



modular rf

MODEL AIRWALK MUOS AMPLIFIER MODULE 300-320, 360-380 MHz 100 Watts [Peak]

AIRWALK is the first full-duplex amplifier module from **AR Modular RF** to support **MUOS**. **AIRWALK** is a two-port device offering simultaneous transmit and receive operation with amplification in both directions. The module is a sub-system designed for customer integration into a radio system where requirements demand more power than offered by a base or tactical radio alone. Situations and systems for which this **MUOS Amplifier Module** is ideally suited include:

- Rack mount systems supporting command post operations where indoor use of tactical radios signals, specifically those for satellite communications, are inhibited by buildings and other LOS obstructions
- Remote radio head installations where LOS access is otherwise not available
- Aggregating handheld tactical radios in a network to share a single amplifier

Product Highlights:

- Two Port Design (Radio Port, Antenna Port)
- Full Duplex Support for MUOS Band A
- Controllable TX gain
- Thermal efficiency vs. peak power control (see DC DRAIN VOLTAGE CONTROL below)
- Optionally powered directly from Bias-T (available as accessory, see below)



Photo is concept only and subject to change

ar modular rf

PRELIMINARY

21222 30th Dr SE, Suite 200 • Bothell, Washington 98021 • 425-485-9000 • Fax 425-486-9657 • www.arworld.us

DOC-00000425 REV 3 | 2023-02-26



PERFORMANCE SPECIFICATIONS – MUOS AMPLIFIER MODULE

ELECTRICAL

SPECIFICATION		Units	Min.	Typ.	Max.	Notes
OPERATING FREQUENCY RANGE		MHz	300	-	320	Transmitter Path / Uplink / Module HPA
			360	-	380	Receiver Path / Downlink / Module LNA
TX	MAX INPUT POWER – AVG	W	-	0.2	1	Designed to support linear performance for 5 MHz channel W-CDMA with ~7 dB PAPR
		dBm	-	23	30	
	MAX OUTPUT POWER - peak	W	-	100	200	
		dBm	-	50	53	
	Power Gain	dB	20	21	23	Measured at Typical Peak Output Power (100 W)
	Gain Control Range	dB	-	30	-	Gain controlled at external connector – see below
	ACPR / ACLR	dBc	-35	-40	-	First adjacent channel
	HARMONICS	dBc	-	-70	-60	
SPURIOUS OUTPUTS	dBc	-	-	-70		
DUTY CYCLE		%	-	-	100	with average output power not to exceed 50 Watts and +25 C ambient
RX	GAIN	dB	20	22	24	Fixed gain
	NOISE FIGURE	dB	-	2	4	
INSERTION LOSS		dB	-	0.2	0.5	In bypass mode
INPUT / OUTPUT IMPEDANCE		Ohms		50		Designed for 50 Ohm Systems
INPUT / OUTPUT VSWR		X:1		1.5		Radio port, Antenna port
POWER REQUIREMENTS		V	18	-	48	
		W	-	150	200	Typical under 100 W peak condition, ~7 dB PAPR

Gain may need to be reduced to meet the typical peak output power of 100 W and performance may be degraded, under the reduced gain conditions.

MECHANICAL

SPECIFICATION	Units	Details	Notes
SIZE	Inches	6.8 x 9.2 X 3.1	Sizing approximate, without connectors.
WEIGHT	Kg/lb	3.6 / 7.9	Weight approximate
RF CONNECTORS		N-Type, Female	Radio Port, Front Panel
		N-Type, Female	Antenna Port, Rear Panel
CONTROL, MONITORING & POWER CONNECTOR		D-SUB, 25 pin	Front Panel
CONSTRUCTION			Machined Aluminum Chassis
COOLING		Convection	

ENVIRONMENTAL

SPECIFICATION	Units	Details	Notes
Operating Temperature	°C	-30 to +60	Duty cycle may need to be reduced above 25° C
Relative Humidity	%	95	Maximum, non-condensing
Altitude (operating)	ft	10,000	
Vibration / Shock			Designed to meet applicable sections of MIL-STD-810F



