55J1 DC/DC Converter

50-Watt Ruggedized Converter
Conduction-Cooled, Single and Dual Outputs

Proudly made in the USA

Description

NAI's 55J1 is a 50-Watt DC/DC Converter that accepts a +28 VDC input. This COTS unit provides full-power output, either single or dual, 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 dual outputs:
  - 55JS1 - single output
  - 55JD1 - dual output (±15Vdc only)
- Standard output voltages: 5V, 12V, 28V
- Integrated EMI filtering per MIL-STD-461
- Input transient protection per MIL-STD-704
- 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

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Electrical Specifications

DC Input Characteristics	
Input	16 to 36 VDC; 40 VDC maximum with no damage (50 VDC maximum – optional)
EMI/RFI	Designed to meet the requirements of MIL-STD-461D; CE102
Input Transient Protection	Per MIL-STD-704D
DC Output Characteristics	
Output Power	50 Watts (see Output Power Table below)
Output Voltage	See Output Power Table below
Efficiency	72% 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
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 V and 5.0 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% (single output); dual output units protected against mis-wired sense lines
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	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		Dual	
Volts	**Amps**	**Volts**	**Amps**
5.0	10.0		
12.0	4.2	±15.0	1.7
28.0	1.8		

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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 5
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 = 9 ounces; dual output = 10 ounces

All specifications are subject to change without notice.

Pinout Designations (J1)

Pin No.	Single Output	Dual Output	Pin No.	Single Output	Dual Output
1	+ INPUT	- INPUT	9	- INPUT	+ INPUT
2	+ INPUT	N/C	10	- INPUT	N/C
3	- TTL (ON/OFF)	- TTL (ON/OFF)	11	CHASSIS GND	CHASSIS GND
4	+ TTL (ON/OFF)	+ TTL (ON/OFF)	12	+ SENSE	- SENSE 1*
5	+ OUTPUT	+SENSE 1*	13	- SENSE	- OUTPUT 1*
6	+ OUTPUT	+OUTPUT 1*	14	+ OUTPUT	- SENSE 2*
7	- OUTPUT	+ SENSE 2*	15	- OUTPUT	- OUTPUT 2*
8	- OUTPUT	+OUTPUT 2*			

** For Dual Output versions, the Output #1 and Output #2 ratings can be found in the Code Table for Special Orders, page 6.*

Connector Specifications

Connector	Part # - Series
Unit	DAMME15PR
Mating	DAMM15S

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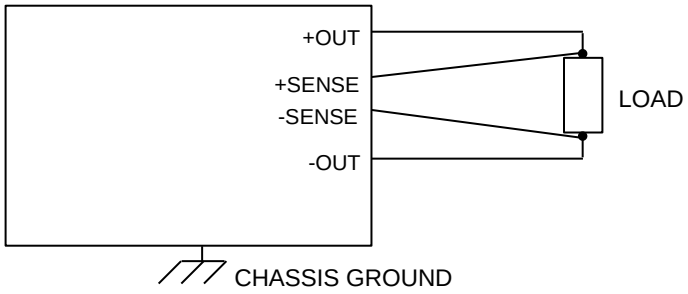
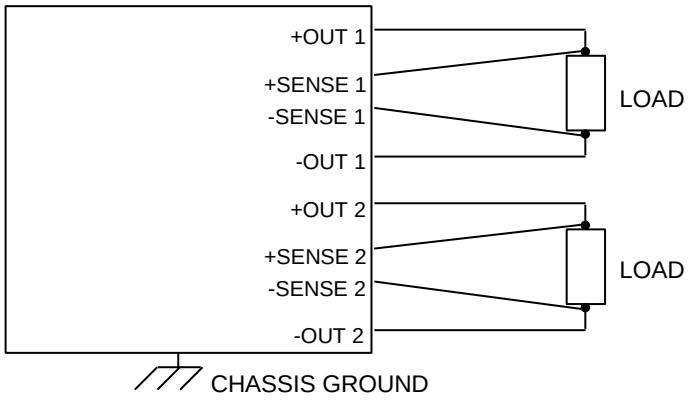
Output Wiring Diagrams

