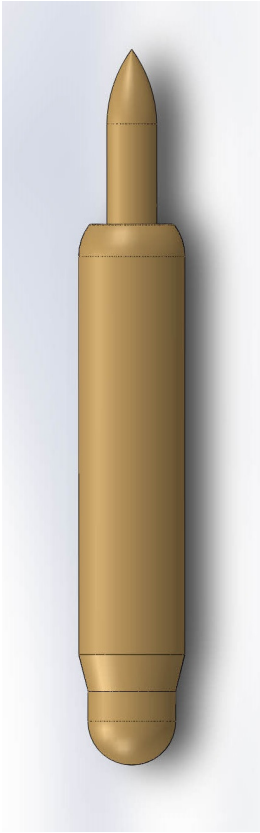
SIGNAL INTEGRITY

A1520
Series
0.4mm (.0157inch) Pitch
0.5mm (.0197inch) Pitch

FEATURES



0.4mm (.0157inch) Pitch

- **<-1db insertion loss to 24.1GHz**
- **<2:1VSWR to 27.1GHz**
- **Z0 = 45.4 Ω**
- **<30ps risetime thru 50 Ω**
- **60 milliOhms contact resistance**
- **2.0 Amps max. drive current**

0.5mm (.0197inch) Pitch

- **<-1db insertion loss to 33.3 GHz**
- **<2:1VSWR to 37.1 GHz**
- **Z0 = 53.9 Ω**
- **<30ps risetime thru 50 Ω**
- **60 milliOhms contact resistance**
- **2.0 Amps max. drive current**

GENERAL DESCRIPTION

The A1520 spring probes from Signal Integrity Inc. are 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 24.1GHz. 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 9ps, the A1520 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 data communication and source synchronous memory busses. Among others, these include Infiniband, PCI-Express, Source Synchronous DDR, Rambus^{tm}, HyperTransport and 10Gb Ethernet.

SERIES A1520 MODELS: ORDERING INFORMATION

A Series 0.4mm (.0157inch) Pitch				
Model	**Length Operating / Initial inches [mm]**	**DUT Plunger and Plating**	**Spring**	**Operating Spring Force**
A1520-A1	**.075 [1.90] / .081 [2.05]**	**Sharp point - Gold**	**Music wire**	**20 Grams**
A1520-B2		**4 Point Crown - Gold**		
A1520-V4		**4 Point Crown - Gold**	**Stainless Steel**	**21 Grams**
A1520-W5		**Sharp point - Gold**		

FUNCTIONAL SPECIFICATIONS

Model	**A1520-B2 0.4mm pitch**			**A1520-B2 0.5mm pitch**			
Time Domain	**Min.**	**Typ.**	**Max.**	**Min.**	**Typ.**	**Max.**	**Units**
TDT Risetime into 50Ω			30.0			30.0	ps
TDR Risetime open circuit			30.0			28.5	ps
TDR Risetime short circuit			27.0			25.5	ps
Signal Delay into 50Ω		9.0			9.0		ps
Frequency Domain							
Insertion Loss <-1db <-3db	 24.1 >40.0			 33.3 >40.0			 GHz GHz
Return Loss, S11 <-10db <-20db	 26.0 13.0			 36.0 26.0			 GHz GHz
VSWR <2:1	27.1			37.1			GHz
Equivalent Circuit Parameters							
Pin Inductance		0.44			0.55		nH
Pin Capacitance to ground, C1, C2		0.23			0.18		pF
Mutual Inductance		0.11			0.11		nH
Mutual Capacitance		0.04			0.03		pF
Transmission Line Zo Tl		 45.4 9			 53.9 9		 Ω ps
DC Parameters							
Contact Resistance	60						mΩ
Maximum Rating							
Drive Current	2						A

