Spacepath STR2375 750W Ku Band Rack Mounted TWTA

STR1340Series, 400W, Ku-Band, Rack Mount TWTA

The new generation of STR Series rack mount TWTAs provide an easy to operate, colour touchscreen interface with a multi-functional selector wheel. The colour touchscreen display provides clear, easy to read status of the amplifier's operation, including: RF output power monitoring, heater, helix monitoring, & TWT temperature. Set up screens are intuitive and simple to manage and the touch panel allows full local control and monitoring of all amplifier parameters, including automatic level control, system event logging and graphical trend analysis. Remote control operation can be made via RS485 or through an Ethernet interface, and a web page interface is also available. If a redundancy system is required, this can be set up and controlled via the touchscreen. Changes to operating parameters can be locked and password protected if required.

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 STR1340 is available with a wide range of options and accessories, backed by worldwide technical support.

OPTIONS

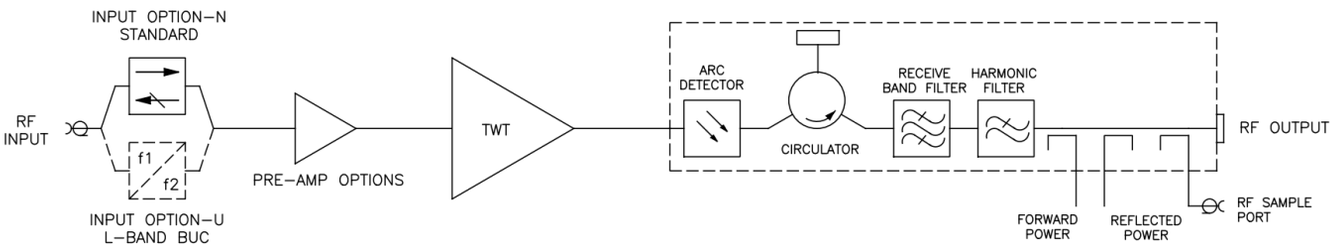
- Integral solid-state amplifier (SSA)
- L-Band Block upconverter
- 10MHz reference
- Lineariser
- Redundant system control
- Quick connect waveguide options

FEATURES

- Touchscreen control
- Ethernet interface
- Remote diagnostics
- Forward and reverse power monitoring
- TWTA performance Data and Event logging
- Built-in redundancy control
- Waveguide arc detection

24/9 Powells Road, Brookvale, NSW 2100, Australia
+61 2 9939 4377 sales@stepelectronics.com.au

BLOCK DIAGRAM



PERFORMANCE (Without Upconverter)

Frequency range:
KU1 ..... 13.75 to 14.50 GHz
KU2 ..... 12.75 to 14.50 GHz
KU3 ..... 13.75 to 14.80 GHz
KU4 ..... 12.75 to 13.25 GHz
KU6 ..... 12.75 to 14.80 GHz
Output power:
TWT output flange ..... 400 W min
HPA rated output ..... 350 W min
Gain:
at rated power (C option) ..... 45 dB min
at rated power (A, D, Z option) ..... 73 dB min
SSG Prated –10 dB (C option) ..... 50 dB min
SSG Prated –10 dB (A, D, Z option) ..... 78 dB min
Attenuation range (D, Z option) ..... 25 dB min
Gain variation:
full band ..... 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 total output = Prated –4 dB:
options A, D ..... -18 dBc max
performance with linearised option, Z ..... -24 dBc max
Harmonic output ..... -60 dBc max
AM to PM conversion at Prated –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
10.70 – 11.70 GHz - extended ..... –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/MHz^2
ripple ..... 0.5 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
Voltage ..... 99 to 265 V

ELECTRICAL

Prime power ..... single phase, line-neutral or line-line
Frequency ..... 47 to 63 Hz
Power requirement ..... 1350 VA max
Power factor ..... 0.95 min

MECHANICAL

Weight ..... 25.0 kg (55 lb) typ
Dimensions ..... see outline
Cooling ..... integral forced-air

CONNECTORS

RF input ..... N-type female
RF output ..... WR75 with 6-32 UNC 2B threaded holes
RF sample port ..... N-type female
Prime power ..... IEC 60320
Control interface ..... 15way D-type female
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/1000 ft)
Storage temperature ..... -40 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, 25 g
EMC:
EN61000-6-3:2001 (Emissions)
EN61000-6-2:2001 (Immunity)
FCC CFR47 Part 15B

CE CERTIFIED

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

NOTES

1. +55 °C applies when the input supply voltage is between 180 and 265 V. Below 180 V, the maximum operating temperature is +50 °C.
2. Safety applies for operating altitude up.

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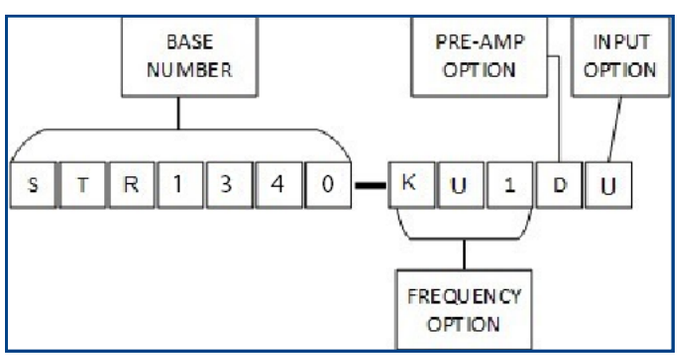
CONTROLS

