



600kW THREE-PHASE DUAL INVERTER REFERENCE DESIGN USING THE XM3 POWER MODULE CRD600DA12E-XM3

HIGH-DENSITY, DOUBLE-SIDED INVERTER

The 600kW three-phase inverter demonstrates system-level power density and efficiency obtained by using six of Wolfspeed's XM3 half-bridge power modules. With half the weight and volume of a standard 62mm module, the XM3 footprint maximizes power density while minimizing loop inductance for low-loss, high-frequency operation with simple power bussing.

Advanced double-sided cold plate and highly-integrated DC Link capacitor reduce component count and increase power density. The three-phase dual inverter has greater than 4x the power density of comparable Si based designs and greater than 98% efficiency.



FEATURES

- High performance double-sided cold plate
- DC link capacitor with integrated bussing
- Sensors and control hardware



BENEFITS

- Improves system efficiency and power density
- Enables high switching frequency operation with low switching losses
- Lower system level cooling requirements



APPLICATIONS

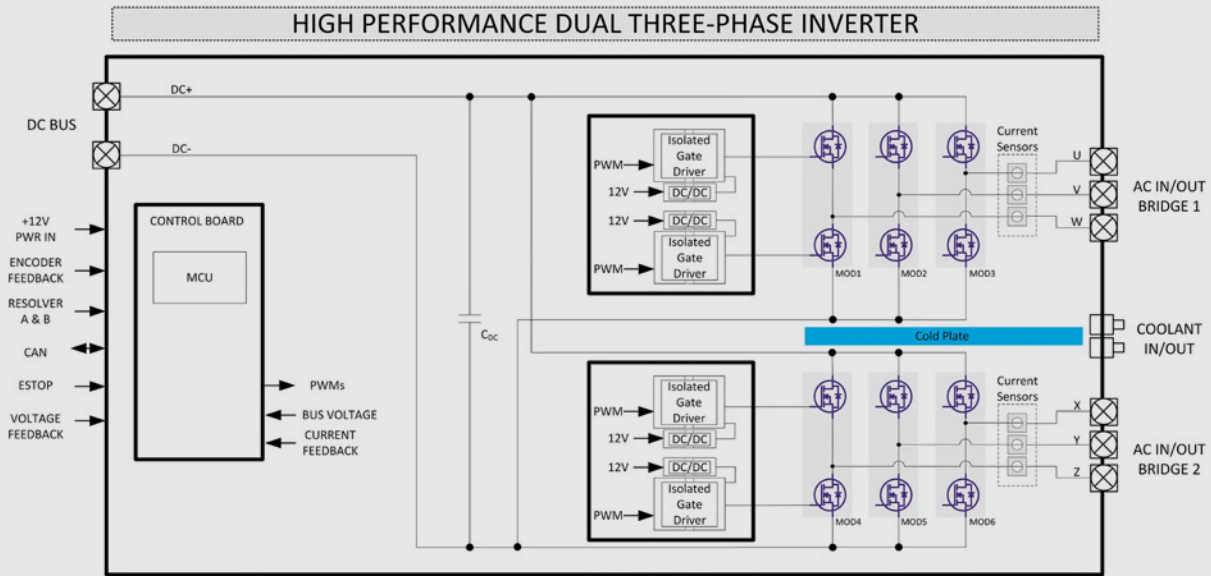
- Motor and traction drives
- Uninterruptible power supplies
- Energy generation and smart grids
- Solar and Wind

SYSTEM SPECS

| Parameter | Specification [Units] | Notes |
|-----------|----------------------------|---|
| P_{OUT} | 600kW | $T_L = 25^{\circ}C, 480 VAC PF=1, F_s = 20 kHz$ |
| V_{DC} | 800V _{DC} nominal | 900 V Maximum |
| F_{SW} | >10 kHz | 80kHz Gate Driver Limit |
| I_L | 720 A _{AC, RMS} | $T_L = 25^{\circ}C, 480 VAC PF=1, F_s = 10 kHz, Outputs Paralleled$ |
| L_{PL} | 13 nH | Includes Caps and Bussing |

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600KW THREE-PHASE DUAL INVERTER REFERENCE DESIGN



EAB450M12XM3



CGD12HBXMP

Parameter

CRD300DA12E-XM3

CRD600DA12E-XM3

| Application | Motor Drive | Dual Motor Drive |
|---------------|-------------------------|---|
| P_{OUT} | 300 kW | 600 kW |
| V_{DC} | 800 V _{DC} | 800 V _{DC} |
| I_L | 360 A _{AC,RMS} | 720 A _{AC,RMS} (Paralleled Output) |
| L_{PL} | 5.3 nH | 13 nH |
| Power Density | 32 kW/L | 70 kW/L |
| Dimensions | 28 cm × 29 cm × 11.5 cm | 20.4 cm × 26.7 cm × 15.7 cm |
| Volume | 9.3 L | 8.6 L |
| Weight | 6.2 kg | 9.7 kg |