

# APPROVAL

DESCRIPTION : TUN-CAP 20-335P 20 × 20A

NCE PARTS NO. : AF443AB92-A04

PARTS NO. :

DRAWING :

**RECEIVED**

**VENDOR:NEWCONT ELEC.CO.,LTD.**

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# NCE

## POLYVARICON

**MODEL: AF443AB92-A04**

**NEWCONT ELEC. CO., LTD.**

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Shennandadao, Shenzhen, Guangdong, P.R. China**

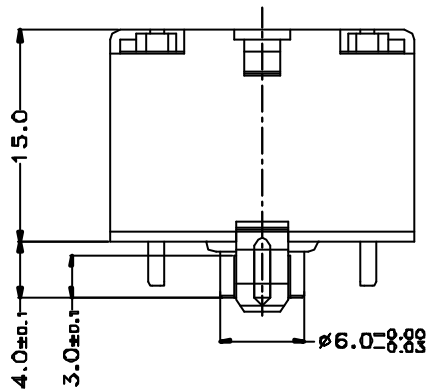
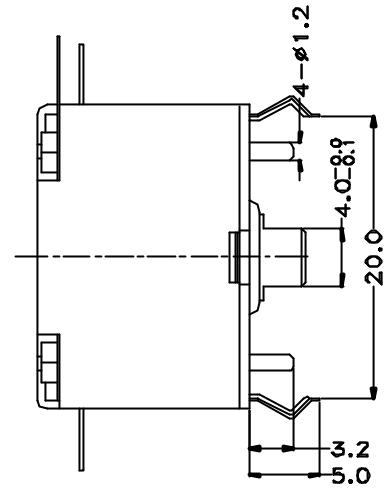
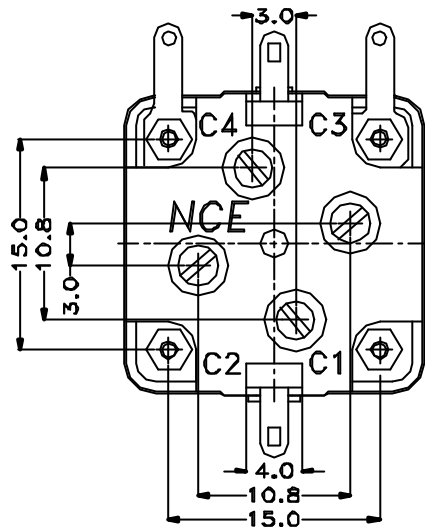
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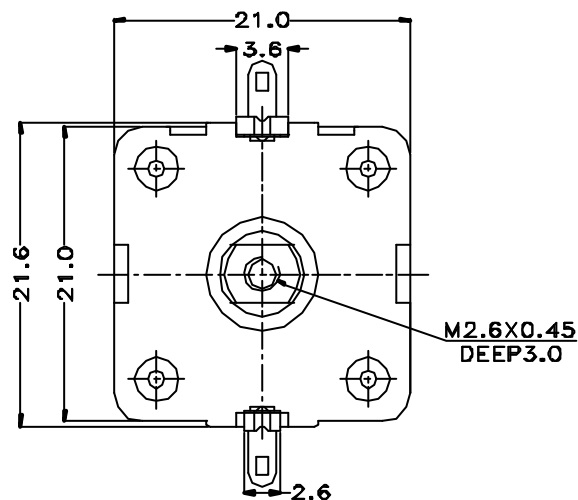
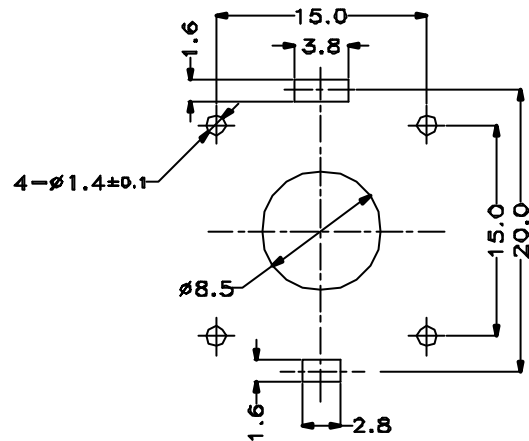
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**Outline drawing**



