

# (12) United States Patent

## LaMeres et al.

## (54) PROBE ACCESSORIES, AND METHODS FOR PROBING TEST POINTS USING SAME

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See application file for complete search history.

#### (56)References Cited

## U.S. PATENT DOCUMENTS

4,883,443	A	11/1989	Chase
5,223,787	A	6/1993	Smith et al.
6,359,452	B1	3/2002	Mozzetta
6,462,570	B1	10/2002	Price et al.
6,469,530	B1	10/2002	Johnson et al.
6,512,389	B1	1/2003	Kocher
6,541,991	B1	4/2003	Hornchek et al.

#### US 7,492,173 B2 (10) **Patent No.:** (45) **Date of Patent:** Feb. 17, 2009

6,570,399	B2	5/2003	Yeghiayan et al.
6,575,772			Soubh et al.
6,624,647	B2	9/2003	Adams et al.
6,667,628	B2	12/2003	Ahrikencheikh et al.
6,756,797	B2	6/2004	Brandorff et al.
6,762,612	B2 *	7/2004	Yu et al 324/757
6,798,225	B2	9/2004	Miller
6,822,466	B1	11/2004	Holcombe et al.
6,867,609	B2	3/2005	Holcombe et al.
7,098,680	B2*	8/2006	Fukushima et al 324/763
2005/0179454	Al	8/2005	LaMeres et al.

## OTHER PUBLICATIONS

LaMeres; "Differential Logic Analyzer Probing"; analogZONE; Jul. 5, 2004; 5 pp.

## (Continued)

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#### (57)ABSTRACT

Probe accessories, and methods for routing signals between a target and a test instrument using the probe accessories, are disclosed. Some of the probe accessories include a flexible circuit and first and second pairs of contacts. Flexible circuit design varies, but one embodiment has first and second regions, a first conductor and a second conductor, and a separation feature. The first conductor extends into the first region while the second conductor extends into both the first and second regions and has a fixed spacing with respect to the first conductor. A separation feature extends between first and second regions and is operable to create two independently maneuverable legs, each leg comprising an end portion of the first and second regions, while maintaining a fixed spacing between the first and second conductors. The first and second pairs of contacts electrically couple the probe accessories between test points and test instruments.

## 19 Claims, 8 Drawing Sheets

