

## Film Dielectric Trimmers



### FEATURES

- High temperature type
- Housing dimensions:  
11 mm x 14 mm x 9 mm
- For a basic grid of 2.54 mm
- Top adjustment
- Mounting: radial
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

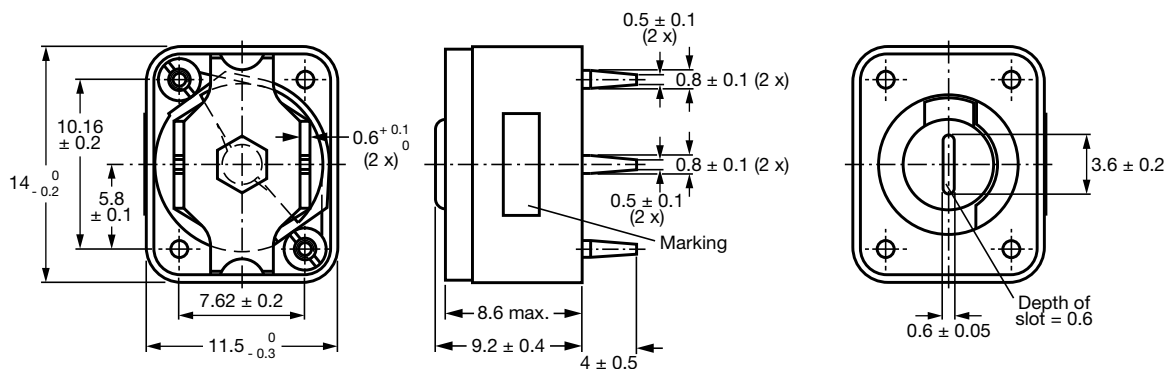


### APPLICATIONS

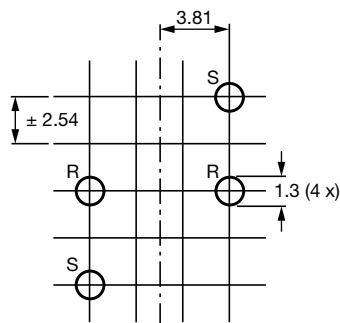
- Antennas
- Impedance matching circuits
- Medical
- RF
- For fine adjustment in professional applications

### QUICK REFERENCE DATA

|                                                           |                                                                                                                                                                                                                                                                                      |                             |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Rated DC voltage                                          | 200 V <sub>DC</sub>                                                                                                                                                                                                                                                                  |                             |
| Test DC voltage for 1 min                                 | 400 V <sub>DC</sub>                                                                                                                                                                                                                                                                  |                             |
| Maximum contact resistance                                | 5 mΩ                                                                                                                                                                                                                                                                                 |                             |
| Minimum insulation resistance between stator and rotor    | 10 000 MΩ                                                                                                                                                                                                                                                                            |                             |
| Category temperature range                                | -40 °C to +125 °C                                                                                                                                                                                                                                                                    |                             |
| Climatic category (IEC 60068)                             | 40/125/21                                                                                                                                                                                                                                                                            |                             |
| Minimum storage temperature                               | -55 °C                                                                                                                                                                                                                                                                               |                             |
| Related specification                                     | IEC 60418-1 and 4                                                                                                                                                                                                                                                                    |                             |
| Effective angle of rotation                               | 180° (rotation in 180° only, see "Life of trimmer")                                                                                                                                                                                                                                  |                             |
| Operating torque                                          | 1.5 mNm to 25 mNm                                                                                                                                                                                                                                                                    |                             |
| Maximum axial thrust                                      | 2 N                                                                                                                                                                                                                                                                                  |                             |
| Capacitance range (C <sub>min.</sub> /C <sub>max.</sub> ) | Single stator type                                                                                                                                                                                                                                                                   | 2.5 pF/20 pF to 7 pF/100 pF |
|                                                           | Differential type                                                                                                                                                                                                                                                                    | 2 pF/12 pF to 7 pF/100 pF   |
| Life of trimmer                                           | Maximum 10 cycles: rotation in 180° only (the electrical and mechanical performance is not guaranteed if rotated beyond 10 cycles)                                                                                                                                                   |                             |
| Quality level                                             | <p>Sampling and data evaluation for quality level in accordance with "MIL-STD-105D" and "IEC 60410":</p> <p>&lt; 0.15 % major defects<br/>&lt; 0.65 % minor defects</p> <p>Each capacitor is tested for minimum C<sub>max.</sub> and is also subjected to the full test voltage.</p> |                             |

**DIMENSIONS** in millimeters


Trimmers BFC2 809 070.. series



R = Rotor, S = Stator

Hole pattern

**ADJUSTMENT**

The trimmers can be adjusted with a screwdriver or trimming key. Capacitance increase is obtained with clockwise rotation.

