

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

## Test Results #TR 8002, v1.0

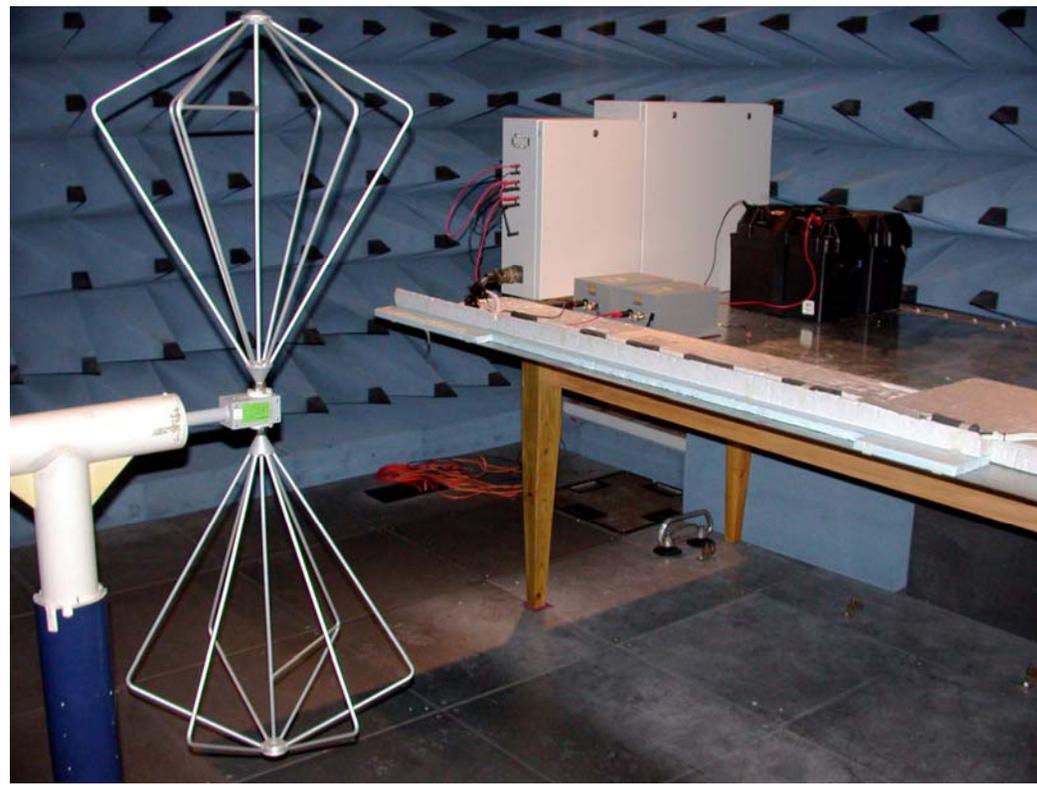
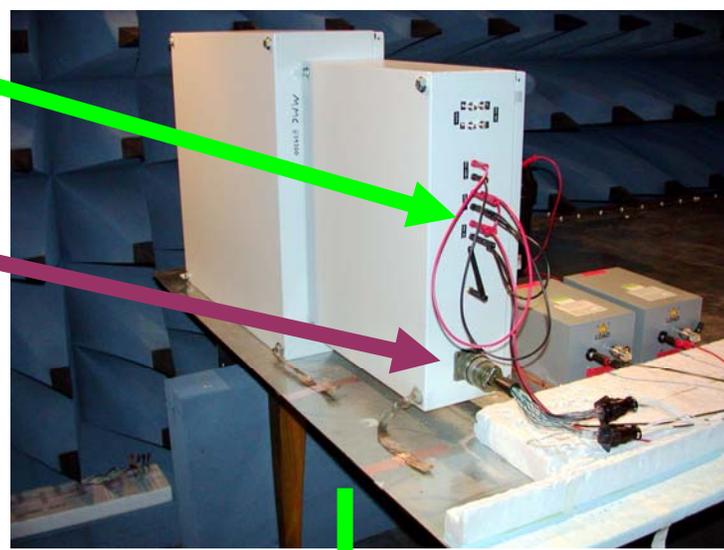
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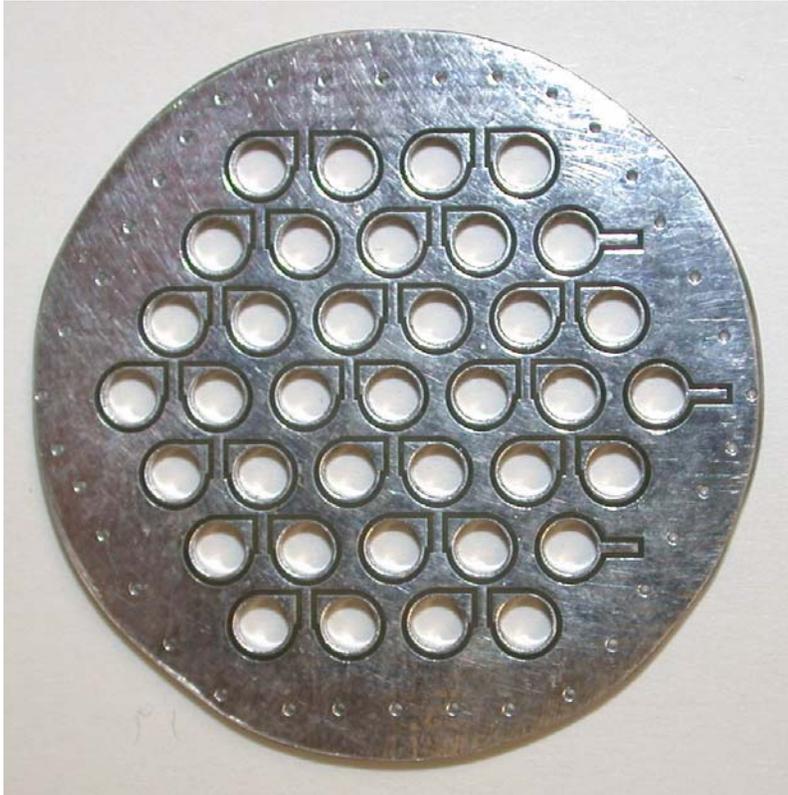
- Data was taken by JCI at their Holland, MI facility.
- Data validation testing to CISPR 25 specifications.
- Data was measured in the following frequency bands:
  - ✓ 30 MHz – 200 MHz
  - ✓ 200 MHz – 300 MHz

