IPG5 PRELIMINARY PRODUCT SUMMARY

IPG5 800V SILICON CARBIDE INVERTER

McLaren Applied's Inverter Platform Generation 5 (IPG5) product harnesses many years of Silicon Carbide (SiC) experience. The IPG5 inverter can power electric motors to over 400 kW[1] peak, 250 kW[2] continuous, at an unrivalled weight and volume. It has been primarily designed for direct drive automotive applications, capable of operating high-speed motors efficiently.

KEY FEATURES

- SiC technology for ultimate compactness and efficiency
- Peak power density (mass)[3] >85 kVA/kg
- Peak power density (volume) >125 kVA/L
- High speed motor drive capability, electrical frequency up to 2.5 kHz
- Variable switching frequency 1 - 32 kHz
- AUTOSAR 4.3

ELECTRICAL INPUTS

- High voltage input up to 900 V
- Low voltage input 8 V - 32 V

ELECTRICAL OUTPUTS

- 3 phase output
- Peak current 540 A_{rms}[4]
- Continuous current 320 A_{rms}

ELECTRICAL PERFORMANCE

- Efficiency 97% typical, 99% peak

SAFETY

- ISO 26262 capable, up to ASIL-D
- Integrated HVIL protection

COMMUNICATION AND MOTOR FEEDBACK

- 3 CAN2.0b interfaces (2 with FD option)
- Vehicle CAN message scheme defined according to customer requirements
- 1 Ethernet interface
- Resolver, motor temperature feedback

MECHANICAL

- Dry mass 5.5 kg
- Volume[5] 3.88 L
- Dimensions 266.2 x 177.9 x 82 mm

ENVIRONMENTAL AND COOLING

- Water/glycol cooled
- Max. coolant inlet temperature 70°C[6]
- Min. coolant flowrate 10 L/min[6]
- Max. coolant pressure 2Bar_{gauge}
- Operating temperature range -40°C to +105°C

1 Subject to further testing – 750 V input voltage, phase current 524 A_{rms}, power factor 0.875, 10 seconds duration, 8 kHz switching frequency
2 750 V input voltage, phase current 320 A_{rms}, power factor 0.875
3 Peak apparent power, 750 V input voltage, phase current 524 A_{rms} , 10 seconds duration
4 Subject to further testing – 70°C coolant, 10 L/min flowrate, 8 kHz switching frequency, 10 seconds duration
5 Volume and dimensions exclude connectors
6 To achieve rated specification

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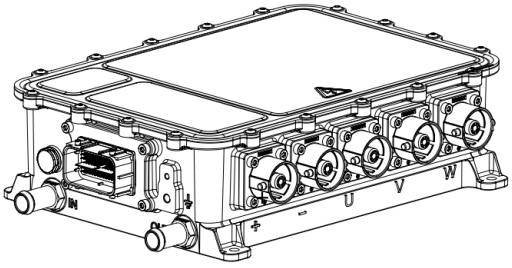

