



When precision matters.

## TW600 Family of Low Noise Amplifiers for Choke Ring Antennas

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The TW600 family of low noise amplifiers (LNA) are optimized for all GNSS bands utilized by the GPS, GLONASS, Galileo, and BeiDou satellite systems. This LNA is designed for integration into existing choke ring antennas thereby upgrading them to receive the entire GNSS band or a subset thereof.

The TW6x3 provides 35 dB of gain and the TW6x5 provides 50 dB of gain. Custom pre-filtering provides suppression of out-of-band interfering signals such as cellular LTE, Ligado, and Iridium satellite communications, while maintaining a low noise figure, high third order intercept point and small group delay.

Meeting the requirements of high performance GNSS receivers, the current consumption is less than 50mA with a 5 VDC supply.

The amplifier housing is compatible with choke ring antennas manufactured by Trimble, Allen Osborne, Ashtech, and Leica (504)



### Models

TW61x: All GNSS Signals (1164 -1300MHz + 1559-1610MHz)

TW62x: L1/L2, G1/G2, B1/B2, E1 + L-band (1195-1254MHz + 1525-1610MHz)

TW63x: L1/L2/L5, G1/G2/G3, B1/B2, E1/E5a+b (1164-1254MHz + 1559-1610MHz)

TW60x: All GNSS Signals + L-Band (1164-1300MHz + 1525-1610MHz)

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### Features

- Available with 35 dB or 50 dB gain
- Low Current / low voltage
- Very low noise
- Wide input voltage 3 to 16 Volts
- Powered via antenna coax from receiver
- 50 Ohm port impedance
- RoHS and REACH compliant

### Benefits

- Upgrades choke ring antennas to receive the full GNSS band or subset thereof
- High gain enables extended cable runs
- Easy to install



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### Specifications

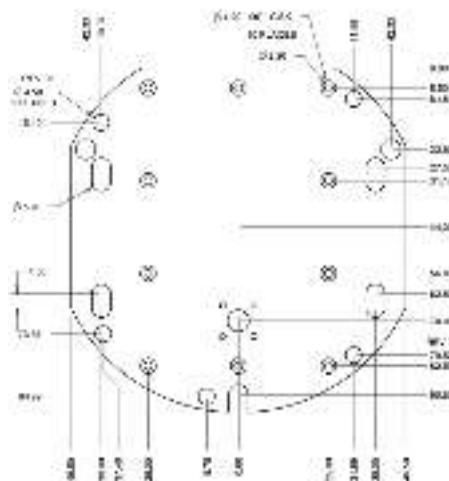
Vcc =5V, over full bandwidth, T=25 °C

#### Electrical

	TW60x	TW61x	TW62x	TW63x
Signals	L1 L2 L5 G1 G2 G3 E1 E5a E5b E6 B1 B2 B3	L1 L2 L5 G1 G2 G3 E1 E5a E5b E6 B1 B2 B3	L1 L2 G1 G2 E1 B1 B2	L1 L2 L5 G1 G2 G3 E1 E5a E5b B1 B2
L-Band (1525-1559MHz)	Yes	No	Yes	No
Pass band ripple (dB-max)	1164 - 1300: 2.0 1525 - 1610: 1.0	1164 - 1300: 2 1559 - 1610: 2	1195 - 1254: 1 1525 - 1610: 2	1164 - 1254: 1.5 1559 - 1610: 2
Out of Band Rejection (dB-min)	< 800 MHz: > 65 < 900 MHz: 25 <1430 MHz: 29 > 1700 MHz: 45 > 1800 MHz: > 70	< 800 MHz: > 70 < 900 MHz: 40 < 1000 MHz: 35 <1536MHz: 50 >1650MHz: 55 > 1730 MHz: > 60	< 800 MHz: > 70 < 900 MHz: 60 < 1100 MHz: 30 <1380 MHz: 50 > 1700 MHz: 40 > 1800 MHz: > 50	< 800 MHz: > 70 < 900 MHz: 40 < 1000 MHz: 35 <1536MHz: 50 >1650MHz: 55 > 1730 MHz: > 60
Group Delay Variation (ns-max)	1164 - 1300: 5 1525 - 1610: 5	1164 - 1300: 7 1559 - 1610: 15	1195 - 1254: 5 1525 - 1610: 5	1164 - 1254: 7 1559 - 1610: 15
Noise Figure (typ)	1164 - 1300: 2.5 1525 - 1610: 2.5	1164 - 1300: 2.7 1559 - 1610: 3.2	1195 - 1254: 2.5 1525 - 1610: 2.5	1164 - 1254: 2.7 1559 - 1610: 3.2

- Impedance 50 Ohms
- Input VSWR 2:1 max input
- Output VSWR 1.5:1 max output
- Supply Range voltage 3 to 16 VDC Nominal, 12 VDC recommended operating max
- Supply Current 50 mA max

### Drawings (all dimensions in mm)





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### Mechanicals & Environmental

Mechanical Size (body dimensions only)	98.0 mm x 93.0 mm x 17.6 mm
Connectors	SMA Jack
Operating Temp. Range	-55 to +85 °C
Environmental	RoHS, REACH compliant
Warranty	One year – parts and labour

### Ordering Information

• TW613 – 35 dB gain Choke Ring Amp with SMA Jack (Full GNSS Spectrum)	32-0613-00-yyy
• TW615 – 50 dB gain Choke Ring Amp with SMA Jack (Full GNSS Spectrum)	32-0615-00-yyy
• TW623 – 35 dB gain Choke Ring Amp with SMA Jack (Dual Band LNA+ L-band)	32-0623-00-yyy
• TW625 – 50 dB gain Choke Ring Amp with SMA Jack (Dual Band LNA+ L-band)	32-0625-00-yyy
• TW633 – 35 dB gain Choke Ring Amp with SMA Jack (Triple Band LNA)	32-0633-00-yyy
• TW635 – 50 dB gain Choke Ring Amp with SMA Jack (Triple Band LNA)	32-0635-00-yyy
• TW603 – 35 dB gain Choke Ring Amp with SMA Jack (Full GNSS Spectrum + L-band)	32-0603-00-yyy
• TW605 – 50 dB gain Choke Ring Amp with SMA Jack (Full GNSS Spectrum + L-Band)	32-0605-00-yyy

Replace yyy with the make of choke ring as follows:

TRI = Trimble Choke Ring    ASH = Ashtech    LEI = Leica    AOA = Allan Osborne and Associates



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