

# 57K1

## 270 Vin DC/DC Converter

### 75 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 57K1 is a high power density, low profile, DC/DC converter in 75 Watt single, dual & triple output configurations. The 57K1 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, 70% for dual output, 65% for triple output   |
| 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 typical; 100 mV p-p maximum for 5V 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 0.5 msec (typical), half to full load  |
| Load Transient Under/Overshoot | 0.35 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       | 120% ±10% typical   |
| OverVoltage Protection | Automatic electronic shutdown if voltage exceeds 115% ±10% (Auto Recovery)                  |
| Remote Error Sensing   | Compensates for up to 0.5-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 = 25 ounces; Dual Output = 33 ounces; Triple Output = 34 ounces  |

**Table 1. Output Power**

| Single |      | Dual  |      | Triple |           |
|--------|------|-------|------|--------|-----------|
| Volts  | Amps | Volts | Amps | Volts  | Amps      |
| 5.0    | 15   | ±12.0 | 3.1  | 5, ±12 | 10.0, 1.0 |
| 12.0   | 6.3  | ±15.0 | 2.5  | 5, ±15 | 9.0, 1.0  |
| 15.0   | 5.0  |       |      |        |           |
| 24.0   | 3.1  |       |      |        |           |
| 28.0   | 2.6  |       |      |        |           |

**Table 2. Pinout Designations (J1)**

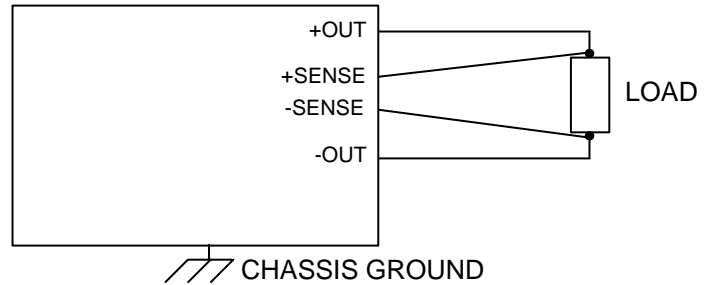
| Pin | Single        | Dual          | Triple        | Pin | Single  | Dual      | Triple      |
|-----|---------------|---------------|---------------|-----|---------|-----------|-------------|
| 1   | +Vin          | +Vin          | +Vin          | 14  | -OUTPUT | -OUTPUT 2 | -Vin        |
| 2   |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

# Connector Specifications

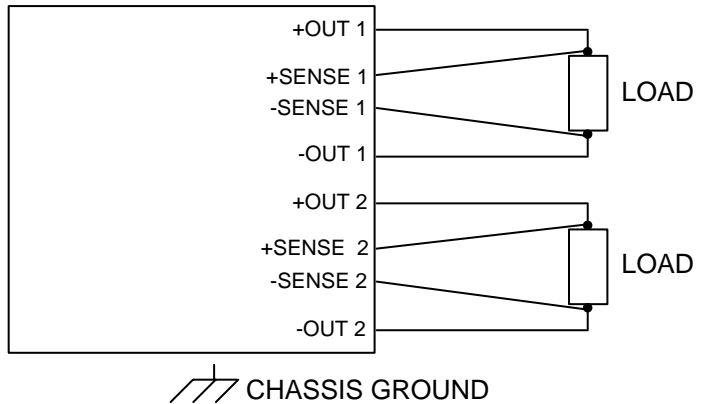
| Connector                      | Part Number - Series |
|--------------------------------|----------------------|
| Unit Connector – Single/Dual   | DAMNE15PR            |
| Mating Connector – Single/Dual | DAMN15S              |
| Unit Connector – Triple        | DBMME25PR            |
| Mating Connector – Triple      | DBMM25S              |

