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Solid-State Pulsed Power Amplifier, 34–36 GHz, 50 W PKAB50-V3

An excellent alternative to traveling wave tube amplifiers, the POAM PKAB50-V3 is a solid-state pulsed power amplifier operating from 34 to 36 GHz, delivering a minimum saturated output power of 47 dBm (50 W). With high gain, efficiency, signal flatness, and RF output power, this SSPA is an ideal building block for millimeter-wave subsystems across a wide range of applications.

The PKAB50-V3 is engineered as a compact, lightweight unit with an integrated thermal management structure to support reliable high-power operation. It is built to military-grade standards and housed in a weatherproof enclosure rated to IP66 for demanding outdoor and mobile environments. Both RF input and output ports are WR28 waveguide interfaces, enabling straightforward system integration.



Features

- Frequency Range: 34– 36 GHz
- Saturated Power: 47 dBm (Min), 48 dBm (typical)
- Solid-state MMIC Reliability
- Multi-Element Redundancy
- Instant On (no warm-up)
- Monitoring and Control
- IP66 protection
- Low weight: 10 kg (22 lbs.)
- Compact size: 368x190x166 mm (14.5x7.5x6.5 inch)
- Overvoltage and overcurrent protections

Typical Applications

- Radar
- Wireless Infrastructure
- Military and Aerospace
- Test Instrumentation
- TR Modules
- TWTA Replacement

Electrical Specifications (TA=+25°C)

PARAMETER	VALUE	UNIT
Operating Frequency	34 to 36	GHz
Saturation Output Power-Pulsed	50 (Minimum), 60 (Typical)	W
Input Power (Pulsed)	-2 (min), +4 (max)	dBm
Small Signal Gain	60	dB
Gain Flatness	+/- 2	dB
Duty Cycle	1 to 100	%
Spurious	60 (min)	dBc
Rise/Fall Time [PW=20 ns]	6/3	ns
Input/Output VSWR	1.5:1(Typical); 2:1(Max)	
Input Impedance	50	Ω (coaxial option)
Operating Voltage	28	VDC
Current	15 (Max)	A
MTBF	200,000	Hours *(25°C, Ground fixed, duty cycle 50%; per MIL-HDBK-217F)*

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Mechanical and Environmental Specification

Parameter	Value	Note
Operational Temperature	-30°C to +75°C	
Storage Temperature	-40°C to +85°C	
Dimension	368x190x166 mm (14.5x7.5x6.5 inch)	
Weight	10 kg (22 lbs.)	
RF Connectors	2.92mm/WR28 (Input/Output)	Also Available with 2.92mm coaxial for Input
DC and M&C Connectors	Military Round connectors D38999 Series by AMPHENOL	Mating connectors will be provided
Environmental Protection	IP66	
Cooling method	Heatsink with fans	fans rated IP67
Colour	Anodized Olive Green	Other colours also available

Test Standards

	Parameter	Value	Note - Test Standard
Vibration	Random Vibration	5Hz to 8Hz @ 6mm, 8Hz to 500Hz @ 15m/s2, 2 hours in each direction of 3 axes	MIL-STD-202G BS EN 60068-2-6 2008:
	Vibration Shock	Half Sine, 400m/s2, 11ms. 3 shocks in each direction of 3 axes	BS EN 60068-2-27: 2009: Shock
	Bump Test	Half Sine, 250m/s2, 6ms, 4000 bumps in each direction of 3 axes	BS EN 60068-2-27: 2009:
Thermal	Ambient Temperature Test	14 days	BS EN 60068
	Damp Heat Test	+40°C 93%RH, 16-hour dwell.	BS EN 60068-2-78:
	Temperature Shock	+55°C to -30°C, 3-hour dwells, 10 second transfer, 2 cycles.	BS EN 60068-2-14: 2023:
	Low Temperature Test	-30°C for 16 hours - Operational -40°C for 16 hours - Storage	BS EN 60068-2-1: 2007:
	High Temperature Test	+60°C for 16 hours - Operational +80°C for 16 hours - Storage	BS EN 60068-2-2: 2007:
	Humidity Cycling Test	3-hour ramp +20°C 95%RH to +30°C 95%RH 12-hour dwell +30°C 95%RH 3-hour ramp +30°C 95%RH to +20°C 95%RH 6-hour dwell +20°C 95%RH 24-hour cycle, 14 cycles Functional test performed during the first 2 hours of the +35°C dwell on the 7th and 14th cycles.	BS EN 60068-2-30: 2005:
Drop	Drop Test	Drop height 250mm onto 6 faces. Steel plate backed with concrete	BS EN 60068-2-31: 2008:
	Topple Test	Drop onto wood, 1 drop from each bottom edge, opposite edge lifted to either 45° or 100mm, then allowed to drop back onto bottom face	BS EN 60068-2-31: 2008:
Protection	Ingress Protection, IP6X	Dust tight (with internal pressure reduction)	BS EN 60529:1992+A2:2013
	Driving Rain	200 l/m2/h for 1 hour	DEF STAN 00-035, Part 3, Issue 4, Test CL 27
	Environmental Protection	IP66	MIL-STD-108E

