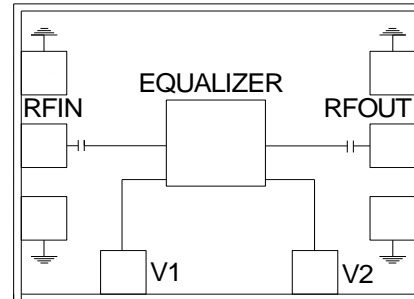


## DC-12 GHz Tunable Passive Gain Equalizer

### Features

- ◆ Frequency Range: DC-12 GHz
- ◆ 6 dB insertion loss
- ◆ Tunable gain slope (+0.5dB/GHz to -0.2 dB/GHz)
- ◆ Input Return Loss > 8 dB
- ◆ Output Return Loss > 8 dB
- ◆ DC decoupled input and output
- ◆ 0.15  $\mu\text{m}$  InGaAs pHEMT Technology
- ◆ Chip dimension : 1.67 x 1.53 x 0.1 mm

### Functional Diagram



### Typical Applications

- ◆ Gain Equalization

### Description

The Aelius ASL11000 is a passive gain equalizer with a voltage tunable gain slope. The equalizer works over a DC-12 GHz frequency range and has nominal input/output return losses of 8 dB. The insertion loss of the equalizer is 6 dB at 12 GHz.

The tunable gain vs. frequency characteristics of the 1753011 makes it suitable for a variety of applications where gain equalization with respect to frequency is desired. The die is fabricated using a reliable 0.15 $\mu\text{m}$  InGaAs pHEMT technology.

### Absolute Maximum Ratings <sup>(1)</sup>

Parameter	Absolute Maximum	Units
Maximum bias Voltage (V1/V2)	+1	volts
RF input power (RFin at Vd=4V)	10	dBm
Operating temperature	-55 to +85	$^{\circ}\text{C}$
Storage Temperature	-65 to +150	$^{\circ}\text{C}$

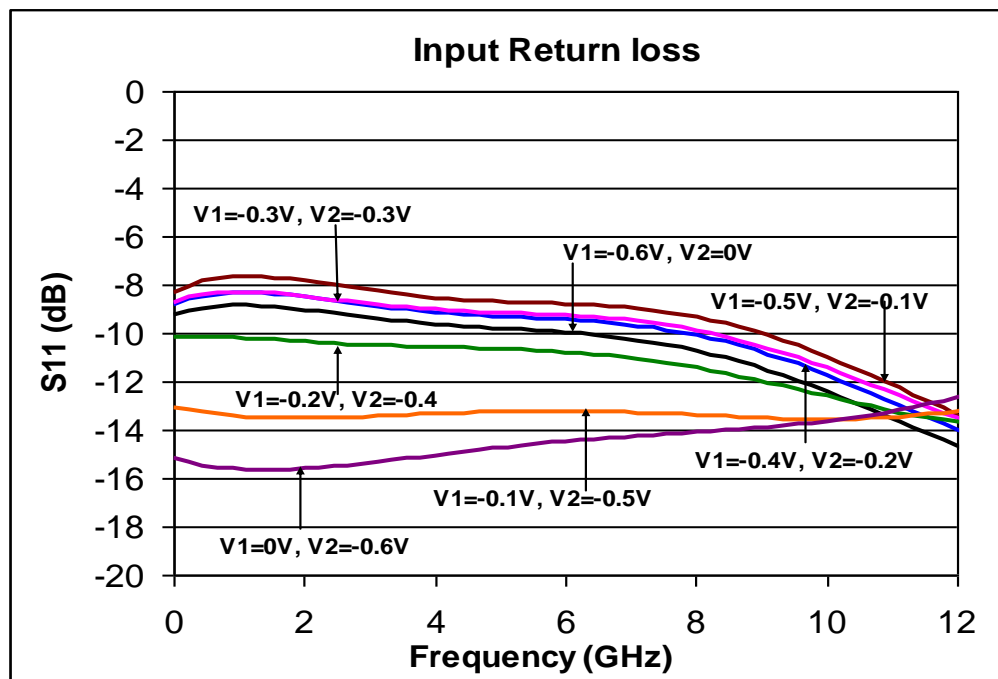
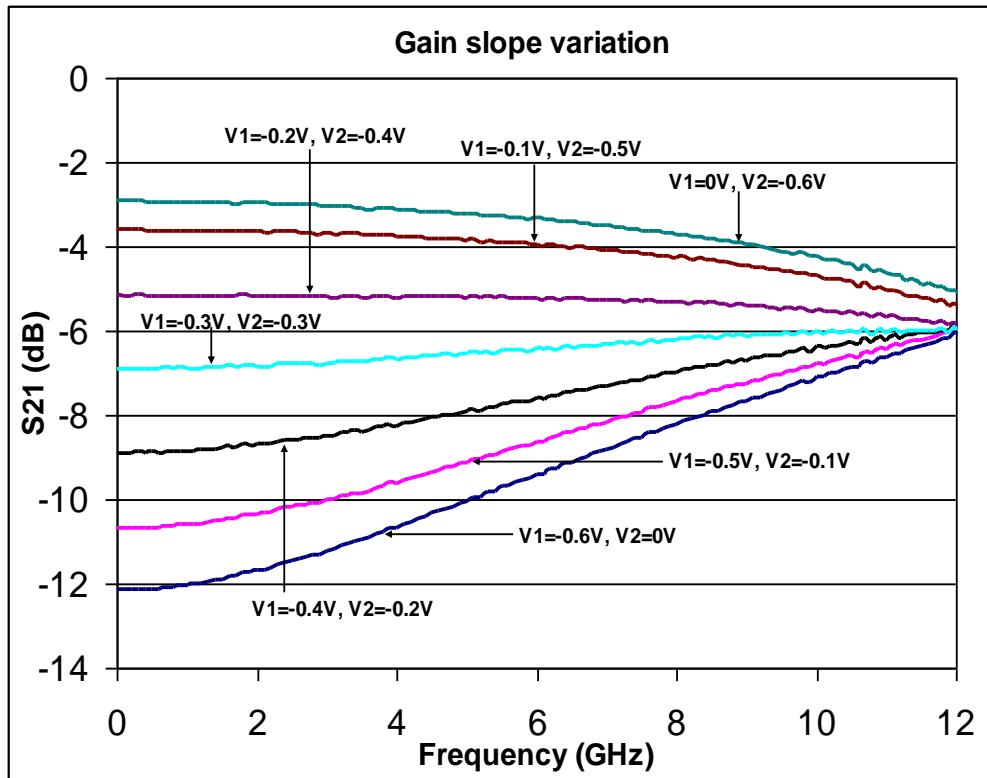
1. Operation beyond these limits may cause permanent damage to the component

