

# Type 168/185 Metallized Polyester Radial Lead Capacitors

## Radial Box Metallized Polyester Capacitors for Automatic Insertion



The Type 168/185 series radial lead metallized polyester box capacitors are available in bulk (Type 168) or on ammo pack or tape and reel (Type 185). These capacitors are constructed in rugged rectangular plastic cases and all come with 5.0 mm (0.197") lead spacing. They are good for general purpose applications such as bypass, decoupling, energy storage/discharge and arc suppression.

### Highlights

- Case and epoxy fill meets UL94V-0
- 5.0 mm (0.197") lead spacing
- Bulk, tape and reel or ammo pack
- Non-inductively wound
- Non-polar
- Low leakage
- Lead material: Tinned copper wire

### Specifications

RoHS Compliant

**Capacitance Range:** 0.001  $\mu\text{F}$  to 1.0  $\mu\text{F}$

**Voltage Range:** 50 Vdc to 400 Vdc (30 Vac to 200 Vac, 60 Hz)

**Capacitance Tolerance:**  $\pm 5\%$ ,  $\pm 10\%$ ,  $\pm 20\%$

**Operating Temperature Range:**  $-55\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$  (with 50% Vdc derating  $>85\text{ }^{\circ}\text{C}$ )

**Dielectric Withstand Voltage:** 1.6 x rated voltage for 2 sec @  $+25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$

**Dissipation Factor (DF):**  $\tan\delta \times 10^{-4}$  at  $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$

| kHz | $C \leq 0.1\text{ }\mu\text{F}$ | $C > 0.1\text{ }\mu\text{F}$ |
|-----|---------------------------------|------------------------------|
| 1   | $\leq 100$                      | $\leq 100$                   |
| 10  | $\leq 150$                      | $\leq 150$                   |
| 100 | $\leq 300$                      |                              |

**Total Self Inductance (L):** Approximately 7 nH

**Long Term Stability (after two years):** Capacitance change  $\Delta C/C \leq \pm 3\%$  under standard environmental conditions

**Maximum Pulse Rise Time (dv/dt):**

| Vn  | V/ $\mu\text{s}$ |
|-----|------------------|
| 50  | 250              |
| 63  | 250              |
| 100 | 300              |
| 250 | 400              |
| 400 | 600              |

If the working voltage (V) is less than the nominal voltage (Vn), the capacitor can work at higher dv/dt. In this case, the maximum value allowed is obtained by multiplying the above value with the ratio Vn/V.

# Type 168/185 Metallized Polyester Radial Lead Capacitors

## Capacitor Outline Drawing



### Soldering

#### Test Conditions

Soldering Temperature: 260 °C ±5 °C  
Soldering Duration: 10 sec ±1 sec

#### Performance

Capacitance Change  $\Delta C/C$ :  $\leq \pm 2\%$   
DF Change  $\Delta tg\delta$ :  $\leq 30 \times 10^{-4}$  at 10 kHz  
Insulation Resistance:  $\geq$  limit value

## Test Method and Performance

### Insulation Resistance

#### Test Conditions

Temperature: 25 °C ±5 °C  
Voltage Charge Time: 1 minute  
Voltage Charge: 10 Vdc for  $V_n < 100$  Vdc  
100 Vdc for  $V_n \geq 100$  Vdc

#### Performance

For  $V_n > 100$  Vdc:  $C \leq 0.33 \mu F$ ,  $\geq 15,000 M\Omega$   
 $C > 0.33 \mu F$ ,  $\geq 5,000 S$   
For  $V_n \leq 100$  Vdc:  $C \leq 0.33 \mu F$ ,  $30,000 M\Omega$   
 $C > 0.33 \mu F$ ,  $\geq 10,000 S$

### Damp Heat Test

#### Test Conditions

Temperature: +40 °C  
Relative Humidity: 95%  
Test Duration: 21 days

#### Performance

Capacitance Change  $\Delta C/C$ :  $\pm 5\%$   
DF Change  $\Delta tg\delta$ :  $\leq 0.005$  (10 KHz)  
Insulation Resistance:  $\geq 50\%$  of limit value

