

*AlphaTest*  $\mu$ HELIX Test Probes can improve test results by decreasing the 'fixture contributed' noise by reducing *signal-crosstalk*, probe inductance, and probe series resistance. The probe's short signal path and low impedance produce superior performance. Even when placed on close centers, these short-length probes can reduce crosstalk below that achieved with traditional spring loaded test probes. The  $\mu$ HELIX Test Probes come in effective electrical lengths ranging from 3mm to 10mm (0.150" to 0.395").

Installing  $\mu$ HELIX Test Probes as *interposer* pins eliminates the long i/o wire and allows user control or conditioning of the signal at the i/o end of the probe. In *high-frequency* applications, these *fine-pitch* probes can be used to contact interstitial ground traces used for impedance control. *Mixed-signal* test applications may achieve better guarding by connecting the guard directly to the test article with these small probes. High current testing can be improved by placing two *S200 Series* probe on 5x20 mil (125x500 micron) pads.

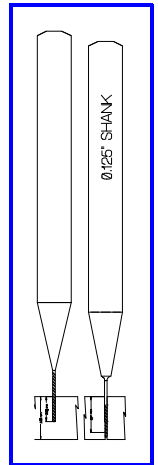


Figure 1:  
Drills and  
Guide Block

Typical installation is straight forward and can result in a simpler process than is required for the typical pogo-style test probe. Though different from that of typical pogo-style probes, it is quite simple and follows these five steps: in TN0013 show drill sizes and depths for the S200\*2300 Series Probes. Install other *AlphaTest*  $\mu$ HELIX Test Probes sizes by this procedure but using drill sizes and depths specified in the applicable data sheet. **[1]** Drill probe-guide holes to a depth equal to *spring length*. **[2]** Counter drill the plunger guide hole (from the same side) without exiting the guide-plate. **[3]** Mill the guide-plate to the probe's *effective length* (overall length less the working travel). **[4]** Install the probes into the guide-holes. NOTE that the *i/o* end of the probe will be flush with the top surface and the plunger will extend through the bottom surface a distance equal to the working travel of the probe. **[5]** Install the *input/output* structure. **[5a]** Install an *i/o* PC board. Signal traces on the board run from pads at the probe *i/o* end locations to a connector, header, or edge fingers. These can be uncontrolled impedance, strip line, or microstrip signal paths. **[5b]** Install a wire *i/o* block. This scheme allows extreme *fine-pitch* connections. Insulated magnet wires installed in the *i/o* block, along the probe axis, provide a cross sectional area equal to the probe diameter and a gold plated contact end. These wires can be routed

