

TangiTek CleanSignal™ Technology for ViewSonic ViewPad 10 – Wi-Fi Antennas

Objectives

1. To quantify the gain in Wi-Fi signal (RSSI) when the **CleanSignal™** antenna enhancement is applied to the ViewSonic ViewPad 10 Wi-Fi antenna in an uncontrolled “real world” noisy urban environment. We have observed a 1 to 9 dB gain in RSSI in Wi-Fi applications. In general a 3 dB gain signifies a 2x improvement in antenna performance.



Testing and Conclusions

1. A ViewSonic ViewPad 10 (Dual OS – Windows 7 Home Premium and Android 1.6) tablet was opened and its Wi-Fi antennas were enhanced using the TangiTek **CleanSignal™** technology.
2. A Windows 7 application that can monitor and log in real time, information and status of wireless Wi-Fi adapter(s) and nearby hot spots and access points was downloaded and installed on the tablet. This helped us analyze and record the Wi-Fi signal strength of nearby wireless routers.
3. The position of the routers relative to the ViewSonic ViewPad 10 was maintained constant during the entire testing period.
4. Several tests were conducted to determine the Wi-Fi signal performance associated with nearby wireless routers with and without the **CleanSignal™** enhancement applied to the tablet.
5. Testing indicates that stronger signals from closer wireless routers tend to be boosted, while low level background signals (noise) and interference from routers that are physically farther away tend to get diminished while at the same time picking up signals from additional weak sources.

6. Overall the **CleanSignal™** enhancement improves the Wi-Fi signal strength (RSSI - dB) reported by the Windows 7 application by 4 to 5 dB for the routers closer to the tablet.
7. Additionally the **CleanSignal™** enhancement picked up the Wi-Fi signal from an additional router while at the same time reducing interference from routers that were farther away.
8. The application of the **CleanSignal™** enhancement on the ViewSonic ViewPad 10 is shown as a sequence of images below.



Figure 1 ViewSonic ViewPad 10 Tablet opened to locate the Wi-Fi antennas

9. Test data from the ViewSonic ViewPad 10 tablet with and without the **CleanSignal™** enhancement are also provided below.

