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HEADQUARTERS: 914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

LG Electronics, Inc.
22 Digital-ro 10-gil
Geumcheon-gu, Seoul 153-801

June 28, 2019

Dear Seungjee Lee,

Enclosed are the test data and photographs obtained from the testing of the LG Electronics, Inc., LG K20, LG K8+. The LG K20, LG K8+ was subjected to Environmental Testing in accordance with MIL-STD-810G, October 2008, and LG Electronics, Inc. Order Number LGE_STD190417.

Thank you for using the services of Eurofins MET Labs. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
EUROFINS MET LABS

Jesse Trawinski
Documentation Department

Reference: (\LG Electronics, Inc.\ESL103479-MIL)

HEADQUARTERS: 914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

Test Report

For the

LG Electronics, Inc.
LG K20, LG K8+

Tested under

MIL-STD-810G

MET Report: ESL103479-MIL

June 28, 2019

Prepared For:

LG Electronics, Inc.
22 Digital-ro 10-gil
Geumcheon-gu, Seoul 153-801

Prepared By:
Eurofins MET Labs
914 West Patapsco Avenue
Baltimore MD 21230

Test Data

For the

LG Electronics, Inc.
LG K20, LG K8+

Tested under

MIL-STD-810G

Eurofins MET Labs Report: ESL103479-MIL

Ulugbek Nadjimov
Project Engineer

Jesse Trawinski
Documentation Department

Johnnie Evans,
Manager, ESL

Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	June 28, 2019	Initial Issue.

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Executive Summary

Eurofins MET Laboratories, Inc. was contracted by LG Electronics, Inc. to perform acceptance testing to MIL-STD-810G criteria on the LG K20, LG K8+ under the LG Electronics, Inc. purchase order number LGE_STD190417.

The tests were based on MIL-STD-810G. The results obtained relate only to the item(s) tested.

MIL-STD-810G Test Method	Test Name	Test Conditions	Test Status
501.5 High Temperature(Storage)	Procedure I - Storage (High Temp)	Storage : with the EUT not operating, continuously 24 hours at 63℃	Compliant
501.5 High Temperature(Operation)	Procedure II - Operation (High Temp)	Operation : with the EUT operating, continuously 24 hours at 43℃	Compliant
502.5 Low Temperature(Storage)	Procedure I - Storage (Low Temp)	Storage : with the EUT not operating, continuously 24 hours at -33℃	Compliant
502.5 Low Temperature(Operation)	Procedure II - Operation (Low Temp)	Operation : with the EUT operating, continuously 24 hours at -21℃	Compliant
503.5 Temperature Shock	Temperature Shock (Procedure I-C) – Multi - Shock(s) from constant extreme temperature (1 day)	43°C for a period of 2 hours. to -21°C in no more than one minute for a period of 2 hours. 3 cycles/ 6 hours	Compliant
507.5 Humidity	Procedure I - Natural Cycles - Humidity (Cycle B3- 16 days per table 507.5-II, Figure 507.5-6)	Maintained for 24 hours, 16 cycles (Humidity 45 ~ 55 %, Temperature 21 ~ 25℃)	Compliant
514.6 Vibration	Procedure I - Vibration – Category 4, Restrained Cargo (Wheeled), Table 514.6C-VI and Figures 514.6C-3	Vibration test in total of 3 hours(3-axis each 1 hour / 5 ~ 500Hz)	Compliant
516.6 Shock	Procedure IV - Transit Drop (Shock)	Drop test at 48 inches in 10 direction with each of 5 cell phones, total drops 50	Compliant

Equipment Configuration

Overview

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform an Acceptance Test of the LG Electronics, Inc., LG K20, LG K8+. The tests were based on MIL-STD-810G. The tests described in this document were formal tests as described with the objective of the testing was to verify compliance of the Equipment Under Test (EUT) to the requirements of the aforementioned specifications.

Model(s) Tested:	LG K20, LG K8+
Model(s) Covered:	LG K20, LG K8+
Analysis:	The results obtained relate only to the item(s) tested.
Evaluated by:	Ulugbek Nadjimov
Report Date:	June 28, 2019

References

ISO 1012-1: 1992 (E)	Quality Assurance Requirements for Measuring Equipment
MIL-STD-810G	Department of Defense Test Methods Standard For Environmental Engineering Considerations and Laboratory Tests

Test Site

All testing was performed in a limited access test laboratory facility located at Eurofins MET Laboratories, Inc., 914 West Patapsco Avenue, Baltimore MD 21230. All testing performed at Eurofins MET Laboratories, Inc. was conducted in the Environmental Simulation Lab. All equipment used in making physical determinations is accurate and bears recent traceability to the National Standards and Technology.

Modifications

a) Modifications to the EUT

No modifications to the EUT were required.

b) Modifications to the Test Standard

No modifications to the Test Standard were necessary.

Disposition of EUT

The test sample including all support equipment (if any), submitted to the Environmental Simulation Lab for testing was returned to LG Electronics, Inc. upon completion of testing.

Equipment Details

Model(s) Tested:	LG K20, LG K8+
Model(s) Covered:	LG K20, LG K8+
EUT Specifications:	Voltage: 3.4 ~ 4.40V AC or DC: DC 4.4V MAX, Charging Battery Frequency: 50 – 60 Hz Number of phases: 1 Amperage: 1.2A Uses an external AC/DC adapter: Yes Additional comments: none
	Size: (HxWxD): 5.85 x 2.83 x 0.33 inches Weight: 0.34 lbs
Description of EUT:	Please describe in detail what the EUT is and its intended use: (add additional sheet(s) if needed) To Certify LG K20, LG K8+ models with MIL-STD-810G test Claims.
Number of Samples Tested:	12 samples
Mode of Operation:	Describe how the EUT functions and what options were used during the testing. EUT will follow standard MIL-STD-810G test procedures.
Monitoring Method - Pass/Fail Criteria:	LGE engineers will be present at MET Laboratory facility in Baltimore to oversee Preliminary Testing Results and to begin Certification process right away after Preliminary Testing Results are in.
Configuration:	All of 12 sample units will be the same.

Name / Description	Model Number	Part Number	Rev. #
Smart Phone	**LM-X120EMW**	**LM-X120EMW**	**Rev.B**
Smart Phone	**LM-X120EMW**	**LM-X120EMW**	**Rev.B**
Smart Phone	**LM-X120EMW**	**LM-X120EMW**	**Rev.B**
Smart Phone	**LM-X120EMW**	**LM-X120EMW**	**Rev.B**
Smart Phone	**LM-X120EMW**	**LM-X120EMW**	**Rev.B**
Smart Phone	**LM-X120EMW**	**LM-X120EMW**	**Rev.B**
Smart Phone	**LM-X120EMW**	**LM-X120EMW**	**Rev.B**
Smart Phone	**LM-X120EMW**	**LM-X120EMW**	**Rev.B**
Smart Phone	**LM-X120EMW**	**LM-X120EMW**	**Rev.B**
Smart Phone	**LM-X120EMW**	**LM-X120EMW**	**Rev.B**
Smart Phone	**LM-X120EMW**	**LM-X120EMW**	**Rev.B**
Smart Phone	**LM-X120EMW**	**LM-X120EMW**	**Rev.B**

Test Data

Method 501.5 High Temperature Test Methods

High Temperature, Procedure I - Storage

Test Requirement(s): The equipment **shall not** sustain any damage or deterioration of functional performance during its operating life when operated within the conditions of MIL-STD-810G, Method 501.5, Procedure I – Storage.

Test Procedure:

A. The EUT, in its storage configuration, was evaluated at ambient temperature and humidity level (25°C +/-5°C).

B. With the EUT not operating, the chamber temperature was increased to 63°C.

C. This condition was maintained for 24 hours.

D. At the conclusion of the test, the chamber temperature was decreased to ambient conditions.

E. The EUT functionality was evaluated at ambient temperature and humidity level (25°C +/-5°C).

Test Results:

EUT Name:	LG K20, LG K8+
Customer:	LG Electronics, Inc.
Job Number	103479
Test Standard:	MIL-STD-810G
Test Name	High Temperature, Procedure I - Storage
Test Dates:	05/15/19 – 05/19/19
Laboratory	ESL
Test Engineer:	Ulugbek Nadjimov
Test Results:	Compliant

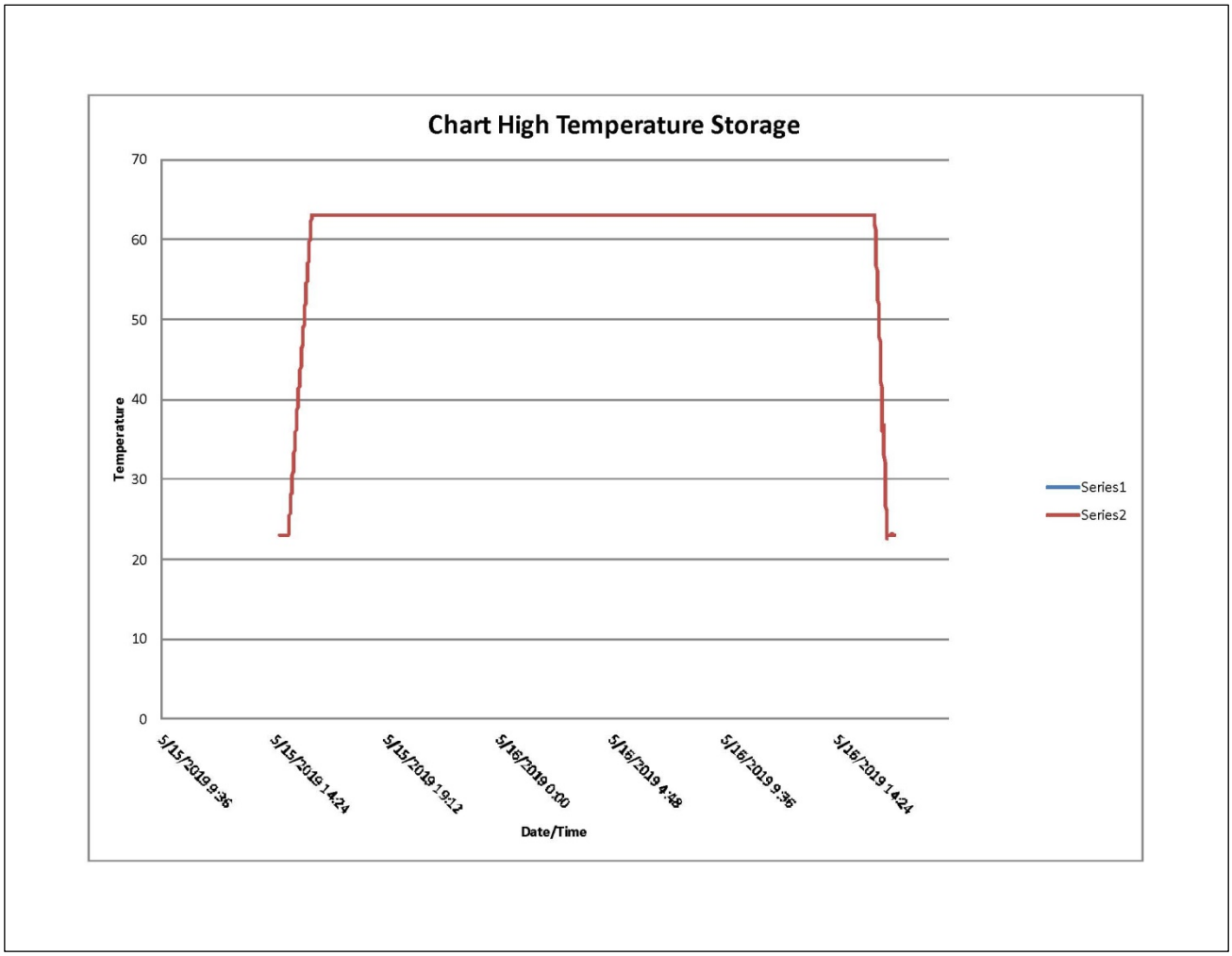

Figure 1: Method 501.5 - High Temperature, Procedure I – Storage, Test Profile

Figure 2: Method 501.5 - High Temperature, Procedure I – Storage, Pretest 1

Figure 3: Method 501.5 - High Temperature, Procedure I – Storage, Pretest 2

Figure 4: Method 501.5 - High Temperature, Procedure I – Storage, Setup in chamber

Figure 5: Method 501.5 - High Temperature, Procedure I – Storage, Post Test

High Temperature, Procedure II - Operation

Test Requirement(s): The equipment **shall not** sustain any damage or deterioration of functional performance during its operating life when operated within the conditions of MIL-STD-810G, Method 501.5, Procedure II – Operation.

