

# 55K SERIES

- 28 Vin DC/DC Converter
- 75 Watt Single & Triple Outputs



## Features

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

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## Description

North Atlantic's 55 Series is a family of high power density, low profile, 28 V<sub>IN</sub> DC/DC switch mode converters. This family extends from 25 Watt through 200 Watt in single, dual, triple & quad configurations. The 55 Series is ideally suited for airborne, shipboard, ground mobile and C<sup>3</sup>I applications. All North Atlantic DC/DC Converters & Power Supplies are designed and qualified to the most stringent performance and environmental requirements. All units receive ESS screening, including burn-in and temperature cycling.

## Electrical Specifications

### DC Input Characteristics:

Input	16 to 36 VDC; 40 VDC maximum with no damage
EMI/RFI Characteristics	Designed to meet the requirements of MIL-STD-461C
Input Transient Protection	Per MIL-STD-704D and MIL-STD-461C, CS06

### DC Output Characteristics:

Output Power	75 Watts, See Table 1
Output Voltage	3.3 VDC to 28 VDC, See Table 1
Efficiency	65% minimum
Line Regulation	Within 0.1% for low to high line changes at constant load
Load Regulation	0.1% for 0 to 100% of rated load at nominal input line. 150mV for auxiliary outputs with 20% minimum main output load.
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 3.3 and 5 V outputs, all other outputs are 5%.
Short Circuit Protection	Under any short circuit condition, output voltage drops to less than 1 volt, with automatic recovery

## DC Output Characteristics (Continued):

Current Limiting	120% ±10% typical
OverVoltage Protection	Automatic electronic shutdown if voltage exceeds 125% ±10%
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	500 VDC input to output and input to case; 100 VDC output to case.
Insulation Resistance	50 Megohm at 50 VDC

## Physical/Environmental Specifications

Temperature Range	Operating: -55°C to +100°C at 100% load (Temperature measured at baseplate; conduction via baseplate only); 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
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 = 11 ounces; Dual Output = 12 ounces; Triple Output = 13 ounces

**Table 1. Output Power**

Single		Triple	
Volts	Amps	Volts	Amps
3.3	15	5, ±12	10.0, 1.0
5.0	15	5, ±15	9.0, 1.0
12.0	6.3	3.3, ±12	7.0, 1.0
15.0	5.0		
24.0	3.1		
28.0	2.7		

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

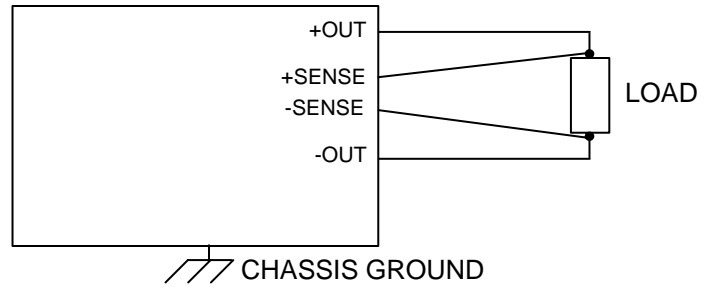
Pin	Single	Triple	Pin	Single	Triple
1	+INPUT	+INPUT	14	-INPUT	-INPUT
2	+INPUT	+INPUT	15	-INPUT	-INPUT
3	+INPUT	N/C	16	-INPUT	N/C
4	N/C	-TTL (ON/OFF)	17	CHASSIS GND	CHASSIS GND
5	+TTL (ON/OFF)	+TTL (ON/OFF)	18	N/C	N/C
6	-TTL (ON/OFF)	+AUX	19	-SENSE	N/C
7	+SENSE	+AUX CM	20	+OUTPUT	N/C
8	+OUTPUT	-AUX CM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

## Connector Specifications

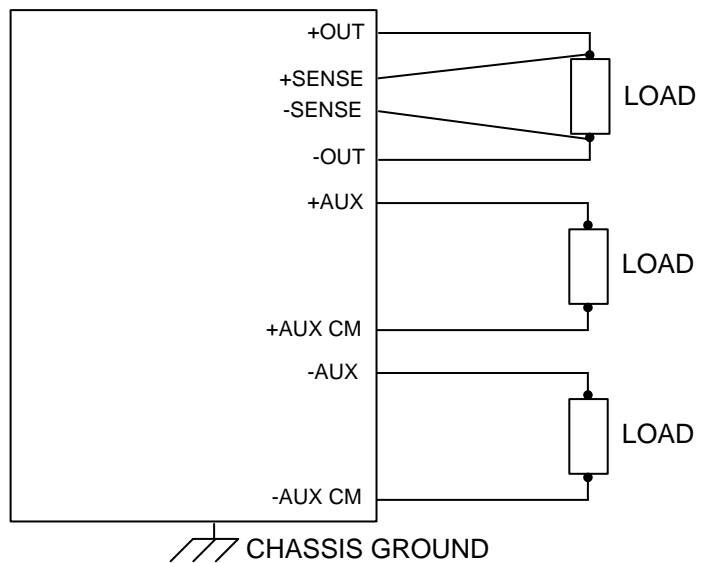
Connector	Part Number - Series
Unit Connector	DBMME25PR
Mating Connector	DBMM25S

