

## Metallized Polyester Film Capacitors - MKT In Heat Shrinkable Tube

### Construction

Dielectric: polyethylene terephthalate  
Stacked-film technology  
Lead spacing 5 mm

Heat shrinkable tube:  
( Polyester 100 $\mu$ m; 125°C )

### Features

Very small dimensions  
Self-healing properties  
High pulse strength

### Terminals

Parallel wire leads, tinned  
Lead spacing 5,0 mm

### Marking

Manufacturer's logo,  
rated capacitance (coded),  
capacitance tolerance (code letter),  
rated ac voltage,  
date of manufacture (coded)

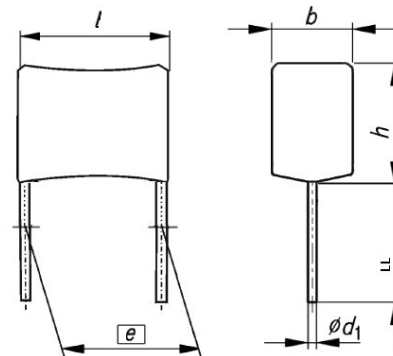
### Delivery mode

Bulk (untaped)  
Taped (Ammo pack or reel)

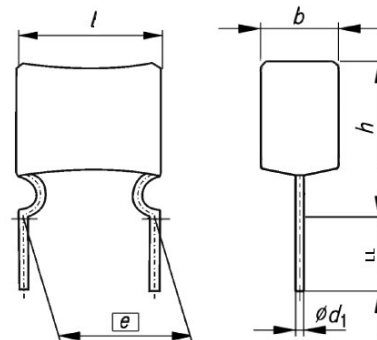
### Detail specifications

Homologated in accordance with IEC 384-2

### Straight Leads



### Conformed Leads "Kink"



| Dimensions in mm |               |
|------------------|---------------|
| Lead spacing     | Lead Diameter |
| $5 \pm 0,4$      | 0,5           |