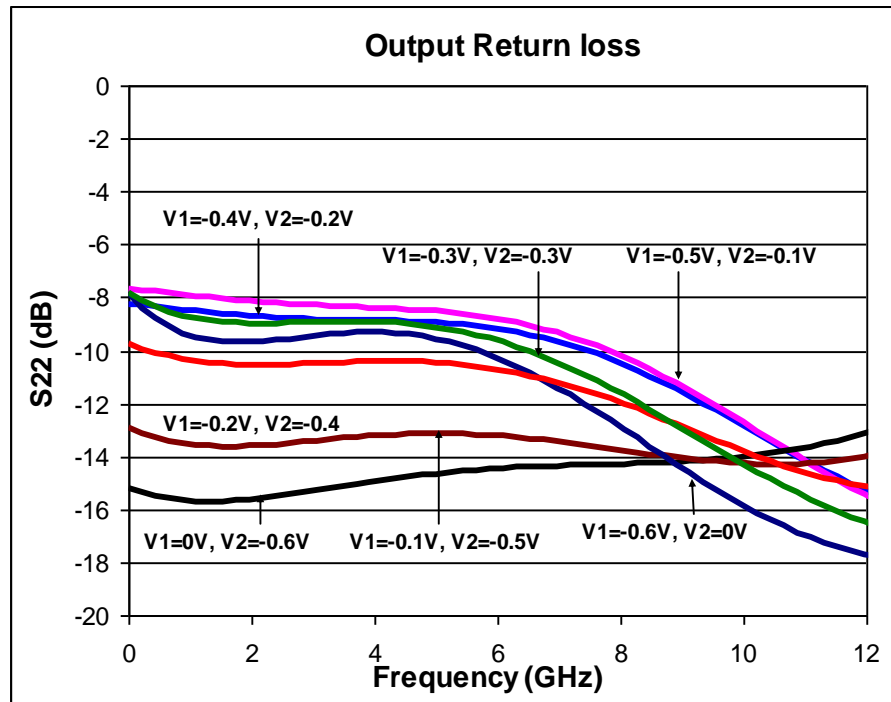
**Electrical Specifications <sup>(1)</sup> @ T<sub>A</sub> = 25 °C, V<sub>1</sub>+V<sub>2</sub>=-0.6V, Z<sub>o</sub> =50 Ω**

Parameter	Typ	Units
Frequency Range	DC-12	GHz
Insertion loss@ 12 GHz	6	dB
Gain Slope	+0.5 to -0.25	dB/GHz
Input Return Loss	8	dB
Output Return Loss	8	dB
DC voltage	0 to -0.6	V