Test Procedure

A. The EUT functionality was evaluated at ambient temperature and humidity level (25°C +/-5°C).

B. With the EUT operating, the chamber temperature was increased to 43°C.

C. Temperature was maintained for 24 hours.

D. At the conclusion of the test, the chamber temperature was decreased to ambient conditions.

E. The EUT functionality was evaluated at ambient temperature and humidity level (25°C +/-5°C).

Test Results:

EUT Name:	LG K20, LG K8+
Customer:	LG Electronics, Inc.
Job Number	103479
Test Standard:	MIL-STD-810G
Test Name	High Temperature, Procedure II - Operation
Test Dates:	05/07/19 – 05/08/19
Laboratory	ESL
Test Engineer:	Ulugbek Nadjimov
Test Results:	Compliant

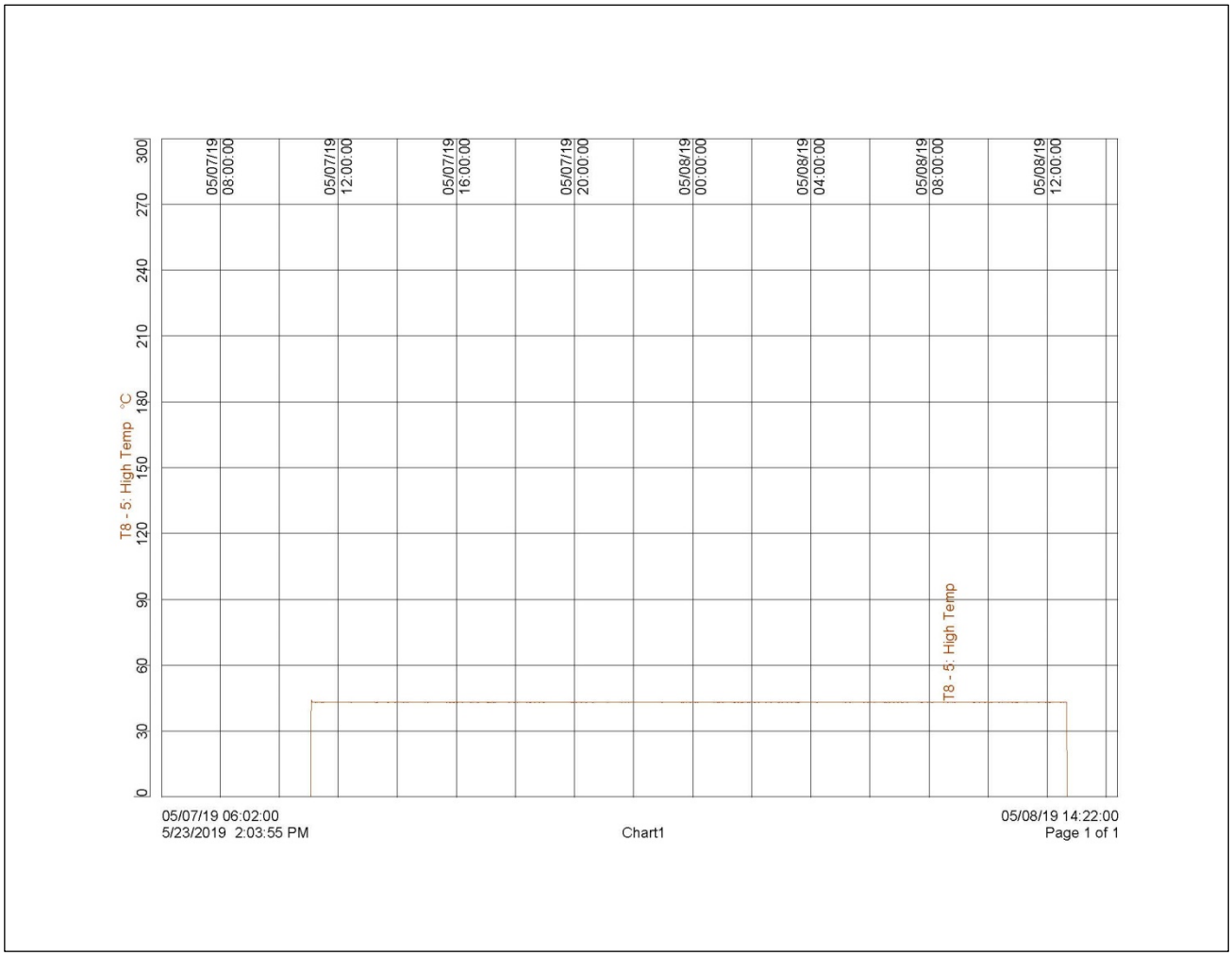

Figure 6: Method 501.5 - High Temperature, Procedure II – Operation, Test Profile

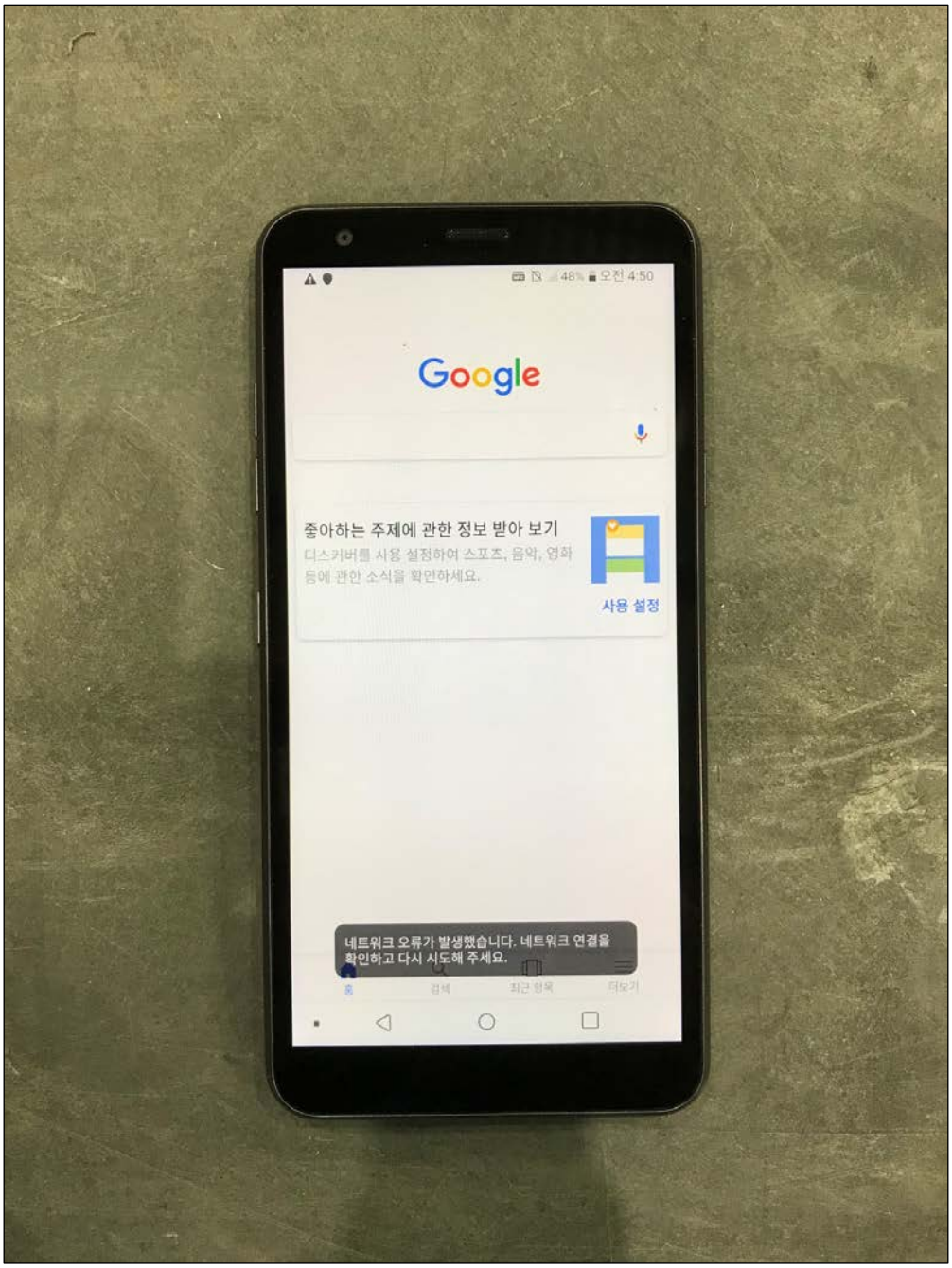

Figure 7: Method 501.5 - High Temperature, Procedure II – Operation, Pretest, 1

Figure 8: Method 501.5 - High Temperature, Procedure II – Operation, Pretest, 2

Figure 9: Method 501.5 - High Temperature, Procedure II – Operation, Setup

Figure 10: Method 501.5 - High Temperature, Procedure II – Operation, Post Test

Method 502.5 Low Temperature Test Methods

Low Temperature, Procedure I - Storage

Test Requirement(s): The equipment **shall not** sustain any damage or deterioration of functional performance during its operating life when operated within the conditions of MIL-STD-810G, Method 502.5, Procedure I – Storage.

Test Procedure:

A. The EUT, in its storage configuration, was placed in a test chamber.

B. With the EUT non-operating, the chamber temperature was decreased to -33°C.

C. The chamber temperature was held at -33°C for 24 hours.

D. At the conclusion of the test, the chamber temperature was increased to ambient conditions.

E. The EUT functionality was evaluated at ambient temperature and humidity level (25°C, 55%RH).

Test Results:

EUT Name:	LG K20, LG K8+
Customer:	LG Electronics, Inc.
Job Number	103479
Test Standard:	MIL-STD-810G
Test Name	Low Temperature, Procedure I - Storage
Test Dates:	05/17/19 – 05/18/19
Laboratory	ESL
Test Engineer:	Ulugbek Nadjimov
Test Results:	Compliant
Additional Notes:	EUT was fully functional after exposure to low temperature storage test.