- 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.)

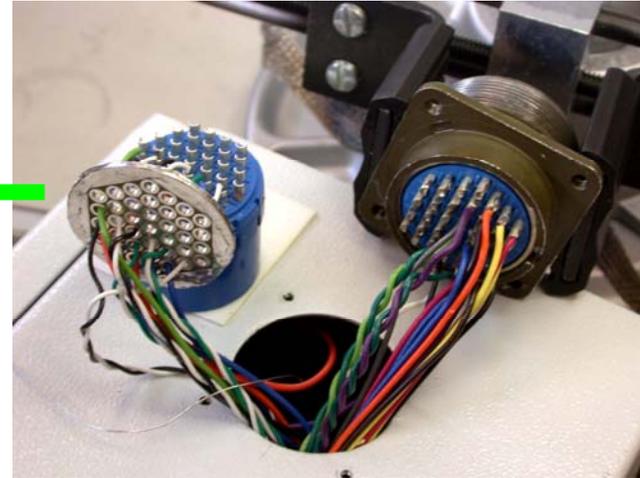
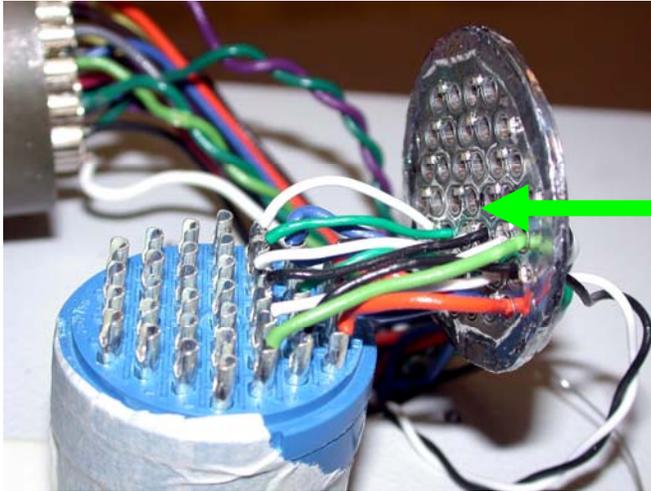
Power Line Pins

