



The STA2T60 range of tri-band TWT amplifiers from e2v technologies provides performance over the C-, X- and Ku-bands and can deliver over 500 W of output power in X-band in a compact, lightweight, rugged, weatherproof, antenna mount, enclosure. The advanced packaging and cooling techniques (Stellar Cool™, patent pending) 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.

The HPA incorporates high efficiency dual collector TWTs powered by an advanced power supply that further advances e2v technologies' reputation for robust, reliable product.

The STA2T60 is available with a wide range of options and accessories, backed by round-the-clock, worldwide technical support.

OPTIONS

- Integral solid-state amplifier (SSA)
- Gain control (requires SSA)
- Lineariser

FEATURES

- Advanced cooling design (Stellar Cool™, patent pending) enables operation at +50 °C and in direct sunlight.
- Weatherproof antenna mount construction allows exposed mounting.
- CE compliant
- cETLus listed
- CB certified
- Redundant control – contains control and drive circuits for 1:1 redundancy.
- Stand-alone setting – automatically sequences to transmit mode.
- Round-the-clock hotline support.
- Wide range of accessories including: controllers, waveguide networks, cable assemblies.

PERFORMANCE

	C-Band 5.85 to 6.425	X-Band 7.9 to 8.4	Ku-Band 14.0 to 14.5	GHz
Frequency range				
TWT output power:				
saturated	450	600	450	W max
rated, without lineariser (A, D options)	350	450	350	W max
linear, without lineariser (A, D options)	263	140	125	W max
linear, with X-band lineariser (Z option)	263	380	125	W max
TWTA flange power:				
saturated	400	540	400	W max
rated, without lineariser (A, D options)	310	400	310	W max
linear, without lineariser (A, D options)	230	120	110	W max
linear, with lineariser (Z option)	230	340	110	W max
Gain:				
at rated power	65	65	65	dB min
small signal gain	70	70	70	dB min
attenuator range (optional)	25	25	25	dB min
Gain variation:				
any 500 MHz	3.0	3.0	3.0	dB max
any 40 MHz	1.0	1.0	1.0	dB max
slope	0.08	0.08	0.08	dB/MHz max
Gain stability:				
over 24hrs (const. temp. and drive)	0.5	0.5	0.5	dB max
over operating temperature	2.0	2.0	2.0	dB max
Intermodulation (two equal carriers, total power $P_{rated} - 4$ dB)	-18	-18	-18	dBc max
Adjacent channel power ratio (ACPR) (at 1 symbol rate offset from carrier at linear power)	-26	-30	-26	dBc max
Harmonic output	0	-10	-12	dBc max
AM to PM conversion (at $P_{rated} - 6$ dB or at linear power)	2.5	2.5	2.5	°/dB max
Noise power:				
transmit band	-64	-64	-64	dBW/4 kHz max
receive band	-64	-64	-64	dBW/4 kHz max
	(3.2-4.2 GHz)	(7.25-7.75 GHz)	(10.95-12.75 GHz)	
Group delay:				
bandwidth	40	40	80	MHz
linear	0.01	0.01	0.01	ns/MHz max
parabolic	0.005	0.005	0.005	ns/MHz ² max
ripple	0.5	0.5	0.5	ns pk-pk
Residual AM noise:				
<10 kHz	-50	-50	-50	dBc max
10 kHz<F<500 kHz	-20(1.5 + log f)	-20(1.5 + log f)	-20(1.5 + log f)	dBc max
>500 kHz	-85	-85	-85	dBc max
Phase noise:				
continuous	10 dB below IESS phase noise profile			
AC fundamental	-50	-50	-50	dBc max
sum of all spurs	-47	-47	-47	dBc max
Input VSWR	1.3:1	1.3:1	1.3:1	
Output VSWR	2.2:1	2.2:1	2.2:1	
Load VSWR	2.0:1	2.0:1	2.0:1	

ELECTRICAL

Prime power..... single phase, line-neutral or line-line
 Voltage..... 180 to 265 V
 Frequency..... 47 to 63 Hz
 Power requirement2200 VA max
 Power factor..... 0.95 min

MECHANICAL

Weight..... 34.0 kg (75 lb) typ
 Dimensions see outline
 Cooling..... integral forced-air

CONNECTORS

RF input N-type female
 RF output WRD580 with 6-32 UNC 2B threaded holes
 RF sample port N-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 e2v technologies for guidance.