**Mounting hole detail**



- C1: FM OSC**
- C2: FM ANT**
- C3: AM OSC**
- C4: AM ANT**

| REVISIONS | APPEARANCE                               |            | MODEL         |
|-----------|--|------------|---------------|
|           | UNIT: mm                                 | SCALE: 2/1 | AF443AB92-A04 |
|           | DIMENSION TOLERANCE<br>GENERAL $\pm 0.3$ |            | CODE NUMBER   |
|           | DESIGNED BY: WISDOM TIAN                 |            | 189-92-01     |
|           | DRAWN BY: WISDOM TIAN                    |            | <b>NCE</b>    |
|           | CHECKED BY: LASER YANG                   |            |               |
|           | APPROVED BY: L.K.ZHANG                   |            |               |

**1. Application**

This specification is applicable for 4 gangs capacitor , model **AF443AB92-A04** with 2 gangs of equal capacitance on AM section and with 2 gangs of equal capacitance on FM section, for tuned 520-1650kHz and oscillation circuit 455kHz of transistor radio.

**2. Electrical Characteristics**

**2-1. Capacitance**

Effective capacitance at each position is shown on Table 1 , defining the rotation angle 180 ° is expressed 100%.

Table 1 Capacitance & Coefficient

| A M      |           |           | F M       |           |          |
|----------|-----------|-----------|-----------|-----------|----------|
| Rotation | OSC / ANT |           | OSC / ANT |           | Rotation |
| (%)      | Coef.     | Capa.(pF) | Coef.     | Capa.(pF) | (%)      |
| *100     | 100.00    | 335.00    | 100.00    | 20.00     | *100     |
| 90       | 84.40     | 282.74    | 86.18     | 17.24     | 90       |
| *80      | 67.90     | 227.47    | 73.37     | 14.67     | 80       |
| 75       | 60.00     | 201.00    | 67.32     | 13.46     | *75      |
| 70       | 52.30     | 175.21    | 61.48     | 12.30     | 70       |
| *60      | 38.00     | 127.30    | 50.42     | 10.08     | 60       |
| 50       | 26.20     | 87.77     | 40.12     | 8.02      | *50      |
| *40      | 17.00     | 56.95     | 30.50     | 6.10      | 40       |
| 30       | 10.20     | 34.17     | 21.52     | 4.30      | 30       |
| *25      | 7.57      | 25.36     | 17.25     | 3.45      | *25      |
| 20       | 5.31      | 17.79     | 13.11     | 2.62      | 20       |
| *10      | 1.74      | 5.83      | 5.23      | 1.05      | *10      |
| 3        | 0.00      | 0.00      | 0.00      | 0.00      | 3        |

**2-2. Minimum Capacitance**

Minimum Capacitance shown on Table 2 is defined at the end stop, where shaft is rotated full clockwise. But trimmer capacitance is minimum.

Table 2

| Section | Minimum Capacitance                 |
|---------|-------------------------------------|
| AM      | C3 : 4.4 ± 1.0pF , C4 : 4.2 ± 1.0pF |
| FM      | C1 : 3.0 ± 1.0pF , C2 : 4.0 ± 1.0pF |

**2-3. Tolerance of Capacitance**

The tolerance of the effective capacitance is shown Table 3

Table 3

| Condition                            | Section | Standard   |
|--------------------------------------|---------|--|
| At the angle of * marking of Table 1 | OSC     | AM ± ( 1.5% + 1.5 pF ) , FM ± ( 1.0 % + 1.0 pF ) |
|                                      | ANT     | AM ± ( 1.5% + 1.5 pF ) , FM ± ( 1.0 % + 1.0 pF ) |

| Clause | Item                  | Condition  | Standard                  |
|--------|-----------------------|--|---------------------------|
| 2 - 4  | Insulation Resistance | At D.C. 100V   | More than 100 M           |
| 2 - 5  | Voltage Proof         | Running D.C. 100V for 1 minute   | Not to be found unusually |
| 2 - 6  | Q Characteristics     | AM   | Valued at 10MHz 50pF      |
|        |                       | FM   | Valued at 100MHz 10pF     |
| 2 - 7  | Contact Resistance    | Valued at the tops of shaft and earth terminals when 1kHz ± 200Hz and 100mA are supplied(Rotation speed 30 times/minute) | Less than 20 m            |

**3. Mechanical Characteristics**

| Clause | Item                          | Condition   | Standard  |
|--------|-------------------------------|---|---|
| 3 - 1  | Direction of the rotation     | Capacitance change when shaft is rotated clockwise                                      | Decreasing  |
| 3 - 2  | Shaft Rotation                | Rotation range is defined 100% for 180 °  | 97% (+2 to -1%)   |
| 3 - 3  | Rotation Torque               | Torque application when shaft is rotated full at normal temperature condition           | 50 - 400 gf.cm  |
| 3 - 4  | Strength of end stop          | A specimen is left in the standard test condition for 1 minute after 5 kgf.cm rotations | Not to be found insulate both electrically and mechanically |
| 3 - 5  | Ratio of Max. and Min. torque | Max.: Min.  | Within 3: 1   |

