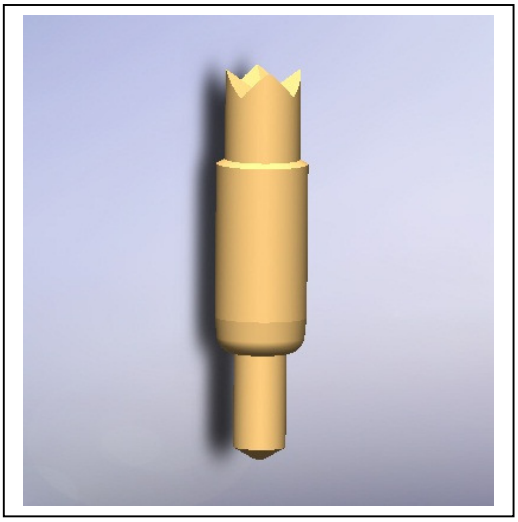
SIGNAL INTEGRITY

E5566
E Series
1.0mm (.0394inch) Pitch

FEATURES



- **<-1db insertion loss to >40 GHz**
- **<2:1 VSWR to >40 GHz**
- **24/35g operating spring force**
- **Z0 = 39.1 Ω**
- **<13.9ps risetime**
- **20milliOhms contact resistance**
- **4.3 Amps max. drive current**

GENERAL DESCRIPTION

The E5566 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 1.0mm, specifically for the fine pitch packaging these markets demand.

The ultra high bandwidth of these probes provides very low insertion loss >40 GHz. 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 33ps and a propagation delay of 15.1ps, the E5566 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.

E5566 Series 1.0mm (.0394) Pitch					
Model	**Length Operating / initial inch [mm]**	**DUT Plunger and Plating**	**Interface Plunger**	**Spring**	**Operating Spring Force**
E5566-A1	.098 [2.49] / .121 [3.08]	Crown - Gold	Spherical	Stainless Steel	35 Grams
E5566-B2		Conic – Gold			
E5566-C3		Crown - Gold			24 grams
E5566-D4		Crown – Gold Anti-Diffusion			
E5566-E5		Crown –Solid Precious Metal Alloy			35 Grams

FUNCTIONAL SPECIFICATIONS

Model	E5566-A1			
Time Domain	**Min.**	**Typ.**	**Max.**	**Units**
TDT Risetime into 50Ω			33.0	ps
TDR Risetime open circuit			51.0	ps
TDR Risetime short circuit			37.5	ps
Signal Delay into 50Ω		15.1		ps
Frequency Domain				
Insertion Loss				
<-1db	34		>40	GHz
<-3db	>40		>40	GHz
Return Loss, S11				
<-10db	>40			GHz
<-20db	2.8			GHz
VSWR				
<2:1	>40		>40	GHz
Equivalent Circuit Parameters				
Pin Inductance		0.49		nH
Pin Capacitance to ground		0.16		pF
Mutual Inductance		.099		nH
Mutual Capacitance		0.03		pF
Transmission Line				
Zo		39.1		Ω
Tl		13.9		ps
DC Parameters				
Contact Resistance		20		mΩ
Maximum Rating				
Drive Current		4.3		A

