

Half- Brick MI-270N Series DC/DC Converter

1 Features

- Input voltage range: 220~320V
- Typical input direct voltage: 270V
- Output voltage: 10V、12V、28V
- Output power: 400W
- Output voltage regulation range: -20%~10%
- Output over-current/over-voltage protection
- Thermal protection
- Working temperature (T_c) :-55~100°C
- Fix-frequency PWM control method
- Standard-brick size
- Pins function: compatibility with similar products of SynQor



63.64×61.10×12.9mm³

Weight: ≤139g

table 1 product category

| |
|----------------------|
| MI-270N-10-HT-N-M-F |
| MI-270N-12-HT-N-M-F |
| MI-270N-10-HT-N-M-FB |
| MI-270N-28-HT-N-M-FB |

2 Scope of application

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

3 Descriptions

Half- Brick 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 PCB surface mounted technology, inside the products, using conductivity material for embedding and alu

minum 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: 350V Output Power: 440W Storage temperature: -55~125°C Lead welding temperature (10s) : 300°C Junction Temperature: <150°C | Input voltage: 220~320V Working temperature (Tc) : -55~100°C |

Table 3a electrical characteristics (MI-270N-10-HT-N-M-F)

| No. | Character | | Symbol | Conditions (Unless otherwise specified (MI-270N-10-HT-N-M-F) , -55°C≤Tc≤125°C, VIN=270V) | Limit value | | Unit | |
|-----|--|------------------|---------------------------|---|----------------------|-------|-------|---|
| | | | | | min | max | | |
| 1 | Input Transient voltage ^a /V | | Vis | TA=25°C, Less 100ms | 200 | 350 | V | |
| 2 | Input under-voltage/ V | turn-on voltage | V _{INL-ON} T | TA=25°C | 185 | 195 | V | |
| | | Turn-off voltage | V _{INL-OFF} F | TA=25°C | 170 | 179 | V | |
| 3 | Output Voltage | | Vo | Full-load | TA=25°C | 9.90 | 10.10 | V |
| | | | | | Tc=-55°C Tc=100°C | 9.75 | 10.25 | |
| 4 | Output Current | | Io | Vin=220V~320V | - | 40 | A | |
| 5 | Voltage Regulation | | Sv | 220V 320V, Full-load TA=25°C、Tc=-55°C and Tc=100°C | - | ±0.30 | % | |
| 6 | Load Regulation | | S1 | No-load Full-load TA=25°C、Tc=-55°C and Tc=100°C | - | ±0.30 | % | |
| 7 | Output voltage regulation range ^a | | V _{TR} | TA=25°C, Full-load | -20 | 10 | % | |
| 8 | Output ripple voltage | | V _{PP} | BW≤20MHz, full-load, peak-peak TA=25°C、Tc=-55°C和 | - | 100 | mV | |

| | | | T _C =100℃ | | | | |
|----|--|-------------------|--|---|-------|-----|----|
| 9 | Output over-voltage protection point | V _{OVp} | T _A =25℃, design guarantee | 11.25 | 13.75 | V | |
| 10 | Output current for over-current protection | I _{imax} | T _A =25℃ | 43.2 | 52.8 | A | |
| 11 | Output load respond recovery voltage | | 50%to100%to50% I _{omax} (0.1A/μs) T _A =25℃ | - | 6 | %Vo | |
| 12 | Output load respond recovery time | | 50%to100%to50% I _{omax} (0.1A/μs) T _A =25℃ | - | 5 | mS | |
| 13 | Capacitive Load | C _o | Full-load, T _A =25℃ | - | 4000 | μF | |
| 14 | Efficiency a | η | V _{in} =240V, Full-load or half-load, T _A =25℃ | 91 | - | % | |
| | | | V _{in} =280V, Full-load or half-load, T _A =25℃ | 91 | - | % | |
| | Efficiency | | V _{in} =220V, Full-load or half-load, T _A =25℃ | 89 | - | % | |
| | | | V _{in} =320V, Full-load or half-load, T _A =25℃ | 89 | - | % | |
| 15 | Output Voltage Temperature rate | av | Full-load | - | ±0.04 | %/℃ | |
| 16 | Input reflect ripple voltage | | Full-load, T _A =25℃, Peak-Peak | - | 5 | V | |
| 17 | Isolation voltage | Viso | T _A =25℃, 10s, 1mA Between input and output | 1500 | - | VDC | |
| 18 | Isolation Resistance/MΩ | Riso | T _A =25℃ 500vdc | Between input ground and output ground | 100 | - | MΩ |
| | | | | Between Input ground and Metal package | 100 | - | MΩ |
| | | | | Between Output ground and Metal package | 100 | - | MΩ |
| 19 | Over-heat protection | T _{OTP} | Temperature of package | 100 | 110 | ℃ | |
| 20 | Parallel power distributing precision | P _E | Full-load, T _A =25℃ | - | 5 | % | |
| 21 | Parallel power distributing precision a | | Full-load, T _C =-55℃, T _C =100℃ | - | 5 | % | |
| 22 | Parallel power distributing | | Half-load, T _A =25℃ | - | 8 | % | |