Connector





## Assembling PCB to connector

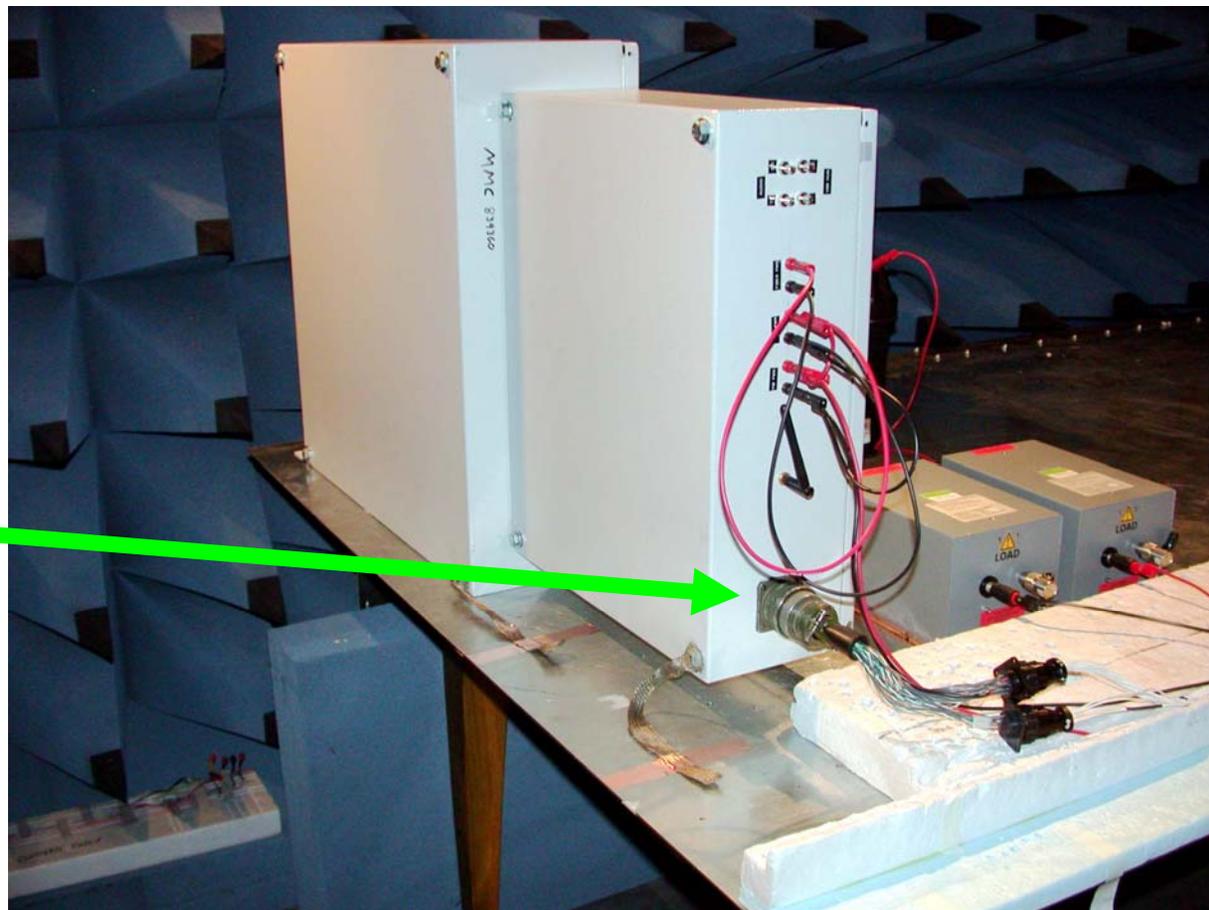


PCB and connector fully assembled and attached in housing (back-side view)

