20W AC-DC On-board Converter Module MVFC-XX020A0782 Series

E542566

◆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 87.5%;
- ●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-XX020A0782 is a 20W 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 87.5% and ultra-low no-load power consumption of less than 0.1W, the MVFC-XX020A0782 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 020 A0782

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

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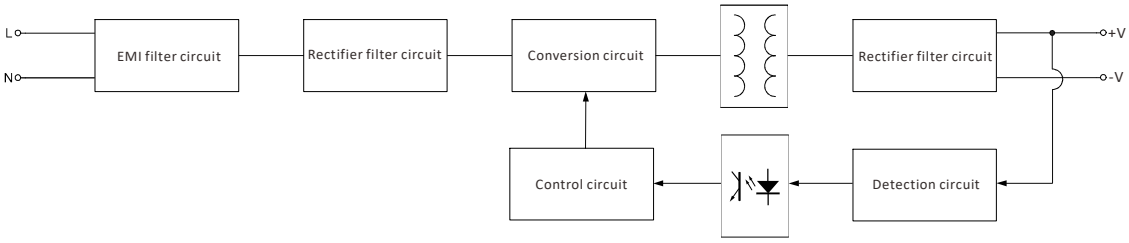
◆Specification:

Model		MVFC-12020A0782	MVFC-24020A0782
Output	DC voltage	12V	24V
	Rated current	1.67A	0.83A
	Current range	0~1.67A	0~0.83A
	Rated Power	20W	20W
	Efficiency (Typ.)	87.5%	87.0%
	Maximum capacitive load	4000uF	1000uF
	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.0.5A	
	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,2G,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. ② Output derating is required under low input voltage conditions. Please refer to the input derating curve for details. ③ Accuracy: includes design error, linear regulation rate, and load regulation rate. 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. 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. ⑥The startup time is measured in the cold start state. Continuous switching may prolong the startup time. ⑦ The input current and safety requirements have slightly different parameters due to different certifications. 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

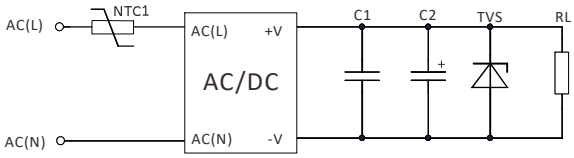


Figure 1: Typical circuit

Model	NTC1	C1	C2	TVS
MVFC-12020A0782	3Ω/3W	1uF/50V	100uF/25V	SMBJ20A
MVFC-24020A0782			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

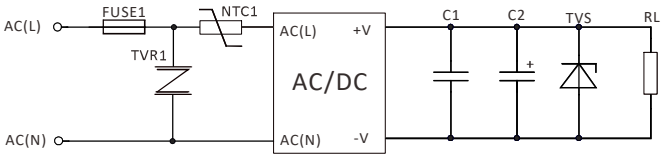


Figure 2: High-demand recommended circuit

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

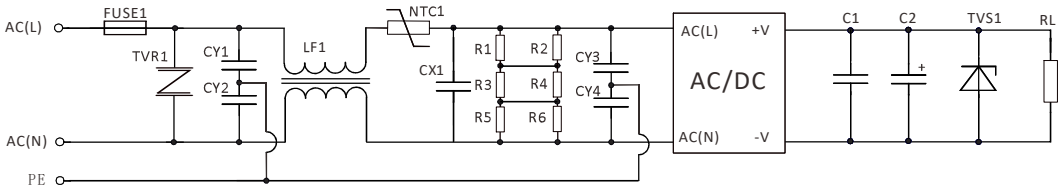
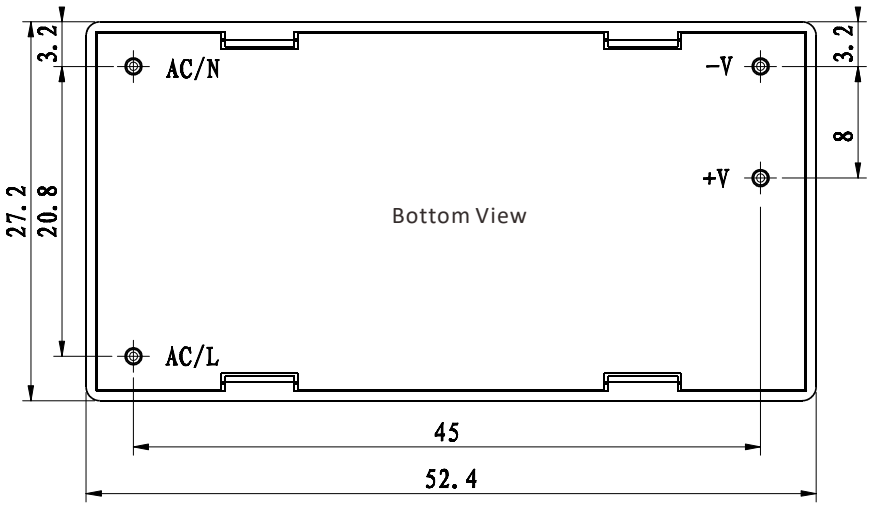
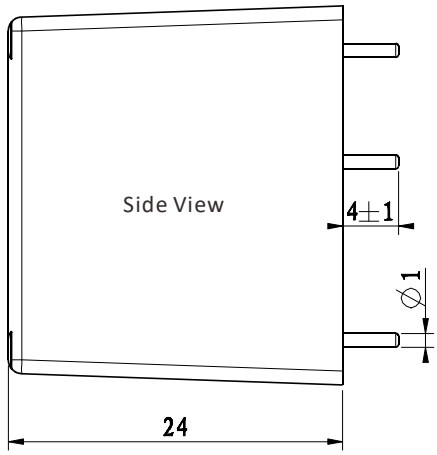


