

AC Coupled Diode Discovery 25 Pair CAT-5 Cable Test Results

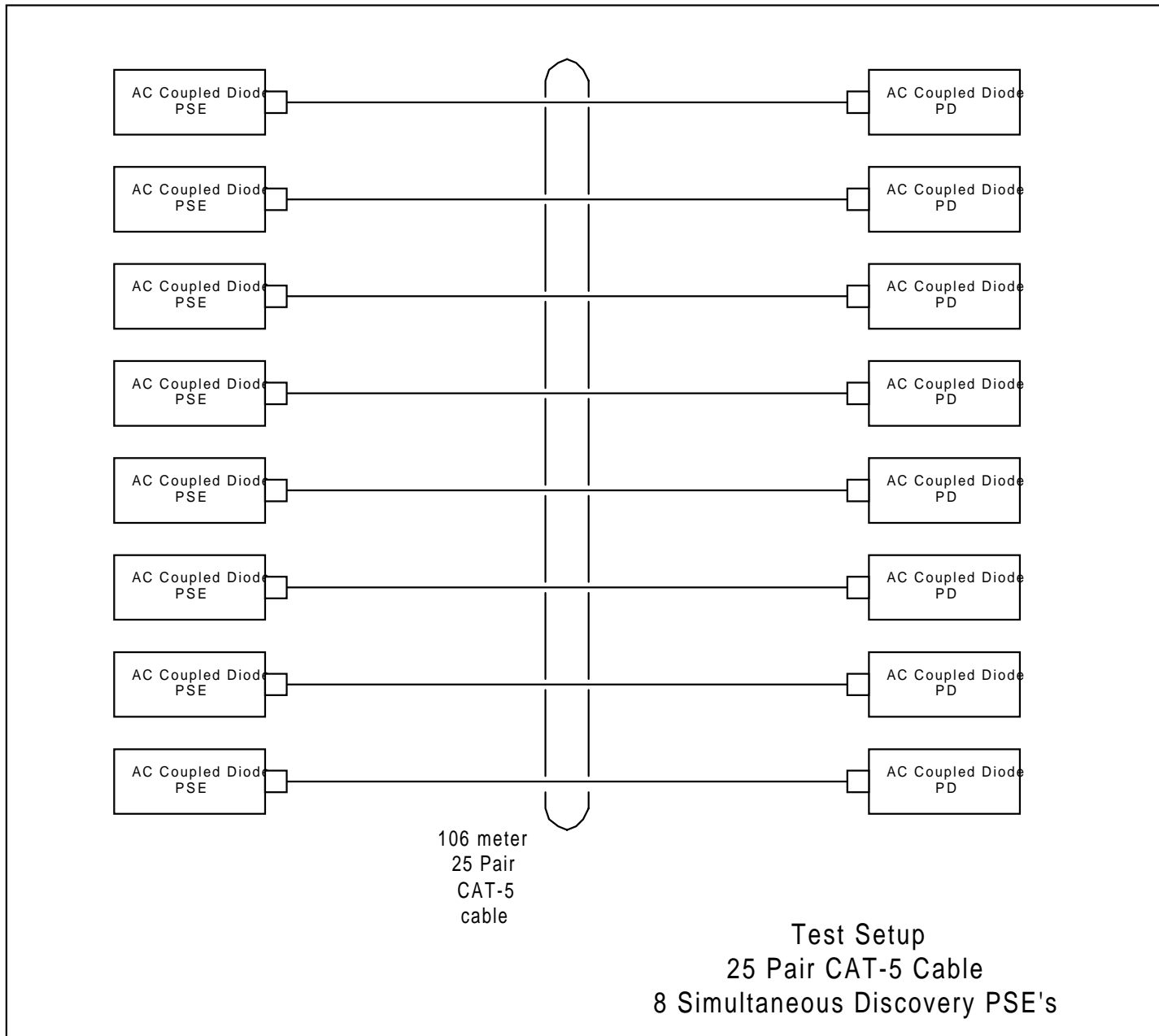
IEEE802.3af Plenary Meeting
November 2000

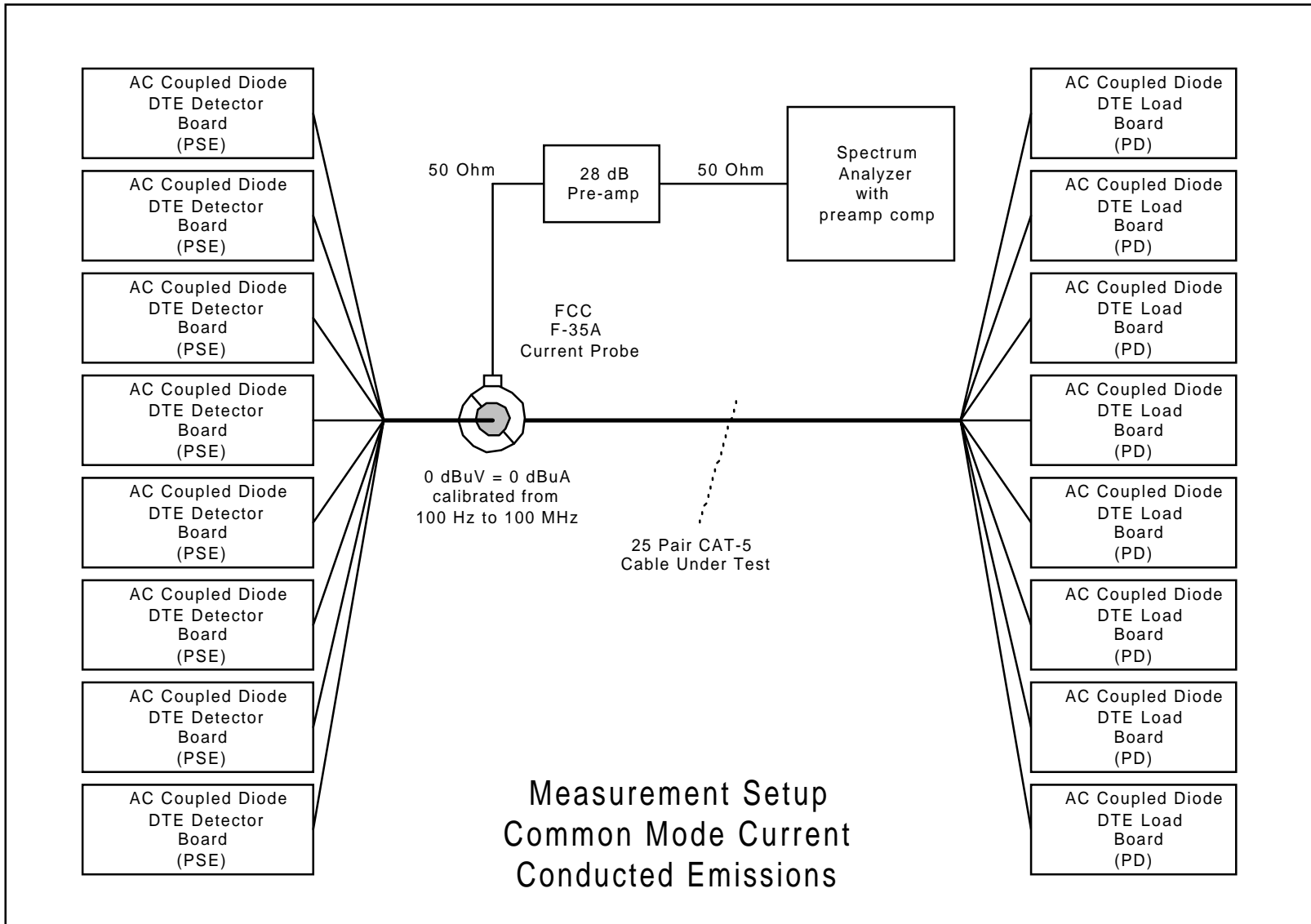
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Acknowledgments:
Dave Hess, Berktek for supplying the 25 Pair CAT-5 cable

