

2 x 4" 150W AC-DC Power Supplies

<https://product.tdk.com/en/power/cus-m>
www.emea.lambda.tdk.com/cus150m



The compact CUS150M is packaged in the industry standard 2x4" footprint. The series can deliver 150W with forced air in ambient temperatures of up to 50°C or 120W convection cooled at 40°C. Conduction cooled, the CUS150M can deliver 150W at 50°C, 100W at 70°C and 50W at 80°C. With Medical & ITE certifications, the unit can be used in both Class I & Class II (no ground wire) applications, and meets Class B Conducted and Radiated EMI. Enclosure options include baseplate, U channel, cover or top fan construction.

Features

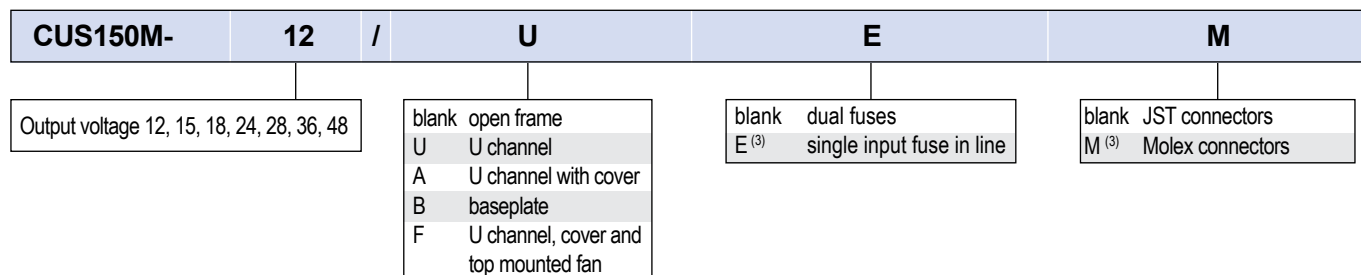
- Up to 150W Utilizing Convection or Conduction Cooling
- Operation in Ambient Temperatures of up to 85°C
- Medical Certifications (2 x MOPP)
- Class B Conducted and Radiated EMI
- Suitable for Class I and Class II installations
- Compact 2 x 4 x 1.24" Size
- Enclosure & Cooling Options

Benefits

- Quiet Operation
- Suitable for High Ambient Temperature Environments
- Suitable for B and BF Type Medical Equipment
- Easier System EMC Compliance
- Flexible Utilisation
- Space Saving in End Equipment
- Versatile Application

Model Selector

| Model | Nominal Output Voltage (V) | Factory Set ⁽¹⁾ Output Voltage Capability (V) | Fan Supply (V) | Maximum Current Convection (A) ⁽²⁾ | Maximum Current Forced Air (A) | Maximum Power Convection (W) ⁽²⁾ | Maximum Power Forced Air (W) |
|--------------------|----------------------------|--|----------------|---|--------------------------------|---|------------------------------|
| CUS150M-12 or /B | 12 | 12 - 13.2 | 11.6 | 10 | 12.5 | 120 | 150 |
| CUS150M-12/A or /U | 12 | 12 - 13.2 | 11.6 | 12.5 | 12.5 | 150 | 150 |
| CUS150M-12/F | 12 | 12 - 13.2 | 11.6 | 12.5 | Internal fan | 150 | Internal fan |
| CUS150M-15 or /B | 15 | 15 - 16.5 | 9.8 | 8 | 10 | 120 | 150 |
| CUS150M-15/A or /U | 15 | 15 - 16.5 | 9.8 | 10 | 10 | 150 | 150 |
| CUS150M-15/F | 15 | 15 - 16.5 | 9.8 | 10 | Internal fan | 150 | Internal fan |
| CUS150M-18 or /B | 18 | 18 - 19.8 | 11.6 | 6.66 | 8.33 | 120 | 150 |
| CUS150M-18/A or /U | 18 | 18 - 19.8 | 11.6 | 8.33 | 8.33 | 150 | 150 |
| CUS150M-18/F | 18 | 18 - 19.8 | 11.6 | 8.33 | Internal fan | 150 | Internal fan |
| CUS150M-24 or /B | 24 | 24 - 26.4 | 11.6 | 5 | 6.25 | 120 | 150 |
| CUS150M-24/A or /U | 24 | 24 - 26.4 | 11.6 | 6.25 | 6.25 | 150 | 150 |
| CUS150M-24/F | 24 | 24 - 26.4 | 11.6 | 6.25 | Internal fan | 150 | Internal fan |
| CUS150M-28 or /B | 28 | 28 - 30.8 | 10.8 | 4.28 | 5.35 | 120 | 150 |
| CUS150M-28/A or /U | 28 | 28 - 30.8 | 10.8 | 5.35 | 5.35 | 150 | 150 |
| CUS150M-28/F | 28 | 28 - 30.8 | 10.8 | 5.35 | Internal fan | 150 | Internal fan |
| CUS150M-36 or /B | 36 | 36 - 39.6 | 11.6 | 3.33 | 4.16 | 120 | 150 |
| CUS150M-36/A or /U | 36 | 36 - 39.6 | 11.6 | 4.16 | 4.16 | 150 | 150 |
| CUS150M-36/F | 36 | 36 - 39.6 | 11.6 | 4.16 | Internal fan | 150 | Internal fan |
| CUS150M-48 or /B | 48 | 48 - 50 | 11.6 | 2.5 | 3.12 | 120 | 150 |
| CUS150M-48/A or /U | 48 | 48 - 50 | 11.6 | 3.12 | 3.12 | 150 | 150 |
| CUS150M-48/F | 48 | 48 - 50 | 11.6 | 3.12 | Internal fan | 150 | Internal fan |



Examples: CUS150M-24/UE CUS150M-12V5/A.

