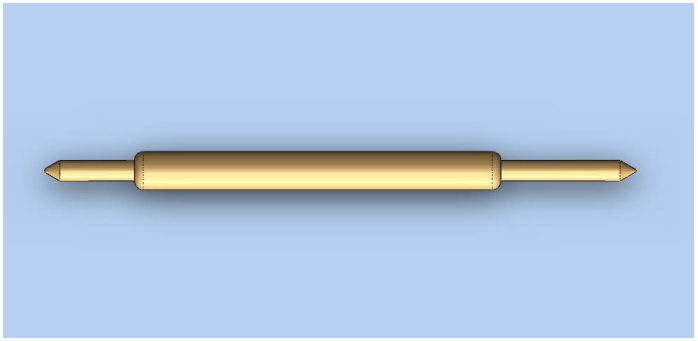
D4697
D Series
0.8mm (.0315inch) Pitch

FEATURES

- **<-1db insertion loss 8.6 GHz**
- **<2:1 VSWR to 8.4 GHz**
- **16-32g operating spring force**
- **Z0 = 39.3 Ω**
- **<42 ps risetime**
- **45 milliohms**
- **2.6 Amps max drive current**



GENERAL DESCRIPTION

The D4697 series spring probes from Signal Integrity Inc. are designed to meet the rigorous test probe bandwidth of the wireless and RF test markets as well as very fast rise times in test applications for telecommunication and broadband data communications system-on-a-chip devices. The risetime requirements for these devices are usually well below 150 picoseconds. Along with speed and accuracy, these probes are designed for testing very fine pitch to 0.8mm, well suited to the packaging constraints driven by the consumer wireless market.

The high bandwidth of these probes provides very low insertion loss up to 8.6GHz. 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 42 ps and a propagation delay of 40.9ps, the AC performance of the D4697 probe is transparent for test applications and interconnections solutions that operate in high speed CMOS, SiGe and GaAs technologies.

SERIES D4697 MODELS: ORDERING INFORMATION

D Series 0.8mm (.0315inch) Pitch				
Model	**Length Operating / Initial inches [mm]**	**DUT Plunger and Plating**	**Spring**	**Operating Spring Force**
D4697-B2	.295 [7.50] / .339 [8.61]	Conic – Gold	Stainless Steel	32 Grams
D4697-C3		Reduced Crown - Gold		
D4697-D4				16 Grams
D4697-G7		Crown - Gold		

FUNCTIONAL SPECIFICATIONS

Model	D4697-B2			
	Corner	Edge	Field	Units
TDT Risetime thru 50Ω	38	36	42	ps
TDR Risetime open circuit	34	56	66	ps
TDR Risetime short circuit	126	38	80	ps
Signal Delay into 50Ω	42.2	41.0	40.9	ps
Insertion Loss <-1db	11.2	10.6	8.6	GHz
Insertion Loss <-3db	26.3	27.7	28.1	GHz
VSWR <2:1	11.4	10.6	8.4	GHz
Equivalent Circuit Parameters				
	Min.	**Typ.**	**Max.**	**Units**
Pin Inductance		2.01		nH
Pin Capacitance		.984		pF
Mutual Inductance		.304		nH
Mutual Capacitance		.067		pF
Transmission Line				
Zo		39.3		Ω
Tl		40.9		ps

