STA3318 Series
StellarMini™ 180 W, Ku-Band Antenna Mount TWTA

The STA3318 range of Ku-Band TWT amplifiers from e2v technologies provide over 150 W of output power 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 deployed globally, are easy to integrate, user-friendly, and incorporate a comprehensive remote control facility as standard via an RS422/485 serial bus.

The HPA incorporates an e2v high efficiency dual collector TWT powered by a state-of-the-art power supply that further advances e2v technologies reputation for robust, reliable product. In addition the circulator, receive band filter and harmonic filter are included as standard, eliminating the need for additional external components.

The STA3318 is available with a wide range of options and accessories, backed by round-the-clock, worldwide technical support.

OPTIONS

- Gain control
- L-band block upconverter

FEATURES

- Lightweight and compact.
- High operating temperature.
- Weatherproof antenna mount construction allows exposed mounting.
- Redundant control – contains control and drive circuits for 1:1 redundancy.
- Stand-alone setting – automatically sequences to transmit mode.
- Wide range of accessories including: controllers, waveguide networks, cable assemblies, ducting adaptor and cowl.
- Round-the-clock hotline support.
- RoHS compliant.
- CE compliant.

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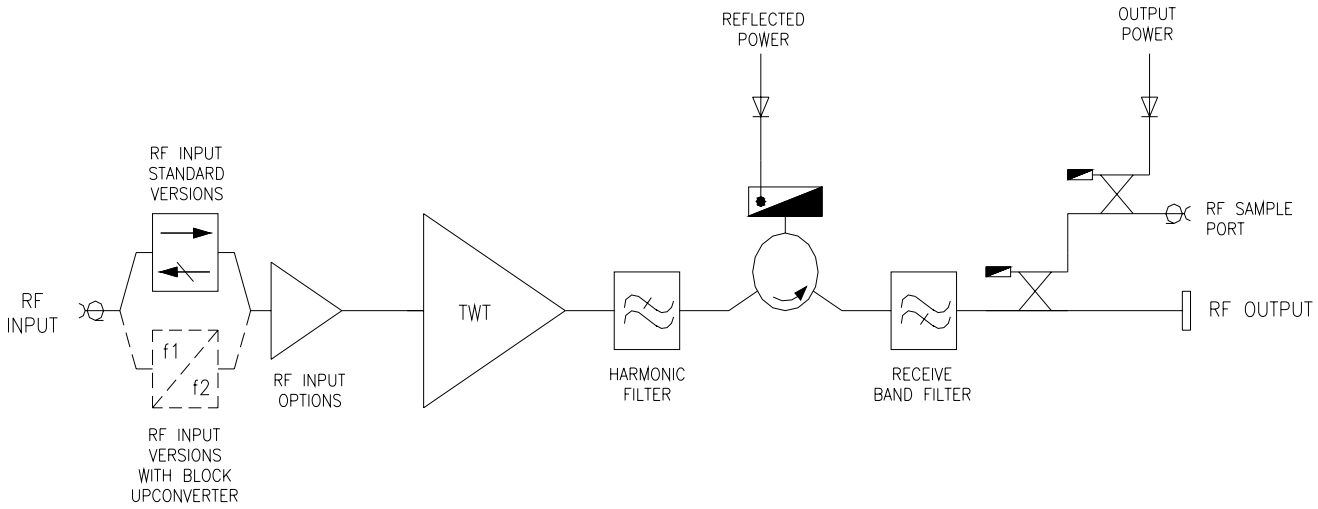
BLOCK DIAGRAM



PERFORMANCE (Without Upconverter)

