

SERIES: PSK-30D | **DESCRIPTION:** INTERNAL AC-DC POWER SUPPLY

FEATURES

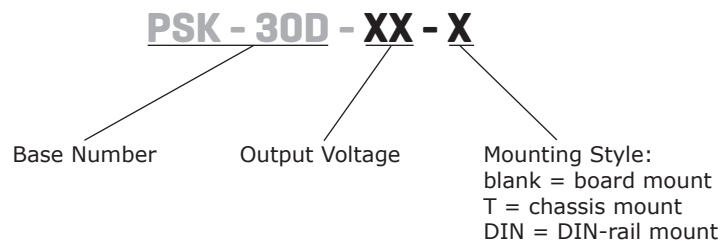
- wide input range (85 ~ 305 Vac)
- wide operating temperature range (-40 to +85 C)
- Class B emissions
- certified to 62368, 61558, and 60335 safety standards
- over voltage, over current, short circuit protections
- input over voltage category III for fixed installations



| MODEL | output voltage | output current | output power | ripple and noise ¹ | efficiency ² |
|------------|----------------|----------------|--------------|-------------------------------|-------------------------|
| | (Vdc) | max (A) | max (W) | max (mVp-p) | typ (%) |
| PSK-30D-3 | 3.3 | 6.0 | 19.8 | 100 | 85 |
| PSK-30D-5 | 5 | 6.0 | 30.0 | 100 | 86 |
| PSK-30D-9 | 9 | 3.4 | 30.6 | 100 | 88 |
| PSK-30D-12 | 12 | 2.5 | 30.0 | 100 | 90 |
| PSK-30D-15 | 15 | 2.0 | 30.0 | 100 | 90 |
| PSK-30D-24 | 24 | 1.3 | 31.2 | 150 | 88 |
| PSK-30D-48 | 48 | 0.63 | 30.2 | 150 | 90 |

Notes: 1. At full load, nominal input, 20 MHz bandwidth oscilloscope, with 1 μF ceramic and 10 μF electrolytic capacitors on the output.
 2. At 230 Vac input.
 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 (3.3/5/9/12/15/24 Vdc output models) | 100 | | 430 | Vdc |
| | dc input (48 Vdc output model) | 120 | | 430 | Vdc |
| frequency | | 47 | | 63 | Hz |
| current | at 115 Vac | | | 0.75 | A |
| | at 230 Vac | | | 0.5 | A |
| inrush current | at 115 Vac | | 25 | | A |
| | at 230 Vac | | 50 | | A |
| leakage current | at 277 Vac/50 Hz | | | 0.1 | mA |

OUTPUT

| parameter | conditions/description | min | typ | max | units |
|---------------------------|-------------------------------------|-----|------|-------|-------|
| capacitive load | 3.3 Vdc output model | | | 6,600 | μF |
| | 5 Vdc output model | | | 6,600 | μF |
| | 9 Vdc output model | | | 4,400 | μF |
| | 12 Vdc output model | | | 4,400 | μF |
| | 15 Vdc output model | | | 3,300 | μF |
| | 24 Vdc output model | | | 1,000 | μF |
| | 48 Vdc output model | | | 470 | 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 | | | | |
| | 3.3 Vdc output model | | ±2 | | % |
| | 5 Vdc output model | | ±1.5 | | % |
| | all other output models | | ±1 | | % |
| hold-up time | at 115 Vac | | 10 | | ms |
| | at 230 Vac | | 50 | | ms |
| switching frequency | | | 65 | | kHz |
| no load power consumption | at 230 Vac | | | | |
| | 3.3, 9, 12, 15, 24 Vdc output model | | | 0.1 | W |
| | 5 Vdc output model | | | 0.3 | W |
| | 48 Vdc output model | | | 0.15 | W |

