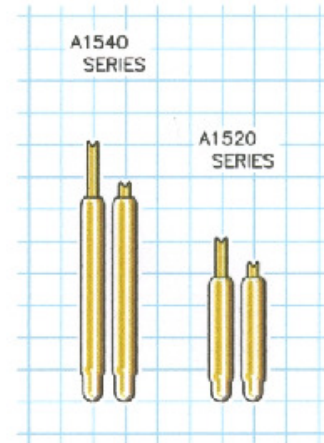


**FEATURES**

- <-1db insertion loss to 16.1GHz
- <2:1VSWR to 15.7GHz
- 18g operating spring force
- Z0 = 38.1Ω
- <30ps risetime
- 20milliOhms contact resistance
- 4.3Amps max. drive current



**GENERAL DESCRIPTION**

The A1540 spring probe from Signal Integrity Inc. is designed to meet the rigorous test requirements driven by the ultra fast risetimes in the digital domain, and high bandwidth, high frequency RF / microwave specifications for the wireless market. Along with speed and accuracy, these probes are designed to operate at pitches to 0.4mm, specifically for the ultra fine pitch packaging these markets demand.

The ultra high bandwidth of these probes provides very low insertion loss up to 16.1GHz. These probes will provide transparent operation on Bluetooth, 802.11b and 3G wireless protocol devices as well as exceed the test probe demands of proprietary microwave communications devices and systems.

With an impulse risetime of less than 30ps and a propagation delay of 15ps, the A1540 has more than enough performance for probe applications and interconnection solutions in broadband digital. These probes are ideal for building transparent test channels or interconnection solutions that must address datacom and source synchronous memory busses. Among others, these include Infiniband, PCI-Express, Source Synchronous DDR, Rambus™, HyperTransport and 10Gb Ethernet.

**SERIES A1540 MODELS: ORDERING INFORMATION**

| A Series 0.4mm (.0157) Pitch |  |                         |                 |                        |
|------------------------------|--|-------------------------|-----------------|------------------------|
| Model                        | Length Operating / Initial inches [mm] | DUT Plunger and Plating | Spring          | Operating Spring Force |
| A1540-B2                     | .114 [2.90] / .126 [3.20]              | 4 Point Crown - Gold    | Music wire      | 22 Grams               |
| A1540-C3                     |  | 4 Point Crown - Gold    | Stainless Steel | 19 Grams               |
| A1540-D4                     |  | 4 Point Crown - Pd      | Music wire      | 26 Grams               |
| A1540-E5                     |  | Ogive - Gold            | Music wire      | 22 Grams               |
| A1540-F6                     |  | Conic - Gold            | Music wire      | 22 Grams               |
| A1540-H8                     |  | 4 Point Crown - Gold    | Stainless Steel | 29 Grams               |
| A1540-K2                     |  | Ogive - Gold            | Stainless Steel | 17 Grams               |
| A1540-L3                     |  | Ogive - Gold            | Stainless Steel | 29 Grams               |
| A1544-B2                     |  | 4 Point Crown - Gold    | Music wire      | 29 Grams               |
| A1544-E5                     |  | Conic - Gold            |                 |                        |

**FUNCTIONAL SPECIFICATIONS**

| Model                             | A1540-B2 |      |      |       |
|-----------------------------------|----------|------|------|-------|
| Time Domain                       | Min.     | Typ. | Max. | Units |
| TDT Risetime into 50Ω             |          |      | 30.0 | ps    |
| TDR Risetime open circuit         |          |      | 39.0 | ps    |
| TDR Risetime short circuit        |          |      | 36.0 | ps    |
| Signal Delay into 50Ω             |          | 15.0 |      | ps    |
| Frequency Domain                  |          |      |      |       |
| Insertion Loss <-1db              | 16.1     |      |      | GHz   |
| <-3db                             | >40.0    |      |      | GHz   |
| Return Loss, S11 <-10db           | 14.0     |      |      | GHz   |
| <-20db                            | 6.0      |      |      | GHz   |
| VSWR <2:1                         | 15.74    |      |      | GHZ   |
| Equivalent Circuit Parameters     |          |      |      |       |
| Pin Inductance                    |          | 0.42 |      | nH    |
| Pin Capacitance to ground, C1, C2 |          | 0.19 |      | pF    |
| Mutual Inductance                 |          | 0.12 |      | nH    |
| Mutual Capacitance                |          | 0.03 |      | pF    |
| Transmission Line Zo              |          | 38.1 |      | Ω     |
| Tl                                |          | 15.0 |      | ps    |
| DC Parameters                     |          |      |      |       |
| Contact Resistance                |          | 20   |      | mΩ    |
| Maximum Rating                    |          |      |      |       |
| Drive Current                     |          | 4.3  |      | A     |

