December 19, 2022

HP Inc.
Tony Griffiths
1501 Page Mill Road
Palo Alto CA 94304

Dear Tony Griffiths,

Enclosed is the Electromagnetic Compatibility for the HP Inc., P033, tested to the requirements of:

- EN 55032:2015/A11:2020; CISPR 32: 2015
- EN 61000-3-2:2014
- EN 61000-3-3:2013/A1:2019
- EN 55035:2017/A11: 2020; CISPR 35: 2016

Thank you for using the services of Eurofins Electrical and Electronic Testing NA, Inc. Please contact me if you have any questions regarding these results or if Eurofins E&E can be of further service to you.

Sincerely,

Nancy LaBrecque
Documentation Department
Eurofins Electrical and Electronic Testing NA, Inc.

Reference: EMCA118717-EN 55032_55035 Rev 2

ACCREDITED
TESTING CERT #0591.06

Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	September 23, 2022	Initial Issue.
1	November 4, 2022	Change Customer Name and Address
2	December 19, 2022	Corrections Requested by Customer

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1.0 Testing Summary

The HP Inc., P033 was found to be compliant to the following specification(s).

- EN 55032:2015/A11:2020; CISPR 32: 2015
- EN 61000-3-2:2014
- EN 61000-3-3:2013/A1:2019
- EN 55035:2017/A11: 2020; CISPR 35: 2016

Sergio Gutierrez
EMC Laboratory Engineer

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements.

Matthew Hinojosa
EMC Laboratory Manager, Austin

2.0 Overview

Eurofins Electrical and Electronic Testing NA, Inc. was contracted by HP Inc. to perform testing on the P033, under purchase order number 10000013761.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of HP Inc., P033.

The results obtained relate only to the item(s) tested.

Model(s) Tested:	P033
Equipment Emissions Class:	A

2.1 Test Site

All testing was performed at Eurofins Electrical and Electronic Testing NA, Inc., 13501 McCallen Pass, Austin, Texas 78753. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology. Eurofins Electrical and Electronic Testing NA, Inc. has been accredited by the American Association for Laboratory Accreditation (A2LA) (Certificate #: 0591.06) in accordance with ISO/IEC 17025:2017.

2.2 Measurement Uncertainty

Measurement uncertainty calculated as per NIST Technical Note (TN) 1297 and ANSI / NCSL Z540-2, as equivalent to EN 55016-4-2 / IEC CISPR 16-4-2.

Test Method	Typical Expanded Uncertainty (dB)	K	Confidence Level
Radiated Emissions, (30 MHz – 1 GHz)	±2.95	2	95%
Radiated Emissions, (1 GHz – 6 GHz)	±3.54	2	95%
Conducted Emission Voltage	±2.97	2	95%
Conducted Emission Telecom	±3.76	2	95%

Measurement Uncertainty

2.3 Overall Immunity Performance Criteria

In accordance with EN 55035, the EUT was evaluated according to the following performance criteria where specified:

Performance Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance Criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance Criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a batter backup, shall not be lost.

2.4 Equipment Overview and Test Configuration

Name of EUT/Model:	P033
Description of EUT and its intended use:	P033 (marketed as STUDIO X52) is a video conferencing video bar designed to act as an audio / video endpoint codec over LAN networks. The device is powered by a AC/DC mains adapter and contains 2.4GHz / 5Ghz Wifi and Bluetooth radio interfaces.
Selected Operation Mode(s):	Emissions pre-testing at 230VAC / 50Hz will be required in order to confirm the worst-case mode for testing; Mode 1 - Video conference call active with local (4k) content added 5.0GHz Wi-Fi pings, BT remote paired Mode 2 - Video conference call active with local (4k) content added 2.4GHz Wi-Fi pings, BT remote paired. Mode 3 - Video conference call active with no local content added 5.0GHz Wi-Fi pings, BT remote paired. Mode 4 - No Video conference call active with local (4k) content added 5.0GHz Wi-Fi pings, BT remote paired. Mode 5 - No Video conference call active with no local content added 5.0GHz Wi-Fi pings, BT remote paired. Mode 6 - System idle mode 5.0GHz OFF, BT remote paired
Rationale for the selection of the Operation Mode(s):	The 6 modes identified are all valid use cases. In HP Inc. experience Modes 1 or 2 are normally worst case
Monitoring Method(s):	Video Call remains active, content is still being sent and audio is monitored for demodulation preferably as per the requirements of En55035 Annex G
Emissions Class Declaration:	Class A
Configuration(s):	All ports except USB C to be loaded with typical equipment and cabling as per provided block diagram. USB C is only used in 'device' mode - this means that a laptop is connected via USB C and the EUT defaults to being a web cab and speaker for said laptop. In HP Inc. experience this is a v quiet mode for radiated emissions testing and therefore we do not recommend testing in it.
EUT Power Requirement	
Voltage:	100 - 240Vac 50 and 60Hz
AC or DC:	AC
Voltage Frequency:	50
Number of Phases:	1
Current:	See below
Uses an external AC/DC Adapter:	True
Physical Description	
Arrangement:	Tabletop
System w/Multiple Chassis?	False
Size:	29inch/5inch/4inch
Weight:	<8kg
Other info	
Highest Frequency used in device (MHz):	2841.6 MHz - but system does use up to 5.8GHz Wi-Fi
All Other Frequencies:	N/A
EUT Software (internal to EUT):	3.11.0.11255
Support Software (used by support PC to exercise EUT):	N/A

EUT List

Ref. ID	Slot #	Name/Description	Model Number	Part Number	Serial Number	Rev. #
1		P033	P033	N/A	N/A	N/A

Ports and Cabling

Ref. Id	Port Name on EUT	Cable Description or reason for no cable	Qty	Length as tested (m)	Max Length (m)	Shielded? (Y/N)	Termination Box ID & Port Name
1	RJ 11 Mic	Mic Cable	1	7.62m	7.62m	No	External Microphone
2	USB 3.0 Type A	Incorporated into support kit				No	USB Mouse
3	USB 3.0 Type A	Incorporated into support kit				No	USB keyboard
4	GB Ethernet	Cat5e	1	5.08m		No	Network/Hub
5	DC Power					No	AC/DC adaptor
6	Aux HDMI Out		1	2.032m		No	4K Monitor
7	Main HDMI out		1	2.032m		No	4K monitor
8	HDMI input		1	2.032m		No	Laptop
9	USB C	Not required to be tested				No	

Support Equipment

Ref. ID	Name/Description	Manufacturer	Model Number	Customer Supplied Calibration Data
1	Microphone			
2	AC/DC PSU			
3	USB Mouse			
4	USB Keyboard			
5	4K Monitor			
6	4K monitor			
7	Laptop			
8	Bluetooth Remote Control			
9	2.4/5GHz Wi-fi router			

2.5 Modifications to the EUT

No modifications were made to the EUT.

2.6 Modifications to the Standard

No modifications were made to the Test Standard.

2.7 Disposition of EUT

The test sample including all support equipment (if any), submitted to the Electromagnetic Compatibility Lab for testing was returned to HP Inc. upon completion of testing.

3.0 Electromagnetic Compatibility Emission Criteria

3.1 Limits for Conducted Disturbance at Mains Terminals

Test Method: The following standards specified below are covered in the scope of this section of the test report:

- EN 55032:2015/A11:2020; CISPR 32: 2015

Sample Calculation:

$$R_f - S = M$$

where:

R_f = Receiver Reading in dBuV
S = Specification Limit in dBuV
M = Margin to Specification in +/- dB

Sample formula for calculating the Corrected Data for the Conducted Emissions Measurements:

Line	Freq (MHz)	Uncorrected QP** Amplitude (dBµV)	LISN IL (dB)	CBL (dB)	Corrected QP** Amplitude (dBµV)	QP** Limit (dBµV)	Delta (dB)	Results
XYZ	0.18	42.65	10	0.58	53.23	79	-25.77	Pass

*Corrected QP** Amplitude (dBµV) = Uncorrected Amplitude (dBµV) +LISN IL (dB) + CBL (dB) =42.65+10+0.58=53.23*
*** Same Calculation applies to Corrected Avg. amplitude as well.*

Test Requirement(s): The EUT shall meet the Class A limits shown in the table below.

Frequency Range (MHz)	Class A Limits(dBµV)		Class B Limits (dBµV)	
	Quasi-Peak	Average	Quasi- Peak	Average
0.15 - 0.5	79	66	66 to 56	56 to 46
0.5 - 5	73	60	56	46
5 - 30	73	60	60	50
Note 1 – The lower limit shall apply at the transition frequencies. Note 2 – The limit decreases linearly with the logarithm if the frequency in the range 0.15 MHz to 0.5 MHz.				

Conducted Emissions - Limits

Test Procedure: The EUT was placed on a non-metallic table, 80 cm above the ground plane and 40 cm away from the vertical reference ground plane. The method of testing, test conditions, and test procedures of CISPR 32: 2015 were used. The EUT was powered through a 50 Ω/50 µH LISN. An EMI receiver, connected to the measurement port of the LISN, scanned the frequency range from 150 kHz to 30 MHz in order to find the peak conducted emissions. All peak emissions within 6 dB of the limit were re-measured using a quasi-peak and/or average detector as appropriate. Any measured frequency that exhibits a margin of compliance that is less than 3 dB below the specification limit is marked. Eurofins E&E recommends that every emission measured, has at least a 3 dB margin to allow for deviations in the emission characteristics that may occur during the production process. Photographs of test setup are presented below.

Test Software Used: TILE 7.4.2.5 was used to perform this test.

Test Results:

Test Standard:	EN 55032:2015/A11:2020; CISPR 32: 2015 Class A
Test Name	Conducted Emissions
Test Dates:	August 20, 2022
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Sergio Gutierrez
Test Results:	Compliant
Additional Notes:	

Test Summary

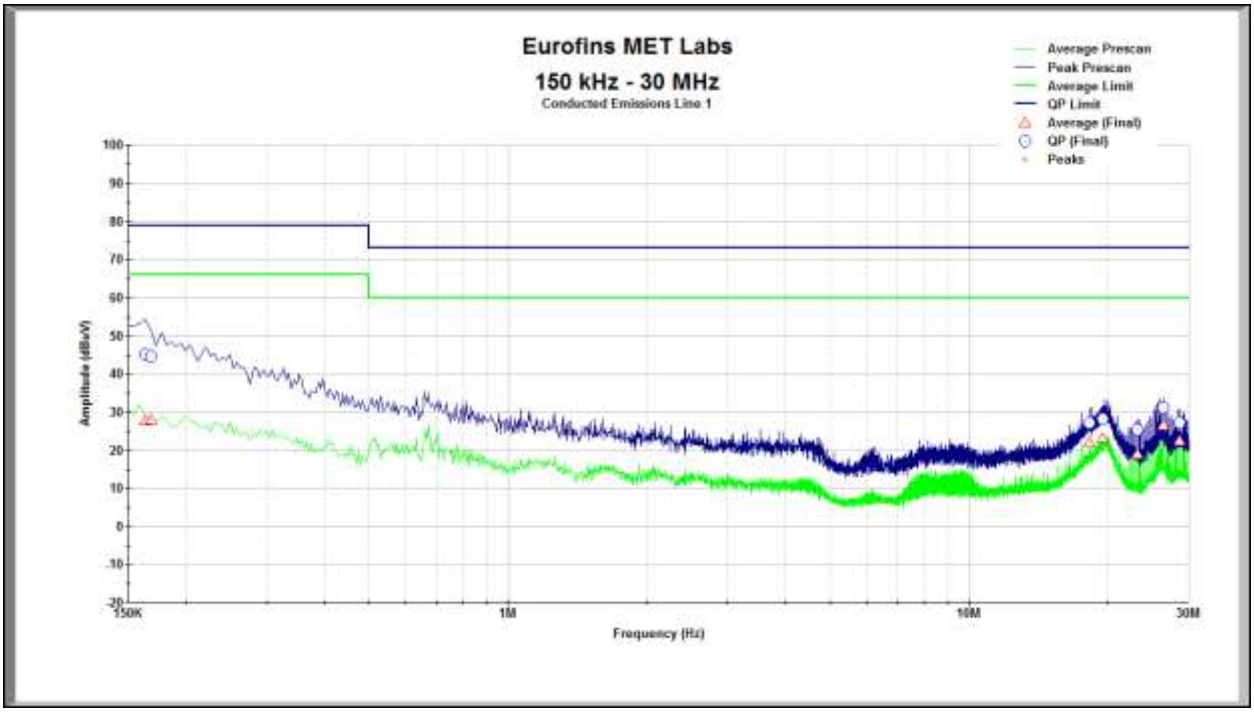
MET Job #	**118717**	**Temperature**	**21.00°C**
Date	**08/29/2022**	**Humidity**	**54.00% RH**
Test Engineer	**SG**	**A. Pressure**	**98.57 kPa**
Customer	**HP Inc.**	**Mode/Configuration**	**In a call, 5G Pings, sending content**
Customer Contact	**Koby Rosenberg**	**EUT Voltage**	**230 VAC/50 Hz**
Limit/Class	**CISPR 32/A**	**Modifications**	**None**
Start Frequency	**150 kHz**	**Latest Quality Check Date**	**08/29/2022**
Stop Frequency	**30 MHz**	**Test Status**	**Compliant**

Test Data

Measurement Location	Measurement	Limit	Result
Bonding measurement from LISN ground to ground plane	0.515 mΩ	< 2.5 mΩ	Pass

Freq (MHz)	QP (dBµV)	QP Lim (dBµV)	QP Margin (dB)	Avg (dBµV)	Avg Lim (dBµV)	Avg Margin (dB)	Result
0.163	45.219	79.00	33.781	27.718	66.00	38.282	**Pass**
0.168	44.712	79.00	34.288	28.068	66.00	37.932	**Pass**
18.267	27.156	73.00	45.844	22.007	60.00	37.993	**Pass**
19.500	28.216	73.00	44.784	23.232	60.00	36.768	**Pass**
23.196	25.450	73.00	47.550	18.754	60.00	41.246	**Pass**
26.406	31.187	73.00	41.813	26.506	60.00	33.494	**Pass**
28.626	27.166	73.00	45.834	22.348	60.00	37.652	**Pass**

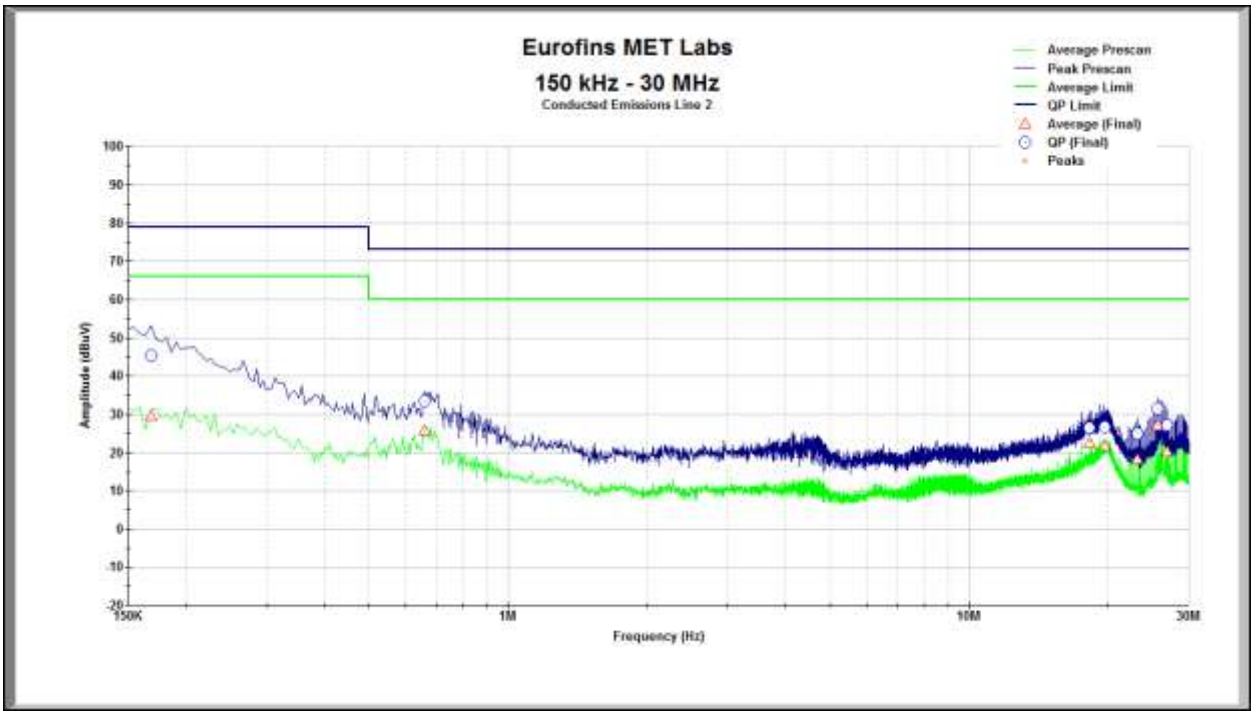
Table 1. Conducted Emissions, Line, Test Results