0.4mm (.0157inch) Pitch

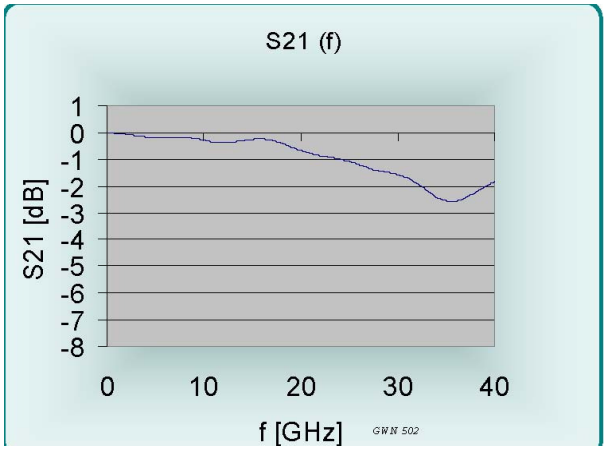


Figure 1: Insertion Loss, S21, A1520-B2

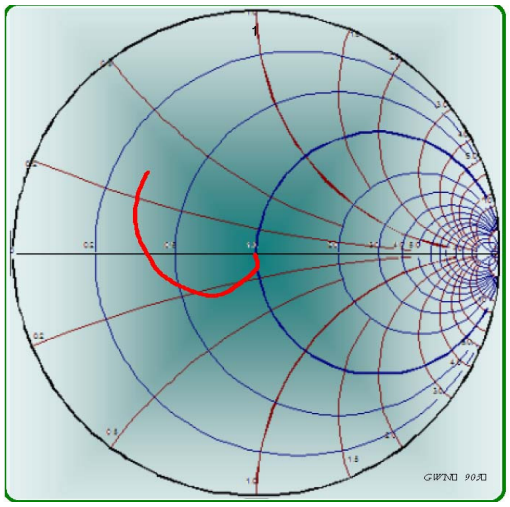


Figure 2: Measurement into 50Ω, A1520-B2

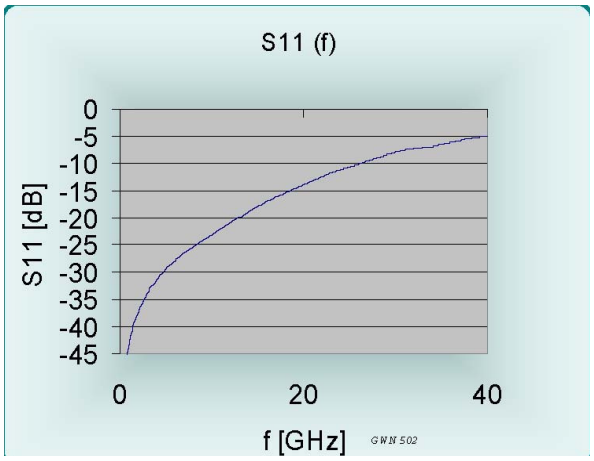


Figure 3: Return Loss, S11, A1520-B2

Figure 4: VSWR, A1520-B2

0.4mm (.0157inch) Pitch
EQUIVALENT CIRCUITS / SPICE MODELS

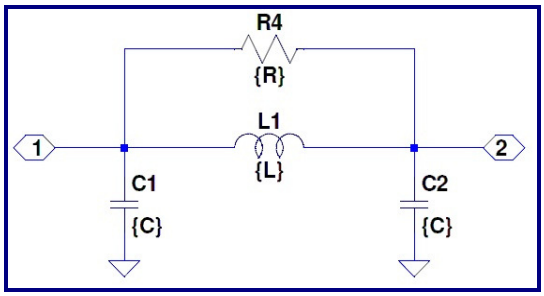


