P802.3bq D2.3 & P802.3bz D1.1 Comments for ad hoc Review

IEEE P802.3bz ENUCA and P802.3bq RxCMNR ad hocs

November 4th, 2015

.bq Clamp Comments (1/3)

IEEE P802.3bq D2.3 25G/40GBASE-T Ethernet 3rd Working Group recirculation ballot comments

Cl 113 SC 113.5.4.3 P 174 L 24 # 96
Cibula, Peter Intel Corporation
Comment Type T Comment Status D Clamp

The text referring to the impairment signal power in 113.5.4.3 defines a maximum limit by stating that the calibrated power "...does not exceed 6 dBm..." The calibration procedure outlined in Annex 113A, 113A.3 Cable clamp validation uses a nominal value and a tolerance of +/- 10%.

Given that the calibration procedure permits a maximum value of 6.6dBm for the power level defined in Clause 113, the normative text should identify a nominal value with tolerance instead of a maximum value.

Note that the suggested remedy, which explicitly identifies the impairment signal power as a nominal level with a tolerance, is better aligned with Clause 40, which defines a signal level in the normative text (40.6.1.3.3) and a tolerance about this level in the informative annex (Annex 40B).

SuggestedRemedy

Change the text in 113.5.4.3, Page 174, Lines 24 and 25 from

"A sine wave with the amplitude held constant over the whole frequency range from 80 MHz to 2000 MHz, with the amplitude calibrated so that the signal power measured at the output of the clamp does not exceed 6 dBm, is used to generate the external electromagnetic field and corresponding shield current."

to

"A sine wave with the amplitude held constant over the whole frequency range from 80 MHz to 2000 MHz, with the amplitude calibrated to a nominal signal power of 6 dBm measured at the output of the clamp, is used to generate the external electromagnetic field and corresponding shield current."

and add a footnote to 113.5.4.3 stating

"The 6dBm nominal measured power may vary by +/-10% across frequency as discussed in Annex 113A."

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 113 SC 113.5.4.3 P 174 L 25 # 74
McClellan, Brett Marvell
Comment Type T Comment Status D Clamp

It is unclear whether the signal power limit is 6dBm as stated in 113.5.4.3 or 6dBm plus the 10% variation allowed by Annex 113A.3.

SuggestedRemedy

Clarify that the limit is 6dBm by adding this footnote: "The 6dBm limit includes the 10% frequency-dependent variation mentioned in Annex 113A.3."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
OBE Comment 96

Cl 113A SC 113A.2 P 221 L 43 # 57
Zimmerman, George CME Consulting, Inc.
Comment Type E Comment Status D Clamp

"As shown in Figure 113A–2 the inner conductor on the bottom half of the clamp extends slightly (~0.1mm)" - this is not shown in the figure

SuggestedRemedy

Delete "As shown in Figure 113A-2", capitalize "the"

Proposed Response Response Status W

PROPOSED ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl 113A
SC 113A.2

Page 1 of 3
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.bq Clamp Comments (2/3)

IEEE P802.3bq D2.3 25G/40GBASE-T Ethernet 3rd Working Group recirculation ballot comments

Cl 113A SC 113A.4 P 224 L 54 # 97
Cibula, Peter
Intel Corporation
Comment Type T Comment Status D Clamp

The Task Force has been been careful to keep Annex 113A flexible and refer practitioners to the receiver specifications of the PHY under test for specific impairments, impairment source power levels, and relevant frequency ranges.

However, the description of the test setup, Page 224, Line 54 and Page 225, Line 1 states "...the signal generator output frequency is swept incrementally from 1 MHz to 2000 MHz...". Since 113A.4 describes the setup for the referenced specifications, this statement should more generic and refer to the "calling" normative text for the test frequency range.

SuggestedRemedy

Change the text in Annex 113A, Page 224, Line 54 and Page 225, Line 1 from

"As with the calibration procedure, the signal generator output frequency is swept incrementally from 1 MHz to 2000 MHz with a step size that should not exceed 1% of the preceding frequency value and with a dwell time at each step of at least 500 ms."

to

"As with the calibration procedure, the signal generator output frequency is swept incrementally over the specified frequency range with a step size that should not exceed 1% of the preceding frequency value and with a dwell time at each step of at least 500 ms."

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 113A. SC 113A.3 P 222 L 20 # 84
Moffitt, Bryan
CommScope
Comment Type E Comment Status D Clamp

This sentence gives me the impression that it implies the documented test is normative (not just doubly equivalent). It is also not clear what it is refering to; the entire procedure, the measurement or the validation.

Note that other measurement methods are allowed providing they can demonstrate equivalent equivalent results to the method described in this Annex.

