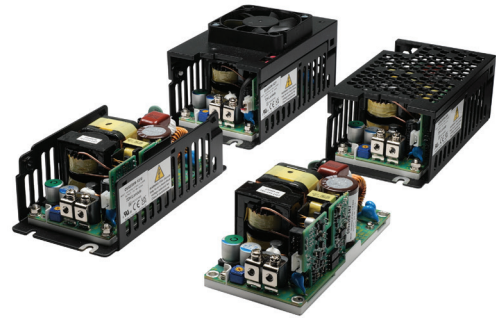
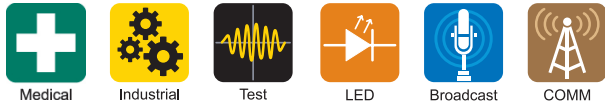


## 2 x 4" 250W AC-DC Power Supplies

<https://product.tdk.com/en/power/cus-m>  
[www.emea.lambda.tdk.com/cus250m](http://www.emea.lambda.tdk.com/cus250m)



The compact CUS250M is packaged in the industry standard 2x4" footprint. The series can deliver 250W with forced air or conduction cooling in ambient temperatures of up to 50°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 with generous margins. Options include a 5V standby voltage, remote on/off, DC\_OK and AC\_Fail signals, with a U channel, cover or top fan mechanical construction.

| Features  | Benefits   |
|---|--|
| • Up to 250W Utilizing Convection and Conduction Cooling      | • Quiet Operation  |
| • Operation in Ambient Temperatures of up to 85°C             | • Suitable for High Ambient Temperature Environments       |
| • Medical Certifications (2 x MOPP)                           | • Suitable for B and BF Type Medical Equipment             |
| • Class B Conducted and Radiated EMI with Significant Margins | • Easier System EMC Compliance                             |
| • Suitable for Class I and Class II installations             | • Flexible Utilisation                                     |
| • Compact 2 x 4 x 1.56" / 50.8 x 101.6 x 39.5mm Size          | • Space Saving in End Equipment                            |
| • Enclosure & Cooling Options                                 | • Versatile Application                                    |
| • EN60335-1 Compliant   | • Suitable for Household and Similar Electrical Appliances |

| Model Selector |                            |                                      |                |                                |                              |
|----------------|----------------------------|--------------------------------------|----------------|--------------------------------|------------------------------|
| Model          | Nominal Output Voltage (V) | Output Adjustment <sup>(1)</sup> (V) | Fan Supply (V) | Maximum Current Forced Air (A) | Maximum Power Forced Air (W) |
| CUS250M-12     | 12                         | 12 - 13.2                            | 11.4           | 20.83                          | 250                          |
| CUS250M-15     | 15                         | 15 - 16.5                            | 11.4           | 16.66                          | 250                          |
| CUS250M-18     | 18                         | 18 - 19.8                            | 11.4           | 13.88                          | 250                          |
| CUS250M-24     | 24                         | 24 - 26.4                            | 11.4           | 10.41                          | 250                          |
| CUS250M-28     | 28                         | 28 - 30.8                            | 11.4           | 8.92                           | 250                          |
| CUS250M-36     | 36                         | 36 - 39.6                            | 11.4           | 6.94                           | 250                          |
| CUS250M-48     | 48                         | 48 - 52.8                            | 11.4           | 5.2                            | 250                          |

Contact Factory for availability - expected Q2 2023

| CUS250M-   | 12 | / | U   | M | -  | J |
|--|----|---|---|---|--|---|
| Output voltage 12, 15, 18, 24, 28, 36, 48  |    |   | blank JST connectors<br>M <sup>(2)</sup> Molex type input connectors  |   | blank Dual fuses<br>E <sup>(2)</sup> Single input fuse in line |   |
| blank Open frame (with integral baseplate)<br>U U channel<br>A U channel with cover<br>F U channel, cover and top mounted fan<br>C M3 inserts for underside mounting |    |   | blank No options<br>G 5V 0.1A standby supply, remote on/off (enable), DC_OK, AC_Fail<br>J 5V 0.1A standby supply, remote on/off (inhibit), DC_OK, AC_Fail |   |  |   |

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 user adjustable or can be factory set.  
 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) Subject to Minimum Order Quantities. Please contact Sales

| Specifications                        |     |  |
|---------------------------------------|-----|--|
| Model                                 |     | CUS250M  |
| <b>Input</b>                          |     |  |
| Input Voltage range                   | Vac | 85 - 264 <sup>(3)</sup>  |
| Input Frequency                       | Hz  | 47 - 63 <sup>(4)</sup>   |
| Input Current (100Vac)                | A   | 3.2  |
| Inrush Current at 230Vac (Cold Start) | A   | <75. Note: the inrush I <sup>2</sup> t is significantly below the rating of the internal 5A fast acting fuse, or an external circuit breaker |
| Leakage Current                       | uA  | <150 at 264Vac 63Hz  |
| Touch Current (Enclosure Leakage)     | uA  | Class I: <10, Class II: <70, at 264Vac 63Hz  |
| Power Factor (115/230Vac)             | -   | >0.9 / >0.7 (>20% load)  |
| Harmonic Compliance                   | -   | Meets IEC61000-3-2 Class A   |
| No Load Power Consumption             | W   | <0.5 (230Vac) when output is inhibited   |
| Hold Up Time                          | ms  | >14  |
| 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 (Edition 4), see immunity table  |
| Insulation Class                      | -   | Construction suitable for Class I or Class II installation   |
| Safety Certifications and Markings    | -   | IEC/ES/EN60601-1, IEC/UL/EN62368-1, 60950-1.<br>Compliant to IEC/EN60335-1 and IEC/EN61010-1, CE Mark and UKCA Mark                          |

