

SERIES: PSK-5D | **DESCRIPTION:** INTERNAL AC-DC POWER SUPPLY

FEATURES

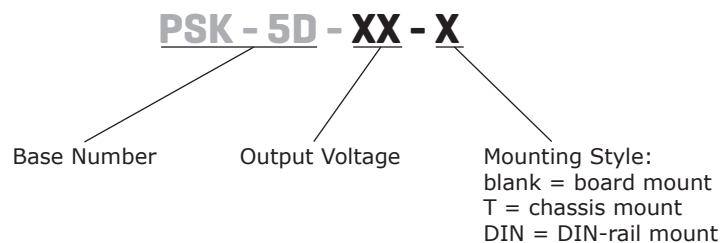
- wide input range (85 ~ 305 Vac)
- wide operating temperature range (-40 to +85 C)
- Class B emissions
- certified to 62368, 61558, and 60335 safety standards
- over voltage, over current, short circuit protections
- compact 1 x 1 inch encapsulated package



| MODEL | output voltage | output current max | output power max | ripple and noise ¹ max | efficiency ² typ |
|-----------|----------------|--------------------|------------------|-----------------------------------|-----------------------------|
| | (Vdc) | (A) | (W) | (mVp-p) | (%) |
| PSK-5D-3 | 3.3 | 1.515 | 5 | 100 | 71.5 |
| PSK-5D-5 | 5 | 1.0 | 5 | 100 | 77.5 |
| PSK-5D-9 | 9 | 0.555 | 5 | 100 | 80.5 |
| PSK-5D-12 | 12 | 0.416 | 5 | 100 | 80.5 |
| PSK-5D-15 | 15 | 0.333 | 5 | 100 | 81.5 |
| PSK-5D-24 | 24 | 0.208 | 5 | 100 | 81.5 |

Notes: 1. Ripple & noise are measured at 20 MHz BW with 10 µF aluminum electrolytic capacitor and 1 µF ceramic capacitor on the output. See application circuit.
 2. Measured at 230 Vac.
 3. All specifications are measured at Ta=25°C, humidity <75%, nominal input voltage, and rated output load unless otherwise specified.

PART NUMBER KEY



INPUT

| parameter | conditions/description | min | typ | max | units |
|-----------------|------------------------|-----|-----|------|-------|
| voltage | ac input | 85 | | 305 | Vac |
| | dc input | 100 | | 430 | Vdc |
| frequency | | 47 | | 63 | Hz |
| current | 115 Vac | | | 0.13 | A |
| | 230 Vac | | | 0.07 | A |
| inrush current | 115 Vac | | 15 | | A |
| | 230 Vac | | 25 | | A |
| leakage current | 277 Vac/50 Hz | | | 0.25 | mA |

OUTPUT

| parameter | conditions/description | min | typ | max | units |
|---------------------------|---|-----|------|-------|-------|
| capacitive load | 3.3 Vdc output model | | | 4,000 | μF |
| | 5 Vdc output model | | | 3,000 | μF |
| | 9 Vdc output model | | | 1,200 | μF |
| | 12 Vdc output model | | | 1,200 | μF |
| | 15 Vdc output model | | | 680 | μF |
| | 24 Vdc output model | | | 220 | μF |
| output voltage accuracy | 3.3 Vdc output model | | ±3 | | % |
| | all other output models | | ±2 | | % |
| line regulation | at full load | | ±0.5 | | % |
| load regulation | 0~100% load | | ±1.0 | | % |
| hold-up time | at 115 Vac | | 5 | | ms |
| | at 230 Vac | | 50 | | ms |
| switching frequency | | | 65 | | kHz |
| no load power consumption | at 230 Vac | | 0.2 | | W |
| | 5 & 12 Vdc output models all other output models | | 0.1 | | W |

PROTECTIONS

| parameter | conditions/description | min | typ | max | units |
|--------------------------|-----------------------------------|-----|-----|-----|-------|
| over voltage protection | 3.3 & 5 Vdc output, latching | | | 7.5 | V |
| | 9 Vdc output, latching | | | 15 | V |
| | 12 Vdc output, latching | | | 16 | V |
| | 15 Vdc output, latching | | | 20 | V |
| | 24 Vdc output, latching | | | 30 | V |
| over current protection | auto recovery | 130 | | | % |
| short circuit protection | continuous, auto recovery, hiccup | | | | |