Altitude	Altitude	30,000 ft, 30 kPa, 16 hours	MIL-STD-810 method 500
Safety	EMC/EMI	CE102, CS101, CS114, CS115, CS116, CS118, RE102, RS103	MIL-STD-461G

RF Connector (J1 & J2)

PIN	Description	Note
RF Input (J1)	2.92mm-Female	Please advise if other kind of input connector is required
RF output (J2)	WR28 – Waveguide	

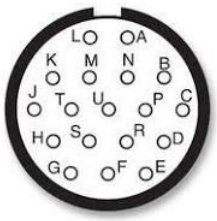
M&C connector pin Description (J5)

[D38999/20WB35SN Amphenol Circular MIL Spec Connector]

PIN	Description	Note
1 - RS422 Tx+	Health, Temperature, Voltage, and current monitoring	
2 - RS422 Tx-		
3 - RS422 Rx+	Disable/ Enable Amplifier (on/off)	
4 - RS422 Rx-		
5	Ground	
6	Ground	
7 to 13	NC	

DC Connectors pin Description (J3 & J4)

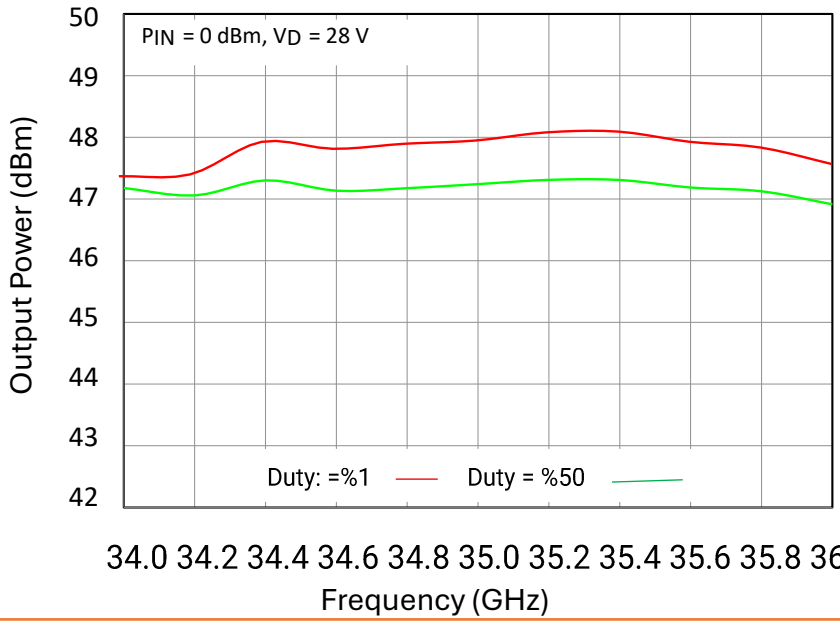
[D38999/20WD18PN Amphenol Circular MIL Spec Connector]

PIN	Description	Note
A	+ 28 VDC	
B	+ 28 VDC	
C	+ 28 VDC	
D	+ 28 VDC	
E	+ 28 VDC	
F	+ 28 VDC	
G	+ 28 VDC	
H	+ 28 VDC	
J	+ 28 VDC	
K to U	GND	

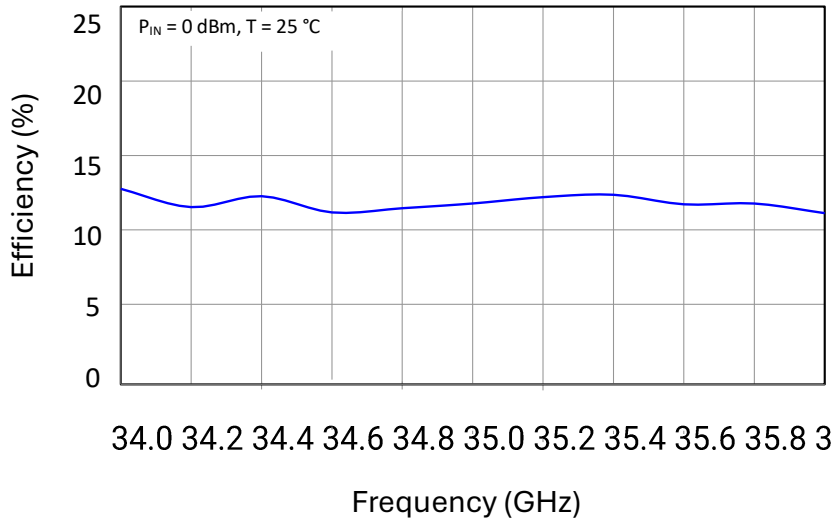
TYPICAL OUTPUT POWER GRAPH:

(Conditions unless otherwise specified: VD = +28 V, IDQ = 5.4 A, PIN= 0 dBm, Pulse Width = 5 us, Duty Cycle = 50%)

Output Power vs. Freq.