Notes:

(3) Derate output power linearly to 225W load from 100 to 90Vac input and to 200W from 90 to 85Vac input

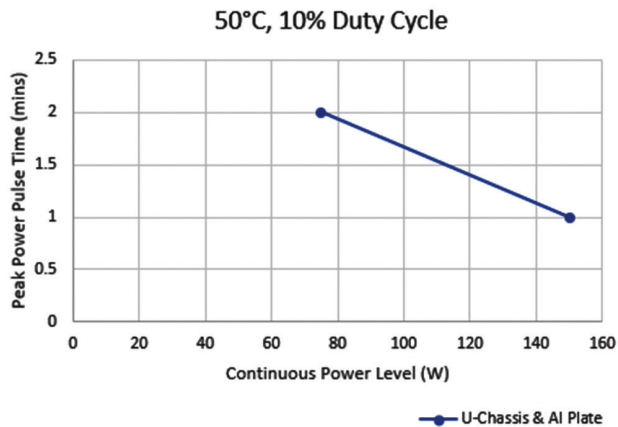
(4) For operation at 440Hz please consult Technical Sales.

| Immunity  |  |          |   |
|---|--|----------|---|
| Test  | Test   | UOM      | Level & Criteria                                    |
| IEC61000-4-2 (ESD)                                    | Enclosure Port   | Lvl      | Level 4, Criteria A                                 |
|   | AC Port  | Lvl      | Level 4, Criteria A                                 |
|   | CH1 and Standby  | Lvl      | Level 3, Criteria A                                 |
|   | Signal I/O Port (Remote On/Off, AC_FAIL, DC_OK)                | Lvl      | Level 3, Criteria A                                 |
| IEC61000-4-3<br>(Radiated Immunity)                   | 80 MHz to 2.7 GHz  | V/m      | 10 (Level 3, Criteria A)                            |
|   | 2.7 GHz to 6 GHz   | V/m      | 10 (Level 3, Criteria A)                            |
| EN 60601-1-2:2015<br>(Radiated Immunity)              | Immunity to RF Wireless Communications Equipment<br>(Table 9)  | -        | All Criteria, Criteria A                            |
| CISPR 35  | 1.8 GHz to 5 GHz   | V/m      | 3 (Table 1, condition 1.3 requirements, Criteria A) |
| IEC 61204-3: 2000                                     | 900 MHz (Keyed Carrier)  | V/m      | 3 (Criteria A)                                      |
| IEC61000-4-4<br><br>(Electrical Fast Transient Burst) | AC Port  | kV       | 4 (Level 4, Criteria A)                             |
|   | CH1  | kV       | 2 (Level 4, Criteria A)                             |
|   | Fan Out, Standby   | kV       | N/A   |
|   | Signal I/O Port (Remote On/Off, AC_FAIL, DC_OK)                | kV       | 2 (Level 4, Criteria A)                             |
| IEC61000-4-5 (Surge)                                  | (AC input common mode)   | kV       | 2 (Level 3, Criteria A)                             |
|   | (AC input normal mode)   | kV       | 1 (Level 3, Criteria A)                             |
| IEC61000-4-6<br>(Conducted Susceptibility)            | (AC input common mode)   | V        | 10 (Level 3, Criteria A)                            |
|   | (DC output common mode)  | V        | 10 (Level 3, Criteria A)                            |
|   | (Fan Out, Standby common mode)                                 | V        | N/A   |
|   | (Signal I/O common mode)                                       | V        | N/A   |
| IEC61000-4-8<br>(Power Frequency Mag. Field)          |  | A/m      | (Level 4, Criteria A)                               |
| IEC61000-4-11<br>(Voltage dips / Interruption)        | When exited factory (Bulk cap life degradation not considered) | -        | Class 3   |
|   | 0% for 0.5 cycle   | Criteria | A   |
|   | 0% for 1 cycle   | Criteria | A ≤175W, B >175W                                    |
|   | 40% for 10/12 cycles   | Criteria | 100Vac: A ≤50W, B >50W; 220Vac: A                   |
|   | 70% for 25/30 cycles   | Criteria | 100Vac: A ≤150W, B >150W; 220Vac: A                 |
| IEC61000-4-11<br>(Voltage dips / Interruption)        | 80% for 250/300 cycles   | Criteria | 100Vac: A ≤200W, B >200W; 220Vac: A                 |
|   | 0% for 250/300 cycles  | Criteria | B   |
|   | When exited factory (Bulk cap life degradation not considered) | -        | -   |
|   | 0% for 0.5 cycle   | Criteria | A   |
|   | 0% for 1 cycle   | Criteria | A ≤175W, B >175W                                    |
| IEC61000-6-2<br>(Voltage dips / Interruption)         | 70% for 25/30 cycles   | Criteria | 100Vac: A ≤150W, B >150W; 220Vac: A                 |
|   | 0% for 250/300 cycles  | Criteria | B   |
|   | 0% for 1 cycle   | Criteria | B   |
|   | 40% for 10/12 cycles   | Criteria | C   |
|   | 70% for 25/30 cycles   | Criteria | C   |
| IEC61204-3<br>(Voltage dips / Interruption)           | 0% for 250/300 cycles  | Criteria | C   |
|   | 30% for 10 ms  | Criteria | B   |
|   | 60% for 100 ms   | Criteria | 100Vac: A ≤70W, B >70W; 220Vac: A                   |
| SEMI F47  | 95% for 5000 ms  | Criteria | C   |
|   | 50% for 0.2 s  | Criteria | 170Vac: A ≤240W, B >240W; 220Vac: A                 |
|   | 70% for 0.5 s  | Criteria | A   |
|   | 80% for 1s   | Criteria | A   |
| IEC61000-4-12 (Ringwave Test)                         |  | -        | (Level 3, Criteria A)                               |
| EN61000-4-14 (Voltage Fluctuations)                   |  | -        | Class 3, Criteria A                                 |

