

Features

- 500 Watt Linearized TWT
- 440 Watt Rated Power @ Flange
- Low Power Consumption
- Ethernet with SNMP
- Web Page
- RS-232 & RS-485
- Beacon receiver interface
- Integrated redundancy, 3 switches
- Data & Event Logger
- Selectable discrete interfaces
Interlock, RF inhibit, Fault
- RF arc protection
- Reflected power protection
- Thermal protection



The PA20-Ka500 series power amplifiers provide the best in class Size, Weight and Power performance of any SATCOM outdoor power amplifier. These amplifiers are designed to optimize linear power performance and minimize power consumption, making them the most efficient linear power amplifiers available. The carbon footprint of a PA20-Ka500 is driven by the high efficiency power conversion of the traveling wave tube; an unmatched technology for power conversion.

The PA20-Ka500 series power amplifiers are designed for global use. The reduced size and weight is user friendly for shipping and installation.

Reliability is built-in. Designs are qualified and all products are manufactured in the USA under very stringent standards for quality and workmanship.

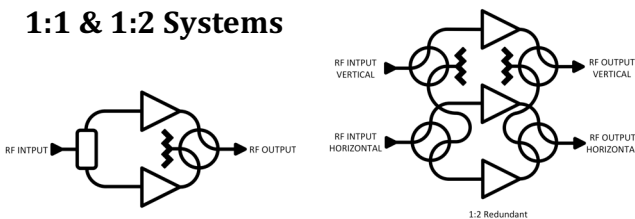
The PA20-Ka500 amplifier's internal monitor & control system provides Ethernet connectivity with plug and play web page interface for out of the box use. In addition SNMPv2 is supported.

Each amplifier includes a detailed system configuration interface for custom integration, as well as, multiple serial interfaces and multiple configurable discrete interfaces.

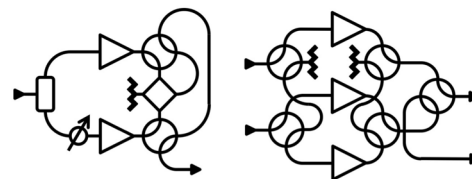
The PA20-Ka500 series power amplifiers are equipped with internal redundancy control, eliminating the need for external controllers. Systems can be configured for redundancy, power combining and combinations of these. Custom configurations with up to 3 switches can be managed over addressable Ethernet on a local area network.

PA20-Ka500

1:1 & 1:2 Systems



Redundant and Phase Combined Systems



RF Performance:

Frequency	27.5 – 30.0 GHz
Bandwidth	2500 MHz
Output Power	(for load VSWR \leq 1.5:1)
TWT Power *	57.0 dBm (500 W) typical
Rated (P_{RATED}) (PA flange) *	56.4 dBm (440 W)
Maximum Linear (MLP), P_{MLP}	53.4 dBm (220 W)

Gain

Gain	\geq 70 dB
Variation, 250 MHz, ΔG_{250MHz}	\leq 1.0 dB peak-peak
Variation, 1000 MHz, $\Delta G_{1000MHz}$	\leq 2.5 dB peak-peak
Slope, ΔG_{SLOPE}	\pm 0.04 dB/MHz
Gain Stability vs. Time @ constant drive & temp	\pm 0.25 dB/24 hours
Gain Stability vs. Temperature @ constant drive & frequency	\pm 1.0 dB
Adjustment range, G_{ADJ}	30.0 dB typical
Adjustment step size	0.1 dB

Linearity

AM/PM @ $P_o \leq MLP - 1$	\leq 2.0°/dB
Inter-modulations (IMD) 2-tone	\leq -28 dBc @ $P_o \leq MLP - 1$ dB
Spectral Re-growth (SR)	\leq -30 dBc @ $P_o \leq MLP - 1$ dB
Noise Power Ratio (NPR)	\leq -20 dBc @ $P_o \leq MLP - 1.5$ dB

Input VSWR (Return Loss)	\leq 1.3:1 (17.7 dB)
Output VSWR (Return Loss)	\leq 1.3:1 (17.7 dB)
Load VSWR (no damage)	\leq 2.0:1 (9.5 dB)
Harmonic 2 nd & 3 rd	\leq -60 dBc

Noise Power

Transmit Band (T_x)	\leq -70 dBW/4KHz
Receive Band (R_x)	\leq -150 dBW/4KHz (\leq 21.2 GHz)
Spurious @ $P_o \leq MLP$	\leq -60 dBc
Residual AM	\leq -50 dBc, $f < 10KHz$ \leq -20(1.5+LOG(frequency KHz))dBc, $f = 10KHz$ to 500KHz \leq -85 dBc $> 500KHz$
Phase Noise	10 dB below IESS requirement \leq - 50 dBc, AC fundamental \leq - 47 dBc, Sum of all spurs

Group Delay (any 80 MHz)

Linear	0.01 nsec/MHz, max
Parabolic	0.005 nsec/MHz ² , max
Ripple	0.5 nsec/Peak-Peak, max

* The users exact frequency range must be specified at the time of purchase. Performance is dependent on the TWT and TWT-Linearizer optimization as a function of frequency.

Prime Power:

AC Input Voltage	200-240 VAC, single phase 180-264 VAC maximum range 50-60 Hz \pm 5%
Full Load Current	7.0 A max @ 200 VAC
Power Consumption	1300 VA typical 1450 VA maximum
Power Factor	0.99 typical 0.96 minimum

Environmental:

Ambient Temperature	-40°C to +60°C
Relative Humidity	100% condensing
Altitude	12,000 ft. with standard adiabatic de-rating of 2°C/1000 ft., operating 50,000 ft., non-operating
Shock	15 g peak, 11mSec, 1/2 sine
Vibration	3.2 g rms, 10-500 Hz
Acoustic Noise	65 dBA @ \geq 3 ft. from amplifier

Mechanical:

Dimensions	Request outline at sales@tango-wave.com
Length	20.0 inches (50.8 cm)
Width	10.0 inches (25.4 cm)
Height	10.0 inches (25.4 cm)
Weight	46 pounds (21 kg) typical
Cooling	
Forced Air	200 cfm (340 m ³ /hr) typical
Thermal Load	3500 BTU/hour typical 4000 BTU/hour maximum
Connectors	
RF Input	WR-34
RF Output	WR-34
RF Output Sample	Type K(f), 50 ohm
AC Input	Amphenol C016 20C003 200 12
Ethernet	RJF71B
M&C Connector	PT07E18-32S (MS3114E-18-32S)
Auxiliary Connector	PT07E18-32SW (MS3114E-18-32SW)

Options:

Ka2730	27.0 – 30.0 GHz ($R_x \leq 21.2$ GHz)
Ka2830	28.0 – 30.0 GHz ($R_x \leq 21.2$ GHz)
Ka3031	30.0 – 31.0 GHz ($R_x \leq 21.2$ GHz)
BUC10	Integrated block up-converter with reference
WR-28-ADPT	RF Output – WR-34-to-WR-28 adapter
QDC34	Waveguide quick connector, WR-34
QDC28	Waveguide quick connector, WR-28 adapter
CON-AUX	Auxiliary Connector Cable Plug