### Life Test

#### Test Conditions

REF  
Temperature: +85 °C  
Test Duration: 2000 hrs  
Voltage Applied: 1.25 x  $V_n$

#### Performance

Capacitance Change  $\Delta C/C$ :  $\leq \pm 2\%$   
DF Change  $\Delta tg\delta$ :  $\leq 30 \times 10^{-4}$  at 10 kHz  
Insulation Resistance:  $\geq 50\%$  of limit value

## Ratings

| Catalog<br>Part Number | Tape & Reel<br>Ammo Pack | Cap<br>(μF) | Inches |       |       |       |       | Millimeters |     |      |     |     |
|------------------------|--------------------------|-------------|--------|-------|-------|-------|-------|-------------|-----|------|-----|-----|
|                        |                          |             | L      | T     | H     | S     | Ød    | L           | T   | H    | S   | Ød  |
| 50 Vdc / 30 Vac        |                          |             |        |       |       |       |       |             |     |      |     |     |
| 168104*50A-F           | 185104*50#A>-F           | 0.10        | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168154*50A-F           | 185154*50#A>-F           | 0.15        | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168224*50C-F           | 185224*50#C>-F           | 0.22        | 0.283  | 0.138 | 0.295 | 0.197 | 0.020 | 7.2         | 3.5 | 7.5  | 5.0 | 0.5 |
| 168334*50C-F           | 185334*50#C>-F           | 0.33        | 0.283  | 0.138 | 0.295 | 0.197 | 0.020 | 7.2         | 3.5 | 7.5  | 5.0 | 0.5 |
| 168474*50H-F           | 185474*50#H>-F           | 0.47        | 0.283  | 0.138 | 0.295 | 0.197 | 0.020 | 7.2         | 3.5 | 7.5  | 5.0 | 0.5 |
| 168684*50F-F           | 185684*50#F>-F           | 0.68        | 0.283  | 0.236 | 0.433 | 0.197 | 0.024 | 7.2         | 6.0 | 11.0 | 5.0 | 0.6 |
| 168824*50G-F           | 185824*50#G>-F           | 0.82        | 0.283  | 0.236 | 0.433 | 0.197 | 0.024 | 7.2         | 6.0 | 11.0 | 5.0 | 0.6 |
| 168105*50G-F           | 185105*50#G>-F           | 1.00        | 0.283  | 0.236 | 0.433 | 0.197 | 0.024 | 7.2         | 6.0 | 11.0 | 5.0 | 0.6 |
| 63 Vdc / 40 Vac        |                          |             |        |       |       |       |       |             |     |      |     |     |
| 168473*63A-F           | 185473*63#A>-F           | 0.047       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168563*63A-F           | 185563*63#A>-F           | 0.056       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168683*63A-F           | 185683*63#A>-F           | 0.068       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168823*63A-F           | 185823*63#A>-F           | 0.082       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168104*63A-F           | 185104*63#A>-F           | 0.10        | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168154*63C-F           | 185154*63#C>-F           | 0.15        | 0.283  | 0.138 | 0.295 | 0.197 | 0.020 | 7.2         | 3.5 | 7.5  | 5.0 | 0.5 |
| 168184*63C-F           | 185184*63#C>-F           | 0.18        | 0.283  | 0.138 | 0.295 | 0.197 | 0.020 | 7.2         | 3.5 | 7.5  | 5.0 | 0.5 |
| 168224*63C-F           | 185224*63#C>-F           | 0.22        | 0.283  | 0.138 | 0.295 | 0.197 | 0.020 | 7.2         | 3.5 | 7.5  | 5.0 | 0.5 |
| 168274*63C-F           | 185274*63#C>-F           | 0.27        | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168334*63H-F           | 185334*63#H>-F           | 0.33        | 0.283  | 0.138 | 0.295 | 0.197 | 0.020 | 7.2         | 3.5 | 7.5  | 5.0 | 0.5 |
| 168474*63H-F           | 185474*63#H>-F           | 0.47        | 0.283  | 0.138 | 0.295 | 0.197 | 0.020 | 7.2         | 3.5 | 7.5  | 5.0 | 0.5 |
| 168684*63F-F           | 185684*63#F>-F           | 0.68        | 0.283  | 0.177 | 0.374 | 0.197 | 0.024 | 7.2         | 4.5 | 9.5  | 5.0 | 0.6 |
| 168105*63G-F           | 185105*63#G>-F           | 1.00        | 0.283  | 0.236 | 0.433 | 0.197 | 0.024 | 7.2         | 6.0 | 11.0 | 5.0 | 0.6 |

