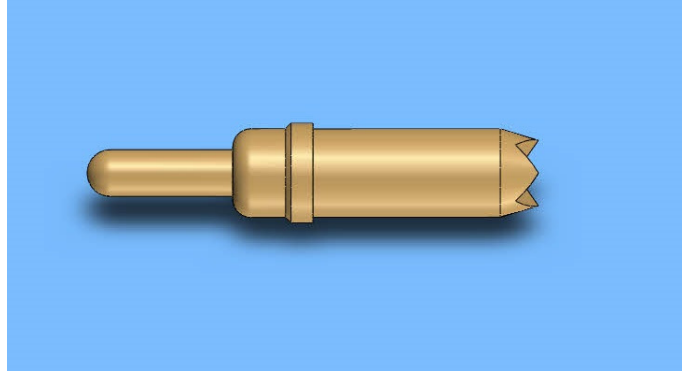


E5544 FEATURES

- <-1db insertion loss to >40 GHz
- <2:1 VSWR to >40 GHz
- 30g operating spring force
- $Z_0 = 43.8\Omega$
- <31.5 ps risetime
- 30 milliohms
- 2.7 Amps max drive current


GENERAL DESCRIPTION

The E5544 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 32 picoseconds. Along with speed and accuracy, these probes are designed for testing very fine pitch to 1.0mm, 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 >40GHz. 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 31.5ps and a propagation delay of 15.5ps, the AC performance of the E5544 probe is transparent for test applications and interconnections solutions that operate in high speed CMOS, SiGe and GaAs technologies.

SERIES E5544 MODELS: ORDERING INFORMATION

E Series 1.0mm (.0394inch) Pitch				
Model	Length Operating / Initial inches [mm]	DUT Plunger and Plating	Spring	Operating Spring Force
E5544-B2	.098 [2.49] / .124 [3.15]	4 Point Crown – Gold	Stainless Steel	30 Grams

FUNCTIONAL SPECIFICATIONS

Model	E5544-B2			Units
	Corner	Edge	Field	
TDT Risetime thru 50Ω	31.5	30	30	ps
TDR Risetime open circuit	31.5	30	31.5	ps
TDR Risetime short circuit	51	30	27	ps
Signal Delay into 50Ω	17.2	16.0	15.5	ps
Insertion Loss <-1db	14.9	>40	>40	GHz
Insertion Loss <-3db	38.7	>40	>40	GHz
VSWR <2:1	>40	>40	>40	GHz

Equivalent Circuit Parameters

	Min.	Typ.	Max.	Units
Pin Inductance		0.70		nH
Pin Capacitance to ground		0.362		pF
Mutual Inductance		0.030		nH
Mutual Capacitance		0.181		pF
Transmission Line				
Zo		43.8		Ω
Tl		15.5		ps