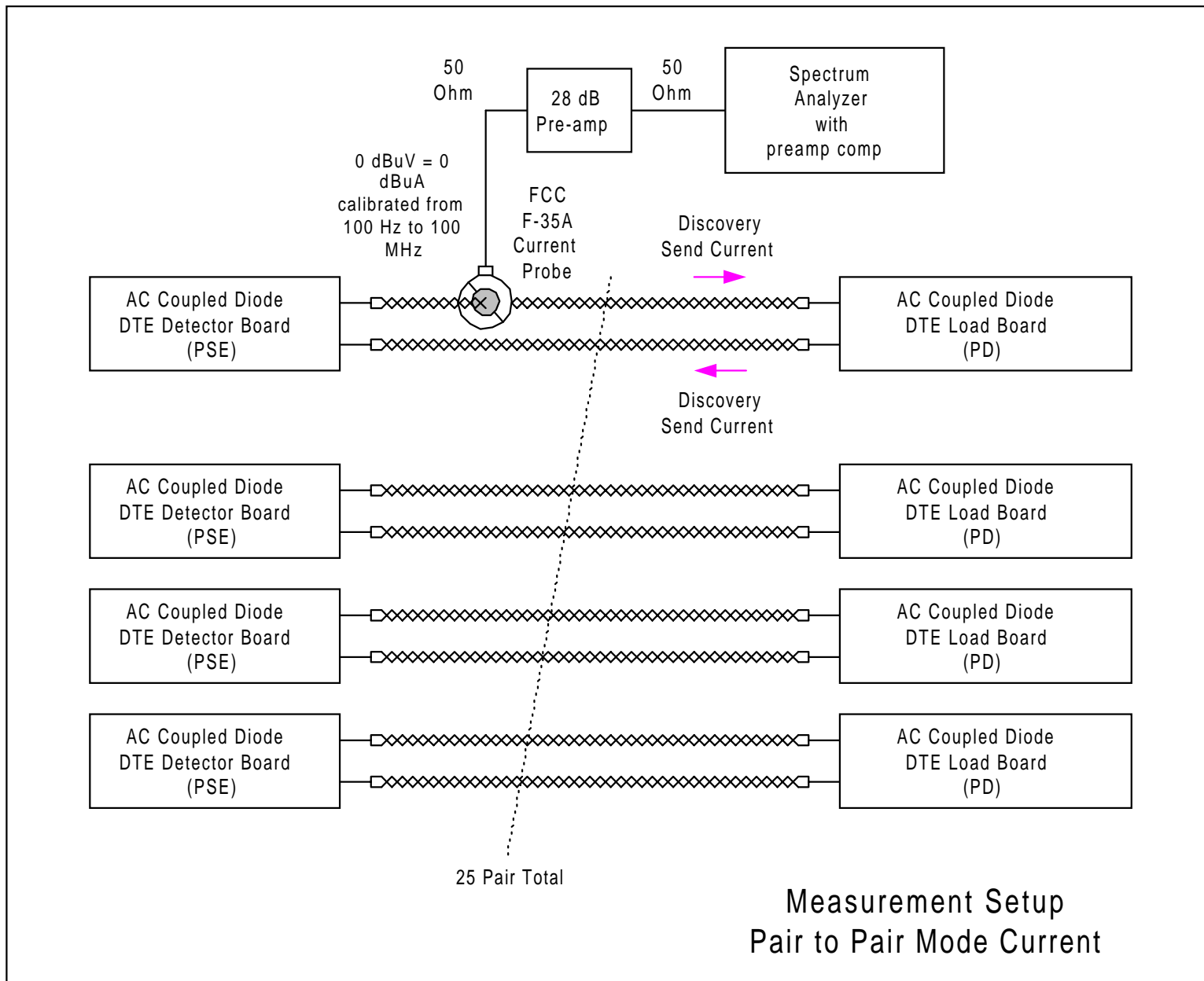
Discovery Spectra

Common Mode Current Pair to Pair Mode Current

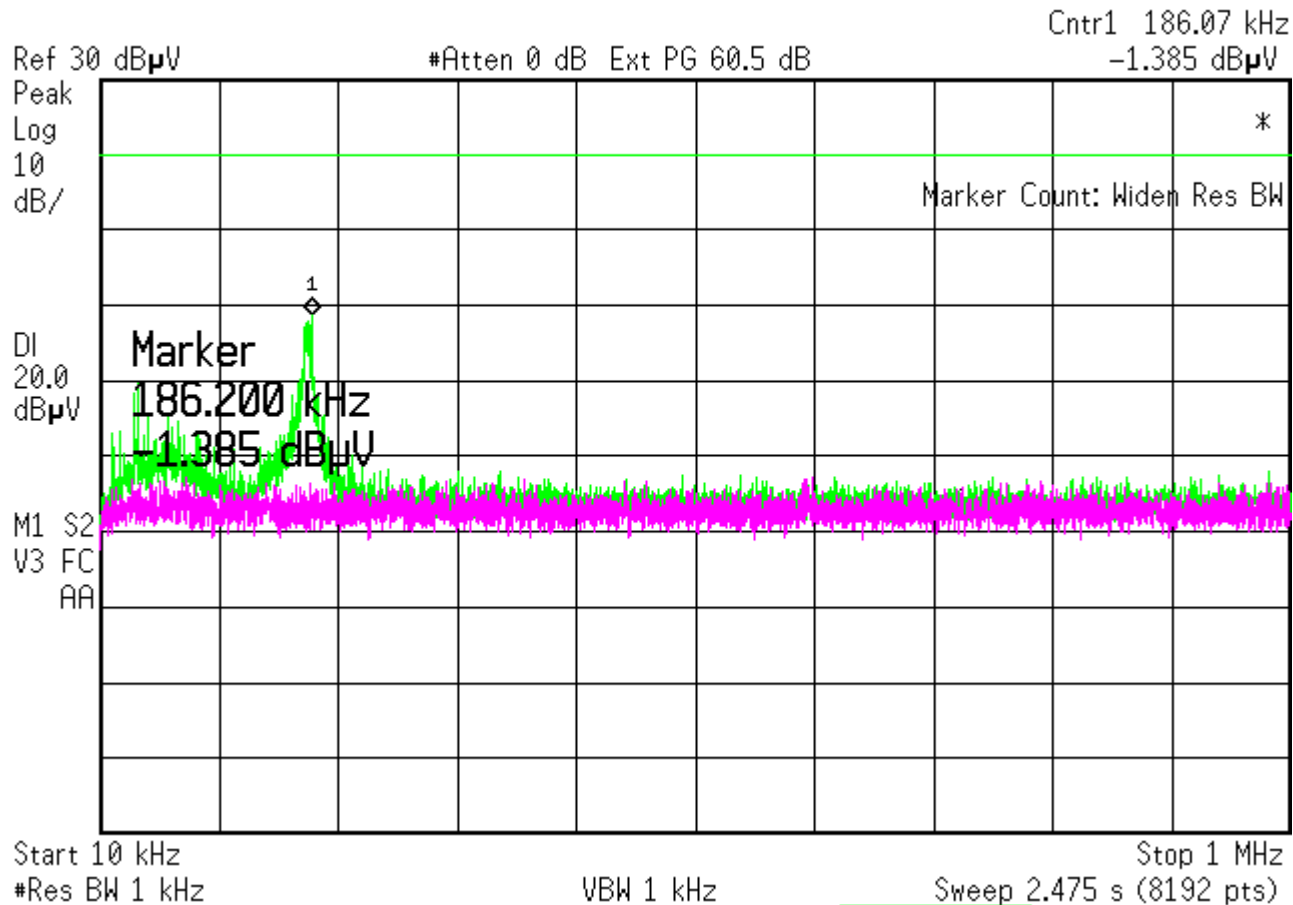




Note: on some measurements, the Preamp gain consisted of two Preamps with a composite gain of 60.5 dB
 In all cases, the preamp gain was measured and compensated for in the Spectrum Analyzer.
 All components were flat over the frequency range of 9 KHz to 100 MHz



Measurement of Pair to Pair mode, both driving pair, and neighbor pair

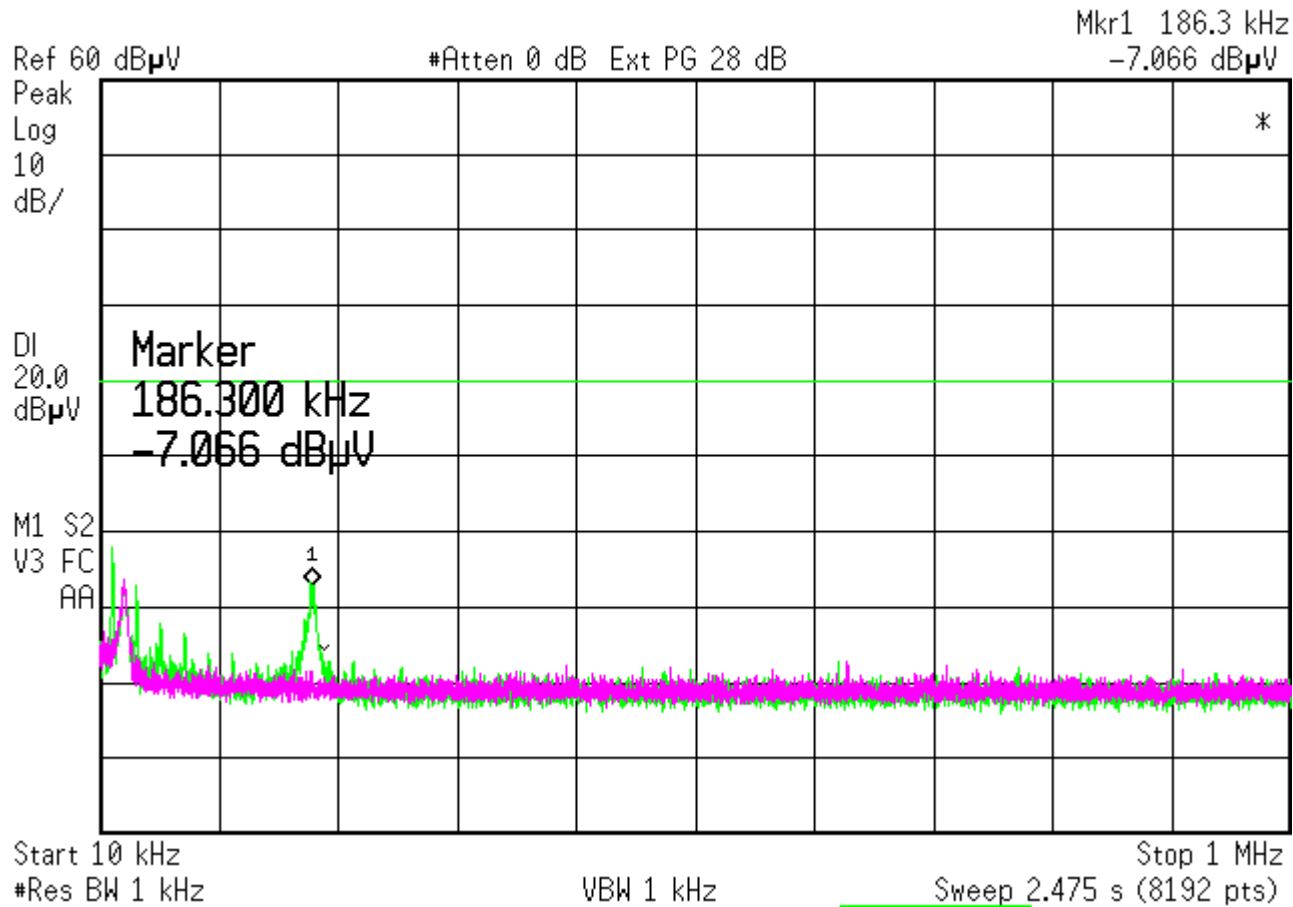


106 meter, 25 Pair CAT-5 Cable, 8 Simultaneous Coupled Diode Discovery PSE's and PD's
 Each Trace taken with Max Hold, 10 minutes of acquisition, 60.5 dB preamp on F-35A cable clamp at DTE load end

Baseline (no power to PSE's) magenta
 25 Pair Common Mode Current (0 dBuV = 0 dBuA) light green
 Display Line, 20 dBuV light green

Common Mode Current, DTE Load End

106 meter 25 Pair CAT-5, On/Off discovery (x8), (0 dBuA = 0 dBuV)

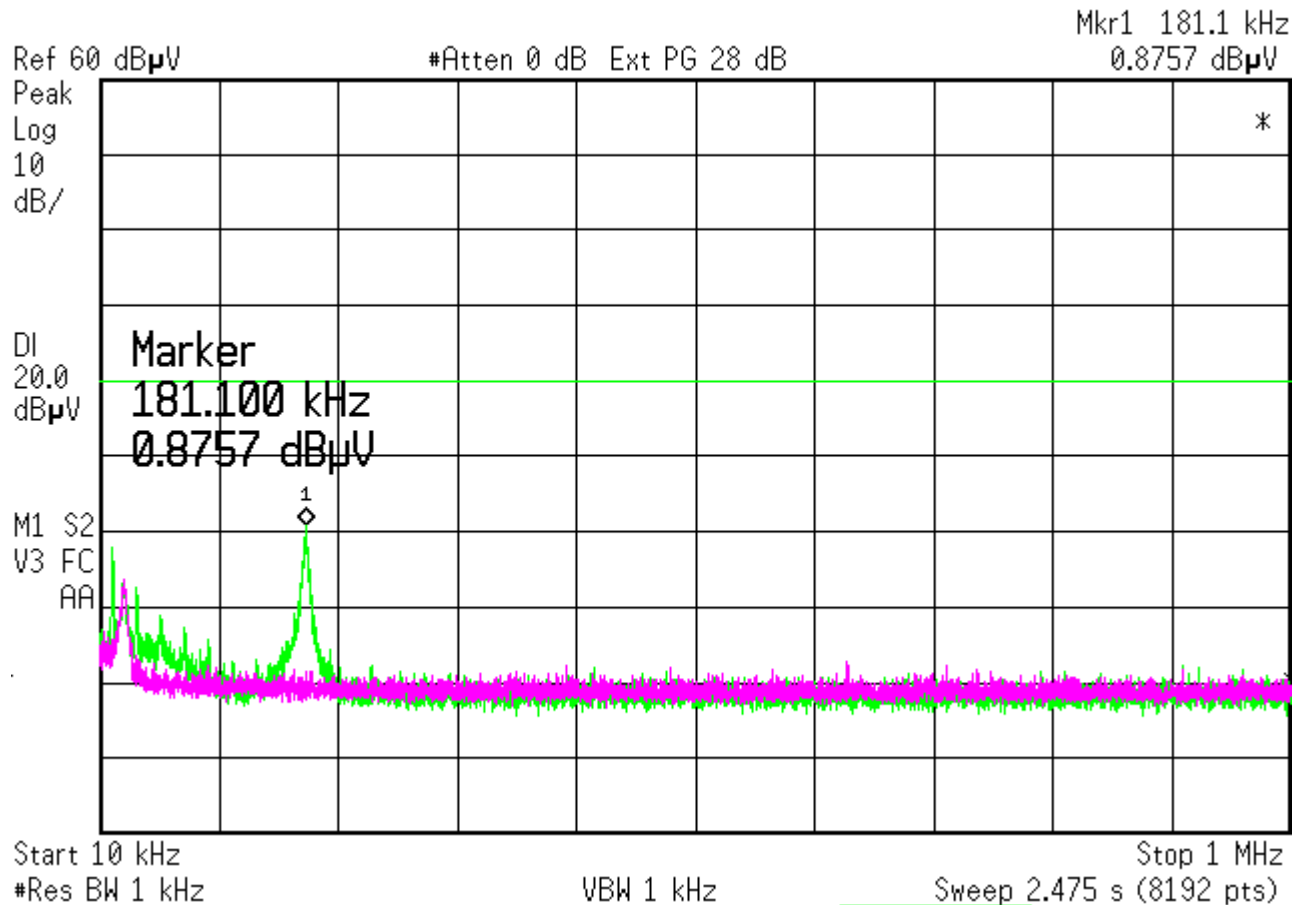


106 meter, 25 pair, 8 proto driven, all open loads
Each Trace taken with Max Hold, 10 minutes of acquisition, 28 dB preamp on F-35A cable clamp at DTE load end

