
Reduced Twisted Pair Gigabit Ethernet SG Channel Definitions Ad Hoc Report

**San Antonio, Texas
November 2012**

**Ad hoc – co-chairs
Chris DiMinico –
MC Communications/ LEONI
Mehmet Tazebay –
Broadcom**

Channel Definitions Ad Hoc

- Ad Hoc chartered to develop channel definitions
- Initial meeting IEEE Interim May 2012
- Communications via RTPGE reflector
- Follow-on conference calls
 - June 14th, November 1

Minutes - Channel definitions ad hoc minutes – Nov 1, 2012

Attendees: I counted 20 attendees

Attendees were asked to review the patent policy slides at

<http://www.ieee802.org/3/patent.html>.

•Contributions received and reviewed:

•RTPSG-channel definition ad hoc-connectors.pdf

•Geoff Thomson - strawman for discussion - attached below

•Discussion:

•Lot's of discussion during review of contributions...

•Geoff provided background detailed in strawman discussion -

•One of the discussion bullets consistent with straw poll question...

•The specs for the MDI attachment and in-line connectors should be

performance based but not mechanically constrained.

•George Zimmerman asked that straw poll questions explicitly state RTPGE,
Revised accordingly.

•Larry Matola (delphi) suggested the answer to the question on in-line
Connector system requirements will be driven primarily by cost/performance;
leading “again” to the question on current performance of current in-line
connector systems. Larry offered to work in cooperation with the UNH-IOL
initiative by providing current automotive cable assemblies for testing.

Geoff Thompson - strawman for discussion

- *There is no particular desire to reuse the RJ-45 as a twisted pair Ethernet connector in the automotive environment. The only possible exception to this might be "external" connections for use by end users for connecting consumer Ethernet equipment to the vehicle. That requirement (if it exists) probably has nothing to do with RTPGE.*
- *RTPGE provides a "moment in history" point for us to escape the tyranny of the installed base for twisted-pair Ethernet and the well-known problems of the RJ-45.*
- *Automotive manufacturers and suppliers have their own requirements (driven by a number of factors) for the physical configuration of connectors to be used for RTPGE.*
- *Automotive manufacturers and suppliers have requirements for RTPGE to pass through in-harness connectors that are very likely to have a significant number of non-ethernet pins carrying a wide variety of signals.*
- *The specs for the MDI attachment and in-line connectors should be performance based but not mechanically constrained.*
- *The above notwithstanding, it would be useful to be able to standardize the circuit board interface for RTPGE. (I have problems with this concept reconciling edge connectors vs. headers, etc.)*

Geoff Thompson - strawman for discussion

-Power transmission over the same conductors and connectors was not discussed today. It is a real consideration and might come into play at multiple power levels.

- It would be very useful to have a fully specified (i.e. electrically and mechanically) test connector for RTGE. This would be used for establishing baseline performance and for interfacing test equipment. This connector would not have as stringent cost constraints as the connectors used in production volumes.

If all of the above is not correct then I hope it is at least useful as a starting point for discussion.

*Best regards,
Geoff Thompson*

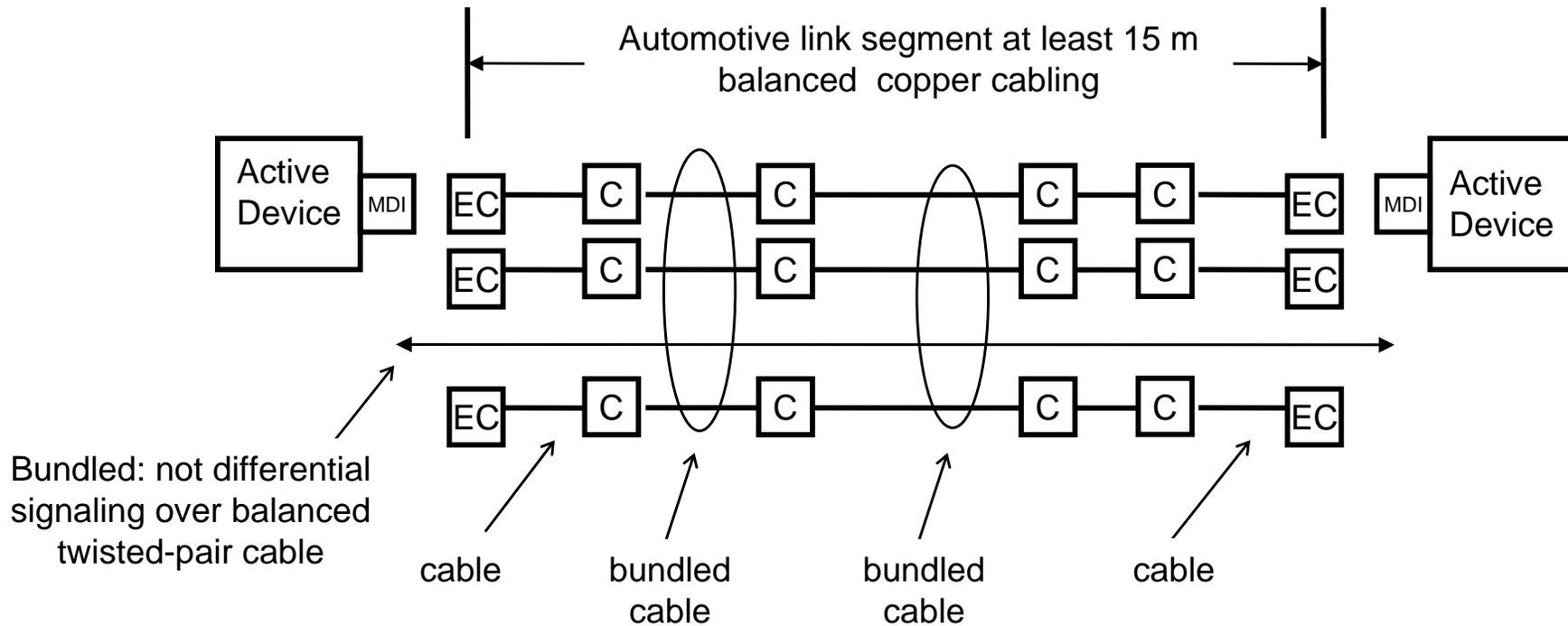
Reduced Twisted Pair Gigabit Ethernet SG link segments

