ElbaTech srl
Soluzioni elettroniche e Innovazione

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HIGH VOLTAGE AMPLIFIER MODEL T-500

1 to 6 CHANNELS HIGH VOLTAGE AMPLIFIER SERIES

Description

The T-500 series is assembled in a 19" x 3U rackmount chassis with one or more integrated power supply. Each channel is a sophisticated amplifier featuring ±200V output and an extremely wide bandwidth (100 KHz without load, up to 500 KHz in the "Fast" grade models). This equipment is especially suited to precisely drive piezoelectric transducers, as well as resistive or inductive loads.

Key features	Applications
High precision	High voltage instrumentation
High stability	Piezo transducer excitation
High output voltage range	Programmable power supplies
Integrated power supply	Electrostatic transducers and deflection
Options available	

Specifications

- Multiple gain selector
- Max input voltage: ±10 V (20 Vpp)
- Max output voltage: ± 200 V (400 Vpp)
- Bandwidth (-N, without load): DC to 100 KHz
- Bandwidth (-F, without load): DC to 500 KHz
- Channels: up to 6 (up to 3 for -F grade)
- Power supply 230 Vac 50-60 Hz
- Load: capacitive, resistive, inductive
- Output current: 400 mA peak-to-peak max
- Ripple Voltage: 2 mV max full bandwidth
- RMS noise absolute 1.2 mV (typical)

Physical dimensions

Specifications:
- Width: 84 TE (19" Rack)
- Heigth: 3 U
- Depth: 480 mm
- Weight: 10 Kg

Environment:
- Operating Temperature: –10°C to 50°C
- Humidity: 0 to 95%

Configuration

T-500 amplifiers are enclosed into a 19" rack mount chassis, 3U x 84TE and include a precision, very low noise, high voltage power supply.

Module	Order code	Channels
HV amplifier, Normal grade	T-501-N	1
	T-502-N	2
	T-503-N	3
	T-504-N	4
	T-505-N	5
	T-506-N	6
HV amplifier, Fast grade	T-501-F	1
	T-502-F	2
	T-503-F	3
Offset generator 0 to ±10V	T-500-OF1	
Inverting Selector	T-500-OI	

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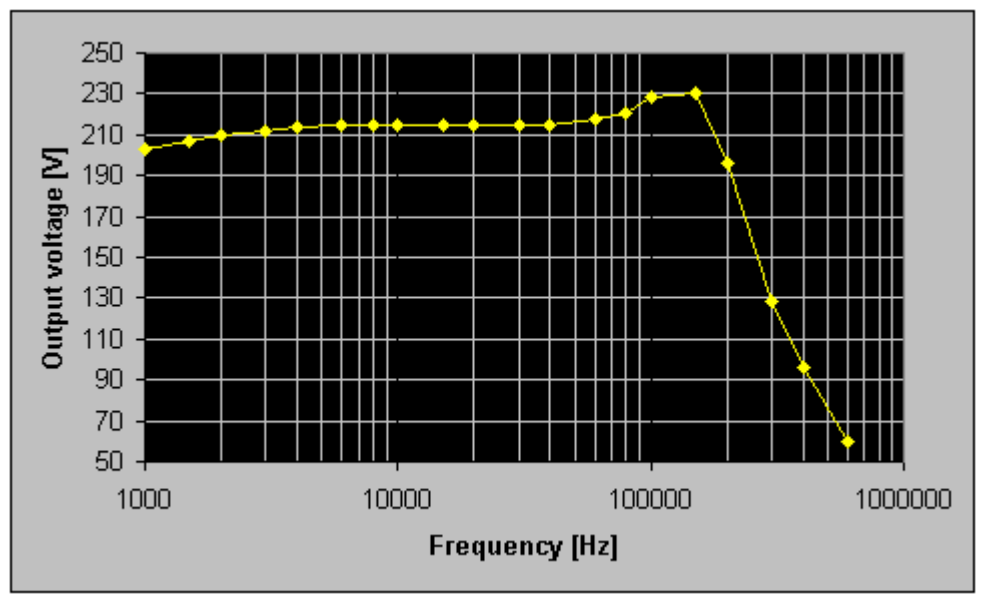
Technical notes

INPUT AMPLITUDE
The input amplitude should normally be kept within ±10 V and not exceed ±12 V. This is most important since the input protection network will limit the signal amplitude and cause distortion. The input protection network effectively cuts accidental spikes and overshoots.