PROTECTIONS

| parameter | conditions/description | min | typ | max | units |
|--------------------------|-----------------------------------|-----|-----|-----|-------|
| over voltage protection | output voltage hiccup | | | | |
| | 3.3 Vdc output model | | | 6.3 | Vdc |
| | 5, 9, 12 Vdc output model | | | 16 | Vdc |
| | 15 Vdc output model | | | 25 | Vdc |
| | 24 Vdc output model | | | 35 | Vdc |
| | 48 Vdc output model | | | 60 | Vdc |
| over current protection | auto recovery | 110 | | | % |
| short circuit protection | continuous, auto recovery, hiccup | | | | |

SAFETY & COMPLIANCE

| parameter | conditions/description | min | typ | max | units |
|-------------------|--|-------|-----|-----|-------|
| isolation voltage | input to output, 1 min., <5mA | 4,200 | | | Vac |
| safety approvals | certified to 62368: EN, UL certified to 60335: EN certified to 61558: EN | | | | |
| safety class | Class II | | | | |
| EMI/EMC | CISPR32/EN55032 CLASS B EN55014-1 | | | | |

SAFETY & COMPLIANCE

| | | | |
|-------------------------------|---|---------|-------|
| ESD | IEC/EN61000-4-2 Contact $\pm 8\text{KV}$ /Air $\pm 15\text{KV}$, perf. Criteria A IEC/EN55014-2, perf. Criteria A | | |
| radiated immunity | IEC/EN61000-4-3 10V/m, perf. Criteria A IEC/EN55014-2, perf. Criteria A | | |
| EFT/burst | IEC/EN61000-4-4 $\pm 2\text{KV}$, perf. Criteria A IEC/EN61000-4-4 $\pm 4\text{KV}$ (See Fig.2 for recommended circuit), perf. Criteria A IEC/EN55014-2, perf. Criteria A | | |
| surge | IEC/EN61000-4-5 line to line $\pm 2\text{KV}$, perf. Criteria A IEC/EN61000-4-5 line to line $\pm 2\text{KV}$ /line to ground $\pm 4\text{KV}$ (See Fig.2 for recommended circuit), perf. Criteria A IEC/EN55014-2, perf. Criteria A | | |
| conducted immunity | IEC/EN61000-4-6 10 Vr.m.s, perf. Criteria A IEC/EN55014-2, perf. Criteria A | | |
| voltage dips and interruption | IEC/EN61000-4-11 0%, 70%, perf. Criteria B IEC/EN55014-2, perf. Criteria B | | |
| MTBF | MIL-HDBK-217F at 25°C | 500,000 | hours |
| RoHS | yes | | |

ENVIRONMENTAL

| parameter | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature | | -40 | | 85 | °C |
| storage temperature | | -40 | | 85 | °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 | DIP: 69.50 x 39.00 x 24.00 chassis mount: 96.10 x 54.00 x 32.50 DIN-rail: 96.10 x 54.00 x 37.10 | | | | mm mm mm |
| weight | DIP chassis mount DIN-rail | | 100 147 190 | | g g g |
| case material | Black plastic, flame-retardant and heat-resistant (UL94V-0) | | | | |
| cooling method | natural convection | | | | |

MECHANICAL DRAWING

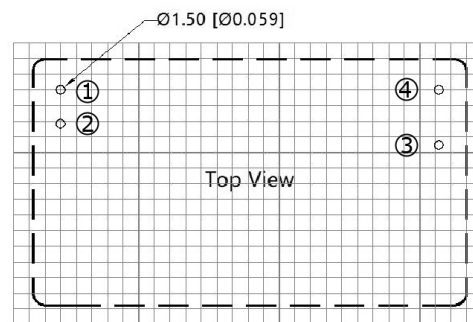
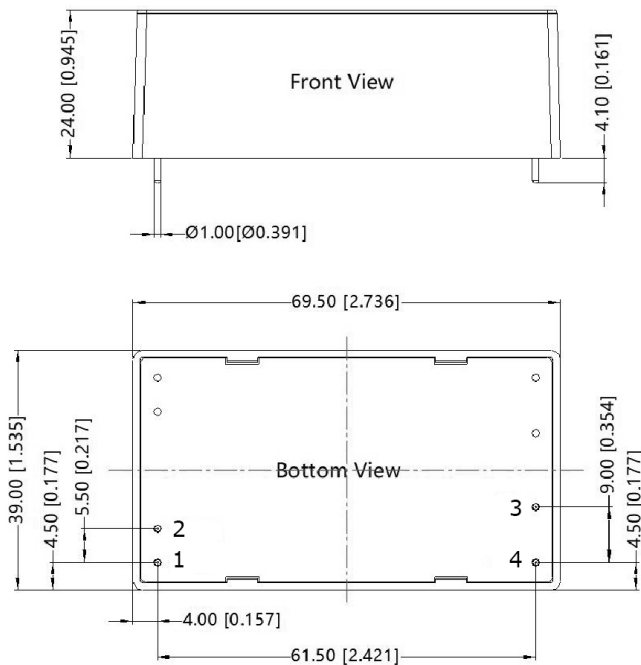
Board mount