### Ordering codes and pack units

| Vr<br>(Vrms,<br>f ≤ 60 Hz)   | CR      | Maximum<br>Dimensions 1<br>(straight leads) | Maximum<br>Dimensions 2<br>(crimped leads) | Ordering code 3<br>(capacitance tolerance,<br>code end) | Packing units (pcs) |              |                   |
|------------------------------|---------|---------------------------------------------|--------------------------------------------|---------------------------------------------------------|---------------------|--------------|-------------------|
|                              |         | b x h x l (mm)                              | b x h x l (mm)                             |                                                         | Ammo<br>pack        | Reel<br>pack | Untaped<br>(bulk) |
| <b>63 Vdc<br/>(40 Vac)</b>   | 0,22 µF | 2,0 x 5,5 x 7,0                             | 2,0 x 9,0 x 7,0                            | B32559-C0224-+***                                       | 4000                | 3200         | 3000              |
|                              | 0,33 µF | 2,5 x 6,0 x 7,0                             | 2,5 x 9,5 x 7,0                            | B32559-C0334-+***                                       | 3200                | 2700         | 2700              |
|                              | 0,47 µF | 3,0 x 6,5 x 7,0                             | 3,0 x 10,0 x 7,0                           | B32559-C0474-+***                                       | 2700                | 1900         | 2500              |
|                              | 0,68 µF | 3,0 x 8,5 x 7,0                             | 3,0 x 12,0 x 7,0                           | B32559-C0684-+***                                       | 2700                | 1900         | 2000              |
|                              | 1,0 µF  | 4,0 x 9,0 x 7,0                             | -                                          | B32559-C0105-+***                                       | 2000                | 1700         | 1500              |
|                              |         |                                             |                                            |                                                         |                     |              |                   |
| <b>100 Vdc<br/>(63 Vac)</b>  | 33 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C1333-+***                                       | 3200                | 2800         | 3000              |
|                              | 47 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C1473-+***                                       | 3200                | 2800         | 3000              |
|                              | 56 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C1563-+***                                       | 3200                | 2800         | 3000              |
|                              | 68 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C1683-+***                                       | 3200                | 2800         | 3000              |
|                              | 0,1 µF  | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C1104-+***                                       | 3200                | 2800         | 3000              |
|                              | 0,12 µF | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C1124-+***                                       | 3200                | 2800         | 3000              |
|                              | 0,15 µF | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C1154-+***                                       | 3200                | 2800         | 3000              |
|                              | 0,22 µF | 2,5 x 7,0 x 7,0                             | 2,5 x 10,5 x 7,0                           | B32559-C1224-+***                                       | 3200                | 2800         | 2800              |
|                              | 0,33 µF | 3,0 x 8,0 x 7,0                             | 3,0 x 11,5 x 7,0                           | B32559-C1334-+***                                       | 2700                | 2200         | 2200              |
|                              | 0,47 µF | 3,5 x 8,0 x 7,0                             | 3,5 x 11,5 x 7,0                           | B32559-C1474-+***                                       | 2300                | 1700         | 1700              |
|                              |         |                                             |                                            |                                                         |                     |              |                   |
|                              |         |                                             |                                            |                                                         |                     |              |                   |
| <b>250 Vdc<br/>(160 Vac)</b> | 22 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C3223-+***                                       | 3200                | 2800         | 3000              |
|                              | 27 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C3223-+***                                       | 3200                | 2800         | 3000              |
|                              | 33 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C3333-+***                                       | 3200                | 2800         | 3000              |
|                              | 47 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C3473-+***                                       | 3200                | 2800         | 3000              |
|                              | 56 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C3563-+***                                       | 3200                | 2800         | 3000              |
|                              | 68 nF   | 3,0 x 7,0 x 7,0                             | 3,0 x 10,5 x 7,0                           | B32559-C3683-+***                                       | 2700                | 2200         | 2500              |
|                              | 82 nF   | 3,0 x 8,0 x 7,0                             | 3,0 x 11,5 x 7,0                           | B32559-C3823-+***                                       | 2700                | 2200         | 2200              |
|                              | 0,1 µF  | 3,0 x 8,5 x 7,0                             | 3,0 x 12,0 x 7,0                           | B32559-C3104-+***                                       | 2700                | 2200         | 2000              |
|                              | 0,12 µF | 3,5 x 8,5 x 7,0                             | -                                          | B32559-C3124-+***                                       | 2300                | 1700         | 1500              |
|                              | 0,15 µF | 4,5 x 8,5 x 7,0                             | -                                          | B32559-C3154-+***                                       | 1800                | 1500         | 1500              |
