

# REPORT No 11682

*Date of issue: May 22, 2026*

*Status: FINAL REPORT*

\*\*\*\*\*

## IEC 60068-2-6

### ENVIRONMENTAL TESTING

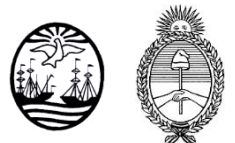
### TEST Fc: VIBRATION SINUSOIDAL

### Program: SQO-EV6 (Round 9)

\*\*\*\*\*

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<b>Berenice Ferrel</b> Assistant Technician	<b>Lic. Esther Casas</b> Physics expert	<b>Eng. Emiliano Medina</b> Quality Assurance Lead

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## 1. FOREWORD

This report summarizes the results of the **SQO-EV6 (Round 9)** proficiency testing program on the adequacy of specimens to resist specified severities of sinusoidal vibration. This program is carried out under a simultaneous participation format, as described in clause A.2.2 of ISO/IEC 17043: 2023 (Types of PT schemes).

**South Quality** conducted the testing program in March/April 2026 with the aim of assessing the laboratory's ability to competently perform the designated tests.

## 2. ORGANIZATION

Program Coordinator: Lic. Esther Casas  
 Assistant Technician: Berenice Ferrel  
 Statistics: Lic. Manuel Tozaki  
 Supervision: Eng. Emiliano Medina

## 3. OBJECTIVE

The objective of this proficiency testing program is to visually and functionally inspect the equipment under test, using the following standard:

Standard
IEC 60068-2-6: 2007

To verify this, electronic equipment has been selected.

Participants in this program have not been previously informed about the expected behavior of the samples they receive.

As part of the usual practice of this program, three different sample combinations may be sent to participants.

- i. Sample A (PASS) + Sample B (PASS).
- ii. Sample A (PASS) + Sample B (FAIL).
- iii. Sample A (FAIL) + Sample B (FAIL).

#### 4. PARTICIPANTS

In the present round, 23 laboratories have participated with the following details:

CODE	Country	ISO 17025 accredited	Results delivered
01	Australia	Yes	Yes
02	Malaysia	Yes	Yes
03	Netherlands	Yes	Yes
04	France	Yes	Yes
05	Portugal	Yes	No
06	Argentina	No	Yes
07	France	Yes	Yes
08	Spain	Yes	Yes
09	Peru	No	No
10	Bangladesh	Yes	Yes
11	Chile	Yes	Yes
12	Germany	Yes	Yes
13	Spain	Yes	No
14	South Africa	No	Yes
15	Türkiye	Yes	Yes
16	Germany	Yes	Yes
17	Thailand	Yes	Yes
18	Belgium	Yes	Yes
19	Italy	Yes	Yes
20	China	Yes	No
21	Brazil	No	Yes
22	Mexico	Yes	Yes
23	Finland	Yes	Yes

## 5. HOMOGENEITY

A homogeneity study was conducted to verify the compliance of the samples with the requirements of the IEC 60068-2-6 standard, using an ISO 17025-accredited laboratory.

Six batches, each consisting of 35 units of different electronic equipment, were prepared and tested to assess the result homogeneity.

The control process followed ISO 33405: 2024, clauses 7.4.1.1 / 7.4.1.2. Stratified random sampling was applied, and the samples were selected using random-number-generation software.

The results of this test are presented below:

Size of each batch: **35 units**  
 Tested samples from each batch: **8 units**  
 Test conditions: **10-500Hz, 10m/s<sup>2</sup>, 1 oct/min, 3 axes, 15 min/axis**

DETERMINATION	HOMOGENEITY OF RESULTS IN THE SAMPLES ANALYZED		
	BATCH: LEV3018	BATCH: LEV3019	BATCH: LEV3020
Visual inspection	YES	YES	YES
Functional performance	NO	YES	YES

Size of each batch: **35 units**  
 Tested samples from each batch: **8 units**  
 Test conditions: **10-500Hz, 10m/s<sup>2</sup>, 1 oct/min, 3 axes, 15 min/axis**

DETERMINATION	HOMOGENEITY OF RESULTS IN THE SAMPLES ANALYZED		
	BATCH: LEV3468	BATCH: LEV3469	BATCH: LEV3470
Visual inspection	YES	YES	YES
Functional performance	YES	NO	YES

Samples for this program are taken from the selected batches identified as **LEV3020**, and **LEV3468**.

