North Atlantic Industries
Logitek Power Division

56K1 SERIES

AC/DC POWER SUPPLY – 75 WATT SINGLE, DUAL AND TRIPLE OUTPUTS

Features

- High Power Density, Low Profile Packaging
- Full Output Power at +85°C Baseplate Temperature
- Switching Power Supply – Low Noise
- ESS Screening (Burn-In) and Temperature Cycling
- Designed and Manufactured Per NAVMAT Guidelines
- EMI Filtering Designed to MIL-STD-461C
- Remote Error Sensing
- Remote Digital (TTL) Turn On/Off
- Transient Protection per MIL-STD-704D
- Full Mil & COTS-Mil-Type Versions (form, fit & function identical)

Contents

Description

The NAI 56 Series is a family of high power density, low profile, AC/DC switch mode power supplies. This family extends from 25 Watt through 300 Watt in single, dual, and triple configurations. The 56 Series is ideally suited for airborne, shipboard, ground mobile and C^3I applications. All NAI AC/DC Power Supplies, as well as DC/DC Converters, are designed and qualified to the most stringent performance and environmental requirements. Full-Mil units receive ESS Screening, including burn-in and temperature cycling.

Electrical Specifications

AC Input Characteristics:

Input	115/230 VAC, See Table 2 and Table 3
EMI/RFI Characteristics	Designed to meet the requirements of MIL-STD-461C
Input Transient Protection	Per MIL-STD-704D; For nominal 115 VAC input: 180 VAC for 0.1 second For nominal 230 VAC input: 292 VAC for 0.1 second
Input Frequency Range	47hz to 440hz
Inrush Current	Limited to 500% of nominal input current

DC Output Characteristics:

Output Power	See Table 1
Output Voltage	5 VDC to 28 VDC See Table 1
Efficiency	75% Typical, 70% for dual output units, 66% for triple output units, 70% for 5 volt units, 65% for 3 volt units
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

Minimum Load Requirements	For single output no minimum load; For dual and triple outputs, 20% minimum on main load, 150mv for auxiliary outputs
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

DC Output Characteristics, cont'd

Load Transient Under/Overshoot	0.35 Volt maximum from nominal output voltage set point for 5V outputs, all others are 5%.
Short Circuit Protection	Under any short circuit condition, continuous short circuit with Auto Recovery
Current Limiting	Limited to 130% of rated output at 85°C
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	1000 VDC input to output and input to case; 200 VDC output to case.
Insulation Resistance	50 Meg Ohms at 50 VDC

Physical/Environmental Specifications:

Temperature Range	Operating: -55°C to +85°C at 100% load; 400Hz input (Temperature measured at baseplate; conduction via baseplate only); See table 1 for de-ratings; 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; 0 to 71°C at baseplate
Dimensions	See Table 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: chem.-film
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 De-Rating

Volts	Current @ 400 Hz & 85°C	Current @ 400 Hz & 100°C	Current @ 60 Hz & 71°C	Current @ 60 Hz & 85°C
5.0	15.0	10.0	12.0	7.5
12.0	6.3	4.0	5.0	3.1
15.0	5.0	3.3	4.0	2.5
24.0	3.1	2.0	2.5	1.6
28.0	2.7	1.7	2.1	1.3
±12	3.1	2.0	2.5	1.6
±15	2.5	1.7	2.0	1.3
5 / ±12	10.0 / ±1.0	6.7 / ±0.7	8.0 / ±0.8	5.0 / ±0.5
5 / ±15	9.0 / ±1.0	6.0 / ±0.7	7.2 / ±0.8	4.5 / ±0.5

Table 2. Pinout Designations (J1)

Single Output	Dual Output	Triple Output	
1. INPUT	1. INPUT	1. INPUT	16. NC
2. INPUT (neutral)	2. INPUT (neutral)	2. INPUT (neutral)	17. GROUND
3. –TTL (rtn)	3. –TTL (rtn)	3. NC	18. NC
4. +TTL	4. +TTL	4. –TTL (rtn)	19. NC
5. +SENSE	5. +SENSE (output 1)	5. +TTL	20. NC
6. OUTPUT	6. OUTPUT 1	6. OUTPUT 2	21. NC
7. OUTPUT	7. OUTPUT RETURN 1	7. OUTPUT RETURN 2	22. –SENSE (rtn)
8. OUTPUT	8. +SENSE (output 2)	8. OUTPUT RETURN 3	23. OUTPUT RETURN 1
9. INPUT (3Ø & 230v)	9. INPUT (3Ø & 230v)	9. OUTPUT 3	24. OUTPUT RETURN 1
10. INPUT (3Ø & 230v)	10. INPUT (3Ø & 230v)	10. +SENSE	25. OUTPUT RETURN 1
11. GROUND	11. GROUND	11. OUTPUT 1	
12. –SENSE (rtn)	12. -SENSE 1 (rtn)	12. OUTPUT 1	
13. OUTPUT RETURN	13. OUTPUT 2	13. OUTPUT 1	
14. OUTPUT RETURN	14. OUTPUT RETURN 2	14. INPUT (3Ø & 230v)	
15. OUTPUT RETURN	15 –SENSE 2 (rtn)	15. INPUT (3Ø & 230v)	