| Specifications | | |
|---------------------------------------|---------|---|
| Model | CUS150M | |
| Input | | |
| Input Voltage range | Vac | 85 - 264 ⁽⁴⁾ |
| Input Frequency | Hz | 47 - 63 ⁽⁵⁾ |
| Input Current (100Vac) | A | 2.2 |
| Inrush Current at 230Vac (Cold Start) | A | <65 |
| Leakage Current | uA | <250 at 230Vac 63Hz |
| Touch Current (Enclosure Leakage) | uA | <100 |
| Power Factor (115/230Vac) | - | >0.98 / 0.92 (100% load) |
| Harmonic Compliance | - | Meets IEC61000-3-2 Class A, Class C >120W output |
| No Load Power Consumption | W | <0.5 (230Vac) |
| Hold Up Time | ms | >18 |
| Efficiency | % | Up to 94 |
| Average Efficiency | % | >91 Measured at 25%, 50%, 75% and 100% load conditions |
| Conducted & Radiated EMI | - | EN55032/EN55011-B (See application notes for conditions) |
| Immunity | - | Compliant with EN60601-1-2:2015 (Ed4), see immunity table |
| Insulation Class | - | Construction suitable for Class I or Class II installation |
| Safety Agency Certifications | - | IEC/EN/UL60950-1 and 60601-1. ES60601-1. IEC/EN/UL62368-1 Designed to meet IEC61010-1 EN60335-1 Compliant versions available (3). CE Mark (LVD, EMC and RoHS) |

| Immunity | | | | |
|--------------------------------------|---|------------------------|----------------------------|---|
| Test | Standard | Test Level | Criteria | Notes (the power stated below is total power (main power + fan output)) |
| ESD | EN61000-4-2 | 4 | A | - |
| Radiated Susceptibility | EN61000-4-3 | 3 | A | Includes proximity field requirements of EN60601-1-2:2015 |
| Electrical Fast Transient Burst | EN61000-4-4 | 4 | A | (AC Port, 5kHz and 100kHz) |
| Surge | EN61000-4-5 | 3 | A | - |
| Conducted Susceptibility | EN61000-4-6 | 3 | A | - |
| Magnetic fields | EN61000-4-8 | 4 | A | - |
| Voltage Dips and Input Interruptions | EN61000-4-11 Class 3 Industrial, incl EN55024 (100Vac) | 0% for 1/2 cycle | A | - |
| | | 0% for 1 cycle | A/B | A up to 125W, B above 125W |
| | | 40% for 10/12 cycles | B | - |
| | | 70% for 25/30 cycles | A | - |
| | | 80% for 250/300 cycles | A | - |
| | | 0% for 250/300 cycles | B | - |
| | EN61000-4-11 Class 3 Industrial, incl EN55024 (240Vac) | 0% for 1/2 cycle | A | - |
| | | 0% for 1 cycle | A/B | A up to 125W, B above 125W |
| | | 40% for 10/12 cycles | A/B | A up to 120W, B above 120W |
| | | 70% for 25/30 cycles | A | - |
| | | 80% for 250/300 cycles | A | - |
| | | 0% for 250/300 cycles | B | - |
| EN60601-1-2:2015 (100Vac) | 0% for 1/2 cycle | A | - | |
| | 0% for 1 cycle | A/B | A up to 125W, B above 125W | |
| | 70% for 25/30 cycles | A | - | |
| | 0% for 250/300 cycles | B | - | |
| EN60601-1-2:2015 (240Vac) | 0% for 1/2 cycle | A | - | |
| | 0% for 1 cycle | A/B | A up to 125W, B above 125W | |
| | 70% for 25/30 cycles | A | - | |
| | 0% for 250/300 cycles | B | - | |
| Ringwave Test | EN61000-4-12 | 3 | A | - |
| Voltage Fluctuations | EN61000-4-14 | Class 3 | A | - |
| SEMI F47 Line Dip | SEMI F47 | - | - | Consult factory |

| Specifications | | |
|--|--------|---|
| Model | | CUS150M |
| Output | | |
| Line Regulation | % | ≤0.5 (90 - 264VAC) |
| Load Regulation | % | ≤1 (0 - 100% load) |
| Ripple & Noise | % | <1 of nominal output for operating temperatures above 0°C At -20°C: 12V model <4, 15V & 18V model <3, other models <2 |
| Temperature Coefficient | %/°C | ±0.02 |
| Minimum Load | - | No minimum load required |
| Overcurrent Protection | % | 110 to 170. Hiccup mode, automatic recovery |
| Overvoltage Protection | - | 115-140% of standard output voltage for each model, 48V model max 60V. Latching (unit shutdown), cycle AC input to reset |
| Remote Sense | - | None |
| Fan Supply | - | 10 - 12V (see model selector), 0.5A, +14/-6% regulation |
| Parallel Operation | - | Not possible |
| Series Operation | - | No |
| Environmental | | |
| Operating Temperature (-25°C start-up) | °C | -20 to +85 (70 maximum for fan version /F), see derating curves below |
| Storage Temperature | °C | -40 to +85 (70 maximum for fan version /F) |
| Operating Humidity (non condensing) | %RH | 5 - 95 (15 - 90 for /F fan version) |
| Cooling | - | Convection, conduction or forced air cooling. See derating curves below |
| Altitude | m | 5,000 |
| Withstand Voltage (For 1 minute) | Vac | Input to Ground 1,500 (1xMOPP), Input to Output 4,000 (2xMOPP), Output to Ground 1,500 (1xMOPP) |
| Isolation Resistance | MΩ | >100 at 25°C, 70%RH & 500VDC |
| Vibration (non operating) | - | 2G, 10-500Hz for 1 hour |
| Shock (non operating) | - | 30G, 11ms half sine |
| Other | | |
| Weight | g | Open frame: 185, /A: 260, /B: 225, /F: 270, /U: 245 |
| Size (WxLxH) | mm | Open frame version: 50.8 x 101.6 x 31.5 |
| Size (WxLxH) | Inches | Open frame version: 2 x 4 x 1.24 |
| Connectors | - | Input: JST B2P3-VH, Output: JST B6P-VH, Fan: Molex 22-04-1021 |
| Warranty | yrs | 5 |

Notes:

See website for detailed specifications, test methods and installation manual.

Specification parameters apply at 25°C ambient temperature unless otherwise stated.

(1) Output voltage is factory set and not user adjustable. Not applicable for /F (internal fan) version.

Non-standard output versions may be subject to minimum order quantities and variations to specification. For all non-standard output voltage settings please consult Sales.