The analysis of the test data indicated that the selected samples exhibited sufficient homogeneity for the program. Therefore, the results of participants identified as outliers cannot be attributed to sample variability.

## 6. SAMPLE INFORMATION

The following samples were sent for testing (Participant **Code 17**):

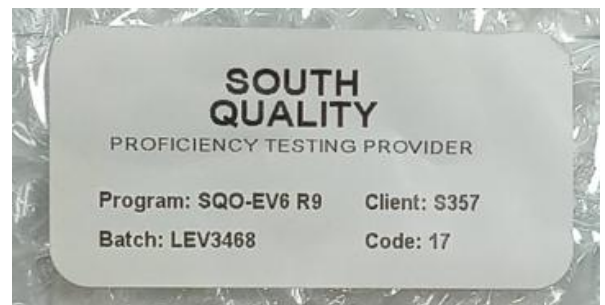
Batch:	LEV3020
Sample ID:	17
Characteristics:	Switching power supply In: 110/220V; 50/60Hz; Class 1 - Out: 12Vcc; 5A; 60W Trademark: SIMALED Model: 12V-5A(S)-60W

Batch:	LEV3468
Sample ID:	17
Characteristics:	ATX power supply 220 V - 50Hz - 600W Trademark: ACONCAWA Model: ATX 600 X 24 P 2S

## 7. IMAGES



## SAMPLES



## 8. ASSIGNED RESULTS

The assigned results are obtained from the results reported by all participants (**Consensus values**).

## 9. STATISTICS

The results must be treated as qualitative.

For qualitative results, the comparison will be made directly against the assigned results, so any difference will be evaluated as **Unsatisfactory**.

The assessment involves assigning a compliance verdict (PASS or FAIL) to each verification parameter (Visual and functional performance) carried out by each participant.

## 10. PARTICIPANTS' RESULTS

LABORATORY CODE	LEV3020		LEV3468	
	Visual inspection	Functional performance	Visual inspection	Functional performance
01	PASS	PASS	PASS	PASS
02	PASS	PASS	PASS	FAIL
03	PASS	PASS	PASS	PASS
04	PASS	PASS	PASS	PASS
06	PASS	PASS	PASS	FAIL
07	PASS	PASS	PASS	PASS
08	PASS	PASS	PASS	PASS
10	PASS	PASS	PASS	PASS
11	PASS	PASS	PASS	FAIL
12	PASS	PASS	PASS	PASS
14	PASS	PASS	PASS	FAIL
15	PASS	PASS	PASS	PASS
16	PASS	PASS	PASS	PASS
17	PASS	PASS	PASS	PASS
18	PASS	PASS	PASS	PASS
19	PASS	PASS	PASS	PASS
21	PASS	PASS	PASS	PASS
22	PASS	PASS	PASS	PASS
23	PASS	PASS	PASS	PASS

ASSIGNED RESULTS			
LEV3020		LEV3468	
Visual inspection	Functional performance	Visual inspection	Functional performance
PASS	PASS	PASS	PASS

## 11. EVALUATION OF PERFORMANCE

Laboratory Code 01: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 02: The laboratory obtained **UNSATISFACTORY** result in the functional performance verification of sample **LEV3468**. However, **SATISFACTORY** results were obtained for the remaining parameters.

Laboratory Code 03: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 04: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 05: The laboratory did not send the results before the deadline.

Laboratory Code 06: The laboratory obtained **UNSATISFACTORY** result in the functional performance verification of sample **LEV3468**. However, **SATISFACTORY** results were obtained for the remaining parameters.

Laboratory Code 07: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 08: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 09: The laboratory did not send the results before the deadline.

Laboratory Code 10: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 11: The laboratory obtained **UNSATISFACTORY** result in the functional performance verification of sample **LEV3468**. However, **SATISFACTORY** results were obtained for the remaining parameters.

Laboratory Code 12: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 13: The laboratory did not send the results before the deadline.

Laboratory Code 14: The laboratory obtained **UNSATISFACTORY** result in the functional performance verification of sample **LEV3468**. However, **SATISFACTORY** results were obtained for the remaining parameters.

Laboratory Code 15: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 16: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 17: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 18: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 19: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 20: The laboratory did not send the results before the deadline.

Laboratory Code 21: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 22: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

Laboratory Code 23: The laboratory obtained **SATISFACTORY** results in the verification of all parameters.

