

Attracting Tomorrow



# MKP DC metal top series

The hermetically sealed DC capacitor

B2568\* 2-terminal capacitors

B25689\* 4-terminal capacitors



# MKP DC 4T: The hermetically sealed DC capacitor with ultra low ESL

## Hermetically sealed MKP DC series with 4 terminals for ESL <14 nH (B25689\* series)

- Range 900 V to 3 kV, 50  $\mu$ F to 3 mF
- Main DC link voltage for traction 1 kV for 1.7 kV IGBTs and 2 kV for 3.3 kV IGBTs
- **Target applications**
  - Traction inverters
  - All high-speed switching applications
- **Humidity** 85 °C/85% RH 1000 hours, condensation possible
- **Fire & smoke classification acc. to EN 45545:** R22: HL3 R23: HL2
- **Dimensions** D 116 H: 74 mm to 345 mm
- **Light weight** (aluminum)
- Good cooling (normally stacked 2 windings)
- Approx. **60% less ESL** than standard capacitor with 2T
- Typical ESL 12 to 15 nH (special designs with 10 nH possible)
- Lifetime up to 200,000 hours
- Samples available

Standard datasheet available under: [www.tdk-electronics.tdk.com/en/power\\_capacitors](http://www.tdk-electronics.tdk.com/en/power_capacitors)



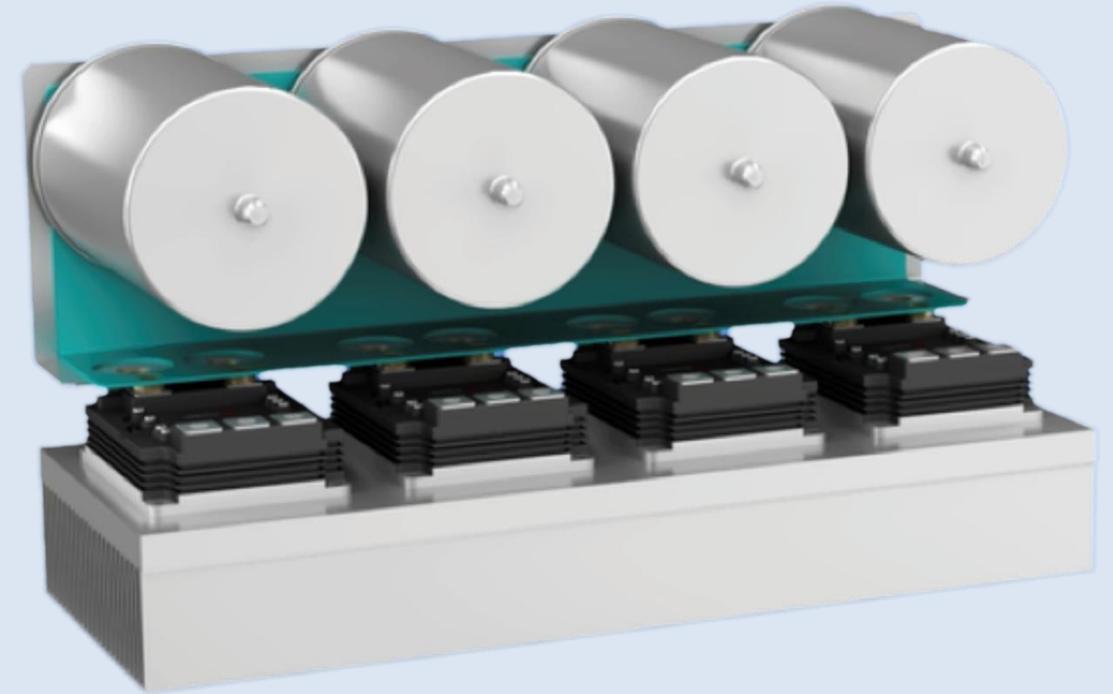
# MKP DC metal top

Low-inductance power modules such as XHP™ (Infineon), nHPD<sup>2</sup> (Hitachi), LinPak (ABB), or LV Dualmodul (Mitsubishi) require

- Modular approach DC link capacitors
- **Easy scalability**
- Capacitors with low inductance close to the IGBTs
- **Hermetically sealed** (important for traction applications)
- **Standard product with optimized cost**

