APPENDIX B
MEASUREMENT DISTANCE ALONG THE POWER LINE

B.1 INTRODUCTION

As noted in the NTIA Phase 1 Study, compliance measurement testing commissioned by BPL equipment vendors and service providers has generally focused on radiated emissions measured on radials from the BPL device under test. However, FCC rules state that Part 15 devices and all attached wiring should be considered when measuring radiated emissions.[2] The Commission's BPL measurement guidelines specify the locations along the power line away from a BPL device where field strength measurements are to be taken.[3] This Appendix provides NTIA's results from evaluating the field strength along the length of the power line and comparing this to the field strength levels at the prescribed measurement locations.

B.2 SIMULATION RESULTS

Figures B-1 through B-84 show the electric field strength level along the power line for a variety of simulated power line configurations, and over the frequency range of 2 to 28 MHz. Each figure includes the Part 15 radiated emissions limit extrapolated to a measurement distance of 10 meters assuming the power line height is 12 meters.[4] In addition, these figures show the measurement points specified in the measurement guidelines. The peak value of these points was used to scale the signal source level so that the power line model satisfies the Part 15 limit, as extrapolate to the 10 meter measurement distance. Electric field strength values were determined from NEC magnetic field strength simulations of the power line models using the methodology described in Section 2.2.

[2] *See* 47 C.F.R. §15.31(g)-(k).

[3] *See* BPL Report and Order, at Appendix C ¶ 2.b.2 ("Testing shall be performed at distances of 0, ¼, ½, ¾, and 1 wavelength down the line from the BPL injection point on the power line. Wavelength spacing is based on the mid-band frequency…").

[4] *Id.* ¶ 2.b.4 (describing the slant range distance extrapolation methodology).

2 MHz Plots

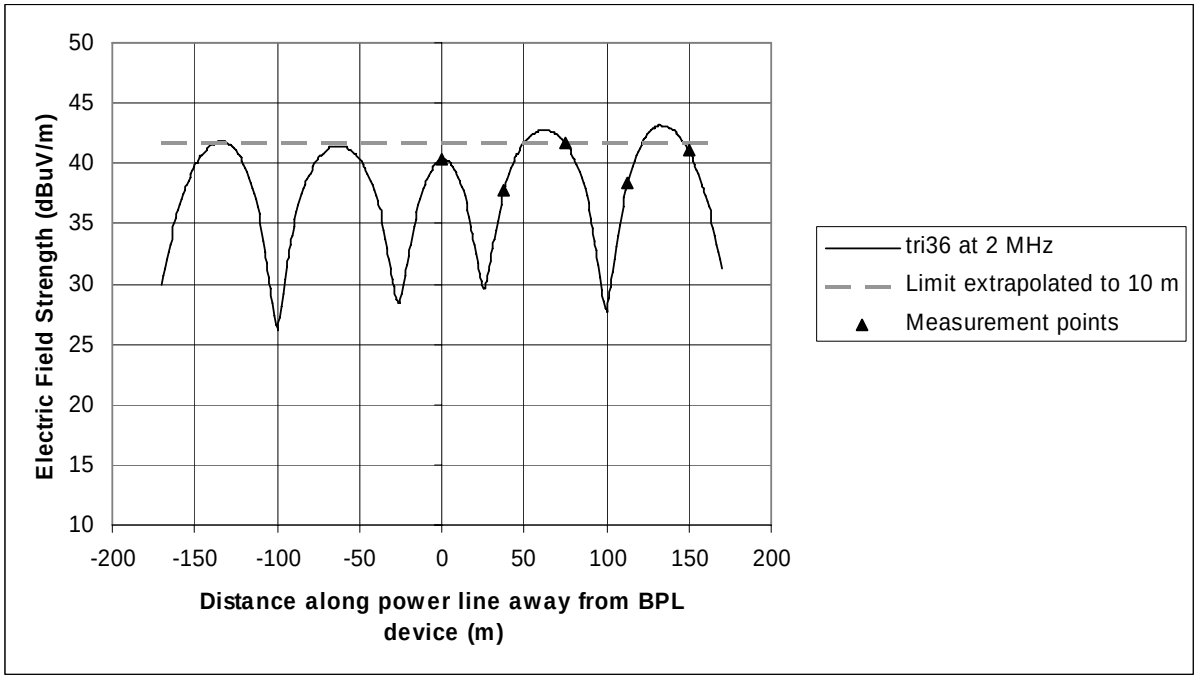

Figure B-1: Vertical electric field strength along power line for tri36 topology

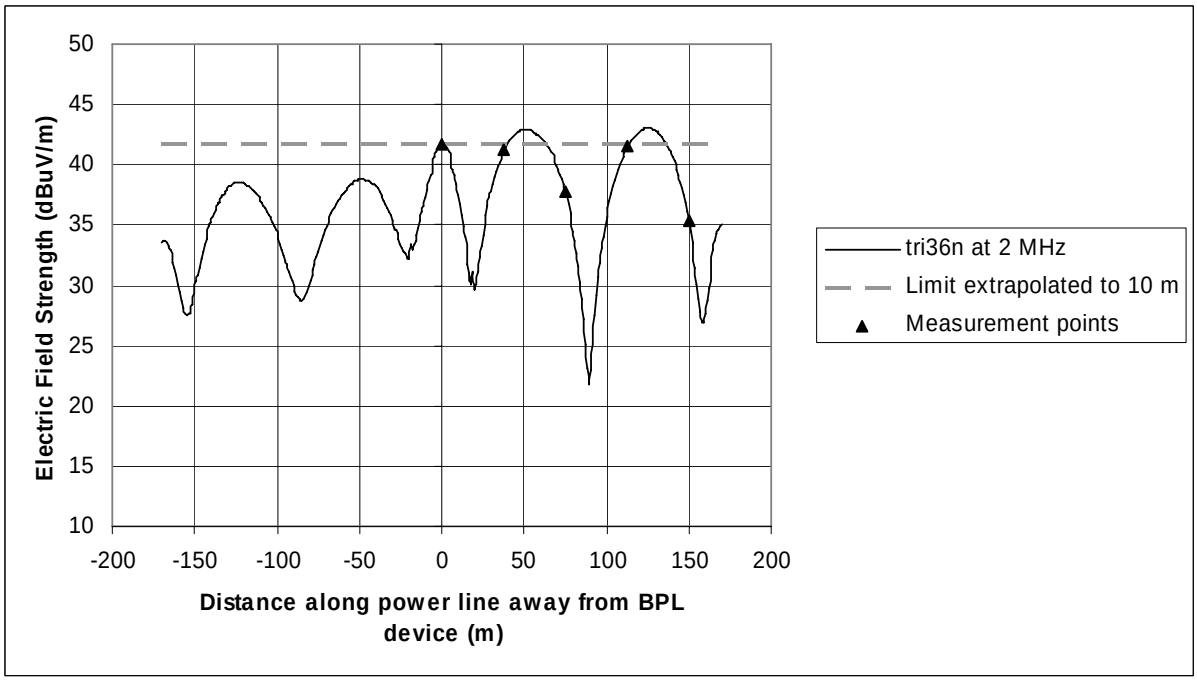

Figure B-2: Vertical electric field strength along power line for tri36n topology

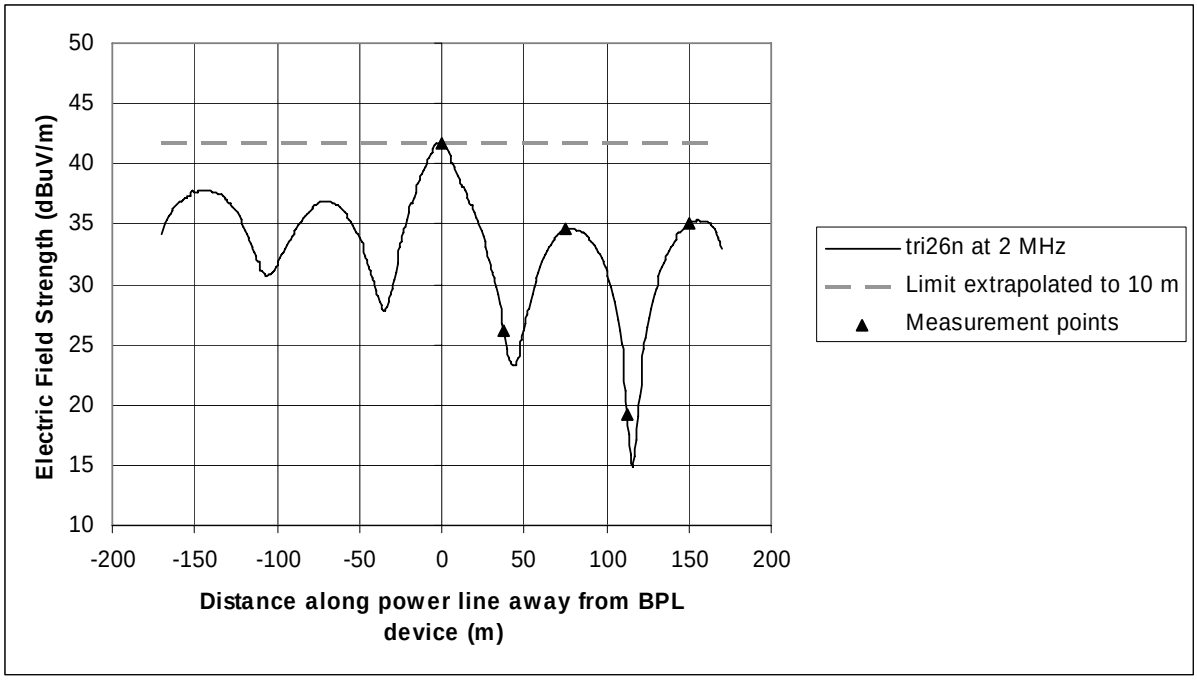

Figure B-3: Vertical electric field strength along power line for tri26n topology

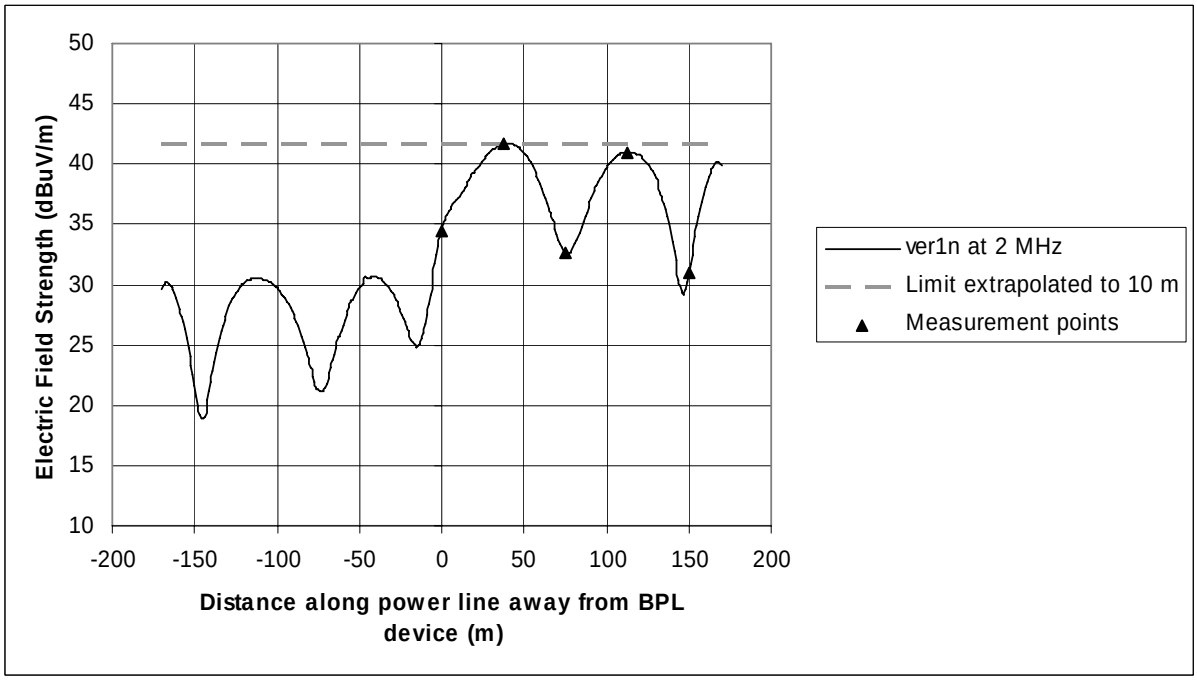

Figure B-4: Vertical electric field strength along power line for ver1n topology

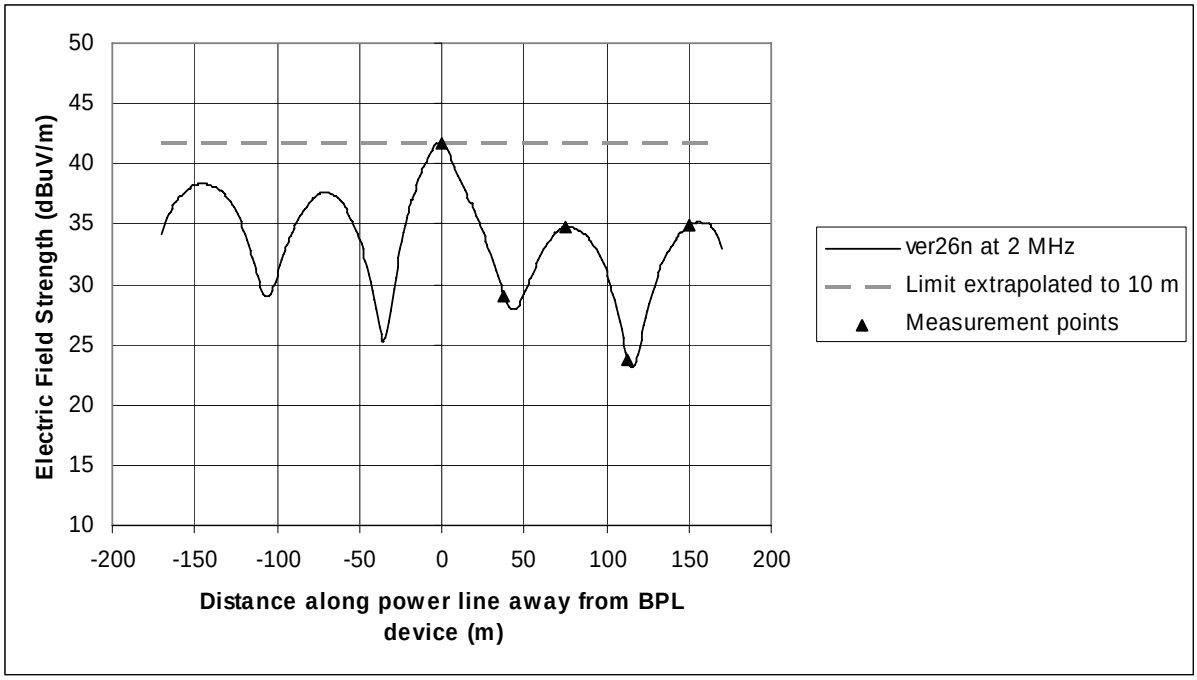

Figure B-5: Vertical electric field strength along power line for ver26n topology

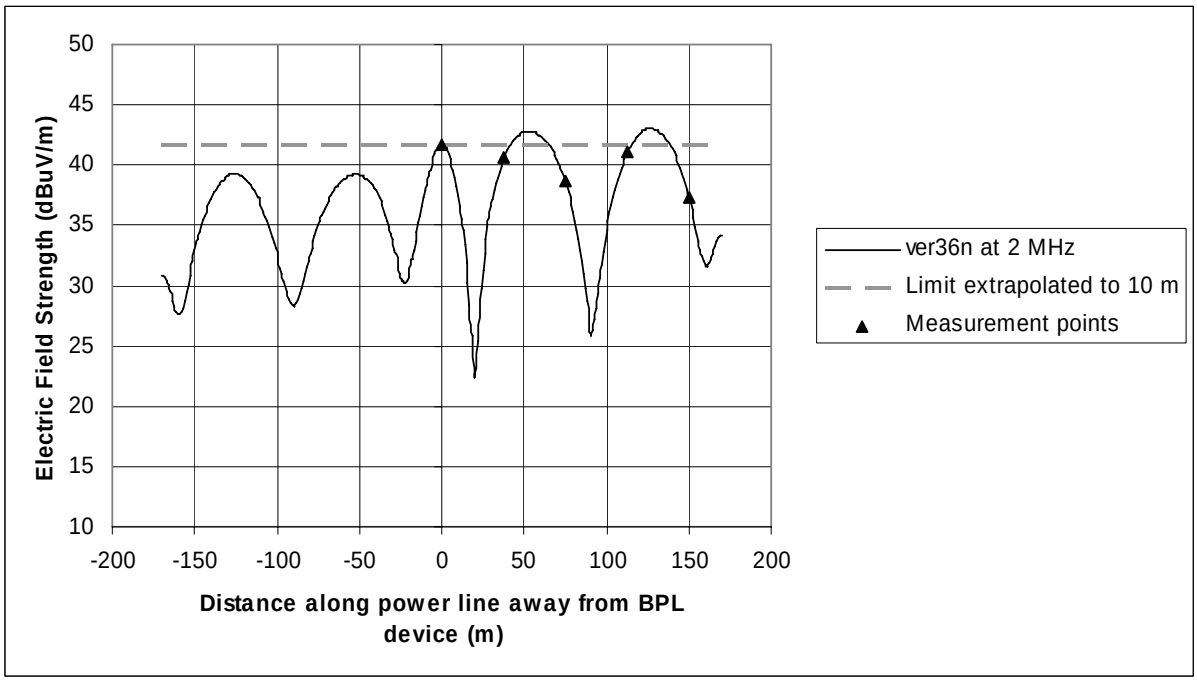

Figure B-6: Vertical electric field strength along power line for ver36n topology

4 MHz Plots

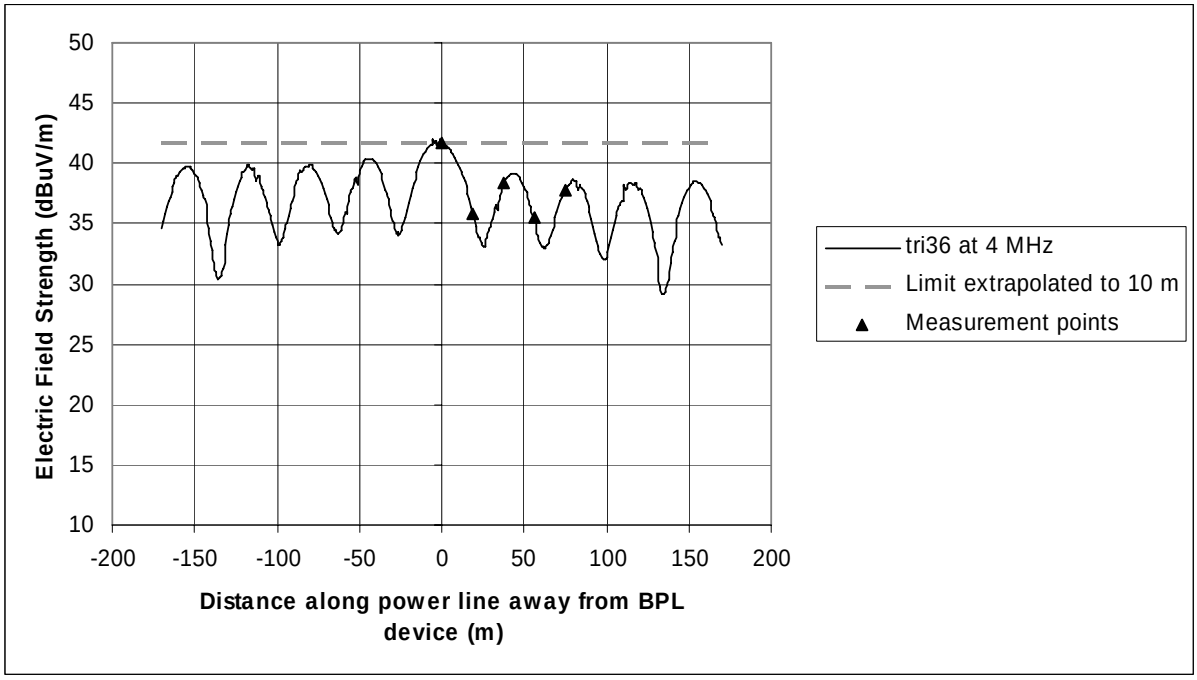

Figure B-7: Vertical electric field strength along power line for tri36 topology

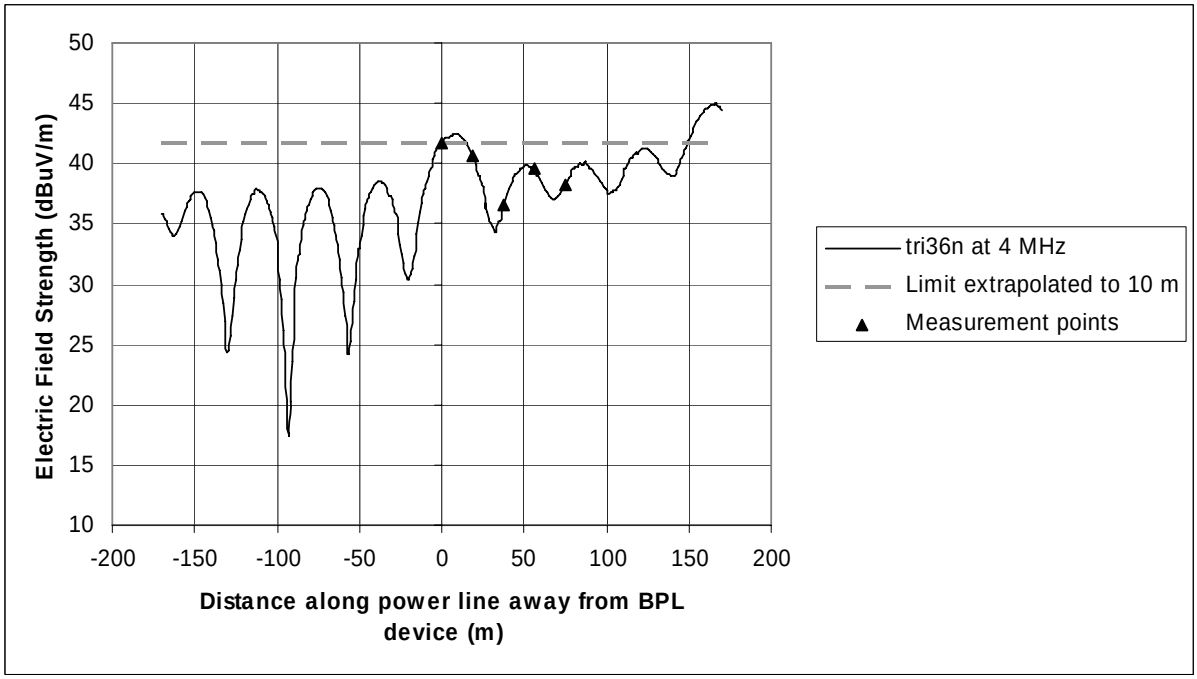

Figure B-8: Vertical electric field strength along power line for tri36n topology

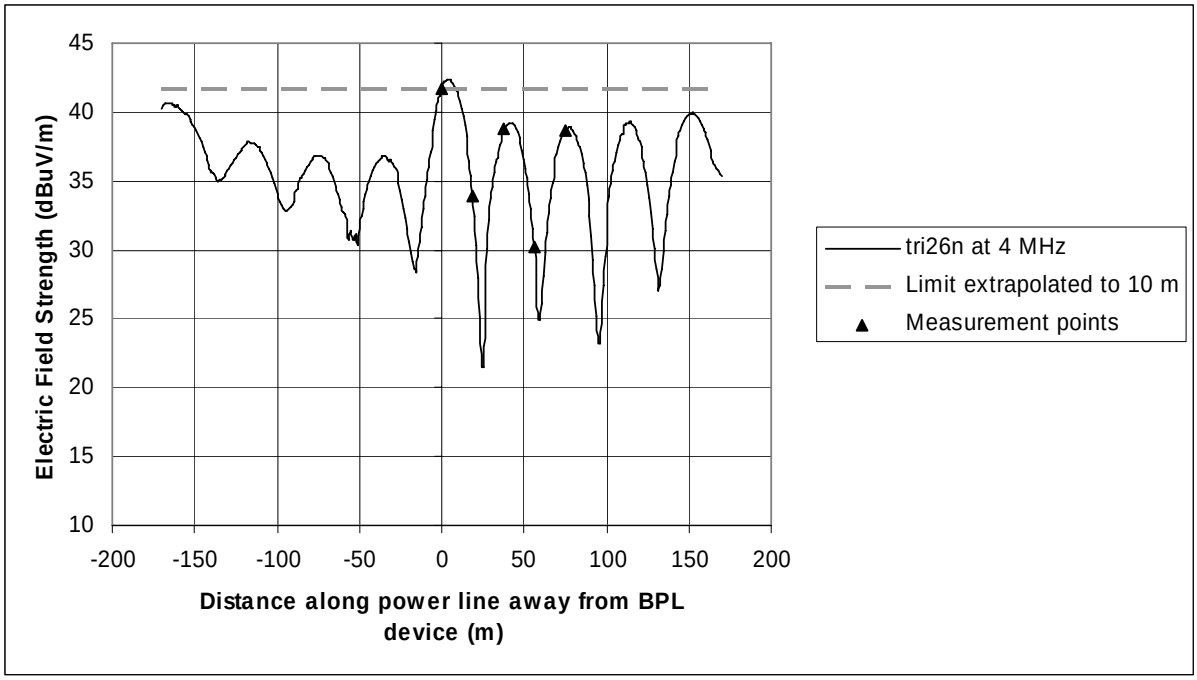

Figure B-9: Vertical electric field strength along power line for tri26n topology

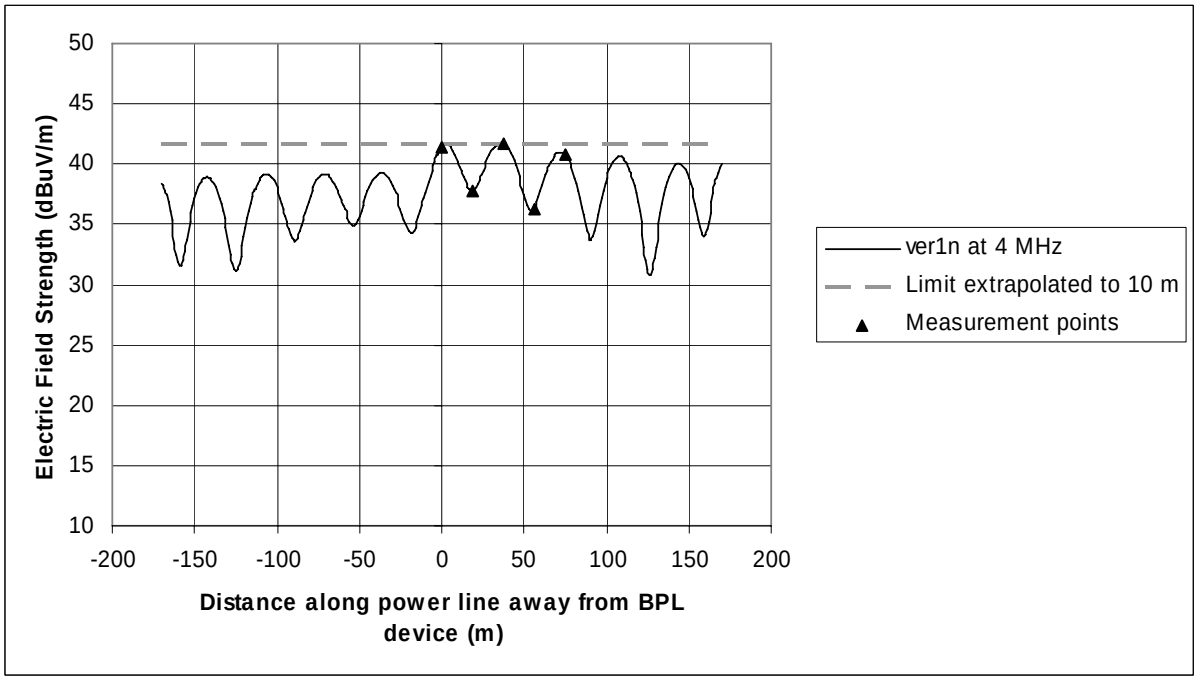

Figure B-10: Vertical electric field strength along power line for ver1n topology