| | | | | | | |
|----|--------------------------------|--|--|---|-----|----|
| | precision | | | | | |
| 23 | Input supply ripple current a | | 8-parallel, full-load, single output ripple current peak-peak, T _A =25°C | - | 2 | A |
| 24 | Input reflect ripple current a | | 8-parallel, full-load, single input reflect ripple current peak-peak, T _A =25°C | - | 800 | mA |
| 25 | Output Overshoot Amplitude | | Full-load, T _A =25°C | - | 1 | % |
| 26 | Output Overshoot time | | Full-load, T _A =25°C | - | 10 | ms |

a test only be needed when identified inspection or parameters are effected by changing process;
b design guarantee, do not require test;
c design guarantee, random testing 2pcs from final electric testing products, qualification inspection and quality consistency testing or testing for status change.

Table 3b function characteristics (MI-270N-10-HT-N-M-F)

| characteristics | conditions (Unless otherwise specified , -55°C≤T _c ≤125°C, V _{IN} =270V±10V) | criteria |
|-------------------|---|---------------|
| Parallel Capacity | Full-load, T _A =25°C | Max 8pcs |
| Using function | ON/OFF voltage is over 2.4V, T _A =25°C | No output |
| | ON/OFF voltage is lower than 0.7V or hung in the air, T _A =25°C | Normal Output |

Table 3c electrical characteristics (MI-270N-10-HT-N-M-FB)

| No. | characteristics | | Symbol | Condition (Unless otherwise specified , -55°C≤T _c ≤125°C, V _{IN} =270V) | Limit value | | Unit | |
|-----|---|------------------|----------------------|---|-----------------------|------|-------|---|
| | | | | | min | max | | |
| 1 | Input Transient voltage ^a /V | | Vis | T _A =25°C, less 100ms | 200 | 350 | V | |
| 2 | Input under-voltage/ V | turn-on voltage | V _{INL-ON} | T _A =25°C | 185 | 195 | V | |
| | | Turn-off voltage | V _{INL-OFF} | T _A =25°C | 173 | 183 | V | |
| 3 | Output Voltage | | Vo | Full-load | T _A =25°C | 9.90 | 10.10 | V |
| | | | | | T _c =-55°C | 9.75 | 10.25 | |
| | | | | | T _c =100°C | | | |

| | | | | | | | |
|----|--|------------|--|--|------------|----------------|------------|
| 4 | Output Current | I_o | $V_{in}=220V\sim 320V$ | - | 40 | A | |
| 5 | Voltage Regulation | S_v | 220V 320V, Full-load $T_A=25^{\circ}C$ 、 $T_c=-55^{\circ}C$ 和 $T_C=100^{\circ}C$ | - | ± 0.30 | % | |
| 6 | Load Regulation | S_I | No-load Full-load $T_A=25^{\circ}C$ 、 $T_c=-55^{\circ}C$ 和 $T_C=100^{\circ}C$ | - | ± 0.30 | % | |
| 7 | Output voltage regulation range ^a | V_{TR} | $T_A=25^{\circ}C$, Full-load | -20 | 10 | % | |
| 8 | Output ripple voltage | V_{PP} | BW $\leq 20MHz$, full-load, peak-peak $T_A=25^{\circ}C$ 、 $T_c=-55^{\circ}C$ 和 $T_C=100^{\circ}C$ | - | 520 | mV | |
| 9 | Output over-voltage protection point | V_{OVP} | $T_A=25^{\circ}C$, design guarantee | 11.25 | 13.75 | V | |
| 10 | Output current for over-current protection | I_{imax} | $T_A=25^{\circ}C$ | 43.2 | 52.8 | A | |
| 11 | Output load respond recovery voltage | | 50%to100%to50% I_{omax} (0.1A/ μs) $T_A=25^{\circ}C$ | - | 6 | % V_o | |
| 12 | Output load respond recovery time | | 50%to100%to50% I_{omax} (0.1A/ μs) $T_A=25^{\circ}C$ | - | 5 | mS | |
| 13 | Capacitive Load | C_o | Full Load, $T_A=25^{\circ}C$ | - | 4000 | μF | |
| 14 | Efficiency a | η | $V_{in}=240V$, Full-load or half-load, $T_A=25^{\circ}C$ | 89 | - | % | |
| | | | $V_{in}=280V$, Full-load or half-load, $T_A=25^{\circ}C$ | 89 | - | % | |
| | Efficiency | | $V_{in}=220V$, Full-load or half-load, $T_A=25^{\circ}C$ | 87 | - | % | |
| | | | $V_{in}=320V$, Full-load or half-load, $T_A=25^{\circ}C$ | 87 | - | % | |
| 15 | Output Voltage Temperature rate | Δv | Full-load | - | ± 0.04 | %/ $^{\circ}C$ | |
| 16 | Input reflect ripple voltage | | Full-load, $T_A=25^{\circ}C$, peak-peak | - | 5 | V | |
| 17 | Isolation voltage | V_{iso} | $T_A=25^{\circ}C$, 10s, 1mA Between input and output | 1500 | - | VDC | |
| 18 | Isolation Resistance/M Ω | Riso | $T_A=25^{\circ}C$ 500vdc | Between input ground and output ground | 100 | - | M Ω |
| | | | | Between Input ground and Metal package | 100 | - | M Ω |
| | | | | Between Output ground and Metal | 100 | - | M Ω |