Figure 5 Pi Equivalent, Valid to <23GHz

C1, C2	0.12	pF
L1	0.44	nH
R4	2000	Ohms

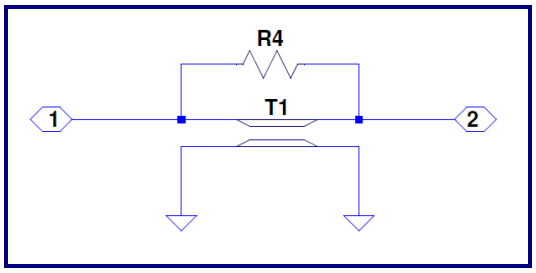


Figure 6 Transmission Line Model,
Valid to >40GHz

Z0	45.4	Ohms
L	9	ps
R4	2000	Ohms

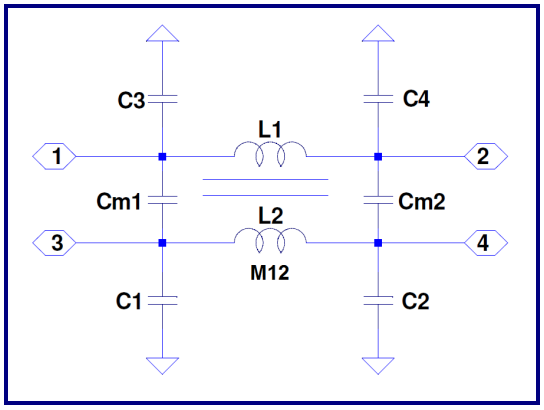


Figure 7: Lumped, Mutual Elements

C1,2,3,4	0.116	pF
Cm1, Cm2	0.021	pF
L1, L2	0.44	nH
M12	0.108	nH

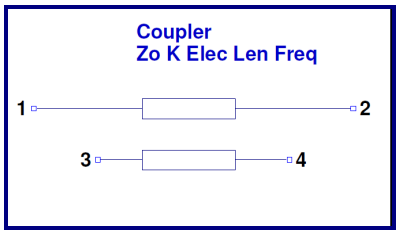


Figure 8: Transmission Line