## 12. CONCLUSIONS

The overall performance in the **SQO-EV6 (Round 9)** program, based on expected results from the participating laboratories, was as follows:

- Participants Codes **01, 03, 04, 07, 08, 10, 12, 15, 16, 17, 18, 19, 21, 22**, and **23** have obtained **SUFFICIENT** performance according to the expected results, and no action is required;
- Participants Codes **02, 06, 11**, and **14** have obtained **INSUFFICIENT** performance in comparison with the expected results and must take corrective action for the tests in which their results differ from the expected values (see Appendix B).

The criteria used for the evaluation of the overall performance are the following:

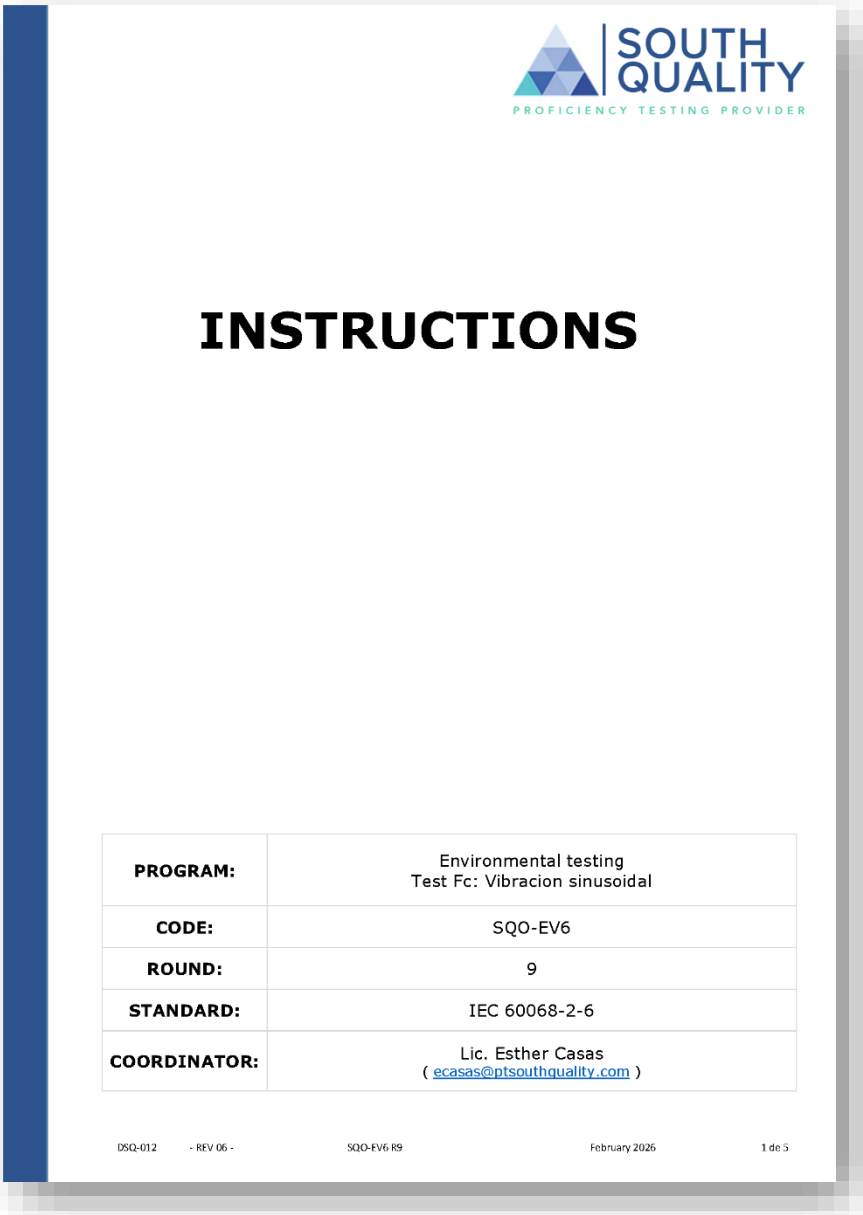
- **SUFFICIENT** performance: No unsatisfactory results were obtained.
- **INSUFFICIENT** performance: An unsatisfactory result was obtained.

