

2.5kW TROPO C-Band Modular GaN based Solid State Power Amplifier

Features

- Modular architecture
- High stability (phase and amplitude)
- Gain compensation over temperature
- Remote monitor and control capability via RS485 or Ethernet ports
- Input and output sample monitor ports
- Power factor correction
- Field replaceable modules
- No rear access required for operation or maintenance
- Adjustable ALC provided
- Protection against open or short circuit loads

Overview

The Advantech Wireless Model ARMA-CL2500A, C-Band GaN based Solid-State Power Amplifier operates over the Low C-band Tropo frequency of 4.4 – 5.0 GHz.

The ARMA-CL2500A is fully modular. The design of the product is based on Advantech Wireless' tradition of high power and high efficiency line of amplifiers.

Description

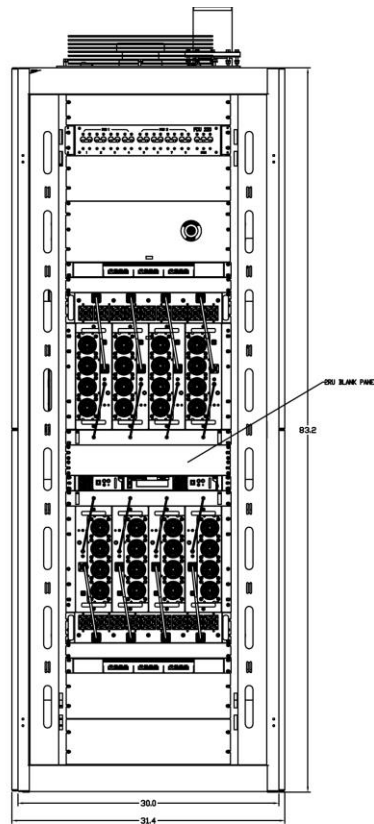
The design of the ARMA Modular GaN based Amplifier is based on Advantech Wireless' industry proven reliable solid state power amplifiers. The following is a description of the system elements and their salient features:

The ARMA Modular Amplifier contains the following elements:

- Redundant Input/Driver Module
- Splitter panel, one per amplifier chassis
- RF chassis each containing four 500W amplifier modules
- Power supply modular package, one per amplifier chassis
- High-power Combiner.



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Redundant Input/Driver Module

This 1 RU unit contains field-swappable 1:1 redundant driver modules and provides the M&C interface for the entire system. The interface panel provides for:

- Output RS485 DB9 connector for the serial port interface
- Ethernet (TCP/IP) RJ45 port

The Interface panel is connected to each amplifier module via the blind-mate connectors and also to the power supply shelves.

Input Splitter panel

The output of the Driver module passes through a 1:2 splitter and then to the 1 RU Input Splitter panel which is a 1:4 splitter. One is associated with each RF chassis. The output ports are accessible from the front. Each output port is connected to the input of each amplifier module.

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Amplifier module

The individual amplifier module provides 500W of output power. Each amplifier module is pre-adjusted for a normalized phase and gain. The units are field-swappable modules. The input and output connectors are on the front of the module and all other connections are via a blind-mate connector at the back of the module. A micro-controller is included in each amplifier module to specify the timing specs and provide an RS485 interface. The amplifier module reports on fault conditions and internal temperature.

Due to the modular system architecture, a failed RF module may be removed safely and replaced by a spare one without any tuning and adjustment procedures. Furthermore, a single failed RF amplifier will cause only a 1.16 dB drop in the total output power of the system.

Monitor & Control System

The M&C system operates at the module level via RS485. The amplifier module reports on fault conditions and internal temperature. The power supply shelf also provides an RS485 serial port interface. The complete system may be monitored via the RS485 interface port on the Driver Module. A laptop may also be used with appropriate adapter.

RF Chassis

The RF chassis contains four (4) amplifier modules. Each chassis is 7U high. The 2.5kW system contains two chassis.

Power supply shelf

A Power Supply shelf is associated with each chassis. The 1U high power supply shelf is modular, containing 4 individual power supplies. Failure of a single power module will have no impact on the operation of the system as they operate in a load-sharing configuration with three power supplies being sufficient to power the associated RF Chassis. The power supply modules are hot-swappable. The output of the power supply is connected to each amplifier module in the RF chassis via the blind-mate connector. The power supply shelf has an RS485 serial port for M&C.

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| Technical Specifications | | | |
|--|--|--|-------------|
| | Full system | Amplifier Module | |
| Operating Frequency Range | 4.4 – 5.0 GHz | | |
| Output Power (P _{SAT}) nominal | 2,500 W (64 dBm) | 500W (57 dBm) | |
| Output Power (Plinear) min | 1,250 W (61 dBm) | 200W (54 dBm) | |
| Input Drive Level | 0 dBm | +20 dBm | |
| Small Signal Gain | 63 – 66 dB | 30 dB | |
| Gain Variation | 2dB p-p over frequency range ± 0.2 dB over any 18 MHz bandwidth | | |
| Output Power adjustability | 0 – 20 dB in steps of 0.1 dB | | |
| Harmonics | - 60 dBc typical (with harmonic filter) | | |
| Non-Harmonic Spur | - 60 dBc max @ 2kW output | | |
| AM/PM Conversion | 1°/dB @ Plinear | | |
| Intermodulation (IMD3) | -25dBc @ at Plinear | | |
| Group Delay | 1.0 ns/MHz max. linear 0.1 ns/ MHz ² max. parabolic 1 ns pk-pk max ripple | | |
| Input Impedance | 50 Ohms | | |
| Input VSWR | 1.4:1 or better | | |
| Load VSWR for full compliance | 2:1 max with protection against open or short circuit loads | | |
| Output VSWR | 1.3:1 | | |
| Input Connector | N-type /Female/ | | |
| Output Connector | CPR 187G | N-Type | |
| Monitor Output (optional) | | Calibrated output sample loop with 50dB coupling - SMA connector | |
| Dimensions | 19" rackmount (48.26 cm) 45 U high (90") (228.6 cm) 42" deep (106.6 cm) | H | 7U (12.25") |
| | | D | 14" |
| | | W | 4" |
| Combiner (Qty 1/system) | | | |
| Insertion loss | 1dB typical | | |
| Input connector | Qty 8 N-type | | |
| Power Supply shelf (Qty 2/system) | | | |
| Operating Input Voltage | 220V nominal (200 – 264V) AC 47-63 Hz or 3-phase 415/240 V | | |
| Power factor | 0.97 | | |
| Total capacity | 10.0 kW | | |
| Dimensions | 19" rackmount, 1U high, 17" deep | | |
| Splitter Panel (Qty 2/system) | | | |
| Output ports | 4 | | |
| Input / Output connectors | N/SMA (Female) | | |
| Dimensions | 19" rackmount 1U high | | |
| Interface Panel (Qty 1/system) | | | |
| Serial port Interface | RS485 DB9S | | |
| Ethernet (TCP/IP) | RJ45 | | |
| Environmental Conditions | | | |
| Operating temperature range | -10°C to +50°C | | |
| Non-operating | -55°C to +85°C | | |
| Humidity | 5% to 95%, non-condensing | | |
| Altitude | 10,000' AMSL, derated 2°C/1000' from AMSL | | |

Ref.: PB-ARMA-CL500A-001-TROPO -18226

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