

A1110-16-A

4-quadrant voltage amplifier

DC – 1 MHz | 100 V/ μ s | 1000 W (source) | 250 W (sink)



DATA SHEET

The A1110-16-A is a linear, extreme broadband precision power amplifier. It is ideally suited for applications that require fast signal processing at high power.

There are two operating voltages available for optional selection: high-voltage / low-current or low-volt / high-current. Particularly with low impedance load the operating voltage can be reduced to 1/2 the value, which entails a corresponding reduction of dissipation power.

The device is equipped with a low-noise, temperature-controlled fan. In addition to over temperature shut-down, a feature for dissipation power calculation and current monitoring ensures perfect overload and short-circuit protection.

Operation is performed via the control elements on the front panel of the amplifier and the graphical user interface on a PC, which is connected to the amplifier by means of the USB interface (the required software is included in the scope of delivery).

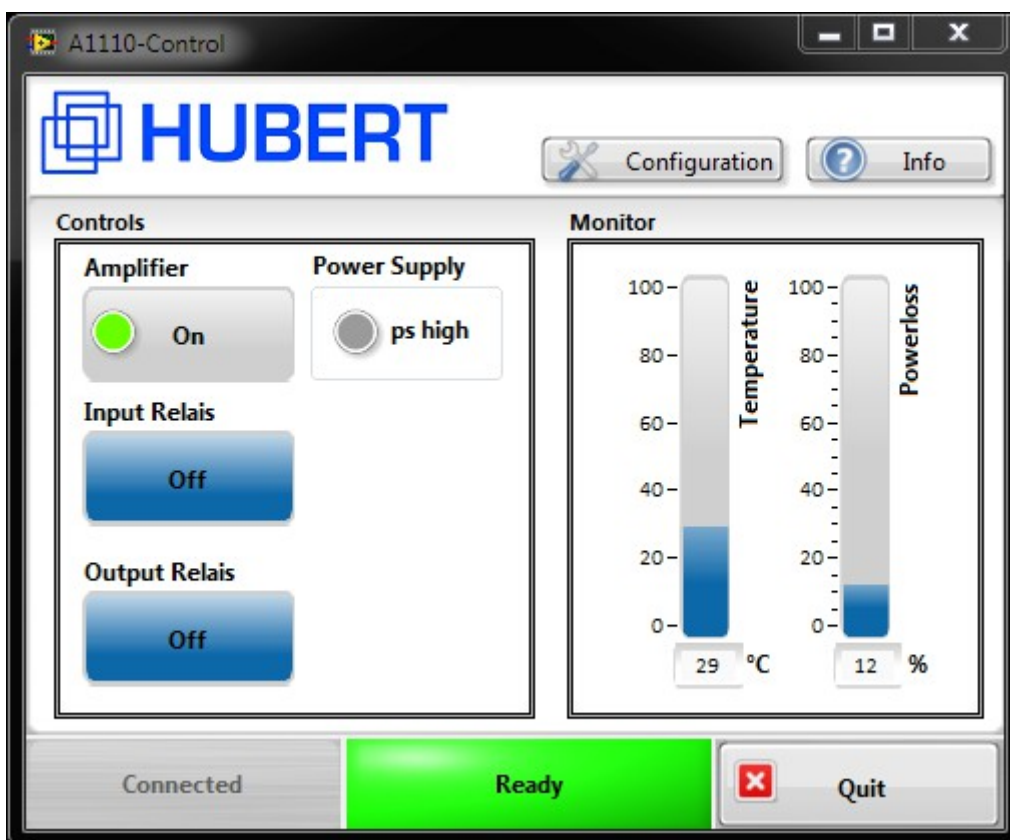
If higher output voltages or higher output currents are needed, configurations with several A1110-16-A devices connected in series or in parallel are possible.

Features

- 4-quadrant voltage amplifier
- Fully configurable and operable by means of the supplied software
- Output voltages up to 75 V_{peak}
- Output current up to 28 A_{peak}
- Symmetrical input
- Series / parallel input connection in case of higher voltage / current requirements
- USB port as standard
- 2 supply voltages

