

CL32 antenna preliminary study report

Prepared by Steven Chang

8/18/2003

I .Purpose: To study the effect when right_side antenna shifted to right and the laptop system noise effect.

II .R_side antenna:

(1)Antenna electrical specification:

A.2.4 ~ 2.5GHz:peak gain $\leq$ 3 dBi, average gain $\geq$ -5 dBi ,VSWR $\leq$ 2.0 。

B.5.15 ~ 5.35GHz: peak gain $\leq$ 6 dBi, average gain $\geq$ -5 dBi ,VSWR $\leq$ 2.5。

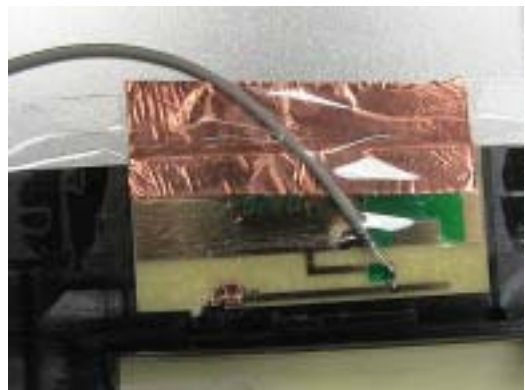
(2) cable: junkosha cable diameter 1.13mm,323 mm,black.

(3)Antenna type:

A. Metal PIFA

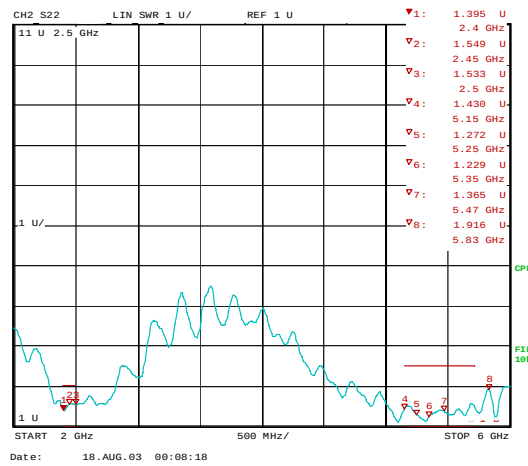


B.PCB IFA

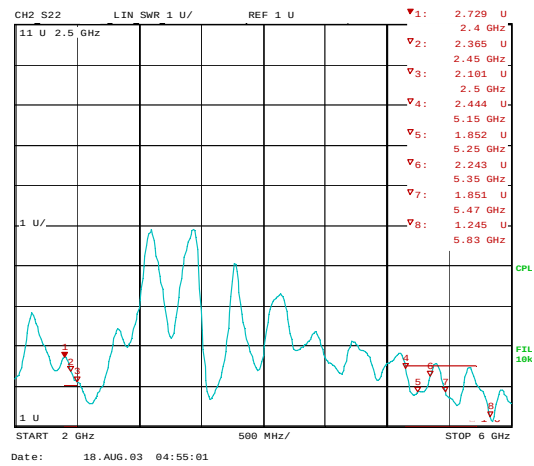


(4)Antenna VSWR

A. Metal PIFA



B. PCB IFA



	2.4GHz	2.45GHz	2.5GHz	5.15GHz	5.25GHz	5.35GHz
Metal PIFA	1.4	1.55	1.53	1.43	1.27	1.23
PCB IFA	2.73	2.36	2.1	2.44	1.85	2.24

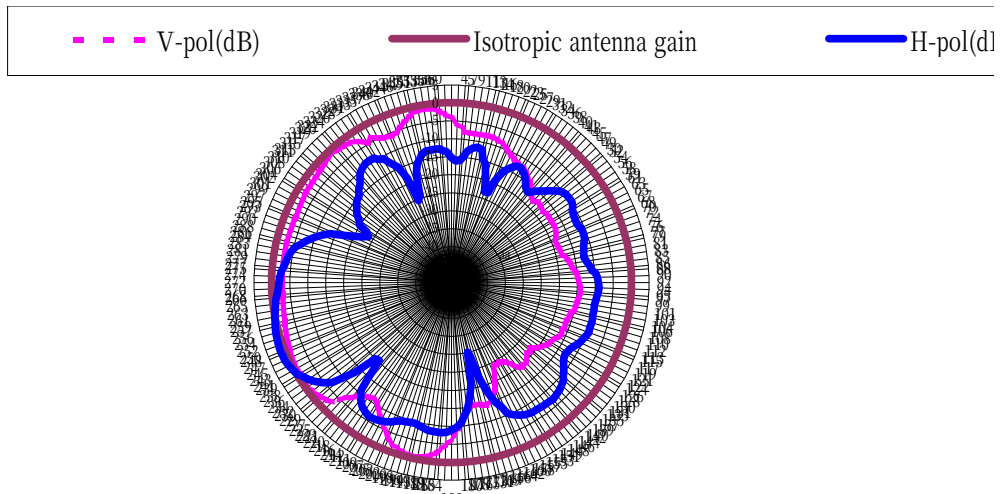
(5)Antenna average Gain:

