# 57M1

## 270 Vin DC/DC Converter
## 150 Watt Single, Dual and Triple Outputs

## Features

- High Power Density, Low Profile Packaging
- Full Output Power at +100°C Baseplate Temperature
- Switching Power Supply – Low Noise
- ESS Screening
- Designed and Manufactured Per NAVMAT Guidelines
- EMI Filtering Designed to MIL-STD-461
- Remote Error Sensing
- Remote Digital (TTL) Turn On/Off
- Transient Protection per MIL-STD-704

## Contents


*Specifications*.....1
*Electrical*.....1
*Physical/Environmental*.....2
*Output Power (Table 1)*.....2
*Pinout Designations (J1) (Table 2)*.....2
*Connector Specifications*.....3
*Output Wiring Diagram*.....3
*Mechanical Layout*.....4
*Mechanical Dimensions (Table 3)*.....4
*Ordering Information*.....5


## Description

North Atlantic Industries 57M1 is a high power density, low profile, DC/DC converter in 150 Watt single, dual & triple output configurations. The 57M1 is ideally suited for rugged, military conduction cooled applications. All North Atlantic Industries DC/DC Converters are designed and qualified to the most stringent performance and environmental requirements.

## Electrical Specifications

### DC Input Characteristics:

| | |
|---|---|
| Input | 170 to 355 VDC |
| EMI/RFI Characteristics | Designed to meet the requirements of MIL-STD-461 |
| Input Transient Protection | Per MIL-STD-704E and MIL-STD-461C, CS06 |

### DC Output Characteristics:

| | |
|---|---|
| Output Power | See Table 1 |
| Output Voltage | See Table 1 |
| Efficiency | 75% typical for single output units, 70% for dual output units and 66% for triple output units |
| Line Regulation | Within 0.1% or 10mv (whichever is greater) for low to high line changes at constant load |
| Load Regulation | 0.1% or 10mv (whichever is greater) for 0 to 100% of rated load at nominal input line |
| PARD (Noise and Ripple) | 50 mV p-p max, all outputs. Measurement taken across the load lines < 5 inches from the unit, terminated with a 1 uf capacitor, with a 20MHz instrument |
| Load Transient Recovery | Output voltage returns to regulation limits within 1.0 msec (typical), half to full load |
| Load Transient Under/Overshoot | 0.5 Volt maximum from nominal output voltage set point for 5 V outputs, all other outputs are 5%. |
| Short Circuit Protection | Under any short circuit condition, continuous short circuit protection with Auto Recovery |

## *DC Output Characteristics (Continued):*

| | |
|---|---|
| Current Limiting | 200% maximum |
| OverVoltage Protection | Automatic electronic shutdown if voltage exceeds 130% ±10% (auto recovery) |
| Remote Error Sensing | Compensates for up to 0.7-volt 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 Megohm at 50 VDC |

# Physical/Environmental Specifications

| | |
|---|---|
| Temperature Range | Operating: -55°C to +85°C at 100% load (Temperature measured at baseplate; conduction via baseplate only); Derate linearity to 67% load at 100°C; Storage: -55°C to +125°C |
| 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, and 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 Table 3 |
| 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 per Page 2 of this Data Sheet |
| Weight | Single Output = 42 ounces; Dual Output = 44 ounces; Triple Output = 45 ounces |

## Table 1. Output Power

| Single | | Dual | | Triple | |
|---|---|---|---|---|---|
| **Volts** | **Amps** | **Volts** | **Amps** | **Volts** | **Amps** |
| 5.0 | 30 | ±12.0 | 6.25 | 5, ±12 | 20.0, 2.1 |
| 12.0 | 12.5 | ±15.0 | 5.0 | 5, ±15 | 20.0, 1.7 |
| 15.0 | 10.0 | | | | |
| 24.0 | 6.3 | | | | |
| 28.0 | 5.4 | | | | |

