

VI TELEFILTER**Filter specification****TFS 38C****1/5****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 38C** 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 **20 dB** filter attenuation level relative to the insertion loss a_e . The nominal frequency f_N is fixed on **38 MHz** without tolerance. The temperature coefficient of frequency T_{c_f} is valid both for the reference frequency f_C and the frequency response of the filter. All specified parameters have to be reached in the operating temperature range (**OTR**).

| Data | typ. value | tolerance / limit |
|---|--|---|
| Insertion loss (Reference level) a_e | 22,5 dB | max. 25 dB |
| Nominal frequency : f_N at temperature $T_O = 30^\circ\text{C}$ | 38,000 MHz | 38 MHz |
| Centre frequency f_C at ambient temperature $T_A = 23^\circ\text{C}$ (f_{CAT}) | 38,019 MHz | |
| Pass band (PB) at OTR : $0^\circ\text{C} \dots 60^\circ\text{C}$: | | $f_N - 2,48 \text{ MHz} \dots f_N + 2,48 \text{ MHz}$ |
| Amplitude ripple in PB (p-p) : | 0,15 dB | max. 0,4 dB |
| Bandwidth at ambient temperature T_A (f_{CAT}) : | | |
| 0,5 dB | 5,78 MHz | min. 5,14 MHz |
| 1 dB | 6,01 MHz | |
| 3 dB | 6,47 MHz | min. 6,18 MHz |
| 10 dB | 7,21 MHz | |
| 20 dB | 7,74 MHz | |
| 30 dB | 8,10 MHz | max. 8,32 MHz |
| 40 dB | 8,30 MHz | |
| Bandwidth at OTR : $0^\circ\text{C} \dots 60^\circ\text{C}$: | | |
| 0,5 dB - band width | 5,60 MHz | min. 4,96 MHz |
| 3 dB - band width | 6,29 MHz | min. 6,00 MHz |
| 30 dB - band width | 8,28 MHz | max. 8,50 MHz |
| Relative attenuation a_{rel} | | |
| $f_N \dots f_N \pm 2,48 \text{ MHz}$ | 0,15 dB | max. 0,4 dB |
| $f_N \pm 2,48 \text{ MHz} \dots f_N \pm 3,0 \text{ MHz}$ | 2 dB | max. 3 dB |
| $f_N \pm 4,25 \text{ MHz} \dots f_N \pm 6 \text{ MHz}$ | 40 dB | min. 30 dB |
| $f_N - 26 \text{ MHz} \dots f_N - 6 \text{ MHz}$ | 45...50 dB | min. 40 dB |
| $f_N + 6 \text{ MHz} \dots f_N + 20 \text{ MHz}$ | 45...50 dB | min. 40 dB |
| $f_N + 20 \text{ MHz} \dots f_N + 26 \text{ MHz}$ | 42...38 dB | min. 35 dB |
| Group delay (mean value in PB): | 1,46 μs | |
| Group delay ripple in PB (p-p): | 25 ns | max. 60 ns |
| Deviation from linear phase in PB (p-p): | 1,5 deg | |
| Triple transit attenuation compared to main signal Crosstalk | 55 dB | |
| | 60...70 dB | |
| Temperature coefficient of frequency (T_{c_f}) | -75 ppm/K | |
| Frequency deviation of f_C over temperature | $\Delta f_C(\text{Hz}) = T_{c_f}(\text{ppm/K}) \times (T - T_A) \times f_{CAT} (\text{MHz})$ | |
| Operating temperature (OTR) : | | $0^\circ\text{C} \dots + 60^\circ\text{C}$ |
| Storage temperature range | | $- 25^\circ\text{C} \dots + 85^\circ\text{C}$ |

Generated: Dunzow W.

