Fixed Coaxial Attenuators

General Information

In this section of the catalog, each Fixed Coaxial Attenuator is outlined utilizing individual data sheets containing product features, specifications, and outline drawings. These data sheets are preceded by a quick reference guide to help you select the Fixed Coaxial Attenuator(s) that fits your needs. The page number for each Fixed Coaxial Attenuator data sheet is given in the quick reference guide.

From the company’s very first DC - 1 GHz tee attenuator, came the technology that enabled the design of the first DC - 5 GHz, the first DC - 10 GHz, and the first DC - 18 GHz coaxial attenuators. These designs led to the development of the distributed resistor card attenuator element, which is the basis for most all attenuators manufactured today from DC - 60 GHz. Until the original patents expired a few years ago, most major attenuator manufacturers in the U.S. were licensed under one or more Weinschel Engineering, Co., patents.

Also MIL-DTL-3933 Qualified - Aeroflex / Weinschel is a QPL supplier of Fixed Attenuators. Most Aeroflex / Weinschel Fixed Coaxial Attenuators can be supplied according to customer specified testing, environmental or military or government specification requirements (page 41).

Attenuator Sets of Aeroflex / Weinschel Fixed Attenuators are also available...see page 40.

NOTE: EXPRESS Shipment available via www.argosysales.com or 800-542-4457. Check with our distributor for current products and stocking quantities.
## Fixed Coaxial Attenuators

### Low Power Fixed Attenuators...dc-40 GHz, 1-5 Watts

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Frequency Range (GHz)</th>
<th>Average Power (Watts)</th>
<th>Peak Power (kW)</th>
<th>Nominal Attenuation Value (dB)</th>
<th>SWR</th>
<th>Connector Type</th>
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* VARIATES WITH FREQUENCY.

**EXPRESS Shipment available via [www.argosysales.com](http://www.argosysales.com) or 800-542-4457.**

Note: Other models may also be available from Express delivery.

### Hi-Reliability & Space Fixed Attenuators...dc-40 GHz, 2 Watts

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<th>Connector Type</th>
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* VARIATES WITH FREQUENCY.
## Medium Power Fixed Attenuators...dc-40 GHz, 10-50 Watts

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<td>25 5</td>
<td>3, 6, 10, 20, 30</td>
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<td>1.10-1.20*</td>
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<td>3, 6, 10, 20, 30, 40</td>
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<td>1.20-1.35*</td>
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<td>47a</td>
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<th>Model Number</th>
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<th>Average Power (Watts)</th>
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<th>Connector Type</th>
<th>Page No.</th>
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<td>10</td>
<td>6, 10, 20, 30, 40</td>
<td>1.20</td>
<td>N</td>
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<td>6, 10, 20, 30, 40</td>
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<td>6, 10, 20, 30, 40</td>
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* VARIATES WITH FREQUENCY.

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<thead>
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<th>Average Power (Watts)</th>
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<th>Connector Type</th>
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<td>150</td>
<td>1</td>
<td>10, 20, 30, 40</td>
<td>1.90</td>
<td>7/16</td>
<td>54</td>
</tr>
<tr>
<td>79-XX-XX</td>
<td>dc-6.0</td>
<td>150</td>
<td>10</td>
<td>10, 20, 30, 40</td>
<td>1.20</td>
<td>7/16</td>
<td>64</td>
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<tr>
<td>90-XX-XX-LIM</td>
<td>dc-18.0</td>
<td>50</td>
<td>1</td>
<td>3, 6, 10, 20, 30</td>
<td>1.15-1.30</td>
<td>3.5mm / N</td>
<td>56</td>
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<tr>
<td>253-XX-XX-LIM</td>
<td>dc-6.0</td>
<td>550</td>
<td>10</td>
<td>10, 20, 30, 40</td>
<td>1.10-1.20*</td>
<td>SMK (2.92mm) / N</td>
<td>80</td>
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<tr>
<td>257-XX-XX-LIM</td>
<td>dc-6.0</td>
<td>250</td>
<td>10</td>
<td>10, 20, 30, 40</td>
<td>1.10</td>
<td>SMK (2.92mm) / N</td>
<td>78</td>
</tr>
<tr>
<td>258-XX-XX-LIM</td>
<td>dc-6.0</td>
<td>250</td>
<td>10</td>
<td>10, 20, 30, 40</td>
<td>1.10-1.25</td>
<td>SMK (2.92mm) / N</td>
<td>79</td>
</tr>
<tr>
<td>260-XX-XX-LIM</td>
<td>dc-18.0</td>
<td>100</td>
<td>1</td>
<td>3, 6, 10, 20, 30</td>
<td>1.15-1.30</td>
<td>3.5mm / N</td>
<td>60</td>
</tr>
<tr>
<td>268-XX-XX-LIM</td>
<td>dc-6.0</td>
<td>100</td>
<td>10</td>
<td>10, 20, 30, 40</td>
<td>1.10-1.15*</td>
<td>SMK (2.92mm) / N</td>
<td>77</td>
</tr>
</tbody>
</table>

* Varies with frequency.
## Fixed Coaxial Attenuators

### Conduction Cooled...dc-40 GHz, 5-550 Watts

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Frequency Range (GHz)</th>
<th>Average Power (Watts)</th>
<th>Peak Power (kW)</th>
<th>Nominal Attenuation Value (dB)</th>
<th>SWR</th>
<th>Connector Type</th>
<th>Page No</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
<td>dc-2.5</td>
<td>100</td>
<td>10</td>
<td>3, 6, 10, 20, 30, 40</td>
<td>1.15</td>
<td>SMK (2.92mm) / N</td>
<td>76</td>
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<tr>
<td>72</td>
<td>dc-4.0</td>
<td>50</td>
<td>1</td>
<td>3, 6, 10, 20, 30, 40</td>
<td>1.20</td>
<td>SMK (2.92mm) / N</td>
<td>74</td>
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<tr>
<td>86</td>
<td>dc-22.0</td>
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<td>1</td>
<td>3, 6, 10, 20, 30</td>
<td>1.30</td>
<td>3.5mm</td>
<td>75</td>
</tr>
<tr>
<td>253 NEW</td>
<td>dc-6.0</td>
<td>550</td>
<td>10</td>
<td>10, 20, 30, 40</td>
<td>1.10-1.20*</td>
<td>SMK (2.92mm) / N</td>
<td>80</td>
</tr>
<tr>
<td>257 NEW</td>
<td>dc-6.0</td>
<td>250</td>
<td>10</td>
<td>10, 20, 30, 40</td>
<td>1.10</td>
<td>SMK (2.92mm) / N</td>
<td>78</td>
</tr>
<tr>
<td>258 NEW</td>
<td>dc-6.0</td>
<td>400</td>
<td>10</td>
<td>10, 20, 30, 40</td>
<td>1.10-1.25*</td>
<td>SMK (2.92mm) / N</td>
<td>79</td>
</tr>
<tr>
<td>268 NEW</td>
<td>dc-6.0</td>
<td>100</td>
<td>10</td>
<td>6, 10, 20, 30, 40</td>
<td>1.10-1.15*</td>
<td>SMK (2.92mm) / N</td>
<td>77</td>
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<tr>
<td>275 NEW</td>
<td>dc-40.0</td>
<td>5</td>
<td>1</td>
<td>6, 10, 20, 30</td>
<td>1.25-1.45*</td>
<td>SMK (2.92mm)</td>
<td>73</td>
</tr>
<tr>
<td>284 NEW</td>
<td>dc-10.0</td>
<td>50</td>
<td>5</td>
<td>3, 6, 10, 20, 30, 40</td>
<td>1.15-1.30*</td>
<td>SMK (2.92mm) / N</td>
<td>74a</td>
</tr>
</tbody>
</table>

* VARIIES WITH FREQUENCY.
Frequently Asked Questions about Fixed Coaxial Attenuators....

What are the advantages of Weinschel's fixed attenuators?

Aeroflex / Weinschel low power fixed attenuators feature a combination of advantages over other designs:* 1. Most Aeroflex / Weinschel attenuators feature injection molded dielectric for better center pin captivation and alignment. Injection molded dielectric also eliminates the need for the epoxy hole "stake" as seen in other designs. This epoxy hole in other designs is subject to RF leakage and movement when exposed to environmental extremes and prolonged use.

2. Aeroflex / Weinschel fixed attenuators have a proprietary resistor element, fired at 950°C for superior long term stability over temperature, power and time. The attenuator element is trimmed for precise custom attenuation values.

3. Aeroflex / Weinschel fixed attenuators have no solder contacts. They feature spring loaded plunger contacts to the resistor cards that provide expansion tolerance over wide temperature and power ranges.

4. Aeroflex / Weinschel fixed attenuators are made with high quality materials and machined to very close tolerances. The result is a design that stands up to severe environmental and multiple matings.

5. High power designs feature special high temperature dielectric support beads.

Does Aeroflex / Weinschel offer high reliability fixed attenuators?

Yes, most Most Aeroflex / Weinschel Fixed Coaxial Attenuators can be supplied according to customer specified testing, environmental or military or government specification requirements.

Hi-Rel units can be laser-marked and are manufactured from materials which have a TML of less than 1% and CVCM less than 0.1%.

What is a bidirectional and unidirectional attenuator?

All Aeroflex / Weinschel attenuators are bidirectional unless they are specified as unidirectional in the power rating specification. Bidirectional means the maximum specified power can be applied to either the input or output of the attenuator. Unidirectional means the maximum specified power can only be applied to the input port of the attenuator. Unidirectional designs allow for smaller overall package sizes and reduced costs. All our attenuators have maximum average and peak pulse input power limits. The average power limit decreases linearly as the ambient temperature increases. If these limits are exceeded, burnout of the attenuator element results or its calibration may be permanently changed. When used within its specifications, an attenuator is an indispensable component in measurement and system applications.

What dB values are available besides those in the catalog?

Most any dB value is available; however you should consult your local sales representative or the factory for design availability for a particular dB value for the selected model. There is generally an additional charge for non-catalog values.

Can Aeroflex / Weinschel provide attenuators for space applications?

Yes, Aeroflex / Weinschel fixed attenuators are being used on a wide variety of military and commercial communication satellites. "S" level fixed attenuators can be provided for any dB value up to 40 dB from dc to 52 GHz. Aeroflex / Weinschel has recently introduced Models 32K (page 30) and 32L (page 31) standard fixed attenuators that operates from dc to 42 or 52 GHz. These attenuators offer superior electrical and mechanical design that is ideally suited for space applications.

Aeroflex / Weinschel's use of precision connectors, injection molded captivation of connector contacts (no solder or contact fingers) and very precise and stable resistors result in a superior electrical and mechanical design that is ideally suited for space applications.

Aeroflex / Weinschel program experience includes:

- Aussat (Optus)
- KOREASAT
- TDRSS
- TELSTAR
- GOES
- MILSTAR
- GEM
- GlobalStar
- INTELSAT
- ACoS
- EOS
- ...and many others.

Aeroflex / Weinschel offers extensive testing programs for space qualified attenuators and other components that can include:

- Random Vibration: Random and/or Sine Vibration up to 100 g rms.
- Monitored Thermal Cycle: Units monitored for open condition over –55 °C to +100 °C, 15 cycles.
- Burn-In Testing: Performed at rated power and operating temperature from 96 to 360 hours typical.
- Mechanical Shock: Performed per MIL-STD-202, Method 213 Test Condition F up to 1000 G peak.
- Moisture Resistance Testing: Performed per MIL-STD-202, Method 106. (except sub-cycle 7b is not applicable) with connectors capped.

*Most designs, some features may not apply to certain low cost attenuator designs.
Fixed Coaxial Attenuators

Can Weinschel provide special fixed attenuators?
Yes. Aeroflex / Weinschel has produced over 2000 custom fixed attenuator designs. Specials continue to be a significant part of Weinschel's product offering. Special features may include:

1. Custom Connector Configurations
2. Matched Pairs or Sets
3. Lower VSWR & Higher Accuracy
4. Special Mounting & Environmental Conditions
5. Unique Test Requirements & Data

Does Weinschel offer any attenuators with IM3 specified?
Yes Aeroflex / Weinschel has recently introduced new as well as updated models specifically for applications requiring low intermodulation distortion. Models are available with the low IM options are...24, 33, 40, 45, 46, 47, 48, 48, 53, 57, & 58. Refer to the page 15 for a product line overview or the specific data sheet for IM3 details.

How is the temperature or power coefficient specification applied?
These specifications tell how much the attenuation will change when the ambient temperature or input power changes. First multiply the catalog temperature coefficient or power coefficient by the ambient temperature range or input power range to which the attenuator will be exposed. Then multiply that number by the dB value of the attenuator. The result is the maximum change in attenuation than can be expected over the ambient temperature range or power range that was specified.

How is the attenuator power rating calculated?
An attenuator will handle specified power at ambient temperatures as specified in the catalog. No special fan cooling is required. At higher temperatures the power rating is calculated by using catalog specifications and a straight line graph (Example shown above). For instance the power rating of the Model 48 attenuator is 100 watts at 25°C and 10 watts at 125°C. Using linear graph paper, plot a straight line between these two points. This plot shows that the power rating at 75°C is approximately 56 Watts.

Does Aeroflex / Weinschel offer attenuators sets or attenuation test kits?
Aeroflex / Weinschel offers a variety of attenuation standard sets consisting of precision designed fixed attenuators. These sets are ideally suited for standards and research laboratories as well as production, quality control, and inspection departments. Aeroflex / Weinschel attenuation sets are available in either 3, 6, 10, 20 dB or 1, 3, 6, 10, 20, 30 dB attenuation values. Each attenuator is tested in 1 GHz intervals to minimize interpolation error. The attenuator sets are available in stainless steel type N (Model 1 & 44), and 3.5mm (Model 56) connectors. Custom sets with other connector type and higher power sets are also available upon request. Refer to page 66 for more details.

What is Third-Order Intermodulation Distortion?
(IM3) Intermodulation distortion (IM) consists of the spurious signals which result from the mixing of nth order frequencies in the non-linear elements of a component. Third order intermodulation distortion is of particular interest because third order products typically represent the highest level distortion appearing close to the desired signal, and as such the highest level non-filterable distortion. Third order IM level (IM3) is tested by injecting two pure tones of equal magnitude (f1 and f2) into the component to be tested. The third order IM products will appear in the output spectrum at the frequencies 2f1-f2 and 2f2-f1. These products are characterized by defining their level (in dBc) relative to the fundamental output tones at either f1 or f2.

Applications....
Aeroflex / Weinschel Attenuators are used in a wide variety of applications in the electronic field for the control or measurement of radio frequency energy. Attenuators are used as accurate standards in the measurement of loss or gain by the RF substitution method. They are used as a means of extending the dynamic range of measuring equipment such as power meters, field intensity meters, spectrum analyzers, and amplifiers, or to prevent overloading of receivers and amplifiers. They also reduce, by masking, the effects of variable or mismatched impedances on such circuit elements as oscillator, T-junctions, mixers, etc.

Fixed Attenuators can satisfy almost any requirement involving a reduction in power. Attenuators designed and manufactured by Aeroflex / Weinschel are very stable and remain precision calibrated over wide ranges of humidity, temperature, and other ambient conditions for long periods of time.
Fixed Coaxial Attenuators

Attenuation Selection Guide: Power Handling / Frequency / Connector Type
Fixed Coaxial Attenuators

Understanding Temperature & Power Coefficient in Attenuators

By the Components Engineering Staff @ Aeroflex / Weinschel
Article written By Jimmy Dholoo, VP Engineering & Rob Sinno, Design Engineer

Temperature Coefficient of Resistance, TCR, is a well-known parameter in the Electronics Industry. Power Coefficient of Resistance, PCR, is not such a familiar term. Manufacturers seldom provide PCR specifications for their resistors. TCR and PCR are usually expressed in parts per million per degree (ppm / °C), or parts per million per watt (ppm / W). Applying PCR in an example, a 10-Watt, 100-ohm resistor with a PCR of +/- 200ppm/W could change by +/- 0.2 ohms when subjected to 10 Watts of average power at ambient temperature (100Ωx10Wx200x10−6 /W).

Attenuators in their discrete form are usually a combination of chip resistors in a Pi or T network, and the type of resistors selected for such networks depends on the desired frequency, temperature and power handling requirements. The individual chips in such a network might either be thin- or thick-film resistors. For higher frequency applications, attenuators usually take on a distributed form, with a resistive sheet of thick-film or thin-film terminated with suitable metalization, Figure 1. The most common material for thick-film resistors is ruthenium dioxide. Popular thin film materials are nichrome, tantalum nitride and tin oxide.

Almost all the fixed and programmable attenuators offered by Weinschel specify a Temperature Coefficient of Attenuation (TCA) and a Power Coefficient of Attenuation (PCA) in the product data sheets. Based on the inquiries we receive about the interpretation of these specifications, it seems that some basic explanation is necessary so the end user can correctly forecast the worst case scenario for his system; i.e. what attenuation change might be expected at temperature and power extremes.

Case 1: TCA of Fixed Attenuators

All of Weinschel's fixed attenuators are of the distributed type and of a proprietary thin-film Tin Oxide composition. The tin oxide is deposited on a ceramic substrate at 930°C via a chemical vapor deposition process and terminated with gold metallization. Depending on the product type, the substrate could be Alumina, BeO or ALN. The vast fixed attenuator family covers a frequency range of DC to 40 GHz, and the power handling ranges from as low as 2 watts to 1000 watts. The TCA for every fixed product is specified as 0.0004dB/dB/°C because the predominant factor determining the TCA is the TCR of the tin oxide film. The substrate material, the sheet resistivity and the mechanical contacts between the connectors and the substrate and between the substrate and the grounds do contribute to the overall TCA, but to a much lesser extent. The TCA is usually measured at a power level low enough so as not to cause any significant warming of the unit. Attenuation is measured at various ambient temperatures over a specified frequency range. The worst-case coefficient arrived at is based on the maximum attenuation change over the frequency band. Military Standard, MIL-A-3993 for fixed attenuators calls for a TCA of 0.0004dB/dB/°C. Over a 100°C ambient temperature change, a 30 dB attenuator would change by a maximum of 1.2 dB at low signal levels. In reality, the TCA of Weinschel attenuators is 0.0001dB/dB/°C. The maximum change would only be 0.3 dB on a 30 dB attenuator, thus providing a significant guard band to the user.

Figure 2 is a theoretical plot showing the attenuation variation on a 10 dB distributed attenuator as a function of the TCR of the resistive thin-film at two temperature extremes, -75°C and +125°C. It is interesting to note that the change in attenuation is rather small over such a wide swing of both temperature and TCR. Figure 3 is a similar plot of the impedance variation of the same attenuator and this shows a significant change from the nominal 50-ohm impedance. Three obvious conclusions can be drawn from these plots:

• As long as the shunt and series resistive elements of an attenuator have the same TCR the attenuation will always increase at DC, independent of the temperature and the magnitude of the TCR. Distributed film attenuators will always behave in this manner because the shunt and series sections are formed from the same resistive film and therefore have the same TCR. Discrete attenuator networks may not behave in this...
Fixed Coaxial Attenuators

• Materials with poor TCR figures will seriously impact the
  accuracy requires a set of high-power, broadband bias tees
  and good matching techniques. The test set-up is shown in the
  good accuracy requires a set of high-power, broadband bias tees

-0.6 -0.5 -0.4 -0.3 -0.2 -0.1 0 0.1 0.2 0.3 0.4 0.5
-0.19 0.005 0.01 0.02 0.05
0 1.00 1.50 2.00 2.50
0 -0.4 -0.6 -0.8 -1.0 -1.2 -1.4 -1.6 -1.8
-0.19 0.005 0.01 0.02 0.05
0 1.00 1.50 2.00 2.50
0 -0.4 -0.6 -0.8 -1.0 -1.2 -1.4 -1.6 -1.8

Figure 3. Impedance as a Function of TCR for Two Temperature
Extremes, 25 ± 100 °C.