Operating temperature..... -40 to +50 °C
 Derating 2 °C/300 m above sea level
 (3.6 °F/1000 ft)
 Solar gain..... 1120 W/m²
 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

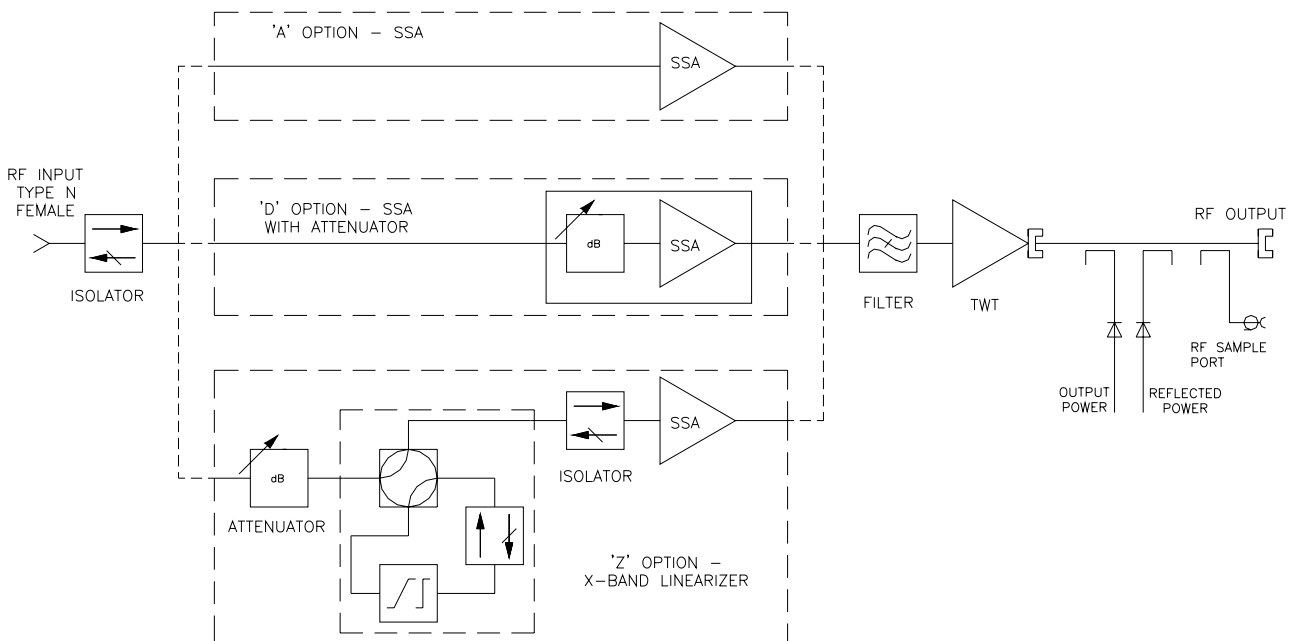
SAFETY (see note)

cETLus Listed to ANSI/UL 60950-1-2002 and CAN/CAS-C22.2 No 60950-1-3.
CB Certified to IEC 60950-1:2001

NOTE

Safety applies for operating altitude up to 2000 m.

BLOCK DIAGRAM

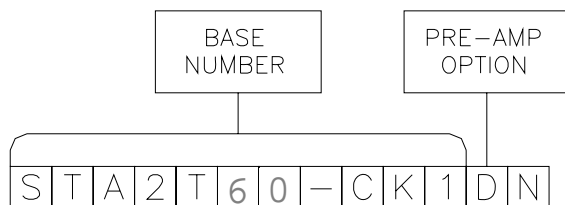


CONTROLS		
TYPE	FUNCTION	
REMOTE CONTROL	Off Standby Transmit RF Inhibit Band Select*	High Power Alarm Set* Low Power Alarm Set* Auto Redundancy Control* RF Switch Control* Gain Control* (when fitted)
REMOTE STATUS/MONITOR	Off Warm-Up Standby Transmit Fault Summary Reflected Power External Interlock TWT Too Hot Mean Helix Current Peak Helix Current High Power Alarm* Low Power Alarm*	Output Power Monitor* Reflected Power Monitor* Helix Current Monitor* Helix Voltage* Collector Voltages* Heater Voltage* Heater Current* Elapsed Hours*
INTERFACES: Serial User	RS-422/485 Dry Relay Contact	
Other Features	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 STA2T60 and include: integral pre-amplifiers, gain control and linearisers. The options are defined by adding to the base number as shown below:



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 (see performance). The lineariser also incorporates the pre-amp and gain control options. (Consult e2v technologies for availability).

ACCESSORIES

The STA2T60 is supplied with an operation manual, prime power connector mating part, interface connector mating part and air cowls. Additional accessories include:

- **N6080/N6080-01 Override Controller**
Provides automatic power-up for 'emergency' situations (N6080-01 allows selection of output frequency).
- **N6143 1:1 Control Unit**
Provides control of 2 HPA's in 1:1 switch configuration. (The waveguide switch network can also be supplied). Refer to data sheet A1A-N6143.
- **Cable Assemblies**
For connecting STA2T60 to controllers and waveguide switches. Refer to data sheet A1A-Stellar_Cables.
- **DAS563750AA**
Additional mains connector parts.
- **DAS563751AA**
Additional interface connector parts.