## Output – Wiring Diagram

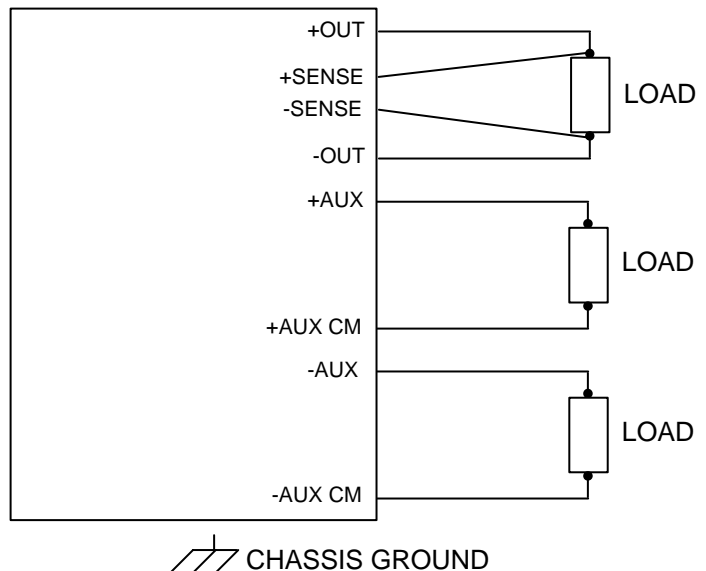
### Single Output



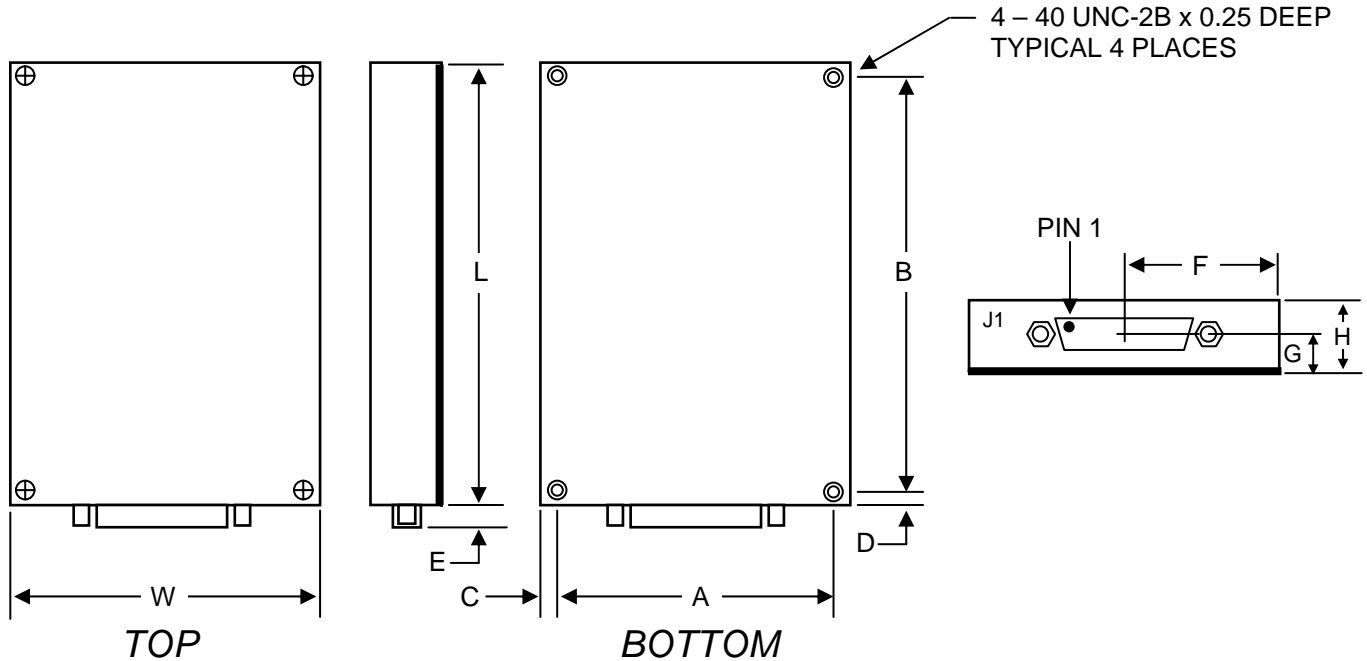
### Dual Output



### Triple Output



# Mechanical Layout



**Table 3. Mechanical Dimensions**

| Case* | Units  | L     | W     | A      | B      | F     |
|-------|--------|-------|-------|--------|--------|-------|
| 1     | Inches | 5     | 3.75  | 2.85   | 4.1    | 1.87  |
| 1     | mm     | 127   | 95.25 | 72.39  | 104.14 | 47.49 |
| 2     | Inches | 5.5   | 5     | 4.1    | 5.1    | 2.5   |
| 2     | mm     | 139.7 | 127   | 104.14 | 129.54 | 63.5  |

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

## Notes

- Dimension C is .45" (11.43 mm)
- Dimension D is 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 PS-57K1 (75 Watt DC/DC Converter)

**57 K S1 - 005 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.

| <b>OUTPUT VOLTAGE(s):</b> | <u>Single Output</u> | <u>Dual Output</u> | <u>Triple Output</u> |
|---------------------------|----------------------|--------------------|----------------------|
|                           | 000 = *              | 000 = *            | 000 = *              |
|                           | 005 = 5 V            | 012 = ±12 V        | 512 = 5 V, ±12 V     |
|                           | 012 = 12 V           | 015 = ±15 V        | 515 = 5 V, ±15 V     |
|                           | 015 = 15 V           |                    |                      |
|                           | 024 = 24 V           |                    |                      |
|                           | 028 = 28 V           |                    |                      |

\*Special Voltage - See Code Table Below

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

**WATTAGE:** K = 75 W

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

**Example:** 57KD1-012M1 = DC/DC (High Voltage); 75 Watt; Dual Output; ±12 V; COTS-Mil-Type; ESS Vibration Testing  
57KT1-515M1 = DC/DC (High Voltage); 75 Watt; Triple Output; 5 V, ±15 V; COTS-Mil-Type; ESS Vibration Testing

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

### UNITRONIX Pty Ltd

PO Box 486, Morisset NSW 2264

NSW: Tel: 61 2 4977 3511 Fax: 61 2 4977 3522

WA: Tel: 61 8 9455 2424 Fax: 61 8 9455 2458

unitsyd@unitronix.com.au www.unitronix.com.au