25 Pair Common Mode Current (0 dBuV = 0 dBuA) light green
baseline magenta
Display Line, 20 dBuV light green

Common Mode Current, DTE Load End

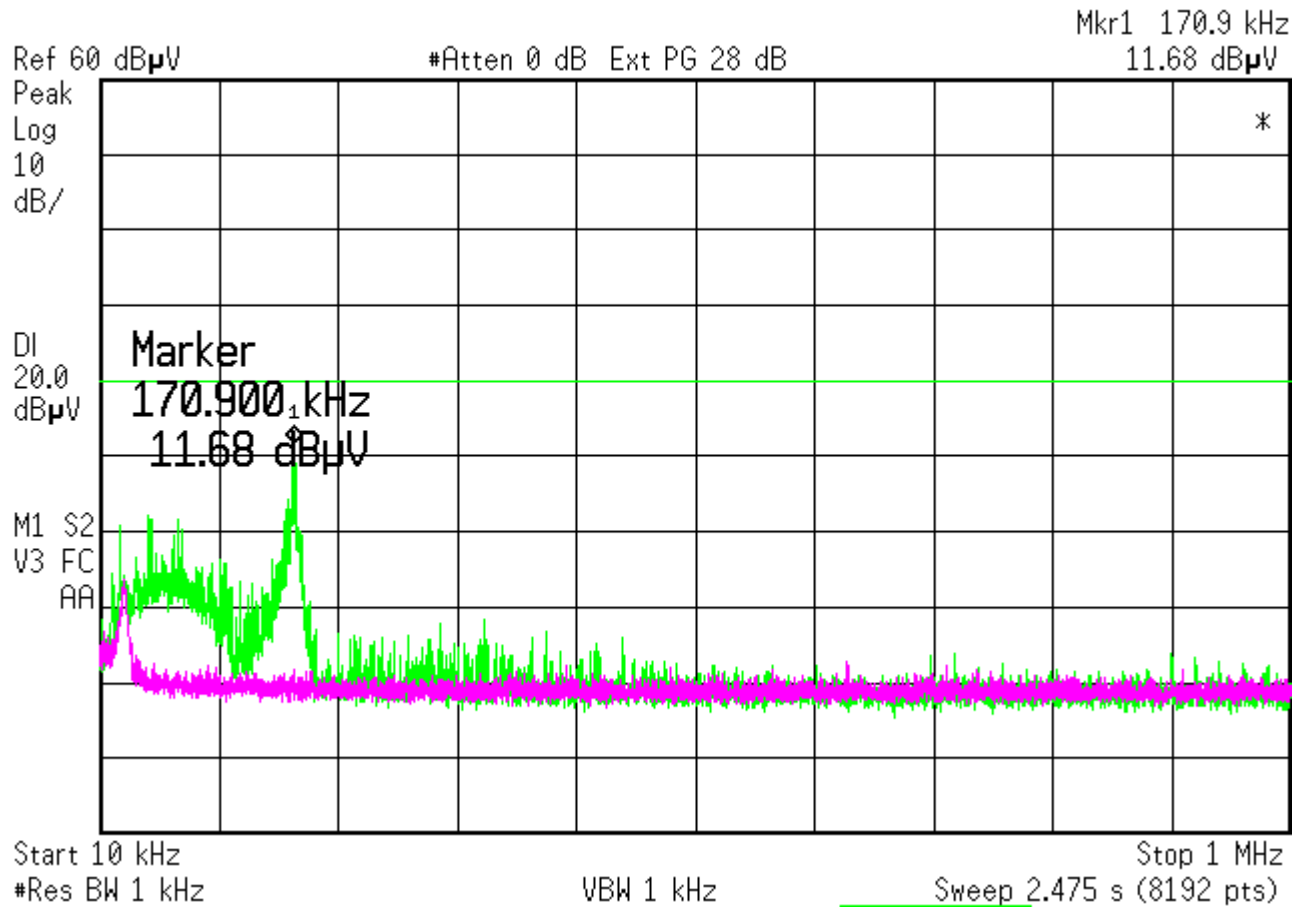
106 meter 25 Pair CAT-5, Open Load discovery (x8), (0 dBuA = 0 dBuV)



106 meter, 25 pair, 8 proto driven, all shorted loads
Each Trace taken with Max Hold, 10 minutes of acquisition, 28 dB preamp on F-35A cable clamp at DTE load end

25 Pair Common Mode Current (0 dBuV = 0 dBuA) light green
baseline magenta
Display Line, 20 dBuV light green

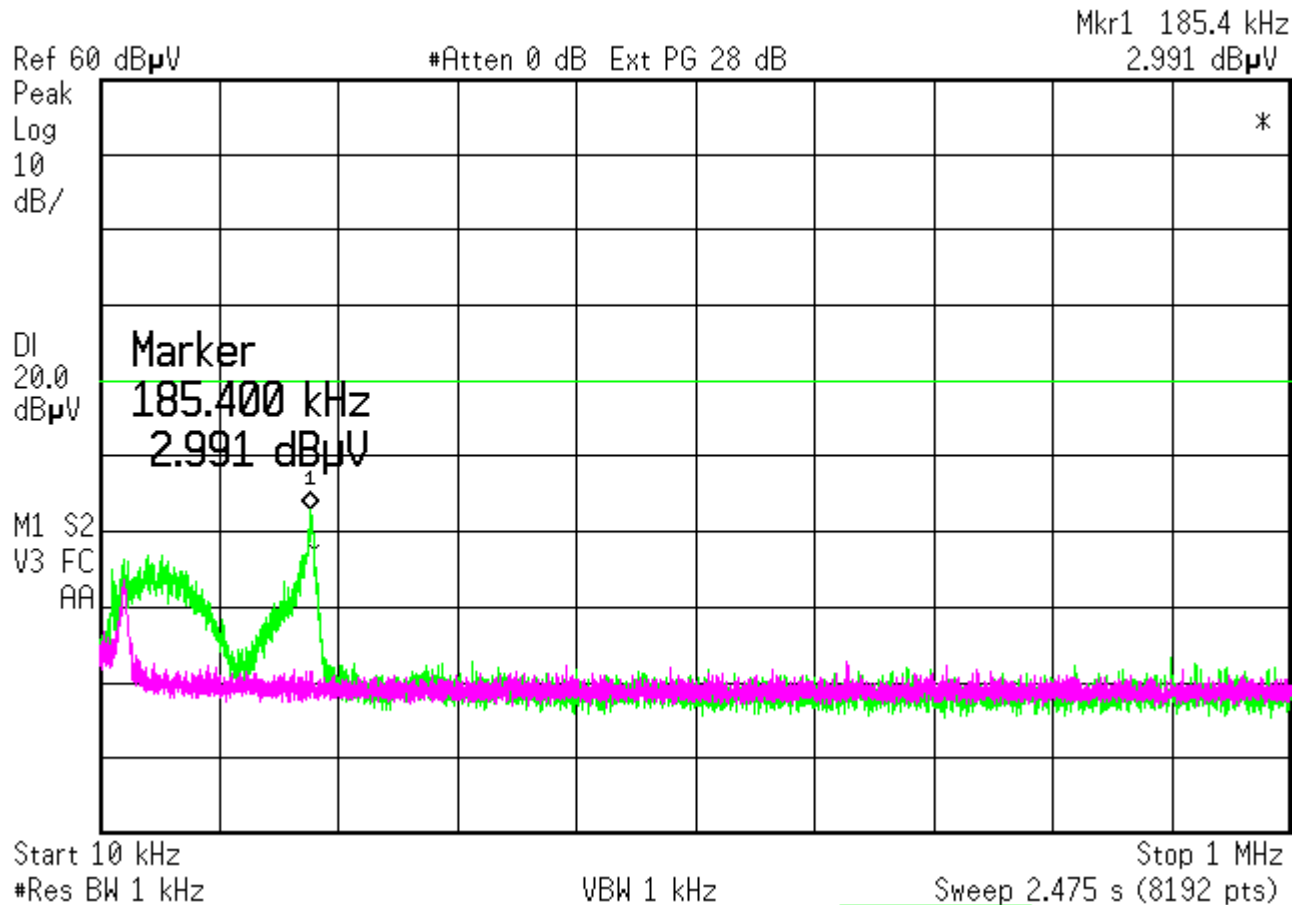
Common Mode Current, DTE Load End
106 meter 25 Pair CAT-5, Shorted Load discovery (x8), (0 dBuA = 0 dBuV)



106 meter, 25 pair, 6 proto driven, on/off disc
Each Trace taken with Max Hold, 10 minutes of acquisition, 28 dB preamp on F-35A cable clamp at PSE driving end

25 Pair Common Mode Current (0 dBuV = 0 dBuA) light green
baseline magenta
Display Line, 20 dBuV light green

Common Mode Current, Driving End
106 meter 25 Pair CAT-5, On/Off discovery (x6), (0 dBuA = 0 dBuV)



