

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Carrier Current Systems, including)	ET Docket No. 03-104
Broadband over the Power Line Systems)	
)	
Amendment of Part 15 regarding new)	ET Docket No. 04-37
Requirements and measurements guidelines)	
For Access Broadband over the Power)	
Line Systems.)	

Comments on the Proposed Rulemaking
By David Garnier

Dear Commissioners, I have been an Amateur Radio operator for almost 30 years. This has been a wonderful hobby that has paid off many times personally and professionally. I work in the Midwest for a major medical electronics company. In the last 8 years I have developed a sub-specialty of EMC testing and certification.

The focus of my comments to this Proposed Rule Making will be through the lens of an Amateur Radio operator with EMC Test & Certification experience. My comments to ET Docket 03-104 will focus on these specifics.

- 1) Authorization of In-House and Access BPL equipment components should NOT be done by Verification Procedure but by the Certification Process. These devices have the potential to cause significant interference to already licensed services. I feel that BPL is a highly contentious issue that will require FCC intervention. In-House and Access BPL are Part 15 devices that share the frequencies on a non-interference basis. Thus, both In-House and Access BPL equipment are special cases that require FCC Certification and Type Acceptance numbers. If there were an interference problem, I would like to review the test data kept on FCC Website. This should not be burdensome to the manufacturers since today's documents are digitized.

- 2) In-House and Access BPL equipment manufactures need to accept the fact that there are fundamental differences between wide-band and narrow band communications in terms of signal to noise ratio. They are not the only users employing DSP techniques to improve their signal to noise ratio. BPL's "bursty" non-coherent "noise" may rear its ugly head in places never envisioned by the FCC. BPL's may turn out to be an "incompatible device" that cannot

be managed with narrow band users or other technologies. The FCC may need to step in and stop deployment of these devices.

- 3) I disagree with the FCC proposal that Radiated Emissions be the sole measurement criteria for In-House BPL devices. I purchased a pair of In-House BPL devices and discovered significant and objectionable interference on the 5 MHz & 10 MHz bands. I measured Conducted Emissions of these devices (at work) and discovered emissions to be 20 dB over Class B limit (conveniently not required for In-House BPL devices.) There is a 13 dB relaxation clause that can be taken if the QP measurements are 5 dB greater than the Average measurements, but even with factoring in that exception these devices still fails Class B limits. These devices need to be measured for Conducted Emissions. It's obvious to me that this omission favors the manufacturers and allows greater output power from their devices. (Pre-Compliance data is included the appendix of this document.)
- 4) The 3 house rule is laughable for its omissions. How do you measure emissions from a second story house? Are all of the house lights ON or OFF? If the EMC test antenna isn't raised to 4 meters in height the second story emissions are not being realistically measured. (Amateur antennas are usually located well off the ground and this is the height where the interference will be picked up.) Doesn't CISPR 16 require realistic measuring situations? Loop antennas are magnetic field antennas not electric field antennas. "Near field versus Far field" measurement error is greater with a Loop antennas. Laboratory Conducted Emissions measurements are clearly more repeatable.
- 5) Loop antennas are designed to measure Magnetic fields not Electric fields. Monopole antenna or Turned Horizontal dipoles should be required for all "In-situ" testing. (Bicon antennas only work well vertically. They have poor horizontal calibration factors.) Measuring horizontal power line emissions require horizontally polarized antenna.
- 6) I disagree with the proposal on exempting Conducted Emissions testing for Access BPL installs on overhead power lines. "Direct Probe Measurement" is an acceptable measurement technique in many test standards. The Access BPL manufacturers could build in the "Direct Probe" circuitry into their devices and thus eliminate the multiple proposed "In-Situ" measurements. I don't buy the argument that it's solely a safety issue. Do you think the power companies are going to shut down their power lines when the Access BPL devices are installed? I don't think so. "In-Situ" measurements are laborious and problematic because of all of the ambients. Remove the Loop Antenna option from this proposal. Besides, as a long-term solution how long will Access BPL's will want to conduct "In-Situs?" I can see it coming now, the 3 power line rule!
- 7) With the nature of BPL's bursty hopping ability QP measurements compared against a Max-Hold "mask" should be required.
- 8) Require the Electric Power Companies to have an interference department and require it's listing in the company telephone directory. My experiences with the Wisconsin Electric Power Company in solving line interference problems has been an absolute joke. There really is no excuse for this kind of customer service.