| | | | package | | | |
|----|---|------------------|--|-----|-----|----|
| 19 | Over-heat protection | T _{OTP} | Temperature of package | 100 | 125 | °C |
| 20 | Parallel power distributing precision | P _E | Full-load, T _A =25°C | - | 5 | % |
| 21 | Parallel power distributing precision a | | Full-load, T _C =-55°C, T _C =100°C | - | 5 | % |
| 22 | Parallel power distributing precision | | Half-load, T _A =25°C | - | 8 | % |
| 23 | Input supply ripple current a | | 8-parallel, full-load, single output ripple current peak-peak, T _A =25°C | - | 2 | A |
| 24 | Input reflect ripple current a | | 8-parallel, full-load, single input reflect ripple current peak-peak, T _A =25°C | - | 800 | mA |
| 25 | Output Overshoot Amplitude | | Full-load, T _A =25°C | - | 1 | % |
| 26 | Output Overshoot time | | Full-load, T _A =25°C | - | 10 | ms |

a test only be needed when identified inspection or parameters are effected by changing process;
b design guarantee, do not require test;
c design guarantee, random testing 2pcs from final electric testing products, qualification inspection and quality consistency testing or testing for status change.

table 3d function characteristics (MI-270N-10-HT-N-M-FB)

| characteristics | Conditions (Unless otherwise specified , -55°C≤T _c ≤125°C, V _{IN} =270V±10V) | criteria |
|-------------------|---|---------------|
| Parallel Capacity | Full-load, T _A =25°C | Max 8pcs |
| Using function | ON/OFF voltage is over 2.4V, T _A =25°C | No output |
| | ON/OFF voltage is lower than 0.7V or hung in the air, T _A =25°C | Normal Output |

Table 3e electrical characteristics (MI-270N-12-HT-N-M-F)

| No. | characteristics | | symbol | Conditions (Unless otherwise specified , -55°C≤T _c ≤125°C, V _{IN} =270V) | Limit value | | Unit |
|-----|---|-----------------|----------------------|--|-------------|-----|------|
| | | | | | min | max | |
| 1 | Input Transient voltage ^a /V | | Vis | T _A =25°C, less 100ms | 200 | 350 | V |
| 2 | Input under-voltage/ | turn-on voltage | V _{INL-ONT} | T _A =25°C | 185 | 195 | V |

| | | | | | | | |
|----|--|------------------|---|--|-------|------------|----------------|
| | V | Turn-off voltage | $V_{INL-OFF}$ | $T_A=25^{\circ}C$ | 170 | 179 | V |
| 3 | Output Voltage | V_o | Full-load | $T_A=25^{\circ}C$ | 11.90 | 12.10 | V |
| | | | | $T_c=-55^{\circ}C$ $T_c=100^{\circ}C$ | 11.75 | 12.25 | |
| 4 | Output Current | I_o | $V_{in}=220V\sim 320V$ | | - | 34 | A |
| 5 | Voltage Regulation | S_v | 220V 320V, Full-load $T_A=25^{\circ}C$ 、 $T_c=-55^{\circ}C$ 和 $T_c=100^{\circ}C$ | | - | ± 0.30 | % |
| 6 | Load Regulation | S_I | No-load Full-load $T_A=25^{\circ}C$ 、 $T_c=-55^{\circ}C$ 和 $T_c=100^{\circ}C$ | | - | ± 0.30 | % |
| 7 | Output voltage regulation range ^a | V_{TR} | $T_A=25^{\circ}C$, Full-load | | -20 | 10 | % |
| 8 | Output ripple voltage | V_{PP} | BW $\leq 20MHz$, full-load, peak-peak $T_A=25^{\circ}C$ 、 $T_c=-55^{\circ}C$ 和 $T_c=100^{\circ}C$ | | - | 100 | mV |
| 9 | Output over-voltage protection point | V_{OVP} | $T_A=25^{\circ}C$, design guarantee | | 13.25 | 15.75 | V |
| 10 | Output current for over-current protection | I_{imax} | $T_A=25^{\circ}C$ | | 36 | 44 | A |
| 11 | Output load respond recovery voltage | | 50%to100%to50% I_{omax} (0.1A/ μs) $T_A=25^{\circ}C$ | | - | 6 | % V_o |
| 12 | Output load respond recovery time | | 50%to100%to50% I_{omax} (0.1A/ μs) $T_A=25^{\circ}C$ | | - | 5 | mS |
| 13 | Capacitive Load | C_o | Full Load, $T_A=25^{\circ}C$ | | - | 4000 | μF |
| 14 | Efficiency a | η | $V_{in}=240V$, Full-load or half-load, $T_A=25^{\circ}C$ | | 92 | - | % |
| | | | $V_{in}=280V$, Full-load or half-load, $T_A=25^{\circ}C$ | | 92 | - | % |
| | Efficiency | | $V_{in}=220V$, Full-load or half-load, $T_A=25^{\circ}C$ | | 91 | - | % |
| | | | $V_{in}=320V$, Full-load or half-load, $T_A=25^{\circ}C$ | | 91 | - | % |
| 15 | Output Voltage Temperature rate | av | Full-load | | - | ± 0.04 | %/ $^{\circ}C$ |
| 16 | Input reflect ripple voltage | | Full-load, $T_A=25^{\circ}C$, peak-peak | | - | 5 | V |
| 17 | Isolation voltage | V_{iso} | $T_A=25^{\circ}C$, 10s, 1mA Between input and output | | 1500 | - | VDC |

