



5.18 Vibration Thermal Cycling - 2

Purpose: This test evaluates the DUT for adequate design margin for fatigue resulting from random vibration induced by rough roads per GMW3172 para. 5.4.1.2 and 5.4.1.4. Criteria: Functional status shall be class A after this test.

During vibration load testing the DUT shall be simultaneously subjected to temperature cycles according to the vibration test temperature cycle. The DUT shall be electrically operated and continuously monitored while on test.

5.18.1 Test Procedure

Reference: 2.1, 2.2, and 2.4. Operating type 3.2. Failure procedure per section 5.1.

5.18.1.1 Power the test samples at 14.0VDC and subject them to 8-hours of Vibration with Temperature testing, in the X, Y and Z axes, (for a total of 24-hours of testing), per the vibration specification presented in Table 18 and the temperature specification presented in Figure 8 herein.

5.18.1.2 The executive monitoring system will be used to constantly monitor the DUT. During the course of testing verify that the test executive does not detect any DTCs that would indicate a system failure.

Frequency [Hz]	Acceleration Power Density (m/s ²) ² /Hz	Power Spectral Density (g ² /Hz)
10	20	.208
55	6.5	.0677
180	.25	.0026
300	.25	.0026
360	.14	.00146
1000	.14	.00146
RMS Acceleration Value 27.8 (m/s)² = 2.84 Grms		

Table 18: Vibration Thermal Cycling Profile

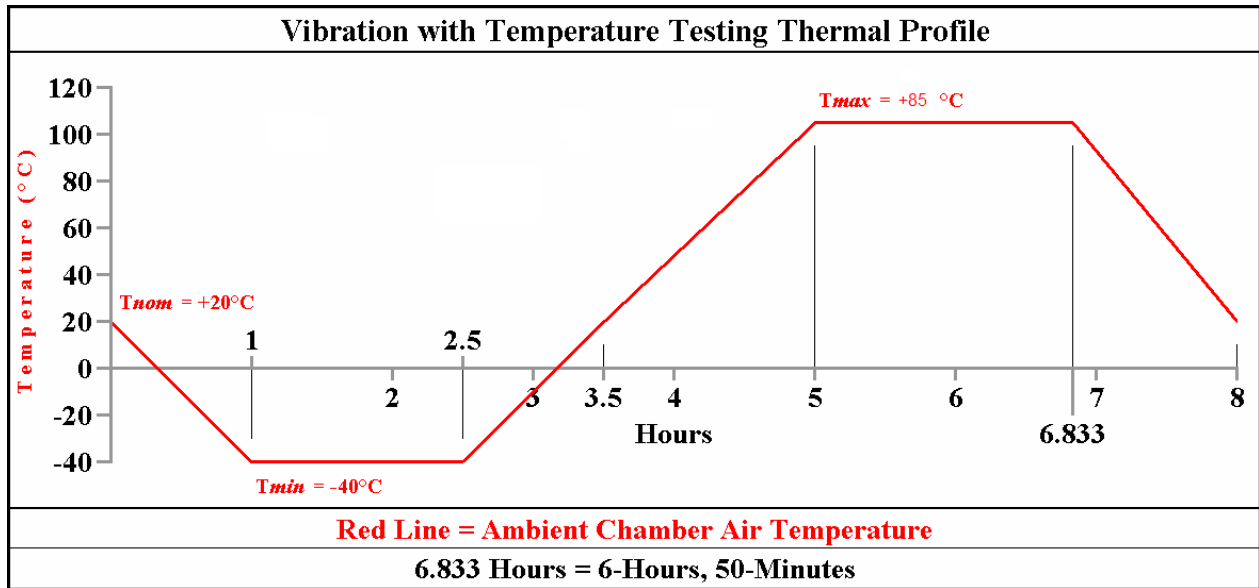


Figure 4: Vibration with Temperature Testing Thermal Profile

Frequency [Hz]	Acceleration Power Density (m/s ²) ² /Hz	Power Spectral Density (g ² /Hz)
10	20	.208
55	6.5	.0677
180	.25	.0026
300	.25	.0026
360	.14	.00146
1000	.14	.00146
RMS Acceleration Value 27.8 (m/s)² = 2.84 Grms		

Table 14: Random Vibration Profile For Sprung Mass

5.10 Functional and Parametric Test

Purpose: verify the functional and parametric system requirements per GMW3172 para. 5.1.1.
Criteria: Functional status shall be class A.

5.10.1 Test Procedure

Reference: 2.1 and 2.2. Operating type 3.2. Failure procedure per section 5.1.

The functional/parametric test shall be performed at different ambient temperatures (low, room and high) and at multiple power supply operational voltages. Allow the temperature to stabilize for a minimum of 0.5 hours before performing the test.