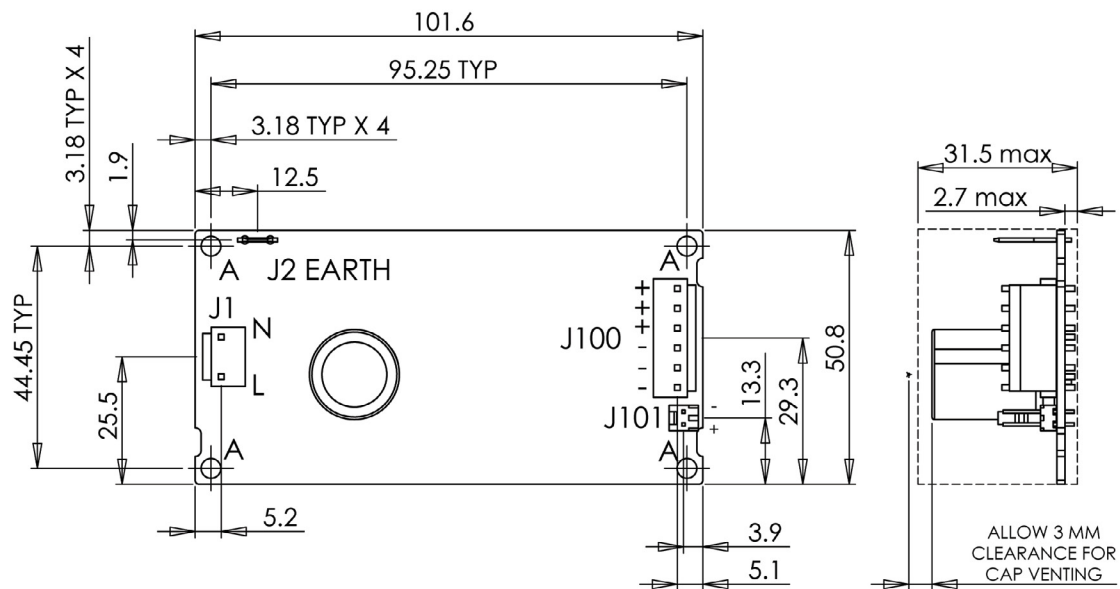
(2) Please see curves below for ambient temperature ratings.

(3) Subject to Minimum Order Quantities. Please contact Sales

(4) Derate linearly to 90% load from 90 to 85VAC input.

(5) For operation at 440Hz please consult Technical Sales.

Outline Drawing CUS150M Open Frame Unit



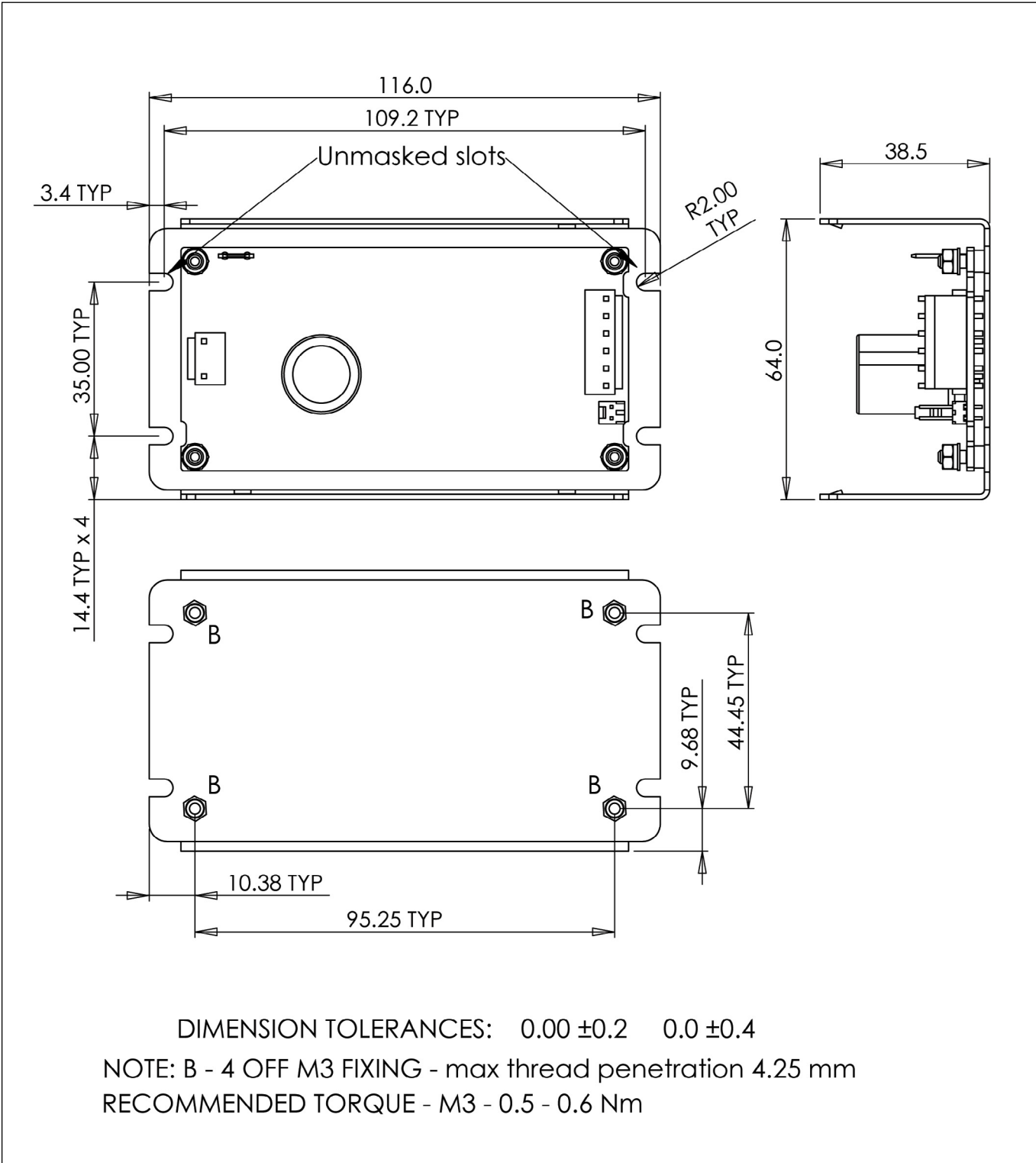
OPEN FRAME UNIT

DIMENSION TOLERANCES: 0.00 ±0.2 0.0 ±0.4
 (CONNECTOR PART NUMBERS ALSO IN APPLICATION NOTE)

