

ISO 17987-7:2025-05 (E)

Road vehicles - Local Interconnect Network (LIN) - Part 7: Electrical physical layer (EPL) conformance test specification

| Contents | | Page |
|--------------------|---|-------------|
| Foreword | | vi |
| Introduction | | vii |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms, definitions, symbols and abbreviated terms | 1 |
| 3.1 | Terms and definitions | 1 |
| 3.2 | Symbols | 2 |
| 3.3 | Abbreviated terms | 4 |
| 4 | General | 5 |
| 4.1 | Auto addressing procedures | 5 |
| 4.2 | Conventions | 5 |
| 5 | EPL 12 V LIN class A and class B devices with RX and TX access | 6 |
| 5.1 | Test specification overview | 6 |
| 5.1.1 | Test case organization | 6 |
| 5.1.2 | Measurement and signal generation requirements | 6 |
| 5.2 | Operational conditions -- Calibration | 7 |
| 5.2.1 | Electrical input/output, LIN protocol | 7 |
| 5.2.2 | [EPL-CT 1] Operating voltage range | 7 |
| 5.2.3 | Threshold voltages | 9 |
| 5.2.4 | [EPL-CT 5] Variation of VSUP_NON_OP | 14 |
| 5.2.5 | IBUS under several conditions | 15 |
| 5.2.6 | Slope control | 18 |
| 5.2.7 | Propagation delay | 22 |
| 5.2.8 | Supply voltage offset | 23 |
| 5.2.9 | Failure | 28 |
| 5.2.10 | [EPL-CT 22] Verifying internal capacitance and dynamic interference -- IUT as responder | 29 |
| 5.3 | Operation mode termination | 31 |
| 5.3.1 | General | 31 |
| 5.3.2 | [EPL-CT 23] Measuring internal resistor -- IUT as responder | 32 |
| 5.3.3 | [EPL-CT 24] Measuring internal resistor -- IUT as commander | 33 |
| 5.4 | Static test cases | 33 |
| 6 | EPL 12 V LIN class C devices with RX and TX access | 37 |
| 6.1 | Test specification overview | 37 |
| 6.2 | Communication scheme | 37 |
| 6.2.1 | General | 37 |
| 6.2.2 | IUT as responder | 37 |
| 6.2.3 | IUT as commander | 38 |
| 6.2.4 | IUT class C device | 38 |
| 6.3 | Test case organization | 41 |
| 6.4 | Measurement and signal generation -- Requirements | 41 |
| 6.4.1 | Data generation | 41 |
| 6.4.2 | Various requirements | 43 |
| 6.5 | Operational conditions -- Calibration | 44 |
| 6.5.1 | Electrical input/output, LIN protocol | 44 |

| | | |
|--------|---|-----|
| 6.5.2 | [EPL-CT 25] Operating voltage range | 44 |
| 6.5.3 | Threshold voltages | 46 |
| 6.5.4 | [EPL-CT 29] Variation of VSUP_NON_OP [-0,3 V to 7,0 V], [18 V to 40 V] | 50 |
| 6.5.5 | IBUS under several conditions | 51 |
| 6.5.6 | Slope control | 55 |
| 6.5.7 | Propagation delay | 59 |
| 6.5.8 | Supply voltage offset | 65 |
| 6.5.9 | Failure | 74 |
| 6.5.10 | [EPL-CT 48] Verifying internal capacitance and dynamic interference -- IUT as responder | 76 |
| 6.6 | Operation mode termination | 78 |
| 6.6.1 | General | 78 |
| 6.6.2 | [EPL-CT 49] Measuring internal resistor -- IUT as responder | 79 |
| 6.6.3 | [EPL-CT 50] Measuring internal resistor -- IUT as commander | 79 |
| 6.7 | Static test cases | 79 |
| 7 | EPL 24 V LIN class A and class B devices with RX and TX access | 83 |
| 7.1 | Test specification overview | 83 |
| 7.1.1 | Test case organization | 83 |
| 7.1.2 | Measurement and signal generation -- Requirements | 84 |
| 7.2 | Operational conditions -- Calibration | 84 |
| 7.2.1 | Electrical input/output, LIN protocol | 84 |
| 7.2.2 | [EPL-CT 51] Operating voltage range | 85 |
| 7.2.3 | Threshold voltages | 86 |
| 7.2.4 | [EPL-CT 55] Variation of VSUP_NON_OP | 91 |
| 7.2.5 | IBUS under several conditions | 92 |
| 7.2.6 | Slope control | 95 |
| 7.2.7 | Propagation delay | 98 |
| 7.2.8 | Supply voltage offset | 99 |
| 7.2.9 | Failure | 109 |
| 7.2.10 | [EPL-CT 80] Verifying internal capacitance and dynamic interference -- IUT as responder 110 | |
| 7.3 | Operation mode termination | 112 |
| 7.3.1 | General | 112 |
| 7.3.2 | [EPL-CT 81] Measuring internal resistor -- IUT as responder | 113 |
| 7.3.3 | [EPL-CT 82] Measuring internal resistor -- IUT as commander | 113 |
| 7.4 | Static test cases | 114 |
| 8 | EPL 24 V LIN class C devices without RX and TX access | 117 |
| 8.1 | Test specification overview | 117 |
| 8.2 | Communication scheme | 117 |
| 8.2.1 | Overview | 117 |
| 8.2.2 | IUT as responder | 117 |
| 8.2.3 | IUT as commander | 118 |
| 8.2.4 | IUT class C device | 118 |
| 8.3 | Test case organization | 121 |
| 8.4 | Measurement and signal generation -- Requirements | 121 |
| 8.4.1 | Data generation | 121 |
| 8.4.2 | Various requirements | 123 |
| 8.5 | Operational conditions -- Calibration | 124 |
| 8.5.1 | Electrical input/output, LIN protocol | 124 |
| 8.5.2 | [EPL-CT 83] Operating voltage range | 124 |
| 8.5.3 | Threshold voltages | 126 |
| 8.5.4 | [EPL-CT 87] Variation of VSUP_NON_OP [-0,3 V to 7,0 V], [18 V to 58 V] | 131 |
| 8.5.5 | IBUS under several conditions | 132 |
| 8.5.6 | Slope control | 136 |
| 8.5.7 | Propagation delay | 140 |
| 8.5.8 | Supply voltage offset | 146 |
| 8.5.9 | Failure | 155 |
| 8.5.10 | [EPL-CT 106] Verifying internal capacitance and dynamic interference -- IUT as responder | 157 |
| 8.6 | Operation mode termination | 158 |

| | | |
|--|--|-----|
| 8.6.1 | General | 158 |
| 8.6.2 | [EPL-CT 107] Measuring internal resistor -- IUT as responder | 159 |
| 8.6.3 | [EPL-CT 2] Measuring internal resistor -- IUT as commander | 159 |
| 8.7 | Static test cases | 160 |
| Annex A (normative) LIN AA procedure C EPL conformance test plan | | 163 |
| Annex B (normative) LIN AA procedure D EPL conformance test plan | | 175 |
| Annex C (normative) LIN AA procedure E EPL conformance test plan | | 188 |
| Bibliography | | 195 |