**4. Trimmer ability**

| Clause | Item                  | Condition  | Standard                                  |
|--------|-----------------------|--|---|
| 4 - 1  | Shaft Rotation        | Rotation range   | 360 °                                     |
| 4 - 2  | Rotation Torque       | On the whole rotation range.<br>Ratio of Max. and Min. torque  | 50 – 400 gf-cm<br>Max.: Min. within 3 : 1 |
| 4 - 3  | Effective Capacitance |  | More than 5 pF                            |
| 4 - 4  | Q Characteristics     | At maximum capacitance and 10 MHz(main capacitance is minimum) | More than 200                             |

**5. Materials**

**5-1. Body Parts**

| Component    | Materials                              |
|--------------|--|
| Base         | Degeneration PPO or PPE included glass |
| Case         | Degeneration PP or AS                  |
| Rotor Shaft  | Brass                                  |
| Rotor Plate  | Aluminum or Brass                      |
| Stator Plate | Aluminum - Polyethylene film           |
| Terminal     | Iron or Brass - Tin plating            |

**5-2. Trimmer Parts**

| Component            | Materials                              |
|----------------------|--|
| Trimmer Base         | Degeneration PPO or PPE included glass |
| Trimmer Shaft        | Brass or Copper Alloys                 |
| Trimmer Rotor Plate  | Brass - Nickel plating                 |
| Trimmer Stator Plate | Brass - Polypropylene film             |

**6. Specific Examinations**

| Clause | Item                          | Condition  | Standard   |
|--------|-------------------------------|--|--|
| 6 - 1  | Vibration                     | By the vibration with frequency 10-55-10HZ/minute. 2.0mm to three directions of maximum capacitance for 2 hours.   | Clattering or loosening shall not be occurred.   |
| 6 - 2  | Load (at maximum capacitance) | Parallel load: 2kg weight is loaded to the shaft for 10 second and removing.   | Satisfying clauses 2-4, 2-5, 2-6, 2-7 and 3-3.   |
|        |                               | Perpendicular load: 1kg weight is loaded to the shaft for 10 second  |  |
| 6 - 3  | Impact                        | By letting a specimen fall down from the height of 50 cm three times to a wooden board, or by giving impact of 80 grams to 6 faces of the specimen on time each. | Capacitance drift within $\pm 2\%$ or $\pm 0.5\text{pF}$ against initial value at maximum effective capacitance. |
| 6 - 4  | Rotation Life                 | By 10000 rotations with 10-15 rotations per minute $80\pm 5\%$ rotation range.   |  |
| 6 - 5  | Heat Endurance                | A specimen is kept in a chamber with constant temperature $70\pm 2$ for 16 hours and left in the standard test condition for one or two hours.                   | Satisfying clauses 2-4 , 2-6 , 4-2 , 4-3 and 4-4   |
| 6 - 6  | Cold Endurance                | A specimen is kept in a chamber with constant temperature $-20\pm 2$ for 16 hours and left in the standard test condition for one or two hours.                  |  |
| 6 - 7  | Soldering (Terminals)         | The end part 2mm of the terminal are given temperature $270\pm 5$ for $2\pm 0.5$ seconds.  | Satisfying clauses 2-4, 2-5, 2-6, 2-7, 3 and 4.  |

**6-8. Temperature Cycles**

A specimen at maximum capacitance is kept in the chamber (one is cold, another is hot) with constant temperature and humidity in every stage on table 4 and left in the standard test condition for 1 hour, clattering or loosening shall not be occurred. Satisfying clauses 2-4, 2-6, and 3-3. Maximum capacitance variation rate : within 2.0%

Table 4

| Stage               | 1   | 2  | 3   | 4  | 5   | 6  | 7   | 8  |
|---------------------|-----|----|-----|----|-----|----|-----|----|
| Temperature $\pm 2$ | -20 | 70 | -20 | 70 | -20 | 70 | -20 | 70 |
| Time ( Hour )       | 1   | 1  | 1   | 1  | 1   | 1  | 1   | 1  |

**6-9. Humidity Endurance**

A specimen is kept in a chamber with temperature  $40\pm 2$  and relative humidity 90% to 95% for 96 hours. And after leaving in the standard test condition for one or two hours. The specimen is valued, and the results shall satisfy table 5.