| | | | | | | | |
|---|---|------------------|--|---|-----|----|----|
| 18 | Isolation Resistance | Riso | T _A =25°C 500vdc | Between input ground and output ground | 100 | - | MΩ |
| | | | | Between Input ground and Metal package | 100 | - | MΩ |
| | | | | Between Output ground and Metal package | 100 | - | MΩ |
| 19 | Over-heat protection | T _{OTP} | 壳温 Temperature of package | 100 | 110 | °C | |
| 20 | Parallel power distributing precision | P _E | Full-load, T _A =25°C | - | 5 | % | |
| 21 | Parallel power distributing precision a | | Full-load , T _C =-55°C, T _C =100°C | - | 5 | % | |
| 22 | Parallel power distributing precision | | Half-load, T _A =25°C | - | 8 | % | |
| 23 | Input supply ripple current a | | 8-parallel, full-load, single output ripple current peak-peak, T _A =25°C | - | 2 | A | |
| 24 | Input reflect ripple current a | | 8-parallel, full-load, single input reflect ripple current peak-peak, T _A =25°C | - | 800 | mA | |
| 25 | Output Overshoot Amplitude | | Full-load, T _A =25°C | - | 1 | % | |
| 26 | Output Overshoot time | | Full-load, T _A =25°C | - | 10 | ms | |
| <p>a test only be needed when identified inspection or parameters are effected by changing process; b design guarantee, do not require test; c design guarantee, random testing 2pcs from final electric testing products, qualification inspection and quality consistency testing or testing for status change.</p> | | | | | | | |

table 3h function characteristics (MI-270N-12-HT-N-M-F)

| characteristics | Conditions (Unless otherwise specified , -55°C≤T _C ≤125°C, V _{IN} =270V±10V) | criteria |
|-------------------|---|---------------|
| Parallel Capacity | Full-load, T _A =25°C | Max 8pcs |
| Using function | ON/OFF voltage is over 2.4V, T _A =25°C | No output |
| | ON/OFF voltage is lower than 0.7V or hung in the air, T _A =25°C | Normal Output |

table 3g electrical characteristic (MI-270N-28-HT-N-M-FB)

| No. | characteristics | Symbol | Conditions (Unless otherwise specified , $-55^{\circ}\text{C}\leq T_c\leq 125^{\circ}\text{C}$, $V_{IN}=270\text{V}$) | Limit value | | Unit | |
|-----|--|------------------|--|--|------------|---------------|---|
| | | | | Min | Max | | |
| 1 | Input Transient voltage ^a /V | Vis | $T_A=25^{\circ}\text{C}$, less 100ms | 200 | 350 | V | |
| 2 | Input under-voltage/V | turn-on voltage | $V_{INL-ONT}$ | $T_A=25^{\circ}\text{C}$ | 185 | 195 | V |
| | | Turn-off voltage | $V_{INL-OFF}$ | $T_A=25^{\circ}\text{C}$ | 173 | 183 | V |
| 3 | Output Voltage | Vo | Full-load | $T_A=25^{\circ}\text{C}$ | 27.72 | 28.28 | V |
| | | | | $T_c=-55^{\circ}\text{C}$ $T_c=100^{\circ}\text{C}$ | 27.60 | 28.40 | |
| 4 | Output Current | Io | $V_{in}=220\text{V}\sim 320\text{V}$ | - | 14.5 | A | |
| 5 | Voltage Regulation | Sv | 220V 320V, Full-load $T_A=25^{\circ}\text{C}$ 、 $T_c=-55^{\circ}\text{C}$ 和 $T_c=100^{\circ}\text{C}$ | - | ± 0.30 | % | |
| 6 | Load Regulation | S1 | No-load Full-load , $T_A=25^{\circ}\text{C}$ 、 $T_c=-55^{\circ}\text{C}$ 和 $T_c=100^{\circ}\text{C}$ | - | ± 0.30 | % | |
| 7 | Output voltage regulation range ^a | V_{TR} | $T_A=25^{\circ}\text{C}$, Full-load | -20 | 10 | % | |
| 8 | Output ripple voltage | V_{PP} | $BW\leq 20\text{MHz}$, full-load, peak-peak $T_A=25^{\circ}\text{C}$ 、 $T_c=-55^{\circ}\text{C}$ 和 $T_c=100^{\circ}\text{C}$ | - | 460 | mV | |
| 9 | Output over-voltage protection point | V_{OVP} | $T_A=25$ | 31.5 | 28.5 | V | |
| 10 | Output current for over-current protection | I_{imax} | $T_A=25^{\circ}\text{C}$ | 16.0 | 20.3 | A | |
| 11 | Output load respond recovery voltage | | 50%to100%to50% I_{omax} (0.1A/ μs) $T_A=25^{\circ}\text{C}$ | - | 6 | %Vo | |
| 12 | Output load respond recovery time | | 50%to100%to50% I_{omax} (0.1A/ μs) $T_A=25^{\circ}\text{C}$ | - | 5 | mS | |
| 13 | Capacitive Load | Co | Full-load, $T_A=25^{\circ}\text{C}$ | - | 4000 | μF | |
| 14 | Efficiency a | η | $V_{in}=240\text{V}$, Full-load or Half Load, $T_A=25^{\circ}\text{C}$ | 89 | - | % | |
| | | | $V_{in}=280\text{V}$, Full-load or Half Load , $T_A=25^{\circ}\text{C}$ | 89 | - | % | |