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 Fault Summary Reflected Power External interlock TWT too hot Mean Helix Current Peak Helix Current High Power Alarm Low Power Alarm Arc Fault	Output Power Monitor Reflected Power Monitor Helix Current Monitor Helix Voltage Collector Voltages Heater Voltage Heater Current Elapsed Hours
INTERFACES		
Serial	RS-422/485 / Ethernet	
User	Dry Relay Contact	
Other Features	Auxiliary Output Voltage Redundant system & waveguide switch drive	

OPTIONS

Extensive options are offered with the STR1340 and include; integral pre-amplifiers, gain control, linearisers 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 STR1340 is offered in a number of frequency bands:

KU1 - 13.75 – 14.50 GHz
KU2 - 12.75 – 14.50 GHz
KU3 - 13.75 – 14.80 GHz
KU4 - 12.75 – 14.80 GHz
KU5 - 12.75 – 14.50 GHz (BUC 12.75-13.25/13.75-14.50GHz)
KU6 - 12.75 – 14.80 GHz
KU7 - 12.75 – 14.80 GHz (BUC 14.30-14.80GHz)

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
Z - Integral lineariser that improves the linearity of the HPA, providing a C/I of typically –26 dBc at 4dB OPBO. The lineariser also incorporates the pre-amp and gain control options. (Consult SpacePath Communications for availability)

Input Option

The STR1340 can be offered with an L-Band Block Upconverter.
Specify:
N - Standard RF
U - L to Ku-Band Block Upconverter (see page 4)

Note:

The upconverter requires the inclusion of the 'D' and 'Z' option. (Consult SpacePath Communications for availability)

For more information contact SpacePath Communications.

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PERFORMANCE WITH INTEGRAL BLOCK UPCONVERTER

Output frequency range:
option KU1 ..... 13.75 to 14.5 GHz
option KU5 ..... 12.75 to 14.5 GHz
L-band input:
frequency range option KU1 ..... 950 to 1700 MHz
frequency range option KU5 ..... 950 to 1700 MHz
frequency range option KU7 ..... 950 to 1700 MHz
level ..... 10 dBm max
LO frequency:
option KU1 ..... 12.8 GHz
option KU5 ..... 13.05 GHz
option KU7 ..... 13.35 GHz
External reference (see note):
frequency ..... 10 MHz
level ..... -3 to +7 dBm
impedance ..... 50 Ω
Output power:
TWT output flange ..... 400 W min
HPA rated output ..... 350 W min
Gain:
at rated power (D, Z option) ..... 70 dB min
SSG Prated –10 dB (D, Z option) ..... 75 dB min
Attenuation range (D, Z 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 = Prated –4 dB:
options C, A, D ..... -18 dBc max
performance with linearised option, Z ..... -24 dBc max
Harmonic output ..... -60 dBc max
AM to PM conversion at Prated –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/MHz^2
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: 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

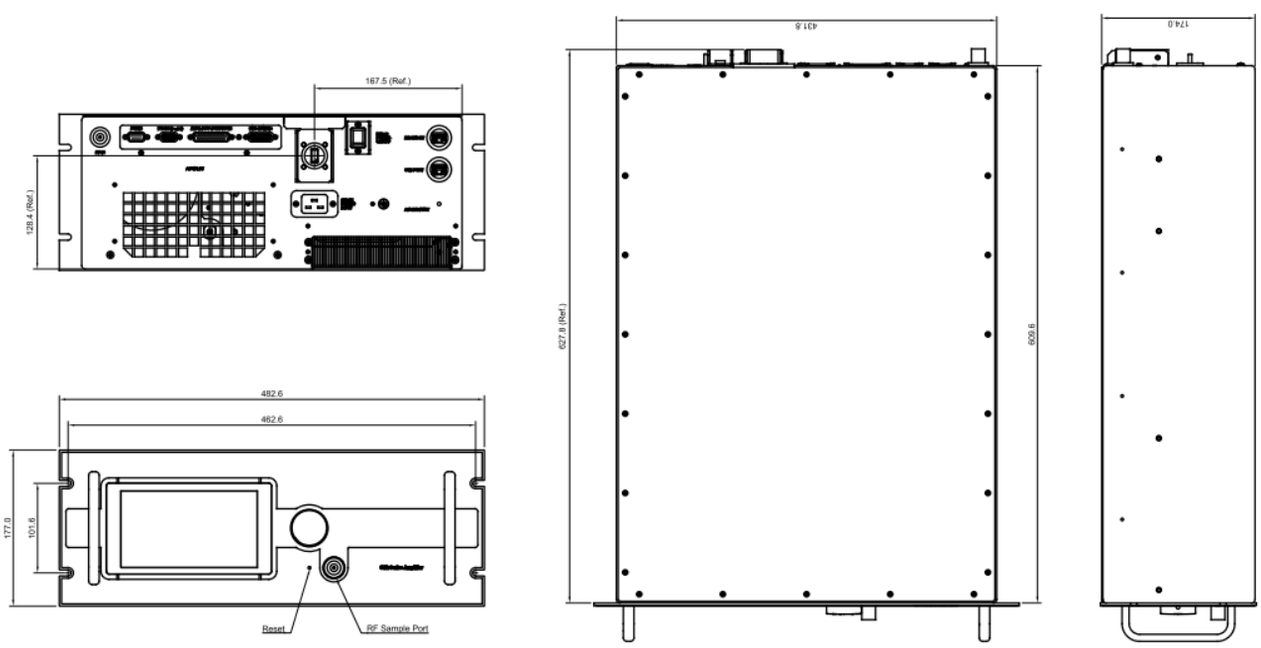
Dangerous voltages are present within the TWT amplifier when operating normally. However, the equipment is designed so that personnel cannot come into contact with high voltage circuits unless covers are removed.

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.



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