Software

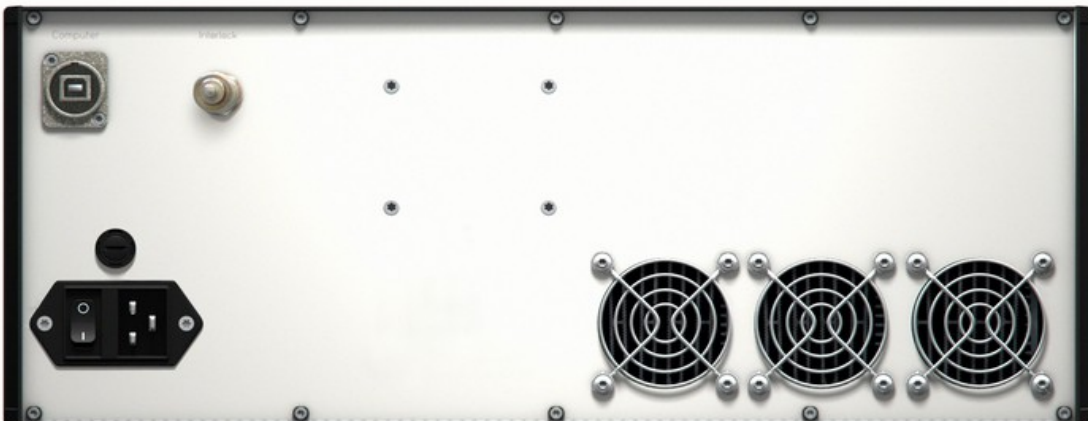
The scope of delivery includes an application software that ensures fully remote-controlled operation and comprehensive configuration of the amplifier via the USB interface. In this context, disclosure of the line commands guarantee trouble-free integration of existing automated test systems.



Applications

- General lab applications for research, development and testing
- EMC testing
- Material testing
- MRI
- Component tests
- Plunger coil drives
- Piezo actuation
- Generation of magnetic fields (e.g. with Helmholtz coils)
- Medical engineering
- Laser technology
- Plasma technology

Rear of the amplifier



Specifications

Parameters	Specification	Conditions/Moments
	Controlled Voltage Mode	25° C ambient temperature Continuous operation
Input Impedance	100 kOhm 200 kOhm	unbalanced, 1kHz balanced, 1kHz
Maximum Input Level	5.5 V (+14,5 dBV)	< 1 % THD, 1 kHz, 8 Ohm Load
Gain	1 V / 10 V; $\pm 0.1 \%$ ($\pm 0.01 \%$ / °C))	Uin/Uout
Common-Mode Rejection Ratio	>60 dB	Rs=50 Ohm, 10 Hz – 200 kHz, re +34.5 dBV @ Output
Small Signal Frequency Response		
	DC - 200 kHz	+0, -0.2 dB, 1 W @ 8 Ohm High Voltage Mode
	DC - 1 MHz	+0, -3.0 dB, 1 W @ 8 Ohm High Voltage Mode
Phase response	+0, -5 degrees	10 Hz - 30 kHz
Power Response (continuous)		
8 Ohm Load	340 W	DC - 100 kHz, < 1% THD High Voltage Mode
	300 W	DC – 200 kHz, < 1% THD High Voltage Mode
3 Ohm Load	800 W	DC - 30 kHz, < 0.1% THD High Voltage Mode
	660 W	DC - 100 kHz, < 0.1% THD High Voltage Mode
	540 W	DC - 200 kHz, < 1% THD High Voltage Mode
2.5 Ohm Load	800 W	DC – 10 kHz, < 0.1% THD High Voltage Mode
	620 W	DC - 100 kHz, < 0.2% THD High Voltage Mode
	460 W	DC - 200 kHz, < 1% THD High Voltage Mode
2 Ohm Load	280 W	DC - 30 kHz, < 1% THD Low Voltage Mode
	210 W	DC – 100 kHz, < 0.5% THD Low Voltage Mode
	150 W	DC – 200 kHz, < 0.5% THD, Low Voltage Mode
1 Ohm Load	300 W	DC - 10 kHz, < 0.06% THD Low Voltage Mode
	260 W	DC - 30 kHz, < 0.1% THD Low Voltage Mode