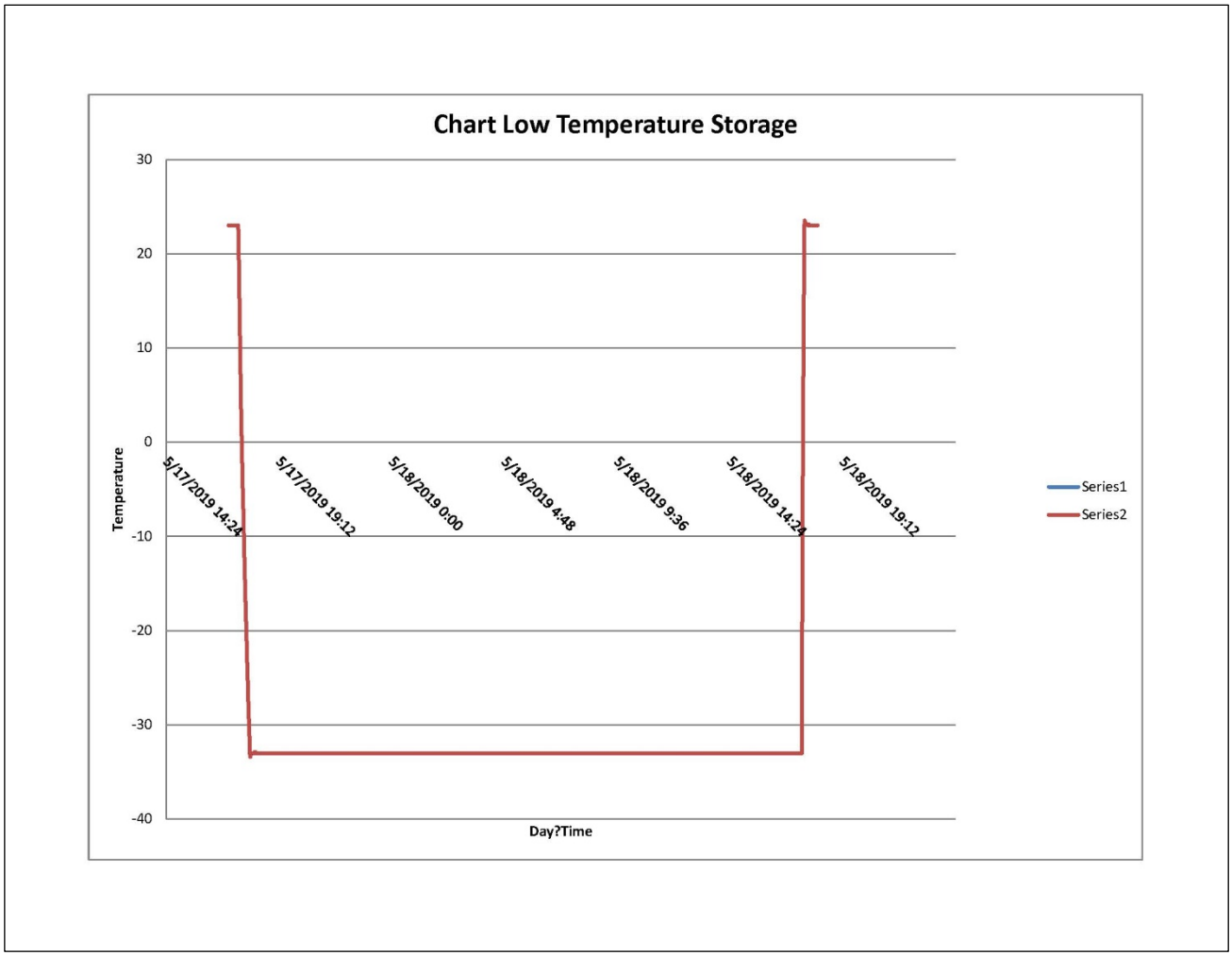

Figure 11: Method 502.5 - Low Temperature, Procedure I – Storage Test Profile

Figure 12: Method 502.5 - Low Temperature, Procedure I – Storage, Pretest

Figure 13: Method 502.5 - Low Temperature, Procedure I – Storage, Setup

Figure 14: Method 502.5 - Low Temperature, Procedure I – Storage, Post Test 1

Figure 15: Method 502.5 - Low Temperature, Procedure I – Storage, Post Test 2

Low Temperature, Procedure II – Operation

Test Requirement(s): The equipment **shall not** sustain any damage or deterioration of functional performance during its operating life when operated within the conditions of MIL-STD-810G, Method 502.5, Procedure II – Operation.

Test Procedure

A. The EUT functionality was evaluated at ambient temperature and humidity level (25°C +/-5°C, 55%RH).

B. With the EUT operating, the chamber temperature was decreased to -21°C.

C. The chamber temperature was held at -21°C for 24 hours, while the functionality of the EUT was evaluated.

D. At the conclusion of the test, the chamber temperature was increased to ambient conditions.

E. The EUT functionality was evaluated at ambient temperature and humidity level (25°C, 55%RH).

Test Results:

EUT Name:	LG K20, LG K8+
Customer:	LG Electronics, Inc.
Job Number	103479
Test Standard:	MIL-STD-810G
Test Name	Low Temperature, Procedure II – Operation
Test Dates:	05/16/19 – 05/17/19
Laboratory	ESL
Test Engineer:	Ulugbek Nadjimov
Test Results:	Compliant

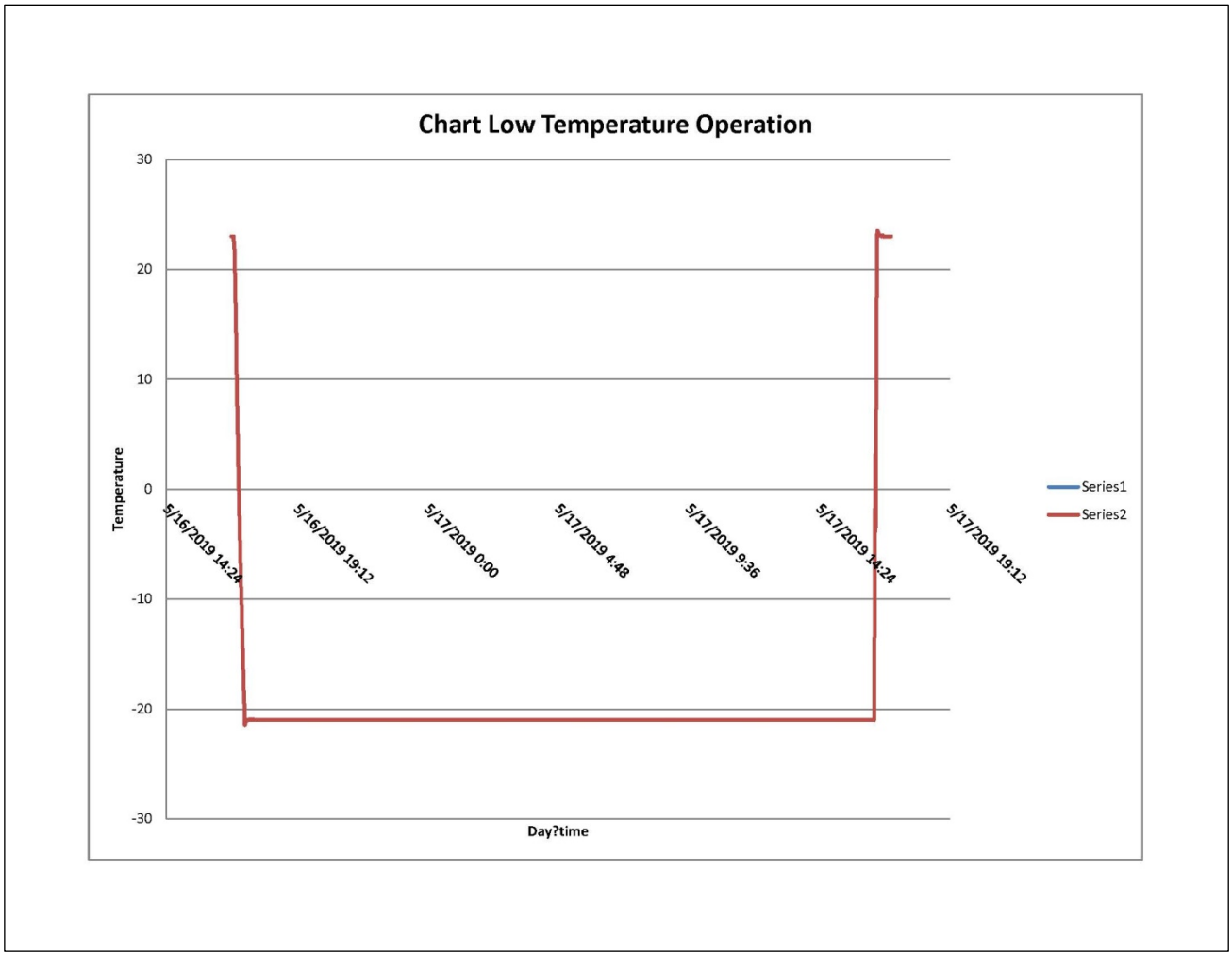

Figure 16: Method 502.5 - Low Temperature, Procedure II – Operation, Test Profile

Figure 17: Method 502.5 - Low Temperature, Procedure II – Operation, Pretest 1

Figure 18: Method 502.5 - Low Temperature, Procedure II – Operation, Pretest 2

Figure 19: Method 502.5 - Low Temperature, Procedure II – Operation, Setup in Chamber

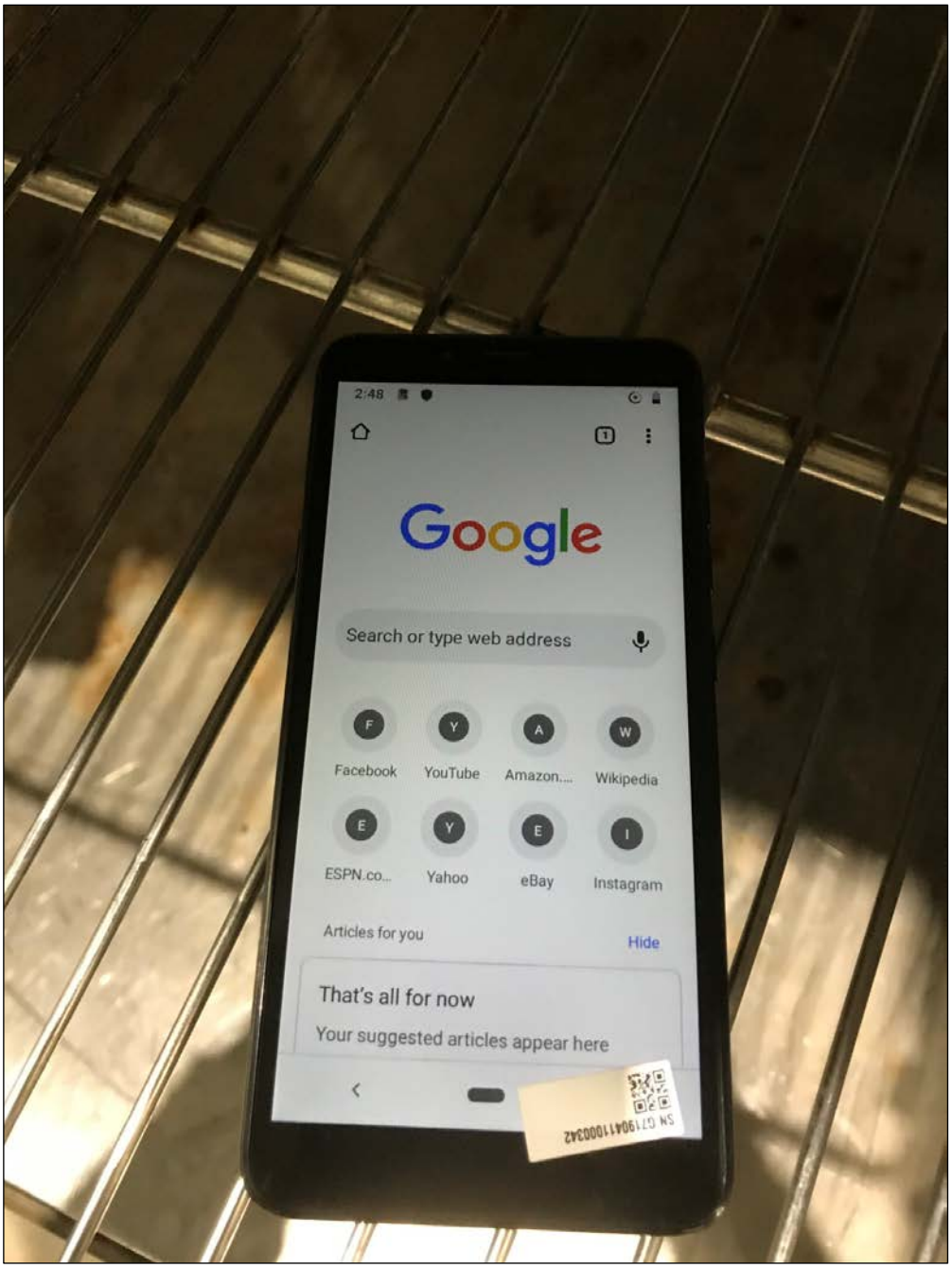

Figure 20: Method 502.5 - Low Temperature, Procedure II – Operation, Post Test

Method 503.5 Temperature Shock Test Methods

Temperature Shock, Procedure I-C – Multi-Cycle Shocks

Test Requirement(s): The equipment **shall not** sustain any damage or deterioration of functional performance during its operating life when operated within the conditions of MIL-STD-810G, Method 503.5, Procedure I-C – Multi-Cycle Shocks.

Test Procedure:

A. The EUT was placed in the chamber at 43°C and subjected to a temperature shock in Figure 21. The temperature was maintained for a period of 2 hours. The EUT was allowed to stabilize.