Since an increase in the resistance of the series element
increases the attenuation and an increase in the resistance of the
shunt element reduces the attenuation, the overall change in the
attenuation is very small and far less than the change in the
individual resistors.

Materials with poor TCR figures will seriously impact the
impedance of distributed attenuators and significantly degrade
the SWR, with little effect on the DC attenuation.

Case 2: PCA of Fixed Attenuators

Though the specified TCA of all attenuators is the same, the PCA
varies across the product line since it is no longer just a function of
the tin oxide resistive film. It also depends on the substrate
material, metalization, packaging, heat sinking and forced cooling,
if any. The effect of high power/high voltage on this resistive film is
quite different from that of a temperature increase at low
voltages/low power. A detailed discussion of this is beyond the
scope of this article but it is important to note that this effect is a
function of the electrical stress in the film and will depend on the
dimensions of the resistive film, and so is a function of the size and
shape of the resistor. Also, it is worth clarifying that referring to this
high voltage effect as a “Power Coefficient” is misleading since the
rate of change of resistance with applied voltage is not constant
and the film exhibits some degree, albeit small, of non-linearity.

From the Weinschel fixed attenuator product line, a typical 2 W
attenuator has a PCA of < 0.005 dB/dB/W, so a 30 dB unit would
change by less than 0.3 dB (across the full frequency band, when
the incident power increases from, say, 10mW to 2 Watts.
Similarly, a 500W unit with a PCA of 0.0001dB/dB/W would change
by less than 1.5dB (over its operating frequency band when the
incident power increases from a low level signal to the full 500
watts.

PCA measurements are not easily made. Just as the TCA is
measured at a constant low power level with varying ambient
temperatures, the PCA must be measured at a constant ambient
temperature of 25°C with varying power and over the entire
operating frequency range. To carry out such measurements with
good accuracy requires a set of high-power, broadband bias tees
and good matching techniques. The test set-up is shown in the

Case 3: TCA of switched Programmable
Attenuators

Switched Programmable attenuators typically comprise several
attenuator “cells”, usually in a binary sequence: 1 dB, 2 dB, 4 dB,
8 dB, 16 dB, 32 dB etc, Fig 4. These cells are selectively switched
ON from their ‘zero’ state, using DPDT relays for electromechani-
cal models and PIN diodes, for solid state versions. Programmable
attenuators basically have two states, a zero state when the unit is
sitting in its minimum insertion loss position and an attenuate state
when the unit is sitting in any of the selected attenuation positions.
The interpretation of TCA for these products has at times raised
questions because there are two TCA figures associated with them.
The first is the Absolute TCA, which is derived from the total change
in any selected attenuation, between two temperatures at low
signal levels. The second is the relative or Incremental TCA.
Programmable attenuators are frequently installed in systems and
instruments to accurately control RF signal levels. Their insertion
loss in the ZERO attenuation position usually becomes part of the
overall system loss and is zeroed out in the normalization process.
What is important in such cases is the accuracy of the incremental
attenuation with reference to the normalized state and, therefore,
it is the Incremental TCA that is more relevant to the designer/user.
Incremental TCA is derived from the change in the incremental
attenuation state at two temperatures; i.e., the normalization of the
zero is carried out at both temperatures.

The blue plot in Figure 4 shows the change in the zero state
attenuation of an 8 cell electromechanical unit. It was generated by
first normalizing its zero state loss at room temperature and then
raising the ambient to 100°C. The major attenuation change over
temperature comes from the 8 relays. Typically a 75-degree
change causes a 0.5 dB change in the Zero insertion loss (0.063
dB per relay). For this unit, if normalization were carried out at
25°C, the 1 dB cell switched ON and the ambient raised to 100°C,
the 1 dB cell would read 1.5 dB at around 1.5 GHz. This would
yield the worst-case Absolute TCA of 0.0066 dB/dB/°C (0.5dB
/1dB/75°C). As a comparison, the red plot in Figure 4 shows that
the Incremental attenuation change of the 32 dB is only 0.05 dB at
about 2 GHz because we measure it at 25°C with one normaliza-
tion and again at 100°C with another normalization. So all changes
due to the relays are masked and the worst-case Incremental TCA
works out to be 0.000021 dB/dB/°C (0.05dB/32dB/75°C). This
shows that the ruthenium based thick-film attenuators screened on
a ceramic substrate hardly change over this temperature range.
Almost all the temperature variance is therefore attributable to the
relay contacts.

Figure 4 -- 8 Cell Relay Based Programmable Attenuator:
Change in the Absolute & Incremental Attenuation
from 25°C and 100°C
Fixed Coaxial Attenuators

**Model 3T**
**Model 4T**

*Ruggedized SMA Connectors*

**dc to 12.4 GHz**
**dc to 18.0 GHz**

**2 Watts**

**RoHS**

**Features**
- Rugged injection molded connectors.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Small Package Size
- Usable to 22 GHz.

**Specifications**

<table>
<thead>
<tr>
<th>NOMINAL IMPEDANCE:</th>
<th>50 Ω</th>
</tr>
</thead>
</table>

**FREQUENCY RANGE:**
- Model 3T: dc to 12.4 GHz
- Model 4T: dc to 18.0 GHz

**MAXIMUM DEVIATION OVER FREQUENCY:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>3T</th>
<th>4T</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 6</td>
<td>± 0.30</td>
<td>± 0.30</td>
</tr>
<tr>
<td>7 - 12</td>
<td>± 0.30</td>
<td>± 0.50</td>
</tr>
<tr>
<td>20</td>
<td>± 0.50</td>
<td>± 0.70</td>
</tr>
<tr>
<td>30, 40</td>
<td>± 0.75</td>
<td>± 1.00</td>
</tr>
<tr>
<td>50, 60</td>
<td>± 1.00</td>
<td>± 1.50</td>
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</table>

**MAXIMUM SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>3T</th>
<th>4T</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.15</td>
<td>1.15</td>
</tr>
<tr>
<td>4 - 8</td>
<td>1.20</td>
<td>1.20</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.25</td>
<td>1.25</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>- - -</td>
<td>1.35</td>
</tr>
</tbody>
</table>

**POWER RATING:** 2 watts *average* to 25°C ambient temperature, derated linearly to 0.5 watts at 125°C. 500 watts *peak* (5 μsec pulse width; 0.2% duty cycle).

**POWER COEFFICIENT:** < 0.005 dB/dB/watts

**TEMPERATURE COEFFICIENT:** < 0.0004 dB/dB/°C

**TEMPERATURE RANGE:** -55°C to +125°C

**TEST DATA:** Swept data plots of attenuation and SWR from 50 MHz to 12.4 / 18 GHz is available at additional cost.

**CONNECTORS:** SMA connectors per MIL-STD-348 interface dimensions - mate nondestructively with SMA, 3.5mm, SMK and other 2.92mm per MIL-C-39012.

**CONSTRUCTION:** Passivated stainless steel body and connectors; gold plated beryllium copper contacts.

**WEIGHT (Both Models):**

<table>
<thead>
<tr>
<th>DB VALUE</th>
<th>WEIGHT (Net)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 12</td>
<td>3.9 g (0.14 oz)</td>
</tr>
<tr>
<td>20</td>
<td>4.3 g (0.15 oz)</td>
</tr>
<tr>
<td>30</td>
<td>6.5 g (0.23 oz)</td>
</tr>
<tr>
<td>40, 50, 60</td>
<td>12.7 g (0.45 oz)</td>
</tr>
</tbody>
</table>

**PHYSICAL DIMENSIONS:**

- **Specification Limit**
- **Specification Limit**

**Typical SWR of a Model 4T-10**

**Typical Attenuation Performance of 4T-10**

**MODEL NUMBER DESCRIPTION:**

Example:

4T - XX

Basic Model Number

Attenuation Value (dB)

**Note:** All dimensions are given in mm (inches) and are maximum, unless otherwise specified.
Fixed Coaxial Attenuators

Model 3M
Model 4M

Ruggedized SMA Connectors

Features

- Rugged injection molded connectors.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Usable to 22 GHz.

Specifications

- NOMINAL IMPEDANCE: 50 Ω
- FREQUENCY RANGE:
  - Model 3M: dc to 12.4 GHz
  - Model 4M: dc to 18.0 GHz

**MAXIMUM DEVIATION OVER FREQUENCY:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>3M</th>
<th>4M</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2</td>
<td>± 0.30</td>
<td>± 0.50</td>
</tr>
<tr>
<td>3 - 6</td>
<td>± 0.30</td>
<td>± 0.30</td>
</tr>
<tr>
<td>7 - 10</td>
<td>± 0.30</td>
<td>± 0.50</td>
</tr>
<tr>
<td>20</td>
<td>± 0.50</td>
<td>± 0.70</td>
</tr>
<tr>
<td>30, 40</td>
<td>± 0.75</td>
<td>± 1.00</td>
</tr>
<tr>
<td>50, 60</td>
<td>± 1.00</td>
<td>± 2.00</td>
</tr>
</tbody>
</table>

**MAXIMUM SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>3M</th>
<th>4M</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.15</td>
<td>1.15</td>
</tr>
<tr>
<td>4 - 8</td>
<td>1.20</td>
<td>1.20</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.25</td>
<td>1.25</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>- -</td>
<td>1.35</td>
</tr>
</tbody>
</table>

**POWER RATING:**

- 2 watts average to 25°C ambient temperature, derated linearly to 0.5 watts at 125°C.
- 500 watts peak (5 μsec pulse width; 0.2% duty cycle).

**TEMPERATURE RATING:**

- -55°C to +125°C

**TEST DATA:**

Swept data plots of attenuation and SWR from 50 MHz to 12.4 GHz is available at additional cost.

**CONNECTORS:**

SMA connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

**CONSTRUCTION:**

Passivated stainless steel body and connectors; gold plated beryllium copper contacts.

**WEIGHT (Both Models):**

<table>
<thead>
<tr>
<th>dB VALUE</th>
<th>WEIGHT (Net)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 10, 20</td>
<td>10 g (0.35 oz)</td>
</tr>
<tr>
<td>30, 40, 50, 60</td>
<td>20 g (0.70 oz)</td>
</tr>
</tbody>
</table>

**PHYSICAL DIMENSIONS:**

- DIM A + 0.5 (0.02)
- DIA. (5/16) HEX NDM

**MODEL NUMBER DESCRIPTION:**

Example:

*4M - XX*

*Add Prefix M for double male and F for double female connectors.
Fixed Coaxial Attenuators

Models 3330A & 3331A
General Purpose, Subminature SMA
dc to 18.0 GHz
2 Watts

Features

- **Low Cost** - These general purpose attenuators offer subminiature size, broadband frequency response, and attenuation values from 1 to 30 dB at low, competitive prices.
- **Two Configurations** - Round body Model 3330A and a hex body Model 3331A.
- **Ideal for Bulk Quantity Requirements.**

Specifications

**NOMINAL IMPEDANCE:** 50 Ω

**FREQUENCY RANGE:** dc to 18.0 GHz

**MAXIMUM DEVIATION OVER FREQUENCY:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>± 0.30</td>
</tr>
<tr>
<td>7-10, 20</td>
<td>± 0.50</td>
</tr>
<tr>
<td>30</td>
<td>± 0.75</td>
</tr>
</tbody>
</table>

**MAXIMUM SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.15</td>
</tr>
<tr>
<td>4 - 12.4</td>
<td>1.30</td>
</tr>
<tr>
<td>12.4 - 18.0</td>
<td>1.40</td>
</tr>
</tbody>
</table>

**POWER RATING:** 2 watts average to 25°C ambient temperature, derated linearly to 0.5 watts @ 125°C. 250 watts peak (5 μsec pulse width; 0.4% duty cycle).

**TEMPERATURE RANGE:** -55°C to +125°C.

**CONNECTORS:** SMA connectors per MIL-STD-348 interface dimensions mate nondestructively with MIL-C-39012 connectors.

**CONSTRUCTION:** Passivated stainless steel body and connectors; gold plated beryllium copper contacts.

**WEIGHT:** 5.6 g (0.2 oz) maximum (Both Models)

**MODEL NUMBER DESCRIPTION:**

Example:

3330A - XX

Basic Model Number

Attenuation Value (dB)

RoHS
Fixed Coaxial Attenuators

Model 4H
Hex Body Precision SMA Connectors
dc to 18.6 GHz
2 Watts

Features

- **Subminiature** - These attenuators offer the smallest package size with broadband frequency response, and attenuation values from 0 to 10, 12, 15, 20 & 30 dB.
- **Designed to meet environmental requirements of MIL-DTL-3933.**
- **Precision SMA Connectors.**
- **Usable to 23 GHz.**

Specifications

**NOMINAL IMPEDANCE:** 50 Ω
**FREQUENCY RANGE:** dc to 18.6 GHz

**MAXIMUM DEVIATION OVER FREQUENCY:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>± 0.40</td>
</tr>
<tr>
<td>1-10</td>
<td>± 0.30</td>
</tr>
<tr>
<td>12, 15, 20, 30</td>
<td>± 0.70</td>
</tr>
</tbody>
</table>

**MAXIMUM SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 12.4</td>
<td>1.25</td>
</tr>
<tr>
<td>12.4 - 18.6</td>
<td>1.35</td>
</tr>
</tbody>
</table>

**POWER RATING:** 2 watts average to 25°C ambient temperature, derated linearly to 0.5 watts @ 125°C. 250 watts peak (5 μsec pulse width; 0.4% duty cycle).

**POWER COEFFICIENT:** < 0.005 dB/dB/watt

**TEMPERATURE COEFFICIENT:** < 0.0004 dB/dB/°C

**TEMPERATURE RANGE:** -50°C to +125°C
Fixed Coaxial Attenuators

Model 56
3.5mm Connectors

dc to 26.5 GHz
2 Watts

Features
- Useable to 28 GHz
- Precision 3.5mm Connectors
- Low SWR & Flat Response

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 26.5 GHz

MAXIMUM DEVIATION OVER FREQUENCY (dB):

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>DEVIATION (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>+ 0.50</td>
</tr>
<tr>
<td>3, 6, 10</td>
<td>± 0.60</td>
</tr>
<tr>
<td>20, 30</td>
<td>± 0.75</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 8</td>
<td>1.10</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.15</td>
</tr>
<tr>
<td>12.4 - 26.5</td>
<td>1.25</td>
</tr>
</tbody>
</table>

POWER RATING: 2 watts average to 25°C ambient temperature, derated linearly to 0.2 watts at +100°C. 500 watts peak (5 μsec pulse width; 0.2% duty cycle).

POWER COEFFICIENT: < 0.005 dB/dB/watts

TEMPERATURE COEFFICIENT: < 0.0004 dB/dB/°C
TEMPERATURE RANGE: -55°C to +100°C.

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 26.5 GHz is available at additional cost.

CONNECTORS: 3.5mm connectors - contact pin recession (0.003 maximum) - mate nondestructively with SMA, 3.5mm, SMK and other 2.92mm per MIL-C-39012.

CONSTRUCTION: Stainless steel body and connectors; gold plated beryllium copper contacts.

WEIGHT: 8 g (0.28 oz) maximum

PHYSICAL DIMENSIONS:

* Add Prefix M for double male and F for double female connectors.

ATTENUATOR SET (AS-20): Model 56 is also available in a Attenuator Set which includes five different attenuators (3, 6, 10, 20, 30 dB). Refer to Attenuator Sets data sheet for more information.
Fixed Coaxial Attenuators

Model 87
SMK Connectors

dc to 32.0 GHz
2 Watts

Features

- Available in 0.5 dB increments from 0-30 dB.
- Rugged injection molded connectors.
- Designed to meet environmental requirements of MIL-DTL-3933.
- New Lower Cost Commercial Version.

Specifications

NOMINAL IMPEDANCE: 50 \Omega
FREQUENCY RANGE: dc to 32.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>+ 0.5 / -0.0</td>
</tr>
<tr>
<td>0.5 - 12</td>
<td>± 0.5</td>
</tr>
<tr>
<td>12.5 - 20</td>
<td>± 1.0</td>
</tr>
<tr>
<td>20.5 - 30</td>
<td>± 2.0</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 32</td>
<td>1.25</td>
</tr>
</tbody>
</table>

POWER RATING: 2 watts average to 25°C ambient temperature, derated linearly to 0.5 watts at 100°C. 500 watts peak (5 \mu sec pulse width; 0.2% duty cycle).

POWER COEFFICIENT: < 0.005 dB/dB/watts
TEMPERATURE COEFFICIENT: < 0.0004 dB/dB/°C
TEMPERATURE RANGE: -55°C to +100°C

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 32 GHz is available at additional cost.

CONNECTORS: SMK (2.92mm) connectors - mate non-destructively with SMA, 3.5mm and SMK (2.92mm) connectors.
CONSTRUCTION: Passivated stainless steel body and connectors; gold plated beryllium copper contacts.
WEIGHT: 8 g (0.28 oz)

PHYSICAL DIMENSIONS:

MODEL NUMBER DESCRIPTION:
Example:

<table>
<thead>
<tr>
<th>dB VALUE</th>
<th>DIM A ± 0.5 (0.02)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12</td>
<td>29.2 (1.15)</td>
</tr>
<tr>
<td>12.5-20</td>
<td>31.2 (1.23)</td>
</tr>
<tr>
<td>20.5-30</td>
<td>33.8 (1.33)</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.
Fixed Coaxial Attenuators

Model 84A
Ruggedized 2.4mm Connectors
dc to 40.0 GHz
2 Watts

Features
- Useable to 42 GHz.
- Designed to meet environmental requirements of MIL-DTL-3933.

Specifications

| NOMINAL IMPEDANCE: | 50 Ω |
| FREQUENCY RANGE: | dc to 40.0 GHz |

Maximum Deviation over Frequency:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6, 10</td>
<td>± 0.50 ± 1.00</td>
</tr>
<tr>
<td>20, 30</td>
<td>± 0.80 ± 1.50</td>
</tr>
</tbody>
</table>

Maximum SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 26.5</td>
<td>1.25</td>
</tr>
<tr>
<td>26.5 - 40</td>
<td>1.45</td>
</tr>
</tbody>
</table>

Power Rating: 2 watts average to 25 °C ambient temperature, derated linearly to 0.1 watt at 125 °C. 200 watts peak (5 μsec pulse width; 0.5 % duty cycle).

Power Coefficient: < 0.005 dB/dB/watts

Temperature Coefficient: < 0.0004 dB/dB/°C

Temperature Range: -55°C to +125°C

Test Data: Swept data plots of attenuation and SWR from 50 MHz to 40 GHz is available at additional cost.

Connectors: 2.4mm connectors mate nondestructively with other 2.4mm connectors. Contact Pin Recession (0 to 0.003)

Construction: Stainless steel body; gold plated beryllium copper contacts and brass connectors.

Weight: 13 g (0.46 oz.) maximum

Physical Dimensions:

<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIM &quot;A&quot; MAX</td>
</tr>
<tr>
<td>7.0 [.28]</td>
</tr>
<tr>
<td>2.4MM FEMALE CONNECTOR</td>
</tr>
<tr>
<td>2.4MM MALE CONNECTOR</td>
</tr>
<tr>
<td>7.9 [.312]</td>
</tr>
<tr>
<td>HEX [NOM]</td>
</tr>
</tbody>
</table>

Model Number Description:

Example:

*84A - XX

Basic Model Number

Attenuation Value (dB)

* Add Prefix M for double male and F for double female connectors.
Fixed Coaxial Attenuators

Model 54A

SMK Connectors

dc to 40.0 GHz

2 Watts

RoHS

Specifications

**Nominal Impedance:** 50 Ω

**Frequency Range:** dc to 40.0 GHz

**Maximum Deviation Over Frequency:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc-26.5</td>
<td>26.5-40</td>
</tr>
<tr>
<td>3, 6</td>
<td>± 0.50</td>
</tr>
<tr>
<td>± 1.00</td>
<td></td>
</tr>
<tr>
<td>10, 20, 30</td>
<td>± 0.80</td>
</tr>
<tr>
<td>± 1.50</td>
<td></td>
</tr>
</tbody>
</table>

**Maximum SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 26.5</td>
<td>1.25</td>
</tr>
<tr>
<td>26.5 - 40</td>
<td>1.45</td>
</tr>
</tbody>
</table>

**Power Rating:** 2 watts average to 25 °C ambient temperature, derated linearly to 0.1 watt at 125 °C. 200 watts peak (5 μsec pulse width; 0.5 % duty cycle).

