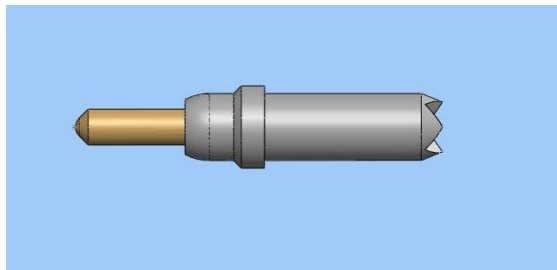


FEATURES

- E5533-LM features a solid Pd alloy tip
- <-1db insertion loss to 25.5 GHz
- <2:1VSWR to 8 GHz
- 25g operating spring force
- $Z_0 = 43.1 \Omega$
- <34.5 ps risetime
- 26 milliOhms contact resistance
- 2.9 Amps 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 25.5 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 34.5ps and a propagation delay of 30 ps, 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-LM			Units
	Corner	Edge	Field	
TDT Risettime thru 50Ω	34.5	30	30	ps
TDR Risettime open circuit	31.5	33	37.5	ps
TDR Risettime short circuit	45	28.5	28.5	ps
Signal Delay into 50Ω	8.4	6.1	7.1	ps
Insertion Loss <-1db	10.8	24.9	25.5	GHz
Insertion Loss <-3db	35.9	>40	>40	GHz
VSWR <2:1	>40	12.8	8.0	GHz

Equivalent Circuit Parameters

Pin Inductance		0.72		nH
Pin Capacitance to ground		0.379		pF
Mutual Inductance		0.163		nH
Mutual Capacitance		0.060		pF
Transmission Line Zo		43.1		Ω
Transmission Line Tl		7.1		ps