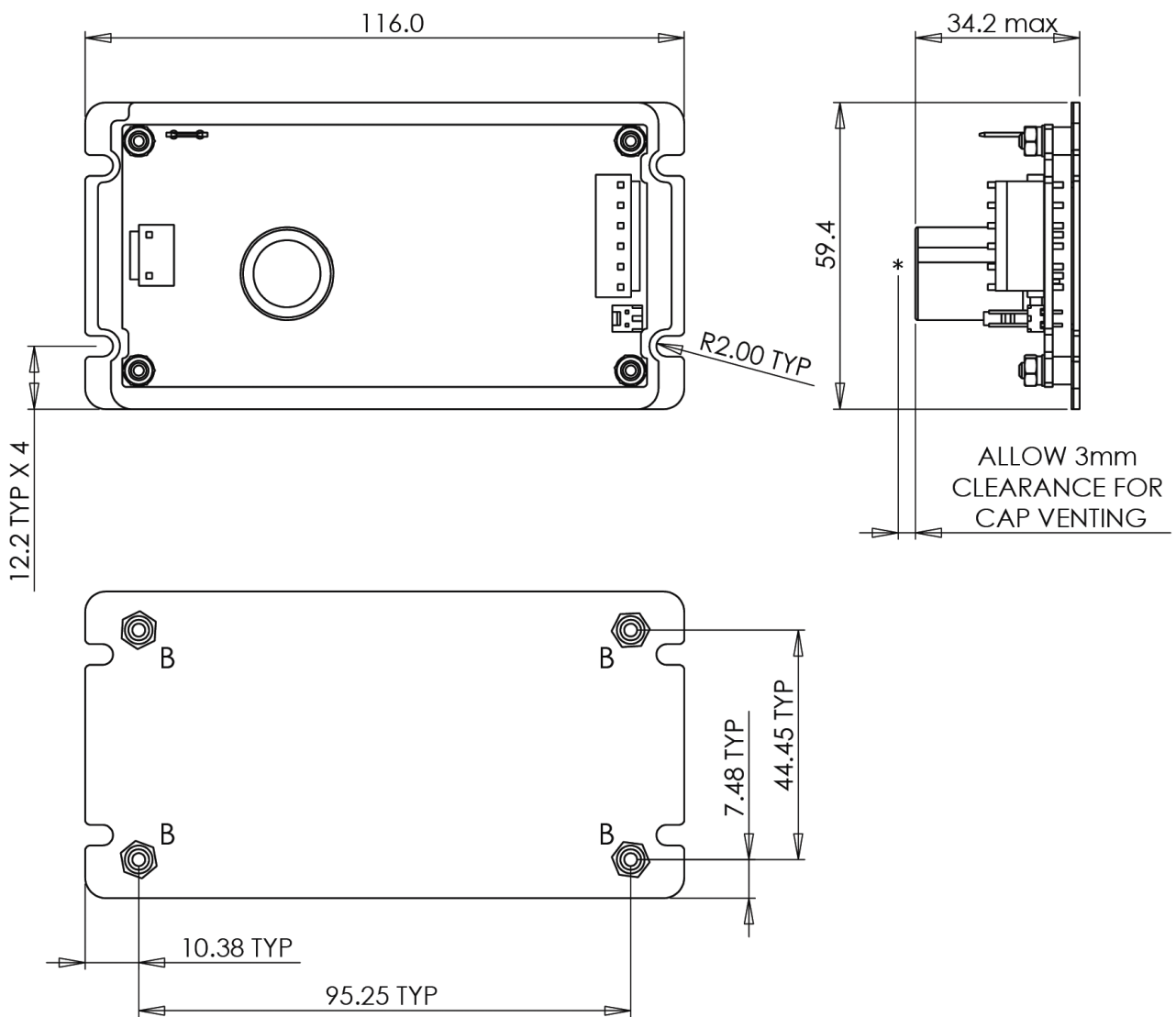
| REF DES | MANUFACTURER | CONNECTOR TYPE | MATING HOUSING | CRIMP |
|---------------|--------------|----------------|--|--|
| J1 | JST | B2P3-VH | VAR-2 | 20-18AWG - SVA-41T-P1.1 |
| J1 M-option | Molex | 10-63-4027 | 09-50-1031 | 08-70-1031 |
| J2 | Tyco | 62490 | 22-18AWG - 2-520407-2 16-14AWG - 3-520408-2 | 22-18AWG - 2-520407-2 16-14AWG - 2-520408-2 |
| J100 | JST | B6P-VH | VHR-6N | 22-18AWG - SVH-21T-P1.1 20-16AWG - SVH-41T-P1.1 |
| J100 M-option | Molex | 09-65-2068 | 09-50-1061 | 08-70-1031 |
| J101 | Molex | 22-04-1021 | 51191-0200 | Series 50802 |