For more information on accessories, contact e2v technologies.

HEALTH AND SAFETY HAZARDS

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

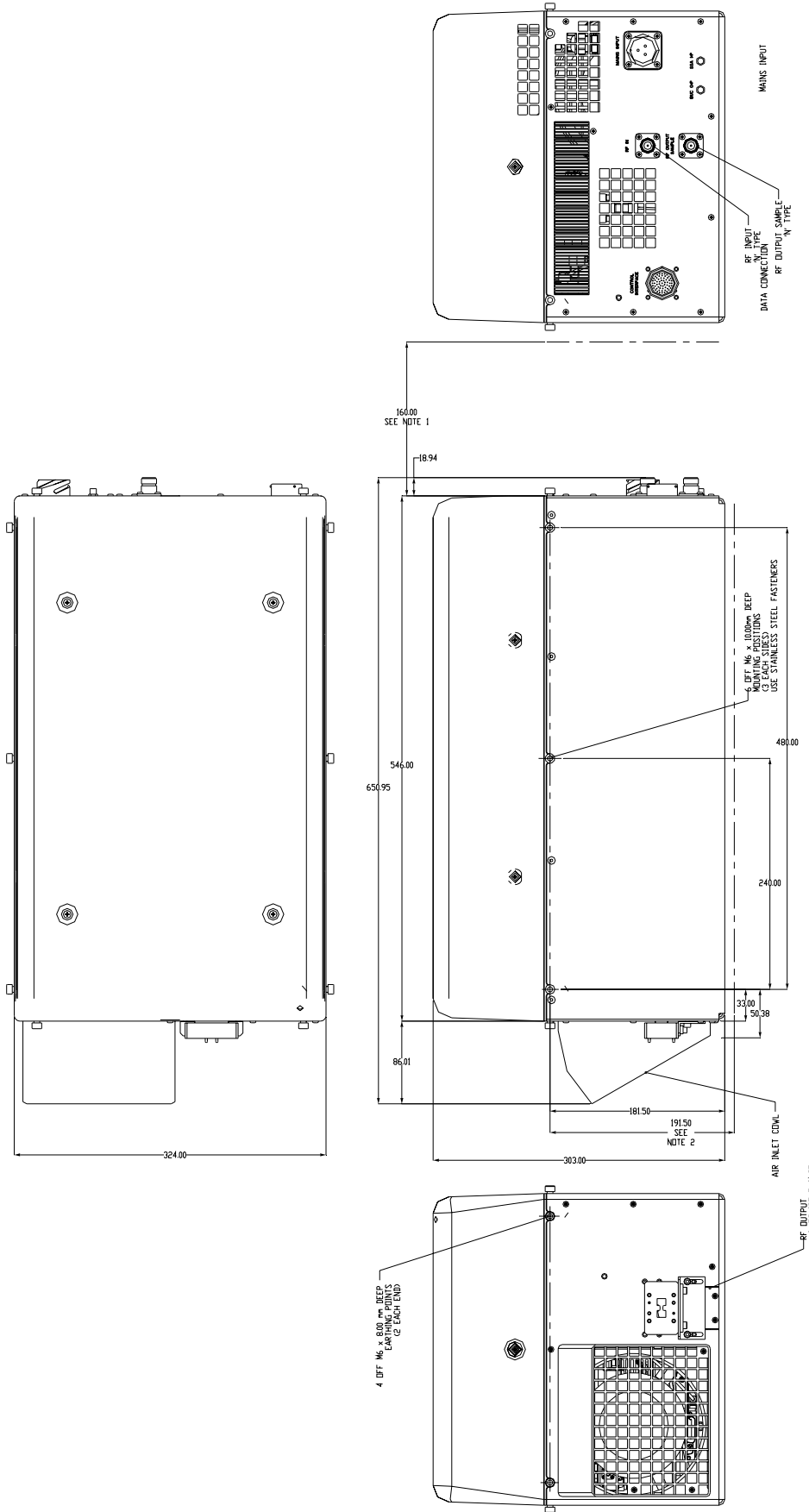
RF Radiation

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

OUTLINE



NOTES:
 1. THIS DIMENSION TO BE UNOBSERVED FOR MATING/UNMATING OF CABLE CONNECTORS
 2. THIS DIMENSION TO BE UNOBSERVED FOR MATING/UNMATING OF CABLE CONNECTORS
 3. INLET COWL POSITION
 4. COWL MAY BE ROTATED THROUGH 4 x 90° FROM POSITION SHOWN

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