Plot 1. Conducted Emissions, Line Plot

Freq (MHz)	QP (dBµV)	QP Lim (dBµV)	QP Margin (dB)	Avg (dBµV)	Avg Lim (dBµV)	Avg Margin (dB)	Result
0.168	45.274	79.00	33.726	29.375	66.00	36.625	**Pass**
0.658	33.471	73.00	39.529	25.566	60.00	34.434	**Pass**
18.267	26.395	73.00	46.605	22.488	60.00	37.512	**Pass**
19.702	26.625	73.00	46.375	21.606	60.00	38.394	**Pass**
23.205	24.914	73.00	48.086	18.143	60.00	41.857	**Pass**
25.663	31.457	73.00	41.543	26.997	60.00	33.003	**Pass**
26.896	27.124	73.00	45.876	20.191	60.00	39.809	**Pass**

Table 2. Conducted Emissions, Neutral, Test Results



Plot 2. Conducted Emissions, Neutral Plot

Photograph 1. Conducted Emissions, AC Mains, Front View

Photograph 2. Conducted Emissions, AC Mains, LISN View

Photograph 3. Conducted Emissions, AC Mains, Side View

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: CEV				**Test Date(s):**	**08/29/2022**
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1A1065	EMI Test Receiver	Rohde & Schwarz	ESCI	08/04/2022	08/04/2023
1A1177	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	11/23/2021	11/23/2022
3A3215	ATC Digital Ohmmeter	Valhalla Scientific	4150	05/12/2022	05/12/2023
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1164	True-RMS Multimeter	Fluke	117	10/19/2021	10/19/2022
1A1122	LISN	TESEQ	NNB 51	09/13/2021	09/13/2022
1A1079	Conducted Comb Generator	COM-Power Corp	CGC-255	See Note	
1A1123	LISN	TESEQ	NNB 51	11/29/2021	11/29/2022
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 3. Conducted Emissions, Test Equipment

3.2 Limits for Conducted Disturbance at Telecommunication Ports

Test Method: The following standards specified below are covered in the scope of this section of the test report:

- EN 55032:2015/A11:2020; CISPR 32: 2015

Test Requirement(s): The EUT shall meet the Conducted Common Mode Class A limits shown in below:

Frequency Range (MHz)	Voltage Limits dB(µV)		Current Limits dB(µA)	
	Quasi-Peak	Average	Quasi- Peak	Average
0.15 - 0.5	97 to 87	84 to 74	53 to 43	40 to 30
0.5 - 30	87	74	43	30
Note: The limits decrease linearly with the logarithm of the frequency in the range of 0.15 MHz to 0.5 MHz. The current and voltage disturbnace limits are derived for use with an ISN which presents a common mode (asymetric mode) impedance of 150 Ω to the telecommunication port under test (conversion factor is 20 Log_{10} 150/1 = 44 dB).				

Limits of Conducted Common Mode (Asymmetric Mode) Disturbance at Telecommunication Ports per Annex A of EN 55032 Class A

Test Procedure: The EUT was placed on a non-metallic table, 80 cm above the ground plane and 40 cm away from the vertical reference ground plane. The measurements were performed using normal operation of the equipment. The method of testing, test conditions, and test procedures of CISPR 32: 2015 were used. The EMC receiver scanned the frequency range from 150 kHz to 30 MHz. The measurements were performed over the frequency range of 0.15 MHz to 30 MHz using an ISN, Current Probe or Capacitive Voltage Probe as the input transducer to an EMC field intensity meter. Any measured frequency that exhibits a margin of compliance that is less than 3 dB below the specification limit is marked. Eurofins E&E recommends that every emission measured, has at least a 3 dB margin to allow for deviations in the emission characteristics that may occur during the production process. Photographs of test setup are presented below.

Test Software Used: TILE 7.4.2.5 was used to perform this test.

Test Results:

Test Standard:	EN 55032:2015/A11:2020; CISPR 32: 2015 Class A
Test Name	Telecom Ports Conducted Emissions
Test Dates:	September 14, 2022
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Sergio Gutierrez
Test Results:	Compliant
Additional Notes:	

Test Summary

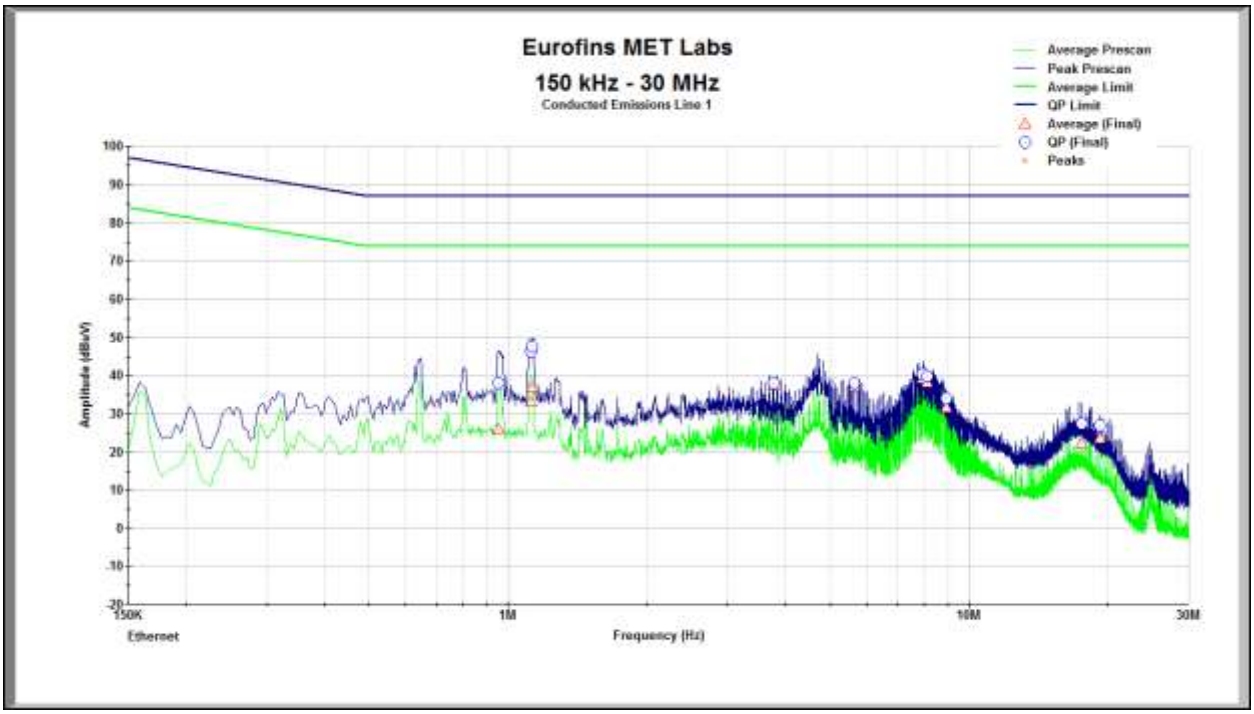
MET Job #	**118717**	**Temperature**	**21.40°C**
Date	**09/14/2022**	**Humidity**	**52.90% RH**
Test Engineer	**SG**	**A. Pressure**	**98.95 kPa**
Customer	**HP Inc.**	**Mode/Configuration**	**In a call, 5G Pings, sending content**
Customer Contact	**Koby Rosenberg**	**EUT Voltage**	**230 VAC/50 Hz**
Limit/Class	**CISPR 32/A**	**Modifications**	**None**
Start Frequency	**150 kHz**	**Latest Quality Check Date**	**09/14/2022**
Stop Frequency	**30 MHz**	**Test Status**	**Compliant**

Test Data

Measurement Location	Measurement	Limit	Result
Bonding measurement from LISN ground to ground plane	1.91 mΩ	< 2.5 mΩ	Pass

Freq (MHz)	QP (dBµV)	QP Lim (dBµV)	QP Margin (dB)	Avg (dBµV)	Avg Lim (dBµV)	Avg Margin (dB)	Result
0.956	38.120	87.00	48.880	26.025	74.00	47.975	**Pass**
1.122	46.366	87.00	40.634	33.043	74.00	40.957	**Pass**
1.127	47.532	87.00	39.468	36.891	74.00	37.109	**Pass**
3.761	38.126	87.00	48.874	37.181	74.00	36.819	**Pass**
5.642	38.072	87.00	48.928	37.145	74.00	36.855	**Pass**
7.911	40.315	87.00	46.685	38.974	74.00	35.026	**Pass**
8.100	39.909	87.00	47.091	38.126	74.00	35.874	**Pass**
8.942	33.926	87.00	53.074	31.544	74.00	42.456	**Pass**
17.523	27.486	87.00	59.514	22.072	74.00	51.928	**Pass**
19.257	26.905	87.00	60.095	23.319	74.00	50.681	**Pass**

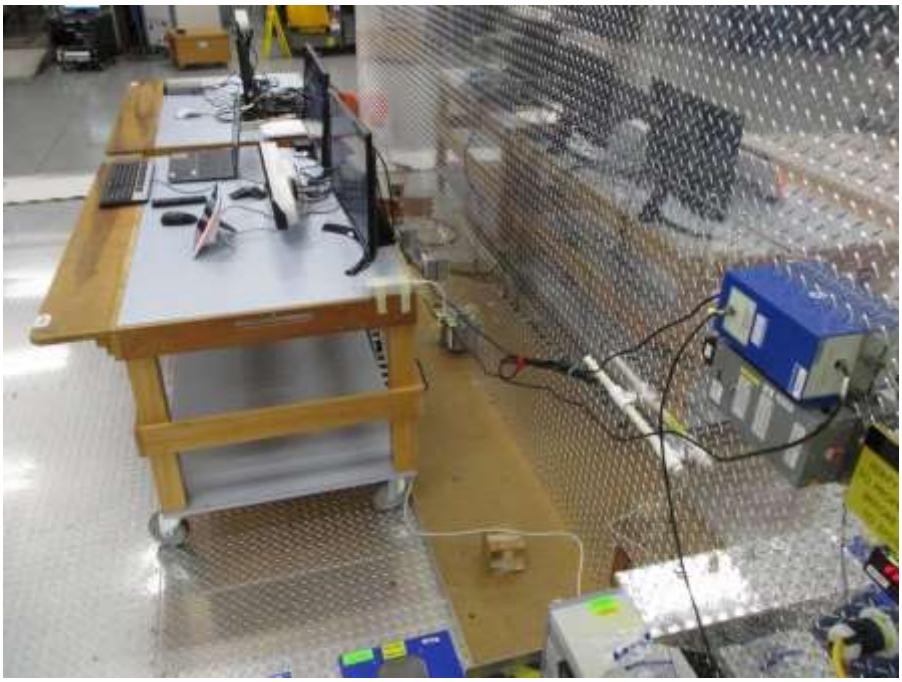
Table 4. Conducted Emissions, Telecom Port, Test Results



Plot 3. Conducted Emissions, Telecom Port Plot

Photograph 4. Conducted Emissions, Telecom Port, Front View

Photograph 5. Conducted Emissions, Telecom Port, ISN View



Photograph 6. Conducted Emissions, Telecom Port, Side View

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: CEV				**Test Date(s):**	**09/14/2022**
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1A1065	EMI Test Receiver	Rohde & Schwarz	ESCI	08/04/2022	08/04/2023
1A1177	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	11/23/2021	11/23/2022
3A3215	ATC Digital Ohmmeter	Valhalla Scientific	4150	05/12/2022	05/12/2023
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1164	True-RMS Multimeter	Fluke	117	10/19/2021	10/19/2022
1A1241	ISN	Com-power	T8SE	09/07/2022	09/07/2023
1A1079	Conducted Comb Generator	COM-Power Corp	CGC-255	See Note	
1A1123	LISN	TESEQ	NNB 51	11/29/2021	11/29/2022
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 5. Conducted Emissions, Test Equipment

3.3 Radiated Emissions: Limits of Electromagnetic Radiation Disturbance

Test Method: The following standards specified below are covered in the scope of this section of the test report:

- EN 55032:2015/A11:2020; CISPR 32: 2015

Test Requirement(s): For radiated emission in the frequency range 30 MHz – 1000 MHz, the EUT shall meet the Class A limits shown in the following table.

Table Clause	Frequency Range (MHz)	Measurement		Limits (dBµV/m)
		Distance m	Detector type/ bandwidth	
A2.1	30 – 230	10	Quasi Peak / 120 kHz	40
	230 to 1000			47
A2.2	30 – 230	3		50
	230 to 1000			57

Requirements for radiated emissions at frequencies up to 1 GHz for Class A equipment

Table Clause	Frequency Range (MHz)	Measurement		Limits (dBµV/m)
		Distance m	Detector type/ bandwidth	
A3.1	1000 – 3000	3	Average / 1 MHz	56
	3000 – 6000			60
A3.2	1000 – 3000		Peak / 1 MHz	76
	3000 – 6000			80

Requirements for radiated emissions at frequencies above 1 GHz for Class A equipment

Sample Calculation for Distance Correction factor (DCF) measurement:

$$F_d = 20*LOG_{10}(D_m/D_s)$$

where:

F_d = Distance Factor in dB
D_m = Measurement Distance in meters
D_s = Specification Distance in meters

Sample formula for calculating the Corrected Data for the Radiated Emissions Measurements:

Frequency (MHz)	Antenna Polarity	EUT Azimuth (Degrees)	Antenna Height (cm)	Uncorrected Amplitude (dBµV)	ACF (dB/m) (+)	Pre Amp Gain (dB)(-)	CBL (dB) (+)	DCF (dB) (+)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
249.99	V	359.9	240.7	55.46	11.4	28.335	0	0	***38.505***	47	-8.495

Corrected Amplitude (dBµV/m) = Uncorrected Amplitude (dBµV) +ACF (dB/m) - Preamp Gain (dB) + CBL (dB) +DCF (dB) = 55.46 + 11.4 - 28.355 + 0 + 0 = ***38.505***

Test Procedure: The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. The method of testing, test conditions, and test procedures of CISPR 32 were used. Any measured frequency that exhibits a margin of compliance that is less than 3 dB below the specification limit is marked. Eurofins E&E recommends that every emission measured, has at least a 3 dB margin to allow for deviations in the emission characteristics that may occur during the production process.

For emissions between 30 MHz and 1000 MHz, a biconilog antenna was located 10 m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. Unless otherwise specified, measurements were made using a quasi-peak detector with a 120 kHz resolution bandwidth.

For emission between 1 GHz and 6 GHz, a double ridged guide horn was located 3 m from the EUT on an adjustable mast. A pre-scan was performed and used to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied depending on the geometry of the EUT. In order to ensure maximized emissions, the horn antenna was positioned both vertically and laterally. Measurements in both horizontal and vertical polarities were made and the data was recorded. Unless otherwise specified, measurements were made using a peak and average detector with a 1 MHz resolution bandwidth.

Test Software Used: Jamila RE Rev 1.002 was used to perform this test.

