HIGH SPEED BIPOLAR AMPLIFIER

BA Series BA4825 [2MHz Type] / BA4850 [50MHz Type]

Achieves DC to 50MHz (max.) broadband, high speed, and high-power output voltage! Enables a wide range of applications.

NEW Bipolar power amplifier

Broadband
DC to 2MHz
DC to 50MHz
Ultrasonic motor
Quick response
FPD
Four-quadrant operation
Magnetic materials
Piezoelectric elements
High-voltage output
100Vrms (300Vp-p), 0.5Arms
±20V, ±1A
Capacitors
Signal amplification

2 MHz

BA4825

50 MHz

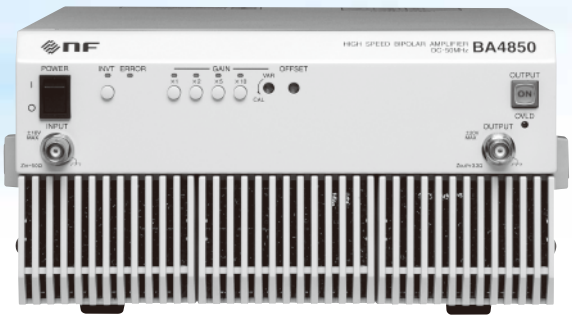
BA4850

	BA4825	BA4850
Broadband	DC to 2MHz	DC to 50MHz
High-power output voltage	100Vrms (300 Vp-p), 0.5Arms	±20V, ±1A
High slew rate	500V/μs	6,000V/μs
Low-power impedance	0.5Ω+1.5μH or less (typ.)	3.3Ω+0.01μH or less (typ.)
Bipolar output	Four-quadrant operation that enables positive and negative voltage and current to be supplied (source) and absorbed (sink).	
Multiple functions	Output polarity switching, output range shift, output monitoring, external output on/off control, DC bias addition, and DC offset adjustment	Output polarity switching, external output on/off control, and DC offset adjustment

NF Corporation

Wide broadband of DC to 50MHz max., high speed, output that easily drives a wide variety of devices.

BA4825 : DC to 2MHz, 100Vrms (300Vp-p), 0.5Arms

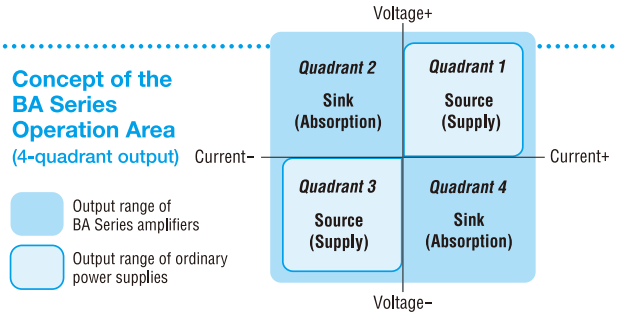


BA4850 : DC to 50MHz, ±20V, ±1A

The BA Series are power amplifiers that handle DC to 50MHz (max.) signals and output broadband, high speed, and high voltage (300Vp-p max) bipolar (both positive and negative polarities) outputs. While ordinary DC power supplies only supply one-way currents, the BA Series amplifiers supply (source) and absorb (sink) currents, and handle positive and negative voltages as well, because they operate across all four quadrants.

Concept of the BA Series Operation Area

(4-quadrant output)



●Available for capacitive and inductive loads●

If a load containing a capacitor or coil is driven with alternating current, the current generally flows back from the load. In this case, an ordinary power supply or amplifier may not be able to drive the load. BA Series amplifiers also operate (i.e., output the current) with a capacitive or inductive load such as a piezoelectric element or solenoid. This is because it operates also with a sink, where the voltage and current directions are reverse.

●Broadband, high speed, and high-voltage●

The BA4850 faithfully reproduces pulse signals with quick rise and complex waveform signals as well, because the frequency band is DC to 50MHz and the slew rate is 6,000V/μs. The BA4825 drives current from a large piezoelectric element or display device, because the band is DC to 2MHz and the maximum high-voltage output is 300Vp-p. Since both models can amplify direct current, waveforms containing an offset and those that are asymmetric in the positive and negative areas can be input for amplification.

●Low output impedance●

The BA Series keeps a low output impedance throughout the overall range (0.5Ω+1.5μH or less typ. for BA4825). With the voltage drop (raised due to load connection) suppressed to the minimum, the power of the equipment is maximized.