## Table 2. Pinout Designations (J1)

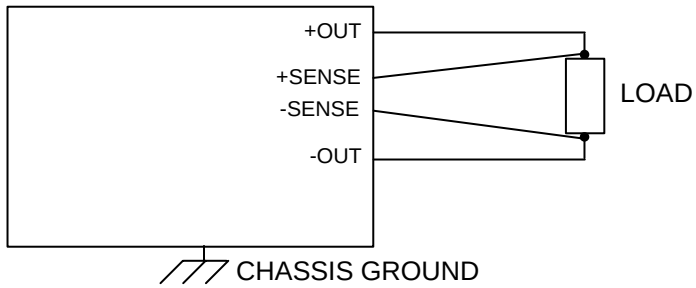
| Pin | Single | Dual | Triple | Pin | Single | Dual | Triple |
|---|---|---|---|---|---|---|---|
| 1 | +Vin | +Vin | +Vin | 14 | -Vin | -Vin | -Vin |
| 2 | NC | NC | NC | 15 | NC | NC | NC |
| 3 | -TTL (ON/OFF) | NC | -TTL (ON/OFF) | 16 | CHASSIS GND | NC | CHASSIS GND |
| 4 | +TTL (ON/OFF) | NC | +TTL (ON/OFF) | 17 | -OUTPUT | CHASSIS GND | -OUTPUT |
| 5 | NC | NC | +AUX | 18 | -OUTPUT | NC | -OUTPUT |
| 6 | NC | +TTL (ON/OFF) | +AUX CM | 19 | -OUTPUT | +OUTPUT 2 | -OUTPUT |
| 7 | NC | -TTL (ON/OFF) | -AUX CM | 20 | -OUTPUT | +OUTPUT 2 | -OUTPUT |
| 8 | NC | +OUTPUT 1 | -AUX | 21 | -OUTPUT | +SENSE 2 | -OUTPUT |
| 9 | +OUTPUT | +OUTPUT 1 | +OUTPUT | 22 | -OUTPUT | -SENSE 2 | -OUTPUT |
| 10 | +OUTPUT | +SENSE 1 | +OUTPUT | 23 | -SENSE | -OUTPUT 2 | -SENSE |
| 11 | +OUTPUT | -SENSE 1 | +OUTPUT | 24 | +OUTPUT | -OUTPUT 2 | +OUTPUT |
| 12 | +OUTPUT | -OUTPUT 1 | +OUTPUT | 25 | +OUTPUT | NC | +OUTPUT |
| 13 | +SENSE | -OUTPUT 1 | +SENSE | | | | |

# Connector Specifications

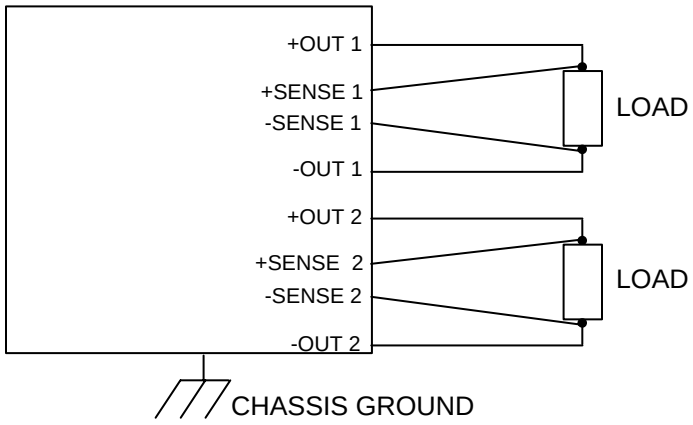
| Connector | Part Number - Series |
|---|---|
| Unit Connector | DBMME25PR |
| Mating Connector | DBMM25S |