|                              |         |                                             |                                            |                                                         |                     |              |                   |
|                              |         |                                             |                                            |                                                         |                     |              |                   |
|                              |         |                                             |                                            |                                                         |                     |              |                   |
|                              |         |                                             |                                            |                                                         |                     |              |                   |
| <b>400 Vdc<br/>(200 Vac)</b> | 6,8 nF  | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C6682-+***                                       | 3200                | 2800         | 3000              |
|                              | 8,2 nF  | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C6822-+***                                       | 3200                | 2800         | 3000              |
|                              | 10 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C6103-+***                                       | 3200                | 2800         | 3000              |
|                              | 12 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C6123-+***                                       | 3200                | 2800         | 3000              |
|                              | 15 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C6153-+***                                       | 3200                | 2800         | 3000              |
|                              | 22 nF   | 2,5 x 6,5 x 7,0                             | 2,5 x 10,0 x 7,0                           | B32559-C6223-+***                                       | 3200                | 2800         | 3000              |
|                              | 27 nF   | 2,5 x 7,0 x 7,0                             | 2,5 x 10,5 x 7,0                           | B32559-C6273-+***                                       | 3200                | 2800         | 2800              |
|                              | 33 nF   | 3,0 x 7,0 x 7,0                             | 3,0 x 10,5 x 7,0                           | B32559-C6333-+***                                       | 2700                | 2300         | 2500              |
|                              | 47 nF   | 3,5 x 7,0 x 7,0                             | 3,5 x 10,5 x 7,0                           | B32559-C6473-+***                                       | 2300                | 1900         | 2500              |
|                              | 56 nF   | 4,0 x 7,5 x 7,0                             | -                                          | B32559-C6563-+***                                       | 2000                | 1700         | 1700              |
|                              | 68 nF   | 4,5 x 8,0 x 7,0                             | -                                          | B32559-C6683-+***                                       | 1800                | 1500         | 1500              |
|                              | 0,1 µF  | 5,5 x 10,0 x 7,0                            | -                                          | B32559-C6104-+***                                       | 1400                | 1100         | 1000              |
|                              | 0,12 µF | 5,5 x 11,0 x 7,0                            | -                                          | B32559-C6124-+***                                       | 1400                | 1100         | 1000              |
|                              |         |                                             |                                            |                                                         |                     |              |                   |
|                              |         |                                             |                                            |                                                         |                     |              |                   |
| <b>630 Vdc<br/>(400 Vac)</b> | 1,0 nF  | 3,0 x 7,0 x 7,0                             | 3,0 x 10,5 x 7,0                           | B32559-C8102-+***                                       | 2700                | 2300         | 2500              |
|                              | 1,5 nF  | 3,0 x 7,0 x 7,0                             | 3,0 x 10,5 x 7,0                           | B32559-C8152-+***                                       | 2700                | 2300         | 2500              |
|                              | 2,2 nF  | 3,0 x 7,0 x 7,0                             | 3,0 x 10,5 x 7,0                           | B32559-C8222-+***                                       | 2700                | 2300         | 2500              |
|                              | 2,7 nF  | 3,5 x 7,5 x 7,0                             | 3,5 x 11,0 x 7,0                           | B32559-C8272-+***                                       | 2300                | 1900         | 2000              |
|                              | 3,3 nF  | 3,5 x 7,5 x 7,0                             | 3,5 x 11,0 x 7,0                           | B32559-C8332-+***                                       | 2300                | 1900         | 2000              |
|                              | 4,7 nF  | 3,5 x 8,0 x 7,0                             | 3,5 x 11,5 x 7,0                           | B32559-C8472-+***                                       | 2300                | 1900         | 2000              |
|                              | 6,8 nF  | 3,5 x 8,0 x 7,0                             | 3,5 x 11,5 x 7,0                           | B32559-C8682-+***                                       | 2300                | 1900         | 2000              |
|                              | 8,2 nF  | 3,5 x 8,0 x 7,0                             | 3,5 x 11,5 x 7,0                           | B32559-C8822-+***                                       | 2300                | 1900         | 2000              |
|                              | 10 nF   | 3,5 x 8,0 x 7,0                             | 3,5 x 11,5 x 7,0                           | B32559-C8103-+***                                       | 2300                | 1900         | 2000              |
|                              |         |                                             |                                            |                                                         |                     |              |                   |