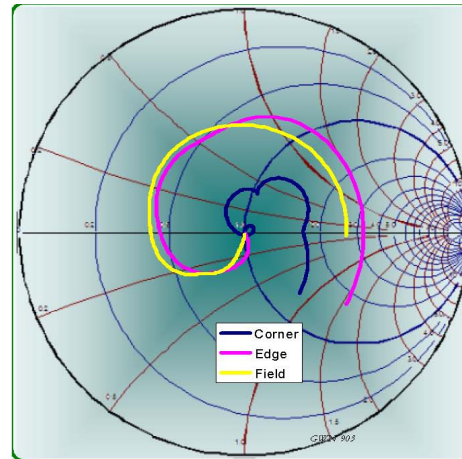


Figure 2: Measurement into 50Ω, A1540-B2

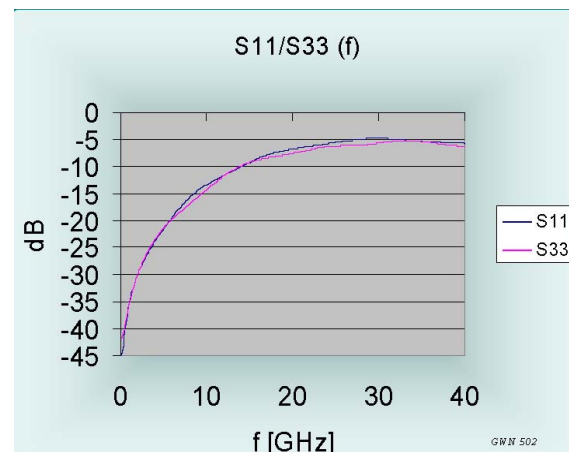


Figure 3: Return Loss, S11, A1540-B2

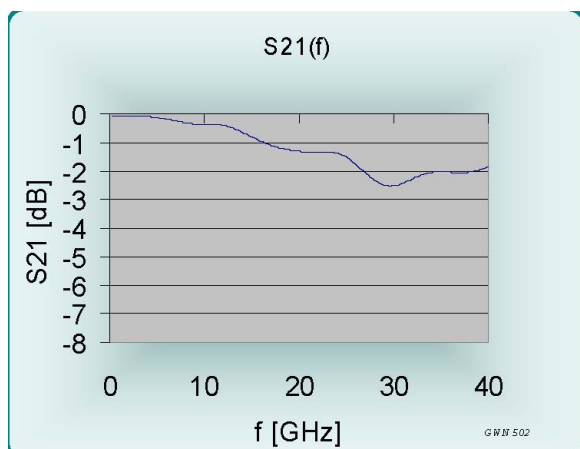


Figure 1: Insertion Loss, S21, A1540-B2

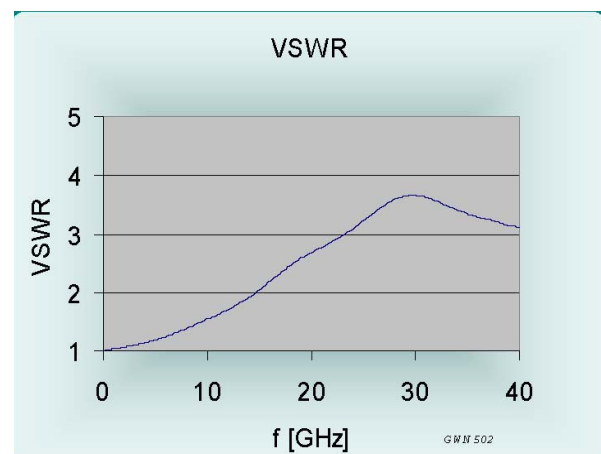


Figure 4: VSWR, A1540-B2

EQUIVALENT CIRCUITS / SPICE MODELS

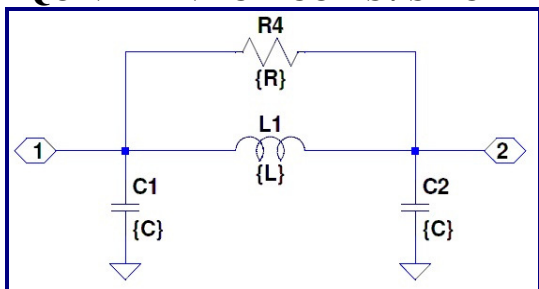


Figure 5: Pi Equivalent, Valid to 16GHz

| Site     | Cg = C1+C2 | L1      |
|----------|------------|---------|
| Corner   | 0.139 pF   | 0.83 nH |
| Edge     | 0.168 pF   | 0.71 nH |
| Field    | 0.191 pF   | 0.42 nH |
| Diagonal | 0.191 pF   | 0.42 nH |