Test Results:

Test Standard:	EN 55032:2015/A11:2020; CISPR 32: 2015 Class A
Test Name	Radiated Emissions
Test Dates:	August 29, 2022
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Sergio Gutierrez
Test Results:	Compliant
Additional Notes:	

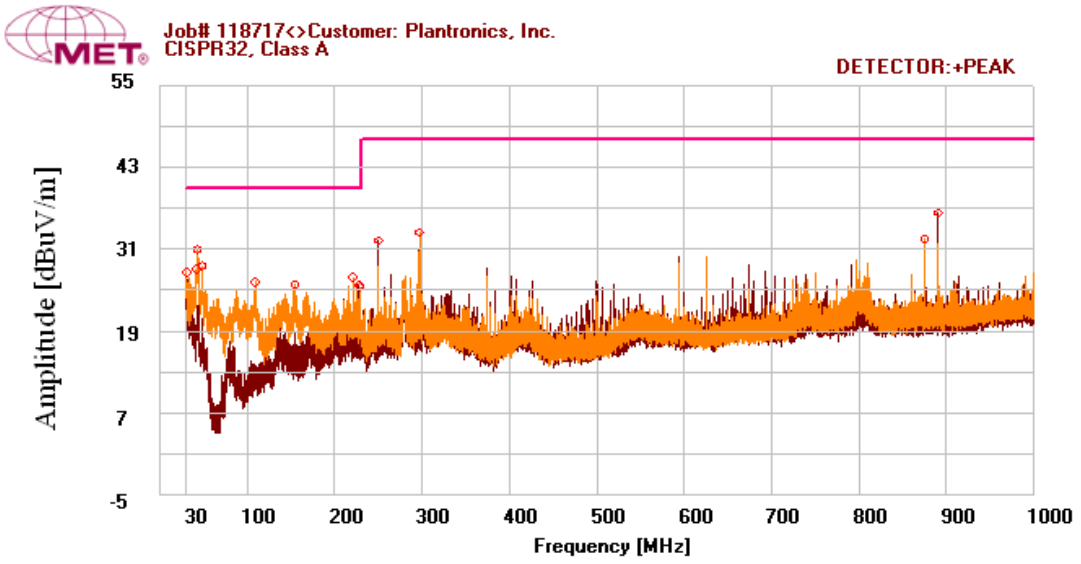
Test Summary

Test Date	08/29/2022	Temperature	21.00°C
Engineer	SG	Humidity	54.00% RH
Customer	HP Inc.	A. Pressure	98.60 kPa
MET#	118717	Mode	In a call, 5G Pings, sending content
EUT	P033	Doors	No
Limit/Class	CISPR32 / A	EUT Voltage	230 VAC/50 Hz
Highest Clock	5.8 GHz	Setup V./Date	08/29/2022/ SG
Start Frequency	30 MHz	Setup Picture	SG
Stop Frequency	6 GHz	Pass Date	08/29/2022----10:34:34 AM

Test Data

Frequency (MHz)	Antenna Polarity	EUT Azimuth (Degrees)	Antenna Height (cm)	Uncorrected Amplitude (dBµV)	ACF (dB/m)	Pre-Amp Gain & CBL (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
43.104	V	113.10	400.00	38.06	14.248	24.462	27.846	40.00	-12.154
891.000	H	258.10	100.00	29.91	24.700	19.649	34.961	47.00	-12.039
48.143	V	343.10	102.50	37.01	12.343	24.373	24.980	40.00	-15.020
297.000	H	202.10	288.70	40.65	17.200	22.539	35.311	47.00	-11.689
297.000	V	338.40	100.00	40.03	17.400	22.539	34.891	47.00	-12.109
110.570	V	101.00	126.20	28.85	15.700	23.614	20.936	40.00	-19.064

Table 6. Radiated Emissions, 30 MHz – 1000 MHz, Quasi-Peak Test Results



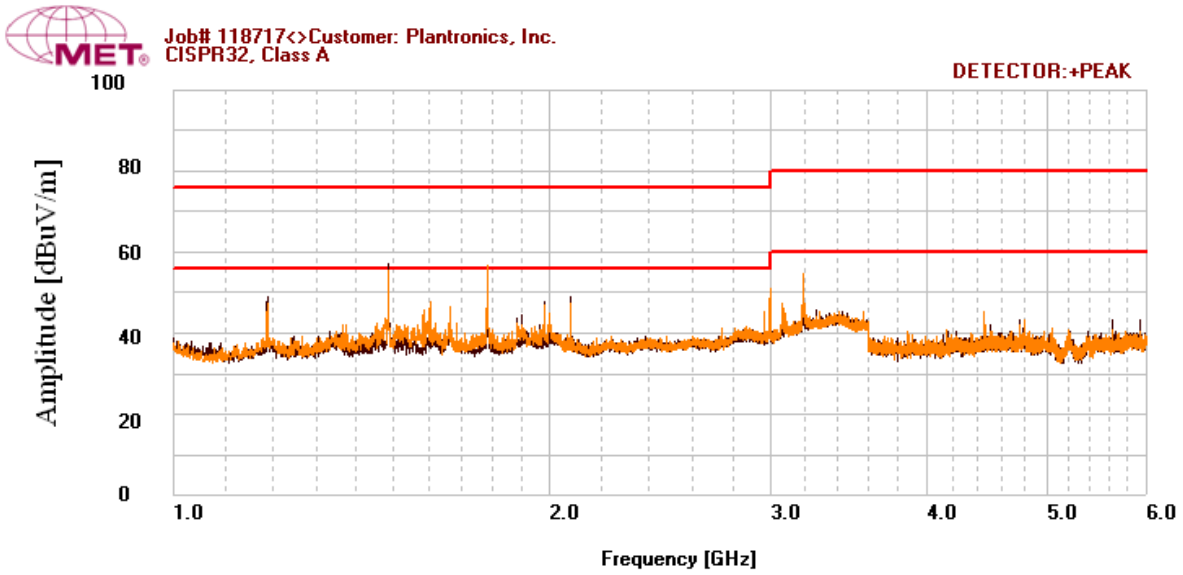
Plot 4. Radiated Emissions, 30 MHz – 1000 MHz, Peak Plot

Frequency (GHz)	Antenna Polarity	EUT Azimuth (Degrees)	Antenna Height (cm)	Uncorrected Amplitude (dBµV)	ACF (dB/m)	Pre-Amp Gain & CBL (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1.484	V	91.80	129.70	52.10	28.238	30.749	49.589	56.00	-5.589
1.484	H	89.10	145.50	53.21	28.386	30.745	50.851	56.00	-5.149
1.782	H	40.40	194.00	52.88	30.117	32.667	50.330	56.00	-5.670
1.782	V	218.90	159.60	50.11	30.259	32.667	47.702	56.00	-8.298
3.199	V	270.20	130.50	36.20	33.411	36.315	33.296	60.00	-26.704
3.000	V	153.00	186.90	44.98	33.108	36.420	41.668	60.00	-18.332

Table 7. Radiated Emissions, 1 GHz – 6 GHz, Average Test Results

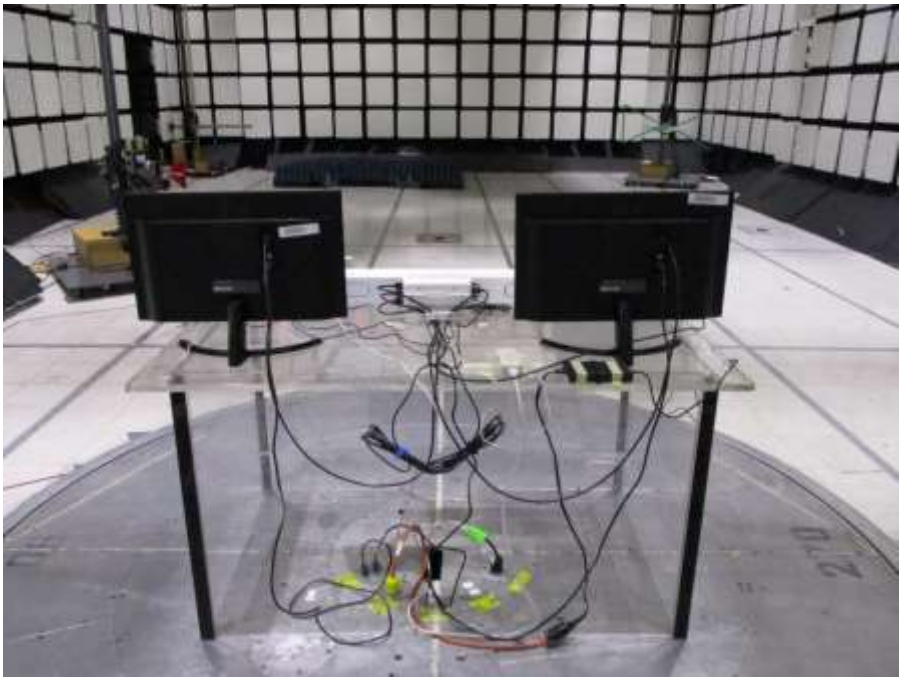
Frequency (GHz)	Antenna Polarity	EUT Azimuth (Degrees)	Antenna Height (cm)	Uncorrected Amplitude (dBµV)	ACF (dB/m)	Pre-Amp Gain & CBL (dB)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1.484	V	91.80	129.70	63.25	28.237	30.745	60.742	76.00	-15.258
1.484	H	89.10	145.50	63.36	28.386	30.745	61.001	76.00	-14.999
1.782	H	40.40	194.00	65.17	30.117	32.667	62.620	76.00	-13.380
1.782	V	218.90	159.60	63.19	30.259	32.667	60.782	76.00	-15.218
3.199	V	270.20	130.50	60.04	33.411	36.315	57.136	80.00	-22.864
3.000	V	153.00	186.90	58.30	33.108	36.420	54.988	80.00	-25.012

Table 8. Radiated Emissions, 1 GHz – 6 GHz, Peak Test Results

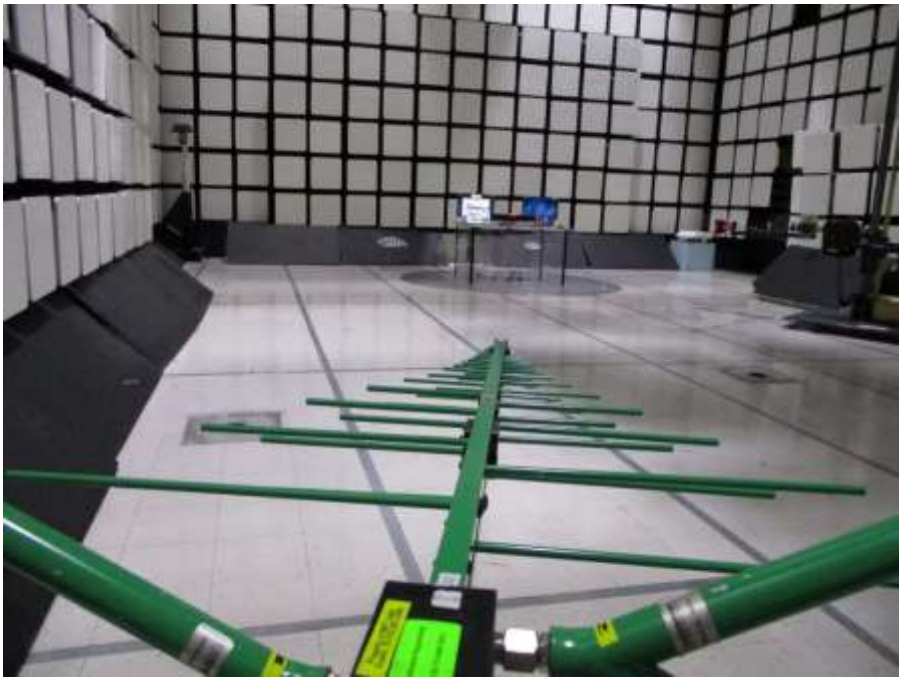


Plot 5. Radiated Emissions, 1 GHz – 6 GHz, Peak Plot

Photograph 7. Radiated Emissions, 30 MHz – 1000 MHz, Front View

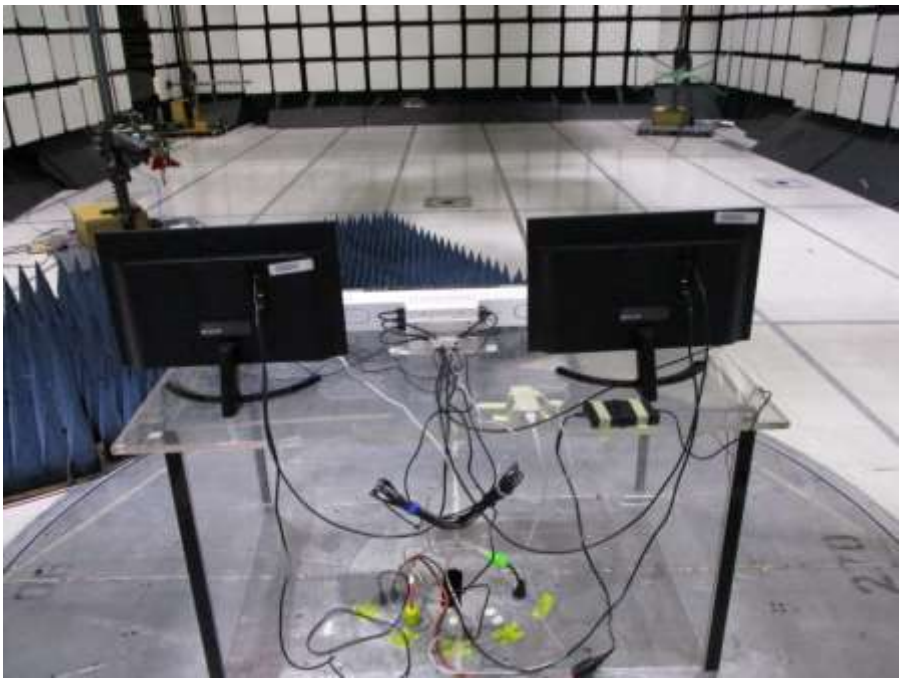


Photograph 8. Radiated Emissions, 30 MHz – 1000 MHz, Rear View

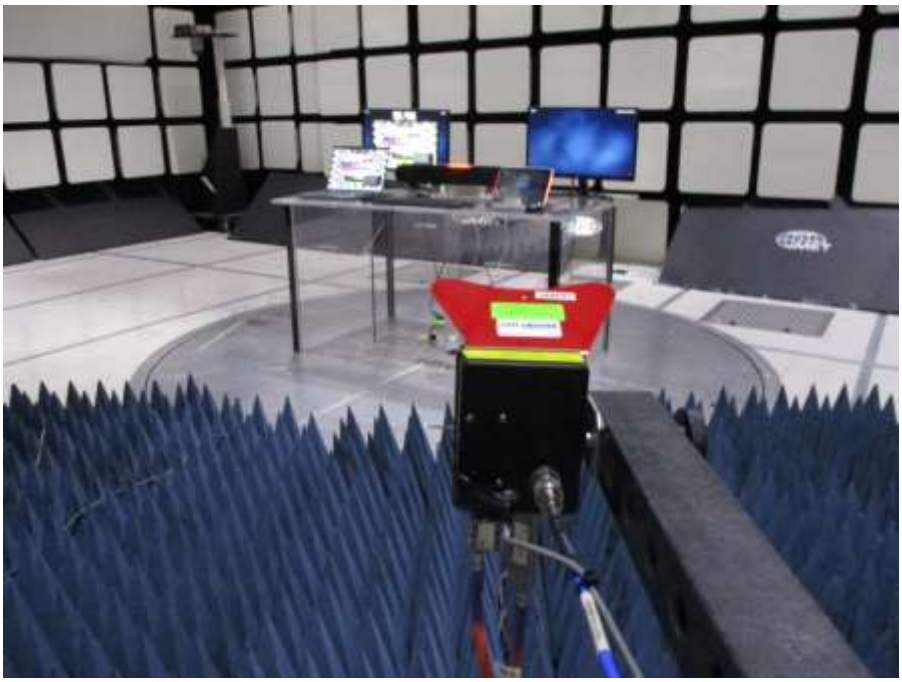


Photograph 9. Radiated Emissions, 30 MHz – 1000 MHz, Antenna View

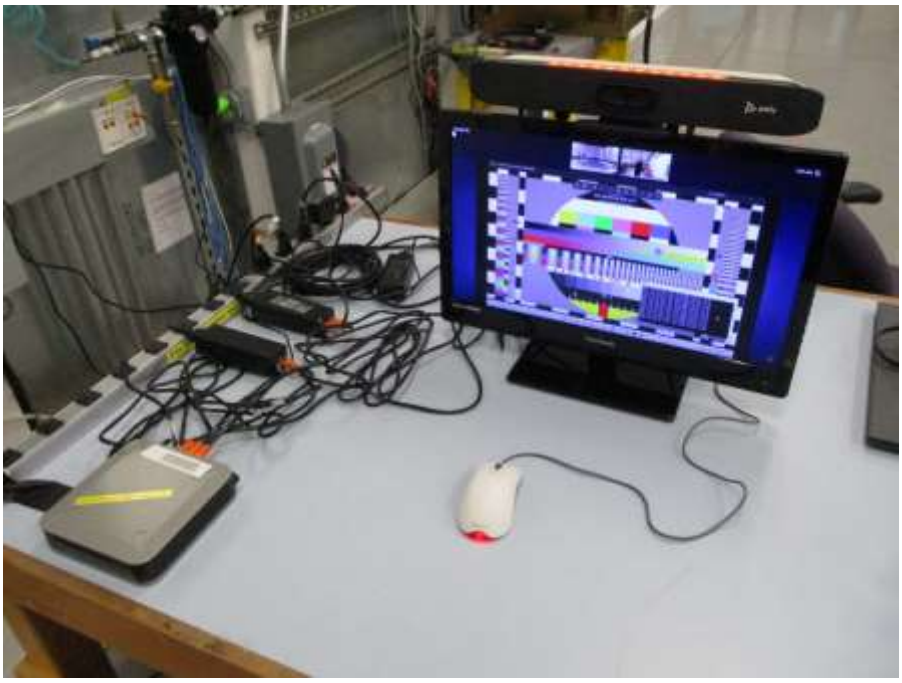
Photograph 10. Radiated Emissions, 1 GHz – 6 GHz, Front View



Photograph 11. Radiated Emissions, 1 GHz – 6 GHz, Rear View



Photograph 12. Radiated Emissions, 1 GHz – 6 GHz, Antenna View



Photograph 13. Radiated Emissions, Support Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: Radiated Emissions				**Test Date(s):**	**08/29/2022**
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
30 MHz – 1 GHz					
1A1083	Test Receiver	Rohde & Schwarz	ESU40	10/12/2021	10/12/2022
1A1088	Preamplifier	Rohde & Schwarz	TS-PR1	See Note	
1A1050	Bi-Log Antenna	Schaffner	CBL 6112D	12/01/2020	12/01/2022
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1044	Generator	COM-Power Corp	CG- 520	See Note	
1A1073	Multi Device Controller	ETS EMCO	2090	See Note	
1A1106	10 M Semi-Anechoic Chamber (NSA)	ETS - Lindgren	04X07	01/06/2022	01/06/2025
1 GHz – 6 GHz					
1A1180	Amplifier	Miteq	AMF-7D-01001800-22-10P	See Note	
1A1047	Horn Antenna	ETS - Lindgren	3117	06/16/2022	06/16/2024
1A1099	Generator	COM-Power Corp	CGO 51000	See Note	
1A1080	Multi Device Controller	ETS EMCO	2090	See Note	
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 9. Radiated Emissions, Test Equipment

3.4 Harmonic Current Emissions

Test Method: **EN 61000-3-2:2014 –** Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

Test Requirement(s): The EUT must not produce harmonic currents that exceed the limits expressed in table below.