\* Indicates capacitance tolerance: J =  $\pm 5\%$ , K =  $\pm 10\%$ , M =  $\pm 20\%$

# Indicates packaging type: R = Tape and Reel, A = Ammo Pack

> Indicates tooling code: A = 16.5 mm, B = 18.5 mm (See H dimension in taping specifications)

RoHS  
Compliant

# Type 168/185 Metallized Polyester Radial Lead Capacitors

**RoHS  
Compliant**

| Catalog<br>Part Number | Tape & Reel<br>Ammo Pack | Cap<br>(µF) | Inches |       |       |       |       | Millimeters |     |      |     |     |
|------------------------|--------------------------|-------------|--------|-------|-------|-------|-------|-------------|-----|------|-----|-----|
|                        |                          |             | L      | T     | H     | S     | Ød    | L           | T   | H    | S   | Ød  |
| 100 Vdc / 63 Vac       |                          |             |        |       |       |       |       |             |     |      |     |     |
| 168102*100A-F          | 185102*100#A>-F          | 0.0010      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168152*100A-F          | 185152*100#A>-F          | 0.0015      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168222*100A-F          | 185222*100#A>-F          | 0.0022      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168272*100A-F          | 185272*100#A>-F          | 0.0027      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168332*100A-F          | 185332*100#A>-F          | 0.0033      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168392*100A-F          | 185392*100#A>-F          | 0.0039      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168472*100A-F          | 185472*100#A>-F          | 0.0047      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168562*100A-F          | 185562*100#A>-F          | 0.0056      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168682*100A-F          | 185682*100#A>-F          | 0.0068      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168822*100A-F          | 185822*100#A>-F          | 0.0082      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168103*100A-F          | 185103*100#A>-F          | 0.010       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168153*100A-F          | 185153*100#A>-F          | 0.015       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168183*100A-F          | 185183*100#A>-F          | 0.018       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168223*100A-F          | 185223*100#A>-F          | 0.022       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168273*100A-F          | 185273*100#A>-F          | 0.027       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168333*100C-F          | 185333*100#C>-F          | 0.033       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168393*100C-F          | 185393*100#C>-F          | 0.039       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168473*100C-F          | 185473*100#C>-F          | 0.047       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168683*100H-F          | 185683*100#H>-F          | 0.068       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168104*100H-F          | 185104*100#H>-F          | 0.10        | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168154*100F-F          | 185154*100#F>-F          | 0.15        | 0.283  | 0.177 | 0.374 | 0.197 | 0.024 | 7.2         | 4.5 | 9.5  | 5.0 | 0.6 |
