



The N6612 range of Tri-Band TWT Amplifiers from e2v technologies provides performance over the; C, X and Ku Bands and can deliver over 120 W of output power in X-Band in a compact, lightweight, rugged, weatherproof, antenna mount, enclosure. The advanced packaging and cooling techniques enables 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 a high reliability TWT, designed and manufactured by e2v, powered by an advanced power supply that further advances e2v technologies reputation for robust, reliable product.

The N6612 is available with a wide range of options and accessories, including a state-of-the-art Tri-Band upconverter that enables operation in C-, X- or Ku-Band from an L-Band input.

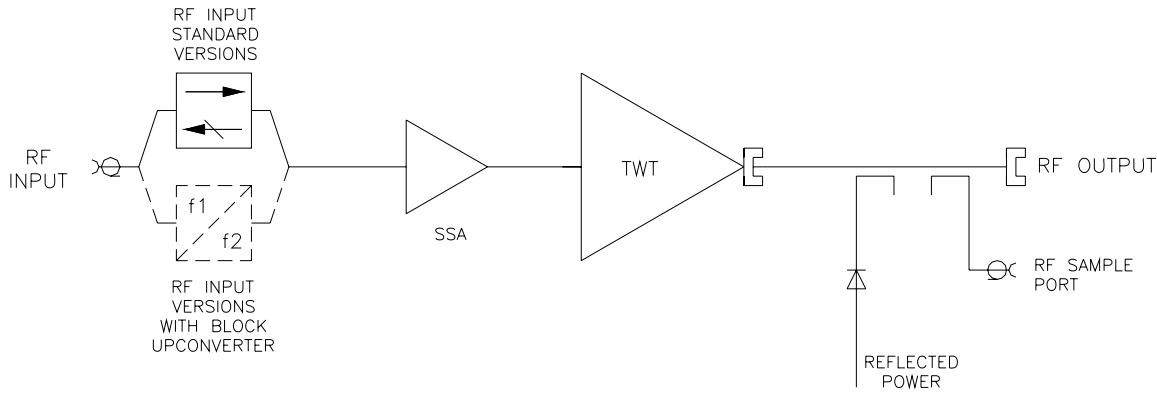
OPTIONS

- Integral solid-state amplifier (SSA)
- Gain control
- Tri-Band upconverter (requires gain control)

FEATURES

- Wide operating temperature range -40°C to $+55^{\circ}\text{C}$.
- Weatherproof antenna mount construction allows exposed mounting.
- CE compliant
- 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.

BLOCK DIAGRAM



PERFORMANCE (Without Upconverter)

Parameter	C-Band	X-Band	Ku-Band	Units
Frequency range	5.85 to 6.425	7.9 to 8.4	13.75 to 14.5	GHz
Rated power (at TWTA flange)	90	125	85	W max
Gain:				
at rated power	55	60	55	dB min
small signal gain	60	65	60	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 24 hrs (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) at:	-18	-18	-18	dBc max
$P_{rated} - 4.0$ dB	-17	-17	-17	dB
$P_{rated} - 7.0$ dB	-23	-23	-23	dB
Harmonic output	-3	-7	-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	-70	-70	-70	dBW/4kHz max
receive band	-70	-70	-70	dBW/4kHz 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	1.0	1.0	1.0	ns pk-pk
Residual AM noise:				
<10 kHz	-50	-50	-50	dBc max
10 kHz < F < 500 kHz	-20(1.5+logf)	-20(1.5+logf)	-20(1.5+logf)	dBc max
>500 kHz	-85	-85	-85	dBc max
Phase noise:				
continuous	Meets IESS Phase Noise Profile			
AC fundamental	-50	-50	-50	dBc max
sum of all spurs	-47	-47	-47	dBc max
Input VSWR	1.35:1	1.35:1	1.35:1	
Output VSWR	2.5:1	2.1:1	2.0:1	
Load VSWR max. – no damage	2.0:1	2.0:1	2.0:1	

OPTIONS

The options are defined by adding to the base number as shown below:

N6612
 N6612D
 N6612DU
 N6612DUS

- Standard, includes integral solid-state amplifier.
- D - Digitally controlled attenuator to provide 25 dB (min.) of gain control.
- U - Tri-band upconverter provides L-band input (see page 5)
- S - Bypass link, provides access to the upconverter output and the RF input.