9) Require Access BPL's to "notch" all licensed service frequencies.

10) Require Access BPL's to file their "In-Situ" test data with FCC and be made available for review on the FCC website.

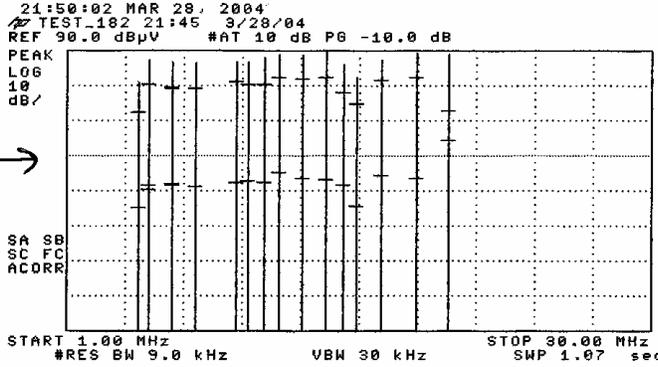
Respectfully Submitted 4/3/2004,

David Garnier

APPENDIX DATA

BELKIN ETHERNET

L1



CLASS B →

- AUTO
- VIEW TABLE
- VIEW LOG
- VIEW LINEAR
- VIEW TRACE
- SAVE TO CARD
- Return

#	FREQUENCY (MHz)	PEAK (LIN)	QP (LIN)	AVG (LIN)
1	15.346	82.3	22.3	45.7 -14.3
2	11.523	89.0	29.0	82.2 22.2 55.1 -4.9
3	14.702	86.0	26.0	78.1 18.1 51.5 -8.5
4	6.244	87.0	27.0	79.4 19.4 51.6 -8.4
5	6.251	86.2	26.2	79.4 19.4 51.9 -8.1
6	9.958	86.9	26.9	80.6 20.6 52.3 -7.1
7	16.570	87.1	27.1	81.5 21.5 54.5 -6.5
8	18.355	89.1	29.1	82.5 22.5 53.6 -6.4
9	18.867	89.4	29.4	82.5 22.5 53.1 -6.9
10	9.375	86.7	26.7	81.1 21.1 52.3 -7.7
11	10.751	88.0	28.1	80.2 20.2 52.3 -7.7
12	7.412	86.2	26.2	79.4 19.4 51.0 -9.0
13	4.552	80.9	20.9	72.2 12.2 45.0 -15.0
14	5.088	87.0	27.0	80.5 20.5 50.4 -9.6
15	19.901	88.8	28.8	72.9 12.9 64.3 4.3
16	12.694	88.7	28.7	81.8 21.8 53.7 -6.3
17	5.092	86.5	26.5	80.4 20.4 51.4 -8.6

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~~MARGIN SET TO 10.0 DB BELOW LIMIT LINE~~
~~TEST_182 21:45 3/28/04~~

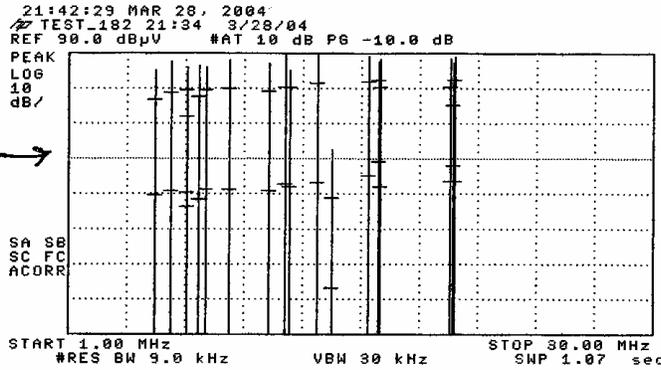
BELKIN POWERLINE ADAPTER -
 - ETHERNET.