SAFETY & COMPLIANCE

| parameter | conditions/description | min | typ | max | units |
|-------------------|---|-------|-----|-----|-------|
| isolation voltage | input to output, 1 min., <5mA | 4,000 | | | Vac |
| safety approvals | certified to 62368: IEC, EN, UL/cUL | | | | |
| | certified to 60335: EN | | | | |
| | certified to 61558: EN | | | | |
| safety class | Class II | | | | |
| EMI/EMC | CISPR32/EN55032 CLASS B EN55014-1 | | | | |
| ESD | IEC/EN 61000-4-2 Contact ±6KV/Air ±8KV perf. Criteria B EN55014-2 perf. Criteria B | | | | |
| radiated immunity | IEC/EN61000-4-3 10V/m perf. Criteria A EN55014-2 perf. Criteria A | | | | |

SAFETY & COMPLIANCE

| | | | |
|-------------------------------|--|-----------|-------|
| EFT/burst | IEC/EN61000-4-4 ±2KV (See Fig.1 for typical application circuit) perf. Criteria B IEC/EN61000-4-4 ±4KV (See Fig.2 for recommended circuit) perf. Criteria B EN55014-2 perf. Criteria B | | |
| surge | IEC/EN61000-4-5 line to line ±1KV (See Fig.1 for typical application circuit) perf. Criteria B IEC/EN61000-4-5 line to line ±2KV (See Fig.2 for recommended circuit) perf. Criteria B EN55014-2 perf. Criteria B | | |
| conducted immunity | IEC/EN61000-4-6 10Vr.m.s perf. Criteria A EN55014-2 perf. Criteria A | | |
| voltage dips and interruption | IEC/EN61000-4-11 0%, 70% perf. Criteria B EN55014-2 perf. Criteria B | | |
| MTBF | MIL-HDBK-217F at 25°C | 2,602,000 | hours |
| RoHS | yes | | |

ENVIRONMENTAL

| parameter | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature | | -40 | | 85 | °C |
| storage temperature | | -40 | | 105 | °C |
| storage humidity | | 0 | | 95 | % |

SOLDERABILITY

| parameter | conditions/description | min | typ | max | units |
|----------------|------------------------|-----|-----|-----|-------|
| wave soldering | 5~10 seconds max | 255 | 260 | 265 | °C |
| hand soldering | 3~5 seconds max | 350 | 360 | 370 | °C |