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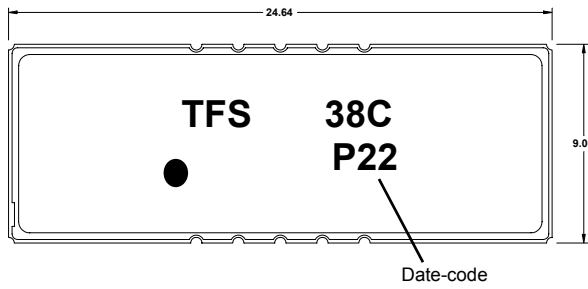
E-Mail: ftf@telefilter.com

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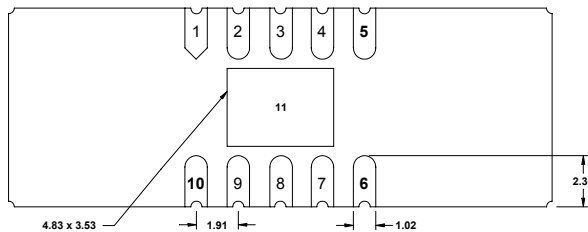
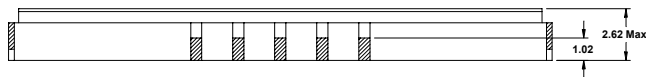
3. Construction and pin connection

(all dimensions in mm)

pin grid 1,91 mm

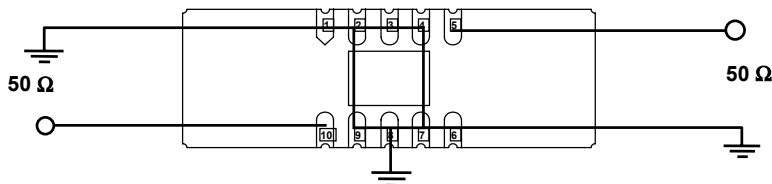


| | |
|------------|-----------|
| Date-code: | Year+week |
| M | 2000 |
| N | 2001 |
| P | 2002 |
| ... | ... |



| | |
|---------------|------------------|
| Pin 10 | Input |
| Pin 1 | Input RF Return |
| Pin 5 | Output |
| Pin 6 | Output RF Return |
| Pin 2-4, 7-9 | Package Ground |

4. 50 Ω matching networks :



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. 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): max. 2 times reflow process;
for temperature conditions refer to the attached "Air reflow temperature conditions" on page 4;

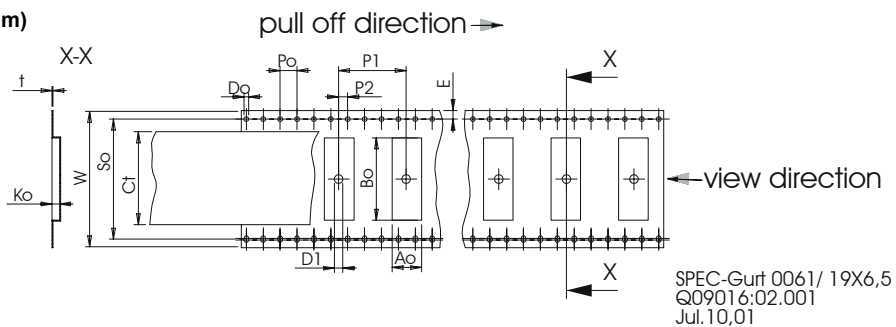
6. Packing :

Tape & Reel: DIN 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 per reel: | 1000 |
| reel of empty components at start: | min 300 mm |
| reel of empty components at start including leader: | min 500 mm |
| Trailer | min 300 mm |

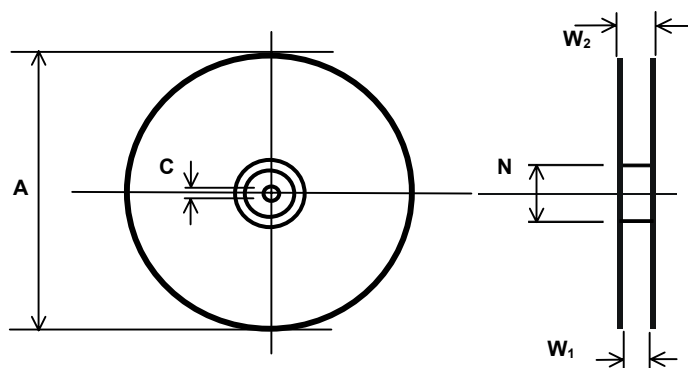
Tape (all dimensions in mm)

