

Film Dielectric Trimmers

TEST VOLTAGE (DC) FOR 1 MINUTE:

400 V

MAXIMUM CONTACT RESISTANCE:5 m Ω **MINIMUM INSULATION RESISTANCE BETWEEN STATOR AND ROTOR:**10 000 M Ω **CATEGORY TEMPERATURE RANGE:**

- 40 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 to 25 mNm

MAXIMUM AXIAL THRUST:

2 N

FEATURES

- High temperature type
- Housing dimensions:
11 mm x 14 mm x 9 mm
- For a basic grid of 2.54 mm
- Top adjustment
- Vertical version

**APPLICATIONS**

- For fine adjustment in professional applications

DESCRIPTION:

The trimmers consist of a glass reinforced polysulphone frame with a polysulphone dust cover, brass rotor and stator with PTFE or polycarbonate film as the dielectric. The stator plates are stacked on pins and separated by rings, so that it is possible to produce a single stator or a differential type.

The rotor contact surfaces are plated to ensure a long life and a stable contact even under severe climatic conditions.

QUALITY LEVEL:

Sampling and data evaluation for quality level in accordance with "MIL-STD-105D" and "IEC 60410":

- < 0.15 % major defects
- < 0.65 % minor defects

Each capacitor is tested for minimum C_{\max} and is also subjected to the full test voltage.

 C_{\min}/C_{\max} :**SINGLE STATOR TYPE**

2.5/20 to 7/100 pF

DIFFERENTIAL TYPE

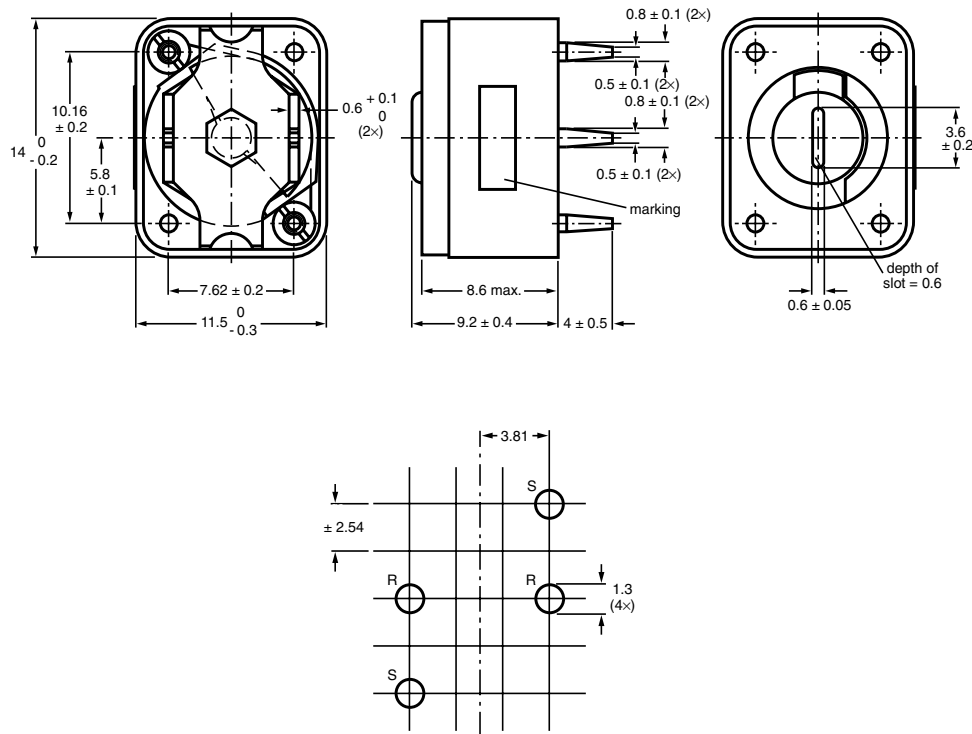
2/12 to 7/150 pF

RATED VOLTAGE (DC):

200 V

LIFE OF TRIMMER:

Maximum 10 cycles: rotation in 180° only (the electrical and mechanical performance is not guaranteed if rotated beyond 10 cycles)



R = rotor, S = stator

Trimmers 2281 809 07... series

Dimensions in millimeters

ADJUSTMENT:

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

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).

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.