| 168224*100G-F          | 185224*100#G>-F          | 0.22        | 0.283  | 0.197 | 0.394 | 0.197 | 0.024 | 7.2         | 5.0 | 10.0 | 5.0 | 0.6 |
| 250 Vdc / 160 Vac      |                          |             |        |       |       |       |       |             |     |      |     |     |
| 168332*250A-F          | 185332*250#A>-F          | 0.0033      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168472*250A-F          | 185472*250#A>-F          | 0.0047      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168682*250A-F          | 185682*250#A>-F          | 0.0068      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168103*250A-F          | 185103*250#A>-F          | 0.010       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168153*250A-F          | 185153*250#A>-F          | 0.015       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168223*250C-F          | 185223*250#C>-F          | 0.022       | 0.283  | 0.138 | 0.295 | 0.197 | 0.020 | 7.2         | 3.5 | 7.5  | 5.0 | 0.5 |
| 168333*250C-F          | 185333*250#C>-F          | 0.033       | 0.283  | 0.138 | 0.295 | 0.197 | 0.020 | 7.2         | 3.5 | 7.5  | 5.0 | 0.5 |
| 168473*250F-F          | 185473*250#F>-F          | 0.047       | 0.283  | 0.177 | 0.374 | 0.197 | 0.024 | 7.2         | 4.5 | 9.5  | 5.0 | 0.6 |
| 168683*250F-F          | 185683*250#F>-F          | 0.068       | 0.283  | 0.177 | 0.374 | 0.197 | 0.024 | 7.2         | 4.5 | 9.5  | 5.0 | 0.6 |
| 168104*250G-F          | 185104*250#G>-F          | 0.100       | 0.283  | 0.197 | 0.394 | 0.197 | 0.024 | 7.2         | 5.0 | 10   | 5.0 | 0.6 |
| 400 Vdc / 200 Vac      |                          |             |        |       |       |       |       |             |     |      |     |     |
| 168102*400A-F          | 185102*400#A>-F          | 0.001       | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168152*400A-F          | 185152*400#A>-F          | 0.0015      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168222*400A-F          | 185222*400#A>-F          | 0.0022      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168332*400C-F          | 185332*400#C>-F          | 0.0033      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168472*400C-F          | 185472*400#C>-F          | 0.0047      | 0.283  | 0.098 | 0.256 | 0.197 | 0.020 | 7.2         | 2.5 | 6.5  | 5.0 | 0.5 |
| 168682*400C-F          | 185682*400#C>-F          | 0.0068      | 0.283  | 0.138 | 0.295 | 0.197 | 0.020 | 7.2         | 3.5 | 7.5  | 5.0 | 0.5 |
| 168103*400F-F          | 185103*400#F>-F          | 0.010       | 0.283  | 0.138 | 0.295 | 0.197 | 0.020 | 7.2         | 3.5 | 7.5  | 5.0 | 0.5 |
| 168153*400F-F          | 185153*400#F>-F          | 0.015       | 0.283  | 0.177 | 0.374 | 0.197 | 0.024 | 7.2         | 4.5 | 9.5  | 5.0 | 0.6 |
| 168223*400G-F          | 185223*400#G>-F          | 0.022       | 0.283  | 0.197 | 0.394 | 0.197 | 0.024 | 7.2         | 5.0 | 10   | 5.0 | 0.6 |