	2.4GHz	2.45GHz	2.5GHz	5.15GHz	5.25GHz	5.35GHz
Metal PIFA	-3.14	-3.4	-3.58	-4.5	-4.56	-4.26
PCB IFA	-3.8	-3.9	-4.23	-4.8	-5.2	-5.4

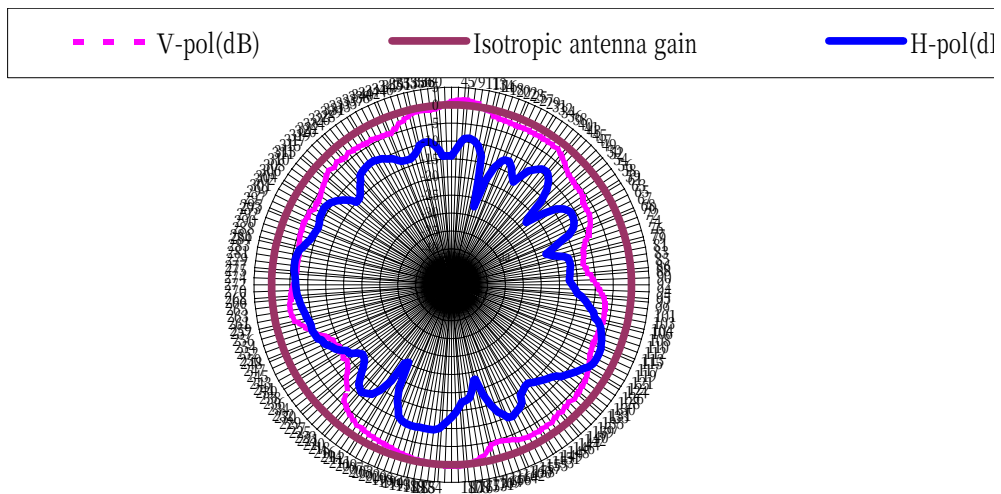
(6) Antenna pattern

A. @2.45GHz

Metal Antenna -@2.45GHz

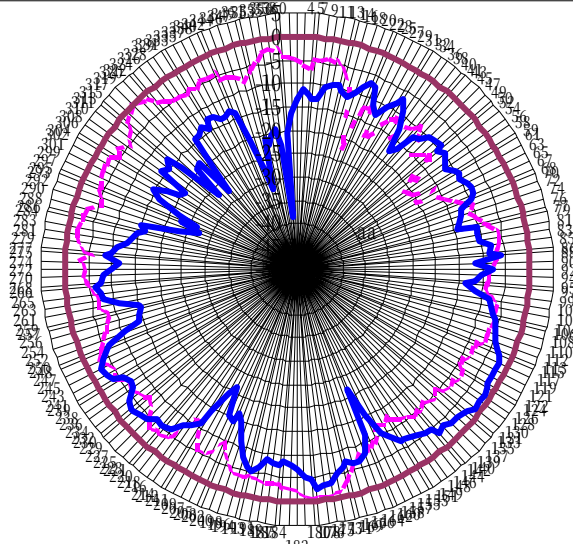
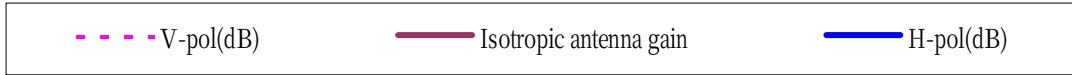