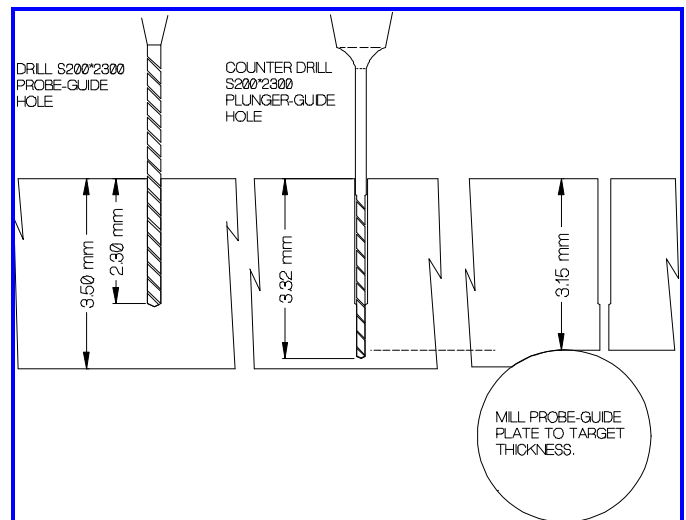


Figure 2: Drill, Counter Drill, and MILL

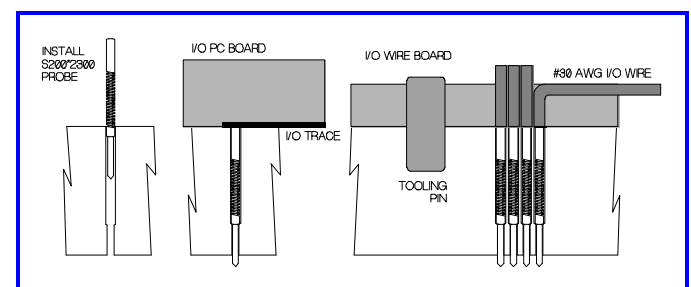


Figure 3: Install Probes and i/o Block

along milled slots on the top surface or off through a dressed bundle to connectors or headers.

Some applications require a plunger at each end of the test probe. *AlphaTest* offers probes in the *S400* and *S500* groups with a plunger at both ends and choices of sharp, flat, round, or crown tips at each end. Also, probes are available in *S200*, *S300*, *S400*, and *S500* groups which have the tube turned down (reduced diameter) near the *i/o* end. This provides the *keeper* feature required to sandwich the probes between two plates.

## PROBE SELECTION:

probe model group	probe diameter		spring length		spring max compliance		force @ ½Cmax		overall length		effective length	
	µm	inch	µm	inch	µm	inch	grams	oz	mm	inch	mm	inch
S200*2300/250/p1	200	.008	2300	.091	250	.010	60	2	3,30	.130	3,175	.125
S200*2300/300/p1	200	.008	2300	.091	300	.012	30	1	3,30	.130	3,150	.124
S200*3800/600/p1	200	.008	3800	.150	600	.024	60	2	5,10	.201	4,80	.189
S200*3800/700/p1	200	.008	3800	.150	700	.028	30	1	5,10	.201	4,75	.187
S300*2300/250/p1	300	.012	2300	.091	250	.010	60	2	3,30	.130	3,175	.125
S300*2300/300/p1	300	.012	2300	.091	300	.012	30	1	3,30	.130	3,150	.124
S300*3800/600/p1	300	.012	3800	.150	600	.024	60	2	5,1	.201	4,80	.189
S300*3800/700/p1	300	.012	3800	.150	700	.028	30	1	5,1	.201	4,75	.187
S400*3800/700/p1	400	.016	3800	.150	700	.028	100	3½	5,1	.201	4,75	.187
S400*3800/900/p1	400	.016	3800	.140	900	.035	30	1	5,1	.201	4,65	.183
S400*4500/900/p1/p2	400	.016	4500	.177	900	.035	30	1	7,1	.280	6,65	.262
S400*6350/1200/p1	400	.016	6350	.250	1200	.047	100	3½	8,25	.325	7,65	.301
S400*6350/1500/p1	400	.016	6350	.250	1500	.059	30	1	8,25	.325	7,50	.295
S500*2440/400/p1	500	.020	2440	.096	400	.016	30	1	5,1	.201	4,65	.183
S500*3800/700/p1	500	.020	3800	.150	700	.028	100	3½	5,1	.201	4,75	.187
S500*3800/900/p1	500	.020	3800	.150	900	.035	30	1	5,1	.201	4,65	.183
S500*4500/900/p1/p2	500	.020	4500	.177	900	.035	30	1	7,1	.280	6,65	.262
S500*6350/1200/p1	500	.020	6350	.250	1200	.047	100	3½	8,25	.325	7,65	.301
S500*6350/1500/p1	500	.020	6350	.250	1500	.047	30	1	8,25	.325	7,50	.295

### Model Group Name Definition:

Diameter\*SpringLength/MaxCompliance/plunger configuration

Example: S200\*2300/300/p1: 200 micron diameter; 2300 micron spring length; 300 micron max compliance; single plunger

Example: S400/4500/900/p1/p2: 400 micron diameter; 4500 micron spring length; 900 micron max compliance; two plungers

Typical Applications: BGA Sockets, flat-panel test fixtures, fine-pitch test fixtures, high-density test fixtures, high frequency test fixtures, pcb2pcb, interconnections.