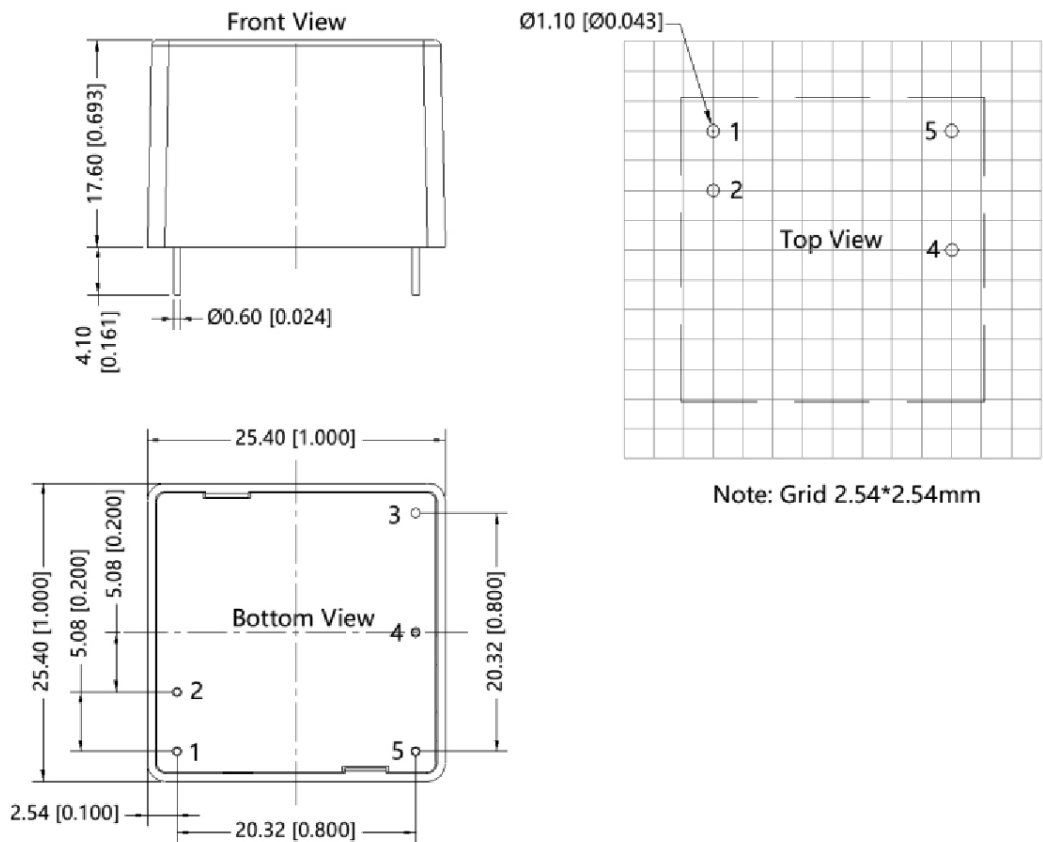
MECHANICAL

| parameter | conditions/description | min | typ | max | units |
|---------------|---|-----|------|-----|-------|
| dimensions | horizontal package: 25.40 x 25.40 x 17.60 | | | | mm |
| | chassis mount: 76.00 x 31.50 x 26.40 | | | | mm |
| | DIN-rail: 76.00 x 31.50 x 31.00 | | | | mm |
| weight | horizontal package, 3.3 Vdc, 5 Vdc, 9 Vdc & 12 Vdc output | | 18.0 | | g |
| | horizontal package, 15 Vdc & 24 Vdc output | | 18.5 | | g |
| | chassis mount | | 38.0 | | g |
| | DIN-rail | | 58.0 | | g |
| case material | Black plastic, flame-retardant and heat-resistant (UL94V-0) | | | | |

MECHANICAL DRAWING

units: mm [inch]
 pin diameter tolerance: ± 0.10 [± 0.004]
 tolerance: ± 0.50 [± 0.020]

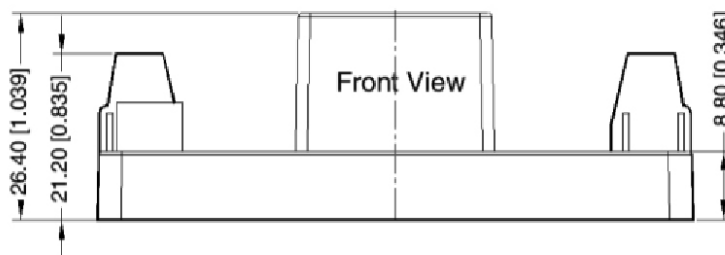
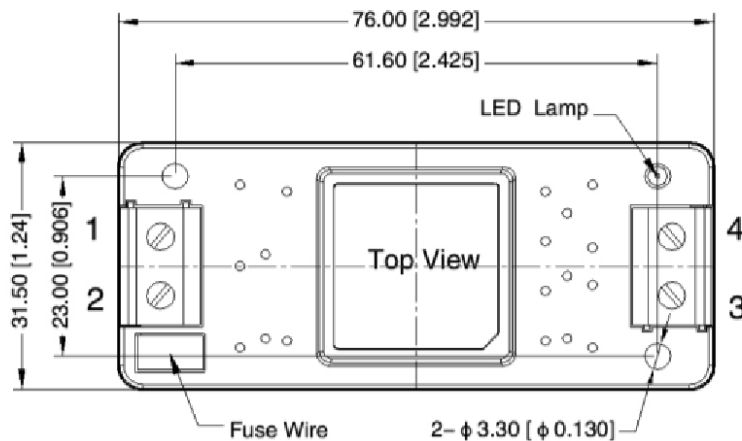
| PIN CONNECTIONS | |
|-----------------|----------|
| PIN | Function |
| 1 | AC(N) |
| 2 | AC(L) |
| 3 | no pin |
| 4 | -Vo |
| 5 | +Vo |