| Specifications                         |        |  |
|--|--------|--|
| Model                                  |        | CUS250M  |
| <b>Output</b>                          |        |  |
| Line Regulation                        | %      | <0.5 (85 - 264Vac)   |
| Load Regulation                        | %      | <1 (0 - 100% load)   |
| External Load Capacitance              | µF     | 12V: 20,830, 15V: 16,660, 18V: 9,440, 24V: 2,290, 28V: 4,460, 36V: 3,470, 48V: 1,300   |
| Ripple & Noise                         | %      | <1 of nominal output for operating temperatures above 0°C<br>12V model: <2, other voltages: <1.5 at -20°C. <2 in burst mode when the load is <10% of the rated current<br>External load capacitance will reduce the amplitude. |
| 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<br>Latching (unit shutdown), cycle AC input or use remote on/off to reset  |
| Overtemperature Protection             | -      | Latching, cycle AC or use remote on/off to reset   |
| Remote Sense                           | -      | None   |
| Remote On/Off                          | -      | Opto-isolated. Inhibit: High = OFF, Low = ON, Enable: High = ON, Low = OFF   |
| Standby Voltage                        |        | 5V 0.1A  |
| Fan Supply                             | -      | 11.4V 0.5A   |
| Parallel Operation                     | -      | Not possible   |
| Series Operation                       | -      | Please contact Technical Sales for guidance  |
| <b>Environmental</b>                   |        |  |
| Operating Temperature (-40°C start-up) | °C     | -20 to +85 with system forced air cooling (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)  |
| Pollution Degree                       | -      | PD2 Material group IIIb  |
| 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  |
| <b>Other</b>                           |        |  |
| Weight                                 | g      | Open frame: 275, /A: 320, /C: 275, /F: 345, /U: 305  |
| Size (WxLxH)                           | mm     | Open frame : 50.8 x 101.6 x 39.5   |
|  |        | U channel : 64 x 119.2 x 39.5  |
|  |        | Cover (/A) : 64 x 119.2 x 43   |
|  |        | Fan (/F) : 64 x 119.2 x 60.6   |
| Size (WxLxH)                           | Inches | Open frame: 2 x 4 x 1.56   |
|  |        | U channel : 2.52 x 4.69 x 1.56   |
|  |        | Cover (/A) : 2.52 x 4.69 x 1.69  |
|  |        | Fan (/F) : 2.52 x 4.69 x 2.39  |
| Connectors                             | -      | Input: JST B2P3-VH, Output: M3 screw, Fan: Molex 22-05-7025, Signals: Molex 87833-0833   |
| Warranty                               | yrs    | 5  |

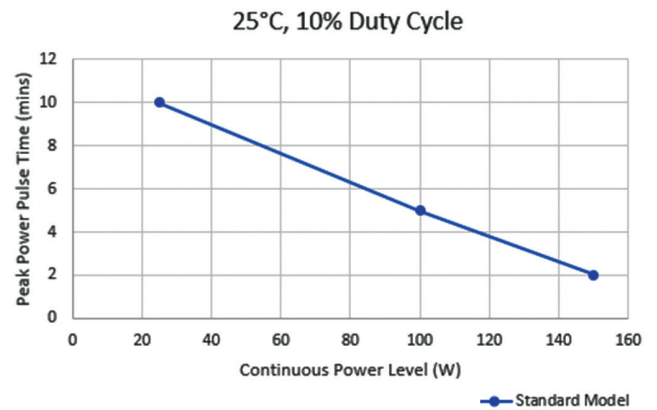
## Peak Power Rating Curves

U chassis configuration, convection cooled  
on metal baseplate



## Peak Power Rating Curves

Open frame configuration, convection cooled  
(no metal baseplate)

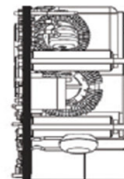


## Orientation

Horizontal Orientation A



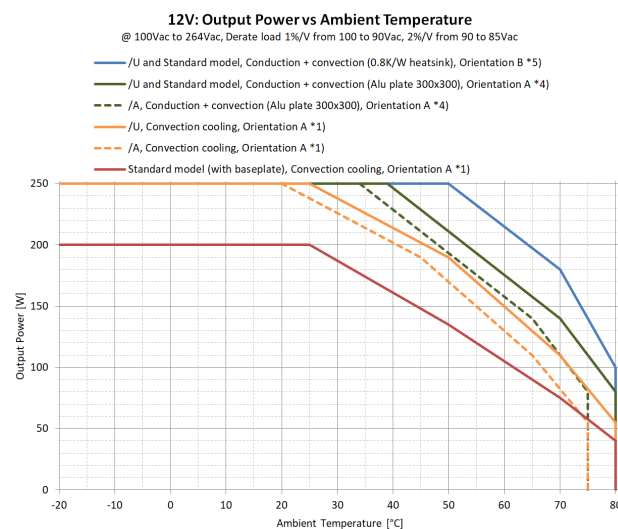
Vertical Orientation B



Notes:  
See website for detailed specifications, test methods and installation manual.  
Specification parameters apply at 25°C ambient temperature unless otherwise stated.