Frequency range:		
standard – KU1	13.75 to 14.5	GHz
Output power:		
TWT output flange	175	W min
HPA rated output	150	W min
Gain:		
at rated power (A, D option)	61	dB min
SSG P_{rated} –10 dB (A, D option)	66	dB min
Attenuation range (D option)	25	dB min
Gain variation:		
over any 80 MHz band	1.0	dB max
slope	0.1	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 total output = P_{rated} –7 dB:		
options A, D	-23	dBc max
performance with harmonic output	-60	dBc max
AM to PM conversion at P_{rated} –6 dB	2.5	°/dB
Noise power:		
transmit band	-70	dBW/4 kHz max
receive band		
10.95 – 12.75 GHz - standard	–150	dBW/4 kHz max
Residual AM:		
<10 kHz	-50	dBc max
10 kHz< f <500 kHz	-20(1.5+log f)	dBc max
>500 kHz	-85	dBc max
Group delay:		
linear	0.01	ns/MHz
parabolic	0.005	ns/MHz²
ripple	1.0	ns p-p
Phase noise:		
continuous	10 dB lower than IESS phase noise profile	
AC fundamental	-50	dBc
sum of all spurs	-47	dBc
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	99 to 265	V
Frequency	47 to 63	Hz
Power requirement	850	VA max
Power factor	0.95	min

MECHANICAL

Weight	9.0 kg (19.8 lb) typ
Dimensions	see outline
Cooling	integral forced-air

CONNECTORS

RF input	N-type female
RF output	PBR120 with 6-32 UNC 2B threaded holes
RF sample port	N-type female
Prime power	Amphenol T3110-000
Control interface	62GB-12E-18-32-PN

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

ENVIRONMENTAL

The amplifier complies with EU Directive 2002/95/EC, the RoHS Directive, restricting the use of hazardous substances in electronic equipment.

The amplifier falls within the scope of EU Directive 2002/96/EC, the WEEE Directive, governing disposal at end of life. Users should contact e2v technologies (uk) limited or their distributors for disposal information.

Operating temperature	-40 to +60	°C
Derating	2 °C/300 m above sea level (3.6 °F/1000 ft)	
Solar gain	1120	W/m²
Storage temperature	-40 to +85	°C
Relative humidity (condensing)	100	%
Altitude:		
operating	4.5 km (15,000 ft) max	
non-operating	12 km (40,000 ft) max	
Vibration/shock	BS EN 60721-3-2 Level 2M3	

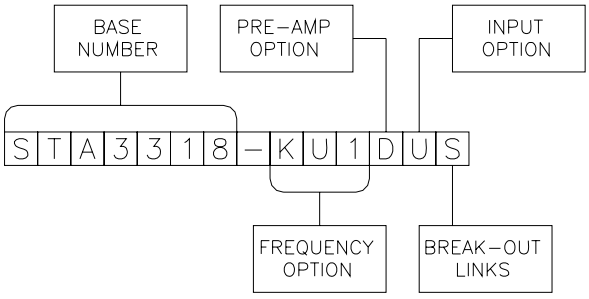
For operation outside these parameters, refer to e2v technologies for guidance.

CONTROLS		
TYPE	**FUNCTION**	
REMOTE CONTROL	Off Standby Transmit RF Inhibit	High Power Alarm Set Low Power Alarm Set Auto Redundancy Control RF Switch Control Gain Control (when fitted)
REMOTE STATUS/MONITOR	Off Warm-Up Standby Transmit Summary Fault Redundancy Fault Reflected Power External Interlock TWT Too Hot Mean Helix Current Peak Helix Current High Power Alarm Low Power Alarm	Output Power Monitor Reflected Power Monitor Helix Current Monitor Helix Voltage Collector Voltages Heater Voltage Elapsed Hours
INTERFACES: Serial User*	 RS-422/485 Input: +15 V logic, Output: Open Collector	
Other Features	Auxiliary Output Voltage Redundant system and waveguide switch drive 'Stand Alone' setting for automatic power-up	

***Note:** User Interface provides: Transmit On/Off control, Status Outputs, Summary and Redundancy Fault Outputs..

OPTIONS

Extensive options are offered with the STA3318 and include: integral pre-amplifiers, gain control and block upconverters. The options are defined by adding to the base number as shown below:



(Consult e2v technologies for availability of options).

