Johnson Controls (JCI) & X2Y Attenuators
Preliminary Test Results
“EMI Suppression of an Automotive Load Box”

Test Results #TR 8002, v1.0

Testing Presented Within this Document

- Data was taken by JCI at their Holland, MI facility.
- Data validation testing to CISPR 25 specifications.
- Data was measured in the following frequency bands:
  - ✓ 30 MHz – 200 MHz
  - ✓ 200 MHz – 300 MHz

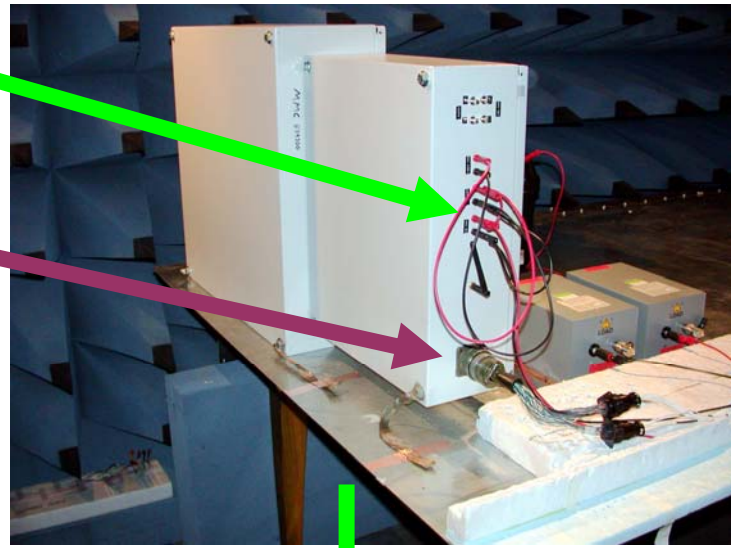
Testing Presented Within this Document

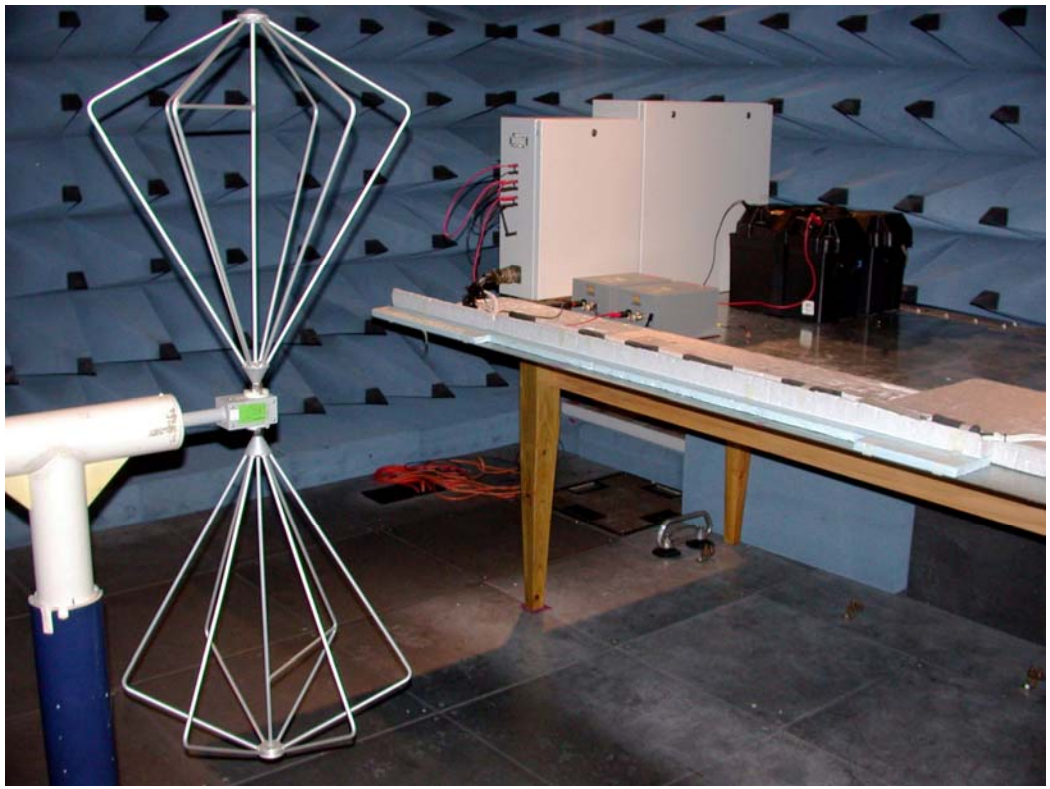
- For each frequency band, 4 iteration of filters tested:
  - ✓ Baseline – current load box configuration and filtering.
  - ✓ Filter #1 – X2Y components applied to PCB and located at back of the connector. (Note: Baseline filtering was NOT removed.)
  - ✓ Filter #2 – same as Filter #1 except reference “gnd” was improved between the connector and housing.
  - ✓ Filter #3 – same as Filter #2 with an additional PCB added to 3 pairs of power pins. (Note: Power pins are separate of the connector.)