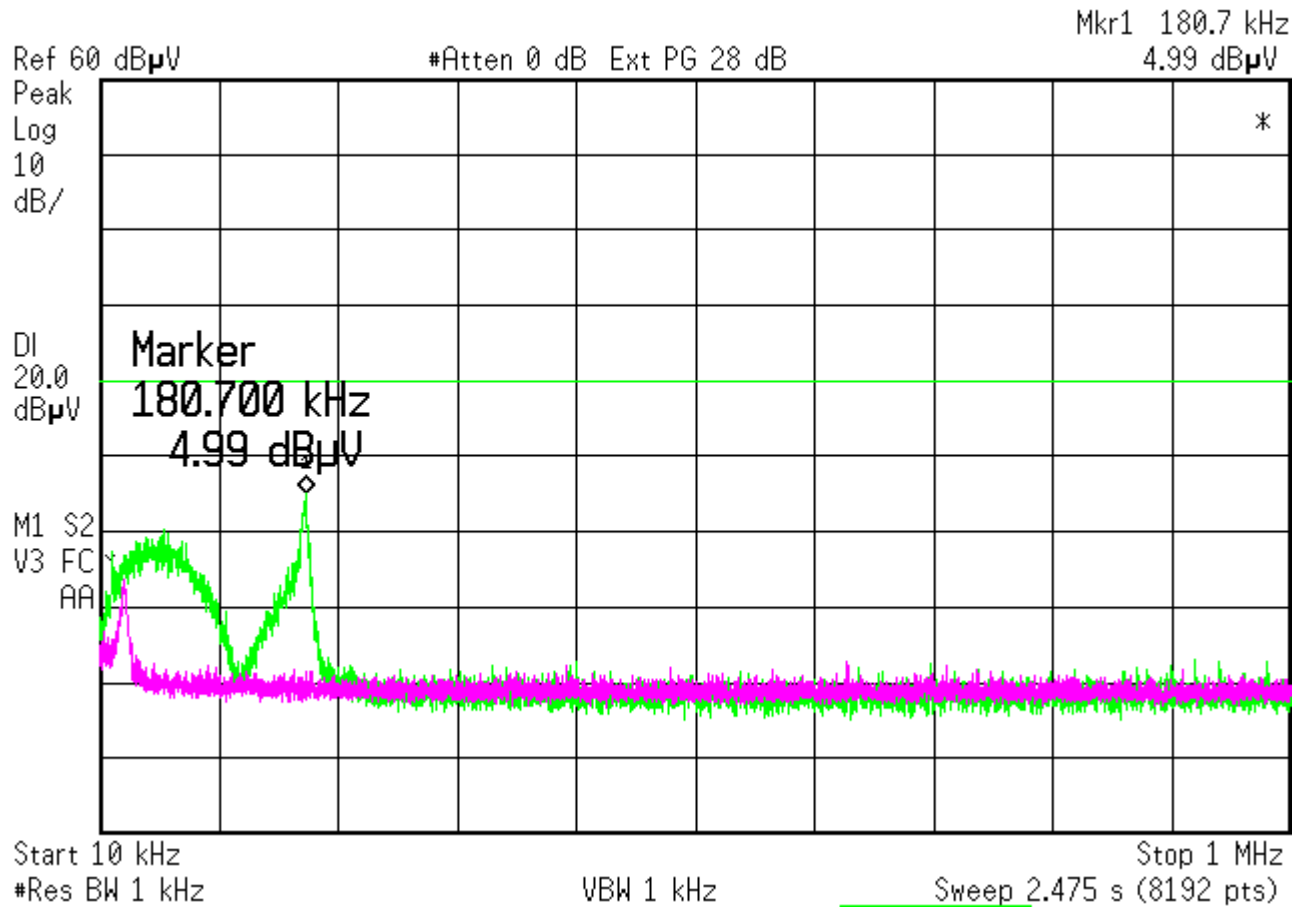
106 meter, 25 pair, 6 proto driven, open loads

Each Trace taken with Max Hold, 10 minutes of acquisition, 28 dB preamp on F-35A cable clamp at PSE driving end

25 Pair Common Mode Current (0 dBuV = 0 dBuA) light green
baseline magenta
Display Line, 20 dBuV light green

Common Mode Current, Driving End

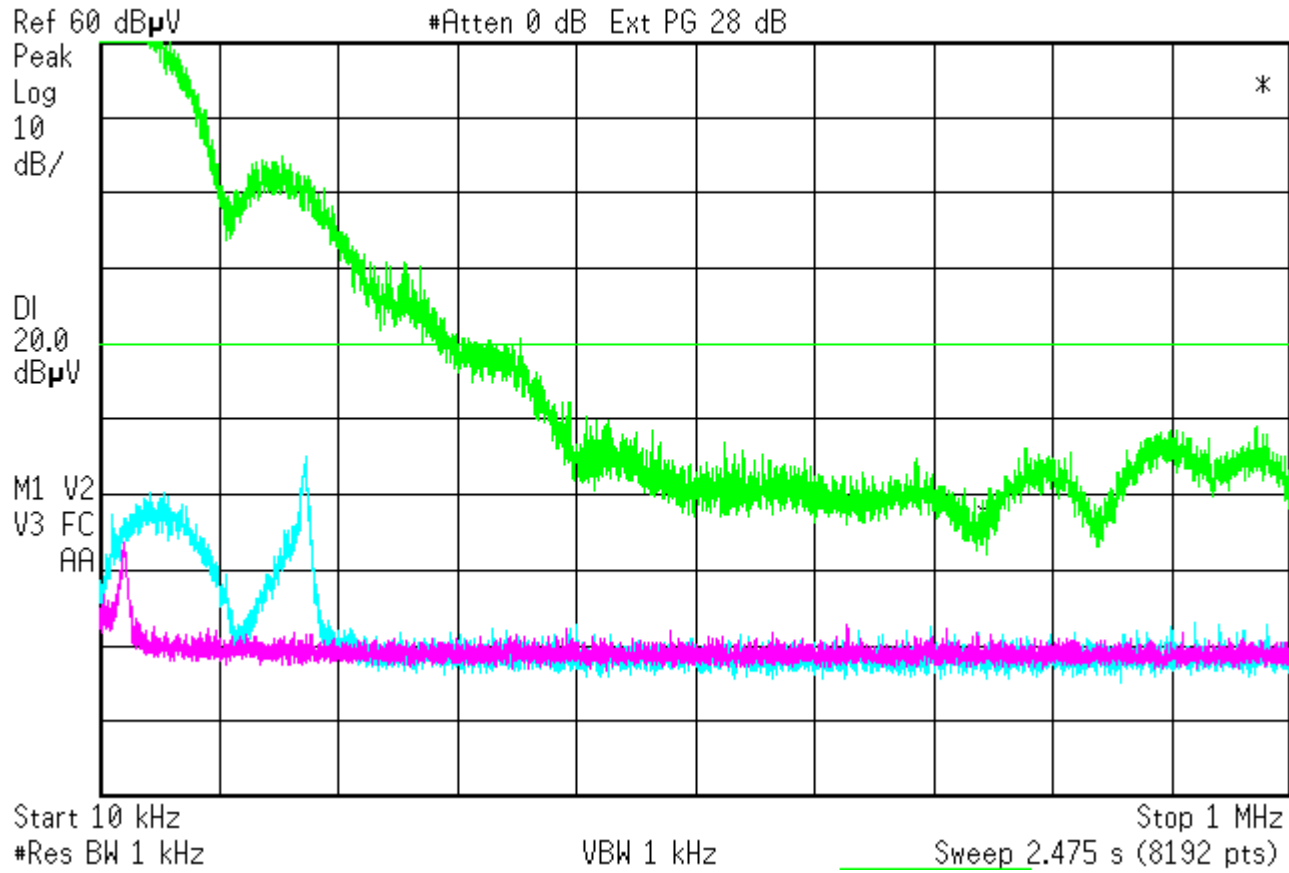
106 meter 25 Pair CAT-5, Open Load discovery (x6), (0 dBuA = 0 dBuV)



106 meter, 25 pair, 6 proto driven, shorted loads
 Each Trace taken with Max Hold, 10 minutes of acquisition, 28 dB preamp on F-35A cable clamp at PSE driving end

25 Pair Common Mode Current (0 dBuV = 0 dBuA) light green
 baseline magenta
 Display Line, 20 dBuV light green

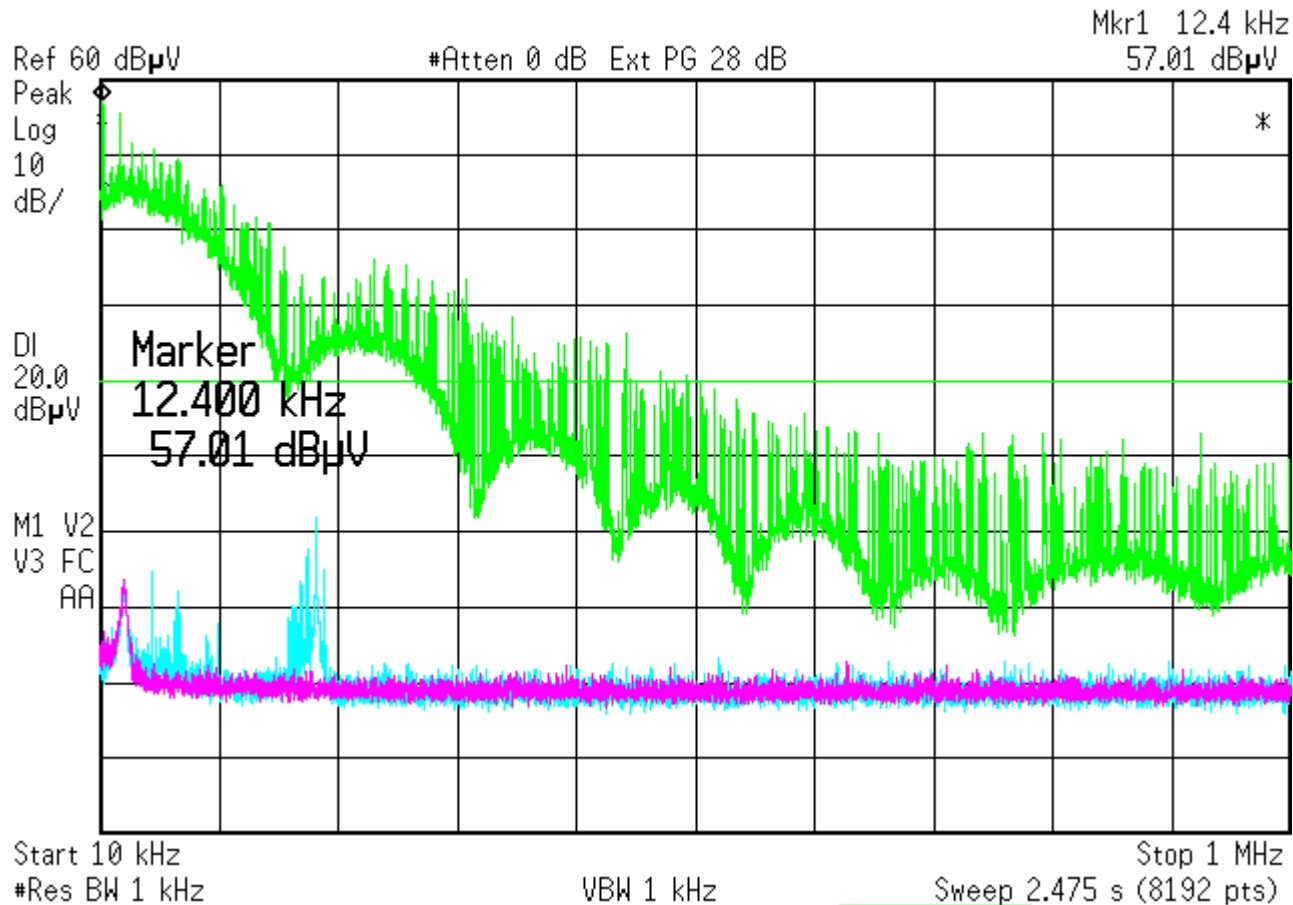
Common Mode Current, Driving End
 106 meter 25 Pair CAT-5, Shorted Load discovery (x6), (0 dBuA = 0 dBuV)



106 meter, 25 pair, 6 proto driven, shorted loads
Each Trace taken with Max Hold, 10 minutes of acquisition, 28 dB preamp on F-35A cable clamp at PSE driving end

pair to pair mode, all 6 send lines (0 dBuV = 0 dBuA) light green
25 Pair Common Mode Current (0 dBuV = 0 dBuA) light blue
baseline magenta

