# 15W AC-DC On-board Converter Module MVFC-XX015A0782 Series


E542566

ECO Automate Industrial Security Network Telecom

## ◆Features

- ●Constant Voltage;
- ●Wide AC input: 90-305VAC;
- ●Working tempreture: -30~+70℃;
- ●No load power consumption<0.1W;
- ●Protections: Short- circuit/Over-load/Over-voltage;
- ●Typical efficiency up to 86.5%;
- ●Comply with RoHS/REACH environmental standards;
- ●100% full-load aging test;
- ●3 years warranty;

## ◆Applications

- ●Industrial electrical equipment;
- ●Mechanical equipment;
- ●Factory automation equipment;
- ●Hand-held electronic device;

## ◆Description

MVFC-XX015A0782 is a 15W compact size (52.4*27.2*24mm) AC-DC power module with the advantages of wide AC input and at the same time accepts DC input voltage, low power consumption, low ripple noise, high reliability, and safe isolation. Ready to be soldered onto the PCB boards of various kinds of electronic instruments or industrial automation equipments. The flame-retardant plastic case and silicone potting are used to enhance the heat dissipation capability, with basic dust and moisture-proof functions, while meeting the vibration-proof requirements of 5G. With an efficiency of up to 86.5% and ultra-low no-load power consumption of less than 0.1W, the MVFC-XX015A0782 series meets the global regulatory requirements for low power consumption of electronic products. The entire series is a Class II design (without FGpin), with built-in EMI filter devices, in compliance with CISPR32/EN55032 CLASS B, and good electromagnetic compatibility (EMC) characteristics to protect terminal electronic equipment from electromagnetic interference.

## ◆Modle Encoding

MVFC-XX 015 A0782

- A0782 — Housing Number
- 015 — Rated wattage
- XX — Output voltage
- MVFC- — Series name

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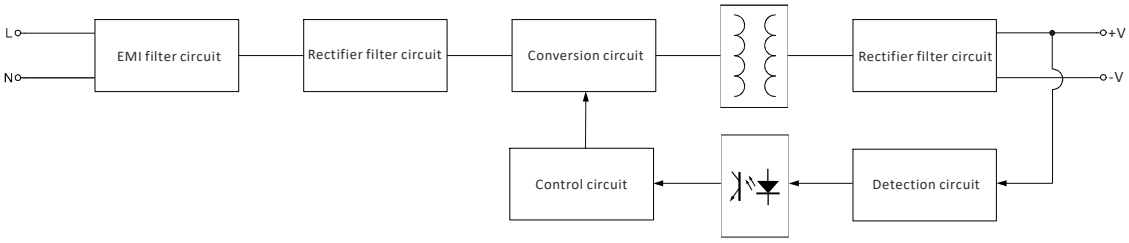
# 15W AC-DC On-board Converter Module MVFC-XX015A0782 Series