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

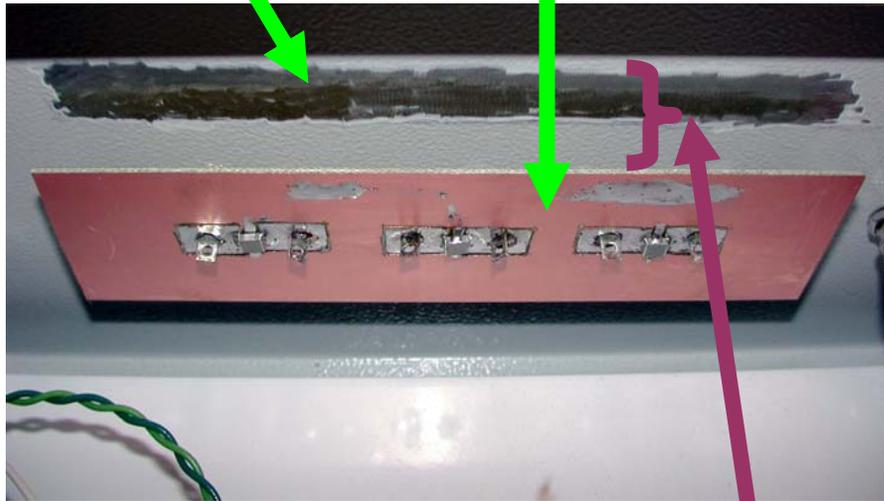


Non-conductive coating removed behind connector



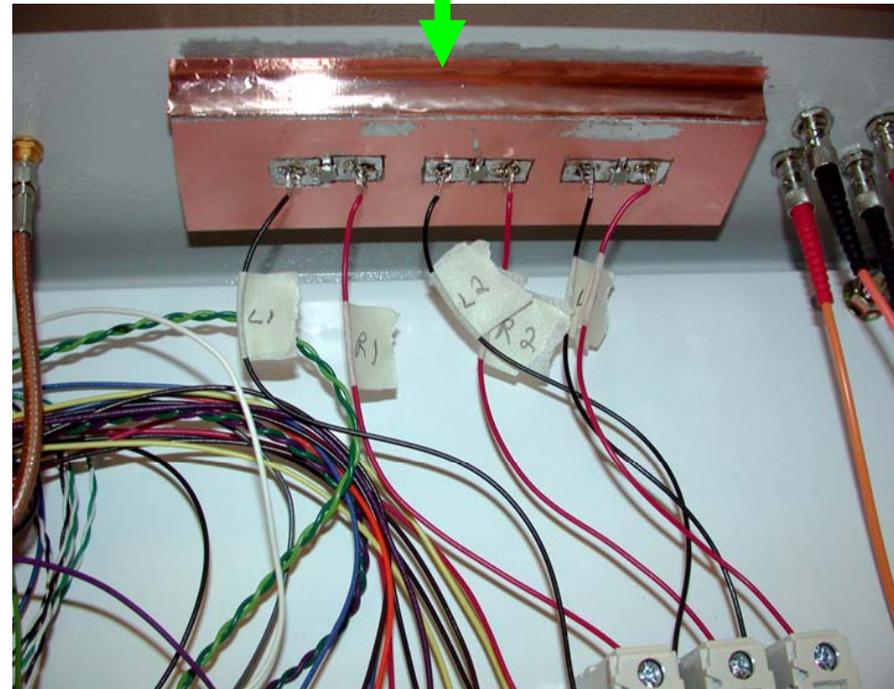
Non-conductive coating removed