**Power Coefficient:** < 0.005 dB/dB/watts

**Temperature Coefficient:** < 0.0004 dB/dB/°C

**Temperature Range:** -55 °C to +125 °C

**Test Data:** Swept data plots of attenuation and SWR from 50 MHz to 40 GHz is available at additional cost.

**Connectors:** SMK (2.92mm) connectors - mate nondestructively with SMA, 3.5mm and SMK (2.92mm) connectors.

**Construction:** Stainless steel body and connectors; gold plated beryllium copper contacts.

**Weight:** 13 g (0.46 oz.) maximum

**Physical Dimensions:**

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

**Model Number Description:**

Example:

*54A - XX*

Basic Model Number

Attenuation Value (dB)

* Add Prefix M for double male and F for double female connectors.

Features

- Useable to 42 GHz.
- Designed to meet environmental requirements of MIL-DTL-3933.
Fixed Coaxial Attenuators

Model 1W
General Purpose, Type N

dc to 4.0 GHz
2 Watts

☑ RoHS

CONNECTORS: Type N (male/female) connectors - mate nondestructively with MIL-C-39012 connectors.
CONSTRUCTION: Nickel-plated brass body and connectors, gold plated Beryllium contacts
WEIGHT: 65 g (2.5 oz) maximum

Features

- Attenuation Values from 1 to 10, 20 dB.
- Low Cost
- Wireless Applications - Optimized for use in the wireless communications bands.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 4.0 GHz

<table>
<thead>
<tr>
<th>MAXIMUM DEVIATION OVER FREQUENCY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal ATTN (dB)</td>
</tr>
<tr>
<td>1 - 6</td>
</tr>
<tr>
<td>7 - 10, 20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MAXIMUM SWR:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (GHz)</td>
</tr>
<tr>
<td>dc - 8.0</td>
</tr>
</tbody>
</table>

POWER RATING: 2 watts average to 25°C ambient temperature, derated linearly to 0.5 watts @ 105°C. 250 watts peak (5 μsec pulse width; 0.4% duty cycle).

POWER COEFFICIENT: < 0.005 dB/dB/watt
TEMPERATURE COEFFICIENT: < 0.0004 dB/dB/°C
TEMPERATURE RANGE: -20°C to +105°C.

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:

1W - XX

Basic Model Number
Attenuation Value (dB)
Fixed Coaxial Attenuators

Model 55
*TNC Connectors*

dc to 18.0 GHz

5 Watts

**Features**

- **Quality TNC Connectors** - This Attenuator incorporates an improved 18 GHz TNC connector design standardized through the IEC.
- **Designed to meet environmental requirements of MIL-DTL-3933.**

**Specifications**

**NOMINAL IMPEDANCE:** 50 Ω

**FREQUENCY RANGE:** dc to 18.0 GHz

<table>
<thead>
<tr>
<th>NOMINAL DEVIATION OVER FREQUENCY:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal ATTN (dB)</td>
<td>Deviation (dB)</td>
</tr>
<tr>
<td>1 - 6</td>
<td>± 0.40</td>
</tr>
<tr>
<td>7 - 10, 20</td>
<td>± 0.50</td>
</tr>
<tr>
<td>30</td>
<td>± 0.90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MAXIMUM SWR:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (GHz)</td>
<td>SWR</td>
</tr>
<tr>
<td>dc - 4</td>
<td>1.15</td>
</tr>
<tr>
<td>4 - 8</td>
<td>1.20</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.25</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>1.35</td>
</tr>
</tbody>
</table>

**POWER RATING:** 5 watts average @ 25°C ambient temperature, derated linearly to 0.5 watt @ 125°C. 1 kilowatt peak (5 μsec pulse width; 0.25% duty cycle)

**POWER COEFFICIENT:** < 0.005 dB/dB/watt

**TEMPERATURE COEFFICIENT:** < 0.0004 dB/dB/°C

**TEMPERATURE RANGE:** -55°C to +125°C

**TEST DATA:** Swept data plots of attenuation and SWR from 50 MHz to 18 GHz are available at additional cost.

**CONNECTORS:** TNC connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

**CONSTRUCTION:** Stainless steel body and connectors; gold plated beryllium copper contacts.

**WEIGHT:** 28 g (1 oz) maximum

**PHYSICAL DIMENSIONS:**

**NOTES:** All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

**MODEL NUMBER DESCRIPTION:**

Example:

55 - XX

Basic Model Number  Attenuation Value (dB)
Fixed Coaxial Attenuators

Model 1
Model 2
Precision N Connectors

POWER RATING: 5 watts average @ 25°C ambient temperature, derated linearly to 0.5 watt @ 125°C.
1 kilowatt peak (5 μsec pulse width; 0.25% duty cycle)

POWER COEFFICIENT: <0.005 dB/dB/Watt
TEMPERATURE COEFFICIENT: < 0.0004 dB/dB/°C
TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 12.4 / 18 GHz is available at additional cost.

CONNECTORS: Precision Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

CONSTRUCTION: Stainless steel body and connectors; gold plated beryllium copper contacts.

WEIGHT:

<table>
<thead>
<tr>
<th>dB VALUE</th>
<th>WEIGHT (Net)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2, 10, 20, 30</td>
<td>71 g (2.5 oz)</td>
</tr>
<tr>
<td>40, 50, 60</td>
<td>79 g (2.8 oz)</td>
</tr>
</tbody>
</table>

PHYSICAL DIMENSIONS:

<table>
<thead>
<tr>
<th>dB VALUE</th>
<th>DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10, 20, 30</td>
<td>57.9 (2.28')</td>
</tr>
<tr>
<td>40, 50, 60</td>
<td>68.1 (2.68')</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:

*1 - XX

Basic Model Number
Attenuation Value (dB)

*Add Prefix M for double male or F for double female connectors.

ATTENUATOR SET (AS-6): Model 2 is also available in an Attenuator Set which includes four different attenuators (3, 6, 10, 20 dB). Refer to Attenuator Sets data sheet for more information.
Fixed Coaxial Attenuators

Model 44
Lab Standard, Precision N Connectors
dc to 18.0 GHz
5 Watts

Features

- Precision Connectors
- Test data - A certificate of test supplied with each attenuator.
- Hex Nut Connector - Allows for use of a torque wrench to improve connector repeatability.
- Designed to meet environmental requirements of MIL-DTL-3933.

Specifications

**Nominal Impedance:** 50 Ω
**Frequency Range:** dc to 18.0 GHz

**Maximum Deviation Over Frequency:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 9</td>
<td>± 0.30</td>
</tr>
<tr>
<td>10, 20</td>
<td>± 0.50</td>
</tr>
<tr>
<td>30, 40</td>
<td>± 1.00</td>
</tr>
<tr>
<td>50</td>
<td>± 1.25</td>
</tr>
<tr>
<td>60</td>
<td>± 1.50</td>
</tr>
</tbody>
</table>

![Typical Attenuation Accuracy of a 44-6](image)

**Maximum SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.15</td>
</tr>
<tr>
<td>4 - 12.4</td>
<td>1.20</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>1.25</td>
</tr>
</tbody>
</table>

![Typical SWR of a 44-6](image)

**Power Rating:** 5 watts average @ 25°C ambient temperature, derated linearly to 0.5 watt @ 125°C. 1 kilowatt peak (5 μsec pulse width; 0.25% duty cycle)

**Power Coefficient:** <0.005 dB/dB/Watt

**Temperature Coefficient:** < 0.0004 dB/dB/°C

**Temperature Range:** -55°C to +125°C

**Test Data:** Swept data plots of attenuation and SWR from 50 MHz to 18 GHz.

**Connectors:** Precision Type N per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. Coupling Torque: 14 ± 1 in/lbs.

**Construction:** Brass Body (plated) and Stainless steel connectors; gold plated beryllium copper contacts.

**Weight:**

<table>
<thead>
<tr>
<th>dB Value</th>
<th>Weight (Net)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 10, 20, 30</td>
<td>100 g (3.5 oz)</td>
</tr>
<tr>
<td>40, 50, 60</td>
<td>140 g (4.5 oz)</td>
</tr>
</tbody>
</table>

**Physical Dimensions:**

![Physical Dimensions](image)

**Model Number Description:**

**Example:**

*44 - XX*

Basic Model Number

Attenuation Value (dB)

*Add Prefix M for double male or F for double female connectors.

**Attenuator Set (AS-18):** Model 44 is also available in a Attenuator Set which includes six different attenuators (1, 3, 6, 10, 20, 30 dB). Refer to Attenuator Sets data sheet for more information.
Fixed Coaxial Attenuators

Model 69A
Bi-directional Design, SMA Connectors
dc to 18.0 GHz
5 Watts

Features
- Compact Construction - Lowest size/power ratio.
- Precision Injection Molded Connectors
- Designed to meet environmental requirements of MIL-DTL-3933.
- Flat Response & Low SWR.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 6</td>
<td>± 0.30</td>
</tr>
<tr>
<td>7 - 10, 20, 30</td>
<td>± 0.50</td>
</tr>
</tbody>
</table>

Typical Attenuation Accuracy of a 69A-10

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 8</td>
<td>1.15</td>
</tr>
<tr>
<td>8 - 18</td>
<td>1.25</td>
</tr>
</tbody>
</table>

Typical SWR of a 69A-10

POWER RATING (mounted horizontally): 5 watts average (bi-directional) to 25°C ambient temperature, derated linearly to 0.5 Watt @ 125°C. 500 watts peak (5 μsec pulse width; 0.5% duty cycle).

POWER COEFFICIENT: <0.003 dB/dB/watt
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55 °C to 125 °C

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 18 GHz is available at additional cost.

CONNECTORS: SMA connectors per MIL-STD-348 interface dimensions - mate nondestructively with SMK, 3.5mm, 2.92mm and SMA connectors per MIL-C-39012 .

<table>
<thead>
<tr>
<th>Connector Options</th>
<th>Type/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SMA, Female</td>
</tr>
<tr>
<td>2</td>
<td>SMA, Male</td>
</tr>
</tbody>
</table>

CONSTRUCTION: Black, finned aluminum body, stainless steel connectors; gold plated beryllium copper contacts.

WEIGHT: Net 10 g (0.35 oz) maximum

PHYSICAL DIMENSIONS:

Typical SWR of a 69A-10

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:

69A - XX - 12*

*Unit is bi-directional and full power may be applied to either connector.
Fixed Coaxial Attenuators

Model 75A

**Bi-directional Design, SMK Connectors**

**dc to 40.0 GHz**

**5 Watts**

**Features**

- Usable to 42 GHz
- Compact Construction - Lowest size/power ratio.
- Precision Injection Molded Connectors
- Designed to meet environmental requirements of MIL-DTL-3933.
- Flat Response & Low SWR

**Specifications**

**Nominal Impedance:** 50 Ω  
**Frequency Range:** dc to 40.0 GHz  

**Maximum Deviation Over Frequency:**

| Nominal ATTN (dB) | Deviation (dB) | 26.5-40 GHz
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6</td>
<td>± 0.50</td>
<td>± 1.00</td>
</tr>
<tr>
<td>10, 20, 30</td>
<td>± 0.80</td>
<td>± 1.50</td>
</tr>
</tbody>
</table>

**Maximum SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 26.5</td>
<td>1.25</td>
</tr>
<tr>
<td>26.5 - 40</td>
<td>1.45</td>
</tr>
</tbody>
</table>

**Power Rating (mounted horizontally):** 5 watts average (bi-directional) to 25°C ambient temperature, derated linearly to 0.5 Watt @ 125°C. 200 watts peak (5 μsec pulse width; 1.25% duty cycle).

**Power Coefficient:** <0.002 dB/dB/watt  
**Temperature Coefficient:** <0.0004 dB/dB/°C

**Connector Options**

<table>
<thead>
<tr>
<th>Type/Description</th>
<th>Connector Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.92mm Female</td>
<td>1 2.92mm Female/Female</td>
</tr>
<tr>
<td>3.5mm Male</td>
<td>2 2.92mm Male/Female</td>
</tr>
</tbody>
</table>

**Construction:** Black, finned aluminum body, gold plated beryllium copper contacts.

**Weight:** 200 g (7.0 oz.) maximum

**Physical Dimensions:**

<table>
<thead>
<tr>
<th>Features</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usable to 42 GHz</td>
<td>Nominal Impedance: 50 Ω</td>
</tr>
<tr>
<td>Compact Construction - Lowest size/power ratio.</td>
<td>Frequency Range: dc to 40.0 GHz</td>
</tr>
<tr>
<td>Precision Injection Molded Connectors</td>
<td>Maximum Deviation Over Frequency:</td>
</tr>
<tr>
<td>Designed to meet environmental requirements of MIL-DTL-3933.</td>
<td></td>
</tr>
<tr>
<td>Flat Response &amp; Low SWR</td>
<td></td>
</tr>
</tbody>
</table>

**Model Number Description:**

Example:

```
75A - XX - XX*
```

*Unit is bi-directional and full power may be applied to either connector.
Attenuator Sets
dc to 18.0/26.5 GHz

Features

- **Test Data:** Test Data for each attenuator is provided.
- **Data furnished:** AS-6 and AS-18, Insertion loss & SWR ports 1 and 2 test data supplied at 0.05, 4.0, 8.0, 12.4 and 18.0 GHz and AS-20, Insertion loss & SWR ports 1 and 2 test data supplied at 0.05, 4.0, 8.0, 12.4, 18.0 and 28.0GHz.
- **Wide Temperature Range:** -55 °C to 100 °C. Full rated power to 25 °C. Derated Linearity to 0.5 watts @ 125 °C.
- **Uniform Phase Characteristics:** Excellent unit-to-unit tracking and phase linearly with frequency.
- **Rugged Construction:** Designed to meet all environmental requirements of MIL-DTL-3933.
- **High Repeatability Connectors:**
  - AS-6: Type N per MIL-STD-348
  - AS-18: Precision N per MIL-STD-348
  - AS-20: Precision 3.5mm
- **Durable Storage Case.**

Specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Standard Model Number</th>
<th>Nominal Values (dB)</th>
<th>Frequency Range (GHz)</th>
<th>Average Power (W)</th>
<th>Connector Type</th>
<th>Maximum* SWR</th>
<th>Page No.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS-6</td>
<td>2</td>
<td>3, 6, 10, 20</td>
<td>dc-18 GHz</td>
<td>5</td>
<td>N</td>
<td>1.15 - 1.35</td>
<td>36</td>
</tr>
<tr>
<td>AS-18</td>
<td>44</td>
<td>1, 3, 6, 10, 20, 30</td>
<td>dc-18 GHz</td>
<td>5</td>
<td>N</td>
<td>1.15 - 1.25</td>
<td>37</td>
</tr>
<tr>
<td>AS-20</td>
<td>56</td>
<td>3, 6, 10, 20, 30</td>
<td>dc-26.5 GHz</td>
<td>2</td>
<td>3.5mm</td>
<td>1.10 - 1.25</td>
<td>30</td>
</tr>
</tbody>
</table>

*Varies with frequency.
**Refer to indicated page for more detailed attenuator specifications.

STORAGE CASE DIMENSIONS:

- **Model AS-6:** 136.5mm (5-3/8 in) long x 125.4mm (4-15/16 in) wide x 35.6mm (2-3/16 in) high
- **Model AS-18:** 215.9mm (8.5 in) long x 273mm (10-3/4 in) wide x 63.5mm (2-1/2 in) high
- **Model AS-20:** 139.7mm (5-1/2 in) long x 123.8mm (4-7/8 in) wide x 60.3mm (2-3/8 in) high
Fixed Coaxial Attenuators

High Reliability Attenuators

*Designed to meet requirements of MIL-DTL-3933, CLASS III/IV, N/S*

---

## Basic Model Information...

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Outline Drawing/Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>272N-XX (Non-screened) 272S-XX (Screened) (Available in 1-10, 20, 30 &amp; 40 dB)</td>
<td>dc to 18 GHz 5 watts Average; 1 kW peak</td>
<td>Refer to Aeroflex / Weinschel Standard Model 272 (page 41a) for specifications.</td>
</tr>
<tr>
<td>273N-XX (Non-screened) 273S-XX (Screened)</td>
<td>dc to 18 GHz 2 watts Average; 500 W peak</td>
<td>Refer to Aeroflex / Weinschel Standard Model 273 (page 41b) for specifications.</td>
</tr>
<tr>
<td>274N-XX (Non-screened) 274S-XX (Screened) (Available in 0-10 in 0.5 dB steps, 11-20 in 1 dB steps &amp; 25-40 in 5 dB steps)</td>
<td>dc to 18 GHz 2 watts Average; 500 W peak</td>
<td>Refer to Aeroflex / Weinschel Standard Model 274 (page 41c) for specifications.</td>
</tr>
<tr>
<td>276N-XX (Non-screened) 276S-XX (Screened) (Available in 3, 6, 10, 20, 30 dB)</td>
<td>dc to 18 GHz 25 Watts Average; 2 kW peak</td>
<td>Refer to Aeroflex / Weinschel Standard Model 276 (page 41d) for specifications.</td>
</tr>
</tbody>
</table>

---

## Features

- Screened and Non-screened models available.
- Choice of attenuation values from 0 to 40 dB.
- Frequency Ranges from dc to 18 GHz.
- Power capability from 2 to 25 watts.
- Test Data supplied at additional cost as follows:
  - **Non-screened (N):** Swept data plots of Attenuation and SWR across the frequency band.
  - **Screened (S):** Swept data plots of Attenuation and SWR across the frequency band. Film, Standard data package includes lot record performance showing pass/fail quantities for all tests and test reports as applicable.
- Type N and SMA Connectors.

**MODEL NUMBER DESCRIPTION:**

Example:

```
272N - XX
```

<table>
<thead>
<tr>
<th>Basic Model Number</th>
<th>Attenuation Value (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = Non-screened</td>
<td></td>
</tr>
<tr>
<td>S = Screened</td>
<td></td>
</tr>
</tbody>
</table>

---

## Screening

Units are screened as follows:

**"N" versions:**
- SWR
- Attenuation
- Peak Power

**"S" versions:**
- Thermal Shock
- Monitored Thermal Cycle (MTC)
- Attenuation w/Parts Assembly Verification (PAV)
- Conditioning
- Peak Power
- Attenuation
- SWR
- Radiographics

---

5305 Spectrum Drive, Frederick, MD 21703-7362 • TEL: 301-846-9222, 800-638-2048 • Fax: 301-846-9116
web: www.aeroflex.com/weinschel • email: weinschel-sales@aeroflex.com

Revision Date: 10/4/2013
Fixed Coaxial Attenuators

Model 272
High Reliability, N Connectors

Designed to meet requirements of MIL-DTL-3933, CLASS III/IV, N/S

Features

- Rugged injection molded connectors.
- Screened (Model 272S) and Non-screened (Model 272N) designs available.
- Available in 1-10, 20, 30 & 40 dB.
- Test Data supplied at additional cost as follows:
  Non-screened (N): Swept data plots of Attenuation and SWR across the frequency band.
  Screened (S): Swept data plots of Attenuation and SWR across the frequency band. Film, Standard data package includes lot record performance showing pass/fail quantities for all tests and test reports as applicable.