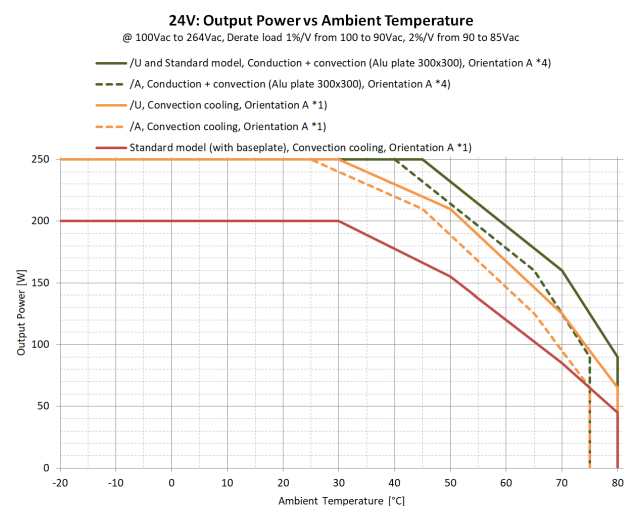
## Output Power vs Ambient Temperature

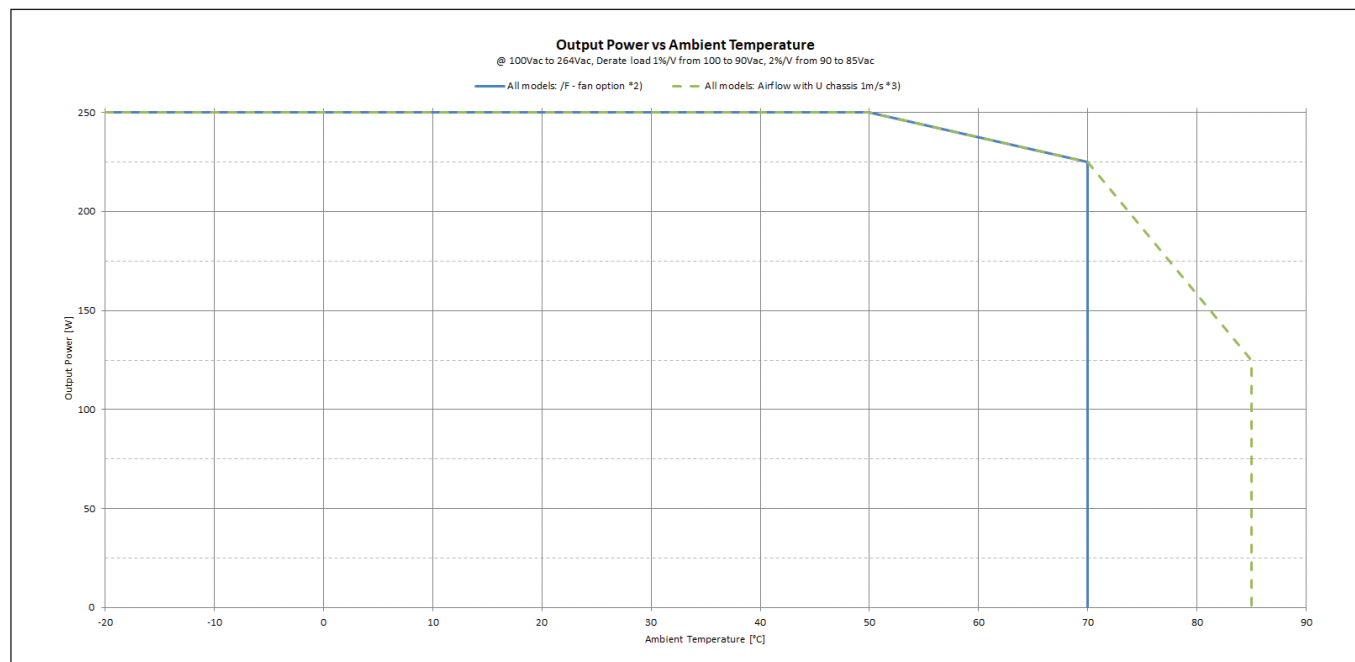
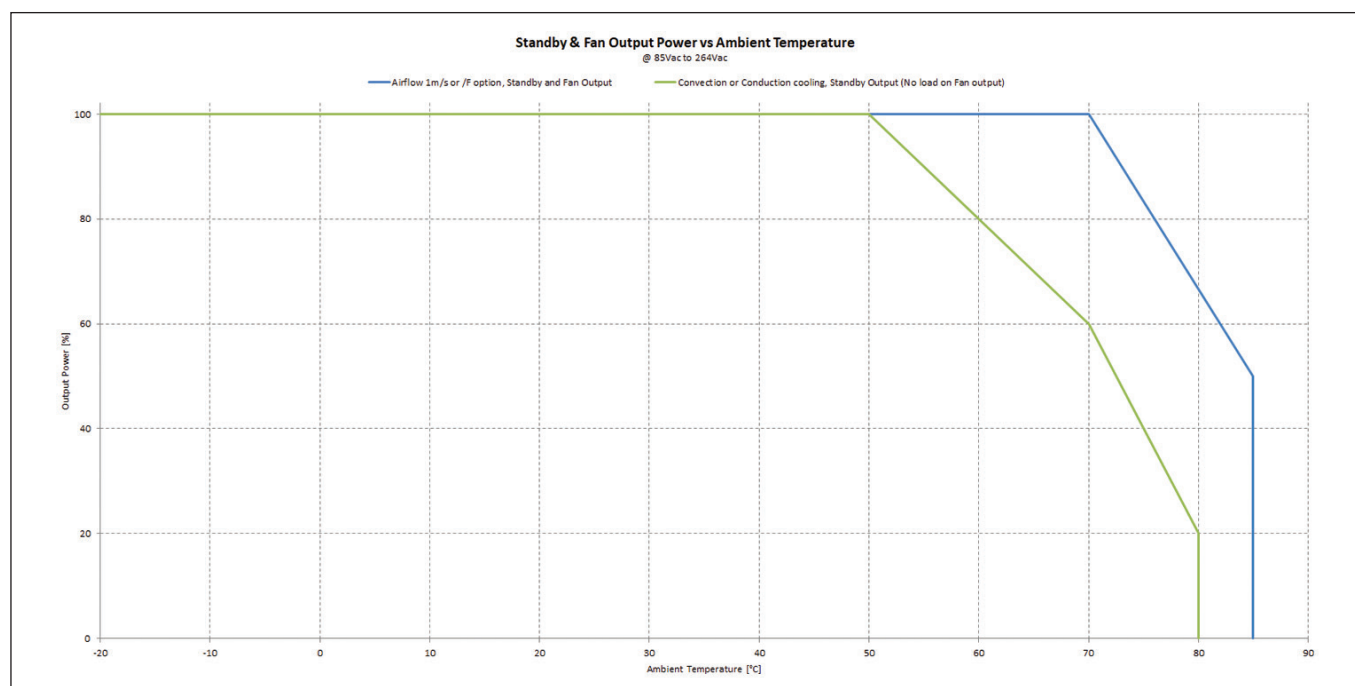
### Conduction/convection cooled CUS250M-12