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

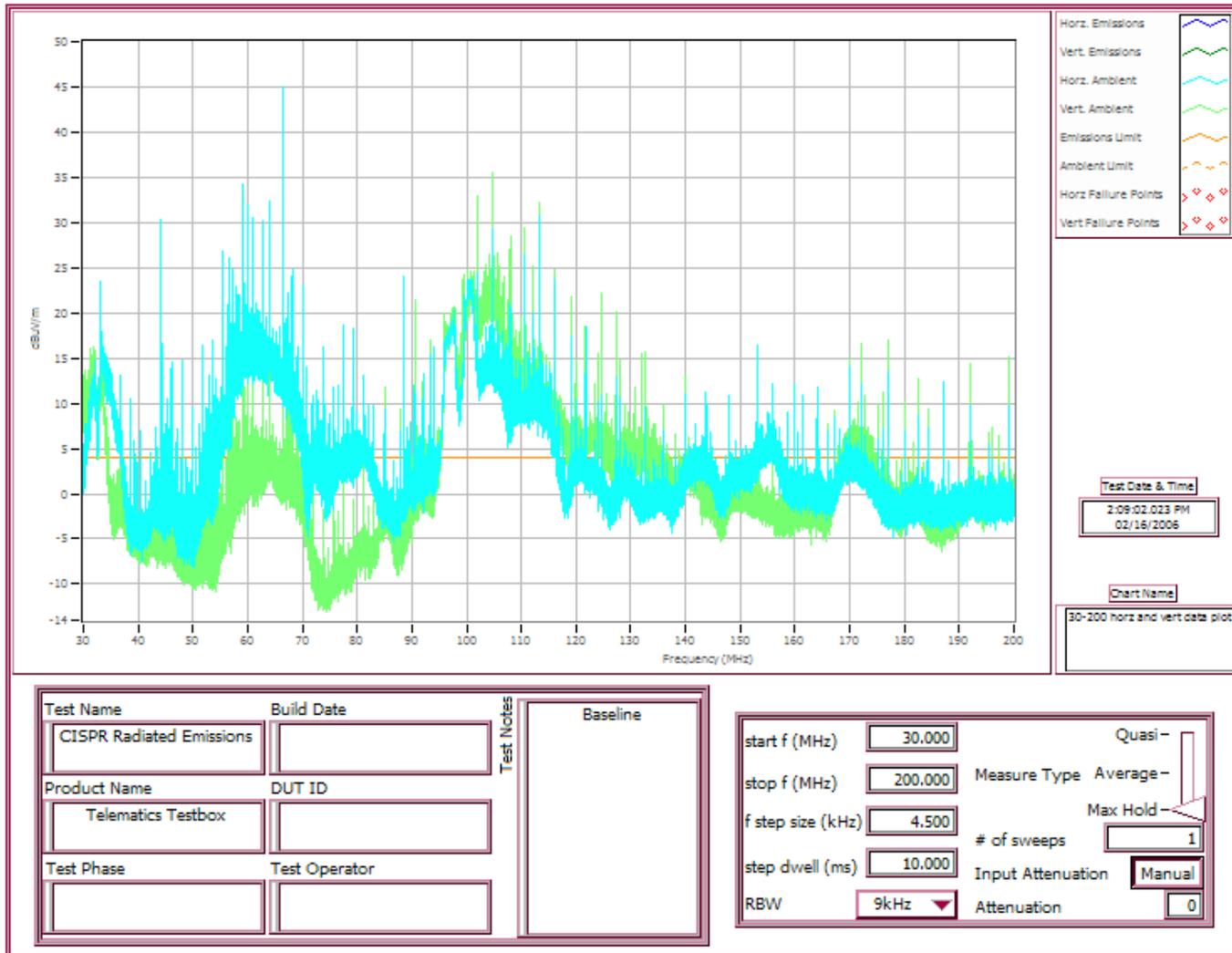


About 3/4" spacing

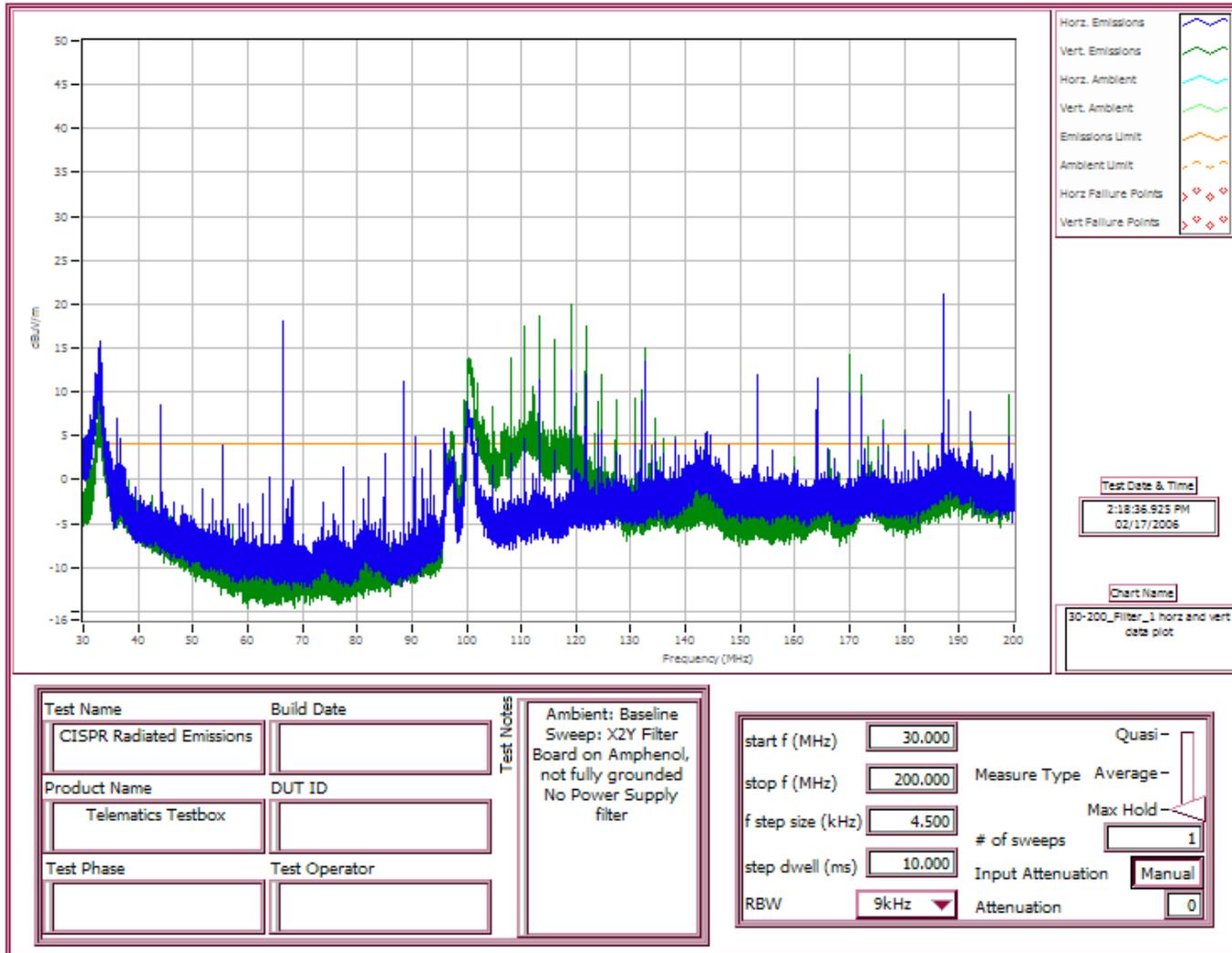
Copper tape used to make  
(1) side reference  
connection (gnd)