SuggestedRemedy

delete or figure a good way to move the repaired statement into the overview 113A.1

Proposed Response Response Status W

PROPOSED REJECT.
Commenter fails to provide sufficient solution, statement has been substantially wordsmithed.

Cl 113A. SC 113A.3 P 224 L 10 # 87
Moffitt, Bryan
CommScope
Comment Type E Comment Status D Clamp

duplicate statement two sentences above (and incorrect as stated)

SuggestedRemedy

delete The cable between the clamp and the balun should be straight and not in contact with the ground plane.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
Change "between the clamp and the balun" to "between the breakout fixture and the balun"

Cl 113A. SC 113A.3 P 224 L 31 # 88
Moffitt, Bryan
CommScope
Comment Type E Comment Status D Clamp

Note 1 should be with the first figure

SuggestedRemedy

move it

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 113A. SC 113A.4 P 224 L 36 # 89
Moffitt, Bryan
CommScope
Comment Type E Comment Status D Clamp

this paragraph reads as if a new cable is now inserted, but the previous section ends instructing the tester not to move the cable used for validation

SuggestedRemedy

delete it or merge it with the original description in the validation step page 224 line 6

Proposed Response Response Status W

PROPOSED REJECT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl 113A.
SC 113A.4

Page 2 of 3
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.bq Clamp Comments (3/3)

IEEE P802.3bq D2.3 25G/40GBASE-T Ethernet 3rd Working Group recirculation ballot comments

Cl 113A. SC 113A.4 P 225 L 11 # 90

Moffitt, Bryan CommScope

Comment Type E Comment Status D Clamp

It would be better to see this image redrawn so it does not appear that the cable was pulled out an extra length from its original validation position.

SuggestedRemedy

as suggested

Proposed Response Response Status W

PROPOSED REJECT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl 113A.
SC 113A.4

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Summary of .bq Comments

Clause	Subclause	Page	Line	Type	Comment	Suggested Remedy
113	113.5.4.3	174	24	T	The text referring to the impairment signal power in 113.5.4.3 defines a maximum limit by stating that the calibrated power "...does not exceed 6 dBm..." The calibration procedure outlined in Annes 113A, 113A.3 Cable clamp validation uses a nominal value and a tolerance of +/- 10%. Given that the calibration procedure permits a maximum value of 6.6dBm for the power level defined in Clause 113, the normative text should identify a nominal value with tolerance instead of a maximum value. Note that the suggested remedy, which explicitly identifies the impairment signal power as a nominal level with a tolerance, is better aligned with Clause 40, which defines a signal level in the normative text (40.6.1.3.3) and a tolerance about this level in the informative annex (Annex 40B).	Change the text in 113.5.4.3, Page 174, Lines 24 and 25 from "A sine wave with the amplitude held constant over the whole frequency range from 80 MHz to 2000 MHz, with the amplitude calibrated so that the signal power measured at the output of the clamp does not exceed 6 dBm, is used to generate the external electromagnetic field and corresponding shield current." to "A sine wave with the amplitude held constant over the whole frequency range from 80 MHz to 2000 MHz, with the amplitude calibrated to a nominal signal power of 6 dBm measured at the output of the clamp, is used to generate the external electromagnetic field and corresponding shield current." and add a footnote to 113.5.4.3 stating "The 6dBm nominal measured power may vary by +/-10% across frequency as discussed in Annex 113A."
113	113A.4	224	54	T	The Task Force has been been careful to keep Annex 113A flexible and refer practitioners to the receiver specifications of the PHY under test for specific impairments, impairment source power levels, and relevant frequency ranges. However, the description of the test setup, Page 224, Line 54 and Page 225, Line 1 states "…the signal generator output frequency is swept incrementally from 1 MHz to 2000 MHz…". Since 113A.4 describes the setup for the referenced specifications, this statement should more generic and refer to the "calling" normative text for the test frequency range.	Change the text in Annex 113A, Page 224, Line 54 and Page 225, Line 1 from "As with the calibration procedure, the signal generator output frequency is swept incrementally from 1 MHz to 2000 MHz with a step size that should not exceed 1% of the preceding frequency value and with a dwell time at each step of at least 500 ms." to "As with the calibration procedure, the signal generator output frequency is swept incrementally over the specified frequency range with a step size that should not exceed 1% of the preceding frequency value and with a dwell time at each step of at least 500 ms."
113A	113A.2	221	43	E	As shown in Figure 113A–2 the inner conductor on the bottom half of the clamp extends slightly (~ 0.1mm) - this is not shown in the figure	Delete "As shown in Figure 113A-2", capitalize "the"
113A.3	113A.3	222	20	E	This sentence gives me the impression that it implies the documented test is normative (not just doubly equivalent). It is also not clear what it is refering to; the entire procedure, the measurement or the validation. Note that other measurement methods are allowed providing they can demonstrate equivalent equivalent results to the method described in this Annex.	delete or figure a good way to move the repaired statement into the overview 113A.1
113A.3	113A.3	223	7	E	indentations not matching	dent
113A.3	113A.3	223	30	E	should be plural - two are shown	change to Oscilloscopes, power meters or spectrum analyzers
113A.3	113A.3	224	10	E	duplicate statement two sentences above (and incorrect as stated)	delete The cable between the clamp and the balun should be straight and not in contact with the ground plane.
113A.3	113A.3	224	31	E	Note 1 should be with the first figure	move it
113A.4	113A.4	224	36	E	this paragraph reads as if a new cable is now inserted, but the previous section ends instructing the tester not to move the cable used for validation	delete it or merge it with the original description in the validation step page 224 line 6
113A.4	113A.4	225	11	E	It would be better to see this image redrawn so it does not appear that the cable was pulled out an extra length from its original validation position.	as suggested
113	113.5.4.3	174	25	T	It is unclear whether the signal power limit is 6dBm as stated in 113.5.4.3 or 6dBm plus the 10% variation allowed by Annex 113A.3.	Clarify that the limit is 6dBm by adding this footnote: “The 6dBm limit includes the 10% frequency-dependent variation mentioned in Annex 113A.3.”
113	113.5.4.3	174	14	E	This sub-clause seems to grammatically indicate that a shield is always present. The other two uses of the term "shield" in the draft seem to indicate that a shield is optional.	Change grammar here to somehow indicate "when present" or change the other two uses.

