

# 270V Standard Input Series DC/DC Converter

## (Output 750W)

### 1 Features

- Input voltage range: 200~400V
- Typical input direct voltage: 270
- Output voltage: 12V
- Output power: 750W
- Output voltage regulation range: -20%~10%
- Input under-voltage protection
- Output over-current/over-voltage protection
- Working temperature (T<sub>c</sub>) :-55~100℃
- Fix-frequency PWM control method
- Standard-brick size
- Pins function: compatibility with similar products of SynQor



119.02×63.14×13.05mm<sup>3</sup>

table 1 product category

weight: ≤270g

MX-270H-12-FP-N-M-F

### 2 Scope of application

For high reliability electronic systems in aviation, aerospace, etc.

### 3 Descriptions

MI-270N series DC/DC converters use two stages circuit topology, the first stage is voltage regulation stage, the second stage is input-output isolation stage. Output voltage produce error amplifying signal by error amplifier. This signal is use for control the duty ratio of PWM waveform thus controlling the output voltage of the whole module.

These series products has module circuits structure with surface mounted technology, inside the products, using conductivity material for embedding and aluminum baseboard for cooling. The products' outlines are compatible with similar products' of SynQor, and their pins can be replacement.

## 4 Technical Specifications

Table 2: Rated conditions and Operating conditions

| Absolute maximum rating   | Operating conditions  |
|---|---|
| Input Voltage: 425V<br>Output Power: 825W<br>Storage temperature: -65~135°C<br>Lead welding temperature (10s) : 300°C<br>Junction Temperature: <150°C | Input voltage: 200~400V<br>Working temperature (Tc) : -55~100°C |

| No. | Character                                  |                  | Symbol               | Conditions<br>( Unless otherwise specified ,<br>-55°C≤T <sub>c</sub> ≤125°C , V <sub>IN</sub> =270V)          | Limit value                                    |       | Unit  |   |
|-----|--|------------------|----------------------|---|--|-------|-------|---|
|     |  |                  |                      |   | min  | max   |       |   |
| 1   | Input<br>under-voltage/V                   | turn-on voltage  | V <sub>INL-ONT</sub> | T <sub>A</sub> =25°C  | 185  | 195   | V     |   |
|     |  | Turn-off voltage | V <sub>INL-OFF</sub> | T <sub>A</sub> =25°C  | 170  | 180   | V     |   |
| 2   | Output Voltage                             |                  | V <sub>o</sub>       | Full-load   | T <sub>A</sub> =25°C                           | 11.88 | 12.12 | V |
|     |  |                  |                      |   | T <sub>c</sub> =-55°C<br>T <sub>c</sub> =100°C | 11.8  | 12.2  |   |
| 3   | Output Current                             |                  | I <sub>o</sub>       | V <sub>in</sub> =200V~400V  | -  | 62.5  | A     |   |
| 4   | Voltage regulation                         |                  | S <sub>v</sub>       | 200V 400V, Full-load<br>T <sub>A</sub> =25°C、 T <sub>c</sub> =-55°C and<br>T <sub>c</sub> =100°C              | -  | ±0.20 | %     |   |
| 5   | Load regulation                            |                  | S <sub>1</sub>       | No-load Full-load<br>T <sub>A</sub> =25°C、 T <sub>c</sub> =-55°C and<br>T <sub>c</sub> =100°C                 | -  | ±0.50 | %     |   |
| 6   | Output voltage regulation range            |                  | V <sub>TR</sub>      | T <sub>A</sub> =25°C, Full-load   | -20  | 10    | %     |   |
| 7   | Output ripple voltage                      |                  | V <sub>PP</sub>      | BW≤20MHz, full-load,<br>peak-peak<br>T <sub>A</sub> =25°C、 T <sub>c</sub> =-55°C and<br>T <sub>c</sub> =100°C | -  | 200   | mV    |   |
| 8   | Output over-voltage protection point       |                  | V <sub>OVP</sub>     | T <sub>A</sub> =25°C, design guarantee  | 13.2   | 15.6  | V     |   |
| 9   | Output current for over-current protection |                  | I <sub>imax</sub>    | T <sub>A</sub> =25°C  | 69   | 81    | A     |   |
| 10  | efficiency                                 |                  | η                    | V <sub>in</sub> =270V, full load, T <sub>A</sub> =25°C  | 92   | -     | %     |   |