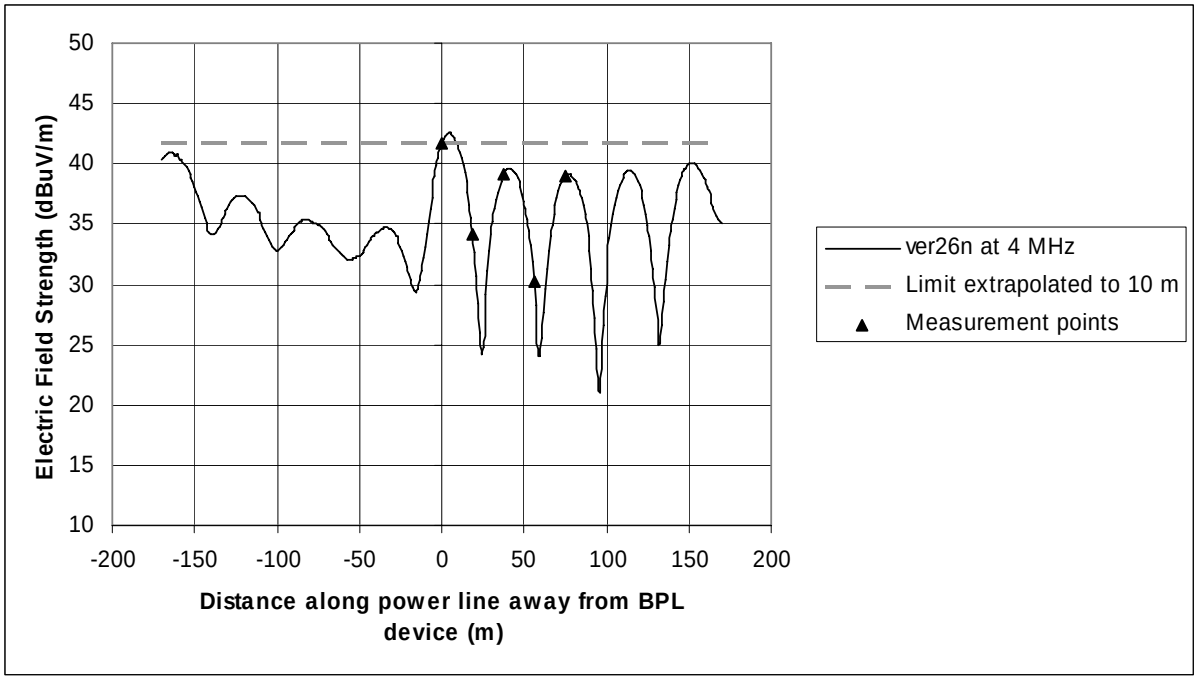

Figure B-11: Vertical electric field strength along power line for ver26n topology

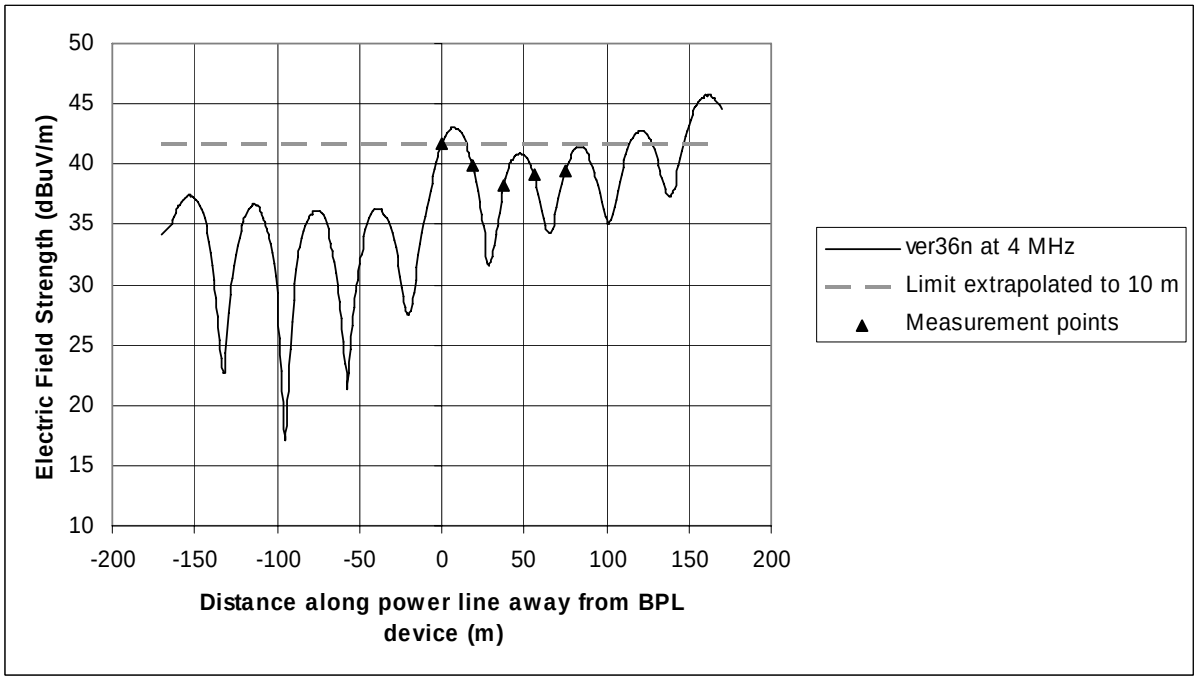

Figure B-12: Vertical electric field strength along power line for ver36n topology

6 MHz Plots

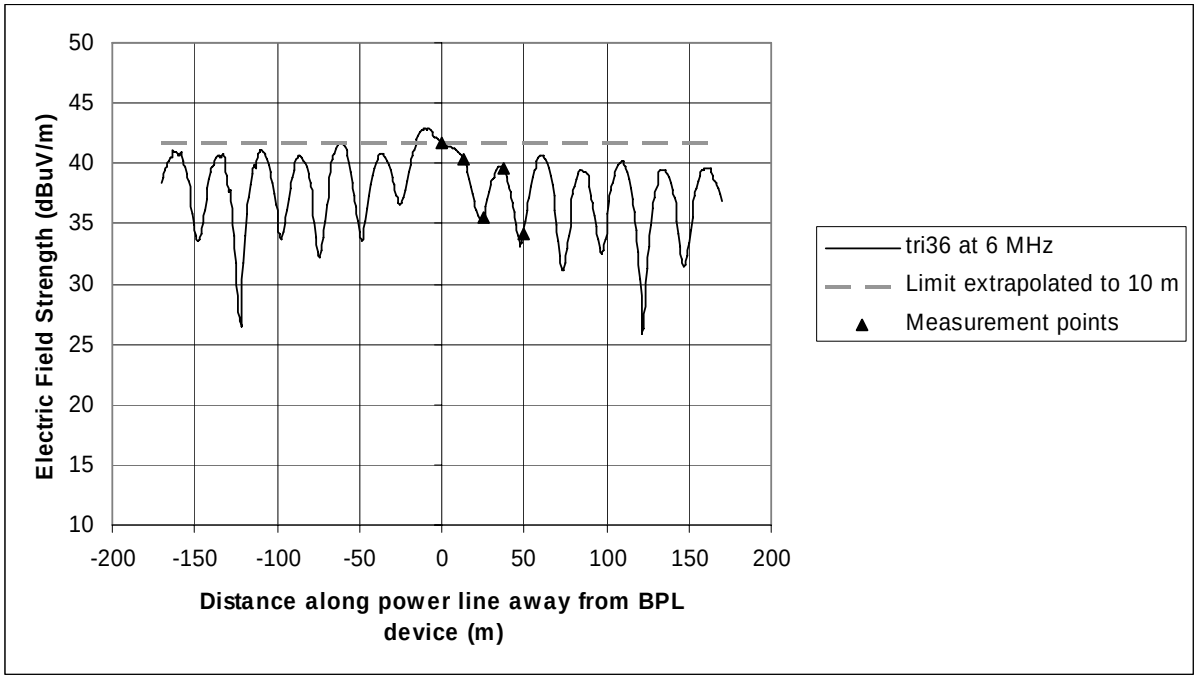

Figure B-13: Vertical electric field strength along power line for tri36 topology

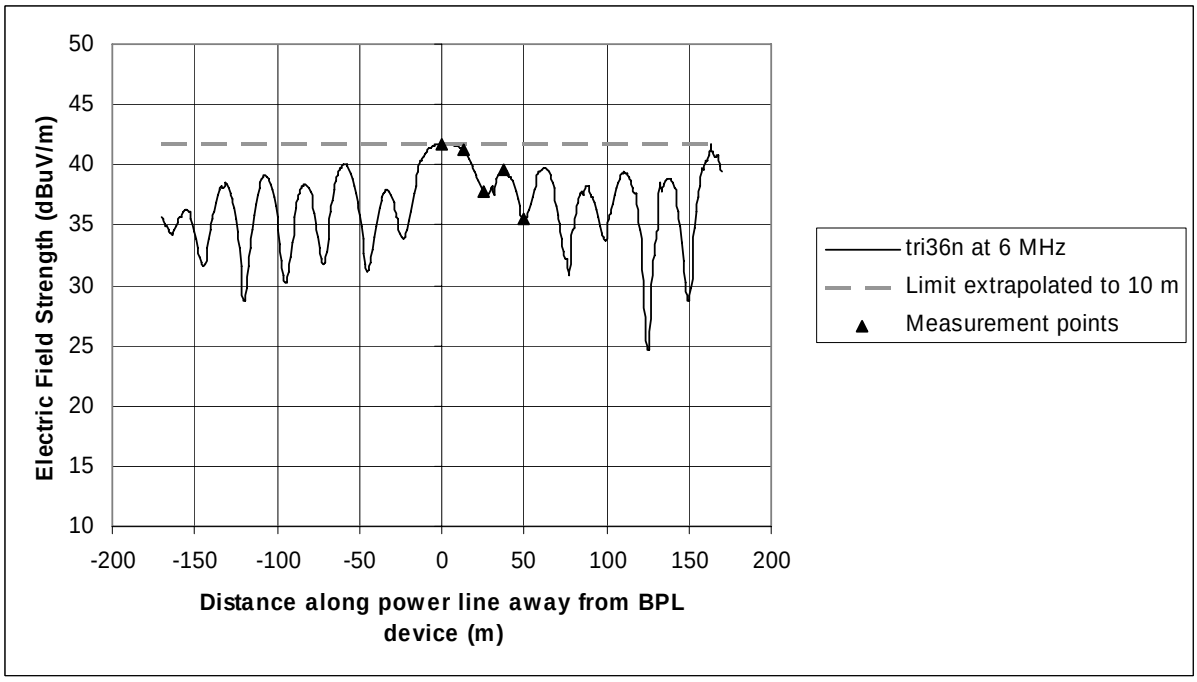

Figure B-14: Vertical electric field strength along power line for tri36n topology

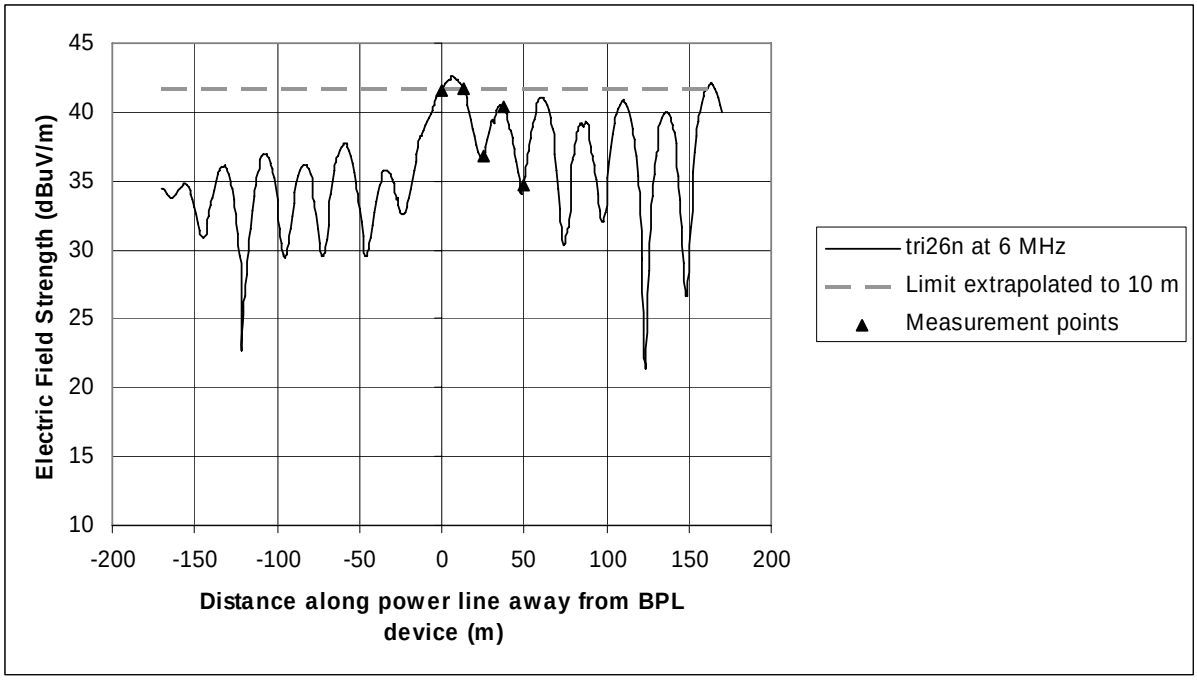

Figure B-15: Vertical electric field strength along power line for tri26n topology

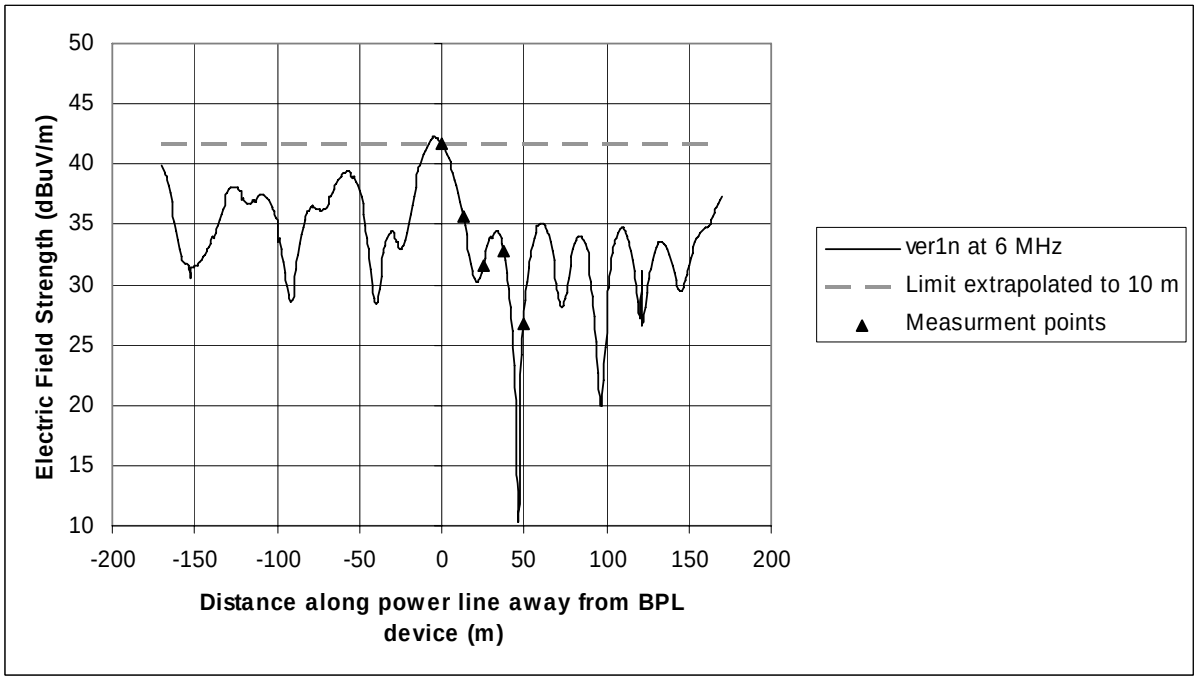

Figure B-16: Vertical electric field strength along power line for ver1n topology

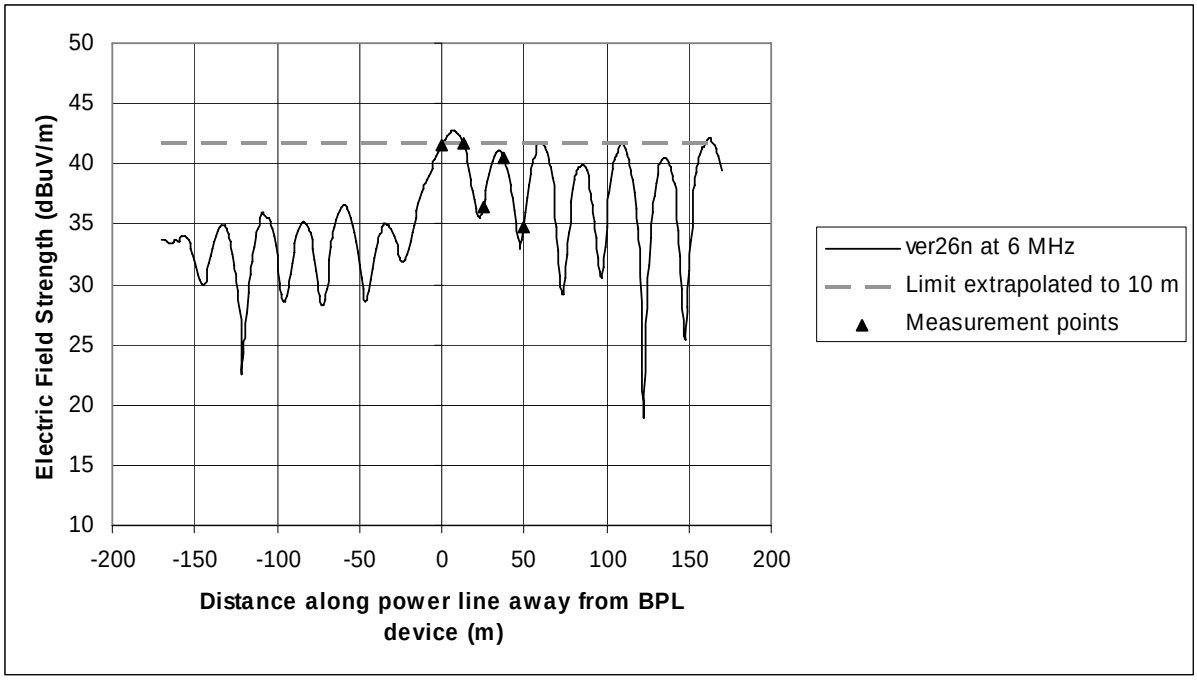

Figure B-17: Vertical electric field strength along power line for ver26n topology

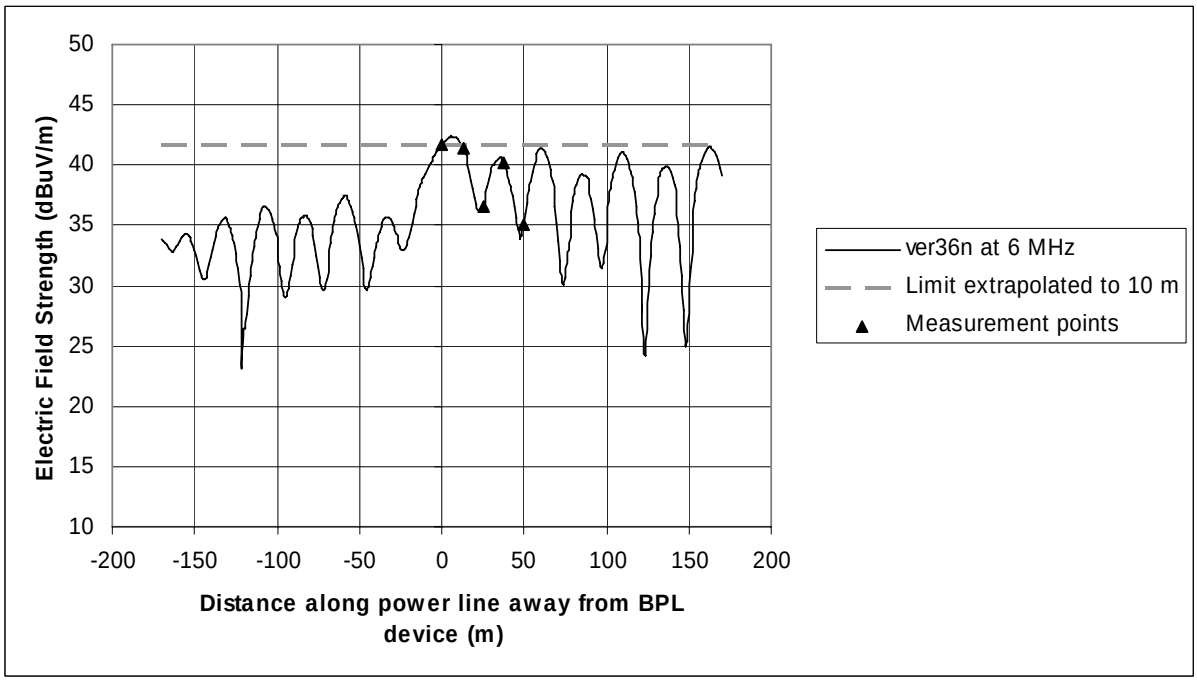

Figure B-18: Vertical electric field strength along power line for ver36n topology

8 MHz Plots

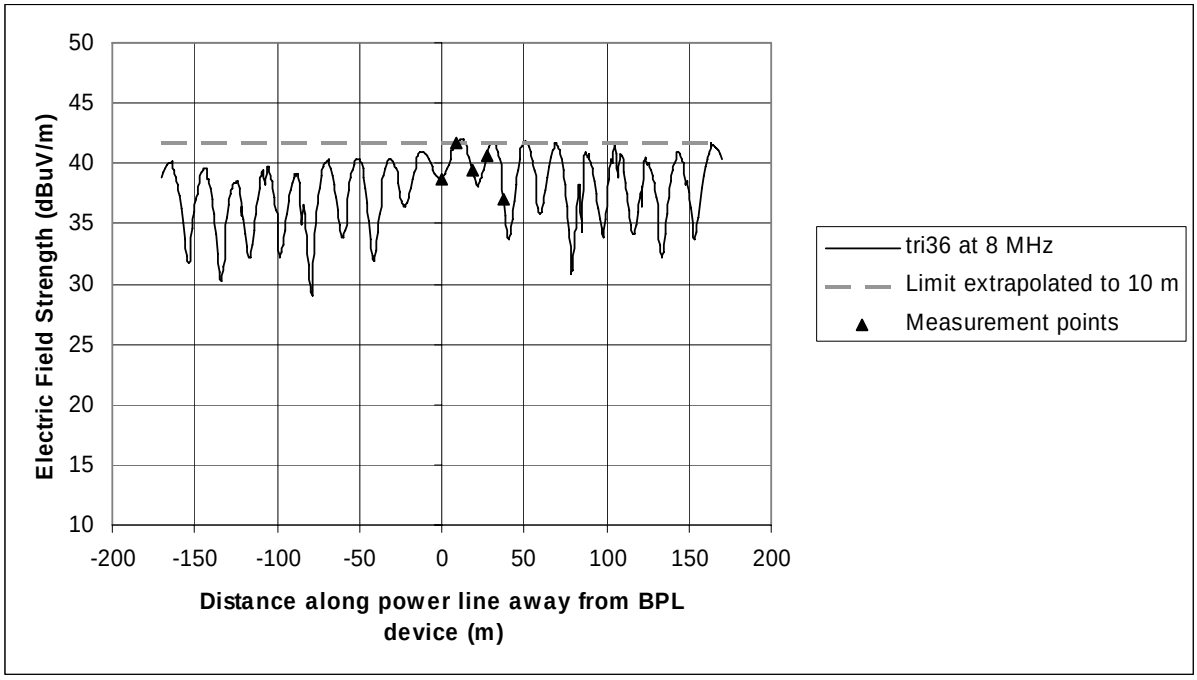

Figure B-19: Vertical electric field strength along power line for tri36 topology

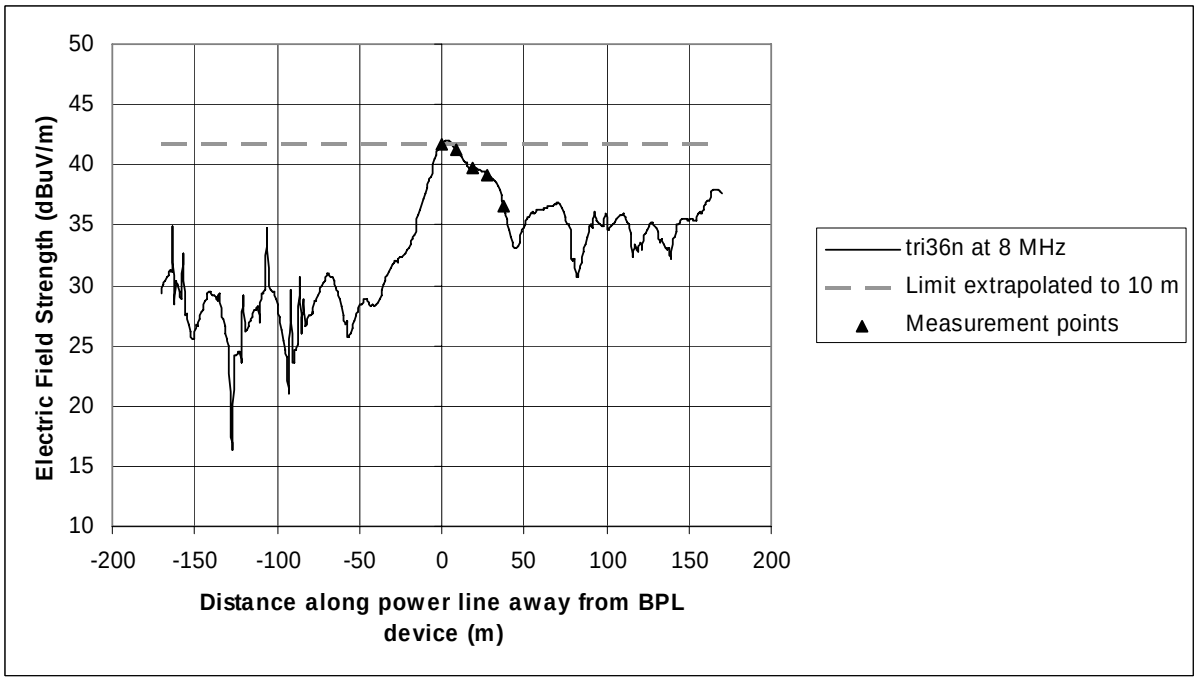

Figure B-20: Vertical electric field strength along power line for tri36n topology

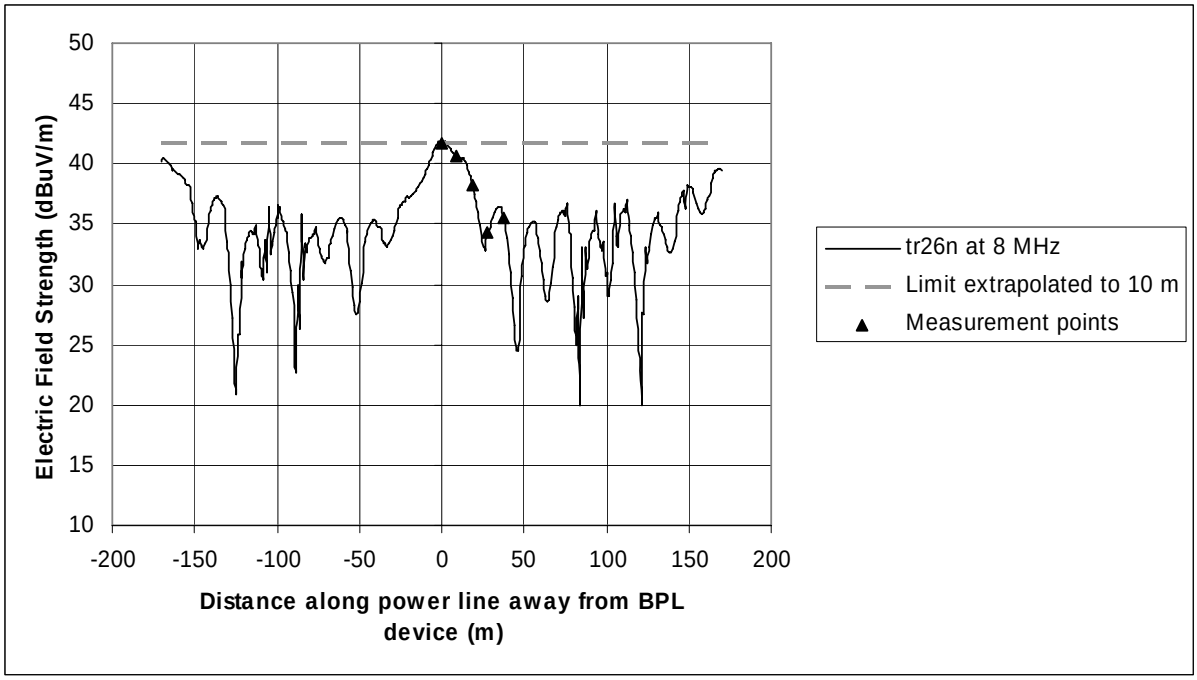

Figure B-21: Vertical electric field strength along power line for tri26n topology

