

VI TELEFILTER**Filter specification****TFS 299****1/5****Measurement condition**

Ambient temperature:	23°C
Input power level:	0 ± 2 dBm
Source impedance:	50 Ω
Load impedance:	50 Ω
Terminating impedance: *	
Input:	625 Ω -5,3 pF
Output:	520 Ω -5,1 pF

Characteristics**Remark:**

The nominal frequency f_N is fixed at 299 MHz. The insertion loss a_e is defined as loss value determined at f_N . Reference level for the relative attenuation a_{rel} of the TFS299 is the insertion loss a_e . All specified data are met within the operating temperature range.

D a t a		typ. value	tolerance / limit		
Insertion loss (reference level)	a_e	-	max.	8,0	dB
Nominal frequency	f_N	-		299,0	MHz
Passband	PB	-	f_N	± 80	kHz
Pass band ripple	p-p	-	max.	±0,5	dB
Bandwidth 3 dB	BW	-	min.	400	kHz
Relative attenuation	a_{rel}				
$f_N \pm 1,8$ MHz ... $f_N \pm 6,0$ MHz		-	min.	20	dB
$f_N \pm 6,0$ MHz ... $f_N \pm 60,0$ MHz		-	min.	35	dB
$f_N - 298,0$ MHz ... $f_N - 60,0$ MHz		-	min.	20	dB
$f_N + 60,0$ MHz ... $f_N + 701,0$ MHz		-	min.	20	dB
Absolute group delay at f_N		-	max.	1	µs
Group delay ripple within PB	p-p		max.	1	µs
Input power level			max.	+10	dBm
Operating temperature range	OTR	-	-40 °C ... + 85 °C		
Storage temperature range		-	-40 °C ... + 90 °C		
Temperature coefficient of frequency	TC_f^{**}	-0,036 ppm/K ²		-	
Frequency inversion temperature		25 °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.

**) $\Delta f_c(\text{Hz}) = TC_f(\text{ppm/K}^2) \times (T - T_0)^2 \times f_{T0}(\text{MHz})$.

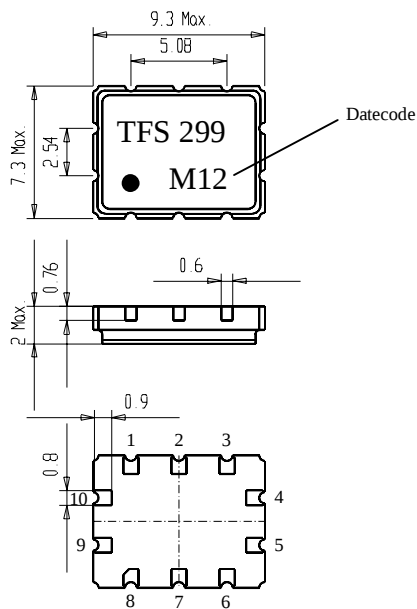
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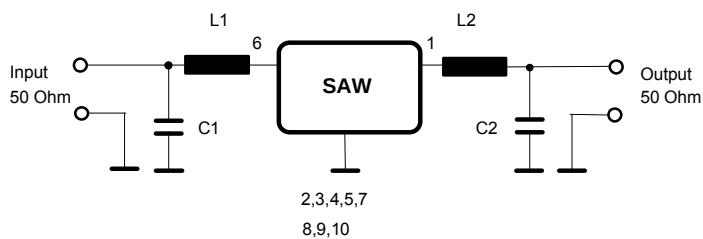
VI TELEFILTER**Filter specification****TFS 299****2/5****Filter characteristic**

t.b.d.

Construction and pin connection

1	Output
2	Ground
3	Ground
4	Ground
5	Ground
6	Input
7	Ground
8	Ground
9	Ground
10	Ground

Datecode:	Year+week
K	1998
L	1999
M	2000
...	