LOAD
The amplifier is intended to drive resistive, inductive and capacitive loads. The maximum load capacitance depends on the slew rate of the amplifier and on the working frequency.
The maximum capacitance limit includes the capacitance of the connection cable (ca 100 pF/m for a standard coaxial cable). See diagram bandwidth vs. capacitance (reported below) load for the proper working conditions. Increasing the capacitive load causes overshoot to appear. If a larger capacitive load is required then the slew rate should be reduced accordingly. Such an adjustment can be made before shipment. It may also be performed at a later date by qualified personnel and the factory should be contacted for advice. Inside the cabinet exist hazardous voltage levels and the amplifier circuit is sensitive to static discharge.
Overloading the output may cause an overshoot which might be dangerous for the connected devices.
The amplifier can also be used to drive inductive loads. In this case the main application concern is Total Harmonic Distortion (THD). The amplifier's response behaves accordingly to the real current flowing into the inductive load, therefore the inductance limit depends on the working frequency and on the required maximum output voltage.
The continuous output current limit is 200 mA and the output power limit is 40 W (total power dissipation is then 63 W), which corresponds to Safe Operating Area (SOA). The temporary peak current may be up to 250 mA. The output is equipped with a current limiting circuit which withstands accidental short-circuits.
The amplifier may be overheated when the output is short-circuited for a long time and/or if the peak current appears to be frequent.

Typical Bode plot (no load, normal grade):



Bode plot of the output signal of a T-500 HV amplifier with 10Vpp sinusoidal AC input signal.

