Overview

FormFactor’s Pyramid Accel™ debug fixture provides a unique and innovative approach for accelerating the development of test programs for System-on-Chip (SoC) and RF devices by up to 30%. Comprised of a PCB containing customer-supplied packaged parts mounted on an Advanced Spring Interposer, the Pyramid Accel fixture is mounted directly on the Pyramid Probe® card to enable necessary debugging for “Known-Good Test Program” status before silicon wafers are ready for production test. This approach facilitates more predictability by reducing the variables during test program debug. By eliminating the need for a wafer prober during test program debug, Pyramid Accel lowers your cost of test, while streamlining the entire development process. Once production test has begun, the Pyramid Accel fixture delivers the added benefit of providing a “golden reference” to allow fast diagnosis of test program issues that arise, resulting in less production downtime.

Features / Benefits

| Superior signal performance | • Microstrip and stripline options provide excellent signal integrity, all the way to the package DUT pin  
|                           | • With a single probe card solution, performance with bare wafer device and a packaged device can be compared |

| Mechanical robustness | • During production test, the Pyramid Accel fixture provides a golden reference, allowing quick isolation of probe card or test equipment issues  
|                       | • Low maintenance and permanent probe tip placement improve test cell uptime, reducing the cost of ownership compared to other probing technologies |

| Versatile and cost-effective | • With the Grypper™ socket option, Cascade Microtech’s unique solder down device footprint, BGA test sockets can be directly mounted on the Pyramid Accel PCB without socket mounting holes or hardware considerations, eliminating the need for a special test socket footprint  
|                           | • Available for all Pyramid Probe cores, Pyramid Accel can be used with all device types  
|                           | • Advanced Spring Interposer (ASI) is designed for fast replacement of interconnect elements |
As an option to directly mounting the DUTs on the Pyramid Accel fixture, you can also use FormFactor’s innovative BGA Grypper solder down device footprint BGA test sockets. Featuring a 0.4 mm – 1.0 mm pitch and outstanding signal integrity, Grypper test sockets can be directly mounted on the Pyramid Accel PCB without socket mounting holes or hardware considerations, eliminating the need for a special test socket footprint.
Pyramid Accel Test Program Process

The superior Pyramid Accel approach to test program development facilitates more predictability by reducing the variables during test program debug, simplifying and streamlining test program development for complex device designs. An enhancement to the Pyramid Probe product family, Pyramid Accel uniquely lowers the overall cost of test by reducing test program development time and resources — directly improving a product’s time to market.

Electrical

Trace options
- Microstrip, Stripline, Power, Ground, DC

Maximum current/signal
- 0.5 A

Max power 50 Ω microstrip
- +33 dBm CW, +36 dBm pulsed

Max power 50 Ω Coplanar Waveguide (CPW)
- +33 dBm CW, +39 dBm pulsed

Power Supply Performance

Power trace impedance
- 10 Ω

Max current std. power trace (limited by probe)
- 0.5 A

Max current per power supply
- 10 A

Signal Trace Performance

Standard
- Signal line impedance
  - 50 Ω nominal
- Return loss (S11) to coax
  - >10 dB @ 10 GHz

Optional
- Differential impedance
  - 50 Ω, 100 Ω and 200 Ω

Signal Trace Length Matching

Typical signal
- no match

Optimized signal (custom layout)
- ±1.5 ps (3 ps window)

Series Path Resistance (SPR)

<table>
<thead>
<tr>
<th></th>
<th>Accel</th>
<th>A100</th>
<th>A300</th>
<th>A400</th>
<th>A500</th>
<th>A800</th>
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</thead>
<tbody>
<tr>
<td>Microstrip, Stripline</td>
<td>1.2 Ω</td>
<td>1.2 Ω</td>
<td>2 Ω</td>
<td>3 Ω</td>
<td>3 Ω</td>
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RF-Class Bandwidth and Risetime Performance

<table>
<thead>
<tr>
<th>Accel PCB</th>
<th>Probe card PCB</th>
<th>Probe card connector</th>
<th>Pyramid Accel</th>
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<tbody>
<tr>
<td>Microstrip</td>
<td>Microstrip</td>
<td>Pogo pad</td>
<td>2 GHz, 200 ps</td>
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<tr>
<td>Microstrip</td>
<td>Microstrip</td>
<td>PCB coaxial</td>
<td>7 GHz, 50 ps</td>
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Optional Components Attached to Accel PCB

<table>
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<tr>
<th>Package type</th>
<th>Sizes</th>
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<tr>
<td>SMT</td>
<td>0201, 0402 (preferred), 0603, 0805</td>
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</table>

Advanced Spring Imposer: Mechanical

- Probe contact life: 1000 insertions minimum
- Max operating temperature: 125°C

Advanced Spring Imposer: Electrical

- Plastic dielectric strength: 540 V/mil.
- Plastic volume resistivity: 1 E+15 Ωcm
- Plastic dielectric constant (1 MHz): 3
- Probe resistance: 50 mΩ
- Probe inductance: 2.5 nH @ 6 GHz
- Probe bandwidth (-0.20dB): 6 GHz

Advanced Spring Imposer: Chemical

- Water absorption immersion (24 hr): 0.01%
- Alcohol (isopropanol, methanol only): Acceptable service
- UV or sunlight exposure: Discoloration may occur

Accel Options

<table>
<thead>
<tr>
<th>Previous frame core name</th>
<th>RFC</th>
<th>SRF</th>
<th>MSI</th>
<th>LSI</th>
<th>VLSR</th>
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<tbody>
<tr>
<td>Pyramid Probe core name</td>
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<td>P300</td>
<td>P400</td>
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<td>P800</td>
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<td>A400</td>
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<td>I/O capacity</td>
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