a test only be needed when identified inspection or parameters are effected by changing process; b design guarantee, do not require test

table 3a electrical characteristics (MI-270H-12-FP-N-M-F)

table 3b function characteristics (MI-270H-12-FP-N-M-F)

| characteristics | conditions<br>( Unless otherwise specified ,<br>-55°C≤T <sub>c</sub> ≤125°C , V <sub>IN</sub> =270V±10V) | criteria      |
|-----------------|--|---------------|
| Using function  | ON/OFF voltage is over 2.4V, T <sub>A</sub> =25°C  | No output     |
|                 | ON/OFF voltage is lower than 0.7V or<br>hung in the air, T <sub>A</sub> =25°C                            | Normal Output |

## 5 Circuit block Fig

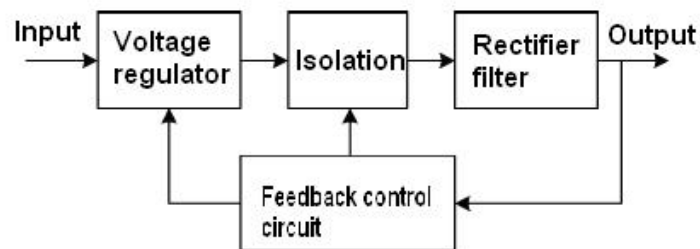


Fig 2 Product schematic Fig

## 6 Typical Characteristic Curve

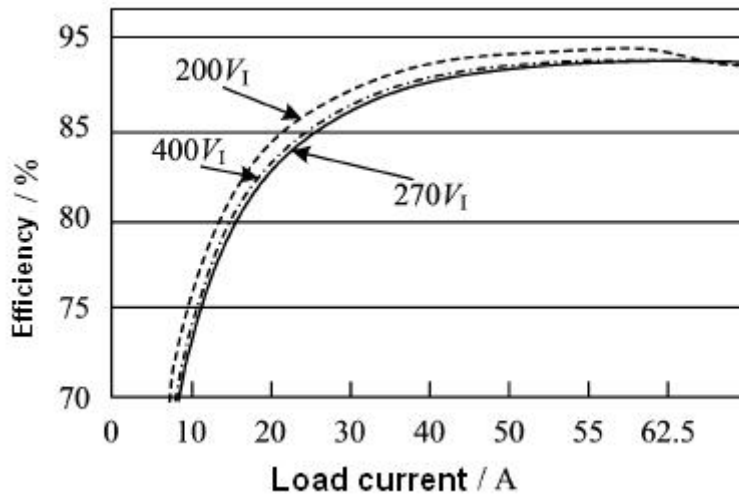


Fig 3 Efficiency (Output power)