B. The EUT was transferred to the second chamber with -21°C in no more than one minute. This temperature was maintained for a period of 2 hours. The EUT was allowed to stabilize.

C. The total number of cycles was 3 cycles.

D. The EUT was returned to standard ambient conditions after the final cycle.

E. The EUT was visually inspected and functionally evaluated.

F. The above steps were repeated with the chambers temperature extreme set at 43°C and -21 °C respectively.

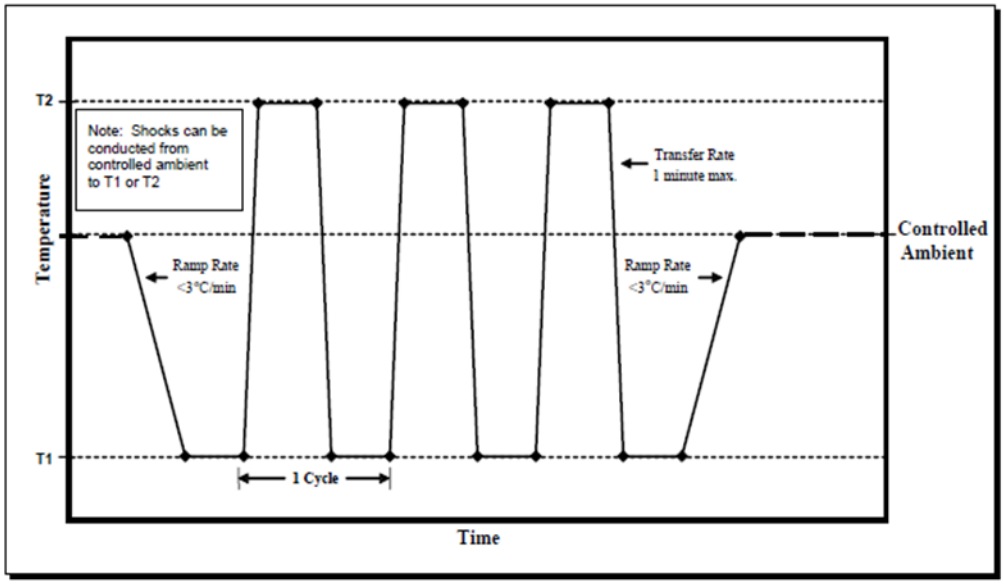

Figure 503.5-3. Multi-cycle shocks.

Figure 21: Method 503.5, Procedure I-C – Multi-Cycle Shocks

Test Results:

EUT Name:	LG K20, LG K8+
Customer:	LG Electronics, Inc.
Job Number	103479
Test Standard:	MIL-STD-810G
Test Name	Temperature Shock, Procedure I-C – Multi-Cycle Shocks
Test Dates:	05/22/19
Laboratory	ESL
Test Engineer:	Ulugbek Nadjimov
Test Results:	Compliant

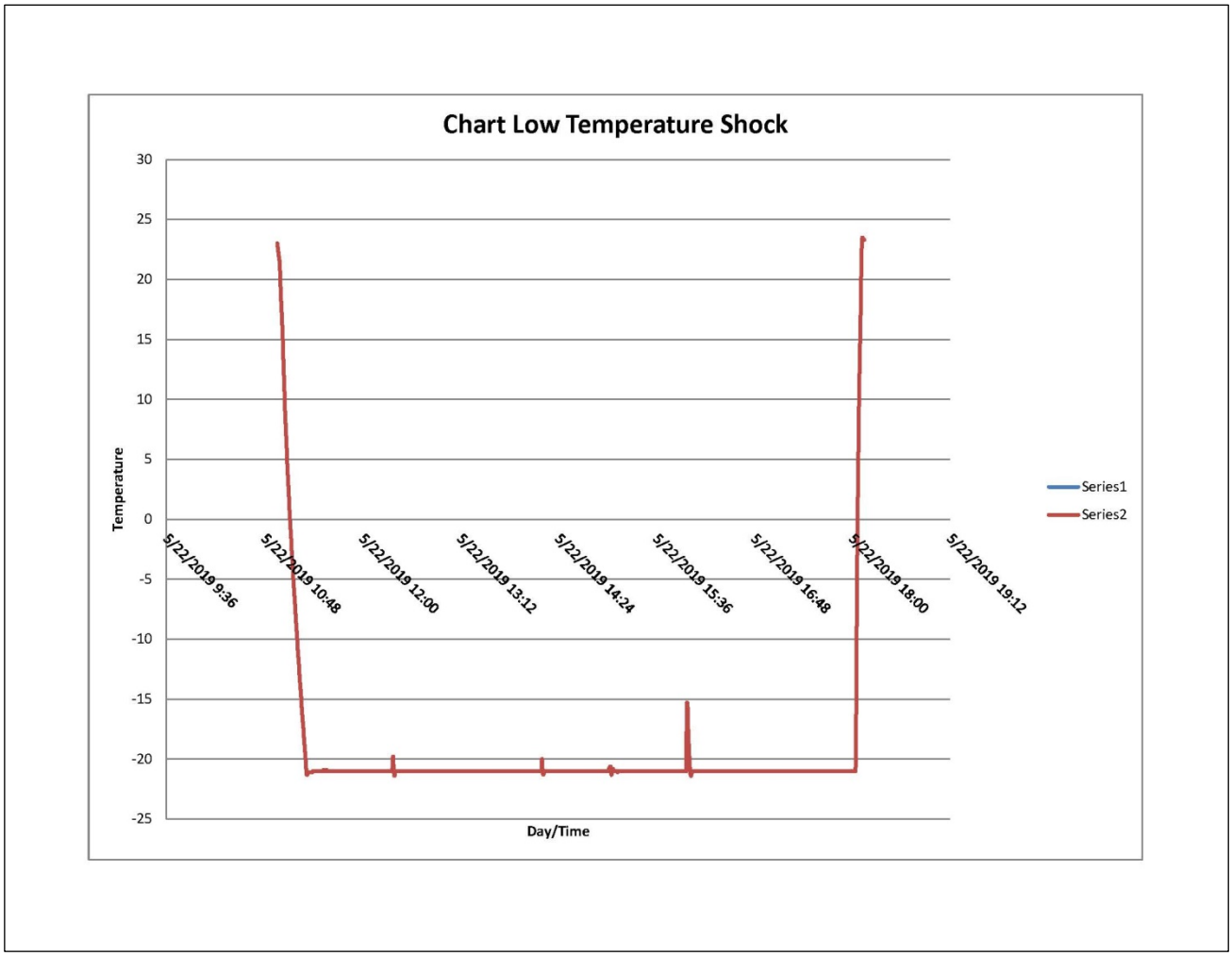

Figure 22: Method 503.5 - Temperature Shock, Procedure I-C – Multi-Cycle Shocks, Test Profile, Low Temperature

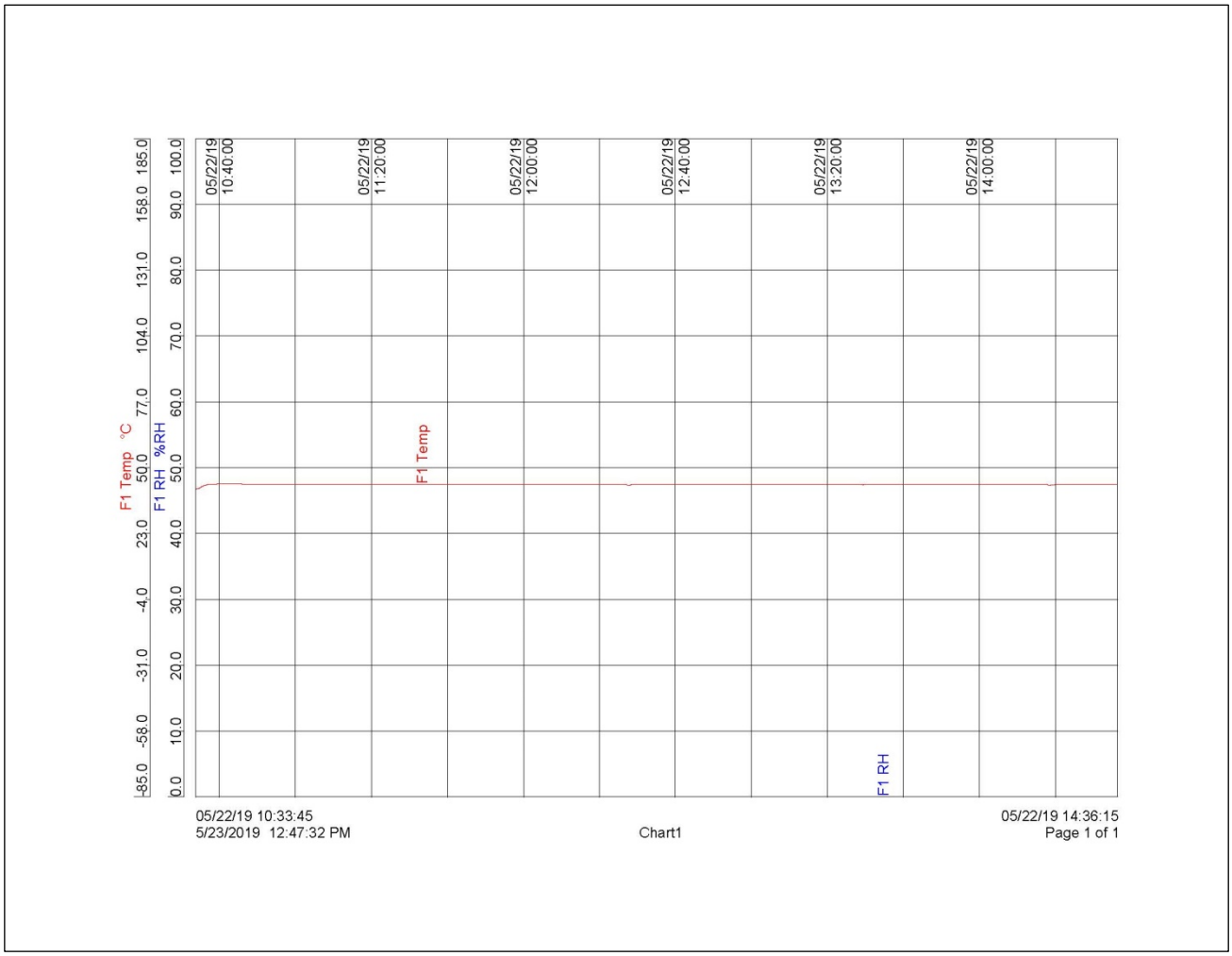

Figure 23: Method 503.5 - Temperature Shock, Procedure I-C – Multi-Cycle Shocks, Test Profile, High Temperature

Figure 24: Method 503.5 - Temperature Shock, Procedure I-C – Multi-Cycle Shocks, Pretest