NOTE:
 A - 4 OFF FIXING HOLES ø3.96 TO ACCOMMODATE M3 SCREWS

Outline Drawing CUS150M/U (U Channel) Option



Outline Drawing CUS150M/B (Baseplate) Option

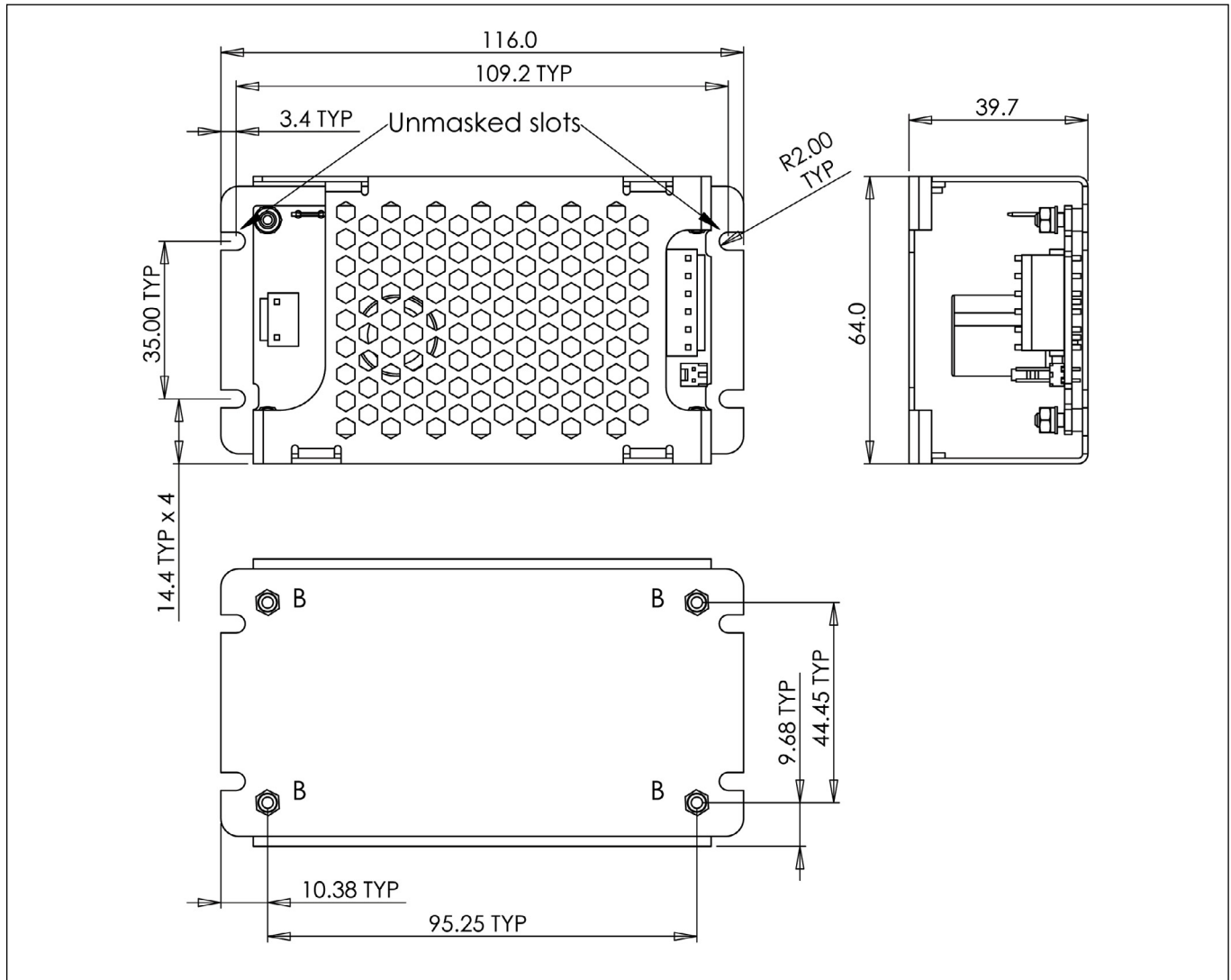


DIMENSION TOLERANCES: 0.00 ±0.2 0.0 ±0.4

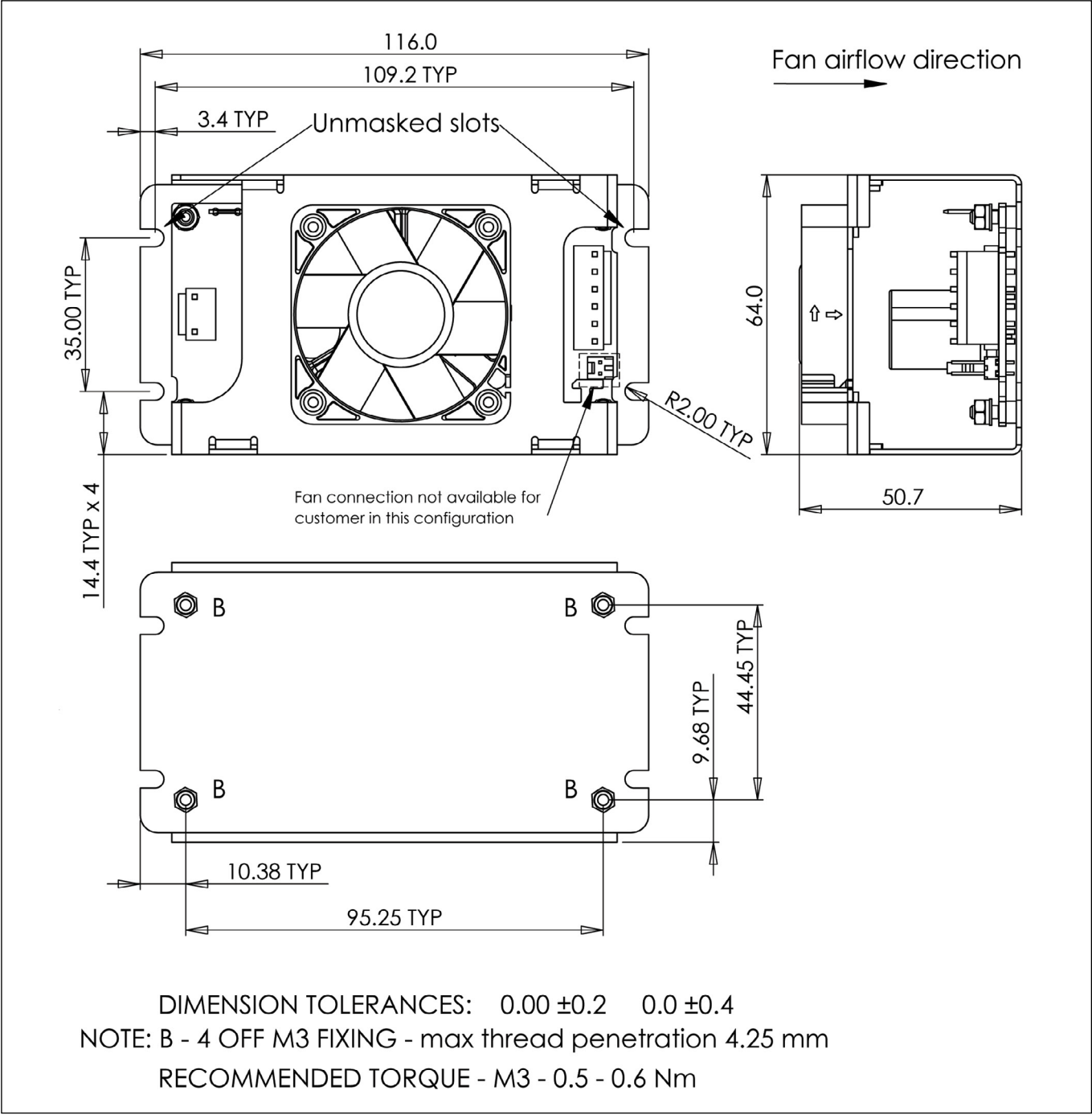
NOTE: B - 4 OFF M3 FIXING - max thread penetration 4.25 mm