*** notes:**

- Use all pins which have been allotted for the main output and return lines
- TTL logic 1 inhibits (turns off) the output; a floating input acts as a logic 0 (output on); (Remote Turn On/Off feature).
- Remote sense feature (SENSE) is available on 1st output of the single and triple output versions; on dual output version it is available on both outputs (see output wiring diagram sheet 4).

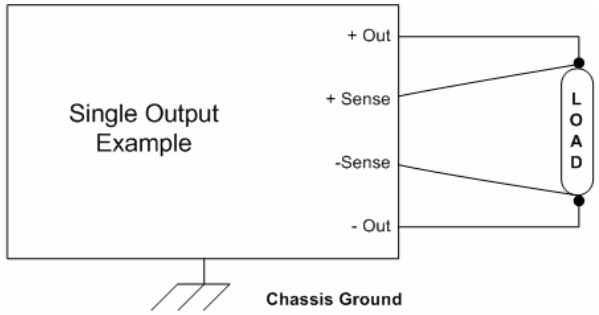
Table 3. Input Connections for J1 Connector

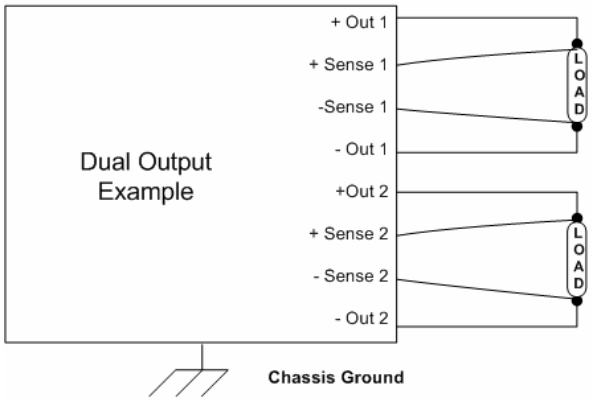
AC Input Type	Single/Dual Input	Triple Input
115 VAC, 1∅	1, 2 (Neutral)	1,2 (Neutral)
115 VAC, 3∅, Δ	1, 9,10	1,14,15
115 VAC, 3∅, Y	1, 9,10,2 (Neutral)	1,14,15,2 (Neutral)
230 VAC, 1∅	1,9,10	14,15
230 VAC, 3∅ Δ	1,9,10	1,14,15

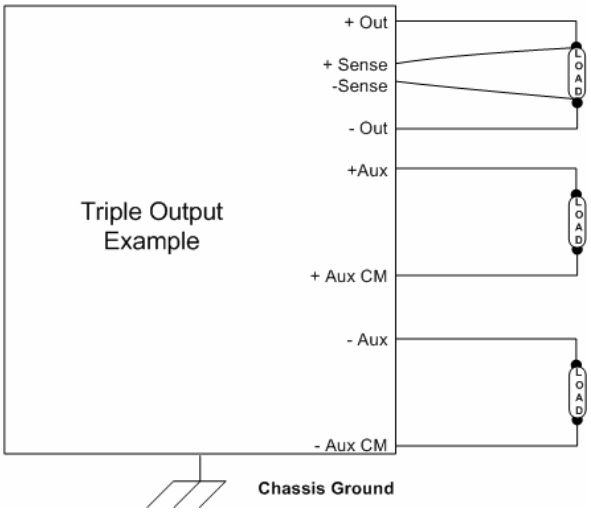
Table 4. Connector Specifications

Connector	Part Number - Series
Unit Connector – Single/Dual	DAMME15PR
Mating Connector – Single/Dual	DAMM15S
Unit Connector - Triple	DBMME25PR
Mating Connector – Triple	DBMM25S