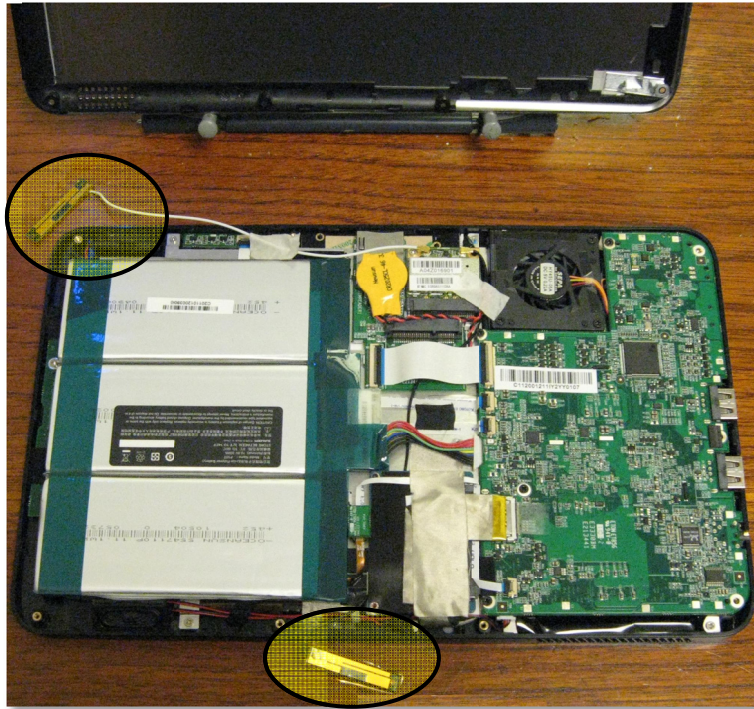


Figure 2 Wi-Fi antennas of the ViewPad 10 tablet are exposed

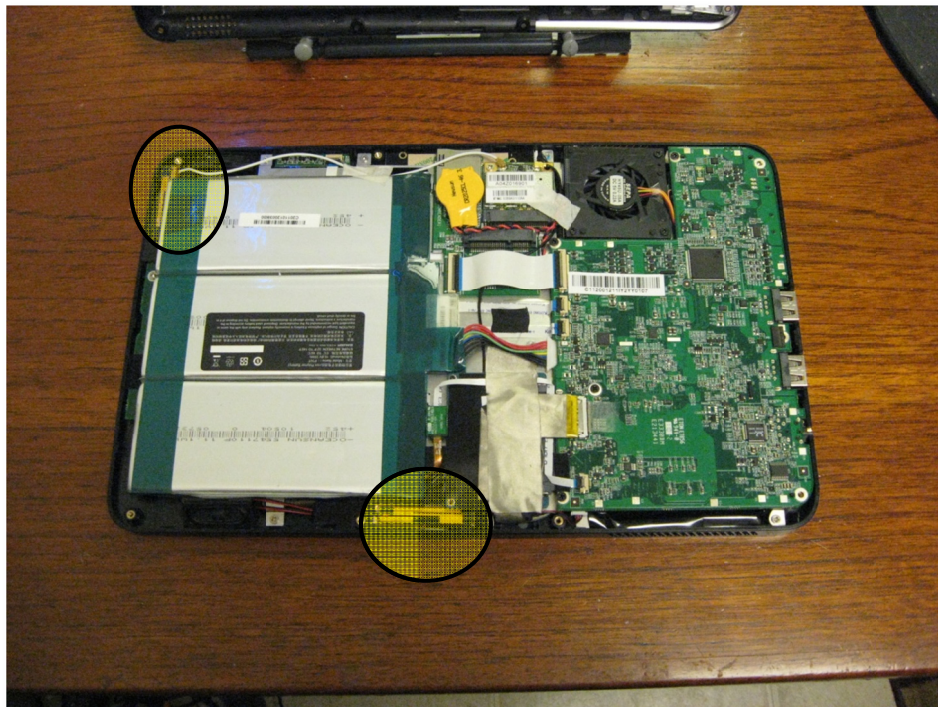


Figure 3 ViewSonic ViewPad 10 with