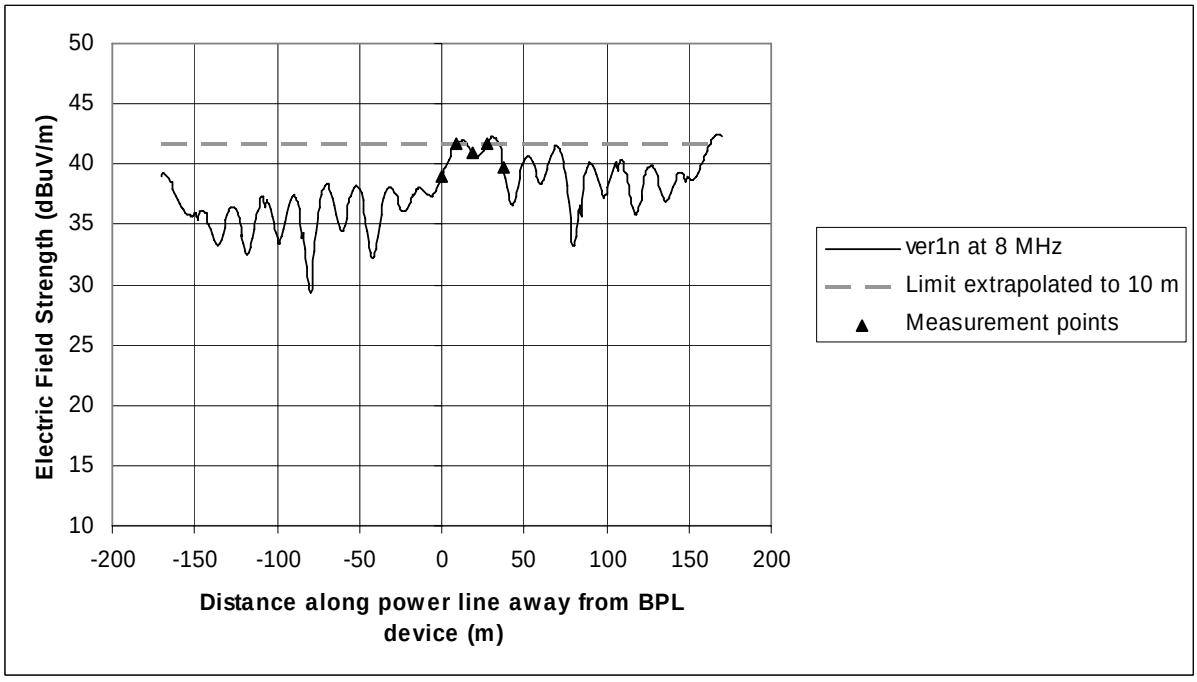

Figure B-22: Vertical electric field strength along power line for ver1n topology

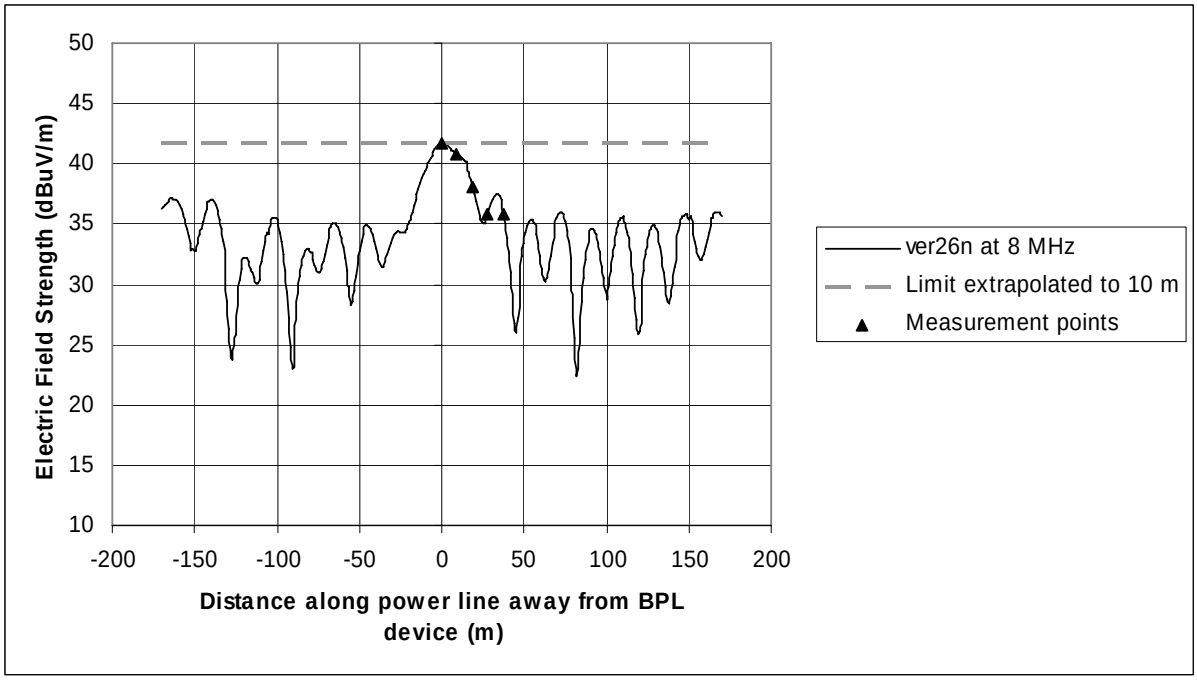

Figure B-23: Vertical electric field strength along power line for ver26n topology

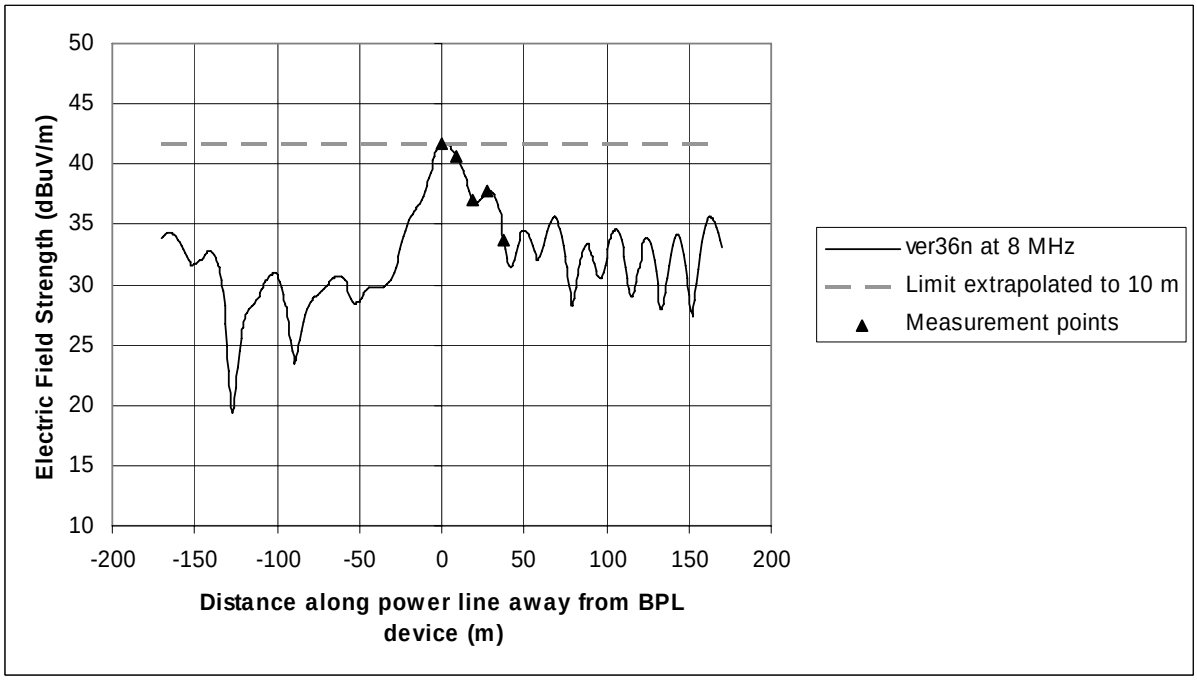

Figure B-24: Vertical electric field strength along power line for ver36n topology

10 MHz Plots

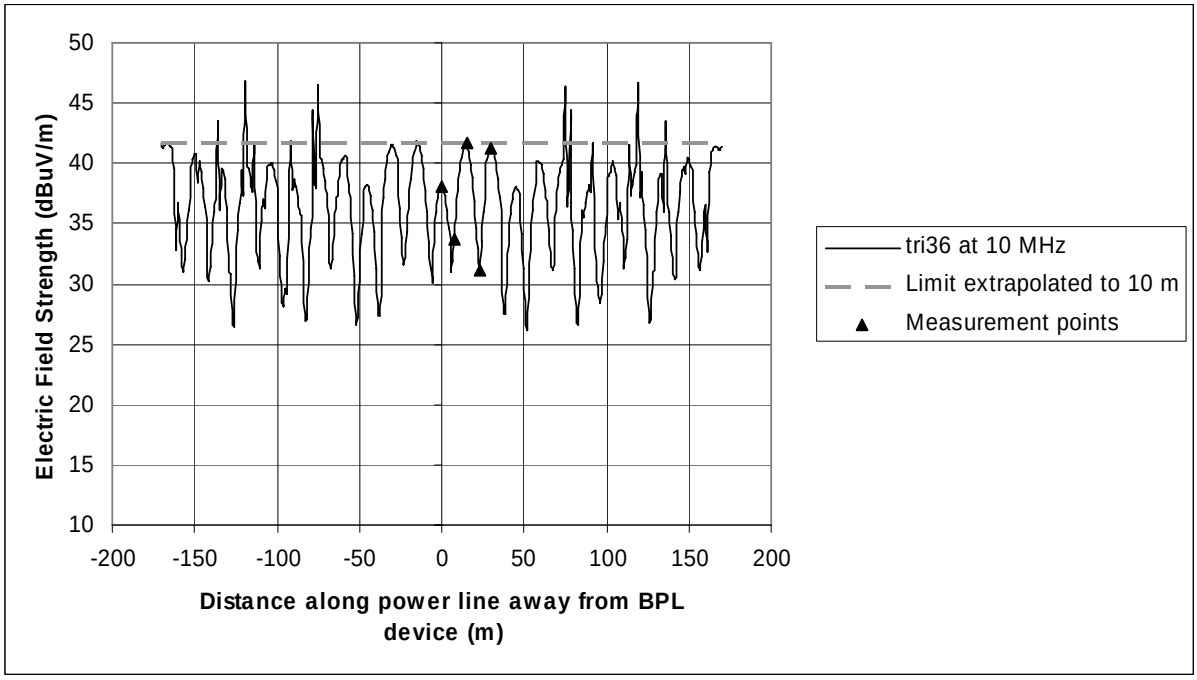

Figure B-25: Vertical electric field strength along power line for tri36 topology

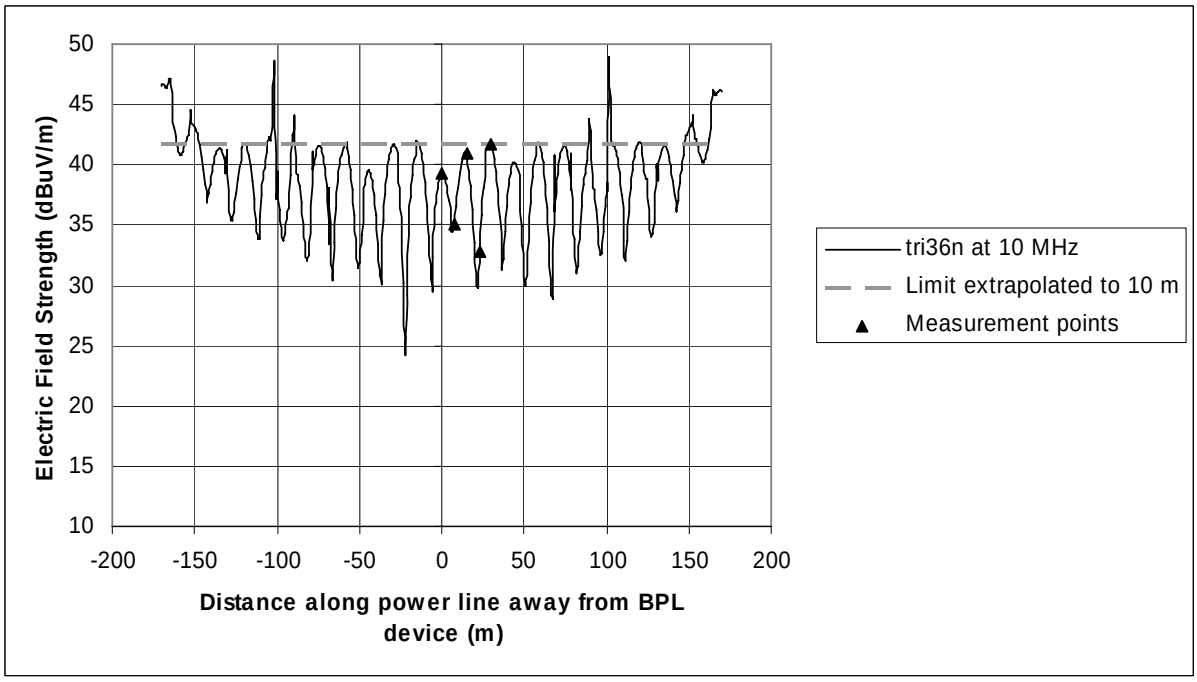

Figure B-26: Vertical electric field strength along power line for tri36n topology

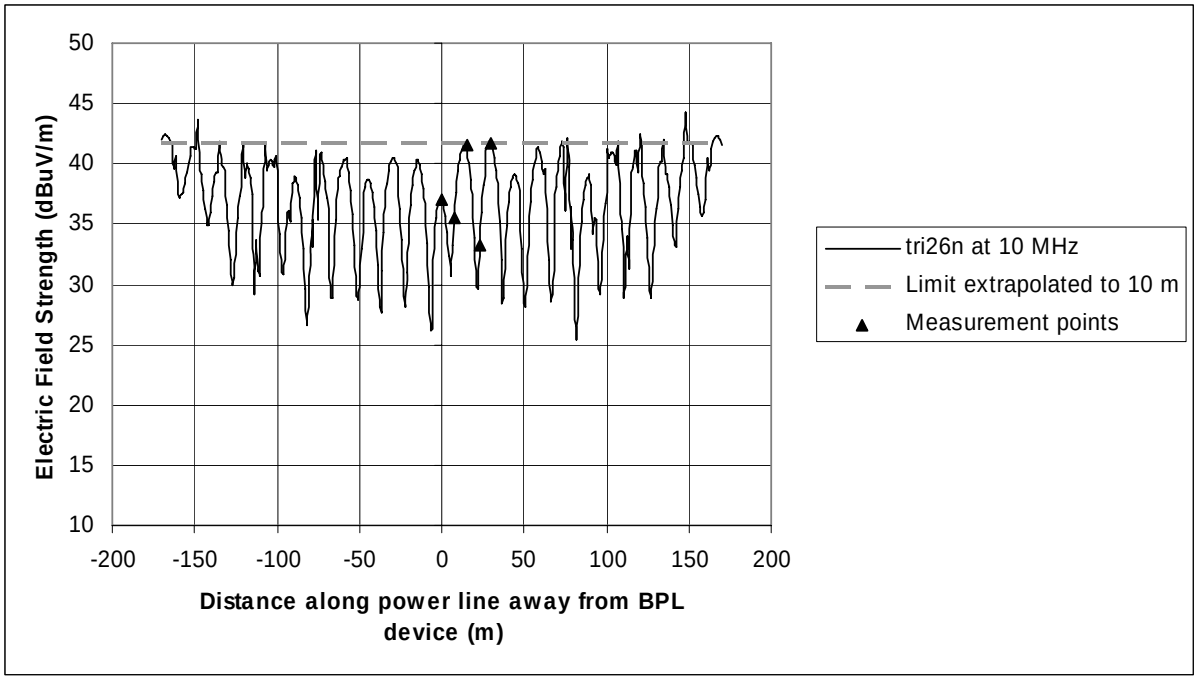

Figure B-27: Vertical electric field strength along power line for tri26n topology

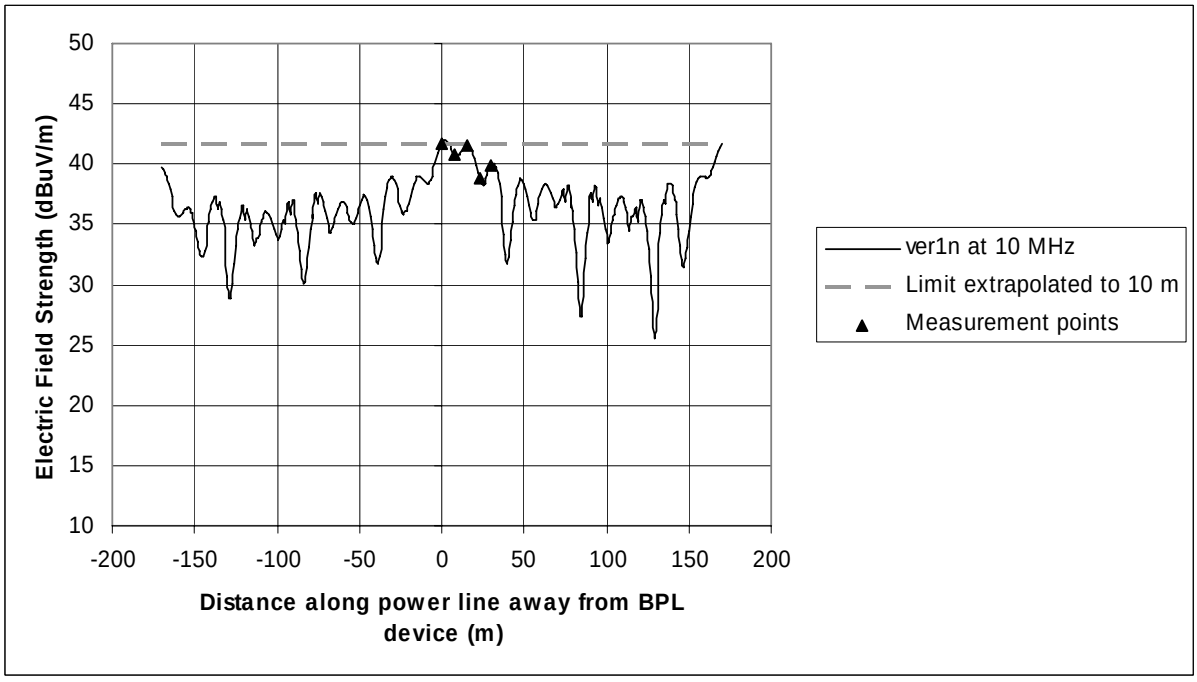

Figure B-28: Vertical electric field strength along power line for ver1n topology

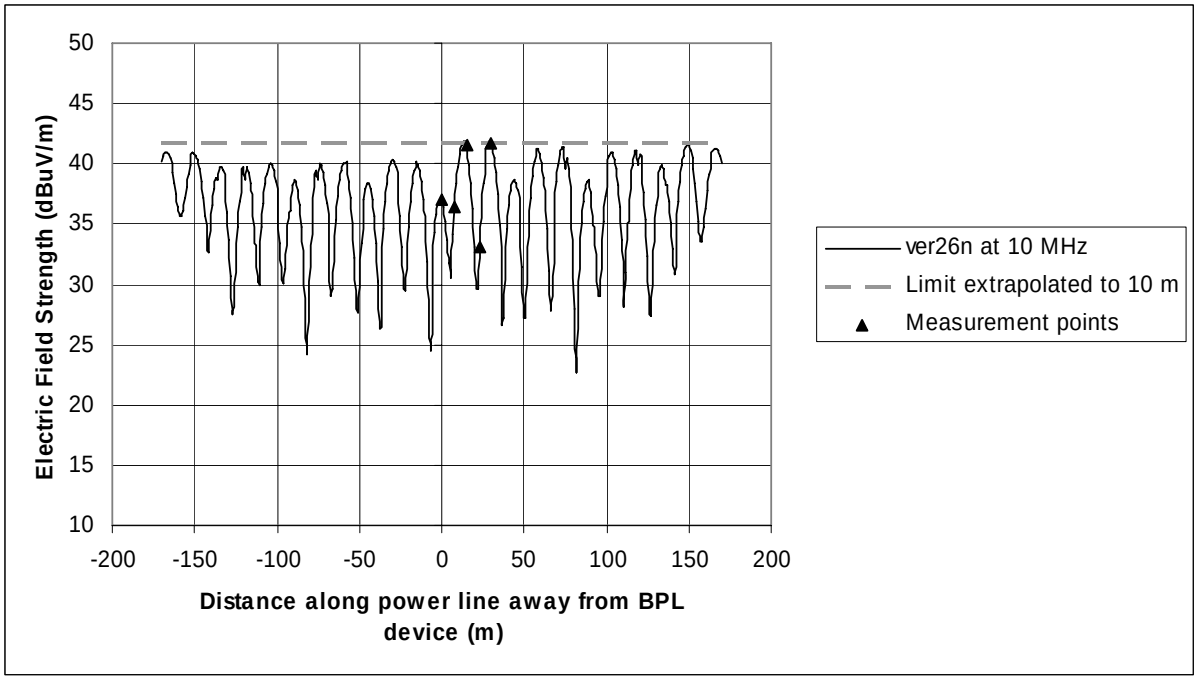

Figure B-29: Vertical electric field strength along power line for ver26n topology

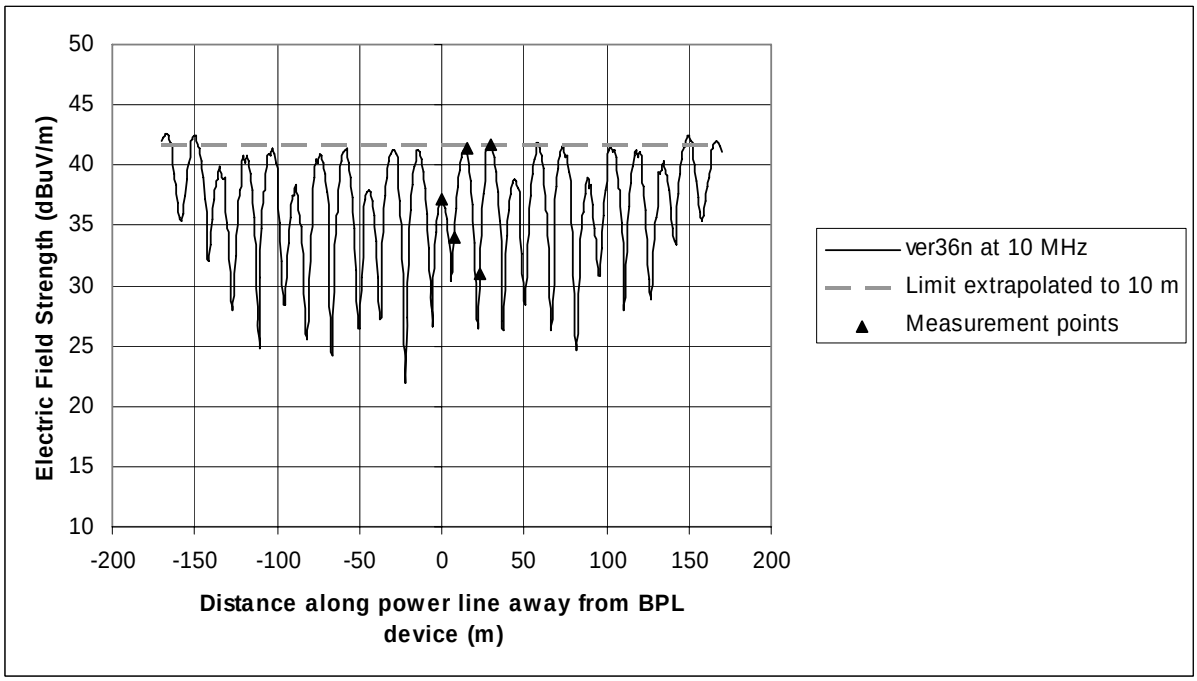

Figure B-30: Vertical electric field strength along power line for ver36n topology

12 MHz Plots

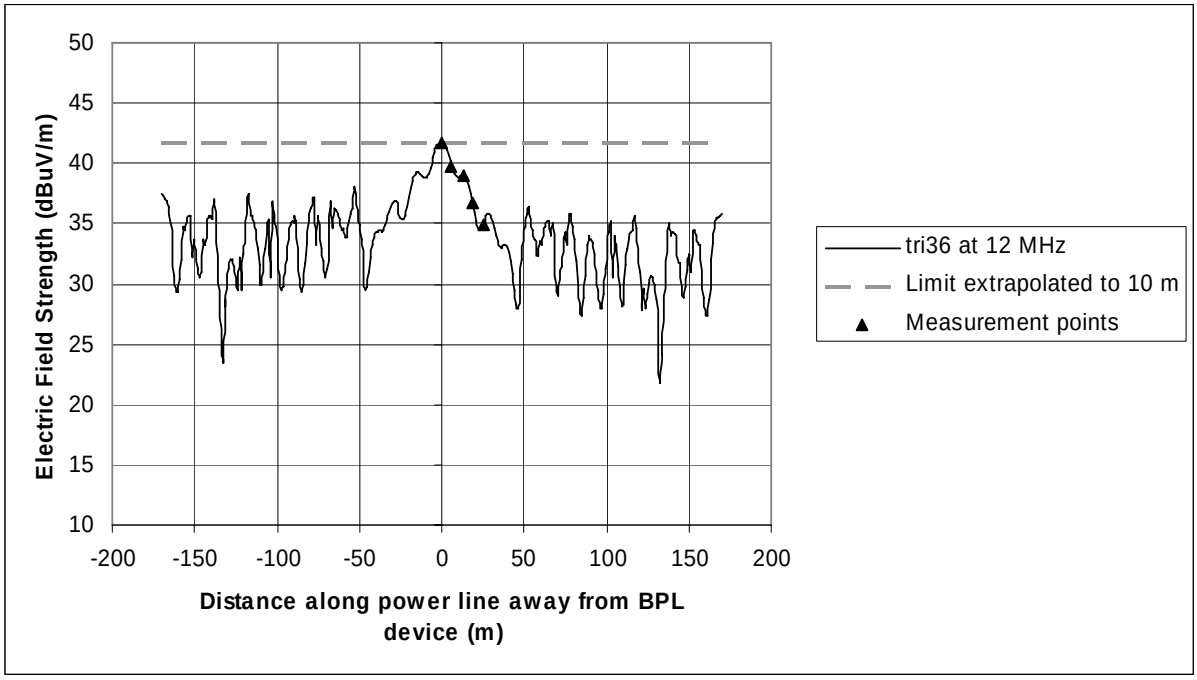

Figure B-31: Vertical electric field strength along power line for tri36 topology

