



■ Features :

- Universal AC input / Full range
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Ultra-miniature size, light weight
- Cooling by free air convection
- UL60601-1/IEC60601-1/EN60601-1 medical safety approved
- No load power consumption<0.75W
- 100% full load burn-in test
- Optional on-board type version available
- Fixed switching frequency at 90KHz
- High reliability
- 3 years warranty



SPECIFICATION

| MODEL | NFM-20-3.3 | NFM-20-5 | NFM-20-12 | NFM-20-15 | NFM-20-24 | |
|-----------------------|--|--|---------------------------------|----------------|----------------|--------------|
| OUTPUT | DC VOLTAGE | 3.3V | 5V | 12V | 15V | 24V |
| | RATED CURRENT | 4.5A | 4.4A | 1.8A | 1.4A | 0.92A |
| | CURRENT RANGE | 0 ~ 4.5A | 0 ~ 4.4A | 0 ~ 1.8A | 0 ~ 1.4A | 0 ~ 0.92A |
| | RATED POWER | 14.85W | 22W | 21.6W | 21W | 22.08W |
| | RIPPLE & NOISE (max.) Note.2 | 80mVp-p | 80mVp-p | 150mVp-p | 150mVp-p | 240mVp-p |
| | VOLTAGE ADJ. RANGE | 3.1 ~ 3.6V | 4.5 ~ 5.4V | 10.8 ~ 13.2V | 13.5 ~ 16.5V | 21.6 ~ 26.4V |
| | VOLTAGE TOLERANCE Note.3 | ±2.0% | ±2.0% | ±1.0% | ±1.0% | ±1.0% |
| | LINE REGULATION | ±1.0% | ±1.0% | ±0.5% | ±0.5% | ±0.5% |
| | LOAD REGULATION | ±1.5% | ±1.5% | ±0.5% | ±0.5% | ±0.5% |
| | SETUP, RISE TIME | 500ms, 20ms/230VAC | 500ms, 20ms/115VAC at full load | | | |
| HOLD UP TIME (Typ.) | 50ms/230VAC | 16ms/115VAC at full load | | | | |
| INPUT | VOLTAGE RANGE | 85 ~ 264VAC | 120 ~ 370VDC | | | |
| | FREQUENCY RANGE | 47 ~ 440Hz | | | | |
| | EFFICIENCY (Typ.) | 71% | 75% | 81% | 83% | 84% |
| | AC CURRENT (Typ.) | 0.6A/115VAC | 0.4A/230VAC | | | |
| | INRUSH CURRENT (Typ.) | COLD START 30A/115VAC | 65A/230VAC | | | |
| LEAKAGE CURRENT | <200uA / 240VAC | | | | | |
| PROTECTION | OVERLOAD | Above 105% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed | | | | |
| | OVER VOLTAGE | 3.8 ~ 4.46V | 5.75 ~ 6.75V | 13.8 ~ 16.2V | 17.25 ~ 20.25V | 27.6 ~ 32.4V |
| | OVER TEMPERATURE Note.5 | Tj 160°C typically (U1) detect on main control IC Protection type : Shut down o/p voltage, recovers automatically after temperature goes down | | | | |
| ENVIRONMENT | WORKING TEMP. | -20 ~ +60°C (Refer to "Derating Curve") | | | | |
| | WORKING HUMIDITY | 20 ~ 90% RH non-condensing | | | | |
| | STORAGE TEMP., HUMIDITY | -40 ~ +85°C, 10 ~ 95% RH | | | | |
| | TEMP. COEFFICIENT | ±0.03%/°C (0 ~ 50°C) | | | | |
| SAFETY & EMC (Note 4) | VIBRATION | 10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes | | | | |
| | SAFETY STANDARDS | UL60601-1, TUV EN60601-1, IEC60601-1 approved | | | | |
| | WITHSTAND VOLTAGE | I/P-O/P:4KVAC | I/P-FG:1.5KVAC | O/P-FG:1.5KVAC | | |
| | ISOLATION RESISTANCE | I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH | | | | |
| | EMC EMISSION | Compliance to EN55011(CISPR11), EN55022 (CISPR22) Class B, EN61000-3-2,-3 | | | | |
| OTHERS | EMC IMMUNITY | Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024, EN60601-1-2, EN61204-3, medical level, criteria A | | | | |
| | MTBF | 487.8Khrs min. MIL-HDBK-217F (25°C) | | | | |
| | DIMENSION | 89*51*19.3mm (L*W*H) | | | | |
| NOTE | PACKING 0.09Kg; 105pcs/10.5Kg/0.97CUFT | | | | | |
| NOTE | <ol style="list-style-type: none"> 1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. 5. The over temperature protection (OTP) is the built-in function of the control IC (U1). The activating level described above is based on the specification provided by the IC manufacturer. | | | | | |

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Mechanical Specification

Unit: inch(mm)

AC Input Connector (CN1) : Molex 41791-03 or equivalent

| Pin No. | Assignment | Mating Housing | Terminal |
|---------|------------|--------------------------|--------------------------|
| 1 | AC/N | Molex 2139 or equivalent | Molex 2478 or equivalent |
| 2 | No Pin | | |
| 3 | AC/L | | |

DC Output Connector (CN2) : Molex 41791-04 or equivalent

| Pin No. | Assignment | Mating Housing | Terminal |
|---------|------------|--------------------------|--------------------------|
| 1,2 | +V | Molex 2139 or equivalent | Molex 2478 or equivalent |
| 3,4 | -V | | |

Block Diagram

fosc : 90KHz

Derating Curve

Output Derating VS Input Voltage

| Ambient Temperature (°C) | Load (%) |
|--------------------------|----------|
| -20 | 100 |
| 0 | 100 |
| 10 | 100 |
| 20 | 100 |
| 30 | 100 |
| 40 | 100 |
| 50 | 100 |
| 60 | 50 |

| Input Voltage (VAC) 60Hz | Load (%) |
|--------------------------|----------|
| 85 | 80 |
| 95 | 85 |
| 105 | 90 |
| 115 | 100 |
| 120 | 100 |
| 140 | 100 |
| 160 | 100 |
| 180 | 100 |
| 200 | 100 |
| 220 | 100 |
| 240 | 100 |
| 264 | 100 |

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