# Output – Wiring Diagram

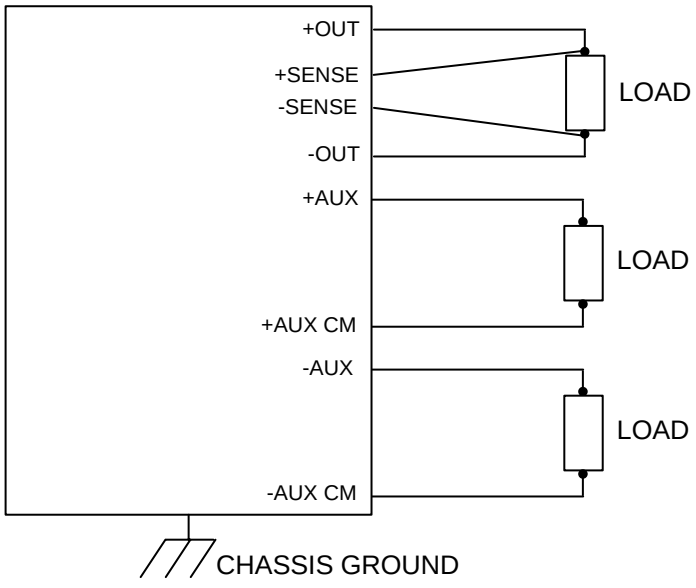
## Single Output



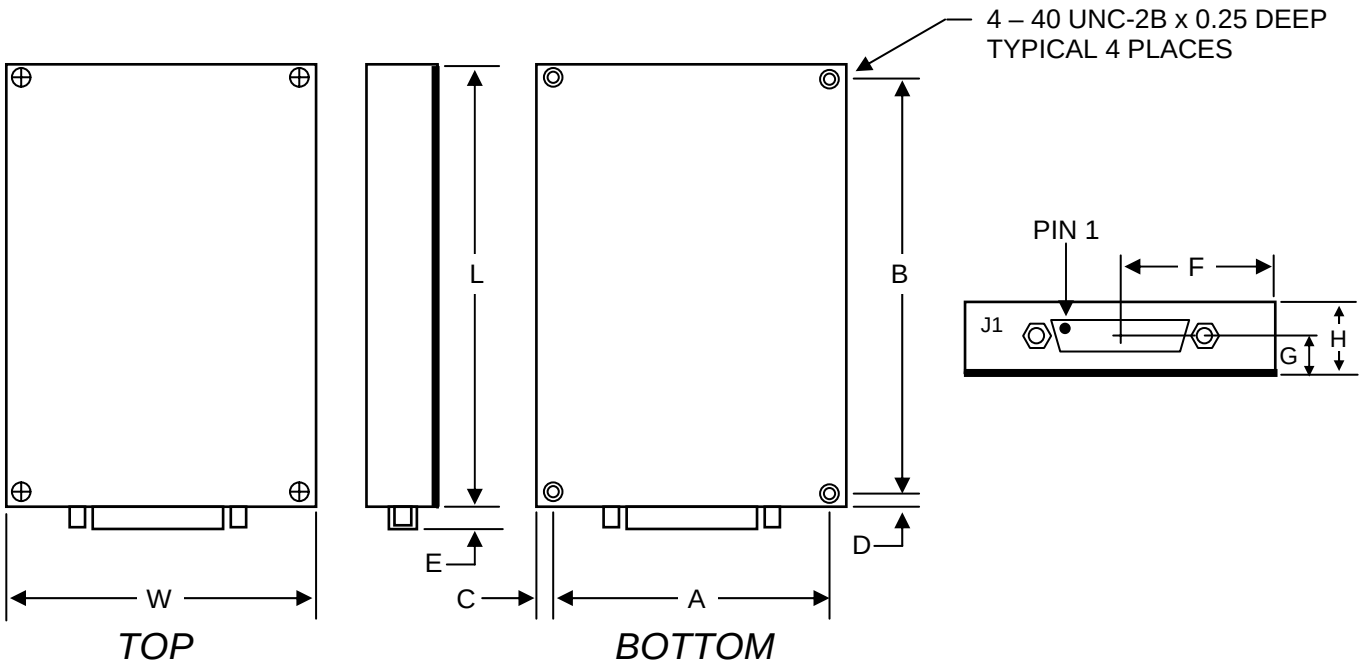

## Dual Output




## Triple Output



# Mechanical Layout




## Table 3. Mechanical Dimensions

| Case* | Units | L | W | A | B | F |
|---|---|---|---|---|---|---|
| 1 | Inches | 6.25 | 5.0 | 4.1 | 5.85 | 2.5 |
| 1 | mm | 158.75 | 127 | 104.14 | 148.59 | 63.5 |
| 2 | Inches | 6.5 | 5.25 | 4.35 | 5.6 | 2.62 |
| 2 | mm | 165.1 | 133.35 | 110.49 | 142.24 | 66.55 |

*Use Case 1 for Single Converter; Use Case 2 for Dual and Triple Converters

### Notes

Dimension C is .45” (11.43 mm)
Dimension D 0.2” (5.08 mm)
Dimension E is 0.23” (5.84 mm)
Dimension G is 0.47” (11.94 mm)
Dimension H is 1.0” (25.4 mm)

# Ordering Information for 57M1 (150 Watt DC/DC Converter)

**57 M S1 - 012 M 0 - XX**

**CODE** (Used only for "Specials")

**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, Designed to meet the requirements of MIL-STD-810C, Designed per NAVMAT Guidelines.

**OUTPUT VOLTAGE(s):**

| Single Output | Dual Output | Triple Output |
|---|---|---|
| 000 = * | | |
| 005 = 5V | 000 = * | |
| 012 = 12 V | 012 = ±12 V | 512 = 5 V, ±12 V |
| 015 = 15 V | 015 = ±15 V | 515 = 5 V, ±15 V |
| 024 = 24 V | | |
| 028 = 28 V | *Special Voltage - See Code Table Below | |

**OUTPUTS:** S1 = Single
D1 = Dual
T1 = Triple

**WATTAGE:** M = 150 W

**SERIES:** 57 = DC/DC (High Voltage)

***Example:*** *57MD1-012M1 = DC/DC (High Voltage); 150 Watt; Dual Output; ±12 V; COTS-Mil-Type; ESS Vibration Testing*
*57MT1-515M1 = DC/DC (High Voltage); 150 Watt; Triple Output; 5 V, ±15 V; COTS-Mil-Type: ESS Vibration Testing*

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

**Code Table for "Specials"**

| Code | Code Description |
|---|---|
| 57MT1-512M0-01 | Over Voltage Protection Shutdown at 5.75 Volts Max |
| 57MS1-005X1-02 | 1,500VDC Continuous Isolation; input to output; input to case. **Uses case 2 Mechanical Dimensions.** |