Parameters	Specification	Conditions/Moments
	160 W	DC - 100 kHz, < 0.2% THD Low Voltage Mode
	140 W	DC - 200 kHz, < 0.3% THD Low Voltage Mode
Slew Rate	100 V/uSec	
Residual Noise		
10 Hz - 22 kHz	< 64 uV (< -84 dBV)	High Voltage Mode Input shorted 8 Ohm Load
10 Hz - 80 kHz	< 141 uV (< -77 dBV)	High Voltage Mode Input shorted 8 Ohm Load
10 Hz - 200 kHz	< 177 uV (< -75 dBV)	High Voltage Mode Input shorted 8 Ohm Load
10 Hz - 22 kHz	< 64 uV (< -84 dBV)	Low Voltage Mode Input shorted 8 Ohm Load
10 Hz - 80 kHz	< 178 uV (< -75 dBV)	Low Voltage Mode Input shorted 8 Ohm Load
10 Hz - 200 kHz	< 282 uV (< -73 dBV)	Low Voltage Mode Input shorted 8 Ohm Load
Signal-to-Noise Ratio		
10 Hz - 22 kHz	< -118.5 dB	re +34.5 dBV, < 1% THD 8 Ohm Load High Voltage Mode
10 Hz - 80 kHz	< -111.5 dB	re +34.5 dBV, < 1% THD 8 Ohm Load High Voltage Mode
10 Hz - 200 kHz	< -109.5 dB	re +34.5 dBV, < 1% THD 8 Ohm Load High Voltage Mode
THD+N		
10 Hz - 30 kHz High Voltage Mode	< 0.02 %	1 W @ 8 Ohm
10 Hz - 100 kHz High Voltage Mode	< 0.02 %	1 W @ 8 Ohm
10 Hz - 30 kHz Low Voltage Mode	< 0.03 %	1 W @ 8 Ohm
10 Hz - 100 kHz Low Voltage Mode	< 0.03 %	1 W @ 8 Ohm
Output Offset	< 1.0 mV	adjustable to less than 1mV
Output Impedance	< 50 mOhm	@1 kHz; Instrument: HP8751A, Network Analyzer
Power, Pulse, 40ms, 20% Duty Cycle		
Peak output		
8 Ohm	76 V, 9.5 A	High Voltage Mode
4 Ohm	76 V, 19 A	High Voltage Mode
2 Ohm	50 V, 25 A	High Voltage Mode
1 Ohm	28 V, 28 A	Low Voltage Mode
0.5 Ohm	14 V, 28 A	Low Voltage Mode

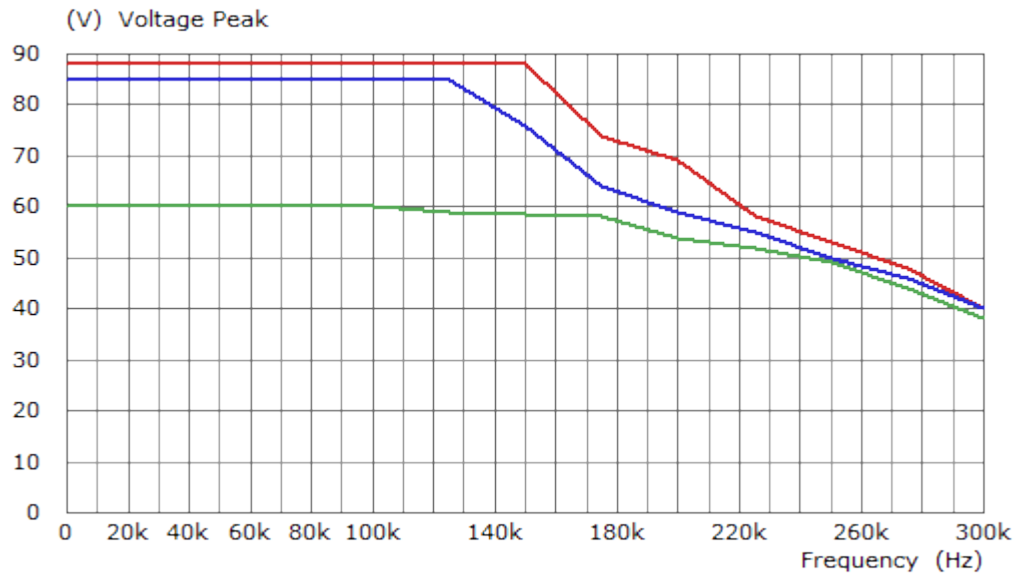
Parameters	Specification	Conditions/Moments
Power, Sinus, 100Hz, continuous		
1 Ohm	20 V, 20 A, 400 W	< 0.02 % THD Low Voltage Mode
0.5 Ohm	10 V, 20 A, 200 W	< 0.03% THD Low Voltage Mode
Power, DC		
4 Ohm	65 V, 16.25 A, 1056 W	High Voltage Mode
2 Ohm	32 V, 16 A, 512 W	Low Voltage Mode
1 Ohm	28.5 V, 28.5 A, 812 W	Low Voltage Mode
0.5 Ohm	14 V, 28 A, 392 W	Low Voltage Mode
Sink Power, DC	250 W	Low Voltage Mode; see U/I-Plot
Physical Characteristics		
AC Power	230 VAC / 50 Hz	
Remote control	USB	
Operating Temperature	10 °C to 55 °C	
Humidity	80% or less	non-condensing
Cooling	Forced air	
Dimensions (W x H x D)	449 x 177 x 585.5 mm	
Weight	Approx. 30 kg	

