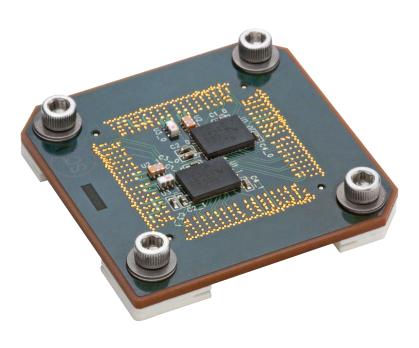# Pyramid Accel™
Wafer-less Debug Fixture for Rapid Test Program Development
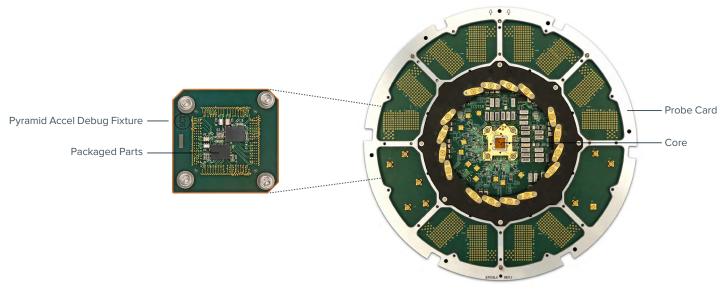
Overview

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.
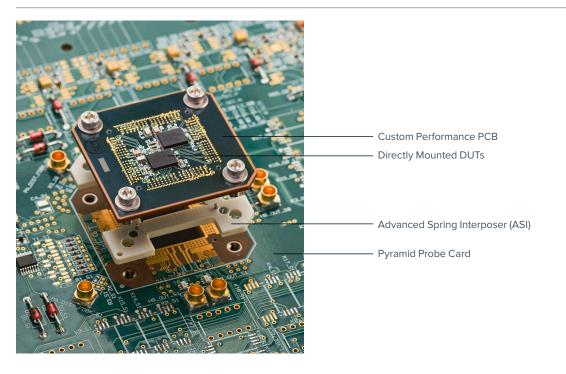
Features / Benefits

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 ownershipcompared 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

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Pyramid Accel Concept

Pyramid Accel Debug Fixture

Packaged Parts

Probe Card

Core

Pyramid Accel Assembly

Custom Performance PCB

Directly Mounted DUTs

Advanced Spring Interposer (ASI)

Pyramid Probe Card

Grypper Socket Option

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.
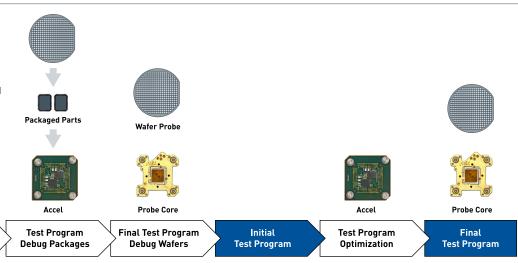
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Pyramid Accel Test Program Process

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.

Packaged Parts

Wafer Probe

Accel

Probe Core

Accel

Probe Core

| Test Program Creation | Initial Silicon Wafer | Test Program Debug Packages | Final Test Program Debug Wafers | Initial Test Program | Test Program Optimization | Final Test Program |

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 (S_{11}) 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)

Accel	A100	A300	A400	A500	A800
Microstrip, Stripline	1.2 Ω	1.2 Ω	2 Ω	3 Ω	3 Ω

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RF-Class Bandwidth and Risetime Performance

	Transmission Line		Bandwidth and Rise Time	
Accel PCB	**Probe card PCB**	**Probe card connector**	**Pyramid Accel**	
Microstrip	Microstrip	Pogo pad	2 GHz	200 ps
Microstrip	Microstrip	PCB coaxial	7 GHz	50 ps

Optional Componets Attached to Accel PCB

Package type	SMT
Sizes	0201, 0402 (preferred), 0603, 0805

Advanced Spring Imposer: Mechancial

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

Previous frame core name	RFC	SRF	MSI	LSI	VLSR
Pyramid Probe core name	P100	P300	P400	P500	P800
Pyramid Accel name	A100	A300	A400	A500	A800
I/O capacity	108	264	408	520	804

PYRAMID ACCEL-DS-0518

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