55K1 DC/DC Converter

75-Watt Ruggedized Converter
Conduction-Cooled, Single and Triple Outputs

Proudly made

Description

NAI's 55K1 is a 75-Watt DC/DC Converter that accepts a +28 VDC input. This COTS unit provides full-power output, either single or triple, at a baseplate temperature of +100°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, switching 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
- Ordering information for single and triple outputs:
  - 55KS1 - single output
  - 55KT1 - triple output
- Standard output voltages: 3.3V, 5V, 12V, 15V, 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 +100°C temperature range
- Contact factory for additional options and special units

116 Wilbur Place, Bohemia, NY 11716 Tel: 631.567.1100 www.naii.com

Electrical Specifications

DC Input Characteristics	
Input	16 to 36 VDC; 40 VDC maximum with no damage
EMI/RFI	Designed to meet the requirements of MIL-STD-461D; CE102
Input Transient Protection	Per MIL-STD-704D
Output Power	75 Watts (see Output Power Table below)
Output Voltage	3.3 VDC to 28 VDC (see Output Power Table below)
Efficiency	70% minimum; 65% minimum for single output @ +3.3 V
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; 150 mV for auxiliary outputs with 20% minimum main output load
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 0.5 msec (typical), half to full load
Load Transient Under/Overshoot	0.35 V 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 V with automatic recovery
Current Limiting	120% ±10% typical
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, on main output only
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 Mega Ohm at 50 VDC

All specifications are subject to change without notice.

Output Power

Single Output		Triple Output	
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		
15.0	5.0		
28.0	2.67		

116 Wilbur Place, Bohemia, NY 11716 Tel: 631.567.1100 www.naii.com

Additional Specifications

Physical/Environmental	
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; 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 Mechanical Dimensions Table, page 4
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 below)
Weight	Single output = 11 ounces; dual output = 12 ounces; triple output = 13 ounces

All specifications are subject to change without notice.

Pinout Designations (J1)

Pin No.	Single Output	Triple Output	Pin No.	Single Output	Triple Output
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			

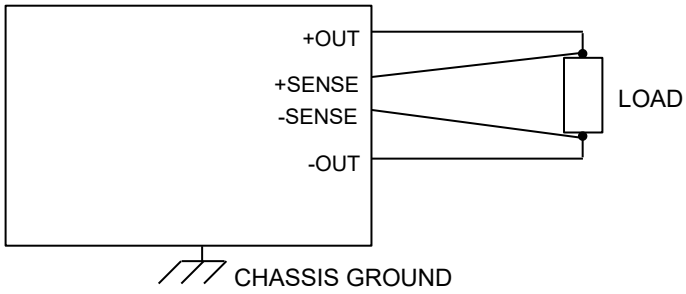
Connector Specifications

Connector	Part # - Series
Unit	DBMME25PR
Mating	DBMM25S

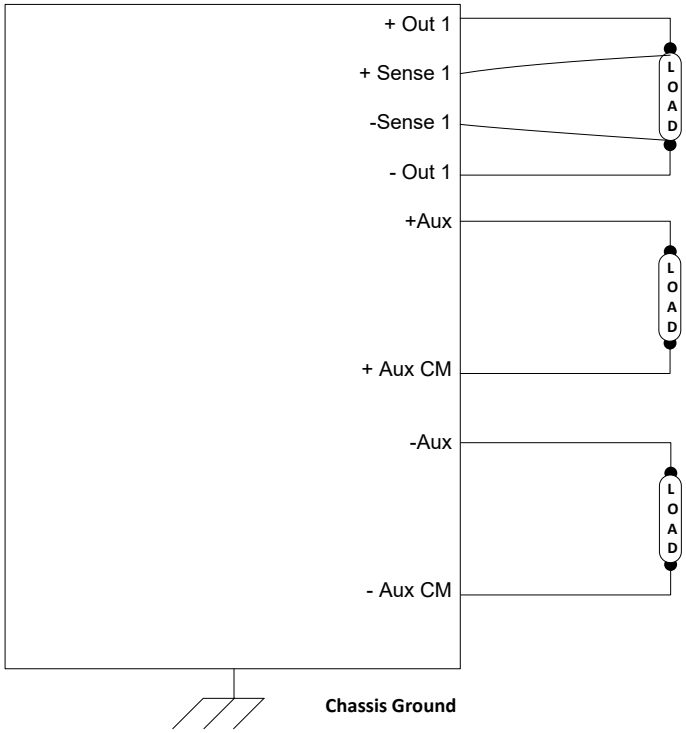
116 Wilbur Place, Bohemia, NY 11716 Tel: 631.567.1100 www.naii.com