| | | | | | | | |
|----|---|------------------|---|---|-------|------|----|
| | Efficiency | | Vin=220V, Full-load or Half Load , T _A =25°C | 87 | - | % | |
| | | | Vin=320V, Full-load or Half Load , T _A =25°C | 87 | - | % | |
| 15 | Output Voltage Temperature rate | av | Full-load | - | ±0.04 | %/°C | |
| 16 | Input reflect ripple voltage | | Full-load , T _A =25°C, peak-peak | - | 5 | V | |
| 17 | Isolation voltage | Viso | T _A =25°C, 10s, 1mA Between input and output | 1500 | - | VDC | |
| 18 | Isolation Resistance | Riso | T _A =25°C 500vdc | Between input ground and output ground | 100 | - | MΩ |
| | | | | Between Input ground and Metal package | 100 | - | MΩ |
| | | | | Between Output ground and Metal package | 100 | - | MΩ |
| 19 | Over-heat protection | T _{OTP} | Temperature of package | 100 | 125 | °C | |
| 20 | Parallel power distributing precision | P _E | Full-load, T _A =25°C | - | 5 | % | |
| 21 | Parallel power distributing precision a | | Full-load , T _C =-55°C, T _C =100°C | - | 5 | % | |
| 22 | Parallel power distributing precision | | Half-load, T _A =25°C | - | 8 | % | |
| 23 | Input supply ripple current a | | 8-parallel, full-load, single output ripple current peak-peak, T _A =25°C | - | 2 | A | |
| 24 | Input reflect ripple current a | | 8-parallel, full-load, single input reflect ripple current peak-peak, T _A =25°C | - | 800 | mA | |
| 25 | Output Overshoot Amplitude | | Full-load, T _A =25°C | - | 1 | % | |
| 26 | Output Overshoot time | | Full-load, T _A =25°C | - | 10 | ms | |

a test only be needed when identified inspection or parameters are effected by changing process;
b design guarantee, do not require test;
c design guarantee, random testing 2pcs from final electric testing products, qualification inspection and quality consistency testing or testing for status change.

table 3h function characteristics (MI-270N-28-HT-N-M-FB)

| characteristics | conditions (Unless otherwise specified , | criteria |
|-----------------|--|----------|
|-----------------|--|----------|

| | | |
|-------------------|---|---------------|
| | $-55^{\circ}\text{C} \leq T_c \leq 125^{\circ}\text{C}$, $V_{IN} = 270\text{V} \pm 10\text{V}$ | |
| Parallel Capacity | Full-load, $T_A = 25^{\circ}\text{C}$ | Max 8pcs |
| Using function | ON/OFF voltage is over 2.4V, $T_A = 25^{\circ}\text{C}$ | No output |
| | ON/OFF voltage is lower than 0.7V or hung in the air, $T_A = 25^{\circ}\text{C}$ | Normal Output |