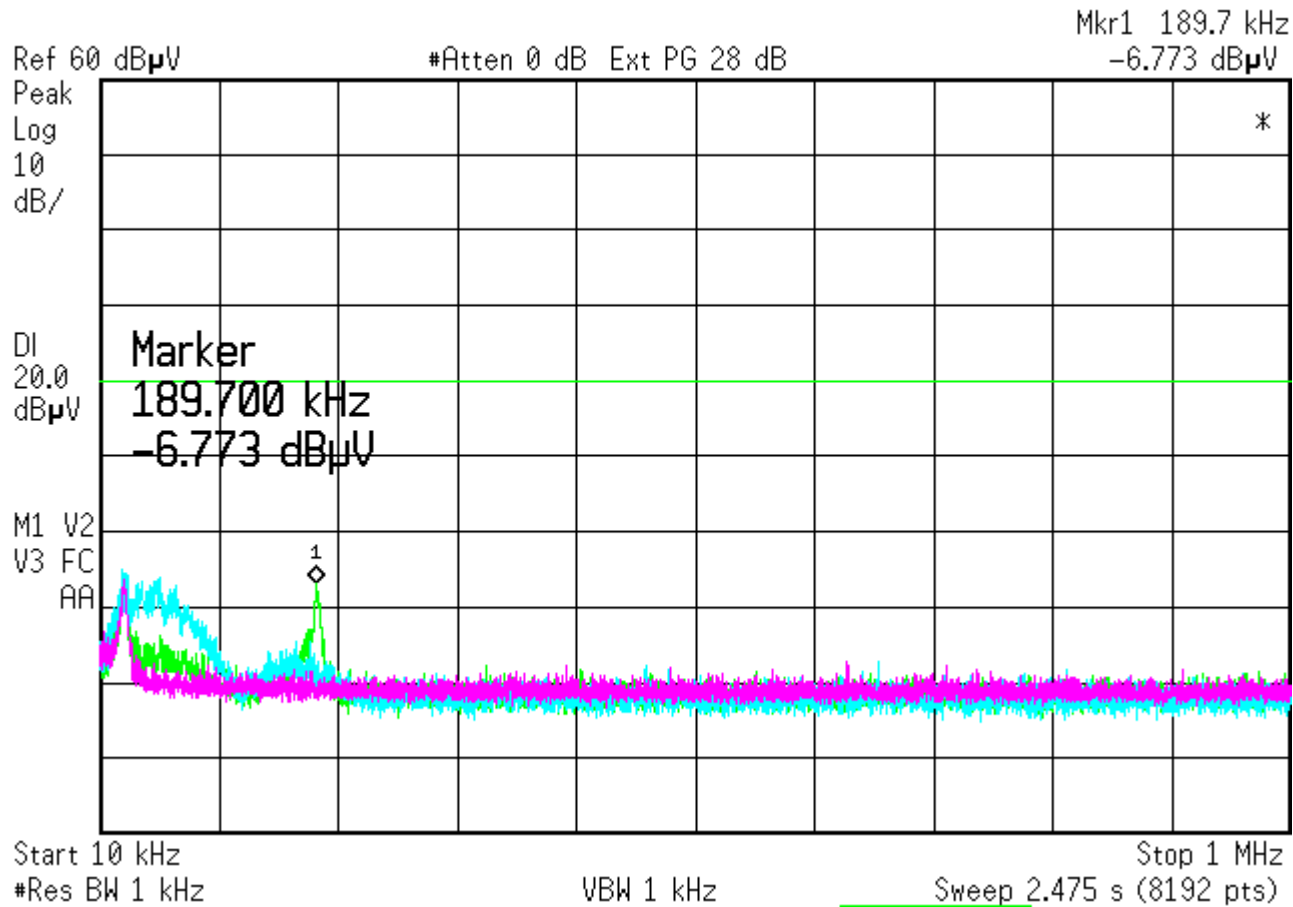
Common Mode Current and Pair to Pair Mode Current, Driving End 106 meter 25 Pair CAT-5, Shorted Load discovery (x6), (0 dBuA = 0 dBuV)



106 meter, 25 pair, 1 proto driven, on/off disc
Each Trace taken with Max Hold, 10 minutes of acquisition, 28 dB preamp on F-35A cable clamp at PSE driving end

pair to pair mode, (0 dBuV = 0 dBuA) light green
25 Pair Common Mode Current (0 dBuV = 0 dBuA) light blue
baseline magenta

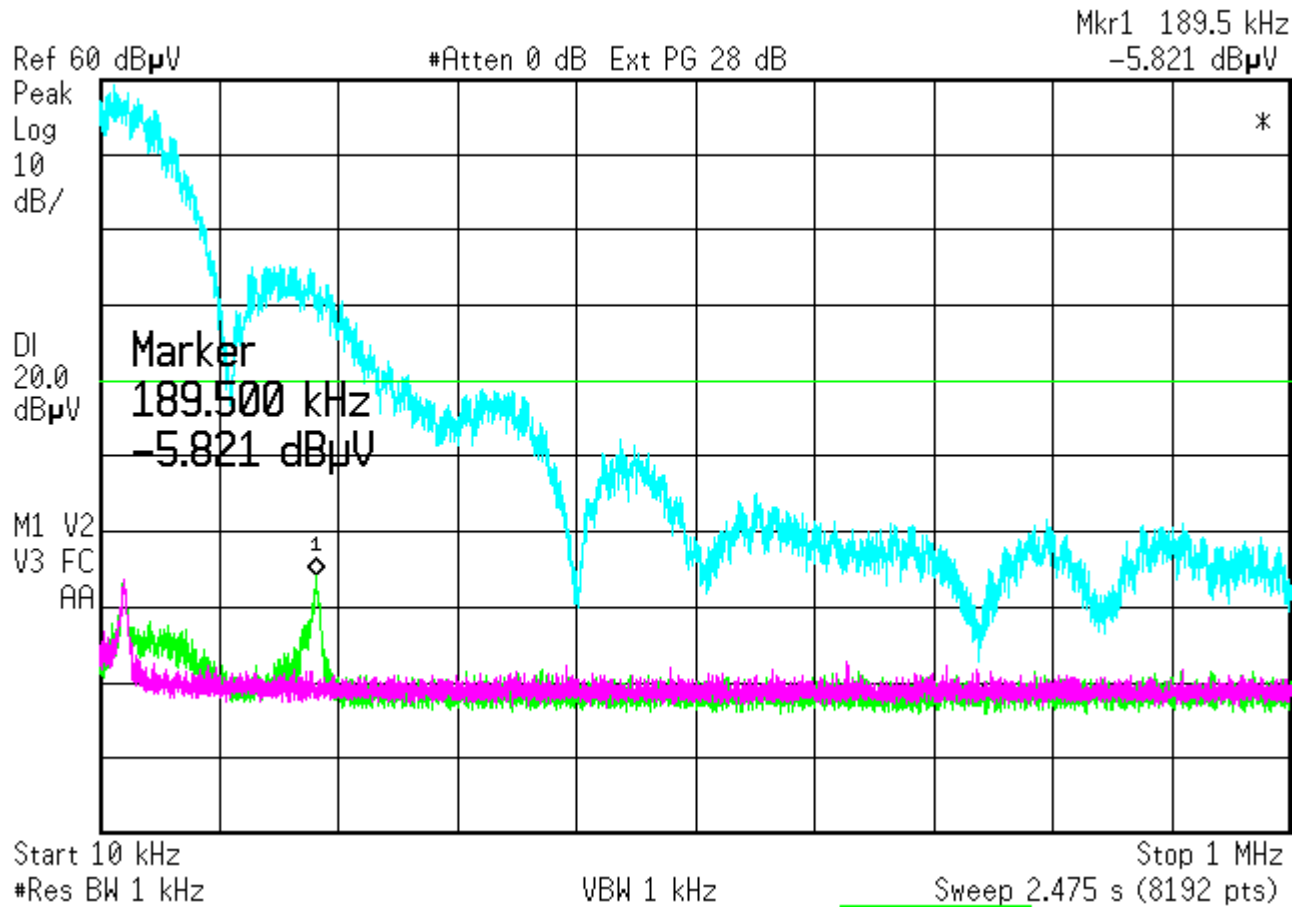
Common Mode Current and Pair to Pair Mode Current, Driving End 106 meter 25 Pair CAT-5, On/Off discovery (x1), (0 dBuA = 0 dBuV)



106 meter, 25 pair, 1 proto driven, open load
Each Trace taken with Max Hold, 10 minutes of acquisition, 28 dB preamp on F-35A cable clamp at PSE driving end

pair to pair mode, (0 dBuV = 0 dBuA) light blue
25 Pair Common Mode Current (0 dBuV = 0 dBuA) light green
baseline magenta

Common Mode Current and Pair to Pair Mode Current, Driving End 106 meter 25 Pair CAT-5, Open Load discovery (x1), (0 dBuA = 0 dBuV)

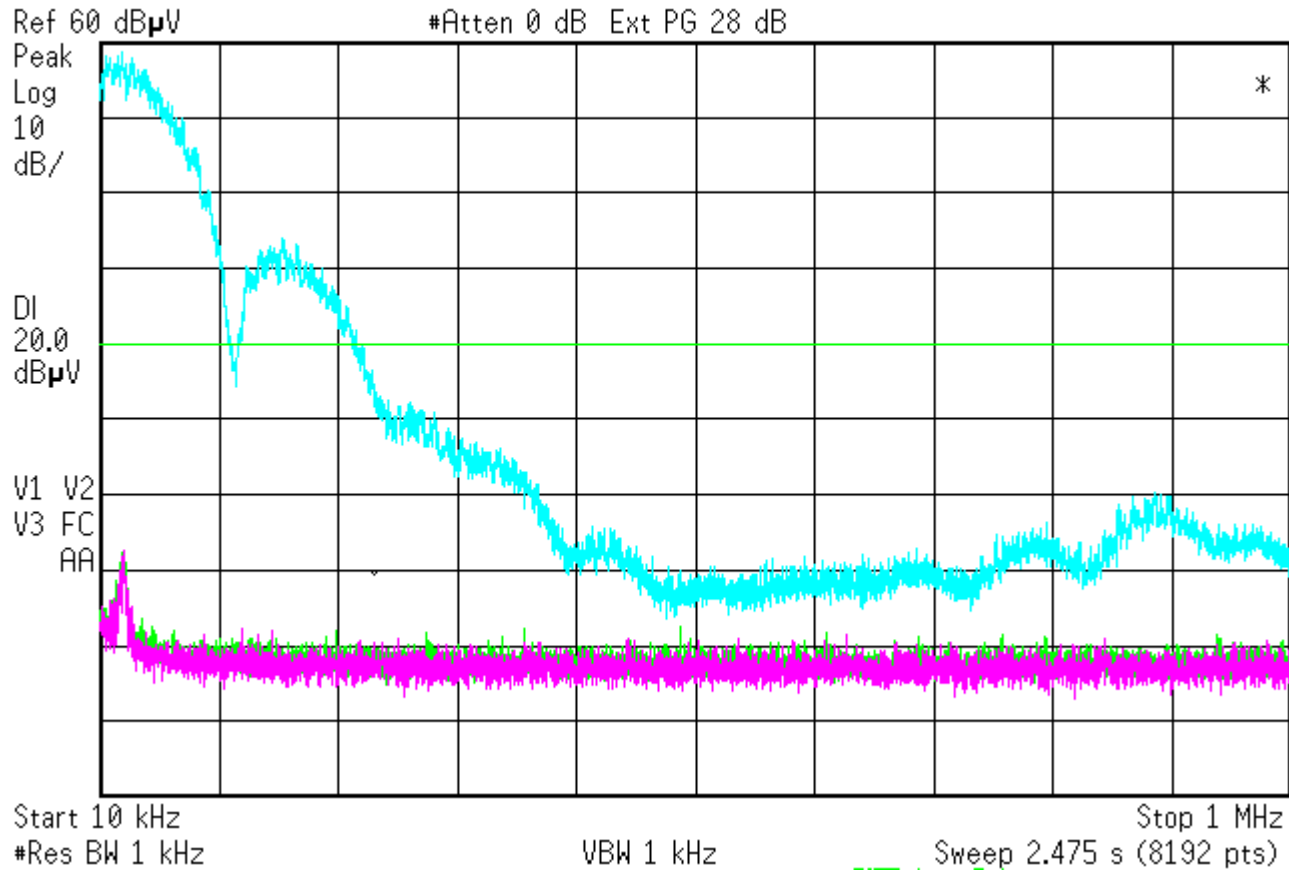


106 meter, 25 pair, 1 proto driven, shorted load
Each Trace taken with Max Hold, 10 minutes of acquisition