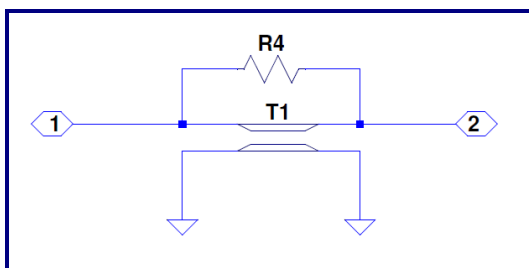


Figure 6: Transmission Line Model, Valid to >40GHz

|        | Zo     | L     | R4     |
|--------|--------|-------|--------|
| Corner | 54.0 Ω | 15 ps | 1500 Ω |
| Edge   | 42.6 Ω | 15 ps | 1000 Ω |
| Field  | 38.1 Ω | 15 ps | 1000 Ω |

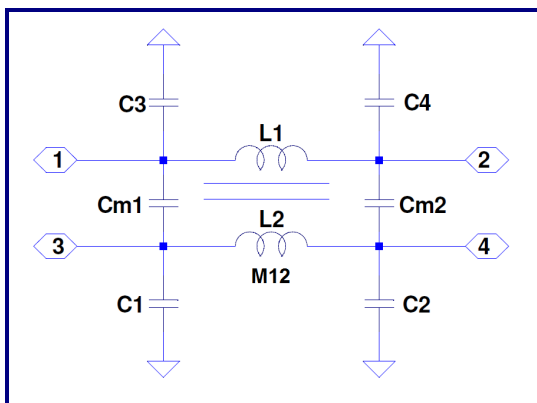


Figure 7: Lumped, Mutual Elements

| Site     | C1,2,3,4 | Cm1,Cm2  | L1,L2 | M        |
|----------|----------|----------|-------|----------|
| Corner   | 0.139    | 0.046 pF | 0.83  | 0.249 nH |
| Edge     | 0.168    | 0.043 pF | 0.71  | 0.163 nH |
| Field    | 0.191    | 0.032 pF | 0.42  | 0.119 nH |
| Diagonal | 0.191    | 0.007 pF | 0.42  | 0.045 nH |

