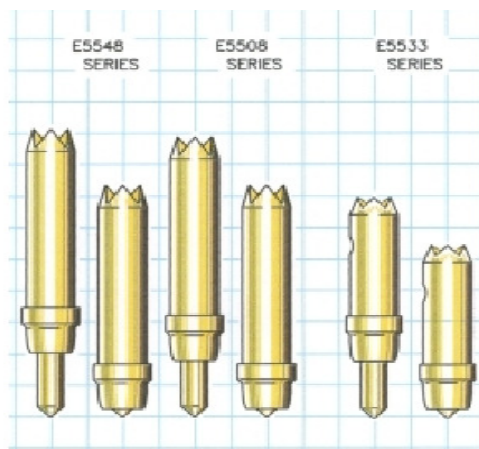


FEATURES

- <-1db insertion loss to 25.3GHz
- <2:1VSWR to 18.3GHz
- 34-40g operating spring force
- $Z_0 = 43.6\Omega$
- <18ps risetime
- 20milliOhms contact resistance
- 8.5Amps max. drive current


GENERAL DESCRIPTION

The E5533 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 up to 25.3GHz. 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 28.5ps and a propagation delay of 18ps, the E5533 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[™], HyperTransport and 10Gb Ethernet.

E SERIES MODELS

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
E5544	.124"	3.15	.098"	2.49	25 g	0.70 nH	>40 GHz	30 mOhms	2.7 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

FUNCTIONAL SPECIFICATIONS

Model	E5533-A1			
Time Domain	Min.	Typ.	Max.	Units
TDT Risettime into 50Ω			28.5	ps
TDR Risettime open circuit			28.5	ps
TDR Risettime short circuit			30.0	ps
Signal Delay into 50Ω		18.0		ps
Frequency Domain				
Insertion Loss <-1db	25.3			GHz
<-3db	40.0			GHz
Return Loss, S11 <-10db	19.0			GHz
<-20db	9.0			GHz
VSWR <2:1	18.3			GHz
Equivalent Circuit Parameters				
Pin Inductance		0.72		nH
Pin Capacitance to ground		0.18		pF
Mutual Inductance		0.18		nH
Mutual Capacitance		0.03		pF
Transmission Line Zo		43.6		Ω
Tl		18.0		ps
DC Parameters				
Contact Resistance		20		mΩ
Maximum Rating				
Drive Current		8.5		A

