

1. Measurement condition :

Ambient temperature T_A :	23 °C
Input power level:	0 dBm.
Terminating impedances at f_C :	for input: 50 Ω 0 pF.
	for output: 50 Ω 0 pF.

2. Characteristics

Remark:

Reference level for the relative attenuation a_{rel} of the **TFS 36A** 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 **40 dB** filter attenuation level relative to the insertion loss a_e . The nominal frequency f_N is fixed on **36 MHz** without tolerance. The temperature coefficient of frequency T_{CF} 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 included in the production tolerance scheme.

Data	typ. value	tolerance / limit
Insertion loss (Reference level) a_e	30,8 dB	max. 36 dB
Nominal frequency : f_N at temperature $T_{OT} = 45^\circ\text{C}$		36 MHz
Centre frequency f_C at ambient temperature T_A (f_{CAT})	36,065 MHz	
Centre frequency f_C at temperature $T_{OT} = 45^\circ\text{C}$	36,00 MHz	
Pass band (PB) :	$f_N - 3,805 \text{ MHz} \dots f_N + 3,805 \text{ MHz}$	
Amplitude ripple in PB (p-p) :	0,7...0,9 dB	max. 1 dB
Bandwidth	at operating temperature:	
1 dB - band width	7,70 MHz	min. 7,61 MHz
2 dB - band width	7,81 MHz	
3 dB - band width	7,87 MHz	
4 dB - band width	7,92 MHz	
40 dB - band width	8,43 MHz	max. 8,46 MHz
45 dB - band width	8,51 MHz	
50 dB - band width	8,54 MHz	max. 8,76 MHz
Relative attenuation	a_{rel}	
$f_N \pm 4,23$ MHz ... $f_N \pm 4,38$ MHz	45...48 dB	max. 1 dB min. 40 dB
$f_N - 35$ MHz ... $f_N - 34$ MHz	33...36 dB	min. 30 dB
$f_N - 34$ MHz ... $f_N - 30$ MHz	37 dB	min. 35 dB
$f_N - 30$ MHz ... $f_N - 21$ MHz	44...46 dB	min. 40 dB
$f_N - 21$ MHz ... $f_N - 4,38$ MHz	52...55 dB	min. 50 dB
$f_N + 4,38$ MHz ... $f_N + 33$ MHz	55 dB	min. 50 dB
$f_N + 33$ MHz ... $f_N + 60$ MHz	48...55 dB	min. 45 dB
Group delay (mean value in PB) :	4,64 μs	max. 5 μs
Group delay ripple in PB (p-p):	90...130 ns	
Deviation from linear phase in PB (p-p):	4,4°..5,1° (r.m.s. 1,3...1,7°)	max. 5,5° p-p
Triple transit attenuation compared to main signal Crosstalk	70 dB	min. 55 dB
	64..67 dB	
Temperature coefficient of frequency (T_{CF})	-87 ppm/K	-94 ppm/K
Frequency deviation of f_C over temperature	$\Delta f_C(\text{Hz}) = T_{CF}(\text{ppm/K}) \times (T - T_A) \times f_{CAT}(\text{MHz})$	
Operating temperature	+ 45 °C	
Storage temperature range	- 25 °C ... + 85 °C	

Generated:

Dunzow W.P.

Checked/Approved:

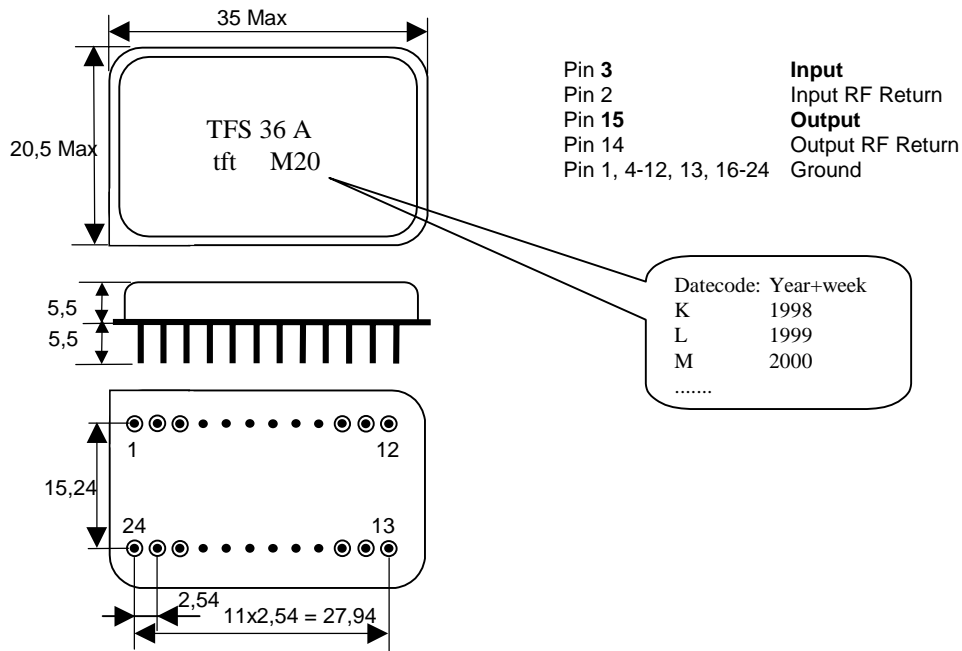
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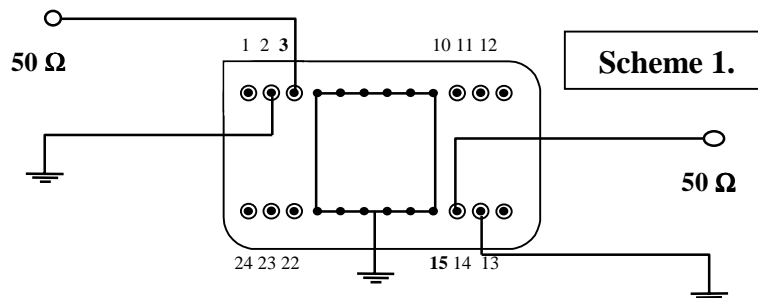
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3. Package :