<sup>1</sup> Straight leads; <sup>2</sup> Conformed leads "Kink". <sup>3</sup> Replace the + by the code letter for the required capacitance tolerance. **Capacitance tolerance:** ±20 % = M, ±10 % = K, ±5 % = J.

**Code end:** Replace the \*\*\* by the code number for the required lead length or packing:

**000** = lead length 6 mm (untaped bulk "kink" wire); **001** = lead length 6mm (untaped bulk straight lead); **289** = taped, Ammo pack ("kink" leads); **489** = taped, Ammo pack (straight leads).

### Technical Data

|                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                |                                                                        |                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Climatic category in accordance with IEC 68-1<br>Lower category temperature $T_{min}$<br>Upper category temperature $T_{max}$<br>Damp heat test<br>Limit values after damp heat test | 55/125/56<br><br>- 55 °C<br>+ 125 °C<br>56 days/40 °C/93 % relative humidity<br>Capacitance change $ \Delta C/C $ ≤ 5 %<br>Dissipation factor change $\Delta \tan \delta$ ≤ $5 \cdot 10^{-3}$ (at 1 kHz)<br>Insulation resistance $R_{is}$ ≥ 50 % of minimum<br>or time constant $\tau = C_R \cdot R_{is}$ as-delivered values |                                                                        |                                                                                  |
| Reliability:<br>Reference conditions                                                                                                                                                 | 0,5 · $V_r$ ; 40 °C                                                                                                                                                                                                                                                                                                            |                                                                        |                                                                                  |
| Failure rate<br>Service life                                                                                                                                                         | $1 \cdot 10^{-9} / h = 1$ fit<br>200 000 h                                                                                                                                                                                                                                                                                     |                                                                        |                                                                                  |
| Failure criteria:<br>Total failure<br>Failure due to variation of parameters                                                                                                         | Short circuit or open circuit<br>Capacitance change $\Delta C/C$ > 10%<br>Dissipation factor $\tan \delta$ 2 · upper limit value<br>Insulation resistance $R_{is}$ < 150 MΩ ( $C_R \leq 0,33 \mu F$ )<br>Or time constant $\tau = C_R \cdot R_{is}$ < 50s ( $C_R > 0,33 \mu F$ )                                               |                                                                        |                                                                                  |
| DC test voltage                                                                                                                                                                      | 1,4 · $V_r$ , 2s                                                                                                                                                                                                                                                                                                               |                                                                        |                                                                                  |
| Category voltage $V_c$<br>Operation with dc voltage or ac voltage $V_{rms}$ up to 60 Hz                                                                                              | $T_A$ (°C)                                                                                                                                                                                                                                                                                                                     | DC voltage derating                                                    | AC voltage derating                                                              |
|                                                                                                                                                                                      | $T_A \leq 85$<br>$85 < T_A \leq 125$                                                                                                                                                                                                                                                                                           | $V_C = V_R$<br>$V_C = V_R \cdot (165 - T_A)/80$                        | $V_{C,rms} = V_{rms}$<br>$V_{C,rms} = V_{rms} \cdot (165 - T_A)/80$              |
| Operating voltage for short operating periods                                                                                                                                        | $T_A$ (°C)                                                                                                                                                                                                                                                                                                                     | DC voltage (max. hours)                                                | AC voltage (max hours)                                                           |
|                                                                                                                                                                                      | $T_A \leq 100$<br>$100 < T_A \leq 125$                                                                                                                                                                                                                                                                                         | $V_{op} = 1,25 \cdot V_C$ (2000h)<br>$V_{op} = 1,25 \cdot V_C$ (1000h) | $V_{op} = 1,0 \cdot V_{C,rms}$ (2000h)<br>$V_{op} = 1,0 \cdot V_{C,rms}$ (1000h) |
| Dissipation factor $\tan \delta$ (in $10^{-3}$ )<br>at 20 °C<br>(upper limit values)                                                                                                 | at 1 kHz<br>10 kHz<br>100 kHz                                                                                                                                                                                                                                                                                                  | $C_R \leq 0,1 \mu F$<br>8<br>15<br>30                                  | $0,1 \mu F < C_R \leq 1 \mu F$<br>10<br>20<br>-                                  |
| Insulation resistance $R_{is}$<br>or time constant $\tau = C_R \cdot R_{is}$<br>at 20 °C, rel. humidity ≤ 65 %<br>(minimum as-delivered values)                                      | $V_r$<br>≤ 100 Vdc<br>≥ 250 Vdc                                                                                                                                                                                                                                                                                                | $C_R \leq 0,33 \mu F$<br>3750 MΩ<br>7500 MΩ                            |                                                                                  |

### Pulse Handling capability

| $V_r$   | Max. rate of voltage rise $V_{pp}/\tau$ in V/μs ( for $V_{pp} = V_r$ ) |
|---------|------------------------------------------------------------------------|
| 63 Vdc  | 250                                                                    |
| 100 Vdc | 300                                                                    |
| 250 Vdc | 400                                                                    |
| 400 Vdc | 600                                                                    |
| 630 Vdc | 800                                                                    |

| $V_r$ | Pulse characteristic $k_o$ in $V^2/\mu s$ ( for $V_{pp} \leq V_r$ ) |
|-------|---------------------------------------------------------------------|
|-------|---------------------------------------------------------------------|