Equivalent for Crosstalk

Z0	45.4	Ohms
Lel	9	ps
k	0.25	
f	55.6	GHz

0.5mm (.0197inch) Pitch

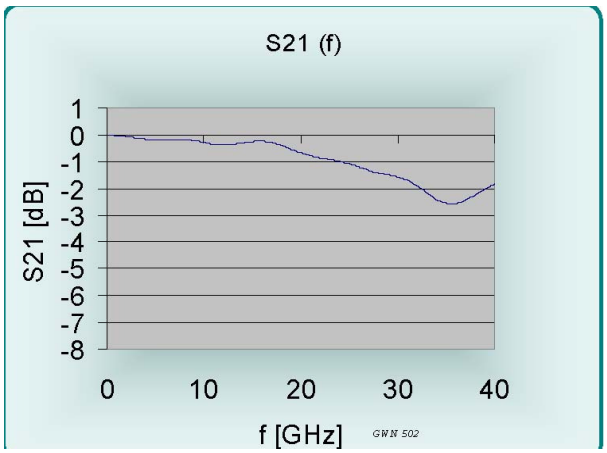


Figure 9: Insertion Loss, S21, A1520-B2

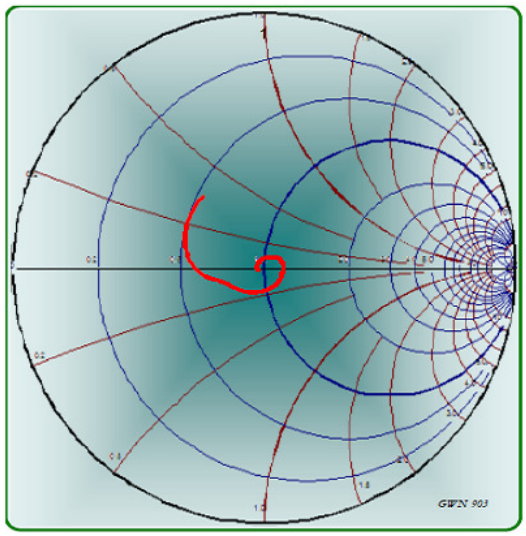


Figure 10: Measurement into 50Ω, A1520-B2

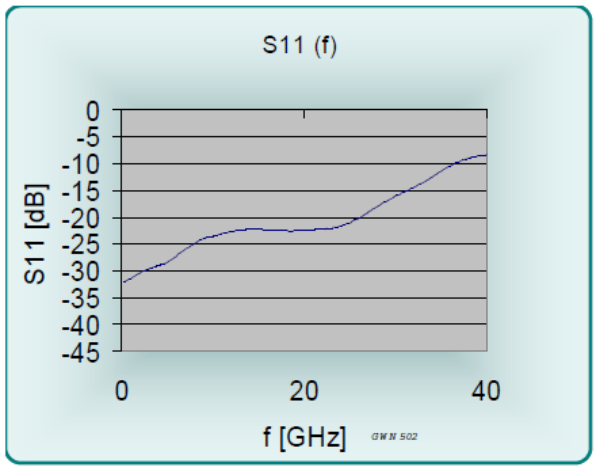


Figure 11: Return Loss, S11, A1520-B2

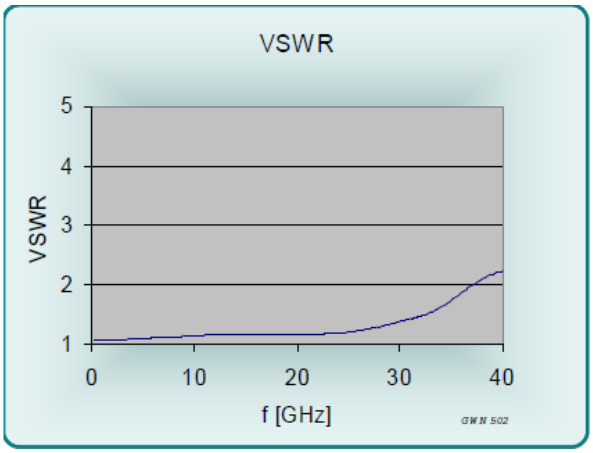
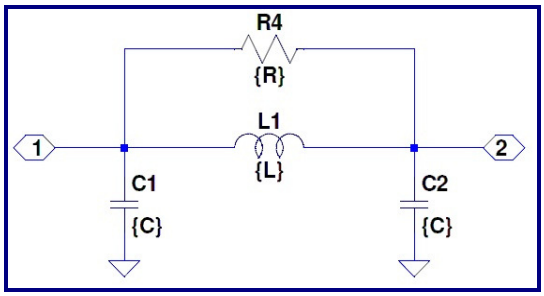


