

FEATURES

- **Ultralinear**
- **Lightweight (18.6Kg)**
- **Compact Formfactor**
- **Liquid Cooled**
- **High Efficiency**



STA3253 Ka Series 500W Liquid Cooled Hub Mounted HPA

The STA3253Ka series HPA provides ultra linear, high efficiency performance in a compact, lightweight, rugged, weatherproof, antenna mount enclosure. The advanced packaging and cooling techniques enable the unit to operate in extreme environmental conditions from direct rain to direct sunlight. The amplifiers can be simply deployed anywhere in the world, are user-friendly and incorporate a comprehensive remote control facility as standard, including RS485 and Ethernet options.

The HPA incorporates a high efficiency multi-collector TWT powered by an advanced power supply built on over 30 years of experience in the design and manufacture of satellite amplifiers.

The company's products have an enviable reputation for performance, robust quality and reliable service.

The STA3253Ka is available with a wide range of options and accessories, backed by worldwide technical support.

Options

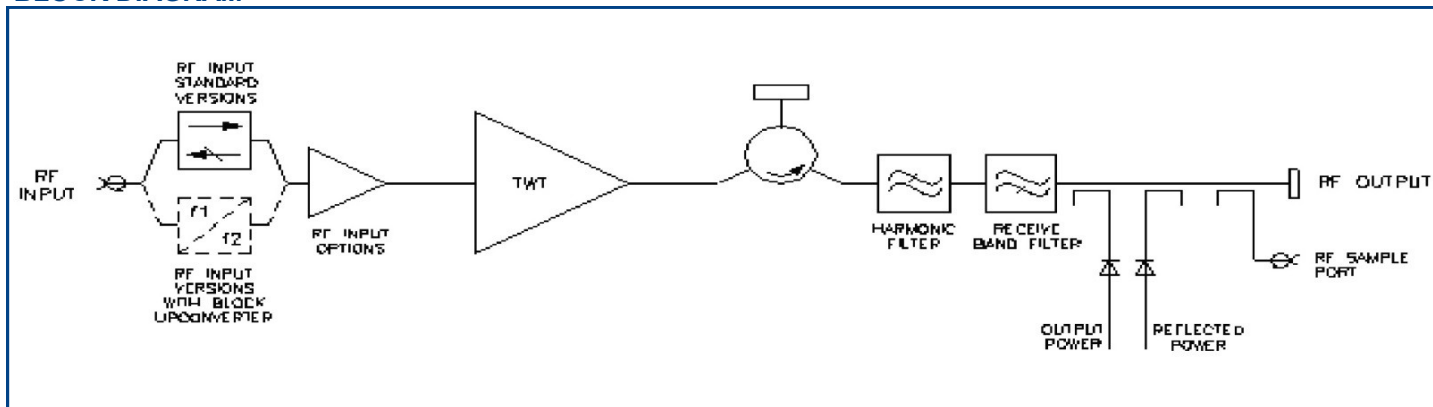
- Integral solid-state amplifier (SSA)
- L-Band block upconverter
- Gain control (requires SSA)
- Linearizer
- Uplink power control

Features

- Advanced cooling design enables operation at +55°C and in direct sunlight
- Weatherproof antenna mount construction allows exposed mounting
- Quick release fluid connectors

- Redundant control - contains control and drive circuits for 1:1 redundancy and 1:2 redundancy
- Stand-alone setting - automatically sequences to transmit mode
- Wide range of accessories including: Controllers, waveguide networks, cable assemblies
- CE compliant
- Wide input voltage range - can operate from mains supplies worldwide

BLOCK DIAGRAM



PERFORMANCE (Without Upconverter)