Baseline/Test Set-up

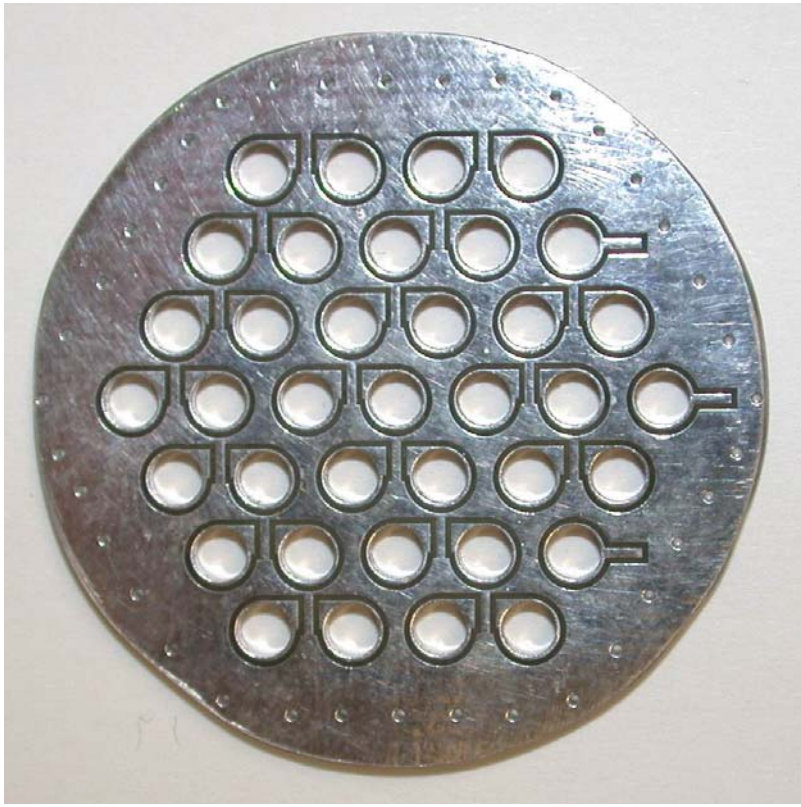
Power Line Pins

Connector



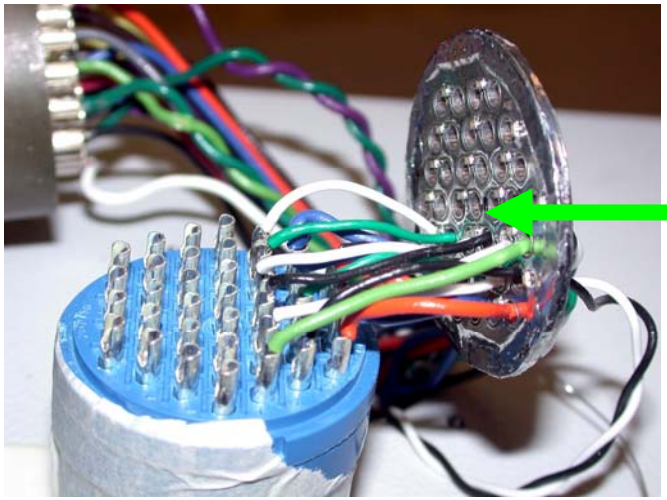


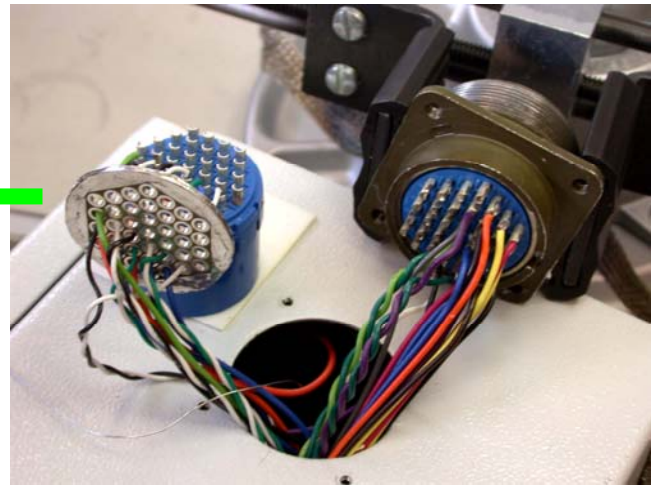
X2Y Connector Prototype PCB



Filter #1

Assembling PCB to connector



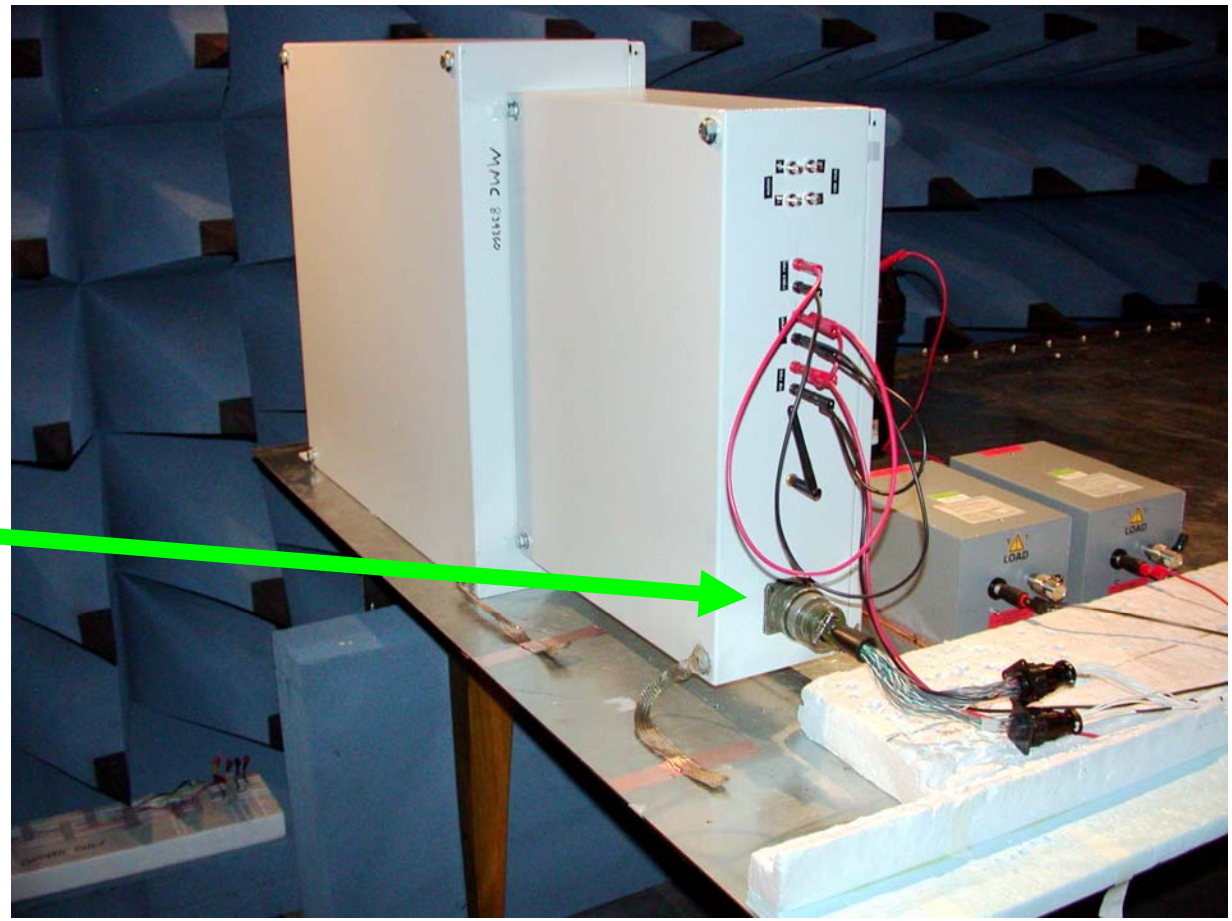