Wi-Fi CleanSignal™ enhancement

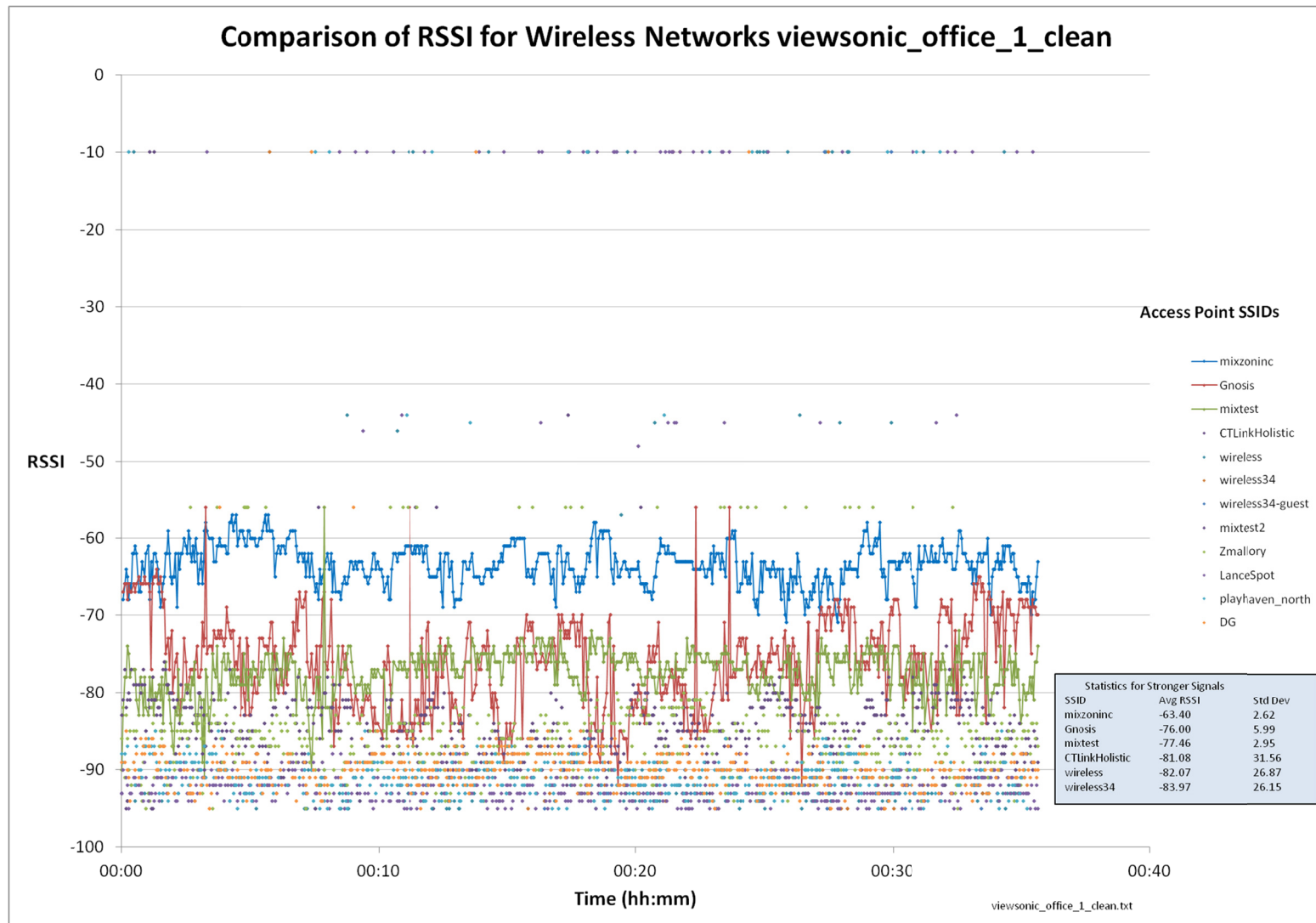


Figure 4 Wi-Fi signal strength test data of the ViewSonic ViewPad 10 with CleanSignal™ enhancement – Test 1