Harmonic Order	Maximum Permissible Harmonic Current (in Amperes)
Odd Harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15 < n < 39	0.15 - 15/n
Harmonic Order	**Maximum Permissible Harmonic Current (in Amperes)**
Even Harmonics	
2	1.08
4	0.43
6	0.30
8< n <40	0.23 - 8/n

Harmonic Current Emission Limits from Clause 7 of EN 61000-3-2

Test Procedure: The measurement was performed using normal operation of the equipment. The method of testing, test conditions, and test procedures of *EN 61000-3-2.* Photographs of test setup are presented below.

Test Results:

Test Standard:	EN 55032:2015/A11:2020; CISPR 32: 2015 Class A
Test Name	Harmonic Current Emission
Test Dates:	August 30, 2022
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Sergio Gutierrez
Test Results:	Compliant
Additional Notes:	

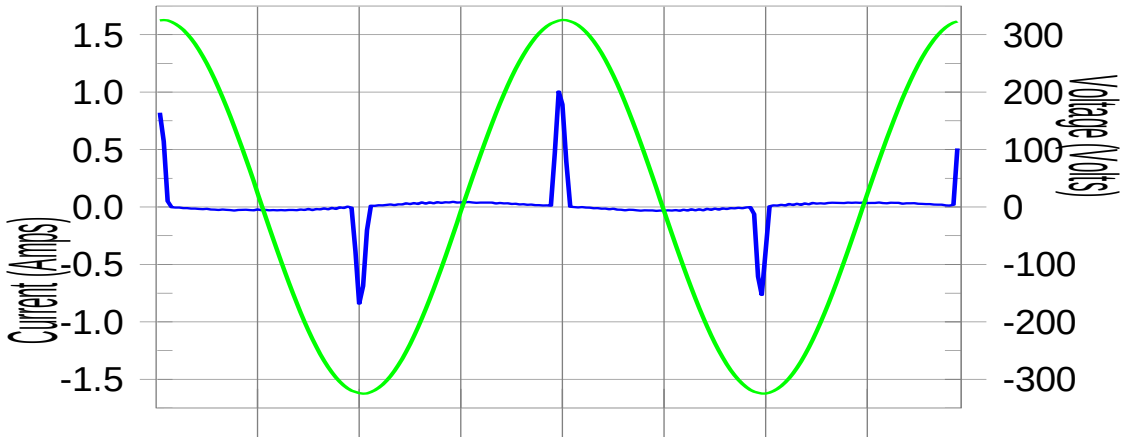
Test Summary

MET Job #	**118717**	**Temperature**	**23.80°C**
Date	**08/30/2022**	**Humidity**	**53.90% RH**
Test Engineer	**SG**	**A. Pressure**	**98.90 kPa**
Customer	**HP Inc.**	**Mode/Configuration**	**In a call, 5G Pings, sending content**
Customer Contact	**Koby Rosenberg**	**Last Quality Check Date**	**05/31/2022**
Standard(s)	**EN 55032, EN 61000-3-2**	**Test Level**	**See Below**
Criteria Achieved	**A**	**EUT Voltage**	**230 VAC/50 Hz**
EUT Name/Model	**P033**	**Test Status**	**Compliant**

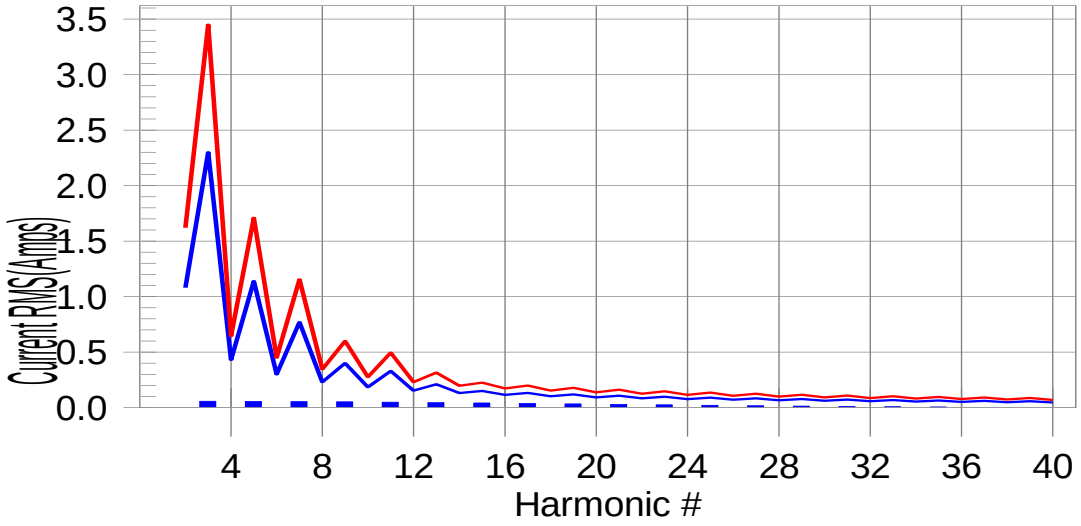
Test Data

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass **Worst harmonic was #17 with 18.97% of the limit.**

Current Test Result Summary

Test Result: Pass **Source qualification: Normal**

THC(A): 0.15 **I-THD(%): 238.87** **POHC(A): 0.050** **POHC Limit(A): 0.251**

Highest parameter values during test:

V_RMS (Volts):	**230.05**	**Frequency (Hz):**	**50.00**
I_Peak (Amps):	**1.037**	**I_RMS (Amps):**	**0.174**
I_Fund (Amps):	**0.064**	**Crest Factor:**	**6.173**
Power (Watts):	**14.0**	**Power Factor:**	**0.352**

Harm #	Harms (avg)	100% Limit	% Of Limit	Harms (max)	150% Limit	% Of Limit	Status
2	0.001	1.080	0.1	0.001	1.620	0.09	Pass
3	0.056	2.300	2.5	0.058	3.450	1.68	Pass
4	0.001	0.430	0.2	0.002	0.645	0.23	Pass
5	0.055	1.140	4.8	0.056	1.710	3.30	Pass
6	0.001	0.300	0.3	0.002	0.450	0.33	Pass
7	0.053	0.770	6.9	0.054	1.155	4.72	Pass
8	0.001	0.230	0.4	0.001	0.345	0.42	Pass
9	0.051	0.400	12.7	0.052	0.600	8.66	Pass
10	0.001	0.184	0.5	0.001	0.276	0.50	Pass
11	0.048	0.330	14.5	0.049	0.495	9.89	Pass
12	0.001	0.153	0.6	0.001	0.230	0.58	Pass
13	0.044	0.210	21.2	0.046	0.315	14.45	Pass
14	0.001	0.131	0.7	0.001	0.197	0.64	Pass
15	0.041	0.150	27.2	0.042	0.225	18.56	Pass
16	0.001	0.115	0.7	0.001	0.173	0.69	Pass
17	0.037	0.132	27.9	0.038	0.199	18.97	Pass
18	0.001	0.102	0.8	0.001	0.153	0.75	Pass
19	0.033	0.118	27.7	0.034	0.178	18.88	Pass
20	0.001	0.092	0.8	0.001	0.138	0.82	Pass
21	0.029	0.107	26.8	0.029	0.161	18.25	Pass
22	0.001	0.084	0.9	0.001	0.125	0.82	Pass
23	0.025	0.098	25.1	0.025	0.147	17.18	Pass
24	0.001	0.077	0.8	0.001	0.115	0.81	Pass
25	0.021	0.090	22.9	0.021	0.135	15.73	Pass
26	0.001	0.071	0.8	0.001	0.106	0.82	Pass
27	0.017	0.083	20.2	0.017	0.125	13.93	Pass
28	0.000	0.066	0.8	0.001	0.099	0.77	Pass
29	0.013	0.078	17.1	0.014	0.116	11.91	Pass
30	0.000	0.061	0.7	0.001	0.092	0.74	Pass
31	0.010	0.073	13.9	0.011	0.109	9.71	Pass
32	0.000	0.058	0.6	0.001	0.086	0.66	Pass
33	0.007	0.068	10.6	0.008	0.102	7.53	Pass
34	0.000	0.054	0.6	0.001	0.081	0.63	Pass
35	0.005	0.064	7.5	0.005	0.096	5.42	Pass
36	0.000	0.051	0.5	0.000	0.077	0.56	Pass
37	0.003	0.061	4.5	0.003	0.091	3.41	Pass
38	0.000	0.048	0.5	0.000	0.073	0.55	Pass
39	0.001	0.058	2.4	0.002	0.087	1.83	Pass
40	0.000	0.046	0.5	0.000	0.069	0.56	Pass

Voltage Source Verification

Test Result: Pass **Source qualification: Normal**

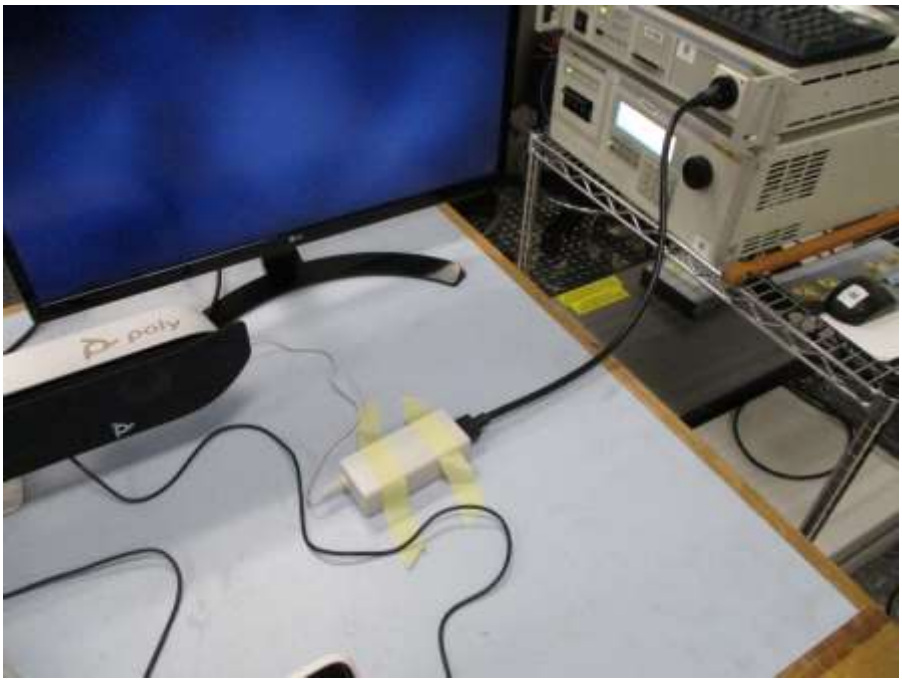
Highest parameter values during test:

Voltage (Vrms):	**230.05**	**Frequency (Hz):**	**50.00**
I_Peak (Amps):	**1.037**	**I_RMS (Amps):**	**0.174**
I_Fund (Amps):	**0.064**	**Crest Factor:**	**6.173**
Power (Watts):	**14.0**	**Power Factor:**	**0.352**

Harm #	Harmonics V-rms	Limit V-rms	% Of Limit	Status
2	0.108	0.460	23.46	OK
3	0.414	2.070	20.00	OK
4	0.087	0.460	18.87	OK
5	0.084	0.920	9.09	OK
6	0.081	0.460	17.51	OK
7	0.064	0.690	9.31	OK
8	0.065	0.460	14.13	OK
9	0.038	0.460	8.24	OK
10	0.042	0.460	9.12	OK
11	0.052	0.230	22.64	OK
12	0.033	0.230	14.13	OK
13	0.048	0.230	21.01	OK
14	0.024	0.230	10.41	OK
15	0.045	0.230	19.62	OK
16	0.025	0.230	10.75	OK
17	0.041	0.230	17.86	OK
18	0.025	0.230	10.80	OK
19	0.051	0.230	22.15	OK
20	0.035	0.230	15.07	OK
21	0.040	0.230	17.28	OK
22	0.019	0.230	8.29	OK
23	0.037	0.230	16.05	OK
24	0.014	0.230	6.28	OK
25	0.032	0.230	14.12	OK
26	0.017	0.230	7.41	OK
27	0.031	0.230	13.37	OK
28	0.013	0.230	5.56	OK
29	0.022	0.230	9.38	OK
30	0.013	0.230	5.78	OK
31	0.024	0.230	10.26	OK
32	0.011	0.230	4.91	OK
33	0.018	0.230	7.74	OK
34	0.011	0.230	4.70	OK
35	0.017	0.230	7.58	OK
36	0.010	0.230	4.18	OK
37	0.011	0.230	4.70	OK
38	0.011	0.230	4.80	OK
39	0.014	0.230	6.06	OK
40	0.015	0.230	6.66	OK

Table 10. Harmonics, Test Results

Photograph 14. Harmonics, Overall Test Setup



Photograph 15. Harmonics, AC Mains Test

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: EN 61000-3-2: Harmonic Current				Test Date(s):	08/30/2022
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1A1051	A/C Power Source	California Instrument	5001IX	09/15/2021	09/15/2022
1A1052	PC Interface	California Instrument	Harmonic/Flicker	09/15/2021	09/15/2022
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1120	Ground Plane	Custom Made	N/A	See Note	
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

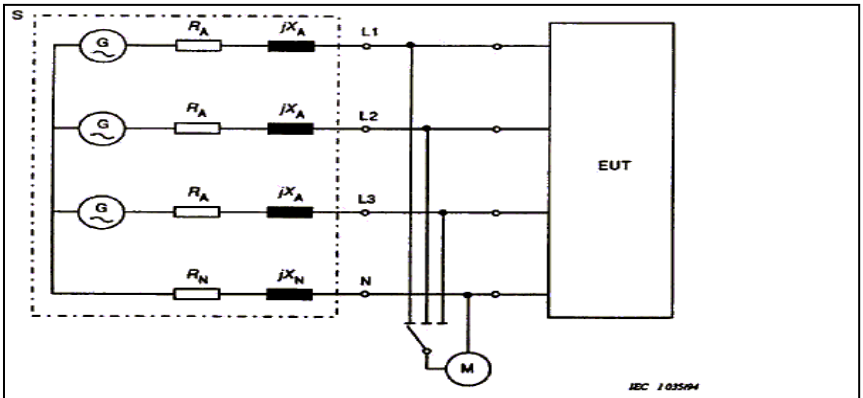
Table 11. Harmonics, Test Equipment

3.5 Voltage Fluctuations (Flicker)

Test Method: **EN 61000-3-3: 2013 –** Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection

Test Requirement(s): The EUT must not produce voltage fluctuations and/or flicker at the supply terminals as measured or calculated according to clause 4, according to limits expressed in *Section 5*, under test conditions described in *Clause 6* and *Annex A* of *EN 61000-3-3*.

Test Procedure: The EUT was operated with an AC main source at 230 VAC/50 Hz. Tests to prove the compliance of the EUT with the limits of *EN 61000-3-3, Clause 5* were made using the test circuit provided in the below figure of *EN 61000-3-3*. The test circuit consisted of the test power supply, the reference impedance, the EUT, and a flickermeter. The test supply voltage (open-circuit voltage) was the rated voltage of the equipment. The test voltage was maintained within ±2 % of the nominal value. The frequency was 50 Hz ±0.5%. The total harmonic distortion of the supply voltage was less than 3%. The limits applicable to voltage fluctuations and flicker at the supply terminals of the EUT were automatically measured with the analyzer. See the test setup photographs for pictures of the test setup.



EUT equipment under test

M measuring equipment

S supply source consisting of the supply voltage generator G and reference impedance Z with the elements:

R_A = 0,24 Ω; jX_A = 0,15 Ω at 50 Hz;

R_N = 0,16 Ω; jX_N = 0,10 Ω at 50 Hz.