PCB and connector fully assembled and attached in housing (back-side view)

Copper tape used to reference (gnd) PCB to connector housing

Filter #2

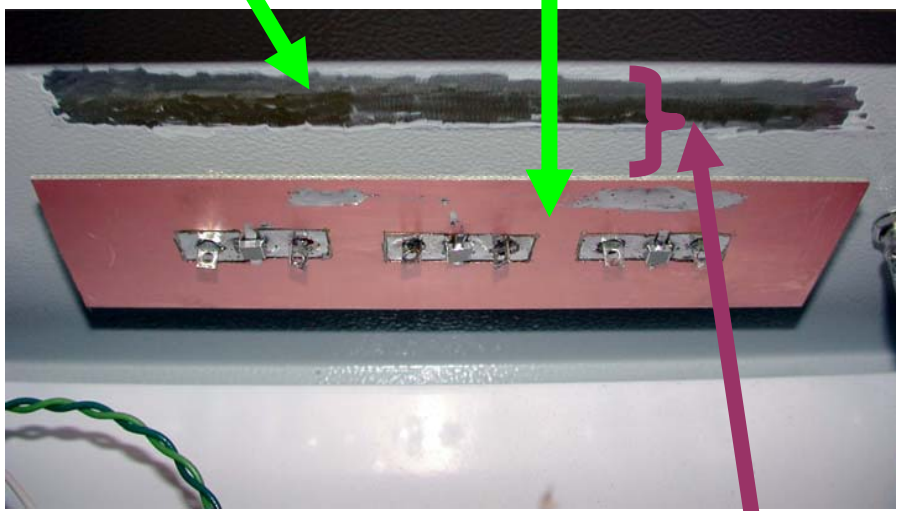
Non-conductive coating removed behind connector



Filter #3

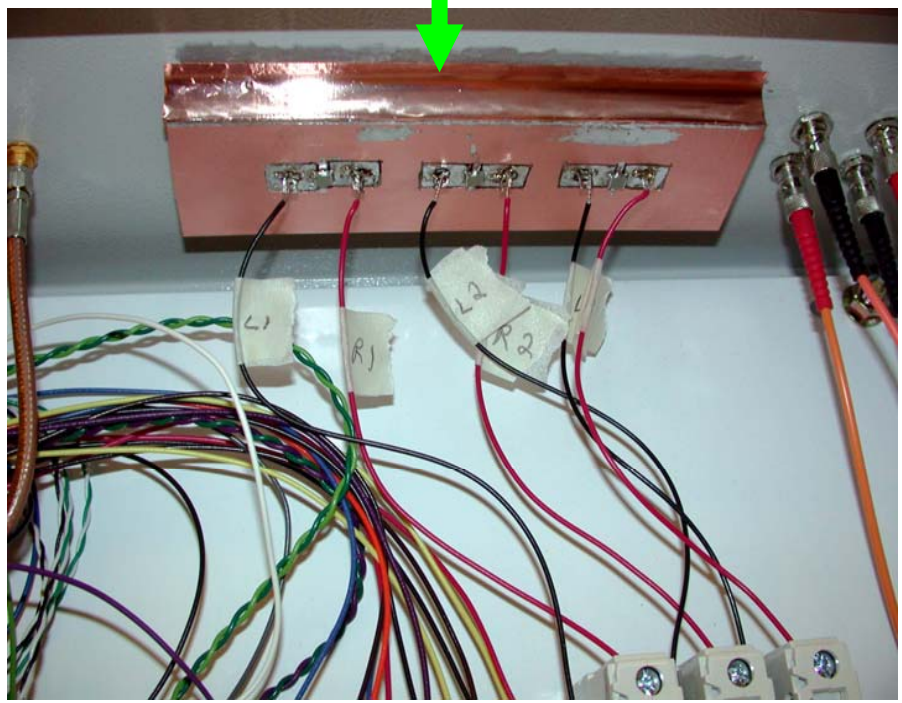
Non-conductive coating removed

Prototype PCB w/ (3) X2Y 2220 470nF (C1)