| | | |
|---------|--------|--------|
| W | : 44 | ± 0,3 |
| Po | : 4 | ± 0,1 |
| Do | : 1,5 | + 0,1 |
| E | : 1,75 | ± 0,1 |
| So | : 40,4 | ± 0,1 |
| P2 | : 2 | ± 0,15 |
| P1 | : 16 | ± 0,1 |
| D1(min) | : 2,0 | |
| Ao | : 9,3 | ± 0,1 |
| Bo | : 24,9 | ± 0,1 |
| Ko | : 2,0 | ± 0,1 |
| t | : 0,35 | ± 0,05 |
| CT | : 38,0 | ± 0,1 |



Reel (all dimensions in mm):

| | |
|---------|--------------------|
| A | : 330 |
| W1 | : 44,4 + 2/-0 |
| W2(max) | : 50,4 |
| N(min) | : 100 |
| C | : 13,0 +0,5 / -0,2 |



The minimum bending radius is 45 mm. The mounting surface of the filters faces the bottom side of the embossed carrier tape. The marking of the filters is able to read if the view is directed on the upper side of the carrier tape in the above shown direction.

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6. 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

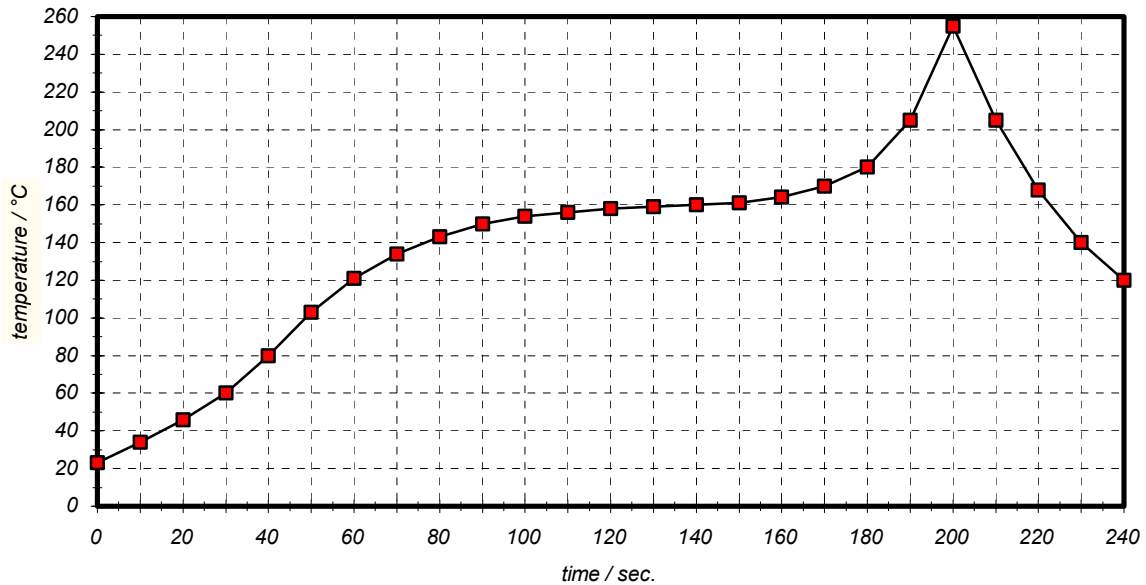


Table for temperature vs. time during the air reflow process

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 |

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7. History :

| Version | Reason of changes | Name | Date |
|----------------|---|-------------|-------------|
| 1.0 | - generate development specification according to customer requirements. | Dunzow W. | 07.11.2001 |
| 1.1 | - generate filter specification. - add typical value. - change limit line for selection from min.30 dB to min.35...40 dB - change group delay ripple from max.90ns to max.60 ns. | | |

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