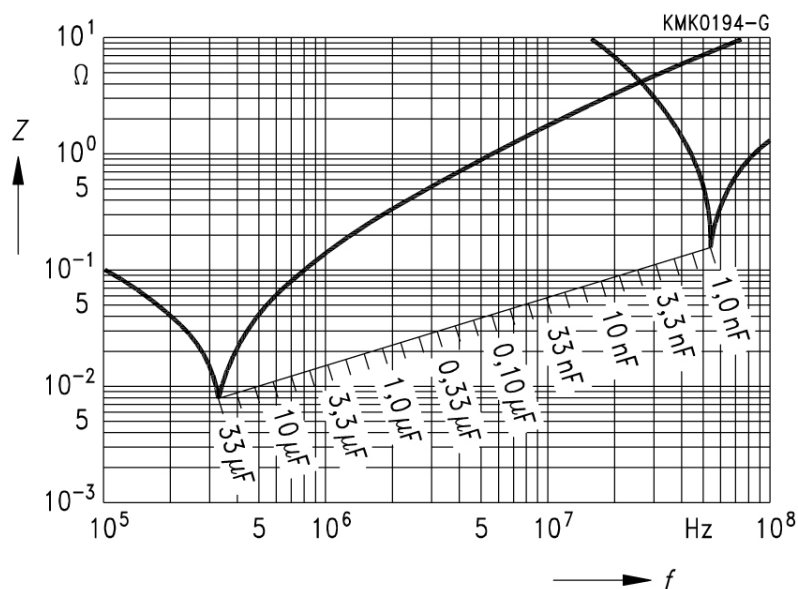
|         |           |
|---------|-----------|
| 63 Vdc  | 30 000    |
| 100 Vdc | 60 000    |
| 250 Vdc | 200 000   |
| 400 Vdc | 500 000   |
| 630 Vdc | 1 000 000 |