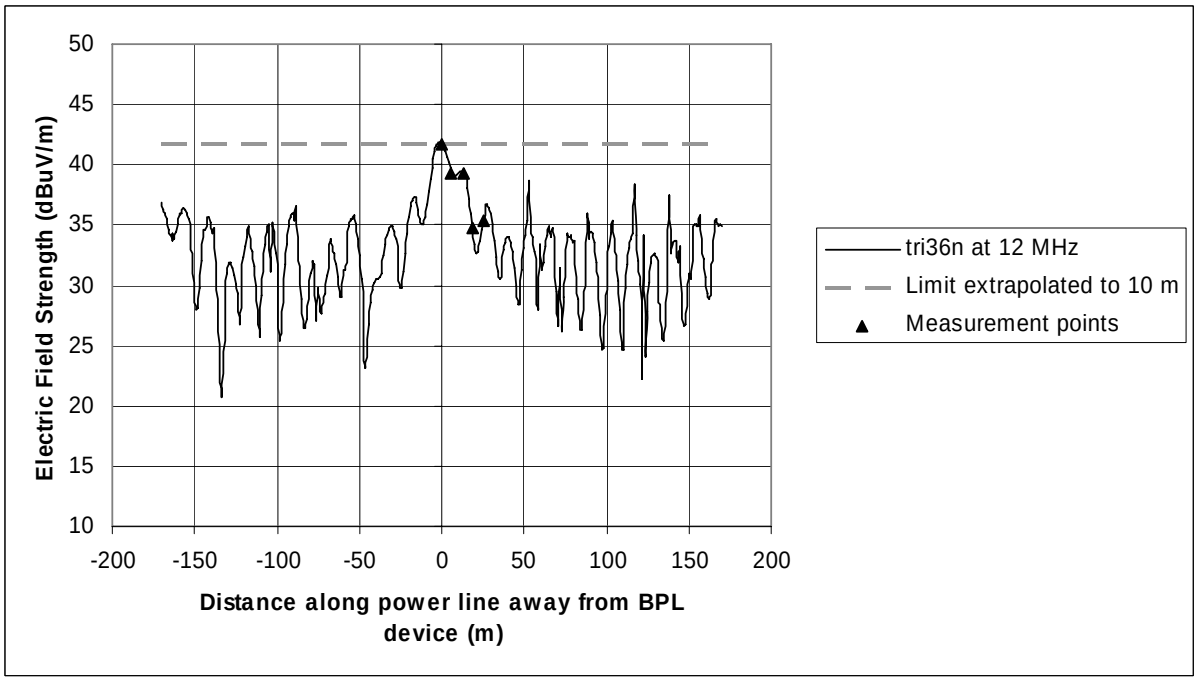

Figure B-32: Vertical electric field strength along power line for tri36n topology

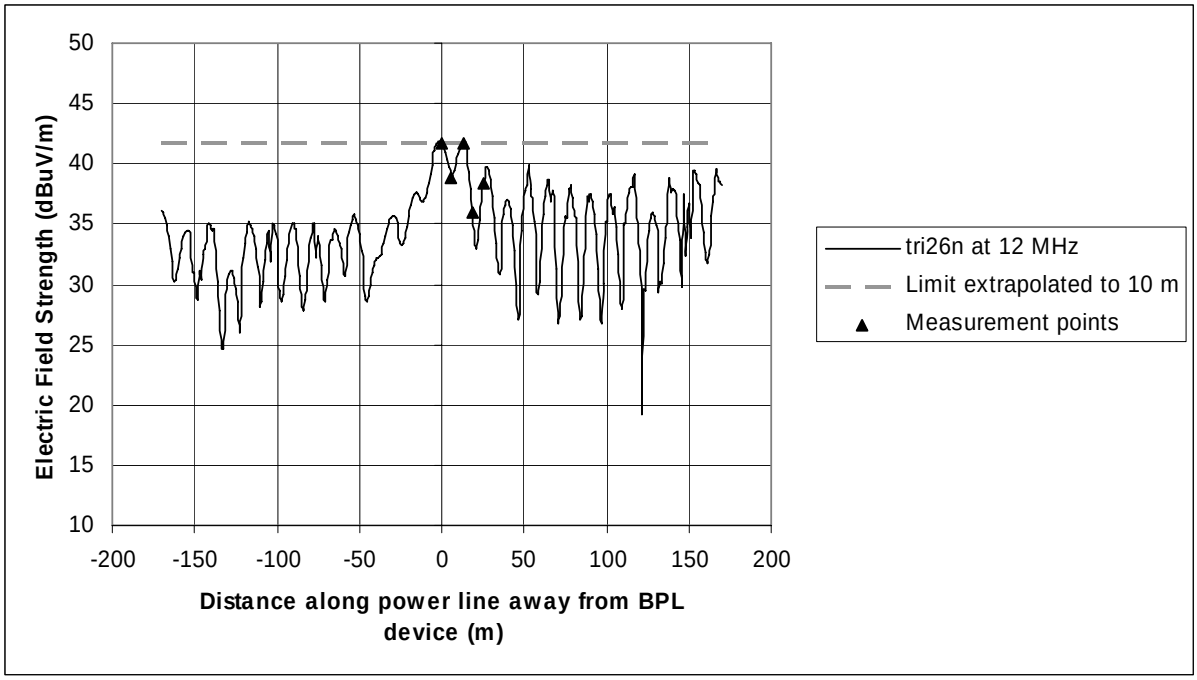

Figure B-33: Vertical electric field strength along power line for tri26n topology

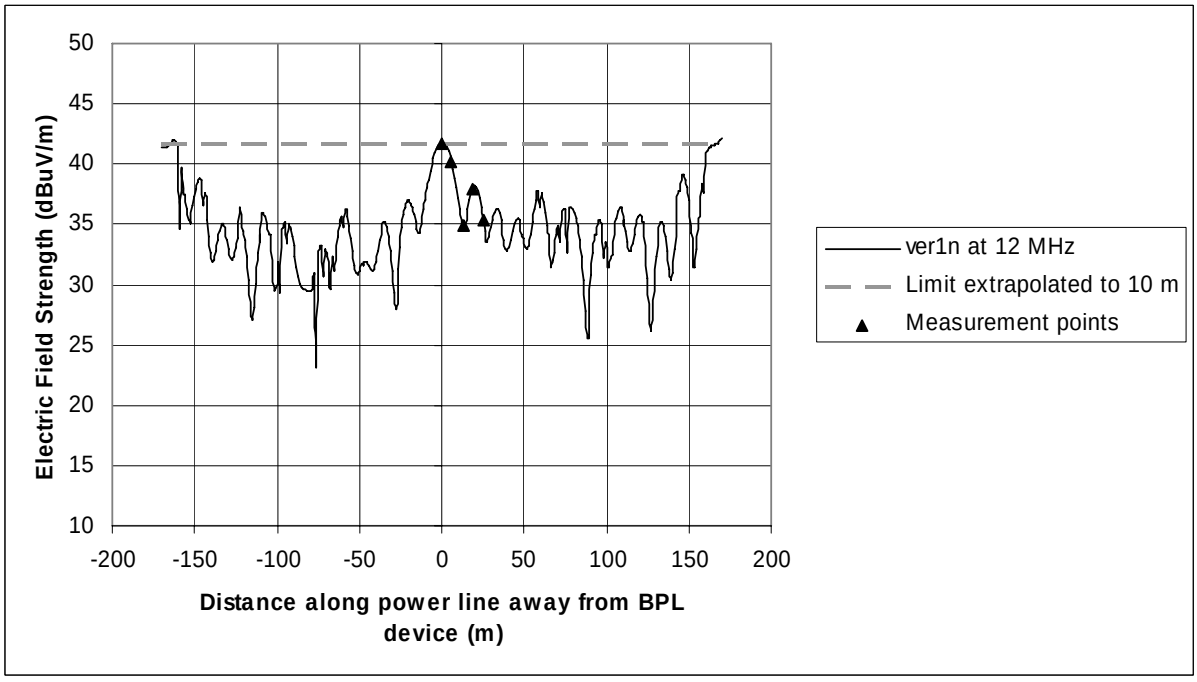

Figure B-34: Vertical electric field strength along power line for ver1n topology

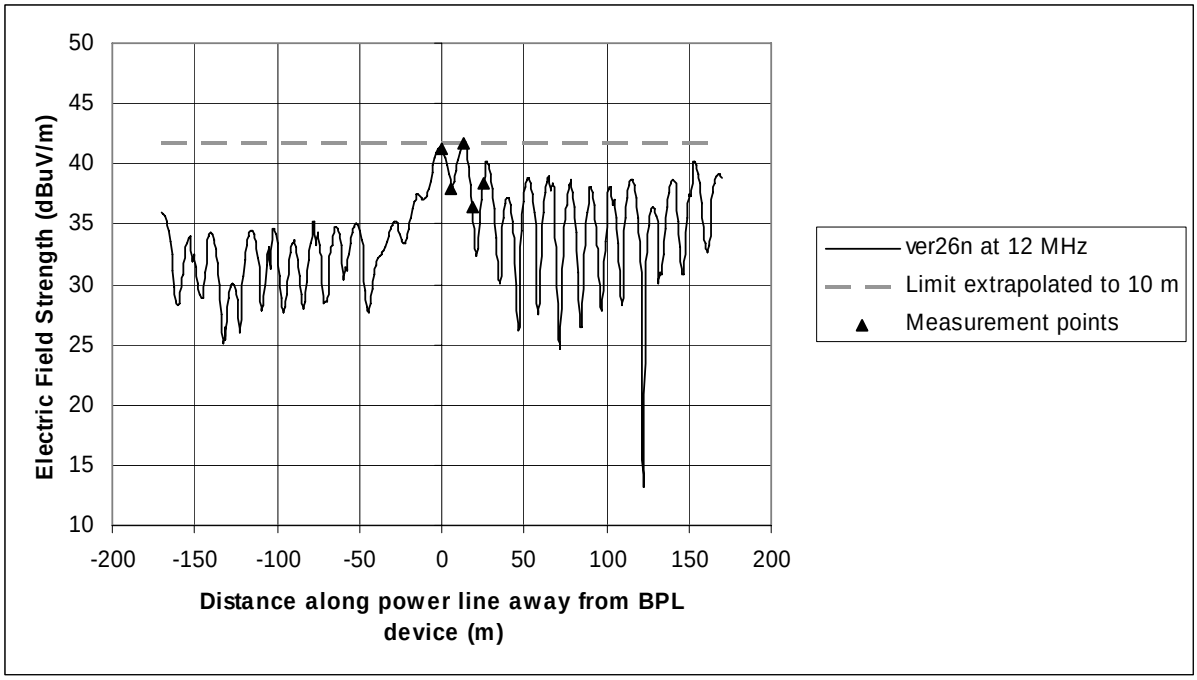

Figure B-35: Vertical electric field strength along power line for ver26n topology

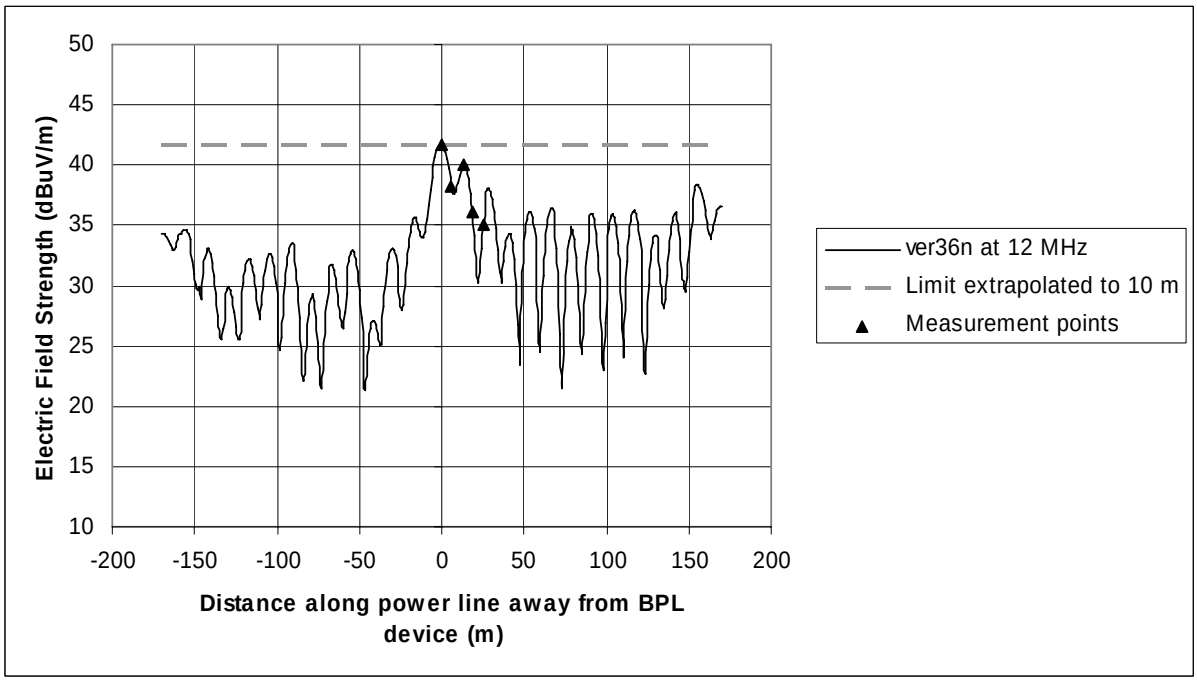

Figure B-36: Vertical electric field strength along power line for ver36n topology

14 MHz Plots

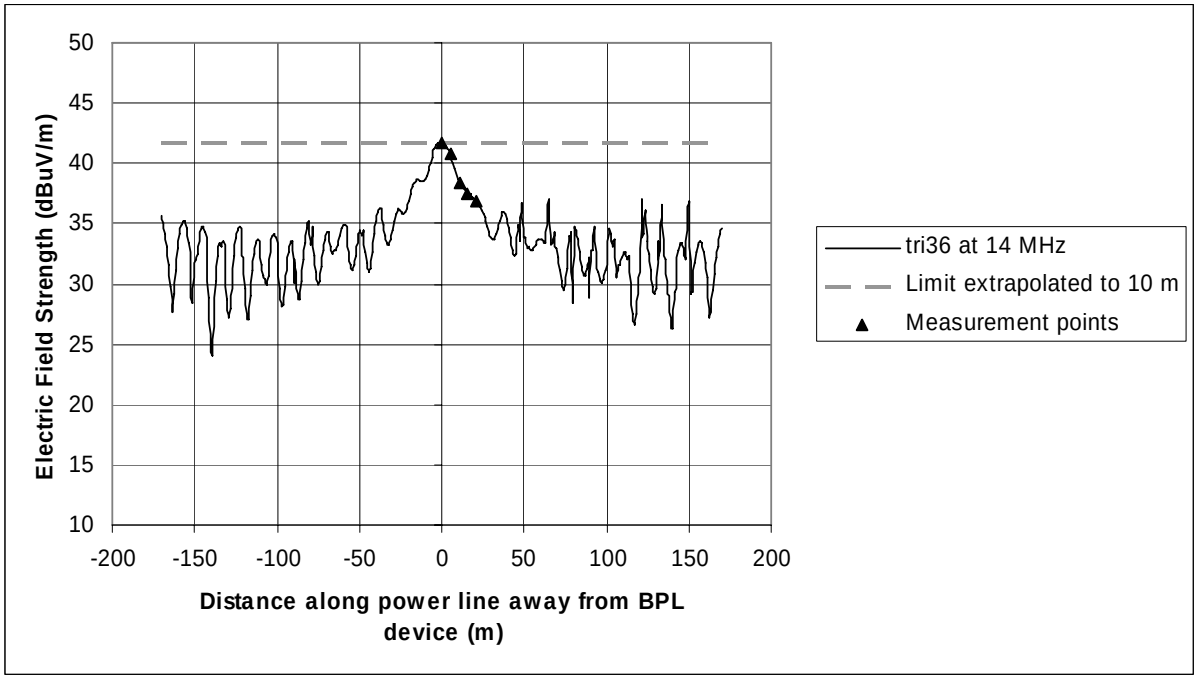

Figure B-37: Vertical electric field strength along power line for tri36 topology

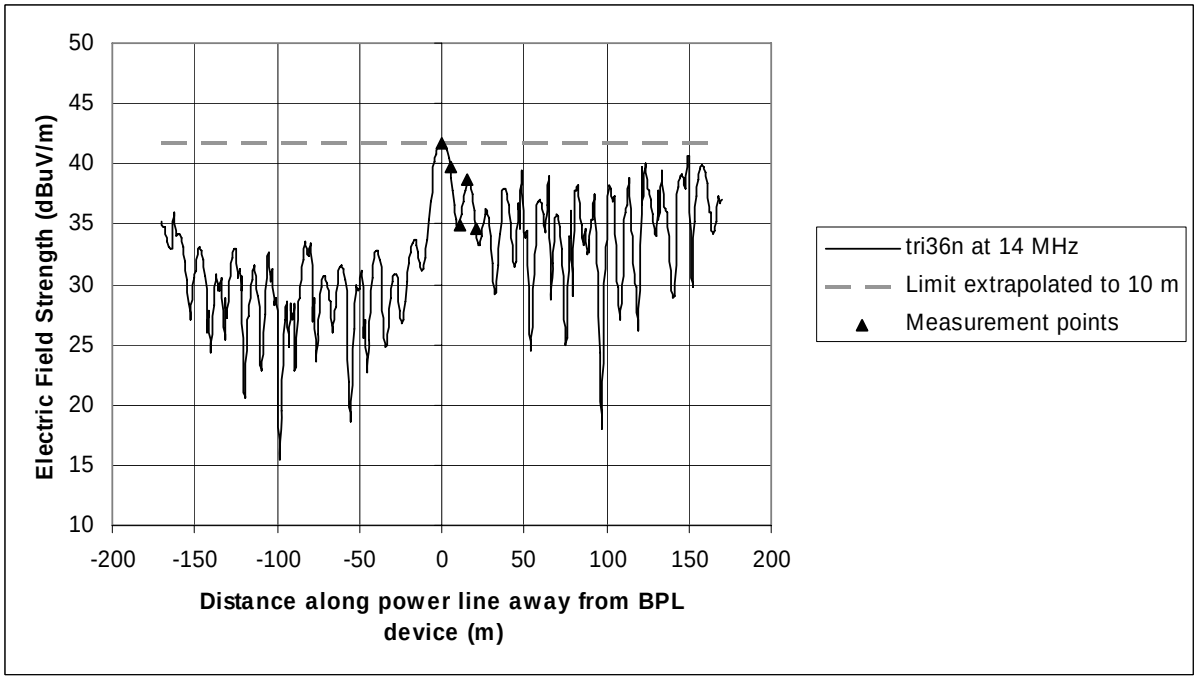

Figure B-38: Vertical electric field strength along power line for tri36n topology

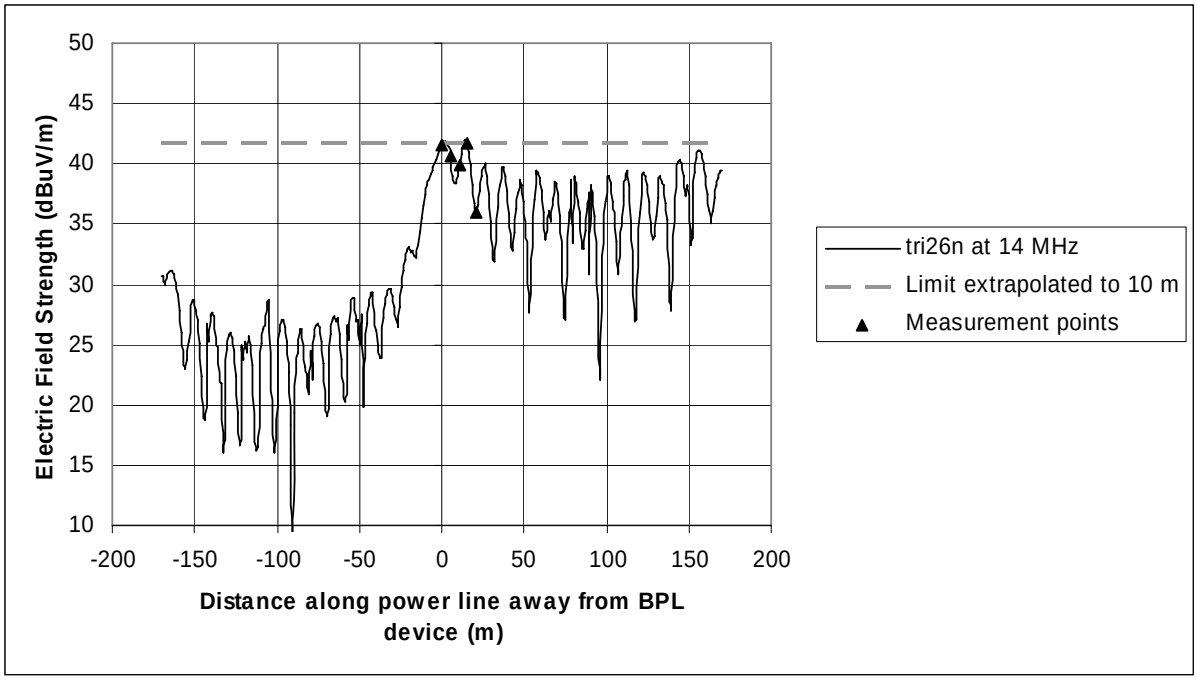

Figure B-39: Vertical electric field strength along power line for tri26n topology

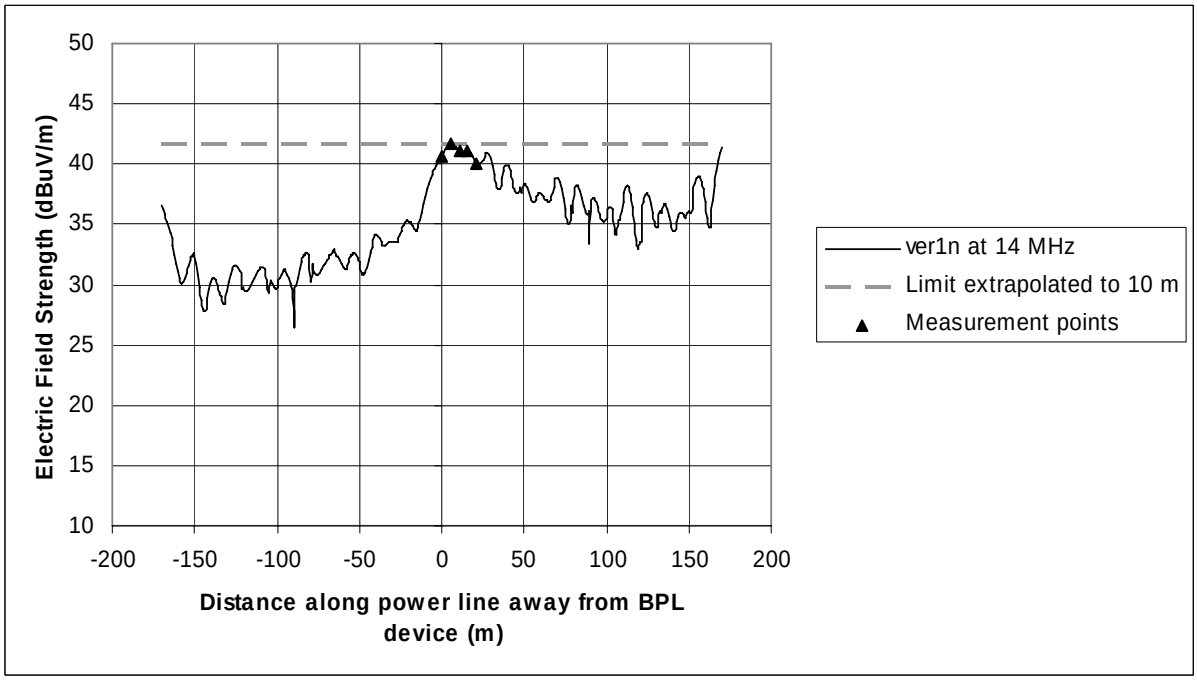

Figure B-40: Vertical electric field strength along power line for ver1n topology

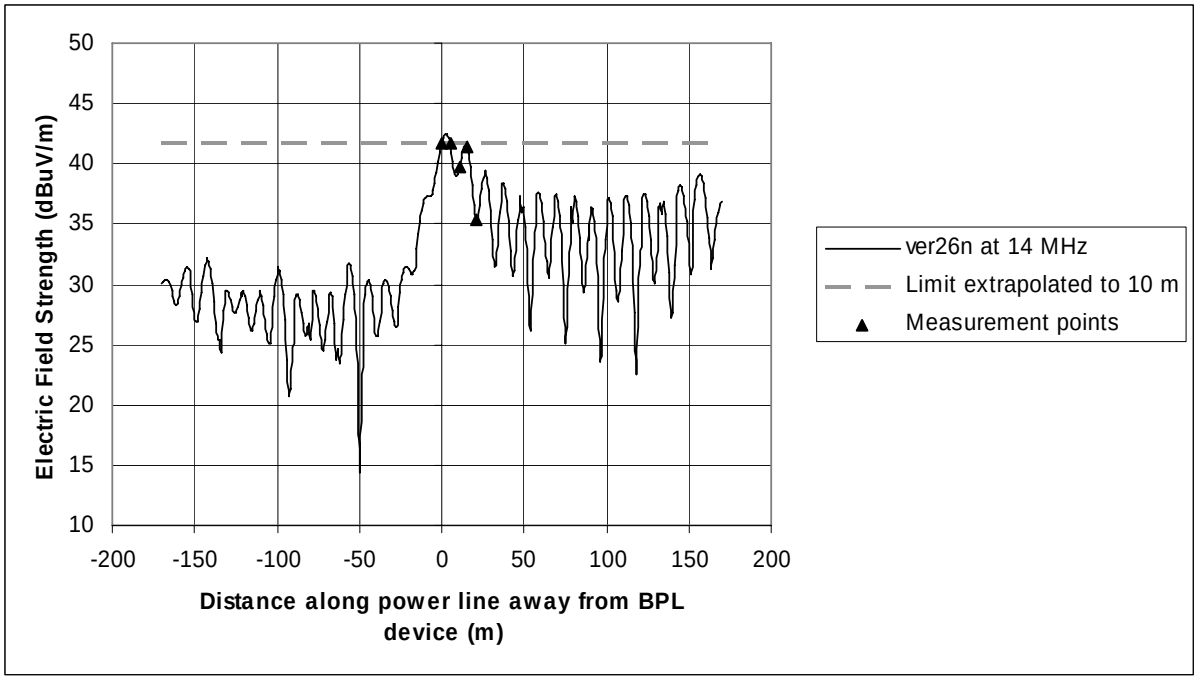

Figure B-41: Vertical electric field strength along power line for ver26n topology

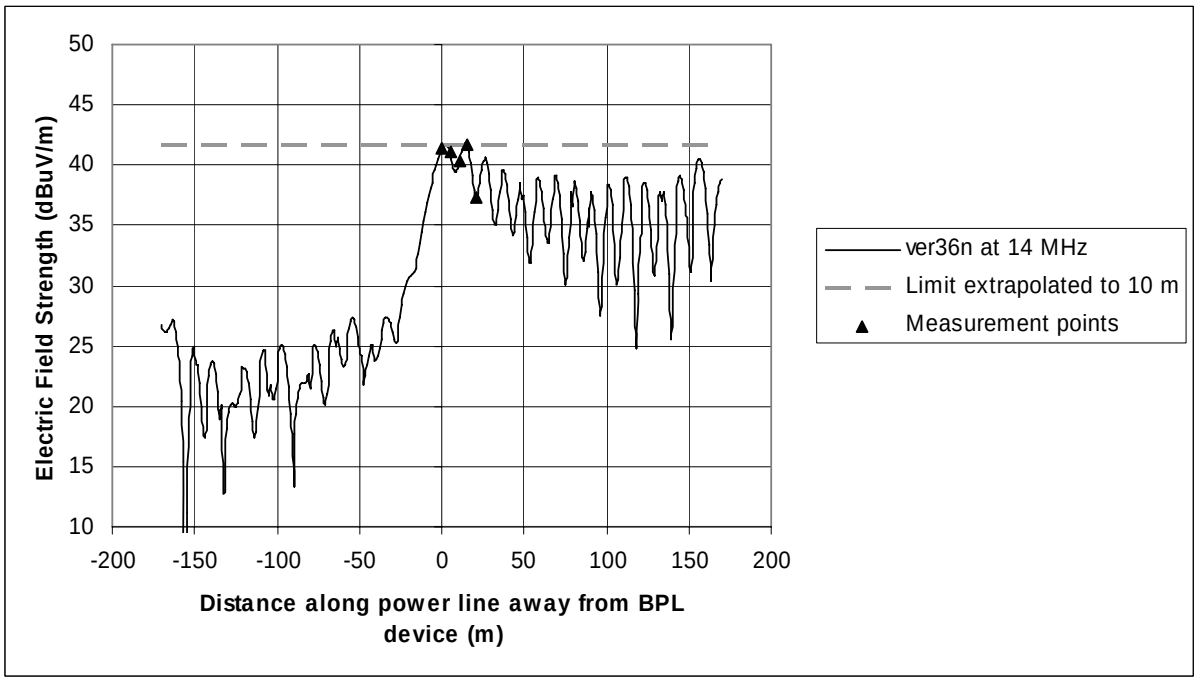

Figure B-42: Vertical electric field strength along power line for ver36n topology