5 Circuit block diagram

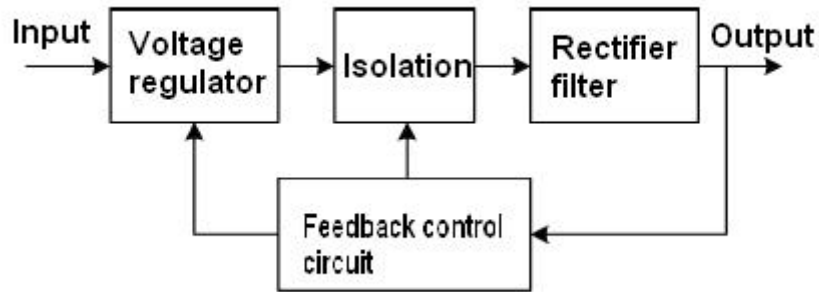


Diagram 2 Product schematic diagram

6 Typical Characteristic Curve

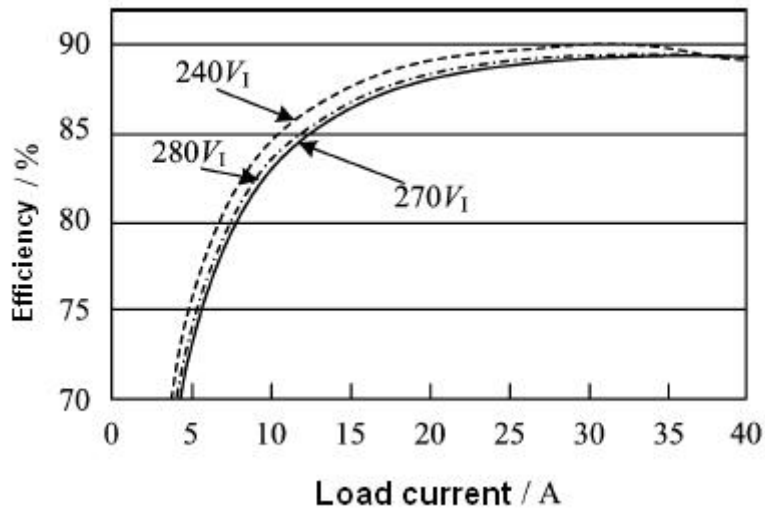


Diagram 3 efficiency (Output Power)

7.MTBF Curve

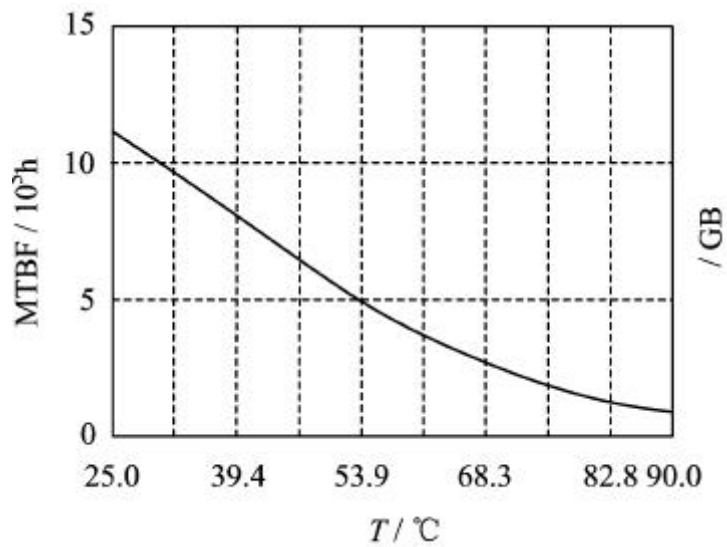


Diagram 4 MTBF Curve

(Predicting the ground is in good condition)

8 Pin Designation

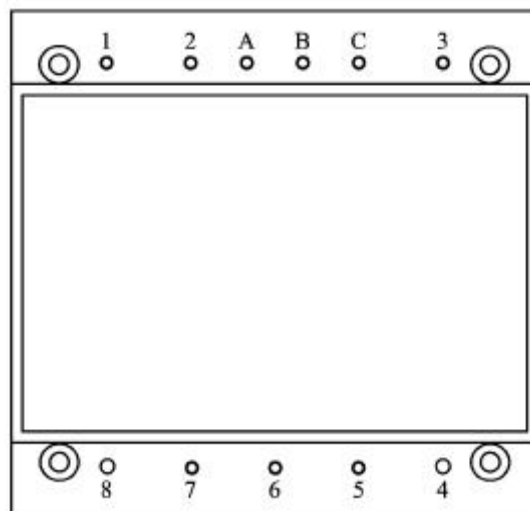


Figure 5 Out Bottom View

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

| Pin | Symbol | Designation |
|-----|--------|-------------------|
| 1 | Vin+ | Positive Input |
| 2 | ON/OFF | Positive Enabling |

| | | |
|---|-----------|----------------------------|
| A | ClockSync | Synchronizing signal |
| B | StartSync | Synchronizing start |
| C | Ishare | Paralleled current sharing |
| 3 | Vin- | Negative Input |
| 4 | Vo- | Negative Output |
| 5 | S- | Negative Output Inductio |
| 6 | Trim | Output voltage regulatio |
| 7 | S+ | Positive Output Inductio |
| 8 | Vo+ | Positive Output |