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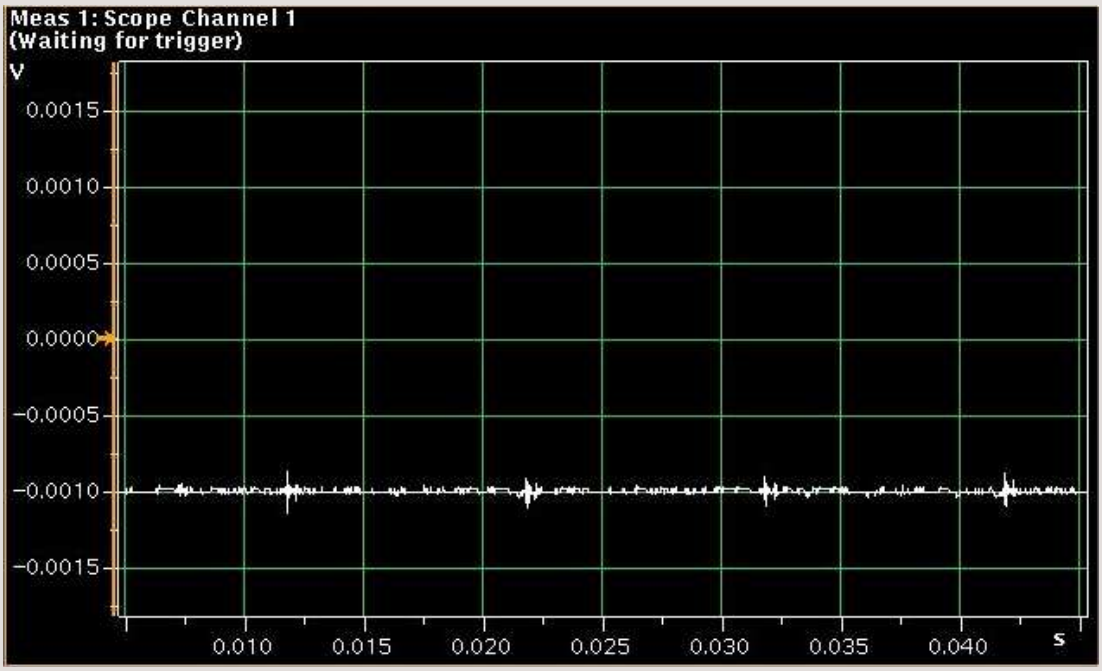
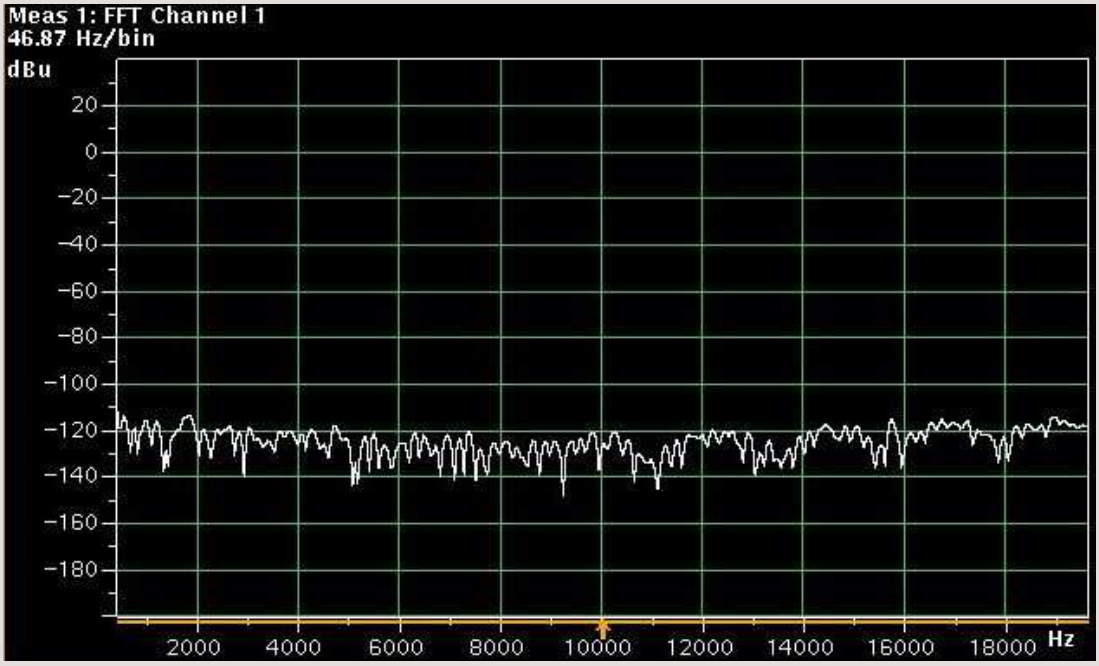
Noise response