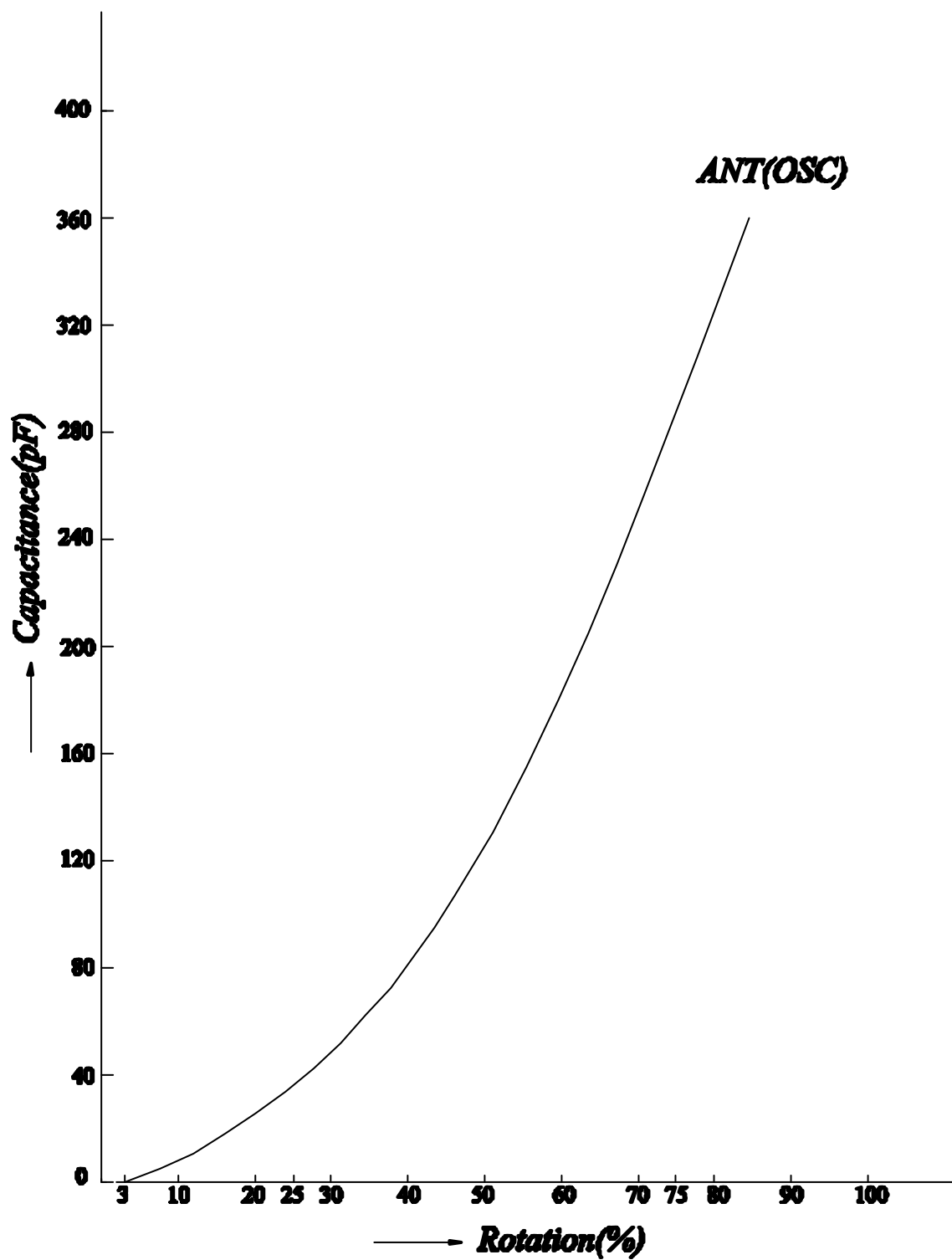
Table 5

|                           |         | AM side                       | FM side                     |
|---------------------------|---------|-------------------------------|-----------------------------|
| Insulation Resistance     |         | More than 50 M ( D.C. 100V )  |                             |
| Q                         | Body    | More than 500 ( 10MHz 50pF)   | More than 150 (100MHz 10pF) |
| Characteristics           | Trimmer | More than 150 ( 10 MHz Cmax ) |                             |
| Maximum Capacitance Drift |         | Within $\pm 2\%$              |                             |

The standard test condition

This means the condition of temperature 5 to 35 and relative humidity 45 to 85% , but that of  $20\pm 2$  and  $65\pm 5\%$  if there is any doubt.

# AM curve-AA



# FM curve-FB

