

M286 SERIES

AC/DC POWER SUPPLY



PRODUCT HIGHLIGHTS

- MINIATURE, HIGH DENSITY
- SINGLE OUTPUT UP TO 1500W
- INPUT RANGE: 85-115V_{AC} /
50/60/600Hz 3-PHASE
- CAN PARALLEL UNITS FOR MORE POWER
- OPERATING TEMPERATURE:
-52°C to +80°C
- EFFICIENCY 88% (TYPICAL)
- DESIGNED TO MEET: MIL-STD-461,
MIL-STD-704, MIL-STD-810

THIS DATA SHEET IS APPLICABLE TO M286-28 UNITS OF REV D OR HIGHER



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|---------------|--|---|
| INPUT | Type | 3-Phase (3-lines), 115/200VAC, 400Hz Per MIL-STD-704F. Note: The M286-28 will operate and provide full performances when fed by a 270VDC source (per MIL-STD-704F) or by a 3-Phase 115/200VAC, 50/60Hz source (except that the input power factor will be lower). |
| | Voltage Range | Steady State: 104 to 127VAC (180 to 215Vac Line-to-Line) Transients: up to 180Vac/50mS (per Figures 3 and 4 of MIL-STD-704F). During voltage transient (per Figure 3 of MIL-STD-704E) the output voltage may deviate by -15% +5% from the regulation range, but will recover within 50mS. Will also accept a +270VDC input. |
| | Frequency | 45 to 450Hz (will also operate from a 270VDC source). |
| | Input Power Factor | 0.85 Minimum (at full load and 115VAC/400Hz input). |
| | Missing Phase Protection | The M286 will not be damaged by a missing phase, but may shutdown. Automatic recovery within 1.5 Sec after input recovery. |
| OUTPUT | Nominal Voltage | 28DC |
| | Rated Current | 54Amp |
| | Regulation (Using the Sense Lines) | $\pm 1.5\text{Vdc}$ (worst case combination of steady state load, line and temp.) Note: In order to facilitate current sharing when several M286 are paralleled, the output voltage exhibits a controlled slop of 1.3Vdc from 0% to 100% load. ($28.5\pm 0.4\text{Vdc}$ at No-load and $27.2\pm 0.4\text{Vdc}$ at 100% load, measured on the load near to the Remote Sense connection. Can be set, upon request, to lower or higher voltage). |
| | Remote Sense | Capable of up to 3VDC line drop (round trip) compensation. When left open, the point of regulation shifts to the output connector. |
| | Current Limit & Overload Protection | Output current internally limited to less than 125% of the full rated current. If an over-load pulls the output voltage below 14Vdc for more than 100mS, the output is disabled and will attempt to recover after 1 second. The recovery attempts (100mS On, 1 sec Off) will continue until the overload is removed. |
| | Ripple & Noise | Less than 300mVpp (measured with BW of 20MHZ on any resistive load between 2 to 54Amp and any capacitance between 1 to 10,000 μF . Below 2Amp the ripple may rise to 1.5 Vpp. |
| | Over Voltage Protection | In case of an internal failure that causes the output voltage to exceed $32.2\pm 0.5\text{V}$, the output will shut down. (Externally imposed voltage will not trip the protection). Recovery upon toggling the AC input or the INHIBIT Input |
| | Over Temp Protection | Automatic shutdown when the Base Plate exceeds 90°C. Automatic recovery when the heatsink temperature drops below 80°C. |