Output Wiring Diagram

Single Output

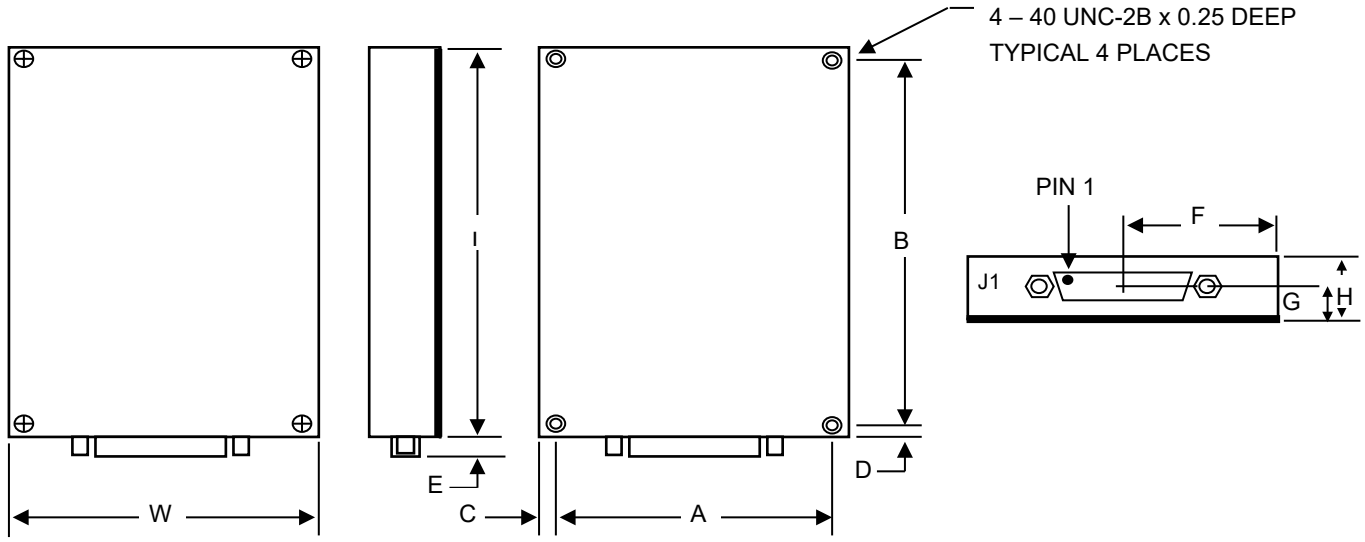


Triple Output



116 Wilbur Place, Bohemia, NY 11716 Tel: 631.567.1100 www.naii.com

Mechanical Layout



See tables below for Mechanical Dimensions.

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

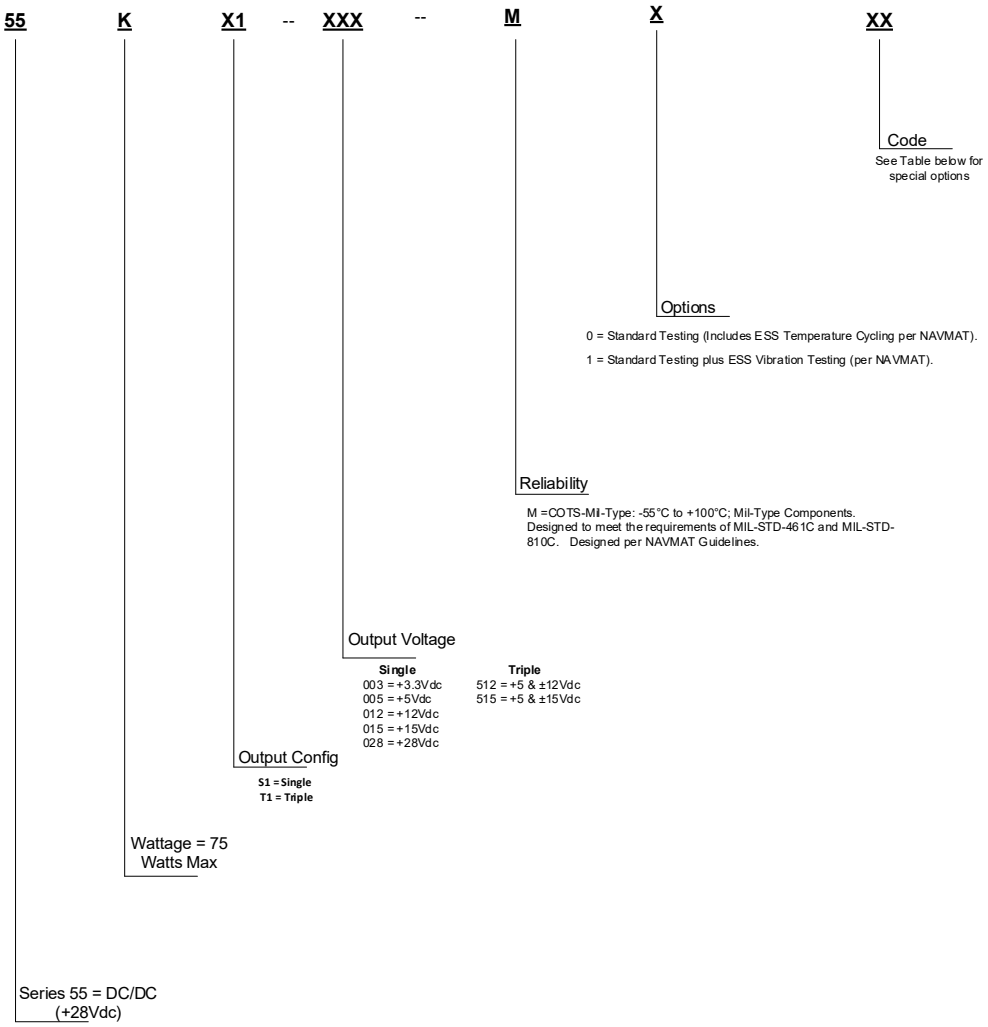
Use Case 1 for Single Output Converter; Case 2 for Triple Output Converter.

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

116 Wilbur Place, Bohemia, NY 11716 Tel: 631.567.1100 www.naii.com

Ordering Information



Example: 55KS1-028M0 = DC/DC (Low Voltage); 75 Watt; Single Output; +28V; COTS-MIL-Type; Standard Testing

Code Table for Special Orders

Code	Description
01	55KT1-515 with maximum weight of 11.5 ounces
02	55KT1-000XX with outputs of 5.2 VDC and ±12 VDC
03	55KS1-XX Potted. Designed to meet MIL-STD-810C, Procedure 1, Category 6, 70,000 feet. (Add 3 ounces max to weight of unit.)

Consult Factory for Additional Options and/or Special Units

116 Wilbur Place, Bohemia, NY 11716 Tel: 631.567.1100 www.naii.com