## Output Power vs Ambient Temperature

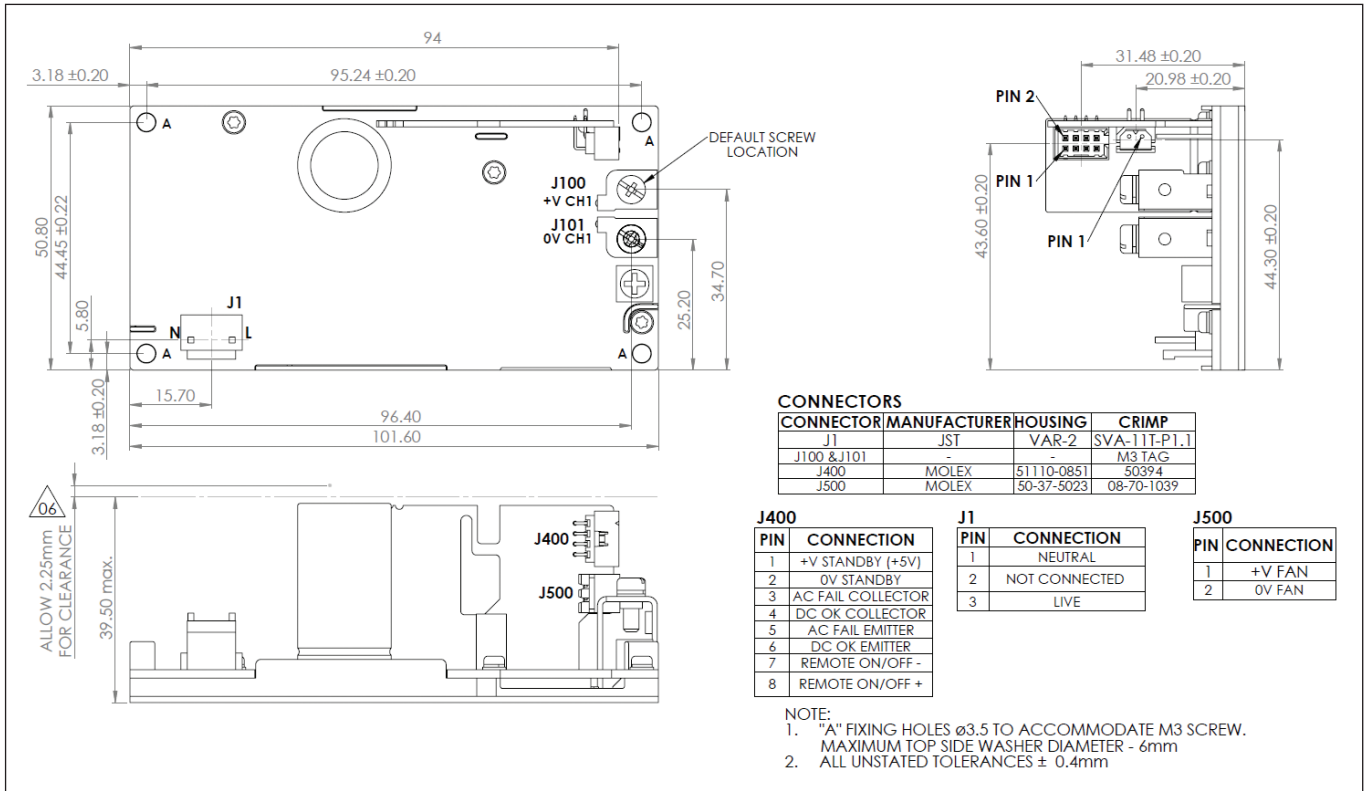
### Conduction/convection cooled CUS250M-24