PCB Antenna -@2.45GHz

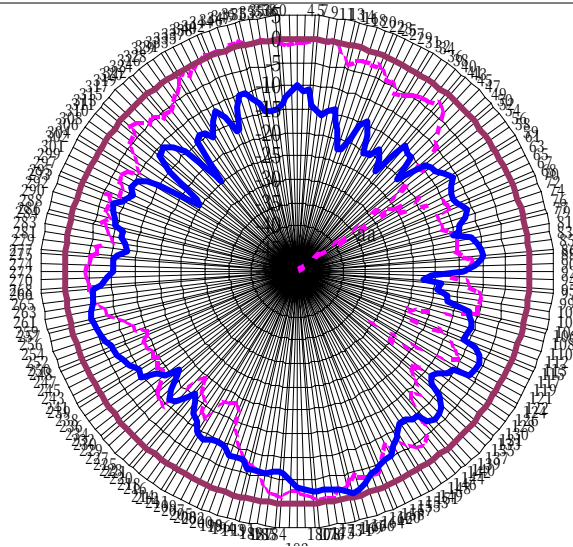
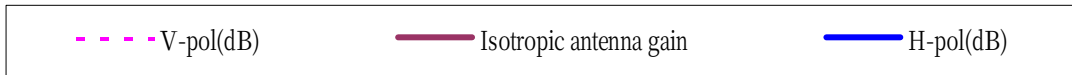


B. @5.15GHz

Metal antenna -@5.25GHz



PCB antenna -@5.25GHz



III. Left_side antenna:

(1)Antenna electrical specification:

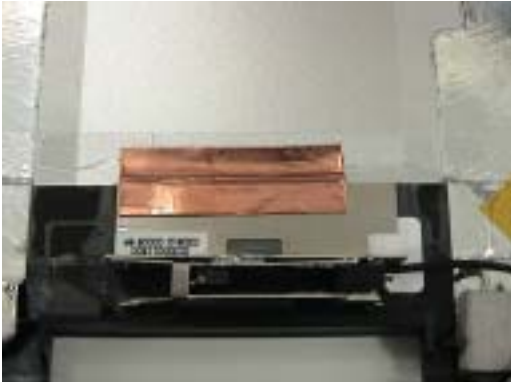
A.2.4 ~ 2.5GHz: peak gain ≤ 3 dBi, average gain ≥ -5 dBi, VSWR ≤ 2.0 .

B.5.15 ~ 5.35GHz: peak gain ≤ 6 dBi, average gain ≥ -5 dBi, VSWR ≤ 2.5 .

(2) cable: junkosha cable diameter 1.13mm,460 mm,Gray

(3)Antenna type:

B. Metal PIFA

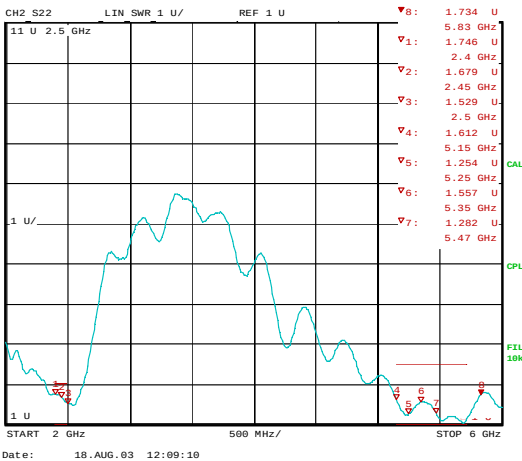


B.PCB IFA

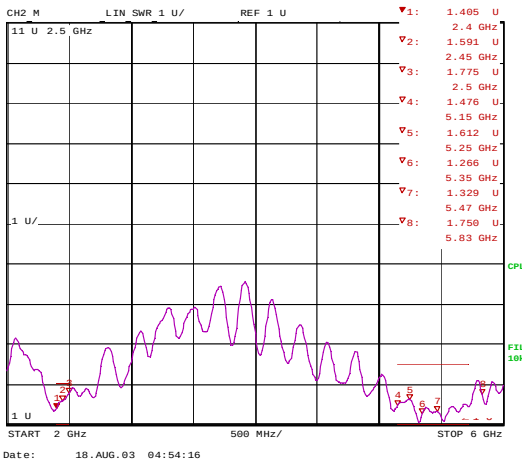


(4) Antenna VSWR

A. Metal PIFA



B. PCB IFA



	2.4GHz	2.45GHz	2.5GHz	5.15GHz	5.25GHz	5.35GHz
Metal PIFA	1.75	1.68	1.53	1.61	1.25	1.55
PCB IFA	1.40	1.59	1.77	1.47	1.61	1.26

(5) Antenna Gain:

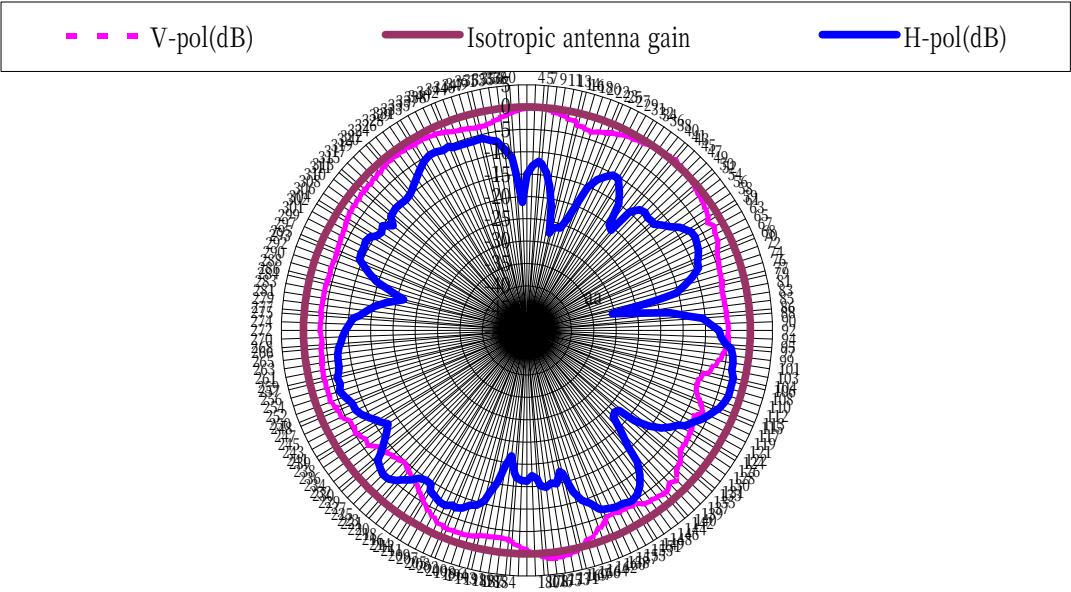
	2.4GHz	2.45GHz	2.5GHz	5.15GHz	5.25GHz	5.35GHz
Metal PIFA	-2.95	-2.51	-2.13	-4.32	-4.53	-4.35
PCB IFA	-3.8	-4.1	-3.6	-4.86	-5.2	-5.05

