Electromagnetic Field Measurement System

Magnetic Near Field Probes
- Low-frequency (Active Probes)
- Low-frequency, High-current, Wideband
- High-frequency (GHz), Wideband

Probe Amplifiers
- High-gain, Ultra-low noise
- High-gain, Ultra-wideband

LF Active Antenna (Three axes)
- Three Axes Near Magnetic Field/Far Electric Field Active Antenna

Measurement Instruments
- Spectrum Analyzers

EMI/ESD Visualization Systems
- High-precision Scanner System
- Compact Scanner System

Measurement Services
- A2LA Calibration Services
### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>AEKP001</th>
<th>AEKP002</th>
<th>AEKP003</th>
<th>ALMP001</th>
<th>AEMP002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>9 kHz - 30 MHz</td>
<td>3 kHz - 2 MHz</td>
<td>100 kHz - 3 GHz</td>
<td>10 MHz - 18 GHz</td>
<td></td>
</tr>
<tr>
<td>Measurement range</td>
<td>0.02 A - 14 A</td>
<td>0.002 A - 1.4 A</td>
<td>0.2 mA - 1.4 A</td>
<td>5 A (max.)</td>
<td>N/A</td>
</tr>
<tr>
<td>Space resolution</td>
<td>1.9 mm</td>
<td>2.4 mm</td>
<td>2.5 mm</td>
<td>1.0 mm</td>
<td>0.5 mm</td>
</tr>
<tr>
<td>Connector</td>
<td>SMA (Jack)</td>
<td>SMA (Jack)</td>
<td>SMA (Jack)</td>
<td>SMA (Jack)</td>
<td>SMA (Jack)</td>
</tr>
<tr>
<td>Detector size</td>
<td>9.0 mm x 3.5 mm</td>
<td>12.0 mm x 3.0 mm</td>
<td>2.5 mm x 0.7 mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attachment**: Compatible with the attachment for CP-2SA in 4EM500/4EM200U (NEC Platforms, Ltd.)

**DUTs**
- Power circuits
- DC/DC converters
- Power devices
- Ferromagnetic field power equipment
- Power equipment
- Boards with high speed digital devices (high speed FPGA, DSP, CPU)
- High speed digital communication boards (PCI Express 2.0, USB3.0, HDMI 1.3, etc.)
- Microwave circuit boards and components

**Recommended Probe Amplifier**
- Not needed (Probe amplifier embedded)
- AELA001, AEMA001
- AEWA001

**Power supply**
- DC 17 V - 22 V (AC adapter included)
- N/A
- N/A

**Compatible probes (products of NEC Platforms, Ltd.)**
- N/A

- Model: MP-10LA
  - Frequency: 150 kHz - 1 GHz
  - Space Resolution: Approx. 1.0 mm
  - Connector: SMA (Jack)
  - Detector Size: 12.0 mm x 3.0 mm
- Model: CP-2SA
  - Frequency: 10 MHz - 3 GHz
  - Space Resolution: Approx. 0.25 mm
  - Connector: SMA (Jack)
  - Detector Size: 2.0 mm x 1.0 mm

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Magnetic Near Field Probes

AEKP001
- Low-frequency
- Built-in amplifier

AEKP002
- Low-frequency
- Built-in amplifier

AEKP003
- Low-frequency
- Built-in amplifier

ALMP001
- Low-frequency
- High-current
- Wideband

AEMP002
- High-frequency (GHz)
- Wideband

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**Measurement System**
- w/AEKP001/AEKP002/AEKP003
- A series of AEKP comes with a bias adapter, AD adapter and a case.
* Spectrum Analyzer is sold separately.
## Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency</th>
<th>Noise figure</th>
<th>Gain</th>
<th>1 dB compression</th>
<th>Max. output power</th>
<th>SWR</th>
<th>Input level</th>
<th>Impedance</th>
<th>Power supply</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Recommended probes</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>AELA001</td>
<td>100 kHz - 1 GHz</td>
<td>≤5 dB</td>
<td>≥50 dB</td>
<td>≤-43 dBm</td>
<td>≥5.5 dBm</td>
<td>≤2</td>
<td>+5 dBm (max.)</td>
<td>SMA (Jack) 50 Ω</td>
<td>17 V - 22 V DC ≤150 mA</td>
<td>W100 mm x D330 mm x H90 mm</td>
<td>Approximately 1 kg</td>
<td>ALMP001, AEMP002, CP-2SA, MP-10LA</td>
<td>Calibration data, AC adapter</td>
</tr>
<tr>
<td>AEMA001</td>
<td>1 MHz - 6 GHz</td>
<td>≤5 dB</td>
<td>10 MHz - 1 GHz: ≥40 dB</td>
<td>10 MHz - 6 GHz: ≤-28 dBm</td>
<td>≥8 dBm</td>
<td>10 MHz - 1 GHz: ≤2</td>
<td>+13 dBm (max.)</td>
<td>SMA (Jack) 50 Ω</td>
<td>15 V - 22 V DC ≤110 mA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AEWA001</td>
<td>10 MHz - 20 GHz</td>
<td>≤5 dB</td>
<td>10 MHz - 1 GHz: ≥40 dB</td>
<td>10 MHz - 6 GHz: ≤-18 dBm</td>
<td>≥8 dBm</td>
<td>10 MHz - 10 GHz: ≤2</td>
<td>+18 dBm (max.)</td>
<td>K (Jack) 50 Ω</td>
<td>12 V, 330 mA DC (16.5 V in max.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Typical performance at 25°C