Output Voltage vs. Frequency (THD + N < 1%)

Red: @ 8 Ohm

Blue: @ 4 Ohm

Green: @ 2 Ohm

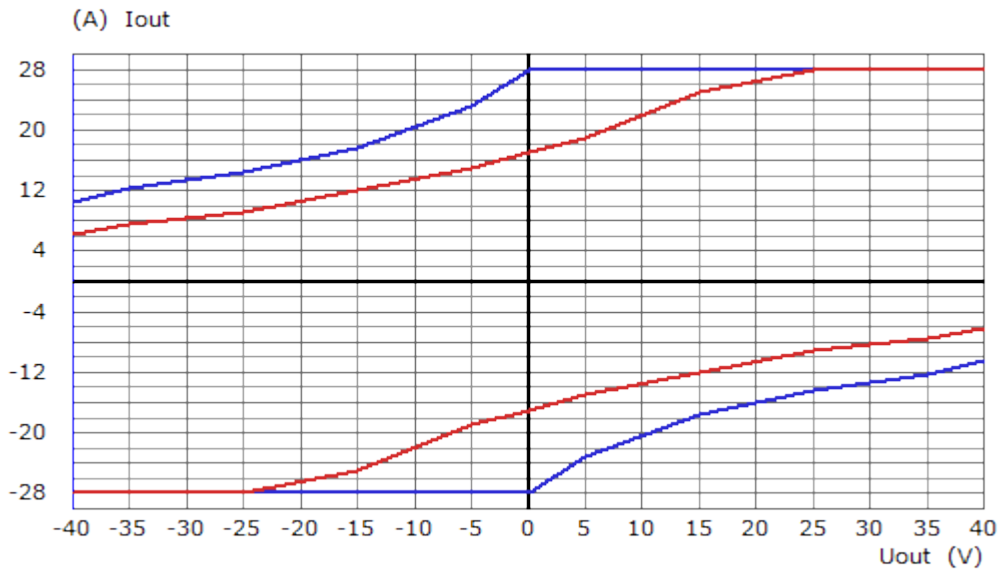


Output Current vs. Output Voltage (THD + N < 1%)