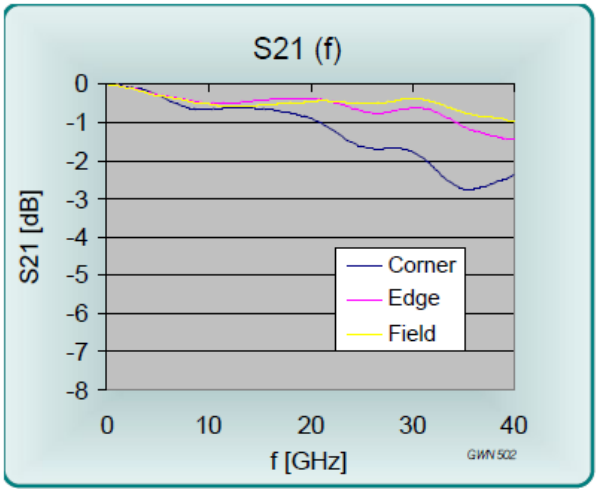


Figure 1: Insertion Loss, S21, E5566-A1

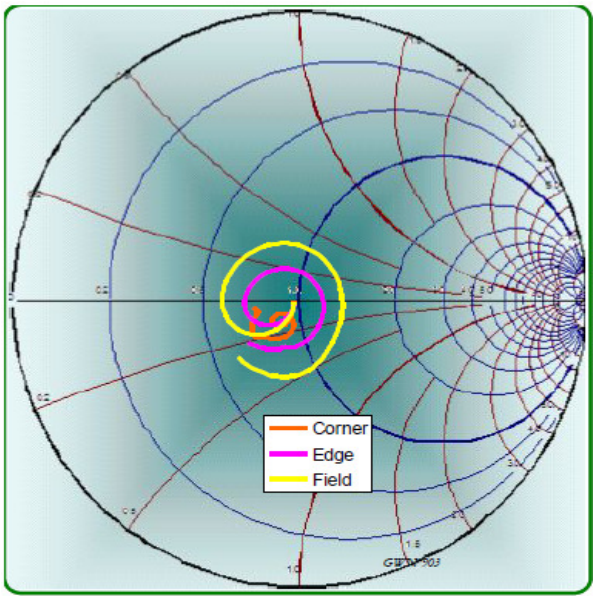


Figure 2: Measurement into 50Ω, E5566-A1

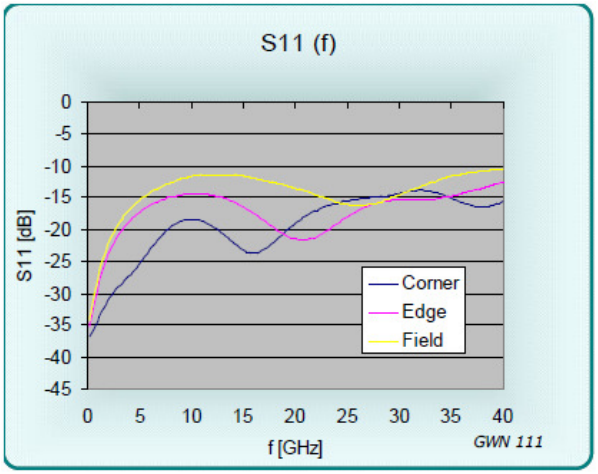


Figure 3: Return Loss, S11, E5566-A1

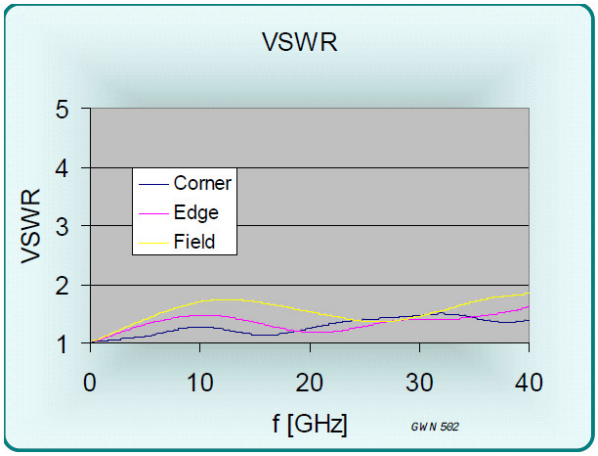
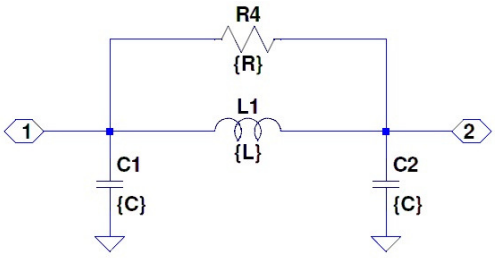