The elements include the actual generator impedance.

When the source impedance is not well defined, see 6.2.

G voltage source in accordance with 6.3.

NOTE – In general, three-phase loads are balanced, and R_N and X_N can be neglected, as there is no current in the neutral wire.

Test Circuit for EN 61000-3-3

Test Results:

Test Standard:	EN 55032:2015/A11:2020; CISPR 32: 2015
Test Name	Voltage Fluctuations (Flicker)
Test Dates:	August 30, 2022
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Sergio Gutierrez
Test Results:	Compliant
Additional Notes:	

Test Summary

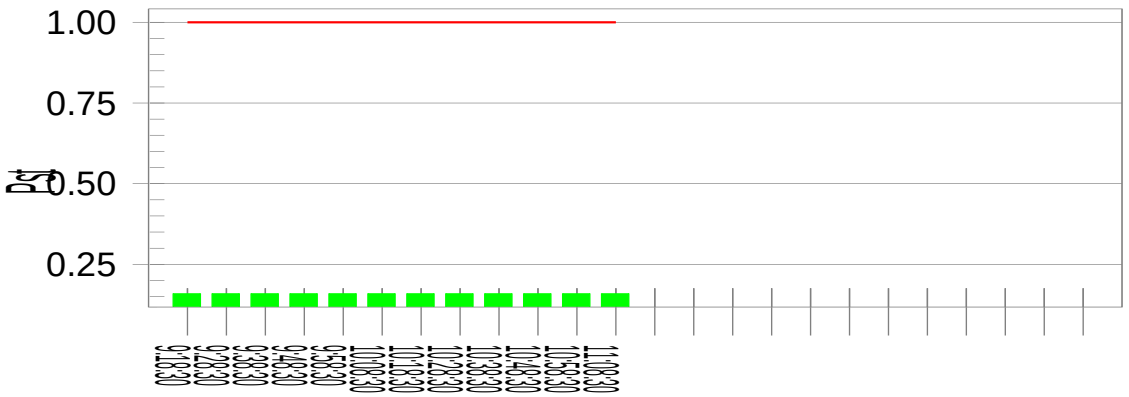
MET Job #	**118717**	**Temperature**	**23.80°C**
Date	**08/30/2022**	**Humidity**	**53.90% RH**
Test Engineer	**SG**	**A. Pressure**	**98.90 kPa**
Customer	**HP Inc.**	**Mode/Configuration**	**In a call, 5G Pings, sending content**
Customer Contact	**Koby Rosenberg**	**Last Quality Check Date**	**05/31/2022**
Standard(s)	**EN 55032, EN 61000-3-3**	**Test Level**	**See below**
Criteria Achieved	**A**	**EUT Voltage**	**230 VAC/50 Hz**
EUT Name/Model	**P033**	**Test Status**	**Compliant**

Test Data

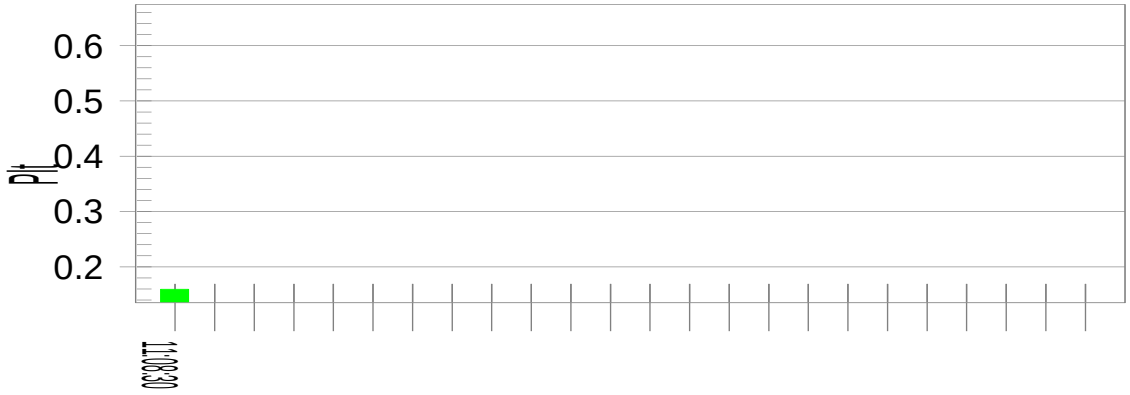
Flicker Test Summary

Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



Plt and limit line

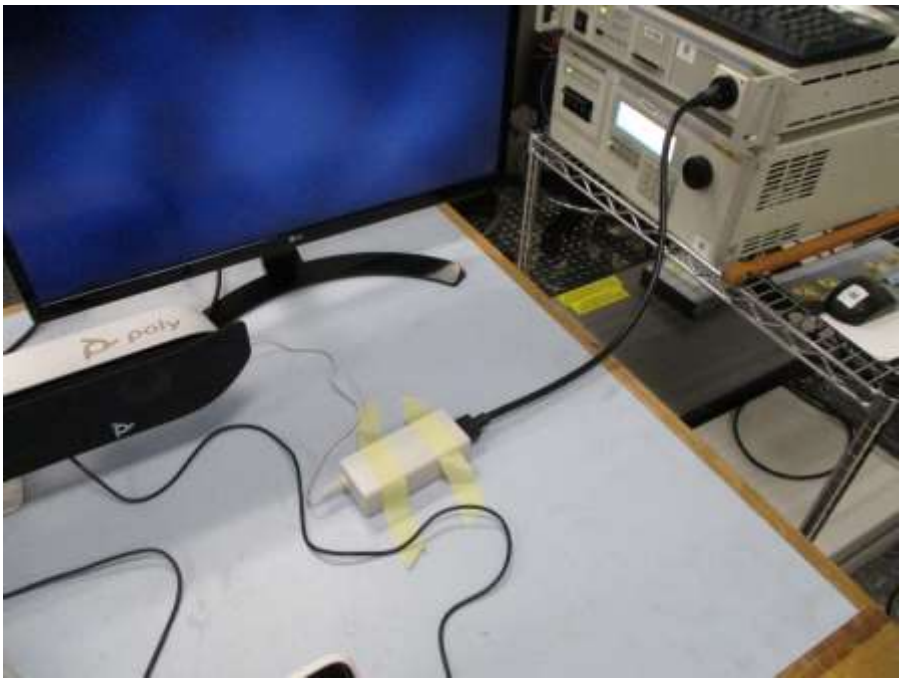


Parameter values recorded during the test:

Vrms at the end of test (Volt):	**228.85**			
Highest dt (%):	**0.16**	**Test limit (%):**	**3.30**	**Pass**
Time(mS) > dt:	**0.00**	**Test limit (mS):**	**500.00**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.10**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.160**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.160**	**Test limit:**	**0.650**	**Pass**

Table 12. Flicker, Test Results

Photograph 16. Flicker, Overall Test Setup



Photograph 17. Flicker, AC Mains Test

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: EN 61000-3-3: Flicker				**Test Date(s):**	**08/30/2022**
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1A1051	A/C Power Source	California Instrument	5001IX	09/15/2021	09/15/2022
1A1052	PC Interface	California Instrument	Harmonic/Flicker	09/15/2021	09/15/2022
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1120	Ground Plane	Custom Made	N/A	See Note	
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 13. Flicker, Test Equipment

4.0 Electromagnetic Compatibility Immunity Criteria

4.1 Electrostatic Discharge

Test Method: The following standards specified below are covered in the scope of this section of the test report:

- **EN 61000-4-2:2009** – Electrostatic Discharge Immunity Test

Test Requirement: The EUT shall be tested with air discharges of up to ±8 kV applied to non-conductive surfaces, and to contact discharges of up to ±4 kV, applied to conductive surfaces of the EUT, HCP and the VCP.

Test Procedure: The EUT was placed on a table, 80 cm above the ground plane. The measurements were performed using normal operation of the equipment and in accordance with EN 61000-4-2. A horizontal coupling plane (HCP), 1.6 m x 0.8 m, was placed on the table. The EUT and cables were isolated from the coupling plane by an insulating support 0.5 mm thick. Air discharges of up to ±8 kV were applied to non-conductive surfaces. Contact discharges of ±4 kV were applied to conductive surfaces of the EUT and the HCP and VCP. Discharges were applied at least ten times to each selected discharge point at each polarity with a minimum time between discharges of 1 s. The functionality of the EUT was determined during and after each discharge. Photographs of the test equipment are provided below.

Test Results:

Test Standard:	EN 55035:2017/A11: 2020; CISPR 35: 2016
Test Name	Electrostatic Discharge
Test Dates:	September 2, 2022
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Sergio Gutierrez
Test Results:	Compliant
Performance Criteria	B
Additional Notes:	

Test Summary

MET Job #	**118717**	**Temperature**	**23.40°C**
Date	**09/02/2022**	**Humidity**	**45.20% RH**
Test Engineer	**SG**	**A. Pressure**	**98.87 kPa**
Customer	**HP Inc.**	**Mode/Configuration**	**In a call, 5G Pings, sending content**
Customer Contact	**Koby Rosenberg**	**Last Quality Check Date**	**09/02/2022**
Standard(s)	**EN 55035, EN 61000-4-2**	**Test Level**	**4 kV/ 8 kV**
Criteria Achieved	**B**	**EUT Voltage**	**230 VAC/50 Hz**
EUT Name/Model	**P033**	**Test Status**	**Compliant**

Test Data

Discharge Type	Test Voltage (+/-kV)	Result/Criteria						Anomalies
		Front	Rear	Right	Left	Top	PSU	
HCP	4	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	N/A	Pass Criteria A	None
VCP	4	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	N/A	Pass Criteria A	None
Contact Discharge	4	N/A	Pass Criteria B	N/A	N/A	Pass Criteria A	N/A	See Note
Air Discharge	2	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	None
	4	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	None
	8	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	None
Note: During – 4 kV contact discharge on the power cable connector, the EUT's call got interrupted and recovered by itself after the discharge. EUT passed the test with criteria B.								

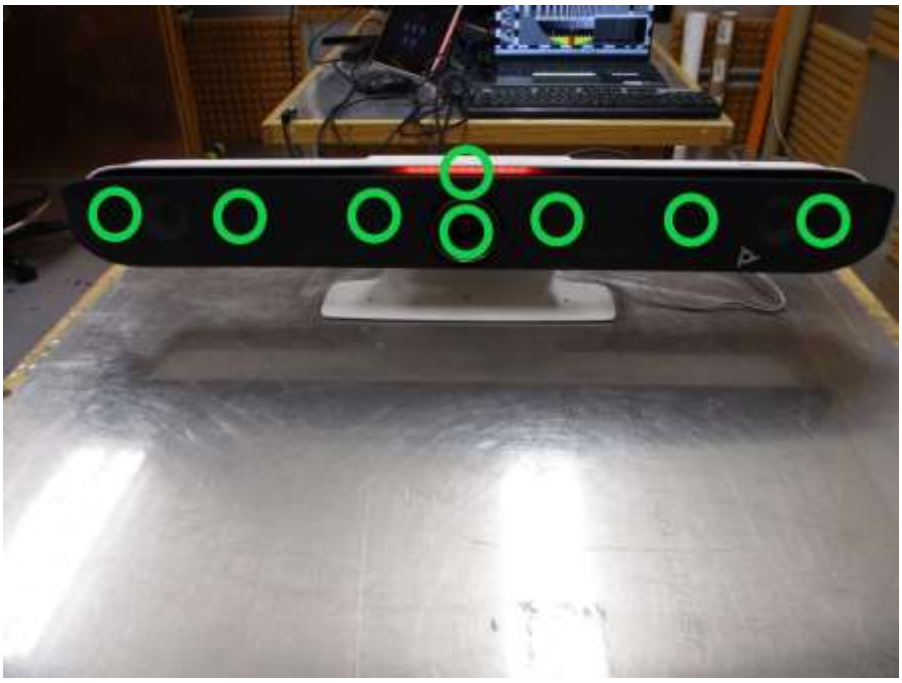
Measurement	Resistance (kΩ)	Limit (kΩ)	Result
Bonding wire w/ 2 series 470 kΩ bleeder resistors (VCP)	938	940 ± 10%	Pass
Bonding wire w/ 2 series 470 kΩ bleeder resistors (EUT Table)	936	940 ± 10%	Pass
Bonding wire w/ 2 series 470 kΩ bleeder resistors (Support Equipment table)	940	940 ± 10%	Pass

Table 14. Electrostatic Discharge, Test Results

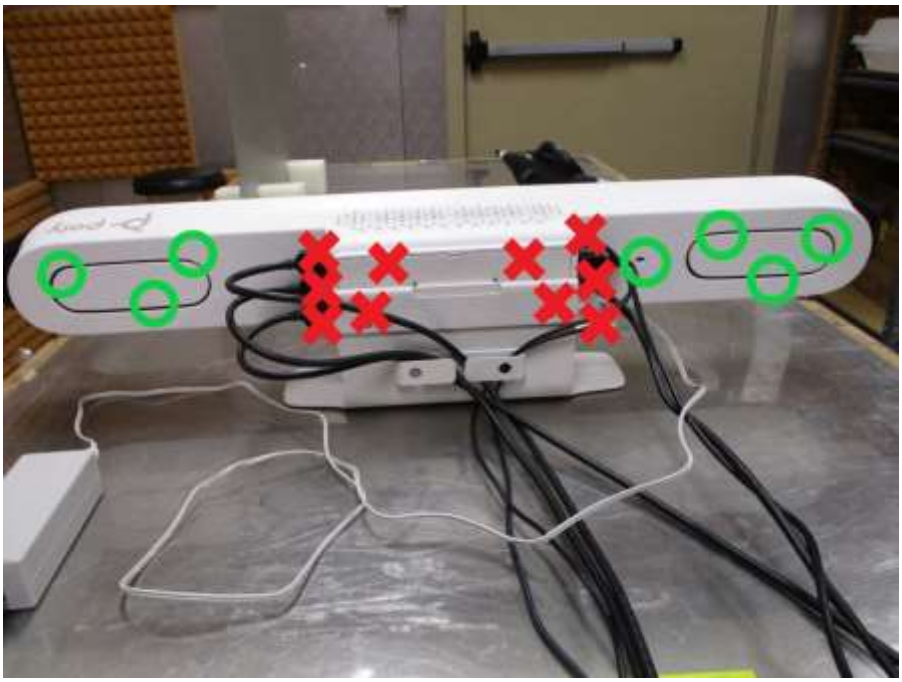
Symbol	Type	Discharged
X	Contact	Yes
X_a	Contact (Anomaly)	Yes
X	Contact	No
O	Air	Yes
O_a	Air (Anomaly)	Yes
O	Air	No

Table 15. Electrostatic Discharge, Marking Key

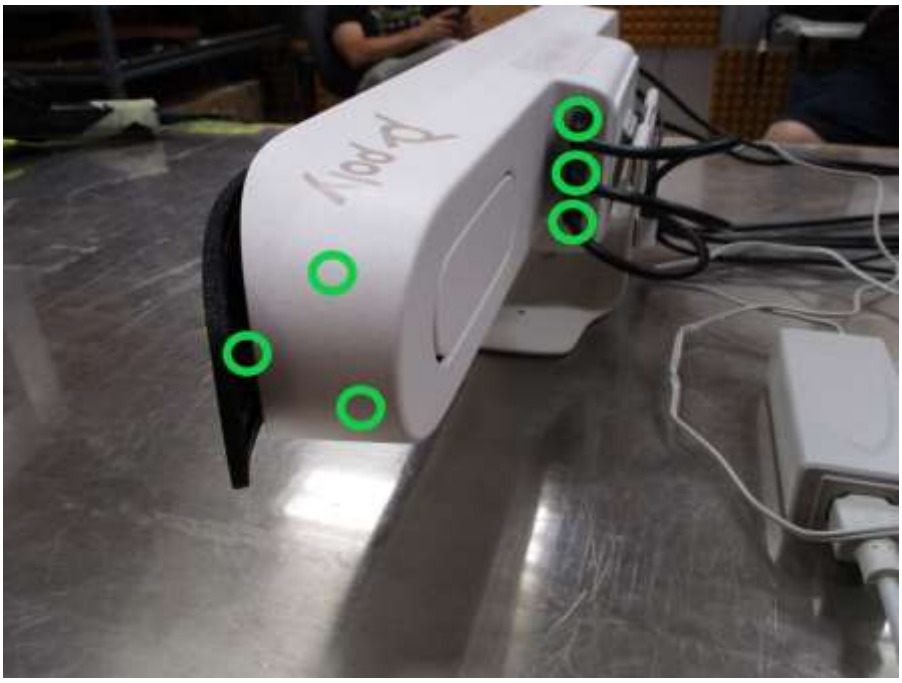
Photograph 18. Electrostatic Discharge, Overall Test Setup