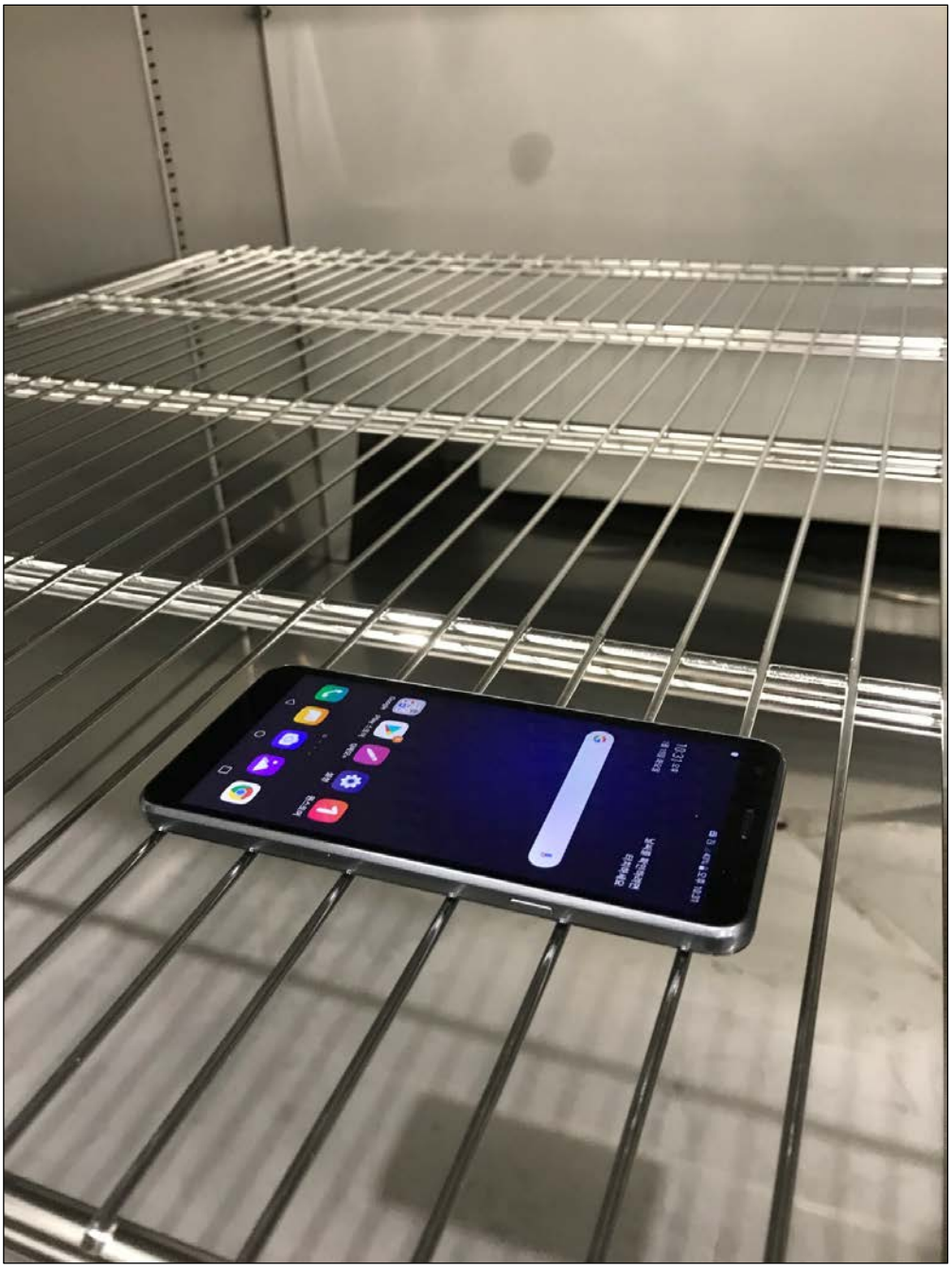

Figure 25: Method 503.5 - Temperature Shock, Procedure I-C – Multi-Cycle Shocks, Setup in chamber

Figure 26: Method 503.5 - Temperature Shock, Procedure I-C – Multi-Cycle Shocks, Post Test

Method 507.5 Humidity Test Methods

Humidity, Procedure I – Natural Cycles

Test Requirement(s): The equipment **shall not** sustain any damage or deterioration of functional performance when subjected to the conditions of MIL-STD-810G, Method 507.5, Humidity, Procedure I – Natural Cycles. (Natural Cycle B3)

Test Procedure

A. The EUT functionality was evaluated at ambient temperature and humidity levels (25°C ± 5°C, 55%RH).

B. The operational EUT was installed in the temperature chamber at 25°C (± 5°C) and a relative humidity between 20 and 55%.

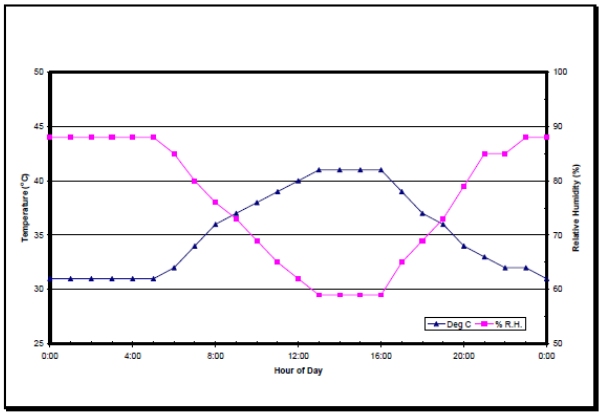

Figure 507.5-6. Natural Cycle B3 - Hot humid.

Table 507.5-VIII. Hot Humid – Natural Cycle B3.

Time	Temp. °F	Temp. °C	RH %	Time	Temp. °F	Temp. °C	RH %
0000	88	31	88	1300	105	41	59
0100	88	31	88	1400	105	41	59
0200	88	31	88	1500	105	41	59
0300	88	31	88	1600	105	41	59
0400	88	31	88	1700	102	39	65
0500	88	31	88	1800	99	37	69
0600	90	32	85	1900	97	36	73
0700	93	34	80	2000	94	34	79
0800	96	36	76	2100	91	33	85
0900	98	37	73	2200	90	32	85
1000	100	38	69	2300	89	32	88
1100	102	39	65	2400	88	31	88
1200	104	40	62				

Figure 27: Humidity –Natural Cycle B3

C. The EUT was subjected to the environment (Natural Cycle B3) described in the table and figure on the next page, and as detailed in Steps D through K.

D. The chamber temperature and relative humidity was increased to 31°C and 88% RH

E. The chamber temperature and relative humidity was increased to follow the profile shown in Figure 26.

F. Step D and E were repeated (15) times for a total of sixteen (16) 24 hour cycles

G. At the conclusion of sixteenth cycle, the chamber and humidity were decreased to ambient conditions.

H. The EUT functionality was evaluated at ambient temperature and humidity level (25°C, 55%RH).

Test Results:

EUT Name:	LG K20, LG K8+
Customer:	LG Electronics, Inc.
Job Number	103479
Test Standard:	MIL-STD-810G
Test Name	Humidity, Procedure I – Natural Cycles (Natural Cycle B3)
Test Dates:	05/13/19 – 06/02/19
Laboratory	ESL
Test Engineer:	Ulugbek Nadjimov
Test Results:	Compliant

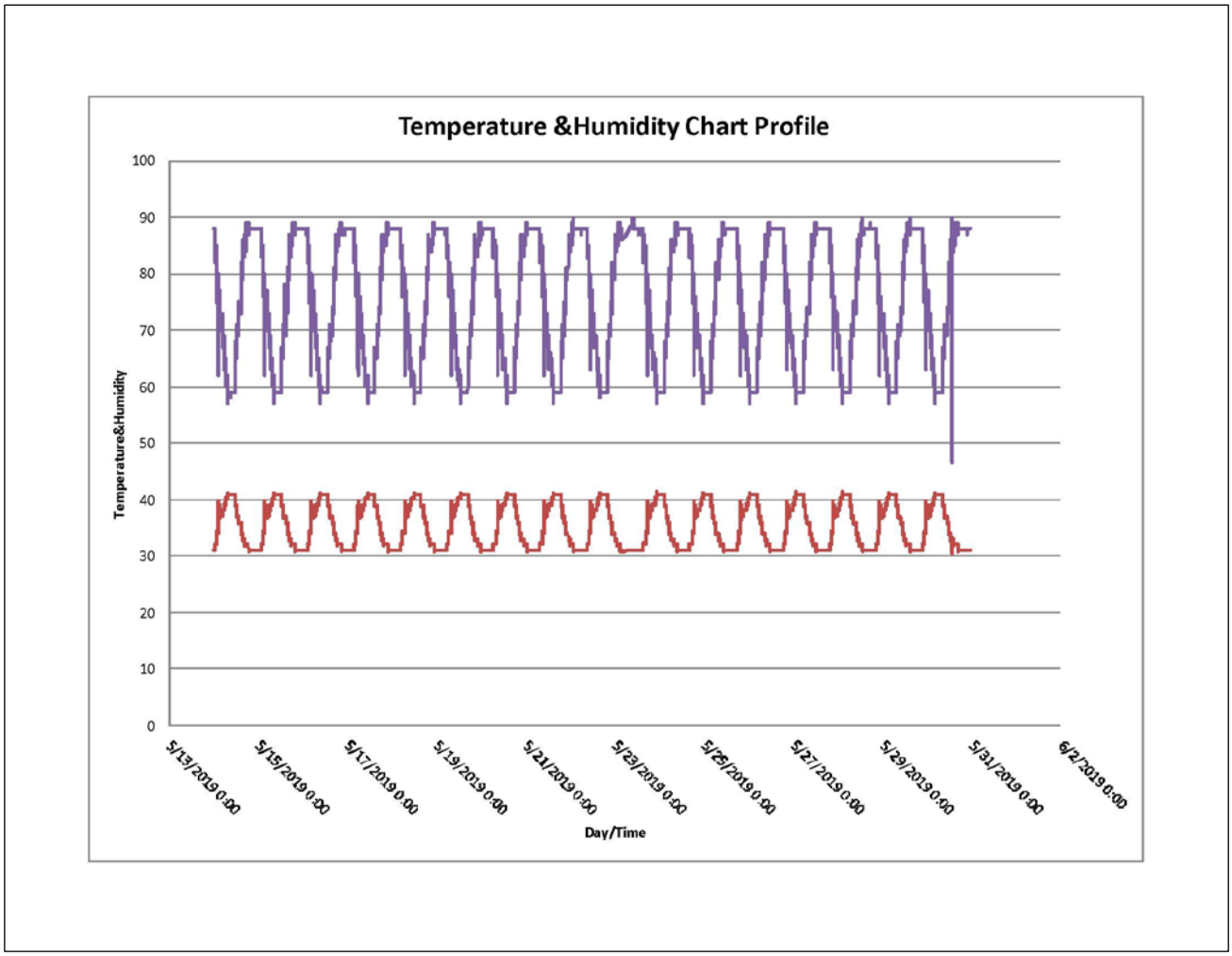

Figure 28: Method 507.5, Humidity, Procedure I, Test Profile

Figure 29: Method 507.5, Humidity, Procedure I, Setup in chamber

Figure 30: Method 507.5, Humidity, Procedure I, Post Test 1

Figure 31: Method 507.5, Humidity, Procedure I, Post Test 2

Figure 32: Method 507.5, Humidity, Procedure I, Post Test Verification

Method 514.6 Vibration Test Methods

Vibration, Procedure I – General Vibration

Vibration, Category 4 – Composite Wheeled Vehicle Vibration Exposure (MIL-STD-810G Method 514.6)

Test Requirements The equipment **shall not** sustain any damage or deteriorate in functional performance during or after it has been exposed to the environment described in MIL-STD-810G.

Test Procedure

A. The EUT was installed on the vibration test fixture in the vertical axis.

B. An input (control) accelerometer was mounted to the base of the test fixture as near as possible to the attachment point of the EUT. A monitor accelerometer was mounted to the frame of the fixture to record the response.

C. The EUT was subjected to a random vibration, in the vertical axis, at the following test levels.

D. The EUT was installed on the vibration test fixture in the longitudinal axis.

E. An input (control) accelerometer was mounted to the base of the test fixture as near as possible to the attachment point of the EUT. A monitor accelerometer was mounted to the frame of the fixture to record the response.

F. The EUT was subjected to a random vibration, in the longitudinal axis, at the following test levels.

G. The EUT was installed on the vibration test fixture in the transverse axis.

H. An input (control) accelerometer was mounted to the base of the test fixture as near as possible to the attachment point of the EUT. A monitor accelerometer was mounted to the frame of the fixture to record the response.

