

ATTACHMENT 8

AEC - Q100-008 REV-A

EARLY LIFE FAILURE RATE (ELFR)

Automotive Electronics Council
Component Technical Committee

Acknowledgment

Any document involving a complex technology brings together experience and skills from many sources. The Automotive Electronics Council would especially like to recognize the following significant contributors to the development of this document:

James Peace	DaimlerChrysler
Robert V. Knoell	Visteon Corporation
John Mick	Formerly with Visteon Corporation
Gerald E. Servais	Delphi Delco Electronics Systems - Retired
Nick Lycoudes	Motorola
Mark Yasin	Formerly with Motorola AIEG
Philippe Briot	Formerly with PSA, Peugeot, Citroën

Automotive Electronics Council
Component Technical Committee

Change Notification

The following summary details the changes incorporated into AEC-Q100-008 Rev-A:

- **All Sections**: Minor revisions made to all sections to correct formatting errors.
- **Section 3.2**: Added operating temperature grades (0 through 4).

Automotive Electronics Council
Component Technical Committee

METHOD - 008

EARLY LIFE FAILURE RATE (ELFR)

1 SCOPE

This test method is applicable to all IC part qualifications. In the case of many parts, generic data (see Q100, section 2.3) may fulfill the requirements of this test method. If the supplier is qualifying a part for which no generic data is available (unproven technology or design rules) for general usage then the requirements of this test method should be utilized to meet the requirements of Q100. If the supplier is qualifying a part for a single user, that user may optionally designate the implementation of AEC-Q001 as a substitute for ELFR. All parts used for such a qualification must have been evaluated to Q001 tests and limits approved by the user. If AEC-Q001 is utilized, the user shall review and approve of the particular tests and the method used to determine test limits. (Note: The failures from ELFR and Q001 do not always show a 1:1 correlation.)

1.1 Description

This specification establishes the testing method for evaluation of early life failure characteristics on parts that are utilizing new or unproven processing technology or design rules where generic data is not available. This would include parts for which there is no prior usage information or generic data. Unsatisfactory results in this evaluation indicate that corrective action is required and the parts may require processing changes, design changes, burn-in, more aggressive burn-in, or application of statistical part test limits (see AEC-Q001).

2 REFERENCE DOCUMENTS

- 1. AEC-Q001 Guidelines for Part Average Testing
- 2. JESD22-A108 Bias Life

3 PROCEDURE

3.1 Sample Size

The sample size shall be per Table 2 of Q100. In the case of parts that are deemed too expensive, the requirement for use of this test method and the sample size will be based upon agreement between the user and supplier.

DaimlerChrysler	Date	Delphi Delco Electronics Systems	Date	Visteon Corporation	Date
<i>Majdi Mortazavi</i>	<i>7/18/03</i>	<i>Detlef Griessman</i>	<i>7/18/03</i>	<i>Robert V. Knoell</i>	<i>7/18/03</i>
Majdi Mortazavi		Detlef Griessman		Robert V. Knoell	

Copyright © 2003 by DaimlerChrysler, Delphi Delco Electronics Systems, and Visteon Corporation. This document may be freely reprinted with this copyright notice. This document cannot be changed without approval by the AEC Component Technical Committee.

Automotive Electronics Council
Component Technical Committee

3.2 General ELFR Procedure

The parts shall be tested per the High-Temperature Operating Life (HTOL) requirements in JESD22-A108 with the following special condition. The ambient test temperature and duration shall be per the applicable operating temperature grade as follows:

<u>Grade 0:</u>	<u>48 hours at 150°C or 24 hours at 175°C</u>
<u>Grade 1:</u>	<u>48 hours at 125°C or 24 hours at 150°C</u>
<u>Grade 2:</u>	<u>48 hours at 105°C or 24 hours at 125°C</u>
<u>Grade 3:</u>	<u>48 hours at 85°C or 24 hours at 105°C</u>
<u>Grade 4:</u>	<u>48 hours at 70°C or 24 hours at 90°C</u>

3.3 Acceptance Criteria

The parts shall be electrically tested within 48 hours after completion of high temperature exposure. Testing shall be at room temperature followed by high temperature. Failures during this test are not acceptable and indicate that corrective action must be taken. The supplier shall notify all interested users of this non-conforming condition and the corrective action that has / will take place. The user(s) must approve of the corrective action for the part to be qualified.

3.4 Sample Disposition

Parts that pass electrical testing after this test can be used to populate other non-operating tests. These parts can also be supplied as productive material if agreed to by the user.

Revision History

<u>Rev #</u>	<u>Date of change</u>	<u>Brief summary listing affected sections</u>
-	June 9, 1998	Initial Release
A	July 18, 2003	<u>Minor revisions to correct formatting errors. Added operational temperature grades to section 3.2.</u>