16 MHz Plots

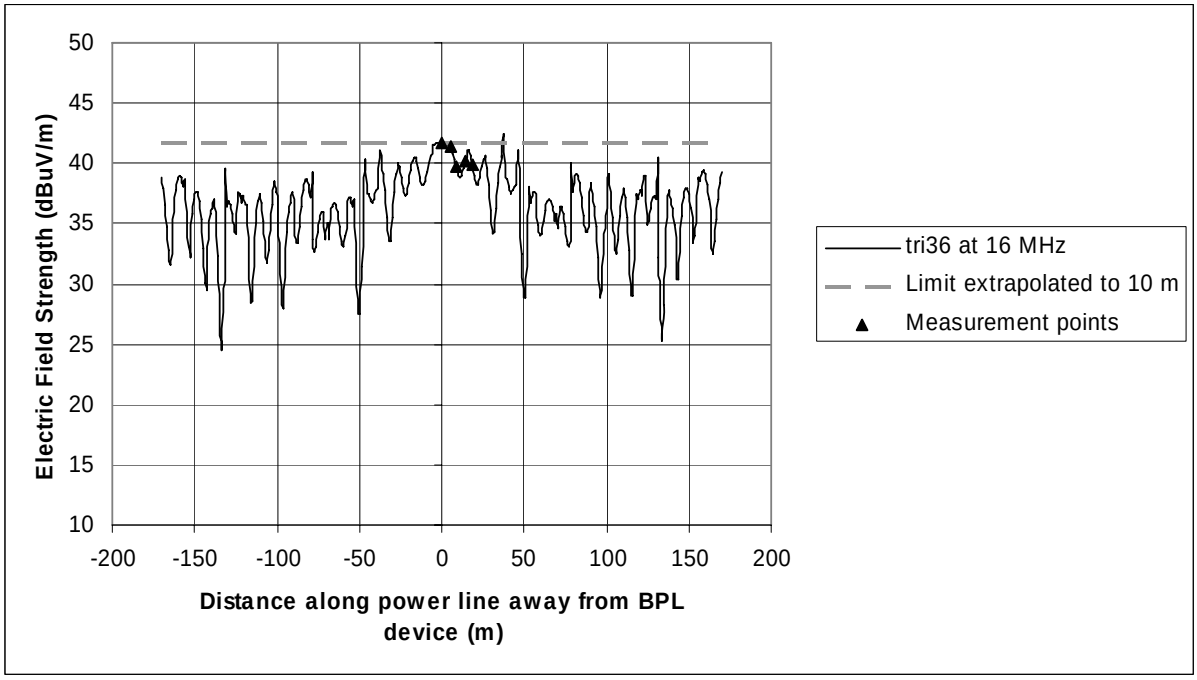

Figure B-43: Vertical electric field strength along power line for tri36 topology

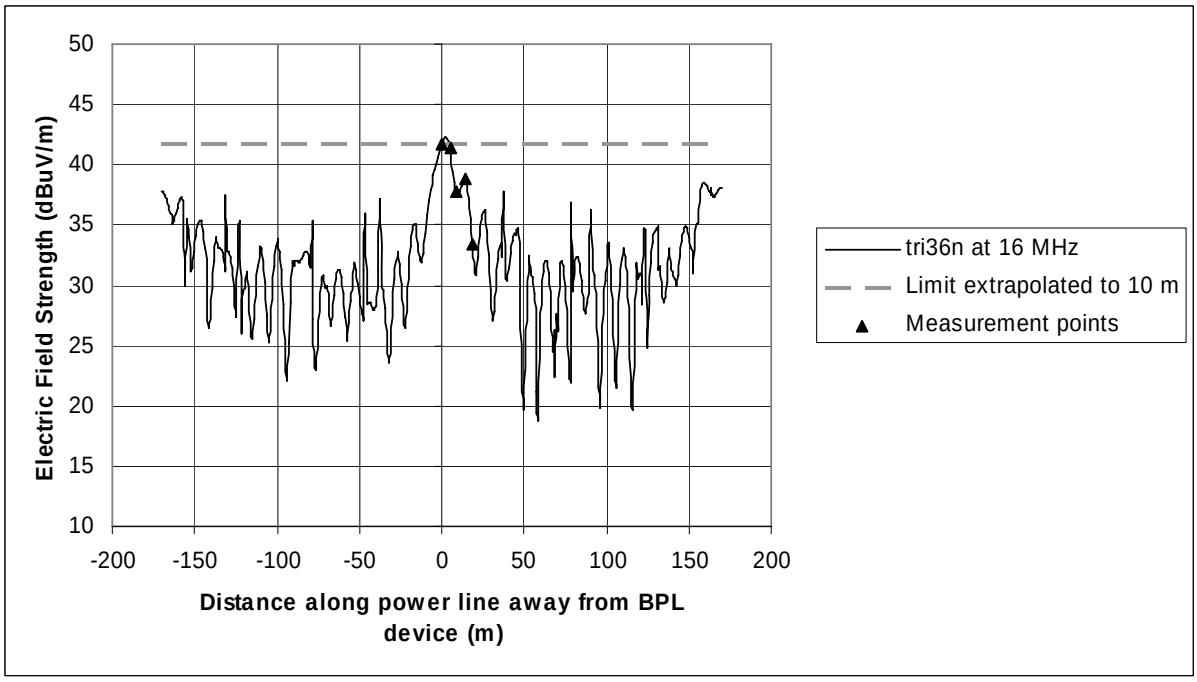

Figure B-44: Vertical electric field strength along power line for tri36n topology

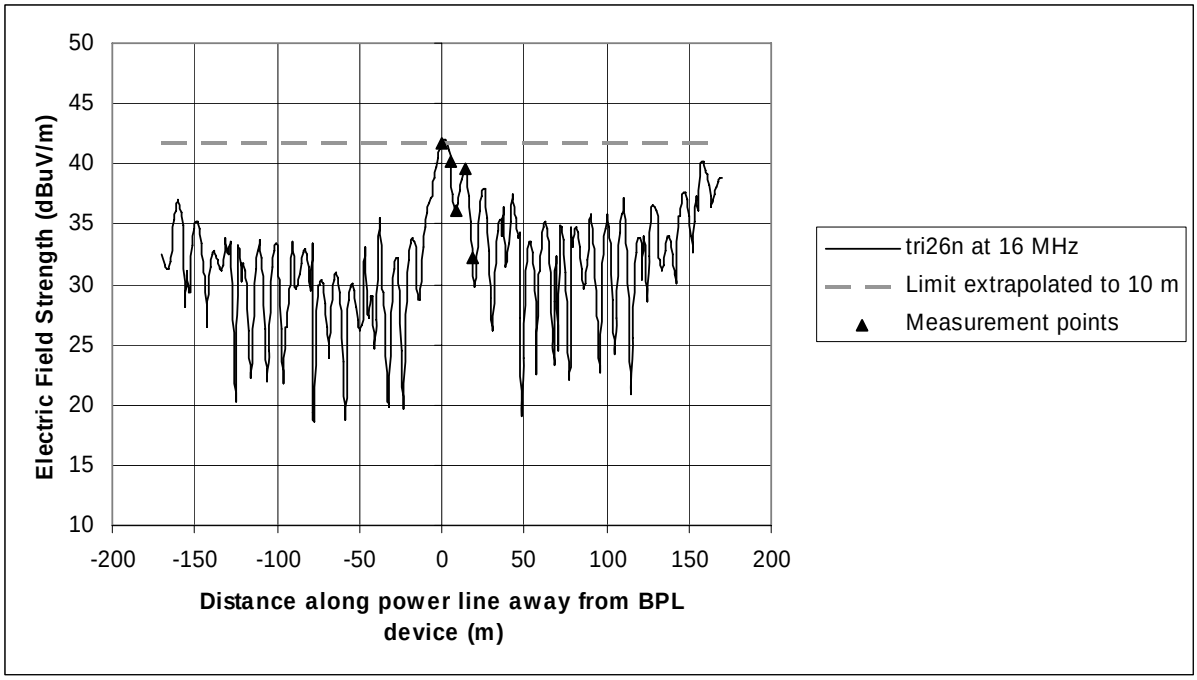

Figure B-45: Vertical electric field strength along power line for tri26n topology

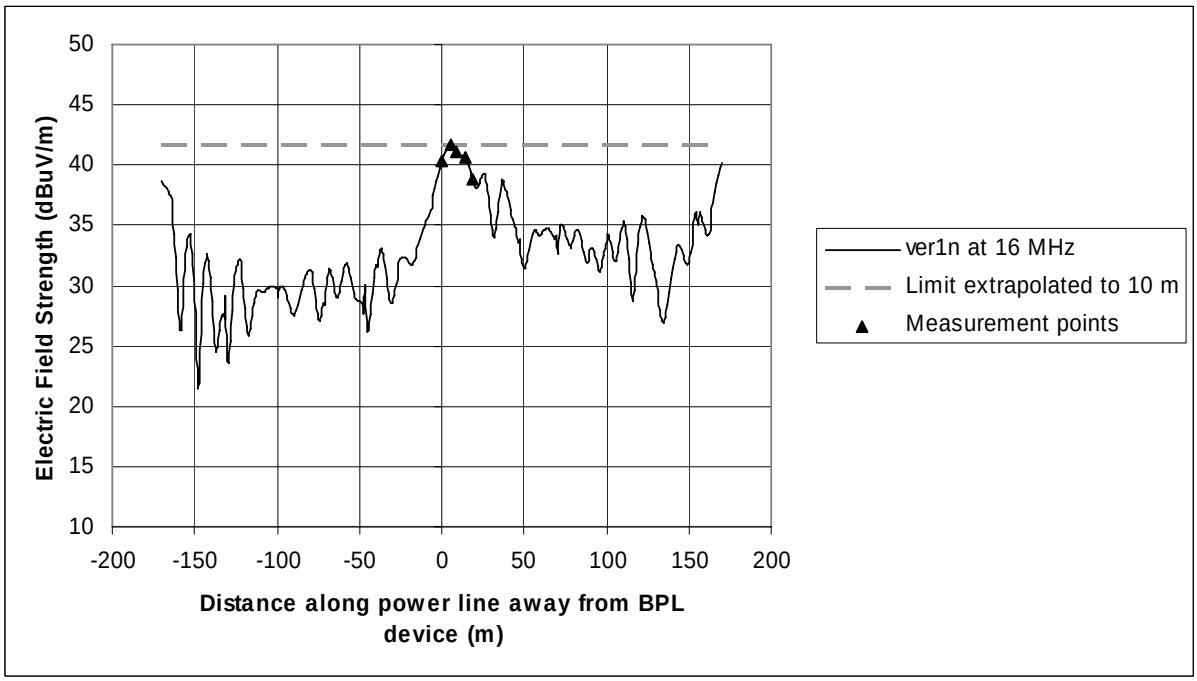

Figure B-46: Vertical electric field strength along power line for ver1n topology

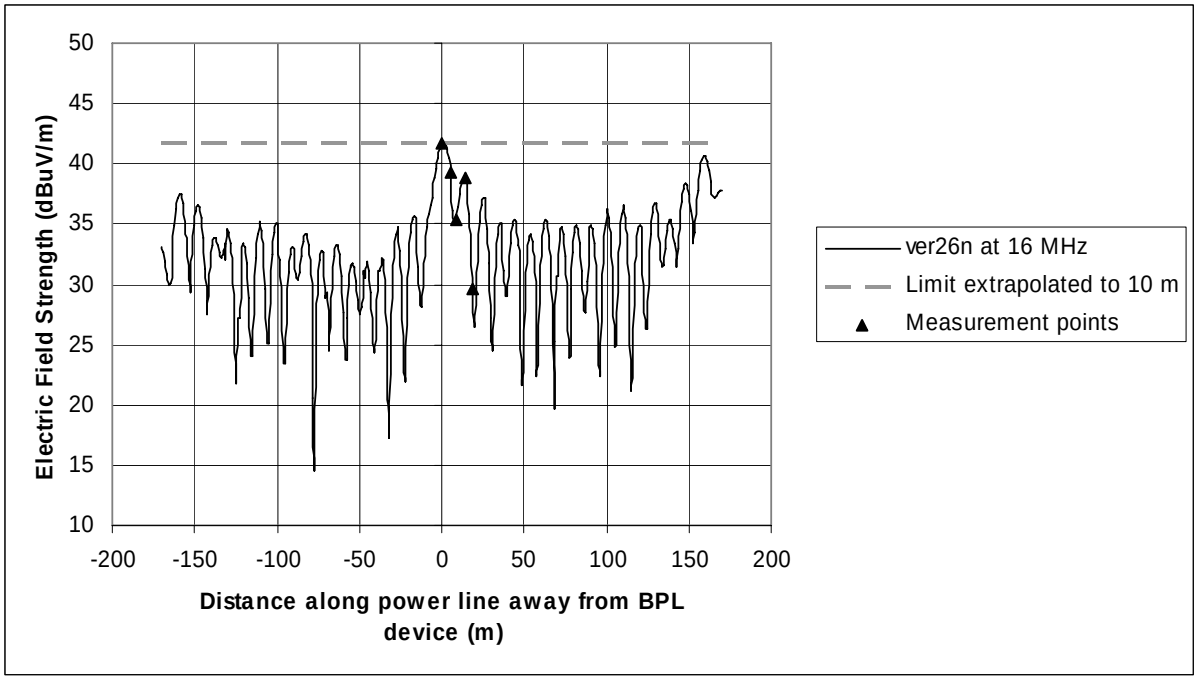

Figure B-47: Vertical electric field strength along power line for ver26n topology

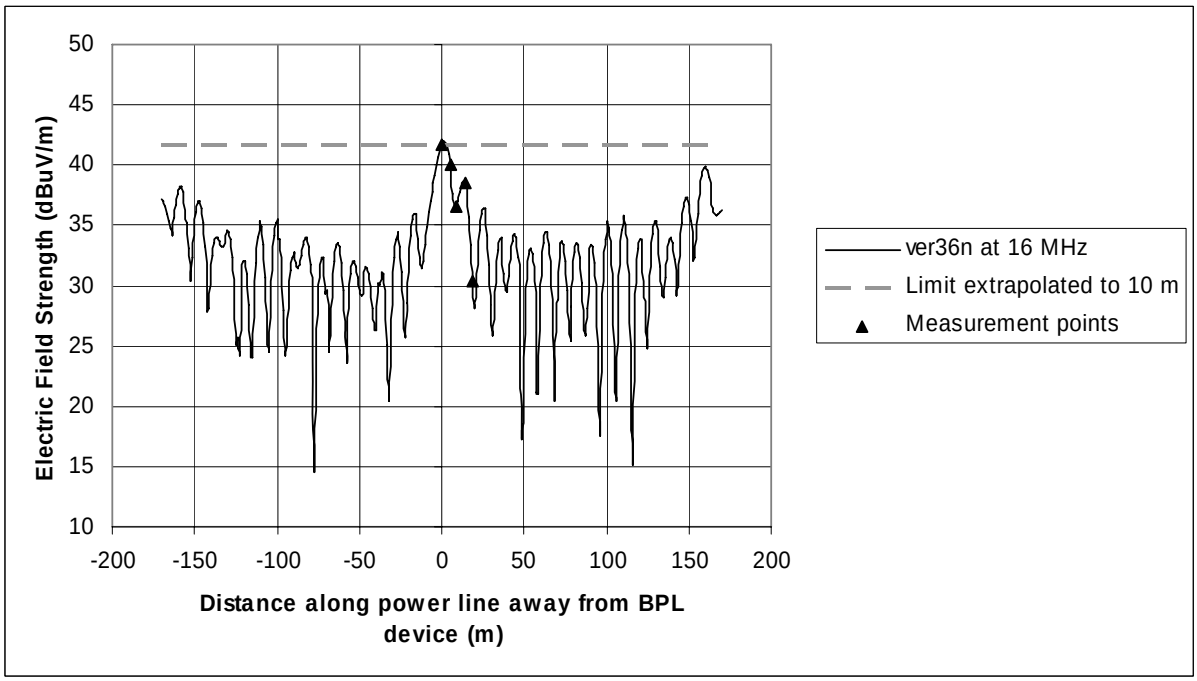

Figure B-48: Vertical electric field strength along power line for ver36n topology

18 MHz Plots

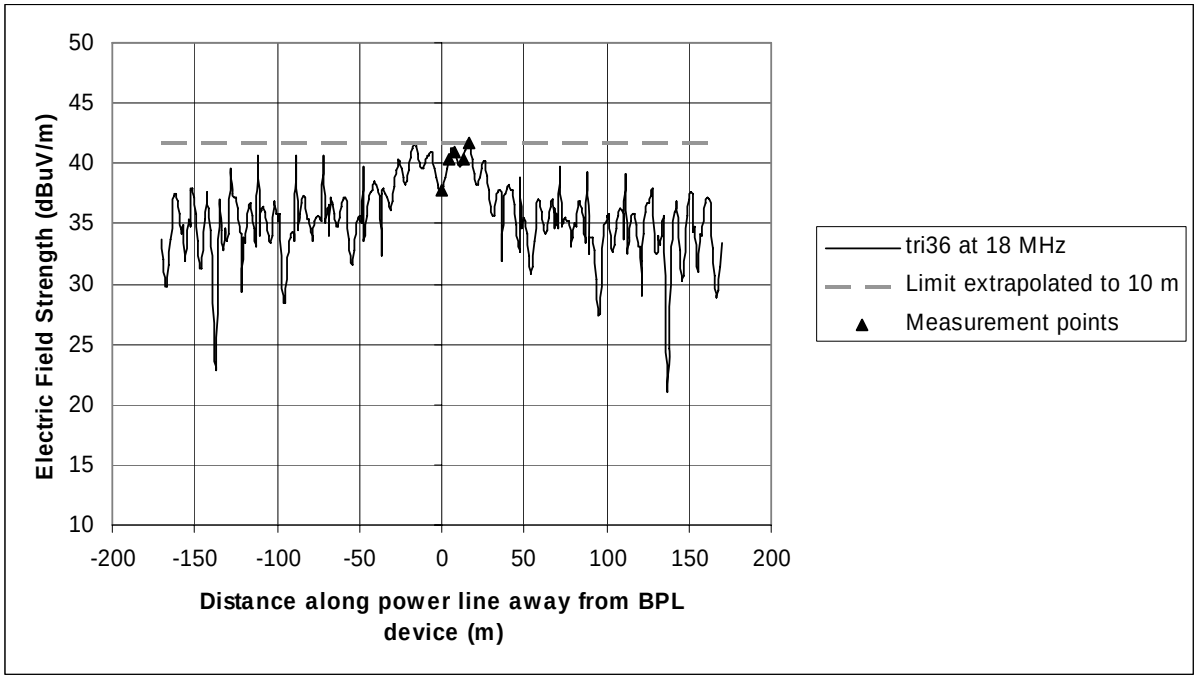

Figure B-49: Vertical electric field strength along power line for tri36 topology

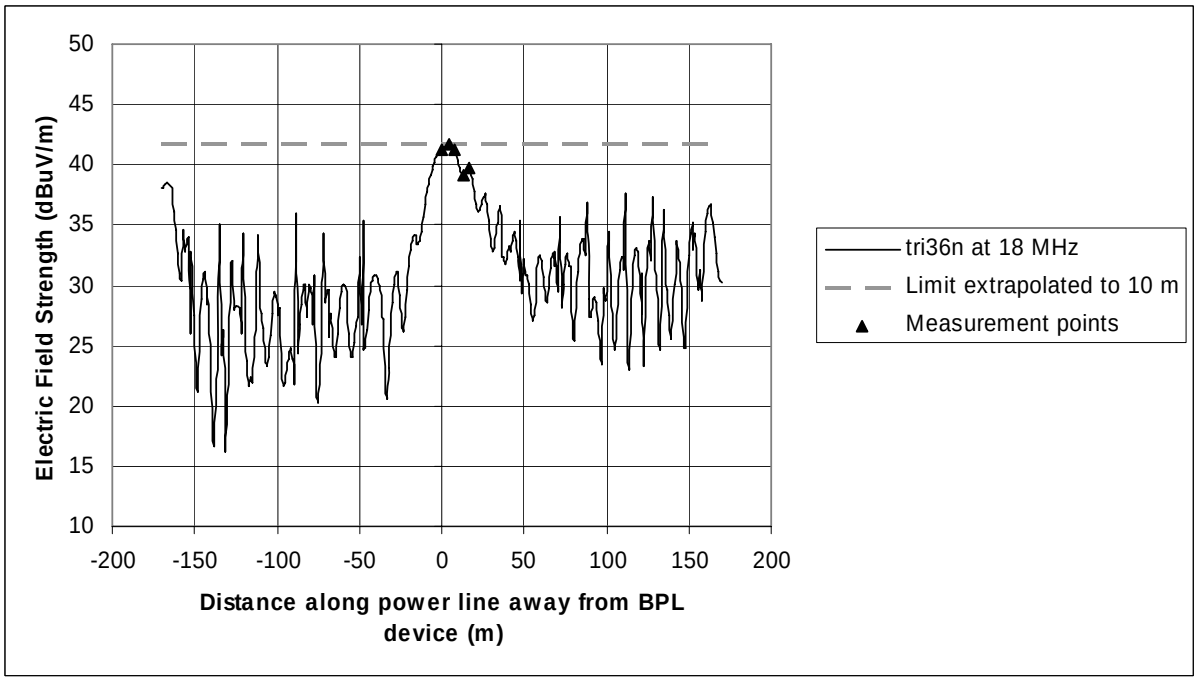

Figure B-50: Vertical electric field strength along power line for tri36n topology

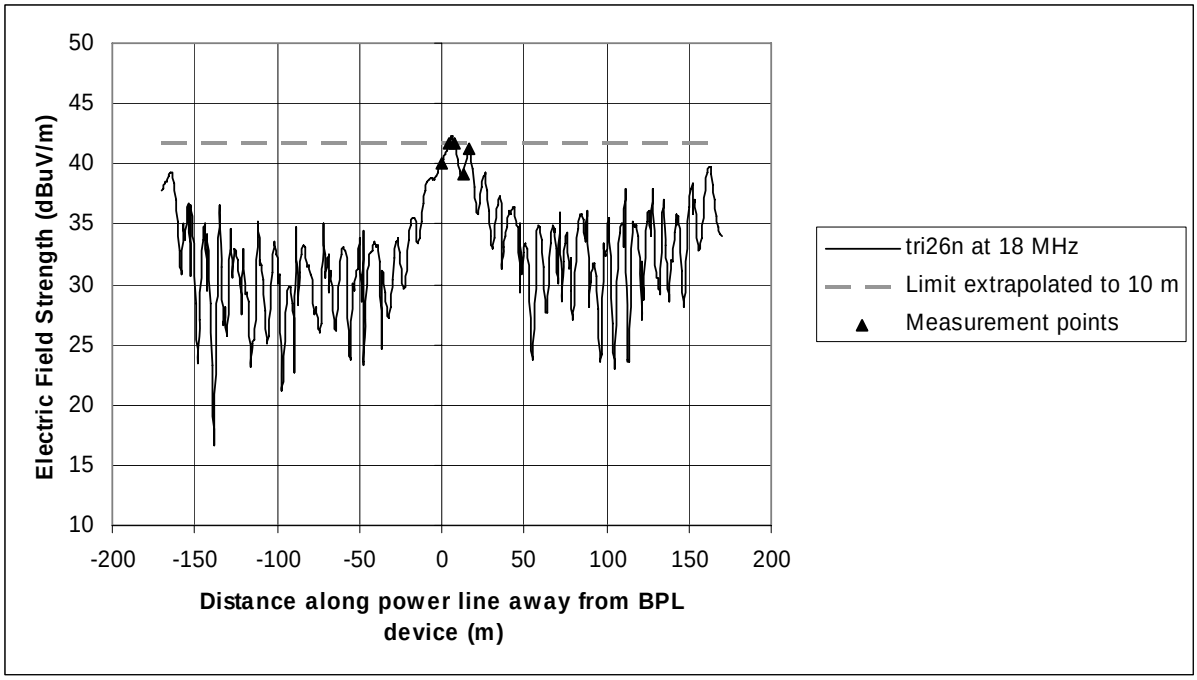

Figure B-51: Vertical electric field strength along power line for tri26n topology

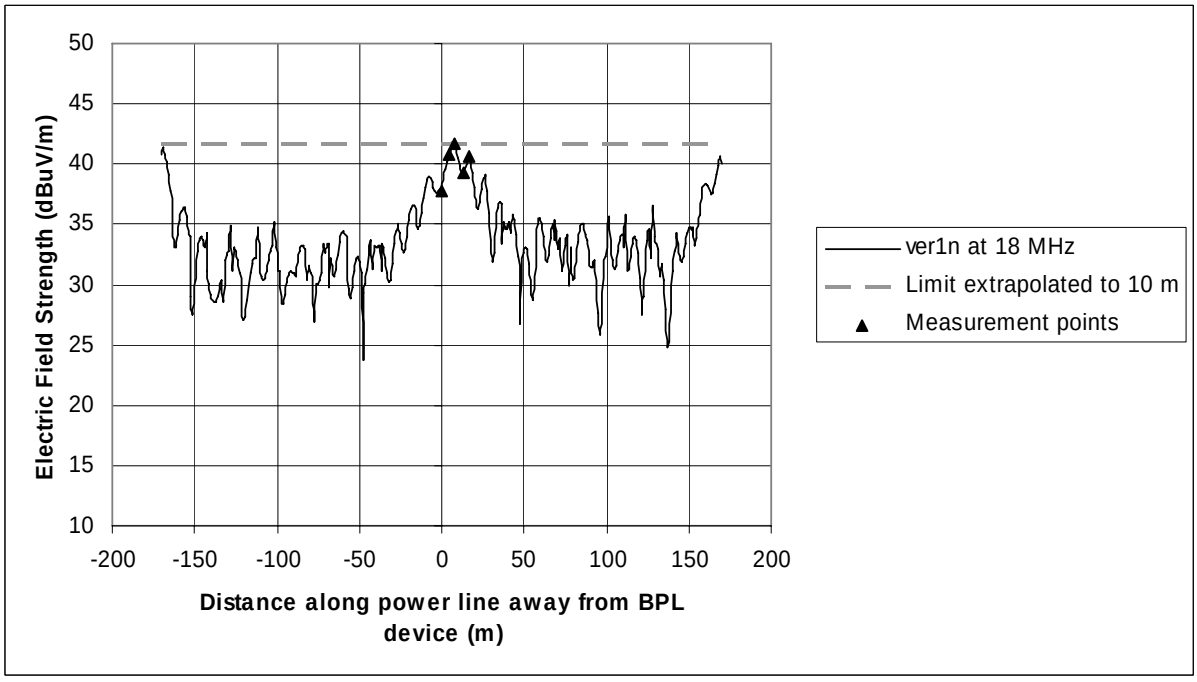

Figure B-52: Vertical electric field strength along power line for ver1n topology