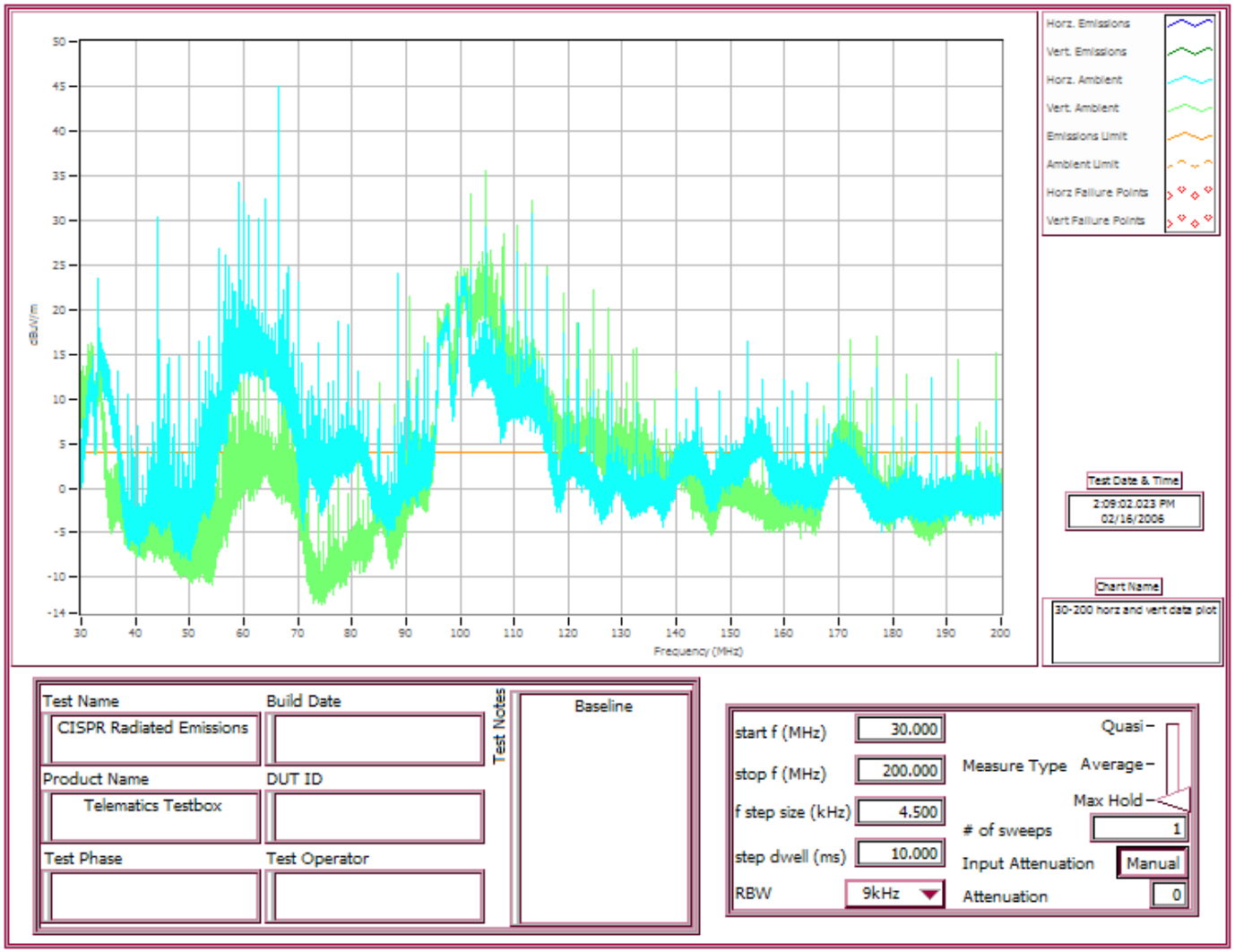
About ¾" spacing

Copper tape used to make (1) side reference connection (gnd)



