Measurement condition

Ambient temperature: 23 °C
Input power level: 0 dBm
Terminating impedance: *
Input: 950 Ω || -2,3 pF
Output: 950 Ω || -2,3 pF
External Coil: 330 nH

Characteristics

Remark:
Reference level for the relative attenuation a_{rel} of the TFS 240M 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 centre frequency f_C is the arithmetic mean value of the upper and lower frequencies at the 3 dB filter attenuation level relative to the insertion loss a_e. The nominal frequency f_N is fixed at 240 MHz without tolerance. The given values for the relative attenuation a_{rel} and for 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 in OTR	a_e	3,9	dB	max.	5,5	dB
Insertion loss in ROTR		3,9	dB	max.	5,0	dB
Nominal frequency	f_N	-			240,0	MHz
Centre frequency	f_C	240,02	MHz		-	
Relative attenuation	a_{rel}					
f_N ... f_N ± 100 kHz		0,8	dB	max.	1,5	dB **
f_N ± 100 kHz ... f_N ± 120 kHz		1,5	dB	max.	3	dB
0,3 MHz ... f_N - 4,8 MHz		50	dB	min.	45	dB
f_N - 4,8 MHz ... f_N - 700 kHz		42	dB	min.	40	dB
f_N - 700 kHz ... f_N - 500 kHz		29	dB	min.	25	dB
f_N + 500 kHz ... f_N + 800 kHz		33	dB	min.	25	dB
f_N + 800 kHz ... f_N + 4,8 MHz		46	dB	min.	40	dB
f_N + 4,8 MHz ... 450 MHz		51	dB	min.	45	dB
Group delay ripple						
f_N ± 120 kHz		800	ns	max.	2	µs
Input power level	****	-		max.	10	dBm
Operating temperature range	OTR	-		- 40°C ... + 85 °C		
Reduced operating temperature range	ROTR	-		0°C ... + 50 °C		
Storage temperature range		-		- 55°C ... + 125 °C		
Frequency inversion temperature	T_0 ***	0	°C		-	
Temperature coefficient of frequency	TC_f ***	-0,036	ppm/K²		-	

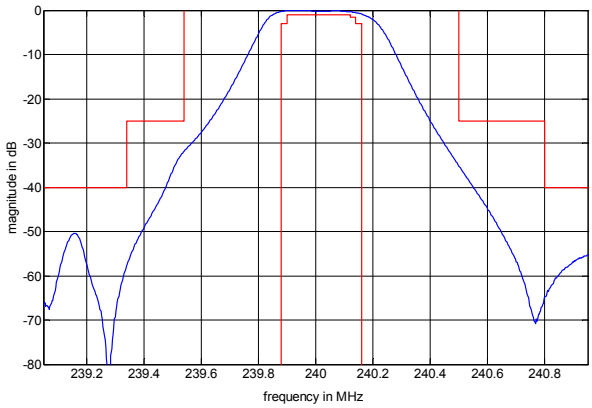
*) The terminating impedances depend on parasitics and q-values of matching elements and the board used, and are to be understood as reference values only. Should there be additional questions do not hesitate to ask for an application note or contact our design team.
**) 1 dB in reduced operating temperature range
***) $\Delta f(Hz) = TC_f(ppm/K) \times (T-T_0)^2 \times f_{To}(MHz)$.
****) also guaranteed 15 dBm for 1 minute over lifetime of filter

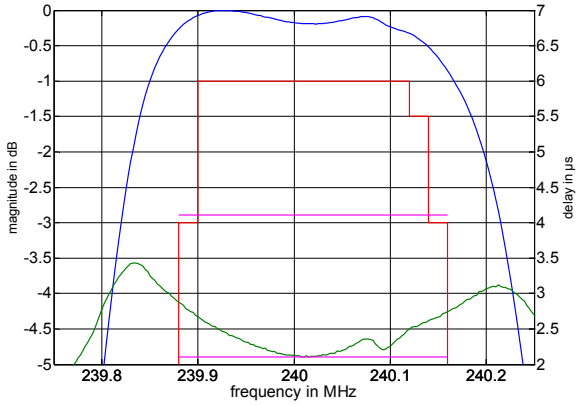
Generated:

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

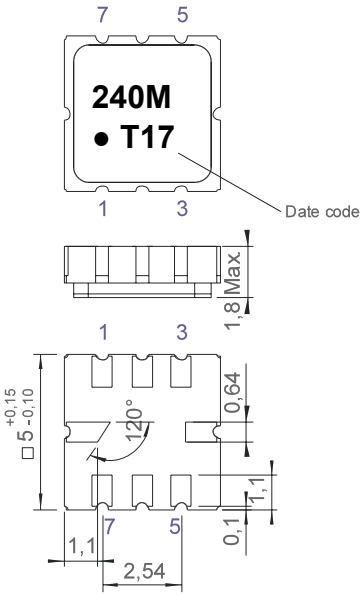
Filter characteristic





Construction and pin connection

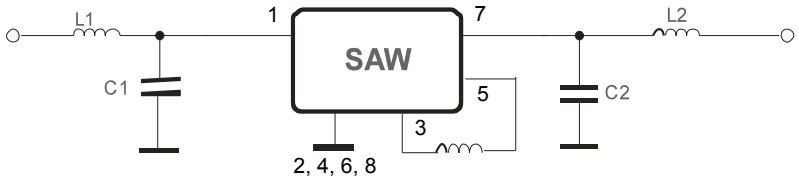
(All dimensions in mm)



1	Input
2	Ground
3	External Coil
4	Ground
5	External Coil
6	Ground
7	Output
8	Ground

Date code:	Year + week
T	2005
U	2006
V	2007
...	

