

# ISO 17987-7:2016-12 (E)

## Road vehicles - Local Interconnect Network (LIN) - Part 7: Electrical Physical Layer (EPL) conformance test specific ation

---

<b>Contents</b>		<b>Page</b>
Foreword .....		v
Introduction .....		vi
<b>1</b>	<b>Scope .....</b>	<b>1</b>
<b>2</b>	<b>Normative references .....</b>	<b>1</b>
<b>3</b>	<b>Terms, definitions, symbols and abbreviated terms .....</b>	<b>1</b>
<b>3.1</b>	<b>Terms and definitions .....</b>	<b>1</b>
<b>3.2</b>	<b>Symbols .....</b>	<b>1</b>
<b>3.3</b>	<b>Abbreviated terms .....</b>	<b>4</b>
<b>4</b>	<b>Conventions .....</b>	<b>5</b>
<b>5</b>	<b>EPL 12 V LIN devices with RX and TX access .....</b>	<b>5</b>
<b>5.1</b>	<b>Test specification overview .....</b>	<b>5</b>
<b>5.1.1</b>	<b>Test case organization .....</b>	<b>5</b>
<b>5.1.2</b>	<b>Measurement and signal generation requirements .....</b>	<b>6</b>
<b>5.2</b>	<b>Operational conditions -- Calibration .....</b>	<b>7</b>
<b>5.2.1</b>	<b>Electrical input/output, LIN protocol .....</b>	<b>7</b>
<b>5.2.2</b>	<b>[EPL-CT 1] Operating voltage range .....</b>	<b>7</b>
<b>5.2.3</b>	<b>Threshold voltages .....</b>	<b>8</b>
<b>5.2.4</b>	<b>[EPL-CT 5] Variation of VSUP_NON_OP .....</b>	<b>12</b>
<b>5.2.5</b>	<b>IBUS under several conditions .....</b>	<b>13</b>
<b>5.2.6</b>	<b>Slope control .....</b>	<b>16</b>
<b>5.2.7</b>	<b>Propagation delay .....</b>	<b>19</b>
<b>5.2.8</b>	<b>Supply voltage offset .....</b>	<b>21</b>
<b>5.2.9</b>	<b>Failure .....</b>	<b>28</b>
<b>5.2.10</b>	<b>[EPL-CT 22] Verifying internal capacitance and dynamic interference -- IUT as slave .....</b>	<b>30</b>
<b>5.3</b>	<b>Operation mode termination .....</b>	<b>32</b>
<b>5.3.1</b>	<b>General .....</b>	<b>32</b>
<b>5.3.2</b>	<b>[EPL-CT 23] Measuring internal resistor -- IUT as slave .....</b>	<b>33</b>
<b>5.3.3</b>	<b>[EPL-CT 24] Measuring internal resistor -- IUT as master .....</b>	<b>34</b>
<b>5.4</b>	<b>Static test cases .....</b>	<b>34</b>
<b>6</b>	<b>EPL 12 V LIN devices without RX and TX access .....</b>	<b>38</b>
<b>6.1</b>	<b>Test specification overview .....</b>	<b>38</b>
<b>6.2</b>	<b>Communication scheme .....</b>	<b>38</b>
<b>6.2.1</b>	<b>General .....</b>	<b>38</b>
<b>6.2.2</b>	<b>IUT as slave .....</b>	<b>38</b>
<b>6.2.3</b>	<b>IUT as master .....</b>	<b>39</b>
<b>6.2.4</b>	<b>IUT class C device .....</b>	<b>40</b>
<b>6.3</b>	<b>Test case organization .....</b>	<b>42</b>
<b>6.4</b>	<b>Measurement and signal generation -- Requirements .....</b>	<b>43</b>
<b>6.4.1</b>	<b>Data generation .....</b>	<b>43</b>
<b>6.4.2</b>	<b>Various requirements .....</b>	<b>45</b>
<b>6.5</b>	<b>Operational conditions -- Calibration .....</b>	<b>45</b>
<b>6.5.1</b>	<b>Electrical input/output, LIN protocol .....</b>	<b>45</b>
<b>6.5.2</b>	<b>[EPL-CT 25] Operating voltage range .....</b>	<b>45</b>
<b>6.5.3</b>	<b>Threshold voltages .....</b>	<b>47</b>

6.5.4	[EPL-CT 29] Variation of VSUP_NON_OP [-0,3 V to 7,0 V], [18 V to 40 V]	51
6.5.5	IBUS under several conditions	52
6.5.6	Slope control	55
6.5.7	[EPL-CT 35] 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 slave	76
6.6	Operation mode termination	78
6.6.1	General	78
6.6.2	[EPL-CT 49] Measuring internal resistor -- IUT as slave	79
6.6.3	[EPL-CT 50] Measuring internal resistor -- IUT as master	79
6.7	Static test cases	79
7	EPL 24 V LIN devices with RX and TX access	82
7.1	Test specification overview	83
7.1.1	Test case organization	83
7.1.2	Measurement and signal generation -- Requirements	83
7.2	Operational conditions -- Calibration	84
7.2.1	Electrical input/output, LIN protocol	84
7.2.2	[EPL-CT 51] Operating voltage range	84
7.2.3	Threshold voltages	86
7.2.4	[EPL-CT 55] Variation of VSUP_NON_OP	90
7.2.5	IBUS under several conditions	91
7.2.6	Slope control	94
7.2.7	Propagation delay	97
7.2.8	Supply voltage offset	98
7.2.9	Failure	112
7.2.10	[EPL-CT 80] Verifying internal capacitance and dynamic interference -- IUT as slave	114
7.3	Operation mode termination	116
7.3.1	General	116
7.3.2	[EPL-CT 81] Measuring internal resistor -- IUT as slave	117
7.3.3	[EPL-CT 82] Measuring internal resistor -- IUT as master	117
7.4	Static test cases	118
8	EPL 24 V LIN devices without RX and TX access	121
8.1	Test specification overview	121
8.2	Communication scheme	121
8.2.1	Overview	121
8.2.2	IUT as slave	122
8.2.3	IUT as master	122
8.2.4	IUT Class C device	123
8.3	Test case organization	125
8.4	Measurement and signal generation -- Requirements	126
8.4.1	Data generation	126
8.4.2	Various requirements	128
8.5	Operational conditions -- Calibration	128
8.5.1	Electrical input/output, LIN protocol	128
8.5.2	[EPL-CT 83] Operating voltage range	128
8.5.3	Threshold voltages	130
8.5.4	[EPL-CT 87] Variation of VSUP_NON_OP [-0,3 V to 7,0 V], [18 V to 58 V]	135
8.5.5	IBUS under several conditions	137
8.5.6	Slope control	141
8.5.7	[EPL-CT 93] Propagation delay	146
8.5.8	Supply voltage offset	151
8.5.9	Failure	164
8.5.10	[EPL-CT 106] Verifying internal capacitance and dynamic interference -- IUT as slave	166
8.6	Operation mode termination	167
8.6.1	General	167
8.6.2	[EPL-CT 107] Measuring internal resistor -- IUT as slave	168
8.6.3	[EPL-CT 108] Measuring internal resistor -- IUT as master	168
8.7	Static test cases	169
	Bibliography	172