9 Typical Connection Diagram

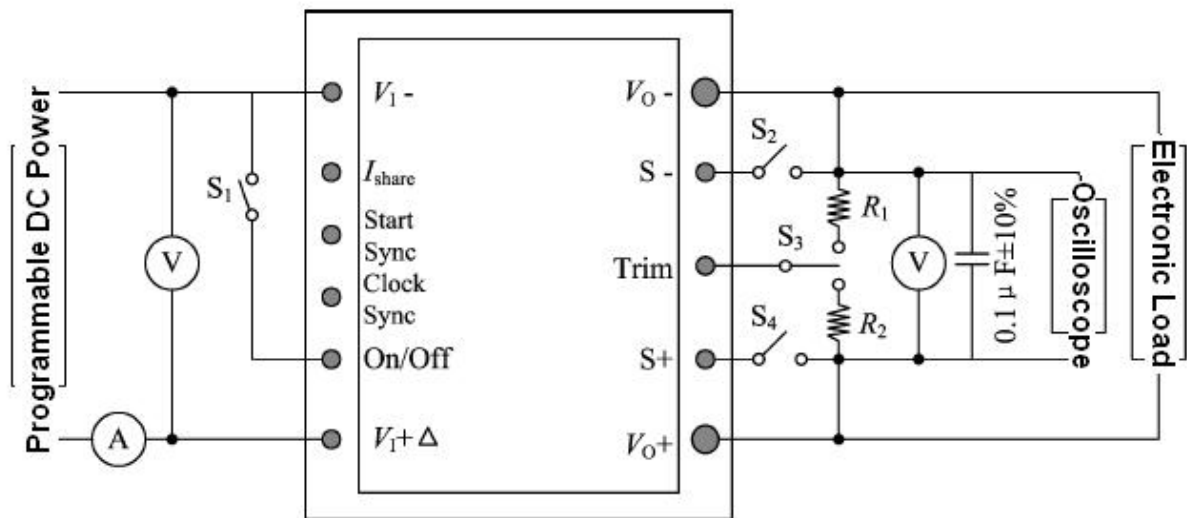


Diagram 6: Electrical testing connection diagram

10. Package Specifications

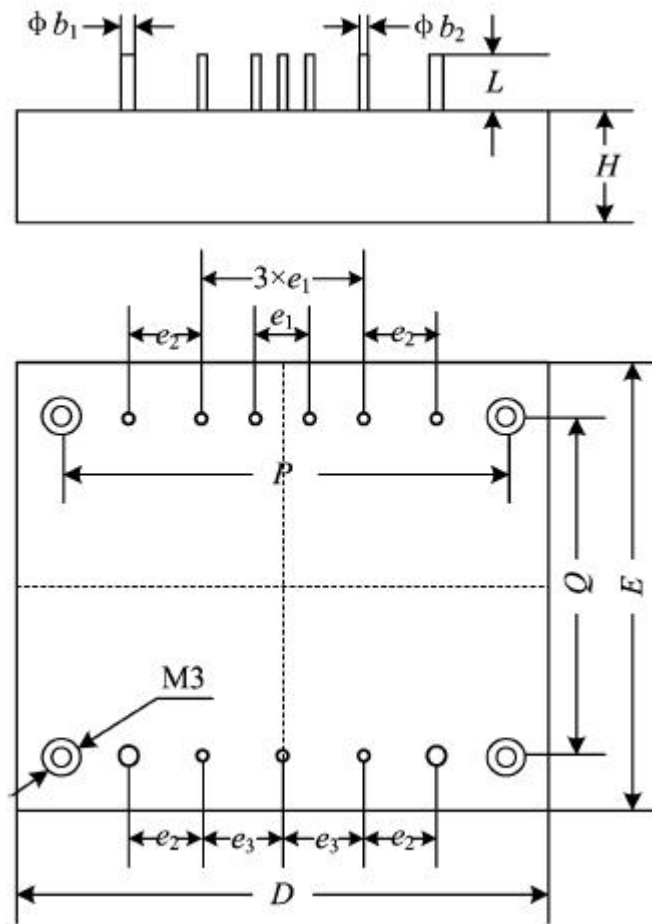


Diagram 7: Package outline drawing (MI-270N-10-HT-N-M-F、MI-270N-12-HT-N-M-F, Upward view)

Table 8 Package Outline

| Symbols | Unit/mm | | |
|------------|---------|---------|---------|
| | Minimum | Typical | Maximum |
| ϕb_1 | 1.8 | - | 2.2 |
| ϕb_2 | 0.9 | - | 1.1 |
| D | 62.64 | - | 63.64 |
| E | 60.10 | - | 61.10 |
| E_1 | - | 5.08 | - |
| E_2 | - | 10.16 | - |
| E_3 | - | 7.62 | - |
| H | 12.40 | 12.70 | 12.90 |
| L | 4.05 | - | 4.55 |
| P | - | 50.8 | - |
| Q | - | 48.26 | - |