Specifications

**Nominal Impedance:** 50 Ω

**Frequency Range:** dc to 18.0 GHz

**Maximum Deviation Over Frequency:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 6.5</td>
<td>± 0.30</td>
</tr>
<tr>
<td>7 - 8.5</td>
<td>± 0.40</td>
</tr>
<tr>
<td>9 - 14</td>
<td>± 0.50</td>
</tr>
<tr>
<td>15 - 20</td>
<td>± 0.60</td>
</tr>
<tr>
<td>21 - 40</td>
<td>± 1.00</td>
</tr>
</tbody>
</table>

**Maximum SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.12</td>
</tr>
<tr>
<td>4 - 8</td>
<td>1.15</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.18</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>1.20</td>
</tr>
</tbody>
</table>

**Power Rating:** 5 watts average @ 25°C ambient temperature, derated linearly to 0.5 watt @ 125°C. 1 kilowatt peak (5 μsec pulse width; 0.25% duty cycle)

**Power Coefficient:** <0.005 dB/dB/Watt

**Temperature Coefficient:** < 0.0004 dB/dB/°C

**Temperature Range:** -55°C to +125°C

**Connectors:** Precision Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

**Construction:** Stainless steel body and connectors; gold plated beryllium copper contacts.

**Weight:**

<table>
<thead>
<tr>
<th>dB Value</th>
<th>Weight (Net)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10, 20, 30</td>
<td>70 g (2.6 oz)</td>
</tr>
<tr>
<td>40</td>
<td>100 g (3.6 oz)</td>
</tr>
</tbody>
</table>

**Physical Dimensions:**

<table>
<thead>
<tr>
<th>Dimension (mm)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>16.3</td>
</tr>
<tr>
<td>A</td>
<td>21.0</td>
</tr>
</tbody>
</table>

**Note:** All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

**Screening**

Units are screened as follows:

**“N” versions:**
- SWR
- Attenuation
- Peak Power

**“S” versions:**
- Thermal Shock
- Monitored Thermal Cycle (MTC)
- Attenuation
- Conditioning
- Peak Power
- SWR
- Radiographics

**Model Number Description:**

Example:

272N - XX

Basic Model Number
N = Non-screened
S = Screened

Attenuation Value (dB)
Fixed Coaxial Attenuators

Model 273
High Reliability, SMA Connectors

Designed to meet requirements of MIL-DTL-3933, CLASS III/IV, N/S

Features

- Rugged injection molded connectors.
- Screened (Model 273S) and Non-screened (Model 273N) designs available.
- Available in 0-10 in 0.5 dB steps, 11-20 in 1 dB steps & 25-40 in 5 dB steps.
- Test Data supplied at additional cost as follows:
  - Non-screened (N): Swept data plots of Attenuation and SWR across the frequency band.
  - Screened (S): Swept data plots of Attenuation and SWR across the frequency band. Film, Standard data package includes lot record performance showing pass/fail quantities for all tests and test reports as applicable.

Specifications

**Nominal Impedance:** 50 Ω
**Frequency Range:** dc to 18.0 GHz

**Maximum Deviation Over Frequency:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 6.5</td>
<td>± 0.30</td>
</tr>
<tr>
<td>7 - 8.5</td>
<td>± 0.40</td>
</tr>
<tr>
<td>9 - 14</td>
<td>± 0.50</td>
</tr>
<tr>
<td>15 - 20</td>
<td>± 0.60</td>
</tr>
<tr>
<td>25 - 40</td>
<td>± 1.00</td>
</tr>
</tbody>
</table>

**Maximum SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 2</td>
<td>1.10</td>
</tr>
<tr>
<td>2 - 4</td>
<td>1.15</td>
</tr>
<tr>
<td>4 - 8</td>
<td>1.20</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.25</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>1.35</td>
</tr>
</tbody>
</table>

**Power Rating:** 2 watts average to 25°C ambient temperature, derated linearly to 0.5 watts at 125°C. 500 watts peak (5 μsec pulse width; 0.2% duty cycle).

**Power Coefficient:** < 0.005 dB/dB/watts

**Temperature Coefficient:** < 0.0004 dB/dB/°C

**Temperature Range:** -55°C to +125°C
Fixed Coaxial Attenuators

Model 274
High Reliability, SMA Connectors
Designed to meet requirements of MIL-DTL-3933, CLASS III/IV, N/S

Features

- Rugged injection molded connectors.
- Screened (Model 274S) and Non-screened (Model 274N) designs available.
- Available in 0 - 20 in 0.5 dB steps, 30 & 40 dB.
- Test Data supplied at additional cost as follows:
  Non-screened (N): Swept data plots of Attenuation and SWR across the frequency band.
  Screened (S): Swept data plots of Attenuation and SWR across the frequency band. Film, Standard data package includes lot record performance showing pass/fail quantities for all tests and test reports as applicable.

Specifications

Nominal Impedance: 50 Ω
Frequency Range: dc to 18.0 GHz

Maximum Deviation Over Frequency:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 2</td>
<td>± 0.50</td>
</tr>
<tr>
<td>3 - 6</td>
<td>± 0.30</td>
</tr>
<tr>
<td>7 - 12</td>
<td>± 0.50</td>
</tr>
<tr>
<td>20</td>
<td>± 0.70</td>
</tr>
<tr>
<td>30, 40</td>
<td>± 1.00</td>
</tr>
</tbody>
</table>

Maximum SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.15</td>
</tr>
<tr>
<td>4 - 8</td>
<td>1.20</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.25</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>1.35</td>
</tr>
</tbody>
</table>

Power Rating: 2 watts average to 25°C ambient temperature, derated linearly to 0.5 watts at 125°C. 500 watts peak (5 μsec pulse width; 0.2% duty cycle).

Power Coefficient: < 0.005 dB/dB/watts

Temperature Coefficient: < 0.0004 dB/dB/°C

Temperature Range: -55°C to +125°C

Connectors: SMA connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

Construction: Passivated stainless steel body and connectors; gold plated beryllium copper contacts.

Weight:

<table>
<thead>
<tr>
<th>dB VALUE</th>
<th>WEIGHT (Net)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 20</td>
<td>10 g (0.35 oz)</td>
</tr>
<tr>
<td>30, 40</td>
<td>20 g (0.70 oz)</td>
</tr>
</tbody>
</table>

Physical Dimensions:

<table>
<thead>
<tr>
<th>dB VALUE</th>
<th>DIM A ± 0.5 (0.02)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 -10, 20</td>
<td>STD 30.5 (1.20) 29.7 (1.17) 32.3 (1.27)</td>
</tr>
<tr>
<td>30, 40</td>
<td>Prefix F 47.0 (1.85) 46.2 (1.82) 47.7 (1.86)</td>
</tr>
</tbody>
</table>

Screening

Units are screened as follows:

"N" versions:
- SWR
- Attenuation
- Peak Power

"S" versions:
- Thermal Shock
- Monitored Thermal Cycle (MTC)
- Attenuation w/Parts Assembly Verification (PAV)
- Conditioning
- Peak Power
- Attenuation
- SWR
- Radiographics

Model Number Description:

Example:

274N - XX

Basic Model Number
N = Non-screened
S = Screened

Attenuation Value (dB)
### Fixed Coaxial Attenuators

**Model 276**  
**High Reliability, N Connectors**  
*Designed to meet requirements of MIL-DTL-3933, CLASS III/IV, N/S*  

**Features**
- Rugged injection molded connectors.
- Screened (Model 276S) and Non-screened (Model 276N) designs available.
- Available in 3, 6, 10, 20 & 30 dB.
- Test Data supplied at additional cost as follows:
  - Non-screened (N): Swept data plots of Attenuation and SWR across the frequency band.
  - Screened (S): Swept data plots of Attenuation and SWR across the frequency band. Film, Standard data package includes lot record performance showing pass/fail quantities for all tests and test reports as applicable.

**Specifications**
- **Nominal Impedance:** 50 Ω
- **Frequency Range:** dc to 18.0 GHz

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>DB</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6</td>
<td>± 0.30</td>
</tr>
<tr>
<td>10, 20</td>
<td>± 0.50</td>
</tr>
<tr>
<td>30</td>
<td>± 1.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.15</td>
</tr>
<tr>
<td>4 - 8</td>
<td>1.20</td>
</tr>
<tr>
<td>8 - 12</td>
<td>1.25</td>
</tr>
<tr>
<td>12 - 18</td>
<td>1.40</td>
</tr>
</tbody>
</table>

**Power Rating (mounted horizontally):** 25 watts average (bi-directional) to 25°C ambient temperature, derated linearly to 2.5 watts @ 125°C.

3, 6 dB: 1 kilowatt peak (5 μsec pulse width; 0.05% duty cycle), 10, 20 30 dB: 2 kilowatt peak (5 μsec pulse width; 0.05% duty cycle).

**Power Coefficient:** <0.0006 dB/db/watt

**Temperature Coefficient:** <0.0004 dB/°C

**Temperature Range:** -55°C to 125°C

**Connectors:** Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Type N Female</td>
</tr>
<tr>
<td>4</td>
<td>Type N Male</td>
</tr>
</tbody>
</table>

**Construction:** Black, finned aluminum body, stainless steel connectors with gold plated beryllium copper contacts.

**Weight:** 110 g (4 oz.) maximum

**Physical Dimensions:**

**Screening**
Units are screened as follows:

**"N" versions:**
- SWR
- Attenuation
- Peak Power

**"S" versions:**
- Thermal Shock
- Monitored Thermal Cycle (MTC)
- Attenuation
- Conditioning
- Peak Power
- Attenuation
- SWR
- Radiographics

**Model Number Description:**

Example:

276N - XX

Basic Model Number
N = Non-screened
S = Screened

**Attenuation Value (dB)**
Model 32
High Reliability, SMA Connectors
Suitable for Space & Airborne Applications

Features
- Available in 0.5 dB increments from 0-20 dB.
- Precision injection molded connectors.
- Designed to meet environmental requirements of MIL-DTL-3933.
- 100% Subjected to Thermal Shock, Peak Power & Monitored Thermal Cycle (MTC).

Specifications
NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:
<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>± 0.30</td>
</tr>
<tr>
<td>0.5 - 6</td>
<td>± 0.30</td>
</tr>
<tr>
<td>6.5 - 12</td>
<td>± 0.50</td>
</tr>
<tr>
<td>12.5 - 20</td>
<td>± 0.70</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.15</td>
</tr>
<tr>
<td>4 - 8</td>
<td>1.20</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.25</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>1.35</td>
</tr>
</tbody>
</table>

Typical SWR of a 32-10

POWER RATING: 2 watts average to 25°C ambient temperature, derated linearly to 0.5 watts at 125°C. 500 watts peak (5 μsec pulse width; 0.2% duty cycle).

POWER COEFFICIENT: < 0.005 dB/dB/watts
TEMPERATURE COEFFICIENT: < 0.0004 dB/dB/°C
TEMPERATURE RANGE: -55°C to +125°C

Screening
Units are screened 100% as follows:
Thermal Shock: 10 cycles, -55°C to +100°C
Peak Power: 200 Watts, 5 μsec pulse width; 0.05% duty cycle for 3 minutes at each end. DC Attenuation is measured before and after peak power.
Monitored Thermal Cycle: Units are subjected to 10 thermal cycles between -55°C to +100°C. The PIN-to-PIN DC resistance is continuously monitored and stored. Attenuation and SWR are tested as final electrical test.

MODEL NUMBER DESCRIPTION:
Example:

32 - XX
Basic Model Number Attenuation Value (dB)

Fixed Coaxial Attenuators
dc to 18.0 GHz
2 Watts
RoHS

CONNECTORS: SMA connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.
CONSTRUCTION: Passivated stainless steel body and connectors, gold plated beryllium copper contacts. Each unit is sealed using low outgassing sealant.

WEIGHT:

<table>
<thead>
<tr>
<th>dB VALUE</th>
<th>WEIGHT (Net)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 12</td>
<td>3.9 g (0.14 oz)</td>
</tr>
<tr>
<td>12.5 - 20</td>
<td>4.3 g (0.15 oz)</td>
</tr>
</tbody>
</table>

PHYSICAL DIMENSIONS:

Typical SWR of a 32-10

EXPORT CONTROL:
This product is controlled for export under the International Traffic in Arms Regulations (ITAR). A license from the U.S. Department of State is required prior to the export of this product from the United States.

EXPORT WARNING:
Aeroflex’s military and space products are controlled for export under the International Traffic in Arms Regulations (ITAR) and may not be sold or proposed or offered for sale to certain countries. (See ITAR 126.1 for complete information.)

5305 Spectrum Drive, Frederick, MD 21703-7362 • TEL: 301-846-9222, 800-638-2048 • Fax: 301-846-9116
web: www.aeroflex.com/weinschel • email: weinschel-sales@aeroflex.com
Revision Date: 9/27/2013
Fixed Coaxial Attenuators

Models 32J
High Reliability, SMK Connectors
Suitable for Space & Airborne Applications

dc to 32.0 GHz
2 Watts

Features

- Available in 0.5 dB increments from 0-30 dB.
- Rugged injection molded connectors.
- Designed to meet environmental requirements of MIL-DTL-3933.
- 100% Subjected to Thermal Shock, Peak Power & Monitored Thermal Cycle (MTC).

Specifications

| NOMINAL IMPEDANCE: | 50 Ω |
| FREQUENCY RANGE: | dc to 32.0 GHz |

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>+ 0.5 / -0.0</td>
</tr>
<tr>
<td>0.5 - 12</td>
<td>± 0.5</td>
</tr>
<tr>
<td>12.5 - 20</td>
<td>± 1.00</td>
</tr>
<tr>
<td>20.5 - 30</td>
<td>± 2.00</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 32</td>
<td>1.25</td>
</tr>
</tbody>
</table>

POWER RATING: 2 watts average to 25°C ambient temperature, derated linearly to 0.5 watts at 100°C. 500 watts peak (5 μsec pulse width; 0.2% duty cycle).

POWER COEFFICIENT: < 0.005 dB/db/watts
TEMPERATURE COEFFICIENT: < 0.0004 dB/db/°C
TEMPERATURE RANGE: -55°C to +100°C

CONNECTORS: SMK (2.92mm) connectors - mate nondestructively with SMA, 3.5mm and SMK (2.92mm) connectors.

CONSTRUCTION: Passivated stainless steel body and connectors; gold plated beryllium copper contacts. Each unit is sealed using low outgassing sealant.

WEIGHT: 13 g (0.46 oz)

Screening

Units are screened 100% as follows:

Thermal Shock: 10 cycles, -55°C to +100°C
Peak Power: 200 Watts, 5 μsec pulse width; 0.05% duty cycle for 3 minutes at each end. DC Attenuation is measured before and after peak power.

Monitored Thermal Cycle: Units are subjected to 10 thermal cycles between -55 °C to +100 °C. The PIN-to-PIN DC resistance is continuously monitored and stored. Attenuation and SWR are tested as final electrical test.

MODEL NUMBER DESCRIPTION:

Example:

32J - XX

Basic Model Number
Attenuation Value (dB)

EXPORT CONTROL:

This product is controlled for export under the International Traffic in Arms Regulations (ITAR). A license from the U.S. Department of State is required prior to the export of this product from the United States.

EXPORT WARNING:

Aeroflex’s military and space products are controlled for export under the International Traffic in Arms Regulations (ITAR) and may not be sold or proposed or offered for sale to certain countries. (See ITAR 126.1 for complete information.)
Model 32K
High Reliability, SMK Connectors
Suitable for Space & Airborne Applications

Features
- Usable to 42 GHz.
- Ideal for Space & Airborne Applications.
- Available in 3, 6, 10, 20 & 30 dB. Other values available upon request.
- Precision injection molded connectors.
- Designed to meet environmental requirements of MIL-DTL-3933.
- 100% Subjected to Thermal Shock, Peak Power & Monitored Thermal Cycle (MTC).

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 40.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>dc-26.5 GHz</td>
</tr>
<tr>
<td>3, 6, 10</td>
<td>± 0.50</td>
</tr>
<tr>
<td>20, 30</td>
<td>± 0.80</td>
</tr>
<tr>
<td>26.5-40 GHz</td>
<td>± 1.00</td>
</tr>
<tr>
<td></td>
<td>± 1.50</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 26.5</td>
<td>1.25</td>
</tr>
<tr>
<td>26.5 - 40</td>
<td>1.45</td>
</tr>
</tbody>
</table>

POWER RATING: 2 watts average to 25 °C ambient temperature, derated linearly to 0.2 watt at 100 °C. 200 watts peak (5 μsec pulse width; 0.5 % duty cycle).

POWER COEFFICIENT: < 0.005 dB/dB/watts
TEMPERATURE COEFFICIENT: < 0.0004 dB/dB/°C
TEMPERATURE RANGE: -55 °C to +100 °C
CONNECTORS: SMK (2.92mm) connectors - mate nondestructively with SMA connectors per MIL-C-39012, 3.5mm and other 2.92mm connectors.
CONSTRUCTION: Passivated stainless steel body and connectors; gold plated beryllium copper contacts. Each unit is sealed using low outgassing sealant.
WEIGHT: 8 g (0.3 oz.) maximum

Screening
Thermal Shock: 10 cycles, -55 °C to +100 °C
Peak Power: 200 Watts, 5 μsec pulse width; 0.05% duty cycle for 3 minutes at each end. DC Attenuation is measured before and after peak power.
Monitored Thermal Cycle: Units are subjected to 15 thermal cycles between -55 °C to +100 °C. The PIN-to-PIN DC resistance is continuously monitored and stored. Attenuation and SWR are tested as final electrical test.

MODEL NUMBER DESCRIPTION:
Example:

*32K - XX

Basic Model Number Attenuation Value (dB)

EXPORT CONTROL:
This product is controlled for export under the International Traffic in Arms Regulations (ITAR). A license from the U.S. Department of State is required prior to the export of this product from the United States.

EXPORT WARNING:
Aeroflex’s military and space products are controlled for export under the International Traffic in Arms Regulations (ITAR) and may not be sold or proposed or offered for sale to certain countries. (See ITAR 126.1 for complete information.)
Fixed Coaxial Attenuators

Model 41
Medium Power, SMA Connectors
Bi-directional Design

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2</td>
<td>± 0.50</td>
</tr>
<tr>
<td>3, 6</td>
<td>± 0.30</td>
</tr>
<tr>
<td>10</td>
<td>± 0.50</td>
</tr>
<tr>
<td>20</td>
<td>± 0.70</td>
</tr>
<tr>
<td>30</td>
<td>± 1.00</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 8</td>
<td>1.20</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.30</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>1.35</td>
</tr>
</tbody>
</table>

POWER RATING (mounted horizontally): 10 watts average (bi-directional) to 25°C ambient temperature, derated linearly to 1 Watt @ 125°C. 1 kilowatt peak (5 μsec pulse width; 0.5% duty cycle).

POWER COEFFICIENT: <0.0015 dB/dB/watt
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55 °C to 125 °C

FEATURES:

- Compact Construction - Lowest size/power ratio.
- Quality Connectors with special high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.

CONSTRUCTION: Black, finned aluminum body, gold plated beryllium copper contacts.

WEIGHT: 28 g (1 oz.) maximum

PHYSICAL DIMENSIONS:

<table>
<thead>
<tr>
<th>Connector</th>
<th>DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMA Male</td>
<td>11.18 (0.44)</td>
</tr>
<tr>
<td>SMA Female</td>
<td>9.4 (0.37)</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:
Example:

41 - XX - XX*

Basic Model Number
Attenuation Value (dB)
Connector Options
-11 Female/Female
-12 Female/Male
-22 Male/Male

* Unit is bi-directional and full power may be applied to either connector.
Fixed Coaxial Attenuators
dc to 8.5 GHz
10 Watts

Model 37
Medium Power, Type N Connectors
Bi-directional Design!

Features
- Optimized for Wireless OEM & Test Applications.
- Precision injection molded connector dielectric.
- Designed to meet environmental requirements of MIL-DTL-3933.