50 Ω single ended test circuit

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VI TELEFILTER**Filter specification****TFS 299****3/5****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. Damp heat: 25 °C to 55°C / 95% r.H. / 10 cycles
(cycle) DIN IEC 68 - 2 - 30 Db
4. Resistance to solder heat (reflow): max. 2 times reflow process;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;
5. ESD MIL-STD-883E using coupling network of ISO 10605 and EN 6100-4-2
HBM:250V;MM:200V;

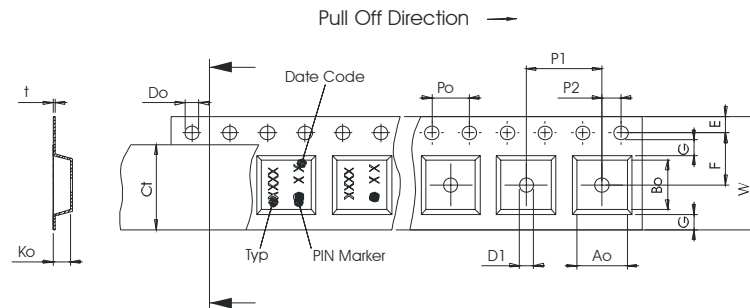
Packing

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;

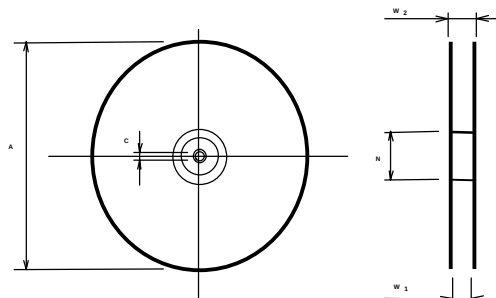
max. pieces of filters peer reel:	3000
reel of empty components at start:	min. 300 mm
reel of empty components at start including leader:	min. 500 mm
trailer:	min. 300 mm

Tape (all dimensions in mm)

W : 16,00 ± 0,3
Po : 4,00 ± 0,1
Do : 1,50 +0,1/-0
E : 1,75 ± 0,10
F : 7,50 ± 0,10
G(min) : 0,60
P2 : 2,00 ± 0,1
P1 : 12,00 ± 0,1
D1(min) : 1,50 +0,1/-0
Ao : 7,60 ± 0,10
Bo : 9,60 ± 0,10
Ct : 13,5

**Reel (all dimensions in mm)**

A : 330
W1 : 16,4
W2(max) : 22,4
N(min) : 50
C : 13,0



The minimum bending radius is 45 mm.

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VI TELEFILTER**Filter specification****TFS 299****4/5****Air reflow temperature conditions**

1st and 2nd air reflow profile

Name:	pre-heating periods	main-heating periods	peak temperature
Temperature:	150 °C - 170 °C	over 200 °C	255 °C ± 5 °C
Time:	60 sec. - 90 sec.	20 sec. - 25 sec.	

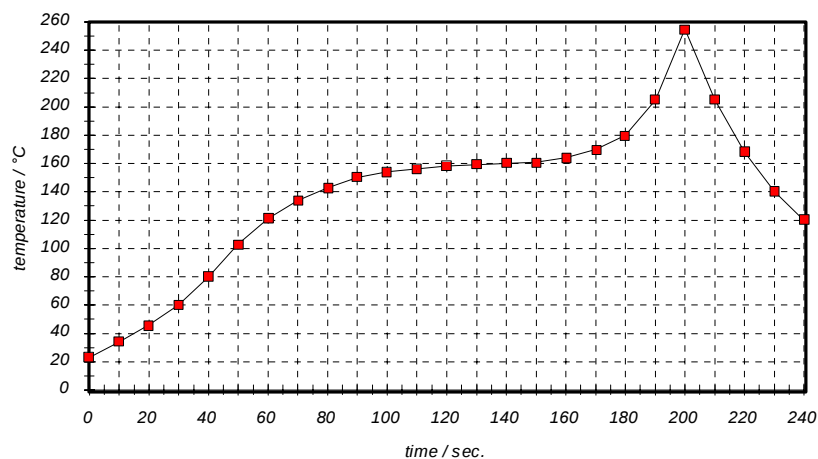
Chip-mount air reflow profile

Table for temperature vs. time during the air reflow process

Tolerance of temperatures: ± 5 °C

time / sec.	temperature / °C	time / sec.	temperature / °C
0	23	140	160
10	34	150	161
20	46	160	164
30	60	170	170
40	80	180	180
50	103	190	205
60	121	195	230
70	134	200	255
80	143	205	230
90	150	210	205
100	154	215	180
110	156	220	165
120	158	230	140
130	159	240	120

VI TELEFILTER**Filter specification****TFS 299****5/5****History**

Version	Reason of Changes	Name	Date
1.6	- impedances modified	Steiner	24.03.2000
	- date code changed and explained		
1.7	- tape and reel dimensions corrected	Steiner	12.07.2000
1.8.	- ESD limits added	Strehl	17.09.2004
	- Storage temperatur range added		
	- Change remark		

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