I. The EUT was subjected to a random vibration, in the transverse axis, at the following test levels.

J. The EUT was visually inspected before and after each axis of vibration.

Vibration, Category 4 – Composite Wheeled Vehicle Vibration Exposure

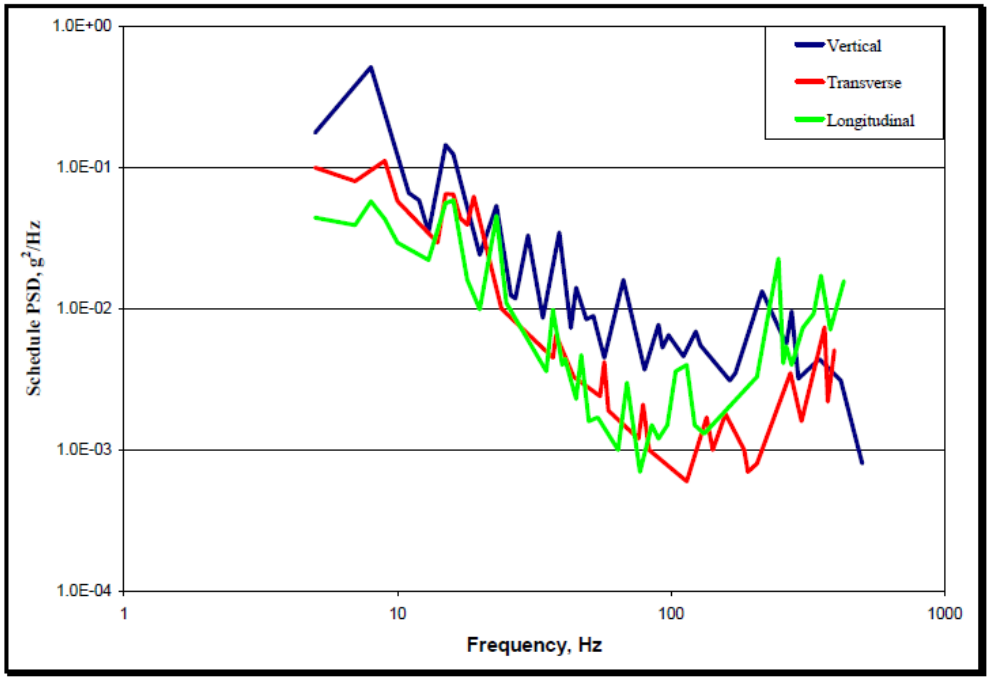

Figure 514.6C-3 – Category 4 - Composite wheeled vehicle vibration exposure.

Figure 33: Composite Wheeled Vehicle Vibration Exposure [Figure 514.6C-3]

Vibration, Category 4 – Composite Wheeled Vehicle Vibration Exposure

Table 514.6C-VI. Category - 4 - Composite wheeled vehicle vibration exposure. (Break points for curves of Figure 514.6C-3.)

Vertical		Transverse		Longitudinal	
Frequency, Hz	PSD, g^2/Hz	Frequency, Hz	PSD, g^2/Hz	Frequency, Hz	PSD, g^2/Hz
5	0.1759	5	0.0998	5	0.0441
8	0.5120	7	0.0799	7	0.0390
11	0.0660	9	0.1115	8	0.0576
12	0.0585	10	0.0577	9	0.0430
13	0.0348	14	0.0294	10	0.0293
15	0.1441	15	0.0651	13	0.0221
16	0.1237	16	0.0646	15	0.0558
20	0.0241	17	0.0436	16	0.0585
23	0.0536	18	0.0393	18	0.0160
26	0.0124	19	0.0622	20	0.0099
27	0.0118	24	0.0100	23	0.0452
30	0.0331	37	0.0045	25	0.0110
34	0.0086	38	0.0065	35	0.0036
39	0.0347	44	0.0033	37	0.0098
43	0.0073	55	0.0024	40	0.0040
45	0.0141	57	0.0042	41	0.0044
49	0.0084	59	0.0019	45	0.0023
52	0.0089	76	0.0012	47	0.0047
57	0.0045	79	0.0021	50	0.0016
67	0.0160	83	0.0010	54	0.0017
80	0.0037	114	0.0006	64	0.0010
90	0.0077	135	0.0017	69	0.0030
93	0.0053	142	0.0010	77	0.0007
98	0.0065	158	0.0018	85	0.0015
99	0.0063	185	0.0010	90	0.0012
111	0.0046	191	0.0007	97	0.0015
123	0.0069	206	0.0008	104	0.0036
128	0.0055	273	0.0035	114	0.0040
164	0.0031	300	0.0016	122	0.0015
172	0.0035	364	0.0074	132	0.0013
215	0.0133	374	0.0022	206	0.0033
264	0.0056	395	0.0051	247	0.0226
276	0.0096	500	0.0012	257	0.0041
292	0.0032	rms = 1.48 g		264	0.0054
348	0.0044			276	0.0040
417	0.0031			303	0.0073
500	0.0008			332	0.0092
rms = 2.24 g				353	0.0172
				382	0.0071
				428	0.0157
				500	0.0016
				rms = 1.90 g	

Figure 34: Composite Wheeled Vehicle Vibration Exposure [Table 514.6C-VI]

Vibration, Category 4 – Common Carrier - US Highway Truck Vibration Exposure

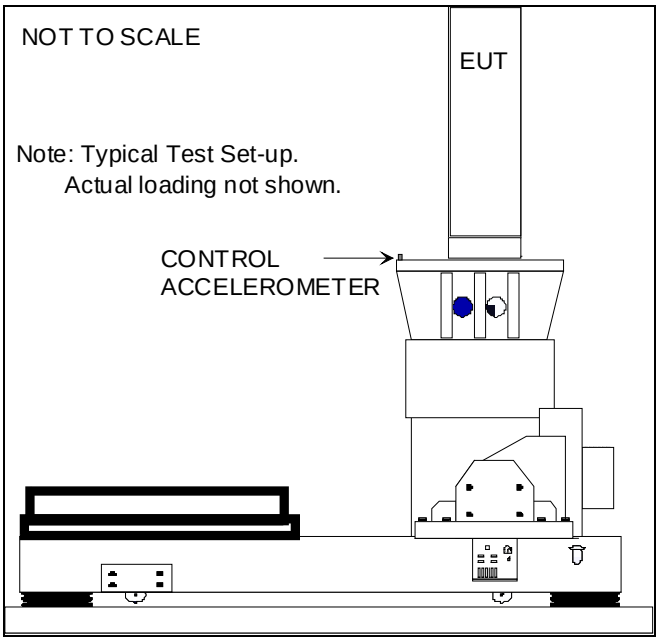

Figure 35: Vibration Test Set-up (Vertical Axis)

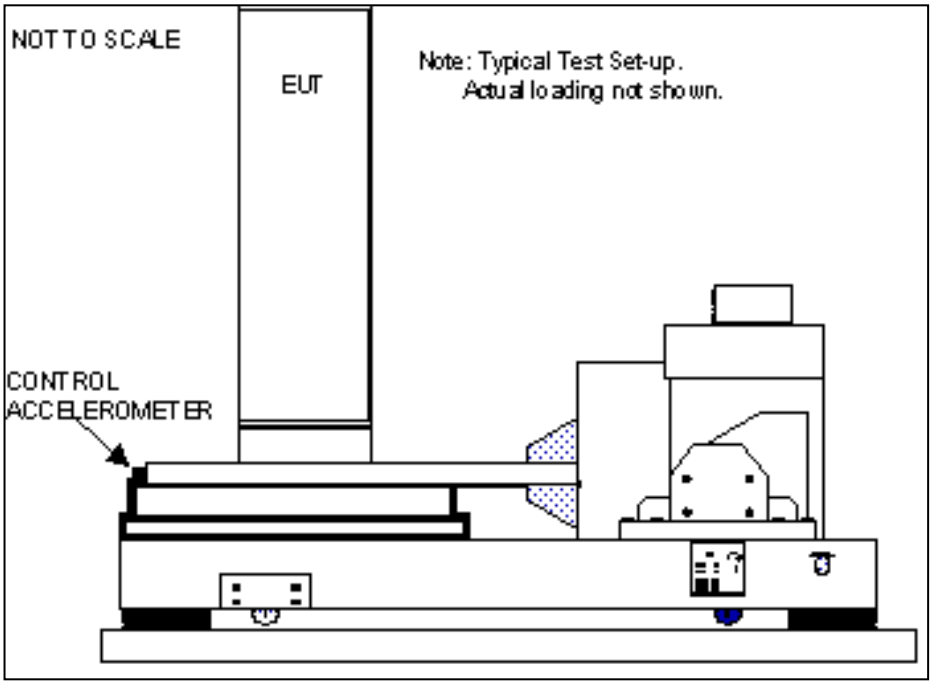

Figure 36: Vibration Test Set-up (Transverse and Longitudinal Axis)

Test Results:

EUT Name:	LG K20, LG K8+
Customer:	LG Electronics, Inc.
Job Number	103479
Test Standard:	MIL-STD-810G
Test Name	Vibration, Category 4 –Composite Wheeled Vehicle Vibration Exposure
Test Dates:	05/20/19 – 05/21/19
Laboratory	ESL
Test Engineer:	Ulugbek Nadjimov
Test Results:	Compliant

Vibration, Category 4 – Composite Wheeled Vehicle Vibration Exposure

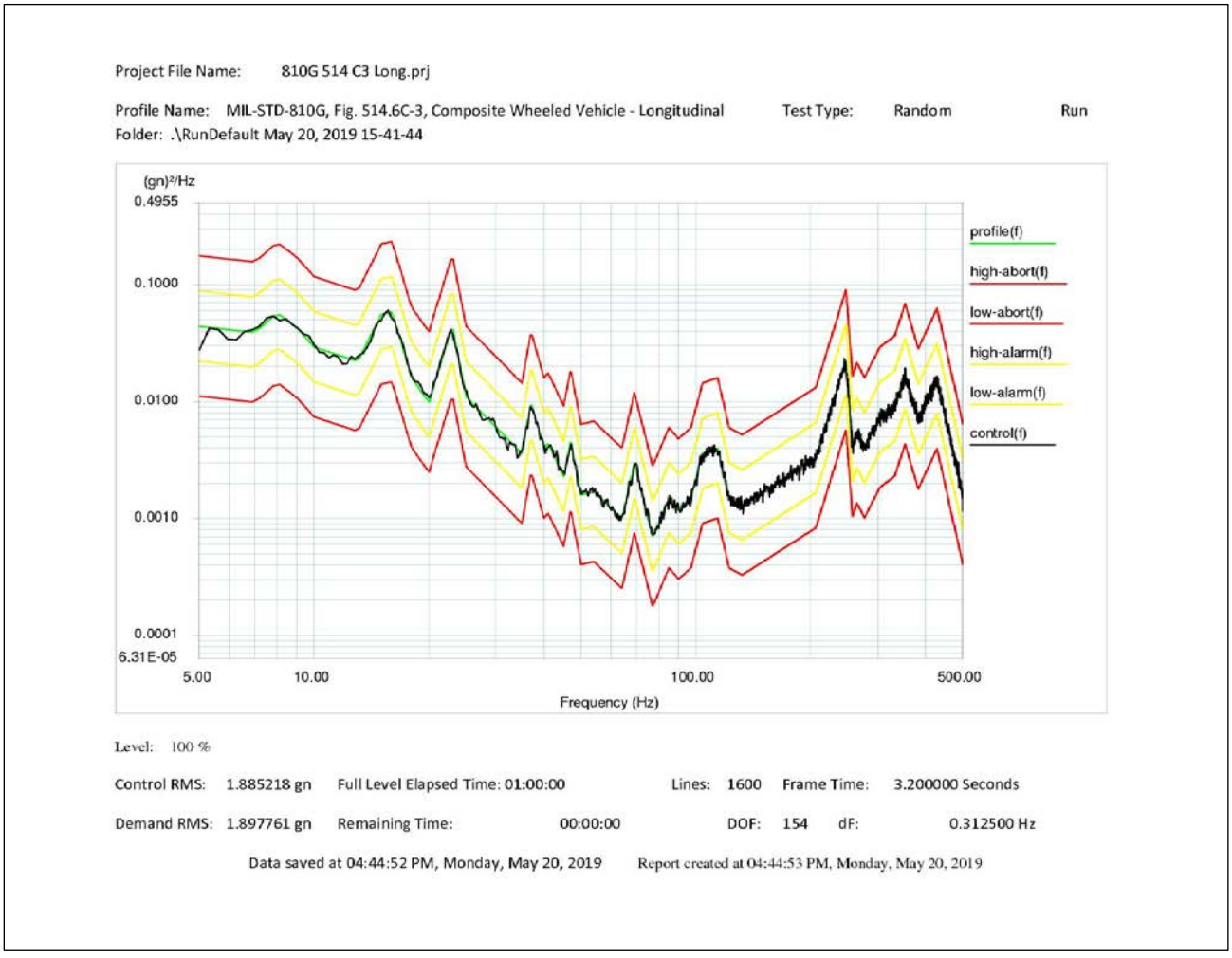

Figure 37: Method 514.6, Category 4 - Truck/Trailer/Tracked - Restrained Cargo, Longitudinal Axis