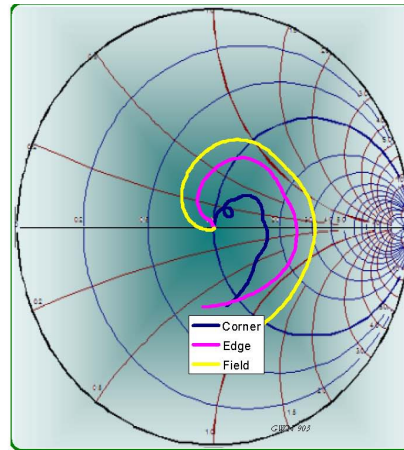


Figure 2: Measurement into 50Ω, E5533-A1

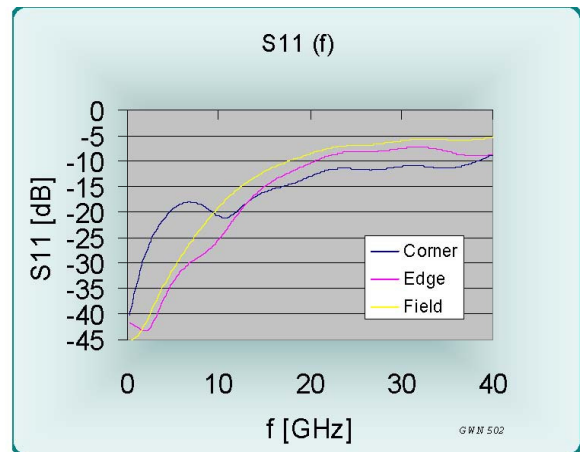


Figure 3: Return Loss, S11, E5533-A1

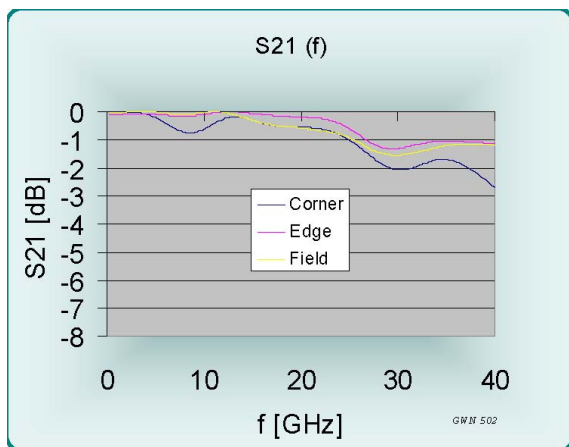


Figure 1: Insertion Loss, S21, E5533-A1

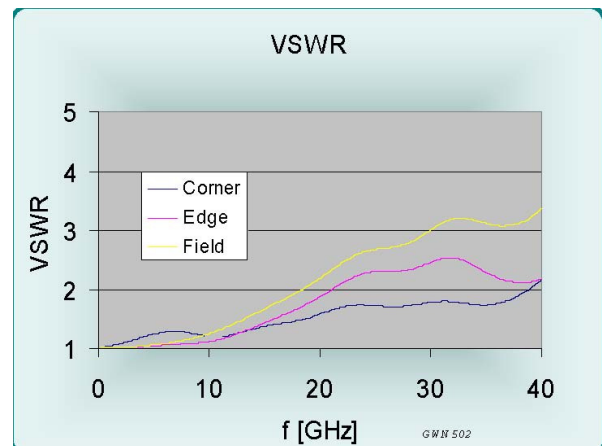


Figure 4: VSWR, E5533-A1

EQUIVALENT CIRCUITS / SPICE MODELS

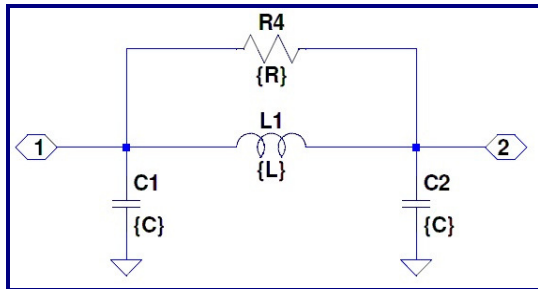


Figure 5: Pi Equivalent, Valid to <13GHz

C1, C2	0.184	pF
L1	0.72	nH

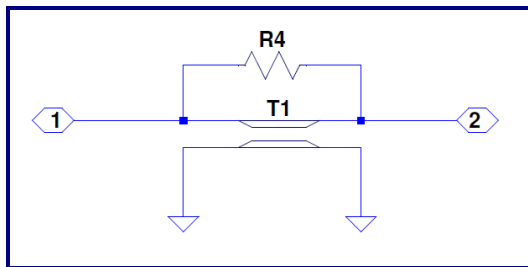


Figure 6: Transmission Line Model

Z0	43.6	Ohms
L	18.0	ps
R4	10,000	Ohms

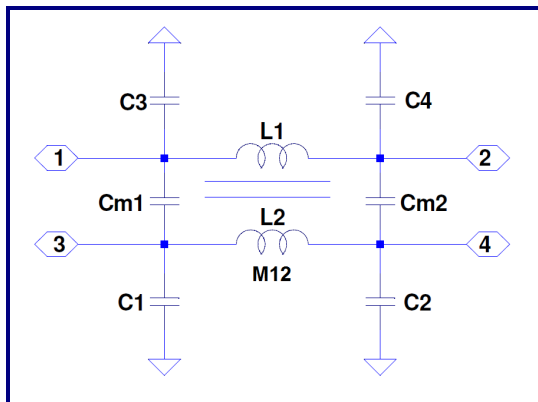


Figure 7: Lumped, Mutual Elements

C1,2,3,4	0.184	pF
Cm1, Cm2	0.032	pF
L1, L2	0.72	nH
M12	0.18	nH

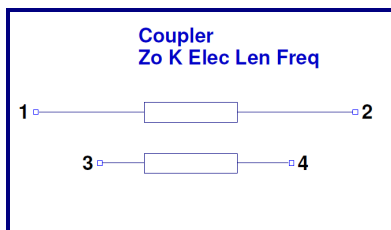


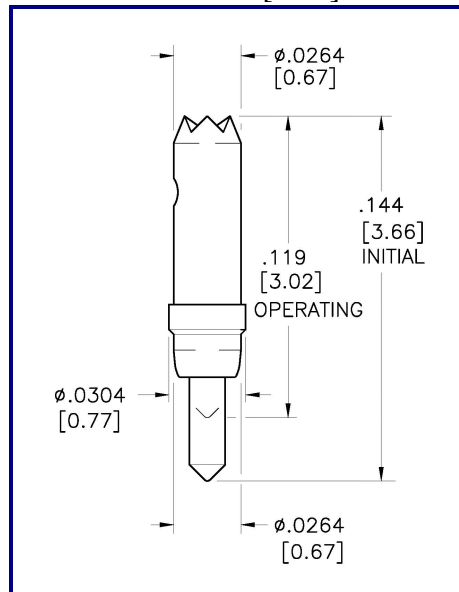
Figure 8: Transmission Line Equivalent for Crosstalk

Z0	43.6	Ohms
Tl	18.0	ps

SERIES E5533 MODELS: ORDERING INFORMATION

E Series 1.0mm (.0394) Pitch					
Model	Length Operating / initial inch [mm]	DUT Plunger and Plating	Interface Plunger	Spring	Operating Spring Force
E5533-A1	.119 [3.02] / .144 [3.66]	Reduced Crown - Gold	Conic	Stainless Steel	34 Grams
E5533-AB		Reduced Crown - Palladium	Spherical		27 Grams
E5533-B2		Reduced Crown - Palladium	Conic		34 Grams
E5533-C3		Conical - Gold	Conic		34 Grams
E5533-D4		Conical - Palladium	Conic		34 Grams
E5533-K2		Reduced Crown - Palladium	Conic		40 Grams
E5533-L3		Reduced Crown - Palladium	Crown		40 Grams
E5533-M4		Reduced Crown - Gold	Crown		40 Grams
E5533-N5		Reduced Crown - Palladium	Crown		34 Grams
E5533-P6		Reduced Crown - Palladium	Crown		26 Grams
E5533-Q7		Reduced Crown - Palladium	Spherical		34 Grams
E5533-R8		Reduced Crown - Gold	Spherical		34 Grams
E5533-S1		Red. Crown - Anti Diffusion	Spherical		34 Grams
E5533-T2		.0118" Crown - Gold	Spherical		34 Grams
E5533-V4		Reduced Crown - Gold	Spherical		29 Grams
E5533-W5		Red. Crown - Anti Diffusion	Crown		40 Grams
E5533-Y7		Red. Crown - Anti Diffusion	Spherical		40 Grams

MECHANICAL DIMENSIONS
INCHES [MM]



Signal Integrity, Inc.
 104 County Street, Ste. 210, Attleboro, MA 02703
 Tel: 1-508-226-6480 Email: sales@signalin.com Internet: www.signalin.com

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