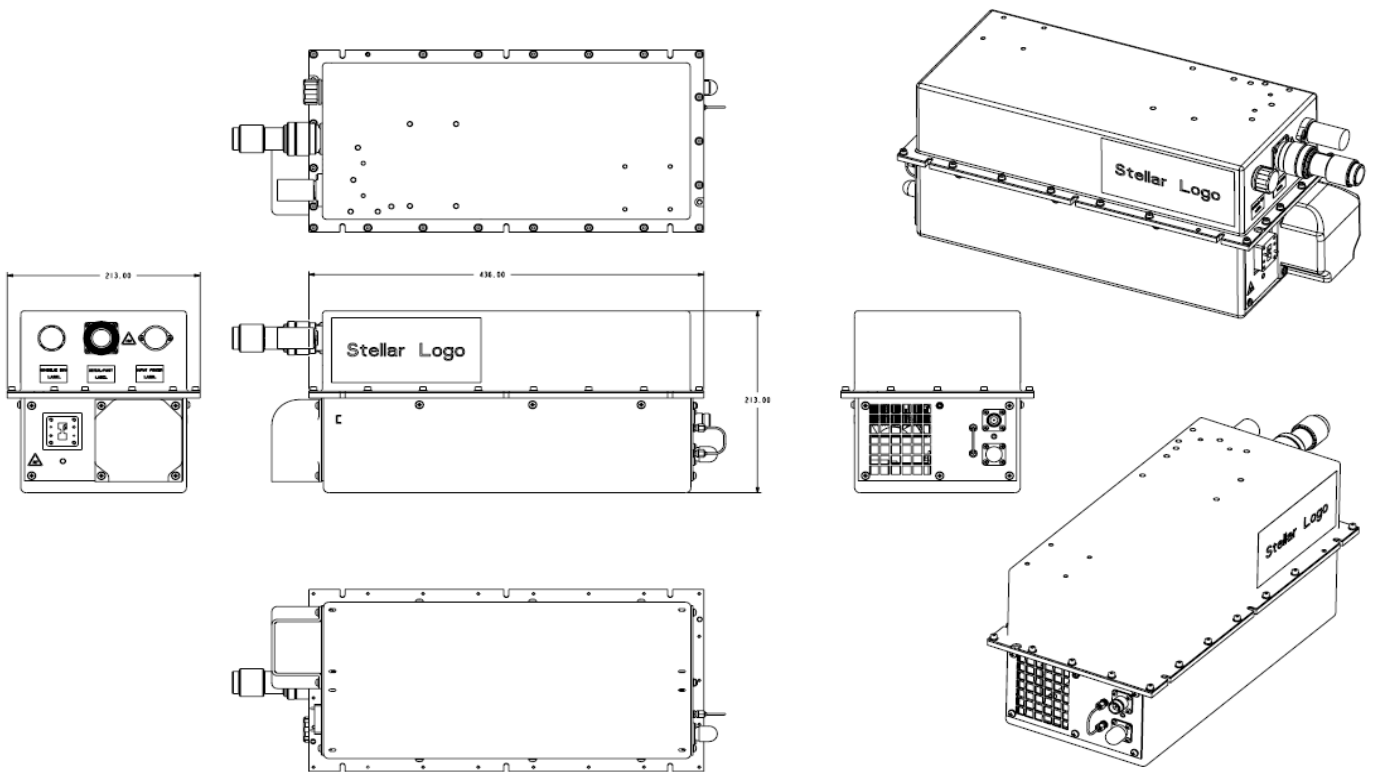
ACCESSORIES

The N6612 is supplied with an operation manual, prime power connector mating part, interface connector mating part and air cowls. Additional accessories include:

- **N6080/N6080-1 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 N6612 to controllers and waveguide switches. Refer to data sheet A1A-Stellar_Cables.
- **DPP563119AA - Additional air cowl.**
- **DPP563119BA - Circular duct adaptor.**
 Can be fitted to either the cooling air inlet or outlet and provides a method of connecting to a circular duct.
- **DAS563751AA - Additional interface connector parts.**

For more information on accessories, contact e2v technologies.

OUTLINE



PERFORMANCE WITH INTEGRAL BLOCK UP CONVERTER (BUC)

Parameter	C-Band	X-Band	Ku-Band	Units
Output frequency range	5.85 to 6.425	7.9 to 8.4	13.75 to 14.5	GHz
L-band input frequency range	950 to 1525	950 to 1450	950 to 1700	MHz
LO frequency	4.9	6.95	12.8	GHz
External reference:	see note	see note	see note	
frequency	10	10	10	MHz
level	-3 to +7	-3 to +7	-3 to +7	dBm
impedance	50	50	50	Ω
Rated power (at TWTA flange)	90	125	85	W max
Gain:	-	-	-	-
at rated power	55	60	55	dB min
small signal gain	60	65	60	dB min
attenuator range (optional)	25	25	25	dB min
Gain variation:	-	-	-	-
any 500 MHz	5.0	5.0	5.0	dB max
any 40 MHz	1.5	1.5	1.5	dB max
slope	0.08	0.08	0.08	dB/MHz max
Gain stability:				
over 24 hrs (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) at:	-18	-18	-18	dBc max
P _{rated} -4.0 dB	-17	-17	-17	dB
P _{rated} -7.0 dB	-23	-23	-23	dB
Harmonic output	-3	-7	-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	-70	-70	-70	dBW/4kHz max
receive band	-70 (3.2-4.2 GHz)	-70 (7.25-7.75 GHz)	-70 (10.95-12.75 GHz)	dBW/4kHz max
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	1.0	1.0	1.0	ns pk-pk
Residual AM noise >100 kHz from carrier	-60	-60	-60	dBc
Phase noise:				
continuous	Meets IESS Phase Noise Profile			
AC fundamental	-50	-50	-50	dBc max
sum of all spurs	-47	-47	-47	dBc max
Input VSWR	1.6:1	1.6:1	1.6:1	
Output VSWR	2.5:1	2.1:1	2.0:1	
Load VSWR max. – no damage	2.0:1	2.0:1	2.0:1	

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

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.

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