units: mm [inch]

pin diameter tolerance: ± 0.10 [± 0.004]

tolerance: ± 0.50 [± 0.020]

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



Note: Grid 2.54*2.54mm

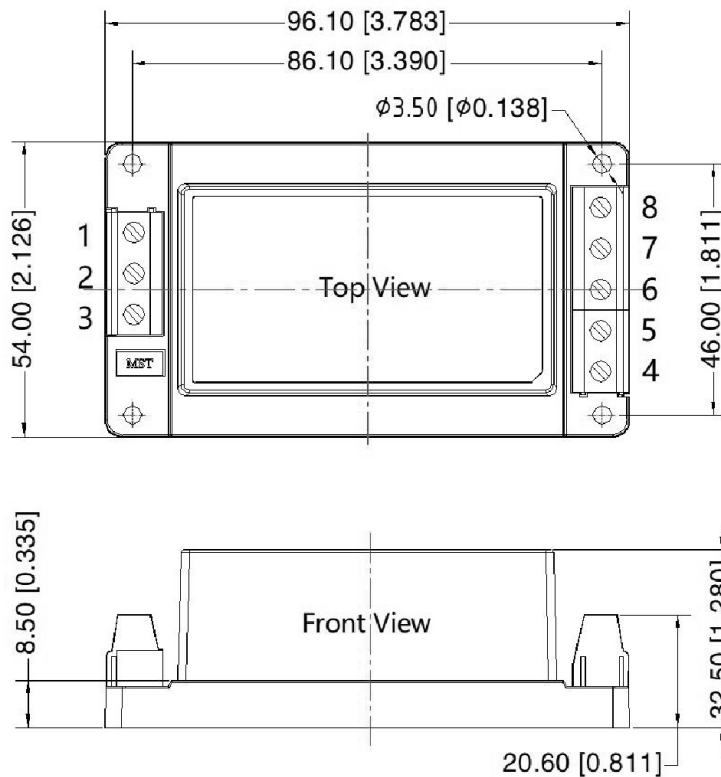
MECHANICAL DRAWING (CONTINUED)

Chassis mount

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 | NC |
| 2 | AC(N) |
| 3 | AC(L) |
| 4 | +Vo |
| 5 | NC |
| 6 | NC |
| 7 | NC |
| 8 | -Vo |