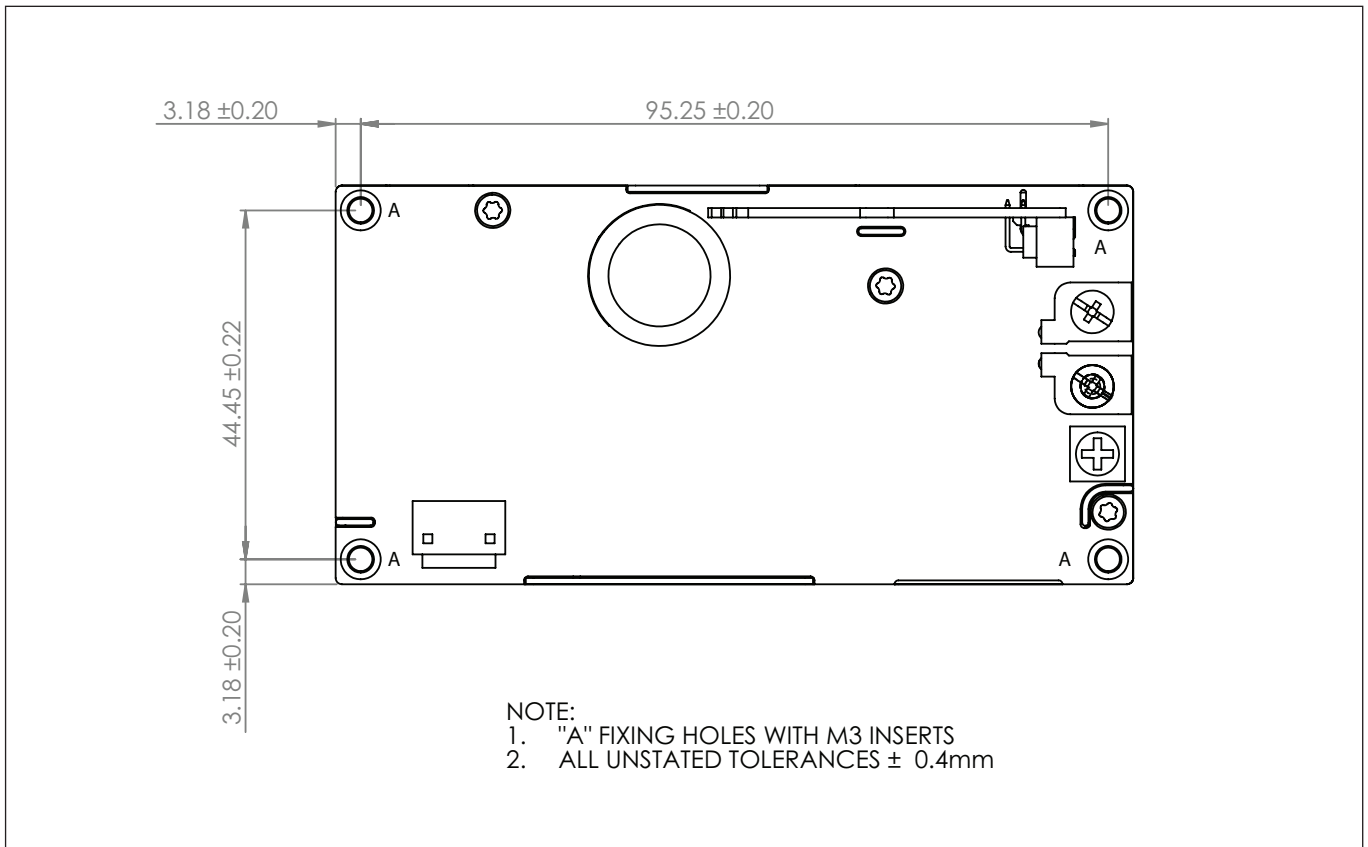
**Output Power vs Ambient Temperature (forced air cooled) all CUS250M voltages**

**Standby and Fan Output Power vs Ambient Temperature**

**Notes**

- 1: Orientation A (see Application Note), 50mm above surface.  
Standby output is loaded (see derating curves for Standby output), no load on Fan output
- 2: 50mm above surface. Limited by fan specification to 70°C maximum
- 3: Tested with U chassis with airflow direction 1 (see Application Note).  
Customer to ensure airflow rate and direction to keep components temperature below the limits.  
Standby and Fan output load according to derating curves.  
Measured in wind tunnel with 5mm space on side of U chassis.
- 4: Mounted on natural aluminium plate, 300x300x1mm lifted 50mm above other surfaces  
Orientation A (see Application Note)  
Standby output is loaded (see derating curves for Standby output), no load on Fan output