MAXIMUM DC CURRENT					
DUTY CYCLE	DC	50%	25%	10%	1%
AMPS	2.67	3.74	4.72	5.84	6.94

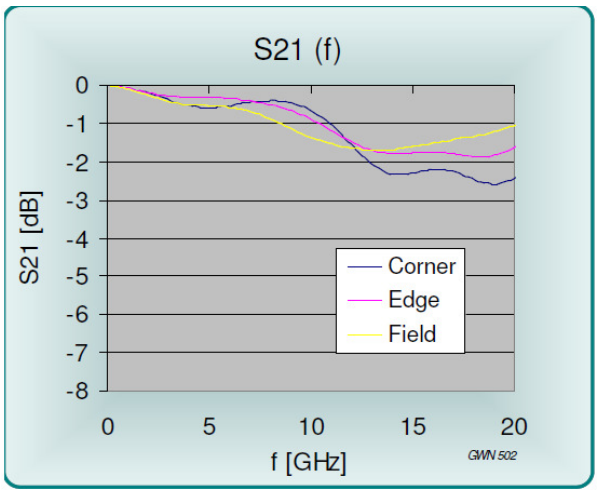


Figure 1: Insertion Loss, S21, D4697-B2

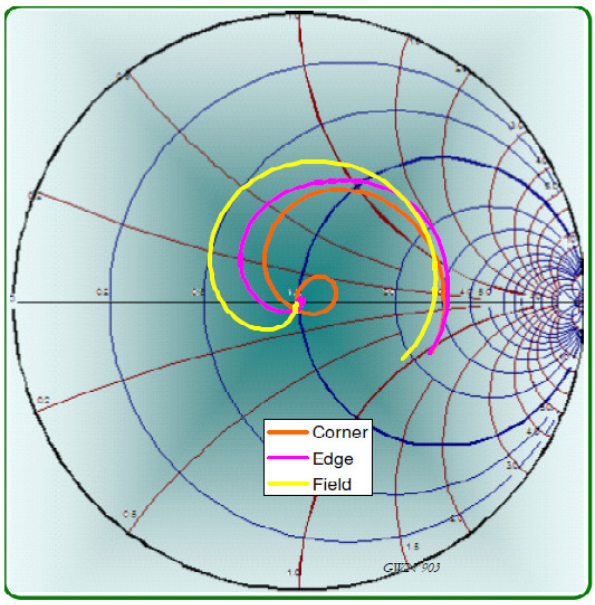


Figure 2: Measurement into 50Ω, D4697-B2

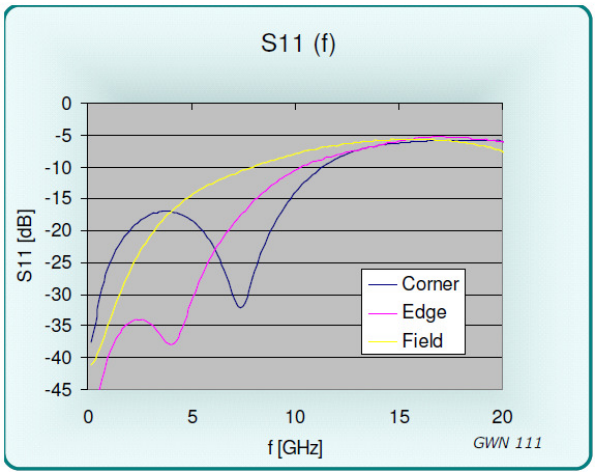


Figure 3: Return Loss, S11, D4697-B2

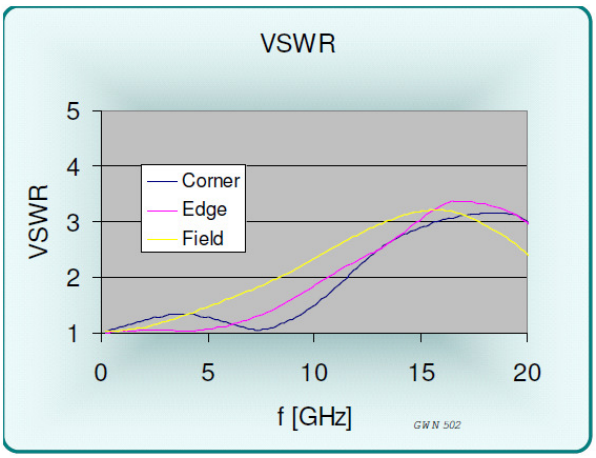


Figure 4: VSWR, D4697-B2

EQUIVALENT CIRCUITS / SPICE MODELS

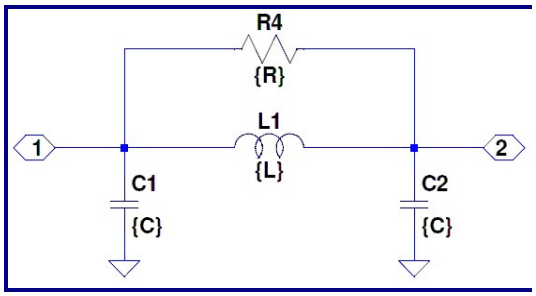


Figure 5: Pi Equivalent, Valid to >5 GHz

Site	Cg = C1+C2	L1	R4
Corner	0.736 pF	2.76 nH	800 Ω
Edge	0.861 pF	2.30 nH	600 Ω
Field	0.984 pF	2.01 nH	500 Ω
Diagonal	0.984 pF	2.01 nH	500 Ω

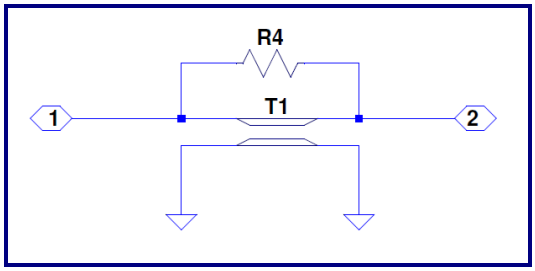


Figure 6: Transmission Line Model Valid <14.9 GHz

	Zo	L	R4
Corner	61.3 Ω	45.12 ps	1200 Ω
Edge	51.7 Ω	44.47 ps	900 Ω
Field	45.2 Ω	44.51 ps	800 Ω