Frequency range:		
Standard - KA1.....	27.5 to 30	GHz
Optional KA2.....	30 to 31	GHz
Other bands available within 27.5 - 31GHz		
Output Power:		
TWT output flange (peak).....	500	W min
TWT rated output (CW).....	350	W min
HPA rated output (CW).....	320	W min
Linear Power @ Flange:		
with linearizer (Plin).....	240	W min
without linearizer	100	W min
Gain:		
At rated power (C option).....	45	dB min
At rated power (A,D, Z option).....	70	dB min
SSG P rated -10dB (C option).....	50	dB min
SSG P rated - 10dB (A,D,Z option).....	75	dB min
Attenuation range (D,Z option).....	25	dB min
Gain Variation:		
Over any 1GHz.....	2.5	dB max
Over any 80 MHz band.....	1.0	dB max
Slope.....	0.08	dB/MHz max
Gain stability 24hrs (constant drive, temperature and load).....	0.5	dB max
Gain stability over full operating temperature.....	2.0	dB max
Intermodulation (two equal carriers) with output = Plin, relative to total power.....	-25	dBc max
Harmonic output.....	-60	dBc max
AM to PM conversion at P rated -6dB.....	2.5	%/dB
Noise Power:		
Transmit band.....	-70	dBW/4 kHz max
Receive band (below 21.2GHz).....	-150	dBW/4 kHz max
Residual AM:		
<10kHz.....	-50	dBc max
10kHz < f < 500kHz.....	-20 (1.5+ log f)	dBc max
>500kHz.....	-85	dBc max
Group delay:		
Linear.....	0.01	ns/MHz
Parabolic.....	0.005	ns/MHz ²
Ripple.....	0.5	ns p-p
Phase Noise:		
Continuous.....	12dB lower than IESS phase noise profile	
AC fundamental.....	-50	dBc max
Sum of al spurs.....	-47	dBc max
Input VSWR (operating).....	1.3:1	max
Output VSWR (non-operating).....	1.3:1	max
Load VSWR, no damage.....	2.0:1	max

ELECTRICAL

Prime power	single phase, line-neutral or line-line	
Voltage.....	90 to 264	V
Frequency.....	47 to 63	Hz
Power requirement.....	1300 VA	max
Power factor.....	0.95	min

MECHANICAL

Weight.....	18.6 kg (41Klb)	typ
Dimensions.....	see outline	
Cooling.....	integral forced-air	

CONNECTORS

RF input.....	K-type female
RF output.....	WR-28G with 4-40 UNC 2B threaded holes
RF Sample port.....	K-type female
Prime Power.....	ITT Cannon-CGL02A20-3P-E1B-B
Control interface.....	62GB-12E-2041-PN

Note: Mating connectors for the mains supply and control interface are supplied.

ENVIRONMENTAL

For operation outside these parameters, refer to Spacepath Communications for guidance.

Operating temperature (see note 1).....	-40 to +55	°C
Derating.....	2 °C/300 m above sea level	
	(3.6 °F/1000ft)	
Solar gain.....	1120	W/m ²
Storage temperature.....	-50 to +80	°C
Relative humidity (condensing).....	100	%
Altitude:		
Operating.....	4.5 Km (15,000 ft)	max
Non-operating.....	12 Km (40,000 ft)	max
Vibration.....	BS EN 60068-2-64 test Fh, transportation	
Shock.....	IEC Publication 68-2-27 Part 2 test Ea, 25g	
EMC:		
	EN61000-6-3:2001 (Emissions)	
	EN61000-6-2:2001 (Immunity)	
	FCC CFR47 Part 15B	

COOLING REQUIREMENT

Total Dissipation:	750W
Cooling Capacity:	1050 W
Radiated Amplifier Heat:	75W
Thermal Efficiency:	90%
Liquid Cooling :	3.7 lpm (1gpm)

NOTES

- +55 °C applies when the input supply voltage is between 180 and 265 V. Below 180 V, the maximum operating temperature is +50 °C
- Safety applies for operating altitude up