4. 50 Ω matching networks (about other matching networks see Application Note):



5. Soldering temperature conditions :

Soldering temperature 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.	

Soldering temperature profile

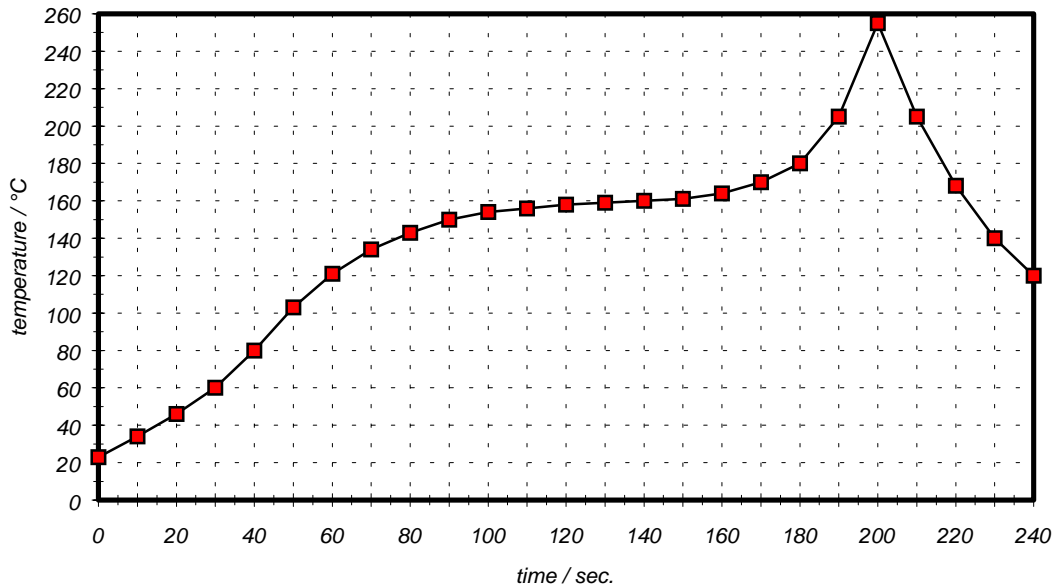


Table for temperature vs. time during the soldering process

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

History

Version	Reason of Changes	Name	Date
1.0	Generate specification according to customer requirements.	Wall B.	10.12.1999
1.1	Generate specification according to customer requirements.	Wall B.	21.12.1999
1.2	Generate specification according to customer requirements.	Wall B.	21.12.1999
1.3	Generate specification according to customer requirements.	Wall B.	10.12.1999
1.4	Edit Preliminary Specification. Edit typical values of the filter parameters after measured. Change stop band limit line in $f_N - 35 \text{ MHz} \dots f_N - 30 \text{ MHz}$ from min. 50 dB to min. 35 dB. Change stop band limit line in $f_N - 30 \text{ MHz} \dots f_N - 21 \text{ MHz}$ from min. 50 dB to min. 40 dB. Change limit of phase ripple in any 1 MHz in pass band from max. 4° to max. $5,5^\circ$ in pass band.	Dunzow W.	26.07.1999
2.0	Edit Filter Specification. Change stop band limit line in $f_N - 35 \text{ MHz} \dots f_N - 34 \text{ MHz}$ from min. 35 dB to min. 30 dB. Change stop band limit line in $f_N + 33 \text{ MHz} \dots f_N - 35 \text{ MHz}$ from min. 50 dB to min. 45 dB.	Dunzow W.	10.11.2000
2.1	Change 40 dB bandwidth from min. 8.46 dB to max. 8.46 dB Change 50 dB bandwidth from min. 8.76 dB to max. 8.76 dB	Dr. Wall	15.11.2000