Comments on 113.5.4.3

113.5.4.3 Rejection of External EM Fields

When the cabling system is subjected to electromagnetic fields, currents are generated in the shield which may be converted to interference. This specification is provided to limit the sensitivity of the PMA receiver to external EM fields picked up by the cabling and interconnect system. It provides an assessment method of the electromagnetic performance of the link segment and the PHY, including the MDI.

An 80 MHz to 2000 MHz test can be made based on the cable clamp test described in Annex 113A, a 30 meter plug-terminated cabling that meets the requirements of 113.7, and suitable broadband ferrites. All components in the test remain over the ground reference plane. A sine wave with the amplitude held constant over the whole frequency range from 80 MHz to 2000 MHz, with the amplitude calibrated so that the signal power measured at the output of the clamp does not exceed 6 dBm, is used to generate the external electromagnetic field and corresponding shield current.

A system integrating a 25G/40GBASE-T PHY may perform this test to evaluate anticipated performance in regulatory test environments. Operational requirements of the transceiver during the test are determined by the manufacturer.

113.5.4.3 Comments #96 & 74

- Comment #96 - The text referring to the impairment signal power in 113.5.4.3 defines a maximum limit by stating that the calibrated power "...does not exceed 6 dBm..." The calibration procedure outlined in Annex 113A, 113A.3 Cable clamp validation uses a nominal value and a tolerance of +/- 10%. Given that the calibration procedure permits a maximum value of 6.6dBm for the power level defined in Clause 113, the normative text should identify a nominal value with tolerance instead of a maximum value.
  Note that the suggested remedy, which explicitly identifies the impairment signal power as a nominal level with a tolerance, is better aligned with Clause 40, which defines a signal level in the normative text (40.6.1.3.3) and a tolerance about this level in the informative annex (Annex 40B).
- Suggested Remedy - **Change** the text in 113.5.4.3, Page 174, Lines 24 and 25 from
  "A sine wave with the amplitude held constant over the whole frequency range from 80 MHz to 2000 MHz, with the amplitude calibrated ~~so that the signal power measured at the output of the clamp does not exceed 6 dBm~~, is used to generate the external electromagnetic field and corresponding shield current."
  to
  "A sine wave with the amplitude held constant over the whole frequency range from 80 MHz to 2000 MHz, with the amplitude calibrated to a nominal signal power of 6 dBm measured at the output of the clamp, is used to generate the external electromagnetic field and corresponding shield current."
  and **add** a footnote to 113.5.4.3 stating
  "The 6dBm nominal measured power may vary by +/-10% across frequency as discussed in Annex 113A."

- Comment #74 - It is unclear whether the signal power limit is 6dBm as stated in 113.5.4.3 or 6dBm plus the 10% variation allowed by Annex 113A.3.
- Suggested Remedy - Clarify that the limit is 6dBm by adding this footnote: "The 6dBm limit includes the 10% frequency-dependent variation mentioned in Annex 113A.3."