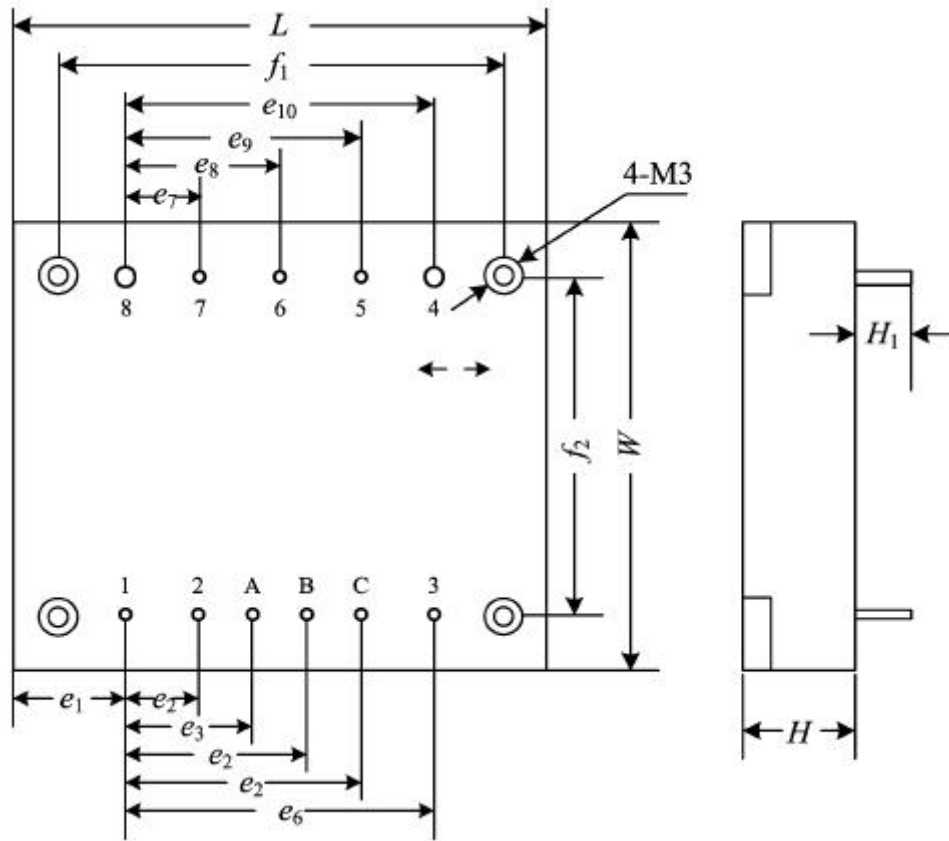


Diagram 8: Package outline drawing (MI-270N-10-HT-N-M-FB、MI-270N-28-HT-N-M-FB，
Upward view)

Table 9 Package Outline

| Symbols | Unit/mm | | |
|------------|---------|---------|---------|
| | Minimum | Typical | Maximum |
| <i>W</i> | 60.10 | 60.60 | 61.10 |
| <i>L</i> | 62.64 | 63.14 | 63.64 |
| <i>H</i> | 11.94 | 12.57 | 13.20 |
| <i>H1</i> | | 4.57 | |
| <i>f1</i> | - | 50.80 | - |
| <i>f2</i> | - | 48.30 | - |
| <i>E7</i> | - | 10.16 | - |
| <i>E8</i> | - | 17.78 | - |
| <i>E9</i> | - | 25.40 | - |
| <i>E10</i> | - | 35.36 | - |
| <i>E1</i> | - | 13.79 | - |
| <i>E2</i> | - | 10.16 | - |
| <i>E3</i> | - | 15.24 | - |
| <i>E4</i> | - | 20.32 | - |
| <i>E5</i> | - | 25.40 | - |
| <i>E6</i> | - | 35.56 | - |

11 Ordering Information

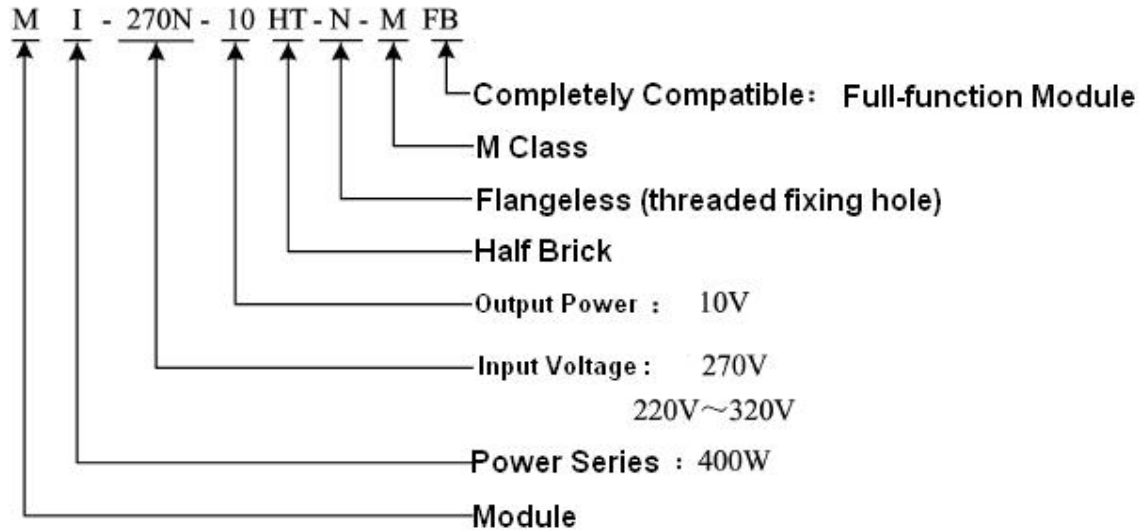


Diagram 9: Ordering Information

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.