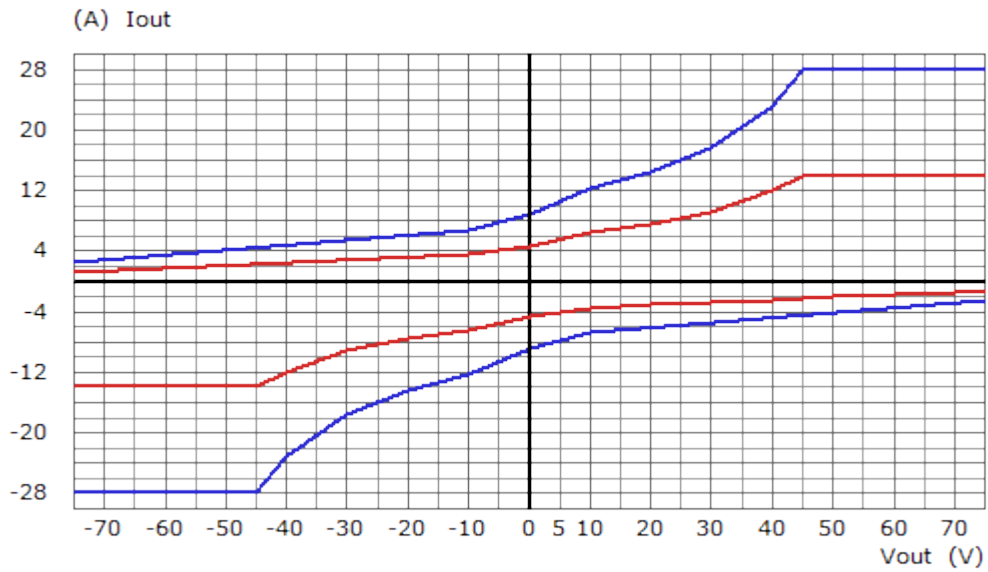
Supply Voltage: Low

Blue: AC Limit

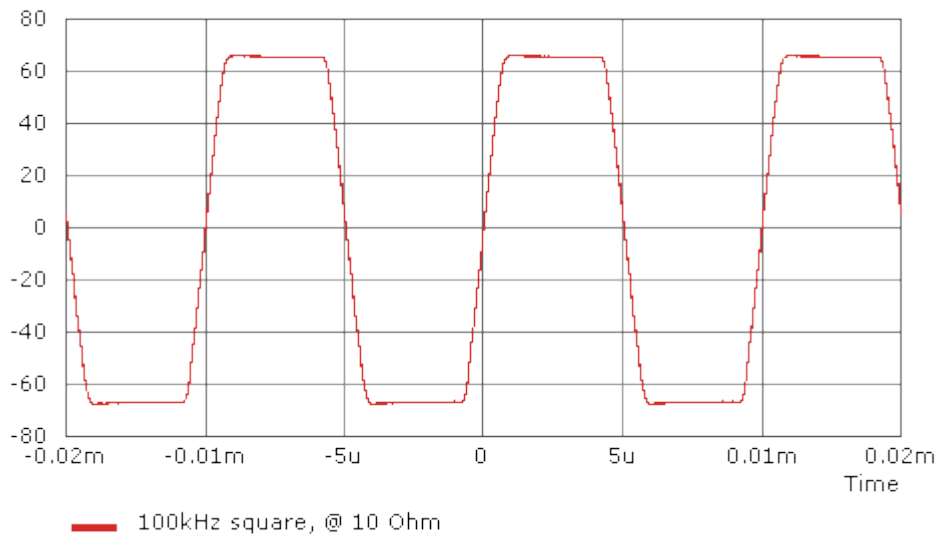
Red: DC Limit



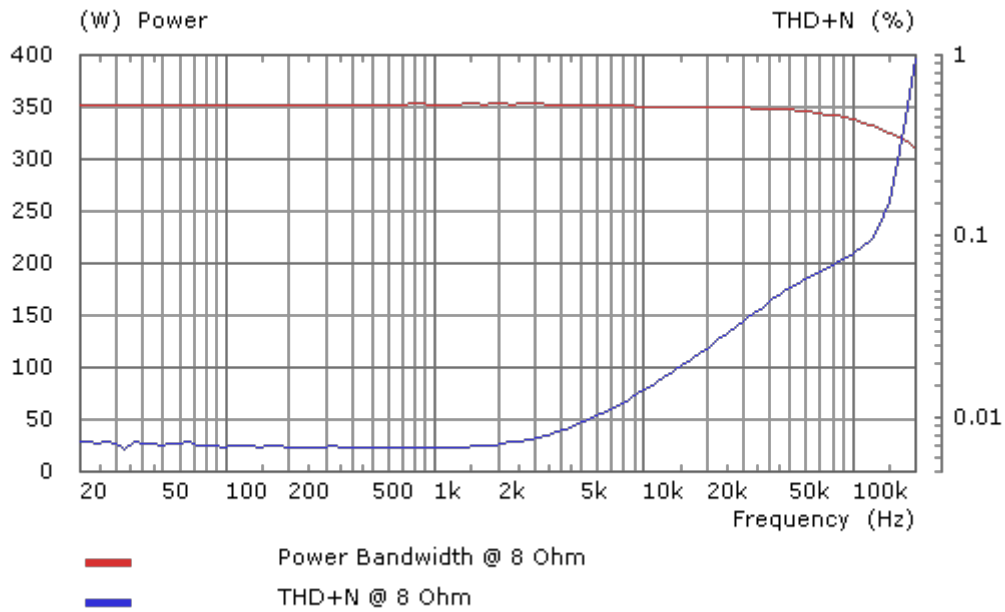
Output Current vs. Output Voltage (THD + N < 1%)
 Supply Voltage: High
 Blue: AC Limit
 Red: DC Limit