CE CERTIFIED

EMC Directive 89/336/EEC, Low Voltage Directive 73/23/EEC

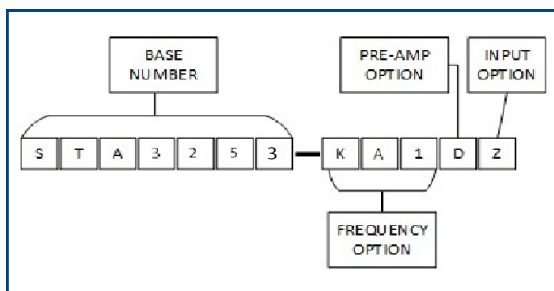
CONTROLS

Type	Function
REMOTE CONTROL	Off Standby Transmit RF inhibit
REMOTE STATUS/MONITOR	High Power Alarm Set* Low Power Alarm Set* Auto Redundancy Control* RF Switch Control* Gain Control* (when fitted)
INTERFACES	Off Warm-up Standby Transmit Fault Summary Reflected Power External interlock TWT too hot Mean Helix Current Peak Helix Current High Power Alarm* Low Power Alarm*
Other Features	Output Power Monitor* Reflected Power Monitor* Helix Current Monitor* Helix Voltage* Collector Voltages* Heater Voltage* Heater Current* Elapsed Hours*
	RS-422/485, Optional Ethernet Dry Relay Contact
	Auxiliary Output Voltage Redundant system & waveguide switch drive 'Stand Alone' setting for automatic power up

Note: Controls/Monitoring marked * are only available via Serial Interface

OPTIONS

Extensive options are offered with the STA3253Ka and include: integral pre-amplifiers, gain control, linearizers and block upconverters. The options are defined by adding to the base number as shown below:



(Consult Spacepath Communications for availability of options)

Frequency Options

The STA3253 is offered in 0.5 GHz and 1GHz bands within 27.5-30 GHz. Other bandwidths or dual band operation on request.

Pre-Amp Option

The pre-amp option can be selected from any of the following:

- AN - Integral solid-state amplifier (typical SSG 78 dB)
- DN - As option 'A' but includes an attenuator to provide 25 dB (min) of gain control
- ZN - Integral linearizer that improves the linearity of the HPA, providing a C/I of typically -26 dBc at Plin. The linearizer also incorporates the pre-amp and gain control options. (Consult Spacepath Communications for availability)

Input Option

Note: The Upconverter requires the inclusion of either the 'DN' or 'ZN' options. (Consult Spacepath Communications for availability)

ACCESSORIES

The STA3253Ka is supplied with an operation manual, prime power connector mating part, interface connector mating part, quick release fluid connectors.

For more information on accessories, contact Spacepath Communications.

PERFORMANCE WITH INTEGRAL BLOCK UPCONVERTER

Output frequency range: Option DU1.....29-30	GHz	Group Delay: Linear.....0.01 ns/MHz
L-Band input: Frequency range option DU1.....950 to 1950	MHz	Parabolic.....0.005 ns/MHz ²
Level.....10 dBm	max	Ripple.....0.5 ns/p-p
LO frequency: Option DU1.....28.05	GHz	Phase noise: Continuous.....meets IESS phase noise profile
External reference (see note): Frequency.....10	MHz	AC Fundamental.....-50 dBc
Level.....-3 to +7	dBm	Sum of all spurs.....-47 dBc
Impedance.....50	Ω	Input VSWR (non-operating).....1.6:1 max
Output power: TWT output flange.....500	W min	Output VSWR (non-operating).....1.3:1 max
TWT output CW.....350	W min	Load VSWR, no damage.....2.0:1 max
HPA rated output.....320	W min	
Gain: At rated power (DN,ZN option).....70	dB min	
SSG Prated -10dB (DN, ZN option).....75	dB min	
Attenuation range (DN, ZN option).....30	dB min	
Gain Variation: Any 1GHz.....0.3	dB max	
Over any 40 MHz band.....1.2	dB max	
Slope.....0.08	dB/MHz .max	
Gain Stability 24hrs constant drive, temperature and load.....0.5	dBm	
Gain stability over full operating temperature..2.0	dB max	
Intermodulation (two equal carriers) with total output = Plin: Relative to sum of two equal carriers.....-25	dBc max	
Harmonic output.....-60	dBc max	
AM to PM conversion at Plin.....2.5	°/dB	
Noise Power: Transmit band.....-70	dBW/4 KHz max	
Receive band (Below 21.2 GHz).....-150	dBW/4 KHz max	
Residual AM >100MHz from Carrier.....-60	dBc max	