- **1 dB comp. (dBm)**
- **Gain (dB)**
- **Max. output power (dBm)**
- **NF (dB)**

### Other Details

- **AELA001:** High-gain, Ultra-low noise
- **AEMA001:** High-gain, Ultra-wideband
- **AEWA001:** High-gain, Ultra-wideband

*Please see the probe specifications for details.*
LF Active Antenna (Three axes)

AALF001 (Directional/Non-directional selectable)
Three Axes Near Magnetic Field/Far Electric Field Active Antenna
This is designed and developed to measure near magnetic field strength of power electronics (e.g. cars, medical equipment, and robots), as well as to monitor a transmitting antenna for long and medium wavebands.

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>AALF001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directivity</td>
<td>Each axis and composition of X, Y, and Z</td>
</tr>
<tr>
<td>Frequency</td>
<td>9 kHz - 3 MHz</td>
</tr>
<tr>
<td>Impedance</td>
<td>50 Ω</td>
</tr>
<tr>
<td>VSWR</td>
<td>≤1.2</td>
</tr>
<tr>
<td>Minimum reception field strength</td>
<td>80dB μV/m (9 kHz)</td>
</tr>
<tr>
<td>Output connector</td>
<td>BNC (Jack)</td>
</tr>
<tr>
<td>Power supply</td>
<td>DC 17 V - DC 22 V, 60 mA</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0°C - +50°C (No condensation)</td>
</tr>
<tr>
<td>Weight</td>
<td>220 g</td>
</tr>
<tr>
<td>Size</td>
<td>• Antenna radome Φ67 x 90 mm • Grip Φ38 x 130 mm</td>
</tr>
<tr>
<td>Applications</td>
<td>• Noise measurement by power inverter • Noise measurement by switching regulator • LF, MF Transmitting antenna field measurement</td>
</tr>
</tbody>
</table>

*Spectrum Analyzer and cable are sold separately. *AC adapter is included. *Antenna stand is not included. *A2LA calibration data sheet is available (optional). *Cert. #3606.01 is the certification number to OHTAMA Calibration Service Co., Ltd.

### Measurement Instruments

**Spectrum Analyzers**
AET, Inc. is a Solution Partner in Japan of Keysight Technologies, Inc. For further information, please contact us.
### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>4EM500</th>
<th>4EM200U</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DUTs</strong></td>
<td>Equipment, PCBs, LSIs, Modules, Components, etc.</td>
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</tr>
<tr>
<td><strong>Measurement method</strong></td>
<td>Four-axis stage operates a probe.</td>
<td></td>
</tr>
<tr>
<td><strong>Measurement range</strong></td>
<td>(X, Y, Z = 500 \times 500 \times 210 \text{ (mm)}, \theta = +/- 90 \text{ deg.})</td>
<td>(X, Y, Z = 200 \times 200 \times 100 \text{ (mm)}, \theta = 0 \text{ and } 90 \text{ deg.} ) (Two positions)</td>
</tr>
<tr>
<td><strong>Stepping motion</strong></td>
<td>(X, Y, Z = 0.01 \text{ mm}, \theta = 1 \text{ deg.})</td>
<td>(X, Y, Z = 0.1 \text{ mm})</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>(W860 \times D862 \times H840 \text{ (mm), excluding protruding parts})</td>
<td>(W297 \times D420 \times H500 \text{ (mm), excluding protruding parts})</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Approximately 110 kg</td>
<td>Approximately 15 kg</td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>(\text{AC 100-240 V, 50/60 Hz})</td>
<td></td>
</tr>
<tr>
<td><strong>Control interface</strong></td>
<td>Motor Control Board (USB or PCI-Express*), GPIB-USB</td>
<td>Motor Control Card (USB), GRIP-USB</td>
</tr>
<tr>
<td><strong>Measurement instruments</strong></td>
<td>Spectrum Analyzer</td>
<td></td>
</tr>
<tr>
<td><strong>Accessories</strong></td>
<td>RF cables</td>
<td>Rotary joint</td>
</tr>
</tbody>
</table>

\*Options and customization are available. \*For further information, refer to the product catalog of NEC Platforms, Ltd. \*PCI Express\* is the trademark of PCI-SIG.

### Options

#### Optional Function (4EM500)

With the laser height measurement function, 4EM500 can measure EMI distribution with a probe non-contact tracking according to a DUT height.

#### Measurement and Simulation

- **Superposition of measurement results**
- **Data link from EMIStream\® to CST MICROWAVE STUDIO\®**

*High-precision Scanner System, Compact Scanner System and EMD Viewer System are the products of NEC Platforms, Ltd.

*EMIStream is the trademark or the registered trademark of NEC Solution Innovators, Ltd. in the United States and/or other countries.

*CST MICROWAVE STUDIO is the trademark or the registered trademark of CST in North America, the European Union, and other countries.
Measurement Services

A2LA Calibration Services
This is A2LA accredited calibration services to ISO/IEC17025 for LF Magnetic Field Sensor and High-sensitivity Low-frequency Active Antenna.

*The measurement is provided by OHTAMA Calibration Service Co., Ltd.