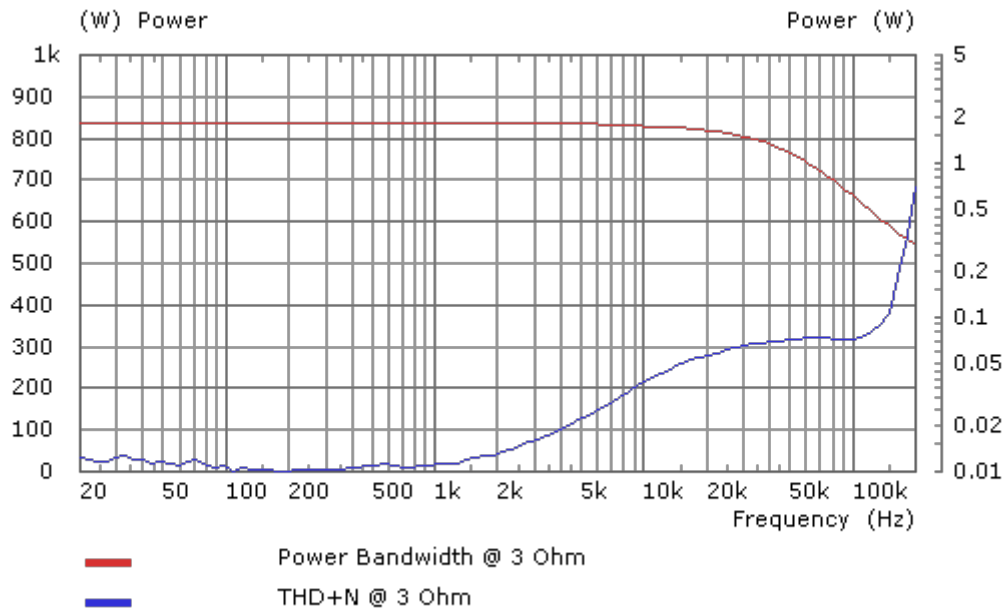
Square wave at 100 kHz and 10 Ohm Last



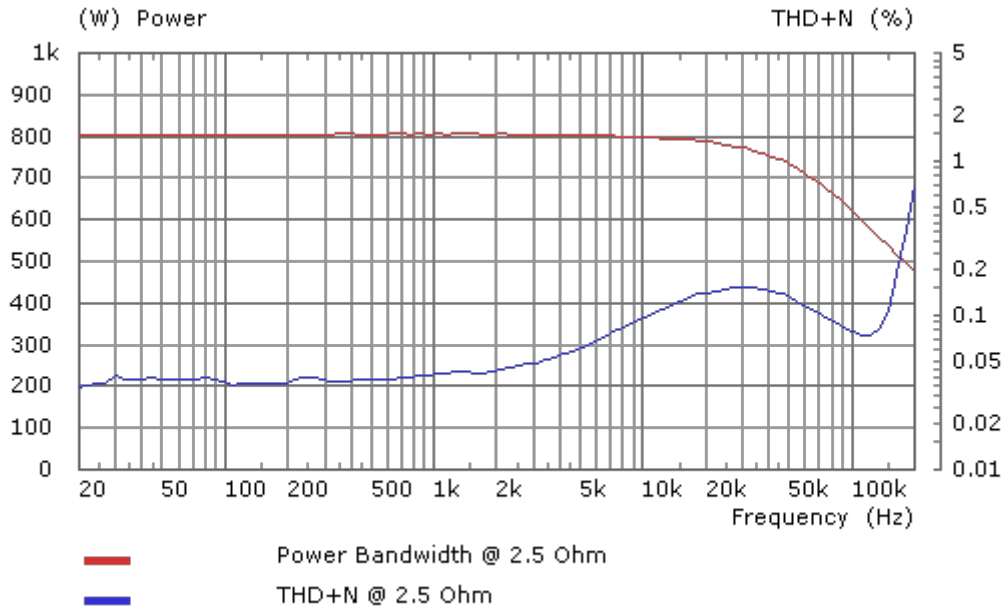
Power bandwidth at 8 Ohm load
 (Input level normalised to max. output level at 200 kHz; THD+N < 1%)



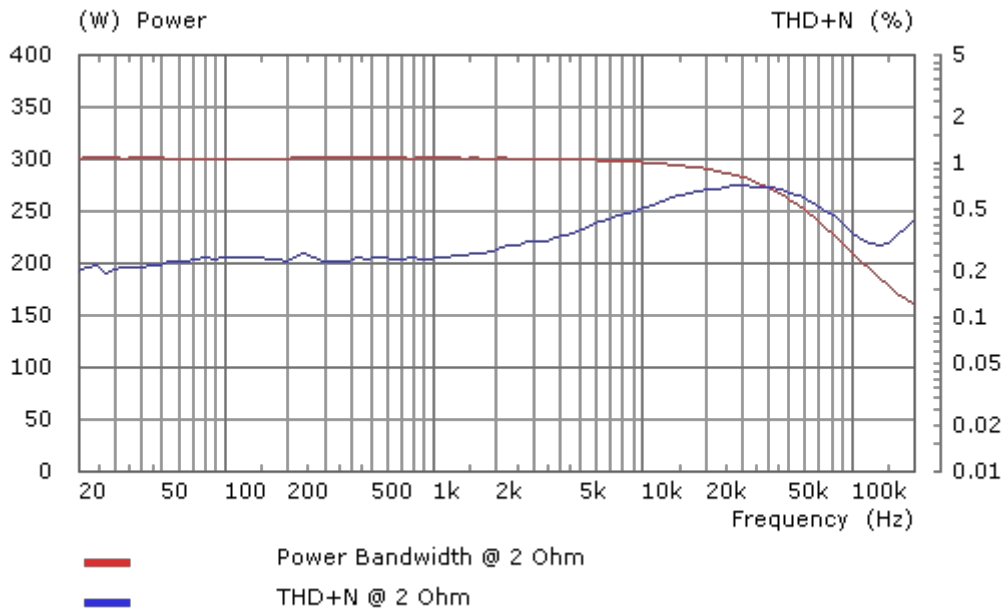
Power bandwidth at 3 Ohm load
 (Input level normalised to max. output level at 200 kHz; THD+N < 1%)