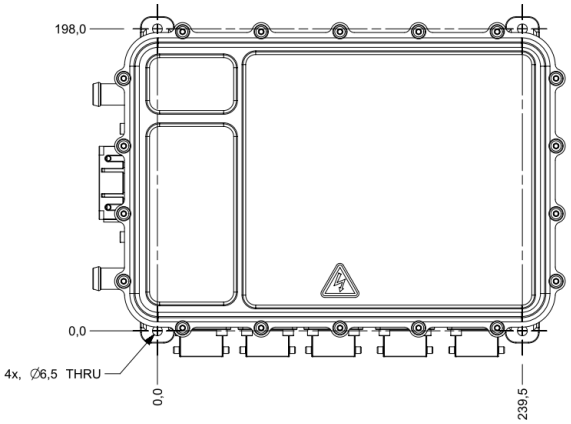

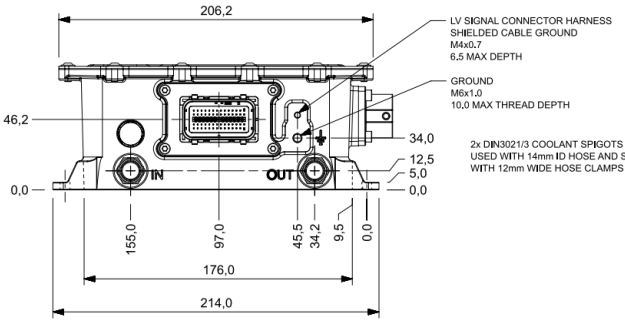

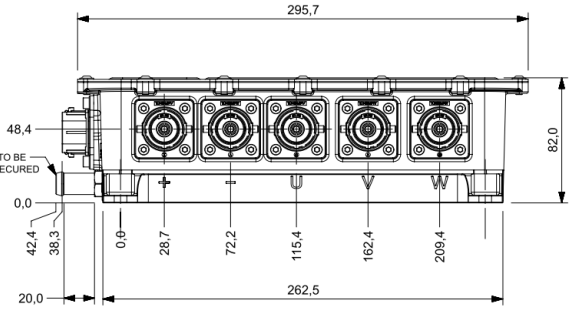

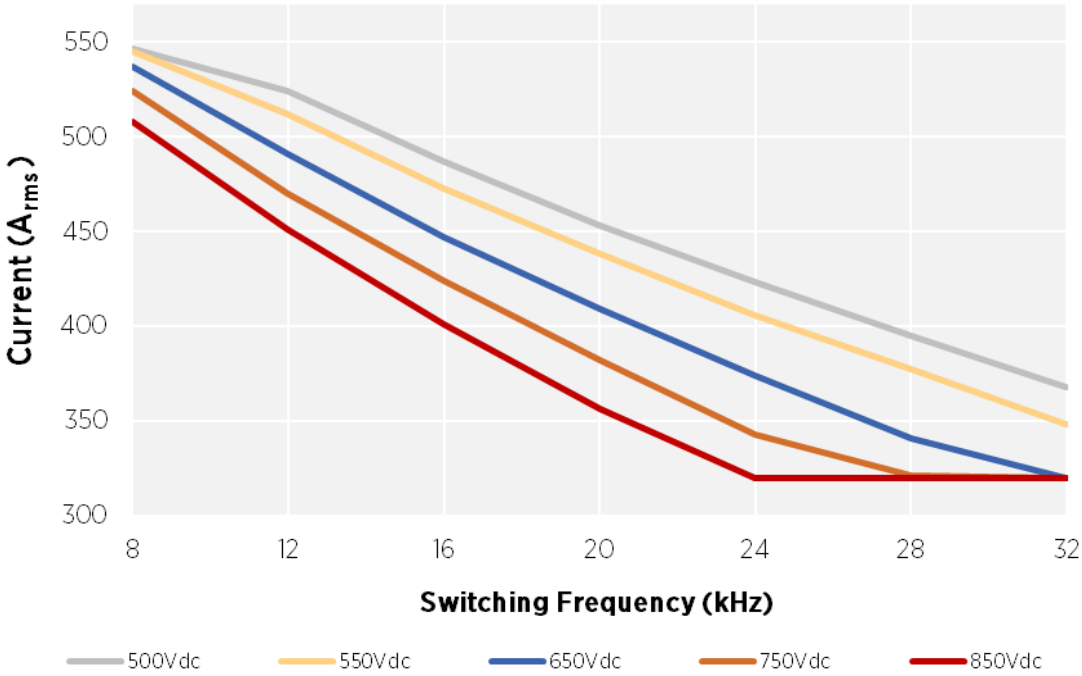

Peak Current vs Switching Frequency Map: 10s rating, 70°C Coolant @ 10L/min, Modulation Index = 1.0, Power Factor = 0.875

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