Optium tool for analysis of high-frequency circuit design High-frequency passive probe MP300

Application

MP300 is a passive probe that has a wide frequency range and low input capacitance.
It is used in connected with measurment equipment (Spectrum analyzer or Oscilloscope). Danping ratio is 10:1 for that
MP300's input resistance is 500 . Its ratio is quite lower than popular passive probe and FET probe.
Operator is demanded a little attention when measure the circuit in low frequency range (DC-XXKHz)
However,since this probe is low input capacitance and low impedance, it has favourable frequency response in high
frequency range.   It is useful for analysis and diagnostics on high-frequency circuit design.

Solution

Configuration

Micronix Spectrum analyzer
MSA400 series

High-frequency passive prove
MP300

Digital Oscilloscope
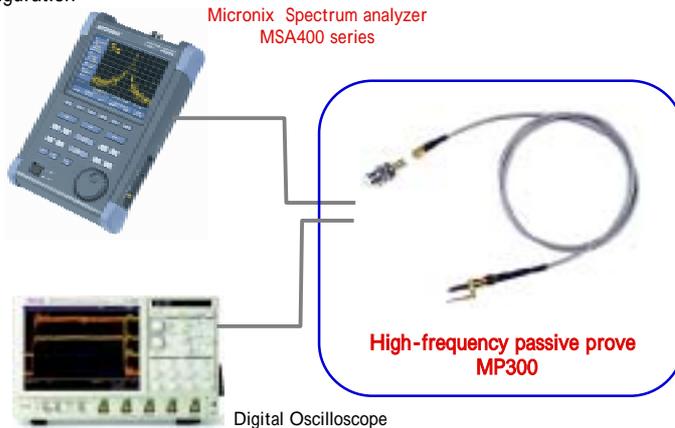
	Specification
frequency bandwidth -3dB	6GHz
attenaution ratio	10:1± 2% 50 ± 1%connected load
input resistance	500 ± 2% 50 ± 1%connected load
input capability	0.25pF typ
cable length	1m
connector shape	SMA
input voltage endurance	10Vrms, 20Vpeak PW<1ms
operating temperature range	5 35
operating humidity range	85%RH non condensing
storage temerature range	-20 70

price		input impedance		output impedance	measurement frequency range (roughly)	recital
		R	C			
1	Oscillo probe 10:1	10M	10pF	9M	DC 200MHz	Adjusting phase of the probe is required
30 50	FET Probe	1M	1 4pF	50	DC 1000MHz	DC power supply is required
99,800	MP300	500	0.25pF	50	100MHz 6GHz	input impedance is a little lower

Fig of simple circuit component

input
0dBm

amplifer
10dB

amplifer
10dB

amplifer
10dB

output

P1   P2   P3   P4
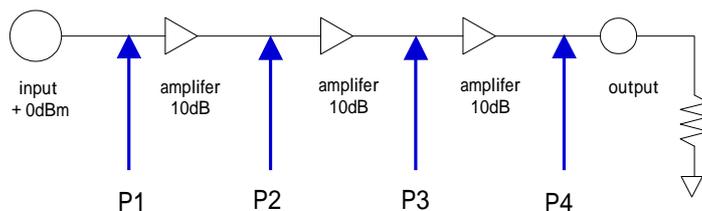
Suit for comparison of simulation results and failure analysis on design of high-frequency.

Indicate is 20dB lower than a given level by using
50 line measuring equipment for that probe input
impedance is 500 Ω .

※20 log 50 / 500

If this circuit is inputted 0dBm.Since there are three 10dBm amplifers on it, Implicit output
level is +30dBm. When 50Ω lines Measuring equipment doesn't indicate +10 dBm on output point.
,there is a defect on this cirucuit. Measuring each point (P1,P2,P3,P4,)
by using this probe that can caluculate where circuit defect arise.

2010/2