Proposed Accept & Accept in Principle.
Need to develop final text for the footnote

113.5.4.3 Comment #TBA

- Comment #TBA - This sub-clause seems to grammatically indicate that a shield is always present. The other two uses of the term "shield" in the draft seem to indicate that a shield is optional.

- Suggested Remedy - This sub-clause seems to grammatically indicate that a shield is always present. The other two uses of the term "shield" in the draft seem to indicate that a shield is optional.

For further discussion

Comments on Annex 113A

- Review of P802.3bq D2.3 comments received on 113.A2, 113A3 and 113A.4
  - Treated individually in the following pages

113.A2 Comment #57

- Comment #57 - As shown in Figure 113A–2 the inner conductor on the bottom half of the clamp extends slightly (~ 0.1mm) - this is not shown in the figure
- Suggested Remedy - Delete "As shown in Figure 113A-2", capitalize "the“

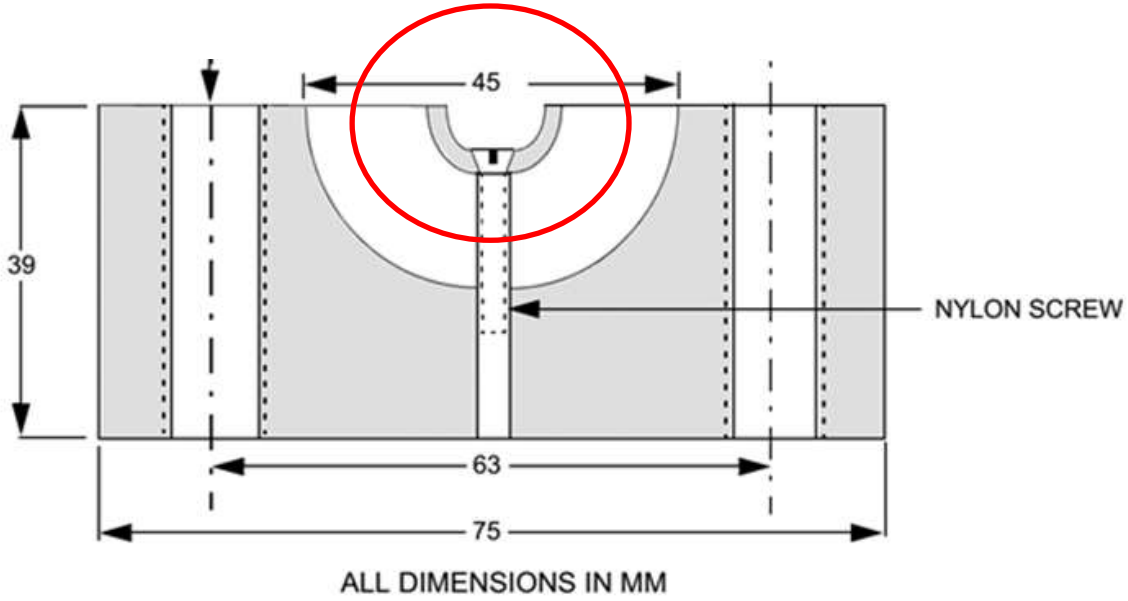

Figure 113A–2—Cross-section of cable clamp

As shown in Figure 113A–2 the inner conductor on the bottom half of the clamp extends slightly (~ 0.1mm) ~~above the dielectric to ensure~~ there is good electrical connection with the inner conductor of the top half of the clamp along the full length of the conductor when the two halves are clamped together.

Proposed Accept

Note – A similar discrepancy exists in Annex 40B, Figure 40B-2

113.A3 Comment #84

- Comment #84 - This sentence gives me the impression that it implies the documented test is normative (not just doubly equivalent). It is also not clear what it is referring to; the entire procedure, the measurement or the validation. “Note that other measurement methods are allowed providing they can demonstrate equivalent results to the method described in this Annex.”

- Suggested Remedy - delete or figure a good way to move the repaired statement into the overview 113A.1.

113A.3 Cable clamp validation

In order to ensure the cable clamp is operating correctly, the following calibration, measurement and validation procedures are provided and should be completed prior to conducting the test described in 113A.4 and illustrated in Figure 113A–4. Note that other measurement methods are allowed providing they can demonstrate equivalent equivalent results to the method described in this Annex.

Proposed Reject.
Suggest keeping this comment in 113A.3 so as not to be confused with existing overview text that allow variations in the methodology. Note that the statement is specific to section 113A.3 by virtue of its location.

113.A3 Comment #TBA

- Comment #TBA- indentations not matching
- Suggested Remedy #TBA - Indent

Note that other devices for detecting differential and common mode signals may also be used, provided the performance is demonstrated to be equivalent or better.