Note: NC = no connection

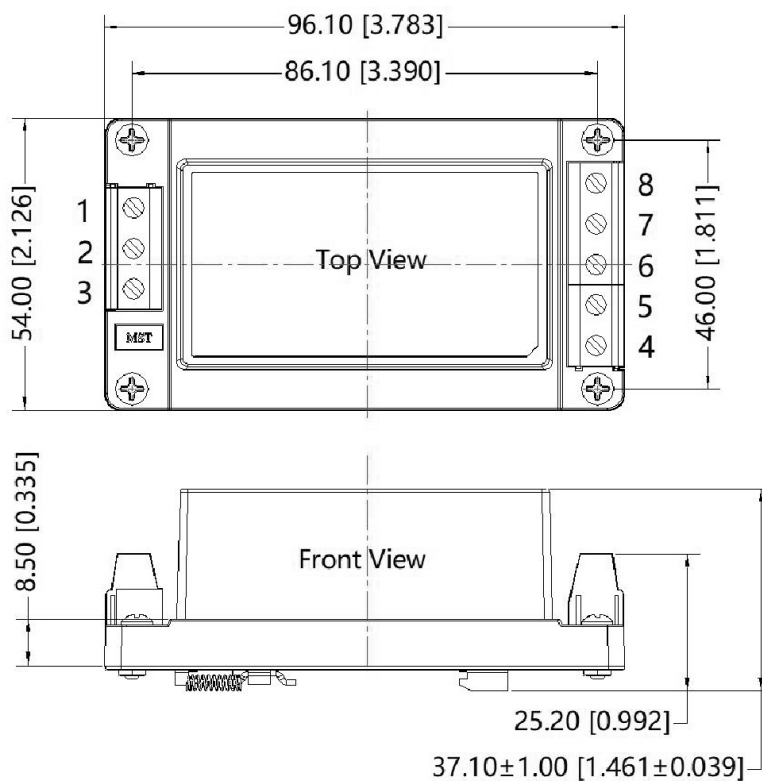


DIN-rail mount

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 | NC |
| 2 | AC(N) |
| 3 | AC(L) |
| 4 | +Vo |
| 5 | NC |
| 6 | NC |
| 7 | NC |
| 8 | -Vo |

Note: NC = no connection



APPLICATION DESIGN REFERENCE

Output Filtering Components:

C1 should be a ceramic capacitor and the TVS will help protect downstream electronics in the unlikely event of converter failure.

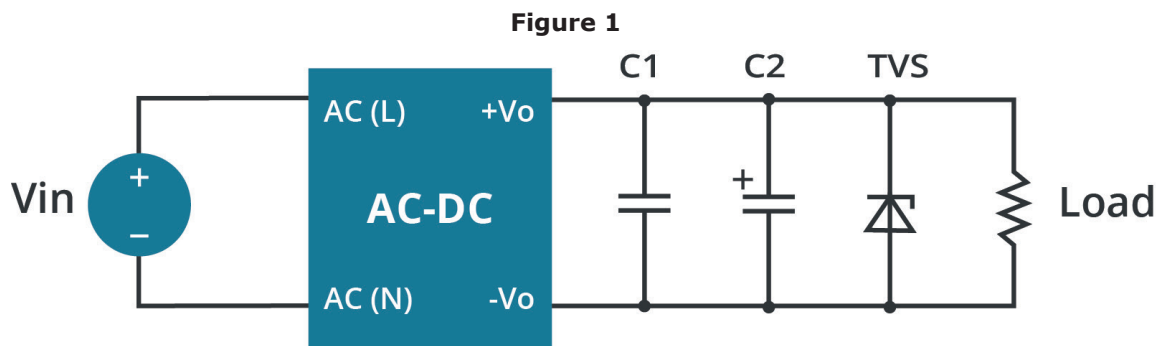


Table 1

| Part No. | C1 ($\mu\text{F} / \text{V}$) | C2 ($\mu\text{F} / \text{V}$) | TVS |
|------------|---------------------------------|---------------------------------|----------|
| PSK-30D-3 | 1 / 100 | 10 / 50 | SMBJ7.0A |
| PSK-30D-5 | | 10 / 50 | SMBJ7.0A |
| PSK-30D-9 | | 10 / 50 | SMBJ12A |
| PSK-30D-12 | | 10 / 50 | SMBJ20A |
| PSK-30D-15 | | 10 / 50 | SMBJ20A |
| PSK-30D-24 | | 10 / 50 | SMBJ30A |
| PSK-30D-48 | | 10 / 63 | SMBJ64A |

Note: 2A / 300V slow-blow fuse integrated into unit.

