# 56J1 AC/DC Power Supply

## 50-Watt Ruggedized Power Supply
## Conduction-Cooled, Single Output

*Proudly made*

## Description

NAI's 56J1 is a 50-Watt AC/DC Power Supply that accepts multiple AC inputs plus a +270 VDC input. This COTS unit provides full-power output at a baseplate temperature of +85°C.

Standard features include remote error sensing; remote digital (TTL) turn on/off; and protection against transients, over voltage, over-current, and short-circuits. Options such as ESS vibration testing, and choice of output voltages are available, and additional options and special units can be ordered.

This conduction-cooled power supply is specifically designed with NAVMAT component derating for rugged defense and industrial applications. It is also designed to meet the many harsh environmental requirements of military applications.

## Features

- Ideal for rugged, conduction-cooled, military applications
- Standard output voltages: 3.3 V, 5V, 12V, 15V, 24V, 28V
- Input transient protection per MIL-STD-704
- Integrated EMI filtering per MIL-STD-461
- High power density
- Low profile packaging
- Low noise
- Operates at full load through the entire -55°C to +85°C temperature range
- Contact factory for additional options and special units



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## Electrical Specifications

| AC Input Characteristics | |
|---|---|
| Input | 115/230 VAC, 270 VDC (see tables of Pinout Designations and Input Connections for the J1 Connector, page 4); 270 VDC: input range of 170 VDC to 355 VDC |
| Input Tolerance | ±10% |
| EMI/RFI | Designed to meet the requirements of MIL-STD-461D |
| Input Transient Protection | Per MIL-STD-704D;<br>For nominal 115 VAC input: 180 VAC for 0.1 second<br>For nominal 230 VAC input: 292 VAC for 0.1 second |
| Input Frequency | 47 Hz to 440 Hz |
| **DC Output Characteristics** | |
| Output Power | See Output Power Table, page 3 |
| Output Voltage | See Output Power Table, page 3 |
| Efficiency | 75% typical |
| Line Regulation | Within 0.1% or 10 mV (whichever is greater) for low to high line changes at constant load |
| Load Regulation | 0.1% or 10 mV (whichever is greater) for 0 to 100% of rated load at nominal input line |
| PARD (Noise and Ripple) | 50 mV p-p typical; 100 mV p-p maximum for 5 V outputs (20 MHz bandwidth); 1% of the output voltage, with a maximum of 200 mV p-p, for all other outputs (20 MHz bandwidth) |
| Load Transient Recovery | Output voltage returns to regulation limits within 0.5ms (typical), half to full load |
| Load Transient Under/Overshoot | 0.35V maximum from nominal output voltage set point for 3.3V and 5V outputs; all other outputs 5% |
| Short Circuit Protection | Under any short circuit condition, continuous short circuit protection with auto recovery |
| Current Limiting | Limited to 130% of rated current |
| Over Voltage Protection | Automatic electronic shutdown if voltage exceeds 125% ±10% |
| Remote Error Sensing | Compensates for up to 0.5 V drop on output leads |
| Remote Turn On/Off | TTL logic 1 inhibits (turns off) the output; a floating input acts as a logic 0 (output on) |
| Isolation Voltage | 1000 VDC input to output and input to case; 200 VDC output to case |
| Insulation Resistance | 50 Mega Ohm at 50 VDC |

*All specifications are subject to change without notice.*



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## Additional Specifications

| Physical/Environmental | |
|---|---|
| Temperature Range | Operating: -55°C to +85°C at 100% load, 400 Hz input (see Output Power Table below for deratings); Storage: -55°C to +125°C; (temperature measured at baseplate, conduction via baseplate only) |
| Temperature Coefficient | 0.01% per °C |
| Shock | 30 G's each axis per MIL-STD-810C, Method 516.2, Procedure 1; Hammer shock per MIL-S-901C |
| Acceleration | 6 G's per MIL-STD-810C, Method 513.2, Procedure 11; 14 G's per Procedure 1 |
| Vibration | Per MIL-STD-810C, Method 514.2, Procedure 1A |
| Reliability (MTBF) | 200,000 hours, ground benign, at 50°C baseplate, per MIL-HDBK-217F |
| Humidity | 95% at 71°C per MIL-STD-810C, Method 507.1 (non-condensing) |
| Altitude | 40,000 feet per MIL-STD-810C, Method 504.1, Category 6 Equipment |
| Dimensions | See Mechanical Dimension Tables, page 6 |
| Salt & Fog | Per MIL-STD-810C, Method 509.1 |
| Sand/Dust/Fungus | Per MIL-STD-810C |
| Enclosure | Aluminum housing to aluminum baseplate |
| Finish | Cover: Black anodized; Baseplate: chemfilm |
| Interface | Connections via a D-subminiature connector (see Connector Specifications Table, page 4) |
| Weight | Single output = 8 ounces |

