



## DC to 26.5 GHz Programmable Attenuator, 11 dB, 1 dB Step Size

### Description:

**Model STA-0002731101-3F3F-P7** is a coaxial programmable attenuator for use in microwave and millimeter systems where auto attenuation adjustment is required. The attenuator covers the frequency range of DC to 26.5 GHz. The attenuation bias and control are via a 10 pin (2x5) 0.1" pin spacing shrouded male connector to accommodate remote operations from 0 to 11 dB. The attenuation step sizes are 1 dB. The actuator control and interface circuits are custom designed and uniquely packaged within the attenuator housing. The microprocessor-based electronics ramp the speed of a precision actuator to ensure fast and accurate positioning. The RF connectors are 3.5 mm female. Other connector options are offered under different model numbers. A 9" female to female cable with 10 pin connectors is included for interface convenience.



### Features:

- DC to 26.5 GHz Coverage
- High Attenuation Value up to 11 dB
- TTL Control via Logic Table
- Low DC Power Once Latching

### Applications:

- Test Lab
- Instrumentations
- Auto Test Set

### Electrical Specifications:

| Parameter                                | Minimum  | Typical                      | Maximum             |
|--|--|------------------------------|---------------------|
| RF Frequency Range                       | DC   |                              | 26.5 GHz            |
| Insertion Loss (at 0 dB Setting)         |  | 3.0 dB                       | 3.5 dB              |
| Attenuation Range                        | 0 dB   |                              | 11 dB               |
| Attenuation Accuracy (Attenuation Range) | ±0.8 dB (1 to 4 dB); ±1.0 dB (5 to 6 dB); ±1.3 dB (7 to 9 dB)<br>±1.6 dB (10 to 11 dB) |                              |                     |
| Attenuation Step Size                    | 1 dB   |                              |                     |
| Repeatability                            |  | 0.05 dB                      |                     |
| Switching Speed (Per Switch)             |  | 20 ms                        | 25 ms               |
| Switching Control                        | TTL, Logic Table   |                              |                     |
| Return Loss                              | 10 dB  | 15 dB                        |                     |
| Power Handling                           |  |                              | 1 Watt (CW)         |
| Operating Life (Per Switch)              | 1,000,000 cycles   |                              |                     |
| Specification Temperature                |  | +25 °C                       |                     |
| Operation Temperature                    | -20 °C   |                              | +75 °C              |
| Shock, 3 Axis, 6 Direction               | 10g, 6 ms  |                              |                     |
| Vibration                                | 5g, 50 to 2,000 Hz   |                              |                     |
| Humidity                                 | 240 hours @ +40 °C, 95% RH   |                              |                     |
| Operating Voltage/Current                | +20 V <sub>DC</sub>  | +24 V <sub>DC</sub> / 135 mA | +28 V <sub>DC</sub> |