pair to pair mode, (0 dBuV = 0 dBuA)
25 Pair Common Mode Current (0 dBuV = 0 dBuA)
baseline

light blue
light green
magenta

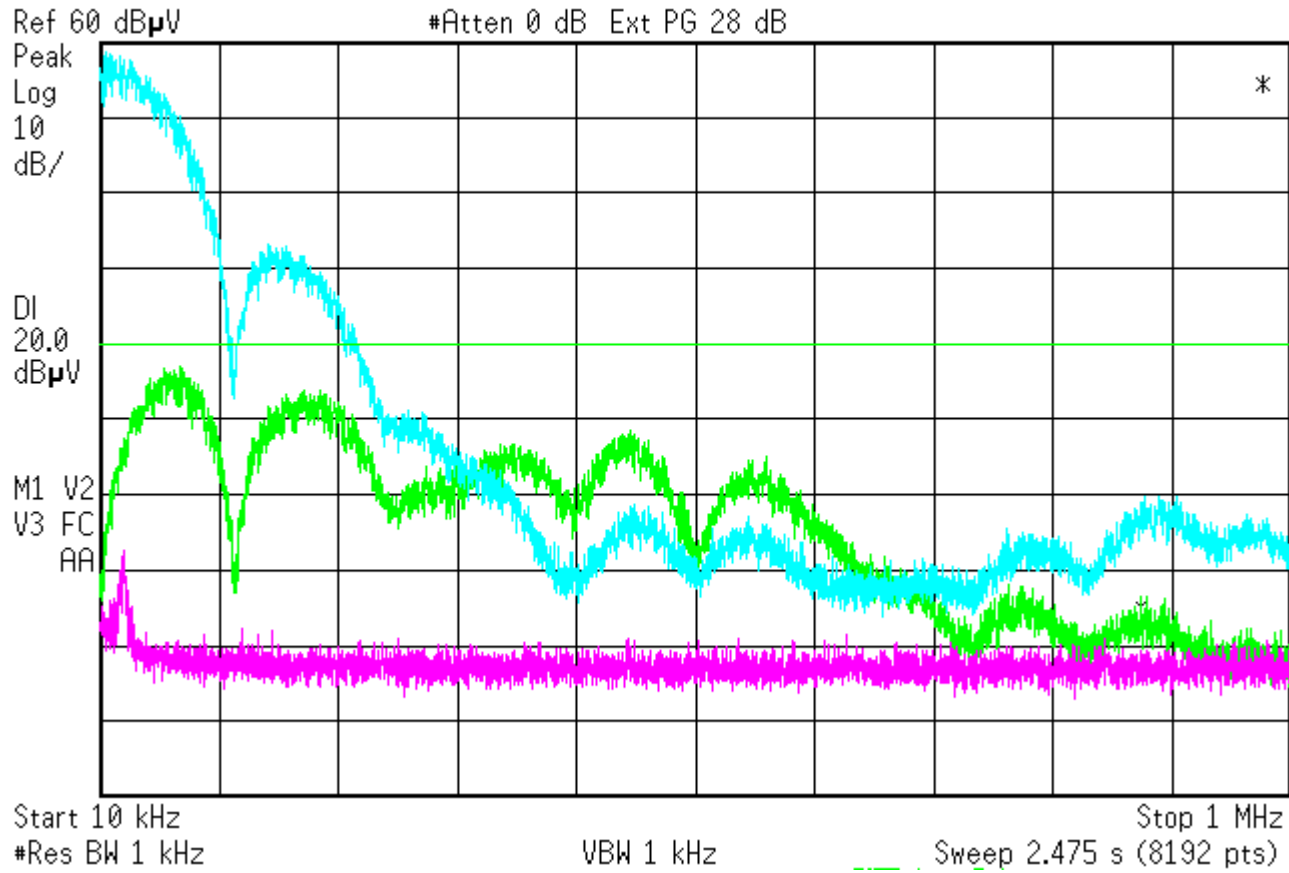
Common Mode Current and Pair to Pair Mode Current, Driving End
106 meter 25 Pair CAT-5, Shorted Load discovery (x1), (0 dBuA = 0 dBuV)



106 meter, 25 pair, 1 proto driven, shorted load
Each Trace taken with Max Hold, 10 minutes of acquisition

pair to pair mode, driving line light blue
unused pair to pair mode light green
baseline magenta

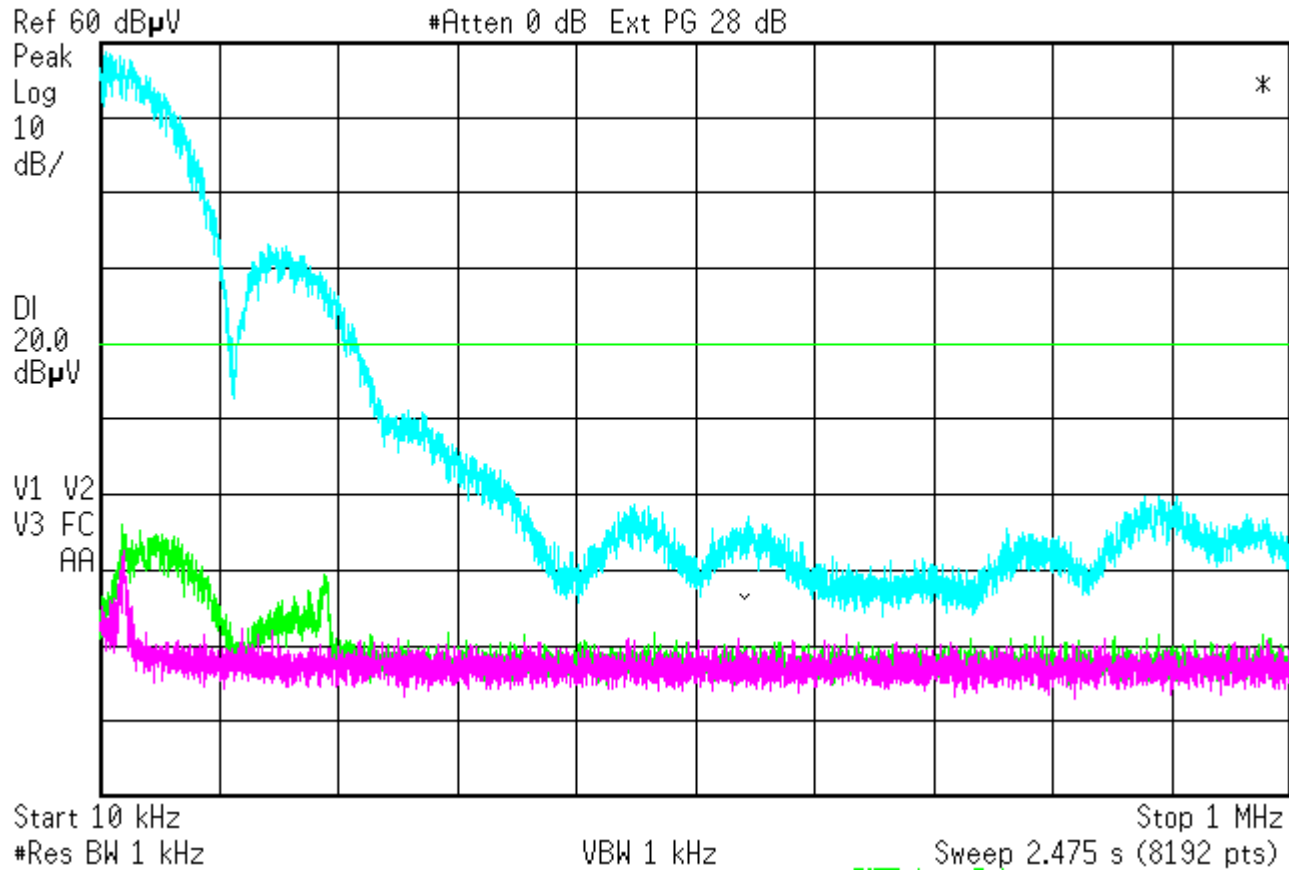
Pair to Pair Mode Current, Driving Pair, and Unused Pair
106 meter 25 Pair CAT-5, Shorted Load discovery (x1), (0 dBuA = 0 dBuV)



25 pair, 1 proto driven, shorted load at far end
Each Trace taken with Max Hold, 10 minutes of acquisition

pair to pair mode, driving line, shorted at far end light blue
neighbor pair to pair mode shorted at the near end light green
baseline magenta

Pair to Pair Mode Current, Driving Pair (shorted at far end),
and Unused Pair Current (shorted at the near end)
106 meter 25 Pair CAT-5, Shorted Load discovery (x1), (0 dBuA = 0 dBuV)