# APPENDIX A

## A1 - PARTICIPANT DATA

Company: TÜV SÜD (THAILAND) LIMITED  
Laboratory: TÜV SÜD (THAILAND) LIMITED - AMATA CITY CHONBURI BRANCH  
Country: Thailand  
Client ID: S357  
Contact person: Watcharin Khamsiri  
( [watcharin.k@tuvsud.com](mailto:watcharin.k@tuvsud.com) )

## A2 - INSTRUCTIONS



The cover page features the South Quality logo at the top right, consisting of a stylized triangle made of smaller triangles. The word "SOUTH QUALITY" is written in a bold, sans-serif font, with "PROFICIENCY TESTING PROVIDER" in a smaller font below it. The word "INSTRUCTIONS" is centered in a large, bold, black font. At the bottom, there is a table with five rows of information, and a footer with technical details.

<b>PROGRAM:</b>	Environmental testing Test Fc: Vibracion sinusoidal
<b>CODE:</b>	SQO-EV6
<b>ROUND:</b>	9
<b>STANDARD:</b>	IEC 60068-2-6
<b>COORDINATOR:</b>	Lic. Esther Casas ( <a href="mailto:ecasas@southquality.com">ecasas@southquality.com</a> )

DSQ-012 - REV 06 - SQO-EV6 R9 February 2026 1 de 5

### 1 - General

This document serves as a guide for managing the results of the **SQO-EV6 (Round 9)** program.

### 2 - Standard

**IEC 60068-2-6: 2007**

### 3 - Participant

TÜV SÜD (Thailand) Limited Amata City Chonburi Branch	CODE 17
--	---------

### 4 - Tests involved

TEST
Verification of the adequacy of specimens to resist specified severities of sinusoidal vibration

### 5 - Samples

CODE	SAMPLE	QUANTITY
LEV3020-17	Switching power supply In: 110/220V; 50/60Hz; Class 1 - Out: 12Vcc; 5A; 60W Trademark: SIMALED Model: 12V-5A(S)-60W	1
LEV3468-17	ATX power supply 220 V - 50Hz - 600W Trademark: ACONCAWA Model: ATX 600 X 24 P 2S	1

### 6 - Notes

- a) The deadline for the delivery of results is **April 20, 2026**.
- b) Participants must submit the results using the usual report employed by their laboratory.
- c) The samples are to be handled as routine lab samples, with all testing, documentation, and reporting adhering to **IEC 60068-2-6**.
- d) Samples must be retained until the end of the program, which concludes with the submission of the final report.
- e) To review the results, the submission of images of the tests is appreciated. These images can be attached at the end of this document or sent via email.