MAXIMUM DC CURRENT

DUTY CYCLE	DC	50%	25%	10%	1%
AMPS	2.74	2.93	3.90	4.78	5.76

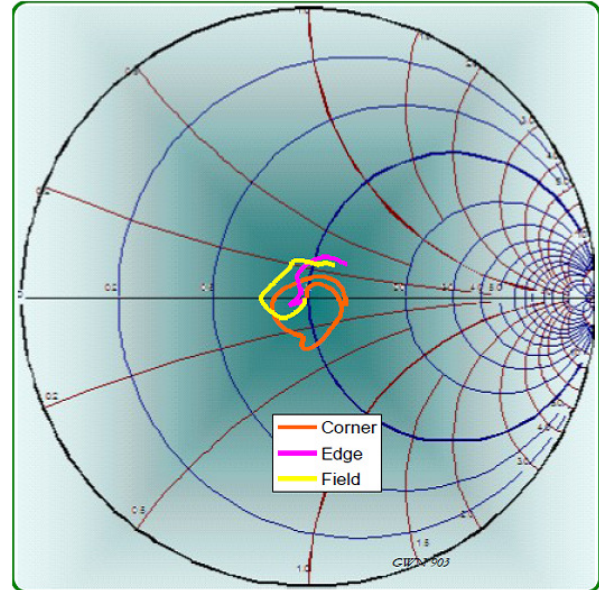


Figure 2: Measurement into 50Ω, E5544-B2

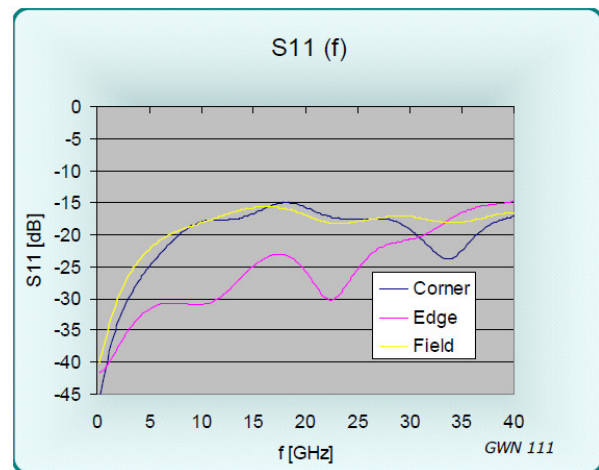


Figure 3: Return Loss, S11, E5544-B2

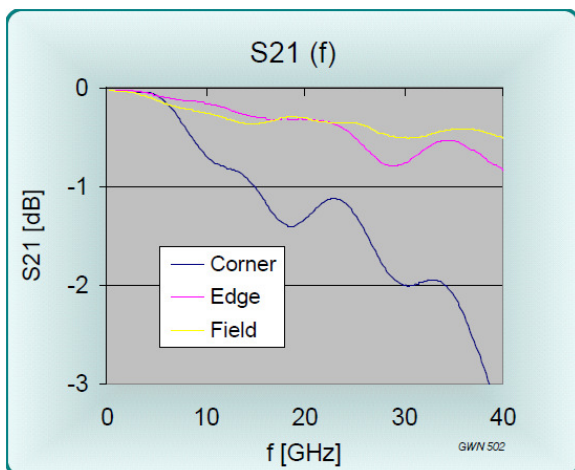


Figure 1: Insertion Loss, S21, E5544-B2

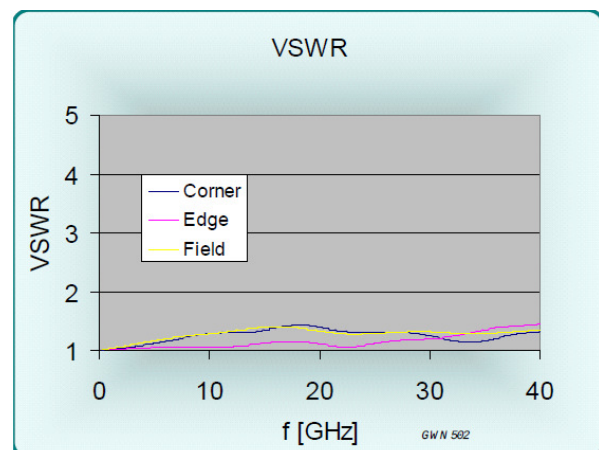


Figure 4: VSWR, E5544-B2

EQUIVALENT CIRCUITS / SPICE MODELS

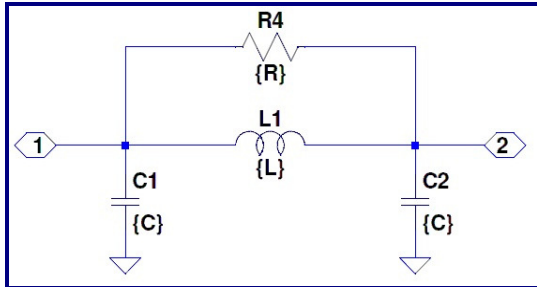


Figure 5: Pi Equivalent, Valid to >14 GHz

Site	Cg = C1+C2	L1	R4
Corner	0.310 pF	0.94 nH	1000 Ω
Edge	0.329 pF	0.82 nH	1600 Ω
Field	0.362 pF	0.70 nH	1200 Ω
Diagonal	0.362 pF	0.70 nH	1200 Ω