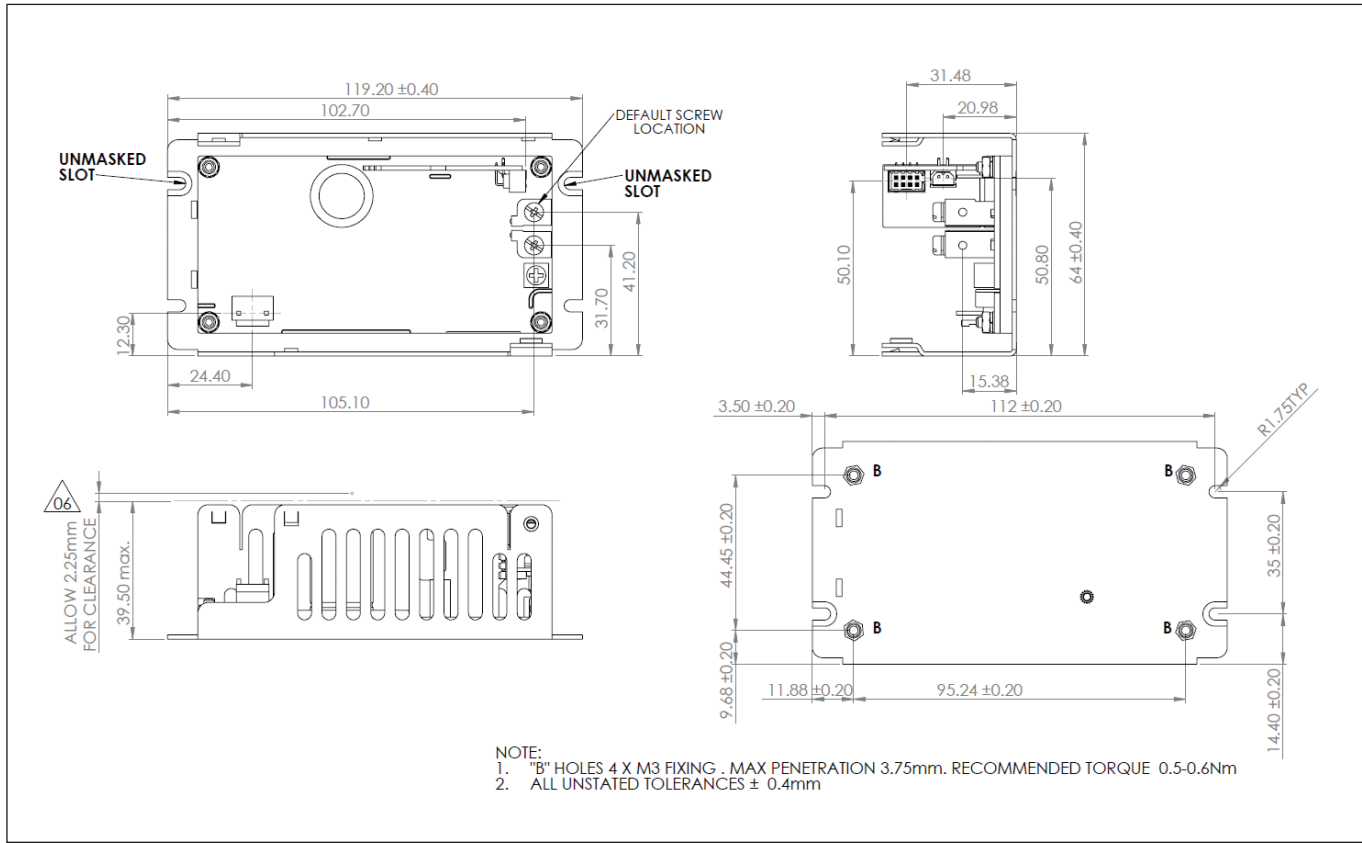
## Outline Drawing CUS250M Open Frame Unit (Integral baseplate)



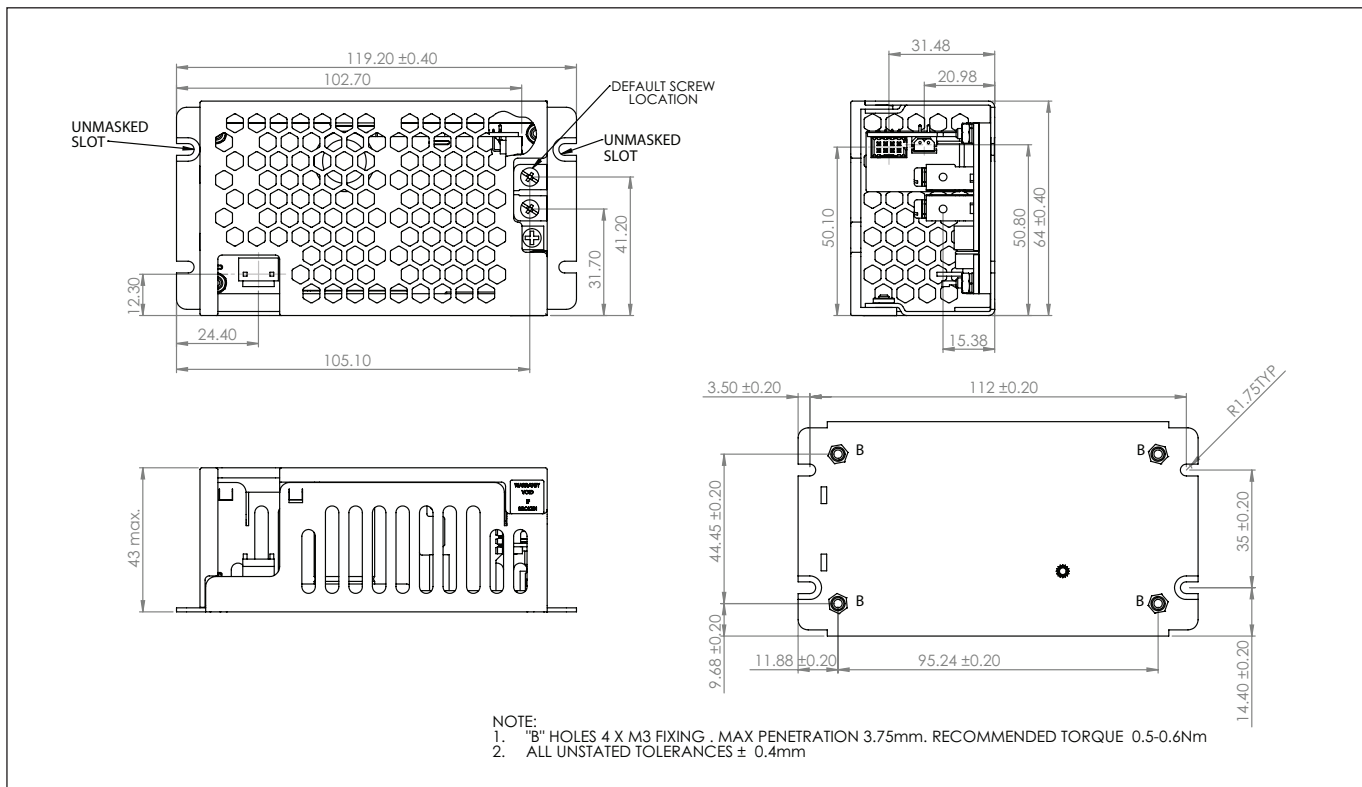
## Outline Drawing CUS250M/C Open Frame Unit with inserts (Integral baseplate)