Specifications

Nominal Impedance: 50 Ω
Frequency Range: dc to 8.5 GHz

Maximum Deviation over Frequency:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB) dc-4 GHz</th>
<th>Deviation (dB) 4 - 8.5 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6, 10, 20</td>
<td>± 0.30</td>
<td>± 0.50</td>
</tr>
<tr>
<td>30</td>
<td>± 0.50</td>
<td>± 0.80</td>
</tr>
</tbody>
</table>

Maximum SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.15</td>
</tr>
<tr>
<td>4 - 8.5</td>
<td>1.25</td>
</tr>
</tbody>
</table>

Power Rating (mounted horizontally): 10 watts average (bi-directional) to 25°C ambient temperature, derated linearly to 1 watts @ 125°C. Note: 3 dB model can handle 20 Watts average (bi-directional). 1 kilowatt peak (5 μsec pulse width; 0.5% duty cycle).

Power Coefficient: <0.001 dB/dB/watt

Temperature Coefficient: <0.0004 dB/dB/°C

Temperature Range: -55 °C to 125 °C

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 8.5 GHz supplied.

Connectors: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

Connector Options

<table>
<thead>
<tr>
<th>Connection Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Type N, Female</td>
</tr>
<tr>
<td>4</td>
<td>Type N, Male</td>
</tr>
</tbody>
</table>

Construction: Black, finned aluminum body, gold plated beryllium copper contacts.

Weight: 110 g (4 oz.) maximum

Physical Dimensions:

Connector DIM A  
N Male 24.1 (0.95)
N Female 19.1 (0.75)

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model Number Description:

Example:

37 - XX - XX*

Basic Model Number
Attenuation Value (dB)
Connector Options  
1st digit is J1 side  
2nd digit is J2 side

*Unit is bi-directional and full power may be applied to either J1 or J2.
Fixed Coaxial Attenuators

Model 23

Medium Power, Type N Connectors

Bi-directional Design!

Features

- Precision injection molded connector dielectric.
- Designed to meet environmental requirements of MIL-DTL-3933.

Specifications

| NOMINAL IMPEDANCE: | 50 Ω |
| FREQUENCY RANGE: | dc to 18.0 GHz |

**MAXIMUM DEVIATION OVER FREQUENCY:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>± 0.50</td>
</tr>
<tr>
<td>3, 6</td>
<td>± 0.30</td>
</tr>
<tr>
<td>10, 20</td>
<td>± 0.50</td>
</tr>
<tr>
<td>30, 40</td>
<td>± 1.00</td>
</tr>
<tr>
<td>50</td>
<td>± 1.25</td>
</tr>
<tr>
<td>60</td>
<td>± 1.50</td>
</tr>
</tbody>
</table>

**POWER RATING (mounted horizontally):** 10 watts average (bi-directional) to 25°C ambient temperature, derated linearly to 1 watts @ 125°C. 1 kilowatt peak (5 μsec pulse width; 0.5% duty cycle).

**POWER COEFFICIENT:** <0.001 dB/dB/watt

**TEMPERATURE COEFFICIENT:** <0.0004 dB/dB/°C

**TEMPERATURE RANGE:** -55°C to 125°C

**CONNECTORS:** Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

**CONSTRUCTION:** Black, finned aluminum body, gold plated beryllium copper contacts.

**WEIGHT:** 110 g (4 oz.) maximum

**PHYSICAL DIMENSIONS:**

<table>
<thead>
<tr>
<th>Connector Options</th>
<th>Type/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Type N, Female</td>
</tr>
<tr>
<td>4</td>
<td>Type N, Male</td>
</tr>
</tbody>
</table>

**FEATURES:**

- Precision injection molded connector dielectric.
- Designed to meet environmental requirements of MIL-DTL-3933.

**CONSTRUCTION:** Black, finned aluminum body, gold plated beryllium copper contacts.

**WEIGHT:** 110 g (4 oz.) maximum

**PHYSICAL DIMENSIONS:**

<table>
<thead>
<tr>
<th>Connector Options</th>
<th>Type/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Type N, Female</td>
</tr>
<tr>
<td>4</td>
<td>Type N, Male</td>
</tr>
</tbody>
</table>

**FEATURES:**

- Precision injection molded connector dielectric.
- Designed to meet environmental requirements of MIL-DTL-3933.

**CONSTRUCTION:** Black, finned aluminum body, gold plated beryllium copper contacts.

**WEIGHT:** 110 g (4 oz.) maximum

**PHYSICAL DIMENSIONS:**

<table>
<thead>
<tr>
<th>Connector Options</th>
<th>Type/Description</th>
</tr>
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<td>3</td>
<td>Type N, Female</td>
</tr>
<tr>
<td>4</td>
<td>Type N, Male</td>
</tr>
</tbody>
</table>

**FEATURES:**

- Precision injection molded connector dielectric.
- Designed to meet environmental requirements of MIL-DTL-3933.

**CONSTRUCTION:** Black, finned aluminum body, gold plated beryllium copper contacts.

**WEIGHT:** 110 g (4 oz.) maximum

**PHYSICAL DIMENSIONS:**

<table>
<thead>
<tr>
<th>Connector Options</th>
<th>Type/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Type N, Female</td>
</tr>
<tr>
<td>4</td>
<td>Type N, Male</td>
</tr>
</tbody>
</table>

**FEATURES:**

- Precision injection molded connector dielectric.
- Designed to meet environmental requirements of MIL-DTL-3933.

**CONSTRUCTION:** Black, finned aluminum body, gold plated beryllium copper contacts.

**WEIGHT:** 110 g (4 oz.) maximum

**PHYSICAL DIMENSIONS:**

<table>
<thead>
<tr>
<th>Connector Options</th>
<th>Type/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Type N, Female</td>
</tr>
<tr>
<td>4</td>
<td>Type N, Male</td>
</tr>
</tbody>
</table>
Fixed Coaxial Attenuators

Model 279
Medium Power, SMK Connectors
dc to 40.0 GHz
10 Watts

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 40 GHz.

CONNECTORS: SMK (2.92mm) Male/Female connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm connectors.

Connector Options

<table>
<thead>
<tr>
<th>Type/Description</th>
<th>Connector Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SMK (2.92mm), Female</td>
<td>1</td>
</tr>
<tr>
<td>2 SMK (2.92mm), Male</td>
<td>2</td>
</tr>
</tbody>
</table>

CONSTRUCTION: Black, finned aluminum body, gold plated beryllium copper contacts.

WEIGHT: 200 g (8.0 oz.) maximum

PHYSICAL DIMENSIONS:

Features

Compact Construction - Lowest size/power ratio.
Precision injection molded connectors.
Designed to meet environmental requirements of MIL-DTL-3933.

Specifications

Nominal Impedance: 50 Ω
Frequency Range: dc to 40.0 GHz

Maximum Deviation Over Frequency:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6, 10, 20, 30</td>
<td>± 1.5</td>
</tr>
</tbody>
</table>

Maximum Swr:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 18</td>
<td>1.20</td>
</tr>
<tr>
<td>18 - 40</td>
<td>1.35</td>
</tr>
</tbody>
</table>

Power Rating (mounted horizontally): 10 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 2 Watts @ 125°C. 200 watts peak (5 μsec pulse width; 5% duty cycle). Maximum power into output port is 5 Watts.

Power Coefficient: <0.002 dB/dB/watt

Temperature Coefficient: <0.0004 dB/dB/°C

Temperature Range: -55 °C to 125 °C

Dash No. Connector Type DIM A
11 SMK Female/Female
12 SMK Female/Male
21 SMK Male/Female
22 SMK Male/Male

Example:

279 - XX - XX

Basic Model Number Attenuation Value (dB) Connector Options
-11 Female/Female
-12 Female/Male
-21 Male/Female
-22 Male/Male

NOTE: All dimensions are given in mm (inches) and are nominal, unless otherwise specified.

Model Number Description:

Example:
Fixed Coaxial Attenuators

Model 89
Medium Power, SMK Connectors
dc to 40.0 GHz
20 Watts

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 40 GHz.

CONNECTORS: SMK (2.92mm) Male/Female connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm connectors.

CONSTRUCTION: Black, finned aluminum body, gold plated beryllium copper contacts.

WEIGHT: 200 g (8.0 oz.) maximum

PHYSICAL DIMENSIONS:

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 40.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10, 20, 30</td>
<td>+ 1.5</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 18</td>
<td>1.25</td>
</tr>
<tr>
<td>18 - 40</td>
<td>1.40</td>
</tr>
</tbody>
</table>

POWER RATING (mounted horizontally): 20 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 2 Watts @ 125°C. 200 watts peak (5 μsec pulse width; 5% duty cycle). Maximum power into output port is 5 Watts.

POWER COEFFICIENT: <0.002 dB/dB/watt
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55 °C to 125 °C

FEATURES

Compact Construction - Lowest size/power ratio.
Precision injection molded connectors.
Designed to meet environmental requirements of MIL-DTL-3933.

SPECIFICATIONS

Model 89 dc to 40.0 GHz
Medium Power, SMK Connectors

CONNECTOR OPTIONS

<table>
<thead>
<tr>
<th>Type/Description</th>
<th>2.92mm, Female</th>
<th>2.92mm, Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONSTRUCTION:
Black, finned aluminum body, gold plated beryllium copper contacts.

WEIGHT: 200 g (8.0 oz.) maximum

PHYSICAL DIMENSIONS:

FEATURES

Compact Construction - Lowest size/power ratio.
Precision injection molded connectors.
Designed to meet environmental requirements of MIL-DTL-3933.

SPECIFICATIONS

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 40.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10, 20, 30</td>
<td>+ 1.5</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 18</td>
<td>1.25</td>
</tr>
<tr>
<td>18 - 40</td>
<td>1.40</td>
</tr>
</tbody>
</table>

POWER RATING (mounted horizontally): 20 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 2 Watts @ 125°C. 200 watts peak (5 μsec pulse width; 5% duty cycle). Maximum power into output port is 5 Watts.

POWER COEFFICIENT: <0.002 dB/dB/watt
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55 °C to 125 °C

MODEL NUMBER DESCRIPTION:
Example:

89 - XX - XX

Basic Model Number
Attenuation Value (dB)
Connector Options
-11 Female/Female
-12 Female/Male
-21 Male/Female
-22 Male/Male
Fixed Coaxial Attenuators

Model 34
Medium Power, Type N or SMK Connectors
Bi-directional Design

dc to 4.0 GHz
25 Watts

Features

- Optimized for Wireless OEM & Test Applications.
- Precision Connectors with high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.

Specifications

- NOMINAL IMPEDANCE: 50 Ω
- FREQUENCY RANGE: dc to 4.0 GHz

Maximum Deviation Over Frequency:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc-2 GHz</td>
<td>+ 0.60</td>
</tr>
<tr>
<td>2 - 4 GHz</td>
<td>+ 1.00</td>
</tr>
</tbody>
</table>

Maximum SWR*:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 2</td>
<td>1.10</td>
</tr>
<tr>
<td>2 - 4</td>
<td>1.20</td>
</tr>
</tbody>
</table>

POWER RATING (mounted horizontally): 25 watts average (bi-directional) to 25°C ambient temperature, derated linearly to 2.5 watts @ 125°C. 5 kilowatt peak (5 μsec pulse width; 0.25% duty cycle).

POWER COEFFICIENT: <0.0006 dB/dB/watt

TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C

TEMPERATURE RANGE: -55 °C to 125 °C

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 4 GHz is available at additional cost. Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. SMK (2.92mm) connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm, SMK, and other 2.92mm connectors.

Options

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SMK Female</td>
</tr>
<tr>
<td>2</td>
<td>SMK Male</td>
</tr>
<tr>
<td>3</td>
<td>Type N, Female</td>
</tr>
<tr>
<td>4</td>
<td>Type N, Male</td>
</tr>
</tbody>
</table>

CONSTRUCTION: Black, finned aluminum body, gold plated beryllium copper contacts.

WEIGHT: 170 g (6 oz.) maximum

PHYSICAL DIMENSIONS:

<table>
<thead>
<tr>
<th>Connector</th>
<th>DIM A</th>
<th>Connector</th>
<th>DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9 (0.90)</td>
<td>2.92mm Male</td>
<td>14.0 (0.55)</td>
</tr>
<tr>
<td>N Female</td>
<td>15.0 (0.59)</td>
<td>2.92mm Female</td>
<td>12.7 (0.50)</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:

34 - XX - XX

Basic Model Number
Attenuation Value (dB)
Connector Options
1st digit is J1 side
2nd digit is J2 side

*Unit is bi-directional and full power may be applied to either J1 or J2.
Fixed Coaxial Attenuators

Model 77
Medium Power, 7/16 Connectors
dc to 6.0 GHz
25 Watts

Specifications

- **Nominal Impedance:** 50 Ω
- **Frequency Range:** dc to 6.0 GHz
- **Maximum Deviation Over Frequency:**
<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10, 20</td>
<td>+ 0.70</td>
</tr>
<tr>
<td>30</td>
<td>+ 1.20</td>
</tr>
</tbody>
</table>
- **Maximum SWR:**
<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 3</td>
<td>1.20</td>
</tr>
<tr>
<td>3 - 6</td>
<td>1.30</td>
</tr>
</tbody>
</table>

3rd Order Intermodulation (77-XX-XX-LIM Only):
Reflected Levels (IM3), -100 dBc and Through Levels (IM3), -110 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +41 dBm each.

- **Power Rating (mounted horizontally):** 25 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 2.5 watts @ 125°C. Maximum power rating into output is 10 watts average. 5 kilowatt peak (5 μsec pulse width; 0.25% duty cycle).
- **Power Coefficient:** <0.002 dB/dB/watt
- **Temperature Coefficient:** <0.0004 dB/dB/°C
- **Temperature Range:** -55 °C to 125 °C

**TEST DATA:** Swept data plots of SWR from 50 MHz to 6 GHz supplied.

**Connectors:** 7/16 connector that conforms to DIN 47223, IEC 169-4, VG 95250, CECC 22 190.

**Construction:** Black, finned aluminum body, silver plated brass connectors

**Weight:** 280 g (10 oz.) maximum

**Physical Dimensions:**

**Model Number Description:**

Example:

- **Model Number:** 77-XX-XX
- **Attenuation Value (dB):**
- **Connector Options:**
  - 1st digit is J1 side
  - 2nd digit is J2 side

*Unit is bi-directional & full power may be applied to either J1 or J2.

**NOTE:** All dimensions are given in mm (inches) and tolerances are X.X±0.8 (0.03) unless otherwise specified.
Fixed Coaxial Attenuators

Model 33
Medium Power, N or SMK Connectors
Bi-directional Design!

Features
- Quality Connectors with special high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Low Intermodulation option available.
- Mode free operation to 10 GHz.

Specifications

**Nominal Impedance:** 50 Ω

**Frequency Range:** dc to 8.5 GHz

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>33</th>
<th>33-LIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc-4 GHz</td>
<td>+ 0.30</td>
<td>+ 0.60</td>
</tr>
<tr>
<td>4 - 8.5 GHz</td>
<td>+ 0.40</td>
<td>+ 0.70</td>
</tr>
</tbody>
</table>

Typical SWR of a 33-10-34

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>dc-4 GHz</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 - 8.5</td>
<td>1.20</td>
<td></td>
</tr>
<tr>
<td>25 Watts</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Power Rating (mounted horizontally):** 25 watts average (bi-directional) to 25°C ambient temperature, derated linearly to 2.5 watts @ 125°C. 5 kilowatt peak (5 μsec pulse width; 0.25% duty cycle).

**Power Coefficient:** <0.0006 dB/dB/watt

**Temperature Coefficient:** <0.0004 dB/dB/°C

**Temperature Range:** -55 °C to 125 °C

**Test Data:** Swept data plots of attenuation and SWR from 50 MHz to 8.5 GHz.

**Connectors:** Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. SMK (2.92mm) connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm, SMK, and other 2.92mm. Female 2.92mm connector NOT RoHS compliant.

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SMK Female</td>
<td>3</td>
<td>Type N, Female</td>
</tr>
<tr>
<td>2</td>
<td>SMK Male</td>
<td>4</td>
<td>Type N, Male</td>
</tr>
</tbody>
</table>

**Construction:** Black, finned aluminum body, gold plated beryllium copper contacts.

**Weight:** 170 g (6 oz.) maximum

**Physical Dimensions:**

<table>
<thead>
<tr>
<th>Connector</th>
<th>DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9 (0.90)</td>
</tr>
<tr>
<td>N Female</td>
<td>15.0 (0.59)</td>
</tr>
<tr>
<td>2.92mm Male</td>
<td>2.92mm Female</td>
</tr>
</tbody>
</table>

**Model Number Description:**

Example:

33 - XX - XX* - LIM

**IM Option**

*Unit is bi-directional & full power may be applied to either J1 or J2.
**Add -LIM to entire model number for Low Intermodulation option.

Available in only 10, 20, 30 dB and is not available through Express.
Fixed Coaxial Attenuators

Model 46
Medium Power, N or 3.5mm Connectors
Bi-directional Design!

dc to 18.0 GHz
25 Watts

Features
- Designed to meet environmental requirements of MIL-DTL-3933.
- Rugged injection molded connectors.
- Low Intermodulation option available.

Specifications

Nominal Impedance: 50 Ω
Frequency Range: dc to 18.0 GHz

Maximum Deviation Over Frequency:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>46</th>
<th>46 LIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2</td>
<td>± 0.50</td>
<td>± 1.00</td>
</tr>
<tr>
<td>3, 6, 10, 20,</td>
<td>± 1.00</td>
<td></td>
</tr>
<tr>
<td>30, 40</td>
<td></td>
<td>+2.0/-1.0</td>
</tr>
</tbody>
</table>

Maximum SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 8</td>
<td>1.15</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.20</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>1.30</td>
</tr>
</tbody>
</table>

3rd Order Intermodulation (46-XX-XX-LIM Only):
Reflected Levels (IM3), -100 dBc and Through Levels (IM3), -110 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +41 dBm each. Option only available 10, 20, 30, 40 dB.

Power Rating (mounted horizontally): 25 watts average (bi-directional) to 25°C ambient temperature, derated linearly to 2.5 watts @ 125°C. 1 kilowatt peak (5 μsec pulse width; 1.25% duty cycle).

Power Coefficient: <0.0006 dB/dB/watt

Temperature Coefficient: <0.0004 dB/Degree C

Temperature Range: -55°C to 125°C

Test Data: Swept data plots of attenuation and SWR from 50 MHz to 18 GHz supplied.

Connectors: N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. 3.5mm Connectors - mate nondestructively with SMA per MIL-C-39012, 2.92mm and other 3.5mm connectors.

Construction: Black, finned aluminum body, stainless steel connectors with gold plated beryllium copper contacts.

Weight: 110 g (4 oz.) maximum

Physical Dimensions:

<table>
<thead>
<tr>
<th>Connector</th>
<th>DIM A</th>
<th>Connector</th>
<th>DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>24.1  (0.95)</td>
<td>N Female</td>
<td>19.0  (0.75)</td>
</tr>
<tr>
<td>N Female</td>
<td>19.0  (0.75)</td>
<td>3.5mm Female</td>
<td>14.0  (0.55)</td>
</tr>
<tr>
<td>3.5mm Male</td>
<td>13.2  (0.52)</td>
<td>2.92mm Male</td>
<td>14.0  (0.55)</td>
</tr>
</tbody>
</table>

Note: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Model Number Description:

Example:

46 - XX - XX* | LIM

Basic Model Number | Attenuation Value (dB) | Connector Options
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1st digit is J1 side</td>
<td>2nd digit is J2 side</td>
<td></td>
</tr>
</tbody>
</table>

* Unit is bi-directional & full power may be applied to either J1 or J2.
** Add -LIM for Low Intermodulation option. Option only available in 10, 20, 30 and 40 dB and is not available through Express.
Fixed Coaxial Attenuators

Model 74
Medium Power, 3.5mm Connectors
dc to 28.0 GHz
25 Watts

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 28 GHz.