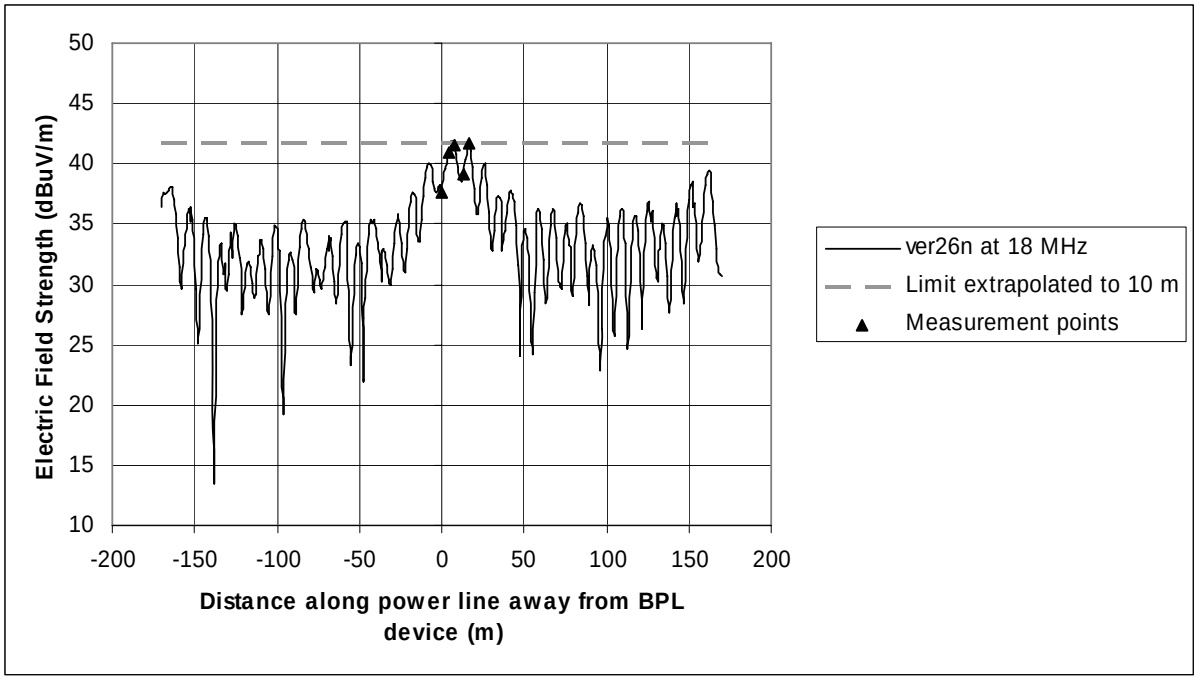

Figure B-53: Vertical electric field strength along power line for ver26n topology

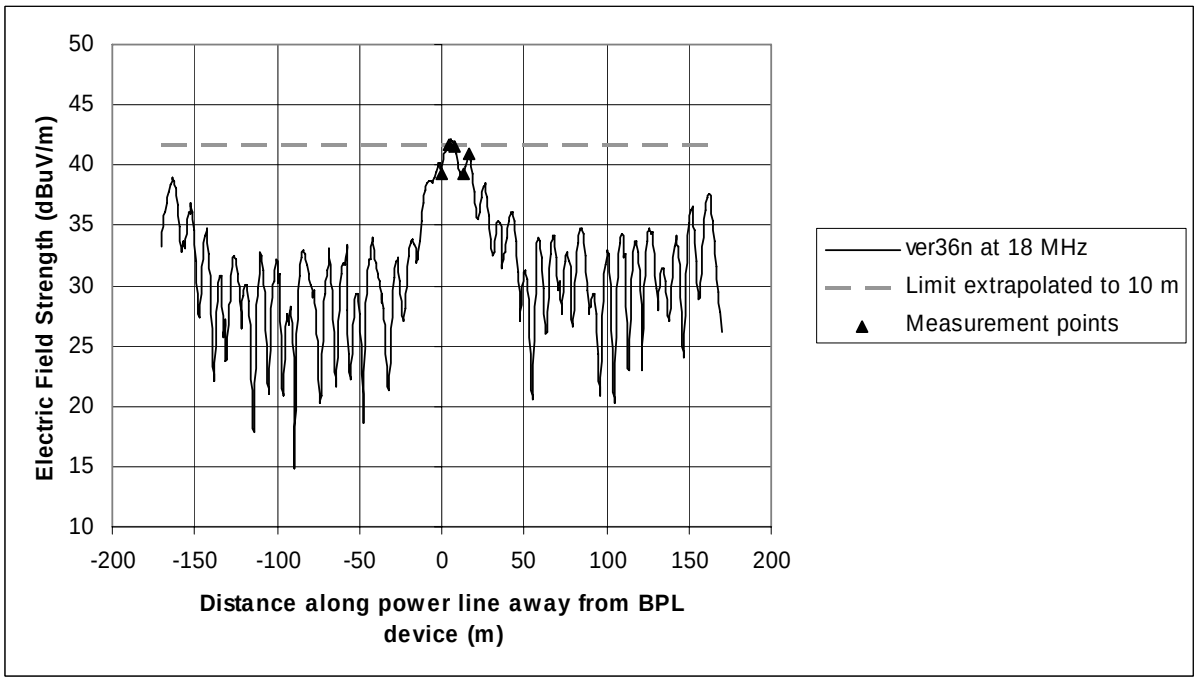

Figure B-54: Vertical electric field strength along power line for ver3n topology

20 MHz Plots

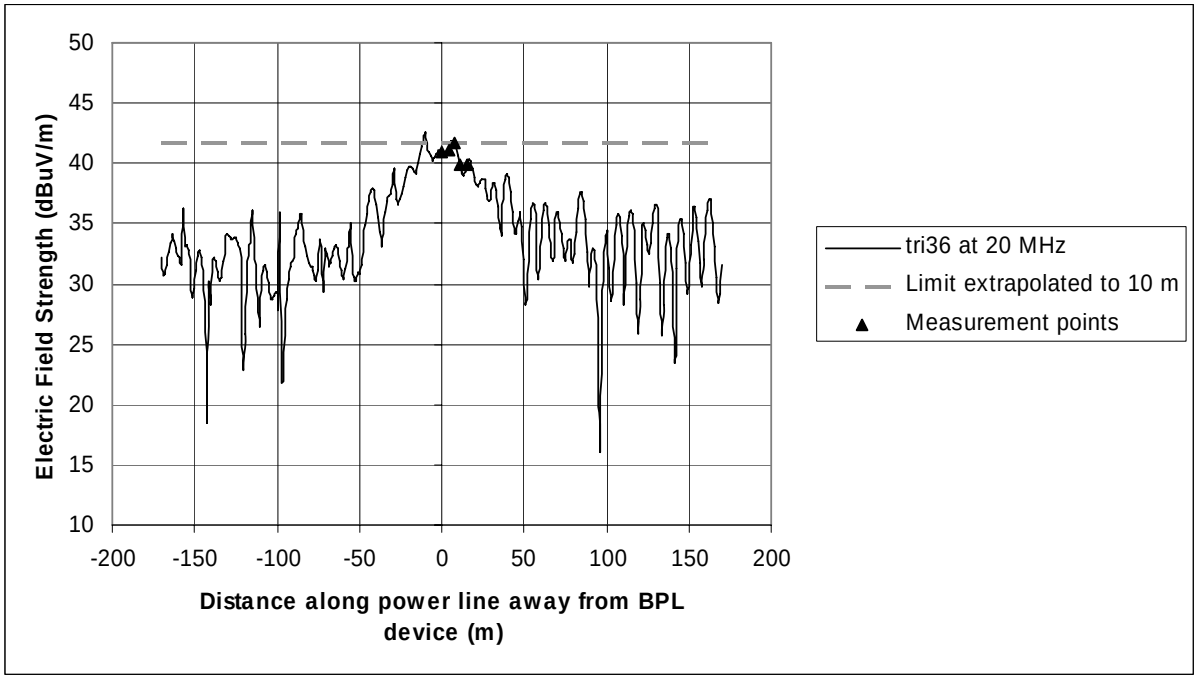

Figure B-55: Vertical electric field strength along power line for tri36 topology

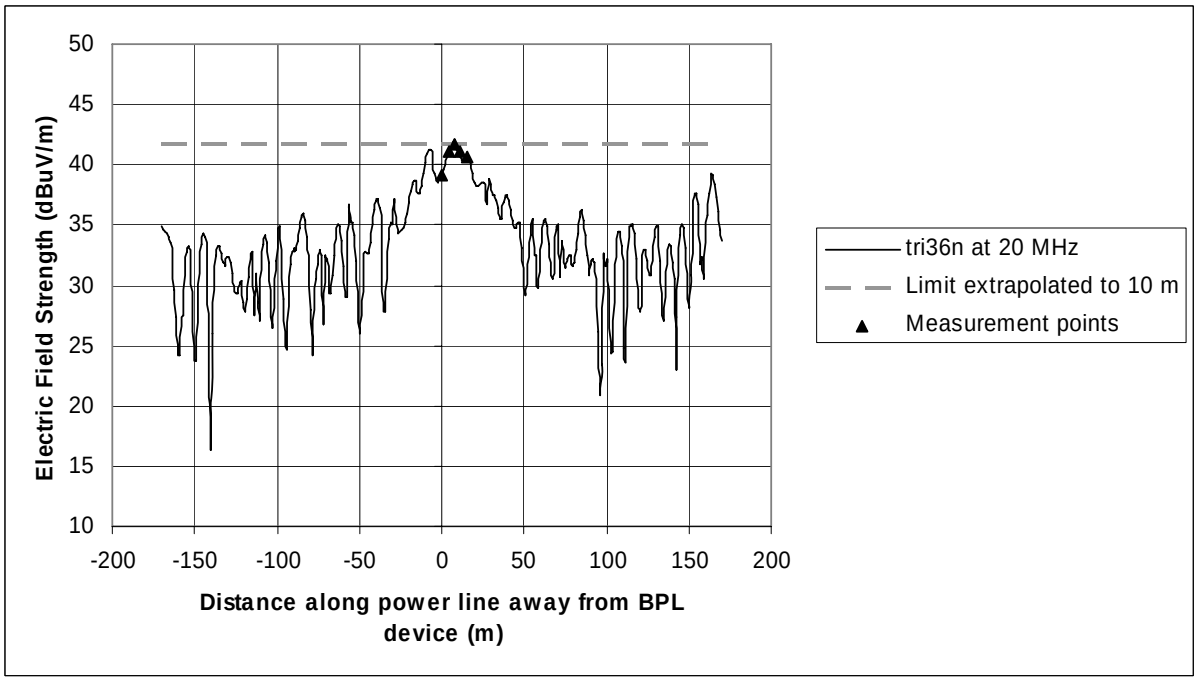

Figure B-56: Vertical electric field strength along power line for tri36n topology

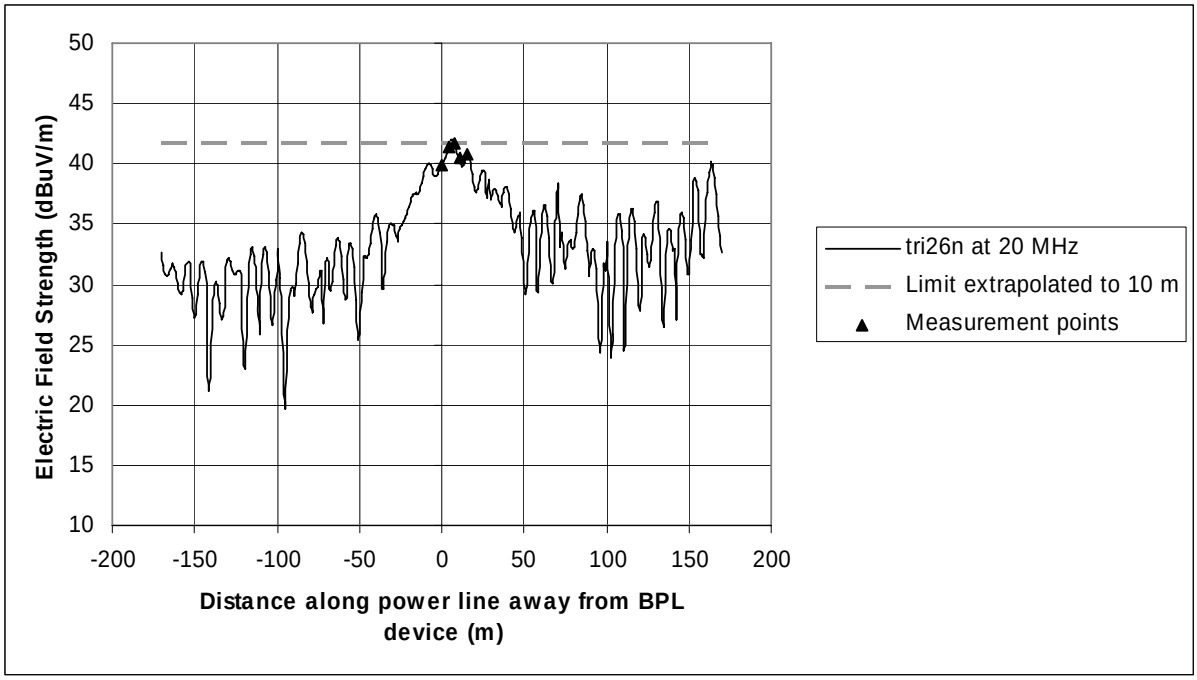

Figure B-57: Vertical electric field strength along power line for tri26n topology

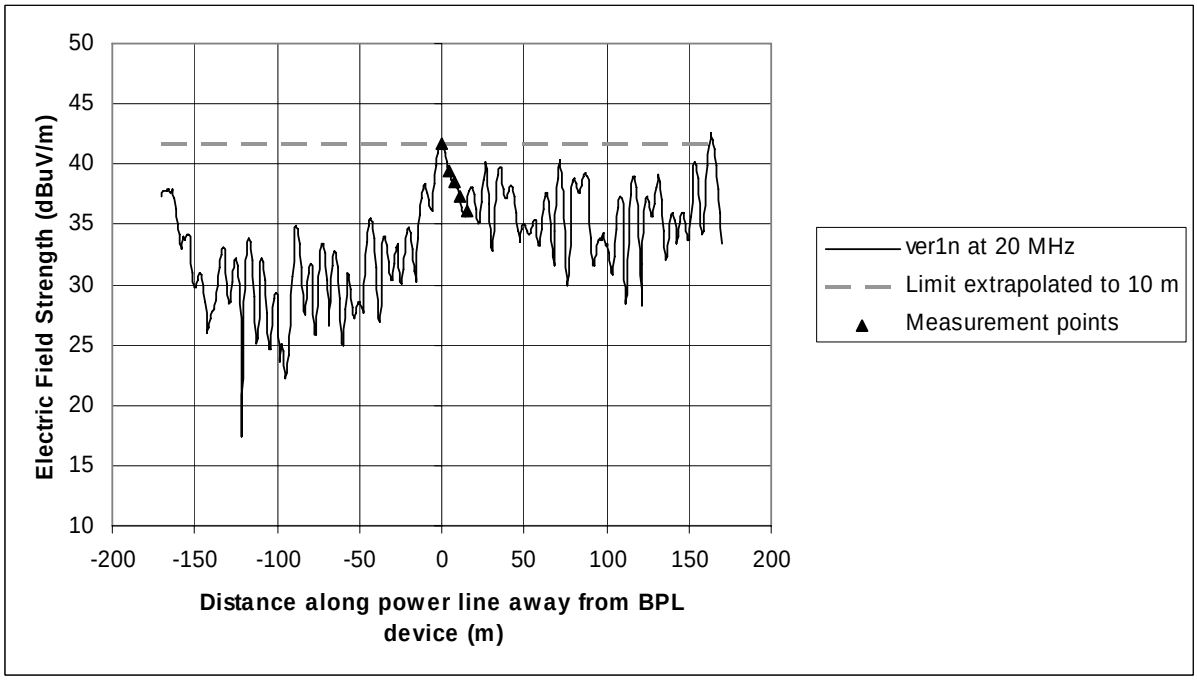

Figure B-58: Vertical electric field strength along power line for ver1n topology

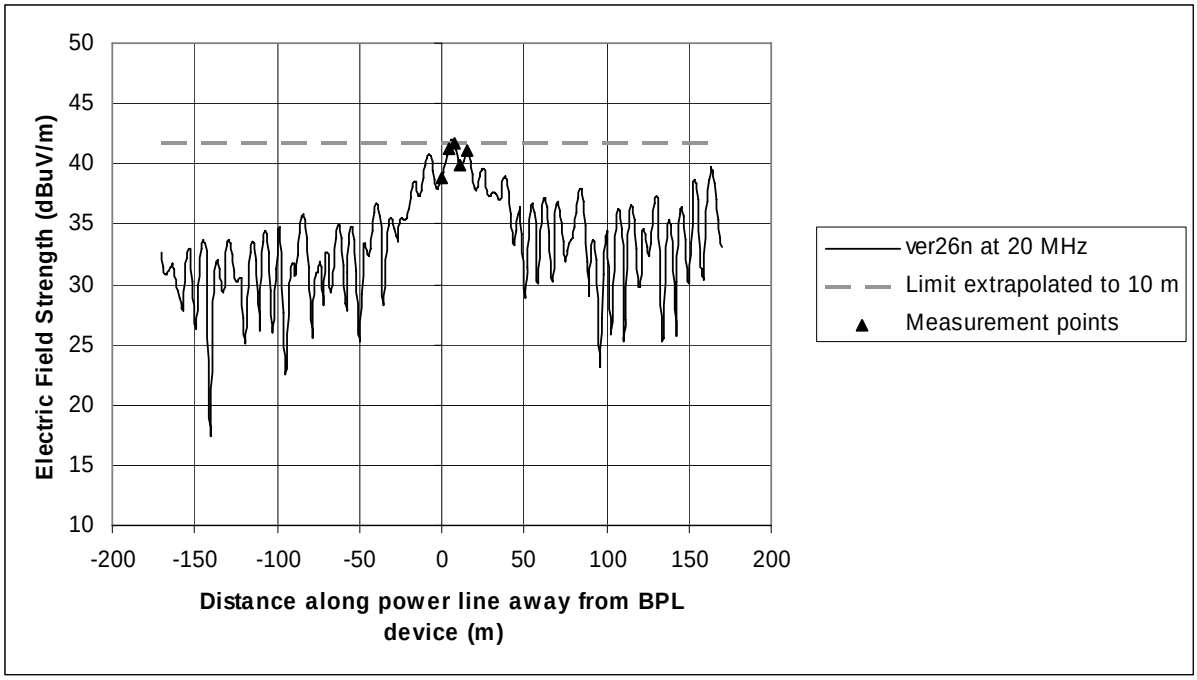

Figure B-59: Vertical electric field strength along power line for ver26n topology

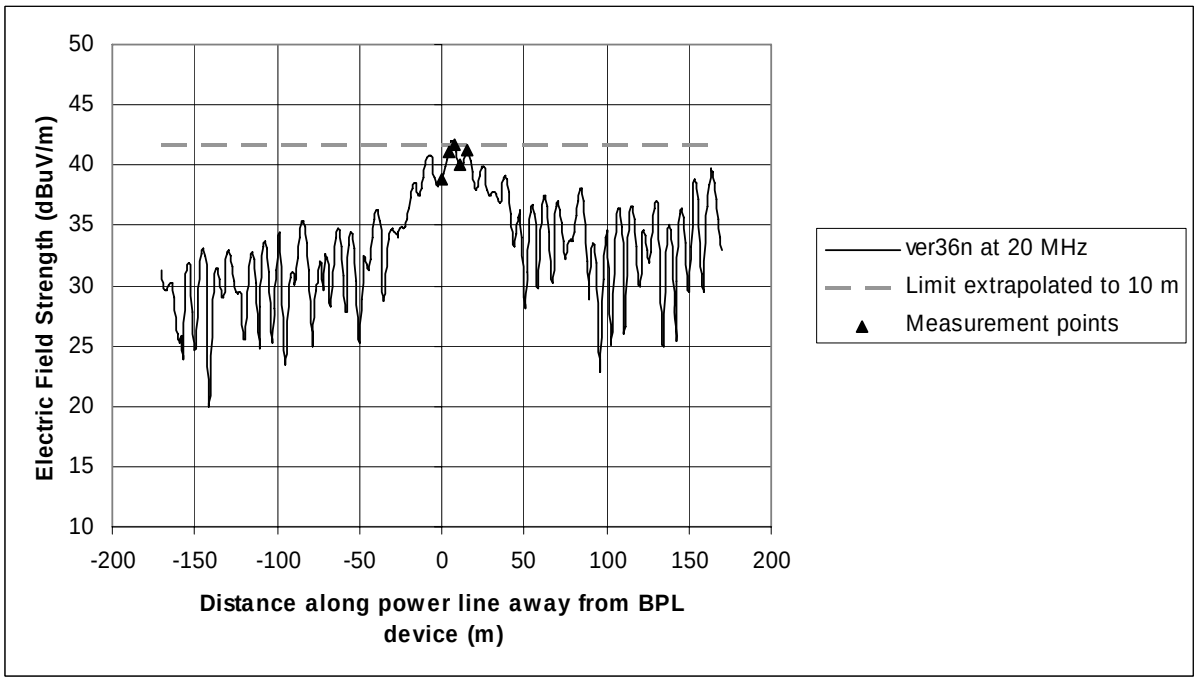

Figure B-60: Vertical electric field strength along power line for ver36n topology

22 MHz Plots

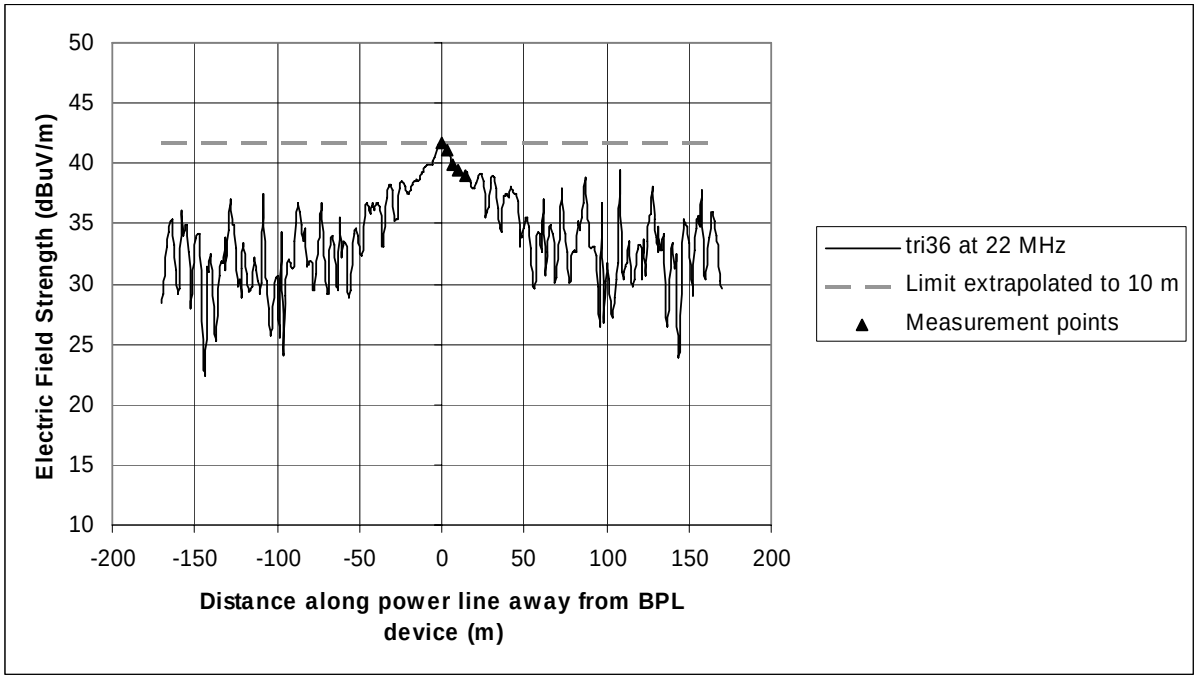

Figure B-61: Vertical electric field strength along power line for tri36 topology

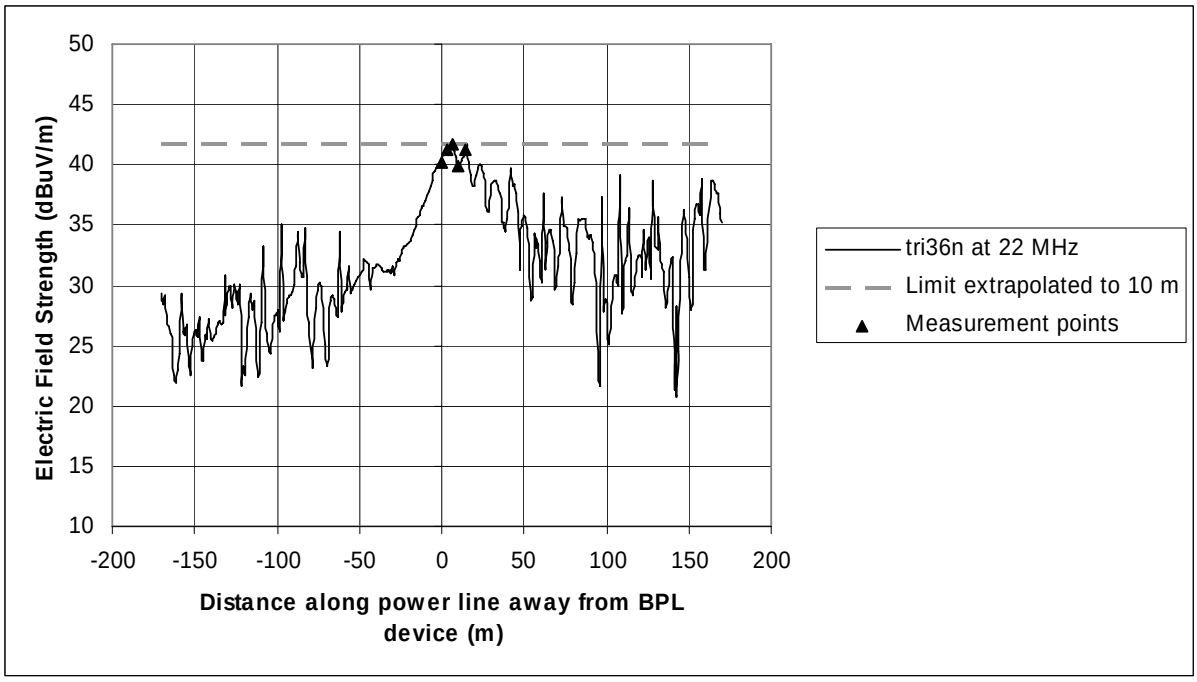

Figure B-62: Vertical electric field strength along power line for tri36n topology

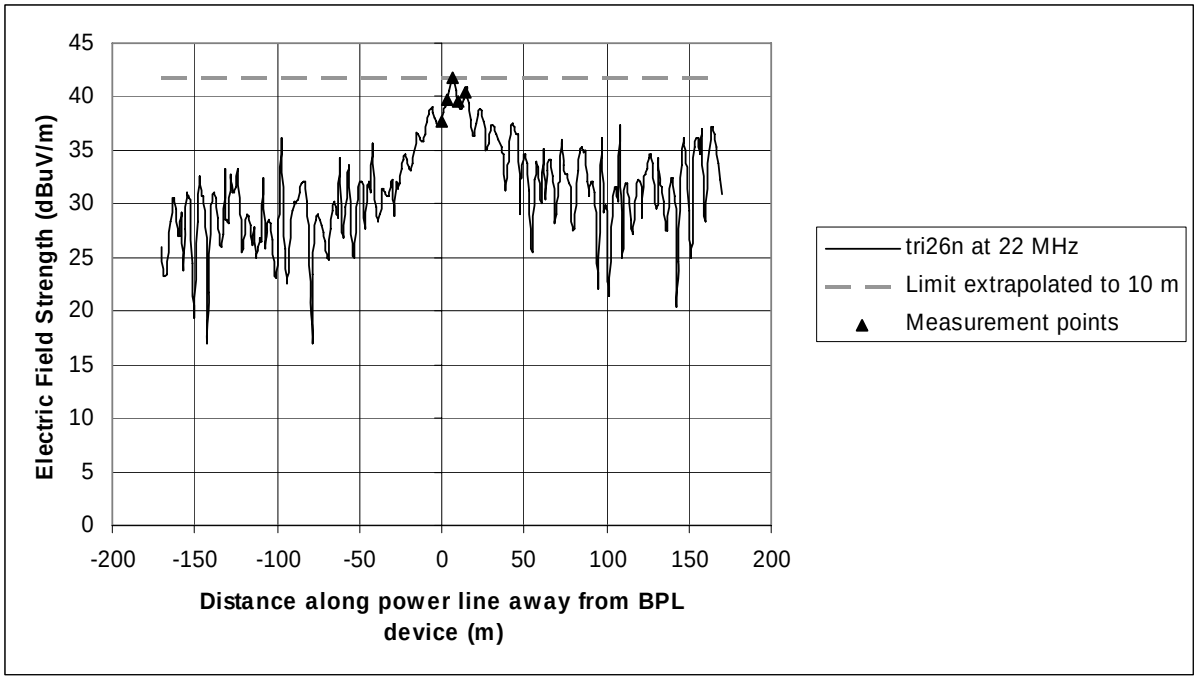

Figure B-63: Vertical electric field strength along power line for tri26n topology

