Product presentation – ModCap HF
DCR Modular | New Modular High Frequency Series
Introducing the New Modular HF series

Highligths

- The most powered design with highest power density
- Reduce time to market & lead time
- Cost saving solution, Reduce weight & volume
- Ultra low ESR vs frequency
- Product developed fire and smoke compliant
- Low inductance (8 nH) to avoid use of additional snubbers
- Renewable energies & Traction (SiC)
- Finite elements analysis

Switch it faster !!!

MODCAP HF
ModCap HF series | B25647

AC FILTER

= DC-LINK / DC FILTER

ModCap HF / MKK-DCR / MKK-DCi-R / MKK-DCi-H

MKK-HP
ModCa HF series | B25647
DC-Link applications

Renewable energies
- Solar
- Wind

Traction
- Light train
- Loco & EMU

Energy transmission

Industry
- LV
- MV
General overview
B25647 series

ModCap HF (dry-modular-high frequency)

Features
- Capacitance range from 640 µF up to 1850 µF and voltage from 900 V up to 1,600 V
- Low ESL (8 nH)
- Temperature range up to 90 °C hotspot
- IEC 61071, IEC 61881-1, EN 45545-2 HL3 R23 (fire and smoke), UL recognized
- Filled with polyurethane resin (dry technology)
- Plastic case (opened), 8 terminals construction
- Flat windings

Benefits
- High power density, high frequency performance
- Modular concept for parallelization
- Snubber avoidance / low voltage overshoot
- Lifetime up to 200,000 hours
- Finite elements analysis available for the whole series
- Specially recommended for SiC semiconductors
- Reduced time to market & lead time

Recommended applications
Construction C
Simplified drawing & 3-D

Main dimensions: 243 x 169.5 x 90 mm

Terminal

3D

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Attracting Tomorrow
Highlights: HF performance, Ultra low ESL & higher operation temperature

- Capacitors can be mounted very close to the power modules to reduce loop inductance.

  → Compact and scalable solution specially designed for SiC semiconductors

  → Less investment on cooling

- Very short connection between capacitor and semiconductor

  → Ultra Low inductance (8nH)

  → Snubber capacitors avoidance and suppression of HF resonance
Electromagnetic behavior of Modular HF Series

Electromagnetic: modelling

Customer Input
Current-frequency spectrum

TDK Input
Capacitor design

Simulation
Capacitor electrical model: including ESL and ESR Vs Freq
Total losses and its internal distribution (must for accurate thermal simulation)

Customer benefits

- Electromagnetic model available for specific simulation according to current-frequency spectrum defined by the customer.
- Capacitor electrical model available in time and frequency domain
- Losses at defined current-frequency spectrum and its internal distribution
- Graphs with simulated ESR fully available for further thermal calculations by calculating losses all along the complete range of frequency
Thermal behavior of Modular HF Series

Thermal: hot spot & temperature mapping

Customer benefits

- Thermal model available for specific simulation according to spectrum and boundary conditions defined by the customer.
- Thermal simulations to be integrated as part of the type test report.
- Thermal Simulations may reduce the complexity and time of technical approvals, no further specific thermal stability test on lab.
- Detailed Temperature mapping allows customer to estimate in advance hot spot areas.
- Thermal Simulation to be done as per specific customer requirements (customized current spectrum and thermal boundary conditions).
- Heating Transference from bus bar may be analyzed in advance.
# ModCap HF Ordering Code System

<table>
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<th>Nominal voltage (V)</th>
<th>Capacitance ±10% (µF)</th>
<th>Nominal current (A)</th>
<th>Surge current (kA)</th>
<th>Repetitive peak current (kA)</th>
<th>Dimensions (LxWxH, mm)</th>
<th>Construction</th>
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Get more info [here](#)