### 7.MTBF Curve

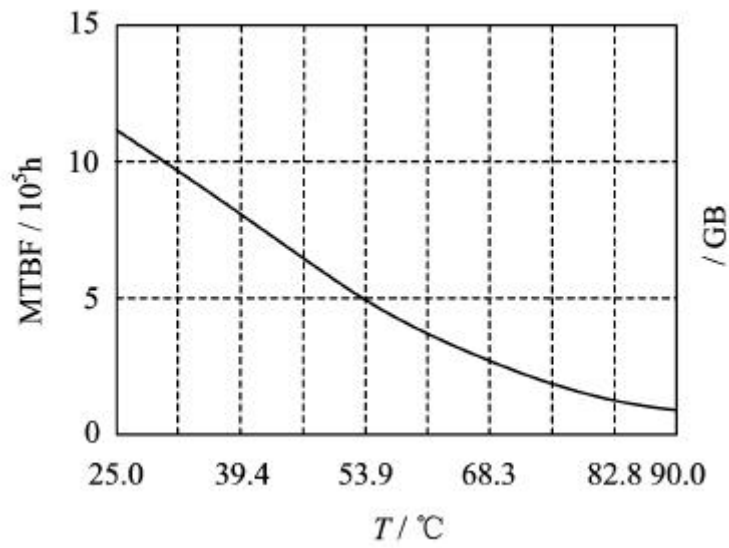


Fig 4 MTBF Curve

(Predicting the ground is in good condition)

### 8 Pin Designation

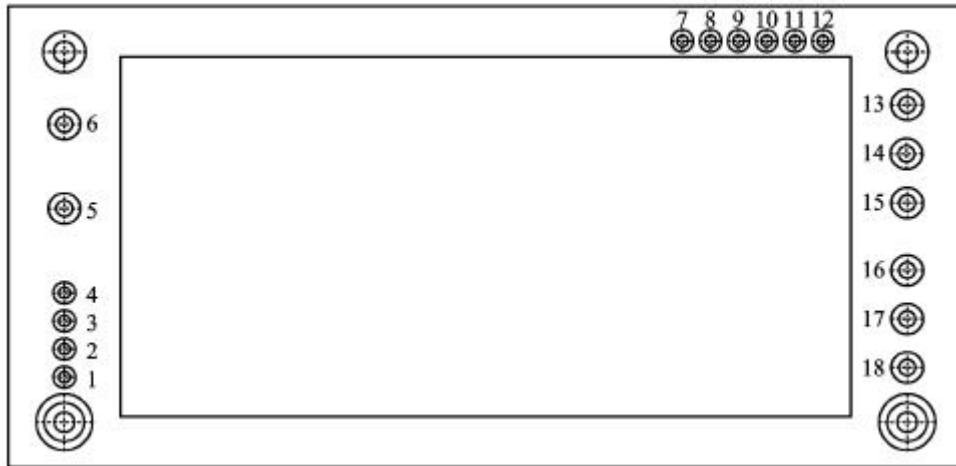


Figure 5 Pin Out Bottom View

Table 4 MI-270-05-FT-N-M-FB Pin Designation

| Pin | Symbol     | Designation  |
|-----|------------|--|
| 1   | SyncIn     | Synchronizing signal Input                         |
| 2   | SyncOut    | Synchronizing signal Output                        |
| 3   | ON/OFF (+) | Positive Enabling(relative to ON/OFF(-))           |
| 4   | ON/OFF(-)  | Negative Enabling (isolation common)               |
| 5   | Vin (+)    | Positive Input                                     |
| 6   | Vin (-)    | Negative Input                                     |
| 7   | Vaux       | Auxiliary power output (relative to output common) |
| 8   | Start Sync | Synchronizing signal start                         |
| 9   | I Share    | Paralleled current sharing Signal                  |
| 10  | TRIM       | Output voltage regulation                          |
| 11  | SENSE(+)   | Positive Output Induction                          |
| 12  | SENSE(-)   | Negative Output Induction                          |
| 13  | Vout (-)   | Negative Output                                    |
| 14  | Vout (-)   | Negative Output                                    |
| 15  | Vout (-)   | Negative Output                                    |
| 16  | Vout (+)   | Positive Output                                    |
| 17  | Vout (+)   | Positive Output                                    |
| 18  | Vout (+)   | Positive Output                                    |

