

# PyramidPRF50

High-performance RF/DC  
parametric Pyramid Probe® card



DATA SHEET

Cascade Microtech has developed its next-generation PRF50 RF/DC parametric Pyramid Probe cards as the higher-performance, lower-cost alternative to existing industry solutions. Designed to enable the accurate monitoring of 65 nm and 45 nm parametric test structures, the PRF50 is compatible with both the Agilent 4070/4080 Series and Keithley S600 Series. Cascade Microtech's innovative Pyramid Plus™ manufacturing process ensures a substantially lower cost of ownership, while delivering superior RF signal integrity and faster DC settling time — all in a single solution.

## FEATURES / BENEFITS

Superior signal performance	<p>High-bandwidth RF transmission lines and guarded DC traces to probe tips guarantee performance and ensure low signal loss.</p> <p>Guarded traces provide excellent measurement fidelity with low leakage (1 fA/V), enabling faster settling times while reducing unwanted crosstalk effects.</p> <p>Consistent low contact resistance and low-inductance probe tips ensure accurate and repeatable high-speed digital and analog measurements.</p>
Mechanical robustness	<p>MicroScrub® technology enables the same probe card and wafer prober to be used for both Cu and Al pads, reducing the number of probe cards, stations and setups.</p> <p>High-density photolithographically placed contact probe tips are stable over lifetime of product.</p> <p>Low maintenance and permanent probe tip placement improve test cell uptime, reducing the cost of ownership compared to other probing technologies.</p>
Versatile and cost-effective	<p>Lower maintenance overhead with less cleaning and no need for probe tip alignment. Field-replaceable cores feature fully integrated test-vendor identification capabilities.</p>
Advanced membrane technology	<p>Cascade Microtech's industry-leading Pyramid Plus manufacturing process delivers higher performance, plus unique features that lower your cost of test.</p>

## PARAMETRIC TESTER SUPPORT

Agilent	4070 Series, 4080 Series
Keithley	S600 Series

## ELECTRICAL

Leakage	5 fA/V (Standard), 1 fA/V (Optional)
Contact resistance	0.1 to 0.2 $\Omega$ (Al pads), 0.005 to 0.010 $\Omega$ (Au pads)
Maximum current/tip	1 A (Au pads), 200m A (Al pads and Cu pads)
Maximum power 50 $\Omega$ microstrip	+33 dBm CW, +36 dBm pulsed
Max. power 50 $\Omega$ Co-Planar Waveguide (CPW)	+33 dBm CW, +39 dBm pulsed

## SIGNAL LINE PERFORMANCE

	MEMBRANE	PCB	RF CONNECTOR	RF BANDWIDTH
RF	Microstrip	Coax	K	20 GHz
RF	CPW	Coax	K	20 GHz
DC	Guarded	Guarded	N/A	N/A

## SERIES PATH RESISTANCE (SPR)

DC resistance	1 $\Omega$
Microstrip	1.2 $\Omega$
CPW	0.8 $\Omega$

## TYPICAL ISOLATION MEASUREMENTS

2 GHz	50 dB to 70 dB
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## SIGNAL LINE LENGTH MATCHING

Typical to RF connector	$\pm 20$ ps (40 ps window)
Typical pogo pad	No match
Custom line match	$\pm 1.5$ ps (3 ps window)

## COMPONENTS ON MEMBRANES

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

## MECHANICAL

Minimum pad size	50 $\mu\text{m}$ x 50 $\mu\text{m}$ (standard), 40 $\mu\text{m}$ x 40 $\mu\text{m}$ (option), 30 $\mu\text{m}$ x 30 $\mu\text{m}$ (option)
Minimum pitch	50 $\mu\text{m}$
Dimensional stability for lifetime	10 $\mu\text{m}$ for single temperature
Probe tip size Al, Cu (nominal)	12 $\mu\text{m}$
Probe tip size Low K/PoAA (nominal)	18 $\mu\text{m}$
Probe tip size Au (nominal)	25 $\mu\text{m}$
Probe tip material	Non-oxidizing nickel alloy
Temperature range	-50°C to 125°C
Pad and bump materials	Al, Cu, Au, TiN, Polysilicon
Spring rate	1.67 g/mil

## RF/DC PARAMETRIC PRODUCTS

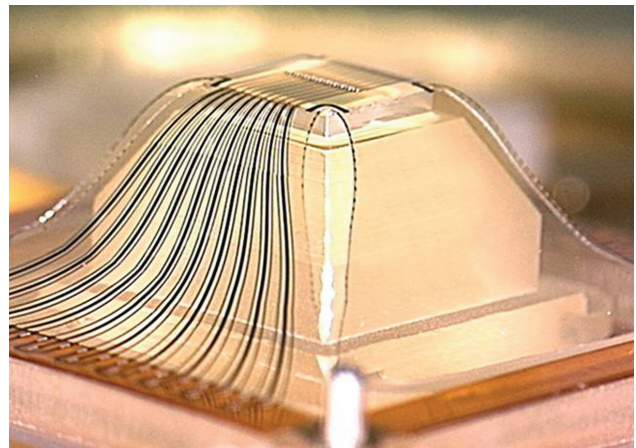
	DC CHANNELS	RF CHANNELS	TESTERS AND NOTES
PRF50 membrane core	36	36	RF Channel capacity is usually limited by tester capability
RFB-4071	48	8	Agilent 4070 Series
RFB-4080	48	12	Agilent 4080 Series
RFB-S600	48	24	Keithley S600 Series

## SERIAL NUMBER ID OPTIONS

Customer-Specified ID resistor	Agilent 4070, 4080
EEPROM	Keithley S600



Pyramid Probe tips feature a 12  $\mu\text{m}$  x 12  $\mu\text{m}$  contact area for probing 30  $\mu\text{m}$  x 30  $\mu\text{m}$  aluminum and copper pads.



Pyramid Probe membrane features guarded traces to the probe tip. The fixed probe tip placement eliminates manual planarity and alignment adjustments.

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Data subject to change without notice

PRF50-DS-0212

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