Output – Wiring Diagram







Mechanical Layout

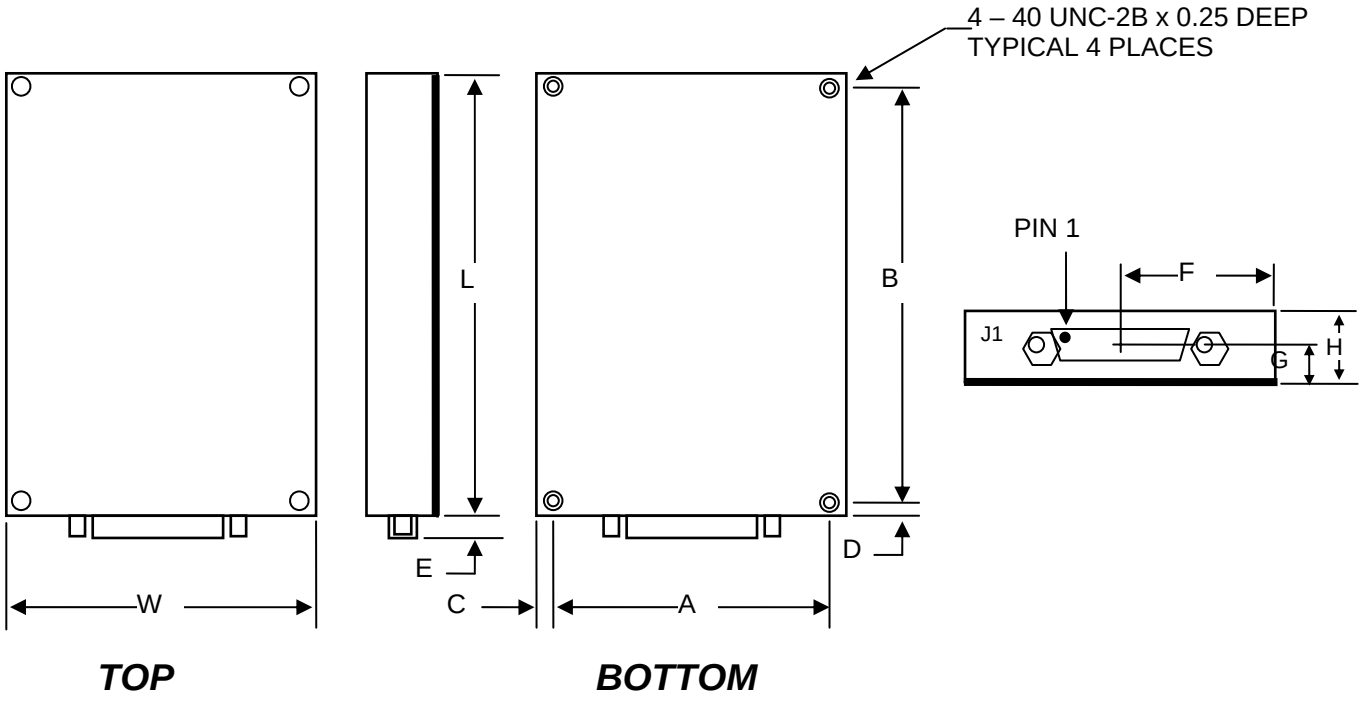


Table 5. Mechanical Dimensions

Case*	Units	L	W	H	A	B	F
1	Inches	4.5	3.25	.80	2.85	4.10	1.63
1	mm	114.3	82.6	20.3	72.39	104.14	41.3
2	Inches	5.0	4.5	.80	4.10	4.6	2.25
2	mm	127	114.3	20.3	104.14	116.84	57.5

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

Notes

Dimensions C & D are 0.2" (5.1 mm)

Dimension E is 0.23" (5.84 mm)
Dimension G is 0.455" (11.56 mm)
Dimension H is 0.8" (20.3 mm)

Ordering Information for PS-56K01 Series (75 Watt AC/DC Power Supply)

56 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 +85°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 +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.

OUTPUT VOLTAGE(s):

Single Output	Dual Output	Triple Output
000 = *	000 = *	512 = 5, ±12 V
005 = 5 V	012 = ±12 V	515 = 5, ±15 V
012 = 12 V	015 = ±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: 56 = AC/DC

Example: *56KS1-005H0 = AC/DC; 75 Watt; Single Output; +5 V; Full-Mil-Type; Standard Testing*
56KD1-012M1 = AC/DC; 75 Watt; Dual Output; ±12 V; COTS-Mil-Type; ESS Vibration Testing
56KT1-515M1 = AC/DC; 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	56KD1 Modified for +12vdc @ 3.0A and + 15vdc @ 2A ; Part Number is 56KD1-000M0-01
02	56KT1 Modified for +5vdc @ 1.0A, +12vdc @ 700ma and +24vdc @ 800ma; Part Number is 56KT1-000M0-02
03	Potted,designed to meet MIL-STD-810C,Proc I,Category 6, 70,000 Ft. Adds 0.9lbs of weight to unit.