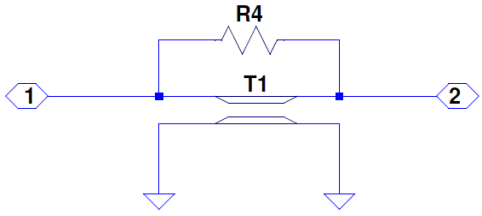
Figure 4: VSWR, E5566-A1

EQUIVALENT CIRCUITS / SPICE MODELS



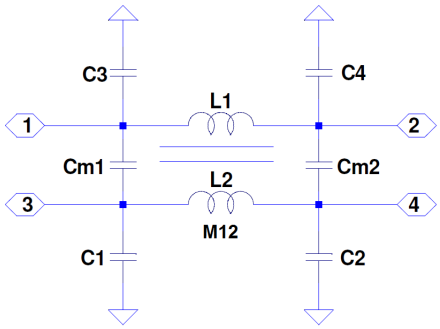
Site	Cg = C1+C2	L1	R4
Corner	0.280 pF	0.80 nH	300 Ω
Edge	0.317 pF	0.62 nH	400 Ω
Field	0.331 pF	0.49 nH	300 Ω
Diagonal	0.331 pF	0.49 nH	300 Ω

Figure 5: Pi Equivalent, Valid <16GHz



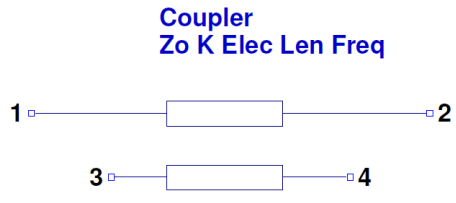
	Zo	L	R4
Corner	53.5 Ω	14.98 ps	700 Ω
Edge	44.3 Ω	14.03 ps	1500 Ω
Field	38.7 Ω	12.78 ps	2000 Ω

Figure 6: Transmission Line Model
Valid to >40GHz



Site	C1,2,3,4	Cm1,Cm2	L1,L2	M
Corner	0.140	0.042 pF	0.80	0.285 nH
Edge	0.158	0.043 pF	0.62	0.215 nH
Field	0.165	0.035 pF	0.49	0.119 nH
Diagonal	0.165	0.006 pF	0.49	0.099 nH

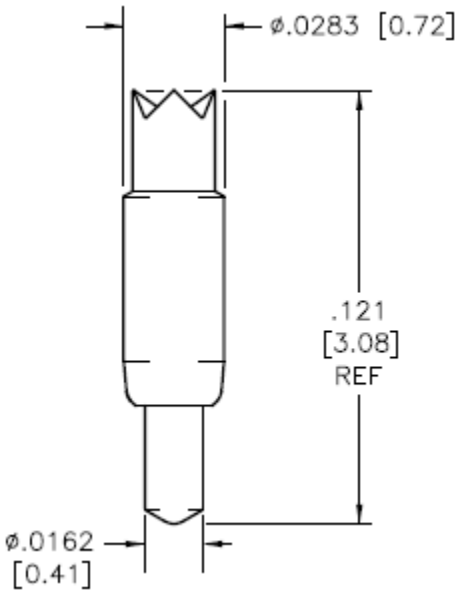
Figure 7: Lumped, Mutual Elements



Z0	39.1	Ohms
Lel	13.9	ps
k	0.24	
f	39.1	Ghz

Figure 8: Transmission Line
Equivalent for Crosstalk

MECHANICAL DIMENSIONS
INCHES [MM]



E Series 1.0mm (.0394) 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
E5566	.121”	3.08	.098”	2.49	24-35 g	0.49 nH	>40 GHz	20 mOhms	4.3 A
E5533	.144"	3.66	.119"	3.02	25-40 g	0.72 nH	25.3 GHz	20 mOhms	8.5 A
E5548	.180"	4.57	.156"	3.96	20-39 g	1.04 nH	14.5 GHz	25 mOhms	7.0 A
E5593					27 g	1.14 nH	31.5 GHz	20 mOhms	6.0 A
E5656					28-36 g	0.90 nH	13.9 GHz	20 mOhms	6.0 A

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