55LS1 DC/DC Converter

Proudly made

100-Watt Ruggedized Converter
Conduction-Cooled, Single Output

Description

NAI's 55LS1 is a COTS, 100-Watt DC/DC Converter that accepts a +28 VDC input and provides a single full-power output 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
- Standard output voltages: 5V, 6.5V, 12V, 15V, 24V, 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	18 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
DC Output Characteristics	
Output Power	100 Watts (see Output Power Table below)
Output Voltage	5 VDC to 28 VDC (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

Watts	Volts	Amps
100	5.0	20.0
100	6.5	15.3
100	12.0	8.4
100	15.0	6.7
100	24.0	4.2
100	28.0	3.6

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 514.2, 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 below)
Weight	12 ounces

All specifications are subject to change without notice.

Pinout Designations (J1)

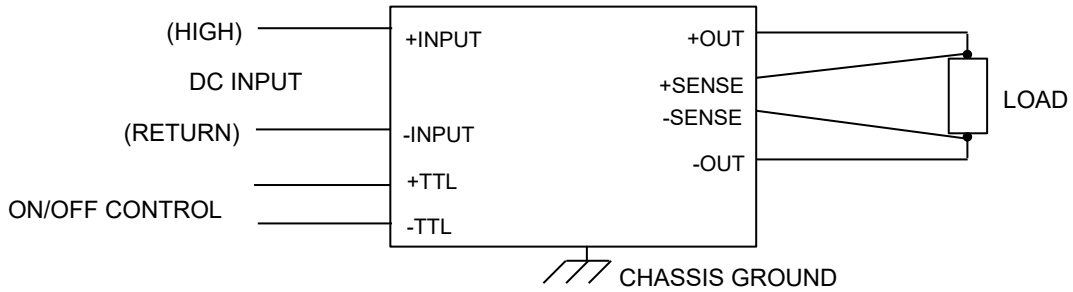
Pin No.	Function	Pin No.	Function
1	+INPUT	14	-INPUT
2	+INPUT	15	-INPUT
3	+INPUT	16	-INPUT
4	N/C	17	CHASSIS GND
5	+TTL (ON/OFF)	18	N/C
6	-TTL (ON/OFF)	19	-SENSE
7	+SENSE	20	+OUTPUT
8	+OUTPUT	21	+OUTPUT
9	+OUTPUT	22	+OUTPUT
10	+OUTPUT	23	-OUTPUT
11	-OUTPUT	24	-OUTPUT
12	-OUTPUT	25	-OUTPUT
13	-OUTPUT		

Connector Specifications

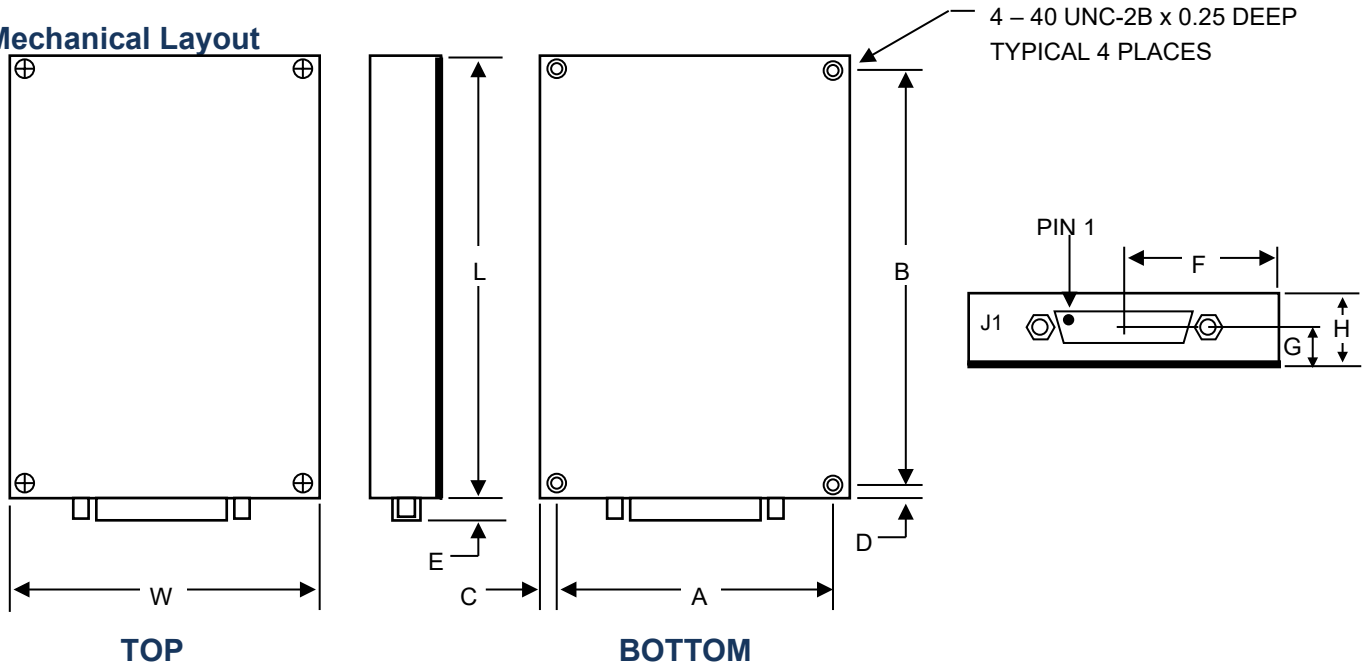
Connector	Part # - Series
Unit	DBMME25PR
Mating	DBMM25S

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

Output Wiring Diagram



Mechanical Layout



Mechanical Dimensions

Units	W	L	A	B	F
inches	3.25	4.25	2.850	3.850	1.63
mm	82.6	108.0	72.39	97.79	41.3

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

55 L S1 – 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	Special Voltage
005 = 5 V	000 = See Code Table below
006 – 6.5 V	
012 = 12 V	
015 = 15 V	
024 = 24 V	
028 = 28 V	

Outputs: S1 = Single

Wattage: L = 100 W

Series: 55 = DC/DC (Low Voltage)

Example: 55LS1-012M1 = DC/DC (Low Voltage); 100 Watt; Single Output; +12 V; COTS-Mil-Type; ESS Vibration

Code Table for Special Orders

Code	Model Number	Description
01	55LS1-000M0-01	Output of +16 VDC
02	55LS1-000M0-02	Single output of 19.5 VDC @ 6.6 A; max operating temperature 50°C baseplate

Consult Factory for Additional Options and/or Special Units

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