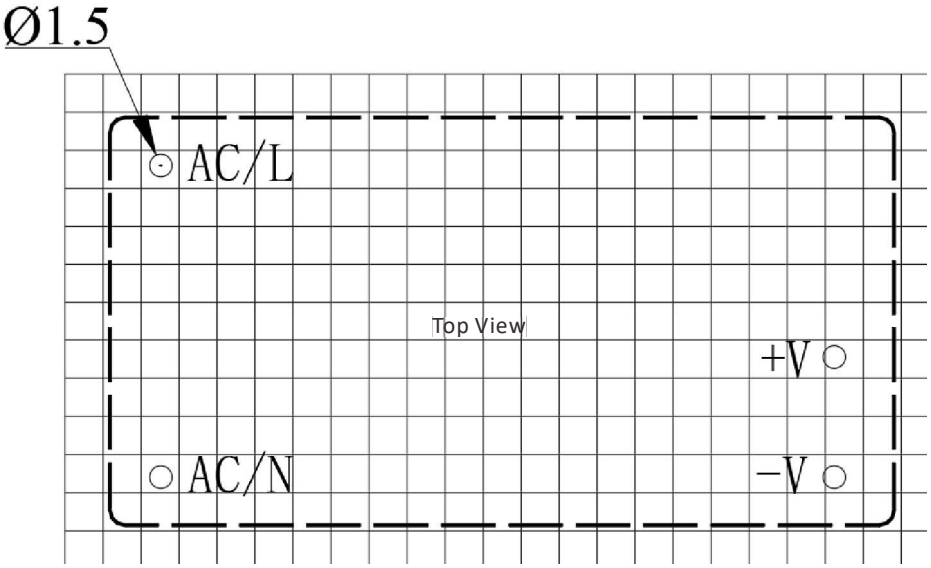
Figure 3: Class I equipment recommended circuit

Component model	FUSE1	TVR1	CY1~CY4	LF1	NTC1	CX1	R1~R6
Recommended value	3.15A/350V	14D561K	2.2nF/400V	FL2D-10-203	6.8Ω/5W	224/310V	1.5MΩ/150VDC

◆ Case Size

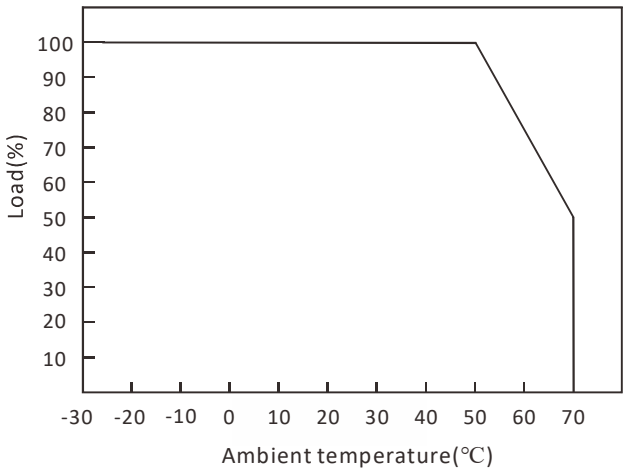
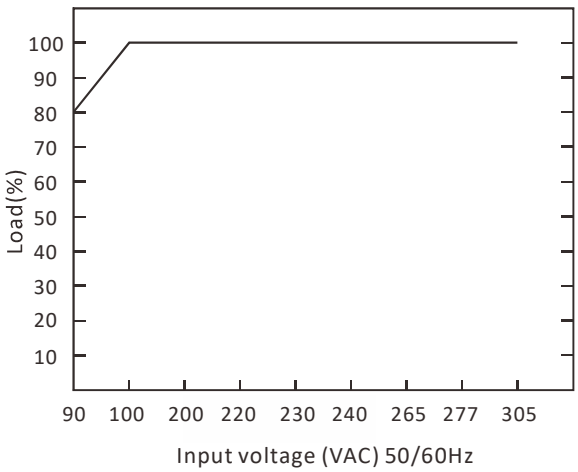






Note:
Dimension unit: mm
Terminal diameter tolerance: ±0.10
Unmarked tolerance: ±0.50

◆ Temperature derating curve



◆ Input derating curve