The use of two separate differential and common-mode signal component measurement configurations is permissible provided the above specifications are met for each measurement device.

The common-mode reference (termination) impedance may be standard specific. The common-mode return loss requirement does not change, but Zref (common-mode) may be 50 Ω for shielded and 75 Ω for unshielded applications.

113.A3 Comment #TBA

- Comment #TBA - should be plural - two are shown
- Suggested Remedy - change to Oscilloscopes, power meters or spectrum analyzers

- Since the measurements could be performed sequentially, suggest keeping text as-is. The text does not preclude using more instruments.

i) Signal Sensor & Measurement System - Oscilloscope, power meter or spectrum analyzer with at least 4000 MHz bandwidth

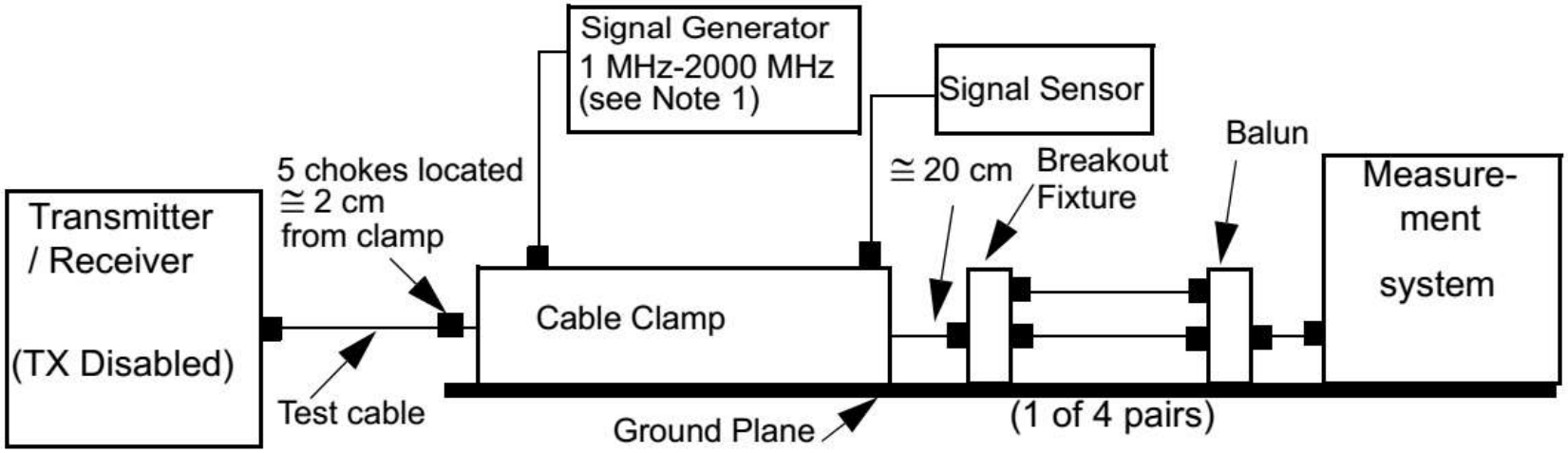

Figure 113A–3—Cable clamp validation test configuration

113.A3 Comment #87

- Comment #87 - duplicate statement two sentences above (and incorrect as stated)
- Suggested Remedy - delete The cable between the clamp and the balun should be straight and not in contact with the ground plane.

- Alternative remedy – Change to “Cables between the breakout fixture and the balun should be straight and not in contact with the ground plane.

nected to the balun (or equivalent measurement network) are terminated in a resistor network. The cable clamp, breakout fixture, and balun are in direct contact with the ground plane in a manner consistent with good RF measurement practices. The chokes are placed on the cable, located next to each other and approximately 2.0 cm from the clamp.

The cable between the clamp and the breakout fixture should be positioned straight from the clamp to the breakout port and not contact the ground plane. Any plug shield contacts should mate with the breakout jack shield. The cable between the transmitter and the cable clamp should be installed either in a linear run or wrapped randomly on a cable rack. The cable rack should be at least 3 m from the cable clamp. The cable between the clamp and the balun should be straight and not in contact with the ground plane.

Proposed Accept in Principle (see suggested text)

113.A3 Comment #88

- Comment #88 - Note 1 should be with the first figure
- Suggested Remedy – move it

After the setup has been validated, the clamp, cabling and choke positions should remain unchanged when performing any receiver tests.

NOTE 1 —The signal generator may include elements needed to control signal generator performance, harmonic distortion, switching transients and reflections so as not to influence signal level and frequency content at specified levels.