Note: The BUC can be operated without the external reference, typical frequency stability ±0.25 ppm.

HEALTH AND SAFETY HAZARDS

Stellar satellite amplifiers are safe to handle and operate provided that the relevant precautions are observed. Spacepath Communications does not accept responsibility for damage or injury resulting from the use of electronic devices it produces.

High Voltage

Dangerous voltages are present within the TWT amplifier when operating normally. However, the equipment is designed so that personnel cannot come into contact with high voltage circuits unless covers are removed.

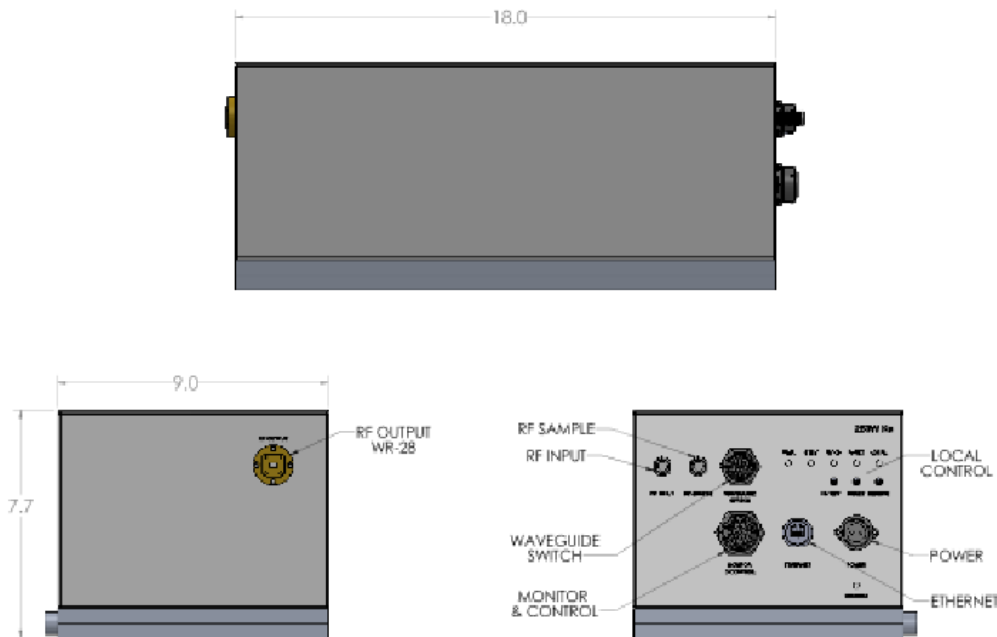
RF Radiation

All RF connectors must be correctly fitted before operation.

Beryllia

The TWT in the amplifier contains Beryllium Oxide ceramic parts. These are not accessible unless the TWT casing is damaged. Consult Spacepath Communications regarding the disposal of damaged or life expired tubes.

Outline



Whilst Spacepath Communications Ltd has taken care to ensure the accuracy of the information contained herein it accepts no responsibility for the consequences of any use thereof and also reserves the right to change the specification of goods without notice. Spacepath Communications Ltd accepts no liability beyond the set out in its standard conditions of sale in respect of infringement of third party patents arising from the use of tubes or other devices in accordance with information contained herein.