Automotive Requirements FOR IEEE802.3bv (GEPOF)

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Aim

- Summarize Automotive requirements to be considered by IEEE802.3bv (GEPOF) when they create Ethernet standard for Automotive application

Typical Product Requirements

	Mandatory	Remark
Ambient temperature	-40 … 105 C	
Quiescent current while system is switched off	< 30 µA	
Power consumption (active)	As small as possible	OEM requirement: To be confirmed
Automotive qualification for semiconductor elements	AEC Q100/ TBD	
I/O voltage level	TBD (Up to TC6 decision)	Selectable if possible (EMC optimization)
Mechanical properties for connector	Same requirements as electrical connectors for automotive	
Mechanical properties for POF	Same requirements as wires for automotive (e.g. AV, AVSS)	

Automotive GEPOF Requirements

	Mandatory	Remark
Physical Medium	POF (Plastics Optical Fiber)	
Max. link length	15m for passenger vehicles 40m for commercial vehicles	
No. of in-line connectors	4	May reduce to commercial vehicles
Remaining Bit Error Ratio	$\leq$ 1E-14 (as system level, for ADAS)	$\leq$ 1E-12 (infotainment)
Electromagnetic Compatibility	EMI: CISPR25 Class 4(<30MHz) $\qquad\qquad\qquad$ 5(>30MHz) EMS: ISO 11452-2 Level 3 Note) To be satisfied as an ECU	
Connectors	2-pole	Water proof
Data Interface to Layer 2	Standard interface (SGMII/RGMII)	
IEEE802.3az (EEE)	Yes	
PHY Latency MAC to MAC	< 6 μs	

Automotive GEPOF Requirements

	Mandatory	Remark
Jitter between MAC to MAC	< 50 ns	
Wake up/ Sleep functionality	Yes	Requirement has to be compatible 802.3bp
Link acquisition time (PHY to PHY link start up time)	<100 ms	Requirement has to be same or compatible 802.3bp
Diagnosis for link up	SQI (Signal Quality Indicator)	
Enhanced diagnosis	Operation, Administration, Maintenance (OAM) side channel, Loopback modes, Link margin measurement report, Optical power measurement report, Cable and link break, Real time information about the healthy of the link for dependability	
Control interface to Microcontroller	MDIO and/or I2C	
Safety Concept	MTTFPA >1e10 years	