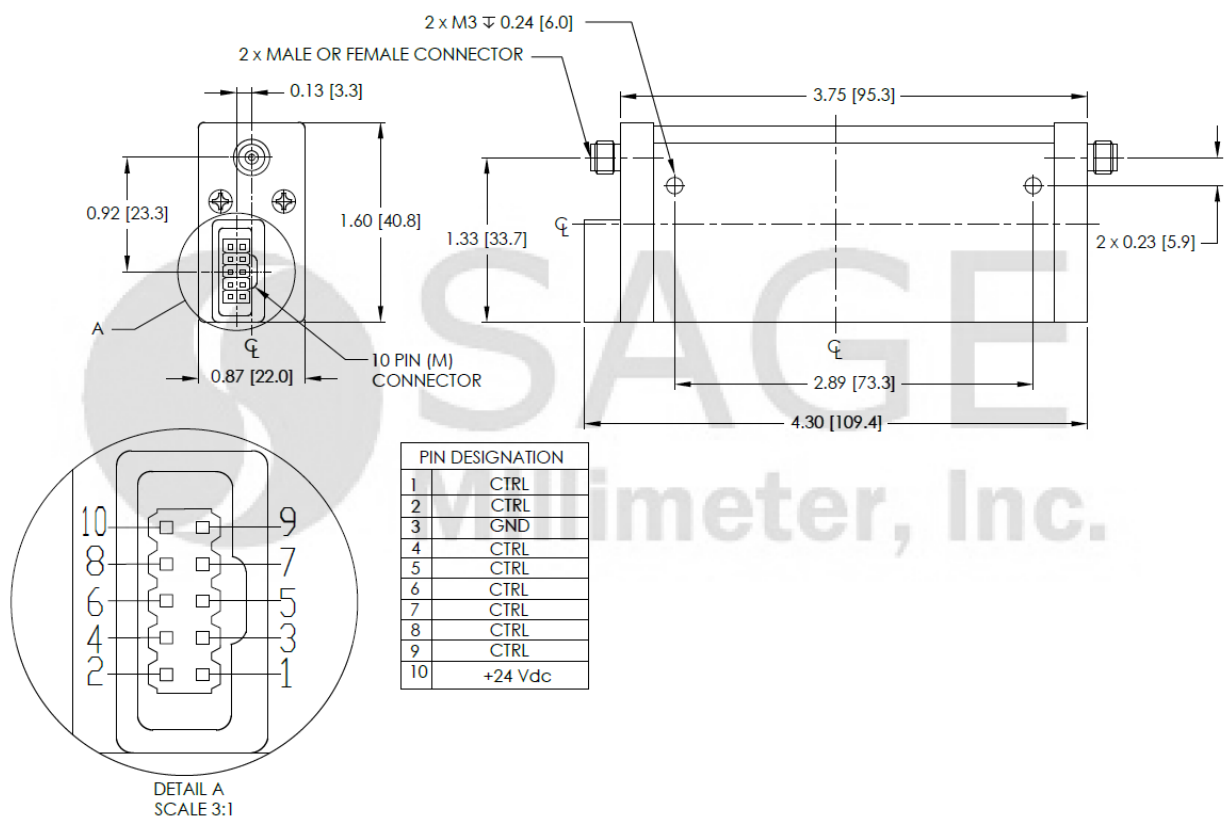


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### Mechanical Specifications:

| Item              | Parameter   |
|-------------------|---|
| RF Ports          | 3.5 mm Female   |
| Control Interface | 10 Pin (2x5) 0.1" Pin Spacing Shrouded Male Connector |
| Bias Port         | 10 Pin (2x5) 0.1" Pin Spacing Shrouded Male Connector |
| Finish            | Black Anodized and Passivate Stainless Steel          |
| Weight            | 12 Oz   |
| Outline           | TA-PC-CE1   |

**Mechanical Outline:** (Unless otherwise specified, all dimensions are in inches [millimeters])



### Bias and Control Instructions:

The attenuator requires a typical DC bias at +24 Volts with 135 mA current capacity. The required current is only for switching. Once the attenuation state is settled no DC power is consumed. The switching time is no longer than 25 milliseconds.

The bias and control signal interface connector is shown in the mechanical outline. The detailed control signal for various attenuation values is shown in the Logic Table.





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### Logic Table

| Attenuation (dB) | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 | Pin 10  |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| 1                | H     | ↓     | GND   | ↓     | ↓     | ↓     | H     | H     | H     | +24 Vdc |
| 2                | ↓     | H     | GND   | ↓     | H     | ↓     | H     | ↓     | H     | +24 Vdc |
| 3                | H     | ↓     | GND   | ↓     | H     | ↓     | H     | ↓     | H     | +24 Vdc |
| 4                | ↓     | H     | GND   | H     | ↓     | ↓     | H     | H     | ↓     | +24 Vdc |
| 5                | H     | ↓     | GND   | H     | ↓     | ↓     | H     | H     | ↓     | +24 Vdc |
| 6                | ↓     | H     | GND   | H     | H     | ↓     | H     | ↓     | ↓     | +24 Vdc |
| 7                | H     | ↓     | GND   | H     | H     | ↓     | H     | ↓     | ↓     | +24 Vdc |
| 8                | ↓     | H     | GND   | H     | ↓     | H     | ↓     | H     | ↓     | +24 Vdc |
| 9                | H     | ↓     | GND   | H     | ↓     | H     | ↓     | H     | ↓     | +24 Vdc |
| 10               | ↓     | H     | GND   | H     | H     | H     | ↓     | ↓     | ↓     | +24 Vdc |
| 11               | H     | ↓     | GND   | H     | H     | H     | ↓     | ↓     | ↓     | +24 Vdc |

#### Note:

- H is TTL “High” = +4.2 Vdc to +5.0 Vdc; L is TTL “Low” = 0 to +1.0 Vdc.
- ↓ indicates transition High to Low, holding Low for 20 ms minimum.
- The pins should be switched one at a time.
- SAGE Millimeter, Inc. reserves the right to change the information presented without notice.

#### Caution:

- The device may be damaged if pin 3 is floating while biasing. Make sure that pin 3 is always grounded.
- Exceeding absolute maximum ratings shown will damage the device.
- Always use provided mounting holes by using M3 screws to mount the device. To achieve the best electrical performance stability against shock and vibration it is recommended to mount the device on the flat baseplate parallel to the earth.
- Keep the device in a dry environment for long term storage as it is not hermetically packaged.
- Proper torque,  $8.0 \pm 0.15$  inch-pounds ( $0.90 \pm 0.02$  Nm), should be applied. **SAGE Millimeter torque wrench, model SCH-08008-S1, is highly recommended.**