MECHANICAL DRAWING

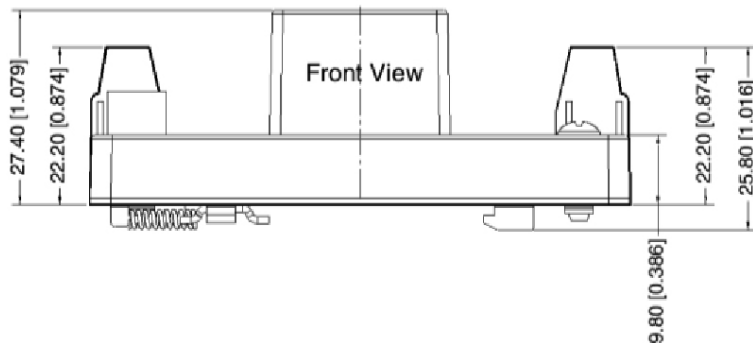
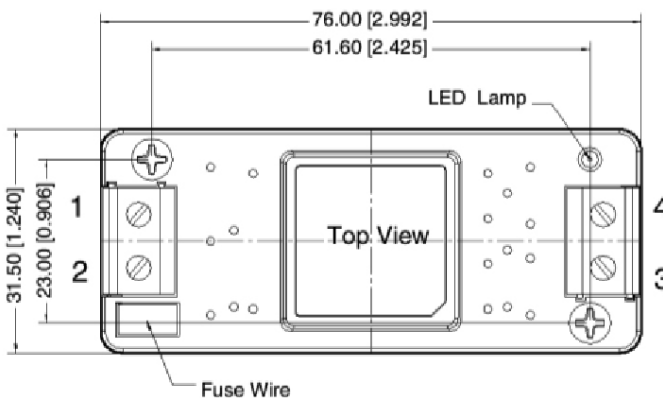
units: mm [inch]
 wire range: 24~12 AWG
 tightening torque: Max 0.4 N·m
 tolerance: ±1.0 [±0.039]

| PIN CONNECTIONS | |
|-----------------|----------|
| PIN | Function |
| 1 | AC(N) |
| 2 | AC(L) |
| 3 | -Vo |
| 4 | +Vo |



units: mm [inch]
 wire range: 24~12 AWG
 tightening torque: Max 0.4 N·m
 mounting rail: TS35, must be connected to safety ground
 tolerance: ±1.0 [±0.039]

| PIN CONNECTIONS | |
|-----------------|----------|
| PIN | Function |
| 1 | AC(N) |
| 2 | AC(L) |
| 3 | -Vo |
| 4 | +Vo |