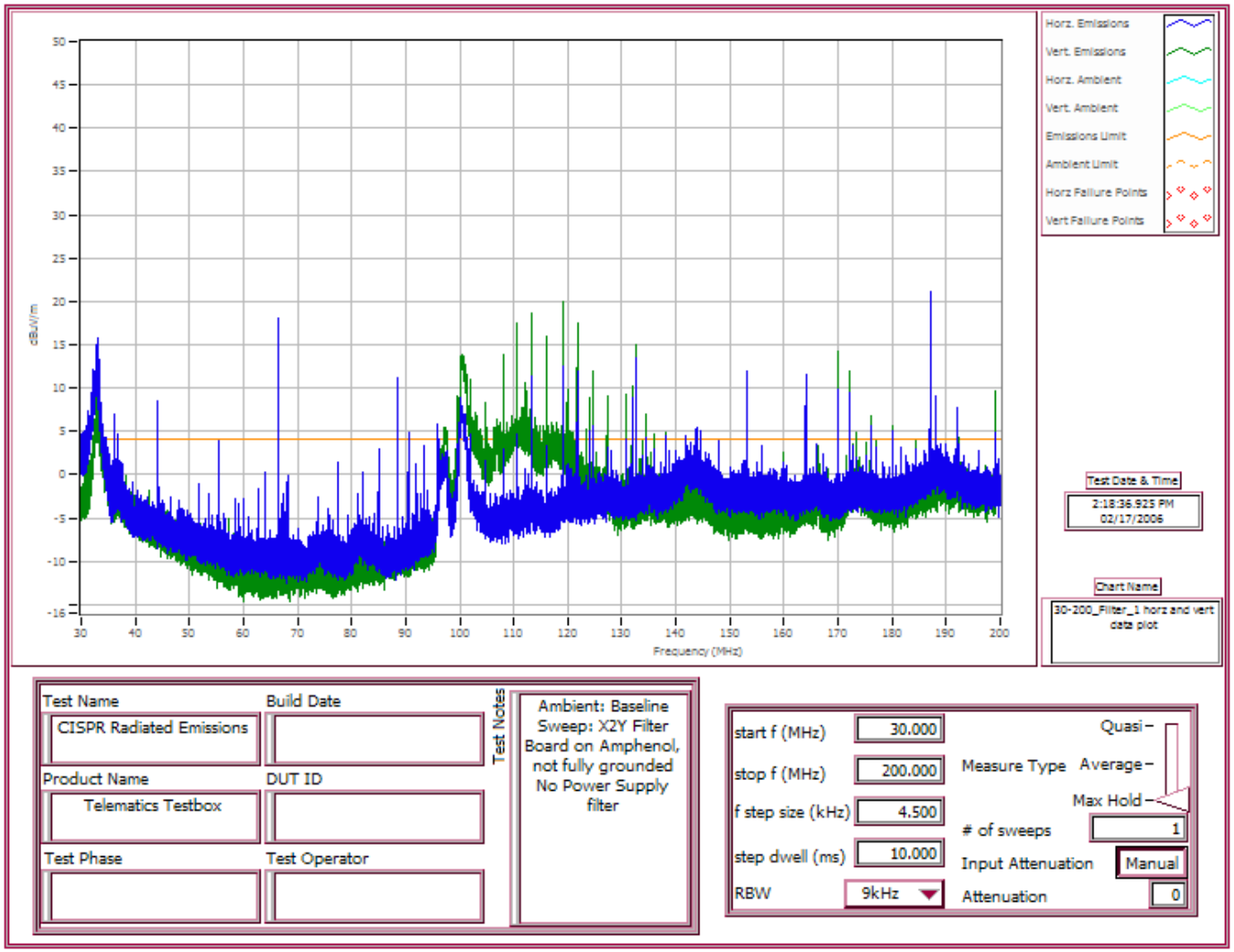
Data 30 MHz – 200 MHz

- Baseline



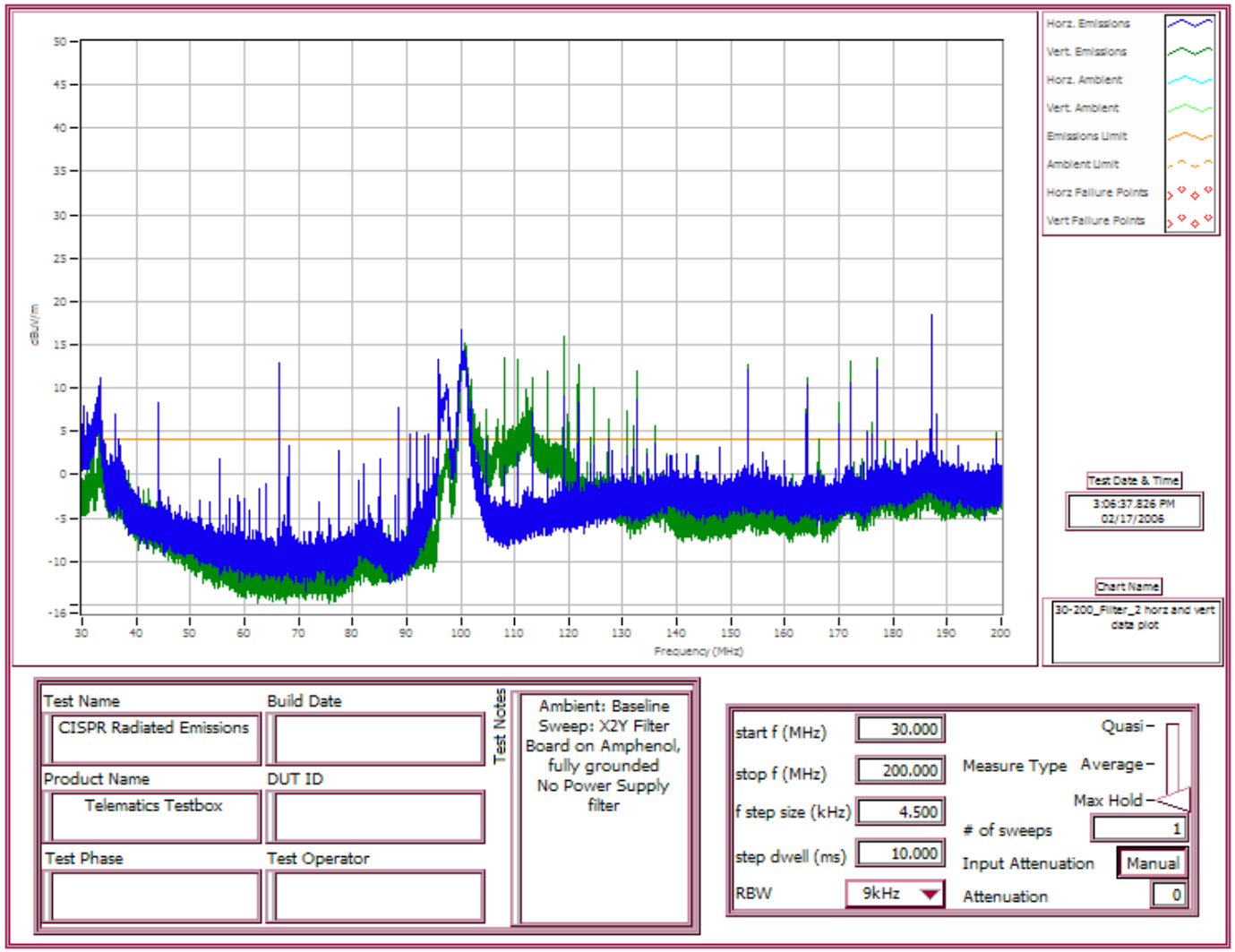
Data 30 MHz – 200 MHz