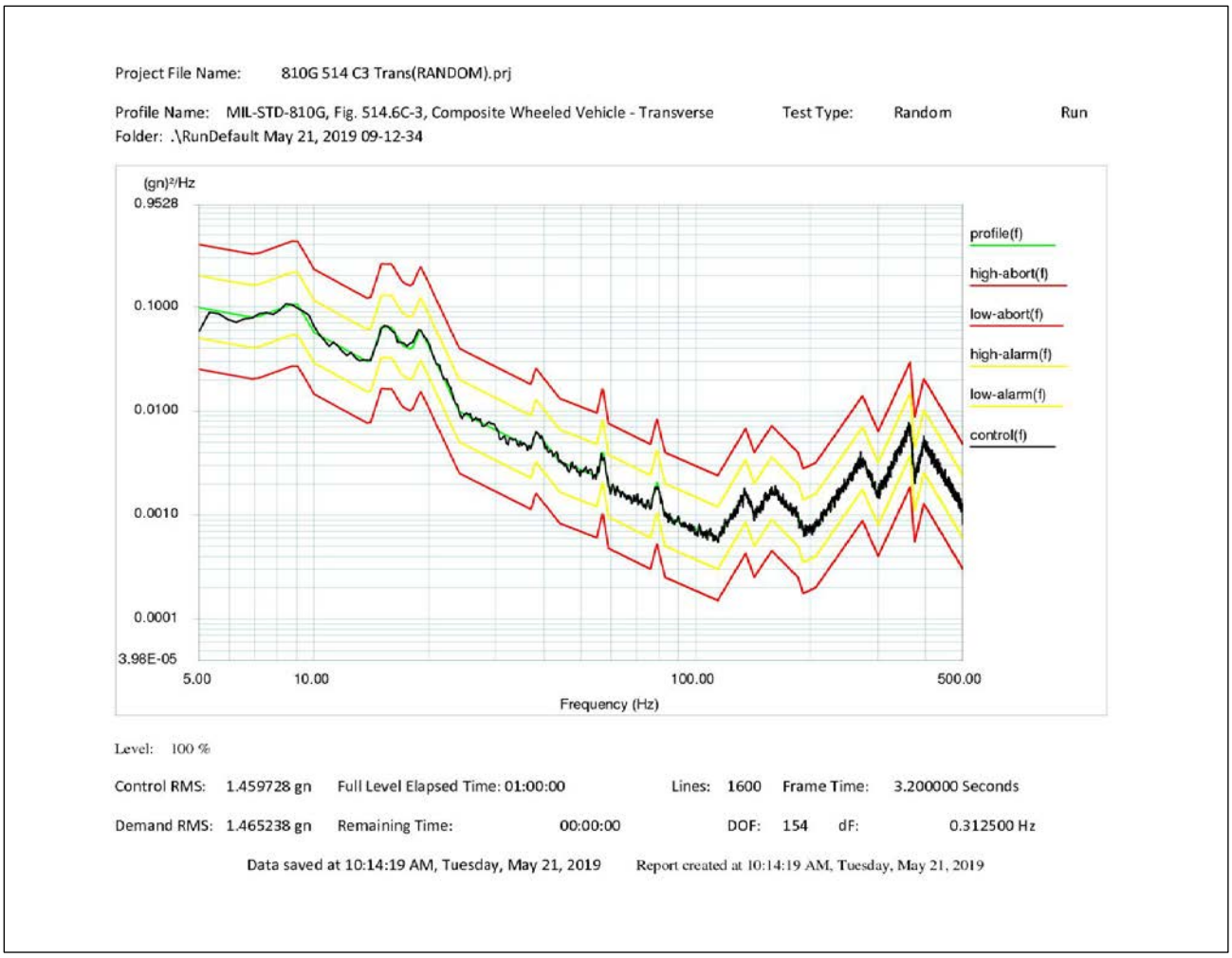

Figure 38: Method 514.6, Category 4 - Truck/Trailer/Tracked - Restrained Cargo, Transverse Axis

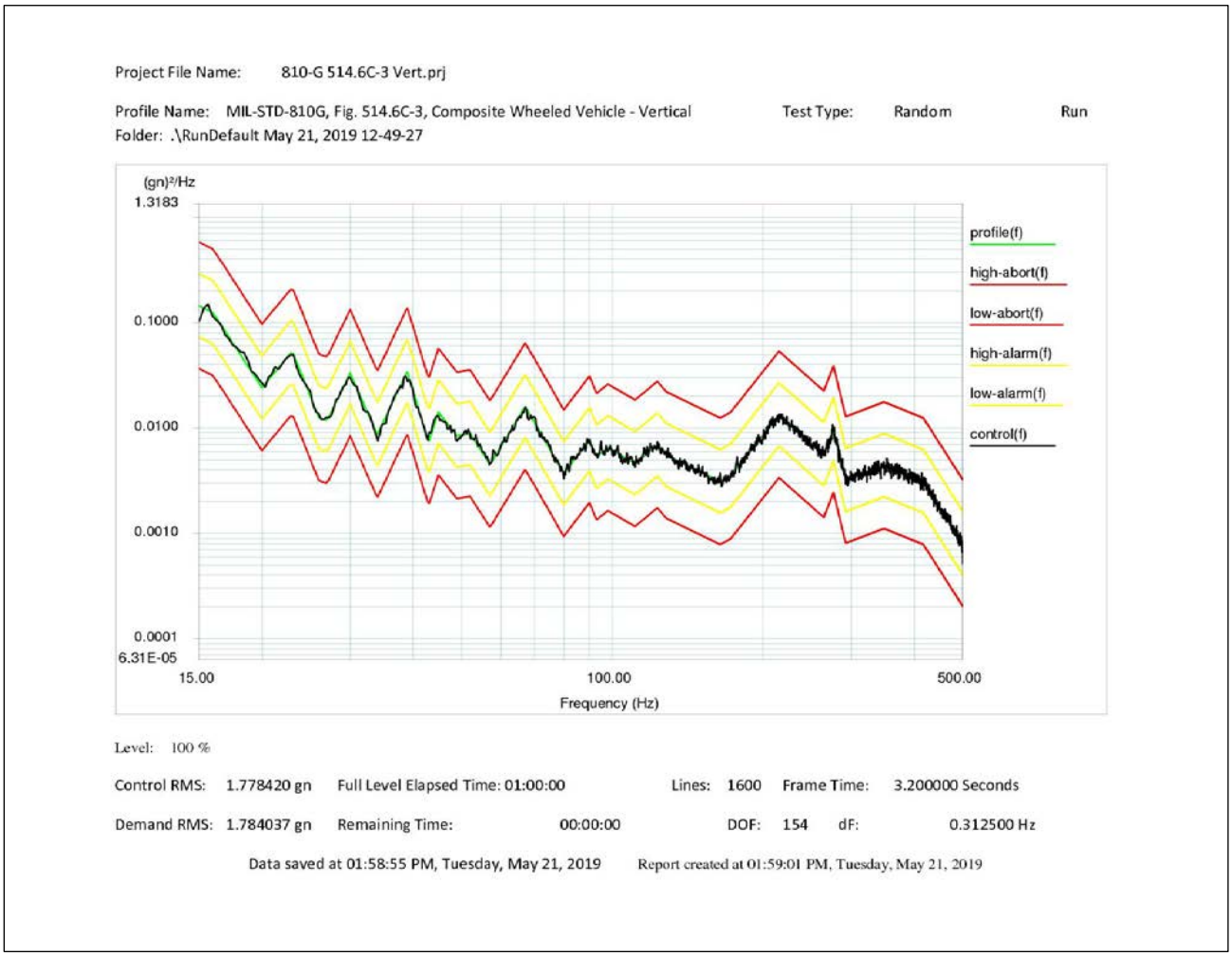

Figure 39: Method 514.6, Category 4 - Truck/Trailer/Tracked - Restrained Cargo, Vertical Axis, 1

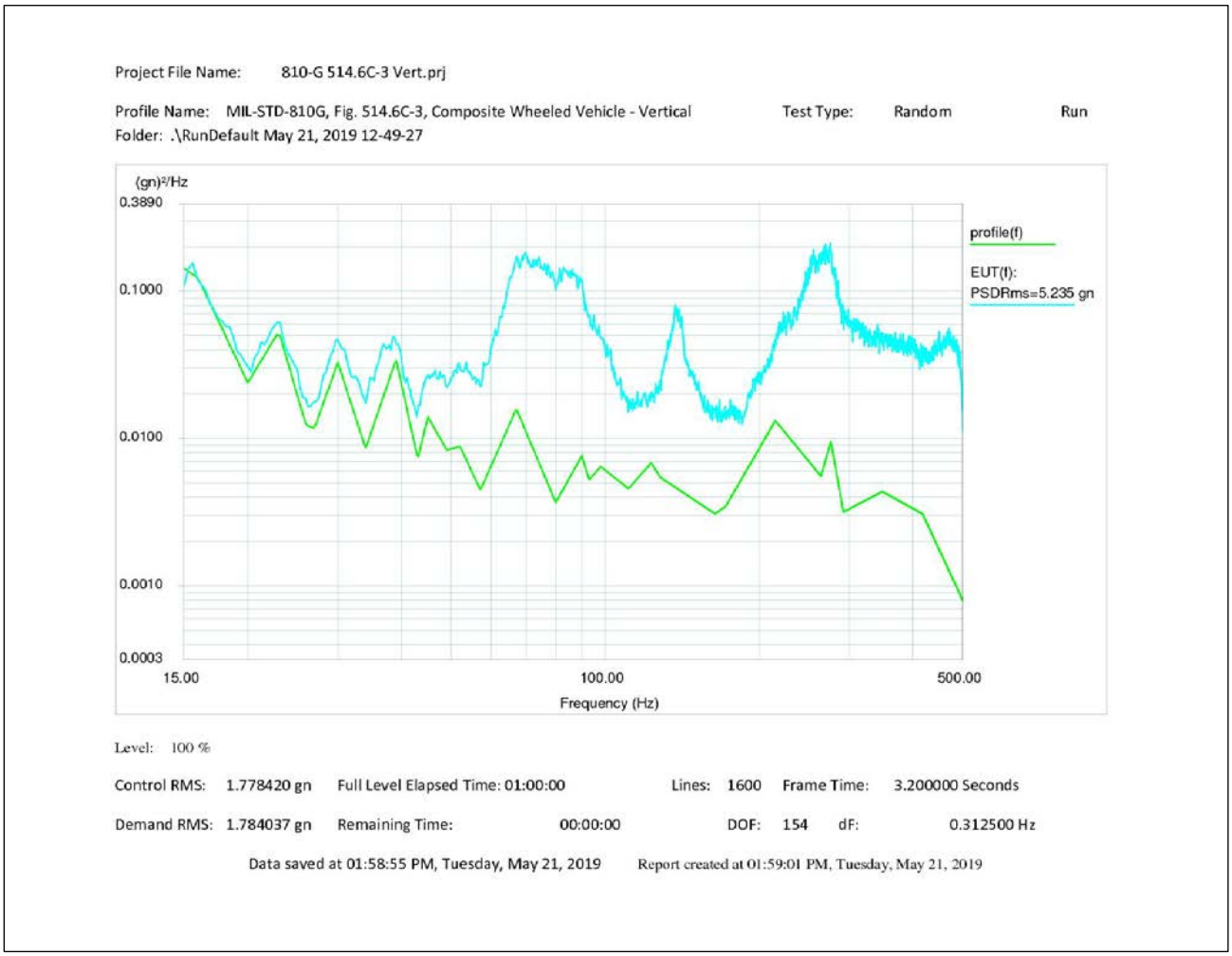

Figure 40: Method 514.6, Category 4 - Truck/Trailer/Tracked - Restrained Cargo, Vertical Axis, 2