APPLICATION DESIGN REFERENCE

Figure 1

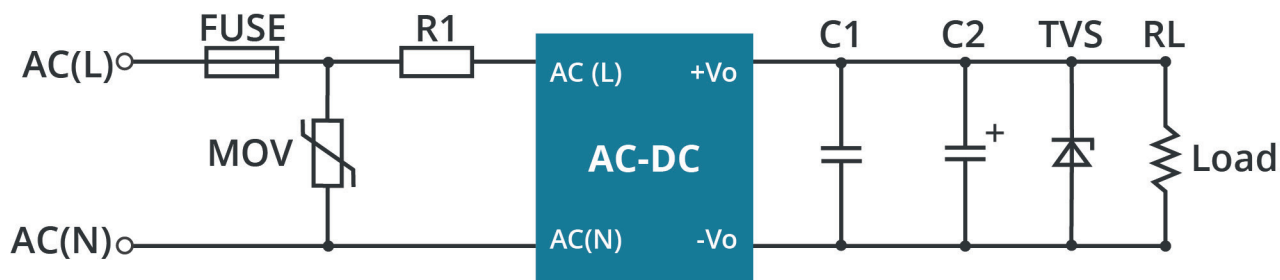


Table 1

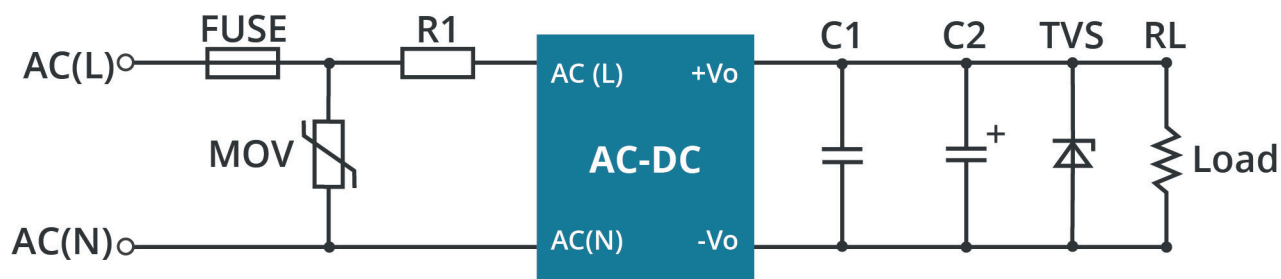
| Part No. | C1(μF) | C2(μF) | FUSE | R1 | TVS | MOV |
|-----------|--------|--------|------------------------------|--------|----------|---------|
| PSK-5D-3 | 1 | 150 | 1A/300V, slow-blow, required | 12Ω/3W | SMBJ7.0A | S10K350 |
| PSK-5D-5 | | 150 | | | SMBJ7.0A | |
| PSK-5D-9 | | 120 | | | SMBJ12A | |
| PSK-5D-12 | | 120 | | | SMBJ20A | |
| PSK-5D-15 | | 120 | | | SMBJ20A | |
| PSK-5D-24 | | 68 | | | SMBJ30A | |

Output Filtering Components:

An electrolytic capacitor with high frequency operation, low ESR, and at least 20% margin on rated output voltage is recommended for C2. C1 should be a ceramic capacitor and the TVS will help protect downstream electronics in the unlikely event of converter failure.