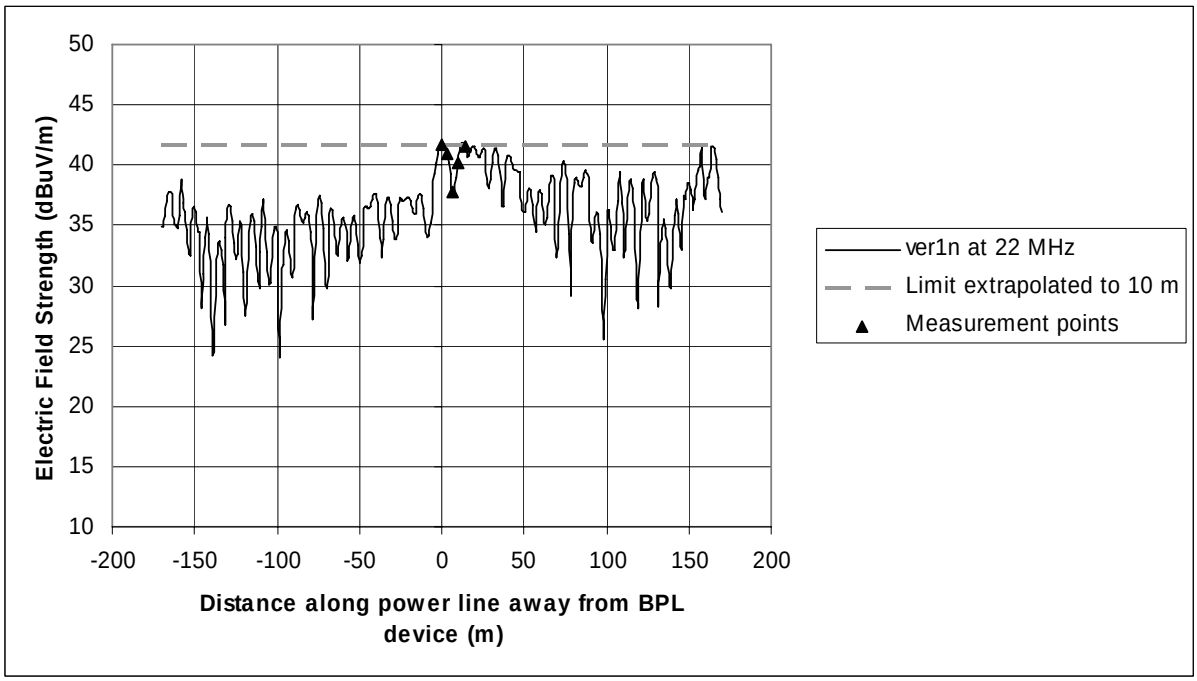

Figure B-64: Vertical electric field strength along power line for ver1n topology

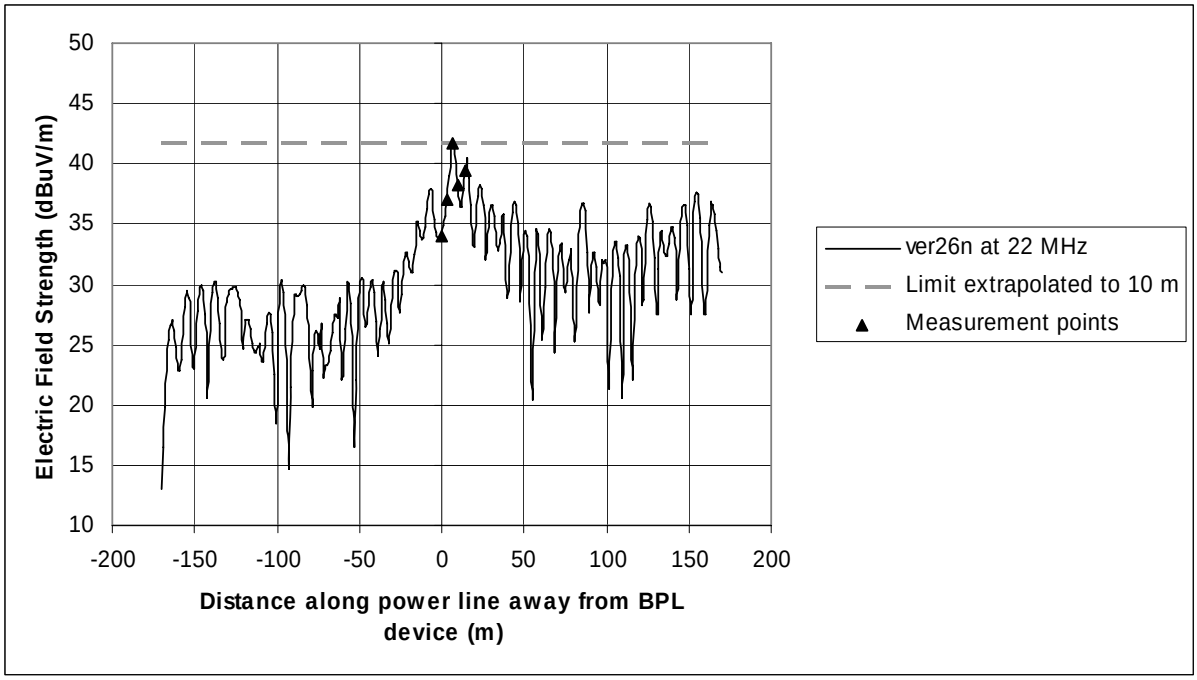

Figure B-65: Vertical electric field strength along power line for ver26n topology

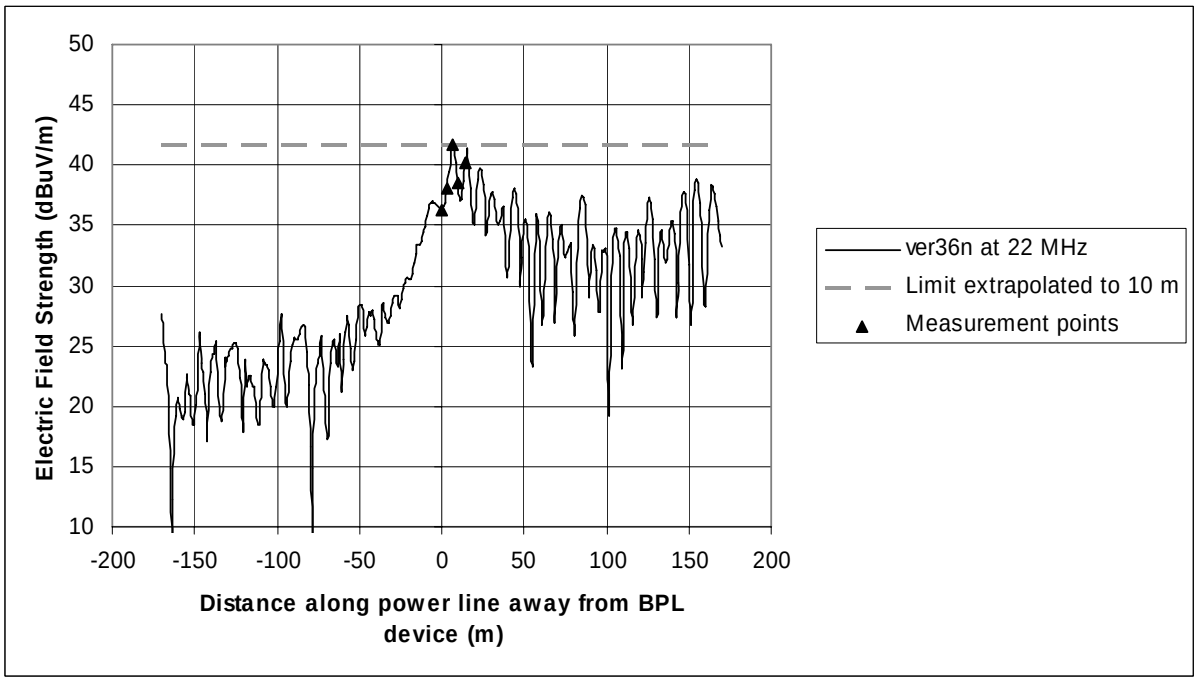

Figure B-66: Vertical electric field strength along power line for ver36n topology

24 MHz Plots

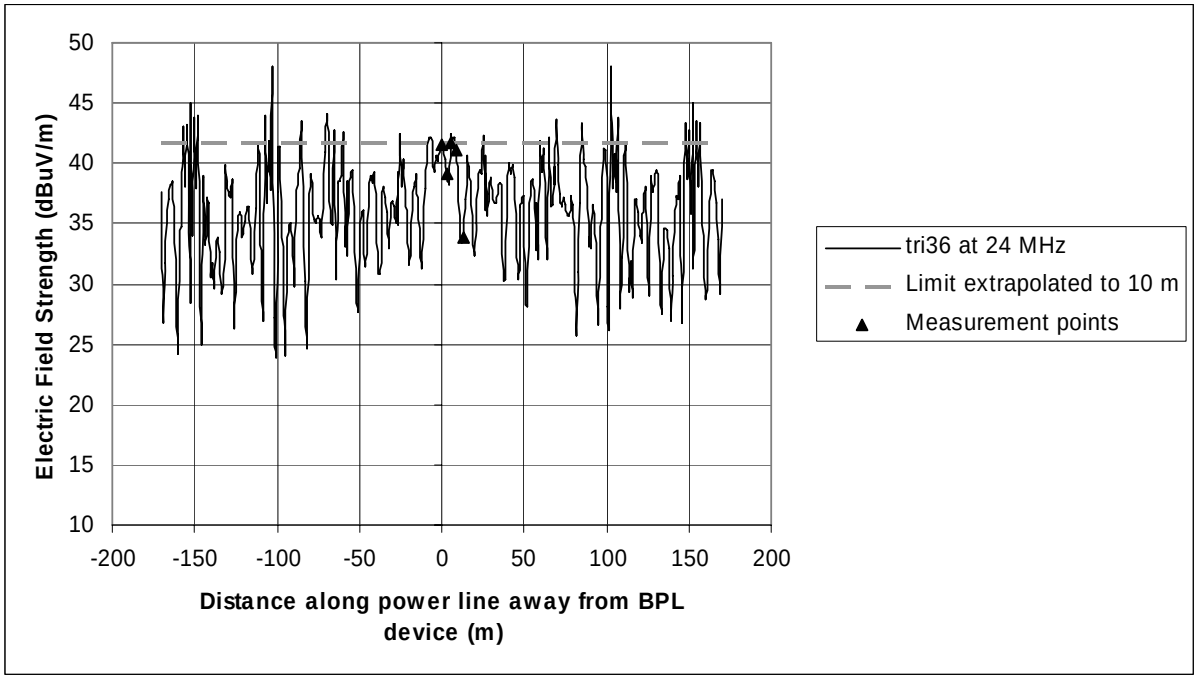

Figure B-67: Vertical electric field strength along power line for tri36 topology

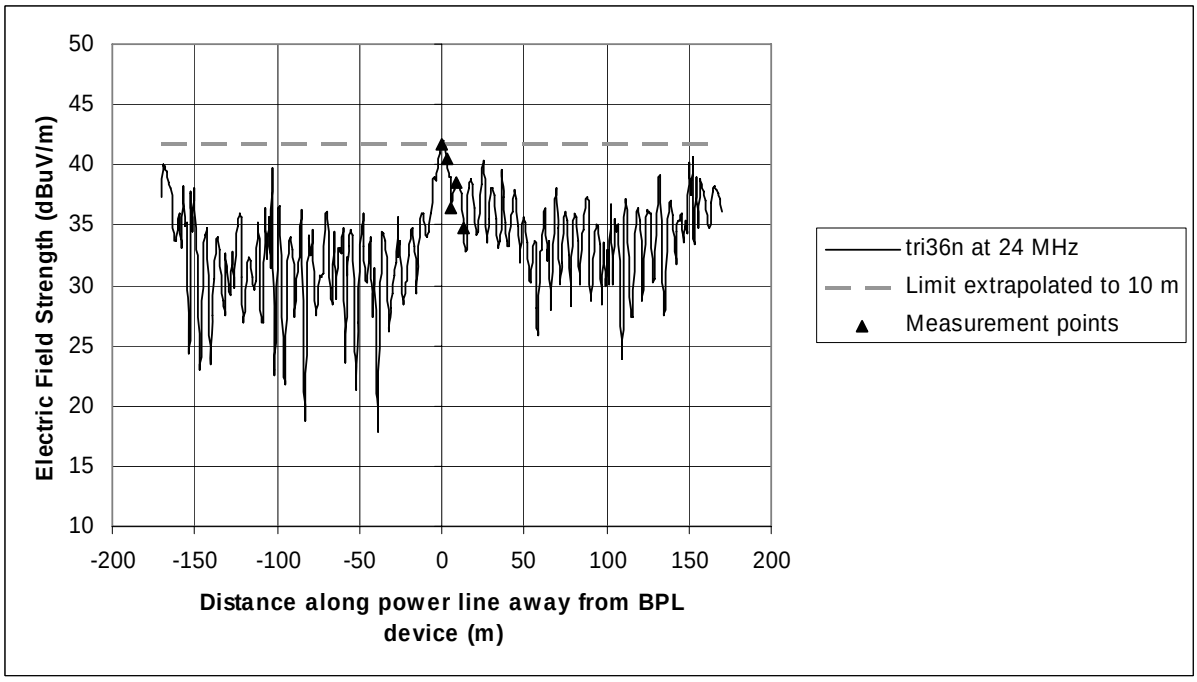

Figure B-68: Vertical electric field strength along power line for tri36n topology

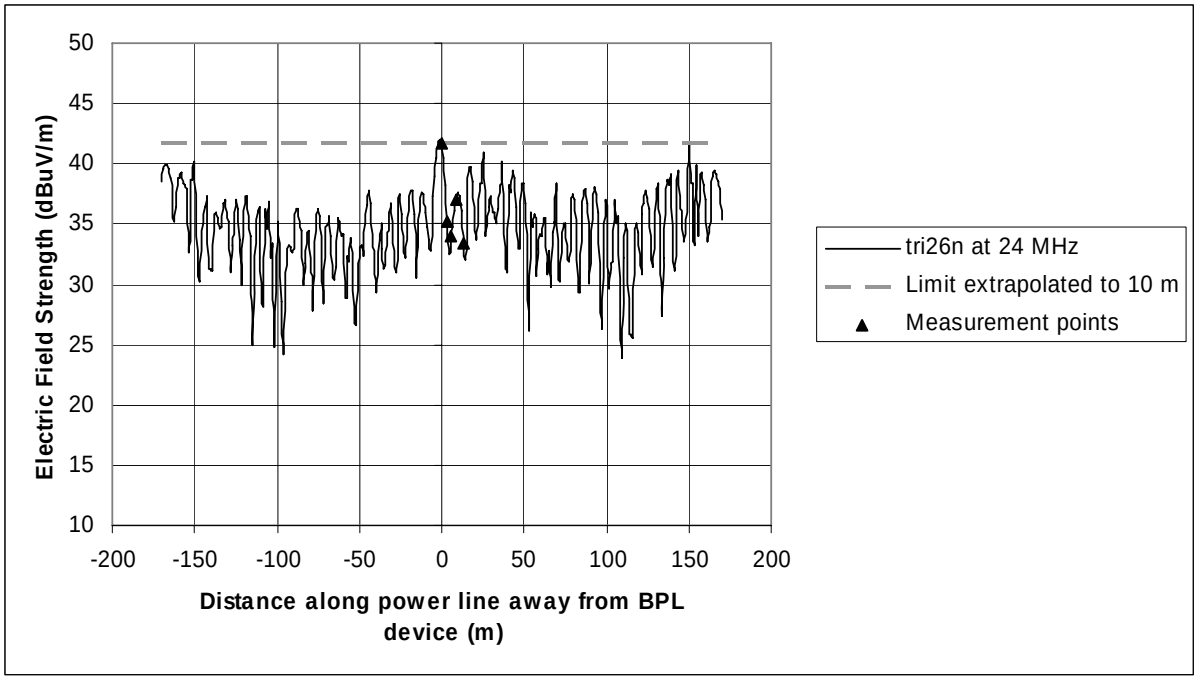

Figure B-69: Vertical electric field strength along power line for tri26n topology

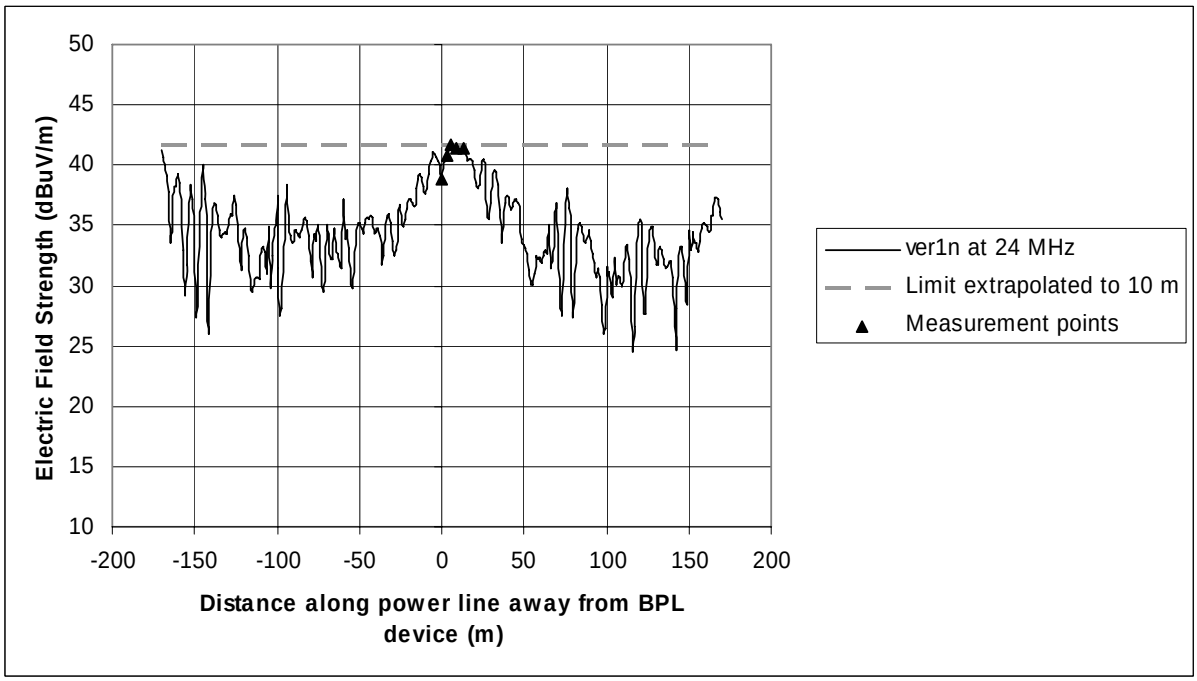

Figure B-70: Vertical electric field strength along power line for ver1n topology

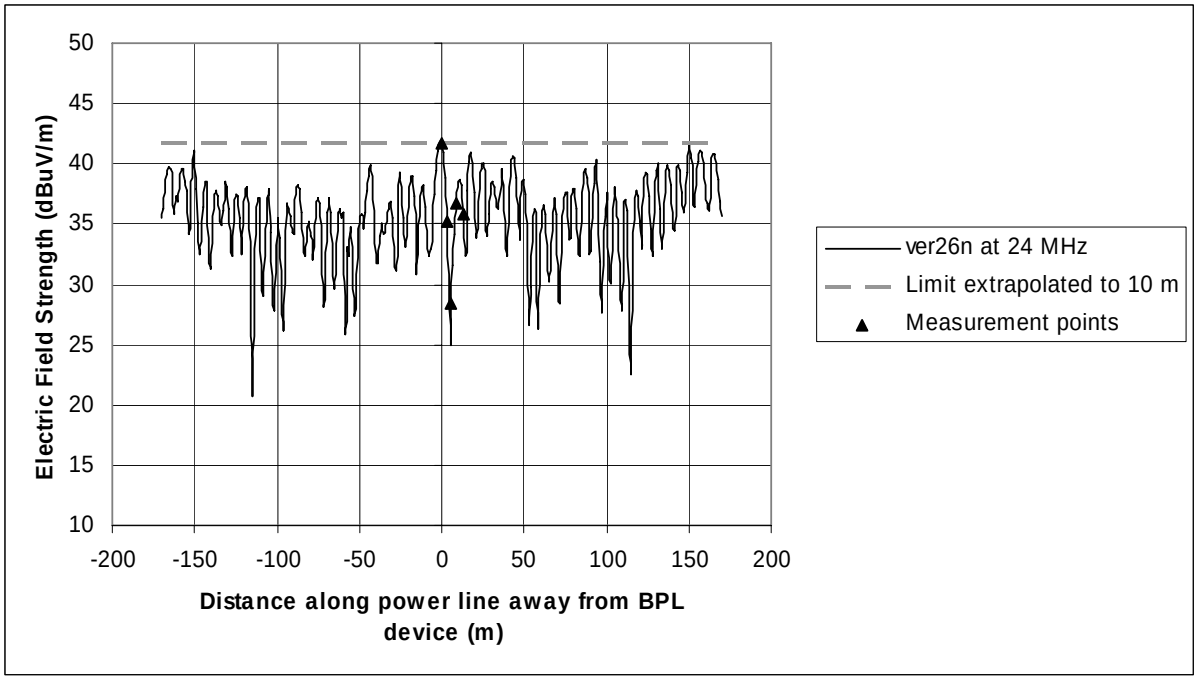

Figure B-71: Vertical electric field strength along power line for ver26n topology

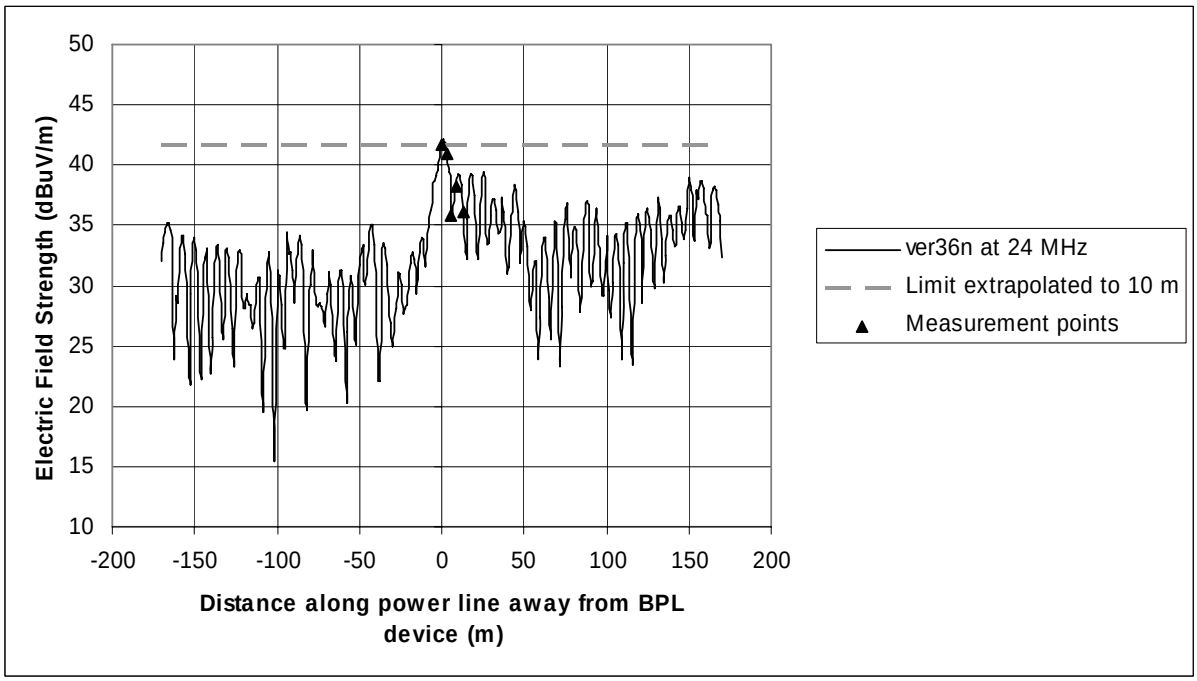

Figure B-72: Vertical electric field strength along power line for ver36n topology

26 MHz Plots

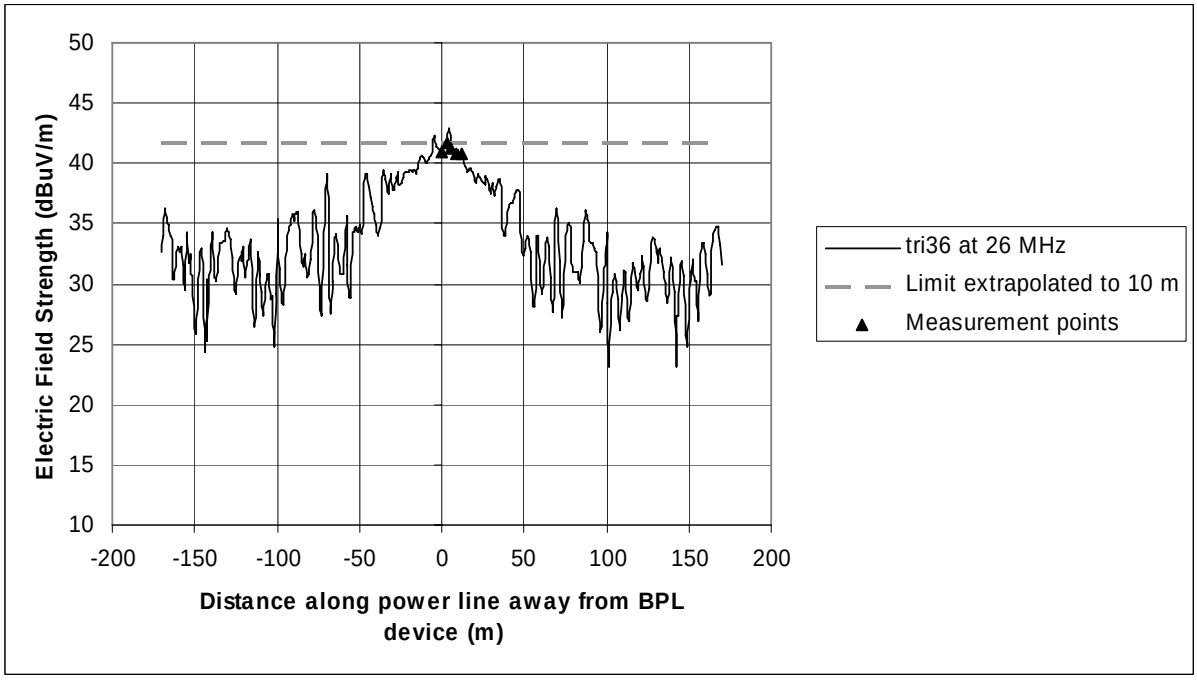

Figure B-73: Vertical electric field strength along power line for tri36 topology