INTERFACE & CONTROL

All monitor/control signals and power on 25 pin D-SUB connector ¶

Signal Description	Function	D-SUB 25 Pin	Details	Notes
TX GAIN	Analog Control	5	-8 dB < Gain < +22 dB; Approximately 0.5 V < Volts < 5 V	Non-linear voltage/dB gain response. May require system calibrations for precision.
DC DRAIN VOLTAGE	Analog Control	22	20 V < Drain Voltage < 36 V Approximately 1.4 V < Volts < 0.6 V	Linear voltage/drain voltage response. Useful for system optimization of heat vs. peak power/linearity. Higher drain voltage = more linear, more heat. NOTE: Drain voltage should not exceed 36 V.
BYPASS	Digital Control	20	TTL, active low 0 = bypassed, 1 = not in bypass	Not in bypass: HPA and LNA in signal path Bypassed: Radio & Antenna ports directly connected
BLANK	Digital Control	6	TTL, active low 0 = blanked, 1 = not blanked	Not blanked: HPA is enabled Blanked: HPA is disabled and power consumption is minimal (receive LNA is active)
OVERTEMP OVERRIDE	Digital Control	3	TTL, active low 0 = overridden, 1 = not overridden	Not overridden: module enters self-protection when overtemp. condition exists Overridden: module enters self-protection when 20° C higher overtemp. condition exists (aka 'battleshort' mode)
INTERNAL TEMPERATURE §	Analog Monitor	4	0° C < temperature < 120° C Approximately 0.4 V < Volts < 2.75 V	Linear voltage/temperature response. Monitor point for HPA's internal temperature
RF OUTPUT POWER §	Analog Monitor	18	1 Watt < Output Power < 60 Watts Approximately 0.7 V < Volts < 4.8 V	Exponential voltage/power response. Monitor point for HPA's AVERAGE output power
DC DRAIN VOLTAGE §	Analog Monitor	1	20 V < Drain Voltage < 36 V Approximately 2.4 V < Volts < 4.2 V	Linear voltage/drain voltage response. Monitor point for HPA's DC Drain Voltage.
OVERTEMP ALARM §	Digital Monitor	10	TTL, active low 0 = alarm state, 1 = no alarm	Indicates module is over temperature and entered self-protection/shutdown (bypass)
BYPASS §	Digital Monitor	9	TTL, active low 0 = bypassed, 1 = not in bypass	Not in bypass: HPA and LNA in signal path Bypassed: Radio & Antenna ports directly connected
OUTPUT POWER OVERLIMIT ALARM §	Digital Monitor	7	TTL, active low 0 = alarm state, 1 = no alarm	AVERAGE output power has exceeded the rated output power. Signal exists as warning only, no protections are implemented under this condition.
OVERCURRENT ALARM §	Digital Monitor	8	TTL, active low 0 = alarm state, 1 = no alarm	Overcurrent limit reached and module has entered self-protections (reduces DC DRAIN VOLTAGE)
+5 VDC AUXILIARY	OUTPUT DC POWER	21	Maximum 500 mA	Used for powering external interfaces (+5V rail)
DC POSITIVE	POWER	11, 12, 13		+18 VDC to +48 VDC
DC GROUND	GND	23, 24, 25		Return for DC POSITIVE
Ground (Return)	Interface GND	16, 17		Return for interface signals

¶ USB interfacing module and monitor/control software available upon request. Speak with your sales representative for more details.

§ Monitoring signals are valid only when DC power is applied

modular rf

OPTIONAL EQUIPMENT & ACCESSORIES

ARM Model Name	Description
AR-RBT-M	Remote Bias-T

BLOCK DIAGRAM

The block diagram below presents a basic overview of the **AIRWALK** module system architecture.