Single Output



Dual Output



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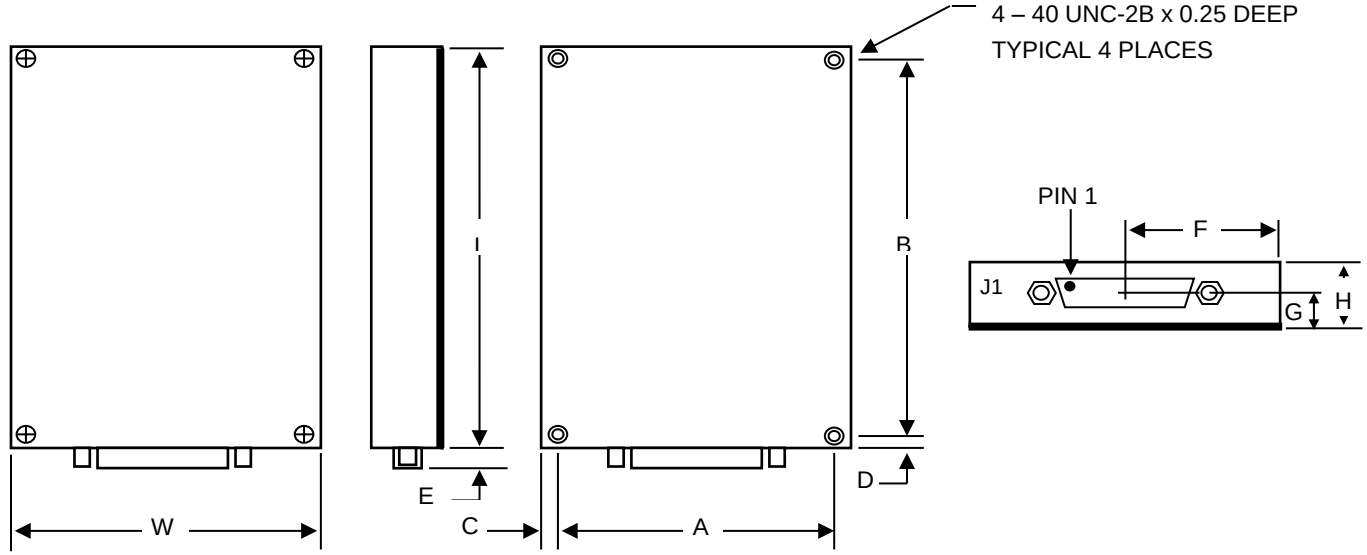
Mechanical Layout



See tables below for Mechanical Dimensions.

Mechanical Dimensions

Case*	Units	W	L	A	B	F
1	inches	2.5	3.5	2.100	3.100	1.25
1	mm	63.5	88.9	53.34	78.74	31.8
2	inches	3.00	3.85	2.600	3.450	1.50
2	mm	76.20	97.79	66.04	87.63	38.1

Use Case 1 for Single Output Converter; Case 2 for Dual 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

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Ordering Information

55 J D1 – 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 +100°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	Dual Output	Special Voltage
005 = 5 V	015 = ±15 V	000 = See Code Table below
012 = 12 V		
028 = 28 V		

Outputs: S1 = Single
D1 = Dual

Wattage: J = 50 W

Series: 55 = DC/DC (Low Voltage)

Example: 55JD1-015M0 = DC/DC (Low Voltage); 50 Watt; Dual Output; ±15 V; COTS-MIL-Type; Standard Testing

Code Table for Special Orders

Code	Model #	Description	Dual Outputs
01		Potted. Designed to meet MIL-STD-810C, Procedure 1, Category 6, 70,000 feet. (Add 0.9 lbs. to weight of unit.)	
06	55JS1-000M1-06	Model 55JS1-024M0 modified to supply an output of 24 VDC @ 1.1 A for 30 seconds while the input voltage is at 11 VDC. Under normal conditions, the input will be within 18 to 32 VDC.	
07	55JD1-000M1-07	Model 55JS1-015M1 encapsulated and NAI UID printed on the label.	

Consult Factory for Additional Options and/or Special Units

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