### 7 - Test conditions

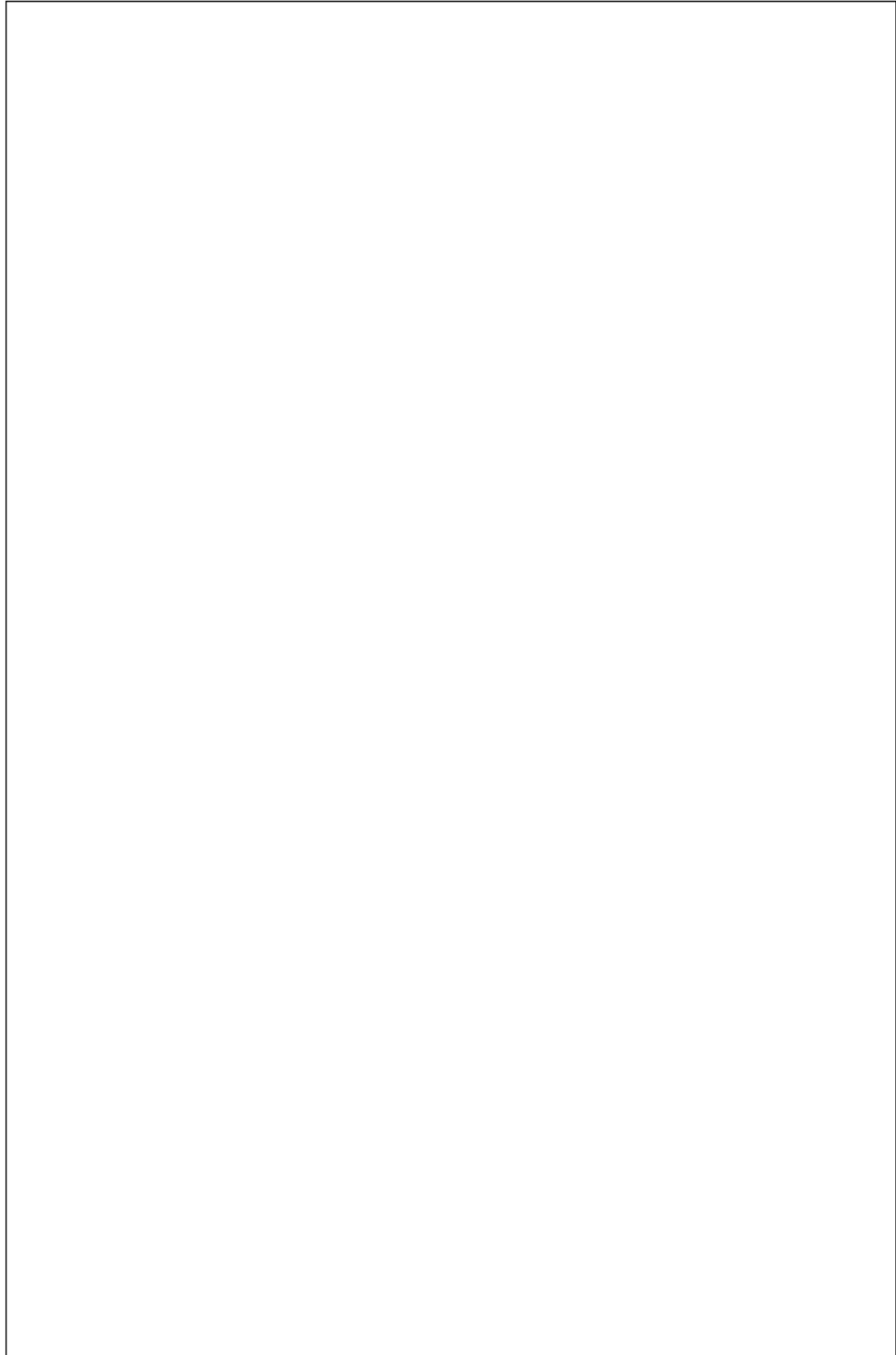
CODE	CONDITION	TEST SEVERITIES
LEV3020-17	Powered-off	10-500 Hz, 10 m/s <sup>2</sup> , 1 oct/min round-trip, 3 axes, 15 min/axis effective (single-point control at fixing point, rigid horizontal mounting)
LEV3468-17	Powered-off	10-500 Hz, 10 m/s <sup>2</sup> , 1 oct/min round-trip, 3 axes, 15 min/axis effective (single-point control at fixing point, rigid horizontal mounting)

### 8 - Parameters to determine

CODE	PARAMETERS (BEFORE VIBRATION)	RECOVERY / STABILIZATION PHASE (AFTER VIBRATION)	PARAMETERS (AFTER RECOVERY)
LEV3020-17	- Visual inspection - Voltage measurement (After 15 minutes powered-on - No load)	2 hours at maximum load - Input: 220 V - 50 Hz - Output: +12 V at 5 A (resistive load)	- Visual Inspection - Voltage measurement (after recovery load)
LEV3468-17	- Visual inspection - Voltage measurement (After 15 minutes powered-on - No load)	2 hours at maximum load - Input: 220 V - 50 Hz - Output: +12 V at 11 A (resistive load)	- Visual Inspection - Voltage measurement (after recovery load)

**PHOTOGRAPHS**

Refer report COM\_R26\_PT\_004



## A3 - PARTICIPANT RESULTS (TEST REPORT #COM/R26/PT-004)

Test Report No. COM/R26/PT-004  
dated 18 Apr 2026



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### SUBJECT

Vibration sinusoidal

### CLIENT

Client name  
Client address 1  
Client address 2  
Client address 3

### SAMPLE SUBMISSION DATE / TEST DATE

24 Mar 2026 / 06 – 09 Apr 2026

### DESCRIPTION OF SAMPLE / CONDITION OF SAMPLE RECEIVED

Product Description : The Sample Under Test (SUT) is 2 sample  
Part Name :  
Part No : } Ref. page no.3  
Model :  
Material :  
Sample Condition : The sample was received in good condition, no scratch or damage were observed.