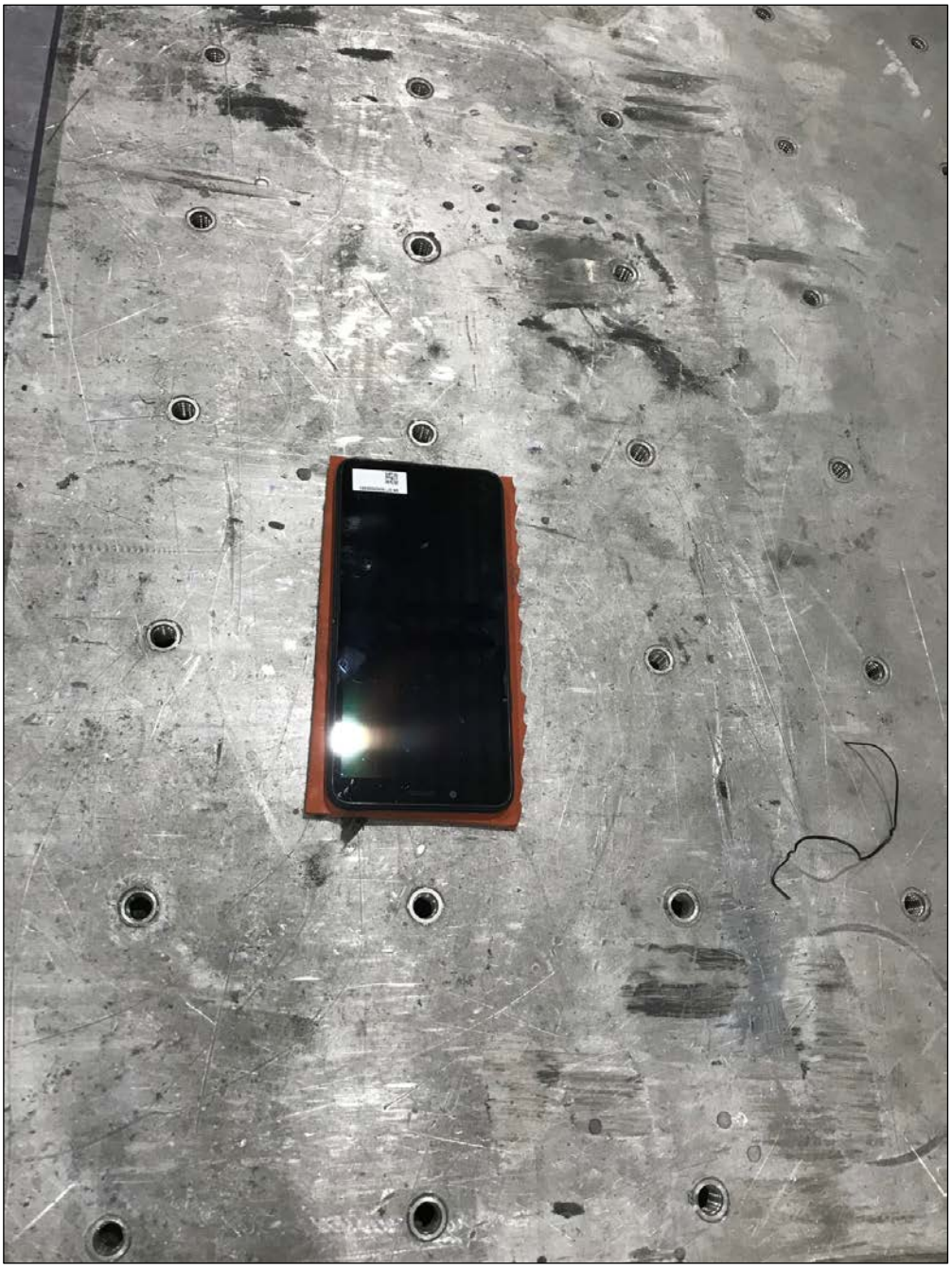

Figure 41: Method 514.6, Category 4 - Truck/Trailer/Tracked - Restrained Cargo, Setup Longitudinal

Figure 42: Method 514.6, Category 4 - Truck/Trailer/Tracked - Restrained Cargo, Setup Transverse

Figure 43: Method 514.6, Category 4 - Truck/Trailer/Tracked - Restrained Cargo, Setup Vertical

Figure 44: Method 514.6, Category 4 - Truck/Trailer/Tracked - Restrained Cargo, Post Test

Method 516.6 Mechanical Shock Test Methods

Shock, Procedure IV - Transit Drop (MIL-STD-810G Method 516.6)

Test Requirements The equipment **shall not** sustain any damage or deteriorate in functional performance during or after it has been exposed to the environment described in MIL-STD-810G.

Test Procedure

A. The test was performed on an unpackaged EUT.

B. The EUT was subjected to drops heights specified below. The number of drops per EUT was performed as specified below

C. The EUT was drop onto a 2-inch plywood backed by concrete.

D. The EUT was dropped from a hand held method.

E. A visual and functional inspection was performed after the test.

Table 516.6-VI. Transit drop test.

Weight of Test Item & Case kg (lbs)	Largest Dimension, cm (in)	Notes	Height of Drop, h cm (in)	Number of Drops
Under 45.4 (100) Manpacked or man-portable	Under 91 (36)	A/	122 (48)	Drop on each face, edge and corner; total of 26 drops D/
	91 & over	A/	76 (30)	
45.4 - 90.8 (100 – 200) inclusive	Under 91	A/	76 (30)	Drop on each corner; total of eight drops
	91 & over	A/	61 (24)	
90.8-454 (200 – 1000) inclusive	Under 91	A/	61 (24)	
	91 – 152 (36 – 60)	B/	61 (24)	
	Over 152	B/	61 (24)	
Over 454	No limit	C/	46 (18)	Drop on each bottom edge. Drop on bottom face or skids; total of five drops

NOTES:

A/ Perform drops from a quick-release hook or drop tester. Orient the test item so that, upon impact, a line from the struck corner or edge to the center of gravity of the case and contents is perpendicular to the impact surface.

B/ With the longest dimension parallel to the floor, support the transit, or combination case with the test item within, at the corner of one end by a block 13 cm (five inches) in height, and at the other corner or edge of the same end by a block 30 cm (12 inches) in height. Raise the opposite end of the case to the specified height at the lowest unsupported corner and allow it to fall freely.

C/ While in the normal transit position, subject the case and contents to the edgewise drop test as follows (if the normal transit position is unknown, orient the case so the two longest dimensions are parallel to the floor):

Edgewise drop test: Support one edge of the base of the case on a sill 13-15 cm (five to six inches) in height. Raise the opposite edge to the specified height and allow it to fall freely. Apply the test once to each edge of the base of the case (total of four drops).

D/ If desired, divide the 26 drops among no more than five test items (see paragraph 4.6.5.1).

Figure 45: Transit Drop Test Procedures

Test Results:

EUT Name:	LG K20, LG K8+
Customer:	LG Electronics, Inc.
Job Number	103479
Test Standard:	MIL-STD-810G
Test Name	Shock, Procedure IV - Transit Drop
Test Dates:	05/17/19
Laboratory	ESL
Test Engineer:	Ulugbek Nadjimov
Test Results:	5 samples were tested, there are no any cracks, damages or deterioration were detected, EUT was fully functional after post test verification

Figure 46: Method 516.6, Shock, Procedure IV - Transit Drop, Pretest 1

Figure 47: Method 516.6, Shock, Procedure IV - Transit Drop, Pretest 2

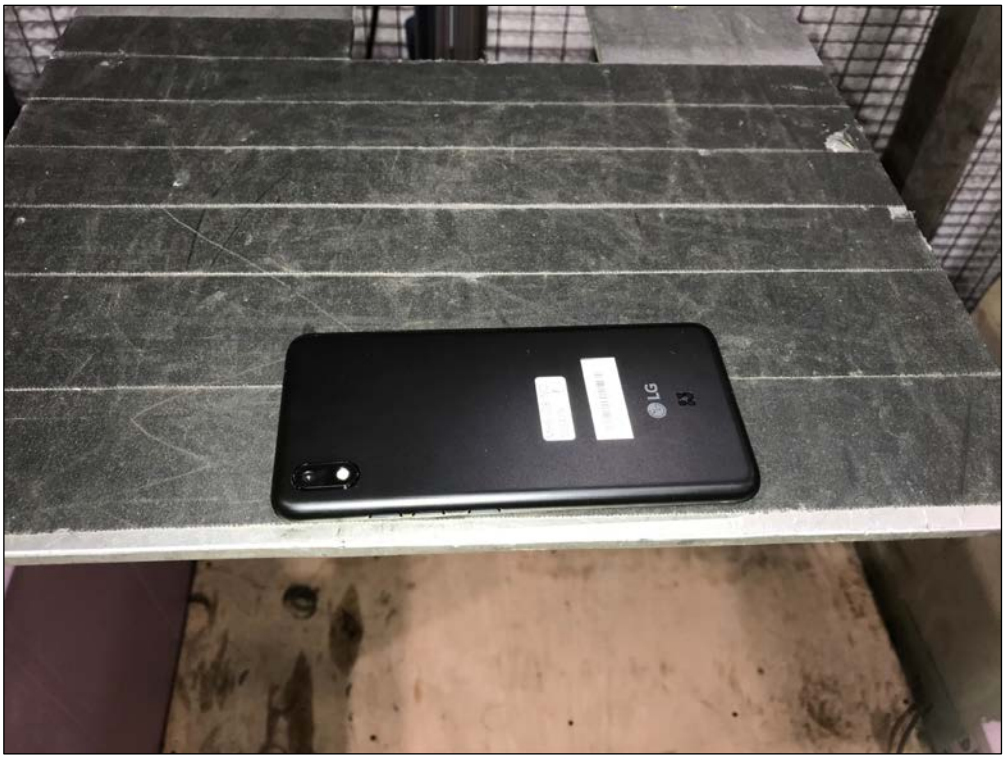

Figure 48: Method 516.6, Shock, Procedure IV - Transit Drop, Setup 1

Figure 49: Method 516.6, Shock, Procedure IV - Transit Drop, Setup 2

Figure 50: Method 516.6, Shock, Procedure IV - Transit Drop, Setup 3

Figure 51: Method 516.6, Shock, Procedure IV - Transit Drop, Setup 4

Figure 52: Method 516.6, Shock, Procedure IV - Transit Drop, Setup 5

Figure 53: Method 516.6, Shock, Procedure IV - Transit Drop, Setup 6

Figure 54: Method 516.6, Shock, Procedure IV - Transit Drop, Setup 7

Figure 55: Method 516.6, Shock, Procedure IV - Transit Drop, Setup 8

Figure 56: Method 516.6, Shock, Procedure IV - Transit Drop, Setup 9

Figure 57: Method 516.6, Shock, Procedure IV - Transit Drop, Setup 10

Figure 58: Method 516.6, Shock, Procedure IV - Transit Drop, Post Test 1

Figure 59: Method 516.6, Shock, Procedure IV - Transit Drop, Post Test 2

Test Equipment

MET #	*Equipment*	*Manufacturer*	*Model*	*Last cal.*	*Cal Due*
Test Name : Method 501.5, High Temperature					
2T5801	High Temperature Chamber (T8)	Tenney	TFO-28	08/27/2018	08/27/2019
Test Name: Method 502.5, Low Temperature					
2T4000	Espec Temperature/Humidity Chamber	Espec North America, Inc.	EPX-4H	4/10/2019	4/10/2020
Test name: Method 503.5, Temperature shock					
2T4000	Espec Temperature/Humidity Chamber	Espec North America, Inc.	EPX-4H	4/10/2019	4/10/2020
2T1079	Chamber	Thermotron	SM-32C	06/07/2018	07/07/2019
Test name: Method 507.5, Humidity					
2T4001	Espec Temperature/Humidity Chamber	Espec North America, Inc.	EPX-4H	05/22/2018	06/22/2019
Test name: Method 514.6, Vibration contents					
2T5663	UD SHAKER SYSTEM	UNHOLTZ DICKIE	R24C	See Note	See Note
2T5871	Shaker Control System	LDS Dactron	Laser USB	05/21/2018	05/21/2019
Test name: Method 516.6, Shock					
2T8179	PDT Drop Test System	Lansmont Corporation	PDT-56ED	See Note	See Note

Note: Functionally verified test equipment is verified using calibrated instrumentation at time of testing.