MODEL # F5D4070

VER. # 1002

"TEST TO COMPLY WITH FCC STANDARDS
 FOR HOME OR OFFICE USE"

BELKIN ETHERNET



AUTO
 VIEW TABLE
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 SAVE TO CARD
 Return

L2

#	FREQUENCY (MHz)	PEAK (LIM)	GP (LIM)	AUG (LIM)
1	16.390	87.5 27.5	82.3 22.3	59.4 -0.6
2	13.292	89.5 29.5	81.6 21.6	53.4 -6.6
3	19.948	88.4 28.4	80.3 20.3	53.5 -6.5
4	7.464	86.5 26.5	77.6 17.6	48.5 -11.5
5	14.026	82.3 2.3	48.9 -11.1	23.1 -36.9
6	11.731	89.6 29.6	80.3 20.3	52.9 -7.1
7	10.964	87.3 27.3	79.4 19.4	50.7 -9.3
8	15.836	89.0 29.1	81.9 21.9	55.1 -4.9
9	6.846	85.9 25.9	79.4 19.4	58.4 -9.6
10	7.790	86.2 26.2	79.6 19.6	51.2 -8.8
11	8.984	87.9 27.9	80.2 20.2	51.0 -9.0
12	11.954	85.3 25.3	80.5 20.5	52.1 -7.9
13	6.053	87.4 27.4	78.7 18.7	50.9 -9.1
14	6.310	85.0 25.0	76.9 16.9	49.5 -10.5
15	20.108	88.7 28.7	82.3 22.3	53.6 -6.6
16	20.877	87.2 27.2	75.3 15.3	59.0 -2.0
17	16.427	88.6 28.6	80.5 20.5	52.0 -8.0
18	6.898	76.5 16.6	72.0 12.0	46.4 -13.6

AUTO
 VIEW TABLE
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~~MARGIN SET TO 10.0 DB BELOW LIMIT LINE~~
 TEST_182 21:34 3/28/04

BELKIN PowerLINE ADAPTER - ETHERNET

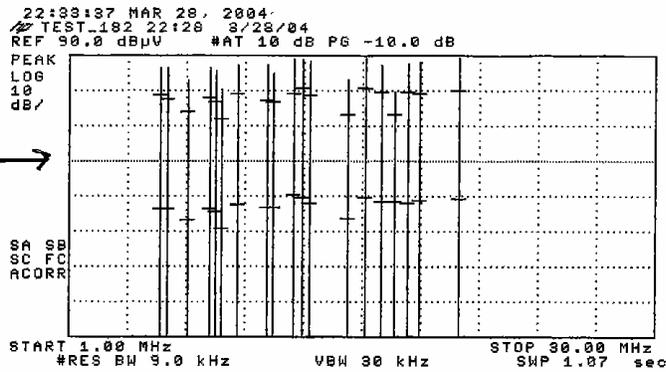
MODEL # F5D4070

VER # 1002

"TESTED TO COMPLY WITH FCC STANDARDS, FOR HOME OR OFFICE USE"

BELKIN USB

LI



- AUTO
- VIEW TABLE
- VIEW LOG
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- VIEW TRACE
- SAVE TO CARD
- Return

#	FREQUENCY (MHz)	PEAK <LIM>	QP <LIM> (dBuV)	Avg <LIM>
1	12.085	88.7 28.7	79.2 19.3	50.4 -9.7
2	20.294	89.2 29.2	80.0 20.0	49.2 -10.8
3	11.089	84.6 24.6	76.8 16.8	46.7 -13.3
4	14.769	88.9 29.3	79.3 19.3	48.5 -16.5
5	17.777	87.4 27.4	79.7 19.7	48.0 -12.0
6	16.424	87.9 27.9	79.5 19.5	48.2 -11.8
7	12.856	86.3 26.3	78.7 18.7	48.1 -11.9
8	13.358	87.0 27.0	78.2 18.2	49.0 -11.0
9	6.871	82.9 22.9	74.0 14.0	43.2 -16.8
10	10.770	87.2 27.2	77.1 17.1	46.8 -13.2
11	8.280	85.5 25.5	76.8 16.8	45.5 -14.5
12	9.353	87.2 27.2	79.8 19.8	47.6 -12.4
13	7.975	86.6 26.6	78.2 18.2	46.5 -13.5
14	8.526	88.5 28.5	72.1 12.1	41.0 -19.0
15	12.437	89.8 29.8	80.7 20.7	49.4 -10.6
16	5.862	86.5 26.5	77.6 17.6	46.5 -13.5
17	17.075	79.5 19.5	73.9 13.9	48.9 -11.7
18	15.622	89.2 29.2	80.5 20.5	49.8 -10.2
19	5.475	86.4 26.4	78.7 18.7	46.8 -13.5