## ◆Specification:

| Model | | MVFC-12015A0782 | MVFC-24015A0782 |
|---|---|---|---|
| Output | DC voltage | 12V | 24V |
| | Rated current | 1.25A | 0.625A |
| | Current range | 0~1.25A | 0~0.625A |
| | Rated Power | 15W | 15W |
| | Efficiency (Typ.) | 86.5% | 86.5% |
| | Maximum capacitive load | 2000uF | 680uF |
| | Voltage accuracy*③ | ±4.0% | ±2.0% |
| | Line Regulation | ±1.0% | ±0.5% |
| | Load Regulation | ±2.0% | ±1.0% |
| | Ripple and Noise (max.)* ④ | 150mVp-p | 240mVp-p |
| | Start-up, rise time*⑥ | 1000ms,30ms(Full load) | |
| | Holding time (Typ.) | 15ms,230VAC/115VAC(Full load) | |
| Input | Voltage range*② | 90~305VAC or 127~432VDC | |
| | Frequency range | 47~63Hz | |
| | AC current | Max.0.39A | |
| | Inrush current(Typ.) | Cold start: 40A/230VAC | |
| | Leakage current | <0.25mA/277VAC | |
| Protection | Overload | 105%~165% of rated output power | |
| | | Protection mode: Hiccup protection mode, automatically recovers after load reduction | |
| | Over voltage | 13.0~18.0V | 25.0~35.0V |
| | | Protection mode: Hiccup protection mode, automatically recovers after fault is eliminated | |
| Environment | Working Temp | -30~70℃ (Please refer to <Temperature Derating Curve>) | |
| | Working humidity | 20~90% RH,non-condensing | |
| | Storage Temp、Humidity | -40~+85℃,10~90% RH | |
| | Temp.coefficient | ±0.05%/℃(-30℃~50℃) | |
| | Vibration | 10~500Hz,5G,10 minutes/cycle, 60 mins for each of X, Y and Z axes | |
| | Soldering tempreture | Wave soldering: 265℃, 5s (max.); Manual soldering: 390℃, 3s (max.) | |
| | Operating height*⑧ | 2000M | |
| Safety | Safety standards | Complies with IEC/EN/UL/BS 62368-1, GB 4943.1, EN 61558-1, EN 60335-1 certification requirements | |
| | Withstand voltage | I/P-O/P:4KVAC | |
| | Isolation resistance | I/P-O/P:100M Ohms/500VDC/25℃/70% RH | |
| Electromagnetic Compatibility Emission | Conducted disturbance | CISPR32/EN55032 CLASS B | |
| | Radiated disturbance | CISPR32/EN55032 CLASS B | |
| | Harmonic current | IEC/EN61000-3-2 Class A | |
| Electromagnetic Compatibility Immunity | ESD | IEC/EN61000-4-2 Contact:±6KV/AIR:±8KV perf.CriteriaB | |
| | Radiation Immunity | IEC/EN61000-4-3 10V/m perf.CriteriaB | |
| | EFT | IEC/EN61000-4-4 ±2KV perf.CriteriaB | |
| | Surge immunity | IEC/EN61000-4-5 L_N±1KV perf.CriteriaB | |
| | CS | IEC/EN61000-4-6 10Vr.m.s perf.criteriaB | |
| | Voltage dip, sag and temporary interruption immunity | IEC/EN61000-4-11 0%,70% perf.CriteriaB | |
| Othere | MTBF | ＞1200K | |
| | Warranty | 3Years | |
| | Dimension | 52.4mm(L)*27.2mm(W)*24.0mm(H) | |
| | Packing | 420mm*340mm*200mm;0.06Kg;10.8Kg/180pcs | |
| Note* | ① Unless otherwise specified, all specifications are measured at 230Vac input, rated load, and 25℃ ambient temperature.<br>② Output derating is required under low input voltage conditions. Please refer to the input derating curve for details.<br>③ Accuracy: includes design error, linear regulation rate, and load regulation rate.<br>④ Ripple and noise measurement method: Use twisted pair cables, and connect 0.luf and 47uf capacitors in parallel at the terminals, and measure at 20MHz bandwidth.<br>⑤ The power supply is regarded as a device used in conjunction with the terminal design, so EMd is affected by the entire device. The terminal equipment manufacturer needs to re-confirm the EMC of the entire device.<br>⑥The startup time is measured in the cold start state. Continuous switching may prolong the startup time.<br>⑦ The input current and safety requirements have slightly different parameters due to different certifications.<br>⑧ When the altitude exceeds 2000 meters (6500FT), the operating ambient temperature decreases at a rate of 3.5℃/1000m. | |

## ◆Block Diagram




## ◆Typical Application Circuit

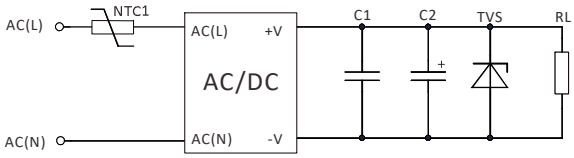



Figure 1: Typical circuit

| Model | NTC1 | C1 | C2 | TVS |
|---|---|---|---|---|
| MVFC-12015A0782 | 6.8Ω/3W | 1uF/50V | 100uF/25V | SMBJ20A |
| MVFC-24015A0782 | | | 100uF/35V | SMBJ30A |

Note: C1 is a ceramic capacitor to filter high-frequency noise. C2 is recommended to use a high-frequency low-resistance electrolytic capacitor. For capacity and current, please refer to the technical specifications provided by each manufacturer. The capacitor withstand voltage should be derated by at least 80%. The TVS tube protects the subsequent circuit when the module fails.

## ◆EMC Recommended Circuit

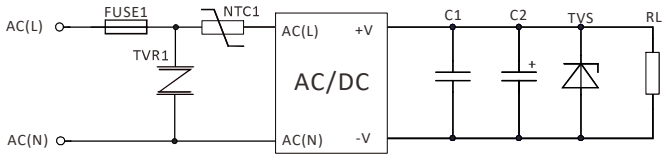



Figure 2: High-demand recommended circuit

| Component model | FUSE1 | TVR1 | NTC1 |
|---|---|---|---|
| Recommended value | 3.15A/350V | 14D561K | 6.8Ω/3W |