## Solution

Metal top series with 2 terminals or 4 terminals – depending on ESL



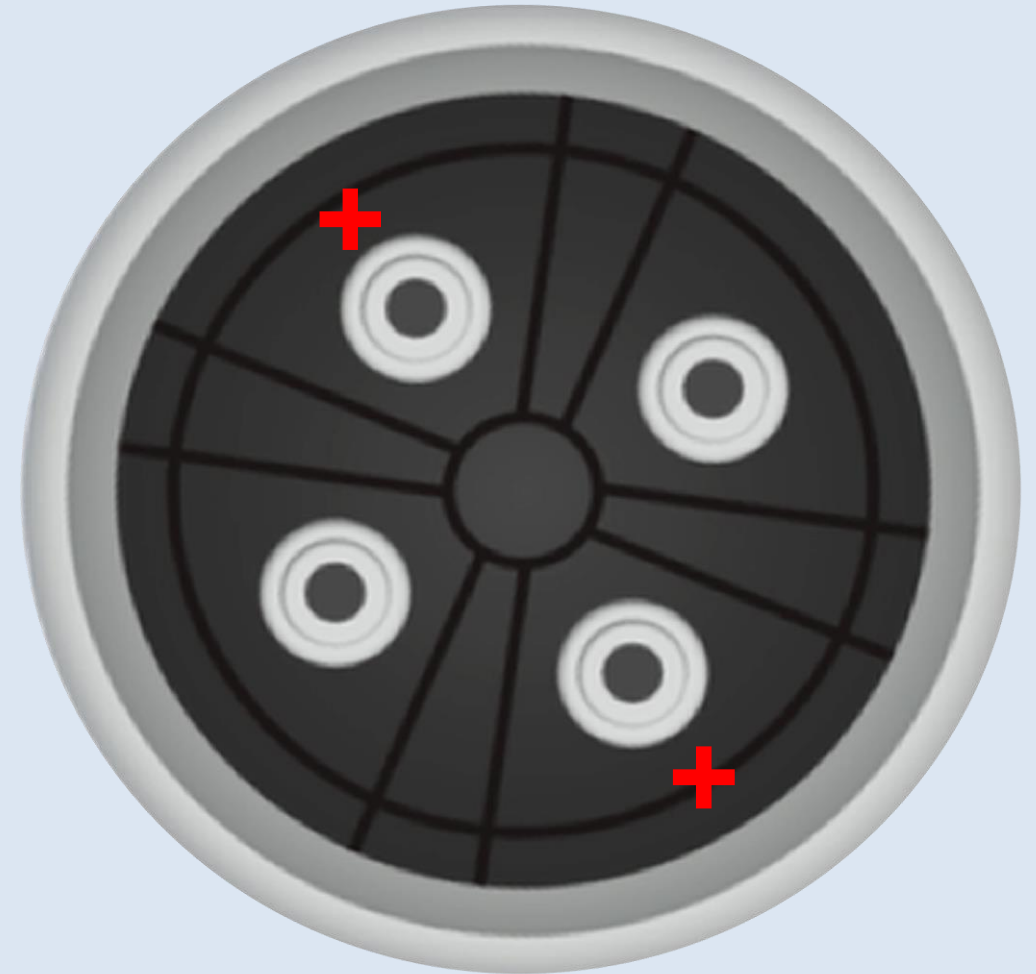
DC link with 4 capacitors in parallel

**1050  $\mu$ F/2 kV: around 3.25 nH**

# MKP DC metal top 4T

## Available in diameter D 116 mm

- Examples of capacitors with 4 terminals
  - 360  $\mu\text{F}/1 \text{ kV}$  in 116 x 79 mm, ESL 13 nH
  - 500  $\mu\text{F}/1 \text{ kV}$  in 116 x 104 mm, ESL 10 nH
  - 1000  $\mu\text{F}/1 \text{ kV}$  in 116 x 179 mm, ESL 13 nH
  - 500  $\mu\text{F}/1.8 \text{ kV}$  in 116 x 229 mm, ESL 15 nH
  - 260  $\mu\text{F}/2 \text{ kV}$  in 116 x 179 mm, ESL 13 nH
- **Polarity** has been defined in order to **reduce not only capacitor inductance but also the external inductance (busbar)**, improving the overall switching loop inductance



# MKP DC metal top: Modular approach

Typical values requested – diameter D = 116 mm

| Hc (mm) | 1000 V DC<br>(1.7 kV power modules) | 1800 V DC<br>(3.3 kV power modules) | 2000 V DC<br>(3.3 kV power modules) | ESL<br>2 terminals | ESL<br>4 terminals |
|---------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------|--------------------|
| 75      | 360 µF                              | 100 µF                              | 80 µF                               | 32                 | 13                 |
| 100     | 550 µF                              | 165 µF                              | 130 µF                              | 25                 | 10                 |
| 179     | 1100 µF                             | 330 µF                              | 260 µF                              | 34                 | 14                 |
| 229     | 1500 µF                             | 450 µF                              | 360 µF                              | 38                 | 15                 |

Typical values requested – diameter D = 85 mm:

| Hc (mm) | 1000 V DC<br>(1.7 kV power modules) | 1800 V DC<br>(3.3 kV power modules) | 2000 V DC<br>(3.3 kV power modules) | ESL<br>(typical nH) |
|---------|-------------------------------------|-------------------------------------|-------------------------------------|---------------------|
| 179     | 550 µF                              | 160 µF                              | 130 µF                              | 22 nH               |
| 229     | 740 µF                              | 220 µF                              | 180 µF                              | 25 nH               |
| 252     | 810 µF                              | 240 µF                              | 195 µF                              | 23 nH               |



**Same mechanical approach  
for all platforms**

\* Special types with even lower ESL upon request



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