RECOMMENDED TORQUE - M3 - 0.5 - 0.6 Nm

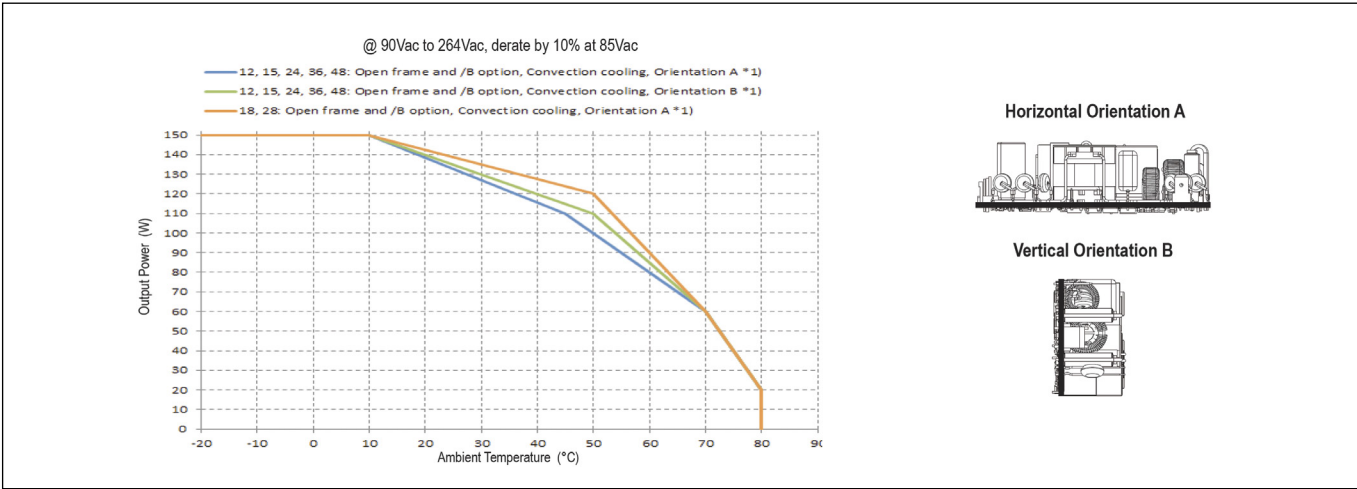
Outline Drawing CUS150M/A (U Channel with Cover) Option



Outline Drawing CUS150M/F (U Channel with Cover & Top Mounted Fan) Option

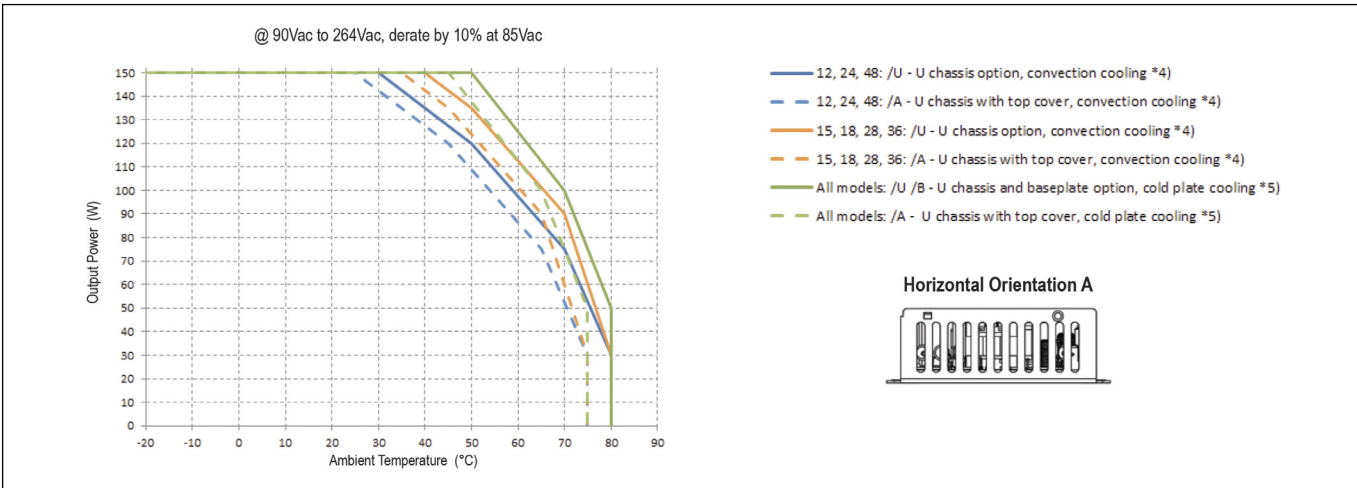


Output Power vs Ambient Temperature (Open Frame & /B Units)