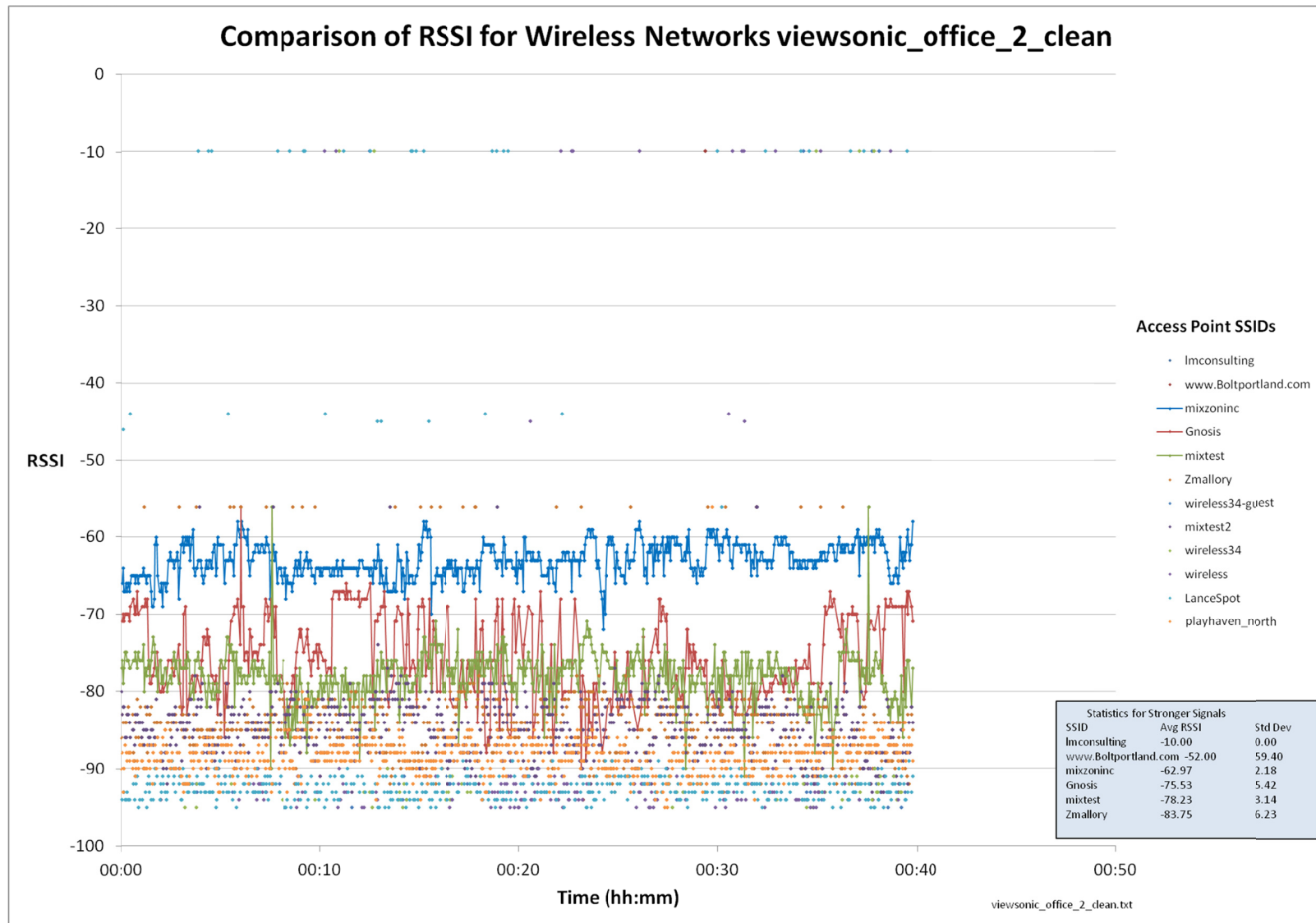


Figure 5 Wi-Fi signal strength test data of the ViewSonic ViewPad 10 with CleanSignal™ enhancement – Test 2

Figures 4 and 5 shows Wi-Fi signal data from two separate tests logged over a 35 minute period each, of the ViewSonic ViewPad 10 **with** the **CleanSignal™** Wi-Fi antenna enhancement. The graphs shows the Wi-Fi signal strength as picked up the onboard Wi-Fi antenna on the ViewSonic ViewPad 10 over time. We focus on three signals which are picked up from nearby Wi-Fi routers called “mixzoninc”, “Gnosis” and “mixtest”. The three wireless routers are at increasing physical distance from the tablet during the testing. Their relative position with respect to the ViewPad always remained the same.

On average, across both tests (Test 1 and 2), the signal strength (RSSI) reported for the three routers are as follows:

- “mixzoninc” is about -63.19 dB (physically closest to the ViewPad 10 during testing).
- “Gnosis” is about -75.77 dB
- “mixtest” is about -77.85 dB (physically farthest from the ViewPad 10 during testing).

Once this data was collected, the tablet was opened and the **CleanSignal™** Wi-Fi antenna enhancement was removed – returning the tablet to its stock condition. Tests to analyze the Wi-Fi signal similar to the ones above were performed again and the results presented in Figures 6 and 7.

Figures 6 and 7 shows Wi-Fi signal data from two separate tests logged over a 35 minute period each, of the ViewSonic ViewPad 10 **without** the **CleanSignal™** Wi-Fi antenna enhancement. Again, we focus on three signals which are picked up from nearby Wi-Fi routers called “mixzoninc”, “Gnosis” and “mixtest”. The three wireless routers are at increasing physical distance from the tablet during testing. Their relative position with respect to the tablet always remain the same and is exactly the same as the original tests 1 and 2.

On average, across both tests (Test 3 and 4), the signal strength (RSSI) reported for the three routers are as follows:

- “mixzoninc” is about -70.38 dB (physically closest to the ViewPad 10 during testing).
- “Gnosis” is about -84.49 dB
- “mixtest” is about -85.88 dB (physically farthest from the ViewPad 10 during testing).

Based on the test results, on average, the **CleanSignal™** antenna enhancement to the ViewSonic ViewPad 10 Wi-Fi antenna provides an improvement of:

- 7.19 dB for Wi-Fi signals associated with the wireless router with SSID “mixzoninc”
- 8.72 dB for Wi-Fi signals associated with the wireless router with SSID “Gnosis”
- 8.03 dB for Wi-Fi signals associated with the wireless router with SSID “mixtest”

The above results are tabulated in Table1.