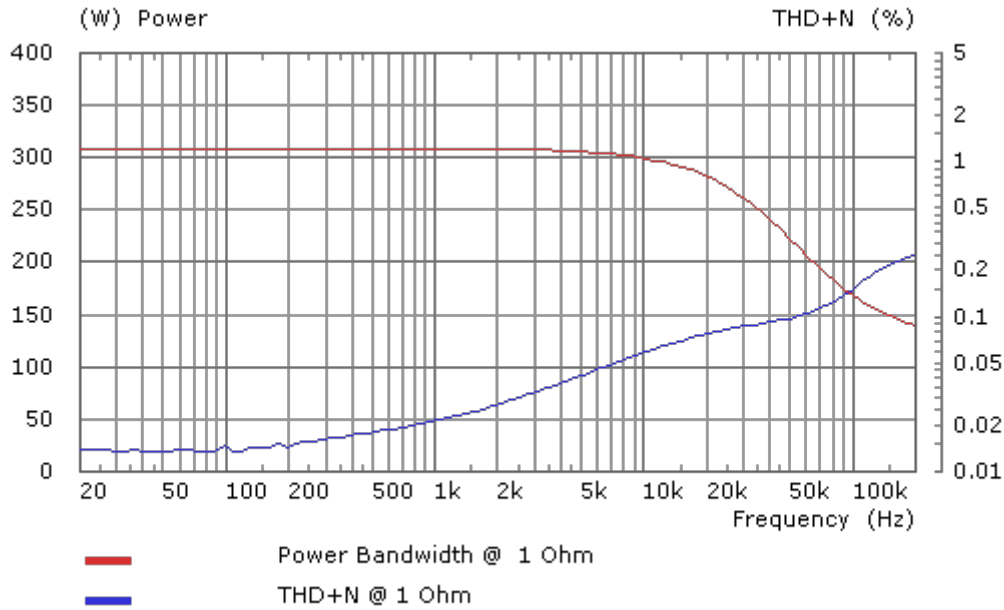
Power bandwidth at 2.5 Ohm load
 (Input level normalised to max. output level at 200 kHz; THD+N < 1%)



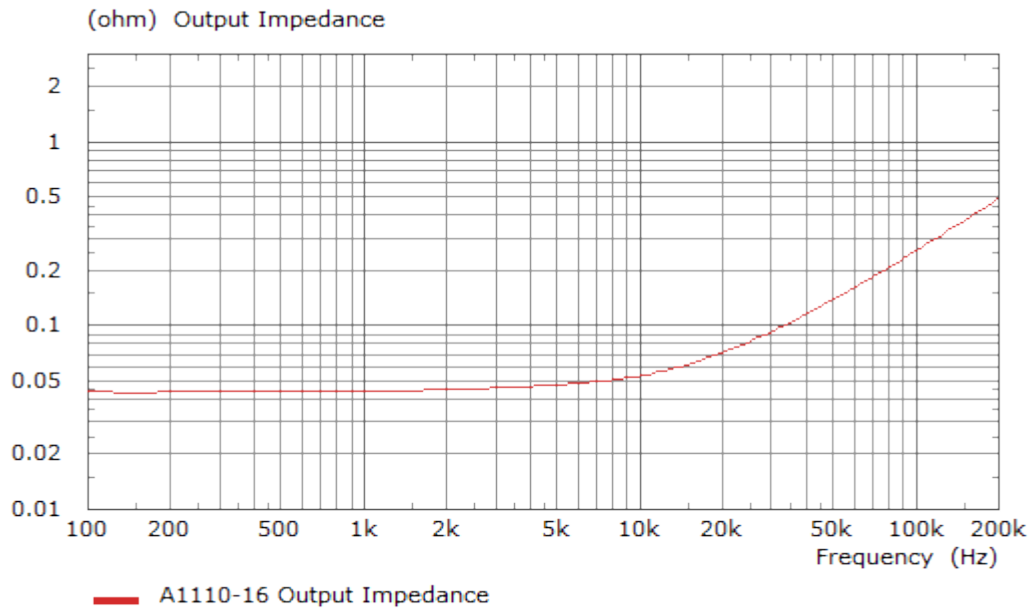
Power bandwidth at 2 Ohm load
 (Input level normalised to max. output level at 200 kHz; THD+N < 1%)