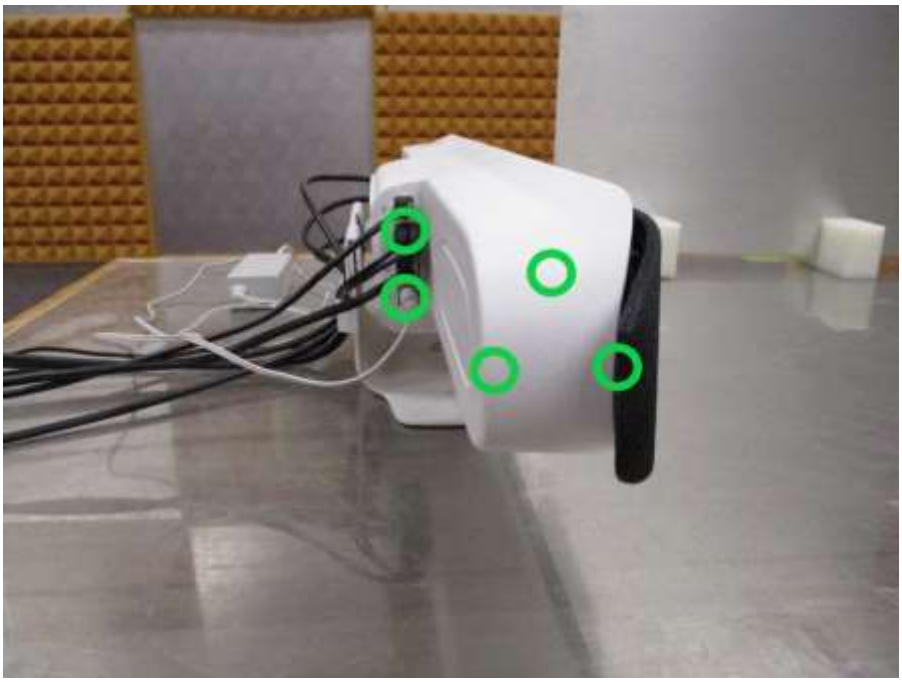
Photograph 19. Electrostatic Discharge, Front Test Points



Photograph 20. Electrostatic Discharge, Rear Test Points

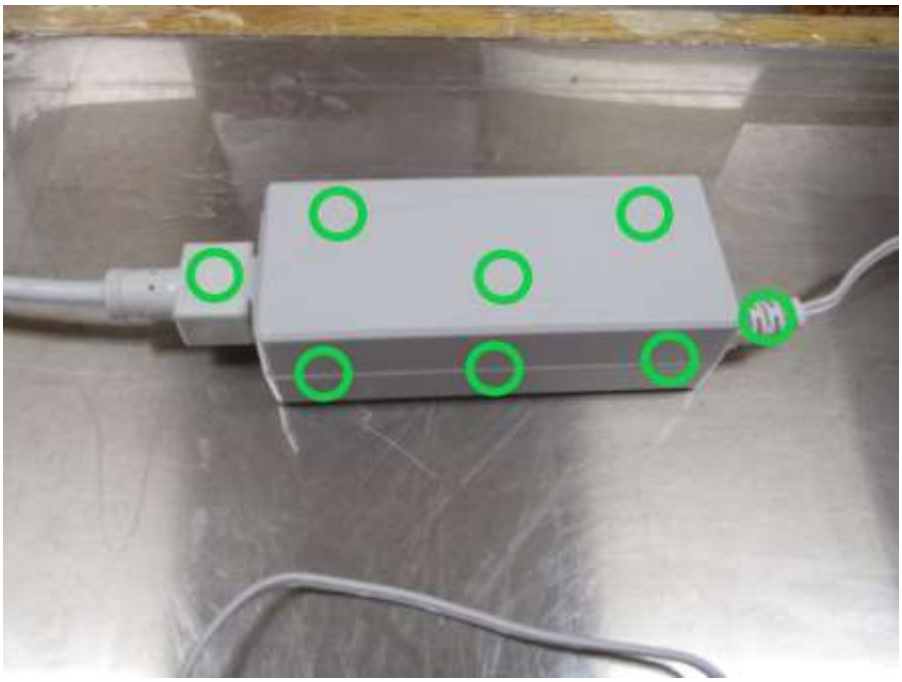


Photograph 21. Electrostatic Discharge, Right Test Points



Photograph 22. Electrostatic Discharge, Left Test Points

Photograph 23. Electrostatic Discharge, Top Test Points



Photograph 24. Electrostatic Discharge, Power Supply Test Points

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: EN 61000-4-2: Electrostatic Discharge				Test Date(s):	09/02/2022
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1A1067	ESD Simulator	EM Test	DITO	05/27/2022	05/27/2023
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1164	True-RMS Multimeter	Fluke	117	10/19/2021	10/19/2022
1A1060	ESD Humidity Chamber	Scientific Climate Control Systems, Inc.	N/A	See Note	
1A1053	Digital Phosphor Oscilloscope	Tektronix	TDS7254B	10/25/2021	10/25/2022
1A1102	Calibration Fixture	EM Test	CTR2	See Note	
1A1167	ESD Test Table - EUT	Custom Made	N/A	See Note	
1A1168	ESD Test Table - Support	Custom Made	N/A	See Note	
1A1163	Vertical Coupling Plane	MET	N/A	See Note	
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 16. Electrostatic Discharge, Test Equipment

4.2 Radio Frequency Electromagnetic Field

Test Method: The following standards specified below are covered in the scope of this section of the test report:

- **EN 61000-4-3:2013 +A1:2008 +A2:2010 –** Radiated, Radio-Frequency, Electromagnetic Field Immunity Test

Test Requirement: The EUT must not be susceptible to a radiated electromagnetic field of 3 V/m, 80% amplitude modulated, in the swept frequency range 80 MHz to 1 GHz and spot frequencies 1.8 GHz, 2.6 GHz, 3.5 GHz, and 5 GHz.

Test Procedure: Testing was performed in a semi-anechoic chamber as recommended by EN 61000-4-3. The EUT was placed on a non-metallic table, 80 cm above the ground plane in the area of field uniformity. The radiating antenna used from 80 MHz to 1 GHz was placed 2. 5 m from the uniform field area. The radiating antenna used the spot frequencies above 1 GHz was placed 1 m from the uniform field area. The amplitude, frequency, and dwell time of the radiated interference was controlled by an automated, computer-controlled system.

The signal source was stepped through the applicable frequency range at a rate no faster than 1% of the fundamental. The signal was amplitude modulated 80% over the frequency range 80 MHz to 1 GHz and spot frequencies at a level of 3 V/m. The dwell time for the swept frequency test was set at 1 s and 60 s for the spot frequencies. Field presence was monitored during testing via a field probe placed in close proximity to the EUT. Throughout testing, the EUT was closely monitored for signs of susceptibility. The test was performed with the antennae oriented in both a horizontal and vertical polarization. Photographs of test setup are presented below.

Test Results:

Test Standard:	EN 55035:2017/A11: 2020; CISPR 35: 2016
Test Name	Radiated Immunity
Test Dates:	August 31, 2022
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Sergio Gutierrez
Test Results:	Compliant
Performance Criteria	A
Additional Notes:	

Test Summary

MET Job #	**118717**	**Temperature**	**22.60°C**
Date	**08/31/2022**	**Humidity**	**49.60% RH**
Test Engineer	**SG**	**A. Pressure**	**98.96 kPa**
Customer	**HP Inc.**	**Mode/Configuration**	**In a call, 5G Pings, sending content**
Customer Contact	**Koby Rosenberg**	**Last Quality Check Date**	**02/02/2022**
Standard(s)	**EN 55035, EN 61000-4-3**	**Test Level**	**3 V/m**
Criteria Achieved	**A**	**EUT Voltage**	**230 VAC/50 Hz**
EUT Name/Model	**P033**	**Test Status**	**Compliant**

Test Data

Frequency Range (MHz)	Step Size (%)	Dwell Time (Seconds)	Voltage Level (V/m)	Polarity	Modulation	Front (0°) Results	Right (90°) Results	Back (180°) Results	Left (270°) Results	Anomalies
80 - 1000	1	1	3	Vertical	80% AM, 1 kHz	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	None
80 - 1000	1	1	3	Horizontal	80% AM, 1 kHz	Pass Criteria A	Pass Criteria A	Pass Criteria A	Pass Criteria A	None

CISPR 35 Spot Frequencies

Frequency (MHz)	Dwell Time (Seconds)	Polarity	Test Results	Anomalies
1800	60	Vertical & Horizontal	Pass Criteria A	None
2600	60	Vertical & Horizontal	Pass Criteria A	None
3500	60	Vertical & Horizontal	Pass Criteria A	None
5000	60	Vertical & Horizontal	Pass Criteria A	None

Table 17. Radiated Immunity, Test Results

Photograph 25. Radiated Immunity, 80 MHz – 1000 MHz, Front View

Photograph 26. Radiated Immunity, 80 MHz – 1000 MHz, Rear View

Photograph 27. Radiated Immunity, 80 MHz – 1000 MHz, Antenna View

Photograph 28. Radiated Immunity, Above 1 GHz, Front View

Photograph 29. Radiated Immunity, Above 1 GHz, Rear View

Photograph 30. Radiated Immunity, Above 1 GHz, Antenna View

Photograph 31. Radiated Immunity, Support Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: EN 61000-4-3: Radiated Immunity				Test Date(s):	08/31/2022
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
80 MHz – 1 GHz					
1A1046	RI 3 M Chamber	ETS - Lindgren		See Note	
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1164	True-RMS Multimeter	Fluke	117	10/19/2021	10/19/2022
1A1082	Multi Device Controller	ETS EMCO	2090	See Note	
1A1030	RF Pwr Meter	Boonton	4232A	10/19/2021	10/19/2022
1A1032	Power Sensor	Boonton	51011	10/19/2021	10/19/2022
1A1061	Starmonitor - Field Monitor & Probe	Amplified Research	FM7004 / FL7000	See Note	
1A1062	Laser Probe Interface	Amplified Research	FL7000	See Note	
1A1115	Laser Powered Field Probe	Amplifier Research	FL7006 Starprobe	10/04/2021	10/04/2022
1A1059	Bi-Log Antenna	Schaffner	CBL 6112B	See Note	
1A1017	RF Signal Generator	IFR Systems	2030	06/23/2022	06/23/2023
1A1085	Amplifier	Amplifier Research	250W1000A	See Note	
1A1178	Dual Directional Coupler	Amplifier Research	DC6180A	See Note	
Above 1 GHz					
1A1109	Horn Antenna	Sunol Sciences Corp	DRH-118	See Note	
1A1063	Signal Generator	Marconi Instruments	2032	03/23/2022	03/23/2023
1A1081	Amplifier	AR Worldwide	50S1G4A	See Note	
1A1045	Dual Directional Coupler	Amplified Research	DC7144M1	See Note	
1A1181	Signal Generator	Keysight Technologies	N5173B 540 UNT	08/05/2022	08/05/2023
1A1137	Amplifier	Communications & Power Industries	VZV-2776K4	See Note	
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 18. Radiated Immunity, Test Equipment

4.3 Fast Transients

Test Method: The following standards specified below are covered in the scope of this section of the test report:

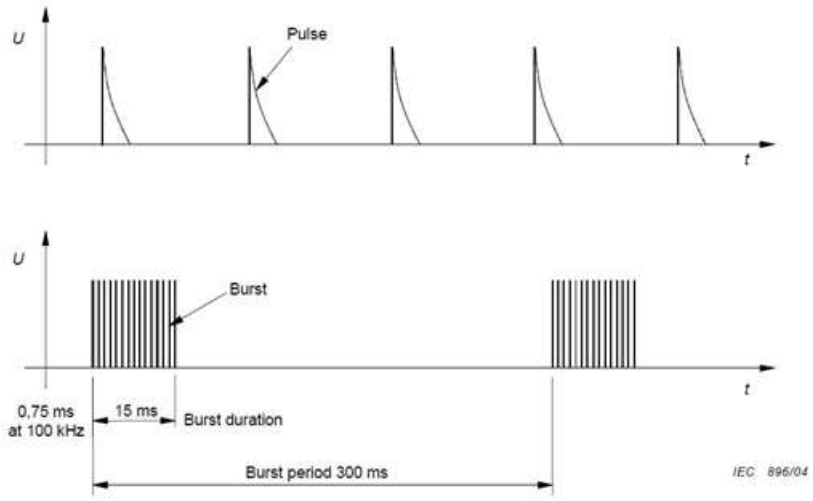
- **EN 61000-4-4: 2004 –** Electrical Fast Transient/Burst Immunity Test

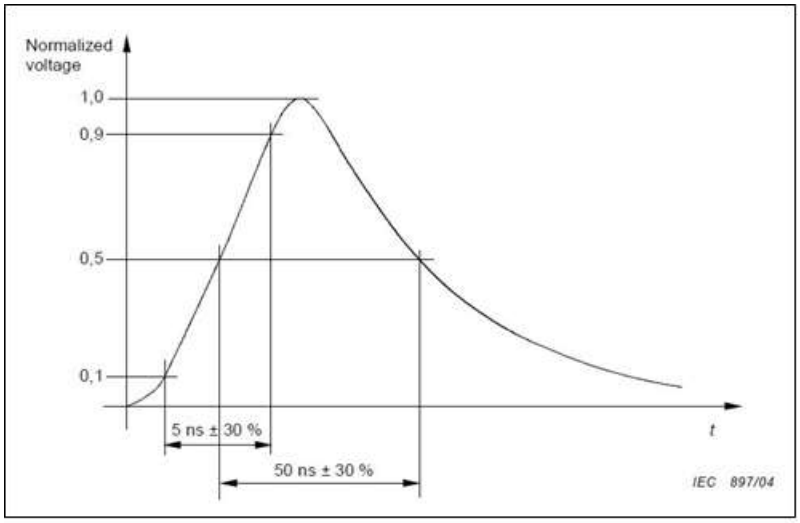
Test Requirement: The EUT shall be tested with the electrical fast transients shown in the test waveform figure, having an amplitude of up to ±1 kV applied to AC power ports and ±0.5 kV applied to DC power ports and signal ports. This is applicable to ports interfacing with cables whose total length according to the manufacturer's functional specification may exceed 3 m. The test setup, test methods, required test equipment, and the test limits of EN 61000-4-4 are to be used.

Test Procedure: The Electrical Fast Transient/Burst (EFT/B) generator and the coupling clamp were mounted to the ground plane. For application of the fast transients to the power lines, power was supplied to the EUT through the EFT/B generator. For application of the fast transients to I/O, data and control lines, the cables were individually placed in the coupling clamp, which was also connected to the EFT/B generator.

The EFT/B generator was operated to couple the required transient bursts to each line of the power input in common mode. Transient bursts were applied for a period not less than one minute with both positive transients and negative transients.

Throughout testing, the EUT was monitored closely for signs of susceptibility.
Photographs of test setup are presented below.