### METHOD OF TEST

The samples were tested in accordance with the client's specifications.  
- IEC 60068-2-6



Peerapat Aryapitak  
Engineer II



Suttipong Tongsayia  
Laboratory Manager

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TEST SUMMARY

Test Results Summary

Vibration sinusoidal IEC 60068-2-6		
Test result	Requirement	Judgment
Ref. page no.3 - 5	Ref. page no.3 - 5	Client's judgment

Product Description

CODE	SAMPLE	QUANTITY
LEV3020-17	Switching power supply In: 110/220V, 50/60Hz, Class 1; Out: 12Vdc, 5A, 60W Trademark: SMALED Model: 12V-5A/S160V	1
LEV3468-17	ATX power supply 230 V - 50Hz - 630W Trademark: ADONIC-ATX Model: ATX 600 X 24 P 26	1

Location: Thailand  
TU 8180, 21850492027

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TEST RESULTS

Vibration sinusoidal

Samples were subject to test in accordance to client specification as show below:

Table 1 Vibration sinusoidal

Frequency	Acceleration	Sweep rate	Duration	Test direction
10 - 500 Hz	10 m/s <sup>2</sup>	1 oct/min	15 min./direction	X, Y, Z

Table results - Vibration sinusoidal:

Sample No.	Test results, (Visual inspection)	Test requirement	Pass / Fail
LEV302017	No abnormal		-
LW346817	No abnormal		-



Figure no.1 - Measurement point of LEV302017

Table results - Vibration sinusoidal: Voltage measurement (LEV302017)<sup>1)1)2)</sup>

No.	Measurement point	Voltage (V)		
		Before	After	Δ
1	V+, V-	12.16	12.17	0.01

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TEST RESULTS

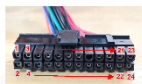


Figure no.1 - LEV346817: Connector no.1

Table results - Vibration sinusoidal: Voltage measurement (LEV346817)<sup>1)1)2)</sup>

Connector no.	Measure point	Voltage (V)		
		Before	After	Δ
1	1, 24	3.321	3.319	0.002
	2, 24	3.320	3.319	0.001
	3, 24	3.320	3.319	0.001
	4, 24	-11.530	-11.520	-0.010
	5, 24	0.000	0.000	0.000
	6, 24	0.000	0.000	0.000
	7, 24	5.231	5.229	0.002
	8, 24	-	-	-
	9, 24	0.000	0.000	0.000
	10, 24	-	-	-
	11, 24	5.231	5.229	0.002
	12, 24	0.000	0.000	0.000
	13, 24	0.000	0.000	0.000
	14, 24	0.000	0.000	0.000
	15, 24	5.203	5.202	0.001
	16, 24	-	-	-
	17, 24	5.133	5.133	0.000
	18, 24	5.231	5.229	0.002
	19, 24	12.150	12.150	0.000
	20, 24	5.231	5.229	0.002
	21, 24	12.150	12.900	0.000
	22, 24	5.231	5.221	0.010
	23, 24	3.317	3.319	-0.002
	24, 24	-	-	-

Location: Thailand  
TU 8180, 21850492027

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TEST RESULTS

Table results - Vibration sinusoidal: Voltage measurement (LEV346817)<sup>1)1)2)</sup>

Connector no.	Measure point	Voltage		
		Before	After	Δ
2	1 - GND	5.231	5.229	0.002
	2 - GND	12.150	12.150	0.000
3	1 - GND	5.232	5.229	0.003
	2 - GND	12.150	12.150	0.000
4	1 - GND	12.150	12.150	0.000
	2 - GND	12.150	12.150	0.000



Figure no.1 - LEV346817: Con. no.2

Figure no.1 - LEV346817: Con. no.3



Figure no.1 - LEV346817: Con. no.4

- Note:
- Environmental condition during inspection
    - Temperature: 23±2°C
    - Relative Humidity: 50±5%RH.
  - Voltage measurement
    - Before last section: Voltage measurement after 15 minutes powered-on - No load
    - After test section: 2 hours at maximum load then voltage measurement - No load

Location: Thailand  
TU 8180, 21850492027

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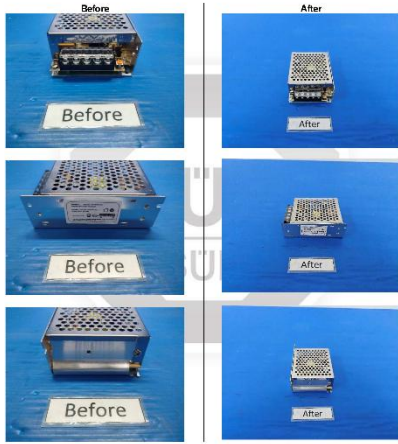