Proposed Accept

113.A4 Comment #97

- Comment #97 - The Task Force has been been careful to keep Annex 113A flexible and refer practitioners to the receiver specifications of the PHY under test for specific impairments, impairment source power levels, and relevant frequency ranges.
  However, the description of the test setup, Page 224, Line 54 and Page 225, Line 1 states "…the signal generator output frequency is swept incrementally from 1 MHz to 2000 MHz…". Since 113A.4 describes the setup for the referenced specifications, this statement should more generic and refer to the "calling" normative text for the test frequency range.

- Suggested Remedy – Change the text in Annex 113A, Page 224, Line 54 and Page 225, Line 1 from

  "As with the calibration procedure, the signal generator output frequency is swept incrementally from 1 MHz to 2000 MHz with a step size that should not exceed 1% of the preceding frequency value and with a dwell time at each step of at least 500 ms."
  to
  "As with the calibration procedure, the signal generator output frequency is swept incrementally over the specified frequency range with a step size that should not exceed 1% of the preceding frequency value and with a dwell time at each step of at least 500 ms."

specified impairment (for example, an external electromagnetic field of approximately 3 V/m). As with the 53
calibration procedure, the signal generator output frequency is swept incrementally from 1 MHz to 54
2000 MHz with a step size that should not exceed 1% of the preceding frequency value and with a dwell 1
time at each step of at least 500 ms. The signal generator output should be reduced to the minimum output 2

Proposed Accept

113.A4 Comment #89

- Comment #2 - this paragraph reads as if a new cable is now inserted, but the previous section ends instructing the tester not to move the cable used for validation
- Suggested Remedy #89 – delete it or merge it with the original description in the validation step page 224 line 6

Cabling up to the maximum specified length that meets the link segment specification for the PHY under test (for example, Clause 113.7 for 40GBASE-T), is connected between two such PHYs and inserted into the cable clamp. The cable should be terminated on each end with an MDI connector plug specified for the PHY under test (for example, Clause 113.8.1 for 40GBASE-T).

Proposed Reject

113.A4 Comment #90

- Comment #90 - It would be better to see this image redrawn so it does not appear that the cable was pulled out an extra length from its original validation position.
- Suggested Remedy– as suggested
- Both figures define the length; the figures are consistent with Clause 40. Suggest not changing.