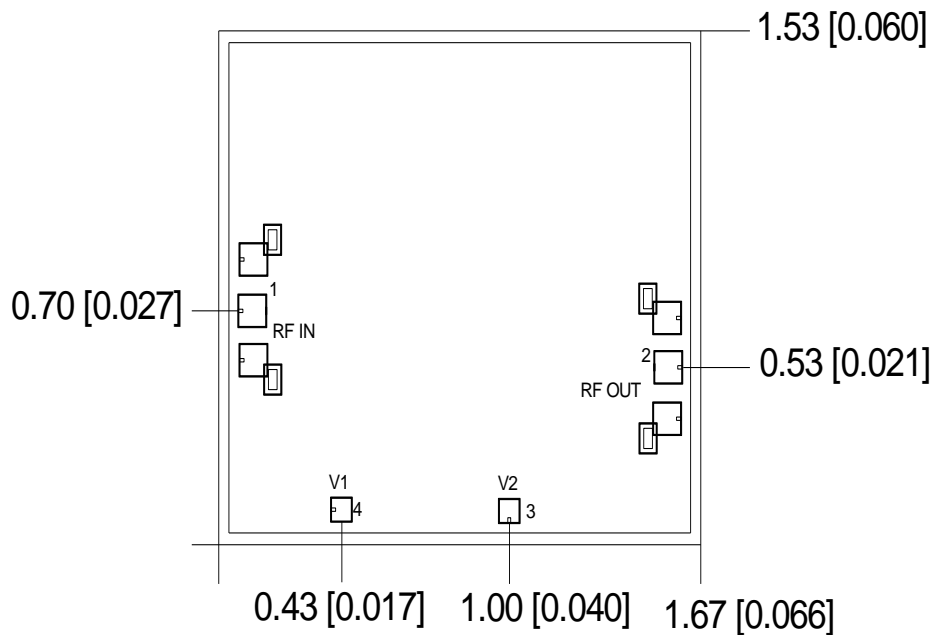
**Note:**

1. Electrical specifications as measured in test fixture.

**Test fixture data**
 $V1+V2=-0.6V, T_A = 25^\circ C$ 


**Test fixture data**
 $V1+V2=-0.6V, T_A = 25\text{ }^{\circ}C$ 


## Mechanical Characteristics



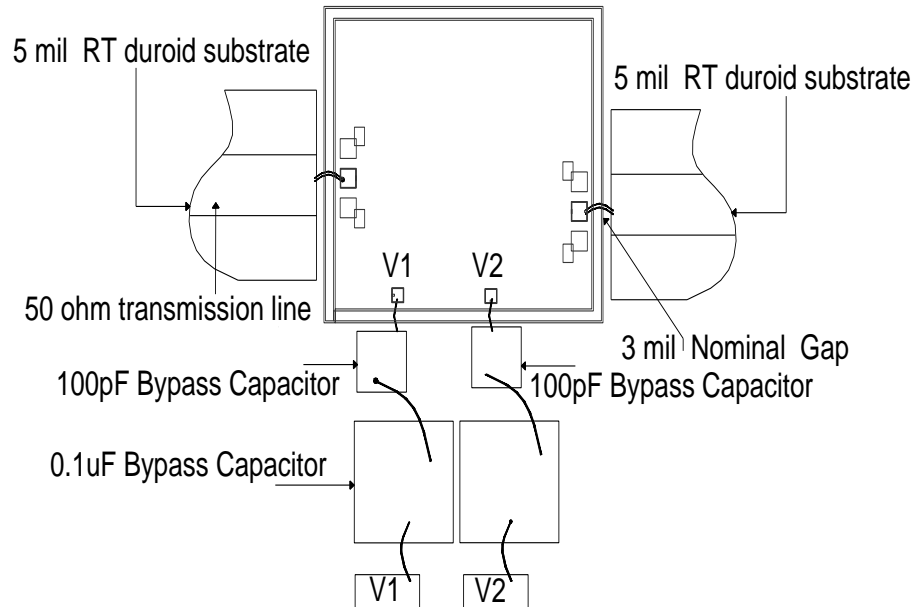
**Units: Millimeters [Inches]**

**All RF and DC bond pads are 100µm x 100µm**

**Note:**

1. Pad no. 4: V1
2. Pad no. 3: V2
3. Pad no. 1 : RF Input
4. Pad no. 2 : RF Output

## Recommended Assembly Diagram



### Note:

1. Two 1 mil (0.0254mm) bond wires of minimum length should be used for RF input and output.
2. Two 1 mil (0.0254mm) bond wires of minimum length should be used from chip bond pad to 100pF capacitor.
3. Input and output 50 ohm lines are on 5 mil substrate.
4. 0.1  $\mu$ F capacitors may be additionally used as a second level of bypass for reliable operation.

**Die attach:** For Epoxy attachment, use of a two-component conductive epoxy is recommended. An epoxy fillet should be visible around the total die periphery. If Eutectic attachment is preferred, use of fluxless AuSn (80/20) 1-2 mil thick preform solder is recommended. Use of AuGe preform should be strictly avoided.

**Wire bonding:** For DC pad connections use either ball or wedge bonds. For best RF performance, use of 150 - 200 $\mu$ m length of wedge bonds is advised. Single Ball bonds of 250-300 $\mu$ m though acceptable, may cause a deviation in RF performance.



***GaAs MMIC devices are susceptible to Electrostatic discharge. Proper precautions should be observed during handling, assembly & testing***

All information and Specifications are subject to change without prior notice

**Aelius Semiconductors Pte. Ltd., Singapore**