2 GHz High-Speed Amplifier

Features
- Bandwidth 10 kHz ... 1.9 GHz
- Rise Time 185 ps
- Gain 40 dB (5 kV/A)
- Input VSWR 1 : 1.2
- Integrated Bias Circuit
- Monitor Output
- Two identical Signal Outputs

Applications
- Preamplifier for ultra-fast Detectors (Microchannel-Plates, Photomultipliers, Avalanche-Photodiodes, PIN-Photodiodes etc.)
- Oscilloscope and Transient-Recorder Preamplifier
- Time-Resolved Pulse and Transient Measurements

Block Diagram

Specifications

<table>
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<tr>
<th>Test Conditions</th>
<th>Vs = ±15 V, Ta = 25°C, System Impedance = 50 Ω</th>
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<tr>
<td>Gain</td>
<td>40 dB (5 kV/A)</td>
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<tr>
<td>Gain Accuracy</td>
<td>± 1 dB</td>
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<tr>
<td>Gain Flatness</td>
<td>± 0.2 dB</td>
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<tr>
<td>Frequency Response</td>
<td>Lower Cut-Off Frequency = 10 kHz</td>
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<td></td>
<td>Upper Cut-Off Frequency = 1.9 GHz</td>
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<td>Time Response</td>
<td>Rise / Fall Time (10% - 90%) = 185 ps</td>
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<tr>
<td>Input</td>
<td>DC Input Impedance = 50 Ω</td>
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<td>RF Input Impedance = 50 Ω</td>
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<tr>
<td></td>
<td>50 Ω Noise Figure = 4.9 dB (@ f &lt; 1 GHz)</td>
</tr>
<tr>
<td></td>
<td>Equivalent Input Voltage Noise = 650 pV/√Hz (@ f &lt; 1 GHz)</td>
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<tr>
<td></td>
<td>Equivalent Input Current Noise = 13 pA/√Hz (@ f &lt; 1 GHz)</td>
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<td></td>
<td>Input VSWR = 1 : 1.2 (@ f &lt; 1 GHz)</td>
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<tr>
<td></td>
<td>Maximum Input VSWR = 1 : 1.45 (@ f &lt; 3 GHz)</td>
</tr>
</tbody>
</table>
## Specifications (continued)

### Output
- **Two identical Signal Outputs:**
  - Output Impedance: 50 Ω
  - Maximum Output VSWR: 1 : 1.8 (@ \( f < 3 \text{ GHz} \))
  - Output Power \( P_{1\text{dB}} \): +12 dBm (@ \( f < 1 \text{ GHz} \))
  - Output Peak-Peak Voltage: 1.7 Vpp (@ \( f < 500 \text{ MHz, for linear Amplification} \))
  - Isolation between Outputs: 20 dB (@ \( f < 3 \text{ GHz} \))

### Monitor Amplifier
- **Gain:** 26 dB (1 kV/A)
- **Lower Cut-Off Frequency:** DC
- **Upper Cut-Off Frequency:** 100 kHz
- **Output Voltage:** ±10 V (@ 10kΩ load)

### Power Supply
- **Supply Voltage:** ±15 V
- **Supply Current:** +185 / -10 mA

### Case
- **Weight:** 180 gr. (0.41 lbs)
- **Material:** AlMg4.5Mn, nickel-plated

### Temperature Range
- **Storage Temperature:** -40 ... +100 °C
- **Operating Ambient Temperature:** 0 ... +60 °C
- **Operating Case Temperature:** 40 °C (@ \( Ta = 25 \text{ °C} \))

### Absolute Maximum Ratings
- **Power Supply Voltage:** ±20 V
- **DC and LF Input Voltage:** ±4 V
- **RF Input Power:** +13 dBm

### Connectors
- **Input:** SMA
- **Signal Outputs:** SMA
- **Monitor Output:** BNC
- **Power Supply:** LEMO Series 1S, 3-pin fixed Socket
  - Pin 1: +15 V
  - Pin 2: -15 V
  - Pin 3: GND

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**Datasheet**

**HSA-Y-2-40**

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**SOPHISTICATED TOOLS FOR SIGNAL RECOVERY**

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Dimensions

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