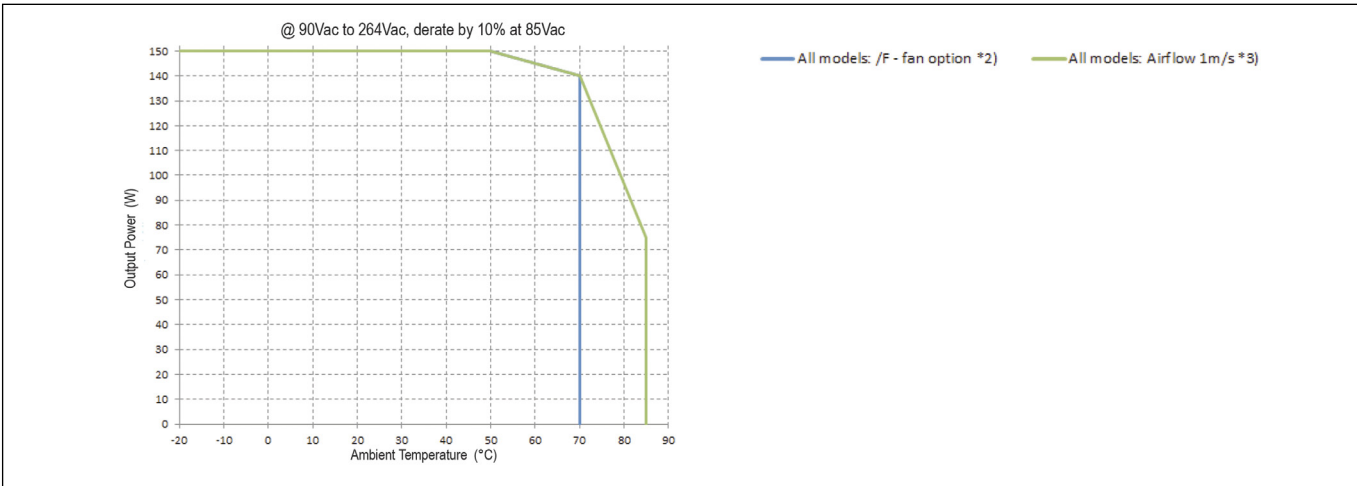
Note (*1) 50mm above surface, see instruction manual for maximum component temperatures.

Output Power vs Ambient Temperature (/U and /A versions)



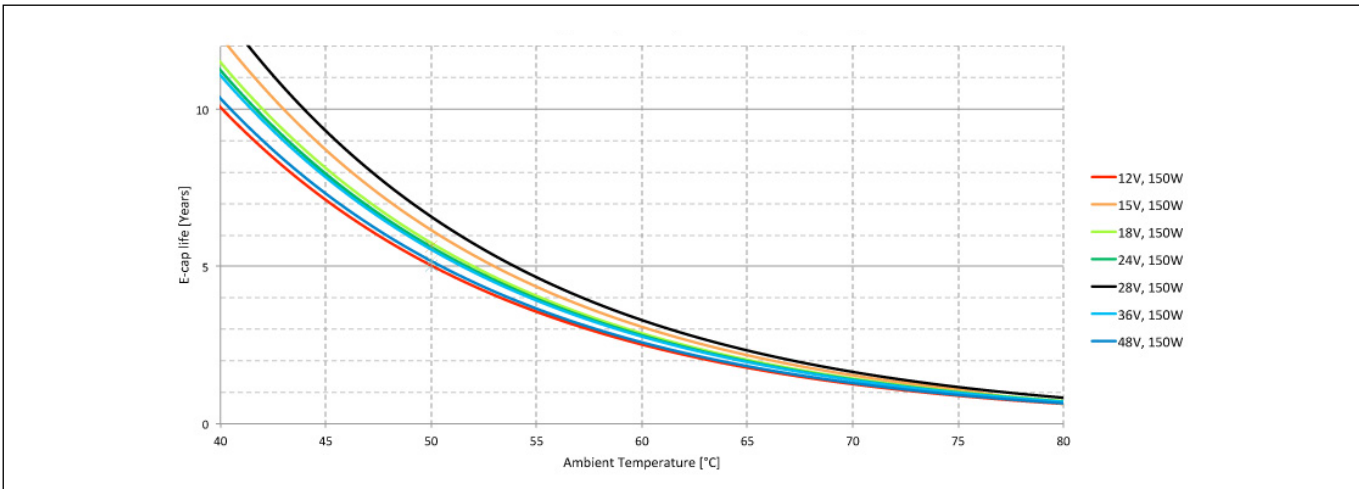
Note (*4) 50mm above surface, orientation A, no additional cold plate. See application note.
 Note (*5) U chassis or Baseplate fixed on a cold plate (system chassis). See application note.

Output Power vs Ambient Temperature (/F version and Open Frame with Airflow)



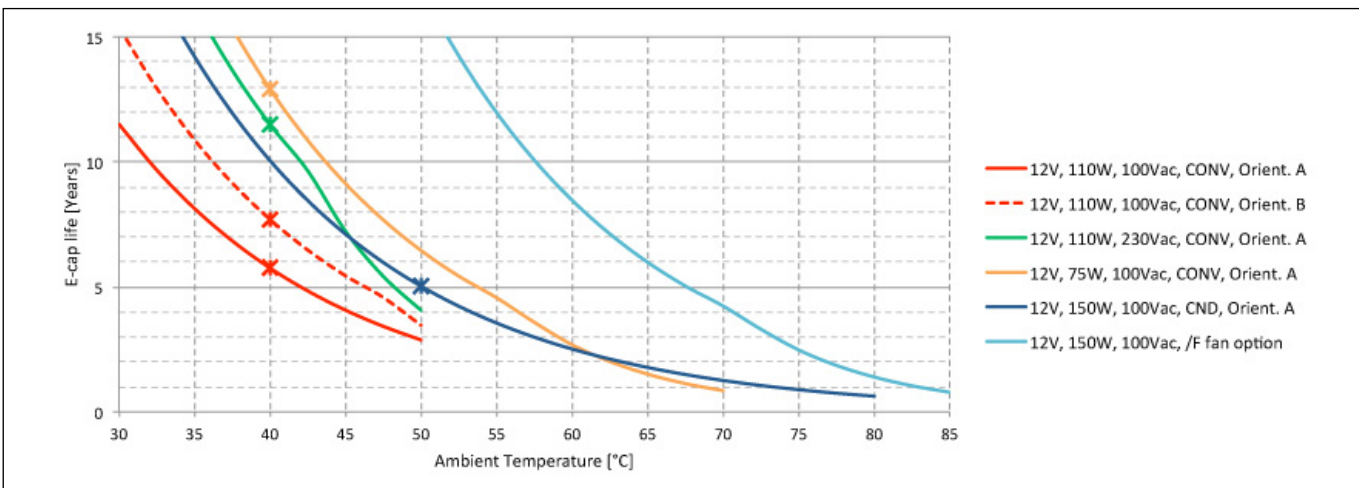
Note (*2) Limited by fan specification to maximum of 70°C. Note (*3) See application note.