## 9 Typical Connection Fig

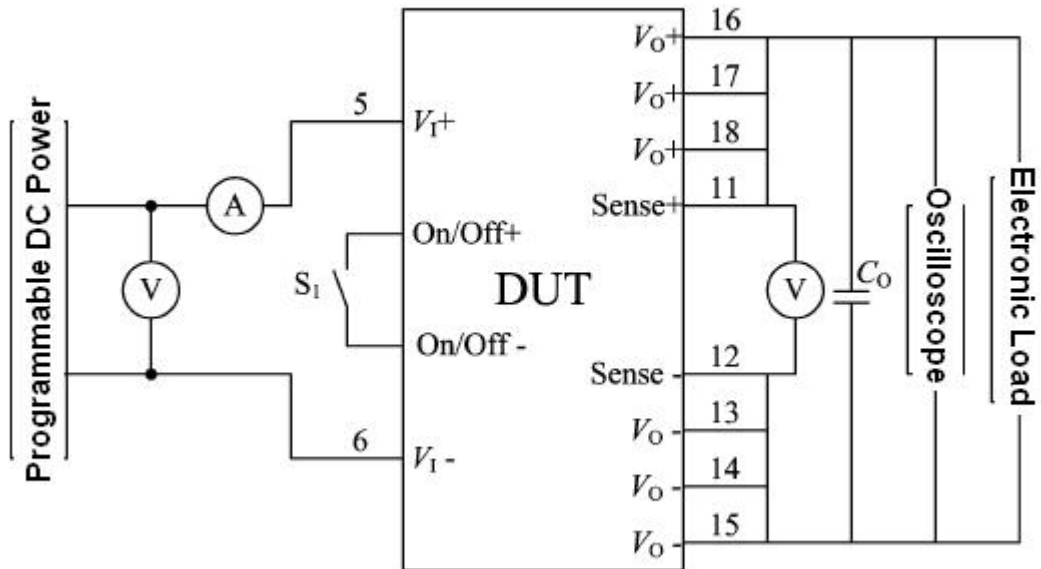


Fig 6: Electrical testing connection Fig

## 10. Package Specifications

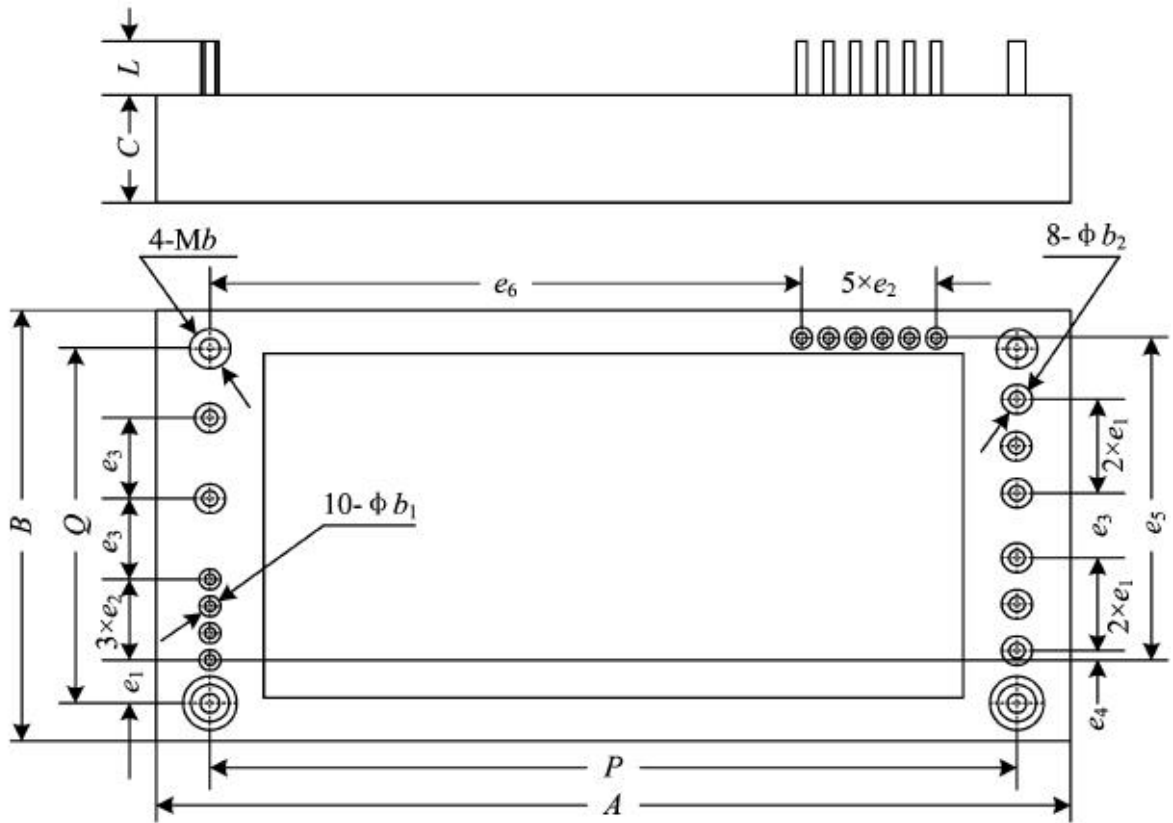


Fig 7: Package outline drawing

Table 4 Package Outline

| Symbols   | mm Unit/mm |         |         |
|-----------|------------|---------|---------|
|           | Minimum    | Typical | Maximum |
| <i>A</i>  | -          | -       | 119.52  |
| <i>B</i>  | -          | -       | 63.64   |
| <i>C</i>  | -          | -       | 13.05   |
| <i>e1</i> | -          | 6.35    | -       |
| <i>e2</i> | -          | 3.81    | -       |
| <i>e3</i> | -          | 10.16   | -       |
| <i>e4</i> | -          | 1.27    | -       |
| <i>e5</i> | -          | 45.72   | -       |
| <i>e6</i> | -          | 80.01   | -       |
| $\Phi b1$ | 0.90       | -       | 1.10    |
| $\Phi b2$ | 1.80       | -       | 2.20    |
| <i>P</i>  | -          | 106.70  | -       |