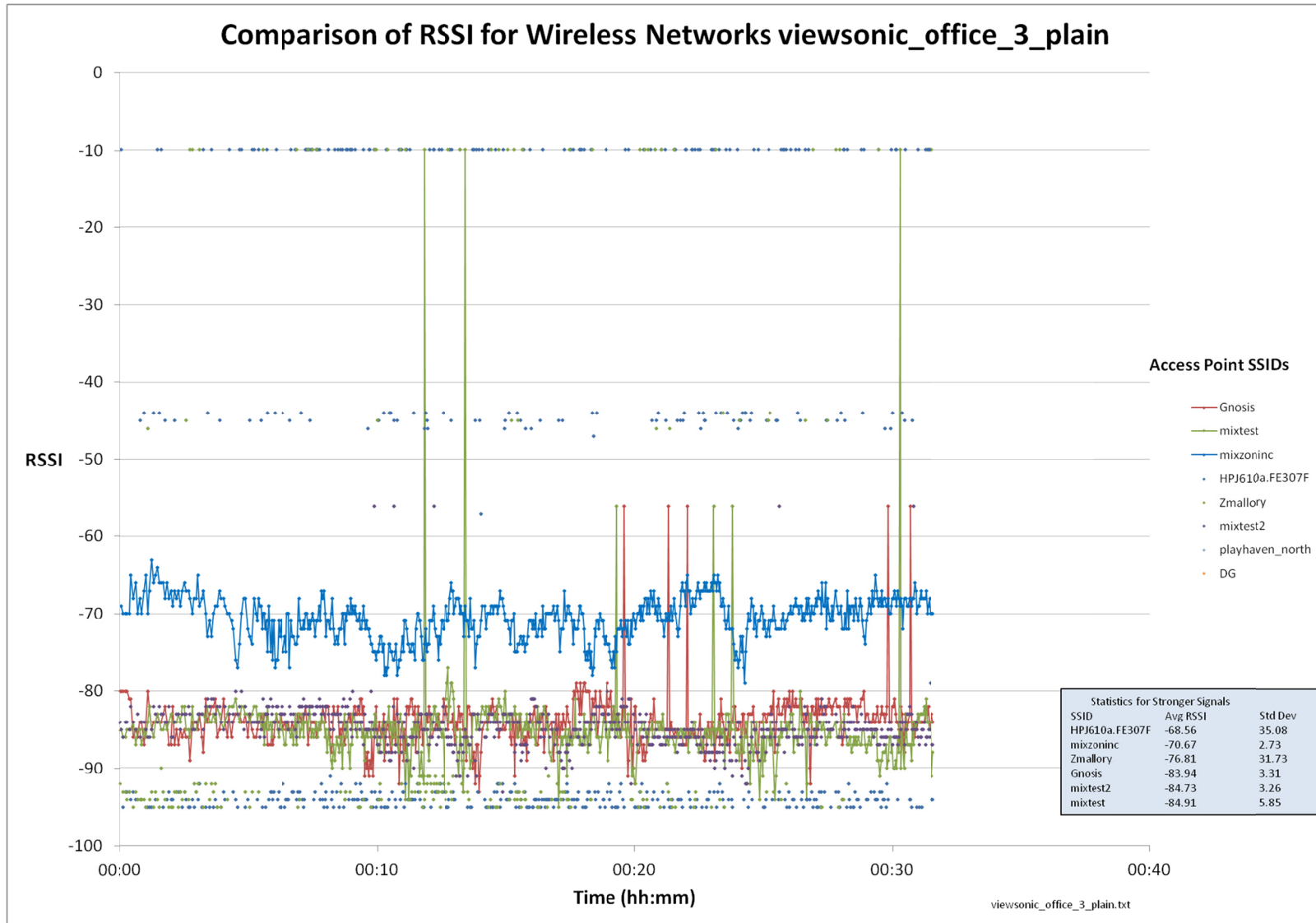


Figure 6 Wi-Fi signal strength test data of the ViewSonic ViewPad 10 without CleanSignal™ enhancement – Test 3