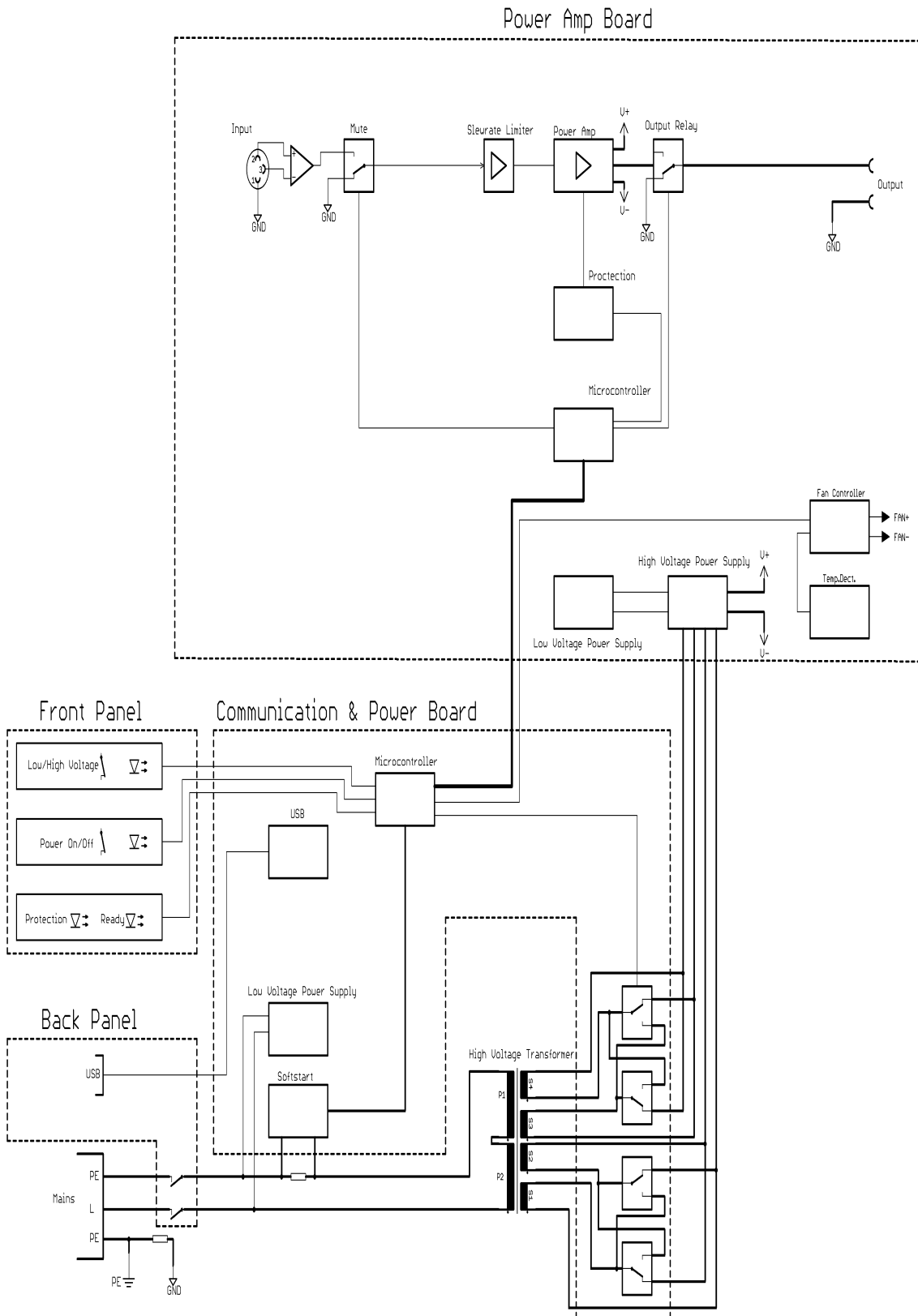
Power bandwidth at 1 Ohm load
 (Input level normalised to max. output level at 200 kHz; THD+N < 1%)



Output impedance



Block diagram A1110-16-A



Ordering information

11100020	A1110-16-A; Precision power amplifier; incl. software
11101020	Option_02: Internal precision current measurement by means of high-performance current transformer 0-50A; Precision DC +/-0,1%; Bandwidth DC...>800kHz; Output BNC bush, galvanically isolated from the amplifier
11101030	Option_03: Ultra stable gain
11101040	Option_04: Function generator; DC, 0.05Hz - 300 kHz, sine, square, triangle
11101050	Option_05: Isolation amplifier for potential isolation of input and output



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