| <i>Q</i>  | -          | 50.80   | -       |
| <i>L</i>  | 3.00       | -       | -       |
| <i>Mb</i> | -          | 2.5     | -       |

## 11 Ordering Information

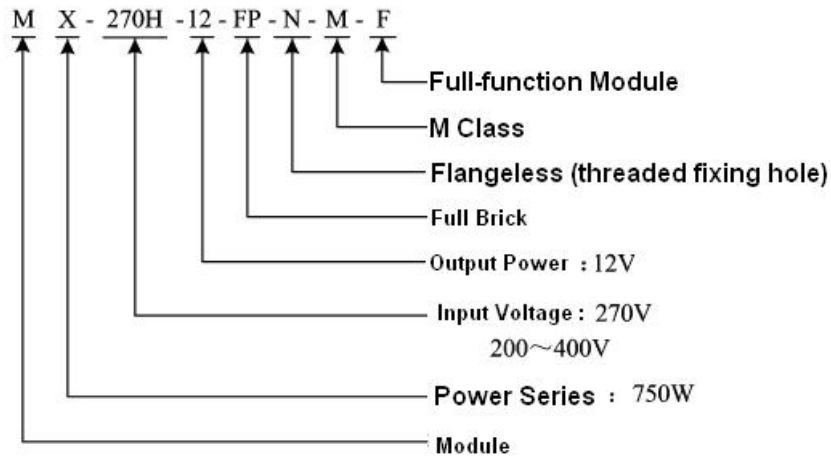


Fig 8: Ordering Information

### Application Notes:

- ☆ The influence of external disturbance on the test accuracy should be avoided.
- ☆ The voltage detection point should be kept at the root of the pin of the testing product.
- ☆ Do not plug the product with electricity.
- ☆ Before power the testing product, you must confirm the polarity of the power supply to avoid damaging products by misconnection. At the same time, please ensure that the power supply voltage and load current does not exceed using limitation of the testing product.
- ☆ Package temperature can not exceed the specified temperature in use, otherwise the heat sink should be needed.
- ☆ When ordering this device , the detailed electrical specifications shall be based on relevant standards.