

# 45W AC-DC Medical-grade Small Package Power Module ADM450K150S001A



## 1 Features

- Wide input voltage: the input working voltage range is 100-240VAC.
- Low power consumption: No-load <math><0.1\text{W}</math>.
- High energy efficiency: Six levels of energy consumption, power efficiency up to 88%.
- High reliability: Compliant with EN60601-1, IEC CLASS II and 2×MOPP insulation protection level, CE.
- Flame retardant insulation: UL94V-0 flame retardant heat resistant material.
- Full protections: Short Circuit/ Over Voltage/ Over Current/ Self-recovery.
- Small size: 115.25\*52.2\*31.5mm, can be put into products with high volume requirements.

## 2 Applications

- Blood glucose meter
- Blood oxygen meter
- COVID-19 PCR test machine
- Household beauty device
- Physiotherapy equipment

## 3 Description

ADM450K150S001A is a medical-grade small package AC-DC switching power supply with a single output. It has the characteristics of low power consumption, broad voltage input, high integration, simple external circuit application, high and low-temperature uniqueness, high efficiency and green, and safe isolation. It adopts 100-240VAC universal input voltages and can continuously output DC of 24V DC Voltage, widely used in portable medical equipment.

## Table of Contents

|          |                                    |          |
|----------|------------------------------------|----------|
| <b>1</b> | <b>FEATURES</b>                    | <b>1</b> |
| <b>2</b> | <b>APPLICATIONS</b>                | <b>1</b> |
| <b>3</b> | <b>DESCRIPTION</b>                 | <b>1</b> |
| <b>4</b> | <b>NAMING CONVENTION</b>           | <b>3</b> |
| <b>5</b> | <b>SPECIFICATION</b>               | <b>3</b> |
| 5.1      | INPUT PARAMETER                    | 3        |
| 5.2      | OUTPUT PARAMETER                   | 3        |
| 5.3      | ENVIRONMENT                        | 4        |
| 5.4      | PROTECTION FUNCTION                | 4        |
| 5.5      | RELIABILITY                        | 4        |
| 5.6      | SAFETY STANDARDS / DIRECTIVES      | 7        |
| 5.7      | EMC                                | 7        |
| <b>6</b> | <b>TYPICAL APPLICATION CIRCUIT</b> | <b>7</b> |
| <b>7</b> | <b>MECHANICAL SPECIFICATION</b>    | <b>8</b> |
| <b>8</b> | <b>PRECAUTIONS FOR USE</b>         | <b>8</b> |
| <b>9</b> | <b>REVISION HISTORY</b>            | <b>9</b> |

## 4 Naming Convention

ADM450K150S001A: medical-grade AC/DC power module with 24V output voltage, 45W rated power and resin filled.

|     |                           |   |
|-----|---------------------------|---|
| □□  | Product Code              | AD=Isolated AC/DC; DD=Isolated DC/DC  |
| □   | Packaging Form            | A=adapter; M=resin filled power module; P=PCB module                                  |
| XXX | Power Coding              | First two digits multiplied by 10 to the power of the third digit                     |
| □   | Application Level         | C=commercial grade T=industrial grade K=medical grade S=harsh environment application |
| XXX | Output Voltage            | *10 <sup>-1</sup> V   |
| □   | Custom tag                | S=standard product Z=customized product   |
| XXX | Product ID                | 001-999, used to identify different products of the same category                     |
| □   | Major Upgrade Information | A-Z, fixed as A for the first mass production   |

## 5 Specification

### 5.1 Input Parameter

|                        |                              |
|------------------------|------------------------------|
| Voltage Range          | 100~240 VAC, 100-370VDC      |
| Frequency Range        | 47~63Hz                      |
| Input Current (Max.)   | 1.1A @ 100VAC, 0.9A @ 240VAC |
| Efficiency (Typ.)      | 88%                          |
| Standby Consumption    | 0.1W                         |
| Impulse Current (Typ.) | 30A @ 110VAC, 40A @ 240VAC   |
| Leakage Current (Typ.) | 0.1mA @ 264VAC, 60Hz         |

### 5.2 Output Parameter

|                      |                                 |
|----------------------|---------------------------------|
| Output Voltage       | 15VDC                           |
| Voltage Tolerance    | ±5%                             |
| Output Current       | 3000mA                          |
| Rated Power (Max.)   | 45W                             |
| Line Regulation      | ±3% at full load                |
| Max. Capacitive Load | 7000uF                          |
| Load Regulation      | ±3%                             |
| Ripple & Noise       | 90mV (Typ.), 150mV (Max.)@20MHz |
| Frequency (Typ.)     | 65kHz                           |
| Hold Up Time (Typ.)  | 15mS @ 100VAC<br>80mS @ 240VAC  |