Frequency Options

The STA3318 is offered in two frequency bands:
KU1 - 13.75 – 14.50 GHz
KU3 - 14.00 – 14.50 GHz (upconverter option only)

Pre-Amp Option

The pre-amp option can be selected from any of the following:
A - Integral solid-state amplifier (typical SSG, 78 dB).
D - As option 'A' but includes an attenuator to provide 25 dB (min.) of gain control.

Input Option

The STA3318 can be offered with an L-Band Block Upconverter. Specify:
N - Standard RF
U - L – Ku-Band Block Upconverter (see page 4)

Note: the upconverter requires the inclusion of the 'D' option. (Consult e2v technologies for availability).

Break-Out Links

Available only with the upconverter option, this enables bypassing of the upconverter and can be used for monitoring, set-up, redundant switching etc. Specify 'S' for Break-Out Links (leave blank if not required).

ACCESSORIES

The STA3318 is supplied with an operation manual, prime power connector mating part and interface connector mating part. Additional accessories include:

- **N6081x-01 Series Control Unit***
  Provides basic control of single HPA.
- **N6143 1:1 Control Unit***
  Provides control of 2 HPAs in 1:1 switch configuration. (The waveguide switch network can also be supplied).
- **Cable Assemblies**
  For connecting STA3318 to controllers and waveguide switches.
- **DPP710351BA Transition**
  Provides an interface for ducting and cowl fitment.
- **DPP710353BA Cowl**

For more information on accessories, contact e2v technologies.

***Note:** Existing controllers may require software upgrade.

PERFORMANCE WITH INTEGRAL BLOCK UPCONVERTER

Output frequency range:		
option KU1	13.75 to 14.5	GHz
option KU3	14.0 to 14.5	GHz
L-band input:		
frequency range option KU1	950 to 1700	MHz
frequency range option KU3	950 to 1450	MHz
level	10	dBm max
LO frequency:		
option KU1	12.8	GHz
option KU3	13.05	GHz
External reference:		
frequency	10	MHz
level	-3 to +7	dBm
impedance	50	Ω
Output power:		
TWT output flange	175	W min
HPA rated output	150	W min
Gain:		
at rated power (D option)	61*	dB min
SSG P_{rated} –10 dB (D option)	66*	dB min
Attenuation range (D option)	25	dB min
Gain variation:		
full band	4.0	dB max
over any 40 MHz band	1.5	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 total output = P_{rated} –4 dB:		
options A, D	-23	dBc max
Harmonic output	-60	dBc max
AM to PM conversion at P_{rated} –6 dB	2.5	°/dB
Noise power:		
transmit band	-70	dBW/4 kHz max
receive band (10.95 – 12.75 GHz)	-150	dBW/4 kHz max
Residual AM >100 kHz from carrier	-60	dBc max
Group delay:		
linear	0.01	ns/MHz
parabolic	0.005	ns/MHz²
ripple	0.5	ns p-p
Phase noise:		
continuous	meets IESS phase noise profile	
AC fundamental	-50	dBc
sum of all spurs	-47	dBc
Input VSWR (non-operating)	1.6:1	max
Output VSWR (non-operating)	1.3:1	max
Load VSWR, no damage	2.0:1	max

***Note:** For S-Link version, gain is decreased by 4 dB.

CE CERTIFIED

EMC Directive 2004/108/EC, Low Voltage Directive 2006/95/EC

EMC:	Emissions	EN61000-6-3:2001 CFR45 Part 15B AUS/NZ 4251.1
	Immunity	EN61000-6-2:2001

SAFETY

EN60950-1

NRTL Listed to ANSI/UL 60950-1-2007 and CAN/CAS-C22.2 No 60950-1-07

IECCB Certified to IEC 60950-1Ed2-2005

HEALTH AND SAFETY HAZARDS

e2v technologies electronic devices are safe to handle and operate provided that the relevant precautions are observed.

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 e2v technologies regarding the disposal of damaged or life-expired tubes.

OUTLINE