## Output – Wiring Diagram

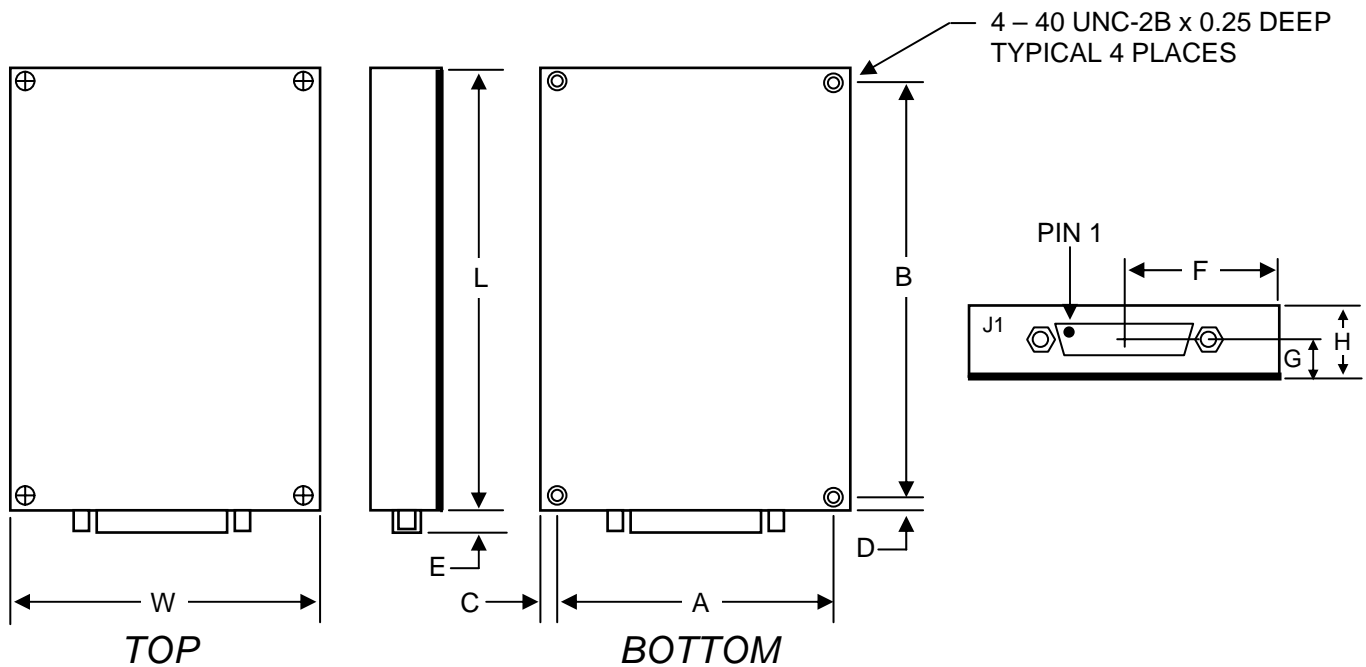
### Single Output



### Triple Output



# Mechanical Layout



**Table 3. Mechanical Dimensions**

Case*	Units	W	L	A	B	F
1	Inches	3.00	3.85	2.600	3.450	1.50
1	mm	76.20	97.79	66.04	87.63	38.1
2	Inches	3.25	4.25	2.850	3.850	1.63
2	mm	82.6	108.0	72.39	97.79	41.3

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

**Notes**

- Dimensions C & D: 0.2" (5.1 mm)
- Dimension E: 0.23" (5.84 mm)
- Dimension G: 0.455" (11.56 mm)
- Dimension H: 0.8" (20.3 mm)

## Ordering Information for 55K1 Series (75 Watt DC/DC Converter)

**55 K S1 - 005 H 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:**

H = Full-Mil: -55°C to +100°C, Hi-Rel Mil Grade Components, Designed to meet the requirements of MIL-STD-461C, Designed to meet the requirements of MIL-STD-810C, Designed per NAVMAT Guidelines

M = COTS-Mil-Type: -55°C to +100°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

003 = 3.3 V  
005 = 5 V  
012 = 12 V  
015 = 15 V  
024 = 24 V  
028 = 28V

Triple Output

512 = 5 V, ±12 V  
515 = 5 V, ±15 V  
312 = 3.3V, ±12V  
000 = Special Voltage – See Code Table Below

**OUTPUTS:** S1 = Single

T1 = Triple

**WATTAGE:** K = 75 W

**SERIES:** 55 = DC/DC (Low Voltage)

**Example:** 55KS1-005H0 = DC/DC (Low Voltage); 75 Watt; Single Output; +5 V; Full-Mil-Type; Standard Testing  
55KD1-012M1 = DC/DC (Low Voltage); 75 Watt; Dual Output; ±12 V; COTS-Mil-Type; ESS Vibration Testing  
55KT1-515M1 = DC/DC (Low Voltage); 75 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
01	55KT1-515 with maximum weight of 11.5 ounces
02	55KT1-000XX with outputs of 5.2vdc and ±12vdc