*All specifications are subject to change without notice.*

## Output Power

| *Volts* | *Current @ 400 Hz & 85ºC* | *Current @ 400 Hz & 100ºC* | *Current @ 60 Hz & 71ºC* | *Current @ 60 Hz & 100ºC* |
|---|---|---|---|---|
| 3.3 | 8 | 6 | 6.4 | 5 |
| 5.0 | 8 | 6 | 6.4 | 5 |
| 12.0 | 4.2 | 3.1 | 3.3 | 2.5 |
| 15.0 | 3.4 | 2.5 | 2.7 | 2 |
| 24.0 | 2.1 | 1.6 | 1.67 | 1.25 |
| 28.0 | 1.8 | 1.35 | 1.4 | 1 |



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## Pinout Designations (J1)

| Pin No. | Designation | | Pin No. | Designation |
|---|---|---|---|---|
| 1 | INPUT | | 9 | INPUT |
| 2 | INPUT | | 10 | INPUT |
| 3 | -TTL (ON/OFF) | | 11 | CHASSIS GND |
| 4 | +TTL (ON/OFF) | | 12 | -SENSE |
| 5 | +SENSE | | 13 | -OUTPUT |
| 6 | +OUTPUT | | 14 | -OUTPUT |
| 7 | +OUTPUT | | 15 | NC |
| 8 | NC | | | |

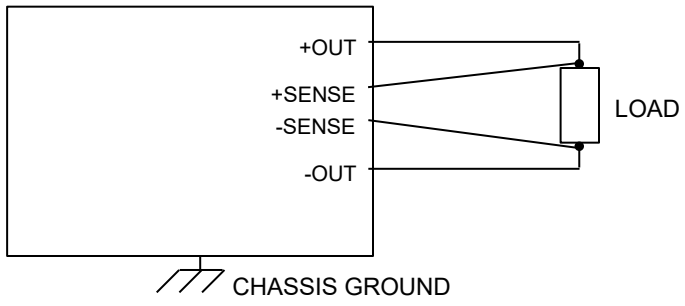
## Input Connections (J1)

| AC Type | Connection |
|---|---|
| 115 VAC, 1∅ | 1 & 2 (Neutral) |
| 115 VAC, 3∅ Δ | 1, 9 & 10 |
| 115 VAC, 3∅, Y | 1, 9, 10, 2 (Neutral) |
| 230 VAC, 1∅ | 1, 9 or 1, 10 or 9, 10 |
| 230 VAC, 3∅ Δ | 1, 9, 10 |
| 270 VDC | 1 (Positive), 9 (Return) |

## Connector Specifications

| Connector | Part # - Series |
|---|---|
| Unit | DAMME15PR |
| Mating | DAMM15S |