Signal vs. time acquired at 0 VDC input, showing the overall amplifier noise

Spectral response



Spectral response at 0 VDC input

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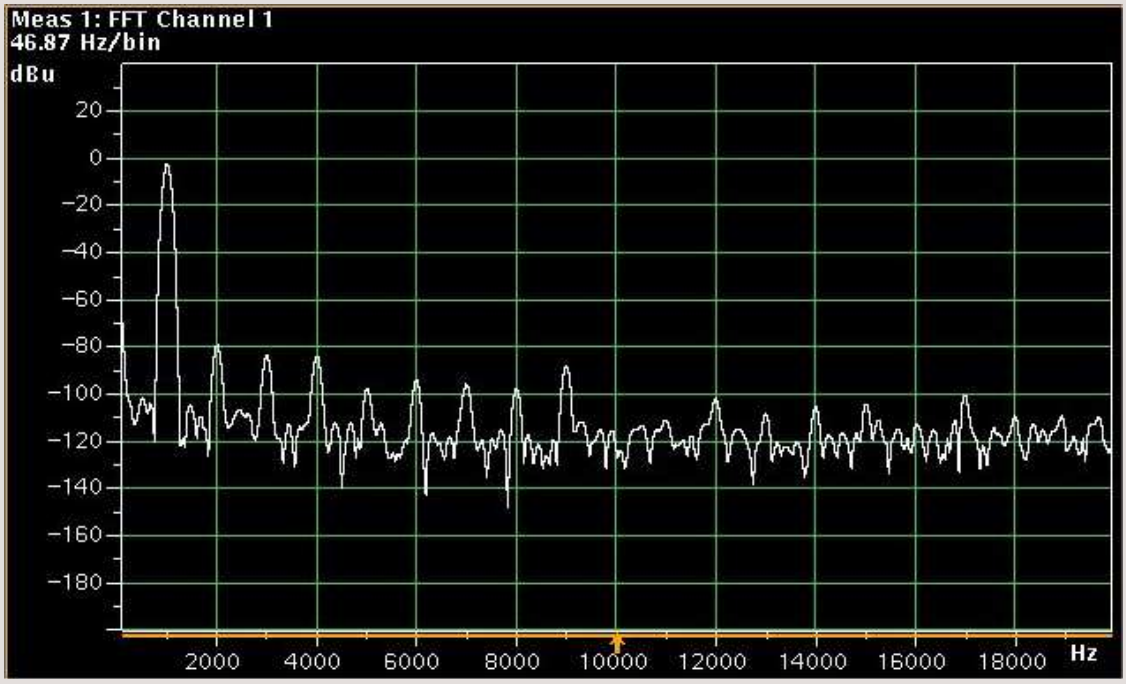
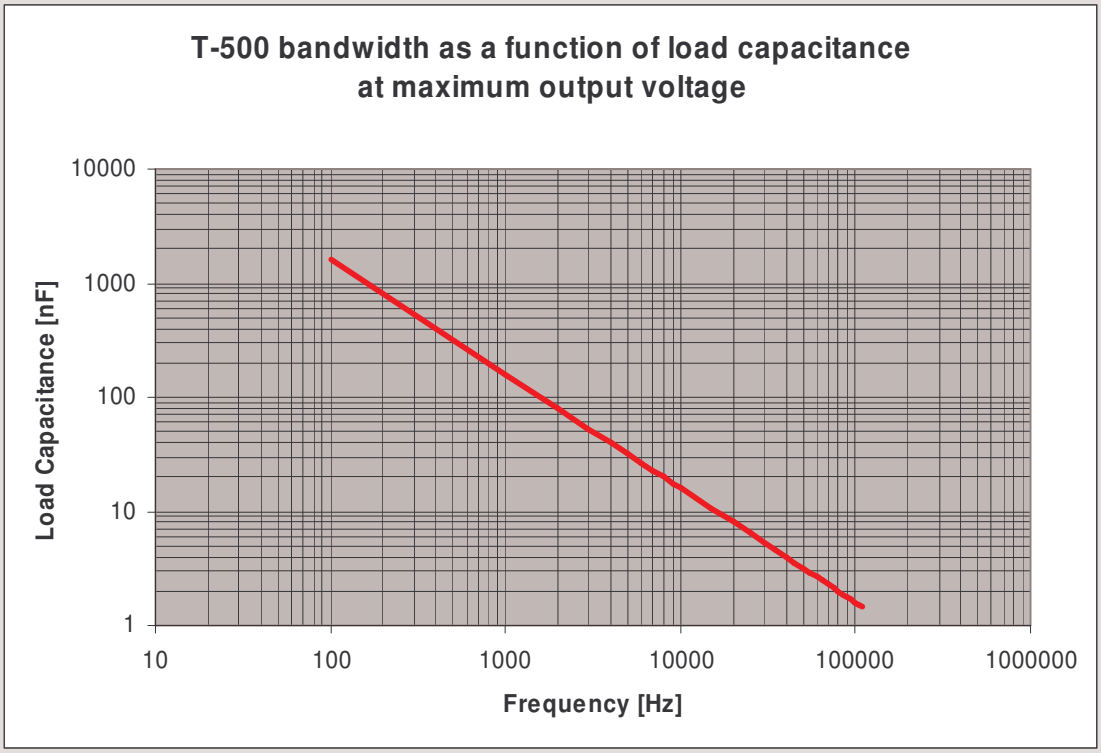
Spectral response