### 5.3 Environment

|                         |                                   |
|-------------------------|-----------------------------------|
| Operating Temperature   | -40 ~ +70°C                       |
| Storage Temperature     | -40 ~ +85°C                       |
| Storage Humidity        | 95%RH (Max.)                      |
| Power Derating          | 3.6%/°C @ -40 ~ -25°C             |
|                         | 2.4%/°C @ +50 ~ +70°C, 15VDC      |
|                         | 2.7%/°C @ +55 ~ +70°C             |
| Temperature Coefficient | ±0.02%/°C                         |
| Soldering Temperature   | 260±5°C @ Wave Soldering, 5~10s   |
|                         | 360±10°C @ Manual Soldering, 3-5s |

### 5.4 Protection Function

|                           |   |
|---------------------------|---|
| Short Circuit             | Long term short circuit, auto recovery. |
| Over Current              | ≥140%IO auto recovery                   |
| Over Voltage              | ≤23VDC @ 15V output                     |
| IEC Safety Class          | CLASSII                                 |
| Electric Shock Protection | 2×MOPP @ primary to secondary           |

### 5.5 Reliability

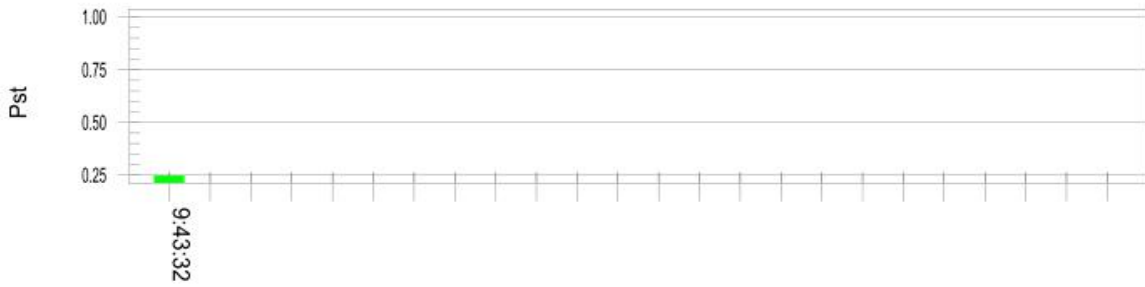
|      |                  |
|------|------------------|
| MTBF | ≥100,000H @ 25°C |
|------|------------------|