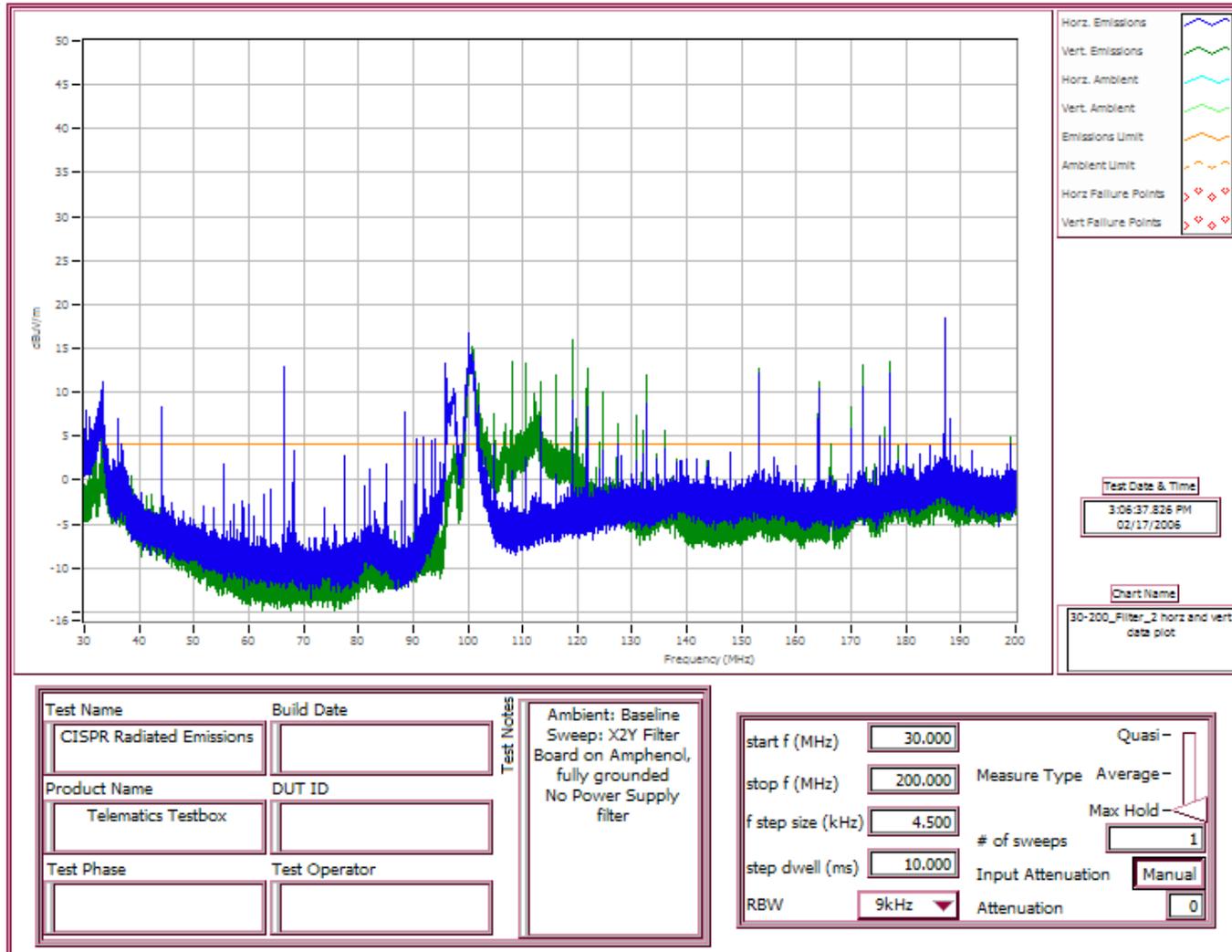
## ■ Baseline



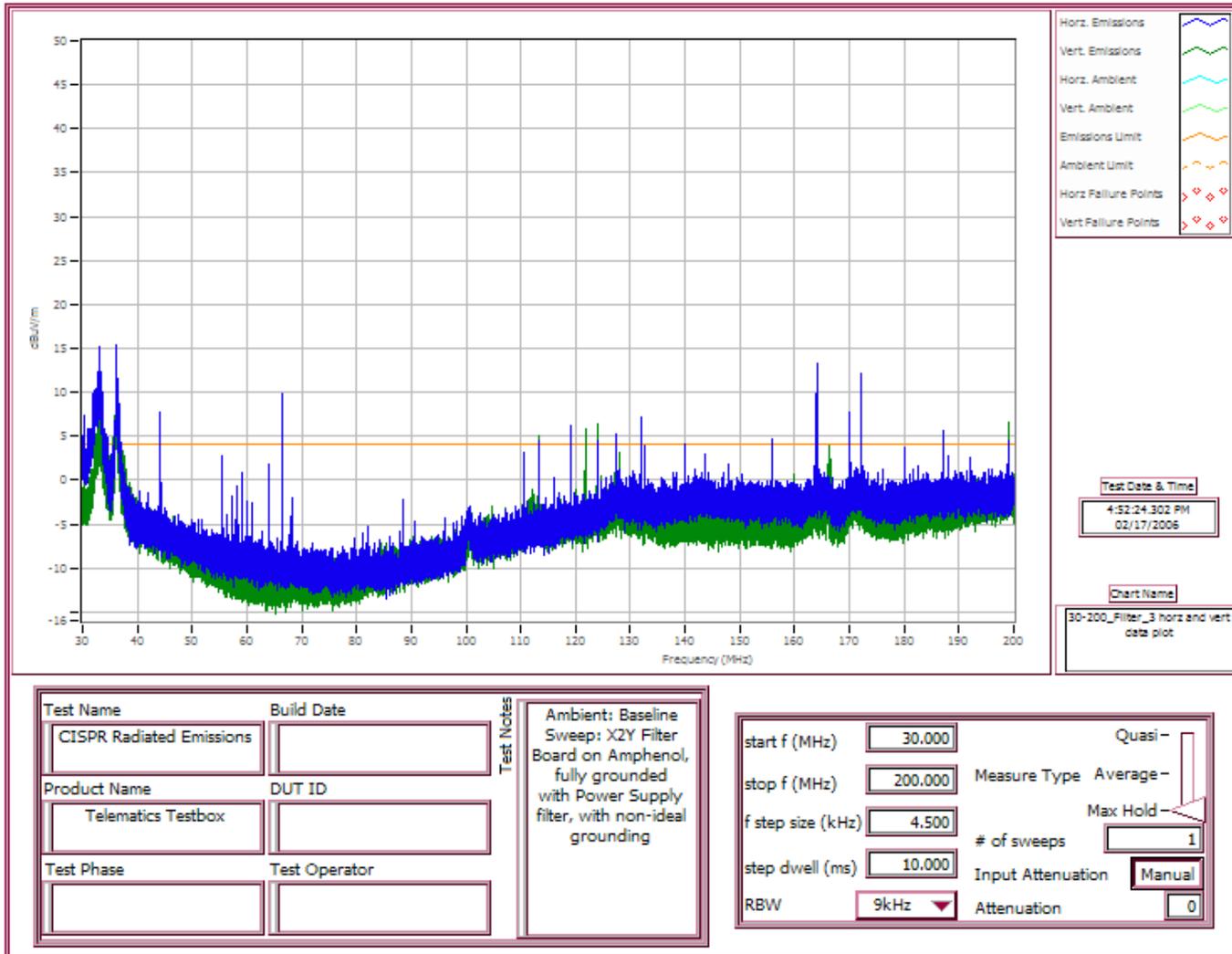
