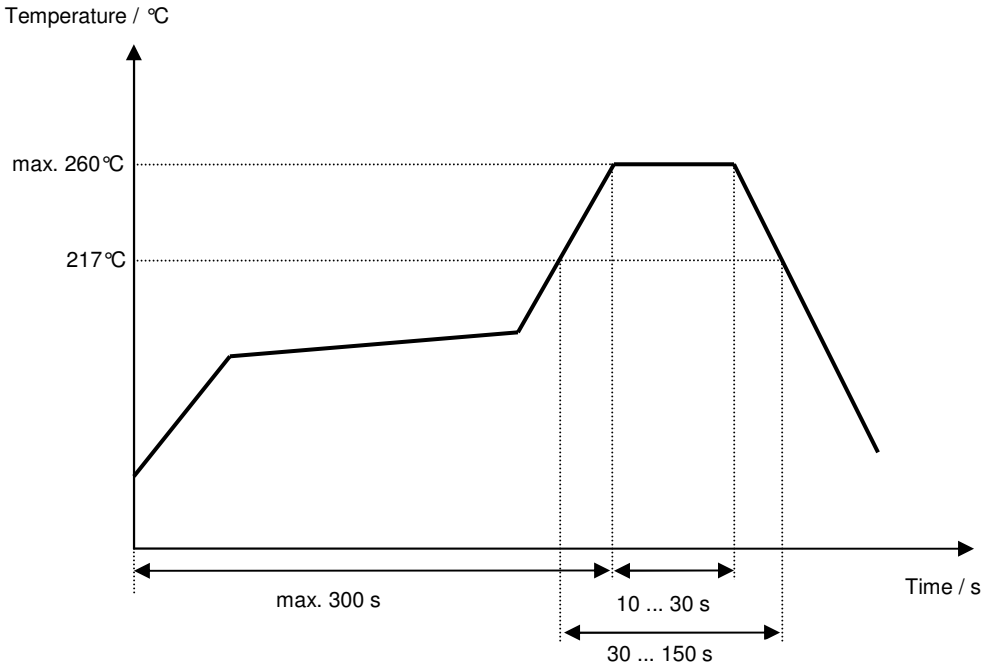
Air reflow temperature conditions

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



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History

Version	Reason of changes	Name	Date
1.0	- generate of development specification	Roizengaft	22.01.2004
1.1	- pinning corrected	Pfeiffer	25.05.2004
1.2	- typical values, matching configuration, terminating impedance (preliminary values) added	Pfeiffer	05.07.2004
1.3	- typical value of phase linearity (high frequency ripple) corrected	Pfeiffer	19.08.2004
1.4	- change of labelling - air reflow temperature conditions and stability characteristics modified	Pfeiffer	14.12.2007
1.5	- update spec to new format; change of labelling	TCUK	12.10.2012

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