EMC RECOMMENDED CIRCUIT

Figure 2

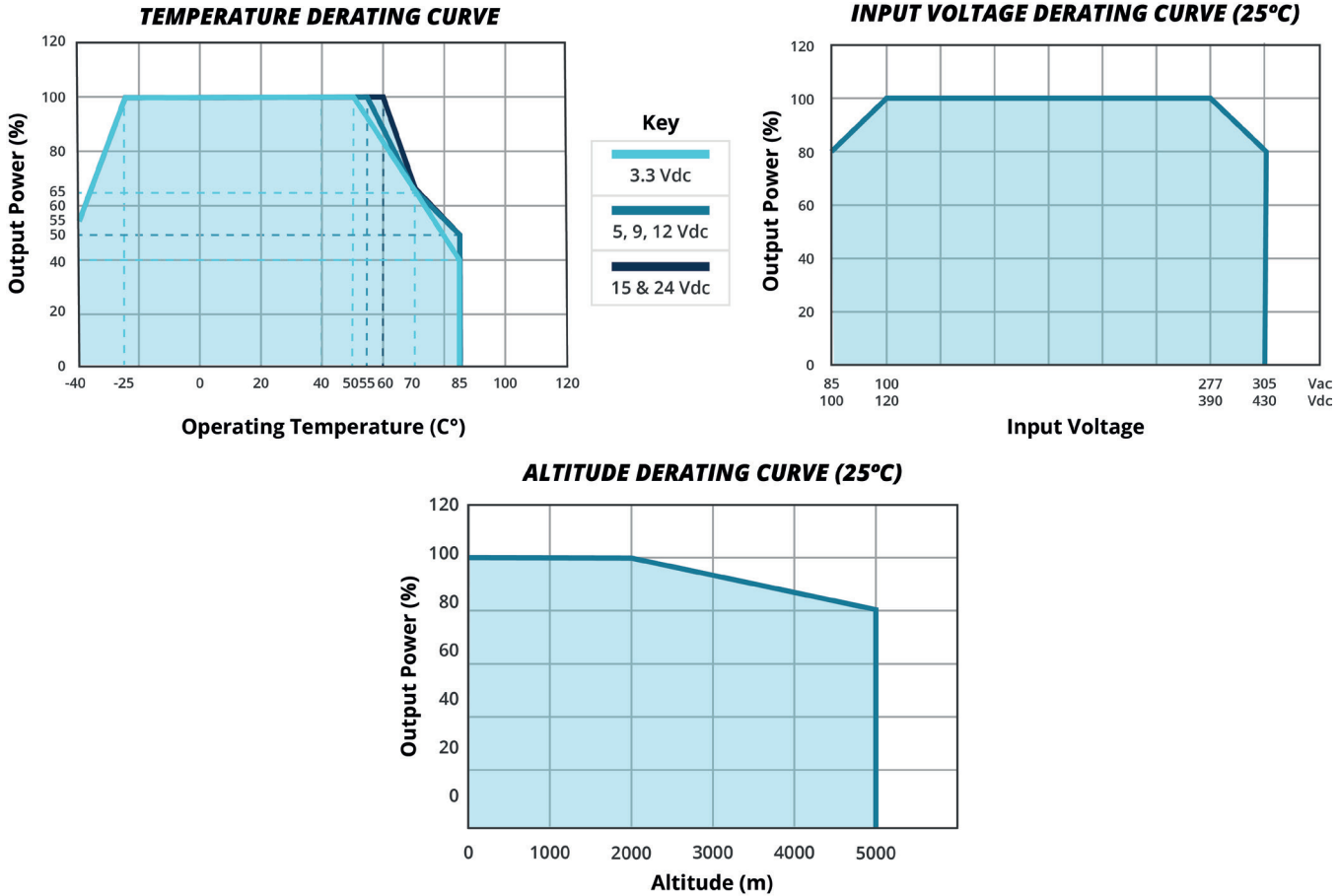


Note: EMC application circuit with higher requirements.

Table 2

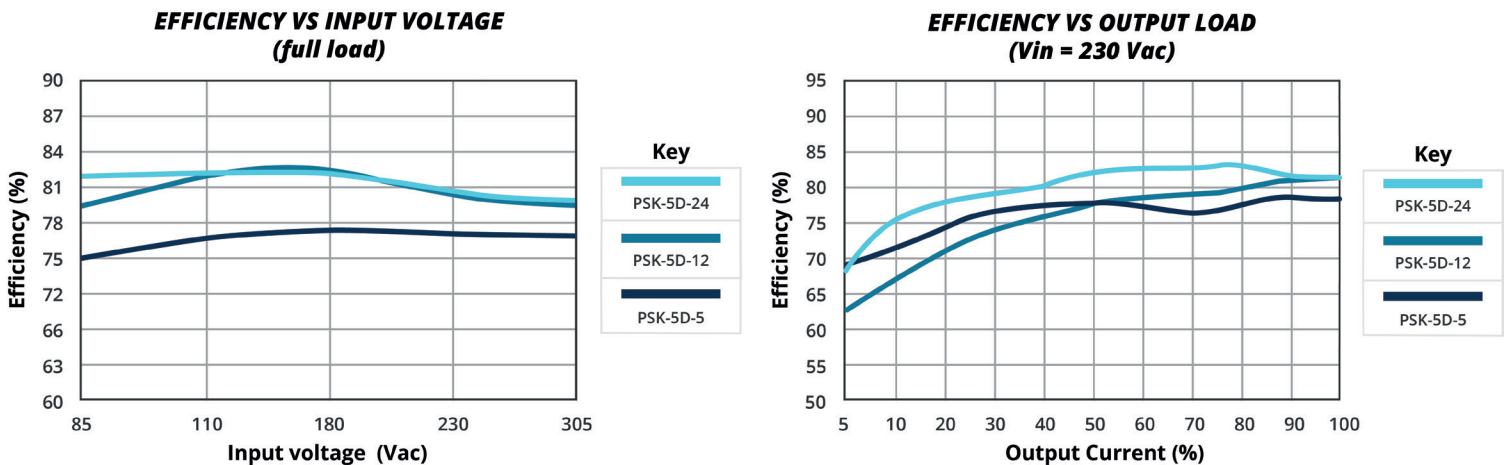
| Components | Recommended Value |
|------------|------------------------------|
| MOV | S14K350 |
| R1 | 33Ω/3W |
| FUSE | 2A/300V, slow-blow, required |

DERATING CURVE



Note: 1. With an AC input between 85~100V/277~305V and a DC input between 100~120V/390~430Vdc, the output power must be derated as per temperature derating curves.
 2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult with CUI.

EFFICIENCY CURVES



REVISION HISTORY

| rev. | description | date |
|------|--|------------|
| 1.0 | initial release | 01/28/2021 |
| 1.01 | OVP updated | 09/30/2021 |
| 1.02 | derating and efficiency curves updated | 01/20/2022 |
| 1.03 | no load power consumption updated | 05/03/2022 |
| 1.04 | UKCA mark added | 06/13/2022 |

The revision history provided is for informational purposes only and is believed to be accurate.



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