●Multiple functions●

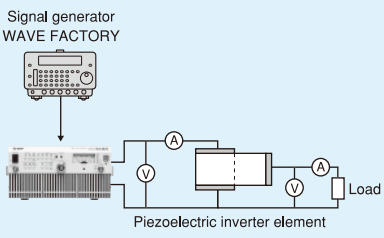
- Range shifting function*1 for changing output range.
- DC bias addition function*1 for adding direct current (bias) to the output.
- DC offset adjustment function for setting DC offset in output to 0 (zero).
- Equipped with output voltage monitor terminal (BNC, monitor ratio 1/100)*1 and monitor meter (output voltage/current switching display)*1.
- Output on/off can be switched from the panel or externally controlled.
- Output polarity switching (INVT) for setting the device to either an in-phase or reversed-phase amplifier. Use of reversed-phase output enables BTL*2 connection, which doubles the output voltage and power, using two BA Series amplifiers.
- Two systems, A and B, for input. Switching and addition of the input by pressing a single key*1.
- Input impedance switchable between 50Ω and 10kΩ*1.
- The settings at power-on can be set using the dip switches on the rear panel.
- The power input is available for worldwide applications (100 to 230V AC).

*1 : BA4825 function *2 : Balanced Transformerless

APPLICATION

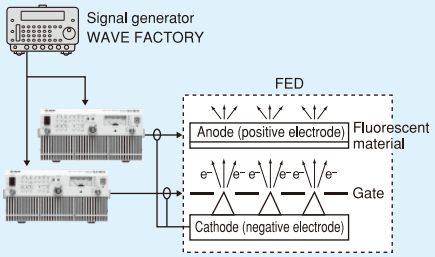
1 Driving and evaluation of piezoelectric elements

High voltage and high speed are required when a piezoelectric element used for a piezoelectric inverter or piezoelectric actuator is to be driven and evaluated.
In addition to high-voltage output, BA Series amplifiers keep extremely small output impedance. Therefore, they can offer superior step response against high capacity piezoelectric element.



2 Test and evaluation of display devices

Flat display panels such as FEDs and LCDs require high voltage for driving, and quick rise for evaluation of their response characteristics. With their high-voltage output and high slew rate, BA Series amplifiers enable accurate drive tests and evaluations.



Other Applications

- Driving of elastic surface wave ultrasonic motors and comb tooth-shaped electrodes in the field of nanotechnology and MEMS
- High-frequency ripple tests of capacitors
- Development of ink jet application technology
- Characteristics tests for semiconductors such as diodes and SCRs

high-power output voltage, and more provide stable

Main ratings

Frequency

Frequency band	BA4825	DC to 2MHz
	BA4850	DC to 50MHz

Output

Maximum output voltage	BA4825	●±150V range (rated resistance load 200Ω) 100Vrms or greater 40Hz to 500kHz 70Vrms or greater 500kHz to 1MHz 40Vrms or greater 1MHz to 2MHz ●±150V range (rated resistance load 450Ω) ±150V (300Vp-p) DC to 500kHz ±100V (200Vp-p) 500kHz to 1MHz ±56V (112Vp-p) 1MHz to 2MHz ●+250V range (rated resistance load 1,250Ω) −50V to +250V DC to 500kHz +40V to +240V 500kHz to 1MHz +80V to +200V 1MHz to 2MHz ●−250V range (rated resistance load 1,250Ω) −250V to +50V DC to 500kHz −240V to −40V 500kHz to 1 MHz −200V to −80V 1MHz to 2MHz
	BA4850	±20V (rated resistance load 50Ω) DC to 20MHz ±14.2V (rated resistance load 50Ω) 20MHz to 50MHz
Rated output current	BA4825	0.5Arms (±150V range, rated resistance load 200Ω)
	BA4850	±1A DC
Output power	BA4825	50W (in rated condition), 150W max.
	BA4850	Approx. 8W max.
Operation mode		Constant voltage (CV)
Output polarity		In-phase or reversed phase (toggled with the panel switch)
Characteristics of small-amplitude frequency	BA4825	DC to 100kHz, ±0.5dB 100kHz to 2MHz, +1, −3dB Conditions : Output amplitude 20 Vrms, reference 1kHz
	BA4850	DC to 100kHz, ±0.5dB 100kHz to 50MHz, +1, −3dB Conditions : Output amplitude ±4V, reference 1kHz
Gain setting	BA4825	Fixed : ×1, ×10, ×20, and ×50
	BA4850	Fixed : ×1, ×2, ×5, and ×10
		Variable : ×1 (CAL) to ×3, consecutive The set gain equals to (Fixed × Variable).
Slew rate	BA4825	500V/μs or greater
	BA4850	6000V/μs or greater
Output DC offset		Adjustment range : ±0.5V or more (input terminal short circuit)
Output DC bias	BA4825	±200V or more (Allows turning on/off by the front panel switch.)
Output impedance	BA4825	0.5Ω+1.5μH or less (typ.)
	BA4850	3.3Ω+0.01μH or less (typ.)
Output terminal		BNC connector (front panel), Lo side grounded to the cabinet
Monitor output	BA4825	1/100 of output voltage, in-phase
Monitor meter	BA4825	Displays output voltage or current (toggled with the switch)
Output on/off		Front panel switch or external control input