(6)
Antenna

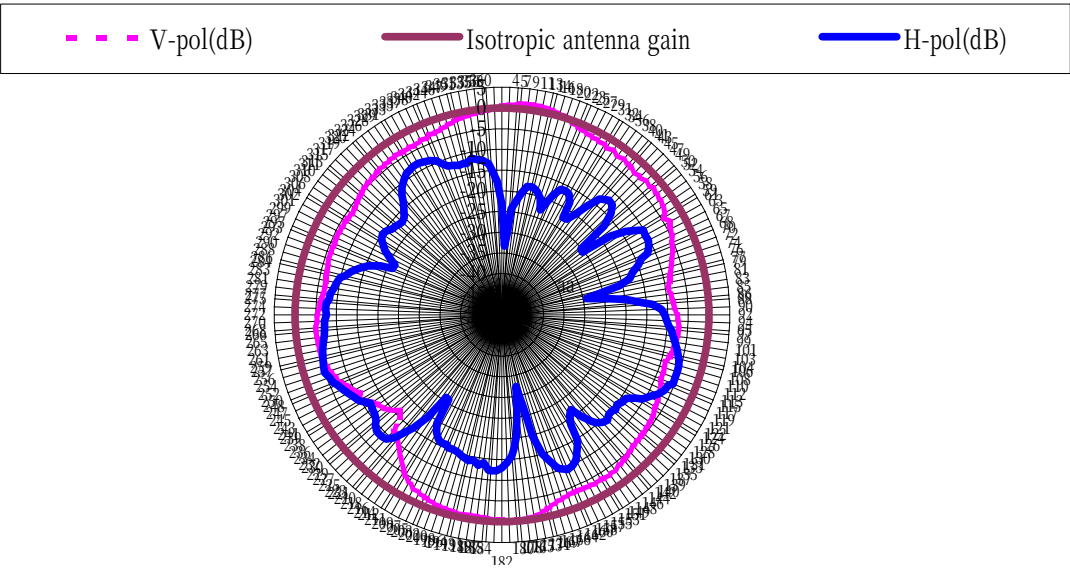
pattern

A. @ 2.45GHz

Metal antenna -@2.45GHz

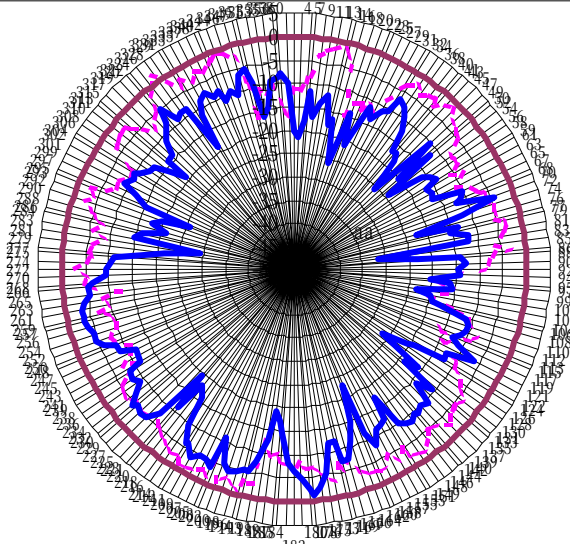
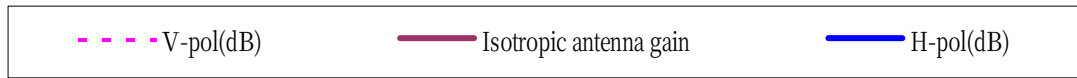


PCB antenna -@2.45GHz



B. @5.25GHz

Metal antenna -@5.25GHz

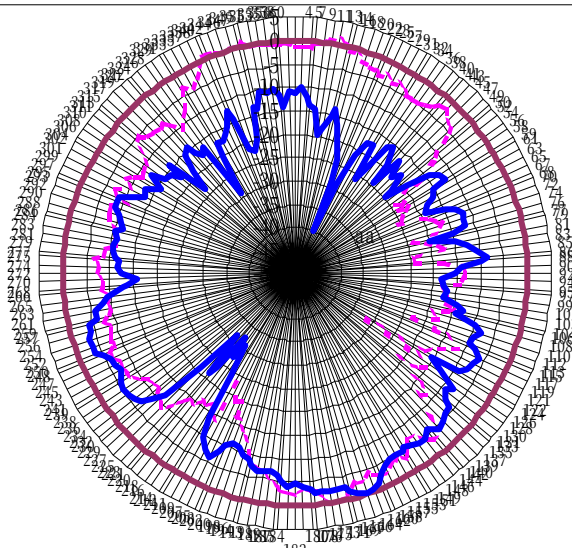


PCB antenna -@5.25GHz

- - - V-pol(dB)

Isotropic antenna gain

— H-pol(dB)