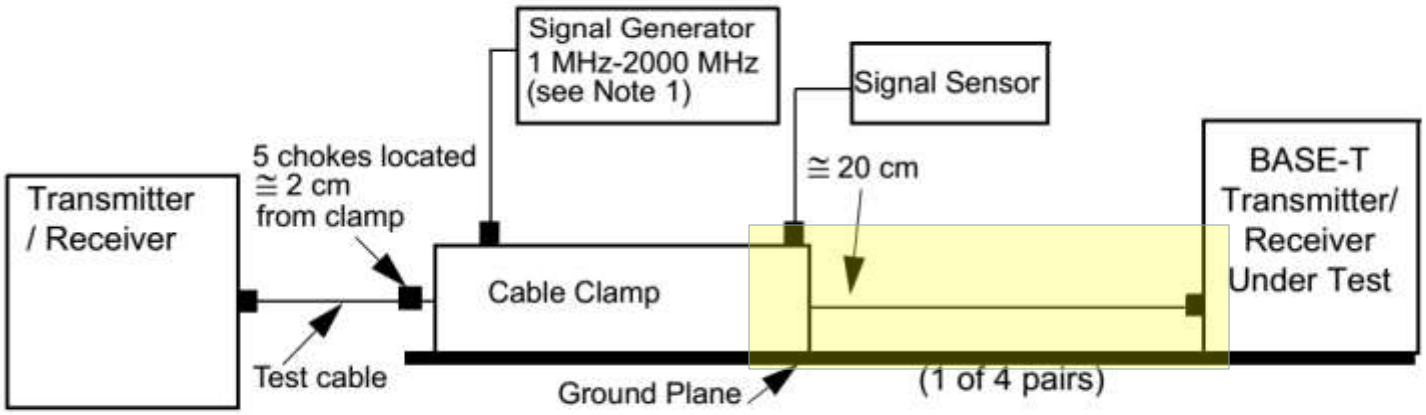

Figure 113A–4—Cable clamp test configuration

Proposed Reject

Figures from Clause 40

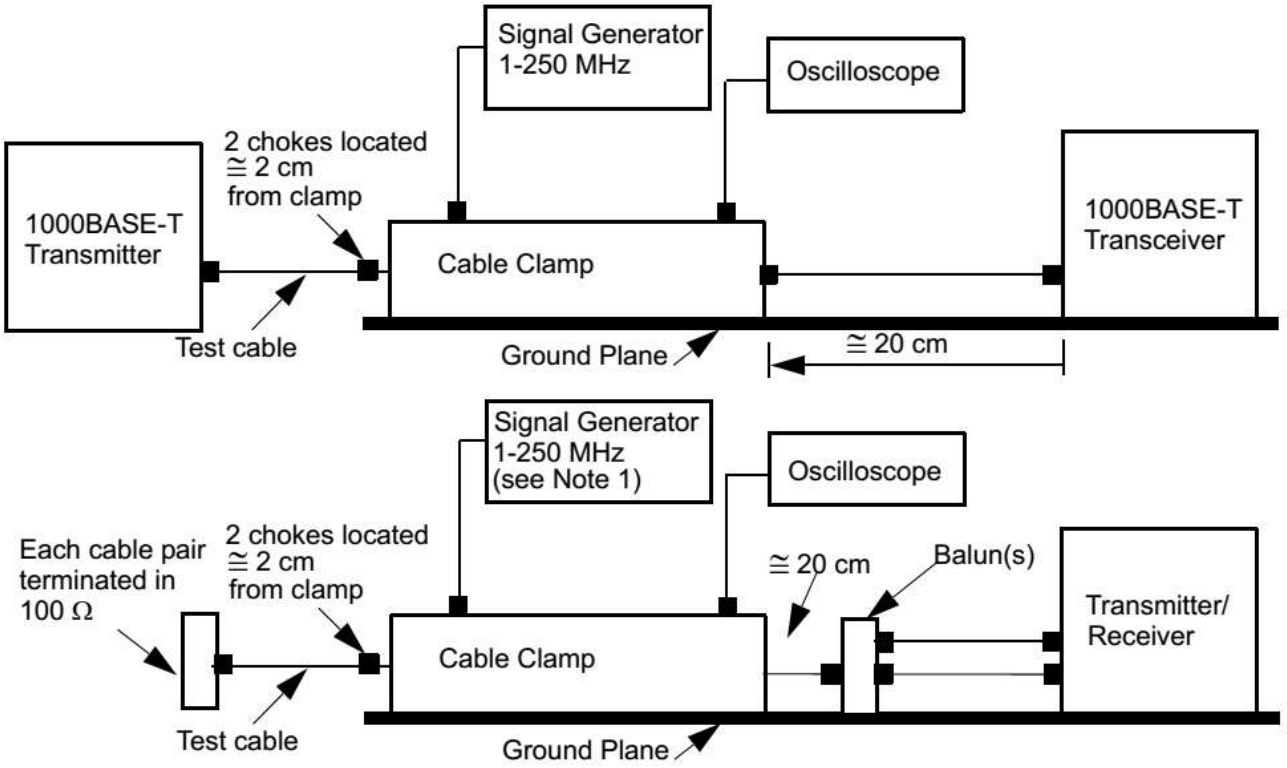

Figure 40B–3—Cable clamp validation test configuration

.bz Clamp Comments (1/1)

IEEE P802.3bz D1.1 2.5G/5GBASE-T 2nd Task Force review comments

Cl 126 SC 126.5.4.3 P 160 L 20 # 54
Cibula, Peter
Intel Corporation
Comment Type T Comment Status D Clamp

The text referring to the impairment signal power in 126.5.4.3 defines a maximum limit by stating that the calibrated power "...does not exceed 6 dBm..." The calibration procedure outlined in Annex 113A, 113A.3 Cable clamp validation uses a nominal value and a tolerance of +/- 10%.

Given that the calibration procedure permits a maximum value of 6.6dBm for the power level defined in Clause 126, the normative text should identify a nominal value with tolerance instead of a maximum value.

Note that the suggested remedy, which explicitly identifies the impairment signal power as a nominal level with a tolerance, is better aligned with Clause 40, which defines a signal level in the normative text (40.6.1.3.3) and a tolerance about this level in the informative annex (Annex 40B).

Note that the final form of the suggested remedy should align with the parallel requirment in Clause 113.5.4.3.

SuggestedRemedy

Change the text in 126.5.4.3, Page 160, Lines 19 and 20 from

"A sine wave with the amplitude held constant over the whole frequency range from 80 MHz to 1000 MHz, with the amplitude calibrated so that the signal power measured at the output of the clamp does not exceed 6 dBm, is used to generate the external electromagnetic field and corresponding shield current."

to

"A sine wave with the amplitude held constant over the whole frequency range from 80 MHz to 1000 MHz, with the amplitude calibrated to a nominal signal power of 6 dBm measured at the output of the clamp, is used to generate the external electromagnetic field and corresponding shield current."

and add a footnote to 126.5.4.3 stating

"The 6dBm nominal measured power may vary by +/-10% across frequency as discussed in Annex 113A."