Power Added Efficiency vs. Freq.

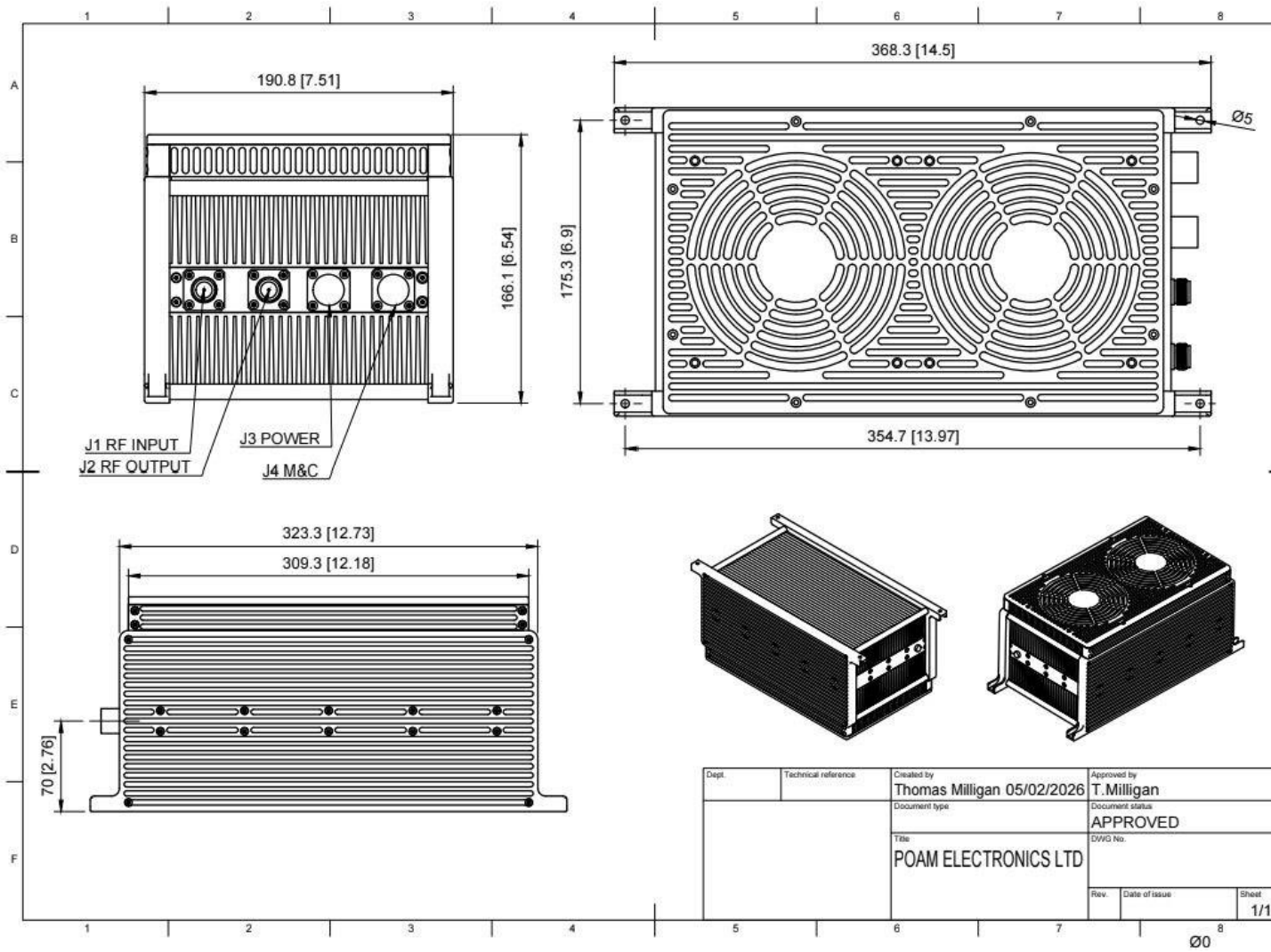


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OUTLINE DRAWING:

Unit: mm [Inches]





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Handling Precautions

Caution! ESD-Sensitive Device

RF VOLTAGE HAZARD: Contact with RF fields at the output connector can cause burns or electric shock. High levels of RF/Microwave energy may be present when the unit is operating.

HIGH DC CURRENT HAZARD: High levels of DC current are present when the unit is operating.

Each amplifier is shipped in a rigid protective carrying case designed to prevent mechanical damage during handling and transport.



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