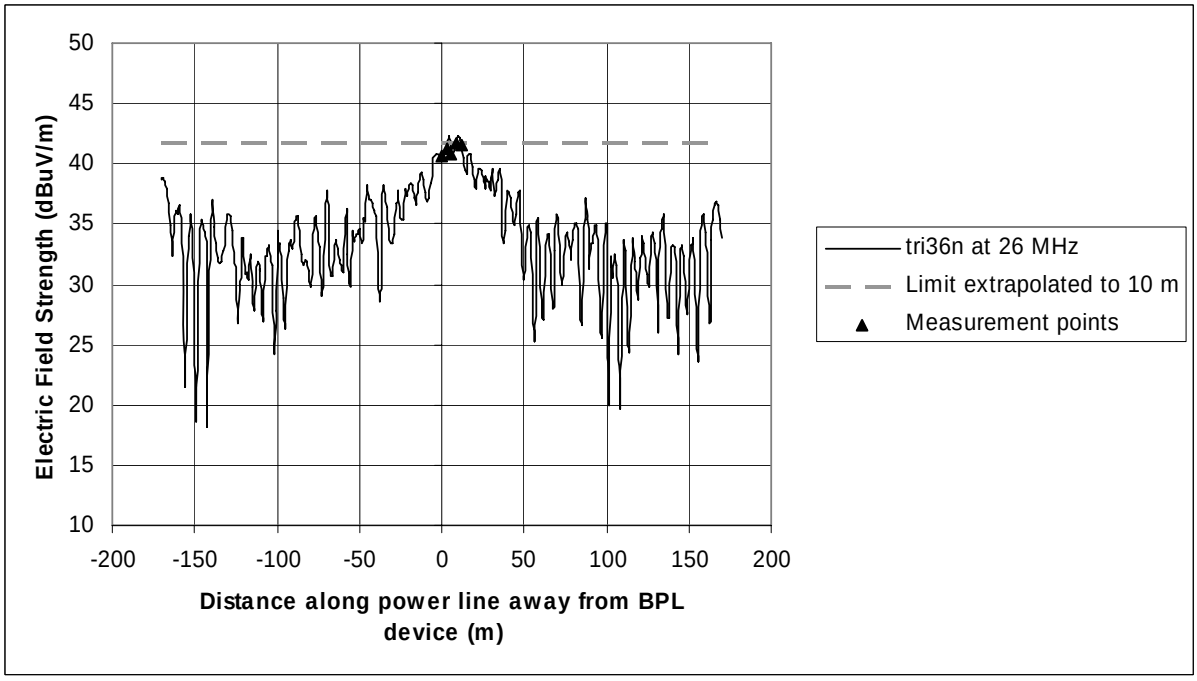

Figure B-74: Vertical electric field strength along power line for tri36n topology

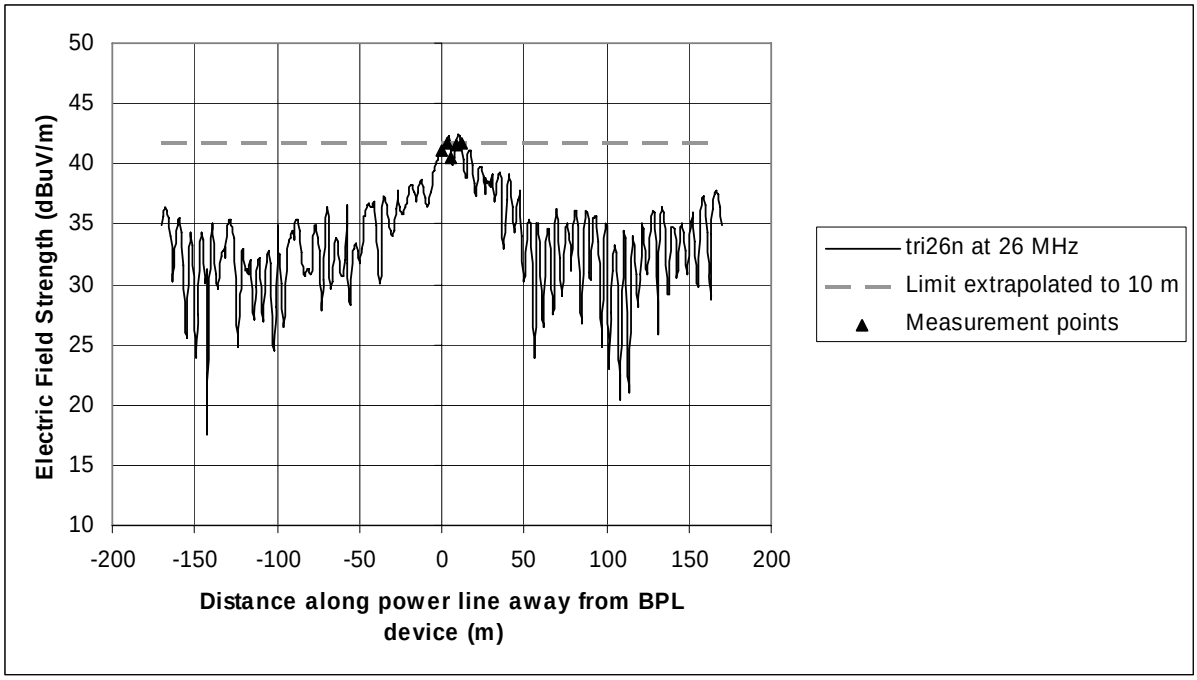

Figure B-75: Vertical electric field strength along power line for tri26n topology

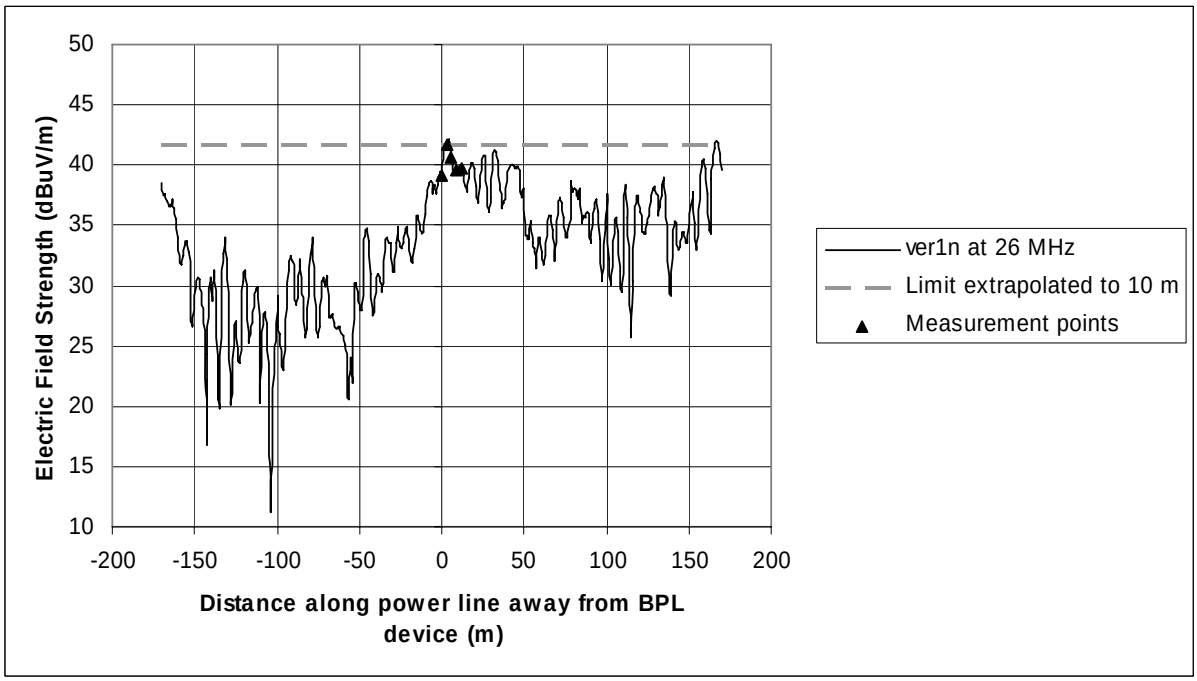

Figure B-76: Vertical electric field strength along power line for ver1n topology

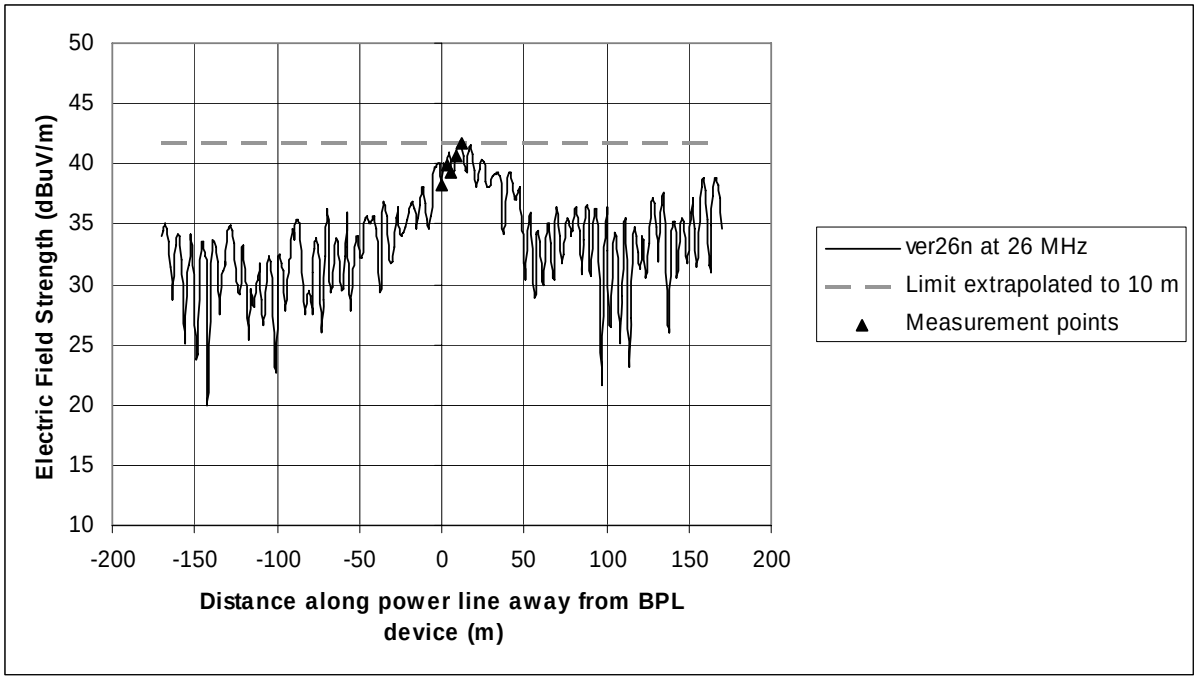

Figure B-77: Vertical electric field strength along power line for ver26n topology

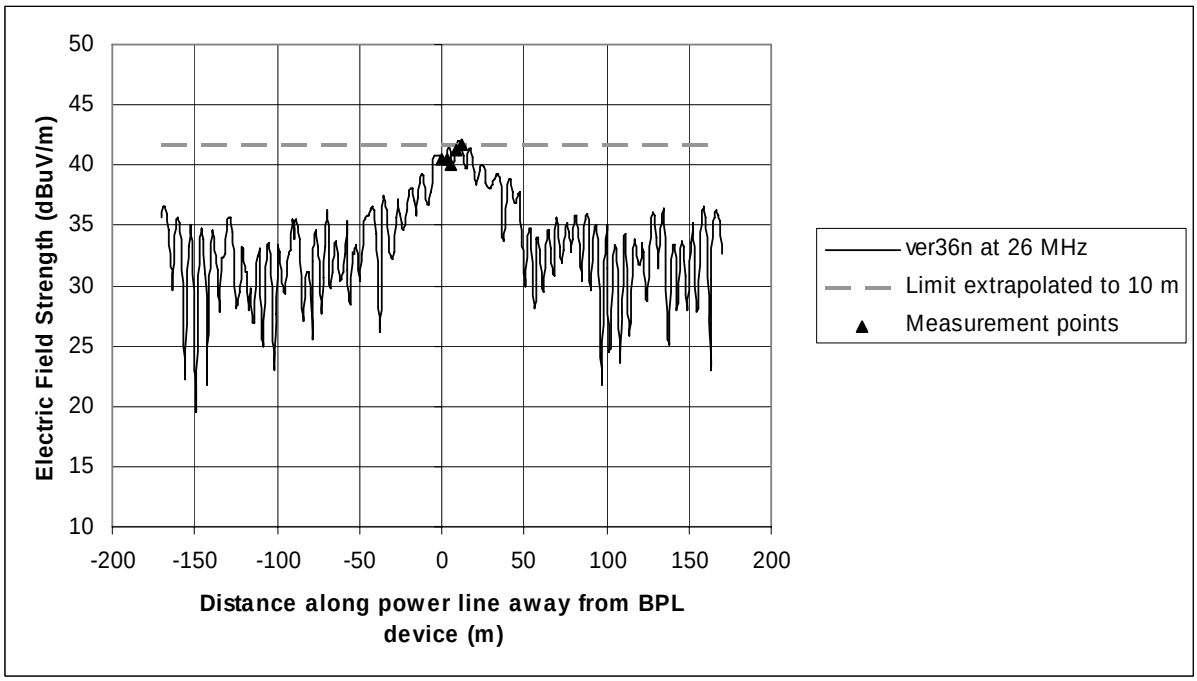

Figure B-78: Vertical electric field strength along power line for ver36n topology

28 MHz Plots

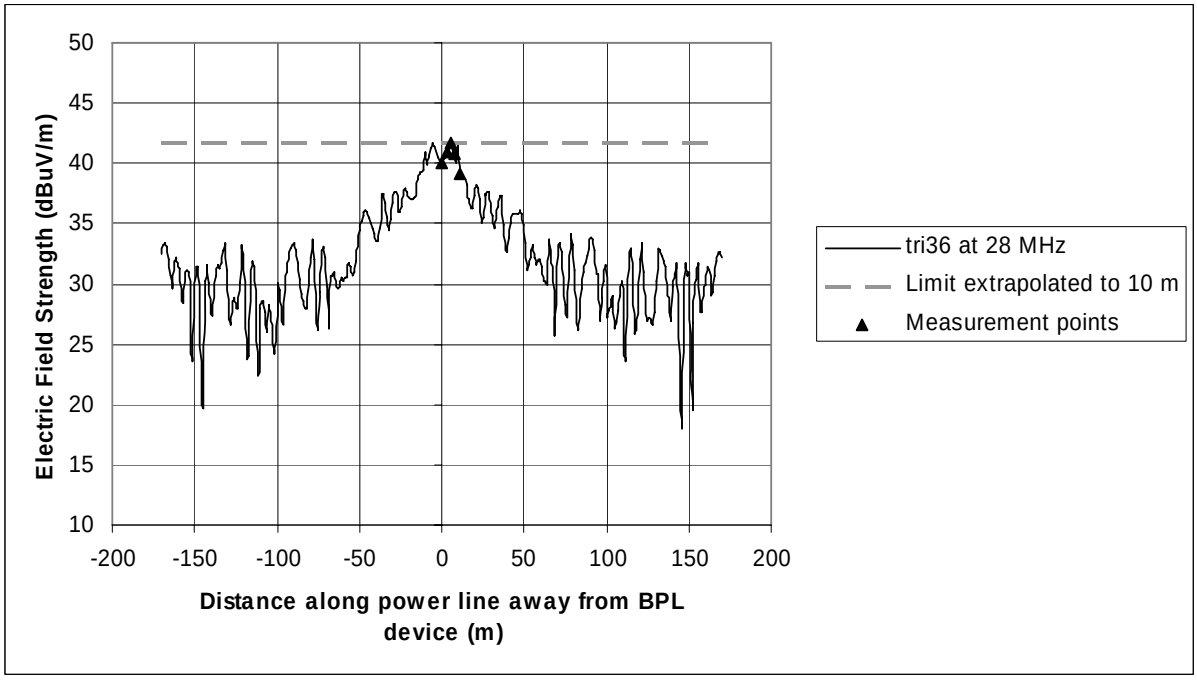

Figure B-79: Vertical electric field strength along power line for tri36 topology

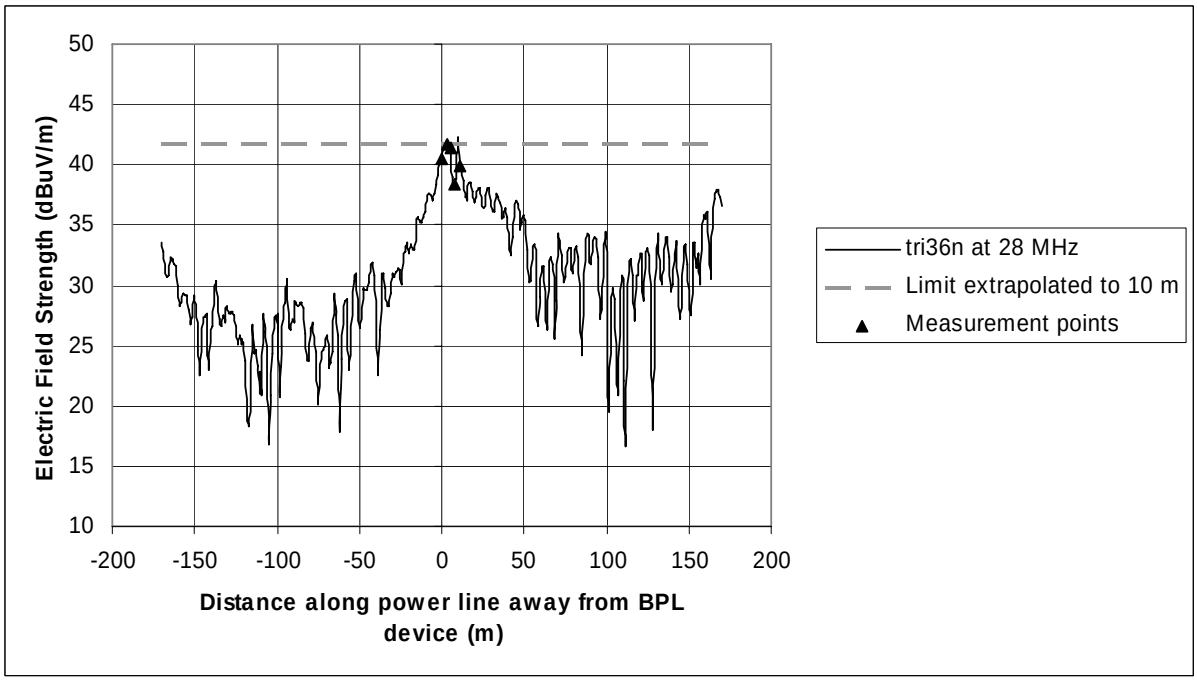

Figure B-80: Vertical electric field strength along power line for tri36n topology

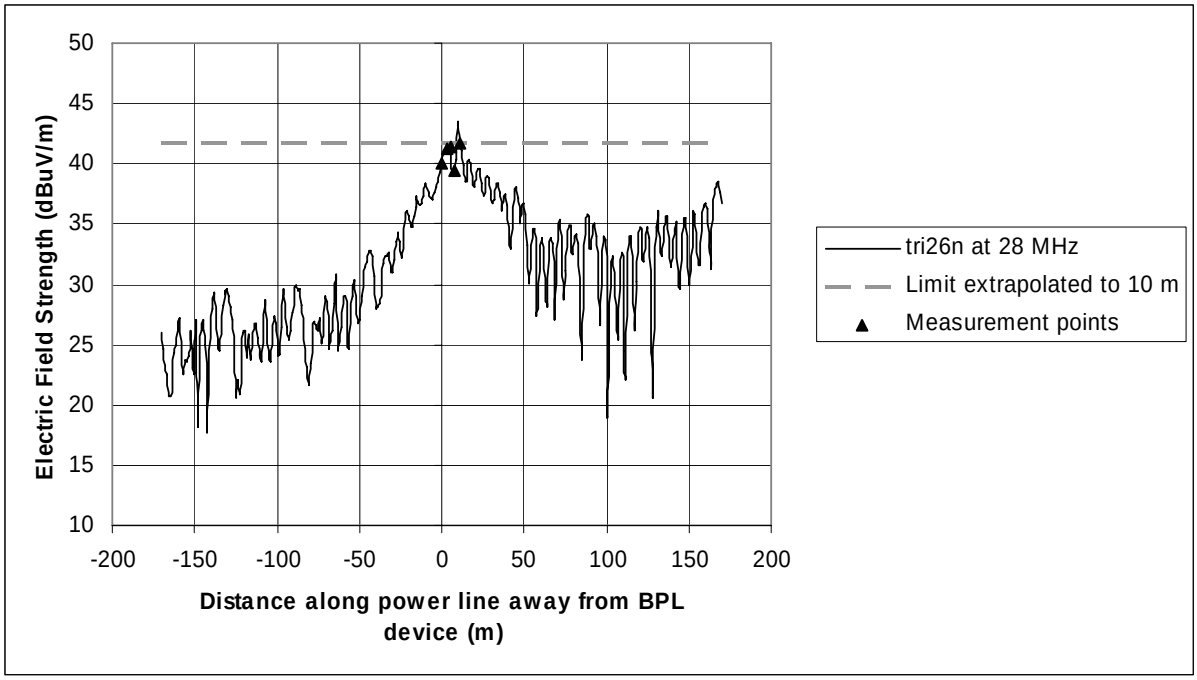

Figure B-81: Vertical electric field strength along power line for tri26 topology

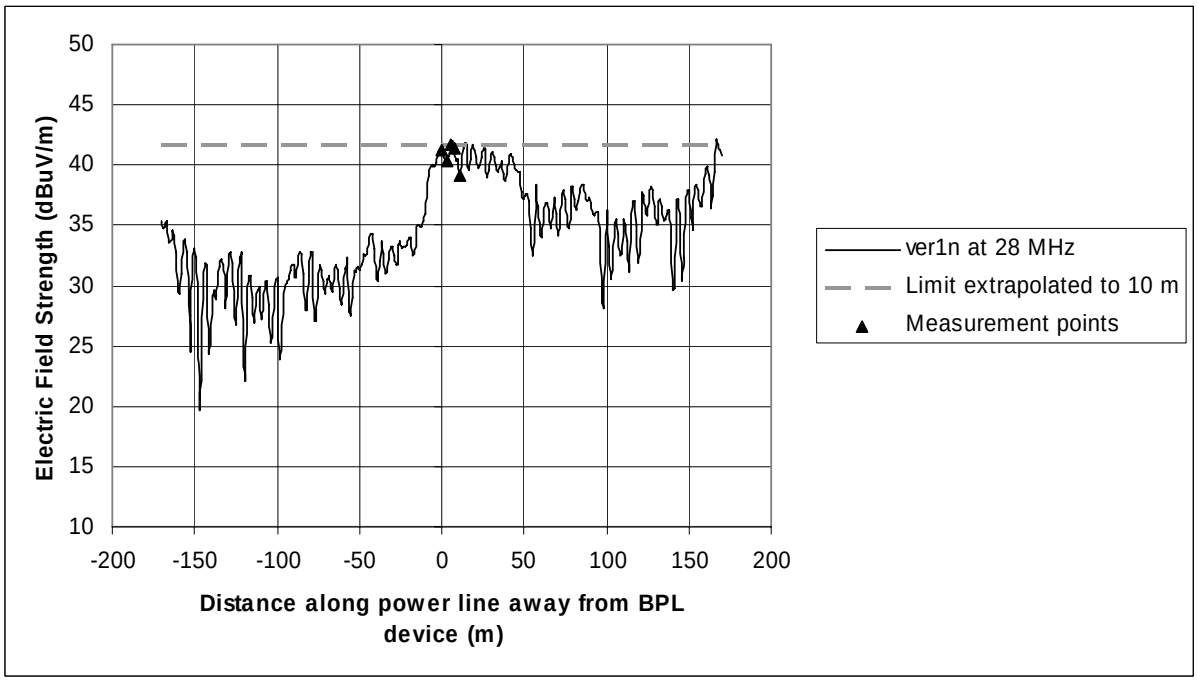

Figure B-82: Vertical electric field strength along power line for ver1n topology

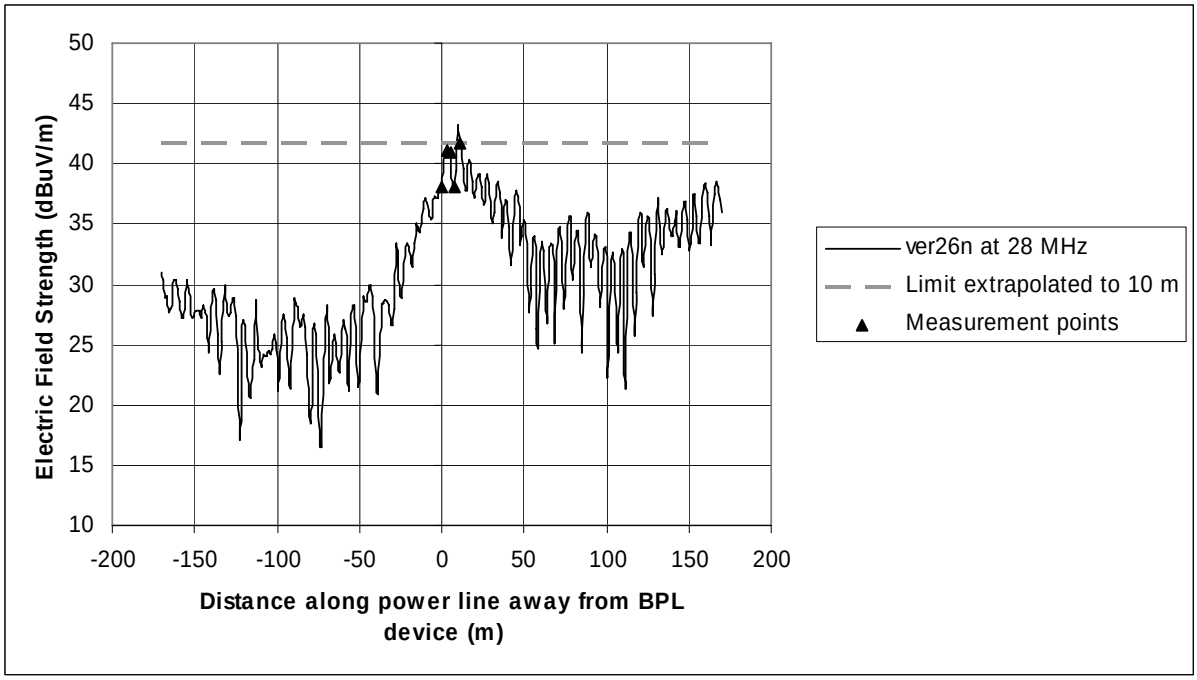

Figure B-83: Vertical electric field strength along power line for ver26n topology

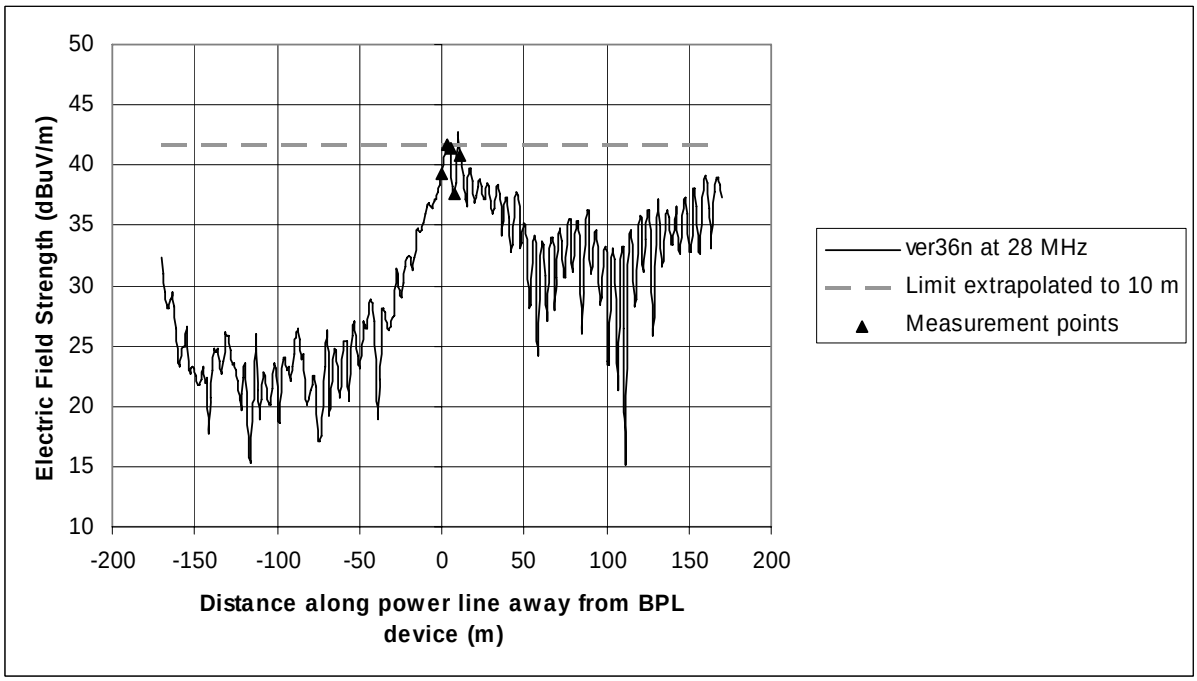

Figure B-84: Vertical electric field strength along power line for ver36n topology