

AVX-M HIGH-SPEED, NARROW-PULSE TRANSFORMERS

The AVX-M series is designed to be used with general-purpose laboratory pulse generators and with Avtech nanosecond pulse generators to match to non-50-Ohm impedance levels, or to obtain higher output currents or voltages.

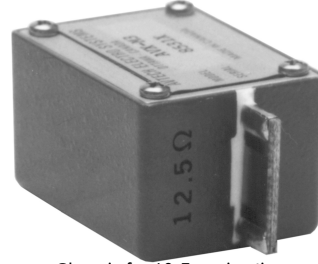
For example, the AVX-M series may be used on the outputs of the AVP, AVI or AVL series to double or quadruple the peak output current, as may be required for pulse testing of high current laser diodes and other low impedance loads (see the application note at <http://www.avtechpulse.com/appnote/general> for details).

Models with rise times of 1, 2 or 5 ns are packaged in a 1.5"x1.1"x0.9" aluminum chassis with microstrip solder terminals as shown in the photo to the right.

Model AVX-M4-H is similar, but has larger dimensions to support its higher peak output currents (up to 63A) and pulse widths (up to 200 ns).

Models with sub-nanosecond rise times (-S units) are packaged in a miniature epoxy coated module as shown below.

For all models, the load is soldered directly to the pads of the microstrip area. Any lead lengths should be kept very short. Both sides of the transformers are ground-referenced (not floating).



Chassis for 1 & 5 ns rise times units, 38x28x23 mm, approx.



-S unit chassis 15x15x15 mm, approx.

| Model: | AVX-M4-S | AVX-M4 | AVX-M4-H | AVX-M3-S | AVX-M3 | AVX-M1-S | AVX-M1 |
|------------------------|---|-----------------------------|------------------------|----------------------------|-----------------------------|----------------------------|-----------------------------|
| Impedance match: | 50Ω to 3Ω | | | 50Ω to 12.5Ω | | 50Ω to 200Ω | |
| Basic function: | current quadrupling | | | current doubling | | voltage doubling | |
| Max. voltage in | 30 V | 350 V | 750V | 30 V | 350 V | 30 V | 350 V |
| Max. voltage out | 7.5 V | 87 V | 188V | 15 V | 175 V | 60 V | 700 V |
| Max. current out | 2.5 A | 28 A | 63A | 1.2 A | 14 A | 0.3 A | 3.5 A |
| Max. pulse width: | 250 ns @ 15V 125 ns @ 30V | 100 ns | 200 ns | 10 ns | 100 ns | 10 ns | 100 ns |
| Rise time (20%-80%): | 300 ps | 2 ns | 5 ns | 100 ps | 1 ns | 100 ps | 1 ns |
| Droop (max): | < 5% | | | | | | |
| Dimensions: (HxWxD) | 15x15x15mm 0.6x0.6x0.6" | 38x28x23mm 1.5x1.1x 0.9" | 43x76x76mm 1.7x3x3" | 15x15x15mm 0.6x0.6x0.6" | 38x28x23mm 1.5x1.1x 0.9" | 15x15x15mm 0.6x0.6x0.6" | 38x28x23mm 1.5x1.1x 0.9" |
| Connectors: | In: SMA | | | | | | |
| | Out: Microstrip line, with ground plane bordering the output center conductor | | | | | | |

AVX-MR HIGH-POWER, WIDE-PULSE TRANSFORMERS

- Voltage-doubling units (to 200 Ohms)
- Output amplitudes to 800 Volts
- Current-doubling and quadrupling units (to 3 Ohms)
- Output amplitudes to 16 Amperes
- Pulse widths to 10 us
- 8 models

Avtech offers a complete range of high-amplitude, high-pulse width voltage-boosting (-MRA) and current-boosting matching transformers (-MRB). These models accommodate wider pulse widths than the AVX-M series described above.

For voltage-doubling applications, Avtech offers 3 AVX-MRA series models rated at peak input voltages of 100, 200 and 400 Volts all with maximum pulse width ratings of 5 us and rise times of less than 5 ns. Voltage-doubling transformers require a load impedance of 200 Ohms for proper operation.

For current-boosting applications, the AVX-MRB1, AVX-MRB2, and AVX-MRB4 current-doubling transformers have peak input voltage ratings of 100, 200 and 400 Volts and maximum pulse

width ratings of 5 us, and require load impedances of 12.5 Ohms. In addition, Avtech offers a current-doubling transformer (AVX-MRB5) and a current-quadrupling transformer (AVX-MRB6) specifically designed for use with the AV-1010-C, AV-1011-B and AV-1015-B pulse generators.

Most models have BNC connectors (type N output connectors on units providing output amplitudes greater than 500 Volts and micro-strip output terminals on the AVX-MRB5 and -MRB6). Both sides of the transformer are ground-referenced (i.e., not floating). The input port of the transformer includes a shunt 470 Ohm resistance followed by a series DC blocking capacitor and as a consequence the input and output ports are not reversible.

| Model: | AVX-MRA1 | AVX-MRB1 | AVX-MRA2 | AVX-MRB2 | AVX-MRA4 | AVX-MRB4 | AVX-MRB5 | AVX-MRB6 |
|----------------------|-------------------------------------|------------------|-------------------------|------------------|--------------------------|------------------|--|---------------------|
| Max. voltage in | 100 V | 100 V | 200 V | 200 V | 400 V | 400 V | 100 V | 100 V |
| Max. voltage out | 200 V | 50 V | 400 V | 100 V | 800 V | 200 V | 50 V | 25 V |
| Max. current out | 1 A | 4 A | 2 A | 8 A | 4 A | 16 A | 4 A | 8 A |
| Function: | voltage-doubling | current-doubling | voltage-doubling | current-doubling | voltage-doubling | current-doubling | current-doubling | current-quadrupling |
| Max. pulse width: | 5 us | | | | | | 10 us | |
| Impedance (Ohms): | 50 to 200 | 50 to 12.5 | 50 to 200 | 50 to 12.5 | 50 to 200 | 50 to 12.5 | 50 to 12.5 | 50 to 3 |
| Rise time (20%-80%): | 1 ns | | 3 ns | | 5 ns | | 20 ns | 30 ns |
| Droop (max): | < 5% | | | | | | | |
| Dimensions: | mm: 28x33x50 inches: 1.1x1.3x2.3 | | 43x76x76 1.7x3.0x3.0 | | 43x66x109 1.7x2.6x4.3 | | 43x76x152 1.67x3x6 43x76x76 1.7x3.0x3.0 | |
| Connectors: | In: BNC Out: BNC | | BNC BNC | | BNC N | | BNC BNC 1 cm microstrip PCB ¹ | |

1) If the load can not be soldered directly to the microstrip PCB, consider using AV-LZ12 or AV-LZ3 low-characteristic-impedance transmission lines.