CONNECTORS: 3.5mm (Male/Female) connectors - mate nondestructively with SMA per MIL-C-39012, 2.92mm and other 3.5mm connectors.

<table>
<thead>
<tr>
<th>Connector Options</th>
<th>Type/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.5mm, Female</td>
</tr>
<tr>
<td>2</td>
<td>3.5mm, Male</td>
</tr>
</tbody>
</table>

CONSTRUCTION: Black, finned aluminum body, gold plated beryllium copper contacts.

WEIGHT: 100 g (3.5 oz.) maximum

PHYSICAL DIMENSIONS:

- Compact Construction - Lowest size/power ratio.
- Precision injection molded connectors.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Low SWR Design.

Features

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 28 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>± 0.70</td>
</tr>
<tr>
<td>6, 10</td>
<td>± 1.00</td>
</tr>
<tr>
<td>20, 30</td>
<td>± 1.50</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 18</td>
<td>1.30</td>
</tr>
<tr>
<td>18 - 28</td>
<td>1.35</td>
</tr>
</tbody>
</table>

POWER RATING: 25 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 2.5 Watt @ 125°C. 500 watts peak (5 μsec pulse width; 2.5% duty cycle). Maximum power rating into output is 10% of the average power rating.

POWER COEFFICIENT: <0.0006 dB/dB/watt
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55°C to 125°C

MODEL NUMBER DESCRIPTION:

Example:

74 - XX - XX

Connector Options
1st digit is input side
2nd digit is output side
Fixed Coaxial Attenuators

Model 78

High Power, 7/16 Connectors

Bi-Directional Design!

Specifications

**Nominal Impedance:** 50 Ω

**Frequency Range:** dc to 6.0 GHz

**Maximum Deviation Over Frequency:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10, 20</td>
<td>± 1.00</td>
</tr>
<tr>
<td>30</td>
<td>± 1.25</td>
</tr>
</tbody>
</table>

**Maximum SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 3</td>
<td>1.20</td>
</tr>
<tr>
<td>3 - 5</td>
<td>1.30</td>
</tr>
</tbody>
</table>

**3rd Order Intermodulation:**

Reflected Levels (IM3), -100 dBC and Through Levels (IM3), -110 dBC with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

**Connector Options:**

<table>
<thead>
<tr>
<th>Type/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/16 Female</td>
</tr>
<tr>
<td>7/16 Male</td>
</tr>
</tbody>
</table>

**Construction:**

Black, finned aluminum body, silver plated brass connectors.

**Weight:**

392 g (14 oz.) maximum

**Physical Dimensions:**

**Model Number Description:**

Example:

78 - XX - XX*

*Unit is bi-directional & full power may be applied to either J1 or J2.
Fixed Coaxial Attenuators

Model 24
Medium Power, N & SMK Connectors
Bi-Directional Design!

dc to 8.5 GHz
50 Watts

Features
- Designed to meet environmental requirements of MIL-DTL-3933.
- Low Intermodulation option available.
- Mode free operation to 10 GHz.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 8.5 GHz

MAXIMUM DEVIATION OVER FREQUENCY (dB):

<table>
<thead>
<tr>
<th>ATTN (dB)</th>
<th>Nominal 24</th>
<th>24-LIM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>dc-4 GHz</td>
<td>4 - 8.5 GHz</td>
</tr>
<tr>
<td>3, 6, 10, 20</td>
<td>± 0.40</td>
<td>± 0.75</td>
</tr>
<tr>
<td>30, 40</td>
<td>± 0.60</td>
<td>± 1.00</td>
</tr>
</tbody>
</table>

Typical Swr of a 24-10-34

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.20</td>
</tr>
<tr>
<td>4 - 8.5</td>
<td>1.30</td>
</tr>
</tbody>
</table>

3rd ORDER INTERMODULATION (24-XX-XX-LIM only!):
Reflected Levels (IM3), -100 & Through Levels (IM3), -110
dBc with two input signals @ 869 MHz and 891 MHz with
average carrier power levels of +43 dBm each.

CONSTRUCTION: Black, finned aluminum body, gold
plated beryllium copper contacts.

WEIGHT: 280 g (10 oz.) maximum

PHYSICAL DIMENSIONS:

Options Description | Options Description
1 | SMK, Female | 3 | Type N, Female
2 | SMK, Male | 4 | Type N, Male

CONNECTIONS: Type N connectors per MIL-STD-348
interface dimensions - mate nondestructively with MIL-C-
39012 connectors. SMK (2.92mm) connectors - mate
nondestructively with SMA per MIL-C-39012, 3.5mm, SMK,
and other 2.92mm.

TEST DATA: Swept data plots of attenuation and SWR
from 50 MHz to 8.5 GHz supplied.

CONNECTORS: Type N connectors per MIL-STD-348
interface dimensions - mate nondestructively with MIL-C-
39012 connectors. SMK (2.92mm) connectors - mate
nondestructively with SMA per MIL-C-39012, 3.5mm, SMK,
and other 2.92mm.

FEATURES:
- Designed to meet environmental requirements of
  MIL-DTL-3933.
- Low Intermodulation option available.
- Mode free operation to 10 GHz.

POWER RATING (mounted horizontally): 50 watts
average (bi-directional) to 25°C ambient temperature,
derated linearly to 2.5 watts @ 125°C. 5 kilowatt peak
(5 μsec pulse width; 0.5% duty cycle).

POWER COEFFICIENT: <0.0003 dB/dB/watt

TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C

TEMPERATURE RANGE: -55°C to 125°C

TEST DATA: Swept data plots of attenuation and SWR
from 50 MHz to 8.5 GHz supplied.

CONNECTORS: Type N connectors per MIL-STD-348
interface dimensions - mate nondestructively with MIL-C-
39012 connectors. SMK (2.92mm) connectors - mate
nondestructively with SMA per MIL-C-39012, 3.5mm, SMK,
and other 2.92mm.

CONSTRUCTION: Black, finned aluminum body, gold
plated beryllium copper contacts.

WEIGHT: 280 g (10 oz.) maximum

PHYSICAL DIMENSIONS:

Options Description | Options Description
1 | SMK, Female | 3 | Type N, Female
2 | SMK, Male | 4 | Type N, Male

CONSTRUCTION: Black, finned aluminum body, gold
plated beryllium copper contacts.

WEIGHT: 280 g (10 oz.) maximum

PHYSICAL DIMENSIONS:

<p>|</p>
<table>
<thead>
<tr>
<th>Connector DIM A</th>
<th>Connector DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9 (0.90)</td>
</tr>
<tr>
<td>N Female</td>
<td>15.0 (0.59)</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are given in mm (inches) and are maximum,
unless otherwise specified.

MODEL NUMBER DESCRIPTION:
Example:

24 - XX - XX* - LIM

Basic Model Number
Attenuation Value (dB)
Connector Options
1st digit is J1 side
2nd digit is J2 side

*IM Option**

*Unit is bi-directional & full power may be applied to either J1 or J2.
**Add -LIM to entire model number for Low Intermodulation option. Option
only available in 10, 20, 30, 40 dB and is not available through Express.

5305 Spectrum Drive, Frederick, MD 21703-7362 • TEL: 301-846-9222, 800-638-2048 • Fax: 301-846-9116
web: www.aeroflex.com/weinschel • email: weinschel-sales@aeroflex.com
Revision Date: 8/20/2013
Fixed Coaxial Attenuators

Model 90
Medium Power, N & 3.5mm Connectors
Bi-directional Design

**TEMPERATURE RANGE:** -55 °C to 125 °C

**TEST DATA:** Swept data plots of attenuation and SWR from 50 MHz to 18 GHz. Frequency markers at 0.05, 2.0, 4.0, 8.0, 12.4, 18.0 GHz

**CONNECTORS:** Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

3.5mm Connectors - mate nondestructively with SMA per MIL-C-39012, 2.92mm and 3.5mm connectors.

Options | Description | Options | Description
---|---|---|---
1 | 3.5mm Female | 3 | Type N, Female
2 | 3.5mm Male | 4 | Type N, Male

**CONSTRUCTION:** Black, finned aluminum body, gold plated beryllium copper contacts.

**WEIGHT:** 120 g (4.2 oz.) maximum

**PHYSICAL DIMENSIONS:**

**NOMINAL IMPEDANCE:** 50 Ω

**FREQUENCY RANGE:** dc to 18.0 GHz

**MAXIMUM DEVIATION OVER FREQUENCY:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
<th>90</th>
<th>90-LIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6</td>
<td>± 1.0</td>
<td>- - -</td>
<td></td>
</tr>
<tr>
<td>10, 20, 30</td>
<td>± 1.0</td>
<td>+2.0 / -1.0</td>
<td></td>
</tr>
</tbody>
</table>

**MAXIMUM SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 8</td>
<td>1.15</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.20</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>1.30</td>
</tr>
</tbody>
</table>

**POWER RATING** (mounted horizontally): 50 watts average (bi-directional) to 25°C ambient temperature, derated linearly to 5 Watts @ 125°C. 1 kW peak (5 μsec pulse width; 2.5% duty cycle).

**POWER COEFFICIENT:** <0.0003 dB/dB/watt

**TEMPERATURE COEFFICIENT:** <0.0004 dB/dB/°C

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

**MODEL NUMBER DESCRIPTION:**

Example:

90 - XX - XX* - LIM

Basic Model Number | Attenuation Value (dB) | Connector Options | IM Option**
---|---|---|---
1st digit is J1 side | 2nd digit is J2 side

* Unit is bi-directional & full power may be applied to either J1 or J2.
** Add -LIM to entire model number for Low Intermodulation option. Option only available in 10, 20, 30 dB.
Fixed Coaxial Attenuators

Model 47
Medium Power, N or 3.5mm Connectors
dc to 18.0 GHz
50 Watts

Features
- Designed to meet environmental requirements of MIL-DTL-3933.
- Rugged injection molded connectors.

Specifications
Nominal Impedance: 50 Ω
Frequency Range: dc to 18.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:
<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6</td>
<td>± 0.75</td>
</tr>
<tr>
<td>10, 20</td>
<td>± 0.75</td>
</tr>
<tr>
<td>30, 40</td>
<td>± 1.00</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:
<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>3, 6 dB</th>
<th>10, 20</th>
<th>30, 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 8</td>
<td>1.25</td>
<td>1.20</td>
<td></td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.35</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>1.45</td>
<td>1.35</td>
<td></td>
</tr>
</tbody>
</table>

POWER RATING (mounted horizontally): 50 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 5 watts @ 125°C. Note: 3 dB model can handle 100 Watts average (unidirectional). 1 kilowatt peak (5 μsec pulse width; 2.5% duty cycle). Maximum power rating into output port is 10 Watts average.

POWER COEFFICIENT: <0.0003 dB/dB/watt
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55°C to 125°C

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 18 GHz.

CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.
3.5mm Connectors - mate nondestructively with SMA per MIL-C-39012, 2.92mm and other 3.5mm connectors.

CONSTRUCTION: Black, finned aluminum body, stainless steel connectors with gold plated beryllium copper contacts.

WEIGHT: 175 g (6 oz.) maximum

POWER RATING (mounted horizontally): 50 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 5 watts @ 125°C. Note: 3 dB model can handle 100 Watts average (unidirectional). 1 kilowatt peak (5 μsec pulse width; 2.5% duty cycle). Maximum power rating into output port is 10 Watts average.

POWER COEFFICIENT: <0.0003 dB/dB/watt
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55°C to 125°C

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 18 GHz.

CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.
3.5mm Connectors - mate nondestructively with SMA per MIL-C-39012, 2.92mm and other 3.5mm connectors.

CONSTRUCTION: Black, finned aluminum body, stainless steel connectors with gold plated beryllium copper contacts.

WEIGHT: 175 g (6 oz.) maximum

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 18 GHz.

CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.
3.5mm Connectors - mate nondestructively with SMA per MIL-C-39012, 2.92mm and other 3.5mm connectors.

CONSTRUCTION: Black, finned aluminum body, stainless steel connectors with gold plated beryllium copper contacts.

WEIGHT: 175 g (6 oz.) maximum
Fixed Coaxial Attenuators

Model 68
High Power, N or SMK Connectors
Convection Cooled

Features
- Precision Connectors with high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.
- 10 Kilowatts peak, Convection Cooled
- Wireless Applications - Optimized for use in the communications bands.

Specifications
- NOMINAL IMPEDANCE: 50 Ω
- FREQUENCY RANGE: dc to 4.0 GHz

Maximum Deviation Over Frequency:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2</td>
<td>± 1.00</td>
</tr>
<tr>
<td>3, 6, 10, 20, 30</td>
<td>± 1.25</td>
</tr>
<tr>
<td>40</td>
<td>± 2.00</td>
</tr>
</tbody>
</table>

Maximum SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.20</td>
</tr>
</tbody>
</table>

Physical Dimensions:

- Connector DIM A
  - N Male: 22.9 (0.90)
  - N Female: 15.0 (0.59)
- Connector DIM A
  - 2.92mm Male: 14.0 (0.55)
  - 2.92mm Female: 12.7 (0.50)

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

Revision Date: 8/20/2013
Fixed Coaxial Attenuators

Model 73  
High Power, N or SMK Connectors

dc to 8.5 GHz  
100 Watts

☑️ RoHS

POWER RATING (mounted horizontally with fins vertical): 100 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 10 watts @ 125°C. 5 kilowatt peak (5 μsec pulse width; 1.0% duty cycle). Maximum power rating into output port is 20 watts average.

POWER COEFFICIENT: <0.00015 dB/dB/watt

TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C

TEMPERATURE RANGE: -55°C to 125°C

TEST DATA: Swept data plots of SWR from 50 MHz to 8.5 GHz.

CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. SMK (2.92mm) connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm, SMK, and other 2.92mm connectors.

CONSTRUCTION: Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts.

WEIGHT: 1130 g (2 lbs, 8 oz.) maximum

Specifications

**Nominal Impedance:** 50 Ω  
**Frequency Range:** dc to 8.5 GHz

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6, 10, 20, 30</td>
<td>± 0.75</td>
</tr>
<tr>
<td>40</td>
<td>+1 / -0.50</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.25</td>
</tr>
<tr>
<td>4 - 8.5</td>
<td>1.35</td>
</tr>
</tbody>
</table>

**Physical Dimensions:**

**NOTE:** All dimensions are given in mm (inches) and are maximum, unless otherwise specified.
Fixed Coaxial Attenuators

Model 260
High Power, N or 3.5mm Connectors
dc to 18.0 GHz
100 Watts

Features
- Designed to meet environmental requirements of MIL-DTL-3933.
- Low Intermodulation option available.
- Rugged injection molded connectors.

Specifications
- NOMINAL IMPEDANCE: 50 Ω
- FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>260</th>
<th>260 LIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>±0.75</td>
<td>-</td>
</tr>
<tr>
<td>10, 20</td>
<td>±0.75</td>
<td>+2.0/-0.75</td>
</tr>
<tr>
<td>30</td>
<td>±1.00</td>
<td>+2.0/-0.75</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>6 dB</th>
<th>10, 20, 30 dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 8</td>
<td>1.25</td>
<td>1.20</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.35</td>
<td>1.25</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>1.45</td>
<td>1.35</td>
</tr>
</tbody>
</table>

3rd ORDER INTERMODULATION (260-XX-XX-LIM ONLY): Reflected Levels (IM3), -100 & Through Levels (IM3), -110 dBc with two input signals at 869 MHz and 891 MHz with average carrier power levels of +43 dBm each. Option only available 10, 20, 30 dB.

POWER RATING (mounted horizontally): 100 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 10 watts @ 125°C. 1 kilowatt peak (5 usec pulse width; 5% duty cycle). Maximum power rating into output port is 20 Watts average.

POWER COEFFICIENT: <0.00015 dB/dB/watt

TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C

TEMPERATURE RANGE: -55°C to 125°C

CONSTRUCTION: Black, finned aluminum body, stainless steel connectors with gold plated beryllium copper contacts.

WEIGHT: 340 g (12.0 oz.) maximum

PHYSICAL DIMENSIONS:

Example:

<table>
<thead>
<tr>
<th>Connector Options Description</th>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 3.5mm Female</td>
<td>3</td>
<td>Type N Female</td>
</tr>
<tr>
<td>2 3.5mm Male</td>
<td>4</td>
<td>Type N Male</td>
</tr>
</tbody>
</table>

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 18 GHz.

CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. 3.5mm connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm, SMK, and other 2.92mm connectors.

RoHS Option

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:

<table>
<thead>
<tr>
<th>Model Number Description</th>
<th>Connector Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>260 - XX - XX - LIM</td>
<td>IM Option*</td>
</tr>
<tr>
<td>Basic Model Number</td>
<td></td>
</tr>
<tr>
<td>Attenuation Value (dB)</td>
<td></td>
</tr>
<tr>
<td>Connector Options</td>
<td>1st digit is input side</td>
</tr>
</tbody>
</table>

* Add -LIM for Low Intermodulation option. Option only available in 10, 20, and 30 dB.
Fixed Coaxial Attenuators

Model 48
High Power, N & 3.5mm Connectors

dc to 18.0 GHz
100 Watts

Features
- Designed to meet environmental requirements of MIL-DTL-3933.
- Rugged injection molded connectors.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 18.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>± 2.00</td>
</tr>
<tr>
<td>10</td>
<td>± 2.00</td>
</tr>
<tr>
<td>20, 30, 40</td>
<td>± 1.00</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>6 dB</th>
<th>10 dB</th>
<th>20, 30, 40 dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 8</td>
<td>1.30</td>
<td>1.40</td>
<td>1.25</td>
</tr>
<tr>
<td>8 - 12.4</td>
<td>1.45</td>
<td>1.40</td>
<td>1.35</td>
</tr>
<tr>
<td>12.4 - 18</td>
<td>1.60</td>
<td>1.55</td>
<td>1.45</td>
</tr>
</tbody>
</table>

POWER RATING (mounted horizontally): 100 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 10 watts @ 125°C. 1 kilowatt peak (5 μsec pulse width; 5% duty cycle). Maximum power rating into output port is 10 Watts average.

POWER COEFFICIENT: <0.00015 dB/dB/watt
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55°C to 125°C

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 18 GHz.

CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.
3.5mm (Male/Female) connectors - mate nondestructively with SMA per MIL-C-39012, 2.92mm and other 3.5mm connectors.

CONSTRUCTION: Black, finned aluminum body, stainless steel connectors, gold plated beryllium copper contacts.

WEIGHT: 383 g (13.5 oz.) maximum

PHYSICAL DIMENSIONS:

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example: 48 - XX - XX

Basic Model Number
Attenuation Value (dB)
Connector Options
1st digit is input side
2nd digit is output side
### Fixed Coaxial Attenuators

**Model 40**

**Model 57**

**High Power, N or SMK Connectors**

#### Features

- Quality connectors with special high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.

#### Specifications

<table>
<thead>
<tr>
<th>NOMINAL IMPEDANCE:</th>
<th>50 Ω</th>
</tr>
</thead>
</table>
| FREQUENCY RANGE:  | Model 40: dc to 1.5 GHz  
|                   | Model 57: dc to 6.0 GHz |

#### Maximum Deviation Over Frequency:

<table>
<thead>
<tr>
<th>Nominal ATN (dB)</th>
<th>Deviation (dB)</th>
<th>40</th>
<th>57</th>
<th>57-LIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>± 0.50</td>
<td>± 1.25</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6, 10</td>
<td>± 0.50</td>
<td>± 1.25</td>
<td>± 1.75</td>
<td></td>
</tr>
<tr>
<td>20, 30</td>
<td>± 0.50</td>
<td>± 1.50</td>
<td>± 2.00</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>± 0.50</td>
<td>± 2.00</td>
<td>± 2.00</td>
<td></td>
</tr>
</tbody>
</table>

#### Maximum SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 2 (1.5*)</td>
<td>1.10</td>
<td>1.10</td>
</tr>
<tr>
<td>2 - 6</td>
<td>1.15</td>
<td>1.20</td>
</tr>
</tbody>
</table>

* Model 40 only!