CUS150M E-Cap Life vs Ambient Temperature



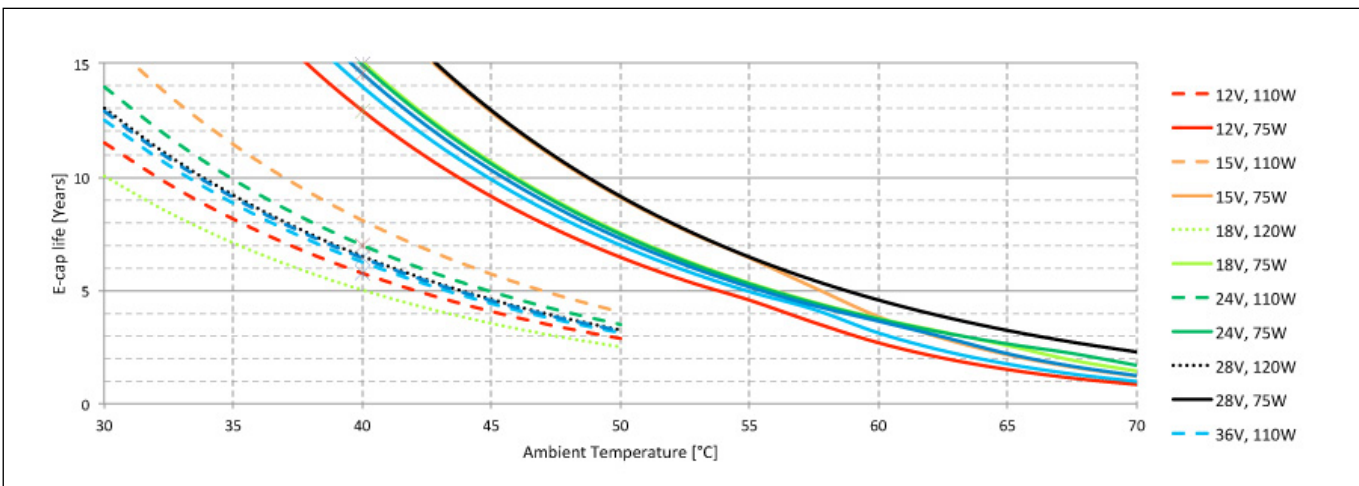
All models: Conduction cooling 150W, 100Vac, measured at 50°C, other points are calculated

CUS150M E-Cap Life vs Ambient Temperature 12V model: Additional Cooling Options

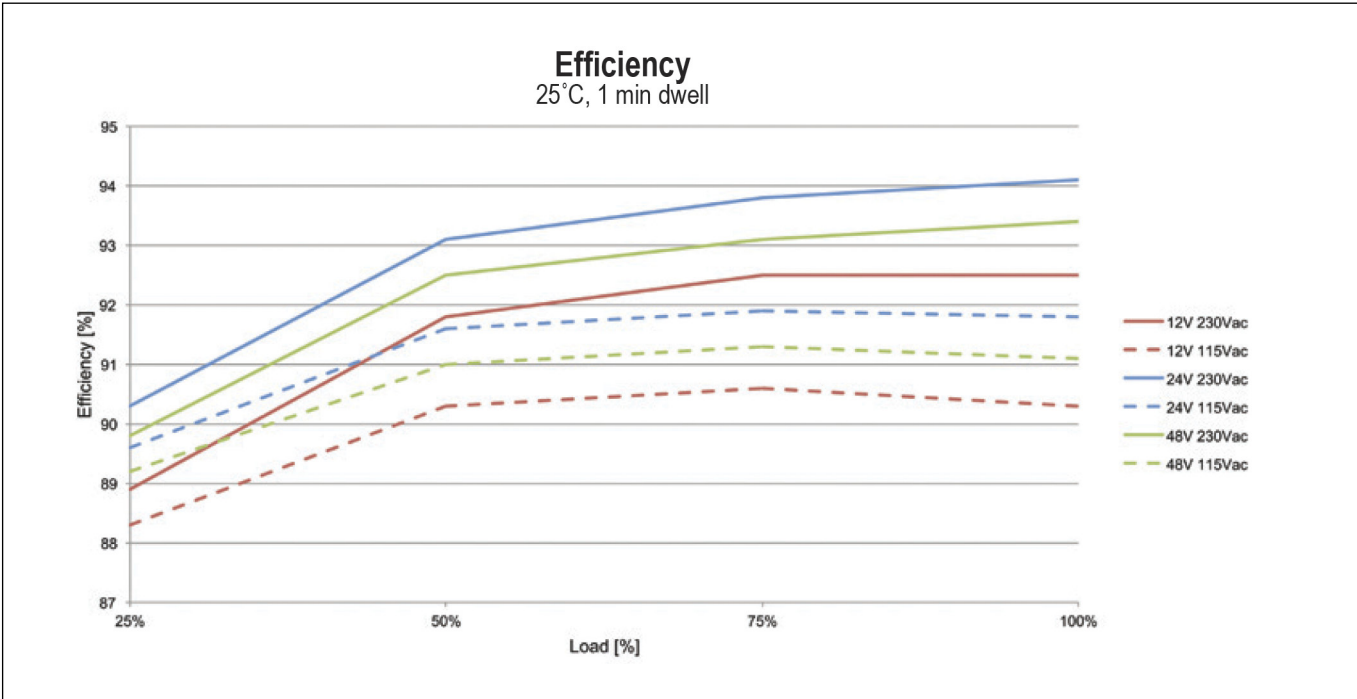


Notes: CONV: Convection Cooling, CND: Conduction Cooling

CUS150M E-Cap Life vs Ambient Temperature 12, 15, 24, 36, 48: conv 110W, 75W, 18, 28: conv 120W, 75W



CUS150M Efficiency Graph



Critical component maximum allowable temperature table

| Circuit reference | Description | Maximum temperature (°C) |
|----------------------|-------------------------|--------------------------|
| 1 | Common mode choke | 110 (130) |
| L2 | PFC choke | 125 (130) |
| L3 | Differential mode choke | 125 (130) |
| C1 | Film capacitor | 105 |
| C2, C110 | Electrolytic capacitors | 86 (105) |
| C6, C102, C104, C105 | Electrolytic capacitors | 92 (105) |
| C3 | X capacitor | 100 |
| C5, C100, C101, C103 | Y capacitor | 105 |
| TX100 | Transformer winding | 110 |
| XU101, XU102 | Opto-coupler | 100 (110) |
| XD8 | Diode | 130 |
| J1 | Input connector | 105 |
| J100 | Output connector | 105 |



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