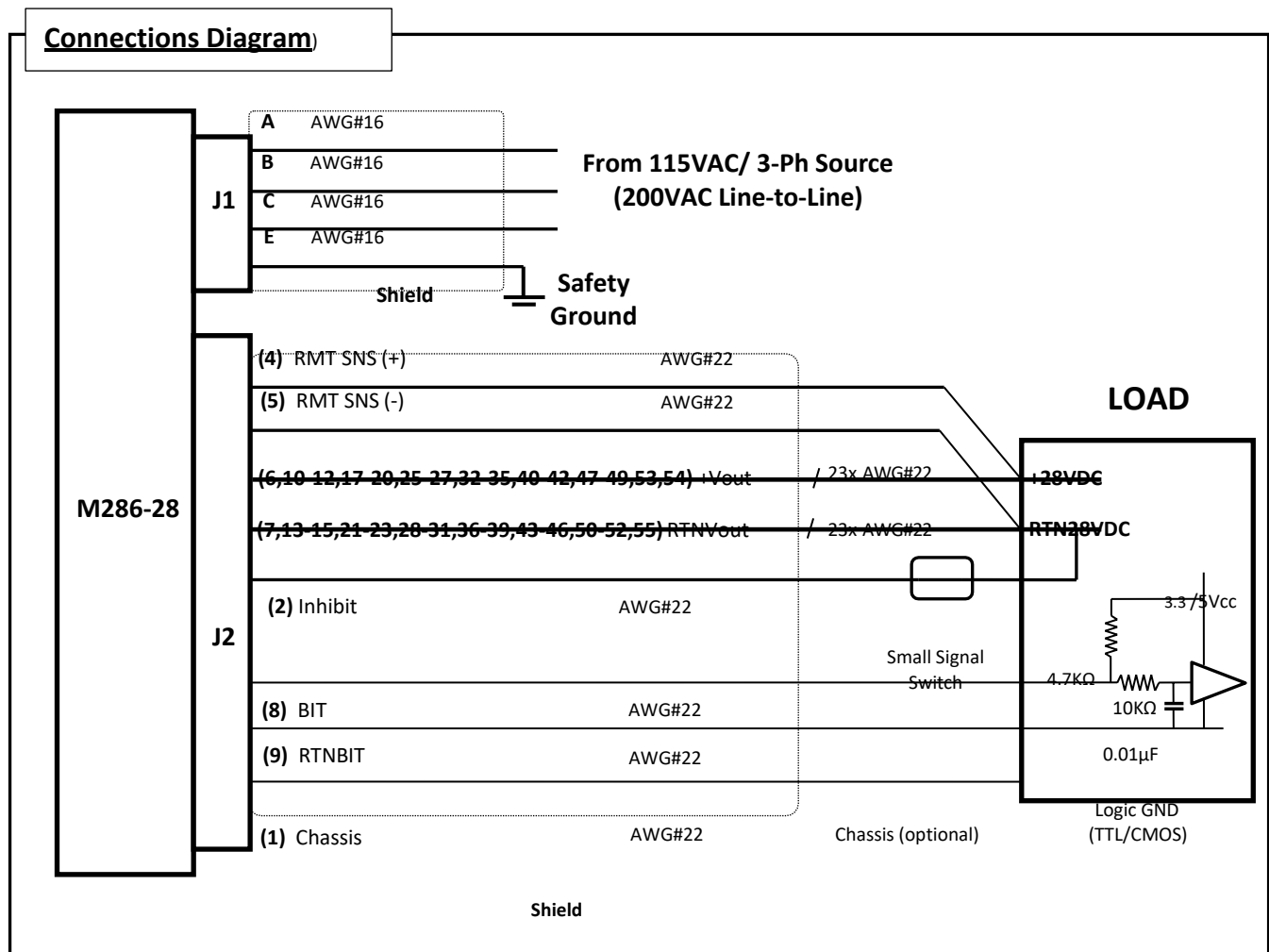
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|---------------------------------------|--|--|
| INHIBIT INPUT | <i>Open-collector (or low level switch)</i> | Low ($V < 3.5V @ 6mA$, relative to RTNVout) inhibits the Output. Open ($I < 1mA @ 12V$) enables the Output. |
| BIT OUTPUT | <i>Opto-coupler (Open-collector)</i> | Low ($V < 0.8 @ 1mA$, relative to RTNBIT) means Normal Operation. Open ($I < 0.1mA @ 15V$) means Failure to Operate. |
| ISOLATION | <i>Input to Chassis GND</i> | 20M Ω (Min) at 500Vdc. |
| | <i>Input to Output and BIT</i> | 20M Ω (Min) at 500Vdc. |
| | <i>Output to Chassis GND</i> | 20M Ω (Min) at 200Vdc. |
| | <i>BIT to Output & Chassis GND</i> | 20M Ω (Min) at 200Vdc |
| EMI | <i>MIL-STD-461E</i> | CE102, CS101, CS114, CS115, CS116, RE102 and RS103. |
| COOLING | <i>Base Plate</i> | User should maintain the M286's Base Plate below 85°C by thermally attaching it to a suitable coldplate (heatsink). |
| TEMPERATURE & ALTITUDE | <i>Operating</i> | -50°C to +70°C, 40,000 feet. |
| | <i>Non-operating</i> | -55°C to +80°C. Up to 40,000 feet. |
| VIBRATION | <i>Operating and Non-operating</i> | MIL-STD-810F , Method 514.5C, Figure 514-5C-17 |
| SHOCK | <i>Operating and Non-operating</i> | Saw-tooth, 40g peak, 11mS (3 shocks in each 6 orthogonal directions). |
| HUMIDITY | <i>Operating and Non-operating</i> | Up to 100% RH (including condensation). |
| SALT FOG | <i>Operating and Non-operating</i> | MIL-STD-810F, Method 509-4. |
| OUTLINES & WEIGHT | | In accordance with Milpower Drawing M286028 |
| I/O PINOUT | | See Tables I and II below |