## Output Wiring Diagrams



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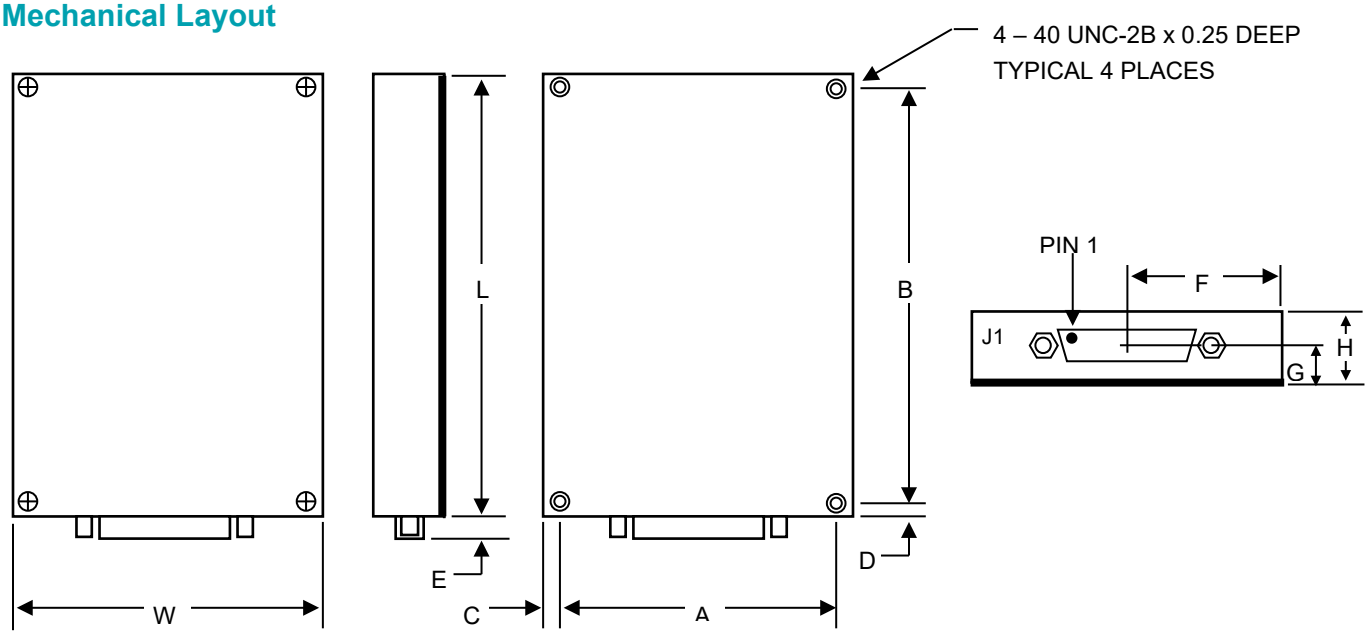
## Mechanical Layout




**TOP** **BOTTOM**

*See tables below for Mechanical Dimensions.*

## Mechanical Dimensions

| Case* | Units | W | L | A | B | F |
|---|---|---|---|---|---|---|
| 1 | inches | 3.25 | 4.0 | 2.85 | 3.60 | 1.63 |
| 1 | mm | 82.6 | 101.6 | 72.4 | 91.44 | 41.4 |

## Additional Dimensions

| Dimension | Inches | Millimeters |
|---|---|---|
| C & D | 0.2 | 5.1 |
| E | 0.23 | 5.84 |
| G | 0.455 | 11.56 |
| H | 0.8 | 20.3 |



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## Ordering Information

**56 J S1 – 005 M 0 – XX**

**Code:** Used only for Special Orders (see Code Table below).

**Options:** 0 = Standard Testing (Includes ESS Temperature Cycling per NAVMAT).
1 = Standard Testing plus ESS Vibration Testing (per NAVMAT).

**Reliability:** M = COTS-Mil-Type: -55°C to +85°C; Mil-Type Components.
Designed to meet the requirements of MIL-STD-461C and MIL-STD-810C.
Designed per NAVMAT Guidelines.

**Output Voltages:** **Single Output**
000 Special Voltage (see Code Table below)
003 = 3.3 V
005 = 5 V
012 – 12 V
015 = 15 V
024 = 24 V
028 = 28 V

**Outputs:** S1 = Single

**Wattage:** J = 50 W

**Series:** 56 = AC/DC

**Example:** 56JS1-012M0 = AC/DC; 50 Watt; Single Output; +12 V; COTS-Mil-Type; Standard Testing

## Code Table for Special Orders

| Code | Description |
|---|---|
| 01 | Model #: 56JS1-000M0-01 - Single output of 5.2 VDC @ 9.6A |
| 02 | Encapsulated, Altitude to 70,000 feet per MIL-STD-810C, Method 504.1, Category 6 Equipment (Add approx.. 2 ounces to weight) |
| 03 | • Encapsulated, Altitude to 70,000 feet per MIL-STD-810C, Method 504.1, Category 6 Equipment (Add approx.. 2 ounces to weight).<br>• Special Baseplate - hexavalent-chromium free coating, Clear type |

## Consult Factory for Additional Options and/or Special Units



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