#### 3rd ORDER INTERMODULATION (57-XX-XX-LIM ONLY):

Reflected Levels (IM3), -100 & Through Levels (IM3), -110 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each. Option only available 6, 10, 20, 30, 40 dB.

#### Physical Dimensions:

```
+-------------------+-------------------+-------------------+
| Connector          | DIM A             | Connector          | DIM A             |
| N Male             | 22.9 (0.90)       | N Female           | 15.0 (0.59)       |
| N Female           | 15.0 (0.59)       | 2.92mm Male Female | 14.0 (0.55)       |
| 2.92mm Female      | 12.7 (0.50)       |                   |                   |
```

**Power Rating** (mounted horizontally with fins vertical): 150 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 15 watts @ 125°C. 10 kilowatt peak (5 μsec pulse width; 0.75% duty cycle). Maximum power rating into output port is 20 watts average.

**Power Coefficient:** <0.0001 dB/dB/watt

**Temperature Coefficient:** <0.0004 dB/dB/°C

**Temperature Range:** -55°C to 125°C

**Test Data:** Swept data plots of attenuation and SWR from 50 MHz to 1.5 / 6 GHz.

**Connectors:** Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. SMK (2.92mm) connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm, SMK, and other 2.92mm connectors.

**Construction:** Aluminum alloy body, stainless steel connectors; gold plated beryllium female copper contacts and stainless steel male contacts.

**Weight:** 1,130 g (2 lbs, 8 oz.) maximum

**Model Number Description:**

Example:

```
57 - XX - XX - LIM
```

* Add -LIM for Low Intermodulation option. Option only available with Model 57 in 6, 10, 20, 30, 40 dB and is not available through Express.

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web: www.aeroflex.com/weinschel • email: weinschel-sales@aeroflex.com  
Revision Date: 8/24/2013
Fixed Coaxial Attenuators

Model 65
High Power, N or SMK Connectors
Conduction/Convection Cooled

Features

- **Compact Construction** - Lowest size/power ratio.
- **Flexible Mounting Position** - The units may be mounted in horizontal (fins up) or vertical position.
- **Rugged Construction** - Quality connectors with special high temperature support beads.

Specifications

**Nominal Impedance:** 50 Ω
**Frequency Range:** dc to 2.5 GHz

**Maximum Deviation Over Frequency:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6, 10, 20, 30</td>
<td>± 1.00</td>
</tr>
</tbody>
</table>

**Maximum SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 2.5</td>
<td>1.20</td>
</tr>
</tbody>
</table>

**Physical Dimensions:**

POWER RATING 150 watts average (unidirectional), 10 kilowatts peak (5 μsec pulse width; 0.75 % duty cycle) with case temperature held within 100 °C maximum with appropriate convection cooling and/or conductive heat sink. Maximum power rating into output port is 20 watts average.

**Power Coefficient:** <0.0001 dB/dB/watt

**Temperature Coefficient:** <0.0004 dB/dB/°C

**Temperature Range:** -55°C to 100°C (case temp.)

**Test Data:** Swept data plots of attenuation and SWR from 50 MHz to 2.5 GHz.

**Connectors:** Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. SMK (2.92mm) connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm, SMK, and other 2.92mm connectors.

**Construction:** Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts.

**Weight:** 850 g (1 lbs., 14 oz.) maximum

**Model Number Description:**

Example: 65 - XX - XX

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SMK Female</td>
<td>3</td>
<td>Type N Female</td>
</tr>
<tr>
<td>2</td>
<td>SMK Male</td>
<td>4</td>
<td>Type N Male</td>
</tr>
</tbody>
</table>

**Connector Options**

<table>
<thead>
<tr>
<th>Connector</th>
<th>Dim A</th>
<th>Connector</th>
<th>Dim A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9  (0.90)</td>
<td>2.92mm Male</td>
<td>14.0  (0.55)</td>
</tr>
<tr>
<td>N Female</td>
<td>15.0  (0.59)</td>
<td>2.92mm Female</td>
<td>12.7  (0.50)</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.
Model 79
High Power, 7/16 Connectors

dc to 6.0 GHz
150 Watts

Specifications

**Nominal Impedance:** 50 Ω

**Frequency Range:** dc to 5.0 GHz

**Maximum Deviation Over Frequency:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10, 20</td>
<td>± 0.90</td>
</tr>
<tr>
<td>30</td>
<td>± 1.25</td>
</tr>
</tbody>
</table>

**Maximum SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 3</td>
<td>1.20</td>
</tr>
<tr>
<td>3 - 6</td>
<td>1.35</td>
</tr>
</tbody>
</table>

**3rd Order Intermodulation:** Reflected Levels (IM3), -100 & Through Levels (IM3), -110 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

**Physical Dimensions:**

![Physical Dimensions Diagram]

**Connector Options:**

<table>
<thead>
<tr>
<th>Type/Description</th>
<th>Connector Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 7/16 Female</td>
<td>7/16 Female</td>
</tr>
<tr>
<td>2 7/16 Male</td>
<td>7/16 Male</td>
</tr>
</tbody>
</table>

**Construction:** Black, finned aluminum body, silver plated brass connectors.

**Weight:** 1,248 g (2.75 lbs.) maximum

**Model Number Description:**

Example:

**79 - XX - XX**

- **Basic Model Number:**
- **Attenuation Value (dB):**
- **Connector Options:**
  - 1st digit is input side
  - 2nd digit is output side

**NOTE:** All dimensions are given in mm (inches) and are maximum, unless otherwise specified.
Fixed Coaxial Attenuators

Model 49
High Power, N Connectors
Conduction/Convection Cooled

dc to 8.5 GHz
150 Watts

**Fixed Coaxial Attenuators**

**Model 49**
**High Power, N Connectors**
**Conduction/Convection Cooled**

**Features**

- Quality connectors with special high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Flexible Mounting Position - The units may be mounted in horizontal (fins up) or vertical position.

**Specifications**

- **Nominal Impedance:** 50 Ω
- **Frequency Range:** dc to 8.5 GHz

**Maximum Deviation Over Frequency (dB):**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>49</th>
<th>49-LIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4 GHz</td>
<td>4 - 8.5 GHz</td>
<td>dc - 4 GHz</td>
</tr>
<tr>
<td>3, 6</td>
<td>± 0.50</td>
<td>± 1.00</td>
</tr>
<tr>
<td>10, 20</td>
<td>± 0.40</td>
<td>± 0.75</td>
</tr>
<tr>
<td>30</td>
<td>± 0.40</td>
<td>± 0.75</td>
</tr>
<tr>
<td>40</td>
<td>± 0.50</td>
<td>± 1.00</td>
</tr>
</tbody>
</table>

**Maximum SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.25</td>
</tr>
<tr>
<td>4 - 8.5</td>
<td>1.35</td>
</tr>
</tbody>
</table>

**3rd Order Intermodulation (49-XX-XX-LIM ONLY):**
Reflected Levels (IM3), -100 & Through Levels (IM3), -110 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

**Power Rating (mounted horizontally or vertically):** 150 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 15 watts @ 125°C. 5 kilowatt peak (5 μsec pulse width; 1.5% duty cycle). Maximum power rating into output port is 25 watts average.

**Power Coefficient:** <0.0001 dB/dB/watt

**Temperature Coefficient:** <0.0004 dB/dB/°C

**Temperature Range:** -55°C to 125°C

**Test Data:** Swept data plots of attenuation and SWR from 50 MHz to 8.5 GHz.

**Connectors:** Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

<table>
<thead>
<tr>
<th>Connector Options</th>
<th>Type/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Type N, Female</td>
</tr>
<tr>
<td>4</td>
<td>Type N, Male</td>
</tr>
</tbody>
</table>

**Construction:** Aluminum alloy body, stainless steel connectors; gold plated beryllium copper female contacts or stainless steel male contacts. (-LIM option uses different connector and contact materials)

**Weight:** 1,450 g (3 lbs, 3 oz.) maximum

**Physical Dimensions:**

- Quality connectors with special high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Flexible Mounting Position - The units may be mounted in horizontal (fins up) or vertical position.

**Nominal Impedance:** 50 Ω

**Frequency Range:** dc to 8.5 GHz

**Maximum SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9 (0.90)</td>
</tr>
<tr>
<td>N Female</td>
<td>15.0 (0.59)</td>
</tr>
</tbody>
</table>

**NOTE:** All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

**Model Number Description:**

Example:

- **Basic Model Number**
- **Attenuation Value (dB)**
- **Connector Options**
- **IM Option**

*Add -LIM for Low Intermodulation option. Option only available in 10, 20, 30, and 40 dB and is not available through Express.*
Fixed Coaxial Attenuators

Model 66
High Power, N or 3.5mm Connectors
Convection Cooled

dc to 18.0 GHz
150 Watts

Features

- Quality injection molded connectors.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Broadband performance, ideal for test applications.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 18.0 GHz

<table>
<thead>
<tr>
<th>Maximum Deviation Over Frequency</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal ATTN (dB)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>± 2.00</td>
</tr>
<tr>
<td>20, 30, 40</td>
<td>± 1.50</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>10</th>
<th>20, 30, 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 18</td>
<td>1.90</td>
<td>1.60</td>
</tr>
</tbody>
</table>

PHYSICAL DIMENSIONS:

<table>
<thead>
<tr>
<th>Connector</th>
<th>DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>24.1 (0.95)</td>
</tr>
<tr>
<td>N Female</td>
<td>19.0 (0.75)</td>
</tr>
<tr>
<td>3.5mm Female</td>
<td>14.0 (0.55)</td>
</tr>
<tr>
<td>3.5mm Male</td>
<td>13.2 (0.52)</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.
Fixed Coaxial Attenuators

Model 45
Model 58
High Power, N or SMK Connectors
Convection Cooled

Features

- Quality connectors with special high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.

Specifications

**Nominal Impedance:** 50 Ω

**Frequency Range:**
- Model 45: dc to 1.5 GHz
- Model 58: dc to 6.0 GHz

**Maximum Deviation Over Frequency:**

<table>
<thead>
<tr>
<th>Nominal</th>
<th>ATTN (dB)</th>
<th>45</th>
<th>Deviation (dB)</th>
<th>58</th>
<th>58 LIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6</td>
<td>± 0.50</td>
<td>± 1.50</td>
<td>- - -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10, 20</td>
<td>± 0.50</td>
<td>± 1.50</td>
<td>± 2.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30, 40</td>
<td>± 0.50</td>
<td>± 1.75</td>
<td>± 3.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Maximum SWR:**

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>45/58</th>
<th>58 LIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 2 (1.5°)</td>
<td>1.10</td>
<td>1.20 (1.10°)</td>
</tr>
<tr>
<td>2 - 6</td>
<td>1.15</td>
<td>1.25</td>
</tr>
</tbody>
</table>

*Model 45 only!

**3rd ORDER INTERMODULATION (58-XX-XX-LIM ONLY):**

Reflected Levels (IM3), -100 & Through Levels (IM3), -110 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

**Physical Dimensions:**

<table>
<thead>
<tr>
<th>Connector</th>
<th>Dimension A</th>
<th>Connector</th>
<th>Dimension A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9 (0.90)</td>
<td>N Female</td>
<td>15.0 (0.59)</td>
</tr>
<tr>
<td>N Male</td>
<td>2.92mm Male</td>
<td>N Female</td>
<td>2.92mm Female</td>
</tr>
<tr>
<td></td>
<td>14.0 (0.55)</td>
<td></td>
<td>12.7 (0.50)</td>
</tr>
</tbody>
</table>

**Revision Date:** 2/22/2013

---

5305 Spectrum Drive, Frederick, MD 21703-7362 • TEL: 301-846-9222, 800-638-2048 • Fax: 301-846-9116
web: www.aeroflex.com/weinschel • email: weinschel-sales@aeroflex.com
**Fixed Coaxial Attenuators**

**Model 45**  
**Model 58**

*High Power, N or SMK Connectors*  
*Convection Cooled*

---

### Features

- Quality connectors with special high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.

### Specifications

**Nominal Impedance:** 50 Ω  
**Frequency Range:**  
- Model 45: dc to 1.5 GHz  
- Model 58: dc to 6.0 GHz

#### Maximum Deviation Over Frequency:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>ATTN Deviation (dB)</th>
<th>Model 45</th>
<th>Model 58</th>
<th>58 LIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6</td>
<td>± 0.50</td>
<td>± 1.50</td>
<td>- - -</td>
<td></td>
</tr>
<tr>
<td>10, 20</td>
<td>± 0.50</td>
<td>± 1.50</td>
<td>± 2.00</td>
<td></td>
</tr>
<tr>
<td>30, 40</td>
<td>± 0.50</td>
<td>± 1.75</td>
<td>± 3.00</td>
<td></td>
</tr>
</tbody>
</table>

#### Maximum SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>45/58 Input</th>
<th>45/58 Output</th>
<th>58 LIM Input</th>
<th>58 LIM Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 2 (1.5°)</td>
<td>1.10</td>
<td>1.20 (1.10°)</td>
<td>1.20</td>
<td>1.25</td>
</tr>
<tr>
<td>2 - 6</td>
<td>1.15</td>
<td>1.25</td>
<td>1.20</td>
<td>1.25</td>
</tr>
</tbody>
</table>

* Model 45 only!

**3rd Order Intermodulation (58-XX-XX-LIM ONLY):**

Reflected Levels (IM3), -100 & Through Levels (IM3), -110 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

**Physical Dimensions:**

![Physical Dimensions Diagram]

---

**Power Rating:** (mounted horizontally with fins vertical): 250 watts average (unidirectional) to 55°C ambient temperature, derated linearly to 25 watts @ 125°C. 10 kilowatt peak (5 μsec pulse width; 1.25% duty cycle). Maximum power rating into output port is 50 watts average.

**Power Coefficient:** <0.0001 dB/dB/watt

**Temperature Coefficient:** <0.0004 dB/dB/°C

**Temperature Range:** -55°C to 125°C

**Test Data:** Swept data plots of attenuation and SWR from 50 MHz to 1.5 / 6 GHz.

**Connectors:** Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. SMK (2.92mm) connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm, SMK, and other 2.92mm connectors.

**Options**  
**Description**  
1. SMK Female  
2. SMK Male  
3. Type N Female  
4. Type N Male

**Construction:** Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts.

**Weight:** 1,530 g (6 lbs, 3 oz.) maximum

**Model Number Description:**

Example:

```
58 - XX - XX - LIM
```

- Basic Model Number
- Attenuation Value (dB)
- Connector Options
  - 1st digit is input side
  - 2nd digit is output side

**RoHS**

---

<table>
<thead>
<tr>
<th>Connector</th>
<th>DIM A (inches)</th>
<th>Connector</th>
<th>DIM A (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9 (0.90)</td>
<td>2.92mm Male</td>
<td>14.0 (0.55)</td>
</tr>
<tr>
<td>N Female</td>
<td>15.0 (0.59)</td>
<td>2.92mm Female</td>
<td>12.7 (0.50)</td>
</tr>
</tbody>
</table>

*Add -LIM for Low Intermodulation option. Option only available with Model 58 in 10, 20, 30, 40 dB and is not available through Express.*

---

**Revision Date:** 9/30/2012
Fixed Coaxial Attenuators

Model 67
High Power Fixed Coaxial Attenuator
Forced Cooled

dc to 12.7 GHz
350 Watts

Features
- Precision Injection Molded Connectors.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Broadband performance, ideal for test applications.

Specifications
NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 12.7 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB) dc-8 GHz</th>
<th>8 - 12.7 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>± 2.00</td>
<td>+6.00/-0.00</td>
</tr>
<tr>
<td>20, 30</td>
<td>± 2.50</td>
<td>+6.00/-0.00</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 8</td>
<td>1.30</td>
</tr>
<tr>
<td>8 - 12.7</td>
<td>1.60</td>
</tr>
</tbody>
</table>

MODEL NUMBER DESCRIPTION:
Example: 67 - XX - XX

Features:
- Precision Injection Molded Connectors.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Broadband performance, ideal for test applications.

Specifications:
NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 12.7 GHz

POWER RATING (mounted horizontally): 350 watts average (unidirectional) @ 25°C ambient temperature. Case temperature must be held to 100°C maximum. 5 kilowatt peak (5 μsec pulse width; 3.5% duty cycle). Maximum power rating into output port is 10 watts average.
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55°C to 100°C (case temp.)
TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 12.7 GHz.
CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.
CONSTRUCTION: Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts.
WEIGHT: 1200 g (43 oz.) maximum

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.
Fixed Coaxial Attenuators

Model 53
High Power, N Connectors
Conduction/Convection Cooled

dc to 2.5 GHz
500 Watts

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 2.5 GHz.

CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

CONSTRUCTION: Aluminum alloy body, gold plated beryllium copper contacts.

WEIGHT: 3,640 g (8 lbs.) maximum

PHYSICAL DIMENSIONS:

Features

/ Quality connectors with special high temperature support beads.
/ Designed to meet environmental requirements of MIL-DTL-3933.
/ Flexible Mounting Position - The units may be mounted in horizontal (fins up) or vertical position.
/ Low Intermodulation Distortion Option.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 2.5 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6</td>
<td>± 1.00</td>
</tr>
<tr>
<td>10, 20, 30, 40</td>
<td>± 1.00</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>53</th>
<th>53 LIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 2.5</td>
<td>1.10</td>
<td>1.15</td>
</tr>
</tbody>
</table>

3rd ORDER INTERMODULATION (53-XX-XX-LIM ONLY):
Reflected Levels (IM3), -100 & Through Levels (IM3), -110 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

POWER RATING (mounted horizontally with fins vertical): 500 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 50 watts @ 125°C. 10 kilowatt peak (5 μsec pulse width; 2.5% duty cycle). Maximum power rating into output port is 50 watts average.

TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55°C to 125°C

MODEL NUMBER DESCRIPTION:

Example:

53 - XX - XX - LIM

- Add -LIM for Low Intermodulation option. Option only available in 10, 20, 30 and 40 dB and is not available through Express.
Fixed Coaxial Attenuators

Model 81
High Power, N Connectors
Conduction/Convection Cooled

dc to 10.0 GHz
500 Watts

Features

// Quality connectors with special high temperature support beads.
// Designed to meet environmental requirements of MIL-DTL-3933.

Specifications

NOMINAL IMPEDANCE:  50 Ω
FREQUENCY RANGE:  dc to 10.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY (dB):

<table>
<thead>
<tr>
<th>NOM ATTN (dB)</th>
<th>Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>dc - 9.0 GHz</td>
</tr>
<tr>
<td>10, 20, 30, 40</td>
<td>+3.0</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 9.0</td>
<td>1.50</td>
</tr>
<tr>
<td>9.0 - 10.0</td>
<td>1.90</td>
</tr>
</tbody>
</table>

POWER RATING: 500 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 50 watts @ 125°C. 5 kilowatt peak (5 μsec pulse width; 5% duty cycle). Maximum power into output is 20 Watts average.

TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C

TEMPERATURE RANGE: -55°C to +125°C

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 10 GHz.

CONNECTOR: Type N connectors - mate nondestructively with MIL-C-39012 connectors.

<table>
<thead>
<tr>
<th>Options</th>
<th>Type/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Type N, Female</td>
</tr>
<tr>
<td>4</td>
<td>Type N, Male</td>
</tr>
</tbody>
</table>

CONSTRUCTION: Black, finned aluminum body, stainless steel or connectors with gold plated beryllium copper contacts.

