

AUTOMOTIVE VOLTAGE AND FAULT CONDITIONS

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CONTENT DISCLAIMER

NOTE: All requirements shown on the following slides are based on General Motors' current requirements for 12V powered systems. Other OEMs may have different requirements. When higher voltage supplies are used different maximum voltages would apply.

DON'T PREVENT LOW POWER MODES

The presence of any of the following Wiring Fault Conditions should not prevent a Controller from entering Low Power Standby Mode. For example, an event-triggered wake-up function is preferred.

CONTROLLER LOSES POWER

Upon return of power, normal operation shall resume without any operator intervention within a time period being specified by the Controller specification, typically 300 ms.

A Controller shall not disturb ongoing transmissions upon return of power; generation of dominant bus conditions (disturbance) and/or sending of error frames is not allowed during Controller supply voltage ramp up and initialization.

CONTROLLER LOSES GROUND

Upon return of ground connection, normal operation shall resume without any operator intervention within a time period being specified by the Controller specification, typically 300 ms.

BR+ AND/OR BR- WIRE SHORTED TO GROUND

Communication may be interrupted but there shall be no damage to any Controller when a bus wire is shorted to ground potential.

Upon removal of the wiring fault, normal operation shall resume without any operator intervention within a time period being specified by the Controller specification, typically 300 ms.

BR+ AND/OR BR- WIRE SHORTED TO BATTERY VOLTAGE

Communication may be interrupted; however, there shall be no damage to any Controller when a bus wire is shorted to positive voltages of up to 26.5 V for 1 minute.

Upon removal of the wiring fault, normal operation shall resume without any operator intervention within a time period being specified by the Controller specification, typically 300 ms.

BR+ WIRE SHORTED TO BR- WIRE

Communication may be interrupted but there shall be no damage to any Controller.

Upon removal of the wiring fault, normal operation shall resume without any operator intervention within a time period being specified by the Controller specification, typically 300 ms.

PHY PROTECTION

The Ethernet PHY shall be self-protected against bus overload conditions, e.g., through thermal shutdown function, through self-controlled limitation of bus output current, etc.

The implementation of the Ethernet transceiver shall support a Controller complying with the GMW3097 EMC requirements and when implemented in a vehicle shall support complying with GMW3091.

NOTE: GMW documents are available for purchase at global.ihs.com.

PHY VOLTAGE LIMITS

Parameter for Ethernet Bus Pins of Integrated Circuit (e.g., PHY)	Conditions	Minimum	Maximum	Unit
DC Voltage	time limit = 60 days	-5	+18	V
Short-Term Voltage	t = 1 minute	-	+26.5	V
Transient Voltage (ISO 7637-1, pulse 5b as modified by GMW3097)	td = 400 ms \pm 30%, tr \leq 10 ms	-	+34	V
Transient Voltage (ISO 7637-1, pulses 3a and 3b)	t = 100 ns, R = 50 Ω , C = 1 nF	-150	+100	V
ESD protection in powered and unpowered state	HBM contact discharge, 10 pulses each	-4	+4	kV