EMC RECOMMENDED CIRCUIT

Figure 2

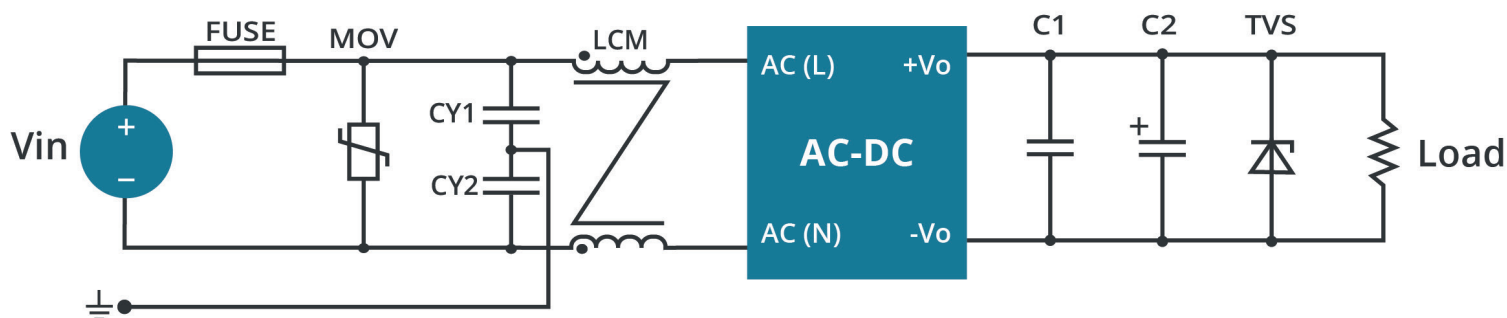
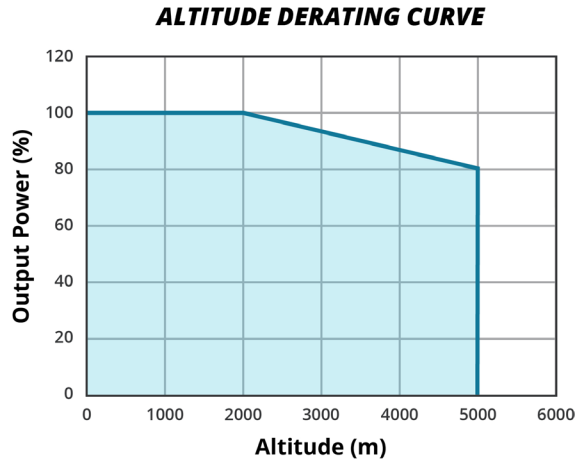
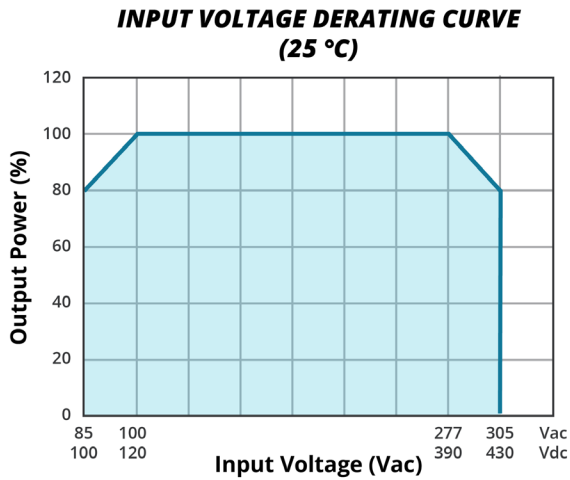
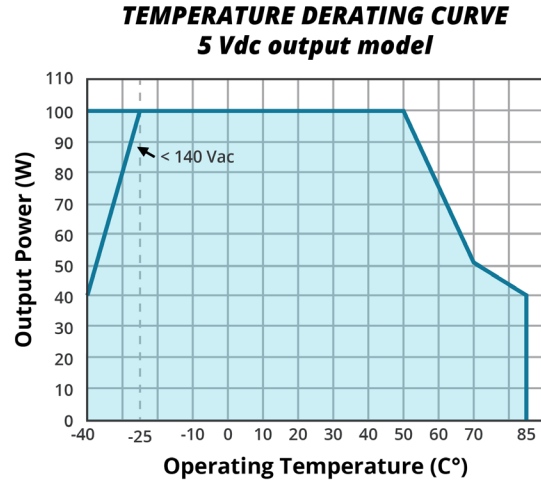
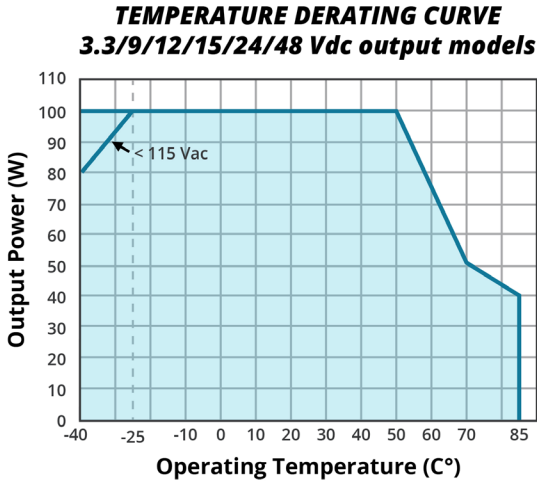