EN 61000-4-4 EFT/B Test Waveform

Test Results:

Test Standard:	EN 55035:2017/A11: 2020; CISPR 35: 2016
Test Name	Fast Transients
Test Dates:	September 1, 2022
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Sergio Gutierrez
Test Results:	Compliant
Performance Criteria	A
Additional Notes:	

Test Summary

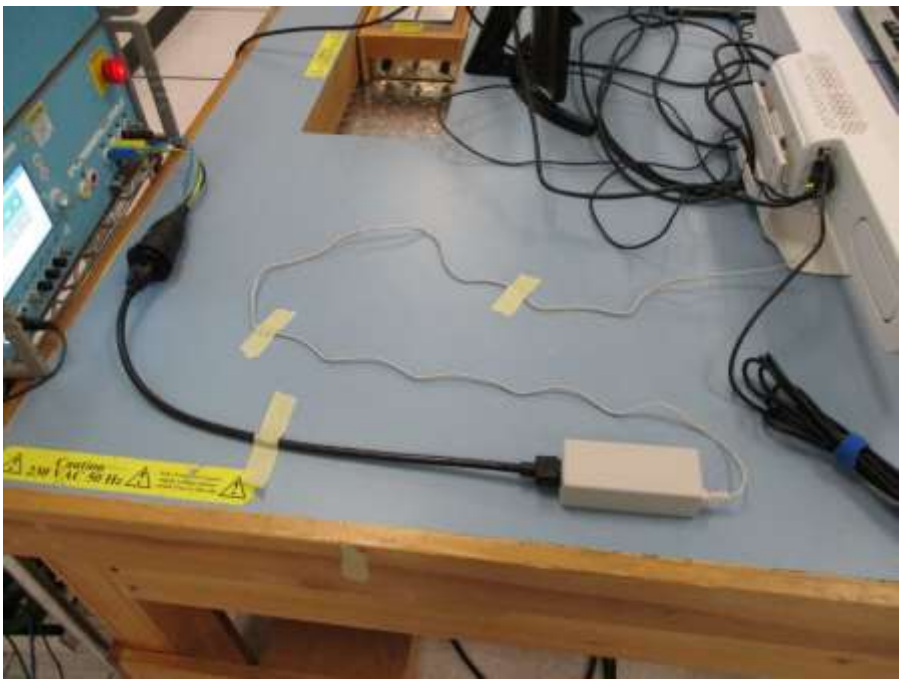
MET Job #	**118717**	**Temperature**	**23.50°C**
Date	**09/01/2022**	**Humidity**	**52.10% RH**
Test Engineer	**SG**	**A. Pressure**	**98.60 kPa**
Customer	**HP Inc.**	**Mode/Configuration**	**In a call, 5G Pings, sending content**
Customer Contact	**Koby Rosenberg**	**Last Quality Check Date**	**06/10/2022**
Standard(s)	**EN 55035, EN 61000-4-4**	**Test Level**	**AC: 1 kV, IO: 0.5 kV**
Criteria Achieved	**A**	**EUT Voltage**	**230 VAC/50 Hz**
EUT Name/Model	**P033**	**Test Status**	**Compliant**

Test Data

Line Under Test	Voltage Level (kV)	Burst Reception	Coupling Method	Test Duration (Seconds)	Result/ Criteria	Anomalies
AC Mains	+/- 1	300 ms/5.0 kHz	Internal CDN	120	Pass Criteria A	None
I/O Cables						
Ethernet Port	+/- 0.5	300 ms/5.0 kHz	CCC	120	Pass Criteria A	None
Microphone Port	+/- 0.5	300 ms/5.0 kHz	CCC	120	Pass Criteria A	None

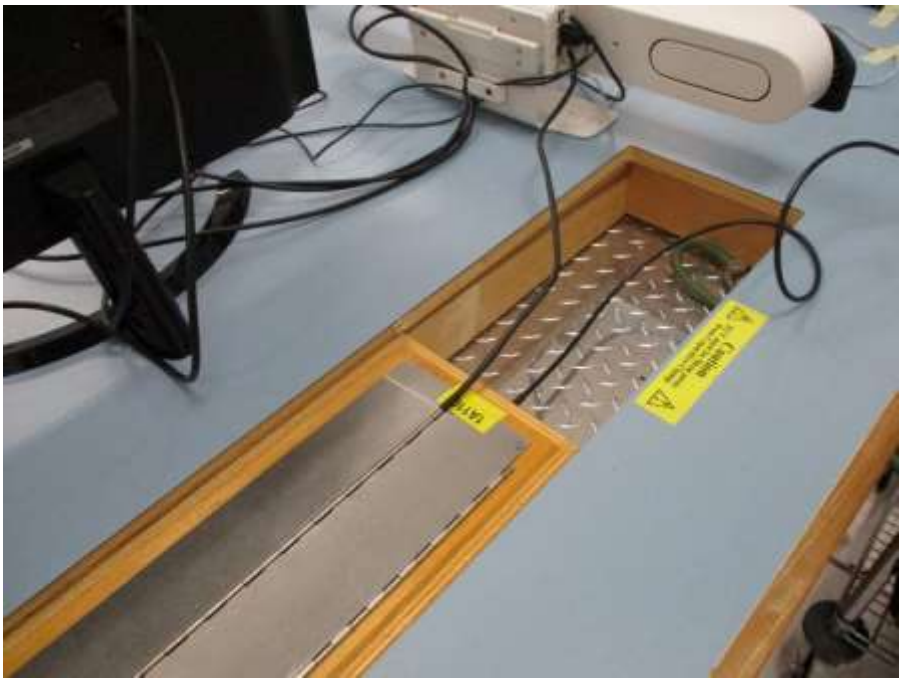
Table 19. Electrical Fast Transient/Burst Immunity, Test Results

Photograph 32. Electrical Fast Transient/Burst Immunity, AC Mains Overall Test Setup

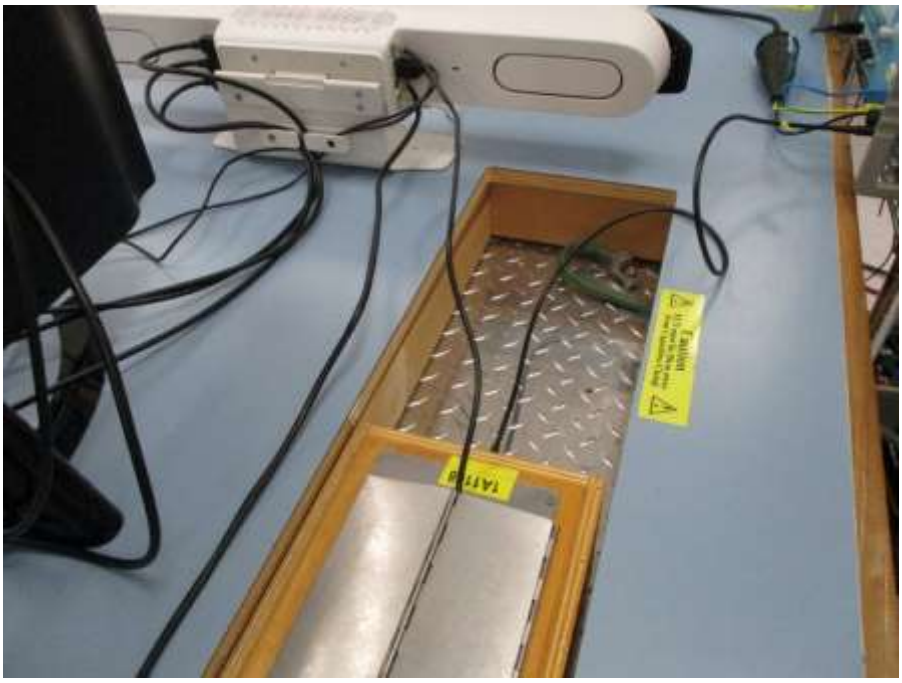


Photograph 33. Electrical Fast Transient/Burst Immunity, AC Mains Test

Photograph 34. Electrical Fast Transient/Burst Immunity, IO Lines Overall Test Setup



Photograph 35. Electrical Fast Transient/Burst Immunity, Ethernet Port Test



Photograph 36. Electrical Fast Transient/Burst Immunity, Microphone Port Test

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: EN 61000-4-4: Electrical Fast Transients/Burst				**Test Date(s):**	**09/01/2022**
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1A1238	Multi-Function Immunity Test System	EMC Partner	IMU MGS with accessory VAR-EXT1000	05/25/2022	05/25/2023
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1164	True-RMS Multimeter	Fluke	117	10/19/2021	10/19/2022
1A1110	Surge/EFTB Test Table	Dell		See Note	
IO Ports Equipment					
1A1108	EFTB Clamp	Schaffner	8014	06/28/2022	06/28/2023
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 20. Electrical Fast Transient/Burst Immunity, Test Equipment

4.4 Surges

Test Method: The following standards specified below are covered in the scope of this section of the test report:

- **EN 61000-4-5: 2006 –** Surge Immunity Test

Test Requirement: The EUT shall be tested with the surge test waveforms shown in accordance with EN 61000-4-5. AC Power Ports shall be tested to surges having an open circuit amplitude of ±1 kV (differential mode), and ±2 kV (common mode). Surges having an open circuit amplitude of ±1 kV (common mode) shall be applied to Signal Ports. This is applicable to ports interfacing with cables which according to manufacturer's specification may connect directly to outdoor cables. The test setup, test methods, required test equipment, and the test limits of EN 61000-4-5 shall be used.

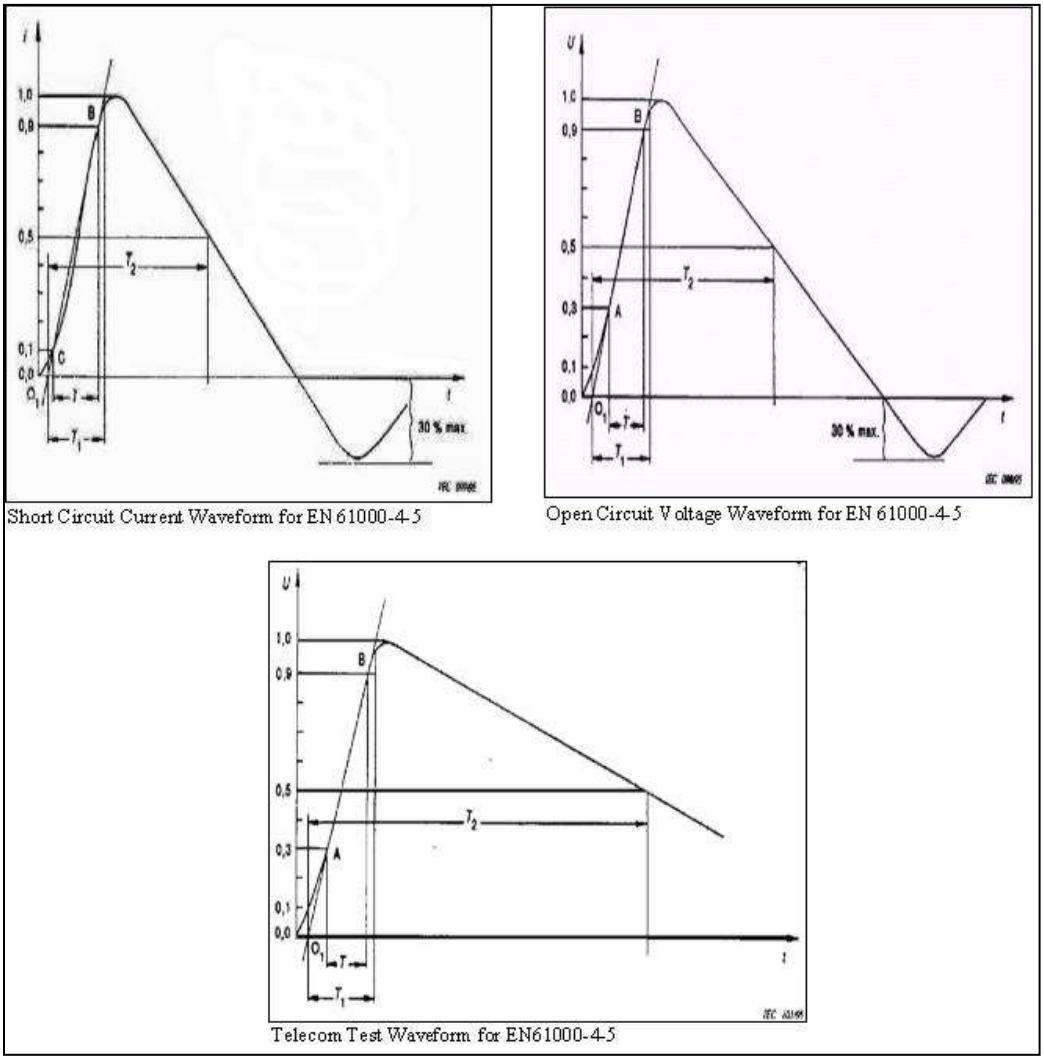
Test Procedure: The EUT was isolated 10 cm above a ground reference plane. For application of the surge to the AC power lines of the EUT, power was supplied to the EUT through the coupling/decoupling section of the surge generator.

Each AC power line under test was subjected to at least five positive and five negative surges at the appropriate voltage and phase angle, at a maximum repetition rate of 1/min. Throughout testing, the EUT was monitored for signs of susceptibility. The provided photographs for pictures of the test setup.

For Signal Ports, a coupling de-coupling network [CDN] was required in order to avoid possible adverse effects on equipment not under test and to provide sufficient decoupling impedance to the surge wave so that the specified wave could be developed on the lines under test. The length of the interconnection line between the CDN and the EUT was no longer than 2 m.

Open Circuit Voltage:	Front Time = 1.2 µs Time to Half = 50 µs
Short Circuit Current:	Front Time = 8 µs Time to Half = 20 µs
Telecom wave parameters:	Front Time = 10 µs Time to Half = 700 µs

Combination Wave Generator Test Parameters for Surge Immunity Testing



EN 61000-4-5 Surge Test Waveforms

Test Results:

Test Standard:	EN 55035:2017/A11: 2020; CISPR 35: 2016
Test Name	Surges
Test Dates:	September 1, 2022
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Sergio Gutierrez
Test Results:	Compliant
Performance Criteria	A
Additional Notes:	

Test Summary

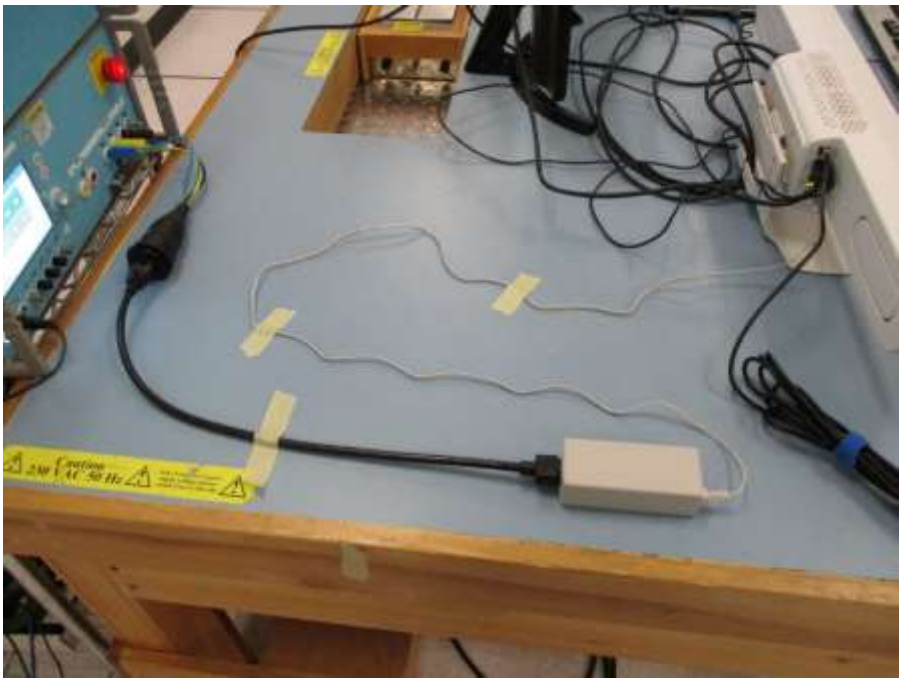
MET Job #	**118717**	**Temperature**	**23.50°C**
Date	**09/01/2022**	**Humidity**	**52.10% RH**
Test Engineer	**SG**	**A. Pressure**	**98.60 kPa**
Customer	**HP Inc.**	**Mode/Configuration**	**In a call, 5G Pings, sending content**
Customer Contact	**Koby Rosenberg**	**Last Quality Check Date**	**06/10/2022**
Standard(s)	**EN 55035, EN 61000-4-5**	**Test Level**	**1 kV/ 2 kV**
Criteria Achieved	**A**	**EUT Voltage**	**230 VAC/50 Hz**
EUT Name/Model	**P033**	**Test Status**	**Compliant**

Test Data

Port Name	Coupling Type	Coupling Method	Surge Repetition (Seconds)	Events per Phase Angle	Voltage Level (kV)	Phase Angle	Result/ Criteria	Anomalies
AC Differential Mode (Line-Neutral)								
AC Mains	L – N	Internal CDN	60	5	+ 0.5	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	L – N	Internal CDN	60	5	- 0.5	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	L – N	Internal CDN	60	5	+ 1	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	L – N	Internal CDN	60	5	- 1	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Common Mode (Line to Ground)								
AC Mains	L – Gnd	Internal CDN	60	5	+ 0.5	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	L – Gnd	Internal CDN	60	5	- 0.5	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	L – Gnd	Internal CDN	60	5	+ 1	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	L – Gnd	Internal CDN	60	5	- 1	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	L – Gnd	Internal CDN	60	5	+ 2	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	L – Gnd	Internal CDN	60	5	- 2	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Common Mode (Neutral to Ground)								
AC Mains	N – Gnd	Internal CDN	60	5	+ 0.5	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	N – Gnd	Internal CDN	60	5	- 0.5	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	N – Gnd	Internal CDN	60	5	+ 1	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	N – Gnd	Internal CDN	60	5	- 1	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	N – Gnd	Internal CDN	60	5	+ 2	0º, 90º, 180º, 270º	Pass Criteria A	None
AC Mains	N – Gnd	Internal CDN	60	5	- 2	0º, 90º, 180º, 270º	Pass Criteria A	None

Table 21. Surges, Test Results

Photograph 37. Surges, Overall Test Setup



Photograph 38. Surges, AC Mains Test

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: EN 61000-4-5: Surge				**Test Date(s):**	**09/01/2022**
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1A1238	Multi-Function Immunity Test System	EMC Partner	IMU MGS with accessory VAR-EXT1000	05/25/2022	05/25/2023
1A1164	True-RMS Multimeter	Fluke	117	10/19/2021	10/19/2022
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1110	Surge/EFTB Test Table	Dell		See Note	
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 22. Surges, Test Equipment

4.5 Radio Frequency, Conducted Continuous

Test Method: The following standards specified below are covered in the scope of this section of the test report:

- **EN 61000-4-6:2009 –** Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields

Test Requirement: This test is applicable for AC and DC power lines connected directly to mains supply and Signal Ports interfacing with cables whose total length according to the manufacturer's functional specification may exceed 3 m.