## Filter #1



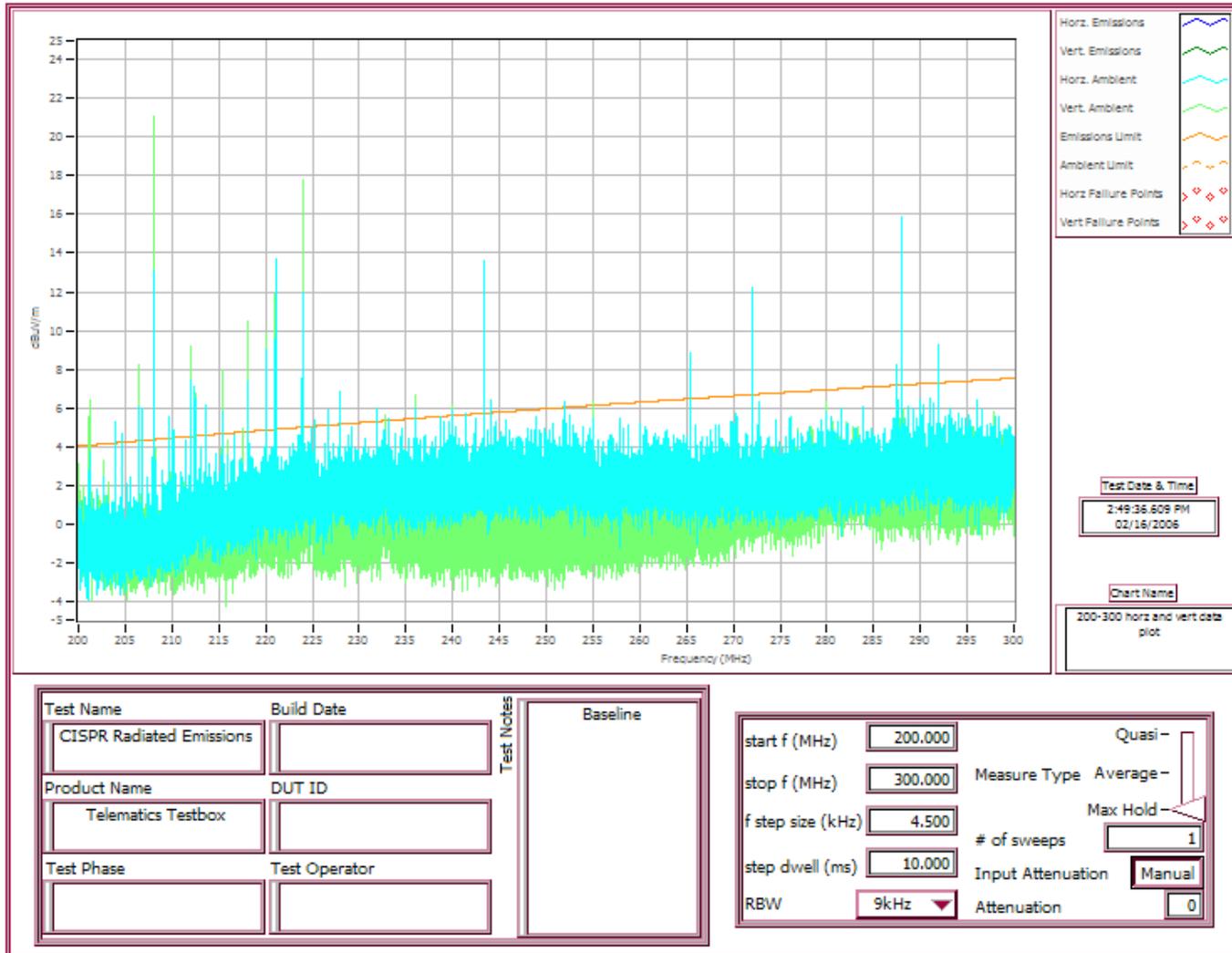
## Filter #2



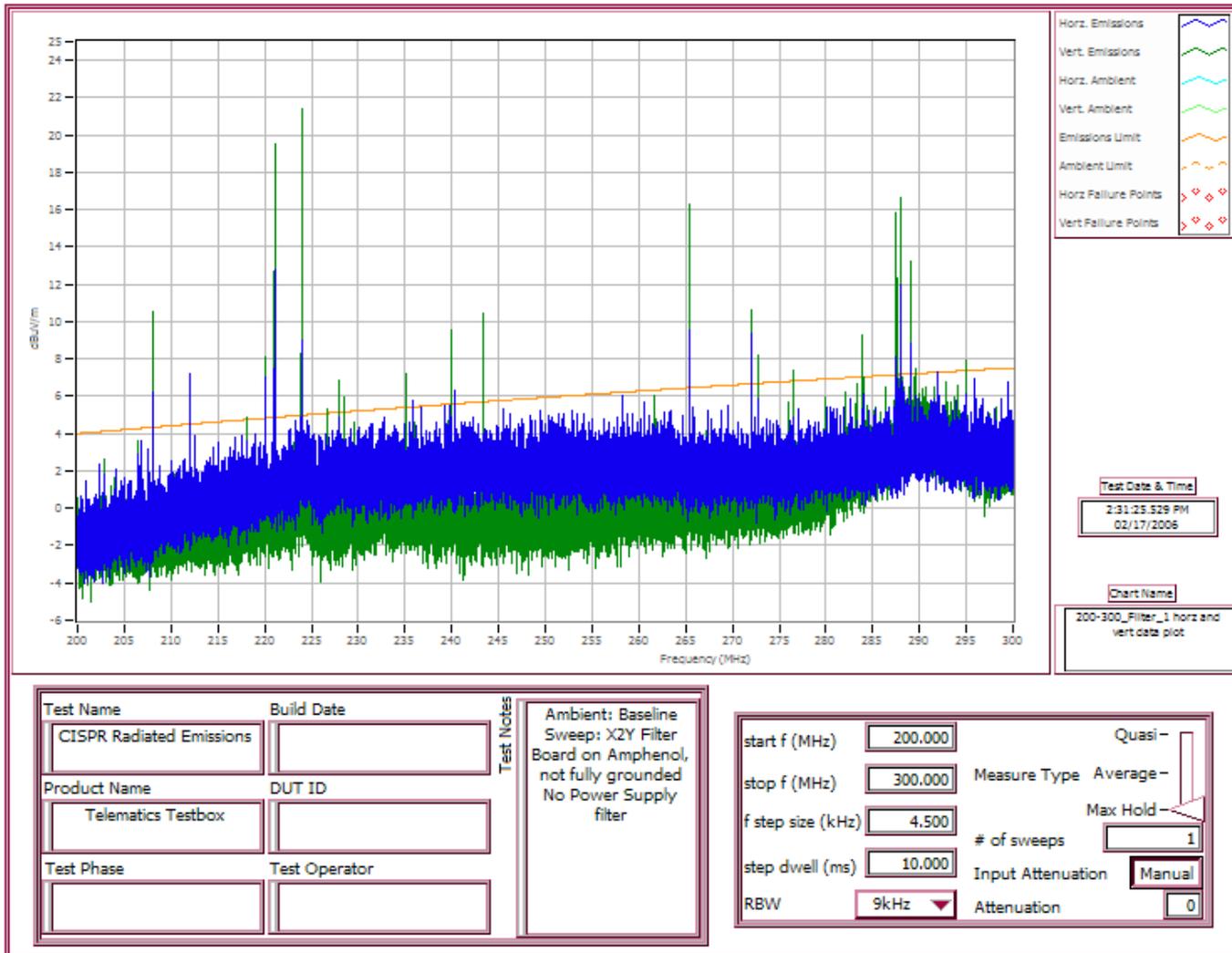