### Outline Drawing CUS250M/U (U Channel) Option

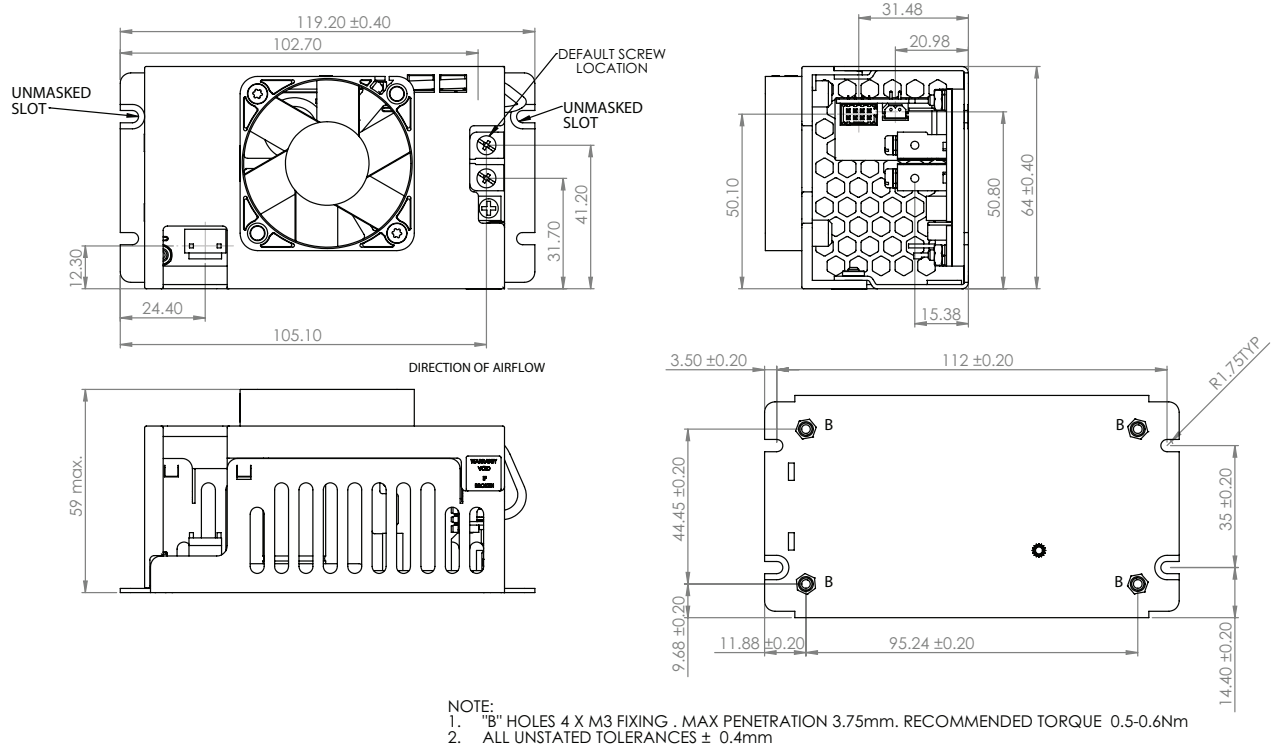


### Outline Drawing CUS250M/A (U Channel with Cover) Option





## Outline Drawing CUS250M/F (U Channel with Cover & Top Mounted Fan) Option



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[CUS250M-12/UJ](#) [CUS250M-24](#) [CUS250M-24/A](#) [CUS250M-24/AJ](#) [CUS250M-24/F](#) [CUS250M-24/FJ](#) [CUS250M-](#)  
[24/J](#) [CUS250M-24/U](#) [CUS250M-24/UJ](#)