Appendix A
Spot Check Summary Document

Applicant	:	GOOGLE 1600 AMPHITEATRE PARKWAY MOUNTAIN VIEW, CA 94043, U.S.A.
Model	:	NC2-6A5
FCC ID	:	A4RNC2-6A5B
IC	:	10395A-NC26A5
EUT Description	:	Multimedia Device with BLE/BT, 2.4Ghz and 5GHz WLAN Radios
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C FCC 47 CFR PART 15 SUBPART E ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date Of Issue:
June 18, 2018

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP TESTING
NVLAP LAB CODE 200065-0

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UL VERIFICATION SERVICES INC.
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: GOOGLE
1600 AMPHITEATRE PARKWAY
MOUNTAIN VIEW, CA 94043, U.S.A

EUT DESCRIPTION: Multimedia Device with BLE/BT, 2.4Ghz and 5GHz WLAN Radios

MODEL: NC2-6A5

SERIAL NUMBER: MLB1(Conducted)
G1172786 (Radiated)

DATE TESTED: March 13 – May 10, 2018

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 2	Complies
ISED RSS-GEN Issue 5	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:

Francisco de Anda
CONSUMER TECHNOLOGY DIVISION
Operations Leader
UL Verification Services Inc.

Prepared By:

Eric Yu
CONSUMER TECHNOLOGY DIVISION
Test Engineer
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 558074 D01 v4, FCC KDB 789033 D02 v02r01, ANSI C63.10-2013, RSS-GEN Issue 5, and RSS-247 Issue 2.

For Canada, testing was originally done under RSS-247 Issue 1 also meets the RSS-247 Issue 2 requirements currently in effect.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☒ Chamber A (ISED:2324B-1)	☐ Chamber D (ISED:22541-1)
☐ Chamber B (ISED:2324B-2)	☐ Chamber E (ISED:22541-2)
☐ Chamber C (ISED:2324B-3)	☐ Chamber F (ISED:22541-3)
	☐ Chamber G (ISED:22541-4)
	☐ Chamber H (ISED:22541-5)

The above test sites and facilities are covered under FCC Test Firm Registration # 208313.

Chambers A through C are covered under ISED company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under ISED company address code 22541 with site numbers 22541 -1 through 22541-5, respectively.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at NVLAP Lab Search.

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47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

Uncertainty figures are valid to a confidence level of 95%.

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5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a Multimedia Device with BLE/BT, 2.4Ghz and 5GHz WLAN Radios.

6. SCOPE OF DOCUMENT

This document is intended to provide Spot test data summary for the following C2PC changes on FCC ID: A4RNC2-6A5B/IC ID: 10395A-NC26A5 for the Chromecast multimedia device;

- Power reduction for channel 36, 802.11 HT20 mode and Channel 64, 802.1 11a mode
- 5GHz Antenna gain change from 2.1dBi to 4dBi

RESULTS;

OUTPUT POWER

Original and new power levels for channel 36, 802.11 HT20 mode , and Channel 64, 802.1 11a mode

			Original Chain 0		Refresh Chain 0		
Mode	**CHANNEL**	**FREQ (MHz)**	**POWER SETTING**	**AVG POWER (dBm)**	**NEW POWER SETTING**	**AVG POWER (dBm)**	**Delta**
11a	64	5320	15	14.98	14	14.26	-0.72
11n HT20	36	5180	13	13.21	13	13.15	-0.06

RESTRICTED BANDEDGE

Original and new power levels for channel 36, 802.11 HT20 mode , and Channel 64, 802.1 11a mode

			Original			New			
	Mode	Channel	Frequency (GHz)	Corrected reading	**ave** Margin	Frequency (GHz)	Corrected reading	**ave** Margin	
BE	11a	5320	5.35	48.36	-5.64	5.35	53.12	-0.88	4.76
BE	11a	5500*	5.428	47.11	-6.89	54.46	47.92	-6.08	0.81
BE	n20	5180	5.149	51.12	-2.88	5.15	51.53	-2.78	0.1

*Highest power BE channel

RSE SPOT CHECKS WITH NEW ANTENNA GAIN

NC2-6A5 5GHz Spot testing									
		Original			New				
		Channel	Frequency (GHz)	Corrected reading	PK Margin	Frequency (GHz)	Corrected reading	PK Margin	Delta
RSE	11a	5180	15.6	52.05	-1.95	15.6	48	-6	-4.05
		5320	5.35	48.36	-5.64	5350	53.12	-0.88	4.76
	n20	5200	15.601	66.13	-7.87	15.603	66.8	-7.2	0.67
		5300	15.893	61.49	-12.51	15.898	62.75	-11.25	1.26
		5580	2.435	39.82	-28.38	2.434	36.13	-32.07	-3.69
		5785	2.44	39.86	-28.34	2.436	37.24	-30.96	-2.62
		5825	2.438	47.36	-6.64	3.883	41.8	-12.2	-5.56
	n40	5230	15.69	45.35	-8.65	3.846	39.17	-14.83	-6.18
	ac80	5775	3.85	36.85	-17.15	3.85	40.49	-13.51	3.64
	ac80	5775	5.11	48.25	-5.75	5.117	48	-6	-0.25

7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Amplifier, 10KHz to 1GHz, 32dB	Agilent (Keysight) Technologies	8447D	T15	08/14/2018
RF Preamplifier, 1 - 26GHz	Agilent	8449B	T404	07/23/2018
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	T130	06/15/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T862	06/09/2018
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1454	01/08/2019
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	Ver 9.5, Dec 01, 2016	

NOTES:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

END OF DOCUMENT

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