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl Annex SC 113A P 206 L 14 # 55
Brillhart, Theodore
Fluke Networks
Comment Type T Comment Status X Clamp

The mode convertion properties of the cable used in this test set-up are a predominant factor in meeting the limits of Table 113A-2. Minimum TCL values should be provided as an aid to the reader, as the alternative can be a time consuming trial and error process.
[Appologies for not having time to work out the equation forms just yet. - TB]

SuggestedRemedy

Insert a note as follows:
Note - as the mode convertion properties of the cable used in this test are a predominant factor in meeting the voltage limits of Table 113A-2, maximun TCL values have been provided to aid the reader in selecting a cable of suitable performance. Cable TCL values should not exceed those shown.

Insert a column in table 113A-2, to the right of DM voltage, labeled TCL, with the following values:
20Log(CM/DM) [equation form TBD]
33.7 dB
20Log(CM/DM) [equation form TBD]
26.6 dB

Proposed Response Response Status O

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl Annex
SC 113A

Page 1 of 1
11/3/2015 3:59:13 PM

Comments on 126.5.4.3

126.5.4.3 Rejection of External EM Fields

Editor's note (to be removed prior to Working Group ballot) - Commenters are encouraged to provide refined text for this section to apply better to 802.3bz link segments and frequencies (e.g., common-mode currents and lower upper-limit frequencies).

When the cabling system is subjected to electromagnetic fields, currents are generated which may be converted to interference. This specification is provided to limit the sensitivity of the PMA receiver to external EM fields picked up by the cabling and interconnect system. It provides an assessment method of the electromagnetic performance of the link segment and the PHY, including the MDI.

An 80 MHz to 1000 MHz test can be made based on the cable clamp test described in Annex 113A, a 30 meter plug-terminated channel that meets the requirements of 126.7, and suitable broadband ferrites. All components in the test remain over the ground reference plane. A sine wave with the amplitude held constant over the whole frequency range from 80 MHz to 1000 MHz, with the amplitude calibrated so that the signal power measured at the output of the clamp does not exceed 6dBm, is used to generate the external electromagnetic field and corresponding currents.

A system integrating a 2.5GBASE-T or 5GBASE-T PHY may perform this test to evaluate anticipated performance in regulatory test environments. Operational requirements of the transceiver during the test are determined by the manufacturer.

126.5.4.3 Comment #54

- Comment #54 - The text referring to the impairment signal power in 126.5.4.3 defines a maximum limit by stating that the calibrated power "...does not exceed 6 dBm..." The calibration procedure outlined in Annex 113A, 113A.3 Cable clamp validation uses a nominal value and a tolerance of +/- 10%. Given that the calibration procedure permits a maximum value of 6.6dBm for the power level defined in Clause 126, the normative text should identify a nominal value with tolerance instead of a maximum value.
  Note that the final form of the suggested remedy should align with the parallel requirement in Clause 113.5.4.3.

- Suggested Remedy - **Change** the text in 126.5.4.3, Page 160, Lines 20 and 21 from
  "A sine wave with the amplitude held constant over the whole frequency range from 80 MHz to 1000 MHz, with the amplitude calibrated ~~so that the signal power measured at the output of the clamp does not exceed 6 dBm~~, is used to generate the external electromagnetic field and corresponding shield current."
  to
  "A sine wave with the amplitude held constant over the whole frequency range from 80 MHz to 1000 MHz, with the amplitude calibrated to a nominal signal power of 6 dBm measured at the output of the clamp, is used to generate the external electromagnetic field and corresponding shield current."
  and **add** a footnote to 126.5.4.3 stating
  "The 6dBm nominal measured power may vary by +/-10% across frequency as discussed in Annex 113A."

Proposed Accept

.bz Annex 113A Comment #55

- Comment #55 - The mode convertion properties of the cable used in this test set-up are a predominant factor in meeting the limits of Table 113A-2. Minimum TCL values should be provided as an aid to the reader, as the alternative can be a time consuming trial and error process. [Appologies for not having time to work out the equation forms just yet. - TB].

- Suggested Remedy - **Insert a note** as follows:
- Note - As the mode conversion properties of the cable used in this test are a predominant factor in meeting the voltage limits of Table 113A-2, maximum TCL values have been provided to aid the reader in selecting a cable of suitable performance. Cable TCL values should not exceed those shown.
- Insert a column in table 113A-2, to the right of DM voltage, labeled TCL, with the following values:
- 20Log(CM/DM) [equation form TBD] 33.7 dB
- 20Log(CM/DM) [equation form TBD] 26.6 dB

For further discussion

Updated Text

- Word mark-up document shows changes identified as “Accept” or “Accept in principle” in the “clamp” comment summary.

Thank You!