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TEST RESULTS

Picture of test – Sample No. LEV 302017



Location: Thailand  
or 81303 21804492227

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11, Suk Pongkorn 14, Bang 11013  
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**TUV**

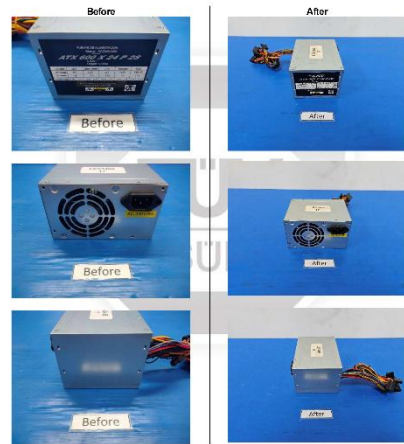
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TEST RESULTS

Picture of test – Sample No. LEV 346817



Location: Thailand  
or 81303 21804492227

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TEST SETUP & CONFIGURATION

Picture of test setup – Vibration sinusoidal



Location: Thailand  
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**TUV**

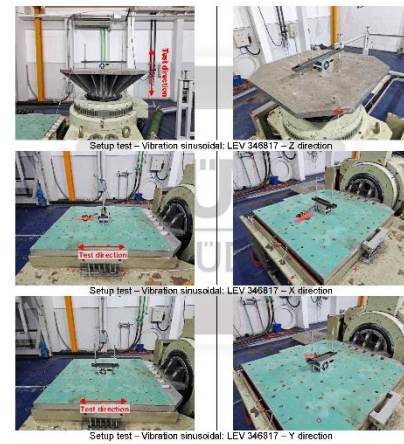
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TEST SETUP & CONFIGURATION

Picture of test setup – Vibration sinusoidal



Location: Thailand  
or 81303 21804492227

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**TUV**

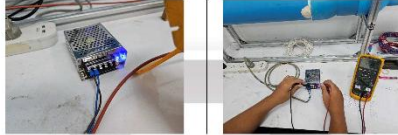
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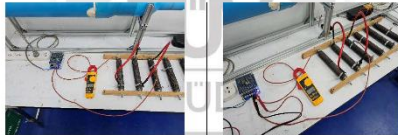


TEST SETUP & CONFIGURATION

Picture of test setup – Vibration sinusoidal



Setup test – Vibration sinusoidal: LEV 302017 – Voltage measurement



Setup test – Vibration sinusoidal: LEV 302017 – Maximum load

Location: Thailand  
Tel: 8130 2130444/82227

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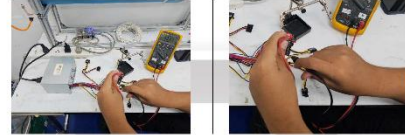


Test Report No. COM/R26/PT-004  
dated 18 Apr 2026

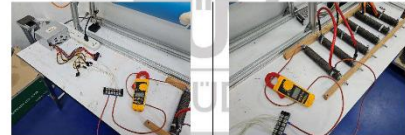


TEST SETUP & CONFIGURATION

Picture of test setup – Vibration sinusoidal



Setup test – Vibration sinusoidal: LEV 346817 – Voltage measurement



Setup test – Vibration sinusoidal: LEV 346817 – Maximum load

Location: Thailand  
Tel: 8130 2130444/82227

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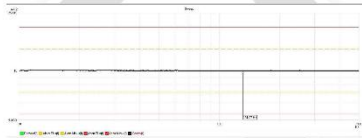


TEST SETUP & CONFIGURATION



Monitoring – Maximum load of LEV302017

Monitoring – Maximum load of LEV346817



Monitoring – Vibration graph

Location: Thailand  
Tel: 8130 2130444/82227

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TEST INSTRUMENTATION

Test Instrumentation

Equipment Name	Equipment No.	Cal Due Date
Vibration tester	AM000038	13 Jun 2026
Accelerometer	AM000180	14 Aug 2026
Multimeter	AM000171	16 Jan 2027



Location: Thailand  
Tel: 8130 2130444/82227

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dated 18 Apr 2026**



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Effective Nov 2024

**Location: Thailand**  
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# APPENDIX B

**VOID**

**----- END OF REPORT -----**