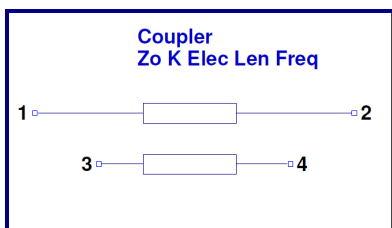
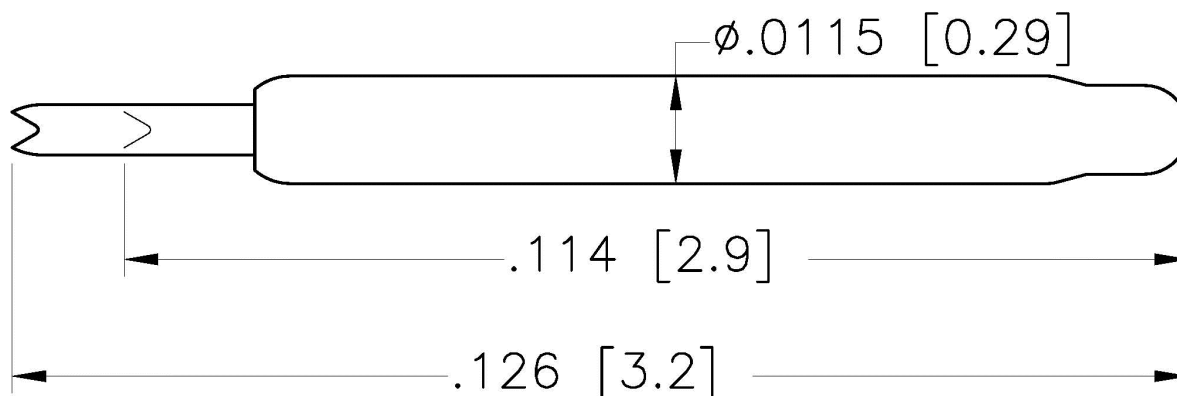


Figure 8: Transmission Line Equivalent for Crosstalk

|     |       |      |
|-----|-------|------|
| Z0  | 38.1  | Ohms |
| Lel | 15    | ps   |
| k   | 0.07  |      |
| f   | 66.67 | Ghz  |

**A Series 0.4mm (.0157) pitch**

| Probe Series          | Initial Length<br>inch/mm |      | Operating Position<br>inch/mm |      | Operating Spring Force | Self Inductance | Insertion Loss<br>< -1db to | Typical Contact Resistance | Maximum Current |
|-----------------------|---------------------------|------|-------------------------------|------|------------------------|-----------------|-----------------------------|----------------------------|-----------------|
| <a href="#">A1512</a> | .131"                     | 3.32 | .119"                         | 3.02 | 18-29g                 | 0.66 nH         | 20.3 GHz                    | 72 mOhms                   | 2.0 A           |
| <a href="#">A1520</a> | .081"                     | 2.05 | .075"                         | 1.90 | 20g                    | 0.44 nH         | 24.1 GHz                    | 60 mOhms                   | 2.0 A           |
| <a href="#">A1540</a> | .126"                     | 3.20 | .114"                         | 2.90 | 22-29g                 | 0.42 nH         | 16.1 GHz                    | 20 mOhms                   | 4.3 A           |
| <a href="#">A1550</a> | .133"                     | 3.30 | .118"                         | 3.00 | 20-29g                 | 0.71 nH         | 18.7 GHz                    | 85 mOhms                   | 2.0 A           |
| <a href="#">A1561</a> | .149"                     | 3.78 | .131"                         | 3.33 | 16-29g                 | 0.67 nH         | 7.4 GHz                     | 90 mOhms                   | 1.65 A          |
| <a href="#">A1562</a> | .160"                     | 4.06 | .144"                         | 3.66 | 14-30g                 | 0.80 nH         | 11.6 GHz                    | 90 mOhms                   | 1.45 A          |
| <a href="#">A1580</a> | .210"                     | 5.33 | .192"                         | 4.88 | 16-32g                 | 1.02 nH         | 7.4 GHz                     | 95 mOhms                   | 1.55 A          |
| <a href="#">A1582</a> | .210"                     | 5.33 | .184"                         | 4.67 | 16-30g                 | 0.93 nH         | 9.6 GHz                     | 100 mOhms                  | 1.4 A           |
| <a href="#">A1586</a> | .219"                     | 5.56 | .199"                         | 5.06 | 19-20g                 | -               | -                           | -                          | -               |

**MECHANICAL DIMENSIONS**  
 INCHES [MM]


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