WEIGHT: 10 dB: 5.3 kg (11 lbs, 11 oz) maximum
20, 30, 40 dB: 6.24 Kg (13 lbs, 12 oz) maximum

PHYSICAL DIMENSIONS:

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

81 - XX - XX
Basic Model Number
Attenuation Value
Connectors Options
- 1st Digit is input side
- 2nd digit is output side.
Fixed Coaxial Attenuators

Model 82
High Power, N Connectors

dc to 3.0 GHz
1,000 Watts

Features

Quality connectors with special high temperature support beads.

Designed to meet environmental requirements of MIL-DTL-3933.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 3.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY (dB):

<table>
<thead>
<tr>
<th>NOM ATTN (dB)</th>
<th>Deviation</th>
<th>dc - 1.5 GHz</th>
<th>1.5 - 3.0 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>10, 20, 30, 40</td>
<td>+1.0</td>
<td>+1.5, -1.0 dB</td>
<td></td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 1.5</td>
<td>1.15</td>
</tr>
<tr>
<td>1.5 - 3.0</td>
<td>1.25</td>
</tr>
</tbody>
</table>

PHYSICAL DIMENSIONS:

<table>
<thead>
<tr>
<th>Connector Type</th>
<th>DIM A</th>
<th>DIM B</th>
</tr>
</thead>
<tbody>
<tr>
<td>N female</td>
<td>15.0  (0.59)</td>
<td>21.4  (0.84)</td>
</tr>
<tr>
<td>N male</td>
<td>22.9  (0.90)</td>
<td>29.3  (1.15)</td>
</tr>
</tbody>
</table>

NOTE:
1. All dimensions are given in mm (inches) and are maximum, unless otherwise specified.
2. Unit available with RoHS compliant materials, specify when ordering.

POWER RATING: 1,000 watts average (unidirectional) to 25°C ambient temperature, derated linearly to 100 watts @ 125°C. 10 kilowatt peak (5 μsec pulse width; 5% duty cycle). Maximum power into output is 75 Watts average.

TEMPERATURE COEFFICIENT: <0.0004 dB/°C

TEMPERATURE RANGE: -55°C to +125°C with power derating applied.

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 3.0 GHz is available at additional cost.

CONNECTION: Type N connectors - mate nondestructively with MIL-C-39012 connectors.

OPTIONS:
3 Type N, Female
4 Type N, Male

CONSTRUCTION: Black, finned aluminum body, stainless steel with gold plated beryllium copper contacts.

WEIGHT: Net 13 kg (28.7 lbs) maximum

MODEL NUMBER DESCRIPTION:

82 - XX - XX

FEET ARE SPRING LOADED FOR SELF LEVELING AND ARE SHOWN FULLY EXTENDED AND CAN BE COMPRESSED UP TO 0.16 INCHES (4 PLCS)
Fixed Coaxial Attenuators

Model 275
Medium Power, SMK Connectors
Conduction Cooled, Bi-directional Design

Features
- Compact Construction - Lowest size/power ratio.
- Precision injection molded connectors.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Flat Response & Low SWR.

Specifications
NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 40.0 GHz

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 40 GHz.

CONNECTORS: SMK (2.92mm) Male/Female connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm and other 2.92mm connectors.

CONSTRUCTION: Aluminum body, gold plated beryllium copper contacts.
WEIGHT: 17 g (0.6 oz.) maximum

PHYSICAL DIMENSIONS:

MODEL NUMBER DESCRIPTION:
Example:

275 - XX - XX*

*Unit is bi-directional and full power may be applied to either connector.
Fixed Coaxial Attenuators

Model 72

Medium Power, N or SMK Connectors
Conduction Cooled, Bi-Directional Design!

dc to 4.0 GHz
50 Watts

Features
- Compact Construction - Lowest size/power ratio.
- Precision Connectors with high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Wireless Applications - Optimized for use in the communications bands.

Specifications

**Nominal Impedance:** 50 Ω

**Frequency Range:** dc to 4.0 GHz

**Maximum Deviation Over Frequency:**

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6, 10, 20, 30, 40</td>
<td>+0.70</td>
</tr>
</tbody>
</table>

**Power Rating:** 50 watts average (bi-directional), 5 kilowatts peak (5 μsec pulse width: 0.5% duty cycle) with case temperature held within 100°C maximum with appropriate conductive heat sink.

**Power Coefficient:** <0.0003 dB/dB/watt

**Temperature Coefficient:** <0.0004 dB/dB/°C

**Temperature Range:** -55°C to 100°C (case)

**Test Data:** Swept data plots of attenuation and SWR from 50 MHz to 4 GHz is available at additional cost.

**Connectors:** Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. SMK (2.92mm) connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm, SMK, and other 2.92mm connectors.

**Construction:** Aluminum body, stainless steel connectors; gold plated beryllium copper contacts.

**Weight:** 170 g (6 oz.) maximum

**Physical Dimensions:**

<table>
<thead>
<tr>
<th>Connector</th>
<th>DIM A</th>
<th>Connector</th>
<th>DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9 (0.90)</td>
<td>2.92mm Male</td>
<td>14.0 (0.55)</td>
</tr>
<tr>
<td>N Female</td>
<td>15.0 (0.59)</td>
<td>2.92mm Female</td>
<td>12.7 (0.50)</td>
</tr>
</tbody>
</table>

**Notes:** All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

**Model Number Description:**

Example:

<table>
<thead>
<tr>
<th>Connector Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st digit is J1 side</td>
</tr>
<tr>
<td>2nd digit is J2 side</td>
</tr>
</tbody>
</table>

*Unit is bi-directional & full power may be applied to either J1 or J2.
Fixed Coaxial Attenuators

Model 284
Medium Power, N or SMK Connectors
Conduction Cooled, Bi-Directional Design!

dc to 10.0 GHz
50 Watts

Features
- Compact Construction - Lowest size/power ratio.
- Precision Connectors with high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Wireless Applications - Optimized for use in the communications bands.

Specifications
NOMINAL IMPEDANCE: 50 \( \Omega \)
FREQUENCY RANGE: dc to 10.0 GHz

Maximum Deviation Over Frequency (dB):

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>DC-4 GHz</th>
<th>4-10 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6, 10, 20</td>
<td>( \pm 0.40 )</td>
<td>( \pm 0.75 )</td>
</tr>
<tr>
<td>30, 40</td>
<td>( \pm 0.60 )</td>
<td>( \pm 1.00 )</td>
</tr>
</tbody>
</table>

Maximum SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 4</td>
<td>1.15</td>
</tr>
<tr>
<td>4 - 10</td>
<td>1.30</td>
</tr>
</tbody>
</table>

POWER RATING 50 watts average (bi-directional), 5 kilowatts peak (5 \( \mu \)sec pulse width; 0.5 % duty cycle) with case temperature held within 100°C maximum with appropriate conductive heat sink.

POWER COEFFICIENT: <0.0003 dB/dB/watt
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55°C to 100°C (case)

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 10 GHz.

CONNECTIONS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. SMK (2.92mm) connectors - mate nondestructively with SMA per MIL-C-39012, 3.5mm, SMK, and other 2.92mm connectors.

Options Description
1 SMK Female 3 Type N Female
2 SMK Male 4 Type N Male

CONSTRUCTION: Aluminum body, stainless steel connectors; gold plated beryllium copper contacts.
WEIGHT: 170 g (6 oz.) maximum

PHYSICAL DIMENSIONS:

<table>
<thead>
<tr>
<th>Connector</th>
<th>DIM A</th>
<th>Connector</th>
<th>DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9 (0.90)</td>
<td>2.92mm Male</td>
<td>14.0 (0.55)</td>
</tr>
<tr>
<td>N Female</td>
<td>15.0 (0.59)</td>
<td>2.92mm Female</td>
<td>12.7 (0.50)</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:
Example:

```
284 - XX - XX
```

**Unit** is bi-directional & full power may be applied to either J1 or J2.
Fixed Coaxial Attenuators

Model 86
Medium Power, 3.5mm Connectors
Conduction Cooled, Bi-directional Design

dc to 22.0 GHz
50 Watts

Features

- Compact Construction - Lowest size/power ratio.
- Precision Injection Molded Connectors.
- Designed to meet environmental requirements of MIL-DTL-3933.
- Ideal for Airborne or Space Applications.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 22.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3, 6, 10, 20, 30</td>
<td>± 0.80</td>
</tr>
</tbody>
</table>

MAXIMUM SWR: 1.30

POWER RATING: 50 watts average (bi-directional),
1 kilowatts peak (5 μsec pulse width; 2.5 % duty cycle) with case temperature held within 90°C maximum with appropriate conductive heat sink.

POWER COEFFICIENT: <0.0003 dB/dB/watt
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C

TEMPERATURE RANGE: -55°C to 90°C (case)

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 22 GHz.

CONNECTORS: 3.5mm connectors - mate nondestructively with SMA per MIL-C-39012, 2.92mm and other 3.5mm connectors.

Options | Description
---|---
1 | 3.5mm Female
2 | 3.5mm Male

CONSTRUCTION: Aluminum body, stainless steel connectors; gold plated beryllium copper contacts.
WEIGHT: 60 g (2.1 oz.) maximum

PHYSICAL DIMENSIONS:

![Diagram of Model 86 specifications]

Example:

86 - XX - XX

Basic Model Number
Attenuation Value (dB)
Connector Options
1st digit is J1 side
2nd digit is J2 side

NOTE: All dimensions are given in mm (inches) and are nominal, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:

86 - 50 - 30

Basic Model Number
Attenuation Value (dB)
Connector Options
1st digit is J1 side
2nd digit is J2 side

*Unit is bi-directional and full power may be applied to either J1 or J2.
Fixed Coaxial Attenuators

Model 59
High Power, N or SMK Connectors
Conduction Cooled

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 2.5 GHz.

CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. SMK (2.92mm) connectors mate with SMA, 3.5mm and other 2.92mm connectors.

Options | Description | Options | Description
--- | --- | --- | ---
1 | SMK Female | 3 | Type N Female
2 | SMK Male | 4 | Type N Male

CONSTRUCTION: Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts.

WEIGHT: 300 g (10.6 oz.) maximum

PHYSICAL DIMENSIONS:

<table>
<thead>
<tr>
<th>Connector</th>
<th>DIM A</th>
<th>Connector</th>
<th>DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9 (0.90)</td>
<td>2.92mm Male</td>
<td>14.0 (0.55)</td>
</tr>
<tr>
<td>N Female</td>
<td>15.0 (0.59)</td>
<td>2.92mm Female</td>
<td>12.7 (0.50)</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are given in mm (inches) and tolerances are ±0.25 (0.01), unless otherwise specified.

MODEL NUMBER DESCRIPTION:
Example:

59 - XX - XX

Basic Model Number
Attenuation Value (dB)
Connector Options
1st digit is input side
2nd digit is output side

POWER RATING 100 watts average (unidirectional), 10 kilowatts peak (5 µsec pulse width; 0.5 % duty cycle) with case temperature held within 100 °C maximum with appropriate conductive heat sink. Note: 3 dB model can handle 200 Watts average (unidirectional). Maximum power rating into output port is 10 % of the average power rating.

POWER COEFFICIENT: <0.00015 dB/dB/watt

TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C

TEMPERATURE RANGE: -55°C to 100°C (case temp)
Fixed Coaxial Attenuators

Model 268

High Power, N or SMK Connectors
Conduction Cooled

Features

- Precision Connectors with high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.
- 10 Kilowatts peak, Conduction Cooled
- Wireless Applications - Optimized for use in the communications bands.

Specifications

Nominal Impedance: 50 Ω
FREQUENCY RANGE: dc to 6.0 GHz

3rd ORDER INTERMODULATION (268-XX-XX-LIM ONLY): Reflected Levels (IM3), -100 & Through Levels (IM3), -110 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

POWER RATING (mounted horizontally): 100 watts average (unidirectional), 10 kilowatt peak (5 µsec pulse width; 0.5% duty cycle) with case temperature held within 100 °C maximum with appropriate conductive heat sink.

POWER COEFFICIENT: <0.00015 dB/dB/watt
TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55 to 100°C (case temperature)

Maximum Deviation over Frequency:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10, 20, 30, 40</td>
<td>± 1.00</td>
</tr>
</tbody>
</table>

Maximum SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 2.5</td>
<td>1.10</td>
</tr>
<tr>
<td>2.5 - 6</td>
<td>1.15</td>
</tr>
</tbody>
</table>

CONNECTIONS:

- Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. SMK (2.92mm) connectors mate with SMA, 3.5mm and other 2.92mm connectors.

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 6 GHz.

WEIGHT: 300 g (10.6 oz.) maximum

PHYSICAL DIMENSIONS:

<table>
<thead>
<tr>
<th>Connector</th>
<th>DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9 (0.90)</td>
</tr>
<tr>
<td>N Female</td>
<td>15.0 (0.59)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connector</th>
<th>DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.92mm Male</td>
<td>14.0 (0.55)</td>
</tr>
<tr>
<td>2.92mm Female</td>
<td>12.7 (0.50)</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are given in mm (inches) and are nominal, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:

268 - XX - XX - LIM

IM Option*

Basic Model Number
Attenuation Value (dB)
Connector Options
1st digit is input side
2nd digit is output side

* Add -LIM for Low Intermodulation option.
Fixed Coaxial Attenuators

Model 257
High Power, N or SMK Connectors
Conduction Cooled

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 6 GHz.

CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. SMK (2.92mm) connectors mate with SMA, 3.5mm and other 2.92mm connectors.

CONSTRUCTION: Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts.

WEIGHT: 500 g (17.6 oz.) maximum

PHYSICAL DIMENSIONS:

Features

- Precision Connectors with high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.
- 10 Kilowatts peak, Conduction Cooled
- Wireless Applications - Optimized for use in the communications bands.

Specifications

<table>
<thead>
<tr>
<th>NOMINAL IMPEDANCE:</th>
<th>50 Ω</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREQUENCY RANGE:</td>
<td>dc to 6.0 GHz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MAXIMUM DEVIATION OVER FREQUENCY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal ATTN (dB)</td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td>10, 20, 30, 40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MAXIMUM SWR:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency (GHz)</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>dc - 2.5</td>
</tr>
<tr>
<td>2.5 - 6</td>
</tr>
</tbody>
</table>

3rd ORDER INTERMODULATION (257-XX-XX-LIM ONLY): Reflected Levels (IM3), -100 & Through Levels (IM3), -110 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

POWER RATING: 250 watts average (unidirectional), 10 kilowatt peak (5 μsec pulse width; 1.25% duty cycle) with case temperature held within 100 °C maximum with appropriate conductive heat sink. Maximum power rating into output port is 40 watts average.

TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C

TEMPERATURE RANGE: -55 to 100°C (case temperature)

Options

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SMK Female</td>
</tr>
<tr>
<td>2</td>
<td>Type N Female</td>
</tr>
<tr>
<td>3</td>
<td>SMK Male</td>
</tr>
<tr>
<td>4</td>
<td>Type N Male</td>
</tr>
</tbody>
</table>

CONSTRUCTION: Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts.

WEIGHT: 500 g (17.6 oz.) maximum

PHYSICAL DIMENSIONS:

<table>
<thead>
<tr>
<th>Connector</th>
<th>DIM A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9 (0.90)</td>
</tr>
<tr>
<td>N Female</td>
<td>15.0 (0.59)</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:

257 - XX - XX - LIM

Basic Model Number
Attenuation Value (dB)
Connector Options
1st digit is input side
2nd digit is output side

* Add -LIM for Low Intermodulation option.
Fixed Coaxial Attenuators

Model 258
High Power, N or SMK Connectors
Conduction Cooled

Features

- Precision Connectors with high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.
- 10 Kilowatts peak, Conduction Cooled
- Wireless Applications - Optimized for use in the communications bands.

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 6.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:
Nominal ATTN (dB) Deviation (dB)
10, 20, 30, 40 + 1.25

MAXIMUM SWR:
Frequency (GHz) SWR
dc - 2.5 1.10
2.5 - 6 1.20

3rd ORDER INTERMODULATION (258-XX-XX-LIM ONLY): Reflected Levels (IM3), -100 & Through Levels (IM3), -110 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

POWER RATING: 400 watts average (unidirectional) to 10 kilowatt peak (5 μsec pulse width; 2% duty cycle) with case temperature held within 100 °C maximum with appropriate conductive heat sink. Maximum power rating into output port is 40 watts average.

TEMPERATURE COEFFICIENT: <0.0004 dB/dB/°C
TEMPERATURE RANGE: -55 to 100°C (case temperature)

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 6 GHz.

CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate non-destructively with MIL-C-39012 connectors. SMK (2.92mm) connectors mate with SMA, 3.5mm and other 2.92mm connectors.

Options Description Options Description
1 SMK Female 3 Type N Female
2 SMK Male 4 Type N Male

CONSTRUCTION: Aluminum alloy body, stainless steel connectors; gold plated beryllium copper contacts.

WEIGHT: 700 g (24.6 oz.) maximum

PHYSICAL DIMENSIONS:

<table>
<thead>
<tr>
<th>Connector</th>
<th>Dim A</th>
<th>Connector</th>
<th>Dim A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Male</td>
<td>22.9 (0.90)</td>
<td>2.92mm Male</td>
<td>14.0 (0.55)</td>
</tr>
<tr>
<td>N Female</td>
<td>15.0 (0.59)</td>
<td>2.92mm Female</td>
<td>12.7 (0.50)</td>
</tr>
</tbody>
</table>

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:

Example:

258 - XX - XX - LIM

IM Option*
Fixed Coaxial Attenuators

Model 253
High Power, N or SMK Connectors
Conduction Cooled

TEST DATA: Swept data plots of attenuation and SWR from 50 MHz to 6 GHz.

CONNECTORS: Type N connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors. SMK (2.92mm) connectors mate with SMA, 3.5mm and other 2.92mm connectors.

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SMK Female</td>
<td>3</td>
<td>Type N Female</td>
</tr>
<tr>
<td>2</td>
<td>SMK Male</td>
<td>4</td>
<td>Type N Male</td>
</tr>
</tbody>
</table>

CONSTRUCTION: Aluminum alloy body, gold plated beryllium copper contacts.

WEIGHT: 900 (31.3 oz.) maximum

PHYSICAL DIMENSIONS:

Features
- Precision Connectors with high temperature support beads.
- Designed to meet environmental requirements of MIL-DTL-3933.
- 10 Kilowatts peak, Conduction Cooled
- Wireless Applications - Optimized for use in the communications bands.

Specifications

Nominal Impedance: 50 Ω
FREQUENCY RANGE: dc to 6.0 GHz

MAXIMUM DEVIATION OVER FREQUENCY:

<table>
<thead>
<tr>
<th>Nominal ATTN (dB)</th>
<th>Deviation (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10, 20, 30, 40</td>
<td>± 1.50</td>
</tr>
</tbody>
</table>

MAXIMUM SWR:

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>SWR</th>
</tr>
</thead>
<tbody>
<tr>
<td>dc - 2.5</td>
<td>1.10</td>
</tr>
<tr>
<td>2.5 - 6</td>
<td>1.20</td>
</tr>
</tbody>
</table>

3rd ORDER INTERMODULATION (253-XX-XX-LIM ONLY): Reflected Levels (IM3), -100 & Through Levels (IM3), -110 dBc with two input signals @ 869 MHz and 891 MHz with average carrier power levels of +43 dBm each.

POWER RATING: 550 watts average (unidirectional), 10 kilowatt peak (5 μsec pulse width; 2.5% duty cycle) with case temperature held within 100 °C maximum with appropriate conductive heat sink. Maximum power into output is 50 Watts average.

TEMPERATURE COEFFICIENT: <0.0004 dB/°C

TEMPERATURE RANGE: -55 to 100°C (case temperature)

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

MODEL NUMBER DESCRIPTION:
Example: 253 - XX - XX - LIM

IM Option*

Basic Model Number
Attenuation Value (dB)
Connector Options
1st digit is input side
2nd digit is output side

* Add -LIM for Low Intermodulation option.