**MOUNTING**

The trimmer can be mounted on printed-circuit boards with a grid of 2.54 mm and a minimum hole diameter of 1.25 mm.

**MARKING**

The trimmers are marked with the capacitance value in pF, followed by the letter "E" (single-stator type) or the letter "D" (differential type).

**PACKAGING**

Blister packs of 70 units each. For smallest packaging quantity (SPQ) see "Electrical Data" table.

| ORDERING INFORMATION                         |                               |                   |
|----------------------------------------------|-------------------------------|-------------------|
| C <sub>min.</sub> /C <sub>max.</sub><br>(pF) | CATALOG NUMBER BFC2 809 070.. |                   |
|                                              | TOP AND BOTTOM ADJUSTMENT     |                   |
|                                              | SINGLE STATOR TYPE            | DIFFERENTIAL TYPE |
| 2/12                                         | -                             | 018               |
| 2.5/20                                       | 004                           | 006               |
| 4/40                                         | 008                           | 009               |
| 5/60                                         | 011                           | 012               |
| 6/80                                         | 013                           | 014               |
| 7/100                                        | 015                           | 016               |

| ELECTRICAL DATA                                                          |               |                     |                                              |           |                                                         |     |                                  |
|--------------------------------------------------------------------------|---------------|---------------------|----------------------------------------------|-----------|---------------------------------------------------------|-----|----------------------------------|
| GUARANTEED<br>MAX. $C_{min.}$ /<br>MIN. $C_{max.}$<br>AT 200 kHz<br>(pF) | TYPE          | DIEL.               | tan $\delta$<br>AT $C_{max.} \times 10^{-4}$ |           | TEMP.<br>COEFF. <sup>(2)</sup><br>(10 <sup>-6</sup> /K) | SPQ | CATALOG<br>NUMBER<br>BFC2 ... .. |
|                                                                          |               |                     | 1 MHz                                        | 100 MHz   |                                                         |     |                                  |
| 2/12                                                                     | Differential  | PTFE <sup>(1)</sup> | $\leq 10$                                    | $\leq 17$ | $0 \pm 200$                                             | 350 | .... 809 07018                   |
| 2.5/20                                                                   | Single stator | PTFE                | $\leq 10$                                    | $\leq 17$ | $0 \pm 200$                                             | 350 | .... 809 07004                   |
|                                                                          | Differential  |                     |                                              |           |                                                         | 350 | .... 809 07006                   |
| 4/40                                                                     | Single stator | PTFE                | $\leq 10$                                    | $\leq 17$ | $0 \pm 200$                                             | 350 | .... 809 07008                   |
|                                                                          | Differential  |                     |                                              |           |                                                         | 350 | .... 809 07009                   |
| 5/60                                                                     | Single stator | PTFE                | $\leq 10$                                    | $\leq 25$ | $0 \pm 200$                                             | 350 | .... 809 07011                   |
|                                                                          | Differential  |                     |                                              |           |                                                         | 350 | .... 809 07012                   |
| 6/80                                                                     | Single stator | PTFE                | $\leq 10$                                    | $\leq 25$ | $0 \pm 200$                                             | 350 | .... 809 07013                   |
|                                                                          | Differential  |                     |                                              |           |                                                         | 350 | .... 809 07014                   |
| 7/100                                                                    | Single stator | PTFE                | $\leq 10$                                    | $\leq 25$ | $0 \pm 200$                                             | 350 | .... 809 07015                   |
|                                                                          | Differential  |                     |                                              |           |                                                         | 350 | .... 809 07016                   |

**Notes**
<sup>(1)</sup> PTFE = Polytetrafluorethylene

<sup>(2)</sup> C: 60 % to 80 % of  $C_{max.}$ ;  $T_{amb.}$ : from +20 °C to +125 °C