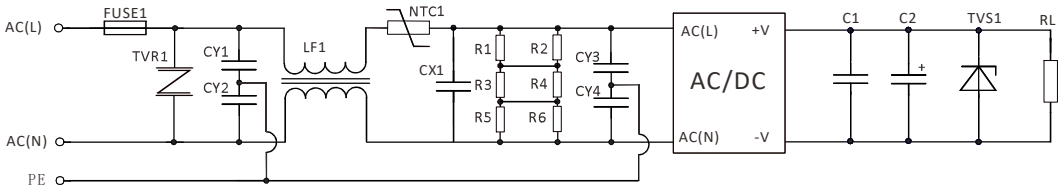
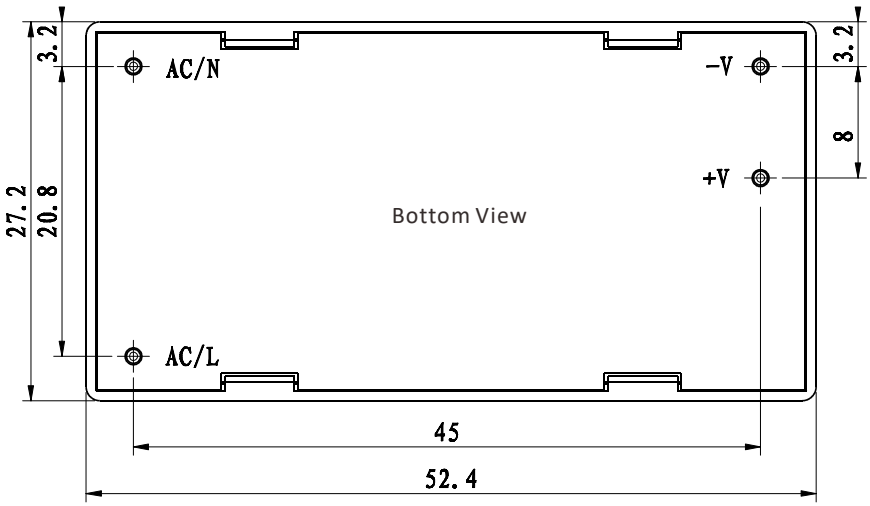
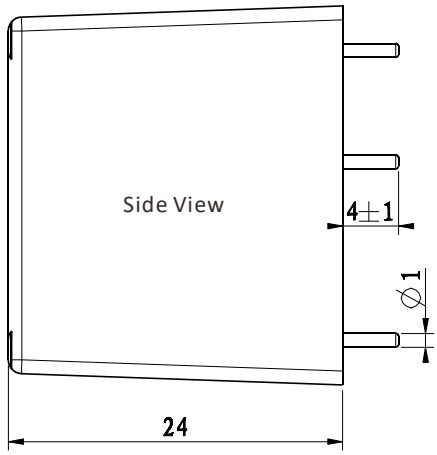


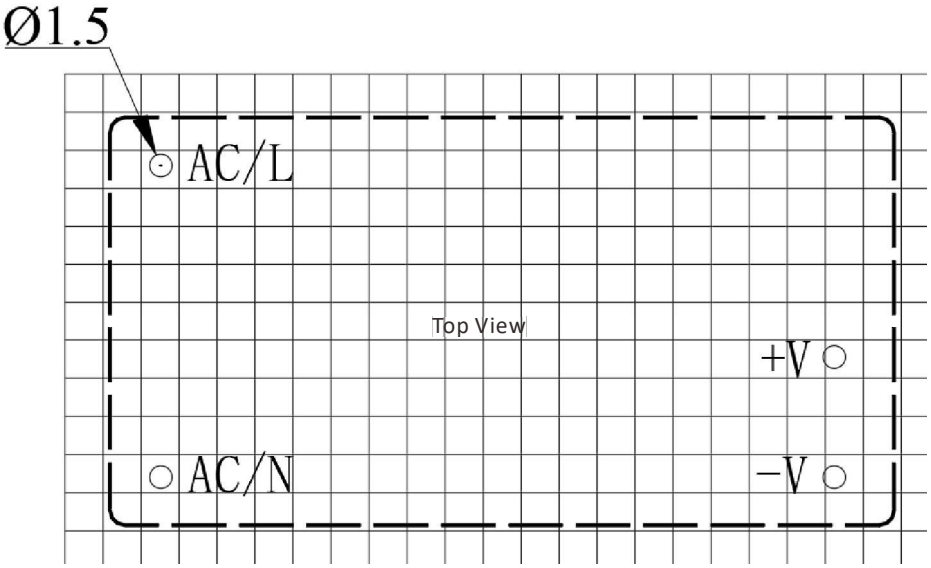

Figure 3: Class I equipment recommended circuit

| Component model | FUSE1 | TVR1 | CY1~CY4 | LF1 | NTC1 | CX1 | R1~R6 |
|---|---|---|---|---|---|---|---|
| Recommended value | 3.15A/350V | 14D561K | 2.2nF/400V | FL2D-10-203 | 12Ω/5W | 224/310V | 1.5MΩ/150VDC |

## ◆ Case Size

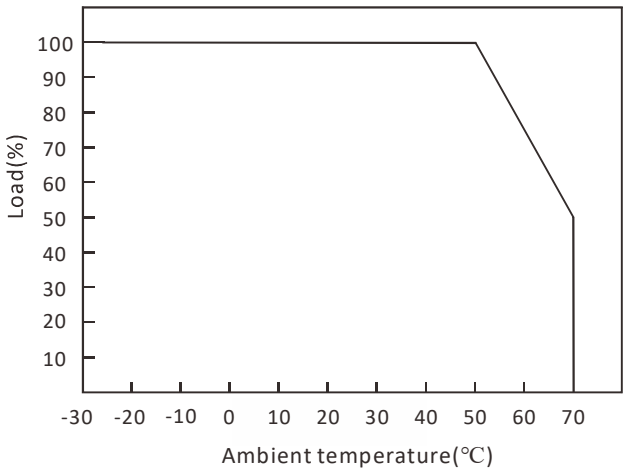



Note:
Dimension unit: mm
Terminal diameter tolerance: ±0.10
Unmarked tolerance: ±0.50

## ◆ Temperature derating curve




## ◆ Input derating curve