**Chris DiMinico
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Discussion

- **MDI requirements**
- **In-line connector requirements**
- **Test fixture connector requirements**

Automotive link segment



The IEEE 802.3 nomenclature is bracketed to identify relationship to the IEEE 802.3 definitions.

Length objective [EC] to [EC] at least 15 m
 Number of inline connectors [C] = 4

- C = inline connector
- EC = connection to equipment
- MDI = Active electronics connector [Medium dependent interface (MDI)]

Straw polls

- Are there requirements for mechanically compatible in-line connector systems for RTPGE between automobile manufacturers?

Y

N

- Are there requirements for mechanically compatible MDIs

Y

N

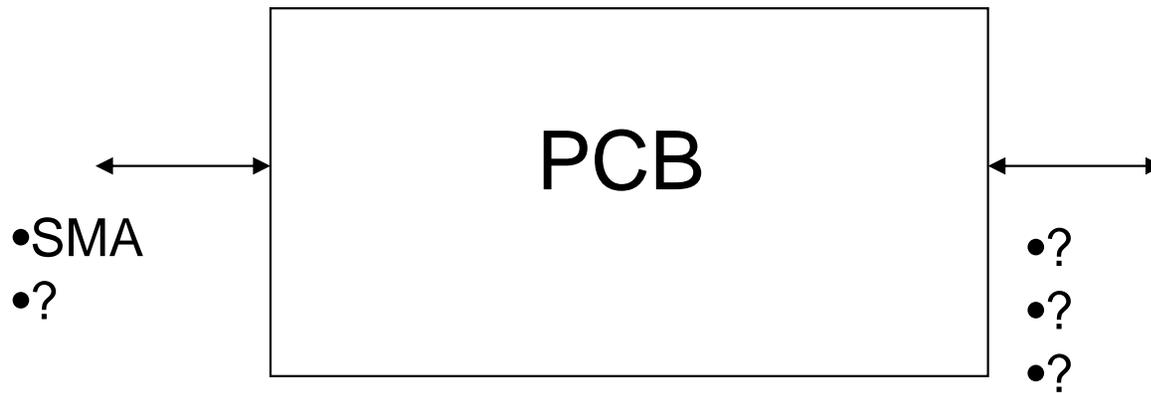
- Are there requirements for automotive link segment test fixtures?

Y

N

Test fixtures

- Connector requirements for automotive link segment test fixtures



Ad hoc conference call follow-up

- Larry Matola (delphi) generated proposal for initial channel definitions.
- Larry shipped materials to be measured at UNH-IOL.

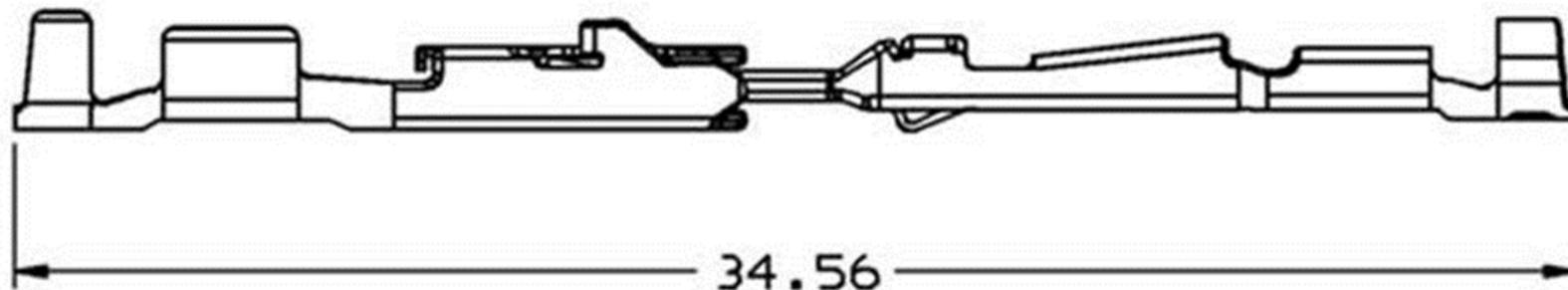
Proposal for Ethernet work group channel definition

◆ Unshielded twisted pair FLR2X-A Cable

- 22 ga (0.35mm² XLPE) and 26 ga (0.13mm² PVC) cable
- 1,3,5 m lengths (+80% fall in this range)
- Twist length less than 45mm per turn (22.2 twists/m 6-7 turns/foot)
- Untwisted wire at connector 50mm (100 per inline connection)
- Insulation PVC or cross linked poly ethylene thin wall (wall thickness 0.25mm)

◆ Connector USCAR standard footprint (common design)

- 3 sizes 0.5, 1.2, 1.5 blade sizes
 - » 0.5 center line spacing 2.0mm, mated pair length 27-29mm
 - » 1.2 center line spacing 2.54mm, mated pair length 33-35mm
 - » 1.5 center line spacing 3.5mm, mated pair length ~33-35mm (tbd)



Slide source: Larry Matola (delphi) laurence.matola@delphi.com