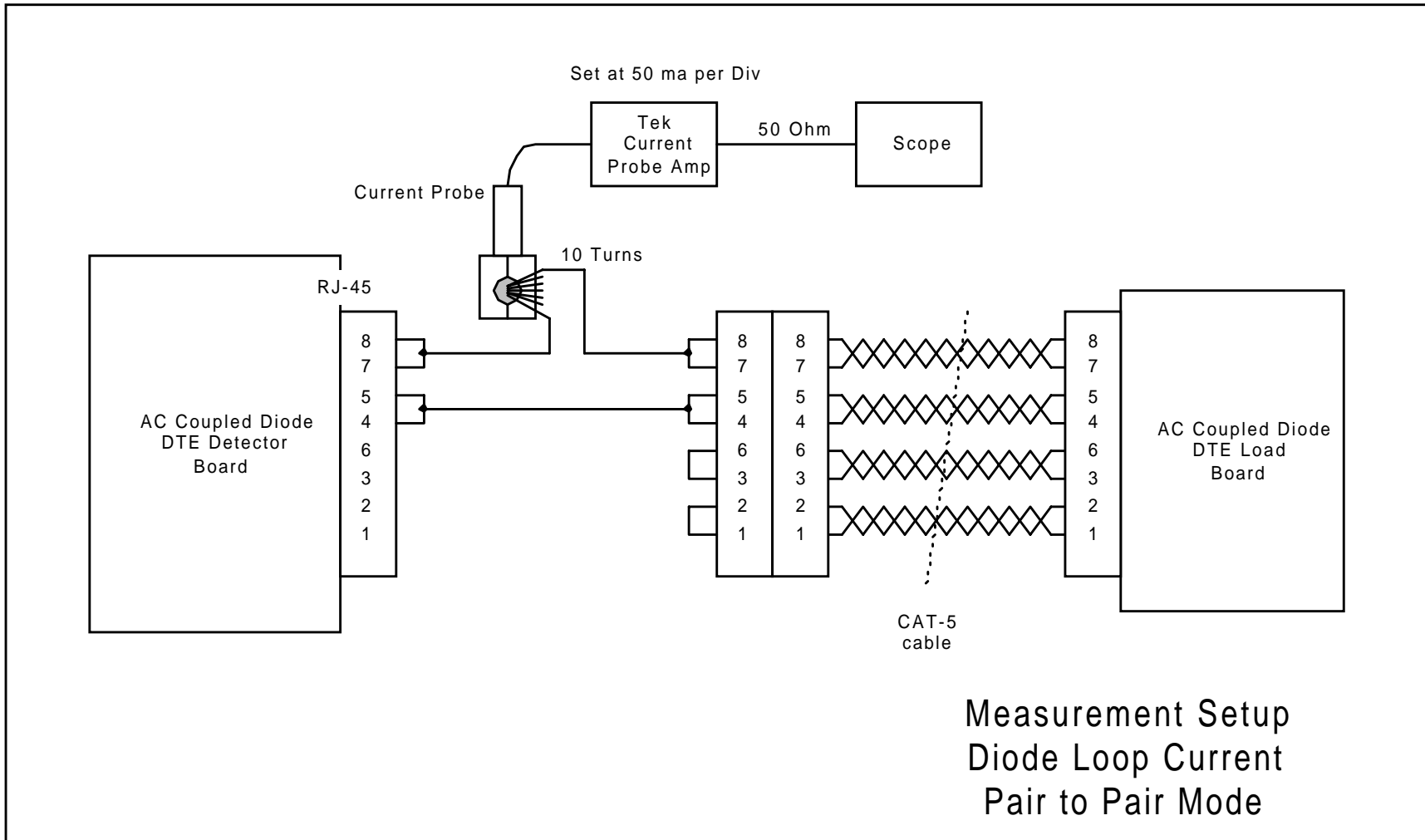


25 pair, 1 proto driven, shorted load at far end
Each Trace taken with Max Hold, 10 minutes of acquisition

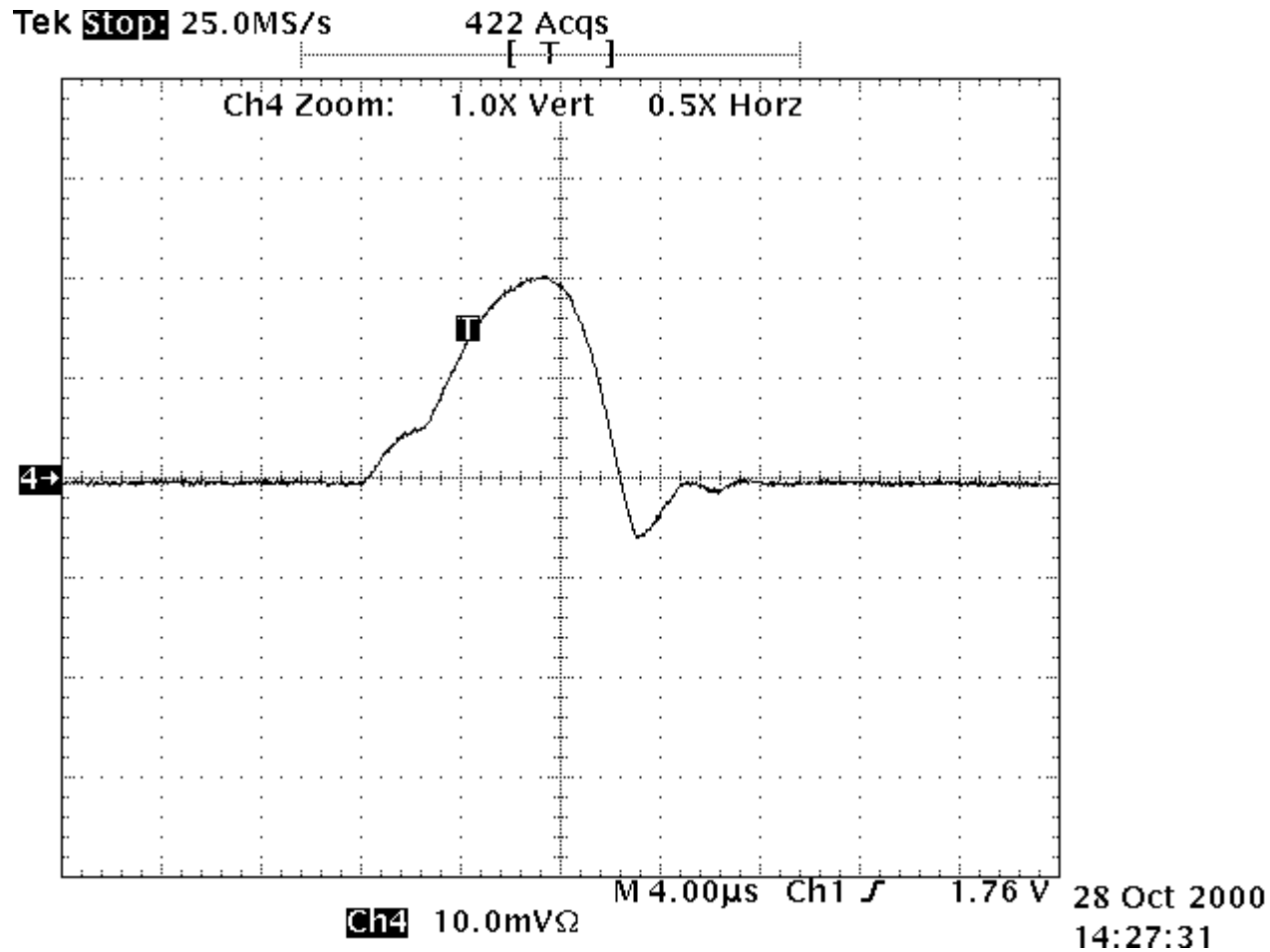
pair to pair mode, driving line, shorted at far end light blue
common mode current light green
baseline magenta

Pair to Pair Mode Current, Driving Pair, and Common Mode Current 106 meter 25 Pair CAT-5, Shorted Load discovery (x1), (0 dBuA = 0 dBuV)

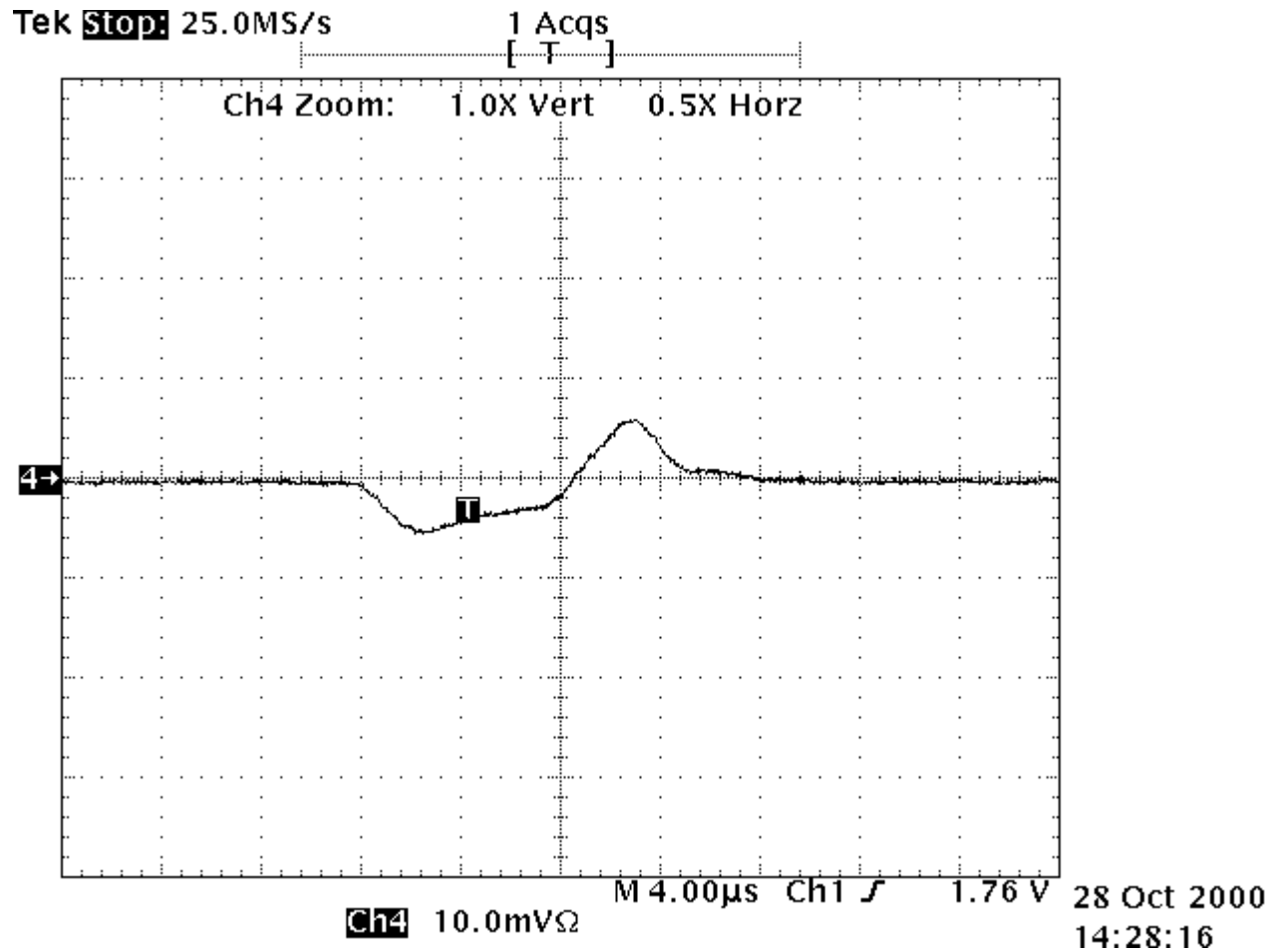
Pair to Pair Mode Current Scope Waveforms