**SOLDERING CONDITIONS**

For general soldering conditions and wave soldering profile, we refer to the application note "Soldering Guidelines for Film Capacitors": [www.vishay.com/doc?28171](http://www.vishay.com/doc?28171)

| TEST PROCEDURES AND REQUIREMENTS |                             |                             |                                                                 |                                                      |
|----------------------------------|-----------------------------|-----------------------------|-----------------------------------------------------------------|------------------------------------------------------|
| IEC<br>60418-1<br>CLAUSE         | IEC 60068<br>TEST<br>METHOD | TEST                        | PROCEDURE                                                       | REQUIREMENTS                                         |
| 4.2                              |                             | Method of mounting          | Method A                                                        |                                                      |
| 14                               |                             | Capacitance drift           | After TC measurement                                            | $\Delta C/C: \leq 1 \%$                              |
| 19                               |                             | Thrust                      | Axial thrust of 2 N                                             | $\Delta C/C: \leq 0.3 \%$                            |
| 21                               |                             | Robustness of terminations: |                                                                 |                                                      |
| 21.1                             | Ua                          | Tensile                     | 1 N                                                             | No damage                                            |
| 21.2                             | Ub                          | Bending                     |                                                                 | Bending not allowed                                  |
| 22                               | Na                          | Rapid change of temperature | 1 cycle; 0.5 h at lower and 0.5 h at upper category temperature | $\Delta C/C: \leq 1 \%$                              |
| 23                               | T                           | Soldering:                  |                                                                 |                                                      |
|                                  | Ta                          | Solderability               | Solder bath immersion 3 mm;<br>235 °C; 2 s                      | Good wetting,<br>no mechanical damage                |
|                                  | Tb                          | Resistance to heat          | Solder bath: 260 °C; 10 s                                       | No mechanical damage                                 |
| 24                               | Eb                          | Impact bump                 | 4000 $\pm$ 10 bumps; 40 g; 6 ms                                 | $\Delta C/C: \leq 0.2 \%$ ;<br>no mechanical damage  |
| 25                               | Fc                          | Vibration                   | Frequency 10 Hz to 55 Hz;<br>amplitude 0.35 mm;<br>1.5 h        | $\Delta C/C: \leq 0.25 \%$ ;<br>no mechanical damage |

| TEST PROCEDURES AND REQUIREMENTS |                             |                                            |                                                                                                                                                             |                                                                                                                                                                                                                                                                               |
|----------------------------------|-----------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IEC 60418-1<br>CLAUSE            | IEC 60068<br>TEST<br>METHOD | TEST                                       | PROCEDURE                                                                                                                                                   | REQUIREMENTS                                                                                                                                                                                                                                                                  |
| 26                               |                             | Climatic sequence:                         |                                                                                                                                                             | $\Delta C/C: \leq 3$                                                                                                                                                                                                                                                          |
| 26.1                             | B                           | Dry heat                                   | 16 h at upper category temperature                                                                                                                          | $\tan \delta: \leq 10 \times 10^{-4}$<br>$R_{ins}: \geq 10\,000\,M\Omega$ ;<br>rotor contact R: $\leq 10\,m\Omega$                                                                                                                                                            |
| 26.2                             | D                           | Damp heat accelerated,<br>first cycle      | 1 cycle; 24 h; +40 °C;<br>95 % to 100 % RH                                                                                                                  | Voltage proof:<br>400 V for 1 min                                                                                                                                                                                                                                             |
| 26.3                             | Aa                          | Cold                                       | 16 h; -40 °C                                                                                                                                                | Visual examination:<br>no mechanical damage                                                                                                                                                                                                                                   |
| 26.5                             |                             | Damp heat accelerated,<br>remaining cycles | 1 cycle; 24 h; +40 °C;<br>95 % to 100 % RH                                                                                                                  | Operating torque:<br>1.5 mNm to 35 mNm                                                                                                                                                                                                                                        |
| 27                               | Ca                          | Damp heat steady state                     | 21 days; +40 °C;<br>90 % to 95 % RH                                                                                                                         | $\Delta C/C: \leq 3\, \%$<br>$\tan \delta: \leq 10 \times 10^{-4}$<br>$R_{ins}: \geq 10\,000\,M\Omega$ ;<br>rotor contact R: $\leq 10\,m\Omega$<br>Voltage proof:<br>400 V for 1 min<br>Visual examination:<br>no mechanical damage<br>Operating torque:<br>1.5 mNm to 35 mNm |
| 29                               |                             | Mechanical endurance                       | 10 cycles<br>Maximum 10 cycles: rotation<br>in 180° only (the electrical and<br>mechanical performance is not<br>guaranteed if rotated beyond<br>10 cycles) | $\Delta C/C: \leq 0.3\, \%$<br>$\Delta C/C$ after axial thrust: $\leq 0.3\, \%$ ;<br>rotor contact R: $\leq 10\,m\Omega$<br>Voltage proof:<br>400 V for 1 min<br>Visual examination:<br>no mechanical damage<br>Operating torque:<br>1 mNm to 50 mNm                          |



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