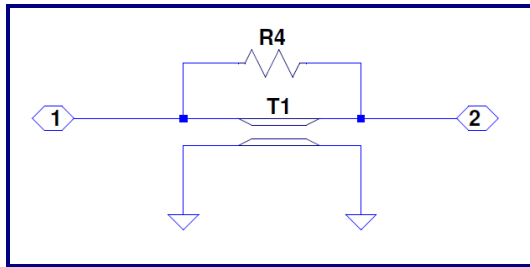


Figure 6: Transmission Line Model Valid to >40GHz

Site	Zo	L	R4
Corner	55.2 Ω	17.11 ps	800 Ω
Edge	50.0 Ω	16.43 ps	3000 Ω
Field	43.9 Ω	15.87 ps	5000 Ω

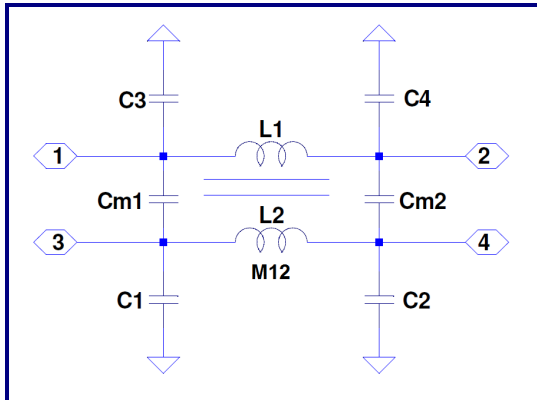


Figure 7: Lumped, Mutual Elements

Site	C1,2,3,4	Cm1,Cm2	L1,L2	M
Corner	0.155	0.036 pF	0.94	0.250 nH
Edge	0.164	0.034 pF	0.82	0.184 nH
Field	0.181	0.030 pF	0.70	0.126 nH
Diagonal	0.181	0.007 pF	0.70	0.057 nH

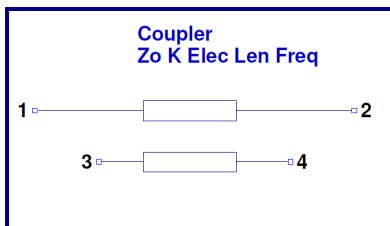
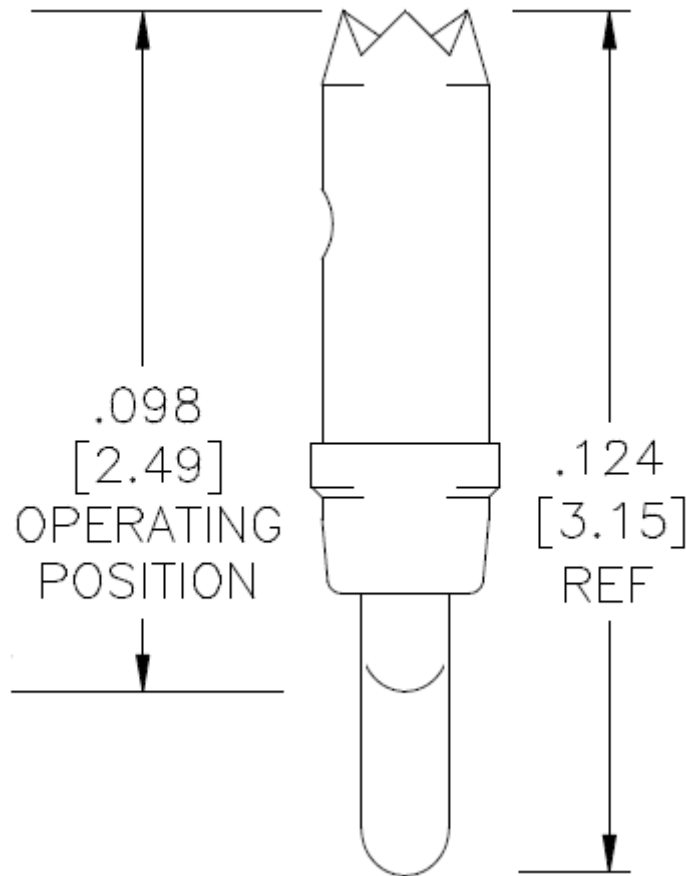


Figure 8: Transmission Line Equivalent for Crosstalk

Z0	43.8	Ohms
Lel	15.5	ps
k	0.18	
f	31.5	Ghz

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	30 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



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