### Soldering conditions

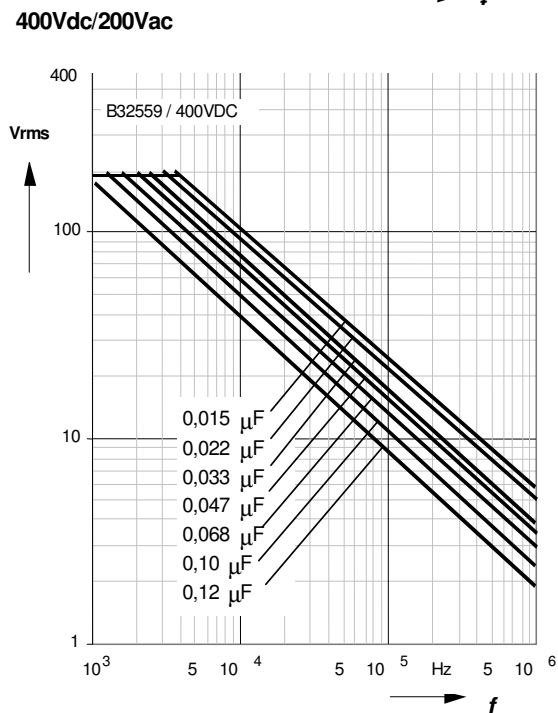
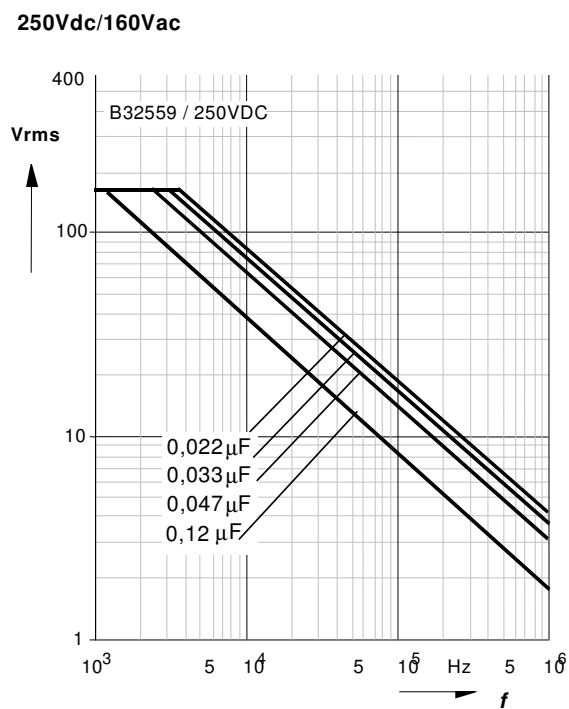
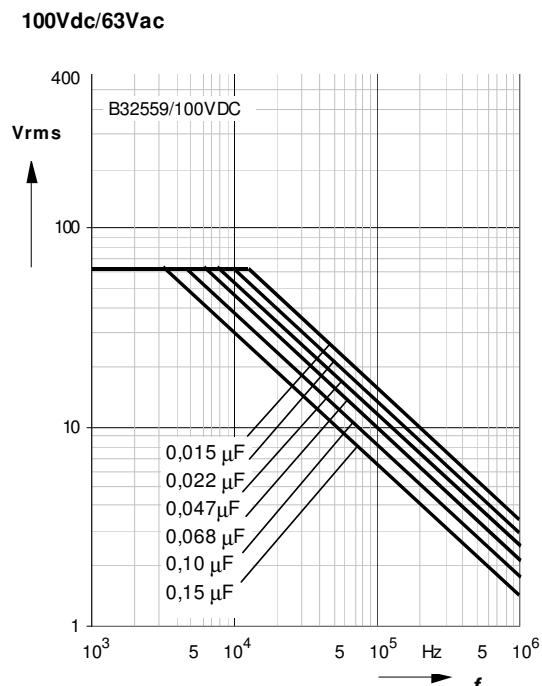
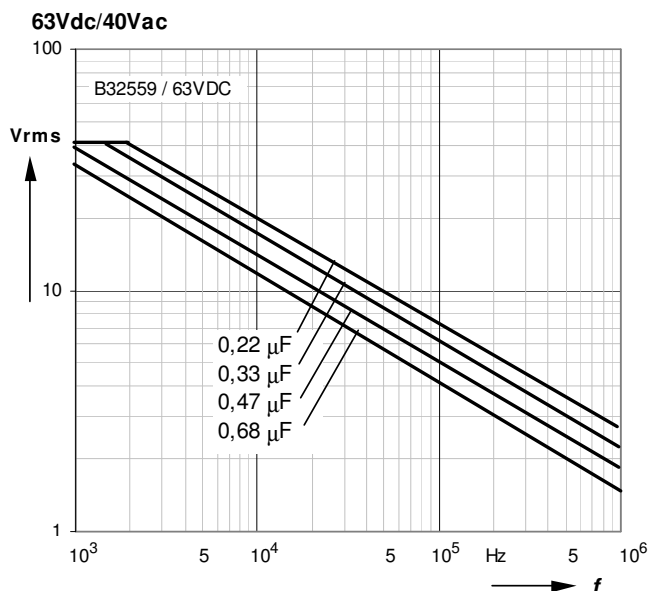
Maximum solder bath temperature: 245 °C

Maximum soldering time: 4s

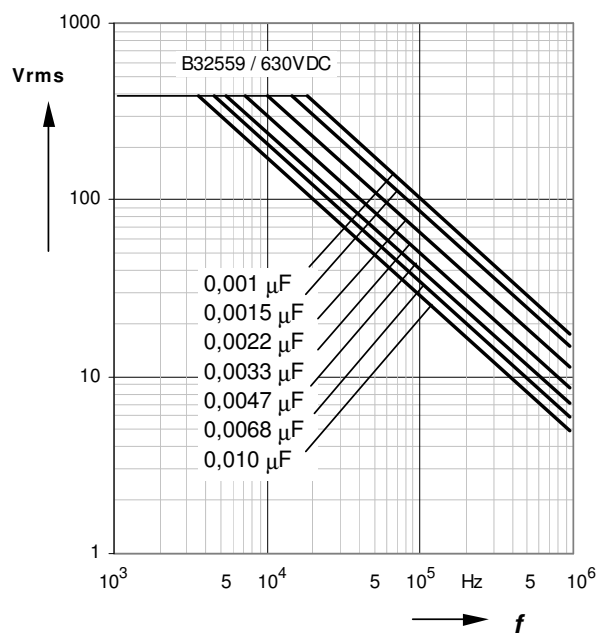
### Impedance Z versus frequency f ( typical values )