The AC and DC power lines and applicable Signal Ports shall be tested to an injected level of 3 Vrms. The injection voltage shall be amplitude modulated 80% by a 1 kHz tone over the frequency range of 150 kHz to 80 MHz.

Test Procedure: The EUT was installed 10 cm above a reference ground plane. For power line cables, a Coupling Decoupling Network (CDN) was used for injection. For I/O cables, a CDN or BCI Probe or EM Clamp was used for injection.

Test Results:

Test Standard:	EN 55035:2017/A11: 2020; CISPR 35: 2016
Test Name	Conducted Immunity
Test Dates:	August 30, 2022
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	James Seib
Test Results:	Compliant
Performance Criteria	A
Additional Notes:	

Test Summary

MET Job #	**118717**	**Temperature**	**23.80°C**
Date	**08/30/2022**	**Humidity**	**53.90% RH**
Test Engineer	**SG**	**A. Pressure**	**98.90 kPa**
Customer	**HP Inc.**	**Mode/Configuration**	**In a call, 5G Pings, sending content**
Customer Contact	**Koby Rosenberg**	**Last Quality Check Date**	**05/02/2022**
Standard(s)	**EN 55035, EN 61000-4-6**	**Test Level**	**3 Vrms**
Criteria Achieved	**A**	**EUT Voltage**	**230 VAC/50 Hz**
EUT Name/Model	**P033**	**Test Status**	**Compliant**

Test Data

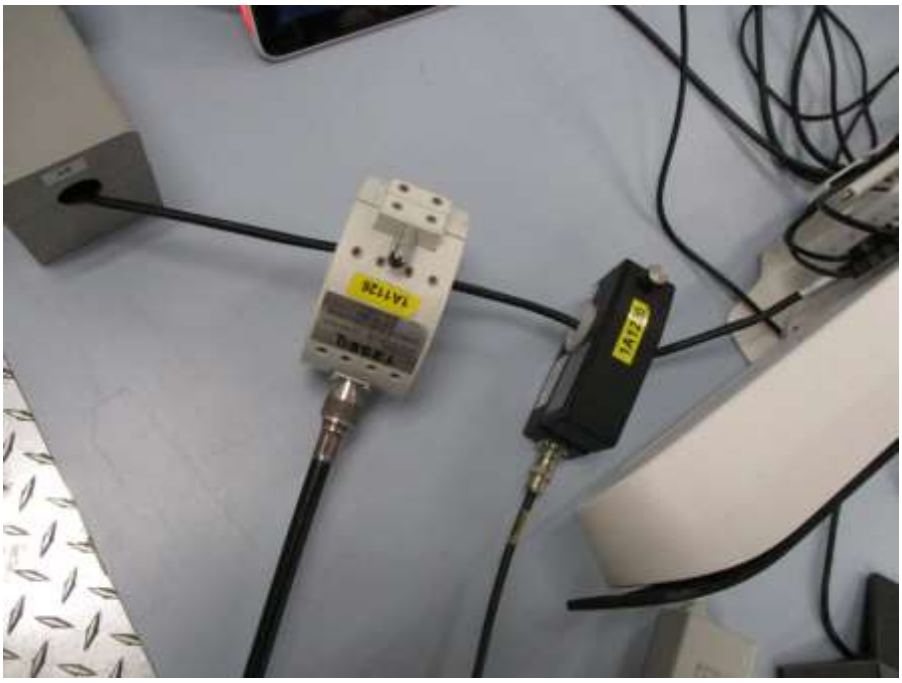
Line Under Test	Dwell Time (Seconds)	Frequency Steps (%)	Frequency (MHz)	Voltage Level (Vrms)	Coupling Method	Result/ Criteria	Anomalies
AC Mains	1	1	0.15 - 80	3	CDN	Pass Criteria A	None
Ethernet Port	1	1	0.15 - 80	3	BCI	Pass Criteria A	None
Microphone Port	1	1	0.15 - 80	3	BCI	Pass Criteria A	None

Table 23. Conducted Immunity, Test Results

Photograph 39. Conducted Immunity, AC Mains Overall Test Setup

Photograph 40. Conducted Immunity, AC Mains Test

Photograph 41. Conducted Immunity, IO Lines Overall Test Setup



Photograph 42. Conducted Immunity, Ethernet Port Test

Photograph 43. Conducted Immunity, Microphone Port Test

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: EN 61000-4-6: Conducted Immunity				Test Date(s):	08/30/2022
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1A1232	Coupling Decoupling Network (CDN 25A)	Com Power	CDN-M325E	11/19/2021	11/19/2022
1A1193	Waveform Generator	Keysight	33612A	08/03/2021	09/03/2022
1A1071	100W Amplifier	Amplified Research	100A250	See Note	
1A1107	10 dB Attenuator	Hewlett Packard	8491 - A	See Note	
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1220	RF Current Probe	Solar Electronics	9207-1	03/04/2022	03/04/2023
1A1164	True-RMS Multimeter	Fluke	117	10/19/2021	10/19/2022
1A1146	Dual Directional Coupler	Werlatone	C2630-10	See Note	
1A1043	RF Pwr Meter	Boonton	4232A	03/03/2022	03/03/2023
1A1015	Spectrum Analyzer	Agilent Technologies	8594E	11/19/2021	11/19/2022
1A1148	100W; 6dB Attenuator	Bird Technologies	100-A-FFN-06	See Note	
1A1101	Power Sensor	Boonton	51011	03/03/2022	03/03/2023
1A1100	Power Sensor	Boonton	51011	03/03/2022	03/03/2023
IO Ports Equipment					
1A1126	Current Injection Probe	TESEQ	CIP 9136A	03/04/2022	03/04/2023
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 24. Conducted Immunity, Test Equipment

4.6 Power Frequency Magnetic Fields

Test Method: The following standards specified below are covered in the scope of this section of the test report:

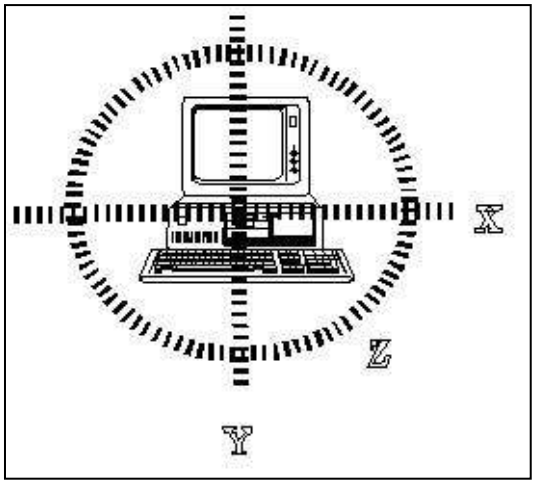
- **EN 61000-4-8:2010** – Power Frequency Magnetic Field Immunity Test

Test Requirement: The EUT must not be susceptible to a power frequency magnetic field of 1 A/m.

Test Procedure: The EUT was placed on a non-conductive table, the power supply, input and output circuits were connected to sources of power supply. All cables were arranged such that at least 1m was exposed to the magnetic field. The inductive coil used has a standard square form with 1m side.

The Magnetic field was calibrated using a magnetic field meter orientated in the center of the radiating loop antenna and the current through the coil adjusted for a 1 A/m field, to obtain homogeneity better than 3 dB. A current measurement clamp was used for setting and measuring the current injected in the inductive coil. The fields were adjusted for a 50 and/or 60 Hz supply frequency. The loop sensor was located 10 ± 0.5 cm and parallel to the surface of the EUT.

The EUT was subjected to the required magnetic field for a period of at least 1 minute at each orientation. Tests were performed at key locations near displays, electronics, and sensors on each side of the EUT. Photographs of test set up are presented below.



Test Results:

Test Standard:	EN 55035:2017/A11: 2020; CISPR 35: 2016
Test Name	Power Frequency, Magnetic Field
Test Dates:	August 30, 2022
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Sergio Gutierrez
Test Results:	Compliant
Performance Criteria	A
Additional Notes:	

Test Summary

MET Job #	**118717**	**Temperature**	**23.80°C**
Date	**08/30/2022**	**Humidity**	**53.90% RH**
Test Engineer	**SG**	**A. Pressure**	**98.90 kPa**
Customer	**HP Inc.**	**Mode/Configuration**	**In a call, 5G Pings, sending content**
Customer Contact	**Koby Rosenberg**	**Last Quality Check Date**	**08/30/2022**
Standard(s)	**EN 55035, EN 61000-4-8**	**Test Level**	**1 A/m**
Criteria Achieved	**A**	**EUT Voltage**	**230 VAC/50 Hz**
EUT Name/Model	**P033**	**Test Status**	**Compliant**

Test Data

Frequency (Hz)	Test Orientation	Test Level (A/m)	Result/ Criteria	Anomalies
50	X-axis	1	Pass Criteria A	None
50	Y-axis	1	Pass Criteria A	None
50	Z-axis	1	Pass Criteria A	None

Measurement Type	Test Level (A/m)	Measurement Reading (%)	Limit (%)	Result
Current Distortion Factor	1	1.70	< 8	Pass

Table 25. Power Frequency, Magnetic Field, Test Results

Photograph 44. Power Frequency, Magnetic Field, Overall Test Setup

Photograph 45. Power Frequency, Magnetic Field, X-Axis Orientation Test

Photograph 46. Power Frequency, Magnetic Field, Y-Axis Orientation Test

Photograph 47. Power Frequency, Magnetic Field, Z-Axis Orientation Test

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: EN 61000-4-8: Magnetic Immunity				**Test Date(s):**	**08/30/2022**
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1A1024	Magnetic Field Loop	FCC	F-1000-4-8/9/10-L-1M	See Note	
3A3097	AC Power Supply	KIKUSUI	PCR12000W2	See Note	
3A3138	Power Quality Analyzer	Fluke	43	04/14/2022	04/14/2023
1A1003	Magnetic Field Meter	Combinova	MFM10	07/07/2022	07/07/2023
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
Note:	Functionality of equipment is verified using calibrated instruments at the time of testing.				

Table 26. Power Frequency, Magnetic Field, Test Equipment

4.7 Voltage Dips and Short Interruptions

Test Method: The following standards specified below are covered in the scope of this section of the test report:

- **EN 61000-4-11:2004** – Voltage Dips, Short Interruptions and Voltage Variations Immunity Test

Test Requirement: The EUT shall be tested for the following voltage dip/short interruption:

Voltage Dips and Short Interruptions		
Unit	**Test level and Characteristic**	**Performance Criterion**
Voltage reduction % Duration Periods	>95% 10 ms or ½ cycle	B
Voltage reduction % Duration Periods	30% 500 ms or 25 cycles	C
Voltage reduction % Duration Periods	>95% 5000 ms or 250 cycles	C

Table 27. Voltage Dips and Short Interruptions Limits

Test Procedure: The EUT was provided with AC power via the programmable power supply. The power supply was programmed to perform the applicable set of voltage dips, interruptions and variations. Each sequence was repeated a minimum of three times to verify the results.

Throughout testing, the EUT was monitored for signs of susceptibility. Photographs of test setup are presented below.

Test Results:

Test Standard:	EN 55035:2017/A11: 2020; CISPR 35: 2016
Test Name	Voltage Dips and Short Interruptions
Test Dates:	September 1, 2022 – September 2, 2022
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Sergio Gutierrez
Test Results:	Compliant
Performance Criteria	A, A, C & A, A, C
Additional Notes:	

Test Summary

MET Job #	**118717**	**Temperature**	**22.60°C**
Date	**09/01/2022 – 09/02/2022**	**Humidity**	**49.20% RH**
Test Engineer	**SG**	**A. Pressure**	**98.74 kPa**
Customer	**HP Inc.**	**Mode/Configuration**	**In a call, 5G Pings, sending content**
Customer Contact	**Koby Rosenberg**	**Last Quality Check Date**	**06/10/2022**
Standard(s)	**EN 55035, EN 61000-4-11**	**Test Level**	**See below**
Criteria Achieved	**See below**	**EUT Voltage**	**See below**
EUT Name/Model	**P033**	**Test Status**	**Compliant**

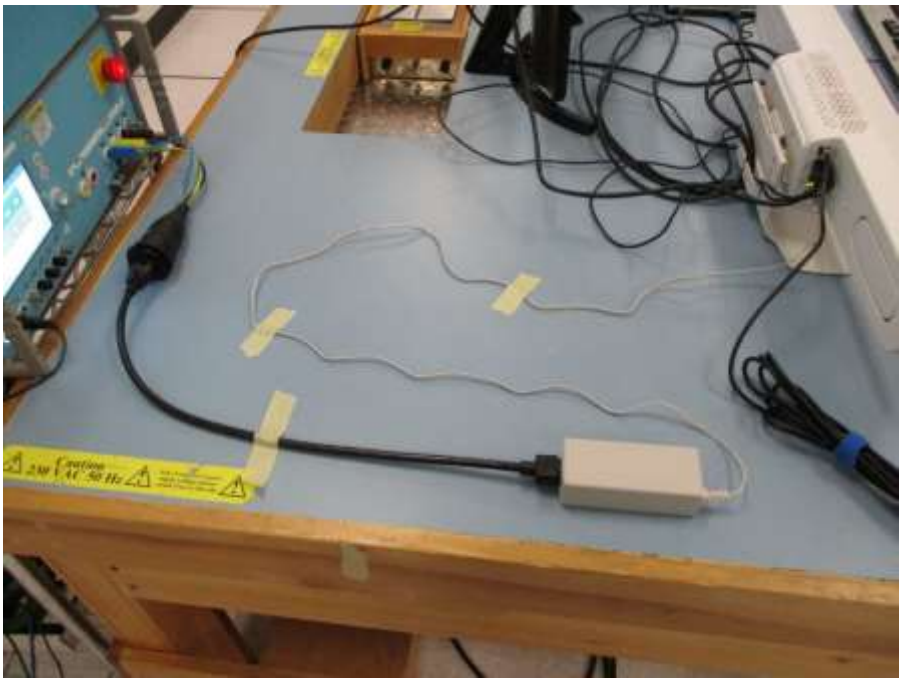
Test Data

240 VAC/50 Hz							
Test Type	**Event Name**	**Duration (milliseconds)**	**Interruption Cycle(s)**	**# Of Test Repetitions**	**Repetition Interval (Seconds)**	**Result/ Criteria**	**Anomalies**
Voltage Dips	0%	10	1/2	5	20	Pass Criteria A	None
Voltage Dips	70%	500	25	5	20	Pass Criteria A	None
Short Interruptions	0%	5000	250	5	20	Pass Criteria C	See Note
Note: EUT turned off during short interruptions test and recovered after completion of the test. Call had to be set manually, therefore EUT complies with criteria C results.							

100 VAC/60 Hz							
Test Type	**Event Name**	**Duration (milliseconds)**	**Interruption Cycle(s)**	**# Of Test Repetitions**	**Repetition Interval (Seconds)**	**Result/ Criteria**	**Anomalies**
Voltage Dips	0%	8.33	1/2	5	20	Pass Criteria A	None
Voltage Dips	70%	500	30	5	20	Pass Criteria A	None
Short Interruptions	0%	5000	300	5	20	Pass Criteria C	None
Note: EUT turned off during short interruptions test and recovered after completion of the test. Call had to be set manually, therefore EUT complies with criteria C results.							

Table 28. Voltage Dips and Short Interruptions, Test Results

Photograph 48. Voltage Dips and Short Interruptions, Overall Test Setup



Photograph 49. Voltage Dips and Short Interruptions, AC Mains Test

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2017.

Test Name: EN 61000-4-11: Voltage Dips, Interrupts, and Variations				**Test Date(s):**	**09/01/2022 – 09/02/2022**
MET Asset #	**Nomenclature**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1A1238	Multi-Function Immunity Test System	EMC Partner	IMU MGS with accessory VAR-EXT1000	05/25/2022	05/25/2023
1A1057	Surge Generator	Schaffner	Module 6150	10/27/2021	10/27/2022
3A3118	Temperature, Humidity and Pressure Recorder	Omega Engineering	OM-CP-PRHTEMP2000	10/22/2021	10/22/2022
1A1164	True-RMS Multimeter	Fluke	117	10/19/2021	10/19/2022
3A3009	Programable power supply	KIKUSUI	PCR2000L	See Note	
Note:	Functionally tested equipment is verified using calibrated instrumentation at the time of testing.				

Table 29. Voltage Dips and Short Interruptions, Test Equipment

END OF REPORT