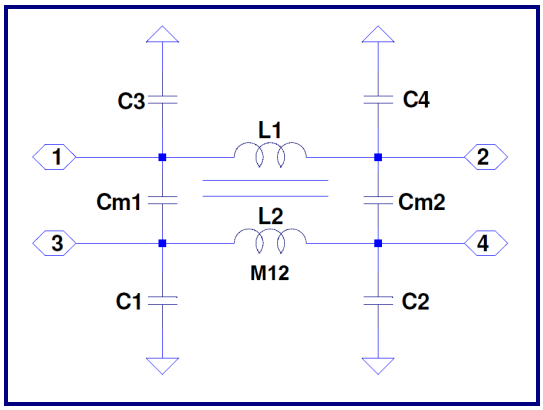


Figure 7: Lumped, Mutual Elements

Site	C1,2,3,4	Cm1,Cm2	L1,L2	M
Corner	0.230	0.138 pF	2.76	0.583 nH
Edge	0.330	0.101 pF	2.30	0.471 nH
Field	0.425	0.067 pF	2.01	0.304 nH
Diagonal	0.478	0.014 pF	2.01	0.098 nH

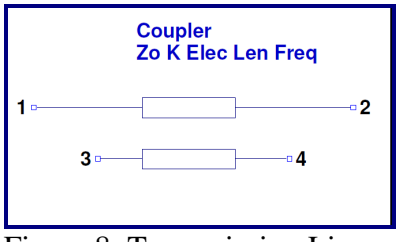


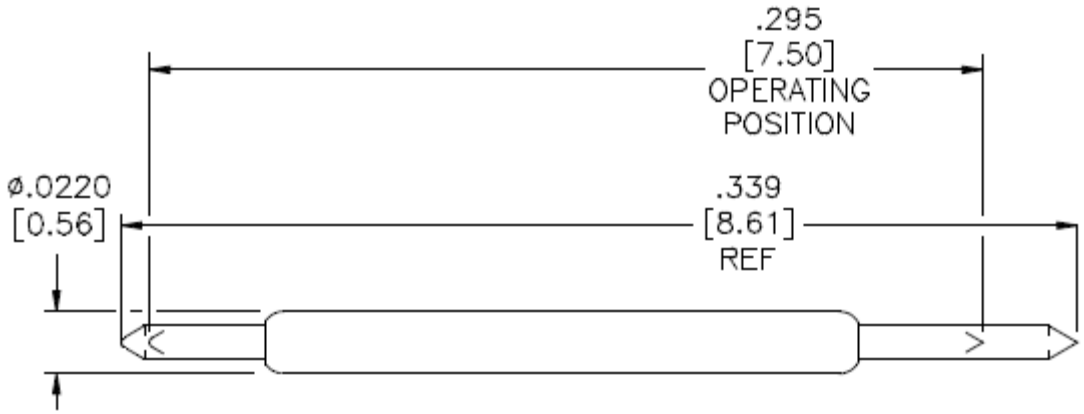
Figure 8: Transmission Line Equivalent for Crosstalk

Z0	39.3	Ohms
Lel	40.9	ps
k	0.15	
f	11.2	Ghz

D Series 0.8mm (.0315) pitch									
Probe Series	Initial Length inch/mm		Operating Position inch/mm		Spring Force	Self Inductance	Insertion Loss < -1db to	Typical Contact Resistance	Maximum Current
D4525	.087"	2.21	.071"	1.80	30 g	0.5 nH	17.0 GHz	20 mOhms	6.0 A
D4565	.092"	2.33	.071"	1.80	30 g	0.5 nH	17.0 GHz	25 mOhms	6.0 A
D4595	.154"	3.91	.128"	3.25	38 g	0.82 nH	19.5 GHz	30 mOhms	3.0 A
D4601	.214"	5.43	.186"	4.72	24-34 g	1.0 nH	12.8 GHz	50 mOhms	6.0 A
D4603	.209"	5.30	.181"	4.59	24 g	1.16 nH	12.4 GHz	70 mOhms	4.0 A
D4613	.249"	6.32	.213-.216"	5.49	24-34 g	1.25 nH	14.3 GHz	40 mOhms	2.15 A
D4623	.289"	7.33	.253”	6.43	34 g	1.55 nH	8.2 GHz	60 mOhms	5.4 A
D4823	.289"	7.33	.253”	6.43	28 g	-	-	-	-
D4693	.185”	4.71	.157”	4.00	24-34 g	0.92 nH	18.3 GHz	40 mOhms	3.0 A
D4694	.185”	4.71	.157”	4.00	23-36 g	0.80 nH	7.8 GHz	40 mOhms	3.0 A
D4697	.339”	8.61	.295”	7.50	32 g	2.01 nH	8.6 GHz	45 mOhms	2.6 A

MECHANICAL DIMENSIONS

INCHES [MM]



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