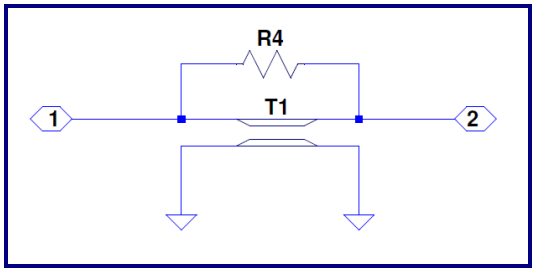
Figure 12: VSWR, A1520-B2

0.5mm (.0197inch) Pitch
EQUIVALENT CIRCUITS / SPICE MODELS



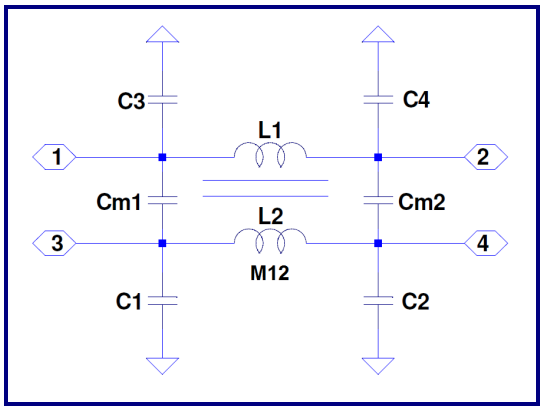
Cg = C1+C2	L1	R4
0.18 pF	0.55 nH	1000 Ω

Figure 13: Lumped, Valid to <24GHz
GSG Configuration



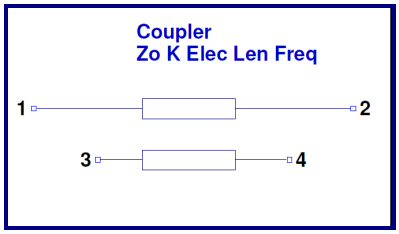
Zo	L	R4
53.9 Ω	9 ps	1000 Ω

Figure 14: Transmission Line



C1,2,3,4	Cm1,Cm2	L1,L2	M
0.088	0.014 pF	0.55	0.110 nH

Figure 15: Lumped, Mutual Elements
GSSG Configuration



Z0	53.9	Ohms
k	0.20	
f	55.6	Ghz

Figure 16: Transmission Line for Crosstalk

SIGNAL INTEGRITY

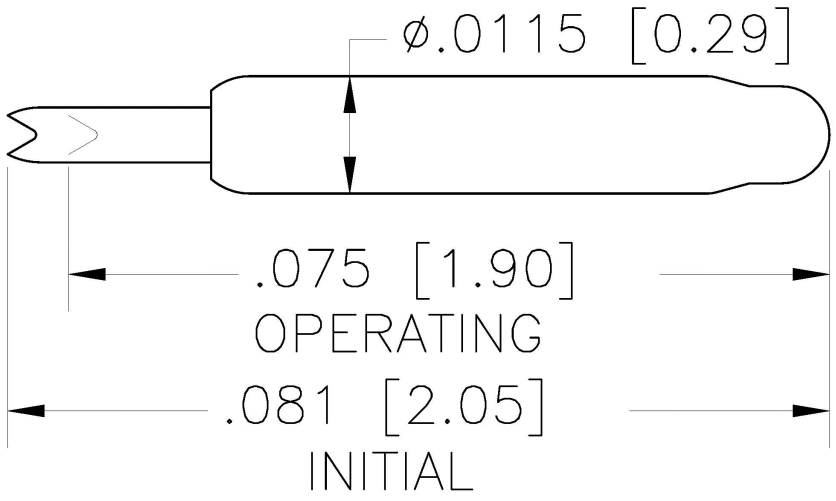
A1520

A SERIES MODELS

A Series 0.4mm (.0157) pitch									
Probe Series	Initial Length inch/mm		Operating Position inch/mm		Operating Spring Force	Self Inductance	Insertion Loss < -1db to	Typical Contact Resistance	Maximum Current
A1512	.131"	3.32	.119"	3.02	18-29g	0.66 nH	20.3 GHz	72 mOhms	2.0 A
A1520	.081”	2.05	.075”	1.90	20g	0.44 nH	24.1 GHz	60 mOhms	2.0 A
A1540	.126"	3.20	.114"	2.90	22-29g	0.42 nH	16.1 GHz	20 mOhms	4.3 A
A1550	.133”	3.30	.118”	3.00	20-29g	0.71 nH	18.7 GHz	85 mOhms	2.0 A
A1561	.149”	3.78	.131”	3.33	16-29g	0.67 nH	7.4 GHz	90 mOhms	1.65 A
A1562	.160”	4.06	.144”	3.66	14-30g	0.80 nH	11.6 GHz	90 mOhms	1.45 A
A1580	.210”	5.33	.192”	4.88	16-32g	1.02 nH	7.4 GHz	95 mOhms	1.55 A
A1582	.210”	5.33	.184”	4.67	16-30g	0.93 nH	9.6 GHz	100 mOhms	1.4 A
A1586	.219”	5.56	.199”	5.06	19-20g	-	-	-	-

MECHANICAL DIMENSIONS

INCHES [MM]



RoHS

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