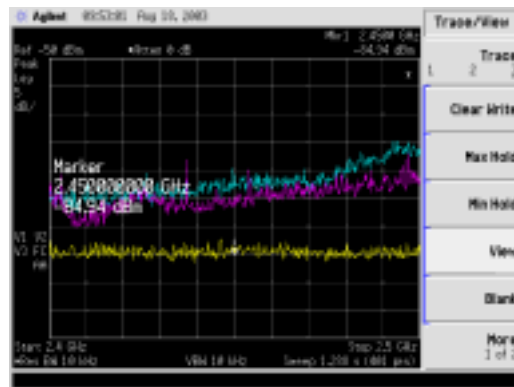


IV. Antenna and system noise measurement:

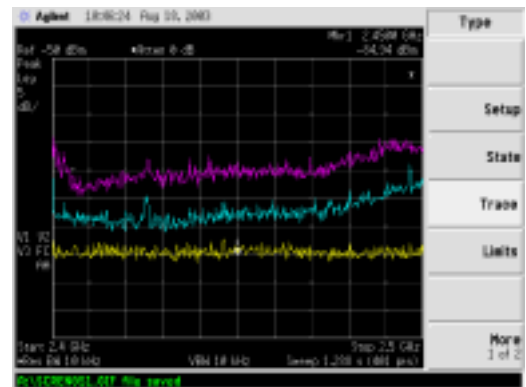
Reference -50dBm, 5 db/div,VBW 10KHz

(1) run the test program

Metal PIFA antenna



PCB IFA antenna

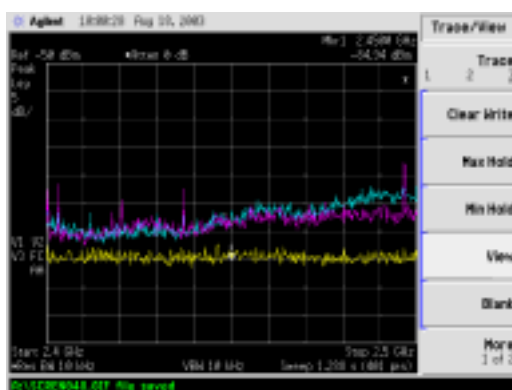


Yellow Line: Noise floor
Blue Line: Main ANT only
Purple Line: Aux ANT only

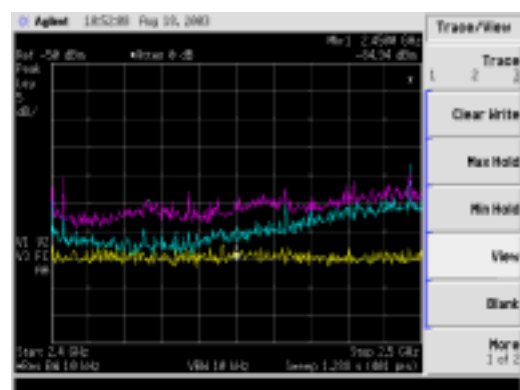
(2) performance optimized mode

→ Power options ->always on

Metal PIFA antenna



PCB IFA antenna



Yellow Line: Noise floor
Blue Line: Main ANT only
Purple Line: Aux ANT only

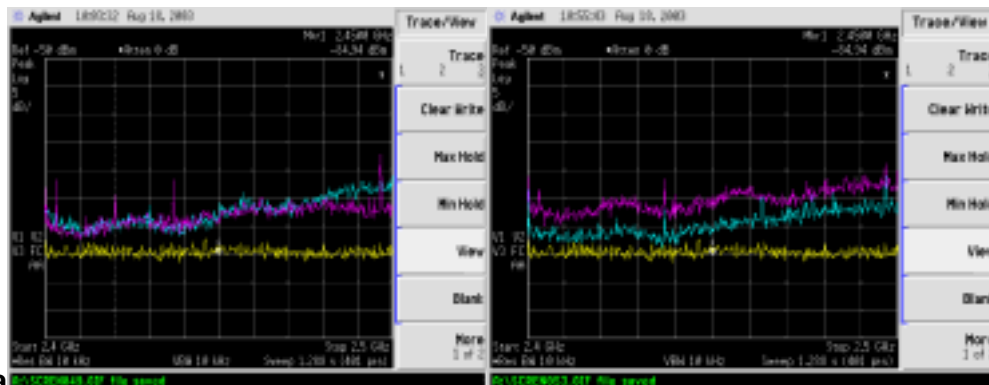
(3) battery optimized mode

→ Power options ->portable/laptop

Metal PIFA antenna

PCB IFA

antenna



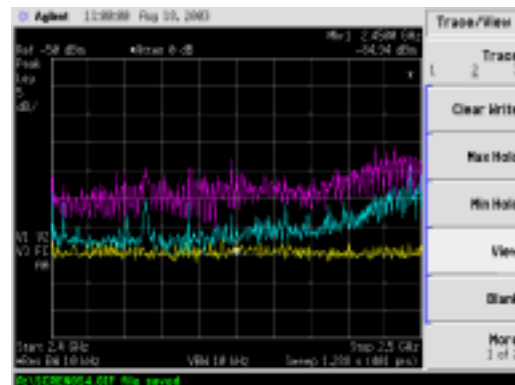
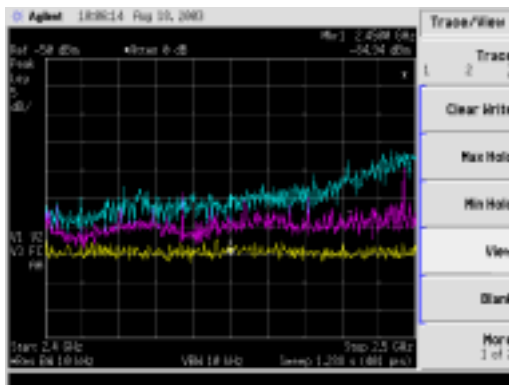
Yellow Line: Noise floor
Blue Line: Main ANT only
Purple Line: Aux ANT only

(4) run a 3D screensaver

→ 3D-pipe

Metal PIFA

PCB IFA



Yellow Line: Noise floor
Blue Line: Main ANT only
Purple Line: Aux ANT only