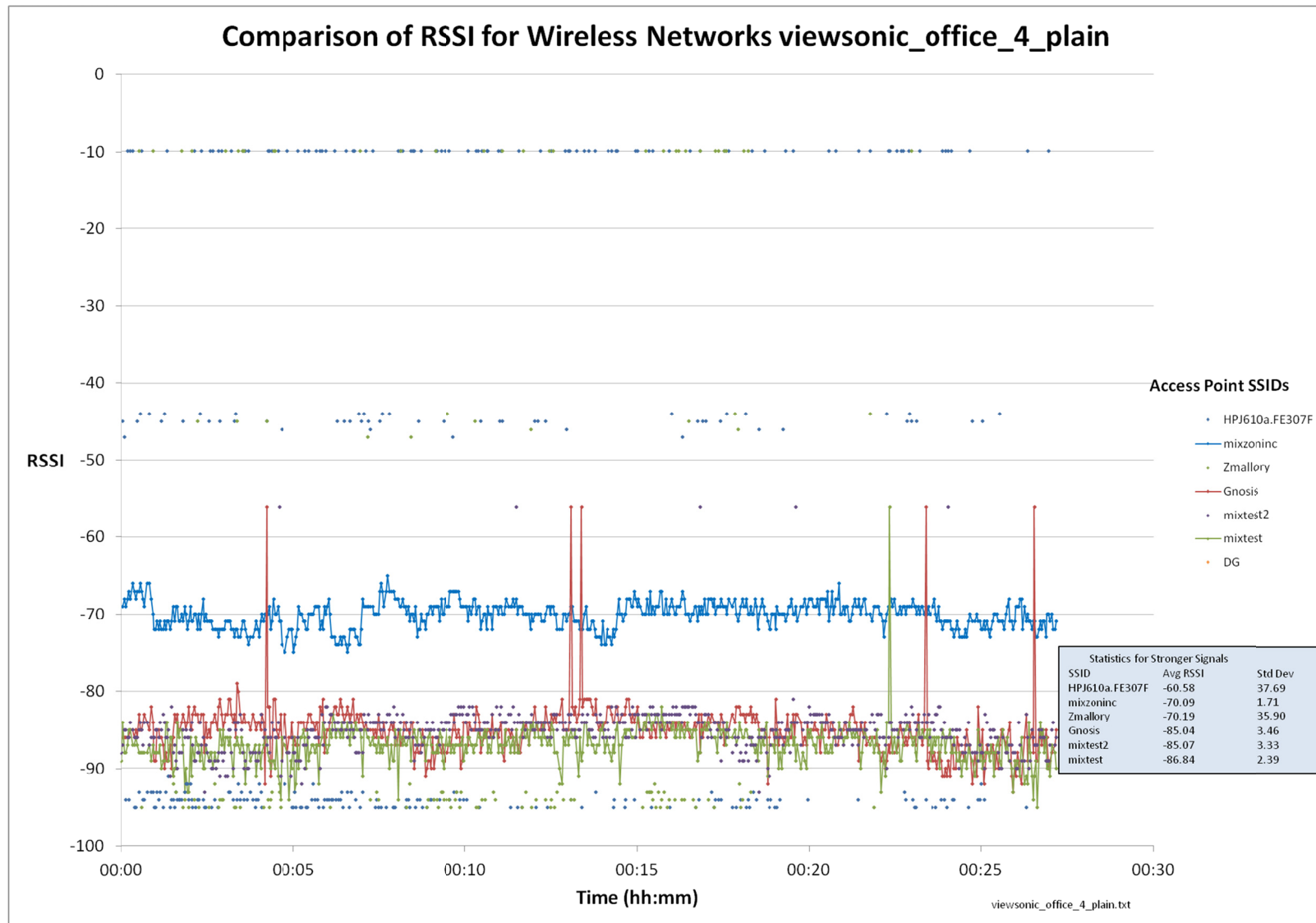


Figure 7 Wi-Fi signal strength test data of the ViewSonic ViewPad 10 without CleanSignal™ enhancement – Test 4

Wireless Router SSID	Tests With CleanSignal™ Enhancement (RSSI)			Test Without CleanSignal™ Enhancement (RSSI)			Average Improvement with CleanSignal™ Enhancement (RSSI) dB
	Test 1 dB	Test 2 dB	Average dB	Test 3 dB	Test 4 dB	Average dB	
mixzoninc	-63.40	-62.97	-63.19	-70.67	-70.09	-70.38	7.19
Gnosis	-76.00	-75.53	-75.77	-83.94	-85.04	-84.49	8.72
mixtest	-77.46	-78.23	-77.85	-84.91	-86.84	-85.88	8.03

Table 1 Summary Wi-Fi signal strength test results of ViewPad10 with and without CleanSignal™ enhancement

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