## Filter #3



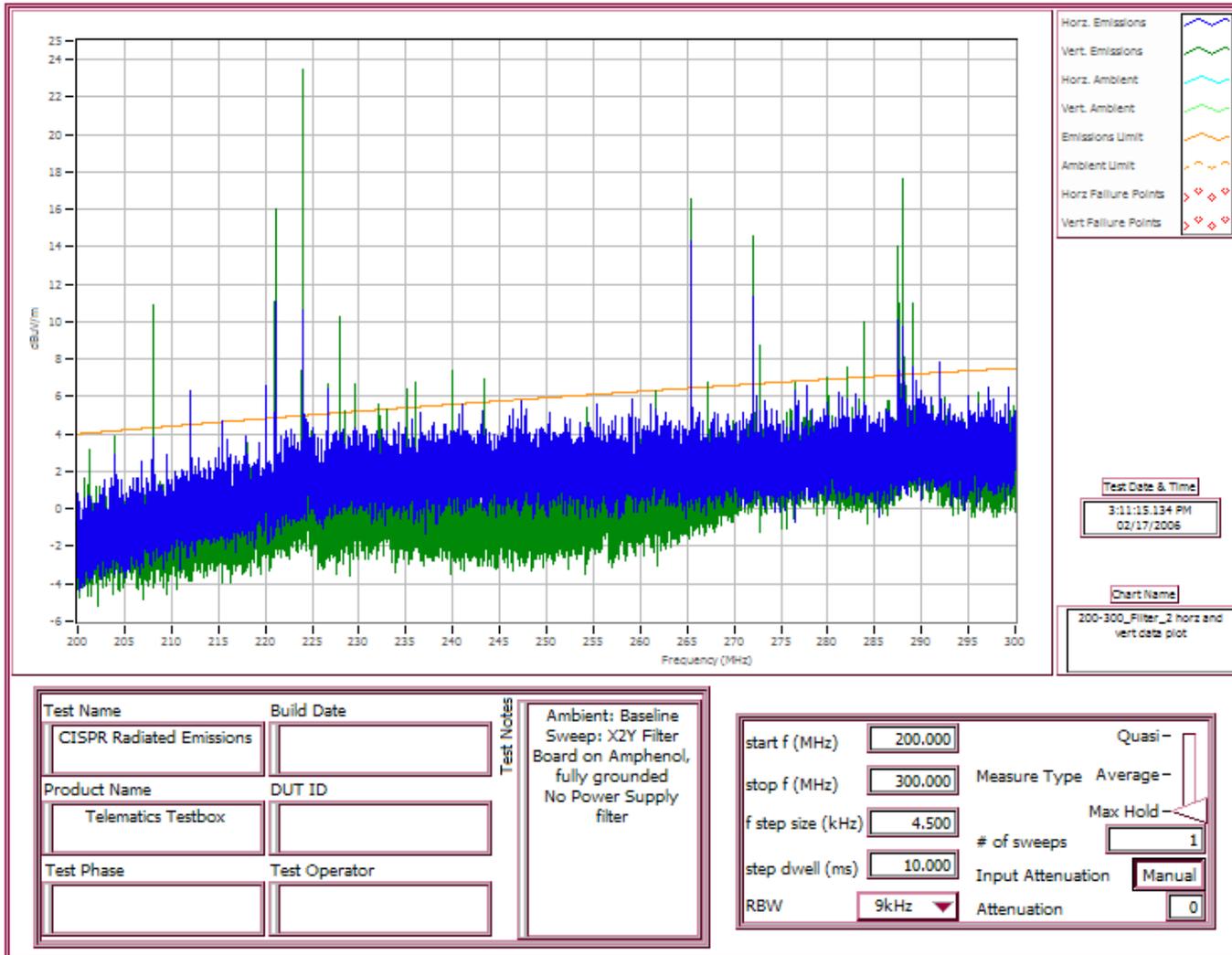
## ■ Baseline



## Filter #1



## Filter #2



## Filter #3