Spectral response applying a 1KHz sinusoidal signal at the input

Frequency performance



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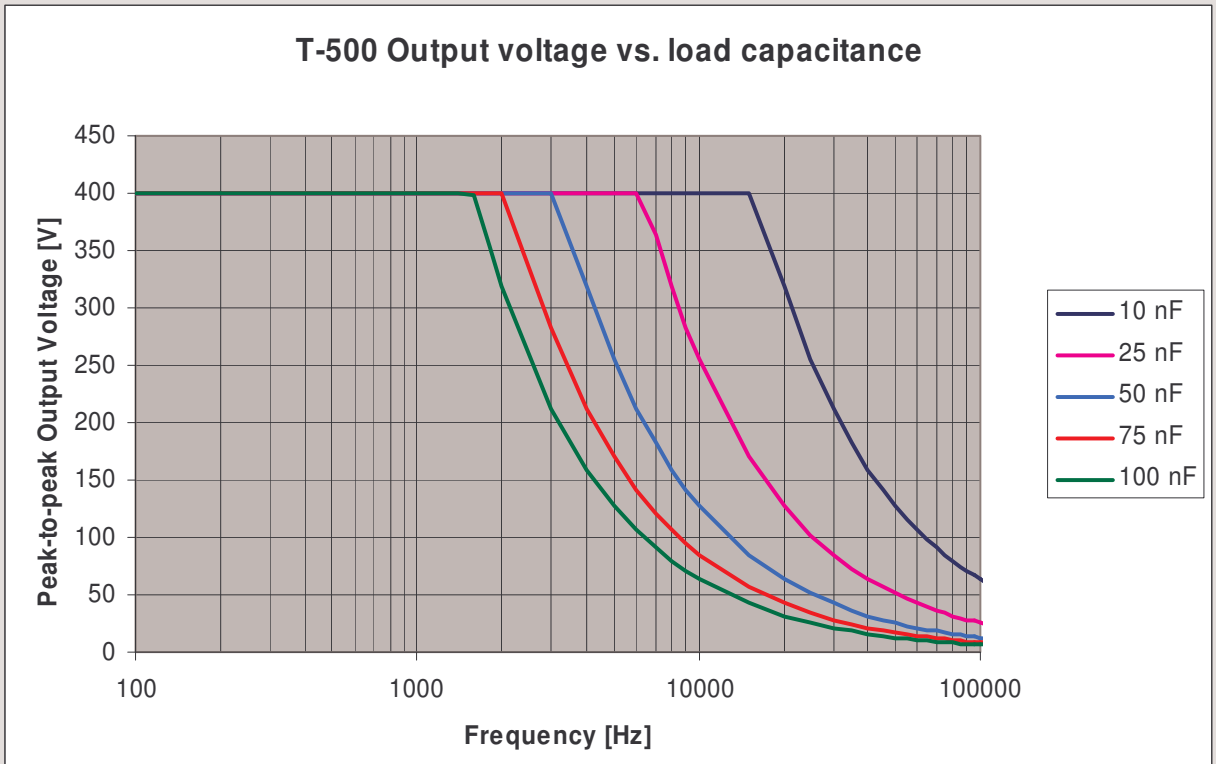
Output voltage



Specifications of this datasheet are subject to change without notice