## Permissible ac voltage $V_{rms}$ versus frequency $f$

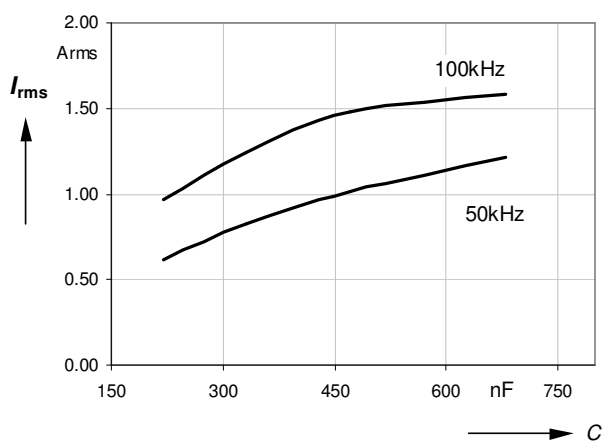


630Vdc/400Vac

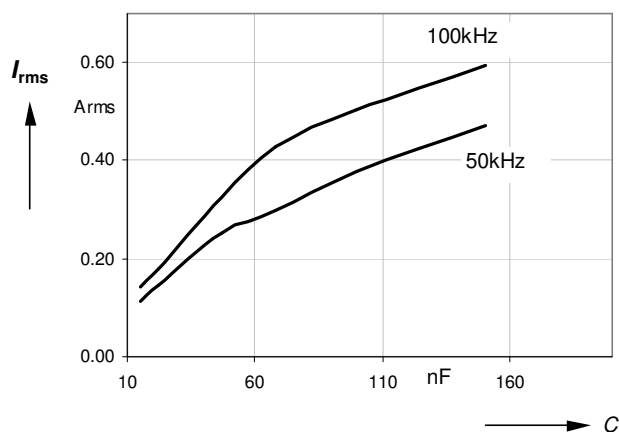


**Permissible ac current  $I_{rms}$  versus frequency  $f$**

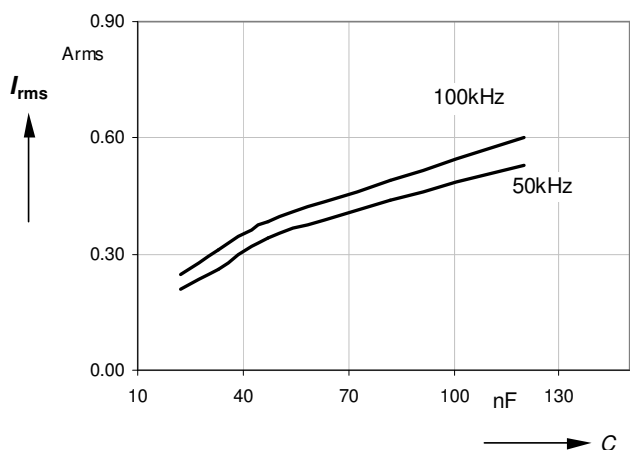
**63Vdc/40Vac**



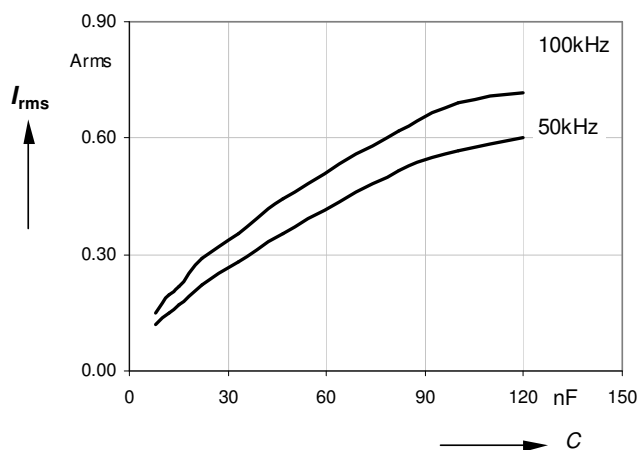
**100Vdc/63Vac**



**250Vdc/160Vac**



**400Vdc/200Vac**



**630Vdc/400Vac**