50 Ω Test circuit



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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;

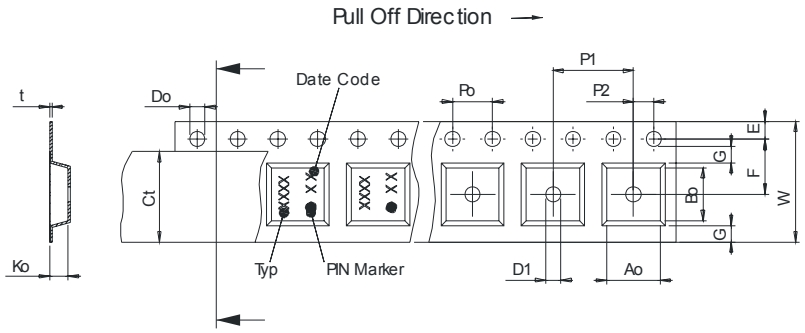
Packing

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:	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

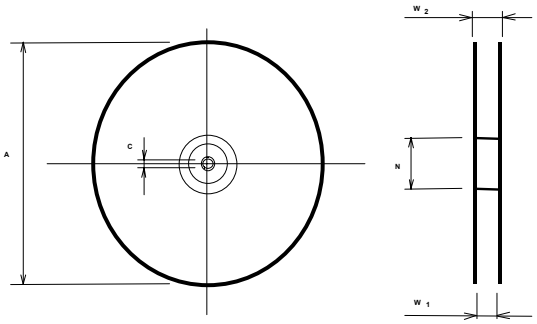
Tape (all dimensions in mm)

W	:	12,00 ± 0,3
Po	:	4,00 ± 0,1
Do	:	1,50 +0,1/-0
E	:	1,75 ± 0,1
F	:	5,50 ± 0,05
G(min)	:	0,75
P2	:	2,00 ± 0,05
P1	:	8,00 ± 0,1
D1(min)	:	1,50
Ao	:	5,30 ± 0,1
Bo	:	5,30 ± 0,1
Ct	:	9,5 ± 0,1



Reel (all dimensions in mm)

A	:	330
W1	:	12,4 +2/-0
W2(max)	:	18,4
N(min)	:	50
C	:	13,0 +0,5/-0,2



The minimum bending radius is 45 mm.

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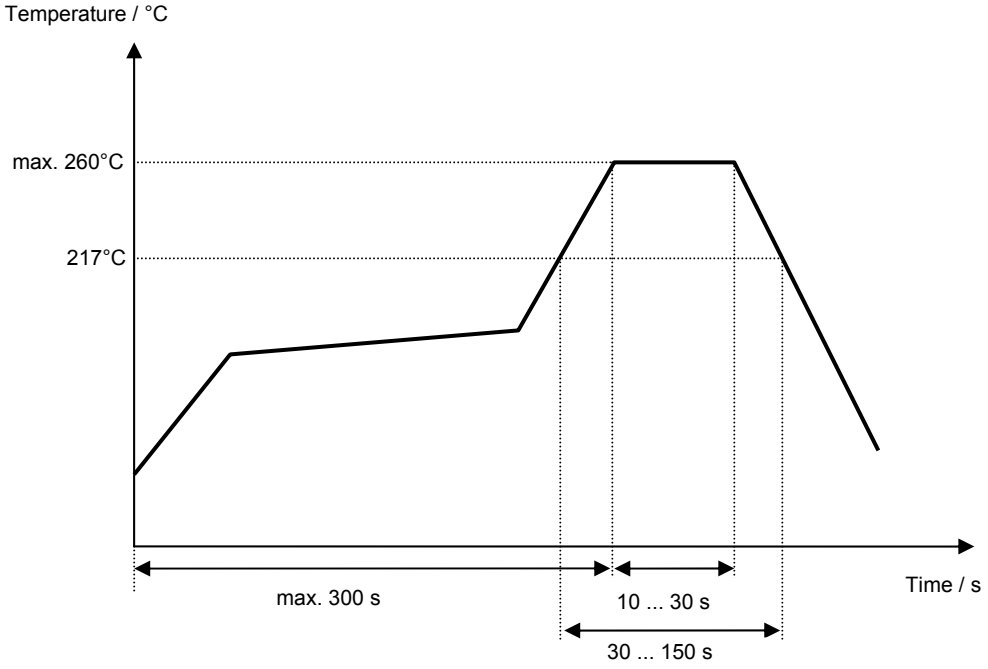
Air reflow temperature conditions

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	- Generation of development specification	Strehl	27.09.2004
1.1	- Increase of operating temperature range	Braun	12.10.2004
1.2	- Changed specification according to new design principle	Martens	16.11.2004
1.3	- Changed specification according to new customer requirement	Martens	02.12.2004
1.4	- Generated filter specification, added typical values	Martens	09.02.2005
1.5	- Changed filter characteristic	Martens	28.04.2005

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