- Filter #1



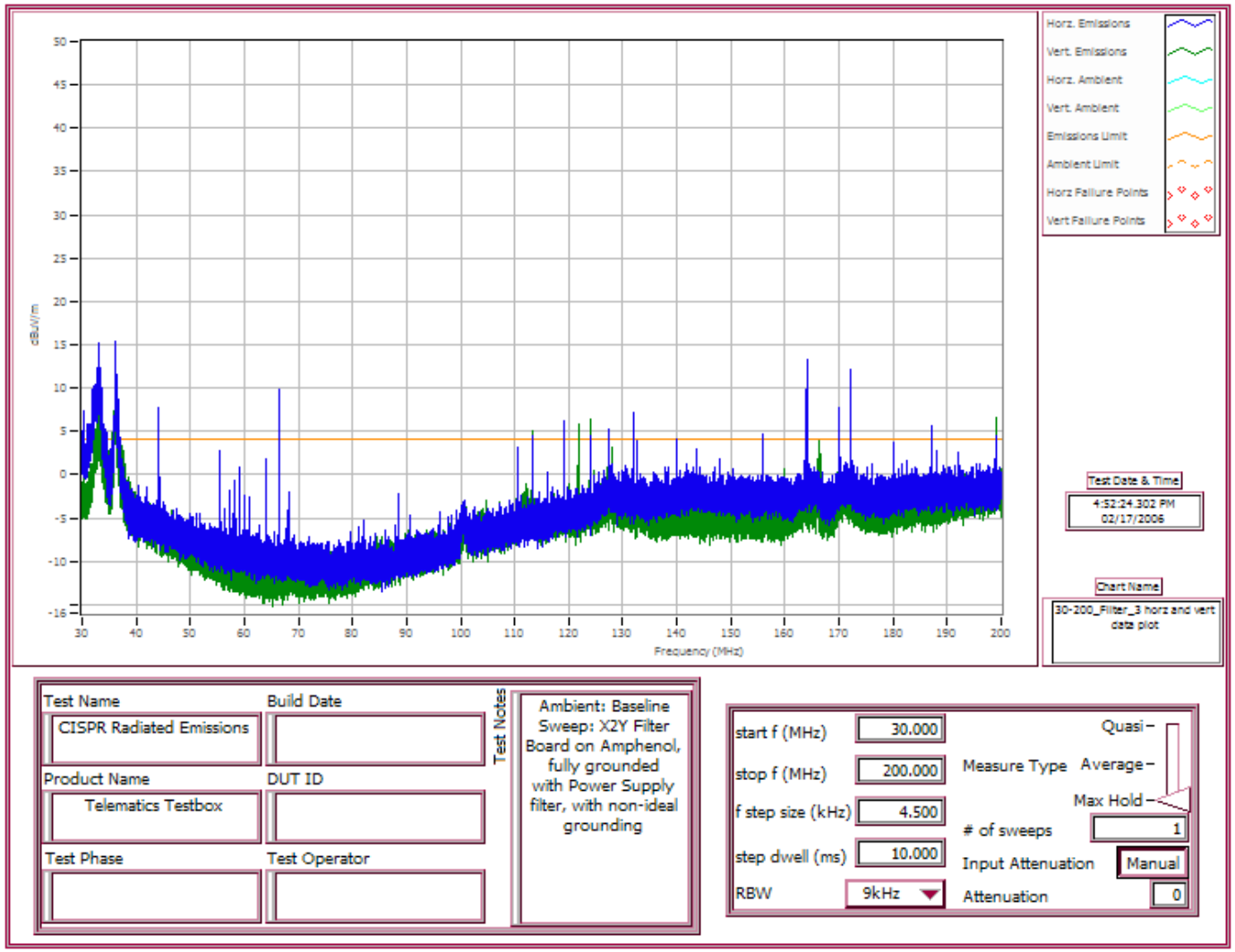
Data 30 MHz – 200 MHz

- Filter #2



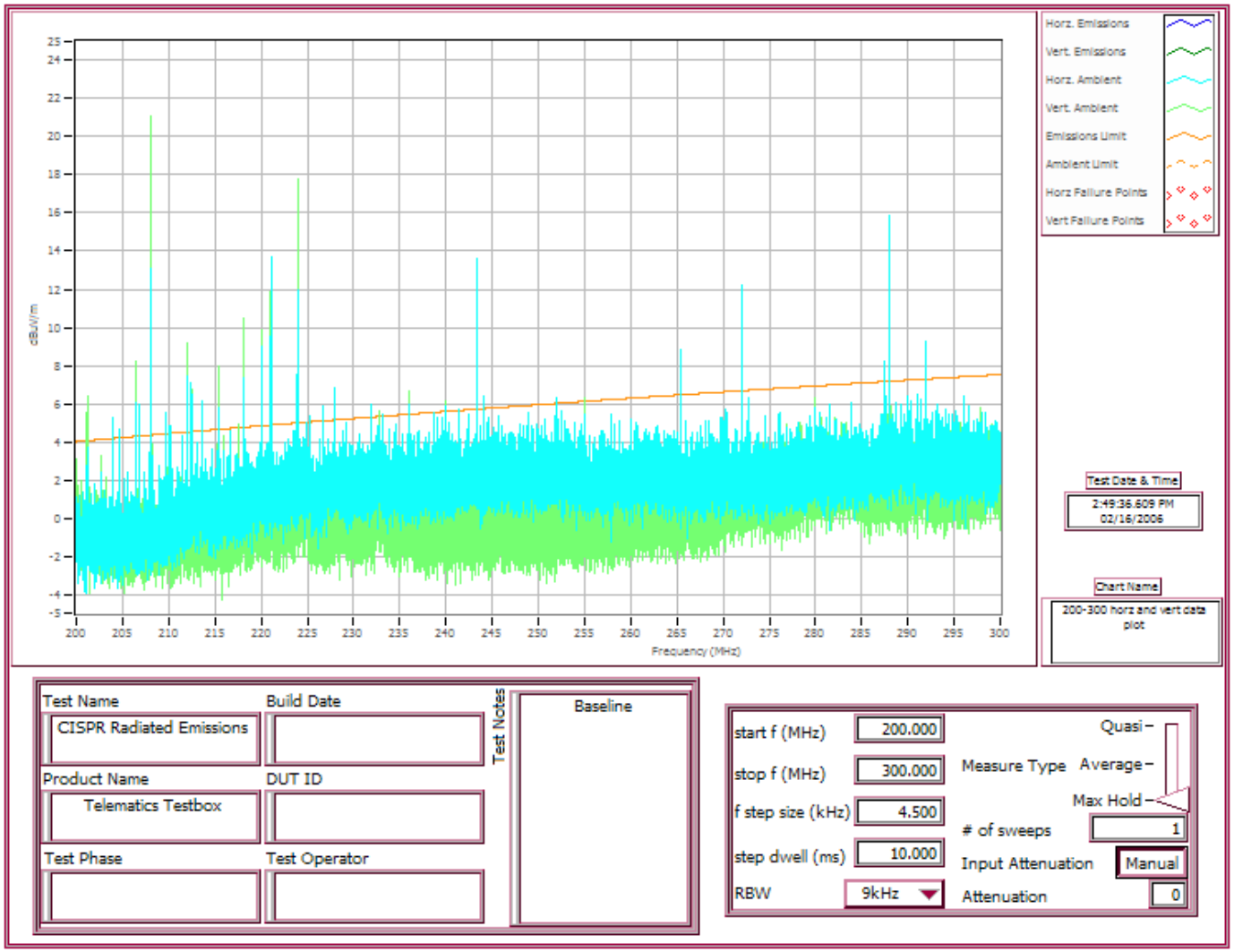