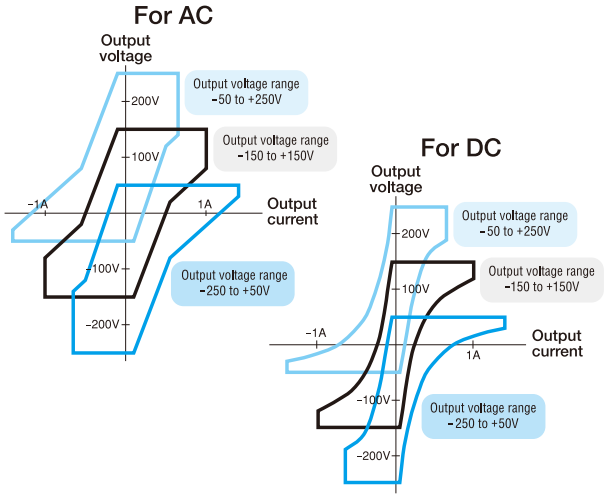
Input

Maximum input voltage		±10V
Number of terminals	BA4825	2 (A input : Front panel, B input : Rear panel) (Input type may be A input, B input, or both A input and B input.)
	BA4850	1 (Front Panel)
Input terminals		BNC connector, Lo side grounded to the cabinet
Input impedance	BA4825	50Ω and 10kΩ switchable
	BA4850	50Ω

Miscellaneous

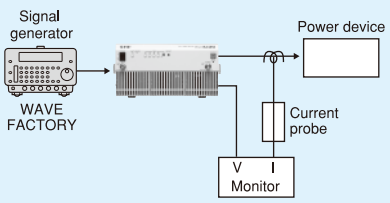
Protection function		Output overcurrent, output overvoltage, power section failure, abnormal internal temperature
External control input/output		Output on/off and other uses
Settings at power-on		Settings power-on made by dip switches on the rear panel (10 settings for BA4825, or 4 settings for BA4850)
Power input		AC 100V to 230V ±10% (at 250V or less) 50/60 ±2Hz
Power consumption	BA4825	350VA or less
	BA4850	200VA or less
Operating temperature and humidity		0 to +40℃, 5 to 85%RH (Absolute humidity 1 to 25 g/m³, no condensation)
External dimensions (mm)		258 (W) × 132.5 (H) × 390 (D) (not including protrusions)
Weight		Approx. 7kg

BA4825 output voltage and current range



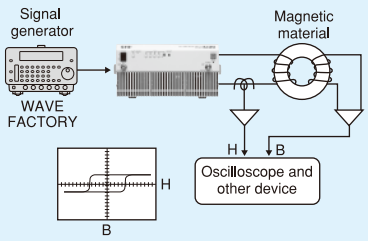
3 Power amplifier for signal or pulse generators

During the evaluation process of power devices, the performance is evaluated with a broadband, high voltage, and large current. With their broadband, high speed, and high voltage output, BA Series amplifiers evaluate and test devices, using various waveforms, pulse patterns, and arbitrary waveforms.



4 Measurement of magnetizing characteristics (B-H curves)

The BA Series can be used for magnetization measurement such as ferrite and amorphous materials. The BA Series features the high frequency of 50MHz required for measuring B-H curves, as well as high voltage output and high stability against inductive loads, reproducing stable measurement.