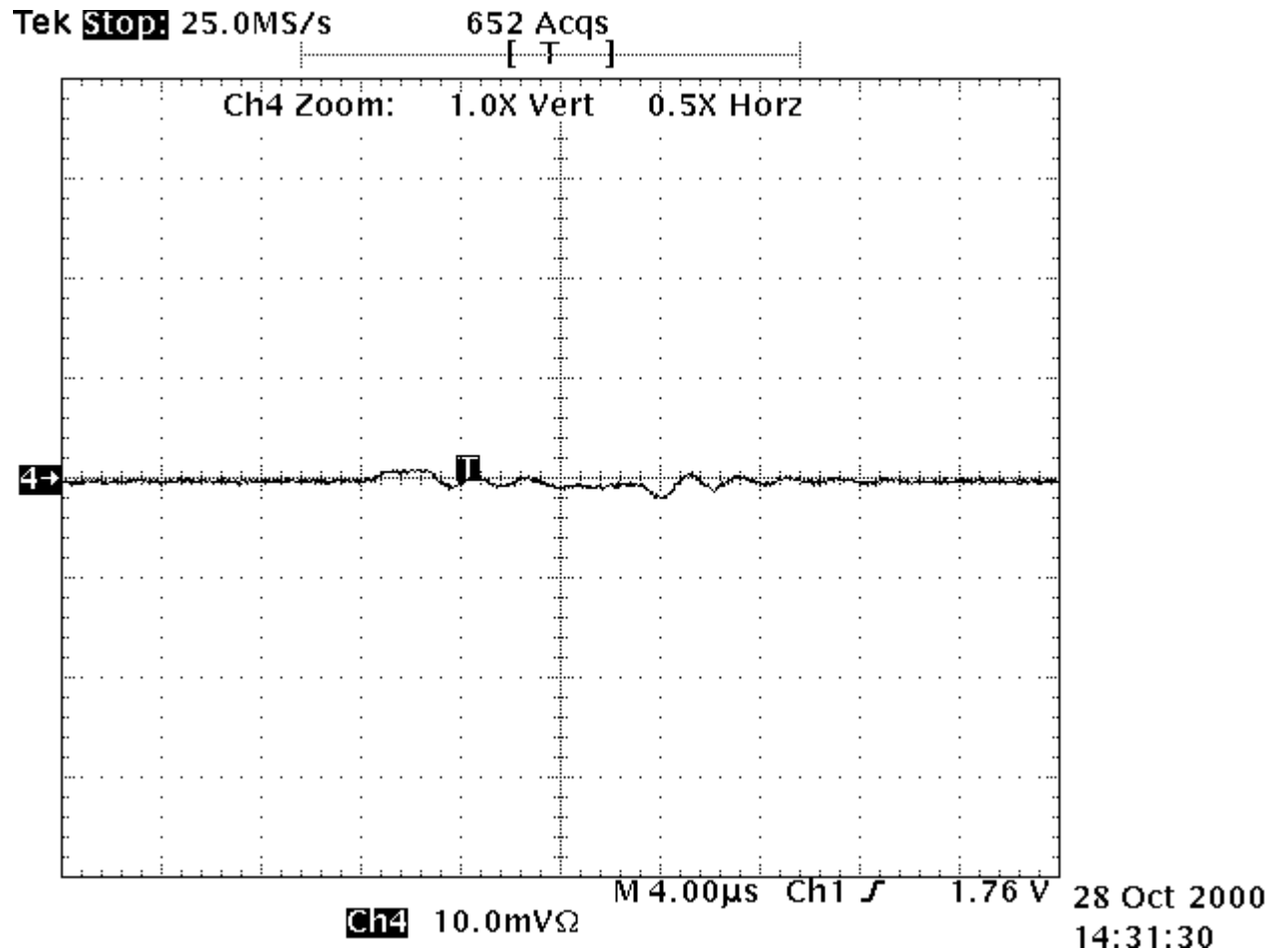
Discovery Pair to Pair Mode Current Measurement Setup



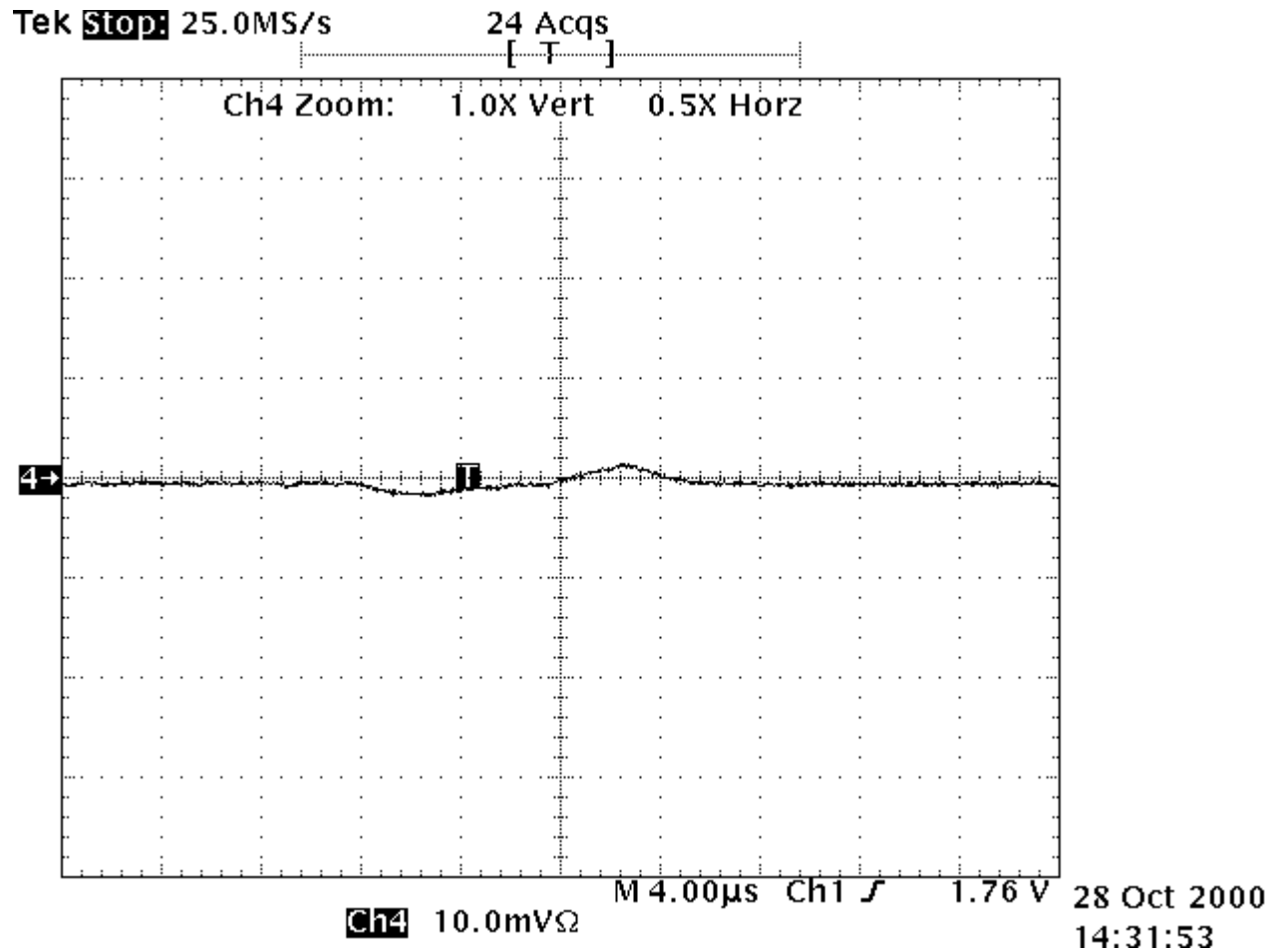
AC Coupled Diode Discovery Evaluation Board, Loop Current, Pair to Pair Mode
106 meter, 25 Pair CAT-5 Cable, Diode Conducting Direction, 5 ma per div



**AC Coupled Diode Discovery Evaluation Board, Loop Current, Pair to Pair Mode
 106 meter, 25 Pair CAT-5 Cable, Diode Non-Conducting Direction, 5 ma per div**

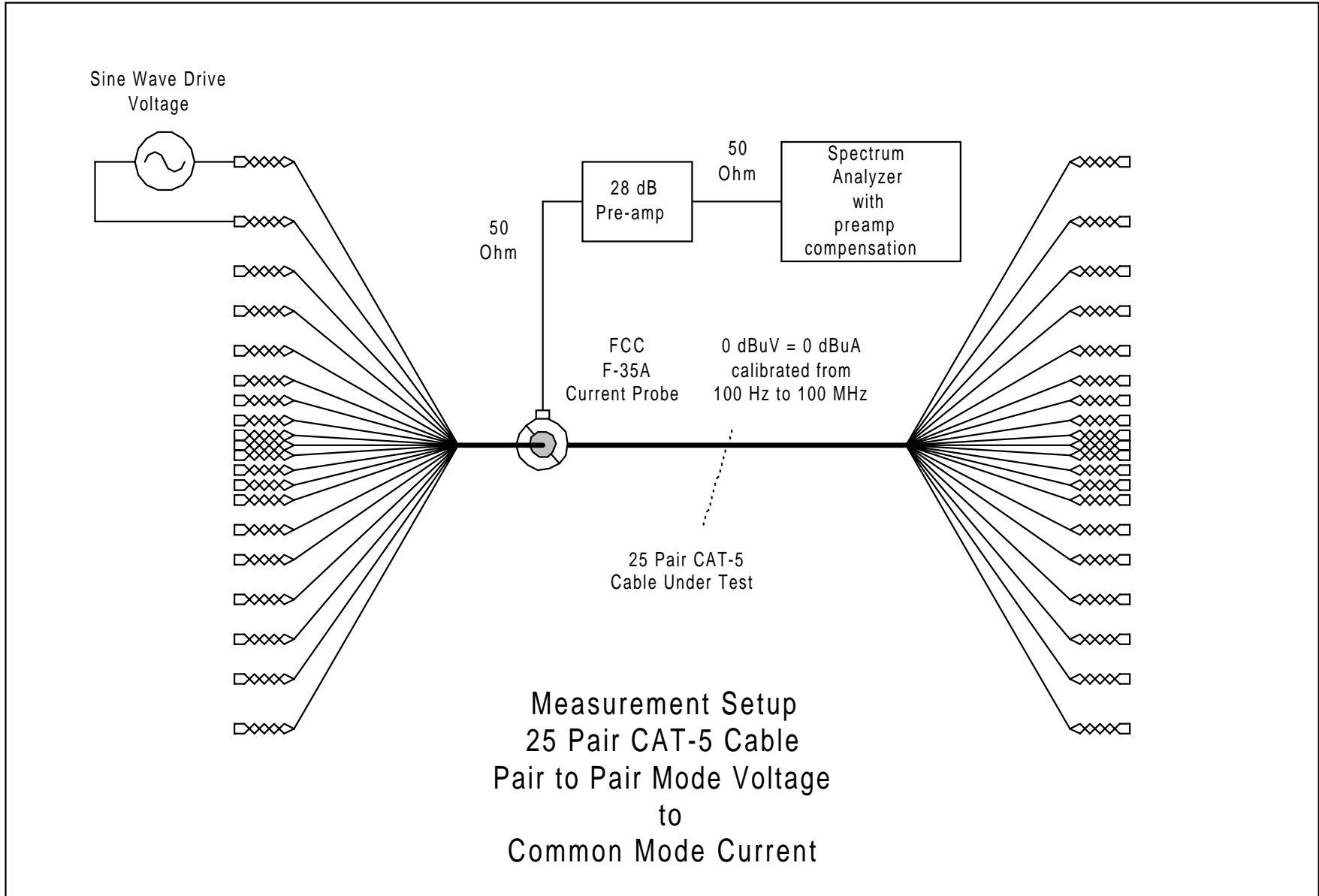


AC Coupled Diode Discovery Evaluation Board, Loop Current,
 Neighbor Pair to Pair Mode, shorted at the near (driving) end
 106 meter, 25 Pair CAT-5 Cable, Diode Conducting Direction, 5 ma per div



AC Coupled Diode Discovery Evaluation Board, Loop Current,
 Neighbor Pair to Pair Mode, shorted at the near (driving) end
 106 meter, 25 Pair CAT-5 Cable, Diode Non-Conducting Direction, 5 ma per div

Pair to Pair Mode Voltage to Common Mode Current Transfer Function



106 meter, 25 pair CAT-5
"pair to pair" mode voltage to common mode current conversion

