HIGH SPEED BIPOLAR AMPLIFIER

HSA SERIES

DC to 10MHz, High Speed and Broad Range
Maximum 300Vp-p high output voltage
plus, minus, source and sink operation are available

NF Corporation

Specifications are subject to change without notice.

REPRESENTATIVE
Tough Bipolar Power Amplifier against High Speed, Broad Range, High Voltage, High Power and Various Loads.

HSA series is a power amplifier which has high speed, broad bandwidth (DC to max.10 MHz), and the capability of supplying high voltage and high power. DC/DC, DC/AC signal is variable continuously with wide output range of maximum 300Vpp without switching. Furthermore, the 4-dimensional output is possible, source mode (providing a power to load from a power amplifier in coincidence of voltage polarity and current polarity as normal amplifier) and sink mode (providing a power to load to power amplifier in reverse current). Operation region of HSA series is available. Therefore, it is possible to drive smoothly a capacitive load and an inductive load like a piezo electric component, a solenoid and others. 6 different models concerning frequency range, output voltage and output current are available as HSA series.

- **Operation region of HSA series**
  - A dimensional output

- **Step response**
  - Slow rise which is important when large amplitude output is required, is maximum 500V/µs, reproduces a signal in high fidelity by good response for high speed, repetitive and high speed transient phenomenon signal.

- **Features**
  - High speed, broad bandwidth and high slew rate
  - Frequency range is DC to max.10MHz, slew rate is max.300V/µs.
  - A fast rise time pulse signal and a complicated waveform signal can be amplified with a high fidelity.
  - High voltage output: Max. output voltage is 300Vpp. Possible to drive power actuators and display devices by a big margin.
  - 4 dimensions output : bipolar output
    - Available for output maximum of voltage and current transfer.
    - Changing of amplitude polarity continuously without switching.
    - Excellent step response
    - Possible to get a clean waveform of low overshoot and ringing.
  - Two inputs are provided
    - Input A and B of dual inputs. One touch operation for additional and input change.
  - DC bias
    - Equipped with DC bias function enabling to add DC to the output.
  - Low output impedance
    - Enable to get excellent response in capacitive and inductive load.

- **Function of output range shift**
  - Equipped with the range shift function which is able to change output range.

- **Others**
  - Equipped with DC-offset adjustment function, protection circuit, monitor meter & monitor output, output on/off switch and others.
  - The above-mentioned functions are not equipped with some model.
  - Please refer to the specifications below for the detail functions and the comparison of such models.

### Applications
- Driving piezoelectric actuator, piezoelectric inverter and others
- Measurement of B field response of magnetic materials.
- High frequency ripple less of capacitance.
- Drive test of display panel for LED, LCD and others.
- Power boosting of Signal generator.

## Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>HSA4011</th>
<th>HSA4012</th>
<th>HSA4014</th>
<th>HSA4015</th>
<th>HSA4052</th>
<th>HSA4101</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Frequency range</td>
<td>100Vpp (≤500MHz)</td>
<td>100Vpp (≤500MHz)</td>
<td>100Vpp (≤500MHz)</td>
<td>300Vpp (≤5000V)</td>
<td>300Vpp (≤5000V)</td>
<td>400Vpp (≤5000V)</td>
</tr>
<tr>
<td>Maximum voltage</td>
<td>50Vrms (≤60MHz)</td>
<td>50Vrms (≤60MHz)</td>
<td>50Vrms (≤60MHz)</td>
<td>150Vrms (≤600MHz)</td>
<td>150Vrms (≤600MHz)</td>
<td>200Vrms (≤600MHz)</td>
</tr>
<tr>
<td><strong>Input</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency range</td>
<td>DC to 1MHz</td>
<td>DC to 1MHz</td>
<td>DC to 1MHz</td>
<td>DC to 50MHz</td>
<td>DC to 50MHz</td>
<td>DC to 50MHz</td>
</tr>
<tr>
<td>Maximum current</td>
<td>14Amps, 22Amps (400V to 1600V)</td>
<td>2Amps, 6Amps (400V to 1600V)</td>
<td>4Amps, 5Amps (400V to 1600V)</td>
<td>6Amps, 8Amps (400V to 1600V)</td>
<td>6Amps, 8Amps (400V to 1600V)</td>
<td>6Amps, 8Amps (400V to 1600V)</td>
</tr>
<tr>
<td><strong>Slew rate</strong></td>
<td>2.7V/µs (max)</td>
<td>2.7V/µs (max)</td>
<td>2.7V/µs (max)</td>
<td>2.7V/µs (max)</td>
<td>2.7V/µs (max)</td>
<td>2.7V/µs (max)</td>
</tr>
<tr>
<td>Impedance</td>
<td>1.0Ω (12.5Ω max)</td>
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</tr>
<tr>
<td><strong>Power output</strong></td>
<td>1000W (≤500V)</td>
<td>1000W (≤500V)</td>
<td>1000W (≤500V)</td>
<td>1000W (≤500V)</td>
<td>1000W (≤500V)</td>
<td>1000W (≤500V)</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>1.0MHz, 2.0MHz</td>
<td>1.0MHz, 2.0MHz</td>
<td>1.0MHz, 2.0MHz</td>
<td>1.0MHz, 2.0MHz</td>
<td>1.0MHz, 2.0MHz</td>
<td>1.0MHz, 2.0MHz</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>500W (400V)</td>
<td>500W (400V)</td>
<td>500W (400V)</td>
<td>500W (400V)</td>
<td>500W (400V)</td>
<td>500W (400V)</td>
</tr>
<tr>
<td>Dimensions/Weight [WxHxD]/[mm/kg]</td>
<td>450x177x171 / 4.4</td>
<td>450x177x171 / 4.4</td>
<td>450x177x171 / 4.4</td>
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</tr>
</tbody>
</table>

**Reference**
- DC mode : DC to 1kHz (≤5000V)
- 40Vpp output frequency (≤1kHz) is inverted.

HSA40101 is only available to change input coupling (AC/DC).
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