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~~MARGIN SET TO 10.0 DB BELOW LIMIT LINE~~
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BELKIN POWERLINE ADAPTER -USB

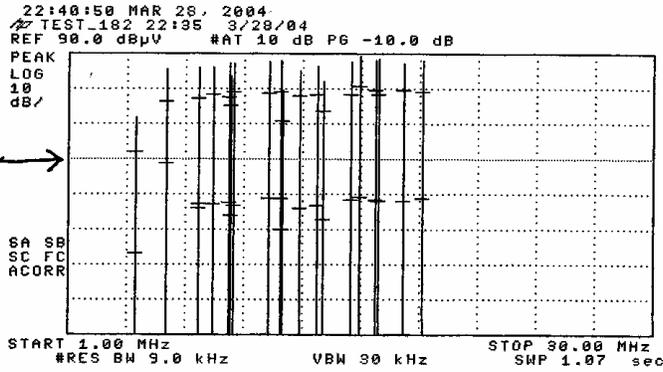
MODEL # F5D4050

VER # 1002

" TEST TO COMPLY WITH FCC STANDARDS, FOR HOME OR OFFICE "

BELKIN USB

L2



CLASS B →

AUTO
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 SAVE TO CARD
 Return

#	FREQUENCY (MHz)	PEAK (LIM)	QP (LIM)	AVG (LIM)
1	13.308	86.2 26.2	78.4 18.4	46.7 -13.8
2	4.342	71.7 11.7	62.2 2.2	38.2 -26.8
3	11.686	79.5 19.6	71.0 11.0	39.9 -20.1
4	16.293	88.1 28.1	79.7 19.7	48.6 -11.4
5	12.467	85.3 25.3	78.0 18.0	45.9 -14.1
6	10.333	87.5 27.5	78.5 18.5	48.9 -11.2
7	18.543	87.8 27.8	79.4 19.4	48.7 -11.3
8	16.367	88.5 28.5	78.5 18.5	47.9 -12.1
9	7.435	85.2 25.2	77.2 17.2	45.9 -14.1
10	15.429	89.3 29.3	80.8 20.8	49.1 -10.9
11	11.507	87.9 27.9	79.3 19.3	48.7 -11.3
12	15.008	87.6 27.6	78.5 18.5	48.4 -11.6
13	9.154	87.9 27.9	79.2 19.2	46.9 -13.1
14	13.685	82.1 22.1	73.6 13.6	42.7 -17.3
15	7.442	86.1 26.1	77.1 17.1	47.1 -12.9
16	8.185	86.0 26.0	78.4 18.4	47.1 -12.9
17	5.833	85.5 25.5	76.5 16.5	58.6 -1.4
18	17.557	87.1 27.1	79.8 19.8	47.9 -12.1
19	8.982	87.3 27.3	77.8 17.8	47.7 -12.3
20	9.044	83.7 23.7	75.1 15.1	48.9 -16.2

* MARGIN SET TO 10.0 DB BELOW LIMIT LINE
 TEST_182 22:35 3/28/04

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BELKIN PowerLINE Adapter - USB

MODEL # F5D4050

VER # 1002

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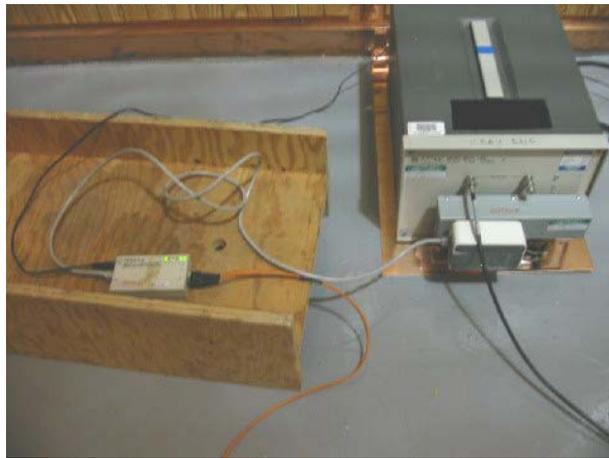
EMCO LISN



HP 8593E



Belkin Ethernet – (with fiber optics isolation)



Belkin - USB