I/O Connectors PinoutTable I - Input Connector (D38999/20WD5PN or Eq.)

| PIN No. | Description |
|----------------|---|
| A | 115VAC Phase A (or +270VDC) |
| B | 115VAC Phase B (or RTN270VDC) |
| C | 115VAC Phase C (not used with DC Input) |
| D | NC |
| E | Chassis (Safety) GND |

Table II- J2 Output Connector (D38999/20WE35SN or Eq.)

| PIN No. | Description | Pin No | Description | Pin No | Description |
|----------------|--------------------|---------------|--------------------|---------------|--------------------|
| 1 | Chassis GND | 20 | +Vout | 39 | RTN Vout |
| 2 | Inhibit | 21 | RTN Vout | 40 | +Vout |
| 3 | Reserved | 22 | RTN Vout | 41 | +Vout |
| 4 | Remote Sense (+) | 23 | RTN Vout | 42 | +Vout |
| 5 | Remote Sense (-) | 24 | NC | 43 | RTN Vout |
| 6 | +Vout | 25 | +Vout | 44 | RTN Vout |
| 7 | RTN Vout | 26 | +Vout | 45 | RTN Vout |
| 8 | BIT | 27 | +Vout | 46 | RTN Vout |
| 9 | RTN BIT | 28 | RTN Vout | 47 | +Vout |
| 10 | +Vout | 29 | RTN Vout | 48 | +Vout |
| 11 | +Vout | 30 | RTN Vout | 49 | +Vout |
| 12 | +Vout | 31 | RTN Vout | 50 | RTN Vout |
| 13 | RTN Vout | 32 | +Vout | 51 | RTN Vout |
| 14 | RTN Vout | 33 | +Vout | 52 | RTN Vout |
| 15 | RTN Vout | 34 | +Vout | 53 | +Vout |
| 16 | NC | 35 | +Vout | 54 | +Vout |
| 17 | +Vout | 36 | RTN Vout | 55 | RTN Vout |
| 18 | +Vout | 37 | RTN Vout | | |
| 19 | +Vout | 38 | RTN Vout | | |



Notes:

1. For effective remote sensing at full load (54Amp), the output cable length should not exceed 20 feet.
2. For best EMC performances use shielded cables.
3. The INHIBIT Switch can be a small-signal mechanical switch or an electronic switch (Small-signal Transistor).
4. To inhibit (disable) the 28VDC output, the low side of the switch (emitter for NPN, source for N-MOS) should be connected to the RTN28VDC.
5. RTNBIT may be connected to any Logic GND (not necessarily RTN28VDC).
6. **When paralleling several M286-28, for best performances:**
 Connect all AC Inputs (J1) to the same AC Source.
 Connect all +Vout and all RMT SNS (+) lines to the same point (+28VDC Point Of Regulation). Connect all RTNVout and all RMT SNS(-) lines to the same point (RTN28VDC Point Of Regulation). The Inhibit lines may be connected to a single or several switches.
 Each BIT should have its own pull-up and gate interface.

Note: Specifications are subject to change without prior notice by the manufacturer