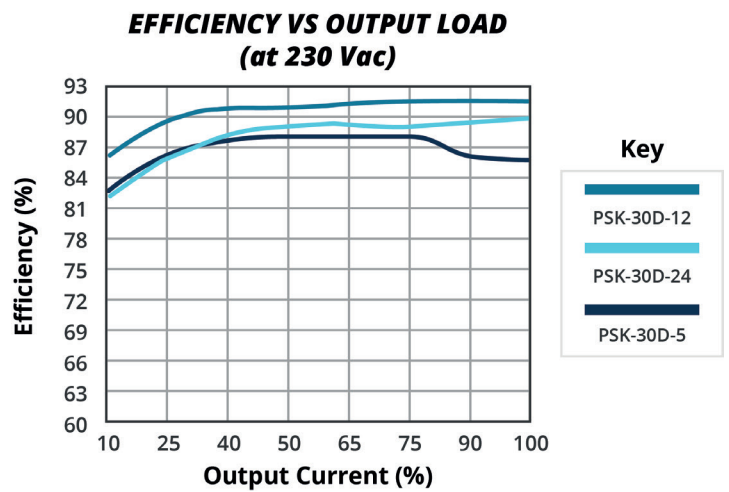
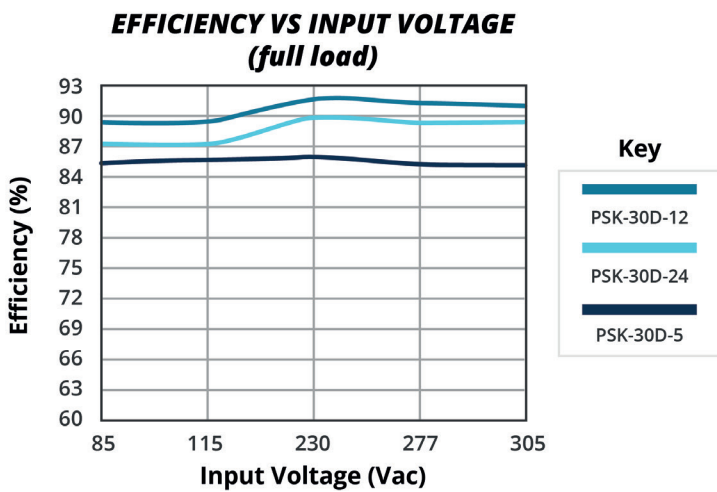
Table 2

| Components | Recommended Value |
|------------|--------------------------------|
| FUSE | 2 A/300 V, slow-blow, required |
| MOV | S14K350 |
| CY1/CY2 | 1 nF/400 Vac |
| LCM | 10 mH |

DERATING CURVE



EFFICIENCY CURVES



REVISION HISTORY

| rev. | description | date |
|------|-----------------------------------|------------|
| 1.0 | initial release | 10/25/2021 |
| 1.01 | no load power consumption updated | 05/03/2022 |

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



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