- Characteristic test for the devices such as relays and switches
- R&D of IC cards
- Use of driving devices and materials and other R&D use or experiments in the leading edge technology field

NF Bipolar Power Supplies/Power Amplifiers Lineup

NF offers a wide-ranging lineup of bipolar power supplies and power amplifiers to meet various consumer demands. You can select what you need, according to your application.

	BA Series High Speed Bipolar Power Amplifier	HSA Series High Speed Bipolar Power Amplifier	BP Series Bipolar Power Supply	As-161 Series High Speed Bipolar Power Amplifier for Testing Vehicle Electronic Components	HVA4321 10kA AC/DC Amplifier
Appearance	 BA4825	 HSA4051	 BP4610	 As-161-30/60	
Frequency band	BA4825 : DC to 2MHz BA4850 : DC to 50MHz	①DC to 1MHz ②DC to 500kHz ③DC to 10MHz	DC to 150kHz	DC to 150kHz	Constant voltage : DC to 7kHz Constant current : DC to 6kHz
Output voltage	BA4825 : 100Vrms (300Vp-p) BA4850 : ±20V	①150Vp-p ②300Vp-p ③142Vp-p	120Vp-p (−5V to +115V、 −115V to +5V)	①−15V to +60V ②−10V to +30V	±10kV
Output current	BA4825 : 0.5Arms BA4850 : ±1A	①2.82Ap-p to 11.3Ap-p ②2.83Ap-p to 5.66Ap-p ③2.8Ap-p	BP4610 : ±10A (30Ap-p) BP4620 : ±20A (60Ap-p)	①±30Apeak to ±120Apeak ②±60Apeak to ±240Apeak	±10mApeak (DC+AC)
Other features	●Slew rate BA4825 : 500V/μs BA4850 : 6000V/μs ●Low-output impedance ●Output polarity switching ●Output range shift (BA4825) ●DC bias addition (BA4825)	●Slew rate 400V/μs to 5000V/μs ●Low-output impedance ●Output range shift ●DC bias addition ●DC offset adjustment ●Six models in the same series	●Built-in sequential signal source ●Operation with constant voltage/current ●Response calibration (response characteristic adjustment) ●Voltage current limiter ●Measuring and displaying the DC/AC voltage current ●Output on/off and memory function	●Low-output impedance ●Slew rate limit adjustable to five levels ●Durability to C load : 100μF or less ●Output monitoring ●Six models in the same series ●Customized specifications available	●Slew rate Constant voltage : 500V/μs Constant current : 1mA/μs ●3 output modes ●Voltage current monitor output ●Small output residual noise ●High-voltage output indicator

Related products

Multifunction Synthesizer WAVE FACTORY

As a signal source of bipolar power amplifiers.

- 0.01μHz to 15MHz or 50MHz
- Six models in the same series
- Outputs a wide variety of waveforms, such as standard and arbitrary waveforms
- Burst, trigger, gate, triggered gate, pulse generation function, sweep function, and modulation function
- Various outputs enabled by two-channel mode
- Standard software for generating arbitrary waveforms

WF1946B
2CH, 0.01μHz to 15MHz

Frequency Response Analyzer FRA5087/FRA5097

For high-accuracy frequency characteristic measurements, including resonance characteristic measurement of piezoelectric elements.

FRA5097
0.1mHz to 15MHz

- FRA5087 : 0.1mHz to 10MHz
  FRA5097 : 0.1mHz to 15MHz
- Gain accuracy : ±0.05dB, phase accuracy : ±0.3°
- Dynamic range : 140dB min
- Auto ranging function
- Isolation voltage : 250Vms

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The NF website offers the latest product and technical information and support. The site also provides forms for requesting various catalogs and inquiry Access the NF website anytime! Our English home page is at :

http://www.nfcorp.co.jp/english/

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NF Corporation

Head Office
6-3-20 Tsunashima Higashi, Kohoku-ku, Yokohama 223-8508, Japan
Phone : +81-45-545-8128 Fax : +81-45-545-8187

Shanghai Representative Office
Room22G, Huamin Empire Plaza, No.726 Yan An West Road, Changning District, Shanghai 200050, China
Phone : +86-21-6473-5735 Fax : +86-21-6415-6576

Shenzhen Representative Office
Room1701, East, Aidi Building, No.5003 Binhe Road, Futian District, Shenzhen 518045, China
Phone : +86-755-8355-1866 Fax : +86-755-8355-1214

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