Data 30 MHz – 200 MHz

- Filter #3



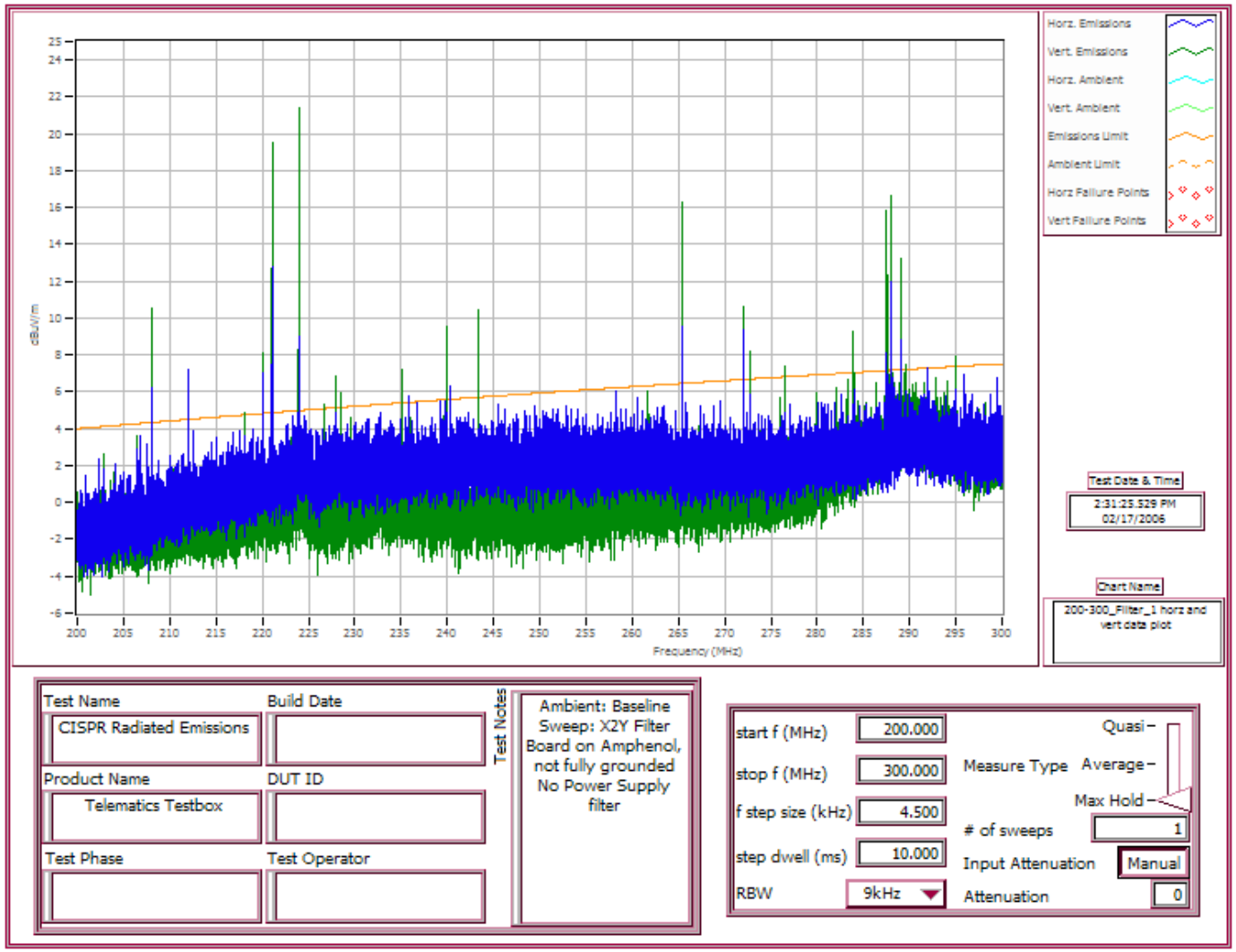
Data 200 MHz – 300MHz

- Baseline