PACKAGING:

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

ORDERING INFORMATION

C _{min} /C _{max} (pF)	CATALOG NUMBER 2281 809 07... OR BFC2 809 07...*	
	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
7/150	-	107

* ordering code for SAP system

ELECTRICAL DATA

GUARANTEED MAX. C_{min}/ MIN. C_{max} AT 200 kHz (pF)	TYPE	DIEL.	TAN δ AT C_{max} × 10⁻⁴		TEMP. COEFF.³⁾ (10⁻⁶/K)	SPQ	CATALOG NUMBER 2281 or BFC2*
			1 MHz	100 MHz			
2/12	differential	PTFE ¹⁾	≤ 10	≤ 17	0 ± 200	350	.... 809 07018
2.5/20	single stator	PTFE	≤ 10	≤ 17	0 ± 200	350	.... 809 07004
	differential					350	.... 809 07006
4/40	single stator	PTFE	≤ 10	≤ 17	0 ± 200	350	.... 809 07008
	differential					350	.... 809 07009
5/60	single stator	PTFE	≤ 10	≤ 25	0 ± 200	350	.... 809 07011
	differential					350	.... 809 07012
6/80	single stator	PTFE	≤ 10	≤ 25	0 ± 200	350	.... 809 07013
	differential					350	.... 809 07014
7/100	single stator	PTFE	≤ 10	≤ 25	0 ± 200	350	.... 809 07015
	differential					350	.... 809 07016
7/150	differential	PC ²⁾	≤ 50	-	0 ± 200	350	.... 809 07107

Notes

1. PTFE = polytetrafluorethylene
 2. PC = polycarbonate
 3. C: 60 % to 80 % of C_{max}; T_{amb}: from + 20 °C to + 125 °C
- * ordering code for SAP system

TEST PROCEDURES AND REQUIREMENTS

IEC 60418-1 CLAUSE	IEC 60068 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
4.2		method of mounting	method A	
14		capacitance drift	after TC measurement	ΔC/C: ≤ 1 %
19		thrust	axial thrust of 2 N	ΔC/C: ≤ 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 hours at lower and 0.5 hours at upper category temperature	ΔC/C: ≤ 1 %
23	T	soldering:		
	Ta	solderability	solder bath immersion 3 mm; 235 °C; 2 s	good wetting no mechanical damage
	Tb	resistance to heat	solder bath: 260 °C; 10 s	no mechanical damage
24	Eb	impact bump	4000 ± 10 bumps; 40 g; 6 ms	ΔC/C: ≤ 0.2 %; no mechanical damage
25	Fc	vibration	frequency 10 to 55 Hz; amplitude 0.35 mm; 1.5 hours	ΔC/C: ≤ 0.25 %; no mechanical damage



IEC 60418-1 CLAUSE	IEC 60068 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
26 26.1	B	climatic sequence: dry heat	16 hours at upper category temperature	$\Delta C/C: \leq 3$ $\tan \delta: \leq 10 \times 10^{-4}$ $R_{ins}: \geq 10000 \text{ M}\Omega$; rotor contact R: $\leq 10 \text{ m}\Omega$
26.2	D	damp heat accelerated, first cycle	1 cycle; 24 hours; + 40 °C; 95 to 100 % RH	voltage proof: 400 V for 1 minute
26.3	Aa	cold	16 hours; - 40 °C	visual examination: no mechanical damage
26.5		damp heat accelerated, remaining cycles	1 cycle; 24 hours; + 40 °C; 95 to 100 % RH	operating torque: 1.5 to 35 mNm
27	Ca	damp heat steady state	21 days; + 40 °C; 90 to 95 % RH	$\Delta C/C: \leq 3 \%$ $\tan \delta: \leq 10 \times 10^{-4}$ $R_{ins}: \geq 10000 \text{ M}\Omega$; rotor contact R: $\leq 10 \text{ m}\Omega$ voltage proof: 400 V for 1 minute visual examination: no mechanical damage operating torque: 1.5 to 35 mNm
29		mechanical endurance	10 cycles Maximum 10 cycles: rotation in 180° only (the electrical and mechanical performance is not guaranteed if rotated beyond 10 cycles)	$\Delta C/C: \leq 0.3 \%$ $\Delta C/C$ after axial thrust: $\leq 0.3 \%$; rotor contact R: $\leq 10 \text{ m}\Omega$ voltage proof: 400 V for 1 minute visual examination: no mechanical damage operating torque: 1 to 50 mNm



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