\* Indicates capacitance tolerance: J = ±5%, K = ±10%, M = ±20%

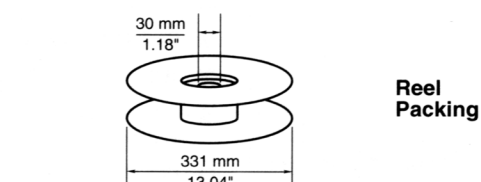
# Indicates packaging type: R = Tape and Reel, A = Ammo Pack

> Indicates tooling code: A = 16.5 mm, B = 18.5 mm (See H dimension in taping specification)

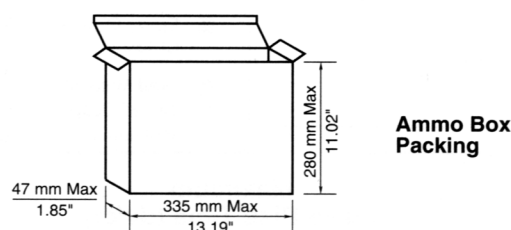
# Type 168/185 Metallized Polyester Radial Lead Capacitors

## Tape Specification - 5.0 mm Lead Spacing

### Standard EIA-468-B



Reel Packing



Ammo Box Packing

| Item                                 | Code           | Millimeters                | Inches                      |
|--------------------------------------|----------------|----------------------------|-----------------------------|
| Lead-to-Lead Distance                | P              | 5.0 <sup>+0.6</sup> -0.2   | .197 <sup>+.024</sup> -.040 |
| Feed Hole Pitch                      | P <sub>0</sub> | 12.7 <sup>±0.3</sup>       | .5 <sup>±.012</sup>         |
| Pitch of Component                   | P <sub>1</sub> | 12.7 <sup>±1.0</sup>       | .5 <sup>±.039</sup>         |
| Hole Center to Lead                  | P <sub>2</sub> | 2.54 <sup>±0.7</sup>       | .100 <sup>±.028</sup>       |
| Feed Hole Center to Component Center | P <sub>3</sub> | 6.35 <sup>±1.3</sup>       | .250 <sup>±.051</sup>       |
| Component Alignment, F-R             | Δh             | 0 <sup>±2.0</sup>          | 0 <sup>±.079</sup>          |
| Tape Width                           | W              | 18 <sup>+1.0</sup> -0.1    | .709 <sup>+.039</sup> -.004 |
| Hold-down Tape Width                 | W <sub>0</sub> | 6.0 min                    | .236 min                    |
| Hole Position                        | W <sub>1</sub> | 9.0 <sup>+0.75</sup> -0.05 | .355 <sup>+.030</sup> -.001 |
| Hold-down Tape Position              | W <sub>2</sub> | 3.0 Max                    | .118 Max                    |
| Height of Component from Tape Center | H              | >                          | >                           |
| Feed Hole Diameter                   | D <sub>0</sub> | 4.0 <sup>±0.3</sup>        | .157 <sup>±.012</sup>       |

| Case Thickness T | Quantity Reeled | Quantity Ammo Pack |
|------------------|-----------------|--------------------|
| 2.5              | 2500            | 2000               |
| 3.5              | 1800            | 1500               |
| 4.5              | 1400            | 1300               |
| 5                | 1200            | 1000               |
| 6                | 1000            | 800                |

> The H dimension depends on the insertion equipment used. Specify the proper tooling code as indicated below.

| Tooling | H Dimensions          |                        |
|---------|-----------------------|------------------------|
| Code    | Millimeters           | Inches                 |
| A       | 16.5 <sup>±0.75</sup> | .679 <sup>±0.030</sup> |
| B       | 18.5 <sup>±0.75</sup> | .728 <sup>±0.030</sup> |

## Part Numbering System for Auto Insertion

|         |               |           |               |                 |          |          |             |
|---------|---------------|-----------|---------------|-----------------|----------|----------|-------------|
| 168/185 | 104           | K         | 100           | R               | H        | B        | -F          |
|         |               |           |               | Packaging       |          | *Tooling | RoHS        |
|         |               |           |               | Type            | Internal | Code     | Compliant   |
| Series  | Capacitance   | Tolerance | Voltage       | (#)             | Code     | (>)      | Designation |
| 185     | 102 = .001 μF | J = ±5%   | 50 = 50 Vdc   | A = Ammo        | Letter   | A        |             |
|         | 103 = .01 μF  | K = ±10%  | 63 = 63 Vdc   | R = Tape & Reel |          | B        |             |
|         | 104 = .1 μF   | M = ±20%  | 100 = 100 Vdc |                 |          |          |             |
|         | 105 = 1.0 μF  |           | 250 = 250 Vdc |                 |          |          |             |
|         |               |           | 400 = 400 Vdc |                 |          |          |             |

\* Tooling code (>) depends on the users insertion equipment requirements. See table for available options.



**ООО «НИОКРсистемс»** - это оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов. Реализуемая нашей компанией продукция насчитывает более полумиллиона наименований.

Благодаря этому наша компания предлагает к поставке практически не ограниченный ассортимент компонентов как оптовыми, мелкооптовыми партиями, так и в розницу.

Благодаря развитой сети поставщиков, помогаем в поиске и приобретении экзотичных или снятых с производства компонентов.

### **Наша компания это:**

- Гарантия качества поставляемой продукции
- Широкий ассортимент
- Минимальные сроки поставок
- Техническая поддержка
- Подбор комплектации
- Индивидуальный подход
- Гибкое ценообразование
- Работаем по 275 ФЗ