**Test Result: Pass**

**Status: Test Completed**

**Pst and limit line**

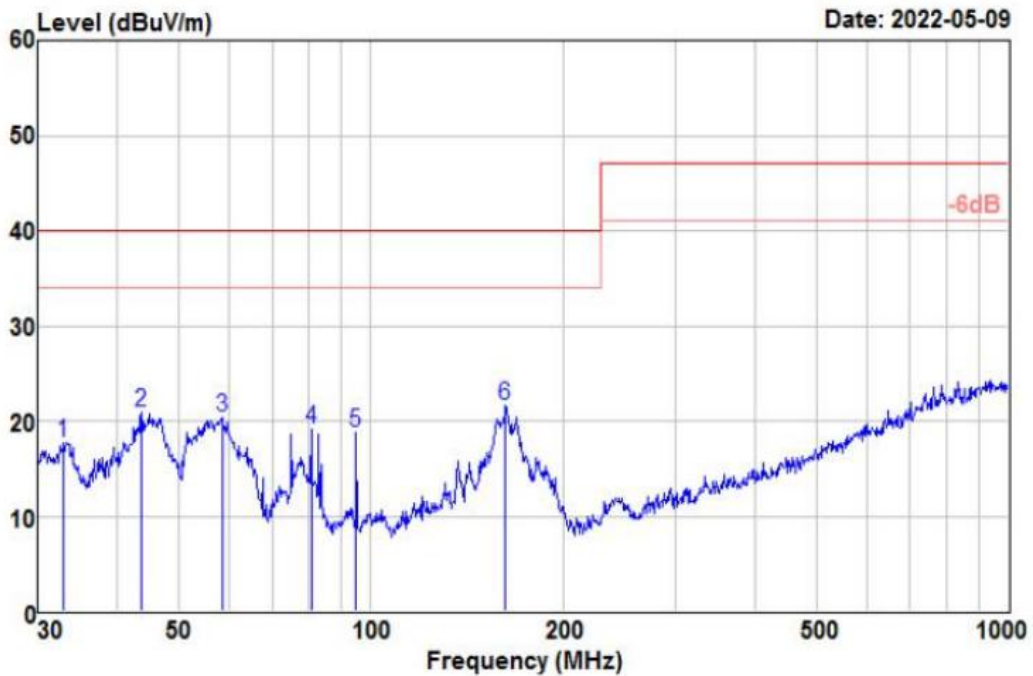
**European Limits**



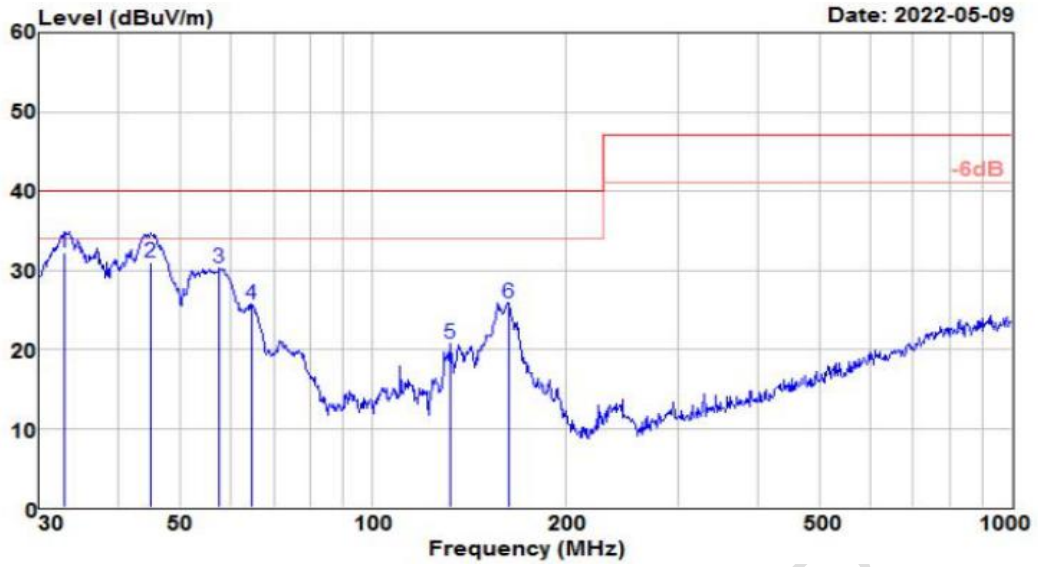
**Plt and limit line**



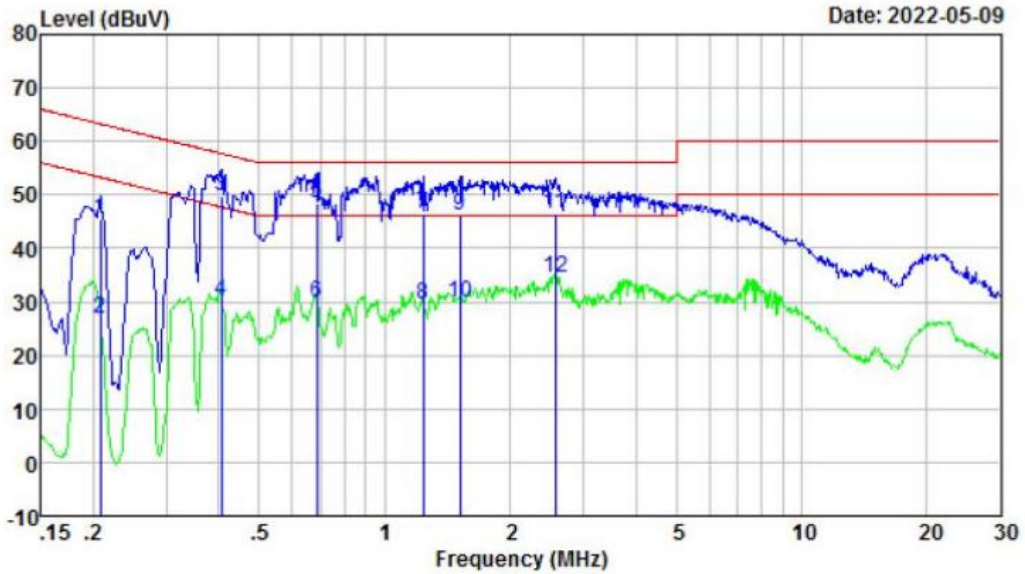
Horizontal:



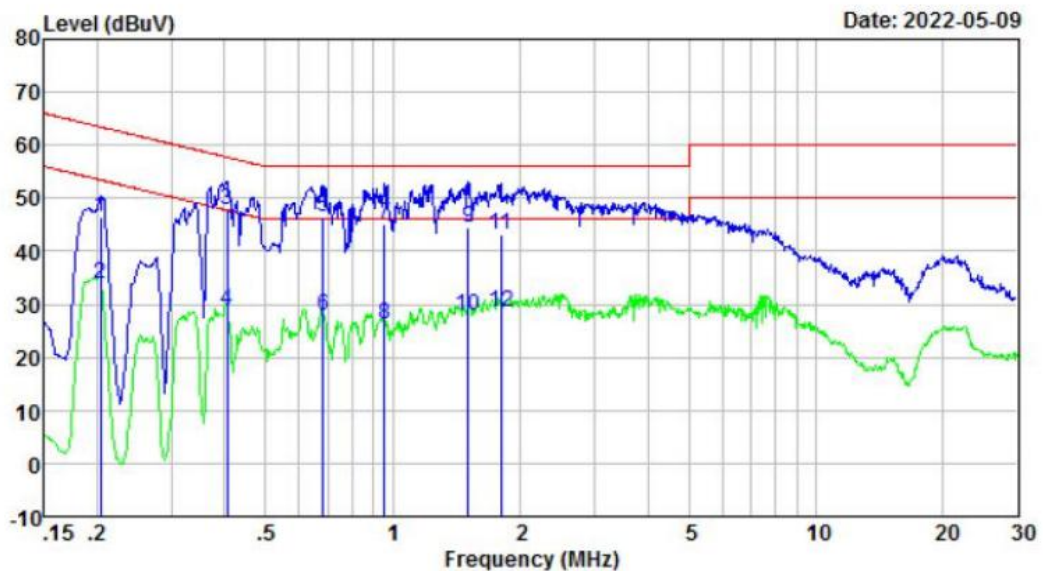
Vertical:



LINE



NEUTRAL



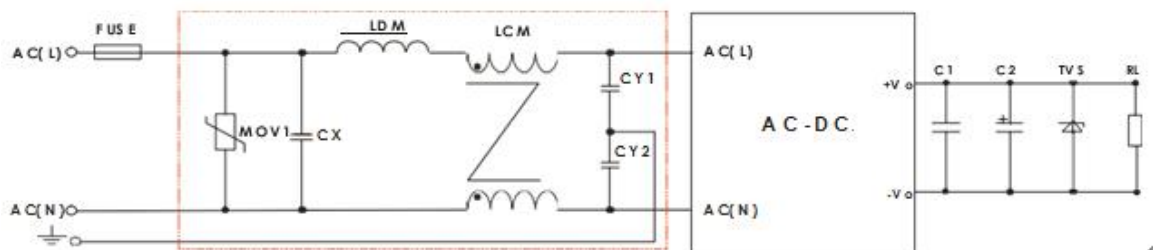
## 5.6 Safety Standards / Directives

|                          |                 |  |
|--------------------------|-----------------|--|
| Medical safety           |                 | EN60601-1  |
| CE                       |                 | Compliant  |
| Isolation Voltage (Min.) | Input to Output | 4000VAC @ 1 minute test and the leakage current is smaller than 5mA. |

## 5.7 EMC

|     | Parameter                       | Standard                          | Test Level / Note   |
|-----|---------------------------------|-----------------------------------|---|
| EMI | Conducted Emission              | EN55011(CISPR11)/EN55032(CISPR32) | CLASS B   |
|     | Radiated Emission               | EN55011(CISPR11)/EN55032(CISPR32) | CLASS B   |
|     | Voltage Flicker                 | EN61000-3-2                       | -   |
|     | Harmonic Current                | EN61000-3-2                       | -   |
|     | Parameter                       | Standard                          | Test Level / Note   |
| EMS | Electrostatic Discharge         | IEC/EN61000-4-2                   | ±8KV/Contact<br>±2,4,8,15KV/Air   |
|     | Radiate Susceptibility          | IEC/EN61000-4-3                   | 10V/m   |
|     | Electrical Fast Transient Burst | IEC/EN61000-4-4                   | ±2 KV   |
|     | Surge                           | IEC/EN61000-4-5                   | ±0.5/±1 KV<br>Professional/Family medicine  |
|     | Conducted Susceptibility        | IEC/EN61000-4-6                   | 3V <sub>m</sub> /0.15MHz-80MHz<br>6V <sub>m</sub><br>(Within 15m band)<br>0.15MHz-80MHz<br>80%AM, 1kHz              |
|     | Voltage Dips and Interruption   | IEC/EN61000-4-11                  | 0%UT 0.5cycle<br>0°, 45°, 90°, 135°, 180°, 270°, 315°.<br>0%UT 1cycle<br>70%UT 25/30 cycle 0°<br>0%UT 250/300 cycle |