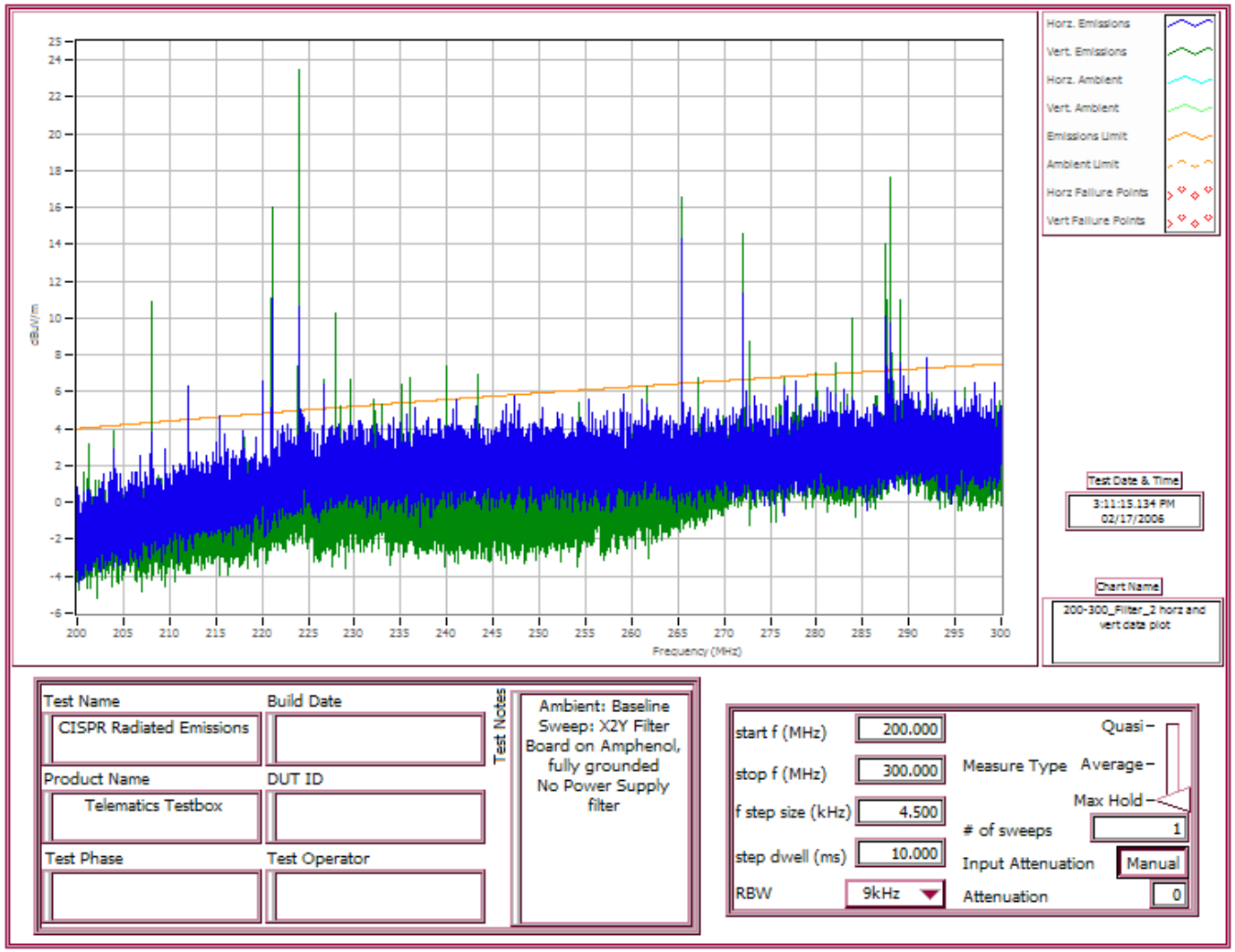
Data 200 MHz – 300MHz

- Filter #1



Data 200 MHz – 300MHz

- Filter #2



Data 200 MHz – 300MHz

- Filter #3