MAXIMUM DC CURRENT

DUTY CYCLE	DC	50%	25%	10%	1%
AMPS	2.92	5.28	6.81	7.27	9.11

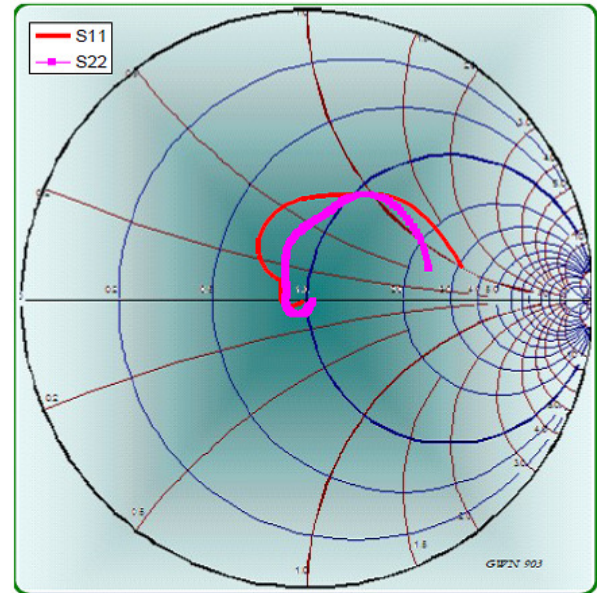


Figure 2: Measurement into 50Ω, E5533-LM

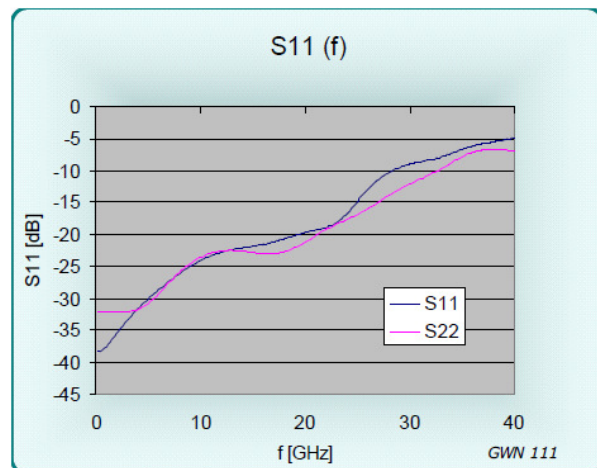


Figure 3: Return Loss, S11, E5533-LM

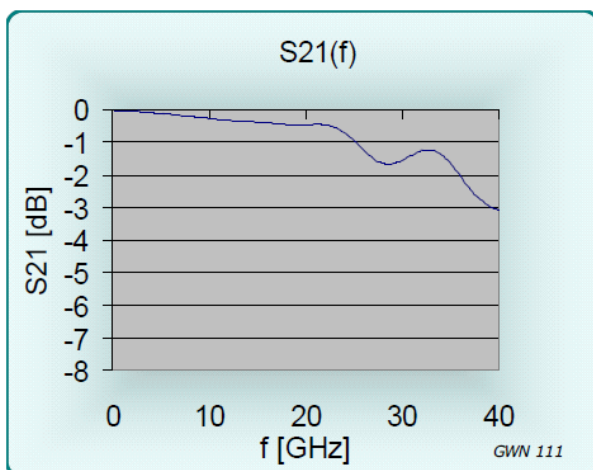


Figure 1: Insertion Loss, S21, E5533-LM

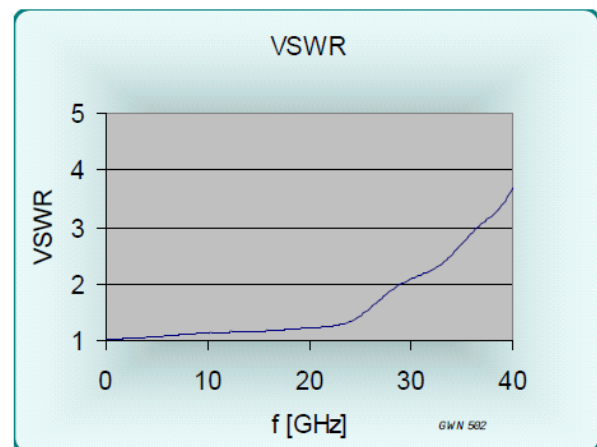


Figure 4: VSWR, E5533-LM

EQUIVALENT CIRCUITS / SPICE MODELS

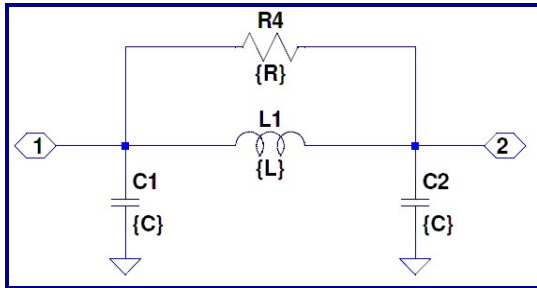


Figure 5: Pi equivalent
Valid to <13GHz

Site	Cg = C1+C2	L1	R4
Corner	0.322 pF	0.97 nH	300 Ω
Edge	0.359 pF	0.74 nH	500 Ω
Field	0.379 pF	0.72 nH	300 Ω
Diagonal	0.379 pF	0.72 nH	300 Ω

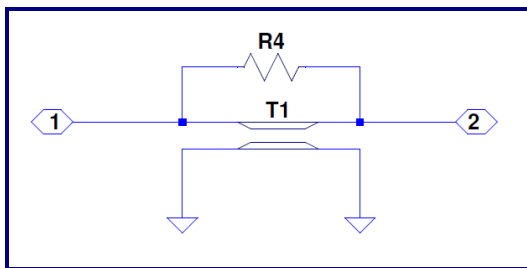


Figure 6: Transmission Line Model
Valid to >40Ghz

	Zo	L	R4
Corner	55.2 Ω	8.4 ps	700 Ω
Edge	45.9 Ω	6.1 ps	2000 Ω
Field	43.1 Ω	7.1 ps	1000 Ω

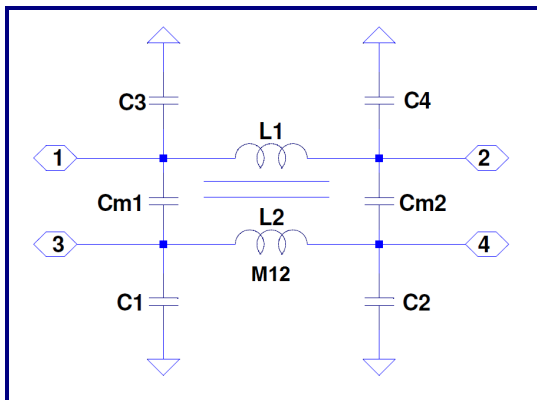


Figure 7: Lumped, Mutual Elements

Site	C1,2,3,4	Cm1,Cm2	L1,L2	M
Corner	0.161	0.035 pF	0.97	0.324 nH
Edge	0.180	0.037 pF	0.74	0.237 nH
Field	0.190	0.030 pF	0.72	0.163 nH
Diagonal	0.190	0.015 pF	0.72	0.108 nH

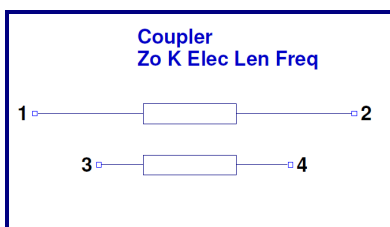
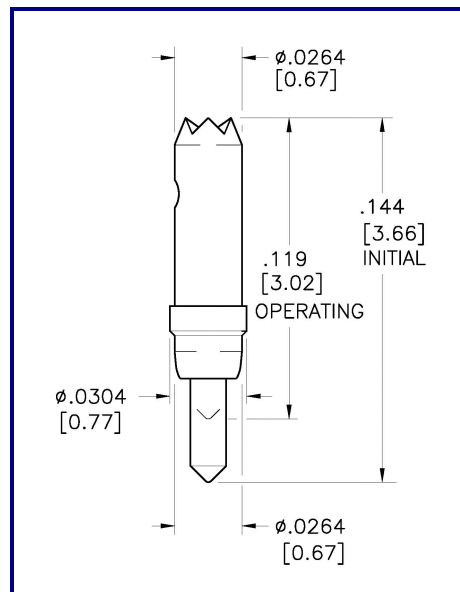


Figure 8: Transmission Line Equivalent for Crosstalk

Z0	41.6	Ohms
Lel	7,4	ps
k	0.23	
f	30.2	Ghz

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-LM		Reduced Crown Solid Pd Alloy	Spherical		25 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-UV		Reduced Crown Solid Pd Alloy	Spherical		40 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]


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