## 6 Typical Application Circuit

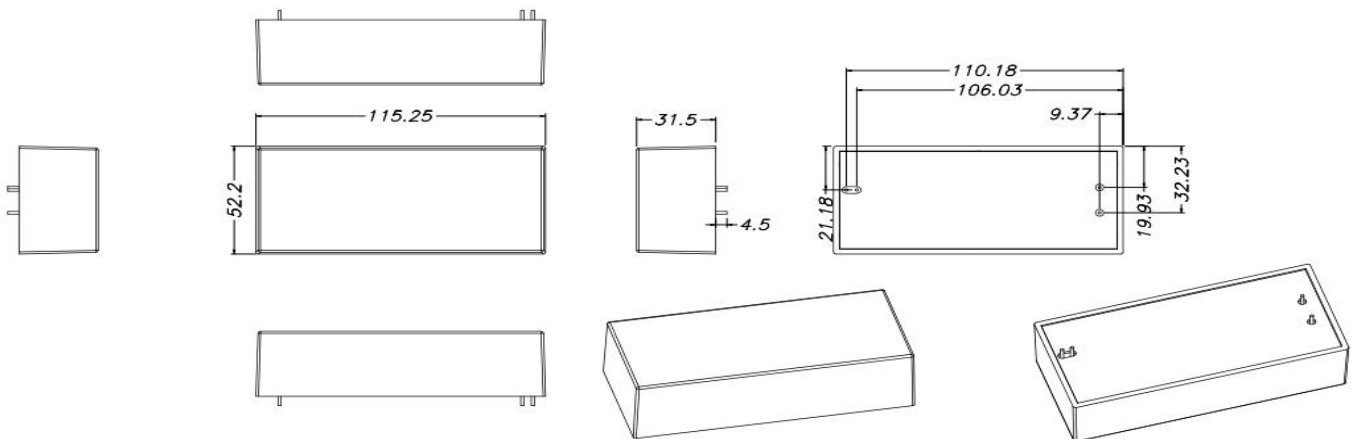


Note: EMC has higher requirements without any additional circuit.



## 7 Mechanical Specification

|                    |   |
|--------------------|---|
| Dimension          | 115.25*52.2*31.5mm  |
| Enclosure Material | Black flame retardant and heat resistant plastics (UL94V-0) |
| Cooling Mode       | Natural air cooling   |



## 8 Precautions for Use

Avoid using the equipment close to or stacked with other equipment, which may lead to improper operation. If it must be used close to or stacked, pay attention to observe and verify the equipment and other equipment to ensure normal operation.

The use of other accessories, sensors and cables provided by the equipment manufacturer may increase the electromagnetic radiation or reduce the immunity.

The distance between the portable radio frequency communication equipment and the equipment should not be greater than 30cm, otherwise the performance of the equipment may be reduced.



## 9 Revision History

| Version | Date       | Description       | Author |
|---------|------------|-------------------|--------|
| 00      | 2023-01-11 | First edition     | Kaya   |
| 01      | 2023-05-23 | Upgrade version   | Kaya   |
| 02      | 2024-08-29 | Modify MTBF Value | YML    |

Disclaimer: The product design is subject to alternation and improvement without prior notice.

Please contact us if you have any questions about the use of this document or our products, or if you would like to know the latest information about our products:

- Customer Service Tel: +86 400 018 9008
- Customer Service Email: [dwinhmi@dwin.com.cn](mailto:dwinhmi@dwin.com.cn)
- DWIN Developer Forum: <https://forums.dwin-global.com/>

Thank you all for continuous support of DWIN, and your approval is the driving force of our progress!

### Important Disclaimer

DWIN reserves the right to make any changes to product designs without prior notice.

Customers should ensure strictly adhering to all the relevant standards and requirements during the product application process, including but not limited to functional safety, information security, and regulatory provisions.

DWIN shall not bear any joint and several liability for any consequences that may arise from customers' adoption of DWIN products. In particular, for risks that may lead to significant property losses, environmental hazards, personal injury, or even death, especially in high-risk application areas such as military applications, flammable and explosive places, and life-saving medical equipment, customers should independently assess the risks and take corresponding preventive and protective measures. DWIN shall not bear any relevant responsibility.